

SUBMITTED | December 7, 2017

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Fauquier County, Virginia



Technical Proposal Volume I

A DESIGN-BUILD PROJECT

Warrenton Southern Interchange US 15/17/29

From: Route 15/17/29 & Route 15/17/29 Business

To: 1.0 mile South of Route 15/17/29 & Route 15/17/29 Business



State Project No.: 0029-030-121, P101, R201, C501, B616
Federal Project No.: STP-032-7(032)
Contract ID Number: C00077384DB100

SUBMITTED BY



December 7, 2017

Mr. Bryan W. Stevenson, P.E.
Alternative Project Delivery Division
Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219

Re: Letter of Submittal | Design-Build | Warrenton Southern Interchange US15/17/29 | Fauquier County, Virginia | State Project No.: 0029-030-121 | Federal Project No.: STP-032-7(032) | Contract ID Number: C00077384DB100

Dear Mr. Stevenson,

Branch Civil, Inc. (Branch), as the Offeror, submits to the Virginia Department of Transportation (VDOT) this Letter of Submittal and accompanying Technical Proposal and Attachments in response to the Request for Proposal (RFP), July 18, 2017, with Addendum 1, August 23, 2017, Addendum 2, October 27, 2017, Addendum 3, November 17 2017, and Addendum 4 dated December 1, 2017, for the above referenced project (Project). Branch, with lead designer **Whitman, Requardt & Associates, LLP (WRA)**, proudly presents this technical proposal with an eager readiness to design and build this much needed grade-separated interchange that the citizens of Warrenton and Fauquier County will welcome as their “Gateway to Warrenton”.

Branch|WRA is a fully integrated team with a proven track record of working together and delivering the highest levels of safety and quality on design-build projects. Through our successful work history, our team is prepared to apply our invaluable lessons learned to eliminate the learning curve on this project while providing rapid responsiveness and compliancy to VDOT. We are committed to completing a final product that exceeds expectations with respect to design, cost and schedule while addressing the Project’s key priorities:

- **Cost** | Our project approach allows for design and construction efficiencies that reduces cost, providing VDOT with the best price for the scope of work identified in the RFP.
- **Design Concept** | To minimize impacts and improve safety throughout the project corridor, our approved ATC concept will allow for **85% of the project improvements to be constructed out of traffic**. Our design will minimize the phases of construction, simplify the maintenance of traffic and reduce the number of traffic shifts required to complete the project.
- **Construction of the Project** | Our construction means and methods demonstrate our ability to provide early completion, effective traffic management, environmental stewardship and a safe separation of construction activities from the traveling public. We are prepared to make the improvements to the project to allow for all of the signals at the existing intersection to be removed early in the project schedule. **Our team is committing to a Unique Milestone date of July 2, 2020 to have the existing signals removed (5 months earlier than the RFP Final Completion Date). We are also committing to a Final Completion Date of October 17, 2020 (2 months earlier than the RFP Final Completion Date).**
- **Project Approach** | Branch|WRA is staffing the Project with the best, brightest and most skilled team of design and construction personnel to manage the work. Many on our team have worked together on previous design-build projects. As reiterated in our organizational chart, we are implementing several value-added positions to limit potential risk for all stakeholders. This includes: Construction Design Coordinator to better facilitate the design and construction process in support of the Construction Manager and Design Manager; Traffic Management Task Force to mitigate safety and MOT risks; and Seventh Point, Inc. to support VDOT with the public relations efforts.

4.1.1 Full legal name and address of the Offeror:

Branch Civil, Inc., located at 442 Rutherford Ave, NE, Roanoke, VA, is the legal entity who will execute the contract with VDOT.

4.1.2 Offeror's intent to enter into a contract with VDOT:

Branch Civil, Inc., if selected, will enter into a contract with VDOT for the Project in accordance with the terms of this RFP.

4.1.3 Offer will remain in full force and effect for one hundred twenty (120) days:

Pursuant to Part 1, Section 8.2, Branch Civil, Inc. declares that the offer represented by the Proposal will remain in full force and effect for one hundred twenty (120) days after the date the Letter of Submittal and Attachments are actually submitted to VDOT ("Letter of Submittal and Attachments Due Date")

4.1.4 Point of Contact for the Offeror:

Jason Hoyle, Vice President Design-Build/Major Projects
Address: 442 Rutherford Avenue, NE, Roanoke, VA 24016
Tel: 540.982.1678 | Fax: 540.982.4216
Email: jason.hoyle@branchcivil.com

4.1.5 Principal Officer for the Offeror:

Patrick Bartorillo, President
Address: 442 Rutherford Avenue, NE, Roanoke, VA 24016
Tel: 540.982.1678 | Fax: 540.982.4216
Email: patrick.bartorillo@branchcivil.com

4.1.6 Unique Milestone Date:

Removal of Signals in Existing Intersection: July 2, 2020 (LD's at \$3,100 per day)
This unique milestone date represents the removal of all signals in the existing intersection allowing traffic to flow freely in both northbound and southbound directions on Route 15/17/29.

Final Completion Date:

October 17, 2020

4.1.7 Executed Proposal Payment Agreement:

An executed copy of Attachment 9.3.1 Proposal Payment Agreement form is included in Appendix, Attachment 9.3.1 Proposal Payment Agreement.

4.1.8 Certification Regarding Debarment Form:

Executed copies of the Certification Regarding Debarment Forms as set forth in Part 1, Section 11.8.6 are provided in Appendix, Attachment 11.8.6 (a) and (b) Certification Regarding Debarment Forms.

Through our careful study of this RFP, we understand the Project site and conditions, utilities, right-of-way, potential impacts to the environment and third-party stakeholders. Our design and construction approach to build the majority of the project out of traffic will significantly reduce the vehicular and pedestrian safety concerns, provide our team the opportunity to complete the project by the proposed Final Completion Date, and be able to provide competitive pricing for the project.

On behalf of Branch|WRA, we appreciate the opportunity to present our technical proposal, which was developed to minimize impacts and meet all project priorities in a safe and timely manner. We look forward to your review and eagerly anticipate another successful delivery with this endeavor.

Respectfully Submitted,

Branch Civil, Inc.



Patrick K. Bartorillo, President

4.2 OFFEROR'S QUALIFICATIONS

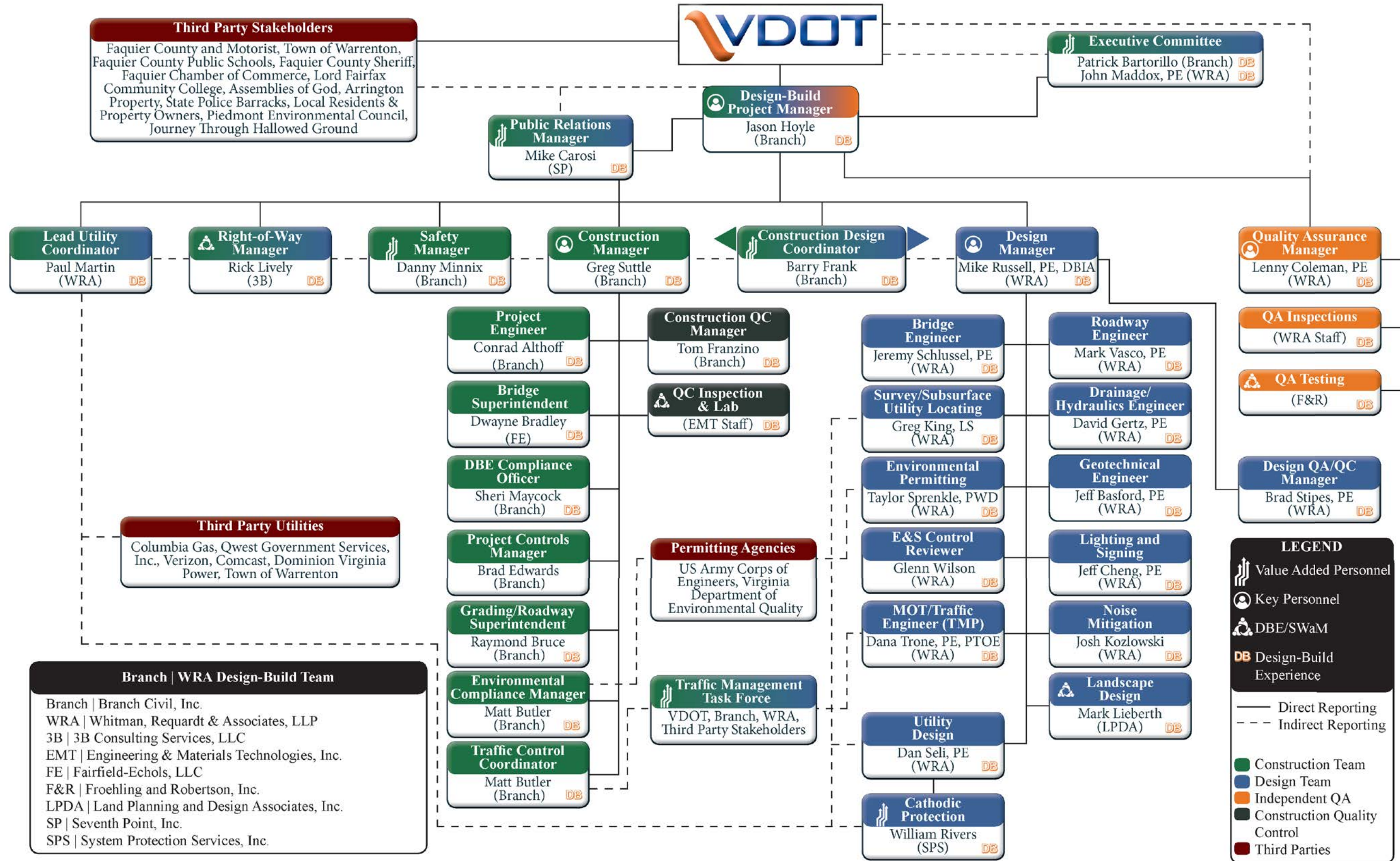
4.2.1 SOQ Confirmation

The information and statements made in our SOQ remain true and accurate in accordance with Part 1, Section 11.4.

4.2.2 Organizational Chart

The Branch|WRA Team's organizational chart is presented on the following page and identifies the chain of command for each team member along with their function and reporting relationships that will be followed throughout the design and construction of the project. As there are no changes in our proposed staffing from that presented in the original Branch|WRA SOQ, a revised organizational narrative is not required per the RFP.

4.2.2 Organizational Chart



4.3 DESIGN CONCEPT

Introduction

Branch Civil (BCI) selected WRA to lead the design for the Warrenton Southern Interchange Design Build project based on their extensive interchange and roundabout design experience, their expertise in delivering economical Design Build projects of the highest quality in Virginia, and the successful past working experience with BCI. This will be the 7th Design Build project that the Branch|WRA Team has successfully delivered or is currently under construction.

Design Manager *Mike Russell, P.E., DBIA* has led the Team through a detailed review of the project’s RFP requirements, conceptual plans, and a thorough Alternative Technical Concept (ATC) process. BCI provided construction methodology and guidance during every step of the process. The Team’s approach to the ATC was to provide an interchange design that provided operational improvements equal to or better than the RFP Concept while *Providing Increased Value by Achieving These Goals*:

- Improving safety
- Reducing cost
- Simplifying construction phasing
- Reducing impact to the public during construction
- Reducing the right-of-way impacts
- Reducing long-term inspection requirements and maintenance costs
- Accelerating the scheduled delivery of operational improvements
- Reducing overall project duration
- Exceeding public expectation
- Presenting a design that can be considered a true “Gateway to Warrenton” that the citizens in the area can be proud to call their own

Our proposed design clearly meets all of these goals. The ATC process provided ample opportunity to discuss our Design Concept with key VDOT Team members and illustrates our understanding of the project scope, constraints, risks, and stakeholder concerns. Recommendations made during these meetings led to minor adjustments in the RFP requirements that provide significant benefits to the project. Our *ATC #1 – Modified Roundabout Interchange* approved on **November 9, 2017** by VDOT meets or exceeds all of the RFP Design Technical Requirements established in Part 2 of the RFP document and provides the following *Design Enhancements and Value Added Benefits*:

Design Enhancement #1 – Relocation of the Eastern Roundabout

Our design relocates the eastern roundabout to the south to improve the grades leading to and from the roundabout as well as accommodate and facilitate additional enhancements that will follow. The following graphic shown in Figure 1 on the following page illustrates the Conceptual Design location relative to the RFP Conceptual Design.

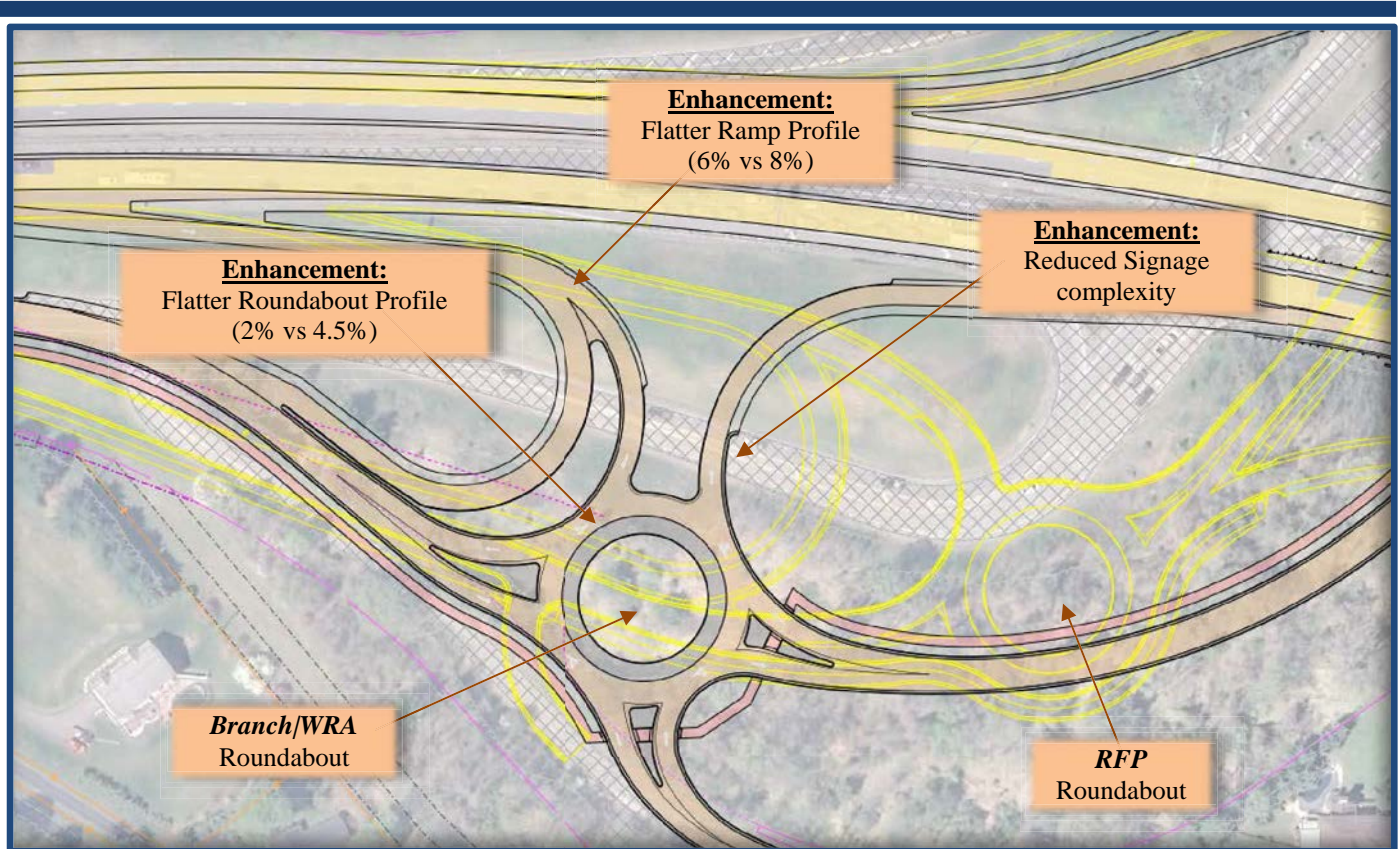


Figure 1 – Relocation of Eastern Roundabout

The following *Value Added Benefits* are realized by this *Design Enhancement*:

- The shift in the eastern roundabout to the south, strategically between the existing roadways and adjustment in the profile of Route 15/17/29 Business results in the roundabout being placed approximately at the same elevation of Turkey Run Drive and Lord Fairfax Road greatly simplifying maintenance of traffic on the eastern side of the interchange. The design allows a temporary connection of Lord Fairfax Road into the roundabout, which reduces the complexity of the maintenance of traffic and eliminates the need for a temporary intersection on the high speed Bypass at the existing crossovers.
- The new location of the eastern roundabout provides a **2%** grade for the proposed roundabout and will improve traffic operations compared to the RFP roundabout location that was located on approximately a **4.5%** grade.
- The relocated roundabout provides direct access to Turkey Run Drive thereby removing an unsignalized intersection along Lord Fairfax Road. The conflict point analysis documented in the Traffic Technical Memorandum demonstrates a reduction of **six conflict points** with the proposed ATC resulting from the removal of this intersection (see Table 1 on the following page).
- The northbound off ramp grade is improved to approximately 6% versus the RFP grade of 8%.
- The relocation of Lord Fairfax Road to the west reduces reconstruction of Traveler’s Way and eliminates right-of-way impacts to the parcels at the intersection.
- Reduces the overall operational delay on this side of the interchange.

Location		Conflict Points	
		RFP Concept	BCI WRA Concept
Southbound Route 15/17/29 ramps at Route 15/17/29 Business (West Roundabout)	Four-Legged Roundabout	8	8
	Bypass Lanes	4	4
Northbound Route 15/17/29 ramps at Route 15/17/29 Business (East Roundabout)	Three-Legged Roundabout (RFP) Four-Legged Roundabout (ATC)	5	8
	Bypass Lane	2	2
Lord Fairfax Road at Turkey Run Drive	Three-Legged Unsignalized Intersection	9	-
Total Conflict Points		28	22

Table 1: Comparison of RFP Concept and ATC Conflict Points

Design Enhancement #2 – Relocation of Route 15/17/29 Business to the North

The proposed design exceeds the other priorities described in the RFP by eliminating the need for long-term traffic detours and temporary signals on the Bypass to accommodate the major northbound left turns onto Route 15/17/29 Business. One of the goals reflected in our design is to develop a traffic management plan that minimizes traffic changes on the Bypass by simply maintaining all traffic movements at the existing signalized intersection and accelerating the project schedule to remove all signals on the Bypass to greatly improve safety.

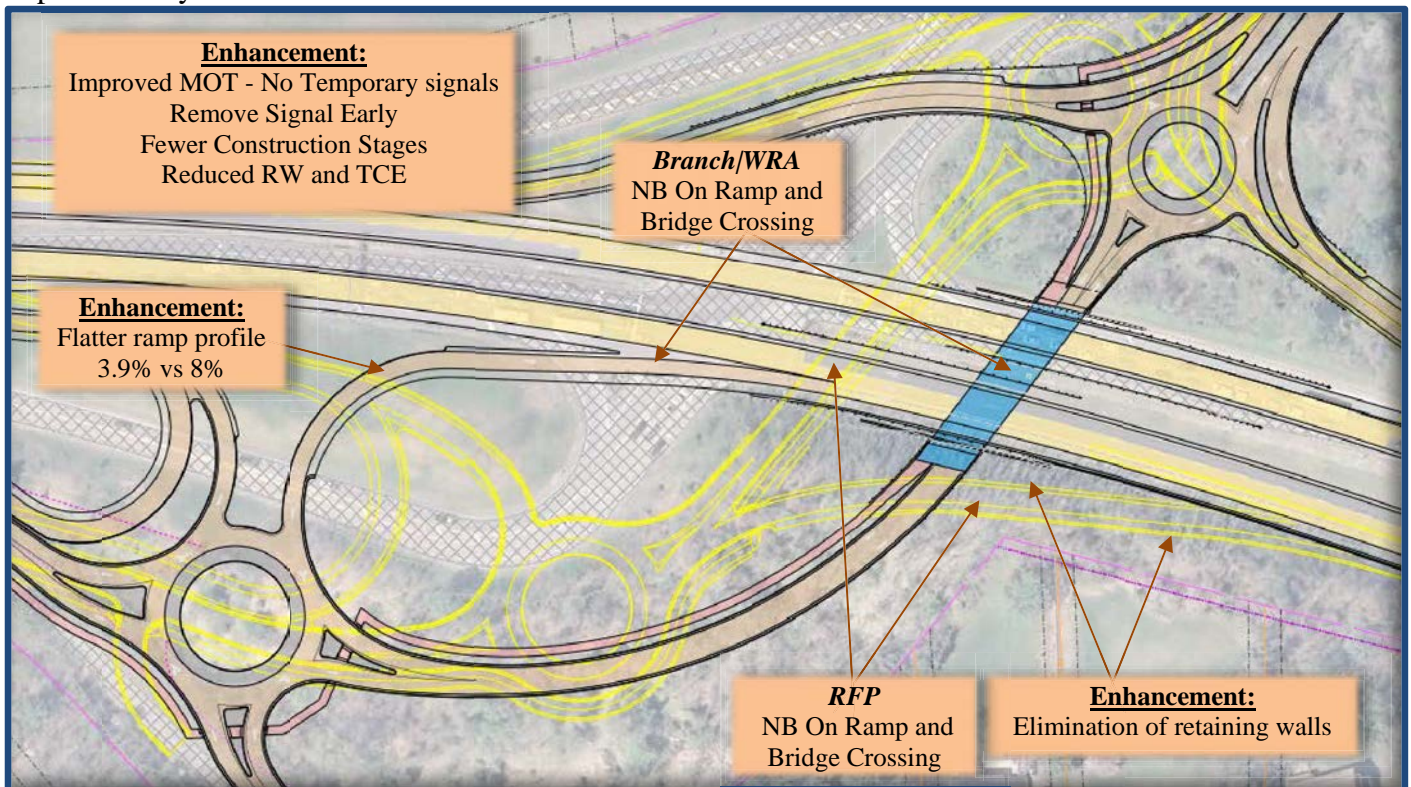


Figure 2 – Shift of Route 15/17/29 Business to the north & Relocation of NB On Ramp

The following *Value Added Benefits* are realized by this *Design Enhancement*:

- The shift to the north of Route 15/17/29 of approximately 140 feet allows for both roundabouts and the bridge over the Bypass to be constructed out of traffic. This will allow all traffic to be maintained on Route 15/17/29 Business without requiring complex shifts of traffic on the Bypass. A slight reduction to the diameter of the western roundabout further facilitates constructability and MOT while also reducing overall cost and accommodating the design vehicle effectively.
- The northern shift reduces right-of-way and easement impacts in the SW quadrant of the interchange as compared to the RFP Design. Our Conceptual Design reduces temporary easements by almost 80,000 sq. ft.

Design Enhancement #3 – Relocation Northbound Route 15/17/29 On Ramp

The previous two design enhancements allow for the northbound on ramp to the Route 15/17/29 Bypass to be relocated such that it exits the new location of the eastern roundabout and proceeds under the proposed overpass. This design more closely resembles the originally planned trumpet interchange and subsequently “fits” better in the existing right-of-way. Please refer to Figure 2 above for an illustration of this enhancement.

The following *Value Added Benefits* are realized by this *Design Enhancement*:

- The relocation of the northbound Route 15/17/29 on ramp eliminates the complex and extensive retaining walls along the ramp. By routing the northbound on ramp under the bridge, the distance between the ramp and the adjacent residential properties is increased considerably.
- Significantly reduces the project cost.
- Significantly reduces long-term and recurring maintenance costs associated with the retaining walls.
- Operations are improved on the ramp by reducing the grade from 8% to approximately 4%.
- Reduces the signing complexity and improves traffic operations for vehicles accessing the northbound on ramp from eastbound Route 15/17/29 Business by eliminating the almost 360 degree turn through the eastern roundabout.
- Eliminates the diverge exiting the west leg of the eastern roundabout for traffic destined for northbound Route 15/17/29 versus Route 15/17/29 Business. Placing a diverge immediately on the departure leg of a roundabout creates signing challenges due to limited space to provide advance warning for the diverge. Further complicating this matter is the overlapping routes (15/17/29), which creates the need for signing of all three routes. Our design eliminates this diverge thereby reducing the potential for driver confusion, minimizing signing complexity, and increasing driver safety exiting the roundabout.
- Eliminates the impacts to private property in the northeast quadrant of the interchange by eliminating impacts to six parcels (including a potential impact to at least one septic drainfield).
- The proposed relocation of the ramp will certainly result in positive support for the project from property owners along Turkey Run Drive due to the elimination of the retaining wall impacts.

Design Enhancement #4 – Roundabout Diameter

The inscribed diameter of the proposed western roundabout has been decreased from 102’ to 72’ as compared to the RFP Design as shown in Figure 3 on the following page.

The following *Value Added Benefits* are realized by this *Design Enhancement*:

- Reduces the overall cost of the project.
- Improves safety and reduces impact to public by allowing the construction sequencing to be simplified to three phases with all of the roundabout construction taking place out of traffic.
- Enhances pedestrian safety by ensuring reduced speeds through the roundabout as compared to the RFP Design.

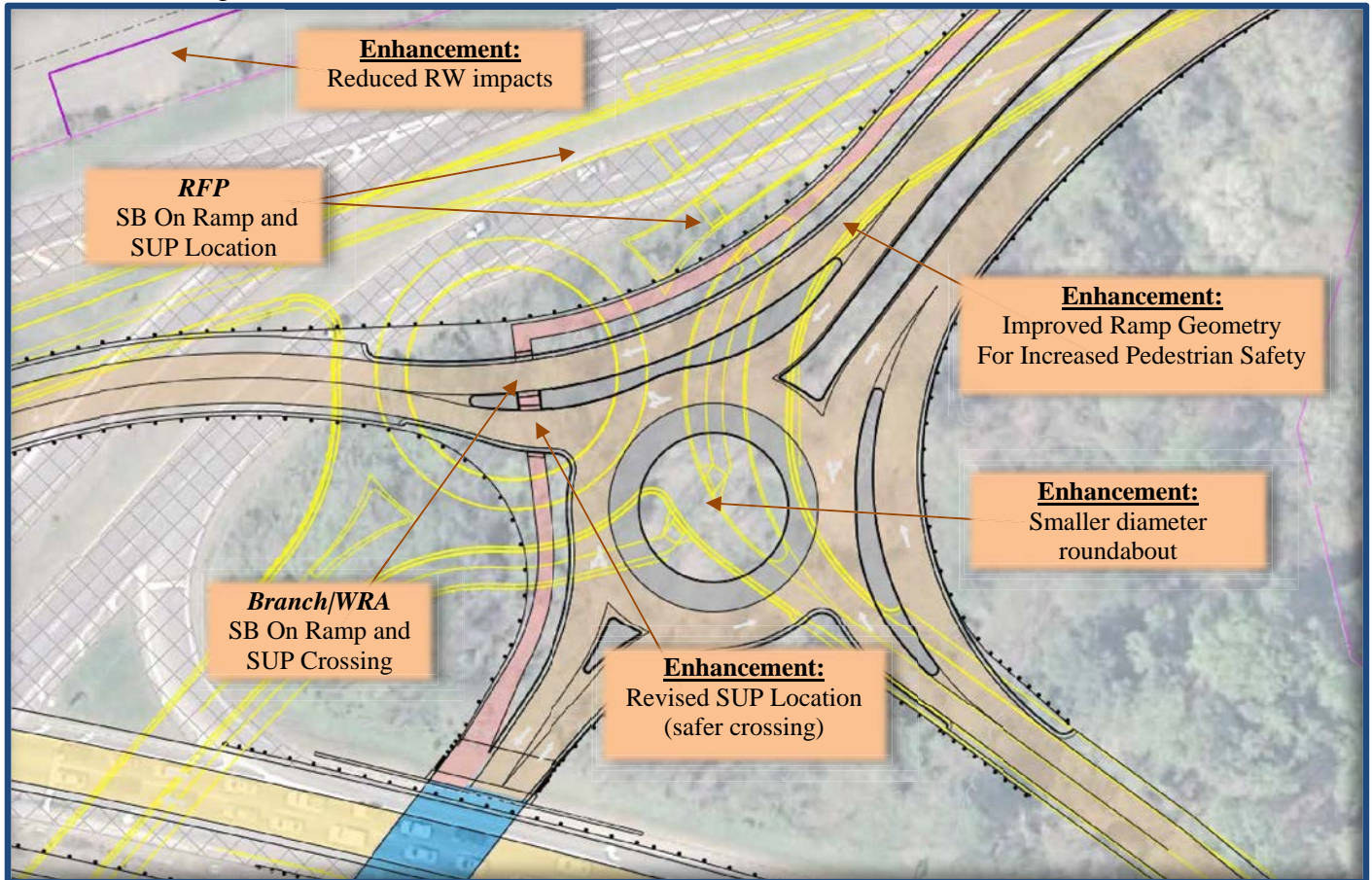


Figure 3 – Roundabout Diameter/Shared Use Path and SB On Ramp Location

Design Enhancement #5 – Shared Use Path and SB On Ramp Location

The location of the shared use path has been relocated to the south side of Route 15/17/29 Business as it approaches the bridge over the Bypass while the southbound on ramp has been pulled closer to the roundabout to maintain lower speeds on the ramp in the areas of pedestrian crossings. Please refer to Figure 3 above for an illustration of this enhancement.

The following *Value Added Benefits* are realized by this *Design Enhancement*:

- Greatly improves pedestrian safety by limiting the amount of roadway they must traverse at each crossing.
- Provides for increased pedestrian safety by holding speeds lower at the roadway crossings of the shared use path while still allowing adequate acceleration length for the southbound on ramp.
- With the shared use path relocated along with the bridge railing, this design improves sight distance for westbound traffic coming off the bridge entering the curve approaching the west roundabout.

Design Enhancement #6 – Mechanically Stabilized/Reinforced Slopes

A temporary fill embankment is proposed adjacent to Route 15/17/29 Business to divert traffic away from construction of the crossing over Route 15/17/29 and the western roundabout. To accommodate the proposed embankment, avoid impacts to the existing stream and minimize impact to right-of-way, a reinforced slope with wire facing will be designed, constructed and maintained during the first two construction stages.

The following ***Value Added Benefits*** are realized by this ***Design Enhancement***:

- Avoids construction impacts to the tributary of Turkey Run.
- Minimizes the footprint of the right-of-way or construction easement required to build the embankment.

Design Enhancement #7 – MSE Abutment Face

Our proposed bridge design replaces the RFP’s 260’ long two-span bridge with a 169’ long two-span bridge by utilizing MSE walls in front of pile supported abutments. This reduced bridge length still accommodates the future widening of Route 15/17/29 and the relocated northbound on ramp.

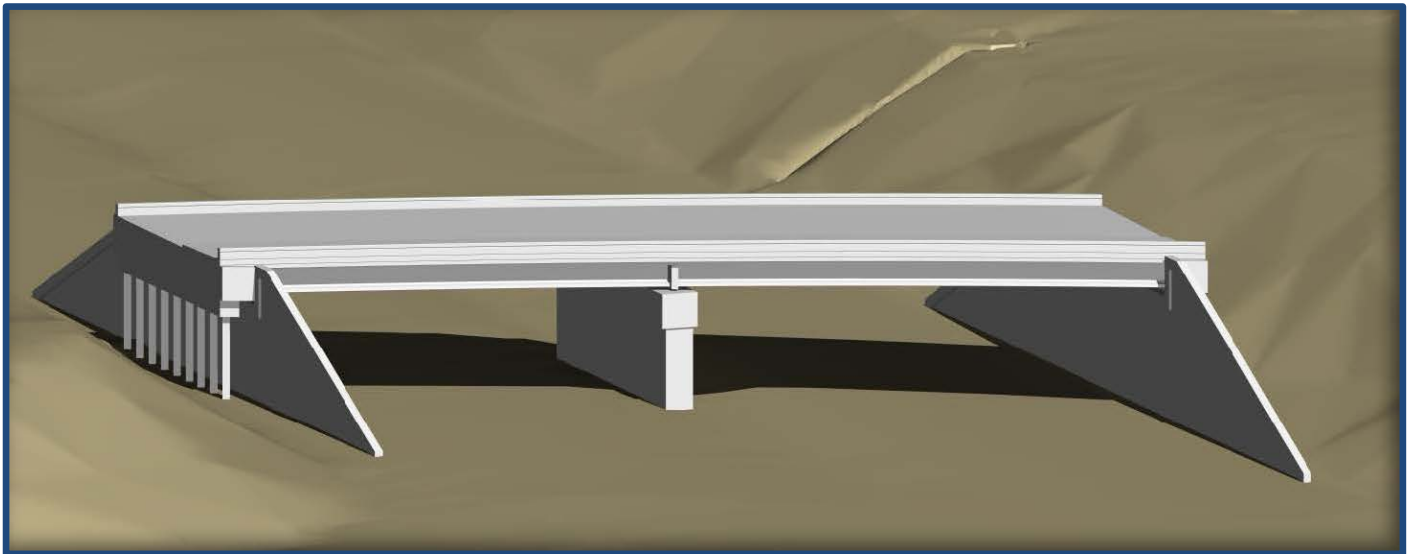


Figure 4 – 3D Model of Proposed Bridge Looking North Showing the MSE Abutment Face and Piles

The following ***Value Added Benefits*** are realized by this ***Design Enhancement***:

- Reduced construction cost.
- Reduced bridge construction duration.
- Reduced long-term maintenance cost.

Design Enhancement #8 – Stormwater Management

The project is “grandfathered” and will be subject to Part IIC Technical requirements of the Virginia Department of Environmental Quality criteria for Stormwater Management. As such water quality treatment requirements will be calculated according to Performance Based criteria, and offsite nutrient credits will be purchased to avoid the need for water quality BMP facilities. Water quantity design will satisfy MS-19 criteria. All existing outfall channels will be shown to be adequate to convey post developed runoff. **No on-site post project detention facilities are proposed.**

The following *Value Added Benefits* are realized by this *Design Enhancement*:

- Reduced construction cost.
- Eliminates long-term recurring maintenance costs to the Department.

4.3.1 Conceptual Roadway Plans

The Conceptual Roadway Plans provided in Volume II of our submittal meet or exceed the RFP, VDOT, and AASHTO requirements for the project.

(a.) General geometry including horizontal curve data and associated design speeds, the number and widths of lanes and shoulders

The design geometry for each roadway design element is provided below. Our conceptual design meets all of these criteria and no design exceptions or design waivers other than those already identified in the RFP are required.

Roadway	Geometric Design Standard	Design Speed (mph)	Number and Width of Lanes	Widths of Paved Shoulders	Curb & Gutter Type	Widths of Shared-Use Paths
US Route 15/17/29	GS-1	60 mph	4 – 12’	4’ Left 10’ Right	N/A	N/A
US Route 15/17/29 Business	GS-6 (urban classification)	40 mph	4 – 12’	N/A	CG-6	8’
Lord Fairfax Road	GS-8 (urban classification)	35 mph	2 – 12’	N/A	CG-6	8’
Travelers Way	Urban Local Street	25 mph	2 – 10’	N/A	CG-6	None
Turkey Run Drive	Urban Local Street	25 mph	2 – 12’	N/A	CG-6	None
Interchange Ramps	GS-R	25-50 mph	varies	4’ Left 8’ Right	N/A	None
Roundabouts	NCHRP Report 672	20-25 mph	1 – 18’	N/A	Modified CG-3	None

Table 2 – General Geometry

(b.) Horizontal alignments

The horizontal alignments for the various interchange roadways are generally similar to the RFP Conceptual Plans and meet the minimum radii for all required design speeds. Noted changes from the RFP Conceptual Plans are depicted in the conceptual plans shown in Volume II and are as follows. With the shifting of Route 15/17/29 Business to the north and the relocation of the eastern roundabout a 536’ radius curve is introduced on the eastern end of the proposed bridge. The connection to existing Route 15/17/29 Business is made by way of a 536’ radius curve. The northbound on ramp was relocated and now comes off of the west quadrant of the roundabout into a 135’ radius curve followed by 1100’ and 4571’ curves as it merges in with the Bypass. The southbound on ramp introduces a 280’ curve as it departs Route 15/17/29 Business at the roundabout to enhance pedestrian safety of the crossing. This is followed by 408’ and 900’ radius curves to merge the ramp onto Route 15/17/29. Turkey Run Drive is proposed to have a direct entry into the eastern roundabout via a 149.7’ radius curve that is a functional part of the roundabout. The remaining horizontal alignment of the entry and exits of the roundabouts were modified as necessary to their new location and are considered functional parts of the roundabouts.

(c.) Maximum Grades for all segments and connectors

The profile grades in our Conceptual Plans meet all RFP requirements and were decreased where possible to improve traffic operations and safety throughout the interchange. The most significant deviation from the RFP design is the relocation of the eastern roundabout and northbound on ramp. This relocation allowed the grades on these segments to be reduced considerably. The eastern roundabout is now at a 2% grade compared to the 4.5% RFP design. The maximum grade for the roundabout legs entering and exiting is 3.9% compared to the 4.5% max grade of the RFP roundabout at this location. One item of note is that the RFP Design profile for Travelers Way exceeded the maximum grade of 6% for the roadway by 2.3%. Our Conceptual Design not only meets the design criteria it is well below the maximum at 2%. Other segments are similar to the RFP design.

Roadway	Max Grade per RFP Design Criteria	Max RFP Conceptual Plan Grades	Max Branch WRA Design Grades
US Route 15/17/29	4%	4%	4%
US Route 15/17/29 Business	8%	8%	8%
Lord Fairfax Road	6%	4.5%	5.75%
Travelers Way	6%	8.3%	2%
Turkey Run Drive	6%	6%	6%
Interchange Ramps	Varies	8%	7.46%
Roundabouts	4.5%	4.5%	4.5%

Table 3 – Maximum Grades

(d.) Typical sections of the roadway segments to include ramps, roundabouts, retaining walls, and bridge structures.

The typical sections are detailed in Volume II of the Technical Proposal and include all features required by the RFP. Our conceptual design also fully allows for future widening of both Route 15/17/19 and Route 15/17/29 Business overpass, including the proposed bridge over the Bypass. All proposed minimum pavement sections are in accordance with the RFP requirements.

(e.) Conceptual hydraulic and stormwater management design

As with all other required elements for conceptual design, the plans in Volume II detail our proposed conceptual drainage and stormwater management design. A combination of culverts, storm sewer, and roadside ditches will convey runoff from the site towards the stream to the west of the project site and existing roadside ditches to the south and north along Route 15/17/29. Hydraulic facilities will be designed in accordance with the RFP requirements including the VDOT Drainage Manual and associated design guidelines. Our conceptual drainage design conveys post development runoff to existing channels by way of existing and proposed permanent drainage easements. As noted, drainage easements are required as anticipated by the RFP and are detailed on the conceptual plans provided in Volume II of our proposal.

