ORIGINAL - Copy 1 of 10 Copies

Response to Request for Proposals

WARRENTON SOUTHERN INTERCHANGE US 15/17/29

Fauquier County, Virginia

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

VOLUME I: TECHNICAL PROPOSAL

Submitted By:

SHIRLEY
CONTRACTING COMPANY, LLC

In Association With:

Dewberry

Attachment 4.0.1.1 - Technical Proposal Checklist

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	N/A
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.7 (Form C-78-RFP)	Sections 3.7, 4.0.1.1	no	N/A
Letter of Submittal	NA	Sections 4.1		Page 1
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	Page 1
Identify the full legal name and address of Offeror	NA	Section 4.1.1	yes	Page 1
Authorized representative's original signature	NA	Section 4.1.1	yes	Page 1
Declaration of intent	NA	Section 4.1.2	yes	Page 1
120 day declaration	NA	Section 4.1.3	yes	Page 1
Point of Contact information	NA	Section 4.1.4	yes	Page 1
Principal Officer information	NA	Section 4.1.5	yes	Page 1
Interim Milestone and Final Completion Date(s)	NA	Section 4.1.6	yes	Page 1
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.7	no	N/A
Certification Regarding Debarment Forms	Attachment 11.8.6(a) Attachment 11.8.6(b)	Section 4.1.8	no	N/A
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	Page 2
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	Page 2
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	Page 2
Design Concept	NA	Section 4.3		Pages 3-19
Conceptual Roadway Plans and description	NA	Section 4.3.1.1	yes	Pages 3-15 and Pages 60-68
Conceptual Structural Plans and description	NA	Section 4.3.1.2	yes	Pages 15-19 and Pages 69-70
Project Approach	NA	Section 4.4		Pages 20-39
Environmental Management	NA	Section 4.4.1	yes	Pages 20-23
Utilities	NA	Section 4.4.2	yes	Pages 23-27
Geotechnical	NA	Section 4.4.3	yes	Pages 27-28
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	Pages 28 - 39

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
Construction of Project	NA	Section 4.5		Pages 40-58
Sequence of Construction	NA	Section 4.5.1	yes	Pages 40-48
Transportation Management Plan	NA	Section 4.5.2	yes	Pages 49-58
Disadvantaged Business Enterprises (DBE)	NA	Section 4.6		Page 59
Written statement of percent DBE participation	NA	Section 4.6	yes	Page 59
Proposal Schedule	NA	Section 4.7		
Proposal Schedule	NA	Section 4.7	no	N/A
Proposal Schedule Narrative	NA	Section 4.7	no	N/A
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.7	no	N/A

Attachment 3.7 - Form C-78

Form C-78-RFP

ATTACHMENT 3.6

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION

RFP NO. C00077384DB100

PROJECT 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

December 7, 2017
DATE

Michael E. Post
PRINTED NAME

President/CEO/Manager
TITLE

4.1 - Letter of Submittal

SHIRLEY
CONTRACTING COMPANY, LLC

December 7, 2017

Mr. Bryan W. Stevenson, PE
Alternative Project Delivery Division
Virginia Department of Transportation
1401 East Broad Street
Annex Building, 8th Floor
Richmond, Virginia 23219

RE: **Warrenton Southern Interchange US 15/17/29**
Fauquier County, Virginia
Contract ID Number: C00077384B100
4.1 Letter of Submittal

Dear Mr. Stevenson:

Shirley Contracting Company, LLC (Shirley), as the Offeror, and Dewberry Consultants LLC (Dewberry), as the Lead Designer, are pleased to submit our Technical Proposal for the Warrenton Southern Interchange US 15/17/29 Project (the Project). Our Team has experience that is unmatched in the industry having been awarded 19 Virginia Department of Transportation (VDOT) design-build projects, valued at approximately $1.3 billion. We are committed to providing VDOT and the traveling public with an unequaled level of assurance that the Project will be completed successfully and exceed the priorities established, while limiting risk to VDOT, the public, and stakeholders. We are excited for this opportunity and look forward to continuing our partnership with VDOT.

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

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

4.1.5 - Principal Officer: Michael E. Post, President/CEO/Manager, Shirley Contracting Company, LLC 8435 Backlick Road, Lorton, VA 22079, 703.550.8100(P).

4.1.6 - Unique Milestone: July 1, 2020

4.1.7 - Final Completion Date: November 25, 2020

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

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

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

Sincerely,

Michael E. Post
President/CEO/Manager

4.2 - Offeror's Qualifications

4.2 Offeror's Qualifications

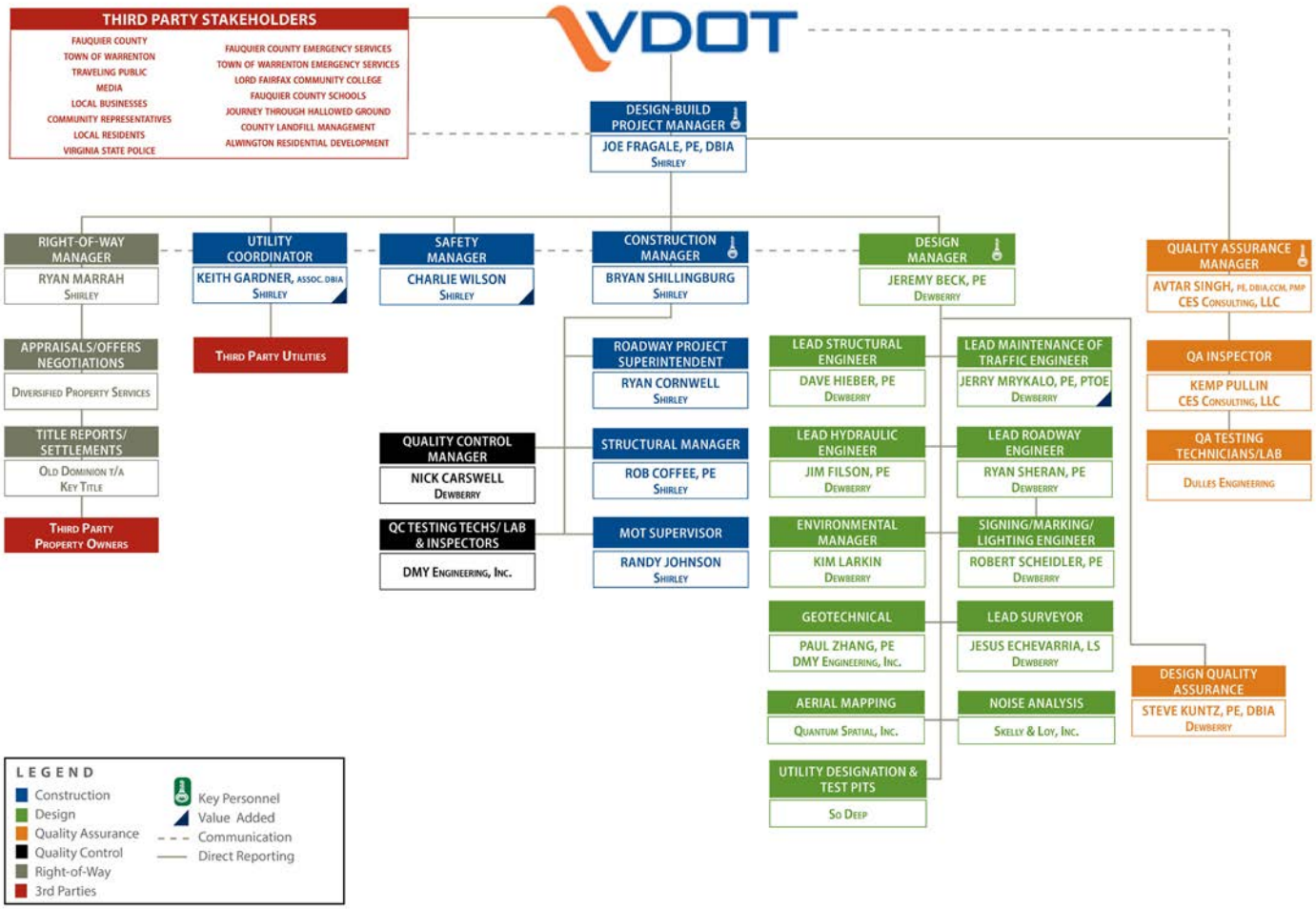
4.2.1 Confirmation

We confirm that the information contained in our Statement of Qualifications (SOQ) remains true and accurate in accordance with Part 1, Section 11.4.

4.2.2 Organizational Chart

The Project Organizational Chart shown in Figure 4.2.2.1, identifies the "chain of command" and major functions to be performed and their reporting relationships in managing, designing and constructing the Project, including quality control/quality assurance. As there is no change to any functional relationships among the participants since the SOQ submittal, an updated narrative is not required.

Figure 4.2.2.1 - Organizational Chart



4.3 - Design Concept

4.3 Design Concept

Introduction

Our Team's approach to developing our Conceptual Design and Technical Proposal is based on a complete review of the Request for Proposal (RFP), numerous site visits, exploring multiple alternative interchange concepts, and interacting with VDOT at our Alternate Technical Concept (ATC)/Proprietary meetings. With this approach our Team developed a design that achieves the following goals:

- Increase safety for the traveling public, construction and inspection staff;
- Reduce congestion and provide appropriate linkage between multiple roadway classifications;
- Ensure early completion
- Maintain public acceptance and stakeholder communications;
- Minimize environmental impacts;
- Reduce right-of-way (ROW) and easement impacts; and
- Reduce future inspection and maintenance costs.

Our Team's Conceptual Design and Technical Proposal are developed utilizing our approved ATC 01 "Modified Barbell Interchange Concept". Our Team's concept is a grade-separated interchange that provides for the ultimate six lane US 15/17/29 by accommodating a future widening within the median, full control activity to the existing roadway on two, reduced bridge deck area, roundabouts on the east and west side of the US 15/17/29 at the ramp terminals, and fully accommodates the implementation of both Option 1 and Option 2.

In addition to achieving the goals identified above, our Team's concept also:

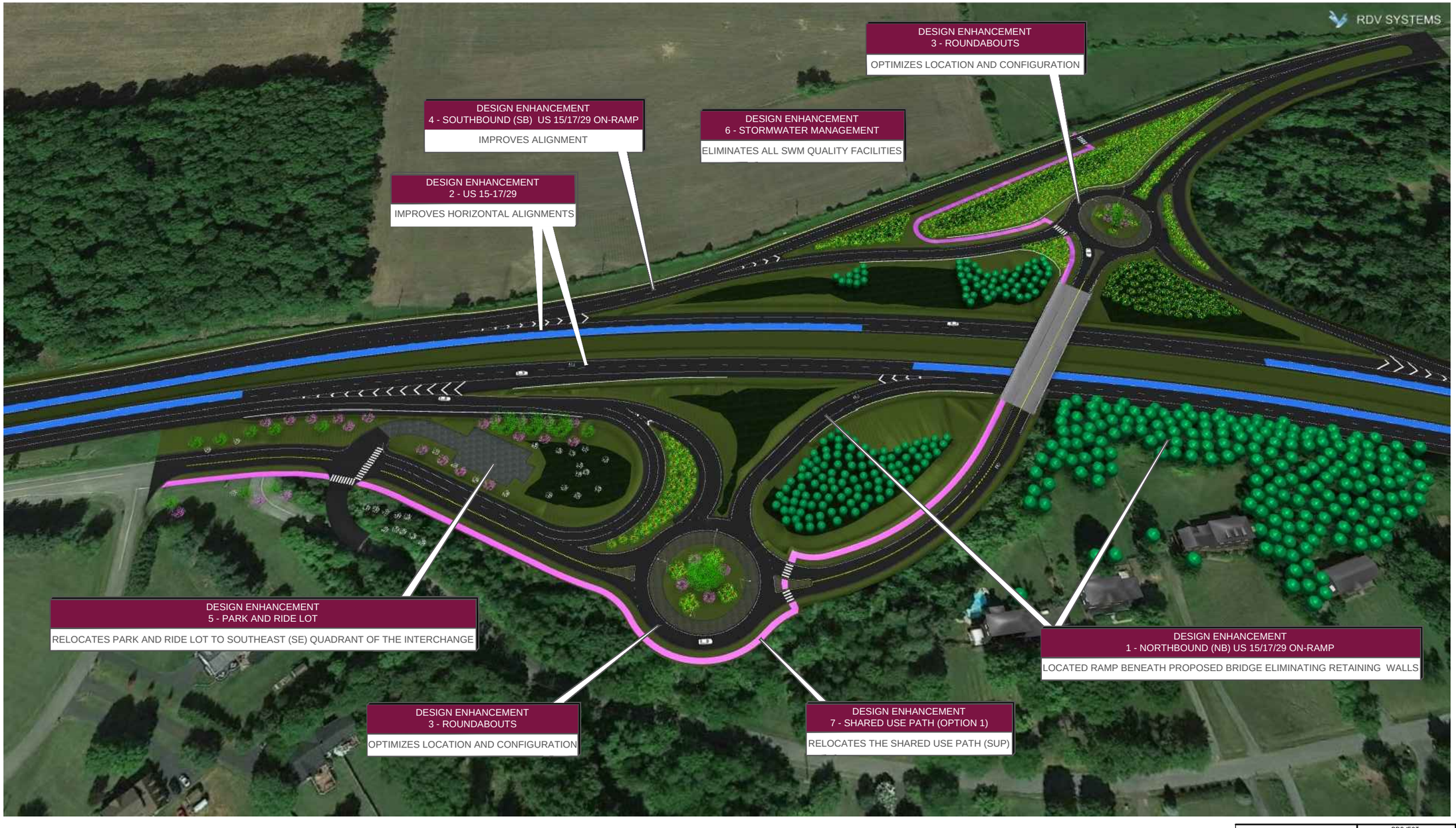
- ✓ Meets or exceeds all requirements listed in the Design Criteria Table;
- ✓ Indicates that the limits of construction, including stormwater management facilities, are within the existing proposed Right-of-Way (ROW) limits shown in the RFP Conceptual Plans, with the exception of permanent and temporary easements; and
- ✓ Does not include design elements that require Design Waivers and or Design Exceptions beyond the one allowed to included in the RFP or Addenda.

Throughout the procurement phase, our Team held weekly meetings to discuss the Project's challenges, explore ATC interchange configurations, and develop solutions addressing the RFP requirements. These meetings included representatives from each discipline including roadway, structures, hydraulics, geotechnical, environmental, traffic, right-of-way (ROW), utilities, and construction. As a result, our Team developed numerous enhancements which have been incorporated into this Technical Proposal. These enhancements are shown on Exhibit 4.3.1, described in Table 1, and are highlighted in our Volume II - Design Concept Graphics.

Exhibit 4.3.1.1

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

Dewberry SHIRLEY CONTRACTING COMPANY, LLC



	PROJECT	SHEET NO.
	0029-030-121	

Table 1 - Design Enhancements and Project Benefits

Item	Location/Design Element	Enhancement	Project Benefit
1	**Northbound (NB) US 15/17/29 On-Ramp**	Lo ates ramp b e ath p p ed b ig	▪ Elimia tes retain g w alls ad a sso iated m ain ea n ce co s ts ▪ Av d s easemen imp cts to m lu tip e resid n es ▪ Eliminates septic field impacts ▪ Main ais ex stig ree b fer adjacen to r esid n es ▪ Reduces project limits along NB US 15/17/29
2	**US 15/17/29**	Imp v s h izo al alig n en s	▪ Max mizes th s e o ex stig p v men ▪ Min mizes o sid wid in g mp cts ▪ Sh tes b ig leg h ▪ Facilitates u timate 6 lan facility
3	**Roundabouts**	Op imizes lo atio and configuration	▪ Red es b ig wid h ▪ Lowers the profile of the overpassing roadway ▪ Elimia tes jig d e id v rsio d emp ary s ig l ▪ Red es temp ary c s tru tio asemen s ▪ Elimia tes u ility r elo atio ▪ Allow s fo in erch g p in g m sig e stag ▪ Imp v s p ratio with n h rd b s ▪ Imp v s p d strian s afety
4	**Southbound (SB) US 15/17/29 On-Ramp**	Imp v s alig n en	▪ Pro d s two lan s en erig U S 5 7 29 ▪ Eli n es in erch g ad d b p ratio ▪ Better utilizes existing topography ▪ Simplifies connectivity to future development ▪ Imp v s p d strian s afety
5	**Park and Ride Lot**	Relo ates Parka d Rid Lo to s o h ast (SE) q d an o th in erch g	▪ Red es ROW imp cts by 3 acres ▪ Av d s imp cts to p p rty ▪ Imp v s accessab lity ▪ Red es trav l time ▪ Av d s imp cts to v m rch eb ig cal elemen s
6	**Stormwater Management (SWM)**	Elimia tes all SWM q lity f acilities	▪ En n es p ch se o n rien cred ts ad esses all SWM n eds ▪ Red es lg term main ea n e ▪ Red es wetlad mp cts ▪ Red es clearig d m ain ais tree b fers
7	**Shared Use Path (Option 1)**	Relo ates th Sh red Use Path (SUP)	▪ Av d s co s tru tio o retain g w alls ▪ Reduces pedestrian conflict points from four to three ▪ En n es ADA com p ian e ▪ Simplifies connectivity to future development ▪ In o p ates eh n ed p d strian s afety d v ces

4.3.1 Conceptual Roadway Plans

Pro ject com p etio will resu t in a g ad sep rated in erch g wh re US 5 7 29 in ersects US 5 7 29 Business to the west and Lord Fairfax Road to the east. In addition to constructing a new overpass, two rd b s will b p iv d d east and west o th o rp ss, acceleratio and d celeratio lan s will b co s tru ted fo each ramp ad a w fu l wid h sh d rs o cu b ad g ter will be p iv d d in acco d n e with th ap ica b e VDOT GS Stad rd . Th s Pro ject will also accom mod te th fu u e wid in g o US 5 7 29 to a 6 lan facility. Lastly, p tio l elemen s (Op io 1 ad Op io 2) may b in o p ated Op io 1 in lu d s the co s tru tio o the en ire leg h o th Sh red Use Path (SUP), ex ep th p tio lo ated o th brid str u tu e, wh ch is a base sco item, ad Op io 2 in lu d s millig ad rep acig th two in id lan s o US 5 7 29 with n th Pro ject limits. As p rmitted by th RFP Co ep ua l Desig a Desig Waiv r will b in o p ated fo th red ed wid h o sh red s e p th from 0 to 8 . No ad tio l Desig Waiv rs ad o Ex ep io s are req ired by th Team's Desig Co ep .

(a.) General Geometry

Com p etio 6 th Prj ect resl ts in a n w g ad -sep rated, l e-rd b in erch g wh re US 15/17/29 intersects US 15/17/28 Business (to the west) and Lord Fairfax Road (to the east). Our configuration is similar to the interchange envisioned by VDOT and presented for public view at the Desig P b ic Hearig M ay, 2 b p imized cp iv d m ers eh n emen s th t:

- Improve design efficiency;
- Decrease cs t;
- Red e imp cts; ad
- Min mize risk o VDOT.

Our Design Concept shown in Exhibit 4.3.1.1, reflects the development and approval of ATC 001, including conditional modifications VDOT identified within Attachment 1 of the ATC Response Form, and is in com plete cf n o man e with th req remen s 6 th RFP. As d scs sed d ig n Prp ietary ATC meetig , n Team ajl s ted th RFP Desig Co ep so th w ris p imizatis p ev s ly d scrb d cb d b ach ev d

Op is 1 ad 2 are com p etely in eg ated ad can b easily accm md ted, ad as p rmitted by th RFP, reflects the SUP reduced width. No other Design Waivers and/or Exceptions are required. Explanations reg rd g bw n Desig Co ep meets o ex eed th in ed d scp , p rtich larly in terms 6 safety adp ratis as well as cs tru tim cp ic accep an e, a re p iv d d n h fb lw ig rrativ .

(b.) Horizontal Alignments

Our Design Concept, slightly adjusts the NB and SB US 15/17/29 alignments, maximizing the use of ek stig p v men , facilitatig b ig leg h red tio s, ad red ig imp cts asso iated with in erch g ramp ax liary lan s, ad accm md ting th fu n e 6 lan wid n g (tw ard th med an) . As sw n in Figure 4.3.1.1, the ultimate 6-lane US 15/17/29 configuration has been used to establish the pier, abutment, ad p to ectio sy tem lo atis fo th n w b ig , su h th t ajl s tmen s will n t b req red to cs tru t th fu n e 6 lan wid n g

Figure 4.3.1.1 - Ultimate Six-Lane US 15/17/29

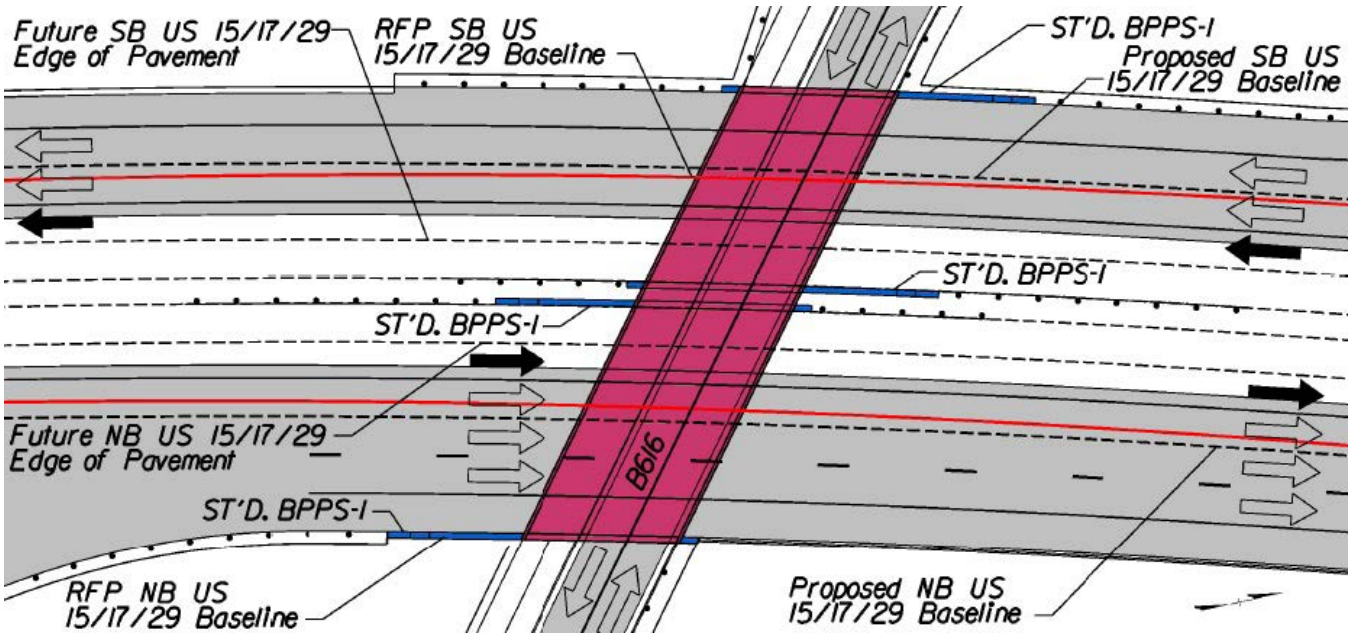
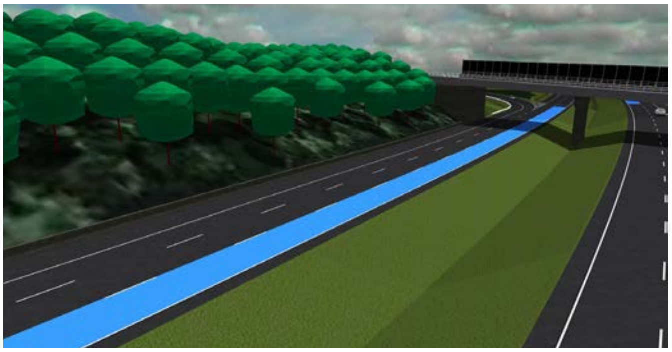
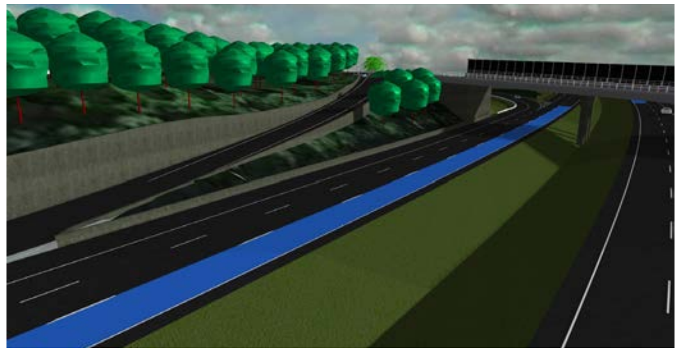


Figure 4.3.1.2 - Retaining Wall Comparison at NB US 15/17/29 On-Ramp



OUR TEAM'S DESIGN CONCEPT



RFP DESIGN CONCEPT

A key geometric change our Team implements is to relocate the NB US 15/17/29 on-ramp beneath the proposed overpassing roadway. This fundamental change eliminates both retaining walls depicted within the RFP Design Concept along with their secondary impacts such as tree clearing, tie-back easements, and difficult and costly construction. A comparison of the conditions adjacent to NB US 15/17/29 just north of the proposed bridge is provided in Figure 4.3.1.2. Our adjustment reduces impacts to the public from our tree clearing (concealing the interchange from the homes in the northeast quadrant, as shown in Figure 4.3.1.3), ROW acquisition, and potential septic field impacts. In order to provide this enhancement, the overpass roadway is moved slightly to the north and both roundabouts are relocated and reconfigured as compared to the RFP.

Figure 4.3.1.3 - Interchange Concealed by our Team's Concept

East of the interchange, as shown in Figure 4.3.1.4, our Design Concept repositions the roundabout further east and south than the RFP Design Concept, places it closer to the existing grade of Lord Fairfax Road, and provides grades more commonly utilized with roundabouts. This is achieved by adjusting the alignment of Lord Fairfax Road such that the free-flow movement from NB US 15/17/29 to Lord Fairfax Road remains, adjustments to Traveler's Way are avoided, and work remains within the existing ROW. This also improves the crossing angle of the 20" gas line and ensures our Design Concept is in accordance with the TransCanada Letter of Conditional Acceptance (LOCA).

Figure 4.3.1.4 - View of Interchange Looking North

Red ig p ic trav l times, th Park ad Rid Lo is also relo ated to th area between NB US 15/17/29 and Lo d Fairfax Road, mu h clo er to th co rid it serv s as sh w n in Fig e 4.3.5. Th lo atio f fers iv sa l clu s to motorists traveling NB US 15/17/29 reg rd g th av ilab lity ad lo atio f th lo wh le also eh n ig ig ess/eg ess. Fu th rmo e, b cau e th Park ad Rid Lo is lo ated clo e to th eastern rd b , p tu ties to eh n e th lo with lad cap g ad

Figure 4.3.1.5 - View Depicting Proximity of Park and Ride Lot to US 15/17/29

West f the in erch g , as sh w n in Fig e 4.3.6, u Desig Co ep relo ates th western rod b fu th r n th ad west th n th RFP Co ept Desig facilitatig co tru tio u sid f ex stig ro w ay ad es u ig th t th sp itter islad o iginatig a ar th v rp ss stru tu e remais f f f th p p ed b ig , ea b ig a red ed b ig wid h (wh n com p red to th RFP Desig Co ep). Th rd b is located to more closely adhere to the existing topography and detaches the SB US 15/17/29 Business to SB mainline on-ramp from the roundabout. This adjustment allows the subject ramp to be reduce in elev tio d creasig ROW imp cts alg th Alwig n Farm, LLC p p rty, wh le p iv id g fo a two lane configuration entering SB US 15/17/29.

In addition, the area created by separating the SB US 15/17/29 Business to SB mainline on-ramp from the western rd b , as well as th re-p p sig f th ramp itself, allow s th SUP to b rer u ed su h th t % max mum grad s, co f o mig to ADA req rement's, are met, wh le p iv id ng iv ew sh d to p en ial landscaping within the interchange proper. The configuration of the SB US 15/17/29 Business to SB main ie n ramp also elimi a tes th p ten ial fo retain g walls n ed d to cons tru t th SUP n ar its western termination point and simplifies connectivity to future development adjacent to the interchange.

Figure 4.3.1.6 - View of Interchange Looking Northeast

The roundabouts themselves are configured to provide slow entry velocities and consistent travel speeds by implementing appropriate deflection, intuitive channelization, and proper accommodations for the design vehicle. These safety features are provided through the correct combination of the size of the inscribed circles, the splitter islands and alignments of connecting roadways, as well as secondary design elements such as splitter islands, entry and exit configurations, and pedestrian accommodations.

Finally our Design Concept eliminates the SUP bridge and ramp as prescribed in the RFP Design Concept but shifts it to the south side of the proposed bridge. This enhancement reduces pedestrian conflict points (with the roadways) from the four shown in the RFP Design Concept to three while also reducing clearing requirements and adjacent to the existing eastbound ramp located north of the eastbound and of the interchange.

Our Volume II – Design Concept graphics illustrate the items described above and also provide horizontal curve data, the associated geometric elements of design speed, number and width of travel lanes and shoulders, and Point of Intersection (PI) elements.

(c.) Maximum Grades

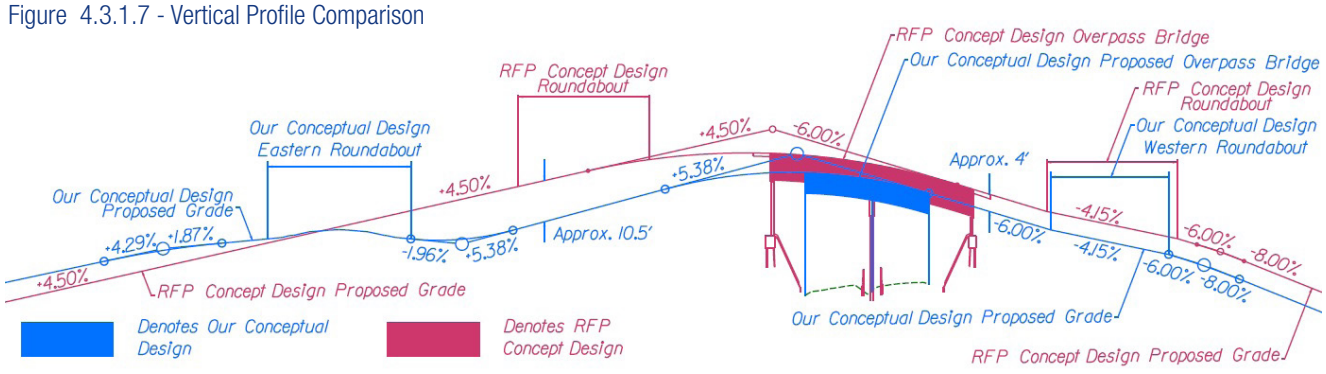
Our design concept adjusts the vertical geometry to improve construction sequencing and safety while meeting or reducing profile grades outlined as maximum grades in the Design Criteria Table. Maximum grades for each alignment are identified in Table 2. Grades proposed for NB and SB US 15/17/29 were developed to meet the 60 mph design speed criteria. A "spline" grade was established to minimize the amount of variable depth overlay to correct cross slopes, provide required superelevation and transition to existing grades at the Project limits.

Table 2 - Maximum Vertical Grades

Alignment	Maximum Profile Grade (%)	
	Maximum Allowable	Proposed Design
US 15/17/29	4	3.5
US 15/17/29 Business	8	8
Lord Fairfax Road	6	4.3
Travelers Way	6	6
Turkey Run Drive	6	2
NB On-ramp	7	6.2
SB On-ramp (from east)	7	7
SB Off-ramp	6	5
NB Off-ramp	7	5.4
NB Off-ramp spur	8	5.3
SB On-ramp (from west)	6	3.4

Proposed grades for the SB US 15/17/29 on-ramp from US 15/17/29 Business and Lord Fairfax Road were developed in a manner to limit changes from existing grades. This allows our Team to maintain the free-flow movements, reduce impacts to ROW, utilities, and the traveling public during construction. The vertical profile for Lord Fairfax Road/US 15/17/29 Business has been lowered approximately 4' as shown on Exhibit 4.3.7 to improve grades through the interchange. The benefits of these improvements enables our Team to construct the eastern roundabout off-line and close to the elevation of existing Lord Fairfax Road, simplifying temporary traffic control. This approach also allows our Team to reduce the grade through the eastern ramp from 4.5% to 2%.

Figure 4.3.1.7 - Vertical Profile Comparison



(d.) Typical Sections of Roadway Segments

Our Team's Design Concept is fully compliant with the lane width and shoulder requirements identified in the Design Criteria Table and the VDOT GS Standards.

A minimum lane width of 12' has been provided for all roadways, except for Travelers Way for which 11' lanes are provided consistent with the RFP. The interchange ramp widths vary from 16' for a single lane ramp to 24' for dual-lane ramps, and minimum 4' and 8' paved shoulder widths will be provided on the left and right sides of the ramps respectively.

US 15/17/29 and the interchange ramps will primarily consist of an open section ditch grading with riprap lining where traversable and recoverable slopes can't be provided. In select locations, our Team is proposing concrete median barrier adjacent to the outside shoulders in order to limit ROW impacts, reduce cut/fill limits, and maintain existing slopes and vegetation. An example of this is adjacent NB US 15/17/29 and SB US 15/17/29. ***When compared to the RFP, providing barrier in these locations eliminates all temporary and permanent easements required to construct the roadside features.*** Along Lord Fairfax Road/US 15/17/29 Business and the ramps interior to the interchange, a curb and gutter section is provided, except in locations where sufficient room is available for an open section.

The roundabouts east and west of the overpass provide a minimum lane width of 18' and a truck apron of 14'. An inscribed circle diameter of 180' has been provided for the eastern roundabout, meeting the minimum requirements identified in *VDOT's Manual for Roundabout Design Guidance* and *NCHRP Report 672*. Careful consideration was given to the entry and exit widths, raidii and angles, and the splitter islands to ensure that acceptable speeds are provided, the design vehicle was accommodated, and that all sight distance requirements are met.

As described in Table 1, our Team has reduced the overpass bridge width when compared to the RFP concept. The RFP Concept Plans required 77' lane widths due to the geometry associated with the western roundabout and the splitter islands. ***By relocating the roundabout further to the west, our Team is able to utilize standard 12' lane widths with 2' buffer, therefore reducing the bridge width by 6'.*** As discussed during ATC/Proprietary Meetings, our Team's typical section of the bridge overpass is fully compliant with the RFP requirements and acceptable to VDOT given the geometric changes.

Pavement design will match the depths provided in the Technical Requirements and VDOT's conceptual design. Asphalt build up may be required along US 15/17/29 to correct pavement cross slopes to current speed relevant criteria.

(e.) Conceptual Hydraulic and Stormwater Management Design (SWM)

Storm Drainage

Storm drainage infrastructure is provided to properly convey flow from the new interchange and associated ramps to large culverts and adequate outfalls. Computations will be developed by our Team as part of the roadway design development, and will be submitted along with each plan submission for review and approval. When compared to existing conditions, the drainage divides proposed with our Team's Design Concept generally follow the existing divides and utilize existing ditches where possible. Our Team's conceptual drainage design has accounted for the roughly 1 and Option 2, as will the computations during the roadway design development.

Median and roadside ditches will be designed to convey the design storm, and minimum ditched depths will be identified to accommodate underdrain outfalls without the need to introduce additional closed storm sewer systems. Improvements to the horizontal alignments and roadside features adjacent to NB and SB

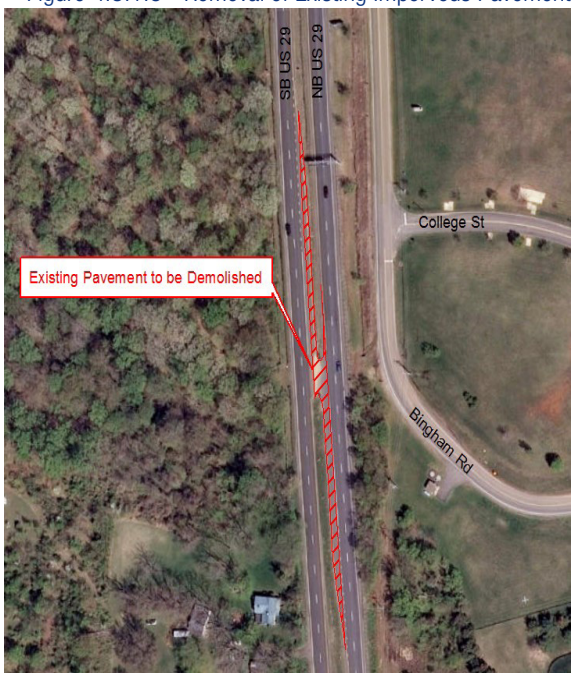
US 15/17/29 reduces the limits of slope widening required when compared to the RFP, allowing our Team to reduce clearing and grading impacts and disturbed flow runoff.

In an effort to minimize construction and maintenance costs, our Team is providing open section with roadside ditches where practical. When closed systems become necessary, our Team has avoided the use of legacy trunk lines and utilized roadside ditches to convey the storm runoff with pipe crossings. This approach not only saves construction and maintenance costs, but also limits impacts to utilities and other roadside elements. Existing storm sewer systems that require modification or are hydraulically inadequate due to increased runoff will be replaced as shown in Volume II-Design Concept.

Stormwater Management

Stormwater management (SWM) will be designed in accordance with Virginia Department of Environmental Quality (DEQ) II-C Criteria. Our stormwater based design eliminates all proposed stormwater management BMP's identified in the RFP concept by purchasing 100% of the removal requirements through nutrient credits. Our design allows for the removal of 4.8 acres of existing impervious area, including the US 15/17/29 crossover (see Figure 4.3.1.8). This offsets a large portion of the new impervious area and reduces the project's phosphorus removal requirement to 9.6 lbs/year. The project therefore satisfies the criteria of VDOT IIM 254 to meet 100% of the requirements through nutrient credits. This approach limits the proposed nutrient credit purchase to 0.4 lbs/yr less than the maximum purchase amount to achieve 100% nutrient credit purchase for SWM and therefore provides flexibility in the design approach moving forward. All nutrient credits will be purchased by the Team and transferred to VDOT at the completion of the Project. The removal of all on-site treatment will eliminate significant long-term maintenance costs related to stormwater management facilities. For water quantity, there are approximately nine locations where concentrated flow leaves the ROW. Each of these locations will be analyzed for channel protection and flood protection adequacy per MS-19 criteria.

Figure 4.3.1.8 - Removal of Existing Impervous Pavement



(f.) Proposed Right-of-Way Limits

Our Team's Design Concept reduces the fee simple ROW impacts by approximately 23,500 SF, a 60% reduction. This has been accomplished through geometric adjustments to the interchange, ramps, and secondary roadways. Specifically, the horizontal and vertical adjustments made to the ramp from SB US 15/17/29 Business towards SB US 15/17/29, along with the changes to the proposed storm sewer and ditches, facilitated a reduction in fee simple ROW adjacent to the outside of the SB on-ramp (from west) as shown in Figure 4.3.1.9

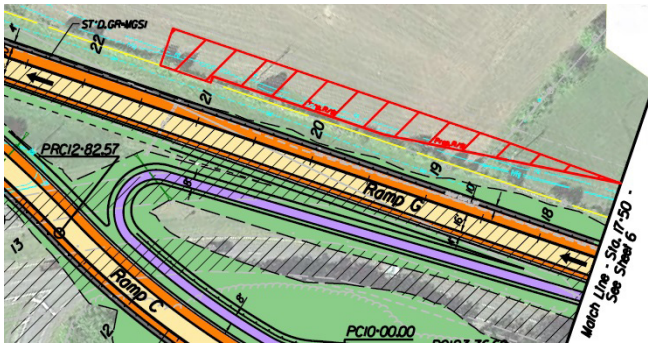


Figure 4.3.1.9 - ROW Reduction Outside SB On-Ramp

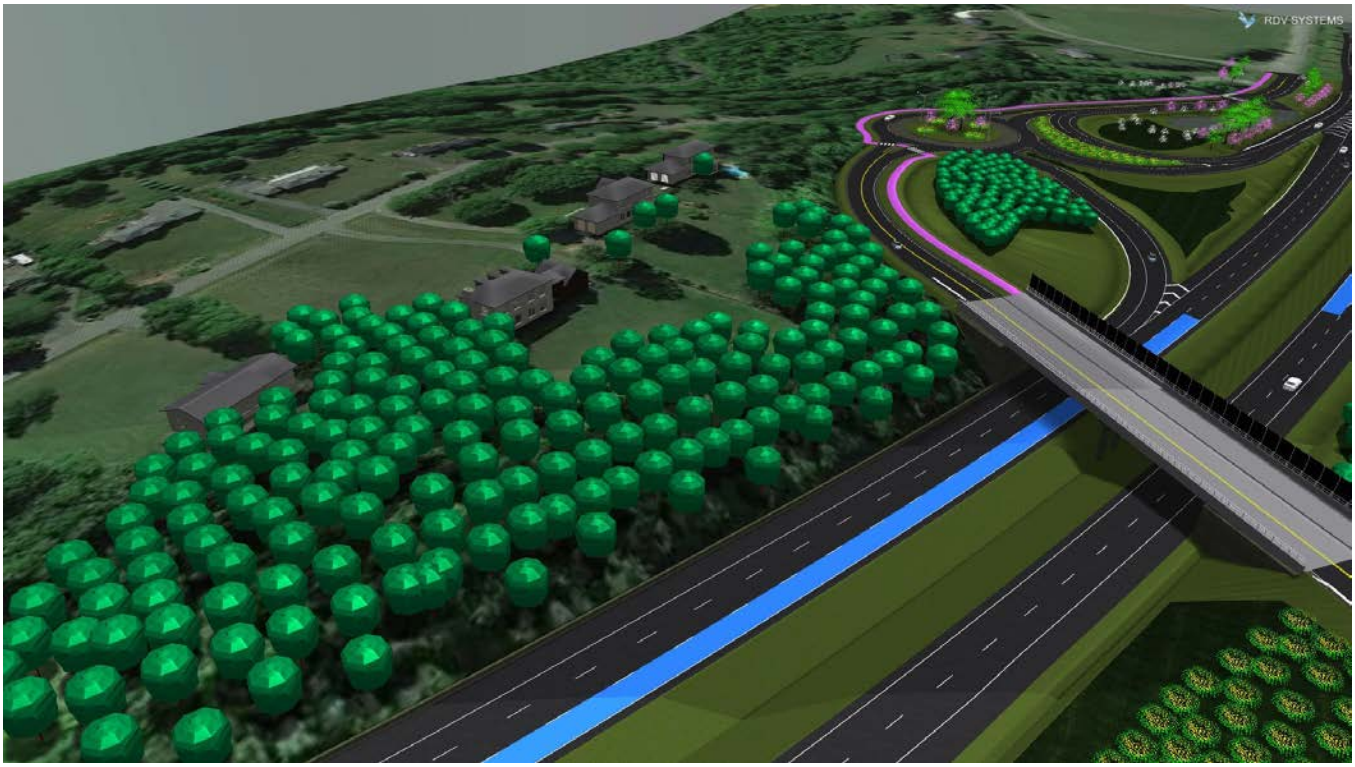
Changes to Lord Fairfax Road and Turkey Run Drive allowed the Park and Ride Lot to be located within the southeast quadrant of the interchange in lieu of adjacent to Bingham Road as envisioned in the RFP Conceptual Plans. The ROW area avoided by our concept is shown in Figure 4.3.1.10.

Figure 4.3.1.10 - ROW Reduction Resulting from Park and Ride Lot Relocation

In addition to the reduction of fee simple right-of-way, by relocating the NB US 15/17/29 on-ramp beneath the overpass, ***our Team eliminated approximately 9,000 SF of temporary construction and permanent retaining wall easements north of the overpass.*** The use of standard concrete barriers along the outside of the shoulder along portions of NB and SB US 15/17/29, eliminates large areas of sliver grading along the existing slopes. This avoids approximately 9,000 SF of temporary construction easement and approximately 6,500 SF of permanent slope easement.

As shown in Figure 4.3.1.11, realignment of the NB on-ramp and elimination of the retaining wall avoids slope grading and tree clearing activities adjacent to the residential properties. The proposed limits of fee simple ROW associated with our Team's Design Concept have been overlaid with the fee simple limits identified within the RFP Conceptual Plan and depicted in our Volume II – Design Concept.

Figure 4.3.1.11 - Reduced Impacts to Residential Community Due to the NB US 15/17/29 On-Ramp Realignment



(g.) Proposed Utility Impacts

The efforts described in the previous sections have resulted in minimal impacts to utilities. The anticipated impacts are described in Table 3

Table 3 - Proposed Utility Impacts

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/Avoidance Strategy
OVERHEAD POWER/COMMUNICATION LINES			
Dominion Energy	US 15/17/29 Station 20+00	Proposed Widening	Relocate in Kind
Comcast	US 15/17/29 Station 20+00	Proposed Widening	Reattached to VP Pole
Lumos Network	US 15/17/29 Station 20+00	Proposed Widening	Reattached to VP Pole
UNDERGROUND POWER/COMMUNICATION LINES			
Verizon	US 15/17/29 from Station 20+00 to 25+00	Proposed Widening	Adjust In Place
GAS			
4" Columbia Gas of VA	Lord Fairfax Road from Station 0+00 to 5+00	Proposed Widening	Relocate in Kind ***Conflict Reduced by Shifting the Bridge North***

(h.) Noise Barrier Locations

Noise barriers are currently not anticipated ***Our Team's Design Concept will potentially reduce noise levels compared to the RFP by moving the mainline ramps away from the homes, lowering the roadway profile, and maintaining existing slopes and vegetation with alternative roadside features.*** A full noise analysis will be performed during final design as required by the RFP.

(i.) Other Key Project Features

Landscaping

A key project feature will be the 0 SF of landscaping placed along US 15/17/29 Business, in addition to the roadways, and near the Park and Ride Lot. Utilizing the Master Plan for the Living Legacy Project (The Journey Through Hallowed Ground Partnership), our Team will coordinate with the Partnership and Fauquier County to develop and implement a landscaping approach consistent with their objectives and in accordance with the RFP. Our final planting plan will be submitted to the VDOT Project Manager for review and approval. A comparison depicting the desired landscaping within the roadway from the Master Plan with a conceptual rendering from anticipated landscaping within the western roadway is provided on Figure 4.3.12.

Figure 4.3.1.12 - Roundabout Conceptual Landscaping Plan

Pedestrian Safety

Our Team's Design Concept provides several pedestrian safety and constructability improvements relating to the SUP connecting Lord Fairfax Road with US 15/17/29 Business. Compared to the RFP, our design has the following benefits:

- Reduces number of total roadway crossing conflict points from seven (RFP) to six;
- Provides a western terminus design that can be easily connected to future off-site development;
- Includes pedestrian activated Rectangular Rapid Flashing Beacons at SB on-ramp (from west); and
- Includes enhanced markings at the SB on-ramp (from west) crossing.

For the SB US 15/17/29 on-ramp (from west) pedestrian crossing the RFP design and our Design Concept both cross SB on-ramp at midblock location and terminate at the same location. However, our optimized horizontal alignment and vertical profile locate the crossing further downstream from the ramp physical gore by approximately 28', as shown in Figure 4.3.1.13. This improvement provides approximately 43' of stopping sight distance and meets 30 mph criteria per VDOT IIM-TE-328.0 exceeding the 25 mph requirements.

Figure 4.3.1.13 - Shared Used Path Alignment West of US 15/17/29

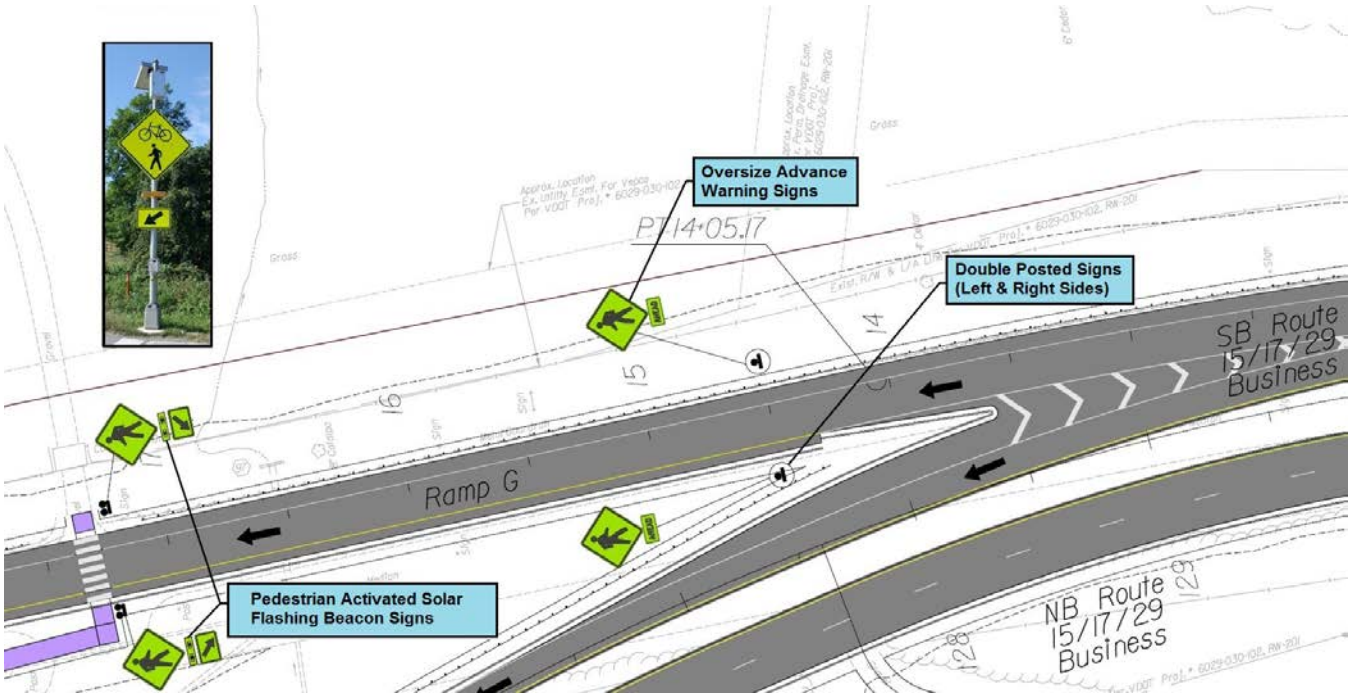
In addition as shown in Figure 4.3.1.14, our Design Concept provides for the crossing to be within 2.5' of the existing grade elevation allowing it to be easily connected by future off-site development. This represents a significant improvement over the RFP profile that ties in approximatly 20' above existing grade.

