

A DESIGN-BUILD PROJECT



I-581 / Valley View Interchange

Phase II From: ~0.240 Mi. S. Route 101 (Hershberger Road)
To: ~1.561 Mi. S. Route 101 (Hershberger Road)

City of Roanoke, Virginia



VOLUME I: TECHNICAL PROPOSAL

Prepared for the Virginia Department of Transportation

September 20, 2012

State Project No.: 0581-128-109, P101, RW201, C501, B627

Federal Project No.: NH-581-5(035) Contract ID Number: C00016595DB45



American Infrastructure™ *in association with*



ATTACHMENT 4.0.1.1
I-581/Valley View Boulevard Interchange Phase II
TECHNICAL PROPOSAL CHECKLIST AND CONTENTS

Offerors shall furnish a copy of this Technical Proposal Checklist, including page references, 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	Inside Front Cover
Acknowledgement of RFP, Revisions, and/or Addenda	Attachment 3.6 (Form C-78-RFP)	Sections 3.6, 4.0.1.1	no	Volume I Appendix 3.6
Letter of Submittal	NA	Sections 4.1		
Letter of Submittal on Offeror's letterhead	NA	Section 4.1.1	yes	Volume I Pages 1–2
Offeror's official representative information	NA	Section 4.1.1	yes	Volume I Page 2
Authorized representative's original signature	NA	Section 4.1.1	yes	Volume I Page 2
Declaration of intent	NA	Section 4.1.2	yes	Volume I Page 2
120 day declaration	NA	Section 4.1.3	yes	Volume I Page 2
Principal Officer information	NA	Section 4.1.4	yes	Volume I Page 2
Proposal Payment Agreement or Waiver of Proposal Payment	Attachment 9.3.1 or 9.3.2	Section 4.1.5	no	Volume I Appendix 4.1.5

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Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Offeror's Qualifications	NA	Section 4.2		
Confirmation that the information provided in the SOQ submittal remains true and accurate or indicates that any requested changes were previously approved by VDOT	NA	Section 4.2.1	yes	Volume I Page 3
Organizational chart with any updates since the SOQ submittal clearly identified	NA	Section 4.2.2	yes	Volume I Page 3
Revised narrative when organizational chart includes updates since the SOQ submittal	NA	Section 4.2.2	yes	Volume I Page 4
Design Build Project Manager's Resume	NA	Section 4.2, SOQ Section 3.3.1	no	Volume I Appendix 4.2
Request for Team Structure Change Approval	NA	Section 11.4, SOQ Section 3.3.1	no	Volume I Appendix 4.2
Updated DPOR Licenses	NA	Section 4.2, Section 11.8	no	Volume I Appendix 11.8
Design Concept	NA	Section 4.3		
Conceptual Roadway Plans and description	NA	Section 4.3.1	yes	Volume I Pages 5-12 & Volume II Pages 39-65
Conceptual Structural Plans, description, and renderings	NA	Section 4.3.2	yes	Volume I Pages 13-14 & Volume II

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Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
				Pages 66-70
VISSIM Analysis in electronic format (CD-ROM)	NA		no	Volume I Front Cover (Copy 1 of 10)
Project Approach	NA	Section 4.4		
Environmental Management	NA	Section 4.4.1	yes	Volume I Pages 15-17
Utilities	NA	Section 4.4.2	yes	Volume I Pages 17-18
Geotechnical	NA	Section 4.4.3	yes	Volume I Pages 18-21
Quality Assurance/ Quality Control (QA/QC)	NA	Section 4.4.4	yes	Volume I Pages 21-28
Construction of Project	NA	Section 4.5		
Sequence of Construction	NA	Section 4.5.1	yes	Volume I Pages 29-34
Transportation Management Plan	NA	Section 4.5.2	yes	Volume I Pages 34-37
Proposal Schedule	NA	Section 4.6		

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Technical Proposal Component	Form (if any)	RFP Part 1 Cross Reference	Included within page limit?	Technical Proposal Page Reference
Proposal Schedule	NA	Section 4.6.1	no	Volume I Appendix 4.6
Proposal Schedule Narrative	NA	Section 4.6.2	no	Volume I Appendix 4.6
Proposal Schedule in electronic format (CD-ROM)	NA	Section 4.6	no	Volume I Front Cover (Copy 1 of 10)
Disadvantaged Business Enterprises (DBE)	NA	Section 4.7		Volume I Page 38
Written statement of percent DBE participation	NA	Section 4.7	yes	Volume I Page 38
DBE subcontracting narrative	NA	Section 4.7	yes	Volume I Page 38

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September 20, 2012

Mr. Joseph A. Clarke, P.E.
Alternate Project Delivery Office
Virginia Department of Transportation
1401 East Broad Street
Richmond, VA 23219

**Letter of Submittal/Technical Proposal Submission:
I-581/Valley View Interchange Phase II Project
State Project No.: 0581-128-109, P101, RW201, C501, B627
Federal Project No.: NH-581-5 (035)
Contract ID Number: C00016595DB45**

Dear Mr. Clarke:

American Infrastructure – VA, Inc. (AI-VA) is pleased to submit our Technical Proposal for the Virginia Department of Transportation (VDOT) I-581/Valley View Interchange Phase II Project in the City of Roanoke, Virginia. **Throughout this proposal, changes to our original Technical Proposal submission are identified by red text, and deletions are indicated by a strikethrough.**

As presented in our Statement of Qualifications, AI-VA is one of the largest and most respected contractors in the Mid-Atlantic Region and enjoys a reputation for delivering quality projects, on time and on budget. We are an award-winning design builder, having recently been presented with the *Merit Award-Transportation Category for the Airport Connector Road PPTA Project in Richmond*. We were also recently named the *Associated Builders and Contractors National Contractor of the Year in 2011*. AI-VA has a *proven history of providing value on high-profile projects through the application of innovative solutions in design and construction*, including the Middle Ground Boulevard Design Build Project, where we provided a \$6.1M savings to the Commonwealth, and the I-581/Elm Avenue Interchange Improvements Design Build Project, on which we recently received notification of Intent to Award and returned over \$6.0M of savings to the Commonwealth.

Our partners have significant experience with VDOT policies, standards, and specifications at both District and Central Office levels. Together, we are committed to providing VDOT and the City of Roanoke with a project that not only completes the partial interchange on Valley View Boulevard, but also eases traffic congestion through the introduction of a Diverging Diamond Interchange (DDI) concept.

In a typical DDI design, no left-turn movements need to clear opposing traffic, making it safer for motorists. The DDI eliminates the tight curves typically used in a clover leaf design, reducing the likelihood of off-road crashes. In this location, a DDI will improve the efficiency of the interchange by allowing traffic to flow freely onto and off of I-581, and would eliminate the need for turning lanes on the bridge. Our concept for the I-581/Valley View Interchange will also:

- Significantly reduce the project footprint over the proposed concept
- Eliminate the need to relocate the Lick Run stream and Greenway
- Reduce the overall Right-of-Way impacts for the community
- Require fewer lanes, resulting in a narrower bridge
- Enhance traffic movements
- Significantly reduce project costs

I-581/Valley View Interchange Phase II

State Project No. 0581 128 109 F01 R4201 C501 B077 Federal Project No. NH-581-50351 Contract ID Number C00076960845

AI-VA and RDA have partnered on and recently received notification of intent to award for the I-581/Elm Avenue Interchange Improvements Design Build Project in Roanoke. A benefit of having the AI Team on the I-581/Valley View Interchange Phase II Project would be a shared approach and common interface on both of the I-581 Design Build Projects, enhancing schedule and providing significant cost savings.

In addition to our emphasis on delivering high-value projects, *AI-VA has a strong commitment to safety*, reflected by our Experience Modification Rate of 0.69, versus the industry standard of 1.0.

AI-VA along with our design partner, Rinker Design Associates (RDA), and our key subconsultants will be referred to as "The AI Team" throughout this Technical Proposal. The AI Team offers the following information as requested in Section 4.1 of the Request for Proposals:

4.1.1. David Nardon M. Jeff Humphreys, Jr. is the official representative and point of contact for the AI Team relative to this Proposal. In his role as the Design Build Project Manager, he will be responsible for the oversight of the entire AI Team. His contact information is as follows:

David Nardon	804.290.8500 (Telephone)
Design-Build Project Manager	610.222.4351 (Fax)
301 Concourse Boulevard—Suite 300	443.876.6367 (Cell)
Glen Allen, VA 23059	david.nardon@americaninfrastructure.com

M. Jeff Humphreys, Jr.	804.290.8514 (Telephone)
Design-Build Project Manager	484.993.6638 (Fax)
301 Concourse Boulevard – Suite 300	804.683.0553 (Cell)
Glen Allen, VA 23059	jeff.humphreys@americaninfrastructure.com

4.1.2. AI-VA's intent is to enter into a contract with VDOT for the Project in accordance with the terms of this RFP.

4.1.3. The offer represented by the Technical and Price Proposals for the Project will remain in full force and effect for one hundred twenty (120) days after the Technical Proposal submission date of ~~July 18, 2012~~ **September 20, 2012**.

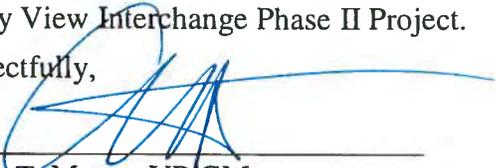
4.1.4. The principal officer of American Infrastructure-VA, Inc. with whom a Design Build contract with VDOT would be written is:

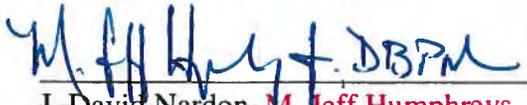
Aaron Myers	804.290.8500 (Telephone)
Vice President/General Manager	804.418.7935 (Fax)
301 Concourse Boulevard – Suite 300	aaron.myers@americaninfrastructure.com
Glen Allen, VA 2305	

4.1.5. AI-VA has included an executed Proposal Payment Agreement (Attachment 9.3.1) in **APPENDIX 4.1.5**.

By coordinating with FHWA, the City of Roanoke, Valley View Crossing Mall, Roanoke Parks & Recreation (Lick Run Greenway) and all other stakeholders and limiting the disruption to the traveling public, the AI Team will provide VDOT with a successful project. The AI Team is committed to providing a quality project safely, on schedule, and cost effectively through a well-managed design and construction process. Our commitment to VDOT is focused and we look forward to partnering with you on the I-581/Valley View Interchange Phase II Project.

Respectfully,


 Aaron T. Myers, VP/GM
 American Infrastructure – VA, Inc.


 J. David Nardon, M. Jeff Humphreys, Jr., DBPM
 American Infrastructure – VA, Inc.

4.2 Offeror's Qualifications

I-581 / Valley View Interchange Phase II

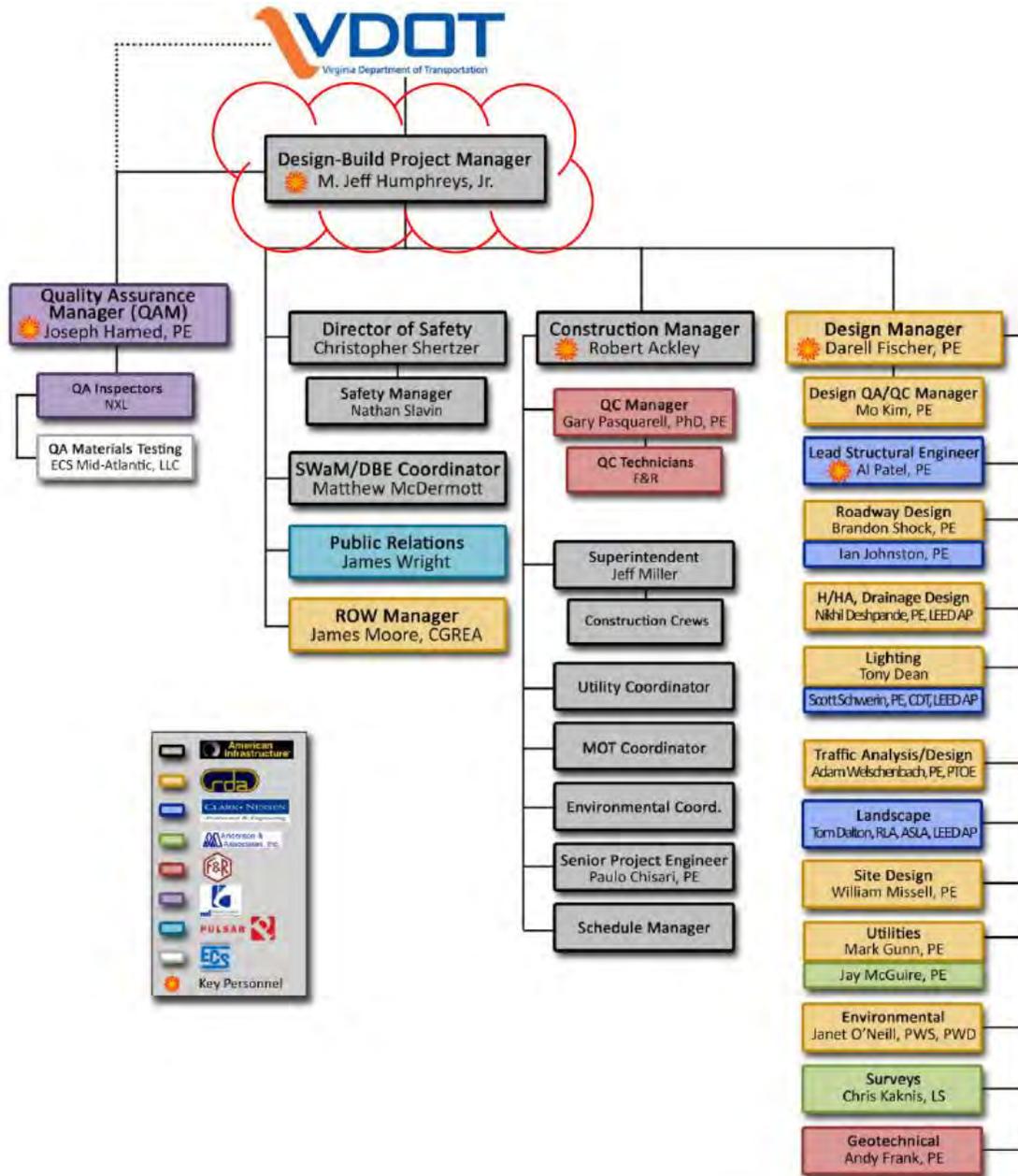


State Project No: 0581-128-109, F101, RW201, CS01, B627 Federal Project No: NH-581-510351 Contract ID Number: C00016595DB45

4.2.1. The AI Team confirms that the information contained in our Statement of Qualifications (SOQ) dated December 9, 2011 remains unchanged, true and accurate in accordance with Section 11.4 of the RFP with the exception of the changes described below. Documentation supporting these changes can be found in **APPENDIX 4.2 (SOQ 3.3.1) – DBPM RESUME**. All applicable DPOR license expiration dates have been renewed to maintain compliance with Section 11.8, and can be found in **APPENDIX 11.8-ADMINISTRATIVE REQUIREMENTS**.

unchanged since the submission of our SOQ; however, David Nardon is no longer employed with AI-VA, so M. Jeff Humphreys will replace him as Design Build Project Manager (DBPM). Our revised organizational chart is shown below. ~~The AI Team is structured with organization chart provided below and has no proposed changes from the SOQ.~~ The AI Team is structured with the intent to promote integration and streamlined communication between team members while providing VDOT with a single, direct point of contact for the entire Design Build Team.

4.2.2. The functional structure of our team remains



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Pursuant to Part 1, Section 4.2.2 of the RFP, the following narrative describes the changes to our SOQ submittal due to the approved team change.

SOQ Section 3.2.1 – Contact Information: M. Jeff Humphreys, Jr. will replace David Nardon as the Design Build Project Manager. He will be the official representative and point of contact for the AI Team. His contact information is included with this Technical Proposal in **SECTION 4.1.1 – LETTER OF SUBMITTAL**.

SOQ Section 3.3.1.1 – Design Build Project Manager: Mr. Humphreys will be responsible for the overall project design, construction, quality management, and contract administration for the project. He will be the primary point of contact for VDOT and other agencies. Mr. Humphreys brings 31 years of VDOT experience to the project and

upholds his DCR and VDOT certifications in order to maintain his connection to field operations. His resume is included in **APPENDIX 4.2 (SOQ 3.3.1) – DBPM RESUME** of this Technical Proposal.

Functional Relationships: As DBPM, Mr. Humphreys is ultimately responsible for the successful completion of the project. He will be the primary point of contact with VDOT regarding the Project, and will work directly with the VDOT Project Manager. The functional relationships of our team will not change except that the Primary Design Build Management Team, including the Quality Assurance Manager (QAM), Design Manager, Construction Manager, Director of Safety, SWaM/DBE Coordinator, Public Relations Manager, and Right-of-Way Manager will now report to Mr. Humphreys.

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As the AI Team began reviewing the RFP plans in order to develop an approach that would minimize both cost and impact to the environment, three elements became focal points of our discussions. First was the width of the bridge. We understood the need for an eight-lane structure due to the large left turning volumes. However, we wanted to explore options that might allow us to reduce the required width and cost. The second element was the amount of fill that would be needed to construct the RFP concept which in turn affected the third element, the stream relocation. If we could reduce the need or change the fill limits of Valley View Boulevard, we could avoid a Lick Run stream relocation and relocation of a 24" sanitary sewer line.

As a result of our evaluation and brain storming, we opted to evaluate a Diverging Diamond Interchange (DDI) option (see image below) instead of the half diamond / half cloverleaf option selected in the IMR and presented in the RFP plans. ***Our DDI concept will produce significant savings and efficiencies.***



Source: Missouri Department of Transportation

The DDI (see **EXHIBIT 1** for overall layout) will transition traffic in a crossing pattern through signal controlled intersections at either end of the bridge where the on-ramps and off-ramps tie-in. As a result, the signal phasing is simplified by removing the left turn phase all together. Left turns onto the ramps and left turns from the ramps onto Valley View Boulevard will be performed as free flowing movements. Eliminating these conflict points and

opening the movements up to be free flowing or yield controlled improves safety and efficiency. The DDI also provides numerous other advantages over the RFP design. It allows us to reduce the bridge width by a minimum of two lanes, possibly a third. It more closely resembles an urban diamond, keeping the ramps tighter to the interstate. This in turn reduces the large fill to the west, where a future extension of Valley View Boulevard is envisioned, and eliminates the need to relocate Lick Run stream and the 24" sanitary sewer line. As an added benefit, the residences on the south side of the Lick Run stream will no longer be impacted.

By adopting the DDI alternative, we can:

- Save money and time
- Significantly reduce environmental impacts
- Eliminate five residential relocations
- Reduce VDOT's Right-of-Way costs

There are still design challenges that we will need to address to incorporate this innovative solution. These challenges include revisiting the Public Involvement process and modifying the IMR in seeking ultimate Design Approval from VDOT and FHWA. The environmental process will need to be revisited; however, the net change in impacts will be a significant reduction.

4.3.1. CONCEPTUAL ROADWAY PLANS:

As described above, the AI Team's unique, innovative solution to this project incorporates one of the latest design innovations being implemented – the DDI. Design and construction of DDI's has primarily been done in the mid-west with some recent ventures in the east.

In order to fully understand our design concept, we make reference to our exhibits at various points in our discussion to provide the reviewers a graphical representation of our narratives provided below. In addition to those elements requested in the RFP, we have included write-ups for our drainage design, lighting design and VISSIM modeling approach, which was prepared to evaluate our alternative in comparison to the selected option (Option C1) in the IMR. ***To clearly evaluate the merits of our concept, we have provided a side by side comparison of Option C1 and our DDI concept,*** which can be found in Volume I, Pages 9 and 10.

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Changes to our original submission are clearly shown in “red” text and where text was removed, “red strikethrough” text. In order to make the changes and maintain the overall page count, exhibits for TMP Phase I and TMP Phase II were removed and all three phases are shown on the remaining exhibit. Given the opportunity to clarify the ramp terminal design criteria and resubmit this Technical Proposal, we made some alignment changes that would have been done as part of our final design. These changes are shown below and are highlighted in red on the appropriate exhibits in Volume II of this proposal submission.

- Shared Use Path – revised to balance earthwork
- Ramp W and associated ramp terminal connections – revised to balance earthwork
- Ramp X and associated ramp terminal connections – revised to balance earthwork and to provide smoother transition from VVB to Ramp X and I-581
- Ramp terminals at Y, W and Z had minor revisions to better depict the design and design criteria

In accordance with VDOT’s letter dated September 5, 2012, “Changes to RFP Requirements,” and depicted on the exhibits in Volume II of this proposal, the ramp terminal movements are not designed to the same criteria as the ramps proper. Specifically, the ramp design and posted speeds along with the minimum radii will be different. Based on AASHTO’s *A Policy on Geometric Design of Highways and Streets* (2004), aka Green Book, the ramp terminals are characterized as either turning movements or turning roadways.

The designs of turning movements (VVB Spurs W1, X1, Y1 and Z2 – left turn movements) are provided for low speeds (min. 10 mph) for a typical vehicle and capable of accommodating a WB-67. The super elevations and transitions are designed accordingly.

The designs of turning roadways (VVB Spurs W2, X2, Y2 and Z2 – right turn movements) are designed to a higher standard than turning movements. AASHTO identifies that a speed reduction of 10 to 20 mph less than the diverging roadway is acceptable. Our design approach was to

maintain a 20 mph design speed using TC-5.01R and a maximum super elevation of 8%.

General Geometry, Horizontal Alignment and Typical Sections

Although there are significant differences between our design approach and the one presented in the RFP, there was much about the RFP design that is incorporated into our design concept. A discussion of each roadway, their geometric principals, horizontal alignment and deviations from the RFP design is provided below. Typical sections of the roadways and roadway features such as guardrail and sound barrier walls are provided in Volume II (EXHIBITS 2 AND 3) to include I-581, Valley View Boulevard, all four ramps and the shared use path.

The design standards used are consistent with those presented in the RFP. The design of each roadway is as follows:

- I-581 – GS-5 (Freeway) – 60 mph design speed, minimum lane width of 12’ with 17’ shoulders in fill and 14’ shoulders in cut
- Valley View Boulevard – GS-7 – 30 mph design speed, minimum lane width of 12’ with curb and gutter (CG-6) along the outside, curb (CG-2) along the median
- Ramps (W, X, Y & Z) – GS-R – 30 mph design speed, minimum lane widths are 16’ (single) and 24’ (dual), shoulder widths are 11’ graded (8’ paved) right of traffic and 6’ graded (4’ paved) left of traffic (guardrail along the left side of traffic requires an additional three feet of widening to the graded shoulder width)
- VVB Spurs (W1, W2, X1, X2, Y1, Y2, Z1 & Z2) – ~~30~~ 10 to 20 mph design speed, minimum lane widths are 16’ (single) and 24’ (dual) – these ~~transition alignments between the ramps and ramp terminal movements~~ at Valley View Boulevard are designed as turning movements and turning roadways in accordance with AASHTO’s Green Book that exceed the design presented in the RFP. Based on DDI documentation we have researched (FHWA and Missouri), the spur alignments are designed to provide adequate turning movements for WB-67 vehicles and as free flowing movements where feasible.

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The DDI, and these specific designs, will provide a traffic calming effect and has the ability to move more traffic through the interchange at lower speeds.

I-581: Improvements to I-581 will provide for continuous acceleration/deceleration lanes between the Hershberger Road interchange and the Valley View Boulevard interchange in both directions. Additionally, an acceleration lane where the on-ramp from Valley View Boulevard ties to I-581 southbound will be designed for a speed transition from 30 mph to 60 mph, a minimum distance of 910'. Similarly, a deceleration lane from I-581 northbound to Valley View Boulevard will be designed for a speed transition from 60 mph to 30 mph, a minimum distance of 430'. Each of these distances meets VDOT and AASHTO criteria.

Additional improvements to I-581 include the construction of sound barrier walls to mitigate noise pollution. The locations of these walls vary from edge of shoulder to top of slope and are shown on our Exhibits in Volume II. Sound Barrier Wall 1 is the only wall that also requires a retaining wall along the backside to avoid additional environmental impacts, specifically to Lick Run stream. The walls that are constructed along the shoulders have an F-shaped barrier section along their face for clear zone protection along with proposed drainage systems to collect the drainage.

Valley View Boulevard (VVB): Based on our Team's DDI alternative, we have been able to reduce the impacts to the Best Buy parking lot. The RFP design impacted both parking spaces and circulation within the parking lot. Our proposed design will only impact the outer row of parking which can be done without significant impact or disruption to the parking lot circulation road.

Our centerline of roadway is shifted to the south in order to align our alternative to provide for bridge widening only to the south. This shift does not create any substantial increase to impacts on the City of Roanoke property opposite from the Best Buy due to the reduction in pavement width resulting from the implementation of our DDI alternative.

Valley View Boulevard has been designed for two (2) 12' lanes in each direction; a 10' shared use path

along the north side; and right/left turn lanes at the interchange and at the Target entrance. ***The right turn movements onto the interchange will be free flowing movements from Valley View Boulevard to I-581.*** Finally, curb and gutter (St'd. CG-6) will be used to capture the drainage and convey it to an adequate outfall.

As Valley View Boulevard crosses over I-581 to the west, our design will provide a stub for the future design/construction of Valley View Boulevard without disruption to traffic. Although a signal will not need to be constructed as part of our alternative design at the western end of the bridge, the dry conduit and traffic boxes will be constructed to facilitate the future expansion.

The efficiency of a DDI is best realized when there are heavy left turn movements onto the roadway below. Based on the IMR data, this will be an ideal location to implement the DDI.

Ramp W and VVB Spurs W1 & W2: Based on our DDI design, Ramp W will no longer be a loop ramp. The location of the ramp has changed to be more in line with an urban diamond. As a result, less full lane widening will be required along I-581 as a lead in to Ramp W. The overall layout depicted on **EXHIBIT 1** in Volume II provides a clear graphical depiction.

Ramp W begins on I-581 near Station 195+75 and transitions to a ~~spur alignment ramp terminal turning roadway~~ that stubs out for the future extension of Valley View Boulevard to the west. Additionally, a ~~spur transition ramp terminal turning movement~~ will be constructed between Ramp W and the bridge across I-581 to provide for stop/signal controlled movement from Ramp W to eastbound Valley View Boulevard. Lane widths are tabulated in the table to the right and were adjusted based on Table 10-67 of the 2004 AASHTO Green Book to include an additional one foot shy line where vertical curb is provided. **EXHIBITS 6, 7 AND 15** clearly depicts the layout of the ramp and spur alignments.

Ramps X & Y, and VVB Spurs X1, X2, Y1 & Y2: Ramps X and Y resemble the RFP plans and generally follow the horizontal alignments of the RFP plans beyond ~~where the spur alignments meet the ramp terminal movements.~~ ~~Either yield, stop, or~~

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Signal controls have been implemented in order to adequately and safely manage the traffic interaction ~~within the interchange between Ramp Y and VVB~~ as well as the adjacent intersection at the Target entrance. **Movements onto Ramp X are free-flowing and have no controls.** Lane widths are tabulated in the table to the right and were adjusted based on Table 10-67 of the 2004 AASHTO Green Book to include an additional one foot shy line where vertical curb is provided. See **EXHIBITS 6, 7, 8, 16, AND 17** for the ramps and spur alignment layouts and additional lane width information.

Ramp Z and VVB Spurs Z1 & Z2: VVB ramp terminal movement, Spur Z, combines with Ramp Z to provide access from Valley View Boulevard to I-581 southbound. Lane widths are tabulated in the table below and were adjusted based on Table 10-67 of the 2004 AASHTO Green Book to include an additional one foot shy line where vertical curb is provided. **EXHIBITS 7, 8, AND 18** clearly depicts the layout of the ramp and spur alignments.

Roadway Criteria			
Roadway	Design / Posted Speed (mph)	No. of Lanes & Widths	Max. Grade
I-581	60 / 55	1 - 12'	~1.2%
VVB	30 / 30	2 - 12' (each way)	5.15% (west) 3% (east)
Ramp W	30 / 25	1 - 16' 2 - 24'	3% 3.32%
VVB Spur W1	30 / 25 10 (min)	1 - 16'	2.51% 3.32%
VVB Spur W2	30 / 25 20 (min)	1 - 16'	2.89% 3.32%
Ramp X	30 / 25	1 - 16' 2 - 24'	2.79% 2.46%
VVB Spur X1	30 / 25 10 (min)	1 - 22'	2.4% 2.94%
VVB Spur X2	30 / 25 20 (min)	1 - 16'	3% 3.05%
Ramp Y	30 / 25	1 - 16' 3 - 12'	3.4%
VVB Spur Y1	30 / 25 10 (min)	2 - 12'	2.65% 2.62%
VVB Spur Y2	30 / 25 20 (min)	2 - 14'	2.65%
Ramp Z	30 / 25	1 - 16' 2 - 24'	3% 3.42%
VVB Spur Z1	30 / 25 20 (min)	1 - 16'	5.12%
VVB Spur Z2	30 / 25 10 (min)	1 - 22'	5.26%

Maximum Grades (Vertical Alignments)

The grades for each roadway are shown on **EXHIBITS 13 TO 18** in Volume II with the exception of the I-581 profiles which will follow the spline grade of I-581 as depicted by the RFP plans. A summary of the maximum grades for each roadway is shown above.

Hydrologic / Hydraulic Design

We have performed an evaluation of the RFP hydrologic / hydraulic analysis provided as well as expanded to further evaluate critical elements and elements unique to our concept. All of the existing pipes within the project right-of-way and permanent easements, either culverts or as part of a closed system, have been analyzed in order to assess their capacity, functionality and condition. Per the RFP, each of these pipes will be repaired or replaced based on analysis and condition to provide a 75 year life span. For capacity of these facilities, we have used Ensoftec's suite of programs to analyze most of the inlets, pipes and culverts throughout the corridor, existing and proposed. There are a couple of cross culverts that we opted to utilize FHWA's HY-8 program since it provides more flexibility in analyzing unique configurations and multiple pipes acting together as a single conveyance system.

Along I-581, we analyzed cross culverts based on a 50 year storm, closed systems on the 25 year storm, and inlets and ditches on a 10 year storm. On Valley View Boulevard, we analyzed the closed systems for the 10 year storm, inlets based on 4 inches/hour intensity and ditches on the 10 year storm.

In all analyses and design calculations, we adhered to the RFP requirements and VDOT's Drainage Manual. As we prepare our design for pricing phase, we have identified several locations where pipes may need new linings or replacement in order to provide a 75 year life in accordance with the RFP. Each of these locations will be accounted for and included in our pricing proposal.

Finally, the storm water management (SWM) for the Project was analyzed. This project will require two SWM facilities; one is new (approximate station 182+50 right) and the other is a retrofit of an

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existing SWM (inside of Ramp Z and I-581 southbound).

Lighting Design

Interchange lighting has been developed for the Project in accordance with the RFP, the VDOT *Traffic Engineering Manual*, *AASHTO Guide for Roadway Lighting Design (6th Edition – 2005)* and IES RP-8-00 Roadway Lighting. Lighting along the ramps and I-581 will be provided in coordination with APCO with VDOT owning and maintaining the system. In turn, the lighting along Valley View Boulevard has been developed based on APCO owning and maintaining the system.

The layout of our lighting concept can be seen in the Exhibits in Volume II.

Signing Design

The signing for the project will follow the *VDOT Traffic Engineering Design Manual* and the *2009 Manual on Uniform Traffic Control Devices (MUTCD)*. An inventory and a condition assessment of the existing signage will be performed. This inventory will provide a basis for specialty signage along the corridor and will be used to coordinate with both VDOT and their vendor consultant.

For the major signage along I-581, we anticipate an overhead sign structure in the southbound direction prior to our first off-ramp (Ramp W). In the northbound direction, we anticipate two overhead sign structures, one prior to the off-ramp at Valley View Boulevard and the second to replace the overhead sign structure prior to the Hershberger Road interchange.

For the major signage on Valley View Boulevard, we anticipate a single overhead sign structure for the westbound direction prior to the bridge. Additional ground mount signs will supplement the overhead signage to provide directional coverage. When the roadway is extended in the future, an additional overhead sign will be required but is not included as part of this proposal.

VISSIM Modeling Approach

The proposed DDI alternative was analyzed using VISSIM as per VDOT's request. The analysis provided the measures of effectiveness (MOE) for the 2036 PM Peak Hour traffic volumes, presented

in Figure 6-18 of the *I-581/Valley View Boulevard Interchange Modification Report (VVB IMR)*, dated November 2010. The sensitivity of the DDI alternative with 15%, 30% and 50% increases in traffic volume was also analyzed.

The DDI alternative includes the ramp terminal intersections with a 6-lane bridge. The intersections to the east (Target Entrance) and west (Development Access) were included in the model to incorporate the affect of the bookend intersections on the ramp operations. The Development Access was located 800' southwest of the I-581 Southbound Ramps. Each of these intersections was modeled with the same lane configurations as presented in the Option CI *Synchro* Reports obtained from the appendix of the VVB IMR. A total of four intersections were modeled; however, only the MOE results of the Northbound Ramp and Southbound Ramp intersections at Valley View Boulevard are reported. Note that, in the tables below, instances where the results of the model exceeded Level of Service D are highlighted in red or yellow.

The model incorporated 2% truck volumes, a posted speed limit of 30 mph, and standard 12' lane widths. The vertical roadway profile on eastbound Valley View Boulevard has a 5.15% grade approaching the I-581 Bridge and the Southbound Ramps, a -3% grade approaching the Northbound Ramps, and a 1% grade approaching the Target Entrance. In the westbound direction, the vertical is the same as the eastbound direction in reverse.

The traffic signal phasing for the Target and Development Access intersections remained consistent with the VVB IMR. For the ramp intersections, this alternative uses two separate traffic signal controllers. The DDI Interchange includes free flow movements for the Valley View Boulevard eastbound and westbound left and right turns. The I-581 Southbound Off-ramp right turn is not signalized. Overall, the phasing is set up for simple two-phase operation at the ramp intersections as shown in the "Signal Phasing" table on page 10. Our signal layouts are depicted on **EXHIBITS 20 TO 22**.

Optimized cycle lengths were evaluated to determine the best overall recommendation. A

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system cycle length of 100 sec was used for the corridor when analyzing the four traffic volume levels. The VISSIM simulation model results are reported as the average of five (5) runs of each volume level. This methodology was followed to predict the operations and levels of service for each of the analysis volume levels. The results are presented in the table on the next page.

During the comparison of the DDI results to Option C1 (provided in table format on Pages 9 11 and 10 12), it is important to note that the VISSIM intersection levels of service and delay for the DDI are calculated based on only the control delay (movements under traffic signal control) and do not include the free flow movements. This is consistent with the Highway Capacity Manual methodology where the benefits of the free flow movements are not weighted into the overall intersection performance. As a result, the zero (0.0) delay for the free flowing volume of traffic is not in the

calculations for the approach or total intersection delay and, therefore, the comparison should be made at the individual movement level.

The DDI option provides the capacity to serve the forecasted volume of traffic for 2036, +15%, and +30% within levels of service (LOS) “C” or better on all movements. In contrast, Option C1 has movements with LOS “D” within each volume level.

The queue lengths are also a product of the VISSIM simulation runs and were found to be less than 550 feet without spillback into upstream signals for the 2036, +15% and +30% scenarios. The operations show failure and cross the threshold of LOS “E” and “F” under the 2036 + 50% volume level.

Based on the results, the DDI will provide equal or better levels of service than Option C1.

Signal Phasing			
Movements	01 (Coordinated Phase)	02	Unsignalized (Free Flow)
NB Ramp	<ul style="list-style-type: none"> VVB WB Thru I-581 NB Off-ramp RT 	<ul style="list-style-type: none"> VVB EB Thru I-581 NB Off-ramp LT 	<ul style="list-style-type: none"> VVB EB LT VVB WB RT
SB Ramp	<ul style="list-style-type: none"> VVB WB Thru I-581 SB Off-ramp LT 	<ul style="list-style-type: none"> VVB EB Thru 	<ul style="list-style-type: none"> VVB WB LT VVB EB RT I-581 SB Off-ramp RT

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SUPPLEMENT to *Figure 4-6: Build Alternatives Operational Performance Summary*

Option DDI

Results based on VISSIM Model of the Diverging Diamond Interchange



The chart below reflects changes as a result of correcting our VISSIM model's RBC controller (changed from "Free" to the appropriate cycle lengths) in accordance with the Technical Proposal Clarification request from VDOT dated August 15, 2012.

Supplement to Figure 4-6 Build Alternatives Operational Analysis / Option DDI

Northbound Ramp Terminal	Approach	Movement	Weekday PM		Weekday PM + 15%		Weekday PM + 30%		Weekday PM + 50%	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
			Free							
Valley View Eastbound	Left	Free								
	Through	C B	27 12	C B	28 12	C D	31 47	E	75 56	
	Approach	N/A								
Valley View Westbound	Through	B	13 16	B C	14 27	B	20 11	C	24 22	
	Right	Free								
	Approach	N/A								
I-581 Northbound Off-Ramp	Left	C B	23 13	C B	23 12	C	24 27	C	24 21	
	Right	B	14 35	B	17	C	21	F	83 87	
	Approach	B	17 14	B	19 15	C	22 23	E	67 70	
Overall	N/A									

Southbound Ramp Terminal	Approach	Movement	Weekday PM		Weekday PM + 15%		Weekday PM + 30%		Weekday PM + 50%	
			LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
			Free							
Valley View Eastbound	Through	B	16 19	B C	18 21	B C	19 33	D	53 46	
	Right	Free								
	Approach	N/A								
Valley View Westbound	Left	Free								
	Through	B	16 15	B	18 17	B C	20 22	C	23	
	Approach	N/A								
I-581 Southbound Off-Ramp	Left	B A	13 10	B	15 11	B	16 15	C	43 27	
	Right	Free								
	Approach	N/A								
Overall	N/A									

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EXCERPT from *Figure 4-6: Build Alternatives Operational Performance Summary*

Option C1: Parclo w/ Split-T to West

Results based on Synchro Model



Supplement to Figure 4-6 Build Alternatives Operational Analysis / Option C1

Northbound Ramp Terminal

Approach	Movement	Weekday PM		Weekday PM + 15%		Weekday PM + 30%		Weekday PM + 50%	
		LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Valley View Eastbound	Left	C	23	C	28	C	24	D	50
	Through	B	11	B	18	C	26	C	31
	Approach	B	14	C	21	C	26	D	37
Valley View Westbound	Through	A	8	B	13	B	19	C	28
	Right	A	1	A	3	A	5	A	4
	Approach	A	7	B	12	B	18	C	26
I-581 Northbound Off-Ramp	Left	C	32	C	34	C	33	C	34
	Right	D	39	D	48	D	53	F	97
	Approach	D	37	D	44	D	48	F	80
Overall		B	18	C	24	C	29	D	45

Southbound Ramp Terminal

Approach	Movement	Weekday PM		Weekday PM + 15%		Weekday PM + 30%		Weekday PM + 50%	
		LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Valley View Eastbound	Through	B	16	C	22	C	34	D	47
	Right								
	Approach	B	16	C	22	C	34	D	47
Valley View Westbound	Left	B	10	B	11	A	9	C	20
	Through	A	2	A	1	A	1	A	1
	Approach	A	5	A	6	A	5	A	9
I-581 Southbound Off-Ramp	Left	D	45	D	53	D	54	F	96
	Right	A	1	A	-	A	-	A	-
	Approach	C	31	D	37	D	37	E	66
Overall		B	12	B	16	B	20	C	31

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4.3.2. CONCEPTUAL STRUCTURAL PLANS:

The Project includes the improvement and widening of the existing bridge on Valley View Boulevard over I-581/Route 220. The design live load capacity of this structure will meet *AASHTO LRFD HL93*. The existing bridge is on a tangent alignment and consists of two spans of continuous composite steel plate girders with an overall length of approximately 238' as shown in **EXHIBIT 30**. The proposed bridge concept will widen the existing bridge on the south side to carry a total of six (6) 12' traffic lanes and one (1) 14' wide shared use path, providing an overall width of 93'-8" from face to face of railings. The modified bridge section will meet all requirements set forth in the RFP and will exceed the minimal requirements for vertical clearance of 16'-6". Since the structure is located in a seismic performance Category A zone, no detailed seismic analysis will be required. All structural steel will consist of ASTM A709 Grade 50 and will be painted to match the color of the existing girders. A transverse section is shown in **EXHIBIT 31**. The existing bridge was constructed using metric units and therefore necessary conversion to existing dimensions will be made to Imperial Units in order to conform to the current design requirement.

To minimize future maintenance needs, the existing open joints at both abutments will be eliminated by modifying the ends of the existing bridge and abutments with deck slab extensions, which will be detailed in accordance with *VDOT Structure & Bridge Manual Volume V Part 2, Chapter 17*. Advantages of eliminating these joints will include:

- No failed joints to replace
- No corrosion of end diaphragms, beam ends, bearing assemblies
- No substructure deterioration due to leaking joints

To further reduce future maintenance needs, all concrete will conform to *VDOT Special Provision for Low Permeability Concrete*, and corrosion resistant reinforcement (CRR) will be used in the deck, railings and abutment neatwork.

The use of weathering steel for all new girders will reduce future maintenance. Additionally, the use of

an epoxy overlay will extend the life of the existing deck while providing a consistent surface across the entire bridge.

Superstructure

We propose to reconstruct the bridge in two stages, and widen only to the south side. This will help reduce the overall construction time and project cost, and will minimize construction impacts to existing pedestrian and vehicular traffic. Having fewer stages will reduce MOT and promote safety to the travelling public.

Phase I construction will consist of building a proposed new widening of approximately 31' to the south of the existing bridge while maintaining existing pedestrian traffic and vehicular traffic uninterrupted. Also, during this phase the existing median barrier will be demolished and new pedestrian railings will be constructed on the existing deck to facilitate the DDI concept (See **EXHIBIT 31**). The new superstructure widening will be constructed with three (3) continuous composite steel plate girder lines and will include an epoxy deck overlay. Additionally, per the RFP, all new girder lines will be weathering steel as dictated by *FHWA Technical Advisory T5140.22*. The concrete at the ends of the existing deck will be removed and reconstructed using deck slab extensions. All traffic will then be switched onto the newly constructed Phase I structure.

During Phase II construction, the existing deck north of girder G1 will be removed (due to its inadequate flexure capacity to carry *AASHTO HL93* loading) and reconstructed, along with new traffic railing, to meet *AASHTO HL93* loadings. The new reinforcing will be lapped with the existing #5 reinforcing using a Class C splice (minimum 26") to satisfy lap requirements; this will be achievable since the existing #5 bars will be exposed 33.5" beyond the center of girder G1. The concrete at the ends of the deck will also be removed and reconstructed using the deck slab extension detail. Finally, the existing deck will be milled and an epoxy overlay will be installed to provide uniform riding surface.

The existing beams (B1 and B2) will be strengthened by adding new stiffeners, cross

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frames, and connection plates as required by the structural analysis to increase the load carrying capacity to meet AASHTO HL93 loading. Additionally, girders G1 through G6 will require cross framing to strengthen the girders to meet AASHTO HL93. The stiffeners and cross frames will be bolted, not welded, to the existing beams and girders as required to avoid the fatigue prone nature of field welding and the associated stringent weld inspection requirements.