The project is “grandfathered” and will be subject to Part IIC Technical requirements of the Virginia Department of Environmental Quality criteria for Stormwater Management. As such water quality treatment requirements will be calculated according to Performance Based criteria, and offsite nutrient credits will be purchased to avoid the need for water quality BMP facilities. Water quantity design will satisfy MS-19 criteria. All existing outfall channels will be shown to be adequate to convey post developed runoff. No on-site post project detention facilities are proposed *eliminating long-term maintenance cost to the Department.*

(f.) Proposed right-of-way limits

The Branch|WRA conceptual design minimizes right-of-way impacts to the maximum extent possible while still meeting the operational requirements of the RFP. Our Modified Roundabout design and the relocation of the northbound on ramp mimics the original trumpet interchange design that was envisioned when the right-of-way was purchased in the 1970s. The footprint of our design fits within the existing right-of-way. A minimal amount of right-of-way is still needed to accommodate the southbound on ramp as was envisioned with the RFP design, however our design significantly reduces the right-of-way required along Route 15/17/29 Business by utilizing a permanent easement in lieu of right-of-way. Planned right-of-way for the Park and Ride lot remains unchanged from the RFP Plans.

The RFP recognizes that permanent and temporary easements beyond those depicted in the RFP plans may be required. The construction phasing enhancements realized with our proposed design concept minimize the amount of temporary construction easements needed for the project. The RFP design includes a significant temporary construction easement in the southwest quadrant to accommodate the complex construction phasing of the RFP’s interchange design. Our proposed design eliminates the need for this detour and the associated need for extensive temporary construction easements. Our Conceptual Design and temporary widening of 15/17/29 Business for MOT includes the need for a temporary construction easement at the connection to Route 15/17/29 Business that was possibly not included with the RFP Design. Our design incorporates the use of temporary “wire walls” and other mechanically stabilized earth construction techniques to minimize the amount of easement needed as much as practicable. Temporary and permanent slope easements along the RFP northbound on ramp have also

been eliminated. This enhancement will most certainly come as a welcome change to the residents along Turkey Run Drive.

The project technical requirements and RFP Conceptual plans discuss the need to adjust the existing Limited Access line in various locations on the project. Our Design adjusts these lines similarly to the RFP Conceptual Design but altered to fit our proposed modified roundabout interchange. Our Team understands the process for getting these adjustments approved through L&D, Right-of-Way, and the Commonwealth Transportation Board. These efforts are included in our Project Schedule in Section 4.7.

Graphical representations of the proposed right-of-way required for our proposed design as they compare to the RFP right-of-way requirements are included in Volume II of this proposal. Below is a summary of the differences in the right-of-way and easement areas (except utility easements).

RFP Conceptual Design:

- Right-of-way: 55,285 sq. ft.
- Perm. Easement: 11,395 sq. ft.
- Temp. Constr. Easement: 95,925 sq. ft.

Branch|WRA Design:

- Right-of-way: 27,755 sq. ft.
- Perm. Easement: 38,320 sq. ft.
- Temp. Constr. Easement: 16,145 sq. ft.

(g.) Proposed utility impacts

The Branch|WRA Team’s conceptual design includes a definitive effort to minimize utility impacts to the extent practicable – particularly any impact to the 20” natural gas transmission line. Our proposed design makes the connection to Lord Fairfax Road in a location that eliminates any potential impact to the natural gas transmission line. Other utility impacts associated with the Department’s RFP Conceptual Design have been significantly reduced or eliminated. Details related to the anticipated utility impacts are provided in Section 4.4.2 for the Project Approach to Utility Relocations.

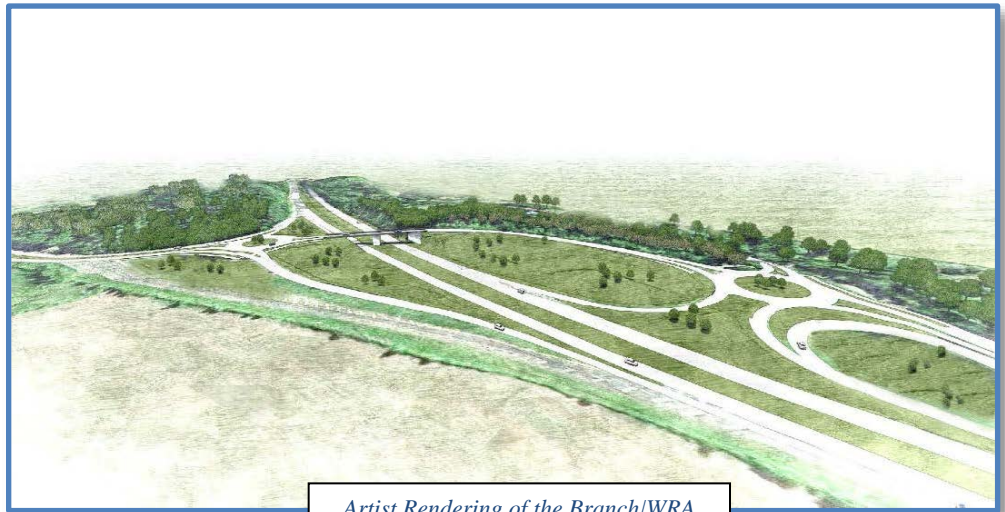
(h.) Noise barrier locations

The noise analysis report provided in the RFP details the possibility of noise barriers and determined that while barriers were feasible they were deemed not reasonable due to the relatively few benefited receptors. The area of noise wall was significantly higher than would be needed to meet the maximum ratio of square foot of barrier to benefited receptor. Since our design does adjust the physical location of several roadway elements we re-evaluated the original noise analysis and confirmed that even with the most conservative estimate of benefited receptors a noise barrier would still not be reasonable. Therefore no noise barriers are included in our conceptual design. As required by the RFP, a final noise analysis will be performed by our Team and presented to VDOT and FHWA for review and approval.

(i.) Other key project features

Landscaping

With the construction of the Warrenton Interchange, a unique opportunity exists to both enhance the appearance of the Route corridor and implement a small portion of the Living Legacy Tree Project, a component of the *Journey Through Hallowed Ground*. The Living Legacy Tree Project seeks to commemorate the sesquicentennial of the American Civil War and the soldiers that died. The commemoration is a legacy of trees planted along roadways from Monticello in Charlottesville, Virginia to Gettysburg, Pennsylvania. In Virginia the project largely follows Route 29. Improvements are called for along Route 29 in Warrenton and specifically, the proposed Warrenton Interchange project is mentioned in the Living Legacy Tree Master Plan. The master plan proposes the planting of large numbers of shade and ornamental trees and the inclusion of signage and gateways to Virginia’s historic places. The Design Build Team agrees that implementing the Living Legacy is a benefit to VDOT, Warrenton, Citizens of Virginia, and the legacy of those who fought on both sides of the conflict. The Living Legacy Project is not a high maintenance landscape project that requires care of small shrubs and perennials, but is a large-scale tree planting project. The trees recommended all are native and adapted to the area and require minimal maintenance.



Artist Rendering of the Branch|WRA Warrenton Southern Interchange

Roundabout Lighting

Addendum #4, released on December 1, 2017, added the requirement to light any roundabouts as recommended by current design guidance. While not depicted on our conceptual roadway plans, the Branch|WRA Team’s design does incorporate LED roadway lighting of the roundabouts and will meet all of the requirements of Section 2.9.5 of the RFP Addendum #4, Part 2.

Park and Ride Lot

A twenty space park and ride is included as part of our design as required by Section 2.2 of Part 2 of the RFP. While the RFP language directs the exact location that the park and ride facility is to be constructed, our Team explored other options and locations for the facility based on our proposed modified roundabout interchange design. While sufficient area exists for the 20 spaces, the access to and from any potential alternate site would have hindered the operational performance of the interchange. Subsequently our proposed design for the facility mirrors that of the RFP Conceptual Design.

4.3.2 Conceptual Structural Plans

The Branch|WRA Bridge Team has reviewed the RFP documentation and have developed a bridge structure that will accelerate the bridge construction and provide a long-term, low maintenance bridge structure for the new interchange. Our Team confirms that the proposed bridge structure will be designed per AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014 and in accordance with the current Instructional and Informational Memoranda, including the S&B Division Manual of the Structure and Bridge.

Proposed Layout

After careful review of the layout in the RFP documentation, our Team modified the interchange concept layout, which precipitated the need for a re-evaluation of the RFP concept for the new overhead bridge. Using the guidelines provided by the S&B Division, the proposed bridge layout were set by the guidelines in Vol V., Part 2, Chapter 17.01-7 (1st Bullet point) that require if a MSE wall is used, the overpass shall accommodate a minimum of one future lane in each direction for the roadway below the overpass. While the 2nd bullet in the same section via Addendum #3 has been waived, the vertical requirements to accommodate potential for future widening of the overpass bridge in Chapter 6.01-2 (H) are still required to be followed. Therefore, our proposed vertical profile has been set to allow for the future widening of Route 15/17/29 Business and still maintain the minimum vertical clearances in the future over Route 15/17/29. Using these geometric guidelines, our design Team subsequently focused on providing a design for a long-term, low maintenance solution. With our design concept modifying the overall layout, the proposed bridge layout was modified from the RFP, which:

- Reduces the skew angle from 30 degrees to approximately 23 degrees.
- Reduces the overall length from 260 ft. to 169 ft.

Superstructure

As discussed with the change in the interchange concept, it allowed our Team to re-evaluate the type of abutments to use. The change in roadway geometry allowed us to evaluate the use of a fully integral superstructure for *either* structural steel or pre-stressed concrete girders and still meet the S&B requirements in Chapter 17. Using this knowledge, our Team evaluated the most cost effective bridge superstructure for this new overpass at this location for not only the short-term initial costs, but for the future costs:

Structural Steel

- Advantages
 - Reduced dead loads, which reduces foundations/substructure requirements.
 - Reduced dead loads, which reduces crane requirements.
 - Meets the FHWA criteria for use of weathering steel, which eliminates future coating costs.
- Disadvantages
 - Splices over Rte. 15/17/29, which increases the impact to traffic.
 - Storm run-off on the weathering steel will stain the substructure units over time.
 - Dead load deflections are larger, which could lead to unanticipated additional deck cracks.
 - Constructability checks could require additional temporary support works to satisfy AASHTO requirements.
 - Requires installation of shear studs in the field, which increases field erection time.

Pre-Stressed Concrete

- Advantages
 - Lower long-term maintenance costs.
 - Reduced deflections, which should result in less deck cracking.
 - Reduced Field Time.
 - Shear Stirrups are pre-cast in beam, which results in the ability to immediately place deck pans.
 - No field splice requirements.
- Disadvantages
 - Higher Dead Loads require larger substructure foundations and units to accommodate bearings.
 - Higher Dead Loads require larger cranes.

After review of the various advantages and disadvantages and evaluation of overall project cost and benefits of the Pre-Stressed Concrete, the Team proposes to use 45-inch pre-stressed bulb-tee girders for the proposed bridge structure.

Substructure

The geometry and skews of our modified interchange allowed the superstructure to be fully integral with the substructure at the abutments. Our Team evaluated various alternatives to reduce the overall bridge length and it was determined most cost effective to use a MSE system to retain the soil along the approaches. The Team evaluated the use of “U-back” or “In-line” walls and after careful consideration, the “in-line” walls were determined the most efficient from design and cost consideration to account for the skew of the bridge and the approach roadway. To support the new superstructure, H-piles will be pre-bored to a determined depth and socketed into the weathered rock. As a value added benefit to the Department, while the requirements to allow for the future widening have been relieved, the Team will have the *MSE panels designed for potential future additional soil retention and the layout of the straps will be designed to accommodate for potential future installation of piles for widening.*

For the pier located in the median, two major factors influenced the design: (1) Pier cap is required to support the beams for our Team’s pre-stressed concrete option and (2) the pier protection requirements and its impact to the overall geometry. The Team evaluated a multi-column pier and a solid wall pier to determine the most cost effective solution for this location and then evaluated how to account for the impacts of the pier protection requirements on current and future geometry. After careful considerations for time of construction and the requirements to have heavy form work to support a cap and a separate bridge pier protection system with a multi-column pier, our Team chose a Solid Wall Pier as the most cost effective solution to support the new overpass bridge structure in the median. The Solid Wall Pier will account for the required collision forces per AASHTO and it will reduce the form work requirements associated with supporting the deep cap requirements of a multi-column pier and it will also reduce construction time. To support the Solid Wall Pier, a solid strip spread foundation will be founded on the hard residual soil approximately 5’ below existing grades.

The combination of these geometric changes to the proposed interchange has allowed our Team the ability to provide a two-span fully integral pre-stressed concrete bridge structure, which will minimize the long-term maintenance with this overpass.

4.4 PROJECT APPROACH

4.4.1 Environmental Management

The Branch|WRA Team has reviewed the RFP and required permits for obtainable and viable timeframes in our schedule. Critical to the design and construction schedule is securing the environmental clearances. Our Design was developed using an integrated approach that linked the designers, environmental staff, and construction experts to ensure that limits of disturbance shown provide adequate space to construct roadway features while achieving a “*permissible*” project. This integrated approach has allowed us to develop solutions and reduce the impacts presented in the RFP Conceptual Plans and identifying required permits and environmental commitments.

Our project schedule takes into account the timeframes to acquire all permits. Both the DBPM and Design Manager will integrate into the environmental management team with a main focus on anticipating and mitigating potential delays. During final design, our environmental staff will continue to collaborate with the designers and the Construction Design Coordinator (CDC) to identify and minimize impacts. By working with the CDC, all construction means and methods are taken into account when preparing permit applications. The following will be performed to ensure that environmental resource impacts have been documented, minimized, and are cleared by the regulatory agencies for construction and that environmental commitments are met during construction.

Identify and Update Environmental Resources: Upon Notice to Proceed (NTP), environmental resource locations within the project corridor will be refined based on our Design. Field work and technical services will be conducted as necessary and may include wetland delineation, stream assessments, water quality studies, and threatened and endangered species reviews that will be utilized for water quality permitting and environmental compliance monitoring. Should this refinement shed light on unanticipated or unknown resources, the preliminary design will be modified to support avoidance and/or minimization opportunities.

Cultural Resources: As stated in the RFP, VDOT, in consultation with the Virginia State Historic Preservation Officer, has determined that there are no historical properties present or affected by the project as proposed in the RFP Conceptual Plans. On April 11, 2017, the Virginia State Historic Preservation Officer determined the Project would have No Effect on historic properties in the Area of Potential Effect. Since our proposed design is entirely within the Area of Potential Effect (APE) of the cultural resources investigation, it is anticipated that DHR’s No Effect determination will remain valid.

V-CRIS was queried on October 19, 2017 to determine if any new resources had been identified since the April 11, 2017 VDHR Concurrence Letter. No new resources were identified.

Hazardous Materials Management and Studies: As stated in the RFP, VDOT has already conducted studies to identify hazardous materials that could occur within the project area. The VDOT Preliminary Hazardous Materials Summary Report dated February 13, 2017 did not identify any recognized environmental conditions (RECs) within the proposed right-of-way limits. Our proposed design requires less right-of-way than the RFP Conceptual Plans and is within the study limits of the February 13, 2017 hazardous materials report. Therefore, it is not anticipated that hazardous materials will impact the project schedule.

VEGIS was queried on October 19, 2017 to determine if new resources had been identified since the February 13, 2017 Preliminary Hazardous Materials Summary Report. No new resources were identified within the project area.

A Spill Prevention, Control, and Countermeasure Plan will be prepared prior to construction. The Branch|WRA Team will comply with Hazardous Materials Special Provisions as per the RFP:

Secure the Virginia Dept. of Environmental Quality (VDEQ) Virginia Stormwater Management Program (VSMP): Starting at NTP, the Branch|WRA Team will design an Erosion and Sediment Control and Stormwater Management Plans to meet VSMP permit regulatory requirements. We will consult with VDEQ to discuss our streamlined permitting approach for each advanced work package and submit a permit application to VDOT to secure a VSMP permit within 30 days of submittal.

Coordinate with Agencies for Threatened and Endangered Species: The Branch|WRA Team has reviewed the threatened and endangered species studies and coordination conducted by VDOT. VDOT's database searches identified two listed species, dwarf wedgemussel (*Alasmidonta heterodon*) and northern long-eared bat (*Myotis septentrionalis*) as potentially occurring in the area. The study area does not contain suitable habitat for the dwarf wedgemussel, and the Branch|WRA Team will adhere to the final 4(d) Rule for northern long-eared bat; therefore, it is not anticipated that the project will affect threatened and endangered species.

On March 31, 2017, VDOT completed a U.S. Fish and Wildlife Service – Virginia Field Office online project review self-certification letter, indicating that no additional coordination with the Virginia Field Office is needed. This self-certification is valid until March 31, 2018. Should project coordination extend beyond this date, the Branch|WRA Team will seek recertification from the U.S. Fish and Wildlife Service.

On October 19, 2017, IPaC, WERMS, VAFWIS, and DCR-DNH were queried to determine if new threatened or endangered species occurrences had been documented in the project area. No new species were identified.

Conduct Avoidance and Minimization: The Branch|WRA Team has refined the RFP design to further avoid and minimize resource impacts. The project will not expand the existing facility to the outside; therefore, resource impacts will be reduced. Additionally, the Route 15/17/29 Business crossing over Route 15/17/29 has been shifted to the north and temporary reinforced slopes are being implemented along Route 15/17/29 Business to further reduce impacts to streams. As the design advances after Notice to Proceed, we will further look for ways to refine the design to avoid and minimize additional impacts.

Secure Water Quality Permits: VDOT secured a USACE preliminary jurisdictional determination (PJD) for the project area on June 28, 2017. However, the RFP states that this PJD is for informational purposes only; therefore, it may be necessary to verify the accuracy of VDOT's wetland delineation and potentially request a revised PJD from the USACE. The Branch|WRA Team will determine compensation for any stream proposed for impact by applying the Unified Stream Methodology (USM).

The Branch|WRA Team will hold a Pre-application Meeting with USACE, VDEQ, and VMRC to discuss scope and identify any agency concerns early in the process. The purpose of this meeting is to partner with the regulators and to identify any additional studies, design considerations or constraints that would cause delays or additional cost.

Because the project has an approved Categorical Exclusion (CE) and will result in impacts less than 0.5-acre of wetlands and 1,000 linear feet of streams, it is anticipated that the project would qualify for a Nationwide Permit 23 from the USACE. No streams proposed for impact have a drainage area larger than 5 square miles; therefore, a permit from VMRC is not anticipated.

Construction Support: Once construction begins, the environmental staff will collaborate and support the construction staff to meet environmental commitments and to advise the field construction staff of any issues or construction activities that may impact the standing permit. We are well aware of the importance of environmental compliance and have qualified staff working on-call for VDOT assisting with enhanced oversight of various construction projects in the NOVA District.

4.4.2 Utilities

Our approach for utility coordination, adjustments, and relocations is an aggressive and proactive approach meant to make the utility representatives feel as a part of the design team from the beginning of the project. We want them to have a great understanding of the project design, schedule, and sequence of work and to take ownership of the key roles that their companies will have in making this a successful project for all involved stakeholders.

The key to starting utility coordination on a positive note is to have a very accurate and verified utility designation survey incorporated into the plans. Each utility company has been coordinated with during the proposal stage to verify that all of their facilities and easements are accurately shown in the plans. A very thorough walk through of the site is necessary for verification, looking for any missed facilities or anything out of place. The utilities will be made aware of which facilities are most likely in conflict, and how those conflicts will play into the project staging. Their input as to which facilities can be temporarily taken out of service or backfed from a different source will be taken into account when developing the project schedule. Where possible we will make project redesigns to minimize or eliminate utility conflicts.

As the design work progresses, we will be directly coordinating with the utility owners about their facilities. We will look at the relocation of individual sections of facilities rather than assuming an entire relocation schedule of all conflicts as a block of time. Relocations and adjustments will be sequenced to fit in with the project schedule and not cause delay. For aerial lines with multiple utilities on the poles, we will have the utilities coordinate with each other as well so that the sequence of their relocations makes sense; top to bottom with power going first followed by CATV and fiber lines and concluding with phone cables.

We will utilize an online cloud based utility coordination tracking system that incorporates both ball in court notifications and set due dates. The utility representatives will be able to see the current version at any time.

Further, we will use the resources of the Design-Build Team for the benefit of the utility companies. They can be provided with traffic control assistance, tree clearing, construction entrances, and lay down yards so that money spent towards utility clearance is not wasted on redundant service providers.

Special attention on this job will be paid to the TransCanada 20" Gas Transmission main including their specialized testing requirements that have been made part of the requirements. This is a vital facility in which most of the planned work would take place over an unencased section of the line. Our design was developed specifically with this utility in mind and any potential conflict has been eliminated. However, there may be areas where any cut near the line will require an approved backfill. We are also very cognizant of any haul routes carrying heavy equipment over the gas transmission line and will have crossings designed and coordinated with TransCanada so as to not do any damage to the line.

Our Team has performed an in depth conflict analysis of all utilities within the project footprint and has developed strategies to address the conflicts. There are 128 potential utility conflicts that have been identified based on this review. The major impacts to the utilities with the RFP Design along Lord Fairfax Road at and to the south of Traveler's Way have been completely eliminated. These conflicts with Dominion Energy, Lumos, Comcast and Verizon facilities (including a previously unidentified 900 pair copper telephone line along Lord Fairfax Road) would have delayed construction in this area by at least 3 months. Utility Summaries are presented below:

Dry Utilities

The Branch|WRA Team has extensive relocation experience with many of the dry utility owners involved on this project. This experience covers the coordination and design of utility relocations, as well as the coordination required during construction of the utility facilities and around these utilities. Our Utility Design Engineers have also provided utility relocation coordination services under annual contract services with VDOT.

DRY UTILITY CONFLICTS & MITIGATION		
UTILITY	CONFLICT	MITIGATION
Columbia Gas	Conflict with storm drain at Lord Fairfax Road and Traveler's Way	Relocate gas line to the east away from the proposed storm drain
Comcast	Conflict with poles and roadway widening on Route 15/17/29 South and temporary pavement on Route 15/17/29 Business; Conflicts with roadway realignment on Lord Fairfax Road and Turkey Run Drive	Relocate with Dominion poles; Place new buried cables out of pavement along Lord Fairfax Road and Turkey Run Drive
Dominion Energy	Conflict with poles and roadway widening on Route 15/17/29 South and temporary pavement on Route 15/17/29 Business; Conflicts with poles due to roadway realignment on Lord Fairfax Road and Turkey Run	Relocate poles to the west of Route 15/17/29 South and temporary pavement on Route 15/17/29 Business; Relocate poles to the south of realigned Lord Fairfax Road and Turkey Run Drive.
Lumos Networks	Conflict with poles and roadway widening on Route 15/17/29 South and temporary pavement on Route 15/17/29 Business; ditch grading on Route 15/17/29 North and Lord Fairfax Road	Relocate with Dominion poles to the west of Route 15/17/29 South and temporary pavement on Route 15/17/29 Business; Lower buried cables under ditch grading along Route 15/17/29 North and Lord Fairfax Road
TransCanada	Possible concerns for grading and driving construction equipment over 20" gas transmission main	Work with TransCanada to use approved backfill around gas line and use matting where equipment would cross transmission main
Verizon Virginia	Conflicts with slopes for temporary pavement along west side of Route 15/17/29 Business; Conflicts with ditch grading and storm drains along Ramp A and Route 15/17/29 South; Conflicts with Ditch Grading along Lord Fairfax Road; Conflicts with poles due to roadway realignment along Turkey Run Drive	Relocate buried cables west out of conflict along Route 15/17/29 Business, Ramp A, and Route 15/17/29 South; Deepen lines under ditch grading along Lord Fairfax Road; relocate lines with Dominion Energy Poles along Turkey Run Drive

Table 4 – Dry Utility Conflicts



Columbia Gas of Virginia: Columbia Gas has a 4” plastic gas line currently running along Turkey Run Drive in a southwesterly direction to Lord Fairfax Road, where it then heads south and then in an easterly direction towards Lord Fairfax Community College down Traveler’s Way. There is a possible conflict with this line and proposed storm drain facilities at Lord Fairfax Road and a possible conflict with grade cuts along Turkey Run Drive. These possible conflicts will be confirmed with test holes. Possible relocation solutions would be moving lines east away from the drainage facilities and going deeper along Turkey Run Drive. The 4” Columbia Gas line does not connect to the 20” TransCanada Transmission line in the project area.



Comcast: Comcast has aerial coax and fiber optic lines that follow the Dominion Energy pole line along the western side of the project. Two of the poles along Route 15/17/29 Business will be impacted by the MOT Phase I temporary lane construction and need to be relocated. The last pole on the west before the line crosses over Route 15/17/29, at station 107+31, will also end up too close to the new pavement, so it will need to be relocated. On the eastern side of the project, Comcast follows the Dominion Energy pole line towards the south on the eastern side of Lord Fairfax Road. None of those poles are in conflict. From the east side pole of the line crossing Route 15/17/29, there is a buried Coax line that goes down Traveler’s Way, which may be in conflict with ditch grading. There is also another aerial line along Dominion poles that goes down Turkey Run Drive where 3 poles will be in conflict and need to be relocated. These will be relocated with the Dominion poles.



Dominion Energy – Distribution: Dominion Energy has two 3-phase aerial circuits that follow its own pole line along the western side of the project. Two of the poles along Route 15/17/29 Business will be impacted by the MOT Phase I temporary lane construction and need to be relocated. The last pole on the west before the line crosses over Route 15/17/29, at station 107+31, will also end up too close to the new pavement so it will need to be relocated. On the eastern side of the project, a Dominion Energy pole line with two 3-phase circuits runs south on the eastern side of Lord Fairfax Road. None of those poles are in conflict. There is also another aerial single phase circuit along Dominion poles that goes down Turkey Run Drive where 3 poles will be in conflict and need to be relocated.



Lumos Networks: Lumos has aerial fiber optic lines that follow the Dominion Energy pole line along the western side of the project. Two of the poles along Route 15/17/29 Business will be impacted by the MOT Phase I temporary lane construction and need to be relocated. The last pole on the west before the line crosses over Route 15/17/29, at station 107+31, will also end up too close to the new pavement so it will need to be relocated. On the eastern side of the project, from the east side pole of the line crossing Route 15/17/29, there is a buried fiber optic line that goes down Traveler’s Way, which may be in conflict with ditch grading. Relocation would consist of burying these lines deeper.



TransCanada: TransCanada owns a 20” gas transmission main line that crosses Route 15/17/29 near Traveler’s Way. It runs through the project from southwest to northeast. The line is approximately 14’ deep and encased under the Route 15/17/29 southbound lanes, which were the original roadway, and then becomes shallower as it crosses the northbound lanes and Lord Fairfax Road. The line is not in direct conflict, but there is a possibility that special measures will need to be taken to protect the line from construction equipment passing over it. Cathodic protection measures for the gas line will also need to be maintained by the project through construction.

verizon[✓] Verizon Virginia: Verizon Virginia has a buried 36 strand fiber optic cable and a 600 pair copper cable in an easement off of the right-of-way through the entire western portion of the project. There is an additional 900 pair copper cable crossing Route 15/17/29 just south of Travelers Way not shown in the RFP plans. A section of these lines will be impacted by the construction of the temporary lanes for MOT phase I and a possible relocation may be required. There are also potential conflicts along Ramp A and Route 15/17/29 southbound as storm drain pipes and ditch lines cross the buried Verizon lines. Test pits will be needed to verify if these facilities are in conflict. If so, then relocation should be possible by lowering the existing lines. On the eastern side of the project, there are buried Verizon lines, which run alongside Lord Fairfax Road and Turkey Run Drive. Potential conflicts exist where the lines cross Traveler’s Way as ditch grading may cause a conflict. Realignment of Turkey Run Drive will also cause a conflict where Verizon will be required to relocate their lines.

Wet Utilities

For nearly 20 years, WRA has assisted the Town of Warrenton in the planning, design and construction management of water and wastewater utility projects. WRA developed the Town’s Water and Wastewater Master Plan at the turn of this century and we have updated the master plans several times in the past 2 decades. WRA has conducted numerous infrastructure improvement design projects in support of implementation of the master plans including water main and sewer main improvements, infiltration and inflow studies, water and wastewater treatment process improvements as well as VDOT utility relocation designs for Town facilities.

WRA has been continuously providing utility relocation design services for VDOT under an annual contract since 1994. This knowledge and longstanding relationship with VDOT and the Town gives us the unique advantage of knowing the standards, specifications, policies and personnel thereby accelerating approvals for water and sewer relocation designs. Water and sanitary sewer conflicts will be addressed to minimize roadway construction and construction sequence impacts.

WET UTILITY CONFLICTS & MITIGATION		
UTILITY	CONFLICT	MITIGATION
Town of Warrenton Utilities - Lord Fairfax Road at Travelers Way	6" and 8" water main conflicts with proposed grade changes.	Relocate water mains and appurtenances as needed. (See roadway plans for planned relocation locations.)
Town of Warrenton Utilities - Lord Fairfax Road	4" sanitary sewer force main conflicts with proposed drainage structures and grade changes.	Relocate sanitary sewer force main and appurtenances as needed. (See roadway plans for planned relocation locations.)
Town of Warrenton Utilities - Turkey Run Drive	8" water main conflicts with proposed drainage structures and grade changes.	Relocate water main and appurtenances as needed. (See roadway plans for planned relocation locations.)
Town of Warrenton Utilities - Turkey Run Drive	4" sanitary sewer force main conflicts with proposed drainage structures and grade changes.	Relocate sanitary sewer force main and appurtenances as needed. (See roadway plans for planned relocation locations.)

Table 5 – Wet Utility Conflicts



Town of Warrenton: From the southern end of the project limits up to Traveler’s Way, the Town of Warrenton has a 4” sanitary force main running along the western edge of pavement of Lord Fairfax Road. This force main line is not in conflict. From Traveler’s Way the line continues to the northeast down Turkey Run Drive. There are possible conflicts with a drainage structure and with roadway grade cuts. There is also an 8” waterline that runs parallel to the sewer line from Traveler’s Way to the northeast up Turkey Run Drive. It has a potential conflict between a water valve, the curb line, and a hydrant being in a ditch line. These potential conflicts will be verified by test holes. If found to be in conflict, we intend to make relocations, having the designs performed on behalf of the Town by our design team.

4.4.3 Geotechnical

The development of project specific geotechnical approach and risk mitigation starts with the review and research of the following:

- Geologic data pertaining to the site.
- Available geotechnical data, including but not limited to Geotechnical Data Report (GDR) provided with the RFP.
- Available Geotechnical subsurface data and construction experience from adjacent projects and from similar site development elsewhere.

VALUE: The Branch/WRA Team has experience working in similar geological and geotechnical conditions as seen on the Route 3 Widening Project, less than 25 miles away.

The Team has reviewed the information included in the Geotechnical Data Report (GDR) provided with the RFP, and researched geological and geotechnical references, maps and publications. The project is located within the Blue Ridge physiographic region, specifically within the Catoclin Formation, which consists of metabasalt and greenstone schist fragments. Based on the borings drilled and included in the GDR, the site is underlain by residual soils from in place weathering of the metabasalt. The soils encountered were found to consist of silts and clays, showing high plasticity towards the south of the proposed interchange and transitioning to low plasticity at and north of the interchange. Groundwater was encountered at depths over 20’ below existing ground surface (within EL 540’ and EL 530’). However, it is expected that perched groundwater levels might be found within the site above the highly plastic soils.

Based on the initial assessment of geotechnical data and multi-discipline evaluations, an Alternative Technical Concept (ATC) was developed for the overall project to reduce project cost, construction time and risk. Many components of the ATC have been incorporated into our conceptual design. The following sections provide details on the design and discussions on effectively managed geotechnical risk associated with the Project including ATC implementation. The discussion on mitigation measures include additional geotechnical investigations, associated soil laboratory testing, and effective design measures.

Bridge Foundation: The proposed bridge consists of a two-span concrete beam option with integral abutments, and fixed bearings on the center pier. Based on the proposed structure and available subsurface information, the following foundation options will be evaluated in design at each substructure unit: for the Abutments, steel H-piles installed into decomposed rock or IGM material to meet all axial and lateral loading requirements; and for the Middle Pier (Pier 1), spread footing bearing over hard residual soils (SPT N60 > 30) identified approximately within 5’ below existing grades.

Alternative Technical Concept

(ATC): When considering all of the subsurface conditions noticed within the site and issues described above, the Branch|WRA Team developed an ATC, which eliminates the cut retaining walls that would be required for the concept presented in the RFP Drawings along the northbound on ramp. Construction of these retaining walls would have caused impacts to the traveling public by requiring live traffic along the ramp immediately next to the work zone on a curved roadway section. By eliminating these retaining walls, the Team has developed a concept that reduces public safety risks associated with maintaining traffic on the curved roadway section while constructing the RFP cut walls.

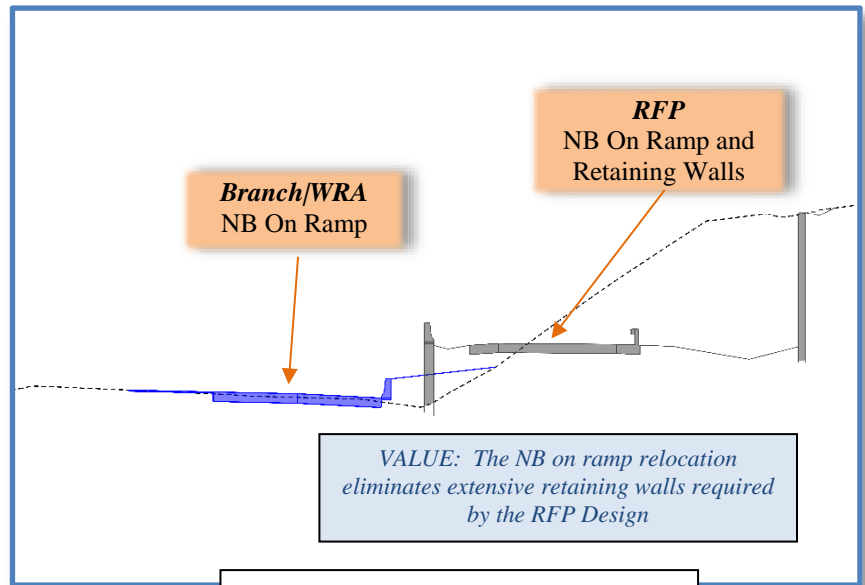


Figure 5 – ATC NB On Ramp Comparison



Figure 6 – Reinforced Slope Construction

Fill Embankment effects on Stream: The proposed ATC requires a temporary roadway along the southwest quadrant of the planned interchange. This roadway requires new fill placed on the existing embankment slope. The western most slope of the new embankment would impact the existing stream if 2:1 side slopes are used. To manage the risks associated with impacting this existing environmental feature our project will incorporate the design of a temporary engineered steepened reinforced soil slope. This technique eliminates the impact to the stream and the environmental risk of negatively impacting the wildlife and vegetation. This plan will also reduce the construction schedule’s risk of being delayed due to associated permitting. The Team has successfully designed and implemented reinforced slopes of this type on other projects to eliminate environmental impacts as well as maintaining traffic within confined right-of-way.

Affecting existing buried utilities: The RFP plans would have required several feet of fill to be placed over an existing 20” gas line that crosses under Route 15/17/29 and Lord Fairfax Road. Placing fill over this existing utility creates concerns of either excess earth pressures on pipe or the settlement induced by the fill to bend and overstress the pipe. Our Design significantly reduced embankment fill to be placed over the existing north slope of Lord Fairfax Road just north of the T-intersection with Turkey Run Drive where the 20” gas line runs. Although the height of the fill is expected to be minimal, the Team will perform additional utility test pits (soft digs) to confirm that adequate cover over the utility will be maintained. These investigative procedures and design analysis will mitigate the risks related to the unknown conditions of the utility and backfill material used for the trench when the utility was laid.

Temporary maintenance of traffic over existing paved shoulder: The proposed bridge design incorporates a two-span bridge, with a center pier to be constructed within the existing Route 15/17/29 median. Construction of the pier is expected to shift traffic into the existing Route 15/17/29 southbound right outside shoulder. The shift is expected for a short run (less than 300 feet) near the bridge pier construction. Mainline traffic will be required to drive on the existing shoulder. The Team will evaluate the necessary strength to safely support live traffic throughout the duration of the planned pier construction or determine what measures would be required to strengthen the pavement section for such purpose. The shoulder may be of sufficient strength or it may require full depth reconstruction. For this engineering assessment, pavement cores along the Route 15/17/29 shoulder will be taken in order to perform an analysis on the adequacy of the existing shoulder. Currently, the Team is performing the described assessment on two design-build projects, and has been viewed favorably by the Department (I-95/Route 3 Safety Improvements and I-64 Exit 200-205 Improvements).

Unsuitable Materials at Pavement Subgrade: Data included in the GDR reflected that subgrade soils within proposed paved areas does not meet the RFP’s minimum required CBR of 5. Soils tested within the subgrade, consisting mostly of clays and silts, revealed CBR values between 1 and 3, with swell percent values over 5. The Team can improve the subgrade by evaluating measures to treat these subgrade soils through use of lime mixing or partial undercut and stabilization with geosynthetics. Other options would be to explore options with VDOT to increase the pavement structure such that it would not require the subgrade strength specified in the RFP.

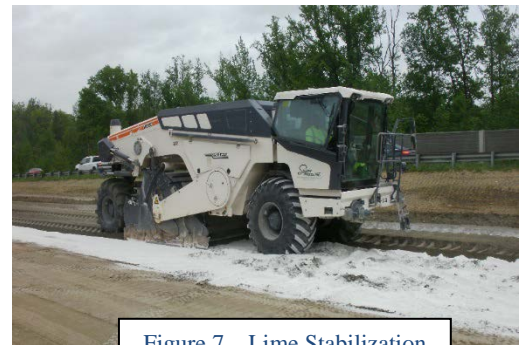


Figure 7 – Lime Stabilization

Recently, the Team successfully implemented lime mixing to achieve higher CBR values on fill material, which would otherwise need to be disposed of off site on the I-95 Express Lanes Southern Terminus Extension.

4.4.4 Quality Assurance / Quality Control (QA/QC)

The Branch|WRA approach to the development and implementation of the Quality Assurance/Quality Control (QA/QC) Plan is to emphasize the importance of and define a process for obtaining a high quality product in every project feature. Quality will be a key consideration in the day-to-day decisions made by employees at every level. All team members are required to become familiar with and follow these procedures. The QA/QC Plan will assure that procedural practices are in place to plan for and achieve the quality of workmanship standards set by the Branch|WRA Team. These practices will establish the protocol to be followed by all team members, including all subcontractors, during the design and construction of the project. It will also provide detailed procedures and means to measure the Team’s success in meeting VDOT’s standards. Branch|WRA has adopted the QA/QC Minimum Guidelines as the guidance document for the QA/QC Plan, central to these quality guidelines are complying with the minimum requirements, specifications and standards of all applicable Federal, State and Local laws and VDOT Standards, Specifications, and Reference Documents. The intent and successful implementation of The Plan will result in process efficiencies, project profitability by elimination of re-work, increased employee morale and ultimately a successful project. Our Team has experienced very favorable performance evaluation scores (minimum 4.5/5 on DBPE) on the I-95 Express Lanes Southern Terminus Extension, which is proof that our QA/QC plan is effective.

