Original

Technical Proposal

VOLUME I

MARCH 3, 2021

I-81 WIDENING

MM 136.6 to MM 141.8

Roanoke County and
City of Salem, Virginia

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

Federal Project No.: NHPP-0812 (330)

Contract ID Number: C00116203DB108

LANE CORMAN KOKOSING

Lane-Corman I-81 Widening JV
in association with Rinker Design Associates, PC

4.1 Letter of Submittal

Lane-Corman I-81 Widening JV

14500 Avion Parkway, Suite 200
Chantilly, VA 20151

March 3, 2021

Commonwealth of Virginia
Department of Transportation (VDOT)
1401 E. Broad Street
Richmond, Virginia 23219
Attention: Bryan Stevenson, P.E. DBIA (APD Division)

RE: I-81 Widening MM 136.6 to MM 141.8
State Project No.: 0081-080-946, P101, R201, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688; Federal Project No.: NHPP-0812 (330); Contract ID Number: C00116203DB108

Dear Mr. Stevenson:

Lane-Corman I-81 Widening JV (**Lane-Corman**), comprised of **The Lane Construction Corporation (Lane)** and **Corman Kokosing Construction Company (Corman)**, is pleased to submit this Technical Proposal for the above referenced project to the Virginia Department of Transportation (VDOT). Our response contains all information requested in the RFP dated October 28, 2020 and Addenda 1-4.

Lane-Corman is teamed with **Rinker Design Associates, PC (RDA),** Lead Designer, to provide the Virginia Department of Transportation (VDOT) a Team with a solid reputation for completing complex projects innovatively, on time, and often ahead of schedule. Our Team's experience enables us to deliver the high quality and technically sound project that both VDOT and the public expects. Our Team has taken every opportunity to include enhancements, provide value-added features, diligently manage and mitigate risks, and reduce both construction and long-term maintenance costs. By focusing on our safety, quality, public information, and environmental protection programs, VDOT, the traveling public, business and residential stakeholders will benefit by the successful completion of this Project.

4.1.1 Offeror's Full Legal Name:

Lane-Corman I-81 Widening JV
90 Fieldstone Court
Cheshire, CT 06410

4.1.2 Declaration of Intent: It is Lane-Corman's intent, if selected, to enter into a contract with VDOT for the Project in accordance with the terms of the RFP.

4.1.3 120-Day Declaration: Pursuant to Part 1, Section 8.2, we declare that the offer represented by the Technical and Price Proposal will remain in full force and effect for one hundred twenty (120) days after the date the Price Proposal is submitted to VDOT.

4.1.4 Offeror's Point of Contact Information: Mr. Richard McDonough is the authorized representative and Point of Contact for the Lane-Corman Team for all matters associated with this submittal.

Richard McDonough, Director, Bid Development
14500 Avion Parkway, Suite 200
Chantilly, VA 20151
Tel: (703) 222-5670 Fax: (703) 222-5960
Email: RAMcdonough@laneconstruct.com

4.1.5 Offeror's Principal Officer Information: Mr. Mark Schiller is a Principal Officer of Lane-Corman.

Mark Schiller, President & CEO (The Lane Construction Corporation)
90 Fieldstone Court
Cheshire, CT 06410
Tel: (203) 235-3351 Fax: (203) 237-4260
Email: MASchiller@laneconstruct.com

4.1.6 Final Completion Date: Lane-Corman proposes a Final Completion Date of November 26, 2025.

4.1.7 Unique Milestone Dates: Lane-Corman proposes the following Unique Milestone Dates:

- I-81 Southbound Substantial Completion: July 2, 2025
- I-81 Northbound Substantial Completion: August 29, 2025

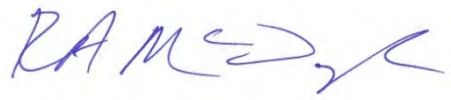
4.1.8 Proposal Payment Agreement: An executed Proposal Payment Agreement (Attachment 9.3.1) can be found in the Appendix of Volume 1.

4.1.9 Certification Regarding Debarment Forms: Certifications for Debarment for Primary and Lower Tier Transactions can be found in the Appendix of Volume 1.

4.1.10 DBE Statement: The Lane-Corman Team is committed to meeting the 9% DBE participation goal for the entire value of the contract.

The Lane-Corman Team appreciates the opportunity to provide our Proposal for this extremely important project. We look forward to working closely with VDOT and stakeholders in our development and delivery to make the I-81 Widening project a landmark success for the citizens of Virginia.

Respectfully submitted,



Richard McDonough
Director, Bid Development
The Lane Construction Corporation

4.2 Offeror's Qualifications

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4.2.1 Qualifications of Key Personnel

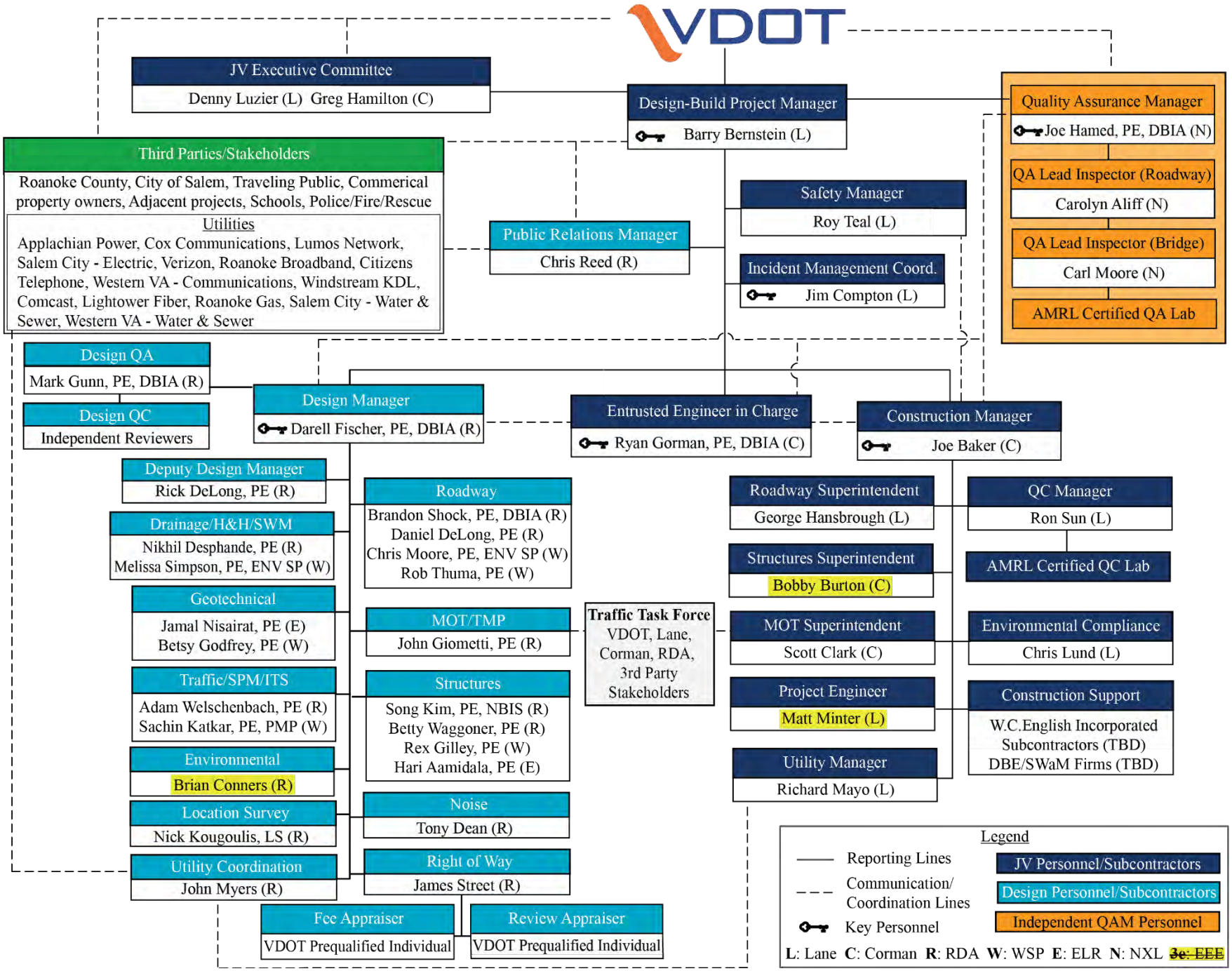
Since the submission of our Statement of Qualifications (SOQ) dated July 8, 2020, the Lane-Corman Team has made the following Non-Key Personnel changes which were approved by VDOT on February 16, 2021:

- Mr. Doug Fraser (3e), Environmental Lead - 3e was ruled in conflict due to having their "on call" contract for this Project enacted by VDOT after our SOQ shortlist. He has been replaced by Mr. Brian Conners (RDA).
- Mr. Bill Potempa, Project Engineer, is no longer with Lane. He has been replaced by Mr. Matt Minter (Lane).
- Mr. Glenn Robertson, Structures Superintendent, is no longer with Corman. He has been replaced by Mr. Bobby Burton (Corman).

The Lane-Corman Team confirms that all other information presented in the SOQ remains true and accurate in accordance with Part 1, Section 11.4. The Lane-Corman Team will remain intact for the duration of the contract.

4.2.2 Organizational Chart

Under the leadership of our Design-Build Project Manager (DBPM), Mr. Barry Bernstein, the Lane-Corman Team is structured to effectively manage and deliver the design and construction of the Project. The Lane-Corman Team is organized to provide VDOT with a single-source point of contact, responsible for all design and construction activities. Our Team organization has a straightforward chain of command, with individual tasks, lines of communication, and functional responsibilities clearly identified. Our organizational chart identifies key personnel and major functions to be performed for the successful management, design, and construction of this project. Though reporting relationships are rigid, communication within our Team will remain fluid and flexible to meet the requirements of each individual project task. Communication needs from team members to their VDOT counterparts will be directed and authorized in advance by Mr. Bernstein and the VDOT Project Manager. Our updated Team organization chart is included on the following page with the changes, previously approved by VDOT in accordance with Part 1, Section 11.4, highlighted in yellow.


VDOT
JV Executive Committee
Denny Luzier (L) Greg Hamilton (C)
Design-Build Project Manager
Barry Bernstein (L)
Quality Assurance Manager
Joe Hamed, PE, DBIA (N)
QA Lead Inspector (Roadway)
Carolyn Aliff (N)
QA Lead Inspector (Bridge)
Carl Moore (N)
AMRL Certified QA Lab
Third Parties/Stakeholders
Roanoke County, City of Salem, Traveling Public, Commerical property owners, Adjacent projects, Schools, Police/Fire/Rescue
Utilities
Applachian Power, Cox Communications, Lumos Network, Salem City - Electric, Verizon, Roanoke Broadband, Citizens Telephone, Western VA - Communications, Windstream KDL, Comcast, Lightower Fiber, Roanoke Gas, Salem City - Water & Sewer, Western VA - Water & Sewer
Public Relations Manager
Chris Reed (R)
Safety Manager
Roy Teal (L)
Incident Management Coord.
Jim Compton (L)
Design QA
Mark Gunn, PE, DBIA (R)
Design QC
Independent Reviewers
Design Manager
Darell Fischer, PE, DBIA (R)
Entrusted Engineer in Charge
Ryan Gorman, PE, DBIA (C)
Construction Manager
Joe Baker (C)
Deputy Design Manager
Rick DeLong, PE (R)
Roadway
Brandon Shock, PE, DBIA (R)
Daniel DeLong, PE (R)
Chris Moore, PE, ENV SP (W)
Rob Thuma, PE (W)
Roadway Superintendent
George Hansbrough (L)
QC Manager
Ron Sun (L)
AMRL Certified QC Lab
Drainage/H&H/SWM
Nikhil Desphande, PE (R)
Melissa Simpson, PE, ENV SP (W)
Structures Superintendent
Bobby Burton (C)
Geotechnical
Jamal Nisairat, PE (E)
Betsy Godfrey, PE (W)
MOT/TMP
John Giometti, PE (R)
Traffic Task Force
VDOT, Lane, Corman, RDA, 3rd Party Stakeholders
MOT Superintendent
Scott Clark (C)
Environmental Compliance
Chris Lund (L)
Traffic/SPM/ITS
Adam Welschenbach, PE (R)
Sachin Katkar, PE, PMP (W)
Structures
Song Kim, PE, NBIS (R)
Betty Waggoner, PE (R)
Rex Gilley, PE (W)
Hari Aamidala, PE (E)
Project Engineer
Matt Minter (L)
Construction Support
W.C.English Incorporated
Subcontractors (TBD)
DBE/SWaM Firms (TBD)
Environmental
Brian Conners (R)
Utility Manager
Richard Mayo (L)
Location Survey
Nick Kougoulis, LS (R)
Noise
Tony Dean (R)
Utility Coordination
John Myers (R)
Right of Way
James Street (R)
Fee Appraiser
VDOT Prequalified Individual
Review Appraiser
VDOT Prequalified Individual
Legend
Reporting Lines
Communication/ Coordination Lines
Key Personnel
JV Personnel/Subcontractors
Design Personnel/Subcontractors
Independent QAM Personnel
L: Lane C: Corman R: RDA W: WSP E: ELR N: NXL ~~3e: EEE~~

4.3 Design Concept

4.3 Design Concept

The Lane-Corman Team's design concept for the widening of I-81 from MM 136.6 to MM 141.8 (the Project) outlined in this Technical Proposal is the collaborative effort of our design and construction teams. As recognized leaders in completing some of VDOT's most challenging Design-Build (D-B) projects, we are fully committed to partnering with VDOT to successfully deliver this Project. We will provide a design concept that meets or exceeds the Technical Requirements presented in the RFP, to include:

- Designing and implementing MOT plans that provide a safe work zone for the traveling public and construction personnel;
- Minimizing impacts to adjacent properties;
- Limiting traffic disruptions;
- Improving the effectiveness of operations;
- Reducing the need for future maintenance; and
- Providing long-term asset performance and durability.

During the Team's preparation of our Conceptual Plans, included in Volume II, we focused on maintaining current traffic patterns to minimize impacts to the I-81 users and local communities, and reducing impacts to surrounding properties, resources, and environmental features as compared to the RFP Conceptual Plans. Throughout the procurement phase, our Team held weekly Technical Work Group (TWG) meetings with the design and construction experts to discuss the Project's challenges. We have developed solutions that address the RFP requirements and VDOT's goals and objectives. Our design concept is based on extensive firsthand experience on similar interstate improvement projects in Virginia and our ability to identify project constraints, potential risks, and stakeholder concerns.

The design process started with a focused evaluation of the Sequence of Construction (see Section 4.5.1) options and opportunities. Next, we reviewed the constructability of the major features to determine if there were optimizations that could simplify construction, reduce costs, and significantly improve the Project Schedule. We gave careful consideration to minimizing construction phases and traffic shifts. The final step in the process was to evaluate design and construction features to determine where we could provide value-added benefits and cost savings.

As a result, our Team is proposing several significant design enhancements to better achieve VDOT's defined Project priorities. These priorities include:

Cost: We have implemented various design changes to minimize impacts and reduce construction and long-term maintenance costs while still providing value-added benefits.

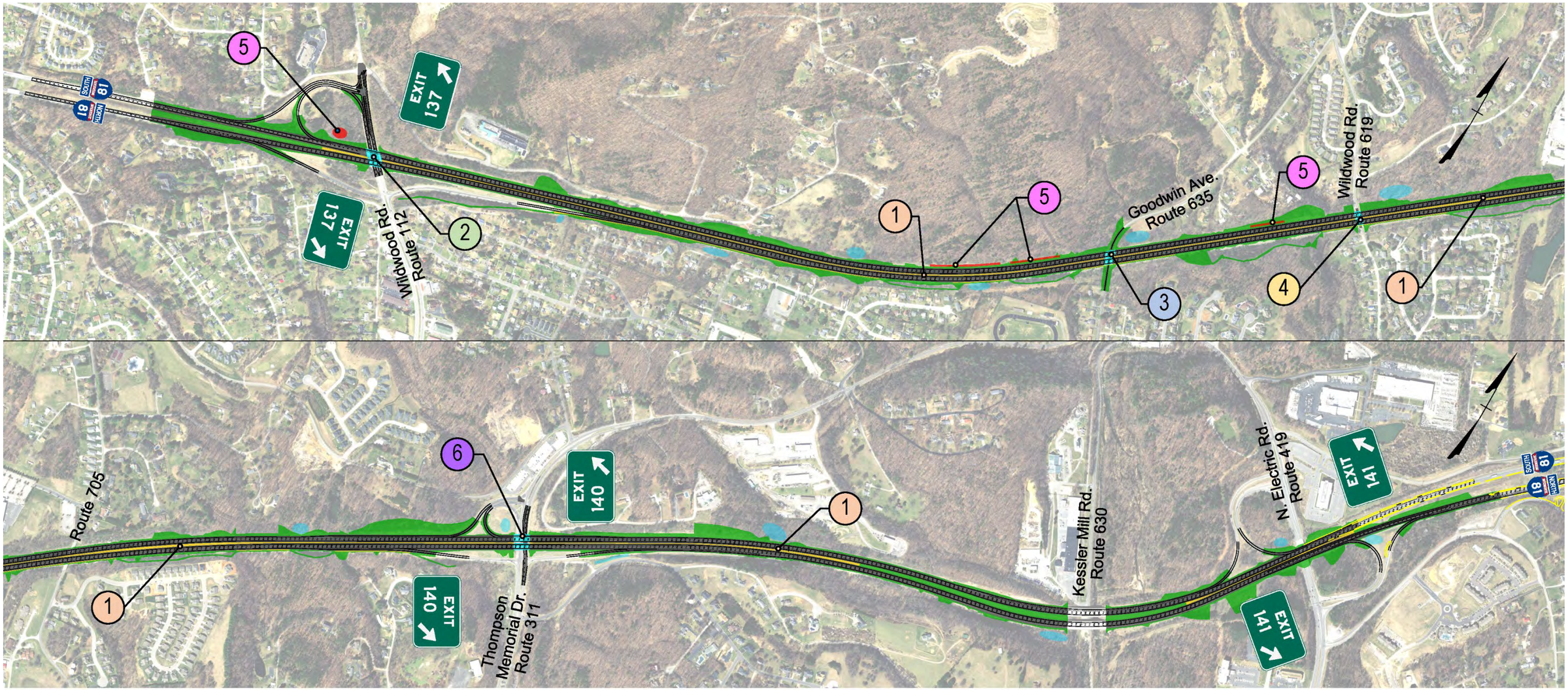
Design Concept: Our Team has optimized the design to reduce environmental impacts, utility conflicts, and construction phasing which ultimately improves the Project Schedule.

Construction of the Project: Our approach minimizes construction phases and changes to traffic patterns to ensure a safe work zone and limited impacts to the traveling public.

Project Approach: Potential Project risks have been diligently identified and evaluated to ensure our Conceptual Design appropriately avoids or mitigates these risks.

Our Team's proposed Design Enhancements, including our approved Alternative Technical Concept (ATC 02), are identified in *Figure 4.3.1-1* on the next page and described in further detail in the following pages. Additionally, these enhancements have been called out in our Conceptual Roadway and Structure plans included in Volume II.

Figure 4.3.1-1. *Design Enhancements*



Lane-Corman Team Design Enhancements

1. I-81 Southbound Horizontal Alignment Shift to the Median
2. Profile Adjustments and Bridge Optimizations at I-81 Over Route 112
3. Profile Adjustments and Bridge Optimizations at I-81 Over Route 635
4. Bridge Optimizations at I-81 Over Route 619
5. Optimized Stormwater Management Design and Reduction of BMP Facilities
6. ATC 02 - Route 311 Reduction of Minimum Girder Depths for Superstructure

Design Enhancements

1 I-81 Southbound Horizontal Alignment Shift to the Median

Our Team has optimized the I-81 southbound (SB) alignment by shifting the proposed alignment towards the median. Our improvement shifts the I-81 SB alignment approximately 8'-10' towards the median for roughly 18,000 feet from Sta. 555+00 to Sta. 736+00. This alignment shift allows for a greater portion of the SB improvements to be **constructed in one phase**, while at the same time **reducing cut slope impacts** to the outside. Depending on the location, the median treatment of our design concept utilizes either a single, double-sided special design constant-slope barrier, or two single-faced, constant-slope barriers with **low maintenance treatment** to separate the northbound (NB) and SB lanes.

Project Benefits:

- ✓ **Reduces construction and long-term maintenance costs** by:
  - Minimizing cut slope impacts to the outside of I-81 SB, reducing potential for slope failure issues and surplus earthwork for the Project
  - Minimizing the length of box culvert extensions
  - Eliminates one retaining wall and reduces the height of several others
  - Greatly reducing grassed median locations which minimizes future maintenance
- ✓ **Optimizes construction** operations by increasing the amount of construction area completed in the first phase of the Project
- ✓ **Improves safety** by maximizing available temporary shoulder widths during MOT for future construction phases

2 Profile Adjustments and Bridge Optimizations at I-81 Over Route 112

Our design concept raises the vertical alignment of I-81 in the vicinity of Route 112 to accommodate a single span structure over Route 112, maintains the required 16'-6" vertical clearance under the structure and eliminates the pier in the median of Route 112. Also, removing the pier in the median provides for an extension of the turn lane from eastbound (EB) Route 112 to I-81 NB. Additionally, we have optimized the MOT at this location with a median cross-over of SB I-81onto the NB median widening to facilitate the SB bridge construction in a single MOT phase, improving upon the RFP two-phase concept.

Project Benefits:

- ✓ **Reduces construction & long-term maintenance costs** by:
  - Eliminating construction of a pier and BPPS in the median on Route 112
  - Eliminating a vertical sag curve and need for permanent drainage on the bridges
- ✓ **Improves safety** by:
  - Eliminating pier/BPPS obstructions in the median on Route 112
  - Constructing the I-81 SB bridge in a single phase of construction will minimize the duration traffic utilizes the median crossover leading to a safer experience for travelers
- ✓ **Improves operations** by additional turn lane capacity for EB Route 112 to I-81 NB
- ✓ **Optimizes the bridge construction, MOT and improves safety** with a single phase, single span bridge structure

3 Profile Adjustments and Bridge Optimizations at I-81 Over Route 635

Our roadway and bridge design concept uses refined roadway geometry and durable, economical, low maintenance precast concrete bulb-tee (PCBT) beams in lieu of steel girders for the bridge. Benefits include **optimizing the construction schedule** by reducing material lead time associated with concrete beams and **minimizing the overall sequence of construction** phasing at the bridge. As our refined roadway alignment progressed in this area, we continued to investigate structure options to improve the RFP concept. Our proposed bridge typical section utilizing PCBT beams allows efficient erection procedures and minimizes impacts to the existing I-81 NB pier cap consistent with the RFP Design. In addition to the benefits of a concrete superstructure, a significant improvement of our I-81 SB alignment shift (described above for Design Enhancement #1), in conjunction with an adjustment to the RT 635 profile results in **additional vertical clearance** over the RFP concept beneath the structure for Route 635. As a result, the available vertical clearance provided by this alignment shift allowed our Team to obtain a minimum standard 16'-6" vertical clearance with no additional construction impacts. The Route 635 profile, already proposed to be lowered by the RFP Design, was lowered an additional 3"-6" to achieve the minimum standard vertical clearance, therefore **negating the need for a Design Waiver at this location**. This profile adjustment was made while still meeting the RFP Design Criteria requirements and did not require extending the improvement limits on Route 635.

Project Benefits:

- ✓ **Optimizes the construction schedule by reducing the material lead time** associated with concrete vs steel girders
- ✓ **Reduces long-term maintenance costs** by utilizing concrete beams girders in lieu of steel girders
- ✓ **Increases vertical clearance** under I-81 SB bridge to provide minimum 16'-6" clearance, therefore **negating the need for a Design Waiver at this location** and, as a result, **removing restrictions to the traveling public** due specifically to substandard bridge clearances

4 Bridge Optimizations at I-81 Over Route 619

Our design concept shifts the location of the proposed abutments to avoid conflicts with the existing piers and improves constructability.

Project Benefits:

- ✓ **Reduces construction costs** by avoiding impacts, constructability issues and conflicts with existing Pier 2, such as eliminating the need for temporary support of the pier cap in Stage 1 Sequence of Construction (SOC) and complete removal of the existing pier
- ✓ **Improves safety** by providing additional lateral clearance to proposed Abutment B on Route 619
- ✓ **Optimizes bridge construction operations** by simplifying construction of the new bridge and demolition of the existing structure

5 Optimized Stormwater Management Design and Reduction of BMP Facilities

As presented in our Proprietary Meetings, our Conceptual Stormwater Management design incorporates the use of a Scenario 5 approval, in accordance with IIM-LD-195.12 requirements; thus **optimizing the stormwater management design** and **eliminating 4 BMP** facilities along the corridor in comparison to the RFP concept.

Project Benefits:

- ✓ **Reduces construction and long-term maintenance costs** by eliminating four proposed permanent BMP facilities
- ✓ **Efficient overall SWM design** by eliminating several pipe crossings, including jack and bore locations under I-81
- ✓ **Reduces proposed ROW needs**, both in total fee taking acreage and number of parcels, therefore reducing costs and accelerating the ROW acquisition schedule

Approved Alternative Technical Concept

6 ATC 02 – Route 311 Reduction of Minimum Girder Depths for Superstructure

As part of our discussions with VDOT during our 2nd ATC/Proprietary Meeting, our Team presented two Preliminary ATCs for VDOT's consideration. **ATC 02 – Route 311 Reduction of Minimum Girder Depths for Superstructure** was reviewed and approved, with conditions, for consideration by VDOT on February 11, 2021. The conditions for this approval include:

1. This ATC shall apply to the proposed exterior girder only;
2. The Design-Builder will be responsible for obtaining all necessary Design Waivers associated with this ATC;
3. The proposed reduced depth exterior girder and structure shall meet all load rating stress checks, and live load deflection limits required by VDOT and AASHTO;
4. Details provided with the ATC shows the LMC-VE overlay with a total deck thickness of 10 5/8" to 10 7/8". The increased deck thickness is not acceptable as previously determined in the VDOT response to ATC Meeting #1 minutes.

This ATC conditional approval allows our Team to provide a minor reduction in the minimum girder depth requirements of AASHTO and VDOT design criteria for the proposed exterior girder of the I-81 SB bridge over Route 311. Incorporating this ATC and satisfying the conditions for approval during final design will provide the minimum vertical clearance of 16'-6" over Thompson Memorial Drive.

Project Benefits:

- ✓ **Reduces construction cost** and **optimizes construction schedule** by eliminating the need to lower Route 311 to obtain the required minimum vertical clearance

4.3.1 Conceptual Roadway Plans

The Lane-Corman Team's Conceptual Roadway Plans are included in Volume II of our Technical Proposal. We have developed our design to meet or exceed all design requirements presented in the RFP documents. Design Waivers and Exceptions to the VDOT/AASHTO standards identified in the RFP regarding reduced shoulder widths to avoid additional impacts to existing interchanges and structures have been incorporated into our Conceptual Design. Our design is contained within the proposed right-of-way (ROW) limits shown in the RFP Conceptual Plans. *Figure 4.3.1-1* on Page 6 identifies some of the design enhancements the Lane-Corman Team has incorporated. Details of these enhancements, and others, are further described in the subsections below and depicted in Volume II.

(a) General Geometry

As illustrated in Volume II, our design will provide three general purpose lanes, NB and SB divided by a median. The Team's Conceptual Roadway Plans include information detailing horizontal curve data and associated design speeds, the number and width of lanes and shoulders, superelevations (meeting TC-5.11R for the design speed), and improvements to acceleration and deceleration ramps within the Project Limits.

Table 4.3.1-1 – *Roadway Geometry*

Roadway	Geometric Design Standard	Design Speed	Number and Width of Lanes (each Direction)	Roadway Shoulder Width	Paved Shoulder Width	Bridge Shoulder Width
I-81	GS-INT	65 MPH	3/12'	12'	10'	12'/10'
Route 112	GS-5	35 MPH	2/12'	10'	8'	N/A
Route 619	GS-7	35/30 MPH	1/11'	6'	N/A	N/A
Route 635	GS-7	35/30 MPH	1/11'	8'	1'	N/A
Route 311	GS-6	45 MPH	2/11'	8'	8'	N/A

(b) Horizontal Alignments

Our Team's horizontal alignment closely mirrors the RFP Conceptual Design for the NB lanes of I-81; however, we have optimized the SB alignment to **reduce impacts and maintenance costs** by shifting the proposed alignment toward the median. Depending on the location, the median treatment of our design concept utilizes either a single, double-sided special design constant-slope barrier, or two single-faced, constant-slope barriers with **low maintenance treatment** to separate the lanes. The use of a single barrier **minimizes maintenance** in the median. The alignment shift to the SB median **reduces impacts** to the outside, lowering the height of several retaining walls and **eliminates one wall** all together. The reduction and elimination of the proposed retaining walls will a**ccelerate construction** and **minimize VDOT's future maintenance concerns**. See *Figure 4.3.1-2* below for an example cross-section depicting the reduction to the I-81 SB outside cut slopes resulting from our alignment shift to the median.

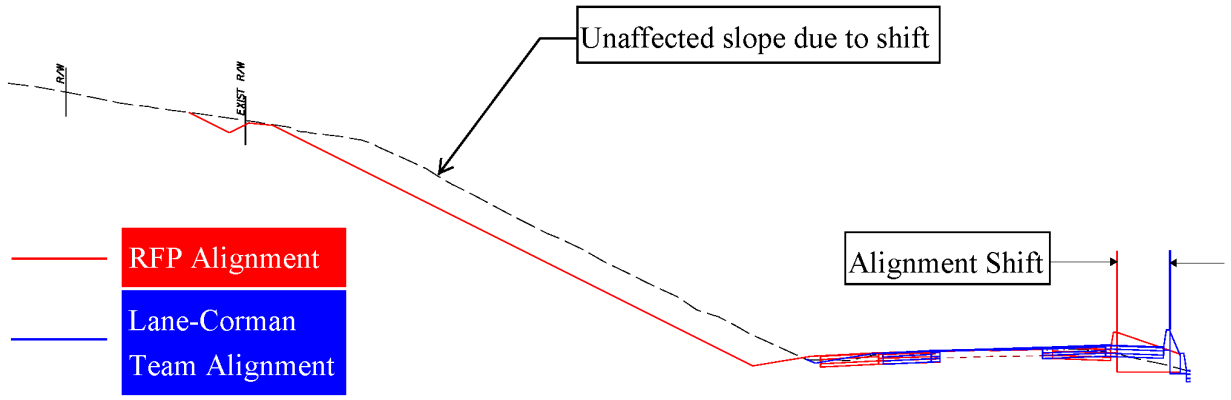


Figure 4.3.1-2 – *Reduction of Cut Slopes to I-81 SB*

Our Team's alignment shift is accomplished without the need for modifications to the current Design Waivers or Design Exceptions outlined in the RFP. Modifications to the alignment incorporated by our Team allow for more median work to be completed in Phase 1 of the Project before any major traffic shifts which will **reduce traffic impacts during construction**.

(c) Maximum Grade for all Segments and Connectors (Vertical Alignments)

Our Team proposes several optimizations to the RFP Plan's vertical alignments and profiles for I-81, ramps, and connecting roadways. Our Roadway Plans illustrate the following opportunities to improve vertical geometry:

- Raising the vertical alignment of I-81in the vicinity of Route 112 to accommodate a single span structure over Route 112 allowed our Team to **eliminate a pier in the median** of Route 112. As a result, this enhancement **reduces impacts during construction to the traveling public**. Our concept design still maintains the required 16'-6" vertical clearance under the structure. An additional benefit of eliminating the center pier is that it provides for an extension of the turn lane from eastbound (EB) Route 112 to I-81 NB, therefore **improving operations by providing additional turn lane capacity**. The adjusted grade of I-81 over Route 112 also **eliminates the need for scuppers** on the I-81 NB bridge to control spread during the temporary condition. See *Figure 4.3.1-3* below which depicts the profile adjustments made on I-81 NB and SB in the vicinity of bridges over Route 112.

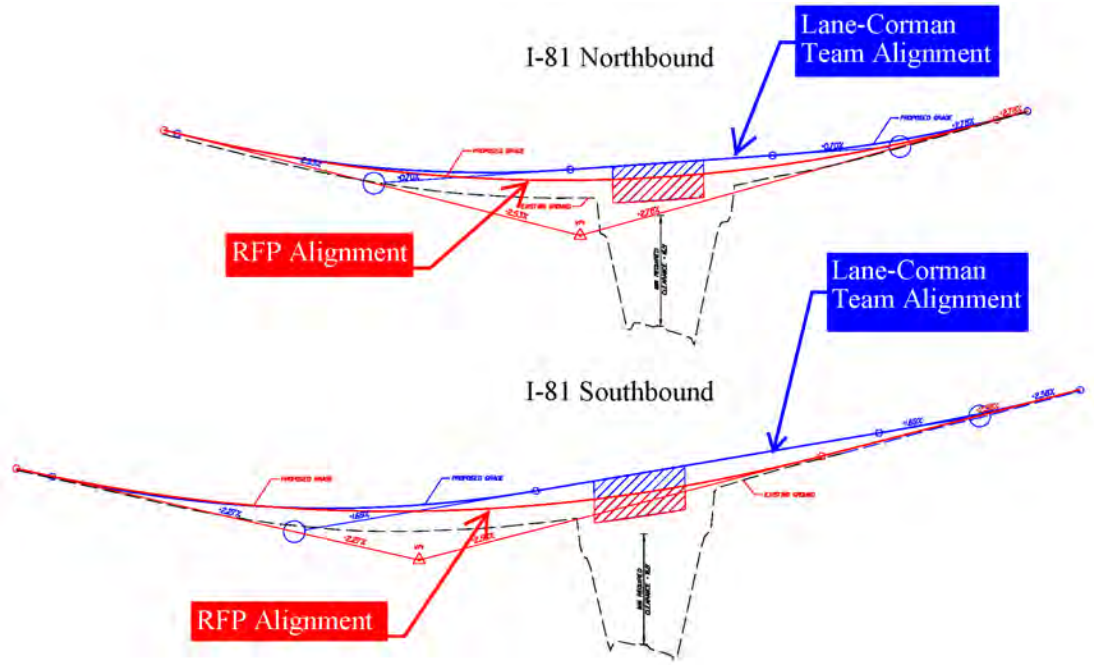


Figure 4.3.1-3 – *Profile Adjustments*

- In addition to our I-81 SB horizontal alignment shift noted in Part (b) above, as well as bridge optimizations at the I-81 over Route 635 bridges, our Team made adjustments to the Route 635 profile resulting in **additional vertical clearance** over the RFP concept beneath the structure for Route 635. These optimizations collectively have **negated the need for a Design Waiver at this location**. This profile adjustment was made while still meeting the RFP Design Criteria requirements and did not require extending the improvement limits on Route 635.
- Utilizing the existing cross slopes for large portions of the Project to minimize pavement build-up, as well as the overall footprint, **reduces Project costs.**

(d) Typical Sections of the Roadway Segments

Roadway: The typical sections presented in Volume II depict the Lane-Corman Team's design concept and fully complies with the RFP requirements. As previously mentioned, the existing cross slope is utilized for much of the Project to **minimize impacts**, complying with the requirements of Part 2 of the RFP. A combination of existing and new design cross slopes is utilized where the proposed crown of I-81 is shifted from the existing crown. Cross slope correction is being proposed in areas where:

1. The proposed profile is being built up above 3";
2. The existing cross slope is below 1%, or;
3. The average existing superelevation is not within 1% of the design superelevation per the RFP requirements.

For the entire Project, the minimum mill and fill depths outlined in Part 2 of the RFP will be applied.

Our Team's design utilizes a single, double-faced, special design constant-slope barrier separating the NB and SB lanes for most of the Project. For the remainder of the median, two single-faced, grade differential, constant-slope barriers with a **low-maintenance median treatment** are used where the distance between barriers is less than 15'. In locations, where the distance between the NB and SB edges of pavement is greater than 40', a grassed median with guardrail will be utilized.

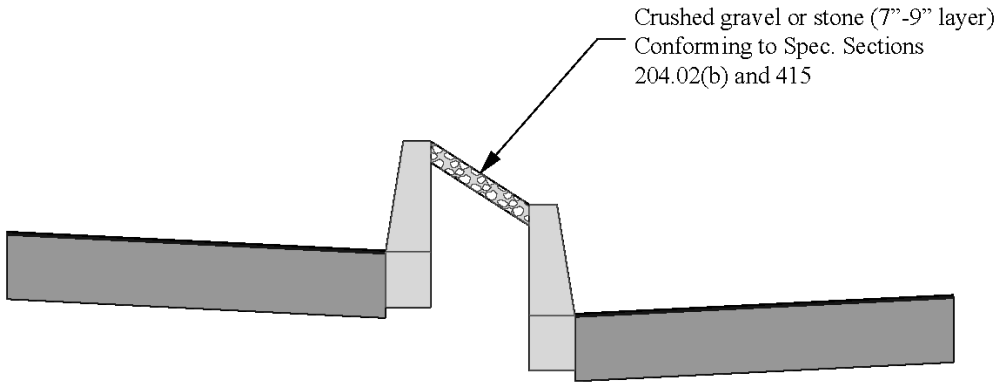


Figure 4.3.1-4 – *Low-Maintenance Median Treatment*

In general, standard CS-4 or CS-4B slope grading will be utilized along the Project corridor. However, where fill heights exceed 7.5' (and right-of-way is constrained) and where fixed objects or other hazards (such as stormwater management ponds, headwalls, and fill retaining walls) are present, guardrail is proposed along with a 2:1 fill slope. Additionally, where noise barrier is placed along the proposed shoulder, it will be protected by a constant slope barrier.

Ramps: Typical sections for ramps are also included in Volume II. All ramps have a minimum 16'-18' travel lane, with a 10' paved, 6' graded right shoulder and a 4' paved, 8' graded left shoulder. Ramp reconstruction is minimized to the extent possible by utilizing spline grade profiles to tie into the mainline in conjunction with mill and overlay of the existing ramps. A recoverable slope is being provided in the infield area of Route 112 Loop D and Ramp D in order to remove the existing guardrail and **improve safety**.

Retaining Walls: Throughout the Project, there are three retaining walls required in cut sections along the outside of the SB alignment. In accordance with Addendum 3, cut walls are located 30' off the proposed mainline, or ramp edge of pavement. In addition to a roadside ditch in front of the cut walls, a ditch is proposed on top to prevent water from sheet flowing over the wall. This will **minimize potential future maintenance concerns**. A total of three (3) roadside walls located in fill sections are required adjacent to the SB alignment. These walls are protected by a barrier system with appropriate offsets to the wall. A ditch is also provided at the top of the fill walls to prevent drainage from overtopping the wall; and a 4' bench is being provided at the bottom of the wall.

Structures: Typical sections for the proposed bridge structures will conform to Volume V, Part 2, Chapter 6 of the VDOT Structures & Bridge Manuals. They also comply with RFP requirements, and match the roadway plans and MOT requirements specific to each location. A minimum of two, 11' lanes will be maintained at all times during construction phasing. The permanent bridge typical will consist of three, 12' lanes and two 12' shoulders unless otherwise specified in approved Design Waivers or Design Exceptions. Cross slopes for the bridge replacements will be 2%. For the widened structures over Route 311, the cross slopes will match existing cross slope. The latex modified concrete overlay joints will be lined up with the proposed lane lines.

(e) Conceptual Hydraulic and Stormwater Management Design

Our Team's hydraulic and stormwater management design concept meets or exceeds all requirements of the RFP. All drainage and stormwater management facilities are contained within the existing and proposed ROW/easement limits shown in the RFP Conceptual Plans. Additionally, there are no Design Exceptions or Design Waivers required for the proposed hydraulic and stormwater management design. Our Team's stormwater management design for water quality includes the use of VDOT's Scenario 5 based on I&IM 195.12. The approval process for this is discussed further in the Stormwater Management – Water Quality section below.

Hydraulic Design. The primary goal of our hydraulic design is to accommodate the widening of I-81 using open and closed drainage systems while **minimizing disturbance of environmentally sensitive natural resources**. We will maintain existing drainage divides to the extent possible. To facilitate **efficient construction of the Project** and **control construction and maintenance costs for VDOT**, key existing cross culverts and storm sewer pipes will be reused and/or rehabilitated to the extent allowed in the RFP. In cases where existing pipes are reused, they will be extended as needed to facilitate the widening of the roadway. Proposed drainage systems will include storm drain inlets, storm sewer pipe, culverts, and ditches to efficiently remove runoff from the proposed roadway. **Proposed inlets will be located to prevent spread into the travel lanes in both the temporary and permanent conditions to improve safety of the traveling public during design storm events.** Our Team has analyzed spread in the temporary condition and provided sufficient temporary shoulder widths to accommodate this wherever possible. In areas that do not have sufficient shoulder width to meet temporary spread, additional median inlet structures will be added to ensure no encroachment of stormwater on the travel lanes during construction for the design storm event. In addition, the following RFP requirements will be met as part of our design concept:

- Metal pipe will only be used to extend existing metal pipe or with Standard DI-13 structures to **reduce future maintenance costs** associated with metal pipe.
- Standard end walls will be used whenever pipe outlets can be located outside of clear zone or when buoyancy is a concern to **prevent the potential for undesired movement within the pipe and end treatment where fluctuating water levels may exist**.
- Grass-lined ditches will have a minimum slope of 1%; when ditches are less than 1% they will be concrete-lined to promote **efficient removal of runoff and decrease future maintenance costs**.
- Proposed drainage systems will be designed to ensure that contact between concentrated runoff and acid-producing materials is avoided using a liner material to provide separation where necessary to **prevent impacts to downstream channels and natural resources**.
- When stone is used for the low-maintenance aggregate treatment in the median of I-81, the aggregate will be designed to accommodate a 10-year storm event, **reducing future maintenance costs**.

Water Quality. Our Team's stormwater management design achieves the Part II B of the technical requirements enumerated within the VSMP regulations and the Construction General Permit. In accordance with IIM-LD-195.12 Requirements for Erosion & Sediment Control and Stormwater Management Plans for VDOT Projects, a Scenario 5 approval will be pursued to enable VDOT to exclude areas of existing impervious surface from the stormwater management requirements for the Project. This exclusion of impervious area within the Project's limits of disturbance will allow the **elimination of 4 BMP facilities** shown in the RFP Conceptual Plans. Elimination of these facilities will **reduce both construction and long-term maintenance costs for VDOT**. Gaining approval of Scenario 5 may be construed as a risk to the Project; however, our Team understands the submission and approval process and has achieved success gaining the necessary approvals to implement Scenario 5 successfully on past projects. Our Team will work with the District to prepare all necessary memorandums and exhibits for submission to VDOT Central Office and ultimately to DEQ for approval.

The Project is located within the Roanoke River-Sawmill Hollow (RU09), Mason Creek (RU10), and Roanoke River-Peters Creek (RU14) HUC Boundaries. *Table 4.3.1-2* provides a summary of disturbed areas and required phosphorus removal broken down by HUC. Also, *Table 4.3.1-3* provides a summary of proposed BMP facilities along with phosphorus removal achieved. The proposed stormwater management design concept utilizes 15

pounds per year of previously purchased nutrient credits plus an additional 1.58 pounds per year to minimize the number of on-site BMP facilities **resulting in reduced maintenance costs for VDOT**. As shown in Table 4.3.1-3, **four of the proposed BMP facilities** shown in the RFP Conceptual Plans have been **eliminated from the Lane-Corman stormwater management design**. Proposed BMP facilities **will not require additional ROW** beyond what is shown in the RFP and will have all required maintenance access as stipulated in the RFP. In addition, the Team does not propose to place any BMP facilities in the restricted area of the Route 112 interchange in which the RFP calls for regrading and removal of the existing guardrail. All BMP types and applications will be designed in accordance with VDOT Part II B BMP Design Manual of Practice requirements including, but not limited to, those requirements that deal specifically with areas of potential karst topography. The following types and locations of BMP facilities are NOT proposed as part of the Team's stormwater management design: permeable pavement, constructed wetlands, sand filters, infiltration practices, non-standard BMPs and BMPs located within the I-81 median.

***Table 4.3.1-2** - Disturbed Area, Required Phosphorus Removal, and On-Site/Off-Site Split by HUC*

Hydrologic Unit Code	Disturbed Area	Required Phosphorus Removal	On-Site Removal (BMP)	*Off-Site Removal (Nutrient Credit)
Roanoke River-Sawmill Hollow (RU09)	62.51 Acres	41.03 lb/year	30.79 lb/year (75%)	10.24 lb/year (25%)
Mason Creek (RU10)	43.96 Acres	23.44 lb/year	17.76 lb/year (76%)	5.68 lb/year (24%)
Roanoke River-Peters Creek (RU14)	6.48 Acres	2.71 lb/year	2.05 lb/year (76%)	0.66 lb/year (24%)

** The first 15 lbs of Nutrient Credit will be provided by VDOT (per the RFP)*

Water Quantity. Our Team's drainage design concept will be completed in accordance with IIM-LD-195, the VDOT Drainage Manual and the Virginia SWM Program Law and Regulations, including Part IIB of the VSMP Regulations. All points of discharge from ROW on the Project will be evaluated to ensure outfall adequacy. In addition to meeting stormwater management criteria, peak discharge will not be increased for the 1-year, 2-year, 10-year, and 100-year storms for outfalls to Dry Creek, Williams Branch, and Unnamed Tributary of Williams Branch as required by the RFP. A summary of the Team's outfall analysis is summarized in *Table 4.3.1-3*, to address water quality and water quantity. In addition, sheet flow will be analyzed to ensure that post-construction sheet flow does not exceed pre-construction sheet flow leaving the ROW.

***Table 4.3.1-3** - Proposed BMP Facilities*

Stream	HUC	Quantity Control	BMP Facility	Phosphorus Removed
Horners Branch	RU09	1% Rule	BMP A	**BMP Eliminated**
Mill Race	RU09	Stormwater Detention	BMP B	1.20 lb/year
			BMP C	1.81 lb/year
			BMP D	2.36 lb/year
			BMP E	**BMP Eliminated**
			BMP F	2.20 lb/year
			BMP G	**BMP Eliminated**
Tributary of Roanoke River	RU09	Stormwater Detention	BMP H	2.54 lb/year
			BMP I	**BMP Eliminated**
Dry Creek*	RU09	Stormwater Detention	BMP J	18.62 lb/year
Snyders Branch	RU09	Stormwater Detention	BMP K	2.06 lb/year
Williams Branch*	RU09	Reduction in Drainage Area	N/A	N/A
Gish Branch	RU10	Stormwater Detention	BMP L	2.56 lb/year
			BMP N	2.23 lb/year
Mason Creek	RU10	Stormwater Detention	BMP M	9.43 lb/year
			BMP O	1.45 lb/year
			BMP P	2.09 lb/year
Peters Creek	RU14	Stormwater Detention	BMP R	2.05 lb/year

**In accordance with the RFP, peak discharge for the 1-year, 2-year, 10-year, and 100-year storms will not be increased for these outfalls.*

Hydrologic and Hydraulic Analysis (H&HA). Our Team will perform H&HA, including scour analysis, for major culvert crossings that have a total 100-year discharge greater than 500 cfs in accordance with the RFP and VDOT Drainage Manual. *Table 4.3.1-4* lists the anticipated locations where an H&HA will be required. No work is anticipated along the I-81 bridges over Route 630 and Mason Creek nor below the existing low chord of these bridges as part of our Team's design, and therefore, in accordance with the RFP, no H&HA, including scour analysis, is required for this crossing.

***Table 4.3.1-4** - H&HA Summary*

Stream	Approximate Drainage Area	Approximate 100-Year Discharge
Horners Branch	2,144 acres	1,930 cfs
Dry Creek	2,310 acres	2,020 cfs
Gish Branch	589 acres	872 cfs

Erosion and Sediment (E&S) Control. Our Team's drainage design concept has been developed with consideration given for the required E&S control during construction. The E&S control concept will include a two-phase plan, as required by the VDOT Drainage Manual, with additional sub-phases, as necessary, due to construction sequencing. The E&S Control Plan will be developed to contain sediment on-site using best management practices such as silt fence, temporary sediment traps and basins, rock check dams, and inlet and outlet protection. To the extent possible, permanent stormwater management basins will be utilized as temporary sediment basins during construction and subsequently converted to their final configuration once all upstream areas have been permanently stabilized. If the proposed ROW is not yet available during early phases of construction, temporary median sediment traps and basins will be used until the permanent basin locations can be constructed. For temporary facilities that are designed to hold water, temporary safety fence shall be installed around the perimeter. Where steep slopes exist within the Project, temporary and permanent stabilization can be difficult to achieve. The Team will continuously monitor these areas throughout construction to ensure stabilization is achieved and maintained as needed. Special consideration will also be given to areas (if any) where acid-producing materials are encountered to ensure that all runoff that comes in contact with these materials is processed appropriately.

(f) Proposed Right-of-Way Limits

Through the incorporation of the I-81 SB alignment shift, our Team's unique stormwater management concept, and noise barrier alignment optimizations, we were able to significantly reduce the ROW impacts on the Project. Specifically, as shown in *Table 4.3.1-5*, we have **reduced the number of impacted properties by 39%; the fee taking ROW impacts by 23%; and the temporary construction easements by 75%**. Locations of these ROW reductions are shown in our Volume II – Conceptual Roadway Plans.

***Table 4.3.1-5 –** ROW Impacts on the Project*

	RFP Design	Lane-Corman Team Concept Design	Reduction	Percent Reduction
Number of Impacted Parcels	56	34	22	**39%**
Total Fee Taking Area (AC)	11.34	8.69	2.65	**23%**
Total Temp. Constr. Ease. (AC)	0.63	0.16	0.47	**75%**

(g) Proposed Utility Impacts

The Team has reviewed the RFP Conceptual Plans for all known utilities and has been in contact with every single utility owner identified in the RFP. The primary impacts involve a Citizens Telephone Cooperative (CTC) fiber line that runs within the median of I-81 for most of the Project as well as utilities at the crossing streets due to bridge and roadway construction. We will work with CTC immediately following Notice of Intent to Award to begin coordinating the relocation of their fiber line to **avoid delay to the start of construction** within the median. We will work with impacted utility owners to undertake their relocations at the crossing streets so that relocations are completed ahead of the bridge replacement schedule. During design, we will more accurately

identify the location and specific impacts of the underground utilities to properly design the relocations out of conflict. Through diligent coordination and management by our Team, **utility relocation work will not adversely impact the overall Project schedule**. Utility impact locations and mitigation measures are detailed in Section 4.4.2.

Table 4.3.1-6 - *Utility Impacts (High Level Summary)*

Utility Company	Location	Conflict ID	Impact Status	Prior Rights
City of Salem Electric (CISA)	Location 2 (Route 112)	UTIL-1	Impacted	YES
Segra/Lumos Networks (LMS)	Location 2 (Route 112)	UTIL-1	Impacted	NO
Zayo (ZAY)	Location 2 (Route 112)	UTIL-1	Impacted	NO
Comcast (CMC)	Location 2 (Route 112)	UTIL-1	Impacted	NO
Verizon (VZN)	Location 2 (Route 112)	UTIL-1	Impacted	NO
Comcast (CMC)	Location 2 (Route 112)	UTIL-2	Impacted	NO
Verizon (VZN)	Location 2 (Route 112)	UTIL-3	Impacted	NO
Citizens Telephone (CTC)	Location 1 (CTC)	UTIL-4	Impacted	NO
City of Salem Electric (CISA)	Location 3 (Route 635)	UTIL-5	Impacted	YES
City of Salem Water-Sewer (CIWS)	Location 3 (Route 635)	UTIL-6	Impacted	YES
Roanoke Gas (RGC)	Location 3 (Route 635)	UTIL-7	Impacted	NO
Western Virginia Water Authority (WVWA)	Location 3 (Route 635)	UTIL-8	Minor Impact	YES
Verizon	Location 4 (Route 619)	UTIL-9	Impacted	NO

(h) Noise Barrier Locations

Potential noise barrier locations are illustrated in accordance with the approximate noise barrier location and heights as shown in the RFP Conceptual Plans. Our Team has evaluated the locations of these potential noise barriers and have made adjustments to their horizontal locations where permissible. Additionally, the **use of combination retaining/noise panels, in lieu of separate noise barriers and retaining walls have been implemented** where feasible. Per the RFP, a total of 352,570 SF of noise barrier is assumed, measured from the finished grade to the sound attenuation line as described in Section 519.04 of VDOT's Road and Bridge Specification. As part of completing the Final Noise Analysis Design Report (FNADR), our Team will further investigate opportunities to optimize these noise barrier locations and wall heights to minimize impacts and costs. We recognize these quantities will be adjusted based on the results of our Team's final approved FNADR and VDOT approved noise barrier plan.

(i) Other Key Project Features

Intelligent Transportation Systems (ITS). The ITS design concept has been developed in accordance with VDOT Road and Bridge Standards, Div. VIII – Intelligent Transportation Systems. The proposed widening will impact the existing fiber optic backbone in the median from the beginning of the Project to the redundant connection at the Traffic Operations Center (TOC) located approximately ¼ mile north of Thompson Memorial Drive. To comply with the RFP, we will relocate this fiber optic cable to outside the shoulder along NB I-81 early in the sequence of construction. This will facilitate the widening of mainline in the median during the subsequent phases of construction. The proposed fiber optic backbone will have a minimum of 96 fibers and all fiber optic drop cables will have a minimum of 24 fibers. All the fiber cables will be encased in new conduits. We are proposing 2-3" conduits for backbone fiber and 2-2" conduits for drop cables or as appropriate based on conduit fill calculations. Redundant backbone communications to the TOC will be maintained at all times in accordance with the RFP. The proposed ITS conduit routing will include open cut trenching as well as directional boring for street crossings. The conduit routing will be coordinated/co-located with proposed street-lighting conduits along northbound I-81. The proposed fiber optic backbone will connect existing CCTV

cameras along northbound I-81 that are not impacted by the proposed widening. A new analog CCTV camera is proposed at approximately milepost marker 139 (just north of the Red Lane overpass), that will be connected to the fiber optic backbone through a drop cable. All other existing ITS assets not impacted by the proposed widening will be maintained in place and ultimately connected to the new backbone. We will connect the existing lateral connections from the TOC to the new fiber optic backbone, which will allow the TOC to remain operational during and after construction.

There are two continuous count stations and one non-intrusive continuous count station indicated in the RFP that will require deployment of a temporary portable trailers at each location to maintain data collection during construction. The Team will coordinate with VDOT CO TED staff and propose suitable locations to where temporary data collection trailers can be placed. Upon completion of construction, new in pavement detectors will be installed and connected to the existing count station infrastructure.

Lighting. The proposed lighting system includes partial interchange lighting at the following interchange locations provided in the RFP documents:

- I-81/Wildwood Rd (Exit 137)
- I-81/Thompson Memorial Dr. (Exit 140)
- I-81/N Electric Rd (Exit 141)

Under-bridge lighting will be provided beneath the I-81 bridges crossing Wildwood Road (Exit 137) and Thompson Memorial Highway (Exit 140). The lighting system will be designed in accordance with latest Illuminating Engineering Society of North America (IESNA) RP-8 guidelines, VDOT's Traffic Engineering Design Manual, and VDOT's Informational & Instructional Memoranda. The lighting will be constructed in accordance with the 2020 VDOT Road and Bridge specifications, the 2016 VDOT Road and Bridge Standards, and the requirements of the National Electric Code (NEC). The partial interchange lighting will cover traffic conflict areas along I-81, including ramp merges and diverges, ramps, ramp termini, and cross streets. The proposed lighting will utilize LED luminaires and will be mounted on VDOT Standard LP-1 and LP-2 poles with mast arms of varying spans. The spacing of luminaires will be optimized by using AGi32 software, and detailed photometric calculations will be performed to ensure required lighting levels are achieved. The lighting system will include lighting cables in conduits that will be routed between junction boxes. The source of power for the proposed lighting system will be coordinated with the local utility company and will be designed in accordance with VDOT Standards. Existing lighting levels will be maintained at all times during construction.

Signing. The Team understands the importance of proper signage and will replace the existing signs and structures and/or providing new permanent signs and structures through the limits of the Project defined by the RFP Section 2.9.1.1. The Team has evaluated the existing sign conditions and impacted structures; our preliminary determination in conformance with the conceptual RFP design is that all existing signage on the Project will be replaced with new signs, with the exception of the Integrated Directional Signing Program (IDSP) maintained signs. This also includes signs on I-81 and adjacent roadways beyond the Project limits that require relocation, replacement, or modification due to the proposed Project.

To provide the traveling public with consistent interchange signage, the Lane-Corman Team will provide VDOT two additional overhead advanced guide signs beyond the Project limits on I-81 NB approaching the Route 112 interchange.

Upon issuance of the NTP, the Team will perform a field review of existing signing. This will be done to document sign messages, location color and sign panel size, qualitative evaluation of the condition of the panels, overhead structures and span lengths, indicating deficiencies and sign structures designed for replacement for both VDOT-maintained signs and IDSP maintained signs. A sign inventory report will be prepared and submitted at the same time as the first plan submittal.

Sign sizes shall adhere to the latest editions of the FHWA Standard Highways Signs Book, MUTCD, the Virginia Supplement to the MUTCD, and all applicable Traffic Engineering Division Numbered memoranda.

Where feasible, IDSP signs will be relocated or replaced as needed. The Team will coordinate with VDOT's IDSP Program Manager for review and approval before making final decisions. Plans for relocation, fabrication and installation will include notifying the VDOT IDSP Program Manager of the plan of operations within 60 days prior to the commencement of any construction activities. Standard milepost markers will be installed along both directions of I-81 at the prescribed tenth mile intervals.

Standard regulatory and warning signs will be dual indicated by installing signs on both the median side and the outside of the roadway, the Team's proposed concept has considered sign placement in the median to ensure adequate space is provided in the final design. All Advance Guide Signs and Exit Direction Signs will be mounted on overhead sign structures. While not directly impacted by construction, the Advance Guide Signs prior to the Route 112 Project limits will be replaced in accordance with the RFP. No guide signs will be mounted on bridges. Overhead signage will be evaluated for illumination in accordance with the latest version of VDOT's IIM-TE-380 and documented with the first plan submittal.

Landscaping. The Team has reviewed the RFP conceptual plans as well as Roadside Development Report (RDR) Dated October 30, 2020 and has looked at opportunities to provide landscaping in disturbed areas. Per the RFP requirements, our landscape plan will cover 1.5 acres of the Project. Our plan provides for tree re-establishment generally along the outside SB direction in areas within 50' of properties with a dwelling and adjacent to the Route 112 exit ramps. Tree re-establishment will conform to AASHTO Roadside Design Guide, VDOT Road Design Manual, and FHWA 23 CFR 752 Landscape and Roadside Development guidelines. The Landscape Plan will provide for minimal maintenance and will be compatible with existing indigenous growth consisting of shade, flowering, and evergreen trees. The Landscape Plan will meet or exceed all requirements of the RFP Section 2.8.

Roadside Development will follow the VDOT Road Design Manual, Section 2G-2 and IIM-Main-2018.8.0 and will be coordinated with the Salem District Roadside Manager. The Preliminary Roadside Development Report provided with the RFP will be used to determine appropriate fescues for permanent as well as temporary seeding.

4.3.2 Conceptual Structural Plans

The Lane-Corman Team's approach to bridge design is to provide a solution which meets or exceeds the RFP requirements. We will utilize reliable, durable, long-lasting materials to provide for safe, dependable structures that **reduce long-term maintenance**, **increase long-term asset performance**, **improve constructability**, **and support widespread public acceptance**. The superstructures utilize standard VDOT single-slope concrete parapets, both steel plate girders and prestressed concrete bulb-T beams - which facilitate standard phased construction techniques, satisfy minimum vertical clearance requirements, and produce low-maintenance solutions. Substructure elements and foundation types were selected for their proven performance with respect to durability, reliability, functionality, and constructability.

The structure designs **meet or exceed the requirements specified in the RFP** and relevant design specifications including VDOT and AASHTO requirements, **reducing future maintenance** as outlined below for each bridge.

Our Team's structural designs follow AASHTO LRFD Bridge Design Specifications, 8th Edition with the VDOT modifications. The foundation's analysis and design will follow the Additional Criteria included in the RFP (Attachment 2.3). The Team's designs and details also incorporate VDOT design requirements such as 20 psf construction tolerances and 15 psf future wearing surface (FWS) in accordance with IIM-S&B-80.

All of the new bridge concrete elements are designed using **low permeability concrete** and **corrosion resistant reinforcing** where specified to improve deck and parapet service life and reduce future maintenance. For example, all new bridge decks and parapets will have solid stainless steel rebars (CRR Class III), with low shrinkage Class A4 modified concrete. No epoxy or galvanized steel reinforcing will be used, therefore eliminating premature corrosion, delamination, and spalls.

The Lane-Corman Team will prepare and submit for approval Stage I bridge and retaining wall plans and reports that will specify the type of structure, size, location, and details that are beneficial to the Project. As outlined in VDOT-approved Alternative Technical Concept (ATC 02), the Team will include the Design Waiver for review and approval for the I-81 southbound bridge widening over Thompson Memorial Drive. Our Team's **bridge structures do not contain any elements of segmental construction, post-tensioning, timber, and fracture-critical members. No steel pile bents are utilized.** Upon VDOT's approval of Stage I submittals, the Team will proceed to final designs and Stage II plans to meet the Project Schedule.

Our Team has evaluated the bridge deck drainage for the new and widened structures for the final conditions. We have **eliminated any need for permanent drainage features**, such as scuppers, **reducing future maintenance**. Furthermore, the Team also evaluated the temporary construction conditions, and have adjusted the sequence of construction to provide adequate shoulders or temporary scuppers to contain the RFP drainage spread requirements, **enhancing safety during construction**.

All bridges within the Project will receive new single slope concrete parapets, whether the bridges are widened on a given side or not, (VDOT SSCP-1) with architectural treatment and noise barrier wall where specified by the RFP. The parapets will not be slip-formed due to the architectural treatment.

The demolished portions of the existing bridge structures will be removed 2' below the finished grade as required by the Demolition Special Provision.

New structural steel girders and crossframe connections are designed to avoid the use of any fatigue prone details, which leads to **increased long-term asset performance and reduced future maintenance**.

All new bridges provided by the Team utilize the most-optimal and preferred full-integral (jointless) abutments, eliminating bearings and expansion joints at the abutment – leading to **improved durability, ease of inspection, and virtually no maintenance**.

There are six bridges that will be replaced on this Project. The proposed structures consist of:

Table 4.3.2-1 – *Proposed Project Structures*

Location	Approx. Length (ft)	Proposed Spans	Girder Type	Clearance	Width (ft)	Substructure Type
I-81 NB-over Route 112 (Wildwood Road)	135.42	1	Steel	16'-6"	60	Full Integral (Jointless) Abutments
I-81 SB-over Route 112 (Wildwood Road)	135.42	1	Steel	16'-6"	72	Full Integral (Jointless) Abutments
I-81 NB-over Route 635 (Goodwin Ave.)	84.33	1	Concrete (Bulb-Ts)	16'-6"*	60	Full Integral (Jointless) Abutments
I-81 SB-over Route 635 (Goodwin Ave.)	84.33	1	Concrete (Bulb-Ts)	16'-6"*	60	Full Integral (Jointless) Abutments
I-81 NB-over Route 619 (Wildwood Road)	70.33	1	Concrete (Bulb-Ts)	16'-6"	60	Full Integral (Jointless) Abutments
I-81 SB-over Route 619 (Wildwood Road)	70.33	1	Concrete (Bulb-Ts)	16'-6"	60	Full Integral (Jointless) Abutments

** While a Design Waiver was provided in the RFP to allow a minimum of 15'-8" vertical clearance, the Team's design enhancements increase the vertical clearance to meet a minimum 16'-6" vertical clearance.*

The two bridge structures over Thompson Memorial Drive are proposed to be widened:

Table 4.3.2-2 – Widening Bridge Structures

Location	Approx. Length (ft)	Spans	Girder Type	Clearance	Width (ft)	Widening (Inside/Outside)
I-81 NB-over Route 311 (Thompson Memorial Drive)	144	1	Steel	16'-6"	58	Inside
I-81 SB-over Route 311 (Thompson Memorial Drive)	144	1	Steel	16'-6"	70	Inside/Outside

Both bridge widenings will be retrofitted to Virginia Micro Abutments, which is considered a jointless detail that protects the steel girders and bulk of the substructure from corrosive deck drainage runoff, **improving the longevity of the structure and reducing future maintenance**.

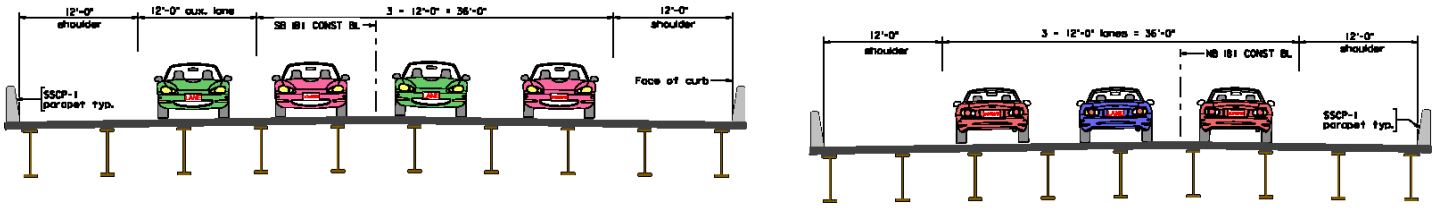
Our Team will provide structural repairs and rehabilitation of two existing bridges in accordance with the RFP:

- Route 419 (Electric Road) over I-81
- Route 705 (Red Lane) over I-81

Bridge Structures

Bridge Replacements I-81 NB (B683) and I-81 SB (B688) over Route 112 (Wildwood Road)

Our Team has significantly **simplified and improved these two bridge designs** by reducing the number of spans from two (as proposed in the RFP) to single span structures. For the SB structure, three 12' lanes, a 12' auxiliary lane, and two 12' shoulders are provided. For the NB structure, three 12' lanes and two 12' shoulders are provided. The unpainted Grade 50 weathering steel girders have a 52"-deep web, which satisfies the AASHTO minimum girder depth, and are composite with the concrete bridge deck. See the exhibit bridge plans in Volume II for additional information.



SOUTHBOUND NORTHBOUND

Figure 4.3.2-1 –Transverse Section - I-81 Over Route 112 (Wildwood Road)

The profiles of both the SB and NB structures are raised to provide 16'-6" minimum vertical clearances along Route 112. In addition, with the raised profiles and designed superstructure depths, 16'-6" clearance is viable for the future fourth lane widening on I-81.

The abutments are full integral abutments on steel HP piles providing the required flexibility in the longitudinal direction. The full integral abutments eliminate deck joints. The design features listed above and the elimination of the piers in the median **significantly reduces the future maintenance costs for VDOT**.

The abutment retaining structures are mechanically stabilized earth (MSE) walls. The bottom of the walls will be at least 2' below the extension of the top of existing roadway to allow for future widening of Route 112. The abutment walls are located outside the structural obstruction zones as specified by the RFP. Due to the elimination of the pier, the median is entirely free for future improvement and reconfiguration of Route 112.

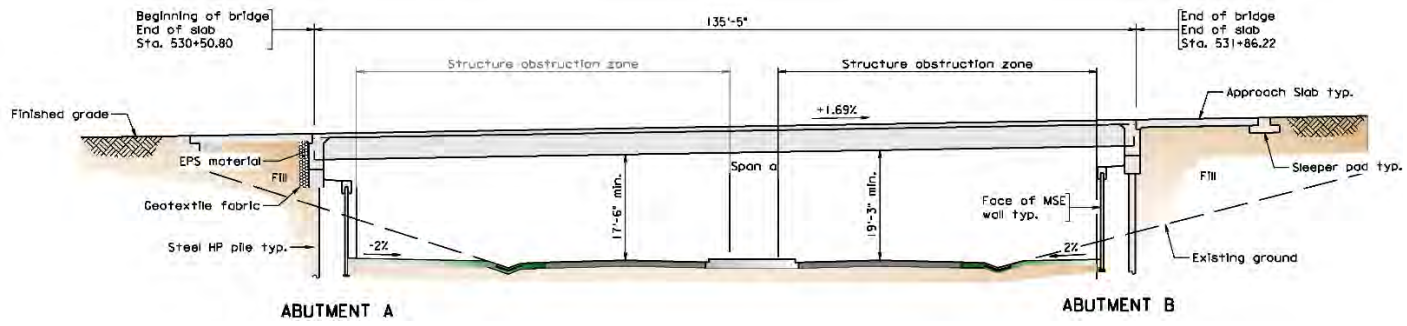


Figure 4.3.2-2 – Elevation Section - I-81 Over Route 112 (Wildwood Road)

During all phases of construction for the bridge replacements and widenings, a minimum of two through lanes with shoulders will be provided on I-81 as required by the RFP

The expansion joints and sleeper pads are located at the end of the approach slabs and will accommodate the necessary superstructure expansion and contraction.

In summary, the following enhancements have been made:

Design Concept Enhancements	Benefits to the Project
Reduced Number of Spans	• Eliminates of center pier • Improves safety
Steel Girders	• Provides Grade 50 Weathering Steel • Allows for additional vertical clearance • Reduces maintenance cost
Raised Profile Grade	• Meets VDOT Bridge Clearance Standards • Allows for future fourth lane along I-81
Full Integral Abutments	• Eliminates deck joints • Significantly reduces future maintenance

Bridge Replacements I-81 NB (B684) and I-81 SB (B685) over Route 635 (Goodwin Avenue)

The NB and SB structures are 84'-4" long, single span PCBT-37 precast prestressed concrete beam composite structures. The widths of the two bridges each accommodate three 12' lanes and two 12' shoulders. For the NB structure, a noise barrier wall with lightweight panels and height not exceeding 15' will also be accommodated and attached to the parapet. With a slight adjustment to the RFP profile design of Route 635, a minimum of 16'-6" vertical clearance will be provided. As a result, the approved Design Waiver for vertical clearance at Route 635 is no longer required. See the bridge plans in Volume II for additional information.

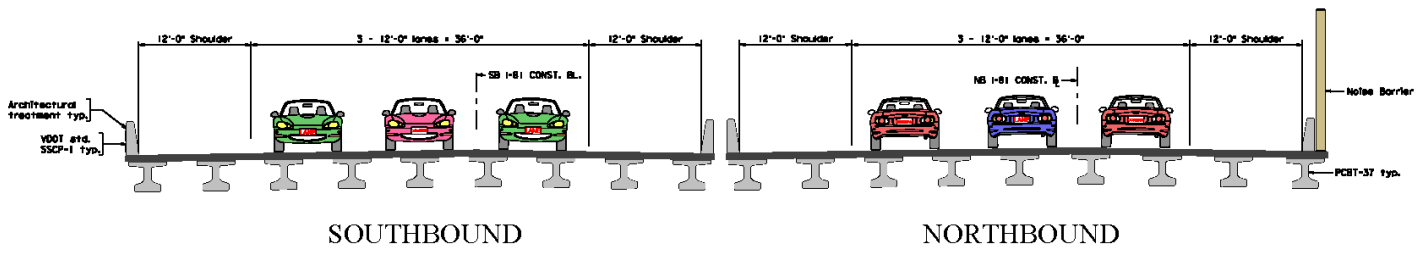


Figure 4.3.2-3 – Transverse Section - I-81 Over Route 635 (Goodwin Avenue)

The abutments are fully integral and supported on steel HP piles and retained by MSE walls. The integral design allows for elimination of open deck joints. The abutments and walls are located outside the structural obstruction zone. In addition, the bottom of the walls will be at least 2' below the top of the extension of the existing roadway for future widening of Route 635.

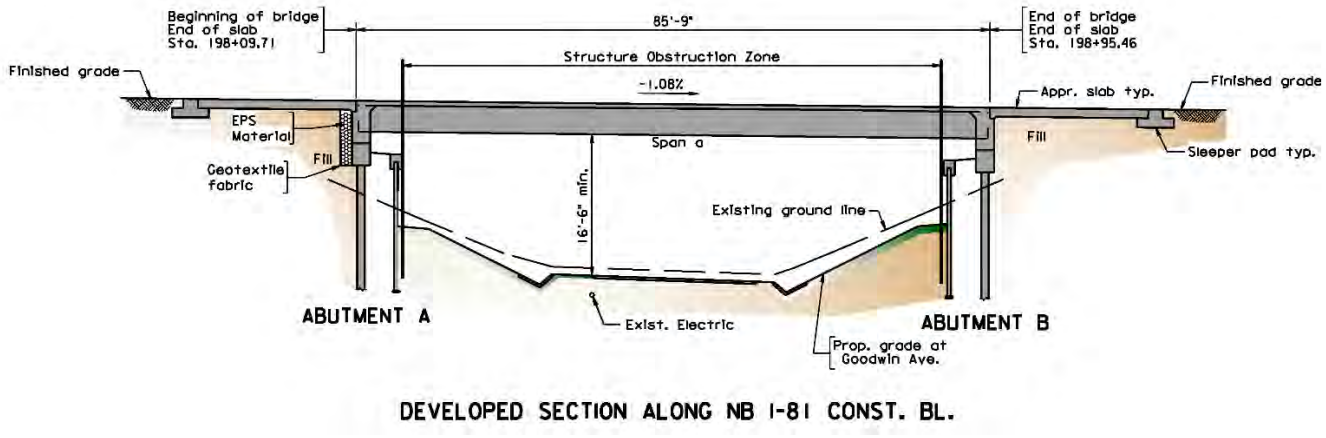


Figure 4.3.2-4 – *Elevation Section - I-81 Over Route 635 (Goodwin Avenue)*

The expansion joints and sleeper pads are located at the end of the approach slabs and will accommodate the necessary superstructure expansion and contraction.

The gap between the two adjacent structures will be approximately 1'-5" satisfying the 1' minimum RFP requirement.

The parapets will receive the required architectural treatment on their outside faces, and the abutments will receive the treatment on exposed exterior faces.

In summary, the following enhancements have been made:

Design Concept Enhancements	Benefits to the Project
Lower Roadway Profile	• 16'-6" vertical clearance is provided, eliminating the need for the approved Design Waiver allowed by the RFP
Full Integral Abutments	• Eliminates deck joints • Reduces future maintenance
MSE Walls/Abutments	• Outside structural obstruction zone allowing for easier future widening • Allows for future widening of Route 635
Approach Slab with Sleeper Pads	• Allows for off-bridge expansion joints • Improves bridge maintenance

<u>Bridge Replacements at I-81 NB (B687) and I-81 SB (B686) over Route 619 (Wildwood Road)</u>

The new NB and SB structures are 70'-4" long, single span PCBT-37 precast prestressed concrete beam structures. The widths of the two bridges are 60' face-to-face of parapets each accommodating three 12' lanes and two 12' shoulders. For the NB structure, a noise barrier wall with lightweight panels and height not exceeding 15' will be accommodated, attached to the parapet. Our Team modified the length of each bridge by 4'-9" to ensure that the new Abutment B locations were clear of conflict with the existing Pier 2 locations, **improving the constructability and increasing Wildwood Road's lateral clearance to the new abutment**.

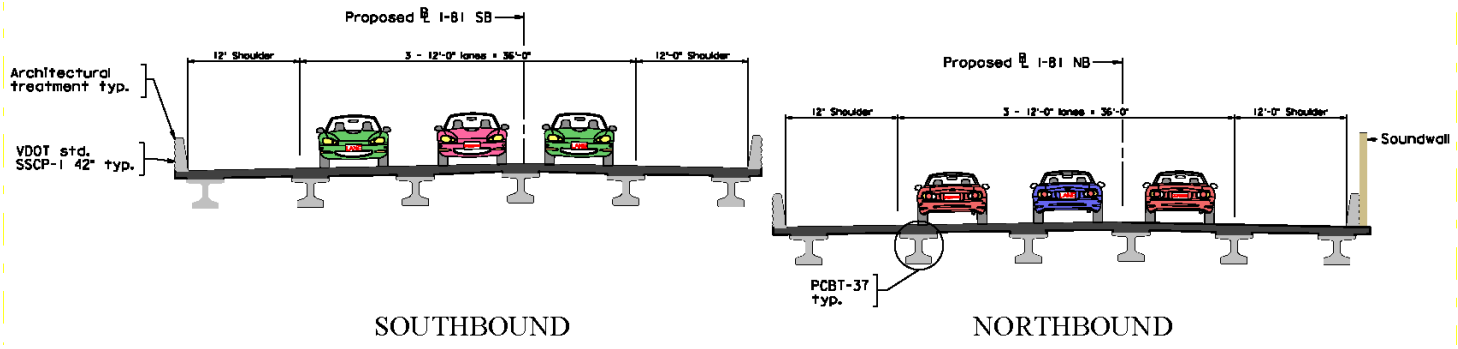


Figure 4.3.2-5 – *Transverse Section - I-81 Over Route 619 (Wildwood Road)*

The abutments and retaining walls are located outside the structural obstruction zone. The bottoms of the walls will be at least 2' below the extension of the top of existing roadway to allow for future widening of Route 619. The abutments are fully integral, supported on steel HP piles and retained by MSE walls. The integral design allows for elimination of any open deck joints. The abutments and walls are located outside the structural obstruction zone.

Approach slabs in combination with sleeper pads will be provided for off-bridge expansion joints.

The gap between the two adjacent structures will be approximately 3'-6" meeting the minimum RFP requirement.

The parapets will receive the Project architectural treatment on their outside faces as well as the exposed exterior faces of the abutments.

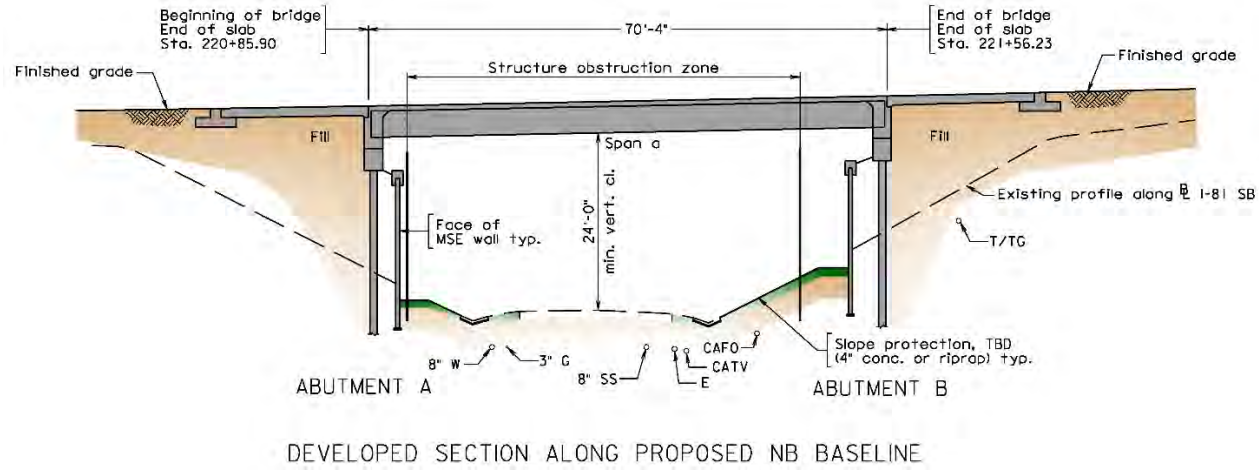


Figure 4.3.2-6 – *Elevation Section - I-81 Over Route 619 (Wildwood Road)*

In summary, the following enhancements have been made:

Design Concept Enhancements	Benefits to the Project
Modified Bridge Length	• Improves constructability • Avoids conflict with existing pier foundation
MSE Walls/Abutments	• Outside of Structural Obstruction Zone • Allows for future widening of Route 619
Full Integral Abutments	• Eliminates deck joints • Reduces future maintenance
Approach Slabs w/Sleeper Slabs	• Allows for off bridge expansion joints • Improves bridge maintenance

Bridge Widenings at I-81 NB (B678) and I-81 SB (B677) over Route 311 (Thompson Memorial Drive)

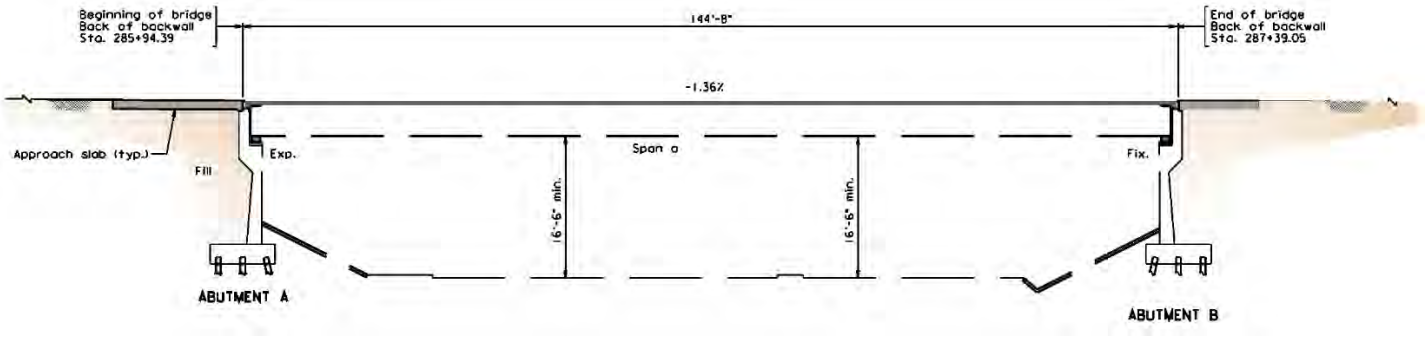
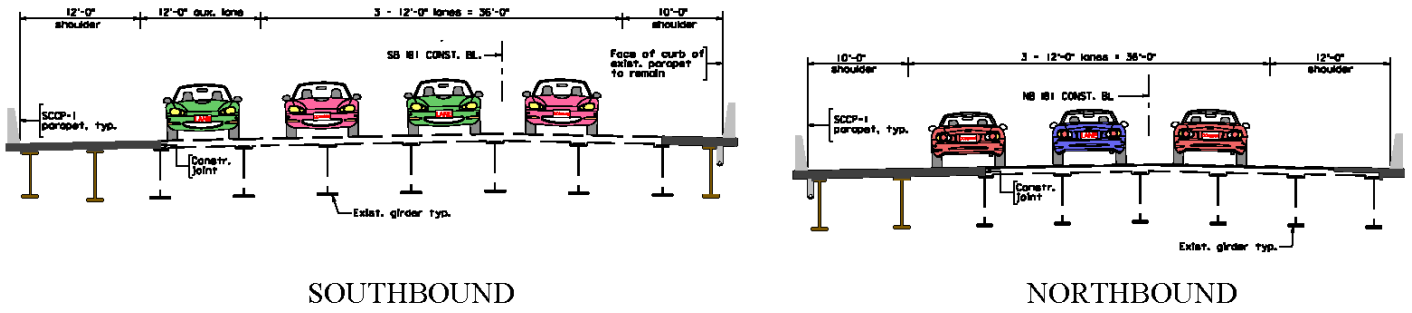


Figure 4.3.2-7 – Elevation Section - I-81 Over Thompson Memorial Drive

The widened NB and SB bridges at this interchange are 144'-8" long, single span steel girder structures. The width of NB bridge is 58'-0" face-to-face of curbs accommodating three 12' lanes, 12' outside shoulder, and 10' inside shoulder. The width of SB bridge is 70'-0" accommodating three 12' lanes, a 12' auxiliary lane, 12' outside shoulder, and 10' inside shoulder. The new southbound abutments will be widened 15'-4 ½" to the outside and 7'-4 ½" to the inside with new wall abutments supported on steel piles similar to the existing substructure. The existing inside parapet for the SB bridge will be reconstructed to the SSCP-1 standard. The NB bridge widening will be entirely to the inside of the roadway. The existing median retaining walls and foundation at the abutments will be removed and reconstructed to match the existing abutments. The existing steel piles under the median retaining walls will be evaluated per the RFP requirements and, as required, will be supplemented with new piles for the widenings. See the Volume II bridge plans for additional information.



