



Addendum No. 1

DATE: February 8, 2024

Reference:	RFP# 1-005-24-0001
Description:	60% Engineering Design and related deliverables/New River Valley Passenger Rail Project
RFP Issue Date:	02/05/2024
Proposal Due:	<u>03/22/2024 (by 2:00 PM EST)</u>

TO ALL OFFERORS:

This Addendum No. 1 addresses broken email/website links within the RFP Documents and informs Offerors as to amendments within RFP Documents:

The corrected email/website links are as set forth below.

RFP Document Reference	Corrected Link
Cover Page, Access to Solicitation:	Current Contracting Opportunities - VPRA (vapassengerrailauthority.org)
Cover Page, Submit Proposals To & Notice:	proposals@vpra.virginia.gov
Cover Page, Notice	procurement@vpra.virginia.gov
Instructions to Offerors, Introduction Section 2.2	New River Valley Project - VPRA %New River Valley % (vapassengerrailauthority.org)
Instructions to Offerors, Pre-Proposal Conference Section 7.2	Pre-Proposal Conference
Instructions to Offerors, Questions/Requests, Section 14.3 & Addenda Section 16.1	Current Contracting Opportunities - VPRA (vapassengerrailauthority.org)
SOW 4.1 Survey, Sue, and Geotechnical	Survey Manual Virginia Department of Transportation
A.2 Definitions, Organizational Conflict of Interest	VPRA-Organizational-Conflict-of-Interest-Policy

The following RFP Documents have been amended:

1. Exhibit 1 (Scope of Work).

Please note that only RFP Documents modified by this Addendum No. 1 are provided. Redline versions of the documents listed above indicate the changes that have been made.

NOTE: Offerors must acknowledge receipt of this Addendum in writing using Form A (VPRA Procurement Form PD 02) at time of proposal submittal.

Very truly yours,

DocuSigned by:
Slade Greenway
107DE7856E8A41B...

Slade Greenway
Buyer



Scope of Work

NEW RIVER VALLEY PASSENGER RAIL PROJECT

60% ENGINEERING DESIGN CONSULTANT
SUPPORT WITH OPTION FOR FINAL DESIGN

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Section I. Overview

Project Name

The project title determined by Virginia Passenger Rail Authority (VPR) is “New River Valley Passenger Rail Project” whereby the contract, including its scope, will be referred to as the “Contract” and the full project, including construction, is referred to throughout as the “New River Valley Passenger Rail Project” or “Project.” The Contract for the Project will consist of the preparation of 60% Engineering Design plans and related documents for the construction of tunnel modifications, passenger platforms, passenger station infrastructures, and layover facilities located within the Project limits.

Project Location

The Project limits will include multiple locations as seen in Figure 1 and Figure 2, and as listed in the Project Description below.

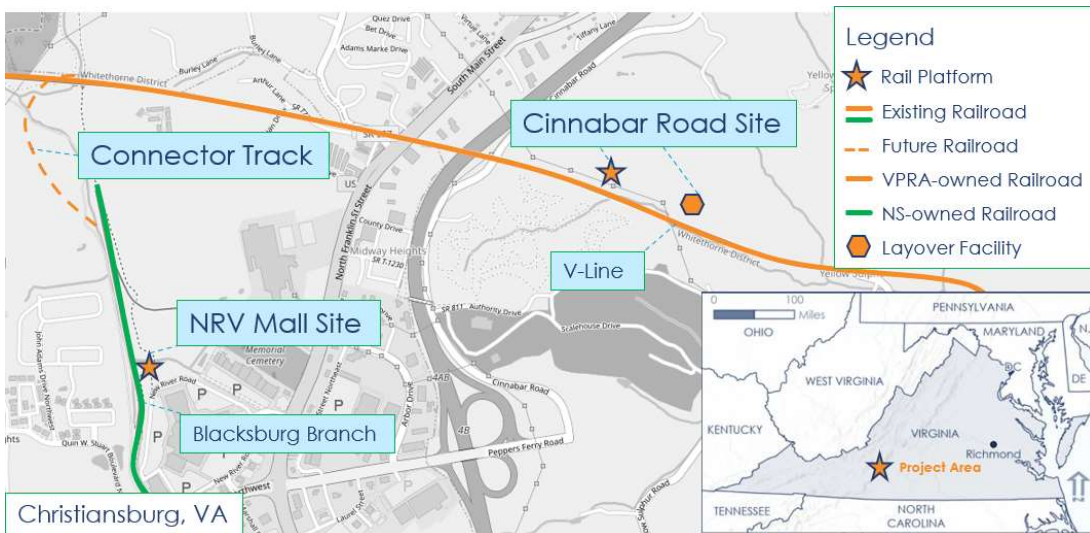


FIGURE 1: PROJECT LOCATION MAP

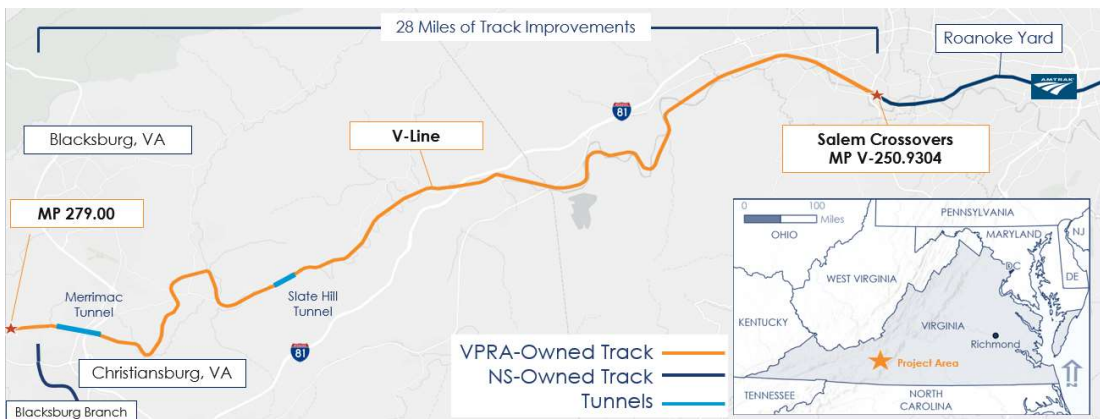


FIGURE 2: V-LINE MAP

Project Description

Amtrak passenger service will be extended from Roanoke to the New River Valley (“NRV”) utilizing the VPRA-owned Virginian Line. The Project includes key infrastructure needed to begin passenger rail service. The Project proposes the following improvements:

- Slate Hill Tunnel Modifications
 - Tunnel Safety Improvements
 - Fire and Life Safety
 - Tunnel Support Building and Building Infrastructure
- Merrimac Tunnel Modifications
 - Tunnel Safety Improvements
 - Fire and Life Safety
 - Tunnel Support Building and Building Infrastructure
- Cinnabar Road Layover Facility
 - Access Road
 - Amtrak Layover Facility and Infrastructure
- Cinnabar Road Station Platform and Station Infrastructure
 - Access Road
 - 1,000’ length [high](#)-level Passenger Platform
 - Cinnabar Road Station Infrastructure
- New River Valley Station (NRV Mall Site) and Connector Track
 - 1,000’ length [high](#)-level Passenger Platform
 - NRV Mall Site Station Infrastructure
 - Virginian Line to Blacksburg Branch Connector Track

Other infrastructure improvements are needed to bring passenger rail service to NRV. However, these improvements are not included in the Contract and will be procured separately from this Request for Proposal.

Section 2. Description of Work

The 30% Preliminary Engineering plans and details have already been developed and reviewed by VPRA, and the work efforts outlined in this Scope of Work (“SOW”) include the continued development of the proposed Project to a 60% Engineering Design set of plans and details together with other deliverables described herein. This section describes expectations of the Consultant for management, controls, stakeholder coordination, and 60% Engineering Design responsibilities. Successful completion of the work in this task order includes on-time, formal submittals of 60% Engineering Plans for VPRA and stakeholder review. In addition, these activities will be used to advance permitting and approvals necessary for project delivery. At VPRA’s sole discretion, the Consultant may be awarded the optional task of carrying the Project through final design under a separate scope of work and amendment to the Contract.

Each task and subtask have additional details on the required submittals and other deliverables.

Task 1: Project Management and Coordination

This task’s objective is to support VPRA in the oversight and execution of technical and administrative functions needed to keep the Project on schedule and within budget and

maintain compliance with all applicable requirements. The Consultant will use the VPRA Brand Standards for all applicable deliverables. All management, administrative, financial, accounting, and reporting procedures will be in accordance with Virginia law and VPRA policies and procedures.

1.1 PROJECT WORK PLAN

VPRA is developing a Program Management Plan (“PMP”) that establishes the overall management strategies and action plan for implementing the Transforming Rail in Virginia program of projects, including managing the program scope, cost, schedule, quality, and associated risks.

A project-level Project Work Plan (PWP) will be provided by VPRA for the Project in accordance with the guidance set forth by the Federal Railroad Administration's (“FRA”) Monitoring Procedure 20 – Project Management Plan Review available here: (<https://www.fra.dot.gov/eLib/Details/L16051>).

VPRA will coordinate input from project partners to include in this Plan. The PWP will be amended and revised as needed over the life of the Project and will be maintained by VPRA with support from the Consultant. VPRA will share the current PWP with the Consultant, who will be responsible for updating the 60% Engineering Design sections of the document once during this Contract.

The PWP prepared during 30% Preliminary Engineering is provided in Appendix M.

Project Work Plan Deliverables

- Project Work Plan Sections at each submission

1.2 QUALITY ASSURANCE/QUALITY CONTROL PLAN

VPRA has developed a program-level Quality Management Plan (“QMP”) that establishes the overall quality management framework for professional services and associated deliverables related to design and construction contract documents within the Transforming Rail in Virginia program of projects.

The Consultant shall develop a project-level quality assurance/quality control plan (“QA/QC Plan”), including detailed QA/QC procedures consistent with or equal to the framework outlined in the QMP. The QA/QC Plan shall define the procedures for providing QC reviews of all deliverables, providing QA throughout the life of the Project, and maintaining quality records. The QA/QC Plan shall ensure conformance with all applicable design criteria, standards, and requirements. A process shall be established to ensure nonconforming work, information, and documents are not used. QA/QC Plan procedures also shall apply to all subconsultants or subcontractors.

It is assumed that work under Section 1.2 will consist of the following:

- Preparation and submission of the project QA/QC Plan to be delivered within 60 days of issuance of the Notice to Proceed (“NTP”), as described above, for approval, including updates as required throughout the Contract
- QA reviews of project deliverables by the project QC Administrator, for adherence to QA/QC Plan procedures

Quality Assurance/Quality Control Plan Deliverables

- Quality Assurance/Quality Control Plan

1.3 RISK MANAGEMENT

On or about issuance of the NTP, VPRA will provide the Consultant with a project Risk and Contingency Management Plan (“RCMP”) and a prepopulated draft Risk Register for the project. The RCMP and Risk Register provided are based on the general procedures outlined in the FRA’s Monitoring Procedure 40a – Risk and Contingency Review available here: (<https://railroads.dot.gov/elibrary/mp-40a-risk-and-contingency-review-sponsor-led>)

The Risk Register will identify any new risks and evaluate each risk based on probability and severity levels included in the register. The Risk Register also will provide the following:

- The entity responsible for each risk
- Parties other than the risk owner that are affected by each risk
- Description of mitigations and control activities that are either in process or planned

The Consultant shall provide updates at each design submission to the Risk Register and will submit to VPRA for review at each update. If there are “Significant” or “Very High” risks associated with the project, the Consultant will report those risks to VPRA immediately upon completion of the risk assessments and updates for inclusion in the programmatic Risk Register. The Consultant shall issue a final Risk Register, including a narrative of major costs and schedule of risks.