The Plan is organized into sections, with appropriate attachments in the Appendices, which provide additional

guidance and checklists for the Branch|WRA Team to implement the QA/QC plan for the project. In particular, the **Design QA/QC Plan** defines what processes, roles, and responsibilities that WRA will follow to ensure Quality Assurance and Quality Control in the design of the project. The **Construction QA Plan** is the plan that WRA's Quality Assurance Manager will lead to ensure Quality Assurance in the construction of the project. WRA will also oversee the implementation and adherence to the Construction QC Plan as part of the Construction QA Plan. To be successful, the Plan must be a living document, updated continuously with lessons learned as the project progresses. *In addition to the minimum requirements*, the Branch|WRA Team intends to put the following enhancements into effect for this project.

- Update QA/QC Plan after each Preparatory Meeting.
- Amend QA/QC Plan after Approved for Construction (AFC) plans are released.
- Incorporate field changes and any associated correspondence into the QA/QC plan.
- Submit QA/QC updates monthly at a minimum.

Design

As Design Manager, *Mike Russell, P.E., DBIA*, will have ultimate responsibility for implementation of quality control and quality assurance processes for all design elements of the project. The Design QC and QA Plan addresses procedures and responsibilities to ensure the project design is correct and consistent with appropriate standards and specifications. Each design submittal of plans, calculations, or reports, whether intermediate or final will be subject to an independent quality review of both Design QC and Design QA functions. Each review is finalized by a review summary form, which indicates by signature that the reviewer has completed the review and that the Design Manager (DM) has confirmed that all review comments have been properly incorporated. The review set of documents becomes a permanent part of the project files.

Design quality control reviews will look at a detail level to verify numerical accuracy and completeness of calculations and plans and conformance to VDOT standards and contract requirements. This review will assess coordination between disciplines, sub-consultants, and details, and will assure that the design is correctly reflected on the plans. This process makes extensive use of standardized checklists, including VDOT LD-436 (Appendix B.1), and materials developed in-house. Design quality assurance reviews will look at the "big picture" to verify completeness and reasonableness of the design solution. The plan will also include conformance with contract requirements for each design discipline and will include the following efforts as a minimum:

1. All existing design data and calculations will be reviewed by the Design Engineer with an emphasis on engineering design and conformance with current VDOT standards in order to identify deficiencies. Deficiencies will be corrected as appropriate by the Design Engineer.
2. The general geometry shown on the drawings will be reviewed by the Design Engineer to ensure standards are met.
3. Once all calculations have been verified, the drawings will be checked by the independent QC Engineer to confirm that the design information has been correctly transferred to the plans.
4. We will supplement the roadway plans with additional items, such as erosion and sediment control plans, traffic management plans, utility relocation plans, right-of-way acquisition plans and traffic engineering plans. Independent checks by the QC Engineer and reviews by the QA Engineer will be provided on these additional plans.
5. Quantity calculations will be confirmed by starting with the original calculations as compiled by the Design Engineer being independently checked by the QC Engineer and comparing the information to the final drawings.

6. Special provisions and special provisions copied notes will be reviewed by the Design Engineer to confirm their applicability. Additional special provisions will be provided as necessary with the concurrence and approval of the DM.

The DM will review constructability, adequate right-of-way, possible utility conflicts, traffic maintenance issues, and interdisciplinary coordination. WRA and all design team members will work directly with Branch’s Construction Design Coordinator and the QAM to complete the constructability reviews of the plans to thoroughly ensure that all aspects of the project can be physically constructed in a safe manner. In addition to being safe, reviews will ensure the completed work is maintainable. This especially holds true for the impact the design will have on MOT. Items, such as material delivery/storage, workforce accessibility, and crane and other equipment placement will be reviewed to minimize traffic impacts. The DM will carry out his responsibilities by ensuring all QC and QA reviews are performed appropriately and by conducting weekly design meetings and special meetings for specific issues and concerns.

Any field changes or any other deviations to the approved construction documents that need to be made will be subject to same design QC and QA measures and procedures as applied to the original design. The requested change will be logged for tracking and will be sent to the Design Engineer who performed the original design. Once the change has been reviewed and the appropriate QC Engineer check performed, the requested change will be forwarded to the QA Engineer for review and DM for approval. Once the DM has approved the change, it will be sent to Branch and ultimately to VDOT and/or other entity, as needed, with a recommendation for approval. If there are no comments, then the field change will be incorporated into the as-built plans. If comments are received, they will be forwarded back to the original designer and we will continue the process until the requested change is acceptable to VDOT and/or the appropriate entity.

In summary, the mission here is to provide quality designs and plans in the fast-paced delivery of a design-build project. The key that drives success is effective communication among everyone involved with the design. QA/QC design procedures goals are to:

- Design features that are safe and maintainable, and also meet VDOT regulations and Design Manuals;
- Conform to the standards and reference documents in RFP, Part 2, Section 2.1.1.
- Design elements that meet requirements, are constructible, durable, economical, inspectable, and minimize maintenance.
- Meet design schedule, budget, and construction staging requirements.
- Minimize design costs.
- Provide an organized and indexed set of design calculations, including design criteria and assumptions.
- Minimize VDOT Reviews.

Teamwork: The Branch/WRA Team has developed a very strong working relationship, level of trust, and common quality goals for the project while working together on I-95 Express Lanes Southern Terminus Extension (photo to the right) and the I-95 Safety Improvements at Route 3.



Specific Design QA/QC Element – Roundabout Design

While Roundabouts are becoming more and more common in Virginia, their design requires specific attention to detail with regard to vehicle tracking, drainage, construction staking detail, and concrete pavement (construction detail, texture, and contrast). The roundabouts proposed by the Branch|WRA Team are an integral component to the success of the overall project, but specifically as they relate to the interchange operations. The close proximity of the western roundabout to the proposed bridge and the approaching grades of the roadway introduce additional design constraints and complexities that must be taken into account. The northbound off ramp connection to the eastern roundabout and the proximity of the existing roadways in the area introduce MOT details that must be carefully reviewed during final design. A constructability review and sequence of construction will be discussed with the construction staff to understand and address the challenges of building the roundabouts.

While many of these issues have been vetted during the ATC process, our Team plans to introduce an interim QC/QA review of the roundabout design early in the design process and prior to any submittal being made to the Department. The intent of this interim review is to ensure that all design elements of the roundabout are in accordance with NCHRP Report 672 and that all necessary design information such as AutoTurn plots and speed profiles have been prepared and reviewed.

The QA/QC process described above will be followed as if this were a true submittal to the Department. Once the Designer has checked their work for completeness, the Design Manager will direct QC Engineers from roadway, traffic engineering, and drainage to perform reviews of the design with particular attention being paid to horizontal and vertical geometry, pedestrian and bicycle accommodations, maintenance of traffic during the various construction phases, and drainage. Once comments have been resolved, incorporated, and back-checked, a separate QA review will be performed to ensure the QC process was followed in accordance with the QA/QC plan followed by an Interdiscipline Review to include the construction team members. Finally, a review will be conducted by the Design Manager to ensure the entire process is complete.

Construction

Quality Assurance (QA) is defined as the overall process performed independently of the construction contractor (contractor’s production forces) for the purpose of determining the conformance of the work by examining Quality Control (QC) data and/or providing objective evidence (independent sampling and testing), to verify the contractor’s quality control sampling and testing. The Construction QA Plan is intended to describe how the Branch|WRA Team will achieve the QA functions in accordance with this definition and

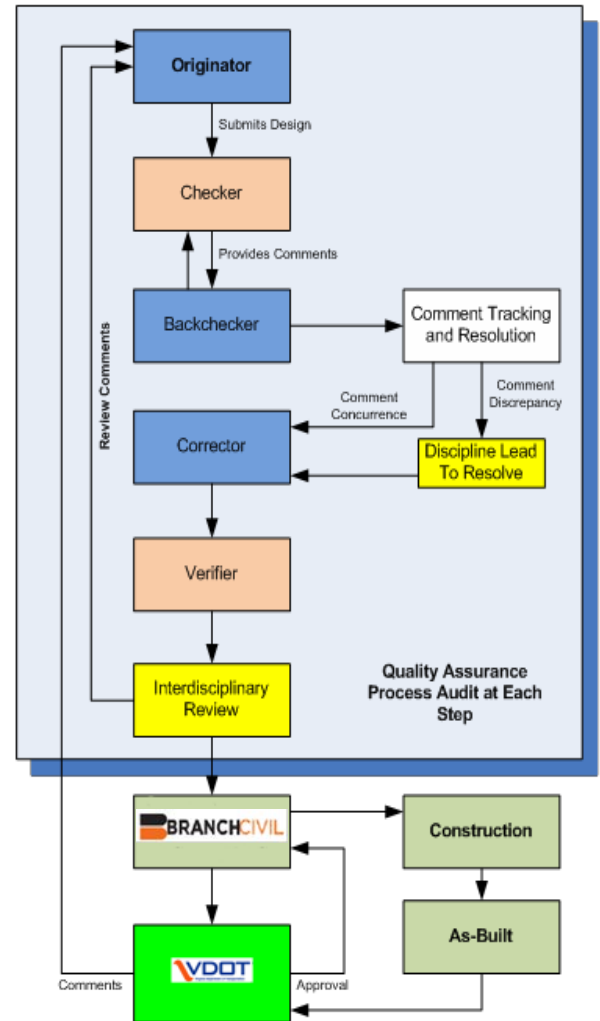


Figure 8 – QA/QC Flow Chart

VALUE: Key to project success is an integrated QA/QC process that includes the QC staff, designers, contractors, and the design team’s quality control checkers.

according to the requirements in the Minimum Guidelines. The QA Staff consists of the *Jason Hoyle, DBIA*, Design-Build Project Manager (DBPM), *Lenny Coleman, PE, CCM*, the WRA Quality Assurance Manager (QAM), WRA QA Inspectors, and the QA Laboratory and Testing Technicians.

The DBPM will be ultimately responsible for the quality of the construction of the individual work elements, including the workmanship and materials incorporated into the Project. The QAM will report directly to the DBPM and will manage the construction Quality Assurance program. The QA organization will be separate from the design and production teams and the QA staff will not perform conflicting duties or production work. Thus, in full compliance with VDOT's requirements, the QA organization will be "distinct and separate from the design and production staff" and "all key personnel performing QA or QC functions" will "be exclusively designated as such and" will "not be assigned to perform conflicting duties or production work." The QAM will provide inspection and testing to assess construction processes relative to the applicable standards and specifications. The QAM and staff will perform independent control testing in accordance with this QA Plan, which is based on VDOT's "Minimum Quality Control and Quality Assurance Requirements for Design-Build & Public-Private Transportation Act Projects" dated January 2012 (Minimum Guidelines), provide feedback to the VDOT PM, and will assure that all the necessary documentation regarding QA/QC inspections and testing of materials and in-place construction has been performed and adheres to the contract before any payment is approved. Per VDOT's Guidelines, Branch|WRA has given the QAM written authority to stop work or hold payment.

Once construction starts, the QAM and his staff will interface on a daily basis with the Construction Manager and his Quality Control Team. The QAM's primary point of contact on site will be the DBPM. The QC Staff, to include the QC Inspectors, Technicians and Laboratory, will submit all of the QC documentation to the QAM for review and acceptance. Based on the Contractor's two-week look-ahead schedule generally provided to the QAM on a weekly basis, the QAM will ensure that upcoming work items are properly inspected and tested. The QAM will review issue logs with the Quality Control Manager (QCM) and will then discuss these issues directly with the DBPM and VDOT with recommendations to correct any problem(s). Four phases of inspection will be used to ensure the work is performed in accordance with the contract documents. They are the Preparatory Phase, Intermediate Phase, the Completion Phase, and the Punch-list Phase.

The QAM, DBPM, and Construction Manager will use the inspection preparatory meetings as an opportunity to proactively address issues related to upcoming work and to convey lessons learned. Preparatory Inspection Meetings will be hold points and will be held in advance of specific work activities to verify approval of proper documents, materials, and permits, discuss the means and methods and sequencing that will be employed in the activity, plan for testing and necessary Owner interaction, and schedule the necessary inspection activities. The meeting will allow for coordination and communication between Branch|WRA, our production personnel, relevant Design-Team members, QC and QA personnel, and VDOT and VDOT's Independent Assurance and Verification, Sampling, and Testing representatives. The meetings will ensure that all parties have the same understanding of the design intent and to confirm the completeness and suitability of the plans, and identify all relevant inspection checklists, inspections and testing that will occur for each work package.

The challenge in having a preparatory meeting 14 days in advance of this particular operation is that this element of work is constant throughout the life the project. In order to reinforce the level of quality discussed at the beginning of the project as the project develops, the Branch|WRA Team will conduct weekly QA-QC meetings with the Branch|WRA, QA, QC, and VDOT teams on-site to ensure each individual understands his or her respective responsibilities and that all work is covered and properly documented. Daily communication

with the Construction QC Manager will occur to review the project's scheduled activities and to ensure proper coordination of QA/QC activities. When deemed necessary, the Branch|WRA Team will conduct supplemental preparatory meetings to discuss previous hold-point topics as well as highlight challenges and solutions that the project has had since the first meetings. The Branch|WRA Team has found this practice to be particularly valuable when a new subcontractor commences operations on the project that will impact a previously covered element of work.

When the procedures established in the QA/QC Plan and discussed at the Preparatory and Weekly Meetings are not followed, the QAM will utilize the enforcement and documentation tools at his disposal and at his discretion. They include an Internal Non-Conformance Statement (INCS), Non-Conformance Report (NCR), and Stop Work Notice. An INCS will be utilized when an element of work has been observed by the QA, QC, Branch|WRA, or VDOT staff that is not in compliance with the project requirements but the next item in succession for this element of work has not yet begun. Examples of this would include the placement of tack on asphalt that has not yet been properly cleaned. An INCS would be issued for the tack to be removed, the asphalt layer cleaned, and tack reapplied. In the event that the INCS was not corrected within seven (7) days and the contractor proceeded with placement of the next lift of asphalt on the uncleaned surface, a NCR would be issued. The contractor would then have to justify to the satisfaction of the QAM, EOR and VDOT of the proposed corrective action. Payment for that element of work would be withheld until the NCR is closed.

Another example using enforcement and documentation tools is monitoring work zone compliance. On a daily basis the QC inspector will inspect the project's MOT elements for general compliance and on a weekly basis the QC and QA inspectors will complete separate Work Zone Safety Inspection Checklists (TE-97001). The inspectors will document the compliance of the various elements of the work zone within the checklist, review with the contractor responsible for the work zone, sign and file the checklist with their daily work report as well as maintaining a separate log. The VDOT checklist already follows the established enforcement policy established within Branch|WRA's QA/QC Plan. If an item is deemed non-compliant per the VWAPM and not an immediate safety hazard (damaged barrel or leaning signage), the inspector will note it as such in the appropriate checkbox and re-inspect the noncompliant items within 5 business days. If an item requires immediate action because it has been determined to be an immediate safety hazard (clear zone infraction or malfunctioning advanced warning light) a NCR and a Stop Work Notice for that operation will be issued until the issue is corrected.

Witness and Hold Points will be established where notification of VDOT is required for the Department's option of observing or visually examining a specific work operation or test. Witness Points are points identified within the QA/QC Plan and CPM schedule, which require notification of VDOT. Work may proceed beyond a witness point with or without participation by VDOT provided proper notification has been given. Hold Points are mandatory verification points identified within the QA/QC Plan and CPM schedule beyond which work cannot proceed until mandatory verification is performed and a written release is granted by VDOT. The QAM will work with VDOT to identify witness and hold points accordingly.

Specific Construction QA/QC Element – Roundabout Construction

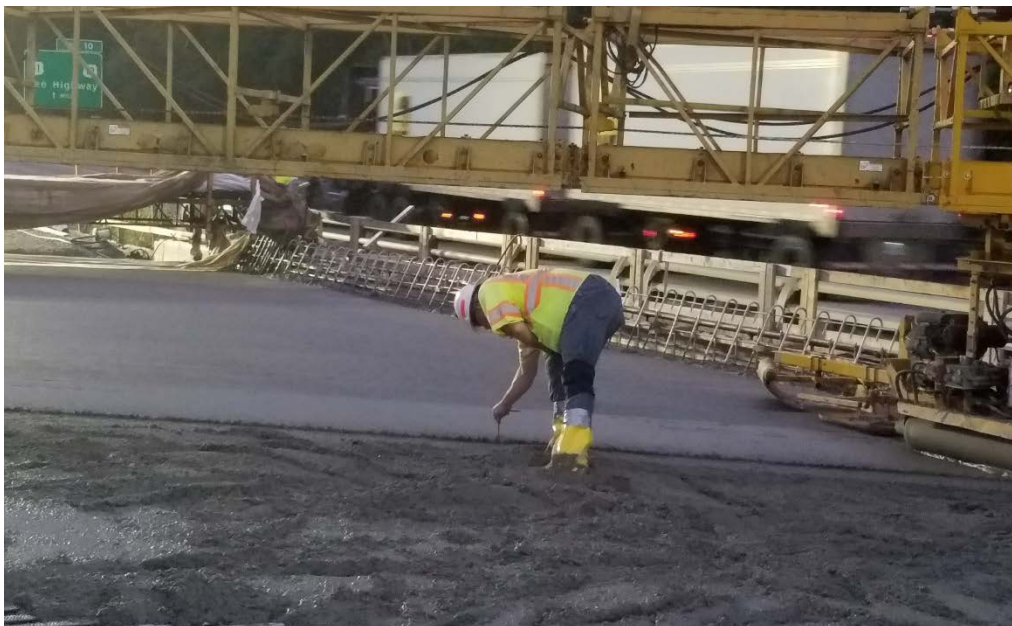
One of the more significant challenges presented by the Warrenton Interchange Project is maintaining traffic throughout the life of the project through the different phases and in particular through the construction of the roundabouts while still in various MOT phases. One of the first preparatory meetings for the project will be for Maintenance of Traffic. This meeting, and all preparatory meetings, will be structured to be informational and not instructional so as to reinforce a collaborative solution based meeting discussion. It is the Branch|WRA Team's experience that these meetings have resulted in impactful comments and questions

being presented back to the design team for clarification and/or revision to assure a quality operation and final product. The inclusion of the applicable design discipline at these meetings has resulted in quick resolution of questions and changes to plans that have provided the maximum level of quality first-time work.

Discussion about the lane and shoulder closure time restrictions will be a key topic in the Maintenance of Traffic preparatory meeting as well as coordination efforts between VDOT, the nearby residents, and Lord Fairfax Community College. Understanding that the RFP takes into account the required restrictions as determined through traffic analysis, the Branch|WRA Team, working with the above partners, will take into account the impact of the project’s phasing on special events and also peak periods of traffic such as events at Lord Fairfax Community College. The Maintenance of Traffic preparatory meeting will also focus on traffic shifts for the roundabouts. Roundabouts have proven to be a vital traffic calming measure, however during phased construction they present challenges for maintaining traffic flow particularly when opened in phases. The Branch|WRA Team will engage all meeting attendees to discuss lessons learned on previous roundabouts constructed throughout the state so to maximize the quality of our construction. Meeting minutes will be prepared and distributed within 48 hours of the meeting so that all parties are fully informed of the discussion. At a minimum, the following topics will be discussed at the Preparatory Meeting:

- ✓ **Layout for Construction**
- ✓ **Verification of Survey for Drainage and Roadway Improvements**
- ✓ **Sequence of Construction**
- ✓ **Maintaining Traffic During Construction**

Prior to making the roundabout fully operational, a Hold-Point will be held with Branch|WRA, VDOT, and the QA/QC teams to review the on-site conditions to verify all elements of work are in working order and the new traffic pattern can safely be implemented. A checklist will be provided by the QAM for all parties to confirm their agreement on the safe and operational condition of the intersection prior to the commencement of all traffic shifts as part of the Hold-Point inspection. This procedure will include confirmation from VDOT that proper notification has been provided to all project stakeholders and media outlets.



WRA Inspector on Deck Pour

4.5 Construction of the Project

Introduction

From working together on previous projects, Branch|WRA drew from our lessons learned to provide the means and methods required to safely and efficiently deliver this critical project *ahead of schedule*. We focused on the following to develop our construction approach:

- Reinforcing the safety of the traveling public, pedestrians and our workers during construction
- Construct the majority of the project without impacting traffic
- Reduce impacts to streams and wetlands
- Minimize impacts to right-of-way
- Decrease the Maintenance of Traffic phases
- Accelerate the removal of all signals and existing intersections on the Bypass
- Overall project acceleration

Members of our Team have met on a weekly basis to develop the Sequence of Work that eventually led to the generation of the Project Schedule, shown in Section 4.7. The Project Schedule illustrates the detailed effort that will be put into the design and engineering, permitting, utilities, right-of-way acquisition, QA/QC and construction.

VALUE: Allows end users the beneficial occupancy of the corridor earlier than anticipated, reduces construction impacts to stakeholders, and reduces construction cost to the citizens of the Commonwealth.

Highlighted in the Table below, our construction approach supported by a solid design has led to several project schedule and safety enhancements. *The Branch|WRA Team is very proud to state that because of these enhancements we will deliver the entire project early, and introduce a Unique Milestone that will further advance the operational improvements at the very heart of the need for this project.*

Project Enhancement	Positive Impacts for the Traveling Public
Final Completion Date of October 17, 2020	Delivers the Project 2 months earlier than the Final Completion Date established by VDOT
Unique Milestone Date of July 2, 2020 for Removing All Signals in Existing Intersection, with Self-Imposed LD's of \$3,100 per day	Removes all signals in the existing intersection and allows for continuous flow along Route 15/17/29 5 months earlier than the Final Completion Date established by VDOT
Optimized Alignment	Reducing the scope of construction work will require less time to complete the project, providing safety improvements to the traveling public earlier
Phased MOT Plan	By reducing the number of traffic shifts and phases of MOT, vehicular and pedestrian safety is increased
Minimized impacts to traffic	85% of the project will be constructed out of traffic

Table 6 – Construction Approach Project Enhancements

4.5.1 Sequence of Construction

4.5.1.a Approach to Construction Phasing

To develop the Construction Sequence, we focused on the pre-planning activities below that will reduce potential construction delays. This approach **maximizes the probability of anticipating and mitigating any potential delays to construction and meeting the Final Completion of the Project** by the dates included in the Letter of Submittal. Should VDOT elect to incorporate Option 1 or Option 2, we have accounted for either or both options without changing our construction approach.

Geotechnical Investigation

Branch|WRA will complete the necessary testing and develop the Geotechnical Engineering Report. Recommendations will be generated in advance of construction to address the impacts of unsuitable soils, low CBR values, and hard residual soils during the construction of embankments, subgrade and structure foundations.

Embankments, Cut Slopes and Pavement Subgrade

Testing will be performed to evaluate the strength and compressibility for the proposed pavements and fill embankments. In addition, in-situ testing will be performed to evaluate shear strength near the proposed cut slopes that reach a height of over 25 ft. Performing the in-situ testing will provide information that will help to better determine the design of the slope in order to meet long term stability requirements and minimize the cost and time for construction.

Based on the information made available by VDOT in the GDR, subgrade soils range from low to highly plastic silts and clays. The CBR values reported within these soils range from approximately 1 to 3 and up to 8% swell. These soils classify as unsuitable for the minimum pavement support at the subgrade level. The table below shows a summary of the unsuitable soils identified in the GDR:

Alignment	Location	Unsuitable Material
Ramp A	Sta. 10+00 to 15+00 Within 3' of subgrade in cut section	CH and MH, CBR < 5, Swell = 8%
Business Route 15/17/29, WB and EB	Sta. 50+75 to 57+50 Within 3' of subgrade in cut section	CH and MH, CBR < 5, Swell =7%
Ramp C	Sta. 10+50 to 10+70 & Sta. 15+50 to 18+25 Within 3' of subgrade in cut section	CH and MH, CBR < 5 Swell =5%
Ramp D	Sta. 12+00 to 16+50 Within 3' of subgrade in cut section	CH and MH, CBR < 5
Route 15/17/29 WB	Sta. 67+50 to 69+00 Within 3' of subgrade in cut section	CH and MH, CBR < 5

Table 7 – Unsuitable Materials

This approach to identifying and mitigating the issues associated with embankment, cut slopes and pavement subgrade issues will provide timely solutions to prevent any delays to the construction schedule. Our Team will evaluate each of these areas during construction and perform one of these three treatment options:

1. Undercut 3’ of the area and replace with material meeting a minimum CBR value of 5
2. Undercut 1ft and replace with a geotextile and 1ft. of # 21B’s
3. Utilize lime or cement to chemically stabilize 1ft. of the subgrade

Bridge Foundation

The proposed bridge consists of a two-span concrete beam with integral abutments and fixed bearings on the center pier. The following foundation design will be incorporated to address the subsurface conditions:

Substructure Unit	Foundation Type	Construction Approach
Abutment A	H-Pile	Pre-drill before driving pile
Pier 1	Spread Footing	N/A
Abutment B	H-Pile	Pre-drill before driving pile

Table 8 – Bridge Foundation

In order to minimize any delays during the construction of the bridge foundations, H-pile in both abutments will be pre-drilled before driving in order to penetrate the anticipated layer of hard residual soils.

Environmental Impacts

The Branch|WRA Team has reviewed all potential environmental impacts and developed a design and construction plan to minimize the impacts. The existing stream running parallel to Route 15/17/29 Business on the west side of the project will not be impacted due to the implementation of using wire baskets to support the temporary widening during construction. No additional noise impacts have been introduced with the proposed design.

Right-of-Way Acquisition

The right-of-way acquisition required for this project has been reduced by our Team’s design. The right-of-way to be acquired in the RFP conceptual plans adjacent to Route 15/17/29 Business on the east side of the project will not be required with our proposed design. This limits the right-of-way to be acquired to:

- Parcel 001 (Fauquier County): Partial ROW take for construction and drainage easements
- Parcel 007 (Alwington Farm, LLC): Partial ROW take for construction as well as utility and drainage easements
- Parcel 005 (David Lux): Temporary construction easement
- Parcel 010 (Potomac District Council of the Assemblies of God, Inc.): Temporary construction easement and permanent slope easement

Vehicular and Pedestrian Safety and Operations

The following enhancements to our design have made positive impacts to vehicular and pedestrian safety and operations:

Alignment	Enhancement	Improvement to Safety and Operations
Relocation of Route 15/17/29 NB OnRamp & Eastern Roundabout	<ul style="list-style-type: none"> • Increased distance between the on ramp and residential properties along Travelers Way and Turkey Run Drive • Allows for adequate space to relocate the eastern roundabout • Allows for the grades of the eastern roundabout to be lowered 	<ul style="list-style-type: none"> • Simplifies the sequence of construction allowing for almost all improvements on the eastern side of the intersection to be constructed out of traffic • Ramp grades reduced from 8% to 2%, which eliminates any staged constructed or temporary shoring
Relocation of Eastern Roundabout (Continued)	<ul style="list-style-type: none"> • Vertical grade differences minimized to no more than 2 feet at Turkey Run Drive • Near existing grade transitions for Traveler’s Way and Turkey Run Drive • Constructing the roundabout away from traffic • Profile of roundabout and approaches improved 	<ul style="list-style-type: none"> • Simplifies this phase of the sequence of construction to make the improvements at the northbound on ramp and off ramp for Route 15/17/29 as well as Route 15/17/29 Business and Lord Fairfax Road • Existing entrances to Traveler’s Way and Turkey Run Drive are maintained during construction and permanent improvements are easily made with asphalt build up • Eliminates any need for long term detours or temporary signals on the Bypass • Traffic operations are improved compared to RFP grade of 4.5%
Relocation of Route 15/17/29 Business	<ul style="list-style-type: none"> • Alignment moved 140ft. to the north • Temporary connection of Lord Fairfax Road to the eastern roundabout • Relocated shared use path to the south side of Route 15/17/29 Business 	<ul style="list-style-type: none"> • Eliminates several MOT phases while increasing vehicular and pedestrian safety • Eliminates the need for a temporary crossover at Route 15/17/29 • Provides additional sight distance at the bridge and improves safety of the pedestrian crossing of the ramps
Relocation of Western Roundabout	<ul style="list-style-type: none"> • Realignment of southbound on-ramp to Route 15/17/29 from roundabout • Reduced design speeds for southbound Route 15/17/29 Business entering the roundabout 	<ul style="list-style-type: none"> • Realignment creates better sight distance when maneuvering through the roundabout • Increases pedestrian safety crossing ramps

Table 9 – Vehicular and Pedestrian Safety Enhancements

Staging and Storage Areas

Branch|WRA understands that the planning and establishment of appropriate staging and storage areas are critical to maximizing safety and efficiency of the Project. The following are considered when determining the most suitable locations for staging and storage areas: proximity to construction activities and ease of access. Additionally, we evaluate each proposed area for line of sight considerations, ingress/egress safety and consideration of clear zone location.

The storage of materials and equipment behind existing guardrail or temporary barrier results in a safe work zone with limited impact to traffic. Branch|WRA is careful to consider the deflection rate of guardrail and barrier to support the proper placement of materials and equipment to prevent these work zone elements from becoming potential hazards, even when placed behind protective devices.

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

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

1. Park and Ride Lot – A general staging/storage area to be developed early in construction
2. Lord Fairfax Community College Property – Consider general staging/storage area immediately adjacent to Lord Fairfax Road

Construction Sequence

Phase 1

The approved Alternative Technical Concept will allow for a significant portion of the improvements to be constructed out of traffic. Roadway and structure construction can progress concurrently. The phases of construction are summarized below and include constructing the permanent improvements up to the final layer of surface course:

1. Under lane closures at night, construct temporary widening along Route 15/17/29 southbound to accommodate the center pier foundation construction.
2. Under lane closures at night, construct temporary widening along Route 15/17/29 Business southbound to move traffic to the west to accommodate proposed improvements to Route 15/17/29 Business.
3. Construct southbound Route 15/17/29 off ramp.
4. Construct the western roundabout including any temporary shoring required to keep the existing western intersection in operation.
5. Construct the new alignment of Route 15/17/29 Business from the western roundabout including the tie in to the existing Route 15/17/29 Business.
6. Construct the new alignment of Route 15/17/29 Business between the eastern and western roundabouts.
7. Construct the southbound on ramp to Route 15/17/29 in the existing gore area between the existing intersection and the current southbound on ramp.
8. Under lane closures at night, construct the widening along southbound Route 15/17/29 from Sta. 121+00 to 126+00.
9. Construct the entire proposed structure including the shared use path on the bridge.
10. Under lane closures at night, construct the widening along northbound Route 15/17/29 from Sta. 102+00 to 110+00.
11. Construct the new northbound on ramp for Route 15/17/29 from Sta. 11+00 to 14+00.

12. Construct the eastern roundabout including the improvements on Lord Fairfax Road from Sta. 10+00 to 16+00 and the northbound off-ramp from Sta. 14+00 to 18+00.
13. Construct Park and Ride facility.

Phase 2

This phase will allow traffic to be placed on the newly constructed eastern roundabout utilizing a temporary connection to access the existing signalized intersection:

1. When the improvements in Phase 1 are complete the following improvements will be constructed under lane closures:
 - a. Any asphalt or milling required to make the permanent tie-in to the western connection to Route 15/17/29 Business up to the final layer of surface.
 - b. Any asphalt or milling required to make the permanent tie-in to the eastern roundabout along Lord Fairfax Road up to the final layer of surface.
 - c. Any asphalt or milling required to make the permanent improvements to Traveler's Way and Turkey Run Drive.
 - d. Construct temporary connection from eastern roundabout to existing intersection on east side.
 - e. Shift traffic onto the newly constructed Lord Fairfax Road allowing traffic to flow through the eastern roundabout.
 - f. Remove any temporary widening previously constructed along Route 15/17/29 Business except for the temporary widening to maintain the southbound on-ramp for Route 15/17/29.
2. Construct the permanent widening on northbound Route 15/17/29 from Sta. 121+00 to 130+50
3. After traffic has been switched onto the new Lord Fairfax Road and Route 15/17/29 Business, the following will be constructed under lane closures up to the final layer of surface course:
 - a. Construct the permanent widening along northbound Route 15/17/29 from Sta. 118+00 to 121+00.
 - b. Construct the remainder of the northbound off ramp Route 15/17/29.
 - c. Construct the remainder of the northbound on ramp Route 15/17/29.
 - d. Remove the temporary connection from the eastern roundabout to the existing intersection.

Phase 3

When this phase begins, all traffic on the eastern side of the interchange will be in its final configuration. The focus of this phase will be on the western side of the interchange to complete any widening and open the southbound on ramp for Route 15/17/29.

1. Shift traffic onto newly constructed southbound Route 15/17/29 off ramp.
2. Shift traffic onto the newly constructed northbound off ramp and on ramp.
3. Shift traffic across bridge and through the western roundabout.
4. The DBT will give notice to VDOT to make the following improvements up to the final layer of surface course by using a short-term temporary detour to be in place for 30 calendar days:
 - a. A short duration detour will be put in place to temporarily divert southbound on ramp traffic for Route 15/17/29 coming from the west along Route 15/17/29 Business.

- b. Remove the existing traffic signal at the intersection.
- c. Construct the southbound on ramp for Route 15/17/29 from Sta. 17+00 to 19+75.
- d. Switch traffic onto the new southbound on ramp for Route 15/17/29.
5. Remove all signals on the western side of the intersection.
6. Construct permanent widening on southbound Route 15/17/29 from Sta. 119+50 to 121+75 and Sta. 105+00 to 116+00.
7. Remove temporary widening along southbound Route 15/17/29 that was installed to accommodate the center pier construction.
8. Remove temporary widening along southbound Route 15/17/29 Business.
9. With traffic in its final pattern, place the final asphalt surface on all alignments and place final pavement markings.

Graphical depictions of these construction phases are provided at the end of this section.

4.5.2 Transportation Management Plan

Maintaining Traffic Through All Phases of Construction

While satisfying the requirements for safety improvements is a key focus of the Project, Branch|WRA places an equal significance on making sure the work is completed in a safe and efficient manner. Our focus is on designing and building a solution using a construction program that delivers the highest standard of safety with the least impact to the public.

To satisfy this high standard of safety and low impact, we have developed a design where **85% of the improvements are constructed out of traffic**. Our Team will also develop a comprehensive Transportation Management Plan (TMP) that will include the following components:

- Fully detailed Temporary Traffic Control (TTC) Plan for all phases of construction
- Public Communications Plan
- Incident Management Plan

This comprehensive TMP will be developed, in part, through the efforts of our **Traffic Management Task Force (TMTF)**. The TMTF will verify that the TMP and construction activities are continually coordinated to mitigate safety and traffic congestion risks. Led by the Construction Manager and supported by the MOT Engineer and Roadway Superintendent, the task force will meet at least monthly with appropriate VDOT staff and project stakeholders to review the TMP and determine if any changes need to be made to address safety and logistics concerns. Not only will this regular coordination alleviate safety and traffic risks, but it will also provide an effective means of keeping VDOT and the stakeholders up-to-date on progress and upcoming changes in the traffic pattern.

Following Project award, Branch|WRA will develop fully detailed TTC plans for each phase of construction to identify each traffic control element required for efficient construction and safe movement of traffic through the project. The Team will take great care to implement the appropriate devices to ensure the safety of the workers and motorists while satisfying the requirements of the Virginia Work Area Protection Manual and the Manual on Uniform Traffic Control Devices (MUTCD). The TTC plans will include barrier locations, temporary attenuation device types and locations, temporary signage and pavement markings, advance warning via Portable Changeable Message Signs (PCMS) installation, temporary drainage features, construction access points and methods, and delineation of staged worked areas.

The TMTF will review historical crash data and existing safety concerns to verify that the TTC plan mitigates these risks. Our Team will consider existing geometry, inadequate sight lines, and any other site

characteristics identified that require special consideration for construction sequencing or traffic control. Branch|WRA has proactively completed a preliminary review of this data to make sure the sequencing and proposed phasing of construction addresses these existing safety concerns.

A Public Communications Plan will consist of providing regular project updates to VDOT to be shared on the project website, public distribution of paper and social media, and sharing work zone information. The work zone information will be provided by using PCMS. During lane closures and traffic shifts, law enforcement will be utilized to assist the construction activities.

An Incident Management Plan (IMP) will be developed to address any field work that is performed, which impacts travel lanes or shoulders. The intent of the IMP will be to prepare for incidents along the construction corridor. Our TMTF will coordinate with VDOT, EMS, and other stakeholders during the development of the plan and hold a stakeholder meeting to discuss the IMP. The IMP will be developed to address the following:

- 24/7 point of contact for emergency notification of incident by TOC.
- Emergency detour routes and sign layout plans in addition to TMP signage.
- Agency and stakeholder Responsibilities Matrix/Checklist.
- Coordination with VDOT TOC.
- Coordination with first responders.
- Law enforcement, fire, and rescue access to the road network during incidents.
- Pre-planned messages for various types of incidents for the portable DMS.
- Contact list for appropriate stakeholder response personnel.

Proposed Lane Closures

The proposed design will allow for a significant portion of the improvements to be made without impacting or making changes to the existing traffic patterns. Temporary lane closures will be utilized to construct the following:

- Temporary widening along southbound Route 15/17/29 to accommodate construction of the center pier.
- Temporary widening along southbound Route 15/17/29 Business to accommodate improvements to be made to Route 15/17/29 Business.
- Permanent widening along southbound Route 15/17/29.
- Permanent widening along northbound Route 15/17/29.
- Making connections to the eastern and western roundabouts.
- Any asphalt or milling required to make the permanent tie-in to the western connection to Route 15/17/29 Business up to the final layer of surface.
- Any asphalt or milling required to make the permanent tie-in to the eastern roundabout along Lord Fairfax Road up to the final layer of surface.
- Any asphalt or milling required to make the permanent improvements to Travelers Way and Turkey Run Drive.
- Construction of the temporary connection from the eastern roundabout to the existing intersection on the east side.
- Construction of the permanent widening along northbound Route 15/17/29 from Sta. 118+00 to 121+00.
- Construction of the northbound off ramp Route 15/17/29.
- Construction of the northbound on ramp Route 15/17/29.

- Construction of the southbound on ramp for Route 15/17/29 from Sta. 17+50 to 19+75.

Temporary Detours

A temporary detour will be used in Phase 3 to construct the southbound on ramp for Route 15/17/29 from Sta. 17+50 to 19+75. This temporary detour will be in place for 30 calendar days. This detour will accommodate westbound traffic from Lord Fairfax Road and Turkey Run Drive heading south on Route 15/17/29 by rerouting them to the adjacent interchange to the north (Route 643). There are only 33 vehicles in the peak hour making this maneuver.

Time of Day Restrictions

Our Team is aware of and will adhere to the Time of Day Restrictions established in the RFP.

Flagging Operations

Flagging operations will be required when making tie-ins to Lord Fairfax Road, Route 15/17/29 Business, Traveler’s Way and Turkey Run Drive. To reinforce the safety of both the workers and traveling public, our flaggers will be fully certified and will adhere to stringent safety standards such as the use of OSHA approved safety equipment and ISEA’s “American National Standard for High-Visibility Apparel,” appropriate station locations with adequate visibility, and the installation of advance warning signs.

Minimum Lane Widths

Existing lane widths on Route 15/17/29 will be maintained throughout construction including the temporary widening on southbound Route 15/17/29 required for pier construction. All other alignments where traffic will be impacted will maintain the minimum lane width required by the RFP.