SOUTHBOUND NORTHBOUND

Figure 4.3.2-8 – Transverse Section - I-81 Over Thompson Memorial Drive

The existing concrete bridge decks will be overlayed with very early high-strength latex modified concrete overlays with their joints located outside of the wheel path. The decks will be prepared for the overlay utilizing milling and hydro-demolition to remove a portion of the existing concrete. After the deck milling and prior to the installation of the overlays, the existing decks will be visually inspected and sounded for delaminations and repaired as necessary per the applicable Specifications.

Deficient concrete substructure surfaces will be repaired per the Specifications with inclusion of galvanic anodes. Also, concrete cracks will be repaired per the VDOT Specifications. All repairs will be confirmed in the field with VDOT representatives.

The minimum 16'-6" vertical clearance will be provided for both widenings. However, for the SB bridge, a Design Waiver (ATC 02) will be required for the new exterior girder depth to be approximately 4" less than the AASHTO minimum. This concept has been put forward to VDOT and conditionally approved. This Design Waiver will be drafted and submitted with the Stage I plans and reports for VDOT review and approval.

The existing abutment backwalls, deck extensions, and approach slabs will be reconstructed and modified per the Virginia Micro-abutment detail. The new abutment will match the existing.

The new approach slabs for the widenings will match and connected to the existing approach slabs.

The new parapets will receive the Project architectural treatment on their outside faces.

The existing rocker bearings will be replaced with new reinforced elastomeric bearings to match the bearings for the new girders.

Bridge Repairs and Rehabilitation of Existing Bridges at Route 419 and Route 705 over Route 81

VDOT BPPS pier protections will be provided for existing piers within the specified clear zone distance to I-81.

Deficient substructure surfaces will be repaired per VDOT Specifications with inclusion of galvanic anode.

Deficient concrete abutment slope protection will be repaired/replaced per the Specifications.

Preliminary repair plans will be submitted VDOT for approval prior to the final plan submittals.

Retaining Walls

MSE walls will be used in front of pile-supported bridge abutments and will extend parallel to Route 112, 635, and 619, functioning as wingwalls. Cast-in-place walls will be utilized to extend existing retaining walls at the widened Route 311 structures. There are six other stand-alone retaining walls which are located along the SB alignment for the purpose of **reducing ROW, grading impacts, and culvert extensions**. These walls will be concrete with a vertical face and have a VDOT Standard HR-1 handrail that is galvanized. All retaining walls have the architectural treatment per Special Provision for Architectural Treatment and Concrete Surface Color Coating.

Major Drainage Structures

Several existing box culverts throughout the Project will be impacted by the widening construction. The goal of our design for these major drainage structures is to reuse the existing culverts to the greatest extent possible. We will inspect and verify to confirm that each location is in a serviceable condition to accommodate the needs of the Project, now and for future service life. Depending on the specific location, this may include performing spot repairs as recommended by inspection reports, extending the existing box culverts to accommodate roadway widening, headwall modifications, and cleaning out the culverts as needed. Each box culvert extension location has been evaluated to ensure that **impacts to existing streams and wetlands have been minimized. One notable example of environmental optimization is the triple box culvert at Station 127+10 where the upstream culvert extension has been eliminated, saving approximately 50 LF of stream impacts and 1,500 SF of wetland impacts.** *Table 4.3.2-3* provides a summary of box culvert locations, sizes and proposed improvements. The proposed improvements shown in the table will be further evaluated in the design phase for the potential combination of retaining walls, extended head walls, and culvert extensions to optimize each location.

***Table 4.3.2-3** – Box Culvert Summary*

Location	Size	Proposed Improvements
Sta. 127+10	Triple 7'x8'	Spot Repairs
Sta. 149+60	Single 4'x6'	Extend Upstream End
Sta. 160+30	Single 4'x6'	Extend Downstream End, Modify Upstream Headwall
Sta. 176+60	Single 4'x6'	Modify Upstream Headwall
Sta. 218+30	Triple 7'x10'	Spot Repairs
Sta. 241+05	Single 4'x6'	Inspect & Spot Repairs (If Needed)
Sta. 262+95	Double 4'x6'	Spot Repairs
Sta. 270+45	Single 4'x6'	Spot Repairs
Sta. 283+90	Double 4'x6'	Spot Repairs
Sta. 315+25	Single 4'x6'	Spot Repairs

4.4 Project Approach

4.4 Project Approach

The Lane-Corman Team provides the Project with highly qualified, seasoned design and construction personnel, subject matter specialists, and subconsultants with the ability to provide VDOT the expertise required to manage and control all design and construction activities. By providing this approach, our Team **minimizes the role of VDOT** to an expected oversight function and allows the Project to be continuously advanced from milestone to milestone; having **diligently planned for and managed the schedule, risk, and cost** through all aspects of design and construction. We will work closely with VDOT and the stakeholders to maintain strong and open lines of communication using down-to-basics work sessions that address concerns and needs. This proactive management of the Project will result in a **D-B process that foresees potential issues, mitigates their risk, and facilitates success**. Our Team believes that this partnering approach with continuous and open communication will best serve the Project and overall development and delivery.

4.4.1 Environmental Management

Our Team recognizes the importance of a comprehensive, environmentally conscious approach to navigate the Project's unique characteristics. Our environmental team's experience and familiarity with a myriad of environmental challenges on numerous VDOT projects throughout the Commonwealth provides us the knowledge and necessary commitment to not only skillfully circumvent potential pitfalls but uphold commitments during the Project's design and construction. Utilizing our staff's expertise, we assembled a multifaceted Environmental Compliance Team (ECT). Our ECT includes oversight by our Environmental Coordinator during design – Brian Conners, and our Environmental Compliance Manager during construction – Chris Lund, along with support staff from Lane-Corman, RDA, and WSP, to foster streamlined processes and a compliant Project from start to finish.

Our ECT is a multifaceted group of environmental professionals who will bring a comprehensive, environmentally conscious approach to the Project to ensure compliance.

Our Team will set up individual meetings with each permitting agency to review the Project's scope and schedule. We will also conduct combined meetings with all permitting agencies to confirm permit and jurisdiction requirements, attain buy-in among the parties, and promote interagency coordination. These coordination meetings will allow us the opportunity to present value-added designs for agency consideration as well as to fully vet any modifications to ensure there is no discrepancy with the NEPA commitments and/or permit requirements.

Key benefits of our environmental approach include:

- **Reducing 677 LF of stream and 0.05 acres of wetland impacts** by significantly shifting the SB alignment
- Eliminating culvert lengthening and **minimize stream and wetland impacts** through the use of retaining walls or modified headwalls
- Achieving an **environmentally responsible Project** through interdisciplinary communication
- Initiating early coordination with agencies upon Notice of Intent to Award to **minimize potential Project delays**
- Providing monitoring and inspection activities to ensure **compliance throughout the Project**
- **Reducing areas of disturbance** compared to RFP design
- Shortening construction duration and achieving early Project completion to **minimize the overall time of disturbance**

Our Team's environmental stewardship is demonstrated with the shifting of the SB alignment toward the median as described in Section 4.3. This **eliminates impacts to several wetland and stream features** including significant amounts of palustrine forested wetland and perennial streams that require the most expensive and extensive mitigation in an area that is currently experiencing mitigation market scarcity. Our design calls for the implementation of retaining walls in place of culvert extensions, where applicable, to further **minimize costly impacts to stream features**. For example, the triple box culvert extension at the Route 112 interchange has been eliminated through the use of a retaining wall to reduce stream impacts.

Additionally, our design ensures that impacts to the Hanging Rock Battlefield Trail will be minimized, and the trail will be maintained for public use during construction. The Lane-Corman Team will yield to trail users when temporarily accessing the BMP area in accordance with 4(f) regulations. Our environmental staff's thorough understanding of the design impacts results in faster and more effective solutions such as mitigation credit acquisition and capitalizing on the short, endangered species survey seasons. Our design plans will include native and indigenous planting that can adapt and survive in roadside environments; and, this environmentally conscience approach to landscaping promotes native vegetation and will reflect the historical and cultural flora of the area. For example, this approach utilizes permanent native low-growing groundcover that inhibits erosion and sedimentation that effectively populates the area. Furthermore, our environmental strategy calls for stormwater management facilities to be considerately placed adjacent to low lying stream and wetland features to **minimize both temporary and permanent impacts**. These responsible design components **significantly reduce impacts, save costs and reduce the timely process of stream and wetland credit acquisition** in a limited market.

Efforts to Avoid/Minimize Project Impacts

Throughout the design phase, the RDA staff will work in unison to minimize design impacts on environmental resources. We recognize the paramount necessity of securing environmental permits as soon as possible and remaining in compliance throughout the Project's lifespan.

Our ECT will produce an Environmental Constraints Map (see excerpt in *Figure 4.4.1-1*) to illustrate the recognized environmental conditions and environmentally sensitive areas that, if encroached upon, could impose excessive costs and burdens on the Project. This map will identify USACE and DEQ approved Waters of the U.S. features that our Team will consider throughout design preparations. Recognized environmental conditions and sensitive areas referenced in the NEPA document, such as Hazardous Material locations, Section 4(f) properties, and Cultural Resource locations, will also be represented on this map. Preparation and careful utilization of the Environmental Constraints Map proves to be an effective communication resource and mechanism that precludes overall risk and potential delays. It also provides all design and construction disciplines with an inventory of sensitive environmental areas that should be avoided to the maximum extent feasible.

The portions of the SB alignment that our plan modifies will avoid impacts to several state and federally regulated wetland and stream features. This minimization will reduce overall cost while lowering impact amounts and facilitating an accelerated permitting process by ensuring the Project meets State Programmatic General Permit thresholds. Our attentive placement of stormwater management facilities and use of retaining walls rather than culvert extensions **diminishes the overall environmental footprint of the Project**.

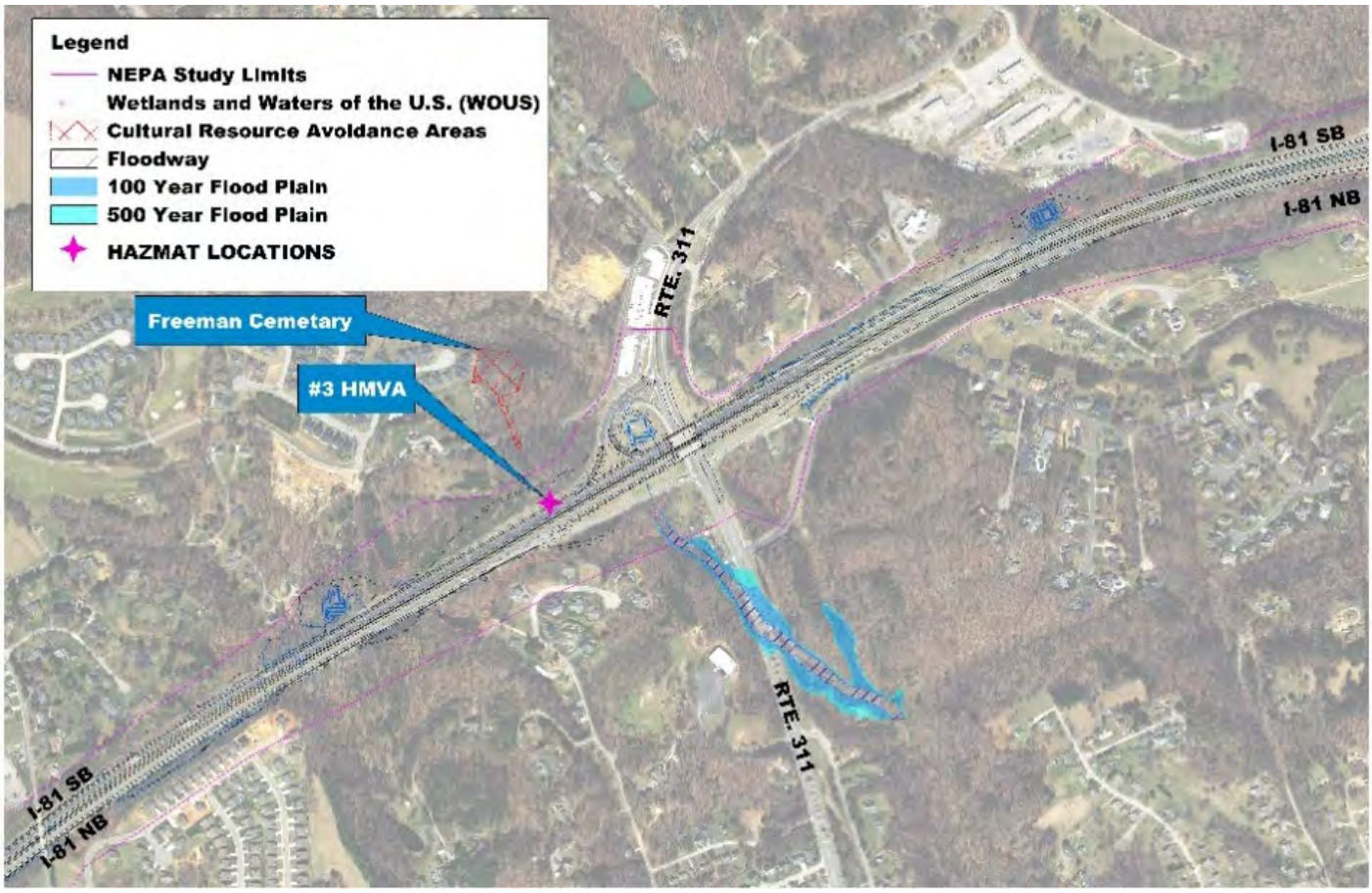


Figure 4.4.1-1. *Excerpt of Environmental Constraints Map*

Addressing Environmental Conditions/Areas of Concern within the Project Footprint

Our ECT will remain diligent in overseeing and ensuring an environmentally responsible Project by identifying and anticipating concerns and obligations early in the design process. Our Team will maintain our conscientious approach to the identified areas of concern and simultaneously coordinate (formally and informally) with the regulating agencies to facilitate a transparent, compliant, and successful undertaking. We will conduct continued fieldwork and reconnaissance to further ensure that **environmentally sensitive areas are identified and avoided to the maximum extent practical**. We will design this Project in accordance with State Programmatic General Permit parameters, reducing permanent impacts and subsequent mitigation costs wherever possible. Our Team has researched the availability of wetland and stream mitigation within the Project's HUC to streamline our approach to permit compliance and expediting construction.

Our ECT will maintain the specific requirements identified in the NEPA document. As the Project design develops, any deviation that may affect Hazardous Material, Section 4(f), Cultural Resources, Noise, Air Quality, or Threatened and Endangered Species will be diligently coordinated to **avoid any potential delays**. The ECT will ensure that the temporary impacts to the Hanging Rock Battlefield are kept minimal and temporary as to not constitute a use within the meaning of Section 4(f) regulations. All locations identified by the Cultural Resources Study referenced in the NEPA document will be carefully avoided so that no further coordination is required. The ECT will utilize the USFWS Information, Planning, and Consultation tool to keep an updated understanding of any Threatened or Endangered Species concerns or development in federal protection throughout the life of the Project. To comply with the "Programmatic Agreement for Project Level Air Quality Analyses for Carbon Monoxide", our Team will exercise all reasonable precautions to limit the emissions of volatile organic compounds and nitrogen oxides. The ECT will prepare a Type I Noise study as required by the NEPA document to avoid further coordination efforts plus ensure no expansion of ROW from the RFP Conceptual Plans to prevent the need for NEPA re-evaluation.

Field Coordination Efforts

Throughout construction, the clear and evident demarcation of environmentally sensitive areas will combat the risk of unwarranted or accidental impacts. Project-specific environmental commitments will be communicated by the ECT to construction personnel for assurance that day-to-day operations remain in compliance. Monthly Virginia Water Protection Permit Inspections will be performed by qualified personnel to safeguard against unpermitted impacts and potentially punitive actions by the Department of Environmental Quality. Bi-annual Construction Status Updates will be submitted to DEQ in accordance with Virginia Water Protection Permit protocol. All work will adhere to the Virginia Erosion and Sediment Control (E&S) Handbook and Regulations. As part of the Project QC plan, these E&S designs will be reviewed by a DEQ Certified Plan Reviewer from our Team, as well as the construction staff. Furthermore, C-107 compliance checks will be completed twice a week by construction staff to identify and maintain any deficiencies in E&S Controls.

The Lane-Corman Team will provide Project-specific environmental training for key team members on environmental resources, which ones must be avoided and compliance with permits. This training will reduce the risk of environmental non-compliance during construction.

Project Schedule and Environmental Permitting Integration

Securing environmental permits and approvals are a principal component in maintaining the Project Schedule. As such, we have incorporated them as Hold Points in the Schedule for areas where environmental permits must be in place before impacts to jurisdictional features can commence. To accelerate this process, we will leverage our relationships with agency representatives and our breadth of experience to expedite permit acquisition. Upon receiving NTP, the ECT will commence fieldwork, due diligence activities, and agency coordination. This includes, but is not limited, obtaining a formal Waters of the U.S. delineation approved by USACE and DEQ, thus laying the groundwork for environmental considerations throughout the design phase. We will introduce all pertinent environmental information and sensitive area locations into the above referenced Environmental Constraints Map for each discipline to consider in their respective design. Once the design has sufficient detail in regard to temporary and permanent impacts, grading, and drainage, we will submit a Joint Permit Application (JPA) and associated deliverables to VMRC, USACE, DEQ, and VDGIF to verify compliance and coverage under the State Programmatic General Permit and Virginia Water Protection Permit. Our Team will submit the JPA as soon as possible to quell any concerns or unexpected issues the agencies may put forth. Our experience has shown to successfully permit projects in a timely manner, a comprehensive and thorough JPA package is critical to maintaining the Project Schedule. The ECT is continually conscious of the overall conditions and special conditions outlined in the DEQ issued Virginia Water Protection Permit. We will adhere to all conditions identified in the permit, such as verifying all fill material is free of contaminants, timely stabilization of exposed slopes and streambanks, monitoring nonimpacted areas, and restoring temporary impacts to preexisting conditions within 30 days of completion, among a multitude of best practices to promote environmental responsibility.

Activity ID	Activity Name	Original Duration	Start	Finish
Environmental		301	24-May-21	25-Jun-22
Permitting		162	24-May-21	24-Dec-21
312	VPDES Submisson and Approval	90	24-May-21	21-Aug-21
62	Wetland Delineation	45	28-Jun-21	11-Aug-21
302	Prepare and Submit SWPPP	15	12-Aug-21	27-Aug-21
202	Preliminary Jurisdictional Determination	45	12-Aug-21	25-Sep-21
A7910	VPDES Permit/SWPPP Approved	0		31-Aug-21
64	ACoE Water Quality Permit	90	26-Sep-21	24-Dec-21
212	State Programmatic General Agreement	90	26-Sep-21	24-Dec-21
292	Virigina Water Quality Permit	90	26-Sep-21	24-Dec-21
A7930	Water Quality Permits Approved	0		24-Dec-21
Hazardous Material		118	25-May-21	27-Oct-21
262	Hazardous Material Structural Inspection and Report	30	25-May-21	25-Jun-21
222	Phase 1 ESA Report (New Properties Only)	30	13-Jun-21	12-Jul-21
272	VDOT Review Hazardous Material Structural Report	21	26-Jun-21	16-Jul-21
232	VDOT Review Phase 1 ESA Report	21	13-Jul-21	02-Aug-21
282	Hazardous Material Abatement (if neeeded)	90	19-Jul-21	27-Oct-21
242	Phase 2 ESA Report	50	03-Aug-21	28-Sep-21
252	VDOT Review Phase 2 ESA Report	21	29-Sep-21	19-Oct-21
A7920	Phase I ESA (and Potential Phase II ESA) Complete	0		19-Oct-21

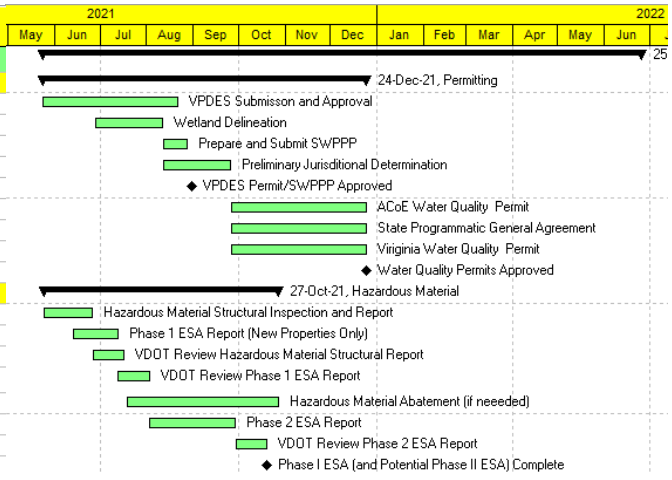


Figure 4.4.1-2. Excerpt of environmental activities and Hold Points incorporated into the Project Schedule

With an acoustic bat survey having been conducted as mentioned in the NEPA document, there will be no Time of Year Restrictions to interrupt the Project Schedule. To further bolster our approach and potential solutions for addressing both recognized environmental conditions and unidentified issues that may be encountered, our Team will remain in frequent contact with VDOT environmental staff to ensure proper protocols are maintained throughout the Project. We understand and anticipate the scarcity in the stream and wetland mitigation market for the Project area. To offset that concern, we will be in contact with multiple mitigation banks early and often to obtain Letters of Credit Availability, stay updated on credit inventory, and apprised of anticipated credit releases. We also have considerable relationships with firms that specialize in permittee responsible mitigation in the event that no mitigation can be purchased from any banking mechanism. The ECT will update Threatened and Endangered Species coordination and supporting documentation throughout Project milestones as preferred by VDOT. This ensures no recently added species or habitat is overlooked, thus securing our compliance throughout the Project. Considering our staff's expertise and proficiency, the ECT is confident in providing/maintaining an unobstructed path to an environmentally conscious, compliant, and successful Project.

Recognized Environmental Condition	Mitigation Strategies
Section 4(f)/Section 6(f)	• **Minimize** temporary impacts to the Hanging Rock Battlefield Trail to gain access for the construction of a proposed stormwater management basin • Ensure the temporary occupancies of land are minimal so as not to constitute a use within the meaning of Section 4(f) • **Avoid additional impacts/use** of Hanging Rock Battlefield Trail, remain within Project corridor identified in the environmental document
Cultural Resources	• Avoidance of NRHP eligible features including VDHR ID# 080-5023, 080-5140, 129-5013, and the Hanging Rock Monument. • Coordinate further with regulators if design is altered to further encroach upon these properties.
Threatened and Endangered Species	• Re-coordinate with USFWS Information, Planning, and Consultation tool for assurance that no new species listing may be affected by the Project
Wetlands/Streams/Water Quality Permitting	• Upon NTP, conduct a formal WOTUS delineation to identify all federal and state jurisdictional areas. • Reduce impacts to these areas to maximum extent practical • Coordinate with regulating agencies to facilitate permitting • Secure mitigation for permanent stream and wetland impacts • Frequently monitor permanent and temporary impact locations to ensure compliance • Develop phased E&S plans for implementation where interim measures are required to avoid agency oversight concerns regarding E&S measures
Air Quality	• Exercise all reasonable precautions to limit the emissions of volatile organic compounds and nitrogen oxides to uphold the "Programmatic Agreement for Project Level Air Quality Analyses for Carbon Monoxide"
Noise	• Perform a detailed Type I Noise study during the final design of the Project. • Determine if the number and locations of the sound barriers are feasible, reasonable, and necessary as identified in the preliminary report
Hazardous Materials	• Manage materials with good housekeeping practices in accordance with all regulations • Reduced ROW needs to avoid unknown preexisting hazardous materials • Perform soil and/or groundwater investigations at disturbance/acquisition areas with documented RECs to identify the need for special media management provisions, where necessary • Ensure that the seven recognized environmental conditions do not represent a substantial liability or require substantial regulatory negotiations

4.4.2 Utilities

Various utility owners are present throughout the Project alignment, primarily at interchanges, along with a handful of utility crossings of the mainline and a Citizens Telephone Cooperative (CTC) fiber line that runs within the median of the Project mainline.

Key benefits of our utility approach are:

- Early coordination with utility companies to **reduce Project impacts**
- Optimized interchange design to **avoid utility impacts**
- Strategic construction sequencing to keep utilities off the Critical Path, **minimizing potential schedule delays**
- Team's experience, knowledge, capability, and authorization to design relocation solutions for utility owners, **mitigaing schedule delays and risk**

Approach for Utility Coordination, Adjustments, and Relocations

The Team's approach to utility coordination, adjustments, and relocations is to develop a design that **minimizes conflicts and relocations that pose a risk to the schedule and Project cost**. Where conflicts are unavoidable, we will sequence construction phasing to minimize schedule dependency on utility relocations. Further, we will engage utility owners early in the design phase and maintain effective communication throughout the Project. By avoiding utilities to the maximum extent possible, we will reduce costs, minimize schedule risk, and expedite the start of construction. This approach has been successfully implemented by RDA with Lane on numerous projects, including I-66/Route 15 Interchange Reconstruction D-B and I-66 Inside the Washington Beltway Widening D-B, and with Lane-Corman on the Route 29 Solutions D-B project.

We have carefully reviewed the RFP Conceptual Plans and the utility data provided with the RFP. Coordination with each impacted utility company has already begun along with researching available records to accurately develop our conceptual plans and schedule. The Team will leverage the information gathered by working with the utility companies in the corridor to provide VDOT with a comprehensive approach to minimizing utility impacts on the Project. Several of the utility conflicts throughout the Project are unavoidable due to the new construction (listed in *Table 4.4.2-1*). Our Team will utilize our extensive design and construction experiences with those utility companies to assist the utility owners with their design to ensure the relocation designs are out of conflict and properly addressed. We utilized this practice recently on the Route 29 Solutions bundle with Dominion Power and avoided relocating of over 90% of their facility along Route 29. Our Team also has experience working with utility owners and betterment requests that arise as part of the relocation process. Should betterments be requested, we are able to react accordingly to have them properly approved and integrated into the design and construction to **minimize Project delay**.

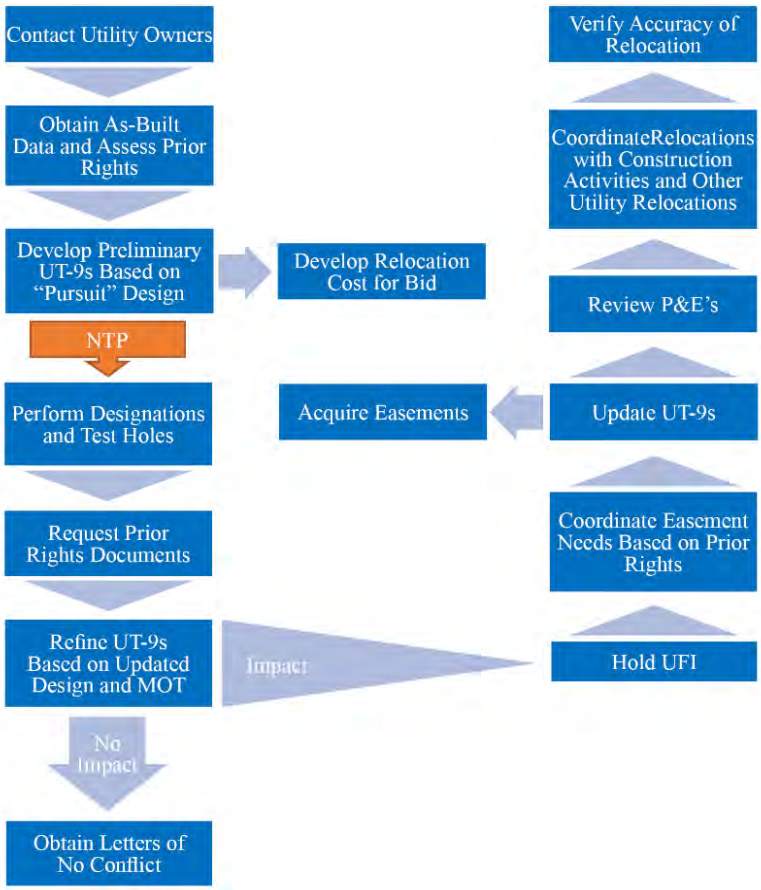


Figure 4.4.2-1. *Utility Coordination Process*

Our utility coordination team has over 100 years of experience in utility planning, design, conflict resolution, relocations, inspection, and construction coordination. We are familiar with the VDOT Utility Manual and the Utility Coordination Process as outlined in *Figure 4.4.2-1*. Our Team understands the important milestone of approved Plan and Estimates (P&Es) and the need for ROW availability for utility relocations to commence (if ROW is required for the relocation). We also have specific experience managing requested betterments, identifying long lead utility tasks, and managing utility owners within the schedule. Our Lead Utility Coordinator, Mr. John Myers, is a former VDOT Regional Utility Coordinator who over the course of his career has developed strong relationships with each of the utility companies that have facilities along this corridor. The utility relocation team includes a 30+ year power company retiree, a past gas company project manager, a 20+ year experienced designer for Verizon, as well as utility company certified, experienced engineers in designing water and sewer facilities, electric power systems, and Washington Gas facilities. Our Team routinely prepares relocation and new build design work for many of the communications and fiber optic companies around the Commonwealth, including those impacted by this Project. As a proactive measure to expedite each utility owner's design and to ensure their relocations are out of conflict with our Project as well as each other, our Team will develop preliminary alignments for each impacted utility owner.

Utility Conflicts

Through our coordination with utility owners and our analysis of available information, we developed a comprehensive matrix identifying all potential utility conflicts in the Project area. This matrix was created using utility designations and test holes provided by the RFP, as well as record information that was also provided. Further modifications to the design will be implemented following supplemental utility designation and test pits to be performed after NTP.

We have identified unavoidable utility conflicts throughout the Project and will gather these together into four Project areas to discuss. The sequence of utility relocations will be coordinated with utility owners to minimize schedule risk.

Below is a general description of the Project utilities separated into four Project locations. Since the utility conflicts identified below are generally unavoidable with the proposed roadway widening and bridge work, we have identified these conflicts so they can be addressed as early as possible in the Project schedule as to not delay any proposed construction.

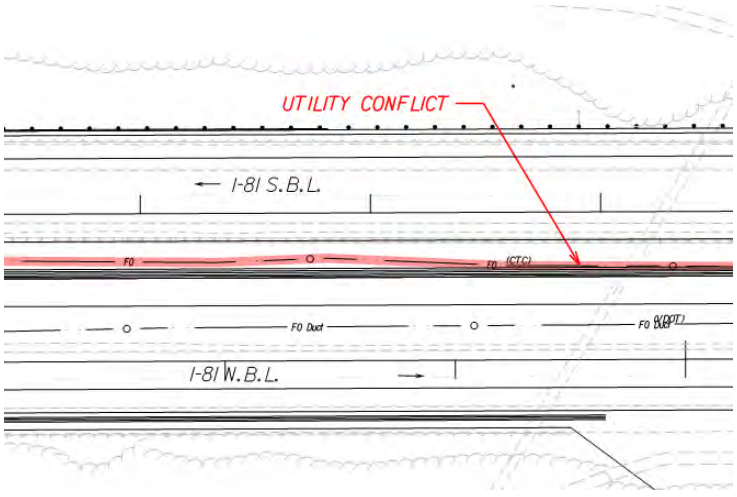


Figure 4.4.2-2. *Location 1*

Location 1 - CTC. CTC has fiber that runs in the median of I-81 from Wildwood Road (Route 112) to the northern Project limit. The fiber cannot remain within the median due to the proposed construction and must be relocated prior to the work proposed within the median in the first phase of construction. Per our coordination with CTC, this utility relocation is to be performed by the utility at their cost due to the permit agreement with VDOT. Our Team has developed a preliminary relocation alignment for CTC to relocate to the outside of the northbound lanes of I-81. Since this is expected to be the only utility relocation near the Project's Critical Path, our Team has already begun coordination with CTC related to the potential new path along the Project alignment. This will allow us to understand any access concerns CTC will have for their fiber and to verify that they will be able to meet the Project Schedule.

Location 2- Wildwood Road (Route 112). At the Route 112/I-81 interchange, the existing utilities are currently running within the Route 112 corridor crossing under I-81. Electric and communication utilities typically are overhead along Route 112, but at the bridge they drop underground to cross under I-81. Generally, the utilities in this corridor are out of conflict with the proposed work, however, there are underground Comcast and Verizon lines that conflict with bridge construction and will require relocation. Additionally, one of the existing utility poles along Route 112 conflicts with the roadway construction and will require relocation. To avoid impact to the construction of the proposed bridge and roadway in this location, the utility relocation work must be completed early in the Project. Since all relocation work is within the existing ROW for Route 112, these relocations can commence without any ties to ROW acquisitions, and therefore can occur as soon as we can identify and establish their design for relocation. The Team will work with the impacted utility owners to confirm their relocation designs avoid all future construction in the area and is complete prior to work commencing on the bridges.

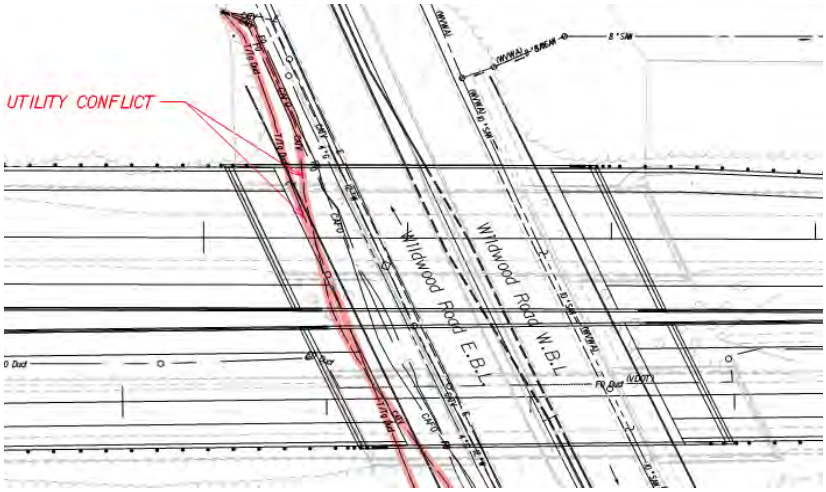


Figure 4.4.2-3. *Location 2*

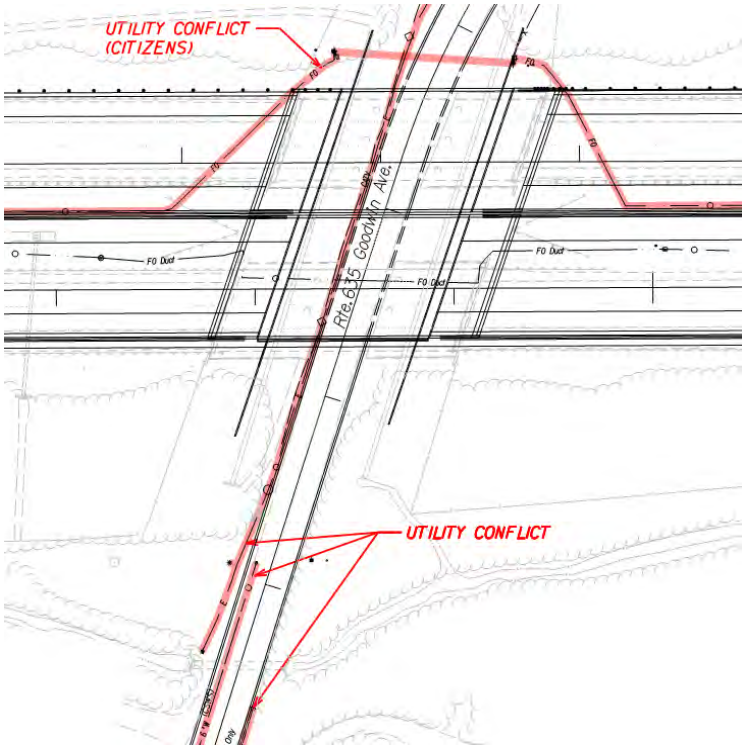


Figure 4.4.2-4. *Location 3*

Location 3 - Goodwin Ave (Route 635). Like Route 112, the dry utilities along Route 635 are overhead and then drop underground as they cross under I-81. The water, sewer, and gas lines on the east side of I-81 that do not cross I-81. Due to the lowering of the roadway along Route 635, several utility poles as well as the underground electric, water, gas, and sanitary sewer are in conflict or require minor adjustments to facilitate the proposed construction. Our early discussions with Roanoke Gas have proved positive: the gas relocation may be avoided by shortening the gas line instead of lowering it within the cut area. Like Route 112, all the existing utilities are currently within the ROW and will remain there; therefore, their relocation is independent of ROW acquisition and can commence as soon as the Plan and Estimate is approved. Since these utility conflicts are unavoidable due to the required lowering of the roadway, our Team will work to expeditiously to have the utilities relocated prior to work commencing at this intersection.

Location 4-Wildwood Road (Route 619). At Route 619, there are various dry utilities that parallel overhead and then drop underground to cross under I-81 before becoming overhead again on the other side of I-81. The majority of the existing underground utilities that cross I-81 are located between the two existing bridge abutments and are not within the work area for the proposed bridge replacement. The exception in this corridor are the Comcast and Verizon facilities that cross near to and behind the proposed bridge abutment respectively. Our Team will work with both Comcast and Verizon to determine if these utilities can be avoided during construction with minor lift and re-lay operations or if relocation is required. It is likely Verizon will require relocation, but Comcast can remain in place during construction of the new bridge as it is protected in place. Any utility relocations at Route 619 would be within the existing ROW and will be designed and scheduled to be performed prior to the start of bridge work at this crossing.

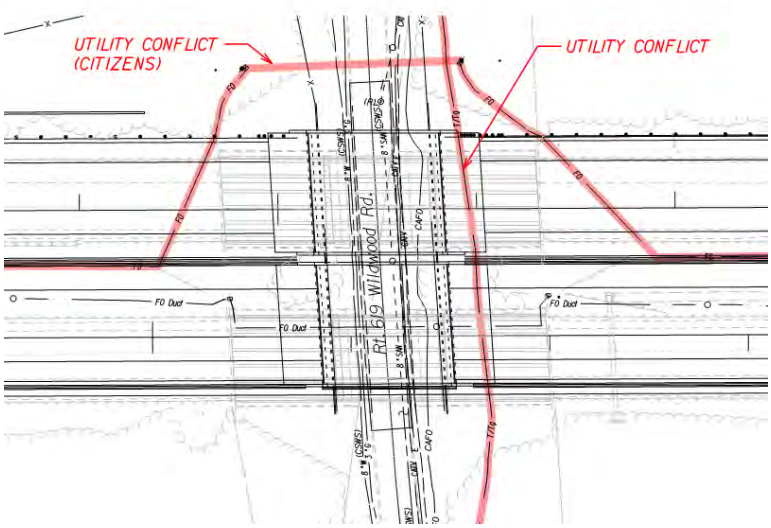


Figure 4.4.2-5. *Location 4*

A summary of the Project-wide conflicts, with Conflict ID numbers corresponding to locations identified in the Volume II Conceptual Roadway Plans, along with our assessment and mitigation measures is provided in *Table 4.4.2-1*.

Table 4.4.2-1. *Utility Impacts (Detailed Level)*

Utility Owner	Type of Utility	Location	Conflict ID	Quantity	Resolution
City of Salem Electric (CISA)	OHE (3-Phase)	Location 2 (Rte. 112)	UTIL-1	1 pole	Pole with multiple attachments to be moved out of proposed ramp. Pole transfer expected by communication companies.
Segra/Lumos Networks (LMS)	96 ct Fiber	Location 2 (Rte. 112)	UTIL-1	1 pole Transfer	Pole transfer required for pole relocation to avoid proposed ramp.
Zayo (ZAY)	24 ct Fiber	Location 2 (Rte. 112)	UTIL-1	1 pole transfer	Pole transfer required for pole relocation to avoid proposed ramp.
Comcast (CMC)	CATV	Location 2 (Rte. 112)	UTIL-1	1 pole transfer	Pole transfer required for pole relocation to avoid proposed ramp.
Verizon	FO/Copper	Location 2 (Rte. 112)	UTIL-1	1 pole transfer	Pole transfer required for pole relocation to avoid proposed ramp.
Comcast (CMC)	CATV	Location 2 (Rte. 112)	UTIL-2	361 LF	Existing facilities in conflict with proposed bridge and MSE wall construction. Relocation required.
Verizon	FO/Copper	Location 2 (Rte. 112)	UTIL-3	339 LF	Existing facilities in conflict with proposed bridge and MSE wall construction. Relocation required.
Citizens Telephone (CTC)	240 ct Fiber	Location 1 (CTC)	UTIL-4	22,000 LF	Fiber line within median requires relocation outside of Project limits.
City of Salem Electric (CISA)	OHE (3-Phase)	Location 3 (Rte. 635)	UTIL-5	4 poles & 336’ conduit	Poles and underground conduit impacted by roadway cut. Relocation required.

City of Salem Water-Sewer (CIWS)	6” Water	Location 3 (Rte. 635)	UTIL-6	115 LF 1 valve	Vertical adjustment to existing waterline required due to roadway cut.
Roanoke Gas (RGC)	2” Gas	Location 3 (Rte. 635)	UTIL-7	50 LF	Vertical adjustment to existing gas line required due to roadway cut.
Western Virginia Water Authority (WVWA)-Sanitary Sewer	Sanitary Sewer Manhole	Location 3 (Rte. 635)	UTIL-8	1 MH vertical adjustment	Vertical adjustment to sanitary manhole required due to roadway cut.
Verizon	FO/Copper	Location 4 (Rte. 619)	UTIL-9	325 LF	Existing facilities in conflict with proposed bridge construction. Relocation required.

Mitigation Strategies to Avoid Impacts

Through design analysis & optimization in coordination with extensive utility due diligence, Lane, Corman, and RDA saved VDOT approximately $4M on the Route 29 Solutions D-B project.

The key to successfully executing the utility conflict resolution process is communication and cooperation between the utilities and the D-B Team. We will continually track and communicate with the companies involved throughout the entire design and construction phases. Through our extensive experience coordinating utility relocation projects, we have developed a tracking matrix and spreadsheets that will be updated regularly and allow us to look ahead to prepare for the coming stages of design, review, and approval cycles. This formal tracking begins at the Utility Field Inspection meeting and will account for all activities to include easement requests, relocation package submissions, construction activities, and the target completion date for each utility. These measures will better facilitate coordination and planning for companies to work in sequence where needed on the Project.

Mitigation of utility impacts on the Project can be divided into three major strategies:

1) Conflict avoidance and minimization
2) Implementation of a proven utility relocation process
3) Field conflict resolution

Together, these items minimize utility risk to the Project in regard to cost and schedule. Our approach to addressing these strategies is provided below:

The first strategy is through avoidance and minimization. When evaluating each potential utility conflict, we will first determine if adjustments to the design can be made to avoid the conflict entirely. We will assess all elements of design to determine if a utility can be avoided – for example, adjusting roadway grades, modifying storm sewer system layouts and drainage structure types, and/or adjusting ditch grades are some of the most common adjustments that can be implemented. The second option, if standard separations from design elements to existing utilities cannot be provided, we will work with the utility owner to evaluate whether a protect-in-place measure such as encasement can be implemented. The third option is to minimize the utility adjustment rather than a full relocation. This approach is often acceptable to communications providers who prefer to “lift & lay” their existing utility out of conflict where slack is available. Only after thoroughly exploring these options will we proceed with a full relocation of a utility.

Our second strategy is to efficiently implement the standard VDOT utility relocation process. A key part of this approach is performing much of the design work that typically is the responsibility of the utility owners. Our Team is unique in that we have specialists who are experienced as approved designers for various utilities. These specialists have backgrounds in electrical, telephone and telecommunications, and gas design allowing our Team to assist utility owners with design to help expedite the utility company design process. To minimize schedule risk and ensure the utility designs are fully coordinated and constructible, we will prepare and provide detailed plans with alignments, profiles, conduit details, and equipment locations to the utility owners for use in their

final designs. We have found this approach to be extremely effective, as it greatly reduces the design effort required by the utility owners and allows us to better control our schedule.

With our Team performing much of the engineering for the utility relocations, we will have more control over the timely submittal of the relocation packages. As construction begins, field personnel will take over tracking the progress of relocations as well as any necessary communication with the utility companies' field supervisors. Progress meetings will be held with all involved utilities onsite on a bi-weekly basis. If it is apparent a utility is falling behind schedule, meetings will be held more often to **partner in solutions to recover the schedule**.

Lastly, our third strategy is through our extensive experience in solving field issues and finding quick cost-effective solutions to complicated problems with relocations always being the last option. The Construction Utility Manager will engage with the Design Utility Manager immediately upon award and work in unison with the utilities to ensure constructability and timeliness for the Project schedule. Oversight of the utility relocations will help foresee possible problems and greatly aide in overcoming any unforeseen problems. One common challenge encountered during construction is the discovery of unidentified utilities. If an unidentified utility is encountered, Mr. Myers will immediately organize a meeting with the construction team and all utility owners to determine ownership of the utility and develop an expedited plan to avoid or relocate. During these situations, the relationships that have been established between the RDA team, Lane-Corman, and the utility owners becomes key in developing solutions that do not affect the schedule or increase the costs of construction.

Integration into Project Sequencing and Schedule

As we have done on all past projects, Lane-Corman fully integrates utilities into the Project Schedule (*Figure 4.4.2-6)*. We have developed the Project Schedule allowing adequate time for utility coordination efforts, design, approvals and authorizations, easement acquisition, utility owner material procurement, and the sequential relocation of utilities. The durations we have used for utility relocation activities in the Project Schedule have been extended where possible beyond the actual planned durations to build contingency into the overall schedule. We have further **minimized schedule risk by phasing our construction sequence to accommodate utility activities**. Specifically, performing the inside widening first keeps the bridge replacements off the Critical Path in Phase 1 as the Project Schedule will be driven by the earthwork and drainage activities. The relocation schedule for Locations 2 and 4 are driven directly by the bridge replacements, and the Location 3 schedule is ultimately determined by the setting new beams on the Goodwin overpass. By sequencing the Project so that the bridges are not critical early, **the Project is given the flexibility to re-sequence work if the relocations lag at any one of these locations**. This can be useful as some of the utilities that need to be relocated at the bridges, such as Verizon, have historically been associated with longer than anticipated construction durations.

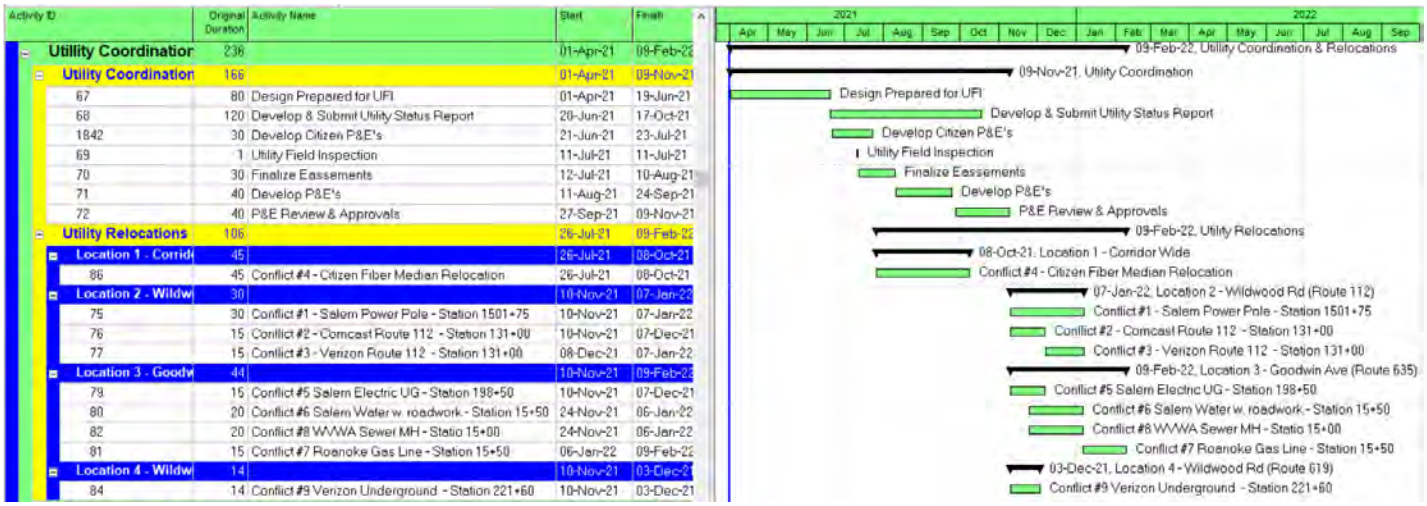


Figure 4.4.2-6. *Excerpt of utility integration into the Project Schedule*

The Project sequencing does leave the Citizens Telephone fiber line in the median near the critical path; however, based on the Team's pre-bid coordination efforts, we feel comfortable about their ability to meet the Project's schedule. **By reducing the number of critical utilities to a single company, our Team can effectively manage the risks associated with any potential schedule delays.**

Throughout both the design and construction phases of the Project, Mr. Myers will monitor each utility owner's progress and report this information to the DBPM. This continuous monitoring and reporting will keep the entire Project team apprised of the status of utility relocations and allow for monitoring of the overall Project schedule and utility risk. During the design phase, the Citizens Telephone relocations will be expedited with construction occurring simultaneous with the project design. For the remainder of the utilities, the focus will be on monitoring the progress of utility test pits, utility easement requests (if necessary), and the preparation of utility designs. Once designs are approved, our Team will continue to monitor utility owner activities including materials procurement, crew scheduling, and relocation activities to ensure they do not encroach on the Project schedule.

4.4.3 Geotechnical

Our Team's comprehensive geotechnical design and construction approach will result in a low-risk, safe, and efficient design that minimizes the long-term maintenance requirements, supporting the construction sequencing and reducing traffic impacts. The geotechnical approach is organized to demonstrate our understanding of the unique challenges of the Project and address specific requirements of the RFP through sound engineering practices and mitigation strategies.

The geotechnical design team has been engaged during the proposal design development and will continue through scope validation, final design, and construction. This effort includes the performance of supplemental explorations 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 pavement subgrade, slope stabilization, and structure and retaining wall foundations. Our design concepts and construction activities also consider the inherent challenges associated with working around existing foundations and maintaining existing structures. The Team will be performing supplemental subsurface investigation to confirm design parameters and construction methods. We will prioritize identifying the geological risks and their mitigation strategies to support design and construction.

Subsurface Conditions

Based on the information available in the RFP and the Final Geotechnical Data Report (GDR) contained in Addendum 4, we perceive the general soil and bedrock stratigraphy, from bedrock to surface, is as follows:

1. Bedrock in this formation predominately consists of dolomite, shale, limestone, and siltstone which was encountered beneath the ground surface at varying depths.
2. The soil directly above bedrock is very dense, highly weathered rock, sometimes referred to as intermediate geo-material (IGM) including boulders and cobbles in some borings.
3. The residual soils underlying the site consist of a range of material that includes lean and fat clays, silty clay, clayey and silty sand, and clayey gravel.
4. Above the residual soils is existing fill material consisting of fat and lean clays with varying amounts of sand, sandy elastic silt, poorly graded gravel with sand, and various amounts of gravel and boulders. The thickness of the fill ranges from one foot to more than 40 feet. The deeper fill areas are in the area of the existing bridge abutments.
5. Surface materials at the existing shoulders consist of 4.5" to 17" of asphalt pavement underlaid by a 6" to 28.5" layer of crushed stone base underlaid by fill materials (subgrade).

Our preliminary findings show nearly half of the material within 1' to 3' of the proposed subgrade in accordance with the parameters for cuts and fills, respectively, is unsuitable.

The RFP's Final GDR information indicates that the existing soil's corrosivity potential is high.

Based on the information above, there are three areas of concern that will need to be addressed if/when encountered. Each will have its own unique solution or solutions to mitigate or avoid if feasible.

Karst Geologic and Geotechnical Conditions

Our geology understanding is enhanced by our extensive and practical experience designing and constructing projects in karst terrain. Karst terrain poses significant challenges for the Project corridor, requiring careful evaluation. Limestone rock contains karst features such as air or water filled voids, weak, gouge, and soil-infilled zones and steep sloping and pinnacled rock surfaces. Based on the GDR, none of the borings show any sign of Karst features. However, the following mitigation strategies will allow us to identify and remediate karst features reducing risk and cost:

- Drilling boreholes and using air-track probes will help identify karst features within rock masses as well as sloping rock surfaces. Within the foundation influence zone, solution cavities will be filled with concrete or grout. We will perform geophysical surveys to fill gaps in the data between various boreholes as needed.
- If geotechnical exploration confirms an undulating rock surface, dental concrete will be used to fill the zones between rock surfaces to provide a uniform bearing surface for any shallow foundations. If the rock surfaces are steeply dipping, rock dowels may be required to prevent footing sliding on the rock surface. Alternatively, drilled shafts are a viable solution.
- Providing drainage layers to drain the pavement section and ensuring positive sloping drainage to minimize water intrusion that contributes to limestone dissolution and sinkhole development.
- Directing drainage and locating ponds away from the edge of the roadway to minimize infiltration risk.
- Driving piles for foundations in karst formations is challenging, as highly variable subsurface conditions frequently are encountered. Therefore, for bridge foundations, if Karst is encountered, the Team will use pre-drilled piles to allow us to grout any possible karst feature or voids within the foundation influence zone during installation. For Gravity retaining walls and culvert headwalls; if spread footings are not feasible due to soft ground or Karst condition, we will evaluate using drilled-in piles to allow us to grout any possible karst feature or voids within the foundation influence zone during installation.

Acid Producing Material (APM) Conditions

Based on the GDR for the Project, the proposed cut areas within the Project boundaries contain some degree of APM. The main risk of the APM is in areas where there is deficient neutralization potential (NP) such that acidic runoff may result (i.e., net acidic balance) which could cause significant environmental damage.

To mitigate and minimize the risk associated with the APM, we will perform a comprehensive exploration program to identify and assess any remaining APM that requires avoidance and/or mitigation considerations. Our Team plans to consider the following three options to manage APM:

- Option 1: Avoid Disturbance of APM.
- Option 2: Excavate, Crush, and Treat with Lime.
- Option 3: Excavate and Dispose at Offsite Permitted Landfill.

Moisture Sensitive Soil Conditions

Our Team has used the RFP geologic data 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 information, it is estimated that more than 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 to be used as pavement subgrade. Due to their moisture sensitivity, if these subgrade soils are exposed to precipitation and allowed to become excessively wet, the time needed to scarify and dry them to a workable moisture content can have a negative impact on the duration of construction activities. Mitigation techniques include:

- Excavation and replacement;

- Excavation, dry and place back;
- Stabilization with lime; and
- Minimize exposure by utilizing a construction sequence that will provide adequate sealing of the exposed surface to minimize exposure.

Subsurface Explorations

Following NTP, we will mobilize drill rigs, as needed, to complete the subsurface exploration program within the allocated period. We will develop and execute our final design program to augment the geotechnical information completed to date during Scope Validation. The geotechnical exploration will be performed to meet or exceed Chapter 3 of the VDOT Manual of Instructions for Materials Division, AASHTO LRFD Highway Bridge Design Specifications, 2020.

Our Team will supplement the available information using a phased subsurface exploration program as follows:

1. Perform a targeted geological survey which is developed from an evaluation of the Project site conditions of both office study and field inspections/observations.
2. Complete the targeted subsurface program, and identify anomalous areas indicating karst features, acid producing materials (APM), and Unsuitable Material when or if encountered.
3. Implement our geotechnical drilling and sampling program to investigate the problematic soils (Karst, APM, Unsuitable Soils) identified early, if any, along with confirmation drilling. We will also perform drilling and testing to better characterize the subsurface conditions along the corridor.

Geotechnical Analysis and Design

Pavement Design. The Lane-Corman team will perform a verification of the RFP pavement designs and follow all minimum pavement section requirements post award per the RFP. We will design the temporary pavement to accommodate the Maintenance of Traffic (MOT) during construction and verify RFP required minimum design. Changes to pavement designs and recommendations for shoulders, ramps, crossroads, and rehabilitation recommendations will be limited to increasing the thickness of the base or sub-base layers where necessary due to poor subgrade. The pavement design will comply with all minimum pavement sections to provide a pavement structure capable of supporting existing and future traffic loadings for the mainline, ramps, and lateral drainage for the pavement and subsurface drainage for the same. The ultimate pavement design's adequacy will be confirmed using the Mechanistic-Empirical Pavement Design Guide. The analysis will be based on the published 2018 VDOT Daily Traffic Volume Estimates, Weigh-in Motion (WIM) data and our GER, which includes supplemental exploration data and investigations during the detailed design phase. The Team will also perform detailed investigations to characterize the subgrade stiffness, presence of unsuitable materials and confirm the shoulder pavement sections with thin pavement (less than 8" of asphalt). The Team will select the pavement alterative that utilizes the Full Depth Reclamation (FDR) and/or Cold Central Plant Recycling (CCRP) alternatives, whenever they are feasible to be used.

Settlement. Design and construction of pavements, subgrades, and embankments will meet the post-construction settlement thresholds stated in the RFP. The design, construction, total and differential settlement criteria in the RFP will be used in the design of the structures to ensure their integrity. During construction, our Team will comply with differential settlement tolerances at bridge structure approaches and bridge decks.

Settlement presents a risk for the pavements in fill sections, soil slope fill embankments, and retaining walls. However, the risk is minimal because competent materials generally are shallow and the clay layers are highly over-consolidated according to the consolidation tests provided in the GDR. If thick, soft clay is encountered under the proposed pavements and retaining walls, over-excavation and replacement will be used to limit the post-construction settlement to the requirements set forth in the RFP.

Borings performed during our design program in combination with the construction excavation to the proposed subgrade, will allow us to identify any issues related to the excessive long-term settlement of the pavements and retaining walls; therefore, the risk will be mitigated accordingly.

Roadway Retaining Walls. The retaining walls requirements for the Project have been reviewed and determined that MSE walls, soldier piles with reinforced concrete panel (post and panel) walls, and gravity RW-2/RW-3 may be used.

If encountered below the gravity retaining walls, soft or loose soil may cause stability, post-construction settlement, and/or bearing capacity concern with respect to the performance of the walls. This risk generally is low based on the borings provided in the Geotechnical Data Report. If this situation is encountered, soft or loose soils will be over excavated and replaced with embankment fill or crushed rock to provide adequate support to the retaining walls, and minimize the post-construction settlement, ensuring a stable retaining wall and pavements on the top of the wall.

The available geotechnical data also indicates the potential for deposits of highly plastic, fine-grained soils near the proposed bridge abutments. If these soils are present adjacent to the proposed MSE retaining walls at the bridge abutments, they could pose a risk to both the external and global stability of the walls. This risk will be evaluated 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.

Cut Slopes. Rock cut slopes will be on fractured or decomposed rock or shale, intermediate geomaterial, or residuum. Based on the GDR, such material has adequate shear strength, as indicated from the SPT-N values of 30 to 100 bpf, and that most of the existing cut slopes are sloped at 2H: 1V or steeper. Therefore, for cut slopes we will use the RFP minimum slope ratio of 2H:1V and flatten the ratio in weak zones. Stabilization of weak slope areas may require using steel wire mesh blankets or shotcrete. This will secure the rock slope, providing adequate stability and reduce long-term maintenance costs. However, the need for stabilization will be confirmed during scope validation. Based on the RFP GDR, there are no cut slopes into competent rock; therefore, we are assuming no rock mapping or rock slope stability analysis or measures will be required.

Fill Slopes. Per the RFP GDR, soft soils are within the Project limits and in some areas consist of a layer of soft compressible clay. The risk generally associated with soft clays is long-term consolidation and settlement. To identify the limits of this material, laboratory and in-situ testing will be performed to evaluate shear strength and consolidation parameters of the existing clay soils. For fill slopes, we will use the RFP minimum slope ratio of 2H:1V and flatten the ratio in weak zones if confirmed during scope validation. Based on the available data, construction without some type of treatment/modification of soft compressible clays may result in long-term settlement and subsequent pavement distress. During scope validation, embankment fills with weak soils at the embankment toe will be identified that may require further analyses and possibly soil replacement during construction. If soft materials are encountered under the embankments, these materials will be over excavated and replaced with competent materials. As noted in the RFP Technical Requirements Section 2.6.2, an adequate number of fully softened friction angle tests will be performed to safely design the slopes.

Geotechnical Considerations for Stormwater Management Basins. Stormwater management basins will be designed in accordance with the RFP. The design of the ponds will take into consideration the effect on and influence of karst terrain. The entire Project corridor is underlain by carbonate rock that is susceptible to acidic conditions. Runoff captured in and effluent from stormwater management basins may affect subsurface flows and features through groundwater recharge. If this condition is discovered, the design will utilize liners in the basins where required by the Specifications and in other locations as necessary to contain runoff.

Scour Analysis. Scour around the foundations of culverts is one of the major causes of culvert damage. Scour is a physical process related to the movement of riverbed sediment as a result of the flow of water around and away from a structure. Representative samples from the soils in the vicinity of the proposed culverts extensions will be sampled and have hydrometer analysis performed to estimate D50 and D90 values. We will then evaluate the scour potential in accordance with Hydraulic Engineering Circular No. 18. The results of the analysis will provide a more accurate understanding of the soil conditions within the vicinity of these structures. This analysis

will be combined with the as-built information from the existing culverts to ensure proposed culvert designs, including needed revetment to account for anticipated scour.

Geotechnical Reporting. Geotechnical design parameters and reports summarizing pertinent subsurface exploration data, tests, and geotechnical engineering analyses, evaluations, and recommendations used in support of our design-build documents will be submitted to VDOT in accordance to the RFP. We will provide supplemental technical specifications for construction methods not addressed in the Standard Specifications.

The Project's QA/QC plan will document how each specific geotechnical recommendation or requirement will be addressed in the final design and construction documentation. The results of the geotechnical exploration and laboratory results will support design and construction efforts to meet the requirements outlined in this section.

Coordination of Geotechnical Design Concepts and Construction Activities associated with our Team's Risk Management Program

The development and implementation of a sound and comprehensive geotechnical analysis program is critical for the success of the Project. Additionally, a geotechnical risk management strategy that evolves as the design and construction evolves is absolutely necessary. Our Team's approach ensures that the design and construction methods are developed based on the available geotechnical data and the program will be adjusted, as needed, to avoid major design or construction deviations. Design solutions for potential risks identified include:

Risk/Impacts	Mitigations	Benefits
Rock Faults: Impacts the stability of bridge foundations, slopes and embankments.	• Geophysical Surveys (i.e., electrical resistivity imaging) • Targeted borings using percussion drilling • Drilled shafts	• Identifies faults within the area of the foundation to a depth of at least 80' • Addresses lateral movements
Karst Conditions: Impacts bridge foundations and structural continuity.	• Geophysical survey in combination with supplemental borings/probes at targeted locations • Fill cavities, if encountered, with concrete • Large soft, soil-filled zones will be strengthened using pressure grouting • Dental concrete will be used to fill the zones between rock surfaces	• Identifies impacts due to the fault within the area of the foundation • Provides reliability and predictability for bridge foundations and roadway stability, saving time • Provides a uniform bearing surface to the shallow foundations where undulated rock surfaces exist
Pile Driving Difficulties (due to weathered/steep sloping rock): Impacts drilling accuracy	• Pile driving shoes will be used	• Provides pile integrity and achieves minimum embedment depth for adequate capacity
Settlement: Impacts construction phasing and schedule.	• If thick, soft clay is encountered under the proposed pavements and foundation elements, over-excavation and replacement will be used. • In-depth analysis of supplemental boring data.	• Limits post-construction settlement • Identifies issues related to excessive post-settlement of the pavements and foundations
Durability of Excavated Materials: Crushed bedrock material used in the embankment.	• Durability tests of the crushed bedrock will be performed on the materials excavated from the Project site	• Ensures stability and reduces maintenance
Long-term Cut Slope Stability: Potential slope failure/erosion.	• Locally flatten areas of concern and stabilize using vegetation, netting, or shotcrete • Deepen/widen the roadway ditch to catch rocks • Diversion ditches or slope drains to minimize drainage impacts on slopes	• Ensures rock slope stability • Avoids/mitigates rockfall concerns • Minimizes long-term maintenance

As construction of critical elements (i.e. sliver fills, cut slopes, foundations, etc.) progress, the Lane-Corman Team will have geotechnical representation onsite, as required, to maintain thorough documentation, and in order to quickly and efficiently assess unexpected conditions and formulate a cost effective and sound solution. The success of the design is enhanced by the importance our Team places on communication between the geotechnical engineer, construction staff, and the QC inspectors.

Working in the Vicinity of Existing Foundations, Maintaining Existing Structures, and Maintaining or Reconstructing Existing Slopes

Working in the Vicinity of Existing Foundations. Our Team has evaluated the proximity of new construction that will impact the existing structures and slopes. For example, staged construction of the MSE walls and abutment foundations will require excavation alongside the existing abutments. Shoring will be utilized to support the existing fill behind the structures to protect the existing foundation and roadway. Slope modifications are anticipated to accommodate roadway grade changes and widening. In general, the Lane-Corman Team will minimize design and construction activities that could have an impact on the existing foundations and structures.

Maintaining Existing Structures. Our construction activities that trigger the need to maintain existing structures includes excavation, pile driving, demolition, embankment placement, and retaining wall construction. We will assemble a qualified independent instrumentation and monitoring consultant team (IIMCT) in order to effectively maintain the existing structures. Our IIMCT will maintain existing structures in accordance with the **Vibration Control and Monitoring of Existing Structures & Utilities During Construction** special provision. To ensure the integrity of existing structures and prevent damage to adjacent properties, a number of precautions will be performed per the special provision, where needed, to include:

- Joint meeting of VDOT, Lane-Corman, RDA, and IIMCT to develop a list of property, structures, and utilities that have the potential to be adversely impacted by construction activities;
- Preconstruction surveys including photographs, videos, and written documentation;
- Develop geotechnical and structural instrumentation plans;
- Survey control and condition assessments;
- Periodic monitoring and surveys of adjoining structures during construction;
- Vibration monitoring;
- Tilt meter surveying.

While adhering to these provisions, we will ensure that the existing structures will be unaffected.

Maintaining or Reconstructing Existing Slopes. Our Team will consider the effects of construction activities and the variable geologic conditions anticipated on the existing slopes. Impacts will be minimized utilizing a comprehensive subsurface investigation program and avoiding excessive excavation at the toe of slope. The Team will maintain the slopes in their existing condition, where feasible, with care to avoid undermining by diverting upland stormwater runoff; minimizing erosion of the slope. Routine inspections will be performed to ensure no damage occurs. Slopes damaged by the new construction or failing in their existing condition will be reconstructed or stabilized.

4.4.4 Quality Assurance/ Quality Control (QA/QC)

The Lane-Corman QA/QC program approach for the design and construction of this Project is to establish, implement, and maintain procedures and systems necessary to provide VDOT assurance that the design and construction of the facilities, components, systems, and subsystems that make up the Project meet the contract requirements. Our Team will implement this approach by integrating our own proven quality programs into the RFP requirements including VDOT's *Minimum Requirements for Quality Assurance and Quality Control on Design-Build and Public-Private Transportation Act Projects July 2018* (VDOT QA/QC). This approach will provide a QA/QC Plan which will include design and construction that will deliver clear and easily auditable documentation for Project compliance with the contract. The QA/QC Plan is a living document with revisions

and addendums expected throughout the life of the Project. Revisions will be made as work progresses to fulfill the goal of continuous improvement to the team's current processes. Addendums will include documents such as testing plans and Preparatory Inspection Meeting Minutes. All entities delivering elements of the Project will comply with the requirements of this plan throughout the duration of the Project.

Approach to QA/QC during Design

Our Lead Designer, RDA, is committed to excellence in providing quality control and quality assurance at all levels of our Team's organization. RDA is unique in that the owners of the firm also serve as the technical experts who are involved with our projects at every phase. RDA has a corporate Quality Management Plan (QMP) that involves every member of the team, from the president of the firm to the engineering technicians. RDA's corporate QMP along with VDOT's Minimum Requirements for QA/QC on Design Build Projects will serve as the basis for our Project specific Design Quality Management Plan (DQMP). The DQMP will define the processes by which the Design Deliverables will comply with the D-B Contract (including good industry practice), the Technical Requirements, the approved QA/QC Plan, and applicable specifications, special provisions and standards as well as applicable Law and Government Approvals.

The DQMP will:

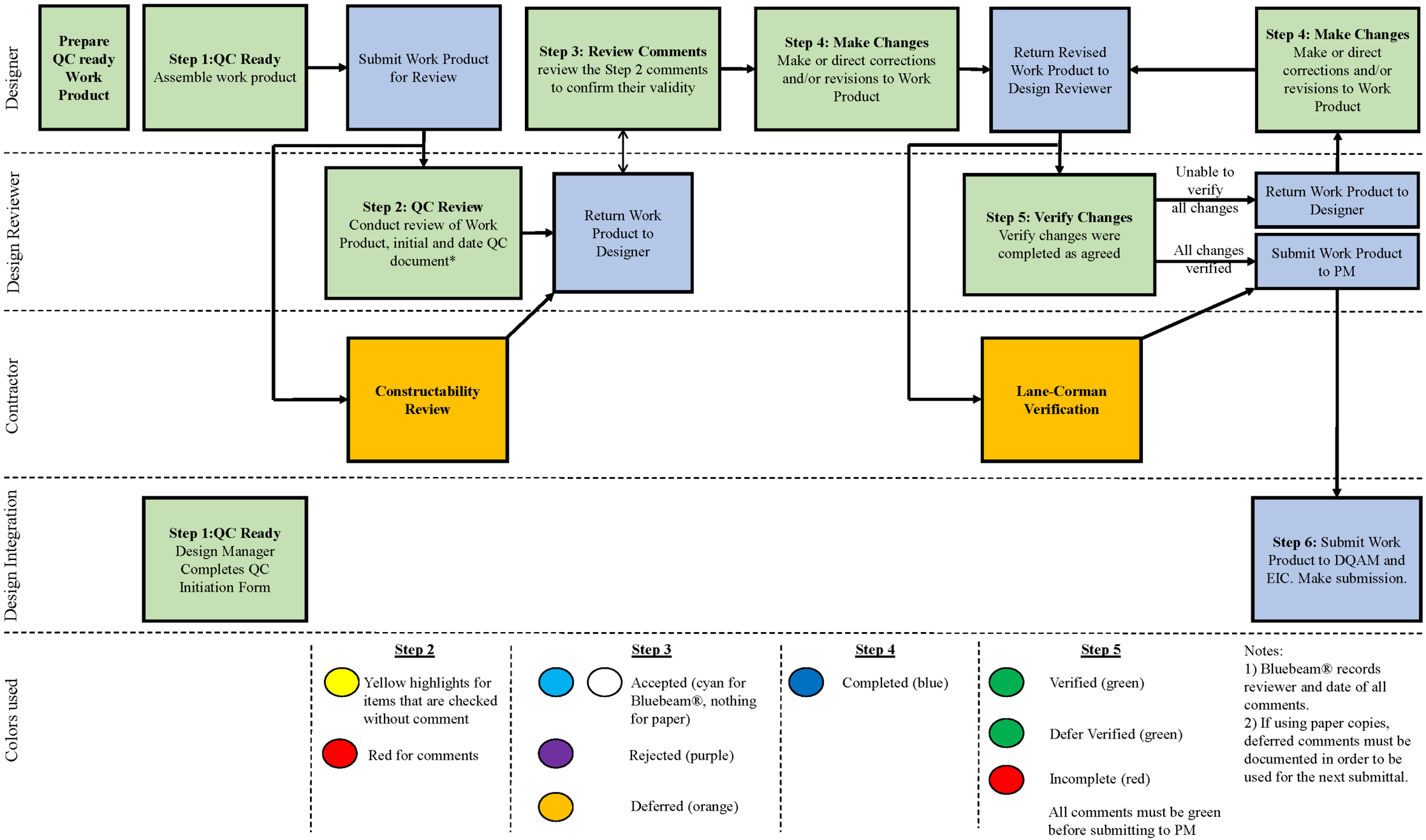
- Incorporate a thorough understanding of all Project technical and execution requirements.
- Identify roles and responsibilities of team members throughout the design and construction phases.
- Define the processes and procedures that will provide efficient execution and documentation of the design quality process.
- Integrate the Design and Construction teams to leverage lessons learned in construction to improve the design.
- Ensure appropriate integration and oversight of the Team's Entrusted Engineer in Charge (EIC) for compiling and sealing of all final documents of each work package
- Minimize VDOT's design review efforts and provide quality design deliverables

The DQMP provides the framework by which RDA will conduct their independent reviews of Work Products. The design phase quality management process will be transparent to VDOT. RDA's DQMP will outline the steps for quality control review processes that must be followed. A requirement of all QC processes is that the Work Product must be ready for submittal before quality control reviews are conducted. This requirement puts the focus on the development of quality products before the QC reviews are even completed. Work Products entering the QC process are checked by the involved designers, well-coordinated, and properly developed, which allows the QC process to focus on the review of the drawing's content.

RDA will follow a 6-Step Review Process, highlighted below in *Figure 4.4.4-1* which includes:

- **Step 1** | Ready for Review: Development of Work Product for QC
- **Step 2** | Review: QC review of Work Product
- **Step 3** | Resolve Comments: Discussion between designers and reviewers to resolve unclear comments
- **Step 4** | Make Changes: Designer makes changes to the drawings based on the comments (if required)
- **Step 5** | Verify Changes: Reviewer verifies comments were adequately addressed
- **Step 6** | Quality Assurance: Design Quality Assurance Manager and QA Reviewers confirm Design QA/QC processes have been adhered to

Figure 4.4.4-1 *- RDA's Design QA/QC Review Process*



Design QA/QC Staffing Plan. RDA has carefully considered the technical expertise and availability of our design staff, including subconsultants, who will be responsible for executing the design development, quality control reviews, and quality assurance for the Project. The table below identifies our proposed staffing plan for the Design QA/QC process:

Discipline / Responsibility	Firm Responsible	Design Engineer	QC Engineer	QA Engineer
Design Manager	RDA	Darell Fischer		
Deputy Design Manager	RDA	Rick DeLong		
Design QA Manager	RDA	Mark Gunn		
Entrusted Engineer in Charge	Lane-Corman	Ryan Gorman		
Roadway Design/Plan Development/Alignment/Grade	RDA/WSP	Brandon Shock Chris Moore	Sohaib Qadir	John Giometti
Hydraulic/Drainage/SWM/E&S	RDA/WSP	Nikhil Desphande Melissa Simpson	A. Knowlton	Brian Komar
Traffic Engineering	RDA/WSP	A. Welschenbach Sachin Katkar	C. Qadir	Mark Gunn
Lighting	WSP	Sachin Katkar	Chris Moore	Connor Eggleston
TMP/SOC (MOT)	RDA	John Giometti	Matt Beales	Adam Welschenbach
Structural Engineering	RDA/WSP	Song Kim Rex Giley	Betty Waggoner John Michels	Mark Gunn
Utility Coordination	RDA	John Myers	Doug Mangin	Maggie Shelton
Geotechnical	ELR/WSP	Jamal Nusairat	Betsy Godfrey	Rick DeLong
Environmental	RDA	Brian Connors	Pam McNichols	Rick DeLong
Right of Way	RDA	Jimmy Street	Patricia Nalley	Chris Calamos
Surveying	RDA	N. Kougoulis	M. Dunnington	Mark Gunn

Approach to QA/QC during Construction

Construction QA/QC is established in our Construction Quality Management Plan (CQMP) to ensure clear and complete procedures for construction inspection, testing and the oversight of the Project and its processes. **Our CQMP will operate with real-time data collection and on-site reporting**. All Team members as well as the subcontractors and suppliers for the Project will be required to submit corresponding Quality Plans ensuring compliance with our CQMP. Any variance from the Project standards will not be tolerated; and as such, continuous audits will be performed to verify adherence to the CQMP.

QA/QC Processes: Our CQMP provides a time-proven process thus reducing the on-site commitments of VDOT.

Our Team's QA/QC Plan will meet or exceed the specific requirements outlined in the VDOT QA/QC and in the Project RFP. These requirements include but are not limited to:

- The Quality Assurance Manager (QAM) will be onsite full-time for the duration of construction
- Lead QA Inspectors – one for structures and one for roadway – will be supplemented by an appropriate number of QA Inspectors reporting to the Lead QA Inspectors
- Staffing levels will assure adequate coverage of the Work precluding the need for VDOT resources
- All inspectors will hold VDOT materials certifications for all activities they inspect/test
- QA will have a presence on-site during all construction activities
- QA and QC laboratories will be separate entities that are accredited in the applicable AASHTO procedures by the AASHTO Accreditation Program (AAP)
- Form C-25 will be utilized for submission and approval of all construction material

- The QA staff will populate the Materials Notebook with actual quantities during the life of the Project
- The QA/QC Plan will feature a robust Quality Assurance Auditing and Non-Conformance Recovery Plan complete with forms for recording and resolving any issues that may arise
- All Project documentation will be uploaded to ProjectWise during the life of the Project
- Tablet-based inspections will be instituted complete with PlanGrid serving as the plan depository
- Checklists will be utilized for inspection to the maximum extent possible
- Each inspector will provide a Daily Work Report to be vetted by the QA Staff
- QA will log all unresolved issues on the Issue Log; the log will be a topic of the Weekly QA/QC meetings
- NCR's will be tracked on the NCR Log and be made available to all team members and VDOT

Construction Quality Control (QC). Management and leadership will be provided by the Construction QC Manager (CQCM), Ron Sun. All work will be in accordance with the CQMP derived from the Lane-Corman Team's in-house construction QC Plan, the requirements of the RFP and VDOT's QA/QC Manual. The CQMP addresses every task, operation, and completed activity. Continuous assessments of all activities will be made throughout construction, and when necessary, adjustments to methods or materials to achieve the required quality levels will be made. Mandatory Preparatory Inspection Meetings (PIM) will be led by the QAM and shall include relevant design, construction, QA/QC, and VDOT personnel; and will take place prior to commencing an activity. The meetings will be key to identifying processes, inspections, testing, and hold points that will gauge quality and ensure operations are not moving forward without confirmation. PIM's and Hold-points have been included in our proposal schedule to ensure they are not missed during construction. In the case of a Non-Conformance Report (NCR), we will react rapidly to correct the non-conforming work in accordance with the approved correction plan and to adjust processes, materials, or techniques to correct and re-establish a process that is significantly improved with results meeting the Project requirements. **Our proven and robust CQMP assures quality with respect to all aspects of the Project requiring minimal input from VDOT.**

Construction Quality Assurance (QA). NXL, a division of Century Engineering, Inc. (NXL) will provide Quality Assurance services. Led by QAM, Mr. Joe Hamed, PE, DBIA; the Quality Assurance program operates independently from the construction QC program and has oversight/verification responsibilities for all QC testing and monitoring activities. The QAM will be supported by one lead roadway QA inspector, Carolyn Aliff and one lead bridge QA inspector, Carl Moore. The QAM provides confirmation that RFP requirements, specifications and special provisions are being met or exceeded. The independent role of the QAM provides direct information to the DBPM, Entrusted EIC, and VDOT outside of the Construction QC chain of command. Additionally, QA will monitor and audit QC procedures and activities to verify proper performance. The QAM has absolute authority for the acceptance of all work products on the Project. He will ensure that the Construction QA function is effective and **minimizes the requirement of resources and involvement by VDOT**. The QAM is authorized to stop work on this Project if quality procedures, measures and controls are not being properly maintained. imposes

Construction QA/QC Staffing Plan. For a project of this size, scope, and complexity, the Lane-Corman Team realizes that our QA/QC staff must be experienced and robust to ensure we deliver a final product that meets or exceeds the requirements. Our Team will incorporate proven processes and procedures from both Lane and Corman to standardize and streamline the construction quality approach. The procedures developed establish proper controls so that the Project will meet all quality requirements and contractual expectations of VDOT and will be built to meet or exceed service-life requirements. The DBPM will have ultimate responsibility to ensure that Project policies are effectively implemented. He also will ensure that the Team is staffed with knowledgeable and dedicated people who are committed to designing and constructing this Project.

Implementing QA/QC as prescribed by Lane-Corman will eliminate the need for VDOT to augment the quality effort. The implementation of our Quality system is comprehensive and imposes responsibility on all levels of our Team. Lane-Corman anticipates having between 4 and 15 individuals actively involved in the Construction QA/QC Program for the Project.

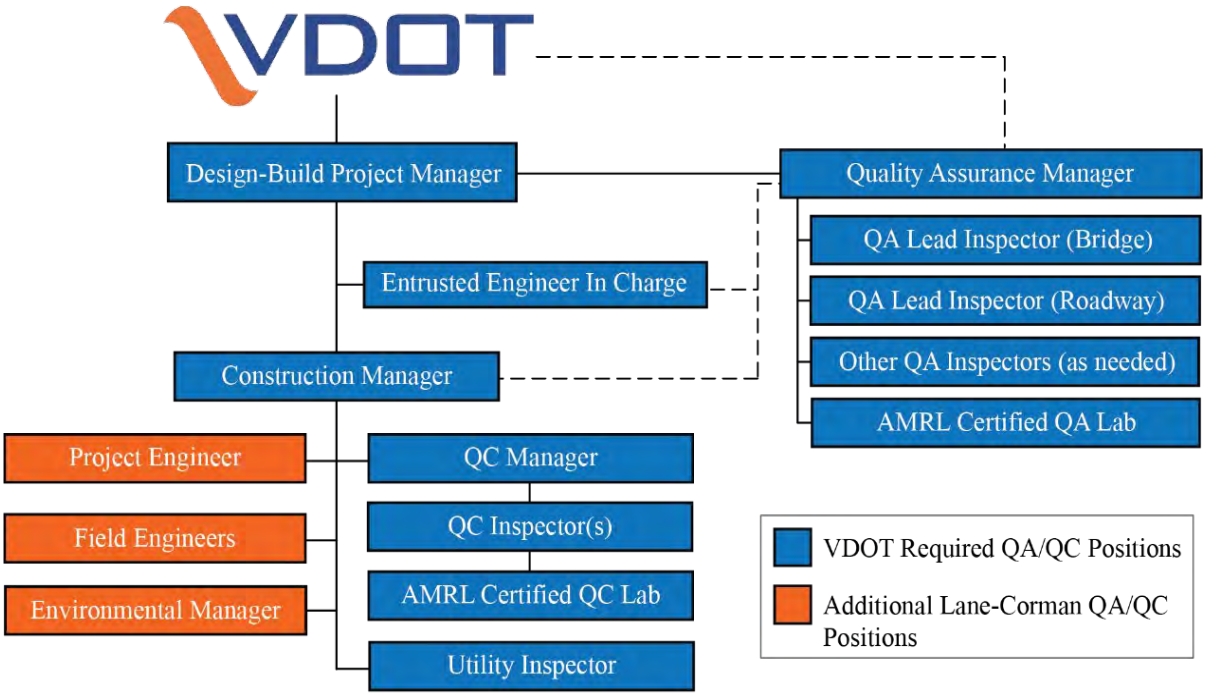


Figure 4.4.4-3 – Lane-Corman Construction QA/QC Organization Chart

The construction quality team will consist of three entities:

Construction Field Engineers (FEs) will perform in-process surveillance inspections on construction activities under their work areas according to the inspection and test plans (ITPs). **Performing in-process quality surveillance is a proactive approach that identifies potential quality concerns before they become an issue and impact schedule, cost, or requirements for VDOT oversight.** In-process inspections assist in the Lane-Corman Team's "right the first time" philosophy. FEs are responsible for QC of the construction and fabrication activities and for making sure that equipment and facilities are erected and installed in compliance with Project plans, specifications, and other appropriate requirements.