The Risk Register Matrix prepared during 30% Preliminary Engineering is provided in Appendix N.

Risk Management Deliverables

- Updates to Risk Register at each submission

1.4 COORDINATION MEETINGS

This task includes the following meetings throughout the length of the Project:

- One (1) kick-off meeting with VPRA within two (2) weeks of issuance of the NTP
- Weekly project management coordination meetings with VPRA; these meetings will be a combination of in-person meetings and/or conference calls.
 - To minimize the number of submittals, help advance the design quickly, and reduce the number of comments, it is anticipated that the Consultant will present the design and other deliverables for interim over-the-shoulder reviews and discussion during the standing project management coordination meetings.
- Design coordination meetings – discipline-specific meetings with VPRA and other stakeholders as directed by VPRA

The Consultant shall develop a coordination meeting schedule for inclusion in the design schedule described in **Task 1.5**. The Consultant shall provide agendas for each meeting (at least one [1] business day in advance of the scheduled meeting), shall facilitate the discussion during the meetings, and shall submit a meeting summary documenting each meeting within three (3) business days after the meeting.

The Consultant shall be responsible for supporting meetings for **Task 2 – Task 8**.

See **Task 8.0, Public Outreach**, for additional meeting requirements.

Coordination Meetings Deliverables

- Coordination Meeting Schedule
- Meeting Attendance, Agendas, and Materials
- Meeting Minutes

1.5 PROJECT ADMINISTRATION AND MANAGEMENT

The Consultant shall submit a detailed design schedule within 30 calendar days from issuance of the NTP. The design schedule shall contain all the activities, tasks, events, meetings, reviews, and deliverables for the duration of the Project to the 60% Engineering Design Submittal. Within the schedule, the Consultant shall provide a clear timeline for completion of deliverables and adhere to the proposed schedule. The Consultant shall complete all Work for the Contract within **228** calendar days from issuance of the NTP. The proposed design schedule shall be reviewed by VPRA. The Consultant shall address the review comments, update the design schedule, and resubmit to VPRA. It is the responsibility of the Consultant to propose recovery measures, mitigate delays, and update the sequence and logic of activities to avoid delays to the critical path and maintain the schedule. VPRA will provide the Consultant invoicing procedures and progress reports for use on this project.

In addition, this task will include:

- Overall technical direction and oversight of the Consultant's team
- Monthly progress reports and invoicing
- Electronic and paper record keeping for the purposes of maintaining an administrative record, which includes, but is not limited to, electronic copies of all deliverables in native (Word, Excel, CAD, etc.) and PDF format

Project Administration and Management Deliverables

- Engineering Design Schedule
- Monthly Progress Reports and Invoices
- Electronic Records of all Deliverables – Native and PDF

Task 2: Slate Hill Tunnel Modifications

This task includes advancing the existing 30% Preliminary Engineering plans (Appendix A) of four (4) project components: Slate Hill Tunnel Modifications, Tunnel safety Improvements, Tunnel Support Building, and Tunnel Support building infrastructure to a 60% Engineering Design set for all elements of the Project. All four (4) components will be designed to 60% Engineering Design unless VPRA decides to end the Project work early for certain or all components in this SOW.

In addition to advancing the above project components, VPRA will provide deferred comments from the 30% Preliminary Engineering design submittal, which shall be incorporated in the 60% Engineering Design plans.

Submittal Process:

The Consultant shall provide two (2) design submissions: draft 60% Engineering Design and Final 60% Engineering Design.

At VPRA's discretion, the Consultant shall advance to Final Design (optional). Should the design progress to final construction documents, submittals at 90%, 100%, and final design are expected and will follow this same process.

All plan submittals must go through the Project's previously established QA/QC process prior to submission. The following process, a similar process using Bluebeam, or a Consultant-proposed electronic comment-resolution process shall be followed for the Engineering Plans:

- VPRA will compile all comments from stakeholders and provide a comment matrix to the Consultant after each review has been completed.
- The Consultant shall respond to the comments using the VPRA-provided comment matrix and submit to VPRA for use during the comment-resolution meeting.
- If needed the Consultant shall conduct a comment-resolution meeting with VPRA and project stakeholders to discuss comments and responses, gather additional background to better understand comments, and provide backup to responses as necessary to reach agreement on the path forward for the submittal comments.
- The Consultant shall submit the updated comment-resolution matrix to document all agreed-to comment responses.
- The agreed-to comments shall be incorporated into the subsequent submittal.

The Final 60% Engineering Design plans shall incorporate all agreed-to comments developed from the reviewers and stakeholders of the Project. VPRA will confirm that all comments were properly incorporated as agreed to during the comment-resolution meeting and documented in the updated comment-resolution matrix. The Consultant is responsible for updating the Final 60% Engineering Design Plans to incorporate any previous comments that were not incorporated, but no new comments will be issued during the check of the Final 60% Engineering Design Plans.

Submittal Quantities:

The Consultant shall provide VPRA with one (1) electronic PDF copy of the plans, cost estimate, schedule, and specification deliverables at each submission. The Consultant shall provide all CADD and other native files with each submission.

2.1 TUNNEL MODIFICATIONS

The structural design scope advances the comprehensive structural design of the modifications and improvements listed below for the Slate Hill Tunnel in accordance with the code requirements listed under the 30% Preliminary Engineering documents. The Consultant shall perform detailed structural analysis and design using loading conditions for the new structures and modifications to the existing tunnels. The structural design shall conform with the requirements of the 2018 IBC, ACI 318-19, ASCE 7-22, American Railway Engineering and Maintenance-of-Way Association ("AREMA"), and state guidelines. The Consultant shall also develop the design documents, including design drawings and specifications for the tunnel components listed below.

The Slate Hill Tunnel is a single-bore, cast-in-place concrete-lined tunnel constructed in 1912. Originally constructed for freight services, the modifications listed below are intended to upgrade the existing tunnel to allow for safe passenger rail service through the tunnel. This 881-foot-long tunnel is in Montgomery County, Virginia.