Work Zone Speed Reductions

Our Team will not request a speed reduction for the construction of the project.

Project Stakeholders

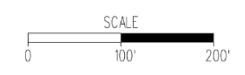
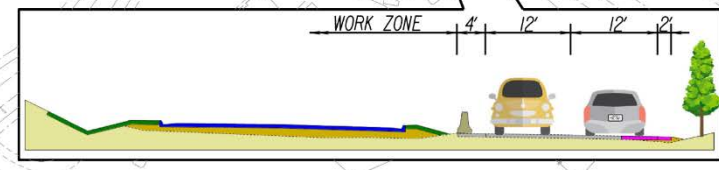
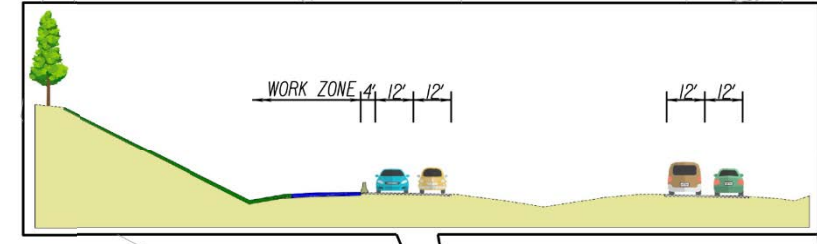
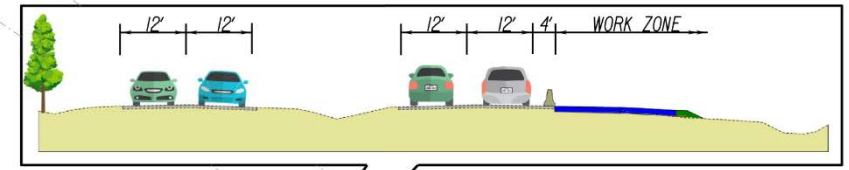
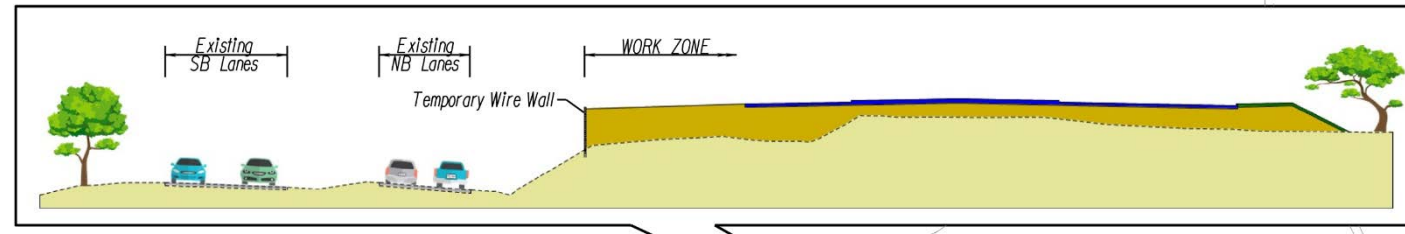
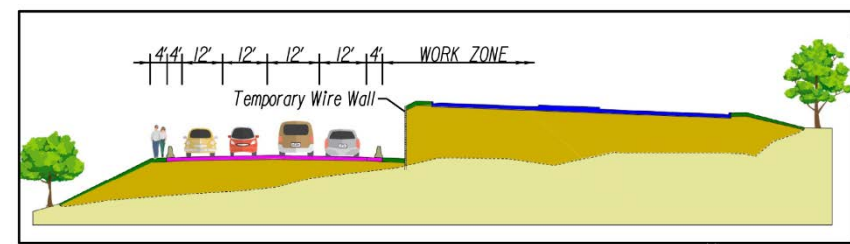
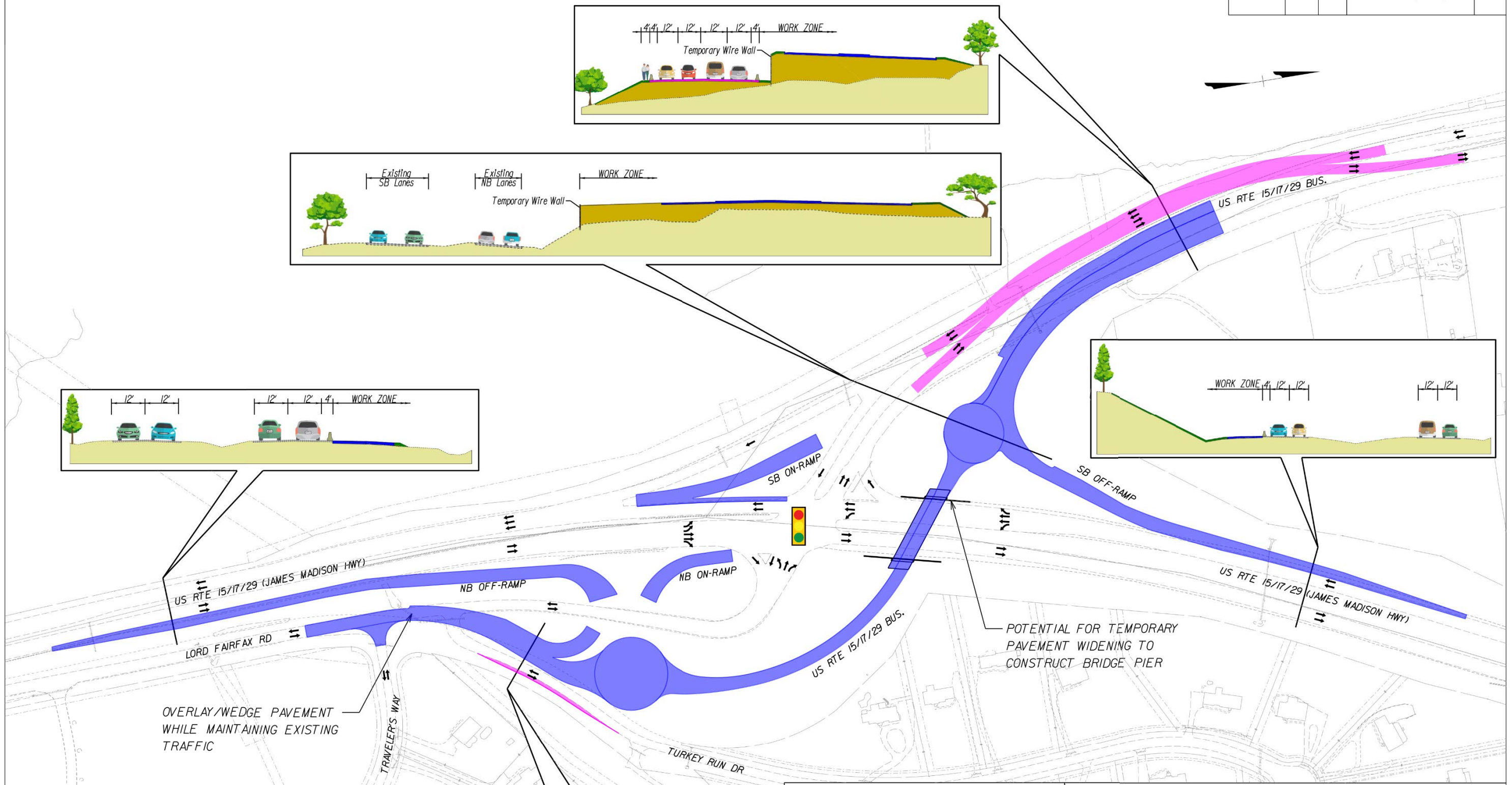
The summary below outlines the stakeholders that are located throughout the Project corridor and outlines our planned communication and mitigation strategies to limit disruptions to vehicular and pedestrian traffic through the work area and adjacent public transportation facilities/roadways.

Stakeholder/Impact	Communication/Mitigation Strategies
<p>Traveling Public:</p> <p><i>Potential time delay for temporary construction operations</i></p>	<ul style="list-style-type: none"> • Provide advance warning via PCMS • Facilitate regular public meetings with stakeholders • Public outreach campaign (media) • Minimize lane closures and traffic shifts • Maximize temporary lane widths
<p>Pedestrians:</p> <p><i>Potential for pedestrians within the work zone near schools, church, and residential areas</i></p>	<ul style="list-style-type: none"> • Maintain all existing sidewalk and pedestrian access facilities • Proactively schedule work activities around churches, schools, and residential areas to avoid delays • Engage TMTF to coordinate with stakeholders in regard to special events and seasonal activities

<p>Fauquier County and Town of Warrenton:</p> <p><i>Potential time delay for temporary construction operations</i></p>	<ul style="list-style-type: none"> • Provide advance warning via PCMS • Facilitate regular public meetings with stakeholders • Public outreach campaign (media)
<p>Utilities (Columbia Gas, Verizon Virginia, Comcast, Dominion Energy, Lumos Networks, TransCanada, Town of Warrenton):</p> <p><i>Need for proactive coordination of relocation efforts with planned construction sequencing</i></p>	<ul style="list-style-type: none"> • Implement weekly utility coordination meetings facilitated by WRA; meeting will be attended by Branch WRA and utility owners to facilitate appropriate coordination and identification of early start areas • Engage TMTF to continuously evaluate and adjust the TMP to provide safe and efficient traffic control as dictated by needed utility operations
<p>Local Community (Residents, Lord Fairfax Community College, State Police Headquarters, Arrington Property):</p> <p><i>Construction in close proximity</i></p>	<ul style="list-style-type: none"> • Facilitate regular public meetings with stakeholders • Public outreach campaign (media) • Maintain access to all adjacent properties • Coordinate driveway and road tie-ins with residents
<p>Schools (Fauquier County, Lord Fairfax Community College):</p> <p><i>Potential delays to school buses and drop-off/pick-up traffic, and pedestrian safety</i></p>	<ul style="list-style-type: none"> • Facilitate regular public meetings with stakeholders • Public outreach campaign (media) • Engage TMTF to coordinate with school administration • Strategically schedule construction activities • Analyze peak AM and PM traffic volumes to minimize disruptions
<p>Assembly of God:</p> <p><i>Possible equipment noise and construction in close proximity</i></p>	<ul style="list-style-type: none"> • Facilitate regular public meetings with stakeholders • Public outreach campaign (media) • Maintain access • Coordinate adjacent construction activities around service dates and times, special events, etc.
<p>Police, Fire & Rescue:</p> <p><i>Potential for delay in response time</i></p>	<ul style="list-style-type: none"> • Facilitate regular public meetings with stakeholders • Public outreach campaign (media) • Engage TMTF to coordinate with designated representative of each agency to serve as point-of-contact for proactive dissemination of upcoming traffic pattern or route changes • Analyze existing coverage areas and review the need for pre-staging of services • Pre-traffic switch meeting with agencies prior to major changes in traffic patterns
<p>Journey Through Hallowed Ground:</p> <p><i>Landscaping preferences</i></p>	<ul style="list-style-type: none"> • Early coordination

Table 10 – Stakeholder Coordination



REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	



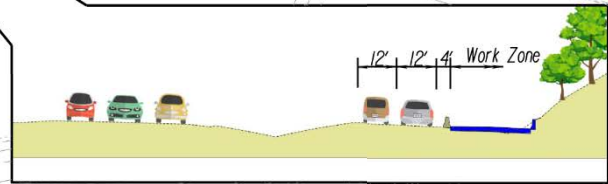
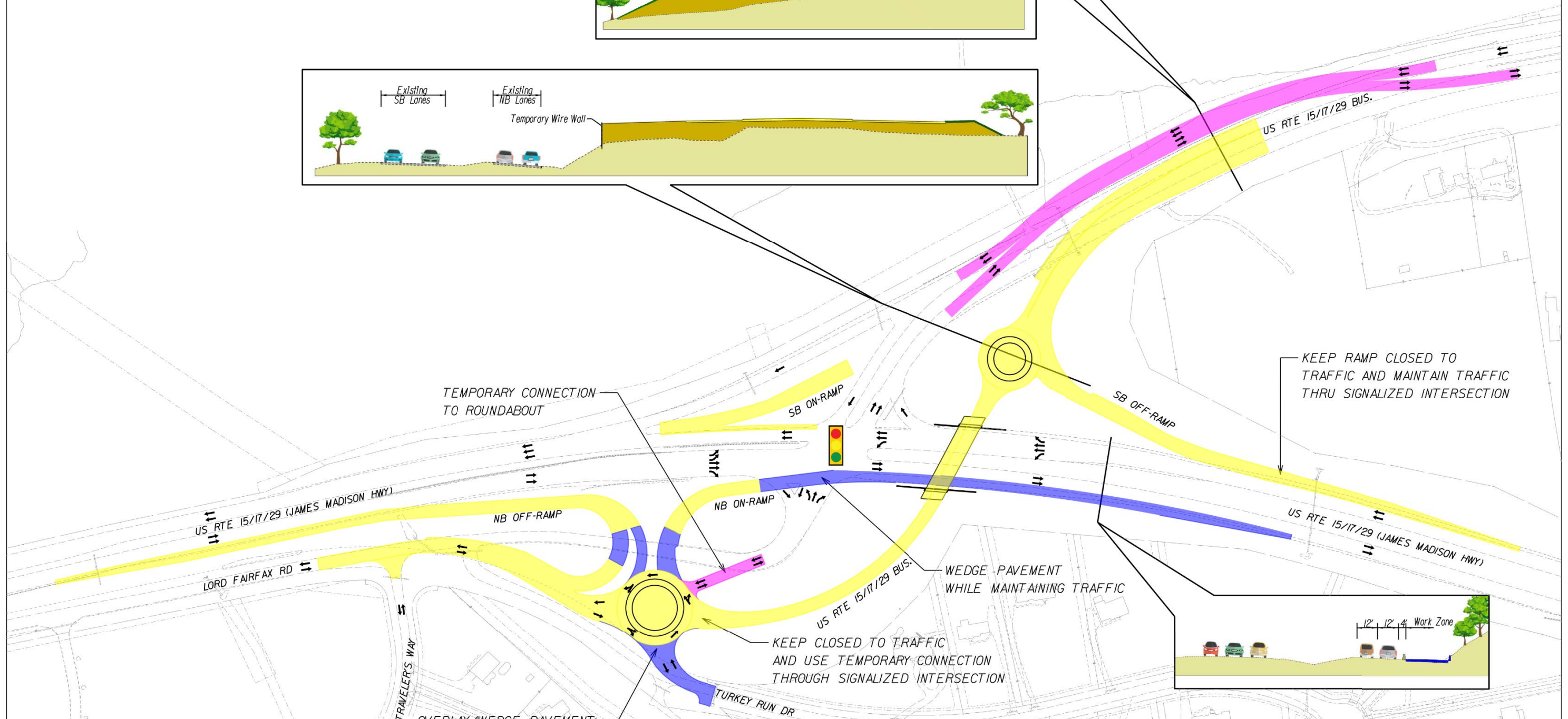
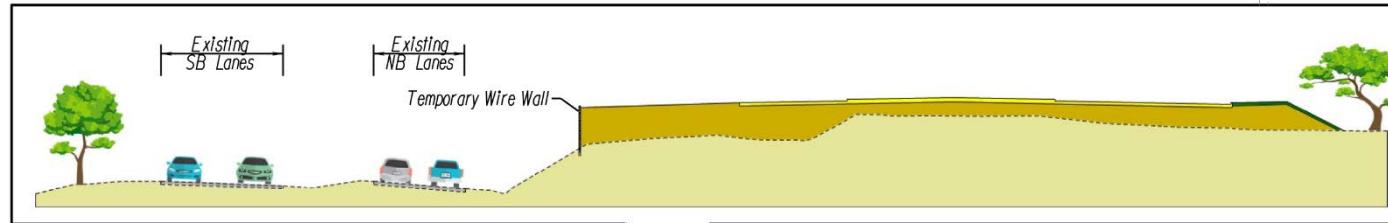
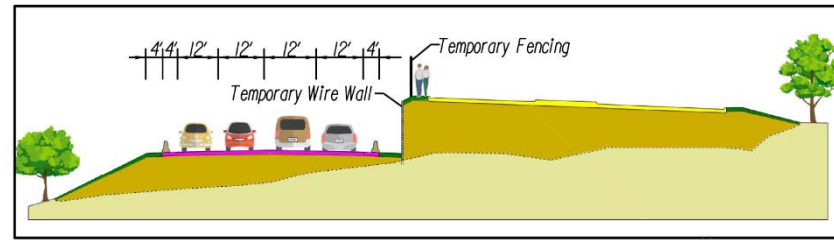
Legend

- Construction This Stage
- Construction Previous Stage
- Temporary Pavement
- Traffic Movements

TECHNICAL PROPOSAL
 Warrenton Southern Interchange
 Alternative Technical Concept - Modified Roundabout
 MOT PHASE I

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 PI01, R201, C501	

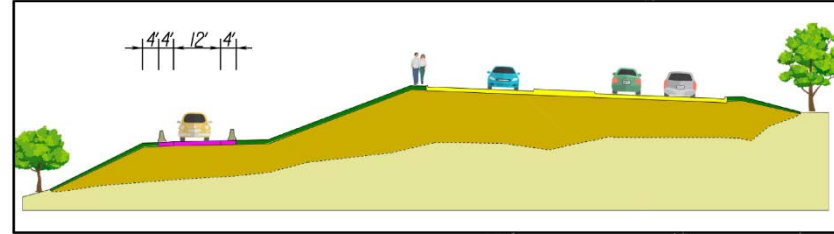


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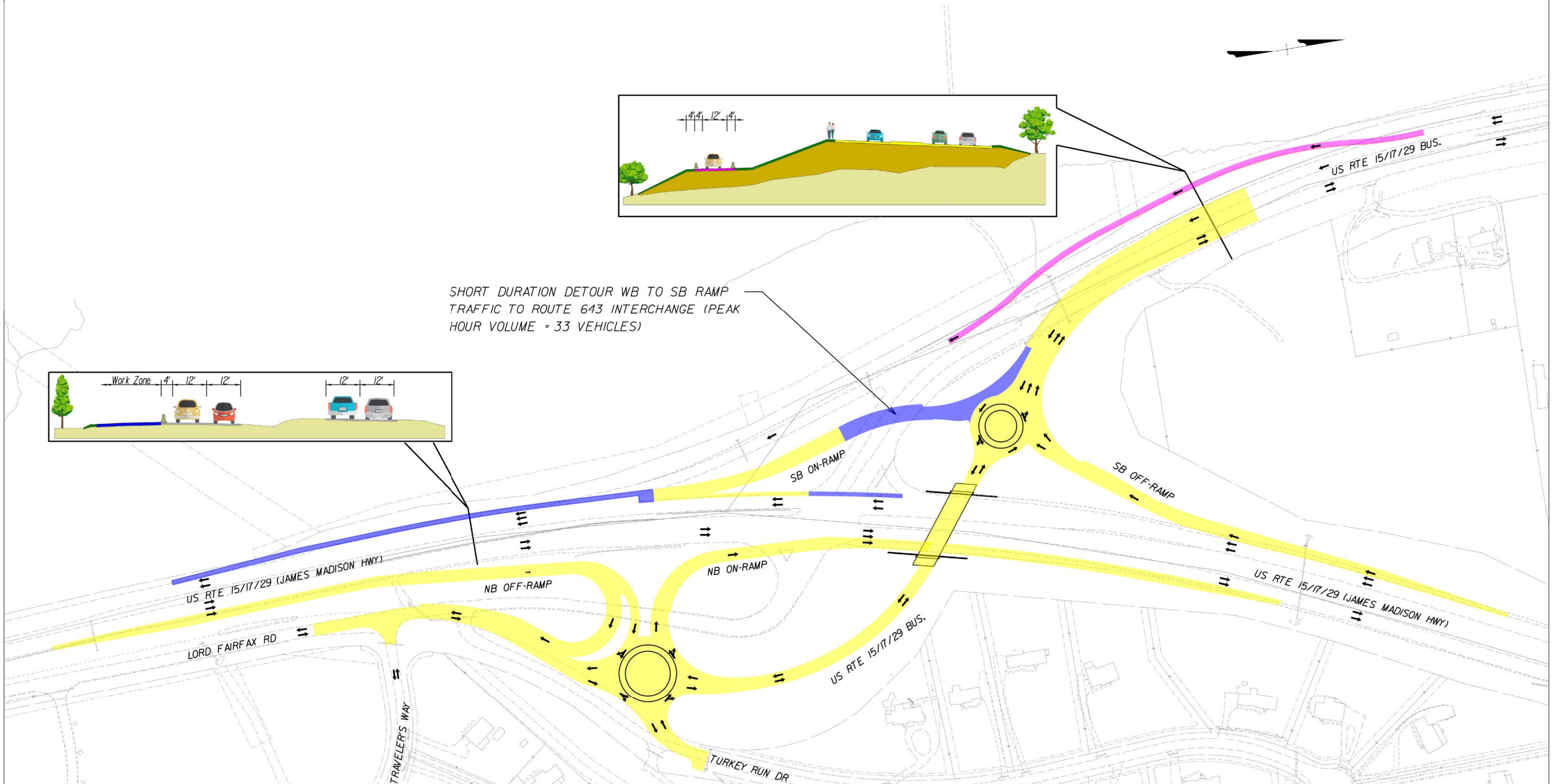
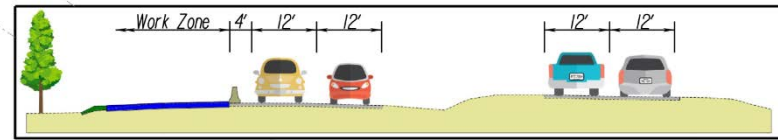
- Construction This Stage
- Construction Previous Stage
- Temporary Pavement
- Traffic Movements

TECHNICAL PROPOSAL
 Warrenton Southern Interchange
 Alternative Technical Concept - Modified Roundabout
 MOT PHASE 2

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	



SHORT DURATION DETOUR WB TO SB RAMP
 TRAFFIC TO ROUTE 643 INTERCHANGE (PEAK
 HOUR VOLUME = 33 VEHICLES)



Legend

- Construction This Stage
- Construction Previous Stage
- Temporary Pavement
- Traffic Movements

TECHNICAL PROPOSAL
 Warrenton Southern Interchange
 Alternative Technical Concept - Modified Roundabout
 MOT PHASE 3

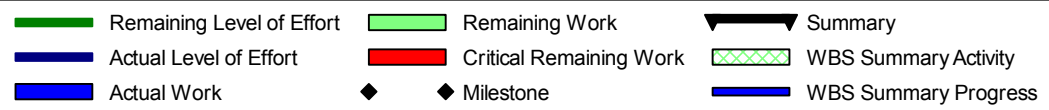
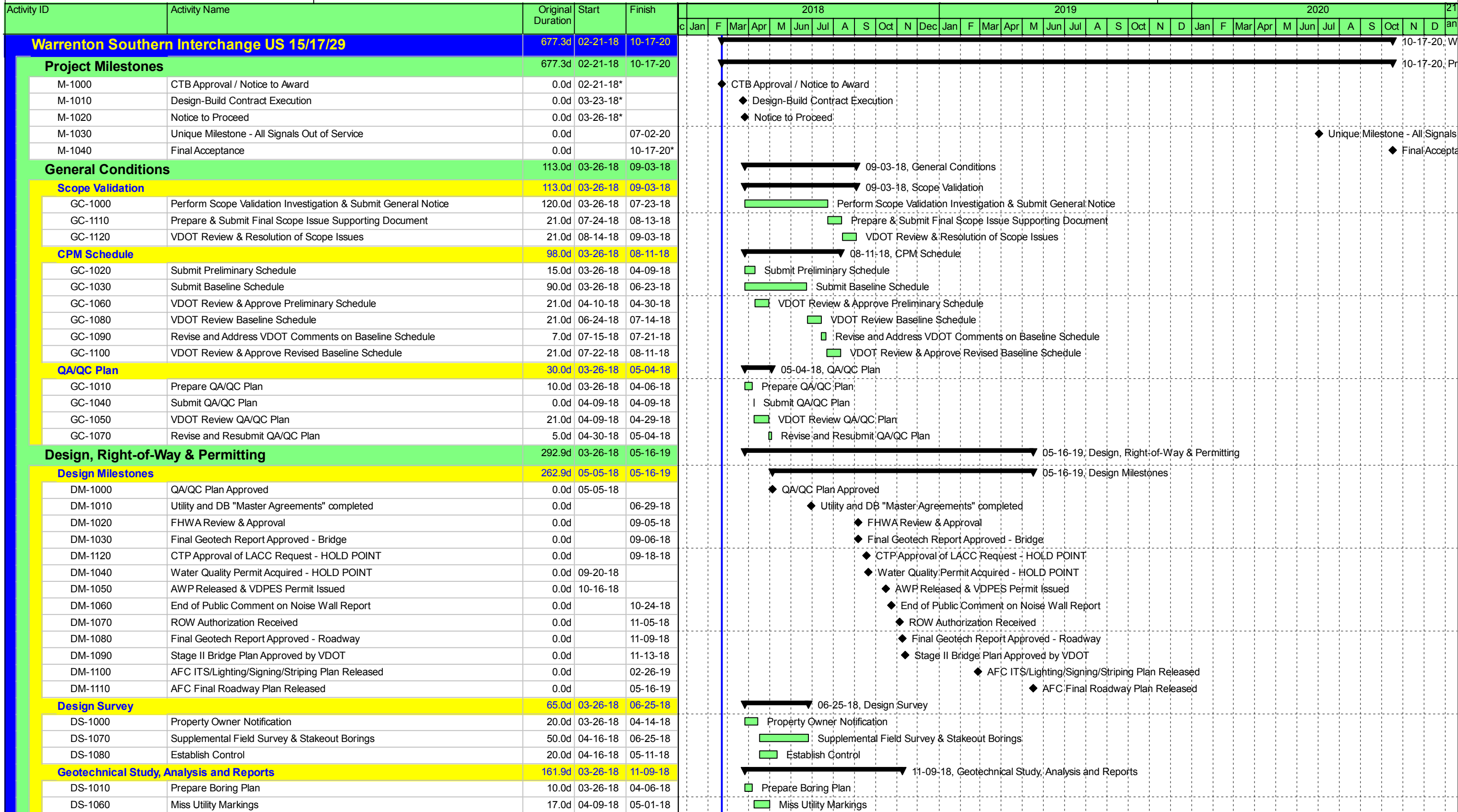
4.6 Disadvantaged Business Enterprises (DBE)

Branch Civil, Inc. confirms that we are committed to meeting or exceeding an 11% DBE participation goal for the entire value of the contract.

4.7 Proposal Schedule

4.7.1 Proposal Schedule

The 11x17 copy of the proposal schedule follows.



Activity ID	Activity Name	Original Duration	Start	Finish	2018												2019												2020											
					c	Jan	F	Mar	Apr	M	Jun	Jul	A	S	Oct	N	Dec	Jan	F	Mar	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	Mar	Apr	M	Jun	Jul	A	S	Oct	N
Part-1 - Bridge					09-06-18, Part-1 - Bridge																																			
DS-1150	Perform Soil Borings and Lab Work - Bridge	35.0d	05-02-18	06-20-18	Perform Soil Borings and Lab Work - Bridge																																			
DS-1240	Prepare Geotech Report and Recommendations - Bridge	15.0d	06-21-18	07-12-18	Prepare Geotech Report and Recommendations - Bridge																																			
DS-1300	QA/QC and Submit Geotech Report - Bridge	5.0d	07-13-18	07-19-18	QA/QC and Submit Geotech Report - Bridge																																			
DS-1320	VDOT Review Geotech Report - Bridge	21.0d	07-20-18	08-09-18	VDOT Review Geotech Report - Bridge																																			
DS-1370	Revise/Resubmit Geotech Report - Bridge	5.0d	08-09-18	08-16-18	Revise/Resubmit Geotech Report - Bridge																																			
DS-1420	VDOT Review & Approval of revised Geotech Report - Bridge	21.0d	08-17-18	09-06-18	VDOT Review & Approval of revised Geotech Report - Bridge																																			
Part-2 - Roadway					11-09-18, Part-2 - Roadway																																			
DS-1250	Perform Soil Borings and Lab Work - Roadway	35.0d	06-21-18	08-09-18	Perform Soil Borings and Lab Work - Roadway																																			
DS-1380	Prepare Geotech Report and Recommendations - Roadway	15.0d	08-10-18	08-30-18	Prepare Geotech Report and Recommendations - Roadway																																			
DS-1440	QA/QC and Submit Geotech Report - Roadway	10.0d	08-31-18	09-14-18	QA/QC and Submit Geotech Report - Roadway																																			
DS-1500	VDOT Review Geotech Report - Roadway	21.0d	09-15-18	10-05-18	VDOT Review Geotech Report - Roadway																																			
DS-1550	Revise/Resubmit Geotech Report - Roadway	10.0d	10-05-18	10-19-18	Revise/Resubmit Geotech Report - Roadway																																			
DS-1590	VDOT Review & Approval of revised Geotech Report - Roadway	21.0d	10-20-18	11-09-18	VDOT Review & Approval of revised Geotech Report - Roadway																																			
Design Noise Analysis					12-14-18, Design Noise Analysis																																			
DS-1090	Noise Analysis and Report Preparation	50.0d	04-16-18	06-25-18	Noise Analysis and Report Preparation																																			
DS-1270	QA/QC Noise Report	5.0d	06-26-18	07-02-18	QA/QC Noise Report																																			
DS-1280	VDOT Review	21.0d	07-03-18	07-23-18	VDOT Review																																			
DS-1330	Incorporate Comments and Resubmit	10.0d	07-23-18	08-06-18	Incorporate Comments and Resubmit																																			
DS-1350	FHWA Review & Approval	21.0d	08-06-18	09-05-18	FHWA Review & Approval																																			
DS-1450	Public Comment	35.0d	09-05-18	10-24-18	Public Comment																																			
DS-1610	Revise Report	10.0d	10-24-18	11-07-18	Revise Report																																			
DS-1680	QA/QC & Submit Amended Report	5.0d	11-07-18	11-14-18	QA/QC & Submit Amended Report																																			
DS-1690	VDOT Review of Amended Report	21.0d	11-15-18	12-05-18	VDOT Review of Amended Report																																			
DS-1710	Incorporate Comments and Final VDOT Approval	7.0d	12-05-18	12-14-18	Incorporate Comments and Final VDOT Approval																																			
Environmental Permits					09-20-18, Environmental Permits																																			
DS-1020	Wetland Delineation	35.0d	03-26-18	05-11-18	Wetland Delineation																																			
DS-1180	Water Quality Permit - WVP3/VMRC/SPGP	80.0d	05-14-18	09-05-18	Water Quality Permit - WVP3/VMRC/SPGP																																			
DS-1400	Submit VPDES Permit Package	1.0d	08-15-18	08-15-18	Submit VPDES Permit Package																																			
DS-1410	VDOT Review VPDES Permit Package	21.0d	08-16-18	09-05-18	VDOT Review VPDES Permit Package																																			
DS-1460	Revise and Resubmit VPDES Permit Package	10.0d	09-05-18	09-19-18	Revise and Resubmit VPDES Permit Package																																			
DS-1470	Address Agency Comments	10.0d	09-06-18	09-19-18	Address Agency Comments																																			
DS-1520	Purchase Wetland Credits	1.0d	09-19-18	09-20-18	Purchase Wetland Credits																																			
Utility Relocation/Coordination					04-26-19, Utility Relocation/Coordination																																			
DS-1030	Obtain Letter authorizing DB to coordinate utility relocations	1.0d	03-26-18	03-26-18	Obtain Letter authorizing DB to coordinate utility relocations																																			
DS-1100	Preliminary Review Meeting with Utility Owners	7.0d	04-17-18	04-26-18	Preliminary Review Meeting with Utility Owners																																			
DS-1110	VDOT Coordination Meeting	7.0d	04-20-18	04-26-18	VDOT Coordination Meeting																																			
DS-1130	Preliminary Plans to Utilities (30% Plans to UFI)	5.0d	04-26-18	05-03-18	Preliminary Plans to Utilities (30% Plans to UFI)																																			
DS-1160	Utility Field Inspection	25.0d	05-03-18	06-08-18	Utility Field Inspection																																			
DS-1170	Prepare UT-9 Forms	5.0d	05-03-18	05-10-18	Prepare UT-9 Forms																																			
DS-1200	Utilities submits plan and estimate (P&E)	65.0d	06-08-18	09-11-18	Utilities submits plan and estimate (P&E)																																			
DS-1210	Utility and DB "Master Agreements" completed	15.0d	06-08-18	06-29-18	Utility and DB "Master Agreements" completed																																			
DS-1220	Utilities Submit Easement Requests	10.0d	06-08-18	06-22-18	Utilities Submit Easement Requests																																			
DS-1310	Prepare & Submit Preliminary Utility Status Report (NLT NTP+120d)	10.0d	07-15-18	07-24-18*	Prepare & Submit Preliminary Utility Status Report (NLT NTP+120d)																																			
DS-1490	Utility P&E approval	5.0d	09-11-18	09-18-18	Utility P&E approval																																			
Utility Relocation					04-26-19, Utility Relocation																																			
US 15/29/17 Bus., Ramp A, US 15/29 SB					04-26-19, US 15/29/17 Bus., Ramp A, US 15/29 SB																																			

█ Remaining Level of Effort
 █ Remaining Work
 Summary
█ Actual Level of Effort
 █ Critical Remaining Work
 WBS Summary Activity
█ Actual Work
 ◆ Milestone
 WBS Summary Progress

Activity ID	Activity Name	Original Duration	Start	Finish	2018												2019												2020											
					c	Jan	F	Mar	Apr	M	Jun	Jul	A	S	Oct	N	Dec	Jan	F	Mar	Apr	M	Jun	Jul	A	S	Oct	N	D	Jan	F	Mar	Apr	M	Jun	Jul	A	S	Oct	N
Stage 1 - Bridge - Prep Work					02-04-19, Stage 1 - Bridge - Prep Work;																																			
CS1-1030	S1B - Widen 29 SB Right Lane Sta. 127+00 to 119+00	5.0d	10-29-18	11-07-18	█ S1B - Widen 29 SB Right Lane Sta. 127+00 to 119+00																																			
CS1-1050	S1B - Install Temp Concrete Barrier @ Bridge Pier	1.0d	11-09-18	11-09-18	█ S1B - Install Temp Concrete Barrier @ Bridge Pier																																			
CS1-1060	S1B - Install Temp Concrete Barrier @ Bridge Abutments	2.0d	11-12-18	11-14-18	█ S1B - Install Temp Concrete Barrier @ Bridge Abutments																																			
CS1-1240	S1B - Grading and Access for Bridge Abutments	10.0d	01-18-19	02-04-19	█ S1B - Grading and Access for Bridge Abutments																																			
Stage 1 - Bridge - Substructure					08-30-19, Stage 1 - Bridge - Substructure																																			
Stage 1 - Bridge - Substructure - Abutment A					08-05-19, Stage 1 - Bridge - Substructure - Abutment A																																			
CS1-1280	S1B - Abut A - EXCAVATION	2.0d	02-06-19	02-08-19	█ S1B - Abut A - EXCAVATION																																			
CS1-1290	S1B - Abut A - PRE-DRILL FOR PILES	3.0d	02-27-19	03-01-19	█ S1B - Abut A - PRE-DRILL FOR PILES																																			
CS1-1300	S1B - Abut A - DRIVE TEST PILE w/ PDA	1.0d	03-04-19	03-04-19	█ S1B - Abut A - DRIVE TEST PILE w/ PDA																																			
CS1-1310	S1B - Abut A - DRIVE PRODUCTION PILE	2.0d	03-06-19	03-08-19	█ S1B - Abut A - DRIVE PRODUCTION PILE																																			
CS1-1320	S1B - Abut A - CONCRETE FILL PRE-DRILLED HOLES	1.0d	03-11-19	03-11-19	█ S1B - Abut A - CONCRETE FILL PRE-DRILLED HOLES																																			
CS1-1340	S1B - Abut A - CONSTRUCT MSE WALL	17.0d	04-12-19	05-17-19	█ S1B - Abut A - CONSTRUCT MSE WALL																																			
CS1-1360	S1B - Abut A - FORM PILE CAP	3.0d	05-20-19	05-24-19	█ S1B - Abut A - FORM PILE CAP																																			
CS1-1390	S1B - Abut A - PLACE PILE CAP REBAR	1.0d	05-29-19	05-29-19	█ S1B - Abut A - PLACE PILE CAP REBAR																																			
CS1-1410	S1B - Abut A - PLACE PILE CAP CONCRETE	1.0d	05-31-19	05-31-19	█ S1B - Abut A - PLACE PILE CAP CONCRETE																																			
CS1-1440	S1B - Abut A - REMOVE PILE CAP FORMS	1.0d	06-10-19	06-10-19	█ S1B - Abut A - REMOVE PILE CAP FORMS																																			
CS1-1530	S1B - Abut A - FORM DIAPHRAGM / BACKWALL ABUTMENT A	5.0d	07-11-19	07-19-19	█ S1B - Abut A - FORM DIAPHRAGM / BACKWALL ABUTMENT A																																			
CS1-1540	S1B - Abut A - PLACE DIAPHRAGM / BACKWALL REBAR ABUTMENT A	2.0d	07-22-19	07-24-19	█ S1B - Abut A - PLACE DIAPHRAGM / BACKWALL REBAR ABUTMENT A																																			
CS1-1550	S1B - Abut A - PLACE DIAPHRAGM / BACKWALL CONCRETE ABUTMENT /	1.0d	07-26-19	07-26-19	█ S1B - Abut A - PLACE DIAPHRAGM / BACKWALL CONCRETE ABUTMENT A																																			
CS1-1600	S1B - Abut A - REMOVE DIAPHRAGM / BACKWALL FORMS ABUTMENT A	2.0d	08-02-19	08-05-19	█ S1B - Abut A - REMOVE DIAPHRAGM / BACKWALL FORMS ABUTMENT A																																			
Stage 1 - Bridge - Substructure - Pier					01-31-19, Stage 1 - Bridge - Substructure - Pier																																			
CS1-1070	S1B - Pier - EXCAVATION	3.0d	11-14-18	11-16-18	█ S1B - Pier - EXCAVATION																																			
CS1-1100	S1B - Pier - FORM FOOTING	3.0d	11-19-18	11-23-18	█ S1B - Pier - FORM FOOTING																																			
CS1-1120	S1B - Pier - PLACE FOOTING REBAR	2.0d	11-26-18	11-27-18	█ S1B - Pier - PLACE FOOTING REBAR																																			
CS1-1140	S1B - Pier - PLACE FOOTING CONCRETE	1.0d	11-28-18	11-28-18	█ S1B - Pier - PLACE FOOTING CONCRETE																																			
CS1-1160	S1B - Pier - REMOVE FOOTING FORMS	1.0d	12-05-18	12-05-18	█ S1B - Pier - REMOVE FOOTING FORMS																																			
CS1-1170	S1B - Pier - FORM STEM	5.0d	12-07-18	12-19-18	█ S1B - Pier - FORM STEM																																			
CS1-1180	S1B - Pier - PLACE STEM REBAR	2.0d	12-21-18	12-26-18	█ S1B - Pier - PLACE STEM REBAR																																			
CS1-1190	S1B - Pier - PLACE STEM CONCRETE	1.0d	12-28-18	12-28-18	█ S1B - Pier - PLACE STEM CONCRETE																																			
CS1-1200	S1B - Pier - REMOVE STEM FORMS	2.0d	01-04-19	01-07-19	█ S1B - Pier - REMOVE STEM FORMS																																			
CS1-1220	S1B - Pier - FORM CAP	3.0d	01-09-19	01-14-19	█ S1B - Pier - FORM CAP																																			
CS1-1230	S1B - Pier - PLACE CAP REBAR	1.0d	01-16-19	01-16-19	█ S1B - Pier - PLACE CAP REBAR																																			
CS1-1250	S1B - Pier - PLACE CAP CONCRETE	1.0d	01-18-19	01-18-19	█ S1B - Pier - PLACE CAP CONCRETE																																			
CS1-1260	S1B - Pier - REMOVE CAP FORMS	2.0d	01-28-19	01-29-19	█ S1B - Pier - REMOVE CAP FORMS																																			
CS1-1270	S1B - Pier - BACKFILL PIER	2.0d	01-30-19	01-31-19	█ S1B - Pier - BACKFILL PIER																																			
Stage 1 - Bridge - Substructure - Abutment B					08-30-19, Stage 1 - Bridge - Substructure - Abutment B																																			
CS1-1080	S1B - Abut B - EXCAVATION	2.0d	02-06-19	02-08-19	█ S1B - Abut B - EXCAVATION																																			
CS1-1090	S1B - Abut B - PRE-DRILL FOR PILES	3.0d	02-11-19	02-15-19	█ S1B - Abut B - PRE-DRILL FOR PILES																																			
CS1-1110	S1B - Abut B - DRIVE TEST PILE w/ PDA	1.0d	02-18-19	02-18-19	█ S1B - Abut B - DRIVE TEST PILE w/ PDA																																			
CS1-1130	S1B - Abut B - DRIVE PRODUCTION PILE	2.0d	02-20-19	02-22-19	█ S1B - Abut B - DRIVE PRODUCTION PILE																																			
CS1-1150	S1B - Abut B - CONCRETE FILL PRE-DRILLED HOLES	1.0d	02-25-19	02-25-19	█ S1B - Abut B - CONCRETE FILL PRE-DRILLED HOLES																																			
CS1-1350	S1B - Abut B - CONSTRUCT MSE WALL	17.0d	03-06-19	04-10-19	█ S1B - Abut B - CONSTRUCT MSE WALL																																			
CS1-1370	S1B - Abut B - FORM PILE CAP	3.0d	04-12-19	04-17-19	█ S1B - Abut B - FORM PILE CAP																																			
CS1-1400	S1B - Abut B - PLACE PILE CAP REBAR	1.0d	04-19-19	04-19-19	█ S1B - Abut B - PLACE PILE CAP REBAR																																			
CS1-1420	S1B - Abut B - PLACE PILE CAP CONCRETE	1.0d	04-22-19	04-22-19	█ S1B - Abut B - PLACE PILE CAP CONCRETE																																			
CS1-1450	S1B - Abut B - REMOVE PILE CAP FORMS	1.0d	04-30-19	04-30-19	█ S1B - Abut B - REMOVE PILE CAP FORMS																																			

█ Remaining Level of Effort
 █ Remaining Work
 Summary
 Actual Level of Effort
 Critical Remaining Work
 WBS Summary Activity
 Actual Work
 ◆ Milestone
 WBS Summary Progress

4.7.2 Proposal Schedule Narrative

Branch|WRA has developed a comprehensive Proposal Schedule and Proposal Schedule Narrative that demonstrates our understanding of the Project. The Proposal Schedule, along with our proven experience in managing and constructing all phases of design-build projects, will reinforce *early delivery* of the Project and *exceeding* the RFP requirements. Branch|WRA brings a history of experience working together that has evolved into a partnership with VDOT that successfully delivers design-build projects.

