



TECHNICAL PROPOSAL - VOLUME I

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

STATE PROJECT NO.: 0081-086-818; 0081-086-742
FEDERAL PROJECT NO.: BR-081-1(336)
CONTRACT ID NUMBER: C0097555DB102

DECEMBER 6, 2018



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	
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.6 (Form C-78-RFP)	Sections 3.6, 4.0.1.1	no	
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	
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	Section 4.1.9	no	
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		
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		
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	6/29
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	10/38
Project Approach	NA	Section 4.4		
Environmental Management	NA	Section 4.4.1	yes	14
Utilities	NA	Section 4.4.2	yes	16
Geotechnical	NA	Section 4.4.3	yes	17
Railroad Coordination	NA	Section 4.4.4	yes	20
Construction of Project	NA	Section 4.5		
Sequence of Construction	NA	Section 4.5.1	yes	23

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	27
Proposal Schedule	NA	Section 4.6		
Proposal Schedule	NA	Section 4.6	no	
Proposal Schedule Narrative	NA	Section 4.6	no	
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.6	no	

4.1 LETTER OF SUBMITTAL



615 Church Street, Lynchburg, Virginia 24504
P. O. Box P-7000, Lynchburg, Virginia 24505
Tel: (434) 845-0301 Fax: (434) 845-0306

December 6, 2018

Suril R. Shah, PE
Alternative Project Delivery Division
Virginia Department of Transportation
1401 E. Broad Street
Richmond, Virginia 23219

RE: LETTER OF SUBMITTAL FOR TECHNICAL PROPOSAL
Replacement of I-81 Bridges over Rte. 11, Norfolk Southern Railway & Middle Fork Holston River
Smyth County/City of Atkins, VA | Contract ID Number: C0097555DB102

Dear Mr. Shah,

English Construction Company, Inc. (English) and **KCI Technologies, Inc. (KCI)** present a fully-integrated design-build team to design and construct this Project. The English Team is focused on providing VDOT with not only the best price for this project but also an unsurpassed quality, and we are 100 percent committed to delivering a successful quality project to VDOT on-time and on-budget.

4.1.1 FULL LEGAL NAME AND ADDRESS OF OFFEROR // English Construction Company, Inc. (615 Church St., Lynchburg, VA 24504) will be the legal entity who will execute the Contract with VDOT.

4.1.2 DECLARATION OF OFFEROR'S INTENT // English Construction Company, Inc. will enter into a contract with VDOT for this project in accordance with the terms of the RFP.

4.1.3 DECLARATION OF TECHNICAL AND PRICE PROPOSAL DATES // Pursuant to Part 1, Section 8.2, the English Team declares that the offer represented by our technical and price proposals will remain in full force and effect for 120 days after the date the Technical Proposal is actually submitted to VDOT.

4.1.4 OFFEROR'S POINT OF CONTACT // **4.1.5 OFFEROR'S PRINCIPAL OFFICER** // John Jordan will serve as both the Point of Contact and the Principal Officer for the English Team on this project.

John M. Jordan, Jr., Senior Vice President
615 Church St.
Lynchburg, VA 24504

jjordan@englishconst.com
434-845-0301
434-845-0306

4.1.6 INTERIM MILESTONE AND FINAL COMPLETION DATES // The Project Final Completion date will be as listed in the RFP – May 23, 2022, with no interim milestone dates.


4.1.7 UNIQUE MILESTONE DATES // The English Team will not have any unique milestone dates.

4.1.8 PROPOSAL PAYMENT AGREEMENT // Attachment 9.3.1, is included in the Appendix.

4.1.9 CERTIFICATION REGARDING DEBARMENT FORMS // Attachments 11.8.6(a) and 11.8.6(b), for all team members, are included in the Appendix.

4.1.10 DBE PARTICIPATION // The English Team is committed to achieving a four percent (4%) DBE participation goal for the entire value of the contract.

Sincerely,
English Construction Company, Inc.


John M. Jordan, Jr.
Senior Vice President

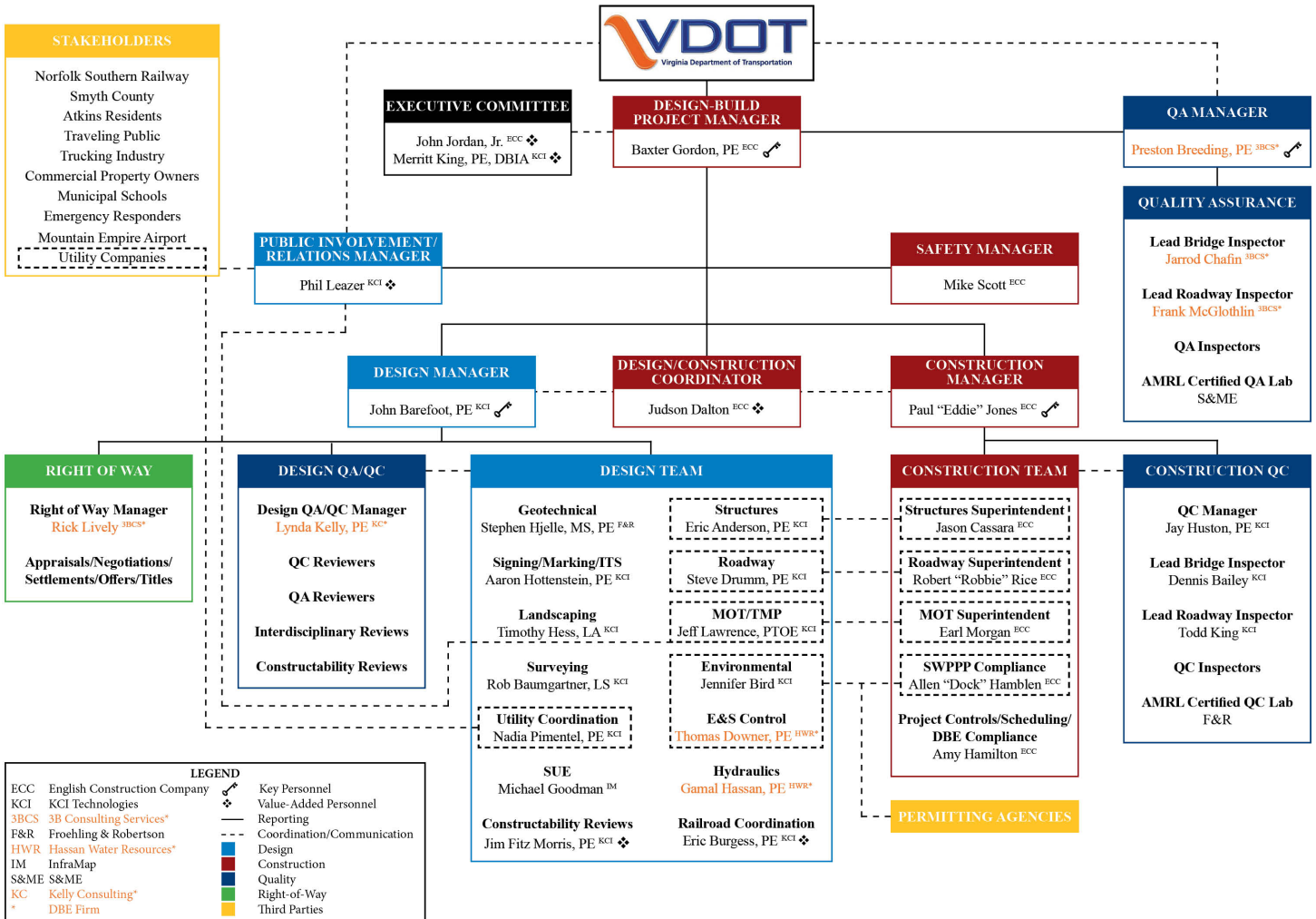
4.2 QUALIFICATIONS

4.2 OFFEROR'S QUALIFICATIONS

4.2.1 CONFIRMATION // The information contained in our SOQ remains true and accurate in accordance with Part 1, Section 11.4 of the RFP. The organizational structure of our Team remains unchanged and the Key Personnel designated remain intact.

4.2.2 ORGANIZATIONAL CHART // Our organizational chart (Figure 1) shows the “chain of command” and identifies major functions to be performed and their reporting relationships with solid lines representing reporting relationships and dashed lines representing the coordination and communication between the design disciplines, VDOT, and other stakeholders. The chart also shows a clear separation exists between QA and QC inspection and field/laboratory testing. The narrative and organizational chart below remain unchanged from the SOQ submission.

Figure 1 // Organizational Chart



4.3 DESIGN CONCEPT

4.3 DESIGN CONCEPT

Commitments and Deliverables of the English Team

The English Team is committed to providing a new, low-maintenance bridge carrying an expandable section of I-81 over Route 11, Norfolk Southern Railway (NSR), and Middle Fork North Holston River with minimal construction impacts. Our approach to design is focused on bridge replacement with minor improvements to I-81 while providing efficiency that meets or exceeds the scope of work while balancing the Project's cost, construction schedule, and long-term asset performance. Our design focused on two key goals:

1. Improving safety and operations in both the final design and temporary configurations.
2. Reducing construction impacts and building the new structure with minimal work on Route 11.

Design Efficiency that Meets or Exceeds the Intended Scope of Work

The design strategy of our Team is meeting or exceeding the RFP requirements. Figure 2 on page 4 graphically depicts the optimizations. The design optimizations presented:

- Eliminates one major construction phase by shifting the alignment to the southeast (right).
- Improves safety by eliminating one temporary traffic configuration on I-81.
- Significantly reduces impacts with no horizontal or vertical realignment of Route 11.
- Reduces maintenance through a reduction in number of square feet of bridge and the elimination of pier protection systems under the bridge.
- Fits the environment and reduces impacts under the bridge due to improved geometrics and substructure layout.
- Provides railroad horizontal clearances greater than requested with 45' or greater clearances.
- Significantly simplifies future widening, as discussed in *Accommodation of Future Widening* on page 5.

Benefits to End Users

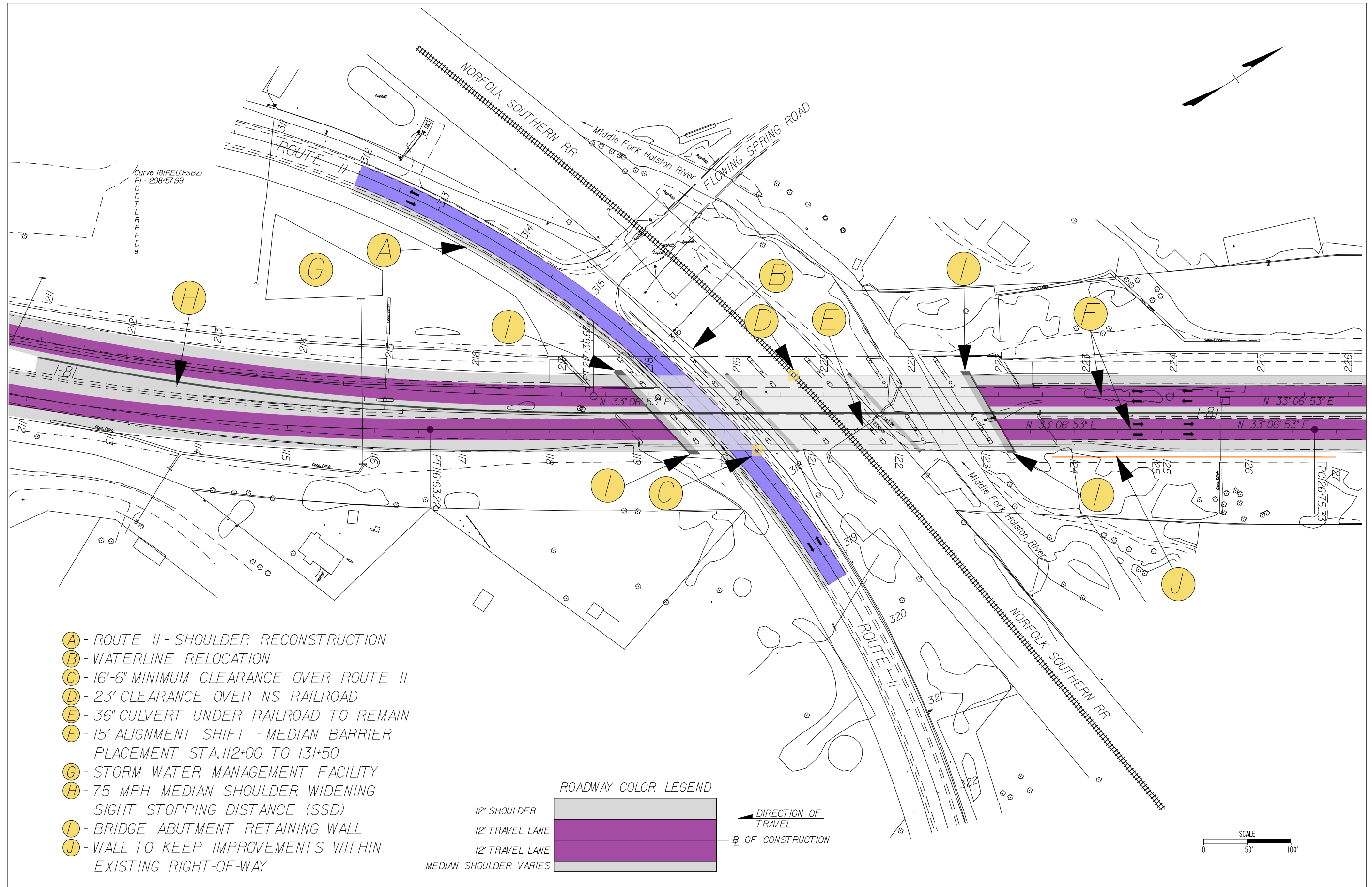
The design and construction utilizes common sense engineering and concern for safety to improve operations, minimize construction impacts, and increase public safety and acceptance. Specific ways where the proposed design benefits end users are summarized below:

Improving Safety & Operations

Minimizing impacts to the existing roadways provides the following improvements to safety and operations:

- *I-81* – The vertical and horizontal alignment of I-81 has been set to maximize the use of existing pavement for maintaining traffic and minimizing lane shifts where possible to maintain driver familiarity and reduce potential for accidents. The new design provides increased superelevation in the curves to provide comfort and safety to drivers. Although improvements require full depth asphalt replacements in some locations, safety has been fully considered in the design and layout of MOT.
- *Route 11* – The horizontal and vertical alignment of Route 11 remains the same as existing. The shoulders will be improved where required, guardrail will be added/replaced as needed, and the pavement will be milled and overlaid near the bridge as a result of shoulder improvements. Both lanes of traffic will remain open and motorist safety is enhanced through familiarity with the current alignment and minimal traffic control through the Project.

Figure 2 // Overview of Project



Meeting the Schedule

Our Team will construct and achieve Final Completion by May 23, 2022. The following design optimizations significantly contribute to adhering to the schedule:

- Minimal impacts to Route 11.
- Increased clear distance to bridge piers and elimination of bridge pier protection barrier on Route 11.
- Maximized use of 8" or less buildups to reduce the need to rebuild the pavement structure on I-81.
- Eliminated one phase of construction from the provided concept plans.
- Use of retaining walls to decrease fill and weather sensitive operations.
- Installation of permanent drainage in Phase I.
- Installation of permanent barrier in Phase I.
- Construction of all bridge pier foundations in Phase I.

Reducing Construction Impacts

Construction impacts have been reduced by focusing on the approach to MOT during construction. Elimination of Route 11 realignment significantly reduces construction impacts by minimizing MOT needs. Our shift of I-81 also reduces construction impacts by placing the median barrier in a location where it can be easily constructed and eliminates a phase of construction for the bridge. It also reduces the final roadway construction as the northbound lanes (NBL) can be constructed in a single phase; this shift also reduces the amount of temporary barrier required and the activities associated with placing that barrier near traffic. As required, our design remains within the existing ROW.

Increasing Public Acceptance

We believe that public acceptance on this interstate bridge replacement Project is best defined by the acceptance of the Project and its progression by those most impacted. As such, our design eliminates a majority of the inconvenience to the citizens of Atkins through limited disturbance of local traffic. Additionally, the English Team design limits phases of construction on I-81 and maintains larger than required lanes (12') on all phases of construction to increase driver comfort and decrease unfamiliar traffic conditions.

Accommodation of Future Widening

Our Team has not only met the requirement of “not to preclude future third lane”, but also **accommodated** the future widening concept of adding one additional lane in each direction. This was done not only to meet the requirement of this RFP, but also because it was the right and responsible thing to do given the history and discussions of improving the corridor. Some design features that are further discussed in this document include:

- ❖ Moving the I-81 alignment away from the rock cut in the northwest corner.
- ❖ Using 8'-6" girder spacing and narrower overhangs to easily add two girder lines at the same spacing for the future 18' widenings.
- ❖ Setting superelevations on I-81 in the vicinity of the bridge at the grade of Route 11.
- ❖ Providing joints in MSE walls for future expansion/tie in.
- ❖ Aligning bridge substructure units with NSR, Route 11, and the river.
- ❖ Shifting to east simplifies future ROW acquisition; ROW will only be needed on the southeast side of I-81 in the future.

Reduced Future Inspection and Maintenance

Our Team has considered the types of materials, methods, and functionality to reduce the need for future maintenance of the Project elements as further explained in the following sections. Optimizing the design reduces future maintenance with a smaller, jointless bridge structure; use of weathering steel; elimination of storm drain system on Route 11; elimination of cross pipes under I-81 at Station 204+15, 207+15, and 215+00; and the replacement of a significant portion of the pavement on the Project.

4.3.1. CONCEPTUAL ROADWAY PLANS //

Commitments and Deliverables of the English Team

The English Team is committed to designing and constructing the I-81 roadway and bridge in accordance with the RFP by meeting the design standards, and minimizing impacts to the traveling public, environment, and NSR. Our goal is to complete the Project on time with innovative design and construction solutions.

The English Team recognizes the importance of communication with the Project stakeholders to address key issues early in design and complete construction per the approved schedule. We will be proactive in coordinating with VDOT, all utility companies, environmental agencies, and NSR to address design and field construction issues.

- **Scope** – Meets/exceeds requirements and scope
 - Obtains bridge clearances over Route 11 and NSR without reconstructing Route 11
 - Stopping sight distance for I-81 NBL meets 75 mph design speed and is improved over concept alignment
- **Safety** – Improves public safety in final configuration and during construction
 - Geometrics provided for 75 mph design speed along I-81
 - Eliminating Route 11 reconstruction, which improves safety by eliminating the need for one-way MOT
 - We are proposing the use of 12' temporary lanes for I-81 to better accommodate the high volumes of truck traffic for MOT phasing
 - Shifting I-81 15' will reduce MOT phasing for I-81 as the NBL is constructed in a single phase
- **Impacts** – Minimizes construction impacts
 - MOT phase is simplified with the 15' alignment shift as the permanent roadway can be constructed in each phase minimizing the final pavement adjustments for the lanes shifts in the final stage. Improvements over concept alignment with the permanent placement of the roadway median barrier/drainage constructed in Phase II
- **Community Acceptance** – Improves citizen perception of Project
 - Reduced MOT phasing and impacts on Route 11
 - 12' lanes on I-81 during all MOT phases
 - Reduced MOT phasing with alignment shift on I-81
- **Durability** – Improves long-term performance and durability
 - Main line pavement of I-81 reconstructed with new pavement section
 - Guardrail and end treatments updated within limits of work
 - Only one side of I-81 will require ROW for future widening
 - Drainage upgrades for culverts and replacement of deficient culverts

Design Approach

Our design has been based upon providing all aspects of work meeting the RFP requirements, addressing safety, and avoiding unnecessary impacts for the traveling public and providing a durable Project.

- **Scope enhancements** are achieved with our revised maintenance of traffic (MOT) phasing to reduce the number of major construction phases from four to three. Our plan is to shift the I-81 southbound lanes (SBL) alignment 15' east and build the NBL roadway and median barrier in the first two phases

eliminating the fourth phase of construction to build the median barrier in its ultimate location. We are also proposing to eliminate undercutting Route 11 by revising the I-81 typical for a 2% constant cross slope (instead of crowning) in the direction of the Route 11 profile to meet the required clearances and avoid the MOT and reconstruction of Route 11 while minimizing utility conflicts. Maintaining a constant 2% slope on the new bridge forces the vertical clearance constraint to the NSR.

- **Mainline I-81 bridge typical** is revised for a constant 2% cross slope above Route 11 to minimize the increase in profile grade for I-81 and avoiding the need to lower Route 11 profile to meet the 16'- 6" minimum clearance requirement and 23' for the NSR tracks. See Figure 6 on page 11 for the transverse section.
- **MOT concept** is revised to eliminate a phase of construction by shifting the centerline 15' east to align with the first phase concrete barrier, building the NBL in its final condition and in a single phase, with the southbound widening completed in the final stage. See phasing comparison in Volume II.
- **Route 11 reconstruction** is avoided with our design concept by balancing of the bridge superstructure depth, raising the profile alignment of I-81, and reverse crowning the bridge typical section to match the Route 11 profile.
- **Utility line relocations** are minimized on Route 11 with the elimination of the reconstruction work on Route 11. Of the three identified utilities, the sanitary force main and telephone fiber optic lines are no longer impacted. Only the waterline is impacted by bridge pier construction; relocation of the line provides a new line in the area of the bridge and removes the County's fears of construction vibrations near the old, 1983 line.
- **Roadway alignment optimization** focused on improving MOT phasing, balancing the I-81 profile to provide the clearances over Route 11 and NSR tracks and eliminating the reconstruction work for Route 11. Based upon the combination of our improvements, the roadway construction time frames are reduced with less impacts to the community with reduced utility relocations and traffic delay along Route 11.
- **Safety enhancements** are provided by eliminating the reconstruction of Route 11 and the associated MOT phasing. Maintaining traffic during construction presented challenges since Route 11 is constrained with the existing I-81 bridge abutment and piers to allow for an adequate traffic shift for lane closure to lower the roadway. Our design eliminates the need for a temporary one-way signal on Route 11, which eliminates traffic delays and results in a safer Project. Traffic on I-81 will benefit with the elimination of a major construction stage, (median barrier construction) as the barrier will be built in stage one in its permanent location protecting both north and south bound traffic.
- **Impact minimization includes** eliminating reconstruction work on Route 11, utility relocations and reduced bridge construction phasing.
- **Community acceptance benefits** are obtained with the elimination of the reconstruction work for Route 11. The proposed MOT phasing to lower Route 11 would have required temporary signals for a one way lane closure to lower Route 11. Our proposed concept provides the required clearances with minor geometric changes to I-81 and avoids reconstruction of Route 11.
- **Durability includes** reducing maintenance with cost effective design for reduced I-81 bridge structure size and eliminating Route 11 realignment. The bridge design will accommodate the third lane widening of I-81 while meeting the required clearances of Route 11 and NSR.

Figure 3 on page 8 summarizes how the roadway design was developed to meet or exceed the RFP requirements in the following key areas:

- ❖ **Scope** – Meets/exceeds requirements and scope
- ❖ **Safety** – Improves public safety in final configuration and during construction
- ❖ **Impacts** – Minimizes construction impacts
- ❖ **Public Acceptance** – Improves public acceptance of final configuration
- ❖ **Durability** – Improves long-term performance and durability; reduces future inspection/maintenance

Figure 3 // Improvements on English Proposed Roadways over RFP Concept Design

Improvement	Area Exceeded	Benefit to End Users
Avoidance of Route 11 Reconstruction	Scope	Eliminates reconstruction of Route 11 and Flowing Springs Road intersection, as well as the associated utility relocations
	Safety	Eliminates temporary traffic controls for Route 11 and final stage of MOT for I-81
	Impacts	No additional design exceptions per RFP
	Acceptance	Minimizes lane closures and delays on Route 11 and Flowing Springs Road
	Durability	Maintains existing roadway pavement with minor shoulder improvement and improved drainage
Alignment Shift for I-81	Scope	Eliminates a stage of MOT for median barrier construction
	Safety	Northbound traffic is separated from southbound with the permanent barrier
	Impacts	Minor widening on northbound embankment for alignment shift
	Acceptance	Driver comfort increased with less traffic shifts as northbound moves to final location in Phase II bridge construction. Additional lane width in all construction phases with 12' useable lanes, instead of 11' restricted lanes
	Durability	New pavement construction for raised profile with lane marking in ultimate locations. Alignment shift reduces future I-81 southbound rock cut
Utility Relocations	Scope	Minimal relocations with just the relocation of approximately 170' of 8" waterline due to bridge pier construction
	Impacts	Eliminates reconstruction for fiber optic and water lines associated with Route 11 reconstruction
	Acceptance	Maintains service without significant disruption
Reduced Maintenance of Traffic	Scope	Eliminated one lane MOT for Route 11 reconstruction
	Impacts	Reduction of a major MOT phase on I-81
	Acceptance	Eliminated community delays for Route 11 and Flowing Springs intersection reconstruction
I-81 Bridge Typical for 2%	Scope	Parallels Route 11 profile to meet 16'-6" clearance for Route 11 and 23'-0" for NSR
	Impacts	Reduces impact to Route 11
	Acceptance	Less impacts to locals traveling Route 11
	Durability	Reduced phasing with barrier and scuppers constructed in initial phase

Design Criteria

Based on our review of the RFP and supporting documents as well as meetings with VDOT, we understand that the design requirements will be in accordance with VDOT 2005 Road Design Manual (rev July 2018), VDOT 2012 CADD Manual (rev April 2016), VDOT Road and Bridge Standards Vol 1 and 2 (2016) latest version, AASHTO 2011 Green Book (latest Revision), AASHTO Roadside Design Guide fourth edition October 2011 (updated chapter 6) and supporting manuals, standards, specifications, and special provisions for survey, traffic, drainage, landscaping, erosion control and SWM. The design will also follow the approved environmental compliance requirements set forth in the approved categorical exclusion, dated July 19, 2018 and the supporting documents for the re-evaluation to mitigate impacts, prepare final permits and comply with the agency requirements.

The conceptual roadway design was developed in accordance with the Design Criteria Table identified in the RFP Attachment 2.2 including requirements for geometric design, traffic capacity, lane and shoulder widths, and overall roadside grading. The limits of construction and all stormwater management facilities are within the RFP right-of-way limits. ***The following design requirements were exceeded and are in accordance with Attachment 2.2:***

- For Route 11, our bridge layout provides 30 additional feet of stopping sight distance as compared to

the conceptual plans.

- For I-81, the conceptual plans did not provide stopping sight distance for 75 mph, and our proposed design meets the 75 mph stopping sight distance requirement.
- I-81 is frequented by heavy trucks, and our design is providing 12' temporary lanes, which will result in a much safer work zone.
- With truck volume of 900 DDHV (exceeding 250 DDHV per GS-1), we are using 12' in lieu of 10' outside paved shoulders.

General Geometry and Roadway Alignments

KCI is proposing to shift the center line alignment of I-81 15' east to improve the traffic control design staging by constructing the median barrier in the first phase. Since the bridge is on a tangent section, we also proposed to revise the bridge cross slope to drain towards the median with a 2% cross slope, parallel the Route 11 profile and improve the vertical clearance to 16'-6" without lowering the roadway underpass.

Figure 4 // Horizontal Roadway Design Summary

Horizontal Geometry				Vertical Geometry				
Curve Name	Radius	Design Speed (mph)	E (%)	Vertical Curve	Design Speed (mph)	Curvature (K) Crest/sag	SSD	Grades
I-81 NB-1	4000'	75	5.6%	I-81	75	312/206 Min.	820'	6% Max.
I-81 NB-2	2900'	75	7.2%	I-81 SB	75	780	>820'	-0.62% *1.56%
I-81 SB-1	3200'	75	6.7 %	I-81 NB	75	1000	>820'	-0.32% +1.41%
I-81 SB-2	3700'	75	6.0%	Route 11	60	151/136 Min.		8% Max.
Route 11	1146'	60	8.0%	Route 11	60	No change		+2.0%

Typical Sections

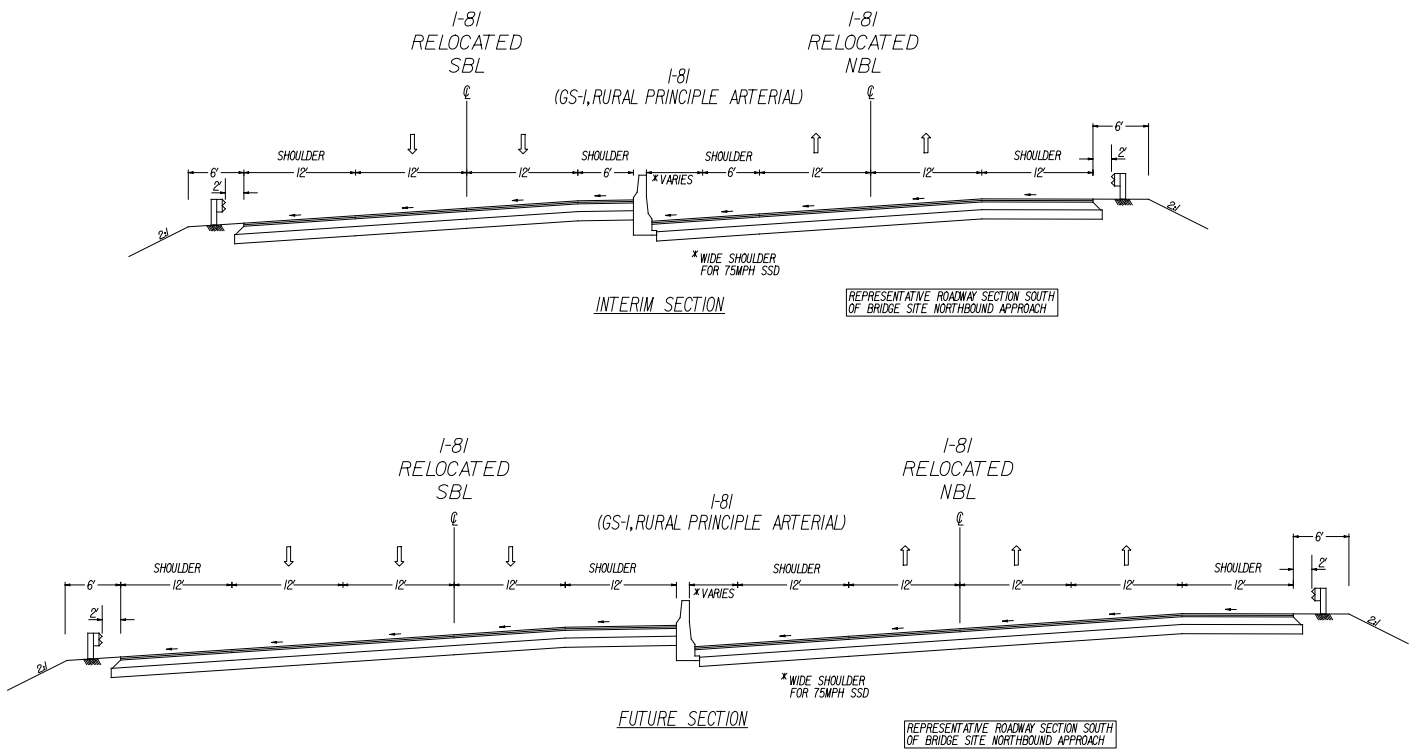
The proposed typical sections meet the RFP requirements for the mainline and Route 11 with the following improvements:

- An adjustment to the typical section for the mainline with a shift 15' east to accommodate MOT and construction of the median barrier with the first phase of bridge construction.
- Complying with the median width for a single bridge with 6' inside shoulders.
- Eliminating a major phase of MOT/construction of the median barrier in its permanent location and removing temporary barrier.
- Construction the I-81 bridge with a 2% cross slope parallel to Route 11 grade eliminating the need to lower Route 11 for existing and future 16'-6" bridge clearances.
- Verification that the future I-81 outside widening of the bridge for the third lane will provide the required 16'-6" roadway and 23' railroad clearances.
- The design minimizes the I-81 mainline and shoulder pavement reconstruction width as each phase of the roadway is shifted to maintain traffic.

