

Response to Request for Proposals

VOLUME I TECHNICAL PROPOSAL

VDOT BRIDGES OVER I-95 SUPERSTRUCTURE

REPLACEMENT AND REHABILITATION BUNDLING

City of Richmond, Virginia

UPC (State Project Nos.; Federal Project Nos.)

UPC 111300 (U000-127-023, P101, R201, C501, B601; STP-5A27(802))

UPC 111294 (0064-127-022, P101, B661; NHPP-064-3(510))

UPC 113375 (0250-127-050, P101, R201, C501; NHPP-BR04(307))

UPC 113388 (0004-127-051, P101, R201, C501; NHPP-BR04(308))

UPC 118484 (9999-127-107, P101, R202, C501, B602; NHPP-5A27(784))

Contract ID Number: C00111300DB107



August 27, 2021

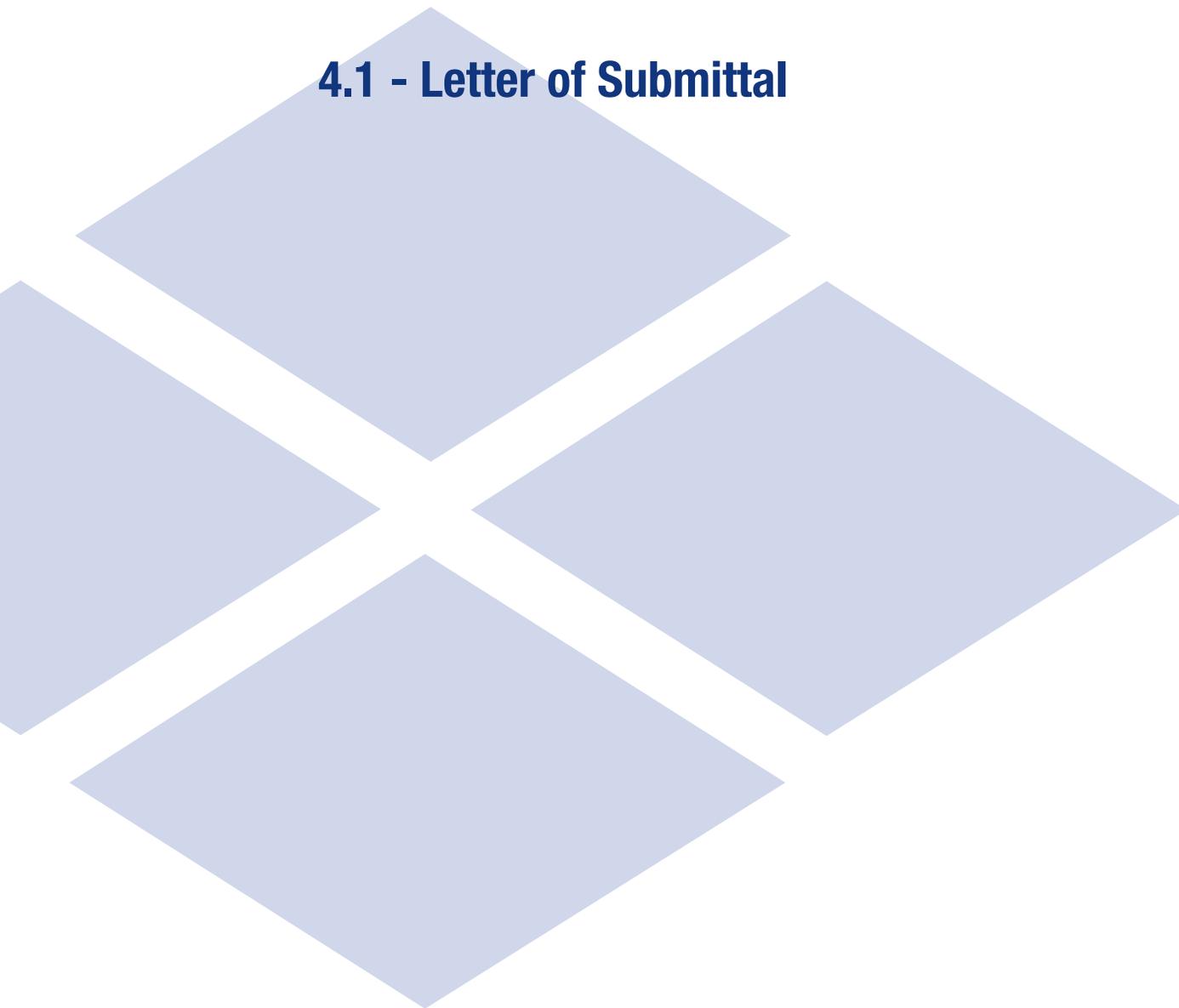
Submitted By:



In Association With:



4.1 - Letter of Submittal



August 27, 2021

Mr. Joseph A. Clarke, PE, DBIA
Alternative Project Delivery Division
Virginia Department of Transportation
1401 East Broad Street
Annex Building, 5th Floor
Richmond, VA 23219

Re: VDOT Bridges Over I-95 Superstructure
Replacement and Rehabilitation Bundling
City of Richmond, Virginia
Contract ID Number: C00111300DB107
4.1 Letter of Submittal

Dear Mr. Clarke:

Shirley Contracting Company, LLC (Shirley), as the Offeror, and Dewberry Engineers Inc. (Dewberry), as the Lead Designer, are pleased to submit our Team's Technical Proposal for the VDOT Bridges Over I-95 Superstructure Replacement and Rehabilitation Bundling Project (the Project). Our Team will provide VDOT and the traveling public with an unequaled level of assurance that the Project is completed successfully and exceeds the priorities established while limiting risk to all stakeholders.

4.1.2 - 4.1.3 Declarations: Should Shirley be selected, it is our intent to enter into a contract with VDOT for the Project in accordance with the terms of this Request for Proposal (RFP). Further, the offer represented by our Technical and Price Proposals will remain in full force and effect for one hundred twenty (120) days after the date the Price Proposal is actually submitted to VDOT.

4.1.4 Point of Contact: Garry A. Palleschi, Vice President, Shirley Contracting Company, LLC, 8435 Backlick Road, Lorton, VA 22079, P: 703.550.3579, F: 703.550.9346, gpalleschi@shirleycontracting.com.

4.1.5 Principal Officer: Michael E. Post, Chief Executive Officer, Shirley Contracting Company, LLC, 8435 Backlick Road, Lorton, VA 22079, P: 703.550.8100.

4.1.6 Final Completion Date: November 22, 2024.

4.1.7 Unique Milestone Date: November 2, 2023 - Completion of 7th Street Bridge.

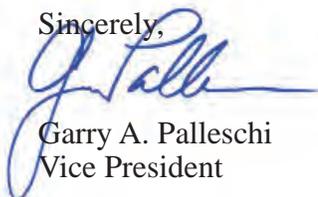
4.1.8 Proposal Payment Agreement: An executed Proposal Payment Agreement, Attachment 9.3.1, is included in the Appendix.

4.1.9 Certification Regarding Debarment: Signed Certification Regarding Debarment Forms from all team members are included as an attachment in the Appendix.

4.1.10 DBE Participation Goal: Shirley commits to achieving a 9% DBE participation goal for the entire value of the contract.

On behalf of the entire Shirley/Dewberry Team, we thank VDOT for the opportunity to submit this Technical Proposal and look forward to your favorable review.

Sincerely,



Garry A. Palleschi
Vice President

4.2 - Offeror's Qualifications

4.2 Offeror's Qualifications

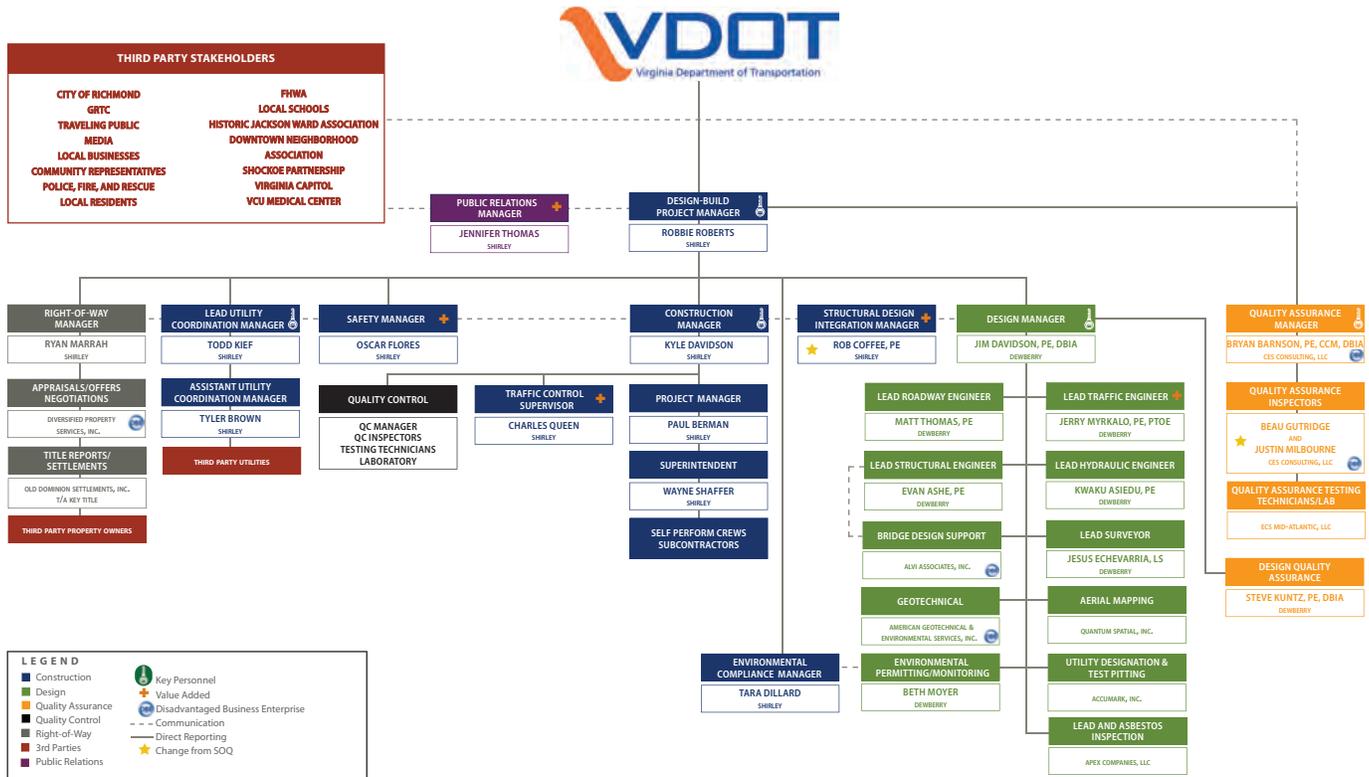
4.2.1 Confirmation

We confirm that the information contained in our Statement of Qualifications (SOQ) remains true and accurate, except for Rob Coffee, PE who has been assigned to the Project as the Structural Design Integration Manager. Rob is replacing John Majane, as he is no longer available for this Project. This change was approved by VDOT on August 20, 2021.

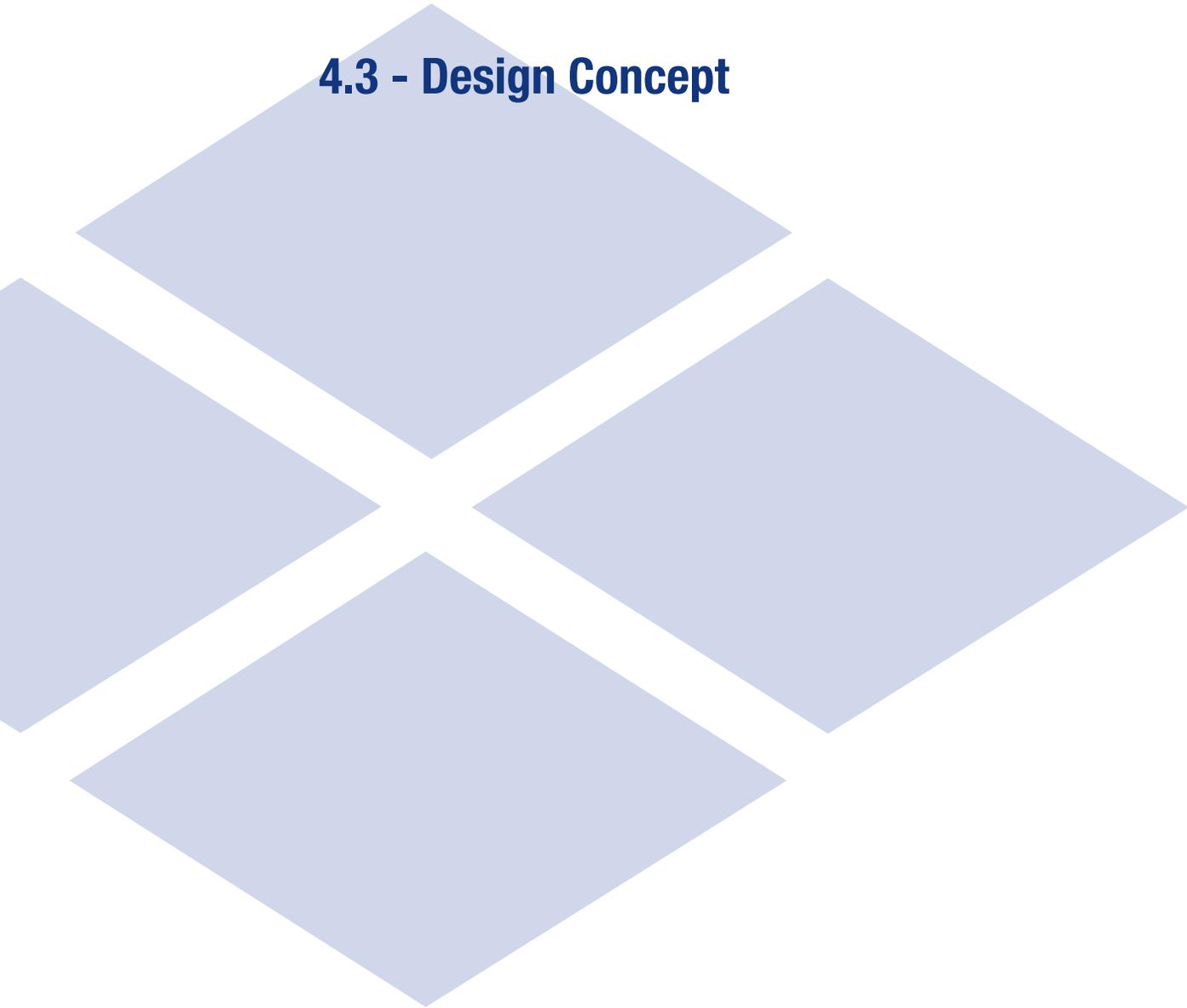
We have also included the additional Quality Assurance Inspector required by the RFP.

4.2.2 Organizational Chart

The Project Organizational Chart below identifies the “chain of command” and major functions to be performed and their reporting relationships in managing, designing, and constructing the Project, including quality control and quality assurance. The organizational chart has been updated to reflect the changes as described in Section 4.2.1. As there are no other changes to the functional relationships among the participants, an updated narrative is not required.



4.3 - Design Concept





4.3 Design Concept

Introduction

The Shirley/Dewberry Team (Team) is excited for the opportunity to work with VDOT to complete the VDOT Bridges Over I-95 Superstructure Replacement and Rehabilitation Bundling Project (Project). The replacement of these critical bridges that move motorists, pedestrians, and bicyclists across I-95 in the downtown Richmond area is paramount to the safety and mobility of the traveling public. As our Team prepared this Technical Proposal, we did so recognizing the extensive efforts of VDOT to date and the impact the Project will have on the surrounding communities. We visited the site on numerous occasions to understand first-hand the challenges the Project will face. We coordinated with each utility owner to discuss their conflicts and develop solutions to address them. We met as a Team extensively, usually at least twice a week since release of the RFP, to develop our concept and the enhancements shown herein. As a result, we are confident that our Team's approach exceeds the schedule objectives, ensures a quality product, and minimizes impacts to the community and stakeholders.

One of our Team's primary focus points is mobility along the I-95 corridor during critical construction activities. To address this, our Team developed ATC 1 for the detour of I-95 southbound during nighttime operations. Implementation of this ATC detours I-95 southbound onto eastbound I-64 via the Route 360 interchange before returning to I-95 southbound. By using this detour, construction can be sequenced such that motorists will avoid having to cross over to the opposite side of I-95 with movable barrier at the 1st, 4th, 5th, and 7th Street bridges. In addition, more efficient construction operations can occur each night given the time savings associated with the elimination of movable barrier. ATC 1 is discussed further within Section 4.5.2.

Our Proposal incorporates additional enhancements described in detail in the following sections, our Volume II Design Concept and summarized in Table 1, which further our goals to:

- Improve safety for the traveling public, construction personnel, and inspection staff;
- Improve traffic operations during construction;
- Maximize vertical clearance while optimizing girder design;
- Avoid and reduce property impacts;
- Minimize construction costs;
- Reduce the Project Schedule; and
- Reduce long-term maintenance for VDOT.

Our Team's concept:

- Meets or exceeds all requirements listed in the Design Criteria Table;
- Results in limits of construction, to include all stormwater management facilities, which are within the existing/proposed right-of-way limits shown in the RFP Conceptual Plans with the exception of permanent and temporary easements; and
- Does not include design elements that require Design Exceptions and/or Design Waivers unless they are identified or included in the RFP or Addendum.

Table 1: Enhancements and Benefits

Location/ Design Element	Enhancement	Project Benefit
Maintenance of Traffic	ATC 1: I-95 Southbound Traffic Detour via I-64 and Route 360.	<ul style="list-style-type: none"> Increases safety to traveling public during demolition and construction. Reduces construction costs. Reduces construction schedule.
	Modified RFP staging to build north half first at 1st, 4th, 5th, and 7th Street bridges.	<ul style="list-style-type: none"> Facilitates earlier utility relocations removing them from the Critical Path. Reduces construction schedule.
1st Street Bridge	Optimized Bridge Design to eliminate one girder line.	<ul style="list-style-type: none"> Reduces long term maintenance. Reduces construction costs. Reduces construction schedule.
	Modified construction sequence to maintain two-way traffic.	<ul style="list-style-type: none"> Eliminates detour and temporary signal. Improves safety to traveling public during construction. Reduces construction schedule.
	Optimized profile to achieve vertical clearance of 15'-7".	<ul style="list-style-type: none"> Improves safety to traveling public by providing more than the minimum vertical clearance. Allows for optimization of girders.
4th Street Bridge	Optimized Bridge Design to eliminate two girder lines.	<ul style="list-style-type: none"> Reduces long term maintenance. Reduces construction costs. Reduces construction schedule.
	Optimized profile to achieve vertical clearance of 15'-1".	<ul style="list-style-type: none"> Improves safety to traveling public by providing more than the minimum vertical clearance.
5th Street Bridge	Refined typical section over the bridge to reduce width by 8' and eliminate one girder line.	<ul style="list-style-type: none"> Reduces long term maintenance. Reduces construction costs. Reduces construction schedule. Eliminates need for permanent easements shown in RFP plans.
	Optimized profile to achieve vertical clearance of 15'-6".	<ul style="list-style-type: none"> Improves safety to traveling public by providing more than the minimum vertical clearance.
7th Street Bridge	Selected first in overall sequence of bridge construction.	<ul style="list-style-type: none"> Removes the RFP constraints for the City of Richmond waterlines from the Critical Path.
	Optimized Bridge Design to eliminate three girder lines.	<ul style="list-style-type: none"> Reduces long term maintenance. Reduces construction costs. Reduces construction schedule.
	Optimized profile to achieve vertical clearance of 15'-6".	<ul style="list-style-type: none"> Improves safety to traveling public by providing more than the minimum vertical clearance. Accommodates standard underbridge waterline construction.
E. Broad Street	Optimized profile to achieve vertical clearance of 15'-0½".	<ul style="list-style-type: none"> Improves safety to traveling public by providing more than the minimum vertical clearance.
	Use of PCUs for Accelerated Bridge Construction (ABC).	<ul style="list-style-type: none"> Reduces allowable weekend closures on I-95 from 8 to 4.
Stormwater Management	Reduced number of facilities from 2 to 1.	<ul style="list-style-type: none"> Reduces long-term maintenance. Reduces construction costs and schedule. Increases safety for public and maintenance crews.
	Proposed use of underground detention-only facility.	<ul style="list-style-type: none"> Reduces long-term maintenance. Increases safety for public and maintenance crews.

4.3.1 Conceptual Roadway Plans

Completion of the Project will provide new superstructures and repaired substructures on the 1st, 4th, 5th, 7th, and E. Broad Street bridges. The work on the approach roadways will be limited to accommodating changes to the profiles and include storm and curb improvements and minor variable depth overlays.

(a) General Geometry

The general geometry of our Team's concept is depicted in our Volume II Design Concept, including horizontal curve data, the number and widths of lanes and shoulders, superelevation rates for each horizontal curve, and design speeds. As the Project consists of five individual Project areas, Table 2 is a reduced design criteria table that identifies the general geometry for each alignment that crosses I-95.

Table 2: Design Criteria

	1st Street	4th Street	5th Street		7th Street	E. Broad Street
			(N of I-95 SB Ramp Exit)	(S of I-95 SB Ramp Exit)		
Functional Classification	GS-7	GS-6	GS-R	GS-5	GS-6	GS-5
Design Speed	30 MPH	30 MPH	25 MPH	25 MPH	30 MPH	30 MPH
Minimum Lane Widths	11 feet	11 feet	12 feet	10.25 feet	10.5 feet	11 feet
Number of Lanes	2 + bike lane	3 + bike lane	2	3	4	5

Our Team's approach to the roadway geometry and design is to provide the most vertical clearance that is practical while returning to existing grades quickly. By taking this approach, we are able to provide vertical clearances that are in excess of the minimum 15 feet required by the RFP while also minimizing the impacts to the surrounding properties. Since we are only replacing the superstructures of the bridges, our horizontal alignments are laid out to match the existing crown lines and bridge widths to limit impacts to the abutments or piers of the substructure. Limiting these changes also reduces the replacement of the roadway and curbs approaching the bridge to accommodate the vertical changes. The limits of curb replacement and pavement milling and overlays are identified in our Volume II Design Concept.

(b) Horizontal Alignments

Our alignment approach is to maintain a straight tangent across the bridges and provide an alignment shift, if needed, off the bridge to tie to the existing roadways. Keeping the alignment straight on the bridge matches the existing configurations and simplifies the construction sequence. All alignments generally follow the RFP, except for 1st Street. To facilitate a smoother transition through the intersection of 1st Street and Duval Street, we have lengthened the transition approaching the bridge. This transition more closely matches the existing curb line on the northbound outside and reduces the abrupt shift currently observed through this intersection. A smoother transition provides safer movements for motorists which is critical as the bike lane parallels northbound traffic.

Horizontal alignments for the intersecting roadways and ramps are consistent with those identified in the RFP. Minor modifications have been incorporated to more closely reflect existing conditions and provide proper transitions to match existing shoulder widths and guardrail locations, and to accommodate the required design vehicles.

(c) Maximum Grades

Our Team developed profiles for each of the roadways that maximize the vertical clearance over I-95 while minimizing the impacts to the connecting roadways, which generally tie-into existing grades by the end of the curb returns. The maximum grades for each roadway are identified in Table 3. All of the maximum

grades proposed are less than the maximum allowed by VDOT and AASHTO criteria. Table 3 also highlights that we are exceeding the 15 foot minimum vertical clearance (MVC) at each bridge. **Overall, we are able to increase the MVC of all bridges by an average of 4 inches.**

Table 3: Maximum Grades

Alignment	Amount Exceeding MVC	Maximum Grade
1st Street	7"	0.67%
4th Street	1"	2.29%
5th Street	6"	1.61%
7th Street	6"	4.50%
E. Broad Street	1/2"	8.73%

(d) Typical Sections

Improvements to 1st, 4th, 5th, 7th, and E. Broad Streets are consistent with the RFP in terms of the number and widths of travel lanes, shoulders, bicycle lanes, and sidewalks. Typical sections are included in our Team's Volume II Design Concept reflecting the lane configuration and widths for each approaching roadway and bridge. Each roadway is designated as an urban roadway and therefore consist of curb or curb and gutter in accordance with either VDOT or the City of Richmond details, depending on their location.

Each of the roadways include either a concrete or brick paver sidewalk with the exception of 5th Street. Each of the sidewalks will be 5 feet wide at a minimum and up to 14 feet wide depending on the location. Our Team's design slopes the sidewalk toward the roadway to provide additional vertical clearance over I-95. This approach benefits the Project by limiting the transitions between the roadway and bridge sections and maintains the drainage patterns across the bridge.

(e) Proposed Right-of-Way Limits

One of our primary goals is to reduce and/or avoid right-of-way impacts to the greatest extent possible. Our optimization of the vertical profile and reconfiguration of the 5th Street Bridge typical section eliminates a permanent easement from Parcel 007 in addition to minimizing easements in many other locations, a temporary construction easement has been removed from Parcel 001 as shown in Figure 4.3.1.1. Overall, we have reduced the permanent easements by approximately **300 square feet** and temporary construction easements by approximately **2,370 square feet**. Locations of these easement reductions are shown in our Volume II Design Concept.

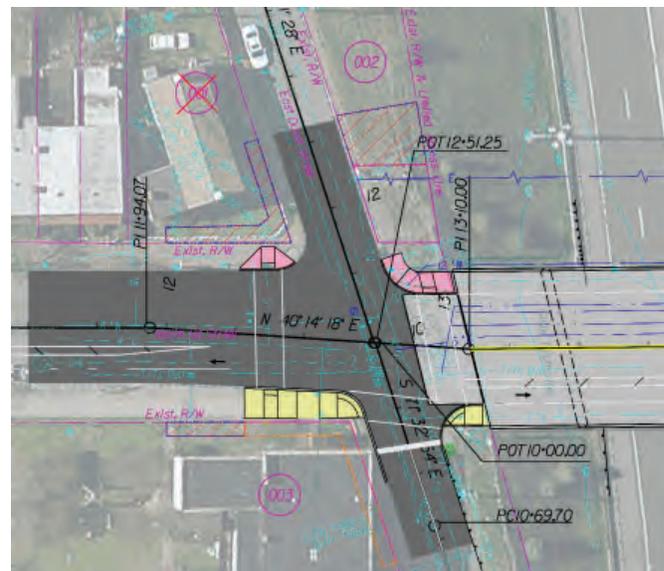


Figure 4.3.1.1 Removal of Temporary Construction Easement from Parcel 001

(f) Proposed Utility Impacts

Utilities impacted by the bridge superstructure replacements are detailed in Section 4.4.2 and shown in our Volume II Design Concept.

(g) Other Key Project Features

Geotechnical Investigations

Our Geotechnical Engineer has reviewed the GDR included in the RFP and identified several items that will be validated during final design to properly evaluate the existing foundation capacities. The existing foundations consist of both spread footings bearing on soil and piles driven to firm soil stratum. Soil corrosivity is of particular concern for the steel H-piles at E. Broad Street during evaluation of the existing pile capacity as the archaeological sites present a constraint that will not permit strengthening of the foundations with deep elements. Our Team will identify concerns in the design phase to present a clear approach for mitigation prior to construction. Modifications to the substructures and bearings will be

4.3 Design Concept

considered if the foundation loading exceeds capacity in an attempt to reduce bearing pressures.

Hydraulic and Stormwater Management Design

Stormwater Management design will be based on Part IIB Criteria of the Virginia Administrative Code 9VAC25-870-62 et seq. All five bridges are located within the James River-Almond Creek (JL01) Hydrologic Unit Code (HUC), within the Lower James watershed (HUC – 02080206). The Project flow will continue to discharge to the City of Richmond combined storm and sanitary sewer system and therefore is exempt from water quality requirements for both onsite and offsite treatments as specified in VA Code §62.1-44.15:34 Part C-5. The Project will not require the purchase of nutrient credits and no VPDES Permit is required.

All outfalls are manmade and will be analyzed to the limits where storm drainage outfalls to the combined storm and sanitary sewer system. The five Project sites drain to approximately 22 inlets, owned by both VDOT and the City of Richmond. Our Team has conducted a preliminary 10-year analysis per the City of Richmond SWM Design and Construction Standards Manual (DCSM), Section 6.1.2. at each outfall and has determined that additional stormwater detention is required at one location to meet the pre-developed condition flows based on our design peak flows. We compared the use of an underground detention system versus a traditional surface detention facility. Due to the constraints of the area between 4th Street and 5th Street where the proposed facility will be placed, shown in Figure 4.3.1.2, we propose the use of an underground detention system that will reduce long term maintenance costs to VDOT and provide safe access to maintenance staff. Different options for underground detention systems are available and each will be analyzed during the final design to provide the most efficient and cost-effective solution. One such system our Team has reviewed includes the use of large diameter concrete pipes connecting to a detention structure with a weir wall.

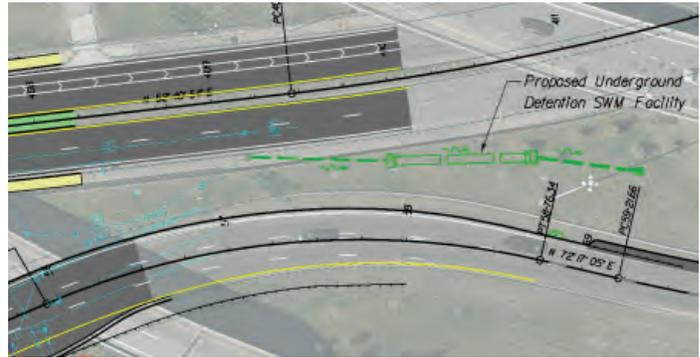


Figure 4.3.1.2 Proposed Stormwater Detention Facility

In addition, our Team continues to look for cost effective solutions by reviewing locations and minimizing replacement of existing storm drainage systems where the gas traps have been installed on the existing City of Richmond inlets. By limiting the impact to these structures, the overall construction costs and complexities of the structure construction can be reduced.

4.3.2 Conceptual Structural Plans

The structure and bridge scope of work consists of five superstructure replacements at locations where the condition of the existing bridge superstructures are the cause of their “structurally deficient” labels. New girder designs will be completed with the goal of keeping sections as shallow as possible in order to improve vertical clearance over I-95. In addition to the superstructure replacements, the Team will evaluate the existing abutments and piers at each location to determine the modifications needed to allow them to carry the new bridge configuration. Additional focus of our Team is to minimize construction related disruptions to local vehicle and pedestrian traffic. The selected bridge construction sequences and configurations minimize unnecessary impacts to those using these bridges on a daily basis.

General Superstructure Concepts

Our Team’s approach to the design of the new superstructures is primarily focused on improving the vertical clearance at each bridge. Achieving the minimum 15-foot vertical clearance, and more where

4.3 Design Concept

possible, will greatly improve the safety and durability of the bridge. Our Team surpassed the 15'-0" MVC at every bridge as shown by the Table 3 in Section 4.3.1.

Vertical clearance requirements led our Team to propose a unique solution regarding the bridge deck cross slopes on three of the bridges for the Project. At 1st, 4th, and 7th Street, a break in the cross slope is being introduced at the sidewalk face of curb. The cross slope of the deck is then reversed to go upwards at 1% as you move towards the edge of the deck. This modification allows for a few inches of depth that can either be applied to making a more economical girder design or raising the minimum vertical clearance. Figure 4.3.2.1 illustrates this cross-slope modification.

Superstructures comprised of steel plate girders with lightweight concrete bridge decks are used for each bridge, allowing lighter vertical loads versus heavier concrete girders. A sacrificial thickness of 1/16" on all exposed surfaces is used for the girders as required by the RFP. Also included in the framing of each of these bridges will be the Bridge Strike Mitigation System that is shown in Figure 4.3.2.2.

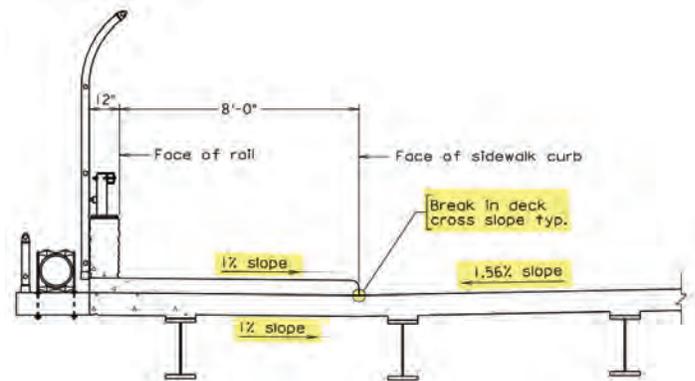


Figure 4.3.2.1 Bridge Cross Slope Modification at 1st, 4th, and 7th Street Bridges

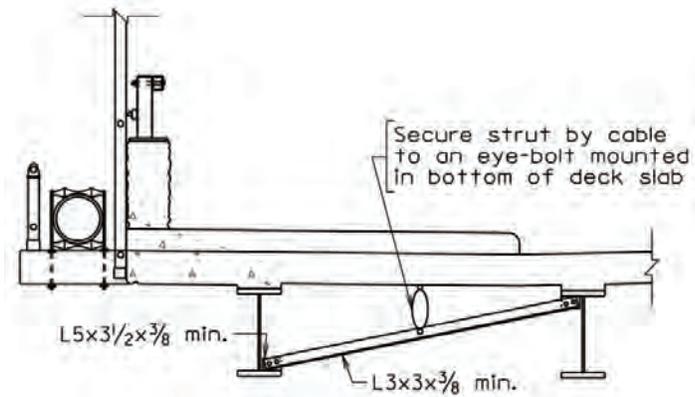


Figure 4.3.2.2 Bridge Strike Mitigation System

General Substructure Concepts

Re-use of substructure elements is a major focus of our design approach to reduce cost, minimize the construction schedule, and avoid impacts to the public. Our bridge configurations minimize dead loads and balance the change in the distribution of horizontal loads inherent with new bearing configurations. Some strengthening of the substructure elements is anticipated and may include the use of fiber reinforced polymers.

The existing conventional abutments are proposed to be modified to use the Virginia Micro Abutment Detail from Chapter 32 of the VDOT Manual of The Structure and Bridge Division. This will allow only minor modifications to the abutment backwalls and create a jointless bridge system thereby reducing maintenance costs. New approach slabs will be constructed behind the rebuilt abutments at the end of each bridge per the RFP. Defects that exist on the substructure units which are to remain in service will be repaired with the goal of raising the General Condition Rating of each bridge substructure to a rating of "7-Good" or better.

Bridge Materials

The proposed structural materials are selected to reduce VDOT's long-term maintenance efforts. Structural steel will be Grade 50 weathering steel. The fascia of exterior beams and all surfaces of the bottom flanges on interior beams shall be painted as described in the RFP. Low permeability, lightweight concrete will be used to create a more durable product and to minimize loads on the existing foundations. Corrosion Resistant Reinforcing Steel shall be used in the concrete as applicable according to VDOT IIM 81. Since ABC methods will be employed at the E. Broad Street bridge, we are proposing the use of Ultra High-Performance Concrete (UHPC) at the closure pours between precast superstructure units.

1st Street Over I-95 and I-64 On Ramp

The design at 1st Street will raise the vertical clearance at the bridge to 15'-7" over I-95. Several superstructure options were considered, including the use of steel rolled beams and prestressed concrete NEXT beams. Ultimately the use of continuous steel plate girders and a lightweight concrete deck was selected for its ability to raise the MVC, but also to reduce the weight of the superstructure and allow for use of the existing bridge piers. Table 4 summarizes our Team's configuration of the 1st Street Bridge over I-95 and the I-64 on ramp.

Table 4: 1st Street Bridge Proposed Configuration

Roadway Section	Total Out-To-Out Width	Span Arrangement and Total Length	Abutment Type	Pier Type
8' Sidewalk 9' Left Shoulder 2 – 11' Travel Lanes 9' Right Shoulder 8' Sidewalk	58'-0"	1 Span at 32'-0" 1 Span at 61'-6" 1 Span at 63'-0 5/8" 1 Span at 61'-6 1/4" 1 Span at 30'-0" Total Length 252'-2 3/8"	Existing abutments to be modified to use the Virginia Mirco Abutment Detail.	Existing multi-column piers on spread footings to be repaired and reused.

The superstructure includes eight steel plate girders, one fewer than the nine shown in the RFP Concept. With this design, that avoids a girder in the center of the bridge, our Team is able to use a two-stage construction sequence which maintains two-way traffic throughout construction. This avoids the use of detours and the portable traffic signals shown in the RFP and will greatly reduce the burden placed on local bridge users during construction. Pedestrian traffic will be maintained as shown in the RFP by keeping a sidewalk open along the outside of the bridge during each stage. The existing substructure includes two conventional perched abutments and four multi-column piers on spread footings and are incorporated in our design.

4th Street Over I-95

The 4th Street Bridge presents a particular challenge as this bridge controls the vertical clearance for the Project corridor. Having longer spans relative to the other bridges, and no clearance to raise the profile beneath the I-64 Ramp bridge, getting the minimum vertical clearance to an acceptable level became the focus of our design efforts. These tight requirements on superstructure depth, along with the longer span lengths, precluded the Team from using concrete or rolled beams and therefore steel plate girders are utilized. Table 5 provides the proposed configuration of the new 4th Street bridge.

Table 5: 4th Street Bridge Proposed Configuration

Roadway Section	Total Out-To-Out Width	Span Arrangement and Total Length	Abutment Type	Pier Type
6.5' Sidewalk 1' Left Shoulder 2 – 12' Travel Lanes 9' – Raised Median 2 – 12' Travel Lanes 1' Right Shoulder 6.5' Sidewalk	74'-0"	2 Spans at 86'-10 3/8" Total Length 177'-10 7/8"	Existing abutments to be modified to use the Virginia Mirco Abutment Detail.	Existing multi-column pier on piles to be repaired and reused.

As a result of our Team's cross-slope modifications, we are able to reduce the number of girder lines from 18 as shown in RFP to 16. Figure 4.3.2.3 shows our Team's proposed Transverse Section and the modifications to the cross slopes under the sidewalks.

4.3 Design Concept

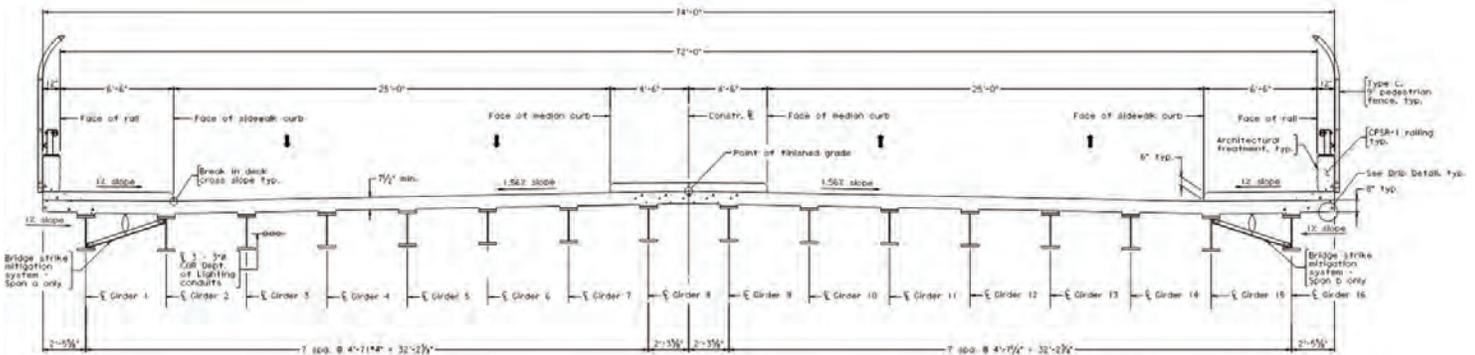


Figure 4.3.2.3 4th Street Bridge Transverse Section

5th Street Over I-95

The 5th Street Bridge consists of a four-span bridge with two short approach spans and two symmetrical main spans. Our Team developed a transverse bridge section concept that allows us to save 8'-0" of bridge width and utilize steel plate girders. This savings will keep the superstructure light and make reusing the existing piers and abutments easier with minimal strengthening. An alternative was explored to use prestressed concrete NEXT beams at this location, given the manageable span lengths and allowable superstructure depths. This was ultimately abandoned to instead take advantage of the lighter vertical loads provided by a steel plate girder superstructure. Table 6 provides the proposed configuration of the 5th Street Bridge.

Table 6: 5th Street Bridge Proposed Configuration

Roadway Section	Total Out-To-Out Width	Span Arrangement and Total Length	Abutment Type	Pier Type
2' Left Shoulder 3 – 12' Travel Lanes 12' Right Shoulder	52'-0"	1 Span at 34'-0" 2 Spans at 54'-9" 1 Span at 29'-6" Total Length 177'-0"	Existing abutments to be modified to use the Virginia Mirco Abutment Detail.	Existing multi-column piers on spread footings to be repaired and reused.

The modification to the shoulder reduces the total bridge width to 52'-0" from 60'-0" shown in the RFP and is depicted in Figures 4.3.2.4 and 4.3.2.5. This reduction in width allows use of seven girder lines as opposed to the eight shown in the RFP. The savings in concrete and steel weight keeps dead loads low on the existing substructure units that we plan to incorporate and allows us to achieve greater than the desired vertical clearance. The abutments and three multi-column piers that are in service at the existing 5th Street bridge are founded on spread footings and are incorporated in our designs.

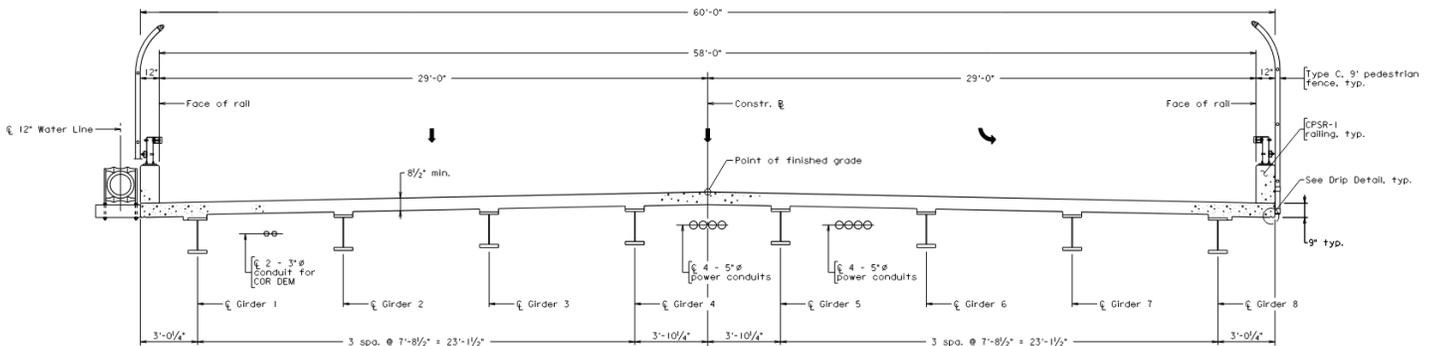


Figure 4.3.2.4 5th Street Bridge RFP Concept Transverse Section

4.3 Design Concept

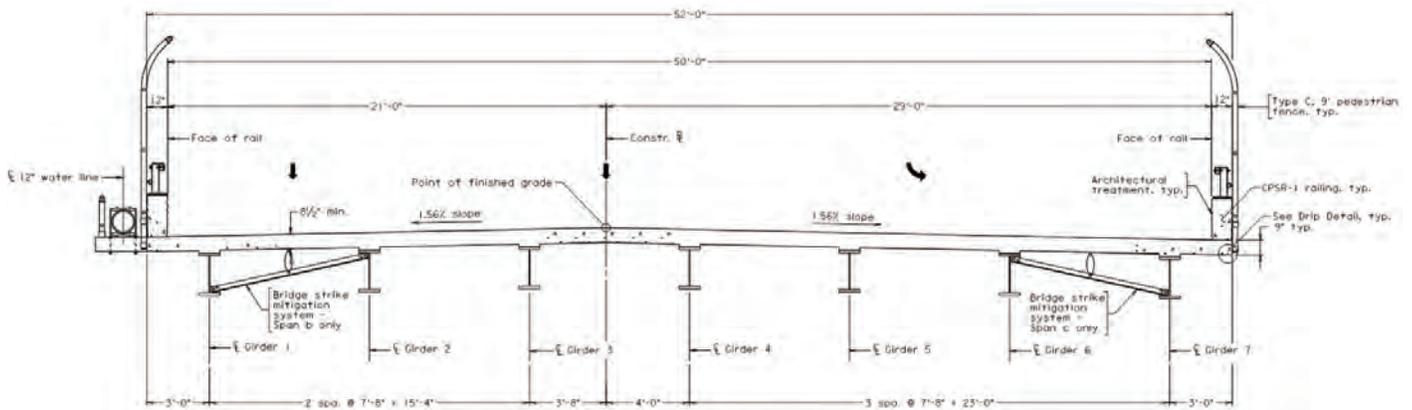


Figure 4.3.2.5 5th Street Bridge Proposed Transverse Section

7th Street Over I-95

The bridge at 7th Street will consist of five spans with an arrangement as shown in Table 7. Our focus in designing the proposed continuous steel plate girder spans is to lighten the superstructure as much as possible to incorporate the existing foundations and substructure elements without modifications. Table 7 provides the proposed configuration of the 7th Street Bridge.

Table 7: 7th Street Bridge Proposed Configuration

Roadway Section	Total Out-To-Out Width	Span Arrangement and Total Length	Abutment Type	Pier Type
8' Sidewalk 2 – 10.5' Travel Lanes 2 – 11' Travel Lanes 7' Right Shoulder	60'-0"	1 Span at 59'-0" 2 Spans at 54'-9" 1 Span at 40'-3" 1 Span at 39'-6" Total Length 252'-3"	Existing abutments to be modified to use the Virginia Mirco Abutment Detail.	Existing multi-column piers on spread footings and piles to be repaired and reused.

We are able to raise the profile by approximately 3" to maximize the clearance below the bridge and to design an economical superstructure with only 10 lines of girders, which is fewer than the 13 shown in the RFP. Figure 4.3.2.6 shows the proposed transverse section at the 7th Street bridge. The deeper allowable structure depth also created an opportunity to support the water line below the bridge. This creates a cost saving opportunity and better location for the water line from a maintenance standpoint.

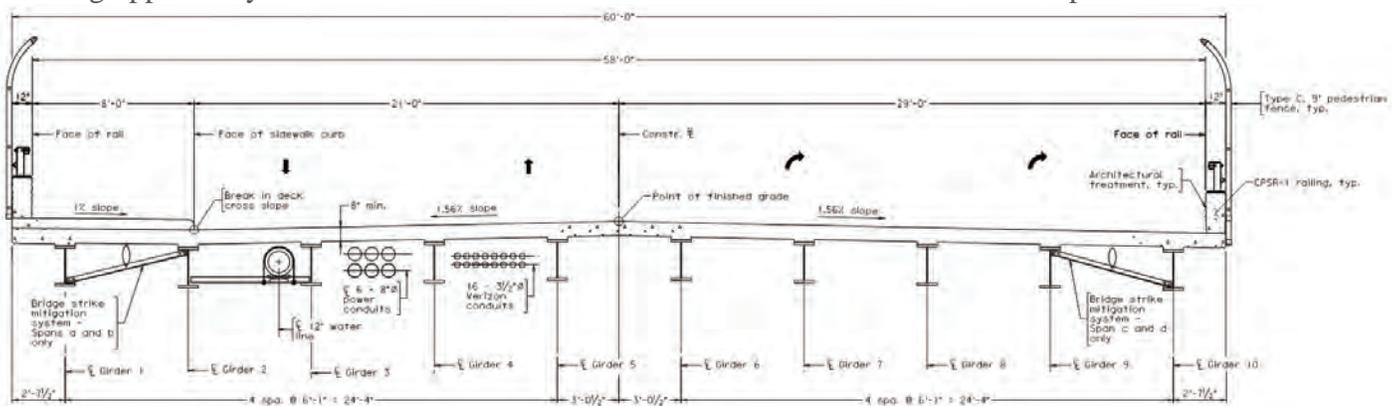


Figure 4.3.2.6 7th Street Bridge Transverse Section

The existing bridge at 7th Street was built in two stages. The first stage foundations are on spread footings and represents the substructure units at Piers 1, 2, and 3. The second stage lengthened the bridge, by building new abutments and Pier 4, all founded on prestressed concrete piles. These existing substructure

elements will be analyzed for the new bridge configuration and incorporated into our design.

E. Broad Street Over I-95

The superstructure replacement will consist of replacing the existing bridge with a two span, simple span configuration. Steel plate girders will be used as the primary members. The RFP specifies that this bridge utilize an Accelerated Bridge Construction technique. Our Team is proposing to use Pre-constructed Composite Units (PCU) with UHPC closure pours to achieve this goal. Table 8 provides the proposed configuration for the E. Broad Street Bridge.

Table 8: E. Broad Street Bridge Proposed Configuration

Roadway Section	Total Out-To-Out Width	Span Arrangement and Total Length	Abutment Type	Pier Type
Left Sidewalk - Varies 5 – Travel Lanes - Varies Right Sidewalk - Varies	Varies 60'-0" (max.) 60'-0" (min.)	1 Span at 69'-11 3/8" 1 Span at 69'-6 3/8" Total Length 143'-7 7/8"	Existing abutments to be modified to use the Virginia Mirco Abutment Detail.	Existing multi-column pier on piles to be repaired and reused.

Our Team’s plan is to break up the bridge into quadrants and replace one side of one span during four of the weekend closures of the bridge. Figure 4.3.2.7 shows the first stage of our construction sequence and illustrates our “quadrant method” to replacing the superstructure. Section 4.5 will describe our construction process in more detail.

A link slab detail will be used over the pier in order to eliminate the joint as shown in Figure 4.3.2.8.

Diamond grind operations will be performed on the bridge once all PCU and closure pours are in place to provide a smooth riding surface. This provides an advantage over using a concrete overlay because it will save 1 inch of concrete deck slab thickness and therefore is a lighter weight option. This is important at E. Broad Street since the archeological site prevents disturbing the ground and strengthening the foundations.

The abutments and the pier will be incorporated in our design with a few location specific items. The existing bents are founded on steel H piles, with the pier and Abutment B being constructed in 1956, while Abutment A was retrofitted in the 1970’s when the bridge was lengthened. The

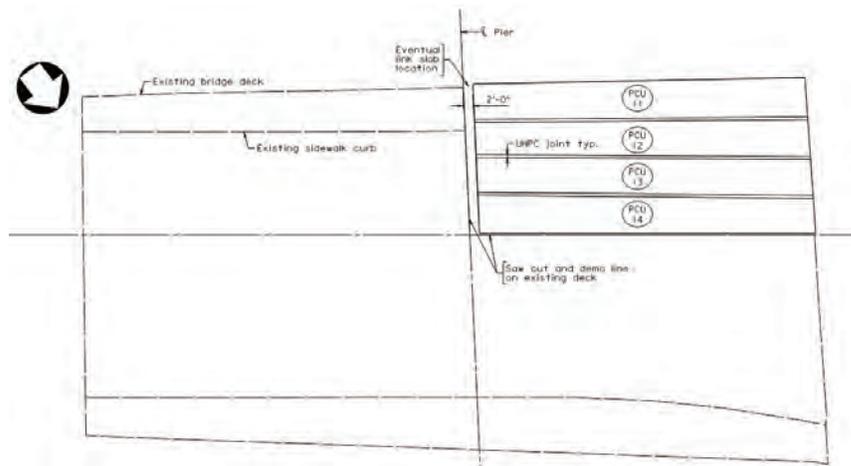


Figure 4.3.2.7 Broad Street Bridge – PCU Units During Construction Sequence

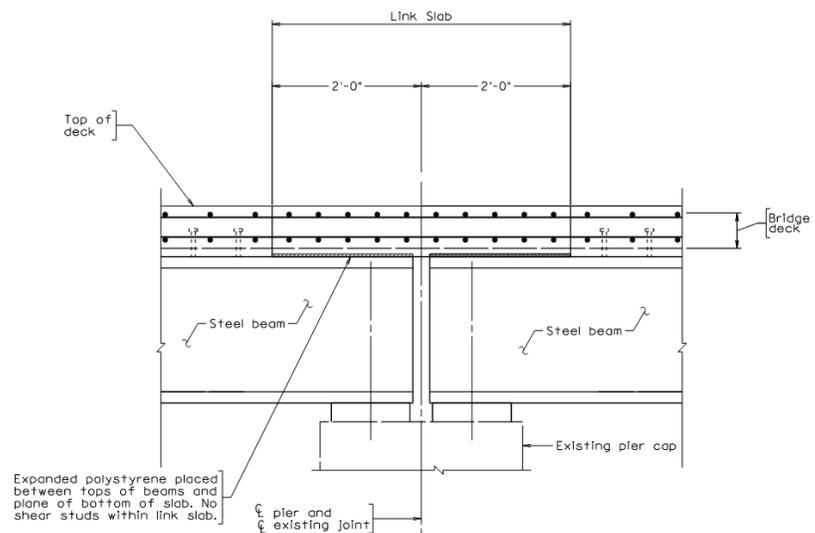


Figure 4.3.2.8 Link Slab Detail for E. Broad Street Bridge

4.3 Design Concept

modification to lengthen the bridge introduced a hinge in the superstructure, and it also created a unique abutment shape. This will be a consideration for the Team during demolition of the superstructure and while rebuilding Abutment A for the final configuration. Reconstructing beam seats will be another unique item here, since we are replacing the superstructure using ABC methods. This operation will be analyzed to determine the best methods and materials to create a durable product that can be built within the given schedule constraints. Lastly, special consideration is needed for the limitation on work below the ground surface. Ground disturbance is limited and cannot exceed a depth of six feet due to Archaeological Site 44HE1089 as detailed in the RFP Information Package. There is also an Environmental Avoidance Area adjacent to the footprint of the bridge that will take special consideration and need to be avoided during construction.

Abutment B (west) will follow the same backwall modifications that are being employed at the other bridge locations. Abutment A will need a different approach due its unique shape. The footing and stem are intended to remain in place, but a new backwall towards the front of the abutment stem will need to be constructed. This new backwall will be constructed to form the Virginia Micro Abutment system that is used at Abutment B.

Retaining Walls at 4th, 7th, and E. Broad Street Bridges

Special design barrier walls are required in the vicinity of the 4th, 7th, and E. Broad Street bridges. At each location, the walls will be designed to prevent errant vehicles from crashing through and falling to I-95 below. These walls will be designed for the TL-4 forces described in Section 13 of the AASHTO LRFD Bridge Design Specifications. Each wall shall have architectural treatment on both faces as described in Section 2.3.3 of the RFP. Figure 4.3.2.9 depicts one potential wall concept with an incorporated moment slab to achieve the TL-4 rated resistance.

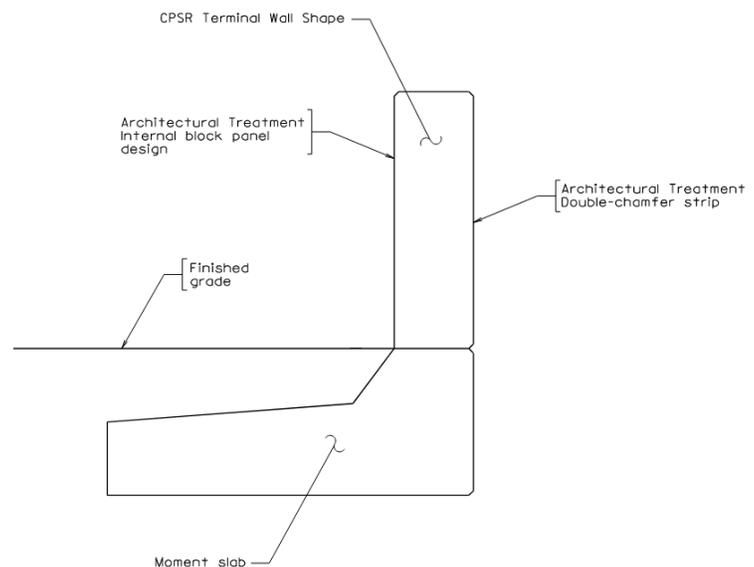
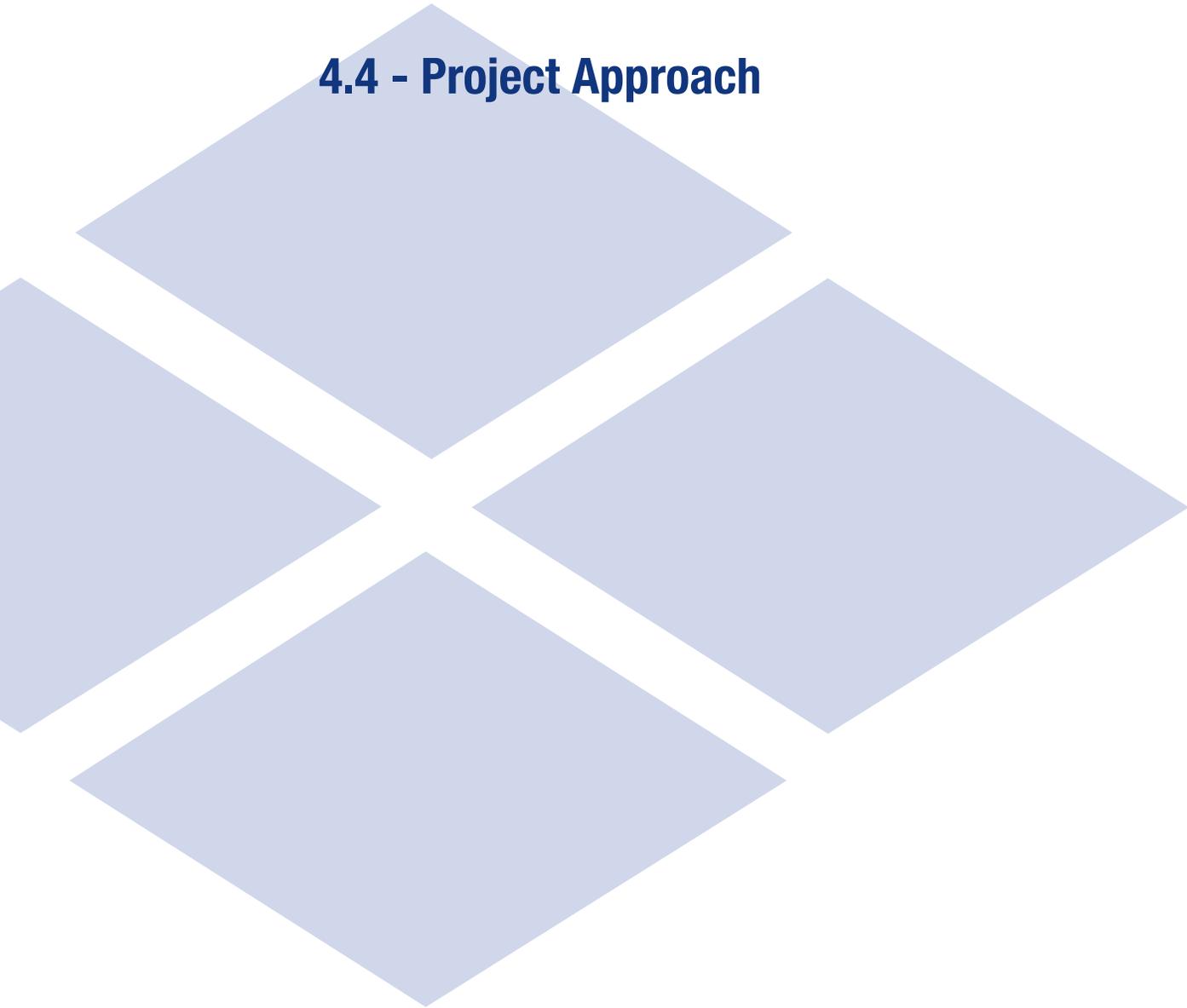


Figure 4.3.2.9 Section of Special Design Wall

Major Drainage Structures

The drainage design for the Project consist of adjustments to existing inlets and extending existing small pipes to new inlets, not requiring any major drainage structures except for the proposed underground detention stormwater facility located between 4th Street and 5th Street discussed in Section 4.3.1. Geotechnical borings will be taken along the proposed alignment of this facility to determine the bedding and/or undercut requirements for construction of the system.