The bridge construction staging plan with details is provided as part of transverse section sheet in **EXHIBIT 31**.

Bridge conduits will be provided as necessary for above and under the bridge lighting and other miscellaneous and future utilities.

Substructure

The proposed substructure needed to support the widened portion of the superstructure will consist of a multi-column pier to complement the existing pier. The existing abutments will be widened with similar abutment configurations. The new abutments will be cast against existing concrete and connected with expansion bolts in accordance with

Section 412.03 of the VDOT *Road and Bridge Specification*. During the widening of the abutments, the existing u-back wing walls will be utilized as temporary walls to retain the fill on the existing approach roadway. The substructure elements will be supported on pile foundations.

In addition, the existing substructure elements will be inspected for concrete defects such as cracks, spalls, and delaminations. The appropriate repair details will be incorporated into the design plans to correct these deficiencies. Conceptual substructure details are shown in **EXHIBITS 32 AND 33**.

MINIMIZING FUTURE INSPECTION AND MAINTENANCE

The AI Team's design concept will reduce the need for future inspection and maintenance through the following:

- Relining of pipes to establish 75 year design life
- Eliminate open joints at both bridge abutments
- Design substructure and superstructure concrete to be low-permeability
- Provide weathering steel for all new girders
- Overlay existing bridge deck with epoxy

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The AI Team is comprised of highly skilled, experienced professionals who are committed to providing a high quality project that will serve as an example of what can be achieved through VDOT's Design Build Program. The AI Team has developed an overall approach to managing, designing, and constructing the I-581/Valley View Interchange Phase II Project (the Project) that will deliver this project to VDOT and the public ahead of schedule in a safe and efficient manner, while minimizing disruption to travelers and the local community.

In the true spirit of the design build process, we have developed an innovative design utilizing a Diverging Diamond Interchange (DDI). As a deviation from the RFP documents, the AI Team presented the DDI concept during our proprietary meeting with VDOT for consideration and received confirmation of compliance within the intent of the Project.

We will achieve early substantial completion on ~~August 26, 2015~~ **May 3, 2016** as detailed in our schedule through the implementation of the Diverging Diamond Interchange (DDI), which provides the following schedule advantages:

- Eliminates relocation of Lick Run stream
- Minimizes the required trail reconstruction
- Reduces ROW acquisition time through elimination of five (5) residential relocations
- Minimizes the fill to build the Valley View Boulevard stub west of the bridge
- Eliminates the relocation of the 24" sanitary line
- Reduces the bridge width from eight (8) lanes to six (6) lanes

The following sections explain, in detail, our approach to this highly-visible project. We have developed a comprehensive understanding of the Project's requirements, challenges, and risks.

4.4.1. ENVIRONMENTAL MANAGEMENT:

VDOT has largely completed the NEPA process for the Project as described in this RFP. Based on the preliminary design, there are no impacts on known cultural resources and no impacts on threatened or endangered species. There are no recognized environmental conditions in terms of hazardous wastes or contamination within the project area, except a potential for asbestos containing materials

(ACM) and lead-based paint associated with the existing structures. VDOT has made a firm commitment to the City of Roanoke that the Lick Run Greenway will be maintained for continuous, uninterrupted use by whatever temporary provisions are needed to provide an adequate walking surface and lighting. This commitment forms the basis for the FHWA's 4(f) "de minimis taking" determination, and any deviation from that commitment could trigger the need for a new 4(f) review. ***As benefits to our design concept, the Lick Run Stream will not require relocation, and the impacts to the Lick Run Greenway will be minimized.***

The AI Team will address environmental management proactively during both design and construction. On the design side, the Environmental Manager will lead the permitting process as detailed below, ensure compliance, and coordinate with all environmental agencies and VDOT as necessary. On the construction side, AI-VA's Environmental Coordinator will conduct site inspections and make certain the project SWPPP is implemented properly. Should field conditions or design modifications warrant changes to existing environmental permits, the Environmental Manager will reassess and coordinate revisions as required.

The Design Team's Environmental Manager on this project will monitor the design for any changes that require a reevaluation of the NEPA CE, or re-coordination with resource agencies, and to keep the VDOT Environmental POC apprised of these changes as soon as they become known. The environmental manager will attend project status meetings and coordinate regularly with the design and construction managers to identify any changes to the plans or construction process that could trigger the need to change the environmental documents or require permit modifications. Our environmental manager will also:

- Ensure that EQ-200 forms (Environmental Document Re-evaluation at PS&E Authorization and Environmental Re-evaluation for Right of Way Authorization) are completed and coordinated with the FHWA through the VDOT Environmental POC. The document re-

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- evaluation forms will be required prior to construction even without a change in project scope, as will an Environmental Certification/Commitments Checklist for each individual construction work plan prior to the VDOT Project Manager (PM) releasing each work plan for construction.
- Update the Hazardous Materials Technical Report using ASTM standards if the final Right-of-Way and Construction plans expand the potential impact area.
 - Coordinate asbestos and lead paint inspections (ECS Mid-Atlantic is on our team to handle geotechnical and hazardous materials investigations) for all structures in the project area, according to the *Special Provision for Inspection of Structures for ACM on Design Build Projects*. Copies of all inspection results shall be provided to the VDOT PM. Asbestos abatement and monitoring shall be performed by a certified removal company as appropriate prior to demolition or renovation and in accordance with the *Special Provision for Asbestos Removal and NESHAP-Related Demolition Requirements for Structures on Design-Build Projects* and with all Federal and State regulations.
 - Provide a formal delineation of state and federal waters and wetlands, and obtain a jurisdictional determination from the Corps of Engineers.
 - Obtain the necessary state and federal wetland/waterway permits. Because the Project has been evaluated as CE under NEPA, it may qualify for a USACE Nationwide Permit 23, depending on the final figures for wetland and stream impacts, which could benefit the Project by streamlining the permitting and shortening the process. The environmental manager will work with the other design leads to avoid and minimize impacts. The environmental manager will also be responsible for ensuring compliance with wetland permit conditions, including construction and post-construction monitoring if required by regulatory agencies. The environmental manager will ensure that the VDOT PM gets copies of all permits.
 - Monitor other project-related activities with the potential to impact the Lick Run Greenway, such as staging, borrow/disposal, and any temporary or permanent easements. We will submit written notification to the VDOT PM when the design plans or construction methods require any activity on the Greenway.
 - Update the coordination with the natural resources agencies (US Fish and Wildlife Service [IPaC Website] Virginia Department of Game and Inland Fisheries, and the Virginia Department of Conservation and Recreation Natural Heritage Program) prior to construction to update threatened and endangered species information. We will continue to ensure that such species will not be impacted.
 - Ensure that the RFP *Special Provision for Sound Walls* is implemented. If, during the design process, our team identifies a need to shift the locations/positions of any of the five sound walls depicted on the RFP Conceptual Plans, or propose another design alternative, the environmental manager will ensure the necessary revision to the *Noise Abatement Design Report* is provided to VDOT's Noise Abatement staff for review and approval.
 - Obtain local noise ordinance variances prior to scheduling night-time operations, as needed.
 - Ensure the Design Build team adheres to the Department of Environmental Quality air pollution regulations applicable to an Ozone Early Action Compact area and a volatile organic compounds (VOC) and nitrogen oxides (NOx) Emissions Control Area (9 VAC 5-40-5490 et seq., Cutback Asphalt restrictions; 9 VAC 5-50-60 et seq., Fugitive Dust precautions, and 9 VAC 5-40-5600 et seq., Open Burning restrictions). All reasonable precautions will be taken to limit the emissions of VOC and NOx.
 - Provide the Virginia Stormwater Management Program permit registration statement, and ensure that a Storm Water Pollution Prevention Plan (SWPPP) is onsite when construction begins.
 - Provide monitoring of VSMP permit conditions during construction.
 - Ensure compliance with all applicable state and federal environmental laws, regulations, and permits. Should any non-compliant item(s) be



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identified during construction, immediate and continuous corrective action shall be taken by the Design Builder to bring the item(s) back into compliance.

The AI Team recognizes the importance of properly implementing a well-designed environmental management plan. AI-VA recently provided EPA-recognized professional training to all project management staff as Certified Compliance Inspectors for Stormwater through Stormwater USA.

The Construction Team’s Environmental Coordinator on this project will be responsible for:

- Ensuring appropriate E&S controls are in place prior to the start of construction.
- Ensuring SWPPP is properly maintained onsite.
- Documenting any required deviations from the SWPPP plan and coordinating with the Design Team Environmental Manager for field changes as required.

4.4.2. UTILITIES:

Utility coordination and preparation of utility relocation plans must be planned and expedited, right-of-way needs identified, and procurement initiated. Communication with the utilities will be key to mitigating unexpected utility conflicts and avoiding unnecessary project delays due to utility conflicts.

Our utility coordination team has extensive experience working with regional power, copper and fiber optic telephone and cable TV companies, as well as gas and other public utility agencies and is familiar with the policies and procedures outlined in the *VDOT Utility Manual*.

Mr. Ackley, our Construction Manager for this Project, recently completed extensive utility coordination and relocations on the Route 60 German School Road (Route 60) project for VDOT involving Virginia Dominion Power, Verizon, Richmond Gas, Richmond Water, Comcast, AT&T, and MCI. On the Route 60 project, AI-VA utilized the Construction Utility Coordinator position to complete this work successfully. As shown on our organization chart, AI-VA will utilize the Utility Coordinator position on this project to track utility progress and provide updated information to VDOT.

The lines of communication between our utility coordination team and the utilities involved in this Project will be open and free-flowing from start to finish. Utility meetings will be scheduled in advance throughout the project schedule, including the Utility Field Inspection (UFI) and Pre-UFI meetings. These meetings will also minimize the possibility of delays.

Partial List of Utility Companies that Rinker Design Associates has worked and coordinated with.	Power	Telephone	Cable	Gas	Water & Sewer	Others
DVP	X					
NOVEC	X					
PGEC	X					
Verizon		X				
AT&T		X				
nTelos		X				
Sprint		X				
T-Mobile		X				
Comcast			X			
Cox			X			
Columbia Gas				X		
Washington Gas				X		
PWCSA					X	
Fairfax Water					X	
LSA					X	
Numerous Counties/Cities					X	
Level3						X

Although the impacts to utilities are not expected to be significant on the Project, there will be minor relocations necessary. Upon notice-to-proceed, we will follow up and finalize our initial discussions with utility companies contacted in the Proposal phase. To progress final design, we will schedule preconstruction meetings with all utility owners, perform utility designations and locations to verify the location of existing utilities, distribute plans, hold a UFI Meeting, and obtain letters of no-conflict from all owners within the project area who do not require relocation. For any utilities that require relocation, conflict evaluations will be performed, cost responsibility determinations made using

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VDOT form UT-9, utility plan and estimates will be reviewed and approved, and relocations will be monitored during construction. All of these activities are accommodated for in the overall project schedule.

To ensure accurate utility locates and prevent schedule delays that may occur due to the improper locating, AI-VA crews will verify and document all utility locations within twenty five feet of our work, using soft dig methods for utilities per AI-VA company policy. This information will be communicated to AI-VA's Utility Coordinator to ensure all crews working in the area are aware of the utility locations. This approach has proved successful in avoiding costly utility hits that impact project schedule.

Appalachian Power Company (APCO) has facilities along I-581 that will be impacted by this project. To the north side of the Valley View interchange, a lift pole powering a closed-circuit TV camera as well as two down guys for one of APCO's transmission lines running parallel to the roadway will require relocation. Due to the high cost of relocating electric transmission lines and poles, our team's design concept successfully avoids impacting the transmission line that crosses I-581.

APCO also owns and maintains the lighting systems along Valley View Boulevard and the Lick Run Greenway. As we prepare our lighting designs, we will coordinate with APCO for their facilities and required construction materials. We will also coordinate with them to provide power to the signals and interchange lighting systems.

Verizon has facilities along the east side of I-581, and in one location on the west side that will be impacted by the expanded shoulder, the sound wall, and drainage structures and will require relocation. There appear to be no other impacts to Verizon facilities by the Project.

Western Virginia Water Authority has facilities throughout the Project and our design has been able to avoid most conflicts. There are two cases where sanitary lines have the possibility of being impacted by drainage structures and one case where a water line along I-581 may be affected by a retaining wall foundation. Test pits will be required in these

locations in order to fully understand the impact the Project has on these facilities.

The remaining utilities that have been identified along this project include, but are not limited to, Cox, Level 3, nTelos, Roanoke Gas, and Kentucky Data Link. These utilities are expected to provide letters of no-conflict upon review of our design.

If any unidentified, non-located utilities are discovered during the construction phase, their relocation will be expedited safely and without conflict to the Project or other utilities. In the areas where utility impacts are unavoidable, the experience of our utility coordination team will allow us to minimize the impacts on the project schedule, right-of-way acquisition, and impacts to other utilities in the area.

Utilities Risk Management Strategies:

- Early utility designating/locating/coordination
- Communication to understand existing and proposed facilities
- Pre-UF1 (immediately after NTP)
- UF1 meeting early in the design process
- Design support for out-of-plan utilities

4.4.3. GEOTECHNICAL:

Our technical approach was developed based on Froehling & Robertson's (F&R) extensive familiarity with the geologic conditions in the Roanoke, Virginia area and their understanding of the subsurface conditions encountered at the site as described in the RFP's *Final Geotechnical Data Report* (GDR).

Geology

The proposed project site lies within the Valley and Ridge Physiographic province of Southwest Virginia and is underlain by Cambrian-aged rocks of the Elbrook and Rome formations. The majority of the project alignment, from the southern project limit to about 1000 feet north of the existing interchange, is underlain by the Rome formation. This formation is locally composed of mudstone interbedded with fine-grained sandstone and siltstone and isolated carbonate intervals of gray dolomite. The northern portion of the project alignment, about 1000 feet north of the existing interchange to the Project's northern limit, is

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underlain by the Elbrook formation which is composed of dolomite, limestone, and shale.

F&R's experience with the underlying Rome Formation and in the vicinity of the Valley View Interchange is that the medium-bedded, alternating bedrock layers are nearly vertically oriented. The bedrock layers have varying degrees of susceptibility to weathering, creating seams of soil-like material sandwiched between weather resistant rock pinnacles. From an excavation and support point of view, this geology contains very hard rock layers interbedded with soft clay seams. Where soil test borings encounter a vertical bed of auger refusal material, direct interpretation of the field data might lead one to envision a rock surface between the auger refusal points. Likewise, where vertical soil seams are encountered, a deep soft soil profile might be anticipated. However, in the Rome Formation, F&R's experience is that a combination of both conditions exists.

Carbonate rock, like the limestone and dolomite of the Elbrook formation and interbedded layers of dolomite present in the Rome formation, is susceptible to dissolution in the presence of acidic groundwater and can result in karst features. F&R's experience in the area of the project site is that continued subsurface dissolution of the carbonate bedrock leads to a highly irregular rock profile that includes open voids and/or open or soil-filled discontinuities within the underlying bedrock as well as very soft, wet, and highly plastic soil immediately above the bedrock surface.

Subsurface Exploration & Laboratory Testing

A final subsurface exploration and geotechnical engineering program will be developed to supplement the information provided in the RFP GDR and to provide a complete exploration program that meets or exceeds the minimum recommendations provided in VDOT's *Manual of Instructions (Chapter III)*. Considering F&R's experience with the geology underlying the project site, the final subsurface exploration will include both geophysical and specialty in-situ testing to further evaluate soil and rock characteristics often related to materials found in karst terrain. Specifically, electro-resistivity survey imaging will

be performed to portray continuous cross-sectional images of the subsurface conditions between test boring locations in specific areas of the project site. When utilized in conjunction with standard test borings, resistivity can reveal soil-filled voids or large air-filled voids and the top of bedrock surface, which is expected to be irregular across the project site. In addition to resistivity testing, Marchetti Dilatometer testing will be performed in areas where deep fills are planned to provide additional in-situ data related to the compressibility characteristics of the highly-plastic and fine-grained soils anticipated.

As part of the final geotechnical evaluation, laboratory testing will be performed, including soil property testing, soil and rock shear strength testing, and soil chemical tests on selected samples. As applicable, additional laboratory testing will be performed to evaluate potential property and strength characteristics of soils obtained from offsite borrow sources. Laboratory testing will be performed by AASHTO accredited labs.

Geotechnical Analyses, Design and Construction General

– The design of new structures will include consideration of challenges associated with site constraints, including consideration of construction and continued operation of structures immediately adjacent to new construction, as well as those associated with the geologic conditions underlying the project site. Recognized conditions include possible highly-plastic soils that oftentimes exhibit wet and soft properties, variable bedrock conditions, and potential karst features. Geotechnical design of structural foundations and retaining walls will be performed in accordance with the current *AASHTO LRFD Bridge Design Specifications*, while other geotechnical evaluations such as selection of soil parameters, slope stability, and embankment settlement and bearing capacity will incorporate reliability assessments as recommended by the following reference: *Duncan, J.M., Factors of Safety and Reliability in Geotechnical Engineering, April 2000, Journal of Geotechnical and Geoenvironmental Engineering*.

Preliminary design of the Project includes deep foundation support for new bridge concrete cantilevered abutments and a pier; Mechanically

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Stabilized Earth (MSE), Gabion wire basket, and concrete gravity retaining walls; asphalt pavements; soil embankment and cut slopes; culvert and drain pipe improvements; sound barrier walls; and storm water management basins.

Bridge Foundation Design – Support of new bridge substructures will be developed such that the design approach will provide the flexibility and reliability required to adapt to variable bedrock conditions. The new bridge abutments will be supported by driven HP 12x53 H-piles bearing on or within bedrock (battered and vertical). Foundation design and construction of the new bridge will be performed in accordance with the requirements and guidelines stipulated in applicable sections of the *AASHTO LRFD Bridge Design Specifications*, the *Additional Substructure and Foundation Criteria* attachment to the RFP, *VDOT Structure & Bridge Manual, Vol. V*, and applicable special provisions.

Wave Equation Analyses (WEAP) will be performed for the specific driving hammer type and the differing subsurface conditions for the driven H-pile foundation elements. Although higher pile design capacity is not anticipated to be more than typical, Pile Dynamic Analysis (PDA) testing will be performed for a minimum of one pile per substructure element during driving to monitor hammer efficiency and driving stresses.

Retaining Wall Design and Construction – The concrete cantilevered retaining wall bridge abutments will be supported on H-piles bearing on or within bedrock and will be designed to support the superstructure as well as loads contributed by the select backfill material used in the MSE wing walls. The concrete cantilevered wall abutments will be designed to result in settlements of less than 0.5 inch; however, maximum settlement due to the new roadway approaches is estimated to be up to 4 inches within the embankment. It is anticipated that the majority of the settlement along the bridge approaches will consist of immediate elastic settlements; however, a portion of the settlement (up to 2 inches) could be time-related consolidation, and is expected to occur within 3 months of the final fill placement. Additional in-situ test data (compressibility characteristics) will be obtained

and further analyses of the planned abutment wall and adjacent approach settlement will be performed as part of F&R's final geotechnical evaluation. A settlement monitoring program will be developed and implemented in the areas of the abutment approaches to verify that settlements have reached magnitudes of at least 90% of the predicted settlement prior to final grading and paving. The abutment wall design and construction will conform to applicable sections of the *VDOT Structure & Bridge Manual, Vol. V* and the applicable special provisions.

Existing Foundations and Structures – The new abutments will be designed to tie into and extend out from the existing abutment retaining walls; thus burying the adjacent MSE U-back walls. Therefore, construction of the new abutments will require work immediately adjacent to the existing abutments and associated MSE U-back walls while maintaining operation of the existing bridge and approaches (Valley View Boulevard). We anticipate that construction of the new abutments will require excavations to depths that will extend below the existing abutment MSE U-back walls. As a result, design and construction of the new abutments will include temporary shoring (soil-nailed wall, tied-back sheet-pile or soldier-pile wall, etc.) to support the existing abutment and approaches so that operation of Valley View Boulevard is not impacted by construction. F&R's geotechnical analyses and recommendations will include the temporary shoring support needed to facilitate construction of the new abutment walls as well as potential impacts of area load settlement due to placement of the adjacent new fills on the existing approaches.

Embankment, Fill, & Cut Design & Construction – It is anticipated that earthwork required to develop the planned finished grades along the project alignment will result in cuts and fills of up to 15 feet and 40 feet, respectively. Earth embankments and cut slopes will be designed and constructed with a slope configuration of 2:1 (H:V) or flatter. The final slope configuration will be selected to provide a minimum safety factor of 1.5 for global stability. Where design will require an increase in embankment height and/or width, new earthwork

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will be continuously benched into the existing embankment/slope. Benching will consist of horizontal cuts with a minimum width of 6 feet, beginning at the intersection of the original ground and continuing at each vertical intersection of the previous cut.

The embankments will be constructed in accordance with VDOT requirements (*Section 303 of the Road and Bridge Specifications*) and as stipulated in the Special Provision for “Density Control of Embankments and Backfill.” The project team’s QA Inspector and a QC technician will be on site on a full-time basis to observe and test fill placement.

Maximum total settlements within the deepest areas of new fill (Ramps W and Z) are estimated to be up to 6 inches and diminish gradually to a negligible amount at the low ends of the embankments. The estimated settlements are expected to consist primarily of immediate elastic settlement; however, a portion of the settlement (up to 2 inches) could be time related consolidation, and is expected to occur within 3 months of the final fill placement. A series of settlement monitoring plates will be installed in areas of deepest fill along the ramps to monitor the progress of settlement. Final grading and paving will occur at a date following verification that the settlements have reached magnitudes of at least 90% of the predicted values. The total post-construction/paving settlements will be limited to less than one inch within 100 feet of the bridge, as well as along the remainder of the embankment alignment.

Pavement Design & Construction – The pavement design will be based on additional geotechnical data (soil boring and CBR laboratory test data), data provided in the RFP, and the *1993 AASHTO Guide for the Design of Pavement Structures* and will meet or exceed the minimum required pavement sections stipulated in the RFP. Earthwork construction activities will be performed in accordance with the Special Provisions for Section 303 of VDOT’s *Road and Bridge Specifications*. Subgrade preparation, undercutting and removal of unsuitable materials, fill placement and compaction, asphalt placement, and construction quality control will be performed in accordance VDOT’s specifications. Soils classified as “unsuitable materials” are common in

the Roanoke area and were reported in the RFP GDR. “Unsuitable materials” will be further evaluated as part of F&R’s exploration program. Earthwork recommendations developed by F&R will include remediation of the unsuitable materials.

4.4.4. QUALITY ASSURANCE/QUALITY CONTROL: Quality Management is establishing, monitoring, and improving the effectiveness of quality control (QC) and quality assurance (QA). The AI Team is committed to producing a high-quality project that consistently exceeds VDOT’s requirements, while minimizing the QC, QA, and contract administration effort needed by VDOT.

Immediately following Notice to Proceed, the AI Team will ensure thorough QA/QC on the Project by developing a Quality Management Plan (QMP). The QMP will be composed of the AI Team’s organizational structure and the Project QA/QC Plan, which will be subdivided into the Design QA/QC and Construction QA/QC Plans.

The AI Team’s QMP is specifically designed to minimize VDOT’s QA/QC effort by:

- Establishing a method for documenting comments, responses, and QA records.
- Ensuring the development of well-structured, easily audited design documents.
- Guaranteeing construction quality meets RFP requirements with minimal VDOT intervention.
- Encouraging VDOT participation in key design QA meetings to expedite the formal review and approval process, thereby minimizing VDOT’s overall involvement.

QA/QC Roles & Responsibilities

Our Team is structured such that it maintains a clear and independent separation between Design QA/QC, Construction QC, and Construction QA. QA and QC for the Project will be managed by several key team members.

Design QC and QA – The Design Manager (DM), Darell Fisher, PE, will lead the Project design and manage all design disciplines. His primary function will be to ensure that all design features are coordinated with utilities, MOT operations, and environmental permitting. Mr. Fisher will report directly to the Design Build Project Manager (DBPM), ~~Mr. David Nardon~~ Jeff Humphreys. Mo

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Kim, PE, will manage the Project's design QC and QA. Mr. Kim will be responsible for managing independent design QC checks and QA reviews, ensuring adherence to VDOT specifications and review of the design for each discipline.

Construction QC – AI-VA's production philosophy emphasizes putting work in place correctly, the first time. As such, construction QC will be the responsibility of the entire Construction Team. Construction QC will be lead by Construction Manager (CM) Robert Ackley, who will assign an AI-VA internal QC Project Engineer to be responsible for planning quality into daily operations by assembling work packets, inspecting work daily, and discussing quality requirements with field personnel. AI-VA believes that proactive QC planning and self-monitoring will prevent the rework and schedule delay that occurs if QC inspections uncover any deficiencies.

The AI Team's QC Manager (QCM), Dr. Gary Pasquarell, PE, LEED AP, of Froehling & Robertson (F&R), will provide appropriate oversight of inspection and testing technicians to verify that construction is being completed in accordance with the Project plans and specifications. F&R's testing laboratories are accredited by the AASHTO Acceptance Program.

Construction QA – The QA Program for Construction will be lead by Quality Assurance Manager (QAM) Mr. Joseph Hamed, PE, of NXL Construction Services, Inc (NXL). He will be responsible for independent QA oversight of construction and will provide documentation and reporting to VDOT, thus minimizing VDOT's QA activities. In accordance with *VDOT's Quality Assurance/Quality Control Requirements Manual, January 2012 (QA/QC Requirements)*, **the QA organization will be distinct and separate from design and production staff, and will not perform conflicting duties or production work.**

The QAM will be supported by ECS Mid-Atlantic, LLC (ECS) for QA Materials Testing. ECS laboratories are WACEL, AASHTO, AMRL, CCRL, and USACE certified, and all testing and inspection technicians will have the certifications required by *QA/QC Requirements*.

Design QA / QC Plan

The Project's Design QA/QC Plan will establish criteria to verify the following:

- Conformity of design documents
- Technical accuracies
- Reviewing procedures
- Stamping, signing and dating requirements
- Coordination between design disciplines
- Constructability reviews

Design QC reviews will occur at a detailed level to verify accuracy and completeness of calculations and plans, and conformance to VDOT standards and contract requirements. This process makes extensive use of standardized checklists, including VDOT LD-436, and document controls developed in-house. Design QA reviews will look at the "big picture" to verify completeness and reasonableness of the design solution. The plan will also include conformance with contract requirements, and will include the following efforts, at a minimum:

- All calculations will be reviewed by the discipline Design Engineer, and deficiencies will be corrected as appropriate.
- The general geometry shown on the drawings will be reviewed by the Design Engineer to ensure established design criteria are met.
- Once all calculations are checked, the QC Engineer will confirm that design information has been correctly transferred to the plans.
- Checks by the QC Engineer and reviews by the QA Engineer will be provided on all plan components
- To confirm quantity calculations, the original calculations compiled by the Design Engineer will be checked by the QC Engineer and compared to information in the final drawings
- Special Provisions and Special Provisions Copied Notes will be reviewed by the Design Engineer, QC Engineer, and QA Engineer to confirm applicability and design conformance.

The DM will also consider constructability, traffic maintenance issues, and interdisciplinary coordination. RDA and all design team members will work directly with AI-VA's construction personnel and the QAM to complete constructability reviews of the plans to ensure that all portions of the Project

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can be physically constructed in a safe manner. The DM will carry out his responsibilities by ensuring all QC and QA reviews are performed appropriately and by conducting monthly design meetings for specific issues and concerns.

The DM will manage and review designs by all subconsultants. The DM will appoint an Engineer in Responsible Charge to assist in the direct oversight and QA reviews of all subconsultants.

Any field changes or other deviations to the approved construction documents that need to be made will be subject to design QC and QA measures and procedures as applied to the original design. The requested change will be logged for tracking and will be sent to the Design Engineer who performed the original design. Once the change has been reviewed and the appropriate QC Engineer check performed, the requested change will be forwarded to the QA Engineer for review and DM for approval. Once the DM has approved the change, it will be sent to the Design Builder (AI-VA and ultimately to VDOT and/or other entity, as needed, with a recommendation for approval. Following approval, the field change will be incorporated into the as-built plans.

The DM shall prepare a **Project Work Plan (PWP)** or equivalent project control design document and update it as information changes. The document shall be reviewed, at a minimum, on a monthly basis to ensure that it is up to date. This document will convey to the Team's design staff the description of the project, required criteria, milestone schedule dates, deliverables, manpower requirements for each technical discipline, and the extent of the services to be provided. This will ensure that the contract requirements are correctly translated from the Contract Documents into drawings and specifications used for procurement, manufacturing, construction, testing, startup, and operation of the project. The DM evaluates the project control design documents to make certain that the design input conforms to the Contract Documents, includes new design information, and complements existing field conditions. This document is intended to support the Contract Documents by compiling all pertinent information necessary for designers in a

single document. It will not replace or add new information beyond the Contract Documents.

There are many elements to a successful QA/QC Plan. We believe that the most critical element is the cyclic process of "verification." Our Team's specific approach to managing this process is defined below.

Design Verification



Design Management Review – Prior to each scheduled submittal, the DM will review deliverables and relevant supporting data for completeness and general conformance with the Contract Documents, require the correction of any deficiencies, confirm that the appropriate QC and QA measures have been implemented, and then deliver them to AI-VA for submission to VDOT.

Technical Management Review – Prior to each scheduled submittal, the responsible technical managers or their designees shall perform a technical QC review at the discipline level on the deliverables and relevant supporting data.

Independent QC Engineer Technical Discipline Check – When the project design or an element thereof is sufficiently complete, the work will be given an independent check by a senior designer who has not previously participated in the design work to be checked. Records of this technical discipline check will be maintained until project completion using RDA's internal Review Forms.

Constructability Review - Constructability reviews will be performed by the Design Builder throughout the entire design process. Adequacy of information, tolerances, site access and restrictions, economics of design and materials, availability of materials, construction equipment and required labor, survey verification, consistency with design

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objectives, environmental mitigation, interferences, maintainability features, conflicts between disciplines, completeness, and prudent construction practices will be evaluated. Review comments will be recorded directly on the documents by the Design Builder. The design team member that prepared the document shall resolve constructability review comments with the Design Builder.

Independent QA Engineer Review – The independent QA Engineers monitored by the DM are experienced professionals in each design discipline. This team will be responsible for conducting formal, independent design reviews in preparation for a specific submission.

Issuance of Documents – Prior to each scheduled submittal, each of the reviews and checks outlined above shall be completed and documented. The Release of Deliverable Form shall be completed by the DM, QAM, QA Engineer, and DBPM indicating that the design, drawings, and specifications are in compliance with the Design QC and QA Plan and that the documents are released to VDOT for review and/or to AI-VA for construction.

Agency Review – VDOT will perform a review at each submission stage as defined in the Project Schedule. These reviews will commence upon delivery of plan documents to VDOT and will be completed within the stipulated 21 calendar days.

Comments/Comment Resolution – Comments received from VDOT following Agency Reviews will be addressed in writing and a Comment Resolution meeting will be held for each discipline to determine the final disposition of each comment. Comments requiring design changes will be incorporated into the plans and subjected to the QA/QC process described above.

Construction QA/QC Plan

The construction QA/QC Management Team is composed of the CM, QAM, and the QCM. QA testing and sampling will be conducted by ECS.

Inspection will be carried out in three stages: preparatory, intermediate, and completion. Project-specific checklists will be developed for all construction operations and processes, to be used by the QA and QC inspection and testing personnel

during each inspection. These checklists will include construction requirements stated in the specifications or Contract, will comply with VDOT *QA/QC Requirements*, and will be approved by VDOT as part of the QA/QC Plan approval. Hold and Witness points will be defined to ensure that all critical testing and inspections are performed. A brief outline of each inspection stage follows:

Preparatory Inspection – Preparatory inspection items, discussed at the preparatory meetings, include C-25 Source of Materials, mix designs, C-31 Sublets, approved for construction plans, shop drawings, etc. These documents must be received and approved prior to the start of the work activity. E&S, MOT, safety issues, and AI-VA's sequence of construction are discussed.

Intermediate Inspection – Intermediate inspections will be performed on a continual basis and shall be consistent with and/or exceed the frequencies defined in *QA/QC Requirements* and shall include examination of the quality of workmanship, a review of control testing for contract compliance, inspection for use of defective or damaged materials, omissions and dimensional requirements, and confirmation that the work performed is in accordance with Contract Documents.

Completion Inspection – A completion inspection shall be performed prior to final payment for each significant construction activity. All documentation will be reviewed to verify the appropriate frequency of testing.

Testing & Verification

The QA and QC laboratory and field sampling and testing program requirements will be based on *VDOT Road and Bridge Specifications*, the *VDOT Construction Manual*, the *VDOT Inspection Manual*, the *VDOT Materials Manual of Instructions*, *QA/QC Requirements*, and other documents outlined in the contract. Testing will be performed by separate and independent QA and QC laboratories using VDOT-certified inspectors and laboratory personnel. The Construction QA/QC Plan will include inspections and testing for all materials manufactured offsite, except for the items specified in the RFP, which will be inspected and tested by VDOT. Notification to AI-VA of work

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and materials not meeting the plans and specifications will be made in a timely manner using the Non-Conformance Reporting Plan.

Documentation

Project work activities and progress documentation will be prepared in a standardized manner based on materials invoicing, daily diaries, sketches for as-builts, and photographs as a matter of record. Documentation procedures will include verifying, logging, and filing all material tickets and invoices received. Sketches will be drawn with calculations for all identified elements that have changed and require a dimensional visualization, and photos of key items will be taken for archive purposes and viewing by others. A detailed Materials Notebook will be maintained during construction, cataloguing the specific materials used on the Project, their test results, and all required certifications.

Construction QC

The Construction QC effort will be lead by the CM, with support from F&R's QCM. The CM will also assign an AI-VA internal QC Manager/Project Engineer who will be responsible for planning quality into work operations through our work packets, daily work inspections, and discussion of quality requirements with field personnel at daily huddles. The Construction Superintendent, Utility Coordinator, MOT Coordinator, Environmental Coordinator, Senior Project Engineer, and Schedule Coordinator will also report directly to the CM on any quality issues to ensure a collaborative framework for QC.

The AI Team will use an Internal Quality Planning Process, above and beyond the *QA/QC Requirements*, to manage Project quality. All members of the Construction Team will be included in the planning process. Subcontractors and materials suppliers will also be included as work activities and materials are required on the Project. This process has been very successful on past projects, such as the Richmond Airport Connector Road Design Build Project and the Route 29 Approaches and Bridge over the Tye River Design Build Project. Monthly, weekly, and daily meetings will be held to discuss key items as outlined below.

Monthly progress meetings provide an opportunity to discuss design and construction progress and upcoming activities. Based on the latest Schedule update, AI-VA will develop a 3-week look-ahead schedule for the project team, which will include:

- Descriptions of upcoming activities
- Activity start and finish dates
- QC inspections and/or testing required
- Dates of upcoming Witness or Hold Points

Weekly meetings provide an opportunity to review the current 3-week look-ahead schedule and develop a detailed QC and QA schedule for the upcoming week. This schedule includes activities to be performed each day by each crew and the QC and QA testing and inspection requirements for each activity. The schedule shows the anticipated Witness Points, Hold Points, Independent Assurance (IA) and Independent Verification (IV) testing, and preparatory meetings for the upcoming week. Upcoming QC and QA testing and inspection requirements will be planned using this schedule.

Daily meetings provide an opportunity for the CM and/or project superintendent to meet with the construction crew staff to review the work that occurred that day and the work planned for the next day. "After Action Review" discussions are held to identify what went well and what could be improved. Activities planned for the following day are reviewed in "Before Action Reviews" including scope of work, sequence, necessary materials and equipment, safety plan, environmental controls, and MOT. Crew members will be assigned tasks based on the pertinent QA/QC checklist. Witness Points and QC, QA, IA, and/or IV testing and inspections will be identified and communicated to the QAM.

The QCM will ensure that the QC Plan is adhered to regarding all construction activities. On a daily basis, the QCM will ensure, at a minimum:

- Inspection of work activities and site conditions.
- Verification that all construction is in accordance with the Contract Documents.
- Testing of materials for conformance with specifications.

The QCM will communicate any issues identified as a result of this continuous monitoring to the CM and the QAM. The CM will take appropriate actions to

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correct the issues or deficiencies, and will update the Design Build Project Manager on their status.

Construction QA

The purpose of the QA Plan is to verify the QC sampling and testing program, and to ensure the conformance of the work to design standards and specifications. The Construction QA Program will be administered by the QAM independent of AI-VA's construction staff. ***The QAM, assisted by a QA Lead Inspector and other QA inspectors and/or testing technicians as needed, will represent VDOT on the site, minimizing the likelihood of additional QA/QC effort needed by VDOT.***

The Construction portion of the Plan will address the five levels of testing and inspection activities and responsibilities required by *QA/QC Requirements*. Detailed checklists will be employed to document the performance of inspection activities, clearly describing the procedures applicable to both QA and QC.

Preparatory Meetings – Prior to the start of a work activity, the QAM will lead a Preparatory Inspection Meeting (PIM). Attendees will include production personnel, subcontractors, QA and QC personnel, and VDOT's Owner Independent Assurance (OIA) and Owner Verification Sampling and Testing (OVST) personnel. The PIM is an excellent forum to review and discuss topics including, but not limited to, relevant specifications, special provisions, drawings, safety, means and methods, and QC requirements. During the PIM, the completion of required permits, safety procedures, approved drawings and shop drawings, material approvals, and scheduled inspections will be verified. The QAM will also review the location, type, and frequency of tests and inspections as outlined in *QA/QC Requirements*. The team will identify and discuss Hold and/or Witness Points associated with the work.

Construction Inspections and Testing – The QAM will establish and monitor testing frequencies throughout the life of the Project to ensure that QC, QAM Independent Assurance (QAM IA), QAM Independent Verification Sampling and Testing (QAM IVST), OIA, and OVST satisfy *QA/QC Requirements*. QA inspectors will submit a Daily

Work Report (DWR), including these nine items identified in *QA/QC Requirements*:

- Work performed, identified by Work Package notation, including QA/QC checklists.
- Weather Conditions.
- Inspections performed and their results.
- Communications.
- Type, location, and results of tests performed.
- Delays encountered.
- Safety related problems and corrective action(s).
- Non-conforming work and corrective action(s).
- Signature of inspector.

The QA organization will also keep the VDOT Project Manager informed of scheduled OIA and OVST testing, Witness Points, and Hold Points during construction.

The QMP will establish a Quality Assurance Auditing and Non-Conformance Recovery Plan in accordance with *QA/QC Requirements*. This plan will establish a uniform process for reporting, controlling, and correction of non-conformance issues. This process will include the issuance of a Non-Conformance Report, documenting an approved recovery plan and concurrence between the Design Builder and VDOT.

Documentation – The QAM will monitor the efforts of the QC team to ensure that appropriate records are prepared and submitted daily, including Daily Work Reports (DWRs) and test reports. A master set of all QA documents will be assembled, including meeting minutes, daily diaries, QA test reports, OIA/OVST test reports, photographs, and materials documentation such as the Project's Materials Notebook and Design Build Materials Tracking information. Hard copy and parallel electronic filing systems with appropriate backup will be used for project documents. ***Project documentation will be available for the Department's review at all times.***

The AI Team, including QA/QC staff and production crews, is committed to providing a high quality, successful project – a project where VDOT is assured that they will not need to provide additional QA/QC or Contract Administration.

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QA/QC Procedure for Critical Risk in Design and Construction – Bolted Stiffener Connections

Because this project will utilize and widen the existing bridge structure, it is of the utmost importance that all components of the existing structure be capable of supporting the loading requirements under the current design criteria. ***The existing beams and girders will require strengthening in order to satisfy the shear and flexural requirements of the new structure system. The AI Team views this as the most critical risk on the Project for both Design and Construction.***

Additional vertical transverse stiffeners will be required near the ends of the bridge beams in order to increase their shear capacity. Similarly, cross frames are required to increase the flexural capacity of beams and girders. Connector plates will be required to install the additional cross frames.

One critical project element with respect to design QA/QC as well as construction QA/QC is the analysis and identification of structural deficiencies in the existing beams and girders, and the evaluation of different strengthening schemes in order to correct these deficiencies without significantly altering the structural behavior and introducing additional potential sources of error during the design and construction phases. In order to minimize the QC requirements during construction, strengthening of the existing members will be detailed with as few attachments or connections as possible. Field welded connections to the existing structural elements will be avoided to minimize fatigue related cracks and to eliminate stringent QA/QC requirements during construction. Thus, to ease the QA/QC both from a design perspective as well as a construction perspective, ***bolted connections will be used*** for these new stiffeners cross frames, and cross frame connector plates.

Design QA/QC for Bolted Connections

The Design QA/QC for strengthening the existing beams and girders will follow our team's established procedures. In order to select the best approach to strengthening the beams and girders, Mr. Patel will investigate detailing options with his design staff and the Construction Team. The advantages, constructability, and potential adverse effects to

existing members introduced by each option will be evaluated to choose the most sound and effective design approach. Once the design and details are completed based on applicable design standards and references, they will be reviewed using the established QA/QC process.

Technical Management Review – The Lead Structural Engineer, Mr. Patel, will perform a technical QC review of the analysis and strengthening design of existing elements and relevant supporting data, such as analysis of design forces, and type of connection details. He will perform independent analysis by rerunning steel bridge analysis and design programs such as MDX and SIMON. Simultaneously, he will run AASHTO's VIRTIS program to validate the analysis and to ensure compliance with LRFR requirements load rating analyzes at the completion of the bridge construction. His review will focus on the completeness of the identified strengthening details and their fatigue characteristics, constructability, plan accuracy and compliance with VDOT design and specification requirements.

Independent QC Engineer (e.g., Technical Discipline) Check – Upon completion of the Technical Management Review, Mr. Patel will forward the revised plans, incorporating his markups, to be checked by senior designers who have not participated in the development of the bridge plans or strengthening details. Records will be maintained until Project completion by Mr. Patel and Mr. Fisher using our Team's Review Forms.

Constructability Review – Simultaneously with the above reviews, AI-VA construction staff will review the bridge plans, details, and specifications to identify elements that may conflict with their intended means, materials and methods. Through a collaborative effort, the plans will be modified to preserve design criteria while accommodating construction activities. Upon completion of any changes, the plans will circulate back through the Technical Management Review and the Independent QC Engineer Check to ensure that QC processes have been followed.

Quality Assurance Engineer Review – Throughout the entire design process, Mr. Danny Taylor,

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Director of Bridge Engineering for Clark Nexsen, will serve as in-house QA and will coordinate directly with RDA's Quality Assurance Manager in order to ensure that the proper design and analysis procedures and processes are followed in a timely manner. Mr. Taylor will ensure that all comments are addressed. He will verify that Review Forms are signed and dated. Finally, he will ensure that the plans and specifications are in compliance with VDOT standards and the RFP documents. With his sign-off, plans can be sent to VDOT for review and approval, and then issued for construction.