Figure 4.3.1.14 - SUP Tie-in to Future Development at SB On-Ramp

To further enhance pedestrian safety, our Team completed a VDOT IIM-TE-328.0 analysis, which determines the recommended safety treatments for uncontrolled crosswalks. Based on this analysis, this crossing is characterized as a "low risk" crossing, primarily due to low speeds, short crossing distance, and moderate traffic volumes. Per the IIM, only a standard crosswalk is required for pedestrian safety. ***As an enhancement to pedestrian safety, our Team commits to providing the following additional safety treatments typically associated with higher risk crossings (as shown in Figure 4.3.1.15):***

1. Installation of a high-visibility "Continental" style crosswalk;
2. Utilization of Advance Warning Signs;
3. Double-post warning signs mounted on the left and right shoulders; and
4. Utilization of pedestrian-activated RRFB (rectangular rapid flashing beacon) signs.

Figure 4.3.1.15 - Pedestrian Safety Enhancements for SB On-Ramp Crossing



4.3.2 Conceptual Structural Plans

As part of our Team's efforts to develop our ATC 01 interchange concept, we evaluated multiple configurations and alternatives for the bridge. These included span arrangements, abutment locations, and type of superstructure. As shown in Table 4, our Structural Design Concept features improvements in addition to enhancements, while meeting all RFP requirements.

Table 4 - Structural Enhancements and Project Benefits

Feature	Enhancement	Project Benefit
Bridge Configuration	▪ Reduces bridge length by 87' ▪ Reduces bridge width by 6' ▪ Lowers bridge profile	▪ Reduces deck area by 30,875 SF (a 40% reduction) ▪ Reduces structure depth ▪ Reduces construction costs ▪ Minimizes construction schedule risk ▪ Reduces long term inspection and maintenance costs
Superstructure	▪ Utilizes prestressed concrete Bulb-T beams	▪ Fast delivery and erection times ▪ Single section to erect per span minimizing traffic interruption ▪ No painting required ▪ Lowers initial and long term maintenance costs
Substructure	▪ Utilizes full integral abutments ▪ Reduces number of piers from 3 to 2 ▪ Utilizes drilled shafts for piers	▪ Eliminates cost associated with bearings and slope protection at the abutments ▪ Reduces overall cost, maintenance, and inspection

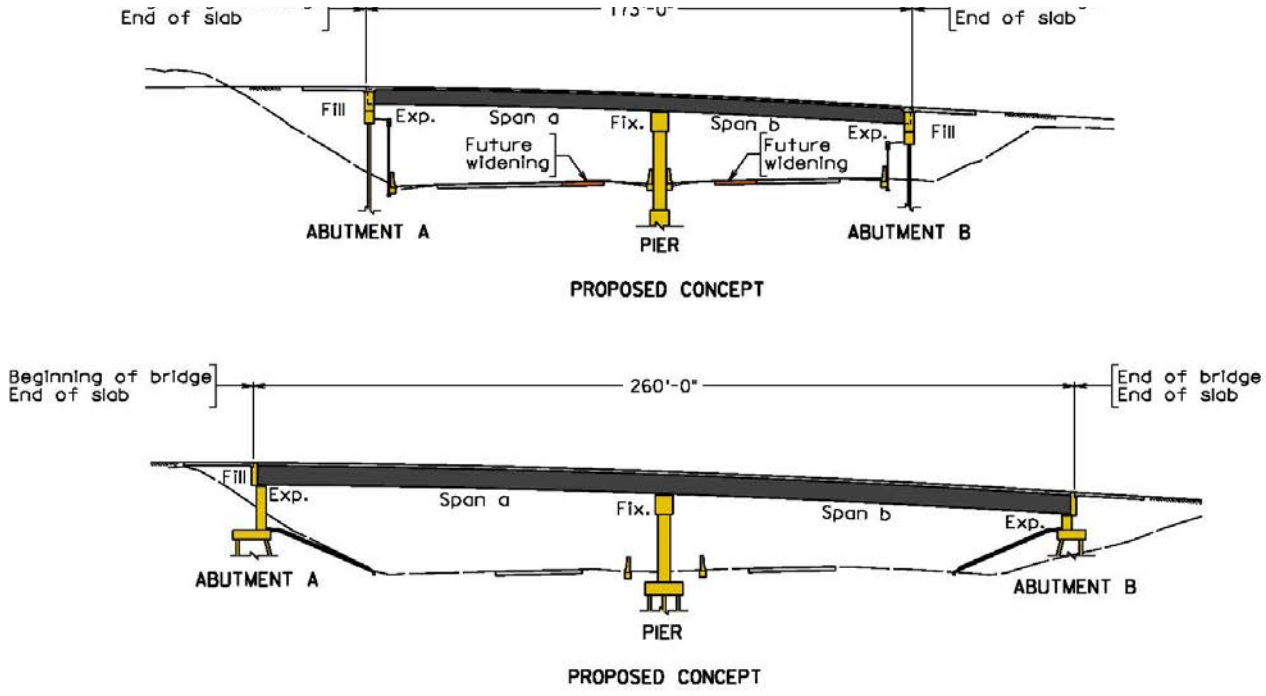
Our Team's layout and location of the abutments and piers ensures that the future widening to 6-lanes of US 15/17/29 is fully accommodated without bridge modifications. A rendering of our Design Concept is shown in Figure 4.3.2.1

Figure 4.3.2.1 - Rendering of Bridge

Superstructure

Our concept reduces the length of the bridge from 260' shown in the RFP Concept plans to 173' (a reduction of 87') while fully accommodating a future widening to a 6 lane facility in the median. A comparison of our Design Concept and the RFP Concept is depicted in Figure 4.3.2.2. In addition to reducing the length of the bridge, our Team reduced the roadway width from 34' to 28' and the overall bridge width from 51'-6" to 45'-6".

Figure 4.3.2.2 - Bridge Span Comparison



As discussed at our ATC/Proprietary Meeting, the 34' roadway width was necessary due to the RFP geometry associated with the splitter island at the road both partially located on the bridge. Our Team was able to reduce the bridge width by shifting the roadway location further from the bridge. ***The length and width adjustments reduce the bridge deck area by approximately 5,520 SF (a 40% reduction) compared with the RFP.*** A comparison of the RFP and our proposed transverse section including shifting the SUP to the south side, is shown in Figure 4.3.2.3

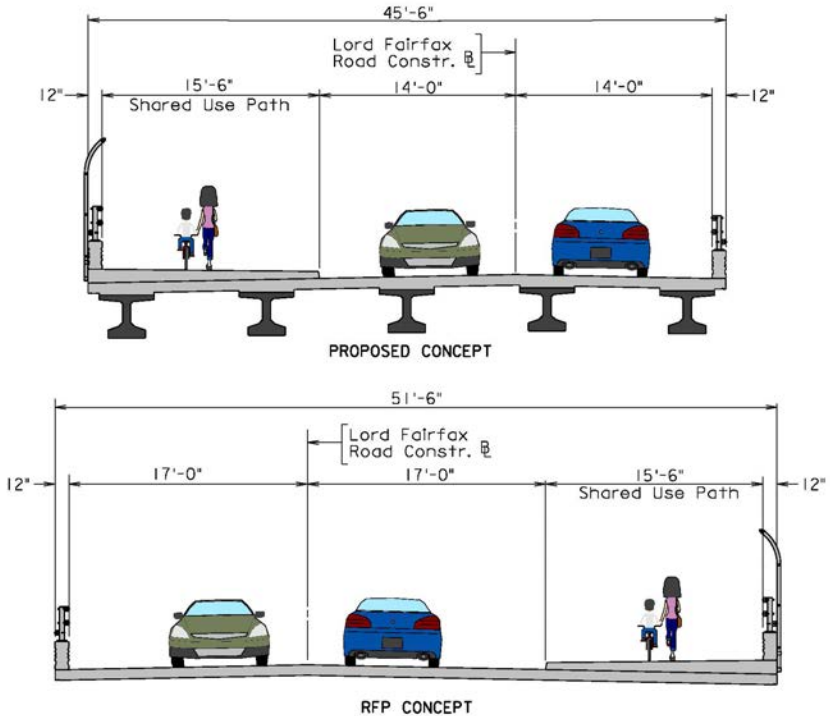


Figure 4.3.2.3 - Typical Transverse Section (Looking West)

Our concept utilizes Prestressed Bulb-T beams for this bridge. The concrete portion of the BR-27 bridge railings will feature Drystack relief architectural treatment on both the faces that meets the requirement of RFP. BPF-5, Type C pedestrian fencing will be provided along the SUP.

Substructure

The proposed bridge consists of two spans supported by a multi-column pier and full-integral, cast in place concrete abutments behind MSE walls. The full-integral abutments are fixed on a single row of H-piles. The reduced leg head size of prestressed concrete girders for our bridge allows us to utilize full-integral abutments (rather than the semi-integral abutments shown in the RFP Concept). The use of full-integral abutments has the added benefit of not requiring any abutment bearings (which are required by the semi-integral abutments in the RFP Concept). ***Eliminating these bearings reduces future maintenance and inspection costs for VDOT.***

Based on our review of the preliminary geotechnical investigation, the multi-column pier is anticipated to be supported on drilled shafts; however, the final foundation type will be dependent upon the final geotechnical investigation.

The pier will be designed to permit future jacking and replacement of the bearings during routine maintenance. Bridge Pier Protection will be provided in front of the abutments and pier in accordance with the VDOT Manual of the Structure and Bridge.

Our preliminary analysis of the geotechnical information provided in the GDR indicates the potential for settlement, slope stability and downdrag on piles. Our geotechnical investigation will take this into account when preparing and executing the field investigation plan to ensure that we obtain the information necessary to properly evaluate these potential issues during final design. Our schedule, shown in Section 4.7, allows time for anticipated settlement.

Material Selection, Maintenance & Construction Considerations

Our Team has reviewed the RFP documents with a goal of selecting materials which will require minimal long term maintenance. The VDOT requirement to utilize low permeability concrete and corrosion resistant reinforcing steel greatly reduces maintenance for the proposed bridge. Reducing bridge area, utilizing full-in egral abutments on a single row of piles behind MSE walls, using prestressed concrete girders, and providing a jo n less structure reduces long term maintenance and inspection costs for VDOT.

The bridge layout, superstructure and substructure elements were chosen with consideration toward constructability. The erection process for the prestressed beams is much faster and can be erected in a single piece (no field splices that would be required with steel girders) which minimizes the traffic interruption on US 15/17/29. This is a further benefit of our concept which reduces the overall bridge length.

The RFP concept located the proposed bridge in conflict with the existing signalized intersection. By shifting the bridge north, impacts to the traveling public are minimized and the bridge can be constructed in a single phase while maintaining full operations of the existing intersection. An added benefit of this shift is the elimination of the temporary jog needed to accomodate described in the RFP. Finally, increasing the offset to the existing intersection increases signal head visibility on SB US 15/17/29 during bridge construction for enhanced safety.

Due to the proximity of the existing turn lanes, the construction of pile supported footings for the piers would be difficult without disruption to the turn lanes. To minimize traffic impacts, we anticipate utilizing drilled shafts (one under each column) which will allow the pier footings to be constructed without any change to the present turn lane configuration.

Retaining Walls

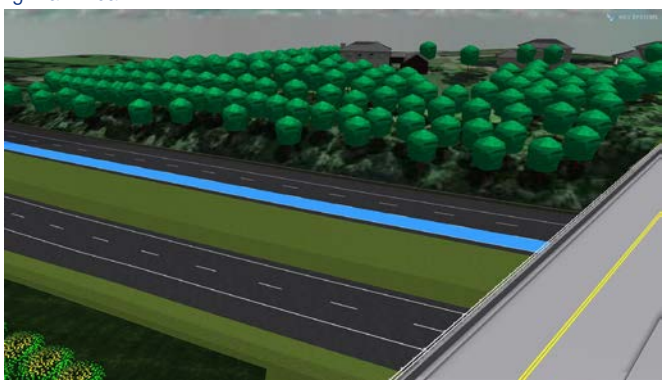
Other than the MSE walls associated with the bridge, ***no retaining walls are required by our Design Concept due to our realignment of the NB on-ramp and configuration of the SUP.*** This eliminates both the 275 and 473 long retaining walls in the north east quadrant representing approximately 90 0 SF of wall area, and the probable walls along the SB on-ramp.

As shown in Figures 4.3.2.4 and 4.3.2.5 our Team's ability to remove these retaining walls provides the following benefits:

- Eliminates long term maintenance costs;
- Avoids easement impacts to multiple residences;
- Eliminates septic field impacts; and
- Maintains existing tree buffer adjacent to residences.

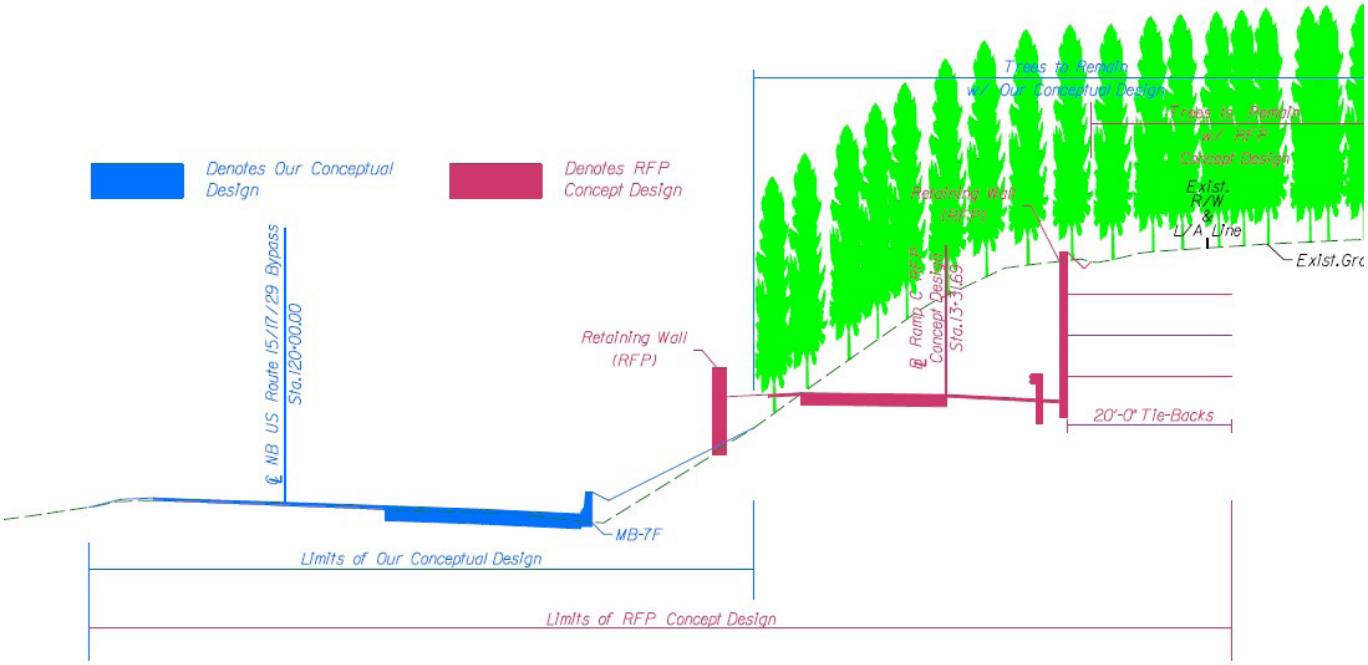
Figure 4.3.2.4 - Conceptual Renderings Depicting Comparison of Retaining Wall Area

RFP Design Concept



Our Team's Design Concept

Figure 4.3.2.5 - Typical Section Showing Comparison of RFP Design Concept and Our Teams Design Concept at NB On-Ramp



Major Drainage Structures

Th re are m ajo d ai g stru tu es asso iated w ith co ep .

4.4 - Project Approach

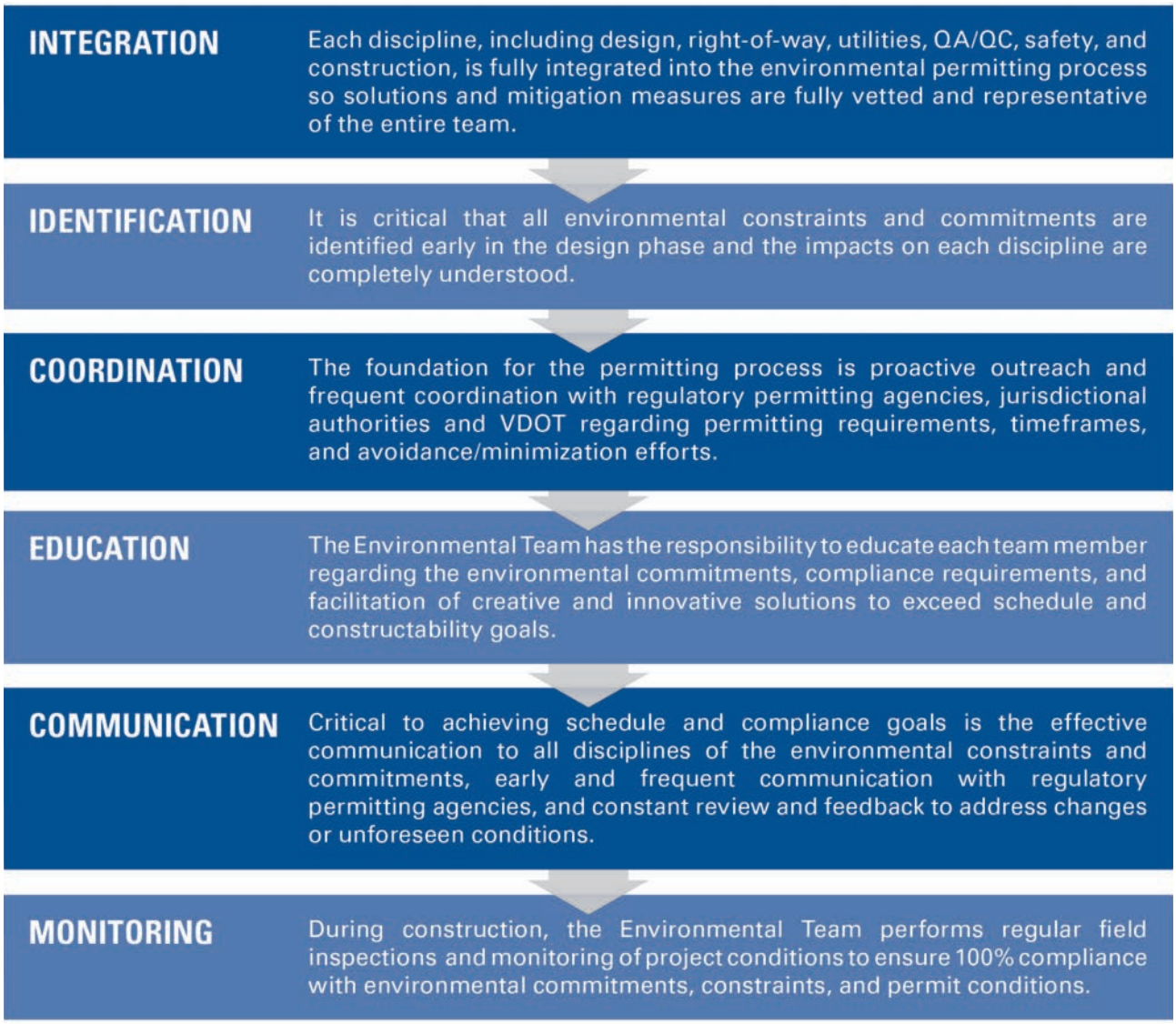
4.4 Project Approach

4.4.1 Environmental Management

Integrating environmental activities is a primary component of successful project delivery and is founded on principals and objectives described in figure 4.4.1.1. Beginning in the Technical Proposal stage, we identify environmental commitments, challenges, and constraints, and develop strategies to avoid and minimize impacts to environmental resources. Identifying recognized environmental conditions and areas of concern early allows our Team to mitigate the risk of unforeseen circumstances. The main goal of our Environmental Manager is to ensure all parties are aware of project constraints, schedule limitations, and to assure constructability. Our fully integrated environmental approach ensures:

- Necessary permits are identified at the beginning of the Project;
- Environmental commitments and constraints are identified and accounted for;
- Stakeholder concerns are addressed;
- Adequate timelines are established for environmental permits; and
- Construction is completed in accordance with RFP, permits, National Environmental Policy Act (NEPA) commitments, and Project specifications.

Figure 4.4.1.1 - Integrated Environmental Process



Planned Efforts During Design and Construction to Avoid/Minimize Impacts to Environmental Resources

The primary objective of the Environmental Manager during design is avoidance and minimization of impacts, and minimizing the risk of schedule delays. Efforts are focused on working with design and construction staff to avoid environmentally sensitive areas. Once plans are approved and permits obtained, the Environmental Manager ensures construction staff understands the Project constraints in order to eliminate environmental impacts. Our environmental professionals work closely with field staff to address construction monitoring of the permit and environmental commitments in the field. Our planned efforts during design and construction to avoid/mininize impacts to environmental resources are summarized in Table 5.

Table 5 - Planned Efforts During Design and Construction to Avoid/Minimize Impacts to Environmental Resources

Design Phase	Construction Phase
1. "Over The Shoulder" Interaction with engineers and Environmental Manager to: • Avoid/minimize impacts within the Project area • Include stakeholder elements • Resolve design issues/concerns **2. Technical Design Meetings** • Comment on: design, schedules, and environmental issues/concerns • Provide technical input and recommendations related to permit requirements and project constraints • Identify commitments to remain in compliance, avoid conflicts between design and construction, and increase avoidance and minimization opportunities **3. Internal Reviews** • Ensure plans and design revisions are in compliance **4. Permiting Process** • Complete updated wetland and Waters delineations and obtain Jurisdictional Determination • Coordination with design and construction staff • Account for utility relocations • Coordination with permitting agencies • Ensure avoidance and minimization • Integrate with the Project Schedule	**1. Constraints And Commitments Training** • Ensure construction team understands constraints and locations **2. Erosion & Sediment (E&S) Compliance Checks** • Identify areas where additional attention may be required **3. Environmental Compliance Discussions** • Review environmentally sensitive areas included in the next month's work **4. Construction Field Revision Reviews** • Limit risks and potential for non-compliance for environmental items **5. On-Call Assistance After Storm Events** • Mitigate for potential delays in construction **6. Compliance Assurance** • Perform regular inspections and monitoring • Ensure compliance with self-reporting requirements **7. Permit Closeout** • Complete final inspection to confirm stabalization of project rating limits • Provide appropriate documentation to permitting agencies

Potential Solutions to Address Recognized Environmental Conditions/Areas of Concern

Our Team utilizes GIS in combination with other technologies to create Environmental Constraint Maps (ECM) and Environmental Commitment Tracking Databases (ECTD). These tools are project-specific and detail the physical constraints and Project commitments made during the design/permitting stage. ECMs and ECTDs are crucial in the field during construction compliance inspections to identify recognized environmental conditions, areas of concern, and permitted impacts. These constraints are tracked through the life of the Project and provided to VDOT at the completion of construction to ensure all project commitments are accounted for. Our Team has utilized this technology on a variety of projects including

Dulles Corridor Metrorail Project Phase II Package A and I-95/Route 630 Reconstruction and Widening. The use of these tools, which exceed the requirements of the RFP, assist our Team in tracking each commitment to mitigate risks and reduce the potential for delays.

Table 6 identifies our Team's solutions to address and limit risks in recognized environmental conditions and areas of concern to ensure that the Project complies with the commitments made.

Table 6 - Solutions to Address and Limit Risk in Recognized Environmental Areas of Concern

Environmental Resources	Requirements	Method to Limit Risk
EQ-103 & RFP Commitments Not noted below	▪ Notify VDOT if necessary easements located outside of ROW beyond conceptual plan, cultural resources, T&E, or other surveys may be required	▪ Utilize ECM, ECTD, over the shoulder, and weekly design reviews to maximize avoidance and minimization efforts
Threatened and Endangered Species (T&E species)	▪ Coordinate with USFWS, VDGIF & VDCR regarding the identification of state and federal T&E species, as well as addressing the impact assessment ▪ Ensure the Project and schedule include provision for T&E species Time of Year (TOY) restriction as required for the northern long eared bat (NLEB)	▪ Conduct early Section 7 consultation with USFWS and early coordination with NMFS and other regulatory agencies, building on VDOT prior work ▪ Implement the 4(d) Rule for the Northern Long Eared Bat ▪ Flag LOD and areas of concern in the field and include on ECM and plans
Noise	▪ Complete Final Noise Analysis based on design	▪ Complete final Noise Abatement Design Report (NADR) ▪ Reviewe prior noise model and run preliminary model of concept design to determine compliance
Wetlands/ Streams/WQ Permitting	▪ Conduct wetland delineation and obtain Corps Jurisdictional Determination and Obtain WQ permits ▪ Evaluate and document possible avoidance and minimization alternatives ▪ Provide mitigation for unavoidable wetland and waters impacts	▪ Study existing and historic aerial photographs, DEM, field checks, topography & delineations to estimate probable wetland impacts ▪ Begin wetland delineation at Notice to Proceed (NTP) ▪ Document avoidance/minimization efforts for rapid permit issuance ▪ Conduct early coordination during JD to address questions concerns early ▪ Facilitate permitting

Our Design Concept incorporates multiple enhancements ensuring safety and minimizing ROW and environmental impacts. Relocating the Park and Ride Lot allowed our Team to avoid previously unknown and undocumented architecture and archeology in addition to reducing impacts to the Living Legacy Project. Eliminating all four stormwater management facilities, avoids secondary impacts to wetlands. Additionally, eliminating the large retaining walls and associated easements in the northeast quadrant avoids the potential for impacts to septic fields.

Schedule Integration

Nationwide 23 (Approved Categorical Exclusion) and Virginia Stormwater Management Program (VSMP) Permits are need prior to commencement of construction. As shown in our Proposal Schedule included in Section 4.7, we account for the entire permit acquisition process, with the appropriate constraints to the applicable construction activities that impact them. Through our efforts to avoid and mitigate the impacts to these areas, and the early initiation of these permitting activities, we have built an appropriate level of

float into our schedule to minimize the risk of delays. The 4(d) rule for the Northern Long Eared Bat will be implemented, ensuring the Project schedule will not be impacted by this species' TOY Restriction.

Throughout the permitting process, our Team closely monitors the status of these permits to ensure that they are tracking for on-time completion. This requires the Environmental Manager to continually update the DBPM regarding permit progress, and to stay in constant communication with the permitting agencies. Should the schedule indicate that activities are falling behind for any reason, the Team will determine the cause and implement measures to correct the schedule deficiency. As appropriate, the DBPM and Construction Manager may also review options for sequencing the work to avoid impacting the environmentally sensitive areas, increase manpower and equipment, or explore other measures available to regain schedule progress.

4.4.2 Utilities

One of the most critical elements of a complex design-build project is the effective and efficient integration of the utility process into each project discipline. Knowing how much of an impact utilities can have on the Project Schedule and cost, our Team has expended considerable effort to coordinate with all impacted utility owners. We carefully studied the RFP Conceptual Plans, reviewed the utilities in the field, discussed the Project extensively with each impacted utility company, researched available records, and developed our Conceptual Plan and Proposal Schedule accordingly. This information has directly impacted our Team's concept, proposed phasing and sequence of work. As a result of these efforts, we have reduced the number of conflicts with the Project and avoided numerous utility conflicts that will reduce costs and the risk of schedule delays

Approach To Utility Coordination

For this Project, our Team will be following the VDOT Utility Relocation Policies and Procedures Manual. As discussed above, we have already begun activities to ensure the success of the utility relocation process, and Figure 4.4.2.1 is a general outline of the steps and activities we will perform once the Project is underway:

Figure 4.4.2.1 - Approach to Utility Coordination

6

- Meet with public utilities to finalize avoidance and/or relocation plans
- Incorporate plans into design documents and submit for approval
- Obtain necessary right-of-way (easements) for the utility relocations

7

- Incorporate approved utility relocation plans into the construction schedule
- Identify utility relocation activities which fall on the critical path
- Evaluate resources needed to accomplish critical relocations

8

- Proceed with utility relocations
- Take immediate action on unforeseen utility conflicts
- Maintain team approach to achieve quick resolution on unforeseen conditions and other field issues

The Shirley Team has been successfully managing utilities on multiple design-build projects for VDOT and other owners for over 15 years. The key to our success is having the experienced in-house resources, with intimate knowledge of governing bodies' policies and procedures, and positive relationships with each utility owner. Our Utility Team is fully engaged in the design process coordinating with the right-of-way, permitting, construction, and scheduling of all other project disciplines. While coordinating with other project disciplines, our first and highest priority throughout the design and construction phases of the Project will be to completely avoid utility impacts. If conflicts cannot be avoided by design, then we will work diligently with each utility owner to minimize these relocations through a combination of design and/or protection measures that allow the utilities to remain in place. Only as a last resort will we relocate utilities to eliminate conflicts with new construction. During construction, our Utility Team remains fully engaged to coordinate relocations between the utility companies and the construction team, ensuring their timely and successful completion.

Specific Utility Impacts

At this stage our Team has identified multiple conflicts within the proposed interchange. Listed below in Table 7 is a summary of the known utilities, their potential conflicts, and our solution for accommodating them:

Table 7 - Impacted Utilities

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/Avoidance Strategy
OVERHEAD POWER/COMMUNICATION LINES			
Dominion Energy	US 15/17/29 Station 204+00	Proposed Widening	Relocate in-kind
Dominion Energy	US 15/17/29 from Station 207+00 to 214+00	Jughandle Detour	***Conflict Avoided by Eliminating Jughandle Detour***
Comcast	US 15/17/29 Station 204+00	Proposed Widening	Reattach to DVP Pole
Lumos Networks	US 15/17/29 Station 204+00	Proposed Widening	Reattach to DVP Pole
Lumos Networks	US 15/17/29 from Station 207+00 to 214+00	Jughandle Detour	***Conflict Avoided by Eliminating Jughandle Detour***
UNDERGROUND POWER/COMMUNICATION LINES			
Verizon	US 15/17/29 from Station 202+00 to 205+00	Proposed Widening	Adjust In-Place

Utility/Owner Description	Approximate Location	Potential Conflict	Relocation Plan/Avoidance Strategy
Verizon	US 15/17/29 from Station 207+00 to 214+00	Jughandle Detour	***Conflict Avoided by Eliminating Jughandle Detour***
WATER			
8" Town of Warrenton Water	Lord Fairfax Road from Station 104+00 to 107+00	Not in Conflict	***Conflict Avoided by Realigning Lord Fairfax Road***
SANITARY SEWER			
4" Town of Warrenton Sanitary Force Main	Lord Fairfax Road from Station 104+00 to 107+00	Proposed Widening	Relocate in-Kind - ***Conflict Reduced by Shifting the Bridge North***
GAS			
20" TransCanada Gas	US 15/17/29 Station 207+00	Not in Conflict	***Conflict Avoided by Realigning Lord Fairfax Road***
4" Columbia Gas of VA	Lord Fairfax Road from Station 104+00 to 107+00	Proposed Widening	Relocate in-Kind - ***Conflict Reduced by Shifting the Bridge North***

Mitigation Strategies

Our Design Concept presented with this Technical Proposal has been developed after reviewing the existing facilities and proposed work with each utility owner. Through this coordination, we have established the needs for each utility owner, and the impacts our concept will have on their systems.

Our Team has developed a design concept that has avoided several utility impacts along US 15/17/29. Our design realigned the north bound on ramp, allowing us to shift the bridge north of the RFP location. That shift allowed our Team to minimize the conflict with the 4" distribution gas line and 4" sanitary force main along Turkey Run Drive, and eliminate the conflict with overhead power, overhead communication, and 20" transmission gas line. Avoiding these impacts will reduce cost and schedule impacts, reduce the risk of any possible delays, and eliminates the risk of working around the 20" TransCanada gas transmission line.

Figure 4.4.2.2 - Strategies to Mitigate Delays of Utility Relocation

Unforeseen Utilities

Discovering utilities during design or construction that are not shown in the RFP can delay the Project schedule and add cost. Our Team has proactively met with each utility owner, reviewed as-built records, and the facilities in the field to reduce this risk. As we move through the design phase, we will confirm the presence of utilities by completing detailed records research, field designations, and test pitting. This information will be integrated with the design to address any conflicts that arise. Concurrently, our coordination with the utility companies will continue in earnest and include updating them on design progress, and conversely providing the design team updates from the utility companies. These efforts will result in utility avoidance and minimization through design, or a utility relocation plan. The Team will also develop a project specific "Utility Strike Prevention Plan" that outlines the procedures to be followed during construction to establish clear lines of communication and authority, train workers about safety policies when working around utilities, describe plans for utility strike avoidance, and address steps to be taken should strikes occur.

Once construction begins, field markings by Miss Utility will be compared to known utilities identified in the design phase and included on the plans. Additional investigations will be completed as necessary

to resolve any discrepancies. Prior to the start of any field construction activities, crews will perform additional test pitting in their work area to verify that there are no unforeseen conflicts with the proposed work. If, during construction, an unforeseen utility is encountered, the crew will immediately cease work, notify the Utility Manager, CM and DBPM, and stabilize the work area. The Utility Manager will attempt to determine the owner of the facility and contact their field representative to investigate whether the utility is still active or abandoned. Concurrently, after an initial assessment is made, the CM will make a determination about moving the crew to a different location/activity, or crews may remain to assist the utility in performing the relocation or providing support. Once the parties have determined what efforts are required to address the unforeseen utility, the Team will update the Project CPM and evaluate for delays. If delays are expected, there are several steps that can be taken to mitigate these delays. On previous projects our Team has successfully handled unforeseen utilities by revising the design, adjusting the utility in place, assisting the utility with the relocation, performing a temporary relocation, and/or resequencing the work.

Schedule and Mitigation of Delays

As we prepare this Technical Proposal, our Team coordinated extensively with each discipline to develop schedule and sequence of work for each utility relocation, as detailed in Section 4.7. This advanced schedule coordination has been developed through multiple discussions with each utility owner, and historical data developed from our past experience with each owner on multiple design-build projects. Since our Team's concept was able to avoid several utility conflicts, we were able to schedule the Project without any utilities on the critical path. This will allow our Team to phase the Project efficiently, maximize the use of float, and reduce risk of delays to construction.

Our Team keeps a detailed schedule for each utility relocation to determine if relocations are behind schedule, or are on the Project's critical path. In order to avoid any delays due to utility relocations, our Team has implemented several methods on past projects to keep utility relocations on schedule:

- ***Performing In-Place Relocations:*** Along US 15/17/29 Verizon's underground fiber and copper are in conflict with the proposed widening. After coordination with Verizon, our Team has determined that we can adjust these lines in place to eliminate the conflict. By avoiding a complete relocation of this line, we will not need to place new duct and cable, or perform any cable splicing. This reduction in scope will minimize the impact to Verizon and the overall schedule.

- ***Avoidance/Protect In-Place:*** During our pre-construction coordination with TransCanada we determined that our concept has eliminated any conflict with TransCanada's 20" Transmission facility by reconfiguring Lord Fairfax Road to improve the crossing angle in accordance with the Letter of Conditional Approval (LOCA). Our Team will verify no-conflict during final design, and coordinate with TransCanada's engineer and field inspector to determine if additional protection is required. TransCanada has approved a special mix flowable fill if additional protection is needed.

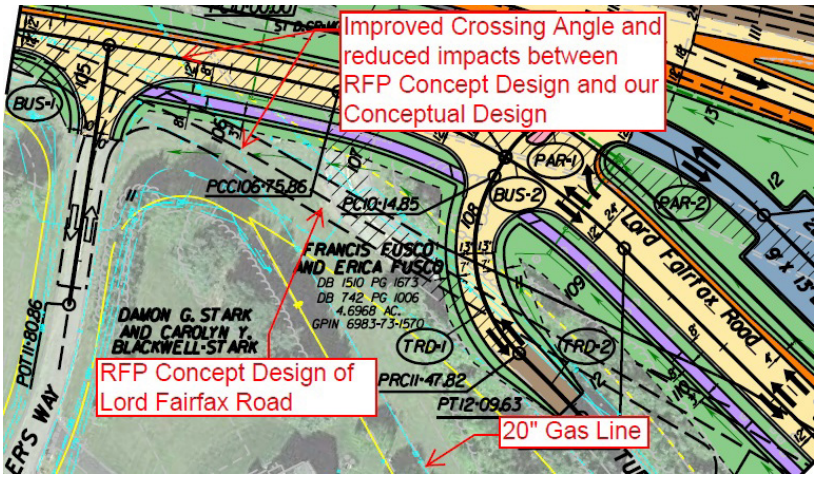


Figure 4.4.2.3 - Improved Crossing Angle with TransCanada's 20" Transmission Line

Our Team's concept eliminated the temporary jughandle shown in the RFP plans. Eliminating this diversion avoided conflicts with double circuit Dominion Energy poles, overhead Lumos, overhead Comcast, and underground Verizon facilities.

4.4.3 Geotechnical

This project is located in the Blue Ridge Physiographic Province of Virginia which presents geotechnical challenges such as characterizing Intermediate Geomaterial (IGM), varying degrees of weathered rock and depths to competent rock.

Geotechnical Approach

Our Team will be following the VDOT RFP, VDOT MOI, and the AASHTO LRFD Bridge Design Specifications regarding the geotechnical scope of work. Our geotechnical approach to identifying and mitigating geotechnical risks is to evaluate the existing project data and information, conduct additional geotechnical investigations, establish geotechnical recommendations, and effectively implement design concepts during construction of the Project. We will also actively engage VDOT at every stage to ensure VDOT's input is incorporated and addressed. Our Team has already begun activities to evaluate the geotechnical risks and develop solutions to remediate and/or minimize the risk.

Prior to acquiring additional geotechnical data, our Team completed a comprehensive review and evaluation of all available data and information regarding the Project area and subsurface soils. Some of the sources of this data include the USGS geologic maps and soil survey reports, existing as-built roadway plans, existing soil test borings, and laboratory data. Our Team has thoroughly reviewed information provided in VDOT's RFP and Addenda, especially, the Geotechnical Data Report (GDR) dated July 13, 2017. The borings included in the GDR indicate significant variations of subsurface conditions across the Project site. For example, three borings (BB-1 through BB-3) were drilled approximately 130' apart for the proposed bridge. BB-1 indicates the presence of 30+ feet of Elastic SILT (MH) layer; while this MH layer was not encountered in either BB-2 or BB-3. Borings BB-1 & BB-3 were drilled to about 73' without encountering rock while rock was encountered in BB-2 at 50' below the existing ground.

Our Team will also perform a thorough site reconnaissance to confirm the potential geotechnical risks, identify any additional site constraints, and tailor the geotechnical exploration program to address the geotechnical issues relative to the proposed design. We will develop a supplemental geotechnical investigation program including SPT, in-situ testing, consolidation & triaxial laboratory testing complying with the VDOT RFP and VDOT MOI. The supplemental geotechnical investigation program will be submitted to VDOT for review and approval prior to implementation. Upon completion of the supplemental geotechnical investigation program (field exploration and laboratory testing), our Team will utilize all available geotechnical information including those provided in the GDR to evaluate subsurface conditions, establish soil parameters, perform engineering analyses, and provide geotechnical recommendations for design and construction.

Geotechnical Project Risks

Our Design Concept is optimized to reduce or avoid geotechnical risks. Examples include elimination of stormwater management facilities and the elimination of the retaining walls along the NB on-ramp. However, some geotechnical risks remain such as those associated with placement of deep fills at the bridge approaches, installation of deep foundations as part of the bridge substructure, and removal or remediation of unsuitable subgrade soils. Table 8 provides more specific details of these geotechnical risks, their potential impacts, and our Team's proposed modifications or mitigation strategies.

Table 8 - Geotechnical Risks and Mitigation Strategies

Risk Factor	Potential Risk	Modifications & Mitigation
Deep Embankment Placement	▪ Excessive long-term and/or short-term settlement ▪ Inadequate slope stability ▪ Inadequate global stability ▪ Excessive downdrag on substructure elements	▪ Lower profile of Lord Fairfax Road and US 15/17/29 Business ▪ Perform design level geotechnical investigations to determine if fill slopes flatter than 2:1 are necessary ▪ Perform 3-dimensional (3D) settlement analysis ▪ Evaluate options to reduce settlement and improve stability ▪ Evaluate circular/non-circular global stability failure potential ▪ Identify ground improvement options ▪ Consider staged construction, including early placement of fill and waiting periods ▪ Predrill piles to reduce downdrag effects at bridge abutments
Uncertain Subsurface Conditions at Bridge Foundations	▪ Differential settlement of bridge abutments ▪ Unexpected changes to location and/or depths of weathered rock ▪ Inability to drive piles to the required depths	▪ Complete additional borings to identify rock depths and conditions of materials ▪ Perform in-situ pressuremeter testing (PMT) to characterize rock ▪ Obtain rock samples and perform uniaxial compression tests ▪ Evaluate alternate foundation types, such as drilled shafts or pre-drilled piles, to eliminate pile driving ▪ Conduct Pile Dynamic Analyzer (PDA) testing
Unsuitable Subgrade Soils	▪ Deep undercuts could require temporary shoring ▪ Increased quantities of unsuitable material could require additional hauling of material on roadways ▪ Low CBR values could require increases in material thicknesses	▪ Evaluate stabilizing options for soils, including use of lime stabilization, soil cement, or installation of geogrid materials ▪ Complete additional materials testing to determine exact locations and limits of potentially unsuitable material ▪ Identify areas of high moisture content material and complete rough grading activities in advance to allow material to dry prior to use ▪ Complete additional CBR and proctor tests to determine specific limits for low CBR material ▪ Identify areas onsite for placement of material to limit offsite hauling of material

4.4.4 Quality Assurance/Quality Control (QA/QC)

Our Quality Assurance/Quality Control (QA/QC) Plan for design and construction will be in accordance with VDOT's *Minimum Requirements for Quality Assurance and Quality Control on Design-Build and Public-Private Transportation Act Projects* (January 2012) and will establish criteria for quality control, quality assurance, VDOT independent assurance, as well as verification and oversight duties for all personnel. Over the past 15 years our Team has continuously refined our QA/QC approach to reduce VDOT staffing and oversight needs. We have done this by enhancing our comprehensive QA/QC procedures to ensure aspects of quality – from document creation to construction completion and acceptance – are identified, defined, and streamlined. Our QA/QC Plan will define the organization, work processes, and systems necessary to provide evidence that the Warrenton Southern Interchange Project will be another quality undertaking successfully delivered by our Team.

Design QA/QC Approach

Our design QA/QC methodology will be summarized within the Design QA/QC portion of the overall QA/QC Plan and will provide the organization, relationship, and procedures that define clear lines of responsibility for various design QA/QC personnel throughout the duration of the Project. Our Design QA/QC Plan will ensure that appropriate quality standards will be included in the plans and other design documents, suitable materials will be selected, and work will be able to be constructed in a safe manner. Our Design QA/QC Plan will be well-structured, easily audited, continually maintained (revised as necessary), and will establish:

- Procedures for preparing and checking all drawings, specifications, and other design submittals including procedures to correct errors and deficiencies prior to submission;
- Processes to ensure design submittals are stamped, signed, and dated by the responsible Professional Engineer licensed by the Commonwealth of Virginia;
- Actions to ensure that the level, frequency, and methods for review of design, including independent review are in compliance with VDOT's functional requirements for the Project;
- Procedures for coordinating work performed by different persons in the same or different area, fabrication shops, casting yards, and other pertinent fabrication facilities at remote locations, or in related tasks to ensure conflicts, omission, or misalignments do not occur;
- Processes for identifying elements of design that require special construction QA/QC attention or emphasis;
- Responsibilities by firm, discipline, name, qualification, duty, responsibility, and authority for all personnel and/or entities conducting Design QA/QC, including sub-consultants.

Our approach to design QA/QC entails establishing general and administrative functions, design management procedures, as well as specific planning and design review processes - and then following through on design QA/QC implementation. Once established, the Design QA/QC Plan will not be revised without consent from the Design-Build Project Manager, the Quality Assurance Manager, and VDOT. The Design QA/QC Plan will be prepared by the Design Manager, coordinated with the Construction Manager, and reviewed by the Design-Build Project Manager and the Quality Assurance Manager. Bentley ProjectWise V8.1 (PW) will be utilized for internal design document control to ensure that all design documents are controlled, shared, and recorded throughout the duration of the Project.

The Design Manager, Jeremy Beck, PE, will be responsible for design quality and will utilize the Design QA/QC Plan as a management and reference tool. Jeremy will make sure appropriate staff is assigned to QA/QC functions, design sub-consultants adhere to the approved Design QA/QC Plan, computer software licenses are current and in conformance with VDOT requirements, and internal design quality audits are performed. He will verify conformance with the Design QA/QC Plan using informal observations or by conducting audits of the checking and review processes established within the QA/QC Plan.

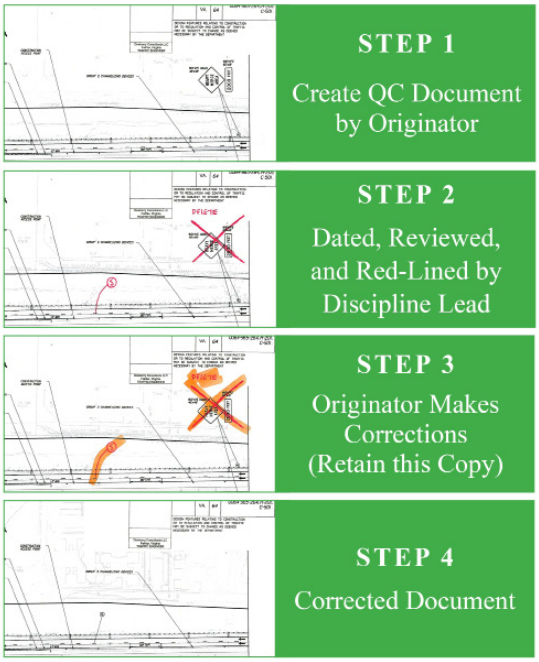
The Design Manager will orchestrate design reviews, ensure interdisciplinary coordination takes place, ensure the design is constructible, process VDOT and third party reviews, oversee design changes during construction, provide timely requests for information, supervise as-built plans, and ensure design quality training occurs. A brief discussion of these activities is provided on the following pages.

Design Review

Design review will involve both quality control and quality assurance activities. Design quality control will include checking various deliverables such as drawings, engineering computations, input/output from computer programs, studies and reports, along with other design related documents for technical accuracy, conformance to Project requirements, as well as form, content, and spelling. Design quality assurance will evaluate whether the designers assessed problems appropriately, applied correct analyses, assigned qualified personnel when conducting design related activities, and will ensure quality control reviews were completed.

Design quality control functions will be provided daily by design discipline leads who will check that the work is being completed by appropriate personnel, the design level is commensurate with the complexity of the design element, the design is complete as well as accurate, and follows the appropriate standards and requirements. Formal, documented reviews will occur at predetermined times for design deliverables identified within the QA/QC Plan.

Figure 4.4.4.1 - QC Design Review Steps



Checking design deliverables will involve a four-step process as shown in Figure 4.4.4.1. Step 1 will include the creation of the QC Document (a copy of the deliverable) by the Originator (designer, technician, or writer). Step 2 will encompass the QC Document being dated, reviewed, and "red-lined" as appropriate by the design discipline lead (or other appropriate Reviewer) who will then return the QC Document to the Originator. Step 3 will require the Originator to "highlight" the "red-line" comments on the QC Document once the correction has been made or to otherwise resolve the "red-line" comments with the Reviewer, making note of the final resolution. Step 4 will involve the creation of the corrected document by the Originator, back-checking by the Reviewer, and the creation of record copies in accordance with the QA/QC Plan.

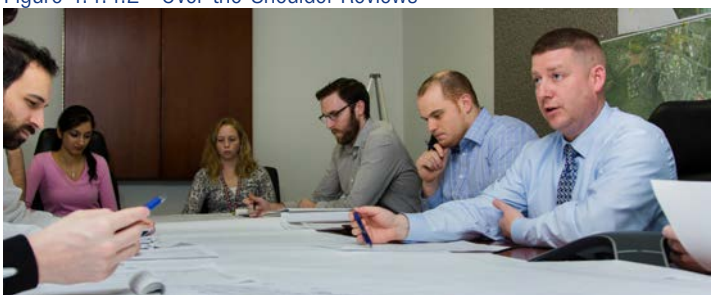
The Design Quality Assurance Supervisor, Steve Kuntz, PE, DBIA, will perform design quality assurance reviews throughout the duration of the Project as set forth in the QA/QC Plan. Steve will ensure that all design deliverables, including design directives and revisions, follow this process and will work with the Design Manager to establish preventative and corrective measures as may be needed. He will ensure design standards, methods, and requirements of the Project are met, professional engineering judgment was applied correctly, and appropriate degree of care was utilized.

Interdisciplinary Coordination

Bringing together multiple concerns from design and permitting disciplines as well as between construction, utility, and right-of-way personnel into one overall action plan will be critical to the success of the Project. Throughout our Team's history of working together on VDOT design-build projects, we have found that constant informal and formal interaction between all team members (through management channels) is the best way to ensure complete coordination. Consequently, our Team will emphasize and facilitate various pre-determined meetings as well as ad-hoc meetings as needed for immediate resolution of a particular challenge.

Up until plan approval, the Design Manager will hold weekly coordination meetings with the design discipline leads (roadway, structural, hydraulic, geotechnical, traffic engineers, and the environmental scientist) to discuss weekly tasks and interactions that need to occur. Long lead items (such as environmental permits) will be discussed, avoidance and minimization strategies will be established, and potential conflicts or challenges will be identified and resolved. The goal of the weekly design meetings will be to keep the design highly coordinated, minimize unforeseen situations, and address situations in a collective setting at the lowest possible level.