4.4 - Project Approach





4.4 Project Approach

4.4.1 Environmental Management Approach

Comprehensive environmental risk management is one of the most critical aspects of a successful Project and requires not only proper planning and coordination during design, but also proper implementation and monitoring during construction. Our approach to environmental management efforts began during the preparation of our Technical Proposal, and included involvement from Shirley’s Environmental Compliance Coordinator and Dewberry’s Environmental Permitting Coordinator. As a result of this close coordination and integration of our environmental staff, we are able to ensure:

- Our design is developed to avoid impacts to environmental constraints;
- Effective Erosion and Sediment Control (ESC) design matches construction phasing and sequence of work;
- Project schedules are developed to accurately reflect permit and approval timelines.
- All necessary permits are identified and will be obtained prior to construction; and
- Construction will be completed in accordance with permit, Cultural Resource (Section 106), NEPA commitments, and contractual requirements.

Our Team has assembled a group of environmental professionals, design engineers, and construction personnel with extensive knowledge of the specific permitting, design, and construction processes required in this area, as well as an understanding of each regulatory agency. Our project-specific approach to mitigate environmental risk due to the recognized environmental constraints and requirements are summarized in Table 9:

Table 9: Strategies to Mitigate Environmental Challenges

Resource	Project Phase	Avoidance and Minimization Strategy
PCE Level NEPA Documentation	Design	<ul style="list-style-type: none"> ■ Ensure design is within limits of Programmatic Categorical Exclusion. ■ Previously coordinated commitments are adhered to.
	Construction	<ul style="list-style-type: none"> ■ Mandate environmental training of contractor staff concurrent with Shirley’s training.
Threatened & Endangered Species	Design	<ul style="list-style-type: none"> ■ At NTP, rerun and submit T&E species database reviews. ■ Provide the T&E package submitted to USFWS, DWR, DCR to VDOT District Environmental Manager.
	Construction	<ul style="list-style-type: none"> ■ No anticipated Time of Year Restrictions.
Natural Resources	Design	<ul style="list-style-type: none"> ■ Conduct tree survey, including height and caliper of all trees that will be removed.
Noise	Design	<ul style="list-style-type: none"> ■ Type III projects do not require noise analysis as the Project is not introducing substantial horizontal or vertical alterations of the existing highway.
Hazardous Waste	Design	<ul style="list-style-type: none"> ■ Complete Lead Based Paint assessment. ■ Utilize the provided Asbestos Containing Materials) Inspection Reports and Phase II ESAs.
	Construction	<ul style="list-style-type: none"> ■ Geotechnical investigation will be avoided adjacent to 1st Street Bridge where DEQ’s Environmental Data Mapper identified areas of potentially contaminated soils. ■ Follow the Special Provisions for: Disclosure, Clarification, and Avoidance of Asbestos Containing Materials (ACM) and Materials with Trace Levels of Asbestos, Asbestos Inspection and Project Monitoring and for Asbestos Removal and NESHAP-Related Demolition Requirements for Structures.

Resource	Project Phase	Avoidance and Minimization Strategy
Cultural Resources & Section 4(f) Resources	Construction	<p>E. Broad Street Bridge:</p> <ul style="list-style-type: none"> ▪ Adhere to Special Provision for Limitation of Operations Archaeology: <ul style="list-style-type: none"> • Contact VDOT five days prior to construction for survey/mark out. ▪ Adhere to Special Provision for Removal and Replacement of Historic Marker: <ul style="list-style-type: none"> • Contact VDOT five days prior to construction for survey/mark out. • Remove sign prior to construction. ▪ Avoid impacts to all historic resources. <ul style="list-style-type: none"> • Stop work if graves, burials grounds, or remains are found. ▪ Adhere to Special Provision for Limitation of Operations Archaeology: <ul style="list-style-type: none"> • No borings deeper than 6 feet within Resource 44HE1089 boundaries. • No construction activities within Environmental Avoidance Area. • Installation of safety fence within VDOT ROW approximately 15 feet east from northbound I-95, north of Broad Street Bridge over I-95 safety fence must be: <ul style="list-style-type: none"> ◆ Maintained by DB for the duration of project (remove and dispose when complete). ◆ No less than 4 feet high. ◆ Colored bright orange polyethylene web. ◆ Installed on metal T or U posts spaced on 6-foot centers driving to a minimum depth of 18”. ▪ Adhere to Special Provision for Removal and Replacement of Historic Marker: <ul style="list-style-type: none"> • Replace as detailed in the Special Provision. ▪ Adhere to the Special Provision for Sidewalk and Curbing Replacement . ▪ Replace brick and granite as detailed in the Special Provision. <p>1st Street Bridge:</p> <ul style="list-style-type: none"> ▪ Adhere to 0.009 de minimis finding for Jackson Ward Historic District and 0.011 de minimis finding for Franciscan Convent.
	Design	<ul style="list-style-type: none"> ▪ Complete Lead Based Paint assessment. ▪ Utilize the provided Asbestos Containing Materials Inspection Reports and Phase II ESAs.
Hazardous Waste	Construction	<ul style="list-style-type: none"> ▪ Geotechnical investigation will be avoided adjacent to 1st Street Bridge where DEQ’s Environmental Data Mapper identified areas of potentially contaminated soils. ▪ Follow the Special Provisions for: Disclosure, Clarification, and Avoidance of Asbestos Containing Materials (ACM) and Materials with Trace Levels of Asbestos, Asbestos Inspection and Project Monitoring and for Asbestos Removal and NESHAP-Related Demolition Requirements for Structures.
	Design	<ul style="list-style-type: none"> ▪ Efficient and effective ESC design. ▪ Prepare Stormwater Pollution Prevention Plan (SWPPP) & Pollution Prevention Plan.
Stormwater Pollution Prevention	Construction	<ul style="list-style-type: none"> ▪ Conduct SWPPP management trainings. ▪ Bi-weekly ESC inspections conducted by DEQ certified personnel.

Approach to Risk Management During Design

One of the most considerable environmental challenges is obtaining timely permits and approvals, while maintaining compliance from Project conception to completion. As our Team begins the design phase, our approach to risk management begins with the refinement of design details and confirming that the design accounts for all environmental commitments and constraints. Coordination between design disciplines and the Environmental Team, as well as with construction, right-of-way, and utility management staff, is critical to ensuring all constraints are recognized and accounted for in the plans and schedule. The specific

4.4 Project Approach

environmental management efforts that will be utilized during design are summarized below:

City of Richmond Land Disturbance Permitting: Permitting agencies and localities pay close attention to ESC and limiting offsite impacts associated with transportation improvement projects. The City of Richmond Land Disturbance permit requirements will be addressed through the development and approval of drainage, stormwater management, and ESC designs. We will provide a comprehensive SWPPP, including a pollution prevention plan, to ensure compliance with permit requirements, kept onsite and updated. Due to our extensive experience in obtaining these land disturbance permits, our schedule has accounted for the appropriate time to prepare, submit, and obtain approvals so that construction is not delayed. Since the 7th and 5th Street bridges are first in our construction sequence, our Team will apply for these permits first. 1st Street, 4th Street, and E. Broad Street will be grouped into one permit that will follow.

The goal of our Team with respect to environmental management is to ensure all possible avoidance and minimization efforts are implemented, there are no adverse impacts to environmental and natural resources, and an accurate schedule is developed. The permits and approvals which we anticipate needing prior to construction are summarized in Table 10 below:

Table 10: Anticipated Permit List and Timelines

Agency	Permit Type/Approval	Anticipated Duration
USFWS	Section 7 Threatened & Endangered Species Concurrence	2-3 Months
City of Richmond	Land Disturbance Permits <ul style="list-style-type: none">▪ 7th Street▪ 5th Street▪ Combined 1st, 4th, and E. Broad Streets	2 Months per permit

Approach to Risk Management During Construction

We recognize the emphasis being placed on environmental reviews and compliance during construction to ensure adherence to all permit and NEPA conditions. We will follow all regulatory agency requirements and will use previous experience and lessons learned to ensure environmental compliance is consistently maintained.

Mandatory Environmental Training: As part of Shirley’s mandatory safety training requirements, our Environmental Team will develop a Project specific environmental training program prior to the start of construction which will be attended by all Project personnel. Sensitive environmental resources and compliance requirements per the Programmatic Categorical Exclusion and Land Disturbance permit will be highlighted to ensure all parties are aware of the environmental commitments applicable to the Project.

Hazardous Materials Management: A Lead Based Paint assessment will be conducted on each bridge as it is classified as a Type B, steel structure that has existing coatings, and the age of the bridges being constructed between the 1950’s and 1970’s. A preliminary database review of DEQ’s Environmental Data Mapper identified both leaking Underground Storage Tanks and closed petroleum tanks adjacent to the 1st Street bridge. Geotechnical investigations will be avoided in this area to reduce the risk of encountering petroleum contaminated materials. As noted in our Demolition Plan in Section 4.5.3, our Team will follow all Special Provisions for the handling of hazardous materials.

City of Richmond Land Disturbance Permit: Following the issuance of the permit and mandatory environmental training, installation of ESC measures takes place prior to any land disturbing activities. Our Team takes an aggressive approach to environmental permit compliance by prioritizing the installation,

4.4 Project Approach

maintenance, and inspection of ESC measures. Site inspections related to land disturbance permit compliance ensure permit requirements are met, ESC measures are correctly installed and maintained, and areas that may require additional attention are identified before any unintended impacts occur. Led by our Environmental Compliance Manager (ECM), our Team will provide updates on the status of any action items identified during inspections and proactively implement corrective actions in a timely manner, as depicted in Figure 4.4.1.1. Our ECM will be available to meet regularly with the City of Richmond and VDOT's Richmond District NPDES and ECI staff to review field conditions and Project compliance status.



Figure 4.4.1.1 - Environmental Inspections During Construction to Ensure Compliance

Schedule Integration: Obtaining environmental permits and environmental approvals in a timely manner is always a schedule and planning priority. In addition to our efforts to minimize and mitigate for the risk of delays due to environmental approvals or non-compliance, we have integrated key environmental permits, environmental hold points, predecessor activities, and approvals into the Proposal Schedule, including the following key activities:

- **City of Richmond Land Disturbance Permit:** Three City of Richmond Land Disturbance permits will be applied for as the 7th Street bridge is on the critical path. Our Team will apply for this permit first and as a stand alone permit, followed by a permit for the 5th Street, 1st Street, 4th Street, and East Broad Street will be grouped into one permit that will come after the 7th and 5th Street permits. City of Richmond Land Disturbance permit applications will be submitted around the same time as the submission of the 60% roadway plans, which provides a two-month issuance period for the agencies. The approved City of Richmond Land Disturbance permits are identified as a Hold Point and is required to begin Construction; and
- **Notice of Termination:** An activity has been setup to ensure the proper notification is provided to the agencies upon completion of construction.

4.4.2 Utilities

Approach To Utility Coordination, Adjustments, and Relocations

Utility conflicts can have an impact on every discipline including design, permitting, right-of-way, construction, and the Project Schedule. Led by our Lead Utility Coordination Manager, our combined Team experience affords us the ability to manage complicated design-build projects with an extensive utility component. We have established a group of experienced, dedicated, in-house resources that focus solely on overseeing and managing this scope of work. Over the years, we have developed strong working relationships with most of the utility companies that have facilities on this Project including Dominion Energy Virginia, Verizon, Comcast, and Crown Castle. Furthermore, our Team has already met with each of them, as well as the City of Richmond Water and City of Richmond Gas to discuss our planned relocation of their facilities. This coordination has benefited and positively affected our design concept and Project approach by developing solutions that minimize risk, reduce conflicts, and promote schedule certainty.

Our approach to successful management of the utility scope encompasses the following goals:

- Accurate and timely identification of existing utilities;
- Investigation of potential conflicts within each bridge rehabilitation footprint;
- Integration with design to determine conflicts early and possible solutions;
- Coordination with utility owners to develop conflict resolution strategies and mitigation options;
- Precise and timely identification of easements needed for required relocations;
- Thorough integration with each bridge's schedule, phasing, and sequence of work; and
- Constant monitoring and tracking of the utility relocation progress.

4.4 Project Approach

Our first and highest priority throughout the process is to completely avoid utility impacts through design. Where conflicts cannot be completely avoided, we work diligently with each utility owner to minimize the scope of relocations needed through a combination of redesign, work re-sequencing, and/or utility protection measures to be implemented during construction. In our experience, relocating existing utilities to eliminate conflicts with new project construction elements should only be performed as a last resort.

During the preparation of this Proposal, our Team’s early coordination began by meeting with the various utility owners to better understand their existing facilities, review designations, discuss both the conceptual and proposed design, review our schedule, and address potential conflicts and risk. Upon award, these coordination efforts will continue during final development of the Project design, right-of-way, permitting, scheduling, and construction work sequencing. Further, continuous coordination and early involvement will enable the utility companies to generate reasonable, clear and concise plans and estimates, better coordinate their crew availability, order and procure the necessary material in a timely manner, and maximize their production. This level of effort and collaboration is necessary as it allows our Team to better facilitate and track the process and manage the costs associated with the utility relocation scope.

Utility Conflicts and Solutions

Table 11 outlines the potential utility conflicts and our relocation plan and mitigation strategy at each bridge.

Table 11: Known Utility Conflicts and Mitigation Strategies

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/ Mitigation Strategy
7TH STREET BRIDGE (STAGE 1 - NORTHSIDE; STAGE 2 - SOUTHSIDE)			
Dominion Energy (DEV) Underbridge Conduits	Six existing conduits are suspended on the north side of the bridge.	Temporary electric lines must be placed on the south side of the bridge, allowing for Stage 1 construction.	During Stage 1 construction, install 6 new conduits on the north side for ultimate relocation of DEV conductor cables.
Verizon Underbridge Conduits	Existing communication conduits are suspended on the south side of the bridge.	These conduits are in conflict with Stage 2 construction.	During Stage 1 construction, install replacement conduits on the north side of the bridge for Verizon relocation.
City of Richmond (COR) Water	An existing 12-inch water line is suspended on the north side of the bridge.	This 12-inch main is in conflict with proposed Stage 1 construction, so must be taken out on service (1st Street Bridge watermain to stay active until 7th Street watermain is back on-line).	During Stage 1, a new 12-inch water main will be installed under the bridge within the second interior bay. This line will be activated prior to start of 1st or 5th Street.

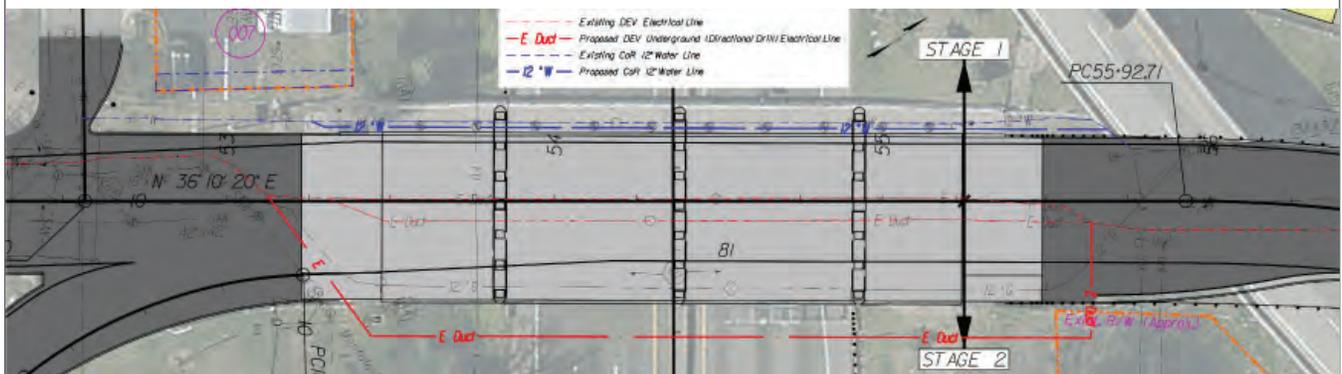
4.4 Project Approach

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/Mitigation Strategy
City of Richmond (COR) Conduits	Existing streetlights are on either side of the bridge, with electrical conduits within the existing sidewalks.	No Conflict.	Per Addendum #3, there are to be no COR conduits replaced or installed under the new bridge deck.
City of Richmond (COR) Gas	An existing 6-inch gas main is suspended on the south side of the bridge.	No Conflict.	Existing gas line is currently out of service and not to be replaced under this contract. Proper removal, cut and cap of this abandoned facility to be coordinated with COR Gas.
1ST STREET (STAGE 1 - NORTHSIDE; STAGE 2 - SOUTHSIDE)			
Dominion Energy (DEV) Overhead Power Line and Poles	This aerial power line, with communication attachments, crosses I-95 on steel utility poles attached to the north side of the bridge.	These poles and attached overhead facilities are in conflict with the bridge rehabilitation construction.	Relocation involves moving the poles off the bridge and installing a new overhead crossing to span I-95. The new poles are to be located approximately 30 feet north of the bridge. This work can start as soon as necessary easements can be acquired.
Verizon	Existing conduits are suspended on the south side of the bridge.	Verizon conduit system will be in conflict with bridge construction (existing conduits cannot be protected and saved).	New conduits will be installed during Stage 1, under the north side of the bridge, to relocate the Verizon system prior to start of Stage 2 construction.
Comcast Communication	Existing fiber optic lines are attached to the Dominion poles spanning the bridge.	These poles and attached overhead facilities are in conflict with the bridge rehabilitation construction.	Comcast facilities to be relocated along with the proposed relocation of the Dominion overhead poles spanning I-95.
Crown Castle Communication	Existing fiber optic lines are attached to the Dominion poles spanning the bridge.	These poles and attached overhead facilities are in conflict with the bridge rehabilitation construction.	Crown Castle facilities to be relocated along with the proposed relocation of the Dominion overhead poles spanning I-95.

4.4 Project Approach

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/ Mitigation Strategy
City of Richmond (COR) Gas	An existing 6-inch gas main is suspended on the south side of the bridge.	Gas line outage is restricted during October -March. Construction timing to match RFP constraints.	Relocate the 6-inch gas to the north side of the bridge during Stage 1, and tie back into the existing system on either side of the bridge prior to start of Stage 2 within the time of year restrictions.
City of Richmond (COR) Conduits	Existing cobra head streetlights are on the bridge: two are attached to the existing DEV poles on the north side of the bridge; one stand-alone light is on the south side.	The streetlights are fed from both overhead services (DEV poles on north side) and from existing COR conduits found inside the existing sidewalk (south side).	Per Addendum #3, existing streetlight electrical conduits for City of Richmond are not to be replaced. There are to be no streetlights on the new bridge. Instead, new 3-inch conduits are to be installed for COR Department of Emergency Services.
City of Richmond (COR) Water	An existing 12-inch water line is suspended on the north side of the bridge.	This 12-inch main is in conflict with proposed Stage 1 construction, so must be taken out on service (before water main work on 1st Street takes place, either the 7th Street Bridge or 5th Street Bridge mains must be on-line).	New 12-inch water main to be installed and tied-in during Stage 1 construction; proposed location to be outside the new parapet on the extended bridge deck.

5TH STREET (STAGE 1 - NORTHSIDE; STAGE 2 - SOUTHSIDE)



Dominion Energy	Existing conduits are suspended on the north and south side of the bridge.	These electrical conduits are in conflict with Stage 1 and 2 bridge construction.	Dominion conduits to be permanently removed from underneath the bridge and directional drilled under I-95.
City of Richmond (COR) Water	An existing 12-inch water main is suspended on the north side of the bridge. This facility is currently not in service.	No conflict. However, this water main must be replaced and put back in service under this contract.	New 12-inch water main to be installed and tied-in during Stage 1 construction; proposed location to be outside the new parapet on the extended bridge deck.
City of Richmond (COR) Conduits	Existing conduits are found within the concrete sidewalks on both sides of the bridge. These conduits are currently abandoned.	No conflict.	Per Addendum #3, there are to be no COR conduits replaced or installed under the new bridge deck.

4.4 Project Approach

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/ Mitigation Strategy
4TH STREET (STAGE 1 - NORTHSIDE; STAGE 2 - SOUTHSIDE)			
City of Richmond (COR) Fire Hydrant	An existing hydrant is located on the east side, off of the bridge, near the Project limits.	No conflict.	N/A.
City of Richmond (COR) Conduits	Existing COR electrical conduits are suspended on the south side of the bridge. These conduits are currently abandoned.	No conflict.	After beams are set and north side bridge deck is replaced during Stage 1, new COR electrical conduits for lighting will be installed under the bridge. Tie-in points to be coordinated with City of Richmond for future use.
E. BROAD STREET (STAGE 1 - SOUTHSIDE; STAGE 2 - NORTHSIDE)			
City of Richmond (COR) Conduits	Existing 3-inch conduits are found suspended under both the north and south sides of the bridge, located in the outer bays.	These conduits are in conflict with the proposed new beam layout and deck replacement.	Following our planned staged construction, including beam and deck replacement, new 3-inch electrical lighting conduits are to be installed.
City of Richmond (COR) 12-inch Waterline Betterment (new laterals)	Proposed 12-inch water laterals to cross Broad Street, at both ends of the bridge, to tie-in and create a connection loop for the existing system.	No Conflict. However, this betterment request is a significant determining factor for the Broad Street bridge schedule and staging decisions.	During the allowable E. Broad Street closures, these laterals will be installed. They will be tied-in to the live 12-inch system to the north and the new waterline installed to the south to create the connection loop.

4.4 Project Approach

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/ Mitigation Strategy
City of Richmond (COR) Water (southside)	An existing 12-inch water main is suspended on the south side of the bridge. This facility is currently out of service.	This 12-inch water line is in conflict with Stage 1 and 2 construction and the proposed new bridge decking system.	After Stage 1 and 2 construction is complete with the decking system in place (south side), a new 12-inch water main is to be installed on the extended bridge deck, outside the parapet. Next, this new water line will be tied-in to the laterals installed for the betterment. This allows for the shutdown of the existing north side water main, in preparation for Stage 3 and 4 construction.
City of Richmond (COR) 12-inch Water (northside)	An existing 12-inch water main is suspended on the north side of the bridge. This facility is currently active.	This 12-inch water line is in conflict with Stage 3 and 4 construction and the proposed new bridge decking system.	After the south side water line has been replaced and put in service during Stage 1 and 2 construction, the north side water main can be shut down and replaced during Stage 3 and 4. It will be located on the extended bridge deck, outside the parapet.
Dominion Energy (DEV) Conduits	Numerous existing DEV electrical conduits are suspended on the north side of the bridge.	These conduits are in conflict with Stage 3 and 4 construction and the proposed new bridge decking system. Though we have learned that these existing conduits are empty, replacement conduits for Dominion are to be installed.	After Stage 2 construction is complete with the decking system in place (north side), new 8-inch conduits are to be suspended from the bridge for future potential electrical service. The conduits are to be located within the interior bays, just north of the bridge construction baseline.
City of Richmond (COR) Gas	Existing 12-inch gas mains are suspended under the bridge on both sides, within the outside bays. Both lines are currently abandoned and out of service.	No Conflict. These gas lines are abandoned and are to be removed.	The gas lines are to be removed during the staged bridge construction. This work is to be coordinated with COR.

Mitigation of Utilities and Schedule Delays

Encountering unexpected or unknown utilities is a risk that can cause many challenges including added cost and the potential for Schedule delays. Additionally, delays to the relocation of known utilities exceeding estimated timeframes can adversely impact the Project's construction schedule. We utilized the following strategies to limit those risks:

Early Coordination: Our Team has already begun early coordination with each utility owner to acquire a comprehensive understanding of existing facilities. We have obtained previous design plans, as-built drawings, and GIS mapping for review. Further, our Team has coordinated site visits and performed field surveys to ensure the utility designations are complete and accurate. This coordination and review of the existing facilities limits the risk of discovering an unidentified utility after award.

Redesign of Project Features: If an unknown utility is identified, we will immediately perform an as-built survey of its location and overlay with the proposed design to determine the extent of the conflict. Options will then be reviewed with affected disciplines to redesign elements that will minimize and/or avoid the conflict. If redesign is feasible, our Team will make the necessary element design changes for the area of concern.

4.4 Project Approach

Resequence the Work: If an unforeseen relocation is required that will delay an activity, our Construction Manager will immediately shift crews to other Work Areas and resequence the Schedule. If this affects the Critical Path, then additional resources, extended hours, and/or further resequencing will be applied to recover the Schedule.

Adjust in Place: Our Team has successfully raised, lowered, and/or shifted existing facilities to eliminate a conflict. This type of mitigation activity is termed a “lift and lay” operation for existing facility vertical and horizontal adjustments. Performing in-place relocations is a key component to minimizing the risk of schedule delay, reduces relocation cost, and reduces potential impact to the utility owner’s facility. Adjusting the utility in place to eliminate a conflict without the need for a complete in-kind relocation is a critical tool to limit the potential impact to the Project Schedule.

Assisting in Construction of the Relocation: Our Team has the ability to assist utility companies with their relocation work. This may include construction of duct banks, performing directional drilling, assisting with backfill operations, or installing utility poles for utility owners to expedite relocations. Assisting utility owners with certain aspects of a relocation activity allows our Team to better control portions of the relocation schedule, thereby reducing the risk of adverse Project Schedule impacts or delays.

Schedule Integration

Our Team has a fully integrated approach to manage the risk of utility conflicts adversely impacting the Project Schedule. First, all the information collected from utility designations, test pits, as-builts, field investigations, and ongoing coordination with utility owners is utilized to develop measures to avoid conflicts and schedule delays. Our Team members are fully engaged with all aspects of the design-build process including early coordination, development of design options, and field construction. Additionally, our Team assists with the right-of-way acquisition process, prior rights research and easement determinations, conflict analysis, utility relocation construction coordination, and scheduling.

Our Team coordinates with each of the utility companies to develop design avoidance measures, protection measures, relocation designs (when required), and relocation schedules for each impacted utility. This information, coupled with historical data captured from our past design-build experience, is integrated into our overall construction sequence and is reflected in our Proposal Schedule. Additionally, numerous discussions and planning sessions take place with each utility company to form an in-depth understanding of what is necessary for the utility to meet the needs and expectations of the Project.

Examples of some of the more critical utilities to be relocated and/or protected, considering potential cost and Schedule impacts, is Verizon and Dominion Energy Virginia (DEV):

- Verizon has existing communication facilities suspended from both the 1st Street and 7th Street bridges. Early discussions with Verizon yielded the possibility that these existing facilities could stay in-place if they could be supported and protected. However, the current concept for the new beam layout and the required clearances over I-95 does not allow for this approach. The existing location of these Verizon communication conduits will interfere with the bridge rehabilitation staging. Therefore, with continued coordination, our Team has a complete understand of Verizon’s necessary relocation work and proposed schedule to facilitate the rehabilitation work to be performed for each of these bridges.
- Dominion Energy Virginia has facilities on the 1st, 5th, and 7th Street bridges. Currently, Dominion does not have live facilities under the E. Broad Street bridge, only empty conduits. However, per the RFP, new conduits are to be provided and installed under E. Broad Street bridge for future use. For the 5th Street bridge, Dominion has facilities underneath both the north and south side spans. This

4.4 Project Approach

poses a schedule risk and would require temporary relocations to coincide with our phased bridge construction. To reduce this schedule risk and improve the critical path for this bridge location, we are planning to directionally drill a new conduit pathway under I-95 in advance of the bridge demolition and construction. This will eliminate both the need for temporary relocations and any future underbridge conduits.

Our utility, bridge construction, and scheduling sequence work together to create a construction sequence that allows for critical activities to occur concurrent with utility relocations. All utility conflicts identified in Table 11 have been incorporated into the Proposal Schedule. The design, approval, and relocation work activities for each of the impacted utility companies are sequenced into the construction phasing and tied as predecessors to the appropriate construction activities. By strategically selecting and sequencing the construction staging based on the required utility relocations, maximum float durations are obtained to mitigate potential delays.

4.4.3 Quality Assurance/Quality Control (QA/QC)

Over the years, our Team has refined our quality control approach resulting in a reduction of VDOT staffing and oversight. Our QA/QC Plan addresses both design and construction and defines the organization, work processes, and systems necessary to provide assurance that the Project is successfully delivered by our team. The QA/QC Plan is in accordance with VDOT's *Minimum Requirements for Quality Assurance & Quality Control on Design-Build & Public-Private Transportation Act Projects, revised July 2018* and establishes criteria for quality control, quality assurance, owners independent assurance, verification, and oversight duties for all personnel.

Our Team has over 20 years of experience performing Quality Assurance/Quality Control on VDOT design-build projects.

Design QA/QC Approach

Our approach to design QA/QC includes implementing multiple processes with various QA/QC personnel throughout the duration of the Project. Our plan and other design documents ensure that the appropriate quality standards included, suitable materials are selected, and work is constructed in a safe manner.

The benefits of our design QA/QC process is that it is:

- Well-structured;
- Easily audited; and
- Continually maintained to minimize VDOT's resource requirements.

Our Team implements design QA/QC by adhering to the approved QA/QC Plan, conducting design reviews, completing interdisciplinary coordination, performing constructability reviews, involving VDOT in the overall design review process, and confirming that all field changes follow the same process as original design.

Design QA/QC Plan

As the Design Manager implements and manages the overall design QA/QC program, a subset of our QA/QC Plan, which identifies design quality assurance and quality control requirements. The design QA/QC program establishes the following:

- Procedures for preparing and checking all drawings, specifications, and other design submittals including procedures to correct errors and deficiencies prior to submission;
- Processes to ensure design submittals are stamped, signed, and dated by the responsible Professional Engineer licensed by the Commonwealth of Virginia;

4.4 Project Approach

- Actions to confirm that the level, frequency, and methods for review of design including independent review follow VDOT's functional requirements for the Project;
- Procedures for coordinating work performed by different persons in the same or different area, fabrication shops, casting yards, and other pertinent fabrication facilities at remote locations, or in related tasks to avoid conflicts, omissions, or misalignments;
- Procedures for identifying elements of design that require special construction QA/QC attention or emphasis;
- Identification by firm, discipline, name, qualification, duty, responsibility, and authority for all personnel and/or entities responsible for design QA/QC including sub-consultants; and
- Establishment of design QA/QC functions, including scheduled activities for design QA/QC, identifying the drawings, specifications, and other design submittals that will be submitted to VDOT.

The Design Manager (DM) verifies conformance with the QA/QC Plan using informal observations or by conducting audits of the checking and review processes established within the QA/QC Plan. Documents marked “Released for Construction” are accompanied by written notification from the DM certifying that the documents were reviewed in accordance with the QA/QC Plan.

Design Review

Design quality control includes review of drawings, engineering computations, and other design related documents for technical accuracy, conformance to contract requirements, grammar and style, and formatting. Design quality assurance evaluates whether the designers assessed problems appropriately, applied correct analyses, and assigned qualified personnel to tasks when conducting design related activities. Figure 4.4.3.1 depicts the flow of documents through the process.

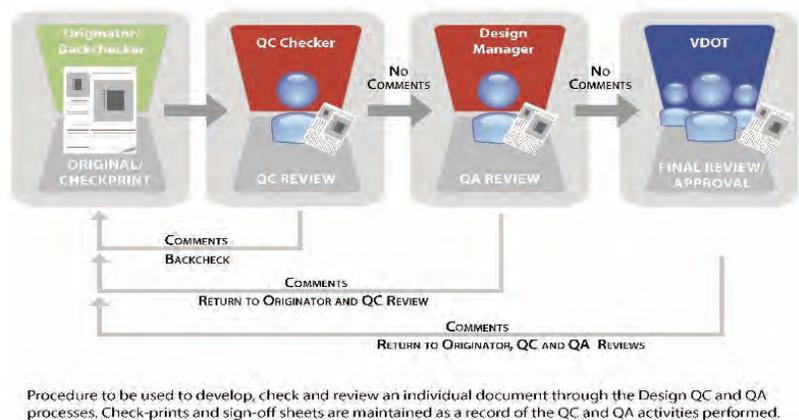


Figure 4.4.3.1 - Design QA/QC Flowchart

Design quality control functions are provided by design discipline leads checking completed work and are carried out to a level commensurate with the complexity of the design element. This effort is managed by the Design Manager who ensures formal and documented reviews occur at predetermined times for submitted design documents as identified within the QA/QC Plan.

The Design QA Reviewer will perform the Design QA function. This final QA review will not take place until all QC comments have been completed and addressed by the QC reviewers and design engineers. Following completion of the design QC process, all check prints, “Review Comment Summary and Resolution Sheets” and “Design QC Check Print Sign-Off Sheets” as well as the updated/corrected set of plans and documents will be provided to the Design Manager for final review. The Design Manager will provide these documents to the QA Reviewer for final QA Review and approval. The purpose of the Design QA Review will be to:

- Verify that the design engineer assessed the design accurately and applied correct analysis;
- Verify qualified personnel were assigned to the specific design tasks and QC reviews;
- Verify proper and complete implementation of the QC process;
- Evaluate whether the design solution is practical and cost effective;
- Verify implementation of and conformance to constructability reviews and findings;

4.4 Project Approach

- Confirm interdisciplinary reviews have been completed with all comments resolved;
- Evaluate overall conformity of final design documents to the design scope of work, project criteria, and client expectations;
- Confirm materials used and elements in the work have been designed to perform for the purpose intended;
- Verify overall appearance, organization and technical accuracy; and
- Verify application of the seal, signature and date of the responsible registered VA Professional Engineer.

Once the Design QA check is completed with all QA Comments resolved between the QA Reviewer, QC Reviewers and Lead engineers, the Design Manager will sign and complete the “Design QA Review Memorandum” and include a record of it in the Project file.

Constructability Reviews

Throughout our Team’s history of working on VDOT design-build projects, we have found that regular, informal, over-the-shoulder type reviews from construction personnel work best to produce quality designs. These types of reviews are conducted at weekly internal progress meetings where the DM and the discipline leads, as appropriate, present roll plots and/or developed plans to the construction personnel who are building particular pieces of them Project. Immediate feedback regarding the design is provided and appropriate adjustments are discussed so that unnecessarily difficult, unsafe, or out-of-schedule construction is avoided. Conversely, explanations regarding design requirements are conveyed to construction personnel, ultimately resulting in a greater overall understanding of Project requirements. This type of on-the-spot review regularly occurs within our design offices between discipline leads and construction personnel, as is typical of all our VDOT design-build work.

In addition to informal constructability reviews, the DM and Design-Build Project Manager (DBPM) will coordinate formal reviews of the design by construction personnel prior to each plan submission. Comments regarding the constructability of the design are provided to the DM for incorporation and/or further discussion prior to completing each design phase.

Quality Assurance and Quality Control of Design and Field Changes

Any design changes, including field adjustments, will adhere to the requirements of the QA/QC Plan, corresponding with those applied to the original design. Our DM will review all changes in the Project deliverable that occurred during the QA/QC review process and will submit those changes to VDOT for concurrence prior to implementation in the field.

Construction QA/QC Approach

Our Team’s Construction QA and QC Procedures, further described within our QA/QC Plan, have been established to conform to VDOT’s Minimum QA/QC Requirements (QA/QC Guide). Our Plan provides the specific requirements of the Project and encompasses procedures for Construction Quality Assurance, Construction Quality Control, VDOT’s role, Materials Testing, Inspections, Documentation, Auditing and Recovery. Schedule and coordination of QA and QC activities are addressed including Witness and Hold Points for inspection of work at critical stages. During construction, the QA and QC Teams follow the established and approved QA/QC Plan. The QA/QC Plan is structured to ensure that QC and QA functions are performed independently and that procedures are closely followed and confirmed through audit processes. Key elements of the Construction QA/QC Procedures are outlined in the following paragraphs.

Construction Quality Assurance Approach

Reporting directly to the DBPM, the Construction Quality Assurance Team is led by the Quality Assurance

4.4 Project Approach

Manager, (QAM). The QA firm is completely independent of the Designer and Contractor and is responsible for QA of all construction operations. The QAM has the autonomy to report directly to VDOT. In addition, he is tasked with the authority to unilaterally halt or suspend any work that is not in compliance with the Contract documents. The QAM will review and approve monthly Applications for Payment and will report to VDOT if payments should be withheld for non-conformance or work that lacks the proper materials documentation. The QAM and designated QA Team are responsible for overseeing the performance of the required QC inspections and materials testing performed by Shirley's QC Team.

The QAM will conduct Preparatory Inspection Meetings in accordance with Section 5.7 of the QA/QC Guide prior to the start of any new type of work. This meeting will be scheduled within two weeks of the start of the pertinent activities and will be attended by the QAM, Construction Manager, Field Superintendents, safety personnel, subcontractors, and QA/QC personnel involved in the work. At these meetings, the QAM will facilitate a dialog between Project stakeholders where items such as the applicable contract drawings, specifications, special provisions, materials submittals, testing requirements, environmental concerns, public communications, and safety concerns. The contractor's schedule and sequence of work will be reviewed, and Witness and Hold Points confirmed based on the requirements in Sections 5.18 and 5.19 of the QA/QC Guide.

Our Team commits to quarterly audit and review of Materials Notebook for acceptance by VDOT, making an efficient Project Closeout Process.

The QA inspection staff will attend the daily construction staff meeting where the superintendent and foremen will be discussing the day's operations. At this meeting, the QA inspectors will reiterate to the field personnel on the QA/QC/IA/IV testing to be carried out and discuss any special inspection items or hold points based on special provisions and shop drawings that apply to the work at hand. They will discuss any deficiencies that were noticed in the previous installed work and the necessary corrections needed. In addition, The Team's two week lookahead schedule will have the names of the QA/QC inspectors assigned to the specific planned work items; the QAM will review the 2-week schedule and adjust staff as needed to cover all operations. VDOT can be confident that sufficient staff will be assigned and available to do the testing and inspections.

The QAM will also manage and oversee the Non-Compliance Report (NCR) process and work closely with both Shirley and VDOT personnel to promptly identify, prepare, and distribute NCR's and document agreeable resolutions to each. In addition, the QAM will work with the QC Team to monitor and track deficiencies and their resolution. The QAM and the QA Team, when notified by Shirley that the work is complete, will coordinate acceptance inspections and develop a final punchlist with the Department and document completion of each punchlist item. Deficiencies, NCR's, and punchlist items will be tracked in the PlanGrid software system and recorded data will be reviewed by the Quality Team at each weekly Progress Meeting.

The QAM and the QA Team will be responsible for oversight of the C-25 materials approval process and entering data provided by Shirley into the Materials Notebook. On a monthly basis, the QAM will audit the Material Notebook prior to approving the monthly Application for Payment for accuracy and completeness, such as QA/QC IDR's materials testing reports, while attaching a list of any open NCR's for VDOT reference. Our Team is committed to providing quarterly VDOT reviews and audits of all materials documentation to ensure an expeditious and efficient Project Closeout process.

Specific Project Challenges

Substructure Repairs and Bridge Demolition: Prior to any field work starting, the QAM in conjunction with the construction team will ensure that all elements that need to be repaired are properly sounded, inspected, marked, surveyed, photographed and videotaped and compared to the approved plans. With

4.4 Project Approach

repair and rehabilitation projects, there is a consistent trend that the quantities will exceed what has been planned for and these changes need to be noted for the project management team to determine if the overrun is warranted and needed. An accurate field survey is essential to ensure that the precast replacement elements will fit properly and will provide a smooth transition between the bridge and adjoining roadway.

For all bridge demolition, substructure repairs, and superstructure replacement activities, the QAM and Lead QA Inspector will ensure all required submittals that include demolition plans, C-25 submissions, DBT packages, MOT detours and temporary sidewalk and bike path closure plans, and cold weather concrete plans are approved by the EOR and VDOT prior to commencing work. For bridge repair items, the QA/QC team will make certain that the extent of repairs are meticulously documented, repairs are performed to the correct depth, and ensure the correct materials are used as outlined in the preparatory meeting. The Team will work closely with the Construction Team to finalize the repair scope as the scope may have changed marginally since the last survey was done. QA will quantify any changes in repair quantities and ensure VDOT is continually made abreast of actual contract repair quantities.

Accelerated Bridge Construction (ABC): ABC techniques will be utilized for the E. Broad Street Bridge. Our QA team understands the importance of strictly following the approved replacement and emergency management plan as required in the RFP. With the heavy traffic in the region, it is critical that the weekend closures be removed by Monday morning to eliminate any traffic impacts during the morning rush hour. To open the completed section of the deck to traffic on Monday morning, the early completion of deck replacement is critical to allow the Ultra High Performance Concrete used for the closure pours to set within the curing time needed and attain the strength before traffic is allowed on the new deck. The Team will discuss the step by step work plan with the contractor prior to the plan implementation in the field. The plan will have durations of all stages of operations and actual times to ensure that all milestones are being met during the weekend closure. The plan will also have mitigation plans and actions to allow the work plan to adjust in case of missed milestone targets during the closure. All logistic, safety, standby equipment, alternate material sources/stockpiles and coordination issues will be discussed during the first preparatory meeting to develop full understating of roles and responsibilities.

Finally, in accordance with RFP Section 2.10.13, our Team shall perform an interim Bridge Safety Inspection (BSI) at the completion of each stage/phase of the structure prior to opening that stage to traffic. The BSI will be performed by an Inspection Team Leader in accordance with 23 CFR 650.309 - Qualification of Personnel.

Construction Quality Control Approach

The Quality Control Team, led by our Quality Control Manager (QCM) and reporting to the CM, is responsible for daily QC inspections and material testing for all construction operations. In addition, the QCM and QC Team are responsible for all QC sampling, testing and analysis of materials and will verify quality at frequencies meeting or exceeding the VDOT Construction Manual, the Materials Manual of Instructions and the QA/QC Guide. The QCM participates in the preparation of the QA/QC Plan, including the checklists that will be utilized by QC inspectors during the inspection process. All QC Inspection Staff will hold the applicable certifications required by the QA/QC Guide for the work they are inspecting. The inspectors will be experienced in VDOT practices and methodology and will be responsible for monitoring all work activities.

All QC staff actively inspecting and/or testing components of the Project complete IDR's. The IDR's are electronic diaries and include, as an attachment, copies of all QC materials tests completed for the day's activities. Signed hard copies of the IDR's are submitted to the QCM daily for review and approval and saved to a shared drive for access and immediate review by the QAM. The QCM prepares and submits an electronic Quality Control Monthly Report which summarizes all work completed during the period,

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inspections, tests, materials placed, action taken for failing materials, and NCR's. The QC Team will coordinate daily with the construction staff to ensure adequate staffing, including testing technicians, are assigned for the scheduled activities. The contractor will provide both three-week look-ahead schedules and an Expected Daily Activities report to the QC Team to facilitate scheduling and coordination of testing and inspections.

QA/QC Staffing Plan

The RFP requirements for the Project specify that two Lead QA Inspectors will be assigned and are onsite full-time during construction operations. We are anticipating that extensive night work will be required, and our staffing plans will reflect this need. The Project's QA team will consist of a Lead Bridge Inspector, a Lead Roadway/MOT Inspector, and two bridge inspectors. A Project Documentation Specialist/Office Engineer will also be assigned, part time or remotely, to maintain all documentation and materials incorporated on the Project. The QAM and Lead Bridge Inspector both have extensive experience in bridge construction, repair, and superstructure reconstruction projects in urban environments. A list of QA/QC staff and duties is provided in Table 12.

Table 12: QA/QC Staff and Duties

Design-Build Project Manager
Robbie Roberts provides supervision and administrative management of the entire Project including the overall design and construction. He establishes the QA/QC program and ensures design and construction QA and QC efforts are adequate.
Quality Assurance Manager
Bryan Barnson, PE is responsible for the development of and adherence to the QA/QC Plan, ensuring all work and materials as well as testing and sampling are performed in accordance with the Contract and approved construction plans and specifications. Bryan's team will include two Lead QA Inspectors, one Roadway and one Bridge Inspector. Beau Gutridge and Justin Milbourne will be onsite full-time as the Lead QA Inspectors.
Design Manager
Jim Davidson, PE directs and coordinates the design process including work by sub consultants and is accountable for the Design QA/QC Plan. He is responsible for implementing, monitoring and adjusting, as necessary, the Design QA/QC Plan to ensure acceptable quality of the design work.
Design Quality Assurance Manager
Steve Kuntz, PE, DBIA is responsible for quality assurance of design elements. Following completion of design quality control reviews, he performs a complete QA review of all design documents prior to submission to VDOT.
Construction Manager
Kyle Davidson directs and manages day-to-day construction operations and the construction QA/QC Program. He ensures construction is in accordance with the Project requirements and will be onsite full-time for the duration of construction operations.
Quality Assurance Testing and Inspections
CES Consulting, LLC will provide full-time Quality Assurance Inspectors for both roadway and bridge construction elements. As noted above, there will be at least two Lead QA inspectors plus additional inspectors during peak construction months. ECS Mid-Atlantic, LLC will perform QA laboratory testing for the Project.
Quality Control Manager (QCM)
The QCM is responsible for construction quality control and oversees construction quality control testing and inspection activities. The QCM assigns inspectors and testing technicians for each work activity and monitors reporting documentation to ensure that the work was completed per Contract requirements.
Construction Quality Control Inspections and Testing
The QC firm will provide full-time Quality Control Inspectors for both roadway and bridge construction elements. A certified QC laboratory will perform all QC laboratory tests. Additional inspectors and testing technicians will be utilized when required by the Project schedule to ensure sufficient coverage is provided at all times throughout the construction phase.

4.5 - Construction of the Project



4.5 Construction of the Project

4.5.1 Sequence of Construction

The design and sequence of construction developed by our Team emphasizes both safety and efficiency through all stages of construction and was developed with a focus on the following strategies:

- Ensuring the safety of the traveling public and workers;
- Maintaining mobility and minimizing impacts to the traveling public;
- Optimizing construction timelines by fully analyzing the RFP constraints related to:
 - Available lane closures hours;
 - Public and private utility outages and relocation plans; and
 - Restrictions to working on specified bridges simultaneously.
- Establishing a ***Unique Milestone of November 2, 2023*** for the 7th Street Bridge that improves mobility and provides congestion relief to this corridor and the VCU Medical Center; and
- Committing to an early ***Final Completion date of November 22, 2024, 28 days earlier than the RFP.***

Our Team’s Proposal Schedule, presented in Section 4.6.1, was developed with input from all Project disciplines including design, permitting, utilities, right-of-way, QA/QC, and construction. Our sequence of construction enables us to achieve the enhancements identified in Table 13:

Table 13: Construction Enhancements and Benefits

Location	Enhancements	Benefits
All	Overall Bridge Construction Sequence.	<ul style="list-style-type: none"> ■ Maximizes design timeframes. ■ Allows utility relocations to occur within realistic timelines. ■ Minimizes strain and congestion on road networks. ■ Minimizes labor requirements by maximizing crew efficiencies.
	Early Final Completion date of November 22, 2024.	<ul style="list-style-type: none"> ■ Delivers the Project <i>28 days earlier than the RFP</i> and finishes prior to the Thanksgiving holiday.
1st, 4th, 5th, and 7th Street Bridges	ATC 1 implementation of the southbound I-95 detour along with the RFP northbound I-95 detour.	<ul style="list-style-type: none"> ■ Eliminates the impacts to traffic necessary for the use and storage of movable concrete barrier. ■ Improves public safety. ■ Reduces Project costs.
1st Street Bridge	Sequence of work always maintains two-way traffic during construction	<ul style="list-style-type: none"> ■ Eliminates the RFP depicted 1st Street detour saving motorist confusion and drive time. ■ Eliminates the RFP depicted temporary reversible signal saving Project cost as well as driver frustration.
	Revise sequence of work to construct the north side first.	<ul style="list-style-type: none"> ■ Maximizes time for public and private utility relocations.
4th Street Bridge	Revise sequence of work to construct the north side first.	<ul style="list-style-type: none"> ■ Maximizes time for public utility relocations.
5th Street Bridge	Reduce the ultimate shoulder width.	<ul style="list-style-type: none"> ■ Reduces overall bridge width by 8’-0”. ■ Eliminates one girder line. ■ Reduces Project costs. ■ Improves the Project Schedule.
7th Street Bridge	Revise sequence of work to construct the north side first.	<ul style="list-style-type: none"> ■ Maximizes time for public and private utility relocations. ■ Removes constraints of the 12” COR waterline.
	Unique Milestone commits to completion of 7th Street work by November 2, 2023.	<ul style="list-style-type: none"> ■ Reduces impacts to the surrounding community. ■ Improves access to VCU Medical Center.

4.5 Construction of the Project

Location	Enhancements	Benefits
E. Broad Street	Sequence and use of ABC Methods.	<ul style="list-style-type: none"> Reduces allowed weekend I-95 crossover detours from 8 to 4. Minimizes the impacts to the public. Reduces Project cost. Improves the Project Schedule.
	Sequencing E. Broad Street to be last in the Project Schedule	<ul style="list-style-type: none"> Maximizes planning and PCU fabrication timeframes. Limits the need for movable barrier.

Construction Sequence

Our Sequence of Work includes five major Work Areas, each with individualized staging requirements. This enables our Construction Team to effectively oversee and manage the construction schedule, allow for the most efficient use of resources, ensure that quality is achieved, and maintain the highest levels of safety.

In summary, and as shown in Figure 4.5.1.1 on page 32, our Proposal Schedule includes three main Phases and several sub-Stages, outlined as follows:

Phase 1: Summer 2022 through Spring 2023 (Figure 4.5.1.2)

- 7th Street Bridge – North Side (Stage 1) and Start of South Side (Stage 2) Demolition.
- 5th Street Bridge – Start of North Side (Stage 1).

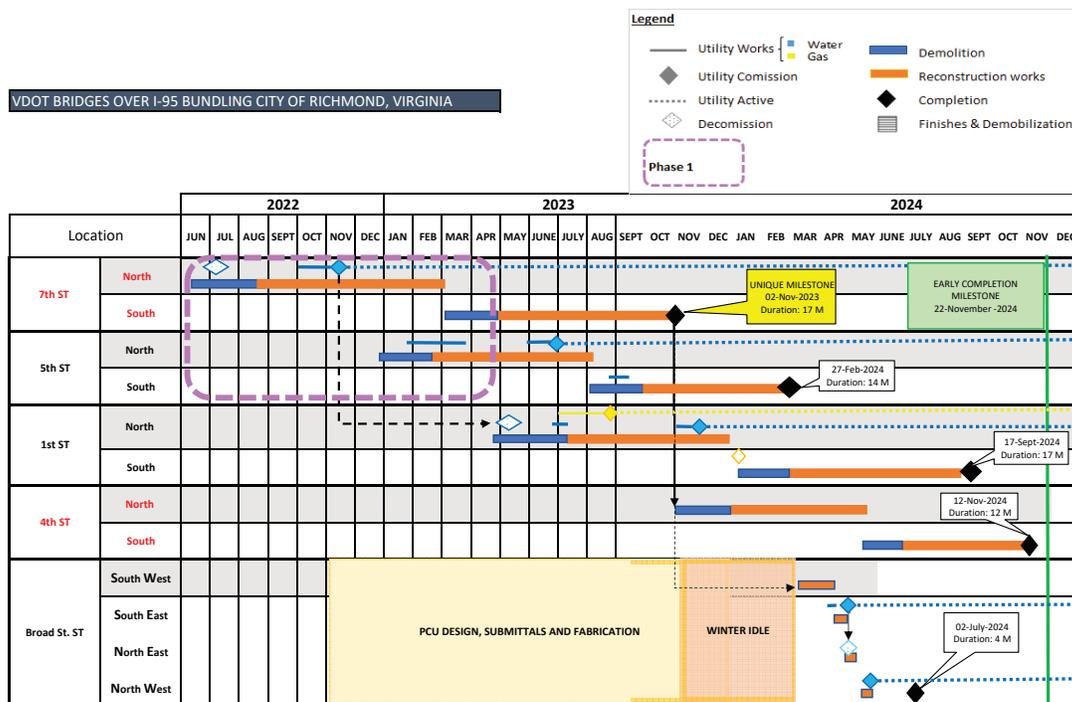
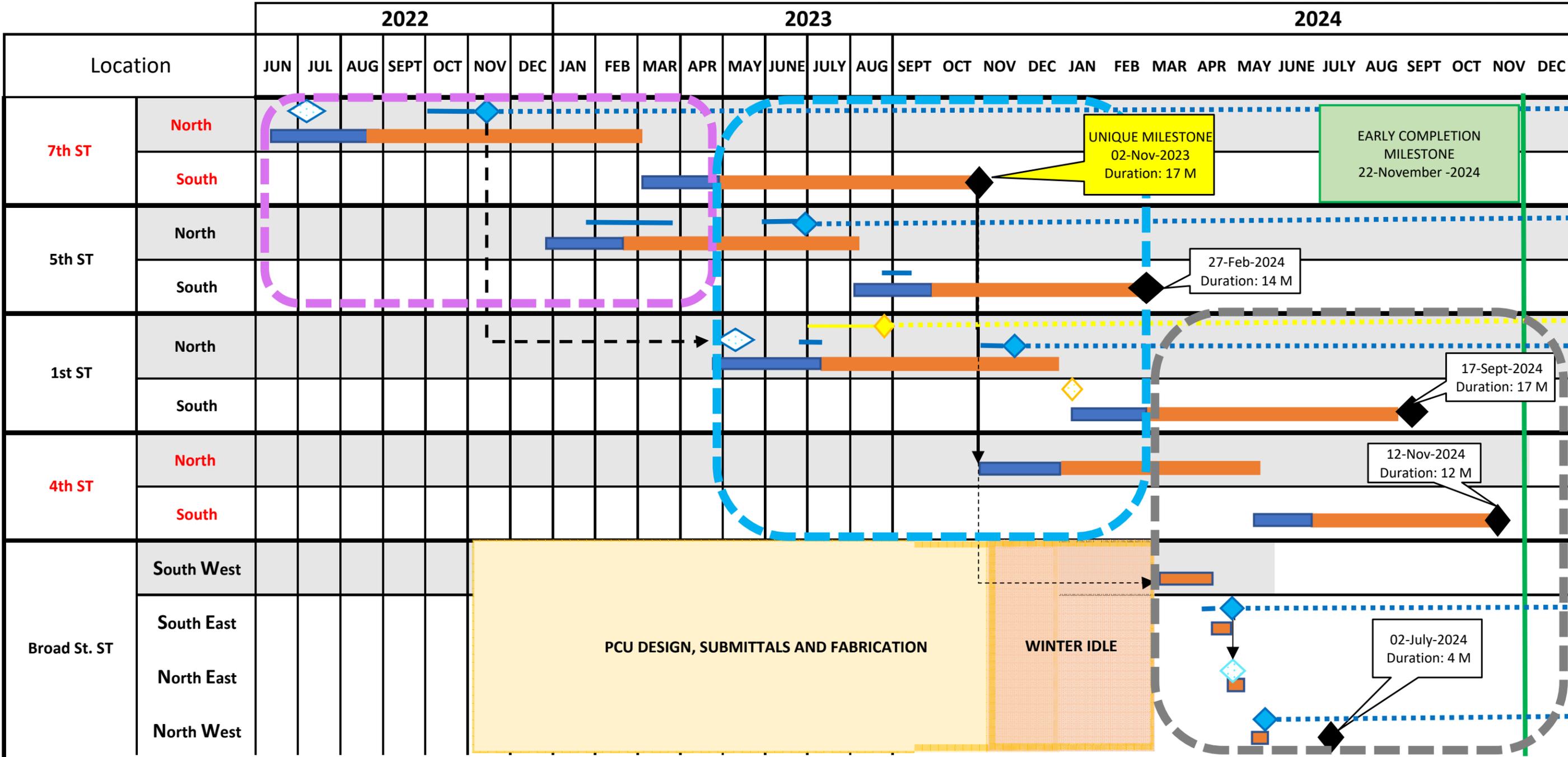
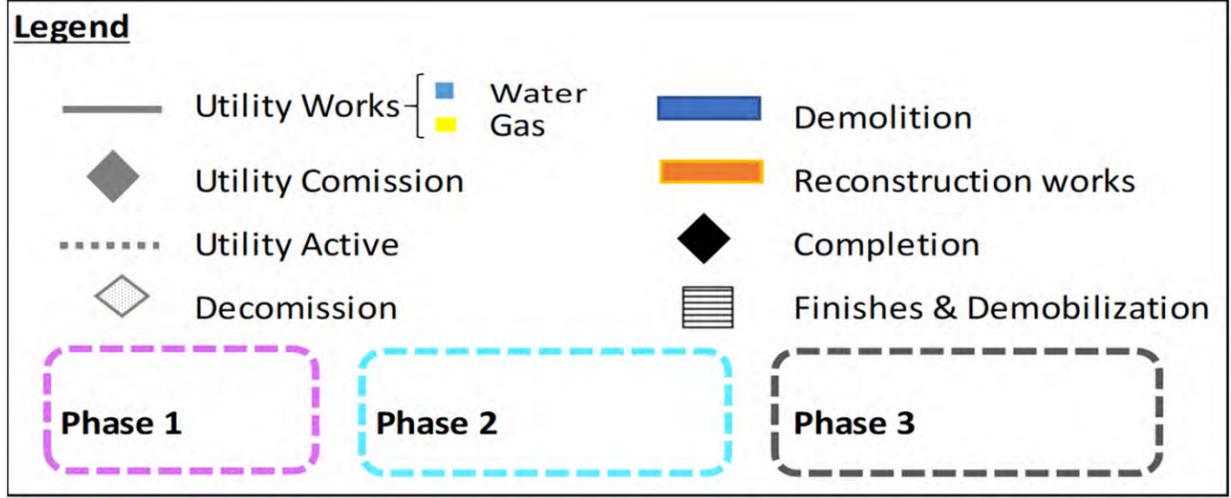


Figure 4.5.1.2 Phase 1 Schedule Summary

After a detailed review of the RFP, discussions with the utility owners, and schedule analysis, our Team determined that it is critical to construct the 7th Street bridge first due to the following:

- 7th Street and E. Broad Street bridges cannot be constructed together per RFP Section 2.10.1;
- 7th Street and 4th Street bridges cannot be constructed together per RFP Section 2.10.1; and
- Completion of the 7th Street bridge first, and subsequent permanent tie-in of the City of Richmond 12” waterline, will satisfy the requirements of RFP Section 2.13 which allow either 1st Street or 5th

Figure 4.5.1.1 - Sequence of Construction and Summary Schedule
VDOT BRIDGES OVER I-95 BUNDLING CITY OF RICHMOND, VIRGINIA



4.5 Construction of the Project

The following narrative provides detailed descriptions of the work in each Stage at each bridge.

7th Street Bridge - Stage 1 – North Side (June 2022 to March 2023)

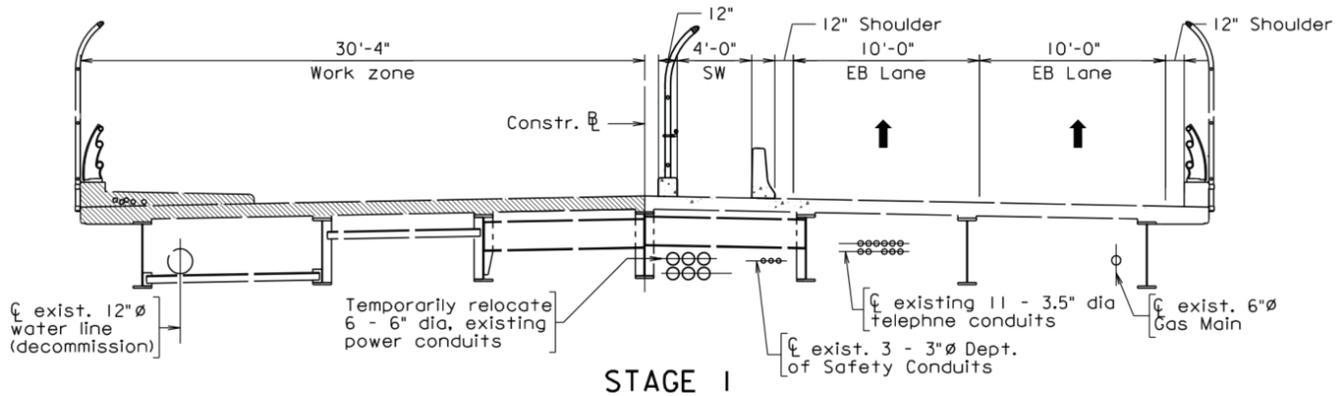
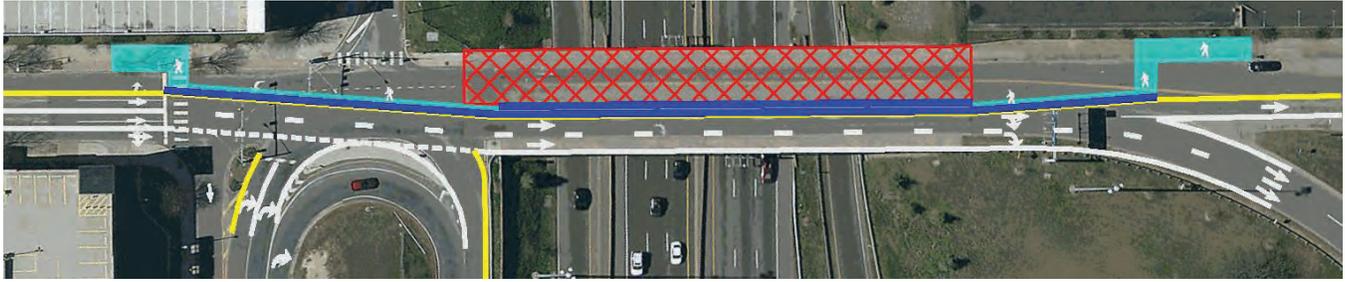


Figure 4.5.1.5 7th Street, Stage 1

Priority Utility Work: 7th Street is sequenced as the first bridge in our schedule due to the critical nature of the waterline restrictions placed by the City of Richmond Water. Crews will begin in Spring of 2022 with the shut-off and decommissioning of the existing 12" waterline located under the 7th Street Bridge's north side. Concurrently, crews will temporarily relocate the existing Dominion Energy conduits located under the north side of the bridge. With the completion of these operations, crews will begin demolition of the north side of the existing bridge.