Construction QA/QC for Bolted Connections

During the installation of the stiffeners, cross-frames, and connector plates, the Construction QA/QC team will hold a PIM reviewing drawings, specifications, special provisions, and material shop drawings. Each of these items will be complete and approved before installation. The PIM will also address inspection procedures, personal safety concerns, and traffic safety concerns.

The Construction Team will thoroughly review material submittals to ensure that only approved materials are incorporated into the work. Crews assigned to this task will be instructed in proper installation of stiffeners, cross frames, and connection plates in "Before Action Reviews," ensuring that the work is performed correctly.

A QC Inspector assigned to the installation of stiffeners, cross frames and connection plates will interface with the production supervisor to ensure correct installation, and will complete the relevant QC checklists and DWR. The inspector will ensure that the drilling or punching of holes meets *Specification 407.04(d)* and that all bolts are properly tensioned in accordance with *Specification 407.06*.

QA/QC Effectiveness

The AI Team's QA/QC approach is based on highly successful programs utilized by both AI-VA and RDA. AI-VA's approach was established for the Richmond Airport Connector Road Design Build Project for Transurban, with VDOT oversight. The same approach was implemented and refined on the recently completed VDOT Route 29 Approaches and Bridge over Tye River Design Build Project in

Amherst/Nelson Counties, where our quality construction and early completion were commended by the VDOT Lynchburg District. RDA's Design QA/QC Plan was similarly successful on the Route 36 Improvements Design Build Project and the Route 15 Widening PPTA Project.

AI-VA and RDA's QA/QC strategies have been combined to develop the QA/QC Plan on the Middle Ground Boulevard Extension Design Build Project. We will implement this same QA/QC Program on the I-581/Elm Avenue Interchange Improvements Design Build Project, for which we recently received notice of intent to award.

The AI Team believes our approach to QA/QC will provide confidence to VDOT that construction will be carried out in accordance with the specifications, with minimal VDOT oversight.

PROJECT APPROACH CONCLUSION

The AI Team has meticulously prepared a concept plan that minimizes risk by avoiding impacts where possible and simplifies the construction sequencing of the Project. The AI Team's previous performance on other design build projects demonstrates our ability to manage risks that do exist, particularly in the areas of environmental management, utility management, geotechnical risk mitigation, and quality management.

We are confident that our approach to each of these elements as described above will successfully deliver this highly-visible Design Build Project by exceeding VDOT's expectations regarding schedule, budget, and safety, while minimizing VDOT's active involvement. ***We are excited for the opportunity to carry our concept plan through to final design and construction.***

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Successful design build delivery of the I-581/Valley View Interchange Phase II Project (the Project) requires management and collaboration that will foster productive relationships among the design build team, VDOT, FHWA, the City of Roanoke, Valley View Crossing Mall, Roanoke Parks & Recreation (Lick Run Greenway) and all other stakeholders. The AI Team will partner with VDOT and stakeholders to work as a unified “team” with the singular goal to deliver this project expeditiously, meeting the needs of the community and the goals of VDOT.

The AI Team members have invaluable experience gained through participation in successful Design-Build Projects, Public Private Partnership Projects (PPTA), and other high-profile, time-critical VDOT projects, as detailed in our Statement of Qualifications. AI-VA and RDA have partnered on the Middle Ground Boulevard Extension Project in Newport News (\$32.7M) and were recently notified of intent to award for the I-581/Elm Avenue Interchange Improvements Design Build Project in Roanoke (\$20.4M). Because it is in the same corridor and because there are common stakeholders, there may be inherent benefits to VDOT to engage the same team for both I-581 projects. Potential benefits would include:

- Common interface between the Design-Builder, VDOT, FHWA, and the City of Roanoke
- Cost savings with regard to mobilizing and scheduling crews, equipment and subcontractors
- Efficiency in logistics because of proximity
- Common strategy for public relations

We believe a shared approach on the two I-581 Design Build Projects will enhance schedule and provide significant cost savings and benefits to VDOT and consequently the public.

The AI Team has developed a unique concept to accomplish VDOT’s goals and objectives for this very challenging project. Upon a thorough evaluation of the RFP conceptual plans and some “thinking out of the box”, our team has developed a ***Diverging Diamond Interchange*** (DDI) concept. This concept allows for expedited construction,

shorter phasing timeframes, improved traffic flow, and a more economical project. ***The result of our experience, planning, functional design, and effective execution will be the complete success of this project for VDOT and the city of Roanoke.***

4.5.1 SEQUENCE OF CONSTRUCTION

As a heavy-civil contractor, building highways is our specialty. The ability to mitigate risks associated with construction determines our success. Our means and methods are founded on our understanding of project risks and all of the elements that must be integrated into one seamless system. The AI Team has developed a solid design and construction plan to mitigate potential risks and delays, and to accelerate the Project.

The interface between design and construction will be critical throughout the Project. Starting in the design phase, the design and construction teams will hold regular collaboration meetings to communicate ideas and ensure the constructability of the design, so that the transition from the board to the field is smooth and efficient. Additionally, VDOT representatives will be invited to attend “over-the-shoulder” reviews that will enable them to see the design progress and raise concerns before official reviews, expediting the release of work packages for construction.

Technical Advisory Panel (TAP)

In addition to the “A” team we have assembled to perform and be in responsible charge of the Project, we have identified experts to form a Technical Advisory Panel (TAP). These independent experts, many with field experience, offer advice for solutions to mitigate risk in the highest-risk areas of our projects. Upon award, the AI Team will call upon key project personnel and the experts from the TAP to brainstorm the Project’s unique challenges and opportunities for innovation, including construction sequencing and scheduling, and the finalization of the DDI concept. This strategy allows us to make use of the most current technologies available to the industry. The TAP will also help us develop a plan to educate the public on the benefits provided by a DDI configuration and ease the transition from the

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existing half-interchange to the complete, free-flowing configuration.

General Construction Sequencing

The AI Team has developed a unique and innovative approach to the construction of this project. ***Our plan is to construct a DDI, simplifying construction sequencing and creating a more free-flowing interchange that will ultimately reduce traffic congestion.*** Our concept also reduces the width of the bridge, accelerating the Project's early substantial completion and reducing cost. The result is a safer work zone that limits disruptions to vehicular and pedestrian traffic, improves traffic operations during construction, and significantly reduces construction activity, resulting in a shorter overall construction time. Although our concept requires a revised IMR, of which we have allowed six months, we will still finish the project one month early, with substantial completion ~~nearly 3~~ two months early (~~August 26, 2015~~) **May 3, 2016**. ***The full benefit of design build construction will be realized through the accelerated completion of the Project.*** A conceptual construction phasing plan is presented in Volume II of this proposal.

Project Phasing & MOT

The Project will have three phases. ***We will divide Phases I and II into sections A, B, and C; streamlining the execution of the work.*** Additionally, each design package will have a separate, interim review and approval, allowing construction to begin sooner in areas where approval can be obtained quickly. Work packages will be developed for all elements of the Project, allowing the AI Team to work incrementally on certain components. Should geo-technical constraints arise or utility relocations be delayed, the development of work packages will allow us to expedite construction in other areas. Work can occur concurrently in Sections A, B, and C. We have learned through successful implementation of the segmenting of project phases that it is a powerful schedule acceleration tool.

Before any construction begins, AI will use orange construction fence to designate wetlands, which

will remain protected and undisturbed. All crews will be briefed on the importance of protecting these areas and the consequences of the failure to do so.

Phase I – In ***Section A***, construction of Valley View Boulevard will take place west of the bridge and on Ramp Z. ***Section C*** will involve the widening of Valley View Boulevard east of the bridge and the construction of Ramp Y. I-581 will be widened south of the bridge, and Ramps Y and Z will be tied in during this phase. All sound barrier wall and barrier construction, acceleration and deceleration lanes and associated work on I-581 NB and SB will be constructed in this phase.

In ***Section B***, the widened section of the bridge and epoxy overlay will be constructed south of the existing structure, allowing ***uninterrupted flow of vehicular and pedestrian traffic*** across the existing bridge. In addition to reducing impacts to the travelling public, we are confident this approach will result in significant cost savings to the Department.

Traffic will be maintained in its current configuration for the widening of Valley View Boulevard. Permanent traffic signals and pedestrian countdown signals will be installed to accommodate traffic in future phases.

Phase II – In ***Section A***, reconstruction of the existing Valley View Boulevard roadway will take place west of the bridge, and Ramp W will be constructed. ***Section C*** will consist of reconstruction of Valley View Boulevard east of the bridge and the construction of new Ramp X. In ***Section B***, the existing bridge deck will be partially removed and replaced, the sub-standard girders will be strengthened, and the remaining epoxy overlay will be completed.

The remaining work on I-581 NB and SB, north of Valley View Boulevard, will occur during Phase II. Ramps W and X will be tied together. The Lick Run Greenway relocation and reconstruction will occur in this phase.

Traffic will be shifted into its new location on the widened portions of Valley View Boulevard



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roadway and bridge. Pedestrian traffic will be shifted onto the new shared-use path on the bridge, while temporary approaches and crosswalks to the bridge and trail are maintained.

Phase III – This phase will include median island construction, installation of final signals on Valley

View Boulevard, and final surfacing, pavement marking, and signage throughout the Project.

During this phase, vehicular traffic will be maintained and shifted temporarily to accommodate these final activities.

CONSTRUCTION SEQUENCE SUMMARY	
Phase I	
Traffic Impacts	Existing traffic (vehicular and pedestrian) will remain in its current configuration.
Construction <i>Valley View Blvd</i>	The bridge will be widened along the south side of the existing structure. The eastbound section of Valley View Boulevard will also be widened, in addition to other plan features and associated ramp construction.
Construction <i>I-581</i>	Work on I-581 SB and NB south of Valley View Boulevard will occur, including soundwalls.
Phase II	
Traffic Impacts	Traffic (vehicular and pedestrian) will be shifted to the newly widened bridge and new roadway widening.
Construction <i>Valley View Blvd</i>	Reconstruction of the existing bridge, existing lanes and remaining ramps will occur in this phase. The trail will be relocated and constructed.
Construction <i>I-581</i>	Work on I-581 SB and NB, north of Valley View Boulevard will be completed. Retaining wall, sound wall, and acceleration/deceleration lane construction between Hershberger Road and Valley View Boulevard will occur.
Phase III	
Traffic Impacts	Traffic will be shifted to accommodate final surfacing.
Construction	Final median construction, surfacing, striping, and signage will occur in this phase.

In the development of construction phasing, the AI Team has considered VDOT’s concern regarding public safety and operations, geotechnical constraints, environmental impacts, ROW acquisition, staging and storage areas, public involvement/stakeholder coordination, QA/QC reviews, and potential delays.

Safety and Operations

Our DDI concept offers significant advantages over the traditional interchange with regard to safety. The configuration allows for free-flowing traffic movement, eliminates left-turn movements crossing traffic, and simplifies the signal phasing, making travel safer for motorists. Our concept directs pedestrians to signalized crossings and uses fewer un-signalized pedestrian crossings than VDOT’s original concept.

Temporary barriers will be used to protect both our work force and the traveling public during work on the bridge widening and I-581. As an added benefit of our phasing plan, maintaining traffic in its current location during the first phase of construction will

allow us to keep all existing safety measures in place. Our construction plan will minimize traffic shifts and will maintain lane widths, making the safer for motorists. We will maintain a dedicated shared-use path during the phased construction of Valley View Boulevard, and during the reconstruction of the Lick Run Greenway, temporary measures will be in place for unobstructed and safe access.

All traffic switches will occur on nighttime off-hours, and ***an extended shutdown is planned from Thanksgiving through New Year’s to facilitate heavy holiday traffic.***

In support of our focus on public safety and project safety, it is important to mention AI-VA’s exceptional safety record and major corporate and local commitment to creating and maintaining safe work zones for their employees and the traveling public.

AI’s strong safety culture promotes “Home Safe Tonight,” a personal and organizational commitment to creating an incident- and injury-free environment.



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AI-VA believes that “Everyone Has a Voice.” To reinforce this belief, we conduct two daily meetings with each crew, one before starting work, and one after finishing for the day. All employees

are encouraged to openly address safety concerns during these meetings. Every employee and stakeholder within the Project has the right to stop work if there is a safety issue. A project is not a complete success unless the goal of zero incidents is achieved; it will be the policy of The AI Team to perform all work in the safest manner possible consistent with good construction practices.

Geotechnical Constraints

AI-VA will mitigate the risk posed by the potential existence of karst formation in the project area through a series of tests. At each foundation, we will perform test probes in multiple locations to a depth of the design pile tip plus ten feet to verify ultimate pile tip elevations. The bridge foundations will be designed to be adaptable to expected variations in subsurface conditions.

A detailed soil analysis will be performed at retaining walls and areas of significant fill to determine whether undercutting of existing soils will be required. Fills will be performed in accordance with VDOT’s requirements to minimize settlement. The major fill under Ramp W will be scheduled to allow an adequate settlement period before ramp construction begins.

By proactively performing these activities, we will mitigate potential delays due to these geotechnical constraints.

Environmental Impacts

Our DDI concept reduces the footprint of the Project, eliminating the need to relocate Lick Run Stream. Due to the confined/urbanized space in which the work will be done, very few environmental issues are anticipated. Based on the Hazardous Materials Technical Report, there are no recognized environmental conditions or hazardous materials (i.e. asbestos, lead) within the proposed project area. To verify this, we will perform testing

immediately following notice to proceed. Early testing and potential mitigation will ensure the project schedule will be maintained. The permitting process will begin early in the design phase to minimize the likelihood of project delay.

Right-of-Way Acquisition

The benefits of our DDI design concept on right-of-way acquisition are twofold: eliminate the cost and time associated with the acquisition of five properties required in the RFP Plans, and reduce the right-of-way impact at Best Buy. Right-of-way acquisition is anticipated to occur during the design phase, within six months of notice to proceed, to reduce its potential to impact the construction schedule.

The majority of the utility impacts occur along the existing roadways, which makes developing the design in phases even more logical and beneficial. Unlike the private utilities, the design of the public utilities will be performed by our team, which allows us to control the process. The biggest impact will be coordinating adequate shut down times of the parallel systems to switch them from their current locations to the relocated systems.

During the design phase, AI-VA will dispatch utility crews to the site to begin physically locating and mapping known utilities using GPS coordinates. In the event that a non-located utility is found during construction, the segmenting of work will allow crews to continue working in other areas while the Right-of-Way Manager coordinates with the found utility.

Our approach will advance the identification and acquisition of right-of-way and easements on critical parcels, allowing the team to initiate utility relocation early. This will minimize risk for the later, utility-dependent, construction phases. ***Early and frequent coordination with utility companies and other stakeholders will allow for continuous monitoring of overall project schedule.***

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Staging and Storage Areas

To support our construction phasing, we have identified several areas for staging and storage. Due to the close proximity of the Mall and the traffic that it generates, our plan is to rent property off-site for our major laydown, storage areas, and office complex. Equipment that is not easily moved and materials needed for current activities will be staged either behind barriers or in the gore areas. Since our DDI design builds a new off-ramp from southbound (SB) I-581 in the northwest quadrant, and VDOT's concept builds a new on-ramp to northbound (NB) I-581 in the northeast quadrant, these areas will serve as onsite storage areas. In areas that could be easily accessible to traffic, we will maintain the required clear-zone setback requirements. Utmost care will be taken to ensure that equipment stored in these active areas will NOT block entrances to businesses, impact line of sight for signage, or obstruct drivers' view of traffic.

Public Involvement & Stakeholder Coordination

Public involvement for this project will be essential to ensure the confidence of property owners, businesses, and the traveling public, particularly with regard to our DDI design. Timely notification and communication with VDOT and the general public will be critical for the Project. Information will be provided through public informational meetings and hearings.

Public Outreach Risk Mitigation Strategies:

- Meet with the City, local businesses, and the public to detail and discuss our DDI design.
- Public notification of traffic patterns/changes in strict adherence to VDOT regulations.
- Meet/accelerate project schedule to ensure continued positive public perception.
- In conjunction with VDOT, provide a multi-faceted information process to maintain liaison with persons occupying property or doing business in close proximity to the work area.
- Establish and maintain a project specific website with a toll-free telephone number for use by the public in case of emergencies.
- Prepare and distribute monthly project information flyers to update the public on project

progress and notify them of any significant events.

Quality Assurance/Quality Control

AI-VA realizes that successful projects are the result of careful planning, open communication, and collaboration with all parties involved. Another important factor is the use of Quality Management to establish, monitor, and improve the effectiveness of Quality Assurance (QA) and Quality Control (QC). Internal QA and QC management will be achieved via development of a Quality Management Plan (QMP) specifically designed to produce an exceptional product for VDOT and the City of Roanoke.

By segmenting the Project the Design QA/QC can be facilitated incrementally within each phase, as opposed to linearly, allowing design packages to be released for construction sooner. As discussed in our QA/QC approach in section 4.4, the QAM will be responsible for hosting Preparatory Information Meetings to coordinate with the project team, QCM, and field staff. The QAM will also coordinate with the team to establish the QMP and schedule Hold Points for QC inspections. Hold Points will occur before all critical activities, and will appear on the 3-Week Look Ahead schedule.

AI-VA's internal QC Manager will perform daily inspections to ensure that all construction work meets VDOT standards. These daily inspections allow any issues to be resolved prior to official Hold Point inspections. Any issues are reported by AI-VA's internal QC Manager via internal Non-Conformance Report to ensure that mistakes are properly corrected and will not be repeated.

The AI Team's QA/QC Plan will create a seamless, transparent environment to ensure that VDOT's high standards of quality are maintained without causing delays to the project schedule.

Potential Delays and Mitigation Strategies

In evaluating our DDI design concept, the AI Team has identified the following potential project delays:

Public Involvement has the potential to delay to the Project due to its high-profile nature. The AI Team will work to maintain positive reception of the

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Project through our public outreach risk mitigation strategies as described above.

IMR Approval has the potential to delay the Project based on a number of factors. The project's public involvement process will need to be revisited to present the DDI to the citizens and local politicians. Their input and buy-in will be important to moving the project forward and getting approval. Additionally, VDOT and FHWA will need to review the specific details of our design and modifications to the IMR. These reviews have added time to the design portion of the schedule; however the savings will be reflected in the construction time. Additionally, the acceleration and deceleration lanes for all four ramps will be constructed in Phase I during the IMR approval time period.

Mitigation of these potential delays will focus on proactive measures. Our team has a professional Public Relations consultant to help with targeting the public in an appropriate manner to facilitate buy-in. The review process with VDOT and FHWA for obtaining IMR approval will be mitigated through open communication to establish and meet the goals and concerns of the reviewers prior to obtaining their comments. Construction within the interchange will only begin once our IMR modification is approved.

Environmental Clearance has the potential to delay any project, including this one. However, our DDI design concept significantly reduces the environmental impacts of the Project and will mitigate any environmental clearance delays.

ROW Acquisition is a potential risk due to people's often over-inflated expectation of their property's value. Our proposal has already reduced much of this risk by decreasing the overall footprint. This risk is also mitigated by a highly qualified and experienced ROW Team. RDA's ROW agents have an average of 25 years of VDOT ROW experience, most of them having worked as VDOT employees. As such, they understand what it takes to present and negotiate with all types of landowners with many different expectations.

Schedule Acceleration

AI-VA is fully capable of accelerating the schedule to account for potential delays. AI-VA has

successfully mitigated schedule challenges on other projects through acceleration methods such as double-shifting, weekend work, and multiple crews. Although not required, AI-VA has implemented these strategies on projects including the Richmond Airport Connector Road and Route 29 Approaches over the Tye River Design Build Projects where we finished substantially ahead of schedule.

With award of the contract by VDOT on ~~October 17, 2012~~ **December 5, 2012**, *the AI Team is confident we will provide final completion in advance of the required ~~November 13, 2015~~ **July 1, 2016** date.*

4.5.2 TRANSPORTATION MANAGEMENT PLAN

Our Transportation Management Plan (TMP) has a number of key components. In developing design concepts, the AI Team evaluated the TMP for the Project and found that a three phase approach would be appropriate. This approach can be implemented as described below, maintaining eleven foot (11') minimum lane widths and a one foot (1') offset to temporary barrier service or traffic control devices for Valley View Boulevard. I-581 and all of the ramps will maintain twelve foot (12') lanes during construction. Lane and road closures may be implemented in accordance with the RFP to assist in construction of the interchange modifications.

The preliminary TMP has considered the constructability of each phase and has broken the Project into logical work sequences providing adequate access and work zones for safe construction practices and effectively maintaining safe passage through the project area for all motorists and pedestrians. Our plan will address and comply with the time-of-day and work hour restrictions as defined in the RFP. The AI Team's TMP phasing diagram is presented in Volume II.

Following NTP, the AI Team will meet with VDOT's Traffic Engineering Office, FHWA, and VDOT's Project Manager to co-ordinate the scope and approval/acceptance process for the TMP development and implementation. The AI Team will prepare a detailed TMP Type B Project (Category III) Plan in accordance with VDOT *I&M 241.5 and TED-351.2*. The TMP will include all necessary traffic analyses required to demonstrate

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sufficient traffic operation during all phases of construction. The TMP will also include a detailed Public Communications Plan, described below, to be implemented during construction to ensure that safe and efficient operation of adjacent public transportation facilities and state highways is maintained throughout the construction phase.

During construction, weekly updates to the TMP will be provided to VDOT, FHWA, and the City of Roanoke to identify upcoming activities including lane closures and work areas.

Assessment of Work Zone (WZ) Traffic Impact – Traffic analysis and modeling supporting the AI Team’s proposed TMP will be provided following coordination with VDOT Traffic Engineering, FHWA and the City of Roanoke to determine the required level and limits of analysis. Our analysis will be developed using Quick Zone, CORSIM, VISSIM or Synchro, depending on the level of analysis required.

Temporary Traffic Control Plan (TTCP) – Within the TMP, the TTCP will address each phase and sub-phase of construction. Plans will include all necessary signage, traffic control devices and temporary signal designs. Plans will address all forms of traffic through the project area, including motorists, pedestrians and public transit.

Additionally, the TTCP will identify staging areas for each phase of construction and identify routes and time of day restrictions for the delivery of materials and equipment to the site to minimize the impact of construction traffic on the overall project area operations. Development of the TTCP will involve both the design team from RDA and AI-VA’s construction team. By involving the construction team, who will be implementing the plan in the field, during the design phase, the AI Team’s approach ensures that the TTCP accurately depicts AI-VA’s procedures for performing the work. This approach has been successful on past projects and minimizes field adjustments and revisions to the TTCP.

Also, during the construction phase, the TTCP designers will participate in AI-VA’s regular construction progress meetings. This will allow for the identification of any changes to the TTCP

necessary for the Project’s upcoming activities and allows RDA the proper time to prepare TTCP revisions when necessary. The TTCP will address construction access to the site, as well as equipment and material movement within the site. The AI Team will develop the TTCP in coordination with VDOT; in conformance with the *Virginia Work Area Protection Manual* (VWAPM); and with necessary typical sections, profiles, and special details.

Valley View Boulevard construction establishes the sequencing of all other roadways. In order to provide a simpler and safer work zone, our unique design allows for widening of the bridge to one side without disruption to Valley View Boulevard traffic and minimal disruption to I-581 traffic. The remaining pieces will be constructed in subsequent phases. These are generally described below and depicted in Volume II of this proposal.

Phase I

I-581 roadway and drainage improvements, to include sound barrier walls, Ramps Z and Y, as well as all acceleration and deceleration lanes will be constructed during this phase. Work packages will be prepared by Sections (described below) in order to provide the maximum flexibility in construction.

Section A – SB I-581 Improvements – The improvements along SB I-581 north and south of Valley View Boulevard will be completed by closing the outside lane where widening occurs next to through traffic or on the shoulder to include soundwalls, retaining walls and barrier construction. The existing on-ramp will be transitioned to the outside lane where reconstruction overlaps with the existing on-ramp. Nighttime ramp closures may be required in order to complete the construction of the acceleration lane for Ramp Z. Completion of the remainder of Ramp Z will require phased construction as the proposed ramp crosses the existing ramp midpoint. Spur Z can be completed at any stage of this phase of construction.

The sound barrier walls that are at the top of the existing cut slopes will be constructed without disruption to SB I-581 traffic.

Section B – Proposed Bridge – The proposed bridge widening to the south will be completed during

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Phase I while vehicular traffic and the existing shared-use path on Valley View Boulevard are maintained in their current locations. Additionally, the new shared-use path (including barrier walls) which is located down the center of the roadway in a DDI configuration will be constructed.

Section C – NB I-581 improvements – The improvements along NB I-581 north and south of Valley View Boulevard will be accomplished by closing the outside lane in accordance with the RFP to include soundwalls, retaining walls and barrier construction. The right lane closure proposed will be limited to work being performed on the shoulder (i.e. sound barrier walls) and the deceleration lane for Ramp Y. Where the proposed ramp overlaps with the existing ramp along I-581, the existing ramp will use the outside lane and transition back to its current alignment. The remainder of the Ramp Y construction will be done in phases by first constructing the outer most lane(s), shifting the existing ramp traffic to the newly constructed portion and then completing the remainder of Ramp Y (including Spur Y).

The sound barrier walls that are at the top of the existing cut slopes will be constructed without disruption to NB I-581 traffic.

Widening along the south side of Valley View Boulevard adjacent to the Round Hill Montessori Primary School will be completed without disruption to existing traffic between the hours of 6 am to 8 pm. Nighttime lane closures (8 pm to 6 am) of the right lane will be used to complete the tie-in with the existing roadway.

Phase II

I-581 improvements (i.e. Ramps W and X, and drainage improvements) north of Valley View Boulevard will be constructed. Design packages will be prepared by Sections (described below) in order to provide the maximum flexibility in construction.

Section A – SB I-581 improvements –Ramp W will be constructed in its entirety without disruption to existing traffic as this is a new ramp movement.

Traffic on Valley View Boulevard will be shifted onto the newly widened bridge construction to include pedestrian traffic.

The shared use path (Lick Run Greenway) will be realigned as shown on our **PLAN EXHIBITS 6 & 7**, and depicted vertically on **EXHIBIT 19** in Volume II. Reconstruction of the Lick Run Greenway will be accomplished by providing continuous, uninterrupted use of the facility during hours of operation (6 am to 11 pm) to include all temporary measures required to provide an adequate walking surface and lighting along the facility. Reconstruction and realignment will be accomplished through multiple sub-phases.

Section B – Proposed Bridge – As described in part above, the newly constructed bridge widening will be used to shift traffic to the SB I-581 on-ramp (Ramp Z, newly constructed). The pedestrian traffic will also be shifted to the newly constructed shared use path as depicted on **EXHIBIT 31**. Once traffic has been shifted, the girders of the existing bridge will be stiffened to meet design requirements and the deck over the two north girders will be reconstructed due to inadequate rebar.

Section C – NB I-581 improvements –Ramp X will be constructed in its entirety without disruption to existing traffic as this is a new ramp movement.

Valley View Boulevard widening along the north side closest to Target and Best Buy will be performed between the hours of 8 PM and 6 AM to minimize disruption to existing traffic. Nighttime lane closures (8 PM to 6 AM) of the right lane will be used to complete the tie-in with the existing roadway.

Phase III

This final phase of construction will include all median work on Valley View Boulevard (Sections A and C), and completion of final paving, signing and pavement markings (all Sections). This work will be accomplished through traffic shifts and



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temporary lane closures in accordance with all requirements and provisions of the RFP.

A Public Communications Plan developed with the TMP will be incorporated into the AI Team's overall Public Involvement Plan, which is described in more detail below. Through this plan, we will maintain multiple channels of communication with the traveling public, VDOT, City of Roanoke, local residents, businesses, and other stakeholders. These open channels of communication will be used throughout the life of the Project to disseminate project information, including TMP information such as lane closures and traffic pattern changes.

Advance notification of construction activities will be provided to the public to minimize and mitigate the disruption to travelers through the project area. We recognize that the construction phases may introduce driver unfamiliarity particularly due to the high volume of truck traffic in this vicinity. We will address this with proper signage and notification, as stated above. The TAP will help us develop a plan to introduce the public to our concept and raise awareness about the changes in traffic patterns to normalize traffic movement. As required, all steps to schedule significant construction events will be taken to use off-peak times for construction activities. Likewise, strict attention will be paid to construction activities being normalized during peak hours.

We anticipate that the businesses and institutions along Valley View Boulevard (i.e. Target, Best Buy, Round Hill Montessori Primary School, Regal Cinemas, Ruby Tuesday, etc.) will be affected by the Project. However, our sequencing of work, our communications plan and our open door policy will facilitate resolution and mitigate their concerns.

Transportation Operations Plan – The AI Team will coordinate with VDOT to develop protocols for the implementation of incident management. We will develop the necessary list of contacts for any emergency action required and will develop plans to address incident scenarios. Such plans will include the use of strategically placed variable message signs to assist motorists. These plans may include recommended alternative routes and procedures for emergency lane closures or hazard protection. Plans may also include recommended signal timing changes at affected intersections as well as possible turn movement restrictions through the installation of cones or drums.

Incident Management – To facilitate the clearing of any incidents, the AI Team will use Safety Service Patrol (SSP) services in accordance with the RFP. In addition to planning for incidents occurring within the immediate project limits, it is also appropriate to consider the effect of an incident outside the project boundary. The AI Team will develop protocols and procedures for various incidents that could affect travel patterns in and around the project area. AI-VA will have on hand: our truck mounted attenuator, variable message sign boards, signs, and channelizing devices to immediately deploy for incident management. In addition, we will develop a Traffic Incident Management pocket guidebook that will include the contact information for emergency alert, including all critical personnel on the AI Team, City of Roanoke, and VDOT essential personnel. This approach will allow AI-VA to be prepared for, and react quickly and appropriately to, any incident affecting travel through and around the Project.

I-581/Valley View Interchange Phase II



State Project No: 0581-128-109, F101, RW201, C501, B627 Federal Project No: NH-581-S10351 Contract ID Number: C00016595DB45

The AI Team is committed to achieving a sixteen percent (16%) DBE participation goal during design and construction of the I-581/Valley View Interchange Phase II Project (the Project). The following DBE participation plan outlines how the AI team will achieve this goal during design and construction.

DBE SUBCONTRACTING PLAN:

AI-VA will be utilizing their standard DBE subcontracting plan to ensure the Project goal is met. A summary of the plan is provided below, specifying the means of soliciting DBE firms during the pre-construction phase. Our SWaM/DBE Coordinator will be responsible for assisting in the solicitation of DBE firms and the compliance to the DBE goals and standards set forth by the Commonwealth.

For each project with DBE requirements, AI-VA will:

- Identify a pool of DBE subcontractors/suppliers certified by the Owner/Governing Agency.
- Validate the qualifications of certified DBE subcontractors/ suppliers to verify that they are able to perform the contract scopes of work.
- Direct and assist certified and capable DBE subcontractors/suppliers to complete the AI-VA subcontractor pre-qualification process.
- Solicit price/scope quotes from certified and capable DBE subcontractors/suppliers while determining AI-VA pre-qualification status.
- Properly document the DBE solicitation process for Good Faith purposes.

The Project's Lead Estimator, in cooperation with the SWaM/DBE Coordinator, is responsible for:

- Ensuring DBE participation is solicited, recorded, and documented in accordance with AI-VA Minority/DBE Compliance and Utilization Policy-defined procedures.
- Investigating all contract provisions to identify all requirements to satisfy Municipal, County, State, or Federal obligations, including training and reporting.
- Reviewing all addenda and correspondence for impact or changes to DBE requirements.
- Ensuring AI-VA's commitment to proactively utilizing certified DBEs and to using all

reasonable efforts to meet or exceed mandated DBE requirements is upheld.

DBE MENTORING:

AI-VA has mentored DBE firms on numerous occasions, including Virginia-based Court One Corporation (COC). We coached this firm on topics like training, safety, operation planning/scheduling, equipment management, and offered job site service assistance. AI-VA has helped DBE firms broaden their prequalification scope and status in the past, and will continue these efforts in the future.

AI-VA estimators, project managers, and purchasing personnel conducted regular mentoring sessions with COC's key players to maximize efficiency in their areas of expertise and introduce them to new scopes of work that AI-VA might otherwise self-perform. We have mentored COC on crew make-up and production and introduced them to new material suppliers. We have conducted detailed post-bid reviews to help make them more competitive in future pursuits. AI-VA has introduced COC to more complex scopes of work, allowing them to be a more competitive and efficient subcontractor across multiple disciplines of highway construction.

DBE SOLICITATION:

The AI-VA Estimating Team solicits quotes from certified and capable DBE subcontractors/suppliers while determining prequalification status. Certified and capable DBE subcontractors/ suppliers will be identified through searching DBE Directory web sites, attending project pre-bid meetings, and mass advertisements. The following elements will be included in the solicitations and advertisements placed as a general solicitation to DBEs:

- A description of the work for which the bid is being solicited
- The date, time, and location where bids are to be submitted
- How to respond to the solicitation
- The name of the contact person within AI-VA who can answer questions about the Project
- The location where bid documents may be reviewed
- Any special requirements

Appendix 3.6—
Acknowledgement of RFP,
Revision and/or Addenda

ATTACHMENT 3.6

(Date Issued: September 14, 2012)

**COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION**

RFQ NO. C00016595DB45
PROJECT NO.: 0581-128-109, P101, RW201, C501, B627

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 March 2, 2012 - RFP
- 2. Cover letter of June 21, 2012 - Addendum No. 1
- 3. Cover letter of July 10, 2012 – Addendum No. 2
- 4. Cover letter of Sept. 5, 2012 – Changes to RFP Requirements (Letter)
- 5. Cover letter of Sept. 13, 2012 – Interim Milestone (Letter)

 9/20/12
SIGNATURE DATE
M. JEFF HUMPHREYS JR., DBPM
PRINTED NAME AND TITLE

ATTACHMENT 9.3.1
PROPOSAL PAYMENT AGREEMENT

THIS PROPOSAL PAYMENT AGREEMENT (this “Agreement”) is made and entered into as of this ____ day of _____, 20__, by and between the Virginia Department of Transportation (“VDOT”), and _____ (“Offeror”).

WITNESSETH:

WHEREAS, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s **October 11, 2011** Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the **I-581/Valley View Boulevard Interchange Phase II, Project No. 0581-128-109, P101, RW201, C501, B627** (“Project”), under a design-build contract with VDOT (“Design-Build Contract”); and

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

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

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

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

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

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

3. **Proposal Payment.** VDOT agrees to pay Offeror the lump sum amount of **Fifty Thousand and 00/100 Dollars (\$50,000.00)** ("Proposal Payment"), which payment constitutes payment in full to Offeror for the conveyance of Offeror's Intellectual Property to VDOT in accordance with this Agreement. Payment of the Proposal Payment is conditioned upon: (a) Offeror's Proposal being, in the sole discretion of VDOT, responsive to the RFP; (b) Offeror complying with all other terms and conditions of this Agreement; and (c) either (i) Offeror is not awarded the Design-Build Contract, or (ii) VDOT cancels the procurement or decides not to award the Design-Build Contract to any Offeror.

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

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

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

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

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

9. **Miscellaneous.**

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

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

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

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

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

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

VIRGINIA DEPARTMENT OF TRANSPORTATION

By: _____

Name: _____

Title: _____

AMERICAN INFRASTRUCTURE - VA, INC

By:  _____

Name: Aaron T. Myers

Title: Vice President/General Manager



State Project No: 0581-128-109, F101, RW201, C501, B627 Federal Project No: NH-581-510351 Contract ID Number: C00016595DB45

ATTACHMENT 3.3.1
KEY PERSONNEL RESUME FORM

Brief Resume of Key Personnel anticipated for the Project.									
a. Name & Title:	M. Jeff Humphreys, Jr., Senior Project Manager/Senior Estimator								
b. Project Assignment:	Design Build Project Manager								
c. Name of Firm with which you are now associated:	American Infrastructure-VA, Inc.								
d. Years experience: With this Firm <u>3</u> Years With Other Firms <u>28</u> Years Please list chronologically (most recent experience first) your employment history, position and general experience or fields of practice for the last fifteen (15) years. (NOTE: If you have less than 15 years of experience, please list all of your experience for those years you have worked.):	<p>American Infrastructure, Senior Estimator/Senior Project Manager; 2009- Present: Mr. Humphreys is responsible for managing all aspects of project estimating, project planning and scheduling work activities, engineering, submittals, pay estimates, coordination with owner, subcontractors, suppliers and other stakeholders, customer satisfaction, P&L and safety for all phases of construction. His responsibilities include overall management of the construction process, including all Quality Control (QC) activities to ensure the materials used and work performed meet contract requirements and the “approved for construction” plans and specifications. As Senior Project Manager, Mr. Humphreys has managed start up of multiple design-build projects in addition to the Middle Ground Boulevard Extension project in Newport News, VA. Additional details for this VDOT design-build project are listed in the relevant projects, section g, which follows.</p> <p>Joseph B. Fay Company (Tarentum, PA), Project Manager/General Superintendent; 2005 - 2009: Duties included initial project procurement and estimating, project management, scheduling, P&L, negotiations, recruitment, owner and public relations. Mr. Humphreys was responsible for overseeing safe and successful project construction, bridge rehabilitation, and bridge demolition projects in the Mid-Atlantic Region.</p> <p>Key Constructors, Inc. (Clarksville, VA), Vice President/Structures Division Manager; 2003 - 2005: Responsible for the safe and successful development, operation and P&L of all corporate bridge projects with an annual volume of \$14M. Estimated and managed safe and successful bridge construction projects in Virginia and North Carolina.</p> <p>D.W. Lyle Corporation (McKenney, VA), Vice President, Construction; 1998–2003: Mr. Humphreys managed all field operations, P&L and personnel on various public projects for VDOT and NCDOT, as well as, private projects up to \$20M. His duties included estimating, construction and delivery of design-build projects.</p> <p>Fairfield Bridge Company, Inc. (Fishersville, VA), Project Manager; 1997–1998: Mr. Humphreys joined the Fairfield Bridge Company in 1980 as a Project Manager responsible for bridge and highway projects throughout Virginia. The projects ranged from \$100K to \$16M and he was responsible for preparing bridge project estimates, P&L and managing the construction activities on awarded projects.</p>								
Notable Experience & Training:	<table border="0"> <tr> <td>Design Build Projects</td> <td>Multi-phased Construction</td> </tr> <tr> <td>Complex Bridge Structures</td> <td>Complex Heavy Traffic Interstate Widening</td> </tr> <tr> <td>Large Complex Fast-Track Projects</td> <td>Adult CPR & First Aid with National Safety Council</td> </tr> <tr> <td></td> <td>10 hour HAZWOPER training</td> </tr> </table>	Design Build Projects	Multi-phased Construction	Complex Bridge Structures	Complex Heavy Traffic Interstate Widening	Large Complex Fast-Track Projects	Adult CPR & First Aid with National Safety Council		10 hour HAZWOPER training
Design Build Projects	Multi-phased Construction								
Complex Bridge Structures	Complex Heavy Traffic Interstate Widening								
Large Complex Fast-Track Projects	Adult CPR & First Aid with National Safety Council								
	10 hour HAZWOPER training								
e. Education: Name & Location of Institution(s)/Degree(s)/Year/Specialization:	Nelson County High School/1976-1980/General Studies, Building Trades Penn State University/1986/Two CEU’s in Supervisor Training								
f. Active Registration: Year First Registered/ Discipline/VA Registration #:	Erosion and Sediment Control Contractor Certification #4983C								

- g. Document the extent and depth of your experience and qualifications relevant to the Project.
 1. *Note your specific responsibilities and authorities for each assignment, not those of the firm.*
 2. *Note whether experience is with current firm or with other firm.*
 3. *Provide beginning and end dates for each assignment.*

(List at least three (3), but no more than five (5) relevant projects for which you have performed a similar function.

I-581 & Elm Avenue Interchange Improvements, Roanoke, Virginia design-build project

1. Responsible for the overall estimating, constructability, design management and preconstruction start up of this \$20.4 M VDOT design-build project that involves improving the I-581/Elm Avenue traffic operations in the City of Roanoke, VA. The project includes the widening of Elm Avenue and the Elm Avenue/I-581/U.S. Route 220 Interchange off ramps, constructing retaining walls, the widening and reconstruction of the Elm Avenue Bridge over the Norfolk Southern Railroad, ROW acquisition, lighting, drainage, SWM, utility relocations, signals, signing, pavement markings and erosion/sediment control.

Owner Contact: Mr. Bobby Phlegar, Virginia DOT, 540-378-5083

2. *American Infrastructure*
3. *Present*

Middle Ground Boulevard Extension, Newport News, Virginia design-build project

1. Responsible for overall design management and preconstruction start up of this \$32.5M design build project that involves widening of two highly congested primary roadways (Route 60 Warwick Blvd and Route 143 Jefferson Avenue) in the City of Newport News. Project scope includes, but is not limited to, the design and construction of 1.2 miles of mainline four-lane divided highway, constructing a bridge over CSX railway, storm drainage, storm water management basin(s), right-of-way acquisition and relocations, utility relocations, reconstruction of connections along mainline, mainline shared use path, traffic signal installation, sanitary sewer pump station and landscaping.

Owner Contact: Mr. Thomas Druhot, Virginia DOT (757) 253-5367

2. *American Infrastructure; Senior Project Manager*
3. *2011 – Present*

Route 29 NBL Tye River Bridge Replacement, Amherst/Nelson Counties, Virginia design-build project

1. Mr. Humphreys advised the construction team on concrete operations, rigging, demolition operations and various special activities, including environmental permitting and water quality management for this \$6.7M five-span bridge replacement design-build project in Amherst and Nelson Counties. In addition, he supervised the demolition activities and bridge deck placement to ensure a safe and successful delivery.

2. *American Infrastructure; Sr. Estimator & Bridging Advisor*
3. *2009-2011*

Masonville Marine Terminal Storm Drain Relocation, Baltimore, Maryland

1. Mr. Humphreys managed and directed all construction activities for this \$13.6M project which included the construction of 1800 LF of various sizes concrete box culvert and the relocation of 940 LF of 48-inch water main. Project submittals including shop drawings for formwork, rebar, temporary shoring and sheet pile templates. His other duties included management and communication with all subcontractors, hiring trades to perform all construction activities, and scheduling all materials, supplies and equipment to the site. Mr. Humphreys managed all QA and QC activities with the owner and third party inspection consultants.

2. *Joseph B. Fay Co., Project General Superintendent*
3. *Apr. 2007 – Aug. 2008*

Route 360 Bridge Replacement over the Dan River and N & S Railroad, South Boston, Virginia

1. Mr. Humphreys managed and directed all construction activities for this \$25M project which included the construction of 2200 LF, twin bridges and demolition of the existing bridge over the Dan River and N & S Railroad. The project also included replacement of a single span bridge with a two span bridge over Route 360, installation of a 7200 SF MSE wall and a 6600 SF concrete face tieback retaining wall and roadway grading and paving. He planned, organized and staffed key field positions; managed all required documents and submittals with the owner all QC, safety issues, project cost and schedule, all materials, supplies, equipment and subcontractors and public relations for the project.