Future Widening by Others – The proposed mainline I-81 typical section at the bridge (Figure 5 on page 10) allows for future third lane widening to the outside for each direction. The future widening will maintain the 23' minimum clearance over the NSR and maintain a minimum of 16'-6" over existing Route 11. The proposed I-81 typical section for future construction will include 12' inside and outside shoulders.

Shoulder Widening - The alignment shift will require minor outside widening of the NBL along the embankment with sliver fills. The toes of slopes are within the existing ROW with minor adjustment to drainage ditches and pipe extensions. Retaining walls will be used to stabilize the slopes and reduce impacts of sliver fills; details will be developed in the final geotechnical analysis.

Figure 5 // Typical Sections - Interim and Future Widening at the Bridge Approach



Right of Way

The proposed I-81 bridge replacement design will not require any additional ROW or temporary construction easement for I-81 and Route 11 impacts.

Proposed Utility Impacts

The proposed design eliminates the lowering of Route 11 to meet the roadway clearance requirements. Three utilities are identified within the shoulders of Route 11 which required an analysis for avoidance or relocations, as identified in our utility impacts table, Figure 9 on page 16. Please see the utility narrative in section 4.4.2. These utility impacts can also be found in our Volume II plans.

4.3.2. CONCEPTUAL STRUCTURAL PLANS //

Commitments and Deliverables of the English Team

Based on our review of the RFP and supporting documents, as well as meetings with VDOT, we understand that the loading requirements will be calculated in accordance with the 7th edition of the AASHTO LRFD Bridge Design and Specifications, and additional loads accounting for future wearing surface and construction tolerances will be considered, in accordance with VDOT I&IM S&B-80.5. Design procedures and details will meet or exceed those provided in the Structure and Bridge Manual Volume V.

Highlights of sections that are specific to this structure:

- Typical Section – Part 2, File No. 06.02-1
- Beam Spacing and Overhangs – Part 2, File No. 11.02-2
- Abutment Type – Part 2, File No. 17.01-12&16
- Abutments/ Use of MSE Walls – Part 2, File No. 17.01-7
- Bridge Length – Part 2, File Nos. 06.02-1 (horizontal clearance), 17.01-7 (pile offset), 15.06-3 (barrier offset/clear zone), 17.01-12 (abut. type limitations)

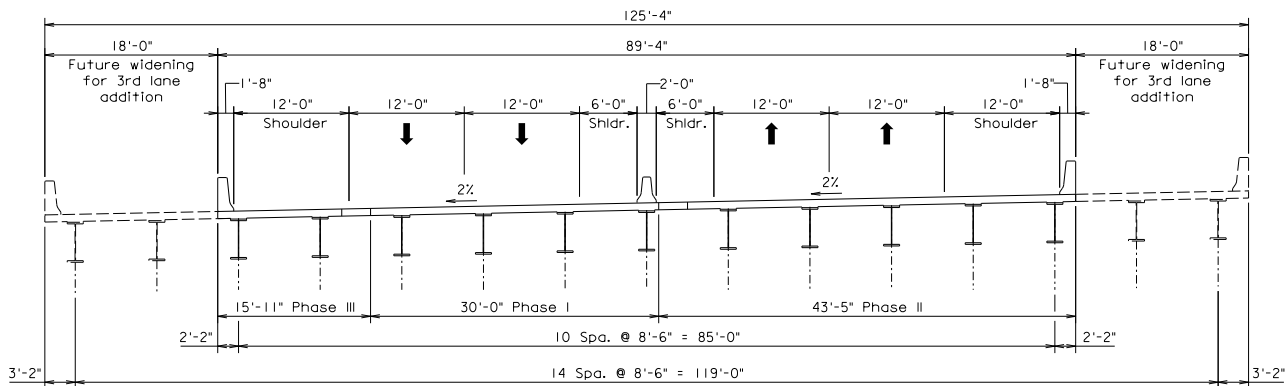
Concept for Bridge over US Route 11, NSR and North Middle Holston River

During the RFP phase, the English Team evaluated bridge alternatives that exceeded the scope and requirements provided by VDOT with regard to safety, risk to the schedule or constructability of the Project, impacts to the traveling public, expandability of the typical section, cost, and long-term maintenance. The Team concluded that a three span continuous steel structure on cantilever abutments with deck slab extensions on steel H-piles and multicolumn piers supported by spread footings (or predrilled steel H-piles, as required) would best showcase the qualities and efficiencies desired by VDOT with the least amount of future maintenance.

Superstructure

The bridge transverse section will be 89'-4" wide with eleven 46" (+/-) weathering steel girders spaced at 8'-6" with 2'-2" overhangs. The girders will be haunched to 39" (+/-) in Span A to facilitate clearance requirements and eliminate impacts to Route 11. This section accommodates the two 12'-lanes in both northbound and southbound directions. Our proposed bridge will be three span continuous in full 2% superelevation up to the right to match the 1.9% (+/-) grade of Route 11. The bridge will be constructed on a skew; Span A and Span B will be on a 43 degree skew with bearing to bearing lengths of 119'-0" and 140'-0", respectively, while Span C will be trapezoidal (43 degree skew at Pier 2 and 30 degree skew at Abutment B) with bearing to bearing lengths ranging from 132'-10" to 102'-6". The bridge deck will be 8.5" thick and constructed with a constant cross slope to accelerate construction, improve quality, and simplify future widening. The constant cross slope will allow for simplified screed operations, which will produce a better riding surface, and allow for future widening to occur to either side without impacting vertical clearances of the railroad or Route 11. Future widening can be easily accommodated with two additional girders on each side of the bridge at the same 8'-6" spacing; the new overhang would increase from the 2'-2" to a reasonable 3'-2". See Figure 6. The bridge will have a closed drainage system to remove runoff from the deck.

Figure 6 // Bridge Transverse Section of I-81



Substructure

Per the Chapter 17 abutment selection algorithm of the Structure and Bridge Manual, the structure will be jointless and use a proven abutment, the cantilever abutment with deck slab extensions. Per Volume V, Part 2, File 17.02-12, this selection is based off of the bridge being steel with a length of less than 450' and a skew greater than 30 degrees but less than 45 degrees. The approaches will be supported by buried approach slabs. The abutments will be constructed on MSE wall structures designed to accommodate extra lanes in each direction on I-81. Piles will be predrilled. The Team has reviewed the limits of the walls to mitigate the risk of conflict with MOT requirements and has determined that the MOT can be accommodated with the walls fully constructed in the first stage of construction. Piers will be multi-column and will likely have spread footing foundations. Final geotechnical analysis following additional drilling and geophysical testing will confirm this selection; concerns discovered through additional investigation will be addressed with remediation and/or the use of pre-drilled piles.

Hydrology & Hydraulic Analysis and Scour Calculations

The English Team will perform a detailed hydrologic and hydraulic analysis (H&HA) and calculate the scour at the substructure units of the proposed bridges over Middle Fork Holston River. H&HA and scour calculations will be in accordance with VDOT Drainage Manual and FEMA requirements for bridge replacements over streams with designated floodplain (AE Zone) and floodway. Our hydraulics engineers will obtain a copy of available existing hydraulic models from FEMA and/or develop a HEC-RAS 5.0.6 hydraulic model using field survey data and calibrated it to FEMA's existing flood elevations (Modified Existing Model). We will develop a Proposed Condition hydraulic model to ensure zero increase in the existing flood elevations and will calculate the 100-, and 500-year scour depths at the proposed substructure units using HEC-18, (FHWA) procedures and equations for long term, contraction, and local scour. For spread footing on rock layer, we will utilize the specialized scour equations for scour in rock formation (HEC-18, Chapters 2 and 4) utilizing the RQD, erodibility index, and stream power. The English Team will submit a detailed hydraulic report including scour calculations, design scour countermeasures (as needed), electronic copies of the hydraulic models, and completed LD-293. Finally, a post-construction hydraulic model utilizing post-construction field and replacement bridges data will be performed to ensure compliance with VDOT requirements for Design/Build projects.

Added Value (Ready for Widening)

The Team will apply its experience in the construction and widening of structures to develop details that are not only more constructible today but also make future widening easier. Examples of this include:

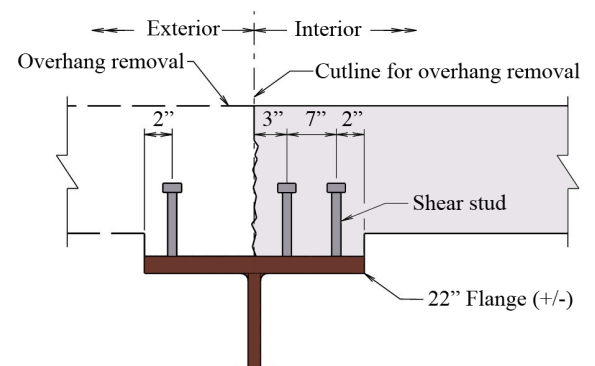
- Spacing shear studs to allow for easier cutting and removal of the overhang (without center stud interference). See Figure 7.
- Spacing piles so the spacing can be repeated in the widening.
- Spacing the girders with small overhangs to easily accommodate widening of 18' (12' lane and 6' additional median = 8.5' space x two bays + 1' of additional overhang).
- Detailing rebar to allow easy lapping of new bars for widening.

Summary

The structure concepts presented meet or exceed the requirements of the RFP in the following key areas:

- ❖ **Scope** – Meets/exceeds requirements and scope
- ❖ **Safety** – Improves public safety in final configuration and during construction
- ❖ **Impacts** – Minimizes construction impacts or compresses schedule
- ❖ **Public Acceptance** – Improves public acceptance of final configuration
- ❖ **Durability** – Improves long-term performance and durability; reduces future inspection/maintenance/costs

Figure 7 // Exterior Girder Shear Stud Spacing



The following table outlines how our ideas and thoughtful consideration of materials, methods, and functionality in developing the proposed structure both address the key areas listed above and exceed the design/requirements in the RFP.

Figure 8 // Improvements on English Proposed Structure over RFP Concept Design

Improvement	Area Exceeded	Benefit to End Users
Shifted I-81/ Median Barrier to Right of First Construction Stage	Safety	Fewer construction phases and traffic shifts equals shorter duration of construction. No median construction in final phase to install barrier on bridge. Fewer traffic shifts results in less motorist confusion.
	Impacts	Decreases construction time and maximizes use of ROW.
	Acceptance	Fewer construction phases and traffic shifts result in less motorist confusion.
	Durability	Fewer construction phases result in less temporary and/or partial construction and better quality.
Increased Horiz. Clearance Between Route 11 and First Pier	Scope	Providing greater clearance underneath structure for Route 11.
	Safety	Immovable objects further from outside of curve.
	Impacts	Less impacts to Route 11. Shortens construction schedule by eliminating need for pier protection.
	Acceptance	Improved visual with open views to river and railroad, decreases tunnel appearance of having two pier protection systems on either side of Route 11.
Decreased Bridge Length (394' to 381')	Impacts	Shortens construction schedule. Change in skews decreases likelihood of piers entering NSR's ROW or envelopes in future widening.
	Acceptance	Substructures at different skews give the appearance of matching the environment.
	Durability	Less bridge to maintain.
Deck Slab Extensions (Instead of Semi-integral)	Impacts	Shortens construction schedule with elimination of integral backwall.
	Acceptance	More visually appealing than a semi-integral abutment (buried approach slabs).
	Durability	No joints at sleeper pad. Easier for maintenance to repave up to bridge. Staging approach slabs and sleeper pads at surface results in construction joints that may lead to premature cracking/spalling.
Spaced Girders at 8.5'	Impacts	Allows for shallower girders, less work zone, and limits or eliminates impacts to Route 11.
	Acceptance	Visually "cleaner" looking from below when widened in the future.
	Durability	Simplifies addition of future lanes. Same future girder spacing decreases complications for future maintenance.
Rearranged Shear Studs – Widening Ready	Scope	Innovative idea – Space shear studs to allow future centerline cut for widening. Improvement to standard spacing.
	Impacts	Saves future construction time when widened.
	Durability	Simplifies future widening by allowing deck to be cut at girder center

4.4 PROJECT APPROACH

4.4 PROJECT APPROACH

4.4.1 ENVIRONMENTAL MANAGEMENT //

Commitments and Deliverables of the English Team

Our Team’s approach to environmental management begins during the proposal phase, and continues with consistent environmental staff oversight throughout design and construction. This process ensures continuity and a coordinated understanding of environmental concerns, potential impacts, and mitigation possibilities. Our Team has used this approach on our design build projects, enabling us to quickly obtain environmental permits and communicate any requirements effectively without delaying construction progress.

Design Phase

Prior to the development of design plans and detailed engineering, our Team will work together with VDOT to identify permits which are needed for the Project. The list of potential permits is developed based on review of the contract documents, environmental database searches, and based on field visits to the Project site.

For this Project, we have already identified several permits which we anticipate are necessary, and the appropriate schedules to obtain those permits is reflected in our Proposal Schedule. The starting dates for each anticipated permit is also tied to the appropriate timeline in the development of the design plans, ensuring that enough detail for grading, drainage, temporary construction access, and utility relocations are available to ensure limits of permits are adequate for completion of the Project. Critical areas, sensitive properties and protected species identified on this Project include:

- Middle Fork of the Holston River
- Tan Riffleshell, Tennessee Heelsplitter or any other mussel species
- Northern Long-Eared Bat , Indiana Bat, Gray Bat, Little Brown Bat and Tri-colored Bat

Following a thorough National Environmental Policy Act (NEPA) review, VDOT approved a Categorical Exclusion for the proposed activity on July 19, 2018. Permits necessary for this Project include:

- U.S. Army Corps of Engineers Nationwide Permit 23- Approved Categorical Exclusions, Pre-Construction Notification via the Joint Permit Application process
- Virginia Department of Environmental Quality General VPDES Permit for Discharges of Stormwater from Construction Activities

Additionally, the Project area lies within the range of federal and state protected bats. The construction activities will observe a time of year restriction (TOYR) for tree removal of April 15th through September 15th of any year. The Virginia Department of Game and Inland Fisheries (DGIF) requested a TOYR for instream work of March 15 - May 15 of any year to protect rainbow trout which will be observed.

During the design phase, the design engineers, construction personnel, environmental staff, as well as any other key staff necessary will participate in regular design and constructability reviews to analyze all environmentally sensitive areas within and adjacent to the Project. This allows the Team to understand the actual impacts of the Project and all requirements associated with those impacts to include schedule constraints as well as operational constraints. The sensitive areas adjacent to the Project will be reviewed to insure that impact to those areas is avoided and the proper controls are included in the design to control any construction activities that may have an impact on those areas. A stormwater pollution prevention plan will be developed for the Project in compliance with the permit to protect water quality throughout the duration of site activities.

Noise Analysis

The design Team has reviewed the site and location of the adjacent homes to I-81 that may be impacted with noise from the 15' shift east for northbound roadway. We identified 8 homes east of I-81 along Churchland Drive with distances from I-81 (measured from Google earth) as shown in the list below:

- The closest home is located 320' south of the bridge and is 116' +/- from I-81 with traffic approximately 10' closer.
- The next home is located 100' south of the bridge and is 227' +/- from I-81 with traffic 15' closer.
- The next home is located 50' south of the bridge and is 421' +/- from I-81 with traffic 15' closer.
- The next home is located in the center of the bridge and is 486' +/- from I-81 with traffic 15' closer.
- The last home is located at the north end of the bridge and is 545' +/- from I-81 with traffic 15' closer.

The Project does not increase capacity along I-81, negating the need for a noise analysis, but we are proposing an easterly shift of the I-81 alignment at the bridge. We recognize there may be concerns of higher noise levels reaching these homes; however, we do not believe a noise study is required as the mitigating factors include rolling topography, existing NSR and the distances are on average 300' from the interstate. The proposed alignment shift is basically the width of a lane with the resulting difference in noise levels small enough to not warrant a noise study; however, we will update the noise study if required.

Construction Phase

After the plans are complete and approved, the construction Team will take over responsibility for avoidance, minimization, and mitigation. The design and environmental staff will actively coordinate on inspections and compliance reviews with the construction Team during the Project's construction.

Prior to the beginning of construction in any area, all environmentally sensitive areas will be discussed with and identified for all field personnel. Additional areas of concern and constraint will be identified in the field with a perimeter of safety fence and signage as necessary; examples will include areas of TOYR restrictions, etc. The Team will continue to monitor and improve the plans in actual field conditions to ensure that all avoidance measures implemented as outlined in the Project plans and modified based on field conditions are performing as necessary. During the preconstruction meetings, field personnel will be made aware of all requirements associated with working in and around the Middle Fork of the Holston River.

At the initiation of construction, all erosion and sediment control measures will be installed in accordance with the approved plans and all environmental monitoring will commence in accordance with applicable permits, standards, and specifications. Also, in addition to initial field implementation of plan measures for avoidance and treatment, all measures will be reviewed to ensure not only proper installation and maintenance, but also to identify additional measures that should be installed to guarantee avoidance, minimization, and mitigation throughout the life of the Project.

Environmental Scheduling

As shown in our Project Schedule included in Section 4.6 of this Technical Proposal we have included reasonable anticipated time for activities associated with all permits needed. Our Baseline Project Schedule, that will be submitted after award will include activities for all permit submittals, reviews, and approvals. It will also include activities for all mitigation necessary to be in compliance with permit requirements. The schedule will also include any agency reviews required that are not part of any permit. All of our work plan submissions, reviews, and approvals will be included in our Baseline Project Schedule, including a detailed all-inclusive list of activities required will allow us to track all environmental requirements to manage and minimize these risks throughout the Project and identify when additional actions or adjustments will be needed to mitigate any potential delays to the overall completion of the Project.

4.4.2 UTILITIES //

Commitments and Deliverables of the English Team

The English Team is committed to reducing the potential schedule risk associated with utility relocations by avoiding and mitigating utility impacts to the greatest extent feasible for the Project. The successful avoidance measures already implemented by our Team and additional strategies to continue to avoid and expedite unavoidable utility relocations include:

- Continuing early coordination efforts from the SOQ phase into this proposal phase to verify planned utility mitigation strategies.
- Confirming avoidance of potential utility impacts identified for the Project.
- Continuing to track and implement avoidance strategies for potential conflicts that remain pending confirmation of exact depths and locations.
- Utilizing in-house utility test pitting and designation crews to expedite resolution of potential conflicts and any unknown utilities encountered during construction;
- Assisting utility companies with relocations (preliminary alignments, preparation of UT-9s and P&E packages, construction stakeout, and MOT).

Our Team initiated utility coordination efforts as we developed our proposed design. Our design impacts the existing 8" ductile iron (DI) transmission water main, as we are proposing three spans in the new bridge; with the Pier 1 adjacent to the waterline. We contacted Scott Simpson, PE, Smyth County Engineer for the Water and Sewer Department, presented a relocation concept, and received approval from the County (Mr. Simpson). Once notice to proceed (NTP) has been received, our design Team will develop design plans following Smyth County Water and Wastewater Specifications and Standard Details (2011) and VDOT's Utility Manual of Instructions Policies and Procedures (2016). The proposed water main relocation consists of approximately 170' of 8" DI pipe for the purposes of constructing Pier 1. The relocation provided extra room for trenching and provides the County with a new water line in the vicinity of the bridge construction. Mr. Simpson was pleased that the line was being replaced around the bridge as the County was concerned about vibrations and construction impacts to the existing 35 year old water line. All other utilities in the corridor have been avoided.

Figure 9 // Utility Impacts

Company	Type	Contacted	Impact	Notes
Smyth County Water and Sewer Department	Water	✓	Minimized	Relocation design has been coordinated with County Engineer. Relocation of ~170' of 8" DI pipe will be part of the Project for pier construction
Sunset-Fiber	Fiber Optic	✓	Eliminated	No conflict due to elimination of Route 11 reconstruction
Smyth County Water and Sewer Department	Sewer	✓	Eliminated	No conflict due to elimination of Route 11 reconstruction
Appalachian Power Company	Electric	✓	Avoided	No facilities within the Project area
CenturyLink	Telephone	✓	Eliminated	No anticipated conflict due to elimination of Route 11 reconstruction; no conflict based on information provided in RFP
Comcast Communications	Cable TV	✓	Avoided	No facilities within the Project area
ATMOS Energy Corporation	Natural Gas	✓	Avoided	No facilities within the Project area

4.4.3 GEOTECHNICAL //

Commitments and Deliverables of the English Team

The English Team will identify, evaluate, and mitigate the geotechnical risks by proactively establishing recommendations that fit the overall Project schedule and effectively implement design concepts during construction. Our implementation of the geotechnical mitigation strategies, which began during the proposal design development, will continue during final design and construction including the performance of supplemental exploration and testing to further evaluate the extent of unsuitable soils and low recovery seams within the rock profile; additional investigations will be used to further evaluate slopes, foundations, and MSE wall areas.

Geotechnical Approach

Based on review of Geologic, as well as topographic, mapping for the site area, the provided historical as-built (circa 1959) original test boring and foundation bottom/tip data, and our geotechnical experience with sites in similar settings, the potential to encounter karst subsurface conditions is a risk that we intend to address. The Project lies within the Valley and Ridge Physiographic province of Southwest Virginia and is underlain by the Rome Formation. The bedrock layers have varying degrees of susceptibility to weathering that result in seams of soil-like material sandwiched between more weather resistant rock. Specifically, carbonate rocks are susceptible to dissolution in the presence of acidic groundwater. The English Team knows that continued subsurface dissolution of the carbonate bedrock leads to a moderately to highly irregular rock profile (sometimes near-vertically oriented) that includes potential voids and/or discontinuities (open or soil-filled) within the underlying bedrock as well as very soft, wet, and highly plastic soil immediately above the bedrock surface. Additionally, the review of Virginia Geologic Map data downloaded to Google Earth indicates four mapped faults within 1.5 miles of the site.

Geotechnical Exploration

The English Team has reviewed the VDOT-provided geotechnical documents including the Geotechnical Data Report (GDR) prepared by ECS Mid-Atlantic, LLC dated August 10, 2018, as well as the three GDR Addenda dated September 24, September 28, and November 30, 2018. A total of 46 Standard Penetration Test (SPT) soil borings were completed for the GDR. At this time, it appears that about 50% of the geotechnical boring coverage required to meet the minimum requirements in the Chapter III of VDOT's Manual of Instructions (MOI) has been accomplished. Additional borings will be performed to meet or exceed the minimum requirements of the MOI including borings at proposed new slopes and MSE wall areas for which there is currently limited or no subsurface information as well as for foundation elements where additional coverage is needed.

The English Team is prepared to expedite the supplemental exploration using our Team's in-house drilling rigs. Our geotechnical Team owns its own fleet of a dozen drilling rigs (three of which are housed on the I-81 corridor in Roanoke). We have identified concerns with unsuitable soils, rock conditions, slopes and walls in this proposal based on our review and evaluation of the provided available data. We will conduct further site reconnaissance and confirm the pre-identified geotechnical risks promptly following NTP. We will expedite the additional geotechnical exploration with our drilling rigs garaged in Roanoke to obtain prompt results for incorporation into the design of the bridge foundations, MSE walls, slopes, and pavements.

The geotechnical exploration program will be tailored to address geotechnical issues relative to the proposed design. To further evaluate the known karst conditions at the site, especially with respect to proposed foundations, we plan to employ a more versatile drilling technique using larger diameter HQ drilling rods to core through and sample rock and intermittently revert to soil sampling with N-values to better characterize the material noted in the GDR as 0% recovery. A final subsurface exploration and geotechnical engineering program will be developed to supplement data from the Project GDR, and the three addenda, to provide an overall exploration program that

meets and exceeds the minimum requirements of two standard penetration test (SPT) borings per substructure unit, as outlined in VDOT's Manual of Instructions (Chapter III). Considering the geologic conditions underlying the Project site, the final subsurface exploration may also utilize geophysical testing to further evaluate the presence of karst features below planned structure components.

More specifically, the final subsurface exploration may incorporate geophysical surveys such as Electrical Resistivity (ER), Refraction Microtremor (ReMi) and/or Multi-Channel Analysis of Seismic Waves (MASW) that will portray continuous cross-sectional images of the subsurface conditions at selected transect lines. When utilized in conjunction with additional SPT proof borings, electrical resistivity and seismic refraction can reveal the top of a highly irregular bedrock surface, as well as soil-filled or air-filled voids below the bedrock surface. This will be valuable in determining whether shallow foundations are a viable option at the piers and what ground improvements may be necessary. As appropriate, this higher level of subsurface exploration can also be extended to areas of mechanically stabilized earth (MSE) walls. The seismic refraction survey (ReMi and/or MASW) will be in addition to a thorough desk review of geologic references in the vicinity of the site to evaluate the effects of the previously mentioned four faults identified within 1.5 miles of the site.

All additional exploration, analysis, and testing will be performed in support of the required final design level Geotechnical Engineering Report (GER). Testing of collected soils will be predominantly performed in our Roanoke AMRL Certified Laboratory, or at other AMRL Certified Laboratories to expedite the completion of the GER.

Geotechnical Design and Analysis

The design and analysis of the geotechnical features will be in accordance with AASHTO LRFD Bridge Design and VDOT's MOI. Laboratory testing, including testing of Shelby tube samples of the in-situ soils, as well as the subsequent selection of accurate engineering parameters will aid in refining the geotechnical analyses that have already been conducted. The geotechnical risk factors that have been identified for evaluation are the presence of moisture sensitive soils at the site and the karst geology with possible voids or soil seams encountered in the bedrock underlying the site.

In addition to the supplemental conventional SPT drilling, sampling, and standard soil index tests; we will augment the MOI compliant exploration with in-situ study as needed with Dilatometer Testing (DMT) or Pressuremeter Testing (PMT). Shelby tube sampling will also be conducted so that triaxial shear testing can be performed, as appropriate, on undisturbed samples. The in-situ test results as well as laboratory shear strength test results will be used to develop the engineering parameters for the various soil strata. The sampling and testing will be scheduled to expedite obtaining the parameters that are critical in confirming our preliminary evaluations of settlement magnitudes, supporting the global stability analyses, and supporting the bridge abutments and pier foundations as well as retaining wall design. We will provide final geotechnical recommendations for the design and construction of the bridge foundations, retaining walls, slopes, roadway embankments and subgrade, pavements, and SWM facilities.

Anticipated Foundation Systems and Construction Methods

Based on our review of current data and existing bridge foundations, it is expected that abutment support with pre-drilled and grouted (where necessary) steel H-piles will be appropriate for this Project. Pre-drilling will limit skewing of piles during installation.

Shallow foundation systems appear to be viable for the interior piers and will be thoroughly considered during the design phase. This is generally supported by existing geotechnical information and further confirmed by the performance of the existing 50-year-old pier foundations. If deemed necessary for support of the interior piers or for void remediation, pre-drilled steel H-piles may also be considered.

During construction of any shallow foundations, further field verification of the rock bearing conditions directly beneath each element can be facilitated through the inclusion of a probe hole program. The purpose of the probe hole program would be to evaluate the presence of voids or soil-filled seams directly below the bottom elevation of each foundation element. Should voids or soil filled seams be encountered in the probe holes or the bearing surface,

the lead project geotechnical engineer may require dental-like repairs where appropriate or further embedment of the foundation element. For deep H-pile foundations, pre-drilling of the pile hole to suitable bearing materials may be used to limit skewing of piles during installation.

To ensure that all geotechnical design recommendations are implemented during construction, the English Team will increase geotechnical representation onsite during critical earthwork and foundation operations and maintain thorough QC documentation throughout these operations. Steve Hjelle, PE, and trained members of his geotechnical design Team will be intimately involved during construction. The success of the design is enhanced with the importance our Team places on communication between the geotechnical engineer, construction staff, and the QC inspectors. The geotechnical representatives will be onsite during the critical earthwork and foundation operations.

Geotechnical Risks and Challenges

The geotechnical risks have been identified and evaluated based on the existing Project information provided by VDOT, our understanding of the Project's geologic setting, and the Team's experience in the area. The mitigation strategies our Team will implement will provide and deliver a high-quality Project with an expedited timeframe.

Moisture Sensitive Soils

The English Team has used the Project information provided by VDOT to evaluate the proposed subgrade soils. There are areas through the Project corridor where shallow, moisture sensitive, moderate to highly plastic, fine-grained soils are present. Based on our Team's evaluation using the currently available geotechnical information it is estimated that up to approximately 50% of the site is host to high plasticity, high moisture, and/ or soft soils. Many of these areas will require remediation because the soils may be deemed unsuitable for pavement subgrade. Due to their moisture sensitivity, if these subgrade soils are exposed to precipitation and allowed to become excessively wet, the time it can take to scarify and dry them to a workable moisture content can have an impact on the duration of construction activities. Mitigation techniques include diverting water away from these construction areas and rolling/sealing sensitive soils that are exposed prior to an imminent rainfall.

Karst

As discussed previously, the site is located within a geologic province known for karst subsurface conditions. The karst geology will mostly affect the foundations of the bridge, but can also affect MSE walls, slopes and general site activities. We will perform additional field exploration techniques (including HQ rock coring with intermittent split-spoon soil sampling and/or geophysical surveys, where appropriate) to more fully evaluate the potential impacts of the karst geology to the Project.

External/Global Stability of MSE Retaining Walls

The available geotechnical data indicates the potential for deposits of highly plastic, fine-grained soils near the proposed bridge abutments. If these soils are present behind and below proposed MSE retaining walls at the bridge abutments, they could pose a risk to both the external and global stability of the walls. We recognize that the proposed MSE wall at Abutment B is in an area of existing fill over the old river bed. These conditions will be addressed in our design. This risk will be further mitigated in the design phase by collecting adequate Shelby tube samples in the fine-grained soil strata at the locations of the bridge abutments. These samples will be subjected to triaxial shear testing and the results will be used to refine the engineering analyses and subsequently confirm or modify the minimum length requirements for the MSE wall reinforced zones such that external and global stability are satisfied both in the short-term and long-term. The one-dimensional consolidation testing results will be used to model settlements on the in-situ soil profile due to the load of new MSE wall embankments.