Modifications to the tunnel include the following:

- Modifications to existing tunnel concrete lining for the two (2) - 100' Long Jet Fan Niches
- Modification to existing tunnel concrete lining for Emergency Egress Walkway
- Emergency Egress Walkway
- Jet Fans and Jet Fan Supports

See [Appendix F](#) for Recommendations for Final Design, [Appendix G](#) for Geotechnical Report, and [Appendix P](#) for Tunnel Safety Improvements (TSI) Report.

Tunnel Niche

The existing tunnel liner is to be modified to accommodate two (2) -100' Long Jet Fan Niches. The Consultant shall expand the details developed during the 30% preliminary design phase. Detailed design calculations and structural drawings shall be performed for all conditions of the tunnel, including preliminary, temporary, and final conditions. Additionally, calculations and details shall be developed for the removal of existing tunnel crown, structural ribbing, ribbing connection to the existing tunnel, rock bolts, grouted ground supports, emergency egress walkways, adits, and temporary support conditions. Structural ribbing in addition to traditional loading shall be designed to accommodate additional fan loadings, including dead load of fans, ancillary equipment, torsional loadings at startup, and impact loading.

Emergency Egress Walkway

Consultant shall expand the details for the emergency egress walkway developed during the 30% Preliminary Engineering design phase. Egress walkway shall be provided between the tunnel portals and connect to emergency access paths. The egress walkway within the tunnel will be designed to be removable and should attach to the existing tunnel. The Consultant shall provide calculations supporting the detail for the emergency egress walkway.

The existing concrete liner has sections that have increased thickness from previous repairs. The liner shall be minimally removed to allow for egress past these sections. Supporting details and calculations that verify capacity or reinforcement of these sections shall be provided.

Construction Monitoring Plan

Consultant shall provide a plan to monitor settlement, horizontal movement, and vibration due to the ongoing tunnel modifications. Plan shall establish acceptable levels of settlement and/or movement and procedures when excessive settlement and/or movement are encountered during construction.

Tunnel Modification Deliverables

- Updated Basis of Design for Tunnel Modification Design Elements.
- Updated structural drawings for the structures indicated above, including but not limited to:
 - Detailed rock bolt layout drawings, sections, and details
 - Detailed grouting plans, sections, and details
 - Detailed concrete removal/demolition plans
 - Detailed proposed reinforced concrete details and existing reinforced concrete modification details

- Detailed precast panel/ steel framing plans for egress walkway
- Proposed construction sequence and temporary support details
- DRAFT Technical Specifications for all structural work related to modifications and improvements to the tunnels, including but not limited to:
 - Rock support
 - Grouting
 - Concrete removal
 - Structural steel
 - Shotcrete
 - Excavation support
 - Geotechnical instrumentation
- Construction Monitoring Plan
- Updated Construction Cost Estimate, including:
 - Each construction task developed utilizing actual work crew sizes, labor progress rates, current construction material and equipment rental costs.
- Updated Construction Schedule
 - Schedule detailed by each construction task based on actual shifts to complete each task with defined working hours during tunnel shutdown windows.

Coordination

The Consultant shall coordinate with the following:

- The Owner for allowable tunnel closures and working hours for construction.
- Geotechnical Investigation

Assumptions and Exclusions

- Geotechnical information is adequate to provide soil/rock properties to accurately advance the design.

2.2 TUNNEL SAFETY IMPROVEMENTS

The existing tunnels were constructed prior to 1914 and were primarily utilized for freight rail traffic. These tunnels need to be upgraded to provide safe passage for passenger rail service. The plans and details developed during the 30% Preliminary Engineering design phase are to be advanced to include the items listed under the trailing sections:

2.2.1 INSTRUMENTATION, CONTROLS, AND AUTOMATION (ICA) DESIGN

The Consultant shall develop and advance the following ICA design elements:

- Tunnel SCADA system
- Tunnel ventilation system
- Linear Heat Detection System
- Radio communications
- Call boxes/Blue Light stations/Telephone systems
- CCTV cameras
- Fire Alarm System

- Communications architecture, networking and interfaces between systems, sub-systems and equipment in the tunnel, support buildings and ancillary areas for communication to Operation Control Center (OCC) and Back-up OCC (BOCC)
 - All references to OCC in this document include the BOCC unless specified otherwise.
- Implementation of Cybersecurity system

Systems and communications design shall consider tunnels, tunnel portals, support buildings, ancillary spaces, equipment rooms, communication rooms, egress paths, areas of refuge and other spaces as determined by the Authority Having Jurisdiction ("AHJ"). Systems, interfaces communications architecture and network designs shall provide safe operation of tunnels per NFPA 130 requirements and in accordance with Basis of Design Report ("BODR") and 30% Preliminary Engineering drawings. The intent is to provide capability to perform normal and emergency tunnel operations per NFPA 130 requirements:

- Normal tunnel operations from existing Operations Control Center and a Back-up OCC
- Emergency operations from the new local control center which shall also be the local command post during emergency situations

The OCC may be one location or multiple locations, to be determined by coordination with Owner.

The Consultant shall hire the services of a Control System Integrator ("CSI") or perform the role of the CSI for the project. The CSI shall also be referred to as the Consultant or Integrator in this section of the document.

Systems and communications design shall be compatible with existing servers and network equipment at existing OCC/BOCC for communications interface. Systems designs shall be in accordance with Owner's requirements and design criteria. Tunnel SCADA system shall include redundant Programmable Logic Controllers ("PLCs"), control panels, and Remote Input/Output (RIO) panels in the tunnel. The RIO panels shall interface with field devices. Tunnel SCADA PLCs shall be programmed to:

- Control and monitor tunnel ventilation system
- Monitor trouble alarms and failures of other systems and sub-systems
- Interface with network equipment for communication to OCC and BOCC

The Consultant shall develop design documents including drawings, technical specifications:

- To clearly describe functionality, programming and system integration requirements for each ICA design element mentioned above. For networking and hardwired interfaces with other systems and sub-systems such as:
 - Mechanical systems
 - Electrical systems
 - Fire Alarm system
 - Lighting control system
- To interface with Owner's existing backbone network for communication to OCC and BOCC.