Figure 4.4.4.2 - Over-the-Shoulder Reviews



As shown in Figure 4.4.4.2, our Team has also found informal, "over-the-shoulder" reviews from construction personnel work best to produce quality designs. These types of reviews will be conducted at bi-weekly progress meetings, held by our Team, where the Design Manager (and the design discipline leads, as appropriate) will present the current design to construction, utility,

and right-of-way personnel. Immediate feedback regarding the design will be provided and necessary adjustments will be discussed so that unnecessarily difficult, unsafe, or out of schedule construction and/or impacts will be avoided. Explanations regarding design requirements will also be discussed, so that issues will be resolved quickly and correctly, ultimately resulting in a superior Project.

The DBPM and Design Manager will coordinate formal design reviews by construction personnel prior to each design deliverable submission. Comments regarding the constructability of the design will be provided to the Design Manager to incorporate and/or discuss prior to completing each design phase.

Formal Review by VDOT and Third Parties

Design deliverables will be prepared and submitted to VDOT and third parties as required for review as well as to solicit and resolve comments throughout the design process. Review comments, responses, response codes, and final dispositions will be recorded on VDOT's Project Review Comment and Resolution Sheet which the Design Manager will be responsible for obtaining and maintaining.

When review comments are received from VDOT and/or third parties, the Design Manager will assemble, organize, and distribute the comments to the design discipline leads who will assess the comments and provide responses. When complete, the Design Manager will review all comment responses and together with the design discipline leads, will determine if a Comment Resolution Meeting (CRM) is necessary. If a CRM will be needed, the Design Manager will coordinate with VDOT and/or the third party to schedule and conduct the meeting, determine the final disposition of all comments, record the resolution, and make the necessary design adjustments.

Design Changes During Construction

Changes in site conditions, corrections to the original design, value engineering, alternate construction methods and/or materials, and other design related changes after Released for Construction Plans will be known as Field Directed Changes (FDC's). The Construction Manager will generate the FDC and the Design Manager will ensure that the tracking and review of the FDC adheres to the requirements of the QA/QC Plan, commensurate with those applied to the original design. If the FDC requires a change to the approved design documents, the Design Manager will ensure that a formal revision will be created and submitted to VDOT for review and approval, commensurate with those applied to the original design.

Requests for Information

Requests for Information (RFI's) will follow a uniform and documented process to provide additional information to clarify design information presented within the Released for Construction Plans. Under no circumstances will a RFI be used to correct incorrectly constructed work or to request a FDC. The Construction Manager will generate the RFI, after consulting with the Construction Quality Control Manager, and the Design Manager will ensure that the tracking and review of the RFI adheres to the requirements of the QA/QC Plan.

As-Built Plans

Record Plan (As-Built Plans) will be a set of Released for Construction Plans that are updated (red-lined) on a continual basis to reflect changes in the design. The Design Manager will be responsible for creating the As-Built Plans which begins by the Construction Quality Control Manager (or his designee) compiling and maintaining a set of red-lined plans for changes made during construction. This information will be provided to the Design Manager who will verify all FDC's, RFI's, and additional changes have been included in the red-line plans – at which time the changes will be incorporated into an official As-Built Plan. The As-Built Plans will adhere to the requirements of the QA/QC Plan, commensurate with those applied to the original design.

Design Quality Training

Design quality training will be conducted by the Design Quality Assurance Supervisor, Steve Kuntz, PE, DBIA, and will include an overview of the quality assurance organization, functions and responsibilities of QA/QC personnel, as well as the QA/QC Plan. Training will occur before the start of design activities and will include design sub-consultants. Additional training will occur as needed.

Constructability Review

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

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

Quality Assurance and Quality Control of Design and Field Changes

Design changes, including field adjustments, will adhere to the requirements of the QA/QC Plan, commensurate with those applied to the original design. The Design Manager ensures that QA and QC reviews of changes after plan approval occur throughout the duration of the Project. Each change is submitted to VDOT for concurrence prior to implementation in the field.

Description of Construction QA/QC Procedures

Our Team's Construction QA and QC Procedures, found within our QA/QC Plan, have been established to conform to VDOT's Minimum QA/QC Requirements. Our Plan stipulates the specific requirements of the Project and implements appropriate Witness and Hold Points for inspection of work at critical stages. These critical inspection points allow for VDOT review and approval and identify inspection requirements by the key members from the Design Team prior to construction activities continuing. Having this level of Design Team involvement in construction activities allows the engineer to confirm that actual construction conditions conform to the parameters anticipated during design.

During construction, the QA and QC Teams follow the established and approved QA/QC Plan. The QA/QC plan is structured to ensure that QC and QA functions are performed independently and that procedures and work products are regularly audited. Key elements of the Construction QA/QC Procedures are summarized in the following paragraphs.

Construction Quality Assurance

The Quality Assurance Manager (QAM), Avtar Singh, P.E., DBIA, CCM, PMP with CES Consulting, LLC, is independent of the Designer, Contractor, and QC Team, and is responsible for Quality Assurance of the roadway, bridges, and other physical construction operations, including the independent QA testing technicians. The QAM will report directly to the Design-Build Project Manager, and has the authority and responsibility to stop work and withhold payment for any work not being performed in accordance

with the Contract requirements or lacking the QA/QC documentation necessary to prove that the work meets Contract requirements. The QAM oversees and directs personnel responsible for performing QA inspections and testing of all materials used and work performed on the Project. He has personnel representing the QA Team that reports directly to him and is not part of the QC Team.

The QAM is experienced and recognizes the differences between deficiencies and Non-Conforming Reports generated by the construction work in the field and has extensive experience in coming up with solutions to resolve these items expeditiously. All deficiencies will be corrected and will not be part of the permanent work; these deficiencies will be immediately relayed (verbally to foreman/superintendent) and documented (via email and daily work report) to the Quality Control Team (QA/QC/IA/CM) to address. The resolution of the deficient item will be witnessed and inspected by the QC/QA inspector and documented (daily work reports, before and after photos or testing as needed).

As part of the Project communication with all stakeholders, the QAM will attend the weekly QA/QC/VDOT meeting to discuss any open items and upcoming work related to the Quality Control and Quality Assurance. Some items that will be discussed at this meeting include Discrepancies, NCRs, MOT, Safety, E&S, RFIs, Project Documentation amongst others.

The QA inspectors will test the material at the required frequency and will be record the tests in the testing tabs incorporated in the new Materials Book issued by VDOT Materials Division. Their daily work reports will document the inspections, materials testing, shop drawings and plans used for the work item at hand, photographs of the work being performed, any deficiencies, MOT and Safety setup or concerns, lane closure hours, visitors and any other relevant items.

All QA inspection staff complete daily reports and QA Independent Assurance (QA IA) and verification sampling and testing (QA VST) reports of all quality assurance inspections. The QAM compares QA IA and QA VST results to the QC, Owner Independent Assurance (OIA) and Owner Verification Sampling and Testing (OVST) results to ensure consistency and accuracy at all testing levels. The QAM determines and certifies to VDOT whether the materials and work are in compliance with the approved drawings, specifications, and applicable VDOT standards and reference documents as outlined in the Contract. The QAM ensures that all inspectors have adequate certifications for the testing performed and that copies are maintained in the QAM project files on site. The QAM has autonomy and the responsibility to coordinate QA inspections and report findings directly to VDOT.

The QA inspection documentation (diaries, testing logs, Materials Book, project photos, NCR logs, Deficiency logs, MOT work zone checklists, C-107s, up to date SWPPP) will be kept in a cloud-based electronic format and will be available for VDOT review and audit at any time (either at the Project or remotely). By following the VDOT guidance for testing and inspection and the Team's approved PQMP, we will ensure that VDOT will have the information to carry the necessary audits and will not have to extend additional effort for the construction administration of the Project.

Construction Quality Control

The Construction Quality Control Manager (QCM), Nick Carswell, with Dewberry, manages the day-to-day QC inspections and material testing of the construction as directed by the Construction Manager and reports directly to the Construction Manager. The QCM and the QC Team are responsible for inspection of the construction activities and all QC sampling, testing and analysis of materials to ensure that construction quality is verified at frequencies exceeding those required by the *VDOT Construction Manual*, *the VDOT Materials Manual of Instructions* and Tables A-3 and A-4 of VDOT's Minimum QA/QC Requirements. As the QCM, he assures that the QC materials sampling and testing is consistent with the QC plan. All QC

staff actively inspecting and/or testing segments of work complete an Inspector Daily Report (IDR). The IDR's are electronic dairies in accordance with VDOT's Construction Division Memorandum CD-2000-14 and include, as an attachment, copies of all QC materials tests completed for the day's activities. Signed hard copies of the IDR's are submitted to the QCM on a daily basis for review and approval. The QCM completes an electronic Daily General Report, which summarizes the work covered by the IDR's. Copies of all signed Daily General Reports, IDR's, and test reports are then forwarded to the Construction Manager, QA Manager and others on the design-build team for use and review while the original documents are placed in three-ring binders, by project and month and maintained as part of the permanent QC records. All binders are stored in fireproof storage cabinets at the Project site and are available for audit by the QAM and VDOT at any time. A weekly report is produced by the QCM that contains summaries of tests, materials placed, actions taken for failing materials, NCR's, safety, inspection, environmental and schedule challenges.

QA/QC Staffing Plan

The personnel selected and staffing commitments of our QA/QC Team provides VDOT with an unparalleled experience and understanding of the quality processes and coordination needed to successfully deliver the Project. Our design and construction staff has worked together and with VDOT for many years and is responsible for assembling and overseeing our QA/QC Plan. A description of our QA/QC staff and duties as well as our staffing commitments are in Figure 4.4.4.3 and Table 9:

Figure 4.4.4.3 - Staffing Plan Organizational Chart

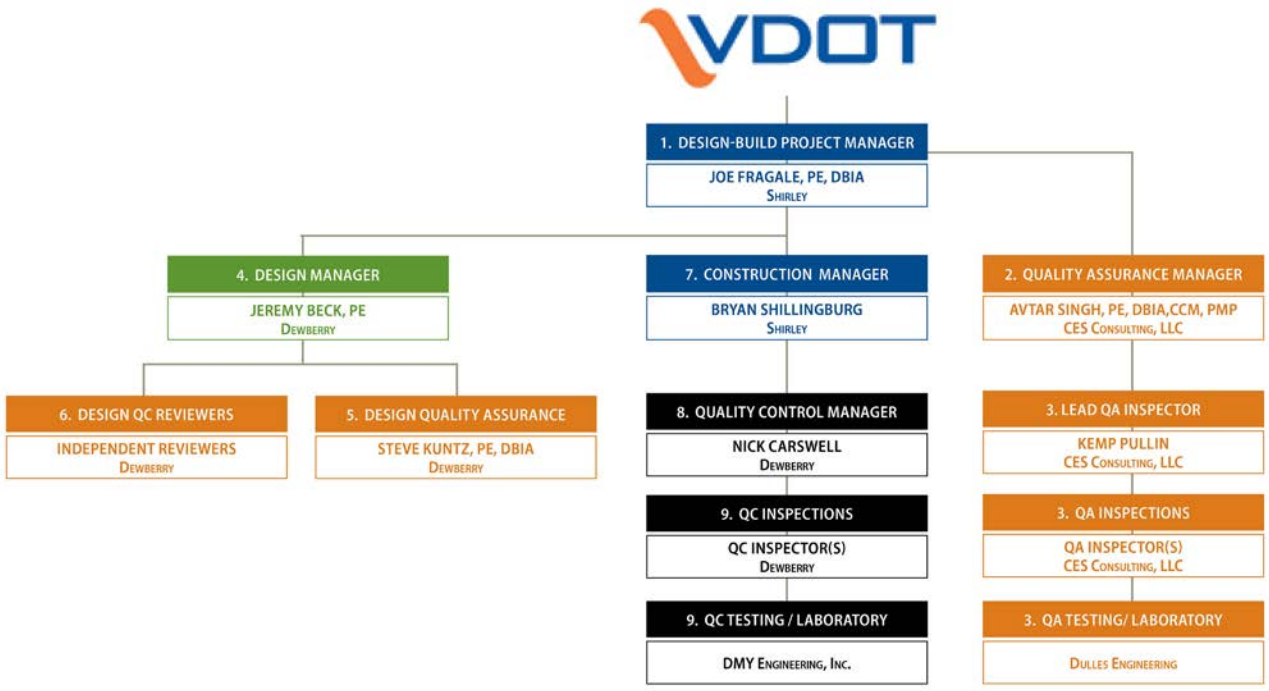


Table 9 - QA/QC Staff and Duties

1. Design-Build Project Manager (DBPM)
As DBPM, ***Joe Fragale, PE, DBIA***, provides supervision and administrative management of the entire project including the overall design and construction. He establishes the QA/QC program and adjusts the process as needed to assure quality of d sig a dc n tru tio
2. Quality Assurance Manager (QAM)
Avtar Singh, PE, is the QAM and is responsible for the development of and adherence to the QA/QC Plan, ensuring all work and materials, as well as testing and sampling is performed in accordance with the Contract and approved construction plans and specifications.Avtar ensures that QA and QC staffing levels are adequate and comprehensive based on the current work activities. He will be supported by at least one full-time Lead QA inspector for roadway and bridge activities (Kemp Pullin). The Lead QA inspector will be supported by QA materials testing technicians, the number of which will vary depending on the number and locations of construction activities underway at any time. Avtar has full authority to initiate work stoppage and is able to recommend to VDOT withholding payment for design and/or construction activities that are not acceptable - this authority will be made in writing as part of the QA/QC Plan.
3. Quality Assurance (QA) Testing and Inspection Technicians
CES Consulting, LLC (CES) will provide one Lead QA Inspector for roadway and bridge construction. The QA inspector will be supported by additional part-time inspectors to ensure QA testing and inspections of work items are performed, QC inspections are observed, and correction of non-conformities are completed in accordance with the Contract documents. Based on the scope and our preliminary schedule of construction activities, we anticipate an additional QA inspector to be on-site during construction. Additional inspectors will supplement the lead inspector when level of work activity necessitates. The Lead QA inspector reports directly to our QAM. ***Dulles Engineering*** will perform QA laboratory testing and is a AMRL and CCRL certified laboratory and is independent from QC laboratory testing on the Project.
4. Design Manager (DM)
Jeremy Beck, PE, directs and coordinates the design process including work by sub consultants and is accountable for the design QA/QC Plan. He is responsible for implementing, monitoring, and as necessary, adjusting the Design QA/QC Plan to ensure acceptable quality of the design work. Jeremy will remain involved during construction to ensure design reviews are comprehensive of all construction submittals, and to ensure design involvement is appropriate for reviews of field adjustments, RFI's, and shop drawing reviews.
5. Design Quality Assurance Superv sor
Steve Kuntz, PE, DBIA, is responsible for QA of design elements included in the Project. Following completion of QC reviews he performs a complete QA review of all design documents prior to submission to VDOT.
6. Independent Design QC Rev ewers
Independent Design QC Reviewers perform the design QC function on each design element. The Design QC reviews are completed by qualified independent reviewers who do not have a direct role in the design development or the QA review function. Each of the QC staff will have prior design experience for the discipline being reviewed to ensure accuracy.
7. Construction Manager (CM)
Bryan Shillingburg, is the CM and is accountable for day-to-day construction operations, the construction portion of the QA/QC Plan, and ensuring construction is in accordance with the Project requirements. He will be on-site full-time for the d ati f c n tru ti p ratio .
8C onstruction Quality Control (QC) Manager
Nick Carswell, is responsible for construction QC and oversees construction QC testing and inspection operations. Nick assigns inspectors and testing technicians for each work package and monitors reporting documentation to ensure that work packages were completed in conformance with the Contract requirements. Based on the preliminary schedule and overlapping work activities, we anticipate one full-time QC inspector for roadway construction, one inspector for bridge construction, and supplemental technicians as needed during peak construction periods. The number of QC inspectors and technicians will decrease during slower periods, such as during winter months and as work decreases towards the completion of the Project.
9. Construction Quality Control (QC) Inspections and Testing
Together, Dewberry & DMY Engineering, Inc. are responsible for QC testing and inspection of construction for conformance with the QA/QC Plan and project related documentation. They possess current VDOT materials certifications for the types of testing and/or inspections they are assigned to complete. DMY provides the independent AMRL and CCRL certified QC Lab ato y t p rfo m all QC lab ato y ests.

Design QA/QC Procedure for One Unique Project Element

Roundabout Configuration

Based on our Team's Design Concept included in ATC 001, VDOT's stated goals, the existing topography, and other Project constraints, our Team has determined that the most critical design element for the Project will be the configuration of the roundabouts. As such, the narrative that follows describes why this design element will be critical as well as the QA/QC procedures that will be implemented to minimize the likelihood of additional VDOT QA/QC efforts.

Proper roundabout design is best verified through performance checks as the layout is developing. These checks ensure that an effective configuration has been achieved while simultaneously meeting the safety and operational principles inherent with roundabouts. These principles include:

- Providing slow entry speeds and consistent speeds through the roundabout by implementing appropriate deflection;
- Providing the appropriate number of lanes and lane assignment;
- Providing smooth channelization that will be intuitive to drivers and will result in vehicles naturally following their intended paths;
- Providing adequate accommodations for the design vehicle;
- Meeting the needs of pedestrians and cyclists; and
- Providing adequate sight distance and visibility for driver recognition of the intersection and potentially conflicting users.

Each principle above will affect the safety and operation of the roundabouts and when developing the design, certain trade-offs will often occur which will need to be assessed. These principles are most directly related to three major design parameters including (1) the size of the inscribed circle, (2) the position of the approach legs with respect to the inscribed circle, and (3) the alignment of the approach legs.

While establishing the major roundabout parameters, it is critical to recognize vertical differences between proposed and existing grades, understand the maintenance of traffic phasing, consider splitter islands, entry and exit locations, the circulatory roadway width, landscaping, and signing. However, due to the numerous variables involved and the impact the roundabout configurations will have to the rest of the interchange, once the three major design parameters have been established for each roundabout, the Design Manger will ensure performance checks including fastest path, sight distance, and angles of visibility checks will be performed (briefly described below) before continuing with design.

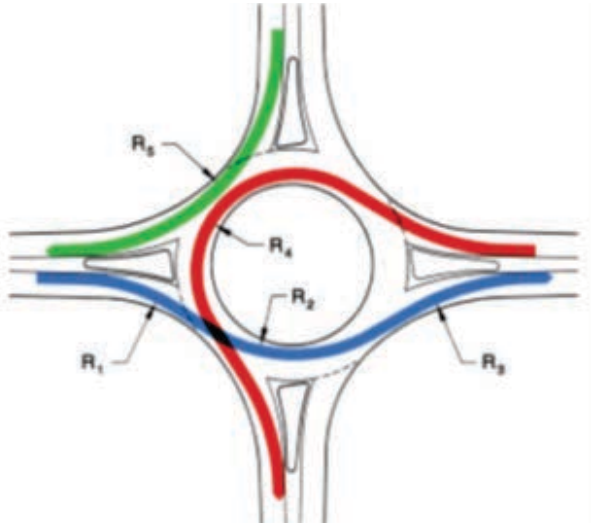
Our Team fully understands that iteration within the roundabout design process will be an integral part of our efforts. Often it will take several iterations to achieve the proper balance of design objectives. The Design Manager will provide exhibits to VDOT demonstrating that the performance checks have been conducted and that the roundabout configurations have been optimized and are in accordance with the applicable roundabout criteria and design guidelines.

Fastest Path

The fastest path allowed by the geometry will determine the negotiation speed into, through, and leaving the roundabout for a particular movement and will be the smoothest, flattest path possible for a vehicle, in the absence of other traffic and while ignoring pavement markings. Consistency between the speeds of various roundabout movements will help to minimize the crash potential between conflicting traffic

streams. Therefore, our designers will check five critical path radii for each approach as illustrated in Figure 4.4.4.4 by constructing the vehicle paths, estimating the speed of negotiating the path, and improving the speed consistency by altering the three major design parameters as appropriate. At the conclusion, the speed differential within the roundabout between movements should be no more than 15 mph.

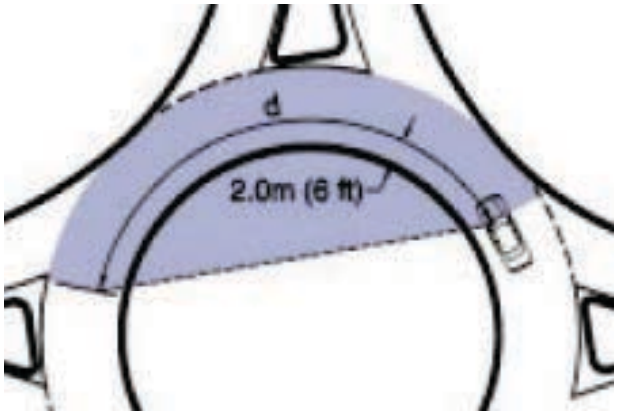
Figure 4.4.4.4 - Vehicle Path Radii from US Department of Transportation Federal Highway Administration, Roundabouts: An Informational Guide.



Sight Distance

The two most relevant aspects of sight distance for roundabouts are stopping sight distance as shown in Figure 4.4.4.5, and intersection sight distance. At roundabouts, three critical stopping sight distances include approach sight distance, sight distance on the circulatory roadway, and sight distance to crosswalks on exit. Intersection sight distance is the distance required for a driver without the right-of-way to perceive and react to a potentially conflicting vehicle.

Figure 4.4.4.5 - Vehicle Path Radii from US Department of Transportation Federal Highway Administration, Roundabouts: An Informational Guide.

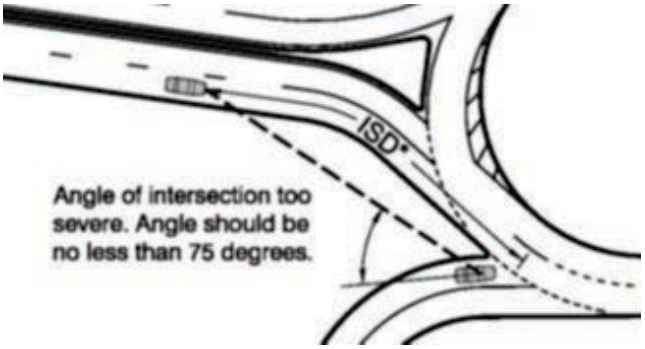


Using a height of eye of 3.5' and a height of object of 2', our designers will establish and assess the stopping sight areas within and adjacent to the roundabouts, making ap p iate d sig aj s tmen s to en n e d iv rs will have a clear sight line to perceive and react to an object in the roadway and to brake completely before reaching the object. Using both a height of eye and object of 3.5', our designers will also evaluate the intersections sight distance at all entry points to the roundabouts, again making design alterations as needed to ensure safety and ease of operation. Once the "sight triangles" for stopping sight distance and intersection sight distance have been established, they will be shared with other design disciplines to ensure encroachments such as landscaping o sig will n o cn .

Angles of Visibility

The intersection angle between consecutive rd b en ry p n s ms t n b v rly act e so that drivers can comfortably turn their head to the left to view oncoming traffic from the immediate upstream entry point. Therefore, our designers will check the intersection angle between consecutive entry points and will ensure a 75 degree minimum intersection angle, as shown in Figure 4.4.4.6, by making the necessary design adjustments.

Figure 4.4.4.6 - Approach Angle from US Department of Transportation Federal Highway Administration, Roundabouts: An Informational Guide.



The Design Mangaer ensures the performance checks are conducted simultaneous with design development, appropriate adjustments are made, and the established QA/QC procedures are followed. The Design Quality Assurance Manager verifies that QA/QC checks performed by appropriate personnel are performed, and that design requirements and professional care is taken to minimize the need for additional VDOT QA/QC. Figure 4.4.4.7 illustrates the configuration of the eastern roundabout after the performance checks were conducted during procurement.

Figure 4.4.4.7 - Eastern Roundabout Layout After Performance Checks

Construction QA/QC Procedure For One Unique Project Element

The construction of the pile supported bridge abutment is one of the critical elements from a quality perspective as settlement is anticipated during this installation. This is our unique construction element for the Project.

Our Team's approach to addressing construction quality of the abutment settlement will begin prior to start of the fieldwork. The QAM (and his team) will be thoroughly familiar with the work planned through review of all plans, shop drawings, geotechnical engineering report, special provisions, settlement monitoring plan, contractor RFP commitments. This information is collected and utilized for the Preparatory Inspection Meetings (PIM) for the element of work. At the PIM, the work means and methods, specifications and standards, approved C-25s, approved shop drawings, manufacturer's recommendations, safety concerns, MOT setups, production rates, materials testing and sampling methods and frequencies, coordination with IA/IV testing and hold points will be discussed in detail. In closing the preparatory meeting the QAM confirms with VDOT construction that the feature can occur.

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

For the installation of the steel piles, the QA/QC Team will ensure that the survey layout of the piles are verified in the field prior to drilling. Once the drilling has started, the Team will inspect and verify that the drilling spoils being removed match the geotechnical data and immediately advise the Geotechnical Engineer of any differences. The tip elevation of the bored hole will be checked and recorded and the bottom of the hole will be inspected to ensure that all loose material has been removed. The installation of the steel pile will be inspected for alignment and location after it has been braced and approved concrete mix poured at the bottom of the pile to hold it in place. The pile center of gravity will be checked at this time to ensure that the VDOT specifications have been met and the piles will be spliced to their final height. The inspectors will be using the Pile Driving forms (modified for drilled piles) daily log to record tip elevations, type of material removed, and any other observable anomalies.

After all piles have been installed, the area in the MSE footprint will be graded and the MSE levelling pad area tested using Dynamic Cone Penetration test to ensure that the required bearing capacity has been attained. The corrugated metal sleeves will then be installed around the steel piles and braced to prevent any movement.

To ensure that the anticipated settlement of the abutment is properly measured and recorded, settlement plates will be installed. Two surveys will be utilized to establish baseline elevations and ensure accuracy. The MSE levelling pads will be formed and poured to allow the start of the MSE walls.

The construction of the MSE walls (consisting of MSE panel installation, corner panels, reinforcing strips and anchors, geotextile fabric covering the joints, and stone backfill) will be carried out per the manufacturer's approved MSE Wall installation guide. The backfill of the stone will be carried out under strict observation to ensure that the approved equipment is in the correct zones. As the MSE wall increases in height, additional settlement plate risers will be added and elevation surveys will be taken before and after installation of each riser extension. The elevation of the riser will also be surveyed daily as the work continues.

As the MSE wall gains height, the QA Team will ensure that the Project safety plan is followed to prevent fall hazards at the edges of the MSE walls. The Team will attend the daily safety meeting and tool box talks as needed and appropriate.

Upon the MSE Wall reaching the height of the abutment, the monitoring points will continue to be surveyed twice a week, the elevations recorded and submitted to the Geotechnical Engineer for review. This process will continue until the total anticipated settlement has been attained and the Geotechnical Engineer has approved and affirmed that the design criteria has been met.

4.5 - Construction of the Project

4.5 Construction of the Project

4.5.1 Sequence of Construction

Throughout development of our Technical Proposal, our Team focused on means and methods to finish critical stages of work safely, quickly and efficiently. Key elements of our Team's collaborative process included optimizing the sequence of work which allows our Team to achieve the goals of:

- Ensuring the safety of the traveling public and workers;
- Providing efficient mobility and full connectivity for the traveling public;
- Effective management of environmental and geotechnical constraints;
- Proactive stakeholder coordination; and
- Early Completion

Our Team's Proposal Schedule, presented in Section 4.7, was developed with input from all Project disciplines including design, permitting, utilities, ROW, QA/QC, and construction. We then analyzed and incorporated numerous enhancements, which are listed in Table 10 to exceed the above goals.

Table 10 - Project Enhancements and Benefits

Enhancements	Benefits
Conceptual Design Maximizes Off-Line Construction	▪ Minimizes impacts to traveling public ▪ Eliminates jughandle diversion and temporary signal ▪ Facilitates crew and schedule flexibility to minimize delay risk
Maximize use of existing wide medians for temporary widening	▪ Maintains the existing lanes while allowing for phased construction at the tie-in areas ▪ Minimizes impacts to the traveling public
Design closely matches existing and proposed grades at ramp tie-ins	▪ Minimizes traffic disruptions after opening of the interchange during completion of ramps
Relocation of the Park and Ride Lot	▪ Minimizes construction impacts on nearby signalized intersections and stakeholders ▪ Utilizes existing right-of-way and reduces risk of ROW acquisition delay
Conceptual Design Relocates NB on-ramp	▪ Eliminates the schedule timeframes for retaining wall construction ▪ Reduces the construction impacts on adjacent land owners ▪ Minimizes risk of ROW acquisition delay ▪ Reduces risk of scheduled delay
Commit to Unique Milestone and Early Completion	▪ Contractual commitments by the Team to achieving schedule milestones for the public benefit

Construction Sequence

We propose three major Stages of roadway construction corresponding to our Team's Temporary Traffic Control (TTC) Plan shown on Exhibit 4.5.1.1 and detailed in Section 4.5.2 - Transportation Management Plan. Each Stage corresponds to a major traffic control sequence as construction activities progress. A brief summary of the work included in each Stage is described in Table 11.

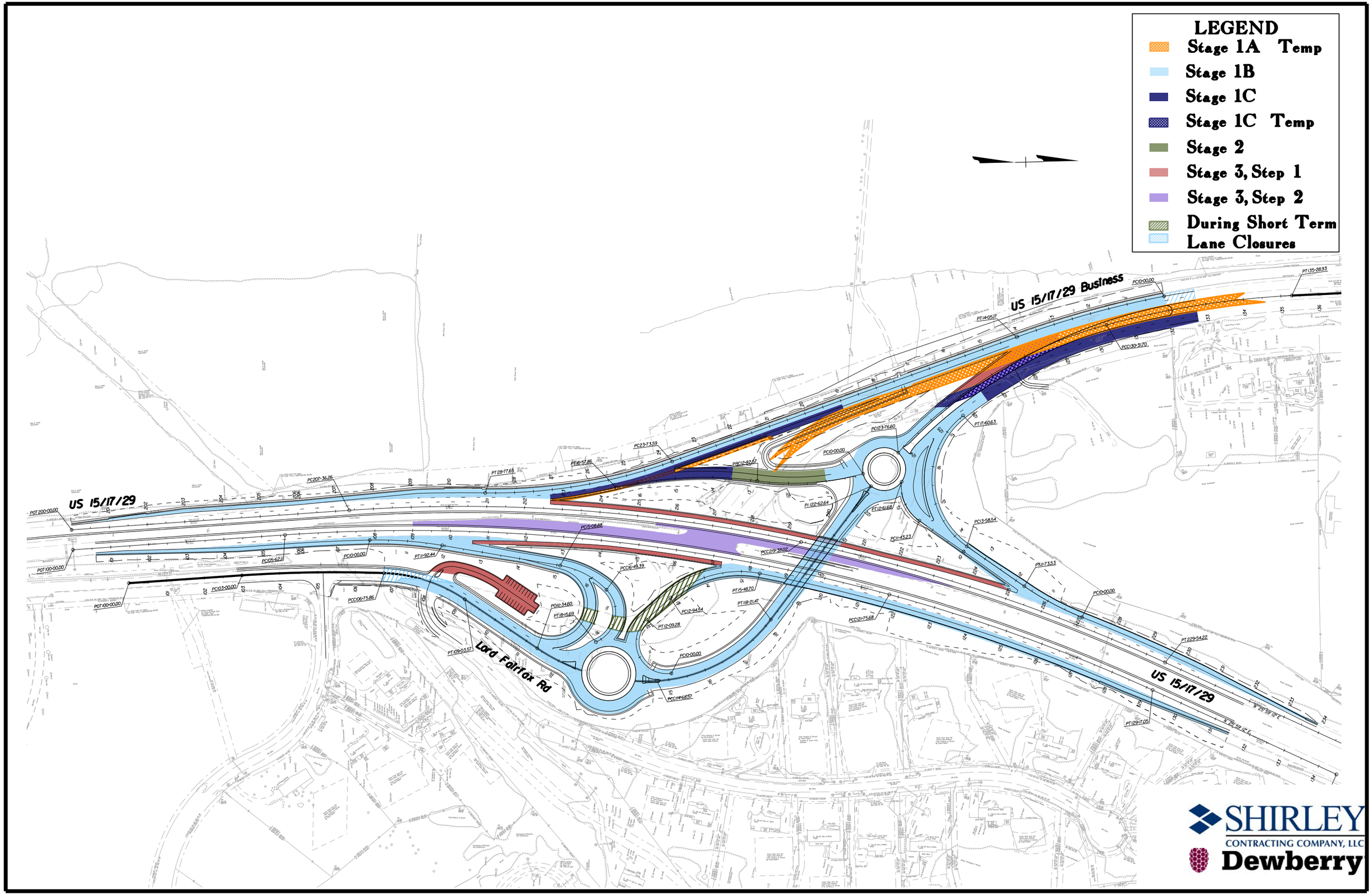

LEGEND
Stage 1A Temp
Stage 1B
Stage 1C
Stage 1C Temp
Stage 2
Stage 3, Step 1
Stage 3, Step 2
During Short Term Lane Closures
US 15/17/29 Business
US 15/17/29
Lord Fairfax Rd
US 15/17/29

Table 11 - Construction Stages

Stage		Activity
Stage 1	**1A**	▪ Mobilization ▪ Temporary construction of US 15/17/29 Business in existing median
	1B	▪ Bridge ▪ First stage of SB on-ramp reconstruction ▪ East and west roundabouts ▪ US 15/17/29 interchange ramps ▪ SB US 15/17/29 Business reconstruction ▪ Lord Fairfax Road
	1C	▪ NB US 15/17/29 Business ▪ Open interchange and remove existing traffic signal ***(Unique Milestone)***
Stage 2		▪ Second stage of SB on-ramp reconstruction ▪ Complete SB on-ramp (from east)
Stage 3		▪ Park and Ride Lot ▪ Complete Permanent Construction of US 15/17/29 Business ▪ Complete Mill & Overlay on US 15/17/29, including Option 2 if awarded. ▪ Demolish existing intersection in median and complete US 15/17/29 inside shoulders ▪ Place all permanent pavement markings, signing, lighting, and "Finishing" items ▪ Punchlist and Project closeout

Provided below is a detailed description of each stage and the benefits of our Team's proposed sequence:

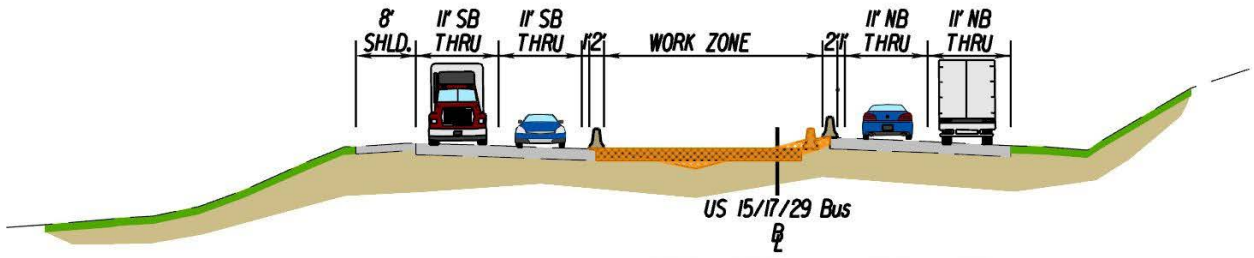
Stage 1

Overall, the work included in Stage 1 constructs a majority of the proposed interchange. Our Team developed a TTC Sequence that maximizes the construction of the interchange offline from the existing roadway.

STAGE 1A - Temporary Construction US 15/17/29 Business in Existing Median

To facilitate offline construction and minimize the impacts to the traveling public, Stage 1A, shown in Figure 4.5.1.1, constructs temporary pavement in the median of existing US 15/17/29 Business. This temporary pavement affords the additional width necessary to allow for construction of portions of SB on-ramp, to the South, as well as the ultimate interchange to the North.

Figure 4.5.1.1 - Stage 1A Construction

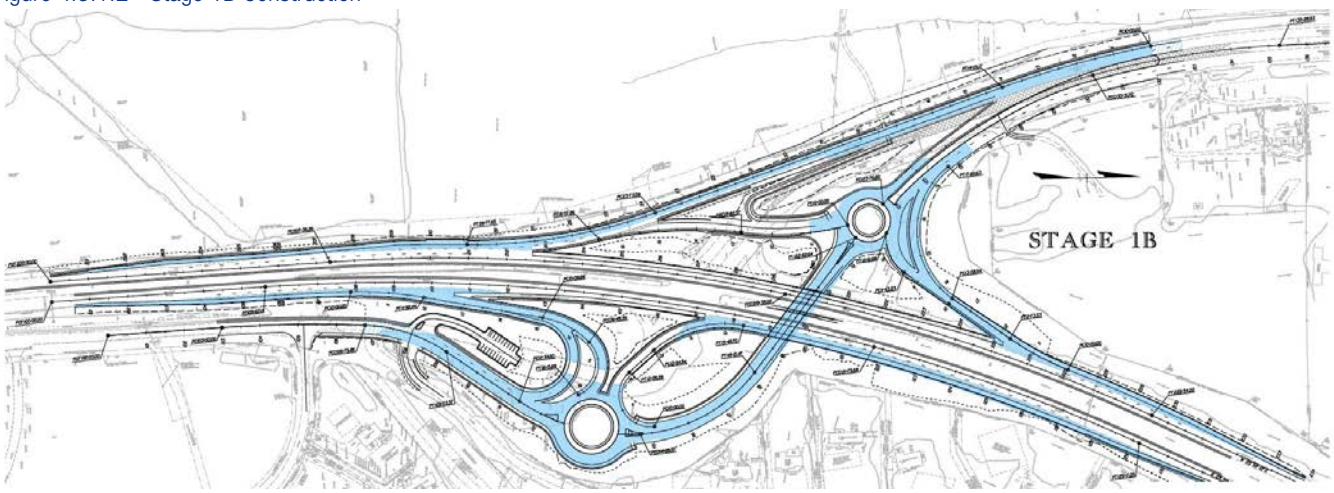


Since all of Stage 1A work is contained within existing VDOT ROW, work can begin in Stage 1A upon approval of the Released For Construction Roadway Plans.

STAGE 1B -Permanent Construction of Offline elements

Once our Team shifts traffic at the end of Stage 1A, construction of the majority of Project elements will begin. Specifically, Stage 1B, shown in Figure 4.5.1.2, consists of all of the interchange elements, out of traffic, and Bridge B616. Generally, all work areas are available for construction concurrently.

Figure 4.5.1.2 - Stage 1B Construction



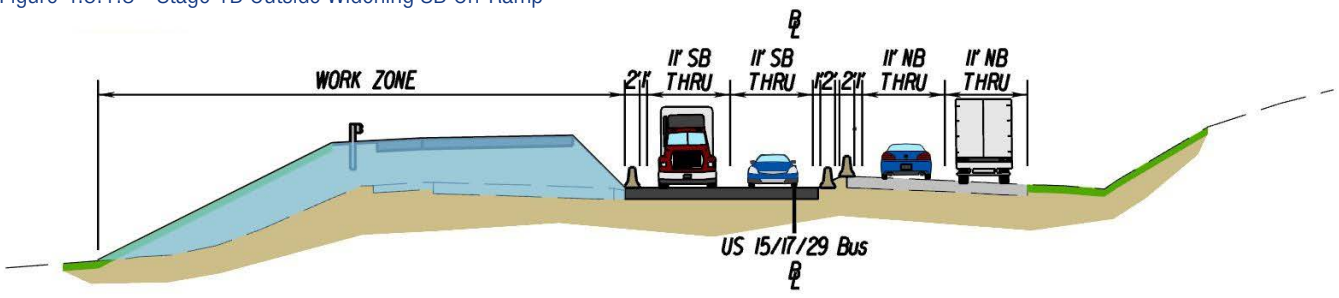
Stage 1B Bridge Construction

Due to our Team's Conceptual Design, construction of Bridge B616 over US 15/17/29 will occur offline of the existing intersection and in the existing median. Locating the substructure elements outside of the existing roadway allows construction to take place during daytime work hours without impacting the traveling public or requiring extensive night operations. While some night operations will be necessary for construction of certain bridge elements such as beam erection, deck overhang/falsework installation, and deck concrete placement, activities will be limited to those that affect the safety of the traveling public. These operations will be extremely limited in duration and will be coordinated in advance with the affected stakeholders. The majority of other bridge activities in this Stage will be behind temporary traffic barrier.

Stage 1B Roadway and Drainage Construction

Following the issuance of environmental permits, clearing and grubbing activities, roadway drainage and excavation activities will commence in all work areas. Work will include the outside wideing of the SB on-ramp as shown in Figure 4.5.1.3. Roadway excavation and grading includes stripping of all native topsoil. Any suitable excavation will be cut and placed in fill areas up to subgrade. In all areas, we have allowed time in our excavation activities to account for the remediation, or removal and replacement, of soft or unsuitable soils.

Figure 4.5.1.3 - Stage 1B Outside Widening SB On-Ramp



Stage 1C – Phased Construction of Both SB On-Ramps, Western Limits of US 15/17/29 Business

Once US 15/17/29 Business NB traffic is switched onto the temporary widening in the existing median and US 15/17/29 Business, SB traffic will be switched to it's ultimate location, as shown in Figure 4.5.1.4. The remainder of Stage 1C can then be constructed as shown in Figure 4.5.1.5.

Figure 4.5.1.4 - Stage 1C SB US 15/17/29 Business

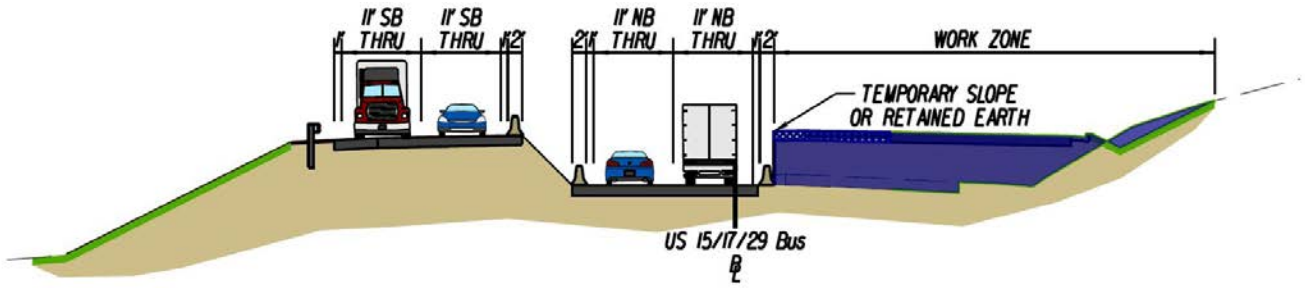
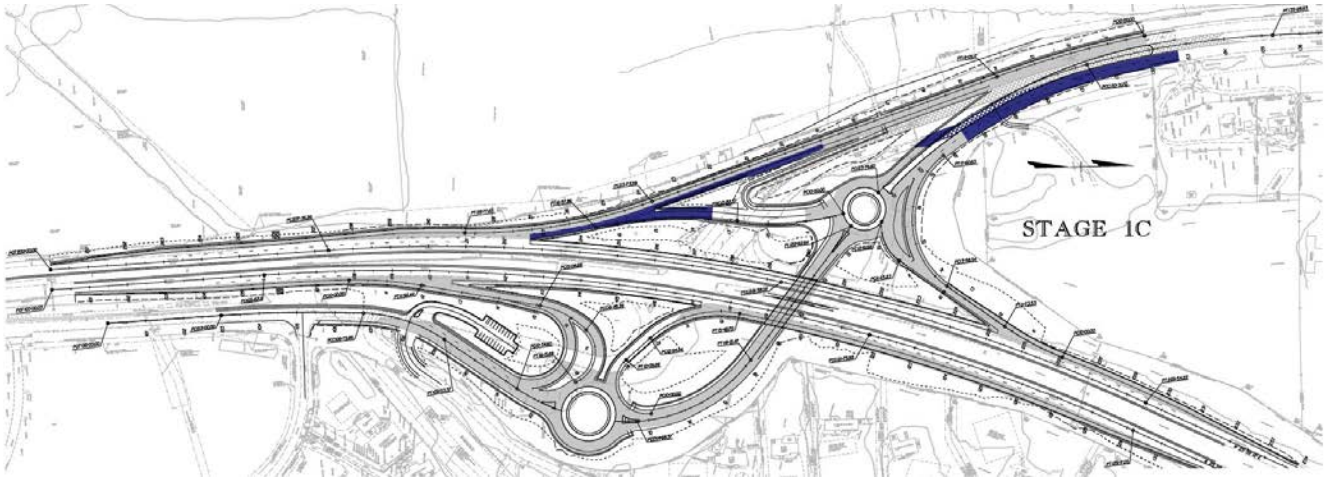


Figure 4.5.1.5 - Stage 1C Construction

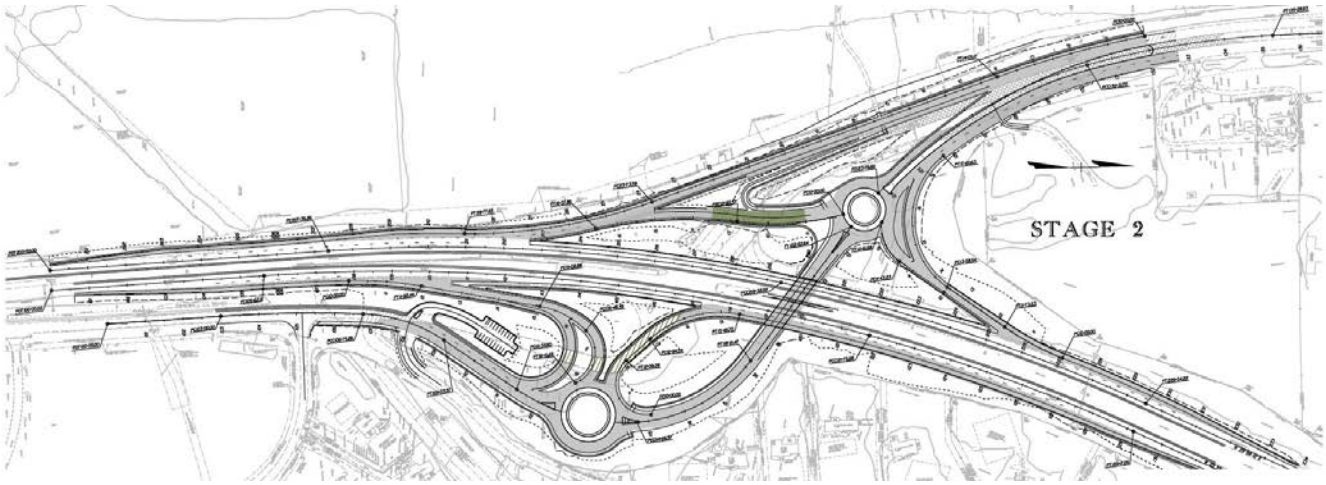


At the end of Stage 1, traffic will be switched to the newly constructed portions of the interchange, and the existing traffic signal will be deactivated and removed. This represents our Team's Unique Milestone. Concurrently, the westbound Lord Fairfax Road to SB US 15/17/29 traffic will be detoured utilizing the NB on-ramp, NB US 15/17/29 to the Meetze Road exit, and returning to SB 15/17/29.

STAGE 2 – Complete Ramp Connections

Following completion of Stage 1, Stage 2 consists of the remaining construction of the SB on-ramp to allow for the removal of the Meetze Road detour as shown in Figure 4.5.1.6.

Figure 4.5.1.6 - Stage 2 Construction



Stage 3 - Park and Ride Lot, Mill and Overlay, Final Completion

As shown in Figure 4.5.1.7, Stage 3 work will consist of completion of US 15/17/29 Business as shown in Figure 4.5.1.8, construction of the Park and Ride Lot, widening of US 15/17/29 between the Ramps, demolition of the existing asphalt in the median, placement of all final surface asphalt, and roundabout lighting. If Option 2 is awarded, completion of the additional mill & overlay would also be performed in this Stage. Placement of surface asphalt at the end of all construction ensures that all final paving is completed at the same time. This provides for the best possible rideability when utilizing an existing underlying pavement structure, and a smooth, "clean" look upon completion. As all work is completed, the inspection and punchlist process will be performed, and the Project will achieve an early Final Completion by November 25, 2020, prior to the Thanksgiving holiday.

Figure 4.5.1.7 - Stage 3 Construction

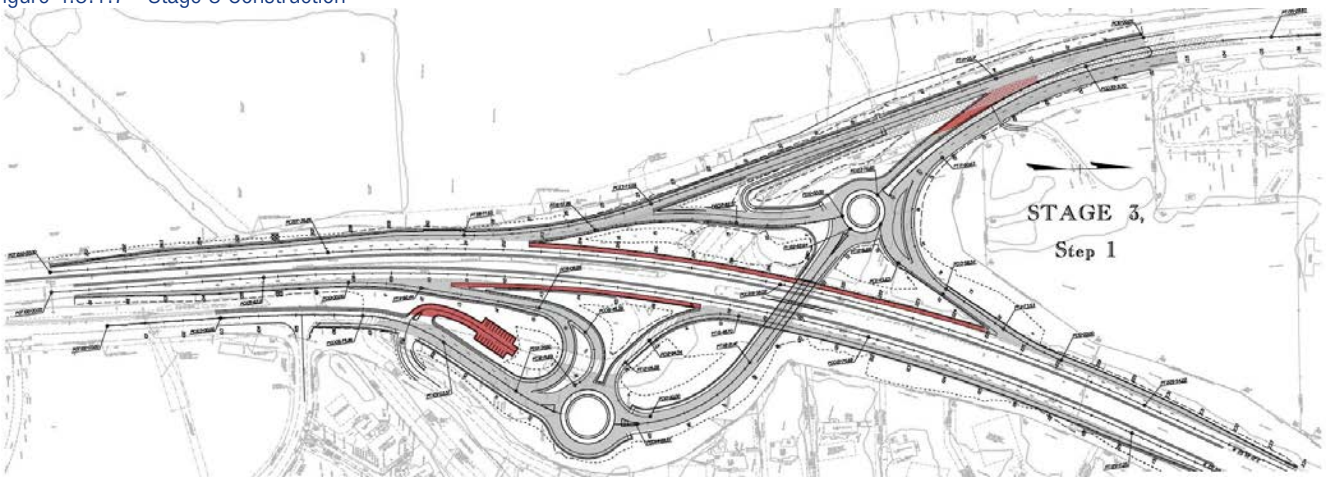
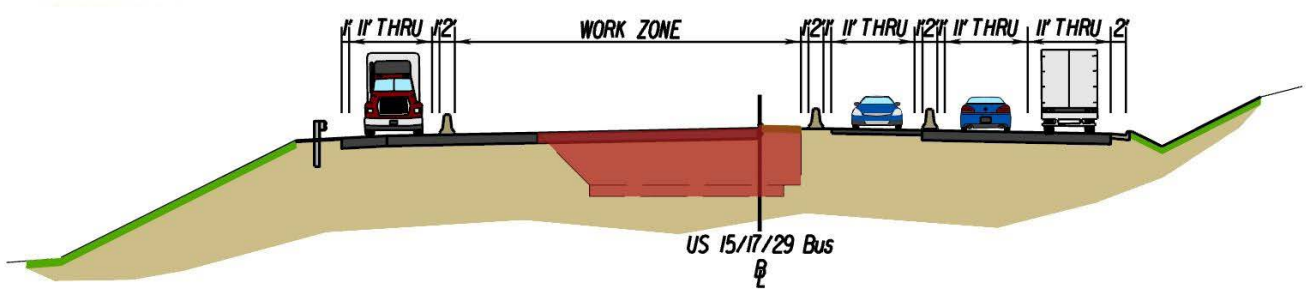


Figure 4.5.1.8 - Stage 3 US 15/17/29 Business



Safety & Operations

Our Team's number one goal is ensuring the safety of the traveling public and the workers. We fully support VDOT's commitment to safety of the public, safety of its employees, and safety of all project stakeholders, and we plan to align our Team's vision of safety with VDOT. We expect each and every individual to be involved, empowered, and accountable for Project safety. Our safety program will be led by Charlie Wilson, our Safety Manager, who will implement a Project Specific Safety Program and work directly with VDOT personnel. He will also have overall responsibility for ensuring the Project is delivered with a goal of zero incidents.