Slopes

The English Team's design approach may involve modifications to existing approximate 2 horizontal to 1 vertical (2H:1V) slopes. In general this is envisioned as a broadening of the slope crests laterally, requiring narrow sliver fills or retaining walls to accomplish the desired lateral extensions for our northbound design. Slope stability

analyses will be performed to confirm post-modification stability. Our analyses will look at fill placements that maintain the current slope configuration as well as the use of various granular fill materials and/or reinforcement to facilitate steeper configurations, thus allowing for less fill placement on the existing slope and reducing lateral extension at the toe of the slope.

4.4.4 RAILROAD COORDINATION //

Commitments and Deliverables of the English Team

The English Team will identify, evaluate, and mitigate the geotechnical risks by proactively establishing recommendations that fit the overall Project schedule and effectively implement design concepts during construction. Our implementation of the geotechnical mitigation strategies, which began during the proposal design development, will continue during final design and construction including the performance of supplemental exploration and testing to further evaluate the extent of unsuitable soils and low recovery seams within the rock profile; additional investigations will be used to further evaluate slopes, foundations, and MSE wall areas.

Eric Burgess, PE will be our dedicated Railroad Coordinator and has over 17 years of experience with NSR requirements and procedures for bridge replacements. He will work with the Project Manager to identify schedule or design restraints that could affect the railroad or jeopardize our schedule. He will be responsible for coordinating all proposed design concepts, as well as preliminary and final plans with NSR. We will prepare and submit the required railroad documentation as stated in RFP, NSR Public Projects Manual, Special Provisions and the VDOT/NSR Construction Agreement. Mr. Burgess has been and will be an integral part in providing effective planning, communication, and engineering with the NSR, state agency, designer, and contractor to ensure that the design, construction, operation, and maintenance of both highway and railroad modes are compatible. Having a dedicated person who understands the design issues, as well as NSR's concerns will go a long way to bridge the gap between the designer, the contractor, and NSR.

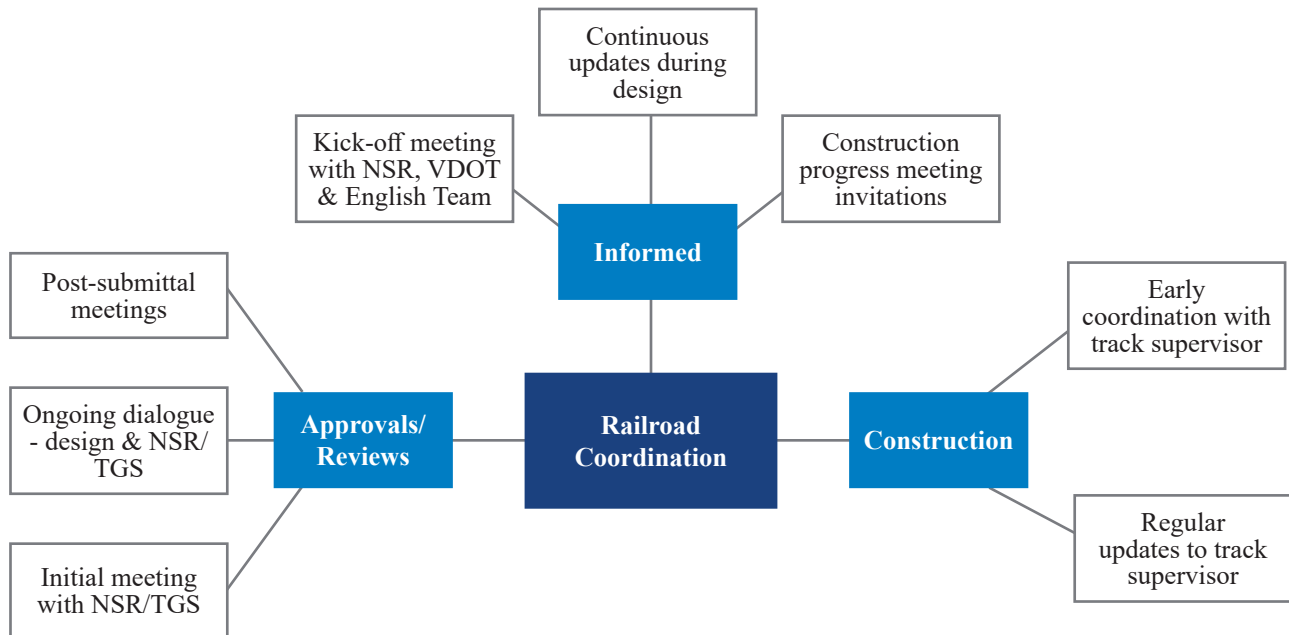
Key Railroad Challenges

- ✪ Access railroad ROW for geotechnical investigations
- ✪ Foundation construction adjacent to track
- ✪ Required submittals & timely reviews/approvals
- ✪ Flagmen/track time availability
- ✪ Possible additional flagging costs above VDOT budget identified in RFP

Our coordination plan demonstrates a thorough and well integrated approach in coordination of activities with NSR during design and construction to adequately manage the Project risks. See Figure 10 on page 21 for a summary of how we plan to keep NSR informed, obtain timely approvals and coordinate construction activities. Mr. Burgess will arrange for a kick-off meeting with VDOT and NSR/TGS (NSR's design consultant) appointed

reviewers to establish Project specific lines of communication for submittal procedures and project schedules. Once established, Mr. Burgess will facilitate constant communication between our Team and the reviewers as the design progresses to ensure that design criteria for permanent bridge replacement and temporary works around the track during construction are met to avoid disruption to NSR rail traffic. We understand that early design submittals require a multi-department review with NSR Design/TGS as the lead. Review departments include: Design, Signals, Communications, Strategic Planning, Industrial Development, Real Estate and the Division Superintendent. Future submittals typically only require Design/TGS review. Mr. Burgess will continue his involvement throughout construction ensuring a consistent link between our Team and NSR.

Figure 10 // Railroad Coordination Plan



Our coordination effort will involve design allowances for future tracks, railroad maintenance of the track, railroad ROW encroachments, and train traffic interruption requirements. We are fully aware of required track protection details, demolition procedures and overhead demolition debris shielding requirements per the RFP and NSR Special Provisions.

Constructability issues for this Project with respect to the railroad include:

- ❖ Staged bridge construction to maintain traffic along I-81.
- ❖ Possibility for temporary shoring at bridge piers.
- ❖ Equipment such as crane placement in and around the railroad.
- ❖ Lifting materials and girder erection over the railroad.
- ❖ Excavations adjacent to tracks during foundation construction and/or removal of existing foundation elements.
- ❖ Demolition of existing bridge over the railroad.

The impacts associated with constructability of this site are potential delays in Project schedule to satisfy NSR for means and methods of construction, additional cost associated with protection systems for the railroad, such as track protection, shoring for excavations and demolition for partial or final stages of existing bridge and potential schedule delays and costs associated with any issues, such as strength or stability, with the existing structure during temporary staging and partial demolition.

Our engineering staff assigned to this Project provides the design and plans for temporary works involving railroad projects to over 50 heavy highway contractors throughout the Mid-Atlantic and Southeast. Our staff annually produces approximately 150 temporary designs for formwork, falsework, shoring/cofferdams, erection and demo plans, crane analysis, lift plans, track protection plans and have a great working relationship and knowledge of NSR staff and procedures for railroad submittals and railroad insurance certificates.

Based on recent discussions with NSR staff, their biggest concern with this Project is focused on clearances and future track accommodation. As Figure 11 on page 22 shows, we meet or exceed clearance requirements and provide an improved design from the concept plans to better accommodate the future track. It also shows that our bridge piers are aligned with the railroad track unlike the concept plan which aligns with the river. This proposed design ensures no impacts to the railroad with future I-81 bridge widening, and allows for not only a future NSR track but additional clearance for other NSR operations.

Figure 11 // Railroad Clearance & Criteria Design Comparisons

Design Criteria	Temporary	Permanent	Existing	Concept	Proposed	Difference
Horizontal Clearance	15'	40'	19-23'	40'	47-51'+	7-11'+
Vertical Clearance	22'	23'	23'-3 3/8"	23'	23'-3"	None
Pier Orientation ¹	N/A	N/A	43°	30°	43°	13°

1 - I-81 Bridge Pier Orientation Angle Crossing Railroad Track (higher is better)

Early coordination with NSR’s Risk Management and Real Estate departments for the Specific Railroad Liability insurance and Right of Entry permits, respectively, is critical to starting work and will be conducted at our Team’s risk from Intent to Award notice. This will allow early review and processing by NSR for this mandatory paperwork that can often cause project delays due to resource issues on NSR’s side.

Our Team will work closely with NSR’s track supervisor and assigned flagman for all construction operations around and near the tracks as needed for our proposed design plans and construction schedule. The impacts associated with availability of flagman and railroad schedule are time and costs that would affect the critical path schedule or potentially require our Team to revise construction sequences and tasks for the bridge construction affecting the overall Project schedule. We will ensure efficient use of track time and flagman availability over concurrent days. Advance communications with NSR staff indicate that emergency flagging may be allowed with proper track supervisor coordination and sufficient notice.

The English Team will rely on experience gained through numerous past design and review projects with NSR and VDOT. Relationships with the noted entities will be used to expedite solutions to any problems that arise during the coordination, design, and plan production phases of the Project. In coordinating railroad construction projects, it is important to understand the railroad has unique clearance, safety, and other requirements.

The English Advantage - Railroad

- ★ Improved clearances over concept plans & minimums
- ★ Improved safety
- ★ Improved pier orientation; parallel to track
- ★ No impacts with future I-81 widening to NSR
- ★ Coordinator close proximity to NSR Primary Design & ROW Office
- ★ Early Railroad insurance & Right of Entry submittals from Intent to Award

4.5 CONSTRUCTION OF PROJECT

4.5 CONSTRUCTION OF THE PROJECT

4.5.1 SEQUENCE OF CONSTRUCTION //

Commitments and Deliverables of the English Team

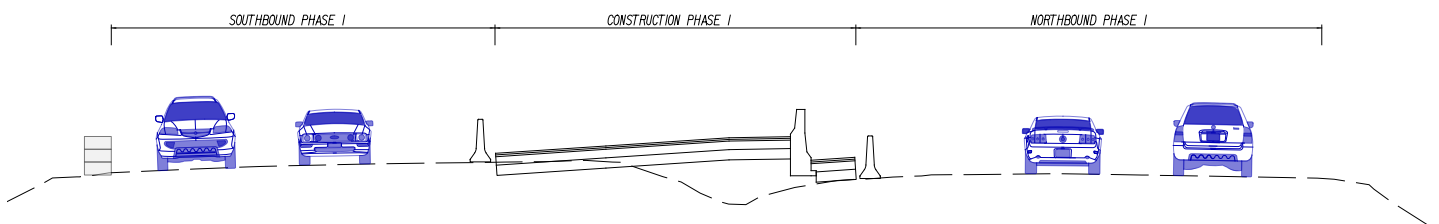
The English Team is committed to constructing a new, bridge carrying an expandable section of I-81 over Route 11, NSR, and Middle Fork North Holston River with minimal impacts to the traveling public during construction. Our Team has accomplished the following with our concept that minimizes public impacts:

1. 12' lanes maintained during all phases of construction.
2. Only three major phases of construction.
3. Minimal need for temporary pavement.
4. Minimize the need for temporary lane closures facilitating shoulder strengthening.
5. Permanent median barrier and drainage built in the first phase that can be used during all other phases.

Phase I

The first phase of the Project will be to construct a portion of the new bridge structure and approaches in the median of I-81 between the two existing structures. During this phase the NBL and SBL will be shifted to the outside shoulders to allow construction of the median improvements and the SBLs.

Figure 12 // Phase I MOT Roadway Typical Section



Step 1 will begin with shoulder strengthening of the outside shoulder of the SBLs. Following the strengthening, the southbound traffic will be shifted to the outside shoulders and temporary concrete barrier will be installed, to include bolt down barrier on the inside shoulder of both existing structures. Following the installation of all traffic control measures, the inside parapets and overhangs will be removed to provide enough space to construct Step 2. During this step, the watermain located on Route 11 will be relocated by maintaining traffic with a flagging operation.

Step 2 will include the construction of the approximately 30' center portion of the new structure and roadway approaches within the existing median. The needed portion of the proposed bridge abutment will be installed to include predrilling piles in place and constructing the MSE walls associated with the abutment construction. This step will also include the relocation of the existing 8" waterline that will be impacted by the construction of pier 1. The construction of bridge substructure components will include all phases of the footing for piers 1 & 2, but only the columns and caps required for Phase I superstructure. The construction of the bridge and its roadway approaches will require the installation of temporary shoring at the abutments due to the depth of excavation and the increased elevation of the new profile between the proposed structure and the adjacent existing structures.

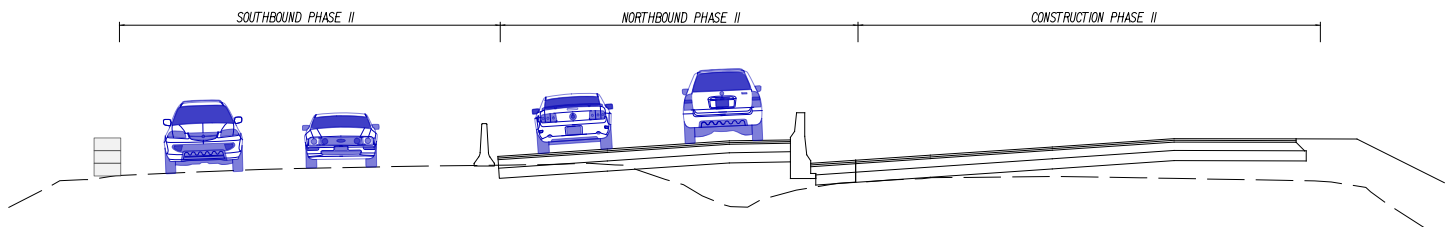
Step 3 will be to tie in the constructed roadway transitions from the existing NBL to the newly constructed alignment constructed in the existing median, modify all traffic control devices in accordance with the TMP,

and switch the NBL traffic from its existing original position to the newly constructed portion. Please note that the reason for moving the NBL first is the condition of the existing structure and attempting to remove it from service as soon as possible.

Phase II

The second phase of the Project will be to demolish the existing NBL bridge and construct the NBL of the new bridge structure and approaches. During this phase, the impact to the traveling public will be minimal primarily due to the fact that both of the SBL will stay in their shifted location from Phase I and that both the NBL and SBL will be protected by temporary concrete barrier.

Figure 13 // Phase II MOT Roadway Typical Section



Step 1 will be to demolish the existing NBL structure.

Step 2 will include the construction of the approximately 44' eastern portion of the new structure and roadway approaches to the outside of the relocated NBL. The needed portion of the proposed bridge abutment will be installed to include predrilling piles in place and constructing the MSE walls associated with the abutment construction. The construction of bridge substructure components will include the columns and caps required for Phase II superstructure.

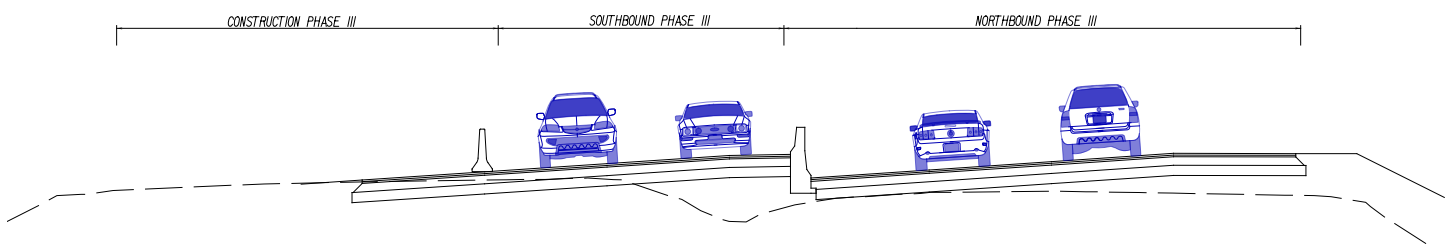
Step 3 will be to tie in the constructed roadway transitions from the relocated NBL to the newly constructed permanent alignment of the constructed NBL and to modify all traffic control devices in accordance with the TMP, and switch the NBL traffic from its relocated position to the newly constructed portion.

Step 4 will be to tie in the existing SBL to the Phase I constructed alignment, modify all traffic control devices in accordance with the TMP, and switch the SBL traffic from its existing original position to the Phase I constructed portion.

Phase III

The third phase of the Project will be to demolish the existing SBL bridge and construct the SBL of the new bridge structure and approaches. During this phase the impact to the traveling public will be minimal due to the fact that both the NBL and SBL will be protected by temporary concrete barrier.

Figure 14 // Phase III MOT Roadway Typical Section



Step 1 will be to demolish the existing SBL structure.

Step 2 will include the construction of the approximately 16' western portion of the new structure and roadway approaches to the outside of the relocated SBL. The final portion of the proposed bridge abutment will be

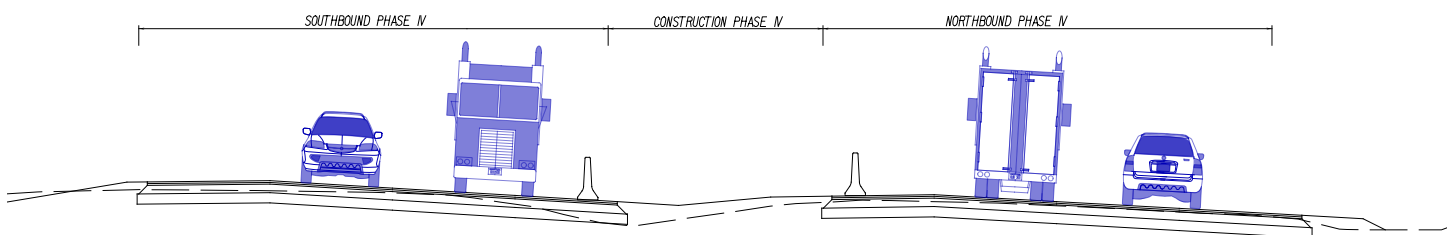
installed to include predrilling piles in place and constructing the final portion of the MSE walls associated with the abutment construction. The construction of bridge substructure components will include the remaining columns and caps required for Phase III superstructure.

Step 3 will be to tie in the constructed roadway transitions from the relocated SBL to the newly constructed permanent alignment of the constructed SBL and to modify all traffic control devices in accordance with the TMP, and switch the SBL traffic from its relocated position to the newly constructed portion.

Phase IV

The fourth phase of the Project will be remove any temporary pavement and complete any construction in the median that could not be completed in the earlier phases. During this phase the impact to the traveling public will be minimal due to the fact that both the NBL and SBL will be protected by temporary concrete traffic barrier. The graphic below shows the final median work to be performed at northbound station 142 to remove the temporary northbound crossover pavement, provide final grading and construction of the median ditch and guardrail.

Figure 15 // Phase IV MOT Roadway Typical Section



Step 1 will be to remove any temporary paving that is no longer required to remain.

Step 2 will be to complete construction of any roadway and drainage elements in the median.

Step 3 will be to complete all paving and striping operations and shift all traffic to their final lane locations.

Safety, Operations, & Access

English established its Safety and Health Policy to demonstrate our commitment to the safety and health of our employees. It is our intention to comply with all relevant safety and health laws, regulations, requirements, and make modifications to fit real time on-site situations, both planned and unplanned. The elimination of accidents is one of our greatest responsibilities, and should be treated in the same manner as our business procedures related to quality, volume, and cost control.

Our Team's approach to access and operations is to limit the amount of interaction that the traveling public has with construction vehicles and access points. We have developed our plan to accommodate that goal to the fullest extent possible.

Phase I access to the proposed roadway improvements and the abutments needed from I-81 to median will be from approved construction entrances identified in our TMP. Temporary access to Pier 1 will be constructed from Route 11. All piers between the NSR and the Middle Fork of the Holston River will be accessed off an improved entrance from Flowing Springs Road. The superstructure construction of this phase will utilize cranes located in the median of I-81 and Route 11 with temporary lane closures on the inside lanes of I-81, as well as temporary closures of Route 11.

Phase II access to the proposed roadway improvements and the abutments needed from I-81 will be from relocated NBL via approved construction entrances identified in our TMP. Both the demolition and new structure construction will utilize a newly installed rail road crossing from Route 11 providing access to the

Northeast side of the bridge (can be constructed in Phase I). The use of the access created in Phase I from Flowing Springs Road will continue in Phase II. The superstructure construction of this phase will utilize cranes located within the proposed alignment of the NBL, as well as Route 11 and will utilize temporary lane closures of Route 11.

Phase III access to the proposed roadway improvements and the abutments needed from I-81 will be from relocated SBL via approved construction entrances identified in our TMP. Both the demolition and new structure construction will utilize the Flowing Springs Road access created in Phase I. The superstructure construction of this phase will utilize cranes located within the proposed alignment of the SBL, as well as Route 11 and will utilize temporary lane closures of Route 11.

Construction affecting the traveling public on I-81 will be done behind temporary concrete barrier limiting the impact to the traveling public to only the lane closures needed for the installation and removal of the barrier, as well as erection of structural steel. Access for the work to the outside will be, to the maximum extent possible, from VDOT ROW, Route 11, and adjacent property owners limiting the need to use the access from the I-81 travel lanes. Access to and from Route 11 and Flowing Springs Road will be installed so that the use of the access can be from the free flowing travel lanes. This will limit the impact to the traveling public on both Route 11 and Flowing Springs Road to the temporary traffic control need for the duration of the installation, which should be limited to short duration flagging operations.

Staging and Storage

Construction staging and storage will be limited to VDOT ROW and 3rd party agreements with private land owners. Our intent is to limit or minimize the need for any storage or staging to be near the operating I-81 travel lanes during any Phase of the Project. We will also limit the amount of storage in and around the flood plain along the Middle Fork of the Holston River. This is not just good environmental judgement but also good for the protection of materials and equipment from damage or removal by flood waters.

We have identified several properties as potential sites. The first is the state ROW just in the southwest corner of the Project located between Route 11 and the SBL of I-81. This location is adjacent to the location currently being used for similar purposes. The opportunities are with 3rd party land include the abandoned property owned by SBCIVA INC (Tax ID 49-A-23-24) located between the NSR and Route 11, the land owned by the Wheeler Family (Tax ID 37-2-1, 37-2-2, & 37-A-21), as well as the Potter Family Land (Tax ID 37-A-15A & 37-A-15) along Flowing Springs Road.

Maximize the Probability of Anticipating and Mitigating Potential Delays

Our Team has come up with two specific items within our approach and sequence of Construction. The first, as indicated in Phase I, step 2 is to construct all pier foundations/footings prior to the need in subsequent phases. This allows us to accelerate the subsequent phases of construction but also allows us to identify and deal with any issues related to those foundations well ahead of any schedule impact that they could cause. The second, is outlined in Phase II, step I and consists of removing the NBL structure as early as possible. This will remove the worst of the existing structures first, and it will limit the exposure for both the English Team and VDOT from the resource need, cost implications, and additional impact to the traveling public by performing the deck repairs as outline in Part 2, 2.3.2.

4.5.2 TRANSPORTATION MANAGEMENT PLAN //

Commitments and Deliverables of the English Team

The English Team shares and is fully committed to VDOT's goal of reducing work zone crashes and improving travel time through work zones. To achieve this goal, our overall MOT strategy is based on maximizing the construction to be completed while the work zone is completely protected by traffic barrier and minimizing the number of major traffic pattern shifts and adjustments. Our detailed plan has eliminated almost all construction on Route 11 and Flowing Springs Road. Our Transportation Management Plan (TMP) maximizes driver safety, optimizes construction efficiency and safety, and minimizes community and driver impacts. Our formal TMP documentation will be prepared in accordance with the process and required content outlined in VDOT IIM-LD-241.5/TED-351.3.

The safe and efficient MOT during construction activities is critical to the success of the I-81 Project. We understand the inherent risks to workers and the traveling public through work zones, and the Project presents some unique challenges in ensuring the safety of motorists while providing enough space to efficiently and safely complete the work. We realize that I-81 is a corridor of nationwide importance and an economic engine for Virginia and the region. Interstate long-haul trucks (many with double trailers), oversize trucks, and permit load vehicles traverse the corridor at all hours and mix with both commuter traffic and vacationers.

Accidents and injuries, both on the roadway and within the work site, are devastating on many levels. The immediate impact to the victim, mobilization of first responders, and the resultant travel delays due to incident management and lane closures cost time and money. Additionally, the English Team understands the human factors; that when drivers "see orange" and are delayed, they "see red" and lash out at other drivers, work crews, and ultimately VDOT. Work zone signing that is confusing to drivers increases the likelihood of abrupt maneuvers that cause crashes. With more and more drivers relying on GPS turn-by-turn directions, maintaining temporary routes that are similar to existing routes is necessary to maximize safety. Our plan to minimize lane closures and lane shifts and not use detours will significantly minimize these work zone traffic operation concerns.

The English Team is committed to maintaining the safest possible work zones. The TMP will include detailed traffic management plans for each stage of the work, a detailed traffic operations plan and an extensive public involvement plan that covers local interests and regional and interstate operations such as long-haul trucking

Earl Morgan will serve as the English Team's MOT Superintendent, and he brings decades of bridge and roadway construction experience on the interstate system. Earl led the MOT efforts on the I-295/VA 895, I-295/I-64, I-95 at Atlee/Elmont, and the I-95/Lewistown Road interchange projects that each included multiple bridges, complex traffic shifts, and required extensive coordination with VDOT. The English Team will work closely with the VDOT Public Information Officer (PIO) to develop and implement the Public Involvement Plan during construction. We will prepare for and participate in "Pardon Our Dust" meetings with the community, create materials (both hard copy and web-based) using standard VDOT templates and language, and keep the PIO aware of construction activities and pending traffic shifts.

Prevailing speeds on I-81 are over 70 mph. The English Team realizes that the risk to workers and travelers could be reduced by incorporating a work zone speed limit when shoulder closures and lane shifts are in place. The traffic control plans will be developed in compliance with the Work Area Protection Manual, Traffic Safety and Operations Manual, and VA Supplement to the MUTCD. We will prepare a Work Zone Speed Limit request and the required supporting documentation per TE Memo 350.1, with the understanding that additional signing, PCMS, and coordination with VDOT Southwest Regional Operations (SWRO) is essential to keep travelers informed of the reduced speeds and traffic shifts. The Hampton Roads District recently implemented a 70 mph

TECHNICAL PROPOSAL

to 55 mph speed reduction to construct the new I-95 bridges over the Meherrin River near Emporia and we will look closely at the “lessons learned” on that project and similar projects. However, we recognize that drivers will travel at their perceived safest speed, regardless of posted speed limits. Therefore, we will design all lane shifts with a minimum 75 mph design speed and limit or reduce the need to implement temporary reduced speed limits.

The English Team understands that VDOT staff is involved in many projects, and our goal is to keep the VDOT team informed while minimizing the work they need to perform. We will keep open communication with the VDOT Project Manager, coordinate with Bristol District staff, and will work closely with the VDOT PIO to keep roadway users and the community aware of construction status and traffic changes. The English Team is aware that there are other construction projects in Smyth County – two south of Route 11 and one north of Route 11 – that may be active at the same time as this Project. We will proactively coordinate with the other project teams during the development of the TMP and during construction to present a consistent message to the public and ensure there are no conflicts between major construction phases.

When developing the TMP, we will work with the Bristol District Traffic Engineer, City of Atkins and Smyth County staff as necessary to prepare the initial plan, implement the plan, and adjust it as needed during construction. Our coordination directly with the Bristol District Engineer will be critical to the coordination of this Project and the adjacent projects, I-81 Mulberry Land and I-81 Reed Creek, as well as the Department’s yearly pavement maintenance. We will also keep other stakeholders (such as emergency services, utility companies, the Virginia State Police, and the Board of Education, etc.) informed. We have developed the initial elements of the TMP and can start to share with the stakeholders our plans to complete this Project efficiently and safely upon award. We believe the early involvement of the stakeholders facilitates their understanding and support of the Project. As additional traffic control details are developed and finalized, updates can be provided before construction commences. This will then ease the dissemination of key information as the Project advances through the construction stages .

4.6 PROPOSAL SCHEDULE

4.6 PROPOSAL SCHEDULE

4.6.1 PROPOSAL SCHEDULE // The English Team has prepared a Proposal Schedule and Proposal Schedule Narrative that depict our overall sequence of work required to complete the project. The Proposal schedule includes all work required to complete the project on time. Our Proposal Schedule has taken into account all internal plan review, VDOT plan review and approvals, NSR plan review and approvals, environmental permitting and constraints, right of way acquisition, utility relocation, construction activities and QA/QC inspection and testing. Our overall schedule approach allows us to achieve Final Completion by May 23, 2022.

4.6.2 PROPOSAL SCHEDULE NARRATIVE //

The English Team’s Overall Plan to Accomplish the Work

The English Team will begin working to get the necessary insurance and other documents required to allow our team right of entry with the Notice of Intent to Award, at the teams own risk. This will allow the necessary geotechnical investigation and survey work to begin as soon as possible after Notice to Proceed.

The design team will work concurrently on all phases of design, investigations, utility relocations and permits required. The design will expedite the MOT and Phase I bridge plans to allow some construction to begin in 2019, particularly before the winter time. Weather sensitive activities are suspended on December 15th on this schedule. The Team will continue to work on all activities as long as the weather permits. Bridge construction will continue through the winter using proper cold weather procedures. Grading and other weather sensitive activities are shown to resume on March 15th of each year.

The construction will be performed with conventional earth moving and bridge construction equipment. The numbers and types required will be developed during the price proposal stage. Key material suppliers and subcontractors will be preselected and their shop drawings and submittal plans will be done concurrent with the design process to the extent possible. Following this procedure we do not anticipate any material procurement items being on the critical path. The required QA/QC is considered an integral part of each work activity shown.

This is primarily a bridge replacement project and the critical path will flow through the three stages of bridge construction. As with all projects, the weather will determine the extent that roadway work impacts the schedule.

Work Breakdown Structure

The Work Breakdown Structure has been developed and detailed to a sufficient level to allow for the proper management and reporting of all elements of the project throughout both design and construction. As defined by VDOT and the project scoping requirements, the project schedule have been developed by identifying all work elements required to accomplish the design and construction of all three phases.