2. *Key Constructors, Inc; VP, Structures Division Manager*
3. *May 2003 – Apr. 2005*

Route 288 Extension, Design-Build, Chesterfield to Goochland Counties, Virginia

1. Contracted as a dedicated bridge subcontractor on this \$200M plus **design-build** project, Mr. Humphreys managed and assisted in complete project cost estimating and scheduling as well as design team constructability issues and project phasing for structures and associated roadway. He oversaw all project management for the 25 bridges constructed across the Route 288 project, from Route 76 in Chesterfield County to I-64 in Goochland County. Mr. Humphreys directly managed all personnel, materials, supplies, equipment and subcontractors for construction of the 15 bridges constructed by D W Lyle Corporation

2. *D. W. Lyle Corporation, Vice President, Construction*
3. *Mar. 2001 – Apr 2003*



COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

1401 EAST BROAD STREET
RICHMOND, 23219-2000

GREGORY A. WHIRLEY
COMMISSIONER

September 13, 2012

Mr. Aaron Myers
American Infrastructure – VA
301 Concourse Boulevard, Suite 300
Glen Allen, VA 23059

**Subject: I-581/Valley View Boulevard Interchange Phase II
Request for Team Structure Change**

Mr. Myers:

Thank you for your request for a change to the American Infrastructure-VA (AI-VA) team for the above referenced project. As you noted in your request, Mr. David Nardon is no longer with AI-VA, so you propose to replace Mr. Nardon with Mr. Jeff Humphreys for the role of Design Build Project Manager.

After careful consideration of the information provided by AI-VA and in accordance with Part 1 Section 11.4 of the RFP which allows VDOT to approve a change in the Team Structure under extraordinary circumstances, VDOT has determined it will grant the substitution of Mr. Humphreys for Mr. Nardon as the proposed Design Build Project Manager for your team.

Sincerely,

Joseph A. Clarke, P.E.
Senior Project Delivery Engineer
Alternate Project Delivery Office

I-581 / Valley View Interchange Phase II



State Project No.: 0581-128-109, P101, RW201, C501, B627 Federal Project No.: NH-581-510351 Contract ID Number: C00016593DB45

The AI Team has thoroughly evaluated the Project RFP documents, performed site visits of the existing interchange, attended pre-proposal meetings, and performed internal brainstorming sessions to fully assess the associated design, right-of-way impacts, utility relocations, construction, and environmental challenges. While performing these activities, we paid special attention to the VDOT stated schedule milestones included in Section 2.4.1, specifically final completion of the Project by **June 2, 2016**. ~~November 13, 2015~~.

This narrative explains how the AI Team plans to maximize the benefits of the Design Build delivery method to mitigate risks of future uncertainties, manage the environmental requirements, minimize impacts to the travelling public, and deliver the Project ahead of VDOT's anticipated schedule. The proposal schedule in its entirety can be found in Exhibit 4.6.c.

The AI Team utilized Primavera scheduling software to create the proposal schedule. Within the program, the Team developed a Work Breakdown Structure (WBS) that represents the major areas and sections of work. In addition, Activity Coding was used to identify Phasing, Type of Work/Work Packages, and Responsible Parties. The WBS and Activity Coding are further described herein.

Project Phasing

The AI Team utilized Activity Coding within Primavera to assign appropriate Project Phasing. There are seven major phases identified in the Proposal Schedule. As is typical with the Design Build delivery method, some of the preconstruction phases will overlap with the construction phases to shorten the overall duration of the project. The seven phases are described below.

00 – Entire Project:

This phase of the schedule captures Contract Milestones and Intermediate Milestones valued by the AI Team and general management activities for the project. This section is important to the schedule because it provides snapshot indicators of the current status of the project.

P1 – Preconstruction – Design:

This phase of the schedule captures activities associated with Design, and Enabling Work. These tasks must take place for construction to proceed. The Design activities have been grouped into Work Packages which mirror the expected Design Packages that will be submitted for VDOT's approval. Although the goal of the "over-the-shoulder" review process is to minimize review cycles, for most design packages AI included two review cycles in the schedule. Thorough coordination with reviewing parties may allow the second cycle to be eliminated or review time to be reduced, which would shorten the duration of the design phase. Also included in the Design Phase is the coordination with Private Utility and Infrastructure companies such as APCO, Roanoke Gas, Verizon, Cox Communications, and Level 3 Telcove.

P2 – Preconstruction – Submittals:

This section of the schedule captures activities associated with Contract Submittals and Construction Working Drawings. AI paid special attention to which submittals would need to be approved by VDOT or RDA as the review times are different for each. In addition, for the landscaping packages, AI accounted for review times by VDOT and the City of Roanoke.

P3 – Preconstruction – Procurement:

To maximize the efficiency of the Design Build delivery method, AI will be performing procurement activities in packages that correlate to the design packages. As each plan set is released for construction, AI-VA will procure all vendors (materials and subcontractors) needed to complete that work. This section of the schedule also captures activities associated fabrication and delivery times for materials that historically have long lead times. AI will work closely with its vendors to manage and minimize these lead times.

C1 – Construction Phase 1:

The primary focus of the first phase of construction will be to build the improvements to the proposed eastbound lanes on Valley View Boulevard. This includes widening Bridge B-627 and reconstructing Ramps Y and Z. In addition, AI plans to have the

I-581 / Valley View Interchange Phase II



State Project No.: 0581-128-109, P101, RW201, C501, B627 Federal Project No.: NH-581-510351 Contract ID Number: C00016593DB45

accel/decel lanes for all four ramps be designed in a separate package. This package would be able to be constructed in Phase 1 independent of the IMR submission and approval. The accel/decel lanes include construction of retaining walls and sound walls. Separating this work into its own package creates enormous schedule savings because it allows the fabrication, delivery and construction of the walls to be completed independent of the IMR submission and approval.

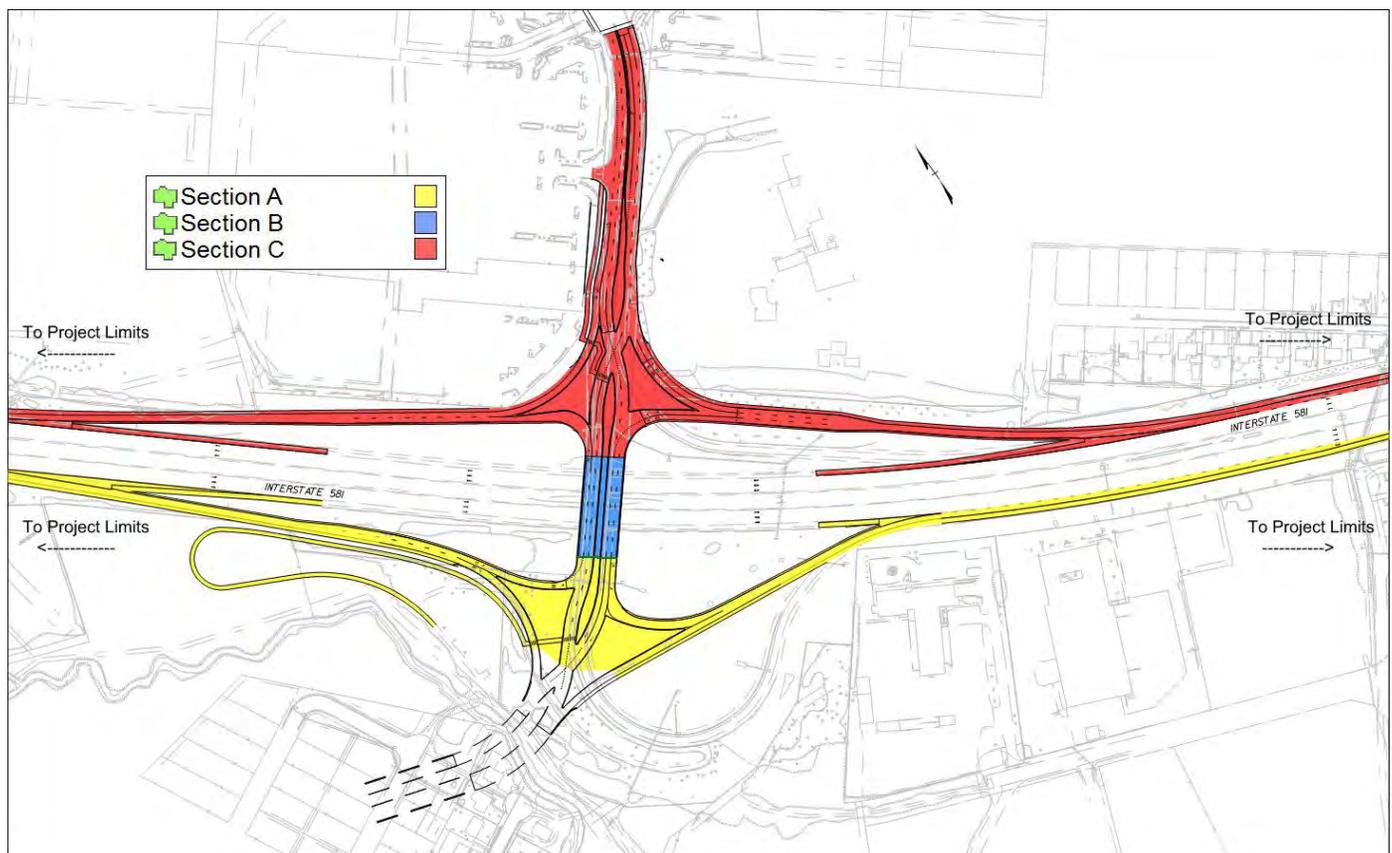
The first Phase of Construction also includes project-wide activities that must be completed prior to commencement of the core construction activities, such as installation of construction signs, Erosion and Sediment Control measures and initial traffic control needed for Phase 1 Construction. In addition, most of the required Preparatory meetings that will be needed for the project in accordance with the QA/QC Program are anticipated to be completed in the first phase.

C2 – Construction Phase 2:

The primary focus of the second phase of construction will be to build the improvements to the proposed westbound lanes on Valley View Boulevard. This includes redecking Bridge B-627 and constructing Ramps X and W. As mentioned previously, the accel/decel lanes for Ramps X and W will have already been constructed in Phase 1.

C3 – Construction Phase 3:

During Phase 3 Construction, AI will be constructing the concrete medians/islands on Valley View Boulevard and adjacent ramps to complete the Diverging Interchange Design. In addition, AI will complete all project finishes such as surface pavement, permanent signs, permanent striping, and final signal configuration. For the construction of the center median, AI will utilize the inside lanes in both directions as a work zone while the public utilizes the outside lanes for travel. AI will need to utilize daily lane closures to install the final surface asphalt and pavement markings.



Project Section Layout

I-581 / Valley View Interchange Phase II



State Project No.: 0581-128-109, P101, RW201, C501, B627 Federal Project No.: NH-581-510351 Contract ID Number: C00016593DB45

WBS and Areas of Work

The WBS has four items on the first tier: Entire Project, Section A, Section B, and Section C. The Design, Preconstruction, and General Conditions activities are all found in the “Entire Project” Section. Sections A, B, and C refer to work areas on the project as described herein and are depicted in the Project Section Layout on the previous page. The full Work Breakdown Structure can be found in Appendix 4.6.a.

SA - Section A:

This area includes all work west of Bridge B-627. It includes Ramps W and Z and their associated accel/decel lanes, the Shared Use Trail near Ramp W and the roadway improvements to Valley View Boulevard west of B-627.

SB - Section B:

This area includes all work associated with the widening and reconstruction of Bridge B-627. It includes substructure work, superstructure work, and tie-ins to adjacent roadways.

SC - Section C:

This area includes all work east of Bridge B-627. It includes Ramps X and Y and their associated accel/decel lanes, the Shared Use Trail adjacent to Valley View Boulevard, and the roadway improvements to Valley View Boulevard east of B-627.

The AI Team believes that breaking the Project down into these three sections will allow for better control and management of the Project. Each Area and Subarea shown in the WBS (Appendix 4.6.a) can be constructed almost independently of the others. This will create opportunities for AI-VA to optimize resource allocation on the project. In addition, the AI Team will be able to reduce schedule risk and have greater opportunity to mitigate any unforeseen schedule impacts.

Calendars

Based on past experiences with construction scheduling, the AI Team has utilized five calendars for the purposes of the Proposal Schedule. All calendars take into account State Holidays and AI Employee Holidays. Upon award of the contract, these calendars would be further tailored to specific restrictions of each traffic area per the contract

documents and any operation-specific considerations.

7-day Review/Cure

This calendar allows work to take place every day of the year. It has only been applied to activities such as submittal reviews and concrete curing periods where durations are primarily based on calendar days instead of working days.

Base Design 5-day with Holidays

This calendar is a base calendar that allows work to take place five days per week every week except where restricted by standard State Holidays and AI Employee Holidays. This calendar was applied to all design activities that are not affected by site conditions or weather.

Base Construction 5-day with Holidays

Like the Base Design calendar, this calendar allows work to take place five days per week every week except where restricted by standard State Holidays and AI Employee Holidays. The primary exception is that this calendar also prohibits work from taking place from the Wednesday before Thanksgiving each year to the first working day after New Year’s Day each year. **AI’s goal is to eliminate impacts to Valley View Mall during peak holiday shopping season.** Construction operations will cease during these times. AI’s activity durations for construction activities are based on getting five days of production per week. If weather impacts the schedule Monday through Friday, Saturdays would be utilized to recover the lost weather days.

Night Work

This calendar has the exact same restrictions as the Base Construction calendar. It simply denotes that the assigned activities will most likely be restricted to be performed at night. Examples of this are striping activities, traffic switches, or any other activity that would require daily lane closures.

Paving

This calendar has the exact same restrictions as the Base Construction calendar. In addition, work is prohibited from taking place from December 15 to March 15 of each year in an effort to account for temperatures that would be non-compliant with VDOT specifications for paving.

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Proposal Schedule Source Documents

Included in the Technical Proposal submission (Copy 1) is a CD associated specifically with Appendix 4.6. This CD contains a PDF of the Schedule Narrative, including all Exhibits and a backup file (.XER) of the Schedule. The schedule was created using Primavera v6.2.1. Also provided are the layout files correlating to the Exhibits which can be imported into Primavera for review purposes. The scheduling settings used in Primavera along with a list of Acronym Definitions used in the schedule are provided in Exhibit 4.6.b.

Proposal Schedule Development and Approach

The success of a project is measured by a number of different factors. One very important factor is the efficiency and speed in which the work can be done – our Project Schedule. We schedule our work by taking into account certain possibilities with the strategy that by identifying potential events early on, we can work to ensure that negative possibilities do not become eventualities. Our schedule narrative that follows is a discussion of the design and construction process, the key elements to maintaining our schedule and a breakdown of the schedule components. In preparing for and developing this detailed proposal, a significant amount of work has already been performed. The level of detail that we have analyzed and developed the design to is not only necessary to position ourselves to win but also to jump start our schedule once NTP is provided.

The AI Team has taken to account the requirements of Article 6 of the General Conditions of the Contract (Part 4) when developing the WBS and list of activities. The AI team will provide correlation between the WBS and the project costs with our submission of the Price Proposal by matching the Schedule of Values and Proposed Monthly Payment Schedule to the WBS. Upon award, a cost and resource loaded project schedule will be provided by the AI Team within the timeframe required in the RFP and will be maintained by our Scheduling Manager.

The AI Team evaluated various contributing factors for each area of the project. Focused attention was applied in the areas of public impact, environmental

protection, and schedule acceleration. By breaking the project into Areas, as previously described, the schedule of each area could be assessed in terms of traffic management, environmental concerns and operation flow. Many Areas of the project have sub-areas and sub-phasing that is a direct result of these assessments. The ultimate goal is to have consistent work flow without delays through the project. Additionally, in many cases, dividing the project into areas and sub-areas allows us to treat sections of the project as independent sub-projects. This is a key strategy to schedule development because it leads to schedule acceleration and risk mitigation by reducing cross-dependencies of work activities.

Design Overview

Although the official kickoff to our schedule is NTP, our team understands the importance of hitting the ground running. Therefore, to be proactive, we intend to utilize the time between Notice of Intent to Award and NTP to advance those elements of work that can be advanced to establish all of our controls in executing the work according to our schedule, especially those activities related to the IMR submission/approval.

To control schedule during the design phase, the AI Team plans to expedite the design of the Project into sub-packages. Activity Codes were used in the Primavera Proposal Schedule to assign all design and construction activities to a work package. A layout of the schedule activities organized by work package can be found in Appendix 4.6.e. The design packages are as follows:

- 1) IMR
- 2) Right of Way Acquisition
- 3) Accel/Decel Lanes
- 4) TMP & MOT
- 5) Erosion & Sediment Control
- 6) In Plan Utilities
- 7) B-627 Bridge
- 8) Grading & Drainage
- 9) Signing, Lighting, Marking & Signalization
- 10) Landscaping

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The design will be developed in a systematic and logical manner. During schedule development, the AI Team realized that the project can be broken into two major chunks – work affected by the approval of the IMR and work not affected by the approval of the IMR. Each quadrant of the project has a ramp and associated accel/decel lane. For each quadrant, there is a point at which the Ramp ties into I-581 and becomes an accel/decel lane. The work from this tie-in point to the outer limits of the project is not affected by the IMR approval. Therefore, this work has been separated into a completely separate work package called “Accel/Decel Lanes”. The Accel/Decel Lanes design package will include all MOT and E&S Controls necessary for that work. After NTP, the AI Team will be able to prepare this design package while the IMR is being prepared, submitted and approved. This will create an opportunity to release long-lead items such as procurement and fabrication of sound wall materials in the early months of the project.

Since the AI Team is planning on approval of the Interchange Modification, this will be the primary focus after NTP along with the Accel/Decel package. Once the IMR is approved, the AI Team will proceed with their standard design process for the work not included in the Accel/Decel package.

Design Build projects succeed by designing in a layering approach. Typically, the first layer after supplemental surveys and utility designations/locations will be an approved E&S plan to allow MOT and demolition operations to begin. Perimeter controls will be designed to function throughout all phases of construction where feasible. In order to realistically accommodate this approach, the SWM design will need to be substantially addressed. In several areas of this project, the E&S operations cannot proceed without appropriate MOT controls. MOT design will require sufficient detail to establish proper controls. Since the project overlays existing roadways, MOT will need to be approved prior to implementation of the E&S or G&D plan at those locations. The second layer will be Grading and Drainage (G&D)

design. This will be our detailed design up to finished grade including pavement design.

Simultaneously, we will develop our in-plan utility relocations design. These designs will continually integrate updated information from other disciplines/designs but will be developed as a separate package to facilitate review and construction once approved. The Design Build team plans to proactively coordinate with the local municipalities during the Design process to prevent delays or impacts.

Also building upon the G&D design will be the Signing, Lighting, Marking and Signalization plan. Although construction of these elements cannot be completed until the final pavement section design is established, having them completed and approved removes any concerns or potential schedule conflicts associated with these elements. In addition, these elements have longer lead times for submittals and fabrication. Early approval of this package will allow other preconstruction tasks to commence such that construction can take place as soon as final pavement section design is approved.

A parallel and integrated, yet independent set of documents is the bridge design (B627). The bridge will be developed in two packages: Type, Size, & Line (TS&L) and final design. The Design Build team may have an acceleration opportunity if the foundation design can be submitted as a separate package after the TS&L plans are approved. This would allow AI’s field forces to begin construction of the foundation widening prior to the entire package being completed. By developing the plans from the ground up rather than from the top down, construction can begin prior to the final approval of the superstructure plan. Conventional design would develop the plans in reverse thereby forcing construction to wait for final approval of all elements before beginning.

Cost & Schedule Savings Design

The unique opportunity presented by the DDI concept brings a number of benefits to the Project, including:

- Free-flowing traffic, and thus reduced delays

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- Elimination of left-turn movements crossing opposing traffic
- Use of a six-lane bridge, as opposed to eight-lanes, without sacrificing interchange capacity
- Elimination of the Lick Run stream relocation
- A smaller Project footprint
- Elimination of five property right-of-way acquisitions and associated relocation
- Reduced impacts to traffic during construction
- Reduced project costs

The greatest advantage of the DDI concept is an efficient design that maximizes traffic flow and creates a shorter construction schedule, resulting in a cost savings to the Department.

Construction

The Construction Team will work closely with the Design Team to monitor progress of Right-of-Way Acquisitions and Design Approvals. Regular Coordination meetings will allow the Construction Team to proactively monitor which project areas will become available first.

In general, the Team intends to focus on preconstruction activities necessary to do the following:

- 1) Begin fabrication of sound wall materials
- 2) Access and begin the construction of the accel/decel lanes
- 3) Access bridge foundations
- 4) Begin fabrication of superstructure elements.

For the Construction Team, detailed operations planning will focus on increasing efficiencies of the road and bridge construction with the advantage of the designed project phasing. The Team will also be evaluating the sub-phasing of the Ramps and roads adjacent to Valley View Boulevard. Since the Elm Avenue Project will be constructed at the same time, the Construction Team will focus on optimizing shared resource efficiencies. By having independent work areas and sub-areas, the project will be greatly controlled by resource allocation and efficiency.

Another focus for the Construction Team will be the demolition operations of the existing bridge. This operation presents many risks such as worker safety, public safety, and schedule risk. AI-VA will maximize its planning and quality control efforts to optimize these operations in all phases.

Finally, the Construction Team will be evaluating concrete pour schedules and cure times to maximize the utilization of resources and acceleration opportunities. For the purposes of the Proposal Schedule, cure times are clearly shown as separate activities in the CPM.

Critical Activities and Potential Constraints:

A schedule layout showing only near critical activities is provided in Exhibit 4.6.d. Near critical activities were defined as having less than twenty days float. The critical path starts with the submission of the preliminary IMR modifications and preparation efforts for the Public Information Meeting. While VDOT and FHWA are reviewing the Preliminary Interchange Modification Report, the AI Team will be holding the Preliminary Information Meeting and addressing comments from the Public. The comments from the public combined with the comments from VDOT/FHWA on the Preliminary IMR will then be incorporated into the final IMR Submission for approval.

Following IMR approval, the critical path moves to the Bridge B-627. Starting with the TS&L submission and approval and moving to the Final Bridge Plans, the design of the bridge is scheduled to be completed by the ~~end of October 2013~~ **middle of February 2014**.

Upon approval of the bridge design, the AI Team will focus on procurement of the vendors needed for the bridge package and preparation of appropriate construction submittals. Once submittals are approved, fabrication of the foundation materials, rebar and girders will fall on the near critical path.

The critical path then follows through the construction of the Phase 1 B-627 substructure and superstructure. By the time the Phase 1 bridge construction is complete, the roadway work will have already been completed and the MOT pattern

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can be reconfigured for Phase 2. This is scheduled to occur around ~~November 2014~~ **April 2015**.

Similar to Phase 1, the Phase 2 critical path follows through the bridge superstructure. By the time the superstructure is completed, the roadway work will have been completed and the MOT pattern can be reconfigured for Phase 3. This is scheduled to take place around ~~July 2015~~ **October 2015**.

Phase 3 construction includes project finishes such as permanent signalization, ground mounted signs, overhead sign structures, permanent striping and landscaping. This phase will also include installation of concrete medians and surface pavement, some of which is critical. Once the Phase 3 finishes are completed, AI-VA will remove MOT Controls and open the road to traffic. The substantial completion of the project and road opening is scheduled to take place ~~towards the end of August 2015~~ **in early May 2016**.

Past Design Build experience indicates that the AI Team will need approximately ~~sixty thirty days following substantial completion~~ to complete final closeout of the project documents and any outstanding punchlist items. This brings the project to final completion in ~~October 2015~~ **June 2016**.

The greatest schedule risk will be the preparation, submission, and approval of the IMR. The entire design schedule is based on the approval of the IMR by ~~May 2013~~ **August 2013**. With great risk brings great opportunity in that any savings to the IMR process will directly correlate to schedule savings to the overall project duration. The Team plans to use its previous Design Build experience to mitigate these risks.

Schedule Management

The project schedule will be utilized not only for management of the project sequencing and duration, but also as a key tool in Team Development and Coordination. The visual representation of the project will provide a method for key stakeholders to initiate “make certain” checklists to identify key tasks to be done by accountable parties. Similarly, the schedule will provide a long-term look ahead to plan for design workshops, over-the-shoulder reviews and Design Build coordination meetings. These meetings will contribute to timely

constructability reviews and intermediate feedback from VDOT through over-the-shoulder review meetings. The AI Team will also hold formal partnering meetings on a quarterly basis for issue resolution, follow-up, and look-ahead reviews of upcoming work and potential “rocks-in-the-road”, allowing the Team ample time to develop a mitigation plan, if needed. Further, AI’s construction team will be able to streamline the development of operation based work packages from the project schedule. These work packages will include short-term scheduling, QA/QC coordination and any methods of addressing all remaining constraints. As our standard schedule management process, the Project Schedule will be the driving force behind all long-term and short-term planning to provide the opportunity to recognize and mitigate risks as early as possible in the project.

Schedule Acceleration / Cost Saving Element

The AI Team has spent extensive time reviewing the VDOT provided information associated with this Project. Our review of the materials suggests that there are some areas where, through additional study and design efforts, potential positive schedule and cost saving recommendations may be realized.

First, streamlining the IMR approval process and public coordination activities can offer schedule acceleration directly to the critical path.

Second, separating the accel/decel lanes in the four quadrants of the project into its own package that can commence independently of the IMR approval process will allow the AI Team to gain schedule by getting a head start on the sound wall fabrication lead times.

Third, constructing the project with a three phase MOT approach will allow the AI construction team to focus the operations planning on independent sections of the project. This will provide opportunities to maximize crew efficiencies minimize the impacts of unforeseen circumstances.

At a minimum, taking into consideration Permitting, Environmental Mitigation, constructability, and long-term maintenance; the AI Team will proactively attack to complete the project ahead of schedule.



EXHIBIT 4.6.a Work Breakdown Structure

WBS Code	WBS Name	Start	Finish	Total Activities
☞ C00016595DB45	VDOT I-581/Valley View Boulevard Interchange Phase II (AI #11270...	14-Jan-13 08:00	02-Jun-16 17:00	422
☞ C00016595DB45.G0	Entire Project	14-Jan-13 08:00	02-Jun-16 17:00	220
☞ C00016595DB45.G0.0	Milestones	14-Jan-13 08:00	02-Jun-16 17:00	10
☞ C00016595DB45.G0.6	MOT/Traffic Switches	15-Jan-14 08:00	03-May-16 17:00	8
☞ C00016595DB45.G0.7	Project Wide Activities	07-Feb-14 08:00	02-May-14 17:00	9
☞ C00016595DB45.G0.1	Design	14-Jan-13 08:00	09-May-14 17:00	80
☞ C00016595DB45.G0.2	Preconstruction Activities	14-Jan-13 08:00	07-Jan-15 17:00	61
☞ C00016595DB45.G0.3	Project Support	14-Jan-13 08:00	02-Jun-16 17:00	44
☞ C00016595DB45.G0.4	Project Finishes	21-Oct-14 08:00	28-Apr-16 17:00	5
☞ C00016595DB45.G0.5	Project Closeout	04-Apr-16 08:00	02-Jun-16 17:00	3
☞ C00016595DB45.SA	Section A - Southbound Traffic West of Bridge B-627	14-Jun-13 08:00	20-Apr-16 17:00	65
☞ C00016595DB45.SA.1	Valley View Boulevard - West of Bridge B-627	26-Feb-14 08:00	20-Apr-16 17:00	18
☞ C00016595DB45.SA.2	Ramp W and Associated Decel Lane	14-Jun-13 08:00	20-Apr-16 17:00	27
☞ C00016595DB45.SA.3	Ramp Z and Associated Accel Lane	19-Jun-13 08:00	18-Apr-16 17:00	20
☞ C00016595DB45.SB	Section B - Bridge B-627 over I-581	29-Jan-14 08:00	15-Oct-15 17:00	84
☞ C00016595DB45.SB.1	Substructure	29-Jan-14 08:00	26-May-15 17:00	39
☞ C00016595DB45.SB.2	Superstructure	18-Aug-14 08:00	15-Oct-15 17:00	45
☞ C00016595DB45.SC	Section C - Northbound Traffic East of Bridge B-627	05-Mar-14 08:00	13-Apr-16 17:00	53
☞ C00016595DB45.SC.1	Valley View Boulevard - East of Bridge B-627	05-Mar-14 08:00	05-Apr-16 17:00	18
☞ C00016595DB45.SC.2	Ramp Y and Associated Decel Lane	14-Apr-14 08:00	08-Apr-16 17:00	19
☞ C00016595DB45.SC.3	Ramp X and Associated Accel Lane	28-Jul-14 08:00	13-Apr-16 17:00	16



EXHIBIT 4.6.b Schedule Settings and Acronyms

Scheduling/Leveling Settings:

General

Scheduling	Yes
Leveling	No
Ignore relationships to and from other projects	Yes
Make open-ended activities critical	Yes
Use Expected Finish Dates	No
Schedule automatically when a change affects dates	No
Level resources during scheduling	No
Recalculate assignment costs after scheduling	No
When scheduling progressed activities use	Retained Logic
Calculate start-to-start lag from	Early Start
Define critical activities as Total Float less than or equal to..	0
Compute Total Float As	Finish Float
Calculate float based on finish date of	Each project
Calendar for scheduling Relationship Lag	Predecessor Activity Calendar

Advanced

Calculate multiple float paths.....	No
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Acronyms:

A/C	Additions and Corrections
E&S	Erosion and Sediment Control
EB	Eastbound
F/R/P	Form/Reinforce/Pour
IMR	Interchange Modification Report
MOT	Maintenance of Traffic
R/A	Review and Approve
RDA	Designer
SFA	Submit for Approval
TMP	Traffic Management Plan
WB	Westbound
WVWA	Western Virginia Water Authority



**EXHIBIT 4.6.c
Proposal Schedule**

Activity ID	Activity Name	Original Duration	Total Float	Start	Finish	Calendar	2013				2014				2015				2016			
							J	F	A	M	J	F	A	M	J	F	A	M	J	F	A	M
VDOT I-581/Valley View Boulevard Interchange Phase II (AI #1127075)							[Gantt bars for 2013-2016]															
1127075 - Phase: Entire Project							[Gantt bars for 2013-2016]															
WBS: Entire Project							[Gantt bars for 2013-2016]															
WBS: Milestones							[Gantt bars for 2013-2016]															
G000NTP	Notice to Proceed	0	0	14-Jan-13 08:00		1127075 - 7-day Review/Cure	Notice to Proceed															
G000010	Construction Start	0	291	13-Jun-13 08:00		1127075 - 7-day Review/Cure	Construction Start															
G000030	Begin Bridge B627 Construction	0	83	20-Feb-14 08:00		1127075 - 7-day Review/Cure	Begin Bridge B627 Construction															
G000399	Substantial Completion of Bridge B627 Completion	0	17		13-Oct-15 17:00	1127075 - 7-day Review/Cure	Substantial Completion															
G000609	Interim Milestone (RFP = 30-OCT-2015)	0	0		30-Oct-15 17:00*	1127075 - 7-day Review/Cure	Interim Milestone															
G000599	Project Substantial Completion (RFP = 01-JUL-2016)	0	0		03-May-16 17:...	1127075 - 7-day Review/Cure	Project Substantial Completion															
G000999	Project Final Completion (RFP = 01-JUL-2016)	0	0		02-Jun-16 17:00*	1127075 - 7-day Review/Cure	Project Final Completion															
WBS: Preconstruction Activities							[Gantt bars for 2013-2016]															
G020010	Mobilization Payment 1	30	381	14-Jan-13 08:00	12-Feb-13 17:00	1127075 - 7-day Review/Cure	Mobilization Payment 1															
G020030	Scope Validation Period	120	291	14-Jan-13 08:00	13-May-13 17:00	1127075 - 7-day Review/Cure	Scope Validation Period															
G020020	Mobilization Payment 2	30	381	13-Feb-13 08:00	14-Mar-13 17:00	1127075 - 7-day Review/Cure	Mobilization Payment 2															
G020040	Scope Validation Negotiations	30	291	14-May-13 08:00	12-Jun-13 17:00	1127075 - 7-day Review/Cure	Scope Validation Negotiations															
G020050	Scope Validation Agreement Reached	0	291		12-Jun-13 17:00	1127075 - 7-day Review/Cure	Scope Validation Agreement Reached															
WBS: Project Support							[Gantt bars for 2013-2016]															
G030010	General Conditions: Survey through Substantial Completion	1206	0	14-Jan-13 08:00	03-May-16 17:00	1127075 - 7-day Review/Cure	General Conditions: Survey through Substantial Completion															
G030020	General Conditions: Project Management through Final Completion	1236	0	14-Jan-13 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure	General Conditions: Project Management through Final Completion															
G030030	General Conditions: QA/QC through Final Completion	1236	0	14-Jan-13 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure	General Conditions: QA/QC through Final Completion															
G030460	Set Up Project Offices	20	261	14-Jan-13 08:00	08-Feb-13 17:00	1127075 - Base Construction 5-day with Holidays	Set Up Project Offices															
G030470	Mobilization	10	177	13-Jun-13 08:00	26-Jun-13 17:00	1127075 - Base Construction 5-day with Holidays	Mobilization															
WBS: Project Finishes							[Gantt bars for 2013-2016]															
G040050	Install Permanent Ground Mounted Signs	30	206	21-Oct-14 08:00	07-Jan-15 17:00	1127075 - Base Construction 5-day with Holidays	Install Permanent Ground Mounted Signs															
G040070	Install Permanent Overhead Signs	30	206	21-Oct-14 08:00	07-Jan-15 17:00	1127075 - Base Construction 5-day with Holidays	Install Permanent Overhead Signs															
G040060	Install Permanent Signalization	30	179	08-Jan-15 08:00	18-Feb-15 17:00	1127075 - Night Work	Install Permanent Signalization															
WBS: Project Closeout							[Gantt bars for 2013-2016]															
G050010	Punchlist/Cleanup for Substantial Completion	30	0	04-Apr-16 08:00	03-May-16 17:00	1127075 - 7-day Review/Cure	Punchlist/Cleanup for Substantial Completion															
G050020	Final Punchlist/Demobilization	30	0	04-May-16 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure	Final Punchlist/Demobilization															
G050030	Closeout Documentation	30	0	04-May-16 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure	Closeout Documentation															
1127075 - Phase: Preconstruction - Design							[Gantt bars for 2013-2016]															
WBS: Entire Project							[Gantt bars for 2013-2016]															
WBS: Design							[Gantt bars for 2013-2016]															
G010010	Design Start	0	112	14-Jan-13 08:00		1127075 - Base Design 5-day with Holidays	Design Start															
G010030	Send Survey Notification Letters	10	102	14-Jan-13 08:00	25-Jan-13 17:00	1127075 - Base Design 5-day with Holidays	Send Survey Notification Letters															
G010080	Property/ROW Research	10	253	14-Jan-13 08:00	25-Jan-13 17:00	1127075 - Base Design 5-day with Holidays	Property/ROW Research															
G010400	Submit Preliminary IMR Modification	45	0	14-Jan-13 08:00	15-Mar-13 17:00	1127075 - Base Design 5-day with Holidays	Submit Preliminary IMR Modification															
G010470	Prepare for Public Information Meeting	45	9	14-Jan-13 08:00	15-Mar-13 17:00	1127075 - Base Design 5-day with Holidays	Prepare for Public Information Meeting															
G010020	Recover Survey Control	3	109	28-Jan-13 08:00	30-Jan-13 17:00	1127075 - Base Design 5-day with Holidays	Recover Survey Control															
G010150	Prepare Soil Boring Plan	10	102	28-Jan-13 08:00	08-Feb-13 17:00	1127075 - Base Design 5-day with Holidays	Prepare Soil Boring Plan															
G010040	Supplemental Field survey	5	109	31-Jan-13 08:00	06-Feb-13 17:00	1127075 - Base Design 5-day with Holidays	Supplemental Field survey															
G010050	Supplemental Utility Designation/Location	5	109	07-Feb-13 08:00	13-Feb-13 17:00	1127075 - Base Design 5-day with Holidays	Supplemental Utility Designation/Location															
G010160	Perform Soil Borings	15	102	11-Feb-13 08:00	01-Mar-13 17:00	1127075 - Base Design 5-day with Holidays	Perform Soil Borings															
G010060	Topo Verification (SWM Basin, Roadway Tie-ins)	5	109	14-Feb-13 08:00	20-Feb-13 17:00	1127075 - Base Design 5-day with Holidays	Topo Verification (SWM Basin, Roadway Tie-ins)															



EXHIBIT 4.6.d
Proposal Schedule – Near Critical Activities

Activity ID	Activity Name	Original Duration	Total Float	Start	Finish	Calendar	2013												2014												2015												2016											
							J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
VDOT I-581/Valley View Boulevard Interchange Phase II (AI #1127075)																																																						
Entire Project																																																						
WBS: Entire Project																																																						
WBS: Milestones																																																						
G000NTP	Notice to Proceed	0	0	14-Jan-13 08:00		1127075 - 7-day Review/Cure	Notice to Proceed																																															
G000399	Substantial Completion of Bridge B627 Completion	0	17		13-Oct-15 17:00	1127075 - 7-day Review/Cure	◆ Substantial Co																																															
G000609	Interim Milestone (RFP = 30-OCT-2015)	0	0		30-Oct-15 17:00*	1127075 - 7-day Review/Cure	◆ Interim Milest																																															
G000599	Project Substantial Completion (RFP = 01-JUL-2016)	0	0		03-May-16 17:...	1127075 - 7-day Review/Cure																																																
G000999	Project Final Completion (RFP = 01-JUL-2016)	0	0		02-Jun-16 17:00*	1127075 - 7-day Review/Cure																																																
WBS: Project Support																																																						
G030010	General Conditions: Survey through Substantial Completion	1206	0	14-Jan-13 08:00	03-May-16 17:00	1127075 - 7-day Review/Cure																																																
G030020	General Conditions: Project Management through Final Completion	1236	0	14-Jan-13 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure																																																
G030030	General Conditions: QA/QC through Final Completion	1236	0	14-Jan-13 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure																																																
WBS: Project Closeout																																																						
G050010	Punchlist/Cleanup for Substantial Completion	30	0	04-Apr-16 08:00	03-May-16 17:00	1127075 - 7-day Review/Cure																																																
G050020	Final Punchlist/Demobilization	30	0	04-May-16 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure																																																
G050030	Closeout Documentation	30	0	04-May-16 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure																																																
Preconstruction - Design																																																						
WBS: Entire Project																																																						
WBS: Design																																																						
G010400	Submit Preliminary IMR Modification	45	0	14-Jan-13 08:00	15-Mar-13 17:00	1127075 - Base Design 5-day with Holidays	■ Submit Preliminary IMR Modification																																															
G010470	Prepare for Public Information Meeting	45	9	14-Jan-13 08:00	15-Mar-13 17:00	1127075 - Base Design 5-day with Holidays	■ Prepare for Public Information Meeting																																															
G010460	Review and Comment - Preliminary IMR Modification (VDOT/FHWA)	45	1	16-Mar-13 08:00	29-Apr-13 17:00	1127075 - 7-day Review/Cure	■ Review and Comment - Preliminary IMR Modification (VDOT/FHWA)																																															
G010480	Hold Public Information Meeting	1	9	18-Mar-13 08:00	18-Mar-13 17:00	1127075 - Base Design 5-day with Holidays	■ Hold Public Information Meeting																																															
G010490	Address Public Comments	30	13	19-Mar-13 08:00	17-Apr-13 17:00	1127075 - 7-day Review/Cure	■ Address Public Comments																																															
G010500	Prepare IMR Modification	30	1	30-Apr-13 08:00	11-Jun-13 17:00	1127075 - Base Design 5-day with Holidays	■ Prepare IMR Modification																																															
G010510	R/A IMR Modification	60	1	12-Jun-13 08:00	10-Aug-13 17:00	1127075 - 7-day Review/Cure	■ R/A IMR Modification																																															
G010360	Prepare B627 TS&L	20	0	12-Aug-13 08:00	09-Sep-13 17:00	1127075 - Base Design 5-day with Holidays	■ Prepare B627 TS&L																																															
G010370	SFA B627 TS&L	5	0	10-Sep-13 08:00	16-Sep-13 17:00	1127075 - Base Design 5-day with Holidays	■ SFA B627 TS&L																																															
G010380	R/A B627 TS&L	21	0	17-Sep-13 08:00	07-Oct-13 17:00	1127075 - 7-day Review/Cure	■ R/A B627 TS&L																																															
G010410	Prepare B627 Bridge Plans	45	0	08-Oct-13 08:00	11-Dec-13 17:00	1127075 - Base Design 5-day with Holidays	■ Prepare B627 Bridge Plans																																															
G010420	SFA B627 Bridge Plans - to VDOT	5	0	12-Dec-13 08:00	18-Dec-13 17:00	1127075 - Base Design 5-day with Holidays	■ SFA B627 Bridge Plans - to VDOT																																															
G010430	R/A B627 Bridge Plans - VDOT	21	0	19-Dec-13 08:00	08-Jan-14 17:00	1127075 - 7-day Review/Cure	■ R/A B627 Bridge Plans - VDOT																																															
G010440	A/C B627 Bridge Plans - to VDOT	15	0	09-Jan-14 08:00	29-Jan-14 17:00	1127075 - Base Design 5-day with Holidays	■ A/C B627 Bridge Plans - to VDOT																																															
G010450	R/A B627 Bridge Plans - VDOT Final	21	0	30-Jan-14 08:00	19-Feb-14 17:00	1127075 - 7-day Review/Cure	■ R/A B627 Bridge Plans - VDOT Final																																															
Preconstruction - Submittals																																																						
WBS: Entire Project																																																						
WBS: Preconstruction Activities																																																						
G020440	SFA Foundation Plan for B627 (RDA)	20	1	20-Mar-14 08:00	16-Apr-14 17:00	1127075 - Base Construction 5-day with Holi...	■ SFA Foundation Plan for B627 (RDA)																																															
G020480	SFA Girder Shop Dwg B627 (RDA)	20	0	20-Mar-14 08:00	16-Apr-14 17:00	1127075 - Base Construction 5-day with Holi...	■ SFA Girder Shop Dwg B627 (RDA)																																															
G020450	R/A Foundation Plan for B627 (RDA)	14	3	17-Apr-14 08:00	30-Apr-14 17:00	1127075 - 7-day Review/Cure	■ R/A Foundation Plan for B627 (RDA)																																															
G020490	R/A Girder Shop Dwg B627 (RDA)	14	0	17-Apr-14 08:00	30-Apr-14 17:00	1127075 - 7-day Review/Cure	■ R/A Girder Shop Dwg B627 (RDA)																																															
G020500	A/C Girder Shop Dwg B627	20	0	01-May-14 08:00	30-May-14 17:00	1127075 - Base Construction 5-day with Holi...	■ A/C Girder Shop Dwg B627																																															
G020510	R/A Girder Shop Dwg B627 - Final (RDA)	14	0	31-May-14 08:00	13-Jun-14 17:00	1127075 - 7-day Review/Cure	■ R/A Girder Shop Dwg B627 - Final (RDA)																																															