Safety Approach

Our Team's approach to safety is based on three primary facets each presenting their own safety challenges:

- Construction safety;
- Pedestrian Safety; and
- Traffic safety.

Construction Safety - Each Stage has distinct safety challenges associated with them. We will work closely with our design partners to finalize a design that incorporates and considers safety elements and fully integrates anticipated construction processes and staging requirements. As an example, our Team's concept includes utilizing the existing median along US 15/17/29 Business for temporary widenings. This allows the temporary traffic barrier service to be installed and construction operations to take place independent of traffic and without the need for reoccurring lane closures, saving hundreds of manhours of workers being exposed to traffic, and creating safe areas for both workers and traveling public. In addition, our Team's design concept significantly increases the amount of construction that can occur out of traffic, which allows for a safer construction area and reduces impacts to traffic.

Pedestrian Safety – Currently the existing intersection and roadway does not accommodate pedestrians. As required by the RFP, our design accommodates a pedestrian path and should Option 1 be awarded, we have scheduled construction to occur primarily after completion of other major construction activities to avoid the risk of pedestrians entering the work zone. If useable portions of the new pedestrian facility are completed during a Stage of construction, they will be inspected for safety and opened only after the appropriate signage and protections are implemented. Should completed segments not be deemed suitable for safe pedestrian access, we will ensure their safe closure with Type III barricades, fencing and applicable signing per the Virginia Work Area Protection Manual.

Traffic Safety - Our Team's TMP, TTC, and construction sequencing have all been developed to provide safe work zones while attaining the peak operational capacity of the roadway. Following traffic counts at the onset of design, detailed TTC plans will be developed to allow the maximum flow of traffic through the corridor. As detailed in Section 4.5.2, enhanced safety strategies exceeding VDOT requirements will also be utilized to maximize safety, such as wider pavement markings, PCMS signs, and longer lane shift lengths (achieving desirable instead of minimum criteria). During construction, the VDOT Work Zone Safety Checklist will serve as the minimum standard to assure conformance with the Project's safety requirements, and checks will be performed daily.

Public Involvement/Stakeholder Coordination and Government Approvals

To avoid the risk of delays to the schedule due to stakeholder approvals, it is imperative that the Team understand all of the parties who have input, their procedures and timeframes for approval, and the affect they have on the sequence of work. We identified stakeholders in our Organizational Chart included in Section 4.2, as well as in Section 4.5.2, and will refine this list as the Project moves forward.

We will plan and hold several Public Information (Pardon Our Dust) Meetings with the public at critical stages of work to communicate Project details, our sequence of construction, and the overall schedule. We also use this forum to solicit feedback and establish lines of communication with those affected. Because traffic patterns change as the work progresses, it is imperative that we coordinate directly with police, fire and rescue, Fauquier County Landfill, local schools & colleges, and public transportation by establishing points of contact, distributing flyer's, and presenting project details directly to them. Traffic changes can be communicated on site through the effective use of PCMS signs. The Team plans to present updates to local Homeowners Associations, first responders, local governments, and other groups. We will also communicate with the public by submitting updates and graphics describing traffic patterns to the local media in order to reach large audiences.

Engaging Lord Fairfax Community College

Our Team is engaged in the school's recent investment in new technology associated with the *Heavy Equipment Operator Fast Track Career Training Program*. ***Shirley is one of only eight local construction firms and the only short-listed firm***, that upon completion of the program agrees to review, evaluate,

and consider the interested individual for potential employment with the company. Through Shirley's active involvement with the Heavy Construction Contractors Association (HCCA) we have positioned ourselves to take an active role in the development and mentoring of our next generation work force. This active role in developing the next generation of construction workers is key to the long-term success and growth of our industry and organization. As a leading regional contractor, we are dedicated to the career development of individuals for the long-term. Our Team is excited about the unique opportunities we have for interaction and engagement with Lord Fairfax Community College.

The Heavy Equipment Operator Fast Track Career Training Program was developed to meet the growing employment demands for equipment operators locally. There are two levels of certification: the first provides students a basic understanding of safety, operational techniques, utility designations, and basic understanding of civil plans. The second level of certification provides students a more in-depth understanding of the skills learned in Level One. In addition, students in Level Two are exposed to cranes, large earth moving equipment, below grade construction techniques, earth moving operations, plant operations, structures, site work and plant operations. Each of these training programs offer both the student and the future employer a hands-on opportunity to mentor and train these next generation workers. Upon completion of the program, students earn a National Center for Construction Education & Research (NCCER), industry-recognized credential which employers can be confident in. This program is in its first year and our Team looks forward to the opportunity to partner with Lord Fairfax Community College on a project adjacent to their campus.

Additionally, for those students interested in the design aspects of our industry, our Team is more than willing to provide mentoring opportunities for these students. We plan to allow those students interested in a career in Civil Engineering, Construction, or any related field the opportunity to be exposed to the actual design and construction in conjunction with their studies. In addition, for those students who are involved in the Journalism Club, we will stay engaged with them, in coordination with VDOT, to insure public notices and press releases are shared with the College community.

Mitigating Potential Delays

Our Team has already advanced a number of concepts, plans and procedures for ensuring the Project is completed ahead of schedule. As we develop our schedules, we are constantly focused on issues and concerns that have the potential to create delays and then direct our efforts on mitigating them. Attacking issues head-on and immediately upon identification as a Team ensures that risks associated with the discovered issues are managed and mitigated quickly with minimal overall impact to the Project. At various stages of the Project, we rely on proven methods for creating, monitoring, and maintaining the schedule:

- ***Technical Proposal Stage*** - As the groundwork for the Team's schedule is developed in this stage of the procurement, it is critical for all disciplines to have input. Our Team has met on a weekly basis since release of the RFP to discuss issues, create our concept, solicit feedback, and to make schedule adjustments accordingly. The Proposal Schedule presented in Section 4.7 is the result of this close collaboration and has buy-in from all Team members.

- ***Design Stage*** - As we proceed through the design process, the integration of the various disciplines rises to a higher level. We continue to hold team meetings on a bi-weekly basis to provide an over- the-shoulder forum for review, discussion and feedback. During this stage, our formal project schedule is developed and reviewed with VDOT and other stakeholders. Should issues arise or conditions change during design that impact the sequence or completion milestones, the Team reviews schedule options for correction so that these milestones are maintained. Once finalized, it is communicated to each discipline, our construction forces, subcontractors and consultants, and other affected parties

and is the basis for the Team's planning efforts moving forward. Throughout this stage, the approved schedule is monitored, updated and communicated to VDOT by the DBPM to ensure that it remains compliant.

- ***Construction Stage*** - As the Project transitions to construction, the Construction Manager and DBPM closely monitor and update the schedule on a regular basis. The CM ensures the schedule is communicated to the entire Team, including utility companies, QA/QC, government agencies, and others. In addition, shorter, more detailed schedules are created by the construction teams to better aid planning their work. These two week and six week "look-ahead" schedules allow teams to plan activities on a daily basis and communicate specific tasks and milestones in a direct, concise way. Our Team also utilizes a proprietary "Daily Shift Cost Report" (DSCR) system that tracks the production and costs for certain critical activities each day and compares them to the budgeted/scheduled production and cost. This is an excellent confirmation that scheduled production rates are being achieved and provides the construction team with "real-time" data to make improvements should the DSCR indicate scheduled production rates are not being achieved. Throughout the construction schedule, these schedules and data are monitored and compared to the approved baseline schedule so that delays can be anticipated prior to impacting the Project. Then, the Team evaluates options for avoiding the delay or recovering the schedule including resequencing the work, adding resources, or redesign of certain features.

Staging and Storage Areas

To maximize safety and avoid delays to the schedule, staging and storage areas must be well-planned and integrated into the overall sequence of work. When planning these areas, the objectives are to establish locations that minimize impacts to public traffic, do not create a public nuisance, and are close enough to the work area to avoid production inefficiencies. Staging areas will be centric to these access points. Staging of materials behind and outside the deflection zones of the temporary traffic barriers serves as convenient areas for items such as storm water pipe and structures and bridge formwork and consumable materials. Material deliveries will be closely coordinated to ensure that excessive stockpiles of materials are avoided and just-in-time deliveries are utilized as much as possible. By utilizing just-in-time deliveries our Team will maximize the available work areas while minimizing delivery impacts on the traveling public.

Access to the work areas will be by means of construction entrances located adjacent to the public roadway. Our Team will coordinate all construction entrances to ensure that appropriate site distance is available to allow for safe egress from these access points as well as adequate deceleration distances for incoming vehicles.

4.5.2 TRANSPORTATION MANAGEMENT PLAN

All aspects of our TMP and the TTC Plans will be developed with a focus on maximizing safety for the traveling public and construction personnel while minimizing travel delays throughout all stages of construction. To accomplish these safety and mobility goals, we have committed to mitigation and communication strategies that exceed the requirements of the RFP. Some of these strategies are listed below and are detailed on the following pages:

- Eliminating the temporary jughandle diversion and temporary signal south of the existing intersection;
- Eliminating the temporary signal north of the existing intersection;
- Opening the interchange and removing the existing signal in one major "switch";
- Providing a full left or right paved shoulder along the mainline of US 15/17/29;

- Analyzing existing safety concerns and mitigating them prior to major construction activities;
- Utilizing enhanced safety devices with higher visibility and wider than required markings;
- Developing custom lane closure schedules to limit motorist delay and maximize construction efficiency;
- Minimizing lane closures by utilizing off-line construction and temporary pavement; and
- Enhanced public communication outreach such as Twitter alerts through social media and "Pardon Our Dust" meetings.

TMP Philosophy

Our TMP and construction program is focused on reducing the Project's anticipated impacts to the traveling public and exceeding the safety requirements of the RFP. Above all, our Team values safety as our highest priority in every facet of design and construction. Our TMP will place a particularly heavy focus on eliminating the need for temporary lane closures.

To meet our high safety and mobility standards, the TTC and TMP plan development will be led by our Maintenance of Traffic Engineer, Jerry Mrykalo, who is a Professional Traffic Operations Engineer, (PTOE) and a certified VDOT Work Zone Traffic Control Training Instructor. Jerry was also the lead traffic engineer for the US 29 / Linton Hall Road Interchange project, allowing him to understand the unique safety and mobility considerations of TMP development for a new interchange on the US 29 corridor. Furthermore, to ensure the TMP development exceeds expectations, our design engineers have completed our in-house Work Zone Traffic Control Training Program and are all VDOT certified in the development of TTC and TMP plans, ***exceeding the requirements of the RFP.***

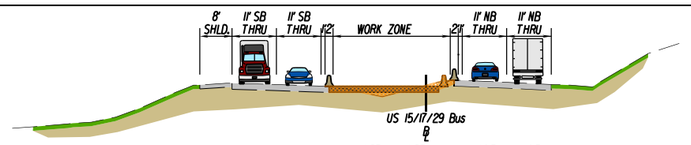
Sequencing of Work

As introduced in Section 4.5.1 - Sequence of Construction, the Project will be split into three overall stages (including 2 sub-stages within Stage 1), each of which has unique construction and temporary traffic control features. Utilizing the construction stages and sub-stages allows our Team to efficiently construct the Project while minimizing mobility impacts to the traveling public. We carefully studied numerous phasing options in conjunction with developing the permanent roadway alignment, and ultimately selected a Design Concept (ATC 001) that significantly reduces impacts to the traveling public. This design allows our Team to deliver the following safety and mobility features that ***exceed the requirements of the RFP:***

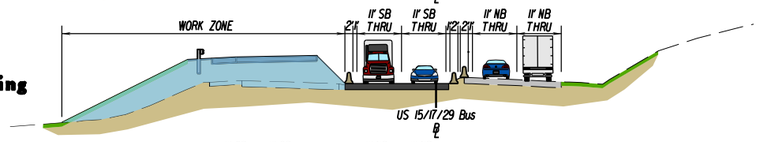
- Eliminating both temporary signals on US 15/17/29;
- Allowing for continued access of the traveling public by maintaining all existing turn movements in their existing configurations until interchange opening;
- Maintaining existing left or right paved shoulders during construction for vehicle breakdown, incident management, and police enforcement;
- Limiting lane closures by locating proposed roundabouts outside of the existing roadway footprint, and by utilizing a roadway profile on the eastern side of the interchange where new ramps cross existing roadways at-grade; and
- Limiting the number of traffic switches the traveling public will need to navigate by utilizing one major opening of the interchange.

For each of the stages of construction, we have developed area-specific temporary traffic control strategies as highlighted on Exhibit 4.5.2.1. This exhibit details the phasing that we will use to safely maintain all lanes during construction based on unique challenges presented in this tight interchange footprint. Throughout all areas in all phases, we strive to exceed required lane and shoulder widths whenever feasible.

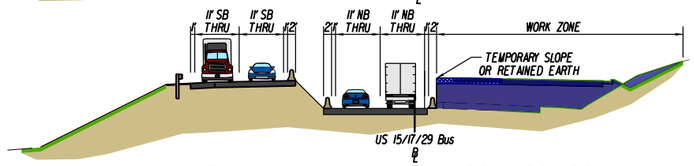
STAGE 1A:
Construct Temporary Pavement



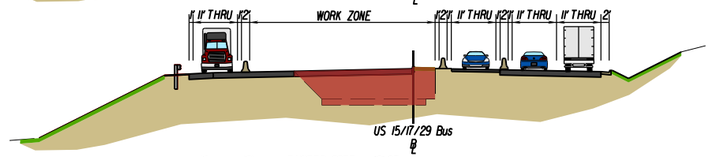
STAGE 1B:
Construct Ramp G Outside Widening



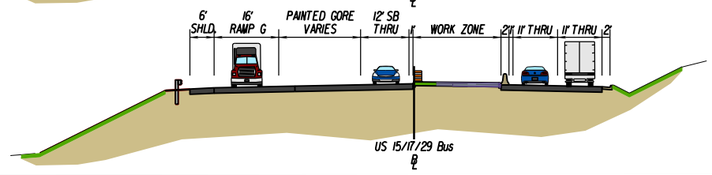
STAGE 1C:
Construct NB Outside Widening



STAGE 3, Step 1:
Construct Remaining Pavement



STAGE 3, Step 2:
Construct Remaining Pavement



LEGEND

- Stage 1A Temp
- Stage 1B
- Stage 1C
- Stage 1C Temp
- Stage 2
- Stage 3, Step 1
- Stage 3, Step 2
- During Short Term Lane Closures

STAGE 1B: Outside Widening

STAGE 3, Step 2

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Traffic Control Details

As shown on Exhibit 4.5.2.1, our Team has developed a temporary traffic control strategy for this Project that minimizes stakeholder impacts. Immediately after beginning the design of the Type C, Category V TMP upon Project Award, we will complete fully detailed design of the site-specific TTC plans. The TTC plans will detail specific elements required during construction, and will be developed for each stage of work to identify barrier and channelization locations, temporary sign locations, PCMS devices, construction access points, temporary pavement markings, temporary drainage, areas of construction, and all other requirements per VDOT's I&IM-241.7, the Virginia Work Area Protection Manual, and the Manual on Uniform Traffic Control Devices (MUTCD).

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

US 15/17/29

- No planned long-term lane closures or temporary detours, eliminating the need to construct a temporary median crossover and temporary signal for dual u-turns as described in the RFP;
- Time of day restrictions will follow Part 2, Section 2.10.3 of the RFP, with additional restrictions self-imposed to minimize public impacts. Temporary lane closures are anticipated for night time paving, shoulder improvements, placement of traffic barriers, delivery of materials, and bridge work;
- Temporary 20 minute maximum full stoppages on US 15/17/29 during overnight hours are only expected for overhead sign or bridge work;
- No flagging operations are anticipated;
- Minimum 11-foot wide lanes will be maintained; and
- All temporary traffic shifts will be designed to meet the full posted speed on US 15/17/29, double the minimum length requirements of the Virginia Work Area Protection Manual.

US 15/17/29 Business and All Other Roads

- No long-term lane closures planned;
- No long-term temporary detours planned except for a detour for outbound Lord Fairfax Road traffic destined for SB US 15/17/29;
- Time of day restrictions will follow Part 2, Section 2.10.3 of the RFP, with additional restrictions self-imposed to minimize public impact;
- Temporary 20 minute maximum full stoppages on US 15/17/29 Business during overnight hours are only expected for overhead sign work;
- Flagging operations are only anticipated on two-lane roadways; and
- Minimum 11-foot lanes will be provided.

Speed Limits During Construction

Our Team has taken the proactive step of completing an analysis utilizing VDOT's TE-350.1 process to determine the appropriate posted speed limit during construction. Based on this analysis, we recommend maintaining the existing posted speed limit of 55 mph on US 15/17/29 for the following reasons:

- All temporary geometry and shifts will meet the standards for the full posted speed limit;
- In addition to increasing motorist delay, research has proven that lowering speed limits where geometric conditions do not require the reduction actually lessens safety, since large deviations between drivers' speeds commonly result in increased crashes.

Unique Project Challenges & Solutions

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

1. ***Maintenance of Existing Shoulder*** - As detailed in the "Sequence of Work" above, our Team will strive to maintain either a full left or full right shoulder along mainline US 15/17/29 at all times. This shoulder will provide valuable room for emergency access, incident management, and police enforcement without blocking a thru lane. Also, providing a shoulder in advance of turn lanes provides refuge for queued vehicles without blocking thru lanes in the situation where queues extend beyond turn lanes.

2. ***Maintenance of Turn Movements*** - While constructing the interchange ramps and proposed bridge over US 15/17/29, we recognize the critical nature of maintaining all existing turn movements and turn lanes. In developing our ATC 001 roadway design, construction sequencing played an integral part in the development of horizontal and vertical alignments. ***This early coordination has allowed us to develop a sequence of construction that maintains all existing turn movements and all existing turn lanes until interchange opening.*** For some alignments, temporary pavement will be utilized, but shifts will not require changes in driver routes or driver decisions. For all stages of construction before interchange opening, turn movements will be checked for sight distances, signal operations will be analyzed, and temporary turn lane lengths will be designed to avoid queue spill back onto the mainline.

3. ***Median U-turn Crossover Elimination*** - With ATC 001 repositioning the proposed roundabouts, our design facilitates construction out of traffic, and effectively maintains all thru and turning movements necessary. This eliminated the need for the temporary southern median crossover (jughandle) detour and northern temporary median u-turn lane that is allowed by the RFP. This provides numerous important benefits including:

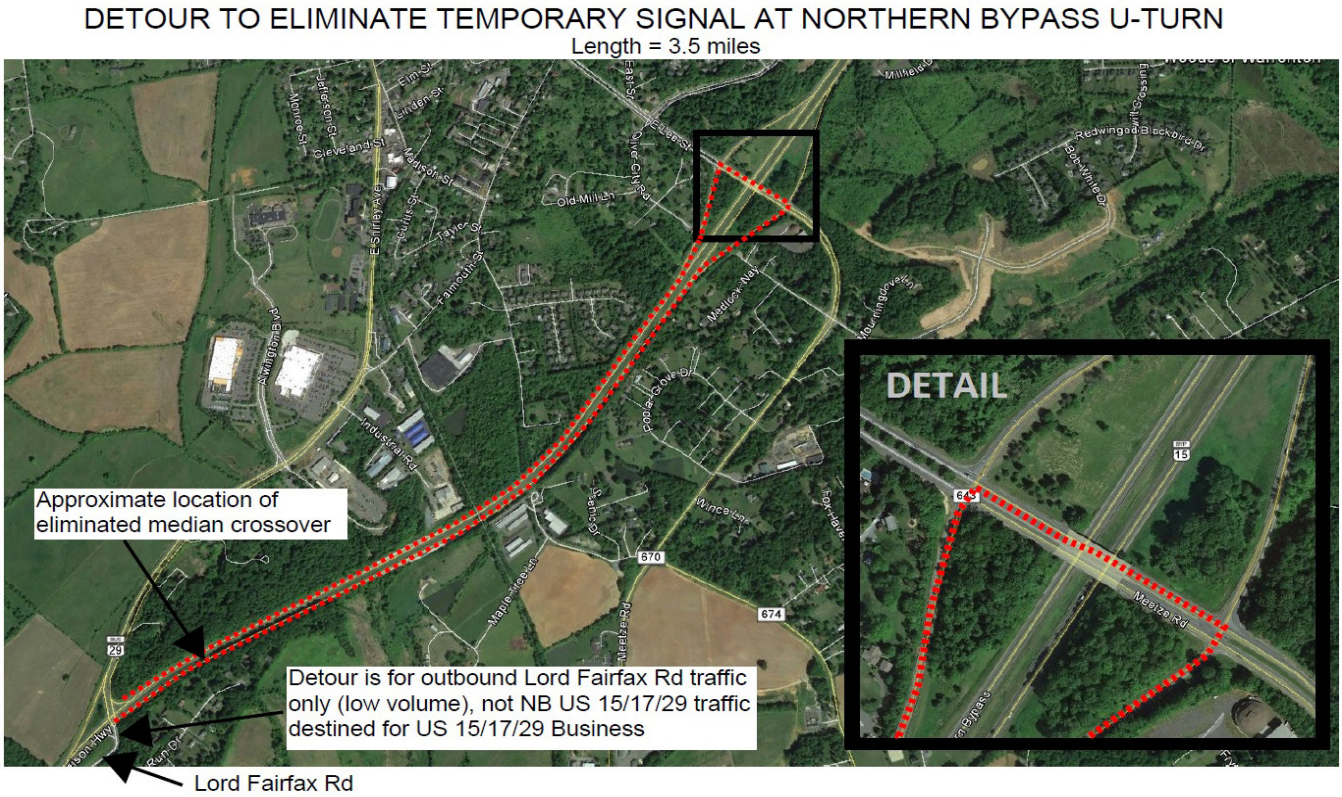
   - Improves safety by reducing conflict points on US 15/17/29;
   - Minimizes travel times on US 15/17/29 by avoiding additional signals;
   - Avoids detour (diversion) roadway construction;
   - Optimizes construction schedule; and
   - Eliminates temporary Limited Access break associated with the jughandle.

4. ***Limiting Traffic Switches By Utilizing One Major Opening*** - Given our Team's experience in opening new interchanges, we know the importance of both minimizing the number of traffic switches, and making them as easy to comprehend as possible. ***Our Team has committed to exceeding the RFP requirements by maintaining all existing movements of the existing intersection continually to the point of the opening of the interchange.***

   Upon opening, all new interchange ramps and turn movements will be operational, with the exception of the "plug" on the SB on-ramp (from the western roundabout) which will be approximately 15' higher than the existing roadway. For this movement (the outbound Lord Fairfax Road movement destined to SB US 15/17/29) traffic will be detoured to finish SB on-ramp (from the western roundabout). This is a low-volume movement of approximately 50 vehicles per hour in the peak hour. For the detour, traffic will make a right turn onto NB US 15/17/29, exit at Lee Street / Meetze Road, and return to SB US 15/17/29. Although the 50 vehicles per hour in the peak hour will be subject to this 3.5 mile detour, ***it will completely eliminate all signalization on SB US 15/17/29.*** Figure 4.5.2.1 details this proposed detour.

This detour was initially presented as the Shirley Team's ATC 003 during the second ATC / Proprietary Meeting, and per meeting minutes, determined by VDOT to not be considered an ATC. VDOT noted in the meeting minutes that an operational analysis of the Meetze Road/Lee Street Interchange is required for VDOT's consideration of the temporary detour being proposed for westbound to SB traffic. A preliminary analysis completed by our Team indicates that the detoured volumes will not create any operational concerns at the Lee Street / Meetze Road interchange. Upon Award, a full intersection operational analysis will be completed for both intersections at the Lee Street / Meetze Road interchange, and any warranted temporary improvements will be included.

Figure 4.5.2.1- Proposed Detour

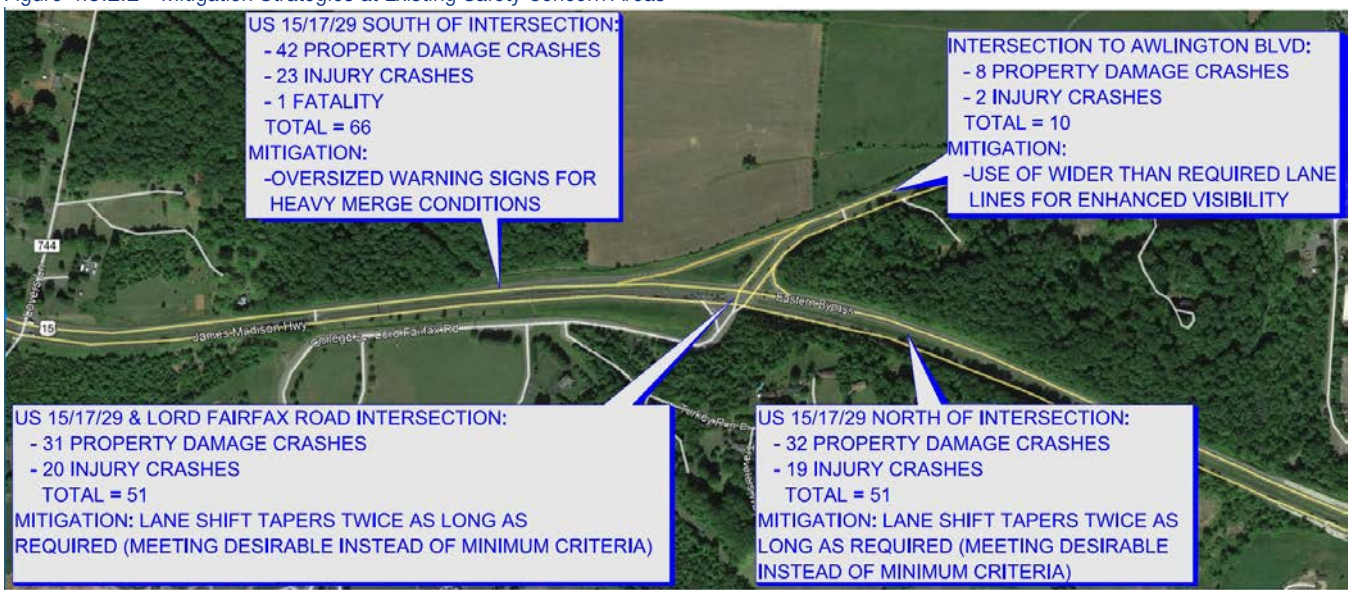


5. ***Traffic Signal Sight Distance*** - Our Team understands that while constructing a new overpass in the vicinity of an existing signalized intersection, traffic signal sight distances have the potential to be diminished. With our Design Concept locating the bridge farther from the existing intersection, the potential for conflicts are minimized. Also, we commit to maximizing sight distance to the signal heads in the SB direction by lowering them to the 15' minimum height. This adjustment will help ensure that the overhead signals are not obstructed by the bottom of the new bridge during Stage 2 construction.

Investigation and Mitigation of Existing Safety Issues

Our Team has performed an investigation of existing crash statistics and safety concerns within the Project limits and have already developed approaches to mitigate these risks. ***Our Team will surpass the RFP requirements by employing site-specific impact management strategies in order to maximize safety.*** As shown in Figure 4.5.2.2, the high traffic volume and congestion contributed to 94 crashes between January 2015 and February 2017, the majority of which were rear-end crashes (60%), and one which resulted in a fatality. Many of our proposed safety improvements detailed in this figure will be installed prior to major construction activities, as we intend to enhance public safety even though the permanent improvements are still in the design phase.

Figure 4.5.2.2 - Mitigation Strategies at Existing Safety Concern Areas



In addition to installing enhancements on the existing roadway prior to construction, the following safety improvements will be utilized throughout construction:

- The use of tighter than required channelizing device spacing for increased work zone delineation and construction personnel safety;
- Use of wider than required lane lines for improved delineation of lane shifts;
- Oversized warning signs for heavy merge conditions;
- Lane shift tapers twice as long as required (meeting desirable instead of minimum criteria);
- Temporary raised pavement markers are used, as shown in Figure 4.5.2.3 for improved visibility of lane alignment, especially at night and during wet pavement conditions (only required at lane shifts per the Work Area Protection Manual);

Figure 4.5.2.3 - Raised Pavement Markers

- Monitoring of traffic and safety conditions during construction. Our Team commits to monitoring traffic and safety conditions in the work zone throughout construction and reviewing conditions for safety upon implementation of new traffic control patterns. These reviews will be completed by traffic engineers to ensure that the controls have been implemented correctly, and to provide suggestions and recommendations for enhancements.

Lane Closure Optimization

When construction starts, lane closure impact minimization will be critical. Our temporary traffic control strategy puts an emphasis on eliminating the need for temporary lane closures to the greatest extent possible. Where lane closures are necessary, our Team is committed to the following enhancements to mitigate impacts that exceed the requirements of the RFP:

- ***Lane Closure Advisory Management System (LCAMS)*** - Our Construction Team is trained and proficient in the VDOT LCAMS system for temporary lane closure management. This allows our Team the advantage of being able to check our proposed lane closures versus planned construction and maintenance activities by others to ensure conflicts do not exist, providing measurable benefit to the Project and the traveling public.

- ***Lane Closure Forms ("Blocking Plans")*** - To communicate temporary traffic operations and lane closures with project stakeholders (such as project inspection staff, emergency services, Fauquier County, and the Town of Warrenton), our Team utilizes specifically developed scheduling "blocking plans" and "lane closure notification forms" (Figure 4.5.2.4) as an enhancement exceeding the RFP requirements. This detailed scheduling plan provides the Project Team and stakeholders the ability to fully understand the proposed work, and easily ensure that the correct traffic control setups are utilized to maximize safety. This also enables transparent communication between the Construction Team, VDOT, and public communications staff.

Figure 4.5.2.4 - Sample Lane Closure Notification Form

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Warrenton Southern Interchange US 15/17/29
Lane/Shoulder Closure Request Form
VDOT Project No. 0029-030-121 Contract ID No. C00077384DB100

List and Attach Applicable TTC Figure(s): **REQUEST No: 1**

TTC-1.1 Work Beyond the Shoulder Operation, Short Term Stationary work

Highway/Ramp:	US 15/17/29	Date of Request:	10.13.2018
Direction:	Southbound	Select Lane Closure Type:	
Date (s) Scheduled:	Monday Oct. XX thru Friday Oct. XX		

Start Time:	M-Th:	9:30am	End Time:	3:00pm
	Fri:	9:30am		12:00pm
	Sat:			
	Sun:			

- ***Additional Traffic Counts*** - to minimize travel delays, we will collect updated 24-hour volume information along US 15/17/29 at locations north and south of the proposed interchange as an initial design activity. We understand that the lane closure restrictions listed in Section 2.10.3 of the RFP are to be followed, and we recognize that constantly changing traffic volumes in this area may be different than previously collected volumes. Furthermore, we recognize that traffic volumes may be different at locations north of the interchange than locations to the south and will consider those differences when analyzing lane closure scheduling and potential impacts. We understand that temporary lane closures, especially on mainline US 15/17/29, can result in cumulative delays if not implemented during the window with the lowest traffic volumes. Therefore, our Team is committed to the development of directional-specific temporary lane closure hours, which our Team will tailor to the Project based on current 24-hour traffic data.

At our recently completed Linton Hall Road interchange along Route 29 in Gainesville, we successfully minimized travel delays by implementing customized lane closure schedules for each direction of travel, with four different lane closure schedules on Route 29. To accomplish this delay minimization, we analyze MOT operations using software such as Quick Zone and HCS to ensure temporary lane closures will be limited to the hours of least impact. Understanding these patterns is crucial to ensuring that we maximize construction efficiency while also limiting motorist delay.

An example of this can be seen in Figure 4.5.2.5, which shows the 24-hour data. From the graph, our Team can determine the hours during which temporary lane closures might cause traffic backups and

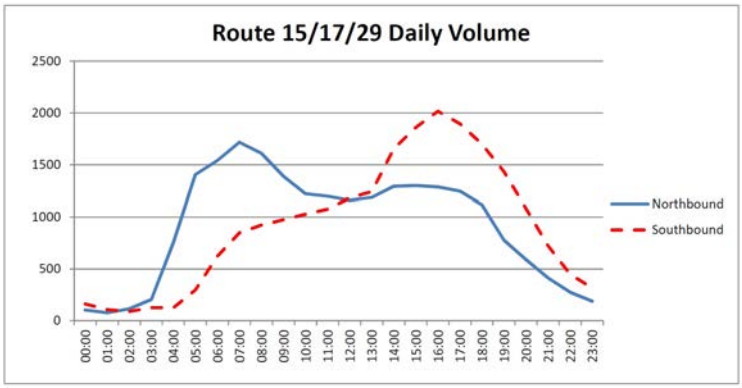


Figure 4.5.2.5 - 24-Hour Traffic Data

delays. This undesirable condition occurs when traffic volumes (blue line) exceed the capacity of the remaining open travel lane (shown in red horizontal line). Utilizing this type of analysis gives us the ability to schedule short duration work during low-volume hours where feasible. By taking this step, our Team provides tremendous safety and travel time benefits. This analysis will be performed by our Team during final design once our new data within the Project limits is available. This data will be used to validate the lane closure schedule in Section 2.10.3 of the RFP, and to ensure unintended delays will not occur due to possible recent changes in traffic patterns.

- ***Validation During Construction*** - Additionally, our Team commits to recounting traffic mid-way through construction to validate lane closure hours at points north and points south of the interchange to ensure mobility impacts are minimized. We can also utilize this data in development of the TMP to allow for construction activities that require lane closures to occur during the hours of lowest volume. For example, this hour-by-hour analysis allows activities of a short duration, such as overhead sign erection, to occur during the hours of lowest volume within the longer allowable overnight lane closure window.

Stakeholder Impacts and Public Outreach Approach

Our Team recognizes that proactive communication with all project stakeholders is essential to a successful TMP. As with any interchange construction project, some inconvenience is unavoidable (such as off-peak lane closures), but our Team's goal is to minimize these impacts. We have proactively identified project stakeholders, and have devised specific innovative communication and mitigation strategies that exceed project requirements. These include our commitments to Lord Fairfax Community College, committing to hold "Pardon Our Dust" meetings, and utilizing enhanced safety devices. The stakeholders, their potential impacts, and our planned communication and mitigation strategies are detailed below.

Traveling Public

Impacts Anticipated:

- Travel delays for temporary operations

Communication and Mitigation Strategies:

- Hold a minimum of three "Public Informational (Pardon Our Dust) Meetings" for the general public and other stakeholders and two meetings for first responders throughout design and construction, especially prior to implementing major traffic pattern switches;
- Utilizing 3D model renderings to clearly show the public how the interchange will look upon construction;
- Optimization of lane closure hours will limit closures to off- peak allowable hours of lowest volume;
- Work operations behind barrier will maximize lane widths;
- PCMS Signs will be utilized for public notices;
- Encouragement for public to follow Project social media; and
- Local media communications.

Lord Fairfax Community College

Impacts Anticipated:

- Travel delay for temporary operation

Communication and Mitigation Strategies:

- Partner with LFCC Journalism Club to develop content for the college newspaper, The Lion's Pride. Content is anticipated to include Project Milestone updates, traffic switch information, and advertisement of opportunities available to students to tour the construction site;
- Partner with the LFCC Civil Engineering GET (General Engineering Technology program to provide guided tours and potential internships with the Shirley Team;
- Participate in the *Heavy Equipment Operator Fast Track Career Training Program;* and
- Provide project literature for distribution on campus or at campus events.

Local Residents

Impacts Anticipated:

- Construction noise, activities in proximity to property

Communication and Mitigation Strategies

- Hold a minimum of three "Public Informational (Pardon Our Dust) Meetings" throughout design and construction, especially prior to major traffic pattern switches;
- Utilize 3D model renderings to clearly show residents how the interchange will look upon construction;
- Offering to meet one-on-one with adjacent property owners and residents;
- Early planting of landscaping adjacent to residences;
- Encouragement for public to follow project pages on social media; and
- PCMS Signs will be utilized for public notices.

Fauquier County Schools

Impacts Anticipated:

- Potential school bus / transportation services delays

Communication and Mitigation Strategies:

- Commitment to coordinate directly with schools staff;
- Avoiding lane closures during school bus operating hours when possible; and
- Advance notification of traffic pattern changes.

Police, Fire & Rescue

Impacts Anticipated:

- Potential response time impacts for Fauquier County Sheriff's Office, Town of Warrenton Police, Fauquier County and Town of Warrenton Fire & Rescue, Virginia State Police, and Fauquier Hospital

Communication and Mitigation Strategies:

- Hold a minimum of two meetings specifically for first responders throughout design and construction, especially prior to implementing major traffic pattern switches;
- Providing 24/7 emergency contacts for the Shirley Team throughout design and construction process;
- Distribution of literature regarding new travel patterns prior to traffic switches;
- Maintenance of shoulder pull-off area along mainline US 15/17/29 for incident management; and
- Develop and maintain a Project access map.

Others

Impacts Anticipated:

- Potential access route impacts to Fauquier County Landfill

Communication and Mitigation Strategies:

- Commitment to coordinate directly with Fauquier County Environmental Services Staff;
- Distribution of literature regarding new travel patterns prior to traffic switches; and
- Ensuring truck turn movements in and out of Lord Fairfax Road are maintained through construction

4.6 - Disadvantaged Business Enterprises (DBE)

4.6 Disadvantaged Business Enterprises (DBE)

Commitment to Achieving the DBE Goal

Shirley Contracting Company, LLC (Shirley) is committed to achieving the 10% DBE participation goal for the Project for the entire value of the contract.

4.7 - Proposal Schedule

4.7 Proposal Schedule

4.7.1 Proposal Schedule

The Shirley Design Build Team's Proposal Schedule is provided in Volume II - Design Concept.

4.7.2 Proposal Schedule Narrative

Shirley has reviewed in detail the Project scope and schedule requirements of the RFP and has developed a Proposal Schedule outlining our plan to successfully manage all phases of the work. This schedule has been optimized to deliver the Project in the shortest amount of time possible while meeting the requirements of the RFP, minimizing impacts to roadusers and local stakeholders, protecting the environment, and ensuring motorist's and worker's safety. Our Team, as an added benefit, commits to a Unique Milestone to remove the existing signal on US 15/17/29 by July 1, 2020. This milestone opens a majority of the interchange to traffic and should alleviate a major bottleneck in the corridor prior to the heavy summer travel season. Further, our Team is committing to an early Final Completion by November 25, 2020. A summary of the Contract and Schedule Milestones are shown in Table 12.

This schedule is based on meeting the following Contract and Schedule Milestones:

Table 12 - Contract and Schedule Milestones

Contract and Schedule Milestone	Date
Notice of Intent to Award	January 23, 2018
CTB Award / Notice of Award	February 21, 2018
Design Build Contract Execution	March 23, 2018
Notice to Proceed	March 26, 2018
Unique Milestone – Remove Existing Signal	July 1, 2020
Final Completion	November 25, 2020

Work Breakdown Structure

Our Team has developed a detailed Proposal Schedule in accordance with the RFP requirements. The Team has organized the schedule into a hierarchical Work Breakdown Structure (WBS) in order to demonstrate the relationship and activity duration among the milestones, scope validation period, design public outreach, environmental permitting, ROW acquisition, utility relocation, construction and project management disciplines. All elements of the design-build process are captured under these Level 1 tasks and are described below:

- **A.** ***Schedule Milestones:*** Area reserved for easy review of the Project status. The Scope Validation Period has also been included in this section.
- **B.** ***Design Phase:*** Included are preliminary engineering services, geotechnical work, plan development, design QA/QC reviews, submittal milestones, and VDOT and FHWA reviews and approvals. This section included as a second level WBS structure to group design activities by construction element.
- **C.** ***Public Outreach:*** This section of the schedule includes activities and milestones for developing the plan and public involvement process including communication plans, public information meetings, first responder meetings and updates to the Office of Public Affairs for major traffic shifts and the VDOT website.
- **D.** ***Environmental Permitting:*** Included are wetland and stream delineations, jurisdictional determinations, permit management and preparation, mitigation, permit submissions, and reviews from the authorities

having jurisdiction. Also included are the LD-445 process, and noise analysis.

E. Right-of-way: This section of the schedule is used to outline and monitor the acquisition of ROW and easements including title searches, appraisals and reviews, offers, negotiations, and settlements.

F. Utility Relocations: Includes activities for utility relocation such as UFI meetings, preparation of plans and estimates (P&E), approval of plans and estimates, utility relocation design by the utility owner, approval of the utility design, and utility relocation. The utility relocations are separated into second level WBS groups based on utility owner.

G. Construction: Includes all components of roadway and bridge construction including Project Management and the Quality Assurance/Quality Control processes. The Construction section of the schedule is segmented by additional levels of WBS structure to divide the construction activities into stages of work, areas of work, and major portions of work such as roadway or bridge. This strategy and grouping of work packages has proven to allow for easy and clear tracking of activity progress to ensure on-time completion.

Below is a complete outline of the WBS Structure for the Project:

C0007738DB100	Warrenton Southern Interchange US 15/17/29
C0007738DB100.A	SCHEDULE MILESTONES
C0007738DB100.B	DESIGN PHASE
C0007738DB100.B.A	PRELIMINARY DESIGN
C0007738DB100.B.B	GEOTECHNICAL INVESTIGATION and REPORT
C0007738DB100.B.C	ROADWAY DESIGN
C0007738DB100.B.D	BRIDGE DESIGN
C0007738DB100.B.E	UTILITY DESIGN
C0007738DB100.C	PUBLIC OUTREACH
C0007738DB100.D	ENVIRONMENTAL PERMITTING
C0007738DB100.E	RIGHT OF WAY
C0007738DB100.E.1	ALL PARCELS
C0007738DB100.F	UTILITY RELOCATIONS
C0007738DB100.F.A	DOMINION ENERGY
C0007738DB100.F.B	COLUMBIA GAS OF VA
C0007738DB100.F.C	TOWN OF WARRENTON SANITARY
C0007738DB100.F.D	VERIZON
C0007738DB100.F.E	COMCAST
C0007738DB100.F.F	LUMOS NETWORKS
C0007738DB100.G	CONSTRUCTION
C0007738DB100.G.A	PROJECT GENERAL ITEMS
C0007738DB100.G.B	ADMINISTRATION & PIM
C0007738DB100.G.5	MONTHLY PROJECT ADMINISTRATION TASKS
C0007738DB100.G.1	STAGE 1
C0007738DB100.G.1.A	STAGE 1 GENERAL ITEMS
C0007738DB100.G.1.1	STAGE 1A
C0007738DB100.G.1.1.D	15/17/29 BUS. TEMPORARY WIDENING IN EXISTING MEDIAN
C0007738DB100.G.1.2	STAGE 1B
C0007738DB100.G.1.2.E	RAMP G STA. 10+00 TO 28+00
C0007738DB100.G.1.2.B	BRIDGE
C0007738DB100.G.1.2.F	15/17/29 BUS. STA. 121+00 TO 133+00
C0007738DB100.G.1.2.G	RAMP D STA. 10+00 TO 17+00
C0007738DB100.G.1.2.H	SPUR D STA. 10+00 TO 12+50
C0007738DB100.G.1.2.I	LORD FAIRFAX DRIVE STA. 107+00 TO 119+50
C0007738DB100.G.1.2.J	RAMP F STA. 10+00 TO 18+00
C0007738DB100.G.1.2.K	SPUR F STA. 10+00 TO 12+50
C0007738DB100.G.1.2.L	RAMP B STA. 13+50 TO 15+48.70
C0007738DB100.G.1.2.M	US 15/17/29 SB STA. 200+00 TO 216+00
C0007738DB100.G.1.2.N	US 15/17/29 SB STA. 225+00 TO 234+00

C0007738DB100.G.1.2.O	US 15/17/29 NB STA. 100+00 TO 112+00
C0007738DB100.G.1.2.P	US 15/17/29 NB STA. 117+00 TO 131+50
C0007738DB100.G.1.3	STAGE 1C
C0007738DB100.G.1.3.S	RAMP C STA. 13+50 TO 16+57.86
C0007738DB100.G.1.3.R	15/17/29 BUS STA. TEMPORARY WIDENING IN MEDIAN STA. 127+00 TO 132+00
C0007738DB100.G.1.3.Q	15/17/29 BUS STA. 123+00 TO 130+50
C0007738DB100.G.1.3.C	RAMP G STA. 19+00 TO 27+00
C0007738DB100.G.2	STAGE 2
C0007738DB100.G.2.A	STAGE 2 GENERAL ITEMS
C0007738DB100.G.2.B	RAMP C STA. 10+00 TO 13+50
C0007738DB100.G.3	STAGE 3
C0007738DB100.G.3.A	STAGE 3 GENERAL ITEMS
C0007738DB100.G.3.C	US 15/17/29 NB STA. 112+00 TO 117+00
C0007738DB100.G.3.D	US 15/17/29 SB STA. 216+00 TO 225+00
C0007738DB100.G.3.E	PARK AND RIDE LOT
C0007738DB100.G.3.F	OPTION 1 - SHARED USE PATH
C0007738DB100.G.3.G	OPTION 2 - ADDITIONAL MILL AND OVERLAY

Geography and Construction Staging

Our Team plans to construct this Project during three major Stages of construction. The limits of these stages were carefully planned in order to construct the Project as safely and efficiently as possible and minimize the impacts on the public.

The three Stages of construction are generally described in Table 13:

Table 13 - Construction Stages

Stage		Activity
Stage 1	**1A**	▪ Mobilization ▪ Temporary construction of US 15/17/29 Business in existing median
	1B	▪ Bridge ▪ First stage of SB on-ramp reconstruction ▪ East and west roundabouts ▪ US 15/17/29 interchange ramps ▪ SB US 15/17/29 Business reconstruction ▪ Lord Fairfax Road
	1C	▪ NB US 15/17/29 Business ▪ Open interchange and remove existing traffic signal ***(Unique Milestone)***
Stage 2		▪ Second stage of SB on-ramp reconstruction ▪ Complete SB on-ramp (from east)
Stage 3		▪ Park and Ride Lot ▪ Complete Permanent Construction of US 15/17/29 Business ▪ Complete Mill & Overlay on US 15/17/29, including Option 2 if awarded. ▪ Demolish existing intersection in median and complete US 15/17/29 inside shoulders ▪ Place all permanent pavement markings, signing, lighting, and “Finishing” items ▪ Punchlist and Project closeout

Schedule Calendars

The following is a description of the calendars used for the scheduling of the Project.

Global Calendar - All calendars are based on eight hour workdays and include the following holidays:

- New Years Day
- Memorial Day
- Independence Day
- Labor Day
- Thanksgiving Day
- Christmas Day

CALENDAR 1

7-Day Workweek

Assigned to activities that have durations based on calendar days instead of work days. Activities such as VDOT's 21-calendar day submittal review, concrete curing activities, and monthly maintenance items are included in this calendar.

CALENDAR 2

5-Day Workweek with Holidays

This calendar is based on five working days per week with the holidays inserted as non-work days. This calendar is used for all design and administrative activities in the CPM network.

CALENDAR 3

5-Day Workweek with Holidays, Weather-Sensitive

This calendar is used for the majority of construction activities. It includes holidays as inserted in the five-day workweek with holidays calendar, as well as 'block-out' days for the anticipated normal weather in the region. The basis of the weather calendar was developed using a NOAA-based weather day assumption from the nearby Manassas Regional Airport, then modified to anticipate that the contractor and sub-contractors are responsible for making up normal weather days as part of their contractual requirements.

CALENDAR 4

Paving Winter Shut Down

DEC 15 – APR 15

Assigned to paving activities that are unable to be performed during mid-December through mid-April due to cold weather. Activities such as asphalt paving, pavement markings, and landscaping installation and establishment are included in this restricted calendar.

CALENDAR 5

Concrete Structural Shutdown

DEC 15 – MAR 15

Assigned to structural activities that are unable to be performed during mid-December through mid-March due to cold weather. Activities such as structural concrete and bridge painting are included in this restricted calendar.

Plan to Accomplish the Work/Means and Methods

The narrative below describes our Team's overall plan and sequence of operations grouped by the Level I WBS Project disciplines. These include design, public outreach, environmental permitting, ROW acquisition, utility relocation, construction, and project management. The sequencing of all disciplines was developed by considering the construction phasing of operations and determining the longest path to project completion with all factors considered including manpower, subcontractors, materials, design, environmental constraints and most importantly, public and workforce safety. The Project Stages were developed by the Team based on the geographic areas and phasing necessary to meet the MOT requirements and critical elements of work. We sequenced the Schedule in three major Stages that establish logical and manageable work areas that can be tracked and managed by dedicated supervision during construction.

Design

This section of the schedule includes those activities necessary for preliminary design, geotechnical work, early TMP and MOT/TTC plans, roadway design, bridge design and third party coordination including engineering plan preparation and approvals. It also includes time for the necessary Design QA/QC reviews at the multiple steps in the design process. As specified in the RFP, we have included a 21-calendar day activity for VDOT review after each submission. The design phase also includes non-critical activities for the completion of surveys, test pits, and geotechnical investigations, including a 90-calendar day activity for VDOT's review of the geotechnical report prior to submission of the final roadway and bridge plans.