Figure 16 // Work Breakdown Structure

WBS ID	WBS Description
CJB-I81-3.1	MILESTONES
3.2. DESIGN DEVELOPMENT	
CJB-I81-3.2.1	Perform Scope Validation Studies
CJB-I81-3.2.2	Identify Supplementary Data Needs
CJB-I81-3.2.2	Identify Supplementary Data Needs
CJB-I81-3.2.2.2.13	Geotechnical plan and Base map
CJB-I81-3.2.2.2.14	Supplemental borings
CJB-I81-3.2.2.2.14.2.14.19	Hydraulic and Hydrologic Analysis
CJB-I81-3.2.2.2.3	US 11, Middle Fork, NSR

CJB-I81-3.2.3	Develop Line, Grade, Cross sections
CJB-I81-3.2.3.3.10	Early Utility Coordination
CJB-I81-3.2.3.3.10.3.10.8	Maintenance of Traffic - TMP
CJB-I81-3.2.3.3.11	Early Stage 1 MOT Plans Median and Shoulder Work
CJB-I81-3.2.3.3.12	ESC Plans Early Stage 1 Median work
CJB-I81-3.2.3.3.13	Final Roadway Design Plans
CJB-I81-3.2.3.3.13.3.13.1	Advance L&G plans to Final design
	- Prepare Drainage plans
	- Prepare Traffic Plans
CJB-I81-3.2.3.3.13.3.13.17	Maintenance of Traffic Stages 2-4
CJB-I81-3.2.4	Stage 1 Bridge Plans
CJB-I81-3.2.4.4.13	Early Foundation and Wall package
CJB-I81-3.2.4.4.14	Stage 2 Bridge Plans
CJB-I81-3.2.5	Sound wall design
CJB-I81-3.2.6	Permitting Environmental
CJB-I81-3.2.7	Threatened & Endangered Species Studies
CJB-I81-3.2.8	Water of US Permit
CJB-I81-3.2.8.8.10	Pollution Prevention Plan
CJB-I81-3.4	SCOPE VALIDATION
CJB-I81-3.6	PUBLIC INVOLVEMENT
3.3 CONSTRUCTION	
3.3.1. PHASE 1	
CJB-I81-3.3.1.2	ROADWORK/GRADING I-81
CJB-I81-3.3.1.4	MOBILIZATION & FIELD OFFICE SETUP
CJB-I81-3.3.1.3	RAILROAD
CJB-I81-3.3.2.1	STRUCTURE
CJB-I81-3.3.1.1.1	SUBSTRUCTURE
CJB-I81-3.3.1.1.1.2	PIER 2
CJB-I81-3.3.1.1.1.1	PIER 1
CJB-I81-3.3.1.1.1.3	ABUTMENT A
CJB-I81-3.3.1.1.1.4	ABUTMENT B
CJB-I81-3.3.1.1.2	SUPERSTRUCTURE
3.3.5. PHASE II	
CJB-I81-3.3.5.2	ROADWORK/GRADING I-81
CJB-I81-3.3.5.1	STRUCTURE
CJB-I81-3.3.5.5.1	SUBSTRUCTURE
CJB-I81-3.3.5.5.1.2	PIER 2
CJB-I81-3.3.5.5.1.1	PIER 1
CJB-I81-3.3.5.5.1.3	ABUTMENT A
CJB-I81-3.3.5.5.1.4	ABUTMENT B
CJB-I81-3.3.5.5.2	SUPERSTRUCTURE
3.3.2. PHASE III	
CJB-I81-3.3.2.2	ROADWORK/GRADING I-81
CJB-I81-3.3.2.1	STRUCTURE
CJB-I81-3.3.2.1.1	SUBSTRUCTURE
CJB-I81-3.3.2.1.1.1	PIER 2
CJB-I81-3.3.2.1.1.2	PIER 1
CJB-I81-3.3.2.1.1.3	ABUTMENT A
CJB-I81-3.3.2.1.1.4	ABUTMENT B
CJB-I81-3.3.2.1.2	SUPERSTRUCTURE

Work Shifts

English has scheduled the work based on one shift of five 10-hour work days per week, 7:00 AM to 5:30 PM, and has scheduled activity durations on that basis. However, there will be times when work will be done on Saturdays and Sundays, as necessary. The Transportation Management Plan will include appropriate night operations that will be utilized as well to minimize impacts to the traveling public and improve construction productivity. Not utilizing weekends and nights in the initial schedule development allows flexibility for the team to adjust the schedule to overcome any impacts as necessary to deliver the project on time. Additional resources may be added to recover time lost on the schedule as well, if necessary. Subcontractors' schedules will vary depending on their typical practice, available work areas, crew/resource constraints and schedule status and will be managed for the betterment of the entire project schedule.

Calendars

The schedule is based on four calendars.

Calendar 1: Five-Day Work Week – This calendar is used for design and administrative activities and utilizes the holiday schedule listed below.

Calendar 2: Seven-Day Week – The primary use for this calendar is to allow review activities to reflect the calendar day review per specifications.

Calendar 3: National Oceanic and Atmospheric Administration (NOAA) Weather – This very essential calendar incorporates 30 year weather means for measurable precipitation and freezing temperatures compiled from the NOAA from the nearest weather station in relation to the project. The purpose for this calendar is to accurately reflect the impact that weather typically has on a project.

Calendar 4: Grading Calendar – Assigned to the grading activities that are typically difficult to perform during January & February.

Calendar 5: Asphalt Calendar – Assigned to all paving activities as paving is typically not performed between December to February.

Weather

Weather data was obtained from the NOAA for the nearest weather station to the project site. Adverse weather is defined as measurable precipitation (MP) of 0.1” or more, or 1.0” or more of snow or ice pellets. Only measurable precipitation can be claimed for any one calendar day. The 10-year averages for adverse weather as defined herein are:

Adverse Weather – 10 Year Averages			
Month	MP-Days	Month	MP-Days
January	7	July	8
February	6	August	5
March	7	September	6
April	6	October	5
May	7	November	7
June	5	December	7

Holidays

The non-working holidays incorporated into the working schedule are New Year’s Day, Easter, Memorial Day, Independence Day, Labor Day, Thanksgiving, the day after Thanksgiving, and Christmas as listed in Part 5, Section 108.02, as well as Bristol’s spring and fall NASCAR races. During the development of the Baseline Schedule this will be further defined to ensure that not only are the holidays placed in the schedule but also

that proper restrictions constraining the work activities are accounted for to ensure there is no impact on the traveling public associated with holiday travel on either side of the holiday itself.

Major Schedule Elements

The schedule is organized according to the different elements of engineering/design, segments of construction set forth in our plans as well as other items.

1. Milestones
2. MOT Phases
3. Permitting
4. Utilities
5. QA/QC

General Schedule Description

The English Team has prepared this proposal schedule narrative which depicts our overall plan to accomplish the scope of work. The proposal schedule includes activities for all work required to be accomplished in order to successfully complete the project on time. Our schedule has taken into account all internal plan review, VDOT plan review and approvals, environmental permitting and constraints, right of way acquisition, utility relocation, construction activities and QA/QC inspection and testing.

Milestones

Notice of Intent to Award	1/28/2019
Design Build Contract Execution	3/22/2019
Notice to Proceed	3/25/2019
Phase 1 - Completion	8/18/2020
Phase 2 - Completion	5/15/2021
Phase 3 - Completion	4/22/2022
Final Completion	5/23/2022

Critical Path

The Critical Path begins with scope validation design, initial investigatory boring, phase-1 bridge design and then construction of bridges of all three phases. The entire Critical Path is shown in red on the Proposal Schedule, Figure 17 in Volume II. For further clarification, we have included a separate schedule, covering only the Critical Path, shown in Figure 18 of Volume II.

Schedule Compliance

In accordance with the RFP, we are in compliance with Section 4.6 Proposal Schedule. Our Team has developed a CPM Schedule that details the necessary interrelationships between all necessary stakeholders involved for the successful execution of the project. We have incorporated all reviews, permitting, ROW acquisitions, utility relocations, etc. to adhere to the required steps for obtaining an acceptable design.

Administrative

We will immediately begin at notice of intent to award to produce the required baseline schedule for the Department's review and approval as well as the QA/QC plan.

APPENDIX

ATTACHMENT 3.6 (FORM C-78-RFP)
ACKNOWLEDGEMENT OF RFP, REVISIONS, ADDENDA



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)

English Construction Company, Inc.



 SIGNATURE

December 6, 2018

 DATE

John M. Jordan, Jr.

 PRINTED NAME

Senior Vice President

 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 6th day of December, 2018, by and between the Virginia Department of Transportation (“VDOT”), and English Construction Company, Inc. (“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 [written number] and 00/100 Dollars (\$[numerical].00) ("Proposal Payment"), which payment constitutes payment in full to Offeror for the conveyance of Offeror's Intellectual Property to VDOT in accordance with this Agreement. Payment of the Proposal Payment is conditioned upon: (a) Offeror's Proposal being, in the sole discretion of VDOT, responsive to the RFP; (b) Offeror complying with all other terms and conditions of this Agreement; and (c) either (i) Offeror is not awarded the Design-Build Contract, or (ii) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror.

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

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

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

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

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

9. **Miscellaneous.**

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

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

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

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

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

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

VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

[Insert Offeror's Name] English Construction Company, Inc.

By:  _____

Name: John M. Jordan, Jr.

Title: Senior Vice President

ATTACHMENT 11.8.6
CERTIFICATION REGARDING DEBARMENT FORMS



ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

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

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

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

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

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

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

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

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


Signature

December 6, 2018
Date

John M. Jordan, Jr.
Senior Vice President
Title

English Construction Company, 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	11/15/2018 Date	Vice President Title
---	--------------------	-------------------------

KCI Technologies, 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.

 11/15/2018 VP
Signature Date Title

3B CONSULTING SERVICES, 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.


Signature _____ (ANDREW R. FRANK) _____ VA. TRANSPORTATION PROGRAM MGR.
Date 11-17-2018 Title

FROEHLING & ROBERTSON, 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.

	6/29/2018	President
Signature	Date	Title

Hassan Water Resources, PLC
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

Date

11/15/18

Vice President Business Development

Title

InfraMap Corp.

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.

Elizabeth M. Porter 11/15/18 Vice President
Signature Date Title

S & ME, 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.

<u><i>Kelly A. Kelly</i></u>	<u>11/16/2018</u>	<u>President</u>
Signature	Date	Title

Kelly Consulting, LLC
Name of Firm



TECHNICAL PROPOSAL - VOLUME II

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

STATE PROJECT NO.: 0081-086-818; 0081-086-742

FEDERAL PROJECT NO.: BR-081-1(336)

CONTRACT ID NUMBER: C0097555DB102

DECEMBER 6, 2018



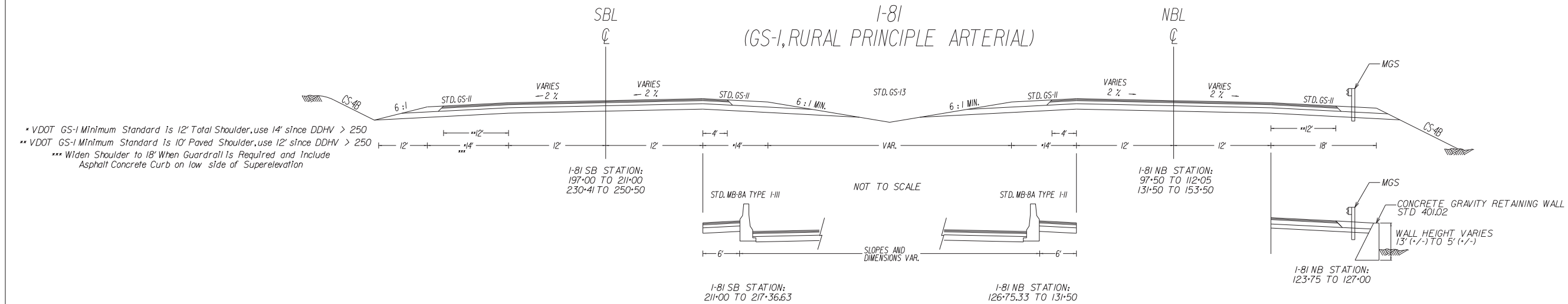
4.3.1 CONCEPTUAL ROADWAY PLANS

PROJECT MANAGER _____
 SURVEYED BY _____
 DESIGN SUPERVISED BY _____
 DESIGNED BY _____

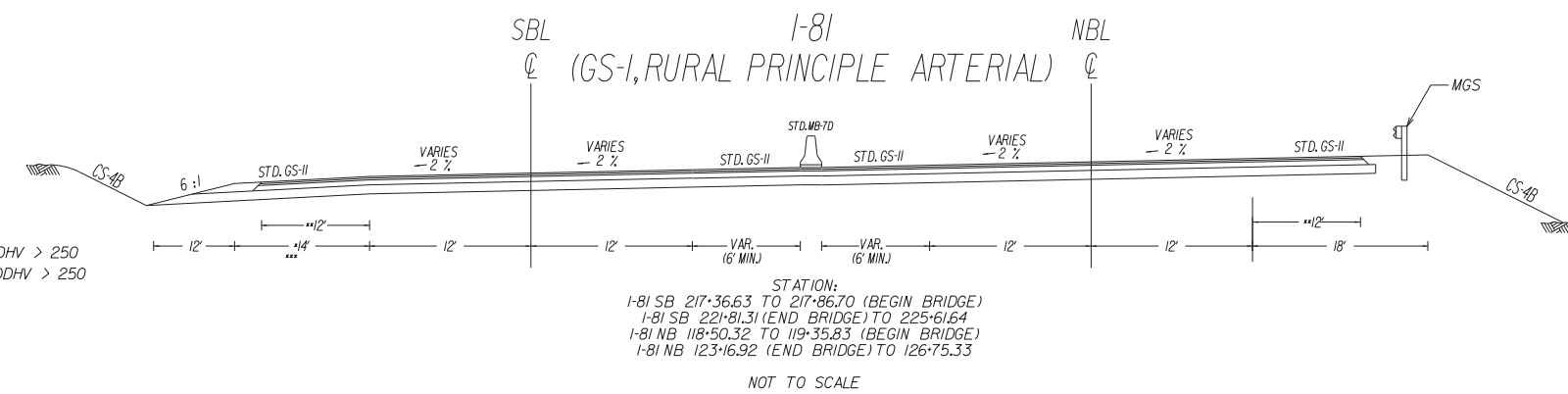
PRELIMINARY TYPICAL SECTIONS

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

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

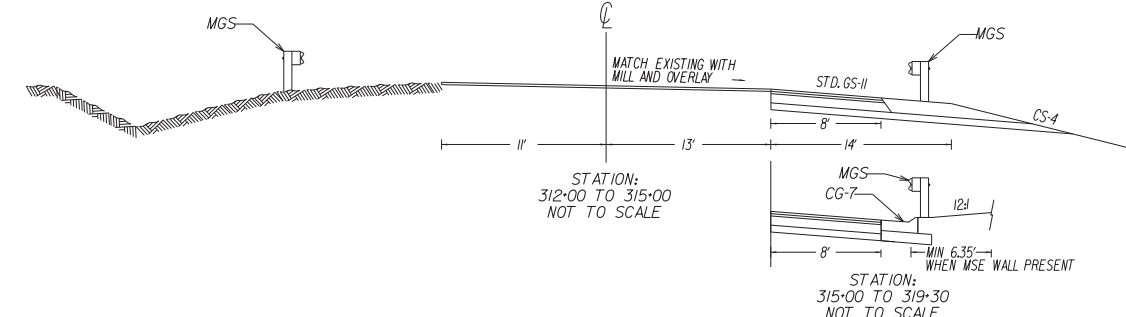


* VDOT GS-1 Minimum Standard is 12' Total Shoulder, use 14' since DDHV > 250
 ** VDOT GS-1 Minimum Standard is 10' Paved Shoulder, use 12' since DDHV > 250
 *** Widen Shoulder to 18' When Guardrail Is Required and Include Asphalt Concrete Curb on low side of Superelevation



* VDOT GS-1 Minimum Standard is 12' Total Shoulder, use 14' since DDHV > 250
 ** VDOT GS-1 Minimum Standard is 10' Paved Shoulder, use 12' since DDHV > 250

ROUTE 11 (GS-2, RURAL MINOR ARTERIAL)



New Pavement and Pavement Widening for I-81 (Including Shoulders)
 Surface Asphalt Concrete Surface Course, SM-12.5E @ 220 lbs/sy
 Intermediate Asphalt Concrete Intermediate Course, IM-19.0E @ 230 lbs/sy
 Base 10 Inches Asphalt Concrete Base Course, BM-25.0D
 Subbase 12 Inches Aggregate Base Material, Type 1, 21-B (Daylight through the Shoulder as Needed)
 Levelling Course: 2 Inches Type 1, 21-B
 Open Graded Aggregate Material: 12 Inches Aggregate Material *

New Pavement and Pavement Widening for Rte. 11 (Including Shoulders)
 Surface Asphalt Concrete Surface Course, SM-12.5A @ 220 lbs/sy
 Intermediate Asphalt Concrete Intermediate Course, IM-19.0A @ 230 lbs/sy
 Base 8 Inches Asphalt Concrete Base Course, BM-25.0A
 Subbase 6 Inches Aggregate Base Material, Type 1, 21-B

Mill and Overlay for I-81 and Rte. 11
 For salvage/build-up areas, no more than 8 Inches of build-up will be permitted. The impacted existing pavement shall be milled 2 Inches and replaced with the below pavement section. Impacted for this purpose is defined as area of Impacted pavement markings.
 Surface Asphalt Concrete Surface Course Type SM-12.5 E @ 220 lbs/sy
 Intermediate Asphalt Intermediate Course Type IM-19.0E @ 115 lbs/sy per Inch of thickness (variable but no more than 8 Inches of Intermediate permitted)

SEE CONCEPTUAL STRUCTURAL PLANS FOR INTERIM AND FUTURE BRIDGE SECTIONS

PRELIMINARY TYPICAL SECTIONS I-81 BRIDGE REPLACEMENT		
PROJECT 0081-086-742, P101, B659; 0081-086-818, B663	SHEET NO. 2A	

\$TIME\$STAMP\$

PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY _____
 SUBSURFACE UTILITY BY, DATE _____

(15) In PI, Unknown Length of 18" CMP
 Direction Only
 Inv. In = 2335.76
 Inv. Out = No Detail Found
 (16) Storm Grate
 Top = 2335.17
 (17) In PI, 234.0 of 18" CMP
 Inv. In = 2335.99
 Inv. Out = 2335.67

(18) Storm Grate
 Top = 2337.32
 (19) In PI, Unknown Length of 18" CMP
 Direction Only
 Inv. In = No Detail Found
 Inv. Out = 2333.44
 (20) In PI, Unknown Length of 24" CMP
 Direction Only
 Inv. In = 2333.54
 Inv. Out = No Detail Found
 (21) In PI, 26.0 of 12" RCP
 Inv. In = 2333.71
 Inv. Out = 2333.84
 (22) Storm Grate
 Top = 2338.47
 (23) In PI, Unknown Length of 4" CMP
 Direction Only
 Inv. In = No Detail Found
 Inv. Out = 2335.80

(24) In PI, 50.5 of 24" CMP
 w/ Flared End Section
 Inv. In = 2344.57
 Inv. Out = 2344.44
 (25) In PI, 13.0 of 18" CMP
 w/ Conc. Endcap
 Inv. In = 2346.30
 Inv. Out = 2344.95

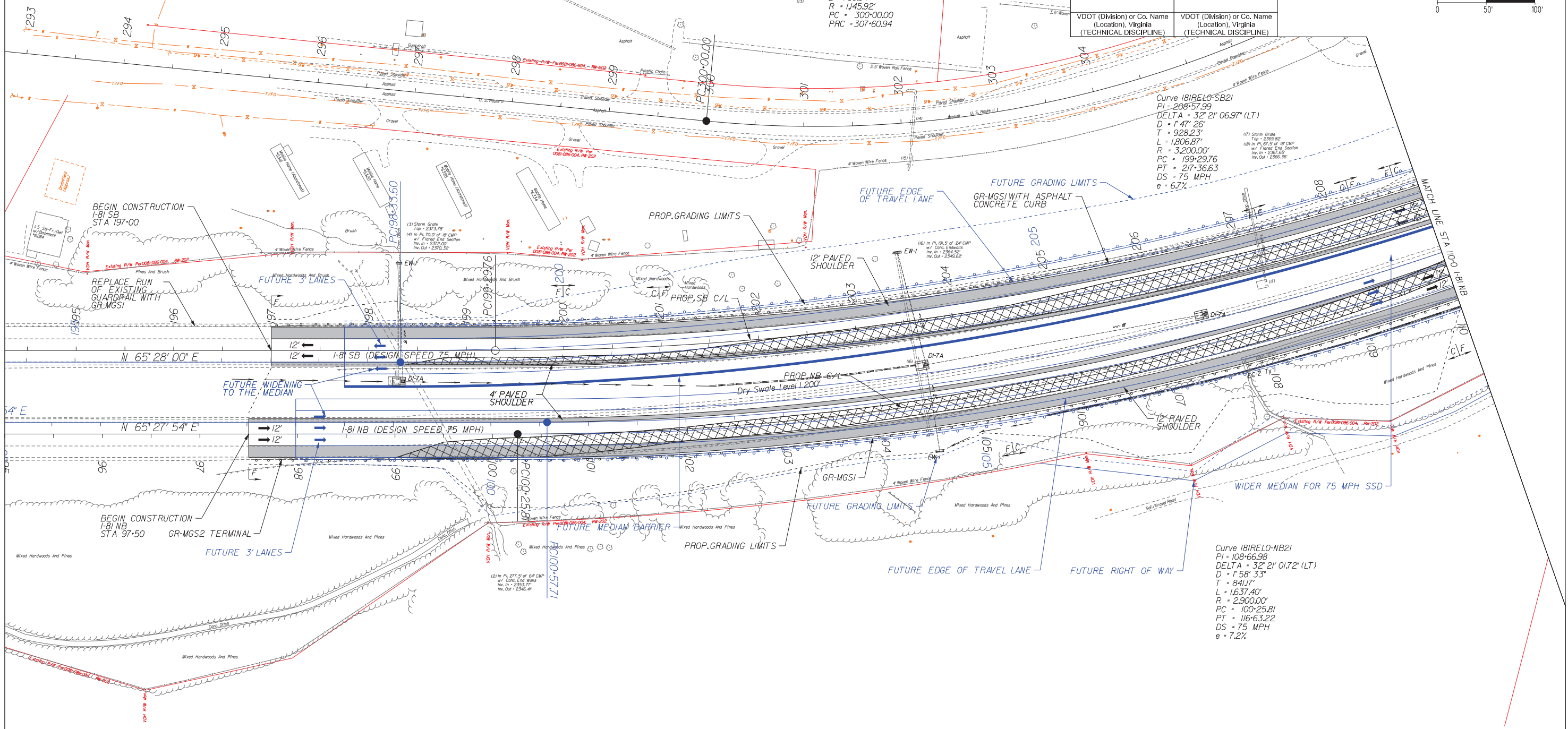
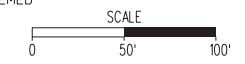
Curve RT1-I
 PI = 303.95.09
 DELTA = 38° 02' 48.62" (LT)
 D = 5° 00' 00"
 T = 395.10'
 L = 760.94'
 R = 1,145.92'
 PC = 300+00.00
 PRC = 307.60.94

Curve 18IRELO-SB21
 PI = 208.57.99
 DELTA = 32° 21' 06.97" (LT)
 D = 1° 47' 26"
 T = 928.23'
 L = 1,806.87'
 R = 3,200.00'
 PC = 199+29.76
 PT = 217+36.63
 DS = 75 MPH
 e = 6.7%

Curve 18IRELO-NB21
 PI = 108.66.98
 DELTA = 32° 21' 01.72" (LT)
 D = 1° 58' 33"
 T = 841.17'
 L = 1,637.40'
 R = 2,900.00'
 PC = 100+25.81
 PT = 116+63.22
 DS = 75 MPH
 e = 7.2%

REVISED	STATE	ROUTE	STATE 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



FUTURE 1-81 SB
 Curve 181SB_FUT1
 PI = 204.74.56
 DELTA = 20° 57' 11.26" (LT)
 D = 1° 39' 11"
 T = 640.96'
 L = 1,267.60'
 R = 3,466.21'
 PC = 198+33.60
 PCC = 211+01.20

FUTURE 1-81 NB
 Curve 181NB_FUT1
 PI = 108.98.88
 DELTA = 32° 21' 01.72" (LT)
 D = 1° 58' 33"
 T = 841.17'
 L = 1,637.40'
 R = 2,900.00'
 PC = 100+25.71
 PT = 116+95.11

- EXISTING R/W
- EXISTING UTILITIES
- FUTURE 6 LANE DESIGN
- ▨ FULL DEPTH PAVEMENT RECONSTRUCTION (TYPICAL)
- [C] Denotes Construction Limits In Cuts
- [E] Denotes Construction Limits In Fills
- ONLY INTERIM DRAINAGE DESIGN SHOWN

REFERENCES
 (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

Mainline Profile 3A
 Drainage Descr.

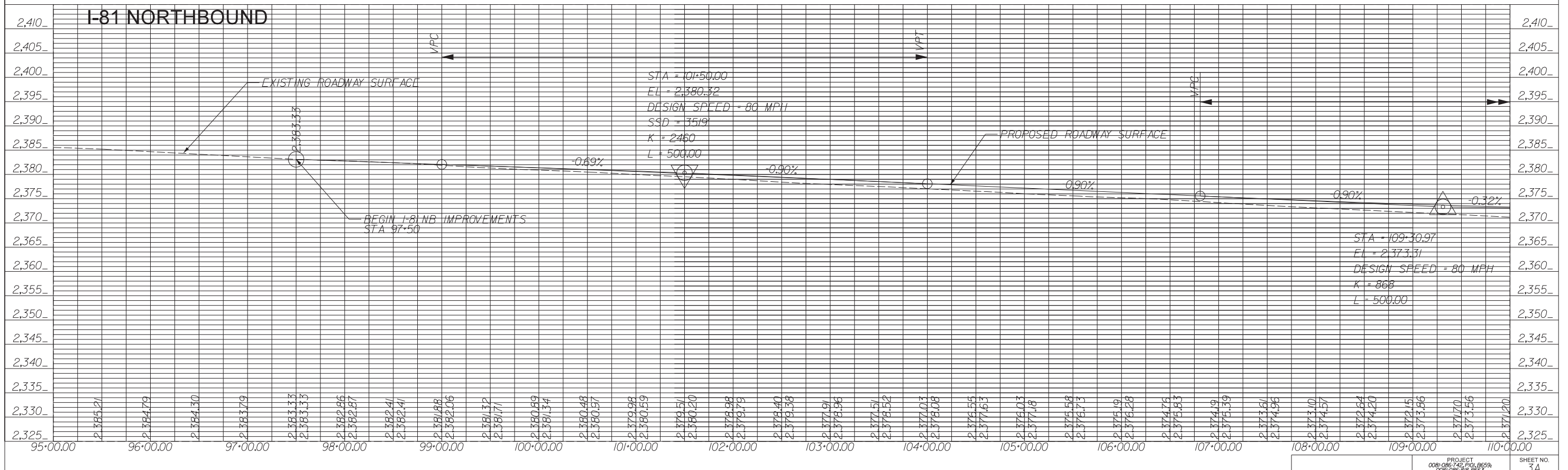
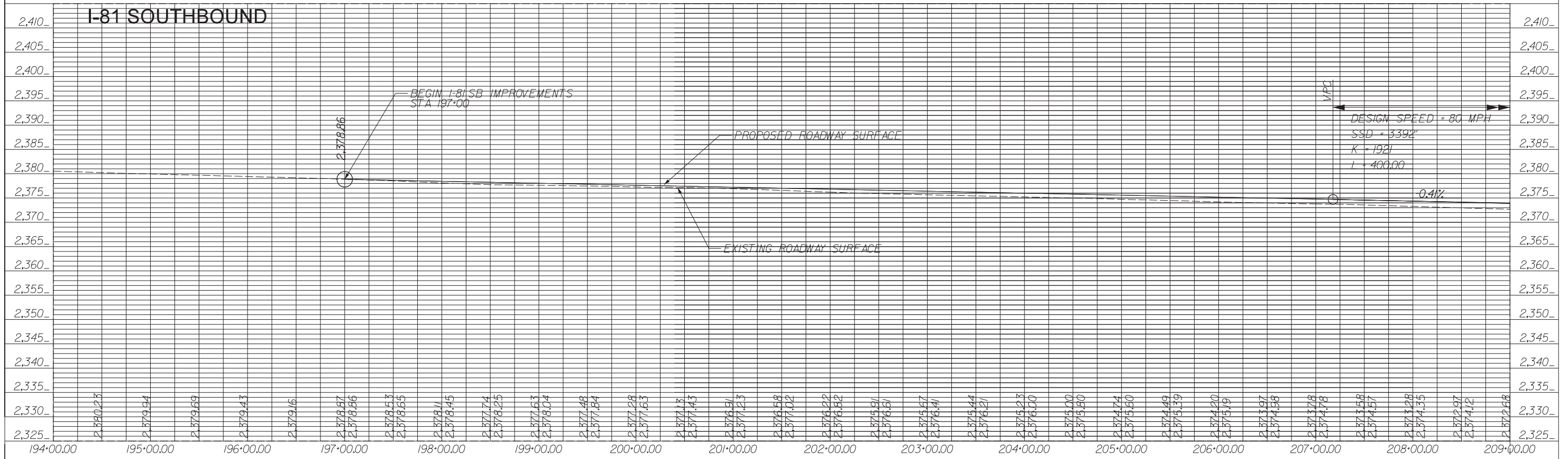
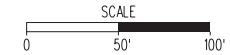


\$TIME\$T\$AMP\$

PROJECT MANAGER _____
SURVEYED BY, DATE _____
DESIGN BY _____
SUBSURFACE UTILITY BY, DATE _____

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

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



PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY _____
 SUBSURFACE UTILITY BY, DATE _____

120) In PL Unknown Length of 12" RCP
 Direction Only
 Inv. In - No Data Found
 Inv. Out - 2332.00
 121) Storm Gully
 Top - 2336.02
 122) In PL 74.0' of 12" RCP
 Inv. In - 2334.55
 Inv. Out - 2332.53
 123) Storm Gully
 Top - 2335.57

124) In PL Unknown Length of 24" CMP
 Direction Only
 Inv. In - No Data Found
 Inv. Out - 2332.52
 125) In PL 264.5' of 24" CMP
 Inv. In - 2332.46
 Inv. Out - 2333.96
 126) Storm Man
 Top - 2335.40
 127) In PL 57.0' of 24" CMP
 Inv. In - 2330.84
 Inv. Out - 2330.75

128) Storm Gully
 Top - 2333.75
 129) In PL Unknown Length of 24" CMP
 Direction Only
 Inv. In - 2330.73
 Inv. Out - No Data Found
 130) In PL 34.5' of 24" CMP
 w/ Conc. Endwall
 Inv. In - 2331.68
 Inv. Out - 2331.02
 131) In PL 58.0' of 24" CMP
 w/ Flared End Section
 Inv. In - 2333.79
 Inv. Out - 2333.77