Activity ID	Activity Name	Original Duration	Total Float	Start	Finish	Calendar	2013												2014												2015												2016											
							J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
WBS: MOT/Traffic Switches																																																						
G060180	Remove Temporary Striping	2	0	29-Apr-16 08:00	02-May-16 17:00	1127075 - Night Work																																																
G060210	Switch Traffic to Permanent Configuration	1	0	03-May-16 08:00	03-May-16 17:00	1127075 - Night Work																																																
WBS: Project Finishes																																																						
G040080	Install Landscaping	20	0	01-Apr-16 08:00	28-Apr-16 17:00	1127075 - Paving																																																
G040030	Install Pavement Markings - Valley View Blvd	4	2	21-Apr-16 08:00	26-Apr-16 17:00	1127075 - Paving																																																
WBS: Section A - Southbound Traffic West of Bridge B-627																																																						
WBS: Valley View Boulevard - West of Bridge B-627																																																						
SA10210	Construct Concrete Median - Valley View Blvd (A)	8	0	21-Oct-15 08:00	30-Oct-15 17:00	1127075 - Base Construction 5-day with Holi...																																																
SA10340	Install Surface Pavement - Valley View Blvd (A)	2	2	19-Apr-16 08:00	20-Apr-16 17:00	1127075 - Paving																																																
WBS: Ramp W and Associated Decel Lane																																																						
SA20010	Construct Concrete Median/Gore Area - Ramp W	8	0	21-Oct-15 08:00	30-Oct-15 17:00	1127075 - Base Construction 5-day with Holi...																																																
SA20320	Install Surface Pavement - Ramp W	2	2	15-Apr-16 08:00	18-Apr-16 17:00	1127075 - Paving																																																
SA20330	Install Permanent Striping - Ramp W	2	6	19-Apr-16 08:00	20-Apr-16 17:00	1127075 - Base Construction 5-day with Holi...																																																
WBS: Ramp Z and Associated Accel Lane																																																						
SA30290	Construct Concrete Median/Gore Area - Ramp Z	8	0	21-Oct-15 08:00	30-Oct-15 17:00	1127075 - Base Construction 5-day with Holi...																																																
SA30330	Remove Old Trail	3	5	21-Oct-15 08:00	23-Oct-15 17:00	1127075 - Base Construction 5-day with Holi...																																																
SA30300	Install Surface Pavement - Ramp Z	2	2	13-Apr-16 08:00	14-Apr-16 17:00	1127075 - Paving																																																
SA30310	Install Permanent Striping - Ramp Z	2	10	15-Apr-16 08:00	18-Apr-16 17:00	1127075 - Base Construction 5-day with Holi...																																																
WBS: Section C - Northbound Traffic East of Bridge B-627																																																						
WBS: Valley View Boulevard - East of Bridge B-627																																																						
SA10220	Construct Concrete Median - Valley View Blvd (C)	8	0	21-Oct-15 08:00	30-Oct-15 17:00	1127075 - Base Construction 5-day with Holi...																																																
SA10350	Install Surface Pavement - Valley View Blvd (C)	3	2	01-Apr-16 08:00	05-Apr-16 17:00	1127075 - Paving																																																
WBS: Ramp Y and Associated Decel Lane																																																						
SA30360	Construct Concrete Median/Gore Area - Ramp Y	2	3	21-Oct-15 08:00	22-Oct-15 17:00	1127075 - Base Construction 5-day with Holi...																																																
SA30500	Install Surface Pavement - Ramp Y	2	2	06-Apr-16 08:00	07-Apr-16 17:00	1127075 - Paving																																																
SA30510	Install Permanent Striping - Ramp Y	1	14	08-Apr-16 08:00	08-Apr-16 17:00	1127075 - Base Construction 5-day with Holi...																																																
WBS: Ramp X and Associated Accel Lane																																																						
SA30530	Construct Concrete Median/Gore Area - Ramp X	3	3	23-Oct-15 08:00	27-Oct-15 17:00	1127075 - Base Construction 5-day with Holi...																																																
SA30540	Install Surface Pavement - Ramp X	3	2	08-Apr-16 08:00	12-Apr-16 17:00	1127075 - Paving																																																
SA30550	Install Permanent Striping - Ramp X	1	11	13-Apr-16 08:00	13-Apr-16 17:00	1127075 - Base Construction 5-day with Holi...																																																



I-581 / Valley View Interchange Phase II

State Project No.: 0581-128-109, P101, RW201, C501, B627 Federal Project No.: NH-581-510351 Contract ID Number: C00016593DB45

EXHIBIT 4.6.e Proposal Schedule – By Work Package

Activity ID	Activity Name	Original Duration	Total Float	Start	Finish	Calendar	2013												2014												2015												2016											
							M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D		
Project: C00016595DB45 VDOT I-581/Valley View Boulevard Interchange ...							[Gantt Bar]																																															
WBS: C00016595DB45.G0 Entire Project							[Gantt Bar]																																															
WBS: C00016595DB45.G0.0 Milestones							[Gantt Bar]																																															
1127075 - Phase: Entire Project							[Gantt Bar]																																															
1127075 - Work Package: General Conditions							[Gantt Bar]																																															
G000NTP	Notice to Proceed	0	0	14-Jan-13 08:00		1127075 - 7-day Review/Cure	Notice to Proceed																																															
G000010	Construction Start	0	291	13-Jun-13 08:00		1127075 - 7-day Review/Cure	◆ Construction Start																																															
G000030	Begin Bridge B627 Construction	0	83	20-Feb-14 08:00		1127075 - 7-day Review/Cure	◆ Begin Bridge B627 Construction																																															
G000399	Substantial Completion of Bridge B627 Completion	0	17		13-Oct-15 17:00	1127075 - 7-day Review/Cure	◆ Substantial Complet																																															
G000609	Interim Milestone (RFP = 30-OCT-2015)	0	0		30-Oct-15 17:00*	1127075 - 7-day Review/Cure	◆ Interim Milestone (
G000599	Project Substantial Completion (RFP = 01-JUL-2016)	0	0		03-May-16 17:...	1127075 - 7-day Review/Cure	◆ Proj																																															
G000999	Project Final Completion (RFP = 01-JUL-2016)	0	0		02-Jun-16 17:00*	1127075 - 7-day Review/Cure	◆ P																																															
1127075 - Phase: Construction - Phase 1							▼ 05-Feb-15 17:00, 1127075 - Phase: Cor																																															
1127075 - Work Package: Maintenance of Traffic							▼ 05-Feb-15 17:00, 1127075 - Work Pack																																															
G000220	Phase 1 Construction Complete	0	43	05-Feb-15 17:00	05-Feb-15 17:00	1127075 - Base Construction 5-...	◆ Phase 1 Construction Complete																																															
1127075 - Phase: Construction - Phase 2							▼ 15-Oct-15 17:00, 11																																															
1127075 - Work Package: Maintenance of Traffic							▼ 15-Oct-15 17:00, 11																																															
G000230	Phase 2 Construction Complete	0	0	15-Oct-15 17:00	15-Oct-15 17:00	1127075 - Base Construction 5-...	◆ Phase 2 Constructio																																															
1127075 - Phase: Construction - Phase 3							▼ 28-A																																															
1127075 - Work Package: Maintenance of Traffic							▼ 28-A																																															
G000240	Phase 3 Construction Complete	0	0	28-Apr-16 17:00	28-Apr-16 17:00	1127075 - Base Construction 5-...	◆ Phas																																															
WBS: C00016595DB45.G0.6 MOT/Traffic Switches							▼ 03-M																																															
1127075 - Phase: Construction - Phase 1							▼ 13-Apr-15 17:00, 1127075 - Phase																																															
1127075 - Work Package: Maintenance of Traffic							▼ 13-Apr-15 17:00, 1127075 - Work																																															
G060010	Install Project Wide Construction Signs	5	53	15-Jan-14 08:00	21-Jan-14 17:00	1127075 - Base Construction 5-...	Install Project Wide Construction Signs																																															
G060040	Install MOT Controls for Phase 1	5	53	22-Jan-14 08:00	28-Jan-14 17:00	1127075 - Base Construction 5-...	Install MOT Controls for Phase 1																																															
G060100	Remove/Replace Temporary Striping for Phase 2	2	44	06-Feb-15 08:00	09-Feb-15 17:00	1127075 - Night Work	Remove/Replace Temporary Striping fo																																															
G060130	Switch Traffic for Phase 2	1	0	13-Apr-15 08:00	13-Apr-15 17:00	1127075 - Night Work	Switch Traffic for Phase 2																																															
1127075 - Phase: Construction - Phase 2							▼ 20-Oct-15 17:00, 1																																															
1127075 - Work Package: Maintenance of Traffic							▼ 20-Oct-15 17:00, 1																																															
G060140	Remove/Replace Temporary Striping for Phase 3	2	0	16-Oct-15 08:00	19-Oct-15 17:00	1127075 - Night Work	Remove/Replace T																																															
G060170	Switch Traffic for Phase 3	1	0	20-Oct-15 08:00	20-Oct-15 17:00	1127075 - Night Work	Switch Traffic for Ph																																															
1127075 - Phase: Construction - Phase 3							▼ 03-M																																															
1127075 - Work Package: Maintenance of Traffic							▼ 03-M																																															
G060180	Remove Temporary Striping	2	0	29-Apr-16 08:00	02-May-16 17:00	1127075 - Night Work	Ren																																															
G060210	Switch Traffic to Permanent Configuration	1	0	03-May-16 08:00	03-May-16 17:00	1127075 - Night Work	Swit																																															
WBS: C00016595DB45.G0.7 Project Wide Activities							▼ 02-May-14 17:00, WBS: C00016595DB45.G0.7 Project Wide																																															
1127075 - Phase: Construction - Phase 1							▼ 02-May-14 17:00, 1127075 - Phase: Construction - Phase 1																																															
1127075 - Work Package: E&S/Clearing							▼ 20-Mar-14 17:00, 1127075 - Work Package: E&S/Clearing																																															
G070020	Install Ph. 1 E&S Controls	10	43	12-Feb-14 08:00	25-Feb-14 17:00	1127075 - Base Construction 5-...	Install Ph. 1 E&S Controls																																															
G070010	Excavate & Grade SWM Basin	15	43	26-Feb-14 08:00	18-Mar-14 17:00	1127075 - Base Construction 5-...	Excavate & Grade SWM Basin																																															
G070030	Install Ph. 1 E&S Storm Drainage	5	174	14-Mar-14 08:00	20-Mar-14 17:00	1127075 - Base Construction 5-...	Install Ph. 1 E&S Storm Drainage																																															
1127075 - Work Package: In Plan Utilities & Utility Relocation							▼ 02-May-14 17:00, 1127075 - Work Package: In Plan Utilities &																																															
G070080	Install/Relocate Water & Sanitary Improvements	30	174	21-Mar-14 08:00	02-May-14 17:00	1127075 - Base Construction 5-...	Install/Relocate Water & Sanitary Improvements																																															
1127075 - Work Package: Private Utility Relocation & Coordination							▼ 07-Apr-14 17:00, 1127075 - Work Package: Private Utility Reloc																																															

Activity ID	Activity Name	Original Duration	Total Float	Start	Finish	Calendar	2013												2014												2015												2016											
							M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D		
G030030	General Conditions: QA/QC through Final Completion	1236	0	14-Jan-13 08:00	02-Jun-16 17:00	1127075 - 7-day Review/Cure	[Gantt bar]																																															
G030460	Set Up Project Offices	20	261	14-Jan-13 08:00	08-Feb-13 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030470	Mobilization	10	177	13-Jun-13 08:00	26-Jun-13 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
1127075 - Phase: Preconstruction - Design		230	294	07-Mar-13 08:00	06-Feb-14 17:00		[Gantt bar]																																															
1127075 - Work Package: Private Utility Relocation & Coordination		230	294	07-Mar-13 08:00	06-Feb-14 17:00		[Gantt bar]																																															
G030350	Schedule and hold Kickoff Meeting with Private Utilities (Gas, Power, Communications, ...)	10	416	07-Mar-13 08:00	20-Mar-13 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030380	Roanoke Gas Design Utility Relocation Plan	30	252	12-Nov-13 08:00	02-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030400	Verizon Design Utility Relocation Plan	30	252	12-Nov-13 08:00	02-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030420	APCO Design Utility Relocation Plan	30	252	12-Nov-13 08:00	02-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030440	Cox Communications Cable Design Utility Relocation Plan	30	252	12-Nov-13 08:00	02-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030480	Level 3 Telcove Design Utility Relocation Plan	30	293	12-Nov-13 08:00	02-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030340	Schedule and hold Kickoff Meeting with Public Utilities (ACSA, VDOT Traffic)	10	234	19-Nov-13 08:00	04-Dec-13 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030385	SFA Roanoke Gas's Relocation Plan	10	252	03-Jan-14 08:00	16-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030405	SFA Verizon's Relocation Plan	10	252	03-Jan-14 08:00	16-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030425	SFA APCO's Relocation Plan	10	252	03-Jan-14 08:00	16-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030445	SFA Cox Communications's Relocation Plan	10	252	03-Jan-14 08:00	16-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030435	SFA Level 3 Telcove's Relocation Plan	10	293	03-Jan-14 08:00	16-Jan-14 17:00	1127075 - Base Design 5-day wi...	[Gantt bar]																																															
G030390	R/A Roanoke Gas's Relocation Plan	21	370	17-Jan-14 08:00	06-Feb-14 17:00	1127075 - 7-day Review/Cure	[Gantt bar]																																															
G030410	R/A Verizon's Relocation Plan	21	370	17-Jan-14 08:00	06-Feb-14 17:00	1127075 - 7-day Review/Cure	[Gantt bar]																																															
G030430	R/A APCO's Relocation Plan	21	370	17-Jan-14 08:00	06-Feb-14 17:00	1127075 - 7-day Review/Cure	[Gantt bar]																																															
G030450	R/A Cox Communications's Relocation Plan	21	370	17-Jan-14 08:00	06-Feb-14 17:00	1127075 - 7-day Review/Cure	[Gantt bar]																																															
G030490	R/A Level 3 Telcove's Relocation Plan	21	427	17-Jan-14 08:00	06-Feb-14 17:00	1127075 - 7-day Review/Cure	[Gantt bar]																																															
1127075 - Phase: Preconstruction - Submittals		15	304	15-Apr-13 08:00	03-May-13 17:00		[Gantt bar]																																															
1127075 - Work Package: Demolition		15	304	15-Apr-13 08:00	03-May-13 17:00		[Gantt bar]																																															
G030300	Perform Hazmat Testing/Inspection	15	280	15-Apr-13 08:00	03-May-13 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
1127075 - Phase: Construction - Phase 1		597	0	25-Nov-13 08:00	31-Mar-16 17:00		[Gantt bar]																																															
1127075 - Work Package: Quality Assurance/Quality Control		597	0	25-Nov-13 08:00	31-Mar-16 17:00		[Gantt bar]																																															
G030060	Preparatory Meeting - MOT	1	53	25-Nov-13 08:00	25-Nov-13 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030210	Preparatory Meeting - Pavement Markings	1	53	21-Jan-14 08:00	21-Jan-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030040	Preparatory Meeting - Erosion & Sedimentation Control	1	43	28-Jan-14 08:00	28-Jan-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030050	Preparatory Meeting - Clear & Grub	1	43	28-Jan-14 08:00	28-Jan-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030120	Preparatory Meeting - Asphalt Pavement	1	181	29-Jan-14 08:00	29-Jan-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030170	Preparatory Meeting - Underdrain	1	181	29-Jan-14 08:00	29-Jan-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030090	Preparatory Meeting - Stabilization & Embankment	1	43	11-Feb-14 08:00	11-Feb-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030080	Preparatory Meeting - Storm Drainage	1	174	27-Feb-14 08:00	27-Feb-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030100	Preparatory Meeting - Subgrade & Aggregate Base	1	113	30-Apr-14 08:00	30-Apr-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030070	Preparatory Meeting - Structure Backfill	1	2	22-May-14 08:00	22-May-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030130	Preparatory Meeting - Piles & Casings	1	2	22-May-14 08:00	22-May-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030140	Preparatory Meeting - Bridge Substructure	1	2	09-Jun-14 08:00	09-Jun-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030270	Preparatory Meeting - Conc Curb & Sidewalk	1	140	30-Jul-14 08:00	30-Jul-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030160	Preparatory Meeting - Girder Erection	1	0	11-Sep-14 08:00	11-Sep-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030150	Preparatory Meeting - Bridge Deck	1	0	19-Sep-14 08:00	19-Sep-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030230	Preparatory Meeting - Signage	1	206	06-Oct-14 08:00	06-Oct-14 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030110	Preparatory Meeting - Signalization	1	176	07-Jan-15 08:00	07-Jan-15 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030290	Preparatory Meeting - Demolition of Existing Structures	1	0	13-Apr-15 08:00	13-Apr-15 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															
G030260	Preparatory Meeting - Electrical Installation & Lighting	1	84	15-May-15 08:00	15-May-15 17:00	1127075 - Base Construction 5-...	[Gantt bar]																																															

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02-28-2014

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NUMBER

0410000156

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AND LANDSCAPE ARCHITECTS

PROFESSIONAL CORPORATION BRANCH OFFICE REGISTRATION

PROFESSIONS: ENG, LS

RINKER DESIGN ASSOCIATES PC
927 MAPLE GROVE DR STE 105
FREDERICKSBURG, VA 22407



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Gordon N. Dixon, Director

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9300 WEST COURTHOUSE RD
STE 300
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301 CONCOURSE BLVD, STE 120
GLEN ALLEN, VA 23059



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06-30-2014

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PROFESSIONAL ENGINEER LICENSE

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6160 KEMPSVILLE CIRCLE
SUITE 200A
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CLARK NEXSEN OWEN BARBIERI & GIBSON PC
CLARK NEXSEN PC
213 SOUTH JEFFERSON
STE 1011
ROANOKE, VA 24011



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NXL CONSTRUCTION SERVICES INC.
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SERVICES INC.
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BUSINESS ENTITY REGISTRATION

PROFESSIONS: ENG, LS

NXL CONSTRUCTION CO INC
NXL CONSTRUCTION SERVICES INC
114 E CARY ST STE 200
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SERVICES INC
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Telephone: (804) 367-8500**

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AND LANDSCAPE ARCHITECTS
PROFESSIONAL ENGINEER LICENSE**

**JOSEPH ROY HAMED
110 WENN DRIVE
CHRISTIANSBURG, VA 24073**



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BRIAN SCOTT WYATT
11745 DICKERSON MILL ROAD
MONETA, VA 24121



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BUSINESS ENTITY REGISTRATION

PROFESSIONS: ENG, LS

ANDERSON & ASSOCIATES OF VIRGINIA INC
100 ARDMORE STREET
BLACKSBURG, VA 24060



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A DESIGN-BUILD PROJECT



I-581 / Valley View Interchange

Phase II From: ~0.240 Mi. S. Route 101 (Hershberger Road)
To: ~1.561 Mi. S. Route 101 (Hershberger Road)

City of Roanoke, Virginia



VOLUME II: TECHNICAL PROPOSAL

Prepared for the Virginia Department of Transportation

September 20, 2012

State Project No.: 0581-128-109, P101, RW201, C501, B627

Federal Project No.: NH-581-5(035) Contract ID Number: C00016595DB45



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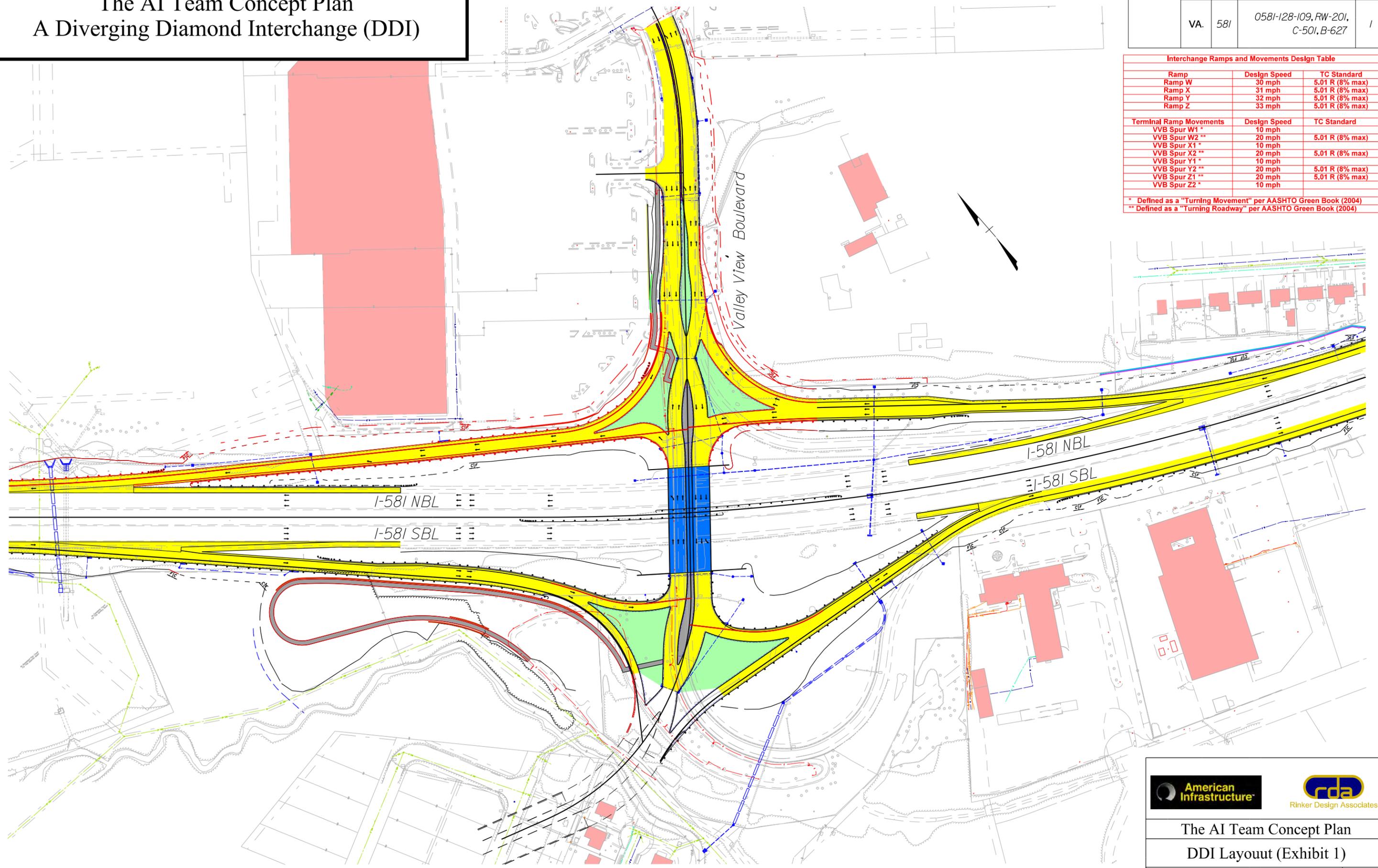
In association with



The AI Team Concept Plan A Diverging Diamond Interchange (DDI)

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501, B-627	1

Interchange Ramps and Movements Design Table		
Ramp	Design Speed	TC Standard
Ramp W	30 mph	5.01 R (8% max)
Ramp X	31 mph	5.01 R (8% max)
Ramp Y	32 mph	5.01 R (8% max)
Ramp Z	33 mph	5.01 R (8% max)
Terminal Ramp Movements	Design Speed	TC Standard
VVB Spur W1 *	10 mph	
VVB Spur W2 **	20 mph	5.01 R (8% max)
VVB Spur X1 *	10 mph	
VVB Spur X2 **	20 mph	5.01 R (8% max)
VVB Spur Y1 *	10 mph	
VVB Spur Y2 **	20 mph	5.01 R (8% max)
VVB Spur Z1 **	20 mph	5.01 R (8% max)
VVB Spur Z2 *	10 mph	
* Defined as a "Turning Movement" per AASHTO Green Book (2004)		
** Defined as a "Turning Roadway" per AASHTO Green Book (2004)		

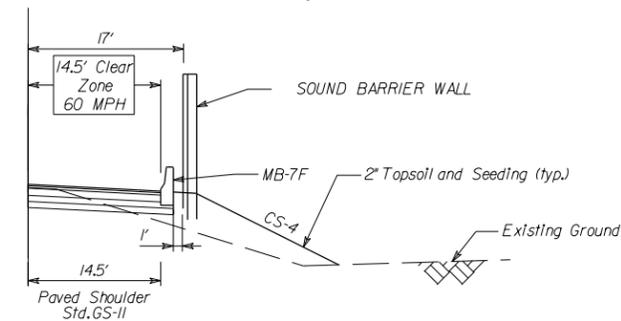
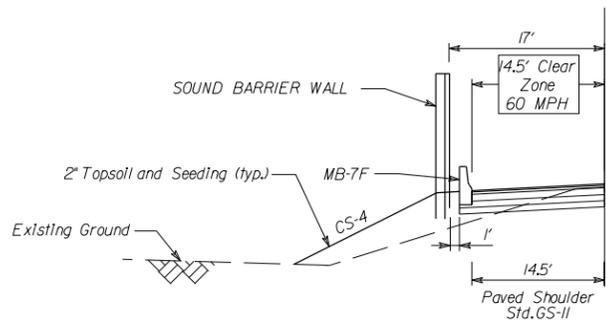
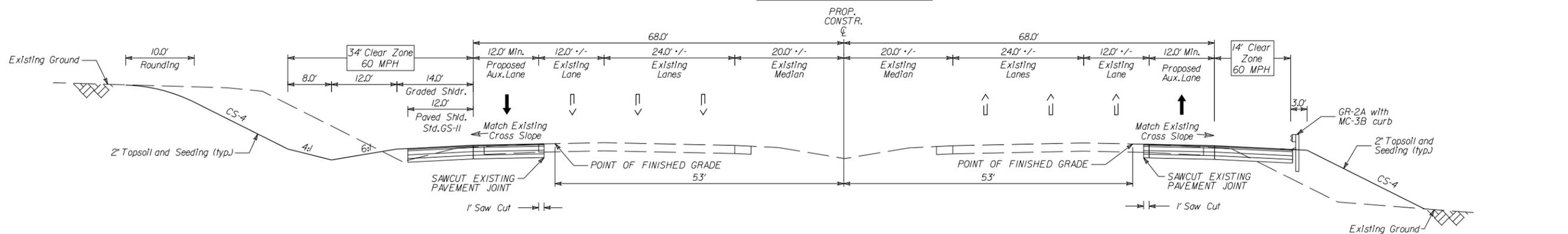


The AI Team Concept Plan
DDI Layout (Exhibit 1)

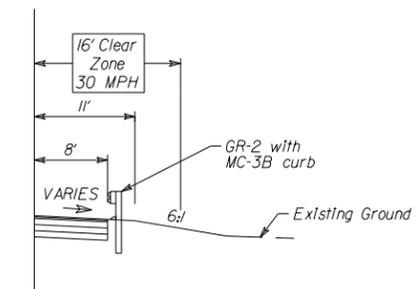
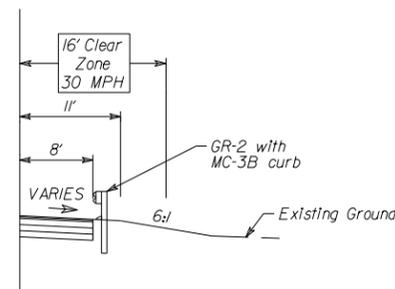
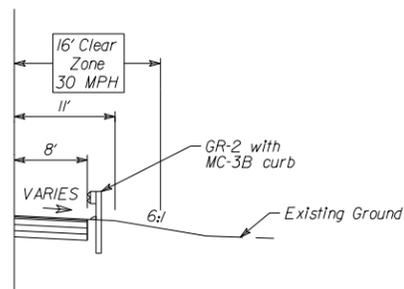
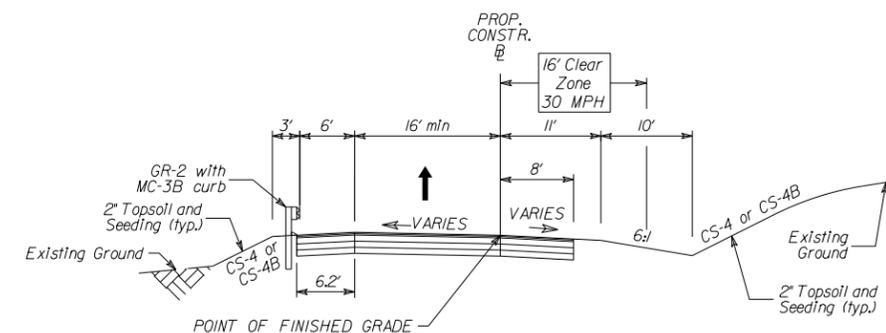
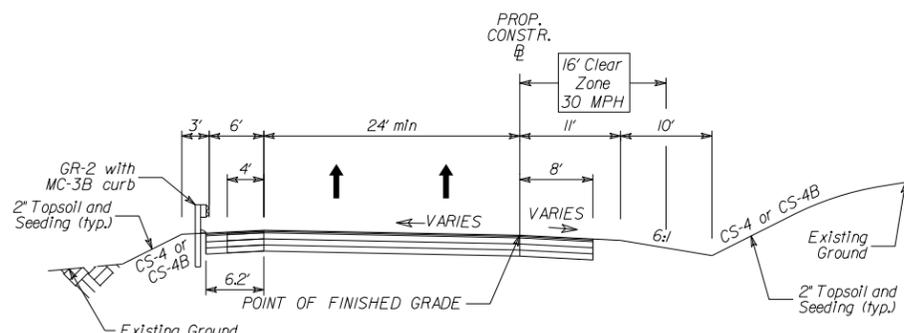
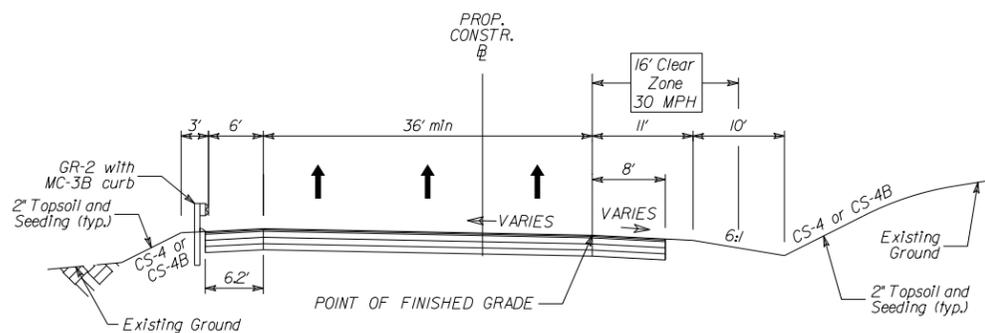
TYPICAL SECTIONS

INTERSTATE 581

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	2



RAMPS & SPUR CONNECTIONS



The AI Team Concept Plan

Typical Sheet (Exhibit 2)

NOT TO SCALE

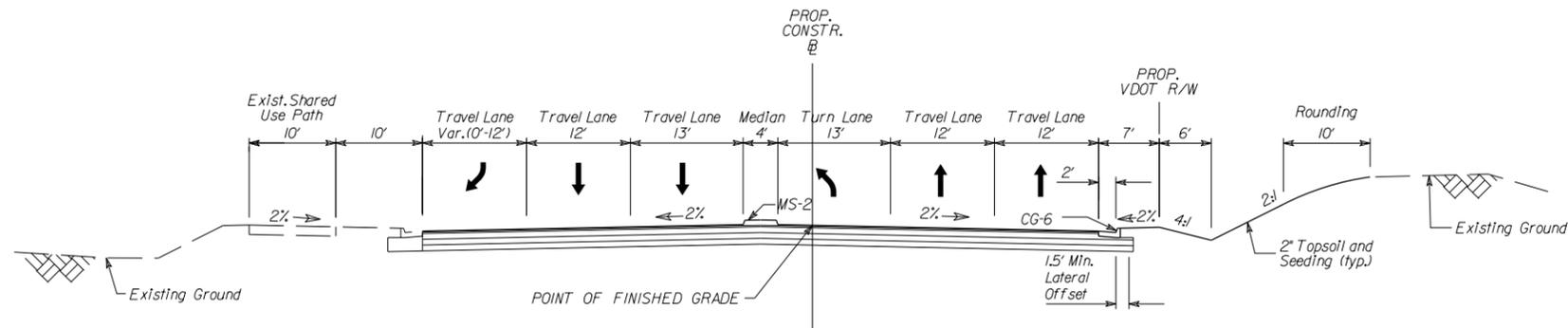
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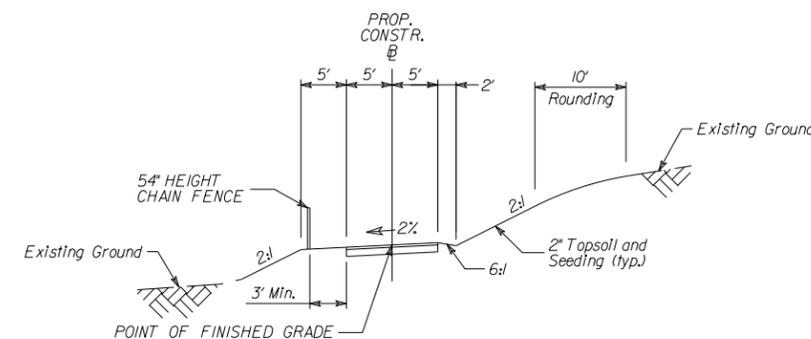
TYPICAL SECTIONS

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	3

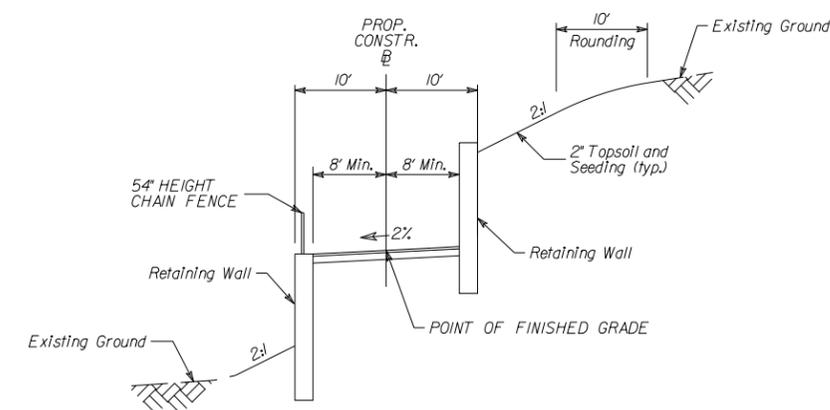
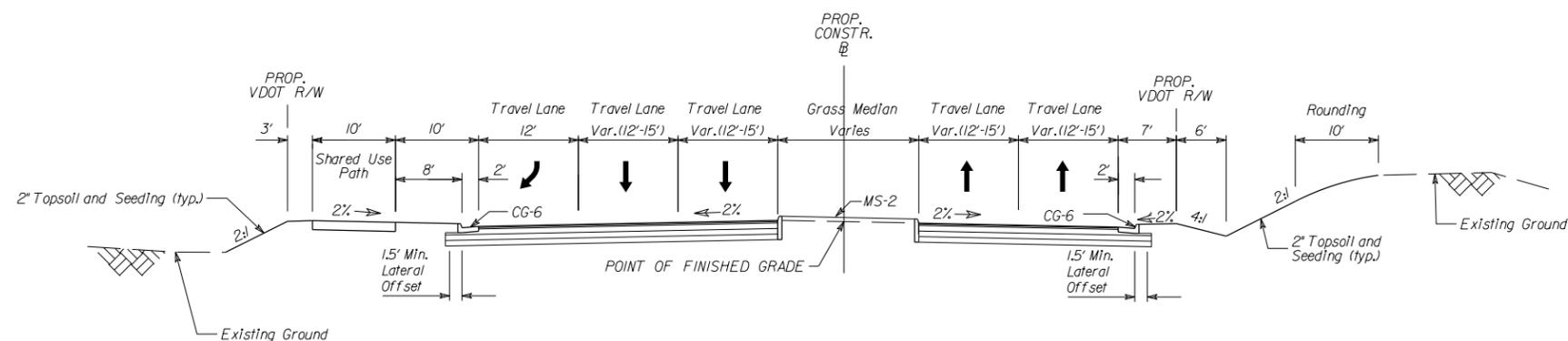
VALLEY VIEW BLVD EXISTING VALLEY VIEW BLVD.(EAST END)



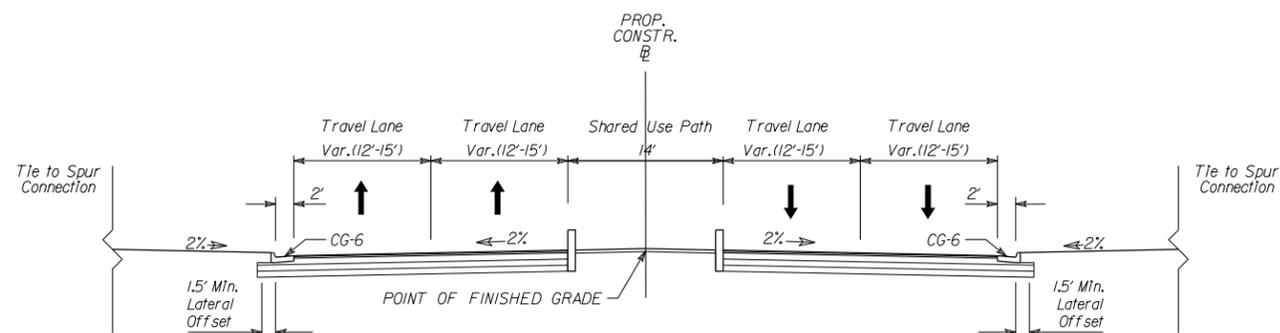
SHARED USE PATH



EAST OF VALLEY VIEW RAMPS



VALLEY VIEW BRIDGE APPROACH



The AI Team Concept Plan

Typical Sheet (Exhibit 3)

NOT TO SCALE

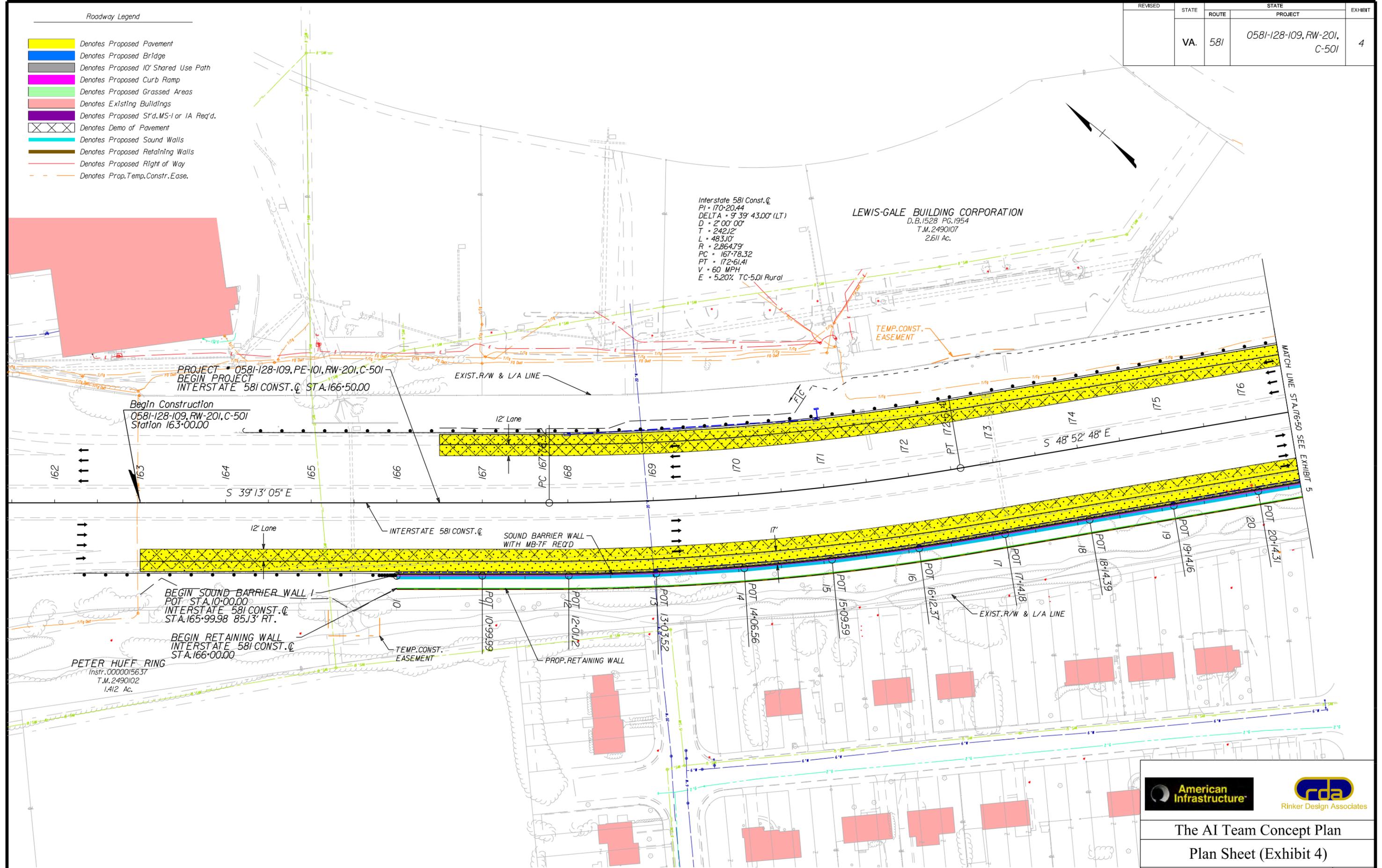
Page

41

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	4

Roadway Legend

- Denotes Proposed Pavement
- Denotes Proposed Bridge
- Denotes Proposed 10' Shared Use Path
- Denotes Proposed Curb Ramp
- Denotes Proposed Grassed Areas
- Denotes Existing Buildings
- Denotes Proposed St'd.MS-1 or IA Req'd.
- Denotes Demo of Pavement
- Denotes Proposed Sound Walls
- Denotes Proposed Retaining Walls
- Denotes Proposed Right of Way
- Denotes Prop.Temp.Constr.Ease.