The **Construction Quality Control Manager (CQCM)** ensures that inspectors and FEs **know the requirements of the Contract and are adhering to the design requirements toward a quality finished product, resulting in minimal VDOT oversight being required**. The CQCM works closely with the FEs. The CQCM and his inspectors will perform inspections on finished work products in line with the ITP. The CQCM

also is responsible for the review of subcontractor QC documentation to ensure its compliance with the Project requirements. QC Inspectors examine ongoing work as required per the ITP. FEs will coordinate with the QC inspectors to verify and confirm that work is constructed in accordance with the requirements.

The CQCM, in coordination with the QAM, is responsible for preparing the ITPs, which will be prepared in consultation with the FEs.

For each identified inspection and test, the ITP will include:

- A list of inspections and tests to be performed.
- Specification paragraphs containing the inspection or test requirements.
- Responsibility for performing inspection and testing.
- Schedules for inspections and testing.
- A list of the independent test laboratories, specialized equipment, and/or personnel training or qualifications required.
- Source inspections.

Coordination is key to the success of a quality project. Upon transition from the design phase to the construction phase, the design organization will evolve into a delivery function supporting construction of the new project. With design personnel integrated into the construction team, the Lane-Corman Team will be an effective and cohesive team focused on compliance with quality requirements.

The **QAM** has overall responsibility for the development of and adherence to the QA/QC Plan. **He will manage and direct action on all quality matters, will schedule and coordinate all QA audits and prepare and submit monthly quality reports to VDOT in a format that will minimize VDOT review time.** The **QA inspectors** will be responsible for QA testing and/or inspection of items of work for conformance with plans and specifications. The QAM will manage and direct action on all quality matters and will schedule and coordinate all QA audits and prepare and submit monthly quality reports to VDOT. Audits will be conducted internally and on subcontractors throughout the life of the Project. The QAM will oversee and ensure follow-up, documentation, and positive closure of all observations and findings arising from Quality Audit and inspection activities.

Project management, including the Lane-Corman executives, will participate in monthly walk-throughs of the Project to observe work in progress and recognize Lane-Corman Team members and subcontractors performing good quality practices. Our policy is to reward personnel for actions that drive good quality behaviors.

Geotechnical representation will support QA and QC activities during construction for verification that conditions are consistent with the basis of design and that work is being completed consistent with the geotechnical recommendations and in accordance with the VDOT QA/QC Manual. Recommendations will be modified as needed based on conditions encountered, related to the bridge foundations, roadway subgrade, subgrade transitions, and slope construction, and other key aspects as construction occurs.

Lane-Corman will provide a Utility Inspector to monitor all utility construction activities performed for private and public utilities on the Project. Our Utility Inspector will ensure that all utilities on the Project are relocated according to the approved plan and estimate (P&E). They will obtain approval for any field changes to the approved P&E from the Design-Builder's Lead Utility Coordinator/Manager, John Myers. They will also maintain UT-7 daily records of utility work being performed. Our Utility Inspector will assist in creating a set of red-lined As-Built Drawings that depicts any changes made from the approved plan and estimate.

Communications is key to the success of every project. During construction, the QAM will be communicating with key team members and staff including the Construction Manager on a regular basis. The QC and QA staff will also meet/communicate on a daily basis to confirm proper inspection coverage of the Work. The QA staff will assist the QAM in notifying the VDOT Project Manager in a timely manner for proper coordination of Witness Points, Hold Points, Independent Assurance (IA), and Verification Sampling and Testing (VST). Other key meetings include:

- **Weekly QA/QC Meeting:** The Construction Manager, QAM, and the Lead QA/QC Inspectors will meet to discuss the progress of the work. Any issues and/or concerns will be discussed and addressed. Minutes will be prepared and all issues and/or concerns that are not resolved during a meeting will be tracked until resolution. The VDOT Project Manager and staff will have a standing invitation to attend this meeting.
- **Preparatory Inspection Meetings:** As mentioned above, the QAM will conduct these meetings per the approved QA/QC Plan to discuss who, what, when, where, and how work is to be done on a particular construction activity. He will ensure that the agenda is complete and that each item is thoroughly vetted. Minutes will be prepared within two business days.
- **Monthly Progress Meetings:** The DBPM will meet monthly with team members including the VDOT PM, Design Manager, ROW (as applicable), Construction, Lead QA Inspectors, QAM and other applicable team members to discuss the work and the progress of the Project. A standard agenda will be established at the first meeting and then followed throughout, and modified as necessary, to emphasize special activities for a given month. Key items will be discussed each month: status of plans, schedule, and materials, environmental/ permitting, ROW, safety, and community interface. Minutes will be prepared for each meeting and promptly distributed, and any issues or concerns not taken care of or resolved during the meeting will be diligently tracked until resolution.

4.5 Construction of the Project

4.5 Construction of the Project

The Lane-Corman Team recognizes the impact this Project will have on the I-81 corridor and the traveling public. We travel this corridor regularly and truly grasp the importance of delivering this Project in the most safe and efficient manner possible. I-81 is the lifeline for commerce and the traveling public for the Roanoke Valley and the Commonwealth. Utilizing this in-depth knowledge, our Team focused our construction approach around one main goal: providing the most beneficial construction solutions to minimize or eliminate disruptions to the traveling public. The following enhancements demonstrate how our construction approach will achieve this goal and **deliver the Project 50 days earlier than the RFP Final Completion Date**.

By minimizing construction phases and efficiently sequencing the Project, the Lane-Corman Team will deliver the Project 50 days ahead of the RFP Final Completion Date. We will also provide two Unique Milestones which will open up I-81 traffic early to significantly reduce impacts to the traveling public.

Enhancements	Benefits to VDOT and the Traveling Public
Reduced Number of Construction Phases	• Improves safety reducing impacts to the traveling public • Reduces daily lane closures and roadway restrictions • Provides for early beneficial occupancy of the 6-lane alignment
Unique Milestone #1: Three lanes of SB I-81 Substantially Complete Prior to the 4th of July	• Provides beneficial occupancy prior to busy holiday travel to minimize impacts and significantly benefit the traveling public • Opens all lanes before college move-ins and football games to minimize impacts and significantly benefit the traveling public
Unique Milestone #2: Three lanes of NB I-81 Substantially Complete Prior to Labor Day	• Provides beneficial occupancy prior to busy holiday travel to minimize impacts and significantly benefit the traveling public • Opens all NB lanes before Labor Day weekend, September NASCAR event, Thanksgiving, and Christmas- significantly benefits the traveling public
Widening to the Median	• Reduces earthwork disruption over RFP Concept and minimizes culvert extensions • Utilizes shared single run of median barrier for approximately 15,000' • Reduces impacts to cut/fill slopes adjacent to ROW • Generates efficient MOT operations and improves bridge construction phasing • Produces less ROW impacts for construction of SWM facilities
Temporary and Permanent Drainage	• Uses temporary scuppers at Route 311 bridge to control spread during construction • Increased MOT shoulders for temporary drainage and to reduce permanent inlets
Improved Drainage– Scenario 5	• Eliminates a BMP pond and three linear facilities, reducing the Project Schedule • Re-routes drainage design reduces the number of cross-pipes under I-81 and minimizes jack and bore locations
Bridge Construction Sequencing	• **Bridges at Route 112:** Cost efficient single-span structure; eliminates median pier and additional inspection and maintenance requirements, improves MOT phasing and safety during construction along I-81 and Route 112 • **Bridges at Route 635:** Optimizes construction schedule with reduced lead time obtaining concrete girders; efficient sequencing of substructure construction to minimize duration of Route 635 detour • **Bridges at Route 619:** Adjusts span length to accommodate efficient abutment construction, reduced support of excavation, and minimal demolition phasing • **Bridges at Route 311:** Phases NB widening and bridge deck rehab within two-phase approach, limiting traffic shifts; achieves RFP spread requirements using temporary scuppers along inside parapets

4.5.1 Sequence of Construction

The Lane-Corman Team's safe and efficient proposed sequence of construction (SOC) was achieved by investigating numerous alternate sequences and choosing the safest, most constructible option. Our team of engineers, estimators, and construction operations personnel jointly participated in Technical Work Group (TWG) meetings to accomplish a balance among safety, design, MOT, construction, quality, maintenance, and final acceptance. Our process began with reviewing and evaluating the RFP concept, including evaluation of key elements such as earthwork volumes, cut/fill operations, MOT concepts, SWM and drainage studies, paving, and structure demolition and construction. We then proceeded with two additional design alternatives which included independent alignments for widening to both the inside and outside throughout the corridor. These concepts were then compared against the key elements noted above to the RFP concept. This iterative process allowed our Team to select the **safest, most efficient and economical, low-maintenance Project by widening to the inside median for a majority of the corridor.**

The proposed SOC was selected to allow the Project to start fieldwork in the fall of 2021. By making Phase 1 exclusively inside widening, the Lane-Corman SOC allows work to begin in the median while performing ROW acquisition and obtaining Water Quality Permits. These two activities can often delay projects; however, since they are limited to the outside of the current shoulders, **they won't become critical until the Project nears Phase 2**. This enhanced sequence also allows additional construction activities on the outside shoulders at the Northern end of the project, such as noise barrier and the ITS/signage work, to remain **off the critical path** by having phasing that is completely independent of the six (6) rebuilt bridge structures on the southern of the Project. This phasing will allow our Team to **exceed the Completion date** shown in Part 1, Section 4.1.6. As shown on the Proposal Schedule, the SOC that we propose allows the Project to be completed on November 26, 2025, **50 days ahead of the RFP proposed Final Completion date**.

Approach to Construction Phasing

Our Team's SOC reduces the number of MOT phases and short-term lane closures, greatly improving safety by minimizing impacts to the traveling public during construction.

Construction operations are divided logically and systematically into three (3) Areas of the Project, with established stages of work, which can be constructed independently from one another. Dividing the Project into these strategically defined Areas allows the Lane-Corman Team to effectively coordinate our design and construction elements and manage the resources required for environmental permitting, ROW, stakeholder coordination, safety, and utility relocations. Unforeseen **delays to any specific location can be mitigated by shifting resources to the other Areas that can continue independent of the affected location**. Additionally, this approach enables the 5-mile corridor to be constructed efficiently while allowing the Team flexibility during construction to mitigate delays and impacts to the traveling public.

Specifically, to maximize our ability to anticipate and mitigate delays, we have structured our sequence to provide the flexibility that enables the Team to address unforeseen circumstances. As further outlined in our Transportation Management Plan Section 4.5.2, we have identified specific mitigation measures for a number of field operations. Also, our Team will have a dedicated scheduling team working under the DBPM committed to tracking and updating the schedule on a weekly basis and providing schedule-related information to the construction team. Revisions to the schedule, if required, will be implemented as necessary. Continued and close involvement with **our Incident Management Coordinator will also ensure procedures are in place to mitigate delays related to MOT and clearing of accidents**.

Our three (3) Project Areas can be constructed independently from one another which maximizes our Team's ability to mitigate potential delays and allocate resources appropriately to maintain the Project Schedule. This approach has proven extremely successful on other VDOT projects including Lane's current I-66 Inside the Beltway.

Our three major Construction Operation Areas are:

Figure 4.5.1-1 *– Project Segmentation*

The Project segments listed in *Figure 4.5.1-1* are developed by the anticipated MOT traffic arrangements for each Area. The following sections describes the anticipated sequencing for each, corresponding to the MOT Plans provided in Volume II.

Area 1: Project Begin to Station 185+00

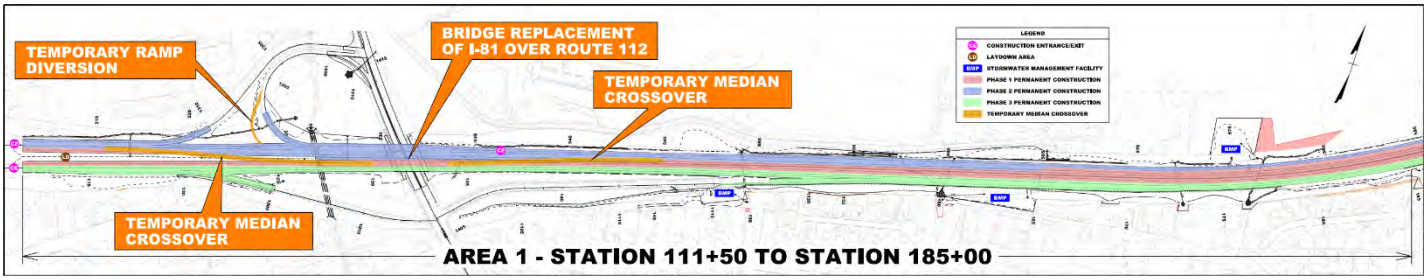


Figure 4.5.1-2 *– Area 1 Major Elements of Work (See Vol II. Page 66)*

Area 1 will be constructed in three (3) distinct phases and completes the I-81/ Route 112 Interchange Construction. This area includes a median cross-over operation of I-81 SB onto I-81 NB median widening to facilitate the I-81 SB bridge construction in a single phase, improving upon the two-phase construction approach shown in the RFP Concept Plans. This design approach will **minimize the duration and potential for delays** associated with I-81 traffic utilizing the median crossover facilitating a **safer experience for travelers** crossing over Route 112. Additionally, this approach will **reduce potential driver confusion** by exiting I-81 SB traffic to Route 112 similarly to the existing condition in lieu of the RFP Concept Plans which makes use of an auxiliary lane developed prior to crossing over the SB bridge. Not including minor lane adjustments on approach to I-81 over Route 112, a single long-term lane shift is proposed approaching/leaving the work zone prior to I-81 over Route 641.

Area 2: Station 185+00 to Station 245+00 (Route 705 Over I-81)

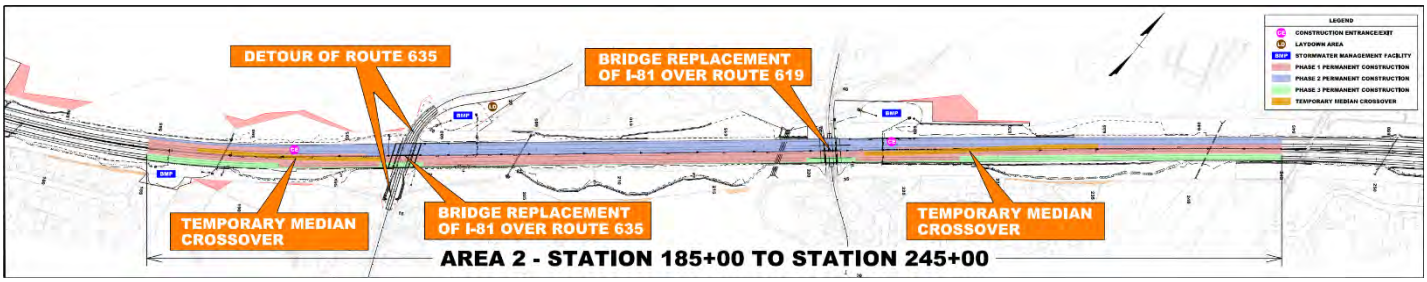


Figure 4.5.1-3 *– Area 2 Major Elements of Work (See Vol II. Page 67)*

Area 2 will be constructed in three (3) distinct phases and completes the bridge construction of I-81 over Route 635 and Route 619. This Area includes a median cross-over operation of I-81 SB onto I-81 NB median widening to facilitate the I-81 SB bridge construction in a single phase. Due to the isolated work area between Route 635 and Route 619, zero long-term lane shifts are proposed between the median cross-overs at either end of Area 2.

Area 3: Station 245+00 (Route 705 Over I-81) to the Project End

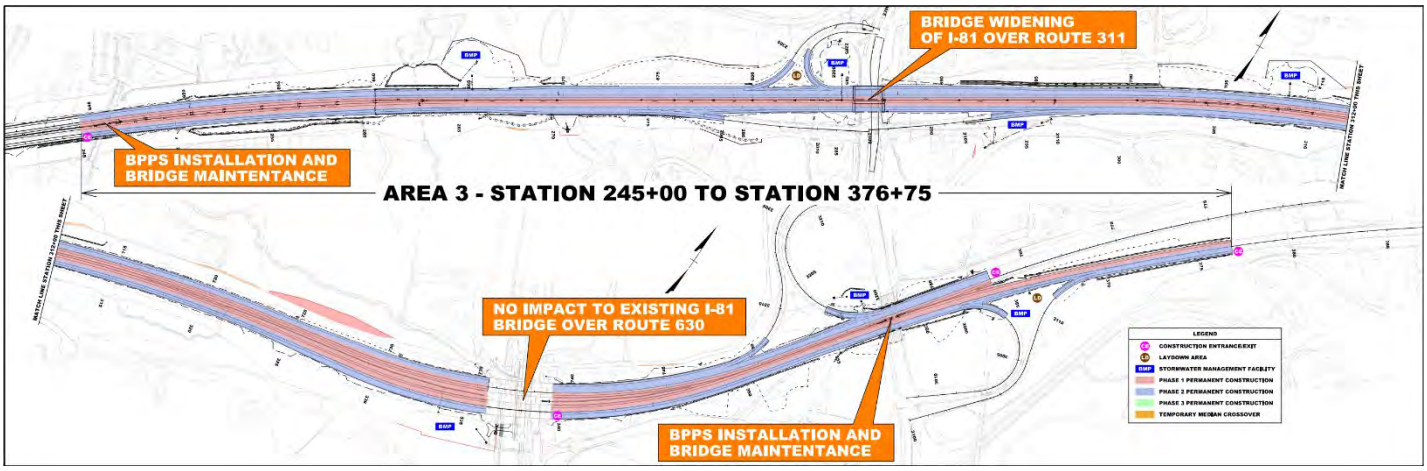


Figure 4.5.1-4 – Area 3 Major Elements of Work (See Vol II. Page 68)

Area 3 will be constructed in two (2) distinct phases and completes the bridge widening of I-81 over Route 311. This Area utilizes the existing I-81 NB and SB pavement to construct median widening, allowing for the outside widening to be completed in Phase 2. Not including minor lane adjustments on approach to I-81 over Route 311, two long-term lane shifts are proposed for this area shifting traffic out of Area 2 and leaving/entering the work zone.

General Sequence of Activities

Phase 1 (Step 1) – Areas 1, 2, & 3: Project Begin to Project End

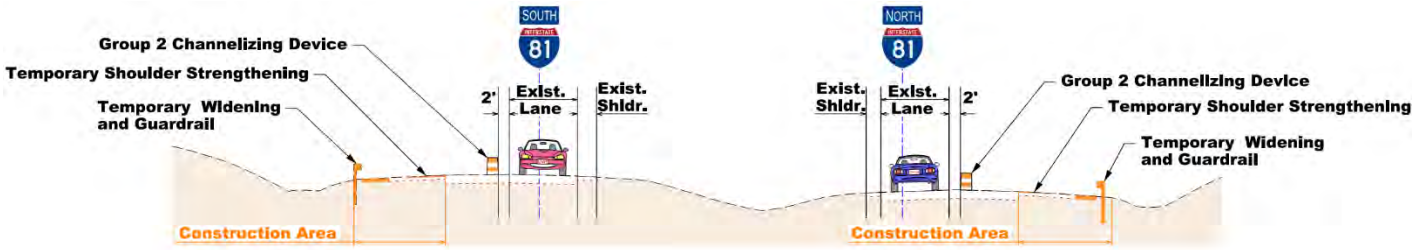


Figure 4.5.1-5 – Phase 1 (Step 1) MOT Scheme

Phase 1 (Step 1) leaves traffic in the existing lane arrangements during the day and will use allowable nightly lane/shoulder closures with channelizing devices to close the outside lanes along I-81 NB and I-81 SB. Temporary shoulder strengthening will be completed to support the Phase 1 traffic shifts onto the outside shoulder, **reducing the potential for deterioration and continual maintenance of existing shoulder pavement during Phase 1**. Additionally, temporary widening and guardrail replacement along the outside shoulders will be installed to meet the RFP requirements of 34' minimum clear width of asphalt. Work will be completed at the end of each night and conditions restored to allow two thru lanes of traffic during the next day.

Phase 1 – Areas 1, 2, & 3: Project Begin to Project End

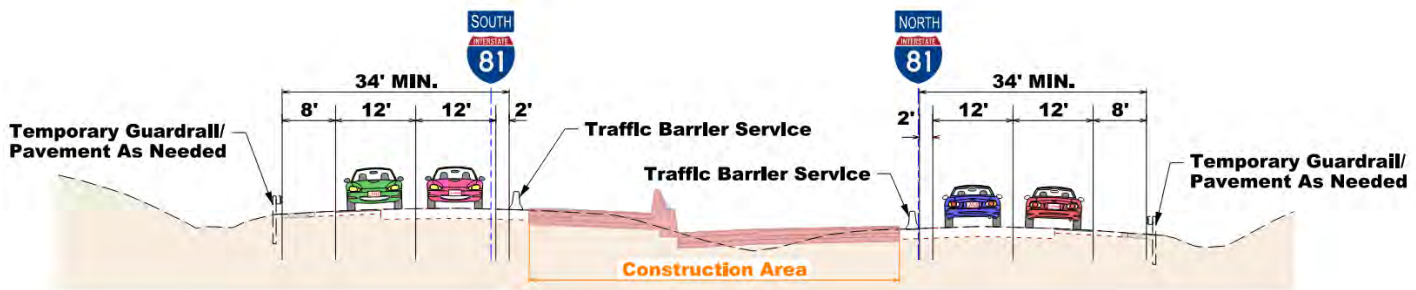


Figure 4.5.1-6– Phase 1 MOT Scheme (See Vol II. Pages 66-68)

Phase 1 shifts I-81 NB and SB traffic on the outside existing shoulders to construct median widening along both travel ways. To ensure traffic has adequate pavement strength and clear roadway width, the Lane-Corman Team will perform shoulder strengthening on all outside shoulders and temporary pavement widening where necessary in both directions within the project limits. **This will avoid pavement raveling and unnecessary shoulder or lane closures during construction** to repair raveling pavement and potholes. Our approach to the sequencing of construction activities will advance the shoulder strengthening/widening and median work ahead of ROW acquisitions to meet interim and final completion dates. The **median construction can begin early** with erosion and sediment control being handled within the existing median utilizing sediment traps. While proposed drainage systems are being installed in the median, ROW and easements acquisitions will be completed. In order to construct the SB Route 112, 635, and 619 overpass bridges in the next phase, temporary median cross-overs will be constructed. The temporary median cross-overs will be located on either end of Route 112, prior to Route 635, and after Route 619 where the proposed median barrier walls will be omitted and constructed in a later phase. Throughout Phase 1, partial bridge construction of I-81 NB over Route 112, 635, 619 and I-81 NB and SB over Route 311 is completed. In addition, beginning construction in the median fully utilizes the existing pavement widths for this area given the proposed alignment has minimal outside widening.

Phase 2 – Areas 1 & 2: Project Begin to Station 245+00 (Route 705 Over I-81)

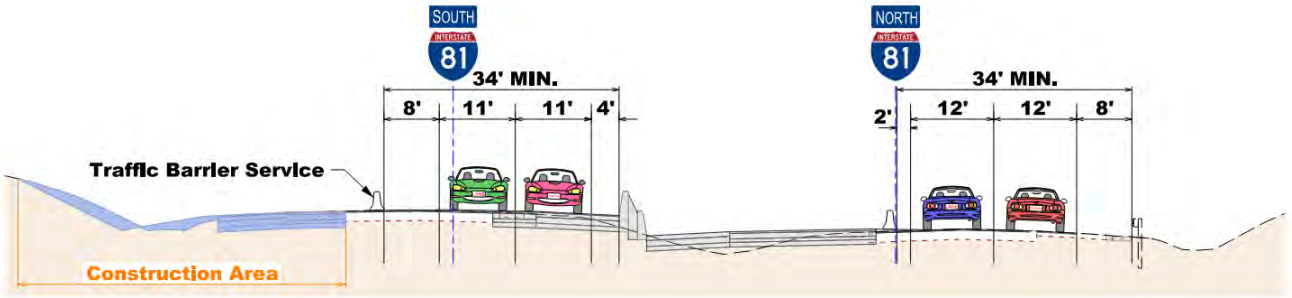


Figure 4.5.1-7 – Area 1 Phase 2 MOT Scheme (See Vol II. Page 66)

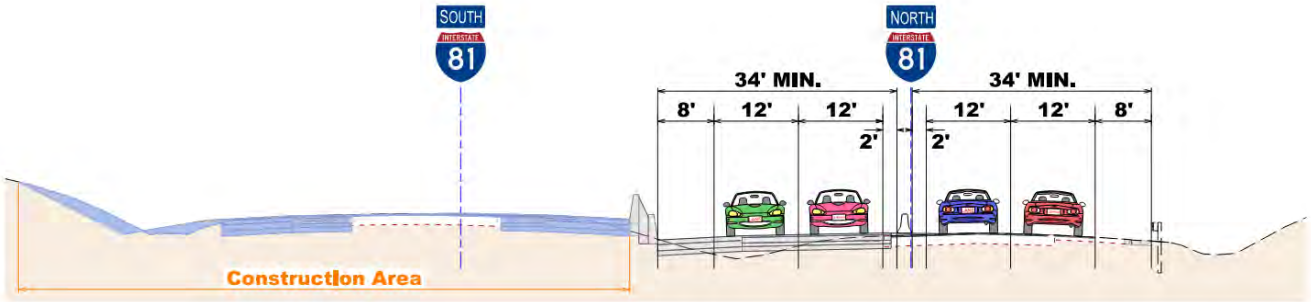


Figure 4.5.1-8 – Area 2 Phase 2 MOT Scheme (See Vol II. Page 67)

Phase 2 leaves I-81 NB traffic on the outside existing shoulder and shifts I-81 SB traffic to the proposed inside shoulders while completing SB widening for the extent of Areas 1 and 2. I-81 SB traffic is crossed onto the I-81 NB median widening completed in Phase 1 at spot locations in order to complete the bridge replacements at Route 112, 635, and 619. Areas 1 and 2 are described in more detail below:

Area 1: Construction of the I-81 SB outside widening is completed including the improvements to the on/off ramps to Route 112. Phase 2 completes the construction of the I-81 SB over Route 112 bridge during a single-phase approach utilizing a tapered exit for I-81 SB traffic heading to Route 112. The temporary ramp diversion **increases the deceleration length by more than 100%** over the existing condition, plus provides an **increase to the recoverable area** and meets the permanent requirements for removal of guardrail. Additionally, signage in advance of the exit will be thoroughly developed to ensure drivers navigate the movement safely and efficiently. This MOT scheme allows for the SB Route 112 bridge to be demolished and rebuilt all at once. This eliminates a cold joint in the deck; **reducing maintenance and increasing safety to the traveling public** by completely separating ramp traffic from the demolition and reconstruction of the SB bridge. The temporary alignment utilizes the fill material required to be placed in the gore area as part of RFP Section 2.2

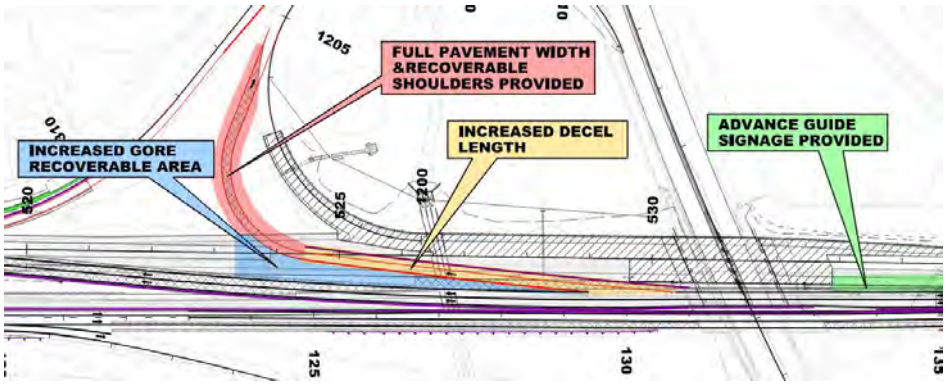


Figure 4.5.1-9 – I-81 SB Over Route 112 MOT Scheme

Area 2: Construction of the full I-81 SB cross section is completed between Route 635 and Route 619 free of traffic. **Material delivery can be efficiently provided at each end of the Area with staging of equipment and material placed outside of I-81 NB median barrier**.

Upon completion of the I-81 SB widening and bridge replacement, I-81 SB traffic will be shifted into the permanent lane configuration while the median cross-over and barrier are restored/constructed to final grade. At the end of Phase 2, I-81 SB improvements will be substantially complete and provide beneficial occupancy to all SB travelers

Phase 2 – Area 3: Station 245+00 (Route 705 Over I-81) to Project End

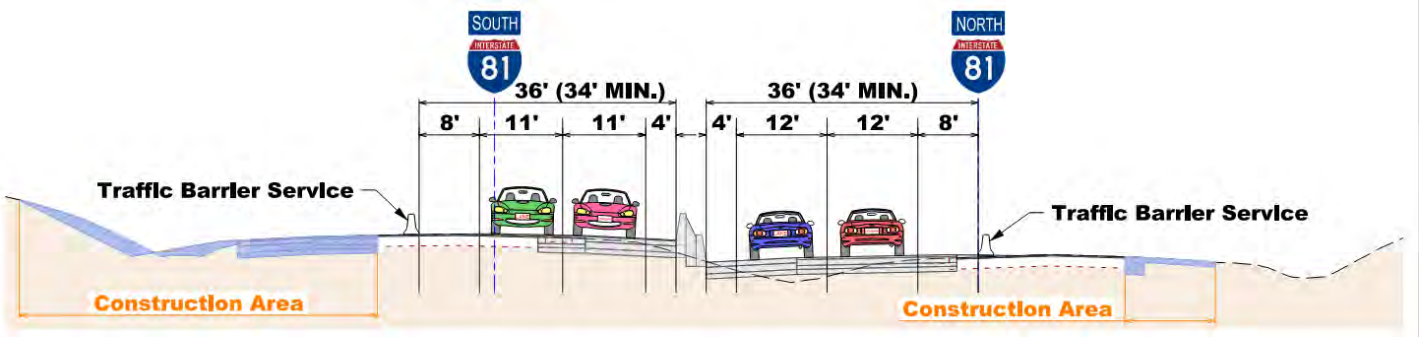


Figure 4.5.1-10 – Area 3 Phase 2 MOT Scheme (See Vol II. Page 68)

Phase 2 shifts I-81 NB and SB traffic onto the inside median widening completed in Phase 1 to construct the remaining improvements along the outside shoulders. Utilizing a sub-phase, gore pavement construction is completed along I-81 NB and SB to Route 419 on/off ramps while maintaining adequate acceleration/deceleration lanes. Completion of I-81 NB and SB over Route 311 bridge construction occurs along the outside parapets along with the completion of deck overlay utilizing additional sub-phases for the SB structure.

Separating Area 3 from Areas 1 and 2 allows the project to start work on outside shoulders of the NB lanes while the SB Bridges at Routes 112, 635, and 619 are still being constructed. This starts schedule critical work on the Noise Barrier and the ITS system months earlier and **keeps them off the Critical Path**.

Phase 3 – Areas 1 & 2: Project Begin to Station 245+00 (Route 705 Over I-81)

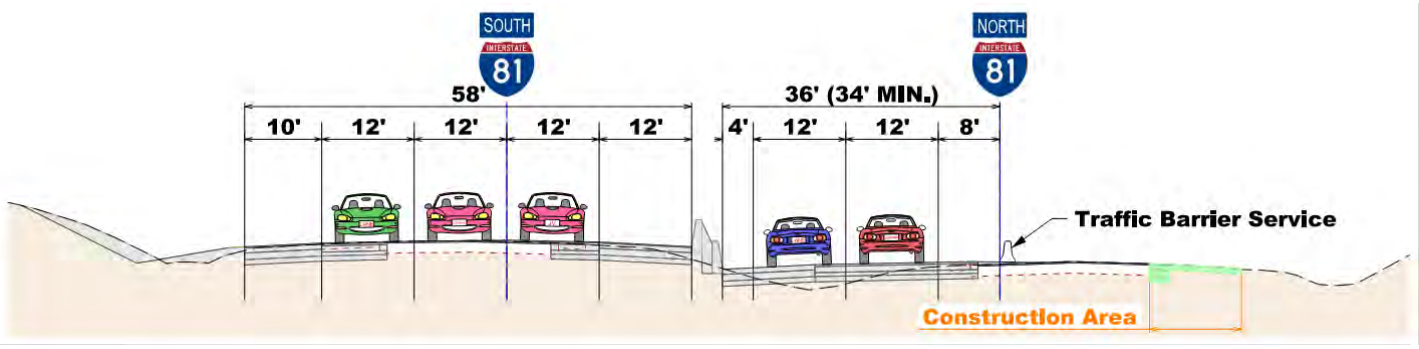


Figure 4.5.1-11 – Area 1 and 2 Phase 3 MOT Scheme (See Vol II. Pages 66-68)

Phase 3 shifts I-81 NB traffic onto the I-81 NB median widening completed in Phase 1 and 2 to construct the remaining improvements along the outside shoulder, as well as the remaining bridge construction of I-81 NB over Route 112, 635, and 619. Utilizing a sub-phase, gore pavement construction is completed along I-81 NB to Route 112 on/off ramps while maintaining adequate acceleration/deceleration lanes. Construction entrances can be provided along the I-81 NB outside shoulder while not impeding the work activities or shifting of mainline traffic.

Safety and Operations

Safety is the highest priority for the Lane-Corman Team. Our record of consistently achieving a world-class safety record reflects our corporate commitments and approach to safety training, engagement of workers at every level, a focus on occupational health, and a deep commitment by the JV to the Project's safety program.

Safety in the construction zone is critically important to the Lane-Corman Team. Clear and comprehensive traffic control plans will be developed to maintain safety. We will implement a safety training program for every employee. Subcontractors will be safety certified prior to starting their work on the project. Safety performance will be closely monitored and any injuries will be investigated, documented, and reviewed by the Safety Manager, Roy Teal. Mr. Teal will report to the DBPM, Mr. Bernstein. The Safety Plan will be aggressively communicated to all subcontractors.

The Safety Manager and all Lane-Corman foremen hold American Red Cross First Aid certification and are OSHA 10-hour trained. Activity plans will be developed to determine and identify the hazards inherent to any work activity and provide information to protect the employee against these hazards. All employees participating in this activity will be oriented prior to beginning work. Orientation includes the following:

- Working in traffic (including safely installing lane closure setups)

Innovative safety programs the Lane-Corman Team will implement include:

The **"4 Seconds for Safety"** program uses regularly posted signage on site to remind personnel to spend four seconds prior to performing any work to ask four basic questions: (1) Am I trained? (2) Do I have the right PPE? (3) Do I need help to do this? (4) Is this the safest way? Since its inception in 2017, Lane's 4 Seconds for Safety program has **led to a 23% decrease in incidents nationwide.**

"Safety Through Teamwork" (ST2) is geared to provide our craft with a voice. Its aim to empower our workers to embrace and take ownership of our policies and programs, and to build an unbreakable safety culture that will keep us all safe on and off the jobsite. ST2 is a supplemental communication tool for the front line.

Safety Assurance Program. Provides industry leading technology to our Safety Supervisors to effectively and adequately ensure safety excellence. This program utilizes internally developed Lane computer software on an Apple iPad from the field to conduct periodic safety audits. Any deficiencies are noted and corrected and all data is populated into a universal system that populates and trends findings across the company. The trend findings from all audits inputted into the system are shared across our organization and they proactively enable our overall safety management system in identifying training opportunities, modifications or additions to procedures/policies, and an overall awareness of safety "focus" areas.

- Working in tight spaces (including asphalt paving in close proximity to temporary concrete barrier)
- Work zone ingress and egress (for material haulers, supervisors, subcontractors, etc.)
- Work zone maintenance and protection of traffic

Due to the nature of the work involved, the Lane-Corman Team will employ the following safety considerations, at a minimum:

Protection of work zone from traveling public: Our traffic control plan provides safe ingress and egress to construction work zones. Our Team has located access points in areas outside of ramps to avoid areas of heavy inflow of vehicles entering the corridor.

- Construction deliveries (inflow and outflow) will be scheduled outside of peak hours as much as practical.
- Safe access points are supported by appropriate notification and advanced warning signage and space to facilitate deceleration and acceleration for trucks entering or exiting a work zone.
- The Team will communicate and notify all stakeholders along the corridor to ensure all public schools, police, and emergency management personnel are updated on all traffic shifts and phasing to maintain ingress and egress through the Project.

Where feasible we will establish work zone access locations to develop VDOT Work Area Protection Manual compliant clear zones within each access or egress area. If this is not feasible, we will provide temporary guardrail or barrier within the area.

Also, proper signage, acceleration and deceleration space in and out of the work zone, positive separation of traffic, extensive MOT planning, and consistent public outreach notifications will ensure protection throughout the work zone during all phases of the Project. Additionally, to ensure we are providing the safest and most efficient MOT, our Team will **videotape all new MOT patterns to verify conformity and operational acceptance/excellence**. We will conduct regular drive-through video inspection of the Project and review work zones for compliance and approved traffic control plans ensuring proper installation of work zones.

Videotaping all new MOT patterns and conducting regular drive-through video inspections will verify conformity and operational acceptance/excellence.

Working within construction areas of restricted movement: Working within narrow zones creates “pinch points” where the safety of construction employees could be compromised. Employee orientations will emphasize the recognition and avoidance of these areas. Toolbox talks will be geared toward reminding equipment operators of the dangers of these zones and the daily “walk-around” inspection of their equipment with special attention to confirmation of a functioning back-up alarm. Activity pre-planning will identify operations requiring the use of “spotters” for the safe completion of the work. All equipment on the project will be evaluated for “blind spots” to determine the need for and installation of rear mounted cab cameras for backing.

Night work: A special safety program will be implemented specifically for the night work environment. Pre-shift planning will require the evaluation of the amount of portable lighting necessary for each operation. Foremen will be required to test and mobilize lighting equipment prior to dark hours to ensure adequate lighting at all times. Sufficient back-up lighting equipment will be maintained and made available during night shift operations in the event that unanticipated additional lighting is necessary. Toolbox talks for the crews involved in night shift operations will be geared towards hazards typically associated with night shift operations.

Public awareness: Public awareness is essential at the beginning of the construction process to maintain safety for the traveling public, VDOT staff, and Project personnel. Public awareness creates a positive impact on MOT. The Lane-Corman Team will work with VDOT personnel to develop a comprehensive public awareness program that informs the traveling public in advance of any traffic impacts or shifts due to construction.

Traffic control measures: Adequate traffic control measures will be utilized where work encroaches upon, or is close in proximity to, traveled roadways. Our procedures will comply with VDOT standards for uniform traffic control signs and devices. Barricades and warning and directional signs will be placed at appropriate locations to alert the public of any lane closures and other traffic control measures. Flaggers, in addition to barricades and signs when necessary, will be utilized at all equipment crossings to control traffic.

Bridge demolition: There is an extensive scope of bridge construction, including (6) replacement structures, (2) bridge widenings, and rehabilitation of (2) existing bridges. Our Demolition Policy requires all demolition operations to be completed in accordance with OSHA 29 CFR 1926.850. Prior to any demolition, a Site-Specific Demolition Plan will be prepared prior to the start of work. The Plan will outline in detail the following:

- Policies and procedures in place to assure employee safety
- Procedure for the identification and removal of hazardous materials
- Site control including protection of the public and adjacent structures and daily inspection procedures
- Methods used to demolish the structure
- Equipment necessary for demolition operations
- Fire protection methods
- Removal of material from the site
- Approved silica protection plan identifying mitigation risk procedures

Incident Management Plan: The Lane-Corman Team will develop an Incident Management Plan (IMP) to define our response and management of incidents. The IMP will be developed in coordination with VDOT, local EMS, and other stakeholders to identify the protocols pertaining to those parties that will be contacted in case of an incident including coordination with the police. The IMP will be reviewed and approved by VDOT before any work zones and/or lane closures become active on the Project. This plan will detail our response and support for the type of incident, estimated duration and will define key project team members, EMS and the procedures required to clear the incidents to meet the requirements of Part 2, Section 2.10.2. The IMP will contain a roster of job personnel, their contact information and that for the various agencies to be notified. The IMP will demonstrate that Lane-Corman has full control of all matters pertaining to incidents that occur within the Project area.

The Incident Management Coordinator (IMC), Mr. Jim Compton, and key members of the Lane-Corman Team will coordinate with VDOT TOC to place the cameras in appropriate locations to maximize coverage. **We will augment this team with additional personnel (who will have the required credentials and training per RFP requirements) to provide 24/7 incident management coverage of the Project.**

Staging and Storage Areas

The Lane-Corman Team has evaluated the corridor and will develop a detailed site-specific access and staging plan. We focused on two primary goals: 1) maximizing the safety of the traveling public, including site access with the least possible impact on traffic and 2) optimizing production to reduce cost and minimize the overall Project schedule. The location of our proposed staging and storage areas is critical to the success of the construction operations.

Our Team has identified multiple locations within the corridor which will facilitate a safe and efficient use of existing ROW for material staging and storage. The SB Route 311 off-ramp provides an ideal location for staging, specifically for the Phase 3 operations. Another benefit to our Teams approach of widening towards the median, is it allows us to utilize the existing median as an effective area for staging in a protected environment to the traveling public and through multiple phases of structure, drainage, and grading operations of the Project.

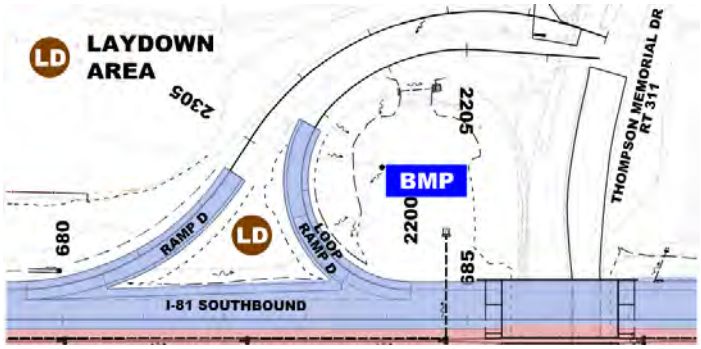


Figure 4.5.1-12 – Potential laydown area

Figure 4.5.1-13 – Potential Adams site laydown area

Key issues that will be addressed specifically in our site access and staging plan include:

- Safety of the traveling public as well as security for employees and visiting personnel
- Safe ingress and egress for construction vehicles, workers, and equipment to and from the construction site. This Project will generate a large quantity of material, equipment, and supplies that require a temporary home.
- Close proximity to the segment work areas for access and operational efficiency
- Appropriate environmental controls required for material and equipment stored
- Located away from residential areas to eliminate noise and view impacts

In order to meet the requirements of the Field Office Special Provision, and to provide appropriate locations for staging, storage and disposal, our Team investigated a number of suitable locations and initiated contact with the landowners for potential opportunities at the following locations:

- Adams Site (*Figure 4.5.1-13*) – previously used as a dump site and located about 3 miles from the 311 intersection north. Potential room to rent space for laydown areas and also has a source of borrow embankment onsite if needed.
- Potential Trailer Site – about 1.5 acres near the Project; room enough to house office trailers and parking.
- Two different commercial locations along the Project corridor (approx. 15,000 SF)

4.5.2 Transportation Management Plan

Our Team is focused on minimizing impacts to the traveling public and all stakeholders during each phase of construction. The TMP and MOT Plans will place an emphasis on safety throughout the project by utilizing sound engineering design, providing constant communication will all parties involved, and reacting to changing conditions to ensure all facets of construction are accounted for. Public mobility and minimizing construction delay are goals that the Lane-Corman Team are committed to delivering on to ensure the success of the Project.

Figure 4.5.2-1 – RDA's I-64 Widening – Segment 2 project successfully implemented a similar MOT/TMP approach

To facilitate construction a Type C, Category V TMP will be developed in accordance with I&IM-241.7/TE-351.5 and designed to the methodology provided in the Virginia Work Area Protection Manual, Revised September 2019; the Manual on Uniform Traffic Control Devices, Revisions 1 and 2 of May 2012; and the Virginia Supplement to MUTCD, Revision 1 of September 2013. The TMP will include an Incident

Management Plan (IMP) as further discussed in Section 4.5.1. The personnel involved in the design and implementation of the work zones are experienced with interstate widening projects throughout the state of Virginia and are certified with VDOT Advanced Work Zone Traffic Control Training.

The Lane-Corman Team understands the effort placed on safety throughout the corridor and will continue that emphasis during design and construction of this Project.

Maintaining Traffic through all Construction Phases

Temporary Pavement. The primary consideration when developing the MOT phasing for the Project was to keep work areas consistently on either the inside or outside of the travel way to **minimize traffic shifts** and avoid simultaneously working on either side of the road. In order to complete the first phase of widening to the median, shoulder strengthening and temporary pavement widening of the existing outside shoulders will be required to comply with RFP Section 2.10.3's lane/shoulder width requirements. This work will mostly be completed within the existing shoulder and have minimal affect along the outside fill/cut slopes, allowing for the work to be completed during allowable mainline lane and shoulder closures. Both thru lanes will be restored to the existing configuration at the end of each operation until all areas are completed and traffic can be shifted onto the outside shoulders.

I-81 SB Median Crossovers. Construction of the I-81 SB bridge structures over Route 112, Route 635, and Route 619 will be completed during a single-phase operation. This requires the use of a temporary diversion of I-81 SB onto I-81 NB widening following the guidance provided by the VWAPM as well as the requirements listed in RFP Section 2.10.3. All diversions will provide 12' travel lanes with 2' minimum offsets to barrier while providing adequate horizontal, vertical, and cross slopes to ensure safe maneuvering along the temporary alignments.

Temporary Drainage. A major concern on limited access highways is the potential for hydroplaning and the effects that spread of water into the lanes can have on traffic. Our Team has made an effort to **mitigate these concerns by removing spread into the lane and provide additional shoulder widths where needed.** Additional changes have been made to address temporary spread in addition to increasing shoulder widths such as temporary scuppers along bridges, revising proposed drainage layouts to accommodate temporary conditions, and phasing work provide adequate drainage relief.

Temporary Ramp Diversion at Route 112. Reducing impacts to the traveling public are not only limited to physical changes to the MOT layout, but also reducing the duration travelers are exposed to temporary lane arrangements. The Team's approach to reduce the SOC of I-81 SB over Route 112 utilizes a tapered exit and ramp diversion for travelers heading from I-81 SB to Route 112 as shown in *Figure 4.5.1-8*. The existing condition develops an auxiliary lane after the bridge with a substandard deceleration length and taper. An improvement to the RFP phasing has been made by diverting traffic after crossing over Route 112 through the ramp infield area. The alternative design provides **increased deceleration length, adequate stopping sight distance, divergence angle, and lane/shoulder widths.** This design concept translates to construction of the I-81 SB bridge in a single phase, **removing the construction joint** needed by the RFP design. The design meets and/or exceeds the guidance by AASHTO and VDOT Road Design Manual Appendix C for exit ramps as well as provides recoverable shoulders throughout the infield area to exceed temporary requirements and meet the proposed design requirements listed in RFP Section 2.2.

Mitigation Measures. A very high truck volume exists for the corridor in addition to steep grades which demands the need for safety to be the driving factor when developing the MOT design. Our Team is experienced with interstate bridge replacements and widening and knows the value in providing advance notification to travelers as well as designing beyond the minimum requirements provided in the VWAPM. We will provide **additional signage and clear traffic control measures on approach to mainline bridges to mitigate potential congestion areas associated with narrower shoulder widths**. The use of reduced shoulder widths will be limited in locations and duration to complete critical construction elements and be increased at the completion of work to minimize the potential for delays.

Proposed Lane or Ramp Closures

The Team's approach to MOT will include **minimizing the need for proposed lane or ramp closures** by phasing work behind temporary traffic barrier as much as possible. This includes phasing the deck rehab and overlay of I-81 NB and SB to eliminate construction joints outside of the final lane configuration wheel paths. Work that must be completed with the use of lane or ramp closures will be detailed in the TMP and coordinated closely with VDOT.

Full depth widening of entrance and exit ramps will be phased in during normal work hours, reducing the need to utilize closures for operations such as milling and overlaying the existing pavement. Temporary closures of minor roads will be utilized for setting beam girders during bridge construction and will be coordinated with the public and emergency responders.

Temporary Detours

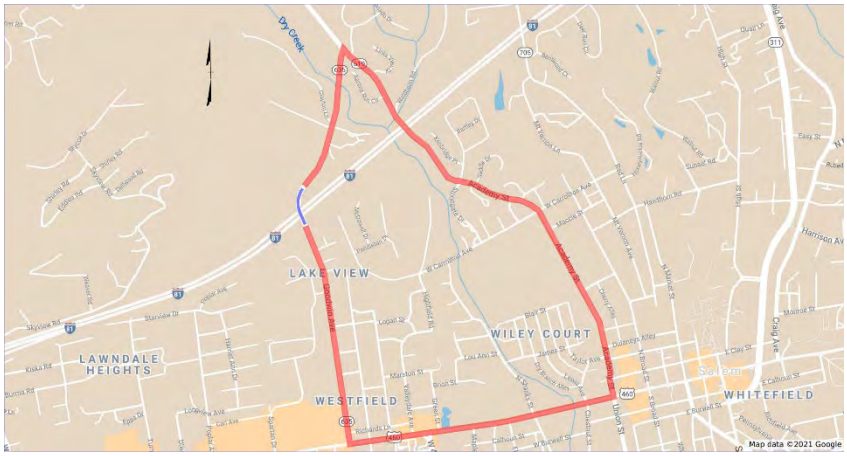


Figure 4.5.2-2 – Route 635 Detour

A temporary detour of Route 635 will be utilized for the construction of I-81 NB and SB bridges. In an effort to **minimize the detour's duration**, abutment construction will begin in Phase 1 outside of the existing travel way. Once girders are ready to be placed for I-81 NB bridge widening, the detour of Route 635 will begin in conjunction with construction of the lowered roadway. The timeframe that the detour is in place will not coincide when schools/universities and colleges are in session to **mitigate potential delays to bus routes and peak-hour commuters**. Additionally, closure of Academy Street (Route 619) will not coincide with any total closure of Goodwin Avenue.

Time of Day Restrictions

Our Team will conform to the RFP requirements for time-of-day restrictions regarding allowable short-term lane, shoulder, and total closures. This information will be coordinated by the Team with VDOT TOC and the VDOT Project Manager for scheduling purposes as well as be discussed in detail in the Public Communication and Incident Management Plan.

Flagging Operations

The I-81 SB and NB bridges over Route 619 require the removal of substructure elements in close proximity to the travel way and will likely require flagging operations, along Route 619 only, to complete portions of the demolition/bridge construction. All other minor roads (except detoured Route 635) can be maintained minimally with a single lane in each direction during construction of the Project.

Minimum Lane Widths

We will conform to the lane and shoulder requirements listed in the RFP by maintaining at least 34' of clear width pavement, comprised minimally of 11' travel lanes, 8' outside shoulders, and 2' inside shoulders. **Where possible, our Team will strive to provide 12' travel lanes and additional shoulder widths to accommodate temporary spread**. Recognizing the high truck percentages for the corridor, all efforts will be made to ensure safe and free-flowing operation is met throughout the work zone including maintaining and/or improving geometry at the existing interchanges. All roadway widths will be designed to sufficiently accommodate WB-67 design vehicle turning movements.

Work Zone Speed Reductions

The Team does not expect any work zone speed reductions. All temporary lane shifts, merges, acceleration and deceleration lanes, and temporary alignments for diversions will meet the standards for 60 MPH.

Project Stakeholders

Our Team has developed and implement an effective plan for continuous stakeholder input to mitigate issues and concerns. We will hold regularly scheduled meetings during construction with stakeholders to ensure all concerns are addressed in an orderly/timely fashion. This outreach will be fully coordinated with the VDOT Salem District Construction Division and Public Affairs staff. This outreach will include representatives from:

Stakeholder	Potential Impacts	Mitigation Strategies
VDOT	• Perceptions / issues raised by residents, motorists, and business owners	• Weekly coordination meetings • Notification of traffic impacts
Roanoke County, City of Salem	• Perceptions / issues raised by residents, motorists, and business owners	• Inclusion in design process regarding minor roads and detours • Cooperatively address outreach and responses to businesses and property owners
EMS, Police, Fire, and Rescue	• Reduced shoulders and/or congestion along I-81 • Long-term detour of Route 635 and short-term closures for girder erection	• Providing adequate lane/shoulder widths on I-81 for first responders • Holding coordination meetings prior to implementing detour routes
Schools and Colleges	• Construction and lane closures along bus routes • Heavy traffic during college events	• Detouring Route 635 when schools are not in session • Providing adequate lane/shoulder widths along minor roads during bridge construction • Providing advance notice and coordination of lane closures • Developing work activities/schedule around Virginia Tech, Radford University, Roanoke College, and other local school events to include move-in days, game days, and graduations
Residential Community Groups	• Property acquisition • Construction Noise	• Engage the residential communities during the design process • Installing noise walls early in the schedule where possible
Utility Companies	• Direct impacts to facilities throughout the corridor	• Early coordination during the design process to locate relocations advantageous for both parties
Local Business Groups	• Construction activities in the vicinity of businesses	• Providing adequate communication and TTC signage/devices to minimize impact to local businesses
Salem Civic Center & Berglund Center	• Heavy traffic during events	• Developing work activities/schedule around large events to minimize construction delay
Trucking Industry	• Delays attributed to construction activities and/or work zone geometry	• Providing adequate lane/shoulder widths on I-81 to accommodate WB-67 vehicles, including ramp movements • Minimizing lane and shoulder closures through efficient phasing as well as reducing lane shifts throughout corridor
NASCAR: Bristol & Martinsville	• Heavy traffic during events	• Developing work activities/schedule around large events to minimize construction delay
Olde Salem Days	• Heavy traffic during events	• Developing work activities/schedule around large events to minimize construction delay

Approach to Public Outreach

Our Team acknowledges the benefit of public outreach on a large-scale project of this nature and will make a concerted effort to include several stakeholders in the decision-making process as well as proactively informing the necessary parties of key project changes prior to and during construction. This approach will be handled in the following ways:

Development of a Traffic Management Task Force (TMTF)

- The TMTF will consist of members from Lane-Corman, RDA, VDOT, and third-party stakeholders.
- A task force dedicated to traffic management will proactively address risks associated with the MOT.
    - VDOT and relevant stakeholders will be invited to work with our Team's project staff throughout the duration of the project to discuss potential risks prior to and during construction.
    - The TMTF will meet regularly to review MOT and optimize traffic safety and efficiency.
    - Recommendations generated by the TMTF will be continually implemented into the MOT plan.
- Goals of the TMTF:
    - Minimize delays to the traveling public;
    - Reduce disruptions to adjacent businesses;
    - Maximize safety throughout the project's life cycle;
    - Keep VDOT and project stakeholders up to date on the Project's progress; and
    - Alert them to any upcoming changes in the traffic pattern.

Submission of Graphics/Progress Photos

- The Team will provide VDOT with written information and graphics about the Project that can posted to VDOT's website or for use during informal meetings and presentations with the public, including:
    - Plan of work graphics
    - Schedule updates
    - Anticipated temporary lane/shoulder closures
    - General Project photos
- All impacts to local routes such as detours and/or lane closures will be accompanied by graphics depicting the necessary routes anticipated for use by the traveling public.
    - Such graphics will be provided a least a month in advance of the impacts and be updated as conditions change.

VDOT and Locality Coordination

- The Team anticipates and ongoing relationship with VDOT and Localities during the design and construction of the Project:
    - The first of which will occur through formal reviews of the MOT plans and TMP documents.
    - Additional coordination will occur throughout construction in the form of regular updates to VDOT, the City of Salem, and Roanoke County to ensure compliance will standards and City/County ordinances.
- The Team will meet all requirements of the RFP regarding the development of the IMP.
    - The Team will coordinate with VDOT SWRO TOC and VSP for wrecker support of disabled vehicles within the Project limits.
    - The Team will coordinate with VDOT and localities when developing allowable alternate routes for detours.

The Team will manage all maintenance activities in accordance with RFP Section 2.10.1 while allowing priority to VDOT Interstate Maintenance Office (IMO) as needed.

Public Safety

The Team will include construction ingress and egress lanes at all construction entrance/exit points along the I-81 work zone to allow safe and efficient operation adjacent to travel lanes consistent with *Figure 4.5.2-3*. The acceleration and deceleration lanes will be located outside of ramp merge areas to **minimize congestions and confusion with oncoming traffic** as well as be adequately signed with the appropriate advance warning signage consistent in the VWAPM. Any construction ingress/egress lane that is in operation will be closed utilizing Group II channelizing devices or open to traffic as increased shoulder width as work is completed.

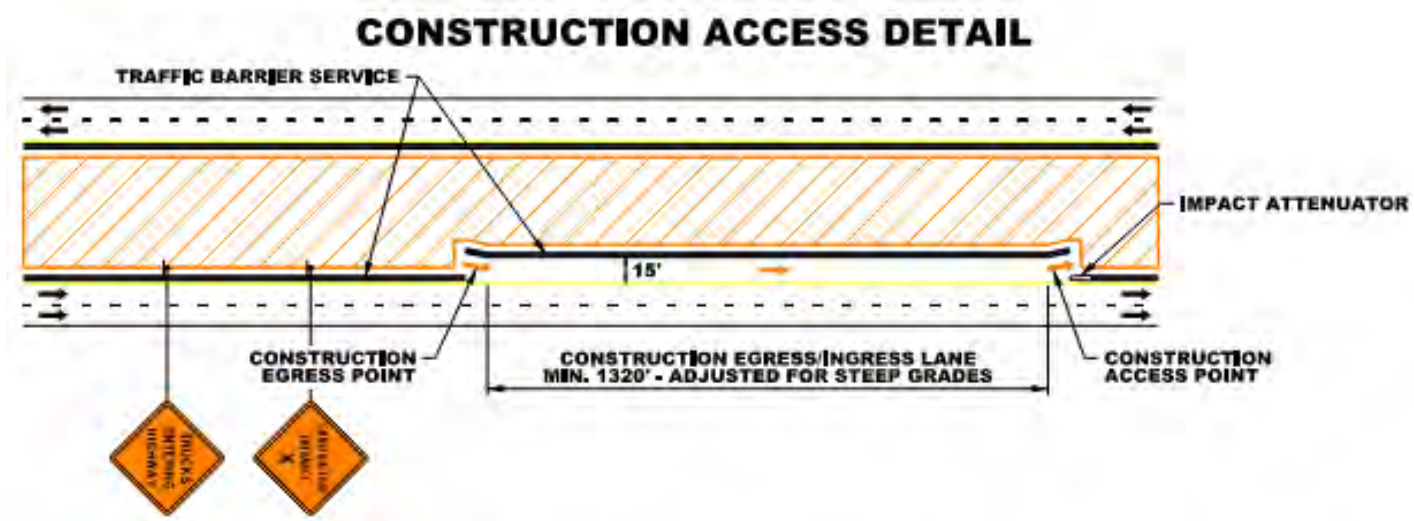


Figure 4.5.2-3 *– Typical Construction Ingress/Egress Scheme*

A major goal of the Team's design is minimizing impact to ramp traffic when constructing mainline widening. All ramp construction will be phased in while **providing adequate acceleration/deceleration lanes, sight distance and adequate widths for turning movements of a WB-67**.

The Team's design places a large emphasis on accommodating temporary spread within existing and temporary shoulders corridor wide. A large effort has been completed to analyze the anticipated spread values for mainline temporary barrier, proposed inlets, and at mainline bridge crossings. **The Team's approach will meet/exceed the requirements regarding temporary spread by increasing shoulder widths, adjusting proposed inlets to provide benefit in the temporary condition, and coordination of bridge construction to adequately manage drainage on the proposed bridge decks**.

In support of the TMP, the Team will develop a temporary signing plan to address the unique challenges with shifting traffic from NB to SB. We will ensure that adequate signage is provided adjacent to the roadway for regulatory, warning, advanced guidance and exit direction as well as signs included in the IDSP program. The temporary signing plan is in addition to construction warning signs and intended to **focus on communicating important wayfinding and exit information** during interim and completed designs.

A goal to reduce crashes and improve safety has been set in place by Virginia State Police, Department of Motor Vehicles, and Department of Transportation for the 15-mile segment from mile marker 127 to 142, designated as one of three Highway Safety Corridors in Virginia. All efforts during design and construction of the project will aim to meet this goal, recognizing the speeding and heavy truck traffic concerns throughout this area. One mitigation measure that will be included in the MOT design is adequate acceleration/deceleration lanes at each ramp location. **When available, the design will provide the permanent design auxiliary lane lengths to help reduce the potential for rear-**

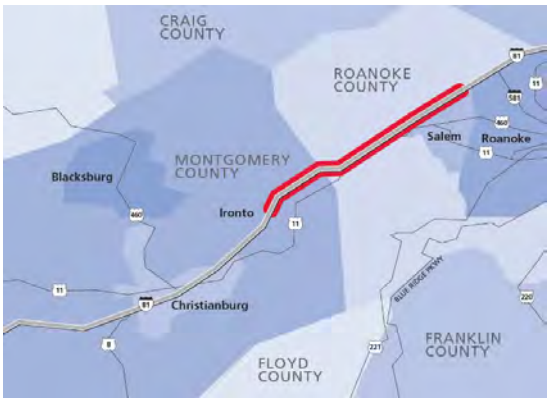


Figure 4.5.2-4 *– I-81 Highway Safety Corridor*

end crashes seen frequently at each interchange location. Additionaly the MOT concept has placed an empahsis on reducing traffic shifts and utilizing sound geometrics adjacent to bridges and median crossovers. This approach coupled with the **isolation of work areas to consistent sides of traffic will help reduce driver distractions** typical seen throughout construction zones.

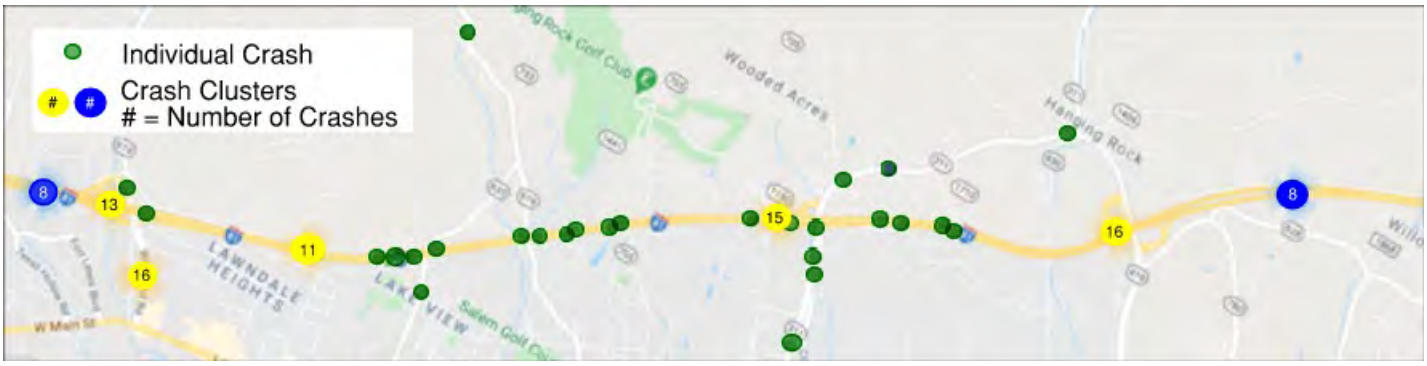


Figure 4.5.2.5 – 2020 Crashes within the Project Corridor

Route 630 and the Hanging Rock Battlefield Trail will accommodate the existing trail without closures. Any necessary protection measures will be placed to delineate work zones from the trail and provide a safe passage for pedestrians during construction. Additionally, any necessary protection measures will be placed to delineate work zones from the trail and provide a safe passage for pedestrians during construction.

Beyond the Hanging Rock Battlefield Trail, pedestrian accommodations will be provided along Route 311 to facilitate the bridge sub-structure construction. Temporary protection will be provided along the existing sidewalk while meeting VDOT and ADA requirements.

Throughout the corridor exists the potential for rock blasting along outside cut slopes. Our Team will take all the necessary precautions with regards to advance communication, signage, and safety measures to ensure blasting operations do not impact adjacent properties or the traveling public.

Throughout the life of the Project, snow-removal and proper drainage during all phases will be accommodated. The Team will provide at least 8’ outside shoulders where possible to assist in the snow removal process and will **continually monitor site conditions to ensure ponding areas are not present**. Our sequencing addresses these concerns by maintaining existing drainage facilities during the first phase of construction and providing proposed storm sewer facilities throughout the median where needed to drain water during outside construction.

4.6 Proposal Schedule

4.6 Proposal Schedule

4.6.1 Proposal Schedule

The Lane-Corman Team's Proposal Schedule (included in Volume II) utilizes Primavera P6 software and CPM scheduling to depict the scope and sequence of work to design and construct the Project per the RFP requirements. The Proposal Schedule is organized by using a hierarchical Work Breakdown Structure (WBS) into major phases of the Project, which include: Project Milestones, Contractual Hold Points, Project Management, Scope Validation Period, Quality Assurance/Quality Control, Design, Environmental Permitting, ROW Acquisition, Utility Relocation, Public Involvement, Engineering and Procurement, and Construction. The Schedule also depicts the anticipated Critical Path, reviews by VDOT, and work performed by the Team's suppliers, subcontractors, and other involved parties.

The Lane-Corman Team will deliver the Project 50 days ahead of the RFP Final Completion Date. We will also provide two Unique Milestones which will open I-81 traffic early to significantly reduce impacts to the traveling public.

4.6.2 Proposal Schedule Narrative

Plan to Accomplish the Work

We have developed the Proposal Schedule detailing our plan to successfully complete the work in accordance with the Contract Documents. The narrative provides an explanation of the sequencing, description, and explanation of the Critical Path, proposed means and methods, and other key assumptions upon which the schedule is based.

The schedule was developed in a Critical Path Method format (CPM) utilizing Primavera software, based on the RFP information, available resources, design concepts, and construction means that our Team has chosen.

The Lane-Corman Team fully intends to pursue obtaining the full 180-day early Project final acceptance "No Excuses" incentive as described in Part 3 Article 5 of the RFP.

Schedule Overview

Notice of Intent to Award	April 1, 2021
Notice to Proceed	May 24, 2021
Design Activities	April 2021 – May 2022
Construction	September 2021 – November 2025
I-81 Southbound (SB) Lanes Substantial Completion*	**July 2, 2025**
I-81 Northbound (NB) Lanes Substantial Completion*	**August 29, 2025**
Proposed Final Completion	**November 26, 2025**
RFP Final Completion	January 15, 2026

**Substantial Completion is defined as having three I-81 lanes open to the traveling public in the direction noted with ongoing temporary lane closures as allowed by the RFP to finish final paving, striping, grading, landscaping, seeding, ITS, signage, and punch list activities.*

Design

The design phase includes concept development, QA/QC reviews, submission of Intermediate, Final, and Ready for Construction (RFC) design stages of the Roadway and Structure elements of the Project. Included are the 21-day VDOT review periods. Included for support of the design preparation is survey coordination and mapping, geotechnical investigation, and utility designations. Activities are included for geotechnical field work, reports, and VDOT's review, prior to submitting the final roadway packages. The design phase will begin immediately upon receipt of the Notice of Intent to Award (NOIA) to begin advancing the concept plans to the intermediate stage. Critical design elements are shown on the Critical Path, specifically the design of the new Structures, Temp Pavement Design, Utility Relocations, and Environmental Permits.

We plan to complete each design package prior to commencing construction of that package, with a priority being placed on the utility relocation and an Advanced Work Package (AWP) which will include the design of the E&S, MOT, and clearing activities required at the start of construction. The AWP will also include shoulder strengthening that will be required for Phase 1 MOT configurations and access for temporary work areas at the bridge location. This package will be followed the roadway and Structural plans. In the event non-critical (such as landscaping, signage, striping, etc.) design elements may hold up the roadway plans, the less critical elements may be held back for a final RFC plan submission, allowing the critical design elements to be submitted and approved and construction to commence.

Scope Validation and Field Investigations. Upon Receipt of NTP, the design and construction teams will start Scope Validation with Field Survey updates taking place simultaneously. These updates include evaluation of property information, validation of existing pavement elevations and limits, and the location of existing underground utilities with a subsurface field investigation. Additionally, geotechnical investigations will commence with the submittal of a boring plan for VDOT informational purposes and the stakeout of the boring locations in the field. The roadway design will also commence concurrent with the survey update and the geotechnical investigations and will be adjusted as necessary to accommodate the results of the fieldwork.

Final Design. While the work shown on the AWP plans is ongoing, final structural, Roadway and any non-critical roadway elements will be developed and submitted to VDOT for review. This will allow RFC plans to be approved by Spring 2022 when full-scale construction activities are scheduled to begin.

Environmental and Permitting

Our schedule will contain all necessary environmental and permitting activities as required. The schedule has been developed to allow time for adequate information to be developed as needed for the permit submittal processes and the environmental site assessment. A milestone was created to show the approval of all the water quality permits, which will be a Hold Point, restricting any work from occurring with-in wetland areas to start prior to permit approval. Schedule activities located in Wetland areas are designated based on the preliminary permit designation performed by VDOT (dated 8/20/2020). In general, the only areas where wetlands are anticipated are outside of the existing shoulder, and at the Route 630 overpass. Actual wetland areas will be determined by the JV when we perform the official delineation post-award. The Schedule shows work starting in upland areas prior to obtaining the Water Quality Permits, with the approval of VDPES and SWPPP as part of the AWP.

Right-of-Way and Utilities

These two activities will be coordinated to start upon receipt of NTP, utilizing the RFP and Design Concept plans to start work immediately. This gives the maximum amount of time for research, appraisals, and negotiations. This process allows the utility owners as much time as possible to develop the most optimized relocation plans and to complete their work in advance of the new roadway construction. Preliminary meetings have already taken place with the utility companies that require relocation, in order to ensure that the Team has a handle on the scope and complexity of the relocations that will be required.

By reducing the number of critical utilities to a single company our Team can effectively manage the risks associated with any potential schedule delays.

QA/QC

QA/QC activities will be performed as required in the contract documents and relevant tasks are included in our proposal schedule. The activities included in our proposal schedule consist of:

1. QA/QC Plan Submittal and Presentation
2. QA/QC review of Design Packages
3. Preparatory Inspection Meetings
4. QA and QC Field Inspections Hold Points

Construction

The first construction phase of the Project will involve utility relocations throughout the median, as well as in the areas of the proposed overpasses at Wildwood Road (both Exit 137 and near MM 139), Exit 137 Ramp, and at the lowered profile on Goodwin Avenue. Much of this work will occur during the design period. Construction by the Team will begin with shoulder strengthening in 2021 prior to the winter weather, allowing traffic to be pushed towards the outside as needed to perform the inside widening during Phase 1. In this phase, Traffic will be pushed to the outside of both NB and SB lanes, allowing work to occur in the median for both directions. At the structures, specialized demo and reconstruction will occur to the median side of the NB bridges only. Goodwin Road will also be lowered with completion required to occur prior to the new structural beams being set.

By minimizing construction phases and efficiently sequencing the Project, the Lane-Corman Team will deliver the Project 50 days ahead of the RFP Final Completion Date. This early completion:

- **Significantly improves safety which reduces impacts to the traveling public**
- **Reduces daily lane closures and roadway restrictions**
- **Provides for early beneficial occupancy of the 6-lane alignment**

Once the NB median is ready to receive traffic, Phase 2 will begin with SB traffic detoured on to the new NB median lanes just constructed between the Project terminus and Sta 245+00 (noted as Areas 1 and 2 on the schedule). NB traffic will remain in the Phase 1 location (shifted towards the outside) in these Areas. During Phase 2, the SB bridges will be demolished and rebuilt in their entirety. In Area 3 (Sta. 245+00 to the Project end terminus), NB and SB traffic will be pushed toward the median, and work on the outside will commence.

In Phase 3, any remaining work in Area 3 will continue, with traffic ending up in its final configuration. In Areas 1 and 2, SB traffic will be placed in its permanent locations, while NB traffic will be pushed toward the inside (running in the lanes where SB traffic was during phase 2), allowing the remaining work on the outside of NB to be completed. Any median barriers/guardrail runs that were left open for MOT purposes in previous phases will be completed during this phase.

Phase 4 involves final surface and striping, with traffic running in the final configuration. Our work schedule/sequencing is shown on the Project Schedule included in Volume II.

Critical Path

The Critical Path for this Project starts with the design elements associated with the utility relocations and AWP, so that the Project will be able to start work into 2021, and to fully enter Phase 1 Project-wide in early 2022.

During Phase 1, the Critical Path remains on roadway activities, as the roadwork durations in the median exceeds structural activities.

In Phase 2, the Critical Path runs through the SB reconstructed bridges and the outside widening in Area 3.

The Critical Path is then fully focused on structures during Phase 3 as the remainder of the NB bridges are constructed, finishing with the final surface and striping in the NB lanes.

Work Breakdown Structure (WBS)

The WBS is a multi-level, hierarchical arrangement of the Work to be performed on the Project. The Lane-Corman Team has arranged the WBS to break down the major phases of the Project by Type of Work and Locations. Level 1 of the WBS was assigned to the Project name, I-81 Design-Build. A brief description of the Level 2 WBS is below, followed by a table showing the Level 2 - Level 4 WBS used on the Project.

1. **Project Milestones:** As required by the RFP, the major Project milestones are included under this WBS. It includes all contractual milestones such as NTP and Final Completion.

2. **General Conditions:** Work Activities Associated with the contractual obligation of the Design-Build Team to administer the Project. Quality control and quality assurance efforts required to meet with VDOT minimum requirements for D-B are included here, as are any contractual hold points.

3. **Design:** Under this WBS, all the design efforts with their respective submission and review/approval timeline are included. A further breakdown of this division is shown on the table below.

4. **Environmental:** This section includes the effort involved with procuring all of the environmental permits associated with the Project.

5. **ROW:** This section shows the effort required to procure any property required to complete the Project. This includes negotiated purchases, condemned properties, and easements (temporary and permanent).

6. **Utility:** This section shows the coordination, design, and construction activities associated with any required Utility Relocations.

7. **Public Involvement:** This section shows the anticipated public involvement activities.

8. **Engineering and Procurement:** This section includes approval and delivery of all major offsite materials and construction support that is not provided by the Lead Designer.

9. **Construction:** This WBS section depicts the construction activities grouped by Type of Work and Locations. Further breakdowns are included in *Figure 4.6.2-1*.

Figure 4.6.2-1 – High-level WBS

Level 2 WBS	Level 3 - Level 4 WBS
Project Milestone	
General Conditions	• Contractual Hold Points • Scope Validation • Project Management • Quality Control/Quality Assurance
Design	• Survey • Geotechnical • Advanced Work Package • Right of Way, Grading, and Drainage • Final Roadway • Structures • ITS/Lighting/Signage/Striping
Environmental	• Permitting • Hazardous Material • Noise Analysis
ROW	
Utility	• Utility Coordination • Utility Relocations
Public Involvement	
Engineering and Procurement	• Engineering - Roadway - Bridge - ITS/Signage/Lighting - Noise Barrier • Procurement - Roadway - Bridge - ITS/Signage/Lighting - Noise Barrier
Construction	• Maintenance of Traffic • Roadway - I-81 Area 1 (Sta 111+50 – 185+00) - I-81 Area 2 - (Sta 185+00 – 245+00) - I-81 Area s (Sta 245+00 – 376+75) - Route 635 (Goodwin Avenue) - Pipe Rehab • Structures - B683, B688 - Route 112 Bridge - B684, B685 - Route 635 Bridge - B686, B687 - Route 619 Bridge - B677, B678 - Route 311 Bridge • Sound Barrier • Signage, Lighting ITS

Assumptions

The Project Schedule was built based on the following key assumptions:

1. **Weather days** – The number of weather days allocated in the schedule is described in detail in the calendar section below, but they were estimated using using the 30-Year Climate Normals Average from locally available NOAA data. This data is updated every 10 years (last updated in 2011, 1991-2020 Normals are expected later this year) so the 1981-2010 Normals were used, with additional weather days added to account for the wetter weather that this area has experienced over the past 10 years.
2. **Crews** – This schedule assumes that crews will be available to work in multiple locations at the same time. This includes both Roadway (where work occurs in All 3 areas simultaneously) and Structures, where the schedule typically shows work ongoing at 2 to 3 bridges at a time.
3. **Design/Construction Start** – This Project assumes that the design of the AWP will be progressed enough to start the outside widening work/Shoulder Strengthening work in 2021, but that major construction work will not begin until the Spring of 2022.
4. **Noise Barrier** – This schedule assumes that the Noise Barrier will be deemed feasible and reasonable in approximately the same area (352,570 SF) that is noted in the RFP. It is further assumed that the Noise Barrier will be desired by the public, but that field investigative design work, such as geotechnical borings, will not be performed until after the barrier is accepted by the public
5. **VDOT Review Periods** – This schedule assumes that VDOT will utilize but not exceed their full review period for all design and construction submittals. This period is 21 days for all submittals except Geotechnical Reviews, where 45 days are allowed.

Calendars

The four Project calendars were used in the schedule and include:

1. **Calendar Days** are based on a seven-day week. This is used for VDOT review periods and other activities whose durations are defined as calendar days in the contract, as well as some design, and procurement activities
2. **5-Day with Holidays** is based on five working days per week and includes holiday restrictions. Used for most design activities and other work not impacted by adverse weather.
3. **5-Day with Holidays and Weather** is based on five working days per week, accounting for holiday restrictions and anticipated weather days. This calendar was used for most construction activities. No Saturday work was shown during the fall or late May/early June to account for Graduation, Move-in Day, and NCAA Football game related restrictions.
4. **5-Day Paving** is similar to the 5-Day and Holidays and Weather calendar described above, except it also does not allow any work from the start of December through mid-March. This is used for paving and striping activities that have temperature restrictions.

As noted above, the number of weather days were estimated using the 1981-2010 Climate Normals Average from locally available NOAA data, with additional weather days built into the calendar, as shown below.

	Average Daytime Temp Below 32°F and/or Precip Greater than 0.5"											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Probability	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Workdays (Mon-Sat) Lost in Calendar Days	10.8	7.2	10.8	5.2	5.8	6.0	5.2	5.1	6.8	6.6	6.1	9.4
Nonworking (Mon-Sat) Days Shown in Calendar Due to Weather	11	9	11	6	6	6	6	6	8	7	7	10

Schedule Management Means and Methods

The schedule will be constantly reviewed and maintained to avoid slippage, as well as impacts discussed as part of the monthly partnering process and finalize mitigation and recovery solutions should they be needed. Systems to manage the design and construction sequencing will be clear and concise and include:

- Weekly design/construction scheduling and coordination meetings during the design phase
- Weekly construction scheduling meetings during the construction phase
- Utility relocation tracking sheets during the design and construction phases
- ROW progress tracking spreadsheets (if needed) during the design and construction phases
- Review and approval tracking spreadsheets of design element submittals
- Shop drawings status tracking sheets
- Material submittals and delivery schedules
- Non-conformance logs by QC and QA for design and construction
- RFI logs
- Monthly progress/partnering meetings with the major stakeholders, including VDOT, the Lane-Corman Team's designers, major subcontractors/vendors, and local businesses. Affected utilities will also be invited for the current stage of work.

At the internal weekly meetings, issues/concerns will be identified using the above tracking aids and action items identified and assigned to someone who can resolve it. Five-week, and long term "look-ahead schedules" will be prepared and discussed to analyze schedule and quality impacts. Similar information will be discussed, and action items assigned at the Monthly Progress/Partnering meetings with key stakeholders. Other stakeholders may be invited for anticipated issues during upcoming schedule activities.

Updating Process. Each month, starting with Notice to Proceed, the Preliminary Schedule will be updated as the Team prepares, submits, and receives approval of the Baseline Schedule. Once the Schedule is approved it will be updated and submitted to VDOT for approval monthly until Final Completion of the Project. Each update will be accompanied with a narrative report and tables as prescribed in the Design-Build Project Schedule Special Provision. The updated schedule and narrative will reflect:

- Activities started or completed during the period
- Actual start and finish dates
- Activities on-going during the period
- Remaining duration for on-going activities
- Modified relationships to correct out-of-sequence progress
- Modified relationships to reflect Corman's plan for completing the remaining work
- Change Orders
- Relief events
- Compensation events

Schedule Recovery. If during the course of the Project, changes or unforeseen circumstances arise that impact the Project schedule, the Team will immediately notify VDOT (and other appropriate stakeholders) and prepare a schedule recovery plan to recover lost time. This plan may include increasing work shifts, adding crews and resources to construct Critical Path activities concurrently, changing MOT schemes or modifying the design to remove activities from the Critical Path. If it is early in the Project at the time of the impact is encountered, schedule recovery may require adjustments by any or all of the discipline managers including design, permitting, ROW, utility relocation, and construction. In the event all other D-B disciplines have completed their tasks, re-sequencing the construction schedule by the Construction Manager will be the primary focus in order to mitigate impacts.

Mitigating Risks

The experience that the Lane-Corman Team has obtained in working on projects of similar nature will be critical to the timeliness of resolving design and construction hurdles as they occur. Our Team has successfully utilized a rolling design process on other jobs that enables critical construction phases and activities requiring normally long lead times to be under production simultaneously with final designs. We pride ourselves in solving construction and design issues rapidly without sacrificing the quality of the Project. Based on our preliminary knowledge of the proposed scope of work for this Project and our experience on previous projects of the same size and complexity, the following risks, issues, or problems may cause schedule delays and may require mitigation:

Right-of-Way. ROW acquisition and relocations can take several months to negotiate and if eminent domain is necessary even longer. We will hit the ground running as soon as we receive NTP and aggressively complete the ROW and relocation process. The Project has mitigated this risk by sequencing the Project to perform inside widening towards the median first, where no acquisition is required. In the event of delays to this activity that extend into the outside widening in Phase 2, we will shift the design and construction focus to other areas of the Project to avoid impacts to the final completion date.

Utility Relocations. There is a risk in schedule delay if the utility companies take longer than anticipated to relocate their utilities with respect to the Project. Specifically, the Citizens Fiber cable must be relocated prior to the onset of any inside widening work to begin (Phase 1) as it conflicts with the proposed inside widening. Our Team has determined that all potential relocations would occur entirely with-in existing ROW, allowing this work to commence as soon Plans and Estimates are approved.

Design Approvals. There is a risk that the design approval process could exceed that anticipated in our CPM schedule which could shorten the time available for construction. In order to take advantage of the D-B process to its greatest extent, we feel it is necessary to develop the construction plans in a manner conducive to staying "one step ahead" of construction. By breaking up the design into early work packages, we will be able to obtain "release for construction" plans sooner to enhance progress and avoid delays.

