

TECHNICAL PROPOSAL

REPLACEMENT OF I-81 BRIDGES OVER RTE. 11, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER

Smyth County/ City of Atkins, Virginia

State Project No.: 0081-086-818; 0081-086-742

Federal Project No.: BR-081-1(336)

Contract ID Number: C0097555DB102



Due December 6, 2018

Submitted to:



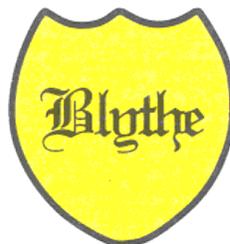
Submitted by:





Section 4.1

Letter of Submittal





BLYTHE DEVELOPMENT COMPANY

1415 EAST WESTINGHOUSE BOULEVARD • CHARLOTTE, NORTH CAROLINA 28273 • TEL (704) 588-0023 • FAX (704) 588-9935

December 6, 2018

Commonwealth of Virginia Department of Transportation (VDOT)
Central Office Mail Center - Loading Dock Entrance
1401 East Broad Street
Richmond, VA 23219
Attention: Suril R. Shah, P.E. (APD Division)

RE: Technical Proposal I-81 Bridges over Rte. 11, Norfolk Southern Railway & Middle Fork Holston River
State Project No. 0081-086-818; 0081-086-742

Dear Mr. Shah:

Blythe Development Company (Blythe) is pleased to submit one original paper version of our Technical Proposal, ten abbreviated copies of the original paper version, and one CD-ROM containing the entire original in a single PDF file to provide design-build services for the subject project. The following requested information and/or attachments as set forth in Section 4.1 are included:

- 4.1.2 It is the intent of Blythe Development Company (Blythe), if selected, to enter into a contract with VDOT for the Project in accordance with the terms of this RFP.
- 4.1.3 Pursuant to Part 1, Section 8.2, Blythe declares that the offer represented by the Technical and Price Proposals will remain in full force and effect for one hundred twenty (120) days after the date the Technical Proposal is actually submitted to VDOT ("Technical Proposal Submission Date").
- 4.1.4 Richard Kirkman, P.E., Design-Build Project Manager, will serve as the Point of Contact for the Offeror:
1415 E. Westinghouse Boulevard, Charlotte, NC 28273 P: (704) 588-0023 F: (704) 588-9935
rkirkman@blythedevelopment.com
- 4.1.5 Luke Blythe, Vice President of Operations, will serve as the Principal Officer for the Offeror.
1415 E. Westinghouse Boulevard, Charlotte, NC 28273 P: (704) 588-0023 F: (704) 588-9935
lblythe@blythedevelopment.com
- 4.1.6 Our Final Completion Date is May 23, 2022. There are no Interim Completion Dates.
- 4.1.7 We do not offer any Unique Milestone dates.
- 4.1.8 Executed Proposal Payment Agreement, in the form set forth in Attachment 9.3.1
- 4.1.9 Section 11.8.6 with supporting documentation in the Appendix
- 4.1.10 Blythe is committed to achieving a 4% DBE participation goal for the entire value of the contract

Acknowledgement of Receipt of RFQ, Revisions, and /or Addenda (Form C-78-RFQ) and SOQ Checklist are completed and included in the appendix.

Our Team (Blythe and TG) is enthusiastic about the opportunity to participate in the design-build process for the subject project and is confident we will complete this project on time and within budget. Collectively, Blythe and Timmons Group bring the leadership, skills and shared core values to assist VDOT in delivering a project that sets the standards for others to follow.

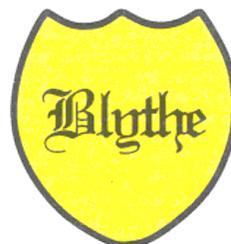
Sincerely,

Luther J. Blythe, Jr
Vice President of Operations



Section 4.2

Offeror's Qualifications



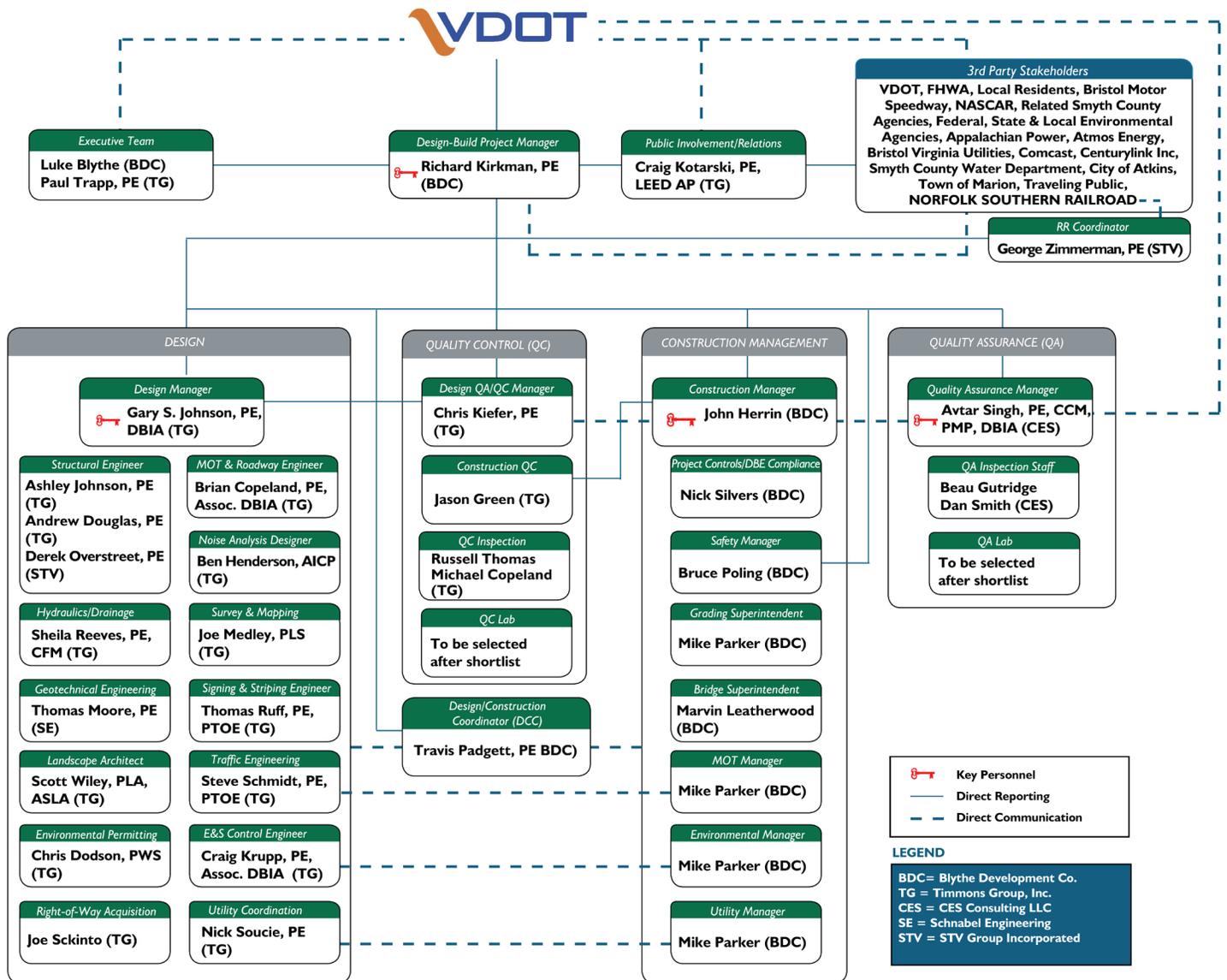
4.2 OFFEROR'S QUALIFICATIONS

4.2.1 INFORMATION IN THE SOQ REMAINS TRUE

The information contained in our Statement of Qualifications (SOQ) remains true and accurate. The Blythe Team has not made any changes to our Lead Contractor, Lead Designer, or other Key Personnel or individuals that would require prior written approval from VDOT.

4.2.2 ORGANIZATIONAL CHART AND FUNCTIONAL RELATIONSHIP NARRATIVE

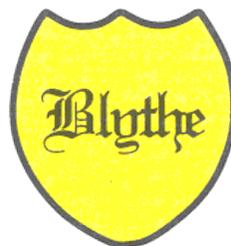
The organizational chart remains the same as that provided in our original SOQ. As there are no changes to the organizational chart, the narrative of the functional relationships denoted in the SOQ remains unchanged.





Section 4.3

Design Concept



4.3 DESIGN CONCEPT

4.3 DESIGN CONCEPT OVERVIEW

The Blythe Team has developed a comprehensive design to meet or exceed all of VDOT’s requirements and expectations for the project. Coupled with the drawings in Volume II, a detailed description of the design concept is included in the following sections. We confirm that the proposed design a) meets or exceeds all requirements listed in the Design Criteria Table, b) provides limits of construction (including all stormwater management facilities) that are within the existing/proposed right of way limits shown in the RFP Conceptual Plans (with the exception of permanent or temporary easements), and c) does not include design elements that require Design Exceptions and/or Design Waivers (unless identified or included in RFP).

While the narrative description and plans will detail them further, the following is a summary of our major design enhancements for the project:

Design Enhancement	Resulting Project Benefit
Piers parallel to railroad corridor	Better accommodates future widening
I-81 NB & SB horizontal alignment shifts allow for construction of center bridge section	Simplifies MOT, no ROW needs, accommodates future widening
Drilled shafts utilized in place of spread footings	Faster construction, fewer environmental impacts, smaller footprint, reduced scour risk
Constant cross-slope of bridge section, consistent with grade of NS & Route 11	Reduced fill requirements for both proposed and future construction
Elimination of Route 11 reconstruction	Reduced MOT requirements, faster construction, reduction in impacts to the traveling public
Flowing Springs Road remains untouched	Reduction in impacts to the traveling public
I-81 NB & SB vertical alignments designed to minimize elevation difference between existing and proposed corridors	Reduction in I-81 full-depth reconstruction areas, simplifies MOT and traffic shifts, eliminates large cut/fill slopes, eliminates future ROW needs
I-81 NB & SB corridors designed to accommodate the future widening of I-81 while maintaining the minimum vertical clearance for NS and Route 11	Reduces design and construction requirements of future improvements, future Route 11 reconstruction will not be required with I-81 widening
Construction limited to within existing right of way – no permanent drainage or utility easements required	Streamlined schedule, minimize potential environmental risks, eliminate impacts to adjacent properties
Dedicated Railroad Coordinator	Minimize or eliminate delays
Minimal to no stream impacts	Streamline environmental coordination and permitting

4.3.1 CONCEPTUAL ROADWAY PLANS

Our conceptual roadway plans are included in Volume II. Specifics as to the questions denoted in the RFP are as follows:

4.3.1 (A) GENERAL GEOMETRY

The Replacement of I-81 Bridges Over Route 11, NS Railroad, and the Middle Fork of the Holston River requires the horizontal and vertical reconstruction of I-81 Northbound and Southbound from 1.95 miles North of Exit 50 to 2.67 miles North of Exit 50, for a total length of approximately 0.72 miles, including bridge length.

4.3 DESIGN CONCEPT

With the primary purpose of the project being to replace the aging structural elements within the project limits, the Blythe Team has developed the roadway geometry to accommodate bridge reconstruction while meeting all clearance requirements for Route 11 and Norfolk Southern (NS) Railroad. While meeting these requirements, we have been able to reduce the overall length of the project by approximately 20% as compared to the RFP Conceptual Plans. The result of this modification is faster construction with fewer impacts to the traveling public, while meeting the project goals.

I-81 is functionally classified as a Rural Principal Arterial Interstate. The VDOT geometric design standard that will be used for I-81 will be GS-1 in rolling terrain with a minimum design speed of 75 mph. The typical section will include two 12 foot-wide travel lanes with 4 to 10 foot left and 10 foot right paved shoulders in each direction. The proposed typical section will accommodate the MGS standard guardrail.

I-81 is vertically divided between I-81 NB and I-81 SB through a portion of the project requiring the use of concrete median barrier intended to vertically separate opposing travel ways. The vertical profiles and superelevation of I-81 NB and I-81 SB have been set such that the vertical difference at the median point is within the tolerance allowed for use of the VDOT Standard MB-12 and MB-13 barrier, thus eliminating the need for true retaining walls through the median. In addition, the proposed median surface treatment between the barrier faces will eliminate the need for mowing and regular maintenance across a significant region of the project.

Route 11 (Lee Highway) is functionally classified as a Rural Minor Arterial consistent with the GS-2 VDOT Geometric Design Standard, in rolling terrain, with a minimum design speed of 60 mph. As a result of the design enhancements proposed by the Blythe Team, reconstruction of Route 11 as shown in the RFP Plans has been eliminated from the project. The 16'-6" minimum vertical clearance is maintained largely due to the use of a constant cross-slope bridge deck which follows the existing topography of Route 11. In addition, the Blythe Team's structural design provides for a location and skew of the bridge components which meet the necessary horizontal clearance and sight distance requirements along existing Route 11. As a further enhancement, with no reconstruction required along Route 11, Flowing Springs Road will also remain in its existing condition with no modifications required.

The Blythe Team understands the primary objective of the project to be the replacement of the I-81 Bridges, with the reconstruction of Route 11 being secondary and only as necessary to accomplish the bridge replacement. Per the RFP, I-81 and Route 11 shall be reconstructed to attain minimum vertical clearance over Route 11 and NS Railroad. By applying the design principles discussed above to improve both the horizontal and vertical clearance for existing Route 11, our team will meet or exceed the RFP requirements without triggering the need for lowering or re-aligning Route 11 in the proposed or future widening conditions.

In Volume II we have included a summary of the design criteria including the major geometric elements in addition to the design criteria listed in the RFP Part 2 Attachment 2.2.



Figure 4.3.1(a): Route 11 Existing Conditions to Remain
- Proposed Clearance to be 16'-6" Min.

4.3 DESIGN CONCEPT

In addition, Volume II contains a summary of the various Design Waivers and Exceptions either granted or requested by VDOT. It should be noted that the complete Design Criteria Table is provided (including criteria for Route 11); however, as demonstrated above, Route 11 will not be reconstructed and therefore these minimum geometric design requirements (i.e. lane width, superelevation, etc.) have not been applied to the existing roadway which will remain in its current configuration.

4.3.1 (B) HORIZONTAL ALIGNMENTS

Horizontal alignments have been developed to facilitate the combination of three critical components: bridge location to meet structural clearances, minimizing public inconvenience during construction, and simplifying the future widening of I-81. The horizontal alignments detailed in Volume II meet or exceed the RFP requirements, promote a simplified future widening, and tie to the existing alignments as efficiently as possible.

4.3.1 (C) MAXIMUM GRADE FOR SEGMENTS AND CONNECTORS

Our team has developed vertical alignments that meet or exceed the requirements of the RFP, as further detailed in Volume II. Our design has been enhanced from the RFP design by minimizing vertical grade difference between the existing and proposed I-81 pavement elevations. By working to minimize this difference, our team has developed a profile which reduces the need for full-depth reconstruction of I-81 while maintaining the 23' vertical clearance for NS Railroad as shown in Figure 4.3.1(c)(1) and 4.3.1(c)(2).

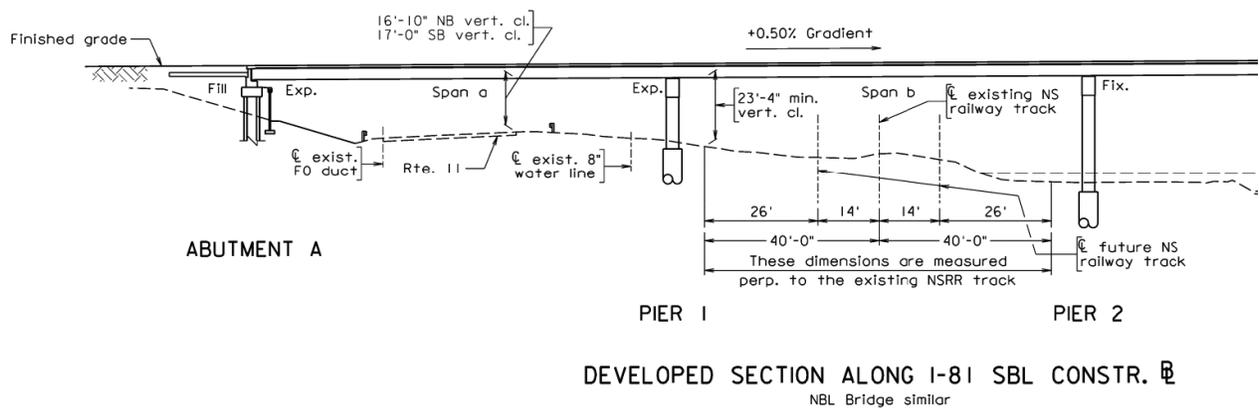


Figure 4.3.1(c)(1): Proposed Bridge Clearance to Route 11 and NS

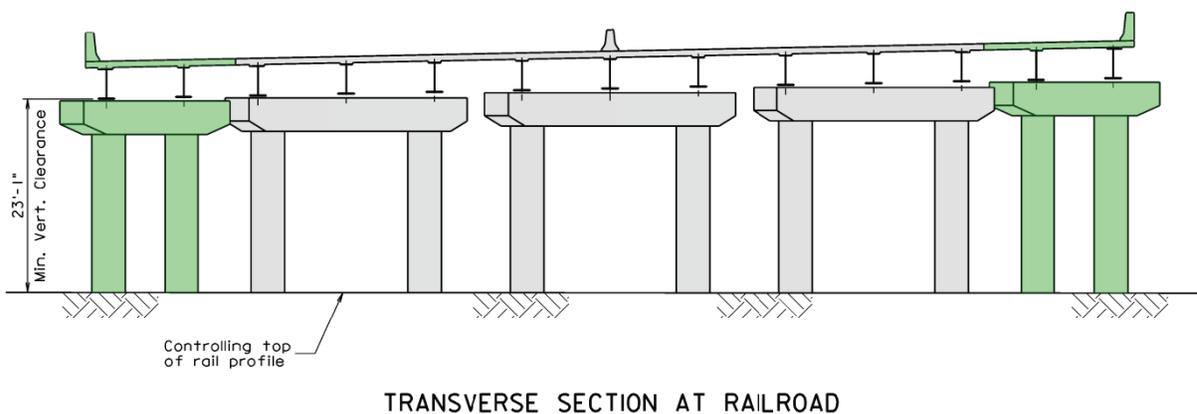


Figure 4.3.1(c)(2): Future Widened Bridge (Green) Clearance to NS Top of Rail

4.3 DESIGN CONCEPT

As shown in these figures and further detailed in Volume II, our team’s vertical profiles for I-81 also eliminate the need for reconstruction of Route 11 entirely, minimizing disruption to the traveling public along Route 11. A minimum vertical clearance of at least 16’-6” is maintained along Route 11 for the proposed bridge location as well as the future widening scenario, thus eliminating the need to lower Route 11 in the future. This will be a cost savings for VDOT in the future. Flowing Springs Road remains untouched, further reducing impacts to the traveling public and stakeholders. The proposed vertical profile grades are well below the maximums specified in the RFP; the actual maximum grades for each roadway are summarized in the conceptual roadway plans found in Volume II.

4.3.1 (D) TYPICAL SECTIONS OF THE ROADWAY SEGMENTS

The general project geometry is described above and a typical section depicting proposed lane configurations (number and width of travel lanes and shoulders) for I-81 is shown in Figure 4.3.1(d) and fully meets or exceeds VDOT requirements and the requirements of the RFP.

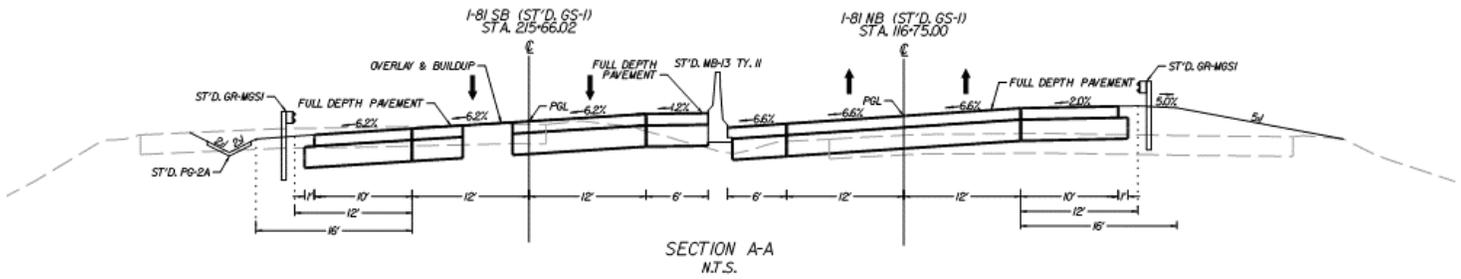


Figure 4.3.1(d): Sample Typical Section Depicting I-81 NB & SB Lane Configuration

Pavement sections and additional typical sections taken at critical locations along the I-81 corridor are provided in the conceptual roadway plans found in Volume II. Additional section details, including underdrain elements, will be included as appropriate with the further development of the project.

As mentioned above, the Blythe Team’s project enhancements eliminate the reconstruction of Route 11 as shown in the RFP; therefore, the existing roadway section will be maintained and no conceptual design is included in our proposal for this roadway.

RETAINING WALLS AND BRIDGE STRUCTURES

No retaining walls are required for our design, other than MSE walls at the bridge abutments. For details on the MSE and bridge structures, please refer to section 4.3.2.

4.3 DESIGN CONCEPT

4.3.1 (E) CONCEPTUAL HYDRAULIC AND STORMWATER MANAGEMENT DESIGN

The overall hydraulic and stormwater management strategy identified in the RFP indicates that this project is subject to the Part IIB Technical Criteria of the Virginia Stormwater Management Program (VSMP) Regulations. The Blythe Team’s hydraulic and stormwater management design meets or exceeds the requirements of the RFP. Our design complies with Virginia Law, the VDOT Drainage Manual, VDOT’s appropriate Instructional and Informational Memoranda (IIM), and the VSMP Regulations. Due to the nature of the project, we plan to purchase nutrient credits to satisfy all the post-construction water quality reduction requirements for the project as prescribed in IIM-LD-251.

We understand that all existing drainage structures that are a functional element in the proposed drainage design will need to be repaired or replaced. We have reviewed the existing drainage structures assessment report and acknowledge that no pipes included in the evaluation were deemed candidates for repair, rather all deficient pipes are to be replaced if they are to continue to convey drainage. Our approach to complete this work efficiently is to fully abandon or remove all of the existing pipes within the project limits that have been identified as deficient.

In reviewing the existing drainage structures that require replacement, three “major” cross-culverts (each 24” CMP) are identified as passing drainage completely across the I-81 NB and SB corridors. Replacement of these pipes would require significant efforts to abandon and then use jack/bore methods to install new pipes without impacting I-81 traffic, presenting several challenges. Rather than introducing additional underground storm sewer facilities beneath the existing I-81 embankment, the Blythe Team has developed a strategy to fully abandon two of the three “major” cross-culverts without the need for replacement, as shown in Figure 4.3.1(e)(1) below. To accomplish this, flow is diverted to alternate drainage facilities and/or shifted to the third cross-culvert to be replaced closest to the bridge.

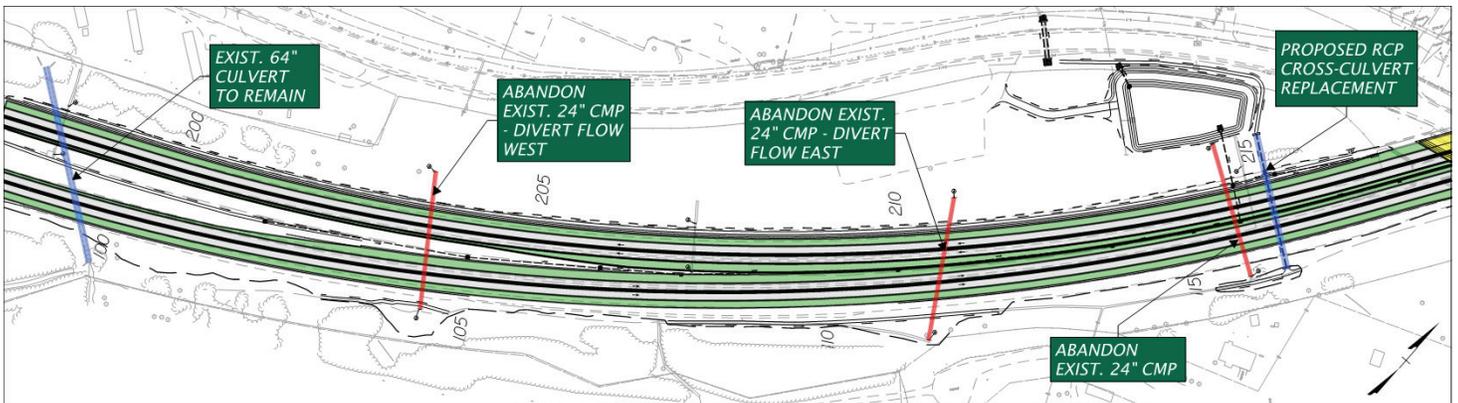


Figure 4.3.1(e)(1): Concept to Abandon Two of the Three Existing Major Cross-Culverts

All other existing drainage facilities identified as to be replaced in the assessment not identified in the figure above will be either abandoned in place or replaced with the proposed drainage design. Further details of the conceptual drainage plan can be found in the Conceptual Roadway Plans located in Volume II.

4.3 DESIGN CONCEPT

With respect to stormwater management design, we have investigated the project holistically and have developed the following concept. We anticipate utilizing a single stormwater management facility located within the existing right of way between I-81 SB and Route 11 to capture and treat drainage from areas of the project south of the proposed bridge as shown in Figure 4.3.1(e)(2). For areas north of the proposed bridge, we intend to discharge drainage from the site to an existing outfall channel adjacent to the Middle Fork Holston River via the proposed drainage network, with energy dissipation measures incorporated at the point of discharge. These energy dissipation measures include the use of a Standard EG-1 dissipator as well as a combination of additional rip-rap outlet/slope protection measures at the downstream terminus of the existing channel. All other outfalls not specifically discussed above will be evaluated for compliance with flood and channel protection criteria as detailed in the Virginia Stormwater Management Handbook and associated Regulations. All drainage and stormwater management facilities will be designed to meet NSCE-8 and AREMA Standards, with no impacts to the NS Railroad Corridor in accordance with RFP Section 2.3.11. For additional stormwater management concept details refer to the Conceptual Roadway Plans found in Volume II.

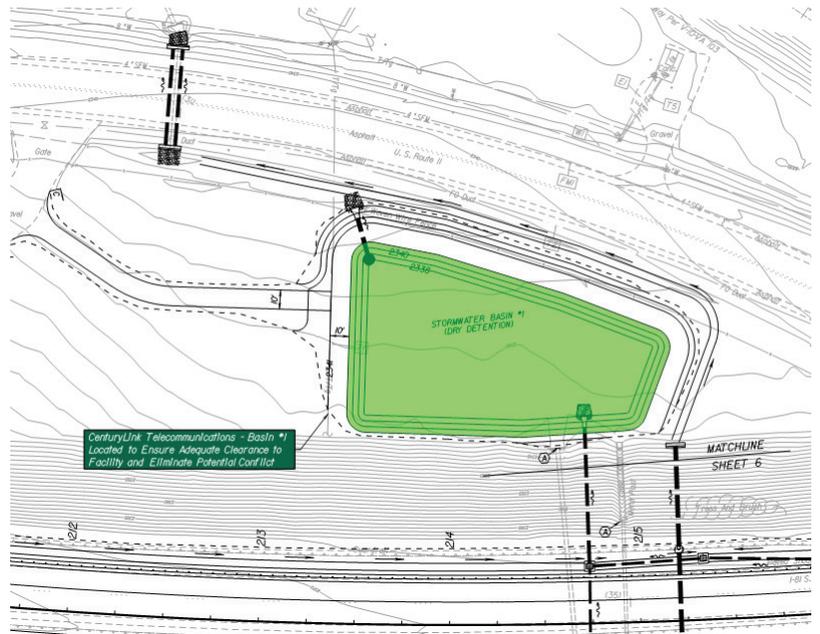


Figure 4.3.1(e)(2): Proposed Stormwater Facility

The Blythe Team’s conceptual plans have been developed to minimize impacts to the Middle Fork Holston River, the associated floodplain, and areas located both upstream and downstream from the project. Abutment B has been designed to remain beyond the limits of the 500-yr floodplain and Pier 2 has been designed to remain as far to the outside fringe of the floodplain as possible, both providing for improved hydraulic conditions at the bridge crossing. Based on our design approach, we anticipate no negative impacts to the surrounding areas or floodplain as a result of the project – this information will be detailed in the Final H&HA and Scour Analysis package to be provided to VDOT and used in the development of final bridge foundation plans.

4.3.1 (F) PROPOSED RIGHT OF WAY LIMITS

The Blythe Team’s design concept meets the RFP requirement to work within the existing right of way (ROW) without the need for additional fee ROW to be acquired. Beyond meeting the requirements of the RFP to work within existing ROW, our proposed design concept provides a significant project enhancement by way of eliminating all proposed permanent drainage and/or utility easements as well.

Although not depicted in the RFP Conceptual Plans, approximate limits of Permanent Drainage Easements and Utility Easements can be inferred based on the information provided. We acknowledge that the RFP Conceptual Plans were not intended to indicate proposed right of way or easements along the project corridor, however proposed improvements were depicted in the RFP Concept Plans extending well beyond the existing right of way. Specifically, cut slopes extended beyond the right of way near Station 105+50 to 109+50 NB, drainage channels were depicted at Station 127+00 and 130+00 NB on private property, and other minor improvements were all indicative of permanent easement requirements.

4.3 DESIGN CONCEPT

As evidenced by the Blythe Team’s construction limits for I-81 NB and SB and associated drainage improvements as shown in the Conceptual Plans of Volume II, all potential permanent easement requirements per the RFP Plans have been mitigated for and eliminated, further reducing the impact to surrounding property owners and streamlining the design-build process. Beyond eliminating the easement needs inferred from the RFP Conceptual Plans, our design also fully eliminates the need for any additional permanent easements. The table below indicates the benefits of our design with respect to ROW:

ROW Acquisition Component	Resulting Project Benefit
Design fully utilizes existing ROW & eliminates permanent easement needs	<ul style="list-style-type: none"> ■ Eliminates the impact on adjacent properties ■ Controls cost of land acquisition ■ Minimizes potential schedule delays to acquire ROW or easements
Design eliminates conflicts with utilities requiring easements for relocations	<ul style="list-style-type: none"> ■ Eliminates need for new or replacement easements ■ Eliminates the impact on adjacent properties ■ Minimizes potential schedule delays to acquire ROW or easements

4.3.1 (G) PROPOSED UTILITY IMPACTS

The Blythe Team has reviewed the RFP documents and conceptual plans for all known utilities and has contacted each utility owner identified in the RFP. With our team’s approach to eliminating the Route 11 reconstruction we have significantly reduced potential for utility conflicts on the project, as the utilities on the project are primarily located along Route 11.

The only anticipated utility impact based on the Blythe Team’s design concept is the existing NS Railroad overhead communication and signal lines as discussed in the RFP. Our team will coordinate the removal or relocation of these lines with NS Railroad in accordance with RFP Section 2.3.11. It should be noted that the RFP identifies an unknown underground telephone line in the area of the proposed stormwater management facility. Our due diligence has confirmed the line in question to contain seven (7) telecommunication (copper and fiber) lines owned by CenturyLink. Based on the results of this due diligence, our Team has developed a Stormwater Management Facility concept which avoids conflict with the existing telecommunications bank.

We do not anticipate that any of the utility mitigation work will impact the overall project schedule. Our team’s extensive utility relocation experience and our plan for working with utility owners to resolve potential impacts is discussed further in Section 4.4.2.