- Additional coordination and discussions with Owner and passenger rail operating entities are required to clarify location of existing OCC/BOCC and communications interfaces to backbone network.
- To implement:
 - A complete and reliable cybersecurity system based on listed standards and codes in the document
 - Passive cybersecurity software or hardware solution

Coordination

The Consultant shall coordinate with the following:

- The Owner and passenger rail operating entities for existing OCC/BOCC and locations to interface with existing backbone network.
- Design development of other trades for programming and interface requirements for monitoring and control operations.

Assumptions and Exclusions

- OCC and backbone network are existing and available for interfaces with Tunnel systems to perform normal operations as per NFPA 130 requirements.
- SCADA systems and communication systems equipment at OCC has availability of spares and scalability to integrate tunnel systems for remote monitoring and control operations.
- The signaling system and Automatic Train Control ("ATC") system design and interfaces with Tunnel SCADA system are beyond the scope of this project.

ICA Deliverables

- Updated Basis of Design for ICA Design Elements
- Concept of Operations ("ConOps")
- ICA drawings
- Tunnel ventilation control system – Plan
- Tunnel ventilation control panels layout & BOM
- Fire detection plan
- Fire detection system network
- Communication Rooms - Plan and Layout
- Local Command Post - Plan and Layout
- Control systems block diagram.
- Communication network architecture
- Communication Node Cabinet layout & BOM
- RIO panel layout & BOM
- Control schematic wiring diagrams
- DRAFT Technical Specifications
- As-builts review

2.2.2 FIRE AND LIFE SAFETY

The scope advances Fire and Life Safety component design for tunnel systems as per NFPA 130, NFPA 14, and NFPA 22 requirements.

The scope of work includes:

- Tunnel Ventilation
- Egress
- Tunnel Fire Protection
- Tunnel Support Building HVAC
- Tunnel Support Building Fire Protection
- Coordination with other disciplines
- Quality Assurance and Quality Control
- System control measures and integration into a broader response shall be demonstrated.

Tunnel Ventilation

The tunnel ventilation system shall be designed in accordance with the design calculations performed during the 30% Preliminary Engineering design development. Additional performance design calculations are not necessary except for structural support calculations.

Tunnel ventilation jet fans shall meet the following:

- The jet fan horsepower requirement shall not exceed the nameplate rating of the jet fan at the ASHRAE 99.6% winter temperature for heating loads. The service factor shall not be used for jet fan power exceedances.
- Forward flow from fan shall move air through impeller then over the motor.
- Fan shall be “fully reversible” with reverse airflow greater than 97% of forward airflow.
- Jet Fans shall be painted carbon steel with aluminum hubs and rotors. Silencers shall be sized to attenuate noise at 5 ft above the walkway at any point along the length of the tunnel in accordance with NFPA 130.
- Motors shall have a 25-year life span, with a service factor of 1.15.
- Bearings shall have a design life of 40,000 hours on a 90-percentile average. The motor shall have grease fittings that are readily accessible for annual changes in order to grease the motor bearings.
- Power and control connection for the fan shall be housed in a NEMA 4x316 stainless box on the exterior of the jet fan, and the power factor shall be in accordance with NEMA MG-1.
- Jet fans shall be inspectable and maintainable. A 30-inch elevated bucket shall be able to rise between the two jet fans such that the structural supports may be inspected, and the power connections may be disconnected. A maintenance manual shall be provided that provides a maintenance regime for the equipment.
- Heaters for the jet fans shall be 120V and can heat the fan motor when the motor is not active.
- Fans shall be capable of being controlled remotely.
- Specified fan specifications shall be able to be sourced from multiple manufacturers.
- Quantity: Four (4) jet fans + one (1) spare jet fan

Egress

The means of Egress shall include the following items:

- Egress signage shall be provided throughout the tunnel at required intervals with exit points clearly identified. The tunnel support building shall also have signage in

accordance with the VAUSBC. Additional signage shall be provided as necessary at locations such as areas of refuge. Evacuation destinations shall be clearly indicated and identified.

- The ConOps shall establish when and how a train evacuation is directed after receipt of alarm.
- The ConOps document shall document the anticipated egress strategy.
- Fire department access and equipment locations shall be coordinated such that tunnel evacuees are not impeded by the presence of this equipment.
- Egress doors adjacent to the trackway shall be rated for repeated pressure swings of +10 in.w.g. to -10 in.w.g.

Tunnel Fire Protection

Tunnel Fire Protection System shall meet the following requirements:

- Utilize a dry standpipe system in accordance with the Basis of Design and the 30% Preliminary Engineering drawings.
- The dry standpipe shall be constructed of ductile iron with mechanical Victaulic type couplings.
- Remote air relief valves shall be provided at appropriate locations and the dry pipe shall be drainable after use.
- Minimum water supply shall be capable of providing 1-hour of water with 2-hose streams active. Freeze protection shall be provided in the water storage tank and any wet lines to the fire pump room.
- Fire department connections and fire hose valves 4" and less shall be bronze or brass construction.
- Hose connections shall have 2-1/2-inch valves and shall be of the pressure-reducing type.
- Fire pumps shall be provided with normal and emergency backup power.
- Fire department connections shall be provided at the tunnel support building such that the fire department may pressurize the standpipe system.

Tunnel Drainage

Existing tunnel structures contain weep holes and allow for entrapped water to pass through the tunnel liner and exit through the tunnel portals. Ability to process drainage shall not be hindered by the proposed tunnel modifications. The tunnel drainage shall be designed to accommodate expected additional water flows during a fire emergency, as fire flows from two (2) fire hoses (500 gpm) must be drained. Tunnel water flows shall be designed to not exceed the height of the bottom of rail in the tunnel.

Tunnel Support Building HVAC and Fire Protection

The ambient outdoor design conditions documented in the ASHRAE Fundamentals Handbook shall be used based upon the 0.4% summer and 99.6% winter annual frequency of occurrence.