Traffic and Pedestrian Movements: As depicted in Figure 4.5.1.5, traffic on 7th Street will be restricted to the two eastbound lanes along with the maintenance of pedestrian movements. Westbound traffic for 7th Street will use the detour route shown in Figure 4.5.1.6, matching the RFP.

Demolition: As detailed in Section 4.5.3, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.



Figure 4.5.1.6 7th Street, Westbound Detour

Substructure Repairs: Once the superstructure is removed, the substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Five new structural steel girder lines will be placed in the bridge's north half. Immediately following diaphragm installation, crews will begin installation of the new 12"

4.5 Construction of the Project

waterline, which for 7th Street can remain underbridge. Concurrently, new conduit lines will be placed for the Dominion Energy facilities, and new Verizon communication conduits will be placed in Stage 1 to relocate the existing lines from the Stage 2 side. Bridge deck construction including stay-in-place (SIP) forms, bridge overhang forms, reinforcing steel placement, and structural concrete will then be completed, followed by bridge railing and fencing. A reduced width sidewalk will be constructed in Stage 1 to accommodate Stage 2 traffic. This sidewalk will be widened to a final 8'-0" width at the conclusion of Stage 2.

Roadway Construction and Utilities: During bridge superstructure construction, utility crews will install storm drainage improvements and continue installation of new underground utilities that are located off the bridge such as the 12" waterline and the Dominion Energy facilities. As the new conduit pathways are completed, each utility owner will relocate their facilities. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the newly constructed north half to start Stage 2 construction.

7th Street Bridge - Stage 2 – South Side (March 2023 to November 2023)

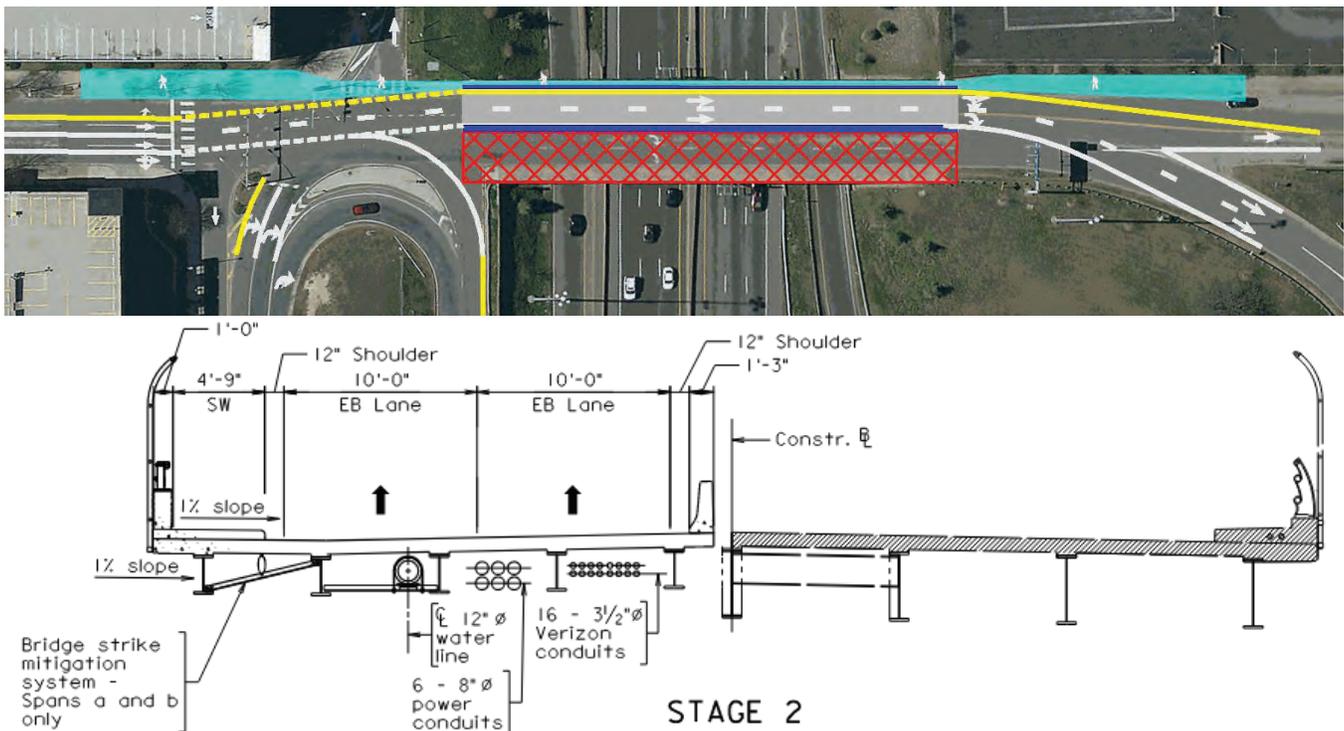


Figure 4.5.1.7 7th Street, Stage 2

Priority Utility Work: Conduit pathways for the existing Verizon and communication carriers on the south side of the bridge were installed in Stage 1 construction. The relocation of these facilities will be coordinated prior to the demolition of the Stage 2 work.

Traffic and Pedestrian Movements: As depicted in Figure 4.5.1.7, traffic on 7th Street will be restricted to the two eastbound lanes along with the maintenance of pedestrian movements. Westbound traffic for 7th Street will continue to use the Detour Route shown in Figure 4.5.1.6.

Demolition: Similar to Stage 1, once traffic is shifted, bridge demolition will occur as detailed in Section 4.5.3.

4.5 Construction of the Project

Substructure Repairs: After demolition is complete, substructure repairs will be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Five new structural steel girder lines will be placed in the bridge's southern half. No new conduit systems are built in this Stage and bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will then occur, followed by bridge railings and fencing. The remaining width of the north side sidewalk will be installed in Stage 2 as the completion of the final bridge deck allows for the shifting of traffic to its ultimate location.

Roadway Construction and Utilities: During superstructure construction, utility crews will install storm sewer improvements located off the bridge. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration and the 7th Street westbound detour will be removed. Following completion of the punchlist and inspection process, **7th Street will achieve our Team's Unique Milestone by November 2, 2023.**

5th Street Bridge - Stage 1 – North Side (January 2023 to August 2023)

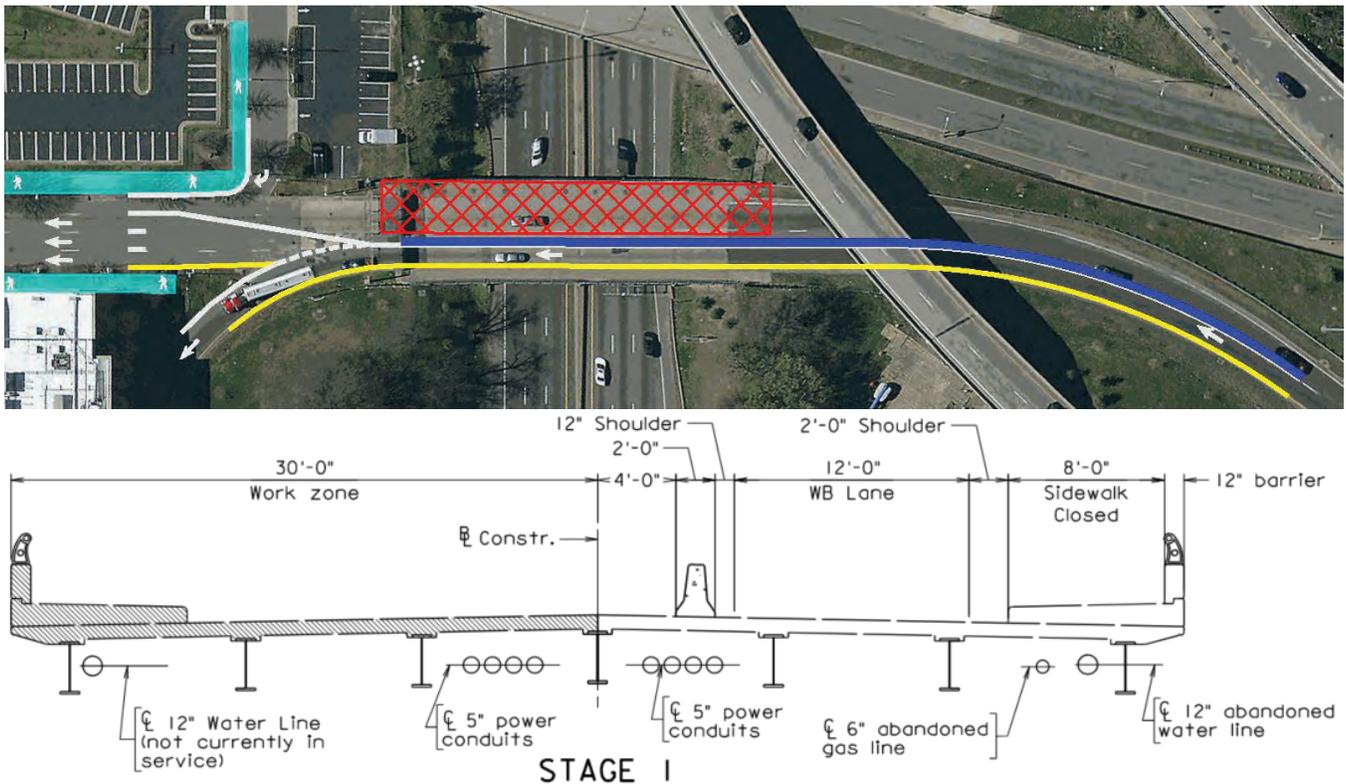


Figure 4.5.1.8 5th Street, Stage 1

Priority Utility Work: Our Team is sequencing construction of the north side of this bridge, instead of the south side, due to the location of the existing 12" City of Richmond waterline. During Stage 1, the waterline will be removed during demolition and replaced with the new superstructure. The 5th Street Bridge also contains two sets of Dominion Energy conduits that are split between the north and south side of the bridge. As outlined in Section 4.4.2, our Team is planning to directionally drill a new underground pathway for the Dominion Energy lines to remove them completely from the 5th Street Bridge.

Traffic and Pedestrian Movements: Concurrent with the priority utility work, incoming traffic from I-64

4.5 Construction of the Project

will be reduced to 1-lane as depicted in Figure 4.5.1.8. No pedestrian accommodations or detours are required during this Stage.

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: After demolition is complete, the substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Due to the narrowing of the existing I-64 westbound Ramp over 5th Street, only three new structural steel girder lines will be placed in the bridge's north side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing. The new City of Richmond 12" waterline will be installed on the extended deck slab overhang as detailed in Figure 4.5.1.9.

Roadway Construction and Utilities: During superstructure construction, utility crews will continue installation of new underground utilities that are located off the bridge including the 12" waterline. As the new conduit pathways are completed, Dominion Energy will relocate their facilities. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the new north side to begin Stage 2 construction.

5th Street Bridge - Stage 2 – South Side (August 2023 to February 2024)

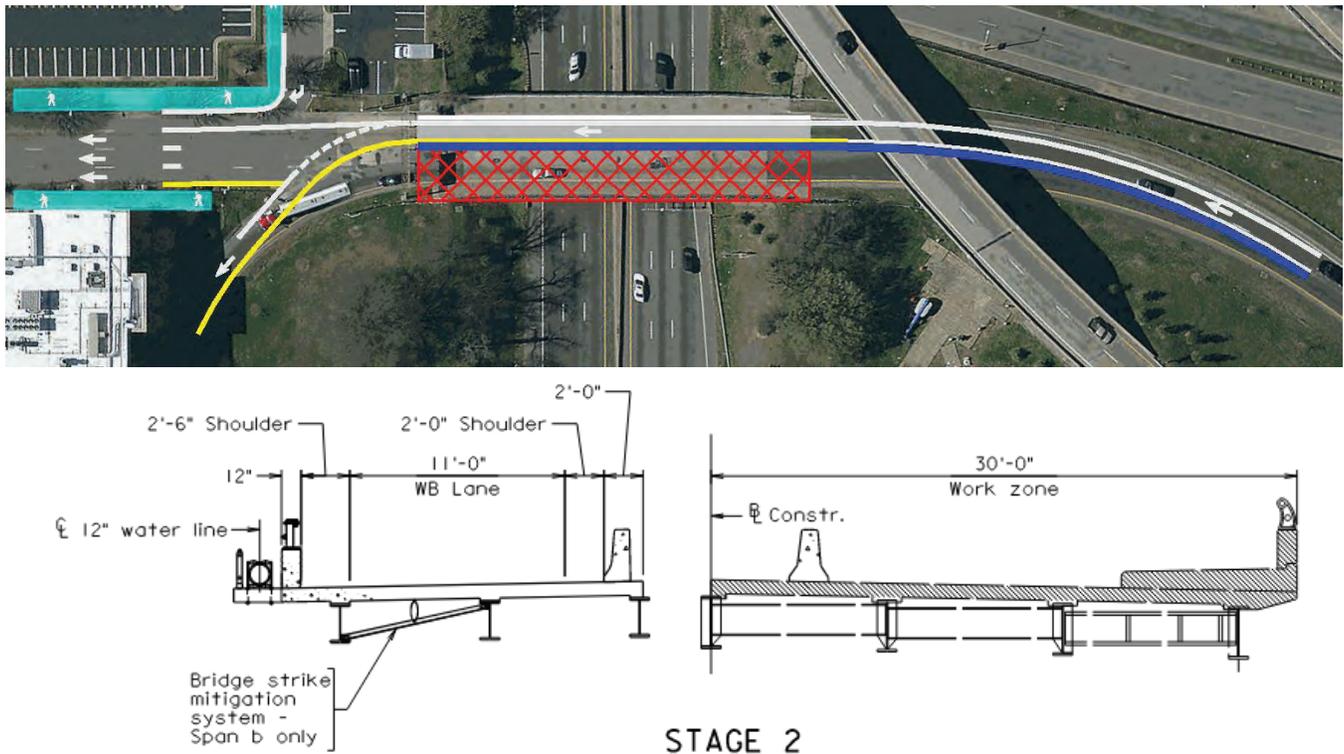


Figure 4.5.1.9 5th Street, Stage 2

Priority Utility Work: With the removal of the Dominion Energy conduits from the bridge in the previous Stage, there are no other critical utilities underbridge. The existing City of Richmond gas line is abandoned and will be removed.

4.5 Construction of the Project

Traffic and Pedestrian Movements: Stage 2 traffic will be configured similar to Stage 1 with incoming traffic from I-64 reduced to 1-lane as depicted in Figure 4.5.1.9. No pedestrian accommodations or detours are provided during this Stage.

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: The substructure repairs will continue from Stage 1 and, as beams are removed during the demolition work, preparation for the beam seats to receive the new girders will be completed.

Superstructure Replacement: Four new structural steel girder lines will be placed in the bridge's south side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing.

Roadway Construction and Utilities: During superstructure construction, roadway crews will install new drainage, curb and gutter, and remove and replace the existing overhead sign located at the western end of the bridge. Following placement of deck concrete, approach slab construction will take place along with pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration.

1st Street Bridge - Stage 1 – North Side (April 2023 to December 2023)

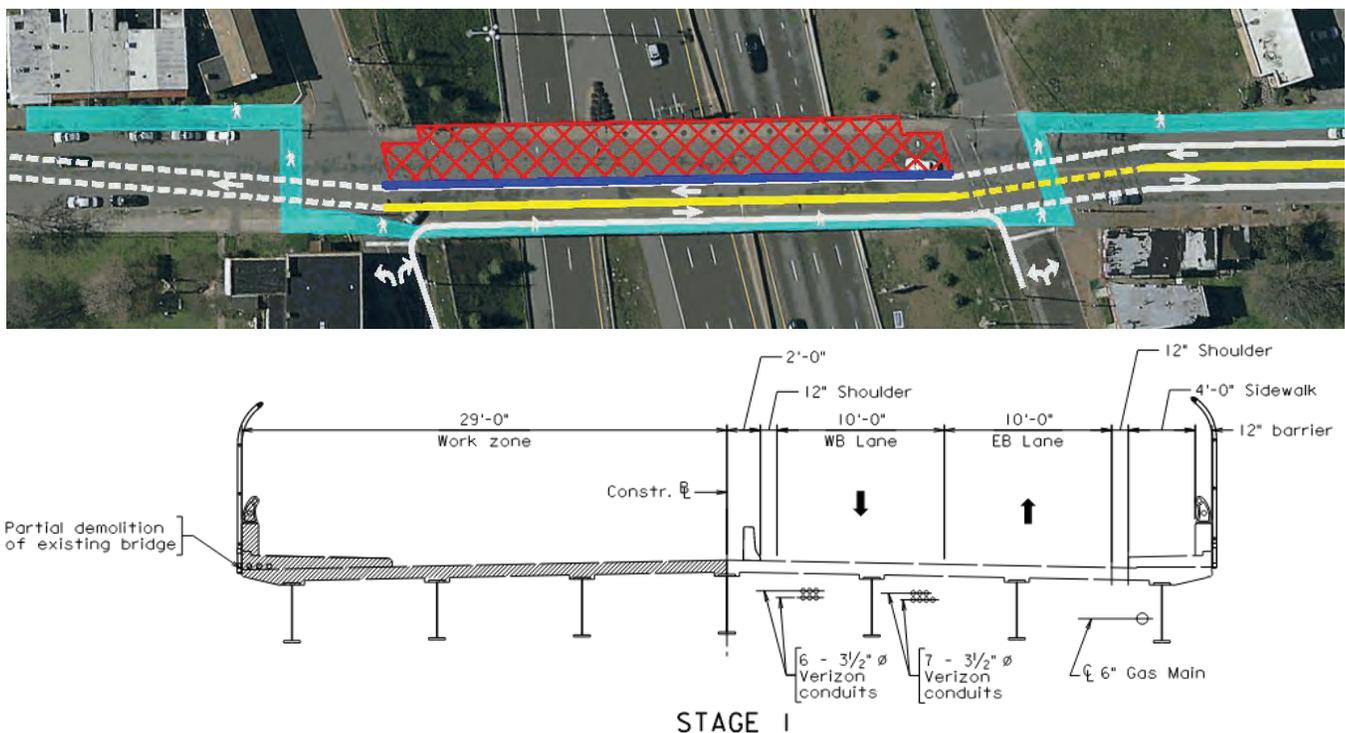


Figure 4.5.1.10 1st Street, Stage 1

Priority Utility Work: Our Team is sequencing construction of the north side, instead of the south side, first due to its proximity to the existing City of Richmond 12” waterline and to allow the installation of the new 6” gas line in this Stage. By completing the north side construction first, the gas line can then be removed from service during the RFP allowable window between March 1st and October 31st. In addition, the existing aerial electric spanning the north side of the bridge will also be relocated to a new easement.

4.5 Construction of the Project

Traffic and Pedestrian Movements: A key benefit to the Project is *our Team's sequence maintains two-way traffic and pedestrian access at all times during construction*, as shown in Figure 4.5.1.10. This will eliminate the need for any detours of traffic through the City of Richmond. Additionally, no temporary signals or one-way traffic will be required, improving public safety.

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: The substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Four new structural steel girder lines will be placed in the bridge's north side. New Verizon communication conduits will be placed in this Stage to relocate the lines in advance of Stage 2. Additionally, a new City of Richmond 6" gas line will be installed underbridge. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will then occur, followed by bridge railing and fencing. A reduced width sidewalk will be constructed in Stage 1 to accommodate Stage 2 traffic. This sidewalk will be widened to a final 8'-0" width at the conclusion of Stage 2.

Roadway Construction and Utilities: During superstructure construction, utility crews will continue installation of new underground utilities that are located off the bridge such as the 12" waterline, gas line and Verizon facilities. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the north side to start Stage 2 construction.

1st Street Bridge - Stage 2 – South Side (December 2023 to August 2024)

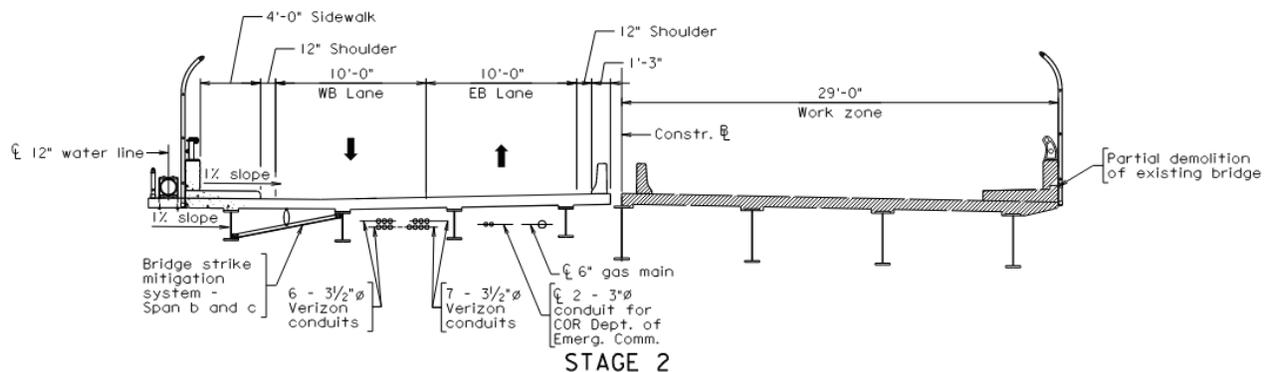
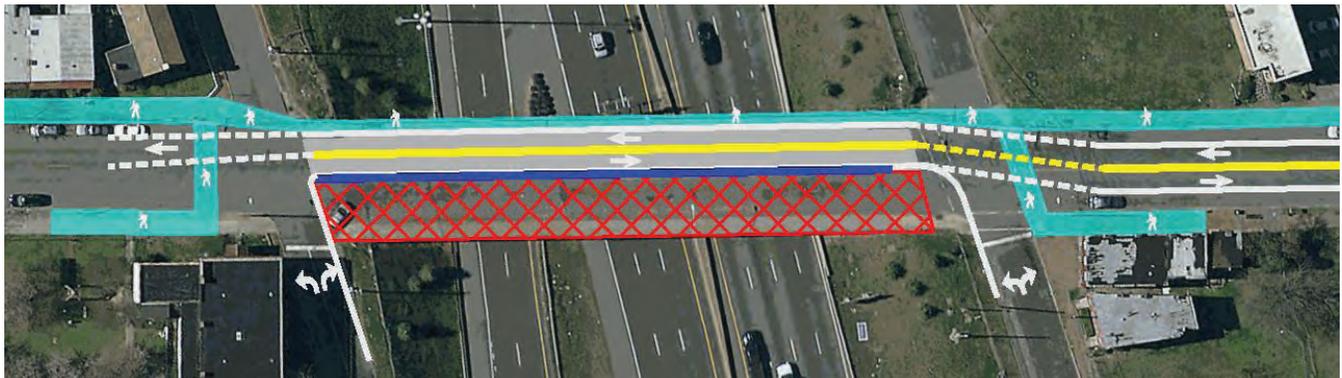


Figure 4.5.1.11 1st Street, Stage 2

4.5 Construction of the Project

Priority Utility Work: With the utility work completed in Stage 1, there are no other critical utility relocations in Stage 2.

Traffic and Pedestrian Movements: Stage 2 traffic will be configured similar to Stage 1 as depicted in Figure 4.5.1.11. Two-way traffic and pedestrian access will be maintained at all times.

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: The substructure repairs will continue from Stage 1 including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Four new structural steel girder lines will be placed in the bridge's south side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement and structural concrete will occur, followed by bridge railings and fencing. The remaining portion of the north side sidewalk will be widened in Stage 2 as the completion of the bridge deck work allows for the shifting of traffic to its ultimate location.

Roadway Construction and Utilities: During superstructure construction, roadway crews will install new drainage, curb and gutter, and will remove and replace the existing overhead sign located at the western end of the bridge. Following placement of deck concrete, approach slab construction will take place along with pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration.

4th Street Bridge - Stage 1 – North Side (November 2023 to May 2024)

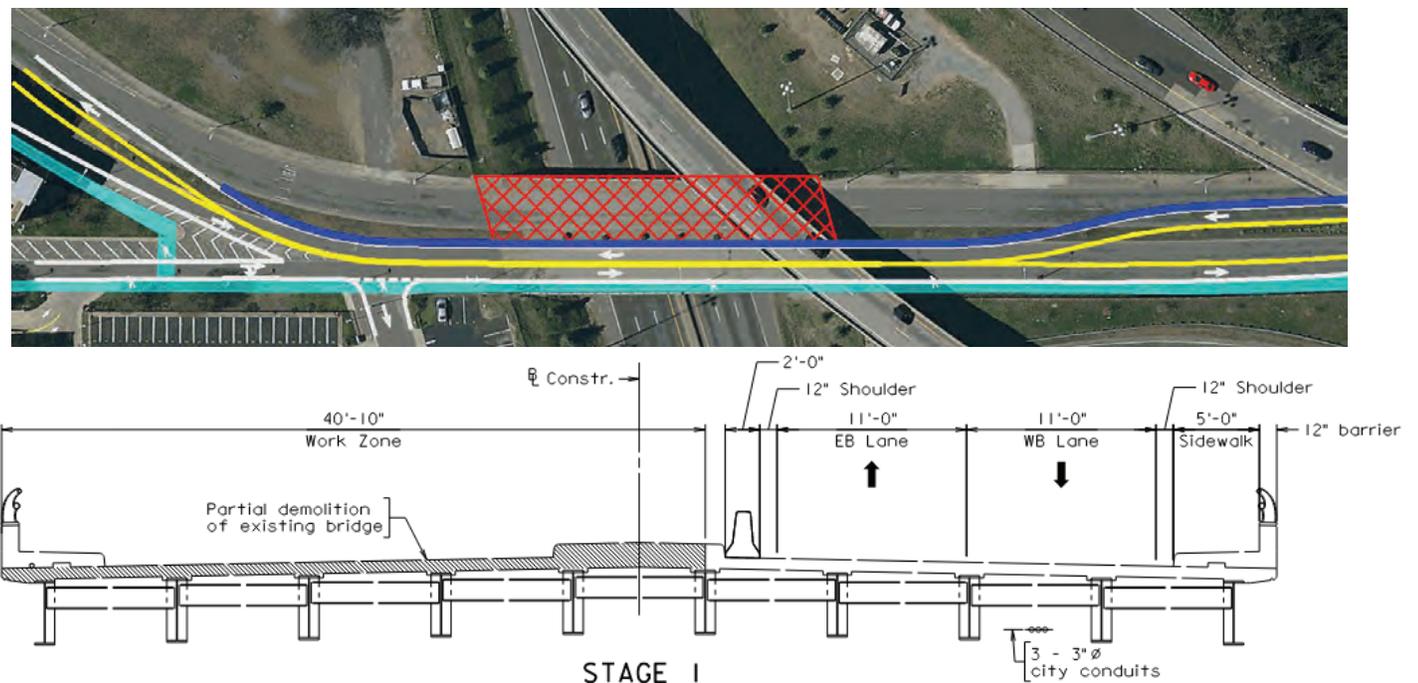


Figure 4.5.1.12 4th Street, Stage 1

Priority Utility Work: 4th Street Bridge has minimal utility work that included City of Richmond street lighting.

4.5 Construction of the Project

Traffic and Pedestrian Movements: Two-way traffic will be maintained, and pedestrian movements provided per the RFP staging plans as shown in Figure 4.5.1.12.

Demolition: The north side of the bridge can be demolished following the removal of the street lighting. As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders. The east span of this Stage of demolition is partially under the existing span of the I-95 southbound to I-64 eastbound flyover ramp. Equipment and staging of equipment will be sized appropriately for this operation.

Substructure Repairs: Substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Eight new girder lines will be placed in Stage 1. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing.

Roadway Construction and Utilities: During superstructure construction, utility crews will install drainage features and new underground utilities that are located off the bridge. Following placement of deck concrete, approach slab construction will take place along with new curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the new north half to start Stage 2 construction.

4th Street Bridge - Stage 2 – South Side (May 2024 to November 2025)

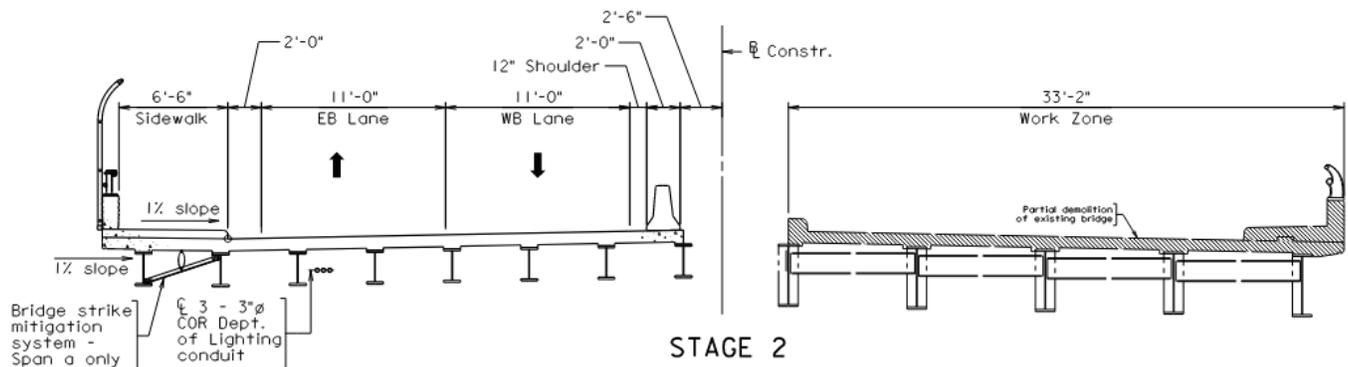


Figure 4.5.1.13 4th Street, Stage 2

4.5 Construction of the Project

Priority Utility Work: City of Richmond lighting conduits, removed in the previous Stage, will be replaced in this Stage of construction.

Traffic and Pedestrian Movements: Stage 2 traffic will be configured similar to Stage 1 with two-way and pedestrian traffic maintained as shown in Figure 4.5.1.13.

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: Substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Eight new structural steel girder lines will be placed in the bridge's south side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing.

Roadway Construction and Utilities: During superstructure construction, roadway crews will install new drainage and curb and gutter. Following placement of deck concrete, approach slab construction will take place along with pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration.

E. Broad Street

Our Team is planning to use Pre-Constructed Composite Units (PCU) utilizing ABC Methods of construction during the allowable E. Broad Street and I-95 closure periods. The PCU will consist of two girder units similar to those shown in Figure 4.5.1.14. Following erection, PCU units will be joined longitudinally via the use of Ultra High Performance Concrete (UHPC) closure pours. A link slab as detailed in Section 4.3.2 will be used for the transverse connections of the PCU over the bridge pier in order to form the jointless structure.

We are planning to fabricate the PCU at an off-site facility as pictured in Figure 4.5.1.15. Structural steel girders will be fabricated at a VDOT approved facility and shipped to a precast yard. Under strict quality control standards, the units will be fabricated in two-girder components in a controlled environment. End units will be cast with reinforcing steel and parapets cast with anchor bolts to receive the bridge railing. Additionally, deck slab extensions and anchorage for the new waterlines will be cast into the PCU units. Our schedule has allowed sufficient time for the design, submission, reviews, and fabrication of both the structural steel and the PCU. Additionally, we have timed the start of the ABC weekend closures to occur in Spring and Summer of 2024 in order to reduce the chance for cold weather elements compromising both traffic and construction operations.



Figure 4.5.1.14 Example of PCU



Figure 4.5.1.15 Offsite PCU Fabrication

E. Broad Street - Stage 1 – First Quadrant (Weekend 1)

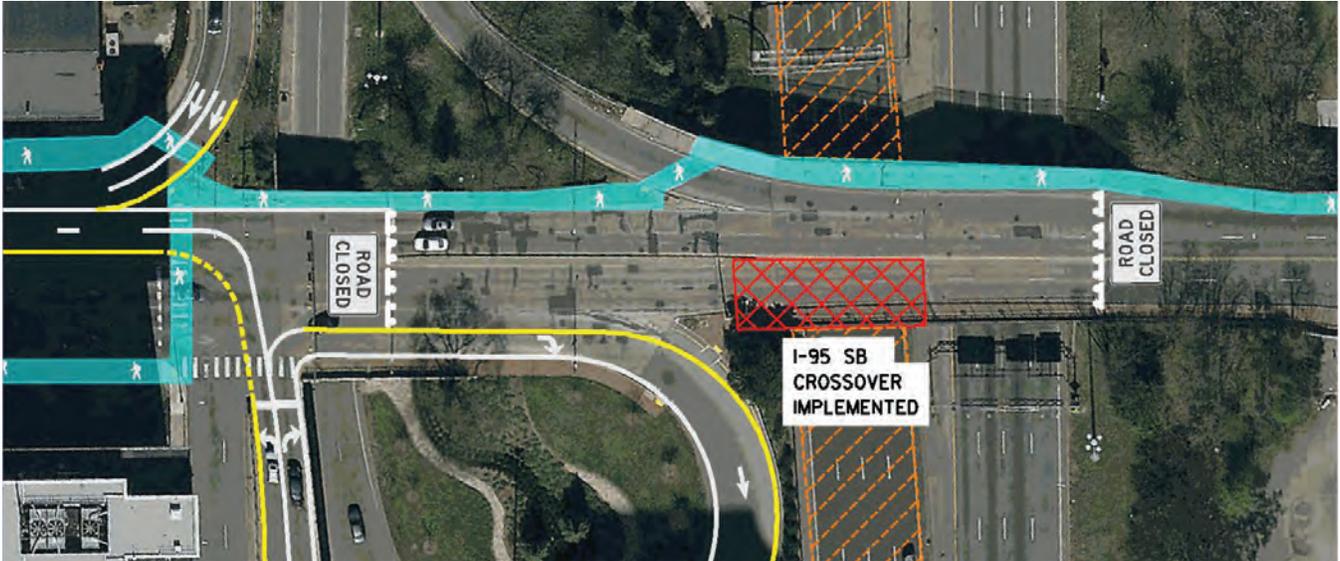


Figure 4.5.1.17 E. Broad Street, Stage 1

Weekend 1 - Preparatory Works

1. Stage traffic barrier service on E. Broad Street for weekend closures.
2. Stage movable barrier on I-95 for southbound closure and crossover to northbound I-95.
3. Working with utility companies, decommission all underbridge utilities under the southern half of the bridge. Remove any underbridge conduits and/or waterlines prior to weekend closures using allowable weekday nighttime closures.
4. Perform any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
5. Sawcut approach asphalt and/or concrete pavement full depth for removal during weekend closure.
6. Perform any asbestos abatement in advance of any actual demolition activities.
7. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
8. Stage cranes for weekend closure.

Weekend 1 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.
4. Sawcut parapet sections and remove to demo trailers positioned on I-95.
5. Composite sections will be removed with a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

Weekend 1 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment B (west) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCUs in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

4.5 Construction of the Project

Weekend 1 – Utility Work

1. Concurrent with the superstructure replacement work, utility crews will take advantage of the E. Broad Street total closure to install the new lateral connection on the east side of the bridge between the southern and northern 12” COR waterlines.
2. Crews will also make any storm sewer adjustments during this period.

Weekend 1–Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU sections, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
3. On the abutment end of the bridge, aggregate base and temporary paving will be installed to create a smooth transition to the new bridge surface.
4. On the pier end, steel plates will be secured to PCU and existing deck for a temporary riding surface.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

E. Broad Street - Stage 2 – Southeast Quadrant (Weekend 2)

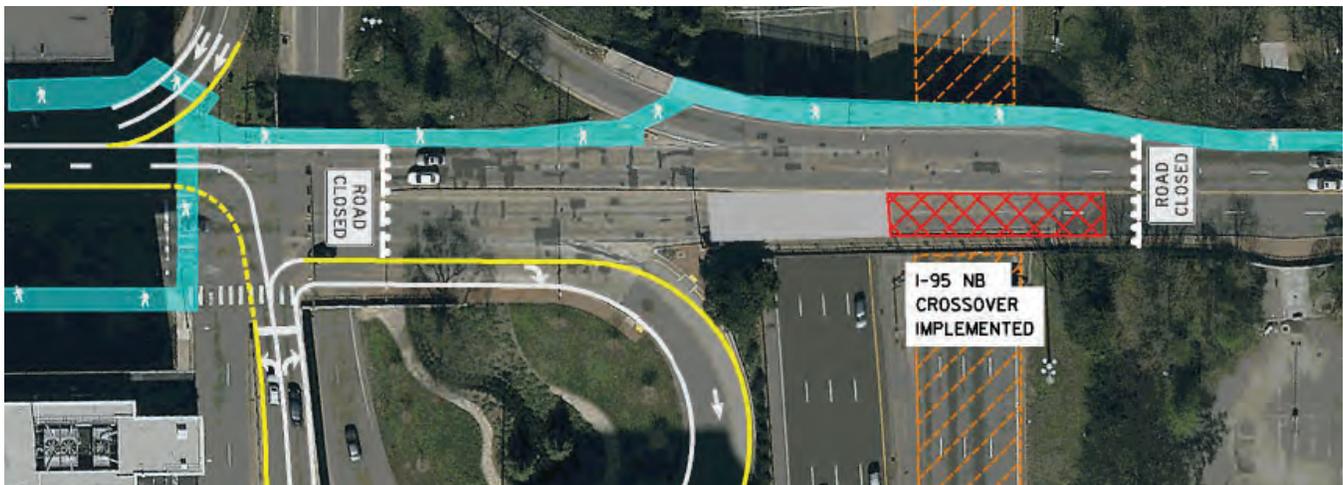


Figure 4.5.1.18 E. Broad Street, Stage 2

Weekend 2 - Preparatory Works

1. Stage traffic barrier service on E. Broad Street for Weekend 2 closure.
2. In order to crossover northbound I-95 to southbound I-95, the movable barrier on I-95 from Weekend 1 will be relocated and staged for Weekend 2 during weekly night-time lane closures.
3. Complete any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
4. Sawcut approach asphalt and/or concrete pavement full depth as required for removal during weekend closure.
5. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
6. Stage cranes for weekend closure.

Weekend 2 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.

4.5 Construction of the Project

4. Sawcut parapet sections and remove to demo trailers positioned on I-95.
5. Composite sections will be removed a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

Weekend 2 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment A (east) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCU in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

Weekend 2 – Utility Work

1. Concurrent with the superstructure replacement work, utility crews will take advantage of the E. Broad Street total closure to install the new lateral connection on the west side of the bridge between southern and northern 12” COR waterlines.
2. Crews will also make any storm sewer adjustments during this period.

Weekend 2–Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU sections, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. On the abutment end of the bridge, aggregate base will be placed and compacted to fill the void left from the removal of the hinged girder system. Base and intermediate asphalt will be installed to create a smooth transition to the new bridge surface.
3. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
4. On the pier end, steel plates will be secured to the PCU for a temporary riding surface. Link slabs will be poured at a later time.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

Southwest/Southeast Quadrant Follow-On Work

Using allowable daily/night-time lane closures of E. Broad Street and I-95, following the Weekend 2 work, crews will complete the following:

1. Install the bridge deck mounted 12” COR Water south waterline and tie-in laterals.
2. Tie-in new 12” waterline to the existing COR waterlines at either end of the bridge. Perform testing, flushing, and chlorination of new watermains in advance of tie-in to active northern waterline.
3. Using night-time I-95 northbound lane closures, install the new hangars and conduit systems for COR lighting.

Weekend 3 - Southwest/Southeast Quadrants

Using weekend closures of E. Broad Street:

1. Install permanent bridge railing and fence at the southern parapet.
2. Install waterline shield on bridge deck per RFP requirements.
3. In coordinated outage with COR Water, perform tie-in of laterals to the existing northern 12” waterline and activate the southern waterline. The portion of the northern waterline spanning the E. Broad Street bridge is now de-activated and can be replaced in Stages 3 and 4.

4.5 Construction of the Project

4. Form and pour the link slab over Pier 1 creating the permanent transverse connection of the PCU installed in Stages 1 and 2.
5. Complete roadway approaches (less approach slabs) up to intermediate asphalt.

E. Broad Street Stage 3 – Northeast Quadrant (Weekend 4)

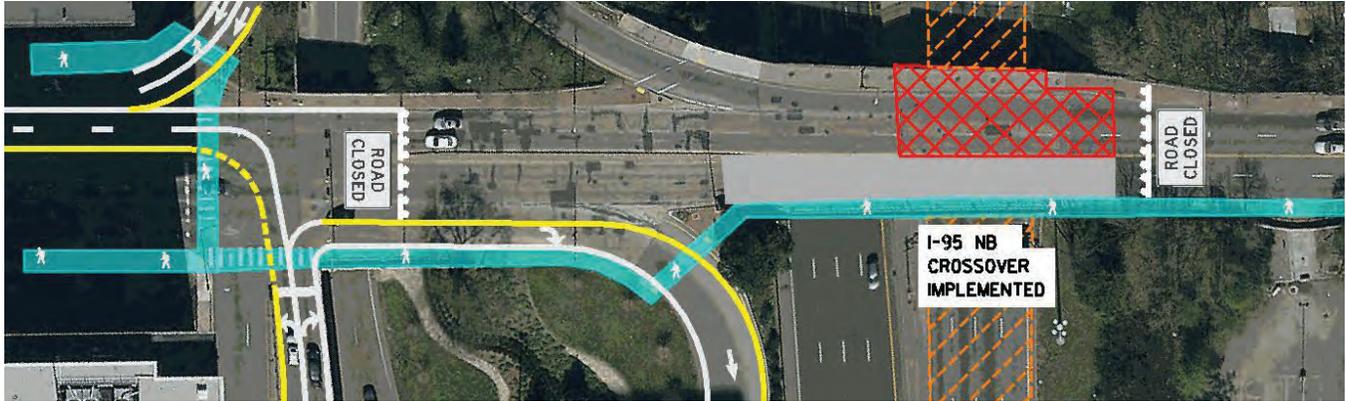


Figure 4.5.1.19 E. Broad Street, Stage 3

Weekend 4 - Preparatory Works

1. The movable barrier used on I-95 from Weekend 2 will be in position and ready for Weekend 4 I-95 northbound crossovers.
2. Complete any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
3. Sawcut approach asphalt and/or concrete pavement full depth as required for removal during weekend closure.
4. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
5. Stage cranes for weekend closure.

Weekend 4 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.
4. Sawcut parapet sections and remove to demo trailers positioned on I-95.
5. Composite sections will be removed a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

Weekend 4 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment A (east) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCUs in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

Weekend 4 – Utility Work

1. Crews will make any storm sewer adjustments during this period.

4.5 Construction of the Project

Weekend 4—Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
3. On the abutment end of the bridge, aggregate base will be placed and compacted to fill the void left from the removal of the hinged girder system. Base and intermediate asphalt will be installed to create a smooth transition to the new bridge surface.
4. On the pier end, steel plates will be secured to the PCU and existing deck for a temporary riding surface.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

E. Broad Street - Stage 4 – Northwest Quadrant (Weekend 5)

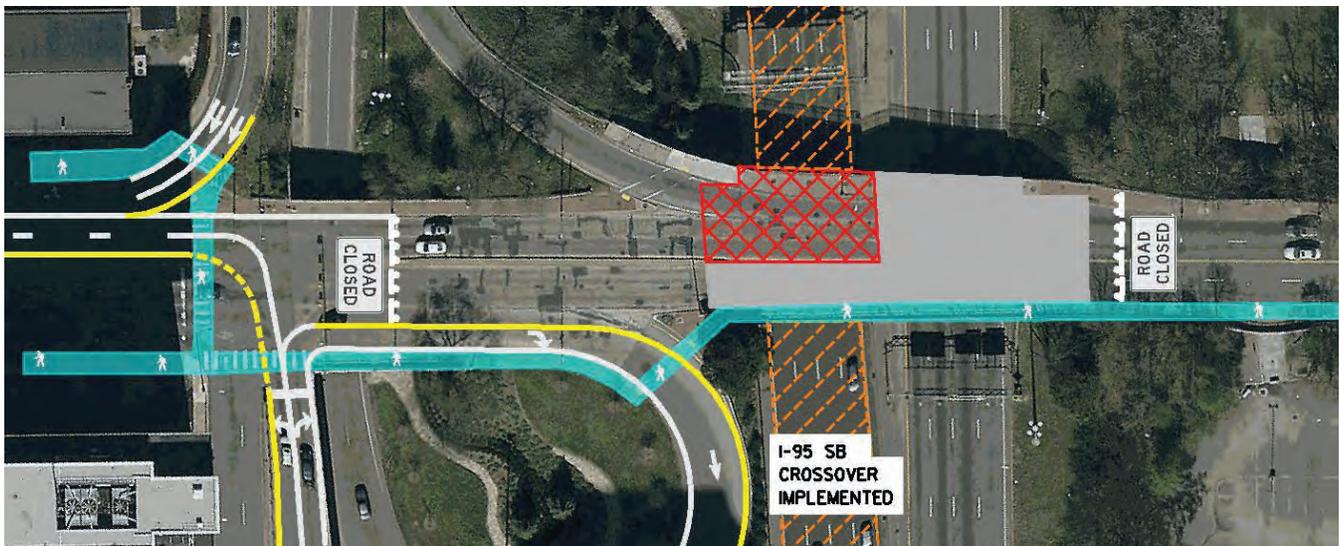


Figure 4.5.1.20 E. Broad Street, Stage 4

Weekend 5 - Preparatory Works

1. Stage traffic barrier service on E. Broad Street for Weekend 5 closure.
2. In order to crossover southbound I-95 to northbound I-95, the movable barrier on I-95 from Weekend 4 will be relocated and staged for Weekend 5 during weekly night-time lane closures.
3. Complete any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
4. Sawcut approach asphalt and/or concrete pavement full depth as required for removal during weekend closure.
5. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
6. Stage cranes for weekend closure.

Weekend 5 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.
4. Sawcut parapet sections and remove to demo trailers positioned on I-95.

4.5 Construction of the Project

5. Composite sections will be removed with a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

Weekend 5 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment B (west) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCUs in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

Weekend 5 – Utility Work

1. Crews will make any storm sewer adjustments during this period.

Weekend 5 -Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU sections, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. On the abutment end of the bridge, aggregate base will be placed and compacted. Base and intermediate asphalt will be installed to create a smooth transition to the new bridge surface.
3. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
4. On the Pier end, steel plates will be secured to the PCU for a temporary riding surface. Link slabs will be poured at a later time.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

Northwest/Northeast Quadrant Follow-On Work

Using allowable daily and night-time lane closures of E. Broad Street and I-95, after the Weekend 5 work, crews will complete the following:

1. Install the bridge deck mounted 12” COR Water north waterline.
2. Tie-in new bridge deck mounted 12” waterline to the existing COR waterlines at either end of the bridge. Perform testing, flushing, and chlorination of new waterline.
3. Using night-time I-95 northbound lane closures, install the new hangars and conduit systems for COR lighting and DEV conduit system.
4. Remove the movable barriers from the Project.

Weekend 6 - Northwest/Northeast Quadrants – Using weekend closures of E. Broad Street

1. Install permanent bridge railing and fence at the northern parapet.
2. Install waterline shield on bridge deck per RFP requirements.
3. In coordinated outage with COR Water, perform tie-in of the new bridge deck mounted northern 12” waterline to the active laterals to complete the looped waterline system.
4. Form and pour the link slab over Pier 1 creating the permanent transverse connection of the PCU installed in Stages 3 and 4.
5. Complete roadway approaches (less approach slabs) up to intermediate asphalt.

4.5 Construction of the Project

E. Broad Street Stage 5 – Approaches and Finishes (Weekends 7 and 8)

The final two weekend closure periods will be utilized for the following:

1. Sawcut pavement, excavate, grade for Abutment A and B Approach Slabs.
2. Form, place reinforcing steel, and pour Abutment A and B Approach Slabs.
3. Form and pour raised sidewalks on north and south bridges.
4. Completion of all curb and gutter and final storm sewer adjustments.
5. Remove all temporary barriers on E. Broad Street.
6. Perform diamond grinding of PCU and install pavement markings.

Follow-On Work

Using allowable daily/night-time lane closures of E. Broad Street and I-95, concurrent with Stage 5 work, crews will be completing the following:

1. Bridge girder painting.
2. Completion of any remaining substructure repairs.
3. Grooving of bridge deck surface.
4. Mill and overlay of final surface asphalt.

Safety and Operations

At the top of our list of core values at Shirley is the safety of our people, our subcontractor partners, the client, and the public. The design and the means and methods of construction are developed with the safety of the workers and the traveling public as the highest priority. Our motto “Safety Starts with Me” reflects the company’s policy and position that every individual must be involved, empowered and accountable for project safety. The construction team will implement safety on site through the following practices:

- Training on construction safety, fall protection, first aid, rigging and trenching, and excavation;
- Support from the Safety Department and a Safety Manager assigned to the Project;
- Orientation to the Project’s unique demands for all Shirley and subcontractor employees;
- Daily safety talks and review of the Safe Plan of Action for the day’s activities;
- Daily safety inspections performed by members of the Project team designed to engage all workers on site to ensure safety is paramount;
- Monthly team safety meetings to review incidents and new safety topics;
- Issuance of a Shirley Dig Permit prior to any excavation activity;
- 100% Glove Policy to mitigate hand injuries; and
- Recognition of employees who consistently display a good safety attitude, follow safe work practices, and achieve safety performance goals.

For the safety of the traveling public, our Team’s Transportation Management Plan (TMP), presented in Section 4.5.2, provides the baseline for maintaining mobility through the Project with limited interaction with construction activities. Construction access has been well thought out at this preliminary stage of development and will be coordinated with the adjacent construction projects. For the work zone setup, or any temporary lane closures allowed by the contract, the VDOT Work Zone Safety Checklist will serve as the minimum standard for conformance with the Project’s safety requirements, and checks will be performed daily. In the case of any incidents on or adjacent to the site, our Team will work closely with first responders and VDOT’s Traffic Operations Center and Incident Management staff to make the scene safe and restore traffic when applicable.

Staging and Storage Areas

Our Team understands the importance of a smart site logistics plan and good housekeeping, as both improve public perception and safety for all involved. Storage of materials will be isolated to areas where

4.5 Construction of the Project

safe delivery access can be provided while ensuring that no material is stored in a location which would introduce a hazard such as obscuring line of sight to the traveling public, construction, or inspection staff. Material staging areas will be defined for both roadway and bridge elements.

Our Team plans to establish a centralized yard on the City of Richmond property identified in the RFP for not only construction materials and equipment staging and storage, but also for our project management staff to maintain control over all aspects of construction. At each individual bridge site, staging and storage will be minimized to primarily house daily equipment, small tool storage, and materials that will be incorporated in the short-term. We will take advantage of any open space and green areas at each bridge site to store these items, being careful not to encroach on any private property, create any unnecessary clutter or impair driver sightlines. Most construction and major materials will be stored and staged at the main yard location and transported daily to each work site on an as-needed basis. This will include any subcontractor's materials and equipment. Examples of these type of materials and equipment include formwork lumber and hardware, stay-in-place deck forms, grout and cementitious materials, utility conduits, light poles, luminaires, manlifts, and staged amounts of gravel and stone utilized for backfill or construction access. When appropriate for larger deliveries such as structural girders or precast elements, just-in-time deliveries will be scheduled so that the site is prepared, and the material can be transported and placed in permanent position during the planned work shift.

4.5.2 Transportation Management Plan

All aspects of our TMP are intended to exceed the Project expectations for safe and effective traffic control, and minimize impacts to the traveling public, stakeholders, and construction personnel. Examples of our efforts include limiting impacts to the 1st Street Bridge by maintaining a lane in each direction, which eliminates a detour and temporary signals, and implementing ATC 1 which minimizes the use of movable barrier. To accomplish other safety and mobility goals, we are committing to mitigation and communication strategies that include the following:

- Sequencing construction to minimize lane closures and flagging operations;
- Configuring work zones to provide motorists and workers temporary barrier protection;
- Analyzing existing safety concerns and mitigating them prior to major construction activities;
- Utilizing enhanced safety devices that surpass the requirements of the RFP, such as higher visibility devices and wider than required markings; and
- Providing enhanced public communication outreach, such as additional PCMS signs for motorist guidance and holding “Pardon our Dust” meetings.

A major challenge associated with this Project is the proposed use of movable barrier along I-95, which has a significant traffic impact and complexity associated with it. Our ATC 1 eliminates the need to implement the movable barrier system for work on southbound I-95 at the 1st, 4th, 5th, and 7th Street bridges, avoiding lengthy barrier moving operations twice nightly. With this ATC, southbound I-95 is diverted to I-64 and Route 360 interchange ramps before returning to Southbound I-95 as shown in Figure 4.5.2.1. The setup and removal time savings results in longer durations for construction operations or activities each night, reduces the



Figure 4.5.2.1 ATC 1 Detour

4.5 Construction of the Project

overall number of Temporary Traffic Control (TTC) operations, and shorten the overall duration of bridge construction. Figure 4.5.2.2 shows the length of movable barrier eliminated by our ATC 1 in green. The remaining portion shown in blue will be implemented at E. Broad Street.



Figure 4.5.2.2 Elimination of Movable Barrier Shown in Green

TMP Philosophy

Our TMP and construction program is aimed at reducing the Project's anticipated impacts to the traveling public and exceeding the safety requirements of the RFP. Above all, our Team values the safety of all parties in every facet of design and construction. Our TMP and TTC plans will place a particularly heavy emphasis on maintaining travel lanes to the greatest extent possible, as we recognize that road closures and detours have high impacts on traffic. To meet these high safety and mobility standards, the TTC and TMP plan development will be led by our Traffic Engineer, Jerry Mrykalo, who is a Professional Traffic Operations Engineer and is certified as a VDOT Work Zone Traffic Control instructor. Additionally, our design engineers have completed our in-house Work Zone Traffic Control Training Program and are VDOT certified in the development of TTC and TMP plans, exceeding the requirements of the RFP.

Sequence of Work

As introduced in Section 4.5.1, the Project will be segmented into five major Work Areas, each of which has unique construction and temporary traffic control features. Sequencing these Work Areas by Stages allows our Team to efficiently construct the Project while minimizing mobility impacts to the traveling public. We carefully studied numerous staging options in conjunction with developing the permanent roadway alignment, and ultimately selected an alignment that, where possible, shifts the new roadway to reduce impacts to traffic during construction. The roadway alignment enhancements as well as bridge span optimizations reduce the impacts of our work zones to the traveling public and provide significant safety and mobility benefits including:

- Allowing for pull-off areas along the paved shoulders of I-95 during construction for vehicle breakdown, incident management, and police enforcement;
- Analyzing existing safety concerns and mitigating them prior to major construction activities;
- Utilizing wider than required pavement markings;
- Using more gradual than required lane shifts; and
- Minimizing lane closures.

For each of the five bridges areas, we have developed bridge-specific temporary traffic control strategies that we will use to safely maintain lanes during construction based on unique challenges presented in each area. Throughout all areas, we strive to exceed required minimum lane and shoulder widths whenever feasible.

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Our Team recognizes common shortfalls with TTC in work zones and are committed to avoiding these conditions with carefully designed site specific TTC plans. For example, we will ensure that barrier ends and impact attenuators are flared as far away from traffic as possible, as driver collisions with impact attenuators can result in high severity crashes. We also thoroughly understand the importance of avoiding “abrupt” lane shifts meeting only minimum lengths on high speed / high volume freeways, and avoiding frequent lane shifts from side to side that are difficult for drivers to navigate safely. Technical highlights of our Proposal are as follows:

I-95

- No planned long-term lane closures.
- Time of day restrictions will follow Part 2, Section 10.4 of the RFP. Temporary lane closures are anticipated for night time, placement of traffic barrier, delivery of materials, and bridge work.
- Temporary 20-minute maximum full stoppages on I-95 during overnight hours are only expected for overhead sign work and bridge girder setting.
- No flagging operations are anticipated.
- Minimum 11’ wide lanes will be maintained.
- All temporary traffic shifts will be designed to meet the full posted speeds on I-95, exceeding minimum length requirements of the Virginia Work Area Protection Manual.
- The only proposed ramp closures and temporary detours are those associated with ATC 1 the allowed northbound I-95 detour and E. Broad Street weekend operations.

1st Street Bridge (Figure 4.5.2.3)

- Two-stage bridge construction that will allow our Team to maintain one eastbound and one westbound lane.
- A 4 foot minimum sidewalk will be maintained during each Stage.
- No long-term lane closures planned.
- No temporary detours planned.
- Minimum 10’ wide lanes will be maintained.

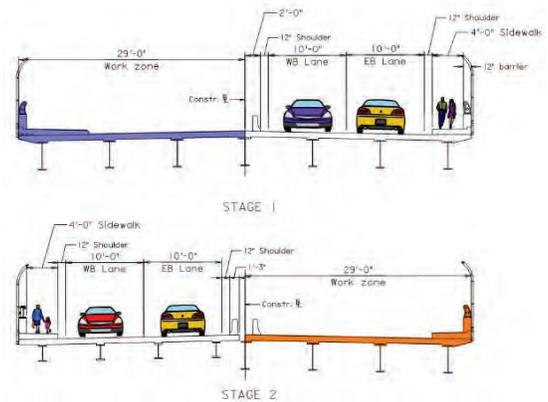


Figure 4.5.2.3 1st Street Staging

4th Street Bridge (Figure 4.5.2.4)

- Two-stage bridge construction that will allow our Team to maintain one eastbound and one westbound lane.
- A 5 foot minimum sidewalk will be maintained during each Stage.
- No temporary detours planned.
- Minimum 10’ wide lanes will be maintained.

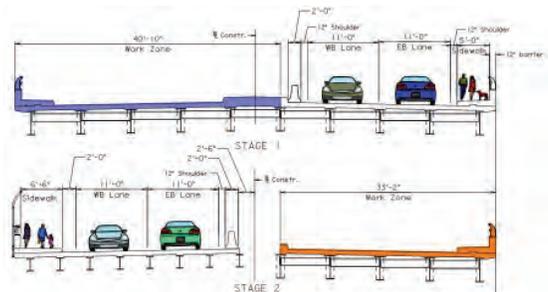


Figure 4.5.2.4 4th Street Staging

5th Street Bridge (Figure 4.5.2.5)

- Two-stage construction that will allow our Team to maintain one westbound lane.
- An 8 foot sidewalk will be maintained during Stage 1.
- No temporary detours planned.
- Minimum 11 foot wide lanes will be maintained.

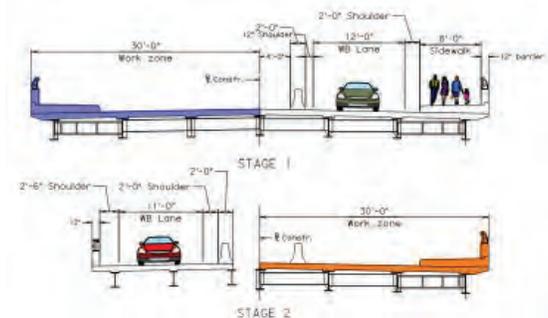


Figure 4.5.2.5 5th Street Staging

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7th Street Bridge (Figure 4.5.2.6)

- Two-stage construction that will allow our team to maintain two eastbound lanes.
- A 4 foot minimum sidewalk will be maintained during each Stage.
- No temporary detours planned.
- Minimum 10 foot wide lanes will be maintained.