Our Team begins the design phase immediately upon execution of the design-build Contract. Since the Bridge B616 is one of the most critical items on the schedule, the geotechnical requirements have been separated into two packages. One package will be bridge related only, which will allow for an early submission of the bridge design. The second package will include all geotechnical activities for the roadways. The Proposal Schedule reflects final approval of all roadway and bridge plans by December 29, 2018.

Public Involvement

The public outreach portion of the Proposal Schedule includes submitting our Emergency Contact List upon NTP, and holding Public Information (Pardon Our Dust) Meetings at incremental stages during construction. This includes providing regular updates to the Office of Public Affairs, and providing information for regular construction updates and weekly lane closure plans to VDOT for use on its website.

Environmental Permitting

The Environmental Permitting process will begin at NTP with gaining access to affected property owners to begin the required Phase I environmental surveys. Our Team immediately performs wetland delineations, obtains jurisdictional determinations and prepares the Section 404/401Clean Water Act Permits. Following completion and submission of the 60% roadway plans we will submit the necessary Permit Applications to the authorities having jurisdiction (AHJ). We anticipate that the Nationwide Permit 23 (Approved Categorical Exclusion) for USACE as well as the Virginia Water Protection (VWP) General Permit WP3 for Linear Transportation Projects from DEQ will require a two- month approval time frame. Our Team will also complete the requisite VDOT forms LD-445, Stormwater Pollution Prevention Plans (SWPPP) and related information for inclusion on the VDOT SWPPP General Information sheets. The LD 445/VSMP permit will be acquired by July 25, 2018. Activities related to completion of the Final Noise Analysis are also included in the section.

Right-of-Way Acquisition

The acquisition of property rights will include permanent right-of-way, and permanent and temporary easements. We have used the historical average timeframes that we anticipate for acquisition of property rights either by agreed negotiation or by certificate of take. We do not anticipate that the property rights will become critical since there are minimal acquisitions required and are not on the critical path. We will dedicate the necessary resources to ensure that schedule dates are adhered to and this process does not impact the schedule.

Utility Relocations

Table 2 in Section 4.3.1(g) of our Technical Proposal lists the anticipated utility impacts. To simplify and track the utility relocations, we created a WBS that groups the utility relocation activities by utility owner and Project location. This further allows us to coordinate the work with utility relocations using the construction sequencing. Within each utility owner group, we have included activities for holding the Utility Field Investigation (UFI) meeting, preparation of the plans and estimates by the utility owner,

ap w l f th p as ad estimates, d sig f th u ility relo atip ad relo atio f th u ility y area. The utility relocation schedule starts with formal UFI meetings following completion of all utility test pits and progression of design documents to roughly 60%. This enables our Team to confirm and adjust our list of utility conflicts based on the field test pit data obtained prior to holding the formal UFI meetings. We co ia th s early co id a tio f u ilities th g th d sig p se to es u e th t rig -f -way ad ro w ay p as are co id a ted with th u ility relo atio p as . Cu ren ly, we are p j ecting th t th overhead facilities of Dominion Virginia Power, Comcast, and Lumos may be impacted. Underground utilities that will be impacted are Town of Warrenton Sewer and Washington Gas. These dates are identified in our Proposal Schedule and linked to the appropriate construction activities. Utility relocations are not an icip ted d critical activ ties o h s Prj ect.

Construction

Project Management - In this section of the schedule, we identified early activities such as survey, mobilization, MOT and signage.

Administration and PIM - In this WBS group, we have included the submission and approval of the QA/QC plan and the Preparatory Meetings (Hold Points) that are required prior to commencing with construction activities. Also shown are the submittal and shop drawing process.

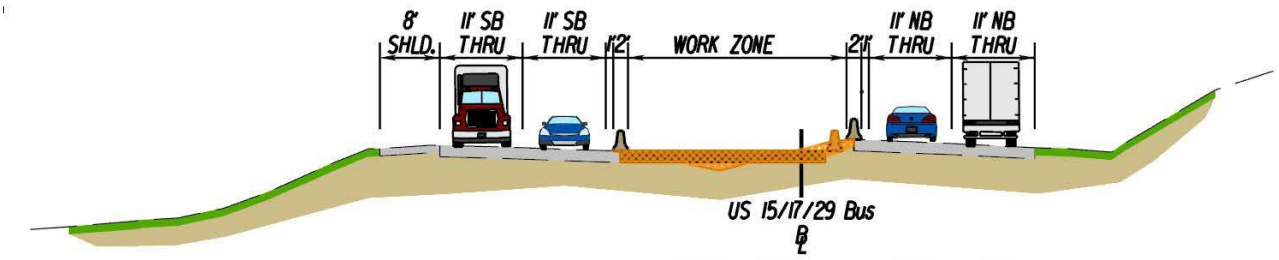
Stage 1

Overall, the work included in Stage 1 constructs a majority of the proposed interchange. Our Team developed a TTC Sequence that maximizes the construction of the interchange offline from the existing ro w ay.

STAGE 1A - Temporary Construction US 15/17/29 Business in Existing Median

To facilitate offline construction and minimize the impacts to the traveling public, Stage 1A, shown in Figure 4.7.1.1, constructs temporary pavement in the median of existing US 15/17/29 Business. This temp ary p v men affo d th ad tio a l wid h n cessary to allw fo cs tru tio f p tis f SB n ramp t o h Sto ,a s well as th lu timate in erch g to h No th

Figure 4.7.1.1 - Stage 1A Construction

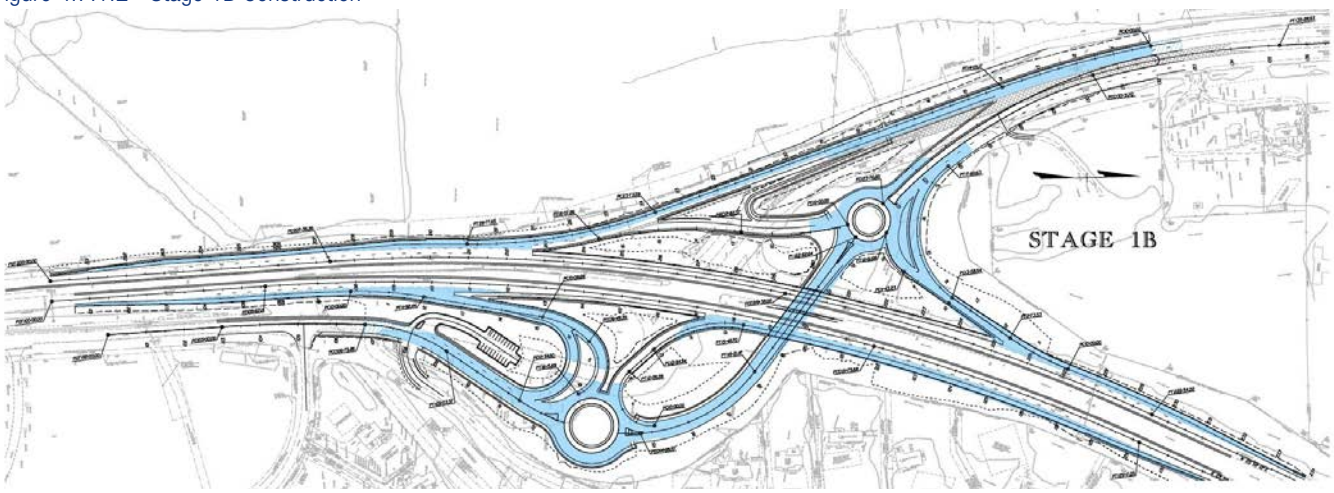


Since all of Stage 1A work is contained within existing VDOT ROW, work can begin in Stage 1A upon ap w l f th ReleasedF o Cs tru tiR ro w ayP las .

STAGE 1B -Permanent Construction of Offline elements

Once our Team shifts traffic at the end of Stage 1A, construction of the majority of Project elements will begin. Specifically, Stage 1B, shown in Figure 4.7.1.2, consists of all of the interchange elements, out of traffic, and Bridge B616. Generally, all work areas are available for construction concurrently.

Figure 4.7.1.2 - Stage 1B Construction



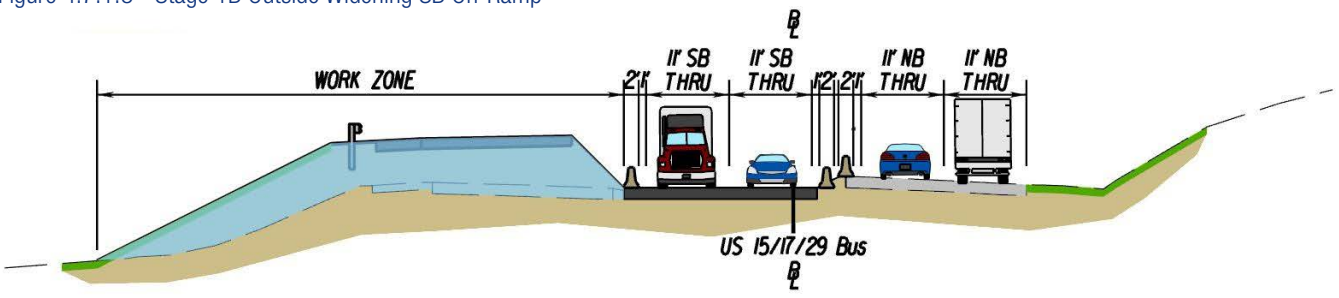
Stage 1B Bridge Construction

Due to our Team's Conceptual Design, construction of Bridge B616 over US 15/17/29 will occur offline of the existing intersection and in the existing median. Locating the substructure elements outside of the existing roadway allows construction to take place during daytime work hours without impacting the traveling public or requiring extensive night operations. While some night operations will be necessary for construction of certain bridge elements such as beam erection, deck overhang/falsework installation, and deck concrete placement, activities will be limited to those that affect the safety of the traveling public. These operations will be extremely limited in duration and will be coordinated in advance with the affected stakeholders. The majority of other bridge activities in this Stage will be behind temporary traffic barrier.

Stage 1B Roadway and Drainage Construction

Following the issuance of environmental permits, clearing and grubbing, roadway drainage and excavation activities will commence in all work areas. Work will include the outside wideing of the SB on-ramp as shown in Figure 4.7.1.3. Roadway excavation and grading includes stripping of all native topsoil. Any suitable excavation will be cut and placed in fill areas up to subgrade. In all areas, we have allowed time in our excavation activities to account for the remediation, or removal and replacement, of soft or unsuitable soils.

Figure 4.7.1.3 - Stage 1B Outside Widening SB On-Ramp



Stage 1C – Phased Construction of Both SB On-Ramps, Western Limits of US 15/17/29 Business

Once US 15/17/29 Business NB traffic is switched onto the temporary widening in the existing median and US 15/17/29 Business, SB traffic will be switched to it's ultimate location, as shown in Figure 4.7.1.4. The remainder of Stage 1C can then be constructed as shown in Figure 4.7.1.5.

Figure 4.7.1.4 - Stage 1C SB US 15/17/29 Business

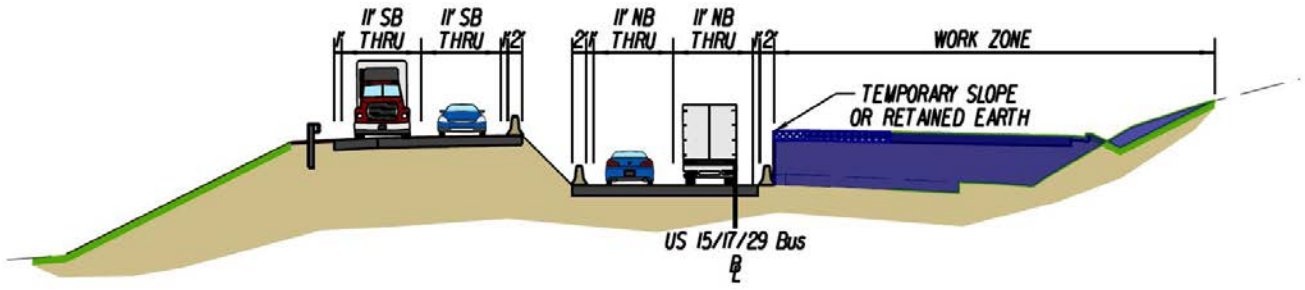
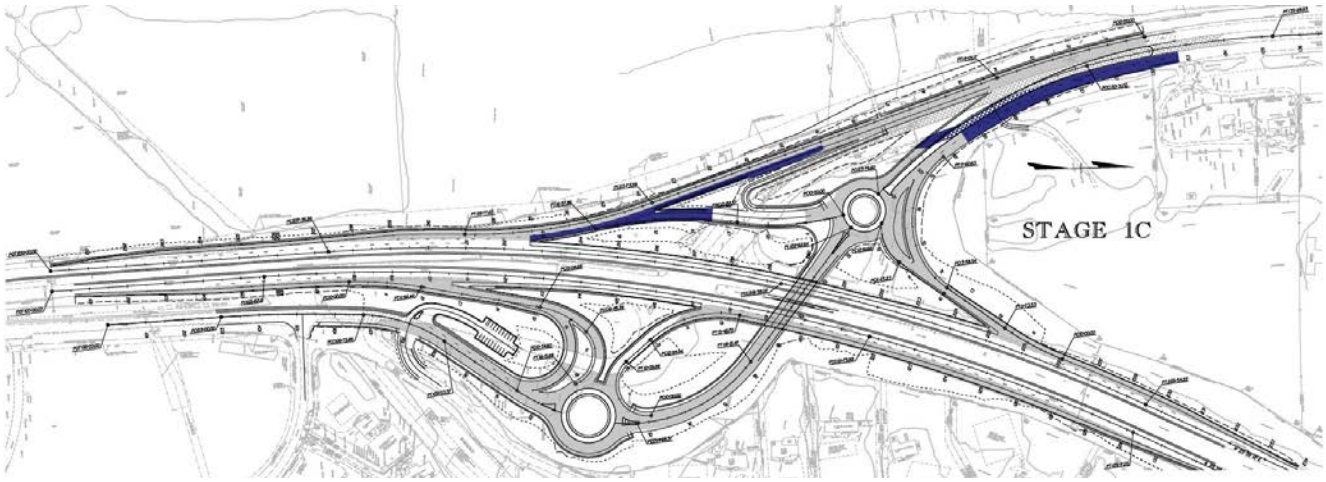


Figure 4.7.1.5 - Stage 1C Construction

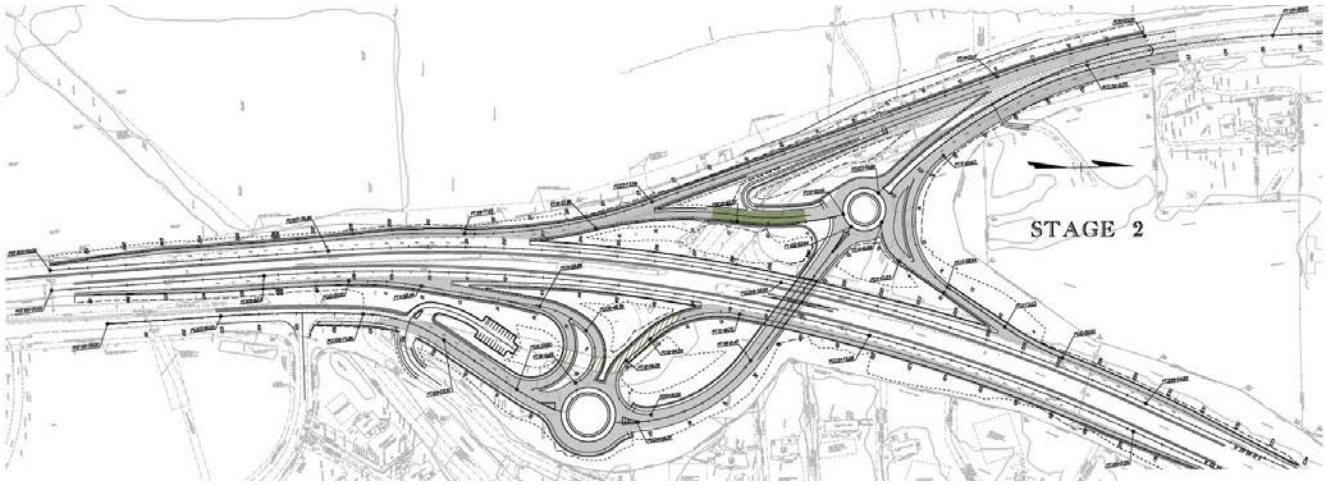


At the end of Stage 1, traffic will be switched to the newly constructed portions of the interchange, and the existing traffic signal will be deactivated and removed. This represents our Team's Unique Milestone. Concurrently, the Westbound Lord Fairfax Road to SB US 15/17/29 traffic will be detoured utilizing the NB on-ramp, NB US 15/17/29 to the Meetze Road exit, and returning to SB US 15/17/29.

STAGE 2 – Complete Ramp Connections

Following completion of Stage 1, Stage 2 consists of the remaining construction of the SB on-ramp to allow for the removal of the Meetze Road detour as shown in Figure 4.7.1.6.

Figure 4.7.1.6 - Stage 2 Construction



Stage 3 - Park and Ride Lot, Mill and Overlay, Final Completion

As shown in Figure 4.5.1.7, Stage 3 work will consist of completion of US 15/17/29 Business as shown in Figure 4.5.1.8, construction of the Park and Ride Lot, widening of US 15/17/29 between the Ramps, demolition of the existing asphalt in the median, placement of all final surface asphalt, and roundabout lighting. If Option 2 is awarded, completion of the additional mill & overlay would also be performed in this Stage. Placement of surface asphalt at the end of all construction ensures that all final paving is completed at the same time. This provides for the best possible rideability when utilizing an existing underlying pavement structure, and a smooth, "clean" look upon completion. As all work is completed, the inspection and punchlist process will be performed, and the Project will achieve an early Final Completion by November 25, 2020, prior to the Thanksgiving holiday.

Figure 4.7.1.7 - Stage 3 Construction

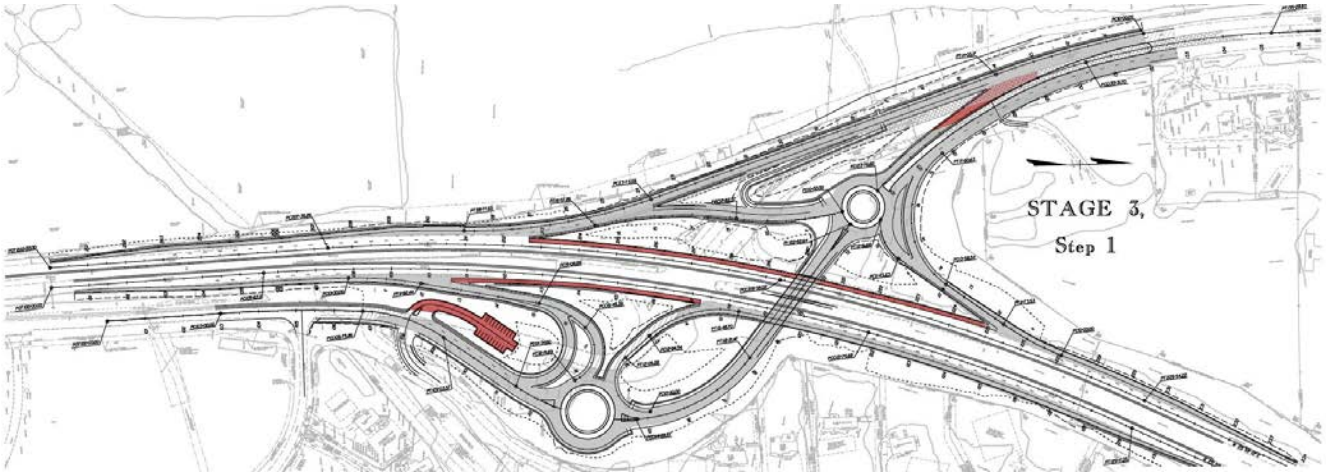
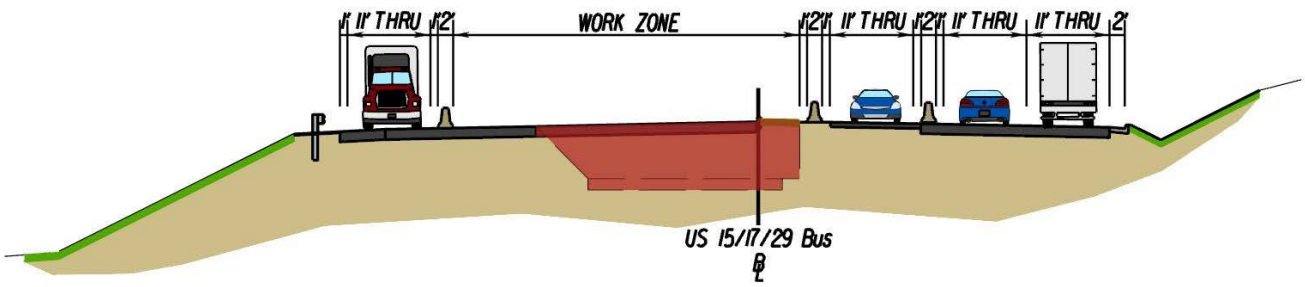


Figure 4.7.1.8 - Stage 3 US 15/17/29 Business



Critical Path

Listed below is a description of the Project's Critical Path as depicted in the Proposal Schedule. As shown, the Critical Path runs directly through the design, environmental permitting and construction activities associated with Lord Fairfax Drive, US 15/17/29 Business, and Ramp C.

C0007738DB100 Warrenton Southern Interchange US 15/17/29	
C0007738DB100.A SCHEDULE MILESTONES	
A1060	NOTICE TO PROCEED
A1220	INSPECTION / PUNCHLIST
A1240	FINAL COMPLETION
C0007738DB100.B DESIGN PHASE	
C0007738DB100.B.A PRELIMINARY DESIGN	
BA1000	NOTIFICATION OF LANDOWNERS/BOND
BA1020	SUPPLEMENTAL BASE MAPPING/FIELD SURVEY

C0007738DB100.B.C ROADWAY DESIGN

BC1000	PREPARE ROADWAY PLANS/ H & HA (1ST SUBMISSION)
BC1020	SUBMIT ROADWAY PLANS/ H & HA (1ST SUBMISSION)
BC1040	VDOT/FHWA REVIEW/COMMENT ROADWAY PLANS (1ST SUBMISSION)
BC1060	PREPARE ROADWAY PLANS (2ND SUBMISSION)
BC1080	SUBMIT ROADWAY PLANS (2ND SUBMISSION)
BC1100	VDOT/FHWA REVIEW/COMMENT ROADWAY PLANS (2ND SUBMISSION)
BC1120	PREPARE FINAL ROADWAY PLANS
BC1140	SUBMIT FINAL ROADWAY PLANS

C0007738DB100.B.D BRIDGE DESIGN

BD1000	SUBMIT PRELIMINARY DESIGN (TS&L)
BD1020	VDOT/FHWA REVIEW/COMMENT BRIDGE PRELIMINARY DESIGN
BD1040	PREPARE BRIDGE PLANS (1ST SUBMISSION)
BD1060	SUBMIT BRIDGE PLANS (1ST SUBMISSION)
BD1080	VDOT/FHWA REVIEW/COMMENT BRIDGE PLANS (1ST SUBMISSION)
BD1100	PREPARE FINAL BRIDGE PLANS
BD1120	SUBMIT FINAL BRIDGE PLANS

C0007738DB100.G CONSTRUCTION

C0007738DB100.G.A PROJECT GENERAL ITEMS

GA1020	MOBILIZATION FOR CONSTRUCTION
GA1040	SETUP FIELD OFFICES & STAGING AREA
GA1060	INITIAL SURVEY CONTROLS
GA1080	INITIAL MOT DEVICES/CONSTRUCTION SIGNAGE

C0007738DB100.G.1 STAGE 1

C0007738DB100.G.1.A STAGE 1 GENERAL ITEMS

G1A21000	SURVEY/LAYOUT LOD/MOT DEVICES
G1A31000	CLEAR AND GRUB WEST OF US 15/17/29
G1A32010	CLEAR AND GRUB EAST OF US 15/17/29
G1A32020	INSTALL PERIMETER EROSION CONROL EAST OF US 15/17/29
G1A32030	STAGE 1 CONSTRUCTION OPEN TO TRAFFIC
G1A32040	STAGE #1 PAVEMENT MARKINGS

C0007738DB100.G.1.2 STAGE 1B

C0007738DB100.G.1.2.I LORD FAIRFAX DRIVE STA. 107+00 TO 119+50

G1I1000	REGULAR EXCAVATION 0' - 10'
G1I1010	REGULAR EXCAVATION 10' - 20'
G1I1020	REGULAR EXCAVATION 20' +
G1I1030	INSTALL STORM DRAINAGE
G1I1040	SLOPE GRADING

C0007738DB100.G.1.2.J RAMP F STA. 10+00 TO 18+00

G1J1000	REGULAR EXCAVATION
G1J1010	INSTALL STORM DRAINAGE
G1J1020	SLOPE GRADING

C0007738DB100.G.1.2.K SPUR F STA. 10+00 TO 12+50

G1K1000	REGULAR EXCAVATION
G1K1010	INSTALL STORM DRAINAGE
G1K1020	SLOPE GRADING

C0007738DB100.G.1.2.L RAMP B STA. 13+50 TO 15+48.70

G1L1000	REGULAR EXCAVATION
G1L1010	INSTALL STORM DRAINAGE
G1L1020	SLOPE GRADING

C0007738DB100.G.1.2.M US 15/17/29 SB STA. 200+00 TO 216+00

G1M1010	INSTALL STORM DRAINAGE
G1M1020	SLOPE GRADING

C0007738DB100.G.1.2.N US 15/17/29 SB STA. 225+00 TO 234+00

G1M1110	REGULAR EXCAVATION
G1M1120	INSTALL STORM DRAINAGE
G1M1130	SLOPE GRADING
G1M1140	FINE GRADE

G1M1150	INSTALL UD-4
G1M1160	PLACE 21B AGGREGATE
G1M1170	PLACE BM-25.0A MAINLINE
G1M1180	PLACE 21B AGGREGATE SHOULDER
G1M1190	INSTALL CURB
G1M1200	PLACE IM-19.0A MAINLINE AND SHOULDER
C0007738DB100.G.1.2.O	**US 15/17/29 NB STA. 100+00 TO 112+00**
G1M1220	REGULAR EXCAVATION
G1M1230	INSTALL STORM DRAINAGE
C0007738DB100.G.1.2.P	**US 15/17/29 NB STA. 117+00 TO 131+50**
G1M1330	REGULAR EXCAVATION
G1M1340	INSTALL STORM DRAINAGE
G1M1350	SLOPE GRADING
C0007738DB100.G.1.3	**STAGE 1C**
C0007738DB100.G.1.3.C	**RAMP G STA. 19+00 TO 27+00**
G2D1000	DEMO ASPHALT
G2D1010	REGULAR EXCAVATION
G2D1020	INSTALL STORM DRAINAGE
G2D1030	SLOPE GRADING
C0007738DB100.G.2	**STAGE 2**
C0007738DB100.G.2.A	**STAGE 2 GENERAL ITEMS**
G2A21000	INSTALL TEMPORARY TRAFFIC BARRIER AND CONSTRUCTION SIGNAGE
C0007738DB100.G.2.B	**RAMP C STA. 10+00 TO 13+50**
G2B1000	PLACE FILL
G2B1010	INSTALL STORM DRAINAGE
G2B1020	SLOPE GRADING
C0007738DB100.G.3	**STAGE 3**
C0007738DB100.G.3.C	**US 15/17/29 NB STA. 112+00 TO 117+00**
G2D1220	REGULAR EXCAVATION
G2D1230	INSTALL STORM DRAINAGE
G2D1240	SLOPE GRADING
C0007738DB100.G.3.D	**US 15/17/29 SB STA. 216+00 TO 225+00**
G2D1110	REGULAR EXCAVATION
G2D1120	INSTALL STORM DRAINAGE
G2D1130	SLOPE GRADING
C0007738DB100.G.3.E	**PARK AND RIDE LOT**
G2C1100	INSTALL STORM DRAINAGE
G2C1110	SLOPE GRADING
G2C1120	FINE GRADE
G2C1130	PLACE 21B AGGREGATE
G2C1140	PLACE BM-25.0A
G2C1150	INSTALL CURB
G2C1160	PLACE IM-19.0A
G2C1170	PLACE ASPHALT SM-9.5D
G2C1180	INSTALL PAVEMENT MARKINGS
G2C1190	REGULAR EXCAVATION

Key Scheduling Assumptions

- Environmental permitting agencies will accept VDOT's RFP avoidance and minimization efforts taken in the RFP phase as sufficient to process permit without delay.
- Utility companies will coordinate their relocations in accordance with our Project Schedule.
- There are no hazardous materials, threatened & endangered species, or unforeseen environmental constraints, other than those identified in the RFP, that could delay the Project Schedule.
- Crew leveling has been developed through crew-flow relationships between like activities.
- Crews are based on an 8-hour workday and 5-day per workweek calendar. A detailed description of the calendars is included in this narrative.

- Generally, the schedule has been built with work in certain areas of the Project starting when access is available (either via work availability, property rights, or utility access) and/or at the completion of a prior stage of work. We have provided some crew flow predecessor relationships in several locations throughout the schedule mainly where adjacent work is available and crew flow is logical as to not 'stack' too many work areas on top of each other.
- Generally, Finish-Start relationships are primarily used as much as possible to create logical flow of the work in one particular area. There is some overlap however of different types of activity in any one area. For example, the earthwork moving activities in any one area may be running concurrent with storm pipe installation. In this type scenario, both will conclude with a 'Fine Grade' activity and then the pavement section activities will begin.

Project Controls

Through our Team's experience delivering major design-build projects ahead of schedule, we have developed scheduling protocols to govern the development, implementation, progress tracking, and recovery of the CPM schedule through all the Project stages.

Schedule Development

For any design-build project, it is imperative that the Project Team develop a detailed CPM schedule that considers the interrelationships between all the design-build disciplines. Our Team has developed the Proposal Schedule with a WBS that clearly delineates the tasks of each discipline manager, including project management, design, permitting, ROW, utilities, and construction.

To develop the overall detailed CPM Schedule, each discipline manager is responsible for producing a schedule to govern his own work and providing insight into how his schedule activities affect and are affected by activities in other disciplines. Once each manager has prepared their individual schedule, we hold schedule development meetings run by the Design-Build Project Manager and attended by all discipline managers to review the individual schedules and integrate them into the overall CPM Schedule. These meetings ensure that:

- work packages within each discipline are comprehensive and define the work with no activities omitted;
- work packages are integrated within each discipline and between disciplines to generate a clearly defined project Critical Path, confirm the Critical Path makes sense, and the schedule shows that the Project will complete on-time or ahead of schedule;
- each discipline manager understands the schedules of the other disciplines and how their work inter-relates with the other disciplines;
- each discipline manager understands how his work affects the Critical Path and the priorities of the Design-Build Project Manager and other discipline managers; and
- the schedule meets or exceeds the requirements of the Contract.

These meetings enable our Team to create a detailed CPM Schedule that is jointly prepared by and agreed to by all the discipline managers, providing realistic expectations of the schedule of work to be completed by all team members and third parties.

Throughout the design phase of the Project as more detailed plans are developed and utility conflicts are verified through test pitting, these meetings continue to further develop the CPM Schedule into the more detailed Baseline CPM Schedule. This schedule can then be utilized by all Team members to plan and track the progress of their work. It is submitted to VDOT for review and approval and utilized during the planning phases for utilities, permitting, ROW, design, and subcontractor/supplier scope and purchasing.

Specific milestone dates from the CPM schedule will be written into subcontracts and purchase orders, making them contractually responsible for meeting schedule deadlines.

Mitigation of Major Delay Risks

Timely Review and Approval of Submittals

Upon Notice of Award, our Team will prepare a submittal schedule identifying all submittals that are required for the Project. This schedule identifies the individual responsible for preparing the submittal, the anticipated submittal date, the parties responsible for reviewing and approving, the anticipated review durations, and a list of the individuals that must receive a copy of the approved submittal. At a minimum, the following submittals will be included:

- Design Submissions
- Permits
- QA/QC Plan
- CPM Schedule and Updates
- MOT and TMP Plans
- Materials documentation, including Source of Supply and Shop Drawings

Submittals deemed critical to the success of the Project, including design and permitting submissions and major materials submissions (such as bridge girder shop drawings), will be included in the Project CPM Schedule where the progress can be monitored concurrently with the affected construction activity. Each submittal includes a transmittal cover sheet identifying the submittal's priority level. For submittals between the contractor and design firm, normal priority submittals will be returned within four weeks; high priority submittals within two weeks and urgent submittals within three days. This also allows the Team to prioritize multiple submittals that are turned in concurrently. For submittals to government agencies and utilities, we include adequate review timeframes in the CPM Schedule for approval of environmental permits and utility submissions as applicable.

We also maintain a submittal log showing the status of all submittals. We will update the log with the submission and return of each submittal and will show the submission date, anticipated response date, priority, and status. The submittal log is reviewed at the weekly Design Coordination, Owner Progress, and Construction Progress meetings. It can easily be sorted to distribute lists of active and overdue submittals. We discuss issues affecting the timely completion of submittal reviews with the responsible party and a plan for resolving them are agreed to.

This process, along with diligent assessment of the CPM schedule, ensures that timely review of submittals will be constantly monitored and managed ensuring that no construction activities are delayed by the submittal process.

Utility Relocations

Some of the biggest risks to a design-build schedule involve public/private utility companies who do not have a vested interest in the Project and are not necessarily compelled to complete their work within the scheduled time constraints. To combat this risk, we have started our planning and coordination process for these utilities by meeting with each affected utility and discussing the Project, the utility impacts, potential relocation options, and discussing ways to accelerate the utility relocations after award.

This early coordination enables us to identify opportunities to advance the utility relocations and minimize the risk for utility delays after NTP. The early personal contact with each utility enables us to manage their issues and concerns and allows us to build float into the utility relocation activities on the Project.

Appendix

Attachment 9.3.1 - Proposal Payment Agreement

ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this "Agreement") is made and entered into as of this 7th day of December, 2017, by and between the Virginia Department of Transportation ("VDOT"), and Shirley Contracting Company, LLC ("Offeror").

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications ("SOQs") pursuant to VDOT's 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: _____

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

By: _____

Name: Michael E. Post

Title: President/CEO/Manager

Attachment 11.8.6(a)(b) - Debarment Forms

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.

Signature	12/7/17 Date	President/CEO/Manager Title

Shirley Contracting Company, 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.

Dave Mahoney 11/20/17 Executive Vice President

Signature Date Title

Dewberry Consultants 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.

W. J. McKeague 11/20/2017 Vice President
Signature Date Title

Quantum Spatial, 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.

[signature] 11/20/2017 Vice President

Signature Date Title

DMY Engineering Consultants Inc.

Name of Firm

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

Project No.: 0029-030-121

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

11/20/2017 Project Manager
Signature Date Title

So-Deep, Inc.
Name of Firm

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

Project No.: 0029-030-121

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

Signature	Date	Title
	11/20/2017	President

SKELLY AND LOY, INC.
Name of Firm

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

Project No.: 0029-030-121

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

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

Signature	November 30, 2017	Principal and Executive Vice-President
Signature	Date	Title

CES Consulting LLC

Name of Firm

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

Project No.: 0029-030-121

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

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

Signature	Date	Title
[signature]	12/01/2017	Principal

Dulles Geotechnical & Material Testing Services, Inc.
Name of Firm

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

Project No.: 0029-030-121

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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.

Patricia E. Dubloch 11/17/2017 President
Signature Date Title

Diversified Property Services, Inc.
Name of Firm

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

Project No.: 0029-030-121

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

R Robb Rueske 11-17-17 Vice President

Signature Date Title

Old Dominion Settlements T/A Key Title

Name of Firm

Response to Request for Proposals

WARRENTON SOUTHERN INTERCHANGE US 15/17/29

Fauquier County, Virginia

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

VOLUME II: DESIGN CONCEPT

Submitted By:

SHIRLEY
CONTRACTING COMPANY, LLC

In Association With:

Dewberry

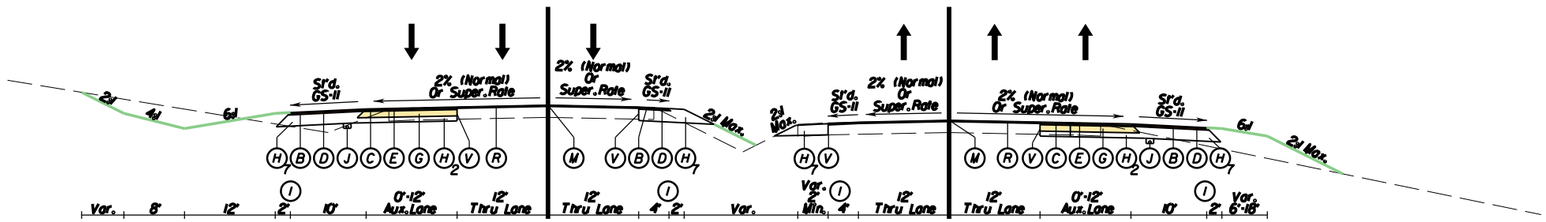
4.3.1 - Conceptual Roadway Plans

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	2A(1)

TYPICAL SECTIONS

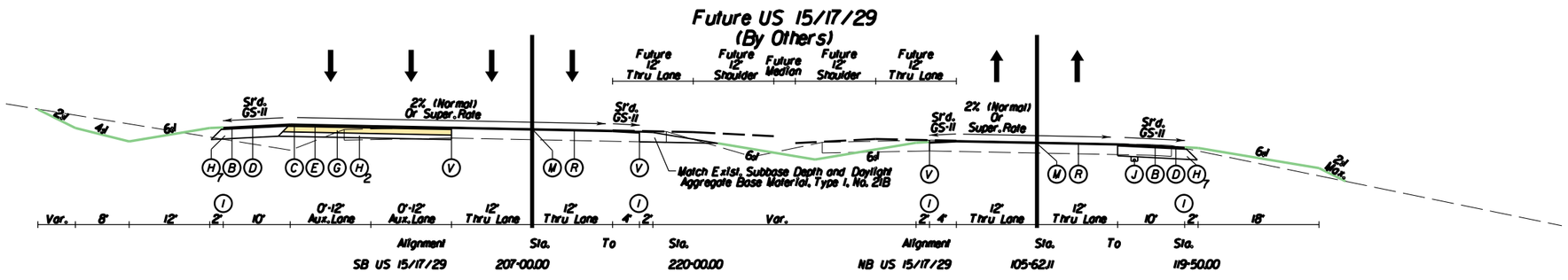
Dewberry SHIRLEY CONTRACTING COMPANY, LLC

SB US 15/17/29
Rural Principle Arterial (GS-1)

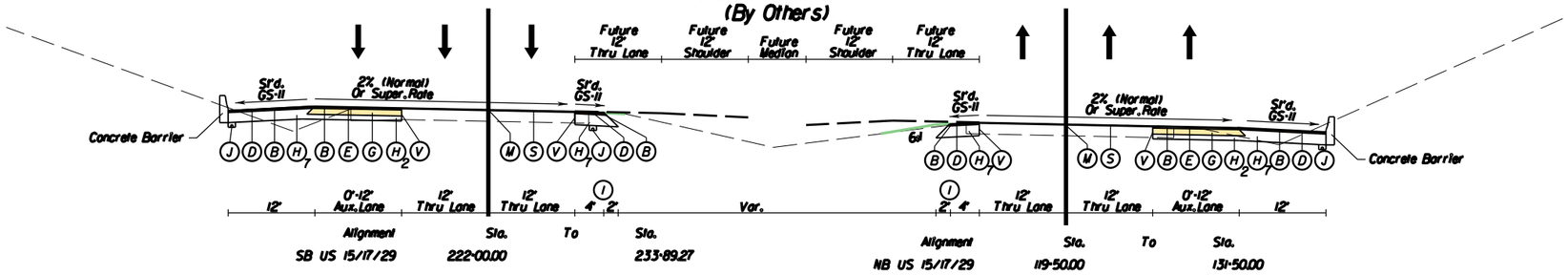


NB US 15/17/29
Rural Principle Arterial (GS-1)

Future US 15/17/29
(By Others)



Future US 15/17/29
(By Others)



LEGEND

- (A) 2" Asphalt Concrete, Type SM-9.5A
- (B) 1.5" Asphalt Concrete, Type SM-9.5D
- (B_1) 1.5" Asphalt Concrete, Type SMA-9.5D
- (C) 2" Asphalt Concrete, Type SM-12.5E
- (D) 2" Asphalt Concrete, Type IM-19.0A
- (E) 2" Asphalt Concrete, Type IM-19.0E
- (F_1) 4" Asphalt Concrete, Type BM-25.0A
- (F_2) 5" Asphalt Concrete, Type BM-25.0A
- (F_3) 6" Asphalt Concrete, Type BM-25.0A
- (G) 10" Asphalt Concrete, Type BM-25.0D
- (H_1) 6" Aggregate Base Material, Type I, Size No. 21B
- (H_2) 8" Aggregate Base Material, Type I, Size No. 21B
- (H_3) 12" Aggregate Base Material, Type I, Size No. 21B
- (H_4) 13" Aggregate Base Material, Type I, Size No. 21B
- (H_5) 14" Aggregate Base Material, Type I, Size No. 21B
- (H_6) 18" Aggregate Base Material, Type I, Size No. 21B
- (H_7) 18.5" Aggregate Base Material, Type I, Size No. 21B
- (J) Underdrain, Sr'd. UD-4 Req'd.
- (K) Curb, Sr'd. CG-2 Req'd.
- (L) Curb & Gutter, Sr'd. CG-6 Req'd.
- (M) Profile Grade Line (PGL) / Point of Rotation
- (N) 6" Aggregate Base Material, Type I, Size No. 21B Connected to a Standard UD-4 Edge Drain Beneath the Curb or Curb and Gutter and Extended 12" Behind the Curb
- (P) Option 1 2" Asphalt Concrete, Type SM-9.5A Placed Above 6" Aggregate Material, Type I, No. 21B, Extended 6" Beyond Either Edge of Asphalt Shared Use Path
- (R) Mill Exis. Surface Min. of 2" and Replace with a Min. 2" Asphalt Concrete, Type SM-12.5E Variable Depth Build-up may be Required
- (S) Mill Exist. Surface Min. of 1.5" and Replace with a Min. 1.5" Asphalt Concrete, Type SMA-9.5D Variable Depth Build-up may be Required
- (T) 8" Hydraulic Cement Concrete, Class A3 Placed Above 6" Aggregate Base Material, Type I, No. 21B
- (U) Extend Mainline Pavement 1':on the Same Slope. Into the Shoulder
- (V) Full Depth Saw Cut

- Denotes Full Depth Pavement
- Denotes Milling and Overlay or Variable Depth Overlay
- Denotes Proposed Grass Median/ Buffer/Planted Area
- Denotes Proposed Shoulder
- Denotes Proposed Bridge
- Denotes Proposed Bridge
- Denotes Option 1 Proposed Shared Use Path
- (I) When Guardrail is Required, Shoulder Widths And Limits of Paving Shall Be Increased In Accordance With Sr'd. GR-MGS-INS And Sr'd. MC-4.

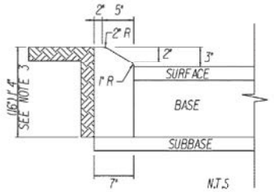
SCALE 0 10' 20'	PROJECT	SHEET NO.
	0029-030-121	2A(1)

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

TYPICAL SECTIONS

CG-3 MODIFIED

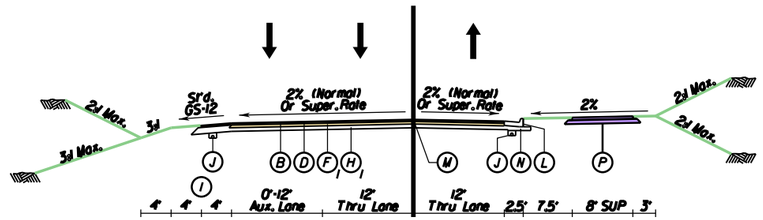
FOR USE ON ROUNDABOUT TRUCK APRONS ONLY



NOTES:

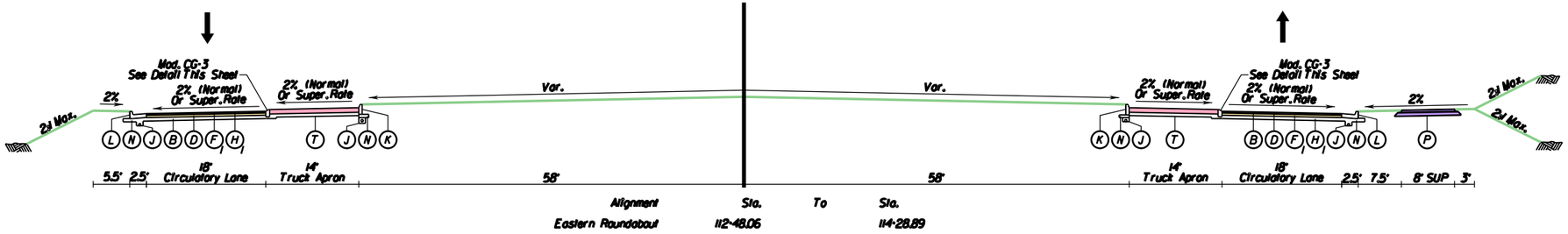
1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.
3. THE DEPTH OF CURB MAY BE REDUCED AS MUCH AS 3" (13" DEPTH) OR INCREASED AS MUCH AS 3" (19" DEPTH) IN ORDER THAT THE BOTTOM OF THE CURB WILL COINCIDE WITH THE TOP OF A COURSE OF THE PAVEMENTS SUBSTRUCTURE. OTHERWISE, THE DEPTH IS TO BE 16" AS SHOWN. NO ADJUSTMENT IN THE PRICE BID IS TO BE MADE FOR A DECREASE OR AN INCREASE IN DEPTH.
4. THE MODIFICATION TO THE STANDARD CG-3 IS TO REDUCE THE EXPOSED HEIGHT OF THE CURB AS SHOWN. MODIFIED CURB SHALL BE PAID FOR AS STANDARD CG-3.

Lord Fairfax Road
Urban Local Street (GS-8)

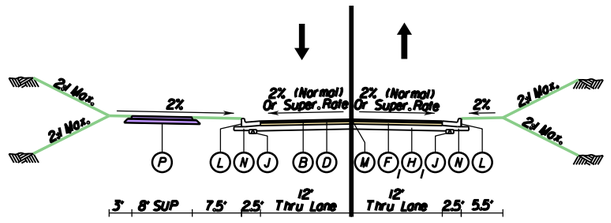


Alignment	Sta.	To	Sta.
Lord Fairfax Road	102+86.63		112+48.06

Eastern Roundabout

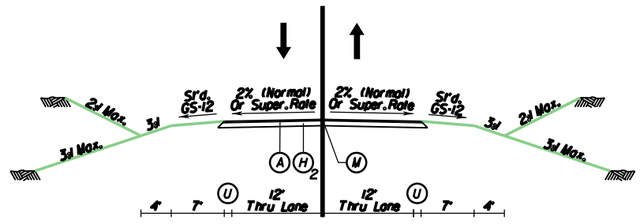


Alignment	Sta.	To	Sta.
Eastern Roundabout	112+48.06		114+28.89



Alignment	Sta.	To	Sta.
Lord Fairfax Road	114+28.89		Bridge (B616)

Turkey Run Drive
Urban Local Street (GS-8)



Alignment	Sta.	To	Sta.
Turky Run Drive	10+00.00		12+09.63

LEGEND

- (A) 2" Asphalt Concrete, Type SM-9.5A
- (B) 1.5" Asphalt Concrete, Type SM-9.5D
- (B_1) 1.5" Asphalt Concrete, Type SMA-9.5D
- (C) 2" Asphalt Concrete, Type SM-12.5E
- (D) 2" Asphalt Concrete, Type IM-19.0A
- (E) 2" Asphalt Concrete, Type IM-19.0E
- (F_1) 4" Asphalt Concrete, Type BM-25.0A
- (F_2) 5" Asphalt Concrete, Type BM-25.0A
- (F_3) 6" Asphalt Concrete, Type BM-25.0A
- (G) 10" Asphalt Concrete, Type BM-25.0D
- (H_1) 6" Aggregate Base Material, Type I, Size No. 21B
- (H_2) 8" Aggregate Base Material, Type I, Size No. 21B
- (H_3) 12" Aggregate Base Material, Type I, Size No. 21B
- (H_4) 13" Aggregate Base Material, Type I, Size No. 21B
- (H_5) 14" Aggregate Base Material, Type I, Size No. 21B
- (H_6) 18" Aggregate Base Material, Type I, Size No. 21B
- (H_7) 18.5" Aggregate Base Material, Type I, Size No. 21B
- (J) Underdrain, Std. UD-4 Req'd.
- (K) Curb, Std. CG-2 Req'd.
- (L) Curb & Gutter, Std. CG-6 Req'd.
- (M) Profile Grade Line (PGL) / Point of Rotation
- (N) 6" Aggregate Base Material, Type I, Size No. 21B Connected to a Standard UD-4 Edge Drain Beneath the Curb or Curb and Gutter and Extended 12" Behind the Curb
- (P) Option 1 2" Asphalt Concrete, Type SM-9.5A Placed Above 6" Aggregate Material, Type I, No. 21B, Extended 6" Beyond Either Edge of Asphalt Shared Use Path
- (R) Mill Exist. Surface Min. of 2" and Replace with a Min. 2" Asphalt Concrete, Type SM-12.5E Variable Depth Build-up may be Required
- (S) Mill Exist. Surface Min. of 1.5" and Replace with a Min. 1.5" Asphalt Concrete, Type SMA-9.5D Variable Depth Build-up may be Required
- (T) 8" Hydraulic Cement Concrete, Class A3 Placed Above 6" Aggregate Base Material, Type I, No. 21B
- (U) Extend Mainline Pavement 1' on the Same Slope, Into the Shoulder
- (V) Full Depth Saw Cut

- Denotes Full Depth Pavement
- Denotes Milling and Overlay or Variable Depth Overlay
- Denotes Proposed Grass Median/ Buffer/Planted Area
- Denotes Proposed Shoulder
- Denotes Proposed Bridge
- Denotes Proposed Bridge
- Denotes Option 1 Proposed Shared Use Path
- (I) When Guardrail is Required, Shoulder Widths And Limits of Paving Shall Be Increased In Accordance With Std. GR-MGS-INS And Std. MC-4.