4.3 DESIGN CONCEPT

4.3.1 (H) PROVISION FOR FUTURE THIRD LANE

We understand VDOT’s strong desire to plan for future widenings and be smart about project development. We also understand that sometimes the design-build delivery method can yield short-term solutions that may not properly align with long-term goals. The Blythe Team has fully embraced the long-term view and has specifically designed our project to accommodate a future widening of I-81. Following are the specific considerations utilized. Please refer to Volume II for a full graphic of these considerations:

ACCOMMODATION FOR FUTURE CROSS SLOPE

Our bridge plans show a minimum vertical clearance over NS greater than the 23 feet required by the RFP. The reason for this increase is to account for the cross slope with the proposed future widening. By properly accounting for this future cross slope, the Blythe Team design eliminates the need to lower the railroad tracks in the future, which may prove infeasible.

PLAN FOR THE ULTIMATE CROSS SECTION

The addition of a third lane does not simply widen the bridge by 12 feet in either direction. As per the GS-1 Standard and the Structure & Bridge Manual criteria (File No. 06.02-1), the left shoulders will also need to be widened from 6 feet to 12 feet. This impending alignment shift equates to a bridge that is 18 feet wider in each direction. Our proposed horizontal and vertical alignments account for this fully widened section. By shifting alignments towards the median and matching existing grades as closely as possible, we anticipate future widening to be completed fully within existing right of way. Our proposed constant cross slope also better accommodates this alignment shift with future widening by avoiding a center crown that would be located within the middle of a travel lane in the future configuration.

PIERS ALIGNED WITH THE RAILROAD

As a design enhancement, we have realigned the proposed piers to be essentially parallel to the existing railroad corridor. These pier locations allow for the future widening to be on the same angle, thus simplifying the widening design and construction. Extending these piers in the future will not conflict with the required railroad clearance envelope nor require the use of railroad crash walls.

SIGHT DISTANCE ON ROUTE 11

The proposed Abutment A configuration is set back far enough from Route 11 such that the future widening will not impede on the sight distance of Route 11. In both the proposed condition and the future widening condition, sight distance in excess of the minimum required for 60 mph is provided therefore eliminating the need for VDOT to proceed with the Draft Design Exception Request provided with Addendum 2. Furthermore, the suggested mitigations proposed in the Draft Request, such as installing advisory speed signs, would not be required to be completed as a part of this project.

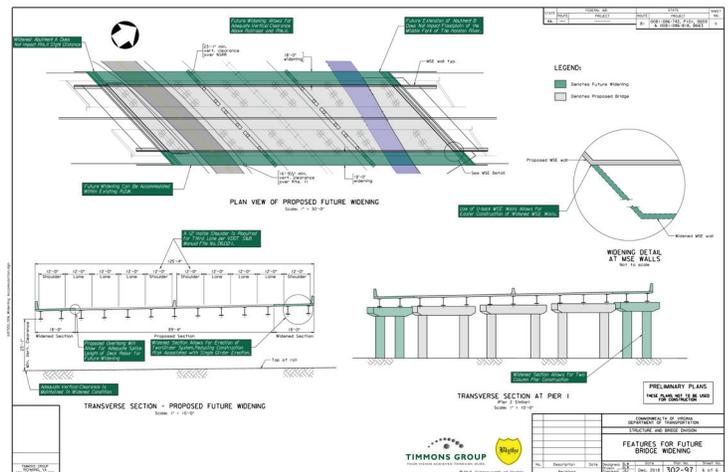


Figure 4.3.1(h): Accommodations for Future Widening Full-sized 11x17 in Volume II

4.3 DESIGN CONCEPT

GIRDER SPACING

Our proposed girder spacing can be maintained with the future widening. As the widened piers and abutments are proposed to be parallel, a similar superstructure design can be used for the future widening. The end result will be deflections of the same magnitude in each section of the bridge, which will reduce maintenance needs due to differential deflections.

Please refer to the drawings in Volume II for a full graphical representation of the accommodations for future widening.

4.3.1 (I) OTHER KEY PROJECT FEATURES

The Blythe Team has incorporated other key features into this project. They are outlined below.

EXTENSIVE MAINTENANCE OF TRAFFIC (MOT) PLANNING

Our team has focused our design to work seamlessly with minimizing traffic disruptions. Temporary median crossovers will be used to maintain traffic during Phases 2 and 3 of construction. The median crossover will allow for I-81 NB or SB traffic to utilize the existing median space while the existing NB and SB bridges are reconstructed. A sample of the travel lane configuration during the Phase 2 and 3 shifts are shown in the images to the right. The crossovers will meet the 75 mph design speed noted for I-81 and use as much of the proposed horizontal and vertical alignment as practical.

In addition, we will replace the northbound structure first, as it is in worse condition than the southbound structure, to minimize disruptions to the traveling public caused by repair work on the existing NB bridge. See section 4.5.1 for additional details.

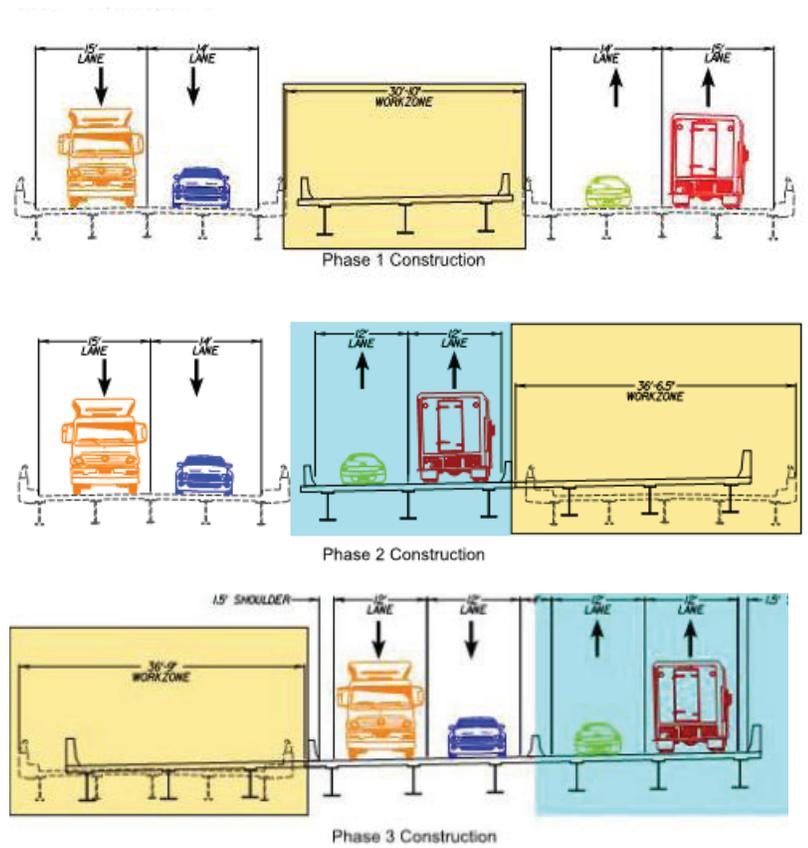


Figure 4.3.1(i): Phasing of Construction

PUBLIC INVOLVEMENT / PUBLIC RELATIONS

We understand the importance of ensuring that the stakeholders, mainly the traveling public, are served during the construction process. Our team is committed to open and honest communication. We will assist VDOT in holding informal meetings with stakeholders, as directed by VDOT at key project intervals and assist VDOT with collateral materials, including hand-outs and project boards, as needed. Project boards will go beyond just engineering drawings but will be developed in a manner that the general public can understand.

4.3 DESIGN CONCEPT

Our specific methods of keeping the public informed of the project and its progress are:

- Our designated public relations point-of-contact will meet regularly with our Design Manager to stay abreast of the project
- Variable message boards utilized depicting upcoming work and traffic shifts
- Providing monthly updates for the VDOT project page with graphics
- Providing multiple emergency contacts to VDOT, including cell and home phone numbers

During construction, our public relations point-of-contact will coordinate with Smyth County, the Town of Marion, the Community of Atkins, and other stakeholders to ensure compliance with local ordinances. Notes of these meetings and coordination events will be distributed during the project progress meetings with VDOT, along with our log of questions, complaints, and comments received from stakeholders.

A more detailed discussion of our public involvement / public relations is discussed in section 4.5.2 as part of the Transportation Management Plan.

PERMITTING

No project would be successful or on schedule if permitting is not in the front of everyone's mind. Our approach to streamlining the permitting process will be to initiate consultation with the regulatory agencies early and often in the project schedule to avoid timely delays. Our wetland delineation of jurisdictional surface waters will be performed as one of the first steps of the project and will be incorporated into the design for avoidance. Our request for a jurisdictional determination and preparation of the Pre-Construction Notification (PCN) will be performed concurrently early in the design phase to ensure compliance with relevant federal, state and local environmental regulations, while shaving valuable time off the permitting schedule. Our experienced team of environmental professionals have an excellent reputation with the U.S Army Corps of Engineers, the Department of Environmental Quality and the Virginia Marine Resources Commission.

4.3.2 CONCEPTUAL STRUCTURAL PLANS

Our conceptual structural design started with the RFP bridge plans which depicted a well-balanced three span configuration. This design worked efficiently structurally but called for a significant raising of the I-81 profile as well as possibly lowering Route 11 in order to arrive at the required clearances.

We investigated multiple bridge configurations, including precast concrete beams and even a 5 span configuration. With the required vertical clearance over NS being the controlling parameter, our investigation of span arrangements focused on limiting the span length, and therefore limiting the structure depth, over the railroad corridor in order to provide the required clearance while limiting the associated profile changes on I-81. We also focused on locating the abutments to reduce impacts to Route 11 and the floodplain, while providing a reasonable span arrangement.

Our design engineers evaluated different abutment and pier configurations and eventually arrived at the design detailed in this Technical Proposal. It is fully compliant with the RFP and is a low-maintenance structure. We have developed a drawing that is in Volume II named Conceptual Bridge Design Enhancements that graphically represents these advantages. Please refer to this sheet and the other conceptual structural plans included in Volume II and the sections below for more detail.

4.3 DESIGN CONCEPT

SUPERSTRUCTURE

The superstructure for the bridge will be one transverse superstructure for both directions of traffic, with a median barrier. It will conform with VDOT’s jointless philosophy by using deck slab extensions at the abutments. Deck slab extensions were determined to be the most appropriate type to provide a jointless bridge based on the abutment type selection algorithm in the VDOT Manual of the Structure and Bridge Division. The proposed structure will have a clear roadway width of 42 feet in each direction, accommodating two 12 foot lanes, a 12 foot outside shoulder and a 6 foot inside shoulder. The conceptual structural plans include plan and transverse section views in compliance with the RFP requirements.

As minimizing the amount that I-81 needed to be raised to provide the required railroad clearance, superstructure depth was a controlling design feature. We have selected a steel plate girder system to minimize this structure depth, while meeting deflection and span-to-depth ratio requirements outlined in the AASHTO LRFD Bridge Design Specifications.

In addition to the jointless bridge details, the Blythe Team’s design reduces the need for future inspection and maintenance by incorporating the following durable materials:

- Low permeability concrete
- Low Shrinkage Class A4 Modified Concrete in the deck slab, median barrier, and parapets
- CRR steel in conformance with VDOT S&B-IIM-81.8 (IIM) including Class III CRR steel in the superstructure elements defined in the IIM
- Weathering steel for plate girders, diaphragms, and bearings

Roadway drainage will be captured in an inlet just north of the bridge. On the bridge itself, scuppers with 8” diameter downspout pipes are envisioned along the exterior parapet on the southbound side and along the median barrier along the northbound side. Scuppers, as needed, will be spaced to avoid spread issues and any required piping will include cleanouts and be routed to minimize negative aesthetic impacts.

STAGING

The inherent design of our superstructure works seamlessly with the need for staging of the superstructure. We have detailed our girder spacing so that the final as well as the temporary overhang dimensions meet VDOT criteria.

In addition, we anticipate utilizing a closure pour between the phases to increase constructability and quality. Without a closure pour, aligning the formwork geometry accounting for camber and live load deflections can be challenging. Our closure pour detailed system mitigates this risk and constructability issue.

To accommodate the installation of the final median barrier, during the initial phase of construction threaded inserts are anticipated to be cast into the deck. These threaded inserts will then be utilized to make the proper connection to the final median barrier which is anticipated to be slip-formed. These threaded inserts will be galvanized or stainless steel, in accordance with IIM-S&B-81.8, reducing future maintenance needs.

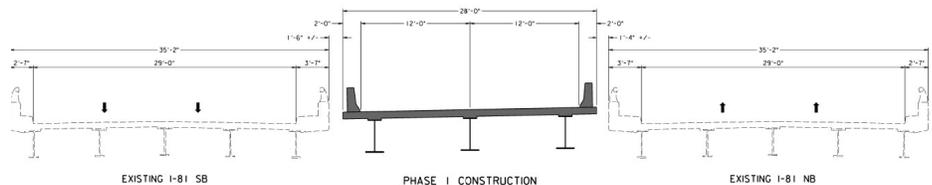


Figure 4.3.2(1): Phase 1 Construction Utilizing Existing Bridges without Modification

4.3 DESIGN CONCEPT

Due to the poor condition of the existing bridges, we developed a maintenance of traffic and construction phasing plan that will utilize the existing bridges in their current configurations without modification, which will avoid the need for traffic barrier to be placed on the existing bridges during construction. Instead, traffic barrier approaching the existing bridges will be tied into the end of the bridges. This eliminates the potential need to strengthen and retrofit the existing bridges to carry the additional load of the traffic barrier service. It also maintains the clear width on the existing bridges, eliminates the need to shift the travel lanes, and avoids having the crown point located within a travel lane. It also eliminates all impacts to traffic on I-81 and Route 11 associated with anchoring the traffic barrier service through the existing bridge decks.

PIERS

The superstructure will be supported by multi-column piers. Due to staging, there will be two columns in the center section and two columns on the outer sections, for a total of six columns per pier. The piers are located entirely outside of the railroad clearance envelope as shown on the RFP Plans, therefore crash walls are not required. Pier 2 is also located entirely outside of the railroad ROW, reducing impacts to the railroad and simplifying coordination with NS.

Pier 1 is located between Route 11 and the railroad. This pier was located to avoid conflicts with the existing bridge footings and existing 8" waterline. Drilled shafts will be used to manage karst and fault conditions as well as speed up construction. Drilled shafts also eliminate any layback and shoring issues with respect to Route 11 and the railroad, thus further reducing impacts and the need for temporary lane closures on Route 11.

Pier 2 is located between the railroad and the river. As a spread footing in this area would be susceptible to scour, we have selected drilled shafts for this location. The drilled shafts will align with the column locations and are anticipated be tied together with a wall pier that extends to 1 foot above the 500-year flood elevation. This wall pier will reduce the buildup of debris in a flooding condition, reducing future maintenance needs and risk of debris impact to pier columns.

We have completed a preliminary design of the piers using RCPier software. Various options for pier fixity, including both piers fixed, Pier 1 fixed, and Pier 2 fixed, were analyzed to determine the best approach. Due to the significant lateral loads induced by temperature expansion and contraction with both piers fixed, a single fixed pier option was pursued. Based on the information in boring BR-04, the rock conditions at Pier 1 appear to be worse than Pier 2, which would require larger diameter shafts or larger shaft embedment to accommodate lateral loads. Therefore, Pier 2 was chosen as the fixed pier.

To reduce future inspection and maintenance needs, the piers will use the following durable materials and/or the following design approaches:

- Concrete used will be low permeability concrete
- The new structures will be constructed in accordance with VDOT's jointless philosophy



Figure 4.3.2(2): Design of the Piers Using RCPier Software

4.3 DESIGN CONCEPT

ABUTMENTS

The new abutments will consist of a conventional cantilevered cast-in-place concrete abutment in conjunction with a deck slab extension, providing a jointless structure in accordance with VDOT's Jointless Bridge Philosophy. The abutments will be supported on deep foundations (steel H-piles prebored and set in rock or driven to refusal) behind MSE walls. Providing the required vertical clearance over NS and Route 11, while reducing the overall bridge length, results in the need for tall retaining walls at the abutment locations. MSE walls were chosen as the most efficient system for constructing these tall retaining walls. The MSE wall foundation system will be complicated by the challenging subsurface conditions. This is further elaborated on in the geotechnical section of this proposal.

Due to the possibility for our abutment piles to shift during installation, we increased the minimum distance from the side of the piles to the nearest edge of the abutment from 9" (VDOT minimum standard) to 12".

To reduce future inspection and maintenance needs, the abutments will use the following durable materials and/or the following design approaches:

- Concrete used will be low permeability concrete
- Concrete slab slope protection or riprap will be used to protect against erosion and/or scour
- Select backfill material will be used behind the abutments to reduce lateral forces, improve drainage, and reduce settlement under the approach slabs

The GDR data suggests a variable top of rock profile across Abutment A, which may result in variable pile installation methods. Throughout construction, our geotechnical engineer will be integrated into the construction team and will visit the site to review foundation operations and verify that the work is being completed consistent with the geotechnical recommendations, or if needed, modify the recommendations based on conditions encountered. In addition, Timmons Group's bridge engineer and Schnabel's geotechnical engineer will be present during critical components of the installation of the deep foundations to quickly address potential foundation design changes.

DESIGN CONSIDERATIONS FOR SCOUR

We understand that our design is different than the bridge foundations in the RFP plans. Therefore, our team will conduct additional geotechnical investigations at our proposed pier and abutment locations. Hydraulic modeling, scour analysis and the design of scour countermeasures will be performed in accordance with the procedures recognized as appropriate by the FHWA and VDOT.

Our design maintains the protected slope location on the west bank of the river at Abutment B. We anticipate fortifying this slope with appropriately designed riprap to ensure that it is not susceptible to damage from scour. The benefit of this approach is the 100 and 500 year flood elevations will not be increased, allowing our proposed Abutment B location to remain above the 500 year flood elevation.

For Pier 2, the depth of the drilled shaft will be fully designed for the anticipated scour, as part of the final design process. This design can be mitigated by the use of a wall pier, connecting the columns.

4.3 DESIGN CONCEPT

ACCOMMODATIONS FOR FUTURE WIDENING

Our team's conceptual bridge design is fully able to accommodate future widening of I-81 to three lanes in each direction, without the need for future ROW acquisition. A discussion of the design features that allow for future widening is included previously in section 4.3.1(f), including details specific to bridge superstructure and substructure widening. Our Conceptual Bridge Plans in Volume II also include details highlighting these accommodations for future widening.

BRIDGE LOAD RATINGS

Per the RFP requirements, load ratings will be performed on the final as-built structure, as well as for phased portions of the newly constructed structure carrying traffic in a temporary configuration. As part of our design process, we will develop the load ratings for the different configurations of the superstructure phasing. These load ratings will be submitted with the plan submissions and follow the same review timeframe. If, after actual construction of the phases, there needs to be an update to the load ratings, this will be conducted and submitted to VDOT for review and approval. As we are not proposing modifications to the existing bridges, load ratings for the existing bridges are not required.

BRIDGE MAINTENANCE AND REPAIR PLANS

As we understand that we will be responsible for completing Type B & Type C repairs to the bridge decks within 72 hours of notification by VDOT and other maintenance work will be required, a bridge maintenance and repair plan, and corresponding MOT plan, will be developed as part of the overall construction plan. This plan will include procedures for notifying VDOT, emergency services, and state police. The plan will also address the need to have materials such as high early strength concrete for deck patch repairs readily available.

BRIDGE DEMOLITION AND ERECTION PLANS

Demolition and erection plans will be developed that contain the details, procedures, and the required sequence of construction necessary for the existing bridges to be removed in a safe and controlled manner. The plan will include details and the limits of debris shields, railroad ballast protection systems, and other measures required to protect the railroad, the traveling public, pedestrians, adjacent structures, existing utilities, and other infrastructure. The plans will also detail ingress and egress of construction equipment, construction means and methods, equipment to be utilized, and any false work or shoring required. As part of this plan, we will also analyze the effect of equipment loading on the existing bridges to ensure the structures' safe load carrying capacities are not exceeded. Prior to commencement of any demolition or erection activities the demolition and erection plans will be submitted to VDOT and NS for review and approval. The railroad's acceptance of these plans will be critical to the overall schedule. In order to improve the probability of the railroad's acceptance of the demolition plan submittal, our Railroad Coordinator will perform a pre-review of the submittal from the railroad's perspective prior to submitting the plan to NS for review and approval.

4.3 DESIGN CONCEPT SUMMARY

The Blythe Team's design and plan fully meets or exceeds the Project's intended scope of work and project goals. Safety, operations, schedule, construction, and public acceptance are paramount. Our design fully integrates the plan for the future bridge widening while minimizing or eliminating future Right of Way acquisition needs. The types of materials, design and construction methods, and functionality used reduce the need for future inspection and maintenance, thus providing VDOT full confidence in the Project's long-term asset performance and durability.



Section 4.4

Project Approach



4.4 PROJECT APPROACH

4.4 PROJECT APPROACH OVERVIEW

The Blythe Team has fully investigated the available material for this project and we have a project approach to successfully manage the project through design and construction.

4.4.1 ENVIRONMENTAL MANAGEMENT

The overall approach to environmental management is to achieve 100% compliance through a detailed avoidance, minimization, and mitigation process built upon a foundation of accurate resource identification and thorough understanding of the laws and regulations protecting each resource. Early design consideration for access, staging, and construction methodologies will minimize the possible Limits of Disturbance (LOD) for permitting purposes, while reducing the risks associated with modifications during construction. Vigilance and awareness of environmental resources and the permitted limits of construction are hallmarks which will eliminate encroachment. Permit modifications carry risk and will be avoided through a collaborative design and construction process and consistent communication with the regulatory agencies.

As determined by Bristol District Water Quality Staff it is anticipated the project will be exempt from any permit requirements from the Virginia Department of Environmental Quality (DEQ) or the Tennessee Valley Authority (TVA). Permits will most likely need to be issued by the Corps of Engineers (NWP23) and the Virginia Marine Resources Commission (VMRC) (VGP-1). A Section 106 effect determination of No Historic Properties Present or Affected has been concluded pursuant to Stipulation II.A of the 2016 Federal Programmatic Agreement among FHWA, USACE, TVA, VA SHPO and VDOT on July 13, 2017. Threatened and Endangered Species have been previously cleared by VDOT through Section 7 consultation as part of the issued Categorical Exclusion pursuant to 40 CFR 1508.4 and 23 CFR 771.117. Bat studies did not observe evidence of any bats, however prior to work commencing, the bridge will be inspected for the presence of bats and any nesting migratory birds. A Time of Year restriction of April 15th to September 15th applies for tree removal associated with federally protected bat species including the Indiana bat and Northern Long-eared bat. A Time of Year restriction for instream work in the Middle Fork of the Holston River to protect the rainbow trout will implemented from March 15th to May 15th of any year. Previous mussel survey work performed by VDOT cleared the project area of any protected mussels. Immediately upon NTP, more detailed studies (i.e. wetland water area delineations) will be completed in support of a U.S. Army Corps of Engineers (USACE) Jurisdictional Determination.

Once design has progressed to a level where the project footprint (including utility relocations, if needed) is known, the required permits will be obtained. Our environmental staff will prepare the permit plates, exhibits, and documentation for submission of a Pre-Construction Notification (PCN) to be submitted to the U.S. Army Corps of Engineers, VMRC and DEQ through the Joint Permit Application (JPA) process.

The Virginia Stormwater Management Permit (VSMP) will be supported by completion of the required LD-445 forms, and Phase I documentation will be updated and submitted in advance of the request for ROW plan approval. Copies of all environmental permit submission documentation will be provided to VDOT making known the status of all environmental permit applications. Copies of approved permits will also be provided once obtained.

Coordination of the final construction plans and approved environmental commitments will verify that permit obligations are clearly identified to make sure impacts are avoided during construction. An appropriate software tracking database will be used to monitor environmental compliance and make sure all environmental commitments and permit obligations are met.



4.4 PROJECT APPROACH

Once plans are approved and released for construction, our environmental team will shift to the permit monitoring phase. Prior to the initiation of construction, we will re-remark the limits of jurisdictional wetlands and streams in the project limits (i.e. Environmentally Sensitive Areas) that may be impacted during construction. As necessary, these critical areas will be marked with highly visible safety or silt fence to avoid non-permitted impacts and accessibility to these areas. Proper erosion and sediment (E&S) controls will also be installed in accordance with the approved plans.

Monitoring and inspection throughout the construction phase will facilitate compliance with project permits and current DEQ requirements. Dedicated E&S control staff will inspect the site every five business days, or within 48 hours after a rainfall event of 0.25 inches or greater to verify the effectiveness of installed devices/controls. Specific field walks will be conducted after each major event as defined by VDOT, and any damaged or deteriorated measures will be repaired or reinstalled immediately.

In addition to construction staff making regular inspections of the E&S devices, the environmental staff who prepared the permit drawings and documents will make regular visits to the site as required by the permit documents to see that areas of avoidance are inaccessible to construction staff and the site is either temporarily or permanently stabilized as required by the permit documents.

At the completion of construction, environmental staff will document the final site conditions to close permits. Any corrective action measures will be identified, such as additional seeding or stabilization, before a request for permit closure is made. This process has been used by our team on past projects, and to date has been successful at avoiding temporary interruptions in construction due to environmental permitting.

EFFORTS DURING DESIGN TO AVOID/MINIMIZE IMPACTS TO ENVIRONMENTAL RESOURCES

The Blythe Team's approach to avoid/minimize environmental impacts during design will be to keep all proposed work within the existing, previously disturbed, VDOT right of way. Any tree clearing in the design will be kept to the absolute minimum to successfully design the project. Drilled shafts will be utilized in place of spread footings to reduce environmental impacts to the stream or any potential wetland areas. Special attention will be paid to the layout of the erosion and sediment control features in the design stage to ensure that the sensitivity of the Middle Fork of the Holston River and Crow Branch immediately adjacent to and within the project area is properly accounted for. The I-81 northbound and southbound vertical alignments will be designed to minimize elevation difference between existing and proposed corridors. This reduction in I-81 full-depth reconstruction areas will eliminate the need for large cut/fill slopes, minimizing the project footprint, wetland and stream impacts, and potential for sediment discharges and additional nutrient loading to the Middle Fork Holston River.

All environmental approvals and permits will be obtained during the design phase to ensure compliance with relevant federal, state, and local environmental resource regulations. Environmentally sensitive areas previously identified will be avoided in the project designs. The project design will have minimal to no stream impacts within the River. The design is developed such that the construction will be phased so that any instream work will be performed in dry/low flow conditions and/or with temporary cofferdams and outside of the time of year restriction for rainbow trout.

Project sequencing and schedules will be developed in the design phases to ensure compliance with all regulatory requirements related to time of year restrictions for tree clearing associated with protected bat species. The RFP indicates that this project will be subject to the Part IIB Technical Criteria of the VSMP Regulations. The Blythe Team's hydraulic and stormwater management design meets or exceeds the requirements of the RFP. Discharges to the Middle Fork Holston River will be routed through energy dissipation measures incorporated at the point of

4.4 PROJECT APPROACH

discharge. These energy dissipation measures include the use of appropriately sized rip-rap and the construction of a concrete dissipator pad at the outfall of the paved flume, similar to that of the VDOT Standard EG-1. All other outfalls not specifically discussed above will be evaluated for compliance with flood and channel protection criteria as detailed in the Virginia Stormwater Management Handbook and associated regulations.

Environmental training will be provided to on-site construction personnel.

EFFORTS DURING CONSTRUCTION TO AVOID/MINIMIZE IMPACTS TO ENVIRONMENTAL RESOURCES

Blythe Development and Timmons Group both have experience successfully managing environmental compliance during construction on large scale projects. Our philosophy is simple – “an ounce of prevention is worth a pound of cure”. *Environmental training will be provided to on-site construction personnel.* Staff will be provided with information detailing the location of sensitive environmental resources and these resources will be clearly marked prior to construction to ensure avoidance.

Erosion and Sediment Controls will be rigorously inspected and maintained throughout the life of the project by individuals holding Erosion and Sediment Control Contractors Certification (ESCC) for enhanced protection to the avoided jurisdictional areas, further minimizing secondary impacts to aquatic resources. Staff will also be trained to identify bats and migratory birds throughout the course of construction and will vigilantly inspect environmentally sensitive area flagging to ensure it is in place and in good condition.

We understand that rights-of-ways are at risk from invasive species colonization and will closely follow Section 244.02(c) of VDOT’s Road and Bridge Specifications, including provisions intended to control noxious weeds (including non-native and invasive species). During stabilization efforts all seeds will be tested in accordance with the Virginia Seed Law and the Department’s specifications to ensure there are no noxious seeds within the seed mixtures. Implementing these provisions will reduce or minimize the potential for introduction or the spread of invasive plant species in the project area.

Stabilization efforts will also incorporate fertilizer recommendations from a certified Nutrient Management Planner to reduce excessive nutrient loading from running off into the Middle Fork Holston River. Proactive and regular agency coordination will be initiated with FWS, DGIF and DCR before construction and during construction to ensure compliance with Section 7 threatened and endangered species requirements.

Strict adherence to the time of year restriction for tree removal of April 15th through September 15th for protected bat species will be followed, and is integrated into our project construction schedule. Through careful planning in the design phase, tree clearing will be minimized to only what is necessary to complete the project.

Strict adherence to the time of year restriction for instream work from March 15th to May 15th of any year will be followed to protect the rainbow trout. Prior to construction and during construction existing bridges and structures will be checked for the presence of bats and nesting migratory birds. Once construction components are complete and final stabilization measures have been applied, our team will completely remove all temporary structures to minimize long-term impacts to the environmental resources and will ensure all permits are properly closed out with the regulatory agencies.

OFFEROR’S APPROACH AND POTENTIAL SOLUTIONS FOR ADDRESSING RECOGNIZED ENVIRONMENTAL CONDITIONS/AREAS OF CONCERN

Our environmental team has investigated the project site and reviewed all provided documentation. We are aware of the recognized environmental conditions (RECs) and areas of concern within the project footprint. The following table summarizes issues, requirements, and potential mitigation solutions.