The following table provides a guide for the application of HVAC and Fire Protection. The HVAC systems shall be designed in accordance with the following criteria:

Rooms	Heating (Min Temp. in deg F dry bulb)	Cooling (Max Temp. in deg F dry bulb)	Ventilation	Fire Protection
Electrical Room	40	104	Positively pressurized	Fire detection only
Emergency Electrical Room	40	104	Positively pressurized	Fire detection only
UPS Room	60	Note 1	Negatively pressurized	Note 2
Communications Room	60	80	Positively pressurized	Note 2
Storage Room	40	104		Sprinklered
Fire Pump Room	40	104		Sprinklered
Air compressor room	40	104		Sprinklered
Clean Agent Room	40	104		Sprinklered
Fire Command Center	60	80		Sprinklered

1. As required by Manufacturer to maintain maximum service life of the batteries.
2. Fire protection shall be in accordance with applicable codes and standards.

Due to the potentially infrequent nature of the electrical equipment operating, heat loads from electrical equipment shall not be part of the heating calculations.

Sheet metal ducts shall be constructed of lock formed, quality galvanized steel with joints that are airtight. Ducts shall be sized such that the pressure drop does not exceed 0.1 in.w.g. per 100 ft of duct.

Portable fire extinguishers shall be provided for each space in accordance with the requirements of NFPA 10, the Virginia Statewide Fire Prevention Code ("SFPC"), and Virginia Uniform Statewide Building Code ("USBC").

HVAC calculations shall be submitted supporting the cooling and heating loads for the ancillary support building.

FIRE AND LIFE SAFETY DELIVERABLES

- Updated Basis of Design for the Fire and Life Safety Design elements
- Provide 60% Engineering Design drawings and specifications, including the following:
 - Calculations
 - Design Reports
 - Updated BODR
 - Full Technical Specifications
 - ConOps
 - QA/QC Documentation

2.2.2 TUNNEL SUPPORT BUILDING AND BUILDING INFRASTRUCTURE

The Consultant shall continue development of the 60% Engineering Design plans for the Project based on 30% Preliminary Engineering plans. Plans for the Tunnel Support Building include civil, architectural, structural, electrical, lighting, communications, public address, CCTV, plumbing, landscape architecture, mechanical, and fire protection plans.

TUNNEL SUPPORT BUILDING AND BUILDING INFRASTRUCTURE DELIVERABLES

- Updated Engineering Basis of Design for the Building and Building Infrastructure design elements.
- Civil Plans for the Support Building, including access roadways.
- Grading Plans and Proposed locations for drainage solutions
- Hydrology and Hydraulics Report
- Hydraulic Structures Plans and details
- E&S Plans
- Plans and details for retaining walls (if required)
- Quantities will be developed to support the cost estimate based on the level of detail included in the design plans, but these will not be presented on plan sheets.

2.3 ROW ACQUISITION DOCUMENTATION

The Consultant must follow VPRA process to notify abutting landowners of entry onto their property for the purpose of performing studies related to the Project. VPRA must approve all notice letters prior to the Consultant sending to the landowners.

The Consultant shall identify Right-of-Way (ROW) impacts to adjacent landowners based on the 60% Engineering Design and shall prepare the ROW Acquisition Plans for all additional properties with a ROW impact. The ROW Acquisition Plans will be based on field survey work and will be used to acquire ROW. A ROW impact is described as a parcel where land acquisition, temporary easement, or permanent easement is required. Permanent easements shall include utility, drainage, right of way and line of sight easements as well as access, construction, and maintenance easements. Temporary easements shall include construction, staging and laydown area easements. The Consultant shall identify temporary easements as part of the 60% Engineering Design and make every effort to minimize all property easements, including temporary construction easements. The Consultant shall present all impacts in a ROW Impacts Matrix.

The ROW Matrix prepared during 30% Preliminary Engineering is provided in Appendix O.

ROW Acquisition Documentation Deliverables

- Updated ROW Impacts Matrix

Task 3: Merrimac Tunnel Modifications

This task includes advancing the existing 30% Preliminary Engineering plans (Appendix B) of four (4) project components: Merrimac Tunnel Modifications, Tunnel safety Improvements, Tunnel Support Buildings, and Tunnel Support building infrastructure to a 60% Engineering Design set for all elements of the Project. All four (4) components will be designed to 60% Engineering Design

unless VPRA decides to end project development for certain or all components in this SOW prior to 60% Engineering Design.

In addition to advancing the above project components, VPRA will provide deferred comments from the 30% Preliminary Engineering design submittal, which shall be incorporated in the 60% Engineering Design plans.

Submittal Process:

The Consultant shall provide two (2) design submissions: draft 60% Engineering Design and final 60% Engineering Design.

At VPRA's discretion, the Consultant shall advance to Final Design (Optional). Should the design progress to final construction documents, submittals at 90%, 100%, and final are expected and will follow this same process.

All plan submittals must go through the Project's previously established QA/QC process prior to submission. The following process, a similar process using Bluebeam, or a Consultant-proposed electronic comment-resolution process shall be followed for the Engineering Plans:

- VPRA will compile all comments from stakeholders and provide a comment matrix to the Consultant after each review has been completed.
- The Consultant shall respond to the comments using the VPRA-provided comment matrix and submit to VPRA for use during the comment-resolution meeting.
- If needed, the Consultant shall conduct a comment-resolution meeting with VPRA and project stakeholders to discuss comments and responses, gather additional background to better understand comments, and provide backup to responses as necessary to reach agreement on the path forward for the submittal comments.
- The Consultant shall submit the updated comment-resolution matrix to document all agreed-to comment responses.
- The agreed-to comments shall be incorporated into the subsequent submittal.

The final 60% Engineering Design plans shall incorporate all agreed-to comments developed from the reviewers and stakeholders of the project. VPRA will confirm that all comments were properly incorporated as agreed during the comment-resolution meeting and documented in the updated comment-resolution matrix. The Consultant is responsible for updating the Final 60% Engineering Design Plans to incorporate any previous comments that were not incorporated, but no new comments will be issued during the check of the Final 60% Engineering Design plans.