E. Broad Street Bridge

- Work to be done during allowable weekend closures and short-term lane closures.
- No long-term lane closures planned.
- No long-term detours planned.
- Minimum 10' wide lanes will be maintained.

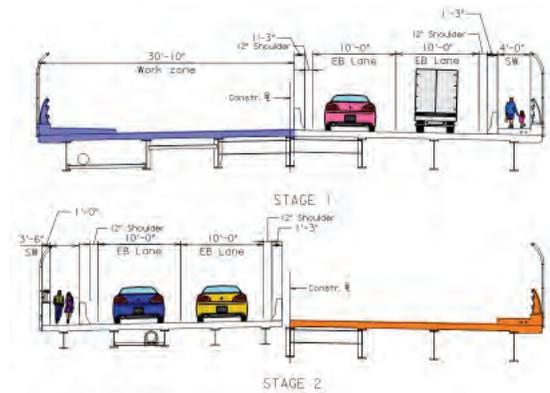


Figure 4.5.2.6 7th Street Staging

Unique Project Challenges & Solutions

Specific attention has been given to the unique challenges of the Project, with focus on mitigation and communication strategies that enhance safety, minimize public impacts, and minimize schedule risk. By carefully studying these elements, our Team has devised the following unique solutions:

1. Minimizing I-95 Impacts

Limiting construction impacts on I-95 is critical. ATC 1 allows for the southbound detour of I-95 to I-64/Route 360 to minimize the use of movable barrier, which minimizes the number of lane closures and avoids impacts to northbound I-95.

2. Pedestrian and Bicycle Safety Enhancements

With the Project focusing heavily on vehicular traffic, it is critical not to lose focus on pedestrian and bicycle traffic utilizing the existing sidewalks. Our Team is committed to maintaining existing pedestrian and bicycle pathways where possible by multi-staging the replacement of each bridge. Where crosswalks must be temporarily closed for safety, a well-marked diversion will be established and communicated in advance.

3. Minimizing Community Impacts

We understand that one of the public's major concerns is maintaining access to the public food assistance distribution centers. Our Team's 1st Street sequencing allows two-way vehicular and pedestrian traffic throughout all Stages, which provides the community with the same connectivity throughout construction.

4. Leveraging I-295 Diversion

We believe one of the keys to maintaining traffic mobility will be to achieve a high diversion rate of through traffic via I-295 during night operations on I-95 as shown in Figure 4.5.2.7. I-295 provides an excellent natural detour, improving mobility while also improving safety by reducing the likelihood of volume related queueing during work activities. To accomplish this, we know the importance of a robust regional public outreach effort. Our Team has identified the following potential public outreach solutions:



Figure 4.5.2.7 I-295 Diversion

4.5 Construction of the Project

- Use of Portable Changeable Message Signs (PCMS) and existing overhead Dynamic Message Signs (DMS) to alert motorists to utilize I-295 during bridge work nights;
- Outreach through social media, radio, and television;
- Coordination with VDOT to provide updates via a project website; and
- Direct communication with emergency responders, major stakeholders, and transportation alliances.

Stakeholder Communication and Mitigation Strategies

Our Team recognizes that proactive communication with all Project stakeholders is essential to a successful TMP. As with any large-scale transportation project, some inconvenience is unavoidable, but our Team’s goal is to minimize these impacts. We have proactively identified Project stakeholders and have devised specific innovative communication and mitigation strategies that exceed Project requirements. These include our commitment to use additional PCMS for motorist guidance, committing to hold additional “Pardon our Dust” meetings, and utilizing enhanced safety devices. A summary of the stakeholders, their potential impacts, and our planned communication and mitigation strategies are detailed in Table 14.

Table 14: Stakeholder Communication and Mitigation Strategies

Stakeholders	Impacts	Communication/Mitigation Strategies
Traveling Public	Minimal travel time delays for temporary operations.	<ul style="list-style-type: none"> ▪ Limiting the number of lane closures necessary. ▪ All work operations behind barrier will maximize lane widths. ▪ Portable Changeable Message Signs (PCMS) will be utilized for public notices.
Local Residents	Possible construction noise and construction activities close to their property.	<ul style="list-style-type: none"> ▪ Coordination of construction activities with residential groups via notification and “Pardon Our Dust” meetings. ▪ Limiting hauling activities to non-residential routes wherever possible.
Hospitals VCU Medical Centers Children’s Hospital of Richmond	Potential response time impact.	<ul style="list-style-type: none"> ▪ Advance notification of temporary lane restrictions and changes to traffic patterns. ▪ Special emergency responder meetings to be held with Project staff. ▪ Representatives will be notified of approved lane closure requests, and provide a 24/7 contact. ▪ <i>Unique Milestone for 7th Street allows for finishing 1 year ahead of schedule and provides congestion relief to VCU Medical Center.</i>
Schools Richmond Public Schools University of Richmond Virginia Commonwealth University Virginia Union University	Potential delays to school buses/ transportation services.	<ul style="list-style-type: none"> ▪ Direct coordination of construction activities with school staff. ▪ No lane closures during school bus operating hours, when possible. ▪ Advance notification of traffic pattern changes.
Police, Fire & Rescue City of Richmond Police City of Richmond Fire & Rescue Chesterfield Fire & Rescue Henrico County Fire & Rescue Virginia State Police	Potential response time impact.	<ul style="list-style-type: none"> ▪ Advance notification of temporary lane restrictions and changes to traffic patterns. ▪ Special emergency responder meetings to be held with Project staff. ▪ Representatives will be notified of approved lane closure requests, and provide a 24/7 contact.
Adjacent Projects 109320 Belvidere Project VCU Health Proposed Ped. Bridge for 7th St Parking Garage Richmond 2020 Bike Lane Project Downtown Buffered Bike Lanes East Broad Street Hawk Project	Potential construction coordination impacts between projects.	<ul style="list-style-type: none"> ▪ Temporary lane closures will be coordinated. ▪ Major operations will be coordinated to avoid compounding traffic impacts. ▪ Resources such as PCMS devices can be coordinated and shared for major events.

4.5 Construction of the Project

Stakeholders	Impacts	Communication/Mitigation Strategies
Area Attractions Historical Attractions Richmond Coliseum	Potential impact to access routes.	<ul style="list-style-type: none"> Representatives will be notified of approved lane closures. Limiting hauling activities to non-attraction routes wherever.
Richmond Area Transport GRTC	Potential impacts to bus transit routes.	<ul style="list-style-type: none"> Notifications of work will be sent to transit operators in advance of traffic switches or detour implementation.
Government/Military Fort Lee Gov. Facility Naval	Potential impact to access routes.	<ul style="list-style-type: none"> Representatives will be notified of approved lane closures. Driveway reconstruction will be completed during non-business hours when possible.
Industrial Facilities ABM Strawberry Hill Industrial Park Chamberlayne Industrial Center International Paper Manchester Industries Inc.	Potential impacts to distribution and delivery truck routes.	<ul style="list-style-type: none"> Temporary traffic control will be designed to accommodate heavy truck traffic. The construction team will notify these stakeholders of major construction activities that may affect business operations, such as temporary stoppages for overhead signal work.

4.5.3 Demolition Plan

Approach to Bridge Demolition

The Project requires the demolition of five highway overpass superstructures. Specifically, the superstructures for 1st, 4th, 5th, and 7th Streets over I-95 require conventional removal, while the superstructure for E. Broad Street over I-95 requires ABC techniques. Our Team brings nearly 50 years of bridge and structure demolition experience, including many over Interstates using ABC methods. Table 15 shows recent bridge demolition projects completed by Shirley that contained either Interstate and/or the use of ABC methodology.

Table 15: Shirley Bridge Demolition Project Experience

Project Name	Interstate Demolition	Use of ABC Methods
I-95 Springfield Interchange, Phases II, III, and IV	X	
Replacement of Southern Avenue Bridge	X	
I-66 Widening	X	X
I-64 Capacity Improvements Segment I	X	
I-64 Capacity Improvements Segment III	X	
Route 606 Bridge Replacement over I-95	X	X
Fort Belvoir North Area Ramp over I-95	X	
I-95 4th Lane Widening	X	
Sugarland Run Superstructure Replacement		X

Early Works Prior to Demolition

Demolition Plan

A detailed Demolition Plan will be included with the final design plan submittal for each structure. The Demolition Plan will provide step-by-step plans of the demolition process and will include, but not be limited to, the following information:

- Demolition procedures with means and methods for each step of the process;
- Proposed timelines;
- Proposed resources including manpower, equipment, tools, and subcontractors;
- Equipment staging areas;
- Girder removal planning with crane locations, crane charts, and rigging specifications;

4.5 Construction of the Project

- Details of the canopy / protection shield of the underlying roadway designed and sealed by a licensed professional engineer in the Commonwealth of Virginia;
- Major traffic closures, detours, or temporary stoppages that will be required for each step; and
- Contingency plans.

Asbestos Abatement Plan

Prior to any demolition work, a site-specific asbestos abatement plan shall be submitted for the Department's approval. The plan shall be in accordance with *Special Provisions for Disclosure, Clarification, and Avoidance of Asbestos Containing Materials and Materials with Trace Levels of Asbestos* dated January 22, 2021. It is expected that any asbestos abatement will be performed in advance of any actual demolition activities. Asbestos abatement shall be performed for all structures found to contain regulated asbestos containing materials (RACM) and non-RACM that is expected to become friable, such as RACM during the course of demolition, in accordance with the *Special Provision for Asbestos Removal and NESHAP-Related Demolition Requirements for Structures*.

Type B Coating on Existing Structures

All coated structural elements are assumed to be classified as Type B. A site and employee specific Environmental and Worker Health and Safety Protection Plan shall be submitted for the VDOT'S approval prior to commencement of demolition activities in accordance with the requirements of VDOT Road and Bridge Specifications. It is anticipated that any onsite lead removal will be strategically localized and contained. Complete lead coating removal of girders and structural elements will not be performed onsite, but rather, taken intact to an approved waste disposal/recycling facility with the ability to process them and provide proper documentation for chain of custody. Localized cutting of these elements shall be subject to the limits and requirements provided in the site specific Environmental and Worker Health and Safety Protection Plan. All requirements for notification, exposure assessment, boundary enclosures, and decontamination procedures shall be followed.

Decommissioning of Existing Utilities

Existing underbridge utilities for each Stage shall be decommissioned and/or relocated prior to demolition activities, as described in Section 4.4.2. Proof of decommission shall include cutting of the utility at the face of the backwall.

Superstructure Removal for the 1st, 4th, 5th, and 7th Street Bridges

Superstructure removal for the 1st, 4th, 5th, and 7th Street bridges over I-95 will be performed in two stages: one for the north half and one for the south half. In addition to the Early Works Activities described above, the overall approach and demolition steps for each of these bridges and each stage is similar as enumerated below in Table 16:

Table 16: Typical Bridge Demolition Sequence (1st, 4th, 5th, and 7th Street Bridges)

Activity	Traffic Consideration
Setup of Traffic Staging including traffic barrier on cross streets (1st, 4th, 5th, and 7th) per approved TTC plans and TMP .	Installed under allowable daily closures of cross streets.
Remove any existing bridge mounted fencing, guardrail, planters, and lighting.	Performed within the staged closure of the bridge with associated lane closures on I-95 below as appropriate.
Permanently or temporarily relocate bridge mounted overhead signs.	Performed under allowable daily/nightly closures of I-95.

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Activity	Traffic Consideration
<p>Parapet/overhang demolition shall be accomplished with a track excavator mounted hydraulic breaker working from the deck surface. Demo trailers will be placed at ground level under the area of the parapet and overhang to be removed when appropriate. For areas not accessible from below, such as protected slopes, a crane suspended demolition collection pan will be utilized. The parapet/overhang will be hammered into larger sections and pulled back to the deck to be removed with a front-end loader from the deck. Smaller concrete debris will drop below the deck into the demo trailer or collection pan. Any material diverging from the collection mechanism is to be cleaned up before the end of each shift. Water will be used if necessary to keep dust to a minimum. Material will be hauled off site for further demolition and recycling.</p>	<p>Performed under allowable daily/nightly lane closures of I-95.</p> <p>Use of southbound I-95 ATC 1 detour or northbound I-95. Detour may be used in select circumstances.</p> 
<p>Installation of the engineered protection shield.</p> 	<p>Performed under allowable daily/nightly closures of I-95.</p> <p>Use of southbound I-95 ATC 1 detour or northbound I-95 detour may be used in select circumstances.</p>
<p>Deck slab sections will be saw cut and removed in approximately 8' longitudinal sections from the flange of any girder to the flange of the adjacent girder. A track excavator outfitted with a Kenco "Slab Crab" or equal will be used to remove the slabs sections and load onto flatbed trailers for removal from the site and processing at an offsite recycling facility. Alternatively, a hydraulic crane will be positioned to pull and load the deck slab sections.</p>	<p>Performed under the staged bridge closures.</p> 
<p>Prepare existing structural steel and under bridge utilities for removal. This includes cutting of anchor bolts, partial cuts of existing diaphragms, removal of existing top flange anchorage at future picking points and sectioned cuts of existing under bridge conduits. An engineered girder removal plan will be submitted for approval that includes provisions for temporary girder tie downs as required.</p>	<p>Performed under allowable daily/nightly lane closures of I-95.</p>
<p>Remove existing girders and under bridge utilities to offsite disposal/recycling facility. Girder removal will commence with a hydraulic crane placed on I-95 mainline or ramp utilizing approved traffic closures / detours. Girders shall be removed in a sequence with temporary restraints as designed by a Professional Engineer registered in the State of Virginia. Hoisted girders shall be loaded onto stretch trailers placed on the associated mainline roadway adjacent to the hydraulic crane. The loaded stretch trailers shall be taken to an approved waste/recycling facility for unloading. During these nighttime operations the temporary timber shield and underbridge utilities shall be removed in conjunction with the girder removal. It is anticipated that any individual span for an individual phase will require multiple night crew shifts.</p>	<p>Use of southbound I-95 ATC 1 detour or northbound I-95 detour.</p> 
<p>Perform selective demolition of existing beam seats, abutment backwall and retaining wall sections as required.</p>	<p>Performed under allowable daily/nightly lane closures of I-95.</p>

4.5 Construction of the Project

Superstructure Removal for E. Broad Street Bridge

Superstructure removal for the E. Broad Street bridge will be performed in four stages, taking place in the ABC weekend closure periods described in Section 4.5.1. The same Early Works activities described herein will be performed. We plan to remove the existing bridge deck and beams in two-beam composite sections. We will size these sections similar to the new PCU sections described in Section 4.3.2, so that the weights are comparable to allow use of the same cranes and rigging for both operations. An engineered Removal Plan will be submitted for approval that includes weight calculations, equipment sizing and provisions for temporary girder tie downs as required. For each of the four stages, the overall approach and demolition steps are similar as described in Table 17:

Table 17: Typical Bridge Demolition Sequence – E. Broad Street Bridge

Activity	Traffic Consideration
Setup of traffic staging and E. Broad Street detours including traffic barrier per approved TTC plans and TMP	Performed under allowable daily/nightly lane closures of E. Broad Street.
Remove any existing bridge mounted fencing, guardrail, planters, and lighting.	Performed under allowable daily closures of cross streets.
Temporarily dismantle existing overhead sign structures situated too close to the E. Broad Street bridge. Sign panels will be temporarily mounted in medians / shoulder areas.	Performed under allowable daily/nightly closures of I-95.
Implement I-95 crossovers and E. Broad Street closures.	Per Approved TTC and TMP plans.
Parapet demolition shall be accomplished via sawcutting and use of the track excavator mounted hydraulic breaker working from the deck surface. Demo trailers will be placed at ground level under the area of the parapet to be removed when appropriate.	Performed during weekend closures of E. Broad Street and I-95, northbound or southbound.
Prepare existing bridge deck and structural steel for removal. Strategic sawcutting of deck slabs sections will be performed in accordance with the Engineered Removal Plan. This includes cutting of anchor bolts, partial cuts of existing diaphragms, and sectioned cuts of existing under bridge conduits.	Performed during weekend closures of E. Broad Street and I-95, northbound or southbound.
Existing two-beam Composite Deck slab sections are planned to be removed in approximately 8' longitudinal sections. Section removal will commence with a hydraulic crane placed on I-95. Sections shall be removed in a sequence with temporary restraints as designed by a Professional Engineer registered in the Commonwealth of Virginia. Hoisted sections shall be loaded onto stretch trailers staged on I-95. The loaded stretch trailers shall be taken to an approved waste/recycling facility for unloading.	Performed during weekend closures of E. Broad Street and I-95, northbound or southbound.
As time allows, crews will perform any critical selective demolition of existing beam seats, abutment backwall and retaining wall sections as required.	Performed during weekend closures of E. Broad Street and I-95, northbound or southbound.

Critical Demolition Concerns

Table 18 lists the general critical demolition concerns and our Team's planned mitigation measures that will be implemented. We are confident that the demolition approach presented in our Technical Proposal, along with our established and proven demolition procedures, will give VDOT assurance that safety and planning are the highest priority.

Table 18: General Critical Demolition Concerns and Mitigation Measures

Concern	Mitigation Measures
Worker Safety	<ul style="list-style-type: none"> ▪ 47 years bridge demolition experience. ▪ Established worker safety practices. ▪ Engineered work plans and procedures put into place.
Existing and Proposed Utilities	<ul style="list-style-type: none"> ▪ Detailed plan of utility relocations, temporary measures and decommissioning procedures in place.

4.5 Construction of the Project

Concern	Mitigation Measures
Hazardous Materials	<ul style="list-style-type: none"> Detailed Asbestos Abatement Plan. Detailed Site and Employee specific Environmental and Worker Health and Safety Protection Plan. Established approved disposal sites.
Noise	<ul style="list-style-type: none"> Work within allowable time frames.
Debris	<ul style="list-style-type: none"> Engineered demolition shield/side shields. Dust Control Plan to protect workers and public from fugitive dust. Cleanup and removal after every shift. QA/QC will have specific inspection procedures.
Traffic	<ul style="list-style-type: none"> Area specific TTC and TMP Plans. Use of ATC 1 and allowable I-95 closure plans.

Critical Demolition Concerns at Each Bridge Location

Table 19 lists the critical demolition concerns at each specific bridge.

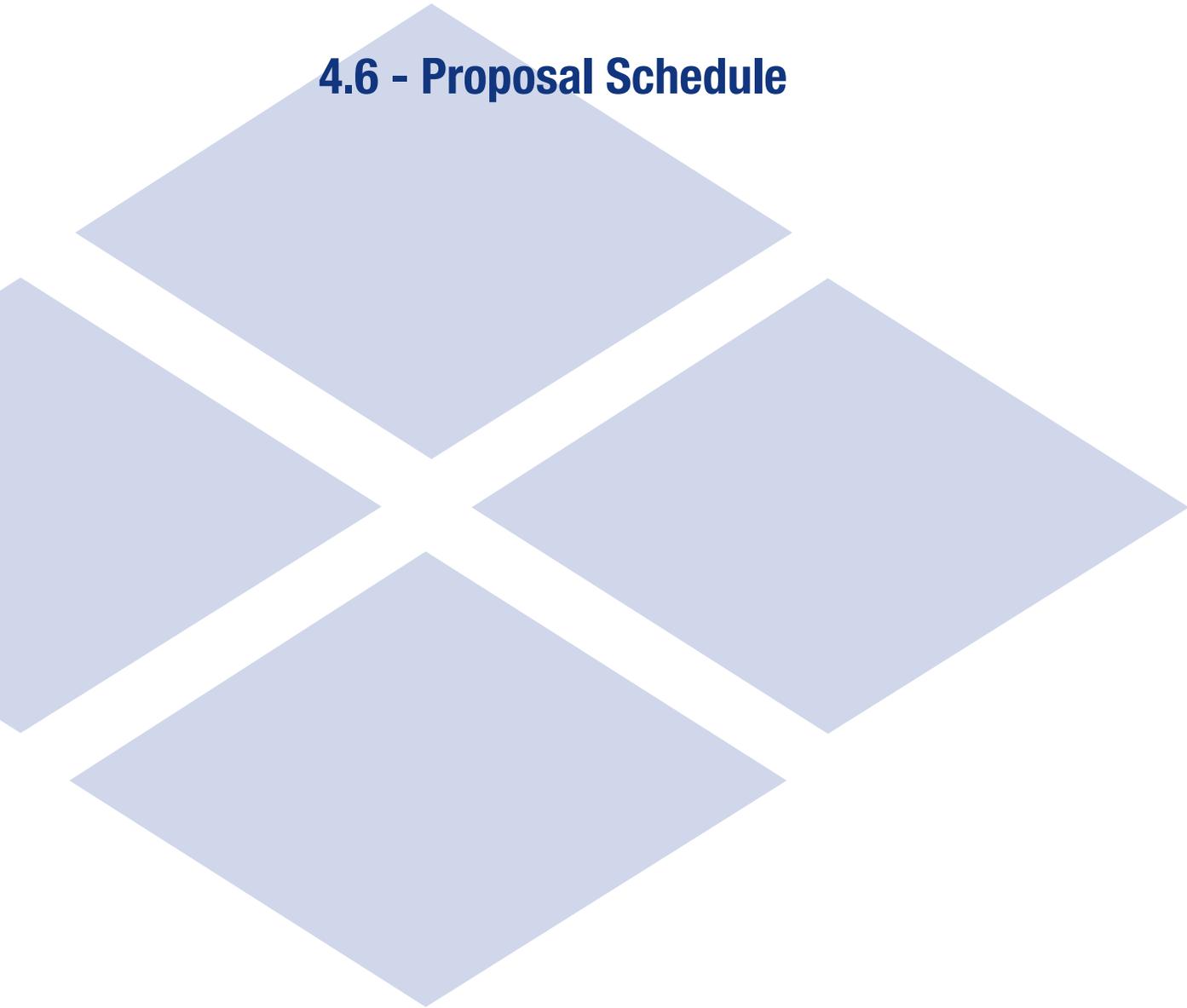
Table 19: Critical Demolition Concerns at Each Bridge Location

Bridge Work Area	Concern	Mitigation Measures
1st Street (5 Spans)	Protection of I-95 southbound motorists.	Use of the ATC 1 detour for I-95 southbound
	Span b demolition will occur over the active I-95 southbound Ramp to I-64 eastbound.	Reduce ramp to a single lane during night-time closures with side shielding in place to contain debris. Intermittent stoppages for critical picks.
	Span d demolition over the active Ramp from I-64 eastbound to I-95 northbound.	With the RFP I-95 northbound detour in place, this ramp will be a single lane only traveling under the span. Side shielding will be used to contain debris. Intermittent stoppages for critical picks.
	Unusual original fascia diaphragm containing waterline supports.	Remove existing deck slabs over waterline (lagging shield in place). Remove waterline from top side and then complete deck slab removal.
	Considerations for both original and extension construction.	Engineered Demolition Plan to evaluate both conditions.
4th Street (2 Spans)	Protection of I-95 northbound and southbound motorists.	Use of the ATC 1 detour for I-95 southbound and use of the RFP I-95 northbound detour.
	I-64 Overpass clearance issues.	Remove existing northeastern girders working from I-95 closure detour with dual heavy-duty forklifts.
5th Street (4 Spans)	Protection of I-95 northbound and southbound motorists.	Use of the ATC 1 detour for I-95 southbound and use of the RFP I-95 northbound detour.
	Unusual original fascia diaphragm containing waterline supports.	Remove existing deck slabs over waterline (lagging shield in place). Remove waterline from top side and then complete deck slab removal.
7th Street (5 Spans)	Protection of I-95 northbound and southbound motorists.	Use of the ATC 1 detour for I-95 southbound and use of the RFP I-95 northbound detour.
	Span a demolition over Ramp B to I-95 southbound.	Ramp to be channelized with side shielding used to contain debris. Intermittent stoppages for critical picks.
	Span d demolition over Loop J to I-95 northbound.	Coordinate with VDOT and COR for temporary closures of Loop J.

4.5 Construction of the Project

Bridge Work Area	Concern	Mitigation Measures
E. Broad Street (2 Spans)	Protection of I-95 northbound and southbound motorists.	Use of movable barriers during allowable weekend crossovers for ABC Construction.
	Hinged bridge extension.	Engineered lifting plan with potential stiffening provided prior to removal.
	Unique fascia sidewalk original construction.	Engineered lifting plan with complete analysis for the stability of section during removal of the two outermost girders in composite section.
	Cultural Resource concerns in bridge vicinity.	Educate workforce and delineate sensitive areas.

4.6 - Proposal Schedule





4.6 Proposal Schedule

4.6.1 Proposal Schedule

The Shirley Team’s Proposal Schedule is provided in our Volume II Design Concept.

4.6.2 Proposal Schedule Narrative

Our Team has reviewed the Project and schedule requirements of the Request for Proposals (RFP) in detail and developed a Proposal Schedule outlining our plan to successfully manage the anticipated scope of work. This schedule has been optimized to deliver the Project in the shortest time possible while meeting RFP requirements, minimizing impacts to road users and stakeholders, protecting the environment, and ensuring the safety of workers and the public.

Durations are based on quantities derived by the Team and combined with expected productions based on our experience and historical data on similar projects, with consideration for site specific conditions.

Schedule Milestones

Project milestones have been set up to easily monitor the delivery of the Project in advance of the RFP specified completion date of December 20, 2024. Our Team commits to an **Early Final Completion Date of November 22, 2024, 28 days earlier than the RFP requirement.**

Additionally, **our Team commits to a Unique Milestone to complete the 7th Street Bridge by November 2, 2023.** This will greatly benefit the corridor and VCU Medical Center by providing early congestion relief to the area. Table 20 provides a summary of dates that will be achieved for key activities, including Schedule Milestones and Key Dates.

Table 20: Schedule Milestones and Key Dates

Schedule Milestones	Date
Notice of Intent to Award	September 30, 2021
CTB Approval / Notice to Award	October 20, 2021
Design-Build Contract Execution	November 3, 2021
Notice to Proceed	November 10, 2021
Unique Milestone	November 2, 2023
Early Final Completion	November 22, 2024
Construction Key Dates	Date
Start Construction 7th Street Bridge	June 14, 2022
Complete 7th Street Bridge	November 2, 2023
Start Construction 5th Street Bridge	December 21, 2022
Complete 5th Street Bridge	February 27, 2024
Start Construction 1st Street Bridge	April 20, 2023
Complete 1st Street Bridge	September 17, 2024
Start Construction 4th Street Bridge	November 3, 2023
Complete 4th Street Bridge	November 12, 2024
Start Construction E. Broad Street Bridge	March 5, 2024
Complete E. Broad Street Bridge	July 2, 2024

4.6 Proposal Schedule

Schedule Calendars

Activity calendars are assigned using project-level calendars as specified below. All calendars are based on an 8-hour workday.

5-day, Holidays, No Weather: Allows work five days per week except on standard holidays and it is used for the majority of the activities in the Proposal Schedule. Durations for normal construction activities affected by weather such as earthmoving and concrete operations have been adjusted to allow for non-working days due to weather conditions.

7 day, No Holidays: Allows works seven days per week on activities that progress on a calendar-day basis such as cure activities and design and construction submittal review activities.

Weekend Full Closure: Assigned to activities under E. Broad Street Construction which are expected to work on weekends.

Work Breakdown Structure

Our Team has developed a detailed Proposal Schedule in accordance with the RFP requirements. The schedule is organized into a hierarchical Work Breakdown Structure (WBS), shown in Figure 4.6.2.1, to demonstrate the relationships and activity durations amongst the milestones, Scope Validation Period, design, public involvement, environmental permitting, ROW, utilities, and construction. All elements of the design-build process are captured under the Level 1 and are described below:

- A. Schedule Milestones:** Area reserved for easy review of the Project status. This contains major milestones that are critical to the Project or prescriptive in the RFP as well as key construction dates.
- B. Design Phase:** Includes preliminary engineering services, plan development, QA/QC reviews, submittal milestones, and interim and final reviews and approvals of plans by VDOT, FHWA and other regulatory agencies. This section of the Schedule includes a second level WBS structure to group design activities by type of design submission classifying it by Preliminary Design and Final Design for Roadways and Bridges. Preliminary design consists of design the QA/QC plans, survey and mapping, geotechnical investigations and recommendations, and utility designations and test pits. Final Design consists of the design, submission and approval process for all roadways and bridges, and any other design element to achieve Released for Construction Plans.
- C. Environmental Permitting:** Includes Asbestos Surveys, ESA reports, permit management and preparation, and permit submissions, reviews, and approvals. Initial efforts will focus on the LD 455 City of Richmond Permit and the SWPPP submissions needed for earliest access to 7th Street Bridge. This section also includes plans for hazardous materials and threatened species.
- D. Public Involvement:** This section of the Schedule allows for coordination, preparation planned public involvement meetings and updates with the Department's Project Manager and the Richmond District Office of Communications.
- E. Right-of-Way/Easement Acquisition:** This section of the Schedule is used to monitor the acquisition of right-of-way and easements for the Project, appraisals and appraisal reviews, offers, negotiations, and certificates. To prioritize groups of properties by order of need, we have included a second level WBS structure that includes separate right-of-way acquisition activities by priority. Dividing the right-of-way activities into groups will enable our Team to focus our right-of-way acquisition efforts on the most schedule critical acquisitions and track these critical acquisitions to ensure on-time completion.

4.6 Proposal Schedule

F. Utility Relocations: This section of the Schedule includes activities for UFI meetings, preparation of preliminary engineering (PE) estimates, approval of PE estimates and approval of the utility design divided by each utility owner.

G. Construction: Includes all construction components of bridges and roadway. The construction section of the Schedule is segmented by levels of WBS structure to divide the construction activities by phases and location, including utility works, to show the interfaces and to easily track to ensure on-time completion of the Project. This section also includes Procurement, Submittals and Fabrication Activities and Construction Quality assurance and Control Process.

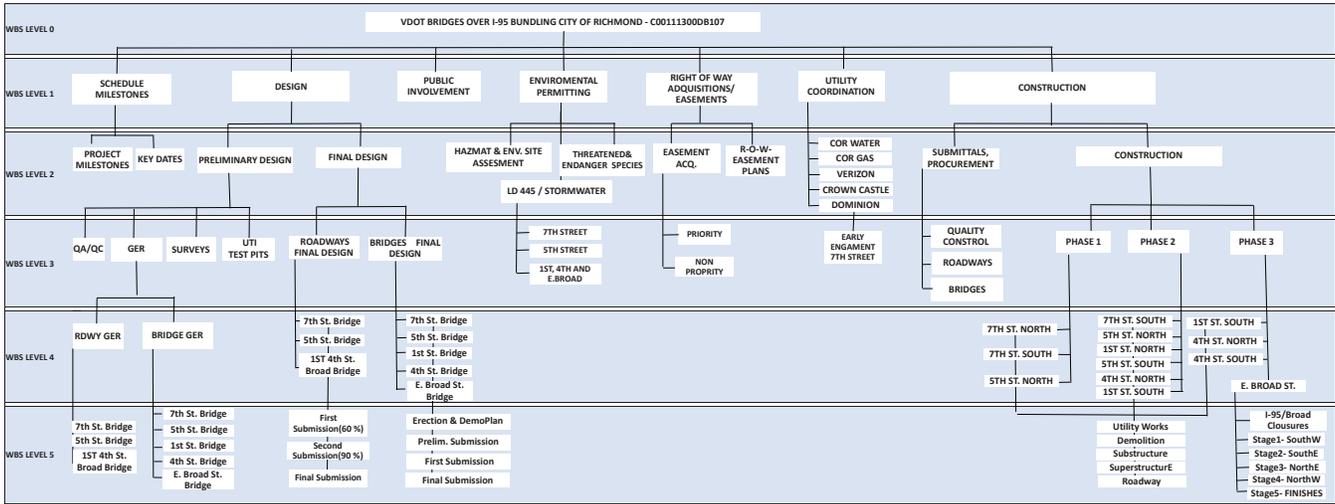


Figure 4.6.2.1 WBS Hierarchy

Critical Path

The critical path on the Project has been defined as the longest path. Figure 4.6.2.2 outlines the critical path to the Early Final Completion milestone. In Volume 2 of the Proposal, we have also included a Filter of the Proposal Schedule showing all activities on the Critical Path.

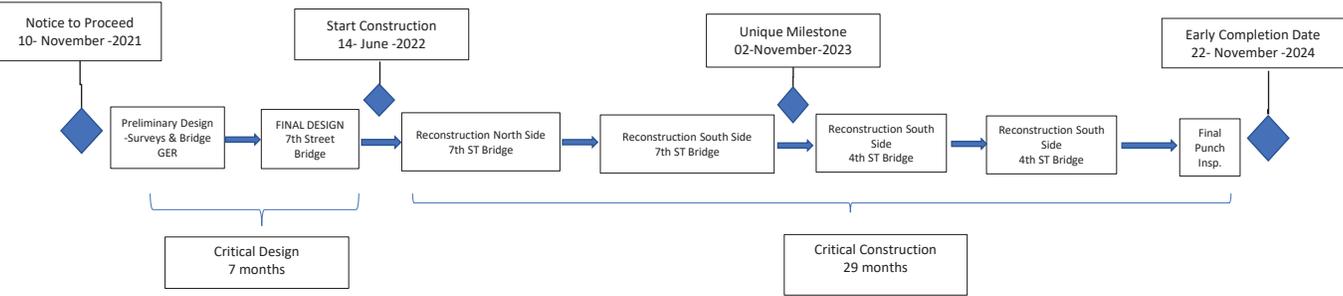


Figure 4.6.2.2 Critical Path Summary

Following the Notice of Intent to Award and NTP, the critical path starts with preliminary design activities such as survey & bridge geotechnical reporting, which are required for the preliminary and final submissions of the design plans needed to start construction on the 7th Street Bridge. Once the approval of the 7th Street critical design drawings is obtained, reconstruction work on the 7th Street Bridge North Side (Stage 1) will occur starting with the decommissioning of the existing 12” waterline followed by demolition, substructure repairs and superstructure replacement. The new underbridge waterline and Verizon conduits will be installed following girder erection. Finally, the approach slabs and roadway will be constructed.

4.6 Proposal Schedule

Once the north side is open to traffic and the existing Verizon lines are relocated to the new underbridge pathways, work on the south side (Stage 2) of the 7th Street Bridge will occur. Stage 2 work on 7th Street includes demolition, substructure repairs, superstructure replacement and approach roadway work.

Once the 7th Street Bridge is fully open, the reconstruction on the north side of the 4th Street Bridge will start followed by the south side. Upon completion of all works, the final inspections and punch list will be performed, and the Project will achieve Early Final Completion by November 22, 2024.

Plan to Accomplish the Work

The narrative below describes our Team's overall plan and sequence of operations grouped by the Level 1 WBS. The sequencing of each discipline was developed by considering the construction phasing and determining the longest path to Project completion. The Project sequence was developed to address the full scope of work. We divided the Project into logical and manageable areas that can be tracked and managed by dedicated supervision during all Stages of work.

Design

The Design Schedule has been broken down into various design packages that will be submitted for approval. When determining the breakdown of the design packages, the construction phasing and location is taken into consideration to ensure early construction activities are addressed in the early design packages for plan reviews and approvals. The early design packages are identified as follows:

- Design QA/QC Plans.
- Survey and Mapping.
- Geotechnical Investigations and Reporting.
- Erection, Demolition Plans for the 7th Street Bridge.
- Preparation of Stage 1 Bridge Reports on the 7th Street Bridge.

Starting the design early for the above packages ensures that the Schedule allows design development phasing, environmental permits, and critical items to proceed as soon as possible. Detailed design submissions have been broken down into three stages to allow for VDOT design reviews at interim periods. Additional design constructability reviews have been incorporated in our schedule to allow the process to be concurrent with design development prior to submitting to VDOT. Design submissions are scheduled as follows:

Roadways:

- 60% Level Submission
- 90% Level Submission
- Final Design Submission

Bridges:

- Stage I Bridge Report (1st Submission)
- Stage I Bridge Report (2nd Submission)
- 90% Level Submission
- Final Design Submission

Our Team encourages over the shoulder reviews by VDOT throughout the design phase to optimize the review periods and avoid delays to the approval schedule.

Environmental Permitting

Environmental Permitting will begin upon NTP with the completion of the needed surveys, followed by ESAs preparation and approval, and the T&E documentation. The critical environmental permitting, such as the City of Richmond Land Disturbance Permit, needed to access 7th Street Bridge will be an early focus.

4.6 Proposal Schedule

Public Involvement/Public Relations

Our public involvement activities include submission of our Emergency Contact List, meeting with District Public Affairs, and holding public outreach meetings during the design phase and at the start of construction of various elements. The schedule includes the major milestone activities for the Public Information meetings at the most relevant construction phases. However, there are many other public involvement activities that our Team will perform, including meeting with affected stakeholders, providing information for regular updates at progress meetings, weekly lane closure notifications, and maintaining a log of issues, questions/comments, and responses to stakeholders.

Right-of-Way Acquisition

The Project requires the acquisition of right-of-way and easements from individual properties for temporary construction and utilities. Some of these properties are required early in the Project. To mitigate the potential delays stemming from the late acquisition of these easements, our Team has broken down the coordination for the priority and non-priority areas to remove acquisitions from the critical path and minimize the risks of delays.

Utility Coordination

To simplify and track the utility coordination activities, our Team has created WBS that groups the utility coordination by owner as follows:

- City of Richmond Gas
- City of Richmond Water
- Dominion Energy Virginia
- Verizon Underground
- Crown Castle

Within each utility owner group, we have included activities for holding the Utility Field Investigation (UFI) meeting, the preparation of the relocation design, the preparation of the PE estimates, and approval of the PE estimate.

Although our Team has already met with each individual utility company to discuss the proposed relocations and prior rights, the utility relocation schedule starts with formal coordination meetings upon NTP. Initial utility designations and test pits will be an early focus. This will enable our Team to confirm and adjust our list of utility conflicts based on the preliminary field surveys prior to holding the formal UFI meeting with each utility owner. The utility relocations are anticipated to be completed in each location prior to impacting construction operations and avoiding delays.

Preconstruction, Submittals & Procurement

Key activities such as mobilization, submittals, subcontractor and major material/structures procurement, shop drawings, and fabrication activities are included in the schedule and linked with the relevant design and construction packages. Procurement packages have been viewed on an individual basis and detailed by areas to allow for tracking of the submittal process and fabrication periods.

Quality Assurance and Quality Control

In a separate WBS group, the Team has identified the QA/QC activities for the Project. These include the submission and approval of the QA/QC plan and the Preparatory Meetings that are required prior to commencing with construction activities. The overall Level of Effort for the QA/QC process is represented by a bar spanning all construction activities.

4.6 Proposal Schedule

Sequence of Construction

Our Sequence of Work includes five major Work Areas, each with individualized staging requirements. This enables our Construction Team to effectively oversee and manage the construction schedule, allow for the most efficient use of resources, ensure that quality is achieved, and maintain the highest levels of safety.

In summary, and as shown in Figure 4.5.1.1 on page 32, our Proposal Schedule includes three main Phases and several sub-Stages, outlined as follows:

Phase 1: Summer 2022 through Spring 2023 (Figure 4.6.2.3)

- 7th Street Bridge – North Side (Stage 1) and Start of South Side (Stage 2) Demolition.
- 5th Street Bridge – Start of North Side (Stage 1).

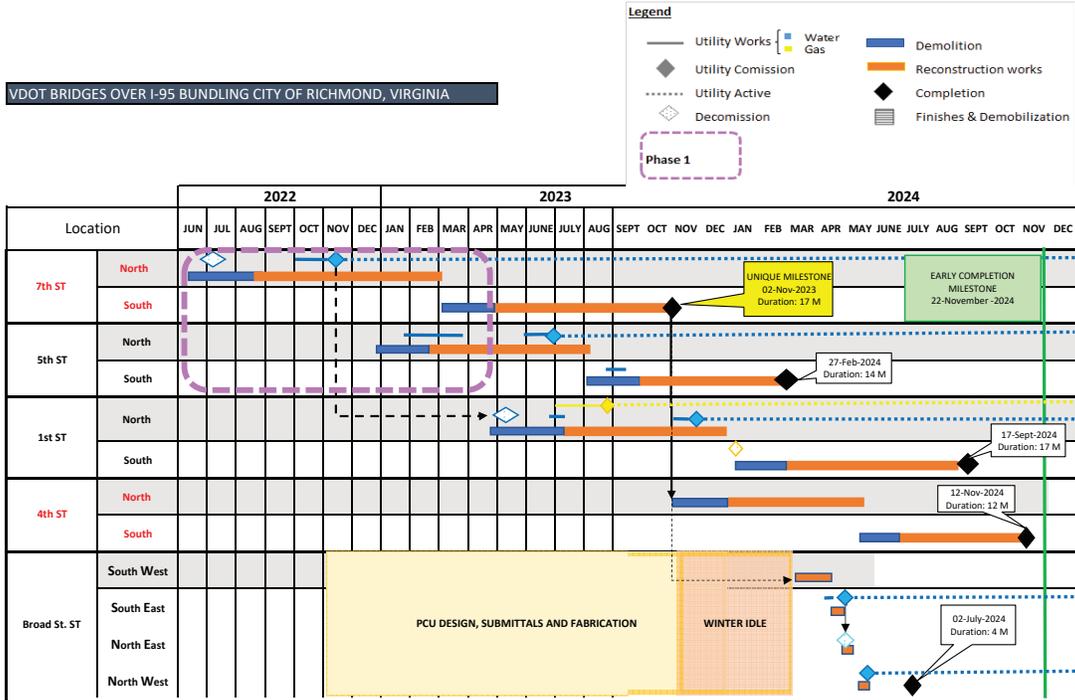


Figure 4.6.2.3 Phase 1 Schedule Summary

After a detailed review of the RFP, discussions with the utility owners, and schedule analysis, our Team determined that it is critical to construct the 7th Street bridge first due to the following:

- 7th Street and E. Broad Street bridges cannot be constructed together per RFP Section 2.10.1;
- 7th Street and 4th Street bridges cannot be constructed together per RFP Section 2.10.1; and
- Completion of the 7th Street bridge first, and subsequent permanent tie-in of the City of Richmond 12” waterline, will satisfy the requirements of RFP Section 2.13 which allow either 1st Street or 5th Street waterlines to remain out of service at the same time. For this reason, our sequence prioritizes completion of the north side of the 7th Street Bridge so that the existing waterline can be relocated as near as possible to its current location. This will minimize the waterline constructed off the bridge and mitigate the potential for any utility conflicts associated with a new alignment. Further benefiting the schedule, our Team will reconstruct the new waterline under the new bridge to avoid complicated bends and simplifying the tie-ins at either end.

5th Street was chosen as the second Work Area due to the following:

- 5th Street is not prohibited from being constructed concurrent with any other structure;

4.6 Proposal Schedule

VDOT BRIDGES OVER I-95 BUNDLING CITY OF RICHMOND, VIRGINIA

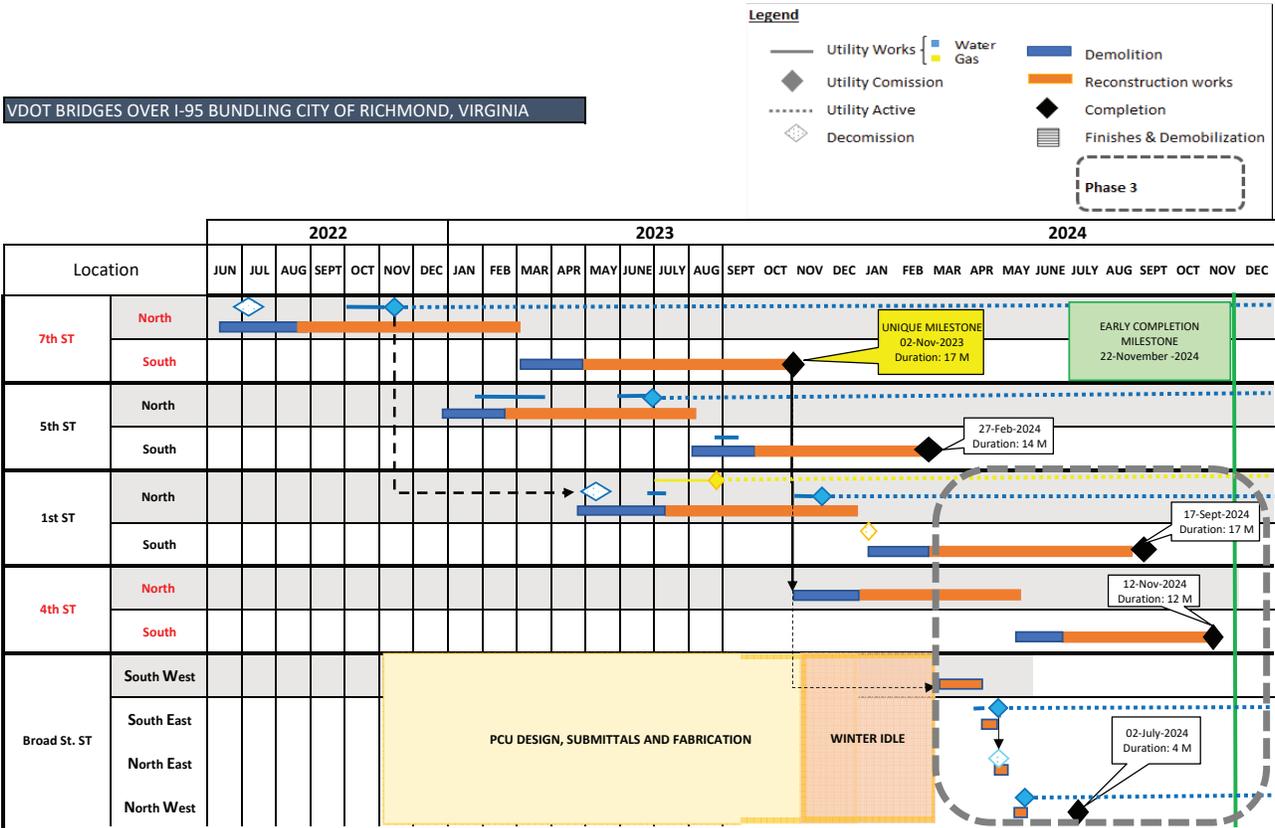


Figure 4.6.2.5 Phase 3 Schedule Summary

E. Broad Street is sequenced last in our schedule to maximize the time available for the detailed planning, long material lead-time, and public outreach necessary to reconstruct this bridge during allowable weekend closures utilizing Accelerated Bridge Construction (ABC) methods. With our planning efforts during preparation of this Technical Proposal, we are confident that *our Team will only use four weekends to implement the allowable I-95 crossovers as compared to allowable eight in the RFP.*

At the end of this Phase 3, our Team will achieve Early Final Completion by November 22, 2024, *28 days earlier than the RFP* requirement of December 20, 2024.

The following narrative provides detailed descriptions of the work in each Stage at each bridge.

7th Street Bridge - Stage 1 – North Side (June 2022 to March 2023)

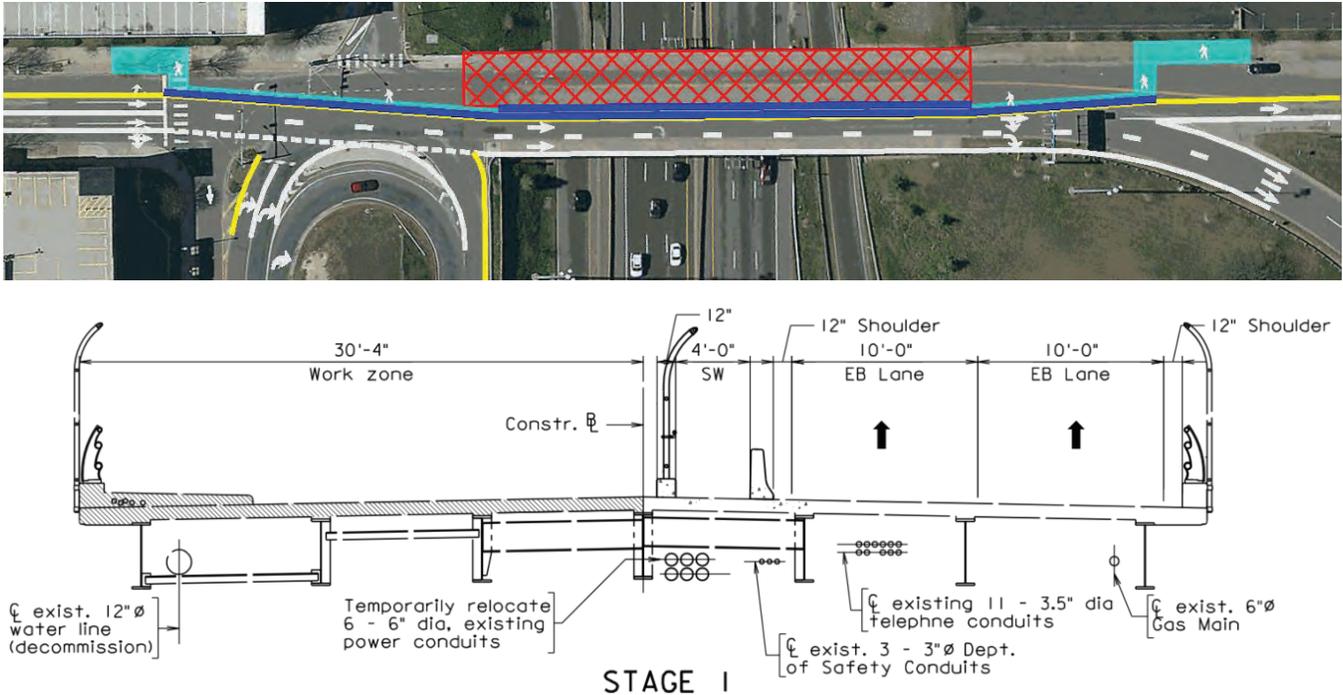


Figure 4.6.2.6 7th Street, Stage 1

Priority Utility Work: 7th Street is sequenced as the first bridge in our schedule due to the critical nature of the waterline restrictions placed by the City of Richmond Water. Crews will begin in Spring of 2022 with the shut-off and decommissioning of the existing 12” waterline located under the 7th Street Bridge’s north side. Concurrently, crews will temporarily relocate the existing Dominion Energy conduits located under the north side of the bridge. With the completion of these operations, crews will begin demolition of the north side of the existing bridge.

Traffic and Pedestrian Movements: As depicted in Figure 4.6.2.6, traffic on 7th Street will be restricted to the two eastbound lanes along with the maintenance of pedestrian movements. Westbound traffic for 7th Street will use the detour route shown in Figure 4.6.2.7, matching the RFP.

Demolition: As detailed in Section 4.5.3, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.



Figure 4.6.2.7 7th Street, Westbound Detour

Substructure Repairs: Once the superstructure is removed, the substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Five new structural steel girder lines will be placed in the bridge’s north half. Immediately following diaphragm installation, crews will begin installation of the new 12” waterline, which for 7th Street can remain underbridge. Concurrently, new conduit lines will be placed for the Dominion Energy facilities, and new Verizon communication conduits will be placed in Stage 1 to relocate the existing lines from the Stage 2 side. Bridge deck construction including stay-in-place

4.6 Proposal Schedule

(SIP) forms, bridge overhang forms, reinforcing steel placement, and structural concrete will then be completed, followed by bridge railing and fencing. A reduced width sidewalk will be constructed in Stage 1 to accommodate Stage 2 traffic. This sidewalk will be widened to a final 8'-0" width at the conclusion of Stage 2.

Roadway Construction and Utilities: During bridge superstructure construction, utility crews will install storm drainage improvements and continue installation of new underground utilities that are located off the bridge such as the 12" waterline and the Dominion Energy facilities. As the new conduit pathways are completed, each utility owner will relocate their facilities. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the newly constructed north half to start Stage 2 construction.

7th Street Bridge - Stage 2 – South Side (March 2023 to November 2023)

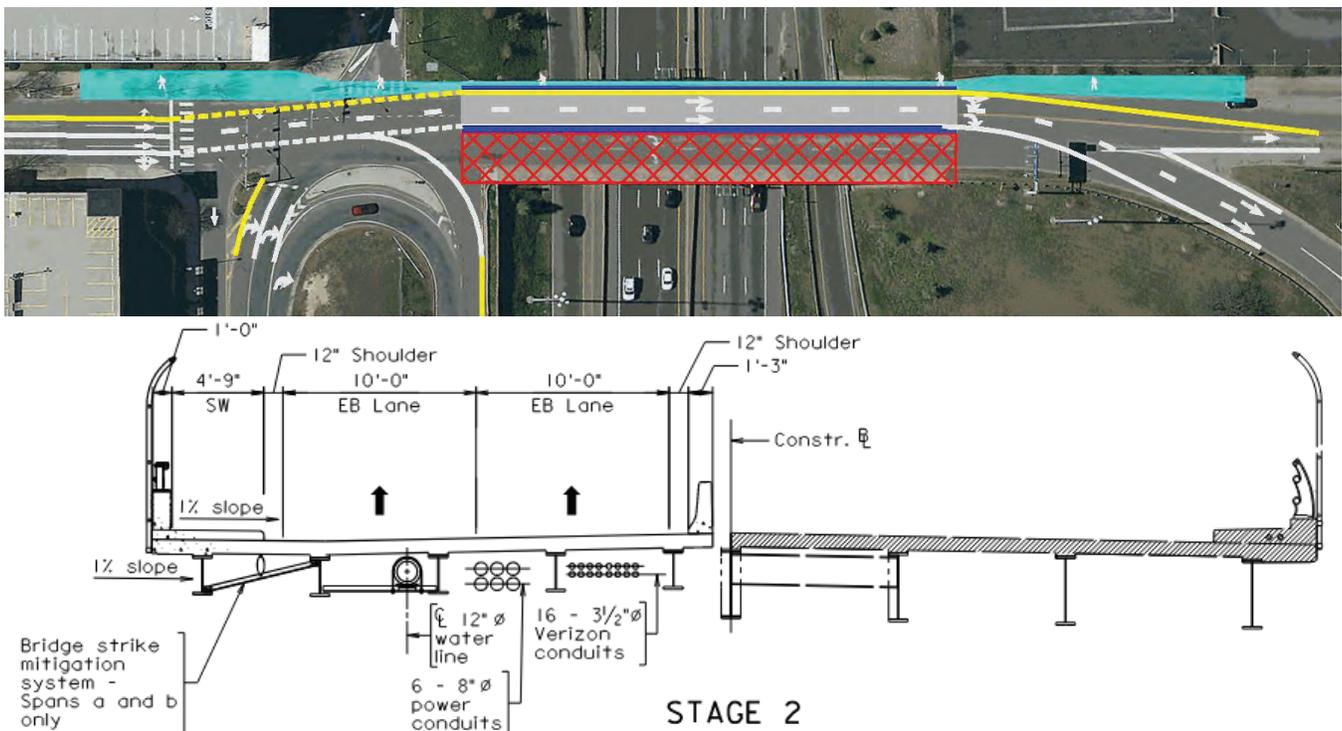


Figure 4.6.2.8 7th Street, Stage 2

Priority Utility Work: Conduit pathways for the existing Verizon and communication carriers on the south side of the bridge were installed in Stage 1 construction. The relocation of these facilities will be coordinated prior to the demolition of the Stage 2 work.

Traffic and Pedestrian Movements: As depicted in Figure 4.6.2.8, traffic on 7th Street will be restricted to the two eastbound lanes along with the maintenance of pedestrian movements. Westbound traffic for 7th Street will continue to use the Detour Route shown in Figure 4.6.2.7.

Demolition: Similar to Stage 1, once traffic is shifted, bridge demolition will occur as detailed in Section 4.5.3.

Substructure Repairs: After demolition is complete, substructure repairs will be performed including preparation for the beam seats to receive the new girders.

4.6 Proposal Schedule

Superstructure Replacement: Five new structural steel girder lines will be placed in the bridge's southern half. No new conduit systems are built in this Stage and bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will then occur, followed by bridge railings and fencing. The remaining width of the north side sidewalk will be installed in Stage 2 as the completion of the final bridge deck allows for the shifting of traffic to its ultimate location.

Roadway Construction and Utilities: During superstructure construction, utility crews will install storm sewer improvements located off the bridge. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration and the 7th Street westbound detour will be removed. Following completion of the punchlist and inspection process, **7th Street will achieve our Team's Unique Milestone by November 2, 2023.**

5th Street Bridge - Stage 1 – North Side (January 2023 to August 2023)

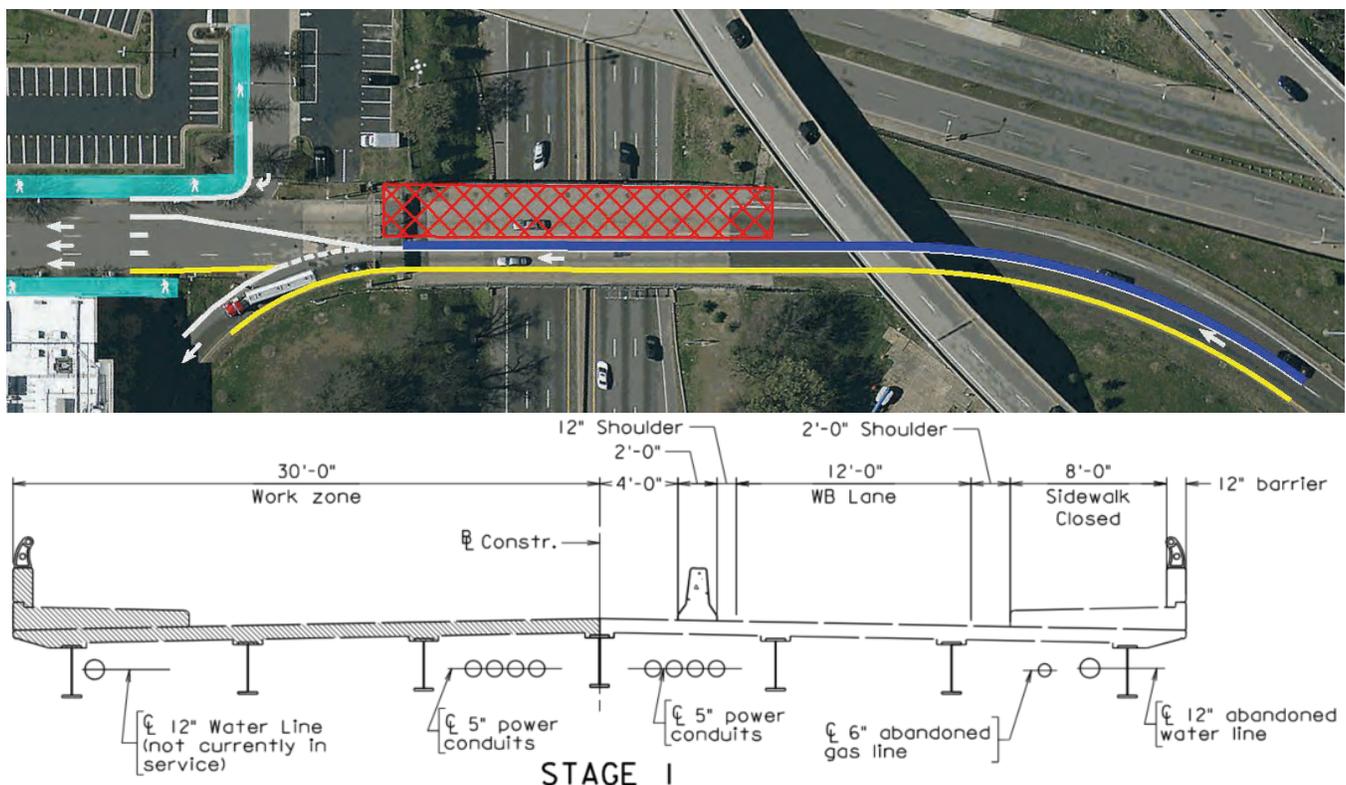


Figure 4.6.2.9 5th Street, Stage 1

Priority Utility Work: Our Team is sequencing construction of the north side of this bridge, instead of the south side, due to the location of the existing 12" City of Richmond waterline. During Stage 1, the waterline will be removed during demolition and replaced with the new superstructure. The 5th Street Bridge also contains two sets of Dominion Energy conduits that are split between the north and south side of the bridge. As outlined in Section 4.4.2, our Team is planning to directionally drill a new underground pathway for the Dominion Energy lines to remove them completely from the 5th Street Bridge.

Traffic and Pedestrian Movements: Concurrent with the priority utility work, incoming traffic from I-64 will be reduced to 1-lane as depicted in Figure 4.6.2.9. No pedestrian accommodations or detours are required during this Stage.