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Environmental Condition/Area of Concern	Requirement	Potential Mitigation
NEPA CE	Provide information to complete NEPA re-evaluations, including changes in project footprint or environmental conditions—VDOT will prepare re-evaluations at the ROW and PS&E milestones	<ul style="list-style-type: none"> ■ Project scope and footprint changes will be avoided to eliminate the need for additional studies
HAZMAT– Petroleum-Based RECs	The team is responsible for confirmation and identification of confirmation or threats of, petroleum releases into the environment in, and adjacent to, the project footprint	<ul style="list-style-type: none"> ■ Based on a hazmat field review and coordination with the Department of Environmental Quality, minimal potential for hazmat issues exist during new bridge pier installation
HAZMAT– Asbestos Containing Material (ACM)	The team is responsible for the abatement of regulated asbestos containing material (RACM) in accordance with the VDOT Special Provision	<ul style="list-style-type: none"> ■ Bridge #2034 was inspected for asbestos in March 2015. No Asbestos found ■ Bridge #2035 was inspected in March 2018. No asbestos was found ■ Will follow VDOT Road and Bridge Specifications Manual, Section 411.08 and 413.02 during construction ■ All work will be completed within existing disturbed, VDOT right of way
HAZMAT– Lead-Based Paint	The team is responsible for management of lead-based paint for Type B Structures in accordance with Sections 411 & 413 of the 2017 VDOT Road and Bridge Specs	<ul style="list-style-type: none"> ■ Minimize lead paint disturbance during bridge demolition ■ Recycle waste streams as applicable ■ Dispose of hazardous material from demolition in accordance with applicable environmental regulations
Commitment Compliance	Provide information to VDOT necessary for completing the Environmental Commitments Checklist prior to releasing the project for construction	<ul style="list-style-type: none"> ■ Carry out all necessary environmental commitments and provide documentation of completion to VDOT ■ Monitor environmental compliance, permitting, and mitigation requirements for environmental issues using a tracking database

4.4 PROJECT APPROACH

Environmental Condition/Area of Concern	Requirement	Potential Mitigation
Wetlands and Water Quality	The team is responsible for securing all water quality permits and will delineate wetlands and other WOUS, conduct stream assessments, develop permit impact plates, request permits, secure required mitigation, and provide documentation to VDOT as required by the RFP	<ul style="list-style-type: none"> ■ Complete early and accurate resource documentation ■ Avoidance/minimization through design is primary goal ■ Incorporate realistic schedules to obtain water quality permits from the USACE, VMRC and DEQ
Threatened and Endangered Species (T&E)	Section 7 coordination resulted in the following time of year restrictions which will be honored: <ul style="list-style-type: none"> ■ Tree clearing from April 15th to September 15th associated with the Northern Long-eared bat ■ Instream work from March 15th to May 15th associated with the rainbow trout 	<ul style="list-style-type: none"> ■ Provide T&E coordination to VDOT prior to the project being released for construction ■ Avoid project scope and footprint changes to utilize clearances obtained in the categorical exclusion to avoid significant impacts to human or natural environment ■ Initiate T&E coordination upon NTP to avoid delays in identifying any potential new species ■ Complete bat and migratory nesting bird inventories prior to work commencing

INTEGRATION OF ENVIRONMENTAL MANAGEMENT INTO THE PROJECT SCHEDULE

Early resource identification will confirm awareness of all the environmental design issues, and the inclusion of realistic permitting timeframes in the design and construction schedule will mitigate possible delays. Our team has successfully secured environmental permits on numerous VDOT projects and has a complete understanding of the required documentation, evaluation, analysis, and coordination necessary to secure critical environmental permits. Following a design approach of “avoidance first” and “minimization second”, we anticipate the project will be permitted through a Nationwide Permit 23 for Approved Categorical Exclusions. Due to the drainage area of the Middle Fork Holston River exceeding 5 square miles, a VGP-1 permit will be obtained from VMRC. If mitigation is required for unavoidable impacts, then compensatory mitigation will likely occur through the purchase of credits from a commercial mitigation bank in the Middle Fork Holston River Basin, or In-Lieu Fee (ILF) Program. Below is a listing of the anticipated required environmental evaluations and permits with the approving agency and approximate review periods.

4.4 PROJECT APPROACH

Evaluation/Permit	Regulated Resource/ Approval Agency	Approximate Review Period	Comments
Jurisdictional Determination	Wetlands, other Waters of the US, State Waters/ USACE	3 months	PJD Request to be submitted with PCN
Threatened and Endangered Species	Federally Listed Species/ DCR, USFWS, DGIF	1 month	Review VDOT survey results; verify from USFWS, DCR and VDGIF databases that no other species are potentially present
Nationwide Permit 23 (PCN)	Wetlands, Waters of the US/ USACE	3 months	Impacts to wetlands less than 1/2 acre and longitudinal stream impacts less than 300' are anticipated
VGP-1	Middle Fork Holston River/ VMRC	4 months	Impacts to river are anticipated to be less than 1/10-acre
Virginia Stormwater Management Program Permit (VSMP)	Streams/DEQ; includes VDOT ROW and off-site support facilities, as applicable	2 months	Submitted with SWM, SPCC, ESC, and SWPPP Plans prior to land disturbance activities

Regulatory review processing times will be concurrent through submission of jurisdictional determination package within our preconstruction notification in the form of a JPA to obtain all clean water act permitting approvals. We anticipate that all clean water act environmental clearances will be obtained within 120 days as reflected in our overall project schedule.

CLEAN WATER ACT ENVIRONMENTAL PERMITTING

Per the RFP, the Blythe Team will be the permittee for all required environmental permits and will take the lead in all permit-related agency coordination. We will work collaboratively with the regulatory agencies to determine the permitting approach, achieve consensus on appropriate avoidance and minimization, and ultimately secure the required permits using limits of construction that are feasible and cost effective. Our permitting, design, and construction specialists will make sure that LODs reflect maximum avoidance and minimization, while accommodating critical design features and allowing reasonable room for construction, including erosion and sediment control.

Avoidance and minimization plans among our team members are already underway and will continue in earnest following NTP. Collaboration with the regulatory agencies will begin during the JD confirmation field walk with USACE representatives. When reviewing each feature during the field walk, avoidance and minimization possibilities and constraints will be determined. Typically, additional field visits with the resource agencies are not necessary and additional collaboration can occur by phone or email as design evolution requires.

4.4 PROJECT APPROACH

4.4.2 UTILITIES

The Blythe Team’s approach to utility coordination is founded on avoiding impacts where feasible. Our experience managing utility coordination efforts on complex design-build projects provides the framework for effectively minimizing project risks. We have the expertise to quickly reach agreement on plans, coordinate unavoidable relocations, and mitigate unexpected utility conflicts to minimize risk to construction sequencing and schedule delays. For this project, initial contacts and coordination with the relevant utility companies have already been made to minimize lead time during the design phase.

Further utility coordination will be required as the project progresses to ensure risk mitigation strategies are carried out. Our team of utility coordination experts includes the Lead Utilities Engineer on the recently completed GRTC Bus Rapid Transit Design-Build project in Richmond and other team members well-suited for the minor coordination work expected with this project. A well-conceived utilities avoidance plan such as what our team has proposed is only realized in practice when the utilities coordination team works continually from NTP to stay in front of potential challenges and achieve the necessary clearances from utility owners to keep the project on schedule. We are confident that the plan discussed below and the dedicated utilities coordination team will ensure the schedule milestones are met and utilities remain off the critical path for the project.

APPROACH FOR UTILITY COORDINATION AND MINIMIZING ADJUSTMENTS

The utilities identified in the RFP documents are generally located along the Route 11 corridor. As discussed in previous sections, our project approach eliminates the reconstruction of Route 11 thus reducing the extent to which utility relocations may be required. A table highlighting the potential utility conflicts and our approach for avoiding and coordinating owner acceptance is provided below:

Utility Owner and Potential Conflict	Potential Solutions and Avoidance
Smyth County PSA 4” Sanitary Force Main (Unknown Non-Metallic Material)	Avoid – Coordinate replacement of existing drainage pipe and propose mitigation strategies to ensure storm sewer installation without the need for force main relocation. Proposed culvert replacement to utilize existing pipe trench with an in-kind or reduced pipe rise dimension.
Smyth County PSA 8” Water Main (Unknown Metallic Material) <ol style="list-style-type: none"> 1. At outlet pipe from basin 2. At Pier 1 foundation 	Avoid – Rip-Rap outlet protection to be placed at the end of the culvert replacement under Route 11 near the outfall of the Basin. Concrete saddle or other protective measures to be implemented through coordination with PSA due to exposed pipe documented in test hole report. Avoid – Our design locates Pier 1 immediately adjacent to the NS horizontal clearance area and will utilize drilled shafts to ensure maximum clearance is maintained to the existing water main. Further protection measures to be coordinated with PSA as appropriate.
Bristol Virginia Utilities Board Fiber Optic Duct Bank	Avoid – Eliminate potential conflict by eliminating Route 11 reconstruction. Abutment A to be located behind existing piers. Replace existing culvert under Route 11 near the outfall of the basin with in-kind or smaller pipe rise dimensions to avoid conflict.



4.4 PROJECT APPROACH

Utility Owner and Potential Conflict	Potential Solutions and Avoidance
<p>CenturyLink</p> <p>Underground Telecommunications Line (Copper & Fiber)</p> <p><i>*Note – This line previously noted as possible telephone service line with unknown owner per RFP SUE.</i></p>	<p>Avoid – Proposed Stormwater Management Basin configured to avoid placement of basin atop existing utilities. Ditch crossing to be at existing grade and further coordination with CenturyLink to be completed to ensure letter of agreement with proposed design. Pending test-hole and continued utility coordination, additional modifications may be necessary to SWM Basin to ensure elimination of conflict.</p>
<p>NS</p> <p>Overhead Communication & Signal Lines</p>	<p>Conflict – to be relocated or removed by NS to eliminate conflict. Utility & RR Coordination teams will work together to provide advance notice to NS to ensure relocation on schedule per RFP.</p>

MITIGATION STRATEGIES TO OFFSET POTENTIAL IMPACTS

The Blythe Team will meet with the affected utility companies early in the design to make sure all facilities have been identified and located within the project limits. We will approach identified conflicts by first adapting the design to avoid conflicts if possible, and then coordinating with utilities to develop a relocation strategy that minimizes service interruptions and schedule impacts.

The RFP identifies existing NS overhead utilities which will require relocation or removal – our team will work closely with NS representatives to ensure timely relocation of these facilities to avoid conflicts during construction. Further discussion of our coordination efforts and extensive experience with NS Railroad is provided in Section 4.4.4. This conflict is the only known or anticipated conflict with the Blythe Team’s Conceptual Plans.

Beyond the known utilities and conflict noted above, our team will complete extensive outreach and coordination to ensure any unknown facilities are quickly identified and resolutions reached. We will complete test holes along existing utility corridors within the project limits to positively locate the water, sewer, and communication lines to evaluate any unforeseen conflicts. In the event of an unexpected conflict, we will adjust the design or work with the utility owners to find a location not in conflict with the proposed construction.

INTEGRATION OF UTILITIES INTO SCHEDULE

We have developed the schedule such that the adjustment of the NS Railroad overhead lines discussed above are not a part of the critical path. Our in-house utility staff will work with the design team and utility companies to develop viable solutions to ensure no scheduling impacts are realized throughout the duration of the project.



Figure 4.4.2: NS Overhead Communication Lines

4.4 PROJECT APPROACH

4.4.3 GEOTECHNICAL

The Blythe Team’s geotechnical approach features proactive design concepts and construction methods developed to manage geotechnical risk. The primary geotechnical risk for this project is karst, which can significantly impact design and construction as discussed below. The complex geology consisting of folded and faulted rock can also amplify the risk and variability associated with karst. Our design concepts and construction activities also consider the inherent challenges associated with working around existing foundations and maintaining existing structures. We offer the following solutions to the project’s geotechnical challenges.



Figure 4.4.3: Recent Schnabel project on I-81 in Bristol District

IDENTIFYING GEOTECHNICAL RISKS

We have identified geotechnical risks on this project by relying upon both the information in the Geotechnical Data Report (GDR) along with Schnabel’s extensive local geotechnical experience.

The project site is underlain by rock of the Valley and Ridge Province; these rocks have undergone significant folding and faulting over geologic time. The faults are inactive and do not pose a known risk of seismicity. However, the ancient folding and faulting have resulted in highly fractured, brecciated, and generally non-homogenous rock conditions. Additionally, the carbonate rocks of the Valley and Ridge Province are susceptible to solutioning and karst. Typical karst features include a highly variable top of rock surface, soft residual soils, steep-sided rock pinnacles, soil-filled troughs, and open cavities. Sinkholes are another common karst features caused by the subsurface erosion and/or collapse of soil overburden into cavities in the rock. Latent karst features encountered during construction can adversely impact project schedule, maintenance of traffic, and adjacent infrastructure such as the railway and Route 11. Schnabel has significant local experience working in fault and karst conditions along the I-81 corridor including the I-81 over Mulberry Lane Bridge Replacement and the I-81 over Reed Creek Bridge Replacement, both located in the Bristol District.

The existing data and Schnabel’s local experience indicate the geotechnical risks include, but are not limited to:

Abutments and Piers Supported on Deep Foundations

Karst and fractured rock caused by faulting pose some degree of risk to any foundation type. For example, the variable top of rock surface can result in significant variation of deep foundation lengths. The existing bridge as-built plans indicate Abutment A pile lengths varied from 25 feet to 61 feet at the southbound bridge and 11 feet to 57 feet at the northbound bridge. Additionally, alluvial cobbles and boulders were encountered in the GDR borings behind Abutment A and several of the existing bridge borings from the 1950s. Alluvial cobbles and boulders as well as steep-sided or pinnacled rock can pose installation challenges for deep foundations such as pile damage, pile mis-alignment, and difficult drilled shaft excavation.

Schnabel has significant local experience working in fault and karst conditions along the I-81 corridor

4.4 PROJECT APPROACH

Construction of drilled shafts in karst and fault zones can pose specific geotechnical risks. During excavation, soil and rock conditions at the as-built shaft locations may be different from what was assumed in design. During placement of concrete, concrete loss can occur due to soils seams or open-voids encountered or created during excavation. Improper management of concrete head levels relative to the extraction of temporary casing can lead to soil intrusion or “necking” of the shaft. These construction defects can reduce the structural capacity of the shaft as well as provide a path for corrosion of the reinforcing steel.

MSE Walls

Karst can pose a high risk to the performance of MSE walls. Porous MSE wall backfill (e.g., open-graded aggregate such as VDOT No. 57 stone) can allow water to infiltrate the foundation materials, which increases the risk of subsurface soil erosion and sinkhole development. If a sinkhole were to develop below the wall, excessive deformation of the wall could occur. Additionally, if soft residual soils are present below MSE walls, they can cause unacceptable settlement, which can impact the overlying pavement structure and cause downdrag forces on the abutment foundation piles.

Existing Foundations, Structures, and Slopes

The proximity of new construction has the potential to impact the existing foundations, structures, and slopes. For example, staged construction of the MSE walls and abutment foundations will require excavation alongside the existing abutments. Also, the proposed pier foundations are adjacent to Route 11, the railroad, and the existing pier foundations. Slope modifications can be required to accommodate roadway grade changes and widening.

Pavements

Residual soils in karst terrane can be very soft and highly plastic and will frequently exhibit low resilient moduli as correlated from California Bearing Ratio (CBR) values. Such residual soils may not be suitable as pavement subgrades and therefore may need to be undercut or augmented.

Stormwater Management Structures

Water is almost always the instigator of sinkholes, so facilities that convey and contain stormwater are particularly prone to the formation of sinkholes.

MITIGATING GEOTECHNICAL RISKS

The Blythe Team will provide a final geotechnical engineering report (GER) according to the VDOT Materials Division Manual of Instructions, Chapter III Geotechnical Engineering (MOI Chapter III), and Chapter VI Pavement Design. Our subsurface exploration and testing program will include soil test borings, rock coring, and laboratory testing. We will also supplement our program with the use of geophysical investigation, where appropriate. The results of this program will be the basis of our final GER which will include recommendations to mitigate geotechnical risks. Mitigation strategies for the preliminary risks identified will include the following:

Enhanced Geotechnical Investigation and Laboratory Testing Program

Common characteristics of karst and faulting includes discontinuous rock and a highly variable top of rock surface. The available GDR data suggests that the top of rock surface and rock quality varies significantly across Abutment A and Pier 1. Our program will emphasize exploration of the proposed abutment and pier locations to better characterize the subsurface conditions and to better define the top of rock

We propose to perform a boring at each individual proposed drilled shaft location

4.4 PROJECT APPROACH

profile and rock continuity. While exploration cannot eliminate karst and fault risk, it will significantly reduce the project's geotechnical risk by providing more characterization and reducing the unknowns. The exploration scope and methods will be adapted to the identified risks and our team's design concepts. Subsurface conditions encountered at the foundation locations will be evaluated as the exploration progresses and borings will be extended as necessary to support foundation design. For example, *we propose to perform a boring at each individual proposed drilled shaft location* and extend those borings below the proposed tip grade to probe for discontinuities in the rock that may influence drilled shaft performance. We also propose to perform additional borings at the team's conceptual abutment locations. The proposed borings at the drilled shaft locations and abutments greatly exceed the requirements of MOI Chapter III.

Geophysical investigations provide valuable tools to supplement traditional exploration methods under the right circumstances. Due to site constraints and the rock types encountered, the successful use of geophysical methods may prove challenging. However, we believe that selective use of electrical resistivity imaging (ERI) may be beneficial to interpolate subsurface conditions between borings and identify potential karst features and fault zones. Our team will be prepared to implement geophysical methods based on the boring results and as needed during construction to aid in assessment and mitigation of karst and fault features.

In addition to the field exploration methods discussed, we plan to perform a detailed laboratory testing program to improve characterization of site-specific soil properties. Selective laboratory testing provides data to evaluate identified risks and enhance geotechnical design and analyses. The Blythe Team plans to utilize laboratory testing to characterize soil shear strength, compressibility, pavement support, and corrosion potential. Emphasis will be placed on testing soils at the bridge substructure locations. The soil laboratory testing will be performed at Schnabel Engineering's Blacksburg, Virginia Office, which is an AASHTO AMRL Accredited Laboratory with significant experience in the Valley and Ridge Province.

We will thoroughly evaluate the geotechnical data to properly characterize the subsurface conditions and perform analyses to further assess the geotechnical risks.

Proactive Design Concepts and Construction Methods

The Blythe Team's design concepts and construction methods have been developed in part to manage geotechnical risks. Design solutions for the preliminary risks identified include the following:

The GDR data provided in Addendum No. 4 indicate that alluvial boulders and cobbles are not anticipated at the proposed Abutment A location. However, the GDR data does suggest that the rock surface varies across the proposed abutment with relatively shallow rock encountered adjacent to the northbound bridge. Due to the potential for shallow rock, the Blythe Team plans to prebore and socket piles where necessary at Abutment A. Pile preboring at Abutment B is not anticipated but will be considered based on the data collected during the field exploration program.

The GDR and existing bridge borings indicate that karst risk related to the MSE walls can be mitigated by founding the proposed MSE walls on rock, weathered rock, suitable residual soil, or existing embankment fill soil. Our enhanced investigation and laboratory testing program will be used to properly characterize the subsurface conditions and support evaluations of stability, settlement, and karst risk. The MSE wall construction grade will also be directly examined for karst features, which will be assessed and mitigated as necessary prior to construction of the MSE wall. Karst mitigation during construction is discussed in the following section. Schnabel used a similar strategy to design MSE walls for the I-81 over Mulberry Lane Bridge Replacement in Smyth County. The proposed exploration program will further delineate and characterize the subsurface conditions at

4.4 PROJECT APPROACH

the abutments to support this design mitigation strategy. Additionally, dense-graded aggregate such as VDOT No. 21B will be used for MSE wall backfill to reduce potential infiltration as compared to open-graded aggregate.

To mitigate the risk of sinkhole formation, the team plans to line stormwater management structures including roadside ditches. The stormwater management pond is anticipated to be lined with either a compacted clay liner or a geosynthetic liner whereas roadside ditches will likely be concrete lined.

The Blythe Team's design concepts have been tailored to reduce construction impacts on the existing foundations, structures and slopes. Our bridge design concept reduces roadway grade changes resulting in minimal impacts to Route 11 and minimal slope modifications along I-81. During construction, our team will also maintain positive drainage of surface water away from slopes. The Blythe Team's conceptual substructure locations reduce conflicts with the existing foundations. The use of drilled shafts at the new piers also eliminates layback and shoring issues with respect to Route 11, the railroad, and the adjacent existing pier foundations. Temporary shoring will be used for the proposed abutment excavations to mitigate risk to existing abutments.

We will thoroughly evaluate our karst and fault mitigation strategies as part of the final GER and select appropriate solutions for the conditions that exist.

Involvement during Construction

Our geotechnical engineer will remain an integral part of the Blythe Team throughout construction. In particular, Schnabel personnel will observe the excavation and construction of the proposed drilled shaft foundations. Schnabel has significant experience observing drilled shaft construction in karst geology of the Valley and Ridge Province and addressing karst related construction issues. Observation of the shaft excavation allows for confirmation that the design subsurface conditions match the encountered subsurface conditions. Observation of the shaft excavation also provides valuable information to help assess and mitigate problems during concrete placement. Having Schnabel personnel on-site during the drilled shaft construction facilitates efficient and effective communication between the drilled shaft subcontractor and the design team. During drilled shaft concrete placement, communication is critical to mitigate potential karst risks.

Latent karst features, such as sinkholes and soil-filled troughs, may be encountered or form as a result of the construction. Schnabel will quickly assess and if necessary provide mitigation options to avert schedule delays and maintain the integrity of the existing interstate. Construction mitigation methods will be tailored to the specific circumstances. Specific construction solutions include cleaning and excavating karst features and either backfilling with dental concrete or constructing graded filters.

The Blythe Team has carefully reviewed the available information, and with our team's local subsurface experience has developed an approach that provides a sound technical and practical basis of design.

4.4 PROJECT APPROACH

The identified geotechnical risks and the associated risk mitigation strategies are summarized below:

Identified Geotechnical Risk	Risk Mitigation Strategy
Geologic risk related to karst and faulting	<p>Geotechnical Engineer with significant local subsurface experience who will:</p> <ul style="list-style-type: none"> ■ Perform an enhanced geotechnical investigation and laboratory testing program, supplement with geophysics where appropriate ■ Use proactive design concepts and construction methods to manage geotechnical risks ■ Support team during construction by quickly assessing issues and providing mitigation strategies where necessary
Karst and fault risk to deep foundations	<p>Abutments on Piles</p> <ul style="list-style-type: none"> ■ Perform additional exploration at the proposed abutments to better characterize subsurface and reduce unknowns ■ Prebore and socket piles in areas of shallow rock <p>Piers on Drilled Shafts</p> <ul style="list-style-type: none"> ■ Perform a boring at each individual proposed drilled shaft location ■ Geotechnical Engineering personnel on-site during drilled shaft construction
Karst and fault risk to MSE walls	<ul style="list-style-type: none"> ■ Found reinforced soil zone on suitable geomaterial to address stability, settlement, and karst concerns ■ Assess encountered karst features at construction grade and mitigate before MSE wall construction ■ Use dense-graded aggregate (VDOT No. 21B) as wall backfill to reduce potential infiltration
Working in the vicinity of existing foundations, maintaining existing structures	<ul style="list-style-type: none"> ■ Design substructure locations that minimize conflicts with Route 11, the railroad, and existing pier foundations ■ Construct drilled shafts at piers to eliminate layback and shoring next to Route 11, the railroad, and existing pier foundations ■ Use temporary shoring such as sheeting for excavations next to existing abutments
Karst risk to pavements	<ul style="list-style-type: none"> ■ Undercut or augment unsuitable soils
Karst risk to stormwater management structures	<ul style="list-style-type: none"> ■ Line stormwater management structures
Maintaining or reconstructing existing slopes	<ul style="list-style-type: none"> ■ Design bridge to reduce roadway grade changes, minimizing slope modifications along I-81 ■ Maintain positive drainage of surface water away from slopes during construction

4.4 PROJECT APPROACH

4.4.4 RAILROAD COORDINATION

Railroad coordination is a significant project risk that must be properly assessed, analyzed, managed, and monitored. For this reason, we have partnered with STV Incorporated (STV) to manage this risk. For the past 30 years, STV has been providing on-call services including oversight on public improvement projects over, under, and along the NS rail system throughout the 22 states in which they operate. STV represents NS during the preliminary engineering phase with office coordination and assistance, estimating, agreement review and plan review. During the construction phase, STV represents NS with on-site field inspections and also regularly performs reviews of contractor submittals and coordinates NS forces as needed where work is required to be completed by the railroad.

The project will involve bridge demolition and construction activities adjacent to and over an existing NS mainline track, which will require close coordination with NS during design and construction. Our experience has shown that the accurate and timely communication of information with NS will improve planning and relationships and also aid in the successful completion of the project. With a focus on safety, the accurate and timely communication of information with NS, and minimizing impacts to NS, our team will implement the following mitigation strategies to minimize or eliminate railroad coordination impacts:

RAILROAD COORDINATOR

All railroad coordination activities will be led by George Zimmerman, PE with STV. George has more than 35 years of experience and has managed over 2,000 individual assignments on behalf of NS for roadway, bridge, and retaining wall public improvement projects over, under, and along the NS rail system. George most recently represented NS on the VDOT I-66-Route 29/Linton Hall Interchange Improvements project in Gainesville, VA, which involved the construction of two bridges over NS. Our Railroad Coordinator will keep the NS Engineer-Public Improvements along with the NS Division Engineer, or their authorized representative, apprised of the project schedule, advance notice of upcoming flagging needs, and major work activities such as demolition and erection operations.

PROJECT WORK PLAN AND SCHEDULE

Our team will work directly with NS to develop a work plan and schedule that incorporates NS's availability and schedule requirements. The work plan and schedule will include both design and construction related activities that impact the railroad. Our team will hold a preconstruction meeting with NS to identify key personnel and contact information, identify required submittals, and review the Special Provisions for Norfolk Southern Railway Work Requirements and the Special Provisions for Protection of Railway Interest.

DESIGN TO MINIMIZE RAILROAD IMPACTS

Our team has evaluated bridge types and span arrangements that will meet the project requirements and minimize railroad impacts to the greatest extent possible.

Minimum Vertical Clearance

The profile of I-81 has been designed to accommodate a minimum vertical clearance of 23'-0" for a future third lane on I-81 in each direction. All as-built bridge seats and top of rail elevations will be surveyed and furnished to NS for review and verification at least 30 days in advance of the beam/girder erection to confirm that the minimum vertical clearances, as approved on the plans, will be achieved.

4.4 PROJECT APPROACH

Pier Locations

The location and orientation of both piers have been set to accommodate requirements specified by NS for future railroad corridor improvements, such as additional tracks and maintenance roadways. The piers have also been located to eliminate the need for crashwalls, facilitate and simplify the erection of beams/girders, and minimize the need for excavation shoring systems to support the NS track. This will help reduce the number of construction submittals requiring review and approval by NS, and it will allow for more conventional means and methods of construction to be used.

Drainage

Drainage encroachments on the railroad right of way will be avoided.

Erosion Control

The bridge and roadway plans will include the proposed methods of erosion control to prevent silt accumulation in the railroad's ditches and culverts and to prevent fouling the track ballast and sub-ballast.

Buried Railroad Utilities

Since "One Call" services do not locate buried railroad utilities, our team will contact NS to locate and mark any existing railroad utilities within the project limits, so we can develop design solutions to avoid impacting their existing facilities. During construction, we will request NS to ensure that their lines are continually marked within the project limits, so they can be avoided.

INDEPENDENT DESIGN PLAN REVIEWS BY RAILROAD COORDINATOR

The railroad's approval of the design documents will be critical to the overall schedule. According to the NS Public Projects Manual and our experience, each design package review by the railroad can take up to four weeks to complete and receive railroad acceptance and/or comments from the railroad. In order to improve the probability of the railroad's acceptance of the various design packages, our Railroad Coordinator will conduct an independent review of the design documents from the railroad's perspective prior to submitting any design documents to NS for review and approval. These independent reviews will be performed by STV's design staff who routinely perform design plan reviews on behalf of NS on similar public improvement projects.

PRE-REVIEW OF CONSTRUCTION SUBMITTALS BY RAILROAD COORDINATOR

NS will require construction submissions for any activities that have the potential to foul the NS track, impact NS operations, or disturb NS right of way. Examples of construction submittals required to be submitted to NS for review and approval include, but are not limited to the following:

- General Project Means and Methods/Construction Phasing
- Construction Excavation & Shoring
- Debris Shielding
- Demolition Plan
- Erection Plan
- Erosion Control
- Roadbed Protection
- Emergency Action Plan

4.4 PROJECT APPROACH

According to the NS Public Projects Manual and our extensive experience, the railroad's review of construction submittals can take up to 30 days to complete. To improve the probability of the railroad's acceptance of the various construction submittals, our Railroad Coordinator will perform a pre-review of the construction submittals from the railroad's perspective prior to submitting any construction submittals to NS for review and approval. These pre-reviews will be performed by STV's design staff who routinely perform construction submittal reviews on behalf of NS on similar public improvement projects.

PROJECT SPECIFIC SAFETY PLAN

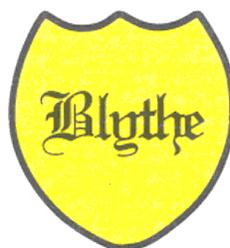
Our team will develop a Project Specific Safety Plan that addresses NS work requirements, NS emergency contacts, required NS safety briefings by the assigned railroad representative and construction staff, NS fall protection requirements, and the minimum personal protective equipment required by NS. The plan may also include requirements for erecting orange safety fencing and/or silt fence between the work areas and the NS track in order to provide a visual barrier to warn workers and equipment operators of the foul zone of the track. The plan will also include areas where vehicles, equipment, and/or materials are prohibited





Section 4.5

Construction of Project



4.5 CONSTRUCTION OF THE PROJECT

4.5 CONSTRUCTION OVERVIEW

The Blythe Team has experience with design-build projects across the Commonwealth and greater mid-Atlantic region, both individually and as a team. Further, STV and Timmons Group have an extensive history working as an engineering team on design-build and other projects for VDOT. Our team will draw from lessons learned to provide the means and methods required to safely and efficiently deliver this project on schedule. Our construction approach is built on these goals with a critical focus on the following items:

- Reinforce safety of the traveling public and workers during construction
- Minimize impacts to traffic by reducing traffic shifts
- Reduce impacts to cultural resources, rivers, and wetlands
- Minimize impacts to adjacent properties

The project schedule is central to our construction sequencing by anticipating and mitigating potential delays.

Our team has met on a weekly basis to develop the design and construction concepts and associated sequence of work that generated the project schedule discussed in Section 4.6. The schedule illustrates the detailed effort put into the design, engineering, permitting, utilities, ROW, QA/QC, and construction activities necessary to meet the demands of on-time project delivery. Advantages of our approach include:

<i>Project Enhancement</i>	<i>Benefits to Traveling Public</i>
Confident Final Completion Date	Adequate float time to ensure an on-time delivery
Elimination of Route 11 Reconstruction	Reduced MOT requirements, Faster construction, Limited disruption to local traffic, Unaffected route for Emergency Detour as needed
Optimized Geometry	Reduces project length by approximately 20%, shortening lengths and durations of traffic shifts
Advanced Work Package (Bridge Foundations)	Completed outside of traffic, significantly limiting duration of impacts to travel ways
Elimination of 2 out of 3 “Major” Jack and Bore Operations	Significantly reduces impacts and disruptions to the traveling public
Phased MOT Plan	Limited number of traffic shifts and overall work phases increases driver expectation/awareness and public safety
Accommodation for Future Widening	Constant cross-slope deck, abutments and piers aligned with NSRR and Route 11 reduces future construction needs and traffic disruptions

4.5.1 SEQUENCE OF CONSTRUCTION

Our approach to sequencing construction addresses optimized phasing, safety and operations, environmental impacts, easement acquisition, staging and storage, stakeholder coordination, and agency approvals. *The project schedule is central to our construction sequencing by anticipating and mitigating potential delays.* Our approach will deliver on the requirements above while maximizing opportunities for early completion and fully meeting or exceeding the RFP requirements.