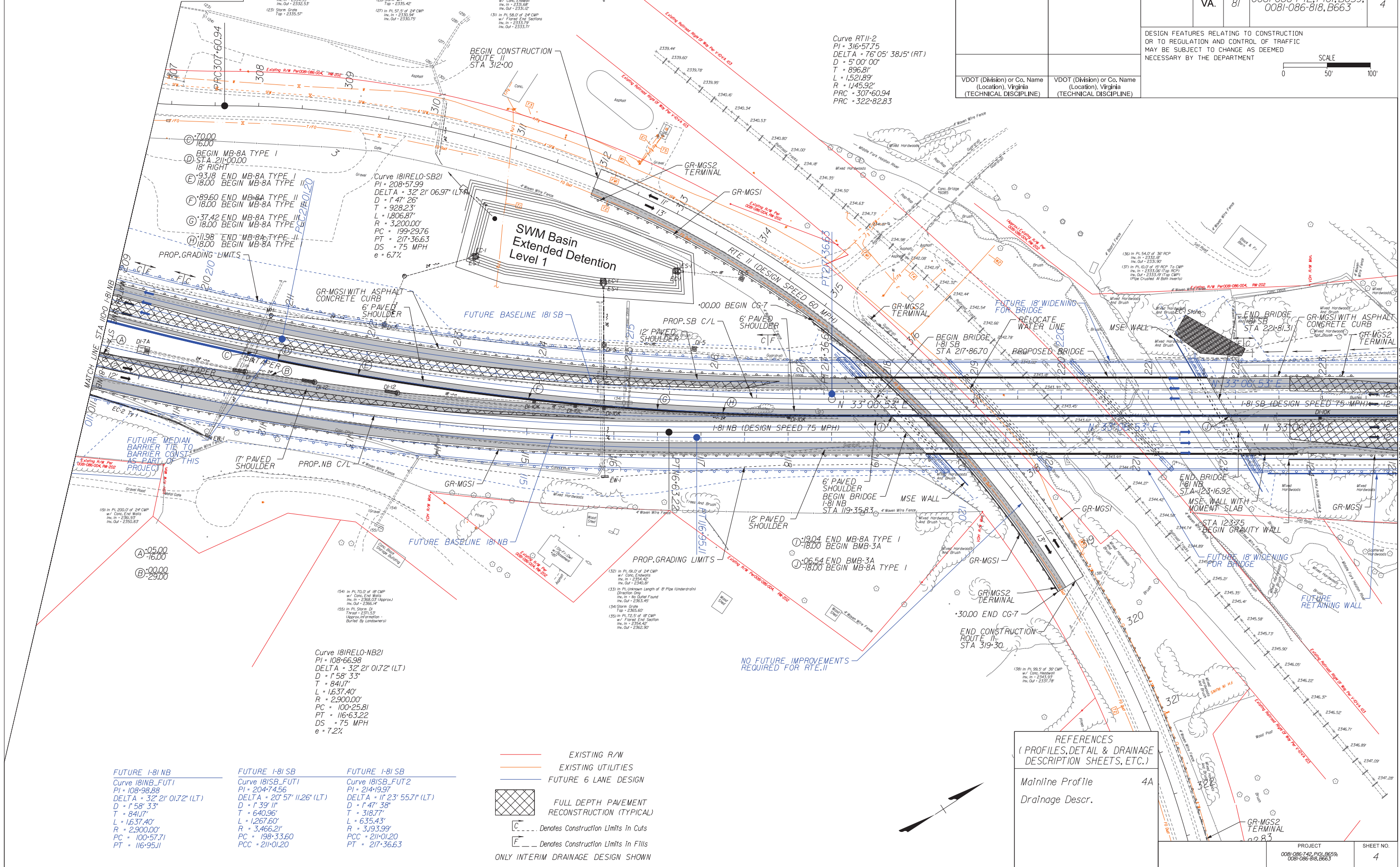
Curve RT11-2
 PI = 316.5775
 DELTA = 76° 05' 38.15" (RT)
 D = 5° 00' 00"
 T = 896.81'
 L = 1521.89'
 R = 1145.92'
 PRC = 307° 60.94'
 PRC = 322° 82.83'

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	81	0081-086-742, P101, B659; 0081-086-818, B663	4

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

SCALE
 0 50' 100'

VDOT (Division or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE))	VDOT (Division or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE))
---	---



\$TIME\$TAMPS

FUTURE I-81 NB
 Curve 181NB_FUT1
 PI = 108° 98.88
 DELTA = 32° 21' 01.72" (LT)
 D = 1° 58' 33"
 T = 841.7'
 L = 1637.40'
 R = 2900.00'
 PC = 100° 57.71
 PT = 116° 95.11

FUTURE I-81 SB
 Curve 181SB_FUT1
 PI = 204° 74.56
 DELTA = 20° 57' 11.26" (LT)
 D = 1° 39' 11"
 T = 640.96'
 L = 1267.60'
 R = 3466.21'
 PC = 198° 33.60
 PCC = 211° 01.20

FUTURE I-81 SB
 Curve 181SB_FUT2
 PI = 214° 19.97
 DELTA = 11° 23' 55.71" (LT)
 D = 1° 47' 38"
 T = 318.77'
 L = 635.43'
 R = 3193.99'
 PCC = 211° 01.20
 PT = 217° 36.63

--- EXISTING R/W
 --- EXISTING UTILITIES
 --- FUTURE 6 LANE DESIGN

▨ FULL DEPTH PAVEMENT RECONSTRUCTION (TYPICAL)

[C] --- Denotes Construction Limits In Cuts
 [E] --- Denotes Construction Limits In Fills

ONLY INTERIM DRAINAGE DESIGN SHOWN

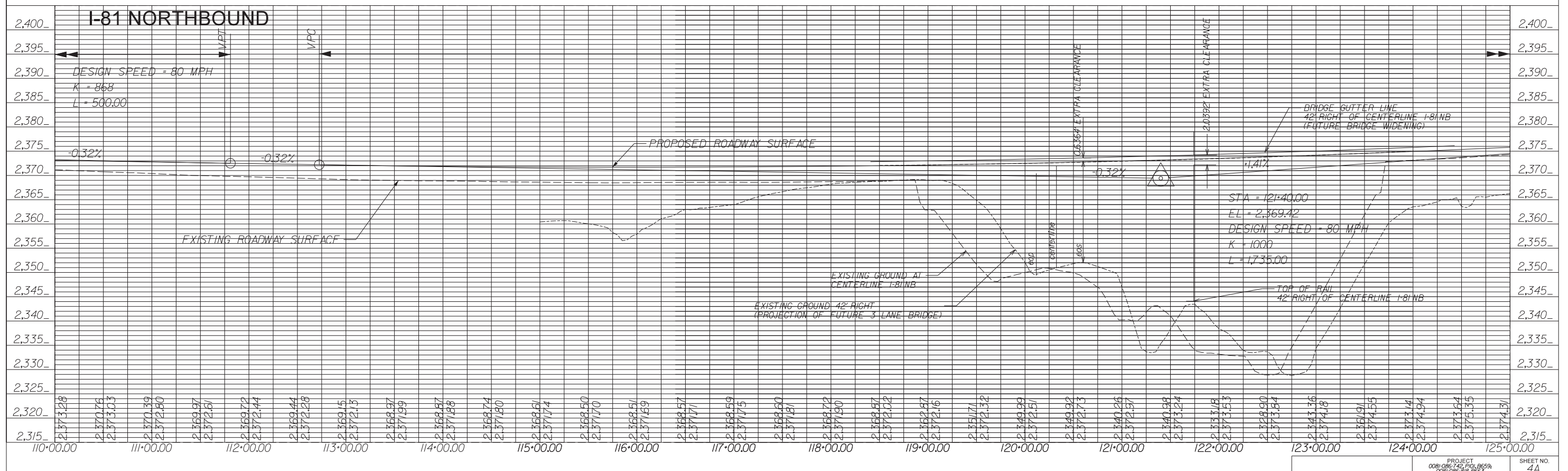
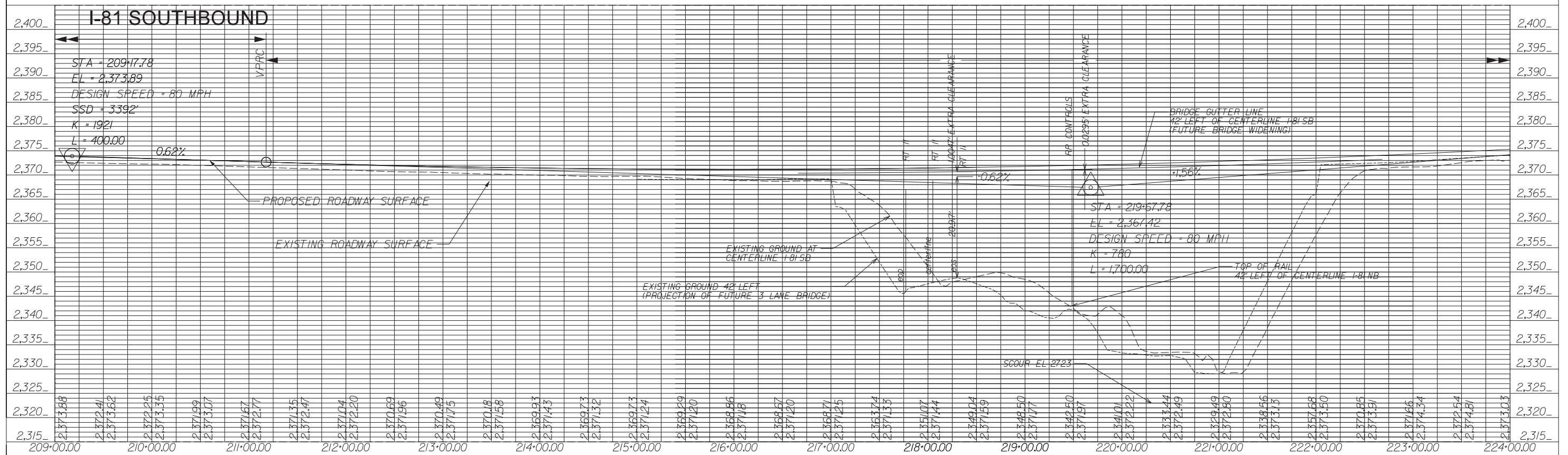
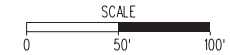
REFERENCES
 (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

Mainline Profile 4A
 Drainage Descr.

PROJECT MANAGER _____
SURVEYED BY, DATE _____
DESIGN BY _____
SUBSURFACE UTILITY BY, DATE _____

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

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	81	0081-086-742, P101, B659; 0081-086-818, B663	4A

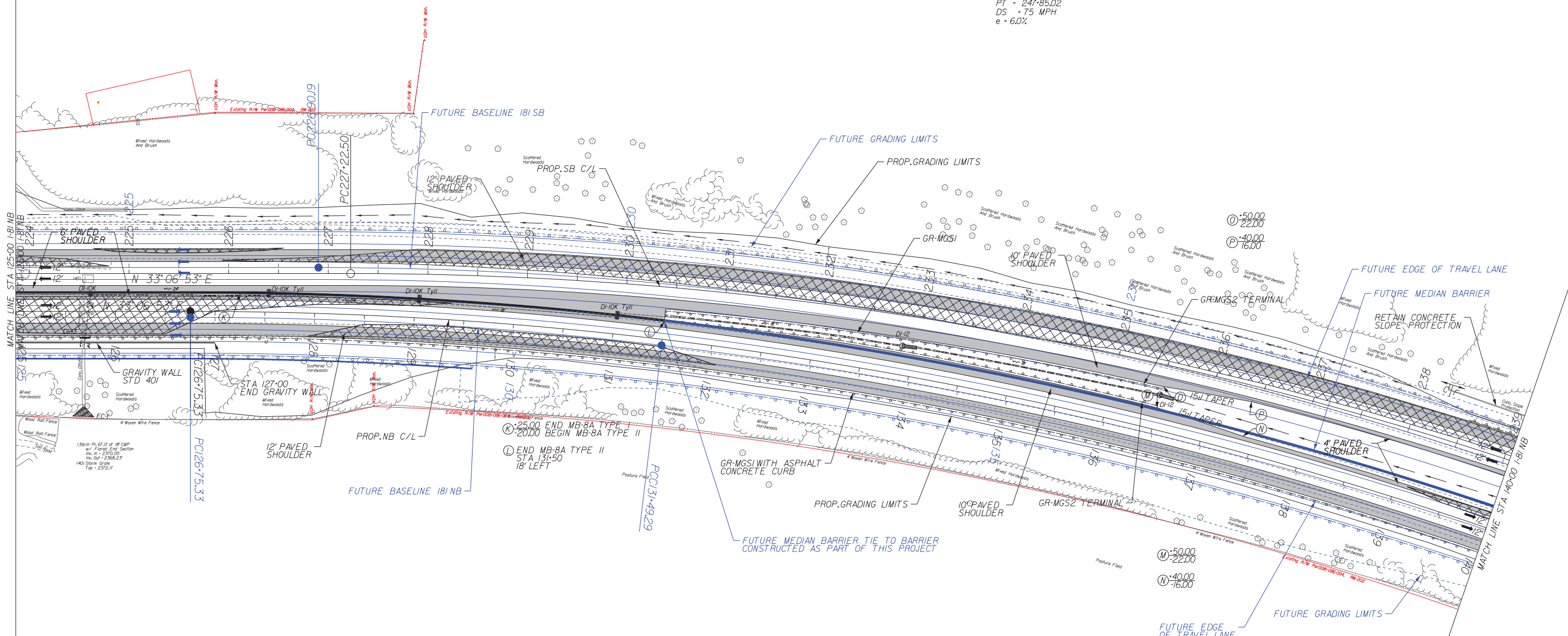


PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY _____
 SUBSURFACE UTILITY BY, DATE _____

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	81	0081-086-742, P101, B659; 0081-086-818, B663	5
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT				
				SCALE 0 50' 100'
VDOT (Division) or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE)		VDOT (Division) or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE)		

FUTURE I-81 SB
 Curve 181SB_FUT3
 PI = 237+49.02
 DELTA = 31° 56' 20.14" (RT)
 D = 1° 32' 55"
 T = 1058.82'
 L = 2062.53'
 R = 3700.00'
 PC = 226+90.19
 PT = 247+52.72

Curve 181RELO-SB22
 PI = 237+81.32
 DELTA = 31° 56' 20.14" (RT)
 D = 1° 32' 55"
 T = 1058.82'
 L = 2062.53'
 R = 3700.00'
 PC = 227+22.50
 PT = 247+85.02
 DS = 75 MPH
 e = 6.0%



FUTURE I-81 NB
 Curve 181NB_FUT2
 PI = 129+12.59
 DELTA = 6° 47' 56.74" (RT)
 D = 1° 26' 04"
 T = 237.26'
 L = 473.95'
 R = 3994.00'
 PC = 126+75.33
 PCC = 131+49.29

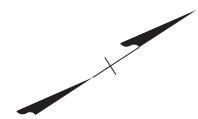
FUTURE I-81 NB
 Curve 181NB_FUT3
 PI = 140+99.61
 DELTA = 25° 38' 08.24" (RT)
 D = 1° 22' 18"
 T = 950.32'
 L = 1868.83'
 R = 4176.86'
 PCC = 131+49.29
 PT = 150+18.12

Curve 181RELO-NB22
 PI = 138+38.76
 DELTA = 32° 26' 04.99" (RT)
 D = 1° 25' 57"
 T = 1163.42'
 L = 2264.37'
 R = 4000.00'
 PC = 126+75.33
 PT = 149+39.70
 DS = 75 MPH
 e = 5.6%

- EXISTING R/W
 - EXISTING UTILITIES
 - FUTURE 6 LANE DESIGN
 - FULL DEPTH PAVEMENT RECONSTRUCTION (TYPICAL)
 - C Denotes Construction Limits In Cuts
 - E Denotes Construction Limits In Fills
- ONLY INTERIM DRAINAGE DESIGN SHOWN

REFERENCES
 (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

Mainline Profile 5A
 Drainage Descr.

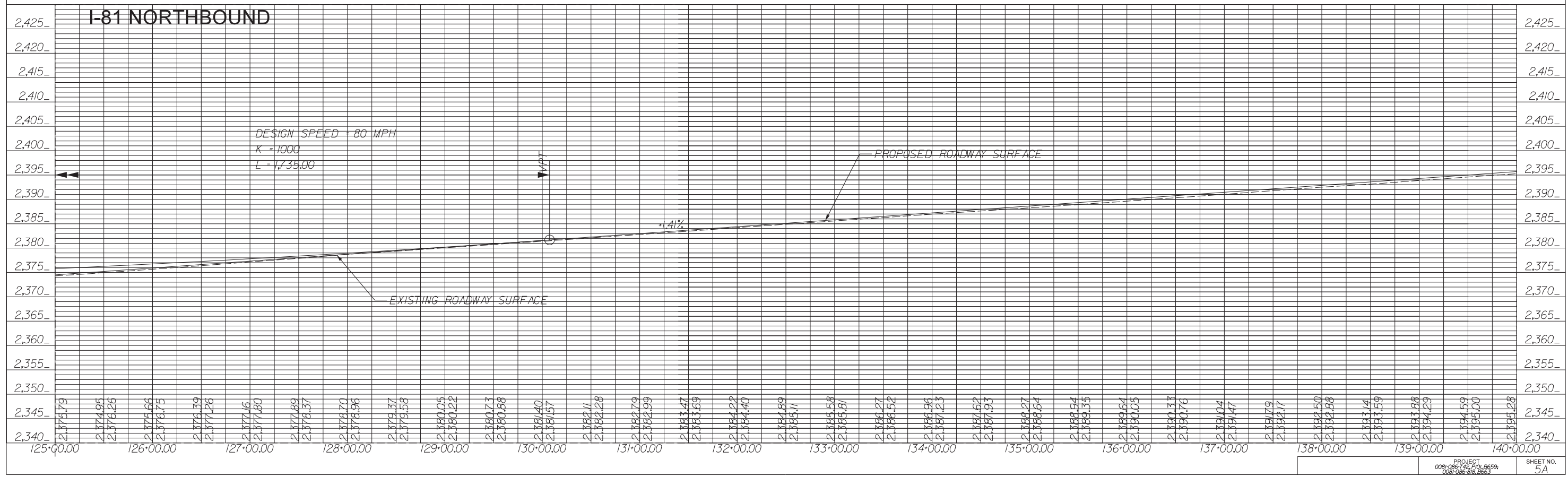
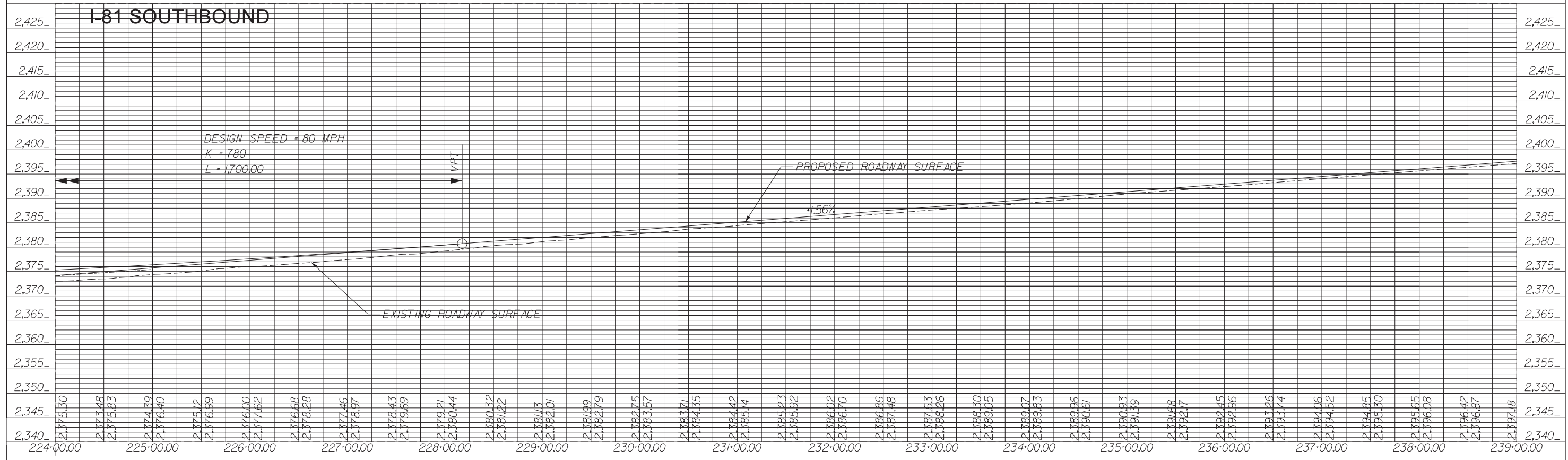
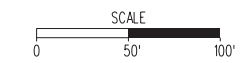


\$TIME\$TAMPS\$

PROJECT MANAGER _____
SURVEYED BY, DATE _____
DESIGN BY _____
SUBSURFACE UTILITY BY, DATE _____

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

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	81	0081-086-742, P101, B659; 0081-086-818, B663	5A



PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY _____
 SUBSURFACE UTILITY BY, DATE _____

REVISED	STATE	ROUTE	STATE 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

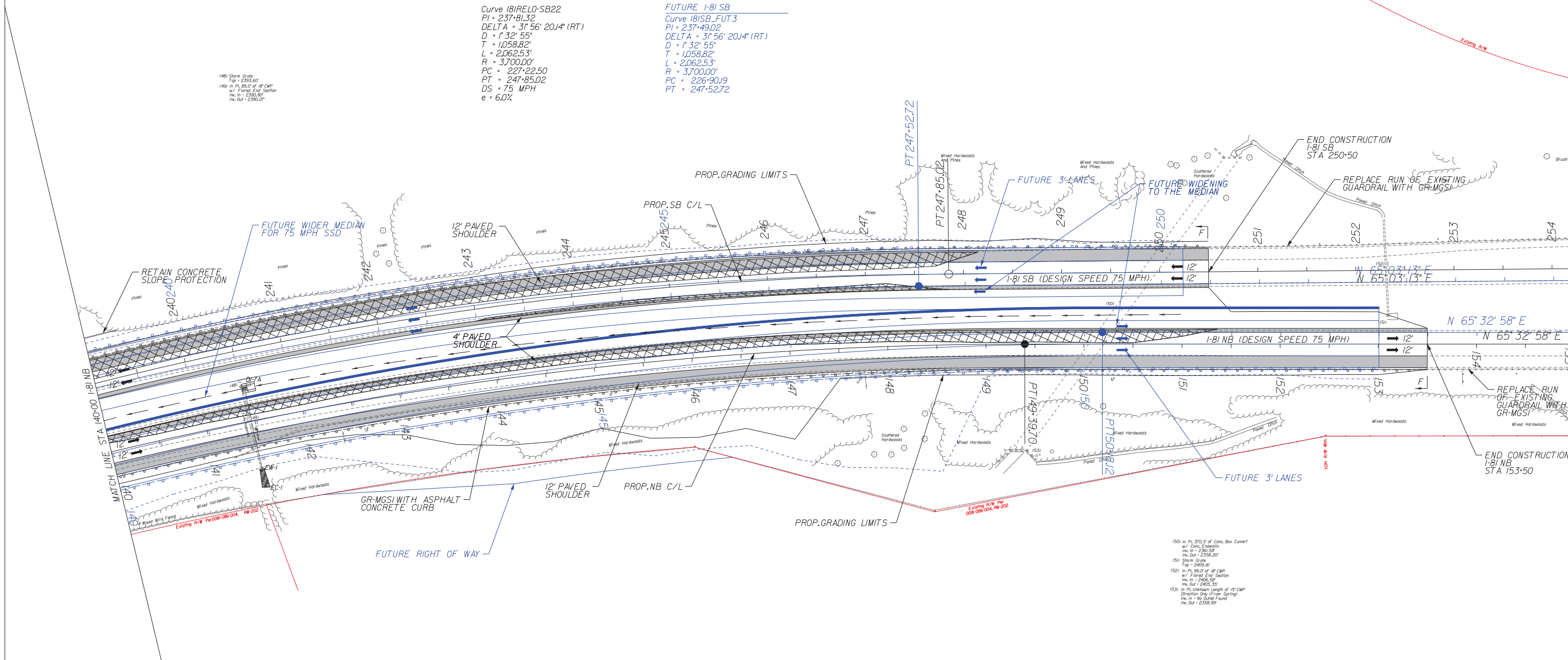
SCALE
 0 50' 100'

VDOT (Division or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE))	VDOT (Division or Co. Name (Location), Virginia (TECHNICAL DISCIPLINE))
---	---

Curve 18IRELO-SB22
 PI = 237-81.32
 DELTA = 31° 56' 20.14" (RT)
 D = 1' 32' 55"
 T = 1,058.82'
 L = 2,062.53'
 R = 3,700.00'
 PC = 227-22.50
 PT = 247-85.02
 DS = 75 MPH
 e = 6.0%

FUTURE I-81 SB
 Curve 18ISB_FUT3
 PI = 237-49.02
 DELTA = 31° 56' 20.14" (RT)
 D = 1' 32' 55"
 T = 1,058.82'
 L = 2,062.53'
 R = 3,700.00'
 PC = 226-90.19
 PT = 247-52.72

1481 Storm Gully
 Top = 2393.60'
 1491 in PI 88.07 of 18' CWP
 w/ 1' Front Slope Section
 Inv. In = 2393.95'
 Inv. Out = 2393.00'



Curve 18IRELO-NB22
 PI = 138-38.76
 DELTA = 32° 26' 04.99" (RT)
 D = 1' 25' 57"
 T = 1,163.42'
 L = 2,264.37'
 R = 4,000.00'
 PC = 126-75.33
 PT = 149-39.70
 DS = 75 MPH
 e = 5.6%

FUTURE I-81 NB
 Curve 18INB_FUT3
 PI = 140-99.61
 DELTA = 25° 38' 08.24" (RT)
 D = 1' 22' 18"
 T = 950.32'
 L = 1,868.83'
 R = 4,176.86'
 PCC = 131-49.29
 PT = 150-18.12

1501 in PI 310.51 of Conc. Box Culvert
 w/ Conc. Endwalls
 Inv. In = 2351.50'
 Inv. Out = 2358.00'
 Storm Gully
 Top = 2400.00'
 1502 in PI 99.07 of 18' CWP
 w/ 1' Front Slope Section
 Inv. In = 2400.50'
 Inv. Out = 2400.50'
 1503 in PI Unknown Length of 18' CWP
 Direction Only (From Surveys)
 Inv. In = No Data Found
 Inv. Out = 2356.99'

- EXISTING R/W
- EXISTING UTILITIES
- FUTURE 6 LANE DESIGN
- FULL DEPTH PAVEMENT RECONSTRUCTION (TYPICAL)
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills
- ONLY INTERIM DRAINAGE DESIGN SHOWN

REFERENCES
 (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)

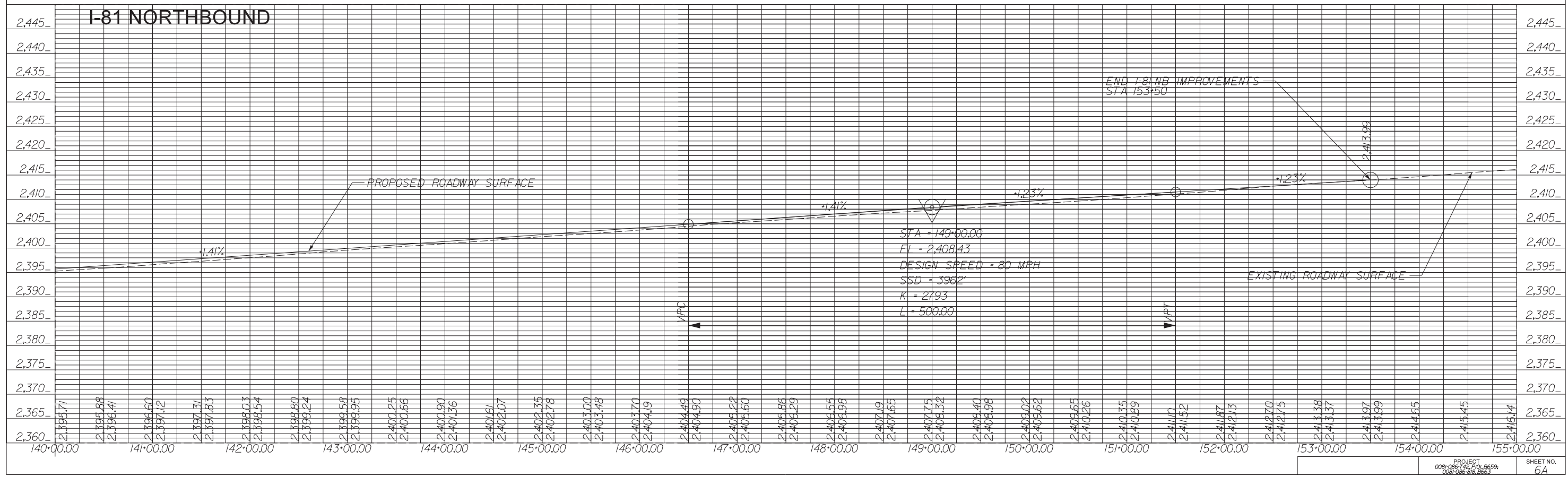
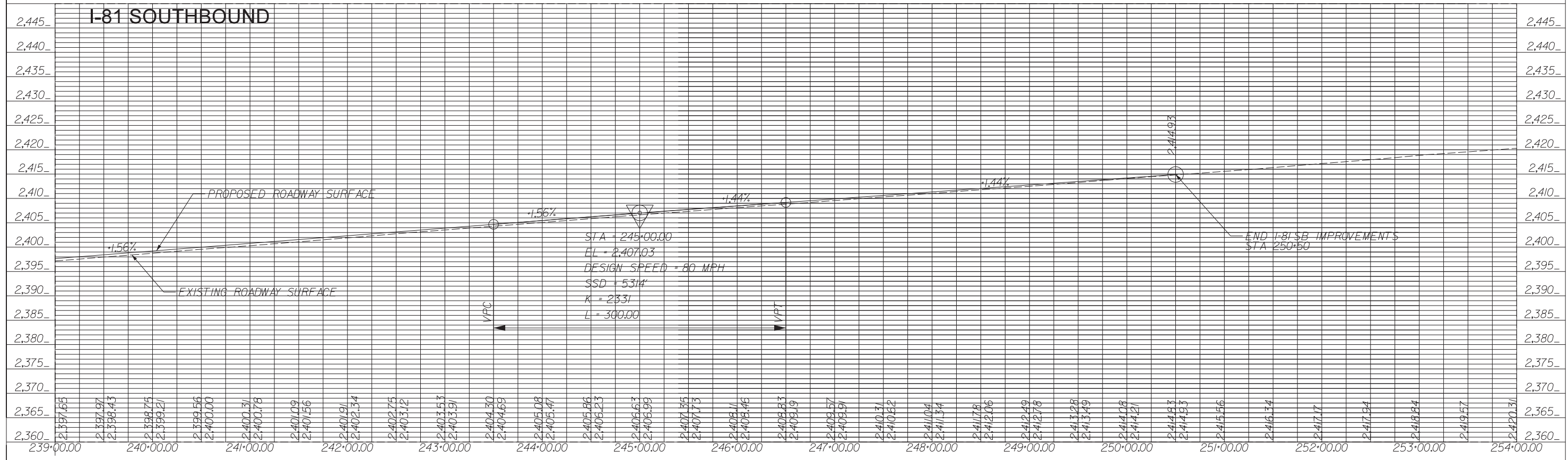
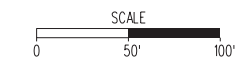
Mainline Profile	6A
Drainage Descr.	