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The AI Team Concept Plan

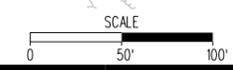
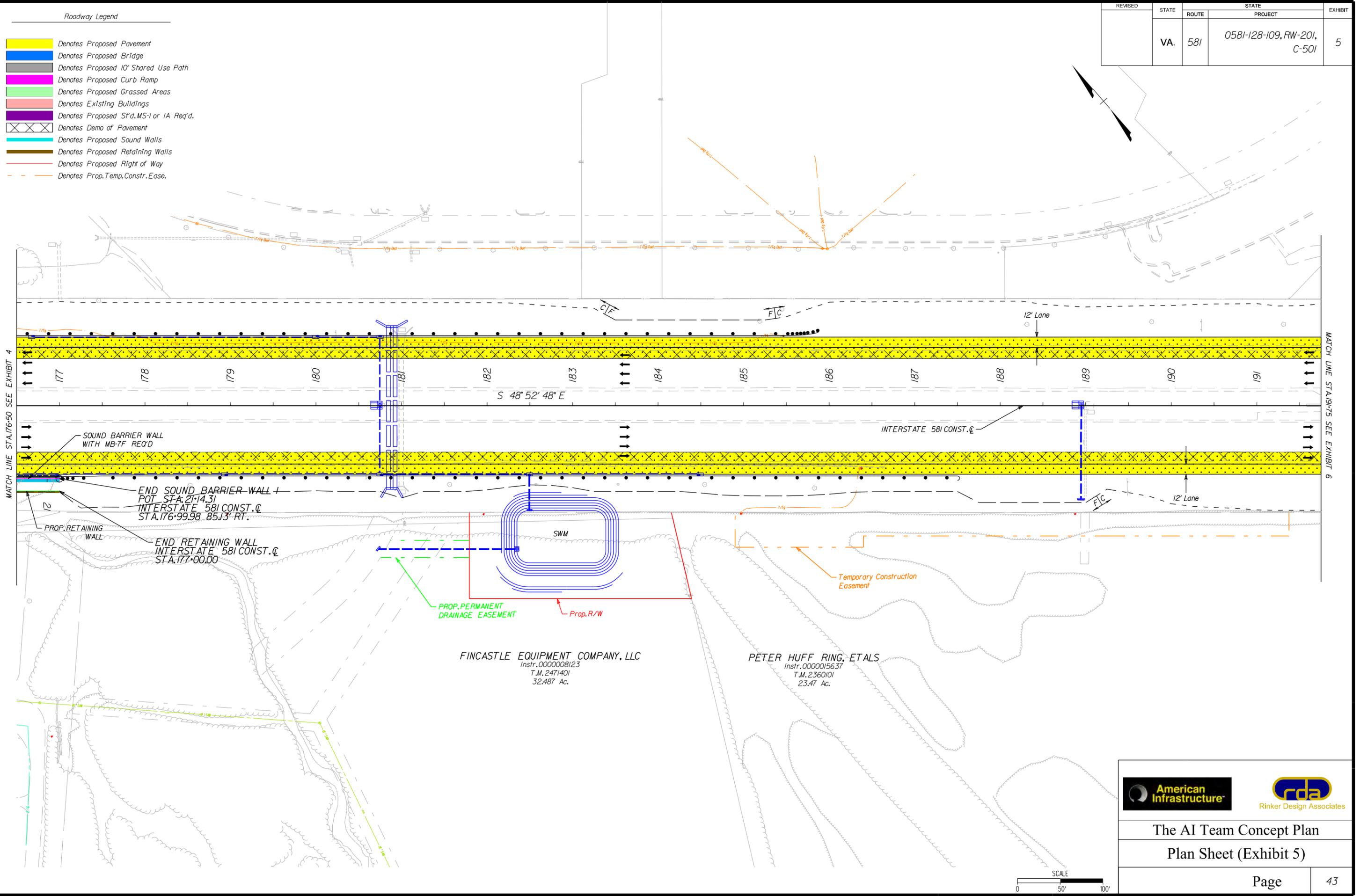
Plan Sheet (Exhibit 4)

Page

42

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	5

- Roadway Legend
- Denotes Proposed Pavement
 - Denotes Proposed Bridge
 - Denotes Proposed 10' Shared Use Path
 - Denotes Proposed Curb Ramp
 - Denotes Proposed Grassed Areas
 - Denotes Existing Buildings
 - Denotes Proposed St'd. MS-1 or IA Req'd.
 - Denotes Demo of Pavement
 - Denotes Proposed Sound Walls
 - Denotes Proposed Retaining Walls
 - Denotes Proposed Right of Way
 - Denotes Prop. Temp. Constr. Ease.





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The AI Team Concept Plan

Plan Sheet (Exhibit 5)

Page

43

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	6

Curve RAMP_X-1
 PI = 22+69.63
 DELTA = 4° 00' 36.97" (RT)
 D = 0° 57' 18"
 T = 210.06'
 L = 419.95'
 R = 6,000.00'
 PC = 20+59.56
 PT = 24+79.52
 V = 30mph
 e = 2.0% TC-5.01 Rural

FRONTIER 0407 VALLEY VIEW, LLC
 Instr. 050007780
 T.M. 2370102
 20.852 Ac.

End Ramp X Const. B PT Sta. 24+86.73+
 I-581 Const. C POT Sta. 194+18.33 Lt. 68'

Curve RAMP_W-1
 PI = 10+71.43
 DELTA = 4° 05' 27.51" (RT)
 D = 2° 51' 53"
 T = 71.43'
 L = 142.80'
 R = 2,000.00'
 PC = 10+00.00
 PT = 11+42.80
 V = 30mph
 e = 2.4% TC-5.01 Rural

PETER HUFF RING, ETALS
 Instr. 0000015637
 T.M. 2360101
 23.47 Ac.

CITY OF ROANOKE, VIRGINIA
 D.B. 1601 PG. 754
 T.M. 2360102
 4.496 Ac.

PETER HUFF RING, ETALS
 Instr. 0000015637
 T.M. 2360101
 23.47 Ac.

PETER HUFF RING, ETALS
 Instr. 0000015637
 T.M. 2360101
 23.47 Ac.

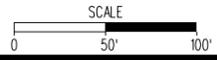
MATCH LINE STA. 191+75 SEE EXHIBIT 5

MATCH LINE STA. 12+30 SEE EXHIBIT 7

MATCH LINE STA. 206+75 SEE EXHIBIT 7

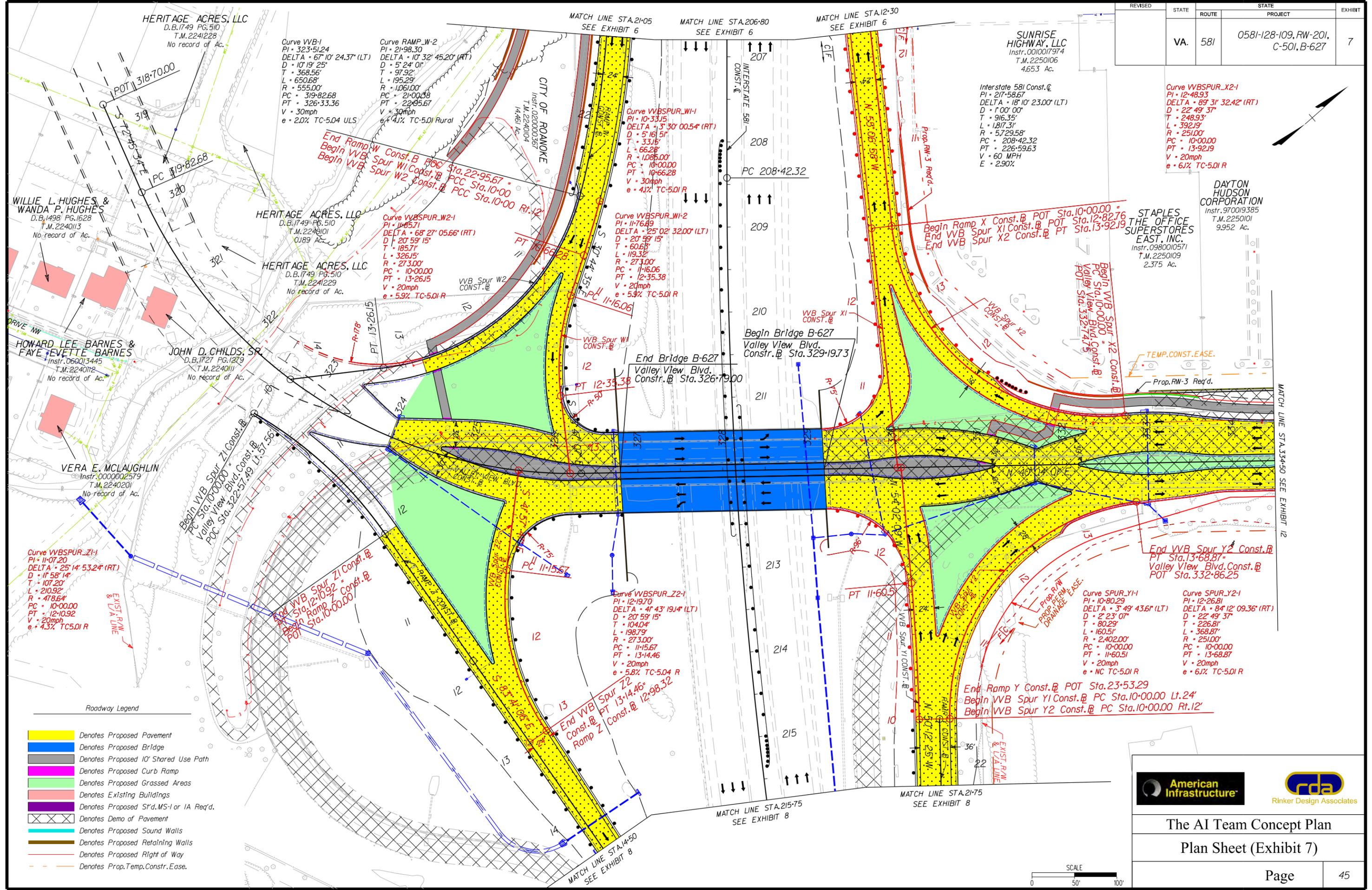
MATCH LINE STA. 21+05 SEE EXHIBIT 7

- Roadway Legend
- Denotes Proposed Pavement
 - Denotes Proposed Bridge
 - Denotes Proposed 10' Shared Use Path
 - Denotes Proposed Curb Ramp
 - Denotes Proposed Grassed Areas
 - Denotes Existing Buildings
 - Denotes Proposed S'd. MS-1 or IA Req'd.
 - Denotes Demo of Pavement
 - Denotes Proposed Sound Walls
 - Denotes Proposed Retaining Walls
 - Denotes Proposed Right of Way
 - Denotes Prop. Temp. Constr. Ease.



The AI Team Concept Plan
 Plan Sheet (Exhibit 6)

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501, B-627	7

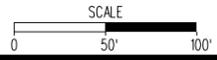


Roadway Legend

- Denotes Proposed Pavement
- Denotes Proposed Bridge
- Denotes Proposed 10' Shared Use Path
- Denotes Proposed Curb Ramp
- Denotes Proposed Grassed Areas
- Denotes Existing Buildings
- Denotes Proposed S'd, MS-1 or IA Req'd.
- Denotes Demo of Pavement
- Denotes Proposed Sound Walls
- Denotes Proposed Retaining Walls
- Denotes Proposed Right of Way
- Denotes Prop. Temp. Constr. Easement

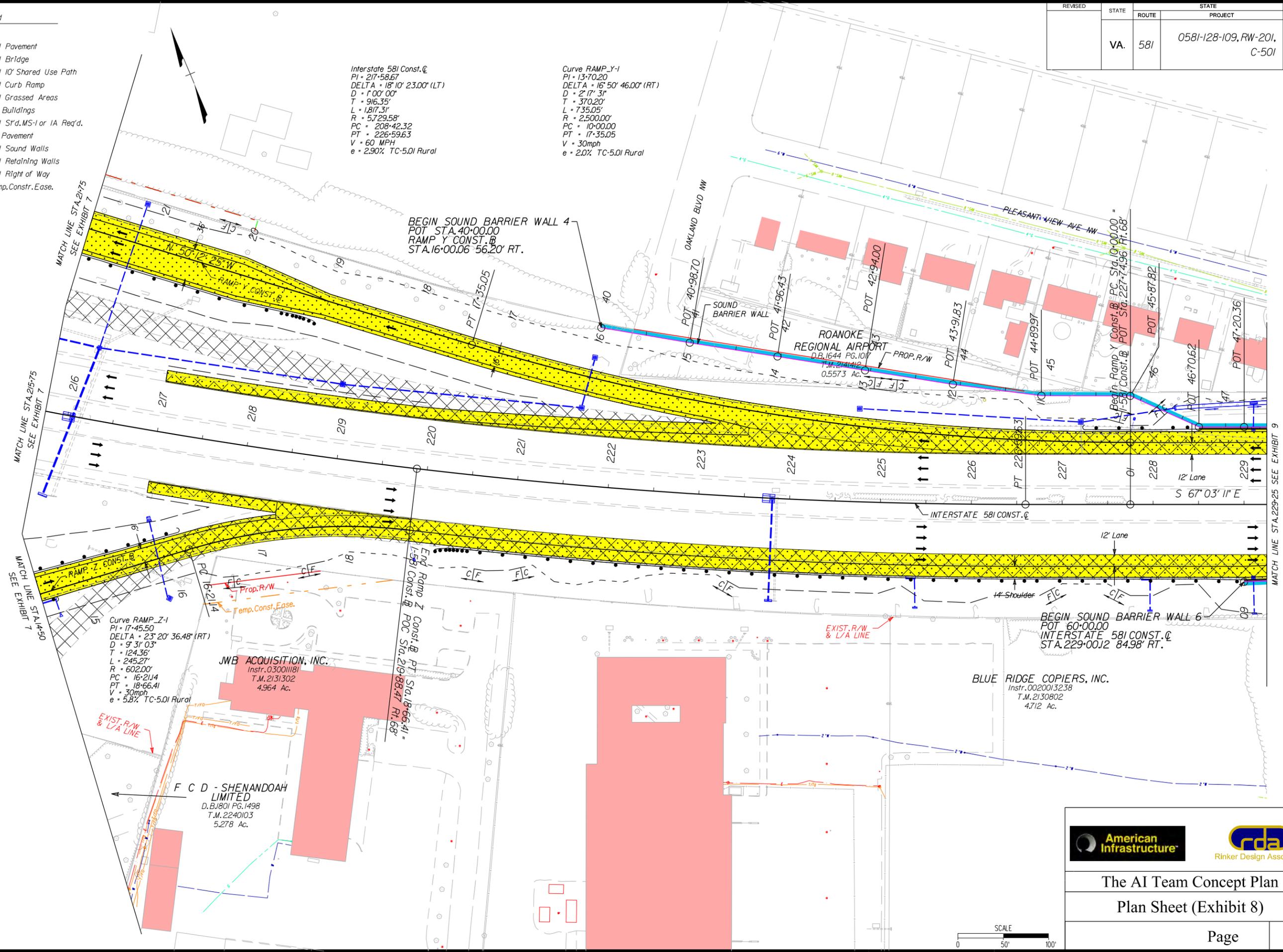


The AI Team Concept Plan
Plan Sheet (Exhibit 7)



REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	8

- Roadway Legend
- Denotes Proposed Pavement
 - Denotes Proposed Bridge
 - Denotes Proposed 10' Shared Use Path
 - Denotes Proposed Curb Ramp
 - Denotes Proposed Grassed Areas
 - Denotes Existing Buildings
 - Denotes Proposed St'd.MS-1 or IA Req'd.
 - Denotes Demo of Pavement
 - Denotes Proposed Sound Walls
 - Denotes Proposed Retaining Walls
 - Denotes Proposed Right of Way
 - Denotes Prop.Temp.Constr.Ease.

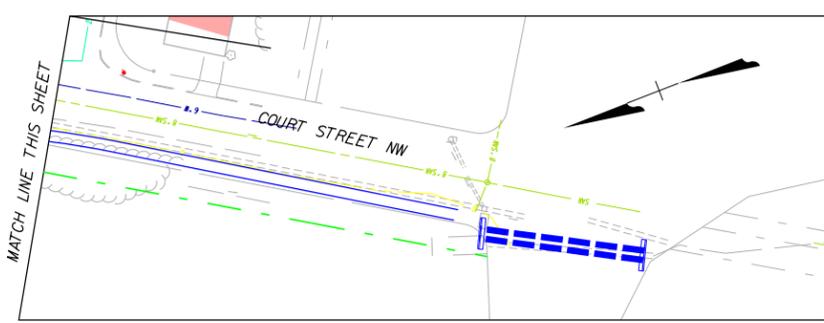


The AI Team Concept Plan
Plan Sheet (Exhibit 8)



REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	9

- Roadway Legend
- Denotes Proposed Pavement
 - Denotes Proposed Bridge
 - Denotes Proposed 10' Shared Use Path
 - Denotes Proposed Curb Ramp
 - Denotes Proposed Grassed Areas
 - Denotes Existing Buildings
 - Denotes Proposed St'd. MS-1 or IA Req'd.
 - Denotes Demo of Pavement
 - Denotes Proposed Sound Walls
 - Denotes Proposed Retaining Walls
 - Denotes Proposed Right of Way
 - Denotes Prop. Temp. Constr. Ease.





American Infrastructure



Rinker Design Associates

The AI Team Concept Plan
Plan Sheet (Exhibit 9)

Page

47

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	10

Roadway Legend

- Denotes Proposed Pavement
- Denotes Proposed Bridge
- Denotes Proposed 10' Shared Use Path
- Denotes Proposed Curb Ramp
- Denotes Proposed Grassed Areas
- Denotes Existing Buildings
- Denotes Proposed St'd.MS-1 or IA Req'd.
- Denotes Demo of Pavement
- Denotes Proposed Sound Walls
- Denotes Proposed Retaining Walls
- Denotes Proposed Right of Way
- Denotes Prop.Temp.Constr.Ease.



The AI Team Concept Plan
Plan Sheet (Exhibit 10)

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	11

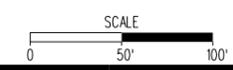
- Roadway Legend
- Denotes Proposed Pavement
 - Denotes Proposed Bridge
 - Denotes Proposed 10' Shared Use Path
 - Denotes Proposed Curb Ramp
 - Denotes Proposed Grassed Areas
 - Denotes Existing Buildings
 - Denotes Proposed St'd.MS-1 or IA Req'd.
 - Denotes Demo of Pavement
 - Denotes Proposed Sound Walls
 - Denotes Proposed Retaining Walls
 - Denotes Proposed Right of Way
 - Denotes Prop.Temp.Constr.Ease.



END SOUND BARRIER WALL 5
 POT STA.75+01.78
 INTERSTATE 581 CONST. @
 STA.267+50.05 117.11' LT.

End Project
 0581-128-109, RW-201, C-501
 Station 267+50.00

END SOUND BARRIER WALL 7
 POT STA.94+00.21
 INTERSTATE 581 CONST. @
 STA.267+49.92 105.09' RT.





American Infrastructure



Rinker Design Associates

The AI Team Concept Plan

Plan Sheet (Exhibit 11)

Page

49

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	12



- Roadway Legend
- Denotes Proposed Pavement
 - Denotes Proposed Bridge
 - Denotes Proposed 10' Shared Use Path
 - Denotes Proposed Curb Ramp
 - Denotes Proposed Grassed Areas
 - Denotes Existing Buildings
 - Denotes Proposed St'd.MS-1 or IA Req'd.
 - Denotes Demo of Pavement
 - Denotes Proposed Sound Walls
 - Denotes Proposed Retaining Walls
 - Denotes Proposed Right of Way
 - Denotes Prop.Temp.Constr.Ease.

Curve VVB-2
 PI • 337+49.29
 DELTA • 12° 01' 59.5" (LT)
 D • 6' 21' 4"
 T • 94.93'
 L • 189.16'
 R • 900.68'
 PC • 336+54.36
 PT • 338+43.52
 V • 30mph
 e • 2.0% TC=5.04 ULS

Curve VVB-3
 PI • 341+40.25
 DELTA • 6° 22' 25.1" (LT)
 D • 11' 27' 33"
 T • 296.72'
 L • 535.59'
 R • 500.00'
 PCC • 338+43.52
 PT • 343+79.11
 V • 30mph
 e • 2.0% TC=5.04 ULS

STA. 335+91.35
 STD.CG-11 RECD. TYPE N
 W-24' GRADE - 1.0%

DAYTON HUDSON CORPORATION
 Instr. 970019385
 T.M. 2250101
 9.952 Ac.

End Construction
 0581-128-109, RW-201, C-501
 Station 339+42.89

ECM ROANOKE, LLC
 Instr. 060017673
 T.M. 2250117
 7.111 Ac.

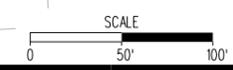
CITY OF ROANOKE
 D.B. 1066 PG. 375
 T.M. 2250102
 15.952 Ac.

MATCH LINE STA. 334+50 SEE EXHIBIT 7

TEMP. CONST. EASE.
 Prop. R/W

EXIST. R/W & L/A LINE
 Prop. R/W

PROP. PERM. DRAINAGE EASE.

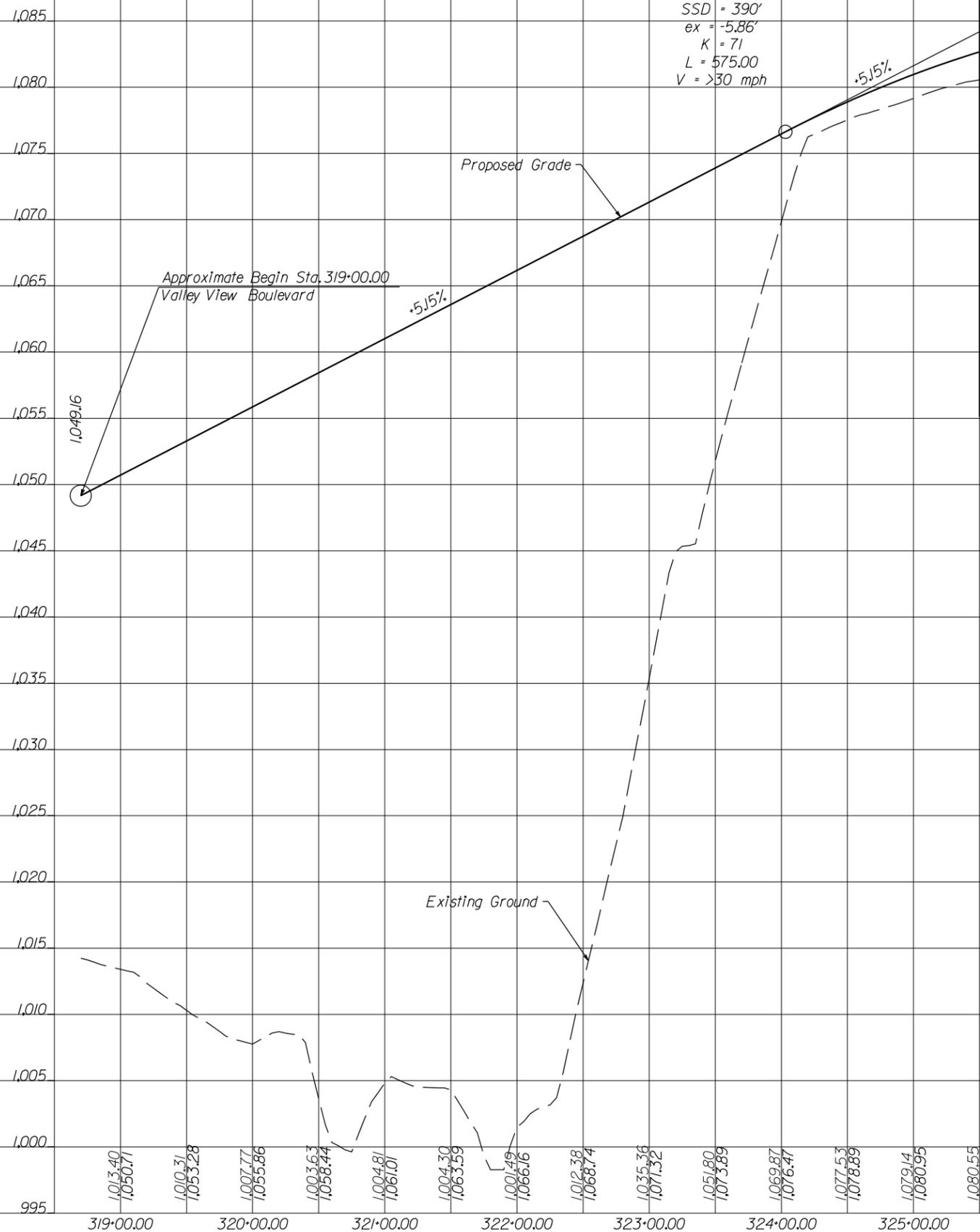


The AI Team Concept Plan
 Plan Sheet (Exhibit 12)

VALLEY VIEW BLVD. PROFILE SECTION I

STA = 326+90.59
 EL = 1,091.44
 SSD = 390'
 ex = -5.86'
 K = 71
 L = 575.00
 V = >30 mph

Scale: 1"=100' HORIZ
1"=10' VERT



REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	13



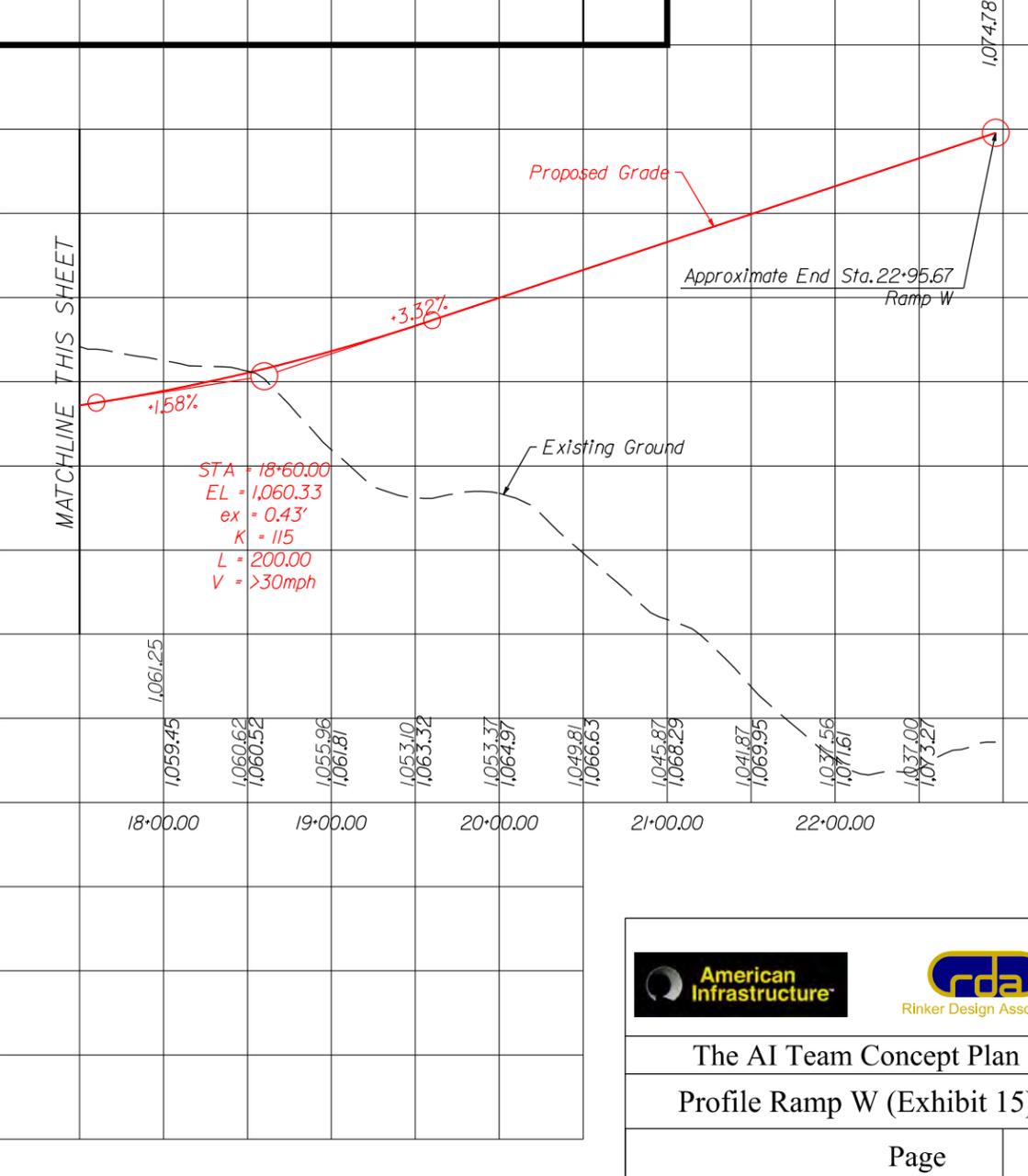
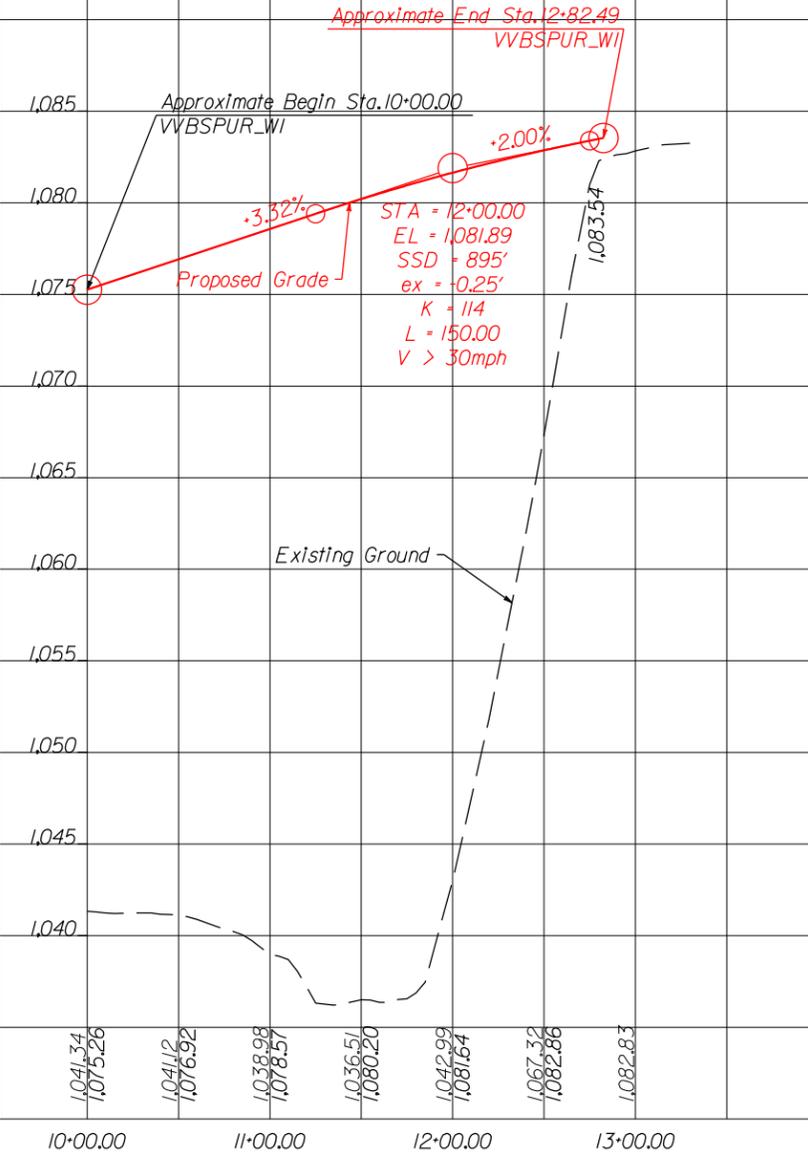
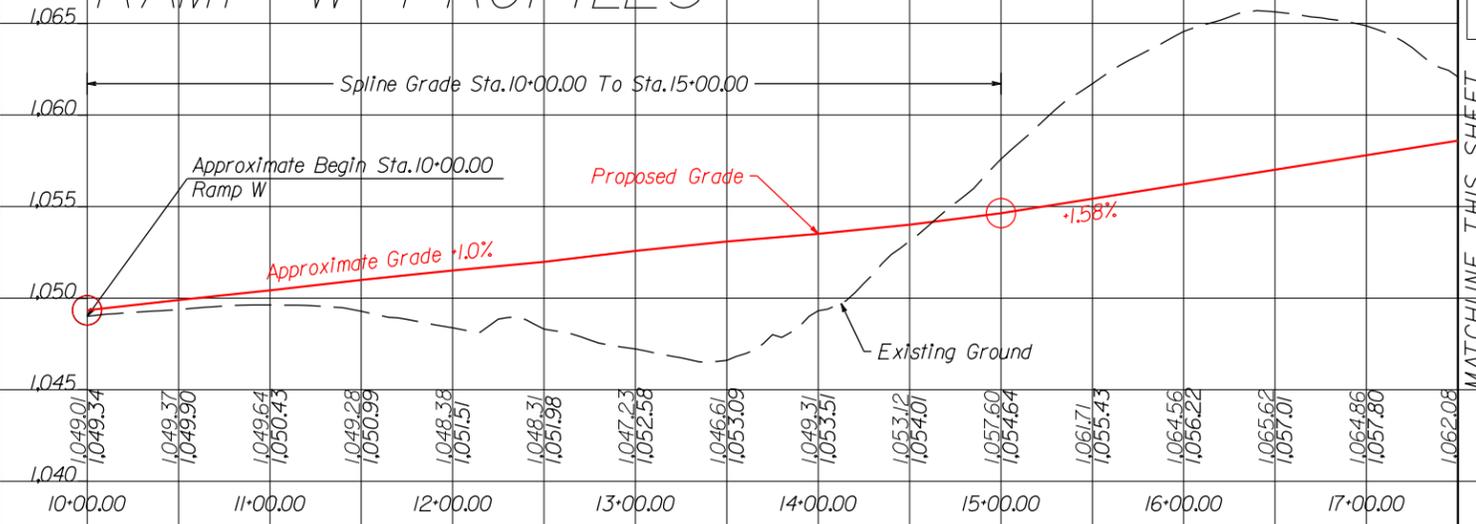
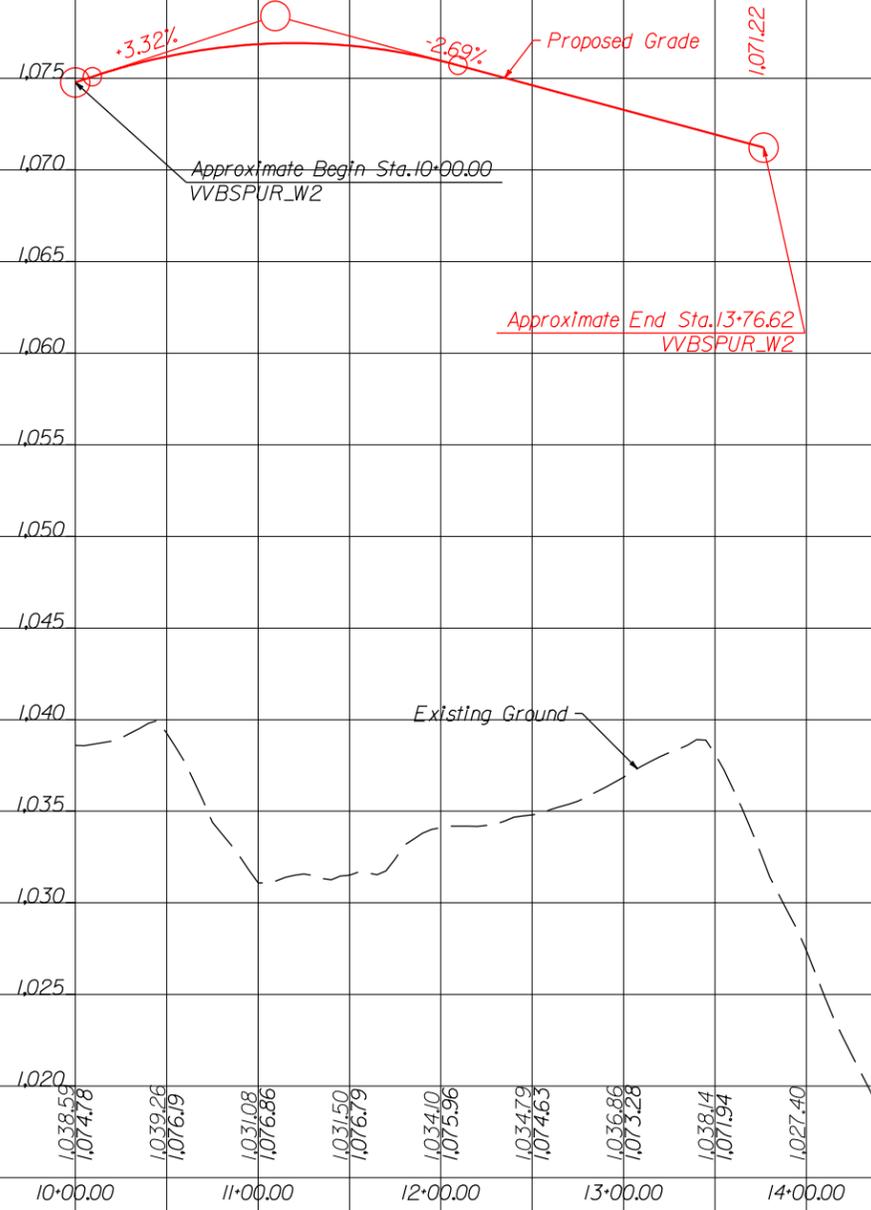
The AI Team Concept Plan
Profile Valley View (Exhibit 13)

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	15

Scale: 1"=100' HORIZ
1"=10' VERT

RAMP W PROFILES

STA = 11+09.39
 EL = 1,078.41
 SSD = 280'
 ex = -1.50'
 K = 33
 L = 200.00
 V = > 30mph

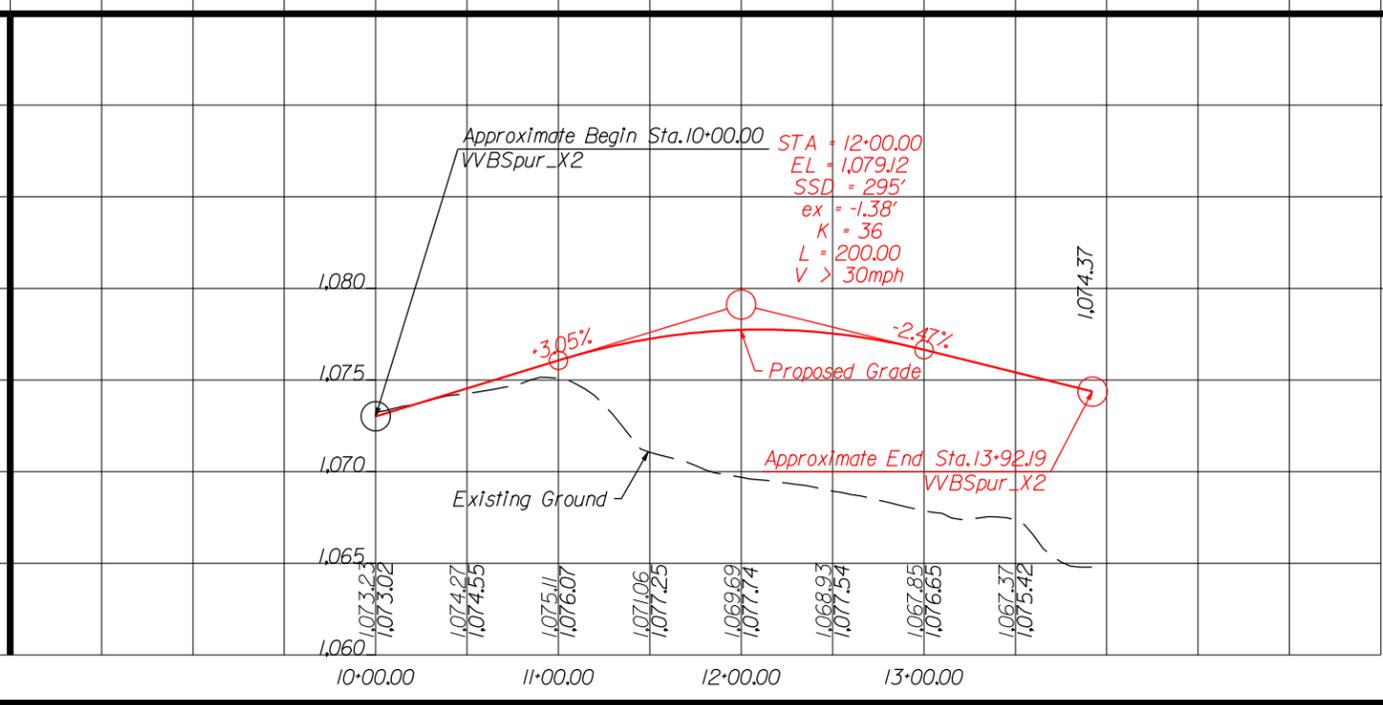
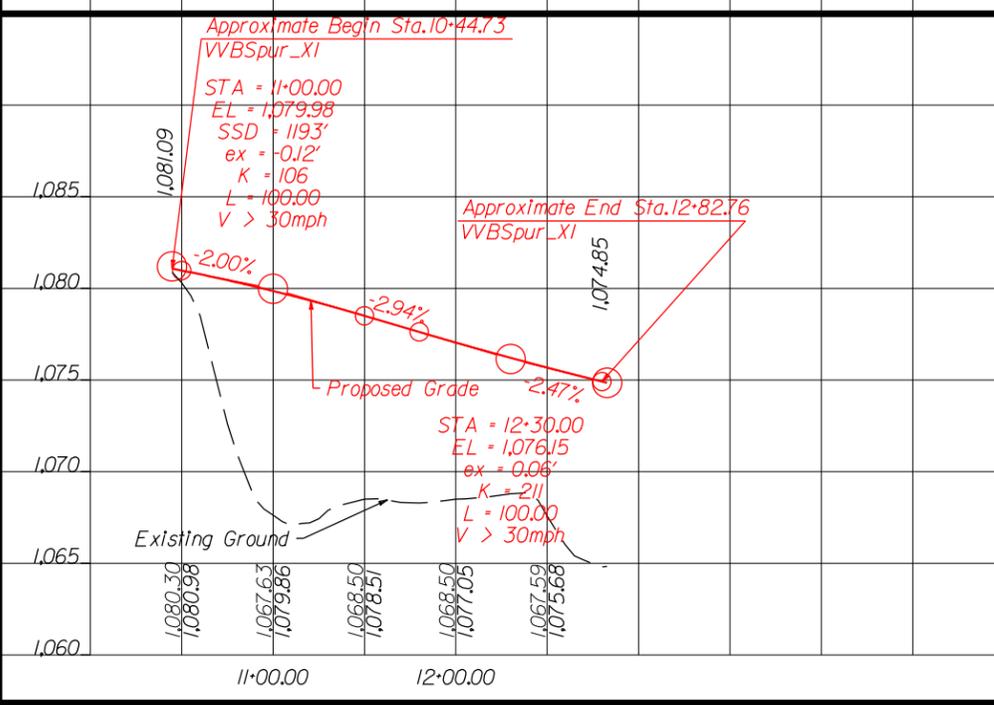
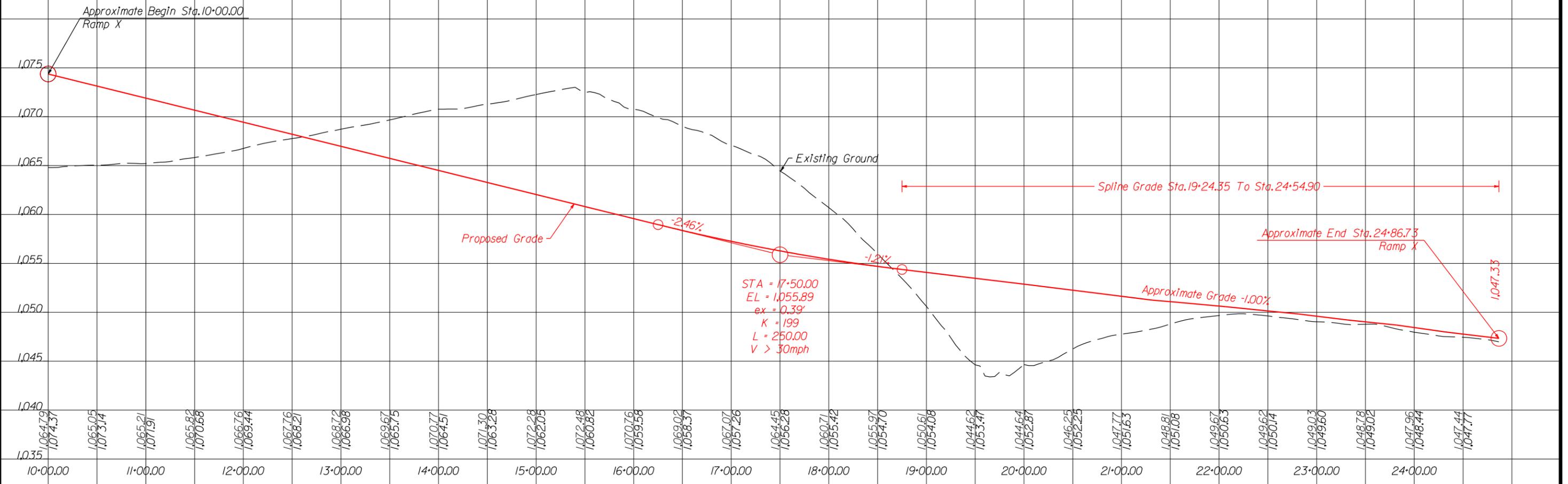