CONSTRUCTION PHASING

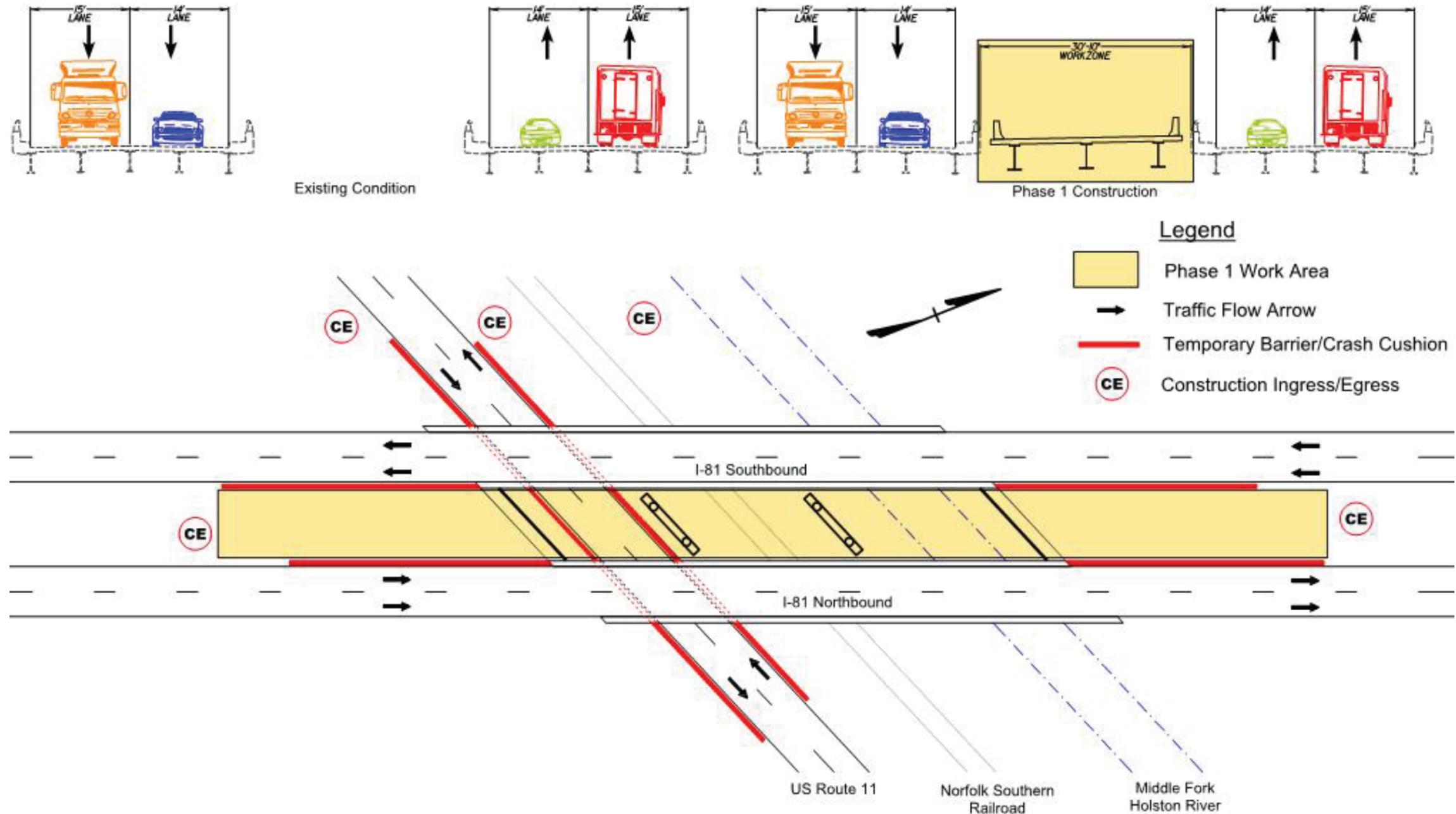
The following 11x17 fold-out sheets depict the general construction phasing approach to be utilized by the Blythe Team to minimize impacts to the traveling public and streamline the overall construction process. Our construction phasing has been developed to ensure I-81 traffic is maintained with minimal disruption by anticipating and mitigating any potential construction delays and meeting the Final Completion Date. Details for each of the three main phases are included on the following pages.



4.5 CONSTRUCTION OF THE PROJECT

SEQUENCE OF CONSTRUCTION AND MOT PHASING – PHASE 1

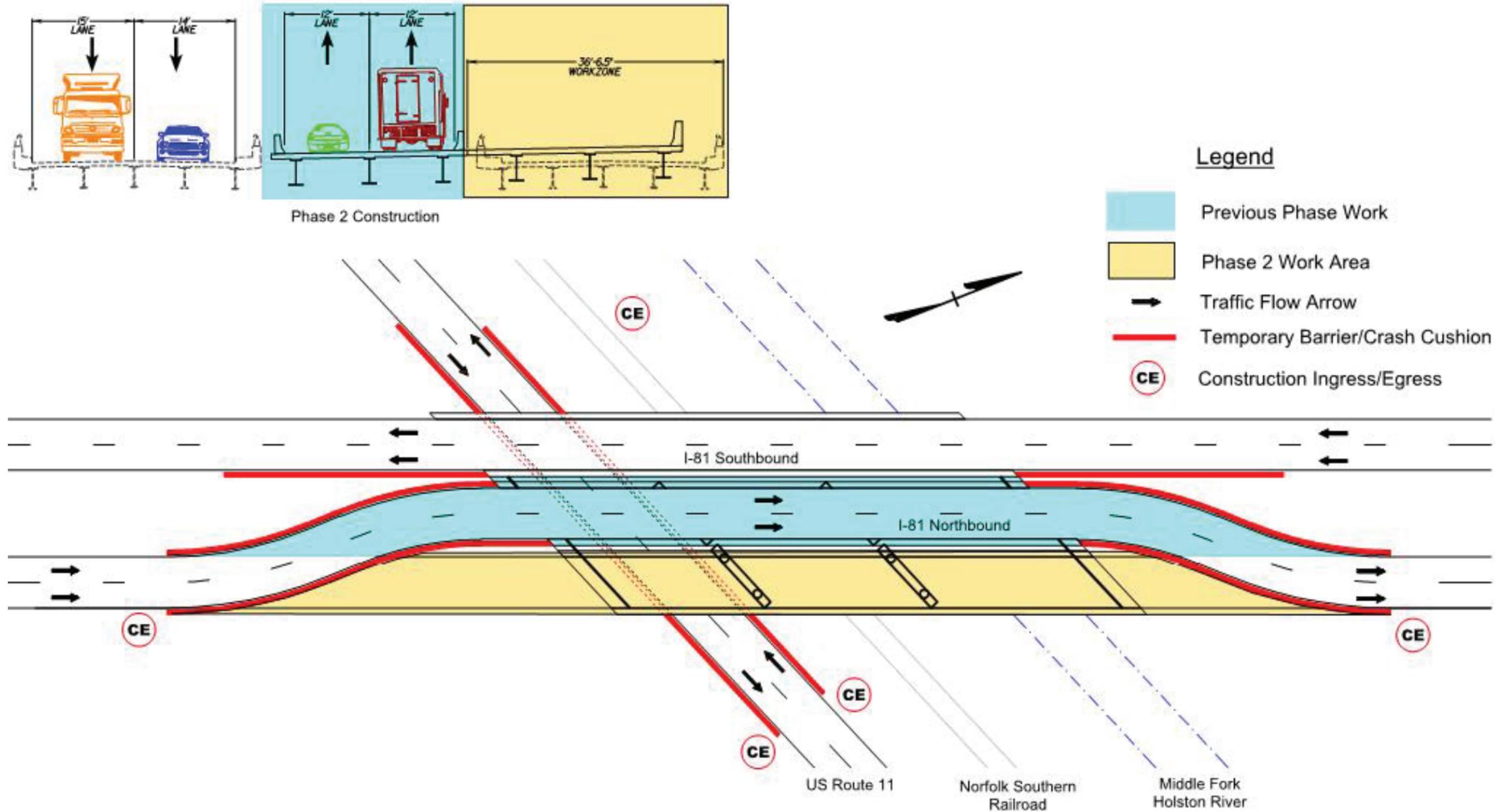
1. During overnight hours, install temporary concrete barriers along the inside shoulder of NB and SB I-81, as well as, the NB and SB outside shoulders of US Route 11. The traffic barriers along I-81 will connect to the existing bridge parapets using a special design connection.
2. Construct the median portion of the Proposed bridge.
3. Construct the temporary roadway crossover for use in Phase 2 to accommodate shifting NB traffic to the new bridge, including any temporary drainage and pavement.
4. Install temporary pavement markings, move to Phase 2.



4.5 CONSTRUCTION OF THE PROJECT

SEQUENCE OF CONSTRUCTION AND MOT PHASING – PHASE 2

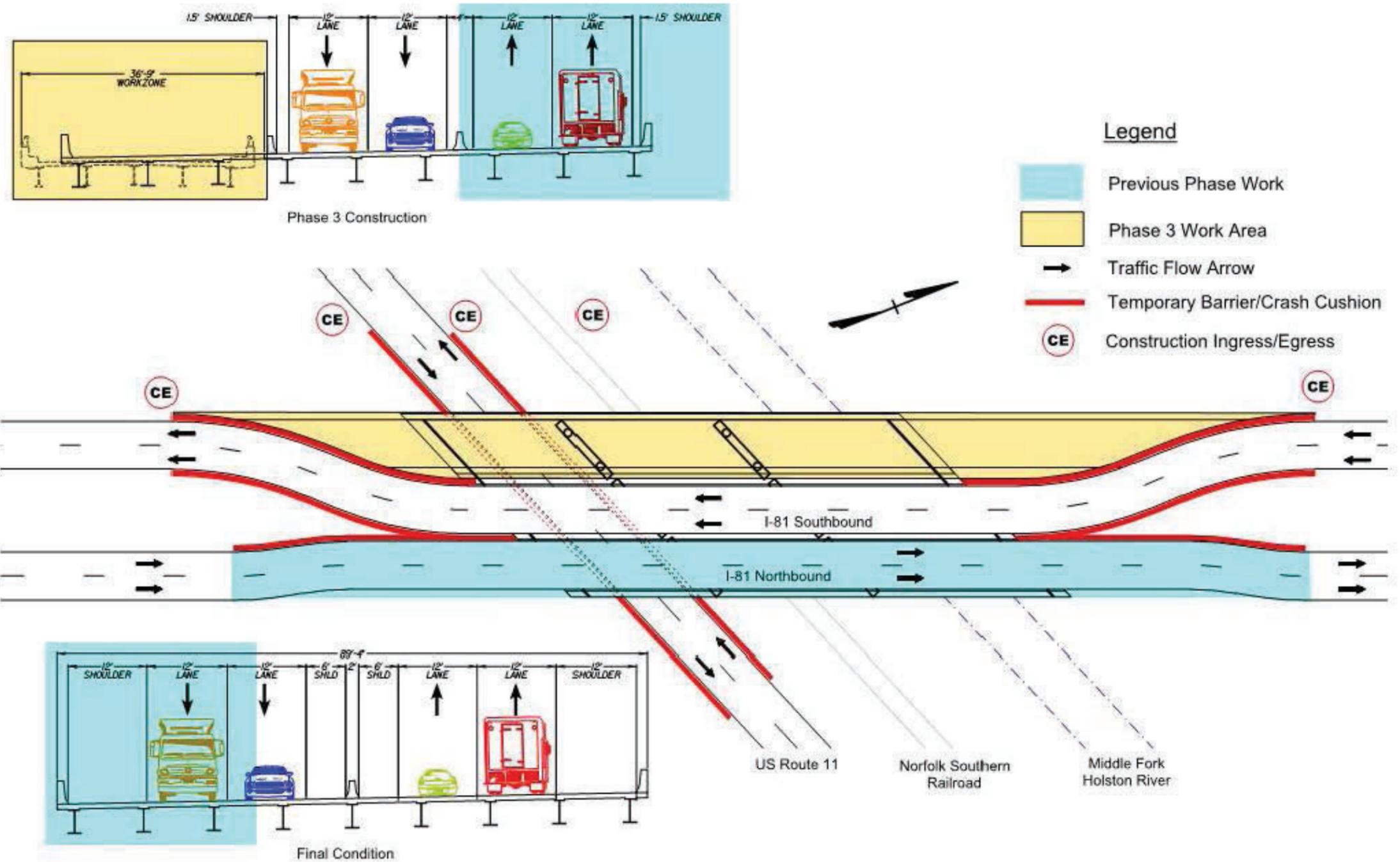
1. During overnight hours, remove temporary concrete barrier service on NB inside shoulder, and install it along the new outside shoulder of the NB lanes — shift NB traffic onto the new median portion of the Bridge using the temporary roadway crossover.
2. Demolish the existing NB Bridge.
3. Construct the proposed NB portion of the bridge.
4. Construct roadway improvements and features along NB I-81.
5. During overnight hours, remove temporary concrete traffic barrier service along the NB outside shoulder and install it along the inside shoulder of the newly constructed NB I-81 — shift NB traffic onto newly constructed NB portion of the bridge.
6. Construct the temporary roadway crossover for use in Phase 3 to accommodate shifting SB traffic to the new bridge, including any temporary drainage and pavement.
7. Install temporary pavement markings for the temporary roadway crossover in Phase 3, move to Phase 3.



4.5 CONSTRUCTION OF THE PROJECT

SEQUENCE OF CONSTRUCTION AND MOT PHASING – PHASE 3

1. During overnight hours, remove temporary concrete barrier service on SB inside shoulder, and install it along the new outside shoulder of the SB lanes — shift SB traffic onto the new median portion of the bridge using the temporary roadway crossover
2. Demolish the existing SB Bridge.
3. Construct the proposed SB portion of the bridge.
4. Construct roadway improvements and features along SB I-81.
5. During overnight hours, remove temporary concrete traffic barrier service along the SB outside shoulder and install it along the inside shoulder of the newly constructed SB I-81 — shift SB traffic onto newly constructed SB portion of the bridge.
6. Remove temporary roadway crossover features and perform final median grading and install remaining median features, including bridge median barrier.
7. During overnight hours, place any final overlay or pavement along NB and SB I-81 — install all permanent pavement markings.
8. Place all traffic in final configuration and remove temporary roadway features.



Legend

- Previous Phase Work
- Phase 3 Work Area
- Traffic Flow Arrow
- Temporary Barrier/Crash Cushion
- CE Construction Ingress/Egress

4.5 CONSTRUCTION OF THE PROJECT

VEHICULAR SAFETY AND OPERATIONS

The following design enhancements provide improved vehicular safety and operations:

Project Element	Enhancement	Safety & Operations Improvement
Advanced Work Package (Bridge Foundations)	Allows for bridge foundations to be constructed in an advanced phase beyond traffic lanes	Reduces the duration of operations requiring traffic shifts and the overall MOT duration
NB & SB Vertical Alignment Adjustment	Relative to RFP Plans, allows for significant reduction in cut and fill within NB & SB corridors	Allows for median traffic shifts with manageable grade differentials providing improved safety for motorists and expanded work area for construction team
MOT Median Crossovers	Allows for minimal number of shifts and expedited construction	Traffic continues to move at normal speeds of 70 mph within reduced extents of project limits

BRIDGE FOUNDATIONS

The proposed foundations for the piers are drilled shafts with rock sockets. The benefit of this type of construction is the minimal footprint they have and the elimination of need for temporary shoring for the railroad or Route 11. There is ample headroom above the proposed pier locations for the installation of the drilled shafts with nearly no impacts to traffic. This work is anticipated to be constructed as part of the Advance Work Package (AWP).

The new abutments will consist of a cantilevered cast-in-place concrete abutment supported on deep foundations (steel H-piles prebored and set in rock or driven to refusal) behind MSE walls. Preboring may not be required at abutment B, but will be determined as part of our geotechnical design.

ENVIRONMENTAL IMPACTS

The Blythe Team’s proposed design works within the existing right of way limits as utilized for the Categorical Exclusion Document prepared for the project. There are no significant variations from the RFP Plans that would warrant additional analysis for noise impacts. Impacts to the existing river and potential wetland areas beyond those inferred by the RFP Plans are not realized with our proposed design. Our team will prioritize completing work in the vicinity of the river using methods which do not require in-stream operations.

Our team is committed to minimizing environmental impacts in every sense – an advanced work package will be prepared to include erosion and sediment control plans specific to foundation work in the area of the river to ensure appropriate protection measures are implemented from project initiation.

PERMANENT EASEMENT ACQUISITION

The final design and construction of the project improvements fall within the existing ROW. In addition, easements for drainage are not required.



4.5 CONSTRUCTION OF THE PROJECT

STAGING AND STORAGE AREAS

The Blythe Team understands that the planning and establishment of appropriate staging and storage areas is critical to maximizing safety and efficiency. Several factors are considered when determining the most suitable locations for staging and storage areas including proximity to construction activities and ease of access. Additionally, we evaluated each proposed area for line of sight considerations, ingress/egress safety, and consideration of clear zone location.

The storage of materials and equipment behind existing guardrail or temporary barrier results in a safe work zone with limited impacts to traffic. The Blythe Team will carefully consider the deflection rate of guardrail and barrier to support the proper placement of materials and equipment to prevent these work zone elements from becoming potential hazards, even when placed behind protective devices.

Similarly, sight lines will be evaluated to verify material and equipment are not placed adjacent to driveways or intersections that may limit visibility for approaching traffic. Each of these potential risks is analyzed and the proposed areas are coordinated with intended construction access points to develop the safest and most efficient plan for staging and storage areas, as well as access points.

Several areas within the project footprint will be considered for staging and storage areas:

- During the center portion of bridge construction (Phase 1), the existing median of I-81 adjacent to the existing bridges will be used as a staging and storage area. Areas will be designated on each side of the new bridge section. Temporary median widening will be constructed on the NB & SB approaches to the staging areas to allow vehicles to enter and exit the median.
- During the NB portion of bridge construction, NB traffic will be shifted onto the new center bridge section. This will allow staging and storage areas to be created at the ends of the existing NB bridge within the existing travel lanes and outer shoulder. An additional area is available in the grassed right of way immediately east of the existing NB bridge approach. Access to these areas will be made from I-81 NB and entering the work zone behind the barrier wall.
- During the SB portion of bridge construction, SB traffic will be shifted onto the new center bridge section. This will allow staging and storage areas to be created at the ends of the existing SB bridge within the existing travel lanes and outer shoulder areas. Access to these areas will be made from I-81 SB and entering the work zone behind the barrier wall.
- In addition to the potential staging and storage areas along I-81 discussed above, the existing right of way area located between the I-81 SB lanes and Route 11 is a prime candidate for long-term storage and staging as well as overall project oversight operations. This area is easily accessed off Route 11 with immediate access to bridge foundation work areas.

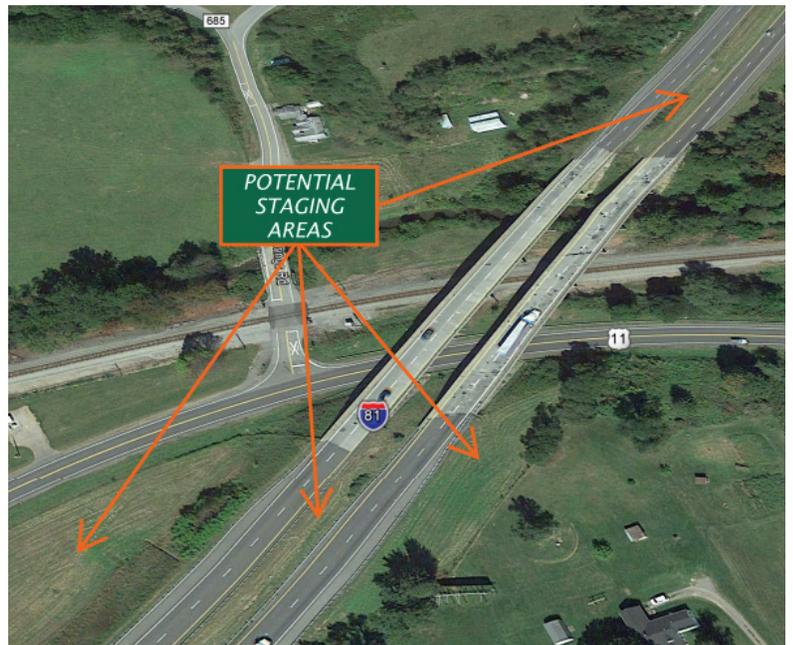


Figure 4.5: Potential Staging Area Locations

4.5 CONSTRUCTION OF THE PROJECT

STAKEHOLDER COORDINATION & PUBLIC INVOLVEMENT

The highest priority of the public involvement program is to create an environment for sustained public awareness. Prior to the start of construction, our in-house public involvement manager will prepare a communications plan detailing communication goals, strategies, messaging, stakeholders, tactics, informal meetings, and procedures for communicating new traffic impacts and project updates to VDOT, key stakeholders, and the general public. We will also prepare an emergency response plan establishing communications protocols for any onsite emergency, including any work zone incidents in accordance with IIM-LD-241. Both plans will be reviewed and approved by VDOT prior to implementation.

We will assist VDOT in holding informal meetings with stakeholders, as directed by VDOT at key project intervals and assist VDOT with collateral materials, including hand-outs and project boards, as needed. We will maintain a master contact list for the project, logging a timeline of inquiries and comments received from the general public and stakeholders, and tracking all responses provided.

AGENCY APPROVALS

To avoid the risk of delays to the schedule due to agency and stakeholder approvals, the team must understand all of the parties that have input, their procedures and timeframes for approval, and the effect they have on the sequence of work. We identified the stakeholders in our Organization Chart included in Section 4.2, and will refine this list as the project moves forward.

COORDINATION WITH MOUNTAIN EMPIRE AIRPORT

We understand that the project is in close proximity to the Mountain Empire Airport, and will coordinate with the airport and the Federal Aviation Authority (FAA) before commencing any crane operations. We have reviewed the preliminary crane operation approval from FAA that is included in the RFP Information Package. While we do not anticipate deviating from the approach in the preliminary approval, if necessary, we will coordinate (through the VDOT Project Manager) to obtain necessary permits and approvals from FAA and the Mountain Empire Airport. We will submit to the VDOT PM a lift plan for all crane operations with appropriate equipment data sheets, maximum height, period of crane operations, staging locations, safety measures, and other pertinent information.

ANTICIPATING AND MITIGATING FOR POTENTIAL CONSTRUCTION DELAYS

The Blythe Team has already advanced a number of concepts, plans, and procedures for completing the project without delay. As we further develop our schedule, we are constantly focused on issues and concerns that have the potential to create delays and will direct our efforts on mitigation. At various project stages, we rely on proven methods for creating, monitoring, and maintaining the schedule, including:

Technical Proposal Stage

As the groundwork for the schedule was developed, all disciplines have had input. Our team has met on a weekly basis since release of the RFP to discuss issues, create our concept, solicit feedback, and to make schedule adjustments. The schedule presented in Section 4.6 is the result of this close collaboration and has buy-in from all team members.

Design Stage

As we proceed through the design process, the integration of the various disciplines rises to a higher level. We continue to hold team meetings, at a minimum on a weekly basis, to provide an over-the-shoulder review. During this period, our formal project schedule is developed and reviewed with VDOT and other stakeholders.

4.5 CONSTRUCTION OF THE PROJECT

Should issues arise or conditions change during the design that impact the sequence or completion milestones, the team will review schedule options for correction to make sure milestones are maintained. Once finalized, it is communicated to each discipline, our construction forces, subcontractors and consultants, and other affected parties and is the basis for planning efforts moving forward. Throughout this stage, the approved schedule is monitored, updated, and communicated to VDOT by the DBPM.

Construction Stage

As the project transitions to construction, the CM and DBPM closely monitor and update the schedule on a regular basis. The CM communicates the schedule to the entire team, including utility companies, QA/QC, government agencies, and others. In addition, more detailed schedules are created by the construction teams to efficiently plan their work. These 3-week and 90-day look-ahead schedules allow teams to plan activities on a daily basis and communicate specific tasks and milestones in a direct, concise way. Throughout construction, these schedules are monitored and compared to the approved baseline schedule so that delays can be anticipated. The team will evaluate options for avoiding delays or schedule recovery if necessary, including re-sequencing work, adding resources, or re-designing certain features.

4.5.2 TRANSPORTATION MANAGEMENT PLAN

The Blythe Team's approach to transportation management is to maximize safety for the traveling public and on-site team members throughout every phase of construction. By ensuring continued communication with the traveling public and key stakeholders, we will work to mitigate impacts that those affected by the project may realize for the duration of the project. Our team understands the importance of maintaining access to the Rest Area at Mile Marker 54.1, therefore our plan has been developed to ensure no conflicts with ingress, egress, and all other operations at the Rest Area. Further, we will work with VDOT and other project stakeholders to accommodate the safe and efficient snow removal operations along the corridor.

MAINTAINING TRAFFIC THROUGH ALL PHASES OF CONSTRUCTION

The Blythe Team understands the overarching goal of this project is to improve safety through this section of the I-81 corridor by replacing the existing bridges which continue to present safety challenges in their current condition. It is critical that in undertaking the task of achieving this goal, the Design-Build team focus on safety and efficiency maintained at each moment along the way. By developing a proposed design concept (involving individuals holding VDOT Advance Work Zone certifications) and a construction approach that delivers the highest quality transportation solution while maintaining overall safety and limiting impact to the public, the Blythe Team will work to complete this project on schedule.

To allow for the most safe and efficient completion of work, the project has been designed in three main phases to maximize the amount of work completed outside of traffic. A complete Transportation Management Plan (TMP) will be developed to ensure delivery of these principles, with the following key components:

- Phased Temporary Traffic Control (TTC) Plans
- Public Communications Plan appropriate to each phase of construction
- Incident Management Plan (IMP) suited for potential risks of each phase
- Transportation Operations Plan

As mentioned above, continued communication with VDOT and key stakeholders is critical for effective implementation of any TMP. A primary objective of our project safety team including MOT Manager, Safety Manager, Traffic Engineers, and other experienced personnel will be to work with interested parties throughout

4.5 CONSTRUCTION OF THE PROJECT

development and implementation of the TMP to ensure the highest level of communication. This coordination will be through a combination of formal and informal meetings, mailings, news postings, project websites, and other methods discussed in the Public Communications Plan of this proposal.

Immediately following Notice to Proceed, the Blythe Team will focus on developing the first phase of the TMP to accommodate the Advanced Work Package highlighted in the project schedule. For this initial phase and all phases of construction, a detailed TTC plan will be developed to address the necessary traffic control measures for efficient construction and safe passage of traffic through the project limits. The safety of motorists and field personnel will be the focus of plans to include the following measures: advanced work zone signing and message boards (PCMS), group II channelizing devices, temporary pavement markings, concrete barrier, impact attenuators/crash cushions, and other items necessary to provide safe conditions. All traffic control measures will be detailed (size, location, type, etc.) based on the requirements of the latest versions of the Virginia Work Area Protection Manual (WAPM) and the Manual on Uniform Traffic Control Devices (MUTCD).

A detailed Public Communications Plan will be developed for each phase of construction, including regular meetings throughout the duration of the project with VDOT and stakeholders. This plan will be utilizing multiple forms of communication to ensure the highest level of distribution including posting to a project website, newspaper and social media postings, radio advertisements, and pre-approved messages to be posted on PCMS boards in advance of the project. Detailed information will be provided to VDOT and the public as changing conditions and phases warrant.

The Incident Management Plan (IMP) is critical to beginning field work in the vicinity of traffic. A project and phase specific IMP will be developed to address field work which affects travel lanes or shoulders with the intent of preparing for and documenting the steps to be taken in the event of an incident along the construction corridor. The plan will be coordinated with VDOT, Police, EMS, and other key stakeholders, with a meeting held with all parties prior to implementation of the plan. The IMP will address the following:

- 24/7 point of contact for emergency notification of incident by Transportation Operations Center (TOC)
- Emergency detour routes and sign layout plans in addition to TMP signage
- Agency and stakeholder responsibilities matrix/checklist
- Pre-staged detour equipment and material needs (i.e. barrels, portable message boards, signage, etc.) as defined in the sign layout plans that shall be provided by the Design-Builder
- Coordination with VDOT Southwest Regional TOC
- Signage of emergency detour routes
- Coordination with 1st responders and stakeholders
- Law Enforcement, Fire, and Rescue access to the road network during incidents
- Pre-planned messages for various types of incidents for the portable DMS
- Contact list for appropriate stakeholder response personnel
- On-call towing information to ensure fast incident clearing

4.5 CONSTRUCTION OF THE PROJECT

PROPOSED TRAFFIC IMPACTS

As detailed above, minimizing traffic impacts is paramount to project safety and stakeholder success. Proper planning and advanced notice are key to safely implementing traffic changes. Our proposed traffic impacts include:

Lane Closures

As shown on the sequence of construction and MOT phasing plans in Section 4.5.1, our team has developed a temporary traffic control strategy that minimizes public impacts. Upon project award, we will develop site-specific TTC plans for each phase in accordance with the requirements of VDOT’s IIM-LD-241, the Virginia WAPM, and the MUTCD. We anticipate using the following lane closures:

Location	Duration	Reason
I-81 NB and SB	Per RFP Part 2, Section 2.10.3	Single lane closures will be used for setting temporary barrier, night time paving, delivery of materials, and bridge work
Route 11	Per RFP Part 2, Section 2.10.3	Single lane closures for bridge work on I-81, delivery of materials. <i>*Note that Route 11 will not need to be reconstructed per the Blythe Team’s plan, limiting lane closure needs</i>
I-81 NB and SB	Per RFP Part 2, Section 2.10.3	Temporary 20-minute total closures will be used for bridge work, with frequency limited as practical

Time of Day Restrictions

Our Team understands and will adhere to the time of day restrictions prescribed in the RFP Part 2, Section 2.10.3 for I-81 and Route 11, as well as holiday and NASCAR Race restrictions.

Temporary Detours

Temporary total road closures will be required on I-81 and Route 11 for limited construction activities and will be completed in accordance with RFP Part 2, Section 2.10.3. These activities may include bridge demolition and other bridge work presenting risks to motorists. No long-term lane closures requiring detours are proposed in the Blythe Team’s TMP.

Flagging Operations

Flagging operations will be limited to Route 11. As noted in this proposal, Route 11 will not require re-alignment or reconstruction, therefore flagging operations will be limited to activities related to I-81 bridge construction. Flagging operations will be in accordance with RFP Part 2, Section 2.10.3.

Minimum Lane Widths

An absolute minimum lane width of 11 feet with 1 foot shoulders will be maintained for I-81 for transition sections and across the bridges during construction per RFP Part 2, Section 2.10.3. We understand the importance of limiting the use of 11 foot lane widths to maintaining the normal operating speed through the work zone and therefore will utilize 12 foot lanes to the extent practical. Route 11 existing lane widths will be maintained throughout construction.



4.5 CONSTRUCTION OF THE PROJECT

Work Zone Speed Reductions

The Blythe Team fully intends to maintain the existing posted speed limit of 70 mph for I-81. Any operations that may require a reduction in speed will have a detailed Speed Analysis completed to determine impacts in accordance with VDOT’s IIM-TE-350. All temporary alignments have been developed to meet the 75 mph design speed for I-81 to ensure normal traffic operations are maintained. In combination with the use of 12 foot travel lanes where practical, our team’s focus remains on minimizing impacts to the traveling public to the greatest extent. The Blythe Team’s project enhancements to eliminate the reconstruction of Route 11 will ensure existing posted speed limits are maintained as well.