4.6 Proposal Schedule

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: After demolition is complete, the substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Due to the narrowing of the existing I-64 westbound Ramp over 5th Street, only three new structural steel girder lines will be placed in the bridge's north side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing. The new City of Richmond 12" waterline will be installed on the extended deck slab overhang as detailed in Figure 4.6.1.9.

Roadway Construction and Utilities: During superstructure construction, utility crews will continue installation of new underground utilities that are located off the bridge including the 12" waterline. As the new conduit pathways are completed, Dominion Energy will relocate their facilities. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the new north side to begin Stage 2 construction.

5th Street Bridge - Stage 2 – South Side (August 2023 to February 2024)

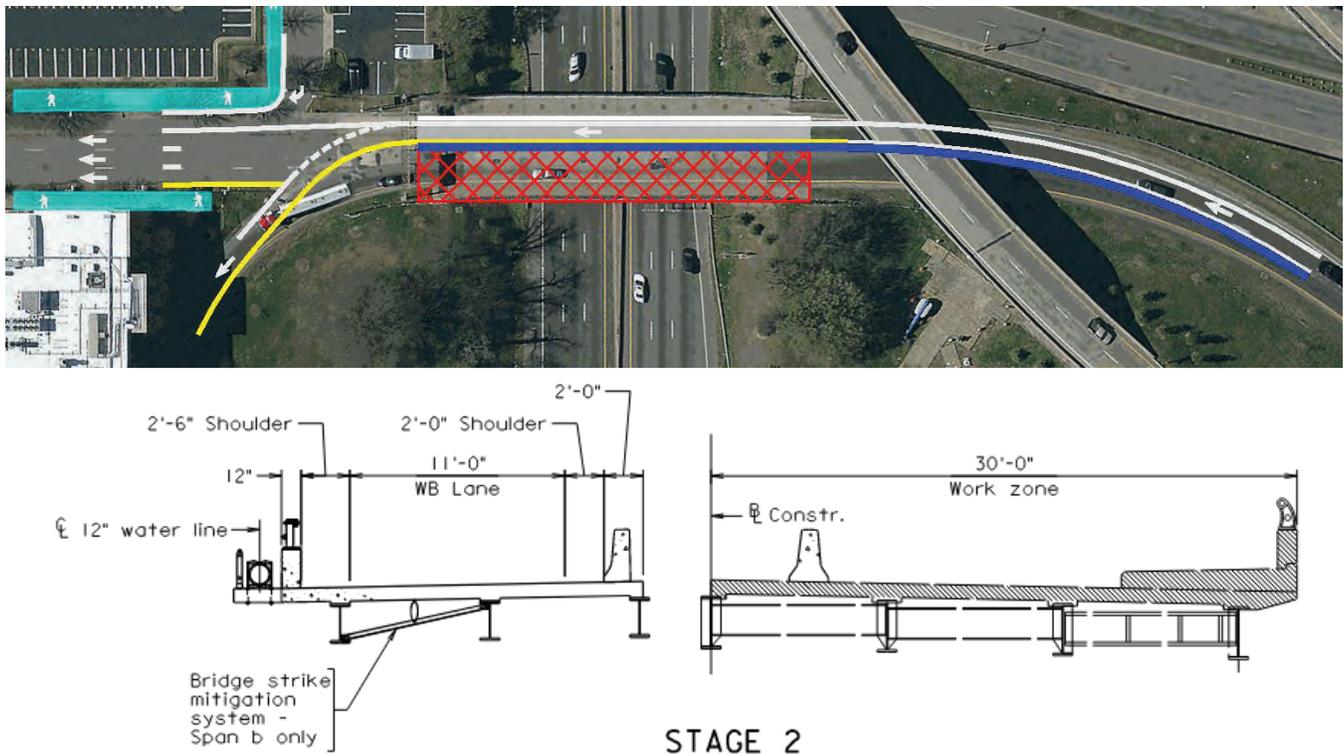


Figure 4.6.2.10 5th Street, Stage 2

Priority Utility Work: With the removal of the Dominion Energy conduits from the bridge in the previous Stage, there are no other critical utilities underbridge. The existing City of Richmond gas line is abandoned and will be removed.

Traffic and Pedestrian Movements: Stage 2 traffic will be configured similar to Stage 1 with incoming traffic from I-64 reduced to 1-lane as depicted in Figure 4.5.2.10. No pedestrian accommodations or detours are provided during this Stage.

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Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: The substructure repairs will continue from Stage 1 and, as beams are removed during the demolition work, preparation for the beam seats to receive the new girders will be completed.

Superstructure Replacement: Four new structural steel girder lines will be placed in the bridge's south side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing.

Roadway Construction and Utilities: During superstructure construction, roadway crews will install new drainage, curb and gutter, and remove and replace the existing overhead sign located at the western end of the bridge. Following placement of deck concrete, approach slab construction will take place along with pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration.

1st Street Bridge - Stage 1 – North Side (April 2023 to December 2023)

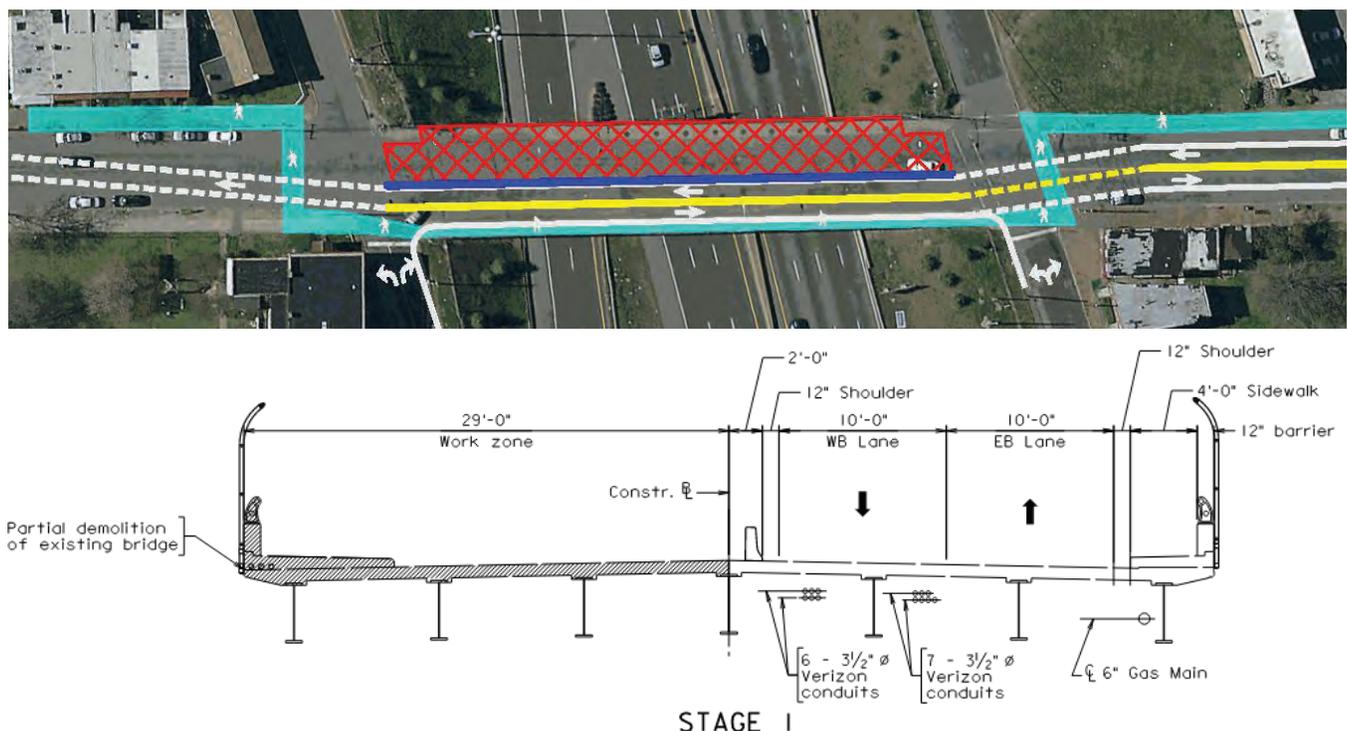


Figure 4.6.2.11 1st Street, Stage 1

Priority Utility Work: Our Team is sequencing construction of the north side, instead of the south side, first due to its proximity to the existing City of Richmond 12” waterline and to allow the installation of the new 6” gas line in this Stage. By completing the north side construction first, the gas line can then be removed from service during the RFP allowable window between March 1st and October 31st. In addition, the existing aerial electric spanning the north side of the bridge will also be relocated to a new easement.

Traffic and Pedestrian Movements: A key benefit to the Project is *our Team’s sequence maintains two-way traffic and pedestrian access at all times during construction*, as shown in Figure 4.6.2.11. This will eliminate the need for any detours of traffic through the City of Richmond. Additionally, no temporary signals or one-way traffic will be required, improving public safety.

4.6 Proposal Schedule

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: The substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Four new structural steel girder lines will be placed in the bridge’s north side. New Verizon communication conduits will be placed in this Stage to relocate the lines in advance of Stage 2. Additionally, a new City of Richmond 6” gas line will be installed underbridge. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will then occur, followed by bridge railing and fencing. A reduced width sidewalk will be constructed in Stage 1 to accommodate Stage 2 traffic. This sidewalk will be widened to a final 8’-0” width at the conclusion of Stage 2.

Roadway Construction and Utilities: During superstructure construction, utility crews will continue installation of new underground utilities that are located off the bridge such as the 12” waterline, gas line and Verizon facilities. Following placement of deck concrete, approach construction will take place including sleeper/approach slab, curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the north side to start Stage 2 construction.

1st Street Bridge - Stage 2 – South Side (December 2023 to August 2024)

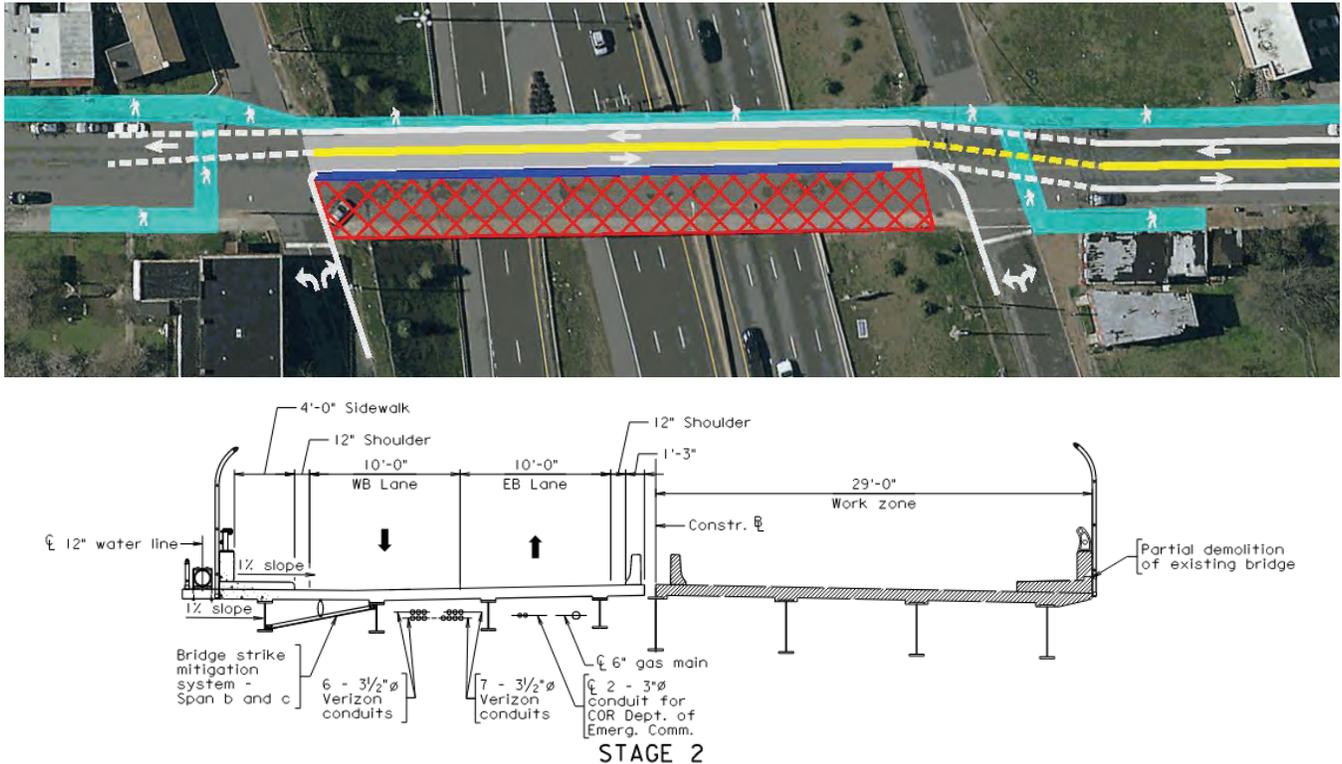


Figure 4.6.2.12 1st Street, Stage 2

Priority Utility Work: With the utility work completed in Stage 1, there are no other critical utility relocations in Stage 2.

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Traffic and Pedestrian Movements: Stage 2 traffic will be configured similar to Stage 1 as depicted in Figure 4.6.2.12. Two-way traffic and pedestrian access will be maintained at all times.

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: The substructure repairs will continue from Stage 1 including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Four new structural steel girder lines will be placed in the bridge's south side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement and structural concrete will occur, followed by bridge railings and fencing. The remaining portion of the north side sidewalk will be widened in Stage 2 as the completion of the bridge deck work allows for the shifting of traffic to its ultimate location.

Roadway Construction and Utilities: During superstructure construction, roadway crews will install new drainage, curb and gutter, and will remove and replace the existing overhead sign located at the western end of the bridge. Following placement of deck concrete, approach slab construction will take place along with pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration.

4th Street Bridge - Stage 1 – North Side (November 2023 to May 2024)

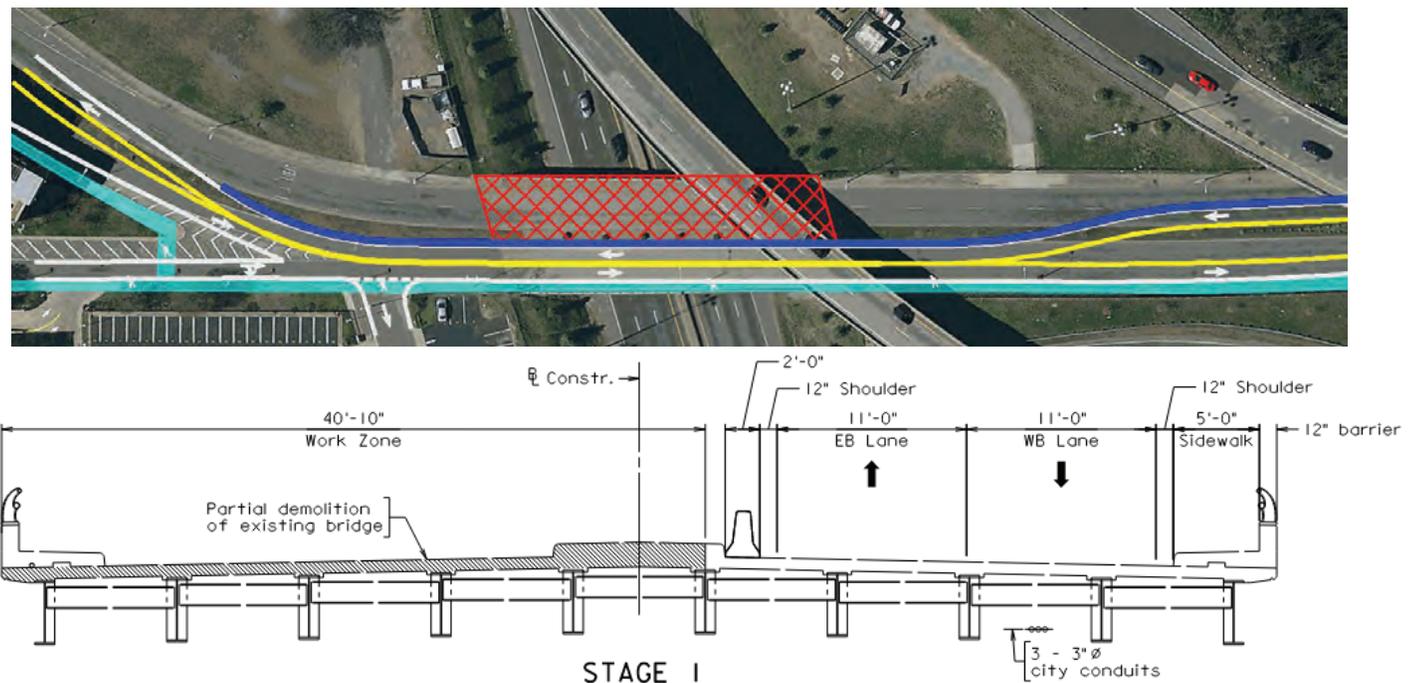


Figure 4.6.2.13 4th Street, Stage 1

Priority Utility Work: 4th Street Bridge has minimal utility work that included City of Richmond street lighting.

Traffic and Pedestrian Movements: Two-way traffic will be maintained, and pedestrian movements provided per the RFP staging plans as shown in Figure 4.6.2.13.

4.6 Proposal Schedule

Demolition: The north side of the bridge can be demolished following the removal of the street lighting. As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders. The east span of this Stage of demolition is partially under the existing span of the I-95 southbound to I-64 eastbound flyover ramp. Equipment and staging of equipment will be sized appropriately for this operation.

Substructure Repairs: Substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Eight new girder lines will be placed in Stage 1. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing.

Roadway Construction and Utilities: During superstructure construction, utility crews will install drainage features and new underground utilities that are located off the bridge. Following placement of deck concrete, approach slab construction will take place along with new curb and gutter, and pavement milling and overlay. After placement of pavement markings and installation of signage and MOT measures, traffic will be shifted to the new north half to start Stage 2 construction.

4th Street Bridge - Stage 2 – South Side (May 2024 to November 2025)

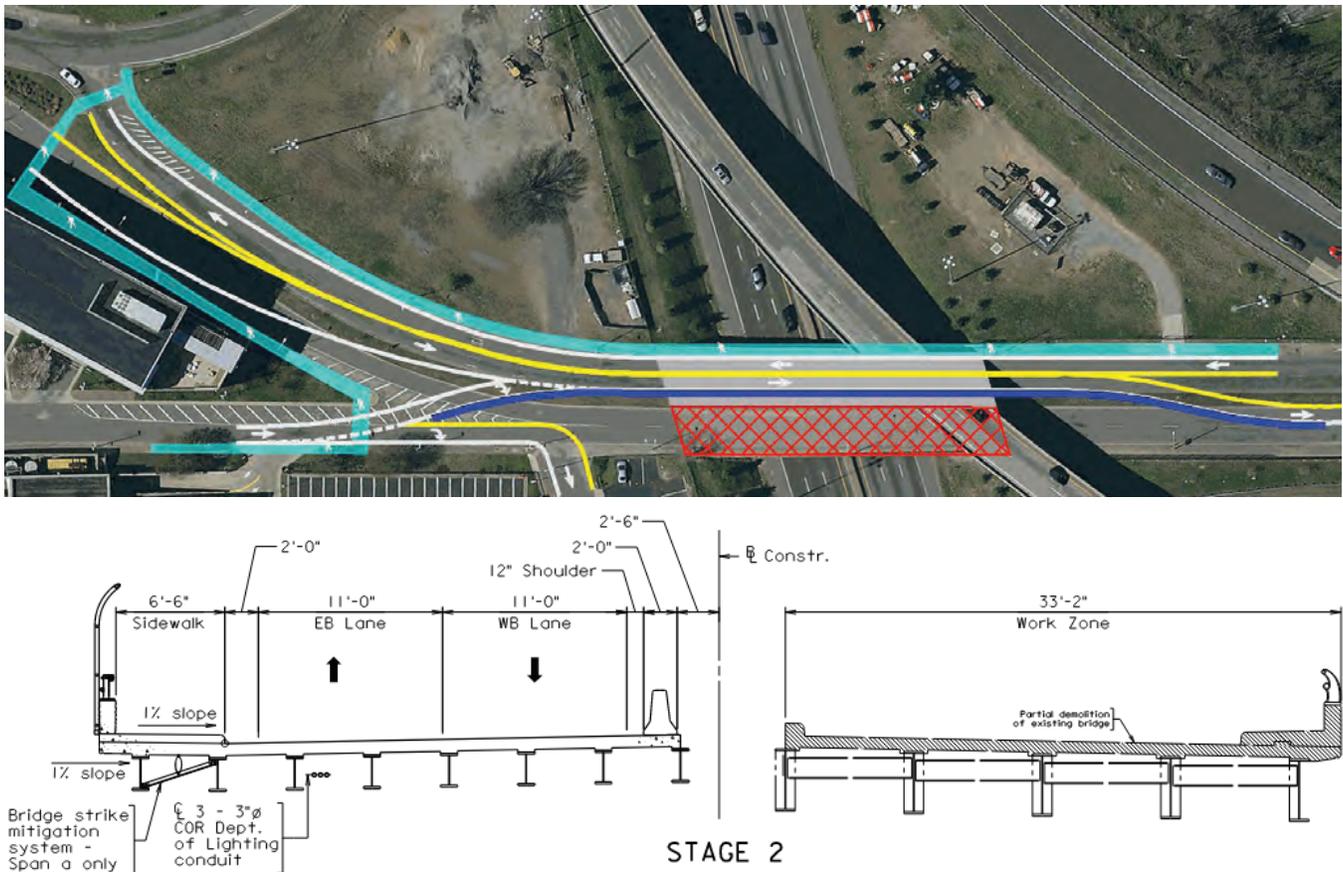


Figure 4.6.2.14 4th Street, Stage 2

Priority Utility Work: City of Richmond lighting conduits, removed in the previous Stage, will be replaced in this Stage of construction.

4.6 Proposal Schedule

Traffic and Pedestrian Movements: Stage 2 traffic will be configured similar to Stage 1 with two-way and pedestrian traffic maintained as shown in Figure 4.6.2.14.

Demolition: As detailed in Section 4.5.3, once traffic is shifted, crews will perform the bridge deck sawcutting, slab removal, and removal of girders.

Substructure Repairs: Substructure repairs will then be performed including preparation for the beam seats to receive the new girders.

Superstructure Replacement: Eight new structural steel girder lines will be placed in the bridge's south side. Bridge deck construction including SIP forms, bridge overhang forms, reinforcing steel placement, and structural concrete will occur, followed by bridge railing and fencing.

Roadway Construction and Utilities: During superstructure construction, roadway crews will install new drainage and curb and gutter. Following placement of deck concrete, approach slab construction will take place along with pavement milling and overlay. After placement of pavement markings and installation of signage, traffic will be opened to its ultimate configuration.

E. Broad Street

Our Team is planning to use Pre-Constructed Composite Units (PCU) utilizing ABC Methods of construction during the allowable E. Broad Street and I-95 closure periods. The PCU will consist of two girder units similar to those shown in Figure 4.5.2.15. Following erection, PCU units will be joined longitudinally via the use of Ultra High Performance Concrete (UHPC) closure pours. A link slab as detailed in Section 4.3.2 will be used for the transverse connections of the PCU over the bridge pier in order to form the jointless structure.

We are planning to fabricate the PCU at an off-site facility as pictured in Figure 4.6.2.16. Structural steel girders will be fabricated at a VDOT approved facility and shipped to a precast yard. Under strict quality control standards, the units will be fabricated in two-girder components in a controlled environment. End units will be cast with reinforcing steel and parapets cast with anchor bolts to receive the bridge railing. Additionally, deck slab extensions and anchorage for the new waterlines will be cast into the PCU units. Our schedule has allowed sufficient time for the design, submission, reviews, and fabrication of both the structural steel and the PCU. Additionally, we have timed the start of the ABC weekend closures to occur in Spring and Summer of 2024 in order to reduce the chance for cold weather elements compromising both traffic and construction operations.



Figure 4.6.2.15 Example of PCU



Figure 4.6.2.16 Offsite PCU Fabrication

Similar to our successful Sugarland Run Superstructure Replacement and Rehab Project completed in 2020, the Team will develop an hour-by-hour work plan similar to that shown in Figure 4.6.2.17 for each

4.6 Proposal Schedule

planned weekend closure. These plans will include all construction steps from start to finish for each quadrant. Additionally, these plans will include logistical and safety plans to include but not limited to:

- Emergency agency personnel and contacts;
- 24-hour contact numbers for involved personnel;
- On-site equipment, maintenance, and fueling plans; and
- Contingency plans for down equipment.

SHIRLEY CONTRACTING COMPANY, LLC
161224 - SGR SUPERSTRUCTURE REPLACEMENT AND REHAB

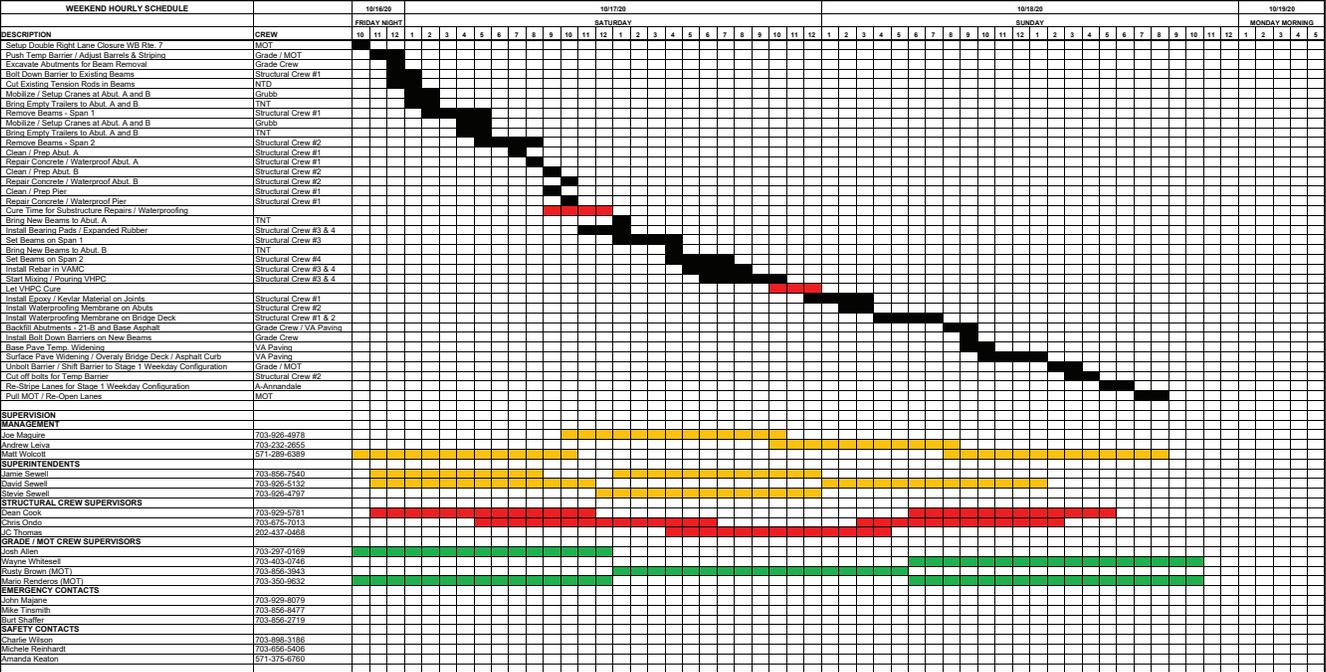


Figure 4.6.2.17 Sample Hour-by-Hour Work Plan

Per RFP Section 2.10.4, closures for the E. Broad Street reconstruction are allowed over 8 weekends from 8 PM Fridays to 6 AM Mondays. This is allowed for both E. Broad Street in all directions along with the use of movable barriers on I-95 to isolate either northbound or southbound work zones. Our Team plans to construct the E. Broad Street bridge in 4 Stages, each Stage representing a quadrant of the structure. Per the work sequence in our Proposal Schedule and as detailed below, **our Team will only use four weekends to implement the allowable I-95 crossovers as compared to allowable 8 in the RFP.** For E. Broad Street, we intend to utilize the allowable eight closures, four of which that will be in combination with the I-95 crossovers. We have selected to construct the two southern quadrants of the bridge first due the active 12” COR watermain that exists on the northern half of the bridge. We will construct the southern quadrants along with the required replacement of the southern 12” watermain and laterals in order to deactivate the existing northern watermain in the last two Stages. Each Stage is detailed in the following pages.

E. Broad Street - Stage 1 – First Quadrant (Weekend 1) (Figure 4.6.2.18)

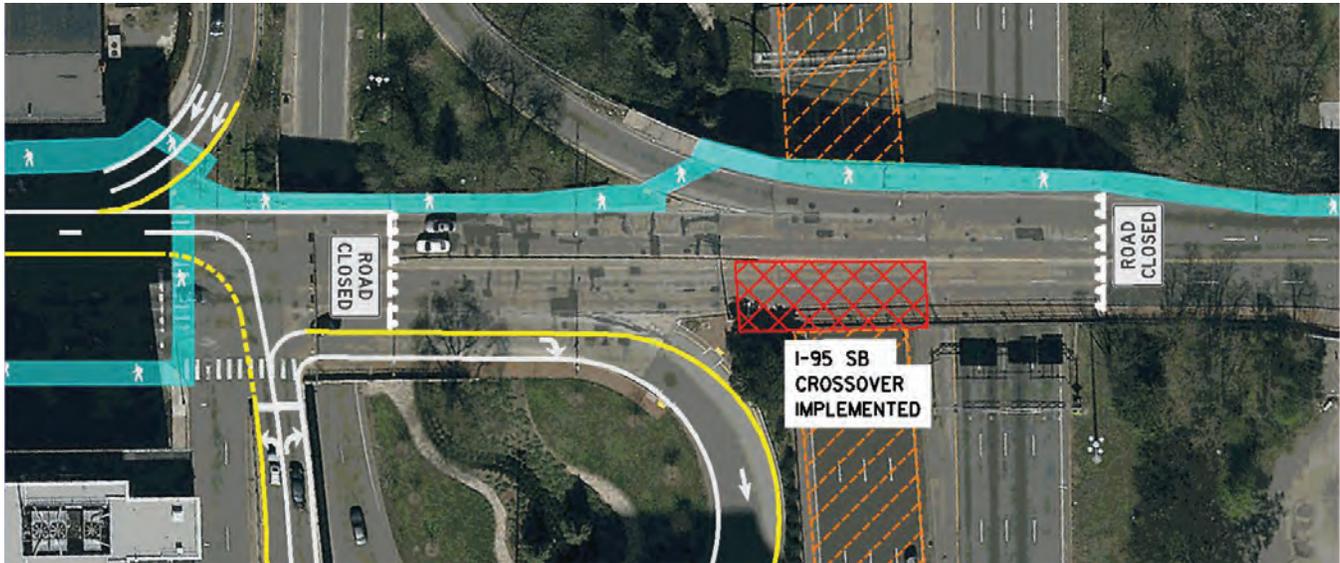


Figure 4.6.2.18 E. Broad Street, Stage 1

Weekend 1 - Preparatory Works

1. Stage traffic barrier service on E. Broad Street for weekend closures.
2. Stage movable barrier on I-95 for southbound closure and crossover to northbound I-95.
3. Working with utility companies, decommission all underbridge utilities under the southern half of the bridge. Remove any underbridge conduits and/or waterlines prior to weekend closures using allowable weekday nighttime closures.
4. Perform any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
5. Sawcut approach asphalt and/or concrete pavement full depth for removal during weekend closure.
6. Perform any asbestos abatement in advance of any actual demolition activities.
7. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
8. Stage cranes for weekend closure.

Weekend 1 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.
4. Sawcut parapet sections and remove to demo trailers positioned on I-95.
5. Composite sections will be removed with a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

Weekend 1 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment B (west) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCUs in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

4.6 Proposal Schedule

Weekend 1 – Utility Work

1. Concurrent with the superstructure replacement work, utility crews will take advantage of the E. Broad Street total closure to install the new lateral connection on the east side of the bridge between the southern and northern 12” COR waterlines.
2. Crews will also make any storm sewer adjustments during this period.

Weekend 1–Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU sections, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
3. On the abutment end of the bridge, aggregate base and temporary paving will be installed to create a smooth transition to the new bridge surface.
4. On the pier end, steel plates will be secured to PCU and existing deck for a temporary riding surface.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

E. Broad Street - Stage 2 – Southeast Quadrant (Weekend 2) (Figure 4.6.2.19)

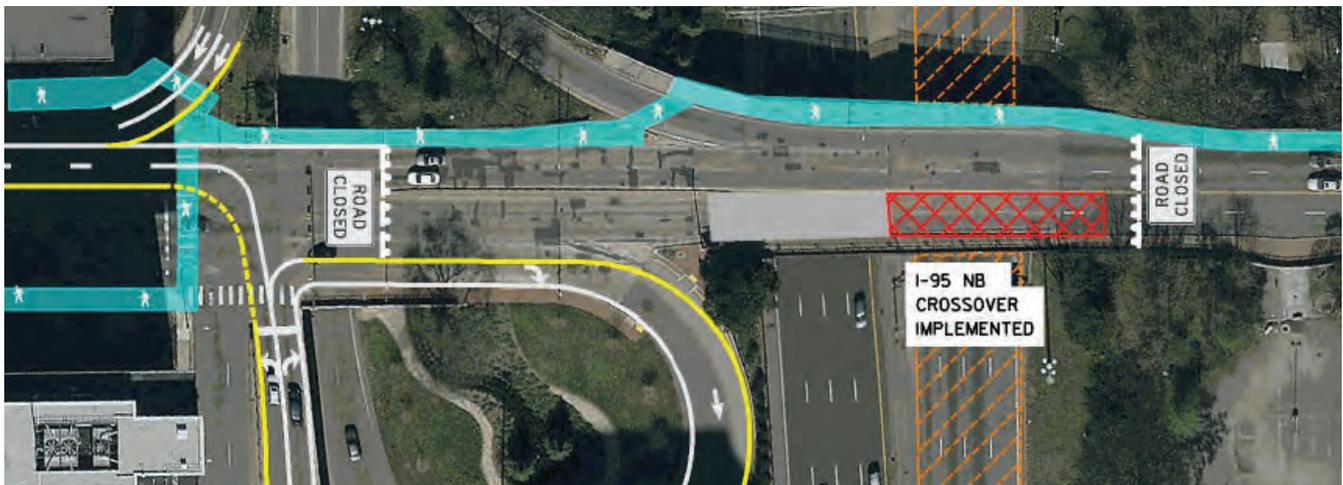


Figure 4.6.2.19 E. Broad Street, Stage 2

Weekend 2 - Preparatory Works

1. Stage traffic barrier service on E. Broad Street for Weekend 2 closure.
2. In order to crossover northbound I-95 to southbound I-95, the movable barrier on I-95 from Weekend 1 will be relocated and staged for Weekend 2 during weekly night-time lane closures.
3. Complete any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
4. Sawcut approach asphalt and/or concrete pavement full depth as required for removal during weekend closure.
5. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
6. Stage cranes for weekend closure.

Weekend 2 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.

4.6 Proposal Schedule

4. Sawcut parapet sections and remove to demo trailers positioned on I-95.
5. Composite sections will be removed a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

Weekend 2 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment A (east) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCU in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

Weekend 2 – Utility Work

1. Concurrent with the superstructure replacement work, utility crews will take advantage of the E. Broad Street total closure to install the new lateral connection on the west side of the bridge between southern and northern 12” COR waterlines.
2. Crews will also make any storm sewer adjustments during this period.

Weekend 2–Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU sections, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. On the abutment end of the bridge, aggregate base will be placed and compacted to fill the void left from the removal of the hinged girder system. Base and intermediate asphalt will be installed to create a smooth transition to the new bridge surface.
3. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
4. On the pier end, steel plates will be secured to the PCU for a temporary riding surface. Link slabs will be poured at a later time.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

Southwest/Southeast Quadrant Follow-On Work

Using allowable daily/night-time lane closures of E. Broad Street and I-95, following the Weekend 2 work, crews will complete the following:

1. Install the bridge deck mounted 12” COR Water south waterline and tie-in laterals.
2. Tie-in new 12” waterline to the existing COR waterlines at either end of the bridge. Perform testing, flushing, and chlorination of new watermain in advance of tie-in to active northern waterline.
3. Using night-time I-95 northbound lane closures, install the new hangars and conduit systems for COR lighting.

Weekend 3 - Southwest/Southeast Quadrants

Using weekend closures of E. Broad Street:

1. Install permanent bridge railing and fence at the southern parapet.
2. Install waterline shield on bridge deck per RFP requirements.
3. In coordinated outage with COR Water, perform tie-in of laterals to the existing northern 12” waterline and activate the southern waterline. The portion of the northern waterline spanning the E. Broad Street bridge is now de-activated and can be replaced in Stages 3 and 4.

4.6 Proposal Schedule

4. Form and pour the link slab over Pier 1 creating the permanent transverse connection of the PCU installed in Stages 1 and 2.
5. Complete roadway approaches (less approach slabs) up to intermediate asphalt.

E. Broad Street Stage 3 – Northeast Quadrant (Weekend 4) (Figure 4.6.2.20)

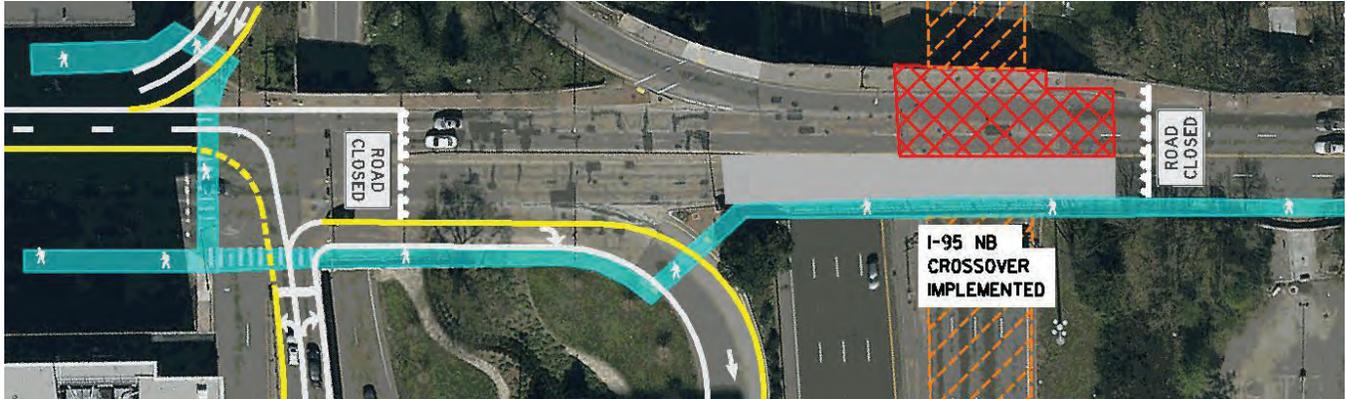


Figure 4.6.2.20 E. Broad Street, Stage 3

Weekend 4 - Preparatory Works

1. The movable barrier used on I-95 from Weekend 2 will be in position and ready for Weekend 4 I-95 northbound crossovers.
2. Complete any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
3. Sawcut approach asphalt and/or concrete pavement full depth as required for removal during weekend closure.
4. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
5. Stage cranes for weekend closure.

Weekend 4 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.
4. Sawcut parapet sections and remove to demo trailers positioned on I-95.
5. Composite sections will be removed a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

Weekend 4 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment A (east) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCUs in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

Weekend 4 – Utility Work

1. Crews will make any storm sewer adjustments during this period.

4.6 Proposal Schedule

Weekend 4—Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
3. On the abutment end of the bridge, aggregate base will be placed and compacted to fill the void left from the removal of the hinged girder system. Base and intermediate asphalt will be installed to create a smooth transition to the new bridge surface.
4. On the pier end, steel plates will be secured to the PCU and existing deck for a temporary riding surface.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

E. Broad Street - Stage 4 – Northwest Quadrant (Weekend 5) (Figure 4.6.2.21)

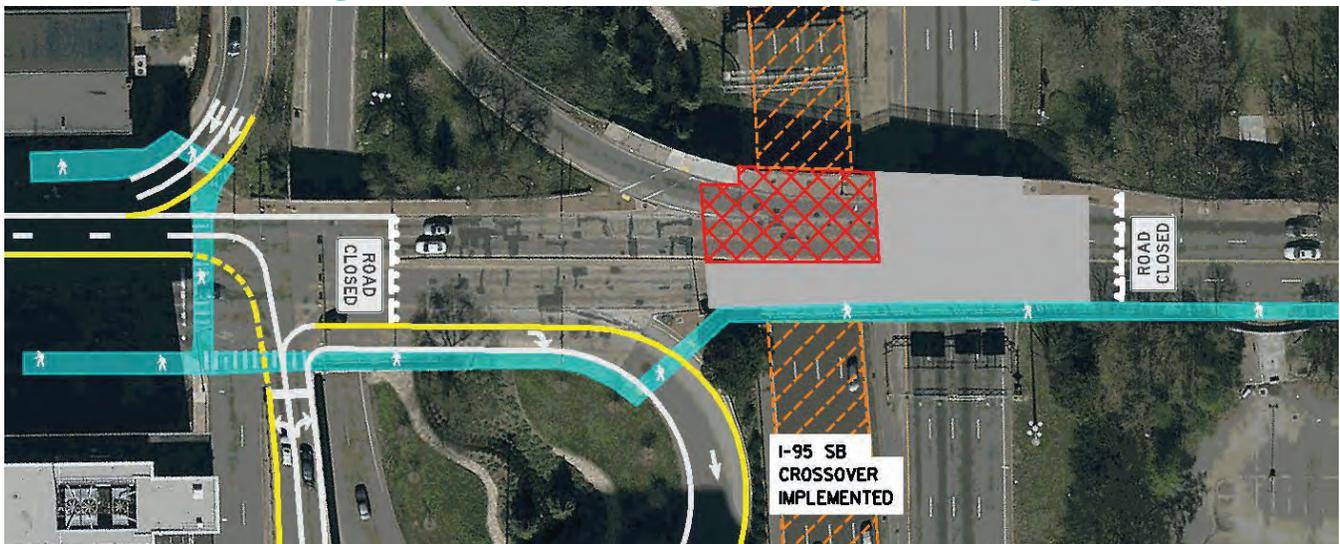


Figure 4.6.2.21 E. Broad Street, Stage 4

Weekend 5 - Preparatory Works

1. Stage traffic barrier service on E. Broad Street for Weekend 5 closure.
2. In order to crossover southbound I-95 to northbound I-95, the movable barrier on I-95 from Weekend 4 will be relocated and staged for Weekend 5 during weekly night-time lane closures.
3. Complete any pre-sawcutting of longitudinal joints in deck per approved Engineered Work Plan.
4. Sawcut approach asphalt and/or concrete pavement full depth as required for removal during weekend closure.
5. Perform any substructure repairs as necessary and/or prepare areas for weekend closure.
6. Stage cranes for weekend closure.

Weekend 5 – Demolition (12-14 Hours)

1. Setup movable barrier into position on I-95 and implement full closure on E. Broad Street.
2. Move cranes and demolition equipment into position.
3. Complete sawcutting of bridge deck and cut anchor bolts and diaphragms for removal of two-girder composite sections.
4. Sawcut parapet sections and remove to demo trailers positioned on I-95.
5. Composite sections will be removed with a hydraulic crane placed on I-95. Hoisted sections shall be loaded onto stretch trailers staged on I-95.

4.6 Proposal Schedule

Weekend 5 – Superstructure and PCU Installation (24-30 Hours)

1. Reconstruct abutment backwall to accommodate deck slab extension.
2. Construct new pedestals at Abutment B (west) and Pier 1 to receive PCU.
3. Install elastomeric bearing pads and anchor bolts as required.
4. Deliver and install superstructure PCUs in proper order.
5. Place soffit forms for UHPC and install diaphragms between the superstructure PCU.
6. Pour UHPC at longitudinal joints and monitor cure.
7. Remove cranes and equipment from I-95 work zone and start restoration of I-95 traffic configurations.

Weekend 5 – Utility Work

1. Crews will make any storm sewer adjustments during this period.

Weekend 5 -Traffic and Pedestrian Accommodations and Approach Roadway (12-14 Hours)

Following installation of all PCU sections, crews will perform the following:

1. Install temporary fencing for pedestrian protection on the outside edges of the bridge.
2. On the abutment end of the bridge, aggregate base will be placed and compacted. Base and intermediate asphalt will be installed to create a smooth transition to the new bridge surface.
3. Traffic barrier service will be placed on the outside of the bridge to create a temporary walkway for pedestrians.
4. On the Pier end, steel plates will be secured to the PCU for a temporary riding surface. Link slabs will be poured at a later time.
5. Traffic barrier service will be placed with attenuators along the center longitudinal joint between the new and existing bridge areas.
6. Traffic will be restored to normal operations.

Northwest/Northeast Quadrant Follow-On Work

Using allowable daily and night-time lane closures of E. Broad Street and I-95, after the Weekend 5 work, crews will complete the following:

1. Install the bridge deck mounted 12” COR Water north waterline.
2. Tie-in new bridge deck mounted 12” waterline to the existing COR waterlines at either end of the bridge. Perform testing, flushing, and chlorination of new waterline.
3. Using night-time I-95 northbound lane closures, install the new hangars and conduit systems for COR lighting and DEV conduit system.
4. Remove the movable barriers from the Project.

Weekend 6 - Northwest/Northeast Quadrants – Using weekend closures of E. Broad Street

1. Install permanent bridge railing and fence at the northern parapet.
2. Install waterline shield on bridge deck per RFP requirements.
3. In coordinated outage with COR Water, perform tie-in of the new bridge deck mounted northern 12” waterline to the active laterals to complete the looped waterline system.
4. Form and pour the link slab over Pier 1 creating the permanent transverse connection of the PCU installed in Stages 3 and 4.
5. Complete roadway approaches (less approach slabs) up to intermediate asphalt.

E. Broad Street Stage 5 – Approaches and Finishes (Weekends 7 and 8)

The final two weekend closure periods will be utilized for the following:

1. Sawcut pavement, excavate, grade for Abutment A and B Approach Slabs.
2. Form, place reinforcing steel, and pour Abutment A and B Approach Slabs.
3. Form and pour raised sidewalks on north and south bridges.
4. Completion of all curb and gutter and final storm sewer adjustments.

4.6 Proposal Schedule

5. Remove all temporary barriers on E. Broad Street.
6. Perform diamond grinding of PCU and install pavement markings.

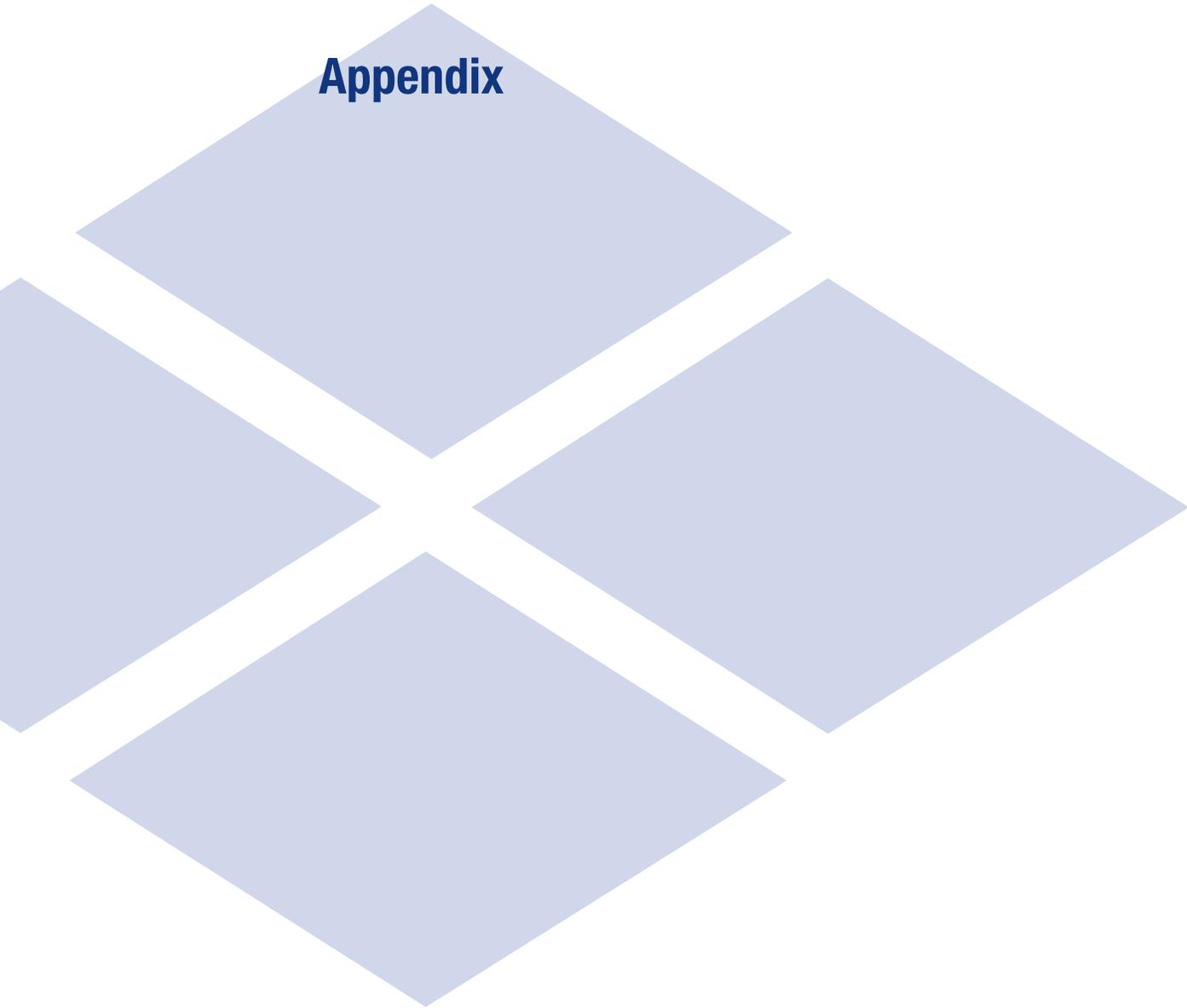
Follow-On Work

Using allowable daily/night-time lane closures of E. Broad Street and I-95, concurrent with Stage 5 work, crews will be completing the following:

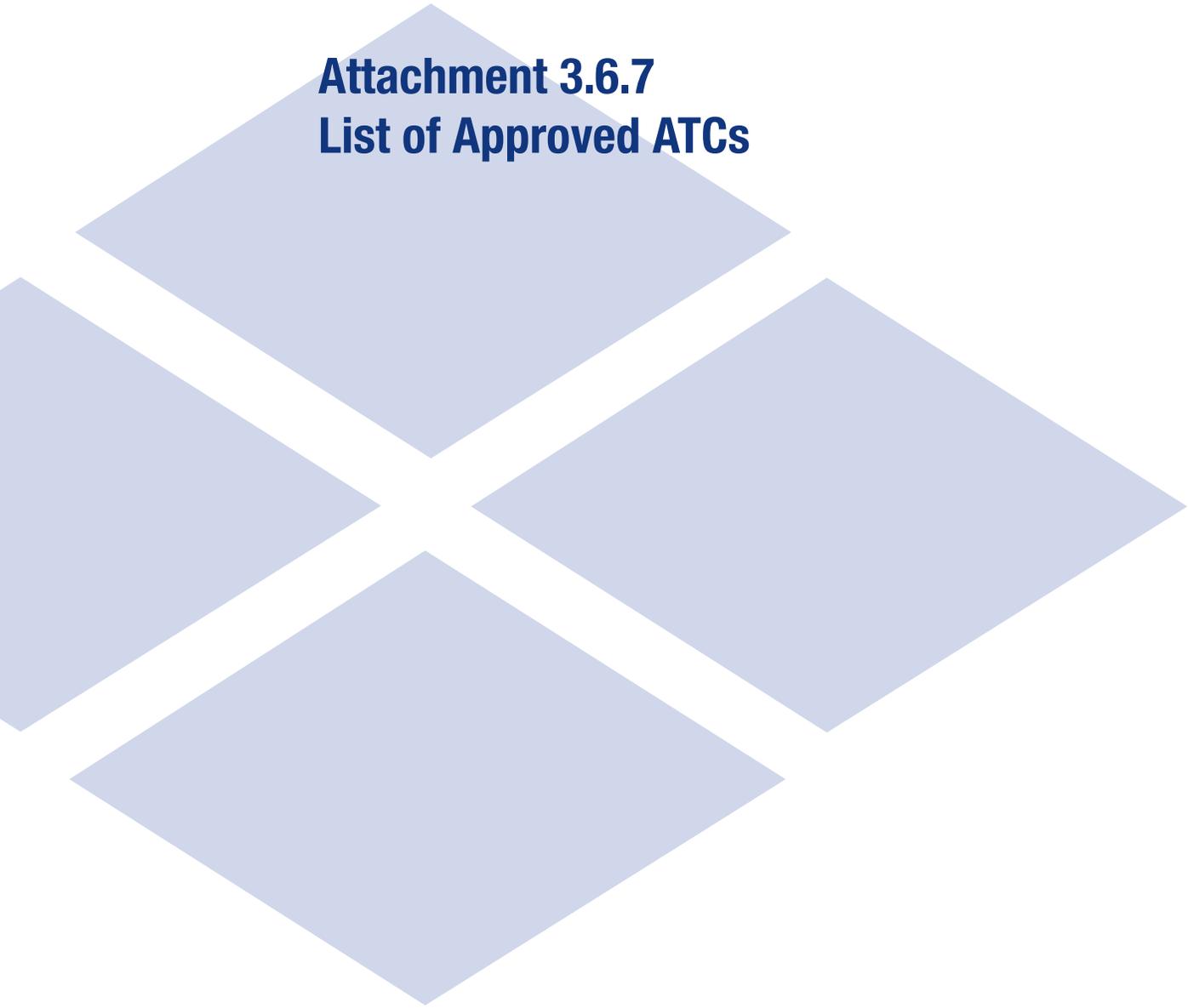
1. Bridge girder painting.
2. Completion of any remaining substructure repairs.
3. Grooving of bridge deck surface.
4. Mill and overlay of final surface asphalt.

Other Key Assumptions

- VDOT will review and approve Early Work packages as described.
- Environmental Permitting agencies will accept VDOT's avoidance and minimization efforts taken during the RFP phase as sufficient to process permits without delay.
- There are no hazardous materials, threatened or endangered species, or unforeseen environmental constraints, other than those in the RFP, that could delay the Schedule.
- Crews are based on 8-hour workday and 5-day workday calendar. A detailed description of the calendars is included in this narrative.
- Generally, the schedule has been built with work in certain areas of the Project starting when access is available (either via work availability, property rights, or utility access) and /or at the completion of a prior stage of work. We have provided some crew flow predecessor relationship in several locations throughout the schedule mainly where adjacent work is available and crew flow is logical as to not 'stack' too many work areas on top of each other.
- Utility companies will complete their work in accordance with the Project Schedule.
- There are no unforeseen utility conflicts that could impact the Project Schedule.
- No environmental noise permit is required for any area of the Project.
- Night-time work restrictions will not be imposed other than as described in the RFP.