Branch|WRA is committed to improving the enclosed Proposal Schedule to benefit VDOT, the traveling public and all associated stakeholders. Once the design process begins, we will work to identify areas where the Proposal Schedule can be improved.

Our design and construction approach detailed in Sections 4.4 and 4.5 minimizes impacts to the traveling public enables our Team to deliver the Project early. The table below outlines the Key Milestone dates from our schedule. To achieve these dates, coordination will be required between our Team, VDOT, and other reviewing agencies. After Project Award, Branch|WRA will develop the Preliminary and Baseline Schedule for the Project.

The Branch|WRA Team is very proud to state that because of our design concept and construction approach we will deliver the entire project early, and introduce a Unique Milestone that will further advance the operational improvements at the very heart of the need for this project. The following are the key milestone dates in our schedule:

Key Milestone	Date
Notice to Proceed	March 26, 2018
Scope Validation Period Complete	September 3, 2018
Start of Construction	September 4, 2018
Unique Milestone Date: Removal of All Signals Along Route 15/17/29	July 2, 2020
Final Completion Date	October 17, 2020

Work Breakdown Structure

The Work Breakdown Structure (WBS) for the Project is a multi-level arrangement of the activities to be performed to complete the Project. Preconstruction and construction activities have been broken down by Phase and into the components as follows:

- **Project Milestones** | Overall project status.
- **General Conditions** | Preliminary schedule, baseline schedule, scope validation and QA/QC plan.
- **Design, Right-of-Way & Permitting** | Design consists of field surveys, geotechnical, preliminary roadway, MOT, clearing and grubbing, drainage, E&S, final roadway, MSE walls, bridge, pavement markings, and signage. Right-of-way will monitor ROW acquisition and any required easements for the Project, which includes title searches, appraisals, appraisal reviews, offers, negotiations and settlements. Parcels that are required to be acquired early are also included. Permitting includes wetland and stream delineation, coordination of approvals with USACE, stormwater permit and the identification/coordination of threatened and endangered species. Utility relocations are included and are broken down by the individual utility company. This approach will allow for better management and coordination of the relocation work required. Submittal milestones and approvals by VDOT are also included for all of these items.

- **Engineering & Procurement** | Includes any shop drawings and review times for work associated with the bridge, ITS, lighting, signage and jack and bore activities.
- **Mobilization/Punchlist/Demobilization** | Initial crew mobilization for construction, punchlist and demobilization.
- **Construction** | This section is segmented by Phase. Construction activities include all work associated with roadway, MSE walls, bridge, MOT, construction access, drainage, signage, quality control and quality assurance.

The table below is a summary of the WBS from Level 2 down to Level 3:

WBS Level 2	WBS Level 3
Project Milestones	<i>Project Milestones</i>
General Conditions	<i>General Conditions</i> <ul style="list-style-type: none"> • Scope Validation • CPM Schedule • QA/QC Plan
Design, Right-of-Way & Permitting	<i>Design, Right-of-Way & Permitting</i> <ul style="list-style-type: none"> • Design Milestones • Survey • Geotechnical Study, Analysis and Reports • Noise Analysis • Environmental Permits • Utility Relocation/Coordination • ROW/MOT/Clearing/E&S/Early Grading and Drainage (AWP) • Bridge • ITS/Lighting/Signing/Striping • Final Roadway (100% Plans)
Engineering & Procurement	<i>Engineering & Procurement</i> <ul style="list-style-type: none"> • Engineering • Procurement
Mobilization/Punchlist/Demobilization	<i>Mobilization/Punchlist/Demobilization</i>
Construction	<i>Construction</i> <ul style="list-style-type: none"> • Phase 1 • Phase 2 • Phase 3

The activity IDs have been created by using the first letters of the WBS Descriptions so the activities can be easily identified throughout the schedule. This identification naming process will make updating the schedule more efficient during the progress of the project.

Calendar

The following calendars have been used in development of our schedule to represent a variety of scenarios:

- **5 DY/WK + HD** | This calendar is based on five working days per week plus holidays and is used for all design, administrative, and construction activities except those impacted by adverse weather.

- **7 DY/WK** | This calendar will be assigned to activities that have durations based on seven days per week. This calendar will be used for review periods and milestones.
- **5 DY/WK + HD + W** | This calendar is based on five working days per week, includes holidays and adverse weather days. This calendar will be used for all construction activities except those involving weather, temperature or time of year restrictions. The following adverse weather days are included and were developed using historic weather data from 2007 to 2016 at the Warrenton weather station that indicated 0.1 inch or more of precipitation:
 - January – 6 days
 - February – 6 days
 - March – 8 days
 - April – 7 days
 - May – 9 days
 - June – 9 days
 - July – 7 days
 - August – 6 days
 - September – 7 days
 - October – 7 days
 - November – 5 days
 - December – 9 days
- **5 DY/WK + HD + W + Paving Shutdown** | This calendar is based on five working days per week, includes holidays, adverse weather days (listed above) and weather / temperature restrictions. This calendar will be used for all stabilization, jack & bore, paving and final seeding.

Plan and Strategy

Branch|WRA have developed the proposed design to allow for a significant portion of the project to be completed out of traffic. Horizontal and vertical changes to the alignment have been made through the approval of the modified roundabout ATC. These alignment changes have allowed for the sequence of construction to be simplified, overall schedule to be reduced, and safety for motorists, pedestrians and workers to be optimized. Our Team’s design has reduced right-of-way acquisition, minimized environmental impacts, eliminated any conflict with the 20” Columbia Gas line and reduced the earthwork required to construct the improvements. *Our Design and Construction Approach will make all improvements early and exceed the RFP requirements.*

Design

This section of the schedule includes activities required to develop preliminary and final roadway plans, bridge and MSE wall plans, and to gain the necessary approvals. As specified in the RFP, we have included a 21-calendar day activity for VDOT review after each submission. The design phase also includes activities for the completion of surveys, traffic management plan, E&S control, hydrologic and hydraulic analysis studies, noise analysis, pavement marking and geotechnical investigations.

The design effort will begin following Notice to Proceed (NTP) on March 26, 2018. The Proposal Schedule reflects approval of final roadway plans by May 16, 2019 and final bridge plans by November 13, 2018.

Environmental Permits

This section of the schedule contains activities involved with the evaluation, preparation, submission and approval of any and all environmental permits.

- **USACE Nationwide Permit 23 (anticipated)** | Allows for the preparation and submission of the joint permit application (including any relevant background studies) to secure a Nationwide Permit 23. Time is also set aside for the purchase of wetland and stream mitigation credits.
- **VPDES Permit** | Includes activities necessary for the submission and approval of the VA stormwater permit for the Project.

Right-of-Way Acquisition

Right-of-way acquisition will be performed in accordance with VDOT requirements and the RFP. Our Project Schedule reflects the necessary durations needed to perform all right-of-way acquisition tasks including: Title Reports, Appraisals, Appraisal Reviews, Submittal of Offers, Negotiations and Settlement/Closing. To minimize schedule risk, parcels that will need to be acquired early will be identified.

Utility Relocation

Tables 4 and 5 in Section 4.4.2 lists the anticipated utility relocations and potential conflicts for the Project. The utility relocation schedule has been broken down by utility owner to simplify and track relocations. Utility-related activities include a Level A SUE investigation, holding the Utility Field Inspection meeting, utility plan and estimate preparation by the utility owner, review and approval of plan and estimates and the relocation of the utilities.

Construction Sequencing

Branch|WRA has developed the schedule to mitigate impacts to the traveling public and delays to construction and to complete the Project in a timely fashion. To achieve this, the proposed design of the Project will allow for **85% of the new improvements to be constructed out of traffic**. The following improvements can be constructed out of traffic during Phase 1:

- Eastern roundabout
- Route 15/17/29 Business from the eastern roundabout to the new tie-in just north of the western roundabout
- All components of the new structure including MSE walls
- Western roundabout

Phase 2 allows for the permanent connections to be constructed on the east side of the intersection allowing for the signals on this side to be taken out of service. Phase 3 will connect the southbound Route 15/17/29 on ramp creating the opportunity to remove the remaining signals in the intersection. ***Our Team's revised design and construction sequence allows for the removal of all signals in the existing intersection in July of 2020, 5 months earlier than the RFP completion date of December 2020 and exceeding RFP Requirements.***

Critical Path

The critical path of the project begins with the Advance Work Package for right-of-way, maintenance of traffic, clearing, erosion and sediment control, early grading and drainage. This work is followed by the right-of-way and easement acquisition and onto the utility relocations to accommodate the temporary widening along Route 15/17/29 Business. Following the utility relocations is the earthwork to build the embankments on the east and west side of the bridge. The eastern roundabout is constructed next followed by the southbound on ramp. The final activities on the critical path consist of the permanent signage and landscaping. Below is the summary of Critical Path activities:

ID	Activity
M-1020	Notice to Proceed
M-1040	Final Acceptance
DM-1070	ROW Authorization Received
DS-1110	VDOT Coordination Meeting
DS-1130	Preliminary Plans to Utilities (30% Plans to UFI)
DS-1160	Utility Field Inspection
DS-1220	Utilities Submit Easement Requests
DS-1260	Preliminary ROW/Easement Acquisition Effort (Title research, BAR)
DS-1390	Design QA/QC Review of AWP
DS-1430	VDOT Review of AWP
DS-1510	Comment Resolution/Revise AWP
DS-1540	VDOT Review and Approval AWP
DS-1570	ROW Authorization
DS-1770	Relocate OH Utilities – DVP, Comcast, Lumos (incl. 3 poles)
DS-1780	Relocate Underground Utilities – VZN F.O., 1 pedestal
DS-1670	Perform ROW/Easement Acquisition
CP1-1330	Cut to Fill
CP1-1490	Grading and Prep work for Temp Pavement
CP1-1560	Construct Temp Pavement
CP1-1610	Install Temp Concrete Barrier @ Temp Pavement
CP1-1590	Drainage
CP1-1720	Subgrade Stabilization
CP1-1750	Place Subbase
CP1-1770	Underdrain
CP1-1870	Install Curb
CP1-1950	Construct Shared Use Path
CP1-2030	Final Dress
CP1-2070	Ph. 2 Permanent Stabilization
CP2-1000	Grade for Temporary Connection (Roundabout to Lord Fx)
CP2-1010	Construct Temporary Connection (Roundabout to Lord Fx)
CP2-1020	Demo/Excavate Shoulder along US 29 for Ramp C
CP2-1040	Place Subbase Ramp C
CP2-1050	Pave Base/IM Ramp C
CP2-1060	Construct Tie-Ins Ramps C & D
CP2-1070	Construct Tie-In Turkey Run Dr.
CP2-1080	Temporary Pavement Markings
CP3-1000	Install MOT/Traffic Switch
CP3-1040	Cut to Fill Ramp A
CP3-1050	Subgrade Stabilization
CP3-1080	Place Subbase
CP3-1090	Underdrain
CP3-1100	Install Curb
CP3-1110	Pave Base/Intermediate
CP3-1140	Guardrail

CP3-1150	Temporary Pavement Markings
CP3-1160	Open Ramp A
CP3-1170	Demo Temp Pavement US 29 Bus, Remove Excess Fill
CP3-1180	Complete Drainage Under Temp Pavement Area
CP3-1210	Permanent Stabilization @ Temp Pavement Area
MOB-1010	Final Punchlist Inspection
MOB-1020	Complete Punchlist
MOB-1030	Demobilization

Table 11 – Critical Path Activities

Schedule Management

Effective management of the Project schedule will require the use of a proven software program for scheduling and document control. Branch|WRA will develop the schedule using Primavera P6 scheduling software to plan, schedule and monitor the construction project.

To develop the initial overall detailed CPM schedule, each discipline manager for design, along with the Construction Manager (CM), will be responsible for producing the individual schedule of their activities. The DBPM will hold a meeting with all discipline managers and the CM to review the individual schedules and to integrate into the overall CPM schedule. This process will create buy-in from everyone and make sure that all activities are captured.

Branch|WRA will manage the CPM schedule from the on-site project field office. The Project Engineer will be responsible for maintaining and updating the schedule. The DBPM, supported by the CM, will ultimately be responsible for the implementation of the project controls required to manage the schedule.

The project controls used to manage the schedule will be founded in efficient communication between the discipline design managers and construction staff. Branch|WRA includes the value-added Construction Design Coordinator (CDC) to help facilitate the design coordination process.

From the date of the NTP through the completion of the design activities, Branch|WRA will hold weekly Design Coordination Meetings, which will be facilitated by the DBPM and attended by all design disciplines, the CDC and the Project Engineer. The CDC will help provide a constructability review of the design and the Project Engineer will help manage and maintain the schedule.

For each Design Coordination Meeting, the DBPM will review the CPM schedule and identify all activities that were scheduled for completion the previous week and planned for the next two weeks. The Design Coordination Meetings will promote discussion related to the current status of activities, critical completion dates, addition or deletion of activities as the schedule progresses, activities that can be advanced for earlier completion or those that will take a longer duration and ways to mitigate any potential schedule delays.

During construction, the same project controls used during the design will be in place. Weekly Construction Coordination Meetings will be held by the DBPM and attended by all construction staff. These meetings will allow all construction schedule activities to be reviewed. The Project Engineer will help manage and maintain the schedule. The DBPM will review the CPM schedule to analyze all scheduled activities for the previous week along with those planned for the next two weeks. These Construction Coordination Meetings will allow for the construction staff to identify activities in the work plan that can be accelerated or those needing mitigation to avoid delays.

Branch|WRA will prepare and submit monthly schedule updates for review and approval by VDOT, which will include a narrative of any schedule changes, updated activities, any issues affecting the schedule and an updated Critical Path showing schedule milestones.

Schedule Recovery

If changes or unforeseen circumstances arise that impact the schedule, Branch|WRA will notify VDOT and begin a Time Impact Analysis, review the activities and durations to revise the schedule and prepare a recovery schedule to reclaim lost time. The recovery plan may include any of the following to recover lost time:

- Additional crews and equipment
- Increased work shifts
- Modify design
- Re-sequence construction work
- Revise priority of utility relocation

If the schedule needs to be revised and subcontractor work is impacted, the CM will work with the subcontractor to accommodate the change in the schedule. Weekly communication with subcontractors will be maintained for timely response to schedule changes, if required.

ATTACHMENT 4.0.1.1
Warrenton Southern Interchange
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	Vol. I – Appendices
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.7 (Form C-78-RFP)	Sections 3.7, 4.0.1.1	no	Vol. I – Appendices
Letter of Submittal	NA	Sections 4.1		Vol. I – Pgs. 1-2
Letter of Submittal on Offeror’s letterhead	NA	Section 4.1.1	yes	Vol. I – Pgs. 1-2
Identify the full legal name and address of Offeror	NA	Section 4.1.1	yes	Vol. I – Pg. 2
Authorized representative’s original signature	NA	Section 4.1.1	yes	Vol. I – Pg. 2
Declaration of intent	NA	Section 4.1.2	yes	Vol. I – Pg. 2
120 day declaration	NA	Section 4.1.3	yes	Vol. I – Pg. 2
Point of Contact information	NA	Section 4.1.4	yes	Vol. I – Pg. 2
Principal Officer information	NA	Section 4.1.5	yes	Vol. I – Pg. 2
Interim Milestone and Final Completion Date(s)	NA	Section 4.1.6	yes	Vol. I – Pg. 2
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.7	no	Vol. I – Appendices
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	Section 4.1.8	no	Vol. I – Appendices
Offeror’s Qualifications	NA	Section 4.2		

ATTACHMENT 4.0.1.1
Warrenton Southern Interchange
TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
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	Vol. I – Pg. 3
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	Vol. I – Pg. 4
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	Vol. I – Pg. 3
Design Concept	NA	Section 4.3		Vol. I – Pgs. 5-17
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	Vol. I – Pgs. 11-15 Vol. II – Pgs. 47-64 (Plans)
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	Vol. I – Pgs. 16-17 Vol. II Pgs. 65-69 (Plans)
Project Approach	NA	Section 4.4		Vol. I – Pgs. 18-32
Environmental Management	NA	Section 4.4.1	yes	Vol. I – Pgs. 18-19
Utilities	NA	Section 4.4.2	yes	Vol. I – Pgs. 20-24
Geotechnical	NA	Section 4.4.3	yes	Vol. I – Pgs. 24-26
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	Vol. I – Pgs. 26-32
Construction of Project	NA	Section 4.5		Vol. I – Pgs. 33-45
Sequence of Construction	NA	Section 4.5.1	yes	Vol. I – Pgs. 34-39
Transportation Management Plan	NA	Section 4.5.2	yes	Vol. I – Pgs. 39-45

ATTACHMENT 4.0.1.1
Warrenton Southern Interchange
TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Disadvantaged Business Enterprises (DBE)	NA	Section 4.6		Vol. I – Pg. 46
Written statement of percent DBE participation	NA	Section 4.6	yes	Vol. I – Pg. 46
Proposal Schedule	NA	Section 4.7		
Proposal Schedule	NA	Section 4.7	no	Vol. I – Pgs. S1-S10
Proposal Schedule Narrative	NA	Section 4.7	no	Vol. I – Pgs. S11-S17
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.7	no	CD-ROM

ATTACHMENT 3.6**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION**RFP NO. C00077384DB100PROJECT NO.: 0029-030-121**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 – July 18, 2017
(Date)
2. Cover letter of Addendum #1- August 23, 2017
(Date)
3. Cover letter of Addendum #2- October 27, 2017
(Date)
4. Cover letter of Addendum #3- November 17, 2017
(Date)
5. Cover letter of Addendum #4- December 1, 2017
(Date)



SIGNATURE

12-4-2017

DATE

PATRICK K. BARTORILLO

PRINTED NAME

PRESIDENT, BRANCH CIVIL, INC.

TITLE

ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this “Agreement”) is made and entered into as of this 7th day of December , 2017, by and between the Virginia Department of Transportation (“VDOT”), and Branch Civil, Inc. (“Offeror”).

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s April 26, 2017 Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the **Warrenton Southern Interchange US 15/17/29 Project No. 0029-030-121** (“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 **Twenty five thousand and 00/100 Dollars (\$25,000.00)** ("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: _____

Branch Civil, Inc.

By: Patrick K. Bartorillo

Name: Patrick K. Bartorillo

Title: President, Branch Civil, Inc.

ATTACHMENT 11.8.6(a)
CERTIFICATION REGARDING DEBARMENT
PRIMARY COVERED TRANSACTIONS

Project No.: 0029-030-121

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.

John K. Bontalbo
Signature

12-4-2017
Date

PRESIDENT
Title

BRANCH CIVIL, INC.
Name of Firm

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

Project No.: 0029-030-121

- 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.

 12/11/17
Signature Date

Senior Vice President
Title

Whitman, Requardt & Associates, LLP
Name of Firm


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

Project No.: 0029-030-121

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

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

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

 11-17-17 Vice President
Signature Date Title

3B CONSULTING SERVICES, LLC
Name of Firm


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

Project No.: 0029-030-121

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

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

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

	11.17.17	Principal Engineer
Signature	Date	Title

Engineering & Materials Technologies, Inc. (E.M. Tech)
Name of Firm

ATTACHMENT NO. 3.2.7(b)

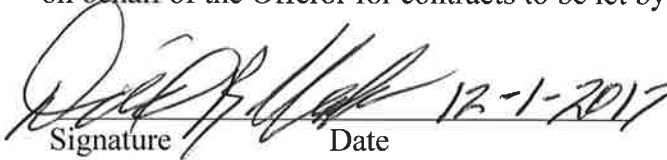
**CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS**

Project No.: 0029-030-121, P101, R201, C501, B616

- 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 form.

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.

 12-1-2017 President
Signature Date Title

Fairfield-Echols, LLC
Name of Firm


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

Project No.: 0029-030-121

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

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

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

 Signature	11/17/2017 Date	CEO Title
---	--------------------	--------------

Froehling & Robertson, Inc.

Name of Firm


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

Project No.: 0029-030-121

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

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

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

	11/20/2017	PRESIDENT
Signature	Date	Title

Land Planning and Design Associates, Inc.
Name of Firm

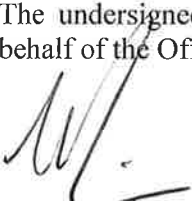
ATTACHMENT 11.8.6(b)
CERTIFICATION REGARDING DEBARMENT
LOWER TIER COVERED TRANSACTIONS

Project No.: 0029-030-121

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

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

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

	11.17.17	Mike Carosi President
Signature	Date	Title

Seventh Point

Name of Firm

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	Modified Roundabout Interchange	11/9/17	Introduced on Page 5 Section 4.3

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]

JASON HOYLE
[Printed Name]

V.P. DESIGN-BUILD / MAJOR PROJECTS
[Title]

DATE: 12-5-2017

ATTACHMENT 3.6.6

ALTERNATIVE TECHNICAL CONCEPT (ATC) RESPONSE FORM

ATC ID NUMBER: 1

ATC NAME-DESCRIPTION: Modified Roundabout Interchange

OFFEROR: Branch/ WRA

DATE ATC SUBMITTED: October 27, 2017

The proposed ATC is acceptable for inclusion in the Proposal with such conditions, modifications and/or requirements as identified by VDOT in Attachment 1 of this response.

The ATC is not acceptable for inclusion in the Proposal.

The submittal does not qualify as an ATC but may be included in the Offeror's Proposal because it appears to be within the requirements of the RFP.

Signed: _____

Harold L. Jones, Jr., PE

DATE OF ATC RESPONSE: 11/9/2017

ATTACHMENT 3.6.6 (cont.)

ALTERNATIVE TECHNICAL CONCEPT (ATC) RESPONSE FORM

ATC ID NUMBER: ATC 1

ATC NAME-DESCRIPTION: Modified Roundabout Interchange

OFFEROR: Branch/ WRA

DATE ATC SUBMITTED: October 27, 2017

ATTACHMENT 1

1. The curb to curb width of the bridge shall match the curb to curb width of the approach roadway.
2. The eastern roundabout shall, at minimum, meet the diameter provided in the RFP Conceptual Plan.



SUBMITTED | December 7, 2017
COPY 1 OF 10 COPIES (ORIGINAL)



Technical Proposal Volume II

A DESIGN-BUILD PROJECT

Warrenton Southern Interchange US 15/17/29

From: Route 15/17/29 & Route 15/17/29 Business

To: 1.0 mile South of Route 15/17/29 & Route 15/17/29 Business

State Project No.: 0029-030-121, P101, R201, C501, B616
Federal Project No.: STP-032-7(032)
Contract ID Number: C00077384DB100

SUBMITTED BY



LIMITED ACCESS HIGHWAY By Resolution of Highway Commission dated October 25, 1973

FOR INDEX OF SHEETS SEE SHEET 1B

THIS PROJECT WAS DEVELOPED UTILIZING THE DEPARTMENT'S ENGINEERING DESIGN PACKAGE (GEOPAK).
GEOPAK Computer Identification No. 77384



COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION

PLAN AND PROFILE OF PROPOSED
STATE HIGHWAY

COUNTY OF FAUQUIER
NEW INTERCHANGE AT

U.S. ROUTE 15/17/29/29 BUSINESS

FROM: 0.416 MILES SOUTH OF U.S. ROUTE 15/17/29 BUSINESS
TO: 0.356 MILES NORTH OF U.S. ROUTE 15/17/29 BUSINESS

PROJ. 0029-030-121, P101, R201, C501, B616

STATE	FEDERAL AID PROJECT	ROUTE	STATE PROJECT	SHEET NO.
VA.	STP-032-7(032)	29	0029-030-121 (SEE TABULATION BELOW FOR SECTION NUMBERS)	1

FUNCTIONAL CLASSIFICATION AND TRAFFIC DATA				
ROADWAY NAME	U.S. ROUTE 15/17/29 BUSINESS	U.S. ROUTE 15/17/29 BYPASS	LORD FAIRFAX DRIVE	RAMP A,B,C,D
FUNCTIONAL CLASSIFICATION	URBAN MINOR ARTERIAL (GS-6) ULS	RURAL PRINCIPAL ARTERIAL (GS-1)	URBAN LOCAL STREET (GS-8)	INTERCHANGE RAMP (GS-R)
LIMITS	FR: 0.291 MI. E. INT. U.S. ROUTE 15/17/29 BYPASS	FR: 0.426 MI. S. INT. U.S. ROUTE 15/17/29 BUSINESS	N/A	N/A
	FR: 0.208 MI. W. INT. U.S. ROUTE 15/17/29 BYPASS	FR: 0.335 MI. N. INT. U.S. ROUTE 15/17/29 BUSINESS	N/A	N/A
ADT (2016)	11,848	44,097		
ADT (2040)	20,000	70,000		
DHV	2,000	7,000		
D (%) (design hour)	NB 50%, SB 50%	NB 55%, SB 45%		
T (%) (design hour)	3.00%	12.00%		
V (MPH)	35	60	35	25

* SEE PLAN AND PROFILE SHEETS FOR HORIZONTAL AND VERTICAL CURVE DESIGN SPEEDS.

CONVENTIONAL SIGNS

STATE LINE	---
COUNTY LINE	----
CITY, TOWN OR VILLAGE	-----
RIGHT OF WAY LINE	-----
FENCE LINE	-----
UNFENCED PROPERTY LINE	-----
FENCED PROPERTY LINE	-----
WATER LINE	-----
SANITARY SEWER LINE	-----
GAS LINE	-----
ELECTRIC UNDERGROUND CABLE	-----
TRAVELED WAY	-----
GUARD RAIL	-----
RETAINING WALL	-----
RAILROADS	-----
BASE OR SURVEY LINE	-----

LEVEE OR EMBANKMENT	-----
BRIDGES	-----
CULVERTS	-----
DROP INLET	-----
POWER POLES	-----
TELEPHONE OR TELEGRAPH POLES	-----
TELEPHONE OR TELEGRAPH LINES	-----
HEDGE	-----
TREES	-----
HEAVY WOODS	-----
GROUND ELEVATION	-----
GRADE ELEVATION	-----

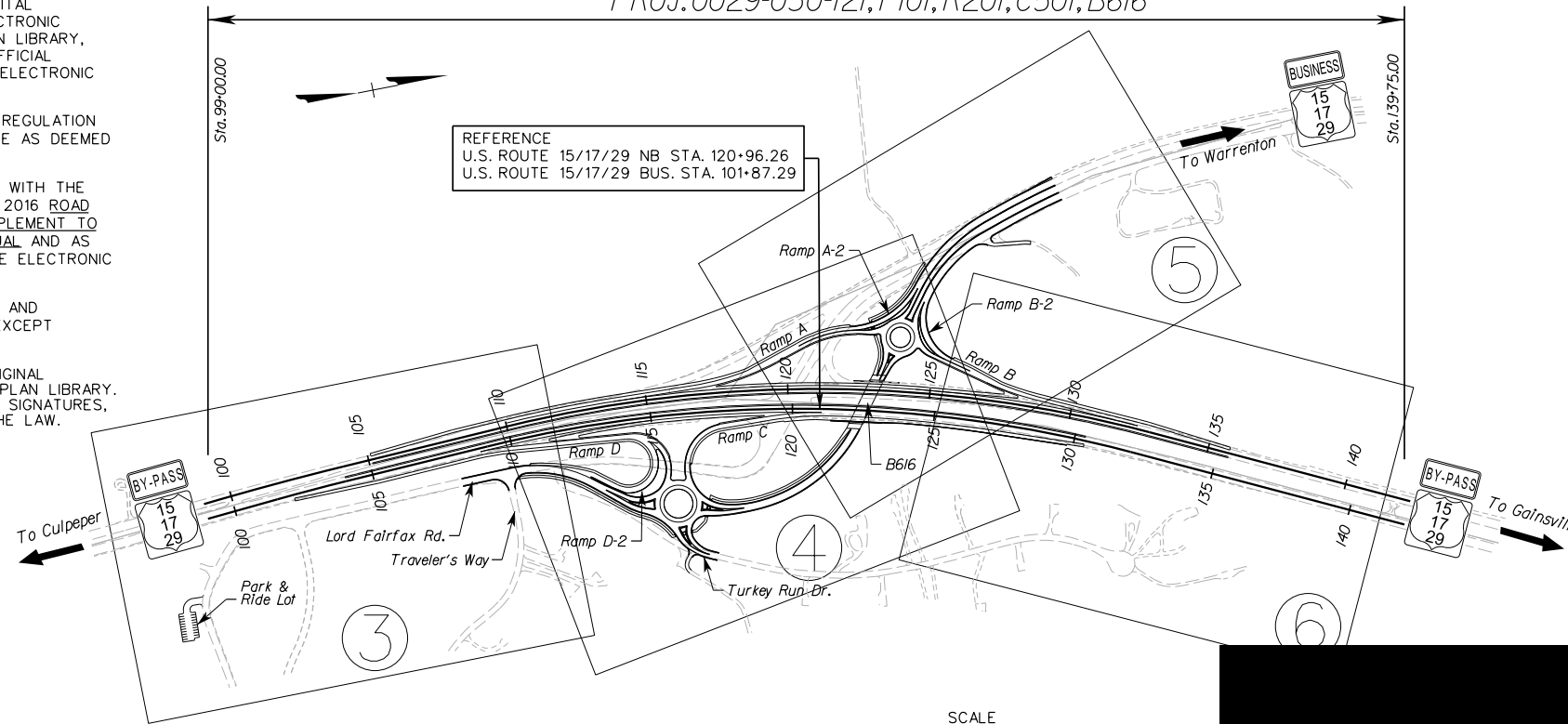
THE COMPLETE ELECTRONIC PDF VERSION OF THE PLAN ASSEMBLY AS AWARDED, HAS BEEN SEALED AND SIGNED USING DIGITAL SIGNATURES AND THE OFFICIAL PLAN ASSEMBLY IN ELECTRONIC FORMAT IS STORED IN THE VDOT CENTRAL OFFICE PLAN LIBRARY. INCLUDING ALL SUBSEQUENT REVISIONS, WILL BE THE OFFICIAL CONSTRUCTION PLANS. FOR INFORMATION RELATIVE TO ELECTRONIC FILES AND LAYERED PLANS, SEE THE GENERAL NOTES.

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

THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DEPARTMENT'S 2016 ROAD AND BRIDGE SPECIFICATIONS, 2016 ROAD AND BRIDGE STANDARDS, 2009 MUTCD, 2011 VIRGINIA SUPPLEMENT TO THE MUTCD, 2011 VIRGINIA WORK AREA PROTECTION MANUAL AND AS AMENDED BY CONTRACT PROVISIONS AND THE COMPLETE ELECTRONIC PDF VERSION OF THE PLAN ASSEMBLY.

ALL CURVES ARE TO BE SUPERELEVATED, TRANSITIONED AND WIDENED IN ACCORDANCE WITH STANDARD TC 5.11ULS, EXCEPT WHERE OTHERWISE NOTED.

THE ORIGINAL APPROVED TITLE SHEET(S), INCLUDING ORIGINAL SIGNATURES, ARE FILED IN THE VDOT CENTRAL OFFICE PLAN LIBRARY. ANY MISUSE OF ELECTRONIC FILES, INCLUDING SCANNED SIGNATURES, IS ILLEGAL AND ENFORCED TO THE FULL EXTENT OF THE LAW.



TIER 2 PROJECT
RECOMMENDED FOR APPROVAL FOR RIGHT OF WAY ACQUISITION

DATE	PROGRAMMING DIVISION DIRECTOR
DATE	STATE LOCATION AND DESIGN ENGINEER
DATE	CHIEF ENGINEER

APPROVED FOR RIGHT OF WAY ACQUISITION

DATE	CHIEF OF POLICY
------	-----------------

RECOMMENDED FOR APPROVAL FOR CONSTRUCTION

DATE	PROGRAMMING DIVISION DIRECTOR
DATE	STATE LOCATION AND DESIGN ENGINEER
DATE	STATE STRUCTURE AND BRIDGE ENGINEER

APPROVED FOR CONSTRUCTION

DATE	CHIEF ENGINEER
------	----------------

APPROVED

DATE	DIVISION ADMINISTRATOR
	CENTRAL HIGHWAY ADMINISTRATION
	DEPARTMENT OF TRANSPORTATION

Commonwealth of Virginia

Population 69,069 (2016 Census)

STATE PROJECT NO.	SECTION	FEDERAL AID PROJECT NO.	TYPE CODE	UPC NO.	EQUALITIES	LENGTH INCLUDING BRIDGE(S)		LENGTH EXCLUDING BRIDGE(S)		BRIDGE PROJECT NO.	TYPE PROJECT	DESCRIPTION
						FEET	MILES	FEET	MILES			
0029-030-121	P101	STP-032-7(032)	PENG	77384	N/A	4075	0.772	4075	0.722	TBD	PRELIM. ENG.	FROM: 0.416 MILES SOUTH OF US 15/17/29 BUS. TO: 0.356 MILES NORTH OF US 15/17/29 BUS.
	R201											
	C501											
	B616											

Project Lengths are based on U.S. Route 15/17/29 NB.