\$TIME\$T\$AMP\$

PROJECT MANAGER _____
SURVEYED BY, DATE _____
DESIGN BY _____
SUBSURFACE UTILITY BY, DATE _____

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

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



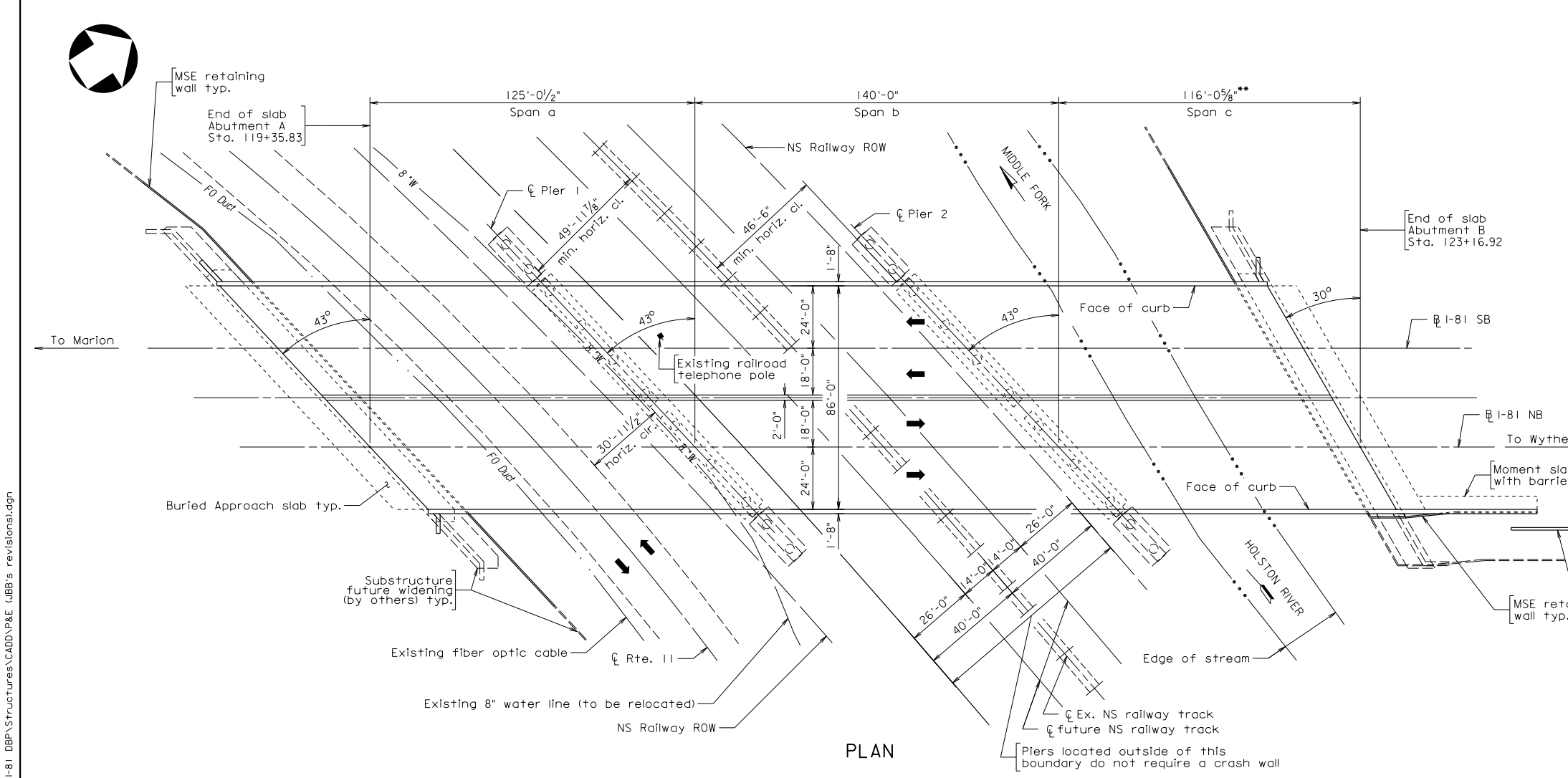
4.3.2 CONCEPTUAL STRUCTURAL PLANS

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

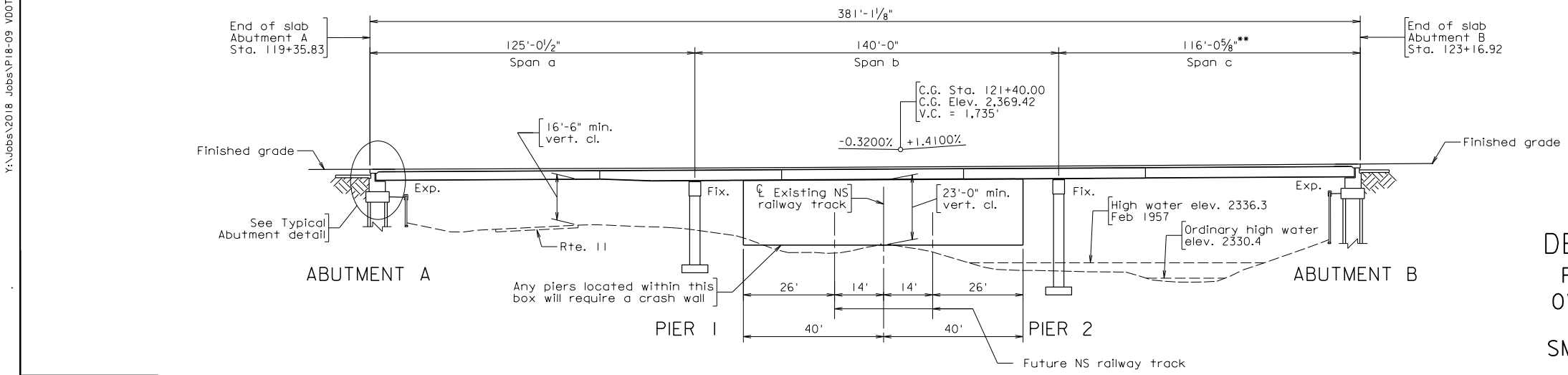
DESIGN EXCEPTION(S):
Use BMB-3A as median barrier.

GENERAL NOTES:
Widths: 42'-0" clear SB roadway, 2'-0" median, 42'-0" clear NB roadway.
Span layout: 125'-0 1/2"-140'-116'-0 5/8" girder spans. (Measured along I-81 NB)
Capacity: HL-93 loading.
Specifications:
Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.
Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.
Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

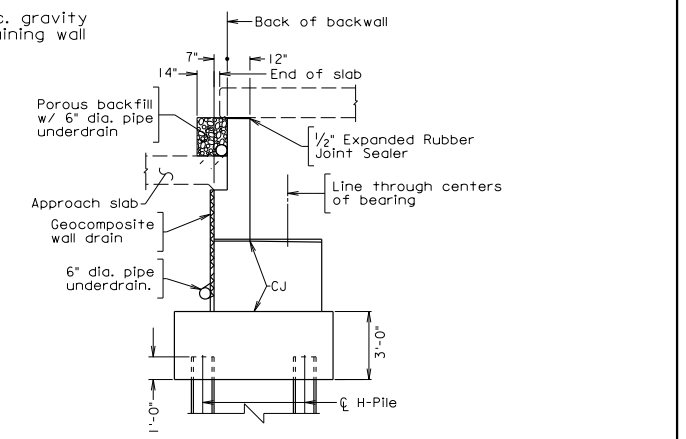
Drainage area: xxx.x sq. mi.
These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.
The existing structures are designated Type B structures in accordance with Sec. 411.
** Note: Span c varies from 106'-11 1/8" to 138'-8 3/8"



PLAN



DEVELOPED SECTION ALONG I-81 NB



TYPICAL ABUTMENT Deck Slab Extension



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

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED
FOR CONSTRUCTION OF BRIDGE

Scale: 1" = 25'-0"

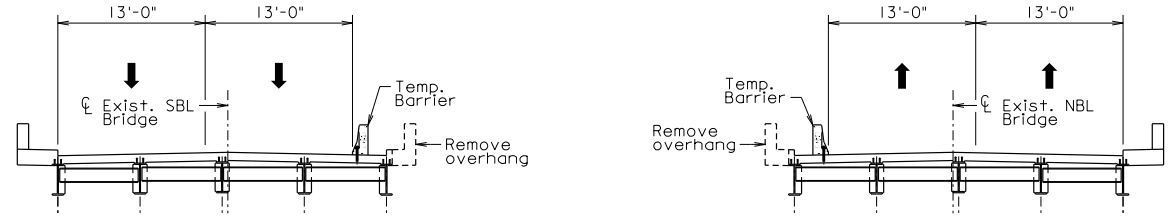
No.	Description	Date

Recommended for Approval: _____ Date _____
Developer
Approved: _____ Date _____
Chief Engineer
Date: December 6, 2018 © 2018, Commonwealth of Virginia Sheet 1 of 3

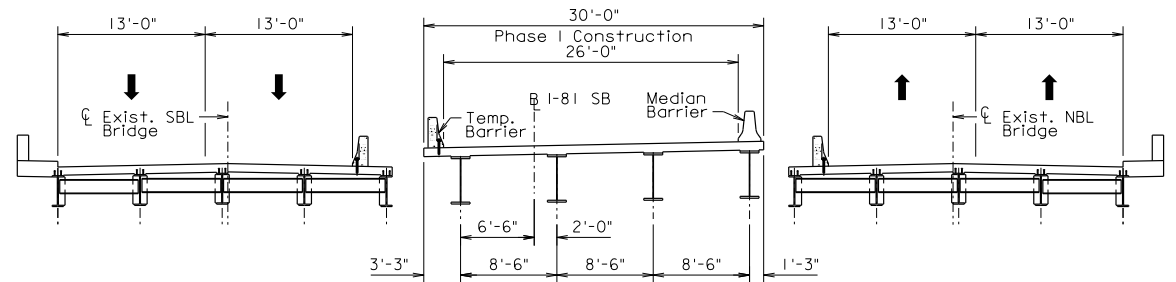
Y:\Jobs\2018 Jobs\PI 18-09 VDOT I-81 DBP\Structures\CADD\P&E (JBB's revisions).dgn

KCI TECHNOLOGIES
STRUCTURAL ENGINEER

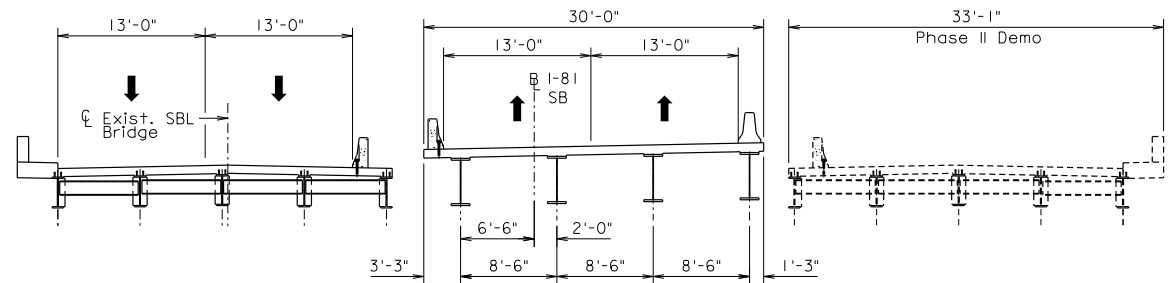
STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-086-742, B659 & 0081-086-818, B663	2



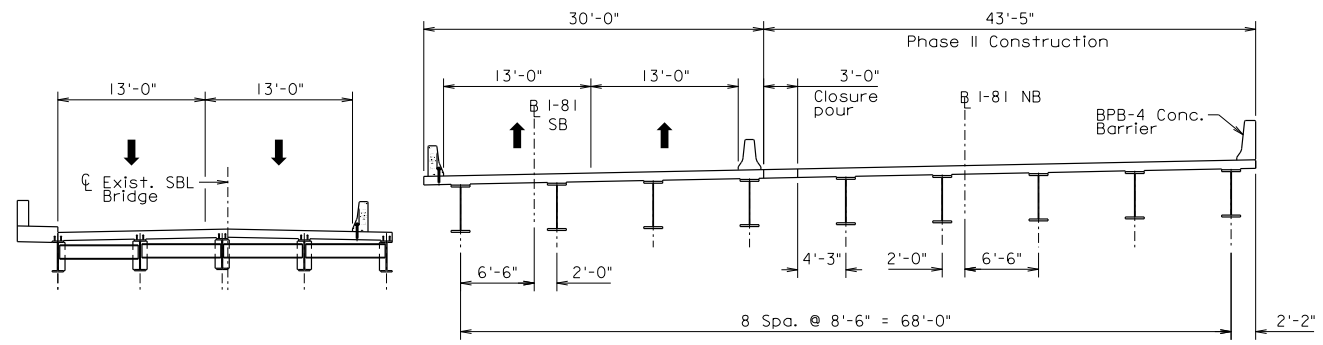
PHASE I DEMOLITION



PHASE I CONSTRUCTION



PHASE II DEMOLITION



PHASE II CONSTRUCTION

PRELIMINARY PLANS
 THESE PLANS NOT TO BE USED
 FOR CONSTRUCTION OF BRIDGE

Y:\Jobs\2018_Jobs\PI 18-09_VDOT I-81_DBP\Structures\CADD\Staging Plan_1 of 2.dgn

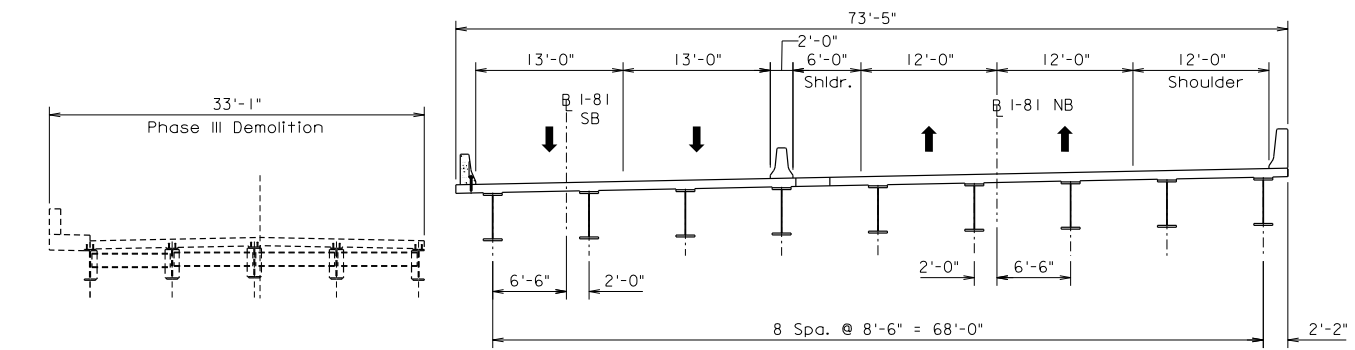
KCI TECHNOLOGIES
 STRUCTURAL ENGINEER

Not to scale unless otherwise noted

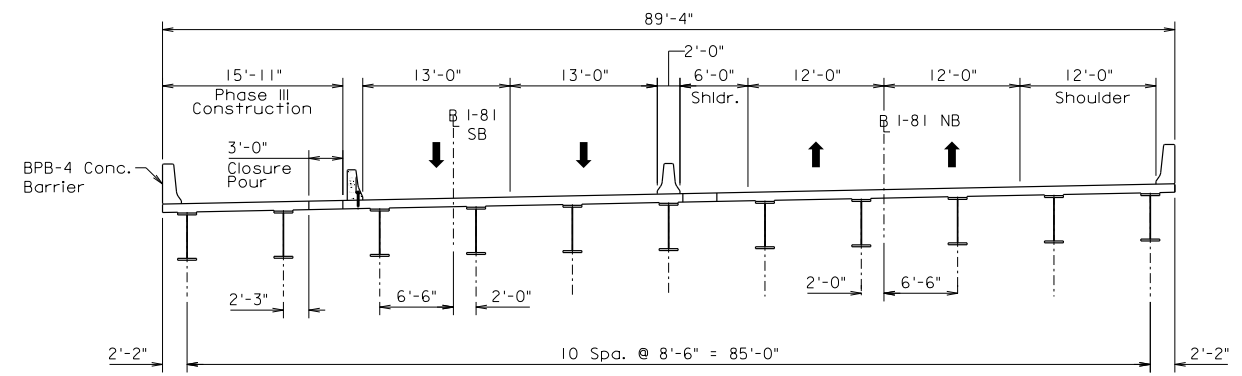
2018, Commonwealth of Virginia

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION				
STRUCTURE AND BRIDGE DIVISION				
STAGING PLAN (SHEET 1 OF 2)				
No.	Description	Date	Designed: DLK Drawn: ... Checked: ...	Sheet No.
	Revisions		Dec. 2018	302-97 2 of 3

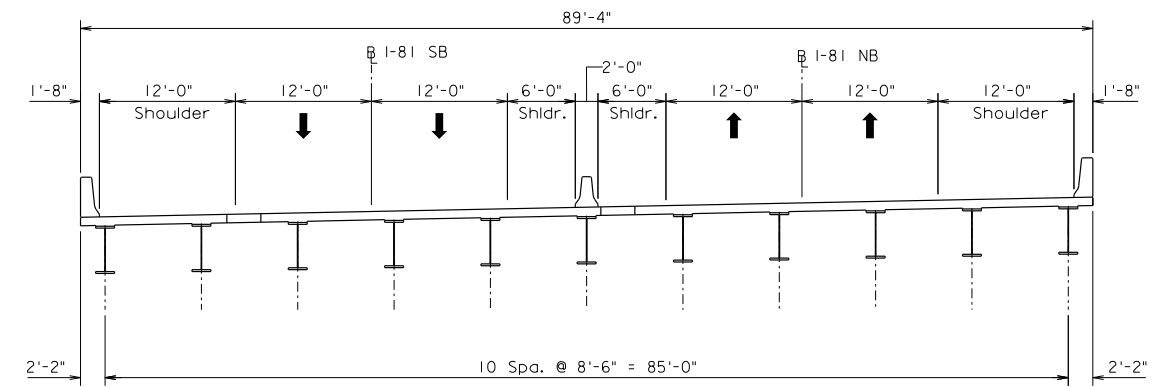
STATE	FEDERAL AID		STATE		SHEET
ROUTE	PROJECT		ROUTE	PROJECT	NO.
VA.			81	0081-086-742, B659 & 0081-086-818, B663	3



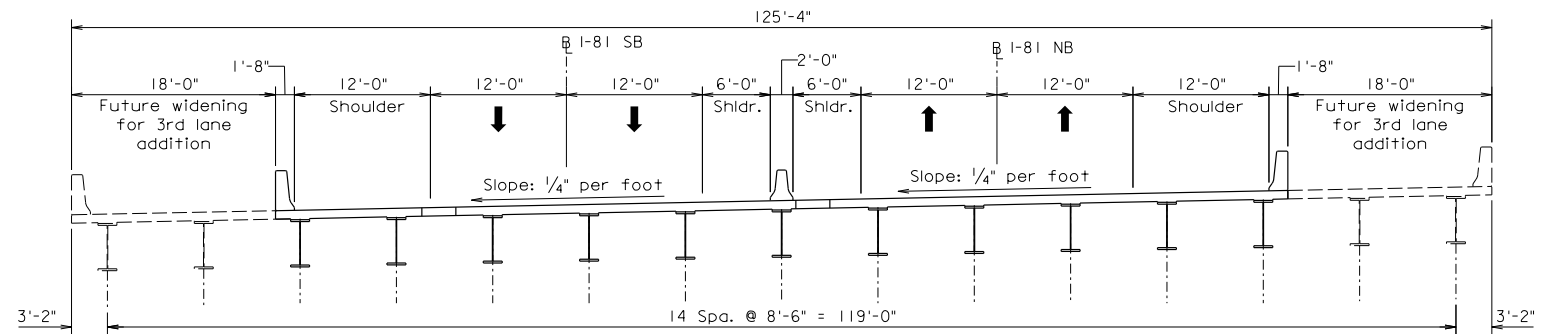
PHASE III DEMOLITION



PHASE III CONSTRUCTION



FINAL CONDITION



FUTURE WIDENING

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED
FOR CONSTRUCTION OF BRIDGE

Y:\Jobs\2018 Jobs\PI 8-09 VDOT I-81 DBP\Structures\CADD\Staging Plan_2 of 2.dgn

KCI TECHNOLOGIES
STRUCTURAL ENGINEER

Not to scale unless otherwise noted

2018, Commonwealth of Virginia

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION STRUCTURE AND BRIDGE DIVISION				
STAGING PLAN (SHEET 2 OF 2)				
No.	Description	Date	Designed: DLK Drawn: ... Checked: ...	Sheet No.
	Revisions		Date: Dec. 2018	Plan No.: 302-97
				3 of 3

4.6.1 PROPOSAL SCHEDULE

Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

Activity ID	Activity Name	Original Duration	Start	Finish	2019												2020												2021												2022														
					N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	
Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Forl					855	Jan-28-19	May-23-22																																																
MILESTONES					855	Jan-28-19	May-23-22																																																
M1030	Notice of Intent to Award	0	Jan-28-19*		◆ Notice of Intent to Award, Jan-28-19*																																																		
M1090	Phase 1 - Start	0	Jan-28-19		◆ Phase 1 - Start, Jan-28-19,																																																		
M1000	Design-Build Contract Execution	0		Mar-22-19*	◆ Design-Build Contract Execution, Mar-22-19*																																																		
M1010	Notice to Proceed	0	Mar-25-19*		◆ Notice to Proceed, Mar-25-19*																																																		
M1110	Construction Start	0	Jul-08-19		◆ Construction Start, Jul-08-19,																																																		
M1040	Phase 1 - Completion	0		Aug-18-20	◆ Phase 1 - Completion, Aug-18-20																																																		
M1050	Phase 2 - Start	0	Aug-19-20		◆ Phase 2 - Start, Aug-19-20,																																																		
M1060	Phase 2 - Completion	0		May-14-21	◆ Phase 2 - Completion, May-14-21																																																		
M1070	Phase 3 - Start	0	May-15-21		◆ Phase 3 - Start, May-15-21,																																																		
M1080	Phase 3 - Completion	0		Apr-22-22	◆ Phase 3 - Completion, Apr-22-22																																																		
M1020	Final Completion	0		May-23-22*	◆ Final Completion, May-23-22*																																																		
M1100	Punchlist	31	Apr-23-22	May-23-22	M1100, Apr-23-22 ◆ Punchlist, May-23-22																																																		
PROJECT MANAGEMENT					794	Mar-25-19	Apr-22-22																																																
PRO100	Submittal - Submission, Approval & Procurement	794	Mar-25-19	Apr-22-22	Mar-25-19 ◆ Submittal - Submission, Approval & Procurement, Apr-22-22																																																		
DESIGN DEVELOPMENT					270	Jan-28-19	Feb-17-20																																																
A1060	Bridge Construction Documents Release	0		Oct-15-19*	◆ Bridge Construction Documents Release, Oct-15-19*																																																		
A1040	100% CD Issue	130	Aug-14-19	Feb-17-20	A1040, Aug-14-19 ◆ 100% CD Issue, Feb-17-20																																																		
Perform Scope Validation Studies					120	Mar-26-19	Jul-25-19																																																
A1000	Scope Validation	120	Mar-26-19	Jul-25-19	A1000, Mar-26-19 ◆ Scope Validation, Jul-25-19																																																		
Identify Supplementary Data Needs					190	Jan-28-19	Oct-23-19																																																
DES1750	Perform Supplemental Surveys	5	Mar-25-19	Mar-29-19*	DES1750, Mar-25-19 ◆ Perform Supplemental Surveys, Mar-29-19*																																																		
DES1880	Update Topographic Mapping	5	Apr-01-19	Apr-05-19	DES1880, Apr-01-19 ◆ Update Topographic Mapping, Apr-05-19																																																		
DES1010	Evaluate Design Optimization	10	Apr-08-19	Apr-19-19	DES1010, Apr-08-19 ◆ Evaluate Design Optimization, Apr-19-19																																																		
DES1140	Schedule / Site Visit with Team	3	Apr-22-19	Apr-24-19	DES1140, Apr-22-19 ◆ Schedule / Site Visit with Team, Apr-24-19																																																		
DES1150	Incorporate Design Optimization	10	Apr-25-19	May-08-19	DES1150, Apr-25-19 ◆ Incorporate Design Optimization, May-08-19																																																		
DES1310	Develop Preliminary MOT Phasing for Early Stage Shoulder Strengthening and Median Work	1	May-09-19	May-09-19	DES1310, May-09-19 ◆ Develop Preliminary MOT Phasing for Early Stage Shoulder Strengthening and Median Work, May-09-19																																																		
DES1330	Sign Survey and SFI Report	5	May-09-19	May-15-19	DES1330, May-09-19 ◆ Sign Survey and SFI Report, May-15-19																																																		
DES1320	Design Survey Coordination Request	10	May-09-19	May-22-19	DES1320, May-09-19 ◆ Design Survey Coordination Request, May-22-19																																																		
DES1350	Environmental Inventory and Report	30	Apr-11-19	May-22-19*	DES1350, Apr-11-19 ◆ Environmental Inventory and Report, May-22-19*																																																		
DES1340	Drainage Pipes, Ditches, Culverts review and SFI Serviceable Condition Assessment Report	20	May-09-19	Jun-06-19	DES1340, May-09-19 ◆ Drainage Pipes, Ditches, Culverts review and SFI Serviceable Condition Assessment Report, Jun-06-19																																																		
DES1360	Conduct Pavement Condition Review and Report	5	Jun-07-19	Jun-13-19	DES1360, Jun-07-19 ◆ Conduct Pavement Condition Review and Report, Jun-13-19																																																		
US 11, Middle Fork, NS railroad					98	Jan-28-19	Jun-13-19																																																
DES1020	Initiate Property Access Approvals for Project	45	Jan-28-19	Mar-29-19	DES1020, Jan-28-19 ◆ Initiate Property Access Approvals for Project, Mar-29-19																																																		
DES1080	English Construction / Flagman Process	5	Apr-01-19	Apr-05-19	DES1080, Apr-01-19 ◆ English Construction / Flagman Process, Apr-05-19																																																		
DES1050	Geotechnical	45	Mar-25-19	May-24-19	DES1050, Mar-25-19 ◆ Geotechnical, May-24-19																																																		
DES1060	Survey	45	Mar-26-19	May-28-19	DES1060, Mar-26-19 ◆ Survey, May-28-19																																																		
DES1070	Determine if Water Line Relocation Required NSR Approvals	45	Apr-11-19	Jun-13-19	DES1070, Apr-11-19 ◆ Determine if Water Line Relocation Required NSR Approvals, Jun-13-19																																																		
Geotechnical plan and Base map					30	Mar-22-19	May-02-19																																																
DES1100	Compile Geotechnical plan and Base maps	2	Mar-22-19	Mar-25-19	DES1100, Mar-22-19 ◆ Compile Geotechnical plan and Base maps, Mar-25-19																																																		
DES1110	Geotechnical Structures	3	Mar-26-19	Mar-28-19	DES1110, Mar-26-19 ◆ Geotechnical Structures, Mar-28-19																																																		
DES1120	Geotechnical Roadway	3	Mar-26-19	Mar-28-19	DES1120, Mar-26-19 ◆ Geotechnical Roadway, Mar-28-19																																																		
DES1130	Geotechnical SWM	3	Mar-26-19	Mar-28-19	DES1130, Mar-26-19 ◆ Geotechnical SWM, Mar-28-19																																																		
DES1160	Prepare Geotechnical Incident Management Plan	2	Mar-29-19	Apr-01-19	DES1160, Mar-29-19 ◆ Prepare Geotechnical Incident Management Plan, Apr-01-19																																																		

- Delay Fragnet
- Dely Fragnet
- Actual Work
- Remaining Work
- Critical Remaining Work
- Milestone
- Summary