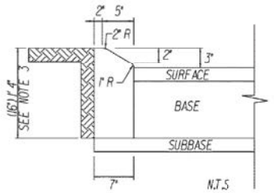
SCALE	PROJECT	SHEET NO.
0 10' 20'	0029-030-121	2A(2)

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

TYPICAL SECTIONS

CG-3 MODIFIED

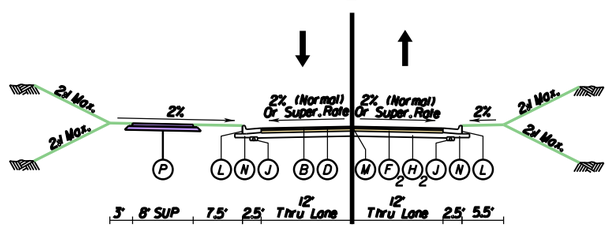
FOR USE ON ROUNDABOUT TRUCK APRONS ONLY



NOTES:

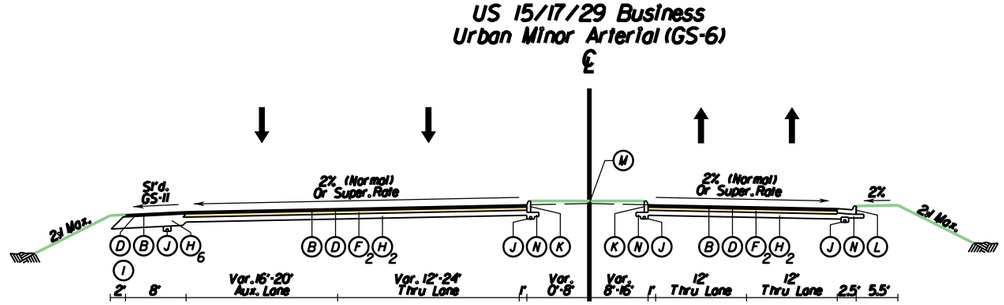
1. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
2. CONCRETE TO BE CLASS A3 IF CAST IN PLACE, 4000 PSI IF PRECAST.
3. THE DEPTH OF CURB MAY BE REDUCED AS MUCH AS 3" (13" DEPTH) OR INCREASED AS MUCH AS 3" (19" DEPTH) IN ORDER THAT THE BOTTOM OF THE CURB WILL COINCIDE WITH THE TOP OF A COURSE OF THE PAVEMENTS SUBSTRUCTURE. OTHERWISE, THE DEPTH IS TO BE 16" AS SHOWN. NO ADJUSTMENT IN THE PRICE BID IS TO BE MADE FOR A DECREASE OR AN INCREASE IN DEPTH.
4. THE MODIFICATION TO THE STANDARD CG-3 IS TO REDUCE THE EXPOSED HEIGHT OF THE CURB AS SHOWN. MODIFIED CURB SHALL BE PAID FOR AS STANDARD CG-3.

US 15/17/29 Business
Urban Minor Arterial (GS-6)
℄



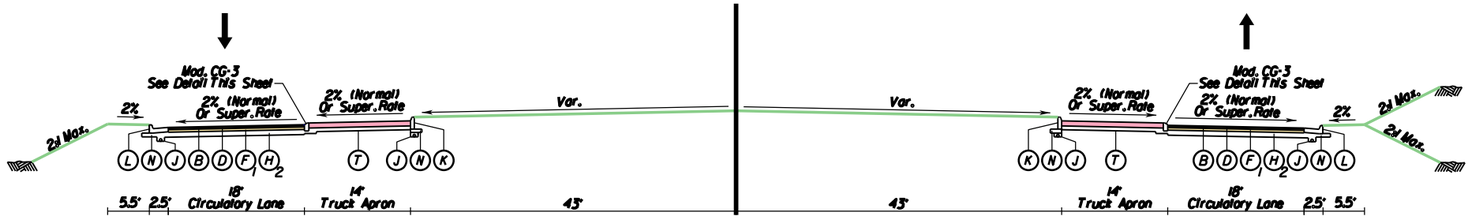
Alignment	Sta.	To	Sta.
US 15/17/29 Business	Bridge (B616)		122+44.64

US 15/17/29 Business
Urban Minor Arterial (GS-6)
℄

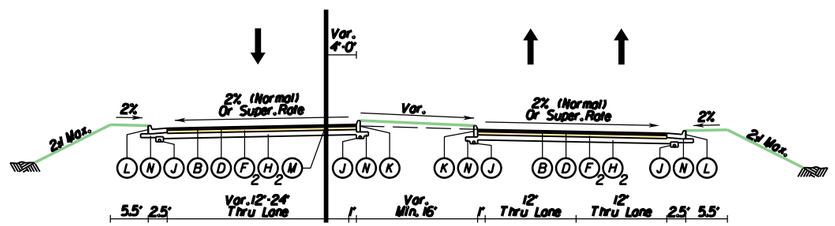


Alignment	Sta.	To	Sta.
US 15/17/29 Business	128+44.35		132+09.83

Western Roundabout



Alignment	Sta.	To	Sta.
Western Roundabout	122+44.64		123+94.60



Alignment	Sta.	To	Sta.
US 15/17/29 Business	123+94.60		128+44.35

LEGEND

- (A) 2" Asphalt Concrete, Type SM-9.5A
- (B) 1.5" Asphalt Concrete, Type SM-9.5D
- (B_1) 1.5" Asphalt Concrete, Type SMA-9.5D
- (C) 2" Asphalt Concrete, Type SM-12.5E
- (D) 2" Asphalt Concrete, Type IM-19.0A
- (E) 2" Asphalt Concrete, Type IM-19.0E
- (F_1) 4" Asphalt Concrete, Type BM-25.0A
- (F_2) 5" Asphalt Concrete, Type BM-25.0A
- (F_3) 6" Asphalt Concrete, Type BM-25.0A
- (G) 10" Asphalt Concrete, Type BM-25.0D
- (H_1) 6" Aggregate Base Material, Type I, Size No. 21B
- (H_2) 8" Aggregate Base Material, Type I, Size No. 21B
- (H_3) 12" Aggregate Base Material, Type I, Size No. 21B
- (H_4) 13" Aggregate Base Material, Type I, Size No. 21B
- (H_5) 14" Aggregate Base Material, Type I, Size No. 21B
- (H_6) 18" Aggregate Base Material, Type I, Size No. 21B
- (H_7) 18.5" Aggregate Base Material, Type I, Size No. 21B
- (J) Underdrain, Std. UD-4 Req'd.
- (K) Curb, Std. CG-2 Req'd.
- (L) Curb & Gutter, Std. CG-6 Req'd.
- (M) Profile Grade Line (PGL) / Point of Rotation
- (N) 6" Aggregate Base Material, Type I, Size No. 21B Connected to a Standard UD-4 Edge Drain Beneath the Curb or Curb and Gutter and Extended 12" Behind the Curb
- (P) Option 1 2" Asphalt Concrete, Type SM-9.5A Placed Above 6" Aggregate Material, Type I, No. 21B, Extended 6" Beyond Either Edge of Asphalt Shared Use Path
- (R) Mill Exis. Surface Min. of 2" and Replace with a Min. 2" Asphalt Concrete, Type SM-12.5E Variable Depth Build-up may be Required
- (S) Mill Exist. Surface Min. of 1.5" and Replace with a Min. 1.5" Asphalt Concrete, Type SMA-9.5D Variable Depth Build-up may be Required
- (T) 8" Hydraulic Cement Concrete, Class A3 Placed Above 6" Aggregate Base Material, Type I, No. 21B
- (U) Extend Mainline Pavement 1' on the Same Slope, Into the Shoulder
- (V) Full Depth Saw Cut

- Denotes Full Depth Pavement
- Denotes Milling and Overlay or Variable Depth Overlay
- Denotes Proposed Grass Median/ Buffer/Planted Area
- Denotes Proposed Shoulder
- Denotes Proposed Bridge
- Denotes Proposed Bridge
- Denotes Option 1 Proposed Shared Use Path
- (I) When Guardrail is Required, Shoulder Widths And Limits of Paving Shall Be Increased In Accordance With Std. GR-MGS-WS And Std. MC-4.

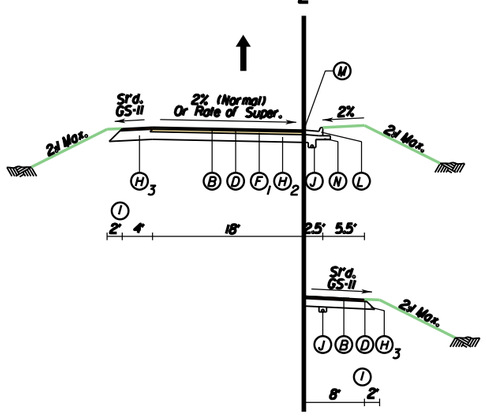
SCALE	PROJECT	SHEET NO.
0 10' 20'	0029-030-121	2A(3)

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	29	0029-030-121 P101, R201, C501	2A(4)

TYPICAL SECTIONS

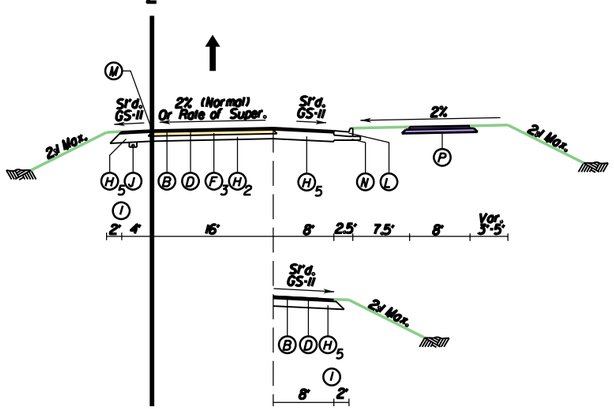
Dewberry SHIRLEY CONTRACTING COMPANY, LLC

Ramp B
Interchange Ramp (GS-R)



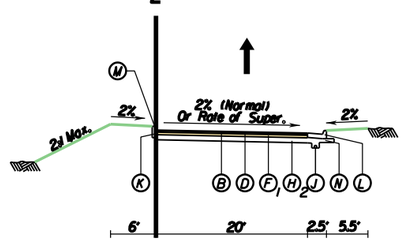
Alignment	Sta.	To	Sta.
Ramp B	10+00.00		15+48.70

Ramp C
Interchange Ramp (GS-R)



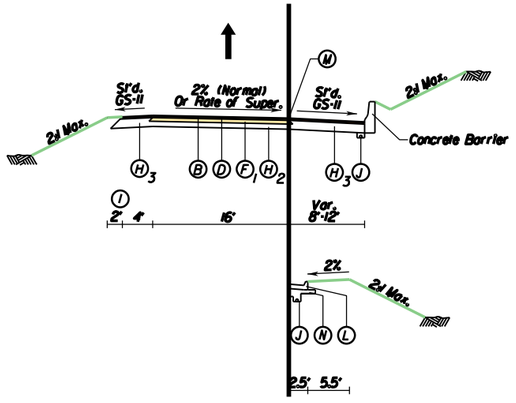
Alignment	Sta.	To	Sta.
Ramp C	10+00.00		16+57.86

Spur D
Interchange Ramp (GS-R)



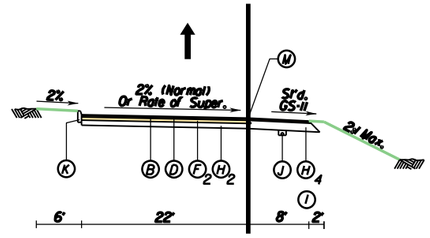
Alignment	Sta.	To	Sta.
Spur D	10+00.00		12+61.68

Ramp D
Interchange Ramp (GS-R)



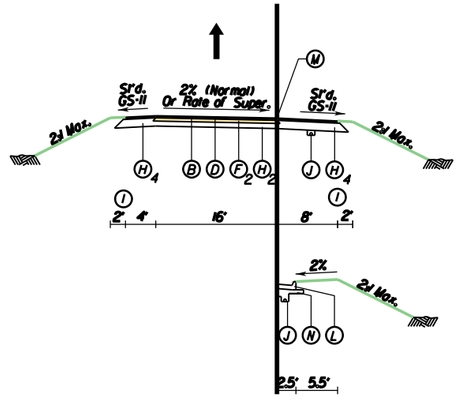
Alignment	Sta.	To	Sta.
Ramp D	10+00.00		17+60.63

Spur F
Interchange Ramp (GS-R)



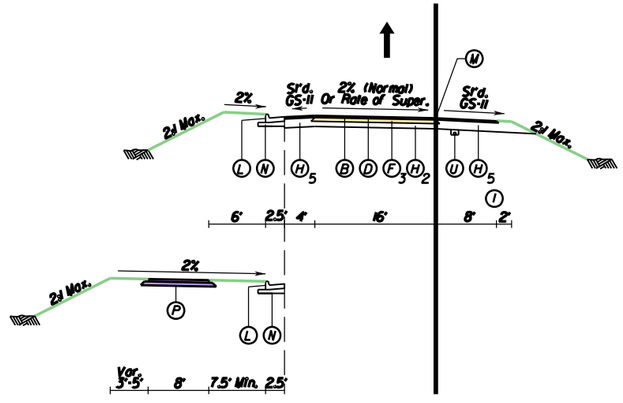
Alignment	Sta.	To	Sta.
Spur F	10+00.00		13+38.78

Ramp F
Interchange Ramp (GS-R)



Alignment	Sta.	To	Sta.
Ramp F	10+00.00		18+15.69

Ramp G
Interchange Ramp (GS-R)



Alignment	Sta.	To	Sta.
Ramp G	10+00.00		28+77.65

LEGEND

- (A) 2" Asphalt Concrete, Type SM-9.5A
- (B) 1.5" Asphalt Concrete, Type SM-9.5D
- (B_1) 1.5" Asphalt Concrete, Type SMA-9.5D
- (C) 2" Asphalt Concrete, Type SM-12.5E
- (D) 2" Asphalt Concrete, Type IM-19.0A
- (E) 2" Asphalt Concrete, Type IM-19.0E
- (F_1) 4" Asphalt Concrete, Type BM-25.0A
- (F_2) 5" Asphalt Concrete, Type BM-25.0A
- (F_3) 6" Asphalt Concrete, Type BM-25.0A
- (G) 10" Asphalt Concrete, Type BM-25.00
- (H_1) 6" Aggregate Base Material, Type I, Size No. 21B
- (H_2) 8" Aggregate Base Material, Type I, Size No. 21B
- (H_3) 12" Aggregate Base Material, Type I, Size No. 21B
- (H_4) 13" Aggregate Base Material, Type I, Size No. 21B
- (H_5) 14" Aggregate Base Material, Type I, Size No. 21B
- (H_6) 18" Aggregate Base Material, Type I, Size No. 21B
- (H_7) 18.5" Aggregate Base Material, Type I, Size No. 21B
- (J) Underdrain, Sr'd. UD-4 Req'd.
- (K) Curb, Sr'd. CG-2 Req'd.
- (L) Curb & Gutter, Sr'd. CG-6 Req'd.
- (M) Profile Grade Line (PGL) / Point of Rotation
- (N) 6" Aggregate Base Material, Type I, Size No. 21B Connected to a Standard UD-4 Edge Drain Beneath the Curb or Curb and Gutter and Extended 12" Behind the Curb
- (P) Option 1 2" Asphalt Concrete, Type SM-9.5A Placed Above 6" Aggregate Material, Type I, No. 21B, Extended 6" Beyond Either Edge of Asphalt Shared Use Path
- (R) Mill Exis. Surface Min. of 2" and Replace with a Min. 2" Asphalt Concrete, Type SM-12.5E Variable Depth Build-up may be Required
- (S) Mill Exist. Surface Min. of 1.5" and Replace with a Min. 1.5" Asphalt Concrete, Type SMA-9.5D Variable Depth Build-up may be Required
- (T) 8" Hydraulic Cement Concrete, Class A3 Placed Above 6" Aggregate Base Material, Type I, No. 21B
- (U) Extend Mainline Pavement 1' on the Same Slope, Into the Shoulder
- (V) Full Depth Saw Cut

- Denotes Full Depth Pavement
- Denotes Milling and Overlay or Variable Depth Overlay
- Denotes Proposed Grass Median/ Buffer/Planted Area
- Denotes Proposed Shoulder
- Denotes Proposed Bridge
- Denotes Proposed Bridge

- Denotes Option 1 Proposed Shared Use Path
- (I) When Guardrail is Required, Shoulder Widths And Limits of Paving Shall Be Increased In Accordance With Sr'd. GR-MGS-INS And Sr'd. MC-4.

SCALE	PROJECT	SHEET NO.
0 10' 20'	0029-030-121	2A(4)

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

Dewberry SHIRLEY CONTRACTING COMPANY, LLC

ROSE M. KENDRICK AND JOHN A. KENDRICK
DB 773 PG 1750
DB 1234 PG 1699
5.4001 AC.
GPIN 6983-61-1528

ROSE M. KENDRICK AND JOHN A. KENDRICK
DB 726 PG 499
DB 1234 PG 1702
4.2626 AC.
GPIN 6983-61-1170

ALWINGTON FARM, LLC
DB 1512 PG 1200
DB 1413 PG 1710
DB 1328 PG 01
DB 1267 PG 1993
435.0676 AC.
GPIN 6983-36-8598

STATE BOARD FOR COMMUNITY COLLEGES
DB 789 PG 1738
DB 610 PG 1114
50.0000 AC.
GPIN 6983-72-7858

ST'D.GR-MGS(
ST'D.MB-7F
ST'D.GR-MGS(
POT 200+00.00
POT 100+00.00
POT 100+00.00
PC 105+62.11
PC 103+00.00
SB US 15/17/29
NB US 15/17/29
Lord Fairfax Road
College Street
Bingham Road
Match Line - Sta. 206+00 - See Sheet 4
29 NB-1
BUS-1

DESIGN ENHANCEMENT
5 – PARK AND RIDE LOT
RELOCATES PARK AND RIDE LOT TO SOUTHEAST (SE) QUADRANT OF THE INTERCHANGE

- Denotes Full Depth Asphalt Pavement
- Denotes Asphalt Milling and Replacement or Variable Depth Asphalt Overlay
- Denotes Asphalt Pavement Shoulder
- Denotes MC-4 Asphalt Pavement Under Guardrail
- Denotes Proposed Grass Median/ Buffer/Planted Area
- Denotes Proposed Concrete Truck Apron or Median
- Denotes Type I, 6" Crusher Run Agg.25 or 26
- Denotes Option 1 Proposed Shared Use Path
- Denotes Option 2 Asphalt Milling and Overlay or Variable Depth Asphalt Overlay
- Denotes Demolition of Pavement
- Denotes Area of R/W Reduction
- Denotes Exist. R/W / Prop. Line
- Denotes Prop. R/W per RFP Conceptual Design
- Denotes Prop. L/A
- Denotes Edge of Pavement (Future 6-lane US Route 15/17/29 Bypass) By Others
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills

Curve BUS-1
PI = 104+88.10
DELTA = 5°55'57.32" (RT)
D = 1°34'42"
T = 188.10'
L = 375.86'
R = 3630.00'
PC = 103+00.00
PCC = 106+75.86
V = 45 MPH
E = NC

SCALE 0 50' 100'

PROJECT	SHEET NO.
0029-030-121	3

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

Dewberry SHIRLEY CONTRACTING COMPANY, LLC

Curve 29 SB-1
PI = 213+41.08
DELTA = 16° 00' 46.52" (RT)
D = 1° 19' 57"
T = 604.82'
L = 1,201.76'
R = 4,300.00'
PC = 207+36.26
PCC = 219+38.02
V = 60 MPH
E = 3.7%

Curve 29 NB-1
PI = 113+76.58
DELTA = 15° 15' 37.89" (RT)
D = 1° 11' 37"
T = 844.41'
L = 1,613.57'
R = 4,800.00'
PC = 105+62.11
PCC = 121+75.68
V = 60 MPH
E = 3.4%

Curve RAMP F-1
PI = 10+96.52
DELTA = 11° 01' 34.35" (RT)
D = 5° 43' 46"
T = 96.52'
L = 192.44'
R = 1,000.00'
PC = 10+00.00
PT = 11+92.44
V = 40 MPH
E = 6.1%

Curve BUS-2
PI = 107+92.71
DELTA = 31° 58' 37.90" (RT)
D = 14° 02' 35"
T = 116.90'
L = 227.71'
R = 408.00'
PCC = 106+75.86
PT = 109+03.57
V = 35 MPH
E = 2.1%

Curve RAMP G-2
PI = 26+28.38
DELTA = 20° 37' 43.52" (RT)
D = 4° 05' 33"
T = 254.79'
L = 504.06'
R = 1,400.00'
PC = 23+73.59
PT = 28+77.65
V = 35 MPH
E = 4.1%

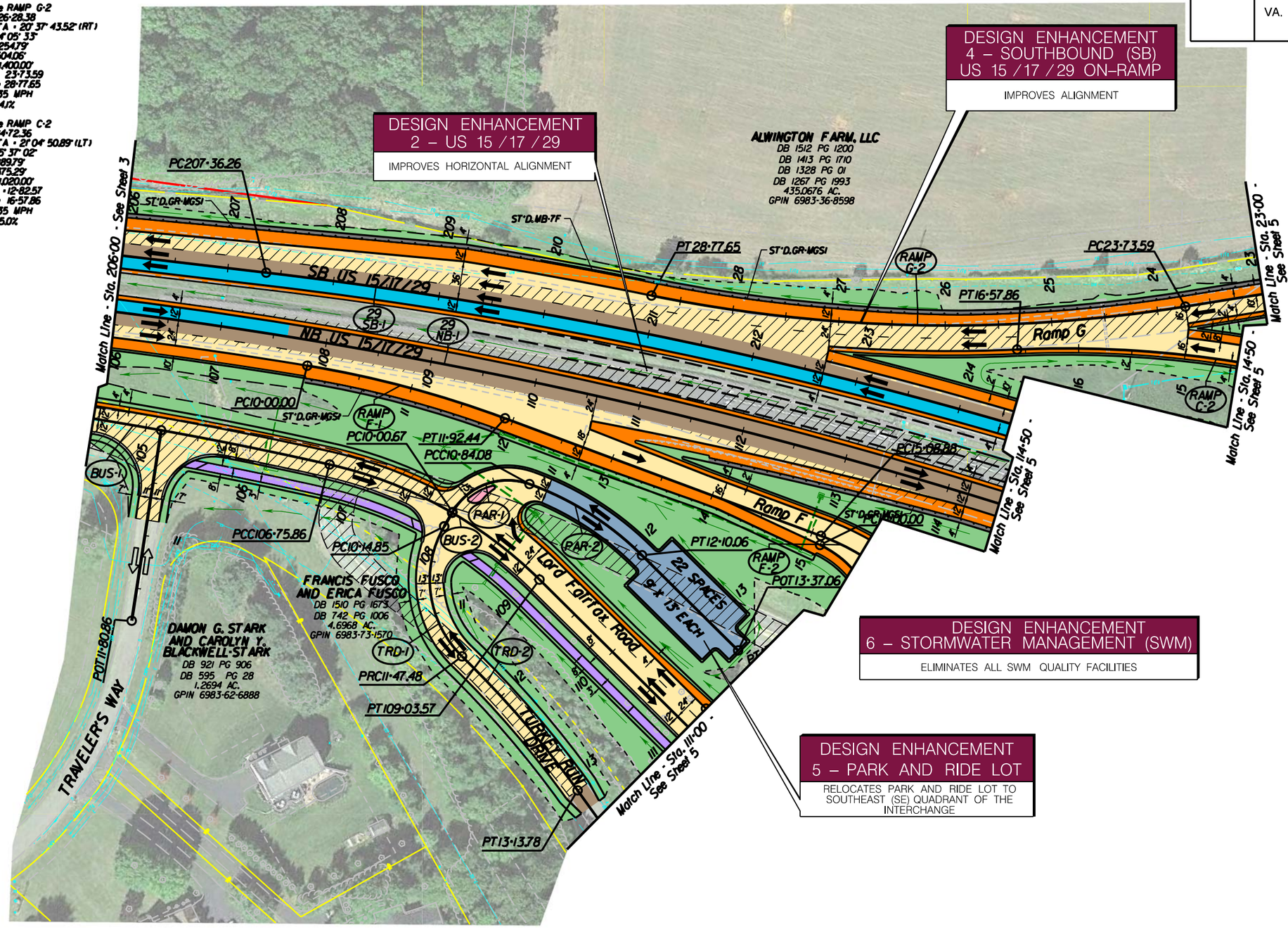
Curve RAMP C-2
PI = 14+72.36
DELTA = 21° 04' 50.89" (LT)
D = 5° 37' 02"
T = 189.73'
L = 375.29'
R = 1,020.00'
PRC = 12+82.57
PT = 16+57.86
V = 35 MPH
E = 5.0%

Curve BBELL_TRD1
PI = 10+92.97
DELTA = 75° 59' 43.54" (LT)
D = 57° 17' 45"
T = 78.12'
L = 132.64'
R = 100.00'
PC = 10+14.85
PRC = 11+47.48
V = 20 MPH
E = NC

Curve BBELL_TRD2
PI = 12+30.85
DELTA = 107° 04' 32.07" (RT)
D = 6° 03' 32"
T = 83.36'
L = 166.29'
R = 945.65'
PRC = 11+47.48
PT = 13+13.78
V = 45 MPH
E = NC

Curve PAR-1
PI = 10+50.71
DELTA = 79° 39' 20.12" (RT)
D = 95° 29' 35"
T = 50.04'
L = 83.42'
R = 60.00'
PC = 10+00.67
PCC = 10+84.08

Curve PAR-2
PI = 11+48.08
DELTA = 24° 53' 19.65" (RT)
D = 19° 45' 26"
T = 64.00'
L = 125.97'
R = 290.00'
PCC = 10+84.08
PT = 12+10.06



Denotes Full Depth Asphalt Pavement
Denotes Asphalt Milling and Replacement or Variable Depth Asphalt Overlay
Denotes Asphalt Pavement Shoulder
Denotes MC-4 Asphalt Pavement Under Guardrail
Denotes Proposed Grass Median/ Buffer/Planted Area
Denotes Proposed Concrete Truck Apron or Median
Denotes Type I, 6" Crusher Run Agg.25 or 26
Denotes Option I Proposed Shared Use Path
Denotes Option 2 Asphalt Milling and Overlay or Variable Depth Asphalt Overlay
Denotes Demolition of Pavement
Denotes Area of R/W Reduction
Denotes Exist. R/W / Prop. Line
Denotes Prop. R/W per RFP Conceptual Design
Denotes Prop. L/A
Denotes Edge of Pavement (Future 6-lane US Route 15/17/29 Bypass) By Others
C _ _ Denotes Construction Limits in Cuts
F _ _ Denotes Construction Limits in Fills

SCALE	PROJECT	SHEET NO.
0 50' 100'	0029-030-121	4

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

Dewberry SHIRLEY CONTRACTING COMPANY, LLC

Curve SPUR F-1
PI = 14+40.88
DELTA = 204° 19' 11.59" (RT)
D = 60° 18' 41"
T = 440.88'
L = 338.78'
R = 95.00'
PC = 10+00.00
PT = 13+38.78
V = 20 MPH
E = 2.0%

Curve RAMP F-2
PI = 15+81.54
DELTA = 35° 46' 50.23" (RT)
D = 25° 27' 53"
T = 726.3'
L = 1405.1'
R = 225.00'
PC = 15+08.88
PCC = 16+49.39
V = 25 MPH
E = 2.0%

Curve RAMP F-3
PI = 17+75.63
DELTA = 112° 05' 38.01" (RT)
D = 67° 24' 24"
T = 1256.24'
L = 1665.29'
R = 113.00'
PCC = 16+49.39
PT = 18+15.69
V = 20 MPH
E = 2.0%

Curve RAMP C-1
PI = 11+43.24
DELTA = 23° 07' 44.40" (RT)
D = 8° 11' 06"
T = 1432.4'
L = 2825.7'
R = 700.00'
PC = 10+00.00
PRC = 12+82.57
V = 30 MPH
E = 2.0%

Curve BUS-3
PI = 113+07.82
DELTA = 37° 31' 08.70" (LT)
D = 11° 14' 04"
T = 173.22'
L = 333.96'
R = 510.00'
PC = 111+34.60
PCC = 114+68.57
V = 35 MPH
E = NC

Curve BUS-4
PI = 116+56.91
DELTA = 49° 33' 32.56" (LT)
D = 14° 02' 35"
T = 188.35'
L = 352.91'
R = 408.00'
PCC = 114+68.57
PT = 118+21.47
V = 35 MPH
E = 2.0%

Curve BUS-5
PI = 127+13.31
DELTA = 32° 38' 20.41" (RT)
D = 4° 58' 56"
T = 336.71'
L = 655.11'
R = 1150.00'
PC = 123+76.60
PCC = 130+31.70
V = 45 MPH
E = NC

Curve RAMP B-1
PI = 12+70.12
DELTA = 146° 13' 37.88" (RT)
D = 69° 52' 22"
T = 270.12'
L = 209.28'
R = 82.00'
PC = 10+00.00
PT = 12+09.28
V = 20 MPH
E = NC

Curve RAMP B-2
PI = 14+31.51
DELTA = 52° 57' 19.11" (RT)
D = 20° 50' 05"
T = 136.98'
L = 254.17'
R = 275.00'
PC = 12+94.54
PT = 15+48.70
V = 25 MPH
E = 6.6%

Curve SPUR D-1
PI = 12+08.93
DELTA = 65° 41' 47.55" (RT)
D = 52° 05' 13"
T = 65.70'
L = 118.45'
R = 110.00'
PC = 11+43.23
PT = 12+61.68
V = 20 MPH
E = 2.0%

Curve RAMP D-2
PI = 16+49.91
DELTA = 107° 09' 12.09" (RT)
D = 26° 38' 57"
T = 291.37'
L = 402.09'
R = 215.00'
PC = 13+58.54
PT = 17+60.63
V = 25 MPH
E = 2.0%

Curve 29 SB-2
PI = 224+48.18
DELTA = 12° 36' 28.95" (RT)
D = 1° 14' 27"
T = 510.16'
L = 1016.20'
R = 4618.00'
PCC = 219+38.02
PT = 229+54.22
V = 60 MPH
E = 3.5%

Curve 29 NB-2
PI = 125+47.19
DELTA = 9° 21' 37.58" (RT)
D = 1° 15' 45"
T = 371.51'
L = 741.38'
R = 4538.00'
PCC = 121+75.68
PT = 129+17.05
V = 60 MPH
E = 3.5%

DESIGN ENHANCEMENT 4 – SOUTHBOUND (SB) US 15 /17 / 29 ON–RAMP
IMPROVES ALIGNMENT

DESIGN ENHANCEMENT 7 – SHARED USE PATH (OPTION 1)
RELOCATES THE SHARED USE PATH (SUP)

DESIGN ENHANCEMENT 3 – ROUNDABOUTS
OPTIMIZES LOCATION AND CONFIGURATION

DESIGN ENHANCEMENT 1 – NORTHBOUND (NB) US 15 /17 /29 ON–RAMP
LOCATES RAMP BENEATH PROPOSED BRIDGE ELIMINATING RETAINING WALLS

DESIGN ENHANCEMENT 2 – US 15 /17 / 29
IMPROVES HORIZONTAL ALIGNMENT

DESIGN ENHANCEMENT 3 – ROUNDABOUTS
OPTIMIZES LOCATION AND CONFIGURATION

DESIGN ENHANCEMENT 6 – STORMWATER MANAGEMENT (SWM)
ELIMINATES ALL SWM QUALITY FACILITIES

Match Line - Sta. 111+00 - See Sheet 4
Match Line - Sta. 114+50 - See Sheet 4
Match Line - Sta. 14+50 - See Sheet 4
Match Line - Sta. 23+00 - See Sheet 4
Match Line - Sta. 17+50 - See Sheet 6
Match Line - Sta. 125+00 - See Sheet 6
Match Line - Sta. 222+50 - See Sheet 7
Match Line - Sta. 14+00 - See Sheet 7
Match Line - Sta. 122+50 - See Sheet 7

US 15/17/29 Business

Eastern Roundabout
Western Roundabout

Lord Fairfax Road
Turkey Run Drive

SB US 15/17/29
NB US 15/17/29

ANNE R. W. PEARCE AND JOHN G. PEARCE
DB 1464 PG 761
DB 556 PG 261
1.4501 AC.
GPIN 6983-73-1701

DAVID LUX
DB 1416 PG 858
DB 556 PG 261
1.2111 AC.
GPIN 6983-64-8055

HELEN PATRICIA HANNETT
DB 1414 PG 962
DB 556 PG 261
1.6213 AC.
GPIN 6983-64-8231

- Denotes Full Depth Asphalt Pavement
- Denotes Asphalt Milling and Replacement or Variable Depth Asphalt Overlay
- Denotes Asphalt Pavement Shoulder
- Denotes MC-4 Asphalt Pavement Under Guardrail
- Denotes Proposed Grass Median/ Buffer/Planted Area
- Denotes Proposed Concrete Truck Apron or Median
- Denotes Type I, 6" Crusher Run Agg.25 or 26
- Denotes Option 1 Proposed Shared Use Path
- Denotes Option 2 Asphalt Milling and Overlay or Variable Depth Asphalt Overlay
- Denotes Demolition of Pavement
- Denotes Area of R/W Reduction
- Denotes Exist. R/W / Prop. Line
- Denotes Prop. R/W per RFP Conceptual Design
- Denotes Prop. L/A
- Denotes Edge of Pavement (Future 6-lane US Route 15/17/29 Bypass) By Others
- Denotes Construction Limits in Cuts
- Denotes Construction Limits in Fills

SCALE	PROJECT	SHEET NO.
0 50' 100'	0029-030-121	5

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

Curve RAMP-G1
PI = 12+02.98
DELTA = 8°44' 35.30" (LT)
D = 2°09' 28"
T = 202.98'
L = 405.17'
R = 2655.19'
PC = 10+00.00
PT = 14+05.17
V = 45 MPH
E = 2%

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CONTRACTING COMPANY, LLC

DESIGN ENHANCEMENT
4 – SOUTHBOUND (SB)
US 15 / 17 / 29 ON–RAMP

IMPROVES ALIGNMENT

Match Line - Sta. 17+50 - See Sheet 5

Match Line - Sta. 125+00 - See Sheet 5

PT 14+05.17

RAMP G-1

PC 10+00.00

Ramp G

US 15/17/29 Business

BUS-5

BUS-6

PCC 130+31.70

PT 135+28.93

POT 138+20.81

PT 17+60.63

RAMP D-2

ALWINGTON FARM, LLC
DB 1512 PG 1200
DB 1413 PG 1710
DB 1328 PG 01
DB 1267 PG 1993
435.0676 AC.
GPIN 6983-36-8598

POTOMAC DISTRICT COUNCIL OF THE ASSEMBLIES OF GOD, INC.
DB 1533 PG 1485
DB 1374 PG 1036
9.9243 AC.
GPIN 6983-65-3190

COMMONWEALTH OF VIRGINIA
DB 309 PG 716
0.42 AC.

LONNIE W. BARR, JR. AND BEVERLY BARR
DB 761 PG 1134
DB 503 PG 95
1.5934 AC.
GPIN 6983-65-0138

H. CYNTHIA SALAMONE AND GREGORY SCOTT SALAMONE
DB 967 PG 1790
DB 503 PG 96
0.7134 AC.
GPIN 6983-65-0315

Denotes Full Depth Asphalt Pavement
Denotes Asphalt Milling and Replacement or Variable Depth Asphalt Overlay
Denotes Asphalt Pavement Shoulder
Denotes MC-4 Asphalt Pavement Under Guardrail
Denotes Proposed Grass Median/ Buffer/Planted Area
Denotes Proposed Concrete Truck Apron or Median
Denotes Type I, 6" Crusher Run Agg. 25 or 26
Denotes Option 1 Proposed Shared Use Path
Denotes Option 2 Asphalt Milling and Overlay or Variable Depth Asphalt Overlay
Denotes Demolition of Pavement
Denotes Area of R/W Reduction
Denotes Exist. R/W / Prop. Line
Denotes Prop. R/W per RFP Conceptual Design
Denotes Prop. L/A
Denotes Edge of Pavement (Future 6-lane US Route 15/17/29 Bypass) By Others
C Denotes Construction Limits in Cuts
F Denotes Construction Limits in Fills

Curve BUS-6
PI = 132+81.30
DELTA = 12°28' 03.70" (RT)
D = 2°30' 27"
T = 249.60'
L = 497.22'
R = 2285.00'
PCC = 130+31.70
PT = 135+28.93
V = 45 MPH
E = 2%

SCALE 0 50' 100'

PROJECT	SHEET NO.
0029-030-121	6

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO. ROUTE
	VA.	29	0029-030-121 P101, R201, C501	7

Dewberry SHIRLEY CONTRACTING COMPANY, LLC

POTOMAC DISTRICT COUNCIL OF THE ASSEMBLIES OF GOD, INC.
DB 1533 PG 1485
DB 1374 PG 1036
9.9243 AC.
GPIN 6983-65-3190

BILLY M. MINTER AS TRUSTEE OF THE BILLY M. MINTER REVOCABLE LIVING TRUST AND MARION P. MINTER AS TRUSTEE OF THE MARION P. MINTER REVOCABLE LIVING TRUST
DB 1233 PG 2486
23.585 AC.
GPIN 6983-66-2070

BARBARA R. CROSS TRUST DATED DECEMBER 3, 2001
DB 1327 PG 1163
DB 556 PG 261
1.9213 AC.
GPIN 6983-64-8697

LISA JEAN NEWCOMB AND PAUL DOUGLAS NEWCOMB
DB 1507 PG 1504
DB 556 PG 261
1.3089 AC.
GPIN 6983-74-0910

SCOTT STEPHEN BEERS AND DANA MARIE LAST
DB 1457 PG 2204
DB 556 PG 261
1.5486 AC.
GPIN 6983-75-0166

COMMONWEALTH OF VIRGINIA
DB 321 PG 586
0.85 AC.

SANJEEVA PARWATIKAR
DB 1264 PG 1082
DB 556 PG 261
1.5606 AC.
GPIN 6983-64-8460

GARRETT SCOTTI AND MELISSA SCOTTI
DB 1478 PG 1100
DB 595 PG 1049
2.2373 AC.
GPIN 6983-75-2215

Match Line - Sta. 14+00 - See Sheet 5

Match Line - Sta. 222+50 - See Sheet 5

Match Line - Sta. 122+50 - See Sheet 5

RAMP D-2

PC13+58.54

RAMP D

ST'D MB-7F

PT11+73.53

RAMP D-1

PC10+00.00

29SB 2

PT229+54.22

ST'D GR-MGSI

POT234+89.27

N 25°59'12" E

SB US 15/17/29

NB US 15/17/29

29NB 2

ST'D GR-MGSI

POT134+52.11

PT129+17.05

ST'D MB-7F

DESIGN ENHANCEMENT
2 – US 15 / 17 / 29
IMPROVES HORIZONTAL ALIGNMENT

DESIGN ENHANCEMENT
1 – NORTHBOUND (NB) US 15 / 17 / 29 ON–RAMP
LOCATES RAMP BENEATH PROPOSED BRIDGE ELIMINATING RETAINING WALLS

DESIGN ENHANCEMENT
6 – STORMWATER MANAGEMENT (SWM)
ELIMINATES ALL SWM QUALITY FACILITIES

Denotes Full Depth Asphalt Pavement
Denotes Asphalt Milling and Replacement or Variable Depth Asphalt Overlay
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Denotes MC-4 Asphalt Pavement Under Guardrail
Denotes Proposed Grass Median/ Buffer/Planted Area
Denotes Proposed Concrete Truck Apron or Median
Denotes Type I, 6" Crusher Run Agg. 25 or 26
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Denotes Option 2 Asphalt Milling and Overlay or Variable Depth Asphalt Overlay
Denotes Demolition of Pavement
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Denotes Exist. R/W / Prop. Line
Denotes Prop. R/W per RFP Conceptual Design
Denotes Prop. L/A
Denotes Edge of Pavement (Future 6-lane US Route 15/17/29 Bypass) By Others
C _ _ Denotes Construction Limits in Cuts
F _ _ Denotes Construction Limits in Fills

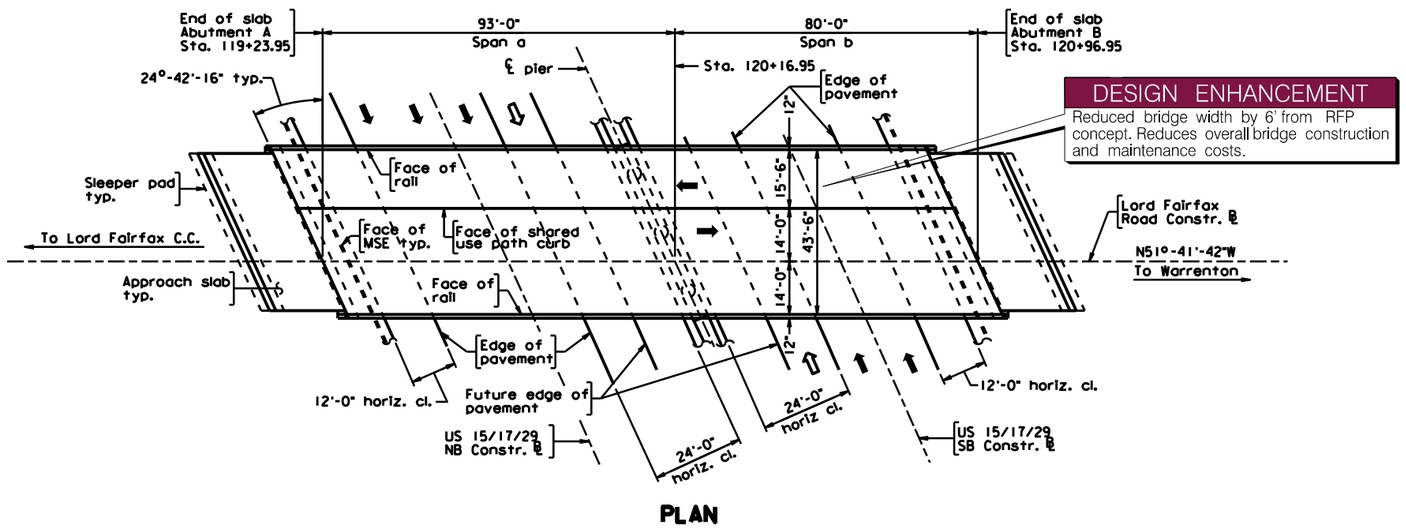
Curve RAMP-D1
PI = 10+87.15
DELTA = 13°15'23.44" (RT)
D = 7°38'22"
T = 87.15'
L = 173.53'
R = 750.00'
PC = 10+00.00
PT = 11+73.53
V = 40 MPH
E = 7%

SCALE 0 50' 100'

PROJECT	SHEET NO.
0029-030-121	7

4.3.2 - Conceptual Structural Plans

STATE	FEDERAL AID ROUTE	FEDERAL AID PROJECT	STATE ROUTE	STATE PROJECT	SHEET NO.
VA.	—	STP-03-7(032)	XX	0029-030-121, B616	1
NBIS Number: 00000000000XXXXX			UPC No.	77384	
Federal Oversight Code: NFO			FHWA Construction and Scour Code:		X2X1-SN



PLAN

DESIGN ENHANCEMENT

Reduced bridge width by 6' from RFP concept. Reduces overall bridge construction and maintenance costs.

DESIGN ENHANCEMENT

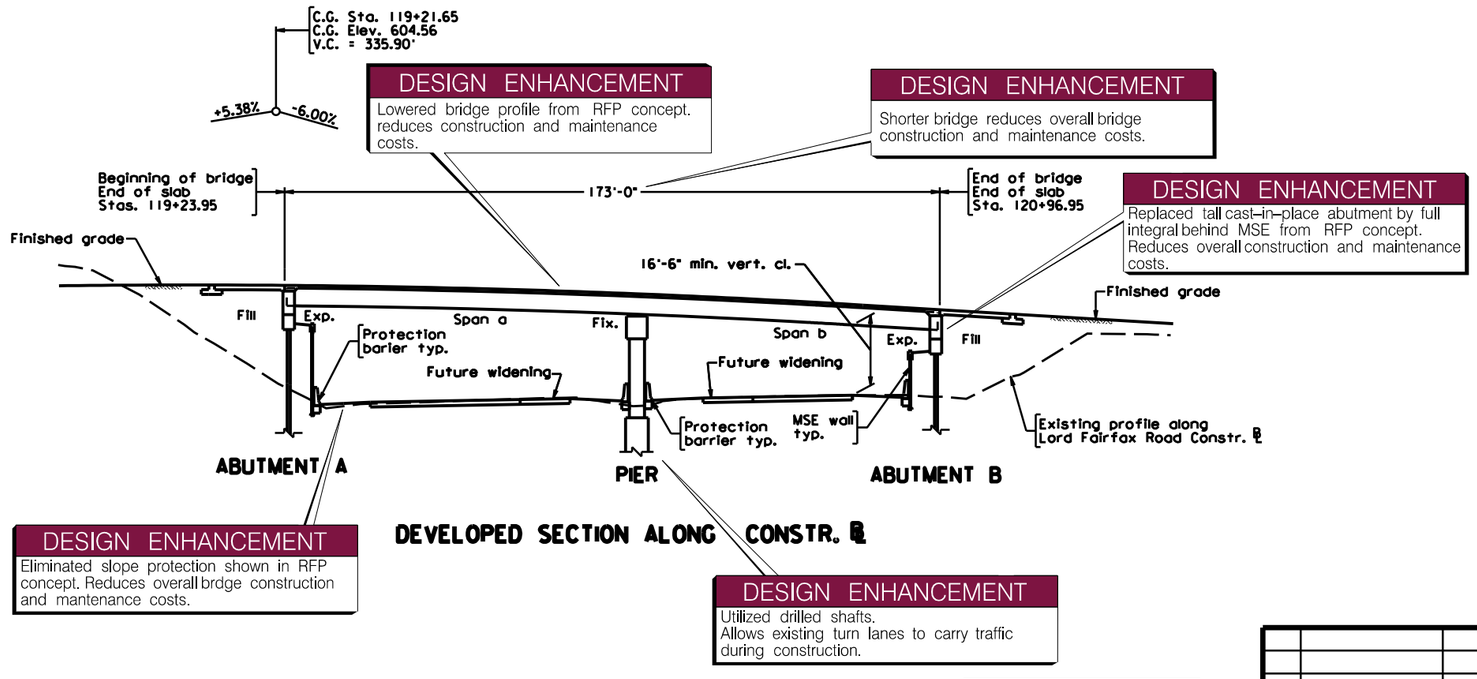
Lowered bridge profile from RFP concept. reduces construction and maintenance costs.

DESIGN ENHANCEMENT

Shorter bridge reduces overall bridge construction and maintenance costs.

DESIGN ENHANCEMENT

Replaced tall cast-in-place abutment by full integral behind MSE from RFP concept. Reduces overall construction and maintenance costs.



DEVELOPED SECTION ALONG CONSTR. ℄

DESIGN ENHANCEMENT

Eliminated slope protection shown in RFP concept. Reduces overall brdge construction and mantenance costs.

DESIGN ENHANCEMENT

Utilized drilled shafts.
Allows existing turn lanes to carry traffic during construction.

DESIGN EXCEPTION(S):

None

GENERAL NOTES:

Widths: 28'-0" roadway, 15'-6" sidewalk.
Overall width 43'-6" face-to-face of rails.

Span layout: 93'-80'

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, 2008; including all current revisions.

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

Architectural treatment shall be "DRYSTACK" texture similar to the pattern detailed on Structure and Bridge Standard Plan sheet BR27C-AT-9.

Low permeability concrete shall be utilized in accordance with the Special Provision for low permeability concrete for design-build projects.

All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for steel noted as Corrosion Resistant Reinforcing (CRR) which shall conform to Section 223 of the Specifications.

SHIRLEY CONTRACTING COMPANY, LLC

Dewberry

VDOT

COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
PROPOSED BRIDGE ON

LORD FAIRFAX ROAD AND US 15/17/29 BUSINESS OVER US 15/17/29 NB AND SB
FAUQUIER CO. - 0.53 MI. S. OF WARRENTON
PROJ. 0029-030-121, B616

12/6/2017

PLANS BY:
COORDINATED:
SUPERVISED:
DESIGNED:
DRAWN:
CHECKED:

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

Scale: 1" = 20'

No.	Description	Date

REVISIONS

For Table of Revisions, see Sheet X.