Submittal Quantities:

The Consultant shall provide VPRA with one (1) electronic PDF copy of the plans, cost estimate, schedule, and specification deliverables at each submission. The Consultant shall provide all CADD and other native files with each submission.

3.1 TUNNEL MODIFICATIONS

The structural design scope advances the comprehensive structural design of the modifications and improvements listed below for the Merrimac Tunnel in accordance with the code

requirements listed under the 30% Preliminary Engineering documents. The Consultant shall perform detailed structural analysis and design using loading conditions for the new structures and modifications to the existing tunnels. The Structural Design shall conform with the requirements of the 2018 IBC, ACI 318-19, ASCE 7-22, AREMA, and state guidelines. The Consultant shall also develop the design documents, including design drawings and specifications for the tunnel components listed below.

The Merrimac Tunnel is a single-bore, cast-in-place concrete-lined tunnel that was completed (and in-service) in 1908, and subsequently, modified with the present concrete-liner in 1914. Originally constructed for freight services, the modifications listed below are intended to upgrade the existing tunnel to allow for safe passenger rail service through the tunnel. This 5,175' foot long tunnel is in Montgomery County, Virginia.

Modifications to the tunnel include the following:

- Modifications to existing tunnel concrete lining for three (3) - 100' Long Jet Fan Niches
- Modification to existing tunnel concrete lining for emergency egress walkway
- Emergency Egress Walkway
- East and West Emergency Egress Shaft excavation and break through at the adit location to egress shaft.
- East and West Stair Headhouses
- Jet Fans and Jet Fan Supports

See [Appendix F](#) for Recommendations for Final Design, [Appendix H](#) for Geotechnical Report, and [Appendix Q](#) for Tunnel Safety Improvements (TSI) Report

Tunnel Niche

The existing tunnel liner is to be modified to accommodate (3) -100' Long Jet Fan Niches. The Consultant shall expand the details developed during the 30% Preliminary Engineering design phase. Detailed design calculations and structural drawings shall be performed for all conditions of the tunnel, including: preliminary, temporary and final conditions. Additionally, calculations and details shall be developed for the removal of existing tunnel crown, structural ribbing, ribbing connection to the existing tunnel, rock bolts, grouted ground supports, emergency egress walkways, emergency egress shaft, adits, and temporary support conditions. Structural ribbing in addition to traditional loading shall be designed to accommodate additional fan loadings, including: dead load of fans, ancillary equipment, torsional loadings at startup, and impact loading.

Emergency Egress Walkway

Consultant shall expand the details for the emergency egress walkway developed during the 30% Preliminary Engineering design phase. Egress walkway shall be provided between the tunnel portals and connect to emergency access paths. The egress walkway within the tunnel will be designed to be removable and should attach to the existing tunnel. The Consultant shall provide calculations supporting the detail for the emergency egress walkway.

The existing concrete liner has sections of the liner that have increased thickness at locations of likely previous repairs. The liner shall be minimally removed to allow for egress past these sections. Supporting details and calculations verify capacity proposed condition or of required reinforcement of these sections shall be provided.

Emergency Egress Escape Shafts

Consultant shall expand the details for the emergency egress escape shafts developed during the 30% Preliminary Engineering design phase. Two escape shafts and stair headhouses, east and west, shall be developed to include the following details and necessary supporting calculations:

- Adit framing
- Adit breakthrough
- Escape shaft stairs and supports
- Emergency Escape Shaft
- Shaft excavation details
- Headhouse structural framing and connection to shaft foundation

Construction Monitoring Plan

Consultant shall provide a plan to monitor settlement, horizontal movement, and vibration because of the ongoing tunnel modifications. Plan shall establish acceptable threshold levels of settlement and/or movement, duration of monitoring prior to, during and after modification work in tunnel and egress shaft/adit construction. Procedures when excessive settlement and/or movement are encountered during construction should be established to control impact to existing structure and limits to determine work stoppages.

Tunnel Modification Deliverables

- Updated Basis of Design for Tunnel Modification Design Elements.
- Updated Structural drawings for the structures indicated above, including but not limited to:
 - Detailed rock bolt layout drawings, sections, and details
 - Detailed grouting plans, sections, and details.
 - Detailed concrete removal/demolition plans.
 - Adit Breakthrough and framing details
 - Emergency Egress Escape Shaft details
 - Detailed proposed reinforced concrete details and existing reinforced concrete modification details.
 - Detailed precast panel/ steel framing plans for egress walkway
 - Proposed construction sequence and temporary support details.
 - Stair structure support in shaft
 - Stair Headhouse structure and connection to shaft foundation
- DRAFT Technical Specifications for all structural work related to modifications and improvements to the tunnels, including but not limited to:
 - Rock support
 - Grouting
 - Concrete removal
 - Structural steel
 - Shotcrete
 - Excavation support
 - Geotechnical instrumentation
 - Reinforced concrete
 - Concrete formwork

- Construction Monitoring Plan
- Updated Construction Cost Estimate, including:
 - Each construction task developed utilizing actual work crew sizes, labor progress rates, current construction material and equipment rental costs.
- Updated Construction Schedule
 - Schedule detailed by each construction task based on actual shifts to complete each task with defined working hours during tunnel shutdown windows.

Coordination

The Consultant shall coordinate with:

- The Owner for allowable tunnel closures and working hours for construction.
- Geotechnical Investigation

Assumptions and Exclusions

- Geotechnical information is adequate to provide soil/rock properties to accurately advance the design.