Environmental Impacts and Permits. Restrictions for permit review periods could extend the approval period thus causing a delay in the schedule. Early submission for permits is necessary to allow as much time as possible for approvals. The Project will also designate Upland locations where work may begin that is not tied to any Wetland water quality permits. Acquiring the required permits from all affected agencies will require diligent performance by the team and VDOT. A proactive approach will help to incorporate those agencies as stakeholders and generate a partnering approach.

Subcontractor Scheduling. There is a significant workload for high priority subcontractors; scheduling will be jointly coordinated and done well in advance to avoid delays. We will mitigate potential delays using a partnered approach for open and often communication with subcontractors.

Material Lead Time. The Team identified schedule critical elements associated with longer lead time materials (i.e., MSE wall panels, Girders, Bridge Pile, Noise Barrier Panels, Fiber Cable) and has designated when they are needed to ensure the design and release of these items is adequately prioritized. This will also expedite the shop drawing process to ensure there are no delays to the Project schedule.

Project Phasing. The complexity of the Project will require that the many of the Project features will be constructed concurrently, and/or in specific sequence. To help mitigate this, we will sequence the Project into three major and distinct Areas which can to some degree be constructed independently from one another. This enables the five-mile corridor to be progressed efficiently, allowing the Team measured flexibility during construction to mitigate delays and limit impacts to the traveling public.

Our three (3) Project Areas can be constructed independently from one another which maximizes our Team's ability to mitigate potential delays and allocate resources appropriately to maintain the Project Schedule.

Summary

The Lane-Corman Team has developed a Proposal Schedule and Proposal Schedule Narrative that demonstrates our understanding of the complexities and interrelationships of the technical elements of the Project. Additionally, our Proposal Schedule takes the following into account: internal plan reviews, VDOT plan reviews and approvals, environmental permitting and constraints, ROW acquisition, utility relocation, construction activities and QA/QC inspection and testing. Our Team is committed to continuously improve the Schedule to better serve VDOT, associated stakeholders, and the traveling public.

Appendix

Attachment 4.0.1.1
TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

ATTACHMENT 4.0.1.1

I-81 WIDENING MM 136.6 TO MM 141.8

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

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

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Technical Proposal Checklist and Contents	Attachment 4.0.1.1	Section 4.0.1.1	no	Appendix
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.7 (Form C-78-RFP)	Sections 3.7, 4.0.1.1	no	Appendix
List of Approved ATC's (if applicable)	Attachment 3.6.7 (Form C-78-RFP)	Sections 3.6.7	no	Appendix
Letter of Submittal	NA	Sections 4.1		1-2
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	2
~~Interim Milestone and~~ Final Completion Date~~(s)~~	NA	Section 4.1.6	yes	2
Unique Milestone Date	NA	Section 4.1.7	yes	2
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.7	no	Appendix

ATTACHMENT 4.0.1.1

I-81 WIDENING MM 136.6 TO MM 141.8

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	Section 4.1.8	no	Appendix
Written Statement of DBE Participation (9%)	NA	Section 4.1.10	yes	2
Offeror's Qualifications	NA	Section 4.2		3-4
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	3
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	4
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	3
Design Concept	NA	Section 4.3		5-25
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	9-18; 66-87
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	18-25; 88-103
Project Approach	NA	Section 4.4		26-49
Environmental Management	NA	Section 4.4.1	yes	26-30
Utilities	NA	Section 4.4.2	yes	31-37
Geotechnical	NA	Section 4.4.3	yes	37-42

ATTACHMENT 4.0.1.1

I-81 WIDENING MM 136.6 TO MM 141.8

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	42-49
Construction of Project	NA	Section 4.5		50-65
Sequence of Construction	NA	Section 4.5.1	yes	51-59
Transportation Management Plan	NA	Section 4.5.2	yes	59-65
~~**Disadvantaged Business Enterprises (DBE)**~~	~~NA~~	~~Section 4.6~~		
~~Written statement of percent DBE participation~~	~~NA~~	~~Section 4.6~~	~~yes~~	
Proposal Schedule	NA	Section 4.6~~7~~		S1-S30
Proposal Schedule	NA	Section 4.6~~7~~	no	S10-S30
Proposal Schedule Narrative	NA	Section 4.6~~7~~	no	S1-S9
Proposal Schedule in single .pdf	NA	Section 4.6~~7~~	no	Electronic

Attachment 3.7 (Form C-78-RFP)
ACKNOWLEDGEMENT OF RFQ, REVISIONS, AND/OR ADDENDA

ATTACHMENT 3.7

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION

RFP NO. C00116203DB108

PROJECT NO.: 0081-080-946

ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA

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

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

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

SIGNATURE

3-3-2021

DATE

Richard A. McDonough

PRINTED NAME

Director

TITLE

Attachment 3.6.7
LIST OF APPROVED ATC'S

ATTACHMENT 3.6.7
LIST OF APPROVED ATCs INCLUDED IN TECHNICAL PROPOSAL

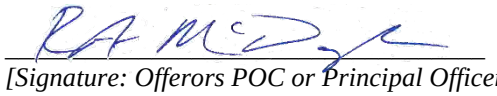
OFFEROR: Lane- Corman I-81 Widening JV

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

ATC ID Number	ATC Name Description	Date ATC Approved	Technical Proposal Reference Page(s) #
02	Route 311 Reduction of Minimum Girder Depths for Superstructure	2-11-2021	5, 6, 9, 19, 24, 103

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

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



[Signature: Offerors POC or Principal Officer]

Richard A. McDonough
[Printed Name]

Director
[Title]

DATE: March 3, 2021

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 3rd day of March, 2021, by and between the Virginia Department of Transportation ("VDOT"), and Lane-Corman I-81 Widening JV ("Offeror").

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications ("SOQs") pursuant to VDOT's May 29, 2020 Request for Qualifications ("RFQ") and was invited to submit proposals in response to a Request for Proposals ("RFP") for the **I-81 Widening MM 136.6 to MM 141.8, Project No. 0081-080-946** ("Project"), under a design-build contract with VDOT ("Design-Build Contract"); and

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

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

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

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

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

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

3. Proposal Payment. VDOT agrees to pay Offeror the lump sum amount of **Two-hundred twenty five thousand and 00/100 Dollars ($225,000.00)** ("Proposal Payment"), which payment constitutes payment in full to Offeror for the conveyance of Offeror's Intellectual Property to VDOT in accordance with this Agreement. Payment of the Proposal Payment is conditioned upon: (a) Offeror's Proposal being, in the sole discretion of VDOT, responsive to the RFP; (b) Offeror complying with all other terms and conditions of this Agreement; and (c) either (i) Offeror is not awarded the Design-Build Contract, or (ii) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror.

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

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

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

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

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

9. Miscellaneous.

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

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

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

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

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

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

VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

Lane-Corman I-81 Widening JV

By: _____

Name: Richard A. McDonough

Title: Director

Attachment 11.8.6(a)
DEBARMENT FORM
PRIMARY COVERED TRANSACTIONS

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0081-080-946

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

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

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

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

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

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

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

Signature	3-3-2021	Director
	Date	Title

Lane-Corman I-81 Widening JV
Name of Firm

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0081-080-946

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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	3-3-2021 Date	Director Title

The Lane Construction Corporation
Name of Firm

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0081-080-946

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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	2/23/21 Date	Regional Sr. Vice President Title

Corman Kokosing Construction Company
Name of Firm

Attachment 11.8.6(b)
DEBARMENT FORM
LOWER TIER COVERED TRANSACTION

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

Project No.: 0081-080-946

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

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

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

	02.23.2021	President/CEO
Signature	Date	Title

Rinker Design Associates, P.C.
Name of Firm

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

Project No.: 0081-080-946

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

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

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

Signature	2/24/21 Date	President & Chief Engineer Title

Alvi Associates, Inc.
Name of Firm

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

Project No.: 0081-080-946

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

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

Signature	2/24/2021	Virginia Operations Manager
Signature	Date	Title

E. L. Robinson Engineering Co.
Name of Firm

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

Project No.: 0081-080-946

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

	2/24/2021	Senior Vice President
Signature	Date	Title

Century Engineering, Inc. d/b/a NXL
Name of Firm

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

Project No.: 0081-080-946

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

Judson H. Dalton 2/23/2021 Judson H. Dalton
Signature Date Vice President
Title

W. C. English, Incorporated
Name of Firm

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

Project No.: 0081-080-946

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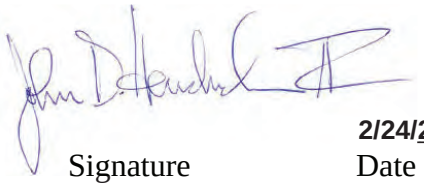


Signature	2/24/21 Date	Assistant VP/Local Business Leader Title

WSP USA Inc.
Name of Firm

Original

Technical Proposal

VOLUME II

MARCH 3, 2021

I-81 WIDENING

MM 136.6 to MM 141.8

Roanoke County and
City of Salem, Virginia

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

Federal Project No.: NHPP-0812 (330)

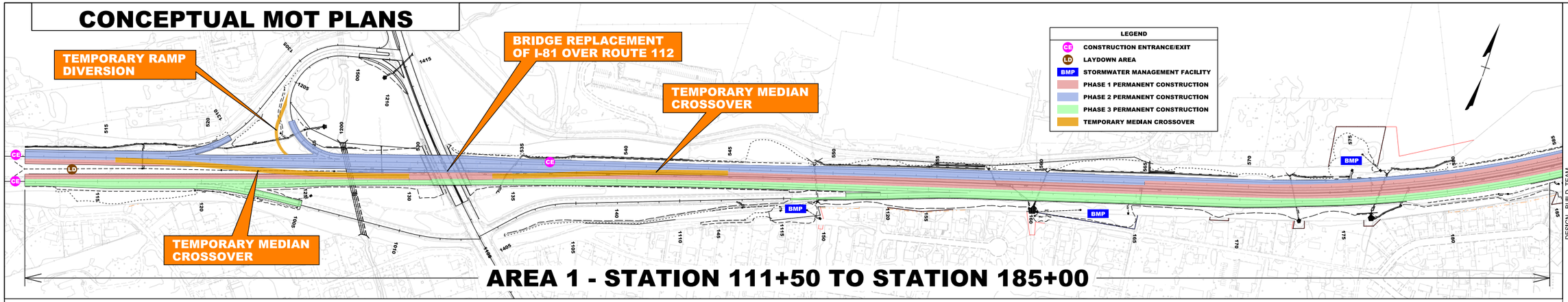
Contract ID Number: C00116203DB108

LANE CORMAN KOKOSING

Lane-Corman I-81 Widening JV
in association with Rinker Design Associates, PC

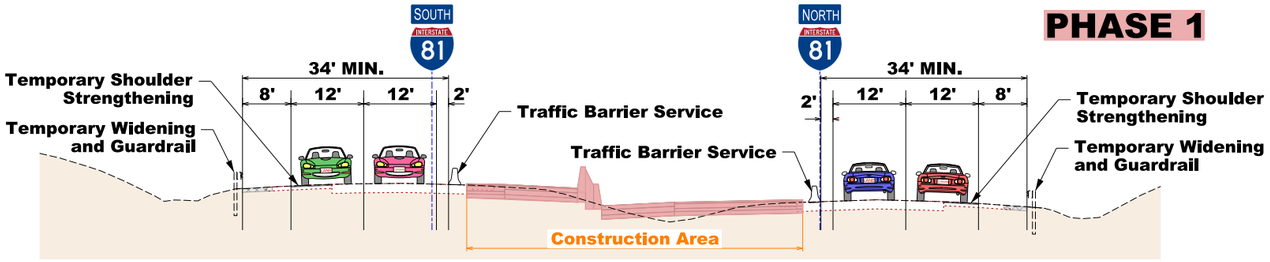
4.3.1 CONCEPTUAL ROADWAY PLANS

CONCEPTUAL MOT PLANS



AREA 1 - STATION 111+50 TO STATION 185+00

PHASE 1



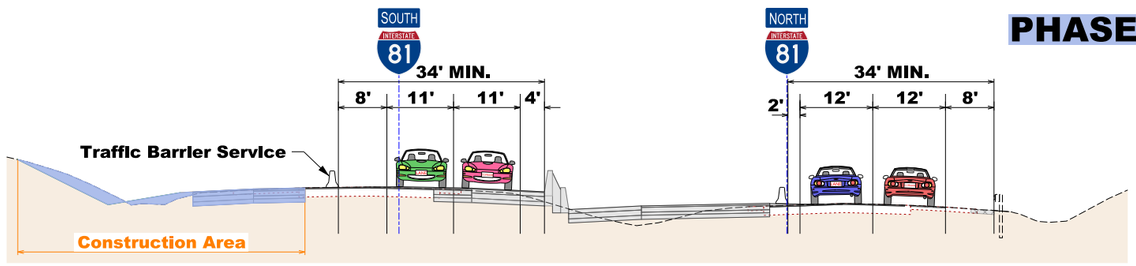
CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- PHASE 1 (STEP 1) UTILIZES ALLOWABLE LANE/SHOULDER CLOSURES TO INSTALL SHOULDER STRENGTHENING, TEMPORARY PAVEMENT, AND GUARDRAIL FOR SHIFTING TRAFFIC TO OUTSIDE SHOULDERS
- COMPLETES INSIDE BRIDGE REPLACEMENT OF I-81 NB OVER ROUTE 112
- CONSTRUCTS TEMPORARY MEDIAN CROSSOVERS FOR USE IN PHASE 2
- COMPLETES MEDIAN PAVEMENT WIDENING AND DRAINAGE INSTALLATION

KEY MOT FEATURES THIS PHASE

- UTILIZES TEMPORARY PAVEMENT AND SHOULDER STRENGTHENING TO PROVIDE 34' OF CLEAR WIDTH PAVEMENT
- PROVIDES ADEQUATE ACCELERATION/DECELERATION LANES FOR CONSTRUCTION INGRESS/EGRESS POINTS
- MINIMIZES LANE SHIFTS BY CONCETRATING WORK AREA IN MEDIAN, ONE LANE SHIFT TO TIE TO EXISTING LANE STRIPING
- CONTROLS TEMPORARY DRAINAGE USING SEDIMENT TRAPS IN MEDIAN UNTIL SEDIMENT BASINS CAN BE CONSTRUCTED ALLOWING FOR FLEXIBILITY IN ROW ACQUISITION

PHASE 2



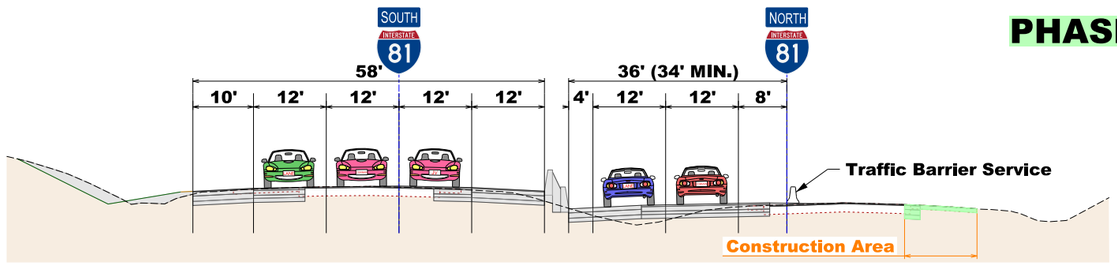
CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- SHIFTS I-81 SB TRAFFIC ONTO INSIDE SHOULDERS AND I-81 NB MEDIAN WIDENING UTILIZING MEDIAN CROSSOVERS
- CONSTRUCTS TEMPORARY RAMP DIVERSION FOR I-81 SB TRAFFIC TO ROUTE 112
- COMPLETES CONSTRUCTION OF I-81 SB OVER ROUTE 112 IN SINGLE BRIDGE PHASE
- COMPLETES I-81 SB OUTSIDE PAVEMENT WIDENING AND DRAINAGE CONSTRUCTION
- REMOVES TEMPORARY MEDIAN CROSSOVER PAVEMENT AND CONSTRUCTS MEDIAN BARRIER LEFT OUT DURING PHASE 1

KEY MOT FEATURES THIS PHASE

- UTILIZES TEMPORARY MEDIAN CROSSOVERS AND RAMP DIVERSION TO CONSTRUCT I-81 SB OVER ROUTE 112 IN SINGLE PHASE, REMOVING CONSTRUCTION JOINT SHOWN IN RFP DESIGN
- INCREASED I-81 SB INSIDE SHOULDERS PROVIDED ABOVE 2' MINIMUM TO ACCOMODATE SPREAD ALONG MEDIAN BARRIER
- MINIMIZES IMPACT TO I-81 NB TRAFFIC BY LEAVING TRAFFIC IN SHIFTED PHASE 1 CONFIGURATION
- TEMPORARY RAMP DIVERSION COINCIDES WITH REQURIEMENTS TO FILL IN GORE AREA TO PROVIDE RECOVERABLE SLOPES ALONG I-81 RAMPS TO/FROM ROUTE 112

PHASE 3



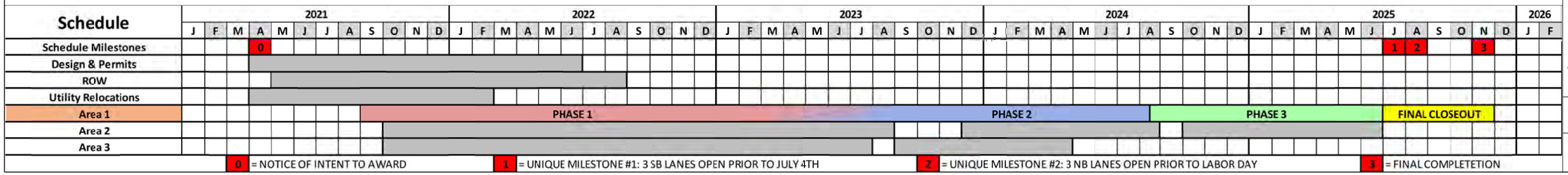
CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- SHIFTS I-81 SB TRAFFIC INTO FINAL CONFIGURATION, NO CONSTRUCTION IMPACTS TO TRAFFIC OCCUR FOR PHASE
- SHIFTS I-81 NB TRAFFIC TO INSIDE WIDENING TO CONSTRUCT OUTSIDE PAVEMENT REPLACEMENT AND DRAINAGE INSTALLATION
- COMPLETES CONSTRUCTION OF I-81 NB OVER ROUTE 112
- UPON COMPLETION OF PHASE 3, FINAL WEARING COURSE PLACED AND PERMANENT STRIPING CONSTRUCTED

KEY MOT FEATURES THIS PHASE

- UNIQUE MILESTONE MET TO OPEN I-81 SB TRAFFIC TO THREE TRAVEL LANES
- INCREASED I-81 NB INSIDE SHOULDERS PROVIDED ABOVE 2' MINIMUM TO ACCOMMODATE SPREAD ALONG MEDIAN BARRIER
- PROVIDES ADEQUATE CONSTRUCTION INGRESS/EGRESS OUTSIDE OF RAMP AUXILIARY LANES

Schedule



DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946 R201, P101, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

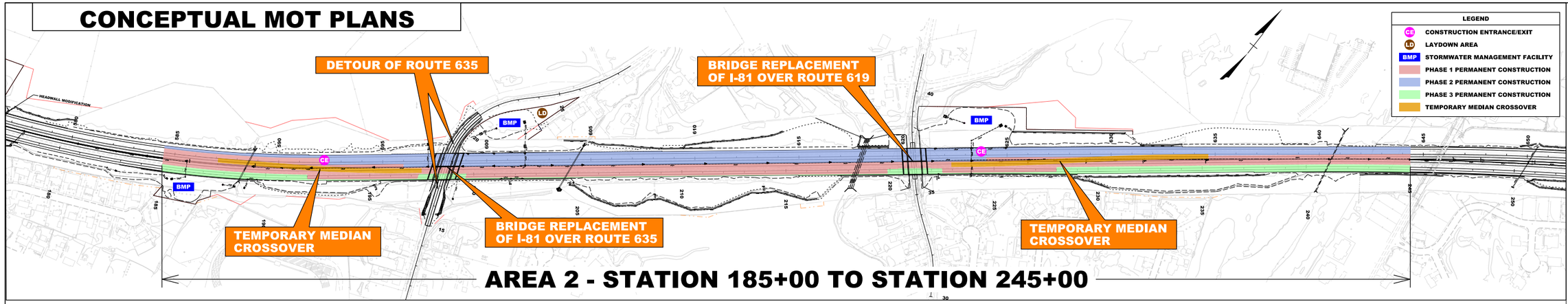
SHEET NUMBER
1J(1)

PAGE NUMBER
66

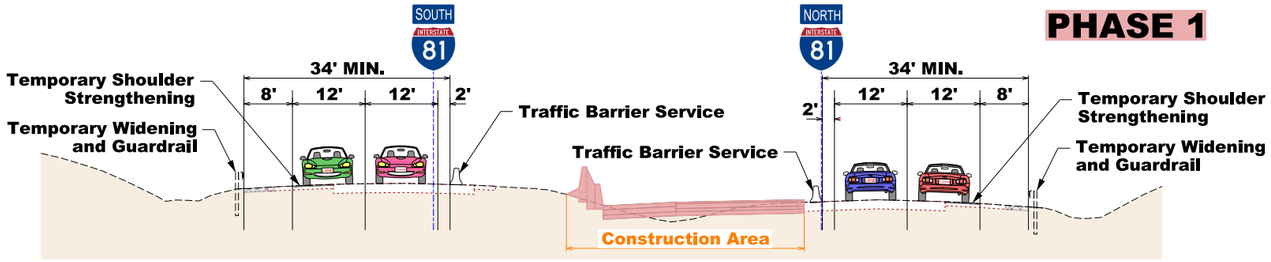
$REF:006

$TIME:$ST:AMPS

CONCEPTUAL MOT PLANS



AREA 2 - STATION 185+00 TO STATION 245+00



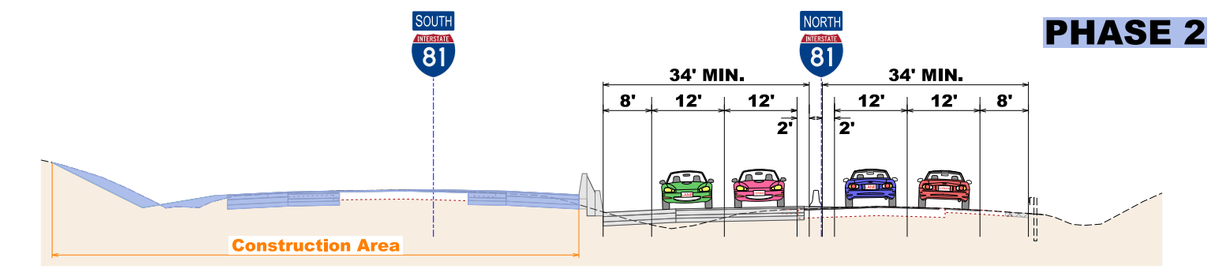
PHASE 1

CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- PHASE 1 (STEP 1) UTILIZES ALLOWABLE LANE/SHOULDER CLOSURES TO INSTALL SHOULDER STRENGTHENING, TEMPORARY PAVEMENT, AND GUARDRAIL FOR SHIFTING TRAFFIC TO OUTSIDE SHOULDERS
- DETOURS ROUTE 635 TO COMPLETE BRIDGE CONSTRUCTION AND MINOR ROAD IMPROVEMENTS
- COMPLETES INSIDE BRIDGE REPLACEMENT OF I-81 NB OVER ROUTE 635 AND ROUTE 619
- CONSTRUCTS TEMPORARY MEDIAN CROSSOVERS FOR USE IN PHASE 2
- COMPLETES I-81 NB MEDIAN PAVEMENT WIDENING AND DRAINAGE INSTALLATION

KEY MOT FEATURES THIS PHASE

- UTILIZES TEMPORARY PAVEMENT AND SHOULDER STRENGTHENING TO PROVIDE 34' OF CLEAR WIDTH PAVEMENT
- PROVIDES ADEQUATE ACCELERATION/DECELERATION LANES FOR CONSTRUCTION INGRESS/EGRESS POINTS
- REMOVES LANE SHIFTS BY CONCETRATING WORK AREA IN MEDIAN, ZERO LANE SHIFTS FOR AREA 2
- CONSOLIDATES IMPACTS TO ROUTE 635 FOR A SINGLE PHASE DESPITE BRIDGE CONSTRUCTION CONTINUING IN PHASE 2/3
- CONTROLS TEMPORARY DRAINAGE USING SEDIMENT TRAPS IN MEDIAN UNTIL SEDIMENT BASINS CAN BE CONSTRUCTED ALLOWING FOR FLEXIBILITY IN ROW ACQUISITION



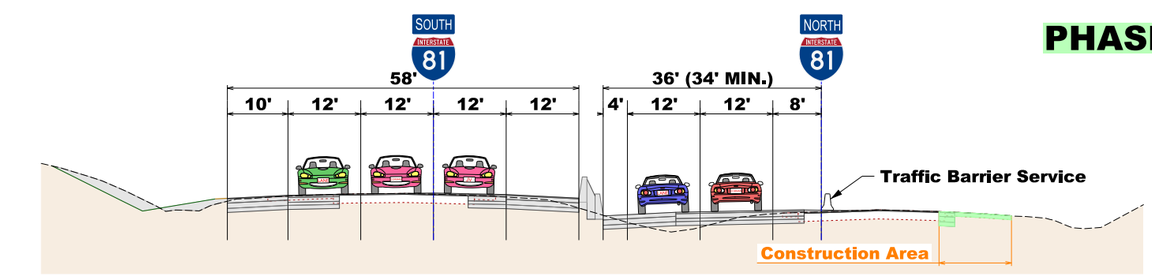
PHASE 2

CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- SHIFTS I-81 SB TRAFFIC ONTO I-81 NB MEDIAN WIDENING THROUGH USE OF MEDIAN CROSSOVERS
- COMPLETES CONSTRUCTION OF I-81 SB OVER ROUTE 635 AND ROUTE 619 IN SINGLE BRIDGE PHASES
- COMPLETES I-81 SB FULL WIDTH PAVEMENT WIDENING AND DRAINAGE CONSTRUCTION
- REMOVES TEMPORARY MEDIAN CROSSOVER PAVEMENT AND CONSTRUCTS MEDIAN BARRIER LEFT OUT DURING PHASE 1

KEY MOT FEATURES THIS PHASE

- UTILIZES TEMPORARY MEDIAN CROSSOVERS TO CONSTRUCT I-81 SB OVER ROUTE 635 AND 619 IN SINGLE PHASE
- I-81 SB TRAFFIC IS PROTECTED FROM CONSTRUCTION BY PERMANENT MEDIAN BARRIER, ALLOWING FOR SAFER AND MORE EFFICIENT CONSTRUCTION ACTIVITIES
- MINIMIZES IMPACT TO I-81 NB TRAFFIC BY LEAVING TRAFFIC IN SHIFTED PHASE 1 CONFIGURATION
- ADDITIONAL SHOULDER WIDTH PROVIDED ON BRIDGES TO ACCOMODATE TEMPORARY SPREAD REQUIREMENTS WITHOUT NEED FOR SCUPPERS



PHASE 3

CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- SHIFTS I-81 SB TRAFFIC INTO FINAL CONFIGURATION, NO CONSTRUCTION IMPACTS TO TRAFFIC OCCUR FOR PHASE
- SHIFTS I-81 NB TRAFFIC TO INSIDE WIDENING TO CONSTRUCT OUTSIDE PAVEMENT REPLACEMENT AND DRAINAGE INSTALLATION
- COMPLETES CONSTRUCTION OF I-81 NB OVER ROUTE 635 AND ROUTE 619
- UPON COMPLETION OF PHASE 3, FINAL WEARING COURSE PLACED AND PERMANENT STRIPING CONSTRUCTED

KEY MOT FEATURES THIS PHASE

- UNIQUE MILESTONE MET TO OPEN I-81 SB TRAFFIC TO THREE TRAVEL LANES
- INCREASED I-81 NB INSIDE SHOULDERS PROVIDED ABOVE 2' MINIMUM TO ACCOMMODATE SPREAD ALONG MEDIAN BARRIER
- PROVIDES ADEQUATE CONSTRUCTION INGRESS/EGRESS LENGTHS BETWEEN BRIDGE CONSTRUCTION

Schedule

	2021												2022												2023												2024												2025												2026	
	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	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Schedule Milestones				0																																																1	2			3							
Design & Permits																																																												
ROW																																																											
Utility Relocations																																																											
Area 1																																																										
Area 2													PHASE 1																								PHASE 2												PHASE 3												FINAL CLOSEOUT							
Area 3																																																										

0 = NOTICE OF INTENT TO AWARD
1 = UNIQUE MILESTONE #1: 3 SB LANES OPEN PRIOR TO JULY 4TH
2 = UNIQUE MILESTONE #2: 3 NB LANES OPEN PRIOR TO LABOR DAY
3 = FINAL COMPLETETION

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE

DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

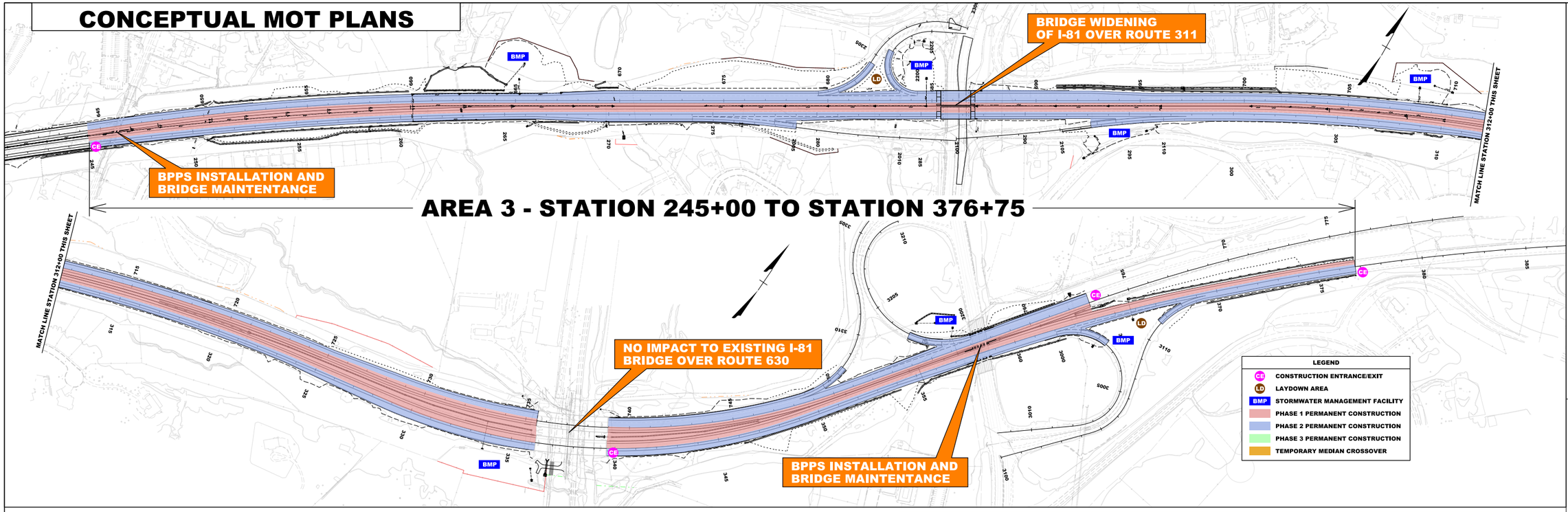
VIRGINIA DEPARTMENT OF TRANSPORTATION
VDOT
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

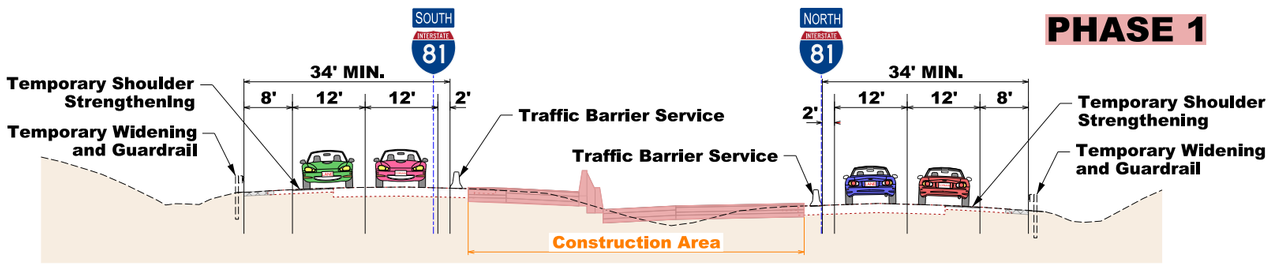
SHEET NUMBER
1J(2)

PAGE NUMBER
67

$REF:006
$TIME:$ST.AMP$

CONCEPTUAL MOT PLANS





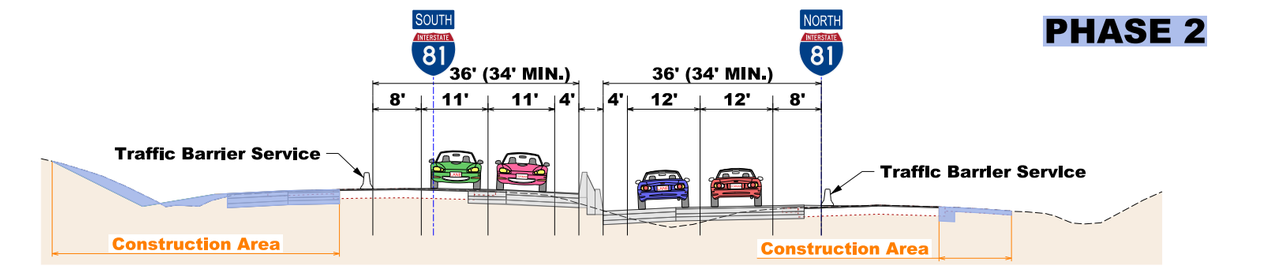
PHASE 1

CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- PHASE 1 (STEP 1) UTILIZES ALLOWABLE LANE/SHOULDER CLOSURES TO INSTALL SHOULDER STRENGTHENING, TEMPORARY PAVEMENT, AND GUARDRAIL FOR SHIFTING TRAFFIC TO OUTSIDE SHOULDERS
- COMPLETES INSIDE BRIDGE REPLACEMENT OF I-81 OVER ROUTE 311
- COMPLETES MEDIAN PAVEMENT WIDENING AND DRAINAGE INSTALLATION
- COMPLETES BPPS INSTALLATION AND BRIDGE MAINTENANCE AT ROUTE 419 AND ROUTE 705 OVER I-81

KEY MOT FEATURES THIS PHASE

- UTILIZES TEMPORARY PAVEMENT AND SHOULDER STRENGTHENING TO PROVIDE 34' OF CLEAR WIDTH PAVEMENT
- PROVIDES ADEQUATE ACCELERATION/DECELERATION LANES FOR CONSTRUCTION INGRESS/EGRESS POINTS
- MINIMIZES LANE SHIFTS BY CONCETRATING WORK AREA IN MEDIAN, ONE LANE SHIFT TO TIE TO EXISTING LANE STRIPING
- CONTROLS TEMPORARY DRAINAGE USING SEDIMENT TRAPS IN MEDIAN UNTIL SEDIMENT BASINS CAN BE CONSTRUCTED ALLOWING FOR FLEXIBILITY IN ROW ACQUISITION



PHASE 2

CONSTRUCTION ACTIVITIES COMPLETED THIS PHASE

- SHIFTS I-81 TRAFFIC TO MEDIAN WIDENING TO COMPLETE OUTSIDE PAVEMENT WIDENING
- COMPLETES OUTSIDE WIDENING OF I-81 OVER ROUTE 311 AS WELL AS DECK REHABILITATION
- CONSTRUCTS STORMWATER MANAGEMENT ACCESS ROAD ADJACENT TO HANGING ROCK BATTLEFIELD TRAIL WITHIN ALLOWABLE TEMPORARY IMPACT AREA
- UPON COMPLETION OF PHASE 2, TRAFFIC IS SHIFTED INTO FINAL CONFIGURATION WHILE AREAS 1 AND 2 CONTINUE CONSTRUCTION ACTIVITIES

KEY MOT FEATURES THIS PHASE

- INCREASED I-81 INSIDE SHOULDERS PROVIDED ABOVE 2' MINIMUM TO ACCOMODATE SPREAD ALONG MEDIAN BARRIER
- RAMP CONSTRUCTION IS SUB-PHASED IN SUCH A WAY TO CONSOLIDATE WORK TO ONE SIDE OF TRAFFIC AT ALL TIMES
- LIMITED USE OF TRAFFIC BARRIER SERVICE ADJACENT TO I-81 OVER ROUTE 630 WHERE ADEQUATE CLEAR ZONE CAN BE PROVIDED

Schedule

	2021												2022												2023												2024												2025												2026	
	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	J	F	M	A	M	J	J	A	S	O	N	D	J	F
Schedule Milestones				0																																																												
Design & Permits																																																																
ROW																																																															
Utility Relocations																																																															
Area 1																																																															
Area 2																																																															
Area 3													PHASE 1																								PHASE 2																								FINAL CLOSEOUT														

0 = NOTICE OF INTENT TO AWARD
1 = UNIQUE MILESTONE #1: 3 SB LANES OPEN PRIOR TO JULY 4TH
2 = UNIQUE MILESTONE #2: 3 NB LANES OPEN PRIOR TO LABOR DAY
3 = FINAL COMPLETETION

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VIRGINIA DEPARTMENT OF TRANSPORTATION
VDOT
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER
1J(3)

PAGE NUMBER
68

$REF:006
$TIME:$ST.AMP$

CONSTRUCTION ALIGNMENT DATA

C16
Curve 112RPD_6
PI = 1310+83.61
DELTA = 52° 11' 47.76" (RT)
D = 10° 03' 07"
T = 279.22'
L = 519.27'
R = 570.00'
PC = 1308+04.39
PT = 1313+23.66
DS = 40 MPH
E = 7.80%

C15
Curve 112RPD_3
PI = 1304+18.43
DELTA = 55° 55' 52.92" (LT)
D = 19° 25' 20"
T = 156.63'
L = 287.98'
R = 295.00'
PC = 1302+61.80
PT = 1305+49.78

C4
Curve I81SB_7
PI = 523+60.39
DELTA = 0° 04' 46.27" (LT)
D = 0° 01' 23"
T = 173.48'
L = 346.96'
R = 250,000.00'
PC = 521+86.90
PT = 525+33.87
DS = 65 MPH
E = NC

C6
Curve RT112_1
PI = 1409+40.39
DELTA = 18° 37' 27.30" (RT)
D = 0° 59' 57"
T = 940.39'
L = 1,864.19'
R = 5,735.00'
PC = 1400+00.00
PRC = 1418+64.19

C11
Curve 112LPD_1
PI = 1201+28.61
DELTA = 54° 26' 40.24" (RT)
D = 22° 55' 06"
T = 128.61'
L = 237.56'
R = 250.00'
PC = 1200+00.00
PCC = 1202+37.56
DS = 30 MPH
E = 8.00%

C12
Curve 112LPD_2
PI = 1204+43.68
DELTA = 81° 18' 48.87" (RT)
D = 23° 52' 24"
T = 206.12'
L = 340.61'
R = 240.00'
PCC = 1202+37.56
PT = 1205+78.16
DS = 30 MPH
E = 8.00%

C13
Curve 112LPD_5
PI = 1206+87.39
DELTA = 48° 03' 22.32" (RT)
D = 23° 52' 24"
T = 107.00'
L = 201.30'
R = 240.00'
PC = 1205+80.39
PT = 1207+81.69

C14
Curve 112LPD_SPUR_1
PI = 1501+75.75
DELTA = 65° 09' 48.89" (RT)
D = 20° 50' 05"
T = 175.75'
L = 312.76'
R = 275.00'
PC = 1500+00.00
PT = 1503+12.76
DS = 20 MPH
E = 3.00%

C5
Curve I81SB_10
PI = 538+05.81
DELTA = 1° 02' 29.37" (RT)
D = 0° 06' 53"
T = 454.45'
L = 908.87'
R = 50,000.00'
PC = 533+51.37
PT = 542+60.24
DS = 65 MPH
E = NC

C3
Curve I81NB_10
PI = 141+27.66
DELTA = 1° 57' 23.12" (RT)
D = 0° 07' 38"
T = 768.36'
L = 1,536.57'
R = 45,000.00'
PC = 133+59.30
PT = 148+95.87
DS = 65 MPH
E = NC

C17
Curve 112RPB_6
PI = 1122+87.97
DELTA = 3° 12' 22.20" (RT)
D = 1° 38' 13"
T = 97.95'
L = 195.85'
R = 3,500.00'
PC = 1121+90.02
PT = 1123+85.87
DS = 45 MPH
E = 2.80%

C7
Curve 112RPA_1
PI = 1000+92.31
DELTA = 10° 32' 54.31" (RT)
D = 5° 43' 46"
T = 92.31'
L = 184.10'
R = 1,000.00'
PC = 1000+00.00
PCC = 1001+84.10
DS = 45 MPH
E = 6.80%

C8
Curve 112RPA_2
PI = 1003+06.75
DELTA = 3° 57' 26.48" (RT)
D = 1° 36' 50"
T = 122.65'
L = 245.19'
R = 3,550.00'
PCC = 1001+84.10
PT = 1004+29.30
DS = 45 MPH
E = 2.80%

C9
Curve 112RPA_5
PI = 1011+64.42
DELTA = 14° 39' 45.33" (LT)
D = 6° 01' 52"
T = 122.23'
L = 243.11'
R = 950.00'
PC = 1010+42.19
PT = 1012+85.31

C1
Curve I81NB_6
PI = 124+34.29
DELTA = 1° 04' 24.07" (LT)
D = 0° 17' 11"
T = 187.34'
L = 374.67'
R = 20,000.00'
PC = 122+46.95
PRC = 126+21.62
DS = 65 MPH
E = NC

C2
Curve I81NB_7
PI = 127+97.23
DELTA = 1° 00' 22.13" (RT)
D = 0° 17' 11"
T = 175.61'
L = 351.21'
R = 20,000.00'
PRC = 126+21.62
PT = 129+72.83
DS = 65 MPH
E = NC

C10
Curve 112RPB_3
PI = 1103+34.12
DELTA = 26° 44' 28.05" (RT)
D = 10° 25' 03"
T = 130.73'
L = 256.70'
R = 550.00'
PC = 1102+03.39
PT = 1104+60.09

C22
Curve RT635_4
PI = 21+00.18
DELTA = 65° 22' 41.01" (RT)
D = 13° 28' 53"
T = 272.73'
L = 484.95'
R = 425.00'
PCC = 18+27.45
PT = 23+12.40
DS = 35 MPH
E = 7.70%

C23
Curve RT635_7
PI = 26+60.03
DELTA = 25° 26' 45.22" (LT)
D = 5° 58' 06"
T = 216.75'
L = 426.35'
R = 960.00'
PC = 24+43.28
PT = 28+69.63

C20
Curve I81SB_13
PI = 581+59.08
DELTA = 22° 18' 52.72" (LT)
D = 1° 01' 40"
T = 1,099.56'
L = 2,171.26'
R = 5,575.00'
PC = 570+59.52
PT = 592+30.78
DS = 65 MPH
E = 3.20%

C18
Curve I81NB_13
PI = 176+90.66
DELTA = 11° 52' 30.01" (LT)
D = 0° 59' 16"
T = 603.21'
L = 1,202.10'
R = 5,800.00'
PC = 170+87.45
PCC = 182+89.55
DS = 65 MPH
E = 3.20%

C19
Curve I81NB_14
PI = 187+75.11
DELTA = 10° 28' 08.97" (LT)
D = 1° 04' 52"
T = 485.56'
L = 968.42'
R = 5,300.00'
PCC = 182+89.55
PT = 192+57.97
DS = 65 MPH
E = 3.50%

C21
Curve RT635_3
PI = 15+04.85
DELTA = 1° 28' 43.55" (RT)
D = 0° 13' 45"
T = 322.63'
L = 645.23'
R = 25,000.00'
PC = 11+82.22
PCC = 18+27.45
DS = 25 MPH
E = NC

BEGIN CONSTRUCTION RT 112 LOOP D SPUR
STA. 1208+52.73 RT 112 LPD CONST. B.L.
STA. 1500+00.00 RT 112 LPD SPUR CONST. B.L.

END CONSTRUCTION
STA. 1418+25.00
RT 112 CONST. B.L.

END CONSTRUCTION
STA. 1203+10.00
RT 112 LPD CONST. B.L.

END CONSTRUCTION RT 112 RAMP D
STA. 517+86.14 SB I81 CONST. B.L.
STA. 1313+23.66 RT 112 RPD CONST.
B.L. 24.00' LT

BEGIN CONSTRUCTION
STA. 1310+00.00
RT 112 RPD CONST. B.L.

BEGIN CONSTRUCTION
STA. 511+10.00
SB I81 CONST. B.L.

BEGIN PROJECT 0081-080-946, P101, C501
BEGIN CONSTRUCTION
STA. 111+50.00 NB I81 CONST. B.L.

END CONSTRUCTION RT 112 LOOP D SPUR
STA. 1413+72.65 RT 112 CONST. B.L.
STA. 1503+12.76 RT 112 LPD SPUR CONST. B.L.
31.46' LT

BEGIN CONSTRUCTION RT 112 LOOP D
STA. 526+30.67 SB I81 CONST. B.L.
STA. 1200+00.00 RT 112 LPD CONST. B.L.
24.00' LT

BEGIN PROJECT 0081-080-946, B688
STA. 530+50.80 SB I81 CONST. B.L.

END PROJECT 0081-080-946, B688
STA. 531+86.22 SB I81 CONST. B.L.

BEGIN CONSTRUCTION
STA. 1407+90.00
RT 112 CONST. B.L.

BEGIN CONSTRUCTION RT 112 RAMP A
STA. 119+78.03 NB I81 CONST. B.L.
STA. 1000+00.00 RT 112 RPA CONST. B.L.
24.00' RT

END CONSTRUCTION
STA. 1005+10.00
RT 112 RPA CONST. B.L.

BEGIN PROJECT 0081-080-946, B683
STA. 131+28.41 NB I81 CONST. B.L.

END PROJECT 0081-080-946, B683
STA. 132+63.83 NB I81 CONST. B.L.

BEGIN CONSTRUCTION
STA. 1115+35.00
RT 112 RPB CONST. B.L.

END CONSTRUCTION RT 112 RAMP B
STA. 156+89.07 NB I81 CONST. B.L.
STA. 1123+85.87 RT 112 RPB CONST. B.L.
24.00' RT

BENEFIT:
Shifted I-81 Southbound Horizontal Alignment to the Median from Station 555+00 to Station 736+00. Reduces construction and long-term maintenance by minimizing cut slopes, box culvert extensions, retaining wall construction and grassed median area.

END PROJECT 0081-080-946, B685
STA. 598+53.92 SB I81 CONST. B.L.

BEGIN PROJECT 0081-080-946, B685
STA. 597+68.07 SB I81 CONST. B.L.

END CONSTRUCTION
STA. 21+00.00
RT 635 CONST. B.L.

BEGIN PROJECT 0081-080-946, B684
STA. 198+09.71 NB I81 CONST. B.L.

END PROJECT 0081-080-946, B684
STA. 198+95.46 NB I81 CONST. B.L.

BEGIN CONSTRUCTION
STA. 15+00.00
RT 635 CONST. B.L.

Match Line Station 160+00 I-81 NB Constr. ℄ (See This Sheet)

Match Line Station 218+00 I-81 NB Constr. ℄ (See Sheet 1K(1))

DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER
1K

PAGE NUMBER
69

$REF:OD6

$TIME$STAMP$

CONSTRUCTION ALIGNMENT DATA

BEGIN PROJECT
0081-080-946, B686
STA. 620+17.61
SB I81 CONST. B.L.

END CONSTRUCTION
STA. 37+50.00
RT 619 CONST. B.L.

END PROJECT 0081-080-946, B686
STA. 620+83.18 SB I81 CONST. B.L.

END PROJECT
0081-080-946, B687
STA. 221+50.48 NB
I81 CONST. B.L.

BEGIN CONSTRUCTION
STA. 35+75.00
RT 619 CONST. B.L.

BEGIN PROJECT
0081-080-946, B687
STA. 220+84.89
NB I81 CONST. B.L.

Match Line Station 218+00 I-81 NB Constr. ℄ (See Sheet 1K)

PT39+93.04
N 25° 09' 43" W
POT41+79.27
PCC37+71.76
PC623+81.80
PT633+63.49
PC645+40.74
PT662+95.13
PC222+95.06
PRC227+03.08
PT231+11.10
PC239+80.14
PT266+90.92
PCC35+51.26
PC33+85.45
N 54° 12' 34" W
PT32+47.98
N 32° 36' 23" W
PC30+97.17
POT30+00.00

N 51° 58' 27" E
N 51° 18' 16" E
SB I81 CONST. B.L.
NB I81 CONST. B.L.

END PROJECT 0081-080-946, B682
STA. 246+29.23 NB I81 CONST. B.L.

BEGIN PROJECT 0081-080-946, B682
STA. 245+95.98 NB I81 CONST. B.L.

Match Line Station 274+00 I-81 NB Constr. ℄ (See This Sheet)

BENEFIT:
Shifted I-81 Southbound Horizontal Alignment to the Median from Station 555+00 to Station 736+00. Reduces construction and long-term maintenance by minimizing cut slopes, box culvert extensions, retaining wall construction and grassed median area.

C29
Curve RT619_7
PI = 36+64.52
DELTA = 1° 49' 40.14" (RT)
D = 0° 48' 25"
T = 113.26'
L = 226.50'
R = 7,100.00'
PCC = 35+51.26
PCC = 37+77.76
DS = 30 MPH
E = MATCH EXISTING

C30
Curve RT619_8
PI = 38+86.02
DELTA = 15° 02' 31.46" (RT)
D = 6° 59' 14"
T = 108.26'
L = 215.28'
R = 820.00'
PCC = 37+77.76
PT = 39+93.04

C27
Curve I81SB_16
PI = 628+72.65
DELTA = 0° 40' 10.56" (RT)
D = 0° 04' 06"
T = 490.85'
L = 981.69'
R = 84,000.00'
PC = 623+81.80
PT = 633+63.49
DS = 65 MPH
E = NC

C31
Curve I81SB_19
PI = 654+19.50
DELTA = 8° 22' 35.66" (RT)
D = 0° 28' 39"
T = 878.76'
L = 1,754.39'
R = 12,000.00'
PC = 645+40.74
PT = 662+95.13
DS = 65 MPH
E = 2.00%

C28
Curve RT619_6
PI = 34+68.62
DELTA = 11° 10' 36.14" (RT)
D = 6° 44' 26"
T = 83.17'
L = 165.81'
R = 850.00'
PC = 33+85.45
PCC = 35+51.26

C24
Curve I81NB_17
PI = 224+99.08
DELTA = 1° 10' 07.97" (RT)
D = 0° 17' 11"
T = 204.02'
L = 408.02'
R = 20,000.00'
PC = 222+95.06
PRC = 227+03.08
DS = 65 MPH
E = NC

C25
Curve I81NB_18
PI = 229+07.09
DELTA = 1° 10' 07.97" (LT)
D = 0° 17' 11"
T = 204.02'
L = 408.02'
R = 20,000.00'
PRC = 227+03.08
PT = 231+11.10
DS = 65 MPH
E = NC

C26
Curve I81NB_21
PI = 253+38.34
DELTA = 9° 01' 48.10" (RT)
D = 0° 19' 59"
T = 1,358.20'
L = 2,710.78'
R = 17,200.00'
PC = 239+80.14
PT = 266+90.92
DS = 65 MPH
E = NC

END CONSTRUCTION
STA. 2202+73.95
RT 311 LPD CONST. B.L.

BEGIN CONSTRUCTION
STA. 2305+45.00
RT 311 RPD CONST. B.L.

END CONSTRUCTION STA.
679+37.45 I81 CONST. B.L.,
STA. 2308+65.19 RT 311
RPD CONST. B.L. 36.00' LT

PT2304+94.61
PCC2203+23.20
PT2205+15.47
PC2300+46.42
S 78° 58' 30" W
N 64° 23' 54" E
POT2206+64.63
PC2305+47.39
S 3° 26' 56" E
N 60° 21' 02" E
PT2308+65.19
N 60° 20' 04" E

BEGIN CONSTRUCTION
STA. 684+36.06 I81 SB CONST. B.L.
STA. 2200+00.00 RT 311 LPD CONST. B.L.
36.00' LT

BEGIN PROJECT 0081-080-946, B677
STA. 685+42.06 SB I81 CONST. B.L.

END PROJECT 0081-080-946, B677
STA. 686+86.76 SB I81 CONST. B.L.

C38
Curve 311RPD_3
PI = 2303+09.80
DELTA = 75° 31' 38.10" (LT)
D = 16° 51' 06"
T = 263.39'
L = 448.19'
R = 340.00'
PC = 2300+46.42
PT = 2304+94.61

C39
Curve 311RPD_6
PI = 2307+20.78
DELTA = 56° 54' 10.92" (RT)
D = 17° 54' 18"
T = 173.40'
L = 317.81'
R = 320.00'
PC = 2305+47.39
PT = 2308+65.19
DS = 35 MPH
E = 8.00%

C40
Curve 311LPD_1
PI = 2203+44.22
DELTA = 137° 10' 13.11" (RT)
D = 42° 26' 29"
T = 344.22'
L = 323.20'
R = 135.00'
PC = 2200+00.00
PCC = 2203+23.20
DS = 25 MPH
E = 8.00%

C41
Curve 311LPD_2
PI = 2204+25.08
DELTA = 46° 52' 39.05" (RT)
D = 24° 22' 52"
T = 101.88'
L = 192.27'
R = 235.00'
PCC = 2203+23.20
PT = 2205+15.47

C33
Curve I81SB_22
PI = 711+88.14
DELTA = 17° 46' 24.20" (RT)
D = 0° 42' 58"
T = 1,250.86'
L = 2,481.63'
R = 8,000.00'
PC = 699+37.28
PT = 724+18.91
DS = 65 MPH
E = 2.40%

C43
Curve I81SB_25
PI = 731+61.66
DELTA = 13° 38' 12.72" (LT)
D = 1° 44' 09"
T = 394.66'
L = 785.59'
R = 3,300.68'
PC = 727+67.00
PCC = 735+52.59
DS = 65 MPH
E = 5.20%

BENEFIT:
Shifted I-81 Southbound Horizontal Alignment to the Median from Station 555+00 to Station 736+00. Reduces construction and long-term maintenance by minimizing cut slopes, box culvert extensions, retaining wall construction and grassed median area.

PT699+37.28
PC699+66.90
PT2111+09.49
PT2105+53.92
PC2106+92.30
PC2102+52.78
PT2009+35.17
PC2006+16.35
PT2004+00.85
POT2012+72.15
PT323+88.57
PT724+18.91
PC727+67.00
PC329+15.51
N 78° 07' 27" E
N 78° 35' 29" E

END CONSTRUCTION
STA. 297+74.06 I81 NB CONST. B.L.
STA. 2111+09.49 RT 311 RPB CONST. B.L.
24.00' RT

END CONSTRUCTION
STA. 2005+00.00
RT 311 RPA CONST. B.L.

BEGIN CONSTRUCTION
STA. 2105+00.00
RT 311 RPB CONST. B.L.

BEGIN PROJECT 0081-080-946, B678
STA. 285+94.39 NB I81 CONST. B.L.

END PROJECT 0081-080-946, B678
STA. 287+38.72 NB I81 CONST. B.L.

BEGIN CONSTRUCTION
STA. 274+01.95 I81 NB CONST. B.L.
STA. 2000+00.00 RT 311 RPA CONST. B.L.
24.00' RT

C34
Curve 311RPA_1
PI = 2002+00.72
DELTA = 7° 39' 20.44" (RT)
D = 1° 54' 35"
T = 200.72'
L = 400.85'
R = 3,000.00'
PC = 2000+00.00
PT = 2004+00.85
DS = 45 MPH
E = 3.20%

C35
Curve 311RPA_4
PI = 2007+75.84
DELTA = 4° 27' 19.27" (LT)
D = 1° 23' 51"
T = 159.49'
L = 318.82'
R = 4,100.00'
PC = 2006+16.35
PT = 2009+35.17

C36
Curve 311RPB_3
PI = 2104+03.39
DELTA = 3° 05' 41.80" (LT)
D = 1° 01' 40"
T = 150.61'
L = 301.14'
R = 5,575.00'
PC = 2102+52.78
PT = 2105+53.92

C37
Curve 311RPB_6
PI = 2109+01.19
DELTA = 7° 28' 11.20" (RT)
D = 1° 47' 26"
T = 208.89'
L = 417.19'
R = 3,200.00'
PC = 2106+92.30
PT = 2111+09.49
DS = 45 MPH
E = 3.00%

C32
Curve I81NB_24
PI = 311+88.08
DELTA = 18° 15' 24.35" (RT)
D = 0° 45' 14"
T = 1,221.18'
L = 2,421.67'
R = 7,600.00'
PC = 299+66.90
PT = 323+88.57
DS = 65 MPH
E = 2.50%

C42
Curve I81NB_27
PI = 339+93.14
DELTA = 43° 04' 54.62" (LT)
D = 2° 05' 55"
T = 1,077.63'
L = 2,052.74'
R = 2,730.00'
PC = 329+15.51
PT = 349+68.25
DS = 65 MPH
E = 6.00%

Match Line Station 332+00 I-81 NB Constr. ℄ (See Sheet 1K(2))

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

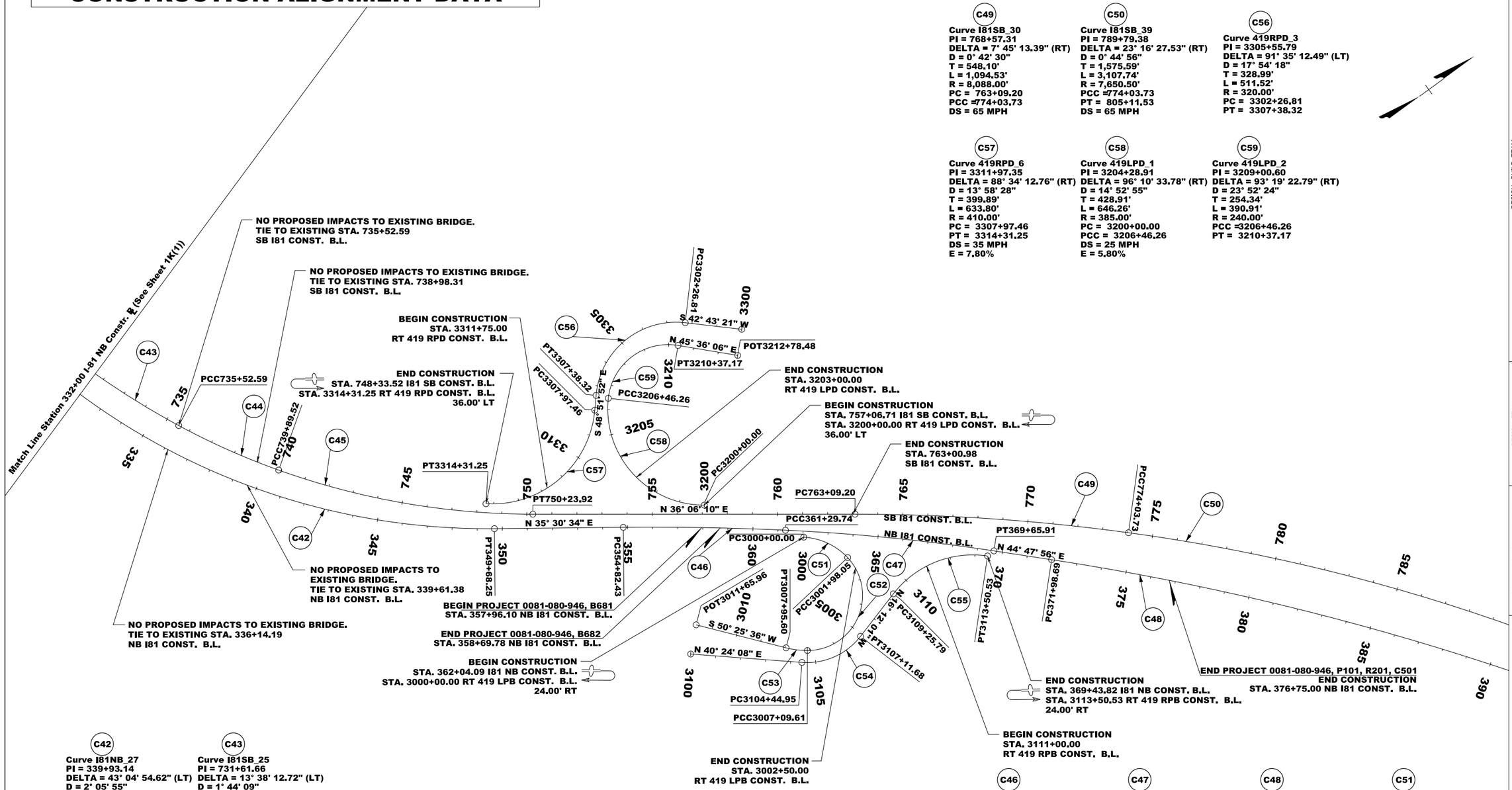
SHEET NUMBER
1K(1)

PAGE NUMBER
70

$REF006

$TIMESTAMP$

CONSTRUCTION ALIGNMENT DATA



C49
Curve I81SB_30
PI = 768+57.31
DELTA = 7° 45' 13.39" (RT)
D = 0° 42' 30"
T = 548.10'
L = 1,094.53'
R = 8,088.00'
PC = 763+09.20
PCC =774+03.73
DS = 65 MPH

C50
Curve I81SB_39
PI = 789+79.38
DELTA = 23° 16' 27.53" (RT)
D = 0° 44' 56"
T = 1,575.59'
L = 3,107.74'
R = 7,650.50'
PCC =774+03.73
PT = 805+11.53
DS = 65 MPH

C56
Curve 419RPD_3
PI = 3305+55.79
DELTA = 91° 35' 12.49" (LT)
D = 17° 54' 18"
T = 328.99'
L = 511.52'
R = 320.00'
PC = 3302+26.81
PT = 3307+38.32

C57
Curve 419RPD_6
PI = 3311+97.35
DELTA = 88° 34' 12.76" (RT)
D = 13° 58' 28"
T = 399.89'
L = 633.80'
R = 410.00'
PC = 3307+97.46
PT = 3314+31.25
DS = 35 MPH
E = 7.80%

C58
Curve 419LPD_1
PI = 3204+28.91
DELTA = 96° 10' 33.78" (RT)
D = 14° 52' 55"
T = 428.91'
L = 646.26'
R = 385.00'
PC = 3200+00.00
PCC = 3206+46.26
DS = 25 MPH
E = 5.80%

C59
Curve 419LPD_2
PI = 3209+00.60
DELTA = 93° 19' 22.79" (RT)
D = 23° 52' 24"
T = 254.34'
L = 390.91'
R = 240.00'
PCC =3206+46.26
PT = 3210+37.17

C42
Curve I81NB_27
PI = 339+93.14
DELTA = 43° 04' 54.62" (LT)
D = 2° 05' 55"
T = 1,077.63'
L = 2,052.74'
R = 2,730.00'
PC = 329+15.51
PT = 349+68.25
DS = 65 MPH
E = 6.00%

C43
Curve I81SB_25
PI = 731+61.66
DELTA = 13° 38' 12.72" (LT)
D = 1° 44' 09"
T = 394.66'
L = 785.59'
R = 3,300.68'
PC = 727+67.00
PCC =735+52.59
DS = 65 MPH
E = 5.20%

C44
Curve I81SB_26
PI = 737+71.47
DELTA = 8° 42' 26.93" (LT)
D = 1° 59' 34"
T = 218.88'
L = 436.93'
R = 2,875.00'
PCC =735+52.59
PCC =739+89.52
DS = 65 MPH
E = 5.80%

C45
Curve I81SB_27
PI = 745+11.86
DELTA = 19° 40' 37.17" (LT)
D = 1° 54' 08"
T = 522.35'
L = 1,034.41'
R = 3,012.00'
PCC =739+89.52
PT = 750+23.92
DS = 65 MPH
E = 5.60%

C46
Curve I81NB_30
PI = 358+06.17
DELTA = 3° 13' 30.29" (RT)
D = 0° 29' 54"
T = 323.74'
L = 647.31'
R = 11,500.00'
PC = 354+82.43
PCC = 361+29.74
DS = 65 MPH
E = 2.00%

C47
Curve I81NB_31
PI = 365+48.22
DELTA = 6° 03' 51.85" (RT)
D = 0° 43' 31"
T = 418.47'
L = 836.17'
R = 7,900.00'
PCC = 361+29.74
PT = 369+65.91
DS = 65 MPH
E = 2.40%

C48
Curve I81NB_34
PI = 393+69.19
DELTA = 22° 27' 43.98" (RT)
D = 0° 31' 27"
T = 2,170.49'
L = 4,285.24'
R = 10,930.64'
PC = 371+98.69
PT = 414+83.94
DS = 65 MPH
E = 2.00%

C51
Curve 419LPB_1
PI = 3001+04.11
DELTA = 43° 38' 37.64" (RT)
D = 22° 02' 13"
T = 104.11'
L = 198.05'
R = 260.00'
PC = 3000+00.00
PCC = 3001+98.05
DS = 25 MPH
E = 6.80%

C52
Curve 419LPB_2
PI = 3007+06.79
DELTA = 133° 13' 42.60" (RT)
D = 26° 02' 37"
T = 508.74'
L = 511.56'
R = 220.00'
PCC = 3001+98.05
PCC = 3007+09.61
DS = 25 MPH
E = 7.30%

C53
Curve 419LPB_3
PI = 3007+52.83
DELTA = 14° 16' 49.84" (RT)
D = 16° 36' 27"
T = 43.22'
L = 85.99'
R = 345.00'
PCC =3007+09.61
PT = 3007+95.60

C54
Curve 419RPB_3
PI = 3105+90.33
DELTA = 56° 36' 08.85" (LT)
D = 21° 13' 14"
T = 145.39'
L = 266.73'
R = 270.00'
PC = 3104+44.95
PT = 3107+11.68

C55
Curve 419RPB_6
PI = 3111+60.66
DELTA = 60° 50' 20.09" (RT)
D = 14° 19' 26"
T = 234.86'
L = 424.74'
R = 400.00'
PC = 3109+25.79
PT = 3113+50.53
DS = 35 MPH
E = 7.90%

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE

DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VIRGINIA DEPARTMENT OF TRANSPORTATION
VDOT
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

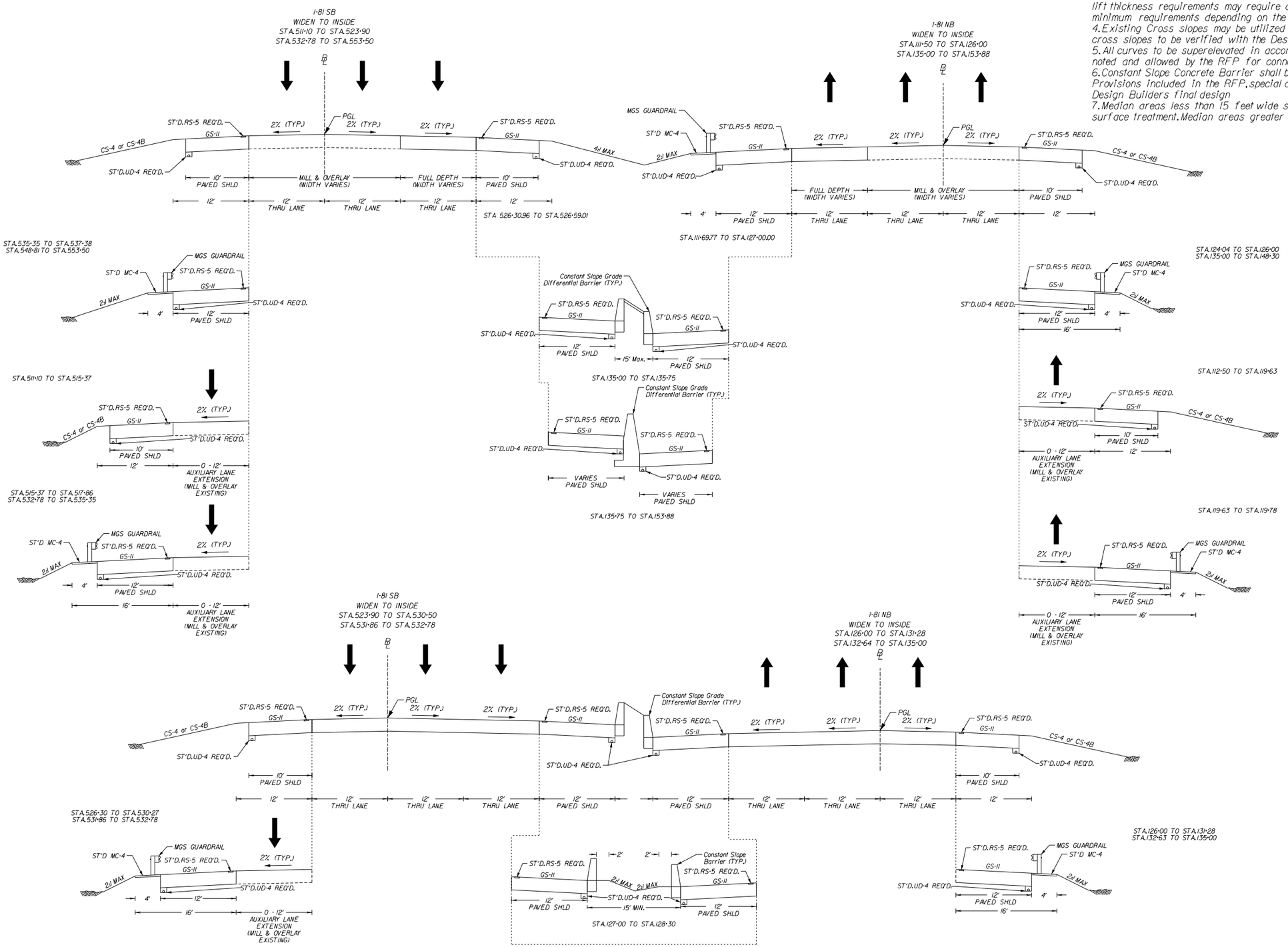
SHEET NUMBER
1K(2)

PAGE NUMBER
71

$REF006
$TIME$ST AMP$

CONCEPTUAL ROADWAY TYPICAL SECTIONS

NOTES:
1. Proposed Minimum Pavement Section is to be in accordance with the RFP for Alternative I Flexible Pavement for I-81 Mainline, Ramps and Shoulders/Connections
2. Rehabilitation of Existing I-81 Travel Lanes is to be in accordance with the RFP Section 2.6.1.1, existing pavement shall be milled and replaced as indicated in the RFP
3. Construction of asphalt layers shall adhere to lift thickness requirements as set forth in Section 315.05(c) of the VDOT Road and Bridge specifications. Asphalt lift thickness requirements may require additional mill depth in excess of the minimum requirements depending on the amount of build-up planned.
4. Existing Cross slopes may be utilized in accordance with RFP section 2.2, cross slopes to be verified with the Design Builder's final design
5. All curves to be superelevated in accordance with TC-5.1IR unless otherwise noted and allowed by the RFP for connections.
6. Constant Slope Concrete Barrier shall be in accordance with the Special Provisions included in the RFP, special design details to be incorporated in the Design Builders final design
7. Median areas less than 15 feet wide shall consist of aggregate or concrete surface treatment. Median areas greater than 15 feet wide shall be grassed



NOT TO SCALE

dl16203_2a.dgn

DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER
2A

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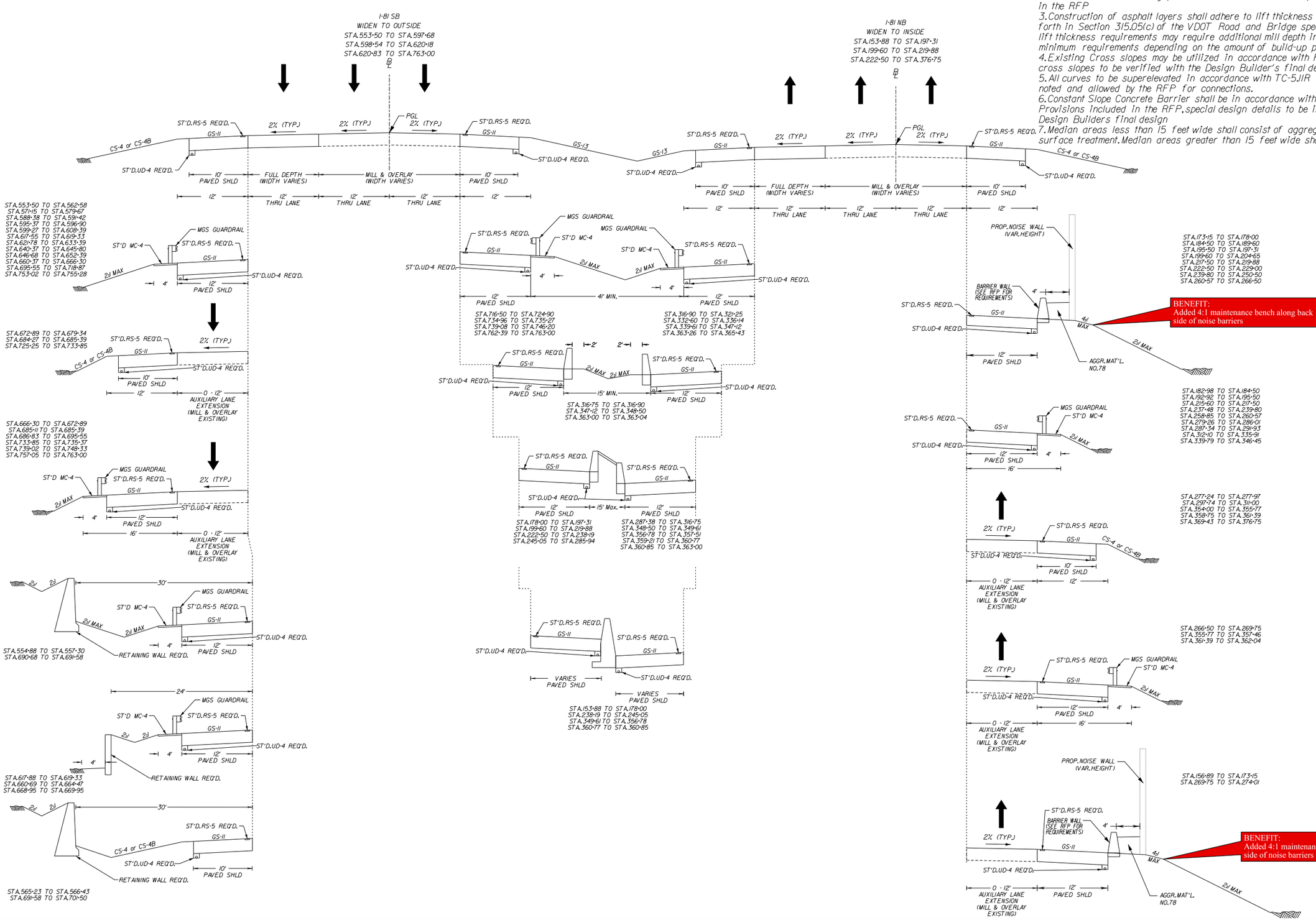
72

CONCEPTUAL ROADWAY TYPICAL SECTIONS

NOTES:
1. Proposed Minimum Pavement Section is to be in accordance with the RFP for Alternative 1 Flexible Pavement for I-81 Mainline, Ramps and Shoulders/Connections
2. Rehabilitation of Existing I-81 Travel Lanes is to be in accordance with the RFP Section 2.6.1.1, existing pavement shall be milled and replaced as indicated in the RFP
3. Construction of asphalt layers shall adhere to lift thickness requirements as set forth in Section 315.05(c) of the VDOT Road and Bridge specifications. Asphalt lift thickness requirements may require additional mill depth in excess of the minimum requirements depending on the amount of build-up planned.
4. Existing Cross slopes may be utilized in accordance with RFP section 2.2, cross slopes to be verified with the Design Builder's final design
5. All curves to be superelevated in accordance with TC-5.1IR unless otherwise noted and allowed by the RFP for connections.
6. Constant Slope Concrete Barrier shall be in accordance with the Special Provisions included in the RFP, special design details to be incorporated in the Design Builders final design
7. Median areas less than 15 feet wide shall consist of aggregate or concrete surface treatment. Median areas greater than 15 feet wide shall be grassed



DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS
0081-080-946 P101, C501, B678, B681, B683, B684, B686, B687, B688
R201, B677, B682, B685

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER
2A(1)

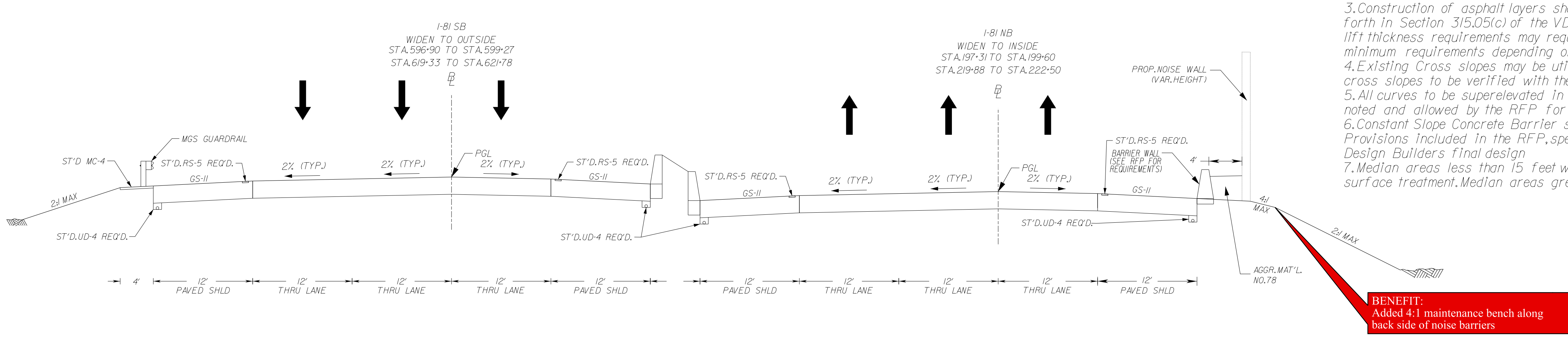
PAGE NUMBER
73

$REF'D06$

$TIME$STAMP$

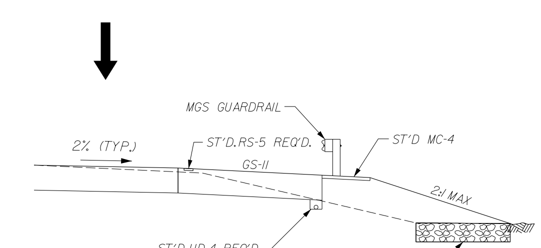
CONCEPTUAL ROADWAY TYPICAL SECTIONS

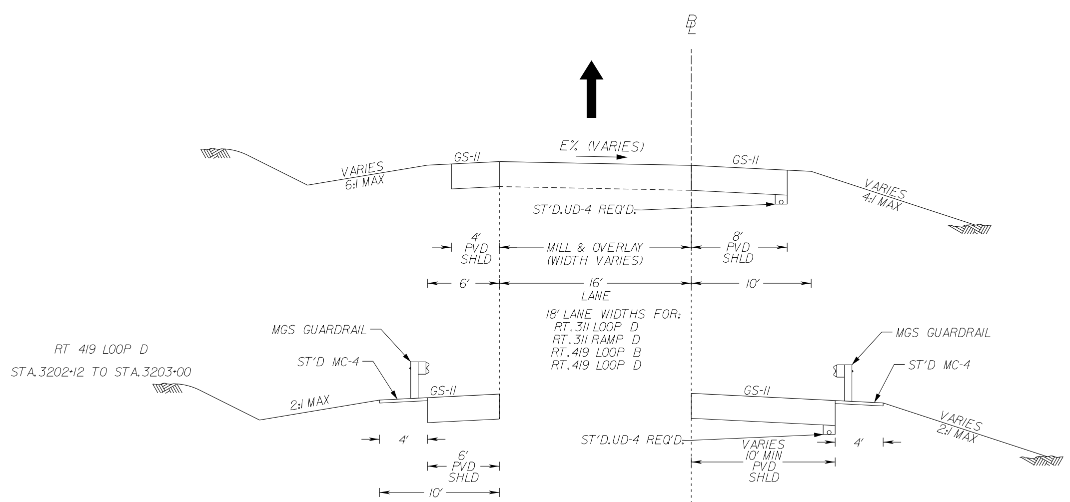
NOTES:
1.Proposed Minimum Pavement Section is to be in accordance with the RFP for Alternative I Flexible Pavement for I-81 Mainline,Ramps and Shoulders/Connections
2.Rehabilitation of Existing I-81 Travel Lanes is to be in accordance with the RFP Section 2.6.1.1,existing pavement shall be milled and replaced as indicated in the RFP
3.Construction of asphalt layers shall adhere to lift thickness requirements as set forth in Section 315.05(c) of the VDOT Road and Bridge specifications. Asphalt lift thickness requirements may require additional mill depth in excess of the minimum requirements depending on the amount of build-up planned.
4.Existing Cross slopes may be utilized in accordance with RFP section 2.2, cross slopes to be verified with the Design Builder's final design
5.All curves to be superelevated in accordance with TC-5.11R unless otherwise noted and allowed by the RFP for connections.
6.Constant Slope Concrete Barrier shall be in accordance with the Special Provisions included in the RFP,special design details to be incorporated in the Design Builders final design
7.Median areas less than 15 feet wide shall consist of aggregate or concrete surface treatment.Median areas greater than 15 feet wide shall be grassed



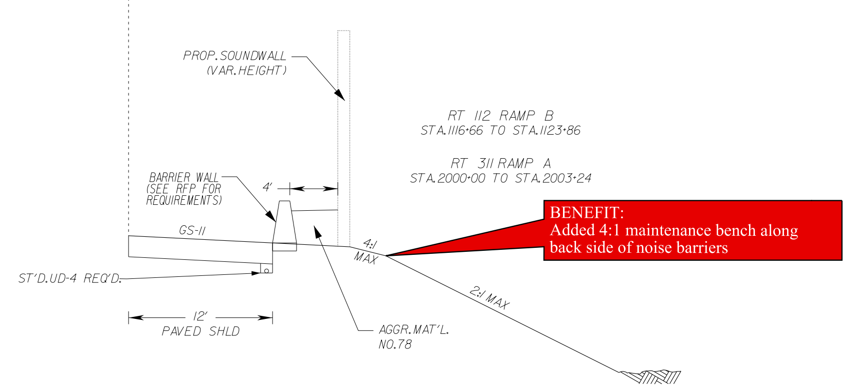
RT 112 RAMP A STA.1002+30 TO STA.1005+10	RT 311 RAMP D STA.2305+45 TO STA.2307+52
RT 112 RAMP B STA.1115+35 TO STA.1119+67	RT 311 LOOP D STA.2200+80 TO STA.2202+80
RT 112 RAMP D STA.1310+00 TO STA.1311+83	RT 419 RAMP B STA.3111+00 TO STA.3112+30
RT 112 LOOP D STA.1201+11 TO STA.1203+10	RT 419 LOOP B STA.3001+15 TO STA.3002+50
RT 311 RAMP A STA.2003+94 TO STA.2005+00	RT 419 RAMP D STA.3311+75 TO STA.3313+02
RT 311 RAMP B STA.2105+00 TO STA.2107+71	RT 419 LOOP D STA.3201+39 TO STA.3203+00

Rock Embankment Treatment





RT 112 RAMP A STA.1000+00 TO STA.1005+00	RT 419 LOOP B STA.3000+00 TO STA.3002+50
RT 112 RAMP B STA.1115+35 TO STA.1116+66	RT 419 RAMP D STA.3313+49 TO STA.3314+31
RT 112 RAMP D STA.1310+60 TO STA.1313+24	RT 419 LOOP D STA.3201+36 TO STA.3203+00
RT 112 LOOP D STA.1200+00 TO STA.1203+10	



RT 112 RAMP B
STA.1116+66 TO STA.1123+86

RT 311 RAMP A
STA.2000+00 TO STA.2003+24

NOT TO SCALE

$REF006 $TIME$STAMP$

DESIGN - BUILD TEAM: LANE CORMAN KOKOSING

DESIGN TEAM: rda wsp

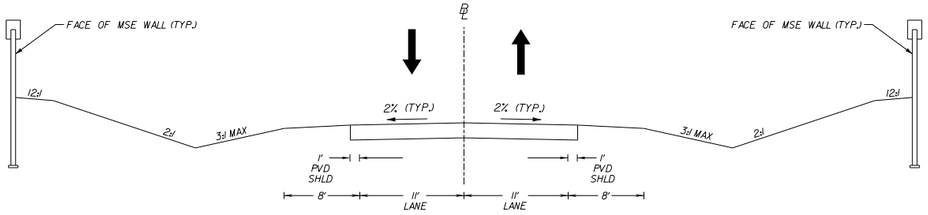
STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

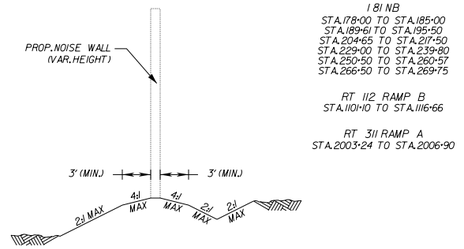
SHEET NUMBER
2A(2)

CONCEPTUAL ROADWAY TYPICAL SECTIONS

RT 635
STA.15+00 TO STA.21+00



PROPOSED NOISE WALL NOT ADJACENT TO SHOULDER



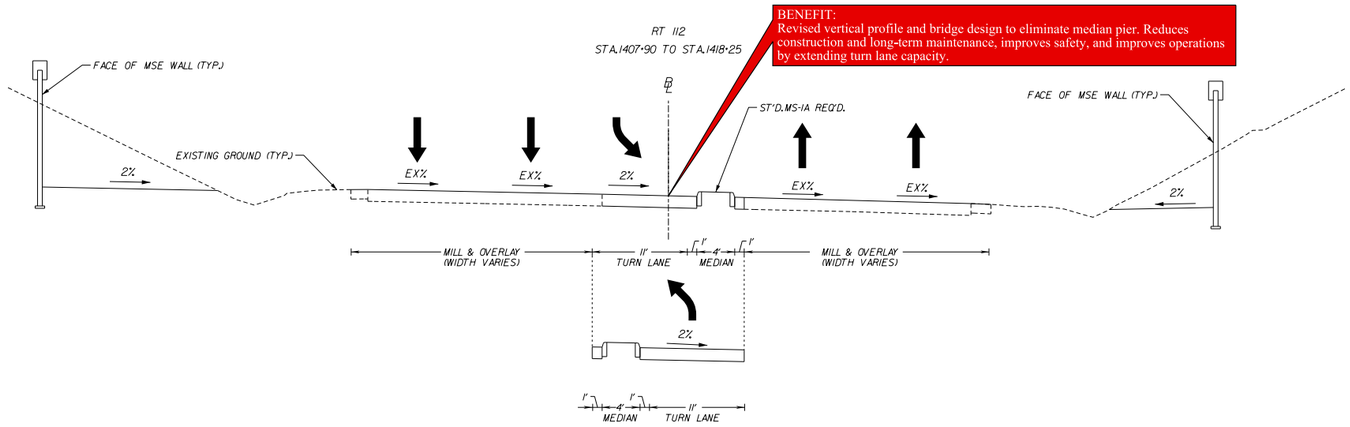
I-81 NB
STA.178+00 TO STA.185+00
STA.189+61 TO STA.195+50
STA.204+65 TO STA.217+50
STA.229+00 TO STA.239+80
STA.250+50 TO STA.260+57
STA.266+50 TO STA.269+75

RT 112 RAMP B
STA.1101+10 TO STA.1116+66

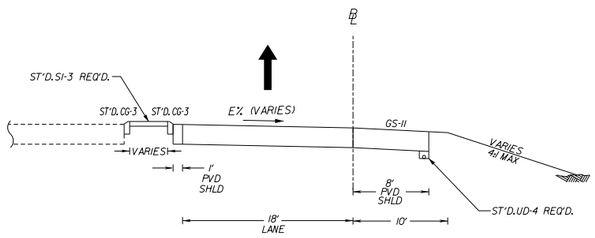
RT 311 RAMP A
STA.2003+24 TO STA.2006+90

RT 112
STA.1407+90 TO STA.1418+25

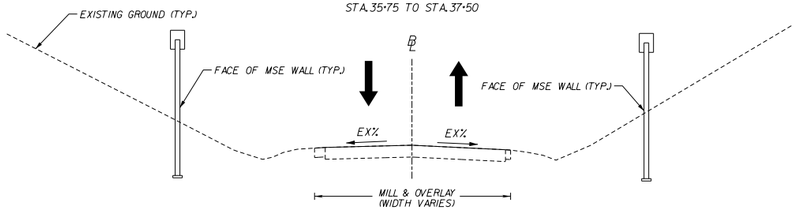
BENEFIT:
Revised vertical profile and bridge design to eliminate median pier. Reduces construction and long-term maintenance, improves safety, and improves operations by extending turn lane capacity.