Project Stakeholders

The following table summarizes the potential stakeholders located in and around the project area and outlines our proposed approach to communication and mitigation strategies to limit disruptions to vehicular and pedestrian traffic through the work area and adjacent public transportation facilities/roadways:

Stakeholder/Impact	Communication & Mitigation Strategies
<p>Traveling Public Potential time delays for temporary construction operations</p>	<ul style="list-style-type: none"> ■ Public outreach campaign (media) ■ Facilitate regular public meetings with stakeholders ■ Advance warning of changing conditions via PCMS ■ Minimize lane closures and traffic shifts ■ Maximize temporary lane widths
<p>Pedestrians Potential for pedestrians within the work zone along Route 11</p>	<ul style="list-style-type: none"> ■ On-site monitoring for existing or predicted pedestrian traffic ■ Elimination of Route 11 reconstruction further maintains existing pedestrian access routes
<p>Norfolk Southern Railroad Construction adjacent & above NS Tracks and ROW</p>	<ul style="list-style-type: none"> ■ Dedicated, experienced railroad coordinator (STV) ■ Maintain regular meetings and communication ■ Strict adherence to VDOT/NS Construction Agreement
<p>Smyth County, Town of Marion, & City of Atkins Potential time delays for temporary construction operations</p>	<ul style="list-style-type: none"> ■ Public outreach campaign (media) ■ Facilitate regular public meetings with stakeholders ■ Advance warning of changing conditions via PCMS
<p>Utilities (Appalachian Power, Atmos, Bristol VA, Comcast, CenturyLink, Smyth PSA) Ensure early coordination and relocation efforts</p>	<ul style="list-style-type: none"> ■ Conduct regular coordination meetings beyond the required UFI, including field meetings prior to construction ■ Continue communication with utilities with increased conflict risk – our team has identified CenturyLink as a high-risk owner at this time and has proactively discussed the project and potential impacts with representatives
<p>Local Community (Residents, Community Groups) Construction in close proximity</p>	<ul style="list-style-type: none"> ■ Public outreach campaign (media) ■ Facilitate regular public meetings with stakeholders ■ Advance warning of changing conditions via PCMS ■ Maintain access to all adjacent properties



4.5 CONSTRUCTION OF THE PROJECT

Stakeholder/Impact	Communication & Mitigation Strategies
<p>Mountain Empire Airport & FAA Construction & crane operations in close vicinity to Airport</p>	<ul style="list-style-type: none"> ■ Facilitate regular coordination meetings and/or phone conferences ■ Early submittal of lift plan for crane operations to allow for continued coordination and accommodations
<p>Schools & Churches (Smyth County, Cedar Bluff Baptist) Potential for delays traveling to/from School and/or Church, particularly buses</p>	<ul style="list-style-type: none"> ■ Public outreach campaign (media) ■ Facilitate regular public meetings with stakeholders ■ Advance warning of changing conditions via PCMS ■ Engage with representatives of each group, including school transportation officials, to coordinate bus schedules and congregation times – schedule construction accordingly ■ School buses given priority during any flagging operation
<p>Police, Fire, & Rescue Potential for delay in response times</p>	<ul style="list-style-type: none"> ■ Public outreach campaign (media) ■ Facilitate regular public meetings with stakeholders ■ Advance warning of changing conditions via PCMS and proactive coordination meetings before implementing major traffic changes ■ Elimination of Route 11 reconstruction allows for minimal interruptions





Section 4.6

Proposal Schedule



4.6 PROPOSAL SCHEDULE

The Blythe Development Co. (BDC) Team understands the complexities and intricate nature of the project’s technical elements. The proposal schedule provided will lay out our plan to successfully design and construct the replacement of the dual I-81 Bridges over Rte. 11, Norfolk Southern Railroad, and Middle Fork Holston River with a single structure. The BDC Team’s design will meet all requirements of the RFP. Our proposal schedule takes into consideration the design and construction activities, tasks, sequence of activities and tasks, overall sequencing of work, and major deliverables required. This proposal schedule is broken down into major phases using the hierarchical Work Breakdown Structure (WBS), which shows major phases of work. This method shows major phases of work which will include the following: project milestones, project management, scope validation, design, public involvement, environmental, ROW acquisition, construction, and utility impacts. By using Primavera P6, a Critical Path which evaluates review responsibilities by VDOT, FHWA, and other agencies, as well as design and construction activities that will be required by the BDC Team has been created. Consideration for 3rd party participants such as subcontractors and suppliers will be given to allow for the critical path to be maintained.

4.6.2 SCHEDULE NARRATIVE

The BDC Team’s proposal schedule along with our experience managing and constructing all phases of Design Build projects, will maximize the efficiency of the project delivery to benefit all stakeholders including VDOT, the traveling public and the citizens of Virginia. Figure 4.6.2 outlines the critical milestone dates from our schedule. After award, BDC will develop the preliminary and baseline schedule for the project.

Key Milestones	Date
Notice to Proceed	March 25, 2019
Scope Validation Period Complete	October 18, 2019
Advanced Work Package	September 11, 2019
Begin Construction Activities	October 2, 2019
Final Completion Date	May 23, 2022

WORK BREAKDOWN STRUCTURE

The Work Breakdown Structure (WBS) uses multiple levels in the arrangement of the activities required to complete this project. Figure 4.6.2.1 is a summary of the WBS from Level 2 down to Level 3. The preconstruction and construction WBS activities are broken down by phase and components. These are as follows:

General Conditions

Preliminary Schedule, base line schedule, scope validation, and QA/QC plan.

Design and Permitting

Design consists of field surveys, geotechnical, preliminary roadway, MOT, clearing and grubbing, drainage, E&S, final roadway, bridge, pavement markings and signage. Permitting for this project includes the delineation of streams and wetlands, coordination of approvals with the USACE, stormwater permit, and the evaluation of threatened and endangered species. All utility relocations will be included and broken down by the individual utility company. This approach will allow for better management and coordination of any relocations that are necessary. Submittal milestones and approvals by VDOT are included for all items described above.

4.6 PROPOSAL SCHEDULE

Construction

This section is broken down by the phases of construction. All construction activities take into account all required work to complete roadway, bridge, MOT, construction access, drainage, signage, quality control, and quality assurance.

WBS Level 2	WBS Level 3
Project Milestones	Project Milestones <ul style="list-style-type: none"> ■ Phase I Completion ■ Phase II Completion ■ Phase III Completion ■ Contract Completion
Scope Validation	
CPM Schedule	
QA/QC Plan	
Incident Management Plan	
Design Survey	
Geotechnical	
Railroad Coordination	
Environmental Coordination & Permitting	
Design	Design <ul style="list-style-type: none"> ■ Foundation Advanced Work Package ■ Roadway Design ■ Bridge Design
Utility Coordination	
Construction	Construction <ul style="list-style-type: none"> ■ Phase I Center Portion Bridge & Roadway ■ Phase II NB Bridge & Roadway ■ Phase III SB Bridge & Roadway ■ Complete Road Work ■ Completion Activities



4.6 PROPOSAL SCHEDULE

CALENDAR

5 DY/WK + Holidays

This is a 5 work day per week calendar with holidays. The schedule activities associated with this calendar are design, administrative and construction other than activities that may be impacted by adverse weather.

VDOT Review Times

We understand that VDOT and other agencies will have 21 calendar days to review most submittals. The schedule submitted utilizes work days, so the duration of these reviews is shown as 15 work days to accurately reflect the required 21 calendar day review time.

Weather Days

Our P6 schedule has been created using anticipated weather delay days shown below. The weather delay days are represented in the overall critical path of our schedule.

Month	Anticipated Weather Delays	Month	Anticipated Weather Delays
January	7	July	3
February	7	August	3
March	5	September	3
April	7	October	3
May	5	November	5
June	3	December	6

PLAN AND STRATEGY

Using temporary pavement and traffic shifts, BDC will build all three phases of the bridge out of traffic. This phasing will minimize the impacts to the traveling public and improve safety throughout the delivery of the project. Phase I of our construction sequencing will allow for this stage (center) of the bridge to be constructed prior to any changes in the traffic pattern. Our schedule includes an Advanced Work Package that will complete the foundation design and allow the drilled shafts to begin for Phase I. To move to Phase II our Team will shift the NB traffic to the Phase I bridge then demo and construct the NB portion of the structure. The shift to Phase III will require moving the NB & SB traffic to the Phase I & II portion of the structure. At the completion of Phase III of the structure and remaining roadway activities, traffic will then be placed in the final configuration. All work required on Route 11 will be performed during Phases II & III of construction. Required work on Route 11 is very minor in nature.

Description	Date
Phase I Completion	October 23, 2020
Phase II Completion	July 8, 2021
Phase III Completion	March 15, 2022
Final Completion Date	May 23, 2022



4.6 PROPOSAL SCHEDULE

DESIGN

This portion of the schedule includes all required activities to develop preliminary and final roadway and bridge plans to allow for all necessary approvals to be obtained. As specified in the RFP, we have included a 15 work day activity in our P6 schedule for VDOT staff to review after each of the submissions. The 15 work days is equivalent to the 21 calendar days required in the RFP. The design phase also includes activities for the completion of surveys, geotechnical investigations, traffic management plan, E&S control, hydrologic and hydraulic analysis studies, noise analysis, and pavement markings. The design effort will begin following the Notice to Proceed (NTP) on March 25, 2019. The BDC Team's proposal schedule reflects approval of final roadway plans by August 26, 2020 and final bridge plans by October 14, 2019.

PLAN REVIEWS AND APPROVALS

Inherent in the durations for all work leading to submittals, adequate time has been budgeted for internal plan reviews.

ENVIRONMENTAL PERMITS

This portion of the schedule contains all activities associated with the evaluation, preparation, submission, and approval of all environmental permits.

RAILROAD COORDINATION

Coordination with Norfolk Southern during the bridge design schedule will require a focused process to reach the stage of receiving the railroad agreement for this structure. An important schedule piece for the railroad coordination is our Team's Advanced Work Package for the bridge foundations. To ensure this process is expedited, our Team has chosen STV to perform the railroad coordination as a subconsultant to Timmons Group. STV's extensive experience in working with the railroad will allow the bridge design schedule to be completed as efficiently as possible.

UTILITY RELOCATION

The BDC Team is presenting a design that has only one known conflict and it is with a Norfolk Southern communications line. Norfolk Southern has committed to moving this line. Should an additional unforeseen situation arise the BDC Team has Timmons Group self-performing any utility coordination necessary.

CONSTRUCTION SEQUENCING

The BDC Team has created a schedule that will mitigate impacts to the traveling public while maximizing safety on this project.

CRITICAL PATH

In order to meet our Team's delivery schedule, our continued focus will be on critical path activities. During this process we will continue to seek opportunities to allow for the acceleration of all activities to ensure a successful delivery that meets the final completion date. By doing this we will identify all work activities for possible acceleration and activities that may be worked on concurrently. The sequencing and critical path follows the activities are shown in the table below.

4.6 PROPOSAL SCHEDULE

ACTIVITY ID	ACTIVITY
130	Notice To Proceed
570	Wetland determination and Delineation
580	Permit Application Packet Development
600	VMRC permit issued
2000	Mobilization / Survey
2010	Install Construction Signs
2020	Install Construction Access
2030	Install Erosion & Sediment Control
2033	Anticipated Weather Delays
2040	Install Concrete Barrier
2050	Install Temporary Shoring Abutment A
2060	Install Temporary Shoring Abutment B
2070	Grade / Excavate Abutment A
2080	Grade / Excavate Abutment B
2090	Install pile Abutment A
2100	Install pile Abutment B
2110	Install MSE Wall Abutment A
2120	Install MSE Wall Abutment B
2130	Form, reinforce, pour & strip (FRPS) Abutment A
2140	FRPS Abutment B
2250	Backfill Abutment A
2260	Backfill Abutment B
2280	Install Slope Protection Abutment A
2290	Install Slope Protection Abutment B
2300	Erect Girders
2310	FRPS Center portion of deck
2370	Grade / Excavate STA 106+00 Lt to STA 135+00 Lt
2380	Install Aggregate Base Course (ABC) STA 106+00 Lt to STA 135+00 Lt
2390	Install Asphalt Base Course STA 106+00 Lt to STA 135+00 Lt
2400	Install Asphalt Intermediate Course STA 106+00 Lt to STA 135+00 Lt
2410	Install Asphalt Surface Course STA 106+00 Lt to STA 135+00 Lt
2420	Install Pavement Markings
2430	Move NB Traffic to completed center portion of bridge
3000	Demo existing NB Bridge
3030	Grade / Excavate Abutment A
3040	Grade / Excavate Abutment B
3050	Install Pile Abutment A

4.6 PROPOSAL SCHEDULE

ACTIVITY ID	ACTIVITY
3060	Install Pile Abutment B
3070	Install MSE Wall Abutment A
3080	Install MSE Wall Abutment B
3090	FRPS Abutment A
3100	FRPS Abutment B
3210	Backfill Abutment A
3220	Backfill Abutment B
3240	Install Slope Protection Abutment A
3250	Install Slope Protection Abutment B
3260	Erect Girders
3330	Grade / Excavate NB
3340	Install ABC NB
3350	Install Asphalt Base Course NB
3360	Install Asphalt Intermediate Course NB
3370	Install Asphalt Surface Course NB
3380	Install Pavement Markings
3390	Move NB & SB to completed center and north portion of bridge
4010	Demo existing SB Bridge
4030	Grade / Excavate Abutment A
4040	Grade / Excavate Abutment B
4050	Install pile Abutment A
4060	Install pile Abutment B
4070	Install MSE Wall Abutment A
4080	Install MSE Wall Abutment B
4090	FRPS Abutment A
4100	FRPS Abutment B
4210	Backfill Abutment A
4220	Backfill Abutment B
4240	Install Slope Protection Abutment A
4250	Install Slope Protection Abutment B
4260	Erect Girders
4270	FRPS SB portion of deck
4330	Grade / Excavate SB
4340	Install ABC SB
4350	Install Asphalt Base Course SB
4360	Install Asphalt Intermediate Course SB
5005	Mill SB Roadway



4.6 PROPOSAL SCHEDULE

ACTIVITY ID	ACTIVITY
5010	Install Asphalt Surface Course SB
5050	Mill NB Roadway
5060	Install Asphalt Surface Course NB
5070	Install Pavement Markings
5080	Install Final Traffic Signage NB
5090	Install Guardrail NB
5120	Install Pavement Markings
5130	Install Final Traffic Signage Route 11
5140	Install Guardrail Route 11
6000	Final Punchlist Inspection
6020	Complete Punchlist
7000	Prepare Record Plans (As-builts)
7010	QA/QC Record Plans (As-builts)

SCHEDULE MANAGEMENT

To allow for effective schedule management and document control to be maintained, the BDC Team developed, and will update monthly, the project schedule using Primavera P6. This schedule will be used to plan, coordinate, and monitor design and construction. During the development of the proposal CPM schedule, each design discipline manager, along with the CM, has been responsible for determining the start times and duration of their activities. The overall development of the CPM has been the responsibility of the DBPM and CM to ensure all activities are covered. The DBPM through continuous coordination with the discipline managers and the CM will review individual schedules and will incorporate these into the overall schedule to ensure all milestones allow for a successful project delivery. By doing this all parties have buy-in and all activities are covered.

BDC will manage the CPM throughout the entirety of this project. This will be done from the on-site project field office. The project engineer will have the responsibility of ensuring that the CPM schedule is maintained and updated on a monthly basis. The DBPM, with support of the CM, will have ultimate responsibility for the creation and implementation of the project controls required to manage the schedule. The project controls maintain an efficient communication between the design discipline managers and construction staff. The BDC Team includes a value-added role of Design Construction Coordinator (DCC) to help facilitate the design coordination process. Beginning on March 25, 2019 (NTP) thru the completion of the design phase, the BDC Team will hold weekly design coordination meetings. These weekly meetings will be facilitated by the DBPM and attended by all design disciplines, the DCC and the project engineer. The DCC, with support of the CM, will provide constructability reviews prior to submittals being made. The project engineer will manage and maintain the schedule throughout the process. The DBPM will review the CPM to analyze all scheduled activities for the prior week along with the upcoming two weeks. These design coordination meetings will promote discussion and buy-in by all parties for the current status of activities, milestones, addition or deletion of activities. By having all parties in attendance activities can be adjusted for early completion or durations extended as well as providing methods to mitigate any potential schedule delays.

During the construction process the same project controls will be used that were used during the design phase. There will be weekly construction coordination meetings that will be held by the DBPM and attended by all construction staff. During these meetings, construction activities will be reviewed for the completion of activities

4.6 PROPOSAL SCHEDULE

previously scheduled and to provide a look ahead for the next two weeks. The project engineer will again be responsible for maintaining and updating the CPM schedule. The DBPM and the CM will review the CPM to ensure delivery of the project remains on schedule. By maintaining a consistent construction coordination meeting schedule, activities available for acceleration or those needing possible mitigation to avoid delays, can be identified. In addition to the BDC Team's weekly coordination meetings there will be a weekly subcontractor coordination meeting with all active subcontractors on site.

The BDC Team will prepare and submit monthly updates of the P6 CPM schedule for review and approval by VDOT. These will include a narrative of any schedule changes, issues affecting the schedule and an updated critical path showing project milestones.

SCHEDULE RECOVERY

If there are changes required or unforeseen circumstances that create delays in the schedule, the BDC Team will notify VDOT and begin a time impact analysis so a review of the remaining activities can be evaluated for acceleration. A recovery schedule will also be prepared that shows the method of reclaiming the lost time. This recovery plan will use methods listed below that will allow the project to get back on schedule:

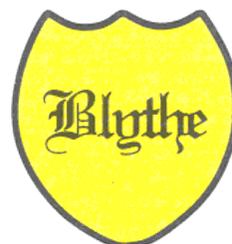
- Additional resources
- Extended and increased work shifts
- Design modifications, with VDOT approval
- Evaluation of order of construction work

Should the schedule need to be revised, the CM will work with all subcontractors and vendors to ensure all changes in the schedule may be accommodated without further adverse effects.



Attachment 4.0.1.1

Technical Proposal Checklist



ATTACHMENT 4.0.1.1
REPLACEMENT OF I-81 BRIDGES OVER RTE. 11. NS RAILROAD & M.F.H RIVER
TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

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

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

ATTACHMENT 4.0.1.1

REPLACEMENT OF I-81 BRIDGES OVER RTE. 11. NS RAILROAD & M.F.H RIVER

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Offeror's Qualifications	NA	Section 4.2		2
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	2
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	2
Design Concept	NA	Section 4.3		3-16
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	3-12
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	12-16
Project Approach	NA	Section 4.4		17-32
Environmental Management	NA	Section 4.4.1	yes	17-22
Utilities	NA	Section 4.4.2	yes	23-24
Geotechnical	NA	Section 4.4.3	yes	25-29
Railroad Coordination	NA	Section 4.4.4	yes	30-32
Construction of Project	NA	Section 4.5		33-44
Sequence of Construction	NA	Section 4.5.1	yes	33-38

ATTACHMENT 4.0.1.1

REPLACEMENT OF I-81 BRIDGES OVER RTE. 11. NS RAILROAD & M.F.H RIVER

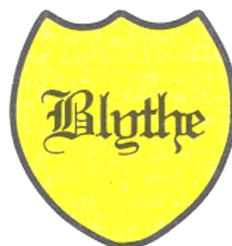
TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Transportation Management Plan	NA	Section 4.5.2	yes	38-44
Proposal Schedule	NA	Section 4.6		
Proposal Schedule	NA	Section 4.6	no	Vol. II S.9-S.14
Proposal Schedule Narrative	NA	Section 4.6	no	S.1-S.8
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.6	no	n/a



Attachment 3.6

Form C-78



ATTACHMENT 3.6

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION**

RFP NO. C00097555DB102

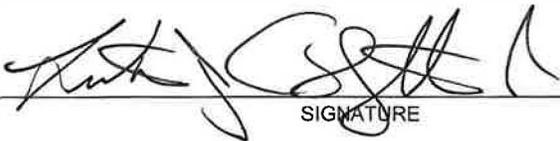
PROJECT NO.: 0081-086-742, P101, B659; 0081-086-818, B663

ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA

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

By signing this Attachment 3.6, the Offeror acknowledges receipt of the RFP and/or following revisions and/or addenda to the RFP for the above designated project which were issued under cover letter(s) of the date(s) shown hereon:

- 1. Cover letter of RFP – August 28, 2018
(Date)
- 2. Cover letter of RFP Addendum #1 – October 12, 2018
(Date)
- 3. Cover letter of RFP Addendum #2 – November 9, 2018
(Date)
- 4. Cover letter of RFP Addendum #3 – November 15, 2018
(Date)
- 4. Cover letter of RFP Addendum #4 – November 30, 2018
(Date)


SIGNATURE

12/6/18
DATE

Luther J. Slythe Jr.
PRINTED NAME

Vice President of Operations
TITLE



Attachment 9.3.1

Proposal Payment Agreement



ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this “Agreement”) is made and entered into as of this 6 day of December, 2018, by and between the Virginia Department of Transportation (“VDOT”), and Blythe Development Co. (“Offeror”).

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s **June 1, 2018** Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the **Replacement of I-81 Bridges over Rte. 11, NS Railroad & M.F.H River, Project No. 0081-086-742, P101, B659; 0081-086-818, B663** (“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 **thirty thousand 00/100 Dollars (\$30,000.00)** ("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.

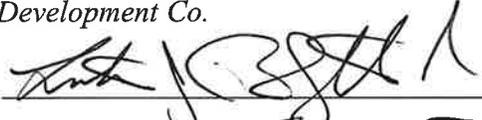
VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

Blythe Development Co.

By:  _____

Name: Luther J. Blythe Jr.

Title: Vice President of Operations



Attachment 11.8.6
(a) and (b)

Certification Regarding Debarment



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

Project No.: 0081-086-742, P101, B659; 0081-086-818, B663

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

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

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


Signature

12/6/2018
Date

Principal
Title

Timmons Group, Inc.
Name of Firm

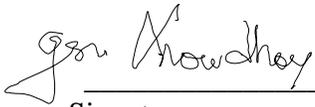
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0081-086-742, P101, B659; 0081-086-818, B663

- 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

November 30, 2018

Date

Principal and Executive Vice-President

Title

CES Consulting LLC

Name of Firm

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

Project No.: 0081-086-742, P101, B659; 0081-086-818, B663

- 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>11/26/2018</u>	<u>Principal / Sr. Vice President</u>
Signature	Date	Title

Schnabel Engineering, LLC

Name of Firm

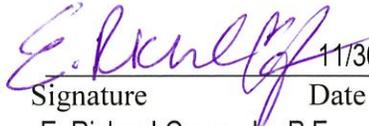
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0081-086-742, P101, B659; 0081-086-818, B663

- 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.

	11/30/18	Senior Vice President
Signature	Date	Title
E. Richard Capps Jr., P.E.		

STV Incorporated dba STV Group Incorporated
Name of Firm

TECHNICAL PROPOSAL - VOLUME II

REPLACEMENT OF I-81 BRIDGES OVER RTE. 11, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER

Smyth County/ City of Atkins, Virginia

State Project No.: 0081-086-818; 0081-086-742
Federal Project No.: BR-081-1(336)
Contract ID Number: C0097555DB102

Submitted to:



Submitted by:



Due December 6, 2018





Section 4.3

Design Concept



I-81 OVER RT. II, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER BRIDGE REPLACEMENT

STATE	STATE PROJECT		SHEET NO.
	ROUTE	PROJECT	
VA.	81	0081-086-742, P101, B659 0081-086-818, B663	1

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

DESIGN CONCEPT

THE BLYTHE TEAM'S TECHNICAL PROPOSAL MEETS OR EXCEEDS ALL REQUIREMENTS LISTED IN THE DESIGN CRITERIA TABLE AS DEFINED IN THE VDOT RFP (SHOWN ON THIS SHEET). THE LIMITS OF CONSTRUCTION ARE SHOWN ON THESE PLANS AND ARE WITHIN THE EXISTING RIGHT-OF-WAY LIMITS PROVIDED IN THE RFP CONCEPTUAL PLANS.

THE RFP CONCEPTUAL PLANS DO NOT INDICATE THE INTENT TO ACQUIRE ANY PERMANENT OR TEMPORARY EASEMENTS, ALTHOUGH DESIGN CHARACTERISTICS INFERRED WOULD BE COMPLETED OUTSIDE OF EXISTING RIGHT-OF-WAY THROUGHOUT THE PROJECT. THE BLYTHE TEAM'S CONCEPT EFFECTIVELY MITIGATES THE INHERENT RISK CONVEYED IN THE RFP CONCEPTUAL PLAN BY ELIMINATING THE NEED FOR ADDITIONAL EASEMENTS AND LIMITING WORK TO WITHIN THE LIMITS OF EXISTING RIGHT-OF-WAY. BLYTHE TEAM'S PROPOSED RIGHT-OF-WAY LIMITS MATCH VDOT'S RFP CONCEPTUAL RIGHT-OF-WAY LIMITS AND NO ADDITIONAL PERMANENT EASEMENTS ARE REQUIRED.

THE PROPOSED DESIGN CONCEPT DOES NOT INCLUDE DESIGN ELEMENTS THAT REQUIRE DESIGN EXCEPTIONS AND / OR DESIGN WAIVERS UNLESS THEY ARE IDENTIFIED OR INCLUDED IN THE RFP.

THE CONCEPTUAL ROADWAY PLANS MEET OR EXCEED ALL OF THE REQUIREMENTS ESTABLISHED IN THE RFP.

- AS REQUIRED IN THE RFP PART I SECTION 4.3, THE CONCEPTUAL ROADWAY PLANS IDENTIFY:
- A. GENERAL GEOMETRY INCLUDING HORIZONTAL CURVE DATA AND ASSOCIATED DESIGN SPEEDS, THE NUMBER AND WIDTHS OF LANES AND SHOULDERS; (SEE PLAN AND TYPICAL SECTION SHEETS 3-9)
 - B. HORIZONTAL ALIGNMENTS; (SEE PLAN AND TYPICAL SECTION SHEETS 3-9)
 - C. MAXIMUM GRADE FOR ALL SEGMENTS AND CONNECTORS; (SEE TABLE THIS SHEET).
 - D. TYPICAL SECTIONS OF THE ROADWAY SEGMENTS TO INCLUDE RETAINING WALLS AND BRIDGE STRUCTURES (SEE PLAN AND TYPICAL SECTION SHEETS 3-9). SEE CONCEPTUAL STRUCTURAL PLANS FOR DETAILED DESIGN INFORMATION ABOUT THE RETAINING WALL AND BRIDGE STRUCTURES.
 - E. CONCEPTUAL HYDRAULIC AND STORMWATER MANAGEMENT DESIGN; SEE PLAN SHEETS 2-9.
 - F. PROPOSED RIGHT OF WAY LIMITS - ALL WORK TO BE COMPLETED WITHIN EXISTING RIGHT OF WAY - ONE MINOR DRAINAGE EASEMENT REQUIRED. (SEE PLAN SHEETS 2-9)
 - G. PROPOSED UTILITY IMPACTS; UTILITY IMPACTS LIMITED TO THE NSRR COMMUNICATION LINE NOTED IN THE RFP (SEE RFP SECTION 2.3.1), AND POTENTIAL CENTURYLINK TELECOMM. FACILITIES NEAR THE STORMWATER MANAGEMENT BASIN (SEE PLAN SHEETS 2-9 AND SECTION 4.4.2 IN VOLUME 1).
 - H. PROVISION FOR FUTURE THIRD LANE IN EACH DIRECTION OF I-81 AND ASSOCIATED CONSTRUCTION LIMITS AND FUTURE RIGHT OF WAY ACQUISITION NEEDS (SEE PLAN SHEETS 2-9 AND CONCEPTUAL STRUCTURAL PLANS). THE BLYTHE TEAM'S DESIGN CONCEPT DOES NOT PRECLUDE FUTURE THIRD LANE WIDENING.
 - I. OTHER KEY PROJECT FEATURES:
 - 1) GUARDRAIL / BARRIER (SEE PLAN SHEETS 3-9 AND THE GUARDRAIL AND BARRIER LOCATION TABLE ON THIS SHEET)
 - 2) LOCATIONS OF MILL AND OVERLAY / BUILDUP OF EXISTING PAVEMENT / NEW PAVEMENT (SEE PLAN SHEETS 3-9)
 - 3) PAVEMENT DESIGN (SEE THIS SHEET).
 - J. MAJOR PROJECT ENHANCEMENTS PROPOSED IN THE BLYTHE TEAM'S DESIGN CONCEPT (SEE PLAN SHEETS 2-9 AND CONCEPTUAL STRUCTURES PLANS)

THE CONCEPTUAL BRIDGE PLANS MEET ALL THE REQUIREMENTS ESTABLISHED IN THE RFP. AS REQUESTED IN THE RFP PART I SECTION 4.3.2, THE CONCEPTUAL BRIDGE PLANS IDENTIFY:

- A. STRUCTURAL CONCEPT FOR THE BRIDGE STRUCTURES
- B. RETAINING WALLS
- C. RENDERINGS OF AN ELEVATION VIEW, TRANSVERSE SECTION, AND ABUTMENT CONFIGURATION FOR EACH PROPOSED STRUCTURE TYPE.
- D. FEATURES THAT ALLOW FOR FUTURE BRIDGE WIDENING (SUPERSTRUCTURE AND SUBSTRUCTURE).

MAXIMUM GRADES

ALIGNMENT	MAX. UPGRADE		MAX. DOWNGRADE		ALLOWABLE GRADE
	RFP DESIGN	REVISED DESIGN	RFP DESIGN	REVISED DESIGN	
I-81 NB	1.37%	1.40%	-0.96%	-1.00%	4.00%
I-81 SB	0.78%	0.58%	-1.53%	-1.53%	4.00%
ROUTE US II	3.12%	3.12%	-3.12%	-3.12%	4.00%

DESIGN CRITERIA TABLE

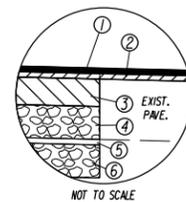
NO.	DESIGN CRITERIA	I-81 SOUTHBOUND	I-81 NORTHBOUND	ROUTE II (LEE HIGHWAY)*
1	ROADWAY CLASSIFICATION	RURAL FREEWAY (INTERSTATE)	RURAL FREEWAY (INTERSTATE)	RURAL MINOR ARTERIAL
2	GEOMETRIC DESIGN STANDARD	GS-1	GS-1	GS-2
3	EXISTING (2016) ADT	30,768 (ONE WAY)	30,768 (ONE WAY)	2,500 (2015)
4	PROJECTED (2045) ADT	45,000 (ONE WAY)	45,000 (ONE WAY)	6,650
5	DESIGN HOUR VOLUME	4,500 (ONE WAY)	4,500 (ONE WAY)	665
6	TRUCK PERCENTAGE (DESIGN HOUR)	20%	20%	2%
7	TERRAIN	ROLLING TERRAIN	ROLLING TERRAIN	ROLLING TERRAIN
8	DESIGN SPEED (MPH)	75	75	60**
9	MAX. RATE OF SUPERELEVATION	8.00%	8.00%	8.00%
10	LANE WIDTH (MIN.)	12 FT	12 FT	12 FT
11	ROADWAY MINIMUM VERTICAL CLEARANCE (FT.)	16'-6"	16'-6"	N/A
12	MAXIMUM ROLLOVER BETWEEN SHOULDER USE LANE AND REGULAR TRAVEL LANE	7%	7%	SEE GS-12
ADDITIONAL DESIGN CRITERIA				
13	RAILROAD MINIMUM VERTICAL CLEARANCE (FT.)	23'-0"	23'-0"	N/A

* NOTE - ROUTE II SHALL REMAIN AS EXISTING ROADWAY. NO RECONSTRUCTION, REALIGNMENT, OR OTHER MODIFICATIONS ARE NECESSARY PER THE BLYTHE TEAM'S DESIGN APPROACH.