The AI Team Concept Plan
Profile Ramp W (Exhibit 15)

RAMP X PROFILES

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	16

Scale: 1"=100' HORIZ
1"=10' VERT






The AI Team Concept Plan

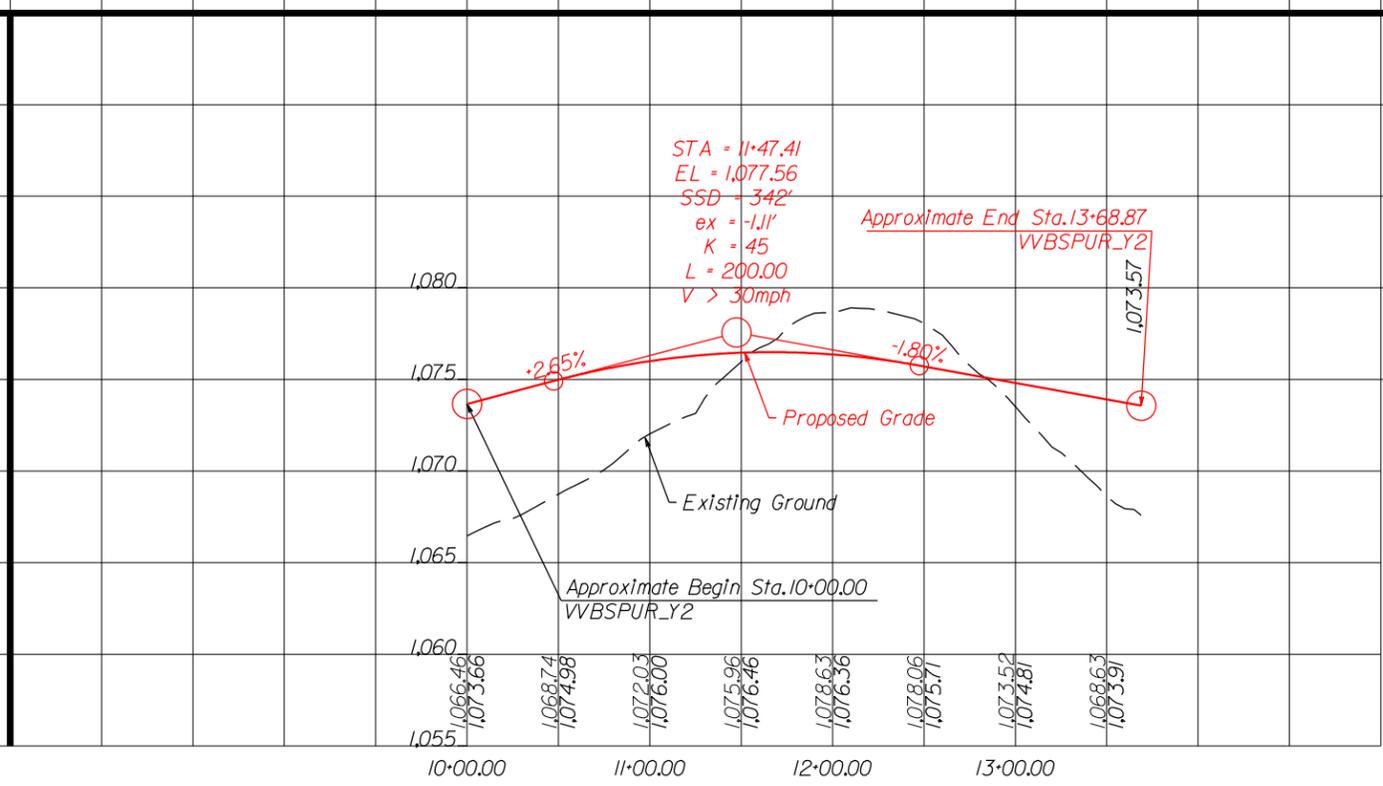
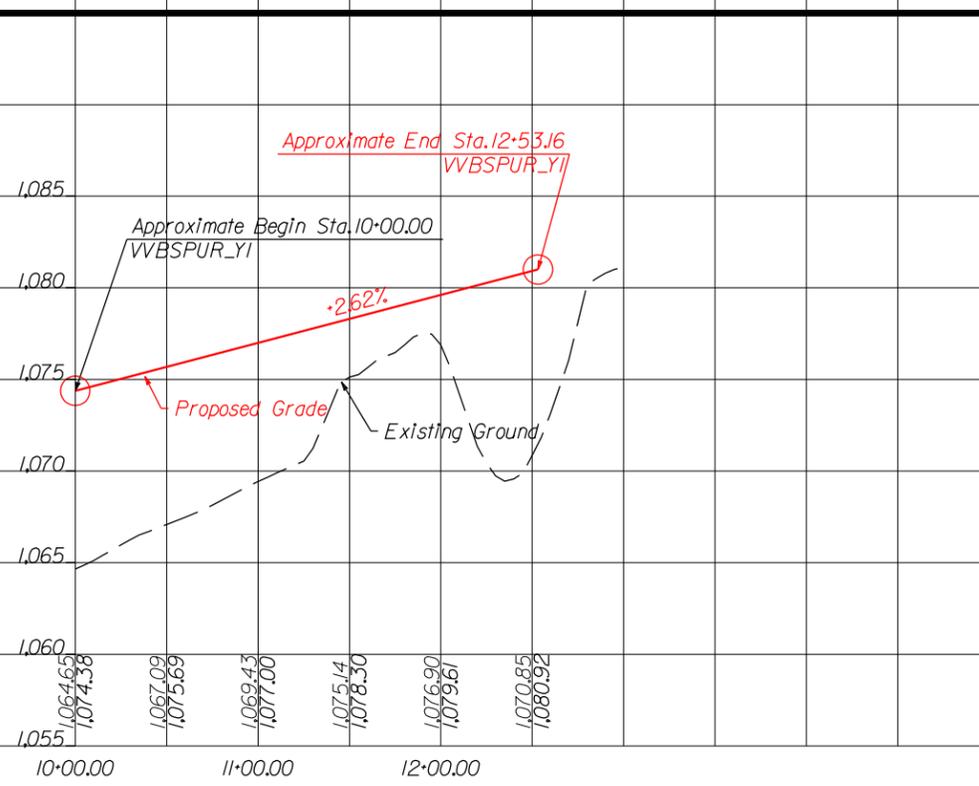
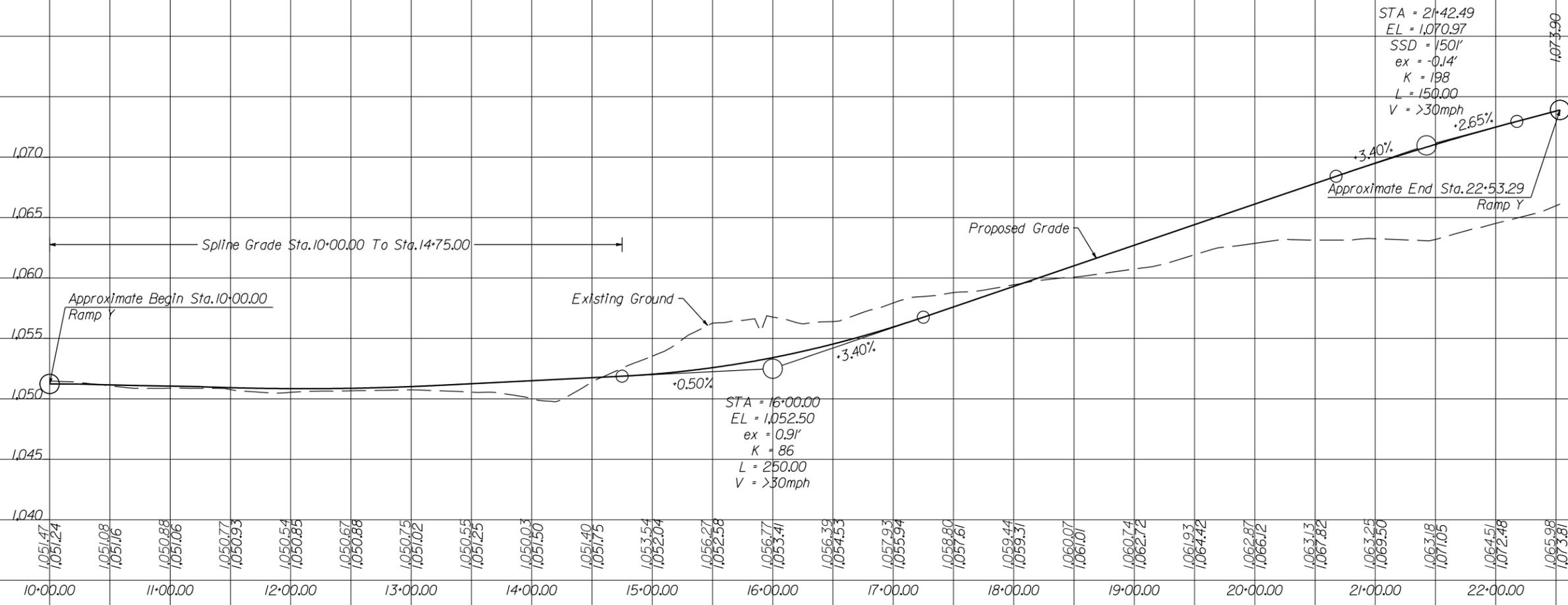
Profile Ramp X (Exhibit 16)

Page	54
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RAMP Y PROFILES

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	17

Scale: 1"=100' HORIZ
1"=10' VERT

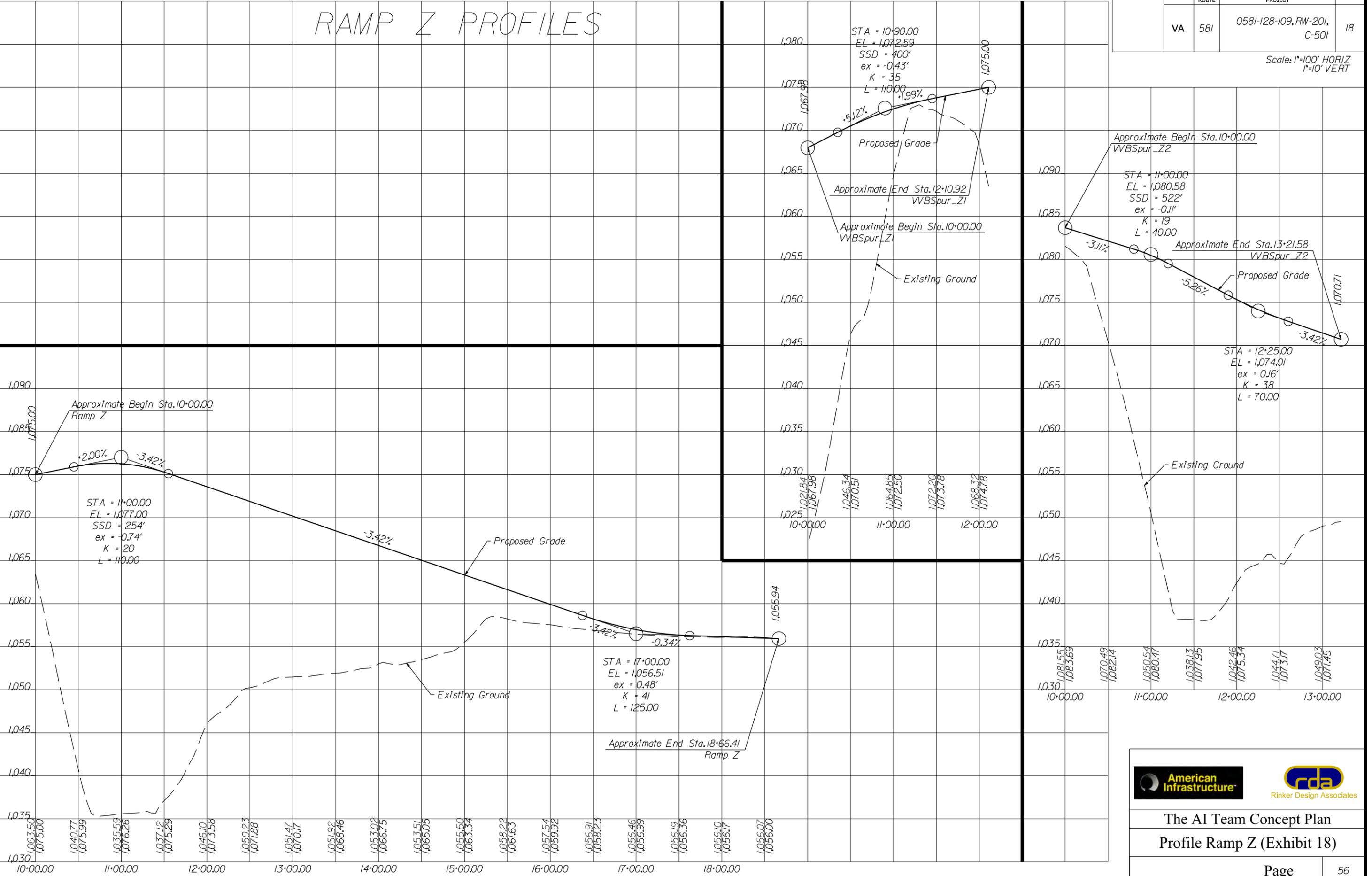


The AI Team Concept Plan
Profile Ramp Y (Exhibit 17)

RAMP Z PROFILES

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	18

Scale: 1"=100' HORIZ
1"=10' VERT

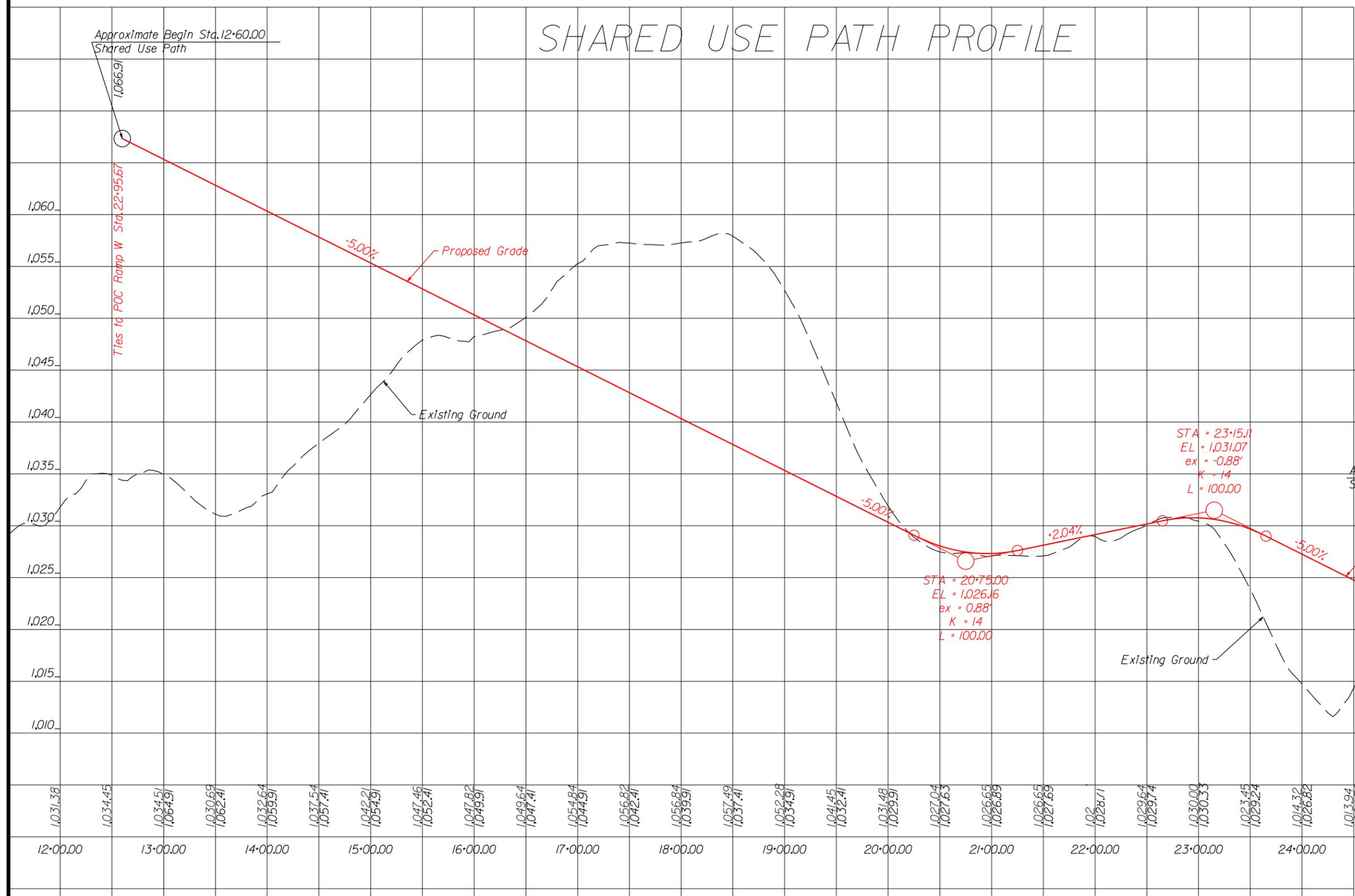


The AI Team Concept Plan
Profile Ramp Z (Exhibit 18)

SHARED USE PATH PROFILE

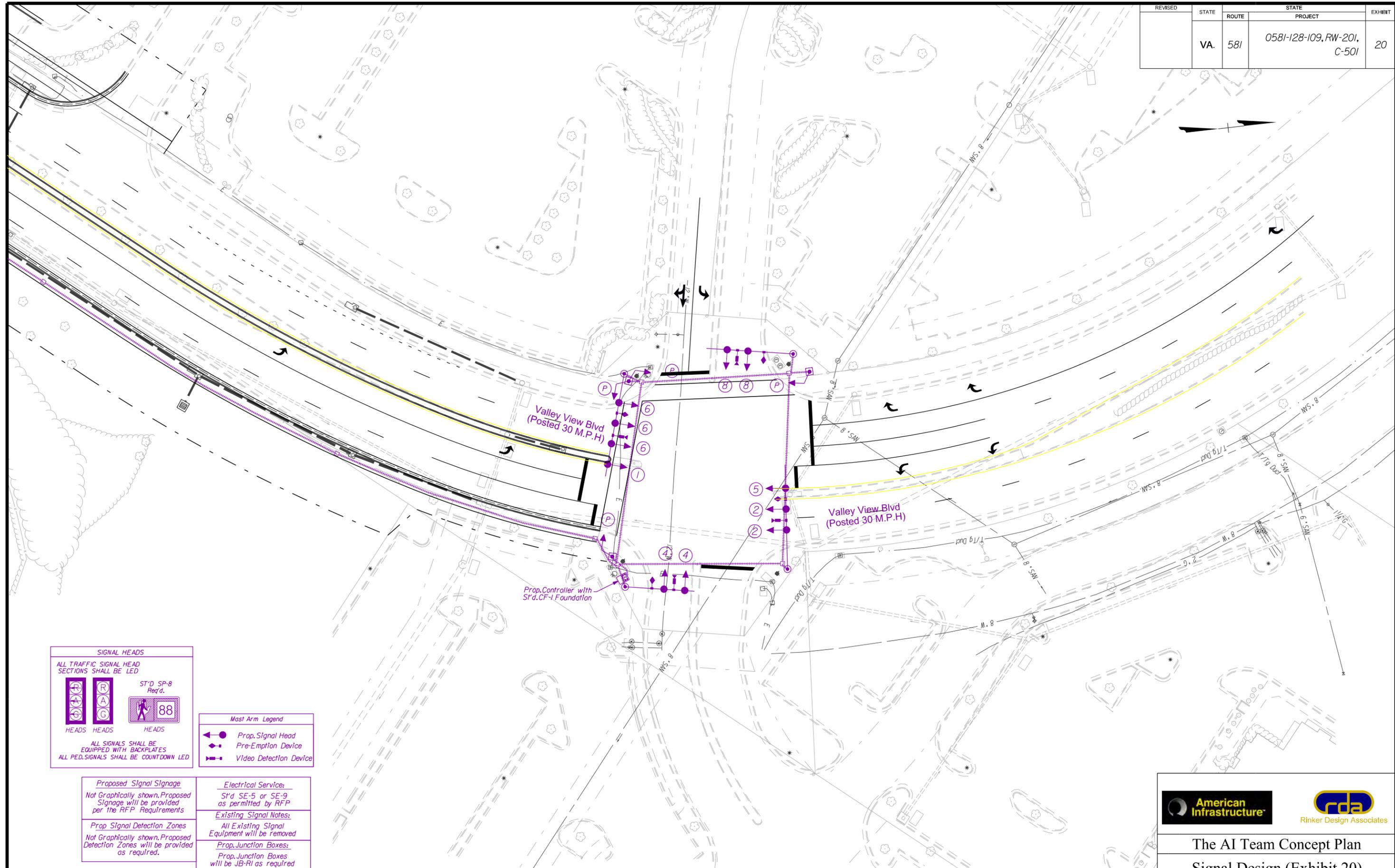
REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	19

Scale: 1"=100' HORIZ
1"=10' VERT



The AI Team Concept Plan
Profile Shared Use Path (Exhibit 19)

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	20



SIGNAL HEADS
ALL TRAFFIC SIGNAL HEAD SECTIONS SHALL BE LED

ST'D SP-8 Req'd.

ALL SIGNALS SHALL BE EQUIPPED WITH BACKPLATES
ALL PED. SIGNALS SHALL BE COUNTDOWN LED

Mast Arm Legend

- ◀● Prop. Signal Head
- ◀◆ Pre-Emption Device
- ▶ Video Detection Device

Proposed Signal Signage
Not Graphically shown. Proposed Signage will be provided per the RFP Requirements

Prop Signal Detection Zones
Not Graphically shown. Proposed Detection Zones will be provided as required.

Electrical Service:
S'd SE-5 or SE-9 as permitted by RFP

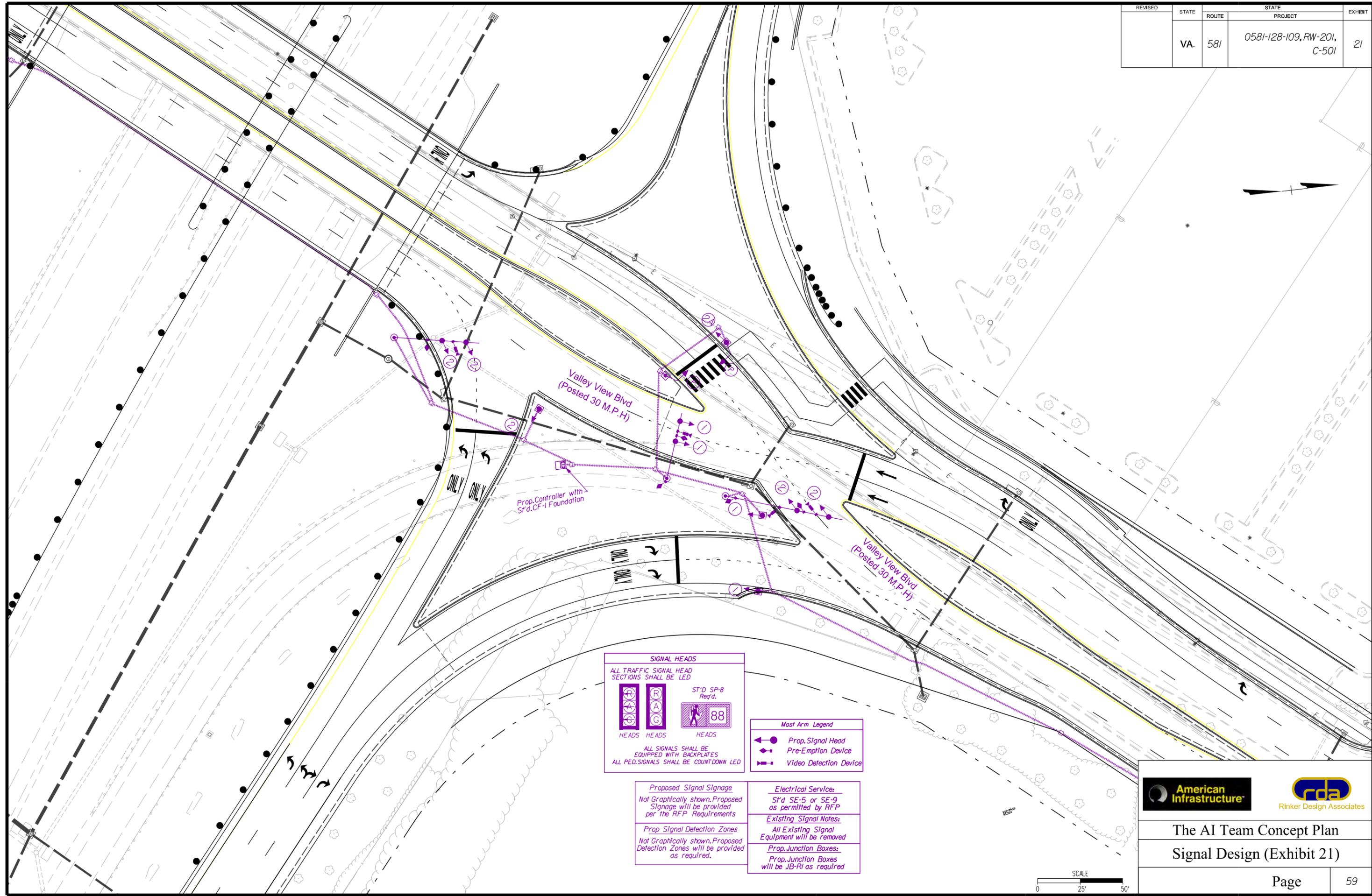
Existing Signal Notes:
All Existing Signal Equipment will be removed

Prop. Junction Boxes:
Prop. Junction Boxes will be JB-RI as required



The AI Team Concept Plan
Signal Design (Exhibit 20)

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	21



SIGNAL HEADS
 ALL TRAFFIC SIGNAL HEAD SECTIONS SHALL BE LED

HEADS HEADS HEADS

ALL SIGNALS SHALL BE EQUIPPED WITH BACKPLATES
 ALL PED. SIGNALS SHALL BE COUNTDOWN LED

Mast Arm Legend

- ◀ Prop. Signal Head
- ▶ Pre-Emption Device
- ▬ Video Detection Device

Proposed Signal Signage
 Not Graphically shown. Proposed Signage will be provided per the RFP Requirements

Prop. Signal Detection Zones
 Not Graphically shown. Proposed Detection Zones will be provided as required.

Electrical Service:
 S'd SE-5 or SE-9 as permitted by RFP

Existing Signal Notes:
 All Existing Signal Equipment will be removed

Prop. Junction Boxes:
 Prop. Junction Boxes will be JB-R1 as required



The AI Team Concept Plan
 Signal Design (Exhibit 21)

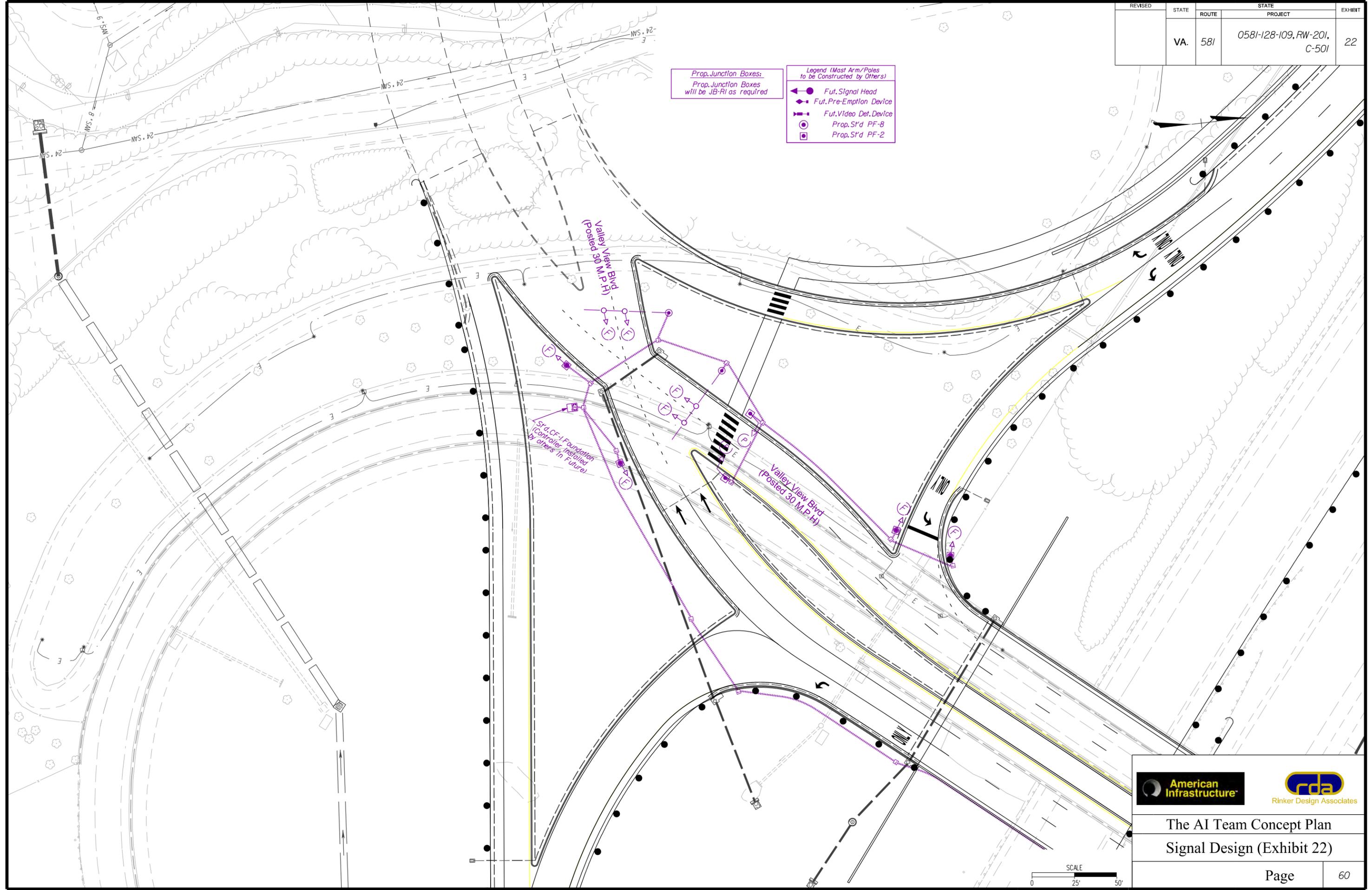


REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	22

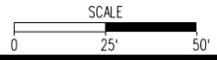
Prop. Junction Boxes:
Prop. Junction Boxes will be JB-RI as required

Legend (Mast Arm/Poles to be Constructed by Others)

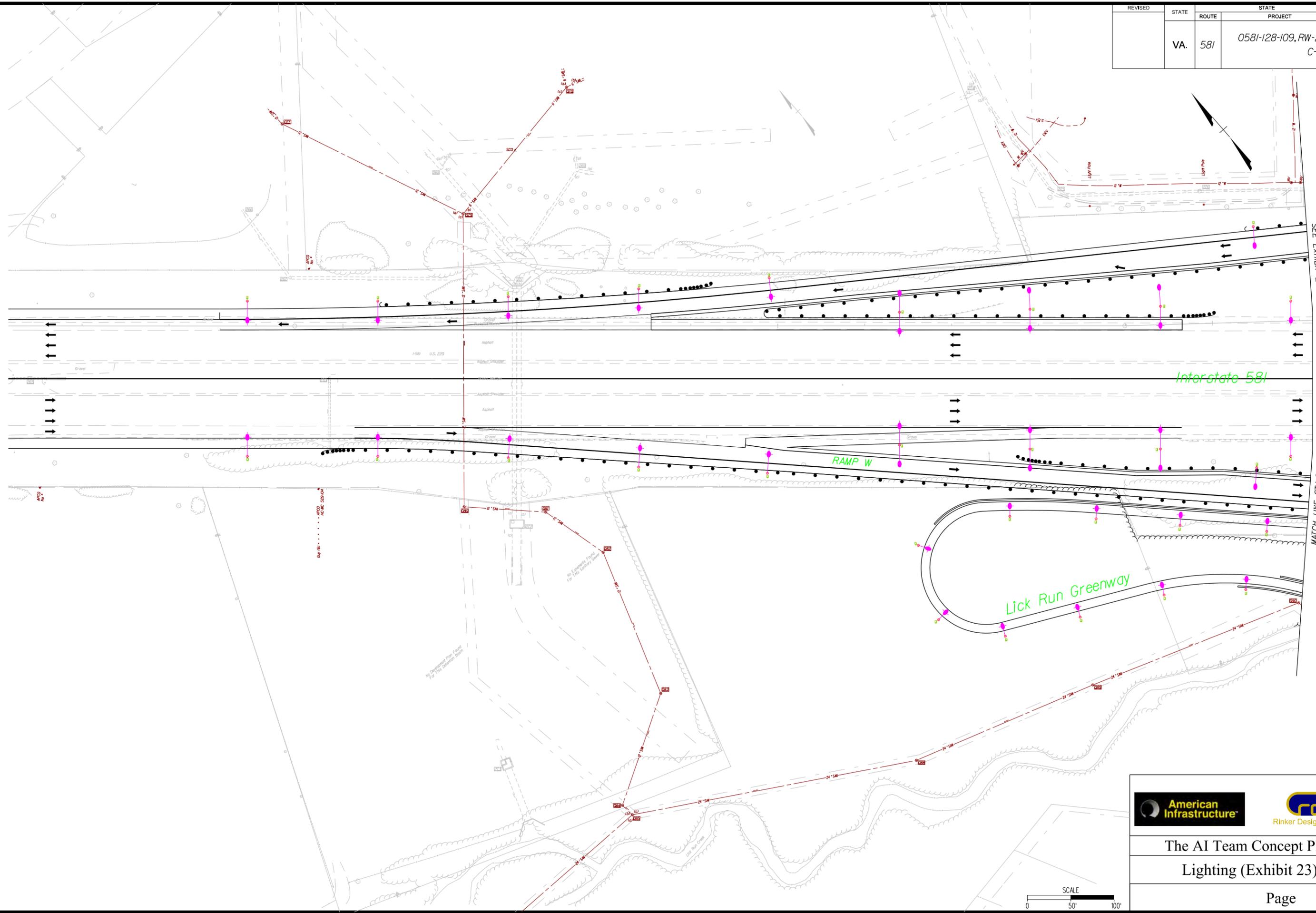
- ◀● Fut. Signal Head
- ◀◀ Fut. Pre-Emption Device
- ▶▶ Fut. Video Det. Device
- Prop. Std. PF-8
- ◻ Prop. Std. PF-2



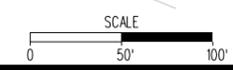
The AI Team Concept Plan
Signal Design (Exhibit 22)



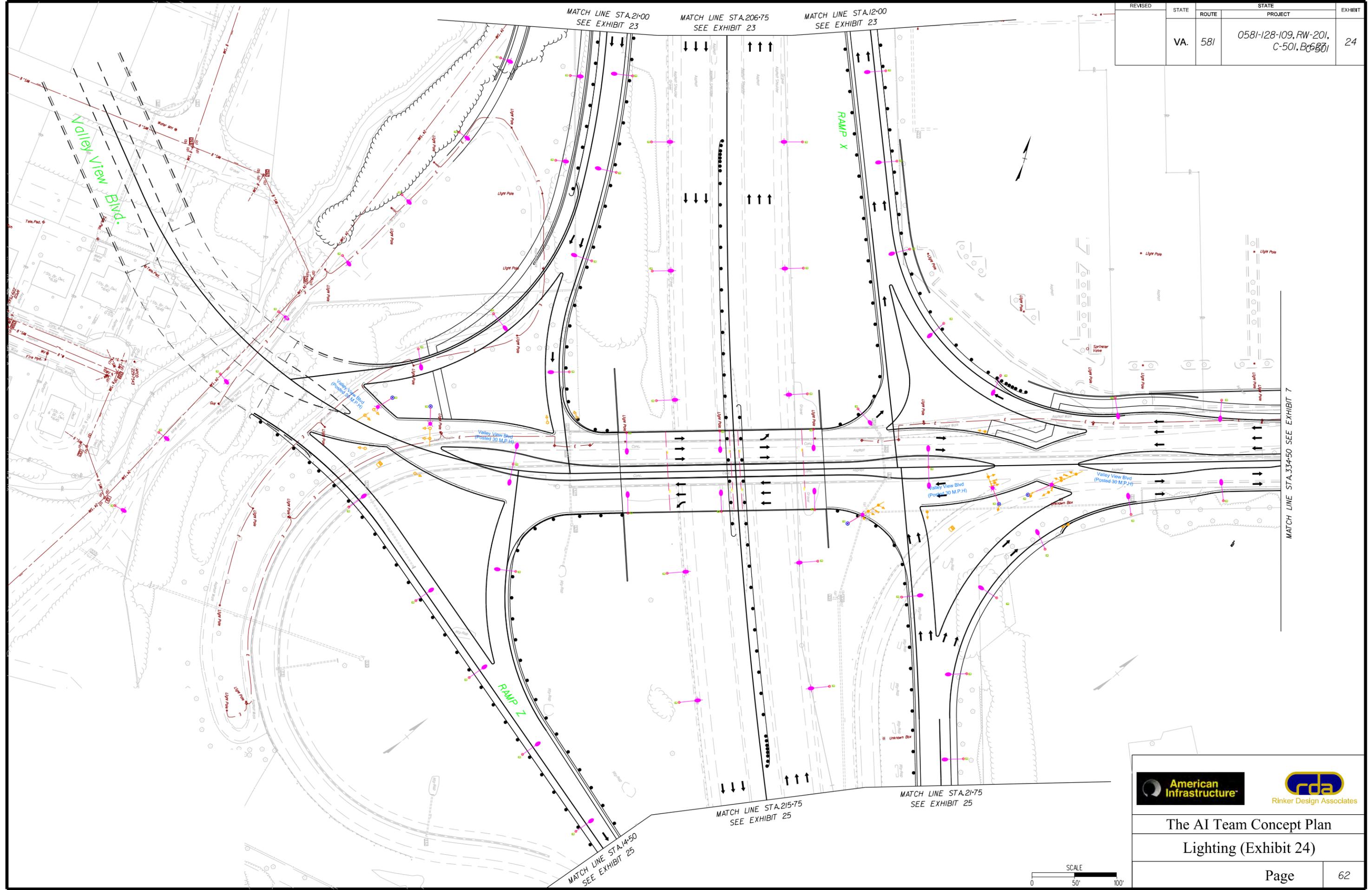
REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	23



The AI Team Concept Plan
Lighting (Exhibit 23)



REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501, B-501	24

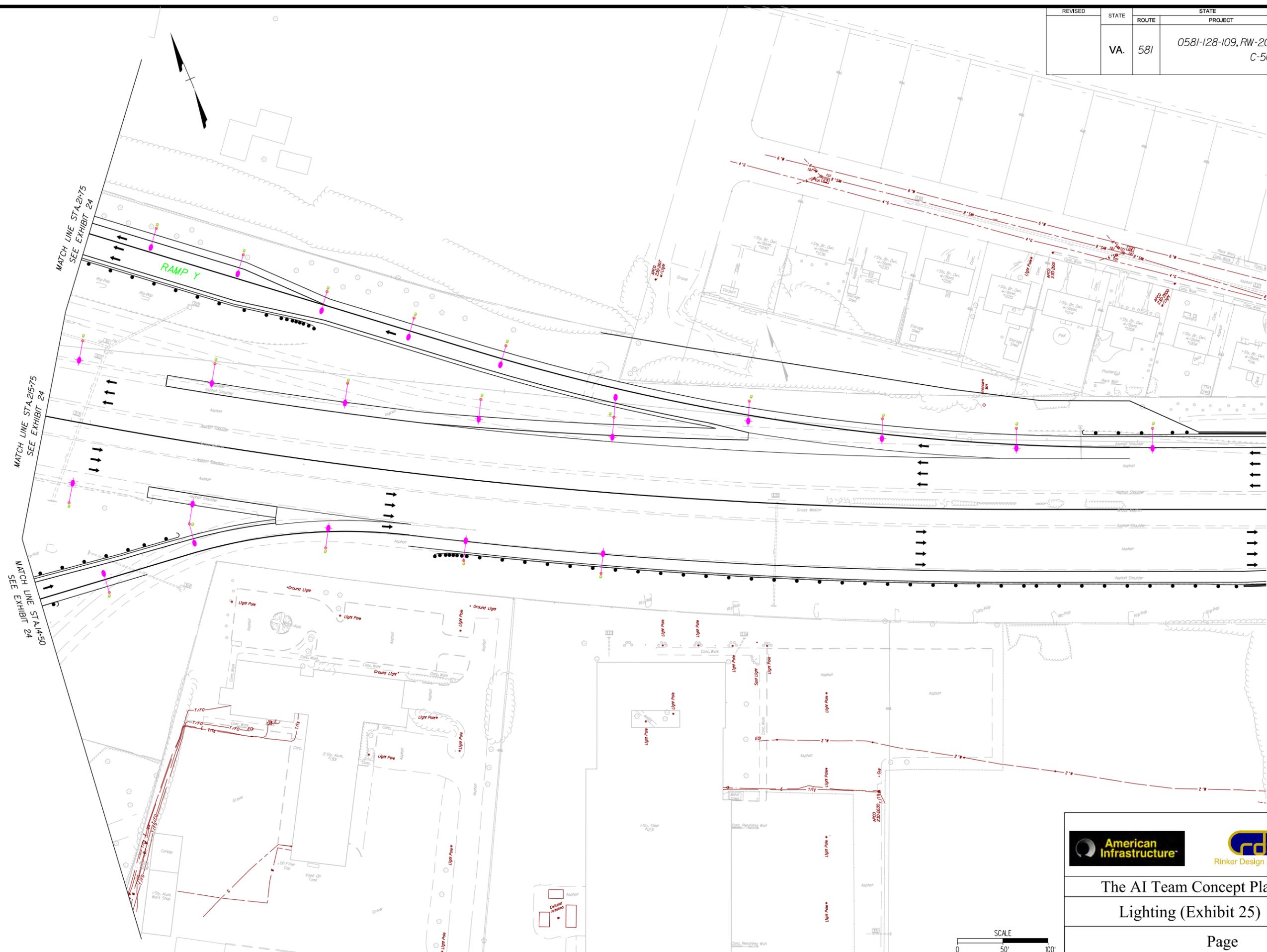


MATCH LINE STA. 33+50 SEE EXHIBIT 7



The AI Team Concept Plan
Lighting (Exhibit 24)