Appendix



Attachment 3.6.7 List of Approved ATCs

ATTACHMENT 3.6.7
LIST OF APPROVED ATCs INCLUDED IN TECHNICAL PROPOSAL

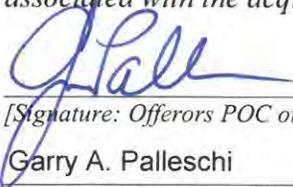
OFFEROR:

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) #
1	I-95 Southbound Traffic Detour via I-64 and Route 360	July 21, 2021	3,4,31,53,55,56,62

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]

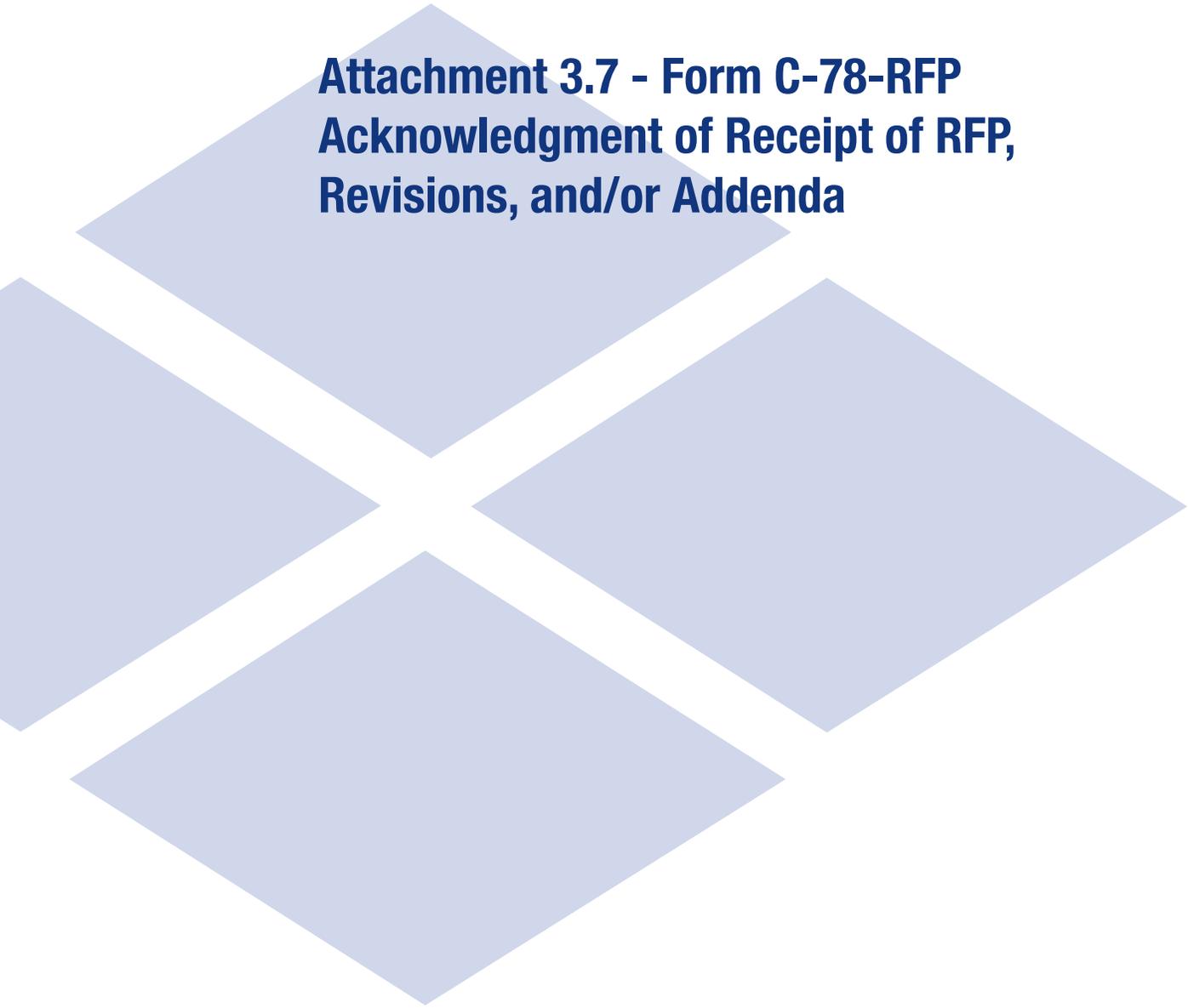
Garry A. Paleschi

[Printed Name]

Vice President

[Title]

DATE: August 27, 2021



**Attachment 3.7 - Form C-78-RFP
Acknowledgment of Receipt of RFP,
Revisions, and/or Addenda**

ATTACHMENT 3.7**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION**RFP NO. C00111300DB107PROJECT: VDOT Bridges Over I-95 Bundling**ACKNOWLEDGEMENT OF RFP, REVISION AND/OR ADDENDA**

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

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

1. Cover letter of RFP – April 7, 2021
(Date)
2. Cover letter of RFP Addendum No. 1 – May 14, 2021
(Date)
3. Cover letter of RFP Addendum No. 2 – June 11, 2021
(Date)
4. Cover letter of RFP Addendum No. 3 – August 9, 2021
(Date)
4. Cover letter of RFP Addendum No. 4 – August 25, 2021
(Date)

SIGNATURE

August 27, 2021

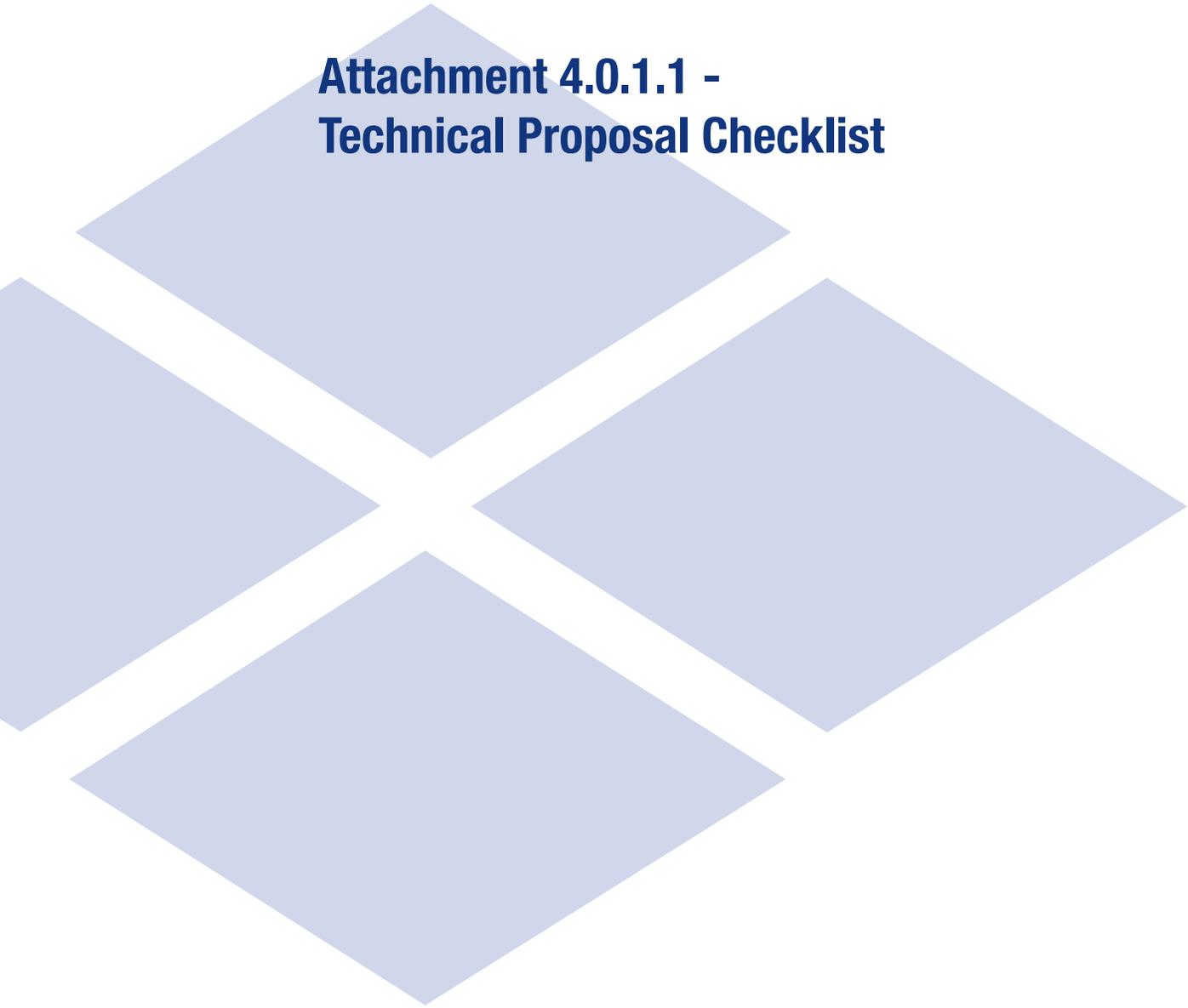
DATE

Garry A. Palleschi

PRINTED NAME

Vice President

TITLE



Attachment 4.0.1.1 - Technical Proposal Checklist

ATTACHMENT 4.0.1.1

VDOT BRIDGES OVER I-95 BUNDLING

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

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

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Technical Proposal Checklist and Contents	Attachment 4.0.1.1	Section 4.0.1.1	no	Appendix
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.6 (Form C-78-RFP)	Sections 3.6, 4.0.1.1	no	Appendix
Letter of Submittal	NA	Sections 4.1		
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	1
Identify the full legal name and address of Offeror	NA	Section 4.1.1	yes	1
Authorized representative's original signature	NA	Section 4.1.1	yes	1
Declaration of intent	NA	Section 4.1.2	yes	1
120 day declaration	NA	Section 4.1.3	yes	1
Point of Contact information	NA	Section 4.1.4	yes	1
Principal Officer information	NA	Section 4.1.5	yes	1
Final Completion Date	NA	Section 4.1.6	yes	1
Unique Milestone Date	NA	Section 4.1.7	yes	1
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.8	no	Appendix
Certification Regarding Debarment Forms	Attachment 11.9.6(a) Attachment 11.9.6(b)	Section 4.1.9	no	Appendix
Written statement of percent DBE participation (9%)	NA	Section 4.1.10	yes	1

ATTACHMENT 4.0.1.1

VDOT BRIDGES OVER I-95 BUNDLING

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

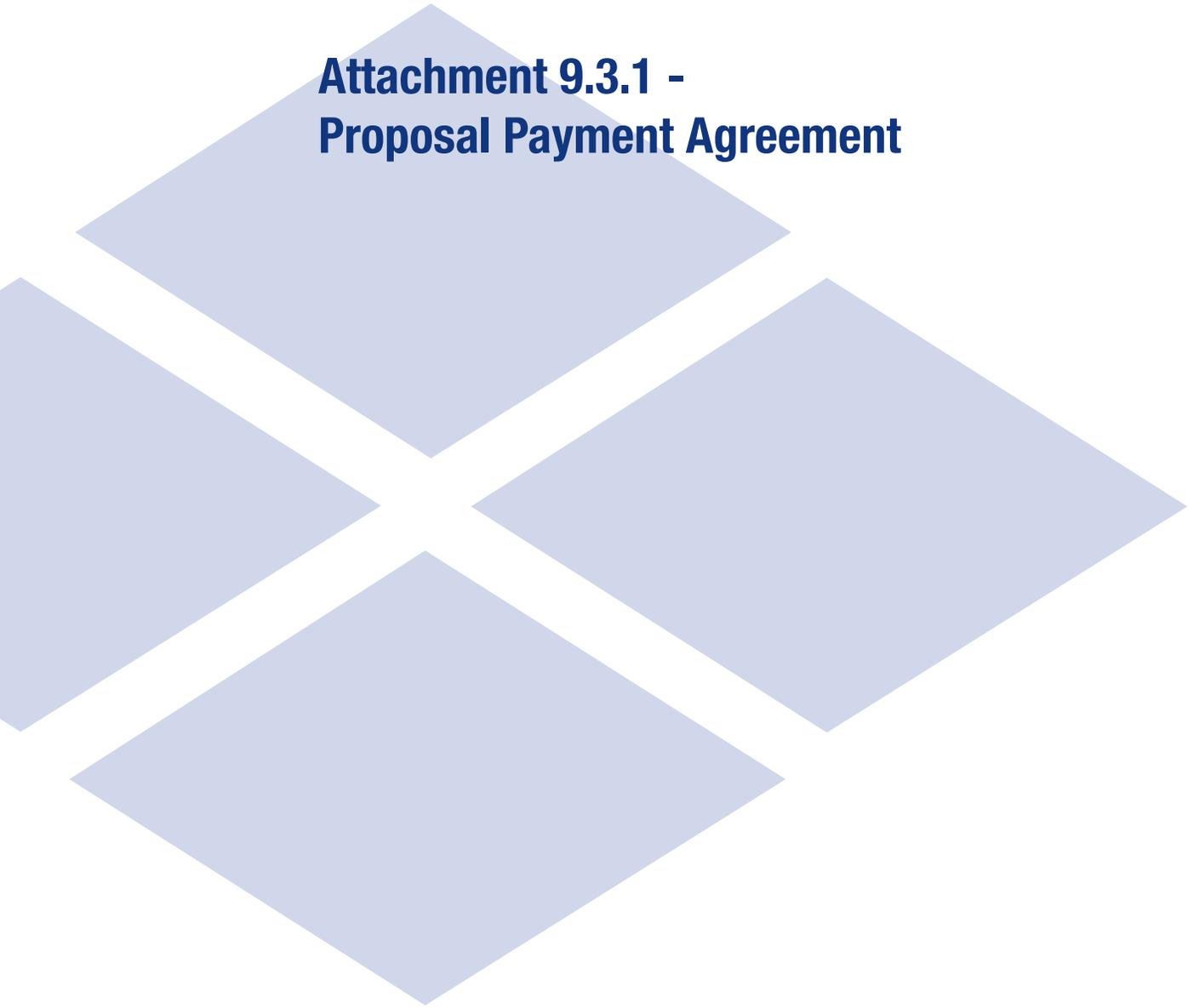
Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Offeror's Qualifications	NA	Section 4.2		2
Confirmation that the information provided in the SOQ submittal remains true and accurate or indicates that any requested changes were previously approved by VDOT	NA	Section 4.2.1	yes	2
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	2
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	N/A
Design Concept	NA	Section 4.3		3-13
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	5-7
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	7-13
Project Approach	NA	Section 4.4		14-29
Environmental Management	NA	Section 4.4.1	yes	14-17
Utilities	NA	Section 4.4.2	yes	17-24
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.3	yes	24-29
Construction of Project	NA	Section 4.5		30-62
Sequence of Construction	NA	Section 4.5.1	yes	30-51
Transportation Management Plan	NA	Section 4.5.2	yes	52-57

ATTACHMENT 4.0.1.1

VDOT BRIDGES OVER I-95 BUNDLING

TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Demolition Plan	NA	Section 4.5.3	yes	57-62
Proposal Schedule	NA	Section 4.6		
Proposal Schedule	NA	Section 4.6	no	Appendix
Proposal Schedule Narrative	NA	Section 4.6	no	Section 4.6
Proposal Schedule in electronic format (PDF)	NA	Section 4.6	no	N/A



**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 ____ day of _____, 20__, by and between the Virginia Department of Transportation ("VDOT"), and Shirley Contracting Company, LLC ("Offeror").

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications ("SOQs") pursuant to VDOT's December 15, 2020 Request for Qualifications ("RFQ") and was invited to submit proposals in response to a Request for Proposals ("RFP") for the VDOT Bridges Over I-95 Superstructure Replacement and Rehabilitation Bundling, Contract ID No. C00111300DB107 ("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 **fifty thousand and 00/100 Dollars (\$50,000.00)** ("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.

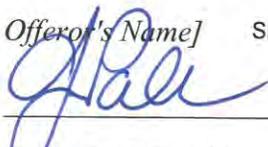
VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

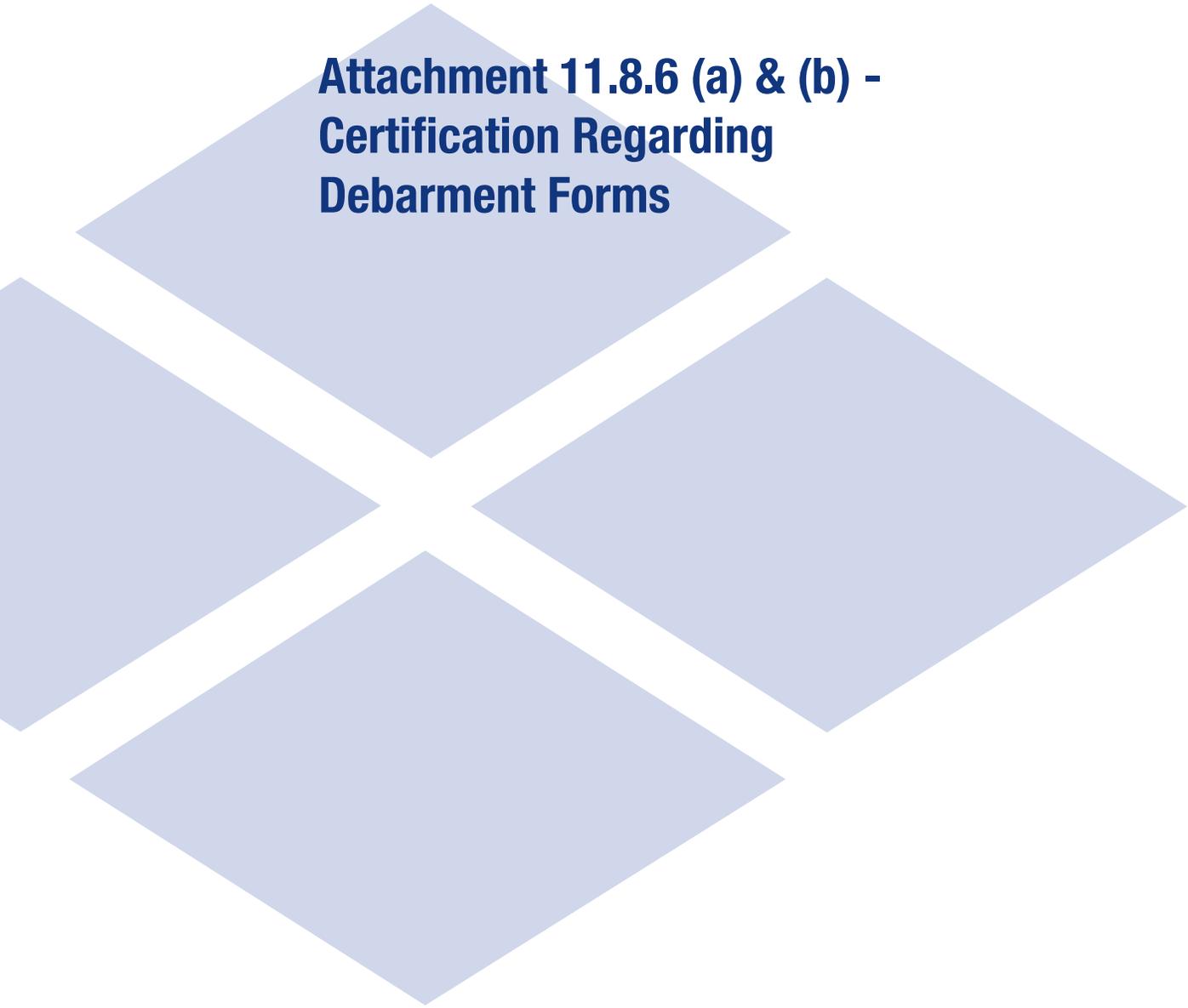
Title: _____

[Insert Offeror's Name] Shirley Contracting Company, LLC

By:  _____

Name: Garry A. Palleschi _____

Title: Vice President _____



**Attachment 11.8.6 (a) & (b) -
Certification Regarding
Debarment Forms**

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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

August 27, 2021

Date

Vice President

Title

Shirley Contracting Company, LLC

Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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.

Dave Mahoney 8/20/2021 Executive Vice President
Signature Date Title

Dewberry Engineers Inc.
Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

- 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 Arta Singh	<u>8/23/2021</u> _____ Date	<u>President</u> _____ Title
<u>CES CONSULTING LLC</u> _____ Name of Firm		

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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<u>J. Randy Wirt</u>	<u>8/23/2021</u>	<u>Chief Engineer</u>
Signature	Date	Title

ECS Mid-Atlantic, LLC
Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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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.

 08/21/2021 PRESIDENT
Signature Date Title

AMERICAN GEOTECHNICAL & ENVIRONMENTAL SERVICES, INC.
Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling

Contract ID No.: C00111300DB107

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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

8/23/21

Date

President/CEO

Title

Alvi Associates, Inc.

Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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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.

<i>Marlin Zook</i>	8/20/2021	Vice President
Signature	Date	Title

Quantum Spatial, Inc.
Name of Firm

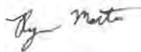
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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	08/20/21	Vice President
Signature	Date	Title

Accumark, Inc.

Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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8-23-21

Division Manager

Signature

Date

Title

Apex Companies LLC

Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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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.

Alewetha Sabido *05/23/2021* *President*
Signature Date Title

Diversified Property Services, Inc.
Name of Firm

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

Project: VDOT Bridges Over I-95 Superstructure Replacement
and Rehabilitation Bundling
Contract ID No.: C00111300DB107

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RRaltRunk 8-23-21 Vice President
Signature Date Title

Key Title II, LLC
Name of Firm

Response to Request for Proposals

VOLUME II DESIGN CONCEPT

VDOT BRIDGES OVER I-95 SUPERSTRUCTURE REPLACEMENT AND REHABILITATION BUNDLING

City of Richmond, Virginia

UPC (State Project Nos.; Federal Project Nos.)

UPC 111300 (U000-127-023, P101, R201, C501, B601; STP-5A27(802))

UPC 111294 (0064-127-022, P101, B661; NHPP-064-3(510))

UPC 113375 (0250-127-050, P101, R201, C501; NHPP-BR04(307))

UPC 113388 (0004-127-051, P101, R201, C501; NHPP-BR04(308))

UPC 118484 (9999-127-107, P101, R202, C501, B602; NHPP-5A27(784))

Contract ID Number: C00111300DB107



August 27, 2021

Submitted By:



In Association With:



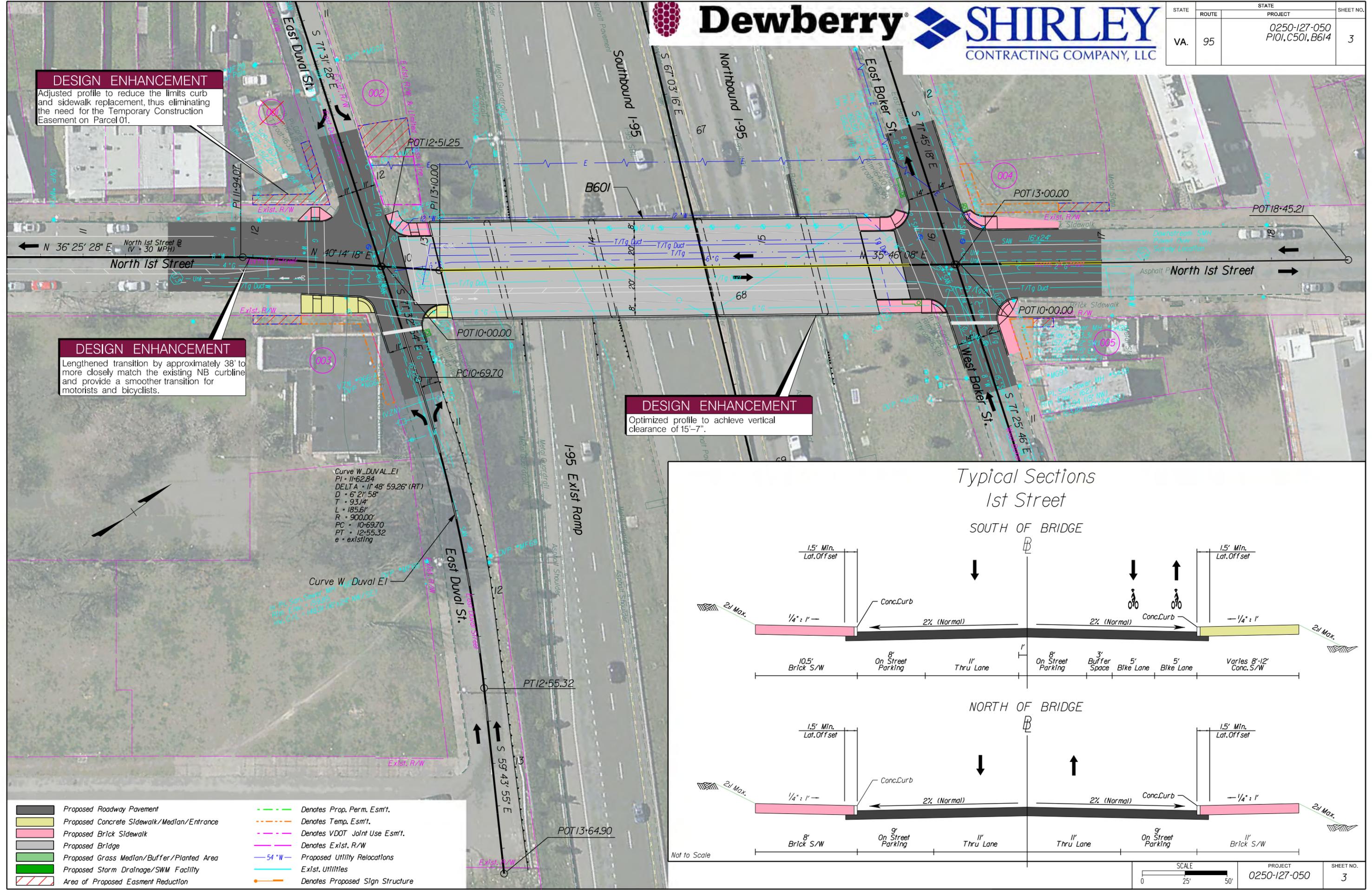
4.3.1 - Conceptual Roadway Plans

STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	95	0250-127-050 P101, C501, B614	3

DESIGN ENHANCEMENT
Adjusted profile to reduce the limits curb and sidewalk replacement, thus eliminating the need for the Temporary Construction Easement on Parcel 01.

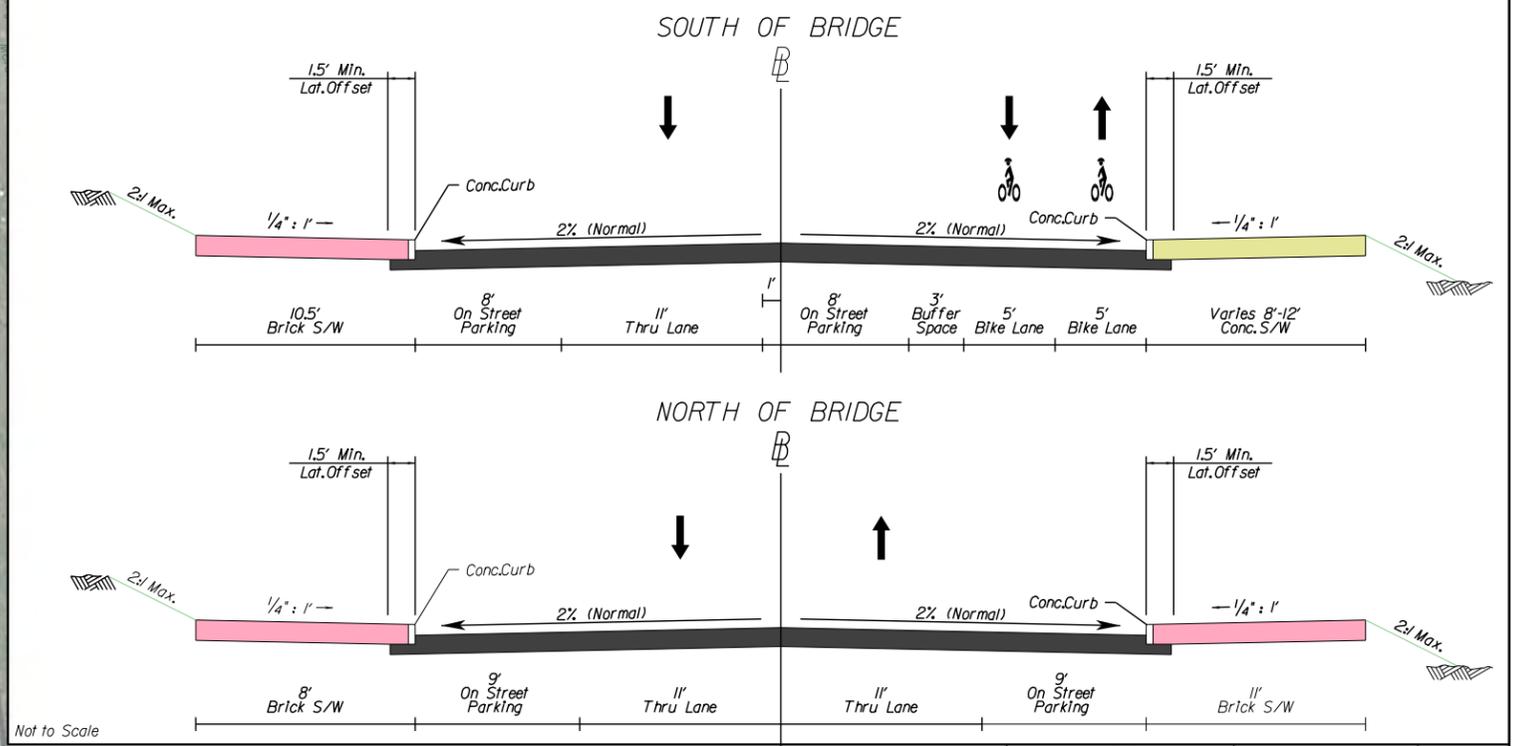
DESIGN ENHANCEMENT
Lengthened transition by approximately 38' to more closely match the existing NB curbline and provide a smoother transition for motorists and bicyclists.

DESIGN ENHANCEMENT
Optimized profile to achieve vertical clearance of 15'-7".



- Proposed Roadway Pavement
- Proposed Concrete Slidewalk/Median/Entrance
- Proposed Brick Sidewalk
- Proposed Bridge
- Proposed Grass Median/Buffer/Planted Area
- Proposed Storm Drainage/SWM Facility
- Area of Proposed Easement Reduction
- Denotes Prop. Perm. Esm't.
- Denotes Temp. Esm't.
- Denotes VDOT Joint Use Esm't.
- Denotes Exst. R/W
- 54" W Proposed Utility Relocations
- Exst. Utilities
- Denotes Proposed Sign Structure

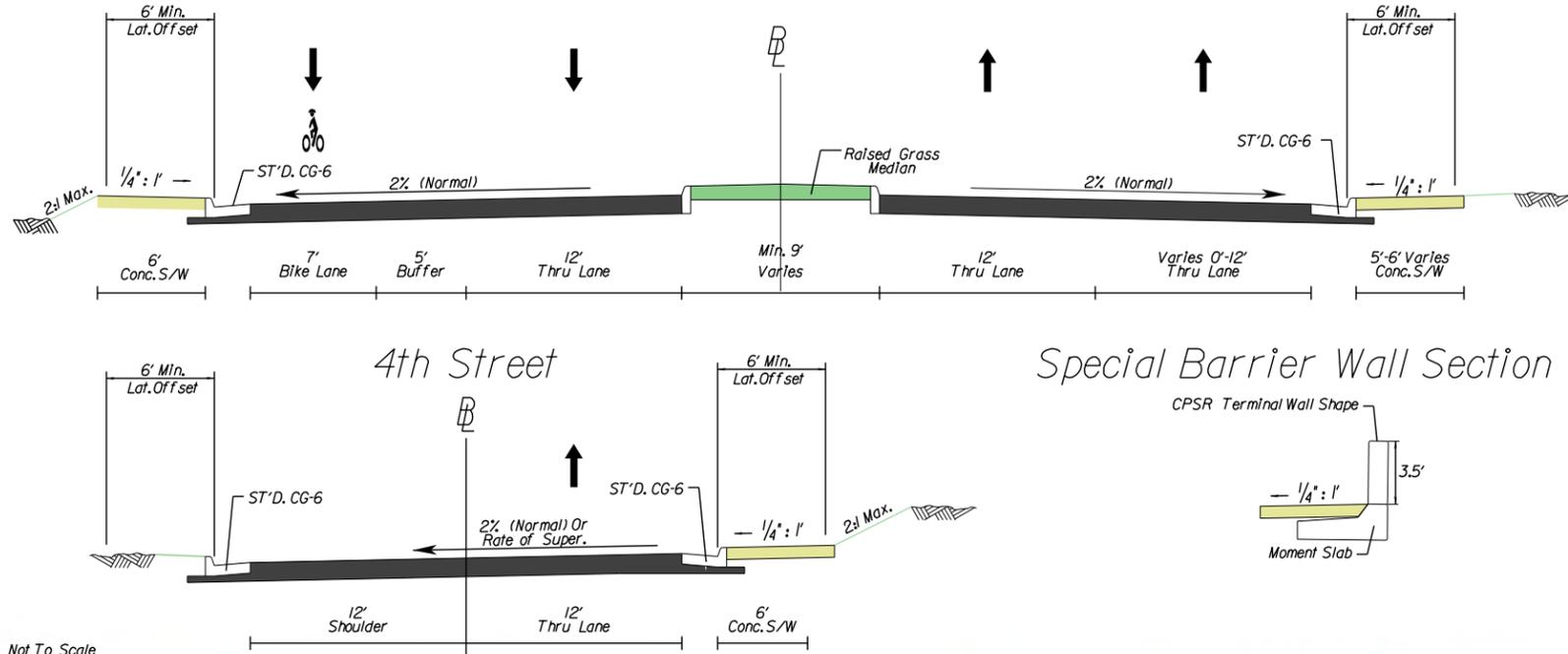
Typical Sections
1st Street



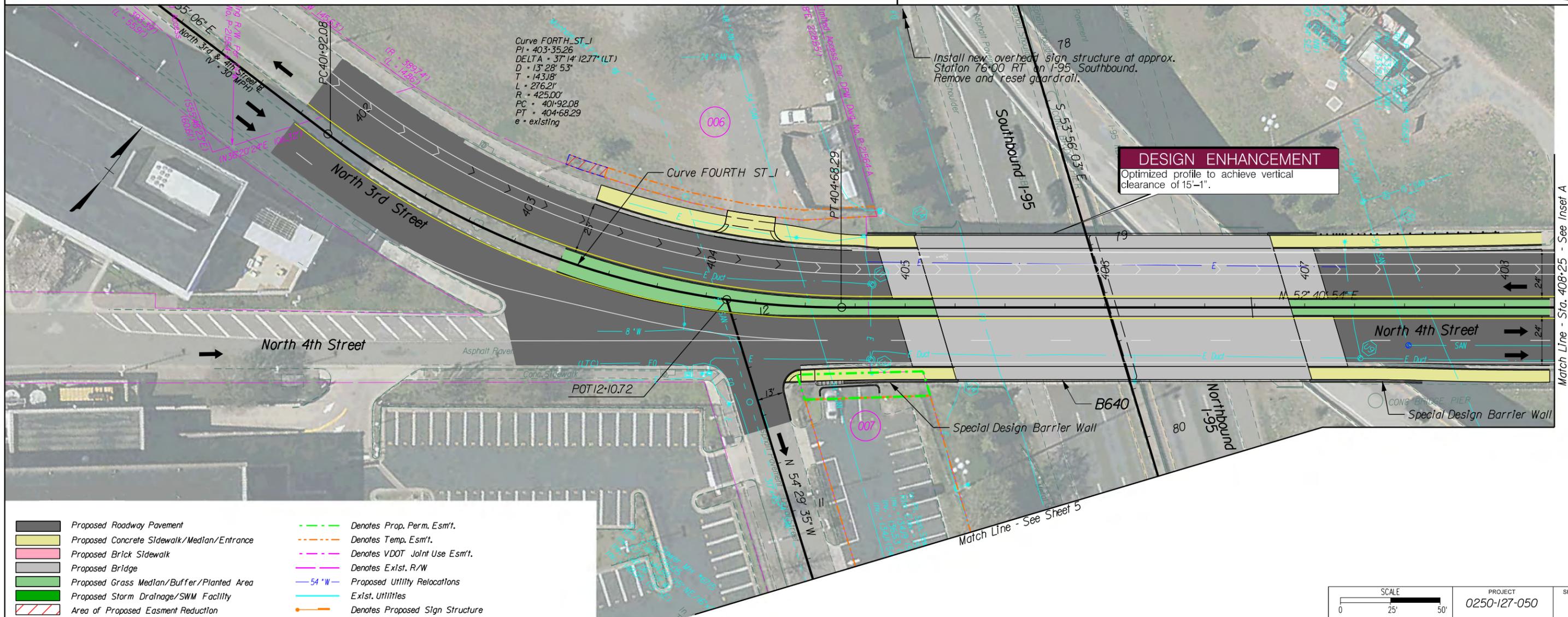
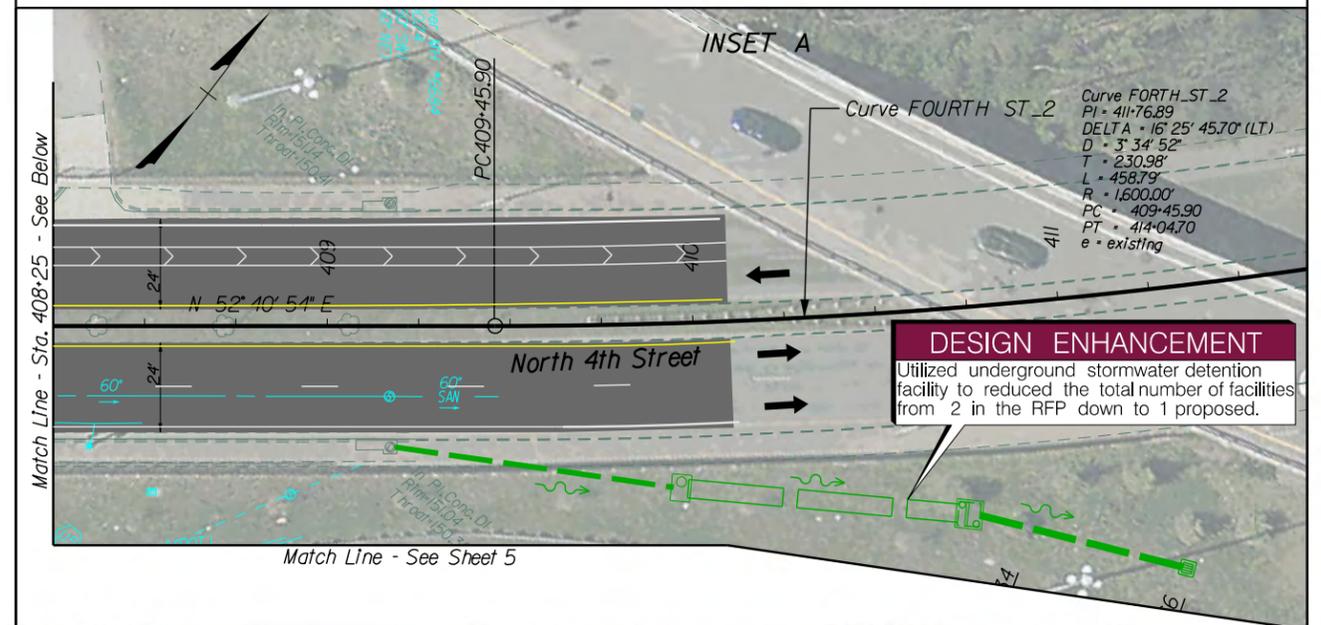
SCALE 0 25' 50'	PROJECT 0250-127-050	SHEET NO. 3
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STATE	ROUTE	STATE	SHEET NO.
		PROJECT	
VA.	95	0250-127-050 PI01, C501, B614	4

Typical Sections
3rd/4th Street

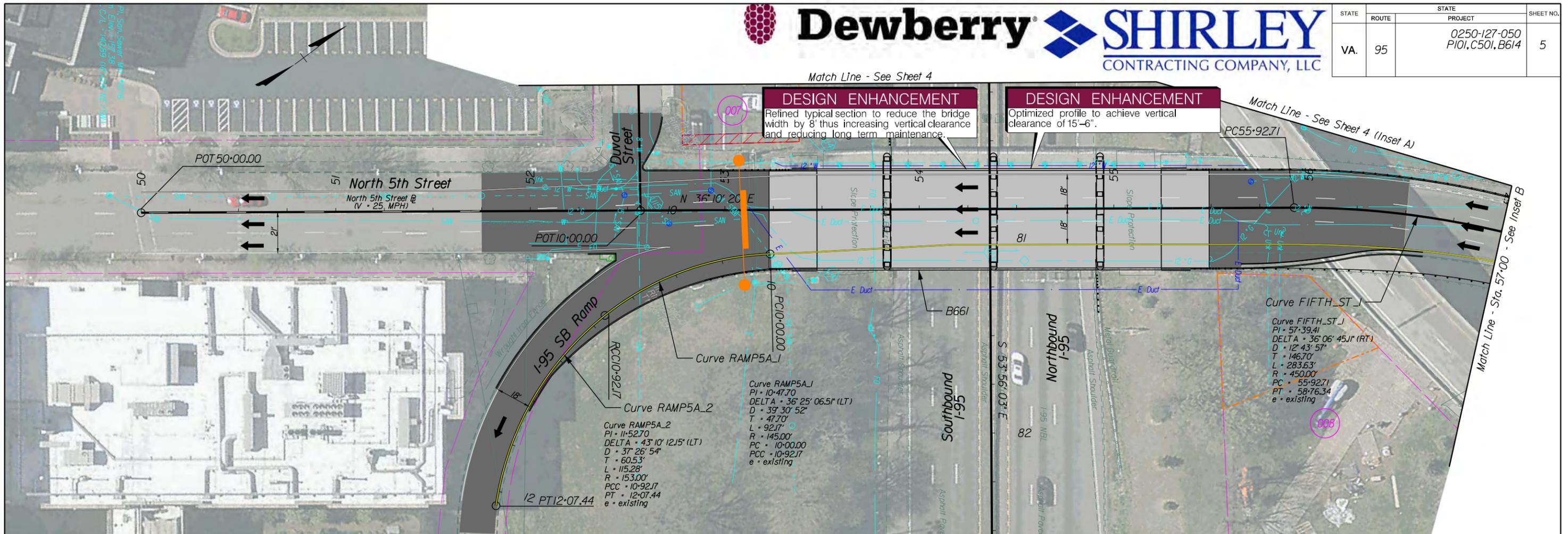


Not To Scale

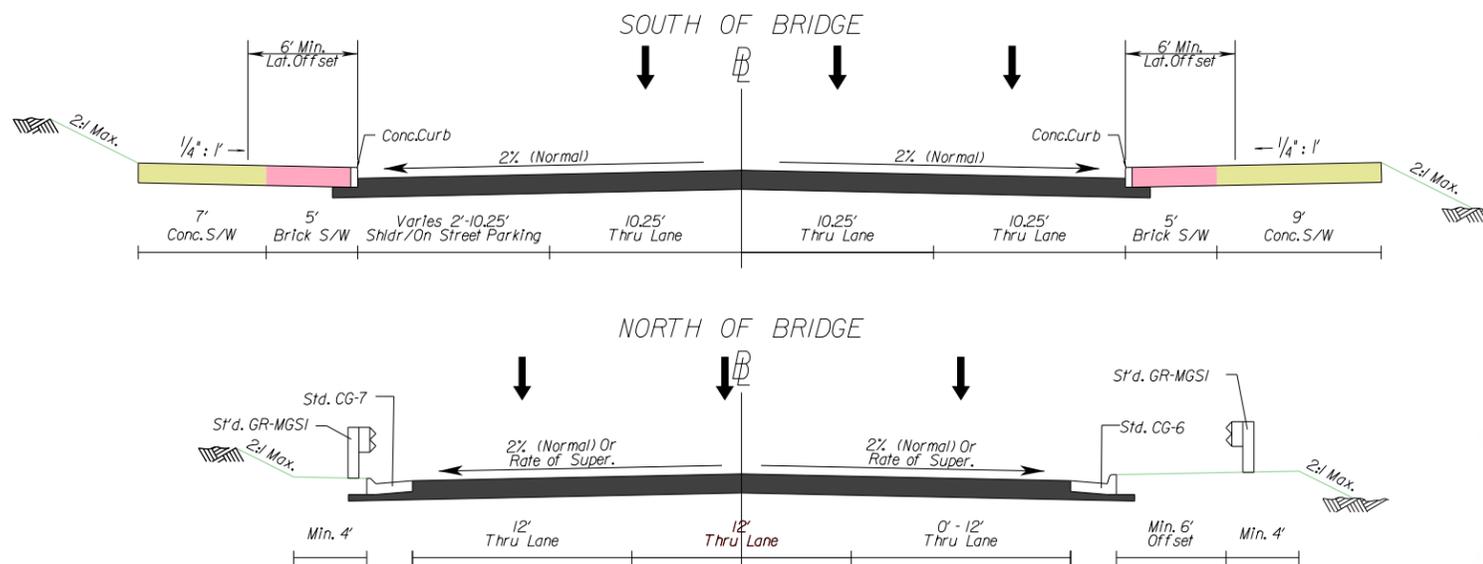


- Proposed Roadway Pavement
- Proposed Concrete Sidewalk/Median/Entrance
- Proposed Brick Sidewalk
- Proposed Bridge
- Proposed Grass Median/Buffer/Planted Area
- Proposed Storm Drainage/SWM Facility
- Area of Proposed Easment Reduction
- Denotes Prop. Perm. Esm't.
- Denotes Temp. Esm't.
- Denotes VDOT Joint Use Esm't.
- Denotes Ex'ist. R/W
- 54' W Proposed Utility Relocations
- Ex'ist. Utilities
- Denotes Proposed Sign Structure

STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	95	0250-127-050 P101, C501, B614	5

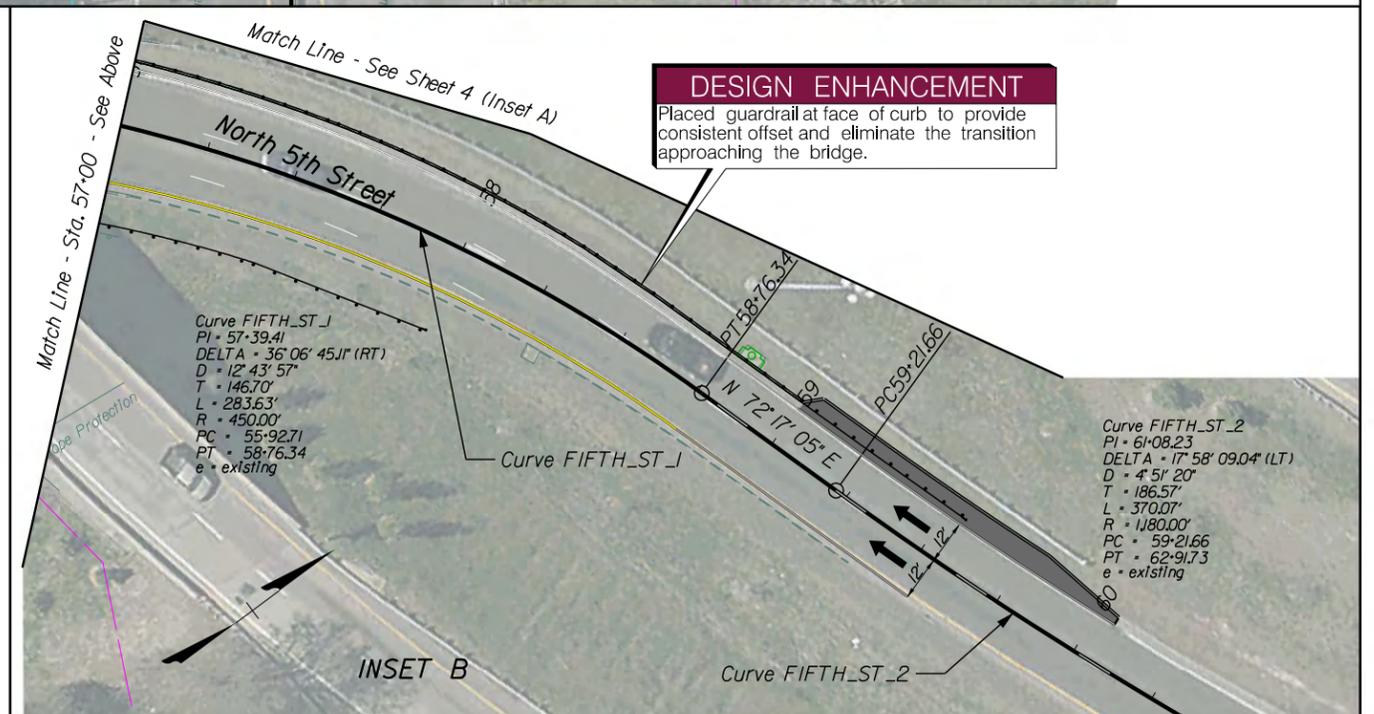


Typical Sections 5th Street



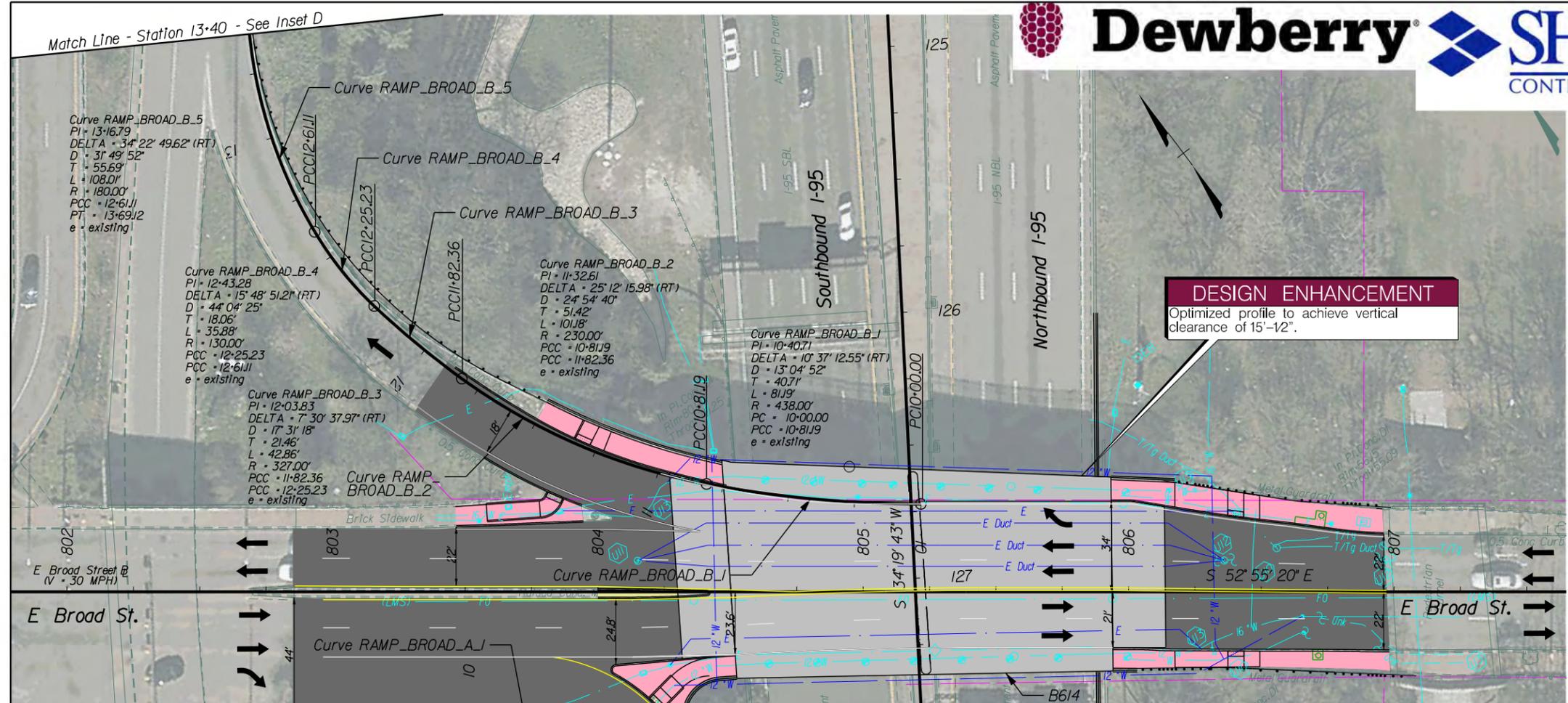
Not To Scale

- Proposed Roadway Pavement
- Proposed Concrete Sidewalk/Median/Entrance
- Proposed Brick Sidewalk
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- Proposed Grass Median/Buffer/Planted Area
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- Denotes Ex'ist. R/W
- Proposed Utility Relocations
- Ex'ist. Utilities
- Denotes Proposed Sign Structure

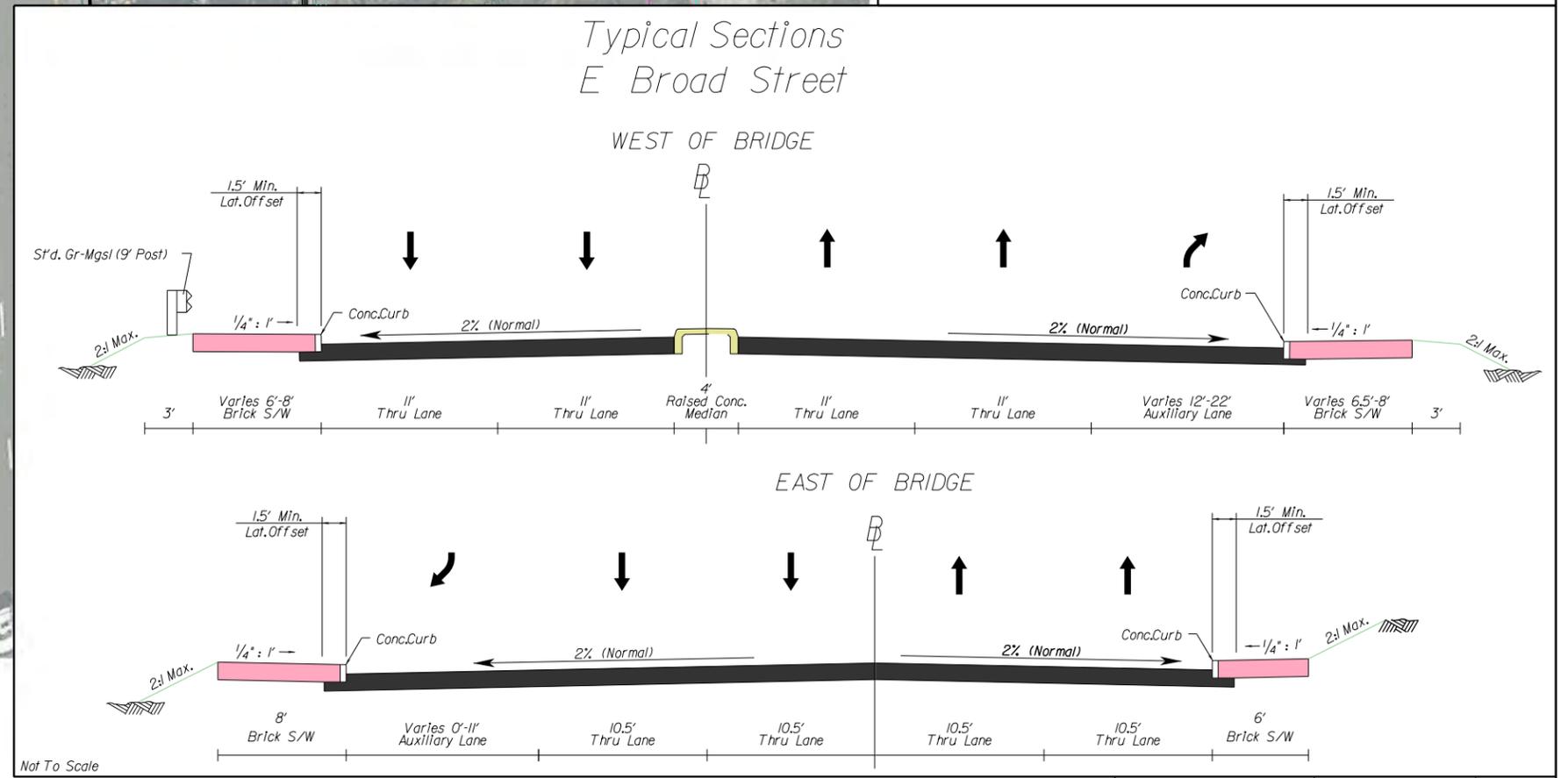
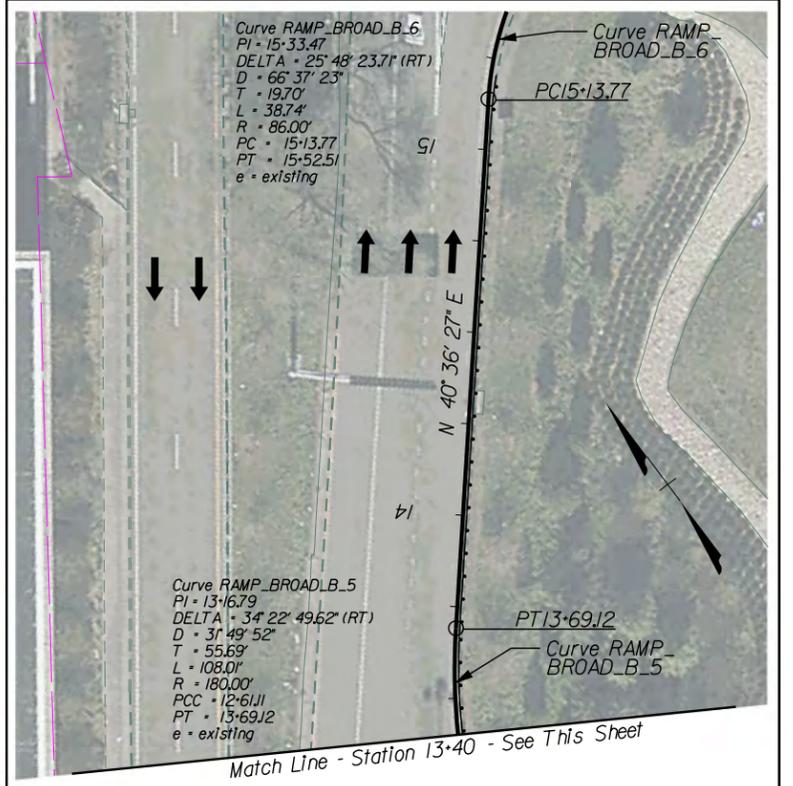


SCALE	PROJECT	SHEET NO.
0 25' 50'	0250-127-050	5

STATE	ROUTE	STATE PROJECT	SHEET NO.
VA.	95	0250-127-050 P101, C501, B614	7



DESIGN ENHANCEMENT
Optimized profile to achieve vertical clearance of 15'-12\"/>

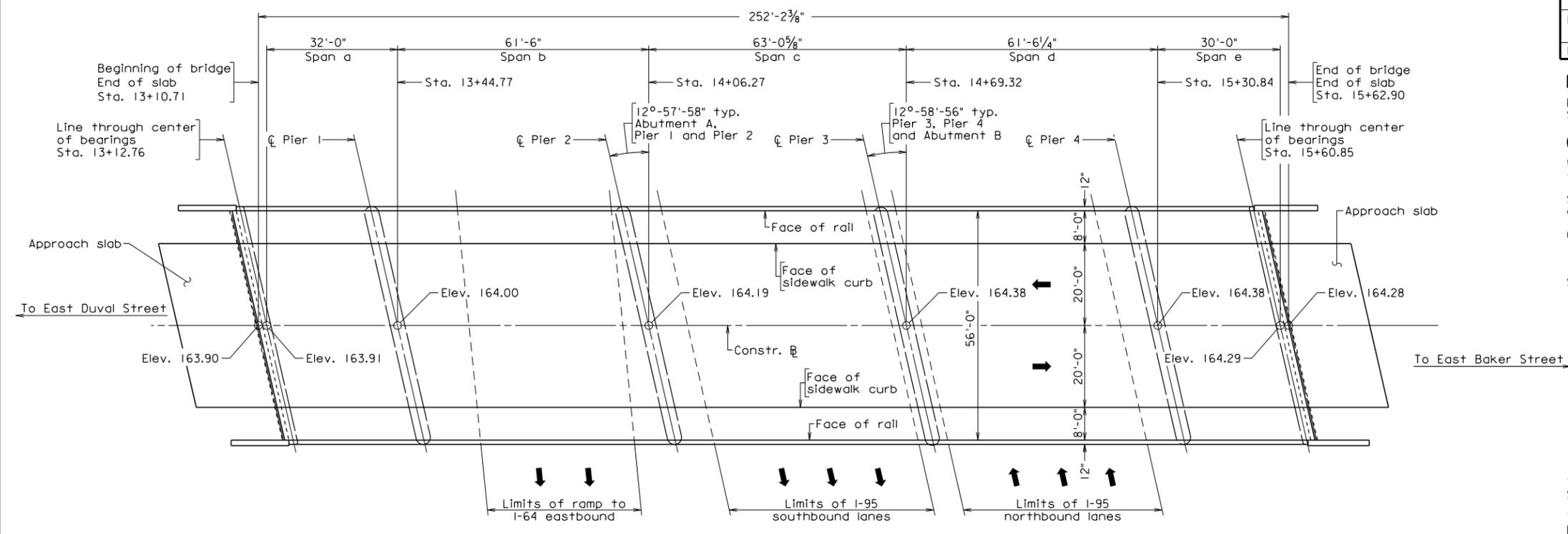


- Proposed Roadway Pavement
- Proposed Concrete Sidewalk/Median/Entrance
- Proposed Brick Sidewalk
- Proposed Bridge
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- Proposed Storm Drainage/SWM Facility
- Area of Proposed Easment Reduction
- Denotes Prop. Perm. Esm't.
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- Denotes VDOT Joint Use Esm't.
- Denotes Exst. R/W
- Proposed Utility Relocations
- Exst. Utilities
- Denotes Proposed Sign Structure

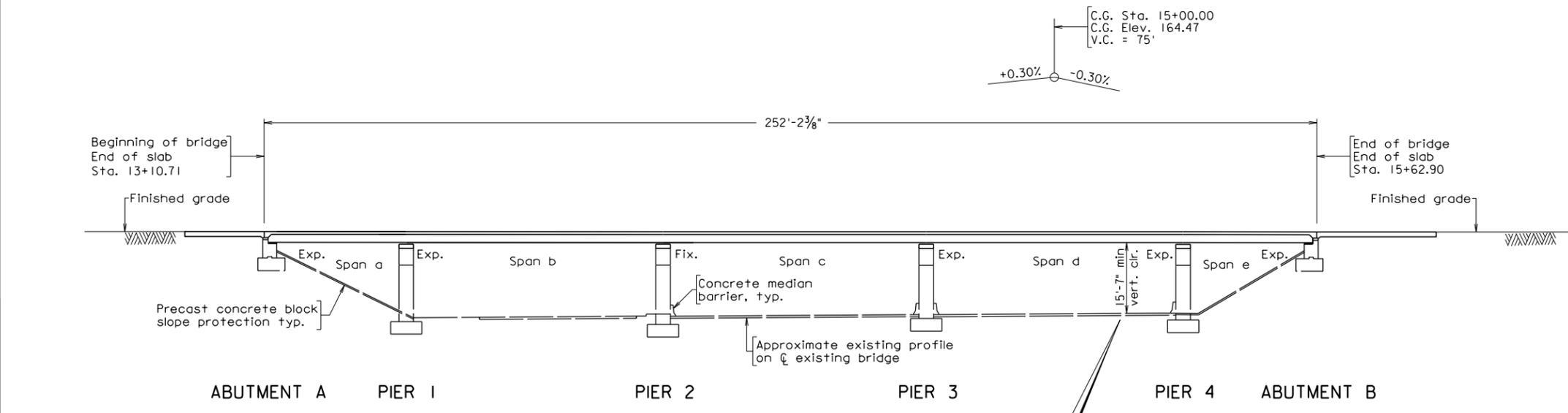
SCALE 0 25' 50'	PROJECT 0250-127-050	SHEET NO. 7
--------------------	-------------------------	----------------

4.3.2 - Conceptual Structural Plans

STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT
VA.	STP-BR04(287)	95	U000-127-023, B601
Federal Structure No. 00000000021282		FHWA Construction and Scour Code: X271-SN	
Federal Stewardship and Oversight Code: N/A		UPC No. I11300	



PLAN



DEVELOPED SECTION ALONG CONSTR. \perp

DESIGN ENHANCEMENT
 Providing 7" more than minimum 15'-0" clearance.

DESIGN EXCEPTION(S):
 Reduced minimum vertical clearance from 16'-6" to 15'-0". Approved by State Structure and Bridge Engineer on April 12, 2021.

GENERAL NOTES:
 Width: 8'-0" sidewalk, 40'-0" roadway, 8'-0" sidewalk. Overall width 56'-0" face-to-face of rails.
 Span layout: 32'-0" - 61'-6" - 63'-0 5/8" - 61'-6 1/4" - 30'-0" steel plate girder spans.
 Capacity: H20-44 loading (Pier 2, Pier 3, Pier 4, Pier 5, Abutment B), HS-20 loading (Pier 1 and Abutment A), HL-93 loading (proposed new elements).
 Specifications:
 Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.
 Design: AASHTO Standard Specifications for Highway Bridges, 1953 (Pier 2, Pier 3, Pier 5, Abutment B elements to remain).
 AASHTO Standard Specifications for Highway Bridges, 1961 (Abutment A and Pier 1 elements to remain).
 AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications (new elements only).
 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.
 This project is to be constructed in accordance with the Virginia Department of Transportation Work Area Protection Manual, August 2011 and latest revisions.
 The existing structure is designated a Type B structure in accordance with Sec. 411.



COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF TRANSPORTATION
 PROPOSED SUPERSTRUCTURE REPLACEMENT

1ST STREET OVER I-95 AND I-64
 CITY OF RICHMOND
 PROJ. U000-127-023, B601

01 - 1st Street GPE.dgn

VDOT S&B DIVISION RICHMOND, VA STRUCTURAL ENGINEER
PLANS BY: Dewberry Engineers Inc.
COORDINATED: ---
SUPERVISED: ---
DESIGNED: ---
DRAWN: ---
CHECKED: ---

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

Recommended for Approval: _____ Date _____
 District Project Development Engineer

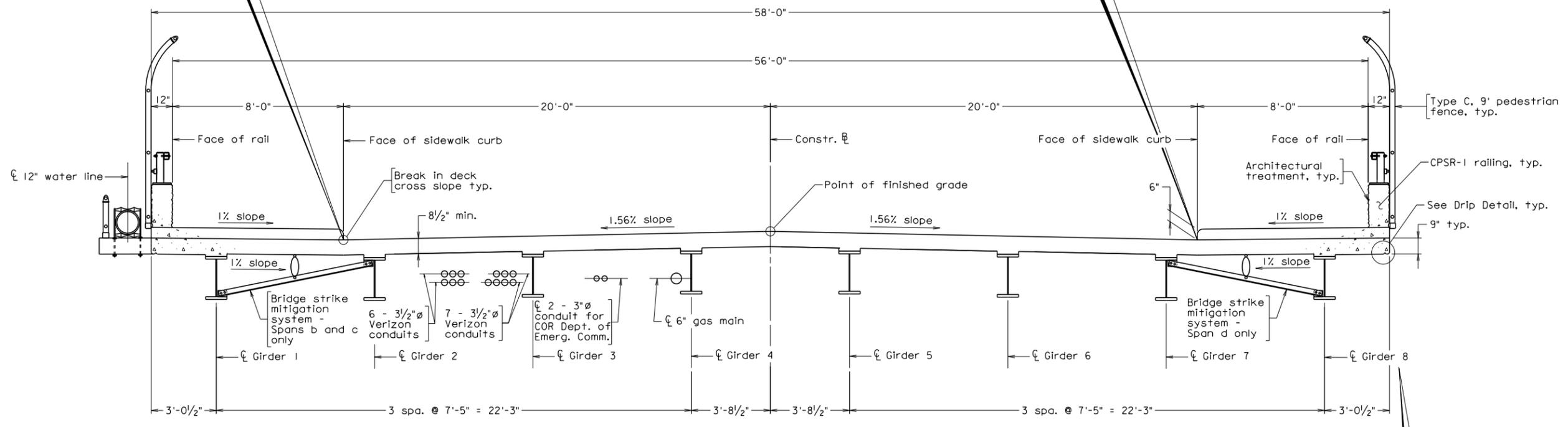
Approved: _____ Date _____
 District Administrator

Date: _____ © 2021, Commonwealth of Virginia Sheet 1 of 2

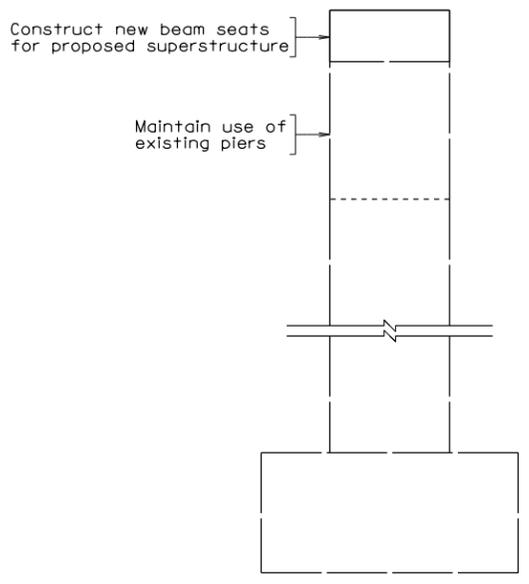
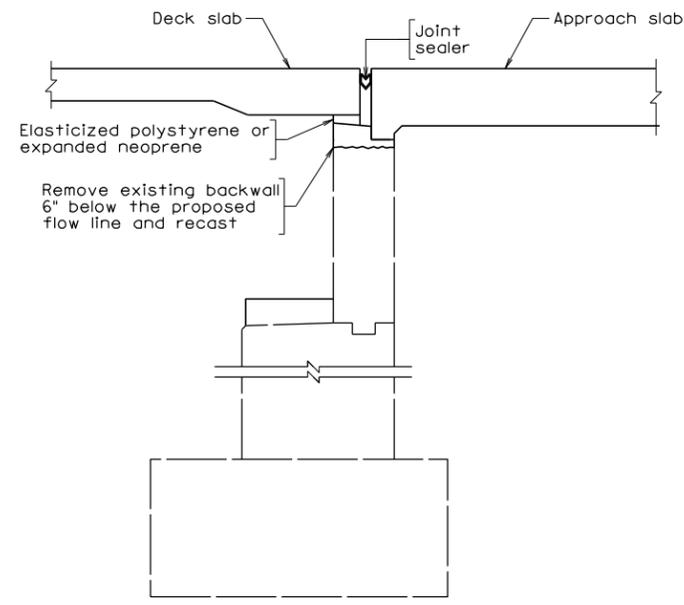
STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	NO.
VA.		XX	XXX-XXX-XXX BXXX

DESIGN ENHANCEMENT
Break in cross slope to help with vertical clearance

DESIGN ENHANCEMENT
Break in cross slope to help with vertical clearance



DESIGN ENHANCEMENT
Eight (8) girder superstructure, compared to nine (9) in the RFP Concept



PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

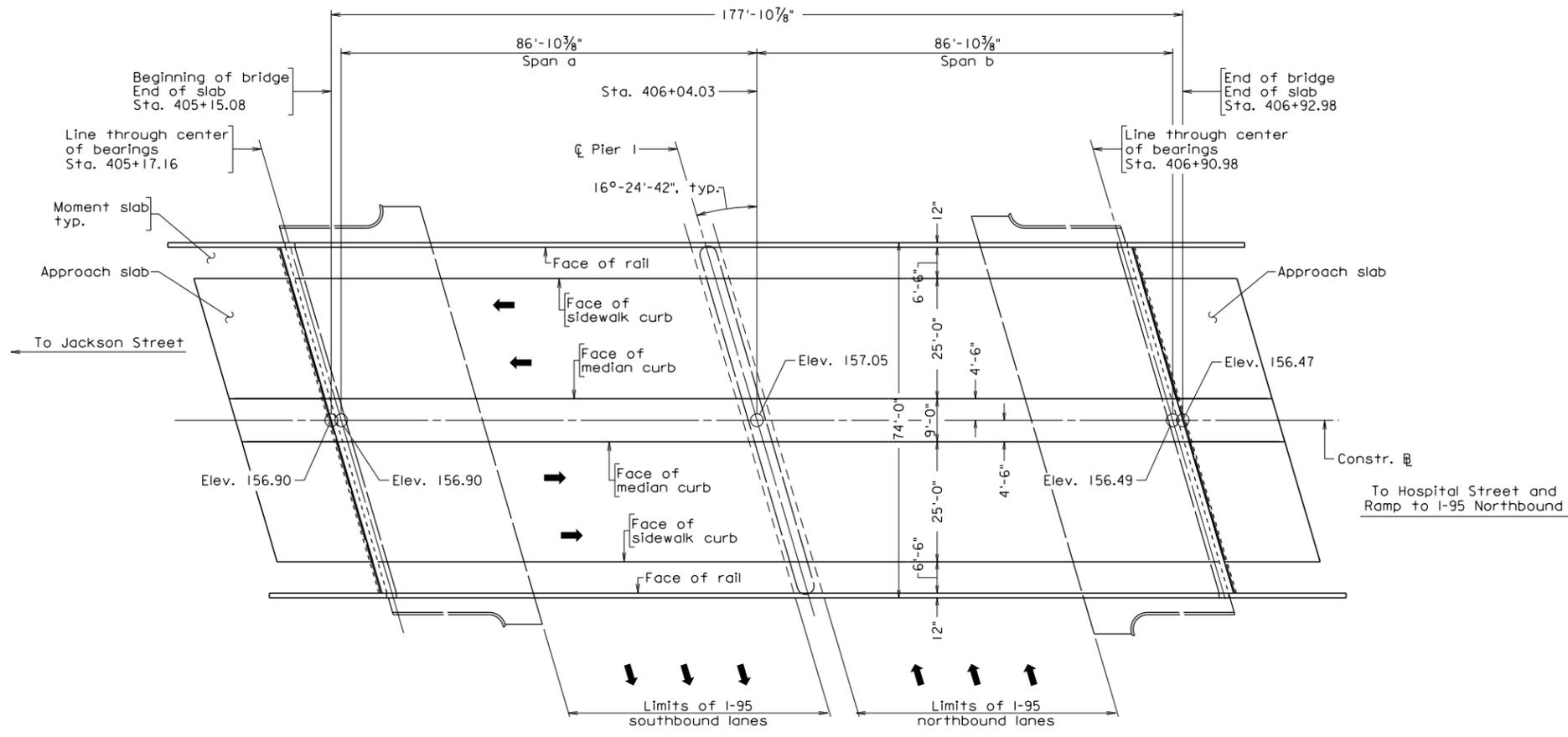


COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
IST STREET TRANSVERSE SECTION ABUTMENT AND PIER			
No.	Description	Date	Designed: EJA..... Drawn: JPD..... Checked: JPD.....
			Date: Aug. 2021
			Plan No.: XXX-XX
			Sheet No.: 2 of 2

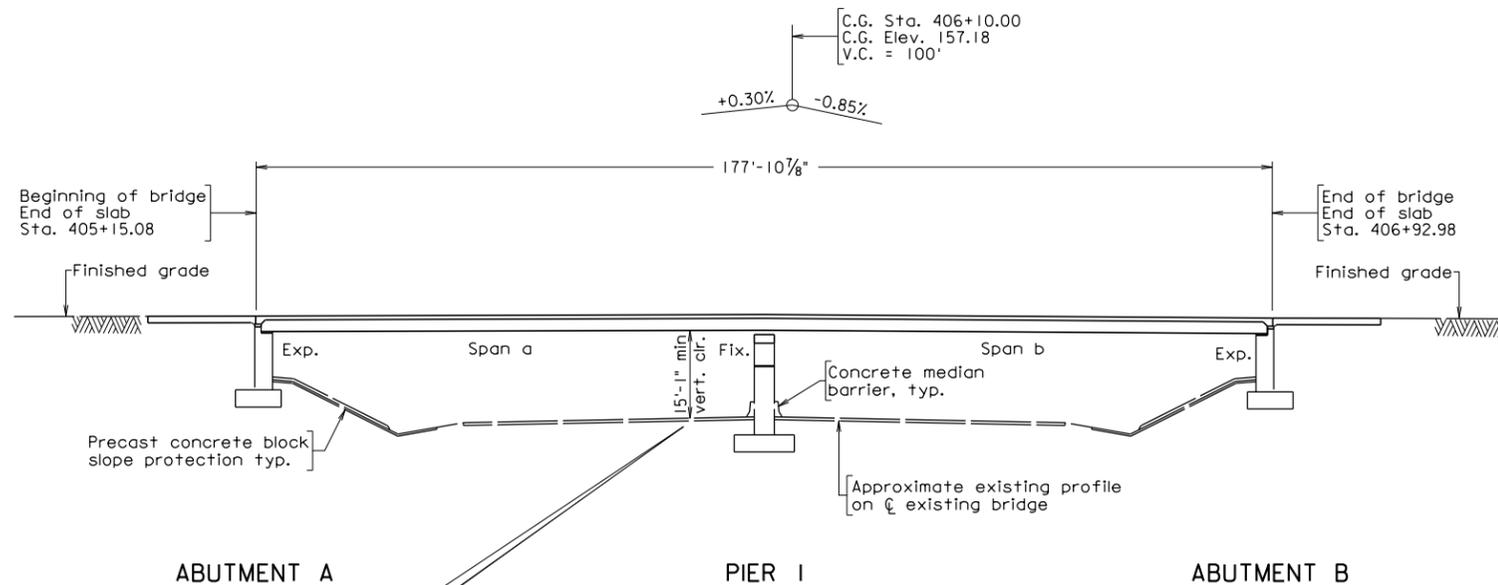
02 - 1st Street Transverse Section.dgn

DEWBERRY ENGINEERS INC.
FAIRFAX, VA
STRUCTURAL ENGINEER

STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT
VA.	NHPP-BR04(308)	95	0004-127-051, B640
Federal Structure No. 00000000021284		FHWA Construction and Scour Code: X271-SN	
Federal Stewardship and Oversight Code: N/A		UPC No. 113388	



PLAN



DESIGN ENHANCEMENT
 Providing 1" more than minimum 15'-0" clearance.

DEVELOPED SECTION ALONG CONSTR. B

DESIGN EXCEPTION(S):

Reduced minimum vertical clearance from 16'-6" to 15'-0". Approved by State Structure and Bridge Engineer on April 12, 2021.

GENERAL NOTES:

Width: 6'-6" sidewalk, 25'-0" roadway, 9'-0" median, 25'-0" roadway, 6'-6" sidewalk. Overall width 72'-0" face-to-face of rails.

Span layout: 86'-10 3/8" - 86'-10 3/8" steel plate girder spans.

Capacity: HS20-44 loading (substructure elements to remain). HL-93 loading (proposed new elements).

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.

Design: AASHTO Standard Specifications for Highway Bridges, 1961 (Substructure elements to remain).

AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications (new elements only)

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.

This project is to be constructed in accordance with the Virginia Department of Transportation Work Area Protection Manual, August 2011 and latest revisions.

Bridge No. of existing bridge is 8017. Plan No. is 176-18.

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



COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF TRANSPORTATION
 PROPOSED BRIDGE ON
 PROPOSED SUPERSTRUCTURE REPLACEMENT
 4TH STREET OVER I-95
 CITY OF RICHMOND
 PROJ. 0004-127-051, B640

Recommended for Approval: _____
 District Project Development Engineer Date

Approved: _____
 District Administrator Date

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

03 - 4th Street GPE.dgn

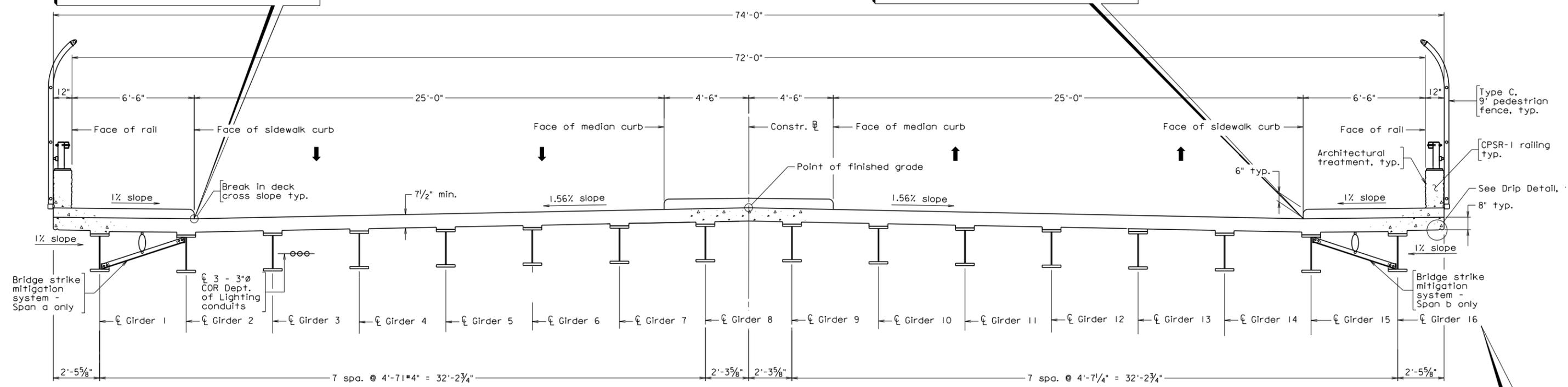
VDOT S&B DIVISION RICHMOND, VA STRUCTURAL ENGINEER
PLANS BY: Dewberry Engineers Inc.
COORDINATED: ---
SUPERVISED: ---
DESIGNED: ---
DRAWN: ---
CHECKED: ---

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

STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT	NO.
VA.		XX	XXXX-XXX-XXX BXXX	

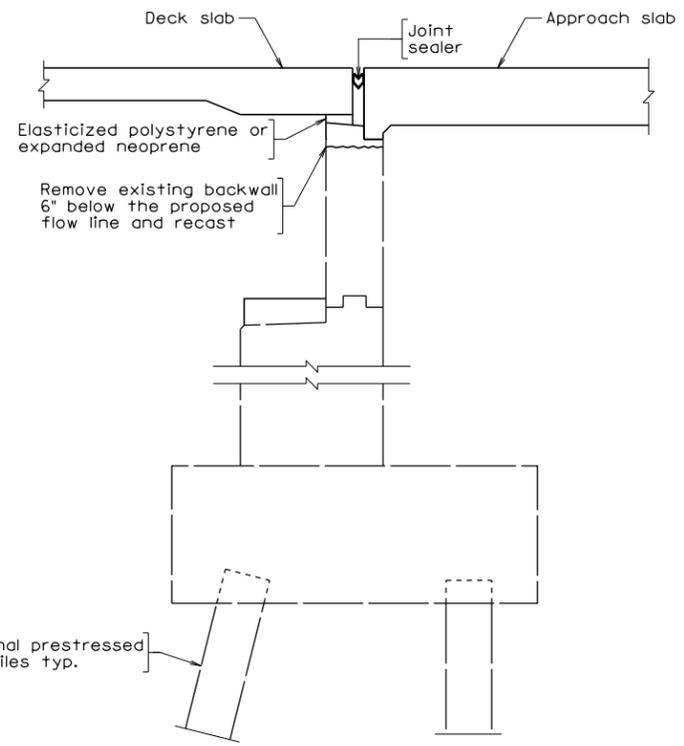
DESIGN ENHANCEMENT
Break in cross slope to help with vertical clearance

DESIGN ENHANCEMENT
Break in cross slope to help with vertical clearance



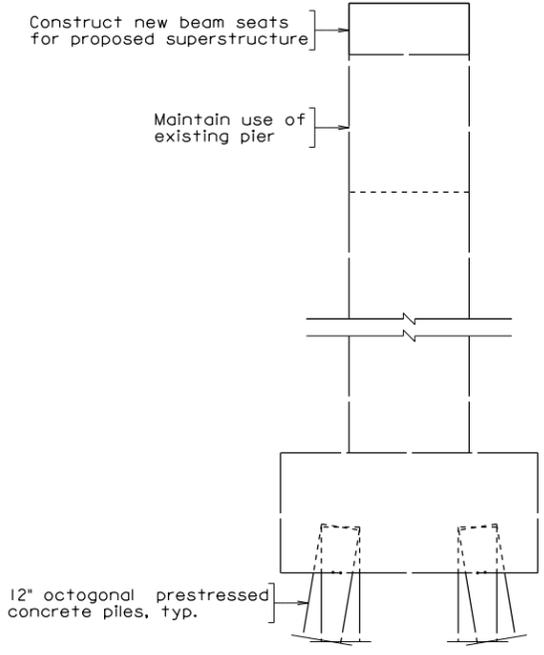
TRANSVERSE SECTION

DESIGN ENHANCEMENT
16 girder superstructure, compared to 18 in the RFP Concept



**ABUTMENT SECTION
CONVERT TO VA MICRO ABUTMENT**

Scale: 1/2" = 1'-0"



PIER END VIEW

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

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION



COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
4TH STREET TRANSVERSE SECTION ABUTMENT AND PIER			
No.	Description	Date	Revisions
Designed: EJA	Date	Plan No.	Sheet No.
Drawn: JPD	Aug. 2021	XXX-XX	2 of 2
Checked: JDD			

04 - 4th Street Transverse Section.dgn

DEWBERRY ENGINEERS INC.
FAIRFAX, VA
STRUCTURAL ENGINEER

STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT	NO.
VA.	NHPP-064-3(510)	95	0064-127-022, B661	1
Federal Structure No. 00000000021287			FHWA Construction and Scour Code: X271-SN	
Federal Stewardship and Oversight Code: N/A			UPC No. 111294	

DESIGN EXCEPTION(S):
 Reduced minimum vertical clearance from 16'-6" to 15'-0". Approved by State Structure and Bridge Engineer on XXXX X, XXXX.

GENERAL NOTES:
 Widths: 50'-0" roadway. Overall width 50'-0" face-to-face of rails.
 Span layout: 35'-0" - 54'-9" - 54'-9" - 30'-6" steel plate girder spans.
 Capacity: H20-44 loading (substructure elements to remain), HL-93 loading (proposed new elements)

Specifications:
 Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.
 Design: AASHTO Standard Specifications for Highway Bridges, 1953 (substructure elements to remain), AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications (new elements only)
 Standards: Virginia Department of Transportation Road and Bridge Standards, 2016; including all current revisions.

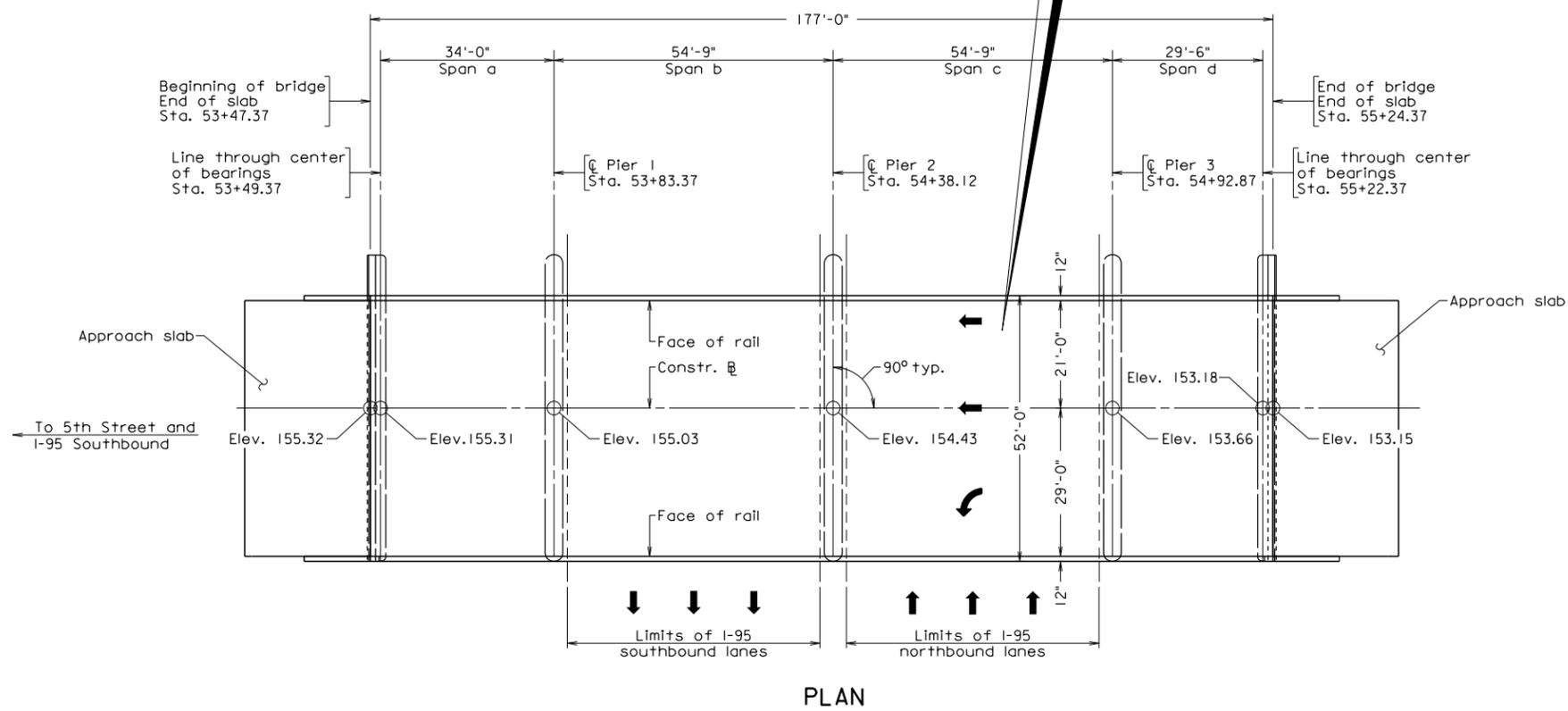
These plans are incomplete unless accompanied by the Supplemental Specifications and Special Provisions included in the contract documents.

This project is to be constructed in accordance with the Virginia Department of Transportation Work Area Protection Manual, August 2011 and latest revisions.

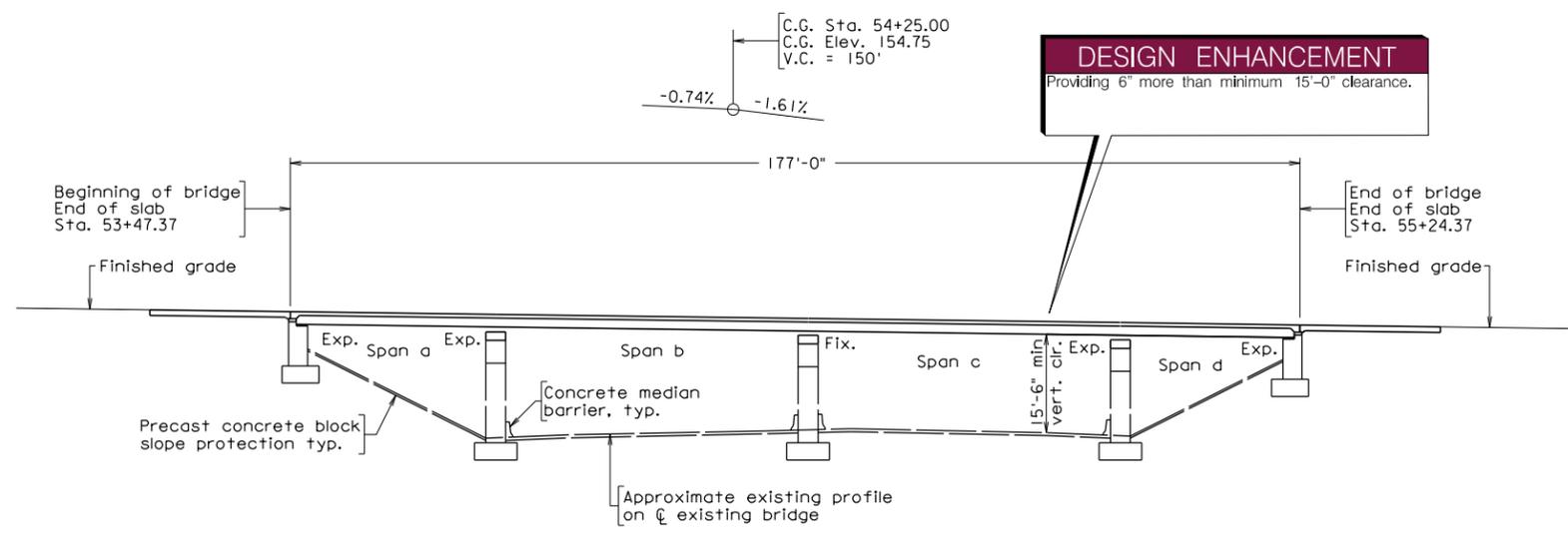
Bridge No. of existing bridge is 8019. Plan No. are 195-17, 195-17A, 195-17B, 195-17C, 195-17D, and 195-17E.

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

DESIGN ENHANCEMENT
 Reduced shoulder from 10'-0" to 2'-0", saves 8'-0" bridge width



DESIGN ENHANCEMENT
 Providing 6" more than minimum 15'-0" clearance.



COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF TRANSPORTATION
 PROPOSED BRIDGE REPAIR ON
 I-64 WB RAMP TO 5TH STREET
 AND I-95 SB OVER I-95
 CITY OF RICHMOND
 PROJ. 0064-127-022, B661

Recommended for Approval: _____ Date _____
 District Project Development Engineer

Approved: _____ Date _____
 District Administrator

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

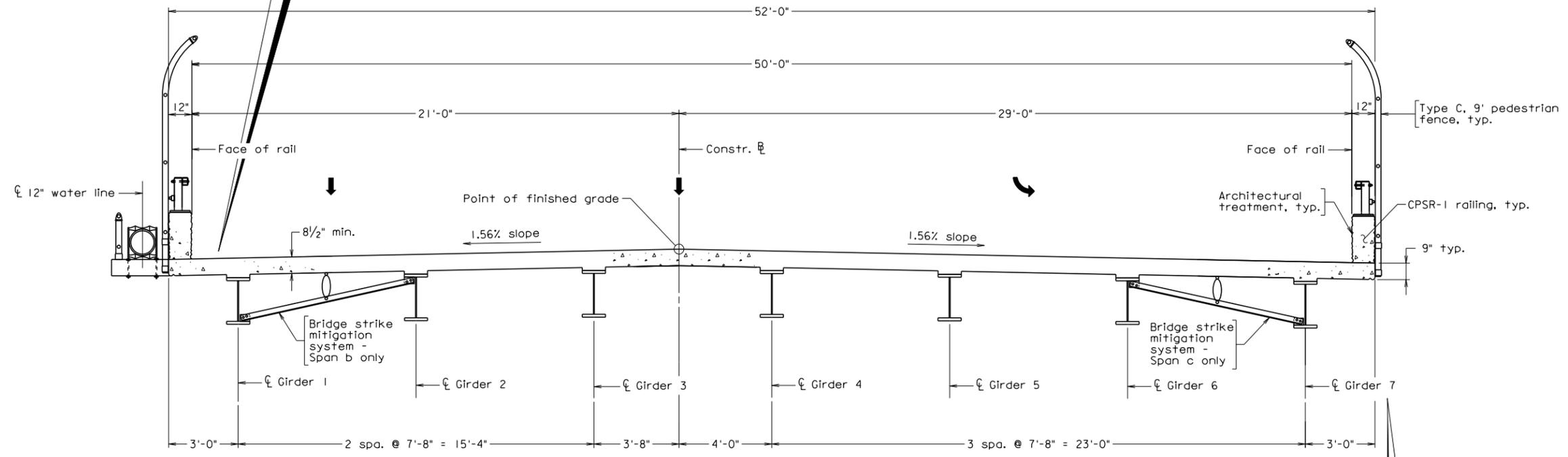
05 - 5th Street GPE.dgn

VDOT S&B DIVISION RICHMOND, VA STRUCTURAL ENGINEER
PLANS BY: Dewberry Engineers Inc.
COORDINATED: ---
SUPERVISED: ---
DESIGNED: ---
DRAWN: ---
CHECKED: ---

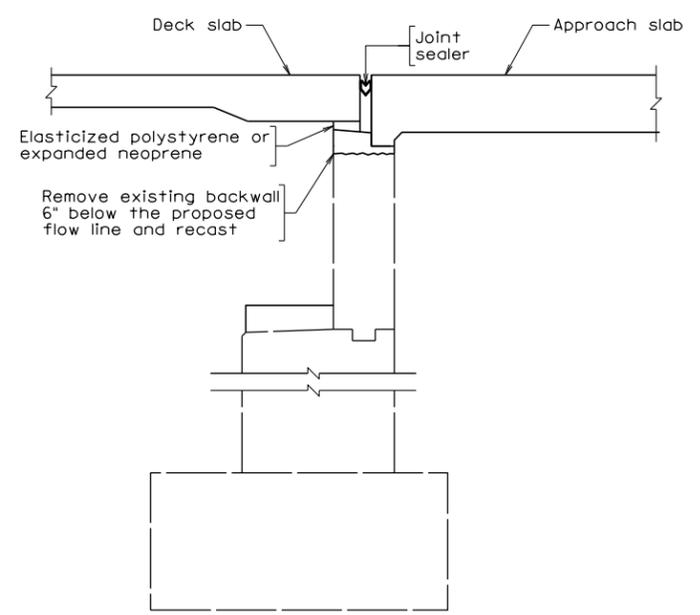
Scale: 1/16" = 1'-0"

STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT	NO.
VA.		XX	XXX-XXX-XXX BXXX	

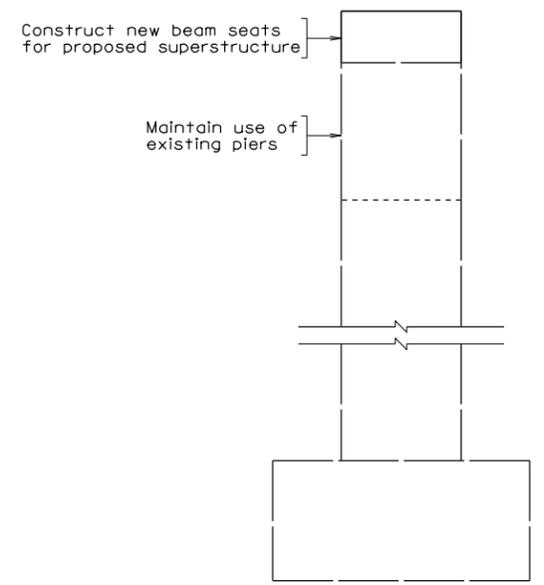
DESIGN ENHANCEMENT
Reduce shoulder from 10'-0" to 2'-0", saves 8'-0" of bridge width.



DESIGN ENHANCEMENT
Seven (7) girder superstructure, compared to eight (8) for the RFP concept



Scale: 1/2" = 1'-0"



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

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
5TH STREET TRANSVERSE SECTION ABUTMENT AND PIER			
No.	Description	Date	Revisions
Designed: FJA	Date	Plan No.	Sheet No.
Drawn: JDD	Aug. 2021	XXX-XX	2 of 2
Checked: JDD			

06 - 5th Street Transverse Section.dgn

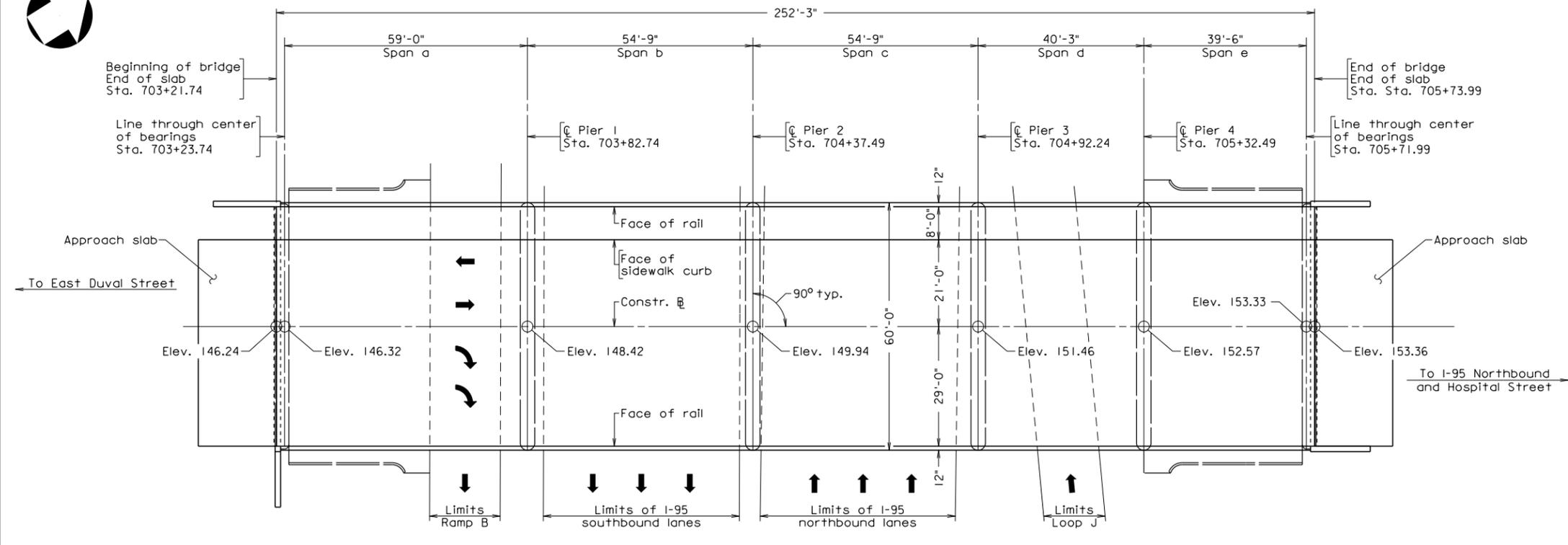
DEWBERRY ENGINEERS INC.
FAIRFAX, VA
STRUCTURAL ENGINEER



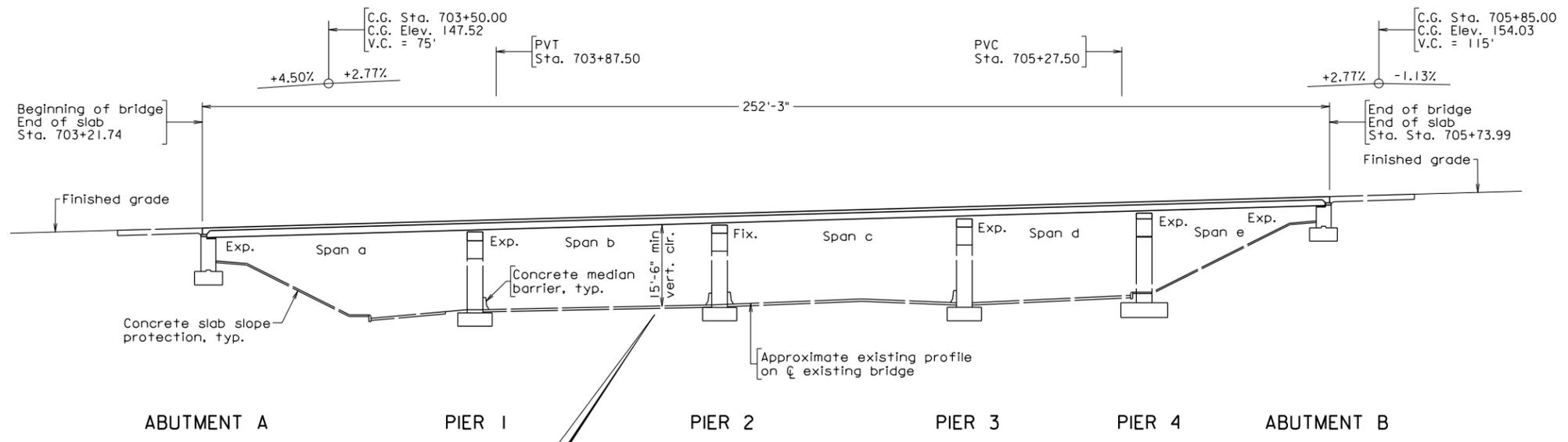
STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT	NO.
VA.	NHPP-5A27(784)	95	9999-127-101, B602	1
Federal Structure No. 00000000021289			FHWA Construction and Scour Code: X271-SN	
Federal Stewardship and Oversight Code: N/A			UPC No. 118484	

DESIGN EXCEPTION(S):
 Reduced minimum vertical clearance from 16'-6" to 15'-0". Approved by State Structure and Bridge Engineer on April 12, 2021.

GENERAL NOTES:
 Widths: 8'-0" sidewalk, 50'-0" roadway, Overall width 58'-0" face-to-face of rails.
 Span layout: 60'-0" - 54'-9" - 54'-9" - 40'-3" - 40'-6" steel plate girder spans.
 Capacity: H20-44 loading (Pier 1, Pier 2, Pier 3), HS20-44 loading (Pier 4, Abutment A, Abutment B), HL-93 loading (proposed new elements).
 Specifications:
 Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.
 Design: AASHTO Standard Specifications for Highway Bridges, 1953 (Pier 1, Pier 2, and Pier 3, elements to remain).
 AASHTO Standard Specifications for Highway Bridges, 1961 (Abutment A, Pier 4, and Abutment B elements to remain).
 AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications (new elements only)
 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.
 This project is to be constructed in accordance with the Virginia Department of Transportation Work Area Protection Manual, August 2011 and latest revisions.
 Bridge No. of existing bridge is 8020. Plan No. are 195-18, 176-19, 176-19A, 195-18A, 195-18B, 195-18C, 195-18D, and 195-18E.
 The existing structure is designated a Type B structure in accordance with Sec. 411.



PLAN



DEVELOPED SECTION ALONG CONSTR. LINE

DESIGN ENHANCEMENT
 Providing 6" more than minimum 15'-0" clearance.



COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF TRANSPORTATION
 PROPOSED SUPERSTRUCTURE REPLACEMENT
 7TH STREET OVER I-95, LOOP J AND RAMP B
 CITY OF RICHMOND
 PROJ.: 9999-127-101, B602

VDOT S&B DIVISION RICHMOND, VA STRUCTURAL ENGINEER
PLANS BY: Dewberry Engineers Inc.
COORDINATED: ---
SUPERVISED: ---
DESIGNED: ---
DRAWN: ---
CHECKED: ---

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

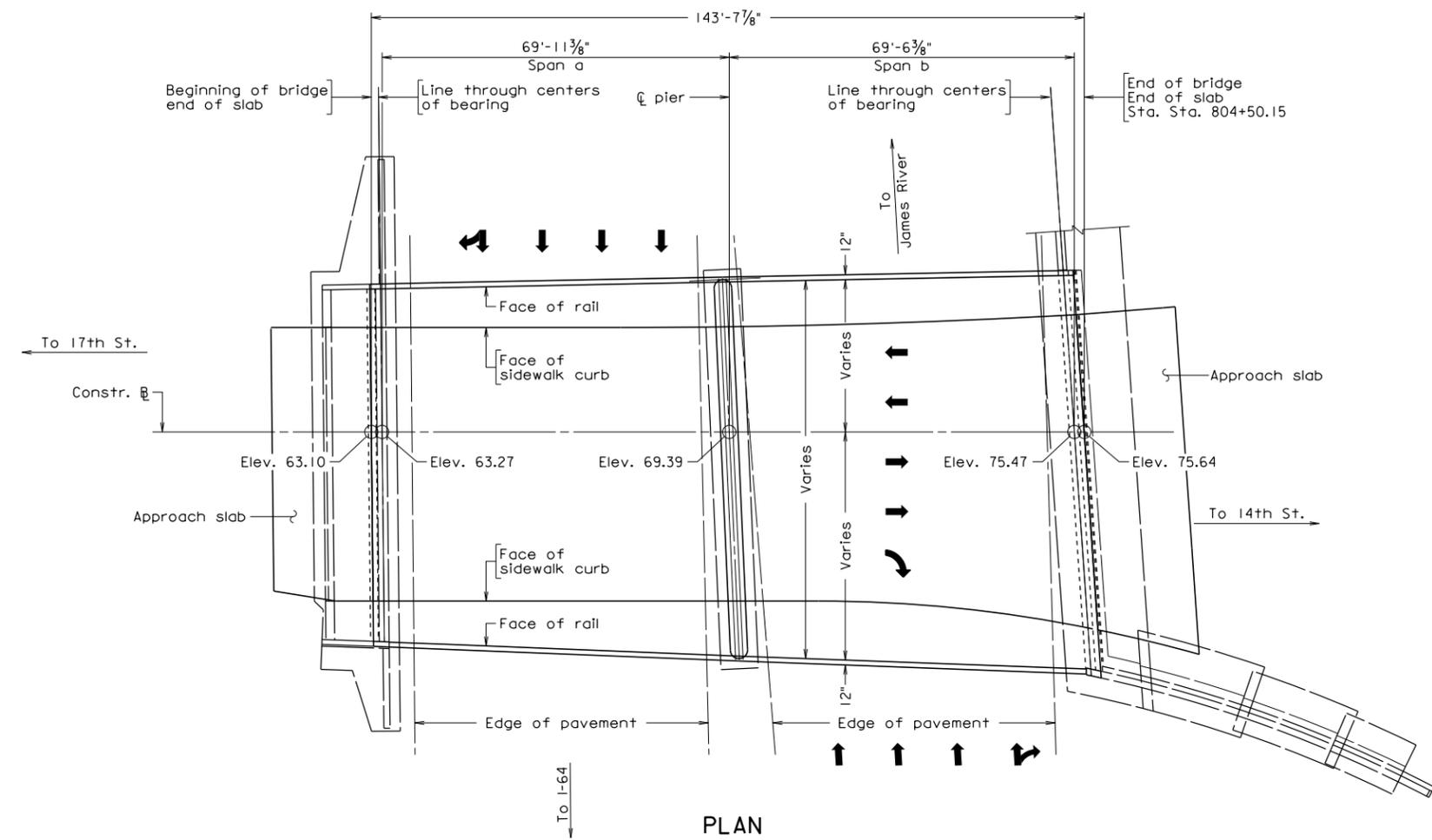
Recommended for Approval: _____ Date _____
 District Project Development Engineer

Approved: _____ Date _____
 District Administrator

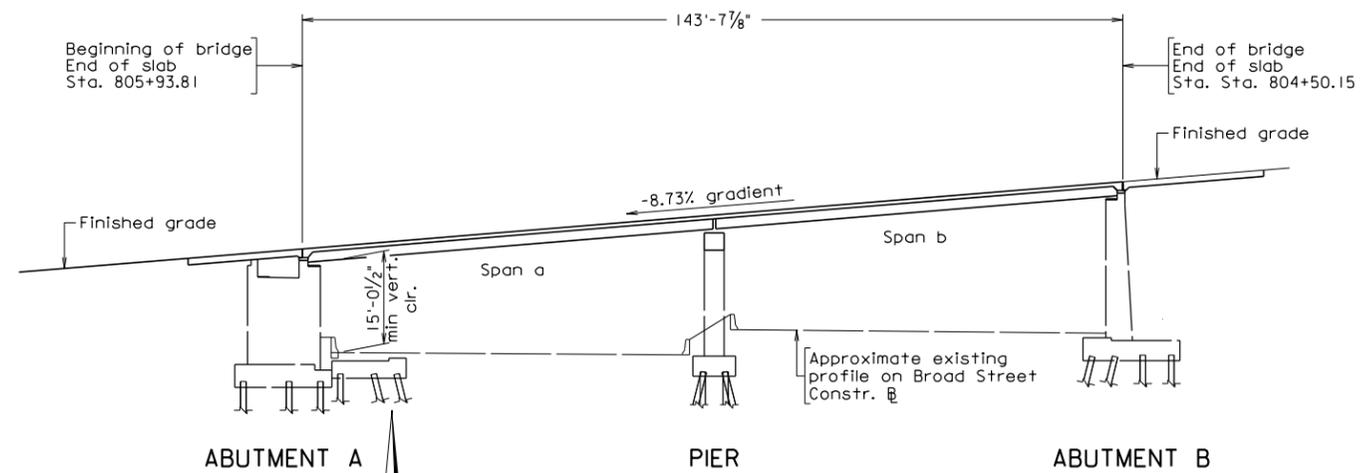
Date: _____ © 2017, Commonwealth of Virginia Sheet 1 of 2



STATE	FEDERAL AID		STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT	NO.
VA.	STP-BR04(287)	95	0250-127-050, B614	1
Federal Structure No. 00000000021569			FHWA Construction and Scour Code: X271-SN	
Federal Stewardship and Oversight Code:			UPC No.	113375



PLAN



DEVELOPED SECTION ALONG CONSTR. B

DESIGN ENHANCEMENT
 Providing 1/2" more than minimum 15'-0" clearance.

DESIGN EXCEPTION(S):
 Reduced minimum vertical clearance from 16'-6" to 15'-0". Approved by State Structure and Bridge Engineer on April 12, 2021.

GENERAL NOTES:
 Width: Varies face-to-face of rails.
 Span layout: 69'-11 3/8" - 69'-6 3/8" steel plate girder spans
 Drainage Area:
 Capacity: H20-44 loading (Pier and Abutment B), HS20-44 loading (Abutment A), HL-93 loading (proposed new elements).

Specifications:
 Construction: Virginia Department of Transportation Road and Bridge Specifications, 2016.
 Design: AASHTO Standard Specifications for Highway Bridges, 1953 (Pier and Abutment B elements to remain).
 AASHTO Standard Specifications for Highway Bridges, 1973 (Abutment A elements to remain).
 AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications (new elements only).
 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.
 This project is to be constructed in accordance with the Virginia Department of Transportation Work Area Protection Manual, August 2011 and latest revisions.
 Bridge No. of existing bridge is 1820. Plan No. are 195-20 and 255-30.
 The existing structure is designated a Type B structure in accordance with Sec. 411.



COMMONWEALTH OF VIRGINIA
 DEPARTMENT OF TRANSPORTATION
 PROPOSED SUPERSTRUCTURE REPLACEMENT ON
 BROAD STREET OVER I-95
 CITY OF RICHMOND
 PROJECT 0250-127-050, B614

Recommended for Approval: _____
 District Project Development Engineer Date

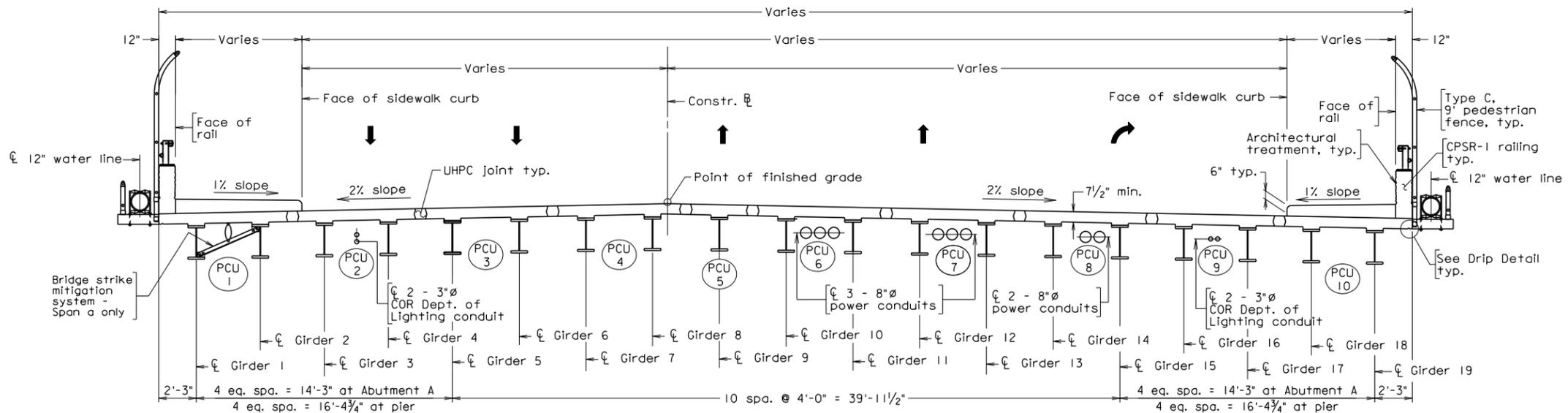
Approved: _____
 District Administrator Date

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

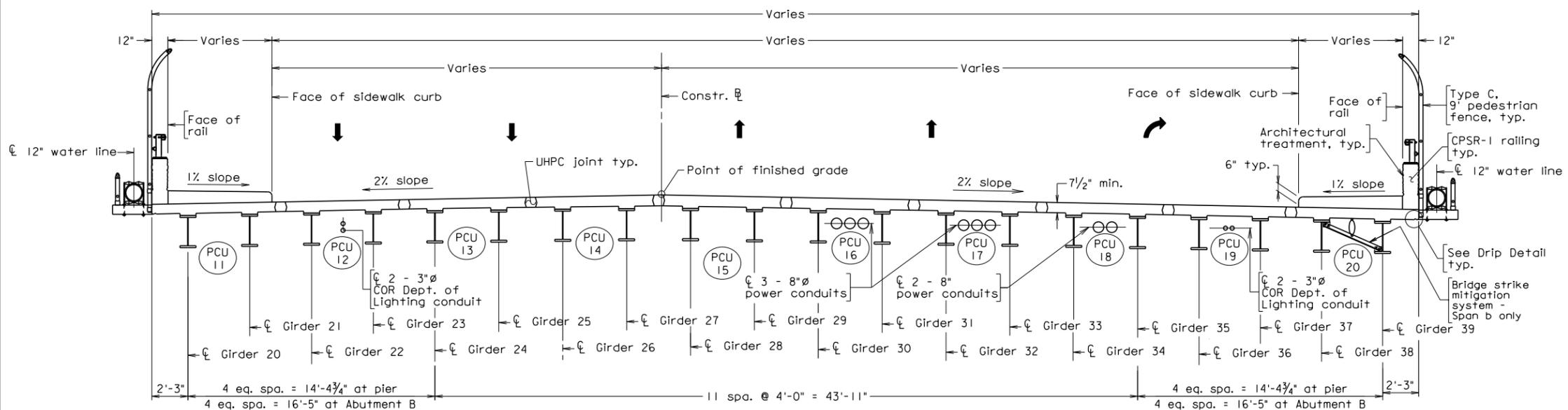
03 - Broad Street GPE.dgn

VDOT S&B DIVISION RICHMOND, VA STRUCTURAL ENGINEER
PLANS BY: Dewberry Engineers Inc.
COORDINATED: ---
SUPERVISED: ---
DESIGNED: ---
DRAWN: ---
CHECKED: ---

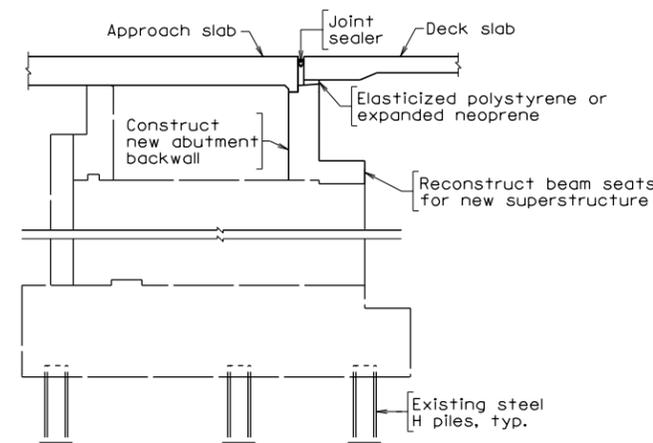
STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	PROJECT
VA.		XX	XXXX-XXX-XXX BXXX
			NO.