** NOTE - SEE VDOT DESIGN EXCEPTIONS/WAIVERS

GUARDRAIL AND BARRIER LOCATION

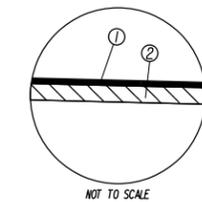
ROADWAY	STATION TO STATION		OFFSET	TYPE
	FROM	TO		
I-81 NB LANES	97+17.01	105+08.06	RT	STD GR-MGS
	102+45.10	103+50.00	LT	STD GR-MGS
	103+50.00	107+25.00	LT	STD MB-13
	107+25.00	108+97.47	LT	STD MB-12B
	108+97.47	118+25.00	LT	STD MB-13
	118+25.00	118+89.87	LT	STD MB-12A
	118+89.87	123+99.56	LT	STD BMB-3A
	123+99.56	128+95.71	LT	STD MB-13
	128+95.71	129+37.47	LT	STD MB-12B
	110+97.03	118+95.97	RT	STD GR-MGS
	118+95.97	123+69.84	RT	STD BPB-4A
	123+69.84	130+52.17	RT	STD GR-MGS
I-81 SB LANES	197+37.12	217+02.22	LT	STD GR-MGS
	206+29.48	207+99.27	RT	STD MB-12B
	207+99.27	217+15.19	RT	STD MB-13
	217+15.19	217+78.19	RT	STD MB-12A
	217+78.19	221+82.19	RT	STD BMB-3A
	221+82.19	222+65.19	RT	STD MB-12A
	222+65.19	227+87.53	RT	STD MB-13
	217+02.22	221+91.10	LT	STD BPB-4A
	221+91.10	227+47.82	LT	STD GR-MGS
	227+47.82	228+29.77	RT	STD MB-12B
	228+29.77	231+41.18	RT	STD MB-13
	231+41.18	232+46.17	RT	STD GR-MGS



I-81 PROPOSED PERMANENT PAVEMENT SECTION

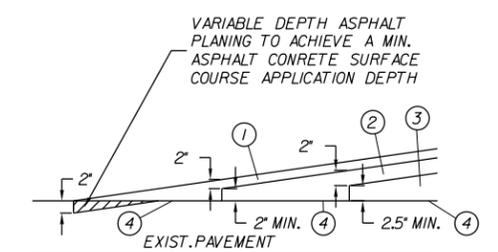
- ① ASPHALT CONCRETE SURFACE COURSE, TYPE SM-12.5E @ 220 LBS/SY
- ② ASPHALT CONCRETE INTERMEDIATE COURSE, IM-19.0E @ 230 LBS/SY
- ③ 10" ASPHALT CONCRETE BASE COURSE BM-25.0D
- ④ 12" AGGREGATE BASE MATERIAL TYPE 1, 2I-B
- ⑤ 2" LEVELING COURSE TYPE 1, 2I-B
- ⑥ 12" AGGREGATE BASE MATERIAL NO. 1

NOTE: IN ACCORDANCE WITH VDOT GUIDELINES, EDGEDRAINS AND/OR UNDERDRAINS WILL BE PROVIDED FOR ALL PAVEMENTS ON THIS PROJECT. MODIFIED UD-1 UNDERDRAIN SHALL BE PROVIDED IN LIEU OF STANDARD UD-4 EDGEDRAIN WHERE APPLICABLE. STANDARD COMBINATION UNDERDRAIN (CD-1) SHALL BE PROVIDED AT THE LOWER END OF CUTS. STANDARD COMBINATION UNDERDRAIN (CD-2) SHALL BE PROVIDED AT GRADE SAGS, BRIDGE APPROACHES, AND AT THE LOWER END OF UNDERCUT AREAS.



I-81 PROPOSED TEMPORARY PAVEMENT SECTION

- ① 2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE IM-19.0A
- ② 6.5" ASPHALT CONCRETE BASE COURSE, TYPE BM-25.0D



PAVEMENT BUILD-UP WITH OVERLAY

- ① ASPHALT CONCRETE OVERLAY TYPE SM-12.5E (2" MIN. DEPTH REQ'D)
- ② VARIABLE DEPTH IM-19.0E ASPHALT LEVELING COURSE (DEPTHS UP TO 2")
- ③ VARIABLE DEPTH BM-25.0D ASPHALT LEVELING COURSE (REMAINDER IF NECESSARY)
- ④ ASPHALT TACK COURSE

PRELIMINARY PLANS
THESE PLANS ARE NOT TO
BE USED FOR CONSTRUCTION

N.T.S.	PROJECT 0081-086-742	SHEET NO. 1
--------	-------------------------	----------------



I-81 OVER RT. 11, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER BRIDGE REPLACEMENT

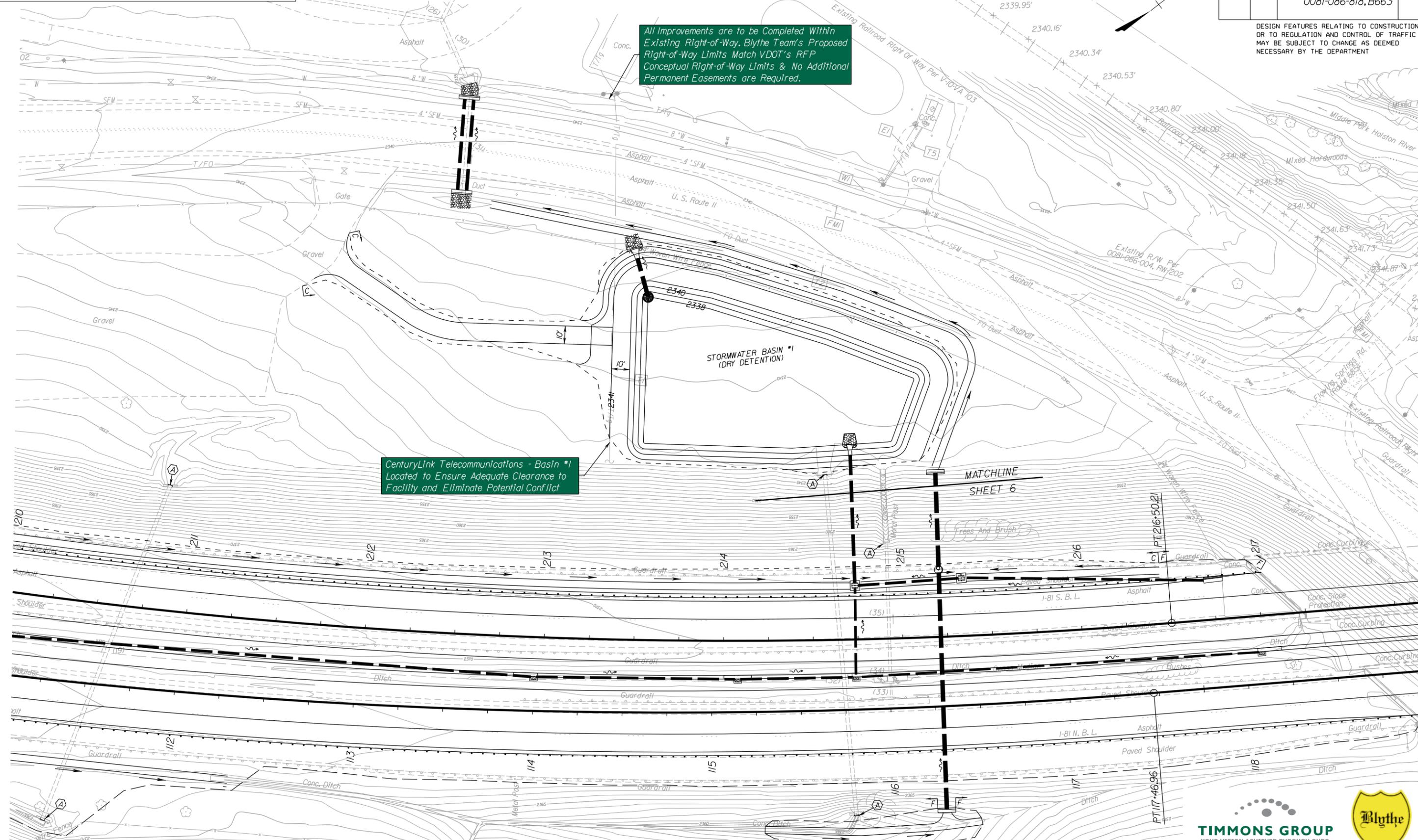
STORMWATER MANAGEMENT BASIN

STATE	STATE PROJECT		SHEET NO.
	ROUTE	PROJECT	
VA.	81	0081-086-742, P101, B659 0081-086-818, B663	2

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

All Improvements are to be Completed Within Existing Right-of-Way. Blythe Team's Proposed Right-of-Way Limits Match VDOT's RFP Conceptual Right-of-Way Limits & No Additional Permanent Easements are Required.

CenturyLink Telecommunications - Basin #1 Located to Ensure Adequate Clearance to Facility and Eliminate Potential Conflict



PRELIMINARY PLANS
THESE PLANS ARE NOT TO
BE USED FOR CONSTRUCTION

SCALE 0 25' 50'

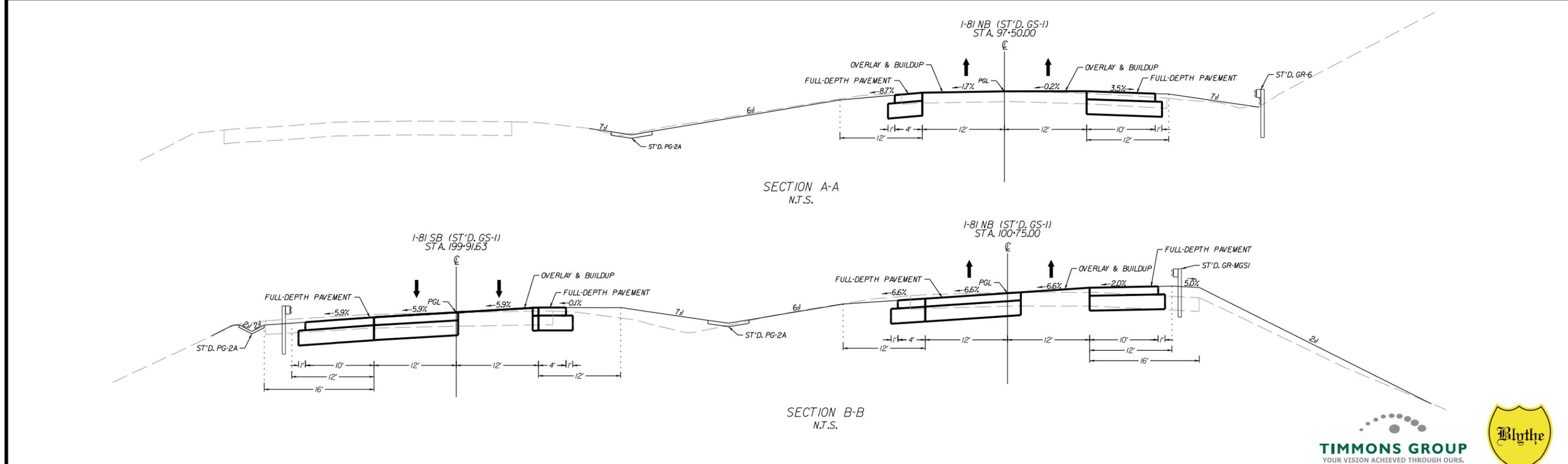
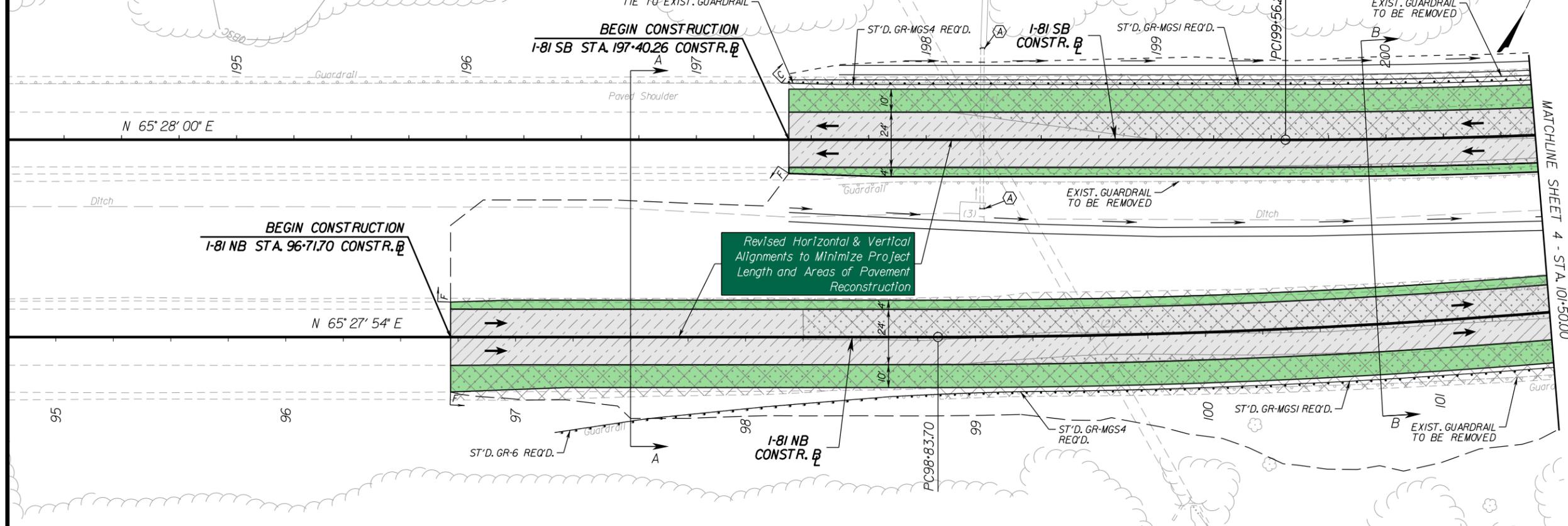
PROJECT 0081-086-742 SHEET NO. 2



I-81 OVER RT. 11, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER BRIDGE REPLACEMENT

STATE	ROUTE	PROJECT	SHEET NO.
VA.	81	0081-086-742, P101, B659 0081-086-818, B663	3

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



PRELIMINARY PLANS
 THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION



PROJECT	SHEET NO.
0081-086-742	3



I-81 OVER RT. 11, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER BRIDGE REPLACEMENT

STATE	ROUTE	PROJECT	SHEET NO.
VA.	81	0081-086-742, P101, B659 0081-086-818, B663	6

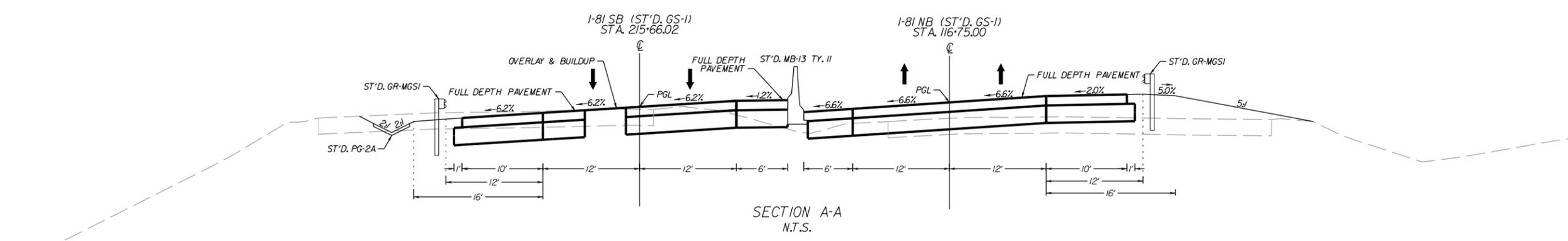
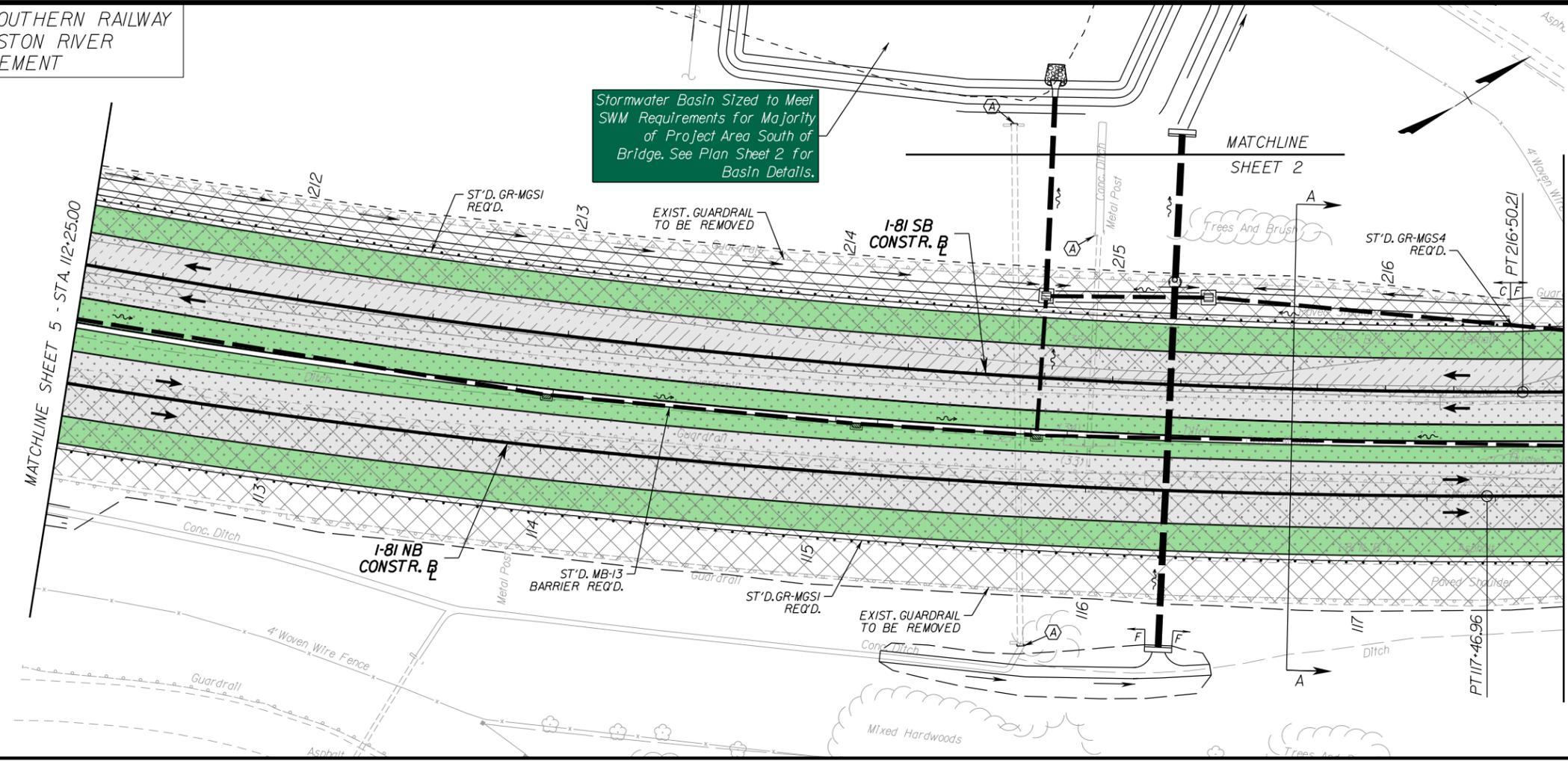
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

LEGEND

- Denotes Full Depth Pavement
- Denotes Mill & Overlay w/ Build-up
- Denotes Demolition of Pavement
- Denotes Travel Lanes
- Denotes Proposed Bridge Limits
- Denotes Proposed Paved Shoulder
- Proposed Drainage Ditch
- Proposed Drainage Pipe
- Abandon Existing Drainage Structure
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills

Curve 81SB-I
 PI = 208+26.48
 DELTA = 32° 21' 06.97" (LT)
 D = 154' 35"
 T = 870.22'
 L = 1693.94'
 R = 3,000.00'
 PC = 199+56.26
 PT = 216+50.21
 V = 75 M.P.H.
 e = 7.2%

Curve 81NB-I
 PI = 108+40.90
 DELTA = 32° 21' 01.72" (LT)
 D = 144' 10"
 T = 957.19'
 L = 1863.25'
 R = 3,300.00'
 PC = 98+83.70
 PT = 117+46.96
 V = 75 M.P.H.
 e = 6.6%



PRELIMINARY PLANS
 THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

SCALE 0 25' 50'	PROJECT 0081-086-742	SHEET NO. 6
--------------------	-------------------------	----------------

I-81 OVER RT. II, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER BRIDGE REPLACEMENT

STATE	ROUTE	PROJECT	SHEET NO.
VA.	81	0081-086-742, P101, B659 0081-086-818, B663	7

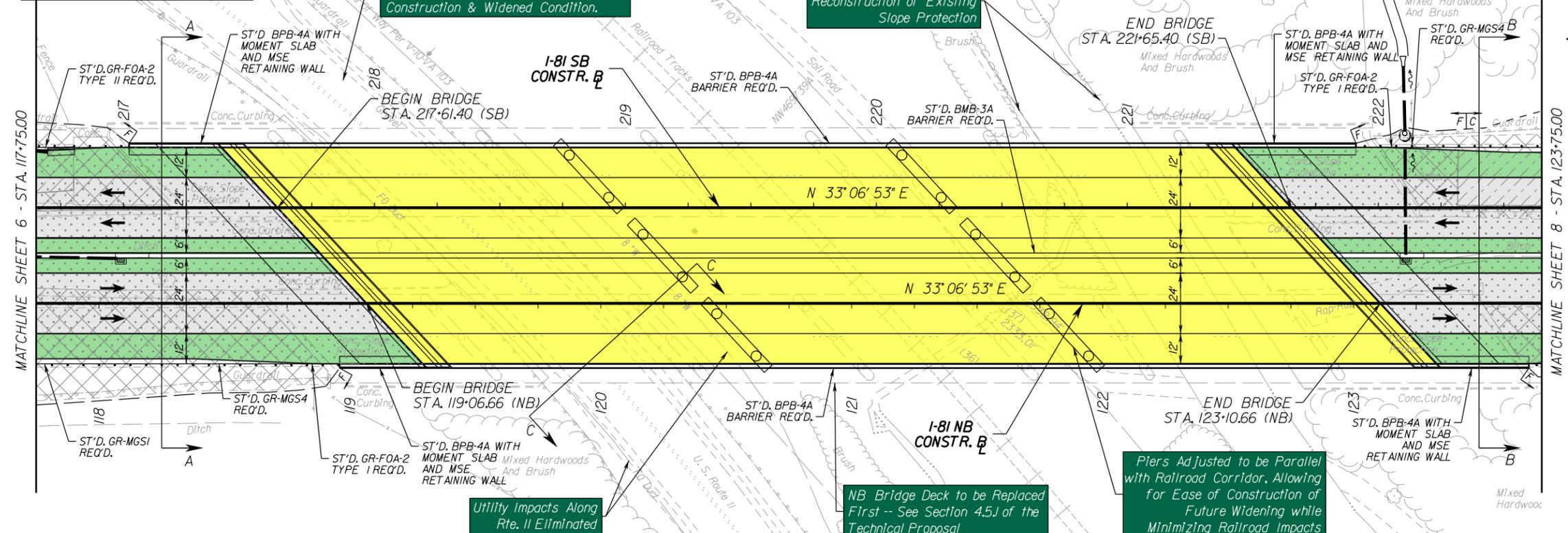
Elimination of Rte. II Reconstruction Eliminates Traffic Impacts on Flowing Springs Rd., Reducing Impacts to Traveling Public.

Vertical Alignment and Structure Depth of I-81 Adjusted to Eliminate Need to Reconstruct Rte. II. Proposed I-81 Meets Clearance Requirements Over Existing Rte. II & Railroad for Proposed Construction & Widened Condition.

Stream Impacts Limited to Reconstruction of Existing Slope Protection

All Improvements are to be Completed Within Existing Right-of-Way. Blythe Team's Proposed Right-of-Way Limits Match VDOT's RFP Conceptual Right-of-Way Limits & No Additional Permanent Easements are Required.

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT



- LEGEND**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay w/ Build-up
 - Denotes Demolition of Pavement
 - Denotes Travel Lanes
 - Denotes Proposed Bridge Limits
 - Denotes Proposed Paved Shoulder
 - Proposed Drainage Ditch
 - Proposed Drainage Pipe
 - Abandon Existing Drainage Structure
 - Denotes Construction Limits in Cuts
 - Denotes Construction Limits in Fills

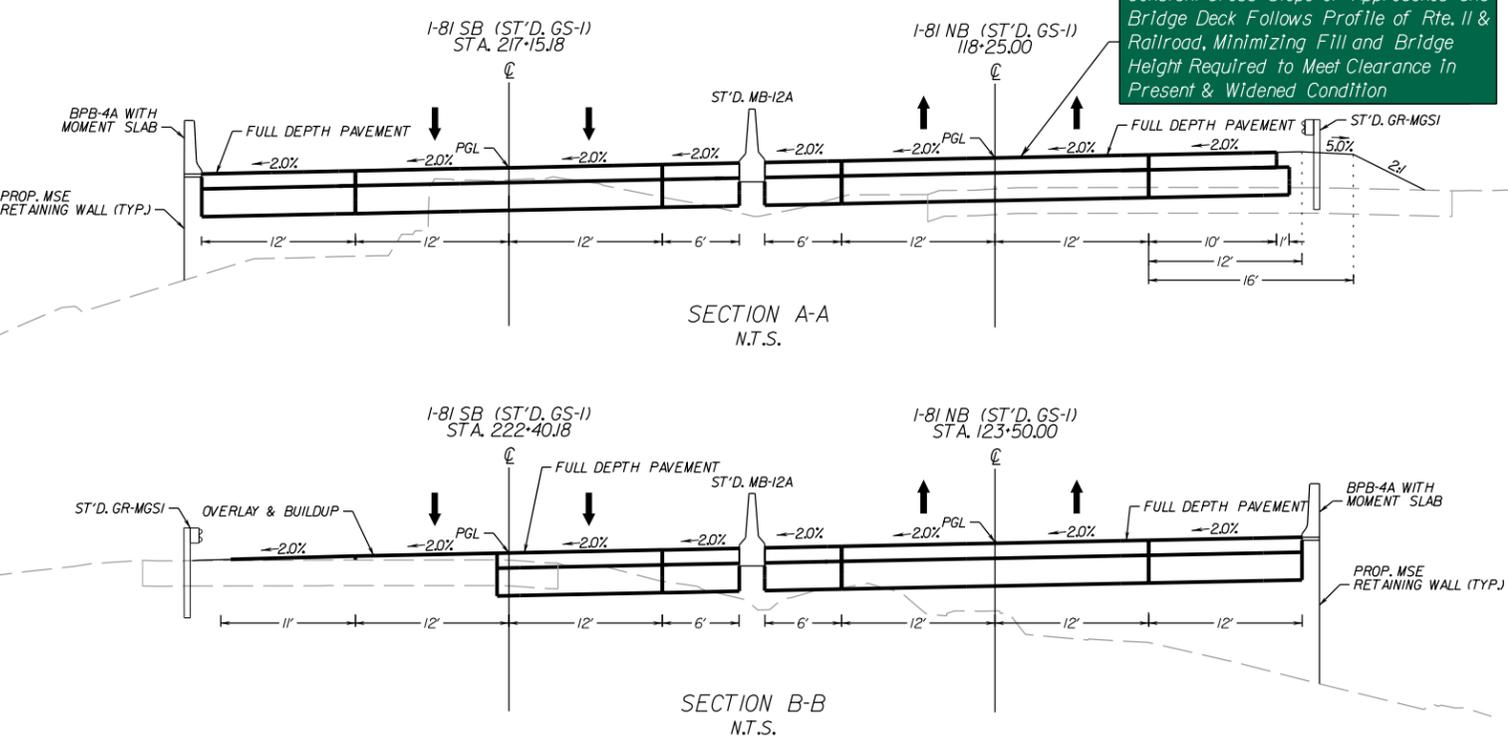
Utility Impacts Along Rte. II Eliminated

NB Bridge Deck to be Replaced First -- See Section 4.5J of the Technical Proposal

Piers Adjusted to be Parallel with Railroad Corridor, Allowing for Ease of Construction of Future Widening while Minimizing Railroad Impacts

Constant Cross Slope of Approaches and Bridge Deck Follows Profile of Rte. II & Railroad, Minimizing Fill and Bridge Height Required to Meet Clearance in Present & Widened Condition

Rte. II Sight Distance Mitigation Measures Suggested in Design Exception are Not Necessary due to Elimination of Rte. II Reconstruction



NOTE: REFER TO CONCEPTUAL STRUCTURAL PLANS FOR DETAILED DESIGN INFORMATION REGARDING THE RETAINING WALL AND BRIDGE STRUCTURES.

PRELIMINARY PLANS THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION



PROJECT	SHEET NO.
0081-086-742	7



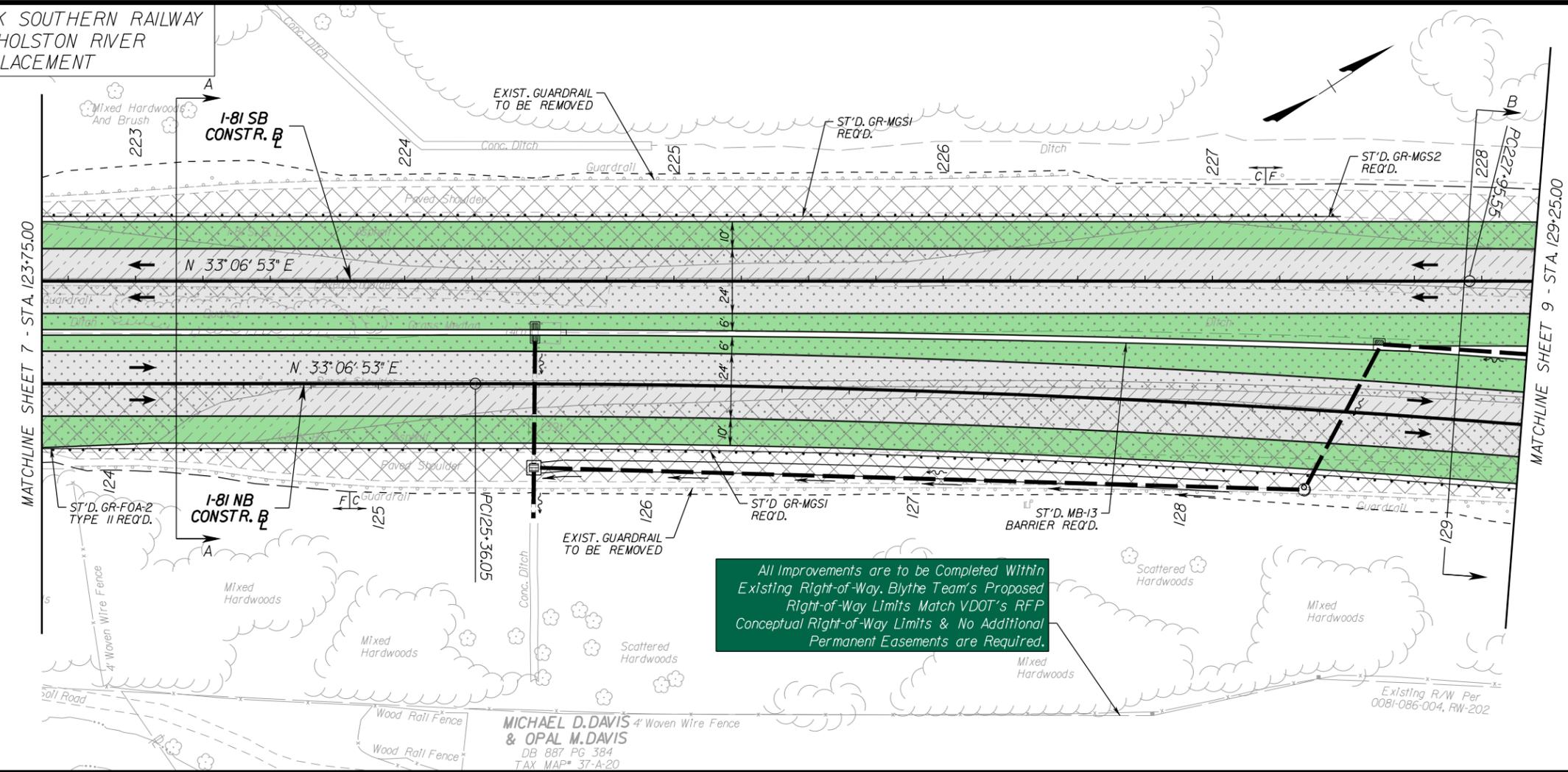
I-81 OVER RT. 11, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER BRIDGE REPLACEMENT

STATE	ROUTE	PROJECT	SHEET NO.
VA.	81	0081-086-742, P101, B659 0081-086-818, B663	8

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

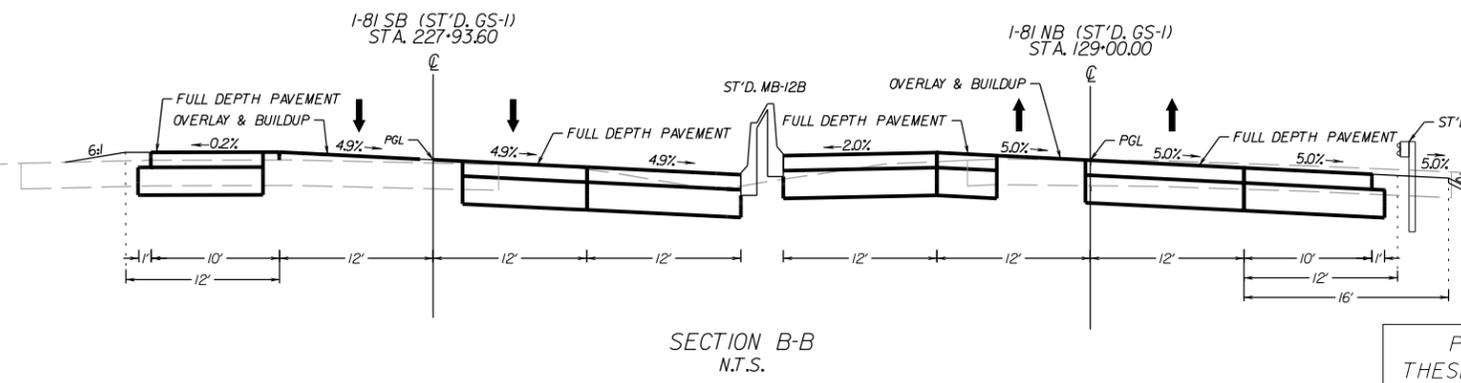
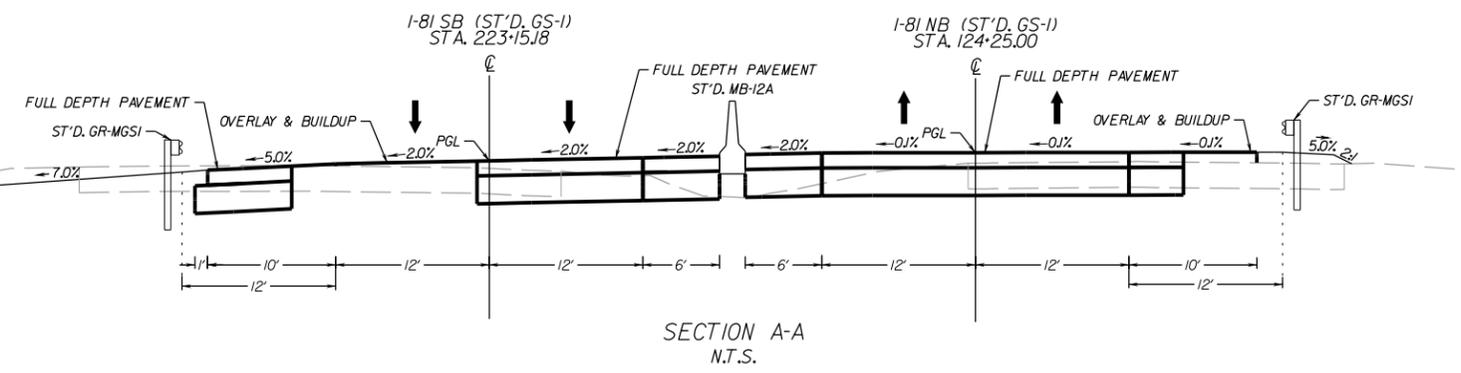
Curve 81SB_2
 PI = 230+40.34
 DELTA = 9° 38' 59.59" (RT)
 D = 158' 33"
 T = 244.79'
 L = 488.42'
 R = 2,900.00'
 PC = 227+95.55
 PCC = 232+83.98
 V = 75 M.P.H.
 e = 7.3%

Curve 81NB_2
 PI = 129+16.21
 DELTA = 8° 41' 45.19" (RT)
 D = 108' 45"
 T = 380.16'
 L = 758.86'
 R = 5,000.00'
 PC = 125+36.05
 PCC = 132+94.91
 V = 75 M.P.H.
 e = 5.0%



All Improvements are to be Completed Within Existing Right-of-Way. Blythe Team's Proposed Right-of-Way Limits Match VDOT's RFP Conceptual Right-of-Way Limits & No Additional Permanent Easements are Required.