PROJECT MANAGER
SURVEYED BY, DATE
DESIGN SUPERVISED BY
DESIGN BY Whitman, Reardon & Associates, LLP (804) 272-8700

CEPT PLANS
INTERCHANGE
(21)

BRANCH



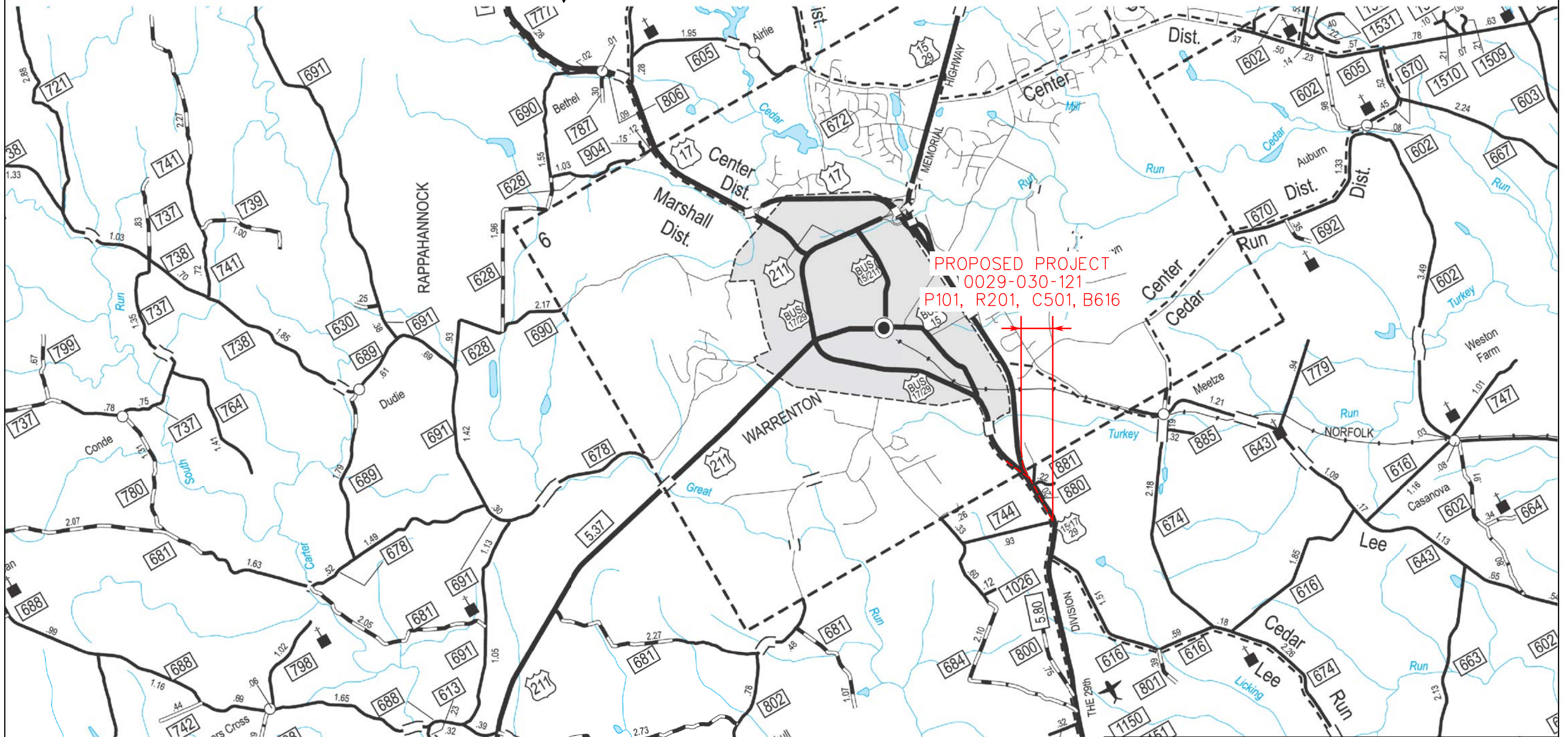
PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

LOCATION MAP

FAUQUIER COUNTY

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

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	IA



PROPOSED PROJECT
 0029-030-121
 P101, R201, C501, B616

TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET IA



\$USERS\$

\$DATE\$

\$FILE\$

PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

INDEX OF SHEETS

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

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	1B

SHEET	DESCRIPTION	STATIONS
1	TITLE SHEET	
1A	LOCATION MAP	
1B	INDEX OF SHEETS	
2A(1) - 2A(3)	TYPICAL SECTIONS	
3	PLAN SHEET SB US RTE.15/17/29 NB US RTE.15/17/29 RAMP D TRAVELERS WAY	S.B.L. STA.99+00 TO STA.111+00 N.B.L. STA.99+00 TO STA.111+00 STA.10+00 TO STA.13+25 STA.75+00 TO STA.78+53.37
3A	PROFILE SHEET RAMP D LORD FAIRFAX ROAD TURKEY RUN DRIVE	STA.10+00 TO STA.19+00 STA.10+00 TO STA.17+35 STA.10+00 TO STA.13+00
4	PLAN SHEET SB US RTE.15/17/29 NB US RTE.15/17/29 RAMP D RAMP D2 RAMP C RAMP A LORD FAIRFAX ROAD TURKEY RUN DRIVE BUS US 15/17/29	S.B.L. STA.111+00 TO STA.112+18.70 N.B.L. STA.111+00 TO STA.121+00 STA.13+25 TO STA.19+17.67 STA.10+00 TO STA.13+15.17 STA.10+00 TO STA.16+30 STA.10+00 TO STA.18+00 STA.13+00 TO STA.17+95.01 STA.10+00 TO STA.16+90.05 STA.50+00 TO STA.56+00
4A	PROFILE SHEET US SB RTE.15/17/29 NB RTE.15/17/29	STA.99+00 TO STA.113+00 STA.99+00 TO STA.113+00
5	PLAN SHEET SB US RTE.15/17/29 NB US RTE.15/17/29 RAMP A RAMP B2 RAMP B BUS US 15/17/29	S.B.L. STA.121+18.70 TO STA.126+25.68 N.B.L. STA.121+00 TO STA.126+00 STA.18+00 TO STA.20+56.86 STA.1+00 TO STA.3+52.89 STA.10+00 TO STA.12+36.71 STA.56+00 TO STA.70+22.19
5A	PROFILE SHEET US SB RTE.15/17/29 NB RTE.15/17/29	STA.113+00 TO STA.127+00 STA.113+00 TO STA.127+00
6	PLAN SHEET SB US RTE.15/17/29 NB US RTE.15/17/29 RAMP B	S.B.L. STA.126+25.68 TO STA.136+00 N.B.L. STA.126+00 TO STA.130+25 STA.12+36.71 TO STA.15+44.13
6A	PROFILE SHEET US SB RTE.15/17/29 NB RTE.15/17/29	STA.127+00 TO STA.141+00 STA.127+00 TO STA.141+00

SHEET	DESCRIPTION	STATIONS
6B	PROFILE SHEET BUSINESS US RTE.15 TRAVELERS WAY	STA.50+00 TO STA.64+00 STA.75+00 TO STA.78+53.37
6C	PROFILE SHEET BUSINESS US RTE.15 RAMP A RAMP B	STA.64+00 TO STA.70+00 STA.10+00 TO STA.20+50 STA.10+00 TO STA.18+60
6D	PROFILE SHEET RAMP C RAMP A2 RAMP B2 RAMP D2	STA.10+00 TO STA.17+42.18 STA.1+00 TO STA.3+75 STA.1+00 TO STA.3+25 STA.10+00 TO STA.14+00
6E	PROFILE SHEET EAST ROUNDABOUT WEST ROUNDABOUT	STA.1000+00.00 TO STA.1004+08.41 STA.2000+00.00 TO STA.2003+14.16

BRIDGE PLAN SHEET	DESCRIPTION
1	BRIDGE PLAN
2	TRANSVERSE SECTION
3	ABUTMENTS
4	PIER
5	MSE WALL ELEVATION

TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 1B



\$USER\$
\$TIME\$

\$DATE\$ \$FILE\$

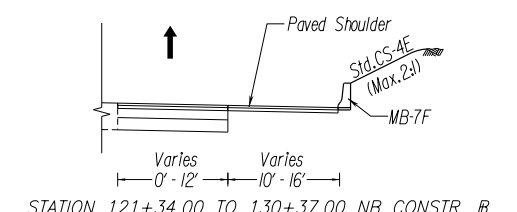
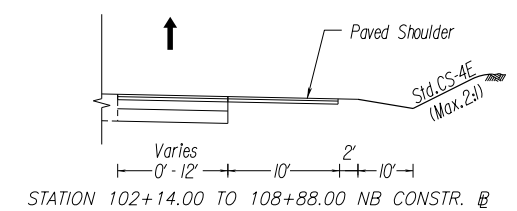
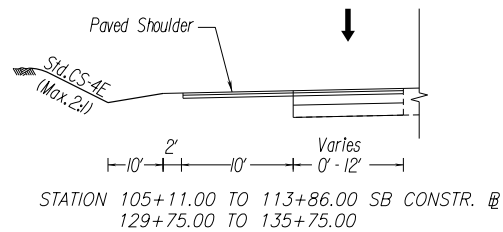
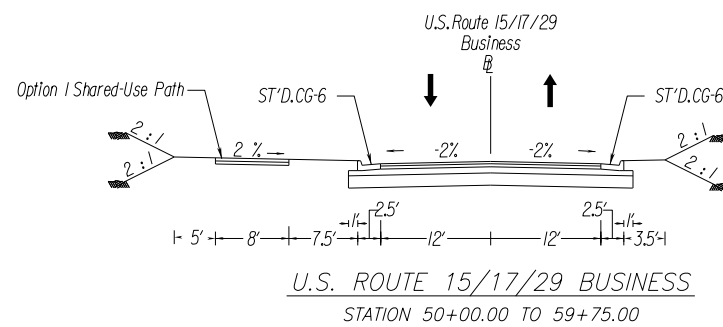
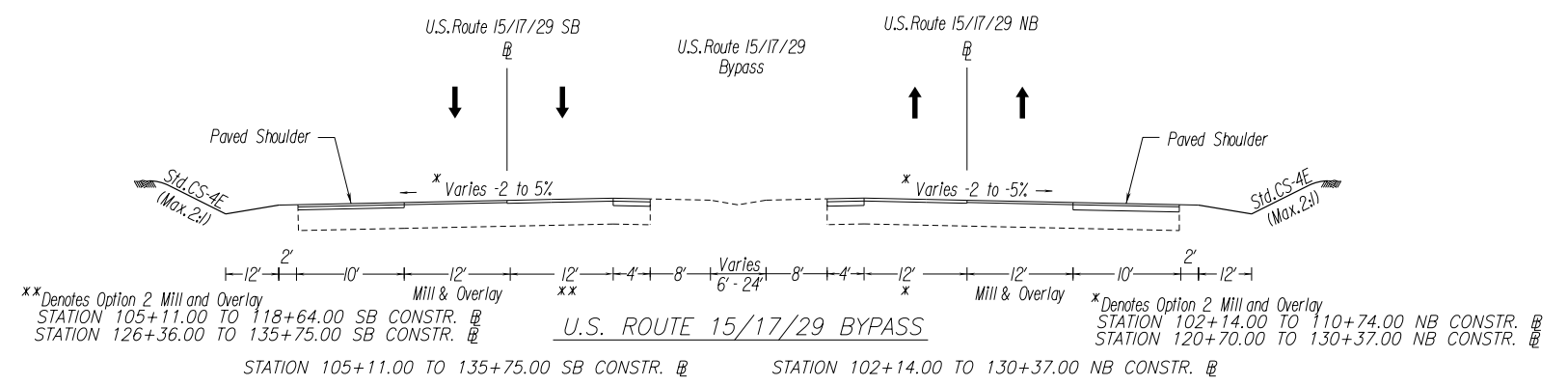
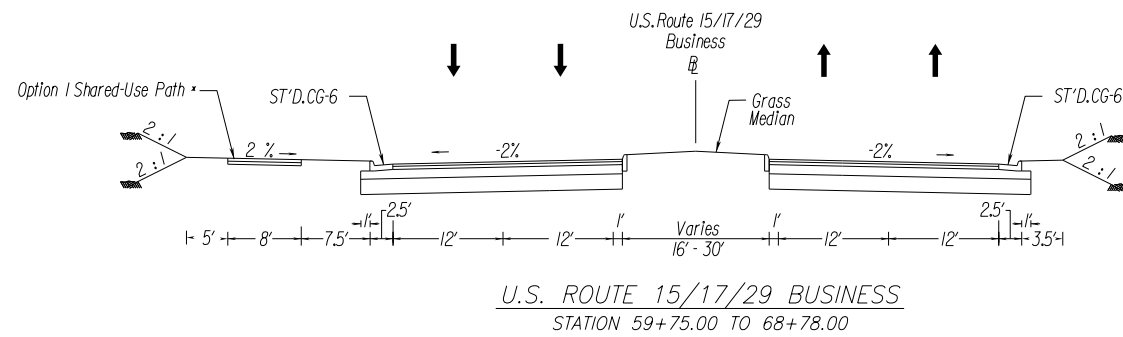
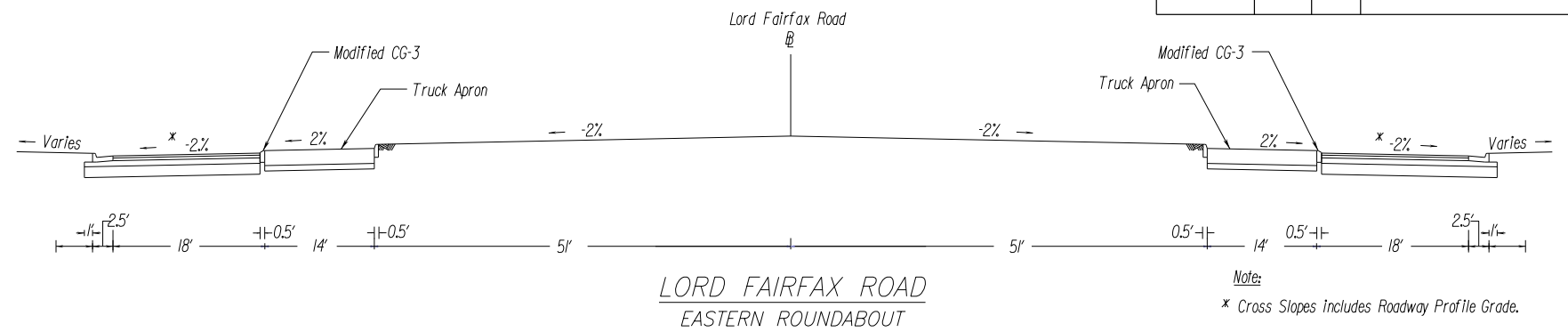
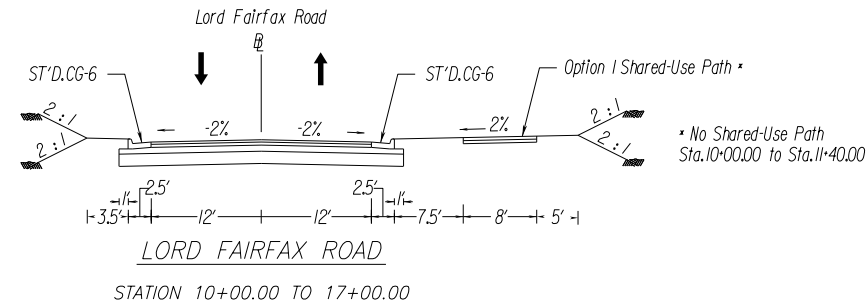
PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

NOTE: PAVEMENT WIDTHS VARY AT TAPERS.
 SEE PLAN SHEETS AND CROSS SECTIONS
 FOR PAVEMENT LENGTHS AND WIDTHS.

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

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 PI01, R201, C501	2A(1)

TYPICAL SECTIONS



MINIMUM PAVEMENT SECTIONS PER RFP

NEW PAVEMENT MAINLINE - US 15/17/29, SOUTH (NORTH) OF EXISTING INTERSECTION

SURFACE - 2" (1.5") ASPHALT TY SM-12.5E (9.5D)
 INTERMEDIATE - 2" ASPHALT TY IM-19.0E
 BASE - 10" ASPHALT TY BM-25.0D
 SUBBASE - 8" AGGREGATE BASE TY I, SIZE 21B

OUTSIDE SHOULDER - US 15/17/29

SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 SUBBASE - 18.5" AGGREGATE BASE TY I, SIZE 21B

MILL & OVERLAY OF MAINLINE - US 15/17/29, SOUTH (NORTH) OF EXISTING INTERSECTION

SURFACE - 2" (1.5") ASPHALT TY SM-12.5E (9.5)

LORD FAIRFAX DRIVE & EAST ROUNDABOUT

SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 BASE - 4" ASPHALT TY BM-25.0A
 SUBBASE - 6" AGGREGATE BASE TY I, SIZE 21B

NEW PAVEMENT AND INSIDE SHOULDER - US 15/17/29 BUSINESS

SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0E
 BASE - 5" ASPHALT TY BM-25.0A
 SUBBASE - 8" AGGREGATE BASE TY I, SIZE 21B

OUTSIDE SHOULDER - US 15/17/29 BUSINESS

SURFACE - 2" ASPHALT TY SM-9.5D

WEST ROUNDABOUT

SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 BASE - 4" ASPHALT TY BM-25.0A
 SUBBASE - 8" AGGREGATE BASE TY I, SIZE 21B

SHARED USE PATH

SURFACE - 2" ASPHALT TY SM-9.5A
 SUBBASE - 6" PLAIN AGGREGATE TY I, SIZE 21B

Note:
 * Cross Slopes Includes Roadway Profile Grade.

U.S. ROUTE 15/17/29 BYPASS

TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 2A(1)



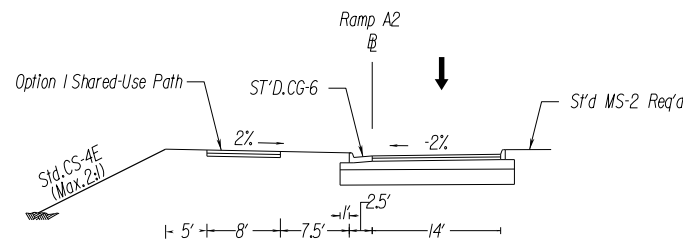
PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

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

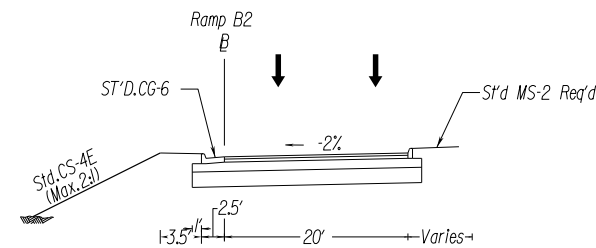
REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	2A(2)

NOTE: PAVEMENT WIDTHS VARY AT TAPERS. SEE PLAN SHEETS AND CROSS SECTIONS FOR PAVEMENT LENGTHS AND WIDTHS.

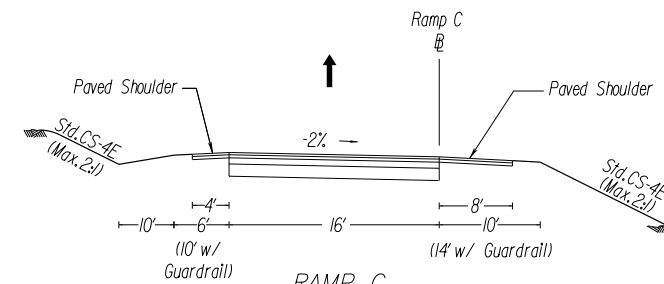
TYPICAL SECTIONS



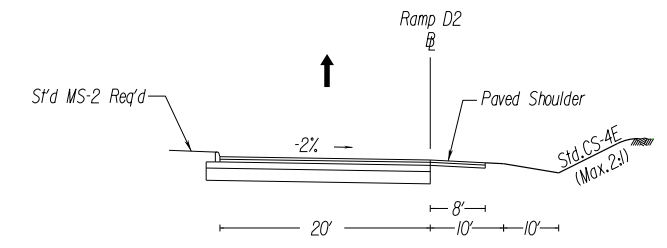
RAMP A2
STATION 1+50.00 TO 3+87.52



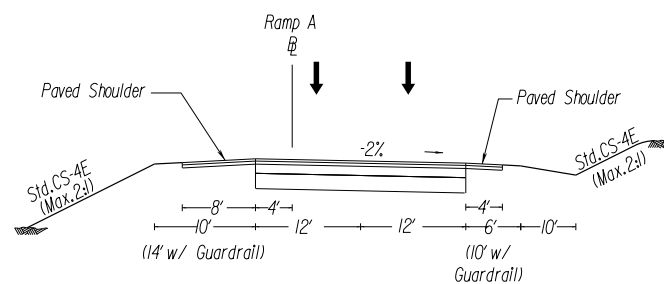
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STATION 1+00.00 TO 3+52.89



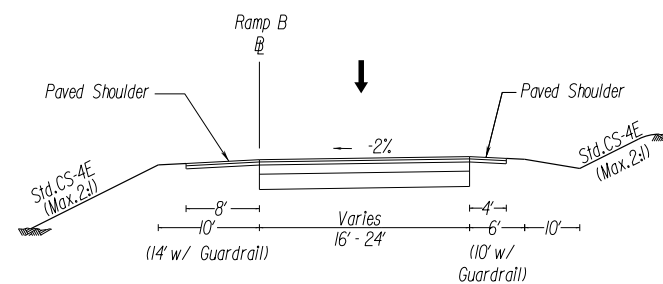
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STATION 10+00.00 TO 16+60.77



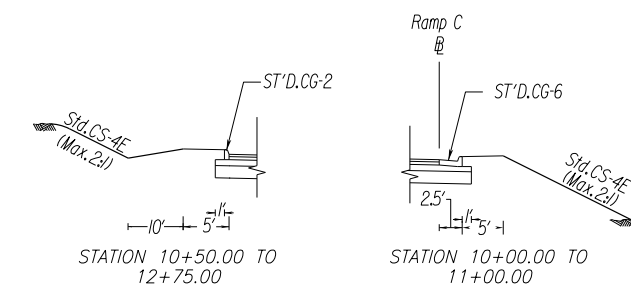
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STATION 10+00.00 TO 14+09.23



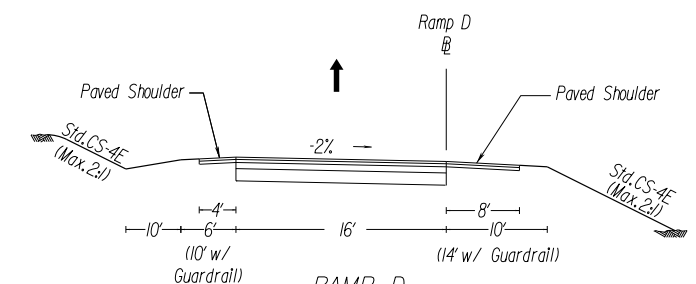
RAMP A
STATION 16+83.00 TO 19+00.00



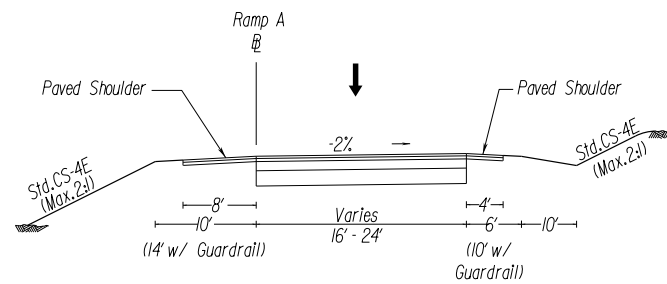
RAMP B
STATION 13+27.00 TO 18+92.96



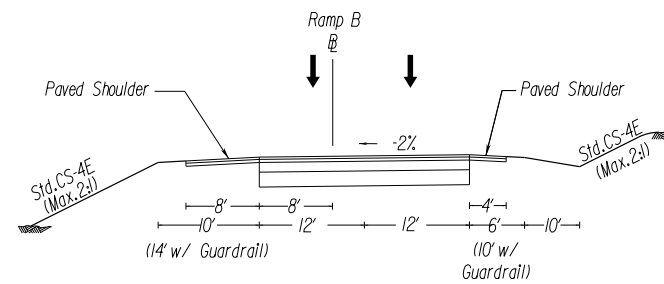
STATION 10+50.00 TO 12+75.00
STATION 10+00.00 TO 11+00.00



RAMP D
STATION 11+00.00 TO 19+17.67



RAMP A
STATION 10+00.00 TO 16+83.00



RAMP B
STATION 12+00.00 TO 13+27.00

MINIMUM PAVEMENT SECTIONS PER RFP

RAMP A/A2
 SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 BASE - 6" ASPHALT TY BM-25.0A
 SUBBASE - 8" AGGREGATE BASE TY I, SIZE 21B

RAMP A SHOULDER
 SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 BASE - 14" AGGREGATE BASE TY I, SIZE 21B

RAMPS B/B2 & C
 SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 BASE - 4" ASPHALT TY BM-25.0A
 SUBBASE - 8" AGGREGATE BASE TY I, SIZE 21B

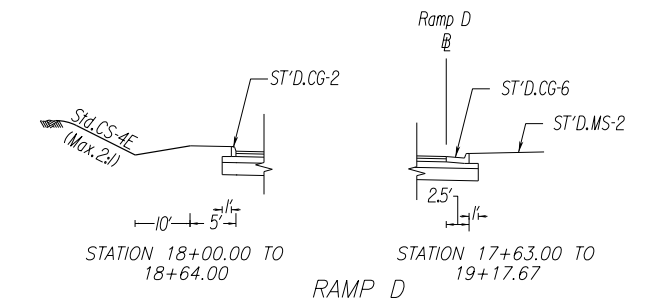
RAMPS B & C SHOULDER
 SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 SUBBASE - 12" AGGREGATE BASE TY I, SIZE 21B

RAMP D/D2
 SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 BASE - 5" ASPHALT TY BM-25.0A
 SUBBASE - 8" AGGREGATE BASE TY I, SIZE 21B

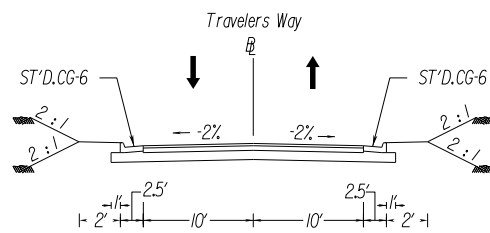
RAMP D/D2 SHOULDER
 SURFACE - 1.5" ASPHALT TY SM-9.5D
 INTERMEDIATE - 2" ASPHALT TY IM-19.0A
 SUBBASE - 13" AGGREGATE BASE TY I, SIZE 21B

TRAVELER'S WAY AND TURKEY RUN DRIVE
 SURFACE - 2" ASPHALT TY SM-9.5A
 SUBBASE - 8" AGGREGATE BASE TY I, SIZE 21B

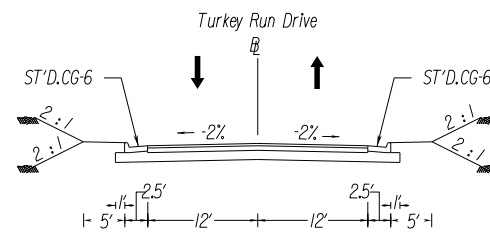
SHARED USE PATH
 SURFACE - 2" ASPHALT TY SM-9.5A
 SUBBASE - 6" PLAIN AGGREGATE TY I, SIZE 21B



STATION 18+00.00 TO 18+64.00
RAMP D
STATION 17+63.00 TO 19+17.67



TRAVELERS WAY
STATION 75+12.00 TO 75+64.00



TURKEY RUN DRIVE
STATION 11+56.00 TO 12+64.00

TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 2A(2)

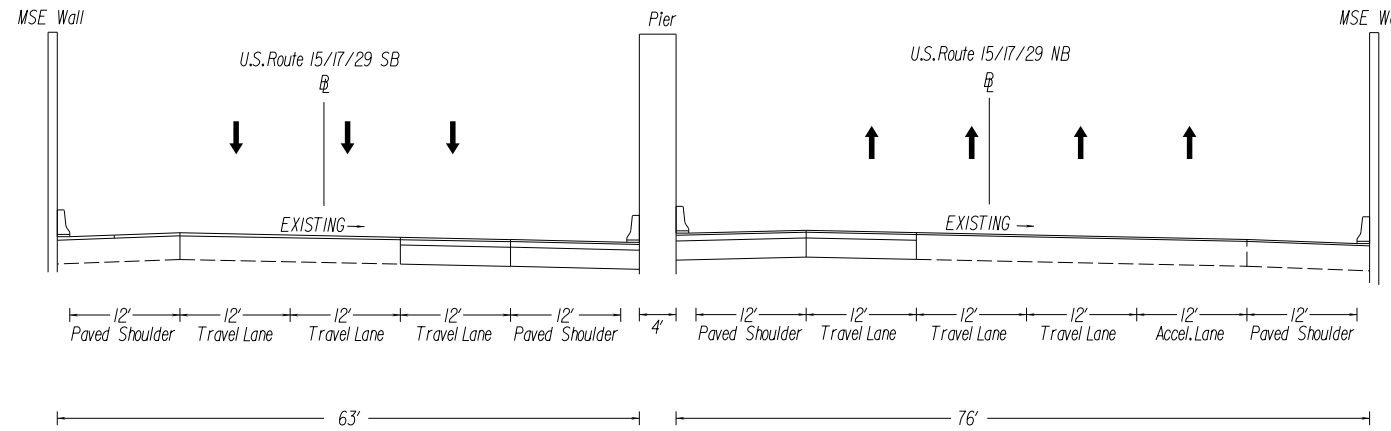


PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

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

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	2A(3)

TYPICAL SECTIONS



FUTURE ROADWAY SECTION UNDER BRIDGE
 U.S. ROUTE 15/17/29 BYPASS

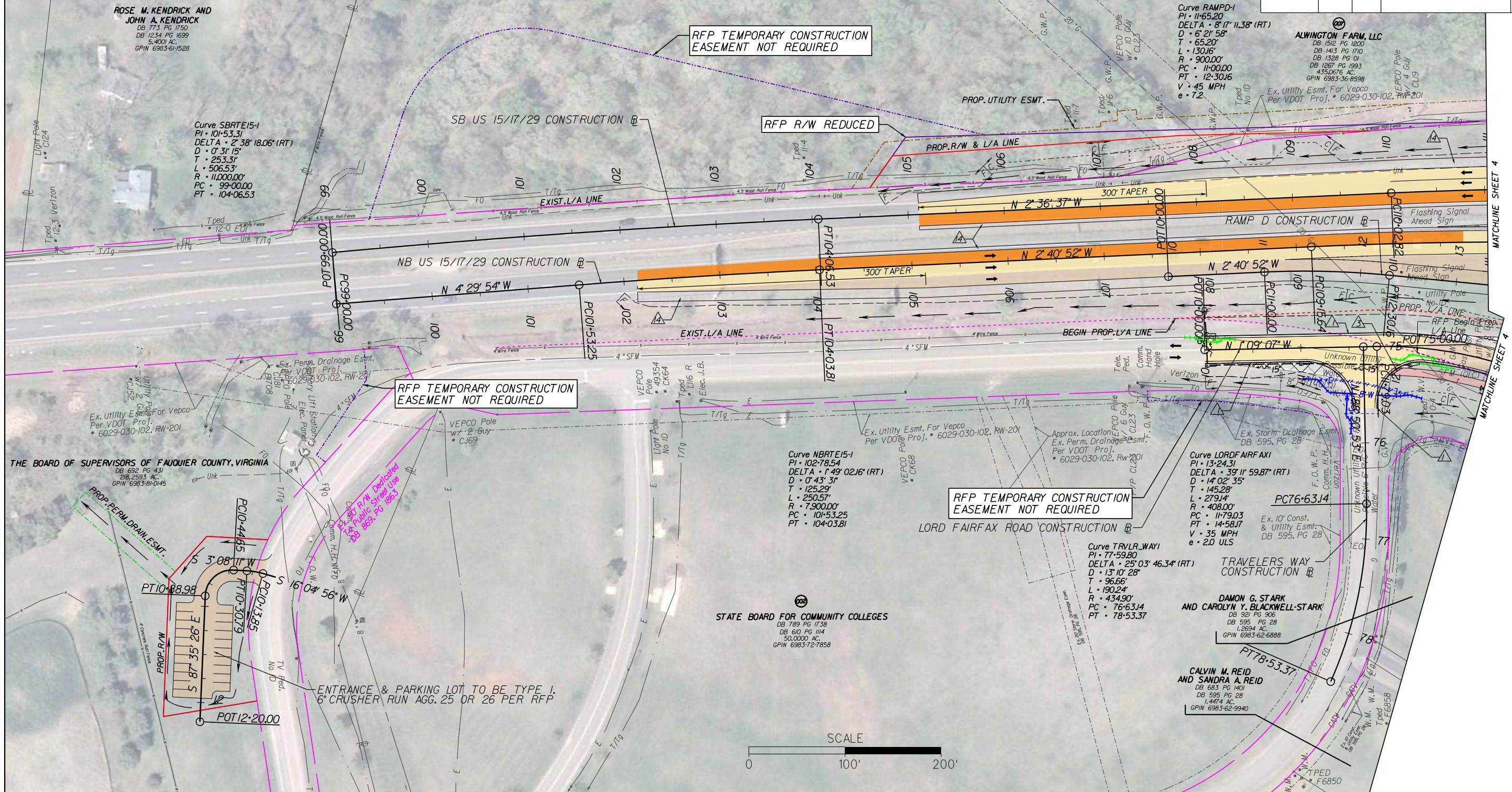
TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 2A(3)



PROJECT MANAGER _____
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 SUBSURFACE UTILITY BY, DATE _____

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REVISED	STATE	ROUTE	PROJECT	SHEET NO
	VA.	29	0029-030-121 P101, R201, C501	3



LEGEND:

— EXISTING RIGHT OF WAY	— SHARED USE PATH OPTION 1	△ ST'D. CG-6 REQ'D	△ ST'D. GR-MGS4 REQ'D	— 8" W — PROPOSED WATER RELOCATION	— SFM — SFM
— EXISTING LIMITED ACCESS LINE	— PROPOSED BRIDGE	△ ST'D. CG-2 REQ'D	△ ST'D. GR-FOA-1, TYPE 2 REQ'D	— 4" FM — PROPOSED SEWER RELOCATION	— G — NATURAL GAS
— EXISTING EASEMENT	— MILL AND OVERLAY OPTION 2 US 15/17/29	△ ST'D. CG-12 REQ'D	△ ST'D. GR-FOA-2, TYPE 2 REQ'D		— 24" W — EXISTING WATER
— PROPOSED LIMITED ACCESS LINE	— MILL AND OVERLAY BASE US 15/17/29	△ ST'D. MS-1A REQ'D	△ MOD CG-3 REQ'D		— E — EXISTING ELECTRIC
— PROPOSED RIGHT OF WAY	— FULL DEPTH PROPOSED PAVEMENT	△ ST'D. MS-2 REQ'D	△ PAVED SHOULDER		— FO — EXISTING FIBER OPTIC
— PROPOSED TEMPORARY EASEMENT	— PAVEMENT DEMOLITION	△ ST'D. MS-7F REQ'D			— CATV — EXISTING CABLE TV
— PROPOSED PERMANENT EASEMENT	— DENOTES CONSTRUCTION LIMITS IN CUT	△ ST'D. GR-MGS1 REQ'D			— T/Tg — EXISTING TELEPHONE
— PROPOSED UTILITY EASEMENT	— DENOTES CONSTRUCTION LIMITS IN FILL	△ ST'D. GR-MGS2 REQ'D			— TC — EXISTING TRAFFIC CONTROL
— RFP PROPOSED LIMITED ACCESS LINE		△ ST'D. GR-MGS3 REQ'D			— Unk — EXISTING UNKNOWN UTILITY
— RFP PROPOSED TEMPORARY EASEMENT					
— RFP PROPOSED PERMANENT EASEMENT					
— RFP PROPOSED RIGHT OF WAY					

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TURKEY RUN	3A
TRAVELERS WAY	6B
RAMP A	6C
RAMP A2	6D
RAMP B	6C
RAMP B2	6D
RAMP C	6D
RAMP D	3A
RAMP D2	6D
EAST ROUNDABOUT	6E
WEST ROUNDABOUT	6E

TECHNICAL PROPOSAL CONCEPT PLANS
WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 3

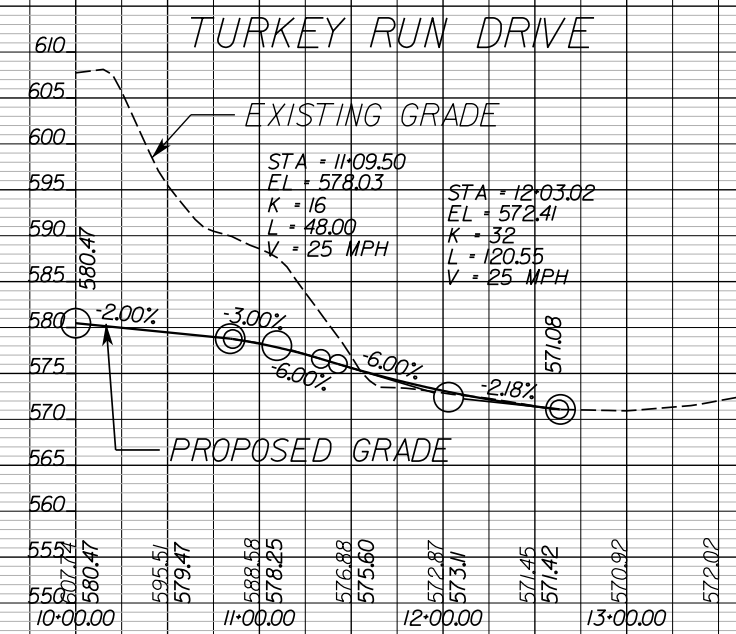
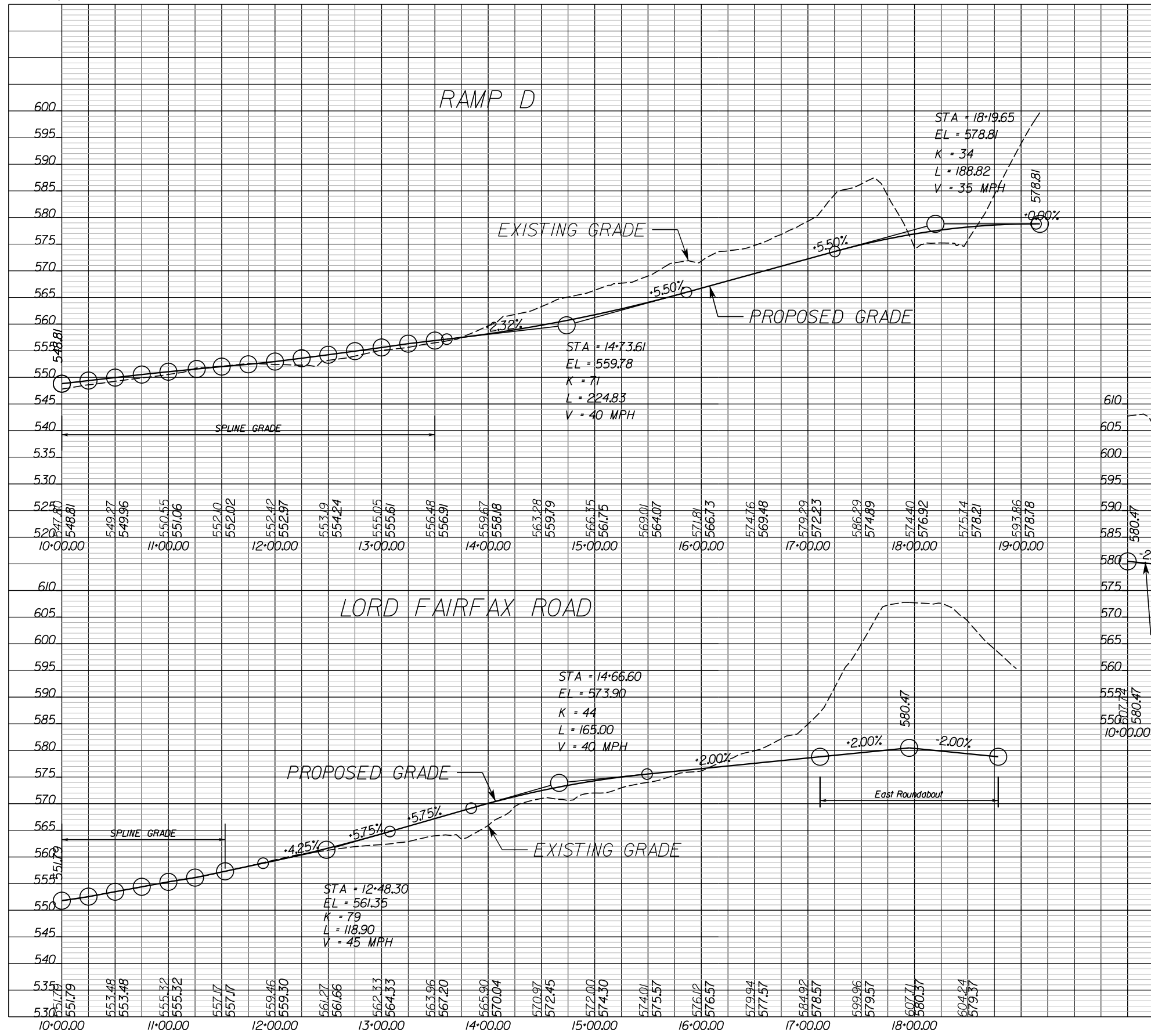


PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY: Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

DESIGN FEATURES RELATING TO CONSTRUCTION
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REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	0029-030-121 PI01, R201, C501	3A