RT. 112 LOOP D SPUR
STA.1500+00 TO STA.1503+13



RT 619
STA.35+75 TO STA.37+50



NOTES:
1. Proposed Minimum Pavement Section is to be in accordance with the RFP for Alternative 1 Flexible Pavement for I-81 Mainline, Ramps and Shoulders/Connections
2. Rehabilitation of Existing I-81 Travel Lanes is to be in accordance with the RFP Section 2.6.1.1, existing pavement shall be milled and replaced as indicated in the RFP
3. Construction of asphalt layers shall adhere to lift thickness requirements as set forth in Section 315.05(c) of the VDOT Road and Bridge specifications. Asphalt lift thickness requirements may require additional mill depth in excess of the minimum requirements depending on the amount of build-up planned.
4. Existing Cross slopes may be utilized in accordance with RFP section 2.2. cross slopes to be verified with the Design Builder's final design
5. All curves to be superelevated in accordance with TC-5.1R unless otherwise noted and allowed by the RFP for connections.
6. Constant Slope Concrete Barrier shall be in accordance with the Special Provisions included in the RFP, special design details to be incorporated in the Design Builders final design
7. Median areas less than 15 feet wide shall consist of aggregate or concrete surface treatment. Median areas greater than 15 feet wide shall be grassed

NOT TO SCALE

DESIGN - BUILD TEAM

CORMAN KOKOSING
LANE

DESIGN TEAM

rda
WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER
2A(3)

PAGE NUMBER
75

$REFDOG
$TIME$STAMP$

CONCEPTUAL ROADWAY PLANS

UTILITY CONFLICT MATRIX - SHEET 3								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 1	RTE 112	1415+00	LEFT	MULT. OWNERS	P #1721-3475	RDWY (POLE TRANSFER)	1 POLE	0
UTIL 2	RTE 112	1408+10	1411+60/LEFT	COMCAST	CONDUIT	BRIDGE/MSE WALL	361'	0
UTIL 3	RTE 112	1408+10	1411+60/LEFT	VERIZON	CONDUIT	BRIDGE/MSE WALL	339'	0

PROP. CLEARING LINE LIMITS		
	NORTHING	EASTING
A	353651.6888	2815019.1703
B	353561.1896	2815150.0409
C	353541.5813	2815306.2877
D	353633.6055	2815680.1973

BEGIN CONSTRUCTION SB I81 STA. 511+10.00

BENEFIT: Begin ITS fiber to be relocated from median to outside of northbound lane prior to construction to avoid impacts

LIGHTING WILL EXTEND THE LENGTH OF EXISTING AUXILLARY LANE

EXIST. R/W

BEGIN PROJECT 0081-080-946, P101, C501
BEGIN CONSTRUCTION STA. 111+50.00

1/2 MILE

1/2 MILE

425' DECEL LANE

EXIST. R/W

PROP. CLEARING LINE (SEE TABLE THIS SHEET & RFP)

RFP REQUIRMENT: Existing Guardrail to be removed and recoverable slopes installed. No BMP facilities shall be installed in this area

END CONSTRUCTION RT 112 RAMP D STA. 1313+23.66

BEGIN CONSTRUCTION RT 112 RAMP D STA. 1310+00.00

BEGIN CONSTRUCTION RT 112 RAMP A STA. 1000+00.00

END CONSTRUCTION RT 112 RAMP A STA. 1005+10.00

END CONSTRUCTION STA. 1418+25.00 RT 112 CONST. B.L.

BEGIN CONSTRUCTION RT 112 LOOP D SPUR STA. 1500+00.00

END CONSTRUCTION RT 112 LOOP D STA. 1203+10.00

EXIST. R/W

RT 112 LPD SPUR CONST. B.L.

PROP. ST'D. CG-3

RT 112 RPD CONST. B.L.

RT 112 LPD CONST. B.L.

PROP. ST'D. CG-3

RFP REQUIREMENT: Clean, inspect, and provide repair recommendations to VDOT

END CONSTRUCTION RT 112 LOOP D SPUR STA. 1503+12.76

BEGIN PROJECT 0081-080-946, B688 STA. 530+50.80

EXIST. R/W

END PROJECT 0081-080-946, B688 STA. 531+86.22

BEGIN CONSTRUCTION RT 112 LOOP D STA. 1200+00.00

BENEFIT: Culvert extension eliminated with retaining wall, reducing impacts to stream and flood plain

BENEFIT: Eliminated BMP reducing long-term maintenance costs

BENEFIT: Eliminated center pier allows for increased turn lane storage along Rte. 112.

BMP A

UTIL-1

UTIL-2

UTIL-3

600' DECEL LANE

SB I81 CONST. B.L.

NB I81 CONST. B.L.

RT 112 CONST. B.L.

BEGIN PROJECT 0081-080-946, B683 STA. 131+28.41

END PROJECT 0081-080-946, B683 STA. 132+63.83

BEGIN PROP. NOISE BARRIER 1 STA. 10+00.00 = I-81 NB STA. 134+57.60

RT 112 RPA CONST. B.L.

RT 112 RPB CONST. B.L.

BEGIN CONSTRUCTION RT 112 STA. 1407+90.00

RFP REQUIREMENT: H&HA Needed for Horners Branch

Match Line Station 535+00 I-81 SB Constr. ℄ (See Sheet 4)

Match Line Station 136+00 I-81 NB Constr. ℄ (See Sheet 4)

EXIT 137 — 112 — 619 — Salem — 1 MILE

EXIT 137 — 112 — 619 — Salem — ½ MILE

EXIT 137 — 112 — 619 — Salem

I-81 SB

Approximate Grade = -2.20%

-2.27%

PROPOSED GRADE

-2.27%

+1.69%

+1.69%

MIN REQUIRED CLEARANCE = 16.5'

EXISTING GROUND

1 STA = 511+25 EL = 1,142.50	4 STA = 512+00 EL = 1,140.80
2 STA = 511+50 EL = 1,141.91	5 STA = 512+25 EL = 1,140.26
3 STA = 511+75 EL = 1,141.35	6 STA = 513+95 EL = 1,136.60

STA = 526+04
EL = 1,109.16
ex = 3.56'
K = 182
L = 720
DS = 70 MPH

BEGIN PROJECT 0081-080-946, B688 STA. 530+50.80 SB I81 CONST. B.L.

END PROJECT 0081-080-946, B688 STA. 531+86.22 SB I81 CONST. B.L.

I-81 NB

Approximate Grade = -1.60%

-1.69%

-2.53%

-2.53%

+0.70%

+0.70%

+2.78%

PROPOSED GRADE

EXISTING GROUND

MIN REQUIRED CLEARANCE = 16.5'

1 STA = 111+75 EL = 1,148.67	4 STA = 112+75 EL = 1,147.14
2 STA = 112+25 EL = 1,147.93	5 STA = 113+00 EL = 1,146.72
3 STA = 112+50 EL = 1,147.55	

STA = 116+50
EL = 1,140.79
SSD = 1459'
ex = -0.37'
L = 350
K = 417
DS = 80 MPH

STA = 127+72.68
EL = 1,112.36
ex = 2.36'
K = 181
L = 585
DS = 70 MPH

STA = 135+56.51
EL = 1,117.82
ex = 0.99'
K = 182
L = 380
DS = 70 MPH

END PROJECT 0081-080-946, B683 STA. 132+63.83 NB I81 CONST. B.L.

BEGIN PROJECT 0081-080-946, B683 STA. 131+28.41 NB I81 CONST. B.L.

CONSTRUCTION LIMITS
C ..... CUT
F ..... FILL

PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
PROP. RIGHT OF WAY REDUCTION
TEMP. CONSTR. EASEMENT REDUCTION

1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE
2 PROP. LIMITED ACCESS FENCE
3 PROP. STD. GR-MGS1
4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING

VERTICAL PROFILE SCALE 10' 5'
HORIZONTAL PLAN SCALE 0 100' 200'

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DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER 3

PAGE NUMBER 76

CONCEPTUAL ROADWAY PLANS

Match Line Station 535+00 I-81 SB Constr. ℄ (See Sheet 3)

Match Line Station 136+00 I-81 NB Constr. ℄ (See Sheet 3)

Match Line Station 563+00 I-81 SB Constr. ℄ (See Sheet 5)

Match Line Station 164+00 I-81 NB Constr. ℄ (See Sheet 5)

UTILITY CONFLICT MATRIX - SHEET 4

CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0

RFP REQUIREMENT: Existing CTV Camera to remain in service during construction

RFP REQUIREMENT: Clean, inspect, and provide repair recommendations to VDOT

RFP REQUIREMENT: Impervious runoff I-81 between Stations 150+00 and 160+00 is diverted away from adjacent residential properties

BEGIN PROP. RETAINING WALL 1 STA. 1+00.00 = I-81 SB STA. 554+88.00

END PROP. RETAINING WALL 1 STA. 3+42.00 = I-81 SB STA. 557+30.00

EXIT 137 — 619 / 112 — Salem ½ MILE

EXIST. R/W

SB I81 12' LANE SHIFT

SB I81 CONST. B.L.

NB I81 CONST. B.L.

RT 112 RPB CONST. B.L.

UTIL-4

HEADWALL MODIFICATION

1325' ACCEL LANE

PROP. TEMP. CONST. ESMT.

PROP. R/W

PROPOSED R/W & L/A

PROP. L/A

BMP B (BIORETENTION)

BMP D (BIORETENTION)

PROP. NOISE BARRIER

BEGIN CONSTRUCTION RT 112 RAMP B STA. 1115+35.00

END CONSTRUCTION RT 112 RAMP B STA. 1123+85.87

I-81 SB

PROPOSED GRADE

EXISTING GROUND

STA = 536+25.22
EL = 1,126.38
ex = 0.34'
K = 336
L = 300
DS = 80 MPH

+1.69%

+2.58%

STA = 564+20
EL = 1,198.48
SSD = 1365'
ex = -14.38'
K = 864
L = 3,152.58
DS = 80 MPH

+2.58%

I-81 NB

PROPOSED GRADE

EXISTING GROUND

STA = 135+56.51
EL = 1,117.82
ex = 0.99'
K = 182
L = 380
DS = 70 MPH

+2.78%

STA = 164+00
EL = 1,196.87
SSD = 1348'
ex = -15.68'
K = 842
L = 3,250
DS = 80 MPH

+2.78%

CONSTRUCTION LIMITS
C ..... CUT
F ---------- FILL

PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
PROP. RIGHT OF WAY REDUCTION
TEMP. CONSTR. EASEMENT REDUCTION

1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE
2 PROP. LIMITED ACCESS FENCE
3 PROP. STD. GR-MGS1
4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING

VERTICAL PROFILE SCALE 10' 5' 0
HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

SHEET NUMBER 4

PAGE NUMBER 77

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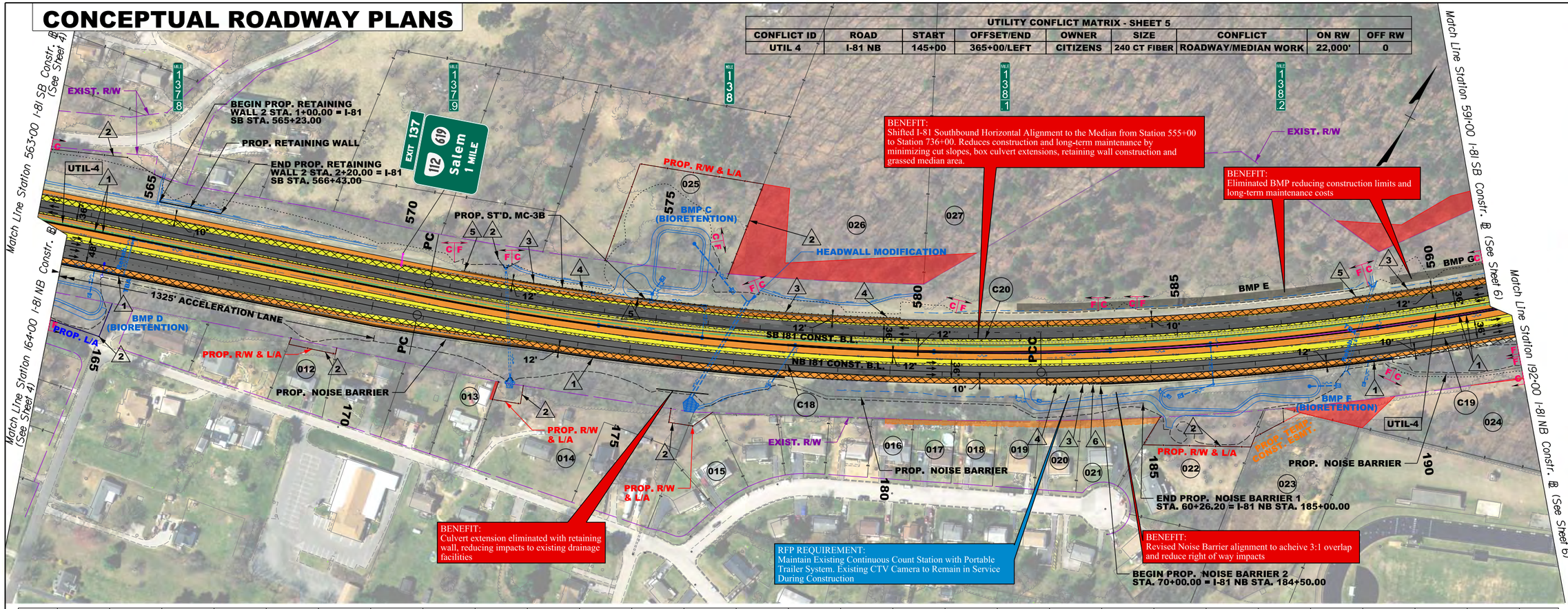
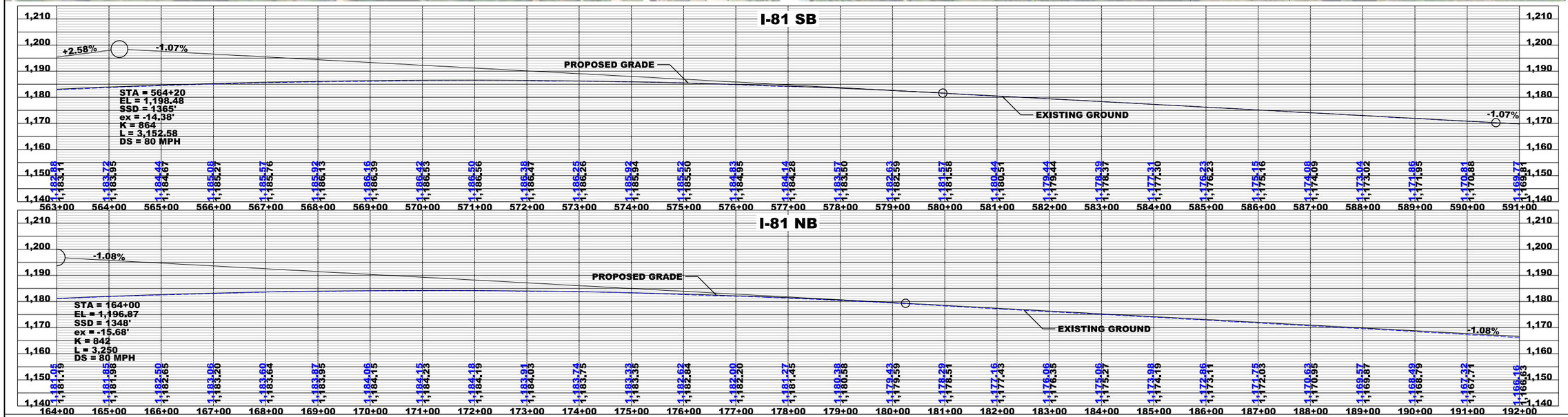
CONCEPTUAL ROADWAY PLANS

UTILITY CONFLICT MATRIX - SHEET 5								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0





CONSTRUCTION LIMITS
C ..... CUT
F ---------- FILL
PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
PROP. RIGHT OF WAY REDUCTION
TEMP. CONSTR. EASEMENT REDUCTION
1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE
2 PROP. LIMITED ACCESS FENCE
3 PROP. STD. GR-MGS1
4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING
VERTICAL PROFILE SCALE 10' 5' 0
HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE
DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946 P101, C501, R201, P101, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER 5
PAGE NUMBER 78

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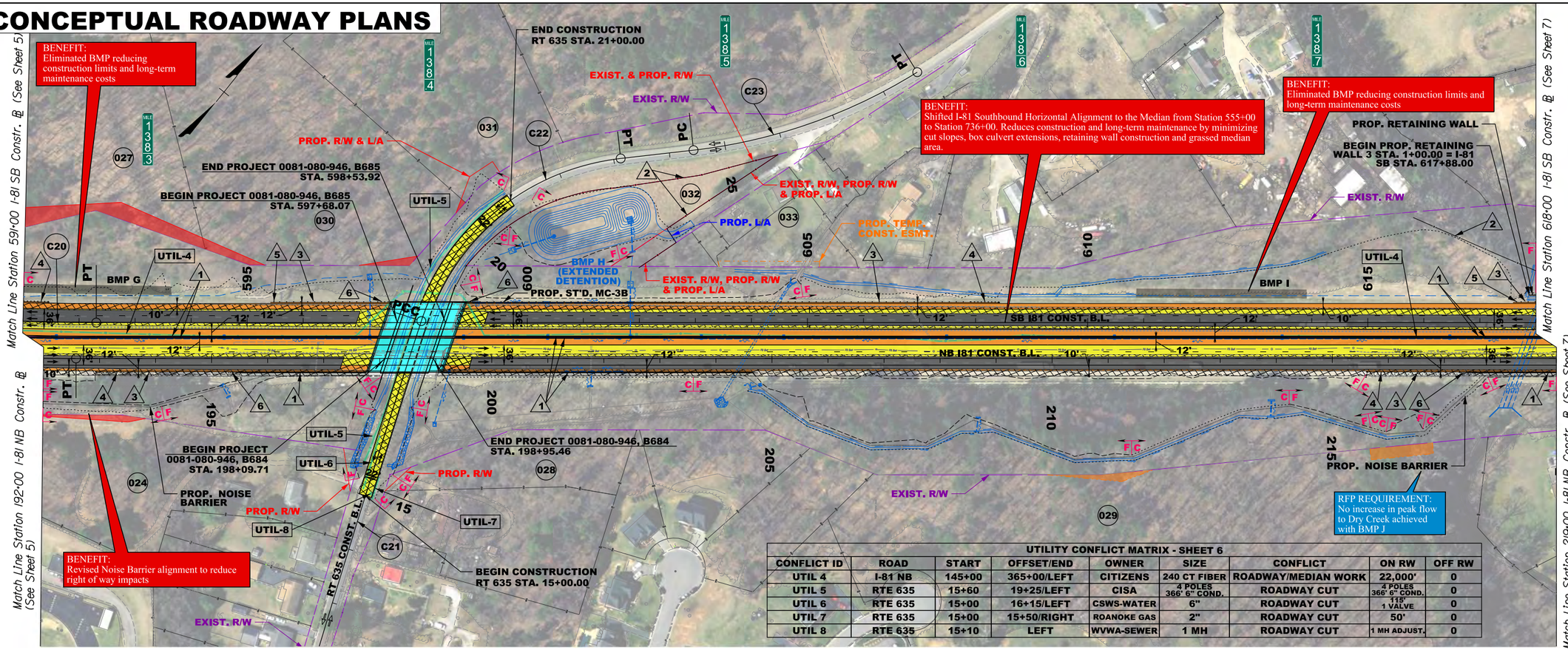
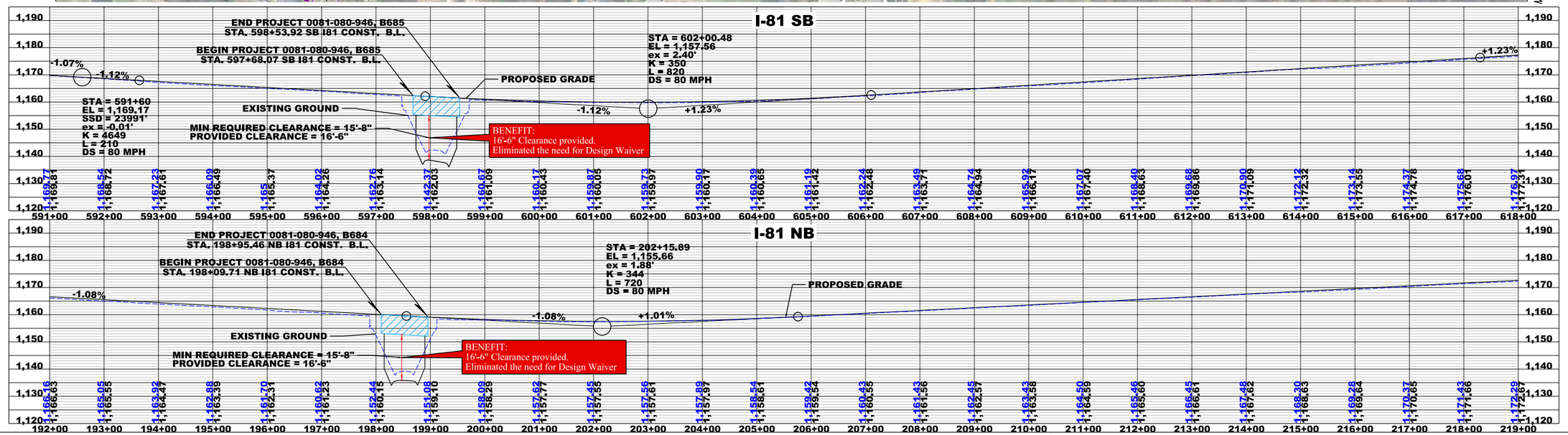
CONCEPTUAL ROADWAY PLANS



UTILITY CONFLICT MATRIX - SHEET 6

CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0
UTIL 5	RTE 635	15+60	19+25/LEFT	CISA	4 POLES 366' 6" COND.	ROADWAY CUT	4 POLES 366' 6" COND.	0
UTIL 6	RTE 635	15+00	16+15/LEFT	CSWS-WATER	6"	ROADWAY CUT	115' 1 VALVE	0
UTIL 7	RTE 635	15+00	15+50/RIGHT	ROANOKE GAS	2"	ROADWAY CUT	50'	0
UTIL 8	RTE 635	15+10	LEFT	WVWA-SEWER	1 MH	ROADWAY CUT	1 MH ADJUST.	0



CONSTRUCTION LIMITS
C ..... CUT
F ..... FILL
PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
PROP. RIGHT OF WAY REDUCTION
TEMP. CONSTR. EASEMENT REDUCTION
1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE
2 PROP. LIMITED ACCESS FENCE
3 PROP. STD. GR-MGS1
4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING
VERTICAL PROFILE SCALE 10' 5'
HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE
DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER 6
PAGE NUMBER 79

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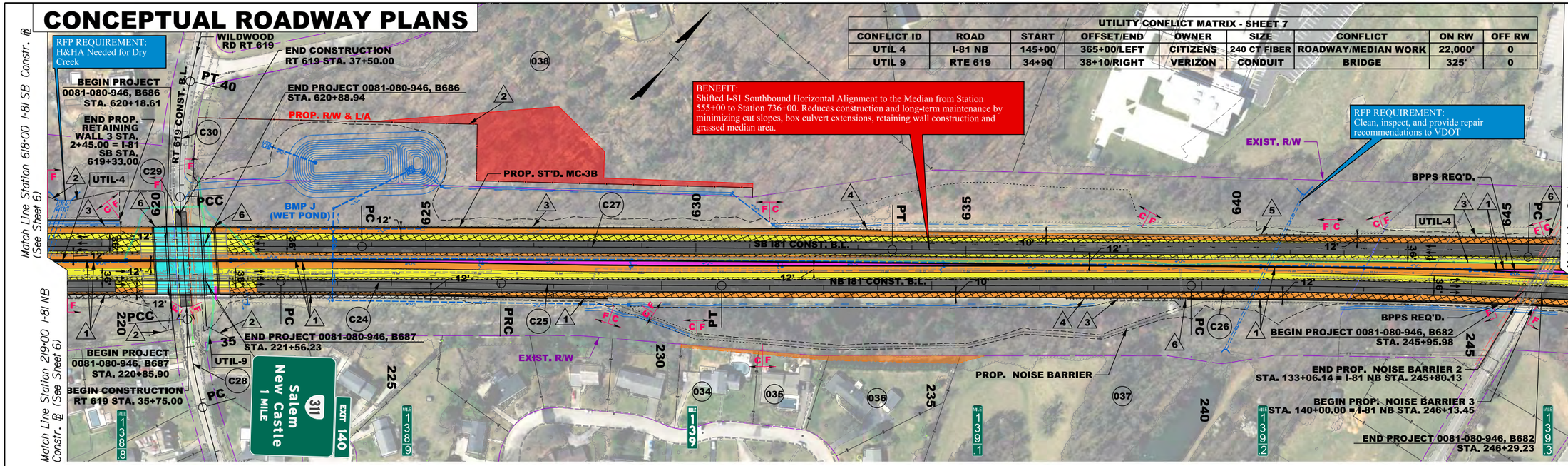
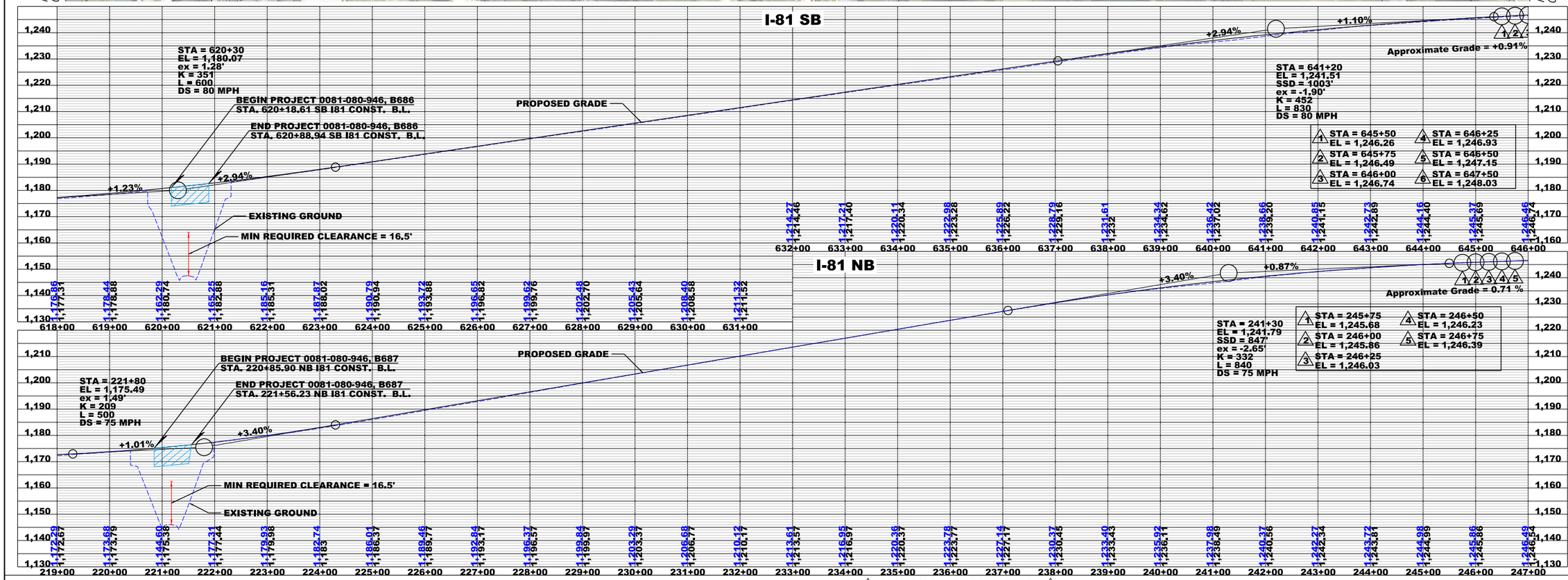
CONCEPTUAL ROADWAY PLANS

UTILITY CONFLICT MATRIX - SHEET 7								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0
UTIL 9	RTE 619	34+90	38+10/RIGHT	VERIZON	CONDUIT	BRIDGE	325'	0





CONSTRUCTION LIMITS
C ..... CUT
F ..... FILL
PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
PROP. RIGHT OF WAY REDUCTION
TEMP. CONSTR. EASEMENT REDUCTION
1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE
2 PROP. LIMITED ACCESS FENCE
3 PROP. STD. GR-MGS1
4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING
VERTICAL PROFILE SCALE 10' 5'
HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE
DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER 7
PAGE NUMBER 80

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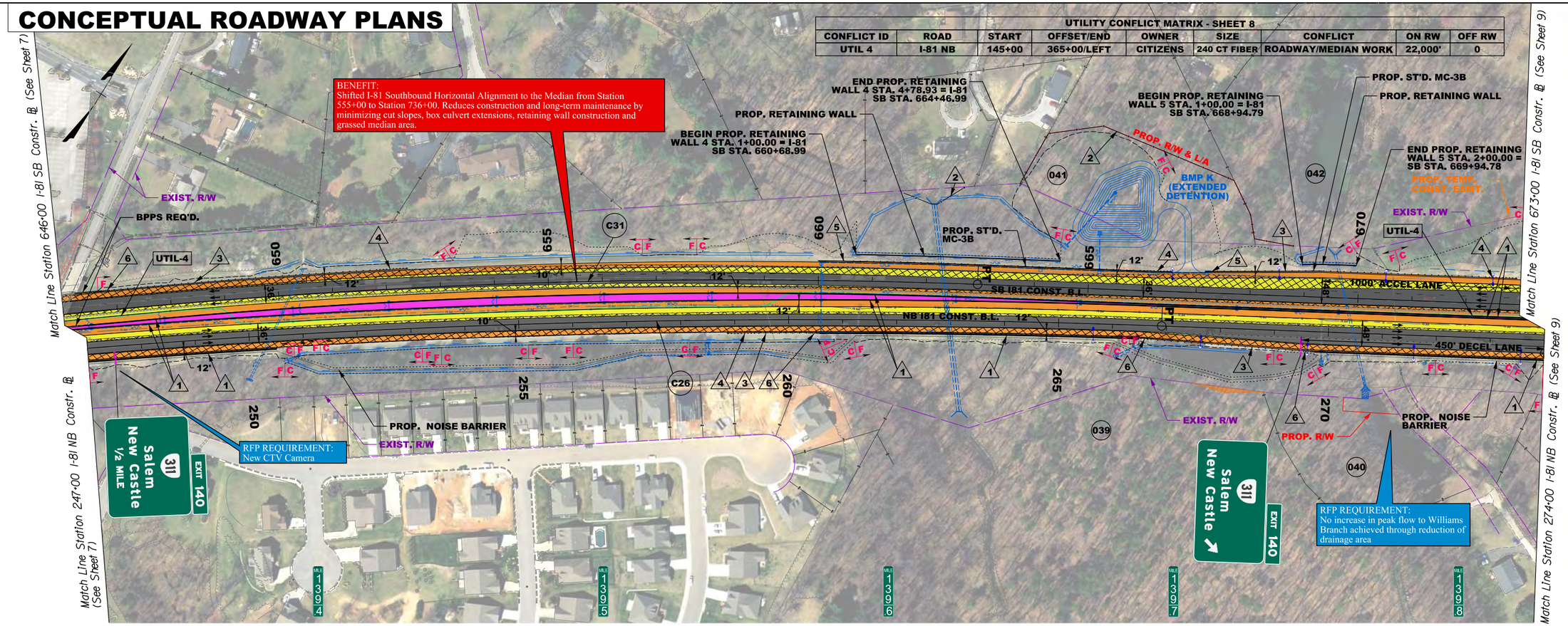
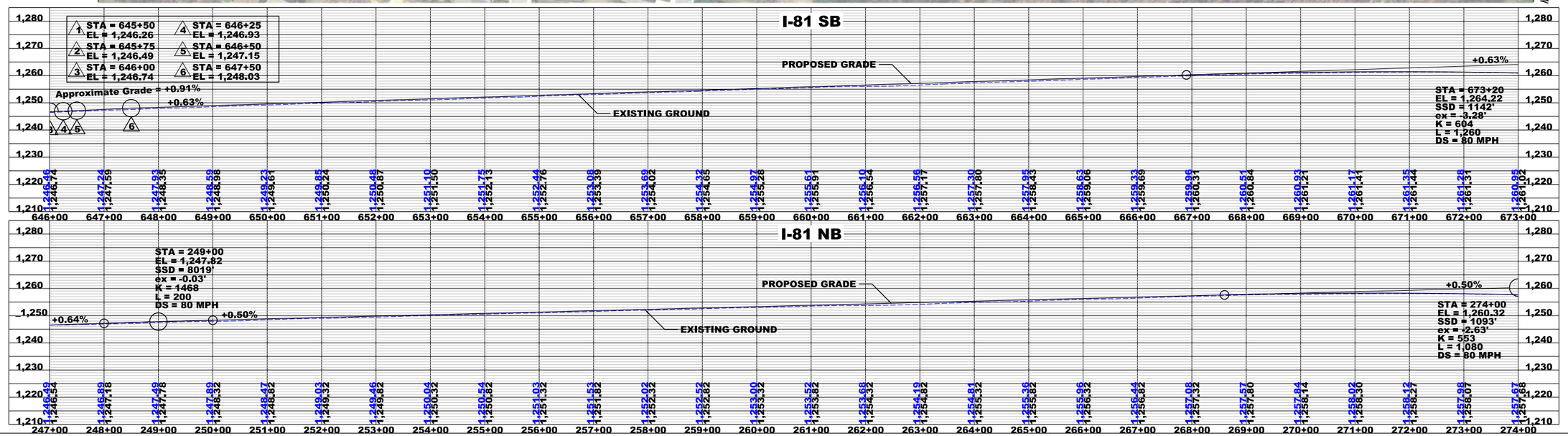
CONCEPTUAL ROADWAY PLANS

UTILITY CONFLICT MATRIX - SHEET 8								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0





CONSTRUCTION LIMITS
C ..... CUT
F ------- FILL

PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
PROP. RIGHT OF WAY REDUCTION
TEMP. CONSTR. EASEMENT REDUCTION
1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE
2 PROP. LIMITED ACCESS FENCE
3 PROP. STD. GR-MGS1
4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING

VERTICAL PROFILE SCALE 10' 5'
HORIZONTAL PLAN SCALE 0 100' 200'

dlls203_08.dgn

DESIGN - BUILD TEAM
CORMAN KOKOSING LANE

DESIGN TEAM
rda WSP

STATE PROJECT NUMBERS
0081-080-946, P101, C501, R201, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER 8

PAGE NUMBER 81

CONCEPTUAL ROADWAY PLANS

UTILITY CONFLICT MATRIX - SHEET 9								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0

Match Line Station 673+00 I-81 SB Constr. ℄ (See Sheet 8)

Match Line Station 274+00 I-81 NB Constr. ℄ (See Sheet 8)

Match Line Station 701+00 I-81 SB Constr. ℄ (See Sheet 10)

Match Line Station 302+00 I-81 NB Constr. ℄ (See Sheet 10)

REMOVE PORTION OF CONCRETE BARRIER

IMPACT ATTENUATOR REQ'D.

END CONSTRUCTION RT 311 LOOP D STA. 2202+80.00

END CONSTRUCTION RT 311 RAMP D STA. 2308+65.19

RFP REQUIREMENT: H&HA Needed for Gish Branch

BEGIN CONSTRUCTION RT 311 RAMP D STA. 2305+45.00

PROP. TEMP. CONST. ESMT.

EXIST. R/W

PROP. R/W & L/A

UTIL-4

1000' ACCEL LANE

RT 311 RPD CONST. BL

BMP L (BIO-RETENTION)

BEGIN CONSTRUCTION RT 311 LOOP D STA. 2200+00.00

BEGIN PROJECT 0081-080-946, B677 STA. 685+39.17

END PROJECT 0081-080-946, B677 STA. 686+83.84

EXIT 140 — 311 Salem

BENEFIT: Shifted I-81 Southbound Horizontal Alignment to the Median from Station 555+00 to Station 736+00. Reduces construction and long-term maintenance by minimizing cut slopes, box culvert extensions, retaining wall construction and grassed median area.

BEGIN PROP. RETAINING WALL 6 STA. 1+00.00 = I-81 SB STA. 690+97.67

825' DECEL LANE

SB I81 CONST. B.L.

NB I81 CONST. B.L.

RT 311 RPA CONST. BL

RT 311 RPB CONST. BL

BMP N (BIORETENTION)

1025' ACCEL LANE

PROP. NOISE BARRIER

RFP REQUIREMENT: No increase in peak flow to Williams Branch achieved through reduction of drainage area

RFP REQUIREMENT: Existing CTV Camera to remain in service during construction

BEGIN CONSTRUCTION RT 311 RAMP A STA. 2000+00.00

BEGIN PROJECT 0081-080-946, B678 STA. 285+94.39

END PROP. NOISE BARRIER 3 STA. 175+33.03 = I-81 NB STA. 280+79.03

END CONSTRUCTION RT 311 RAMP A STA. 2005+00.00

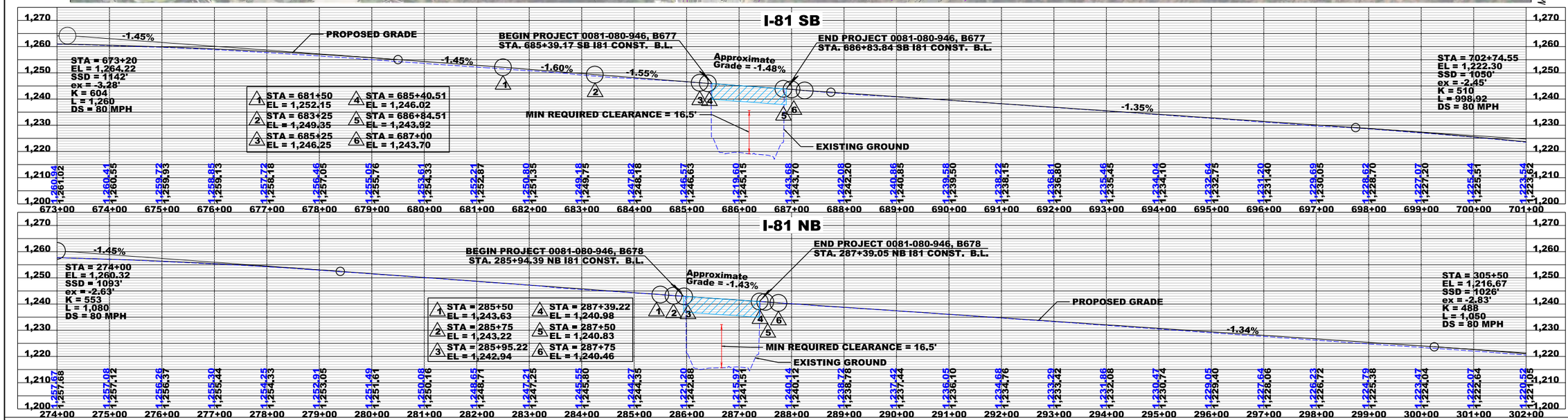
THOMPSON MEMORIAL DR RT 311

BEGIN CONSTRUCTION RT 311 RAMP B STA. 2105+00.00

END PROJECT 0081-080-946, B678 STA. 287+39.05

END CONSTRUCTION RT 311 RAMP B STA. 2111+09.49

EXIST. R/W



CONSTRUCTION LIMITS

C ..... CUT

F ..... FILL

PROP. NEW PAVEMENT

PROPOSED BRIDGE

PROP. MILL & OVERLAY

PROP. NEW SHOULDER PAVEMENT

LOW MAINTENANCE TREATMENT

DEMOLITION OF PAVEMENT

PROP. RIGHT OF WAY

PROP. PERMENANT DRAINAGE EASEMENT

TEMP. CONSTRUCTION EASEMENT

PROP. RIGHT OF WAY REDUCTION

TEMP. CONSTR. EASEMENT REDUCTION

1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE

2 PROP. LIMITED ACCESS FENCE

3 PROP. STD. GR-MGS1

4 PROP. STD. GR-MGS2

5 PROP. STD. GR-MGS3

6 PROP. STD. GR-FOA

UTIL-# UTILITY CONFLICT

PROP. LIGHT POLE

EXIST. LIGHT POLE

UNDERBRIDGE LIGHTING

VERTICAL PROFILE SCALE 10' 5' 0

HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

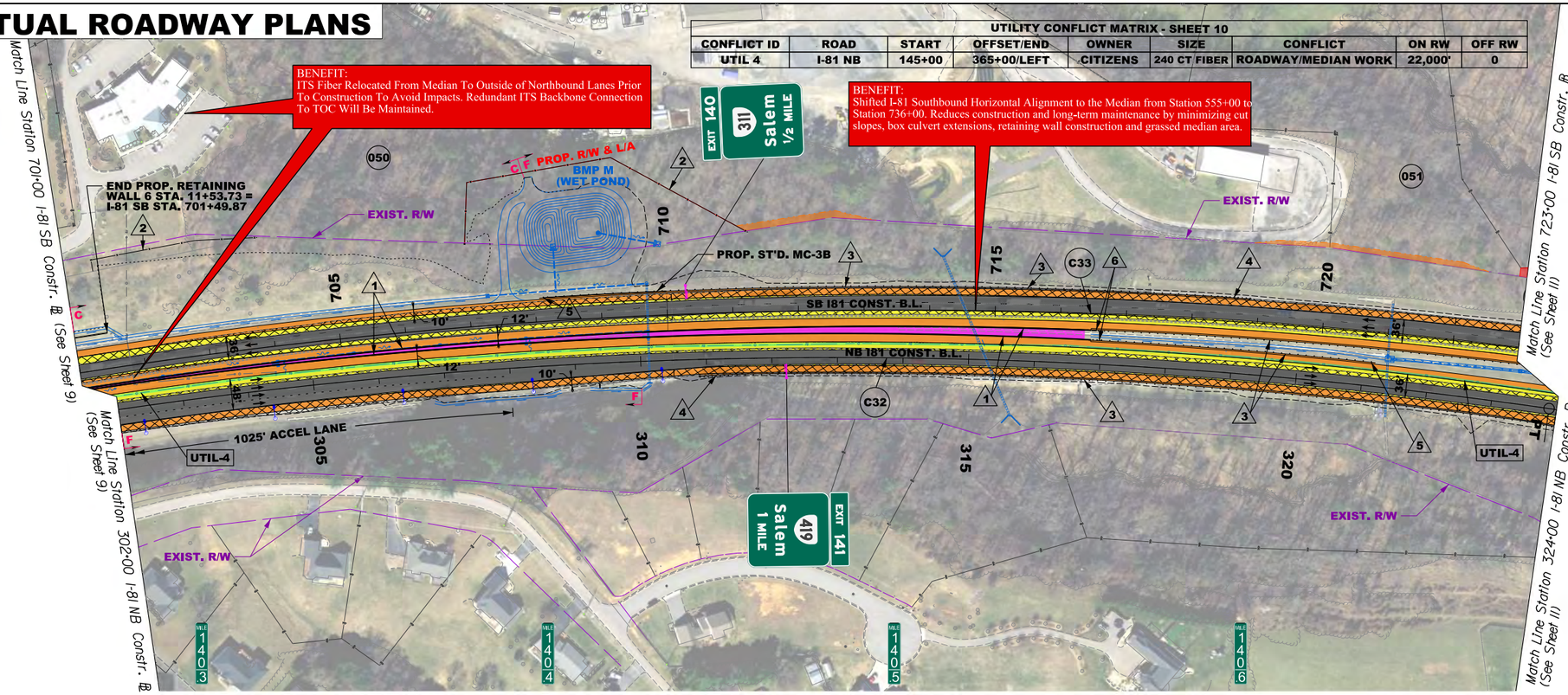
SHEET NUMBER 9

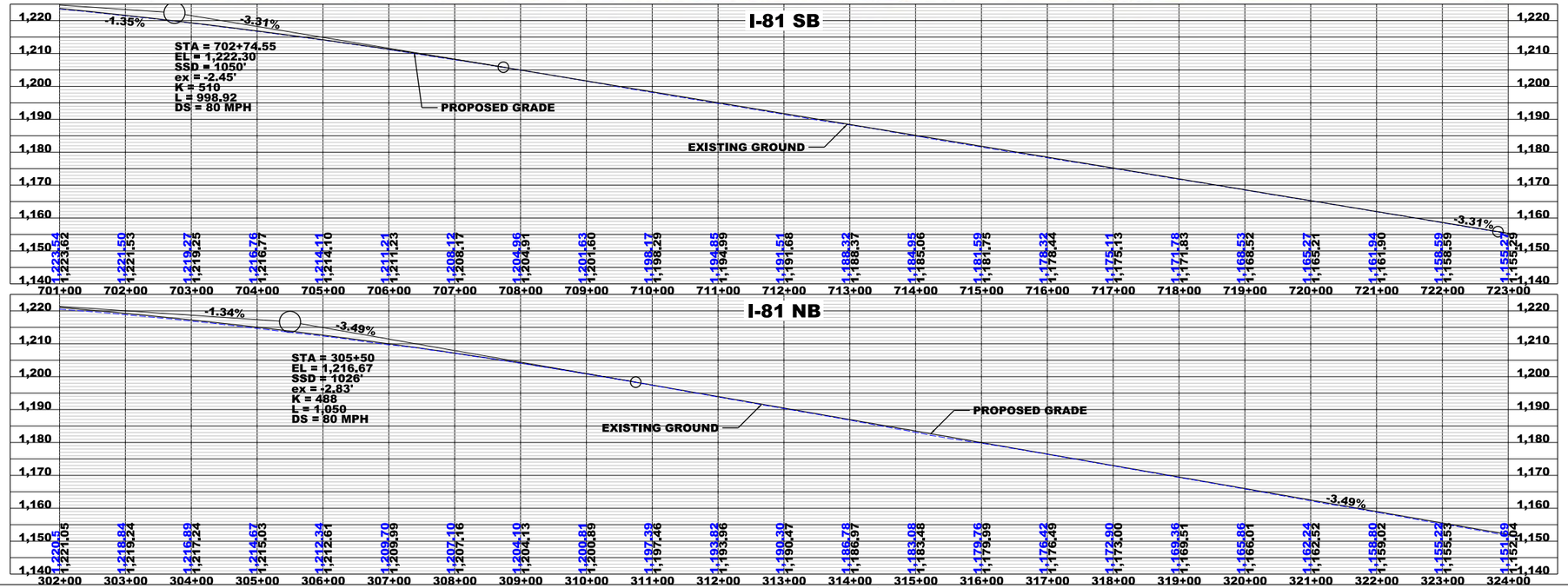
PAGE NUMBER 82

dl6203_09.dgn

CONCEPTUAL ROADWAY PLANS

UTILITY CONFLICT MATRIX - SHEET 10								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0





CONSTRUCTION LIMITS
C ..... CUT
F ------- FILL

PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
PROP. RIGHT OF WAY REDUCTION
TEMP. CONSTR. EASEMENT REDUCTION

1 PROP. CONSTANT SLOPE BARRIER. SEE TYPICAL FOR TYPE
2 PROP. LIMITED ACCESS FENCE
3 PROP. STD. GR-MGS1
4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING

VERTICAL PROFILE SCALE 5' 10'
HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE

DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946 R201, P101, C501, B677, B678, B681, B682, B683, B684, B685, B686, B687, B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

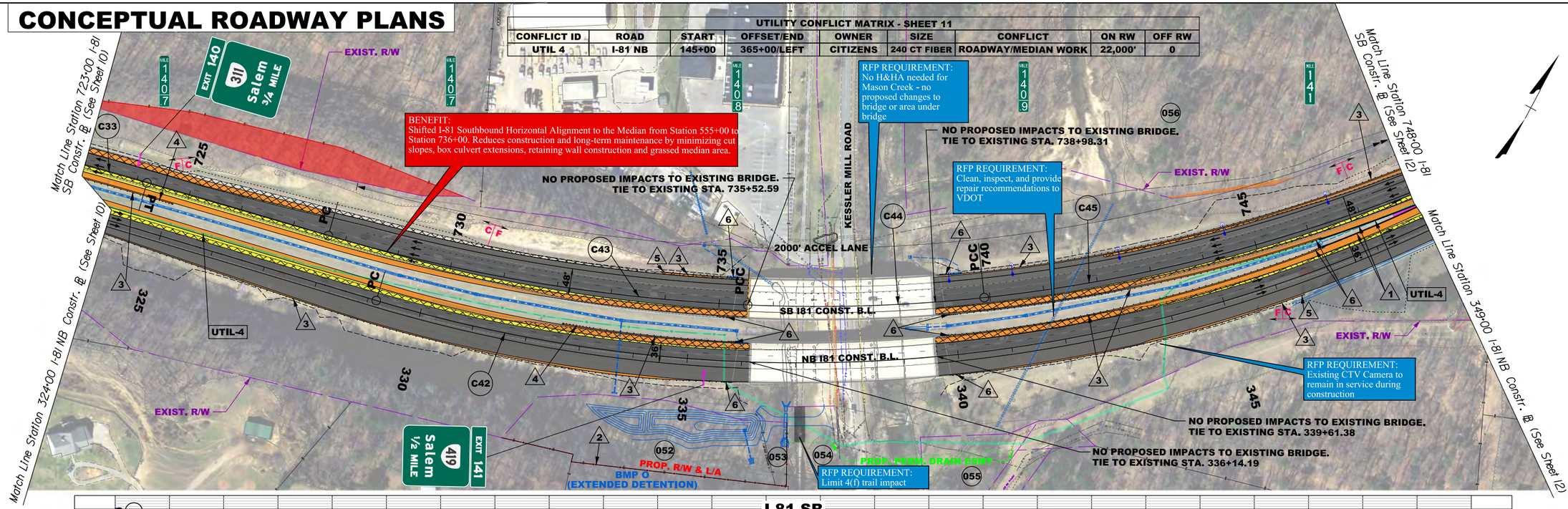
SHEET NUMBER 10

PAGE NUMBER 83

dlr8203_10.dgn

CONCEPTUAL ROADWAY PLANS

UTILITY CONFLICT MATRIX - SHEET 11								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0



CONSTRUCTION LIMITS
C ..... CUT
F ---------- FILL
PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
PROP. PERMENANT DRAINAGE EASEMENT
TEMP. CONSTRUCTION EASEMENT
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4 PROP. STD. GR-MGS2
5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING
VERTICAL PROFILE SCALE 5' 10'
HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE
DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501,
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B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

SHEET NUMBER 11
PAGE NUMBER 84

dlt8203_1.dgn

CONCEPTUAL ROADWAY PLANS

Match Line Station 748+00 I-81 SB Constr. ℄ (See Sheet II)

Match Line Station 349+00 I-81 NB Constr. ℄ (See Sheet II)

UTILITY CONFLICT MATRIX - SHEET 12								
CONFLICT ID	ROAD	START	OFFSET/END	OWNER	SIZE	CONFLICT	ON RW	OFF RW
UTIL 4	I-81 NB	145+00	365+00/LEFT	CITIZENS	240 CT FIBER	ROADWAY/MEDIAN WORK	22,000'	0

END CONSTRUCTION
RT 419 RAMP D
STA. 3314+31.25

BEGIN CONSTRUCTION
RT 419 RAMP D
STA. 3311+75.00

EXIST. R/W

UTIL-4

RT 419 RPD CONST. BL

RT 419 LPD CONST. BL

ROUTE 419 ELECTRIC ROAD

END CONSTRUCTION
RT 419 LOOP D
STA. 3203+00.00

BMP P (BIORETENTION)
STD. GR-MGS4

STD. GR-MGS4

BEGIN CONSTRUCTION
RT 419 LOOP D
STA. 3200+00.00

EXIST. R/W

1290' DECEL LANE

END CONSTRUCTION
STA. 763+00.98

FOR INFORMATION ONLY
DESIGN REFERENCED FROM
0081-080-903, C501
(Under Construction by Others)

EXIST. R/W

SB I81 CONST. B.L.

BPPS

NB I81 CONST. B.L.

BPPS

500' DECEL LANE

STD. GR-MGS4

BEGIN CONSTRUCTION
RT 419 LOOP B
STA. 3000+00.00

END CONSTRUCTION
RT 419 LOOP B
STA. 3002+50.00

RT 419 RPB CONST. BL

RT 419 LPB CONST. BL

BEGIN CONSTRUCTION
RT 419 RAMP B
STA. 3111+00.00

BMP R
(EXTENDED DETENTION)

END CONSTRUCTION
RT 419 RAMP B
STA. 3113+50.53

RFP REQUIREMENT:
Maintain Existing Continuous Count Station with Portable Trailer System MM 141.6 NB & SB

RFP REQUIREMENT:
BMP modification will continue to meet requirements for UPC 108906 and provide benefit for this project

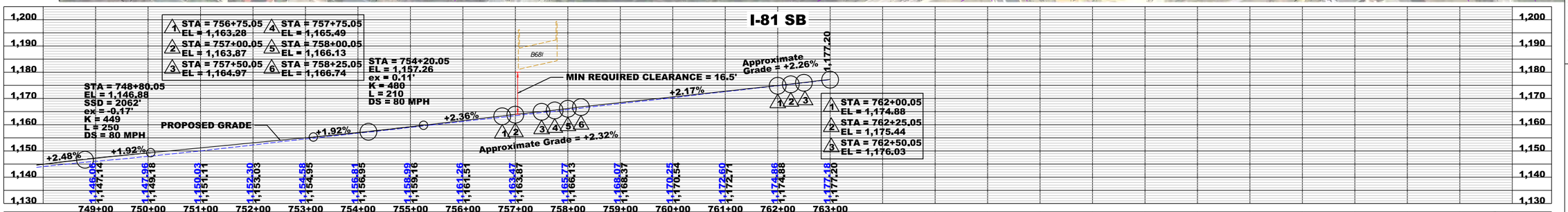
END PROJECT 0081-080-946, P101, R201, C501
END CONSTRUCTION STA. 376+75.00

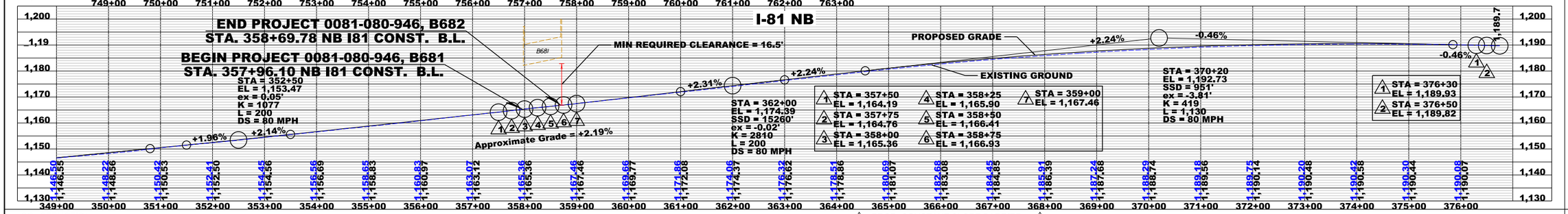
EXIT 141 Salem 419

BEGIN PROJECT 0081-080-946, B681
STA. 357+96.10

END PROJECT 0081-080-946, B682
STA. 358+69.78

EXIST. R/W





CONSTRUCTION LIMITS
C ..... CUT
F ..... FILL
PROP. NEW PAVEMENT
PROPOSED BRIDGE
PROP. MILL & OVERLAY
PROP. NEW SHOULDER PAVEMENT
LOW MAINTENANCE TREATMENT
DEMOLITION OF PAVEMENT
PROP. RIGHT OF WAY
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5 PROP. STD. GR-MGS3
6 PROP. STD. GR-FOA
UTIL-# UTILITY CONFLICT
PROP. LIGHT POLE
EXIST. LIGHT POLE
UNDERBRIDGE LIGHTING

VERTICAL PROFILE SCALE 10' 5'
HORIZONTAL PLAN SCALE 0 100' 200'

DESIGN - BUILD TEAM
CORMAN KOKOSING
LANE

DESIGN TEAM
rda
WSP

STATE PROJECT NUMBERS
0081-080-946
R201, P101, C501,
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B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

SHEET NUMBER 12

PAGE NUMBER 85

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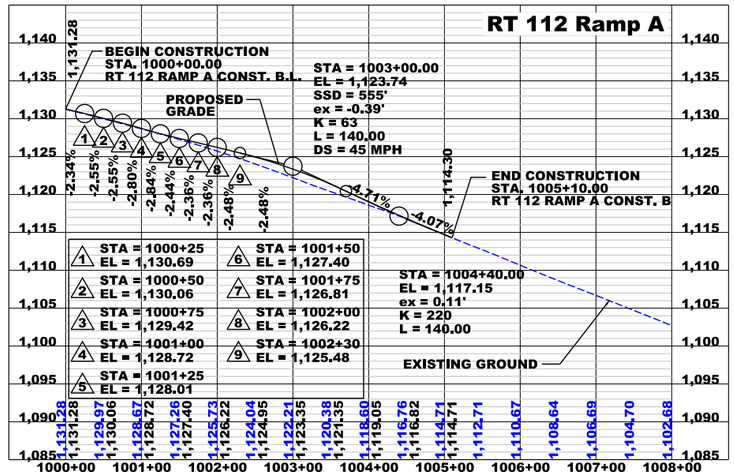
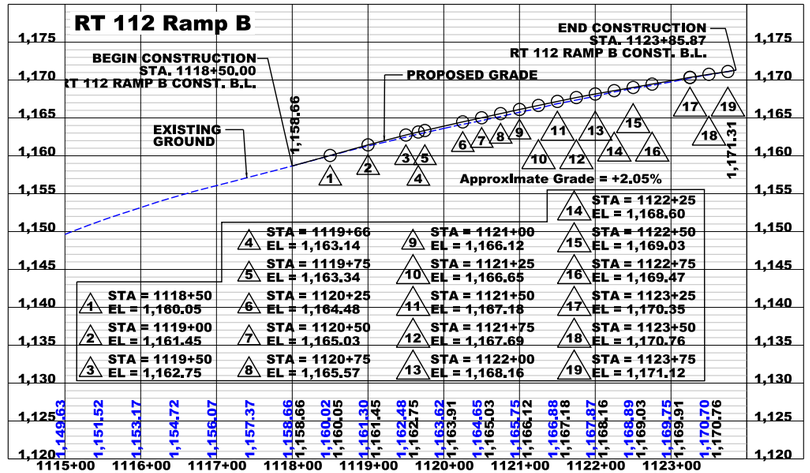
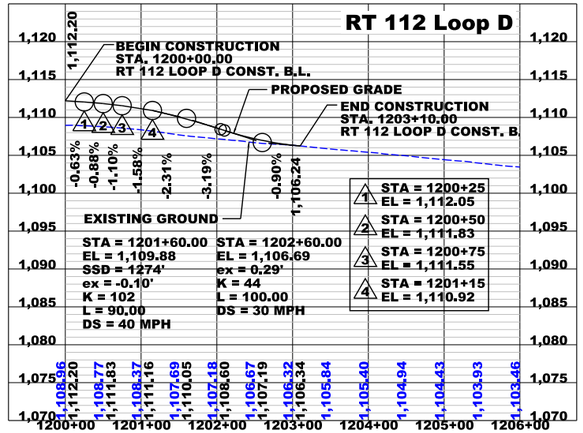
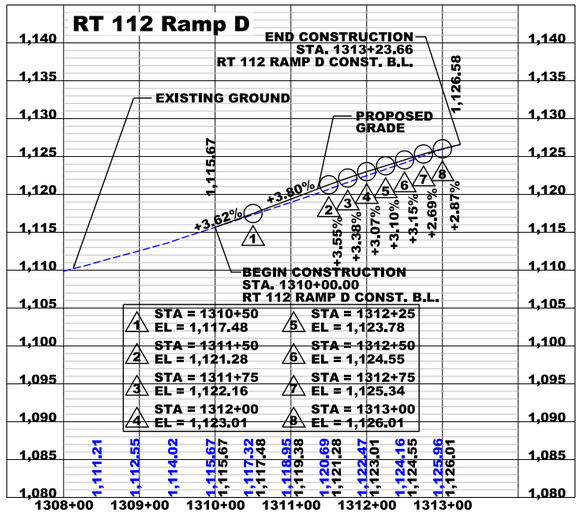
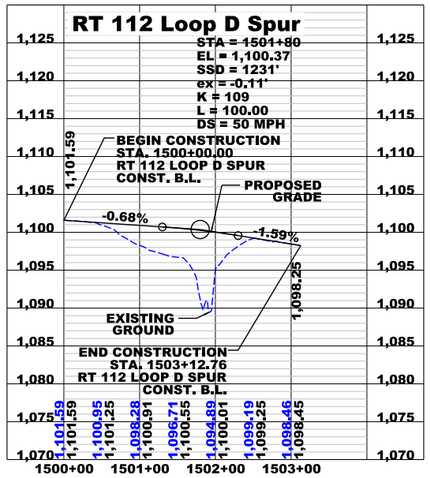
SIDEROAD/RAMP PROFILES

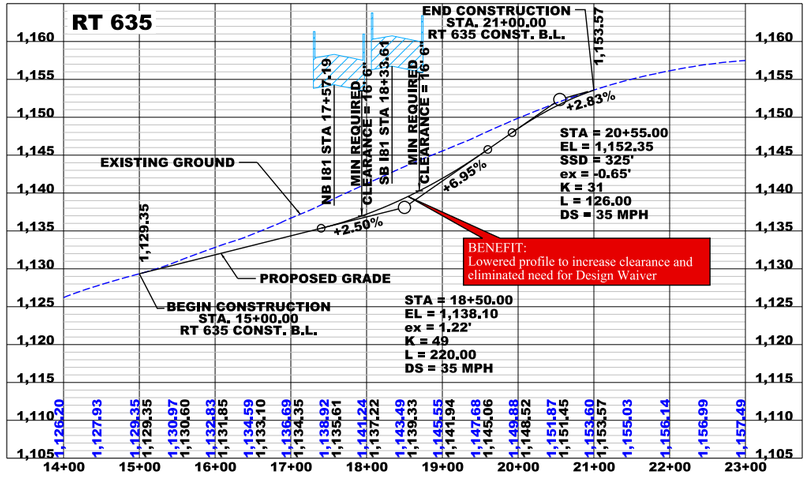












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DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

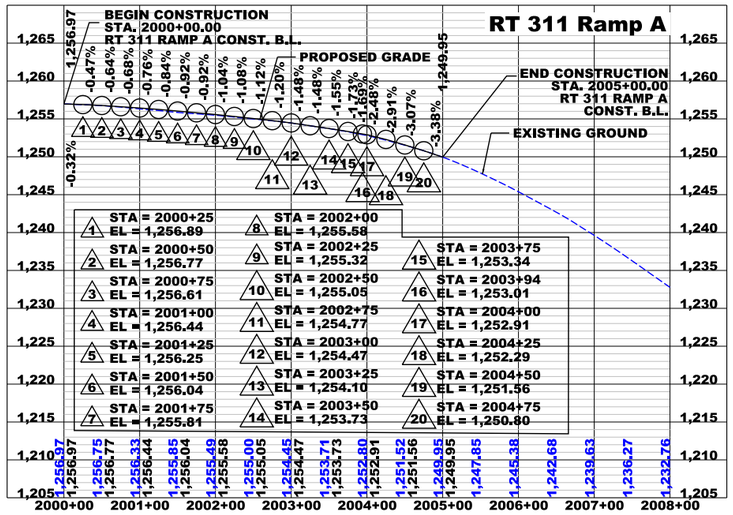
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

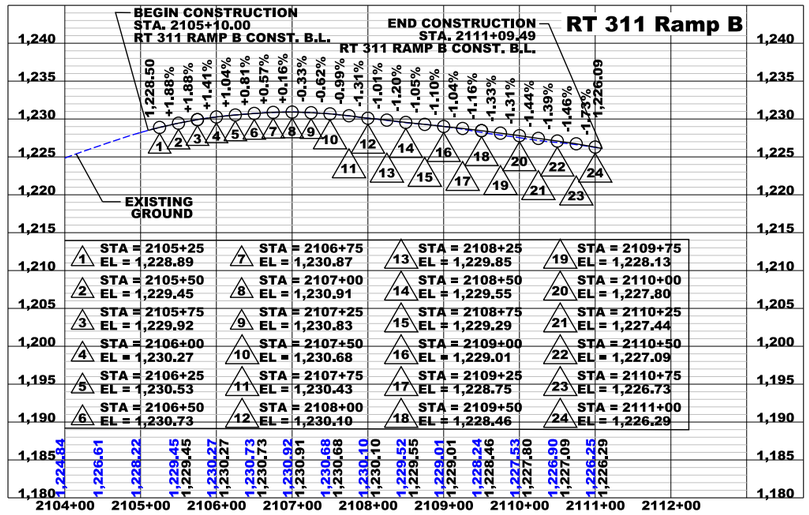
DESIGN-BUILD PROJECT

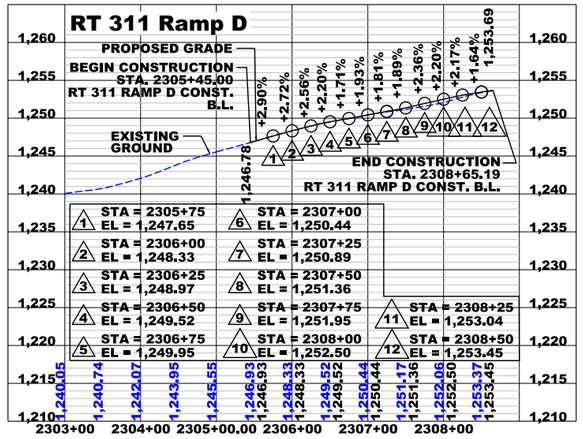
SHEET NUMBER
13

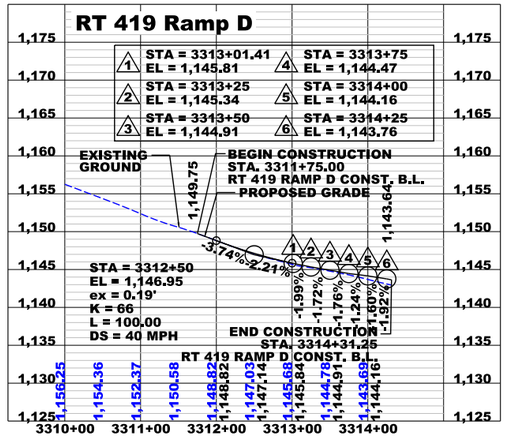
PAGE NUMBER
86

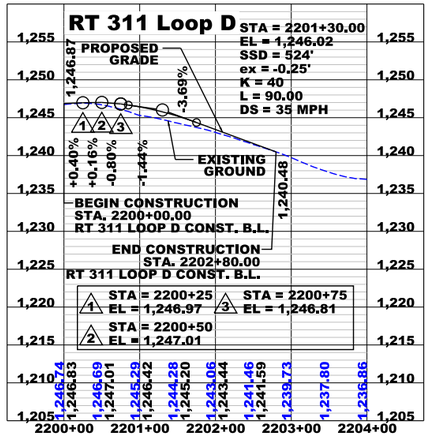
SIDEROAD/RAMP PROFILES

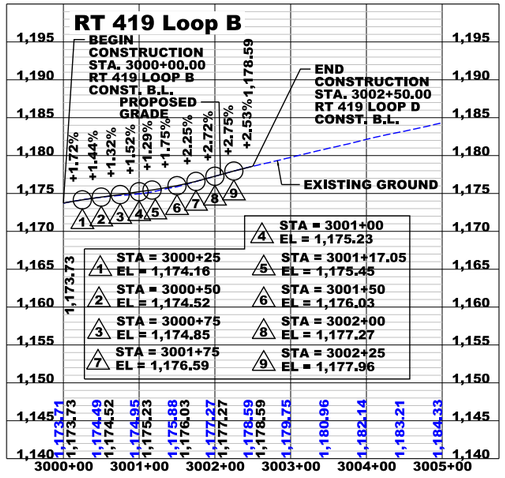


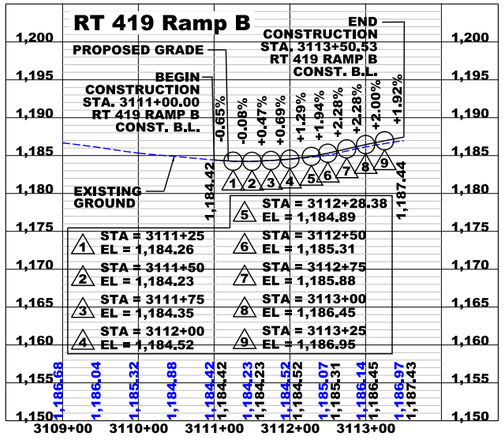


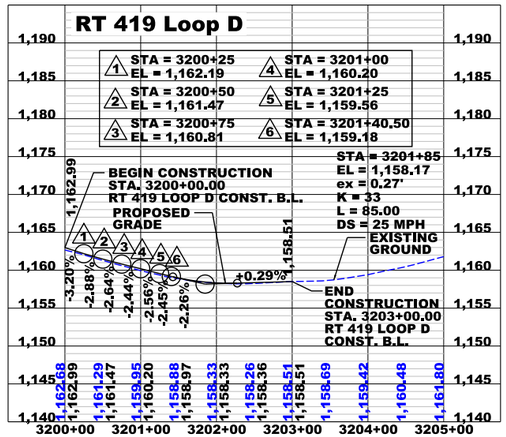












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DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
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VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

SHEET NUMBER
14

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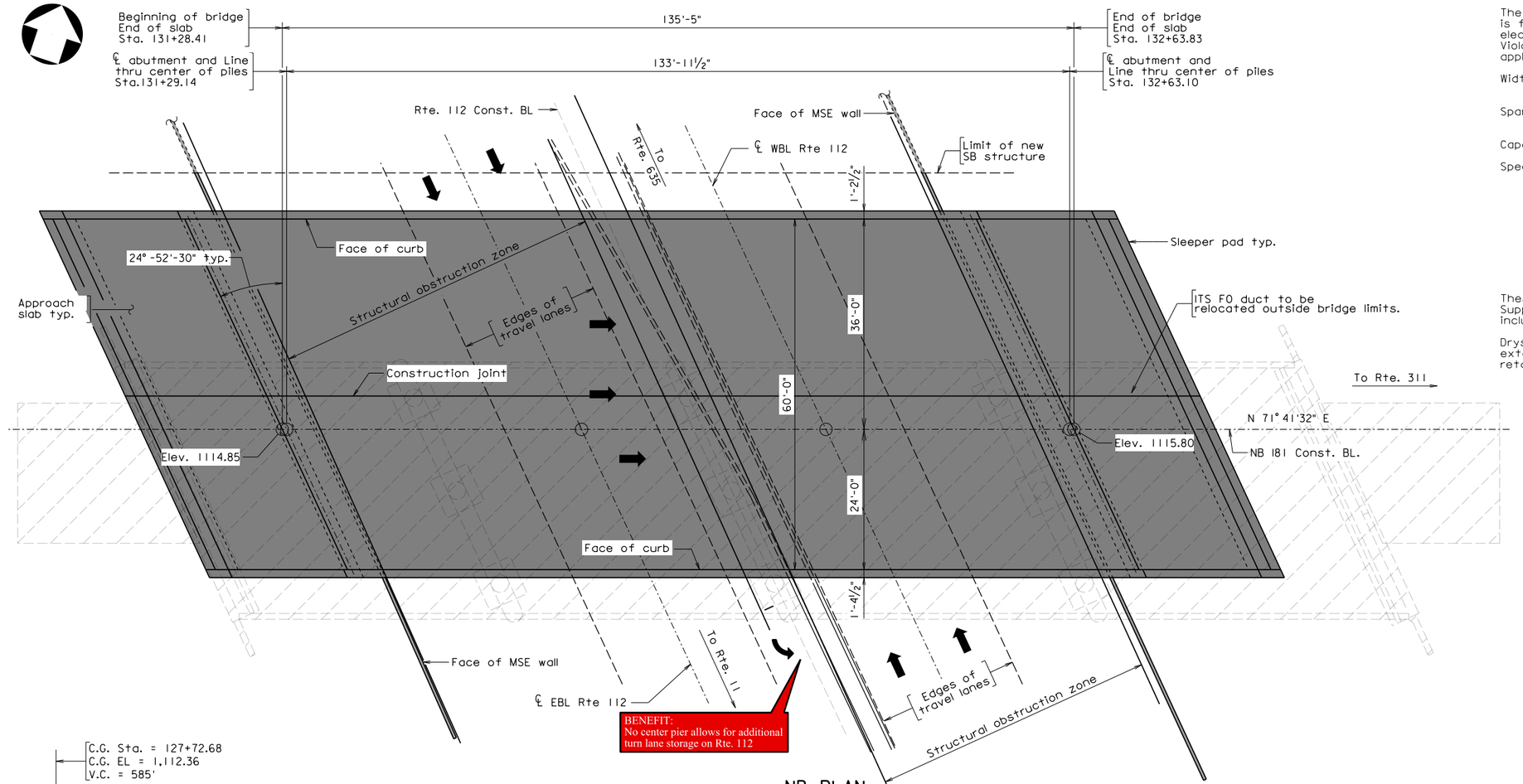
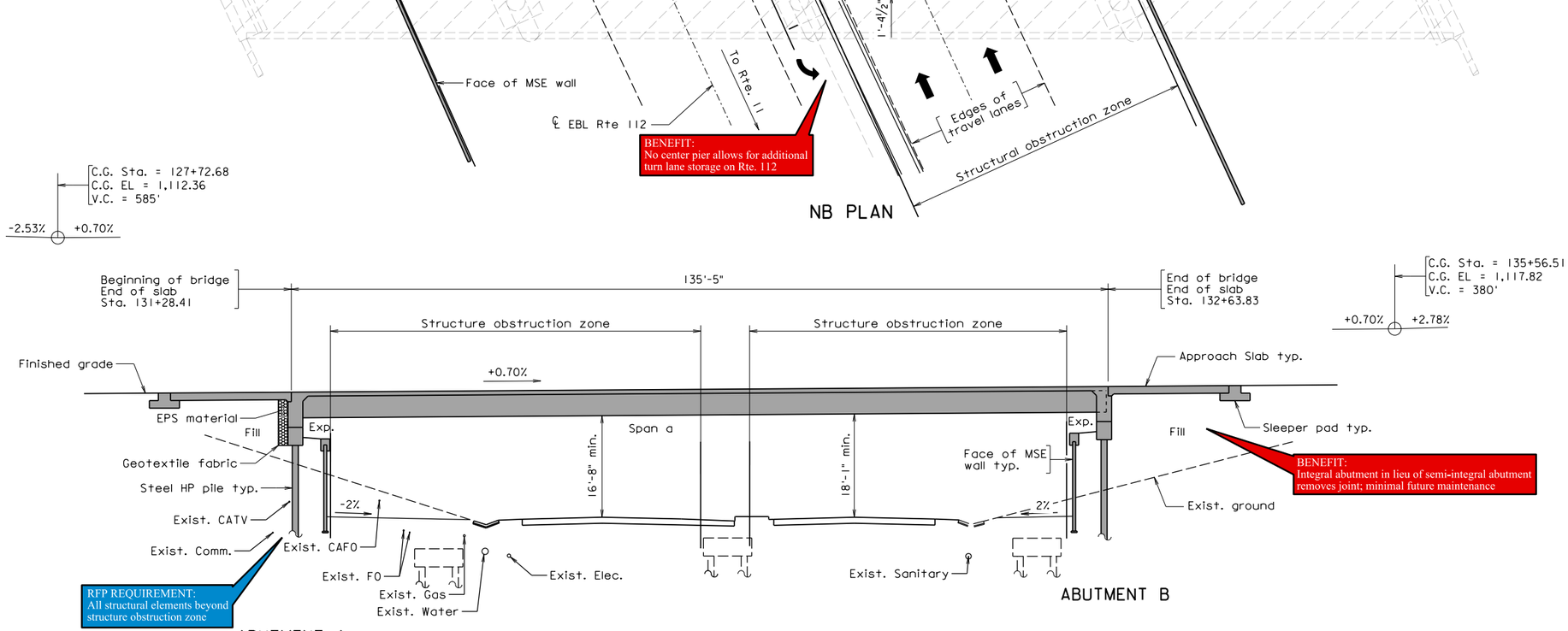
87

4.3.1 CONCEPTUAL STRUCTURAL PLANS

CONCEPTUAL BRIDGE PLANS



Limits of existing structure removal



DEVELOPED SECTION ALONG NB 181 CONST. BL.

Scale: 3/32" = 1'-0"

GENERAL NOTES:

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

Width: 60'-0" face-to-face of curbs. (NBL)
72'-0" face-to-face of curbs. (SBL)

Span layout: 135' steel plate girder span (NBL)
135' steel plate girder span (SBL)

Capacity: HL-93 loading.

Specifications:

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

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2020; and VDOT Modifications.

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

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

Drystack architectural treatment shall be placed on exterior face of parapet, wingwalls, abutments, and retaining walls.