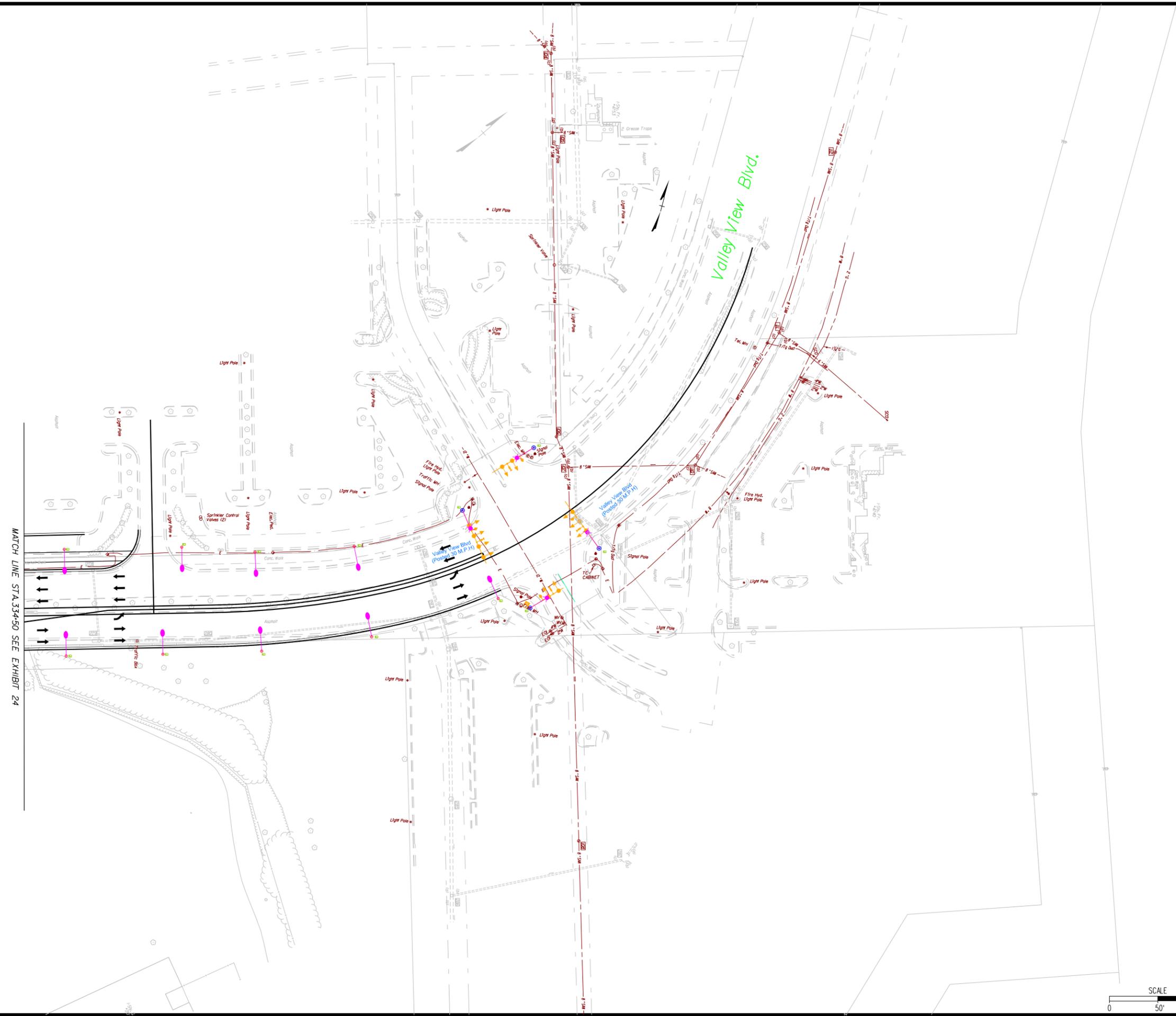
REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	25



The AI Team Concept Plan
Lighting (Exhibit 25)



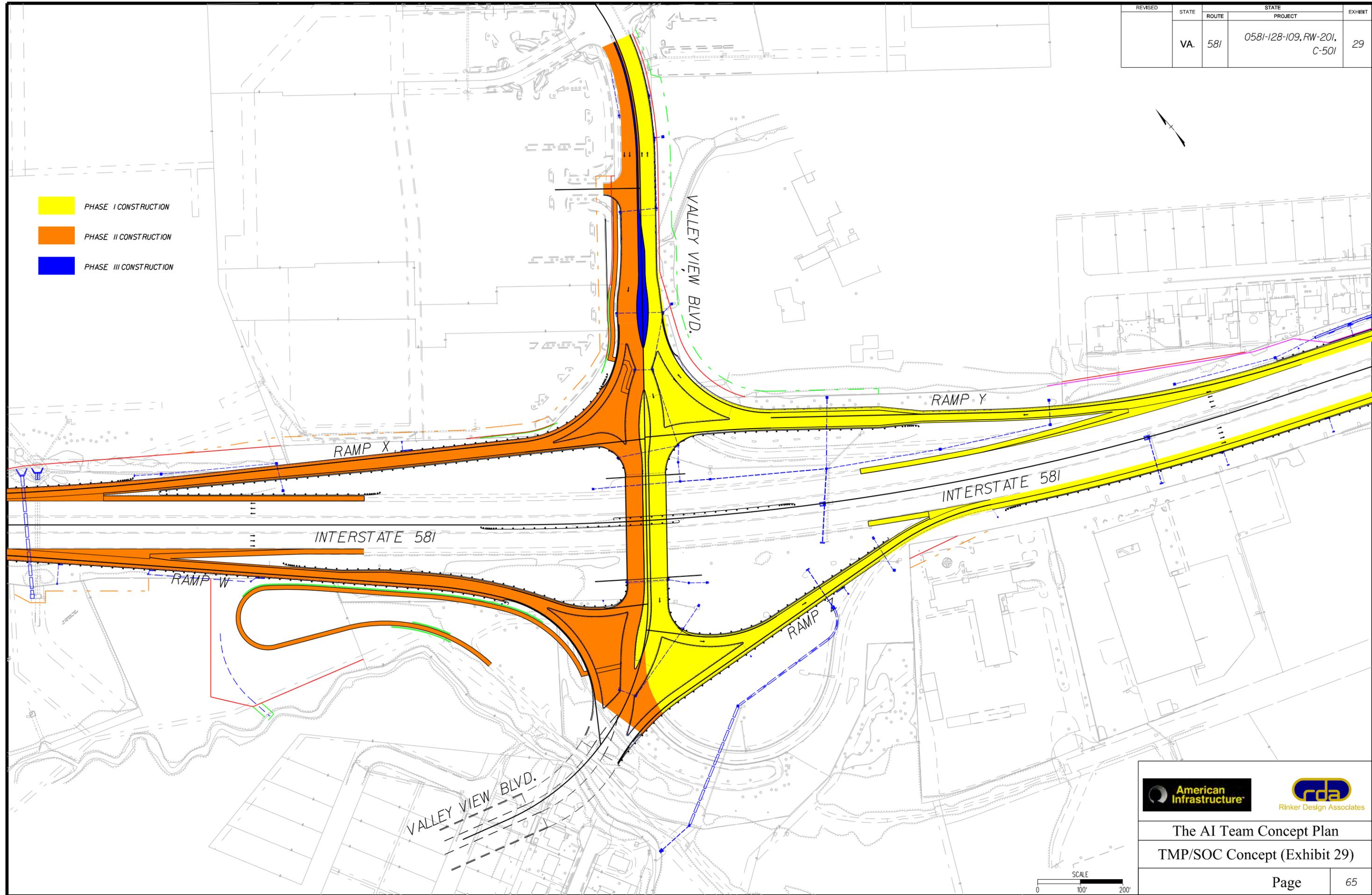
REVISED	STATE	STATE PROJECT		EXHIBIT
		ROUTE		
	VA.	581	0581-128-109, RW-201, C-501	26



The AI Team Concept Plan
 Lighting (Exhibit 26)

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	29

- PHASE I CONSTRUCTION
- PHASE II CONSTRUCTION
- PHASE III CONSTRUCTION



The AI Team Concept Plan
 TMP/SOC Concept (Exhibit 29)



STATE	FEDERAL AID		STATE		EXHIBIT
VA.	ROUTE	PROJECT	ROUTE	PROJECT	
NBIS Number:			UPC No. 16595		30
Federal Oversight Code: N/A			FHWA Construction and Scour Code: X271-SN		

DESIGN EXCEPTION(S):
GENERAL NOTES:

Width: 39'-0" roadway, 15'-8" pedestrian walkway, 39'-0" roadway.
Overall width 93'-8" face-to-face of rails. Includes widening of 31'-4" to right of traffic.

Span layout: 135' - 103' continuous steel plate girder spans.

Capacity: HL-93 loading.

Specifications:

Construction: Virginia Department of Transportation Road and Bridge Specifications, 2007.

Design: AASHTO LRFD Bridge Design Specifications, 5th Edition, 2010; 2010 Interim Specifications and VDOT Modifications.

Standards: Virginia Department of Transportation Road and Bridge Standards, 2008.

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

This project is to be constructed in accordance with the Virginia Department of Transportation Work Area Protection Manual, May 2005 and latest revisions.

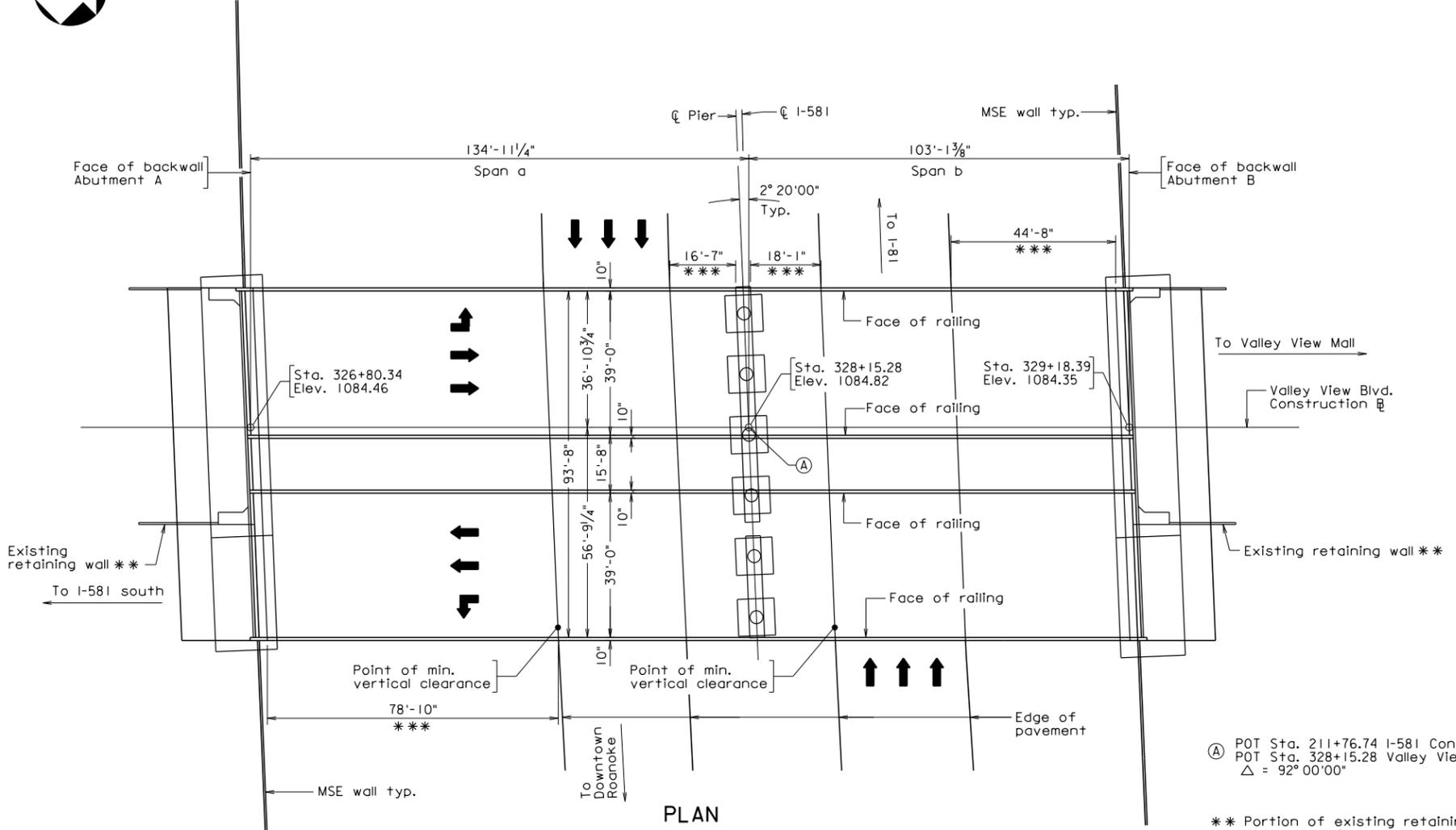
All structural steel, except in bearings and sole plates, shall be ASTM A709 Grade 50W and shall be unpainted except as required by Section 407 of the Specifications. Structural steel in bearings and sole plates shall be ASTM A709 Grade 36 and shall be painted.

Concrete in superstructure including railings shall be Class A4; Class A3 in substructure.

Low permeability concrete shall be used in this project.

All reinforcing steel shall be deformed and shall conform to ASTM A615, Grade 60 except for reinforcing steels noted as CRR (corrosion resistant reinforcing) which shall conform to applicable specifications noted in the special provision. All reinforcing bar dimensions on the detailed drawings are to centers of bars except where otherwise noted and are subject to fabrication and construction tolerances.

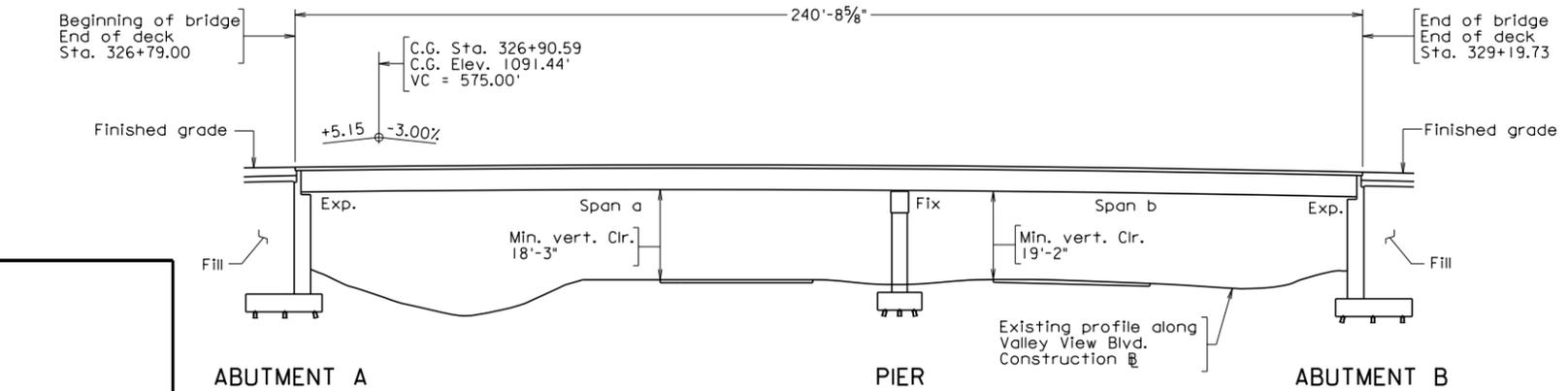
Corrosion resistant reinforcing (CRR) steels shall conform to one or more of the three types (low carbon/chromium, stainless clad and solid stainless) listed in the special provision. The minimum yield strength shall be: 100 ksi for low carbon/chromium and 60 ksi for stainless clad steel and solid stainless steel.



Ⓐ POT Sta. 211+76.74 I-581 Construction B
POT Sta. 328+15.28 Valley View Blvd. Construction B
Δ = 92° 00' 00"

** Portion of existing retaining wall to remain
*** Minimum horizontal clearance

PLAN



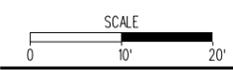
ELEVATION



COMMONWEALTH OF VIRGINIA
DEPARTMENT OF TRANSPORTATION
PROPOSED BRIDGE WIDENING ON
VALLEY VIEW BOULEVARD OVER INTERSTATE I-581
CITY OF ROANOKE - 4.0 MI. S. OF RTE. I-81
PROJ. 0581-128-109, B627

CLARK NEXSEN NORFOLK, VA STRUCTURAL ENGINEER
PLANS BY:
COORDINATED:
SUPERVISED: Achyut Patel
DESIGNED: Derrick M Keltner
DRAWN: William B Bennett
CHECKED: Daniel M Taylor

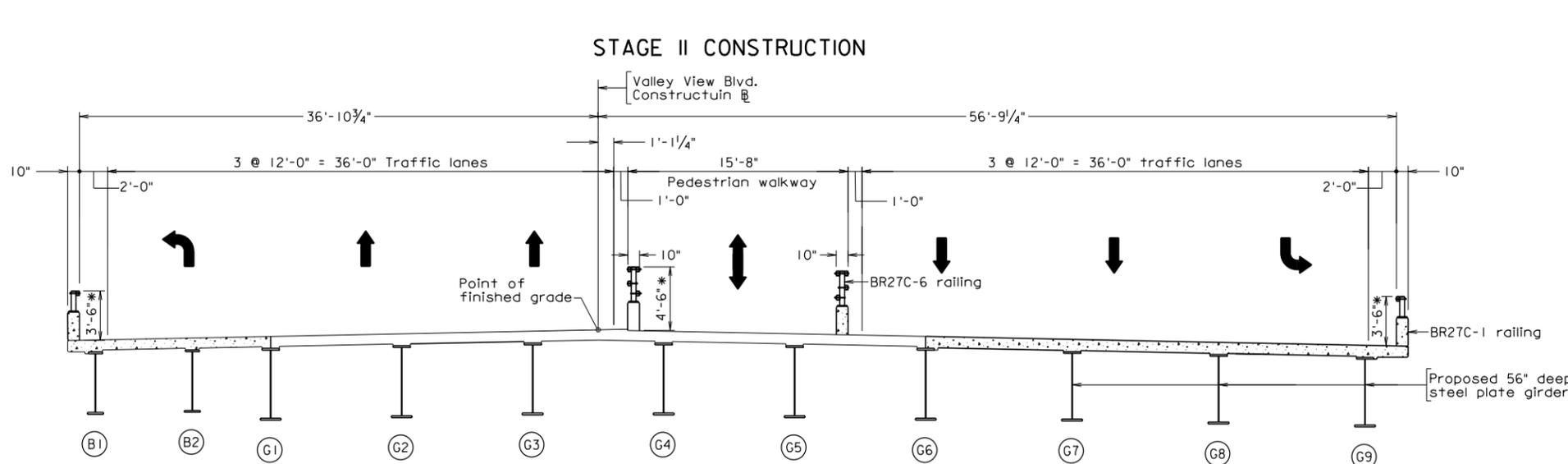
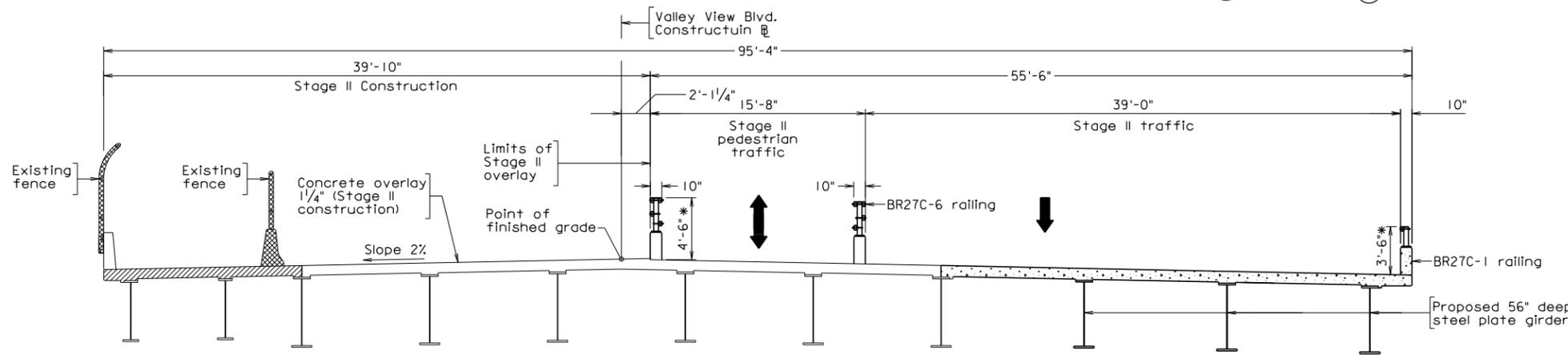
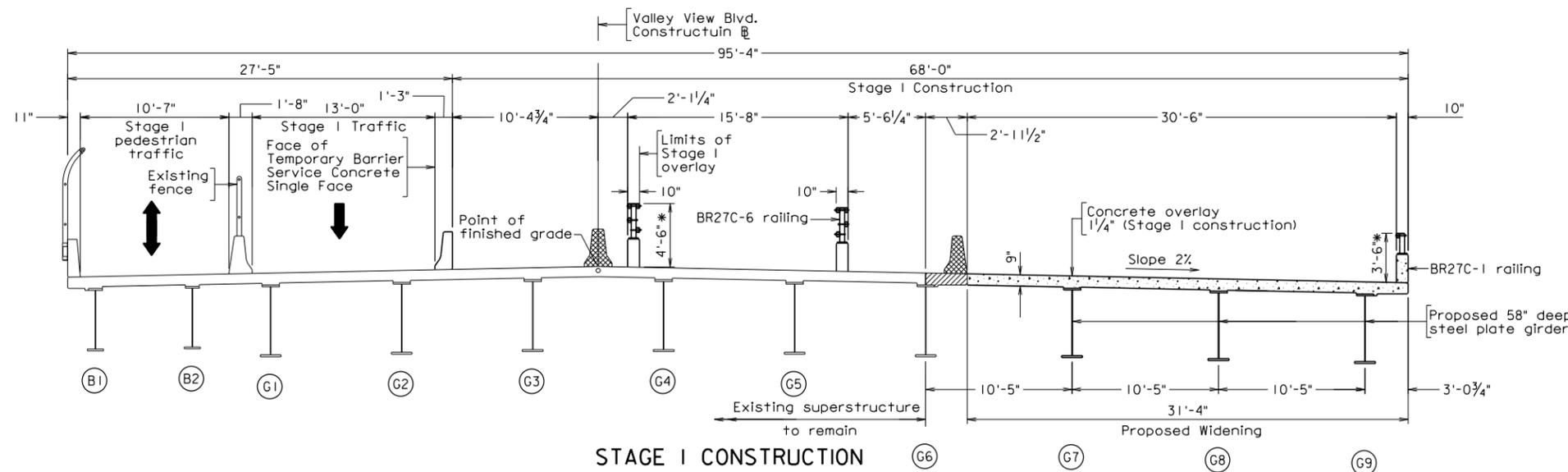
No.	Description	Date
REVISIONS		
For Table of Revisions, see Sheet 2.		



The AI Team Concept Plan	
276-84A (Exhibit 30)	
Page	66

Exhibit 030.dgn

STATE	FEDERAL AID		STATE		EXHIBIT
ROUTE	PROJECT	ROUTE	PROJECT		
VA.			0581-128-109, B627		3/



SEQUENCE OF CONSTRUCTION

STAGE I

Place Temporary Barrier Service Concrete on WBL as indicated.

Shift vehicle traffic as shown.

Demolish existing concrete shown hatched on the existing structure.

Demolish existing approach slabs, backwalls and end of deck slab at each abutment.

Begin rehabilitation at ends of deck slab, abutment backwalls and approach slabs.

Begin construction of proposed widening.

Place concrete overlay, to limits indicated.

Complete pier and abutment construction.

STAGE II

Remove Temporary Barrier Service Concrete on WBL.

Shift vehicle and pedestrian traffic to locations indicated.

Demolish existing concrete and fences shown hatched on the existing structure.

Demolish existing approach slabs, backwalls and end of deck slab at each abutment.

Begin rehabilitation at ends of deck slab, abutment backwalls and approach slabs.

Begin installation of new steel cross frames and stiffeners.

Begin construction of new concrete deck and railing.

Place concrete overlay, to limits indicated.

- Remove and replace portion of concrete
- Complete removal of existing element
- Existing structure
- * Measured from top of the concrete overlay

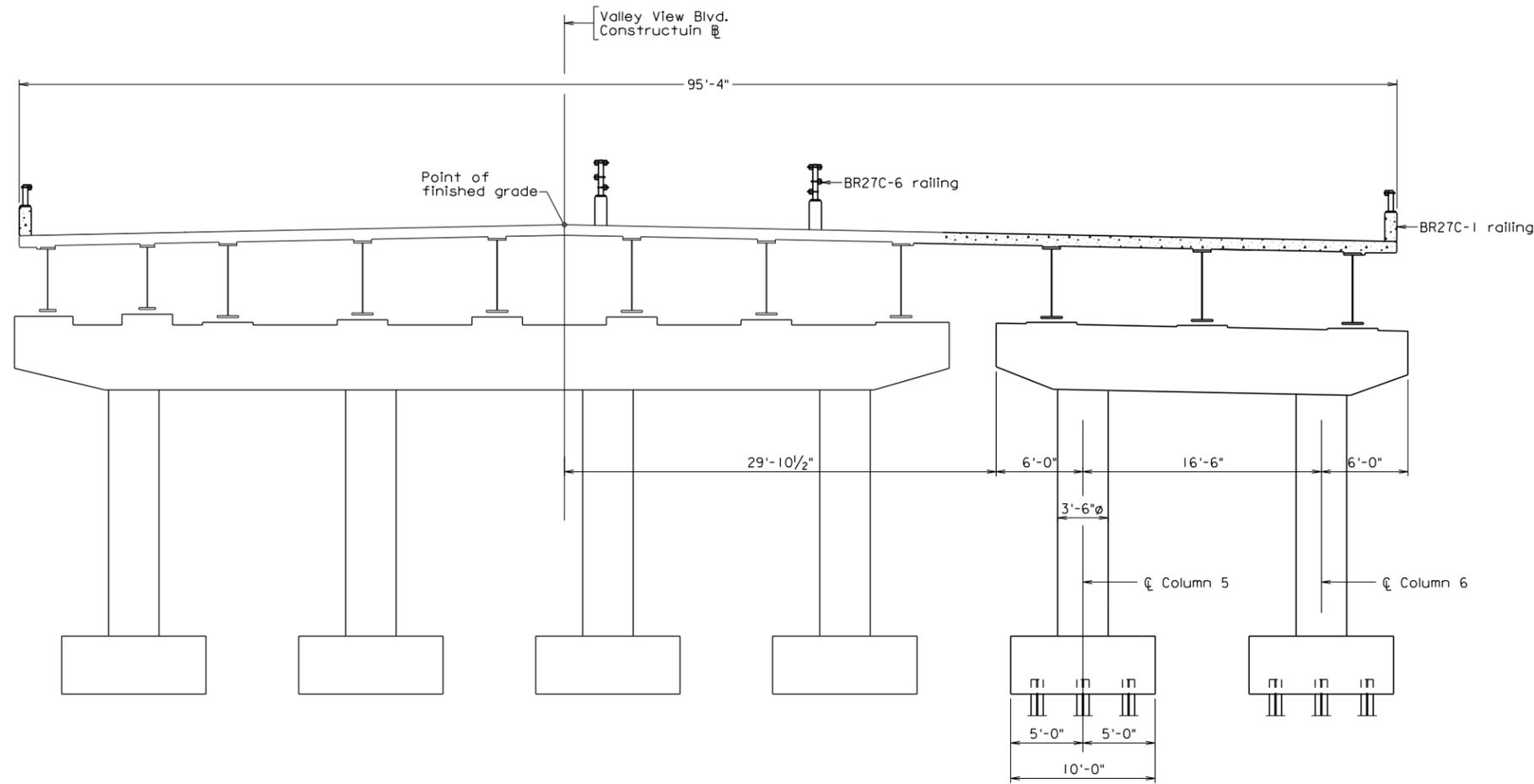
Exhibit 031.dgn

B276084A01

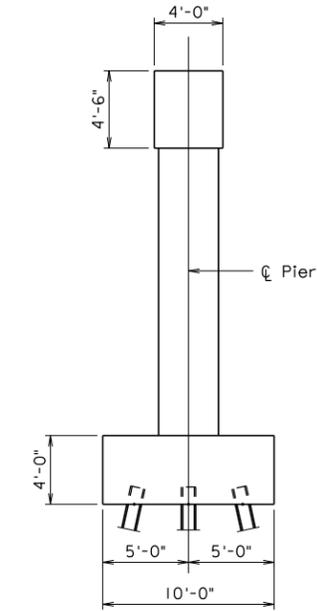
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STRUCTURE AND BRIDGE DIVISION			
The AI Team Concept Plan			
Sequence of Construction (Exhibit 31)			
276-84A			
No.	Description	Date	Designed: AP Drawn: WBB Checked: DBT
	Revisions		Date: July, 2012
			Plan No. Page
			Sheet No. 67



ELEVATION

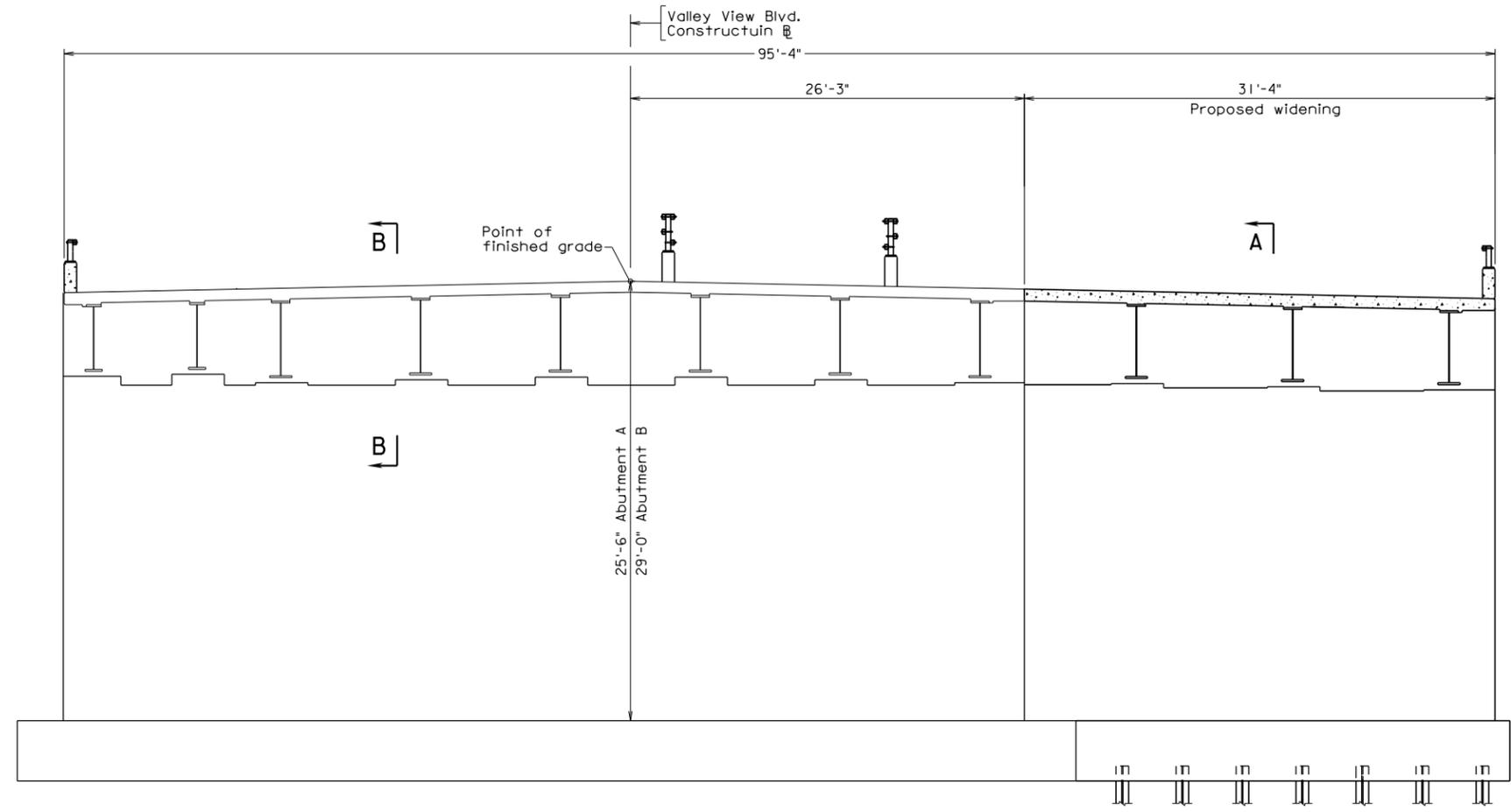


END VIEW

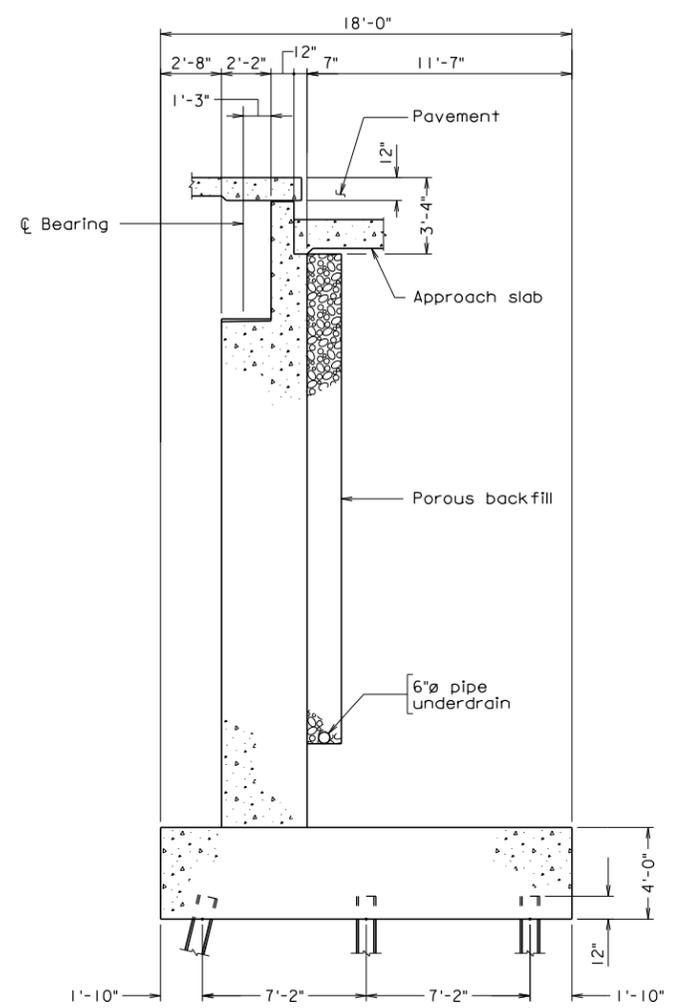
Exhibit 032.dgn

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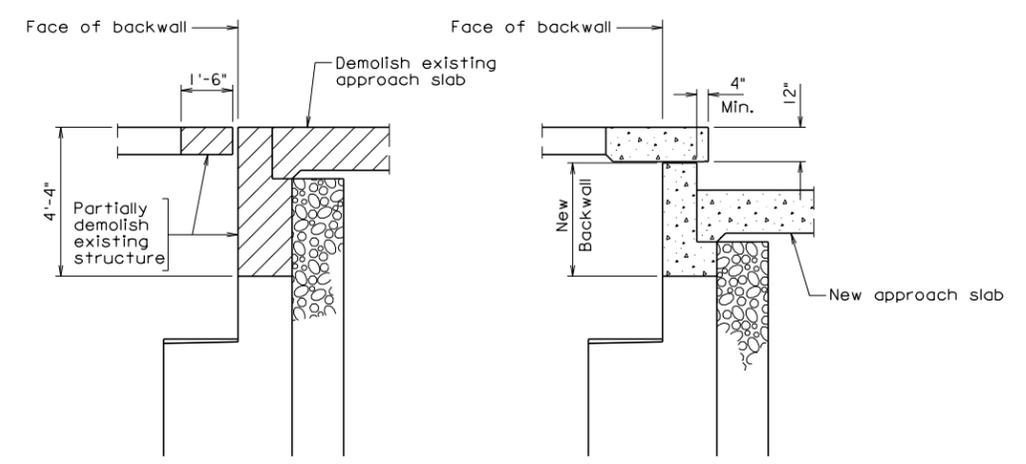
COMMONWEALTH OF VIRGINIA DEPARTMENT OF TRANSPORTATION			
STRUCTURE AND BRIDGE DIVISION			
The AI Team Concept Plan			
Pier Elevation (Exhibit 32)			
276-84A			
No.	Description	Date	Designed: ...DMK Date Drawn: ...WBR Checked: ...AP
	Revisions		July, 2012
			Page
			68



ELEVATION



SECTION A-A



EXISTING CONSTRUCTION NEW CONSTRUCTION

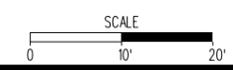
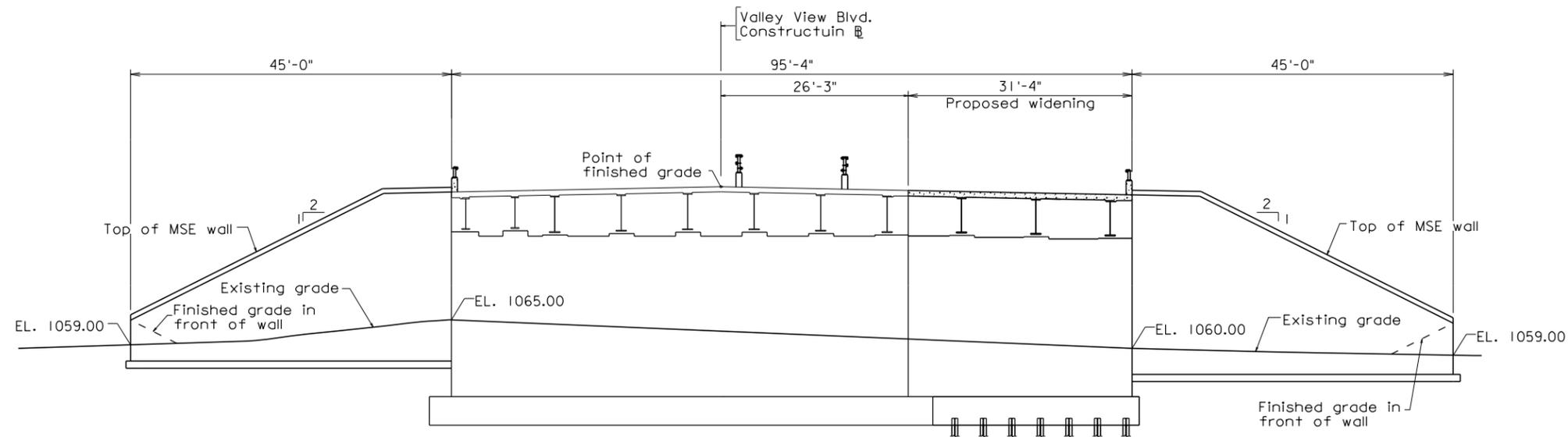
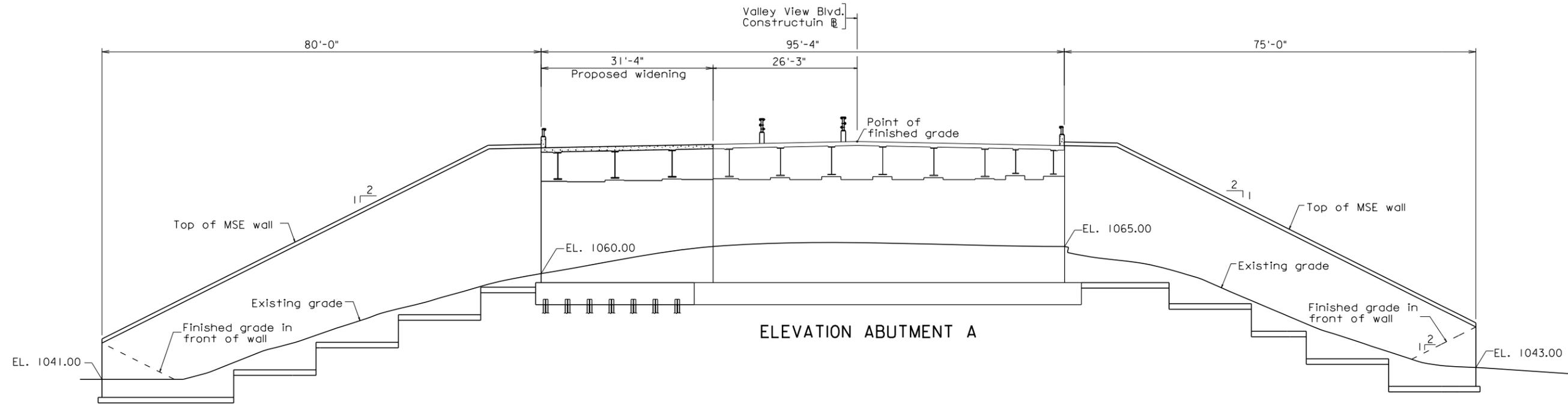
SECTION B-B

Exhibit 033.dgn

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The AI Team Concept Plan			
Abutment Elevation (Exhibit 33)			
276-84A			
No.	Description	Date	Designed:
			Drawn:
			Checked:
Revisions			Date: July, 2012 Plan No.: Sheet No.: 69

REVISED	STATE	ROUTE	STATE PROJECT	EXHIBIT
	VA.	581	0581-128-109, RW-201, C-501	34



The AI Team Concept Plan
Abutment & MSE Walls (Exhibit 34)