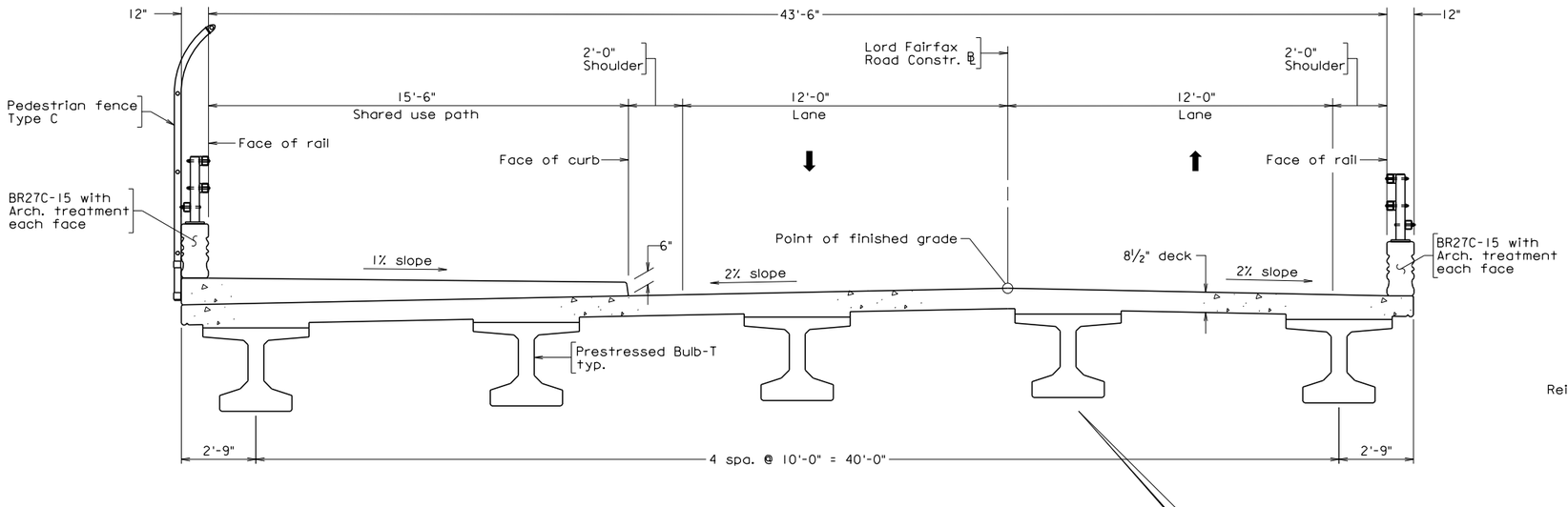
Recommended for Approval: _____ (Developer's Designee) Date

Approved: _____ Chief Engineer Date

Date: _____

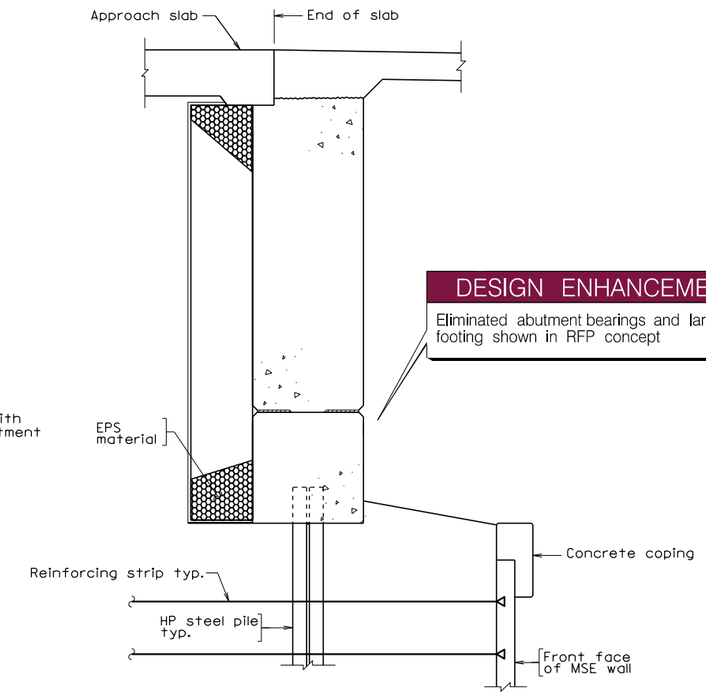
STATE	FEDERAL AID		STATE		SHEET NO.
	ROUTE	PROJECT	ROUTE	PROJECT	
VA.	—			0029-030-121, B616	2

DESIGN ENHANCEMENT
Reduced bridge width by 6' from RFP concept. Reduces overall bridge construction and maintenance costs.



TRANSVERSE SECTION

DESIGN ENHANCEMENT
Bulb–T girders.
Reduced maintenance costs and expedite construction.



ABUTMENT SECTION
Not to scale

SHIRLEY CONTRACTING COMPANY, LLC

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Typical Sections.ATC001.Exhibit

Scale: ⅜" = 1'-0" unless otherwise shown

PRELIMINARY PLANS
THESE PLANS NOT TO BE USED FOR CONSTRUCTION

No.	Description	Date
Revisions		

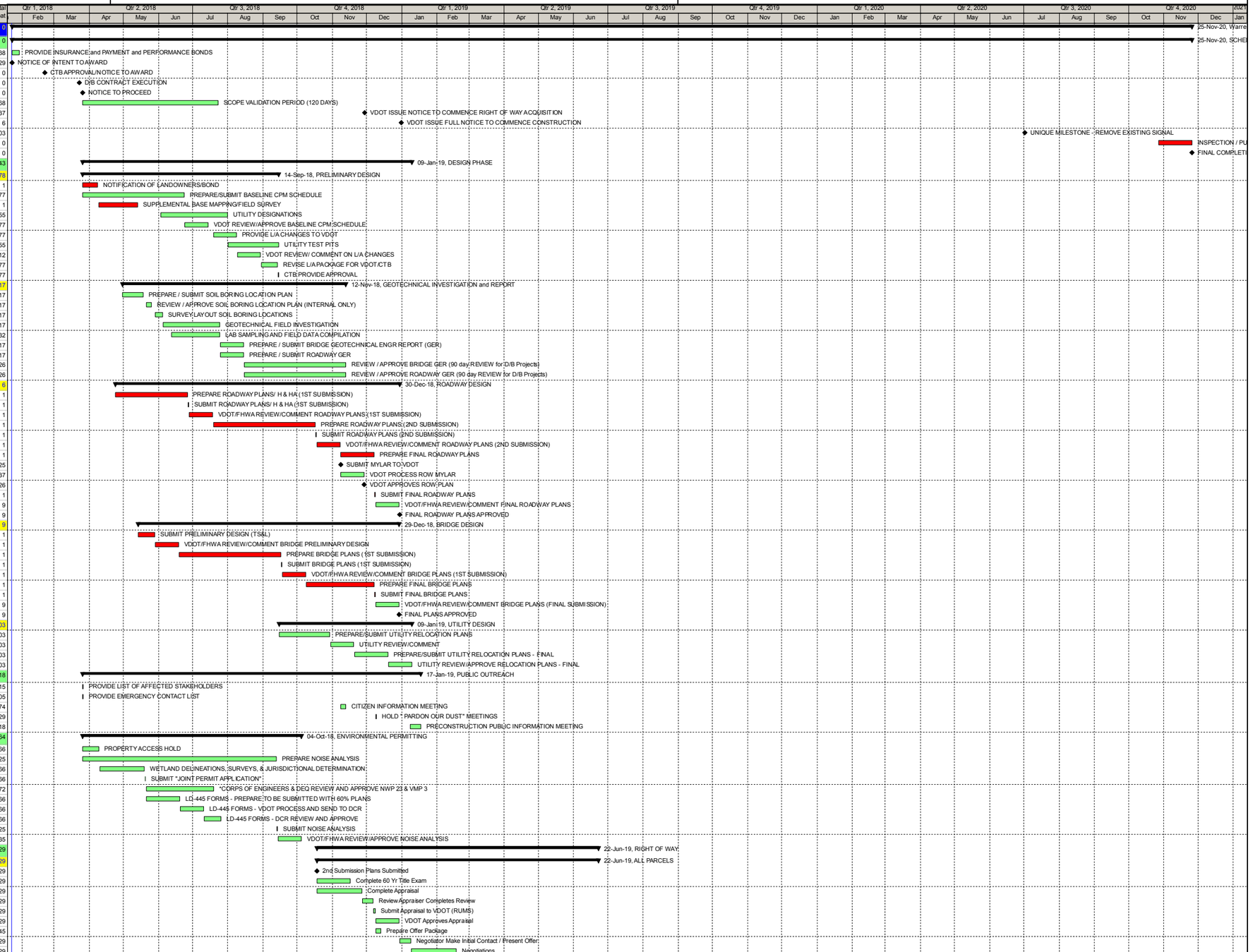
COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
STRUCTURE AND BRIDGE DIVISION

TYPICAL SECTIONS

	Date	Plan No.	Sheet No.
Designed:			2 of 2
Drawn:			
Checked:			

4.7.1 - Proposal Schedule

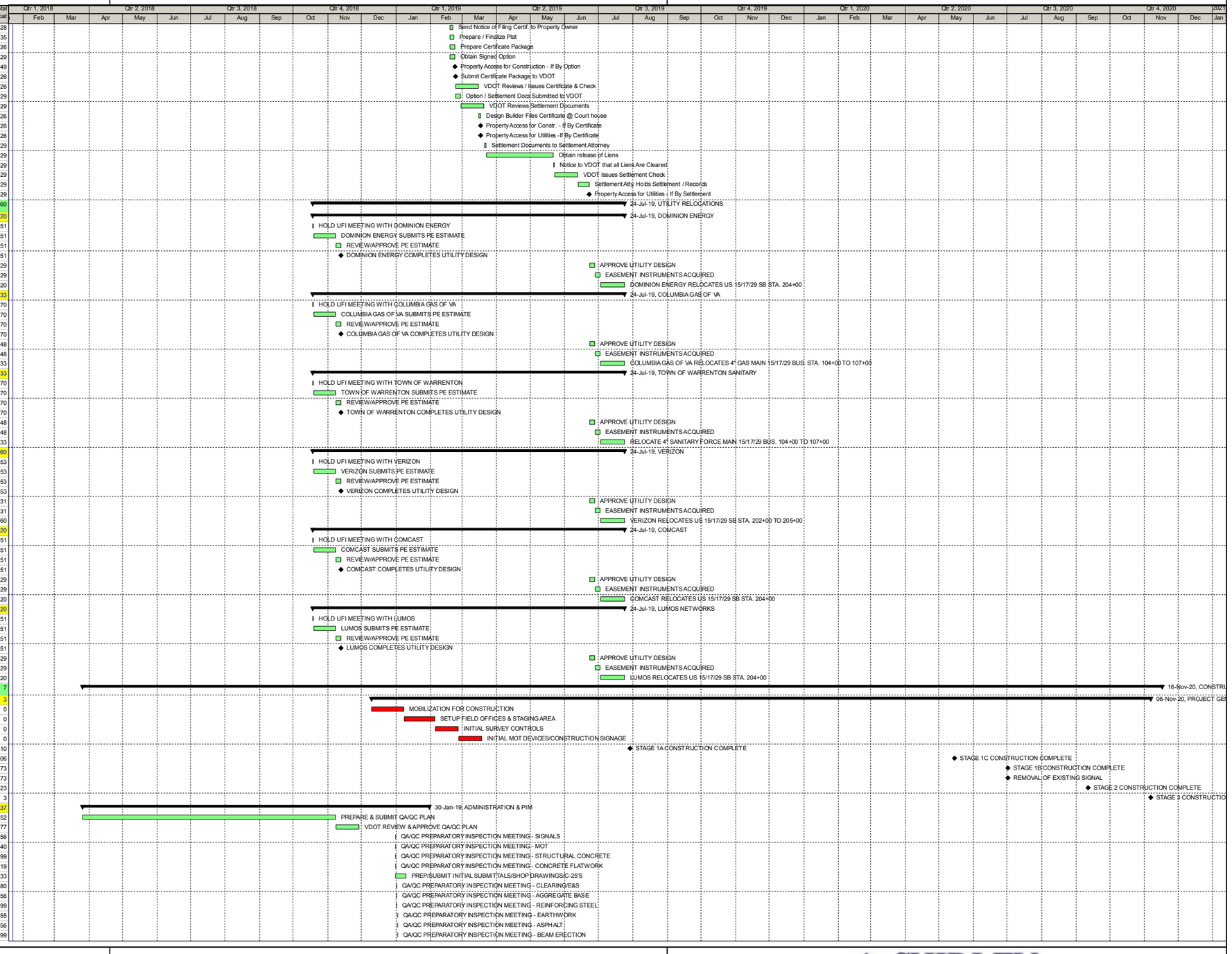
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
Warrenton Southern Interchange US 15/17/29		727	23-Jan-18	25-Nov-20	0
SCHEDULE MILESTONES		727	23-Jan-18	25-Nov-20	0
A1020	PROVIDE INSURANCE and PAYMENT and PERFORMANCE BONDS	5	23-Jan-18	29-Jan-18	38
A1000	NOTICE OF INTENT TO AWARD	0	23-Jan-18		29
A1010	CTB APPROVAL/NOTICE TO AWARD	0	21-Feb-18*		0
A1040	D/B CONTRACT EXECUTION	0	23-Mar-18*		0
A1060	NOTICE TO PROCEED	0	26-Mar-18*		0
A1080	SCOPE VALIDATION PERIOD (120 DAYS)	120	26-Mar-18	23-Jul-18	168
A1100	VDOT ISSUE NOTICE TO COMMENCE RIGHT OF WAY ACQUISITION	0	29-Nov-18		37
A1130	VDOT ISSUE FULL NOTICE TO COMMENCE CONSTRUCTION	0	31-Dec-18		6
A1250	UNIQUE MILESTONE - REMOVE EXISTING SIGNAL	0		01-Jul-20	103
A1220	INSPECTION / PUNCHLIST	30	27-Oct-20	25-Nov-20	0
A1240	FINAL COMPLETION	0		25-Nov-20	0
DESIGN PHASE		202	26-Mar-18	09-Jan-19	143
PRELIMINARY DESIGN		122	26-Mar-18	14-Sep-18	78
BA1000	NOTIFICATION OF LANDOWNERS/BOND	14	26-Mar-18	08-Apr-18	1
BA1080	PREPARE/SUBMIT BASELINE CPM SCHEDULE	90	26-Mar-18	23-Jun-18	177
BA1020	SUPPLEMENTAL BASE MAPPING/FIELD SURVEY	35	09-Apr-18	13-May-18	1
BA1040	UTILITY DESIGNATIONS	59	03-Jun-18	31-Jul-18	55
BA1100	VDOT REVIEW/APPROVE BASELINE CPM SCHEDULE	21	24-Jun-18	14-Jul-18	177
BA1110	PROVIDE L/A CHANGES TO VDOT	15	19-Jul-18	08-Aug-18	77
BA1060	UTILITY TEST PITS	45	01-Aug-18	14-Sep-18	55
BA1120	VDOT REVIEW/ COMMENT ON L/A CHANGES	21	09-Aug-18	29-Aug-18	112
BA1130	REVISE L/A PACKAGE FOR VDOT/CTB	10	30-Aug-18	13-Sep-18	77
BA1140	CTB PROVIDE APPROVAL	1	14-Sep-18	14-Sep-18	77
GEOTECHNICAL INVESTIGATION and REPORT		138	30-Apr-18	12-Nov-18	17
BB1000	PREPARE / SUBMIT SOIL BORING LOCATION PLAN	15	30-Apr-18	18-May-18	17
BB1020	REVIEW / APPROVE SOIL BORING LOCATION PLAN (INTERNAL ONLY)	5	21-May-18	25-May-18	17
BB1040	SURVEY LAYOUT SOIL BORING LOCATIONS	5	29-May-18	04-Jun-18	17
BB1060	GEOTECHNICAL FIELD INVESTIGATION	35	05-Jun-18	24-Jul-18	17
BB1080	LAB SAMPLING AND FIELD DATA COMPILATION	30	12-Jun-18	24-Jul-18	32
BB1100	PREPARE / SUBMIT BRIDGE GEOTECHNICAL ENGR REPORT (GER)	15	25-Jul-18	14-Aug-18	17
BB1120	PREPARE / SUBMIT ROADWAY GER	15	25-Jul-18	14-Aug-18	17
BB1160	REVIEW / APPROVE BRIDGE GER (90 day REVIEW for D/B Projects)	90	15-Aug-18	12-Nov-18	26
BB1180	REVIEW / APPROVE ROADWAY GER (90 day REVIEW for D/B Projects)	90	15-Aug-18	12-Nov-18	26
ROADWAY DESIGN		173	24-Apr-18	30-Dec-18	6
BC1000	PREPARE ROADWAY PLANS/ H & HA (1ST SUBMISSION)	64	24-Apr-18	26-Jun-18	1
BC1020	SUBMIT ROADWAY PLANS/ H & HA (1ST SUBMISSION)	1	27-Jun-18	27-Jun-18	1
BC1040	VDOT/FHWA REVIEW/COMMENT ROADWAY PLANS (1ST SUBMISSION)	21	28-Jun-18	18-Jul-18	1
BC1060	PREPARE ROADWAY PLANS (2ND SUBMISSION)	90	19-Jul-18	16-Oct-18	1
BC1080	SUBMIT ROADWAY PLANS (2ND SUBMISSION)	1	17-Oct-18	17-Oct-18	1
BC1100	VDOT/FHWA REVIEW/COMMENT ROADWAY PLANS (2ND SUBMISSION)	21	18-Oct-18	07-Nov-18	1
BC1120	PREPARE FINAL ROADWAY PLANS	30	08-Nov-18	07-Dec-18	1
BC1101	SUBMIT MYLAR TO VDOT	0	08-Nov-18		25
BC1102	VDOT PROCESS ROW MYLAR	21	08-Nov-18	28-Nov-18	37
BC1103	VDOT APPROVES ROW PLAN	0		28-Nov-18	26
BC1140	SUBMIT FINAL ROADWAY PLANS	1	08-Dec-18	08-Dec-18	1
BC1160	VDOT/FHWA REVIEW/COMMENT FINAL ROADWAY PLANS	21	09-Dec-18	29-Dec-18	9
BC1180	FINAL ROADWAY PLANS APPROVED	0	30-Dec-18		9
BRIDGE DESIGN		230	14-May-18	29-Dec-18	9
BD1000	SUBMIT PRELIMINARY DESIGN (TS&L)	15	14-May-18	28-May-18	1
BD1020	VDOT/FHWA REVIEW/COMMENT BRIDGE PRELIMINARY DESIGN	21	29-May-18	18-Jun-18	1
BD1040	PREPARE BRIDGE PLANS (1ST SUBMISSION)	90	19-Jun-18	16-Sep-18	1
BD1060	SUBMIT BRIDGE PLANS (1ST SUBMISSION)	1	17-Sep-18	17-Sep-18	1
BD1080	VDOT/FHWA REVIEW/COMMENT BRIDGE PLANS (1ST SUBMISSION)	21	18-Sep-18	08-Oct-18	1
BD1100	PREPARE FINAL BRIDGE PLANS	60	09-Oct-18	07-Dec-18	1
BD1120	SUBMIT FINAL BRIDGE PLANS	1	08-Dec-18	08-Dec-18	1
BD1140	VDOT/FHWA REVIEW/COMMENT BRIDGE PLANS (FINAL SUBMISSION)	21	09-Dec-18	29-Dec-18	9
BD1160	FINAL PLANS APPROVED	0		29-Dec-18	9
UTILITY DESIGN		117	15-Sep-18	09-Jan-19	203
BE1000	PREPARE/SUBMIT UTILITY RELOCATION PLANS	45	15-Sep-18	29-Oct-18	203
BE1020	UTILITY REVIEW/COMMENT	21	30-Oct-18	19-Nov-18	203
BE1040	PREPARE/SUBMIT UTILITY RELOCATION PLANS - FINAL	30	20-Nov-18	19-Dec-18	203
BE1060	UTILITY REVIEW/APPROVE RELOCATION PLANS - FINAL	21	20-Dec-18	09-Jan-19	203
PUBLIC OUTREACH		298	26-Mar-18	17-Jan-19	18
C1020	PROVIDE LIST OF AFFECTED STAKEHOLDERS	1	26-Mar-18	26-Mar-18	115
C1000	PROVIDE EMERGENCY CONTACT LIST	1	26-Mar-18	26-Mar-18	305
C1040	CITIZEN INFORMATION MEETING	5	08-Nov-18	12-Nov-18	74
C1080	HOLD " PARDON OUR DUST" MEETINGS	1	09-Dec-18	09-Dec-18	29
C1060	PRECONSTRUCTION PUBLIC INFORMATION MEETING	10	08-Jan-19	17-Jan-19	18
ENVIRONMENTAL PERMITTING		136	26-Mar-18	04-Oct-18	64
D1020	PROPERTY ACCESS HOLD	15	26-Mar-18	09-Apr-18	166
D1030	PREPARE NOISE ANALYSIS	120	26-Mar-18	12-Sep-18	25
D1040	WETLAND DELINEATIONS, SURVEYS, & JURISDICTIONAL DETERMINATION	40	10-Apr-18	19-May-18	166
D1060	SUBMIT "JOINT PERMIT APPLICATION"	1	20-May-18	20-May-18	166
D1080	"CORPS OF ENGINEERS & DEQ REVIEW AND APPROVE NWP 23 & VMP 3	60	21-May-18	19-Jul-18	172
D1100	LD-445 FORMS - PREPARE TO BE SUBMITTED WITH 60% PLANS	30	21-May-18	19-Jun-18	166
D1120	LD-445 FORMS - VDOT PROCESS AND SEND TO DCR	21	20-Jun-18	10-Jul-18	166
D1140	LD-445 FORMS - DCR REVIEW AND APPROVE	15	11-Jul-18	25-Jul-18	166
D1050	SUBMIT NOISE ANALYSIS	1	13-Sep-18	13-Sep-18	25
D1070	VDOT/FHWA REVIEW/APPROVE NOISE ANALYSIS	21	14-Sep-18	04-Oct-18	35
RIGHT OF WAY		248	18-Oct-18	22-Jun-19	29
ALL PARCELS		248	18-Oct-18	22-Jun-19	29
E2000	2nd Submission Plans Submitted	0	18-Oct-18		29
E2010	Complete 60 Yr Title Exam	30	18-Oct-18	16-Nov-18	29
E2020	Complete Appraisal	40	18-Oct-18	26-Nov-18	29
E2030	Review Appraiser Completes Review	10	27-Nov-18	06-Dec-18	29
E2040	Submit Appraisal to VDOT (RUMS)	2	07-Dec-18	08-Dec-18	29
E2050	VDOT Approves Appraisal	21	09-Dec-18	29-Dec-18	29
E2060	Prepare Offer Package	5	09-Dec-18	13-Dec-18	45
E2070	Negotiator Make Initial Contact / Present Offer	10	30-Dec-18	08-Jan-19	29
E2080	Negotiations	40	09-Jan-19	17-Feb-19	29



Actual Work | Critical Remaining Work | Summary
Remaining Work | Milestone

SHIRLEY CONTRACTING COMPANY, LLC

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
E2090	Send Notice of Filing Certif. to Property Owner	3	18-Feb-19	20-Feb-19	128
E2100	Prepare / Finalize Plat	4	18-Feb-19	21-Feb-19	35
E2110	Prepare Certificate Package	5	18-Feb-19	22-Feb-19	126
E2150	Obtain Signed Option	5	18-Feb-19	22-Feb-19	29
E2230	Property Access for Construction - If By Option	0		22-Feb-19	149
E2120	Submit Certificate Package to VDOT	0	23-Feb-19		126
E2130	VDOT Reviews / Issues Certificate & Check	21	23-Feb-19	15-Mar-19	126
E2160	Option / Settlement Docs Submitted to VDOT	5	23-Feb-19	27-Feb-19	29
E2170	VDOT Reviews Settlement Documents	21	28-Feb-19	20-Mar-19	29
E2140	Design Builder Files Certificate @ Court house	2	16-Mar-19	17-Mar-19	126
E2240	Property Access for Constr. - If By Certificate	0		17-Mar-19	126
E2250	Property Access for Utilities - If By Certificate	0		17-Mar-19	126
E2180	Settlement Documents to Settlement Attorney	2	21-Mar-19	22-Mar-19	29
E2190	Obtain release of Liens	60	23-Mar-19	21-May-19	29
E2200	Notice to VDOT that all Liens Are Cleared	1	22-May-19	22-May-19	29
E2210	VDOT Issues Settlement Check	21	23-May-19	12-Jun-19	29
E2220	Settlement Atty. Holds Settlement / Records	10	13-Jun-19	22-Jun-19	29
E2260	Property Access for Utilities - If By Settlement	0		22-Jun-19	29
UTILITY RELOCATIONS		195	18-Oct-18	24-Jul-19	160
DOMINION ENERGY		195	18-Oct-18	24-Jul-19	20
FA1000	HOLD UFI MEETING WITH DOMINION ENERGY	1	18-Oct-18	18-Oct-18	251
FA1020	DOMINION ENERGY SUBMITS PE ESTIMATE	20	19-Oct-18	07-Nov-18	251
FA1040	REVIEW/APPROVE PE ESTIMATE	5	08-Nov-18	12-Nov-18	251
FA1060	DOMINION ENERGY COMPLETES UTILITY DESIGN	0		12-Nov-18	251
FA1080	APPROVE UTILITY DESIGN	5	23-Jun-19	27-Jun-19	29
FA1100	EASEMENT INSTRUMENTS ACQUIRED	5	28-Jun-19	02-Jul-19	29
FA1120	DOMINION ENERGY RELOCATES US 15/17/29 SB STA. 204+00	15	03-Jul-19	24-Jul-19	20
COLUMBIA GAS OF VA		195	18-Oct-18	24-Jul-19	33
FA1270	HOLD UFI MEETING WITH COLUMBIA GAS OF VA	1	18-Oct-18	18-Oct-18	270
FA1280	COLUMBIA GAS OF VA SUBMITS PE ESTIMATE	20	19-Oct-18	07-Nov-18	270
FA1290	REVIEW/APPROVE PE ESTIMATE	5	08-Nov-18	12-Nov-18	270
FA1300	COLUMBIA GAS OF VA COMPLETES UTILITY DESIGN	0		12-Nov-18	270
FA1310	APPROVE UTILITY DESIGN	5	23-Jun-19	27-Jun-19	48
FA1320	EASEMENT INSTRUMENTS ACQUIRED	5	28-Jun-19	02-Jul-19	48
FA1330	COLUMBIA GAS OF VA RELOCATES 4" GAS MAIN 15/17/29 BUS. STA. 104+00 TO 107	15	03-Jul-19	24-Jul-19	33
TOWN OF WARRENTON SANITARY		195	18-Oct-18	24-Jul-19	33
FA1200	HOLD UFI MEETING WITH TOWN OF WARRENTON	1	18-Oct-18	18-Oct-18	270
FA1210	TOWN OF WARRENTON SUBMITS PE ESTIMATE	20	19-Oct-18	07-Nov-18	270
FA1220	REVIEW/APPROVE PE ESTIMATE	5	08-Nov-18	12-Nov-18	270
FA1230	TOWN OF WARRENTON COMPLETES UTILITY DESIGN	0		12-Nov-18	270
FA1240	APPROVE UTILITY DESIGN	5	23-Jun-19	27-Jun-19	48
FA1250	EASEMENT INSTRUMENTS ACQUIRED	5	28-Jun-19	02-Jul-19	48
FA1260	RELOCATE 4" SANITARY FORCE MAIN 15/17/29 BUS. 104+00 TO 107+00	15	03-Jul-19	24-Jul-19	33
VERIZON		195	18-Oct-18	24-Jul-19	160
FA1130	HOLD UFI MEETING WITH VERIZON	1	18-Oct-18	18-Oct-18	453
FA1140	VERIZON SUBMITS PE ESTIMATE	20	19-Oct-18	07-Nov-18	453
FA1150	REVIEW/APPROVE PE ESTIMATE	5	08-Nov-18	12-Nov-18	453
FA1160	VERIZON COMPLETES UTILITY DESIGN	0		12-Nov-18	453
FA1170	APPROVE UTILITY DESIGN	5	23-Jun-19	27-Jun-19	231
FA1180	EASEMENT INSTRUMENTS ACQUIRED	5	28-Jun-19	02-Jul-19	231
FA1190	VERIZON RELOCATES US 15/17/29 SB STA. 202+00 TO 205+00	15	03-Jul-19	24-Jul-19	160
COMCAST		195	18-Oct-18	24-Jul-19	20
FA1340	HOLD UFI MEETING WITH COMCAST	1	18-Oct-18	18-Oct-18	251
FA1350	COMCAST SUBMITS PE ESTIMATE	20	19-Oct-18	07-Nov-18	251
FA1360	REVIEW/APPROVE PE ESTIMATE	5	08-Nov-18	12-Nov-18	251
FA1370	COMCAST COMPLETES UTILITY DESIGN	0		12-Nov-18	251
FA1380	APPROVE UTILITY DESIGN	5	23-Jun-19	27-Jun-19	29
FA1390	EASEMENT INSTRUMENTS ACQUIRED	5	28-Jun-19	02-Jul-19	29
FA1400	COMCAST RELOCATES US 15/17/29 SB STA. 204+00	15	03-Jul-19	24-Jul-19	20
LUMOS NETWORKS		195	18-Oct-18	24-Jul-19	20
FA1410	HOLD UFI MEETING WITH LUMOS	1	18-Oct-18	18-Oct-18	251
FA1420	LUMOS SUBMITS PE ESTIMATE	20	19-Oct-18	07-Nov-18	251
FA1430	REVIEW/APPROVE PE ESTIMATE	5	08-Nov-18	12-Nov-18	251
FA1440	LUMOS COMPLETES UTILITY DESIGN	0		12-Nov-18	251
FA1450	APPROVE UTILITY DESIGN	5	23-Jun-19	27-Jun-19	29
FA1460	EASEMENT INSTRUMENTS ACQUIRED	5	28-Jun-19	02-Jul-19	29
FA1470	LUMOS RELOCATES US 15/17/29 SB STA. 204+00	15	03-Jul-19	24-Jul-19	20
CONSTRUCTION		676	26-Mar-18	16-Nov-20	7
PROJECT GENERAL ITEMS		490	10-Dec-18	06-Nov-20	3
GA1020	MOBILIZATION FOR CONSTRUCTION	20	10-Dec-18	07-Jan-19	0
GA1040	SETUP FIELD OFFICES & STAGING AREA	20	08-Jan-19	04-Feb-19	0
GA1060	INITIAL SURVEY CONTROLS	15	05-Feb-19	25-Feb-19	0
GA1080	INITIAL MOT DEVICES/CONSTRUCTION SIGNAGE	15	26-Feb-19	18-Mar-19	0
GA1090	STAGE 1A CONSTRUCTION COMPLETE	0		29-Jul-19	310
GA1150	STAGE 1C CONSTRUCTION COMPLETE	0		14-May-20	106
GA1100	STAGE 1B CONSTRUCTION COMPLETE	0		01-Jul-20	73
GA1120	REMOVAL OF EXISTING SIGNAL	0		01-Jul-20	73
GA1110	STAGE 2 CONSTRUCTION COMPLETE	0		11-Sep-20	23
GA1130	STAGE 3 CONSTRUCTION COMPLETE	0		06-Nov-20	3
ADMINISTRATION & PIM		217	26-Mar-18	30-Jan-19	237
GB1350	PREPARE & SUBMIT QA/QC PLAN	160	26-Mar-18	07-Nov-18	52
GB1360	VDOT REVIEW & APPROVE QA/QC PLAN	21	08-Nov-18	28-Nov-18	77
GB1340	QA/QC PREPARATORY INSPECTION MEETING - SIGNALS	1	31-Dec-18	31-Dec-18	156
GB1000	QA/QC PREPARATORY INSPECTION MEETING - MOT	1	31-Dec-18	31-Dec-18	40
GB1120	QA/QC PREPARATORY INSPECTION MEETING - STRUCTURAL CONCRETE	1	31-Dec-18	31-Dec-18	199
GB1180	QA/QC PREPARATORY INSPECTION MEETING - CONCRETE FLATWORK	1	31-Dec-18	31-Dec-18	219
GB1400	PREP/SUBMIT INITIAL SUBMITTALS/SHOP DRAWINGS/C-25'S	8	31-Dec-18	09-Jan-19	33
GB1020	QA/QC PREPARATORY INSPECTION MEETING - CLEARING/E&S	1	01-Jan-19	01-Jan-19	80
GB1080	QA/QC PREPARATORY INSPECTION MEETING - AGGREGATE BASE	1	01-Jan-19	01-Jan-19	156
GB1140	QA/QC PREPARATORY INSPECTION MEETING - REINFORCING STEEL	1	01-Jan-19	01-Jan-19	199
GB1040	QA/QC PREPARATORY INSPECTION MEETING - EARTHWORK	1	02-Jan-19	02-Jan-19	155
GB1100	QA/QC PREPARATORY INSPECTION MEETING - ASPHALT	1	02-Jan-19	02-Jan-19	156
GB1200	QA/QC PREPARATORY INSPECTION MEETING - BEAM ERECTION	1	02-Jan-19	02-Jan-19	199



Actual Work | Critical Remaining Work | Summary
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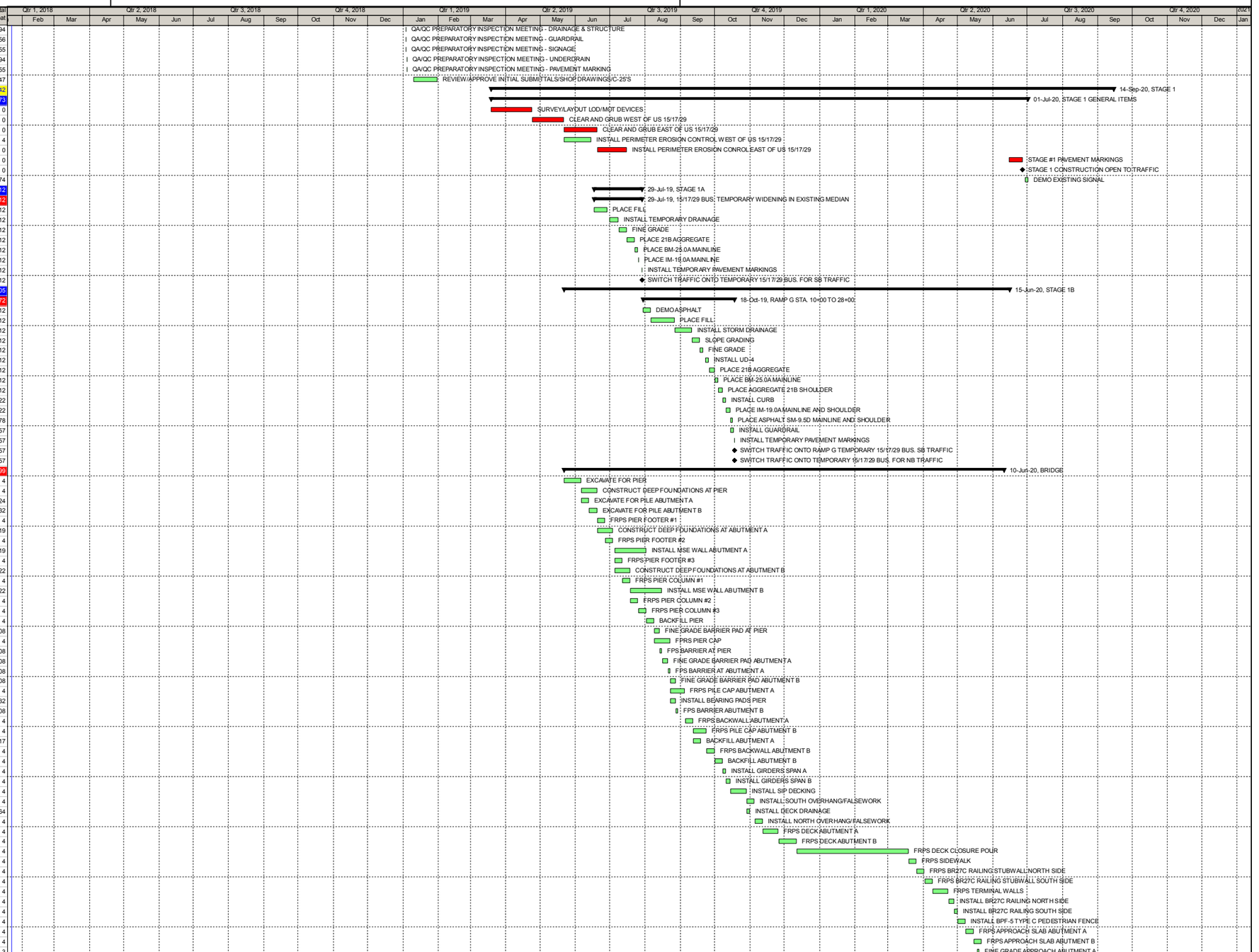
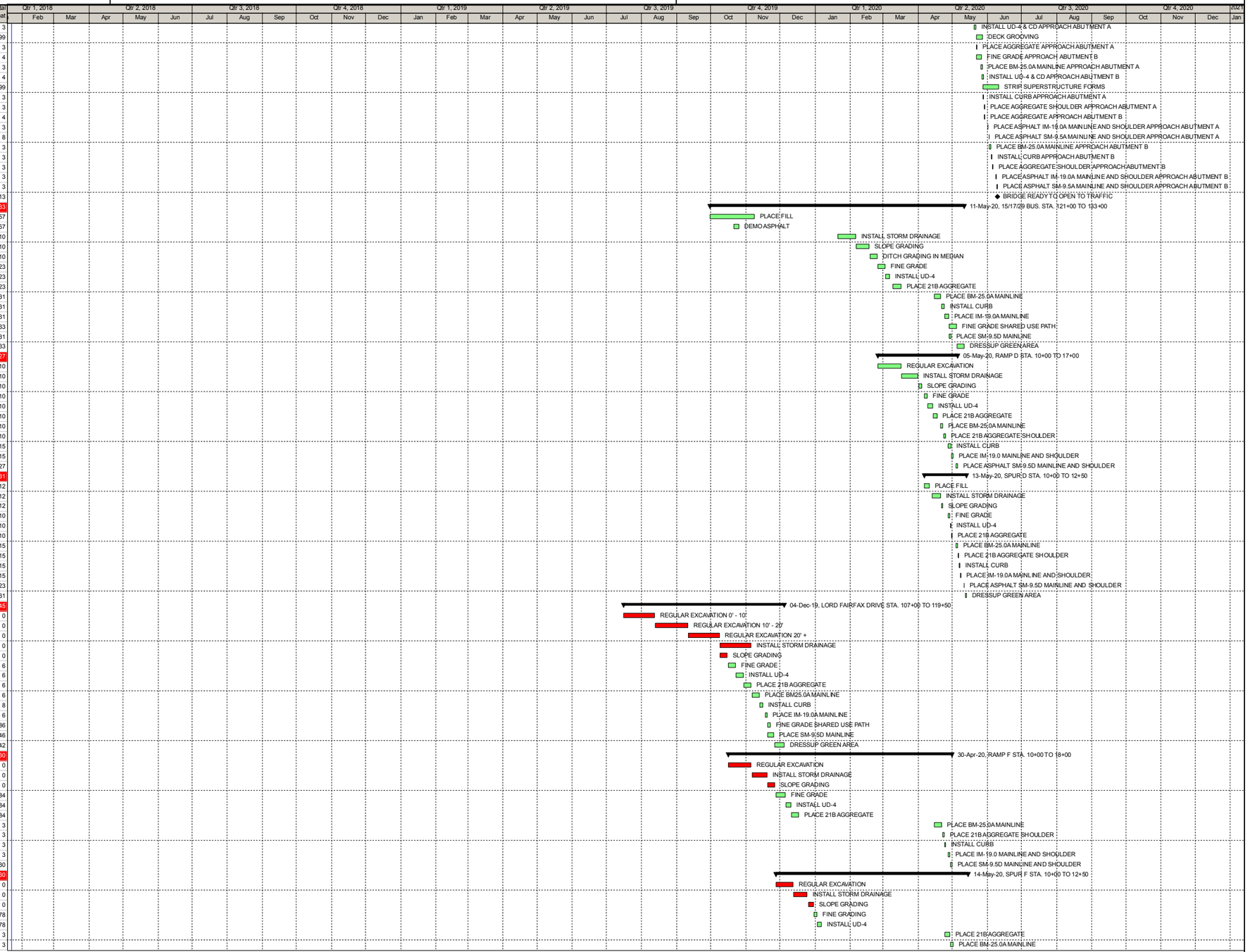
SHIRLEY CONTRACTING COMPANY, LLC

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
GB1060	QA/QC PREPARATORY INSPECTION MEETING - DRAINAGE & STRUCTURE	1	03-Jan-19	03-Jan-19	194
GB1220	QA/QC PREPARATORY INSPECTION MEETING - GUARDRAIL	1	03-Jan-19	03-Jan-19	256
GB1240	QA/QC PREPARATORY INSPECTION MEETING - SIGNAGE	1	03-Jan-19	03-Jan-19	155
GB1160	QA/QC PREPARATORY INSPECTION MEETING - UNDERDRAIN	1	04-Jan-19	04-Jan-19	194
GB1280	QA/QC PREPARATORY INSPECTION MEETING - PAVEMENT MARKING	1	04-Jan-19	04-Jan-19	155
GB1420	REVIEW/APPROVE INITIAL SUBMITTALS/SHOP DRAWINGS/C-25'S	21	10-Jan-19	30-Jan-19	47
STAGE 1		381	19-Mar-19	14-Sep-20	42
STAGE 1 GENERAL ITEMS		330	19-Mar-19	01-Jul-20	73
G1A21000	SURVEY/LAYOUT LOD/MOT DEVICES	25	19-Mar-19	23-Apr-19	0
G1A31000	CLEAR AND GRUB WEST OF US 15/17/29	20	24-Apr-19	21-May-19	0
G1A32010	CLEAR AND GRUB EAST OF US 15/17/29	20	22-May-19	19-Jun-19	0
G1A32000	INSTALL PERIMETER EROSION CONTROL WEST OF US 15/17/29	17	22-May-19	14-Jun-19	4
G1A32020	INSTALL PERIMETER EROSION CONROL EAST OF US 15/17/29	17	20-Jun-19	15-Jul-19	0
G1A32040	STAGE #1 PAVEMENT MARKINGS	10	15-Jun-20	26-Jun-20	0
G1A32030	STAGE 1 CONSTRUCTION OPEN TO TRAFFIC	0		26-Jun-20	0
G1A32050	DEMO EXISTING SIGNAL	3	29-Jun-20	01-Jul-20	74
STAGE 1A		30	17-Jun-19	29-Jul-19	12
15/17/29 BUS. TEMPORARY WIDENING IN EXISTING MEDIAN		30	17-Jun-19	29-Jul-19	12
G1D1000	PLACE FILL	10	17-Jun-19	28-Jun-19	12
G1D1010	INSTALL TEMPORARY DRAINAGE	5	01-Jul-19	08-Jul-19	12
G1D1020	FINE GRADE	5	09-Jul-19	15-Jul-19	12
G1D1030	PLACE 21B AGGREGATE	5	16-Jul-19	22-Jul-19	12
G1D1040	PLACE BM-25.0A MAINLINE	3	23-Jul-19	25-Jul-19	12
G1D1050	PLACE IM-19.0A MAINLINE	1	26-Jul-19	26-Jul-19	12
G1D1060	INSTALL TEMPORARY PAVEMENT MARKINGS	1	29-Jul-19	29-Jul-19	12
G1D1070	SWITCH TRAFFIC ONTO TEMPORARY 15/17/29 BUS. FOR SB TRAFFIC	0		29-Jul-19	12
STAGE 1B		272	22-May-19	15-Jun-20	105
RAMP G STA. 10+00 TO 28+00		58	30-Jul-19	18-Oct-19	272
G1E1150	DEMO ASPHALT	5	30-Jul-19	05-Aug-19	12
G1E1000	PLACE FILL	15	06-Aug-19	26-Aug-19	12
G1E1010	INSTALL STORM DRAINAGE	10	27-Aug-19	10-Sep-19	12
G1E1020	SLOPE GRADING	5	11-Sep-19	17-Sep-19	12
G1E1030	FINE GRADE	3	18-Sep-19	20-Sep-19	12
G1E1040	INSTALL UD-4	3	23-Sep-19	25-Sep-19	12
G1E1050	PLACE 21B AGGREGATE	3	26-Sep-19	30-Sep-19	12
G1E1060	PLACE BM-25.0A MAINLINE	3	01-Oct-19	03-Oct-19	12
G1E1070	PLACE AGGREGATE 21B SHOULDER	2	04-Oct-19	07-Oct-19	12
G1E1080	INSTALL CURB	3	08-Oct-19	10-Oct-19	22
G1E1090	PLACE IM-19.0A MAINLINE AND SHOULDER	2	11-Oct-19	14-Oct-19	22
G1E1100	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	2	15-Oct-19	16-Oct-19	178
G1E1110	INSTALL GUARDRAIL	3	15-Oct-19	17-Oct-19	57
G1E1120	INSTALL TEMPORARY PAVEMENT MARKINGS	1	18-Oct-19	18-Oct-19	57
G1E1130	SWITCH TRAFFIC ONTO RAMP G TEMPORARY 15/17/29 BUS. SB TRAFFIC	0		18-Oct-19	57
G1E1140	SWITCH TRAFFIC ONTO TEMPORARY 15/17/29 BUS. FOR NB TRAFFIC	0		18-Oct-19	57
BRIDGE		269	22-May-19	10-Jun-20	99
G1B1000	EXCAVATE FOR PIER	10	22-May-19	05-Jun-19	4
G1B1010	CONSTRUCT DEEP FOUNDATIONS AT PIER	10	06-Jun-19	19-Jun-19	4
G1B1090	EXCAVATE FOR PILE ABUTMENT A	5	06-Jun-19	12-Jun-19	24
G1B1110	EXCAVATE FOR PILE ABUTMENT B	5	13-Jun-19	19-Jun-19	32
G1B1020	FRPS PIER FOOTER #1	5	20-Jun-19	26-Jun-19	4
G1B1100	CONSTRUCT DEEP FOUNDATIONS AT ABUTMENT A	10	20-Jun-19	03-Jul-19	19
G1B1030	FRPS PIER FOOTER #2	5	27-Jun-19	03-Jul-19	4
G1B1670	INSTALL MSE WALL ABUTMENT A	20	05-Jul-19	01-Aug-19	19
G1B1040	FRPS PIER FOOTER #3	5	05-Jul-19	11-Jul-19	4
G1B1120	CONSTRUCT DEEP FOUNDATIONS AT ABUTMENT B	10	05-Jul-19	18-Jul-19	22
G1B1050	FRPS PIER COLUMN #1	5	12-Jul-19	18-Jul-19	4
G1B1680	INSTALL MSE WALL ABUTMENT B	20	19-Jul-19	15-Aug-19	22
G1B1060	FRPS PIER COLUMN #2	5	19-Jul-19	25-Jul-19	4
G1B1070	FRPS PIER COLUMN #3	5	26-Jul-19	01-Aug-19	4
G1B1660	BACKFILL PIER	5	02-Aug-19	08-Aug-19	4
G1B1590	FINE GRADE BARRIER PAD AT PIER	3	09-Aug-19	13-Aug-19	208
G1B1080	FRPS PIER CAP	10	09-Aug-19	22-Aug-19	4
G1B1600	FPS BARRIER AT PIER	2	14-Aug-19	15-Aug-19	208
G1B1610	FINE GRADE BARRIER PAD ABUTMENT A	3	16-Aug-19	20-Aug-19	208
G1B1620	FPS BARRIER AT ABUTMENT A	2	21-Aug-19	22-Aug-19	208
G1B1630	FINE GRADE BARRIER PAD ABUTMENT B	3	23-Aug-19	27-Aug-19	208
G1B1130	FRPS PILE CAP ABUTMENT A	8	23-Aug-19	04-Sep-19	4
G1B1190	INSTALL BEARING PADS PIER	3	23-Aug-19	27-Aug-19	32
G1B1640	FPS BARRIER ABUTMENT B	2	28-Aug-19	29-Aug-19	208
G1B1140	FRPS BACKWALL ABUTMENT A	5	05-Sep-19	11-Sep-19	4
G1B1150	FRPS PILE CAP ABUTMENT B	8	12-Sep-19	23-Sep-19	4
G1B1200	BACKFILL ABUTMENT A	5	12-Sep-19	18-Sep-19	17
G1B1160	FRPS BACKWALL ABUTMENT B	5	24-Sep-19	30-Sep-19	4
G1B1210	BACKFILL ABUTMENT B	5	01-Oct-19	07-Oct-19	4
G1B1220	INSTALL GIRDERS SPAN A	3	08-Oct-19	10-Oct-19	4
G1B1230	INSTALL GIRDERS SPAN B	2	11-Oct-19	14-Oct-19	4
G1B1240	INSTALL SIP DECKING	10	15-Oct-19	28-Oct-19	4
G1B1250	INSTALL SOUTH OVERHANG/FALSEWORK	5	29-Oct-19	04-Nov-19	4
G1B1370	INSTALL DECK DRAINAGE	3	29-Oct-19	31-Oct-19	164
G1B1260	INSTALL NORTH OVERHANG/FALSEWORK	5	05-Nov-19	11-Nov-19	4
G1B1270	FRPS DECK ABUTMENT A	10	12-Nov-19	25-Nov-19	4
G1B1280	FRPS DECK ABUTMENT B	10	26-Nov-19	11-Dec-19	4
G1B1290	FRPS DECK CLOSURE POUR	5	12-Dec-19	18-Mar-20	4
G1B1300	FRPS SIDEWALK	5	19-Mar-20	25-Mar-20	4
G1B1310	FRPS BR27C RAILING STUBWALL NORTH SIDE	5	26-Mar-20	01-Apr-20	4
G1B1320	FRPS BR27C RAILING STUBWALL SOUTH SIDE	5	02-Apr-20	08-Apr-20	4
G1B1330	FRPS TERMINAL WALLS	10	09-Apr-20	22-Apr-20	4
G1B1340	INSTALL BR27C RAILING NORTH SIDE	3	23-Apr-20	27-Apr-20	4
G1B1350	INSTALL BR27C RAILING SOUTH SIDE	3	28-Apr-20	30-Apr-20	4
G1B1360	INSTALL BPF-5 TYPE C PEDESTRIAN FENCE	5	01-May-20	07-May-20	4
G1B1380	FRPS APPROACH SLAB ABUTMENT A	5	08-May-20	14-May-20	4
G1B1390	FRPS APPROACH SLAB ABUTMENT B	5	15-May-20	21-May-20	4
G1B1430	FINE GRADE APPROACH ABUTMENT A	2	18-May-20	19-May-20	3