SCALE: 5'
 VERT. 1"=5'
 HOR. 1"=100'



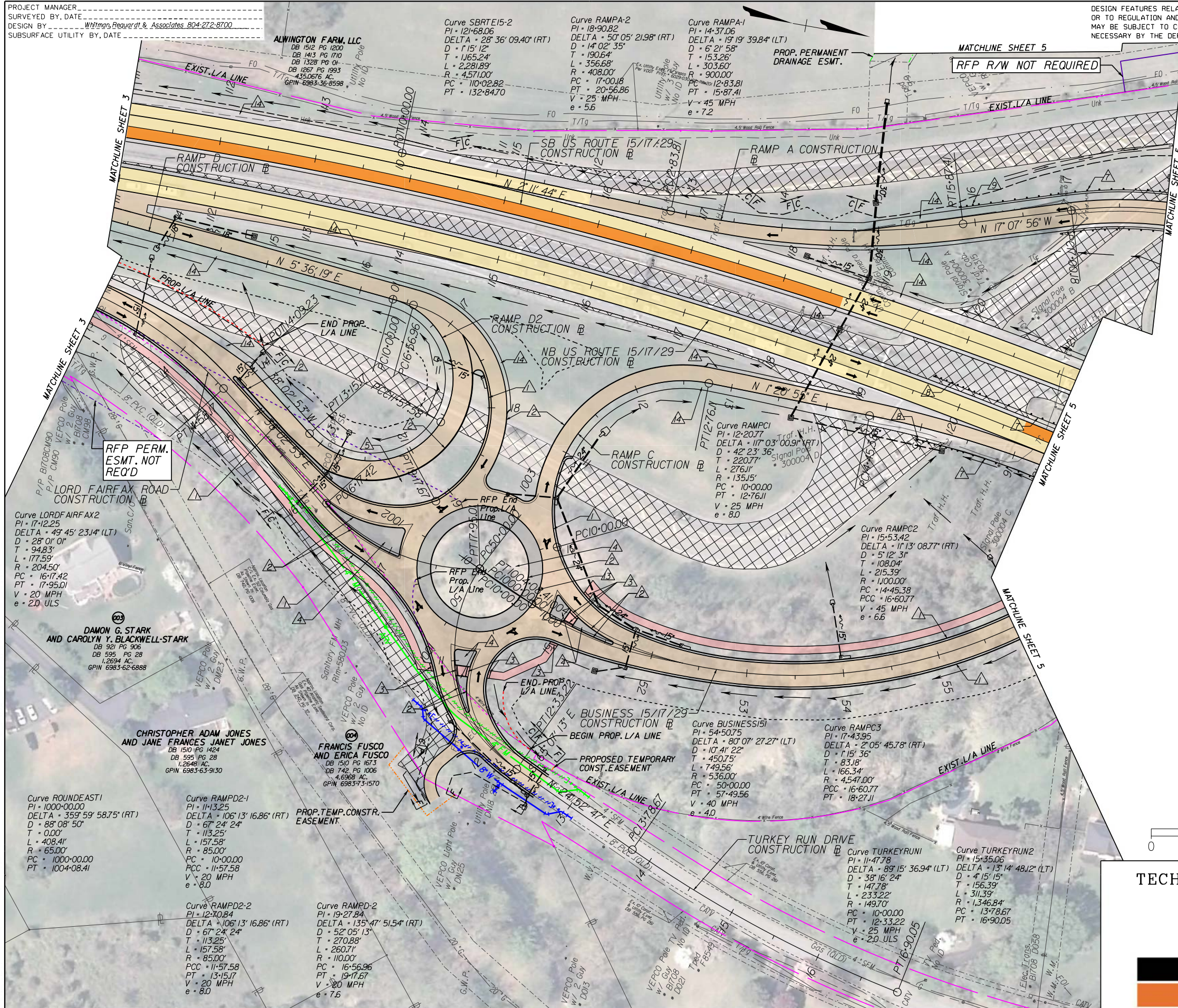
TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 3A



PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY: Whitman, Reardon & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

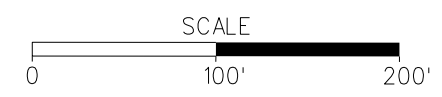
DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

REVISED	STATE	ROUTE	STATE	PROJECT	SHEET NO.
	VA.	29		0029-030-121 P101, R201, C501	4



LEGEND:

- EXISTING RIGHT OF WAY
- EXISTING LIMITED ACCESS LINE
- EXISTING EASEMENT
- PROPOSED LIMITED ACCESS LINE
- PROPOSED RIGHT OF WAY
- PROPOSED TEMPORARY EASEMENT
- PROPOSED PERMANENT EASEMENT
- PROPOSED UTILITY EASEMENT
- RFP PROPOSED LIMITED ACCESS LINE
- RFP PROPOSED TEMPORARY EASEMENT
- RFP PROPOSED PERMANENT EASEMENT
- RFP PROPOSED RIGHT OF WAY
- SHARED USE PATH OPTION 1
- PROPOSED BRIDGE
- MILL AND OVERLAY OPTION 2 US 15/17/29
- MILL AND OVERLAY BASE US 15/17/29
- FULL DEPTH PROPOSED PAVEMENT
- PAVEMENT DEMOLITION
- DENOTES CONSTRUCTION LIMITS IN CUT
- DENOTES CONSTRUCTION LIMITS IN FILL
- △ ST'D. CG-6 REQ'D
- △ ST'D. CG-2 REQ'D
- △ ST'D. CG-12 REQ'D
- △ ST'D. M5-1A REQ'D
- △ ST'D. M5-2 REQ'D
- △ ST'D. MB-7F REQ'D
- △ ST'D. GR-MGSI REQ'D
- △ ST'D. GR-MG2 REQ'D
- △ ST'D. GR-MG3 REQ'D
- △ ST'D. GR-MG4 REQ'D
- △ ST'D. GR-FOA-1, TYPE 2 REQ'D
- △ ST'D. GR-FOA-2, TYPE 2 REQ'D
- △ MOD CG-3 REQ'D
- △ PAVED SHOULDER
- SFM — SFM
- G — NATURAL GAS
- 24" W — EXISTING WATER
- E — EXISTING ELECTRIC
- FO — EXISTING FIBER OPTIC
- CATV — EXISTING CABLE TV
- T/Tg — EXISTING TELEPHONE
- TC — EXISTING TRAFFIC CONTROL
- Unk — EXISTING UNKNOWN UTILITY
- 8" W — PROPOSED WATER RELOCATION
- 4" FM — PROPOSED SEWER RELOCATION



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TRAVELERS WAY	6B
RAMP A	6C
RAMP A2	6D
RAMP B	6C
RAMP B2	6D
RAMP C	6D
RAMP D	3A
RAMP D2	6D
EAST ROUNDABOUT	6E
WEST ROUNDABOUT	6E

TECHNICAL PROPOSAL CONCEPT PLANS
WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 4

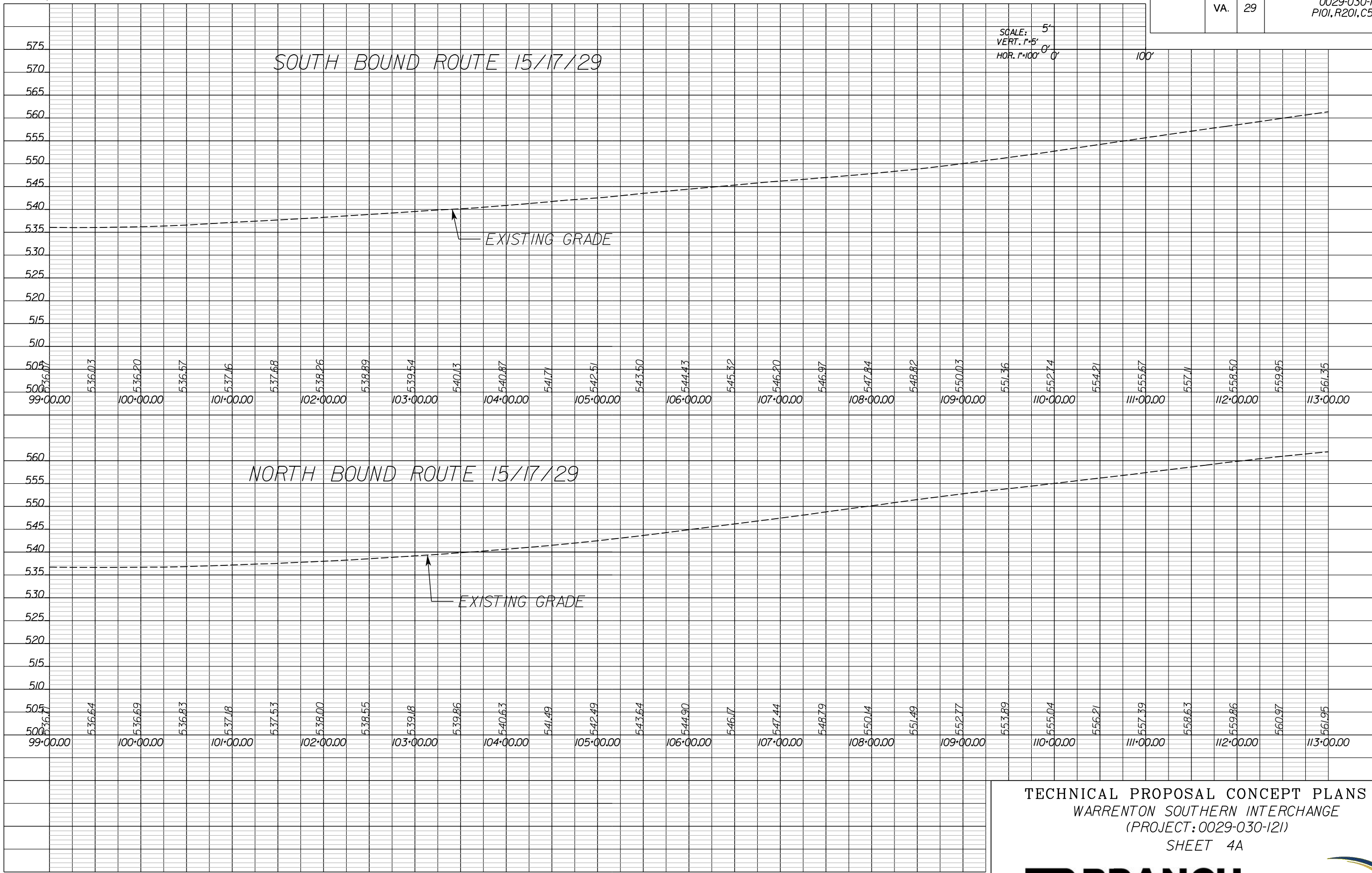


PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

DESIGN FEATURES RELATING TO CONSTRUCTION
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REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	4A

SCALE: 5'
 VERT. 1"=5'
 HOR. 1"=100'



TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 4A



PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY: William Reardon & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

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

REVISED	STATE	ROUTE	STATE	PROJECT	SHEET NO.
	VA.	29		0029-030-121 P101, R201, C501	5

Curve RAMP A2-1
 PI = 257.88
 DELTA = 58° 50' 02.80" (LT)
 D = 20' 27' 46"
 T = 157.88'
 L = 287.52'
 R = 280.00'
 PC = 100.00'
 PT = 387.52'
 V = 25 MPH
 e = 6.6

Curve BUSINESS152
 PI = 6431.32
 DELTA = 34° 24' 54.34" (RT)
 D = 10' 4' 22"
 T = 166.00'
 L = 321.95'
 R = 536.00'
 PC = 6265.32
 PT = 6587.28
 V = 40 MPH
 e = 4.0

Curve BUSINESS153
 PI = 6839.99
 DELTA = 8° 00' 46.36" (RT)
 D = 2' 11' 43"
 T = 182.80'
 L = 365.01'
 R = 2610.00'
 PC = 6657.18
 PT = 7022.19
 V = 40 MPH
 e = 2.3

Curve ROUNDWEST-1
 PI = 200088.83
 DELTA = 121° 15' 14.88" (RT)
 D = 114° 35' 30"
 T = 88.83'
 L = 105.81'
 R = 50.00'
 PC = 200000.00
 PCC = 200105.81

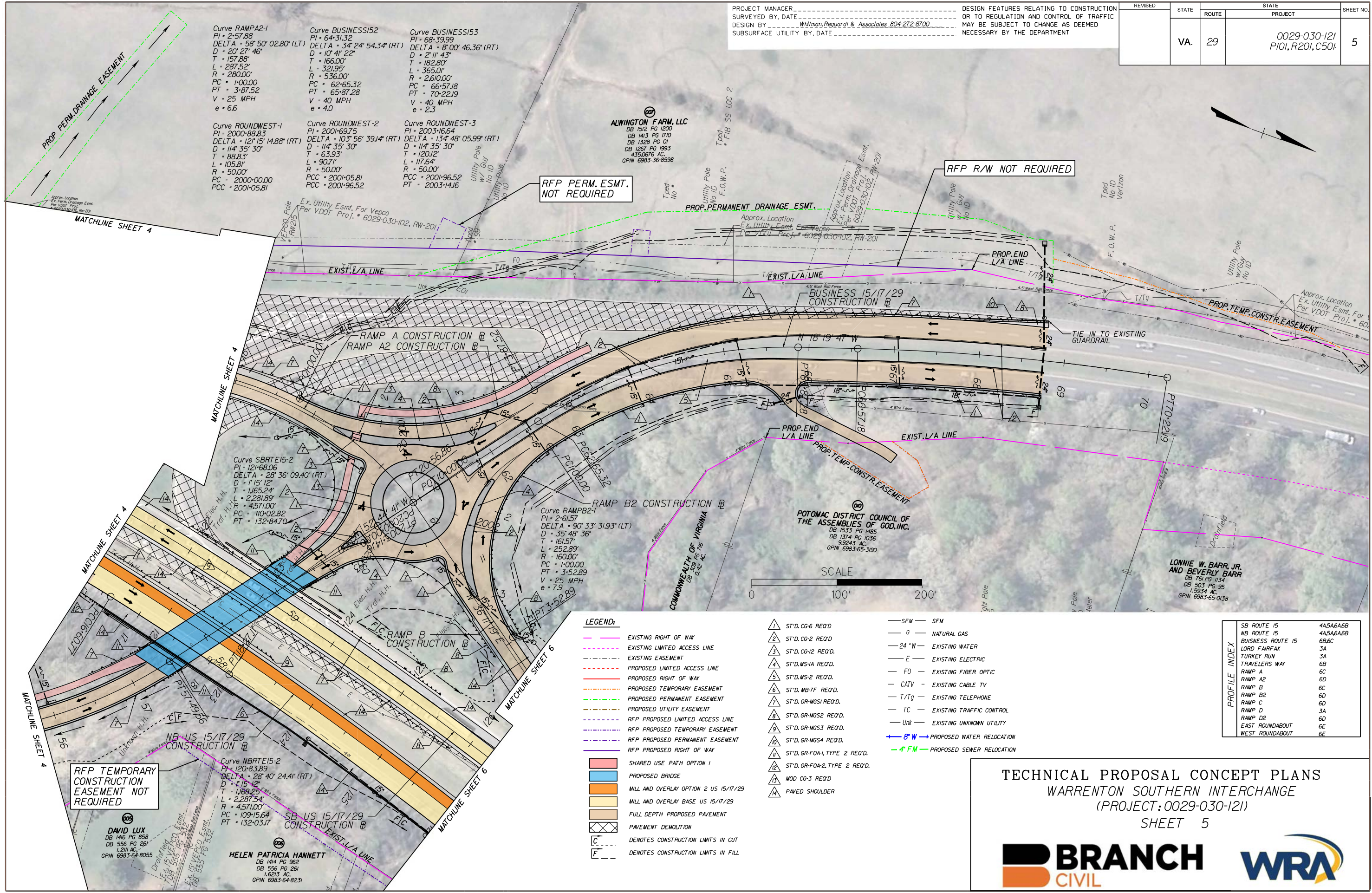
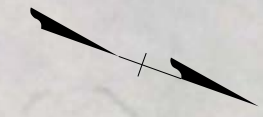
Curve ROUNDWEST-2
 PI = 200169.75
 DELTA = 103° 56' 39.14" (RT)
 D = 114° 35' 30"
 T = 63.93'
 L = 90.71'
 R = 50.00'
 PCC = 200105.81
 PCC = 200196.52

Curve ROUNDWEST-3
 PI = 200316.64
 DELTA = 134° 48' 05.99" (RT)
 D = 114° 35' 30"
 T = 120.12'
 L = 117.64'
 R = 50.00'
 PCC = 200196.52
 PT = 200314.16

RFP PERM. ESMT. NOT REQUIRED

RFP R/W NOT REQUIRED

PROP. PERMANENT DRAINAGE ESMT.



LEGEND:

- EXISTING RIGHT OF WAY
- EXISTING LIMITED ACCESS LINE
- EXISTING EASEMENT
- PROPOSED LIMITED ACCESS LINE
- PROPOSED RIGHT OF WAY
- PROPOSED TEMPORARY EASEMENT
- PROPOSED PERMANENT EASEMENT
- PROPOSED UTILITY EASEMENT
- RFP PROPOSED LIMITED ACCESS LINE
- RFP PROPOSED TEMPORARY EASEMENT
- RFP PROPOSED PERMANENT EASEMENT
- RFP PROPOSED RIGHT OF WAY
- SHARED USE PATH OPTION 1
- PROPOSED BRIDGE
- MILL AND OVERLAY OPTION 2 US 15/17/29
- MILL AND OVERLAY BASE US 15/17/29
- FULL DEPTH PROPOSED PAVEMENT
- PAVEMENT DEMOLITION
- C — DENOTES CONSTRUCTION LIMITS IN CUT
- F — DENOTES CONSTRUCTION LIMITS IN FILL
- 1 ST'D. CG-6 REQ'D
- 2 ST'D. CG-2 REQ'D
- 3 ST'D. CG-12 REQ'D
- 4 ST'D. MS-1A REQ'D
- 5 ST'D. MS-2 REQ'D
- 6 ST'D. MB-TF REQ'D
- 7 ST'D. GR-MGS1 REQ'D
- 8 ST'D. GR-MGS2 REQ'D
- 9 ST'D. GR-MGS3 REQ'D
- 10 ST'D. GR-MGS4 REQ'D
- 11 ST'D. GR-FOA-1, TYPE 2 REQ'D
- 12 ST'D. GR-FOA-2, TYPE 2 REQ'D
- 13 MOD CG-3 REQ'D
- 14 PAVED SHOULDER
- SFM — SFM
- G — NATURAL GAS
- 24" W — EXISTING WATER
- E — EXISTING ELECTRIC
- FO — EXISTING FIBER OPTIC
- CATV — EXISTING CABLE TV
- T/Tg — EXISTING TELEPHONE
- TC — EXISTING TRAFFIC CONTROL
- Unk — EXISTING UNKNOWN UTILITY
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RAMP A	6C
RAMP A2	6D
RAMP B	6C
RAMP B2	6D
RAMP C	6D
RAMP D	3A
RAMP D2	6D
EAST ROUNDABOUT	6E
WEST ROUNDABOUT	6E

TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 5



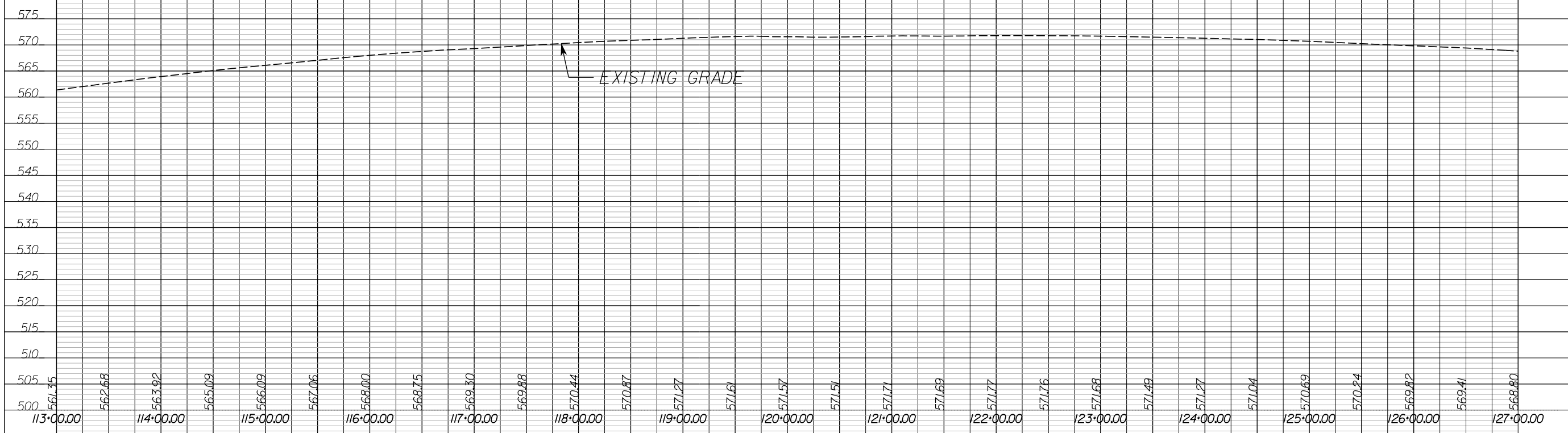
PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

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

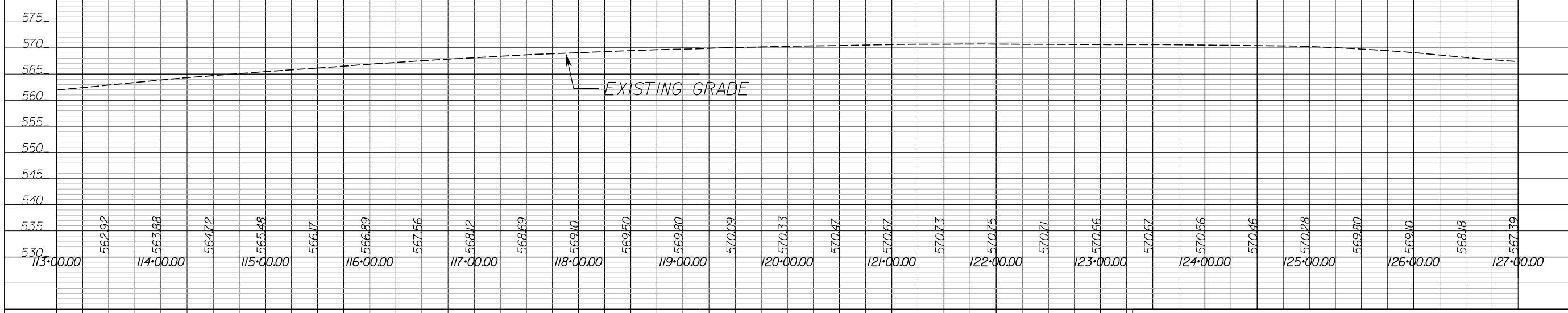
REVISED	STATE	ROUTE	STATE	PROJECT	SHEET NO.
	VA.	29		0029-030-121 P101, R201, C501	5A

SCALE: 5'
 VERT. 1"=5'
 HOR. 1"=100'

SOUTH BOUND ROUTE 15/17/29



NORTH BOUND ROUTE 15/17/29



TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 5A



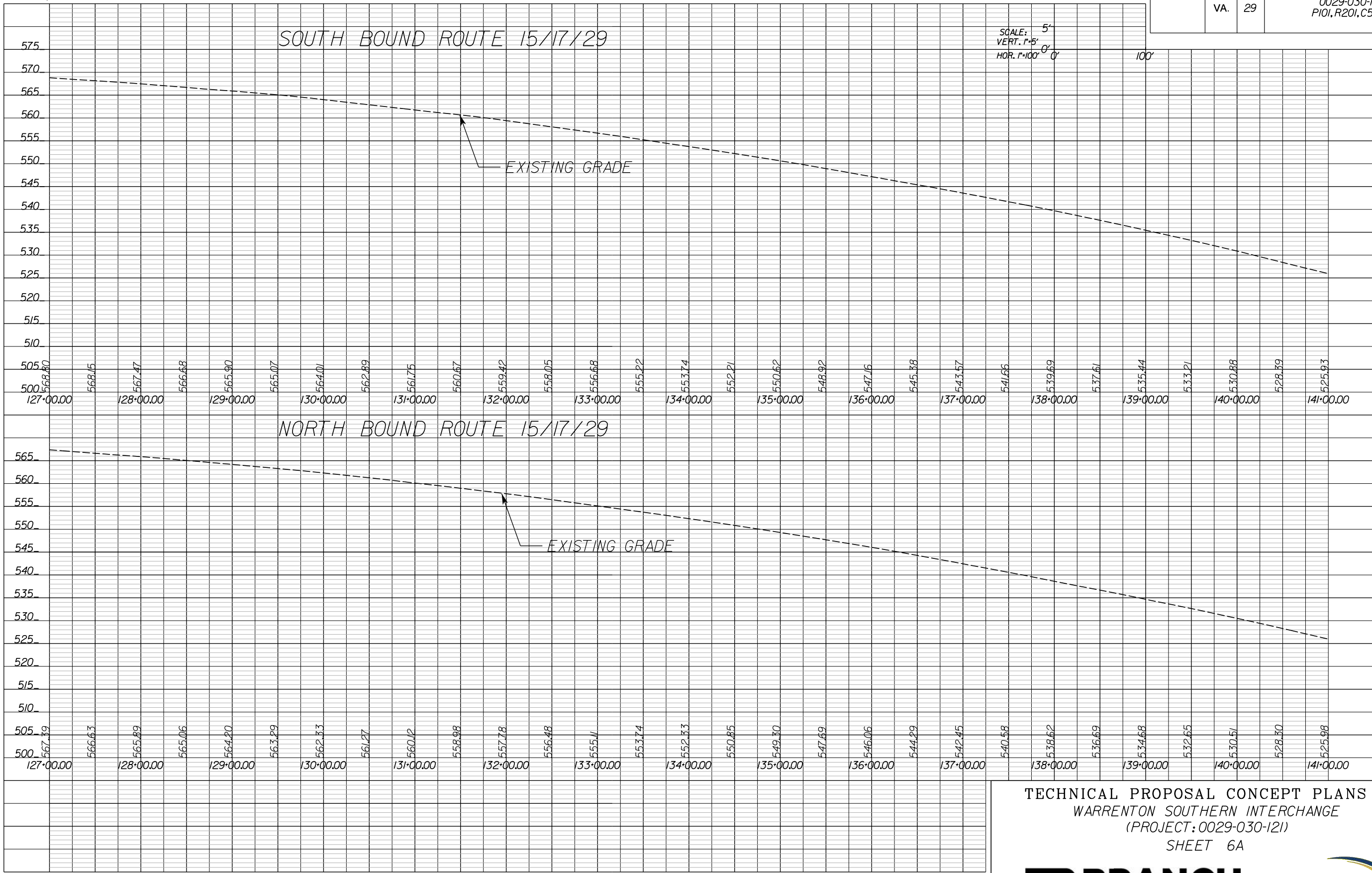
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PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY *Whitman, Requardt & Associates 804-272-8700*
 SUBSURFACE UTILITY BY, DATE _____

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

REVISED	STATE	ROUTE	STATE	PROJECT	SHEET NO.
	VA.	29		0029-030-121 PI01, R201, C501	6A

SCALE: 5'
 VERT. 1"=5'
 HOR. 1"=100'



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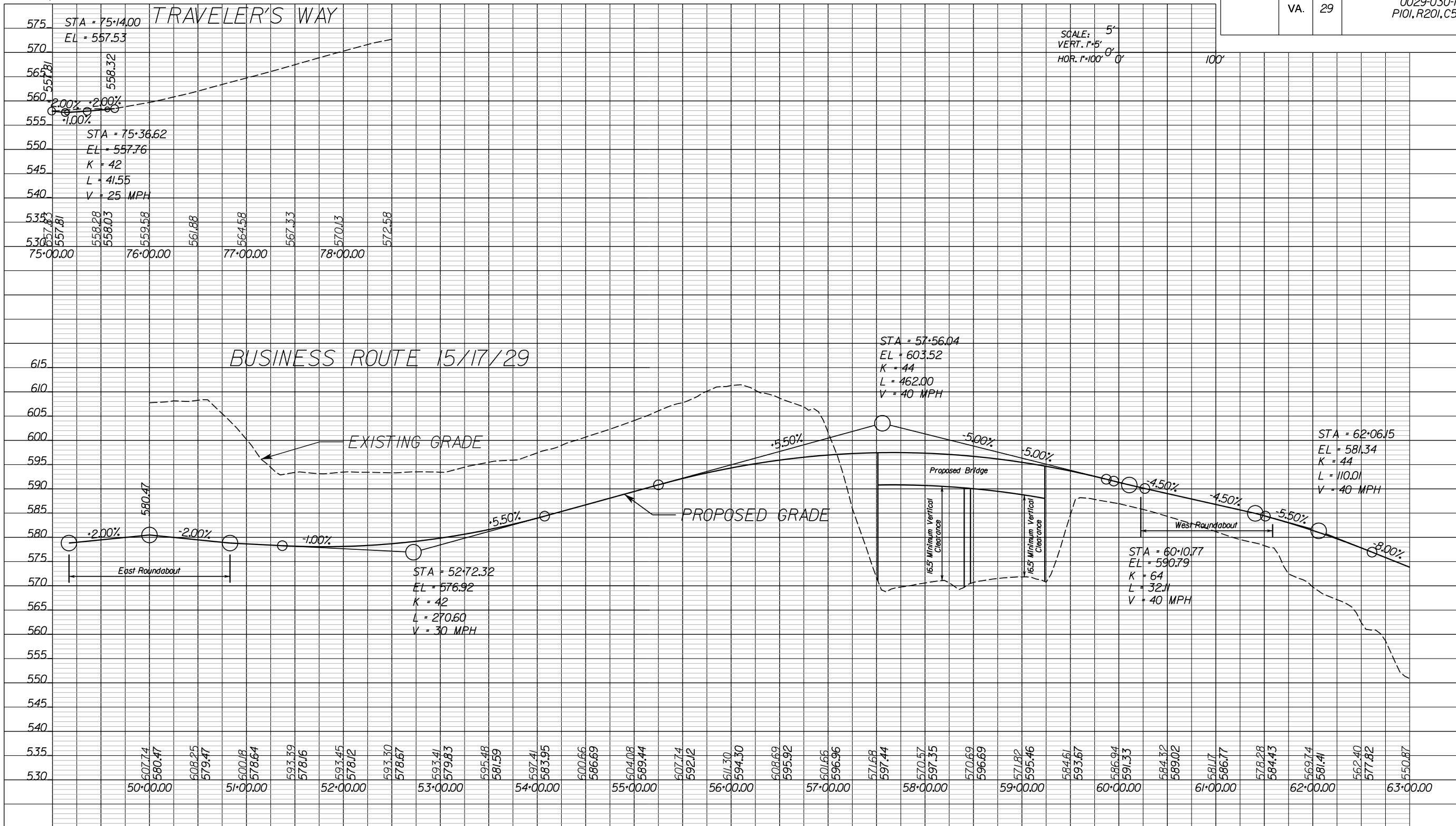
TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 6A



PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY *Whitman, Requardt & Associates 804-272-8700*
 SUBSURFACE UTILITY BY, DATE _____

DESIGN FEATURES RELATING TO CONSTRUCTION
 OR TO REGULATION AND CONTROL OF TRAFFIC
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 NECESSARY BY THE DEPARTMENT

REVISED	STATE	ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	6B



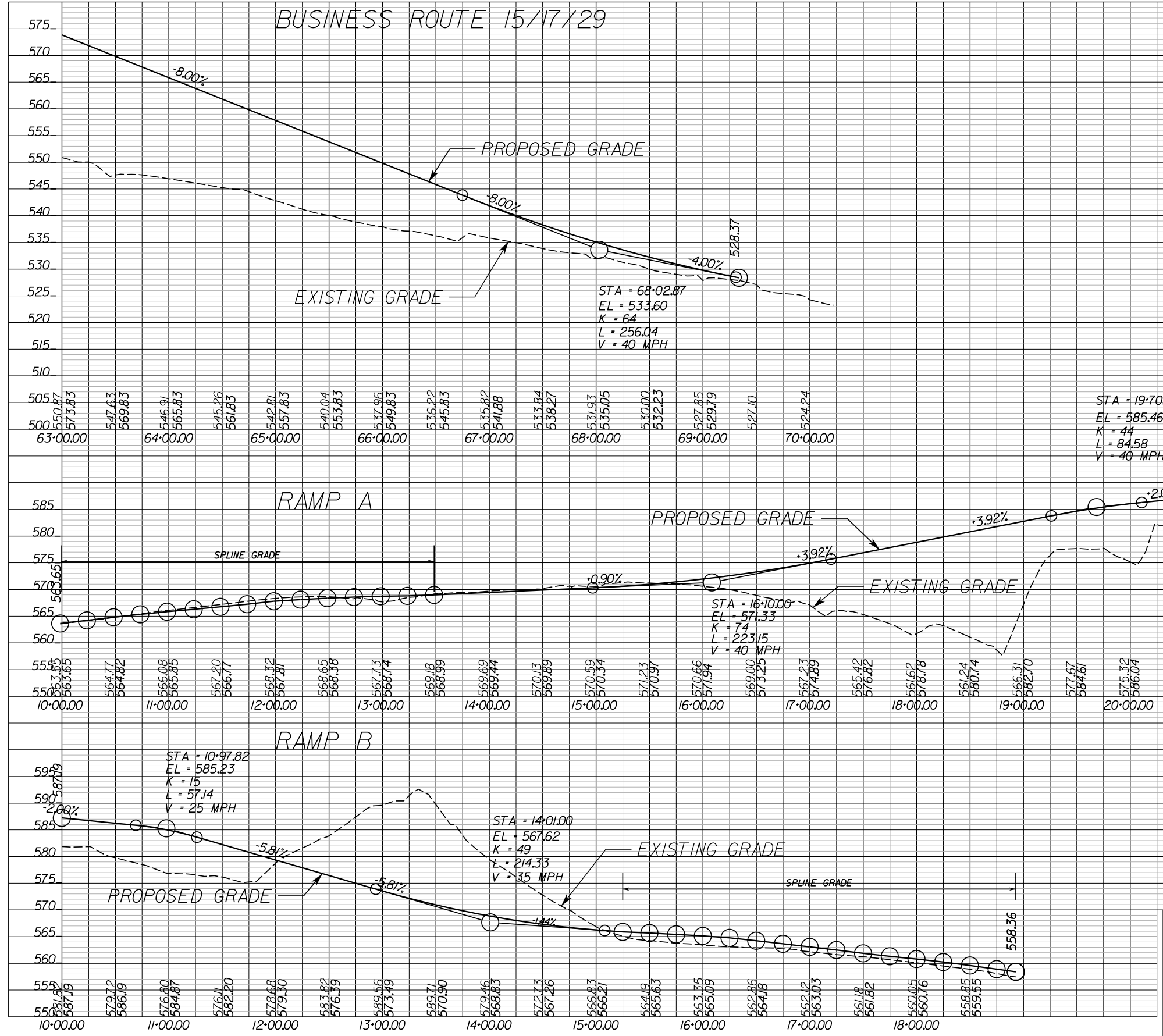
TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 6B



PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY: Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

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

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	6C



SCALE: 5'
 VERT. 1"=5'
 HOR. 1"=100'

TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 6C

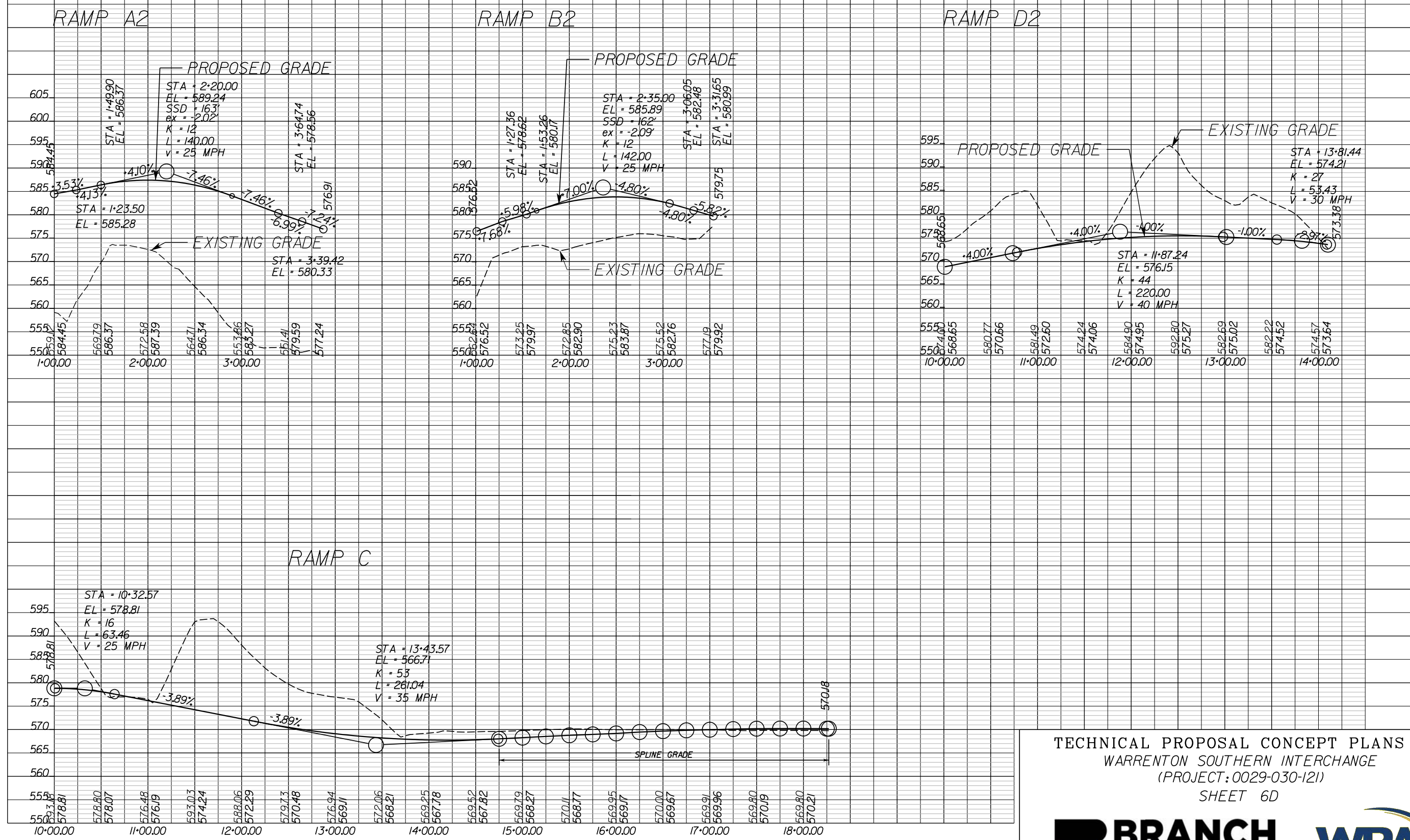


PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY: Whitman, Reardon & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

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

REVISED	STATE	ROUTE	STATE	PROJECT	SHEET NO.
	VA.	29		0029-030-121 P101, R201, C501	6D

SCALE: 5'
 VERT. 1"=5'
 HOR. 1"=100'



TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 6D



PROJECT MANAGER _____
 SURVEYED BY, DATE _____
 DESIGN BY Whitman, Requardt & Associates 804-272-8700
 SUBSURFACE UTILITY BY, DATE _____

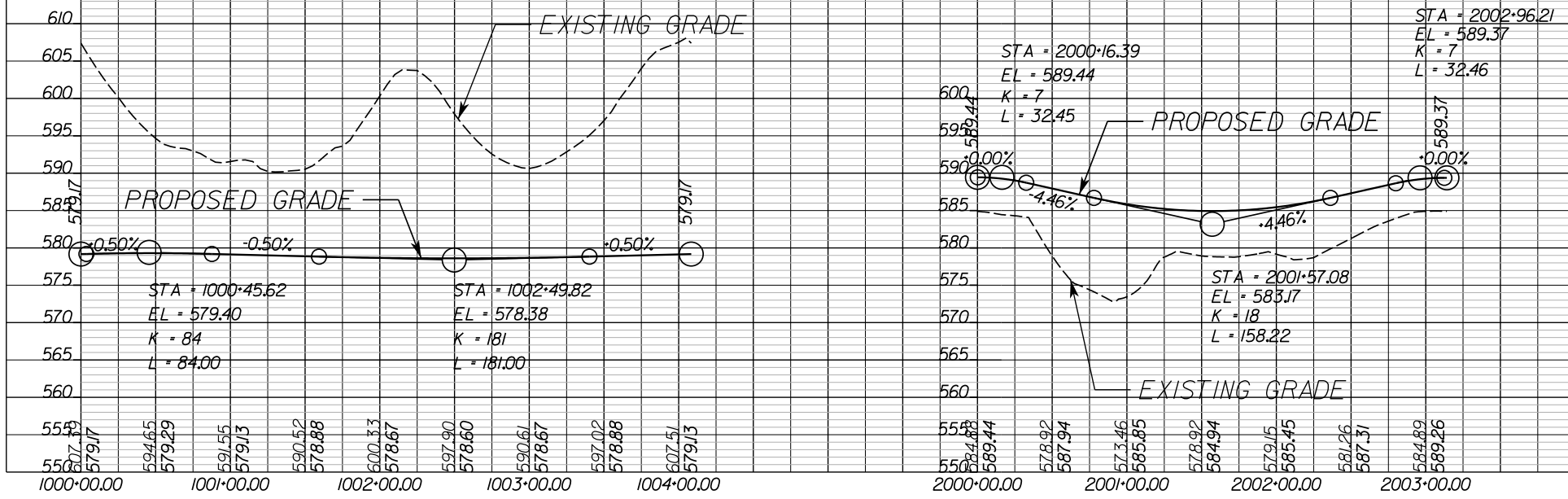
DESIGN FEATURES RELATING TO CONSTRUCTION
 OR TO REGULATION AND CONTROL OF TRAFFIC
 MAY BE SUBJECT TO CHANGE AS DEEMED
 NECESSARY BY THE DEPARTMENT

REVISED	STATE	ROUTE	PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	6E

SCALE: 5'
 VERT. 1"=5'
 HOR. 1"=100'

EAST ROUNDABOUT

WEST ROUNDABOUT



TECHNICAL PROPOSAL CONCEPT PLANS
 WARRENTON SOUTHERN INTERCHANGE
 (PROJECT: 0029-030-121)
 SHEET 6E



0045022_1006E.dgn

STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.	STP-03-7(032)	29	029-030-121, B616
NBIS Number:		UPC No.	77384
Federal Oversight Code:	NFO	FHWA Construction and Scour Code:	X2XI-SN

DESIGN EXCEPTION(S):

GENERAL NOTES:

The original approved sheet, including original signatures, is filed in the VDOT Central Office. Any misuse of electronic files, including scanned signatures is illegal. Violators will be prosecuted to the full extent of the applicable laws.