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

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B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 112 (WILDWOOD ROAD)

GENERAL PLAN AND ELEVATION
NBL

SHEET NUMBER
1 OF 4

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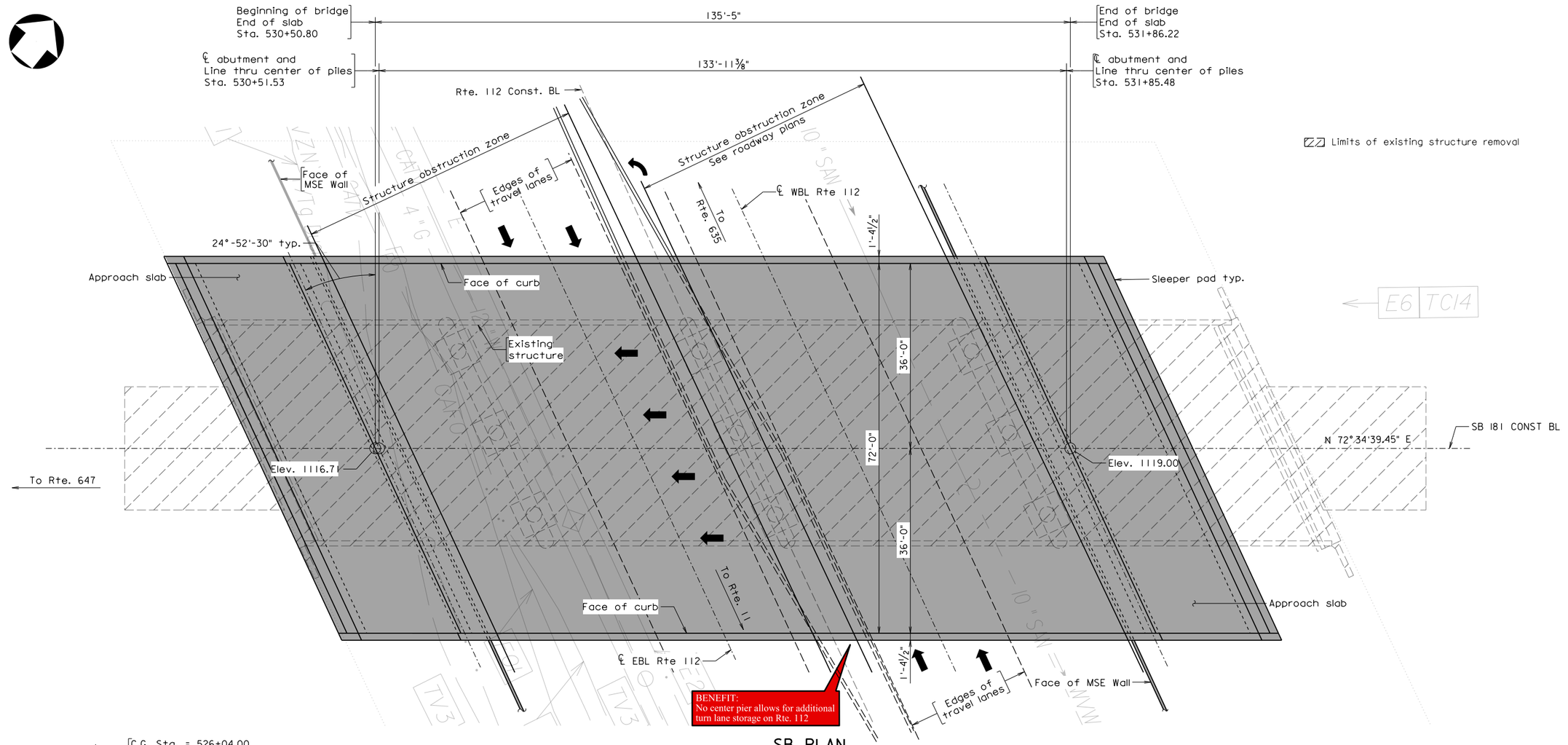
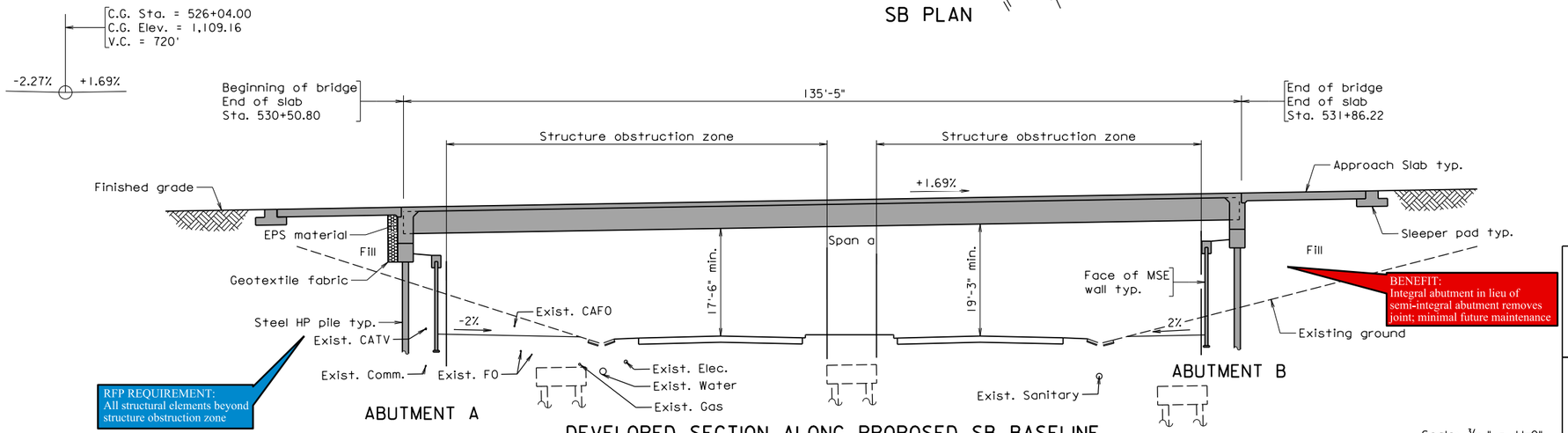
88

3/1/2021

CONCEPTUAL BRIDGE PLANS



SB PLAN



DEVELOPED SECTION ALONG PROPOSED SB BASELINE

Scale: 3/32 " = 1'-0"

3/1/2021

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

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VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO
BE USED FOR CONSTRUCTION

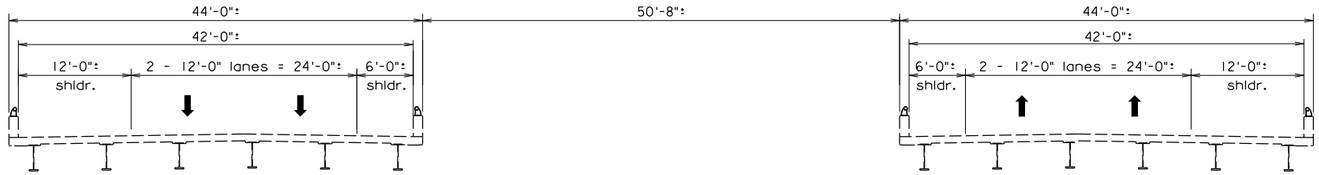
PROPOSED BRIDGE REPLACEMENT ON I-81 NB
AND SB OVER ROUTE 112 (WILDWOOD ROAD)

GENERAL PLAN AND ELEVATION
SBL

SHEET NUMBER
2 OF 4

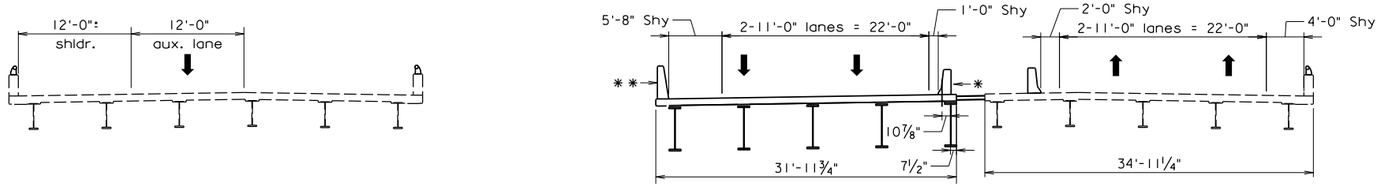
PAGE NUMBER
89

CONCEPTUAL BRIDGE PLANS



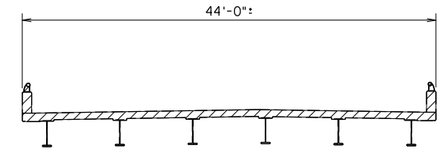
PHASE 0 - EXISTING STRUCTURES

PHASE 1 - PARTIAL DEMOLITION OF NB STRUCTURE, PARTIAL CONSTRUCTION OF NB

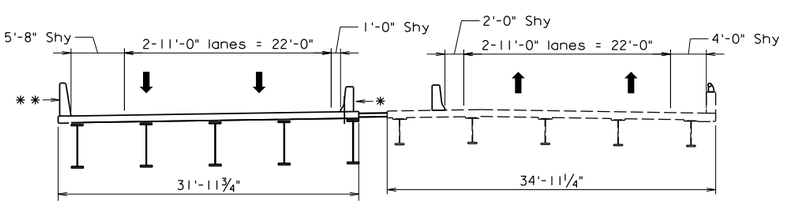


PHASE 2 - ROADWAY CONSTRUCTION

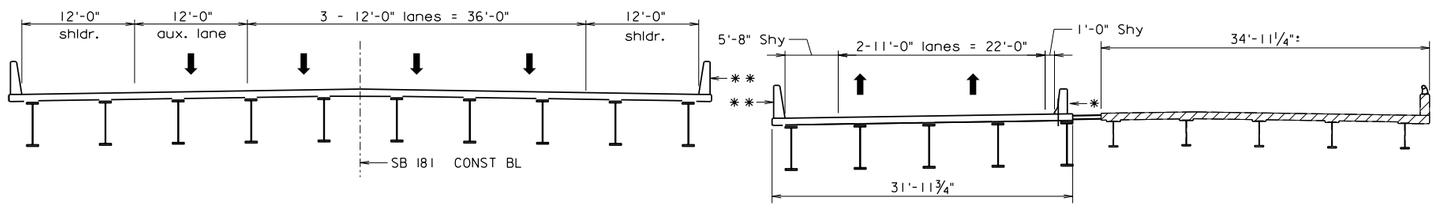
BENEFIT:
Bridge sequencing accomodates temporary spread without additional phases or construction



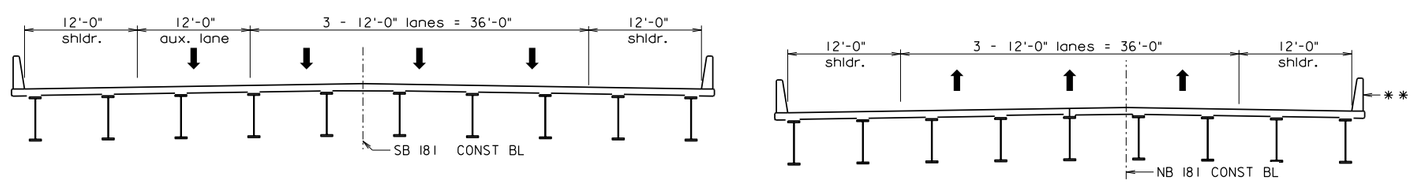
BENEFIT:
Single phase construction removes construction joint. Deceleration lane provided after bridge for auxiliary lane



PHASE 2A - COMPLETE DEMOLITION OF SB STRUCTURE, CONSTRUCTION OF SB STRUCTURE



PHASE 3 - PARTIAL DEMOLITION OF NB STRUCTURE, PARTIAL CONSTRUCTION OF NB



FINAL

Scale: ⅛" = 1'-0"

NOTES:
* MB-10A temporary barrier service
** VDOT Standard SSCP-1 parapet
CJ: Construction Joint
Limits of existing structure removal

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
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VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 112 (WILDWOOD ROAD)

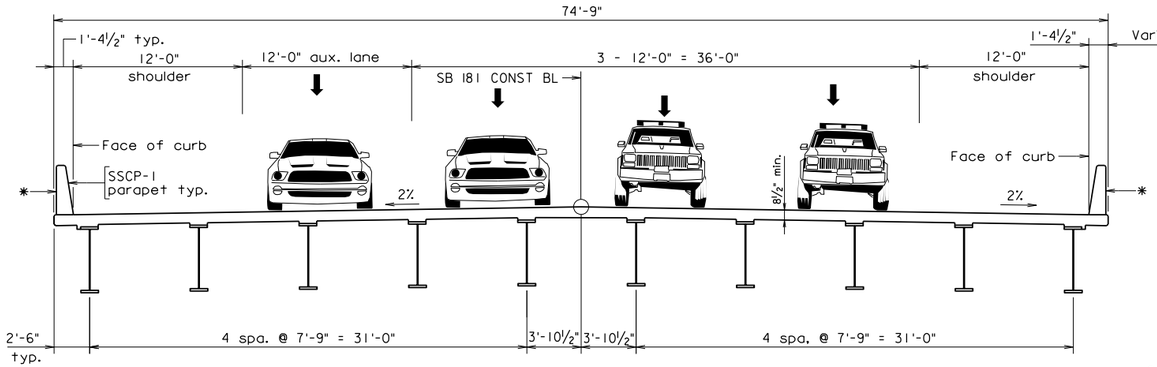
SEQUENCE OF CONSTRUCTION FOR STEEL GIRDER OPTION

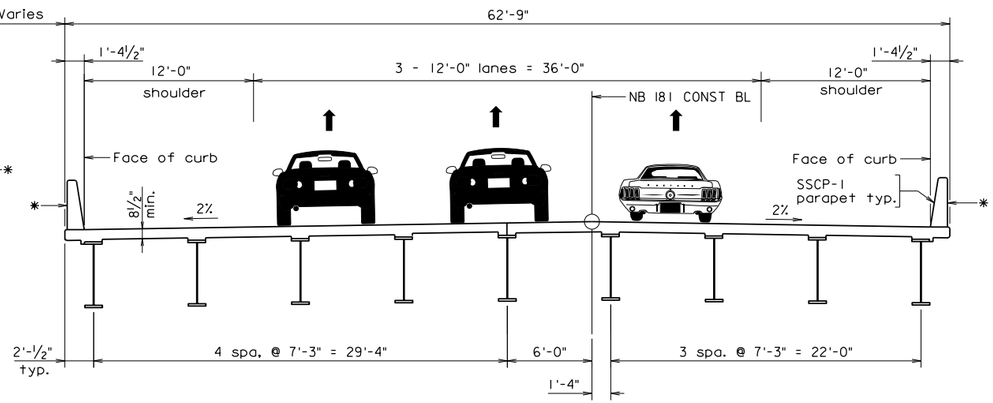
SHEET NUMBER
3 OF 4

PAGE NUMBER
90

3/1/2021

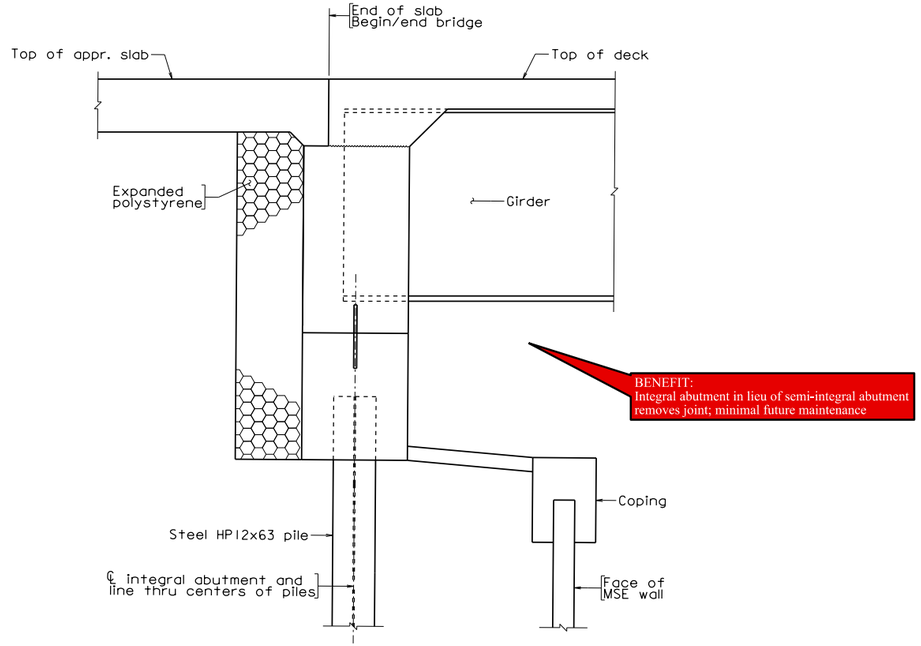
CONCEPTUAL BRIDGE PLANS





NOTES:
CJ: construction joint
* Provide Drystack architectural treatment on the indiated parapet face.

TRANSVERSE SECTION



ABUTMENT TYPICAL SECTION

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

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 112 (WILDWOOD ROAD)

TRANSVERSE SECTIONS FOR ONE SPAN LAYOUT

DESIGN - BUILD TEAM

CORMAN KOKOSING LANE

DESIGN TEAM

rda WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

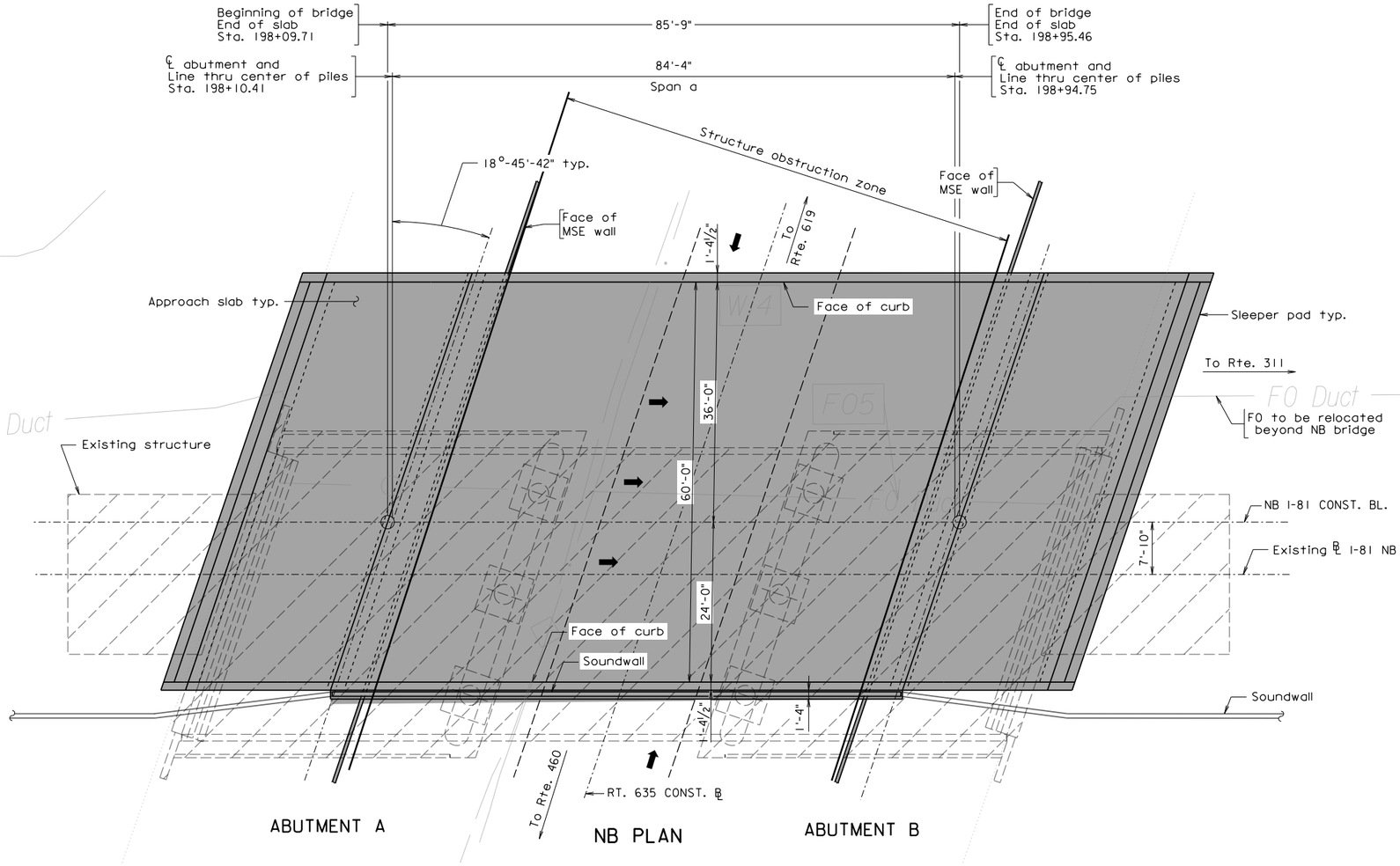
DESIGN-BUILD PROJECT

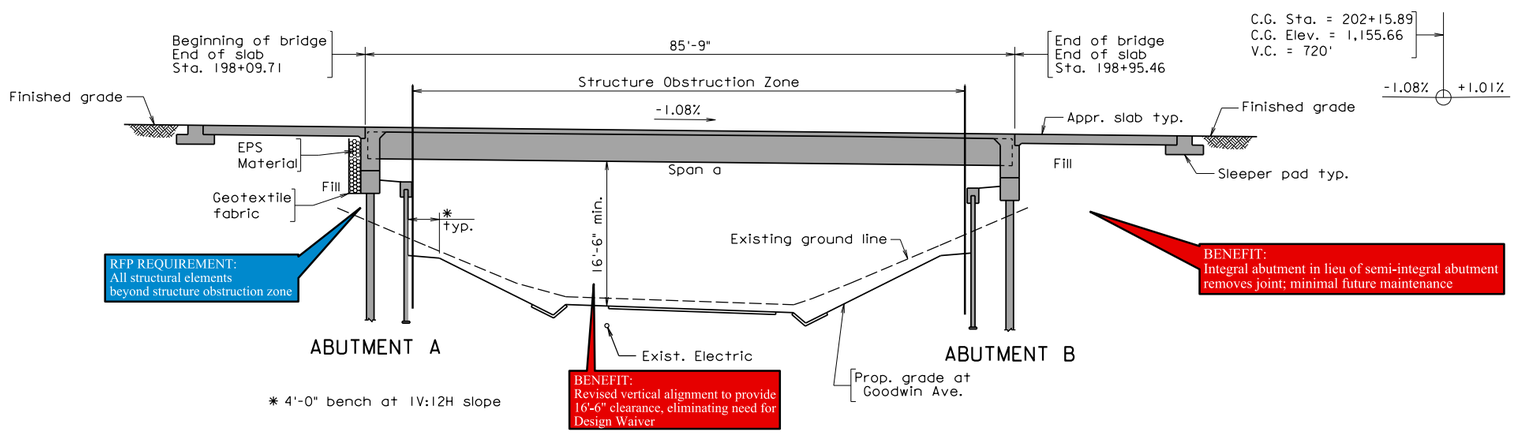
SHEET NUMBER
4 OF 4

PAGE NUMBER
91

3/1/2021

CONCEPTUAL BRIDGE PLANS





DEVELOPED SECTION ALONG NB I-81 CONST. BL.

Scale: 1" = 10'-0"

GENERAL NOTES:

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

Width: 60'-0" face-to-face of curbs. (NBL)
60'-0" face-to-face of curbs. (SBL)

Span layout: 84'-4" prestressed concrete span (NBL)
84'-5" prestressed concrete span (SBL)

Capacity: HL-93 loading.

Specifications:

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

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2020; and VDOT Modifications.

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

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

Drystack architectural treatment shall be placed on exterior face of parapet, wingwalls, abutments, and retaining walls.

Limits of existing structure removal

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 635 (GOODWIN AVE.)

GENERAL PLAN AND ELEVATION
NBL

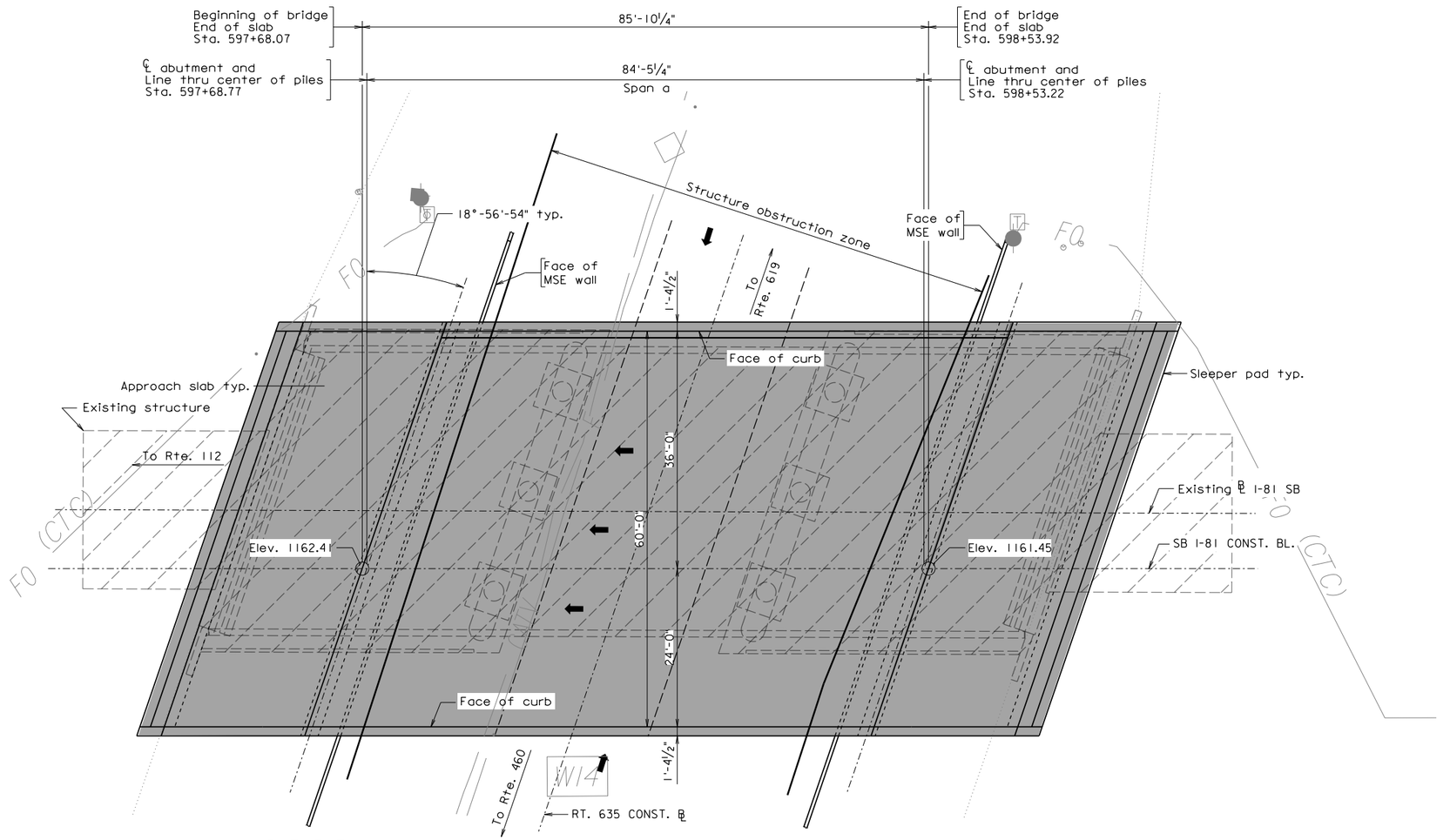
SHEET NUMBER
1 OF 4

PAGE NUMBER
92

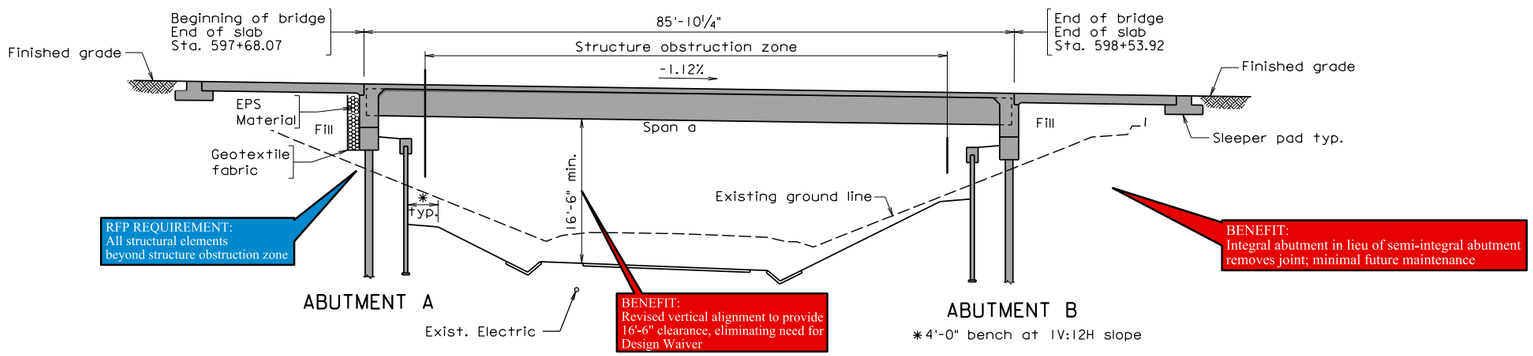
Goodwin_01prop [NB GPEI.dgn

3/1/2021

CONCEPTUAL BRIDGE PLANS



SB PLAN



DEVELOPED SECTION ALONG SB I-81 CONST. BL.

Scale: 1" = 10'-0"

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B678, B681,
B683, B684,
B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 635 (GOODWIN AVE.)

GENERAL PLAN AND ELEVATION SBL

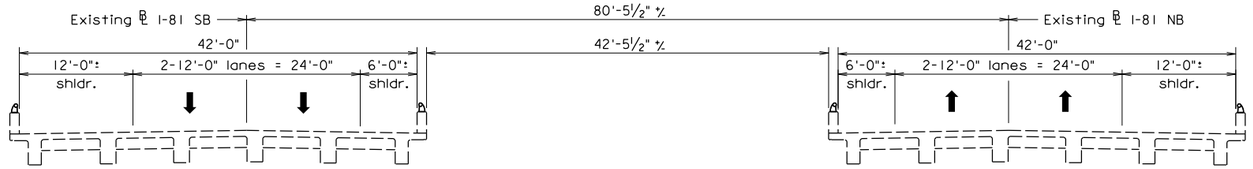
SHEET NUMBER
2 OF 4

PAGE NUMBER
93

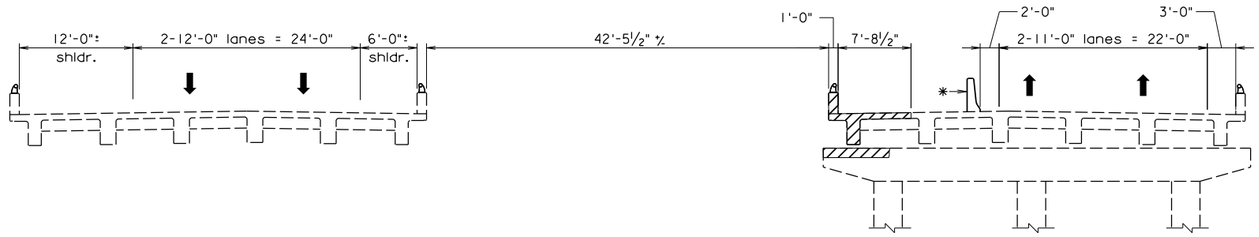
Goodwin_02prop ISB GPE1.dgn

3/1/2021

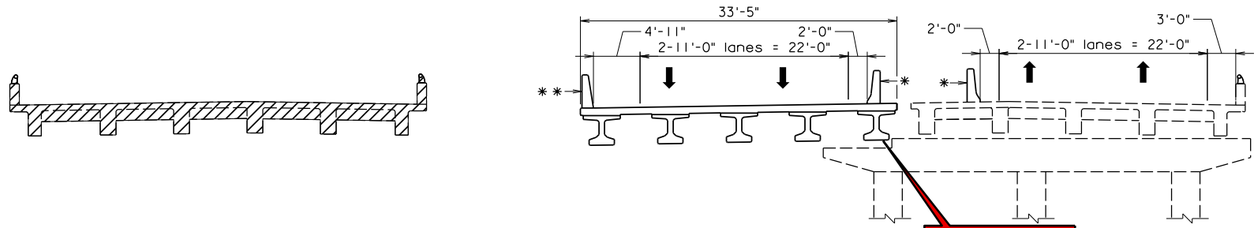
CONCEPTUAL BRIDGE PLANS



PHASE 0 - EXISTING STRUCTURES

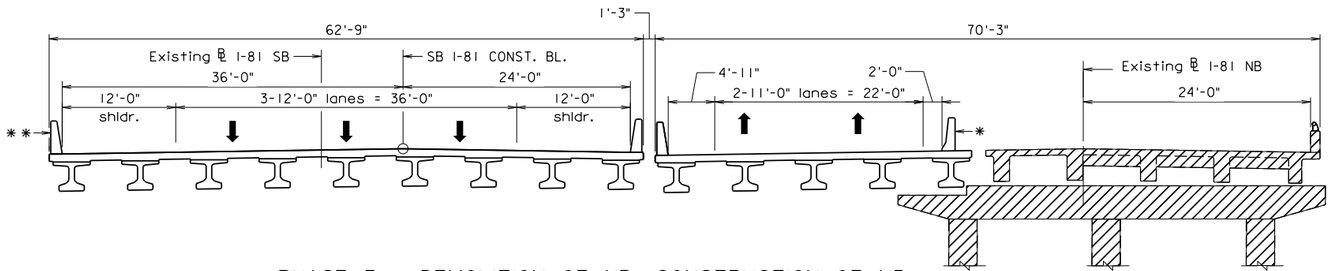


PHASE 1- PARTIAL DEOMLITION NB, PARTIAL NB CONSTRUCTION

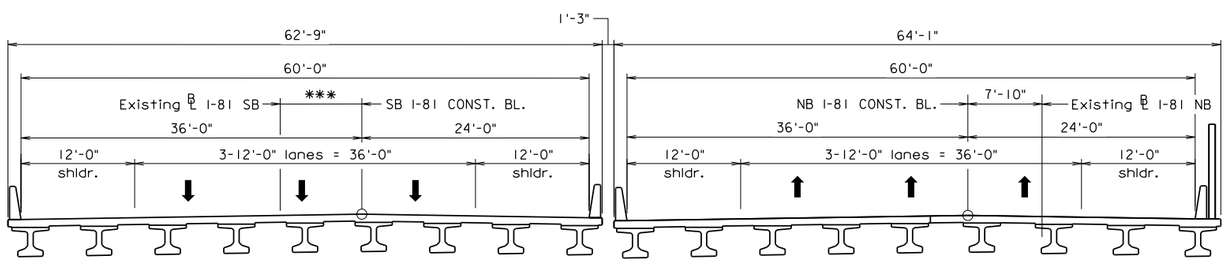


PHASE 2 - DEMOLITION OF SB, CONSTRUCTION OF SB

BENEFIT:
Bridge sequencing accomodates temporary spread without additional phases or construction



PHASE 3 - DEMOLITION OF NB, CONSTRUCTION OF NB



FINAL

Scale: ⅛" = 1'-0"

NOTES:
* MB-10A temporary barrier service
** VDOT Standard SSCP-1 parapet
*** Varies from 8'-5⅛": to 8'-10½":
CJ: Construction Joint
Limits of existing structure removal

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 635 (GOODWIN AVE.)

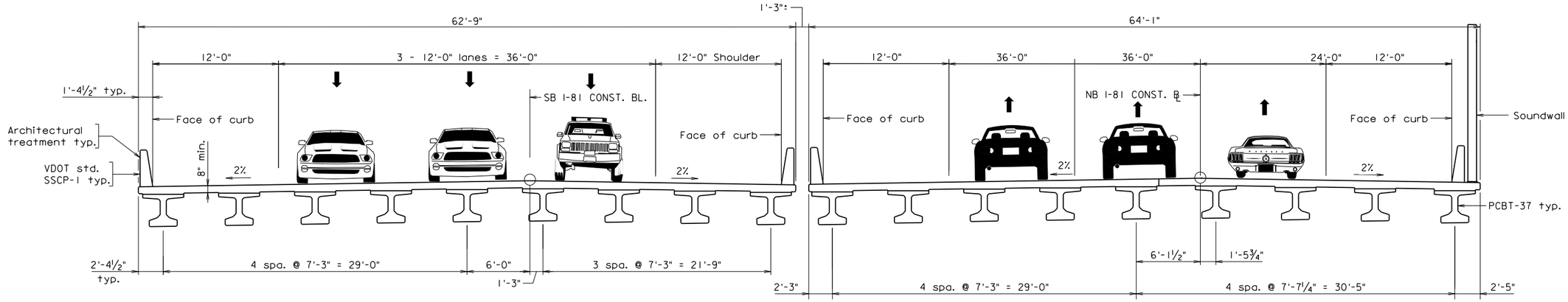
SEQUENCE OF CONSTRUCTION

SHEET NUMBER
3 OF 4

PAGE NUMBER
94

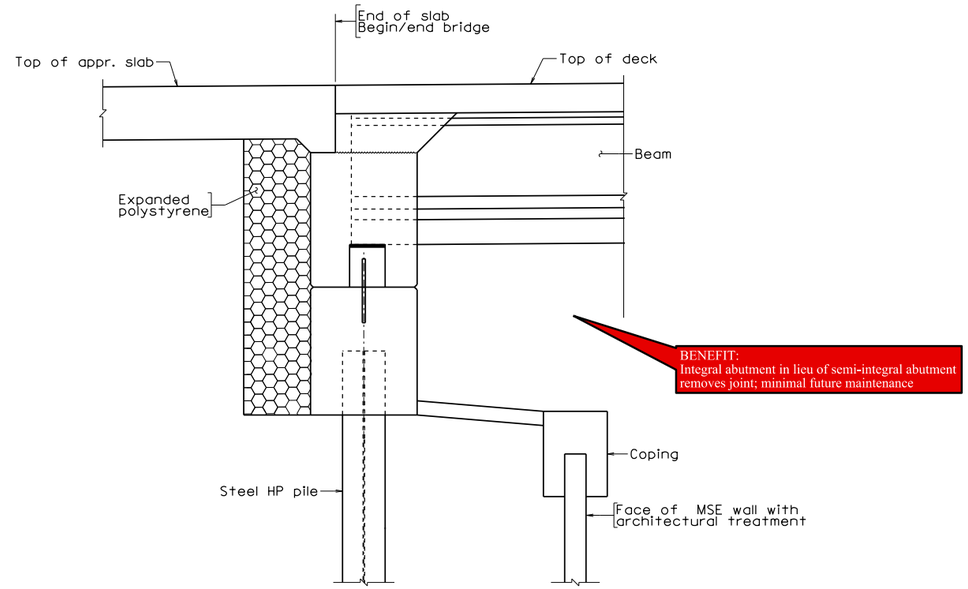
3/1/2021

CONCEPTUAL BRIDGE PLANS



BENEFIT:
Concrete beams reduce long-term maintenance costs and optimize consturction schedule

TRANSVERSE SECTION



ABUTMENT TYPICAL SECTION

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

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 635 (GOODWIN AVE.)

TRANSVERSE SECTION

3/1/2021

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

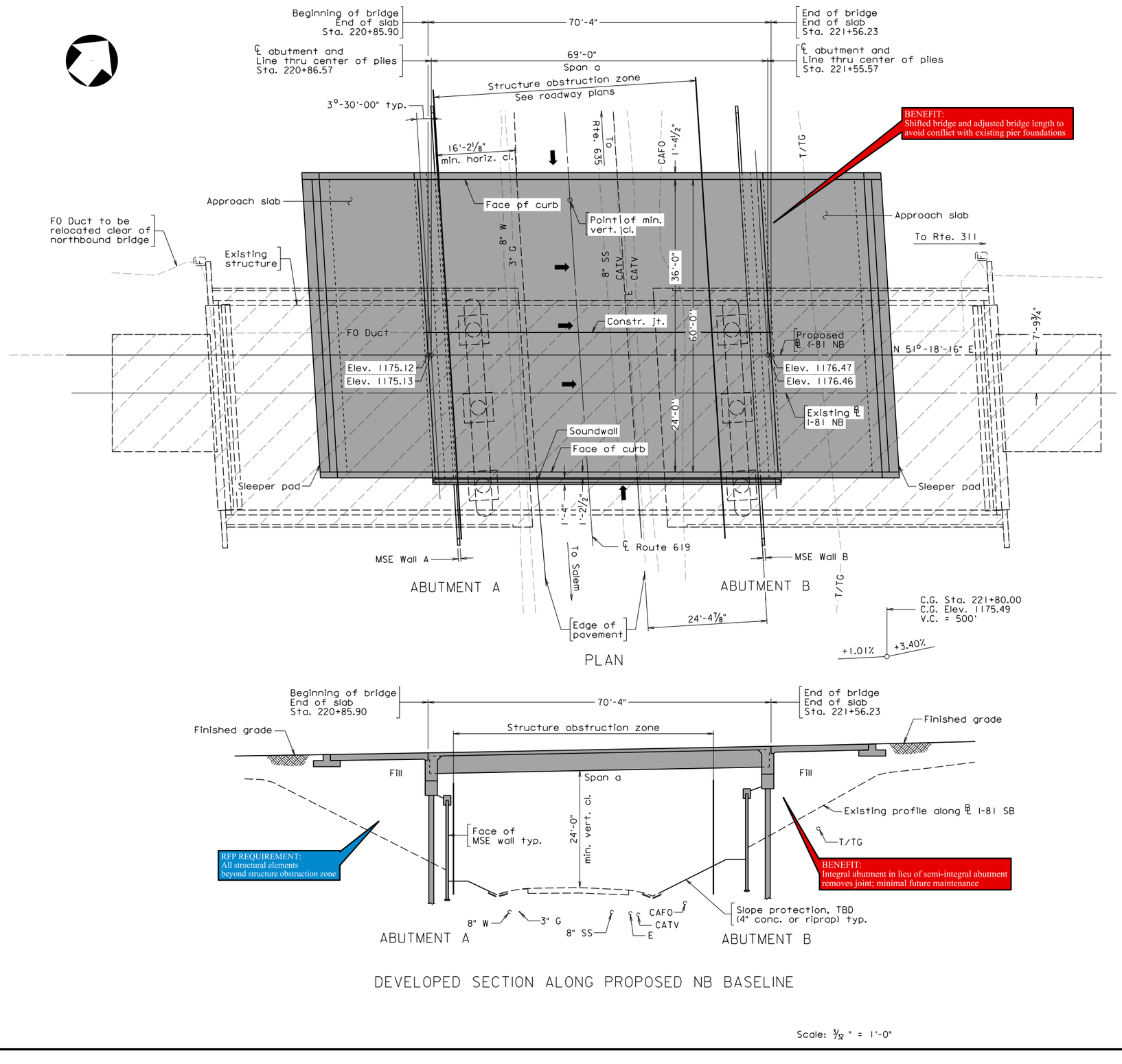
I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

SHEET NUMBER
4 OF 4

PAGE NUMBER
95

CONCEPTUAL BRIDGE PLANS



DEVELOPED SECTION ALONG PROPOSED NB BASELINE

Scale: 3/32 " = 1'-0"

GENERAL NOTES:

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

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

Span layout: 70'-4" prestressed concrete span.

Capacity: HL-93 loading

Specifications:

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

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2020; and VDOT Modifications.

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

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

Drystack architectural treatment shall be placed on exterior face of parapets, wingwalls, abutments and retaining walls.

Concrete in superstructure, parapets, integral backwalls, and terminal walls shall be Low Shrinkage Class A4 Modified; in abutments, Class A3.

Prestressed concrete in Beams shall be Class A5 having a minimum compressive cylinder strength at 28 days equal to 8,000 psi and a minimum compressive cylinder strength at time of release of strands equal to 6,400 psi.

All reinforcing steel shall be deformed and shall conform to ASTM A615 Grade 60 except for steels noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications.

Prestressing strands shall be uncoated, seven-wire, low-relaxation steel strands conforming to ASTM A416 Grade 270.

All H-Piles shall be ASTM A709 Grade 50 steel. H-Piles shall be driven to practical refusal and to the required nominal axial resistance.

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 619 (WILDWOOD ROAD.)

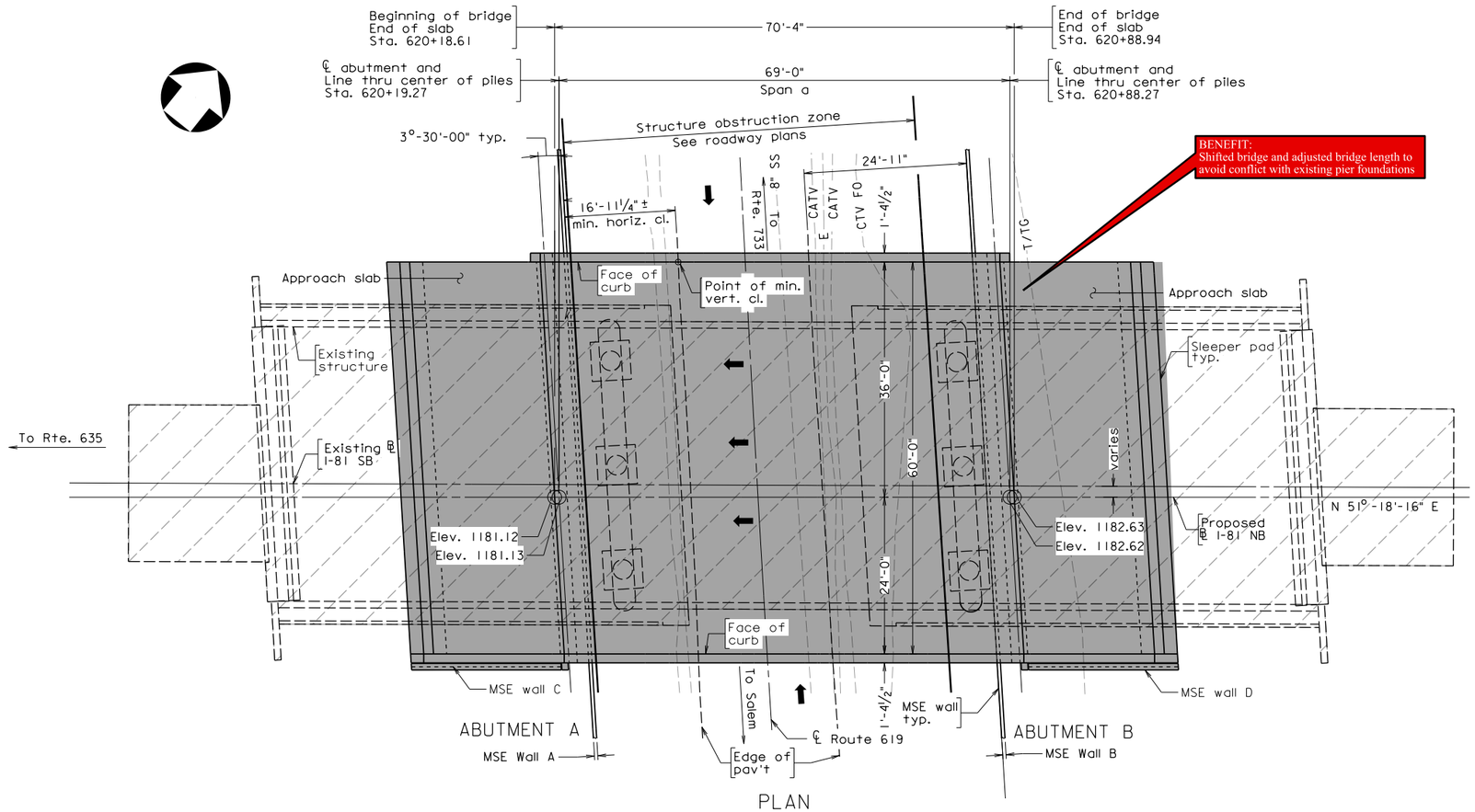
GENERAL PLAN AND ELEVATION
NBL

SHEET NUMBER
1 OF 4

PAGE NUMBER
96

3/1/2021

CONCEPTUAL BRIDGE PLANS



Scale: 3/32 " = 1'-0"

GENERAL NOTES:

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

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

Span layout: 70'-4" prestressed concrete span.

Capacity: HL-93 loading

Specifications:

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

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2020; and VDOT Modifications.

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

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

Drystack architectural treatment shall be placed on exterior face of parapets, wingwalls, abutments and retaining walls.

Concrete in superstructure, parapets, integral backwalls, and terminalwalls shall be Low Shrinkage Class A4 Modified; in abutments,Class A3.

Prestressed concrete in Beams shall be Class A5 having a minimum compressive cylinder strength at 28 days equal to 6,000 psi and a minimum compressive cylinder strength at time of release of strands equal to 4,800 psi.

All reinforcing steel shall be deformed and shall conform to ASTM A615 Grade 60 except for steels noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications.

Prestressing strands shall be uncoated, seven-wire, low-relaxation steel strands conforming to ASTM A416 Grade 270.

All H-Piles shall be ASTM A709 Grade 50 steel. H-Piles shall be driven to practical refusal and to the required nominal axial resistance.

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B683,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 619 (WILDWOOD ROAD.)

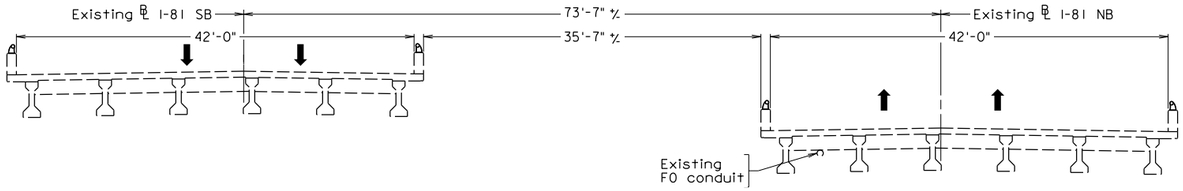
GENERAL PLAN AND ELEVATION SBL

SHEET NUMBER
2 OF 4

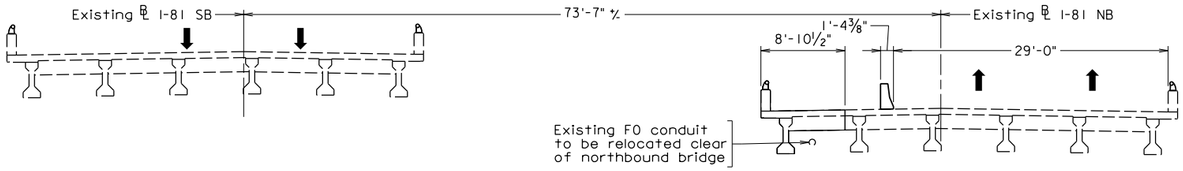
PAGE NUMBER
97

3/1/2021

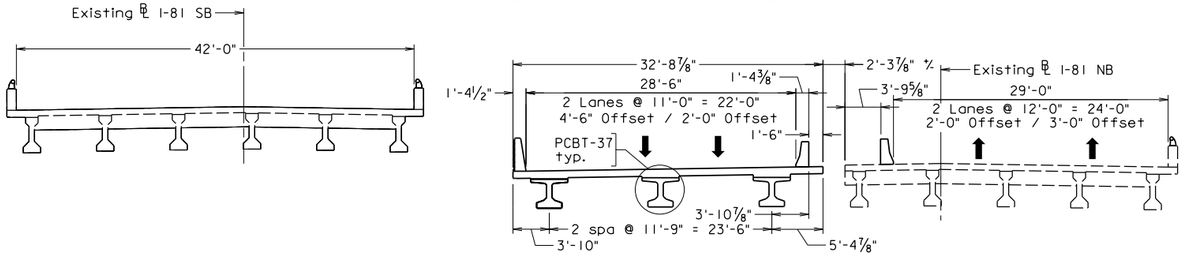
CONCEPTUAL BRIDGE PLANS



PHASE 0 - EXISTING STRUCTURES

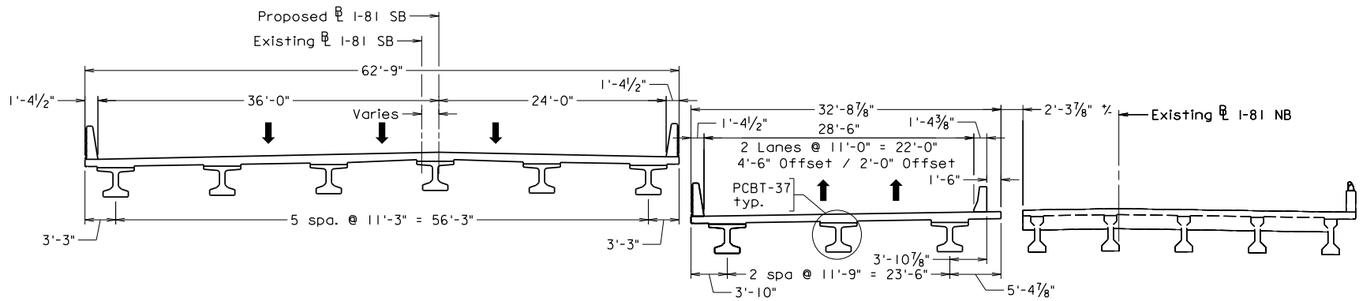


PHASE 1 - PARTIAL DEMOLITION NB, PARTIAL NB CONSTRUCTION

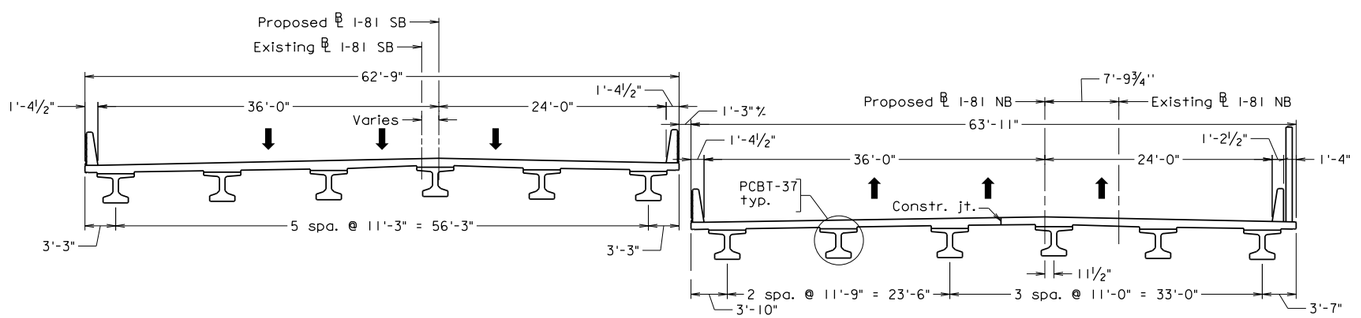


PHASE 2 - DEMOLITION OF SB AND CONSTRUCTION OF SB

BENEFIT:
Bridge sequencing accomodates temporary spread without additional phases or construction



PHASE 3 - DEMOLITION OF NB, CONSTRUCTION OF NB



FINAL

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

Legend:

- Denotes limits of removal
- New Bridge
- Existing Bridge

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 619 (WILDWOOD ROAD.)

SEQUENCE OF CONSTRUCTION

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

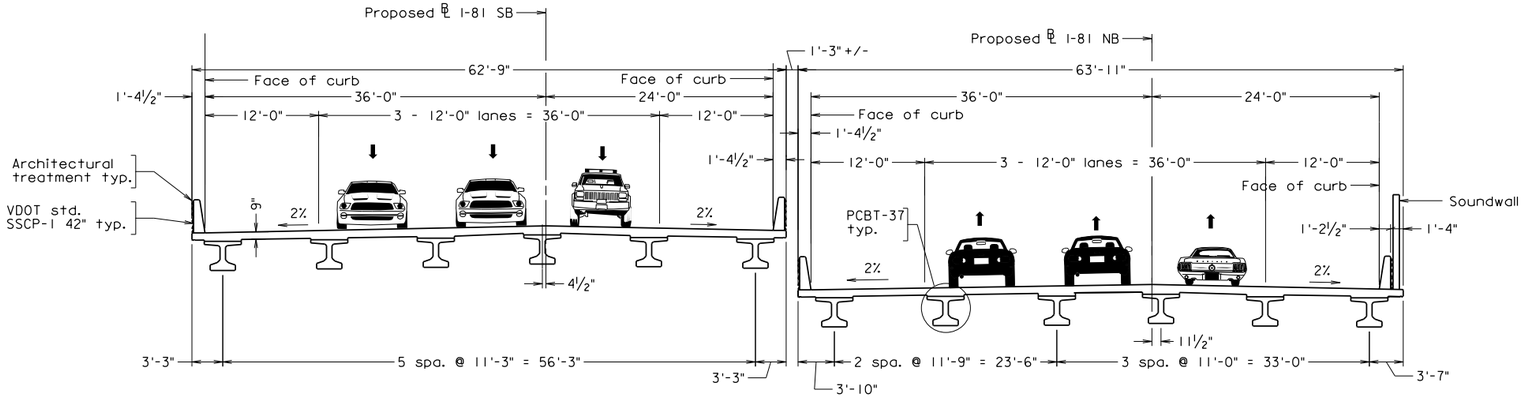
DESIGN-BUILD PROJECT

SHEET NUMBER
3 OF 4

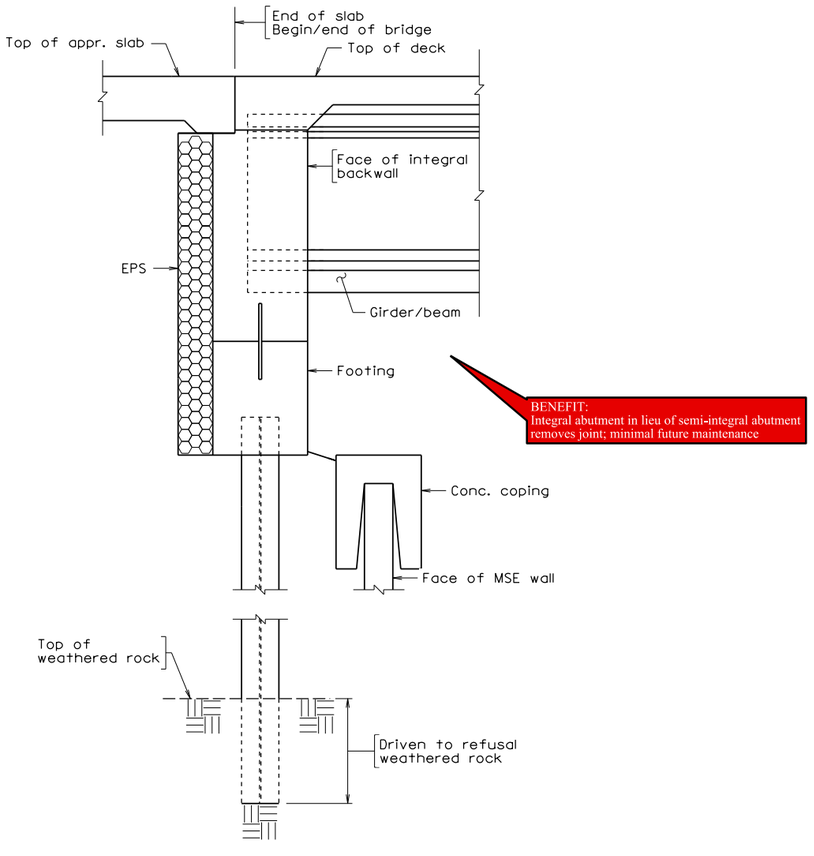
PAGE NUMBER
98

3/1/2021

CONCEPTUAL BRIDGE PLANS



TRANSVERSE SECTION



TYPICAL ABUTMENT SECTION

Scale: ½" = 1'-0"

Scale: ⅛" = 1'-0" unless otherwise noted

3/1/2021

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

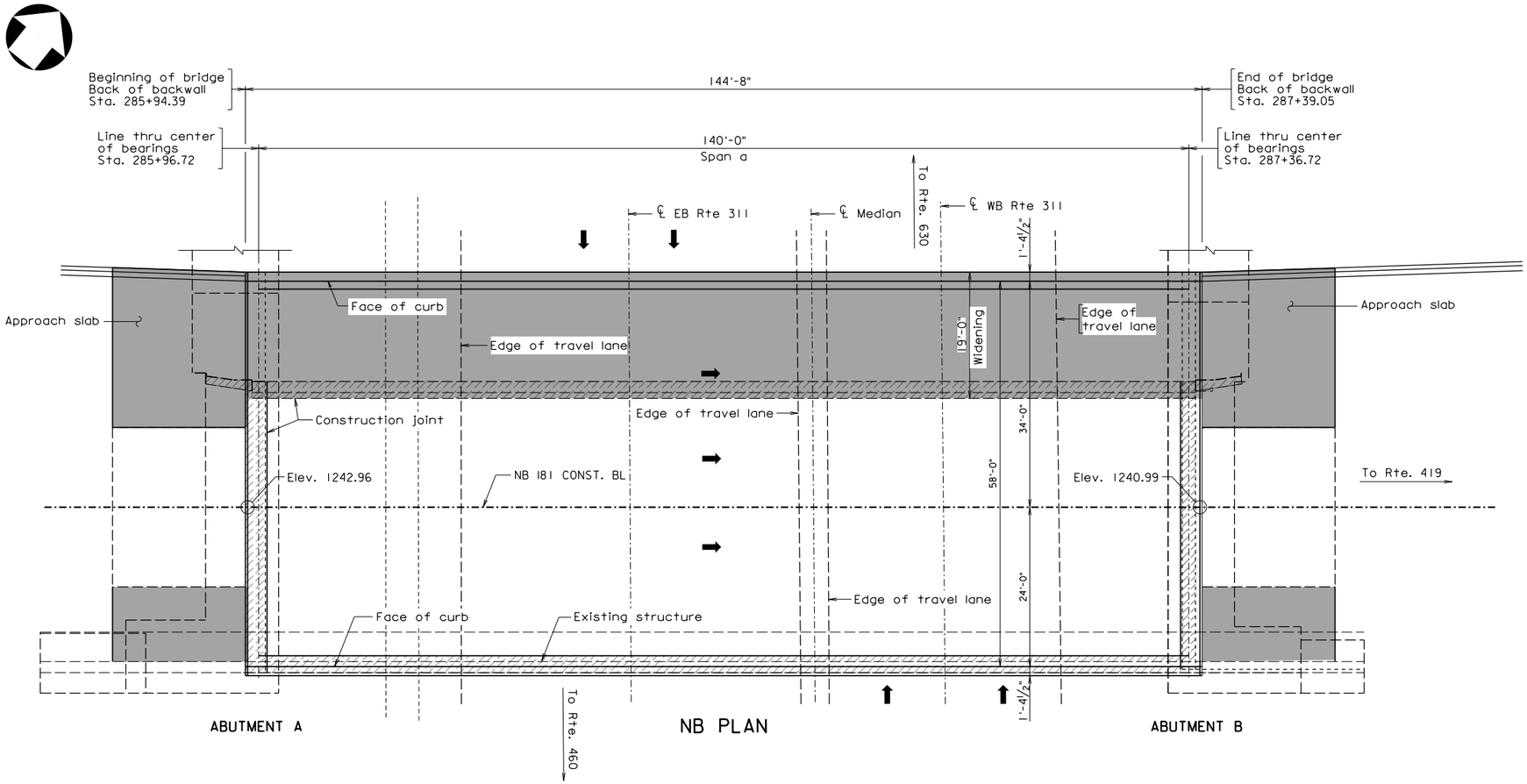
PROPOSED BRIDGE REPLACEMENT ON I-81 NB AND SB OVER ROUTE 619 (WILDWOOD ROAD.)

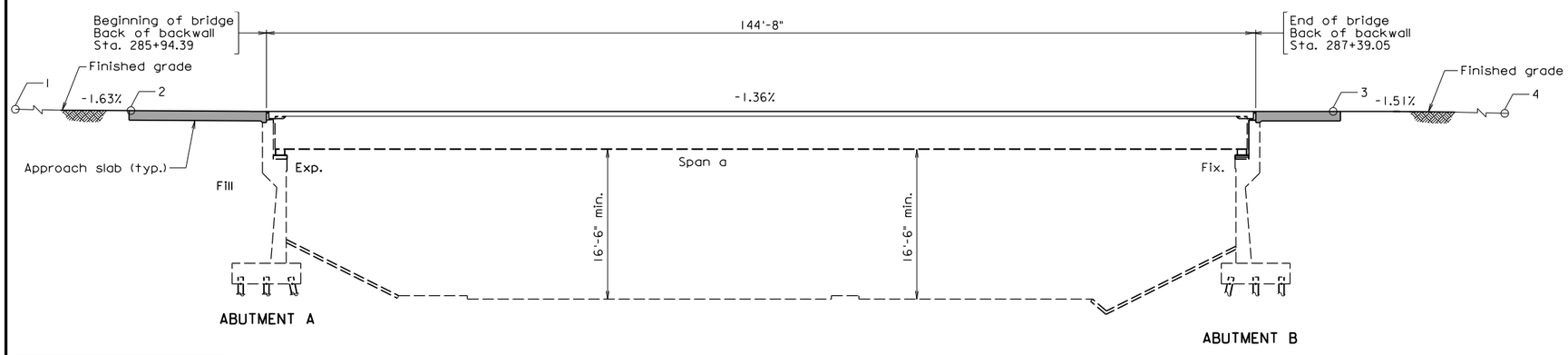
TRANSVERSE SECTION AND DETAILS

SHEET NUMBER
4 OF 4

PAGE NUMBER
99

CONCEPTUAL BRIDGE PLANS





VPI No.	STA.	ELEV.
1	285+50	1243.63
2	285+75	1243.22
3	287+50	1240.83
4	287+75	1240.46

DEVELOPED SECTION ALONG PROPOSED NB 181 CONST. BL

Scale: 1" = 10'

GENERAL NOTES:

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

Width: 58'-0" face-to-face of curbs. (NB), includes 19'-0" widening on the left of traffic.
70'-0" face-to-face of curbs. (SB), includes 7'-5" widening on the left of traffic and 15'-4½" widening on the right of traffic.

Span layout: 144'-8" (NB) steel plate girder
144'-8" (SB) steel plate girder

Capacity: HL-93 loading (widened portion only).

Specifications:

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

Design: AASHTO LRFD Bridge Design Specifications, 8th Edition, 2020; and VDOT Modifications.

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

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

Bridge No. of existing bridge is 2015 (NB) and 2014 (SB).
Plan No. is 257-79.

Limits of existing structure removal

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE WIDENING ON I-81 NB AND SB OVER ROUTE 311 (THOMPSON MEMORIAL DRIVE)

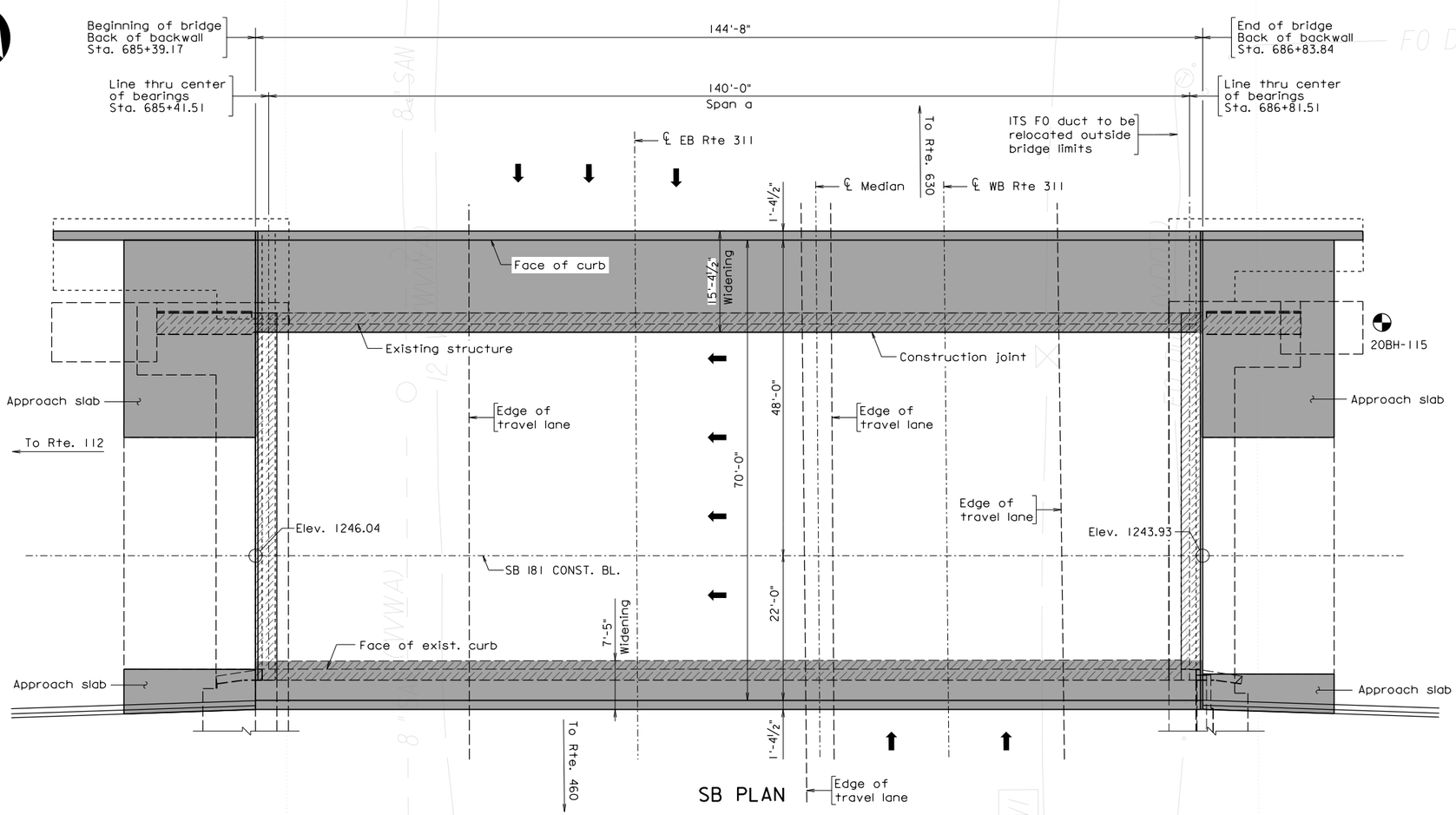
GENERAL PLAN AND ELEVATION NBL

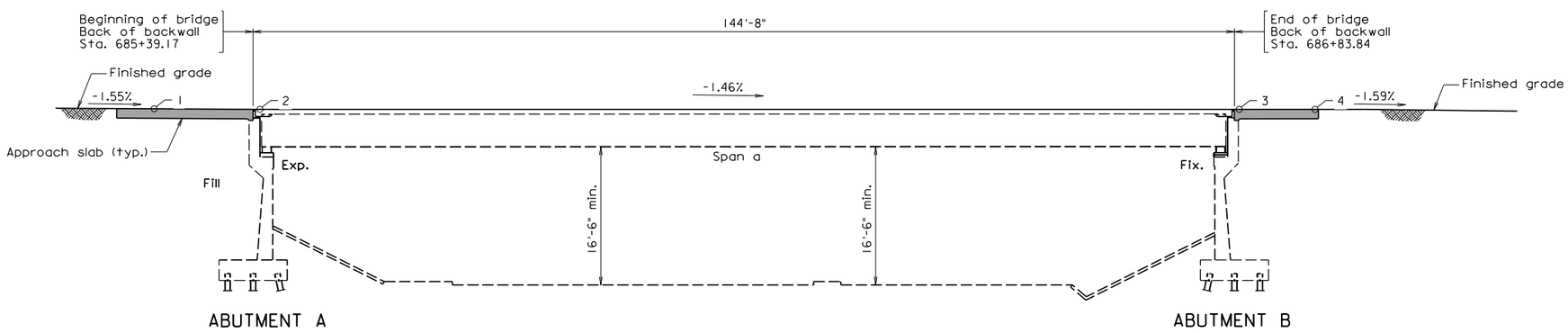
SHEET NUMBER
1 OF 4

PAGE NUMBER
100

3/1/2021

CONCEPTUAL BRIDGE PLANS





DEVELOPED SECTION ALONG PROPOSED ℄ I-81 SB

VPI No.	STA.	ELEV.
1	685+25	1246.25
2	685+40.51	1246.02
3	686+84.51	1243.92
4	687+00	1243.70

Limits of existing structure removal

Denotes approximate boring location using RFP geotechnical information

Scale: 1" = 10'

3/1/2021

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
B682, B683, B684,
B685, B686, B687,
B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

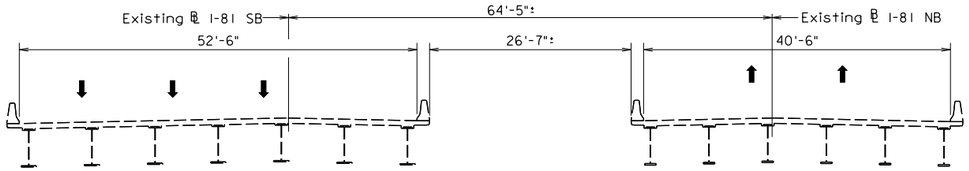
PROPOSED BRIDGE WIDENING ON I-81 NB AND SB OVER ROUTE 311 (THOMPSON MEMORIAL DRIVE)

SBL GENERAL PLAN AND ELEVATION

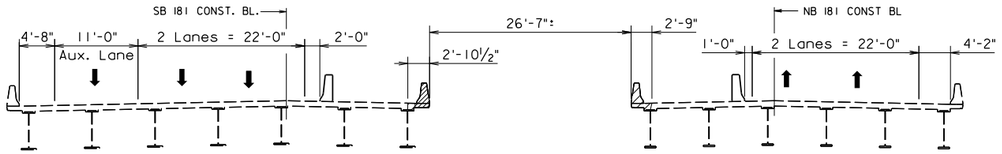
SHEET NUMBER
2 OF 4

PAGE NUMBER
101

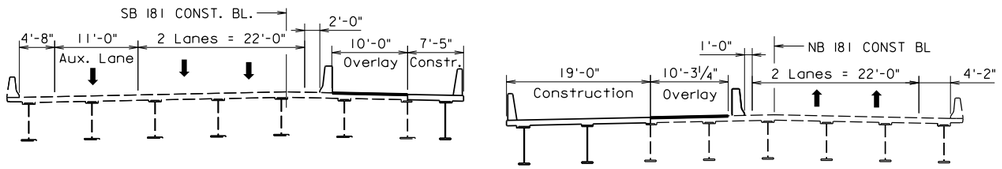
CONCEPTUAL BRIDGE PLANS



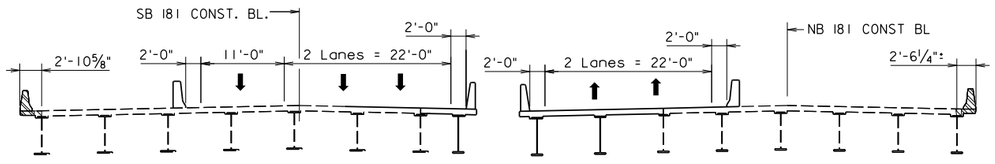
EXISTING TRANSVERSE SECTION



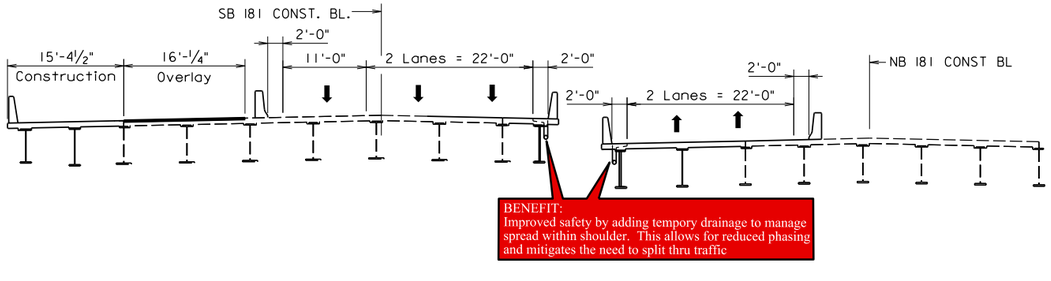
PHASE 1 DEMOLITION



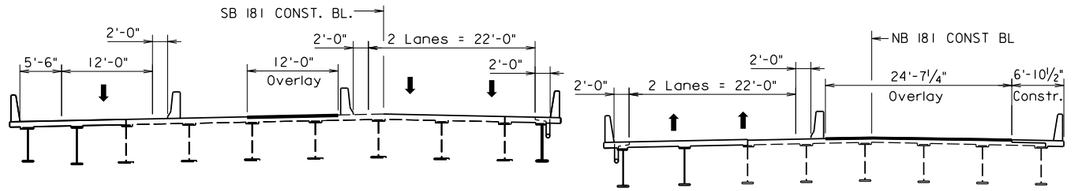
PHASE 1 CONSTRUCTION, JOINT CONSTRUCTION, OVERLAY



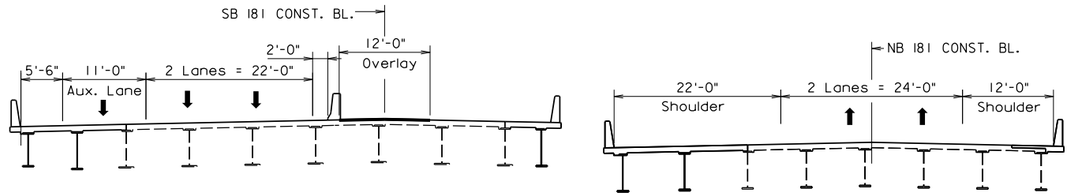
PHASE 2 DEMOLITION



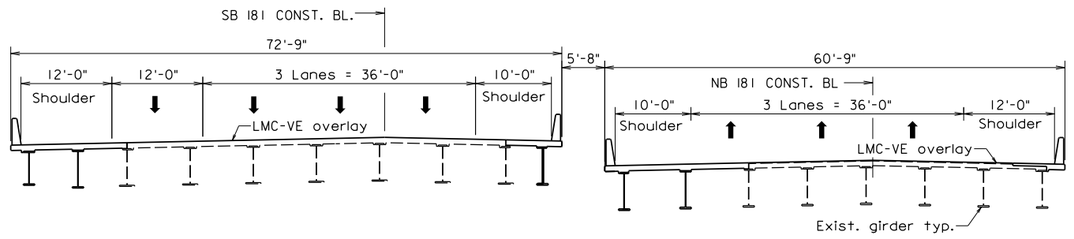
PHASE 2 CONSTRUCTION



PHASE 2A CONSTRUCTION, JOINT CONSTRUCTION, OVERLAY



PHASE 2B JOINT CONSTRUCTION, OVERLAY



FINAL

3/1/2021

Scale: 1" = 10'

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B683,
B682, B683, B684,
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B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY

DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

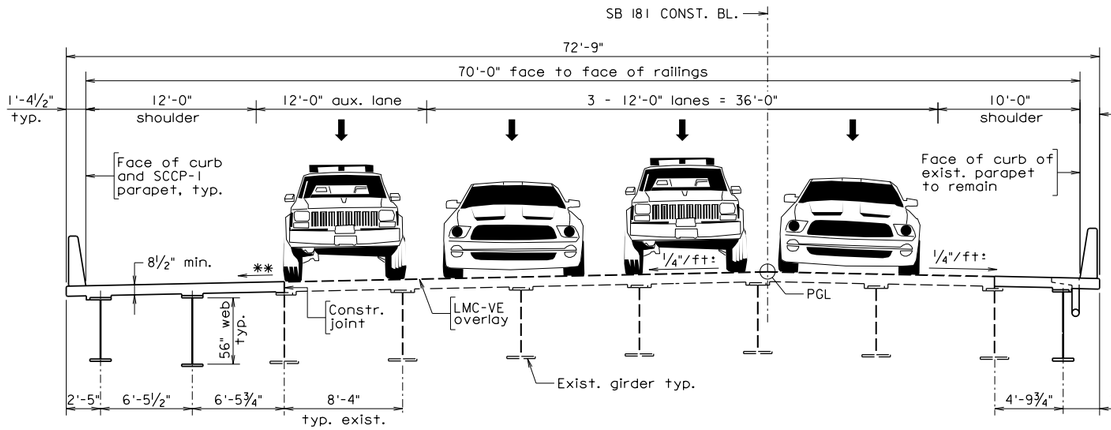
PROPOSED BRIDGE WIDENING ON I-81 NB AND SB OVER ROUTE 311 (THOMPSON MEMORIAL DRIVE)

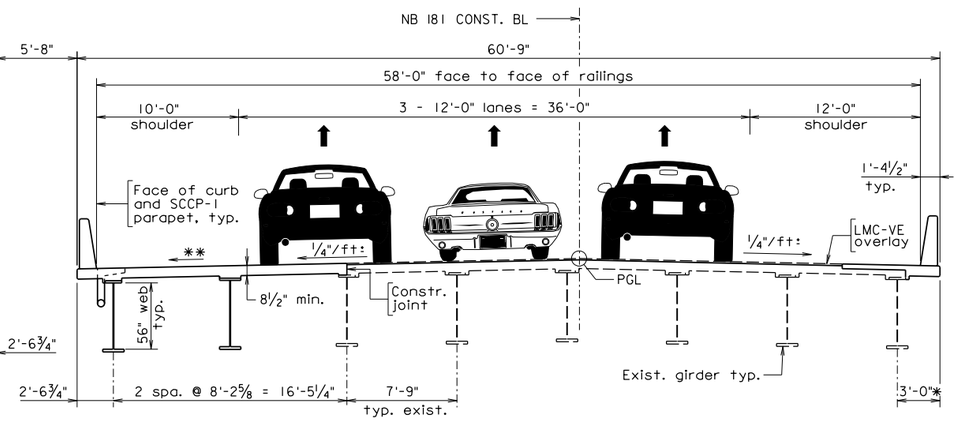
SEQUENCE OF CONSTRUCTION

SHEET NUMBER
3 OF 4

PAGE NUMBER
102

CONCEPTUAL BRIDGE PLANS



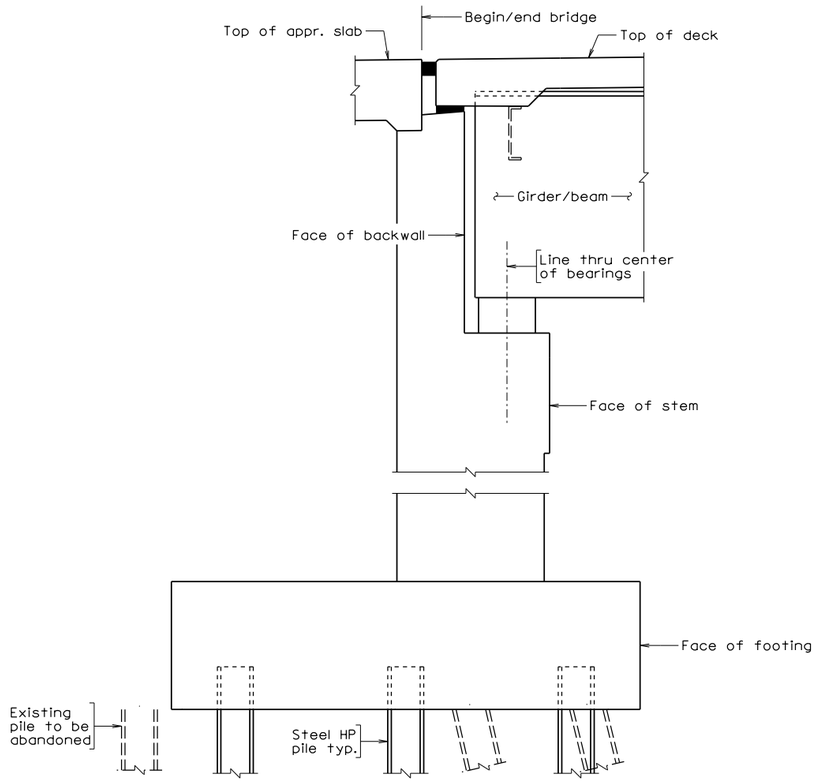


RFP REQUIREMENT:
ATC 02 required for reduction in beam depth.
16'-6" min. clearance provided over Rte. 311.