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

Activity ID	Activity Name	Original Duration	Start	Finish	2019												2020												2021												2022											
					N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
DES1240	Submit Geotechnical Incident Management and Boring plans	1	Apr-02-19	Apr-02-19	0, Apr-02-19												Submit Geotechnical Incident Management and Boring plans, Apr-02-19																																			
DES1260	SFC Geotechnical Incident Management and Boring Plans VDOT	15	Apr-03-19	Apr-23-19	0, Apr-03-19												SFC Geotechnical Incident Management and Boring Plans VDOT, Apr-23-19																																			
DES1480	A/C Geotechnical Incident Management and Boring plans	3	Apr-24-19	Apr-26-19	480, Apr-24-19												A/C Geotechnical Incident Management and Boring plans, Apr-26-19																																			
DES1570	SFA Geotechnical Incident Management and Boring Plans	1	Apr-29-19	Apr-29-19	1570, Apr-29-19												SFA Geotechnical Incident Management and Boring Plans, Apr-29-19																																			
DES1600	VDOT Approves Geotechnical and Incident Management Plans	3	Apr-30-19	May-02-19	1600, Apr-30-19												VDOT Approves Geotechnical and Incident Management Plans, May-02-19																																			
Supplemental borings		130	Apr-22-19	Oct-23-19													Oct-23-19, Supplemental borings																																			
DES1760	Locate and perform Structure Borings	4	May-29-19*	Jun-03-19	\$1760, May-29-19*												Locate and perform Structure Borings, Jun-03-19																																			
DES1830	Locate and Perform Roadway Borings	3	Jun-04-19	Jun-06-19	DES1830, Jun-04-19												Locate and Perform Roadway Borings, Jun-06-19																																			
DES1920	Locate and Perform SWM Borings	2	Jun-07-19	Jun-10-19	DES1920, Jun-07-19												Locate and Perform SWM Borings, Jun-10-19																																			
DES1960	Compile Boring Logs	1	Jun-11-19	Jun-11-19	DES1960, Jun-11-19												Compile Boring Logs, Jun-11-19																																			
DES2000	Conduct Boring laboratory Analysis Roadway	5	Jun-12-19	Jun-18-19	DES2000, Jun-12-19												Conduct Boring laboratory Analysis Roadway, Jun-18-19																																			
DES2010	Conduct Boring laboratory Analysis Structures	5	Jun-12-19	Jun-18-19	DES2010, Jun-12-19												Conduct Boring laboratory Analysis Structures, Jun-18-19																																			
DES2020	Conduct Boring laboratory Analysis SWM	5	Jun-12-19	Jun-18-19	DES2020, Jun-12-19												Conduct Boring laboratory Analysis SWM, Jun-18-19																																			
DES2120	Conduct Geotechnical Analysis and Recommendations SWM	3	Jun-19-19	Jun-21-19	DES2120, Jun-19-19												Conduct Geotechnical Analysis and Recommendations SWM, Jun-21-19																																			
DES2100	Conduct Geotechnical Analysis and Recommendations Roadway	5	Jun-19-19	Jun-25-19	DES2100, Jun-19-19												Conduct Geotechnical Analysis and Recommendations Roadway, Jun-25-19																																			
DES2110	Conduct Geotechnical Analysis and Recommendations Structures	5	Jun-19-19	Jun-25-19	DES2110, Jun-19-19												Conduct Geotechnical Analysis and Recommendations Structures, Jun-25-19																																			
DES2270	Compile Preliminary Geotechnical Engineering Report	5	Jun-26-19	Jul-02-19	DES2270, Jun-26-19												Compile Preliminary Geotechnical Engineering Report, Jul-02-19																																			
DES2400	SFC Preliminary GER VDOT review	1	Jul-03-19	Jul-03-19	DES2400, Jul-03-19												SFC Preliminary GER VDOT review, Jul-03-19																																			
DES2440	VDOT R/C Preliminary GER	15	Jul-05-19	Jul-25-19	DES2440, Jul-05-19												VDOT R/C Preliminary GER, Jul-25-19																																			
DES2590	A/C Advance Final GER	5	Jul-26-19	Aug-01-19	DES2590, Jul-26-19												A/C Advance Final GER, Aug-01-19																																			
DES2650	SFA VDOT R/C Final GER	15	Aug-02-19	Aug-22-19	DES2650, Aug-02-19												SFA VDOT R/C Final GER, Aug-22-19																																			
DES2830	GER Revisions 1	3	Aug-23-19	Aug-27-19	DES2830, Aug-23-19												GER Revisions 1, Aug-27-19																																			
DES2850	VDOT R/A GER Revision 1	1	Aug-28-19	Aug-28-19	DES2850, Aug-28-19												VDOT R/A GER Revision 1, Aug-28-19																																			
DES2890	VDOT Approves GER revision 1	1	Aug-29-19	Aug-29-19	DES2890, Aug-29-19												VDOT Approves GER revision 1, Aug-29-19																																			
Hydraulic and Hydrologic Analysis		130	Apr-22-19	Oct-23-19													Oct-23-19, Hydraulic and Hydrologic Analysis																																			
DES1170	Perform Project Assessment	2	Apr-22-19	Apr-23-19	170, Apr-22-19												Perform Project Assessment, Apr-23-19																																			
DES1250	Obtain / Develop Hydrologic Modeling	7	Apr-24-19	May-02-19	250, Apr-24-19												Obtain / Develop Hydrologic Modeling, May-02-19																																			
DES1290	Obtain Field Data and Cross Sections	5	May-03-19	May-09-19	1290, May-03-19												Obtain Field Data and Cross Sections, May-09-19																																			
DES1450	Obtain Required Bridge Design Information	2	Aug-28-19	Aug-29-19	DES1450, Aug-28-19												Obtain Required Bridge Design Information, Aug-29-19																																			
DES1470	Develop Hydraulic Model for Floodplain and Bridge Pier Scour Analysis	3	Aug-30-19	Sep-04-19	DES1470, Aug-30-19												Develop Hydraulic Model for Floodplain and Bridge Pier Scour Analysis, Sep-04-19																																			
DES1490	Develop Preliminary H&HA report	3	Sep-05-19	Sep-09-19	DES1490, Sep-05-19												Develop Preliminary H&HA report, Sep-09-19																																			
DES1610	SFC preliminary H&HA report LD-293 form	1	Sep-10-19	Sep-10-19	DES1610, Sep-10-19												SFC preliminary H&HA report LD-293 form, Sep-10-19																																			
DES1630	VDOT R/C Preliminary H&HA Report	15	Sep-11-19	Oct-01-19	DES1630, Sep-11-19												VDOT R/C Preliminary H&HA Report, Oct-01-19																																			
DES1800	A/C H&HA Report	3	Oct-02-19	Oct-04-19	DES1800, Oct-02-19												A/C H&HA Report, Oct-04-19																																			
DES1890	SFC Final H&HA Report VDOT (FEMA)	1	Oct-07-19	Oct-07-19	DES1890, Oct-07-19												SFC Final H&HA Report VDOT (FEMA), Oct-07-19																																			
DES1910	VDOT R/C Final H&HA Report	5	Oct-08-19	Oct-14-19	DES1910, Oct-08-19												VDOT R/C Final H&HA Report, Oct-14-19																																			
DES2050	A/C Final Report	3	Oct-15-19	Oct-17-19	DES2050, Oct-15-19												A/C Final Report, Oct-17-19																																			
DES2070	SFA Final H&HA report	3	Oct-18-19	Oct-22-19	DES2070, Oct-18-19												SFA Final H&HA report, Oct-22-19																																			
DES2180	VDOT Approved H&HA report HOLD POINT - Release	1	Oct-23-19	Oct-23-19	DES2180, Oct-23-19												VDOT Approved H&HA report HOLD POINT - Release, Oct-23-19																																			
Develop Line, Grade, Cross sections		130	Apr-22-19	Oct-23-19													Oct-23-19, Develop Line, Grade, Cross sections																																			
DES1180	Prepare Preliminary Roadway plans	20	Apr-22-19	May-17-19	180, Apr-22-19												Prepare Preliminary Roadway plans, May-17-19																																			
DES1500	Prepare preliminary SWM and Drainage Report	20	May-20-19	Jun-17-19	\$1500, May-20-19												Prepare preliminary SWM and Drainage Report, Jun-17-19																																			
DES1840	SFC VDOT R/C Line Grade SWM Submission	15	Jun-18-19	Jul-09-19	DES1840, Jun-18-19												SFC VDOT R/C Line Grade SWM Submission, Jul-09-19																																			
DES2210	A/C Roadway Line	3	Jul-10-19	Jul-12-19	DES2210, Jul-10-19												A/C Roadway Line, Jul-12-19																																			
DES2220	A/C Drainage, ESC, SWM	5	Jul-10-19	Jul-16-19	DES2220, Jul-10-19												A/C Drainage, ESC, SWM, Jul-16-19																																			
DES2340	SFA Line Grade Resolution	3	Jul-15-19	Jul-17-19	DES2340, Jul-15-19												SFA Line Grade Resolution, Jul-17-19																																			



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

Activity ID	Activity Name	Original Duration	Start	Finish	2019												2020												2021												2022											
					N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
DES2360	SFA SWM Concept Resolution	3	Jul-17-19	Jul-19-19	DES2360, Jul-17-19 SFA SWM Concept Resolution, Jul-19-19																																															
DES2410	VDOT R/A Line Grade Concept Approval	3	Jul-18-19	Jul-22-19	DES2410, Jul-18-19 VDOT R/A Line Grade Concept Approval, Jul-22-19																																															
DES2470	VDOT R/A SWM Concept Approval	1	Oct-23-19	Oct-23-19	DES2470, Oct-23-19 VDOT R/A SWM Concept Approval, Oct-23-19																																															
Early Utility Coordination					92	Apr-22-19	Aug-29-19	▶ Aug-29-19, Early Utility Coordination																																												
DES1190	Preliminary Water Line Design	10	Apr-22-19	May-03-19	190, Apr-22-19 Preliminary Water Line Design, May-03-19																																															
DES1380	Submission to County	1	May-06-19	May-06-19	1380, May-06-19 Submission to County, May-06-19																																															
DES1420	R/C County and VDOT	15	May-07-19	May-28-19	1420, May-07-19 R/C County and VDOT, May-28-19																																															
DES1660	AC County and VDOT Comments	5	May-29-19	Jun-04-19	ES1660, May-29-19 AC County and VDOT Comments, Jun-04-19																																															
DES1720	SFA Water Line plans VDOT, County	1	Jun-05-19	Jun-05-19	DES1720, Jun-05-19 SFA Water Line plans VDOT, County, Jun-05-19																																															
DES1370	Submit to NRS for review	45	May-06-19	Jul-09-19	1370, May-06-19 Submit to NRS for review, Jul-09-19																																															
DES2230	Water Line Relocation Preliminary Plan Approval	1	Aug-29-19	Aug-29-19	DES2230, Aug-29-19 Water Line Relocation Preliminary Plan Approval, Aug-29-19																																															
Maintenance of Traffic - TMP					45	May-10-19	Jul-15-19	▶ Jul-15-19, Maintenance of Traffic - TMP																																												
DES1430	Compile Phase 1 TMP / Incident Management Plan	10	May-10-19	May-23-19	1430, May-10-19 Compile Phase 1 TMP / Incident Management Plan, May-23-19																																															
DES1580	SFC Preliminary Phase 1 TMP MOT Plans / Report	1	May-24-19	May-24-19	S1580, May-24-19 SFC Preliminary Phase 1 TMP MOT Plans / Report, May-24-19																																															
DES1620	VDOT R/C B Phase 1 TMP MOT Plans / Report	15	May-28-19	Jun-17-19	ES1620, May-28-19 VDOT R/C B Phase 1 TMP MOT Plans / Report, Jun-17-19																																															
DES1780	AC Prepare Final TMP / MOT Report	7	Jun-18-19	Jun-26-19	DES1780, Jun-18-19 AC Prepare Final TMP / MOT Report, Jun-26-19																																															
DES1940	SFA MPT / MOT Plans Report	5	Jun-27-19	Jul-03-19	DES1940, Jun-27-19 SFA MPT / MOT Plans Report, Jul-03-19																																															
DES2060	A/C TMP MOT Plans and Report	3	Jul-05-19	Jul-09-19	DES2060, Jul-05-19 A/C TMP MOT Plans and Report, Jul-09-19																																															
DES2150	SFA TMP Report & MOT plan	3	Jul-10-19	Jul-12-19	DES2150, Jul-10-19 SFA TMP Report & MOT plan, Jul-12-19																																															
DES2240	Approved TMP MOT for Construction	1	Jul-15-19	Jul-15-19	DES2240, Jul-15-19 Approved TMP MOT for Construction, Jul-15-19																																															
Early Stage 1 MOT Plans Median and Shoulder Work					64	Apr-22-19	Jul-22-19	▶ Jul-22-19, Early Stage 1 MOT Plans Median and Shoulder Work																																												
DES1200	Early Stage 1 Plans for Shoulder Strengthening and Median Bridge work	10	Apr-22-19	May-03-19	200, Apr-22-19 Early Stage 1 Plans for Shoulder Strengthening and Median Bridge work, May-03-19																																															
DES1390	SFC English Stage 1 MOT Plans for Shoulder and Median	1	May-06-19	May-06-19	1390, May-06-19 SFC English Stage 1 MOT Plans for Shoulder and Median, May-06-19																																															
DES1440	English R/C Plans	10	May-07-19	May-20-19	1440, May-07-19 English R/C Plans, May-20-19																																															
DES1590	A/C Stage 1 MOT Plans	3	May-21-19	May-23-19	S1590, May-21-19 A/C Stage 1 MOT Plans, May-23-19																																															
DES1640	Prepare Final Stage 1 MOT Plans for Shoulder and Median	3	May-24-19	May-29-19	S1640, May-24-19 Prepare Final Stage 1 MOT Plans for Shoulder and Median, May-29-19																																															
DES1670	SFC Final Stage 1 MOT Plans Shoulder and median VDOT	1	May-30-19	May-30-19	ES1670, May-30-19 SFC Final Stage 1 MOT Plans Shoulder and median VDOT, May-30-19																																															
DES1790	VDOT R/C Stage 1 MOT plans	15	Jun-18-19	Jul-09-19	DES1790, Jun-18-19 VDOT R/C Stage 1 MOT plans, Jul-09-19																																															
DES2160	A/C Stage 1 MOT Plans	3	Jul-10-19	Jul-12-19	DES2160, Jul-10-19 A/C Stage 1 MOT Plans, Jul-12-19																																															
DES2250	SFA Stage 1 MOT Plans VDOT	5	Jul-15-19	Jul-19-19	DES2250, Jul-15-19 SFA Stage 1 MOT Plans VDOT, Jul-19-19																																															
DES2370	VDOT Issues Limited Notice to Commence Stage 1 MOT	1	Jul-22-19	Jul-22-19	DES2370, Jul-22-19 VDOT Issues Limited Notice to Commence Stage 1 MOT, Jul-22-19																																															
ESC Plans Early Stage 1 Median work					35	May-09-19	Jun-27-19	▶ Jun-27-19, ESC Plans Early Stage 1 Median work																																												
DES1400	SFC Stage 1 ESC plans (VDOT)	5	May-09-19	May-15-19	1400, May-09-19 SFC Stage 1 ESC plans (VDOT), May-15-19																																															
DES1460	VDOT R/C ESC Stage 1	15	May-16-19	Jun-06-19	S1460, May-16-19 VDOT R/C ESC Stage 1, Jun-06-19																																															
DES1680	AC Stage 1 ESC Plans	5	Jun-07-19	Jun-13-19	DES1680, Jun-07-19 AC Stage 1 ESC Plans, Jun-13-19																																															
DES1730	SFA Stage 1 Plans Comm. Resolution	3	Jun-14-19	Jun-18-19	DES1730, Jun-14-19 SFA Stage 1 Plans Comm. Resolution, Jun-18-19																																															
DES1810	VDOT R/A AFC Stage 1 Plans	5	Jun-19-19	Jun-25-19	DES1810, Jun-19-19 VDOT R/A AFC Stage 1 Plans, Jun-25-19																																															
DES1930	VDOT Approves Stage 1 ESC	1	Jun-26-19	Jun-26-19	DES1930, Jun-26-19 VDOT Approves Stage 1 ESC, Jun-26-19																																															
DES1950	VDOT Issues Limited Notice to Commence Stage 1 ESC	1	Jun-27-19	Jun-27-19	DES1950, Jun-27-19 VDOT Issues Limited Notice to Commence Stage 1 ESC, Jun-27-19																																															
Final Roadway Design Plans					93	Apr-22-19	Aug-30-19	▶ Aug-30-19, Final Roadway Design Plans																																												
DES1740	SFC Roadway plans to English Review	1	Jun-11-19	Jun-11-19	DES1740, Jun-11-19 SFC Roadway plans to English Review, Jun-11-19																																															
DES1770	R/C Roadway Plans English	5	Jun-12-19	Jun-18-19	DES1770, Jun-12-19 R/C Roadway Plans English, Jun-18-19																																															
DES1900	AC Roadway Plans	5	Jun-19-19	Jun-25-19	DES1900, Jun-19-19 AC Roadway Plans, Jun-25-19																																															
DES2030	Prepare Final Roadway Plans	4	Jun-26-19	Jul-01-19	DES2030, Jun-26-19 Prepare Final Roadway Plans, Jul-01-19																																															
DES2080	Schedule OTS review meeting VDOT	1	Jul-02-19	Jul-02-19	DES2080, Jul-02-19 Schedule OTS review meeting VDOT, Jul-02-19																																															
DES2130	OTS Meeting VDOT	1	Jul-03-19	Jul-03-19	DES2130, Jul-03-19 OTS Meeting VDOT, Jul-03-19																																															

Delay Fragnet
 Delay Fragnet
 Actual Work
 Remaining Work
 Critical Remaining Work

Milestone
 Summary



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

Activity ID	Activity Name	Original Duration	Start	Finish	2019												2020												2021												2022											
					N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
DES2170	AC OTS Comments	1	Jul-05-19	Jul-05-19	DES2170, Jul-05-19 AC OTS Comments, Jul-05-19																																															
DES2190	Assemble Final Roadway Plans	4	Jul-08-19	Jul-11-19	DES2190, Jul-08-19 Assemble Final Roadway Plans, Jul-11-19																																															
DES2310	SFC Final Roadway Plans VDOT	1	Jul-12-19	Jul-12-19	DES2310, Jul-12-19 SFC Final Roadway Plans VDOT, Jul-12-19																																															
DES2350	VDOT R/C Final Roadway Plans	15	Jul-15-19	Aug-02-19	DES2350, Jul-15-19 VDOT R/C Final Roadway Plans, Aug-02-19																																															
DES2560	AC Final Roadway Plans	4	Aug-05-19	Aug-08-19	DES2560, Aug-05-19 AC Final Roadway Plans, Aug-08-19																																															
DES2600	SFA Final Roadway Plans (VDOT Acceptance)	3	Aug-09-19	Aug-13-19	DES2600, Aug-09-19 SFA Final Roadway Plans (VDOT Acceptance), Aug-13-19																																															
DES2630	VDOT R/A Final Roadway plans	3	Aug-14-19	Aug-16-19	DES2630, Aug-14-19 VDOT R/A Final Roadway plans, Aug-16-19																																															
DES2680	English / VDOT Signs Roadway Plans Title Sheet	5	Aug-19-19	Aug-23-19	DES2680, Aug-19-19 English / VDOT Signs Roadway Plans Title Sheet, Aug-23-19																																															
DES2730	VDOT Issues Notice to Commence Construction Final Roadway Plans	1	Aug-26-19	Aug-26-19	DES2730, Aug-26-19 VDOT Issues Notice to Commence Construction Final Roadway Plans, Aug-26-19																																															
Advance L&G plans to Final design		35	Apr-22-19	Jun-10-19	Jun-10-19; Advance L&G plans to Final design																																															
DES1210	I-81 Plans	20	Apr-22-19	May-17-19	DES1210, Apr-22-19 I-81 Plans, May-17-19																																															
DES1510	US Route 11 Plans	5	May-20-19	May-24-19	DES1510, May-20-19 US Route 11 Plans, May-24-19																																															
DES1650	Assemble Plans from Disciplines	5	May-28-19	Jun-03-19	DES1650, May-28-19 Assemble Plans from Disciplines, Jun-03-19																																															
DES1690	Cross Sections	5	Jun-04-19	Jun-10-19	DES1690, Jun-04-19 Cross Sections, Jun-10-19																																															
Prepare Drainage plans		15	May-20-19	Jun-10-19	Jun-10-19; Prepare Drainage plans																																															
DES1520	Culverts	12	May-20-19	Jun-05-19	DES1520, May-20-19 Culverts, Jun-05-19																																															
DES1530	Storm Drain	12	May-20-19	Jun-05-19	DES1530, May-20-19 Storm Drain, Jun-05-19																																															
DES1540	Ditches	7	May-28-19	Jun-05-19	DES1540, May-28-19 Ditches, Jun-05-19																																															
DES1550	BMP's	15	May-20-19	Jun-10-19	DES1550, May-20-19 BMP's, Jun-10-19																																															
Prepare Traffic Plans		15	May-20-19	Jun-10-19	Jun-10-19; Prepare Traffic Plans																																															
DES1560	Signing	10	May-20-19	Jun-03-19	DES1560, May-20-19 Signing, Jun-03-19																																															
DES1700	Pavement Marking	5	Jun-04-19	Jun-10-19	DES1700, Jun-04-19 Pavement Marking, Jun-10-19																																															
Maintenance of Traffic Stages 2-4		34	Jul-16-19	Aug-30-19	Aug-30-19; Maintenance of Traffic Stages 2-4																																															
DES2280	Prepare Final Stage 2-4 MOT Plans	1	Jul-16-19	Jul-16-19	DES2280, Jul-16-19 Prepare Final Stage 2-4 MOT Plans, Jul-16-19																																															
DES2320	SFC Final Stage 2-4 MOT plans English	3	Jul-17-19	Jul-19-19	DES2320, Jul-17-19 SFC Final Stage 2-4 MOT plans English, Jul-19-19																																															
DES2380	AC Final Stage 2-4 MOT plans	3	Jul-22-19	Jul-24-19	DES2380, Jul-22-19 AC Final Stage 2-4 MOT plans, Jul-24-19																																															
DES2480	Prepare Final Stage 2-4 MOT Plans	1	Jul-25-19	Jul-25-19	DES2480, Jul-25-19 Prepare Final Stage 2-4 MOT Plans, Jul-25-19																																															
DES2500	SFC VDOT Stage 2-4 MOT plans	15	Jul-26-19	Aug-15-19	DES2500, Jul-26-19 SFC VDOT Stage 2-4 MOT plans, Aug-15-19																																															
DES2620	VDOT R/C Stage 2-4 Submission	4	Aug-16-19	Aug-21-19	DES2620, Aug-16-19 VDOT R/C Stage 2-4 Submission, Aug-21-19																																															
DES2690	AC Stage 2-4 MOT Plans	2	Aug-22-19	Aug-23-19	DES2690, Aug-22-19 AC Stage 2-4 MOT Plans, Aug-23-19																																															
DES2700	SFA VDOT R/A Final MOT Plans	3	Aug-26-19	Aug-28-19	DES2700, Aug-26-19 SFA VDOT R/A Final MOT Plans, Aug-28-19																																															
DES2740	VDOT Stage 2-4 Approval	1	Aug-29-19	Aug-29-19	DES2740, Aug-29-19 VDOT Stage 2-4 Approval, Aug-29-19																																															
DES2750	VDOT Issues Notice to Commence Stage 2-4 MOT Plans	1	Aug-30-19	Aug-30-19	DES2750, Aug-30-19 VDOT Issues Notice to Commence Stage 2-4 MOT Plans, Aug-30-19																																															
Stage 1 Bridge Plans		189	Apr-22-19	Jan-17-20	Jan-17-20; Stage 1 Bridge Plans																																															
DES1220	Prepare Bridge Design Calculations to Support Stage 1 submittal	10	Apr-22-19	May-03-19	DES1220, Apr-22-19 Prepare Bridge Design Calculations to Support Stage 1 submittal, May-03-19																																															
DES1410	Advance Bridge Layout Plans to Support Stage 1 Submittal	20	May-06-19	Jun-03-19	DES1410, May-06-19 Advance Bridge Layout Plans to Support Stage 1 Submittal, Jun-03-19																																															
DES1710	Prepare Stage 1 Bridge Plans and Stage 1 report	15	Jun-04-19	Jun-24-19	DES1710, Jun-04-19 Prepare Stage 1 Bridge Plans and Stage 1 report, Jun-24-19																																															
DES1970	SFC Stage 1 Bridge plans English	1	Jun-25-19	Jun-25-19	DES1970, Jun-25-19 SFC Stage 1 Bridge plans English, Jun-25-19																																															
DES2040	R/C Stage 1 Bridge Plans English	5	Jun-26-19	Jul-02-19	DES2040, Jun-26-19 R/C Stage 1 Bridge Plans English, Jul-02-19																																															
DES2140	AC Stage 1 Bridge plans and Stage 1 Report	5	Jul-03-19	Jul-10-19	DES2140, Jul-03-19 AC Stage 1 Bridge plans and Stage 1 Report, Jul-10-19																																															
DES2290	SFC VDOT Stage 1 Bridge Plans and Stage 1 Report	1	Jul-11-19	Jul-11-19	DES2290, Jul-11-19 SFC VDOT Stage 1 Bridge Plans and Stage 1 Report, Jul-11-19																																															
DES2330	VDOT R/C Stage 1 Bridge Plans and Report	15	Jul-12-19	Aug-01-19	DES2330, Jul-12-19 VDOT R/C Stage 1 Bridge Plans and Report, Aug-01-19																																															
DES2550	AC Stage 1 Bridge plans and report Comments	5	Aug-02-19	Aug-08-19	DES2550, Aug-02-19 AC Stage 1 Bridge plans and report Comments, Aug-08-19																																															
DES2610	Assemble Stage 1 Bridge Plans and Stage 1 Report	10	Aug-09-19	Aug-22-19	DES2610, Aug-09-19 Assemble Stage 1 Bridge Plans and Stage 1 Report, Aug-22-19																																															
DES2710	SFA Stage 1 Bridge Plans VDOT	15	Aug-23-19	Sep-13-19	DES2710, Aug-23-19 SFA Stage 1 Bridge Plans VDOT, Sep-13-19																																															
DES2920	VDOT Accepts Stage 1 Bridge Plans	3	Sep-16-19	Sep-18-19	DES2920, Sep-16-19 VDOT Accepts Stage 1 Bridge Plans, Sep-18-19																																															

■ Delay Fragnet
■ Dely Fragnet
■ Actual Work
■ Remaining Work
■ Critical Remaining Work

◆ Milestone
▾ Summary



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

Activity ID	Activity Name	Original Duration	Start	Finish	2019												2020												2021												2022											
					N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O
Early Foundation and Wall package		41	Aug-30-19	Oct-28-19	Oct-28-19, Early Foundation and Wall package																																															
DES2300	Prepare Design for Early Stage Bridge Foundation and MSE Wall Submittal	5	Aug-30-19	Sep-06-19	DES2300, Aug-30-19 Prepare Design for Early Stage Bridge Foundation and MSE Wall Submittal, Sep-06-19																																															
DES2420	SFC Foundations and MSE Walls to English	1	Sep-09-19	Sep-09-19	DES2420, Sep-09-19 SFC Foundations and MSE Walls to English, Sep-09-19																																															
DES2460	A/C Foundations and MSE Walls submittal	1	Sep-10-19	Sep-10-19	DES2460, Sep-10-19 A/C Foundations and MSE Walls submittal, Sep-10-19																																															
DES2490	Assemble and Submit Early Stage Foundation and MSE Wall Submittal	1	Sep-11-19	Sep-11-19	DES2490, Sep-11-19 Assemble and Submit Early Stage Foundation and MSE Wall Submittal, Sep-11-19																																															
DES2450	R/C Foundation and MSE Walls English	3	Sep-10-19	Sep-12-19	DES2450, Sep-10-19 R/C Foundation and MSE Walls English, Sep-12-19																																															
DES2510	SFC VDOT Early Stage Foundation and MSE Walls	1	Sep-13-19	Sep-13-19	DES2510, Sep-13-19 SFC VDOT Early Stage Foundation and MSE Walls, Sep-13-19																																															
DES2520	R/C VDOT Foundation and MSE Walls	15	Sep-16-19	Oct-04-19	DES2520, Sep-16-19 R/C VDOT Foundation and MSE Walls, Oct-04-19																																															
DES2640	A/C Foundations and MSE Walls	2	Oct-07-19	Oct-08-19	DES2640, Oct-07-19 A/C Foundations and MSE Walls, Oct-08-19																																															
DES2660	SFA VDOT Early Stage Foundation and MSE Walls	10	Oct-09-19	Oct-22-19	DES2660, Oct-09-19 SFA VDOT Early Stage Foundation and MSE Walls, Oct-22-19																																															
DES2770	VDOT Accepts Early Stage Submittal	3	Oct-23-19	Oct-25-19	DES2770, Oct-23-19 VDOT Accepts Early Stage Submittal, Oct-25-19																																															
DES2800	VDOT Issues Notice to Commence for Early Stage Work	1	Oct-28-19	Oct-28-19	DES2800, Oct-28-19 VDOT Issues Notice to Commence for Early Stage Work, Oct-28-19																																															
Stage 2 Bridge Plans		70	Oct-09-19	Jan-17-20	Jan-17-20, Stage 2 Bridge Plans																																															
DES2670	Advance Design Stage 2 Bridge Plans	5	Oct-09-19	Oct-15-19	DES2670, Oct-09-19 Advance Design Stage 2 Bridge Plans, Oct-15-19																																															
DES2720	Prepare Design Calculations to Support Stage 2 Bridge Plans	5	Oct-16-19	Oct-22-19	DES2720, Oct-16-19 Prepare Design Calculations to Support Stage 2 Bridge Plans, Oct-22-19																																															
DES2780	Advance Bridge Layout Plans to Support Stage 2 Submission	5	Oct-23-19	Oct-29-19	DES2780, Oct-23-19 Advance Bridge Layout Plans to Support Stage 2 Submission, Oct-29-19																																															
DES2840	Prepare Stage 2 Bridge Plans	3	Oct-30-19	Nov-01-19	DES2840, Oct-30-19 Prepare Stage 2 Bridge Plans, Nov-01-19																																															
DES2860	SFC Stage 2 Bridge Plans English	1	Nov-04-19	Nov-04-19	DES2860, Nov-04-19 SFC Stage 2 Bridge Plans English, Nov-04-19																																															
2900	R/C Stage 2 Bridge Plans English	3	Nov-05-19	Nov-07-19	2900, Nov-05-19 R/C Stage 2 Bridge Plans English, Nov-07-19																																															
DES2930	AC Stage 2 Bridge Plans	3	Nov-08-19	Nov-12-19	DES2930, Nov-08-19 AC Stage 2 Bridge Plans, Nov-12-19																																															
DES2940	SFC Stage 2 Bridge Plans VDOT	15	Nov-13-19	Dec-04-19	DES2940, Nov-13-19 SFC Stage 2 Bridge Plans VDOT, Dec-04-19																																															
DES2960	VDOT R/A Stage 2 Bridge Plans	3	Dec-05-19	Dec-09-19	DES2960, Dec-05-19 VDOT R/A Stage 2 Bridge Plans, Dec-09-19																																															
DES2980	A/C VDOT Stage 2 Bridge Plans	3	Dec-10-19	Dec-12-19	DES2980, Dec-10-19 A/C VDOT Stage 2 Bridge Plans, Dec-12-19																																															
DES2990	SFA VDOT Stage 2 Bridge Plans	15	Dec-13-19	Jan-06-20	DES2990, Dec-13-19 SFA VDOT Stage 2 Bridge Plans, Jan-06-20																																															
DES3000	VDOT accepts Stage 2 Bridge Plans	3	Jan-07-20	Jan-09-20	DES3000, Jan-07-20 VDOT accepts Stage 2 Bridge Plans, Jan-09-20																																															
DES3010	English / VDOT Signs Bridge plans Title Sheet	5	Jan-10-20	Jan-16-20	DES3010, Jan-10-20 English / VDOT Signs Bridge plans Title Sheet, Jan-16-20																																															
DES3020	VDOT issues Notice to Commence AFC Bridge plans	1	Jan-17-20	Jan-17-20	DES3020, Jan-17-20 VDOT issues Notice to Commence AFC Bridge plans, Jan-17-20																																															
Sound wall design		48	Mar-22-19	May-29-19	May-29-19, Sound wall design																																															
DES1030	Confirm Sound wall Design is Not Required	4	Mar-22-19	Mar-27-19	DES1030, Mar-22-19 Confirm Sound wall Design is Not Required, Mar-27-19																																															
DES1850	Sound wall design	4	May-23-19	May-29-19	DES1850, May-23-19 Sound wall design, May-29-19																																															
Permitting Environmental		74	Mar-22-19	Jul-05-19	Jul-05-19, Permitting Environmental																																															
DES1040	Compile / Complete VPDES Construction Permit Registration Forms	10	Mar-22-19	Apr-04-19	DES1040, Mar-22-19 Compile / Complete VPDES Construction Permit Registration Forms, Apr-04-19																																															
DES1230	SFA VPDES Permit	3	Apr-05-19	Apr-09-19	DES1230, Apr-05-19 SFA VPDES Permit, Apr-09-19																																															
DES1270	VDOT R/A Construction Permit	1	Apr-10-19	Apr-10-19	DES1270, Apr-10-19 VDOT R/A Construction Permit, Apr-10-19																																															
DES1280	VDOT Secures VPDES Construction Permit	60	Apr-11-19	Jul-05-19	DES1280, Apr-11-19 VDOT Secures VPDES Construction Permit, Jul-05-19																																															
Threatened & Endangered Species Studies		33	May-23-19	Jul-10-19	Jul-10-19, Threatened & Endangered Species Studies																																															
DES1860	Perform Presence Northern Long-eared Bat	5	May-23-19	May-30-19	DES1860, May-23-19 Perform Presence Northern Long-eared Bat, May-30-19																																															
DES1980	Prepare T&E Mitigation Measures	5	May-31-19	Jun-06-19	DES1980, May-31-19 Prepare T&E Mitigation Measures, Jun-06-19																																															
DES2090	SFA Mitigation Measures Northern Long-eared Bat	3	Jun-07-19	Jun-11-19	DES2090, Jun-07-19 SFA Mitigation Measures Northern Long-eared Bat, Jun-11-19																																															
DES2200	VDOT R/A Mitigation Measures if Applicable	15	Jun-12-19	Jul-02-19	DES2200, Jun-12-19 VDOT R/A Mitigation Measures if Applicable, Jul-02-19																																															
DES2530	SFA Presence / Absence Findings Northern Long-eared Bat	5	Jul-03-19	Jul-10-19	DES2530, Jul-03-19 SFA Presence / Absence Findings Northern Long-eared Bat, Jul-10-19																																															
DES2570	VDOT R/A Presence / Absence Findings Northern Long-eared Bat	21	Jun-11-19	Jul-10-19	DES2570, Jun-11-19 VDOT R/A Presence / Absence Findings Northern Long-eared Bat, Jul-10-19																																															
Water of US Permit		91	May-06-19	Sep-12-19	Sep-12-19, Water of US Permit																																															
DES1870	Confirm Preliminary Waters of US Delineations	5	May-23-19	May-30-19	DES1870, May-23-19 Confirm Preliminary Waters of US Delineations, May-30-19																																															
DES1990	Prepare Water of US Delineation Report	10	May-31-19	Jun-13-19	DES1990, May-31-19 Prepare Water of US Delineation Report, Jun-13-19																																															
DES2260	SFA Waters of US Delineation / Jurisdiction Determination of Wetlands	5	Jun-14-19	Jun-20-19	DES2260, Jun-14-19 SFA Waters of US Delineation / Jurisdiction Determination of Wetlands, Jun-20-19																																															