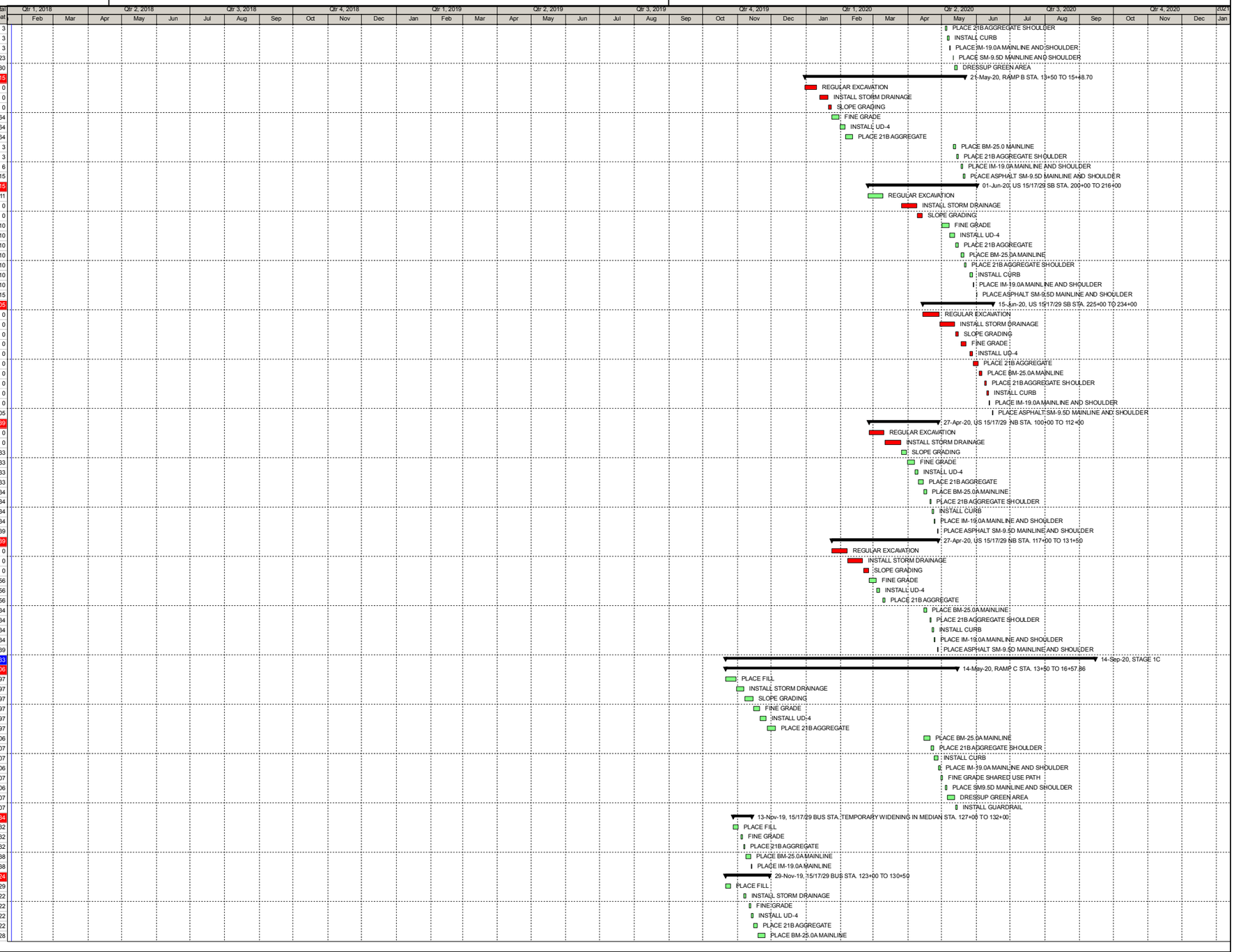
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
G1B1440	INSTALL UD-4 & CD APPROACH ABUTMENT A	2	20-May-20	21-May-20	3
G1B1400	DECK GROOVING	3	22-May-20	27-May-20	99
G1B1450	PLACE AGGREGATE APPROACH ABUTMENT A	1	22-May-20	22-May-20	3
G1B1510	FINE GRADE APPROACH ABUTMENT B	2	22-May-20	26-May-20	4
G1B1460	PLACE BM-25.0A MAINLINE APPROACH ABUTMENT A	2	26-May-20	27-May-20	3
G1B1520	INSTALL UD-4 & CD APPROACH ABUTMENT B	2	27-May-20	28-May-20	4
G1B1420	STRIP SUPERSTRUCTURE FORMS	10	28-May-20	10-Jun-20	99
G1B1470	INSTALL CURB APPROACH ABUTMENT A	1	28-May-20	28-May-20	3
G1B1480	PLACE AGGREGATE SHOULDER APPROACH ABUTMENT A	1	29-May-20	29-May-20	3
G1B1530	PLACE AGGREGATE APPROACH ABUTMENT B	1	29-May-20	29-May-20	4
G1B1490	PLACE ASPHALT IM-19.0A MAINLINE AND SHOULDER APPROACH ABUTMENT A	1	01-Jun-20	01-Jun-20	3
G1B1500	PLACE ASPHALT SM-9.5A MAINLINE AND SHOULDER APPROACH ABUTMENT A	1	02-Jun-20	02-Jun-20	8
G1B1540	PLACE BM-25.0A MAINLINE APPROACH ABUTMENT B	2	02-Jun-20	03-Jun-20	3
G1B1550	INSTALL CURB APPROACH ABUTMENT B	1	04-Jun-20	04-Jun-20	3
G1B1560	PLACE AGGREGATE SHOULDER APPROACH ABUTMENT B	1	05-Jun-20	05-Jun-20	3
G1B1570	PLACE ASPHALT IM-19.0A MAINLINE AND SHOULDER APPROACH ABUTMENT B	1	08-Jun-20	08-Jun-20	3
G1B1580	PLACE ASPHALT SM-9.5A MAINLINE AND SHOULDER APPROACH ABUTMENT B	1	09-Jun-20	09-Jun-20	3
G1B1650	BRIDGE READY TO OPEN TO TRAFFIC	0		09-Jun-20	13
15/17/29 BUS. STA. 121+00 TO 133+00		158	30-Sep-19	11-May-20	33
G1F1010	PLACE FILL	30	30-Sep-19	08-Nov-19	57
G1F1000	DEMO ASPHALT	5	21-Oct-19	25-Oct-19	57
G1F1020	INSTALL STORM DRAINAGE	12	21-Jan-20	05-Feb-20	10
G1F1030	SLOPE GRADING	8	06-Feb-20	17-Feb-20	10
G1F1040	DITCH GRADING IN MEDIAN	5	18-Feb-20	24-Feb-20	10
G1F1050	FINE GRADE	5	25-Feb-20	02-Mar-20	23
G1F1060	INSTALL UD-4	4	03-Mar-20	06-Mar-20	23
G1F1070	PLACE 21B AGGREGATE	6	09-Mar-20	16-Mar-20	23
G1F1080	PLACE BM-25.0A MAINLINE	4	15-Apr-20	20-Apr-20	31
G1F1100	INSTALL CURB	3	21-Apr-20	23-Apr-20	31
G1F1110	PLACE IM-19.0A MAINLINE	2	24-Apr-20	27-Apr-20	31
G1F1120	FINE GRADE SHARED USE PATH	5	28-Apr-20	04-May-20	33
G1F1150	PLACE SM-9.5D MAINLINE	2	28-Apr-20	29-Apr-20	31
G1F1160	DRESSUP GREEN AREA	5	05-May-20	11-May-20	33
RAMP D STA. 10+00 TO 17+00		51	25-Feb-20	05-May-20	27
G1G1000	REGULAR EXCAVATION	15	25-Feb-20	16-Mar-20	10
G1G1010	INSTALL STORM DRAINAGE	10	17-Mar-20	31-Mar-20	10
G1G1020	SLOPE GRADING	3	01-Apr-20	03-Apr-20	10
G1G1030	FINE GRADE	3	06-Apr-20	08-Apr-20	10
G1G1040	INSTALL UD-4	3	09-Apr-20	13-Apr-20	10
G1G1050	PLACE 21B AGGREGATE	3	14-Apr-20	17-Apr-20	10
G1G1060	PLACE BM-25.0A MAINLINE	3	20-Apr-20	22-Apr-20	10
G1G1070	PLACE 21B AGGREGATE SHOULDER	2	23-Apr-20	24-Apr-20	10
G1G1080	INSTALL CURB	3	27-Apr-20	29-Apr-20	15
G1G1090	PLACE IM-19.0 MAINLINE AND SHOULDER	2	30-Apr-20	01-May-20	15
G1G1100	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	2	04-May-20	05-May-20	27
SPUR D STA. 10+00 TO 12+50		28	06-Apr-20	13-May-20	31
G1H1100	PLACE FILL	5	06-Apr-20	10-Apr-20	12
G1H1110	INSTALL STORM DRAINAGE	5	13-Apr-20	20-Apr-20	12
G1H1120	SLOPE GRADING	2	21-Apr-20	22-Apr-20	12
G1H1130	FINE GRADE	2	27-Apr-20	28-Apr-20	10
G1H1140	INSTALL UD-4	1	29-Apr-20	29-Apr-20	10
G1H1150	PLACE 21B AGGREGATE	1	30-Apr-20	30-Apr-20	10
G1H1160	PLACE BM-25.0A MAINLINE	2	04-May-20	05-May-20	15
G1H1170	PLACE 21B AGGREGATE SHOULDER	1	06-May-20	06-May-20	15
G1H1200	INSTALL CURB	1	07-May-20	07-May-20	15
G1H1180	PLACE IM-19.0A MAINLINE AND SHOULDER	1	08-May-20	08-May-20	15
G1H1190	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	11-May-20	11-May-20	23
G1H1210	DRESSUP GREEN AREA	2	12-May-20	13-May-20	31
LORD FAIRFAX DRIVE STA. 107+00 TO 119+50		99	16-Jul-19	04-Dec-19	145
G1I1000	REGULAR EXCAVATION 0' - 10'	20	16-Jul-19	12-Aug-19	0
G1I1010	REGULAR EXCAVATION 10' - 20'	20	13-Aug-19	10-Sep-19	0
G1I1020	REGULAR EXCAVATION 20' +	20	11-Sep-19	08-Oct-19	0
G1I1030	INSTALL STORM DRAINAGE	20	09-Oct-19	05-Nov-19	0
G1I1040	SLOPE GRADING	5	09-Oct-19	15-Oct-19	0
G1I1050	FINE GRADE	5	16-Oct-19	22-Oct-19	6
G1I1060	INSTALL UD-4	5	23-Oct-19	29-Oct-19	6
G1I1070	PLACE 21B AGGREGATE	5	30-Oct-19	05-Nov-19	6
G1I1080	PLACE BM25.0A MAINLINE	5	06-Nov-19	12-Nov-19	6
G1I1100	INSTALL CURB	3	13-Nov-19	15-Nov-19	8
G1I1110	PLACE IM-19.0A MAINLINE	2	18-Nov-19	19-Nov-19	6
G1I1120	FINE GRADE SHARED USE PATH	3	20-Nov-19	22-Nov-19	86
G1I1150	PLACE SM-9.5D MAINLINE	2	20-Nov-19	25-Nov-19	46
G1I1160	DRESSUP GREEN AREA	5	26-Nov-19	04-Dec-19	142
RAMP F STA. 10+00 TO 18+00		139	16-Oct-19	30-Apr-20	30
G1J1000	REGULAR EXCAVATION	15	16-Oct-19	05-Nov-19	0
G1J1010	INSTALL STORM DRAINAGE	10	06-Nov-19	19-Nov-19	0
G1J1020	SLOPE GRADING	5	20-Nov-19	26-Nov-19	0
G1J1030	FINE GRADE	5	27-Nov-19	05-Dec-19	84
G1J1040	INSTALL UD-4	3	06-Dec-19	10-Dec-19	84
G1J1050	PLACE 21B AGGREGATE	5	11-Dec-19	17-Dec-19	84
G1J1060	PLACE BM-25.0A MAINLINE	5	15-Apr-20	21-Apr-20	3
G1J1070	PLACE 21B AGGREGATE SHOULDER	2	22-Apr-20	23-Apr-20	3
G1J1080	INSTALL CURB	1	24-Apr-20	24-Apr-20	3
G1J1090	PLACE IM-19.0 MAINLINE AND SHOULDER	2	27-Apr-20	28-Apr-20	3
G1J1100	PLACE SM-9.5D MAINLINE AND SHOULDER	2	29-Apr-20	30-Apr-20	30
SPUR F STA. 10+00 TO 12+50		119	27-Nov-19	14-May-20	30
G1K1000	REGULAR EXCAVATION	10	27-Nov-19	12-Dec-19	0
G1K1010	INSTALL STORM DRAINAGE	8	13-Dec-19	24-Dec-19	0
G1K1020	SLOPE GRADING	3	26-Dec-19	30-Dec-19	0
G1K1030	FINE GRADING	3	31-Dec-19	02-Jan-20	78
G1K1040	INSTALL UD-4	2	03-Jan-20	06-Jan-20	78
G1K1050	PLACE 21B AGGREGATE	3	24-Apr-20	28-Apr-20	3
G1K1060	PLACE BM-25.0A MAINLINE	3	29-Apr-20	01-May-20	3



Actual Work | Remaining Work | Critical Remaining Work | Milestone | Summary

SHIRLEY CONTRACTING COMPANY, LLC

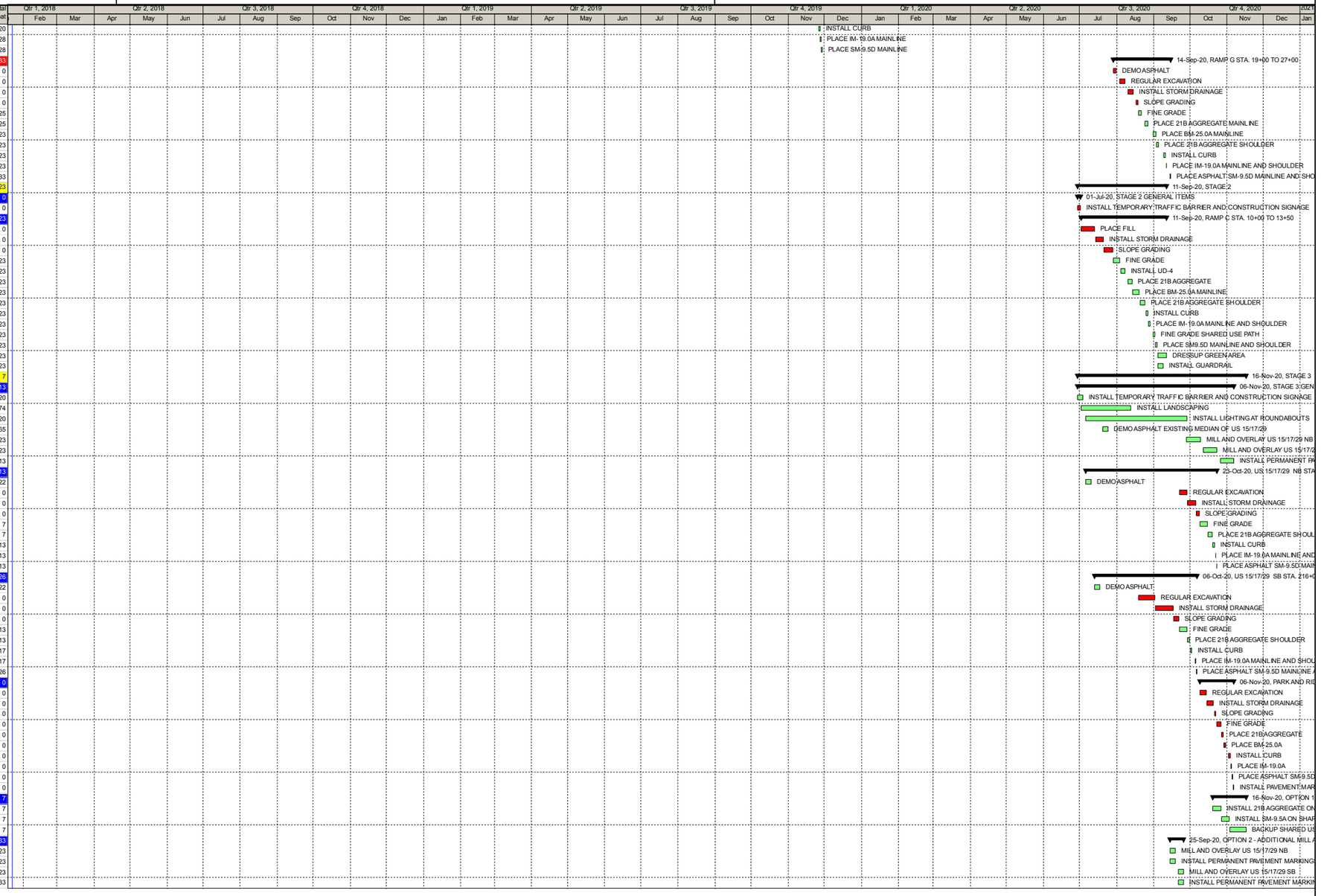
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
G1K1070	PLACE 21B AGGREGATE SHOULDER	2	04-May-20	05-May-20	3
G1K1080	INSTALL CURB	2	06-May-20	07-May-20	3
G1K1090	PLACE IM-19.0A MAINLINE AND SHOULDER	1	08-May-20	08-May-20	3
G1K1100	PLACE SM-9.5D MAINLINE AND SHOULDER	1	11-May-20	11-May-20	23
G1K1110	DRESSUP GREEN AREA	3	12-May-20	14-May-20	30
RAMP B STA. 13+50 TO 15+48.70		103	31-Dec-19	21-May-20	15
G1L1000	REGULAR EXCAVATION	9	31-Dec-19	10-Jan-20	0
G1L1010	INSTALL STORM DRAINAGE	5	13-Jan-20	20-Jan-20	0
G1L1020	SLOPE GRADING	3	21-Jan-20	23-Jan-20	0
G1L1030	FINE GRADE	5	24-Jan-20	30-Jan-20	64
G1L1040	INSTALL UD-4	3	31-Jan-20	04-Feb-20	64
G1L1050	PLACE 21B AGGREGATE	5	05-Feb-20	11-Feb-20	64
G1L1060	PLACE BM-25.0 MAINLINE	3	11-May-20	13-May-20	3
G1L1070	PLACE 21B AGGREGATE SHOULDER	2	14-May-20	15-May-20	3
G1L1090	PLACE IM-19.0A MAINLINE AND SHOULDER	2	18-May-20	19-May-20	6
G1L1100	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	2	20-May-20	21-May-20	15
US 15/17/29 SB STA. 200+00 TO 216+00		69	25-Feb-20	01-Jun-20	115
G1M1000	REGULAR EXCAVATION	10	25-Feb-20	09-Mar-20	11
G1M1010	INSTALL STORM DRAINAGE	10	26-Mar-20	08-Apr-20	0
G1M1020	SLOPE GRADING	3	09-Apr-20	13-Apr-20	0
G1M1030	FINE GRADE	5	01-May-20	07-May-20	10
G1M1040	INSTALL UD-4	3	08-May-20	12-May-20	10
G1M1050	PLACE 21B AGGREGATE	3	13-May-20	15-May-20	10
G1M1060	PLACE BM-25.0A MAINLINE	3	18-May-20	20-May-20	10
G1M1070	PLACE 21B AGGREGATE SHOULDER	2	21-May-20	22-May-20	10
G1M1080	INSTALL CURB	3	26-May-20	28-May-20	10
G1M1090	PLACE IM-19.0A MAINLINE AND SHOULDER	1	29-May-20	29-May-20	10
G1M1100	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	01-Jun-20	01-Jun-20	115
US 15/17/29 SB STA. 225+00 TO 234+00		44	14-Apr-20	15-Jun-20	105
G1M1110	REGULAR EXCAVATION	10	14-Apr-20	28-Apr-20	0
G1M1120	INSTALL STORM DRAINAGE	10	29-Apr-20	12-May-20	0
G1M1130	SLOPE GRADING	3	13-May-20	15-May-20	0
G1M1140	FINE GRADE	5	18-May-20	22-May-20	0
G1M1150	INSTALL UD-4	3	26-May-20	28-May-20	0
G1M1160	PLACE 21B AGGREGATE	3	29-May-20	02-Jun-20	0
G1M1170	PLACE BM-25.0A MAINLINE	3	03-Jun-20	05-Jun-20	0
G1M1180	PLACE 21B AGGREGATE SHOULDER	2	08-Jun-20	09-Jun-20	0
G1M1190	INSTALL CURB	2	10-Jun-20	11-Jun-20	0
G1M1200	PLACE IM-19.0A MAINLINE AND SHOULDER	1	12-Jun-20	12-Jun-20	0
G1M1210	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	15-Jun-20	15-Jun-20	105
US 15/17/29 NB STA. 100+00 TO 112+00		44	26-Feb-20	27-Apr-20	139
G1M1220	REGULAR EXCAVATION	10	26-Feb-20	10-Mar-20	0
G1M1230	INSTALL STORM DRAINAGE	10	11-Mar-20	25-Mar-20	0
G1M1240	SLOPE GRADING	3	26-Mar-20	30-Mar-20	33
G1M1250	FINE GRADE	5	31-Mar-20	06-Apr-20	33
G1M1260	INSTALL UD-4	3	07-Apr-20	09-Apr-20	33
G1M1270	PLACE 21B AGGREGATE	3	10-Apr-20	14-Apr-20	33
G1M1280	PLACE BM-25.0A MAINLINE	3	15-Apr-20	17-Apr-20	34
G1M1290	PLACE 21B AGGREGATE SHOULDER	2	20-Apr-20	21-Apr-20	34
G1M1300	INSTALL CURB	2	22-Apr-20	23-Apr-20	34
G1M1310	PLACE IM-19.0A MAINLINE AND SHOULDER	1	24-Apr-20	24-Apr-20	34
G1M1320	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	27-Apr-20	27-Apr-20	139
US 15/17/29 NB STA. 117+00 TO 131+50		67	24-Jan-20	27-Apr-20	139
G1M1330	REGULAR EXCAVATION	10	24-Jan-20	06-Feb-20	0
G1M1340	INSTALL STORM DRAINAGE	10	07-Feb-20	20-Feb-20	0
G1M1350	SLOPE GRADING	3	21-Feb-20	25-Feb-20	0
G1M1360	FINE GRADE	5	26-Feb-20	03-Mar-20	56
G1M1370	INSTALL UD-4	3	04-Mar-20	06-Mar-20	56
G1M1380	PLACE 21B AGGREGATE	3	09-Mar-20	11-Mar-20	56
G1M1390	PLACE BM-25.0A MAINLINE	3	15-Apr-20	17-Apr-20	34
G1M1400	PLACE 21B AGGREGATE SHOULDER	2	20-Apr-20	21-Apr-20	34
G1M1410	INSTALL CURB	2	22-Apr-20	23-Apr-20	34
G1M1420	PLACE IM-19.0A MAINLINE AND SHOULDER	1	24-Apr-20	24-Apr-20	34
G1M1430	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	27-Apr-20	27-Apr-20	139
STAGE 1C		230	21-Oct-19	14-Sep-20	33
RAMP C STA. 13+50 TO 16+57.86		146	21-Oct-19	14-May-20	106
G2B1290	PLACE FILL	8	21-Oct-19	30-Oct-19	197
G2B1160	INSTALL STORM DRAINAGE	5	31-Oct-19	06-Nov-19	197
G2B1170	SLOPE GRADING	6	07-Nov-19	14-Nov-19	197
G2B1180	FINE GRADE	4	15-Nov-19	20-Nov-19	197
G2B1190	INSTALL UD-4	4	21-Nov-19	26-Nov-19	197
G2B1200	PLACE 21B AGGREGATE	4	27-Nov-19	04-Dec-19	197
G2B1210	PLACE BM-25.0A MAINLINE	4	15-Apr-20	20-Apr-20	106
G2B1220	PLACE 21B AGGREGATE SHOULDER	3	21-Apr-20	23-Apr-20	107
G2B1230	INSTALL CURB	2	24-Apr-20	27-Apr-20	107
G2B1240	PLACE IM-19.0A MAINLINE AND SHOULDER	2	28-Apr-20	29-Apr-20	106
G2B1250	FINE GRADE SHARED USE PATH	2	30-Apr-20	01-May-20	107
G2B1260	PLACE SM9.5D MAINLINE AND SHOULDER	2	04-May-20	05-May-20	106
G2B1270	DRESSUP GREEN AREA	5	06-May-20	12-May-20	107
G2B1280	INSTALL GUARDRAIL	2	13-May-20	14-May-20	107
15/17/29 BUS STA. TEMPORARY WIDENING IN MEDIAN STA. 127+00 TO 132+00		13	28-Oct-19	13-Nov-19	234
G1E1260	PLACE FILL	5	28-Oct-19	01-Nov-19	232
G1E1190	FINE GRADE	2	04-Nov-19	05-Nov-19	232
G1E1210	PLACE 21B AGGREGATE	2	06-Nov-19	07-Nov-19	232
G1E1220	PLACE BM-25.0A MAINLINE	3	08-Nov-19	12-Nov-19	138
G1E1240	PLACE IM-19.0A MAINLINE	1	13-Nov-19	13-Nov-19	138
15/17/29 BUS STA. 123+00 TO 130+50		28	21-Oct-19	29-Nov-19	224
G1C1170	PLACE FILL	5	21-Oct-19	25-Oct-19	229
G1C1090	INSTALL STORM DRAINAGE	3	06-Nov-19	08-Nov-19	222
G1C1100	FINE GRADE	2	11-Nov-19	12-Nov-19	222
G1C1110	INSTALL UD-4	2	13-Nov-19	14-Nov-19	222
G1C1120	PLACE 21B AGGREGATE	2	15-Nov-19	18-Nov-19	222
G1C1130	PLACE BM-25.0A MAINLINE	3	19-Nov-19	25-Nov-19	128



Actual Work | Remaining Work | Critical Remaining Work | Milestone | Summary

SHIRLEY CONTRACTING COMPANY, LLC

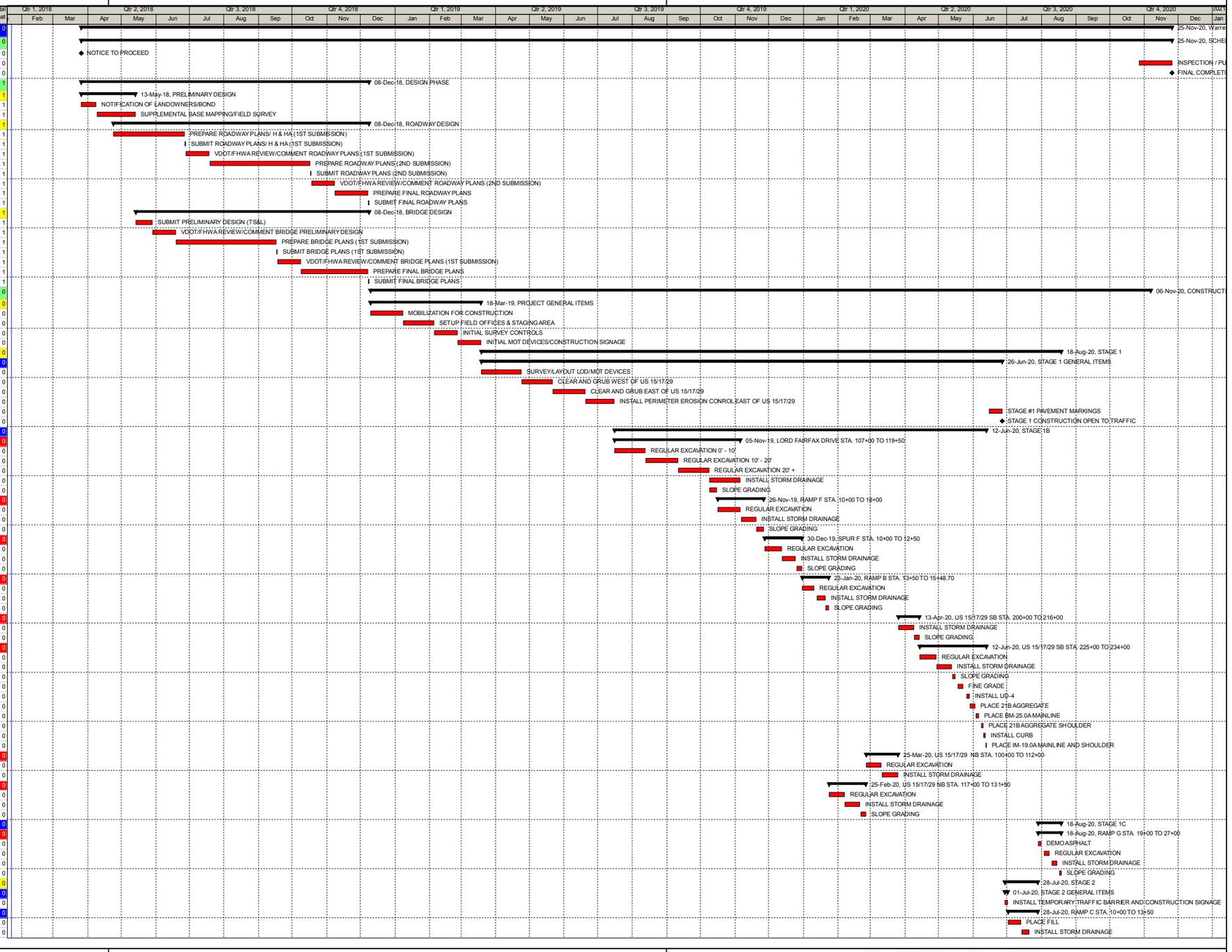
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
G1C1140	INSTALL CURB	2	26-Nov-19	27-Nov-19	220
G1C1150	PLACE IM-19.0A MAINLINE	1	27-Nov-19	28-Nov-19	128
G1C1160	PLACE SM-9.5D MAINLINE	1	28-Nov-19	29-Nov-19	128
RAMP G STA. 19+00 TO 27+00		33	29-Jul-20	14-Sep-20	33
G2D1000	DEMO ASPHALT	3	29-Jul-20	31-Jul-20	0
G2D1010	REGULAR EXCAVATION	5	03-Aug-20	07-Aug-20	0
G2D1020	INSTALL STORM DRAINAGE	5	10-Aug-20	14-Aug-20	0
G2D1030	SLOPE GRADING	2	17-Aug-20	18-Aug-20	0
G2D1040	FINE GRADE	3	19-Aug-20	21-Aug-20	25
G2D1050	PLACE 21B AGGREGATE MAINLINE	3	24-Aug-20	26-Aug-20	25
G2D1060	PLACE BM-25.0A MAINLINE	3	31-Aug-20	02-Sep-20	23
G2D1070	PLACE 21B AGGREGATE SHOULDER	2	03-Sep-20	04-Sep-20	23
G2D1080	INSTALL CURB	2	09-Sep-20	10-Sep-20	23
G2D1090	PLACE IM-19.0A MAINLINE AND SHOULDER	1	11-Sep-20	11-Sep-20	23
G2D1100	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	14-Sep-20	14-Sep-20	33
STAGE 2		53	29-Jun-20	11-Sep-20	23
STAGE 2 GENERAL ITEMS		3	29-Jun-20	01-Jul-20	0
G2A21000	INSTALL TEMPORARY TRAFFIC BARRIER AND CONSTRUCTION SIGNAGE	3	29-Jun-20	01-Jul-20	0
RAMP C STA. 10+00 TO 13+50		50	02-Jul-20	11-Sep-20	23
G2B1000	PLACE FILL	8	02-Jul-20	13-Jul-20	0
G2B1010	INSTALL STORM DRAINAGE	5	14-Jul-20	20-Jul-20	0
G2B1020	SLOPE GRADING	6	21-Jul-20	28-Jul-20	0
G2B1030	FINE GRADE	4	29-Jul-20	03-Aug-20	23
G2B1040	INSTALL UD-4	4	04-Aug-20	07-Aug-20	23
G2B1050	PLACE 21B AGGREGATE	4	10-Aug-20	13-Aug-20	23
G2B1060	PLACE BM-25.0A MAINLINE	4	14-Aug-20	19-Aug-20	23
G2B1070	PLACE 21B AGGREGATE SHOULDER	3	20-Aug-20	24-Aug-20	23
G2B1080	INSTALL CURB	2	25-Aug-20	26-Aug-20	23
G2B1090	PLACE IM-19.0A MAINLINE AND SHOULDER	2	27-Aug-20	28-Aug-20	23
G2B1100	FINE GRADE SHARED USE PATH	2	31-Aug-20	01-Sep-20	23
G2B1130	PLACE SM9.5D MAINLINE AND SHOULDER	2	02-Sep-20	03-Sep-20	23
G2B1140	DRESSUP GREEN AREA	5	04-Sep-20	11-Sep-20	23
G2B1150	INSTALL GUARDRAIL	2	04-Sep-20	08-Sep-20	23
STAGE 3		99	29-Jun-20	16-Nov-20	7
STAGE 3 GENERAL ITEMS		93	29-Jun-20	06-Nov-20	13
G2A32120	INSTALL TEMPORARY TRAFFIC BARRIER AND CONSTRUCTION SIGNAGE	5	29-Jun-20	03-Jul-20	20
G2A32110	INSTALL LANDSCAPING	30	02-Jul-20	12-Aug-20	74
G2A32130	INSTALL LIGHTING AT ROUNDABOUTS	60	06-Jul-20	28-Sep-20	20
G2A32150	DEMO ASPHALT EXISTING MEDIAN OF US 15/17/29	5	20-Jul-20	24-Jul-20	65
G2A32080	MILL AND OVERLAY US 15/17/29 NB OUTSIDE LANES	10	28-Sep-20	09-Oct-20	23
G2A32090	MILL AND OVERLAY US 15/17/29 SB OUTSIDE LANES	10	12-Oct-20	23-Oct-20	23
G2A32100	INSTALL PERMANENT PAVEMENT MARKINGS	10	26-Oct-20	06-Nov-20	13
US 15/17/29 NB STA. 112+00 TO 117+00		79	06-Jul-20	23-Oct-20	13
G2D1320	DEMO ASPHALT	5	06-Jul-20	10-Jul-20	22
G2D1220	REGULAR EXCAVATION	5	22-Sep-20	28-Sep-20	0
G2D1230	INSTALL STORM DRAINAGE	5	29-Sep-20	05-Oct-20	0
G2D1240	SLOPE GRADING	3	06-Oct-20	08-Oct-20	0
G2D1250	FINE GRADE	5	09-Oct-20	15-Oct-20	7
G2D1280	PLACE 21B AGGREGATE SHOULDER	2	16-Oct-20	19-Oct-20	7
G2D1290	INSTALL CURB	2	20-Oct-20	21-Oct-20	13
G2D1300	PLACE IM-19.0A MAINLINE AND SHOULDER	1	22-Oct-20	22-Oct-20	13
G2D1310	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	23-Oct-20	23-Oct-20	13
US 15/17/29 SB STA. 216+00 TO 225+00		61	13-Jul-20	06-Oct-20	26
G2D1210	DEMO ASPHALT	5	13-Jul-20	17-Jul-20	22
G2D1110	REGULAR EXCAVATION	10	19-Aug-20	01-Sep-20	0
G2D1120	INSTALL STORM DRAINAGE	10	02-Sep-20	16-Sep-20	0
G2D1130	SLOPE GRADING	3	17-Sep-20	21-Sep-20	0
G2D1140	FINE GRADE	5	22-Sep-20	28-Sep-20	13
G2D1170	PLACE 21B AGGREGATE SHOULDER	2	29-Sep-20	30-Sep-20	13
G2D1180	INSTALL CURB	2	01-Oct-20	02-Oct-20	17
G2D1190	PLACE IM-19.0A MAINLINE AND SHOULDER	1	05-Oct-20	05-Oct-20	17
G2D1200	PLACE ASPHALT SM-9.5D MAINLINE AND SHOULDER	1	06-Oct-20	06-Oct-20	26
PARK AND RIDE LOT		21	09-Oct-20	06-Nov-20	0
G2C1190	REGULAR EXCAVATION	4	09-Oct-20	14-Oct-20	0
G2C1100	INSTALL STORM DRAINAGE	4	15-Oct-20	20-Oct-20	0
G2C1110	SLOPE GRADING	2	21-Oct-20	22-Oct-20	0
G2C1120	FINE GRADE	2	23-Oct-20	26-Oct-20	0
G2C1130	PLACE 21B AGGREGATE	2	27-Oct-20	28-Oct-20	0
G2C1140	PLACE BM-25.0A	2	29-Oct-20	30-Oct-20	0
G2C1150	INSTALL CURB	2	02-Nov-20	03-Nov-20	0
G2C1160	PLACE IM-19.0A	1	04-Nov-20	04-Nov-20	0
G2C1170	PLACE ASPHALT SM-9.5D	1	05-Nov-20	05-Nov-20	0
G2C1180	INSTALL PAVEMENT MARKINGS	1	06-Nov-20	06-Nov-20	0
OPTION 1 - SHARED USE PATH		20	20-Oct-20	16-Nov-20	7
G2E1030	INSTALL 21B AGGREGATE ON SHARED USE PATH	5	20-Oct-20	26-Oct-20	7
G2E1040	INSTALL SM-9.5A ON SHARED USE PATH	5	27-Oct-20	02-Nov-20	7
G2E1050	BACKUP SHARED USE PATH ASPHALT	10	03-Nov-20	16-Nov-20	7
OPTION 2 - ADDITIONAL MILL AND OVERLAY		10	14-Sep-20	25-Sep-20	33
G2F1040	MILL AND OVERLAY US 15/17/29 NB	5	14-Sep-20	18-Sep-20	23
G2F1050	INSTALL PERMANENT PAVEMENT MARKINGS US 15/17/29 NB	5	14-Sep-20	18-Sep-20	23
G2F1060	MILL AND OVERLAY US 15/17/29 SB	5	21-Sep-20	25-Sep-20	23
G2F1070	INSTALL PERMANENT PAVEMENT MARKINGS US 15/17/29 SB	5	21-Sep-20	25-Sep-20	33



Actual Work | Remaining Work | Critical Remaining Work | Milestone | Summary

SHIRLEY CONTRACTING COMPANY, LLC

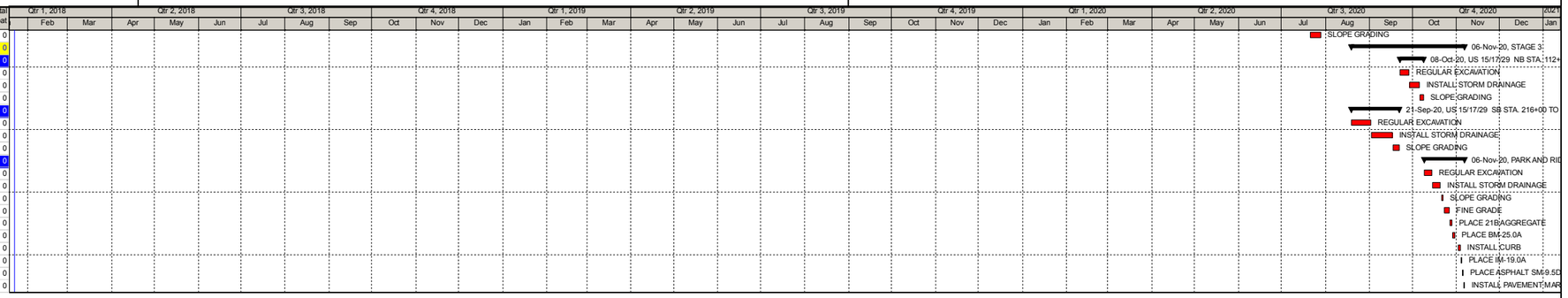
Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
Warrenton Southern Interchange US 15/17/29		683	26-Mar-18	25-Nov-20	0
SCHEDULE MILESTONES		976	26-Mar-18	25-Nov-20	0
A1060	NOTICE TO PROCEED	0	26-Mar-18*		0
A1220	INSPECTION / PUNCHLIST	30	27-Oct-20	25-Nov-20	0
A1240	FINAL COMPLETION	0		25-Nov-20	0
DESIGN PHASE		258	26-Mar-18	08-Dec-18	1
PRELIMINARY DESIGN		49	26-Mar-18	13-May-18	1
BA1000	NOTIFICATION OF LANDOWNERS/BOND	14	26-Mar-18	08-Apr-18	1
BA1020	SUPPLEMENTAL BASE MAPPING/FIELD SURVEY	35	09-Apr-18	13-May-18	1
ROADWAY DESIGN		229	24-Apr-18	08-Dec-18	1
BC1000	PREPARE ROADWAY PLANS/ H & HA (1ST SUBMISSION)	64	24-Apr-18	26-Jun-18	1
BC1020	SUBMIT ROADWAY PLANS/ H & HA (1ST SUBMISSION)	1	27-Jun-18	27-Jun-18	1
BC1040	VDOT/FHWA REVIEW/COMMENT ROADWAY PLANS (1ST SUBMISSION)	21	28-Jun-18	18-Jul-18	1
BC1060	PREPARE ROADWAY PLANS (2ND SUBMISSION)	90	19-Jul-18	16-Oct-18	1
BC1080	SUBMIT ROADWAY PLANS (2ND SUBMISSION)	1	17-Oct-18	17-Oct-18	1
BC1100	VDOT/FHWA REVIEW/COMMENT ROADWAY PLANS (2ND SUBMISSION)	21	18-Oct-18	07-Nov-18	1
BC1120	PREPARE FINAL ROADWAY PLANS	30	08-Nov-18	07-Dec-18	1
BC1140	SUBMIT FINAL ROADWAY PLANS	1	08-Dec-18	08-Dec-18	1
BRIDGE DESIGN		209	14-May-18	08-Dec-18	1
BD1000	SUBMIT PRELIMINARY DESIGN (TS&L)	15	14-May-18	28-May-18	1
BD1020	VDOT/FHWA REVIEW/COMMENT BRIDGE PRELIMINARY DESIGN	21	29-May-18	18-Jun-18	1
BD1040	PREPARE BRIDGE PLANS (1ST SUBMISSION)	90	19-Jun-18	16-Sep-18	1
BD1060	SUBMIT BRIDGE PLANS (1ST SUBMISSION)	1	17-Sep-18	17-Sep-18	1
BD1080	VDOT/FHWA REVIEW/COMMENT BRIDGE PLANS (1ST SUBMISSION)	21	18-Sep-18	08-Oct-18	1
BD1100	PREPARE FINAL BRIDGE PLANS	60	09-Oct-18	07-Dec-18	1
BD1120	SUBMIT FINAL BRIDGE PLANS	1	08-Dec-18	08-Dec-18	1
CONSTRUCTION		490	10-Dec-18	06-Nov-20	0
PROJECT GENERAL ITEMS		70	10-Dec-18	18-Mar-19	0
GA1020	MOBILIZATION FOR CONSTRUCTION	20	10-Dec-18	07-Jan-19	0
GA1040	SETUP FIELD OFFICES & STAGING AREA	20	08-Jan-19	04-Feb-19	0
GA1060	INITIAL SURVEY CONTROLS	15	05-Feb-19	25-Feb-19	0
GA1080	INITIAL MOT DEVICES/CONSTRUCTION SIGNAGE	15	26-Feb-19	18-Mar-19	0
STAGE 1		363	19-Mar-19	18-Aug-20	0
STAGE 1 GENERAL ITEMS		327	19-Mar-19	26-Jun-20	0
G1A21000	SURVEY/LAYOUT LOD/MOT DEVICES	25	19-Mar-19	23-Apr-19	0
G1A31000	CLEAR AND GRUB WEST OF US 15/17/29	20	24-Apr-19	21-May-19	0
G1A32010	CLEAR AND GRUB EAST OF US 15/17/29	20	22-May-19	19-Jun-19	0
G1A32020	INSTALL PERIMETER EROSION CONROL EAST OF US 15/17/29	17	20-Jun-19	15-Jul-19	0
G1A32040	STAGE #1 PAVEMENT MARKINGS	10	15-Jun-20	26-Jun-20	0
G1A32030	STAGE 1 CONSTRUCTION OPEN TO TRAFFIC	0		26-Jun-20	0
STAGE 1B		234	16-Jul-19	12-Jun-20	0
LORD FAIRFAX DRIVE STA. 107+00 TO 119+50		80	16-Jul-19	05-Nov-19	0
G1I1000	REGULAR EXCAVATION 0' - 10'	20	16-Jul-19	12-Aug-19	0
G1I1010	REGULAR EXCAVATION 10' - 20'	20	13-Aug-19	10-Sep-19	0
G1I1020	REGULAR EXCAVATION 20' +	20	11-Sep-19	08-Oct-19	0
G1I1030	INSTALL STORM DRAINAGE	20	09-Oct-19	05-Nov-19	0
G1I1040	SLOPE GRADING	5	09-Oct-19	15-Oct-19	0
RAMP F STA. 10+00 TO 18+00		30	16-Oct-19	26-Nov-19	0
G1J1000	REGULAR EXCAVATION	15	16-Oct-19	05-Nov-19	0
G1J1010	INSTALL STORM DRAINAGE	10	06-Nov-19	19-Nov-19	0
G1J1020	SLOPE GRADING	5	20-Nov-19	26-Nov-19	0
SPUR F STA. 10+00 TO 12+50		21	27-Nov-19	30-Dec-19	0
G1K1000	REGULAR EXCAVATION	10	27-Nov-19	12-Dec-19	0
G1K1010	INSTALL STORM DRAINAGE	8	13-Dec-19	24-Dec-19	0
G1K1020	SLOPE GRADING	3	26-Dec-19	30-Dec-19	0
RAMP B STA. 13+50 TO 15+48.70		17	31-Dec-19	23-Jan-20	0
G1L1000	REGULAR EXCAVATION	9	31-Dec-19	10-Jan-20	0
G1L1010	INSTALL STORM DRAINAGE	5	13-Jan-20	20-Jan-20	0
G1L1020	SLOPE GRADING	3	21-Jan-20	23-Jan-20	0
US 15/17/29 SB STA. 200+00 TO 216+00		13	26-Mar-20	13-Apr-20	0
G1M1010	INSTALL STORM DRAINAGE	10	26-Mar-20	08-Apr-20	0
G1M1020	SLOPE GRADING	3	09-Apr-20	13-Apr-20	0
US 15/17/29 SB STA. 225+00 TO 234+00		43	14-Apr-20	12-Jun-20	0
G1M1110	REGULAR EXCAVATION	10	14-Apr-20	28-Apr-20	0
G1M1120	INSTALL STORM DRAINAGE	10	29-Apr-20	12-May-20	0
G1M1130	SLOPE GRADING	3	13-May-20	15-May-20	0
G1M1140	FINE GRADE	5	18-May-20	22-May-20	0
G1M1150	INSTALL UD-4	3	26-May-20	28-May-20	0
G1M1160	PLACE 21B AGGREGATE	3	29-May-20	02-Jun-20	0
G1M1170	PLACE BM-25.0A MAINLINE	3	03-Jun-20	05-Jun-20	0
G1M1180	PLACE 21B AGGREGATE SHOULDER	2	08-Jun-20	09-Jun-20	0
G1M1190	INSTALL CURB	2	10-Jun-20	11-Jun-20	0
G1M1200	PLACE IM-19.0A MAINLINE AND SHOULDER	1	12-Jun-20	12-Jun-20	0
US 15/17/29 NB STA. 100+00 TO 112+00		20	26-Feb-20	25-Mar-20	0
G1M1220	REGULAR EXCAVATION	10	26-Feb-20	10-Mar-20	0
G1M1230	INSTALL STORM DRAINAGE	10	11-Mar-20	25-Mar-20	0
US 15/17/29 NB STA. 117+00 TO 131+50		23	24-Jan-20	25-Feb-20	0
G1M1330	REGULAR EXCAVATION	10	24-Jan-20	06-Feb-20	0
G1M1340	INSTALL STORM DRAINAGE	10	07-Feb-20	20-Feb-20	0
G1M1350	SLOPE GRADING	3	21-Feb-20	25-Feb-20	0
STAGE 1C		15	29-Jul-20	18-Aug-20	0
RAMP G STA. 19+00 TO 27+00		15	29-Jul-20	18-Aug-20	0
G2D1000	DEMO ASPHALT	3	29-Jul-20	31-Jul-20	0
G2D1010	REGULAR EXCAVATION	5	03-Aug-20	07-Aug-20	0
G2D1020	INSTALL STORM DRAINAGE	5	10-Aug-20	14-Aug-20	0
G2D1030	SLOPE GRADING	2	17-Aug-20	18-Aug-20	0
STAGE 2		22	29-Jun-20	28-Jul-20	0
STAGE 2 GENERAL ITEMS		3	29-Jun-20	01-Jul-20	0
G2A21000	INSTALL TEMPORARY TRAFFIC BARRIER AND CONSTRUCTION SIGNAGE	3	29-Jun-20	01-Jul-20	0
RAMP C STA. 10+00 TO 13+50		19	02-Jul-20	28-Jul-20	0
G2B1000	PLACE FILL	8	02-Jul-20	13-Jul-20	0
G2B1010	INSTALL STORM DRAINAGE	5	14-Jul-20	20-Jul-20	0



Actual Work | Remaining Work | Critical Remaining Work | Milestone | Summary

SHIRLEY CONTRACTING COMPANY, LLC

Activity ID	Activity Name	Original Duration	Start	Finish	Total Float
G2B1020	SLOPE GRADING	6	21-Jul-20	28-Jul-20	0
STAGE 3		57	19-Aug-20	06-Nov-20	0
US 15/17/29 NB STA. 112+00 TO 117+00		13	22-Sep-20	08-Oct-20	0
G2D1220	REGULAR EXCAVATION	5	22-Sep-20	28-Sep-20	0
G2D1230	INSTALL STORM DRAINAGE	5	29-Sep-20	05-Oct-20	0
G2D1240	SLOPE GRADING	3	06-Oct-20	08-Oct-20	0
US 15/17/29 SB STA. 216+00 TO 225+00		23	19-Aug-20	21-Sep-20	0
G2D1110	REGULAR EXCAVATION	10	19-Aug-20	01-Sep-20	0
G2D1120	INSTALL STORM DRAINAGE	10	02-Sep-20	16-Sep-20	0
G2D1130	SLOPE GRADING	3	17-Sep-20	21-Sep-20	0
PARK AND RIDE LOT		21	09-Oct-20	06-Nov-20	0
G2C1190	REGULAR EXCAVATION	4	09-Oct-20	14-Oct-20	0
G2C1100	INSTALL STORM DRAINAGE	4	15-Oct-20	20-Oct-20	0
G2C1110	SLOPE GRADING	2	21-Oct-20	22-Oct-20	0
G2C1120	FINE GRADE	2	23-Oct-20	26-Oct-20	0
G2C1130	PLACE 21B AGGREGATE	2	27-Oct-20	28-Oct-20	0
G2C1140	PLACE BM-25.0A	2	29-Oct-20	30-Oct-20	0
G2C1150	INSTALL CURB	2	02-Nov-20	03-Nov-20	0
G2C1160	PLACE IM-19.0A	1	04-Nov-20	04-Nov-20	0
G2C1170	PLACE ASPHALT SM-9.5D	1	05-Nov-20	05-Nov-20	0
G2C1180	INSTALL PAVEMENT MARKINGS	1	06-Nov-20	06-Nov-20	0



Actual Work
Remaining Work
Critical Remaining Work
Milestone
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SHIRLEY CONTRACTING COMPANY, LLC