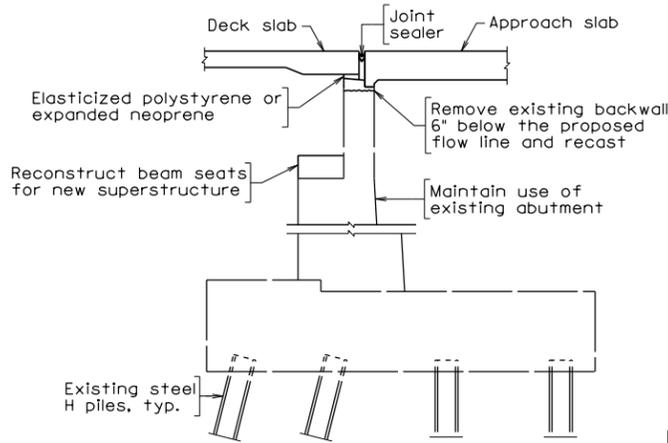
TRANSVERSE SECTION - SPAN a



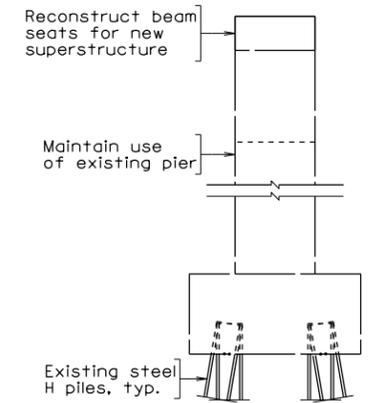
TRANSVERSE SECTION - SPAN b



ABUTMENT A SECTION
REBUILD BACKWALL TO VA MICRO ABUTMENT



ABUTMENT B SECTION
CONVERT TO VA MICRO ABUTMENT



PIER END VIEW

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
E. BROAD STREET TRANSVERSE SECTION			
No.	Description	Date	Designed: FJA Drawn: JPD Checked: JDD
	Revisions	Aug. 2021	Plan No. XXX-XX Sheet No. 2 of 2

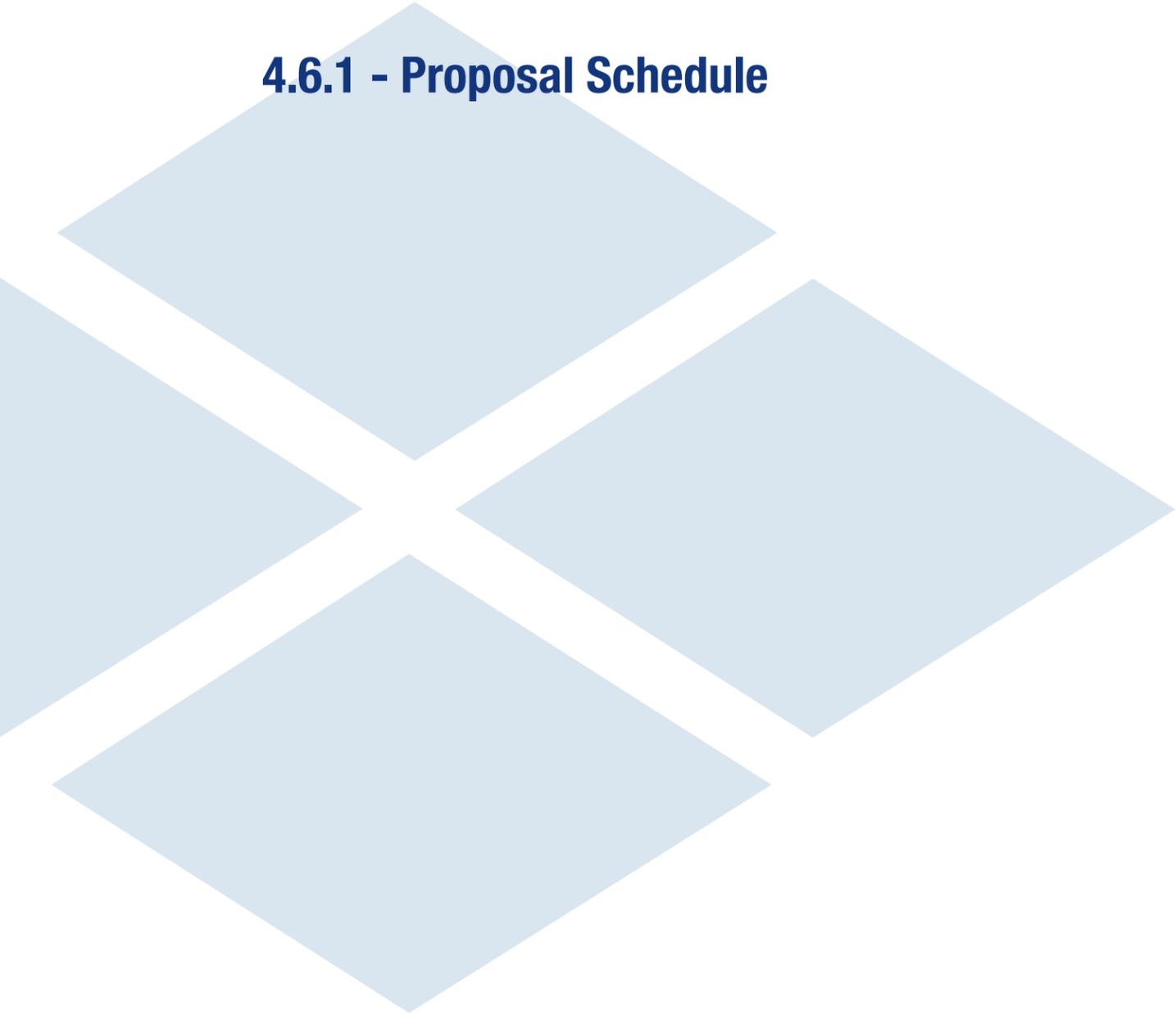
10 - Broad Street Transverse Section.dgn

DEWBERRY ENGINEERS INC.
FAIRFAX, VA
STRUCTURAL ENGINEER

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

© 2021, Commonwealth of Virginia

4.6.1 - Proposal Schedule



Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024												2025
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan									
VDOT BRIDGES OVER I-95 BUNDLING CITY OF RICHMOND-C00111300DB107																																										
SCHEDULE MILESTONES																																										
PROJECT MILESTONES																																										
AA00000-1000	Notice of Intent to Award	0	30-Sep-21*		1	◆ Notice of Intent to Award																																				
AA00000-1010	CTB Approval / Notice to Award	0	20-Oct-21		1	◆ CTB Approval / Notice to Award																																				
AA00000-1020	Provide Payment & Performance Bonds /Insurance	1	21-Oct-21	21-Oct-21	20	◆ Provide Payment & Performance Bonds /Insurance																																				
AA00000-1030	Design-Build Contract Execution	0	03-Nov-21		1	◆ Design-Build Contract Execution																																				
AA00000-1040	Scope Validation Period (120 Days)	120	10-Nov-21	09-Mar-22	74	◆ Scope Validation Period (120 Days)																																				
AA00000-1050	Notice to Proceed	0	10-Nov-21*		1	◆ Notice to Proceed																																				
AA00000-1060	Unique Milestone	0		02-Nov-23	0	◆ Unique Milestone																																				
AA00000-1070	Project Ready for Final Inspection	0		12-Nov-24	0	◆ Project Ready																																				
AA00000-1080	VDOT Punchlist Inspection	10	13-Nov-24	22-Nov-24	0	◆ VDOT Punch																																				
AA00000-1090	Early Completion Milestone -Final Completion Date	0		22-Nov-24*	0	◆ Early Comp																																				
CONSTRUCTION KEY DATES																																										
7TH STREET BRIDGE																																										
AB00000-1000	Start Construction 7th Street Bridge	0	14-Jun-22		0	◆ Start Construction 7th Street Bridge																																				
AB00000-1030	Complete 7th Street Bridge	0		02-Nov-23	0	◆ Complete 7th Street Bridge																																				
5TH STREET BRIDGE																																										
AB00000-1010	Start Construction 5th Street Bridge	0	21-Dec-22		119	◆ Start Construction 5th Street Bridge																																				
AB00000-1050	Complete 5th Street Bridge	0		27-Feb-24	259	◆ Complete 5th Street Bridge																																				
1ST STREET BRIDGE																																										
AB00000-1020	Start Construction 1st Street Bridge	0	20-Apr-23		64	◆ Start Construction 1st Street Bridge																																				
AB00000-1080	Complete 1st Street Bridge	0		17-Sep-24	56	◆ Complete 1st Street Bridge																																				
4TH STREET BRIDGE																																										
AB00000-1040	Start Construction 4th Street Bridge	0	03-Nov-23		0	◆ Start Construction 4th Street Bridge																																				
AB00000-1090	Complete 4th Street Bridge	0		12-Nov-24	0	◆ Complete 4th																																				
E. BROAD STREET BRIDGE																																										
AB00000-1060	Start Construction E. Broad Street	0	05-Mar-24		139	◆ Start Construction E. Broad Street																																				
AB00000-1070	Complete E. Broad Street Bridge	0		02-Jul-24	133	◆ Complete E. Broad Street Bridge																																				
DESIGN PHASE																																										
PRELIMINARY DESIGN WORK																																										
DESIGN QA/QC PLAN																																										
BAA0000-1000	Prepare/Submit Design QA/QC Plan	24	10-Nov-21	15-Dec-21	14	◆ Prepare/Submit Design QA/QC Plan																																				
BAA0000-1010	Present Design QA/QC Plan / Kick Off Meeting	1	16-Dec-21	16-Dec-21	14	◆ Present Design QA/QC Plan / Kick Off Meeting																																				
BAA0000-1020	VDOT Review Design QA/QC Plan	21	17-Dec-21	06-Jan-22	22	◆ VDOT Review Design QA/QC Plan																																				
BAA0000-1030	QA/QC Plan Approved	0		06-Jan-22	16	◆ QA/QC Plan Approved																																				
SURVEY and MAPPING																																										
BAB0000-1010	Set Control and Panel Points	12	10-Nov-21	29-Nov-21	1	◆ Set Control and Panel Points																																				
BAB0000-1000	Distribute Access Letters	34	10-Nov-21	13-Dec-21	34	◆ Distribute Access Letters																																				
BAB0000-1020	Base Mapping / Field Survey	25	10-Nov-21	16-Dec-21	1	◆ Base Mapping / Field Survey																																				
BAB0000-1030	Survey Layout Soil Boring Locations- Roadways	6	17-Nov-21	24-Nov-21	8	◆ Survey Layout Soil Boring Locations- Roadways																																				
BAB0000-1040	Survey Layout Soil Boring Locations- Bridges	6	17-Nov-21	24-Nov-21	8	◆ Survey Layout Soil Boring Locations- Bridges																																				
BAB0000-1050	Property Access Hold	15	14-Dec-21	05-Jan-22	22	◆ Property Access Hold																																				
BAB0000-1060	Property Research	25	06-Jan-22	09-Feb-22	22	◆ Property Research																																				
BAB0000-1070	Set Property Corners	10	10-Feb-22	24-Feb-22	22	◆ Set Property Corners																																				
GEOTECHNICAL INVESTIGATIONS and REPORTING																																										
ROADWAY GER																																										
BAC1000-1000	Prepare Roadway Soil Boring Location Plan-All Locations	5	10-Nov-21	16-Nov-21	28	◆ Prepare Roadway Soil Boring Location Plan-All Locations																																				
7TH STREET BRIDGE																																										
BAC1100-1000	Roadway Geotechnical Field Investigation	6	29-Nov-21	06-Dec-21	8	◆ Roadway Geotechnical Field Investigation																																				
BAC1100-1010	Perform Pavement Analysis	5	07-Dec-21	13-Dec-21	16	◆ Perform Pavement Analysis																																				
BAC1100-1020	Prepare & Submit Pavement Analysis Report	10	14-Dec-21	28-Dec-21	16	◆ Prepare & Submit Pavement Analysis Report																																				
BAC1100-1030	Lab Sampling and Field Data Compilation	10	20-Dec-21	04-Jan-22	8	◆ Lab Sampling and Field Data Compilation																																				
BAC1100-1040	Prepare Roadway GER	20	05-Jan-22	01-Feb-22	8	◆ Prepare Roadway GER																																				
BAC1100-1050	Submit Roadway GER	0		01-Feb-22	8	◆ Submit Roadway GER																																				
BAC1100-1060	VDOT Review Final Geotechnical (90 day Review for D/B Projects)	90	02-Feb-22	02-May-22	11	◆ VDOT Review Final Geotechnical (90 day Review for D/B Projects)																																				
5TH STREET BRIDGE																																										
BAC1200-1000	Roadway Geotechnical Field Investigation	12	07-Dec-21	22-Dec-21	73	◆ Roadway Geotechnical Field Investigation																																				
BAC1200-1010	Perform Pavement Analysis	10	23-Dec-21	07-Jan-22	84	◆ Perform Pavement Analysis																																				
BAC1200-1020	Lab Sampling and Field Data Compilation	20	29-Dec-21	26-Jan-22	184	◆ Lab Sampling and Field Data Compilation																																				
BAC1200-1030	Prepare & Submit Pavement Analysis Report	10	10-Jan-22	21-Jan-22	84	◆ Prepare & Submit Pavement Analysis Report																																				
BAC1200-1040	Prepare Roadway GER	30	27-Jan-22	10-Mar-22	184	◆ Prepare Roadway GER																																				
BAC1200-1050	Submit Roadway GER	0		10-Mar-22	184	◆ Submit Roadway GER																																				
BAC1200-1060	VDOT Review Final Geotechnical (90 day Review for D/B Projects)	90	11-Mar-22	08-Jun-22	265	◆ VDOT Review Final Geotechnical (90 day Review for D/B Projects)																																				
1ST STREET, 4TH STREET AND E. BROAD STREET BRIDGES																																										
BAC1300-1000	Roadway Geotechnical Field Investigation	11	23-Dec-21	10-Jan-22	73	◆ Roadway Geotechnical Field Investigation																																				
BAC1300-1010	Perform Pavement Analysis	10	11-Jan-22	24-Jan-22	73	◆ Perform Pavement Analysis																																				

█ Remaining Level of Effort █ Critical Remaining Work
█ Remaining Work ◆ Milestone



Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024												2025
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
5TH STREET- LAND DISTURBANCE PERMIT						90	28-Apr-22	04-Sep-22	115																																	
DBB0000-1000	Prepare LD-445 Form - 5th Street	40	28-Apr-22	23-Jun-22	115	Prepare LD-445 Form - 5th Street																																				
DBB0000-1010	VDOT Review of LD-445 / SWPPP- 5th Street	21	24-Jun-22	14-Jul-22	167	VDOT Review of LD-445 / SWPPP- 5th Street																																				
DBB0000-1020	Request City of Richmond Permit Coverage- 5th Street	0	24-Jun-22		115	Request City of Richmond Permit Coverage- 5th Street																																				
DBB0000-1030	Complete SWPPP (LD-455E) Certifications for 5th Street	5	15-Jul-22	21-Jul-22	115	Complete SWPPP (LD-455E) Certifications for 5th Street																																				
DBB0000-1040	Approved Land Disturbance Permit Application and SWPPP - 5th Street	0	22-Jul-22		168	Approved Land Disturbance Permit Application and SWPPP - 5th Street																																				
DBB0000-1050	Secure COR Permit Coverage and Release- 5th Street	45	22-Jul-22	04-Sep-22	168	Secure COR Permit Coverage and Release- 5th Street																																				
1ST STREET, 4TH STREET AND E. BROAD STREET - LAND DISTURBANCE PERMIT						90	08-Jul-22	13-Nov-22	148																																	
DBC0000-1000	Prepare LD-445 Form - 1st, 4th and Broad Street	40	08-Jul-22	01-Sep-22	146	Prepare LD-445 Form - 1st, 4th and Broad Street																																				
DBC0000-1010	VDOT Review of LD-445 / SWPPP- 1st, 4th and Broad Street	21	02-Sep-22	22-Sep-22	214	VDOT Review of LD-445 / SWPPP- 1st, 4th and Broad Street																																				
DBC0000-1020	Request City of Richmond Permit Coverage- 1st, 4th and Broad Street	0	02-Sep-22		146	Request City of Richmond Permit Coverage- 1st, 4th and Broad Street																																				
DBC0000-1030	Complete SWPPP (LD-455E) Certifications-1st, 4th and Broad Street	5	23-Sep-22	29-Sep-22	147	Complete SWPPP (LD-455E) Certifications-1st, 4th and Broad Street																																				
DBC0000-1040	Approved Land Disturbance Permit Application and SWPPP-1st, 4th and Broad Street	0	30-Sep-22		214	Approved Land Disturbance Permit Application and SWPPP-1st, 4th and Broad Street																																				
DBC0000-1050	Secure COR Permit Coverage and Release-1st, 4th and Broad Street	45	30-Sep-22	13-Nov-22	214	Secure COR Permit Coverage and Release-1st, 4th and Broad Street																																				
THREATENED & ENDANGERED SPECIES						115	10-Nov-21	26-Apr-22	33																																	
DC00000-1000	Prepare and Submit T&E Species Documentation with AHJs	100	10-Nov-21	05-Apr-22	34	Prepare and Submit T&E Species Documentation with AHJs																																				
DC00000-1010	VDOT review and approve	21	06-Apr-22	26-Apr-22	48	VDOT review and approve																																				
RIGHT OF WAY ACQUISITION/EASEMENTS						217	25-Feb-22	04-Jan-23	89																																	
RIGHT OF WAY/EASEMENT PLANS						60	25-Feb-22	19-May-22	53																																	
RIGHT OF WAYS /EASEMENTPLANS						60	25-Feb-22	19-May-22	53																																	
EAA0000-1000	Prepare R/W Easement Plans (with 60% 1st Submission Roadway Plans)	15	25-Feb-22	17-Mar-22	22	Prepare R/W Easement Plans (with 60% 1st Submission Roadway Plans)																																				
EAA0000-1010	VDOT Review/Comment Right of Way Plans	21	18-Mar-22	07-Apr-22	76	VDOT Review/Comment Right of Way Plans																																				
EAA0000-1020	Comment Response / Plan changes	15	08-Apr-22	28-Apr-22	53	Comment Response / Plan changes																																				
EAA0000-1030	VDOT Review 2nd Round R/W Plans	21	29-Apr-22	19-May-22	77	VDOT Review 2nd Round R/W Plans																																				
EAA0000-1040	Right of Way Plans Approved	0		19-May-22	53	Right of Way Plans Approved																																				
PROJECT SPECIFIC ACQUISITION and RELOCATION PLAN						55	25-Feb-22	12-May-22	21																																	
EAB0000-1000	Prepare and Submit R/W Acquisition and Relocation Plan	15	25-Feb-22	17-Mar-22	22	Prepare and Submit R/W Acquisition and Relocation Plan																																				
EAB0000-1010	VDOT R/A Acquisition and Relocation Plan	21	18-Mar-22	07-Apr-22	32	VDOT R/A Acquisition and Relocation Plan																																				
EAB0000-1020	Comment Response/Re-Submit Acquisition Plan	10	08-Apr-22	21-Apr-22	22	Comment Response/Re-Submit Acquisition Plan																																				
EAB0000-1030	VDOT Review/Approve 2nd Submission Acquisition Plan	21	22-Apr-22	12-May-22	32	VDOT Review/Approve 2nd Submission Acquisition Plan																																				
EASEMENT ACQUISITIONS						157	20-May-22	04-Jan-23	89																																	
PRIORITY EASEMENT ACQUISITIONS- 7th STREET & 5th STREET						128	20-May-22	18-Nov-22	53																																	
EBA0000-1000	R/W Priority- Complete Appraisal	30	20-May-22	01-Jul-22	53	R/W Priority- Complete Appraisal																																				
EBA0000-1010	R/W Priority- Complete 60 Yr Title Exam	30	20-May-22	01-Jul-22	53	R/W Priority- Complete 60 Yr Title Exam																																				
EBA0000-1020	R/W Priority- Review Appraiser Completes Review	8	05-Jul-22	14-Jul-22	53	R/W Priority- Review Appraiser Completes Review																																				
EBA0000-1030	R/W Priority- Submit Appraisal to VDOT (RUMS)	2	15-Jul-22	18-Jul-22	53	R/W Priority- Submit Appraisal to VDOT (RUMS)																																				
EBA0000-1050	R/W Priority- Prepare Offer Package	5	19-Jul-22	25-Jul-22	63	R/W Priority- Prepare Offer Package																																				
EBA0000-1040	R/W Priority- VDOT Approves Appraisal	21	19-Jul-22	08-Aug-22	76	R/W Priority- VDOT Approves Appraisal																																				
EBA0000-1060	R/W Priority- Negotiator Make Initial Contact / Present Offer	10	09-Aug-22	22-Aug-22	53	R/W Priority- Negotiator Make Initial Contact / Present Offer																																				
EBA0000-1070	R/W Priority- Negotiations	36	23-Aug-22	12-Oct-22	53	R/W Priority- Negotiations																																				
EBA0000-1110	R/W Priority- Obtain Signed Option	5	13-Oct-22	19-Oct-22	75	R/W Priority- Obtain Signed Option																																				
EBA0000-1100	R/W Priority- Prepare Certificate Package	5	13-Oct-22	19-Oct-22	53	R/W Priority- Prepare Certificate Package																																				
EBA0000-1080	R/W Priority- Send Notice of Filing Certif. to Property Owner	3	13-Oct-22	17-Oct-22	55	R/W Priority- Send Notice of Filing Certif. to Property Owner																																				
EBA0000-1120	R/W Priority- Property Access for Construction - If By Option	0		19-Oct-22	75	R/W Priority- Property Access for Construction - If By Option																																				
EBA0000-1140	R/W Priority- VDOT Reviews / Issues Certificate & Check	21	20-Oct-22	09-Nov-22	81	R/W Priority- VDOT Reviews / Issues Certificate & Check																																				
EBA0000-1130	R/W Priority- Submit Certificate Package to VDOT	0	20-Oct-22		53	R/W Priority- Submit Certificate Package to VDOT																																				
EBA0000-1170	R/W Priority- Design Builder Files Certificate @ Court house	2	10-Nov-22	11-Nov-22	53	R/W Priority- Design Builder Files Certificate @ Court house																																				
EBA0000-1190	R/W Priority - Design Builder Requests NTCC by Parcels	5	14-Nov-22	18-Nov-22	53	R/W Priority - Design Builder Requests NTCC by Parcels																																				
EBA0000-1180	R/W Priority- Property Access for Constr & Utilities - If By Certificate	0		18-Nov-22	53	R/W Priority- Property Access for Constr & Utilities - If By Certificate																																				
NON PRIORITY EASEMENT ACQUISITIONS- 1st STREET, 4th STREET and BROAD STREET						127	05-Jul-22	04-Jan-23	89																																	
EBB0000-1000	R/W Non Priority - Complete Appraisal	30	05-Jul-22	15-Aug-22	88	R/W Non Priority - Complete Appraisal																																				
EBB0000-1010	R/W Non Priority - Complete 60 Yr Title Exam	30	05-Jul-22	15-Aug-22	88	R/W Non Priority - Complete 60 Yr Title Exam																																				
EBB0000-1020	R/W Non Priority - Review Appraiser Completes Review	8	16-Aug-22	25-Aug-22	88	R/W Non Priority - Review Appraiser Completes Review																																				
EBB0000-1030	R/W Non Priority - Submit Appraisal to VDOT (RUMS)	2	26-Aug-22	29-Aug-22	88	R/W Non Priority - Submit Appraisal to VDOT (RUMS)																																				
EBB0000-1040	R/W Non Priority - Prepare Offer Package	5	30-Aug-22	06-Sep-22	98	R/W Non Priority - Prepare Offer Package																																				
EBB0000-1050	R/W Non Priority - VDOT Approves Appraisal	21	30-Aug-22	19-Sep-22	129	R/W Non Priority - VDOT Approves Appraisal																																				
EBB0000-1060	R/W Non Priority - Negotiator Make Initial Contact / Present Offer	10	20-Sep-22	03-Oct-22	89	R/W Non Priority - Negotiator Make Initial Contact / Present Offer																																				
EBB0000-1070	R/W Non Priority - Negotiations	36	04-Oct-22	22-Nov-22	89	R/W Non Priority - Negotiations																																				
EBB0000-1080	R/W Non Priority - Obtain Signed Option	5	23-Nov-22	01-Dec-22	106	R/W Non Priority - Obtain Signed Option																																				
EBB0000-1090	R/W Non Priority - Prepare Certificate Package	5	23-Nov-22	01-Dec-22	89	R/W Non Priority - Prepare Certificate Package																																				
EBB0000-1110	R/W Non Priority - Send Notice of Filing Certif. to Property Owner	3	23-Nov-22	29-Nov-22	91	R/W Non Priority - Send Notice of Filing Certif. to Property Owner																																				
EBB0000-1120	R/W Non Priority - Property Access for Construction - If By Option	0		01-Dec-22	106	R/W Non Priority - Property Access for Construction - If By Option																																				
EBB0000-1140	R/W Non Priority - VDOT Reviews / Issues Certificate & Check	21	02-Dec-22	22-Dec-22	130	R/W Non Priority - VDOT Reviews / Issues Certificate & Check																																				
EBB0000-1150	R/W Non Priority - Submit Certificate Package to VDOT	0	02-Dec-22		89	R/W Non Priority - Submit Certificate Package to VDOT																																				
EBB0000-1170	R/W Non Priority - Design Builder Files Certificate @ Court house	2	23-Dec-22	27-Dec-22	89	R/W Non Priority - Design Builder Files Certificate @ Court house																																				
EBB0000-1180	R/W Non Priority - Property Access for Constr & Utilities - If By Certificate	0		27-Dec-22	89	R/W Non Priority - Property Access for Constr & Utilities - If By Certificate																																				
EBB0000-1190	R/W Non Priority - Design Builder Requests NTCC by Parcels	5	28-Dec-22	04-Jan-23	89	R/W Non Priority - Design Builder Requests NTCC by Parcels																																				
EBB0000-1210	R/W Non Priority - Access to Construction / Utility Easements	0		04-Jan-23	89	R/W Non Priority - Access to Construction / Utility Easements																																				

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024																																			
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan																				
UTILITY COORDINATION						<ul style="list-style-type: none"> ◆ Begin Utility Relocation Coordination ■ Meeting w/VDOT DB Projects Utility Coordinator ■ Preliminary Utility Conflict Investigations ■ Prepare Preliminary Utility Status Report ◆ Submit Preliminary Utility Status Report ■ VDOT Review: Preliminary Utility Status Report 																																																											
DOMINION ENERGY VIRGINIA POWER						<ul style="list-style-type: none"> ■ Hold UFI Meeting with Virginia Power on 7th Street Bridge ■ Prepare Red-Line/Conceptual Relocation Design on 7th Street Bridge ■ Dominion Power Submits PE Estimate on 7th Street Bridge ■ Review/Approve PE Estimate on 7th Street Bridge ■ Dominion Power Completes Utility Design on 7th Street Bridge ■ Approve Utility Design on 7th Street Bridge 																																																											
EARLY ENGAGEMENT 7TH STREET BRIDGE																																																																	
DOMINION ENERGY VIRGINIA POWER						<ul style="list-style-type: none"> ■ Hold UFI Meeting with Virginia Power ■ Prepare Red-Line/Conceptual Relocation Design ■ Dominion Power Submits PE Estimate ■ Review/Approve PE Estimate ■ Dominion Power Completes Utility Design ■ Approve Utility Design 																																																											
CITY OF RICHMOND WATER						<ul style="list-style-type: none"> ■ Hold UFI Meeting with City of Richmond Water ■ Prepare Red-Line/Conceptual Relocation Design ■ City of Richmond Water Submits PE Estimate ■ Review/Approve PE Estimate ■ City of Richmond Water Completes Utility Design ■ Approve Utility Design 																																																											
CITY OF RICHMOND GAS						<ul style="list-style-type: none"> ■ Hold UFI Meeting with City of Richmond Gas ■ Prepare Red-Line/Conceptual Relocation Design ■ City of Richmond Gas Submits PE Estimate ■ Review/Approve PE Estimate ■ City of Richmond Gas Completes Utility Design ■ Approve Utility Design 																																																											
VERIZON UNDERGROUND						<ul style="list-style-type: none"> ■ Hold UFI Meeting with Verizon ■ Verizon Submits PE Estimate ■ Review/Approve PE Estimate ■ Verizon Completes Utility Design ■ Approve Utility Design 																																																											
CROWN CASTLE						<ul style="list-style-type: none"> ■ Hold UFI Meeting with Crown Castle ■ CC Submits PE Estimate ■ Review/Approve PE Estimate ■ CC Completes Utility Design ■ Approve Utility Design 																																																											
CONSTRUCTION																																																																	
PRE-CONSTRUCTION, SUBMITTALS AND PROCUREMENT																																																																	
SUBMITTALS & PROCUREMENT ROADWAY						<ul style="list-style-type: none"> ■ Prepare and Submit Initial C-25's / Material SUBMITTALS ■ VDOT Review & Approve Initial C-25's ■ Prepare and Submit Shop Drawings for Overhead Sign Structures ■ Review/Approve Shop Drawings for Overhead Sign Structures ■ Fabricate Overhead Sign Structures 																																																											
SUBMITTALS & PROCUREMENT BRIDGES																																																																	
7TH STREET BRIDGE						<ul style="list-style-type: none"> ■ Prepare and Submit Shop Drawings ■ Review/Approve Shop Drawings ■ Fabricate Structural Steel ■ Prepare and Submit Bearing Pad Shop Drawings ■ Prepare and Submit SIP Shop Drawings ■ Fabricate Rebar ■ Review/Approve Bearing Pad Shop Drawings ■ Review/Approve SIP Shop Drawings ■ Fabricate Bearing Pads ■ Fabricate SIP 																																																											

■ Remaining Level of Effort ■ Critical Remaining Work
■ Remaining Work ◆ Milestone



Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024											
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
ROADWAY						<ul style="list-style-type: none"> Off Bridge Storm Adjustments Abutment A Sleeper Slab Abutment A Approach Slab Abutment A Off Bridge Curb/Sidewalk Abutment A Approach Asphalt Abutment A Guardrail Abutment B Sleeper Slab Abutment B Approach Slab Abutment B Off Bridge Curb/Sidewalk Abutment B Approach Asphalt Abutment B Guardrail Safety Inspection/Punchlist Remove Temporary Barrier Final Striping/Traffic Configuration Complete North Side Sidewalk 																																			
STAGE 1- 5TH STREET BRIDGE- NORTH SIDE																																									
UTILITIES						<ul style="list-style-type: none"> Fascia Waterline Supports 12" Deck Elevation Waterline Test/Commission Waterline 																																			
BRIDGE SUPERSTRUCTURE						<ul style="list-style-type: none"> Deck Reinforcing/Bulkheads Set/Dry Run Screed/Prep Deck Pour Decks Cure Decks Bridge Rail - Concrete Parapet Bridge Rail - Railing Bridge Fencing/Waterline Screen Bridge Grooving 																																			
ROADWAY						<ul style="list-style-type: none"> Abutment A Sleeper Slab Abutment A Approach Slab Abutment A Off Bridge Curb Abutment A Approach Asphalt Abutment A Guardrail Abutment B Sleeper Slab Abutment B Approach Slab Abutment B Off Bridge Curb Abutment B Approach Asphalt Bolt Down/Roadway Barrier Abutment B Guardrail Temporary Striping Safety Inspection/Punchlist North Section Bridge Open 																																			
STAGE 1- 1ST STREET BRIDGE- NORTH SIDE																																									
UTILITY RELOCATION						<ul style="list-style-type: none"> Decommission Existing COR DEC Decommission Existing Waterline Off Bridge Gas Line Off Bridge Waterline Underbridge Verizon Underbridge COR DEC Underbridge Gas Line Turn over/Commission Gas Line Off Bridge Verizon Off Bridge COR DEC Conduit Turn over/Commission Verizon Commission COR DEC Fascia Waterline Support Deck Elevation Waterline Test/Commission Waterline 																																			
DEMOLITION						<ul style="list-style-type: none"> Place Temporary Barrier South Side Bridge (MOT) Switch Traffic to South Side Bridge Mobilize Demolition Subcontractor Install Demolition Shield Remove Existing Fence 																																			

█ Remaining Level of Effort
 █ Critical Remaining Work
█ Remaining Work
 ◆ Milestone



Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024															
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
BRIDGE SUPERSTRUCTURE						81	18-Oct-23	13-Feb-24	182																																				
GB24000-1210	Erect New Girders	8	18-Oct-23	27-Oct-23	180																																								
GB24000-1220	Torque New Girders/Survey Top Girder	9	30-Oct-23	09-Nov-23	180																																								
GB24000-1230	Stay in Place Forms	4	10-Nov-23	15-Nov-23	180																																								
GB24000-1240	Studs	2	16-Nov-23	17-Nov-23	180																																								
GB24000-1250	Overhang/Edge Forms	9	20-Nov-23	04-Dec-23	180																																								
GB24000-1260	Deck Reinforcing/Bulkheads	5	05-Dec-23	11-Dec-23	180																																								
GB24000-1270	Set/Dry Run Screenshot/Prep Deck	5	12-Dec-23	18-Dec-23	180																																								
GB24000-1280	Pour Decks	8	19-Dec-23	29-Dec-23	180																																								
GB24000-1290	Cure Decks	7	30-Dec-23	05-Jan-24	260																																								
GB24000-1310	Bridge Rail - Concrete Parapet	6	09-Jan-24	16-Jan-24	182																																								
GB24000-1350	Bridge Fencing	5	17-Jan-24	23-Jan-24	182																																								
GB24000-1360	Bridge Rail - Railing	7	17-Jan-24	25-Jan-24	193																																								
GB24000-1390	Strip Overhangs - North and South	5	24-Jan-24	30-Jan-24	182																																								
GB24000-1410	Bridge Grooving	2	30-Jan-24	31-Jan-24	191																																								
GB24000-1430	Bridge Painting	10	31-Jan-24	13-Feb-24	182																																								
ROADWAY						110	20-Sep-23	27-Feb-24	182																																				
GB24000-1170	OffBridge Storm Adjustments	5	20-Sep-23	26-Sep-23	249																																								
GB24000-1180	Overhead Sign Relocation	35	20-Sep-23	07-Nov-23	219																																								
GB24000-1300	Abutment A Sleeper Slab	5	02-Jan-24	08-Jan-24	184																																								
GB24000-1320	Abutment A Approach Slab	5	09-Jan-24	15-Jan-24	184																																								
GB24000-1330	Abutment A Off Bridge Curb	5	16-Jan-24	22-Jan-24	194																																								
GB24000-1340	Abutment B Sleeper Slab	5	16-Jan-24	22-Jan-24	184																																								
GB24000-1370	Abutment A Approach Asphalt	2	23-Jan-24	24-Jan-24	194																																								
GB24000-1380	Abutment B Approach Slab	5	23-Jan-24	29-Jan-24	184																																								
GB24000-1400	Abutment A Guardrail	2	25-Jan-24	26-Jan-24	194																																								
GB24000-1420	Abutment B Off Bridge Curb	5	30-Jan-24	05-Feb-24	184																																								
GB24000-1440	Abutment B Approach Asphalt	2	06-Feb-24	07-Feb-24	184																																								
GB24000-1450	Abutment B Guardrail	2	08-Feb-24	09-Feb-24	184																																								
GB24000-1460	Safety Inspection/Punchlist	5	14-Feb-24	21-Feb-24	182																																								
GB24000-1470	Final Striping/Traffic Configuration	4	22-Feb-24	27-Feb-24	182																																								
GB24000-1480	Remove Temporary Barrier	4	22-Feb-24	27-Feb-24	182																																								
STAGE 1- 4TH STREET BRIDGE- NORTH SIDE						79	03-Nov-23	28-Feb-24	173																																				
UTILITY RELOCATION						76	03-Nov-23	23-Feb-24	48																																				
GB25000-1020	Temporary Relocation COR Lighting Conduits	5	03-Nov-23	09-Nov-23	0																																								
GB25000-1160	OffBridge Storm Adjustments and Underground Detention System	35	19-Dec-23	07-Feb-24	12																																								
GB25000-1210	Underbridge COR Lighting Conduits	5	17-Jan-24	23-Jan-24	2																																								
GB25000-1260	OffBridge COR Lighting Conduits	7	08-Feb-24	16-Feb-24	12																																								
GB25000-1280	Pull/Commission COR Lighting Conduits	4	20-Feb-24	23-Feb-24	48																																								
DEMOLITION						33	03-Nov-23	21-Dec-23	9																																				
GB25000-1000	Switch Traffic to South Side Bridge	5	03-Nov-23	09-Nov-23	0																																								
GB25000-1010	Place Temporary Barrier South Side and Bridge (MOT)	4	03-Nov-23	08-Nov-23	1																																								
GB25000-1030	Mobilize Demolition Subcontractor	5	10-Nov-23	16-Nov-23	0																																								
GB25000-1040	Install Demolition Shield	8	17-Nov-23	30-Nov-23	0																																								
GB25000-1050	Remove Existing Fence	8	17-Nov-23	30-Nov-23	0																																								
GB25000-1060	Remove Existing Bridge Railing	8	17-Nov-23	30-Nov-23	0																																								
GB25000-1070	Demo Sidewalk and Overhang	8	17-Nov-23	30-Nov-23	0																																								
GB25000-1080	Partial Saw Cut/Prepare Deck	8	17-Nov-23	30-Nov-23	0																																								
GB25000-1090	Remove Existing Deck Slab Sections	6	01-Dec-23	08-Dec-23	0																																								
GB25000-1100	Prepare Girders for Removal	4	11-Dec-23	14-Dec-23	0																																								
GB25000-1110	Excavate for/Partial Abutment Backwall Demolition	6	11-Dec-23	18-Dec-23	12																																								
GB25000-1120	Remove Girder to Offsite Disposal	5	15-Dec-23	21-Dec-23	0																																								
GB25000-1130	Remove Demolition Shield	5	15-Dec-23	21-Dec-23	0																																								
SUBSTRUCTURE REPAIRS						44	19-Dec-23	21-Feb-24	178																																				
GB25000-1140	Reconstruct Abutment Backwalls	5	19-Dec-23	26-Dec-23	39																																								
GB25000-1150	Wingwall Partial Demolition/Reconstruction	8	19-Dec-23	29-Dec-23	56																																								
GB25000-1170	Demo Ex Beam Seats/Construct New	6	22-Dec-23	02-Jan-24	0																																								
GB25000-1180	Cure Beam Seats/Set Elastomeric Pads	7	03-Jan-24	09-Jan-24	0																																								
GB25000-1220	Substructure Repairs North and South	25	17-Jan-24	21-Feb-24	178																																								
BRIDGE SUPERSTRUCTURE						35	10-Jan-24	28-Feb-24	0																																				
GB25000-1190	Erect New Girders	5	10-Jan-24	16-Jan-24	0																																								
GB25000-1200	Torque New Girders/Survey Top Girder	7	17-Jan-24	25-Jan-24	0																																								
GB25000-1230	Stay in Place Forms	4	26-Jan-24	31-Jan-24	0																																								
GB25000-1240	Studs	2	01-Feb-24	02-Feb-24	0																																								
GB25000-1250	Overhang/Edge Forms	7	05-Feb-24	13-Feb-24	0																																								
GB25000-1270	Deck Reinforcing/Bulkheads	5	14-Feb-24	21-Feb-24	0																																								
GB25000-1290	Set/Dry Run Screenshot/Prep Deck	5	22-Feb-24	28-Feb-24	0																																								

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█ Remaining Work
 ◆ Milestone



Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024															
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
STAGE 2- 1ST STREET BRIDGE- SOUTH SIDE						42	29-Dec-23	28-Feb-24	136																																				
UTILITY RELOCATION						38	29-Dec-23	22-Feb-24	130																																				
GB26000-1000	Decommission Existing Comm/Gas/COR Lines	5	29-Dec-23	05-Jan-24	40	Decommission Existing Comm/Gas/COR Lines																																							
GB26000-1140	OffBridge Storm Adjustments	5	15-Feb-24	22-Feb-24	130	OffBridge Storm Adjustments																																							
DEMOLITION						34	08-Jan-24	23-Feb-24	104																																				
GB26000-1010	Mobilize Demolition Subcontractor	5	08-Jan-24	12-Jan-24	40	Mobilize Demolition Subcontractor																																							
GB26000-1020	Install Demolition Shield	10	15-Jan-24	26-Jan-24	40	Install Demolition Shield																																							
GB26000-1030	Remove Existing Fence	10	15-Jan-24	26-Jan-24	40	Remove Existing Fence																																							
GB26000-1040	Remove Existing Bridge Railing	10	15-Jan-24	26-Jan-24	40	Remove Existing Bridge Railing																																							
GB26000-1050	Demo Sidewalk and Overhang	10	15-Jan-24	26-Jan-24	40	Demo Sidewalk and Overhang																																							
GB26000-1060	Partial Saw Cut/Prepare Deck	10	15-Jan-24	26-Jan-24	40	Partial Saw Cut/Prepare Deck																																							
GB26000-1070	Remove Existing Deck Slab Sections	7	29-Jan-24	06-Feb-24	40	Remove Existing Deck Slab Sections																																							
GB26000-1080	Excavate for/Partial Abutment Backwall Demolition	6	07-Feb-24	14-Feb-24	110	Excavate for/Partial Abutment Backwall Demolition																																							
GB26000-1090	Prepare Girders/Remove Existing Comm/Gas	5	07-Feb-24	13-Feb-24	40	Prepare Girders/Remove Existing Comm/Gas																																							
GB26000-1100	Remove Girders to Offsite Disposal	7	14-Feb-24	23-Feb-24	40	Remove Girders to Offsite Disposal																																							
GB26000-1110	Remove Demolition Shield	7	14-Feb-24	23-Feb-24	40	Remove Demolition Shield																																							
SUBSTRUCTURES REPAIRS						9	15-Feb-24	28-Feb-24	136																																				
GB26000-1120	Reconstruct Abutment Backwalls	5	15-Feb-24	22-Feb-24	110	Reconstruct Abutment Backwalls																																							
GB26000-1130	Wingwall Partial Demolition/Reconstruction	9	15-Feb-24	28-Feb-24	136	Wingwall Partial Demolition/Reconstruction																																							
PHASE 3						184	26-Feb-24	12-Nov-24	0																																				
STAGE 2- 1ST STREET BRIDGE- SOUTH SIDE						144	26-Feb-24	17-Sep-24	40																																				
SUBSTRUCTURE REPAIRS						17	26-Feb-24	19-Mar-24	40																																				
GB31000-1000	Demo Ex Beam Seats/Construct New	12	26-Feb-24	12-Mar-24	40	Demo Ex Beam Seats/Construct New																																							
GB31000-1010	Cure Beam Seats/Set Elastomeric Pads	7	13-Mar-24	19-Mar-24	56	Cure Beam Seats/Set Elastomeric Pads																																							
BRIDGE SUPERSTRUCTURE						108	20-Mar-24	20-Aug-24	40																																				
GB31000-1020	Erect New Girders	8	20-Mar-24	29-Mar-24	40	Erect New Girders																																							
GB31000-1030	Torque New Girders/Survey Top Girder	10	01-Apr-24	12-Apr-24	40	Torque New Girders/Survey Top Girder																																							
GB31000-1040	Stay in Place Forms	5	15-Apr-24	19-Apr-24	40	Stay in Place Forms																																							
GB31000-1050	Studs	4	22-Apr-24	25-Apr-24	40	Studs																																							
GB31000-1060	Overhang/Edge Forms	13	26-Apr-24	14-May-24	40	Overhang/Edge Forms																																							
GB31000-1070	Deck Reinforcing/Bulkheads	7	15-May-24	23-May-24	40	Deck Reinforcing/Bulkheads																																							
GB31000-1080	Set/Dry Run Screed/Prep Deck	5	24-May-24	31-May-24	40	Set/Dry Run Screed/Prep Deck																																							
GB31000-1090	Pour Decks	7	03-Jun-24	11-Jun-24	40	Pour Decks																																							
GB31000-1100	Cure Decks	7	12-Jun-24	18-Jun-24	57	Cure Decks																																							
GB31000-1120	Bridge Rail - Concrete Parapet	10	19-Jun-24	02-Jul-24	40	Bridge Rail - Concrete Parapet																																							
GB31000-1150	Bridge Rail - Railing	12	03-Jul-24	19-Jul-24	55	Bridge Rail - Railing																																							
GB31000-1160	Bridge Fencing	12	03-Jul-24	19-Jul-24	40	Bridge Fencing																																							
GB31000-1210	Bridge Grooving	7	22-Jul-24	30-Jul-24	55	Bridge Grooving																																							
GB31000-1230	Strip Overhangs - North and South	12	22-Jul-24	06-Aug-24	40	Strip Overhangs - North and South																																							
GB31000-1260	Bridge Painting	10	07-Aug-24	20-Aug-24	40	Bridge Painting																																							
ROADWAY						68	12-Jun-24	17-Sep-24	40																																				
GB31000-1110	Abutment A Sleeper Slab	5	12-Jun-24	18-Jun-24	53	Abutment A Sleeper Slab																																							
GB31000-1130	Abutment A Approach Slab	5	19-Jun-24	25-Jun-24	53	Abutment A Approach Slab																																							
GB31000-1140	Abutment A Off Bridge Curb/Sidewalk	5	26-Jun-24	02-Jul-24	53	Abutment A Off Bridge Curb/Sidewalk																																							
GB31000-1170	Abutment A Approach Asphalt	2	03-Jul-24	05-Jul-24	53	Abutment A Approach Asphalt																																							
GB31000-1180	Abutment A Guardrail	2	08-Jul-24	09-Jul-24	70	Abutment A Guardrail																																							
GB31000-1190	Abutment B Sleeper Slab	5	08-Jul-24	12-Jul-24	53	Abutment B Sleeper Slab																																							
GB31000-1200	Abutment B Approach Slab	5	15-Jul-24	19-Jul-24	53	Abutment B Approach Slab																																							
GB31000-1220	Abutment B Off Bridge Curb/Sidewalk	5	22-Jul-24	26-Jul-24	53	Abutment B Off Bridge Curb/Sidewalk																																							
GB31000-1240	Abutment B Approach Asphalt	2	29-Jul-24	30-Jul-24	53	Abutment B Approach Asphalt																																							
GB31000-1250	Abutment B Guardrail	2	31-Jul-24	01-Aug-24	53	Abutment B Guardrail																																							
GB31000-1270	Safety Inspection/Punchlist	5	21-Aug-24	27-Aug-24	40	Safety Inspection/Punchlist																																							
GB31000-1280	Remove Temporary Barrier	5	28-Aug-24	04-Sep-24	40	Remove Temporary Barrier																																							
GB31000-1290	Final Striping/Traffic Configuration	5	05-Sep-24	11-Sep-24	40	Final Striping/Traffic Configuration																																							
GB31000-1300	Complete North Side Sidewalk	4	12-Sep-24	17-Sep-24	40	Complete North Side Sidewalk																																							
STAGE 1- 4TH STREET BRIDGE- NORTH SIDE						54	29-Feb-24	14-May-24	0																																				
BRIDGE SUPERSTRUCTURE						34	29-Feb-24	16-Apr-24	5																																				
GB32000-1000	Pour Decks	5	29-Feb-24	06-Mar-24	0	Pour Decks																																							
GB32000-1010	Cure Decks	7	06-Mar-24	13-Mar-24	20	Cure Decks																																							
GB32000-1030	Bridge Rail - Concrete Parapet	6	13-Mar-24	21-Mar-24	14	Bridge Rail - Concrete Parapet																																							
GB32000-1060	Bridge Rail - Railing	7	21-Mar-24	01-Apr-24	14	Bridge Rail - Railing																																							
GB32000-1070	Sidewalk Construction	7	21-Mar-24	01-Apr-24	14	Sidewalk Construction																																							
GB32000-1080	Bridge Fencing	7	21-Mar-24	01-Apr-24	14	Bridge Fencing																																							
GB32000-1130	Bridge Grooving	2	15-Apr-24	16-Apr-24	5	Bridge Grooving																																							
ROADWAY						49	07-Mar-24	14-May-24	0																																				
GB32000-1020	Abutment A Sleeper Slab	5	07-Mar-24	13-Mar-24	0	Abutment A Sleeper Slab																																							
GB32000-1040	Abutment A Approach Slab	5	14-Mar-24	20-Mar-24	0	Abutment A Approach Slab																																							
GB32000-1050	Abutment A Off Bridge Curb/Sidewalk	5	21-Mar-24	27-Mar-24	0	Abutment A Off Bridge Curb/Sidewalk																																							

Remaining Level of Effort Critical Remaining Work
 Remaining Work Milestone



Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024												2025											
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan								
VDOT BRIDGES OVER I-95 BUNDLING CITY OF RICHMOND-C00111300DB107		798	30-Sep-21	22-Nov-24	0																																																
SCHEDULE MILESTONES		1150	30-Sep-21	22-Nov-24	0																																																
PROJECT MILESTONES		1150	30-Sep-21	22-Nov-24	0																																																
AA00000-1000	Notice of Intent to Award	0	30-Sep-21*		1	◆ Notice of Intent to Award																																															
AA00000-1010	CTB Approval / Notice to Award	0	20-Oct-21		1	◆ CTB Approval / Notice to Award																																															
AA00000-1030	Design-Build Contract Execution	0	03-Nov-21		1	◆ Design-Build Contract Execution																																															
AA00000-1050	Notice to Proceed	0	10-Nov-21*		1	◆ Notice to Proceed																																															
AA00000-1060	Unique Milestone	0		02-Nov-23	0	◆ Unique Milestone																																															
AA00000-1070	Project Ready for Final Inspection	0		12-Nov-24	0																																																
AA00000-1080	VDOT Punchlist Inspection	10	13-Nov-24	22-Nov-24	0																																																
AA00000-1090	Early Completion Milestone -Final Completion Date	0		22-Nov-24*	0	◆ Project Ready ◆ VDOT Punc ◆ Early Comp																																															
CONSTRUCTION KEY DATES		883	14-Jun-22	12-Nov-24	0																																																
7TH STREET BRIDGE		507	14-Jun-22	02-Nov-23	0																																																
AB00000-1000	Start Construction 7th Street Bridge	0	14-Jun-22		0	◆ Start Construction 7th Street Bridge																																															
AB00000-1030	Complete 7th Street Bridge	0		02-Nov-23	0	◆ Complete 7th Street Bridge																																															
4TH STREET BRIDGE		376	03-Nov-23	12-Nov-24	0																																																
AB00000-1040	Start Construction 4th Street Bridge	0	03-Nov-23		0	◆ Start Construction 4th Street Bridge																																															
AB00000-1090	Complete 4th Street Bridge	0		12-Nov-24	0	◆ Complete 4th																																															
DESIGN PHASE		148	10-Nov-21	13-Jun-22	0																																																
PRELIMINARY DESIGN WORK		25	10-Nov-21	16-Dec-21	1																																																
SURVEY and MAPPING		25	10-Nov-21	16-Dec-21	1																																																
BAB0000-1010	Set Control and Panel Points	12	10-Nov-21	29-Nov-21	1	■ Set Control and Panel Points																																															
BAB0000-1020	Base Mapping / Field Survey	25	10-Nov-21	16-Dec-21	1	■ Base Mapping / Field Survey																																															
GEOTECHNICAL INVESTIGATIONS and REPORTING		5	10-Nov-21	16-Nov-21	1																																																
BRIDGE GER		5	10-Nov-21	16-Nov-21	1																																																
BAC2000-1010	Prepare Stage I Memo- Existing Data- All locations	5	10-Nov-21	16-Nov-21	1	■ Prepare Stage I Memo- Existing Data- All locations																																															
FINAL DESIGN		148	10-Nov-21	13-Jun-22	0																																																
BRIDGE DESIGN		148	10-Nov-21	13-Jun-22	0																																																
7TH STREET BRIDGE		148	10-Nov-21	13-Jun-22	0																																																
ERECTION AND DEMOLITION PLAN		20	10-Nov-21	09-Dec-21	1																																																
BBB1100-1000	Prepare Erection Plan & Demolition Plan	20	10-Nov-21	09-Dec-21	1	■ Prepare Erection Plan & Demolition Plan																																															
STAGE I- PRELIMINARY SUBMISSIONS		54	10-Nov-21	28-Jan-22	0																																																
BBB1200-1000	Prepare Stage I Bridge Reports/TS&Ls	20	10-Nov-21	09-Dec-21	1	■ Prepare Stage I Bridge Reports/TS&Ls																																															
BBB1200-1010	Submit Stage I Bridge Design	0		09-Dec-21	1	◆ Submit Stage I Bridge Design																																															
BBB1200-1020	VDOT Review/Comment Stage I Bridge Design	21	10-Dec-21	30-Dec-21	3	■ VDOT Review/Comment Stage I Bridge Design																																															
BBB1200-1030	Comment Response Stage I Bridge Report	5	03-Jan-22	07-Jan-22	0	■ Comment Response Stage I Bridge Report																																															
BBB1200-1040	Bridge Design Stage I -2nd Submission	0		07-Jan-22	0	◆ Bridge Design Stage I -2nd Submission																																															
BBB1200-1050	VDOT Review Stage I 2nd Submission Bridge Design	21	08-Jan-22	28-Jan-22	0	■ VDOT Review Stage I 2nd Submission Bridge Design																																															
BBB1200-1060	2nd Submission Stage 1 Bridge RPT Approved	0		28-Jan-22	0	◆ 2nd Submission Stage 1 Bridge RPT Approved																																															
FIRST SUBMISSION		53	31-Jan-22	14-Apr-22	0																																																
BBB1300-1000	Prepare Bridge Plans - 1st Submission	20	31-Jan-22	28-Feb-22	0	■ Prepare Bridge Plans - 1st Submission																																															
BBB1300-1010	Constructability review - 1st Submission	20	25-Feb-22	24-Mar-22	0	■ Constructability review - 1st Submission																																															
BBB1300-1020	Design QA/QC - 1st Submission	5	18-Mar-22	24-Mar-22	0	■ Design QA/QC - 1st Submission																																															
BBB1300-1030	Submit Bridge Plans - 1st Submission	0		24-Mar-22	0	◆ Submit Bridge Plans - 1st Submission																																															
BBB1300-1040	VDOT/FHWA Review/Comment Bridge Plans- 1st Submission	21	25-Mar-22	14-Apr-22	0	■ VDOT/FHWA Review/Comment Bridge Plans- 1st Submission																																															
FINAL SUBMISSION		41	15-Apr-22	13-Jun-22	0																																																
BBB1400-1000	Prepare Final Bridge Plans	16	15-Apr-22	06-May-22	0	■ Prepare Final Bridge Plans																																															
BBB1400-1020	Design QA/QC- Final submission	5	09-May-22	13-May-22	0	■ Design QA/QC- Final submission																																															
BBB1400-1030	Submit Final Bridge Plans	0		13-May-22	0	◆ Submit Final Bridge Plans																																															
BBB1400-1040	VDOT/FHWA Review/Comment Bridge Plans- Final submission	21	14-May-22	03-Jun-22	2	■ VDOT/FHWA Review/Comment Bridge Plans- Final submission																																															
BBB1400-1050	Final Comment Resolution Bridge Plans	6	06-Jun-22	13-Jun-22	0	■ Final Comment Resolution Bridge Plans																																															
BBB1400-1060	RFC Bridge Plans Issued for Construction	0		13-Jun-22	0	◆ RFC Bridge Plans Issued for Construction																																															
CONSTRUCTION		613	14-Jun-22	12-Nov-24	0																																																
CONSTRUCTION		613	14-Jun-22	12-Nov-24	0																																																
PHASE 1		222	14-Jun-22	28-Apr-23	0																																																
STAGE 1- 7TH STREET BRIDGE- NORTH SIDE		180	14-Jun-22	01-Mar-23	0																																																
UTILITY RELOCATION		78	29-Jun-22	18-Oct-22	0																																																
GB11000-1040	Decommission Existing Waterline	5	29-Jun-22	06-Jul-22	0	■ Decommission Existing Waterline																																															
GB11000-1240	Underbridge Waterline	10	05-Oct-22	18-Oct-22	0	■ Underbridge Waterline																																															
GB11000-1260	Underbridge Verizon	10	05-Oct-22	18-Oct-22	0	■ Underbridge Verizon																																															
DEMOLITION		53	14-Jun-22	26-Aug-22	0																																																
GB11000-1010	Partial Demolition South Side Sidewalk (MOT)	6	14-Jun-22	21-Jun-22	0	■ Partial Demolition South Side Sidewalk (MOT)																																															
GB11000-1030	Switch Traffic to South Side Bridge	5	22-Jun-22	28-Jun-22	0	■ Switch Traffic to South Side Bridge																																															
GB11000-1050	Mobilize Demolition Subcontractor	5	07-Jul-22	13-Jul-22	0	■ Mobilize Demolition Subcontractor																																															
GB11000-1070	Install Demolition Shield	10	14-Jul-22	27-Jul-22	0	■ Install Demolition Shield																																															
GB11000-1080	Remove Existing Fence	10	14-Jul-22	27-Jul-22	0	■ Remove Existing Fence																																															
GB11000-1090	Remove Existing Bridge Railing	10	14-Jul-22	27-Jul-22	0	■ Remove Existing Bridge Railing																																															

Remaining Level of Effort Critical Remaining Work
 Remaining Work ◆ Milestone



Activity ID	Activity Name	Original Duration	Start	Finish	Total Float	2022												2023												2024															
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
STAGE 1- 4TH STREET BRIDGE- NORTH SIDE						79	03-Nov-23	28-Feb-24	0																																				
UTILITY RELOCATION						5	03-Nov-23	09-Nov-23	0																																				
GB25000-1020	Temporary Relocation COR Lighting Conduits	5	03-Nov-23	09-Nov-23	0	■ Temporary Relocation COR Lighting Conduits																																							
DEMOLITION						33	03-Nov-23	21-Dec-23	0																																				
GB25000-1000	Switch Traffic to South Side Bridge	5	03-Nov-23	09-Nov-23	0	■ Switch Traffic to South Side Bridge																																							
GB25000-1030	Mobilize Demolition Subcontractor	5	10-Nov-23	16-Nov-23	0	■ Mobilize Demolition Subcontractor																																							
GB25000-1040	Install Demolition Shield	8	17-Nov-23	30-Nov-23	0	■ Install Demolition Shield																																							
GB25000-1050	Remove Existing Fence	8	17-Nov-23	30-Nov-23	0	■ Remove Existing Fence																																							
GB25000-1060	Remove Existing Bridge Railing	8	17-Nov-23	30-Nov-23	0	■ Remove Existing Bridge Railing																																							
GB25000-1070	Demo Sidewalk and Overhang	8	17-Nov-23	30-Nov-23	0	■ Demo Sidewalk and Overhang																																							
GB25000-1080	Partial Saw Cut/Prepare Deck	8	17-Nov-23	30-Nov-23	0	■ Partial Saw Cut/Prepare Deck																																							
GB25000-1090	Remove Existing Deck Slab Sections	6	01-Dec-23	08-Dec-23	0	■ Remove Existing Deck Slab Sections																																							
GB25000-1100	Prepare Girders for Removal	4	11-Dec-23	14-Dec-23	0	■ Prepare Girders for Removal																																							
GB25000-1120	Remove Girder to Offsite Disposal	5	15-Dec-23	21-Dec-23	0	■ Remove Girder to Offsite Disposal																																							
GB25000-1130	Remove Demolition Shield	5	15-Dec-23	21-Dec-23	0	■ Remove Demolition Shield																																							
SUBSTRUCTURE REPAIRS						11	22-Dec-23	09-Jan-24	0																																				
GB25000-1170	Demo Ex Beam Seats/Construct New	6	22-Dec-23	02-Jan-24	0	■ Demo Ex Beam Seats/Construct New																																							
GB25000-1180	Cure Beam Seats/Set Elastomeric Pads	7	03-Jan-24	09-Jan-24	0	■ Cure Beam Seats/Set Elastomeric Pads																																							
BRIDGE SUPERSTRUCTURE						35	10-Jan-24	28-Feb-24	0																																				
GB25000-1190	Erect New Girders	5	10-Jan-24	16-Jan-24	0	■ Erect New Girders																																							
GB25000-1200	Torque New Girders/Survey Top Girder	7	17-Jan-24	25-Jan-24	0	■ Torque New Girders/Survey Top Girder																																							
GB25000-1230	Stay in Place Forms	4	26-Jan-24	31-Jan-24	0	■ Stay in Place Forms																																							
GB25000-1240	Studs	2	01-Feb-24	02-Feb-24	0	■ Studs																																							
GB25000-1250	Overhang/Edge Forms	7	05-Feb-24	13-Feb-24	0	■ Overhang/Edge Forms																																							
GB25000-1270	Deck Reinforcing/Bulkheads	5	14-Feb-24	21-Feb-24	0	■ Deck Reinforcing/Bulkheads																																							
GB25000-1290	Set/Dry Run Screed/Prep Deck	5	22-Feb-24	28-Feb-24	0	■ Set/Dry Run Screed/Prep Deck																																							
PHASE 3						181	29-Feb-24	12-Nov-24	0																																				
STAGE 1- 4TH STREET BRIDGE- NORTH SIDE						54	29-Feb-24	14-May-24	0																																				
BRIDGE SUPERSTRUCTURE						5	29-Feb-24	06-Mar-24	0																																				
GB32000-1000	Pour Decks	5	29-Feb-24	06-Mar-24	0	■ Pour Decks																																							
ROADWAY						49	07-Mar-24	14-May-24	0																																				
GB32000-1020	Abutment A Sleeper Slab	5	07-Mar-24	13-Mar-24	0	■ Abutment A Sleeper Slab																																							
GB32000-1040	Abutment A Approach Slab	5	14-Mar-24	20-Mar-24	0	■ Abutment A Approach Slab																																							
GB32000-1050	Abutment A Off Bridge Curb/Sidewalk	5	21-Mar-24	27-Mar-24	0	■ Abutment A Off Bridge Curb/Sidewalk																																							
GB32000-1090	Abutment A Approach Asphalt	2	28-Mar-24	29-Mar-24	0	■ Abutment A Approach Asphalt																																							
GB32000-1110	Abutment B Sleeper Slab	5	01-Apr-24	05-Apr-24	0	■ Abutment B Sleeper Slab																																							
GB32000-1120	Abutment B Approach Slab	5	08-Apr-24	12-Apr-24	0	■ Abutment B Approach Slab																																							
GB32000-1140	Abutment B Off Bridge Curb/Sidewalk	5	15-Apr-24	19-Apr-24	0	■ Abutment B Off Bridge Curb/Sidewalk																																							
GB32000-1150	Abutment B Approach Asphalt	2	22-Apr-24	23-Apr-24	0	■ Abutment B Approach Asphalt																																							
GB32000-1160	Bolt Down/Roadway Barrier	5	24-Apr-24	30-Apr-24	0	■ Bolt Down/Roadway Barrier																																							
GB32000-1180	Temporary Striping	1	01-May-24	01-May-24	0	■ Temporary Striping																																							
GB32000-1190	Safety Inspection/Punchlist	5	02-May-24	08-May-24	0	■ Safety Inspection/Punchlist																																							
GB32000-1200	North Section Bridge Open	4	09-May-24	14-May-24	0	■ North Section Bridge Open																																							
STAGE 2- 4TH STREET BRIDGE SOUTH SIDE						127	15-May-24	12-Nov-24	0																																				
DEMOLITION						30	15-May-24	26-Jun-24	0																																				
GB33000-1000	Mobilize Demolition Subcontractor	5	15-May-24	21-May-24	0	■ Mobilize Demolition Subcontractor																																							
GB33000-1020	Install Demolition Shield	8	22-May-24	03-Jun-24	0	■ Install Demolition Shield																																							
GB33000-1030	Remove Existing Fence	8	22-May-24	03-Jun-24	0	■ Remove Existing Fence																																							
GB33000-1040	Remove Existing Bridge Railing	8	22-May-24	03-Jun-24	0	■ Remove Existing Bridge Railing																																							
GB33000-1050	Demo Sidewalk and Overhang	8	22-May-24	03-Jun-24	0	■ Demo Sidewalk and Overhang																																							
GB33000-1060	Partial Saw Cut/Prepare Deck	8	22-May-24	03-Jun-24	0	■ Partial Saw Cut/Prepare Deck																																							
GB33000-1070	Remove Existing Deck Slab Sections	8	04-Jun-24	13-Jun-24	0	■ Remove Existing Deck Slab Sections																																							
GB33000-1080	Prepare Girders for Removal	4	14-Jun-24	19-Jun-24	0	■ Prepare Girders for Removal																																							
GB33000-1100	Remove Girder to Offsite Disposal	5	20-Jun-24	26-Jun-24	0	■ Remove Girder to Offsite Disposal																																							
GB33000-1110	Remove Demolition Shield	5	20-Jun-24	26-Jun-24	0	■ Remove Demolition Shield																																							
SUBSTRUCTURE REPAIRS						9	27-Jun-24	10-Jul-24	0																																				
GB33000-1150	Demo Ex Beam Seats/Construct New	5	27-Jun-24	03-Jul-24	0	■ Demo Ex Beam Seats/Construct New																																							
GB33000-1160	Cure Beam Seats/Set Elastomeric Pads	7	04-Jul-24	10-Jul-24	0	■ Cure Beam Seats/Set Elastomeric Pads																																							
BRIDGE SUPERSTRUCTURE						43	12-Jul-24	11-Sep-24	0																																				
GB33000-1170	Erect New Girders	5	12-Jul-24	18-Jul-24	0	■ Erect New Girders																																							
GB33000-1180	Torque New Girders/Survey Top Girder	7	19-Jul-24	29-Jul-24	0	■ Torque New Girders/Survey Top Girder																																							
GB33000-1190	Stay in Place Forms	7	30-Jul-24	07-Aug-24	0	■ Stay in Place Forms																																							
GB33000-1200	Studs	2	08-Aug-24	09-Aug-24	0	■ Studs																																							
GB33000-1210	Overhang/Edge Forms	7	12-Aug-24	20-Aug-24	0	■ Overhang/Edge Forms																																							
GB33000-1220	Deck Reinforcing/Bulkheads	5	21-Aug-24	27-Aug-24	0	■ Deck Reinforcing/Bulkheads																																							
GB33000-1230	Set/Dry Run Screed/Prep Deck	5	28-Aug-24	04-Sep-24	0	■ Set/Dry Run Screed/Prep Deck																																							
GB33000-1240	Pour Decks	5	05-Sep-24	11-Sep-24	0	■ Pour Decks																																							

Remaining Level of Effort Critical Remaining Work
 Remaining Work Milestone