Width: 15'-6" Shared use path, 28'-0" roadway, Overall width 43'-6" face-to-face of rail.

Span layout: 91' and 78' prestressed concrete 45" deep bulb-t spans continuous for live load.

Capacity: HL-93 loading.

Specifications:

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

Design: AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014; and VDOT Modifications.

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

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

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

All structural steel shall be ASTM A709 Grade 36.

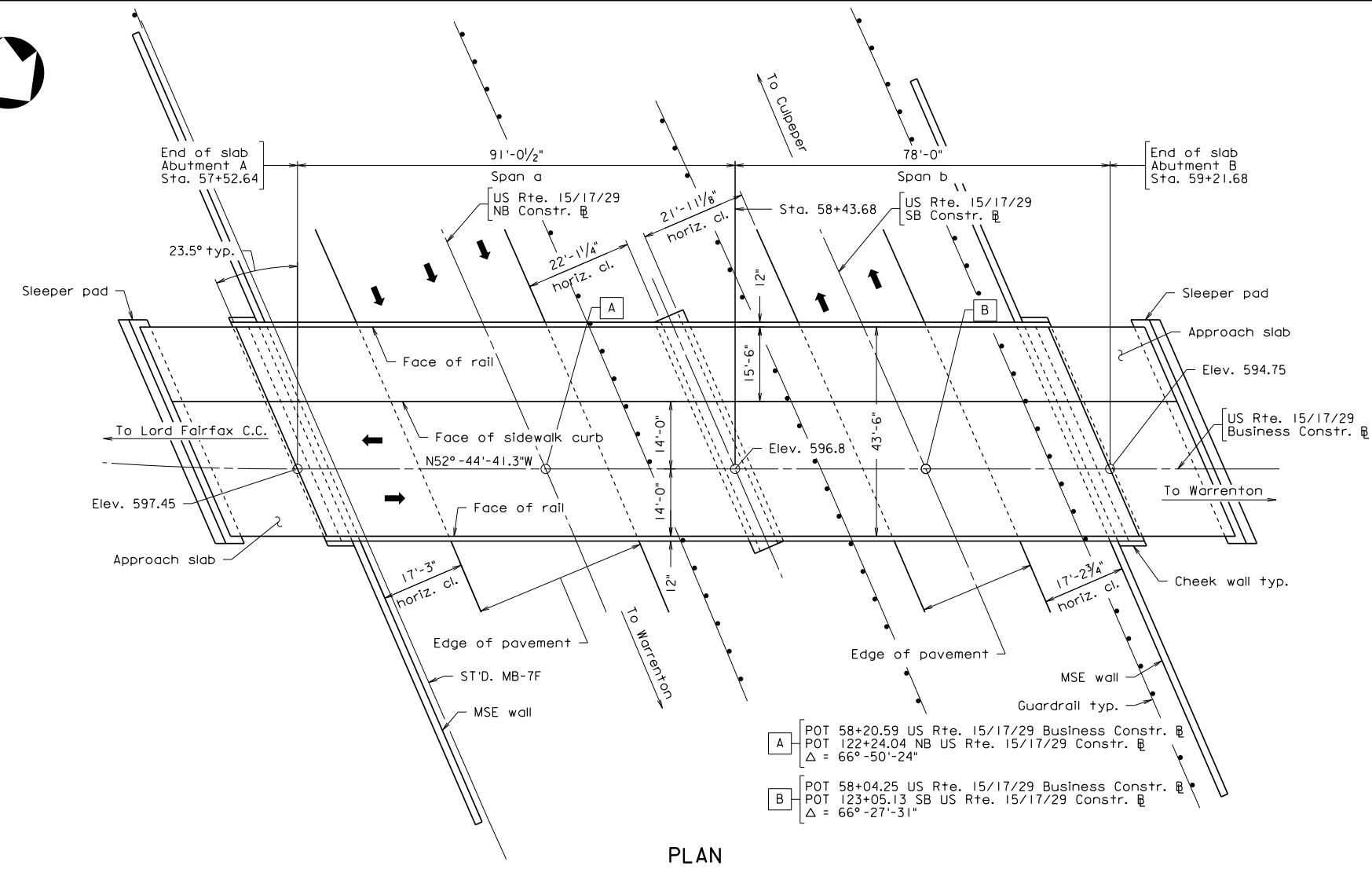
Concrete in superstructure, sidewalks, rails, terminal walls, and integral backwalls shall be Class A4; in substructure Class A3.

Prestressed concrete in superstructure shall be Class A5 having a minimum compressive cylinder strength at 28 days equal to 10,000 psi and a minimum compressive cylinder strength at time of release of strands equal to 8,000 psi.

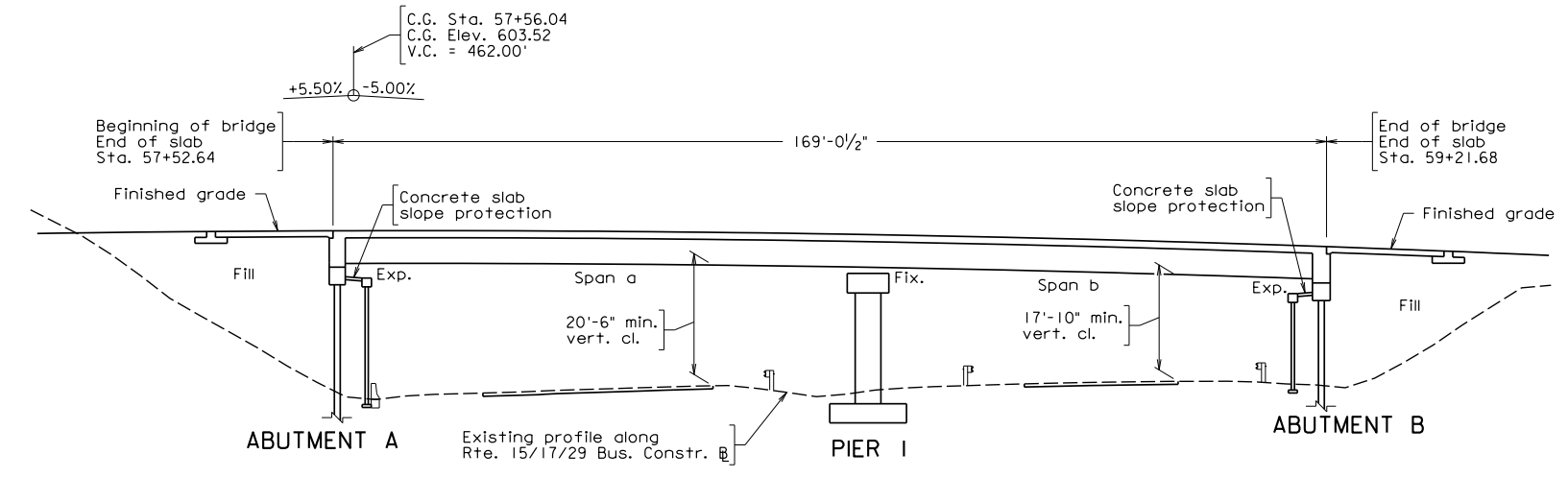
All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for steels noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications. All reinforcing bar dimensions on the detailed drawings are to centers of bars except where otherwise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

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

For continuation of general notes, see sheet 2.



PLAN



DEVELOPED SECTION ALONG CONSTR. L

RECOMMENDED FOR APPROVAL FOR CONSTRUCTION	
VDOT PROJECT MANAGER	
DISTRICT CONSTRUCTION ENGINEER	
WHITMAN REQUARDT & ASSOCIATES RICHMOND, VA STRUCTURAL ENGINEER	
PLANS BY: Consultant	
COORDINATED: Bryan Stevenson	
SUPERVISED: Jeremy Schlusset	
DESIGNED: Jon Marston	
DRAWN: Charlie Reagle	
CHECKED: Lee Cundiff	

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

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

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
 PROPOSED BRIDGE ON
 LORD FAIRFAX RD AND RTE. 15, 17, 29 BUS.
 OVER RTE. 15, 17, AND 29 NB AND SB
 FAUQUIER CO. - 0.53 MI. S. OF WARRENTON
 PROJ. 0029-030-121, B616

Recommended for Approval: _____	Branch Civil, Inc.	Date _____
Approved: _____	District Administrator	Date _____
Date: December 2017	© 2017, Commonwealth of Virginia	Sheet 1 of 5

Scale: 1" = 15'-0"

STATE	ROUTE	FEDERAL AID	ROUTE	STATE	SHEET NO.
		PROJECT		PROJECT	
VA.			29	0029-030-121, B616	2

General Notes Continued:

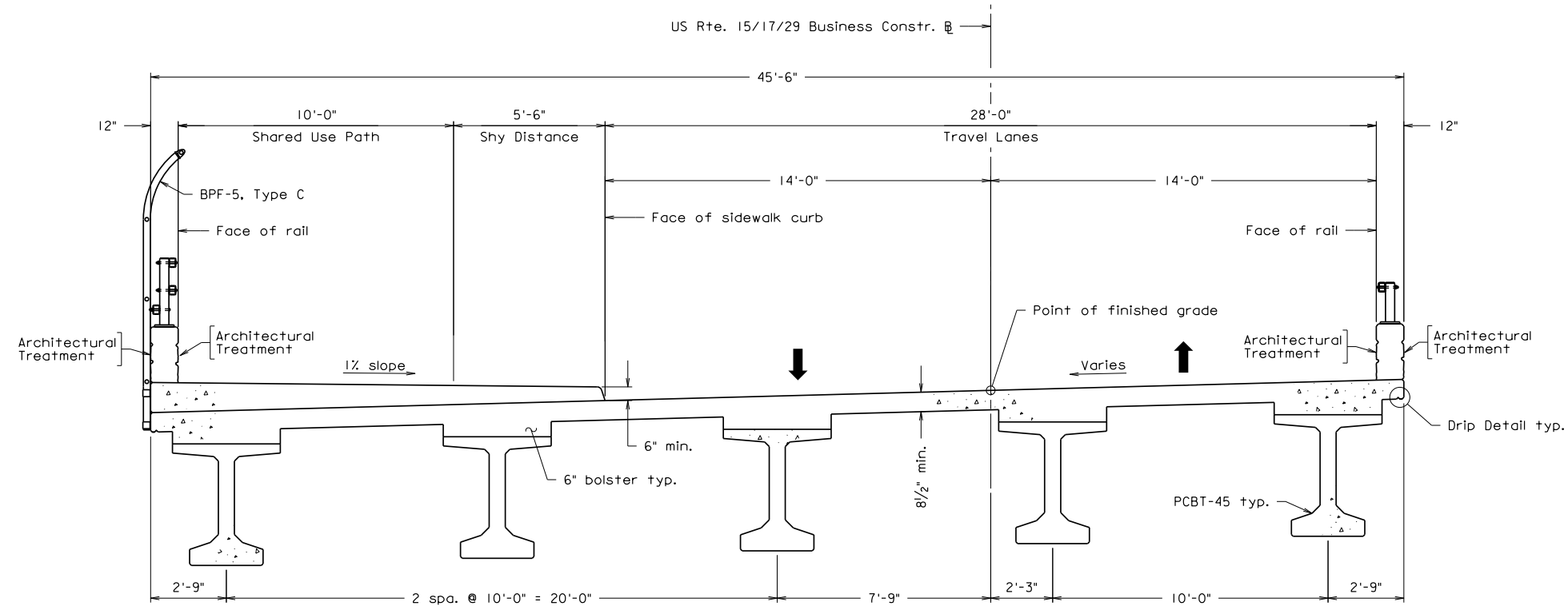
Prestressing strands shall be uncoated, seven-wire, low-relaxation steel strands conforming to ASTM A416 Grade 270.

Footings at pier shall bear on hard residual soils.

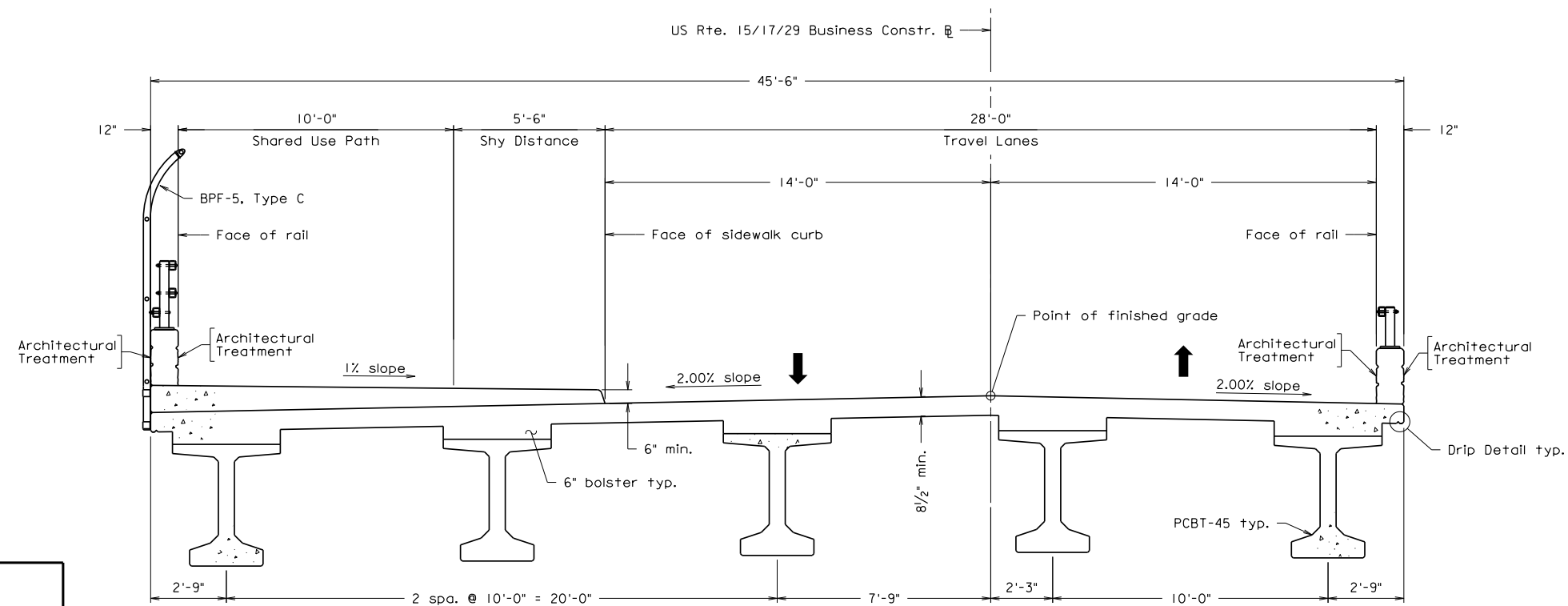
HP piles shall be ASTM A709 Grade 50 steel. HP piles shall be driven to practical refusal and to the required nominal axial resistance.

HP piles shall be driven through pre-bored holes. Preboring shall penetrate fill and original ground to El. 560.

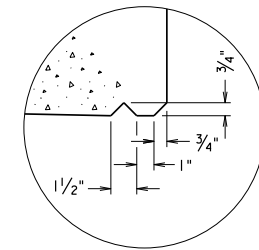
The Bridge Data Plate shall be installed in accordance with VDOT's Road and Bridge Standards and obtained from the District Structure and Bridge Office.



TRANSVERSE SECTION (ABUTMENT A)



TRANSVERSE SECTION (ABUTMENT B)



DRIP DETAIL



COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION	
STRUCTURE AND BRIDGE DIVISION	
TRANSVERSE SECTION	
No.	Description
Revisions	
Designed: WRA	Date
Drawn: WRA	Dec. 2017
Checked: WRA	
Plan No.	Sheet No.
	2 of 5

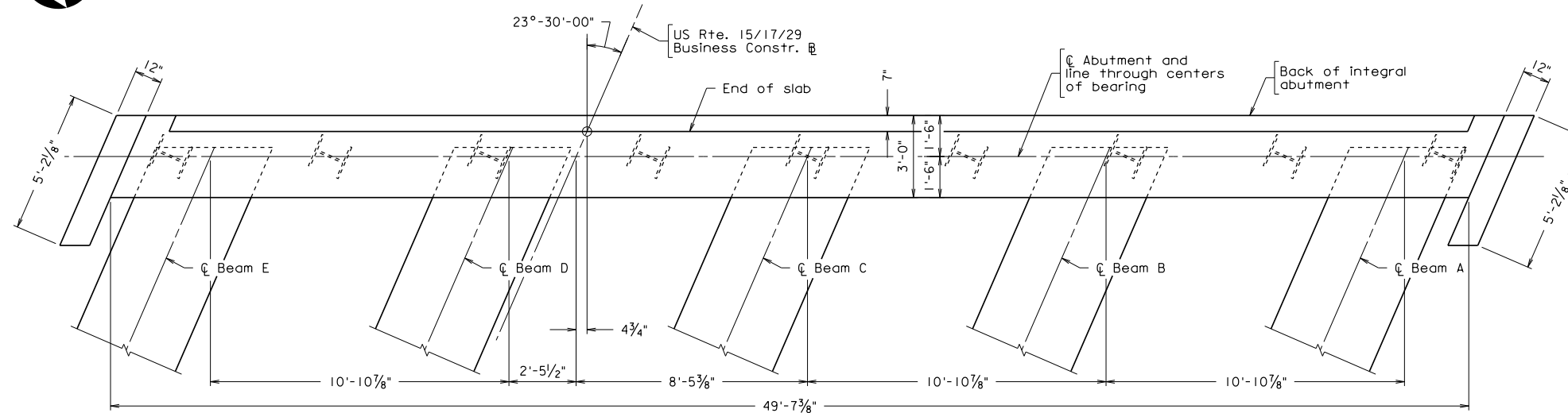
PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

WHITMAN REQUARDT & ASSOCIATES
RICHMOND, VA
STRUCTURAL ENGINEER

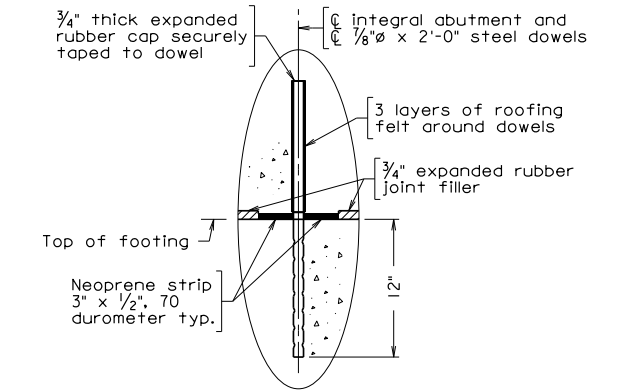
Scale: 3/8" = 1'-0"

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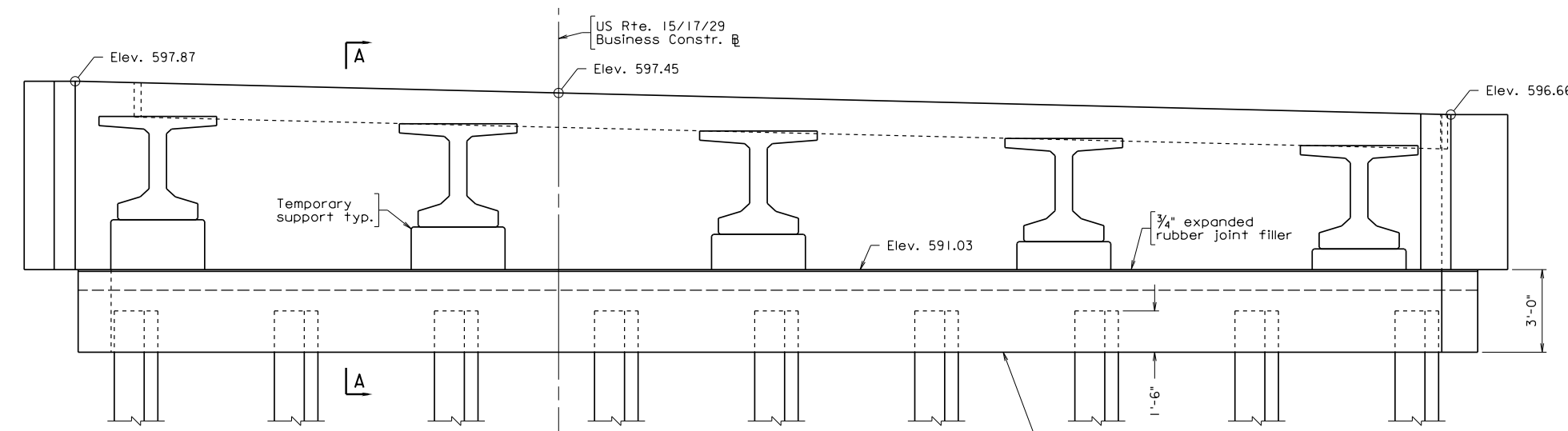
STATE	FEDERAL AID	STATE	SHEET
ROUTE	PROJECT	ROUTE	NO.
VA.		29	3
		0029-030-121, B616	



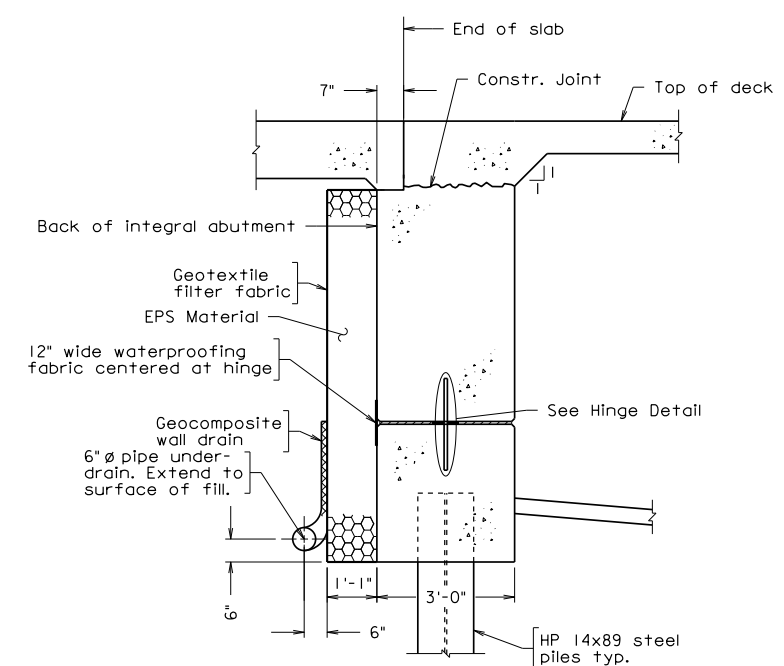
PLAN
Abutment A shown, Abutment B similar.



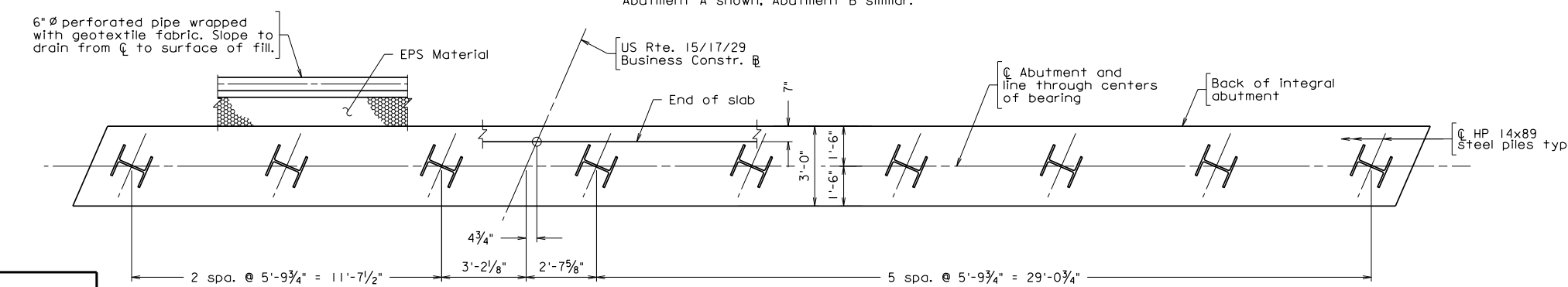
HINGE DETAIL
Not to scale



ELEVATION
Abutment A shown, Abutment B similar.



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



PILE AND FOOTING PLAN
Abutment A shown, Abutment B similar.



COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
ABUTMENTS			
No.	Description	Date	Designed: WRA Drawn: WRA Checked: WRA
			Date: Dec. 2017
			Plan No.
			Sheet No. 3 of 5

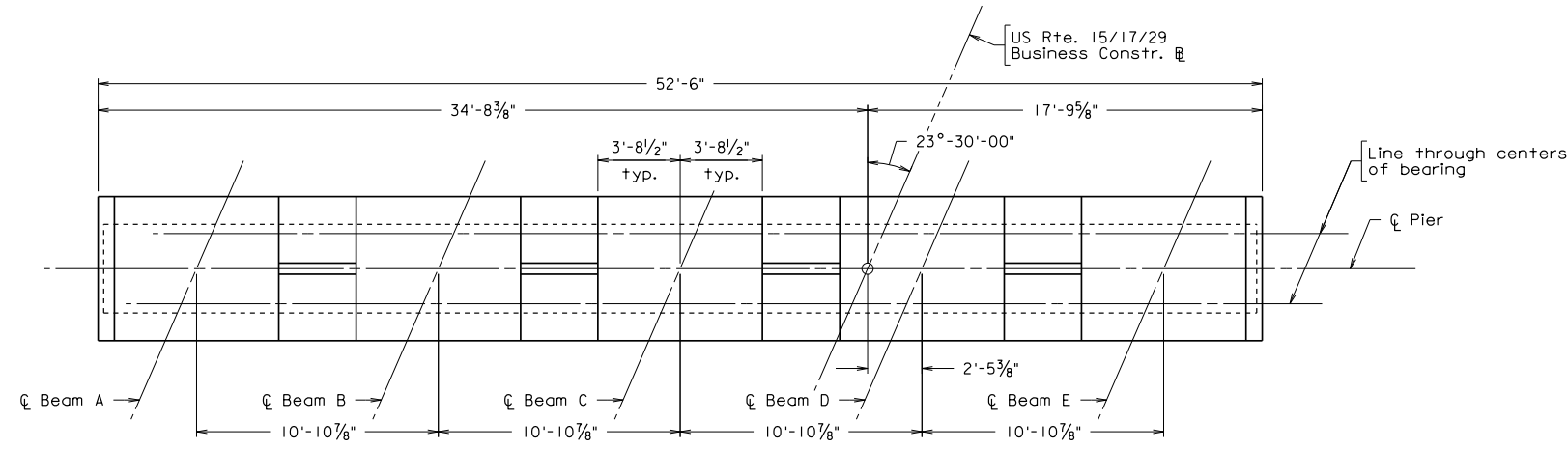
PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

WHITMAN REQUARDT & ASSOCIATES
RICHMOND, VA
STRUCTURAL ENGINEER

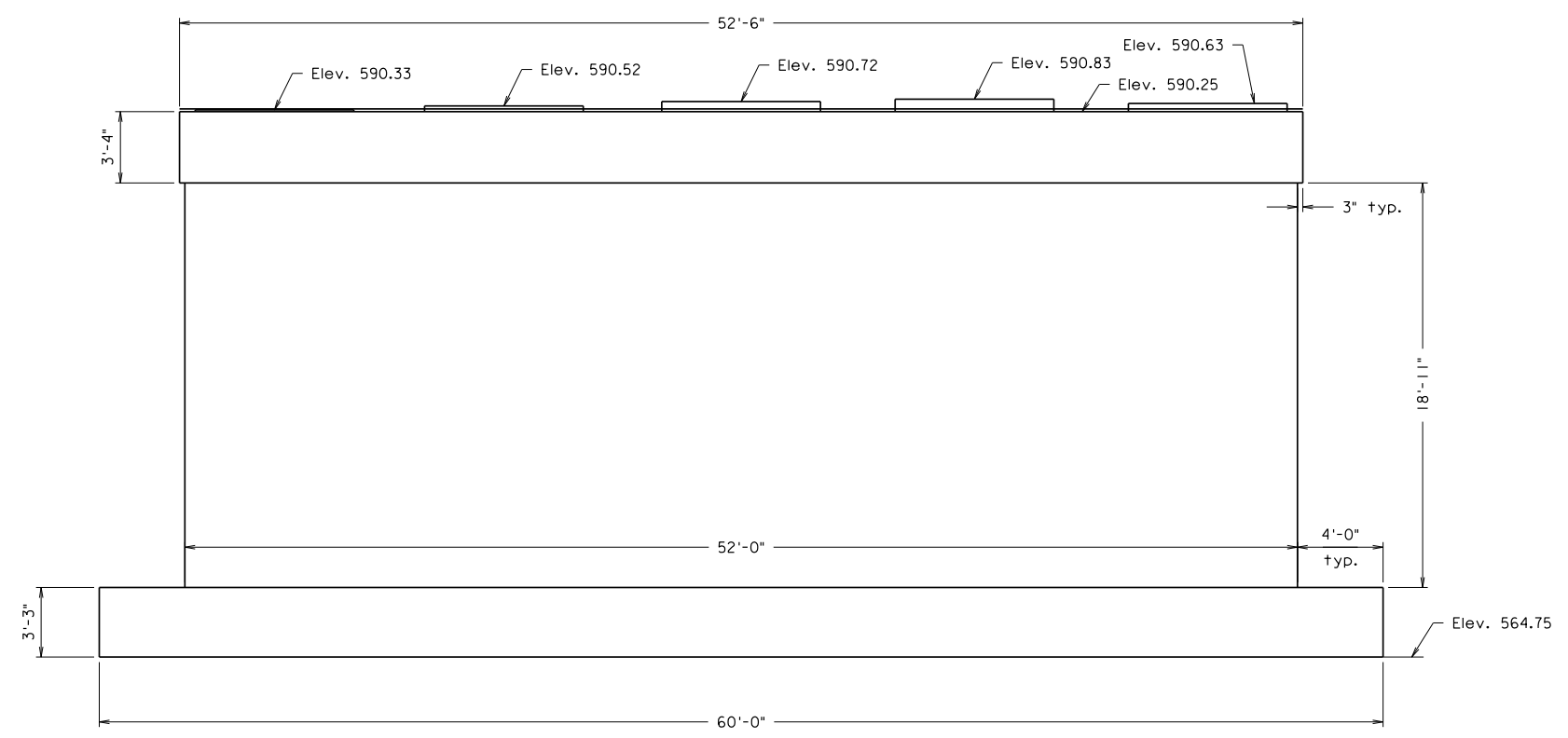
Scale: 3/8" = 1'-0" unless otherwise noted.

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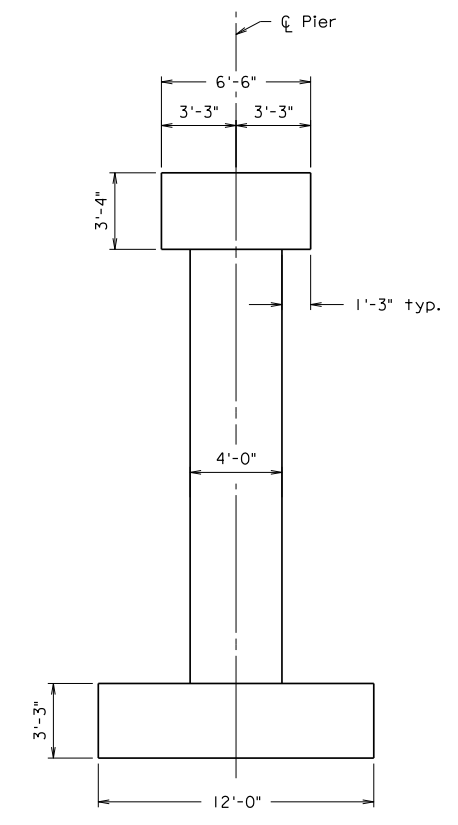
STATE	FEDERAL AID	STATE	SHEET NO.
ROUTE	PROJECT	ROUTE	PROJECT
VA.		29	0029-030-121, B616
			4



PLAN OF CAP



ELEVATION



END VIEW

WHITMAN REQUARDT & ASSOCIATES
RICHMOND, VA
STRUCTURAL ENGINEER

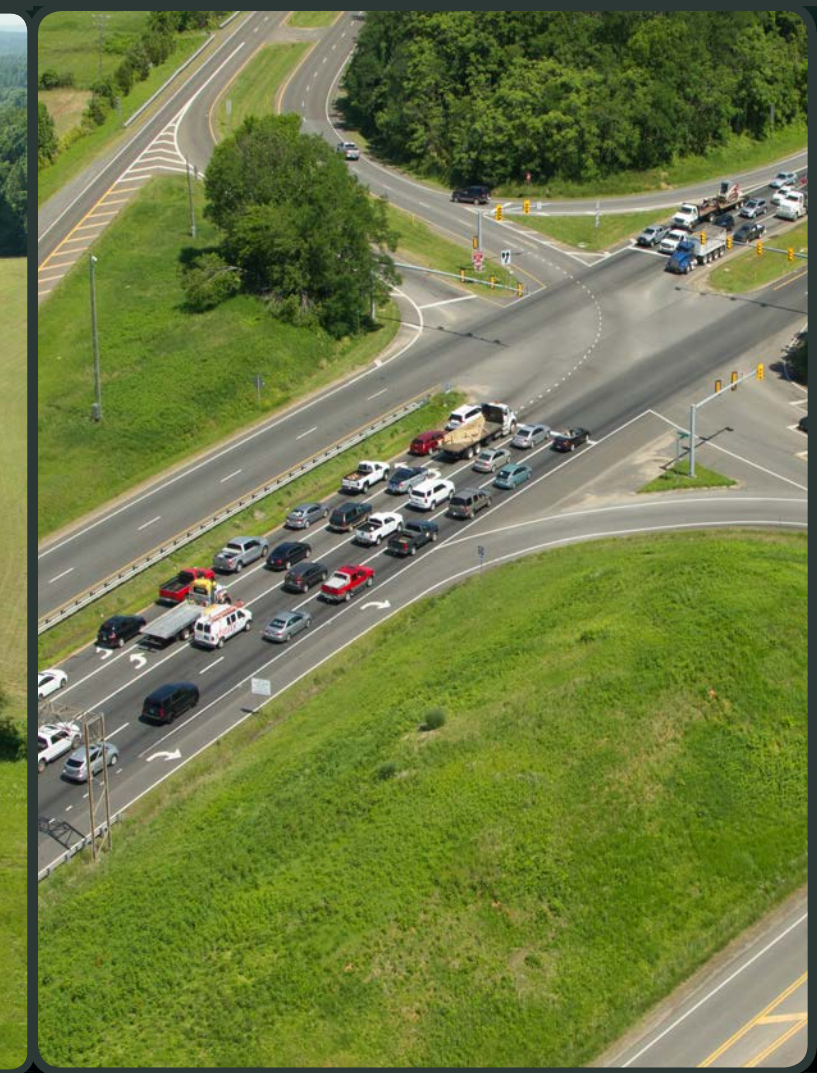
Scale: 1/4" = 1'-0"

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED
FOR CONSTRUCTION

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COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
PIER			
No.	Description	Date	Revisions
Designed: WRA	Date	Plan No.	Sheet No.
Drawn: WRA	Dec. 2017		4 of 5
Checked: WRA			



VDOT

BRANCH
CIVIL

WRA