TRANSVERSE SECTION

* 3'-0" overhang includes 2" Architectural treatment as required in RFP.

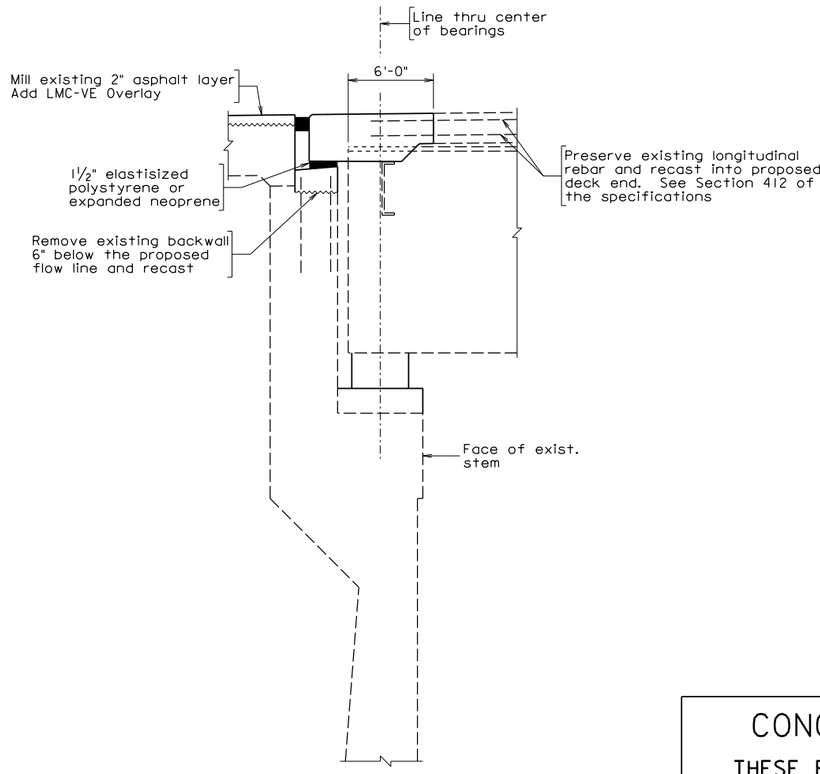
** Match existing slope



TYPICAL NEW ABUTMENT SECTION

Section shown for Abutment A; Abutment B is similiar

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



TYPICAL EXISTING ABUTMENT BUILT UP SECTION

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

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

3/1/2021

DESIGN - BUILD TEAM

CORMAN KOKOSING

LANE

DESIGN TEAM

rda

WSP

STATE PROJECT NUMBERS

0081-080-946
R201, P101, C501,
B677, B678, B681,
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B688

VDOT VIRGINIA DEPARTMENT OF TRANSPORTATION

I-81 WIDENING MM 136.6 TO MM 141.8
ROANOKE COUNTY
DESIGN-BUILD PROJECT

CONCEPT PLANS

THESE PLANS ARE NOT TO BE USED FOR CONSTRUCTION

PROPOSED BRIDGE WIDENING ON I-81 NB AND SB OVER ROUTE 311 (THOMPSON MEMORIAL DRIVE)

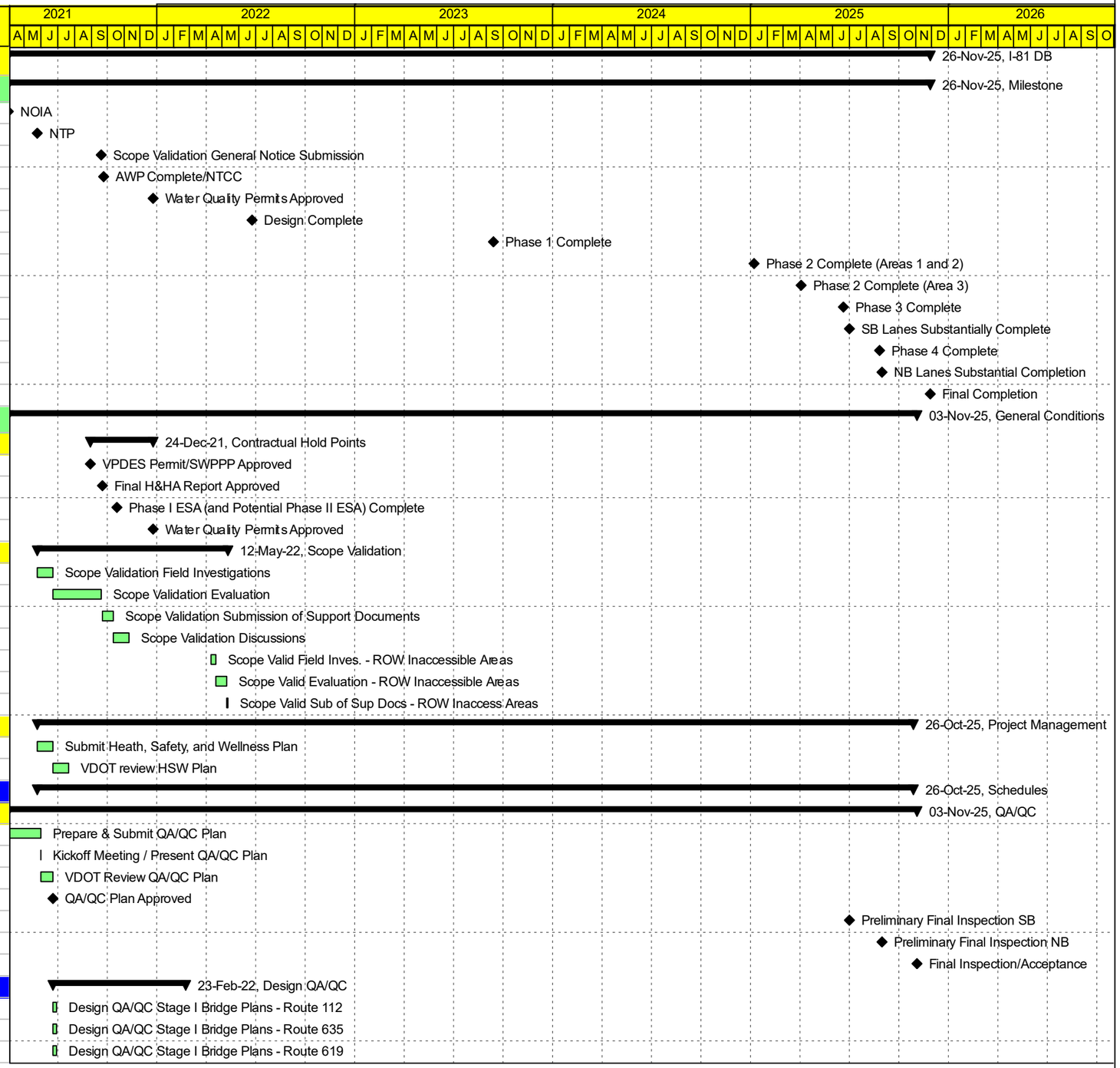
TRANSVERSE SECTION

SHEET NUMBER 4 OF 4

PAGE NUMBER 103

4.6.1 PROPOSAL SCHEDULE

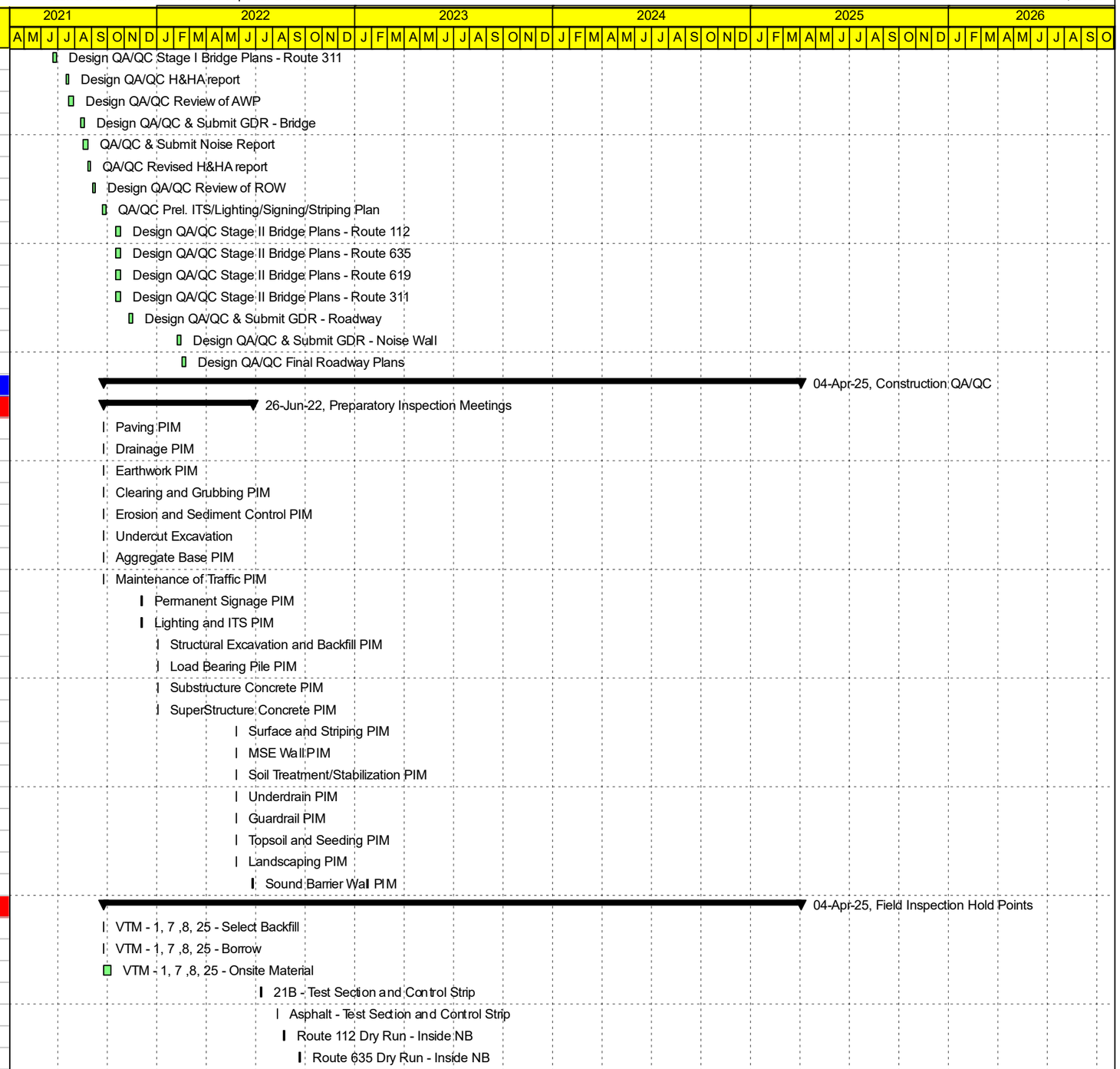
Activity ID	Activity Name	Original Duration	Start	Finish
I-81 DB		1449	01-Apr-21	26-Nov-25
Milestone		1449	01-Apr-21	26-Nov-25
A1000	NOIA	0	01-Apr-21	
A1010	NTP	0	24-May-21*	
A1015	Scope Validation General Notice Submission	0		20-Sep-21
A5270	AWP Complete/NTCC	0	23-Sep-21	
A5290	Water Quality Permits Approved	0		24-Dec-21
A5280	Design Complete	0		25-Jun-22
A1810	Phase 1 Complete	0		13-Sep-23
A1890	Phase 2 Complete (Areas 1 and 2)	0		07-Jan-25
A7520	Phase 2 Complete (Area 3)	0		04-Apr-25
A1900	Phase 3 Complete	0		19-Jun-25
A7470	SB Lanes Substantially Complete	0		02-Jul-25
A1910	Phase 4 Complete	0		26-Aug-25
A1160	NB Lanes Substantial Completion	0		29-Aug-25
A4460	Final Completion	0		26-Nov-25
General Conditions		1426	01-Apr-21	03-Nov-25
Contractual Hold Points		89	31-Aug-21	24-Dec-21
A6590	VPDES Permit/SWPPP Approved	0		31-Aug-21
A7540	Final H&HA Report Approved	0		21-Sep-21
A7530	Phase I ESA (and Potential Phase II ESA) Complete	0		19-Oct-21
A6580	Water Quality Permits Approved	0		24-Dec-21
Scope Validation		354	24-May-21	12-May-22
8	Scope Validation Field Investigations	30	24-May-21	22-Jun-21
9	Scope Validation Evaluation	90	23-Jun-21	20-Sep-21
10	Scope Validation Submission of Support Documents	21	21-Sep-21	11-Oct-21
11	Scope Validation Discussions	30	12-Oct-21	10-Nov-21
2812	Scope Valid Field Inves. - ROW Inaccessible Areas	10	10-Apr-22	19-Apr-22
2822	Scope Valid Evaluation - ROW Inaccessible Areas	20	20-Apr-22	09-May-22
2832	Scope Valid Sub of Sup Docs - ROW Inaccess Areas	3	10-May-22	12-May-22
Project Management		1617	24-May-21	26-Oct-25
2612	Submit Heath, Safety, and Wellness Plan	30	24-May-21	22-Jun-21
2622	VDOT review HSW Plan	28	23-Jun-21	20-Jul-21
Schedules		1617	24-May-21	26-Oct-25
QA/QC		1426	01-Apr-21	03-Nov-25
3	Prepare & Submit QA/QC Plan	60	01-Apr-21	30-May-21
4	Kickoff Meeting / Present QA/QC Plan	1	31-May-21	31-May-21
5	VDOT Review QA/QC Plan	21	31-May-21	23-Jun-21
6	QA/QC Plan Approved	0	23-Jun-21	
2843	Preliminary Final Inspection SB	0		02-Jul-25
2842	Preliminary Final Inspection NB	0		29-Aug-25
2853	Final Inspection/Acceptance	0		03-Nov-25
Design QA/QC		247	22-Jun-21	23-Feb-22
131	Design QA/QC Stage I Bridge Plans - Route 112	7	22-Jun-21	28-Jun-21
143	Design QA/QC Stage I Bridge Plans - Route 635	7	22-Jun-21	28-Jun-21
155	Design QA/QC Stage I Bridge Plans - Route 619	7	22-Jun-21	28-Jun-21



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

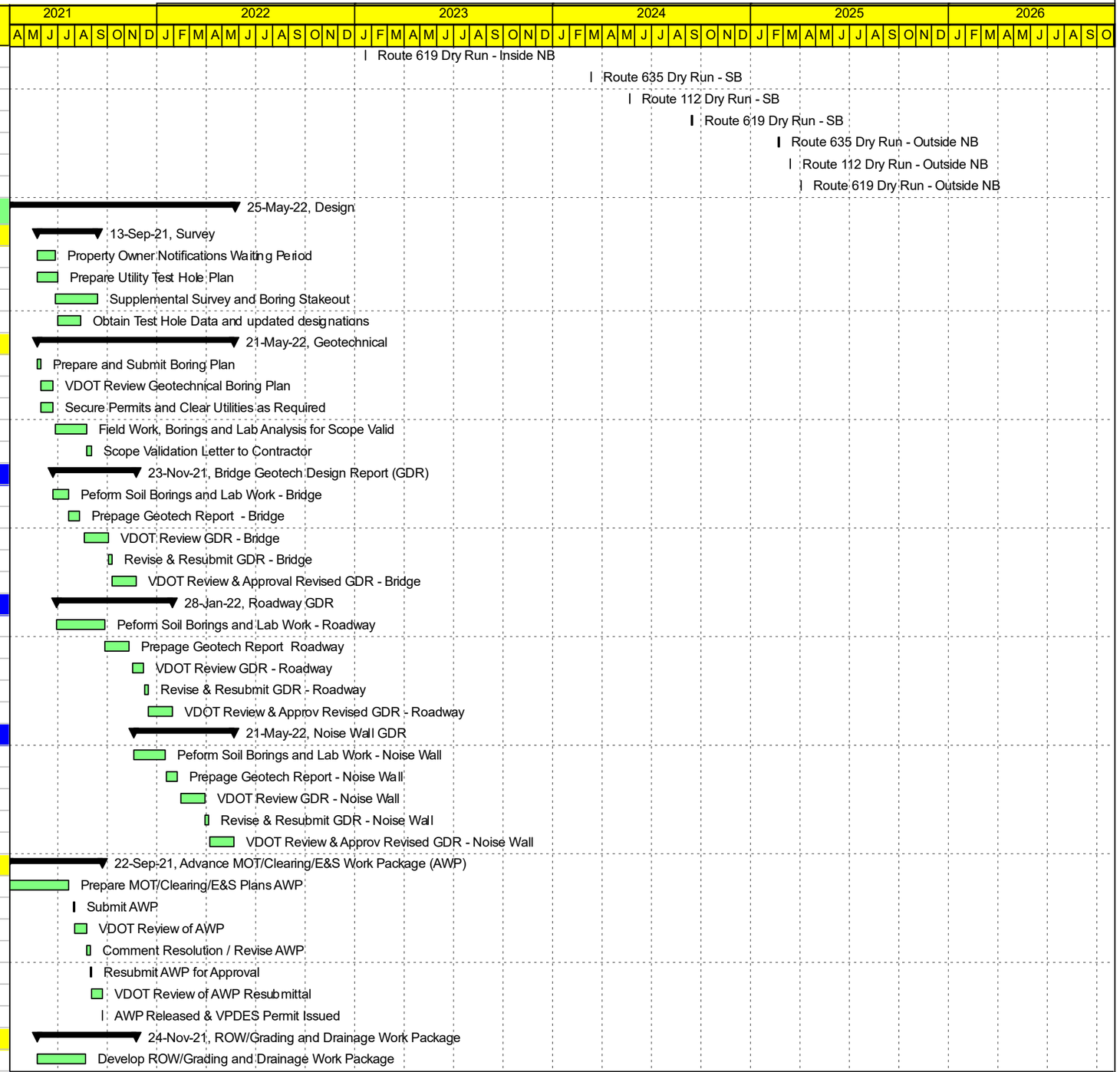
Activity ID	Activity Name	Original Duration	Start	Finish
167	Design QA/QC Stage I Bridge Plans - Route 311	7	22-Jun-21	28-Jun-21
2682	Design QA/QC H&HA report	5	18-Jul-21	22-Jul-21
89	Design QA/QC Review of AWP	7	22-Jul-21	29-Jul-21
26	Design QA/QC & Submit GDR - Bridge	7	12-Aug-21	18-Aug-21
47	QA/QC & Submit Noise Report	8	18-Aug-21	25-Aug-21
2692	QA/QC Revised H&HA report	5	27-Aug-21	31-Aug-21
98	Design QA/QC Review of ROW	5	05-Sep-21	09-Sep-21
179	QA/QC Prel. ITS/Lighting/Signing/Striping Plan	7	22-Sep-21	28-Sep-21
136	Design QA/QC Stage II Bridge Plans - Route 112	10	15-Oct-21	25-Oct-21
148	Design QA/QC Stage II Bridge Plans - Route 635	10	15-Oct-21	25-Oct-21
160	Design QA/QC Stage II Bridge Plans - Route 619	10	15-Oct-21	25-Oct-21
172	Design QA/QC Stage II Bridge Plans - Route 311	10	15-Oct-21	25-Oct-21
33	Design QA/QC & Submit GDR - Roadway	7	10-Nov-21	16-Nov-21
40	Design QA/QC & Submit GDR - Noise Wall	7	07-Feb-22	13-Feb-22
187	Design QA/QC Final Roadway Plans	7	16-Feb-22	23-Feb-22
Construction QA/QC		1289	23-Sep-21	04-Apr-25
Preparatory Inspection Meetings		276	23-Sep-21	26-Jun-22
1852	Paving PIM	1	23-Sep-21	23-Sep-21
2152	Drainage PIM	1	23-Sep-21	23-Sep-21
2162	Earthwork PIM	1	23-Sep-21	23-Sep-21
2182	Clearing and Grubbing PIM	1	23-Sep-21	23-Sep-21
2242	Erosion and Sediment Control PIM	1	23-Sep-21	23-Sep-21
2252	Undercut Excavation	1	23-Sep-21	23-Sep-21
2262	Aggregate Base PIM	1	23-Sep-21	23-Sep-21
2302	Maintenance of Traffic PIM	1	23-Sep-21	23-Sep-21
2342	Permanent Signage PIM	1	03-Dec-21	03-Dec-21
2352	Lighting and ITS PIM	1	03-Dec-21	03-Dec-21
2192	Structural Excavation and Backfill PIM	1	02-Jan-22	02-Jan-22
2212	Load Bearing Pile PIM	1	02-Jan-22	02-Jan-22
2222	Substructure Concrete PIM	1	02-Jan-22	02-Jan-22
2232	SuperStructure Concrete PIM	1	02-Jan-22	02-Jan-22
2142	Surface and Striping PIM	1	26-May-22	26-May-22
2202	MSE Wall PIM	1	26-May-22	26-May-22
2272	Soil Treatment/Stabilization PIM	1	26-May-22	26-May-22
2282	Underdrain PIM	1	26-May-22	26-May-22
2292	Guardrail PIM	1	26-May-22	26-May-22
2322	Topsoil and Seeding PIM	1	26-May-22	26-May-22
2332	Landscaping PIM	1	26-May-22	26-May-22
2312	Sound Barrier Wall PIM	1	25-Jun-22	26-Jun-22
Field Inspection Hold Points		1288	24-Sep-21	04-Apr-25
2722	VTM - 1, 7 ,8, 25 - Select Backfill	1	24-Sep-21	24-Sep-21
2732	VTM - 1, 7 ,8, 25 - Borrow	1	24-Sep-21	24-Sep-21
2742	VTM - 1, 7 ,8, 25 - Onsite Material	14	24-Sep-21	07-Oct-21
2702	21B - Test Section and Control Strip	1	11-Jul-22	12-Jul-22
2712	Asphalt - Test Section and Control Strip	1	10-Aug-22	10-Aug-22
2362	Route 112 Dry Run - Inside NB	1	22-Aug-22	23-Aug-22
2392	Route 635 Dry Run - Inside NB	1	20-Sep-22	21-Sep-22



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

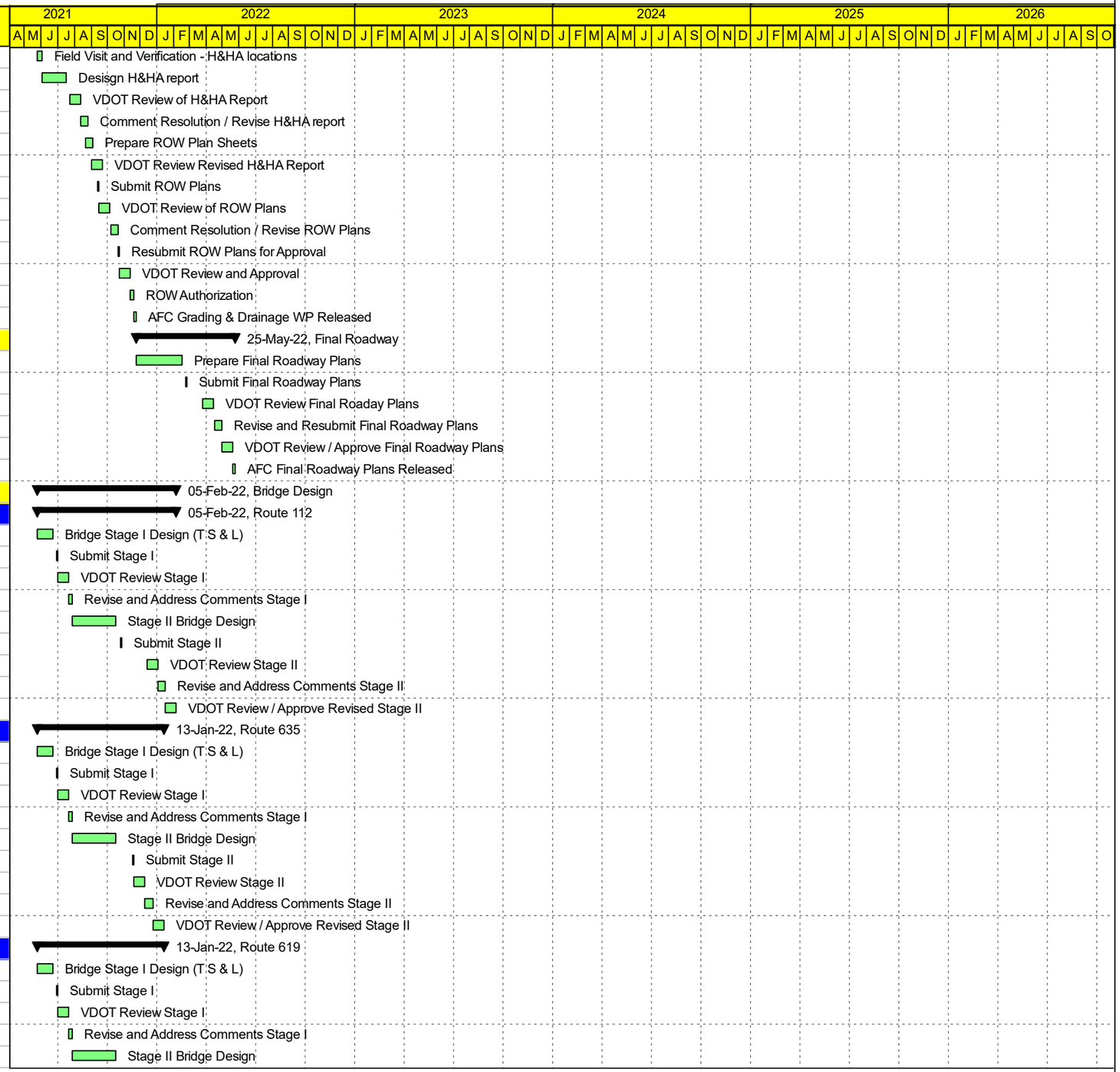
Activity ID	Activity Name	Original Duration	Start	Finish
2422	Route 619 Dry Run - Inside NB	1	19-Jan-23	20-Jan-23
2402	Route 635 Dry Run - SB	1	11-Mar-24	12-Mar-24
2372	Route 112 Dry Run - SB	1	21-May-24	22-May-24
2432	Route 619 Dry Run - SB	1	13-Sep-24	14-Sep-24
2412	Route 635 Dry Run - Outside NB	1	20-Feb-25	21-Feb-25
2382	Route 112 Dry Run - Outside NB	1	14-Mar-25	15-Mar-25
2442	Route 619 Dry Run - Outside NB	1	03-Apr-25	04-Apr-25
Design		316	01-Apr-21	25-May-22
Survey		84	24-May-21	13-Sep-21
13	Property Owner Notifications Waiting Period	35	24-May-21	27-Jun-21
15	Prepare Utility Test Hole Plan	36	25-May-21	02-Jul-21
14	Supplemental Survey and Boring Stakeout	67	28-Jun-21	13-Sep-21
16	Obtain Test Hole Data and updated designations	35	02-Jul-21	12-Aug-21
Geotechnical		275	24-May-21	21-May-22
18	Prepare and Submit Boring Plan	8	24-May-21	31-May-21
19	VDOT Review Geotechnical Boring Plan	21	01-Jun-21	21-Jun-21
20	Secure Permits and Clear Utilities as Required	21	01-Jun-21	21-Jun-21
21	Field Work, Borings and Lab Analysis for Scope Valid	49	28-Jun-21	23-Aug-21
22	Scope Validation Letter to Contractor	9	23-Aug-21	01-Sep-21
Bridge Geotech Design Report (GDR)		155	22-Jun-21	23-Nov-21
24	Peform Soil Borings and Lab Work - Bridge	30	22-Jun-21	21-Jul-21
25	Prepage Geotech Report - Bridge	21	22-Jul-21	11-Aug-21
27	VDOT Review GDR - Bridge	45	19-Aug-21	02-Oct-21
28	Revise & Resubmit GDR - Bridge	7	03-Oct-21	09-Oct-21
29	VDOT Review & Approval Revised GDR - Bridge	45	10-Oct-21	23-Nov-21
Roadway GDR		215	28-Jun-21	28-Jan-22
31	Peform Soil Borings and Lab Work - Roadway	90	28-Jun-21	25-Sep-21
32	Prepage Geotech Report Roadway	45	26-Sep-21	09-Nov-21
34	VDOT Review GDR - Roadway	21	17-Nov-21	07-Dec-21
35	Revise & Resubmit GDR - Roadway	7	08-Dec-21	14-Dec-21
36	VDOT Review & Approv Revised GDR - Roadway	45	15-Dec-21	28-Jan-22
Noise Wall GDR		185	18-Nov-21	21-May-22
38	Peform Soil Borings and Lab Work - Noise Wall	60	18-Nov-21	16-Jan-22
39	Prepage Geotech Report - Noise Wall	21	17-Jan-22	06-Feb-22
41	VDOT Review GDR - Noise Wall	45	14-Feb-22	30-Mar-22
42	Revise & Resubmit GDR - Noise Wall	7	31-Mar-22	06-Apr-22
43	VDOT Review & Approv Revised GDR - Noise Wall	45	07-Apr-22	21-May-22
Advance MOT/Clearing/E&S Work Package (AWP)		131	01-Apr-21	22-Sep-21
88	Prepare MOT/Clearing/E&S Plans AWP	98	01-Apr-21	22-Jul-21
90	Submit AWP	4	29-Jul-21	02-Aug-21
91	VDOT Review of AWP	21	02-Aug-21	23-Aug-21
92	Comment Resolution / Revise AWP	7	23-Aug-21	30-Aug-21
93	Resubmit AWP for Approval	2	30-Aug-21	01-Sep-21
2802	VDOT Review of AWP Resubmittal	21	01-Sep-21	21-Sep-21
94	AWP Released & VPDES Permit Issued	1	22-Sep-21	22-Sep-21
ROW/Grading and Drainage Work Package		185	24-May-21	24-Nov-21
96	Develop ROW/Grading and Drainage Work Package	90	24-May-21	21-Aug-21



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

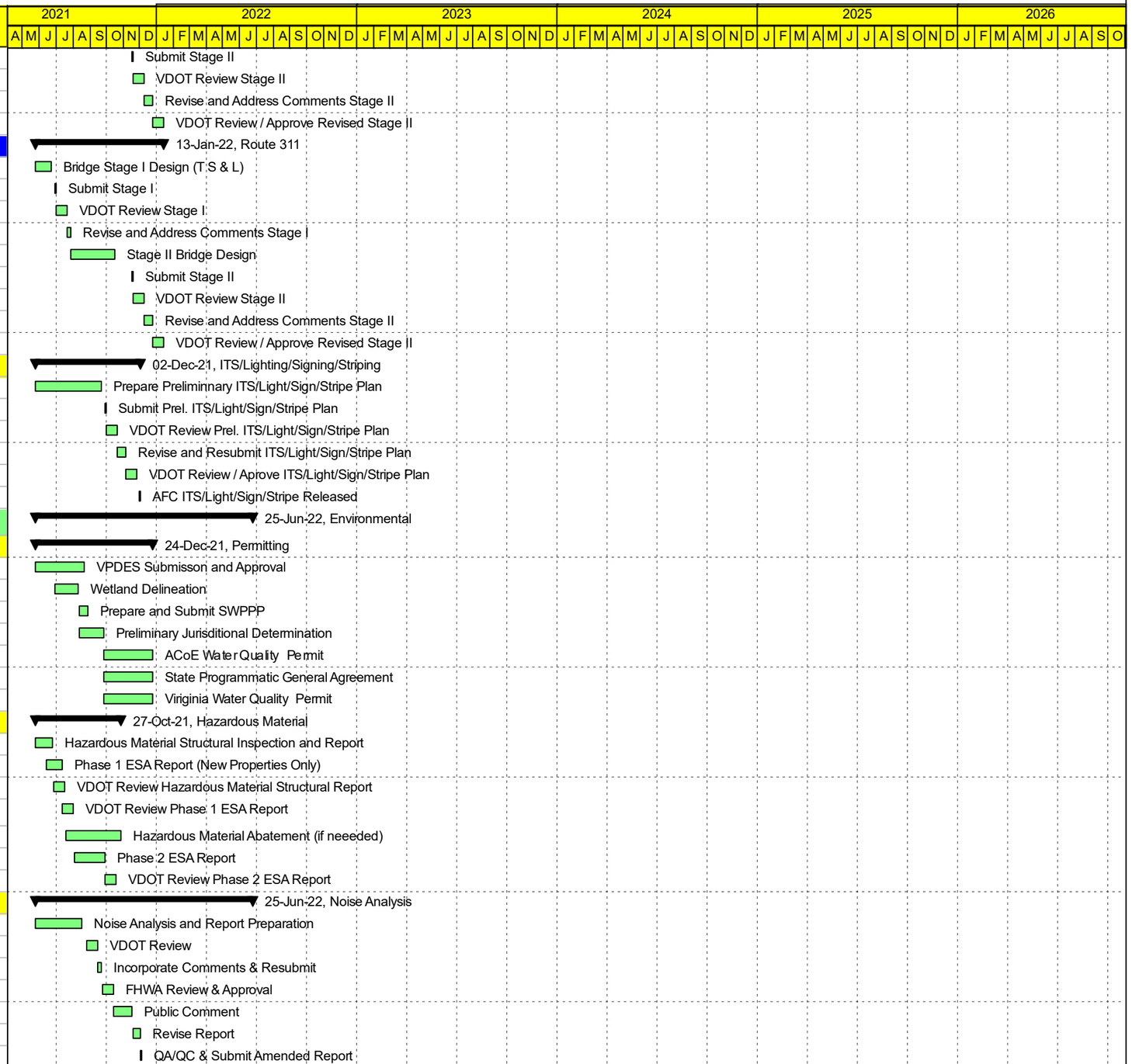
Activity ID	Activity Name	Original Duration	Start	Finish
2632	Field Visit and Verification - H&HA locations	10	24-May-21	02-Jun-21
2642	Desisgn H&HA report	45	03-Jun-21	17-Jul-21
2652	VDOT Review of H&HA Report	21	23-Jul-21	12-Aug-21
2662	Comment Resolution / Revise H&HA report	14	13-Aug-21	26-Aug-21
97	Prepare ROW Plan Sheets	14	22-Aug-21	04-Sep-21
2672	VDOT Review Revised H&HA Report	21	01-Sep-21	21-Sep-21
99	Submit ROW Plans	2	13-Sep-21	15-Sep-21
100	VDOT Review of ROW Plans	21	15-Sep-21	06-Oct-21
101	Comment Resolution / Revise ROW Plans	14	06-Oct-21	20-Oct-21
102	Resubmit ROW Plans for Approval	2	20-Oct-21	22-Oct-21
103	VDOT Review and Approval	21	22-Oct-21	12-Nov-21
104	ROW Authorization	7	12-Nov-21	19-Nov-21
105	AFC Grading & Drainage WP Released	5	19-Nov-21	24-Nov-21
Final Roadway		137	24-Nov-21	25-May-22
186	Prepare Final Roadway Plans	70	24-Nov-21	16-Feb-22
188	Submit Final Roadway Plans	2	23-Feb-22	25-Feb-22
189	VDOT Review Final Roaday Plans	21	26-Mar-22	15-Apr-22
190	Revise and Resubmit Final Roadway Plans	14	16-Apr-22	29-Apr-22
191	VDOT Review / Approve Final Roadway Plans	21	30-Apr-22	20-May-22
192	AFC Final Roadway Plans Released	5	21-May-22	25-May-22
Bridge Design		194	25-May-21	05-Feb-22
Route 112		194	25-May-21	05-Feb-22
130	Bridge Stage I Design (T S & L)	25	25-May-21	21-Jun-21
132	Submit Stage I	2	29-Jun-21	30-Jun-21
133	VDOT Review Stage I	21	30-Jun-21	21-Jul-21
134	Revise and Address Comments Stage I	7	21-Jul-21	28-Jul-21
135	Stage II Bridge Design	70	28-Jul-21	15-Oct-21
137	Submit Stage II	2	25-Oct-21	27-Oct-21
138	VDOT Review Stage II	21	12-Dec-21	01-Jan-22
139	Revise and Address Comments Stage II	14	02-Jan-22	15-Jan-22
140	VDOT Review / Approve Revised Stage II	21	16-Jan-22	05-Feb-22
Route 635		176	25-May-21	13-Jan-22
142	Bridge Stage I Design (T S & L)	25	25-May-21	21-Jun-21
144	Submit Stage I	2	29-Jun-21	30-Jun-21
145	VDOT Review Stage I	21	30-Jun-21	21-Jul-21
146	Revise and Address Comments Stage I	7	21-Jul-21	28-Jul-21
147	Stage II Bridge Design	70	28-Jul-21	15-Oct-21
149	Submit Stage II	2	17-Nov-21	18-Nov-21
150	VDOT Review Stage II	21	18-Nov-21	09-Dec-21
151	Revise and Address Comments Stage II	14	09-Dec-21	23-Dec-21
152	VDOT Review / Approve Revised Stage II	21	23-Dec-21	13-Jan-22
Route 619		176	25-May-21	13-Jan-22
154	Bridge Stage I Design (T S & L)	25	25-May-21	21-Jun-21
156	Submit Stage I	2	29-Jun-21	30-Jun-21
157	VDOT Review Stage I	21	30-Jun-21	21-Jul-21
158	Revise and Address Comments Stage I	7	21-Jul-21	28-Jul-21
159	Stage II Bridge Design	70	28-Jul-21	15-Oct-21



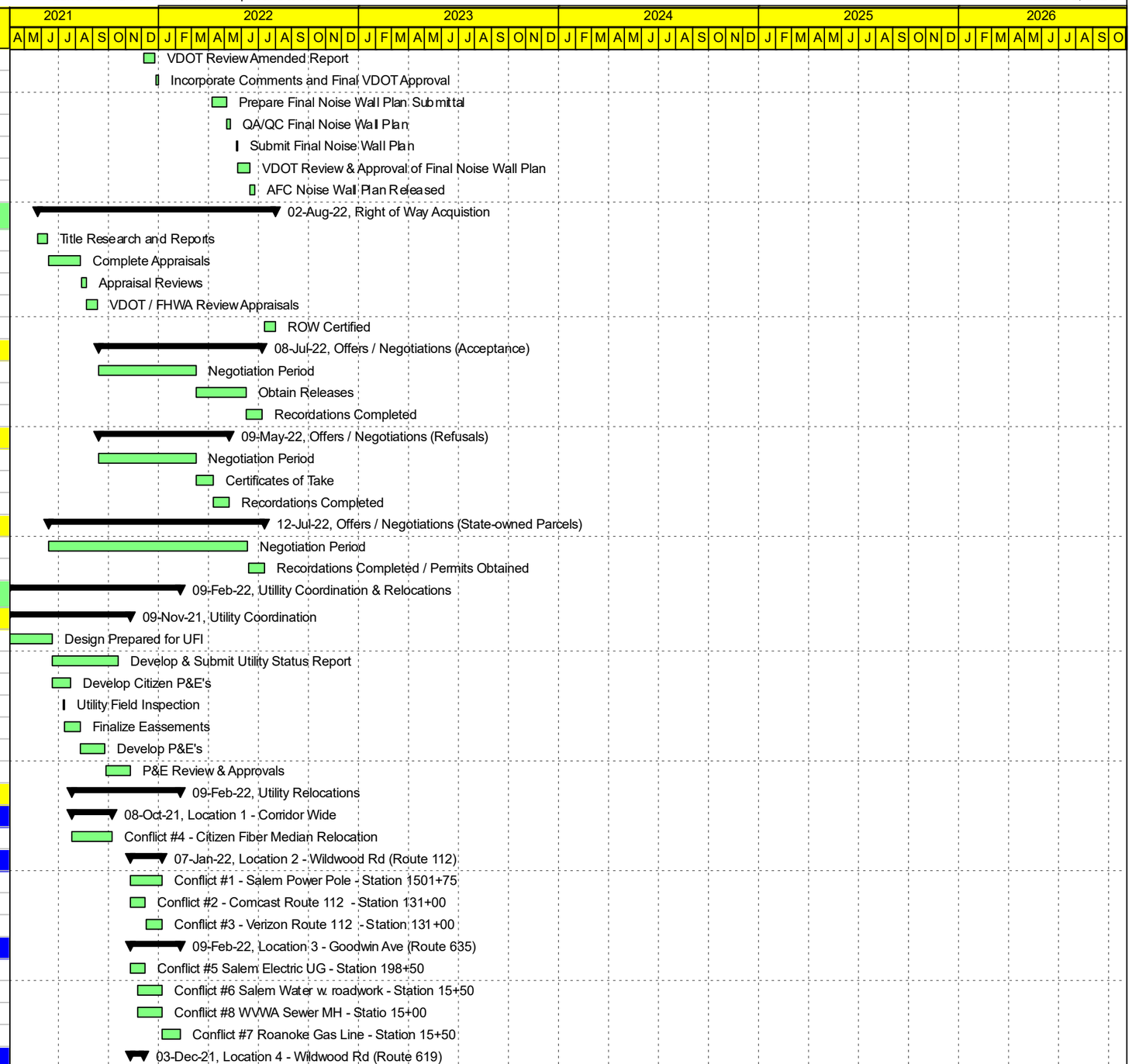
Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
161	Submit Stage II	2	17-Nov-21	18-Nov-21
162	VDOT Review Stage II	21	18-Nov-21	09-Dec-21
163	Revise and Address Comments Stage II	14	09-Dec-21	23-Dec-21
164	VDOT Review / Approve Revised Stage II	21	23-Dec-21	13-Jan-22
Route 311		176	25-May-21	13-Jan-22
166	Bridge Stage I Design (T S & L)	25	25-May-21	21-Jun-21
168	Submit Stage I	2	29-Jun-21	30-Jun-21
169	VDOT Review Stage I	21	30-Jun-21	21-Jul-21
170	Revise and Address Comments Stage I	7	21-Jul-21	28-Jul-21
171	Stage II Bridge Design	70	28-Jul-21	15-Oct-21
173	Submit Stage II	2	17-Nov-21	18-Nov-21
174	VDOT Review Stage II	21	18-Nov-21	09-Dec-21
175	Revise and Address Comments Stage II	14	09-Dec-21	23-Dec-21
176	VDOT Review / Approve Revised Stage II	21	23-Dec-21	13-Jan-22
ITS/Lighting/Signing/Striping		145	25-May-21	02-Dec-21
178	Prepare Preliminnary ITS/Light/Sign/Stripe Plan	105	25-May-21	21-Sep-21
180	Submit Prel. ITS/Light/Sign/Stripe Plan	2	29-Sep-21	30-Sep-21
181	VDOT Review Prel. ITS/Light/Sign/Stripe Plan	21	30-Sep-21	21-Oct-21
182	Revise and Resubmit ITS/Light/Sign/Stripe Plan	14	21-Oct-21	04-Nov-21
183	VDOT Review / Aprove ITS/Light/Sign/Stripe Plan	21	04-Nov-21	25-Nov-21
184	AFC ITS/Light/Sign/Stripe Released	5	29-Nov-21	02-Dec-21
Environmental		301	24-May-21	25-Jun-22
Permitting		162	24-May-21	24-Dec-21
312	VPDES Submisson and Approval	90	24-May-21	21-Aug-21
62	Wetland Delineation	45	28-Jun-21	11-Aug-21
302	Prepare and Submit SWPPP	15	12-Aug-21	27-Aug-21
202	Preliminary Jurisditional Determination	45	12-Aug-21	25-Sep-21
64	ACoE Water Quality Permit	90	26-Sep-21	24-Dec-21
212	State Programmatic General Agreement	90	26-Sep-21	24-Dec-21
292	Viriginia Water Quality Permit	90	26-Sep-21	24-Dec-21
Hazardous Material		118	25-May-21	27-Oct-21
262	Hazardous Material Structural Inspection and Report	30	25-May-21	25-Jun-21
222	Phase 1 ESA Report (New Properties Only)	30	13-Jun-21	12-Jul-21
272	VDOT Review Hazardous Material Structural Report	21	26-Jun-21	16-Jul-21
232	VDOT Review Phase 1 ESA Report	21	13-Jul-21	02-Aug-21
282	Hazardous Material Abatement (if neeeded)	90	19-Jul-21	27-Oct-21
242	Phase 2 ESA Report	50	03-Aug-21	28-Sep-21
252	VDOT Review Phase 2 ESA Report	21	29-Sep-21	19-Oct-21
Noise Analysis		300	25-May-21	25-Jun-22
46	Noise Analysis and Report Preparation	75	25-May-21	17-Aug-21
48	VDOT Review	21	26-Aug-21	15-Sep-21
49	Incorporate Comments & Resubmit	7	16-Sep-21	22-Sep-21
50	FHWA Review & Approval	21	23-Sep-21	13-Oct-21
51	Public Comment	35	14-Oct-21	17-Nov-21
52	Revise Report	10	18-Nov-21	01-Dec-21
53	QA/QC & Submit Amended Report	2	02-Dec-21	03-Dec-21



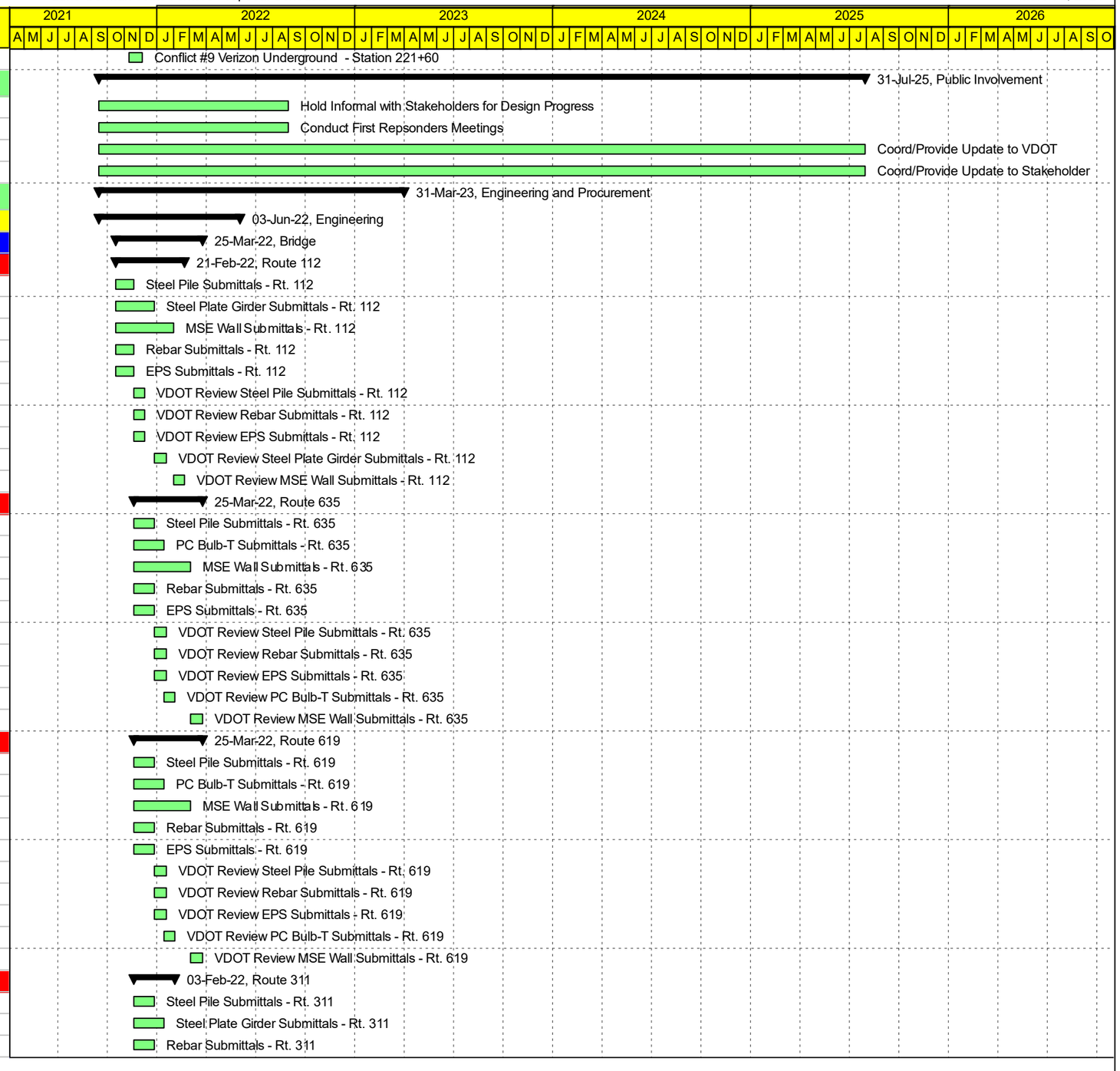
Activity ID	Activity Name	Original Duration	Start	Finish
54	VDOT Review Amended Report	21	04-Dec-21	24-Dec-21
55	Incorporate Comments and Final VDOT Approval	5	27-Dec-21	30-Dec-21
56	Prepare Final Noise Wall Plan Submittal	24	07-Apr-22	04-May-22
57	QA/QC Final Noise Wall Plan	7	04-May-22	11-May-22
58	Submit Final Noise Wall Plan	3	23-May-22	25-May-22
59	VDOT Review & Approval of Final Noise Wall Plan	21	25-May-22	15-Jun-22
60	AFC Noise Wall Plan Released	10	15-Jun-22	25-Jun-22
Right of Way Acquistion		436	24-May-21	02-Aug-22
107	Title Research and Reports	20	24-May-21	12-Jun-21
108	Complete Appraisals	60	13-Jun-21	11-Aug-21
109	Appraisal Reviews	10	12-Aug-21	21-Aug-21
110	VDOT / FHWA Review Appraisals	21	22-Aug-21	11-Sep-21
122	ROW Certified	21	13-Jul-22	02-Aug-22
Offers / Negotiations (Acceptance)		300	12-Sep-21	08-Jul-22
112	Negotiation Period	180	12-Sep-21	10-Mar-22
113	Obtain Releases	90	11-Mar-22	08-Jun-22
114	Recordations Completed	30	09-Jun-22	08-Jul-22
Offers / Negotiations (Refusals)		240	12-Sep-21	09-May-22
116	Negotiation Period	180	12-Sep-21	10-Mar-22
117	Certificates of Take	30	11-Mar-22	09-Apr-22
118	Recordations Completed	30	10-Apr-22	09-May-22
Offers / Negotiations (State-owned Parcels)		395	13-Jun-21	12-Jul-22
120	Negotiation Period	365	13-Jun-21	12-Jun-22
121	Recordations Completed / Permits Obtained	30	13-Jun-22	12-Jul-22
Utillity Coordination & Relocations		236	01-Apr-21	09-Feb-22
Utility Coordination		166	01-Apr-21	09-Nov-21
67	Design Prepared for UFI	80	01-Apr-21	19-Jun-21
68	Develop & Submit Utility Status Report	120	20-Jun-21	17-Oct-21
1842	Develop Citizen P&E's	30	21-Jun-21	23-Jul-21
69	Utility Field Inspection	1	11-Jul-21	11-Jul-21
70	Finalize Eassements	30	12-Jul-21	10-Aug-21
71	Develop P&E's	40	11-Aug-21	24-Sep-21
72	P&E Review & Approvals	40	27-Sep-21	09-Nov-21
Utility Relocations		106	26-Jul-21	09-Feb-22
Location 1 - Corridor Wide		45	26-Jul-21	08-Oct-21
86	Conflict #4 - Citizen Fiber Median Relocation	45	26-Jul-21	08-Oct-21
Location 2 - Wildwood Rd (Route 112)		30	10-Nov-21	07-Jan-22
75	Conflict #1 - Salem Power Pole - Station 1501+75	30	10-Nov-21	07-Jan-22
76	Conflict #2 - Comcast Route 112 - Station 131+00	15	10-Nov-21	07-Dec-21
77	Conflict #3 - Verizon Route 112 - Station 131+00	15	08-Dec-21	07-Jan-22
Location 3 - Goodwin Ave (Route 635)		44	10-Nov-21	09-Feb-22
79	Conflict #5 Salem Electric UG - Station 198+50	15	10-Nov-21	07-Dec-21
80	Conflict #6 Salem Water w. roadwork - Station 15+50	20	24-Nov-21	06-Jan-22
82	Conflict #8 WVWA Sewer MH - Statio 15+00	20	24-Nov-21	06-Jan-22
81	Conflict #7 Roanoke Gas Line - Station 15+50	15	06-Jan-22	09-Feb-22
Location 4 - Wildwood Rd (Route 619)		14	10-Nov-21	03-Dec-21



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

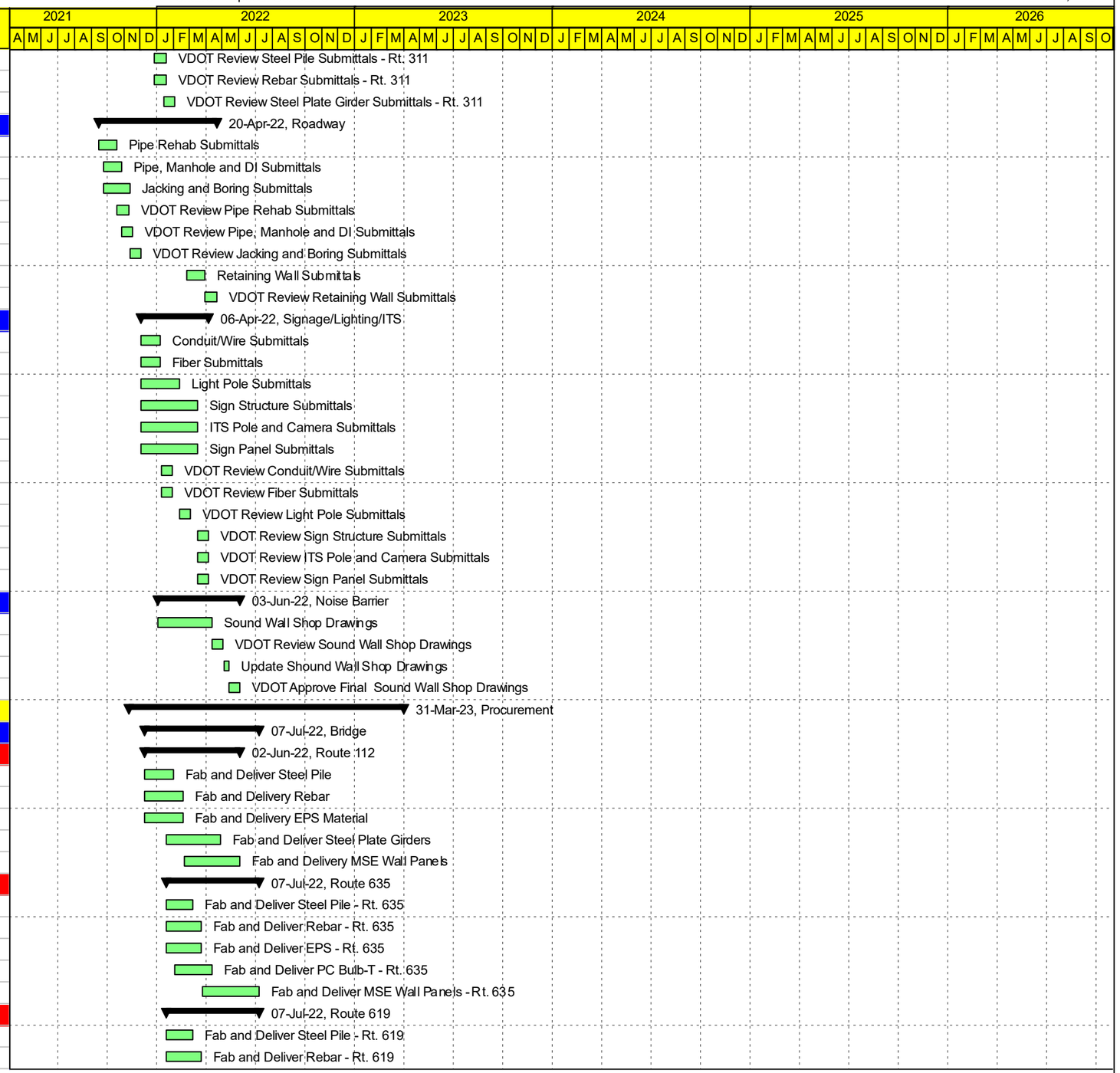
Activity ID	Activity Name	Original Duration	Start	Finish
84	Conflict #9 Verizon Underground - Station 221+60	14	10-Nov-21	03-Dec-21
Public Involvement		1415	15-Sep-21	31-Jul-25
124	Hold Informal with Stakeholders for Design Progress	350	15-Sep-21	31-Aug-22
125	Conduct First Repsonders Meetings	350	15-Sep-21	31-Aug-22
126	Coord/Provide Update to VDOT	1415	15-Sep-21	31-Jul-25
127	Coord/Provide Update to Stakeholder	1415	15-Sep-21	31-Jul-25
Engineering and Procurement		457	15-Sep-21	31-Mar-23
Engineering		199	15-Sep-21	03-Jun-22
Bridge		121	15-Oct-21	25-Mar-22
Route 112		95	15-Oct-21	21-Feb-22
332	Steel Pile Submittals - Rt. 112	30	15-Oct-21	18-Nov-21
1042	Steel Plate Girder Submittals - Rt. 112	60	15-Oct-21	27-Dec-21
1062	MSE Wall Submittals - Rt. 112	90	15-Oct-21	31-Jan-22
1102	Rebar Submittals - Rt. 112	30	15-Oct-21	18-Nov-21
1122	EPS Submittals - Rt. 112	30	15-Oct-21	18-Nov-21
342	VDOT Review Steel Pile Submittals - Rt. 112	21	18-Nov-21	09-Dec-21
1112	VDOT Review Rebar Submittals - Rt. 112	21	18-Nov-21	09-Dec-21
1132	VDOT Review EPS Submittals - Rt. 112	21	18-Nov-21	09-Dec-21
1052	VDOT Review Steel Plate Girder Submittals - Rt. 112	21	27-Dec-21	17-Jan-22
1072	VDOT Review MSE Wall Submittals - Rt. 112	21	31-Jan-22	21-Feb-22
Route 635		96	18-Nov-21	25-Mar-22
1142	Steel Pile Submittals - Rt. 635	30	18-Nov-21	27-Dec-21
1152	PC Bulb-T Submittals - Rt. 635	45	18-Nov-21	13-Jan-22
1162	MSE Wall Submittals - Rt. 635	90	18-Nov-21	04-Mar-22
1182	Rebar Submittals - Rt. 635	30	18-Nov-21	27-Dec-21
1192	EPS Submittals - Rt. 635	30	18-Nov-21	27-Dec-21
1202	VDOT Review Steel Pile Submittals - Rt. 635	21	27-Dec-21	17-Jan-22
1222	VDOT Review Rebar Submittals - Rt. 635	21	27-Dec-21	17-Jan-22
1232	VDOT Review EPS Submittals - Rt. 635	21	27-Dec-21	17-Jan-22
1242	VDOT Review PC Bulb-T Submittals - Rt. 635	21	13-Jan-22	03-Feb-22
1252	VDOT Review MSE Wall Submittals - Rt. 635	21	04-Mar-22	25-Mar-22
Route 619		96	18-Nov-21	25-Mar-22
1262	Steel Pile Submittals - Rt. 619	30	18-Nov-21	27-Dec-21
1272	PC Bulb-T Submittals - Rt. 619	45	18-Nov-21	13-Jan-22
1282	MSE Wall Submittals - Rt. 619	90	18-Nov-21	04-Mar-22
1302	Rebar Submittals - Rt. 619	30	18-Nov-21	27-Dec-21
1312	EPS Submittals - Rt. 619	30	18-Nov-21	27-Dec-21
1322	VDOT Review Steel Pile Submittals - Rt. 619	21	27-Dec-21	17-Jan-22
1342	VDOT Review Rebar Submittals - Rt. 619	21	27-Dec-21	17-Jan-22
1352	VDOT Review EPS Submittals - Rt. 619	21	27-Dec-21	17-Jan-22
1362	VDOT Review PC Bulb-T Submittals - Rt. 619	21	13-Jan-22	03-Feb-22
1372	VDOT Review MSE Wall Submittals - Rt. 619	21	04-Mar-22	25-Mar-22
Route 311		57	18-Nov-21	03-Feb-22
1382	Steel Pile Submittals - Rt. 311	30	18-Nov-21	27-Dec-21
1392	Steel Plate Girder Submittals - Rt. 311	45	18-Nov-21	13-Jan-22
1422	Rebar Submittals - Rt. 311	30	18-Nov-21	27-Dec-21



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
1442	VDOT Review Steel Pile Submittals - Rt. 311	21	27-Dec-21	17-Jan-22
1462	VDOT Review Rebar Submittals - Rt. 311	21	27-Dec-21	17-Jan-22
1482	VDOT Review Steel Plate Girder Submittals - Rt. 311	21	13-Jan-22	03-Feb-22
Roadway		163	15-Sep-21	20-Apr-22
1742	Pipe Rehab Submittals	30	15-Sep-21	19-Oct-21
1712	Pipe, Manhole and DI Submittals	30	23-Sep-21	26-Oct-21
1722	Jacking and Boring Submittals	45	23-Sep-21	11-Nov-21
1772	VDOT Review Pipe Rehab Submittals	21	19-Oct-21	09-Nov-21
1752	VDOT Review Pipe, Manhole and DI Submittals	21	27-Oct-21	16-Nov-21
1782	VDOT Review Jacking and Boring Submittals	21	12-Nov-21	02-Dec-21
1732	Retaining Wall Submittals	30	25-Feb-22	31-Mar-22
1762	VDOT Review Retaining Wall Submittals	21	31-Mar-22	20-Apr-22
Signage/Lighting/ITS		94	03-Dec-21	06-Apr-22
A6600	Conduit/Wire Submittals	30	03-Dec-21	07-Jan-22
A6620	Fiber Submittals	30	03-Dec-21	07-Jan-22
A6640	Light Pole Submittals	60	03-Dec-21	10-Feb-22
A6660	Sign Structure Submittals	90	03-Dec-21	16-Mar-22
A6680	ITS Pole and Camera Submittals	90	03-Dec-21	16-Mar-22
A6810	Sign Panel Submittals	90	03-Dec-21	16-Mar-22
A6610	VDOT Review Conduit/Wire Submittals	21	08-Jan-22	28-Jan-22
A6630	VDOT Review Fiber Submittals	21	08-Jan-22	28-Jan-22
A6650	VDOT Review Light Pole Submittals	21	11-Feb-22	03-Mar-22
A6670	VDOT Review Sign Structure Submittals	21	17-Mar-22	06-Apr-22
A6690	VDOT Review ITS Pole and Camera Submittals	21	17-Mar-22	06-Apr-22
A6820	VDOT Review Sign Panel Submittals	21	17-Mar-22	06-Apr-22
Noise Barrier		119	03-Jan-22	03-Jun-22
A4940	Sound Wall Shop Drawings	90	03-Jan-22	12-Apr-22
A4950	VDOT Review Sound Wall Shop Drawings	21	13-Apr-22	03-May-22
A4960	Update Shound Wall Shop Drawings	10	04-May-22	13-May-22
A4970	VDOT Approve Final Sound Wall Shop Drawings	21	14-May-22	03-Jun-22
Procurement		417	09-Nov-21	31-Mar-23
Bridge		183	09-Dec-21	07-Jul-22
Route 112		153	09-Dec-21	02-Jun-22
1492	Fab and Deliver Steel Pile	45	09-Dec-21	01-Feb-22
1532	Fab and Delivery Rebar	60	09-Dec-21	17-Feb-22
1542	Fab and Delivery EPS Material	60	09-Dec-21	17-Feb-22
1502	Fab and Deliver Steel Plate Girders	90	17-Jan-22	27-Apr-22
1512	Fab and Delivery MSE Wall Panels	90	21-Feb-22	02-Jun-22
Route 635		151	17-Jan-22	07-Jul-22
1552	Fab and Deliver Steel Pile - Rt. 635	45	17-Jan-22	08-Mar-22
1592	Fab and Deliver Rebar - Rt. 635	60	17-Jan-22	24-Mar-22
1602	Fab and Deliver EPS - Rt. 635	60	17-Jan-22	24-Mar-22
1562	Fab and Deliver PC Bulb-T - Rt. 635	60	03-Feb-22	12-Apr-22
1572	Fab and Deliver MSE Wall Panels - Rt. 635	90	25-Mar-22	07-Jul-22
Route 619		151	17-Jan-22	07-Jul-22
1612	Fab and Deliver Steel Pile - Rt. 619	45	17-Jan-22	08-Mar-22
1652	Fab and Deliver Rebar - Rt. 619	60	17-Jan-22	24-Mar-22



Remaining Level of Effort | Remaining Work | Milestone
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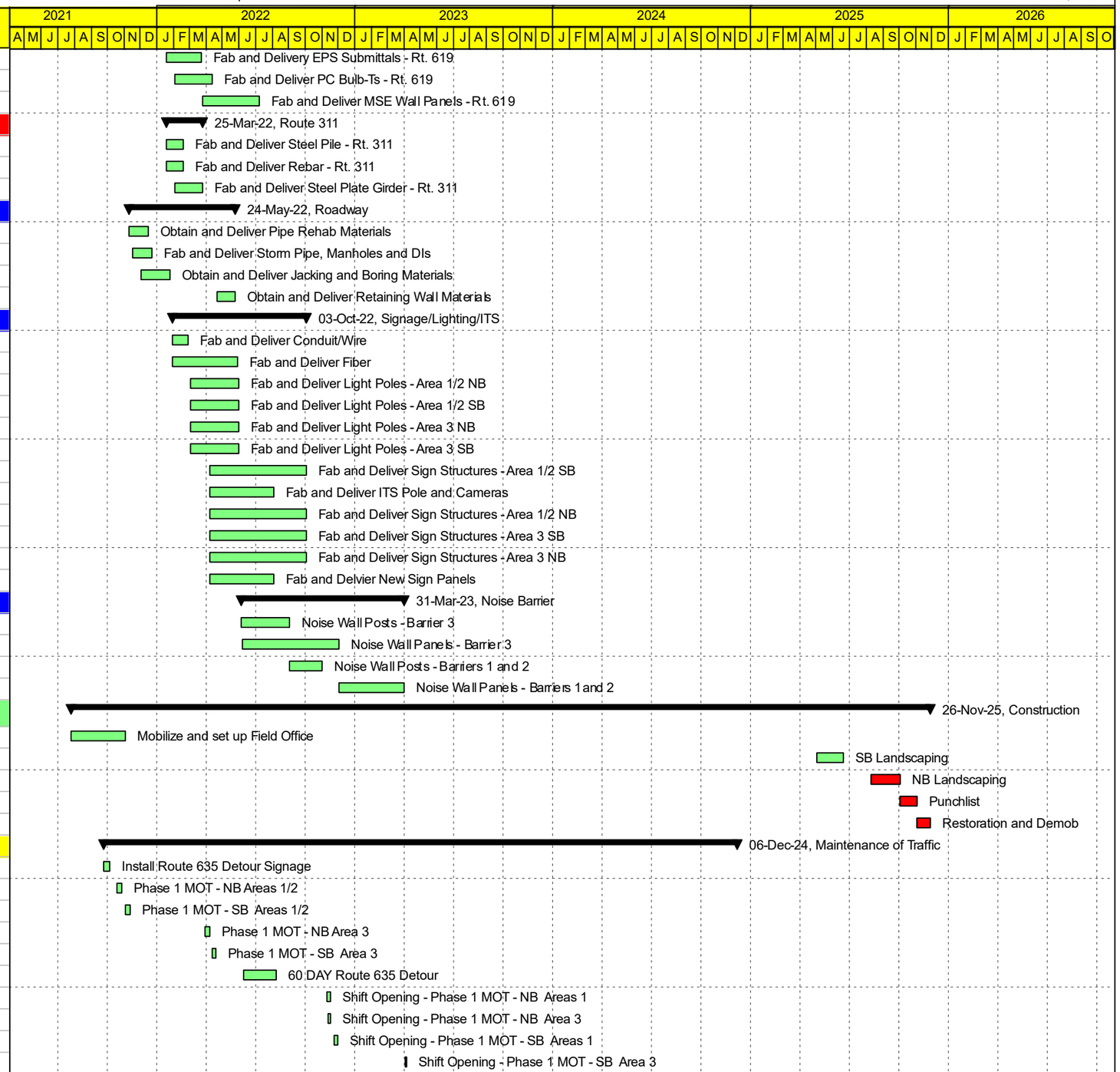
TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
1662	Fab and Delivery EPS Submittals - Rt. 619	60	17-Jan-22	24-Mar-22
1622	Fab and Deliver PC Bulb-Ts - Rt. 619	60	03-Feb-22	12-Apr-22
1632	Fab and Deliver MSE Wall Panels - Rt. 619	90	25-Mar-22	07-Jul-22
Route 311		61	17-Jan-22	25-Mar-22
1672	Fab and Deliver Steel Pile - Rt. 311	30	17-Jan-22	18-Feb-22
1702	Fab and Deliver Rebar - Rt. 311	30	17-Jan-22	18-Feb-22
1682	Fab and Deliver Steel Plate Girder - Rt. 311	45	03-Feb-22	25-Mar-22
Roadway		171	09-Nov-21	24-May-22
1802	Obtain and Deliver Pipe Rehab Materials	30	09-Nov-21	15-Dec-21
1812	Fab and Deliver Storm Pipe, Manholes and DIs	30	17-Nov-21	22-Dec-21
1822	Obtain and Deliver Jacking and Boring Materials	45	03-Dec-21	25-Jan-22
1832	Obtain and Deliver Retaining Wall Materials	30	21-Apr-22	24-May-22
Signage/Lighting/ITS		248	29-Jan-22	03-Oct-22
A6700	Fab and Deliver Conduit/Wire	30	29-Jan-22	27-Feb-22
A6710	Fab and Deliver Fiber	120	29-Jan-22	28-May-22
A6720	Fab and Deliver Light Poles - Area 1/2 NB	90	04-Mar-22	01-Jun-22
A6750	Fab and Deliver Light Poles - Area 1/2 SB	90	04-Mar-22	01-Jun-22
A6770	Fab and Deliver Light Poles - Area 3 NB	90	04-Mar-22	01-Jun-22
A6780	Fab and Deliver Light Poles - Area 3 SB	90	04-Mar-22	01-Jun-22
A6730	Fab and Deliver Sign Structures - Area 1/2 SB	180	07-Apr-22	03-Oct-22
A6740	Fab and Deliver ITS Pole and Cameras	120	07-Apr-22	04-Aug-22
A6760	Fab and Deliver Sign Structures - Area 1/2 NB	180	07-Apr-22	03-Oct-22
A6790	Fab and Deliver Sign Structures - Area 3 SB	180	07-Apr-22	03-Oct-22
A6800	Fab and Deliver Sign Structures - Area 3 NB	180	07-Apr-22	03-Oct-22
A6830	Fab and Delvier New Sign Panels	120	07-Apr-22	04-Aug-22
Noise Barrier		258	04-Jun-22	31-Mar-23
A4980	Noise Wall Posts - Barrier 3	90	04-Jun-22	01-Sep-22
A4990	Noise Wall Panels - Barrier 3	150	07-Jun-22	01-Dec-22
A5000	Noise Wall Posts - Barriers 1 and 2	60	02-Sep-22	31-Oct-22
A5010	Noise Wall Panels - Barriers 1 and 2	120	02-Dec-22	31-Mar-23
Construction		1362	26-Jul-21	26-Nov-25
A7740	Mobilize and set up Field Office	60	26-Jul-21	03-Nov-21
A5300	SB Landscaping	30	02-May-25	19-Jun-25
A5310	NB Landscaping	30	11-Aug-25	03-Oct-25
A4440	Punchlist	30	03-Oct-25	02-Nov-25
A4450	Restoration and Demob	15	03-Nov-25	26-Nov-25
Maintenance of Traffic		999	24-Sep-21	06-Dec-24
A4270	Install Route 635 Detour Signage	5	24-Sep-21	04-Oct-21
A1170	Phase 1 MOT - NB Areas 1/2	5	19-Oct-21	27-Oct-21
A1180	Phase 1 MOT - SB Areas 1/2	5	03-Nov-21	12-Nov-21
A1190	Phase 1 MOT - NB Area 3	5	31-Mar-22	07-Apr-22
A1200	Phase 1 MOT - SB Area 3	5	13-Apr-22	20-Apr-22
A4280	60 DAY Route 635 Detour	60	10-Jun-22*	09-Aug-22
A1370	Shift Opening - Phase 1 MOT - NB Areas 1	3	09-Nov-22	16-Nov-22
A1390	Shift Opening - Phase 1 MOT - NB Area 3	3	11-Nov-22	17-Nov-22
A1380	Shift Opening - Phase 1 MOT - SB Areas 1	3	22-Nov-22	29-Nov-22
A1400	Shift Opening - Phase 1 MOT - SB Area 3	3	03-Apr-23	06-Apr-23



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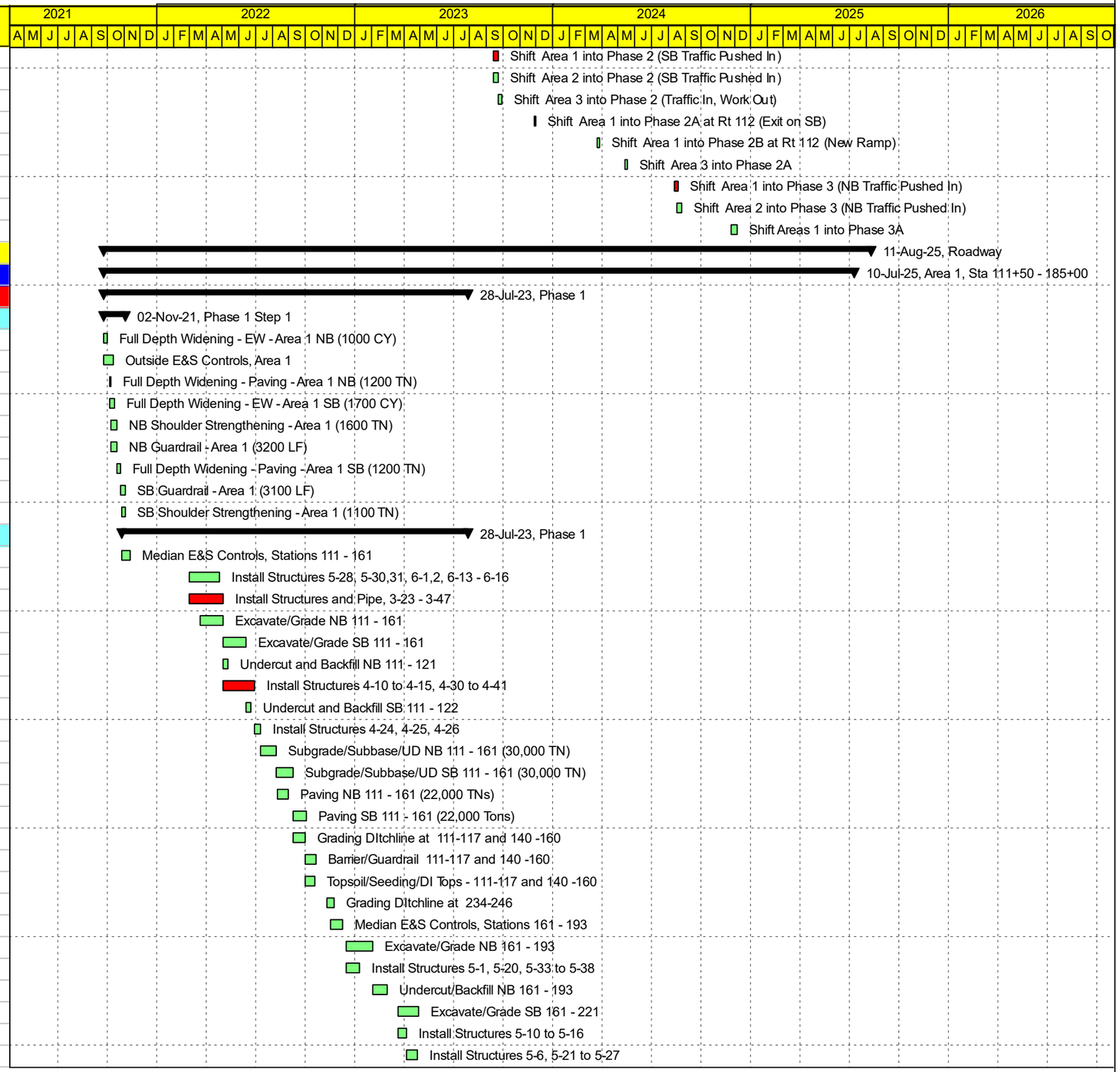
TASK filter: All Activities

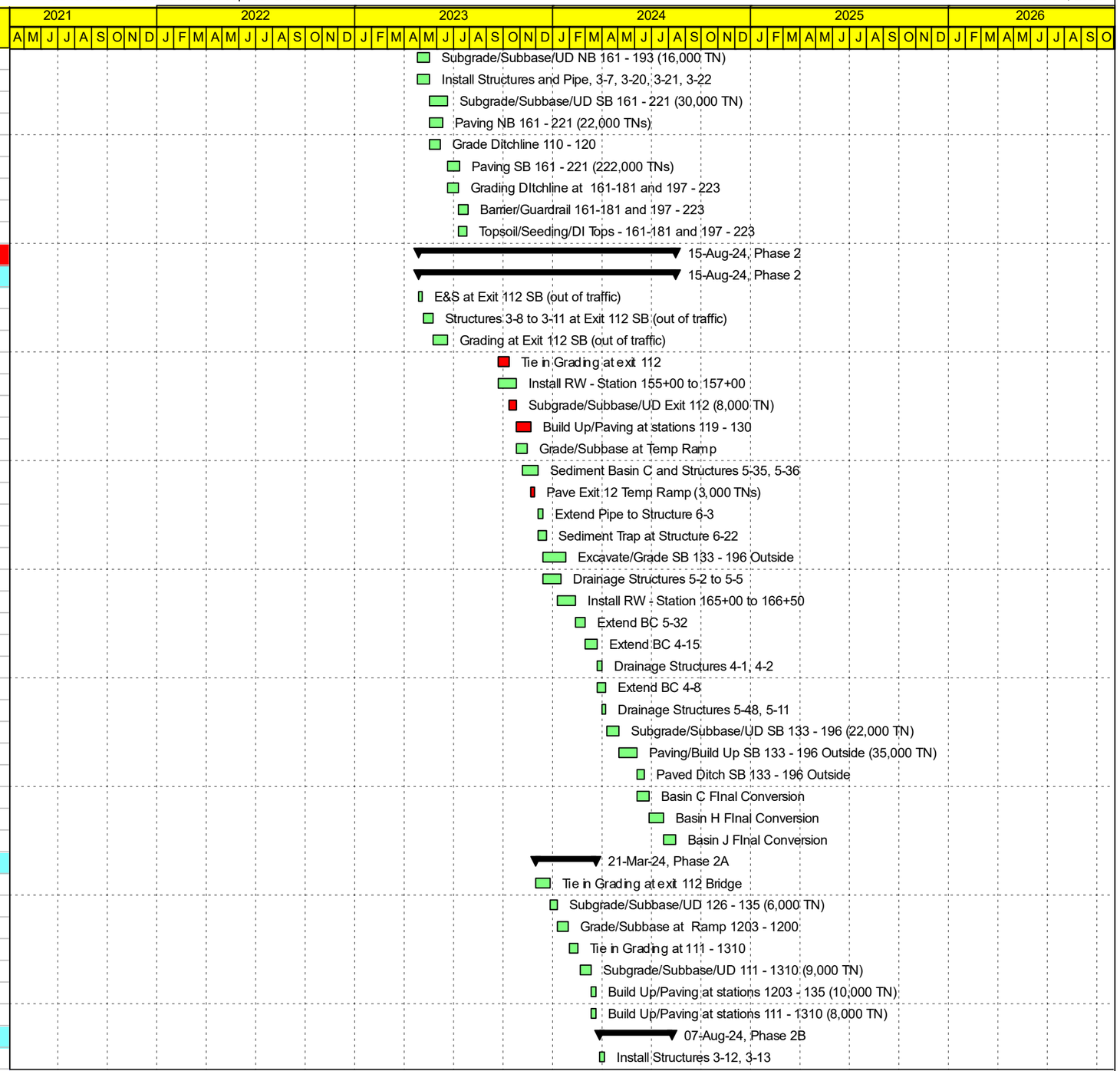
Activity ID	Activity Name	Original Duration	Start	Finish
A2080	Shift Area 1 into Phase 2 (SB Traffic Pushed In)	5	13-Sep-23	21-Sep-23
A6180	Shift Area 2 into Phase 2 (SB Traffic Pushed In)	5	13-Sep-23	21-Sep-23
A2090	Shift Area 3 into Phase 2 (Traffic In, Work Out)	5	21-Sep-23	29-Sep-23
A2340	Shift Area 1 into Phase 2A at Rt 112 (Exit on SB)	2	29-Nov-23	01-Dec-23
A4610	Shift Area 1 into Phase 2B at Rt 112 (New Ramp)	2	22-Mar-24	27-Mar-24
A3040	Shift Area 3 into Phase 2A	2	14-May-24	17-May-24
A3210	Shift Area 1 into Phase 3 (NB Traffic Pushed In)	5	12-Aug-24	19-Aug-24
A6190	Shift Area 2 into Phase 3 (NB Traffic Pushed In)	5	16-Aug-24	26-Aug-24
A3870	Shift Areas 1 into Phase 3A	5	26-Nov-24	06-Dec-24
Roadway		1219	24-Sep-21	11-Aug-25
Area 1, Sta 111+50 - 185+00		1192	24-Sep-21	10-Jul-25
Phase 1		556	24-Sep-21	28-Jul-23
Phase 1 Step 1		30	24-Sep-21	02-Nov-21
A7550	Full Depth Widening - EW - Area 1 NB (1000 CY)	5	24-Sep-21	01-Oct-21
A7730	Outside E&S Controls, Area 1	10	24-Sep-21	12-Oct-21
A7560	Full Depth Widening - Paving - Area 1 NB (1200 TN)	4	04-Oct-21	07-Oct-21
A7590	Full Depth Widening - EW - Area 1 SB (1700 CY)	7	04-Oct-21	13-Oct-21
A1100	NB Shoulder Strengthening - Area 1 (1600 TN)	6	08-Oct-21	18-Oct-21
A7670	NB Guardrail - Area 1 (3200 LF)	6	08-Oct-21	18-Oct-21
A7600	Full Depth Widening - Paving - Area 1 SB (1200 TN)	4	19-Oct-21	25-Oct-21
A7680	SB Guardrail - Area 1 (3100 LF)	6	26-Oct-21	02-Nov-21
A1130	SB Shoulder Strengthening - Area 1 (1100 TN)	4	28-Oct-21	02-Nov-21
Phase 1		531	27-Oct-21	28-Jul-23
A1230	Median E&S Controls, Stations 111 - 161	10	27-Oct-21	12-Nov-21
A4430	Install Structures 5-28, 5-30,31, 6-1,2, 6-13 - 6-16	30	01-Mar-22	25-Apr-22
A4600	Install Structures and Pipe, 3-23 - 3-47	45	01-Mar-22*	03-May-22
A1210	Excavate/Grade NB 111 - 161	25	22-Mar-22	02-May-22
A1220	Excavate/Grade SB 111 - 161	25	02-May-22	13-Jun-22
A7810	Undercut and Backfill NB 111 - 121	5	02-May-22	10-May-22
A5080	Install Structures 4-10 to 4-15, 4-30 to 4-41	35	03-May-22	30-Jun-22
A7850	Undercut and Backfill SB 111 - 122	5	14-Jun-22	22-Jun-22
A5090	Install Structures 4-24, 4-25, 4-26	6	30-Jun-22	11-Jul-22
A1290	Subgrade/Subbase/UD NB 111 - 161 (30,000 TN)	18	11-Jul-22	09-Aug-22
A1300	Subgrade/Subbase/UD SB 111 - 161 (30,000 TN)	18	09-Aug-22	08-Sep-22
A1330	Paving NB 111 - 161 (22,000 TNs)	15	10-Aug-22	31-Aug-22
A1350	Paving SB 111 - 161 (22,000 Tons)	15	08-Sep-22	03-Oct-22
A3600	Grading DItchline at 111-117 and 140 -160	12	09-Sep-22	30-Sep-22
A3610	Barrier/Guardrail 111-117 and 140 -160	12	30-Sep-22	20-Oct-22
A3620	Topsoil/Seeding/DI Tops - 111-117 and 140 -160	10	30-Sep-22	18-Oct-22
A3670	Grading DItchline at 234-246	7	09-Nov-22	23-Nov-22
A5110	Median E&S Controls, Stations 161 - 193	10	16-Nov-22	08-Dec-22
A1410	Excavate/Grade NB 161 - 193	22	16-Dec-22	03-Feb-23
A5120	Install Structures 5-1, 5-20, 5-33 to 5-38	10	16-Dec-22	10-Jan-23
A7820	Undercut/Backfill NB 161 - 193	12	03-Feb-23	28-Feb-23
A1420	Excavate/Grade SB 161 - 221	22	22-Mar-23	28-Apr-23
A5100	Install Structures 5-10 to 5-16	8	22-Mar-23	06-Apr-23
A5130	Install Structures 5-6, 5-21 to 5-27	12	06-Apr-23	26-Apr-23