- ▬ Delay Fragnet
- ▬ Dely Fragnet
- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work

- ◆ Milestone
- ▬ Summary



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

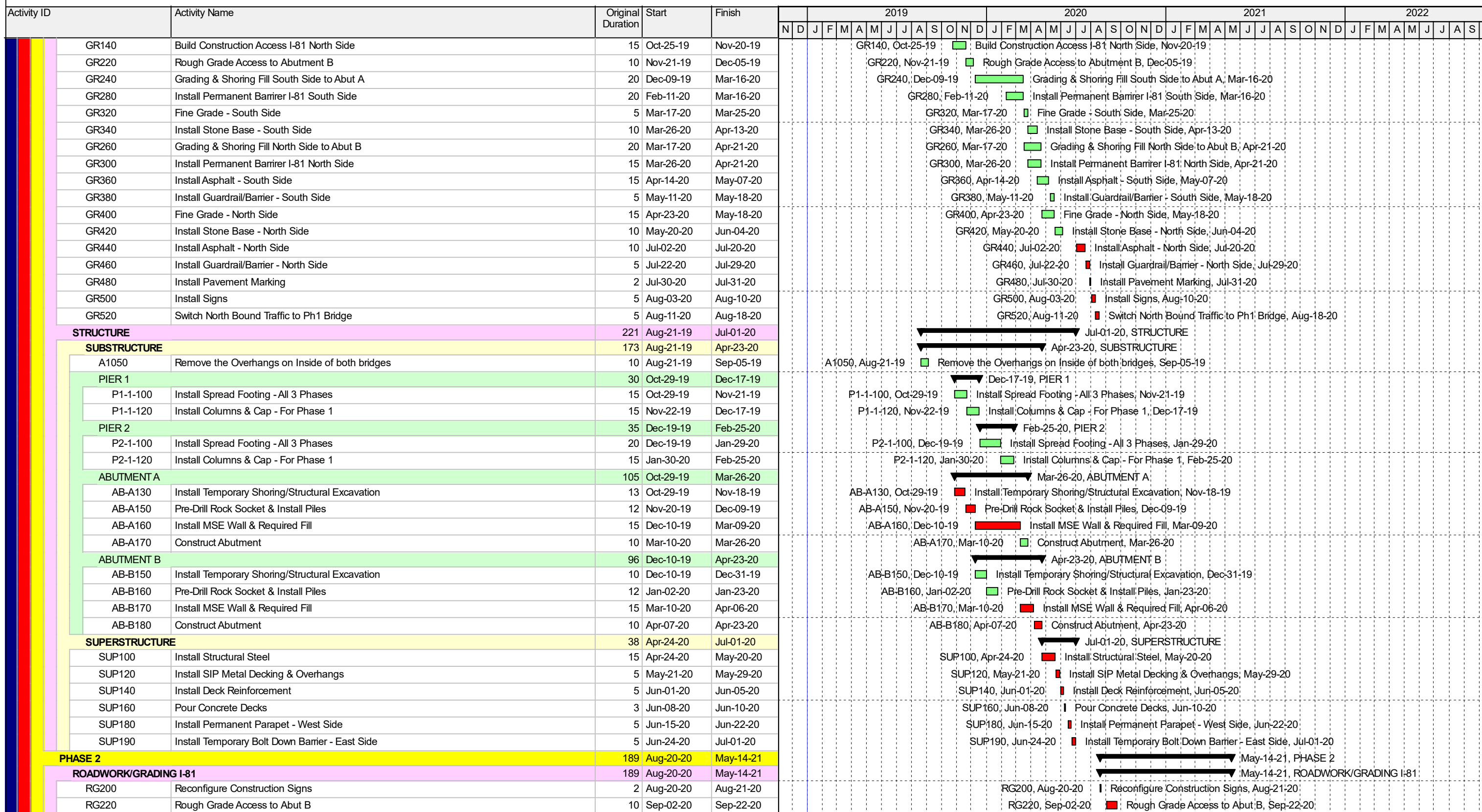
Activity ID	Activity Name	Original Duration	Start	Finish	2019												2020												2021												2022																							
					N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D										
DES2390	Agency Approval of Jurisdictional Determination Request	30	Jun-21-19	Aug-02-19	DES2390, Jun-21-19												Agency Approval of Jurisdictional Determination Request, Aug-02-19																																															
DES2760	Develop Impact Plates - Confirm No ilImpacts to Jurisdictional Determination of Waters of US	2	Aug-05-19	Aug-06-19	DES2760, Aug-05-19												Develop Impact Plates - Confirm No ilImpacts to Jurisdictional Determination of Waters of US, Aug-06-19																																															
DES2790	SFA Project Permit Requirements is not Required	3	Aug-07-19	Aug-09-19	DES2790, Aug-07-19												SFA Project Permit Requirements is not Required, Aug-09-19																																															
DES2810	Develop Documentation that a project Permit is not Required	5	Aug-12-19	Aug-16-19	DES2810, Aug-12-19												Develop Documentation that a project Permit is not Required, Aug-16-19																																															
DES2870	Agencies Confirm Project Permit Requirements	15	Aug-19-19	Sep-09-19	DES2870, Aug-19-19												Agencies Confirm Project Permit Requirements, Sep-09-19																																															
DES2950	Provide VDOT with Project Permit Requirements Conformation form Agencies	3	Sep-10-19	Sep-12-19	DES2950, Sep-10-19												Provide VDOT with Project Permit Requirements Conformation form Agencies, Sep-12-19																																															
Pollution Prevention Plan		64	May-06-19	Aug-05-19													Aug-05-19, Pollution Prevention Plan																																															
DES2430	Compile Pollution Prevention Plan	10	May-06-19	May-17-19	DES2430, May-06-19												Compile Pollution Prevention Plan, May-17-19																																															
DES2540	SFC Pollution Prevention Plan VDOT Rev.	3	May-20-19	May-22-19	DES2540, May-20-19												SFC Pollution Prevention Plan VDOT Rev., May-22-19																																															
DES2580	VDOT R/C Pollution Prevention Plan	21	May-23-19	Jun-21-19	DES2580, May-23-19												VDOT R/C Pollution Prevention Plan, Jun-21-19																																															
DES2820	AC Compile Final Pollution prevention plan	5	Jun-24-19	Jun-28-19	DES2820, Jun-24-19												AC Compile Final Pollution prevention plan, Jun-28-19																																															
DES2880	SFA Final Pollution Prevention Plan	1	Jul-01-19	Jul-01-19	DES2880, Jul-01-19												SFA Final Pollution Prevention Plan, Jul-01-19																																															
DES2910	VDOT R/A Final Pollution Prevention plan	21	Jul-02-19	Jul-31-19	DES2910, Jul-02-19												VDOT R/A Final Pollution Prevention plan, Jul-31-19																																															
DES2970	VDOT Approves Final Pollution prevention plan	3	Aug-01-19	Aug-05-19	DES2970, Aug-01-19												VDOT Approves Final Pollution prevention plan, Aug-05-19																																															
PUBLIC INVOLVEMENT		834	Jan-28-19	Apr-22-22													Apr-22-22, PUBLIC																																															
PI100	Public Involvement - Design	230	Mar-25-19	Feb-17-20	PI100, Mar-25-19												Public Involvement - Design, Feb-17-20																																															
PI110	Public Involvement - Construction Phase 1	399	Jan-28-19	Aug-18-20	PI110, Jan-28-19												Public Involvement - Construction Phase 1, Aug-18-20																																															
PI120	Public Involvement - Construction Phase 2	190	Aug-19-20	May-14-21	PI120, Aug-19-20												Public Involvement - Construction Phase 2, May-14-21																																															
PI130	Public Involvement - Construction Phase 3	245	May-17-21	Apr-22-22	PI130, May-17-21												Public Involvement - Construction Phase 3, Apr-22-22																																															
CONSTRUCTION		834	Jan-28-19	Apr-22-22													Apr-22-22, CONST																																															
ROADWORK RT.11		369	Sep-13-19	Aug-23-21													Aug-23-21, ROADWORK RT.11																																															
UT100	Relocate Water Line Next to Rt. 11	10	Sep-13-19	Sep-30-19	UT100, Sep-13-19												Relocate Water Line Next to Rt. 11, Sep-30-19																																															
UT150	Install Shoulder & Ditch	10	Jul-05-21	Jul-21-21													UT150, Jul-05-21												Install Shoulder & Ditch, Jul-21-21																																			
UT110	Storm Drain	15	Jul-05-21	Jul-29-21													UT110, Jul-05-21												Storm Drain, Jul-29-21																																			
UT120	Mill & Overlay	15	Jul-23-21	Aug-16-21													UT120, Jul-23-21												Mill & Overlay, Aug-16-21																																			
UT140	Install Pavement Markings	2	Aug-17-21	Aug-18-21													UT140, Aug-17-21												Install Pavement Markings, Aug-18-21																																			
UT130	Replace Guardrail	2	Aug-19-21	Aug-23-21													UT130, Aug-19-21												Replace Guardrail, Aug-23-21																																			
PHASE 1		399	Jan-28-19	Aug-18-20													Aug-18-20, PHASE 1																																															
MOBILIZATION & FIELD OFFICE SETUP		80	Mar-25-19	Aug-15-19													Aug-15-19, MOBILIZATION & FIELD OFFICE SETUP																																															
MOB120	Establish Initial Survey Bench Marks	30	Mar-25-19	May-16-19	MOB120, Mar-25-19												Establish Initial Survey Bench Marks, May-16-19																																															
MOB100	Determine Location for the Field Office	30	Jun-24-19	Aug-15-19	MOB100, Jun-24-19												Determine Location for the Field Office, Aug-15-19																																															
MOB140	Submit crane plan to FAA	10	Jul-29-19	Aug-15-19	MOB140, Jul-29-19												Submit crane plan to FAA, Aug-15-19																																															
RAILROAD		220	Jan-28-19	Mar-05-20													Mar-05-20, RAILROAD																																															
RR120	Rail Road training/certification	5	Mar-27-19	Apr-04-19	RR120, Mar-27-19												Rail Road training/certification, Apr-04-19																																															
RR100	Obtain Right of Entry on Railroad Property	45	Jan-28-19	Apr-22-19	RR100, Jan-28-19												Obtain Right of Entry on Railroad Property, Apr-22-19																																															
RR180	Install Ballast Protection	1	Feb-18-20	Feb-18-20													RR180, Feb-18-20												Install Ballast Protection, Feb-18-20																																			
RR200	Install Temporary Barrier Fence (10' from track)	2	Feb-20-20	Feb-21-20													RR200, Feb-20-20												Install Temporary Barrier Fence (10' from track), Feb-21-20																																			
RR140	Install Temporary Rail-Crossing for Phase 2	5	Feb-18-20	Feb-25-20													RR140, Feb-18-20												Install Temporary Rail-Crossing for Phase 2, Feb-25-20																																			
RR160	Install Track Protection	5	Feb-27-20	Mar-05-20													RR160, Feb-27-20												Install Track Protection, Mar-05-20																																			
ROADWORK/GRADING I-81		274	Jul-24-19	Aug-18-20													Aug-18-20, ROADWORK/GRADING I-81																																															
GR100	Install Construction Signs	5	Jul-24-19	Jul-30-19	GR100, Jul-24-19												Install Construction Signs, Jul-30-19																																															
GR250	Install Temporary Barriers	10	Aug-19-19	Sep-04-19	GR250, Aug-19-19												Install Temporary Barriers, Sep-04-19																																															
GR270	Strengthen Shoulder on Outside of South Bound Lane	20	Jul-31-19	Sep-04-19	GR270, Jul-31-19												Strengthen Shoulder on Outside of South Bound Lane, Sep-04-19																																															
GR160	Build Construction Access I-81 - South Side	10	Sep-05-19	Sep-23-19	GR160, Sep-05-19												Build Construction Access I-81 - South Side, Sep-23-19																																															
GR180	Clear & Grub @ Median	5	Sep-16-19	Sep-23-19	GR180, Sep-16-19												Clear & Grub @ Median, Sep-23-19																																															
GR200	Rough Grade Access to Abutment A	15	Oct-01-19	Oct-24-19	GR200, Oct-01-19												Rough Grade Access to Abutment A, Oct-24-19																																															

- Delay Fragnet
- Dely Fragnet
- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work

- ◆ Milestone
- ➔ Summary



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

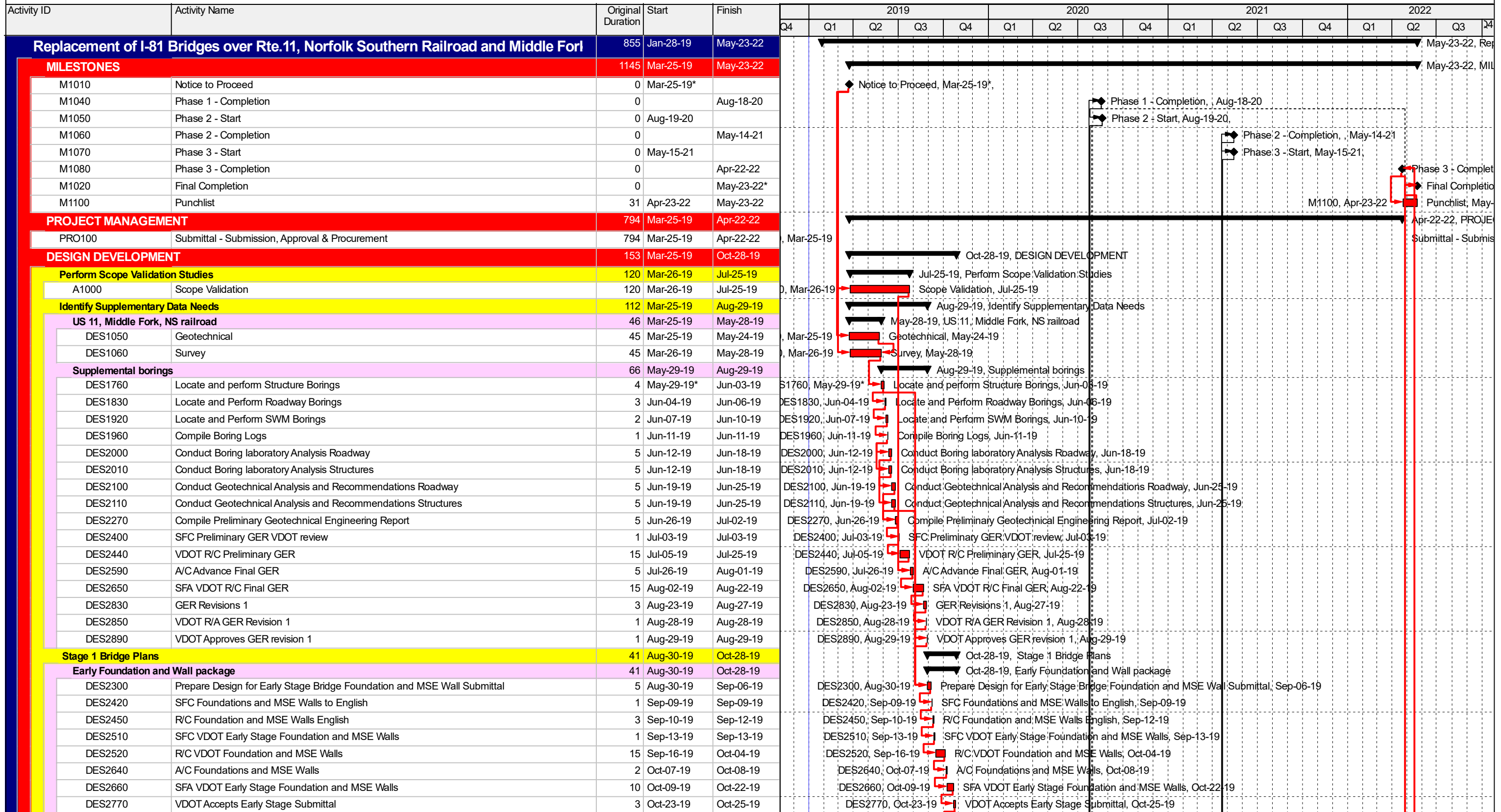


- █ Delay Fragnet
- █ Delay Fragnet
- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work
- ◆ Milestone
- Summary



Figure 18 // Critical Path

Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River



- Delay Fragnet
- Dely Fragnet
- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work

- ◆ Milestone
- Summary



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

Activity ID	Activity Name	Original Duration	Start	Finish	2019				2020				2021				2022						
					Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4		
DES2800	VDOT Issues Notice to Commence for Early Stage Work	1	Oct-28-19	Oct-28-19																			
PUBLIC INVOLVEMENT					834	Jan-28-19	Apr-22-22																
PI100	Public Involvement - Design	230	Mar-25-19	Feb-17-20																			
PI110	Public Involvement - Construction Phase 1	399	Jan-28-19	Aug-18-20																			
PI120	Public Involvement - Construction Phase 2	190	Aug-19-20	May-14-21																			
PI130	Public Involvement - Construction Phase 3	245	May-17-21	Apr-22-22																			
CONSTRUCTION					641	Oct-29-19	Apr-22-22																
PHASE 1					206	Oct-29-19	Aug-18-20																
ROADWORK/GRADING I-81					33	Jul-02-20	Aug-18-20																
GR440	Install Asphalt - North Side	10	Jul-02-20	Jul-20-20																			
GR460	Install Guardrail/Barrier - North Side	5	Jul-22-20	Jul-29-20																			
GR480	Install Pavement Marking	2	Jul-30-20	Jul-31-20																			
GR500	Install Signs	5	Aug-03-20	Aug-10-20																			
GR520	Switch North Bound Traffic to Ph1 Bridge	5	Aug-11-20	Aug-18-20																			
STRUCTURE					173	Oct-29-19	Jul-01-20																
SUBSTRUCTURE					125	Oct-29-19	Apr-23-20																
ABUTMENT A					92	Oct-29-19	Mar-09-20																
AB-A130	Install Temporary Shoring/Structural Excavation	13	Oct-29-19	Nov-18-19																			
AB-A150	Pre-Drill Rock Socket & Install Piles	12	Nov-20-19	Dec-09-19																			
AB-A160	Install MSE Wall & Required Fill	15	Dec-10-19	Mar-09-20																			
ABUTMENT B					33	Mar-10-20	Apr-23-20																
AB-B170	Install MSE Wall & Required Fill	15	Mar-10-20	Apr-06-20																			
AB-B180	Construct Abutment	10	Apr-07-20	Apr-23-20																			
SUPERSTRUCTURE					38	Apr-24-20	Jul-01-20																
SUP100	Install Structural Steel	15	Apr-24-20	May-20-20																			
SUP120	Install SIP Metal Decking & Overhangs	5	May-21-20	May-29-20																			
SUP140	Install Deck Reinforcement	5	Jun-01-20	Jun-05-20																			
SUP160	Pour Concrete Decks	3	Jun-08-20	Jun-10-20																			
SUP180	Install Permanent Parapet - West Side	5	Jun-15-20	Jun-22-20																			
SUP190	Install Temporary Bolt Down Barrier - East Side	5	Jun-24-20	Jul-01-20																			
PHASE 2					189	Aug-20-20	May-14-21																
ROADWORK/GRADING I-81					189	Aug-20-20	May-14-21																
RG200	Reconfigure Construction Signs	2	Aug-20-20	Aug-21-20																			
RG220	Rough Grade Access to Abut B	10	Sep-02-20	Sep-22-20																			
RG240	Rough Grade Access to Abut A	10	Sep-23-20	Oct-07-20																			
RG260	Grade Fill South Side to Abut A	10	Oct-09-20	Oct-27-20																			
RG320	Fine Grade - South Side	5	Oct-28-20	Nov-03-20																			
RG340	Install Stone Base - South Side	10	Nov-04-20	Nov-20-20																			
RG280	Grade Fill North Side to Abut B	10	Nov-23-20	Dec-09-20																			
RG400	Fine Grade - North Side	10	Dec-11-20	Dec-31-20																			
RG360	Install Asphalt - South Side	10	Mar-02-21	Mar-18-21																			
RG420	Install Stone Base - North Side	10	Mar-02-21	Mar-18-21																			
RG440	Install Asphalt - North Side	10	Mar-19-21	Apr-07-21																			
RG380	Install Guardrail/Barrier - South Side	5	Apr-09-21	Apr-16-21																			
RG460	Install Guardrail/Barrier - North Side	5	Apr-19-21	Apr-28-21																			
RG480	Install Pavement Marking	5	Apr-29-21	May-05-21																			

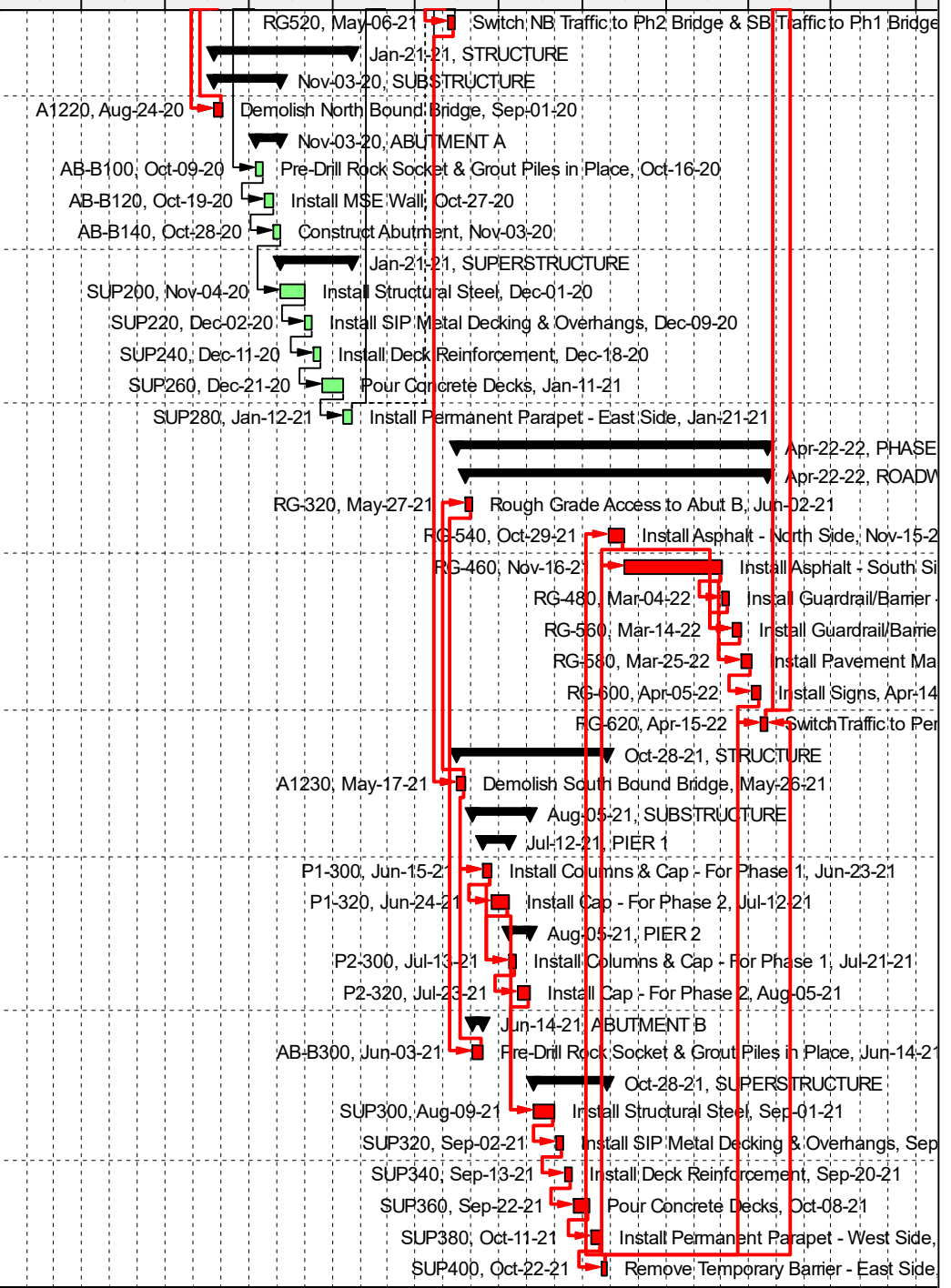
- Delay Fragnet
- Delay Fragnet
- █ Actual Work
- █ Remaining Work
- █ Critical Remaining Work

- ◆ Milestone
- Summary



Replacement of I-81 Bridges over Rte.11, Norfolk Southern Railroad and Middle Fork Holston River

Activity ID	Activity Name	Original Duration	Start	Finish	2019					2020				2021				2022											
					Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4								
RG520	Switch NB Traffic to Ph2 Bridge & SB Traffic to Ph1 Bridge	5	May-06-21	May-14-21																									
STRUCTURE					80	Aug-24-20	Jan-21-21																						
SUBSTRUCTURE					40	Aug-24-20	Nov-03-20																						
A1220	Demolish North Bound Bridge	5	Aug-24-20	Sep-01-20																									
ABUTMENT A					15	Oct-09-20	Nov-03-20																						
AB-B100	Pre-Drill Rock Socket & Grout Piles in Place	5	Oct-09-20	Oct-16-20																									
AB-B120	Install MSE Wall	5	Oct-19-20	Oct-27-20																									
AB-B140	Construct Abutment	5	Oct-28-20	Nov-03-20																									
SUPERSTRUCTURE					40	Nov-04-20	Jan-21-21																						
SUP200	Install Structural Steel	15	Nov-04-20	Dec-01-20																									
SUP220	Install SIP Metal Decking & Overhangs	5	Dec-02-20	Dec-09-20																									
SUP240	Install Deck Reinforcement	5	Dec-11-20	Dec-18-20																									
SUP260	Pour Concrete Decks	10	Dec-21-20	Jan-11-21																									
SUP280	Install Permanent Parapet - East Side	5	Jan-12-21	Jan-21-21																									
PHASE 3					245	May-17-21	Apr-22-22																						
ROADWORK/GRADING I-81					237	May-27-21	Apr-22-22																						
RG-320	Rough Grade Access to Abut B	5	May-27-21	Jun-02-21																									
RG-540	Install Asphalt - North Side	10	Oct-29-21	Nov-15-21																									
RG-460	Install Asphalt - South Side	10	Nov-16-21	Mar-03-22																									
RG-480	Install Guardrail/Barrier - South Side	5	Mar-04-22	Mar-11-22																									
RG-560	Install Guardrail/Barrier - North Side	5	Mar-14-22	Mar-23-22																									
RG-580	Install Pavement Marking	5	Mar-25-22	Apr-04-22																									
RG-600	Install Signs	5	Apr-05-22	Apr-14-22																									
RG-620	Switch Traffic to Permanent Configuration	5	Apr-15-22	Apr-22-22																									
STRUCTURE					90	May-17-21	Oct-28-21																						
A1230	Demolish South Bound Bridge	5	May-17-21	May-26-21																									
SUBSTRUCTURE					35	Jun-03-21	Aug-05-21																						
PIER 1					15	Jun-15-21	Jul-12-21																						
P1-300	Install Columns & Cap - For Phase 1	5	Jun-15-21	Jun-23-21																									
P1-320	Install Cap - For Phase 2	10	Jun-24-21	Jul-12-21																									
PIER 2					15	Jul-13-21	Aug-05-21																						
P2-300	Install Columns & Cap - For Phase 1	5	Jul-13-21	Jul-21-21																									
P2-320	Install Cap - For Phase 2	10	Jul-23-21	Aug-05-21																									
ABUTMENT B					5	Jun-03-21	Jun-14-21																						
AB-B300	Pre-Drill Rock Socket & Grout Piles in Place	5	Jun-03-21	Jun-14-21																									
SUPERSTRUCTURE					45	Aug-09-21	Oct-28-21																						
SUP300	Install Structural Steel	15	Aug-09-21	Sep-01-21																									
SUP320	Install SIP Metal Decking & Overhangs	5	Sep-02-21	Sep-09-21																									
SUP340	Install Deck Reinforcement	5	Sep-13-21	Sep-20-21																									
SUP360	Pour Concrete Decks	10	Sep-22-21	Oct-08-21																									
SUP380	Install Permanent Parapet - West Side	5	Oct-11-21	Oct-21-21																									
SUP400	Remove Temporary Barrier - East Side	5	Oct-22-21	Oct-28-21																									



- Delay Fragnet
 - Delay Fragnet
 - Actual Work
 - Remaining Work
 - Critical Remaining Work
- ◆ Milestone
 - Summary