- LEGEND**
- Denotes Full Depth Pavement
 - Denotes Mill & Overlay w/ Build-up
 - Denotes Demolition of Pavement
 - Denotes Travel Lanes
 - Denotes Proposed Bridge Limits
 - Denotes Proposed Paved Shoulder
 - Proposed Drainage Ditch
 - Proposed Drainage Pipe
 - Abandon Existing Drainage Structure
 - Denotes Construction Limits In Cuts
 - Denotes Construction Limits In Fills



PRELIMINARY PLANS
 THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

SCALE 0 25' 50'

PROJECT 0081-086-742

SHEET NO. 8



I-81 OVER RT. 11, NORFOLK SOUTHERN RAILWAY & MIDDLE FORK HOLSTON RIVER BRIDGE REPLACEMENT

STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	81	0081-086-742, P101, B659 0081-086-818, B663	9

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

LEGEND

- Denotes Full Depth Pavement
- Denotes Mill & Overlay w/ Build-up
- Denotes Demolition of Pavement
- Denotes Travel Lanes
- Denotes Proposed Bridge Limits
- Denotes Proposed Paved Shoulder
- Proposed Drainage Ditch
- Proposed Drainage Pipe
- Abandon Existing Drainage Structure
- Denotes Construction Limits In Cuts
- Denotes Construction Limits In Fills

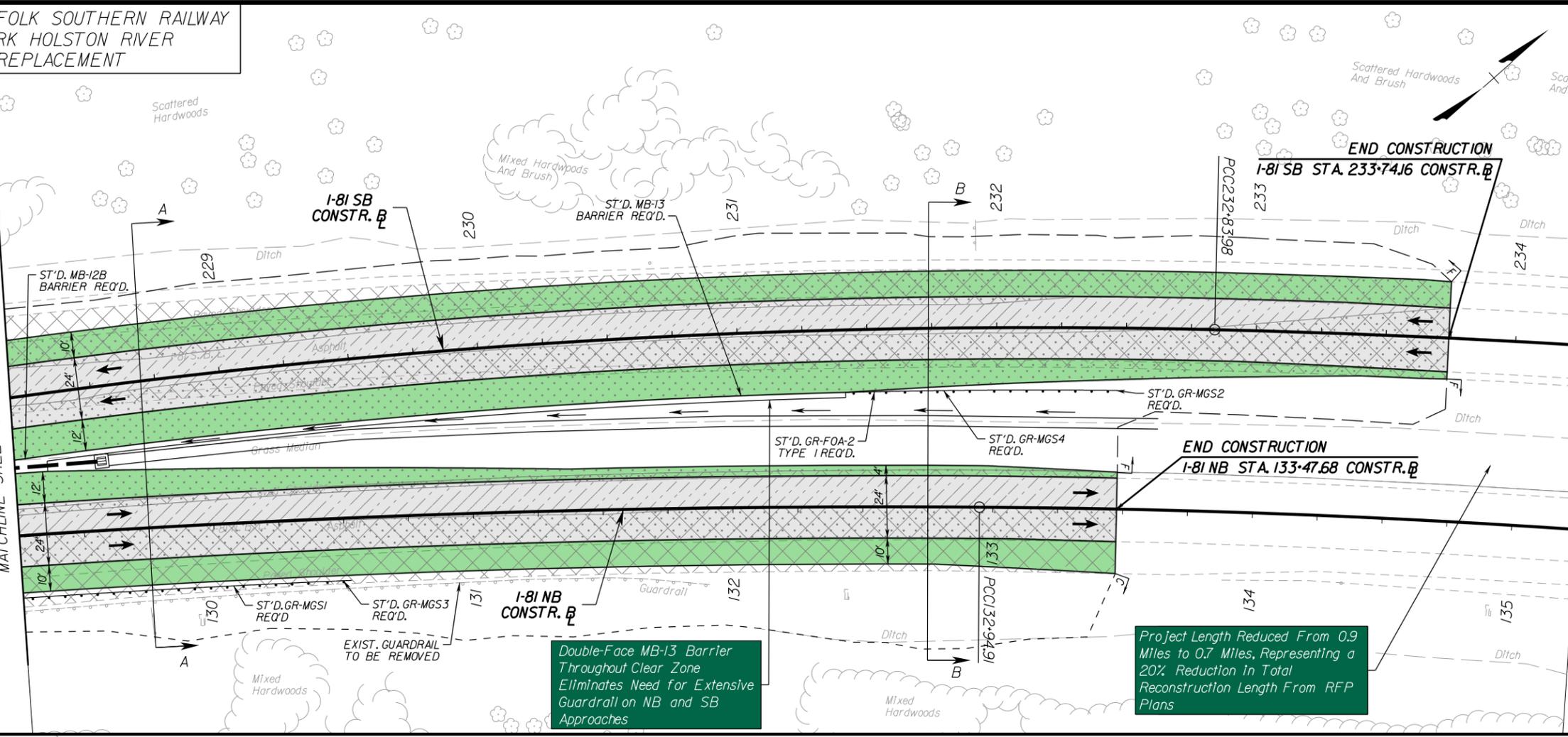
Curve 81SB_2
PI = 230+40.34
DELTA = 9° 38' 59.59" (RT)
D = 158' 33"
T = 244.79'
L = 488.42'
R = 2,900.00'
PC = 227+95.55
PCC = 232+83.98
PT = 247+62.24
V = 75 M.P.H.
e = 7.3%

Curve 81SB_3
PI = 240+32.58
DELTA = 22° 17' 20.55" (RT)
D = 130' 28"
T = 748.60'
L = 1,478.27'
R = 3,800.00'
PC = 232+83.98
PT = 247+62.24
V = 75 M.P.H.
e = EXISTING

Curve 81NB_2
PI = 129+16.21
DELTA = 8° 41' 45.19" (RT)
D = 108' 45"
T = 380.16'
L = 758.86'
R = 5,000.00'
PC = 125+36.05
PCC = 132+94.91
PT = 148+83.83
V = 75 M.P.H.
e = 5.0%

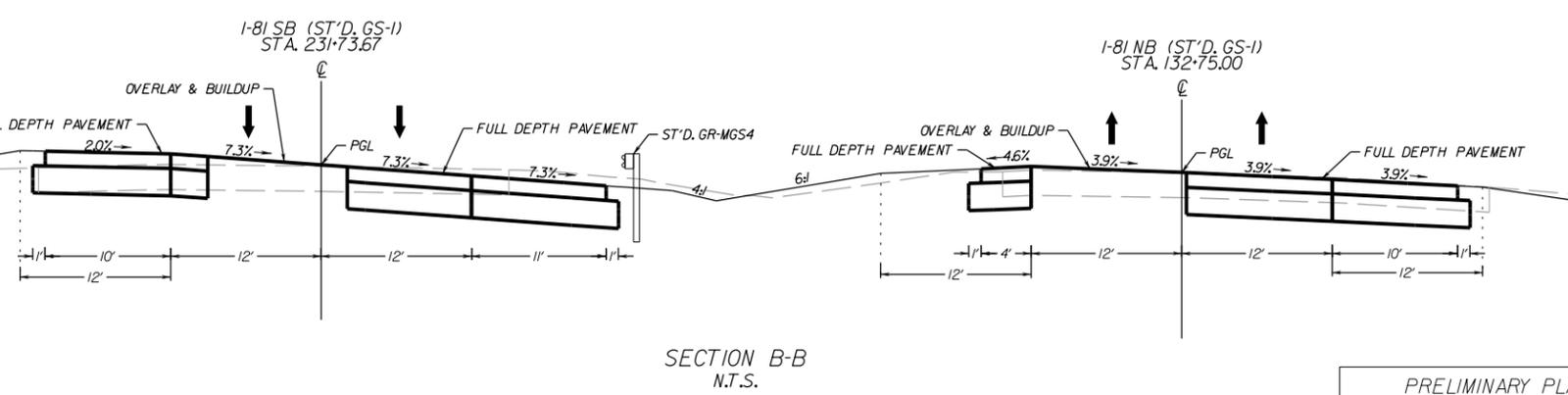
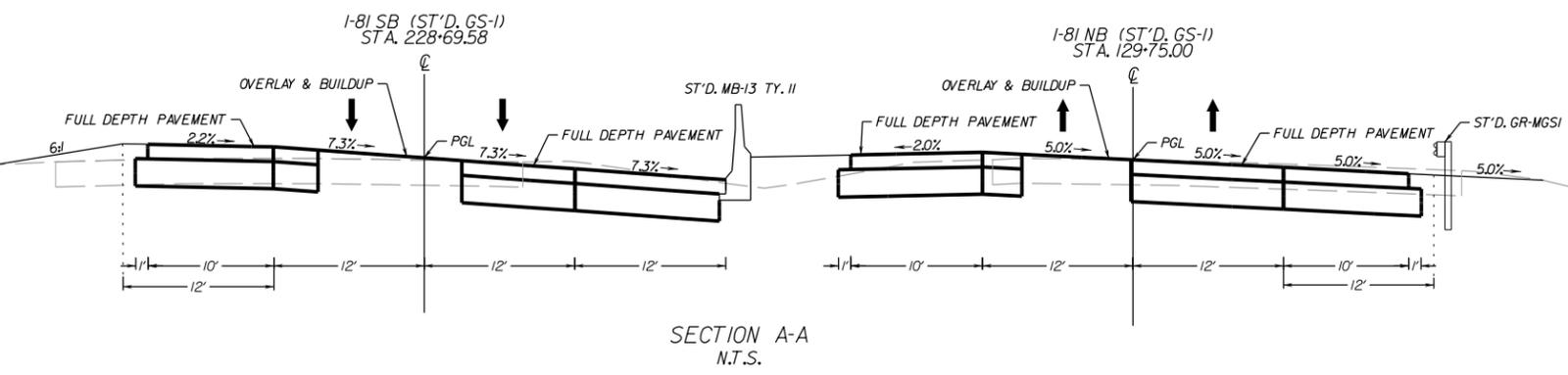
Curve 81NB_3
PI = 141+00.93
DELTA = 23° 44' 19.80" (RT)
D = 129' 38"
T = 806.02'
L = 1,588.92'
R = 3,835.00'
PC = 132+94.91
PT = 148+83.83
V = 75 M.P.H.
e = EXISTING

MATCHLINE SHEET 8 - STA. 129+25.00



Double-Face MB-13 Barrier Throughout Clear Zone Eliminates Need for Extensive Guardrail on NB and SB Approaches

Project Length Reduced From 0.9 Miles to 0.7 Miles, Representing a 20% Reduction in Total Reconstruction Length From RFP Plans



PRELIMINARY PLANS THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION



PROJECT	SHEET NO.
0081-086-742	9



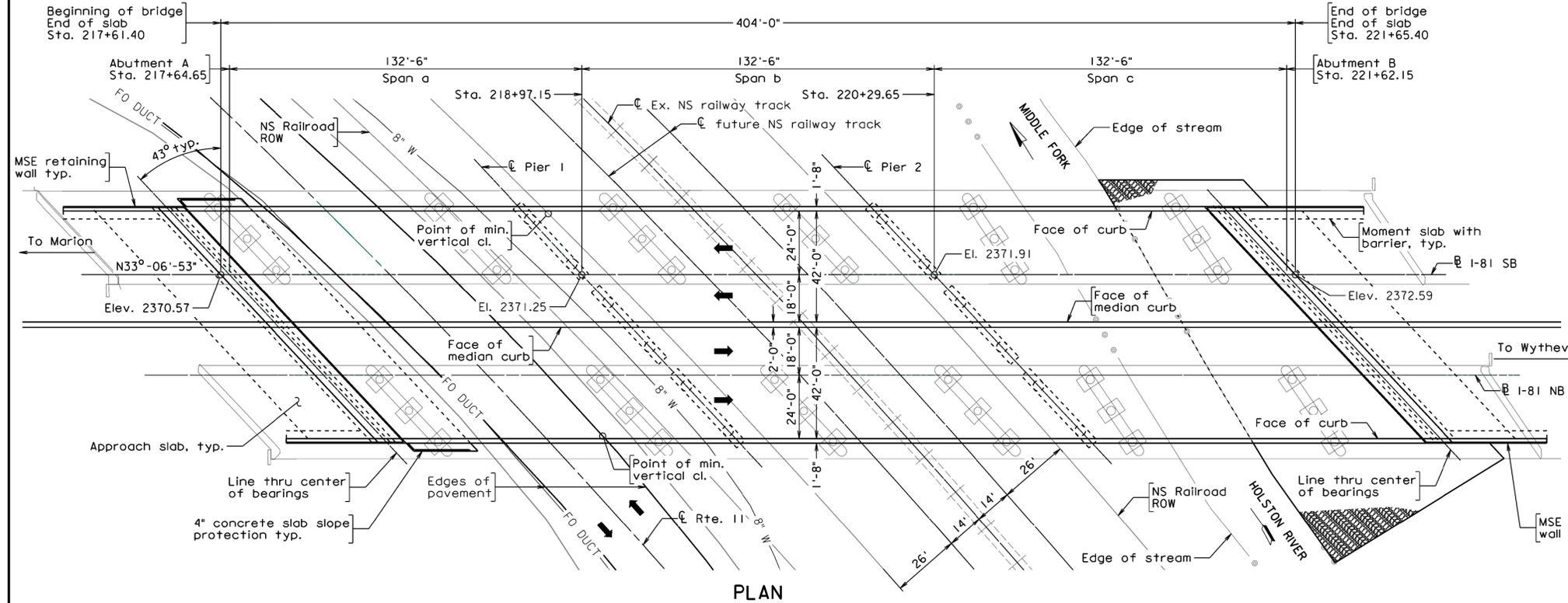


STATE	ROUTE	FEDERAL AID PROJECT	STATE	ROUTE	PROJECT	SHEET NO.
VA.	81		VA.	81	0081-086-742, B659 & 0081-086-818, B663	1
NBIS Number:			UPC No. 97555, 111265			
Federal Oversight Code: N/A			FHWA Construction and Scour Code:			

DESIGN EXCEPTION(S):

GENERAL NOTES:

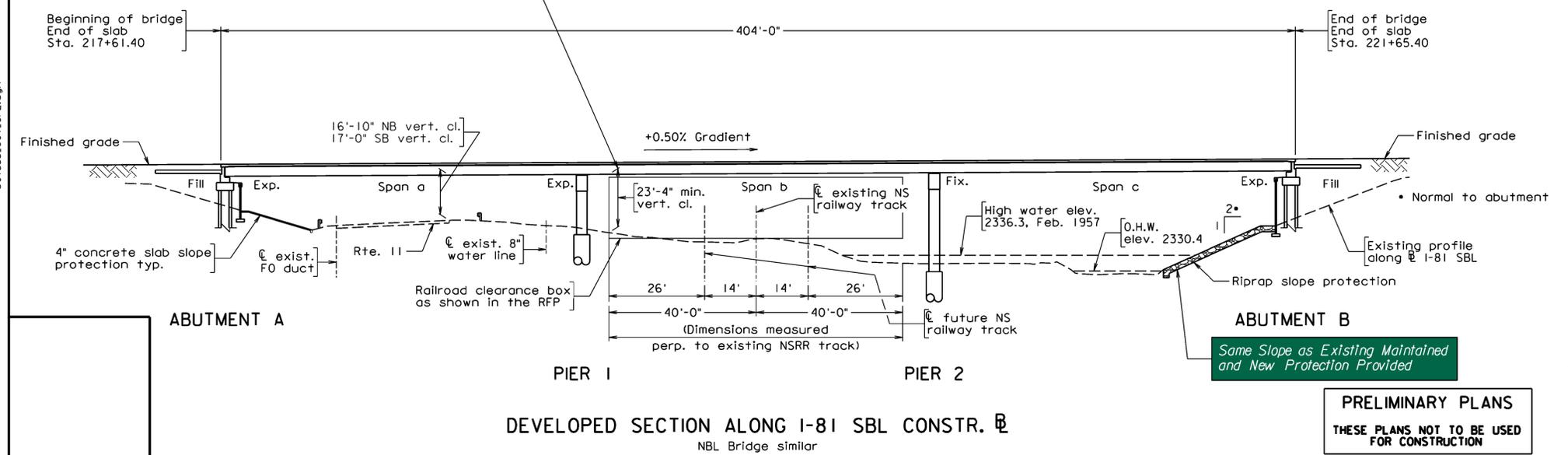
Widths: 42'-0" clear SB roadway, 2'-0" median, 42'-0" clear NB roadway.
 Span layout: Three continuous 132'-6" steel plate girder spans.
 Capacity: HL-93 loading.
 Drainage area: 24.2 sq. mi.
 Specifications:
 Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.
 Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.
 Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.
 All structural steel shall be ASTM A709 Grade 50W and shall be unpainted except as required by Section 407 of the Specifications.
 The existing structure is designated a Type B structure in accordance with Sec. 411.



Railroad Coordination - Bridge Layout Meets or Exceeds Clearance Requirements Established by NSRR, Reducing Risk Associated with Railroad Review and Approval.

Low Maintenance Bridge - Jointless Structure, Class III CRR Steel in Superstructure, Low Permeability Concrete, and Use of Weathering Steel for Plate Girders and Bearings.

Reduced Inspection Needs - No Fracture Critical Members, Limited Fatigue-Prone Details (Diaphragm Connections Only).



TIMMONS GROUP RICHMOND, VA STRUCTURAL ENGINEER	
PLANS BY:	Timmons Group
COORDINATED:	
SUPERVISED:	Gary S. Johnson
DESIGNED:	Brian L. Wright
DRAWN:	Brian L. Wright
CHECKED:	Jennifer A. Johnson



Scale: 1" = 25'-0"

PRELIMINARY PLANS
 THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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

VDOT
 COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF TRANSPORTATION
 PROPOSED BRIDGE ON I-81 NBL AND SBL
 OVER US 11, NORFOLK SOUTHERN RAILWAY
 AND MIDDLE FORK HOLTON RIVER
 SMYTH COUNTY - 1.84 MI. S. OF RTE. 683
 PROJ. 0081-086-742, B659
 & 0081-086-818, B663

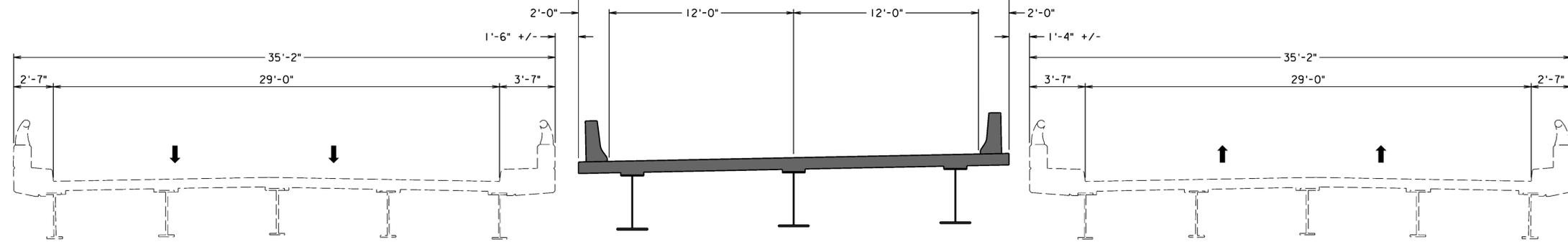
Recommended for Approval: _____ Date _____
 State Structure and Bridge Engineer

Approved: _____ Date _____
 Chief Engineer

Date: December 6, 2018 © 2018, Commonwealth of Virginia

302-97
 Sheet 1 of 6

STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	NO.
VA.		81	2
		0081-086-742, P101, B659 & 0081-086-818, B663	

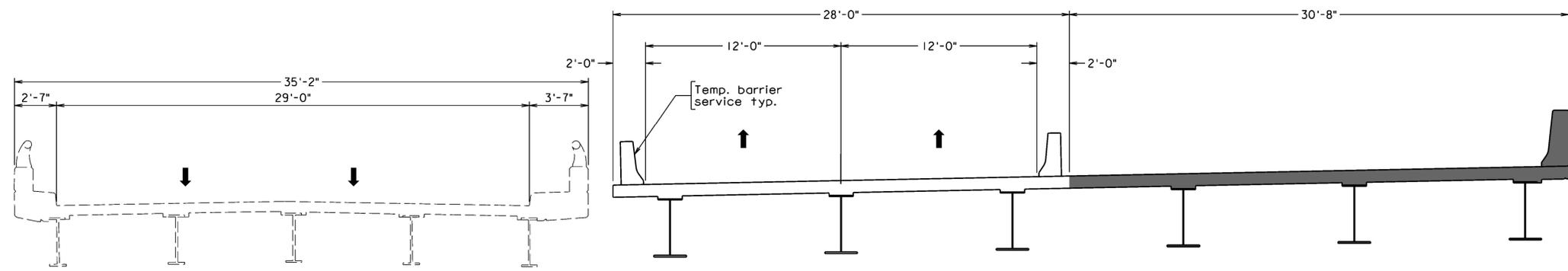


EXISTING I-81 SB

PHASE I CONSTRUCTION

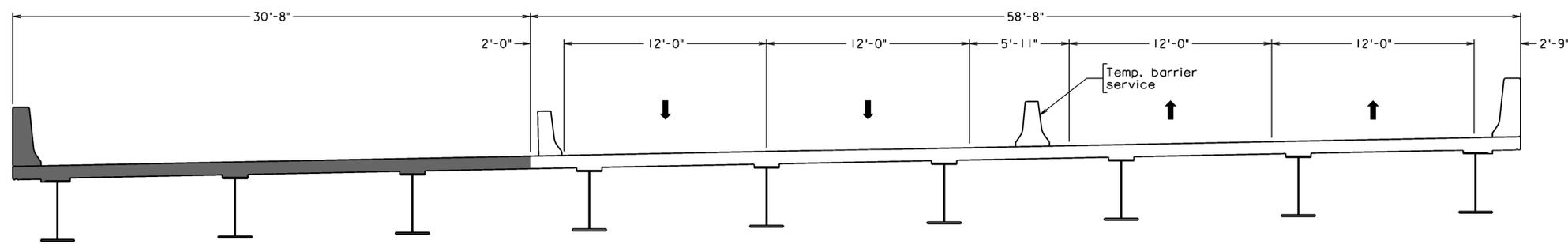
EXISTING I-81 NB

Due to the Extent of Deterioration in the Existing NB Bridge, the Construction Sequence Prioritizes the Replacement of the NB Bridge First



PHASE 2 CONSTRUCTION

A 12 ft. Travelway, Which Includes an 11 ft. Lane and 1 ft. Shoulder, is Provided During All Phases of Construction in Accordance with RFP Requirements.



PHASE 3 CONSTRUCTION

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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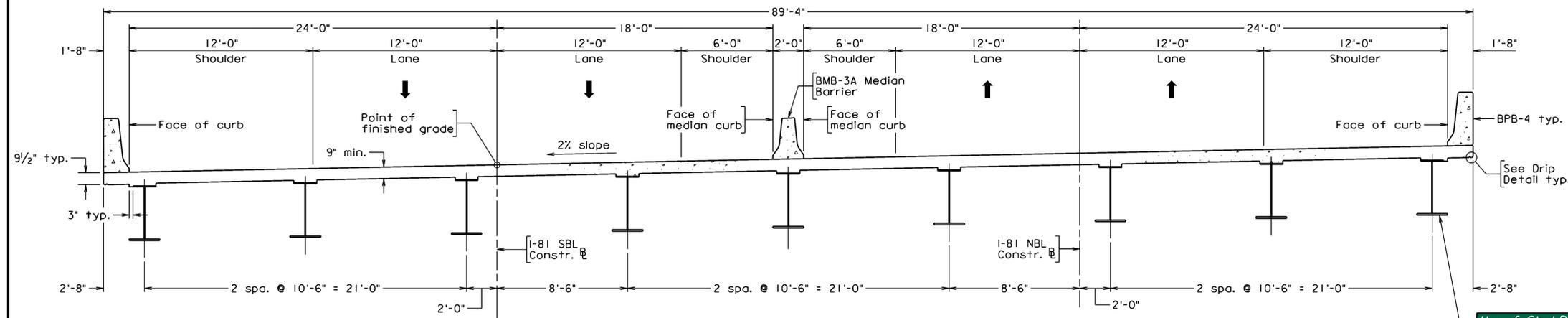
TIMMONS GROUP
RICHMOND, VA
STRUCTURAL ENGINEER



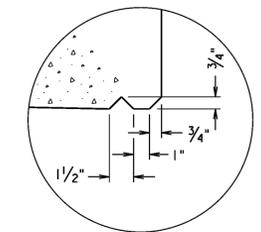
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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
CONSTRUCTION PHASING			
No.	Description	Date	Designed: B.W. / Date: Dec. 2018
			Drawn: B.W. / Plan No.: 302-97
			Checked: B.W. / Sheet No.: 2 of 6
Revisions			

STATE	FEDERAL AID	STATE	SHEET
VA.	PROJECT	ROUTE	NO.
		81	3
		0081-086-742, P101, B659 & 0081-086-818, B663	

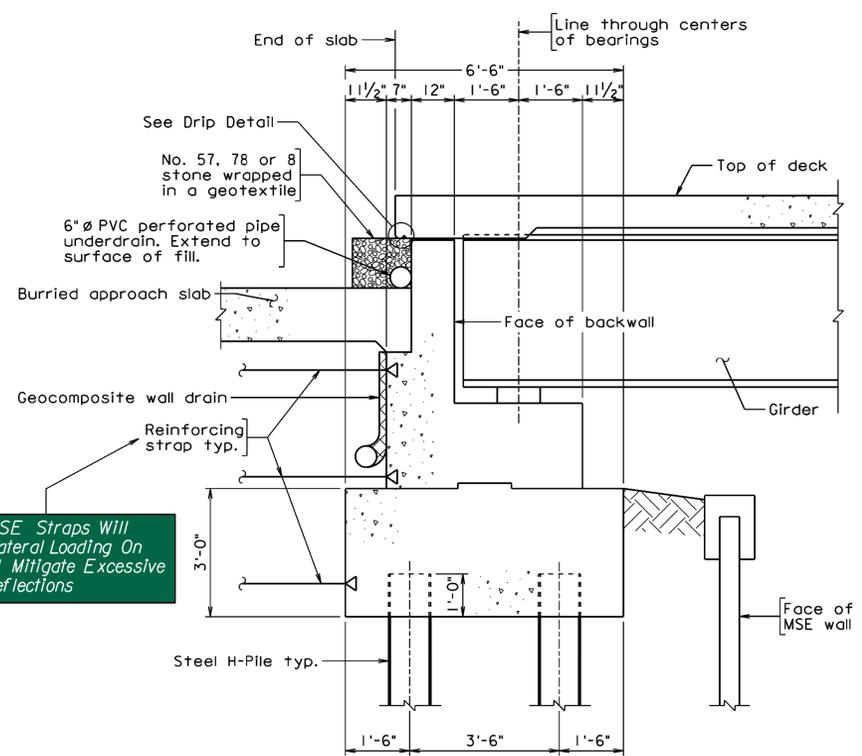


TRANSVERSE SECTION
Scale: 1/4" = 1'-0"



DRIP DETAIL
Not to scale

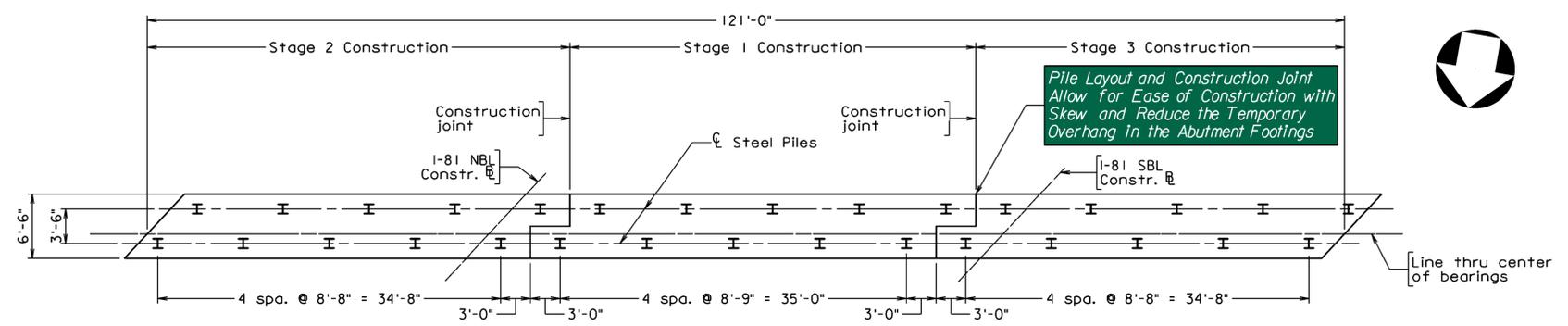
Use of Steel Plate Girders Allows for Meeting Minimum Vertical Clearance Requirements While Limiting the Raising of I-81



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

Use of MSE Straps Will Reduce Lateral Loading On Piles and Mitigate Excessive Lateral Deflections

Deck Slab Extension Type Abutment Conforms to VDOT's Jointless Bridge Philosophy, Reducing Inspection and Maintenance Needs.