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

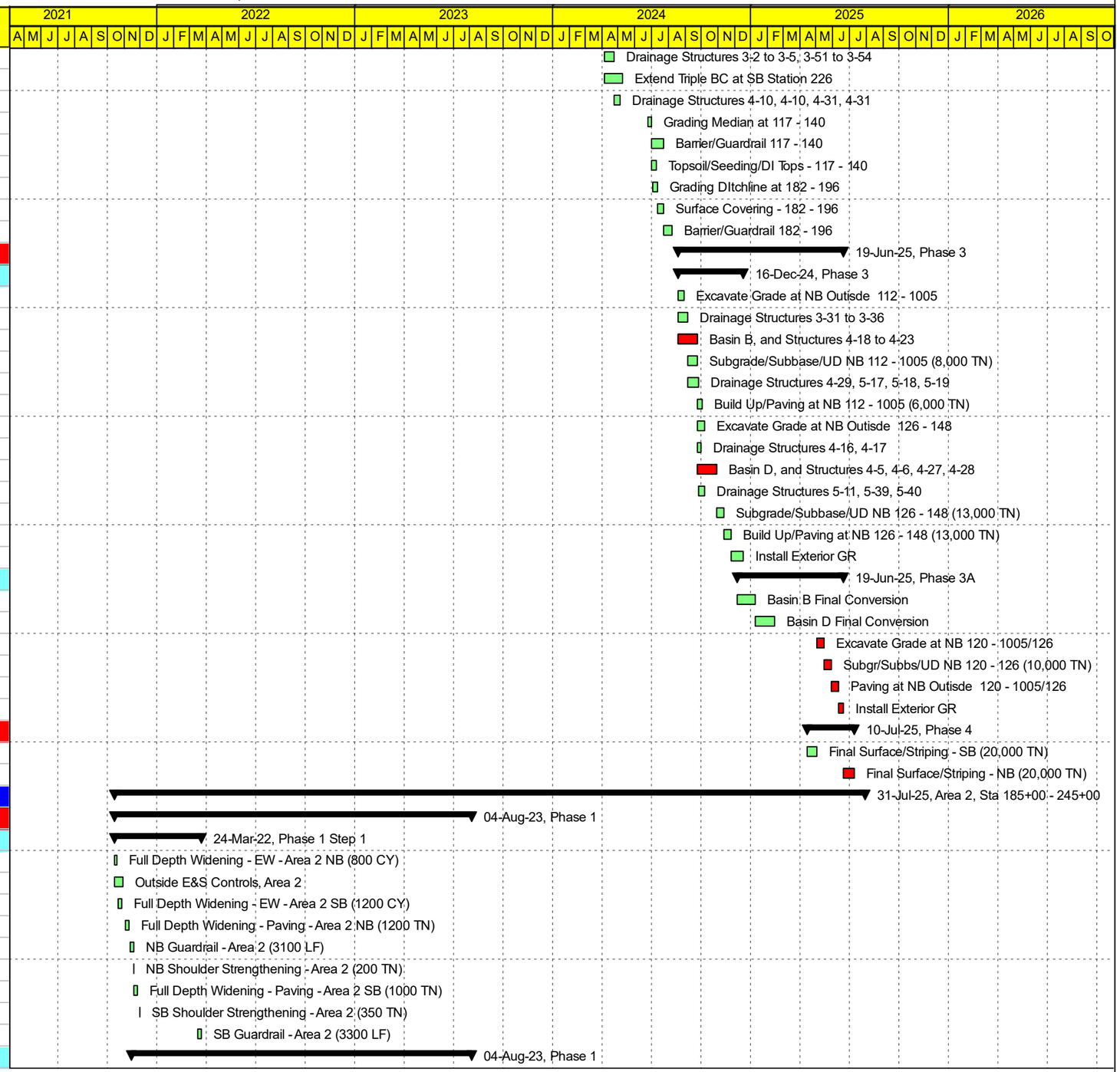
Activity ID	Activity Name	Original Duration	Start	Finish
A1470	Subgrade/Subbase/UD NB 161 - 193 (16,000 TN)	12	26-Apr-23	17-May-23
A5250	Install Structures and Pipe, 3-7, 3-20, 3-21, 3-22	12	26-Apr-23	17-May-23
A1480	Subgrade/Subbase/UD SB 161 - 221 (30,000 TN)	20	17-May-23	20-Jun-23
A1440	Paving NB 161 - 221 (22,000 TNs)	15	17-May-23	12-Jun-23
A5260	Grade Ditchline 110 - 120	12	17-May-23	06-Jun-23
A1450	Paving SB 161 - 221 (222,000 TNs)	15	21-Jun-23	13-Jul-23
A3630	Grading DItchline at 161-181 and 197 - 223	12	21-Jun-23	10-Jul-23
A3640	Barrier/Guardrail 161-181 and 197 - 223	12	10-Jul-23	28-Jul-23
A3650	Topsoil/Seeding/DI Tops - 161-181 and 197 - 223	10	10-Jul-23	26-Jul-23
Phase 2		424	28-Apr-23	15-Aug-24
Phase 2		424	28-Apr-23	15-Aug-24
A2100	E&S at Exit 112 SB (out of traffic)	5	28-Apr-23	05-May-23
A5210	Structures 3-8 to 3-11 at Exit 112 SB (out of traffic)	10	08-May-23	24-May-23
A5220	Grading at Exit 112 SB (out of traffic)	15	24-May-23	20-Jun-23
A2110	Tie in Grading at exit 112	12	21-Sep-23	13-Oct-23
A6350	Install RW - Station 155+00 to 157+00	20	21-Sep-23	26-Oct-23
A2120	Subgrade/Subbase/UD Exit 112 (8,000 TN)	8	13-Oct-23	26-Oct-23
A2130	Build Up/Paving at stations 119 - 130	15	26-Oct-23	20-Nov-23
A2140	Grade/Subbase at Temp Ramp	10	26-Oct-23	15-Nov-23
A4660	Sediment Basin C and Structures 5-35, 5-36	15	06-Nov-23	05-Dec-23
A2150	Pave Exit 12 Temp Ramp (3,000 TNs)	4	20-Nov-23	28-Nov-23
A2350	Extend Pipe to Structure 6-3	5	05-Dec-23	14-Dec-23
A4680	Sediment Trap at Structure 6-22	8	05-Dec-23	19-Dec-23
A2360	Excavate/Grade SB 133 - 196 Outside	20	14-Dec-23	25-Jan-24
A4470	Drainage Structures 5-2 to 5-5	15	14-Dec-23	16-Jan-24
A6360	Install RW - Station 165+00 to 166+50	15	10-Jan-24	12-Feb-24
A4670	Extend BC 5-32	10	12-Feb-24	29-Feb-24
A4620	Extend BC 4-15	10	29-Feb-24	22-Mar-24
A4630	Drainage Structures 4-1, 4-2	5	22-Mar-24	01-Apr-24
A4640	Extend BC 4-8	10	22-Mar-24	08-Apr-24
A4650	Drainage Structures 5-48, 5-11	5	01-Apr-24	08-Apr-24
A2370	Subgrade/Subbase/UD SB 133 - 196 (22,000 TN)	15	09-Apr-24	02-May-24
A2380	Paving/Build Up SB 133 - 196 Outside (35,000 TN)	20	02-May-24	04-Jun-24
A4690	Paved Ditch SB 133 - 196 Outside	8	04-Jun-24	17-Jun-24
A5200	Basin C FInal Conversion	15	05-Jun-24	26-Jun-24
A5190	Basin H FInal Conversion	15	26-Jun-24	22-Jul-24
A5160	Basin J FInal Conversion	15	22-Jul-24	15-Aug-24
Phase 2A		100	01-Dec-23	21-Mar-24
A2470	Tie in Grading at exit 112 Bridge	12	01-Dec-23	27-Dec-23
A2480	Subgrade/Subbase/UD 126 - 135 (6,000 TN)	6	27-Dec-23	10-Jan-24
A2500	Grade/Subbase at Ramp 1203 - 1200	10	10-Jan-24	30-Jan-24
A2510	Tie in Grading at 111 - 1310	8	01-Feb-24	16-Feb-24
A2520	Subgrade/Subbase/UD 111 - 1310 (9,000 TN)	8	21-Feb-24	11-Mar-24
A2490	Build Up/Paving at stations 1203 - 135 (10,000 TN)	8	11-Mar-24	21-Mar-24
A2530	Build Up/Paving at stations 111 - 1310 (8,000 TN)	6	11-Mar-24	20-Mar-24
Phase 2B		80	27-Mar-24	07-Aug-24
A5230	Install Structures 3-12, 3-13	6	27-Mar-24	04-Apr-24



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
A4580	Drainage Structures 3-2 to 3-5, 3-51 to 3-54	10	04-Apr-24	23-Apr-24
A5240	Extend Triple BC at SB Station 226	20	04-Apr-24	08-May-24
A4590	Drainage Structures 4-10, 4-10, 4-31, 4-31	8	23-Apr-24	03-May-24
A3230	Grading Median at 117 - 140	4	25-Jun-24	02-Jul-24
A3240	Barrier/Guardrail 117 - 140	12	02-Jul-24	22-Jul-24
A3250	Topsoil/Seeding/DI Tops - 117 - 140	5	02-Jul-24	10-Jul-24
A3260	Grading DItchline at 182 - 196	5	03-Jul-24	11-Jul-24
A3280	Surface Covering - 182 - 196	8	11-Jul-24	24-Jul-24
A3270	Barrier/Guardrail 182 - 196	9	22-Jul-24	07-Aug-24
Phase 3		272	19-Aug-24	19-Jun-25
Phase 3		106	19-Aug-24	16-Dec-24
A3690	Excavate Grade at NB Outisde 112 - 1005	8	19-Aug-24	30-Aug-24
A6200	Drainage Structures 3-31 to 3-36	12	19-Aug-24	06-Sep-24
A6220	Basin B, and Structures 4-18 to 4-23	20	19-Aug-24	23-Sep-24
A3700	Subgrade/Subbase/UD NB 112 - 1005 (8,000 TN)	8	06-Sep-24	23-Sep-24
A6260	Drainage Structures 4-29, 5-17, 5-18, 5-19	10	06-Sep-24	26-Sep-24
A3710	Build Up/Paving at NB 112 - 1005 (6,000 TN)	6	23-Sep-24	02-Oct-24
A3720	Excavate Grade at NB Outisde 126 - 148	8	23-Sep-24	07-Oct-24
A6210	Drainage Structures 4-16, 4-17	4	23-Sep-24	01-Oct-24
A6240	Basin D, and Structures 4-5, 4-6, 4-27, 4-28	20	23-Sep-24	28-Oct-24
A6270	Drainage Structures 5-11, 5-39, 5-40	6	26-Sep-24	07-Oct-24
A3730	Subgrade/Subbase/UD NB 126 - 148 (13,000 TN)	8	28-Oct-24	12-Nov-24
A3740	Build Up/Paving at NB 126 - 148 (13,000 TN)	8	12-Nov-24	25-Nov-24
A3780	Install Exterior GR	10	26-Nov-24	16-Dec-24
Phase 3A		103	06-Dec-24	19-Jun-25
A6230	Basin B Final Conversion	15	06-Dec-24	09-Jan-25
A6250	Basin D Final Conversion	15	09-Jan-25	13-Feb-25
A3830	Excavate Grade at NB 120 - 1005/126	8	02-May-25	15-May-25
A3840	Subgr/Subbs/UD NB 120 - 126 (10,000 TN)	8	15-May-25	29-May-25
A3850	Paving at NB Outisde 120 - 1005/126	8	29-May-25	10-Jun-25
A3860	Install Exterior GR	5	10-Jun-25	19-Jun-25
Phase 4		56	14-Apr-25	10-Jul-25
A7510	Final Surface/Striping - SB (20,000 TN)	13	14-Apr-25	01-May-25
A3960	Final Surface/Striping - NB (20,000 TN)	13	19-Jun-25	10-Jul-25
Area 2, Sta 185+00 - 245+00		1195	14-Oct-21	31-Jul-25
Phase 1		547	14-Oct-21	04-Aug-23
Phase 1 Step 1		122	14-Oct-21	24-Mar-22
A7570	Full Depth Widening - EW - Area 2 NB (800 CY)	4	14-Oct-21	19-Oct-21
A7750	Outside E&S Controls, Area 2	10	14-Oct-21	29-Oct-21
A7630	Full Depth Widening - EW - Area 2 SB (1200 CY)	6	21-Oct-21	28-Oct-21
A7580	Full Depth Widening - Paving - Area 2 NB (1200 TN)	4	03-Nov-21	09-Nov-21
A7690	NB Guardrail - Area 2 (3100 LF)	6	11-Nov-21	18-Nov-21
A6120	NB Shoulder Strengthening - Area 2 (200 TN)	1	18-Nov-21	18-Nov-21
A7640	Full Depth Widening - Paving - Area 2 SB (1000 TN)	4	19-Nov-21	24-Nov-21
A6130	SB Shoulder Strengthening - Area 2 (350 TN)	2	29-Nov-21	30-Nov-21
A7700	SB Guardrail - Area 2 (3300 LF)	6	17-Mar-22	24-Mar-22
Phase 1		525	15-Nov-21	04-Aug-23



Remaining Level of Effort | Remaining Work | Milestone
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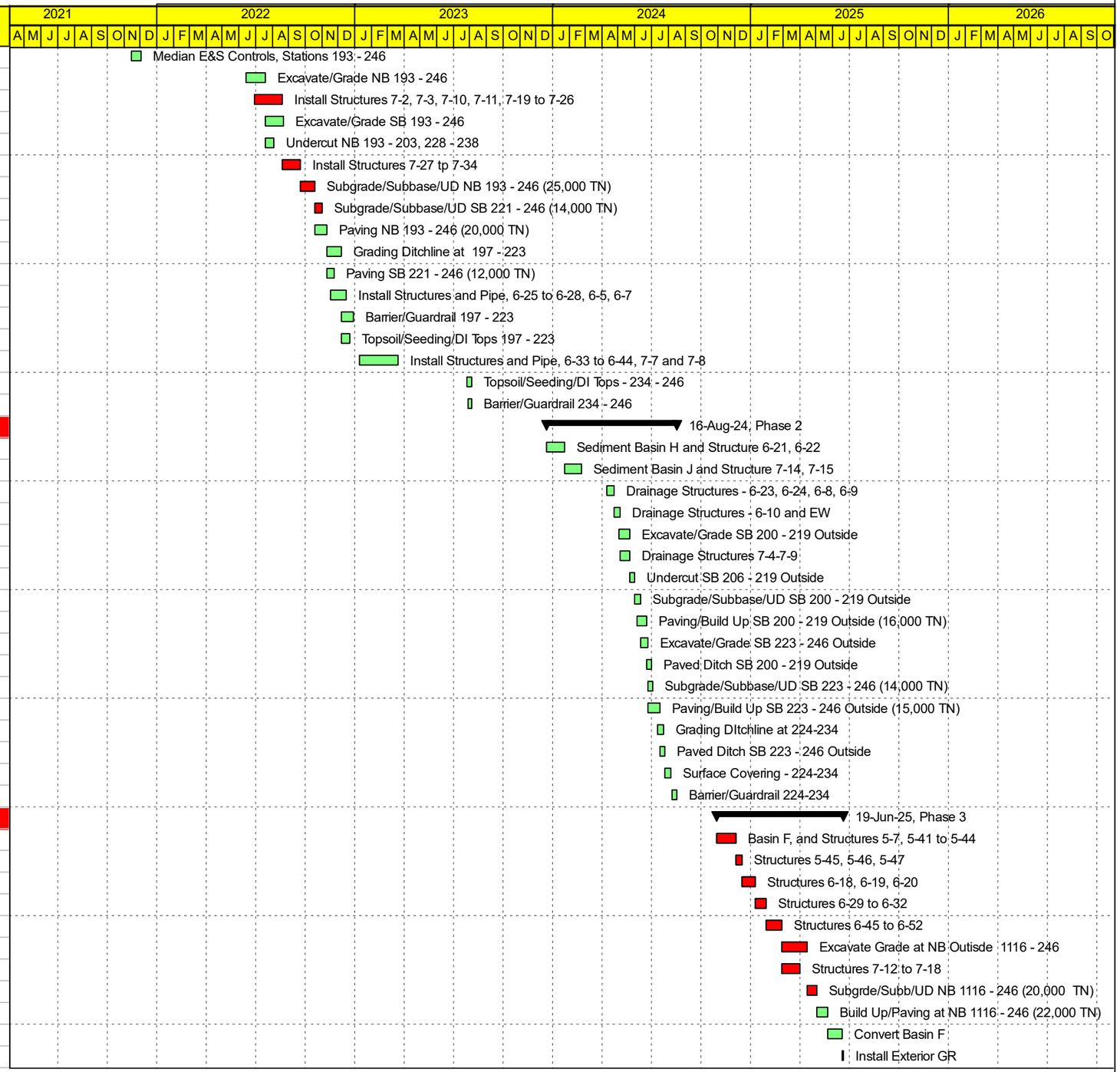
TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
A1250	Median E&S Controls, Stations 193 - 246	10	15-Nov-21	02-Dec-21
A1270	Excavate/Grade NB 193 - 246	22	14-Jun-22	19-Jul-22
A5140	Install Structures 7-2, 7-3, 7-10, 7-11, 7-19 to 7-26	30	30-Jun-22	19-Aug-22
A1280	Excavate/Grade SB 193 - 246	20	19-Jul-22	22-Aug-22
A7830	Undercut NB 193 - 203, 228 - 238	10	19-Jul-22	04-Aug-22
A5150	Install Structures 7-27 tp 7-34	20	19-Aug-22	22-Sep-22
A1310	Subgrade/Subbase/UD NB 193 - 246 (25,000 TN)	15	22-Sep-22	19-Oct-22
A1320	Subgrade/Subbase/UD SB 221 - 246 (14,000 TN)	8	19-Oct-22	01-Nov-22
A1340	Paving NB 193 - 246 (20,000 TN)	12	19-Oct-22	09-Nov-22
A6140	Grading Ditchline at 197 - 223	12	09-Nov-22	07-Dec-22
A1360	Paving SB 221 - 246 (12,000 TN)	8	09-Nov-22	22-Nov-22
A1430	Install Structures and Pipe, 6-25 to 6-28, 6-5, 6-7	15	16-Nov-22	16-Dec-22
A6150	Barrier/Guardrail 197 - 223	12	07-Dec-22	28-Dec-22
A6160	Topsoil/Seeding/DI Tops 197 - 223	10	07-Dec-22	23-Dec-22
A1460	Install Structures and Pipe, 6-33 to 6-44, 7-7 and 7-8	35	10-Jan-23	22-Mar-23
A3680	Topsoil/Seeding/DI Tops - 234 - 246	7	26-Jul-23	04-Aug-23
A3660	Barrier/Guardrail 234 - 246	5	28-Jul-23	04-Aug-23
Phase 2		217	19-Dec-23	16-Aug-24
A5180	Sediment Basin H and Structure 6-21, 6-22	15	19-Dec-23	23-Jan-24
A5170	Sediment Basin J and Structure 7-14, 7-15	15	23-Jan-24	22-Feb-24
A2390	Drainage Structures - 6-23, 6-24, 6-8, 6-9	8	09-Apr-24	23-Apr-24
A4480	Drainage Structures - 6-10 and EW	8	23-Apr-24	03-May-24
A2400	Excavate/Grade SB 200 - 219 Outside	10	02-May-24	21-May-24
A2430	Drainage Structures 7-4-7-9	9	03-May-24	21-May-24
A7870	Undercut SB 206 - 219 Outside	7	21-May-24	31-May-24
A2410	Subgrade/Subbase/UD SB 200 - 219 Outside	5	31-May-24	11-Jun-24
A2420	Paving/Build Up SB 200 - 219 Outside (16,000 TN)	12	04-Jun-24	21-Jun-24
A2440	Excavate/Grade SB 223 - 246 Outside	10	11-Jun-24	25-Jun-24
A4700	Paved Ditch SB 200 - 219 Outside	5	21-Jun-24	01-Jul-24
A2450	Subgrade/Subbase/UD SB 223 - 246 (14,000 TN)	5	25-Jun-24	03-Jul-24
A2460	Paving/Build Up SB 223 - 246 Outside (15,000 TN)	12	25-Jun-24	17-Jul-24
A3290	Grading DItchline at 224-234	7	11-Jul-24	23-Jul-24
A4710	Paved Ditch SB 223 - 246 Outside	5	17-Jul-24	25-Jul-24
A3310	Surface Covering - 224-234	6	25-Jul-24	06-Aug-24
A3300	Barrier/Guardrail 224-234	7	07-Aug-24	16-Aug-24
Phase 3		210	28-Oct-24	19-Jun-25
A6280	Basin F, and Structures 5-7, 5-41 to 5-44	20	28-Oct-24	03-Dec-24
A6300	Structures 5-45, 5-46, 5-47	6	03-Dec-24	16-Dec-24
A6310	Structures 6-18, 6-19, 6-20	10	16-Dec-24	08-Jan-25
A6320	Structures 6-29 to 6-32	8	08-Jan-25	28-Jan-25
A6330	Structures 6-45 to 6-52	15	28-Jan-25	27-Feb-25
A3750	Excavate Grade at NB Outisde 1116 - 246	24	27-Feb-25	14-Apr-25
A6340	Structures 7-12 to 7-18	15	27-Feb-25	31-Mar-25
A3760	Subgrde/Subb/UD NB 1116 - 246 (20,000 TN)	12	14-Apr-25	02-May-25
A3770	Build Up/Paving at NB 1116 - 246 (22,000 TN)	12	02-May-25	22-May-25
A6290	Convert Basin F	15	22-May-25	17-Jun-25
A6170	Install Exterior GR	2	17-Jun-25	19-Jun-25



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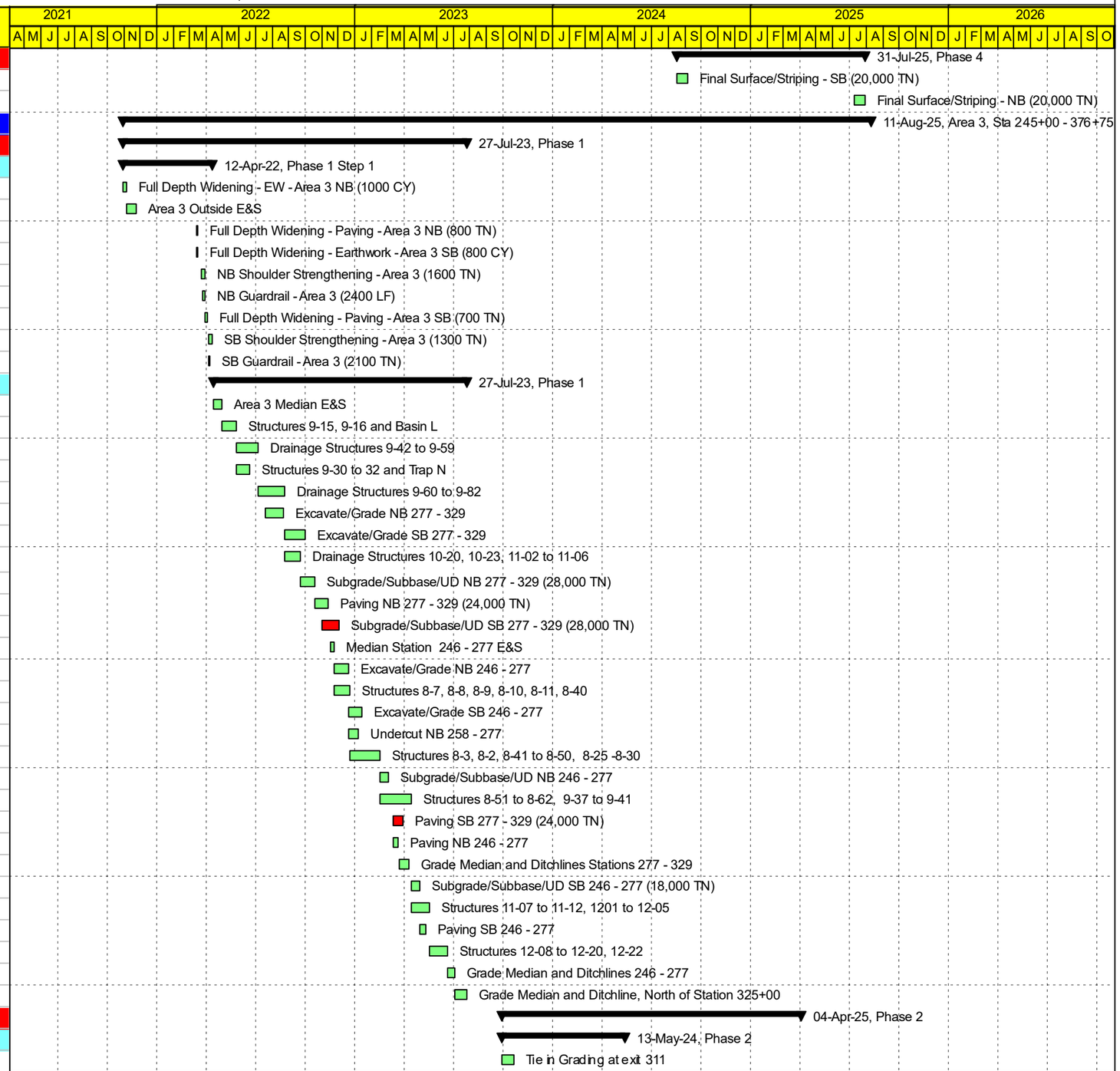
TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
Phase 4		153	16-Aug-24	31-Jul-25
A7490	Final Surface/Striping - SB (20,000 TN)	13	16-Aug-24	06-Sep-24
A6110	Final Surface/Striping - NB (20,000 TN)	13	10-Jul-25	31-Jul-25
Area 3, Sta 245+00 - 376+75		1193	29-Oct-21	11-Aug-25
Phase 1		528	29-Oct-21	27-Jul-23
Phase 1 Step 1		125	29-Oct-21	12-Apr-22
A7610	Full Depth Widening - EW - Area 3 NB (1000 CY)	5	29-Oct-21	04-Nov-21
A7760	Area 3 Outside E&S	10	05-Nov-21	23-Nov-21
A7620	Full Depth Widening - Paving - Area 3 NB (800 TN)	3	14-Mar-22	16-Mar-22
A7660	Full Depth Widening - Earthwork - Area 3 SB (800 CY)	3	14-Mar-22	16-Mar-22
A1140	NB Shoulder Strengthening - Area 3 (1600 TN)	6	23-Mar-22	30-Mar-22
A7710	NB Guardrail - Area 3 (2400 LF)	4	25-Mar-22	30-Mar-22
A7650	Full Depth Widening - Paving - Area 3 SB (700 TN)	3	31-Mar-22	04-Apr-22
A1150	SB Shoulder Strengthening - Area 3 (1300 TN)	5	05-Apr-22	12-Apr-22
A7720	SB Guardrail - Area 3 (2100 TN)	4	05-Apr-22	08-Apr-22
Phase 1		400	15-Apr-22	27-Jul-23
A5030	Area 3 Median E&S	10	15-Apr-22	29-Apr-22
A4720	Structures 9-15, 9-16 and Basin L	15	29-Apr-22	26-May-22
A1940	Drainage Structures 9-42 to 9-59	25	26-May-22	07-Jul-22
A4730	Structures 9-30 to 32 and Trap N	15	26-May-22	21-Jun-22
A1970	Drainage Structures 9-60 to 9-82	30	07-Jul-22	25-Aug-22
A1920	Excavate/Grade NB 277 - 329	20	19-Jul-22	22-Aug-22
A1930	Excavate/Grade SB 277 - 329	20	25-Aug-22	30-Sep-22
A5020	Drainage Structures 10-20, 10-23, 11-02 to 11-06	15	25-Aug-22	21-Sep-22
A1980	Subgrade/Subbase/UD NB 277 - 329 (28,000 TN)	16	21-Sep-22	19-Oct-22
A1950	Paving NB 277 - 329 (24,000 TN)	14	19-Oct-22	11-Nov-22
A1990	Subgrade/Subbase/UD SB 277 - 329 (28,000 TN)	16	02-Nov-22	02-Dec-22
A2000	Median Station 246 - 277 E&S	5	17-Nov-22	24-Nov-22
A2010	Excavate/Grade NB 246 - 277	10	24-Nov-22	20-Dec-22
A4910	Structures 8-7, 8-8, 8-9, 8-10, 8-11, 8-40	12	24-Nov-22	22-Dec-22
A2030	Excavate/Grade SB 246 - 277	12	20-Dec-22	13-Jan-23
A7840	Undercut NB 258 - 277	9	20-Dec-22	06-Jan-23
A4920	Structures 8-3, 8-2, 8-41 to 8-50, 8-25 -8-30	25	22-Dec-22	15-Feb-23
A2040	Subgrade/Subbase/UD NB 246 - 277	8	16-Feb-23	03-Mar-23
A4930	Structures 8-51 to 8-62, 9-37 to 9-41	30	16-Feb-23	14-Apr-23
A1960	Paving SB 277 - 329 (24,000 TN)	14	13-Mar-23	30-Mar-23
A2050	Paving NB 246 - 277	8	13-Mar-23	22-Mar-23
A5050	Grade Median and Ditchlines Stations 277 - 329	12	23-Mar-23	10-Apr-23
A2060	Subgrade/Subbase/UD SB 246 - 277 (18,000 TN)	10	14-Apr-23	01-May-23
A5040	Structures 11-07 to 11-12, 1201 to 12-05	20	14-Apr-23	17-May-23
A2070	Paving SB 246 - 277	8	01-May-23	12-May-23
A5070	Structures 12-08 to 12-20, 12-22	20	17-May-23	21-Jun-23
A5060	Grade Median and Ditchlines 246 - 277	8	21-Jun-23	03-Jul-23
A2020	Grade Median and Ditchline, North of Station 325+00	15	03-Jul-23	27-Jul-23
Phase 2		493	29-Sep-23	04-Apr-25
Phase 2		201	29-Sep-23	13-May-24
A2170	Tie in Grading at exit 311	12	29-Sep-23	20-Oct-23



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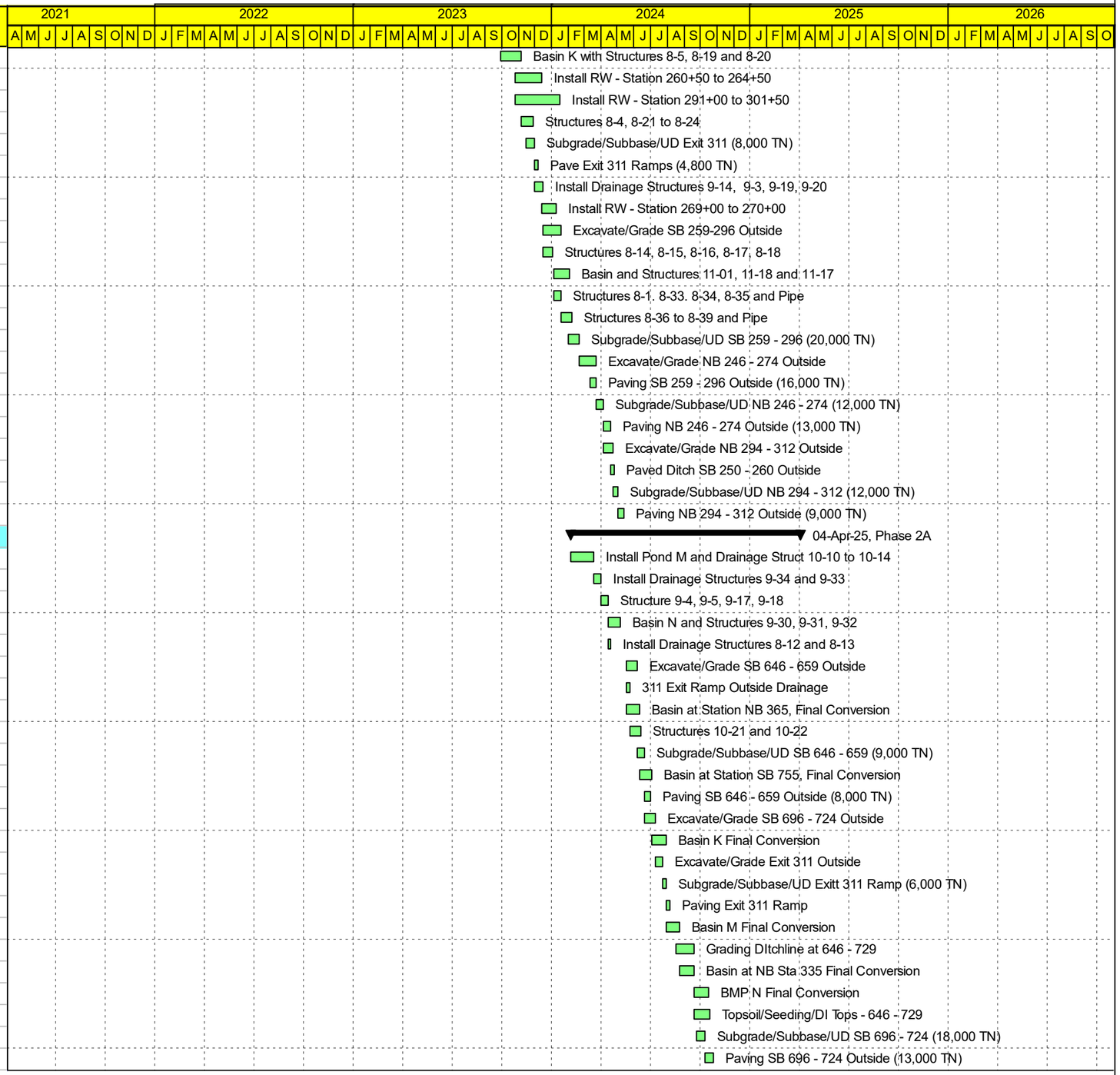
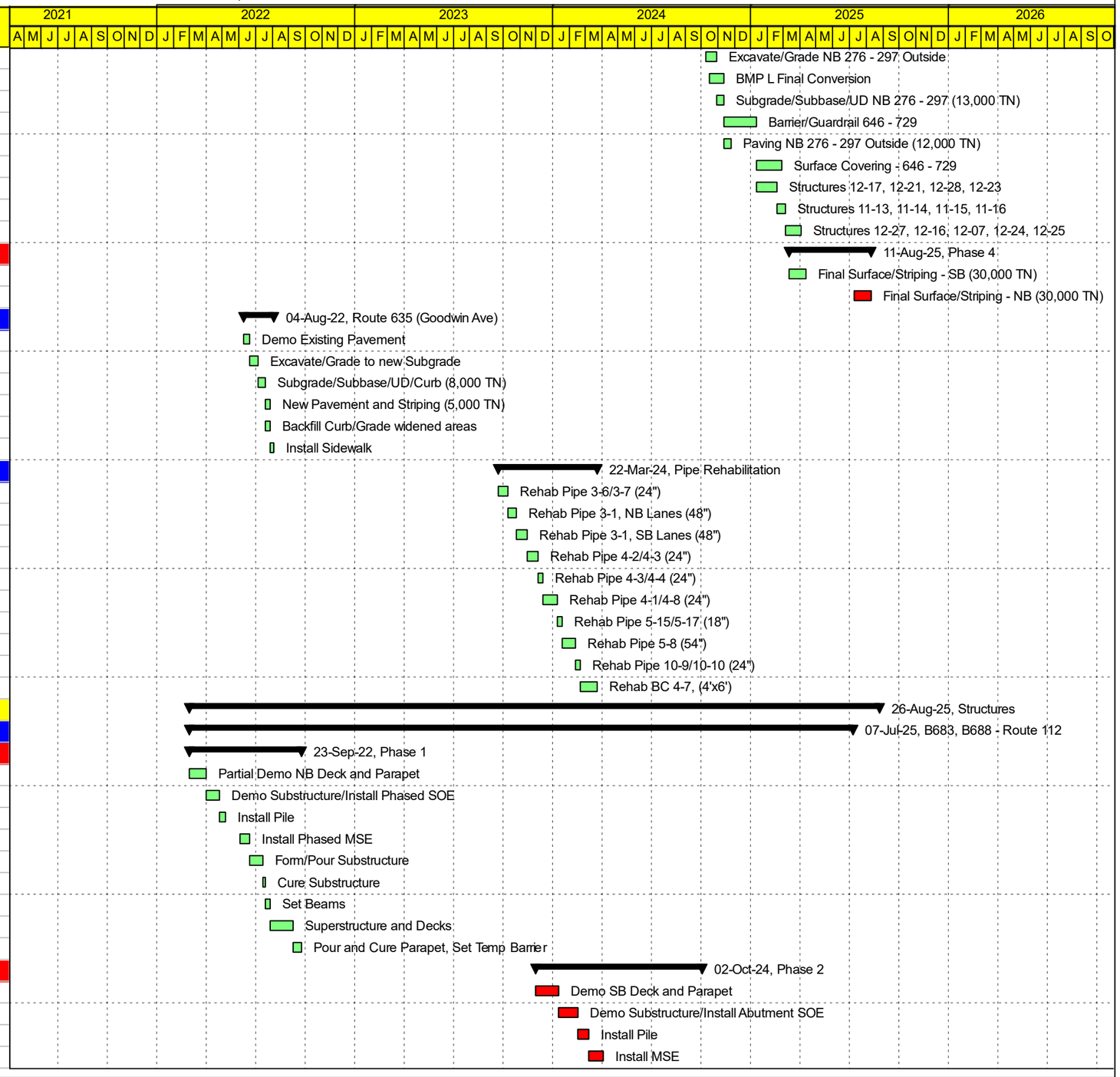
Activity ID	Activity Name	Original Duration	Start	Finish
A4810	Basin K with Structures 8-5, 8-19 and 8-20	20	29-Sep-23	06-Nov-23
A6370	Install RW - Station 260+50 to 264+50	25	26-Oct-23	14-Dec-23
A6390	Install RW - Station 291+00 to 301+50	40	26-Oct-23	16-Jan-24
A4830	Structures 8-4, 8-21 to 8-24	12	06-Nov-23	28-Nov-23
A2180	Subgrade/Subbase/UD Exit 311 (8,000 TN)	8	15-Nov-23	29-Nov-23
A2210	Pave Exit 311 Ramps (4,800 TN)	4	29-Nov-23	07-Dec-23
A2220	Install Drainage Structures 9-14, 9-3, 9-19, 9-20	8	29-Nov-23	15-Dec-23
A6380	Install RW - Station 269+00 to 270+00	12	14-Dec-23	10-Jan-24
A2230	Excavate/Grade SB 259-296 Outside	15	15-Dec-23	17-Jan-24
A2260	Structures 8-14, 8-15, 8-16, 8-17, 8-18	8	15-Dec-23	03-Jan-24
A2300	Basin and Structures 11-01, 11-18 and 11-17	15	04-Jan-24	02-Feb-24
A4740	Structures 8-1. 8-33. 8-34, 8-35 and Pipe	8	04-Jan-24	19-Jan-24
A4760	Structures 8-36 to 8-39 and Pipe	8	19-Jan-24	07-Feb-24
A2240	Subgrade/Subbase/UD SB 259 - 296 (20,000 TN)	10	01-Feb-24	21-Feb-24
A2270	Excavate/Grade NB 246 - 274 Outside	15	21-Feb-24	22-Mar-24
A2250	Paving SB 259 - 296 Outside (16,000 TN)	9	11-Mar-24	22-Mar-24
A2280	Subgrade/Subbase/UD NB 246 - 274 (12,000 TN)	8	22-Mar-24	05-Apr-24
A2290	Paving NB 246 - 274 Outside (13,000 TN)	8	05-Apr-24	18-Apr-24
A2310	Excavate/Grade NB 294 - 312 Outside	10	05-Apr-24	23-Apr-24
A4750	Paved Ditch SB 250 - 260 Outside	5	18-Apr-24	25-Apr-24
A2320	Subgrade/Subbase/UD NB 294 - 312 (12,000 TN)	7	23-Apr-24	02-May-24
A2330	Paving NB 294 - 312 Outside (9,000 TN)	6	02-May-24	13-May-24
Phase 2A		379	06-Feb-24	04-Apr-25
A3050	Install Pond M and Drainage Struct 10-10 to 10-14	20	06-Feb-24	19-Mar-24
A3090	Install Drainage Structures 9-34 and 9-33	8	19-Mar-24	01-Apr-24
A3130	Structure 9-4, 9-5, 9-17, 9-18	8	01-Apr-24	15-Apr-24
A4770	Basin N and Structures 9-30, 9-31, 9-32	14	15-Apr-24	07-May-24
A4840	Install Drainage Structures 8-12 and 8-13	4	15-Apr-24	19-Apr-24
A3060	Excavate/Grade SB 646 - 659 Outside	12	17-May-24	06-Jun-24
A3170	311 Exit Ramp Outside Drainage	5	17-May-24	24-May-24
A3980	Basin at Station NB 365, Final Conversion	15	17-May-24	11-Jun-24
A4860	Structures 10-21 and 10-22	12	24-May-24	14-Jun-24
A3070	Subgrade/Subbase/UD SB 646 - 659 (9,000 TN)	8	06-Jun-24	19-Jun-24
A4790	Basin at Station SB 755, Final Conversion	15	12-Jun-24	03-Jul-24
A3080	Paving SB 646 - 659 Outside (8,000 TN)	7	19-Jun-24	01-Jul-24
A3100	Excavate/Grade SB 696 - 724 Outside	12	19-Jun-24	09-Jul-24
A4820	Basin K Final Conversion	15	03-Jul-24	29-Jul-24
A3180	Excavate/Grade Exit 311 Outside	8	09-Jul-24	22-Jul-24
A3190	Subgrade/Subbase/UD Exitt 311 Ramp (6,000 TN)	5	22-Jul-24	29-Jul-24
A3200	Paving Exit 311 Ramp	5	29-Jul-24	05-Aug-24
A4850	Basin M Final Conversion	15	29-Jul-24	22-Aug-24
A3790	Grading DItchline at 646 - 729	20	16-Aug-24	20-Sep-24
A4870	Basin at NB Sta 335 Final Conversion	15	22-Aug-24	18-Sep-24
A4890	BMP N Final Conversion	15	18-Sep-24	15-Oct-24
A3810	Topsoil/Seeding/DI Tops - 646 - 729	15	20-Sep-24	18-Oct-24
A3110	Subgrade/Subbase/UD SB 696 - 724 (18,000 TN)	10	23-Sep-24	10-Oct-24
A3120	Paving SB 696 - 724 Outside (13,000 TN)	8	10-Oct-24	24-Oct-24



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

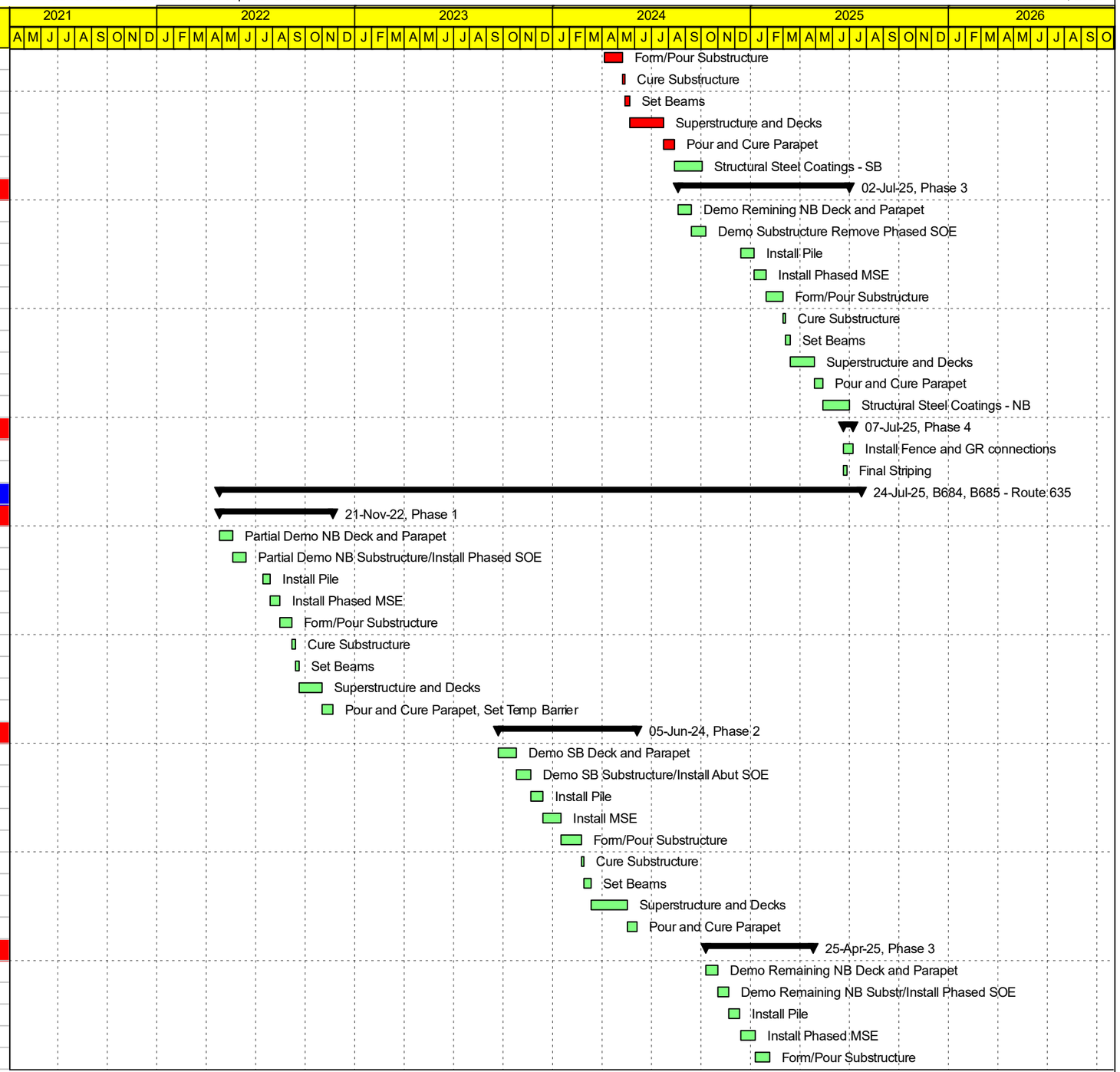
Activity ID	Activity Name	Original Duration	Start	Finish
A3140	Excavate/Grade NB 276 - 297 Outside	10	10-Oct-24	28-Oct-24
A4900	BMP L Final Conversion	15	15-Oct-24	12-Nov-24
A3150	Subgrade/Subbase/UD NB 276 - 297 (13,000 TN)	8	28-Oct-24	12-Nov-24
A3800	Barrier/Guardrail 646 - 729	30	12-Nov-24	10-Jan-25
A3160	Paving NB 276 - 297 Outside (12,000 TN)	8	12-Nov-24	25-Nov-24
A3820	Surface Covering - 646 - 729	20	10-Jan-25	26-Feb-25
A4780	Structures 12-17, 12-21, 12-28, 12-23	16	10-Jan-25	18-Feb-25
A4880	Structures 11-13, 11-14, 11-15, 11-16	8	18-Feb-25	06-Mar-25
A4800	Structures 12-27, 12-16, 12-07, 12-24, 12-25	16	06-Mar-25	04-Apr-25
Phase 4		96	12-Mar-25	11-Aug-25
A7500	Final Surface/Striping - SB (30,000 TN)	20	12-Mar-25	11-Apr-25
A3970	Final Surface/Striping - NB (30,000 TN)	20	10-Jul-25	11-Aug-25
Route 635 (Goodwin Ave)		33	10-Jun-22	04-Aug-22
A4290	Demo Existing Pavement	5	10-Jun-22	21-Jun-22
A4300	Excavate/Grade to new Subgrade	10	21-Jun-22	06-Jul-22
A4310	Subgrade/Subbase/UD/Curb (8,000 TN)	8	06-Jul-22	19-Jul-22
A4320	New Pavement and Striping (5,000 TN)	5	19-Jul-22	27-Jul-22
A4330	Backfill Curb/Grade widened areas	5	19-Jul-22	27-Jul-22
A4340	Install Sidewalk	5	27-Jul-22	04-Aug-22
Pipe Rehabilitation		92	21-Sep-23	22-Mar-24
A4410	Rehab Pipe 3-6/3-7 (24")	10	21-Sep-23	11-Oct-23
A4490	Rehab Pipe 3-1, NB Lanes (48")	10	11-Oct-23	26-Oct-23
A4500	Rehab Pipe 3-1, SB Lanes (48")	10	26-Oct-23	15-Nov-23
A4520	Rehab Pipe 4-2/4-3 (24")	10	15-Nov-23	05-Dec-23
A4530	Rehab Pipe 4-3/4-4 (24")	5	05-Dec-23	14-Dec-23
A4540	Rehab Pipe 4-1/4-8 (24")	12	14-Dec-23	10-Jan-24
A4550	Rehab Pipe 5-15/5-17 (18")	5	10-Jan-24	19-Jan-24
A4560	Rehab Pipe 5-8 (54")	10	19-Jan-24	12-Feb-24
A4570	Rehab Pipe 10-9/10-10 (24")	5	12-Feb-24	21-Feb-24
A4510	Rehab BC 4-7, (4'x6')	15	21-Feb-24	22-Mar-24
Structures		1116	01-Mar-22	26-Aug-25
B683, B688 - Route 112		1071	01-Mar-22	07-Jul-25
Phase 1		163	01-Mar-22	23-Sep-22
A1490	Partial Demo NB Deck and Parapet	15	01-Mar-22*	31-Mar-22
A1520	Demo Substructure/Install Phased SOE	15	31-Mar-22	25-Apr-22
A1550	Install Pile	8	25-Apr-22	06-May-22
A1580	Install Phased MSE	10	02-Jun-22	21-Jun-22
A1560	Form/Pour Substructure	15	21-Jun-22	14-Jul-22
A1570	Cure Substructure	5	14-Jul-22	19-Jul-22
A1670	Set Beams	5	19-Jul-22	27-Jul-22
A1680	Superstructure and Decks	25	27-Jul-22	08-Sep-22
A1690	Pour and Cure Parapet, Set Temp Barrier	10	08-Sep-22	23-Sep-22
Phase 2		273	01-Dec-23	02-Oct-24
A2540	Demo SB Deck and Parapet	20	01-Dec-23	12-Jan-24
A2550	Demo Substructure/Install Abutment SOE	15	12-Jan-24	15-Feb-24
A2560	Install Pile	10	15-Feb-24	08-Mar-24
A2590	Install MSE	15	08-Mar-24	03-Apr-24



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

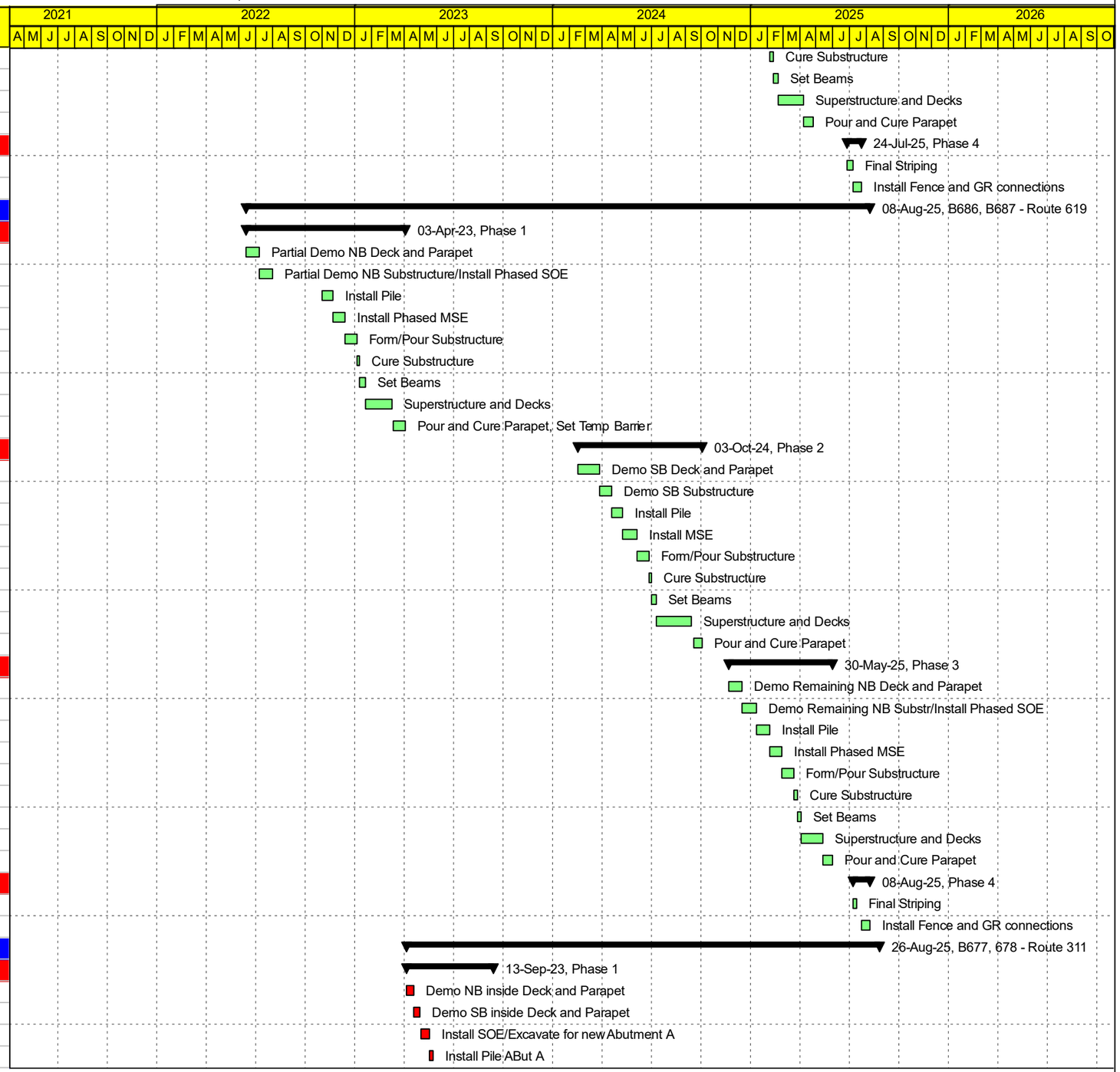
Activity ID	Activity Name	Original Duration	Start	Finish
A2570	Form/Pour Substructure	20	04-Apr-24	08-May-24
A2580	Cure Substructure	5	08-May-24	13-May-24
A2600	Set Beams	5	13-May-24	21-May-24
A2610	Superstructure and Decks	40	21-May-24	24-Jul-24
A2620	Pour and Cure Parapet	10	24-Jul-24	12-Aug-24
A7770	Structural Steel Coatings - SB	30	12-Aug-24	02-Oct-24
Phase 3		283	19-Aug-24	02-Jul-25
A3330	Demo Remining NB Deck and Parapet	15	19-Aug-24	12-Sep-24
A3340	Demo Substructure Remove Phased SOE	15	12-Sep-24	10-Oct-24
A3350	Install Pile	10	12-Dec-24	07-Jan-25
A3380	Install Phased MSE	10	07-Jan-25	29-Jan-25
A3360	Form/Pour Substructure	15	29-Jan-25	28-Feb-25
A3370	Cure Substructure	5	28-Feb-25	05-Mar-25
A3390	Set Beams	5	06-Mar-25	14-Mar-25
A3400	Superstructure and Decks	25	14-Mar-25	28-Apr-25
A3410	Pour and Cure Parapet	10	28-Apr-25	13-May-25
A7780	Structural Steel Coatings - NB	30	13-May-25	02-Jul-25
Phase 4		16	19-Jun-25	07-Jul-25
A3910	Install Fence and GR connections	10	19-Jun-25	07-Jul-25
A3920	Final Striping	5	19-Jun-25	27-Jun-25
B684, B685 - Route 635		1045	25-Apr-22	24-Jul-25
Phase 1		173	25-Apr-22	21-Nov-22
A1500	Partial Demo NB Deck and Parapet	15	25-Apr-22	19-May-22
A1530	Partial Demo NB Substructure/Install Phased SOE	15	19-May-22	14-Jun-22
A1590	Install Pile	10	14-Jul-22	29-Jul-22
A1620	Install Phased MSE	10	29-Jul-22	16-Aug-22
A1600	Form/Pour Substructure	12	16-Aug-22	07-Sep-22
A1610	Cure Substructure	5	07-Sep-22	12-Sep-22
A1700	Set Beams	5	12-Sep-22	20-Sep-22
A1710	Superstructure and Decks	25	20-Sep-22	02-Nov-22
A1720	Pour and Cure Parapet, Set Temp Barrier	10	02-Nov-22	21-Nov-22
Phase 2		230	21-Sep-23	05-Jun-24
A2630	Demo SB Deck and Parapet	20	21-Sep-23	26-Oct-23
A2640	Demo SB Substructure/Install Abut SOE	15	26-Oct-23	22-Nov-23
A2650	Install Pile	10	22-Nov-23	14-Dec-23
A2680	Install MSE	15	14-Dec-23	16-Jan-24
A2660	Form/Pour Substructure	18	16-Jan-24	22-Feb-24
A2670	Cure Substructure	5	22-Feb-24	27-Feb-24
A2690	Set Beams	5	28-Feb-24	11-Mar-24
A2700	Superstructure and Decks	40	11-Mar-24	17-May-24
A2710	Pour and Cure Parapet	10	17-May-24	05-Jun-24
Phase 3		176	10-Oct-24	25-Apr-25
A3420	Demo Remaining NB Deck and Parapet	12	10-Oct-24	31-Oct-24
A3430	Demo Remaining NB Substr/Install Phased SOE	12	31-Oct-24	21-Nov-24
A3440	Install Pile	10	21-Nov-24	11-Dec-24
A3470	Install Phased MSE	12	12-Dec-24	08-Jan-25
A3450	Form/Pour Substructure	12	08-Jan-25	05-Feb-25



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

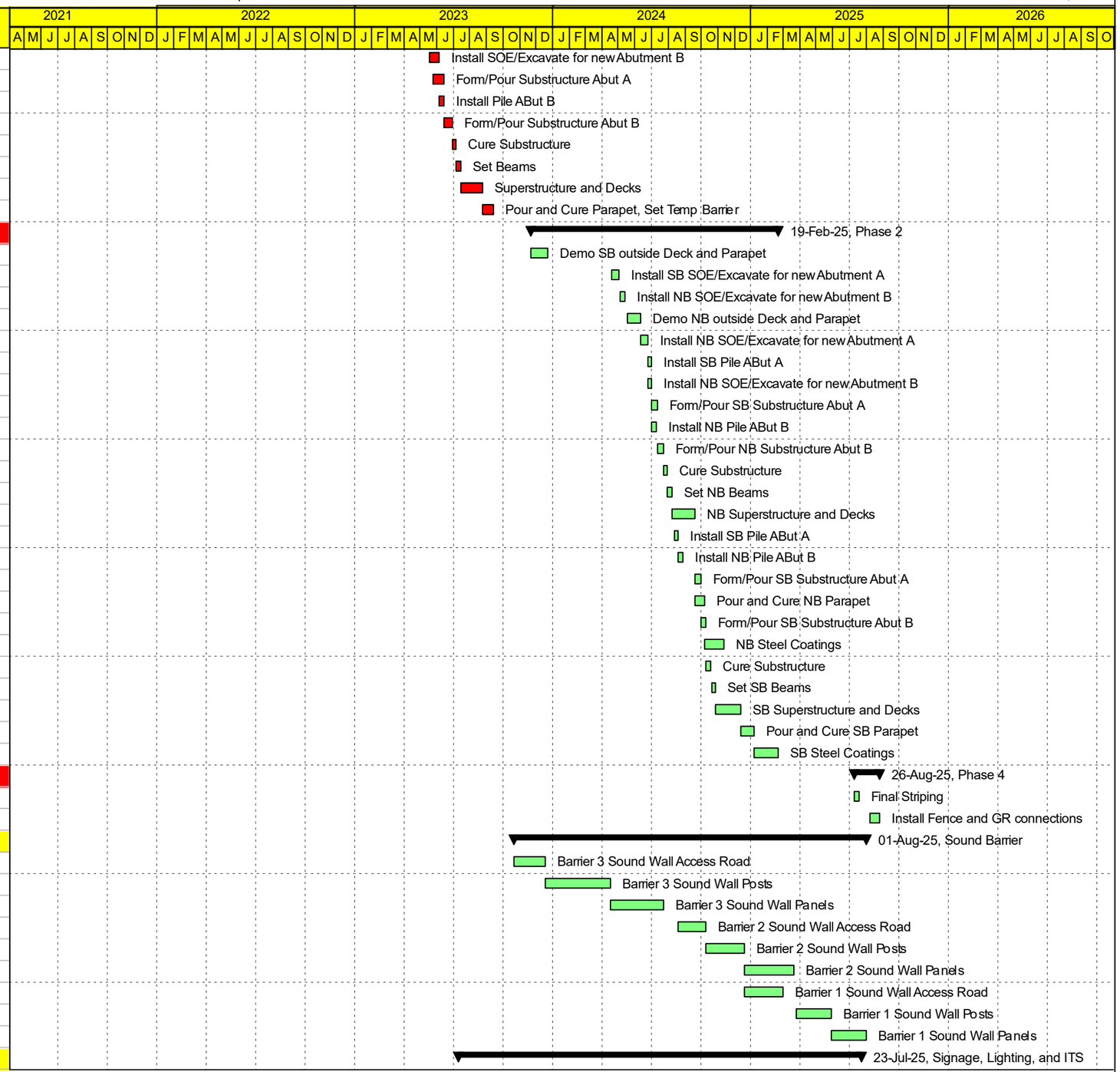
Activity ID	Activity Name	Original Duration	Start	Finish
A3460	Cure Substructure	5	05-Feb-25	10-Feb-25
A3480	Set Beams	5	11-Feb-25	20-Feb-25
A3490	Superstructure and Decks	25	20-Feb-25	08-Apr-25
A3500	Pour and Cure Parapet	10	08-Apr-25	25-Apr-25
Phase 4		24	27-Jun-25	24-Jul-25
A3930	Final Striping	5	27-Jun-25	07-Jul-25
A3900	Install Fence and GR connections	10	07-Jul-25	24-Jul-25
B686, B687 - Route 619		1018	14-Jun-22	08-Aug-25
Phase 1		251	14-Jun-22	03-Apr-23
A1510	Partial Demo NB Deck and Parapet	15	14-Jun-22	08-Jul-22
A1540	Partial Demo NB Substructure/Install Phased SOE	15	08-Jul-22	02-Aug-22
A1630	Install Pile	10	02-Nov-22	21-Nov-22
A1660	Install Phased MSE	10	21-Nov-22	14-Dec-22
A1640	Form/Pour Substructure	10	14-Dec-22	05-Jan-23
A1650	Cure Substructure	5	05-Jan-23	10-Jan-23
A1730	Set Beams	5	10-Jan-23	19-Jan-23
A1740	Superstructure and Decks	25	19-Jan-23	10-Mar-23
A1750	Pour and Cure Parapet, Set Temp Barrier	10	13-Mar-23	03-Apr-23
Phase 2		206	15-Feb-24	03-Oct-24
A2720	Demo SB Deck and Parapet	20	15-Feb-24	27-Mar-24
A2730	Demo SB Substructure	15	27-Mar-24	19-Apr-24
A2740	Install Pile	10	19-Apr-24	08-May-24
A2770	Install MSE	15	08-May-24	03-Jun-24
A2750	Form/Pour Substructure	15	03-Jun-24	26-Jun-24
A2760	Cure Substructure	5	26-Jun-24	01-Jul-24
A2780	Set Beams	5	01-Jul-24	09-Jul-24
A2790	Superstructure and Decks	40	09-Jul-24	13-Sep-24
A2800	Pour and Cure Parapet	10	17-Sep-24	03-Oct-24
Phase 3		170	21-Nov-24	30-May-25
A3510	Demo Remaining NB Deck and Parapet	12	21-Nov-24	16-Dec-24
A3520	Demo Remaining NB Substr/Install Phased SOE	12	16-Dec-24	10-Jan-25
A3530	Install Pile	10	10-Jan-25	05-Feb-25
A3560	Install Phased MSE	10	05-Feb-25	26-Feb-25
A3540	Form/Pour Substructure	12	26-Feb-25	21-Mar-25
A3550	Cure Substructure	5	21-Mar-25	26-Mar-25
A3570	Set Beams	5	27-Mar-25	03-Apr-25
A3580	Superstructure and Decks	25	03-Apr-25	13-May-25
A3590	Pour and Cure Parapet	10	13-May-25	30-May-25
Phase 4		30	07-Jul-25	08-Aug-25
A3940	Final Striping	5	07-Jul-25	14-Jul-25
A3890	Install Fence and GR connections	10	24-Jul-25	08-Aug-25
B677, 678 - Route 311		779	06-Apr-23	26-Aug-25
Phase 1		96	06-Apr-23	13-Sep-23
A1760	Demo NB inside Deck and Parapet	8	06-Apr-23	19-Apr-23
A1850	Demo SB inside Deck and Parapet	8	19-Apr-23	01-May-23
A1770	Install SOE/Excavate for new Abutment A	10	02-May-23	18-May-23
A1780	Install Pile ABut A	5	18-May-23	25-May-23



Remaining Level of Effort | Remaining Work | Milestone
Actual Work | Critical Remaining Work | Summary

TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
A1860	Install SOE/Excavate for new Abutment B	10	18-May-23	06-Jun-23
A1790	Form/Pour Substructure Abut A	10	25-May-23	13-Jun-23
A1870	Install Pile ABut B	5	06-Jun-23	13-Jun-23
A1880	Form/Pour Substructure Abut B	10	13-Jun-23	29-Jun-23
A1800	Cure Substructure	5	29-Jun-23	07-Jul-23
A1820	Set Beams	5	07-Jul-23	14-Jul-23
A1830	Superstructure and Decks	25	14-Jul-23	25-Aug-23
A1840	Pour and Cure Parapet, Set Temp Barrier	10	25-Aug-23	13-Sep-23
Phase 2		242	22-Nov-23	19-Feb-25
A2820	Demo SB outside Deck and Parapet	15	22-Nov-23	22-Dec-23
A2830	Install SB SOE/Excavate for new Abutment A	8	19-Apr-24	02-May-24
A2850	Install NB SOE/Excavate for new Abutment B	5	03-May-24	13-May-24
A2810	Demo NB outside Deck and Parapet	15	17-May-24	11-Jun-24
A2940	Install NB SOE/Excavate for new Abutment A	8	12-Jun-24	24-Jun-24
A2950	Install SB Pile ABut A	5	24-Jun-24	01-Jul-24
A2960	Install NB SOE/Excavate for new Abutment B	5	24-Jun-24	01-Jul-24
A2970	Form/Pour SB Substructure Abut A	6	01-Jul-24	11-Jul-24
A2980	Install NB Pile ABut B	5	01-Jul-24	10-Jul-24
A2990	Form/Pour NB Substructure Abut B	6	11-Jul-24	22-Jul-24
A3000	Cure Substructure	5	22-Jul-24	29-Jul-24
A3010	Set NB Beams	5	29-Jul-24	08-Aug-24
A3020	NB Superstructure and Decks	25	08-Aug-24	18-Sep-24
A2840	Install SB Pile ABut A	5	12-Aug-24	19-Aug-24
A2870	Install NB Pile ABut B	5	19-Aug-24	27-Aug-24
A2860	Form/Pour SB Substructure Abut A	6	18-Sep-24	01-Oct-24
A3030	Pour and Cure NB Parapet	10	18-Sep-24	07-Oct-24
A2880	Form/Pour SB Substructure Abut B	6	01-Oct-24	10-Oct-24
A7790	NB Steel Coatings	20	07-Oct-24	12-Nov-24
A2890	Cure Substructure	5	10-Oct-24	18-Oct-24
A2900	Set SB Beams	5	21-Oct-24	28-Oct-24
A2910	SB Superstructure and Decks	25	28-Oct-24	12-Dec-24
A2920	Pour and Cure SB Parapet	10	12-Dec-24	07-Jan-25
A7800	SB Steel Coatings	20	07-Jan-25	19-Feb-25
Phase 4		42	10-Jul-25	26-Aug-25
A3950	Final Striping	5	10-Jul-25	18-Jul-25
A3880	Install Fence and GR connections	10	08-Aug-25	26-Aug-25
Sound Barrier		355	20-Oct-23	01-Aug-25
A4350	Barrier 3 Sound Wall Access Road	30	20-Oct-23	18-Dec-23
A4360	Barrier 3 Sound Wall Posts	60	18-Dec-23	17-Apr-24
A4370	Barrier 3 Sound Wall Panels	60	17-Apr-24	24-Jul-24
A4380	Barrier 2 Sound Wall Access Road	30	19-Aug-24	10-Oct-24
A4390	Barrier 2 Sound Wall Posts	40	10-Oct-24	20-Dec-24
A4400	Barrier 2 Sound Wall Panels	40	20-Dec-24	21-Mar-25
A7880	Barrier 1 Sound Wall Access Road	30	20-Dec-24	28-Feb-25
A7890	Barrier 1 Sound Wall Posts	40	25-Mar-25	28-May-25
A7900	Barrier 1 Sound Wall Panels	40	28-May-25	01-Aug-25
Signage, Lighting, and ITS		665	10-Jul-23	23-Jul-25



Remaining Level of Effort | Remaining Work | Milestone
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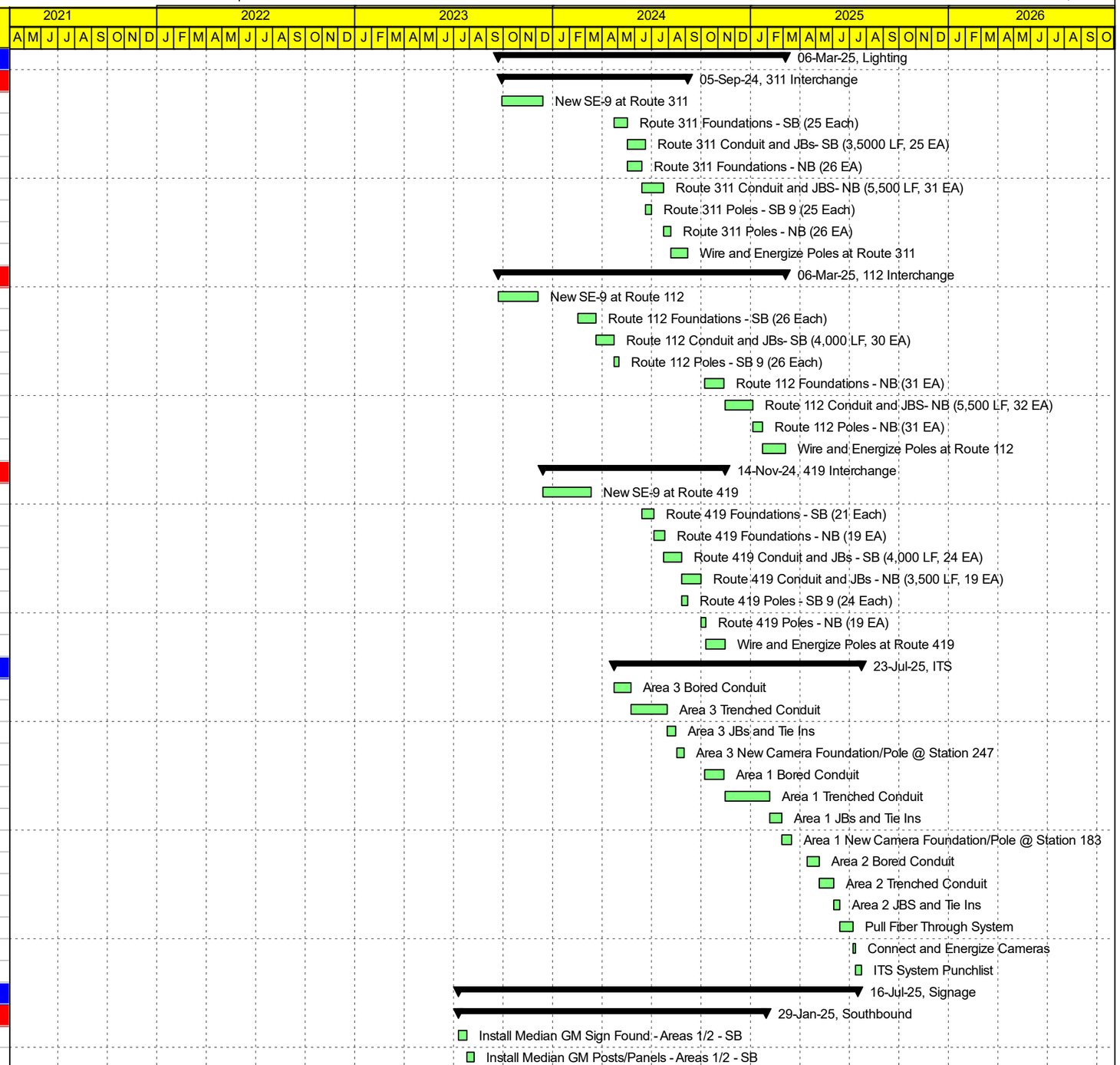
TASK filter: All Activities

Activity ID	Activity Name	Original Duration	Start	Finish
Lighting		284	21-Sep-23	06-Mar-25
311 Interchange		188	29-Sep-23	05-Sep-24
A6920	New SE-9 at Route 311	40	29-Sep-23	14-Dec-23
A6930	Route 311 Foundations - SB (25 Each)	15	23-Apr-24	17-May-24
A6940	Route 311 Conduit and JBs- SB (3,5000 LF, 25 EA)	20	17-May-24	19-Jun-24
A6960	Route 311 Foundations - NB (26 EA)	15	17-May-24	12-Jun-24
A6970	Route 311 Conduit and JBS- NB (5,500 LF, 31 EA)	26	12-Jun-24	24-Jul-24
A6950	Route 311 Poles - SB 9 (25 Each)	7	19-Jun-24	01-Jul-24
A6980	Route 311 Poles - NB (26 EA)	7	24-Jul-24	06-Aug-24
A6990	Wire and Energize Poles at Route 311	20	06-Aug-24	05-Sep-24
112 Interchange		284	21-Sep-23	06-Mar-25
A6840	New SE-9 at Route 112	40	21-Sep-23	05-Dec-23
A6870	Route 112 Foundations - SB (26 Each)	15	16-Feb-24	20-Mar-24
A6850	Route 112 Conduit and JBs- SB (4,000 LF, 30 EA)	20	20-Mar-24	23-Apr-24
A6890	Route 112 Poles - SB 9 (26 Each)	7	23-Apr-24	02-May-24
A6880	Route 112 Foundations - NB (31 EA)	20	07-Oct-24	12-Nov-24
A6860	Route 112 Conduit and JBS- NB (5,500 LF, 32 EA)	26	13-Nov-24	03-Jan-25
A6900	Route 112 Poles - NB (31 EA)	8	03-Jan-25	22-Jan-25
A6910	Wire and Energize Poles at Route 112	20	22-Jan-25	06-Mar-25
419 Interchange		186	14-Dec-23	14-Nov-24
A7000	New SE-9 at Route 419	40	14-Dec-23	11-Mar-24
A7010	Route 419 Foundations - SB (21 Each)	15	12-Jun-24	05-Jul-24
A7030	Route 419 Foundations - NB (19 EA)	12	05-Jul-24	25-Jul-24
A7020	Route 419 Conduit and JBs - SB (4,000 LF, 24 EA)	20	24-Jul-24	26-Aug-24
A7040	Route 419 Conduit and JBs - NB (3,500 LF, 19 EA)	20	26-Aug-24	01-Oct-24
A7050	Route 419 Poles - SB 9 (24 Each)	7	26-Aug-24	05-Sep-24
A7060	Route 419 Poles - NB (19 EA)	5	01-Oct-24	09-Oct-24
A7070	Wire and Energize Poles at Route 419	20	10-Oct-24	14-Nov-24
ITS		408	23-Apr-24	23-Jul-25
A6400	Area 3 Bored Conduit	20	23-Apr-24	24-May-24
A6410	Area 3 Trenched Conduit	40	24-May-24	30-Jul-24
A6460	Area 3 JBs and Tie Ins	10	30-Jul-24	15-Aug-24
A6470	Area 3 New Camera Foundation/Pole @ Station 247	10	16-Aug-24	30-Aug-24
A6520	Area 1 Bored Conduit	20	07-Oct-24	12-Nov-24
A6530	Area 1 Trenched Conduit	40	13-Nov-24	05-Feb-25
A6540	Area 1 JBs and Tie Ins	10	05-Feb-25	26-Feb-25
A6550	Area 1 New Camera Foundation/Pole @ Station 183	10	26-Feb-25	17-Mar-25
A6480	Area 2 Bored Conduit	15	14-Apr-25	07-May-25
A6490	Area 2 Trenched Conduit	15	07-May-25	02-Jun-25
A6500	Area 2 JBS and Tie Ins	8	02-Jun-25	13-Jun-25
A6510	Pull Fiber Through System	20	13-Jun-25	07-Jul-25
A6560	Connect and Energize Cameras	5	07-Jul-25	11-Jul-25
A6570	ITS System Punchlist	10	11-Jul-25	23-Jul-25
Signage		405	10-Jul-23	16-Jul-25
Southbound		311	10-Jul-23	29-Jan-25
A7300	Install Median GM Sign Found - Areas 1/2 - SB	10	10-Jul-23	26-Jul-23
A7340	Install Median GM Posts/Panels - Areas 1/2 - SB	8	26-Jul-23	08-Aug-23



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Activity ID	Activity Name	Original Duration	Start	Finish
A7310	Install Median GM Sign Found - Areas 3 - SB	10	27-Jul-23	11-Aug-23
A7350	Install Median GM Posts/Panels - Areas 3 - SB	8	11-Aug-23	25-Aug-23
A7080	Station 532 Cantilever Sign Found and Upright	10	11-Jul-24	29-Jul-24
A7320	Install Ext GM Sign Found - Areas 1/2 - SB	10	25-Jul-24	13-Aug-24
A7090	Preassemble Station 532 Cantilever Sign	6	29-Jul-24	08-Aug-24
A7100	Station 552 Cantilever Sign Found and Upright	10	29-Jul-24	14-Aug-24
A7360	Install Ext GM Posts/Panels - Areas 1/2 - SB	8	13-Aug-24	23-Aug-24
A7110	Preassemble Station 552 Cantilever Sign	6	14-Aug-24	23-Aug-24
A7120	Station 570 Cantilever Sign Found and Upright	10	14-Aug-24	29-Aug-24
A7130	Preassemble Station 570 Cantilever Sign	6	29-Aug-24	09-Sep-24
A7200	Station 710 Cantilever Sign Found and Upright	10	29-Aug-24	18-Sep-24
A7210	Preassemble Station 710 Cantilever Sign	6	18-Sep-24	27-Sep-24
A7240	Station 724 Cantilever Sign Found and Upright	10	18-Sep-24	04-Oct-24
A7250	Preassemble Station 724 Cantilever Sign	6	04-Oct-24	16-Oct-24
A7330	Install Exterior GM Sign Found - Areas 3 - SB	10	09-Oct-24	25-Oct-24
A7370	Install Exterior GM Posts/Panels - Areas 3 - SB	8	25-Oct-24	08-Nov-24
A7460	Install OH Sign onto Uprights - SB	10	07-Jan-25	29-Jan-25
Northbound		395	26-Jul-23	16-Jul-25
A7380	Install Median GM Sign Found - Areas 1/2 - NB	10	26-Jul-23	11-Aug-23
A7420	Install Median GM Posts/Panels - Areas 1/2 - NB	8	11-Aug-23	24-Aug-23
A7390	Install Median GM Sign Found - Areas 3 - NB	10	11-Aug-23	29-Aug-23
A7430	Install Median GM Posts/Panels - Areas 3 - NB	8	29-Aug-23	11-Sep-23
A7410	Install Ext GM Sign Foundations - Areas 3 - NB	10	20-Sep-24	09-Oct-24
A7450	Install Ext GM Posts/Panels - Areas 3 - NB	8	09-Oct-24	23-Oct-24
A7180	Station 270 Cantilever Sign Found and Upright	10	28-Oct-24	15-Nov-24
A7190	Preassemble Station 270 Cantilever Sign	6	15-Nov-24	25-Nov-24
A7220	Station 312 Cantilever Sign Found and Upright	10	15-Nov-24	03-Dec-24
A7230	Preassemble Station 312 Cantilever Sign	6	03-Dec-24	16-Dec-24
A7260	Station 335 Cantilever Sign Found and Upright	10	03-Dec-24	20-Dec-24
A7270	Preassemble Station 335 Cantilever Sign	6	20-Dec-24	08-Jan-25
A7280	Station 357 Cantilever Sign Found and Upright	10	20-Dec-24	17-Jan-25
A7290	Preassemble Station 357 Cantilever Sign	6	17-Jan-25	30-Jan-25
A7140	Station 221 Cantilever Sign Foun and Upright	10	15-May-25	02-Jun-25
A7400	Install Ext GM Sign Found - Areas 1/2 - NB	8	15-May-25	29-May-25
A7440	Install Ext GM Posts/Panels - Areas 1/2 - NB	8	29-May-25	10-Jun-25
A7150	Preassemble Station 221 Cantilever Sign	6	02-Jun-25	10-Jun-25
A7160	Station 247 Cant Sign Found and Upright	10	02-Jun-25	18-Jun-25
A7170	Preassemble Station 247 Cantilvr Sign	6	18-Jun-25	27-Jun-25
A7480	Install OH Sign onto Uprights - SB	10	27-Jun-25	16-Jul-25