ABUTMENT PILE LAYOUT PLAN
Pile spacing shown is typical of both rows (Abutment A shown, Abutment B similar)
Scale: 1/8" = 1'-0"

Pile Layout and Construction Joint Allow for Ease of Construction with Skew and Reduce the Temporary Overhang in the Abutment Footings

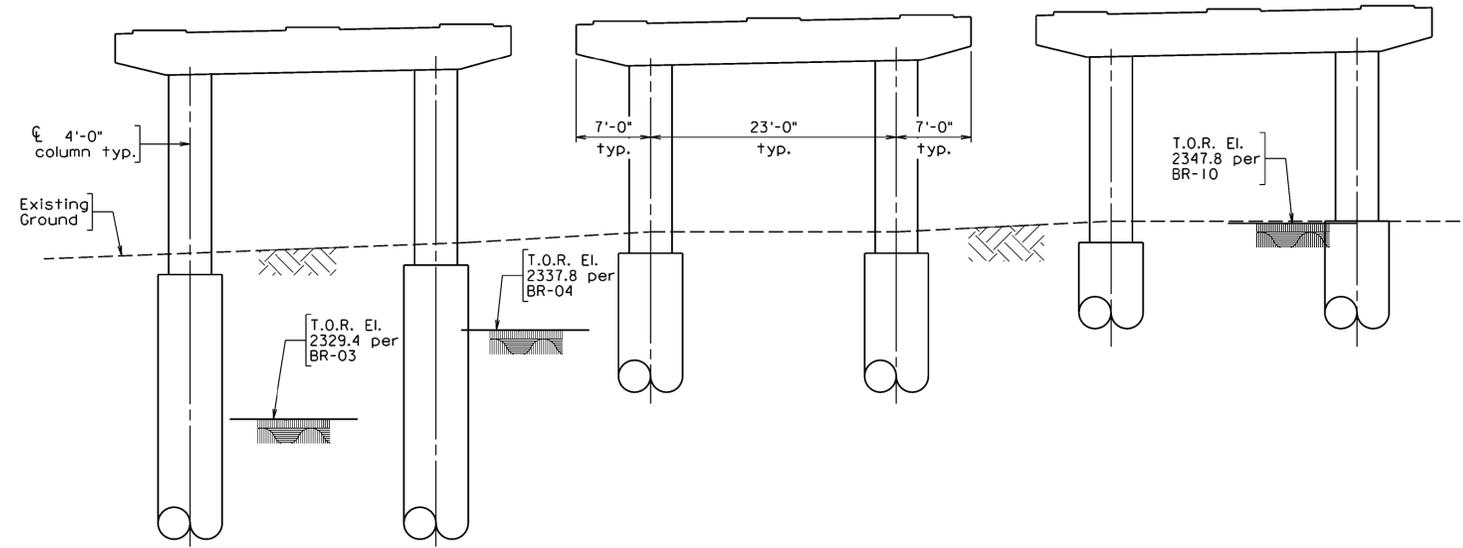
PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

b97555.003_Transverse Section.dgn

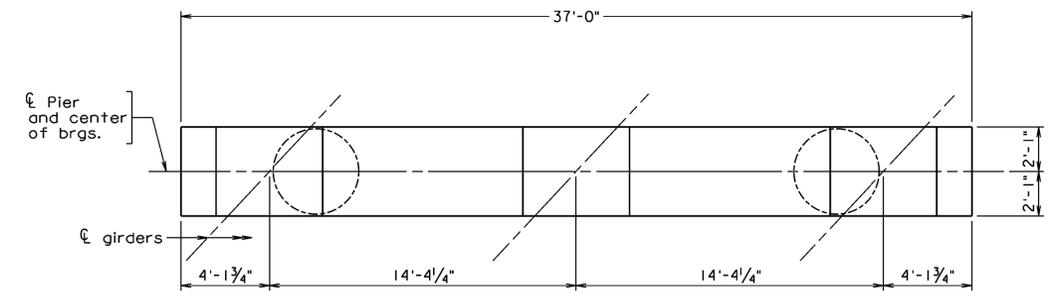
TIMMONS GROUP
RICHMOND, VA
STRUCTURAL ENGINEER

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
TRANSVERSE SECTION AND ABUTMENT DETAILS				
No.	Description	Date	Designed: B.W.	Sheet No.
			Drawn: B.W.	3 of 6
			Checked: B.W.	
Revisions			Date: Dec. 2018	Plan No.: 302-97

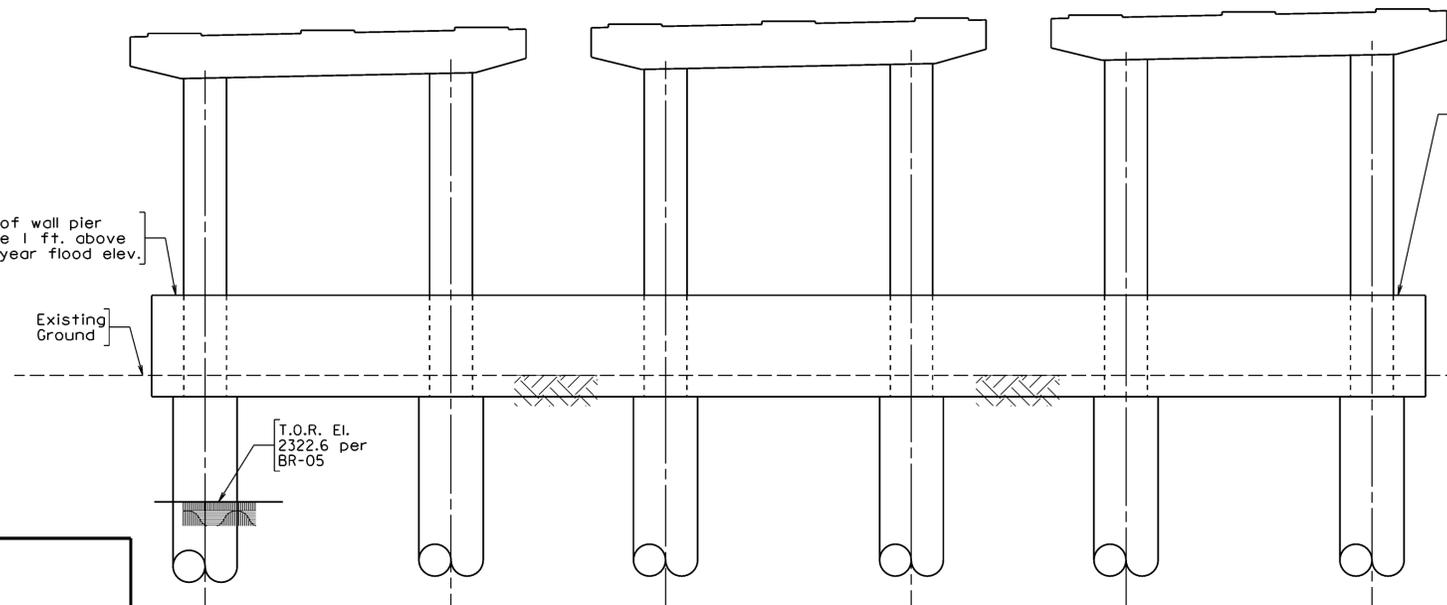
STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	NO.
VA.		81	4
		0081-086-742, P101, B659 & 0081-086-818, B663	



PIER 1 ELEVATION
Scale: 1/8" = 1'-0"



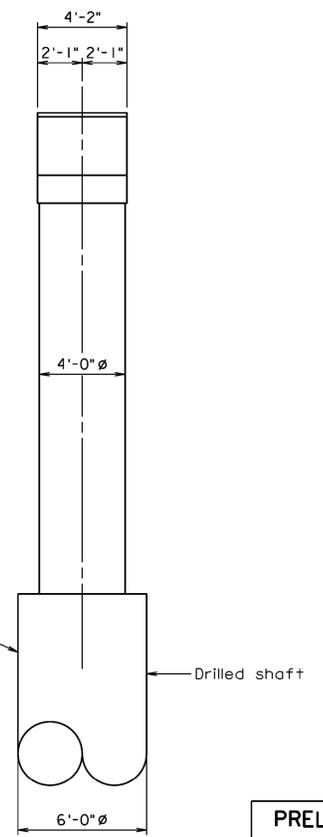
PLAN OF PIER CAP
Typical of all pier caps
Scale: 1/4" = 1'-0"



PIER 2 ELEVATION
Scale: 1/8" = 1'-0"

Partial Wall Pier to Reduce Potential for Trapped Debris at Pier Columns, Reducing Maintenance and Inspection Needs.

Drilled Shafts Eliminate Layback and Shoring Issues with Respect to Route 11 and the Railroad and Reduce Scour Impact at Pier 2.



END VIEW
Scale: 1/4" = 1'-0"

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
PIER CONFIGURATION			
No.	Description	Date	Designed: B.W. / Drawn: B.W. / Checked: J.A.J.
			Date: Dec. 2018
			Plan No. 302-97
			Sheet No. 4 of 6

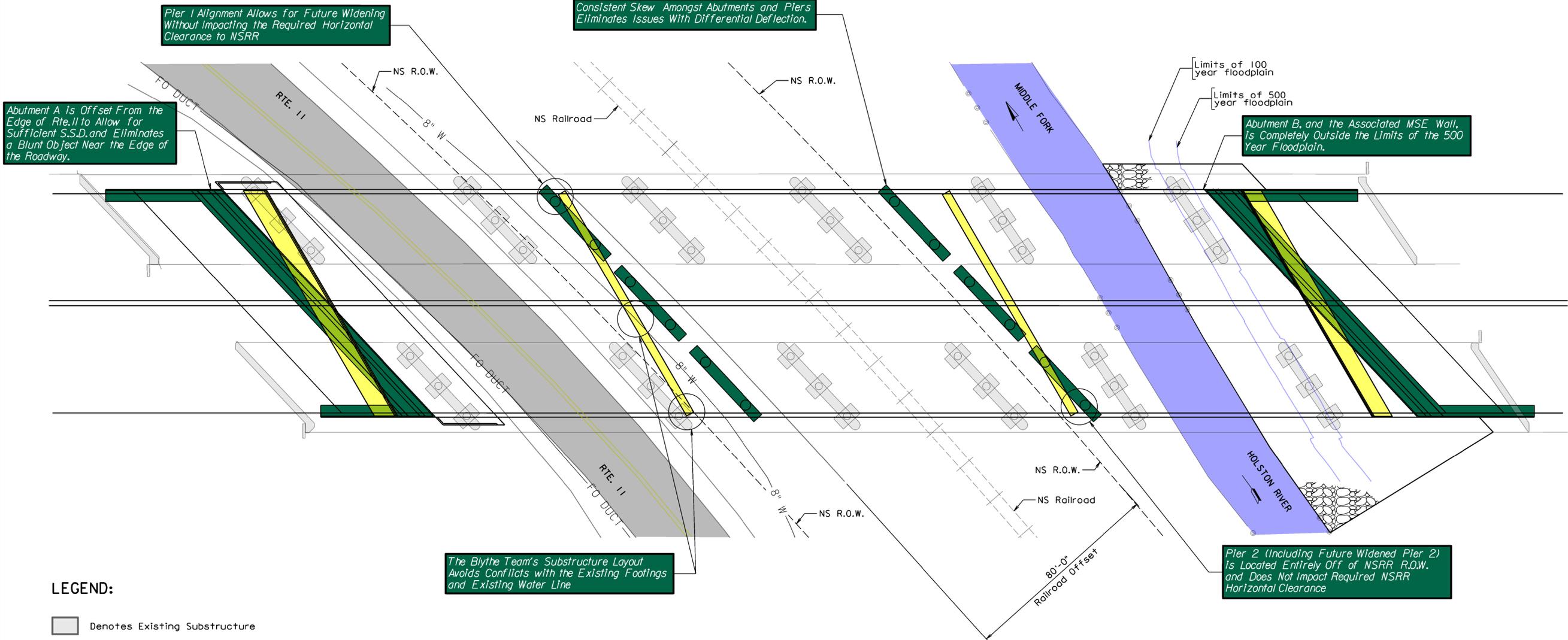
TIMMONS GROUP
YOUR VISION ACHIEVED THROUGH OURS.

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b97555.004_Pier_Details.dgn

TIMMONS GROUP
RICHMOND, VA
STRUCTURAL ENGINEER

STATE	ROUTE	FEDERAL AID PROJECT	STATE ROUTE	PROJECT	SHEET NO.
VA.			81	0081-086-742, P101, B659 & 0081-086-818, B663	5



LEGEND:

- Denotes Existing Substructure
- Denotes VDOT RFP Substructure
- Denotes Blythe Team's Proposed Substructure

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

TIMMONS GROUP
RICHMOND, VA
STRUCTURAL ENGINEER

Scale: 1" = 20'-0"



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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION					
STRUCTURE AND BRIDGE DIVISION					
CONCEPTUAL BRIDGE DESIGN ENHANCEMENTS					
No.	Description	Date	Designed: BLW Drawn: BLW Checked: JAJ	Plan No. Dec. 2018 302-97	Sheet No. 5 of 6
Revisions					



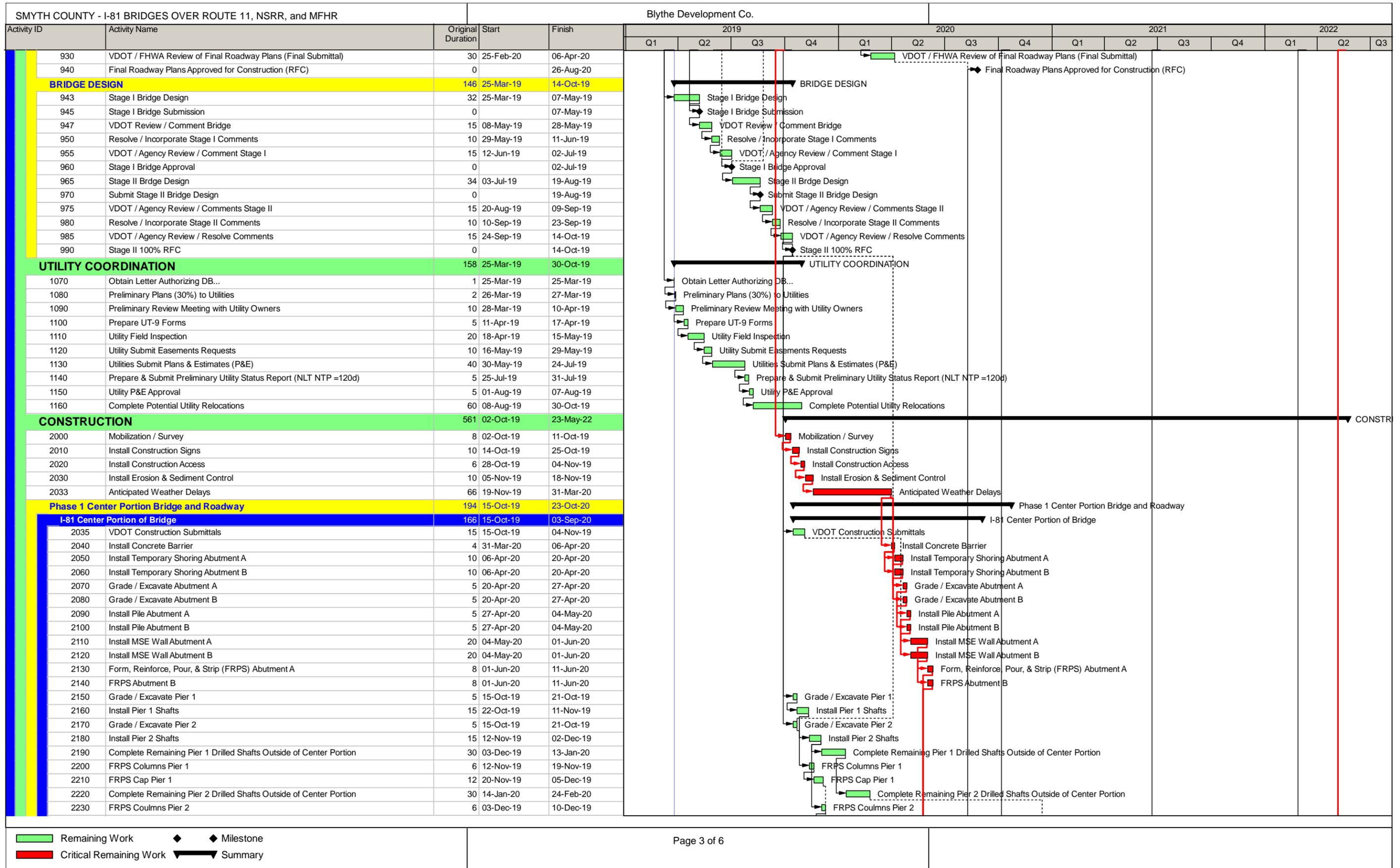
Section 4.6

Proposal Schedule



SMYTH COUNTY - I-81 BRIDGES OVER ROUTE 11, NSRR, and MFHR				Blythe Development Co.																	
Activity ID	Activity Name	Original Duration	Start	Finish	2019				2020				2021				2022				
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3		
SMYTH COUNTY - I-81 BRIDGES OVER ROUTE 11, NSRR, and MFHR				659	25-Mar-19	23-May-22	SMYTH C														
SCHEDULE MILESTONES				659	25-Mar-19	23-May-22	SCHEDU														
130	Notice to Proceed	0		25-Mar-19	◆ Notice to Proceed																
140	Phase 1 Complete	0		23-Oct-20	◆ Phase 1 Complete																
150	Phase 2 Complete	0		08-Jul-21	◆ Phase 2 Complete																
160	Phase 3 Complete	0		15-Mar-22	◆ Phase 3 Complete																
170	Contract Completion	0		23-May-22	◆ Contract Completion																
SCOPE VALIDATION PERIOD				150	25-Mar-19	18-Oct-19	▶ SCOPE VALIDATION PERIOD														
180	Perform Investigation and Submit General Notice	120	25-Mar-19	06-Sep-19	▶ Perform Investigation and Submit General Notice																
190	Prepare & Submit Final Scope Issue Reporting Document	15	09-Sep-19	27-Sep-19	▶ Prepare & Submit Final Scope Issue Reporting Document																
200	VDOT Review & Resolution of Issues	15	30-Sep-19	18-Oct-19	▶ VDOT Review & Resolution of Issues																
CPM SCHEDULE				157	25-Mar-19	29-Oct-19	▶ CPM SCHEDULE														
210	Prepare & Submit Preliminary Schedule	15	25-Mar-19	12-Apr-19	▶ Prepare & Submit Preliminary Schedule																
220	Prepare & Submit Baseline Schedule	90	15-Apr-19	16-Aug-19	▶ Prepare & Submit Baseline Schedule																
230	VDOT Review & Approve Preliminary Schedule	15	19-Aug-19	06-Sep-19	▶ VDOT Review & Approve Preliminary Schedule																
240	VDOT Review & Approve Baseline Schedule	15	09-Sep-19	27-Sep-19	▶ VDOT Review & Approve Baseline Schedule																
250	Address VDOT Comments on Baseline Schedule	7	30-Sep-19	08-Oct-19	▶ Address VDOT Comments on Baseline Schedule																
260	VDOT Review & Approve Revised Baseline Schedule	15	09-Oct-19	29-Oct-19	▶ VDOT Review & Approve Revised Baseline Schedule																
QA/QC PLAN				60	25-Mar-19	14-Jun-19	▶ QA/QC PLAN														
270	Prepare QA/QC Plan	5	25-Mar-19	29-Mar-19	▶ Prepare QA/QC Plan																
280	Submit QA/QC Plan	0		29-Mar-19	▶ Submit QA/QC Plan																
290	VDOT Review of QC/QC Plan	15	01-Apr-19	19-Apr-19	▶ VDOT Review of QC/QC Plan																
300	Revise & Resubmit QA/QC Plan	5	22-Apr-19	26-Apr-19	▶ Revise & Resubmit QA/QC Plan																
310	VDOT Review of Revised QA/QC Plan	15	29-Apr-19	17-May-19	▶ VDOT Review of Revised QA/QC Plan																
315	Update of QA/QC Plan	5	20-May-19	24-May-19	▶ Update of QA/QC Plan																
317	VDOT Review of Updated QA/QC Plan	15	27-May-19	14-Jun-19	▶ VDOT Review of Updated QA/QC Plan																
INCIDENT MANAGEMENT PLAN				50	25-Mar-19	31-May-19	▶ INCIDENT MANAGEMENT PLAN														
320	Develop Incident Management Plan	15	25-Mar-19	12-Apr-19	▶ Develop Incident Management Plan																
330	VDOT Incident Management Plan Review	15	15-Apr-19	03-May-19	▶ VDOT Incident Management Plan Review																
340	Revise & Resubmit Incident Management Plan	5	06-May-19	10-May-19	▶ Revise & Resubmit Incident Management Plan																
350	VDOT Review of Revised Incident Management Plan	15	13-May-19	31-May-19	▶ VDOT Review of Revised Incident Management Plan																
DESIGN SURVEY				60	25-Mar-19	14-Jun-19	▶ DESIGN SURVEY														
360	Property Owner / ROW Research	5	25-Mar-19	29-Mar-19	▶ Property Owner / ROW Research																
370	Distribute Notification Letters, if Needed	15	01-Apr-19	19-Apr-19	▶ Distribute Notification Letters, if Needed																
380	Recover Survey Control	5	22-Apr-19	26-Apr-19	▶ Recover Survey Control																
390	Supplemental Base Mapping / Field Survey	30	29-Apr-19	07-Jun-19	▶ Supplemental Base Mapping / Field Survey																
400	Survey Complete	5	10-Jun-19	14-Jun-19	▶ Survey Complete																
GEOTECHNICAL				117	25-Mar-19	04-Nov-19	▶ GEOTECHNICAL														
410	Develop Proposed Boring Location Plan, Utility Clearance & Permits	10	25-Mar-19	05-Apr-19	▶ Develop Proposed Boring Location Plan, Utility Clearance & Permits																
415	Planning and Coordination of Subsurface Exploration	12	08-Apr-19	23-Apr-19	▶ Planning and Coordination of Subsurface Exploration																
420	Subsurface Exploration	20	24-Apr-19	21-May-19	▶ Subsurface Exploration																
425	Laboratory Testing	20	22-May-19	18-Jun-19	▶ Laboratory Testing																
430	Prepare Major Structures Geotechnical Report	13	19-Jun-19	05-Jul-19	▶ Prepare Major Structures Geotechnical Report																
435	DB Team Review of Major Structures Geotechnical Report	4	08-Jul-19	11-Jul-19	▶ DB Team Review of Major Structures Geotechnical Report																
440	Submit Major Structures Geotechnical Report to VDOT	0		11-Jul-19	▶ Submit Major Structures Geotechnical Report to VDOT																
443	Start of 90 Days Before Construction	60	12-Jul-19	04-Nov-19	▶ Start of 90 Days Before Construction																
445	VDOT Review of Major Structures Technical Report	15	12-Jul-19	01-Aug-19	▶ VDOT Review of Major Structures Technical Report																
450	Revise Major Structures Technical Report	10	02-Aug-19	15-Aug-19	▶ Revise Major Structures Technical Report																
455	DB Team Review of Revised Major Structures Geotechnical Report	4	16-Aug-19	21-Aug-19	▶ DB Team Review of Revised Major Structures Geotechnical Report																
460	Submit Revised Major Structures Geotechnical Report to VDOT	0		21-Aug-19	▶ Submit Revised Major Structures Geotechnical Report to VDOT																
463	VDOT Review & Approval of Major Structures Geotechnical Plan	15	22-Aug-19	11-Sep-19	▶ VDOT Review & Approval of Major Structures Geotechnical Plan																
465	Soil Survey & Minor Structures Geotechnical Report	15	22-Aug-19	11-Sep-19	▶ Soil Survey & Minor Structures Geotechnical Report																
470	DB Team Review of Soil Survey & Minor Structures Report	4	12-Sep-19	17-Sep-19	▶ DB Team Review of Soil Survey & Minor Structures Report																
475	Submit Soil Survey & Minor Structures Geotechnical Report to VDOT	0		17-Sep-19	▶ Submit Soil Survey & Minor Structures Geotechnical Report to VDOT																

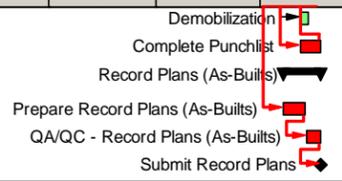
█ Remaining Work ◆ Milestone
█ Critical Remaining Work ▶ Summary



SMYTH COUNTY - I-81 BRIDGES OVER ROUTE 11, NSRR, and MFHR					Blythe Development Co.														
Activity ID	Activity Name	Original Duration	Start	Finish	2019				2020				2021				2022		
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
2240	FRPS Cap Pier 2	12	11-Dec-19	26-Dec-19															
2250	Backfill Abutment A	2	11-Jun-20	15-Jun-20															
2260	Backfill Abutment B	2	11-Jun-20	15-Jun-20															
2270	Backfill Piers 1 & 2	4	27-Dec-19	01-Jan-20															
2280	Install Slope Protection Abutment A	4	15-Jun-20	19-Jun-20															
2290	Install Slope Protection Abutment B	4	15-Jun-20	19-Jun-20															
2300	Erect Girders	10	19-Jun-20	03-Jul-20															
2310	FRPS Center Portion of Deck	30	03-Jul-20	14-Aug-20															
2315	Prepare & Submit Load Rating to VDOT for Completed Section	5	17-Aug-20	25-Aug-20															
2320	FRPS Approach Slabs	8	14-Aug-20	26-Aug-20															
2330	Cover Depth Survey	2	26-Aug-20	28-Aug-20															
2340	Bridge Deck Grooving	2	28-Aug-20	01-Sep-20															
2350	Bridge Safety / Acceptance Inspection	2	01-Sep-20	03-Sep-20															
I-81 Center Portion of Roadway		50	14-Aug-20	23-Oct-20															
2360	Storm Drainage STA 106+0 left to STA 135+00 left	12	14-Aug-20	01-Sep-20															
2370	Grade / Excavate STA 106+00 left to STA 135+00 left	30	14-Aug-20	25-Sep-20															
2380	Install Aggregate Base Course STA 106+00 left to STA 135+00 left	5	25-Sep-20	02-Oct-20															
2390	Install Asphalt Base Course STA 106+00 left to STA 135+00 left	5	02-Oct-20	09-Oct-20															
2400	Install Asphalt Intermediate Course STA 106+00 left to STA 135+00 left	4	09-Oct-20	15-Oct-20															
2410	Install Asphalt Surface Course STA 106+00 left to STA 135+00 left	3	15-Oct-20	20-Oct-20															
2420	Install Pavement Markings	1	20-Oct-20	21-Oct-20															
2430	Move North Bound Traffic to Completed Center Portion of Bridge	2	21-Oct-20	23-Oct-20															
Phase 2 North Bound Bridge and Roadway		132	23-Oct-20	08-Jul-21															
I-81 North Bound Portion of Bridge		104	23-Oct-20	19-May-21															
3000	Demolish Existing North Bound Bridge	50	23-Oct-20	01-Jan-21															
3030	Grade / Excavate Abutment A	5	01-Jan-21	08-Jan-21															
3040	Grade / Excavate Abutment B	5	01-Jan-21	08-Jan-21															
3050	Install Pile Abutment A	5	08-Jan-21	15-Jan-21															
3060	Install Pile Abutment B	5	08-Jan-21	15-Jan-21															
3070	Install MSE Wall Abutment A	20	15-Jan-21	12-Feb-21															
3080	Install MSE Wall Abutment B	20	15-Jan-21	12-Feb-21															
3090	FRPS Abutment A	8	12-Feb-21	24-Feb-21															
3100	FRPS Abutment B	8	12-Feb-21	24-Feb-21															
3160	FRPS Columns Pier 1	6	01-Jan-21	11-Jan-21															
3170	FRPS Cap Pier 1	12	11-Jan-21	27-Jan-21															
3190	FRPS Columns Pier 2	6	01-Jan-21	11-Jan-21															
3200	FRPS Cap Pier 2	12	11-Jan-21	27-Jan-21															
3210	Backfill Abutment A	2	24-Feb-21	26-Feb-21															
3220	Backfill Abutment B	2	24-Feb-21	26-Feb-21															
3230	Backfill Piers 1 & 2	4	27-Jan-21	02-Feb-21															
3240	Install Slope Protection Abutment A	4	26-Feb-21	04-Mar-21															
3250	Install Slope Protection Abutment B	4	26-Feb-21	04-Mar-21															
3260	Erect Girders	10	04-Mar-21	18-Mar-21															
3270	FRPS North Bound Portion of Deck	30	18-Mar-21	29-Apr-21															
3275	Prepare & Submit Load Rating to VDOT for Completed Section	5	30-Apr-21	07-May-21															
3280	FRPS Approach Slabs	8	29-Apr-21	11-May-21															
3290	Cover Depth Survey	2	11-May-21	13-May-21															
3300	Bridge Deck Grooving	2	13-May-21	17-May-21															
3310	Bridge Safety / Acceptance Inspection	2	17-May-21	19-May-21															
I-81 North Bound Portion of Roadway		50	29-Apr-21	08-Jul-21															
3320	Storm Drainage North Bound	12	29-Apr-21	17-May-21															
3330	Grade / Excavate North Bound	30	29-Apr-21	10-Jun-21															
3340	Install Aggregate Base Course North Bound	5	10-Jun-21	17-Jun-21															
3350	Install Asphalt Base Course North Bound	5	17-Jun-21	24-Jun-21															
3360	Install Asphalt Intermediate Course North Bound	4	24-Jun-21	30-Jun-21															
3370	Install Asphalt Surface Course North Bound	3	30-Jun-21	05-Jul-21															

█ Remaining Work ◆ Milestone
█ Critical Remaining Work ⇨ Summary

Activity ID	Activity Name	Original Duration	Start	Finish	2019				2020				2021				2022		
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
6010	Demobilization	5	05-May-22	12-May-22															
6020	Complete Punchlist	12	05-May-22	23-May-22															
Record Plans (As-Builts)																			
7000	Prepare Record Plans (As-Builts)	14	21-Apr-22	10-May-22															
7010	QA/QC - Record Plans (As-Builts)	9	11-May-22	23-May-22															
7020	Submit Record Plans	0		23-May-22															



Remaining Work ◆ Milestone
 Critical Remaining Work ▶ Summary