3.2 TUNNEL SAFETY IMPROVEMENTS

The existing tunnels were constructed prior to 1914 and were primarily utilized for freight rail traffic. These tunnels need to be upgraded to provide safe passage for passenger rail service. The plans and details developed during the 30% Preliminary Engineering Design phase are to be advanced to include the items listed under the trailing sections:

3.2.1 INSTRUMENTATION, CONTROLS, AND AUTOMATION (ICA) DESIGN

The Consultant shall design and advance the following ICA design elements:

- Tunnel SCADA system
- Tunnel ventilation system
- Linear Heat Detection System
- Radio communications
- Call boxes/Blue Light stations/Telephone systems
- CCTV cameras
- Fire Alarm System
- Communications architecture, networking and interfaces between systems, sub-systems and equipment in the tunnel, support buildings and ancillary areas for communication to Operation Control Center (OCC) and Back-up OCC (BOCC)
 - All references to the OCC in this document include references to the BOCC unless specified otherwise.
- Implementation of Cybersecurity System

Systems and communications design shall consider tunnels, tunnel portals, support buildings, ancillary spaces, equipment rooms, communication rooms, egress shafts, egress paths, areas of refuge and other spaces as determined by the AHJ. Systems, interfaces, communications network, and architecture and network designs shall provide safe operation of tunnels per NFPA 130 requirements and in accordance with BODR and 30% Preliminary Engineering drawings. The

intent is to provide capability to perform normal and emergency tunnel operations pursuant to NFPA 130 requirements:

- Normal tunnel operations from existing OCC and a BOCC
- Emergency operations from the new local control center which shall also be the local command post during emergency situations.

The OCC may be one location or multiple locations, to be determined by coordination with Owner.

The Consultant shall hire the services of a CSI or perform the role of the CSI for the project. The CSI shall also be referred to as the Consultant or Integrator in this section of the document.

Systems and communications design shall be compatible with existing servers and network equipment at existing OCC/BOCC for communications interface. Systems designs shall be as per Owner's requirements and design criteria. Tunnel SCADA system shall include redundant Programmable Logic Controllers (PLCs), control panels, and Remote Input/Output (RIO) panels in the tunnel. RIO panels shall interface with field devices. Tunnel SCADA PLCs shall be programmed to:

- Control and monitor tunnel ventilation system
- Monitor trouble alarms and failures of other systems and sub-systems
- Interface with network equipment for communication to OCC and BOCC

The Consultant shall develop design documents including drawings, technical specifications:

- To clearly describe functionality, programming and system integration requirements for each ICA design element mentioned above. For networking and hardwired interfaces with other systems and sub-systems such as:
 - Mechanical systems
 - Electrical systems
 - Fire Alarm system
 - Lighting control system
- To interface with Owner's existing backbone network for communication to OCC and BOCC.
- To implement:
 - A complete and reliable cybersecurity system based on listed standards and codes in the document
 - Passive Cybersecurity software or hardware solution

Coordination

The Consultant shall coordinate with the following:

- The Owner for OCC locations and to interface with existing backbone for communication to OCC.
- Design development of other trades for programming and interface requirements for monitoring and control operations.

Assumptions and Exclusions

- OCC and backbone network are existing and available for interfaces with Tunnel systems to perform normal operations as per NFPA 130 requirements.
- SCADA systems and communication systems equipment at OCC has availability of spares and scalability to integrate tunnel systems for remote monitoring and control operations.
- The signaling system and ATC system design and interfaces with Tunnel SCADA system are beyond the scope of this project.

ICA Deliverables

- Updated Basis of Design for ICA Design Elements
- ConOps
- ICA drawings
- Tunnel ventilation control system – Plan
- Tunnel Ventilation control panels layout & BOM
- Fire Detection plan
- Fire detection system network
- Communication Rooms - Plan and Layout
- Local Command Post - Plan and Layout
- Control systems block diagram.
- Communication network architecture
- Communication Node Cabinet layout & BOM
- RIO panel layout & BOM
- Control schematic wiring diagrams
- DRAFT Technical Specifications
- As-builts Review

3.2.2 FIRE AND LIFE SAFETY

The scope advances Fire and Life Safety component design for tunnel systems as per NFPA 130, NFPA 14 and NFPA 22 requirements.

The scope of work includes the following:

- Tunnel Ventilation
- Egress
- Emergency Egress Shafts/Headhouses
- Tunnel Fire Protection
- Tunnel Support Building and Headhouses HVAC
- Tunnel Support Building and Headhouses Fire Protection
- Coordination with other disciplines
- Quality Assurance and Quality Control
- System control measures, including the area of refuge and integration into a broader response shall be demonstrated.

Tunnel Ventilation

The tunnel ventilation system shall be designed in accordance with the design calculations performed during the 30% Preliminary Engineering design development. Additional performance design calculations are not necessary except for structural support calculations.

Tunnel ventilation jet fans shall meet the following:

- The jet fan horsepower requirement shall not exceed the nameplate rating of the jet fan at the ASHRAE 99.6% winter temperature for heating loads. The service factor shall not be used for jet fan power exceedances.
- Forward flow from fan shall move air through impeller then over the motor.
- Fan shall be “fully reversible” with reverse airflow greater than 97% of forward airflow.
- Jet Fans shall be painted carbon steel with aluminum hubs and rotors. Silencers shall be sized to attenuate noise at 5 ft above the walkway at any point along the length of the tunnel in accordance with NFPA 130.
- Motors shall have a 25-year life span, with a service factor of 1.15.
- Bearings shall have a design live of 40,000 hours on a 90-percentile average. The motor shall have grease fittings that are readily accessible for annual changes in order to grease the motor bearings.
- Power and control connection for the fan shall be housed in a NEMA 4x31 6 stainless box on the exterior of the jet fan, and the power factor shall be in accordance with NEMA MG-1.
- Jet fans shall be inspectable and maintainable. A 30-inch elevated bucket shall be able to rise between the two jet fans such that the structural supports may be inspected, and the power connections may be disconnected. A maintenance manual shall be provided that provides a maintenance regime for the equipment.
- Heaters for the jet fans shall be 120V, that can heat the fan motor when the motor is not active.
- Fans shall be capable of being controlled remotely.
- Specified fan specification shall be able to be sourced from multiple manufacturers.
- Quantity: Six (6) jet fans + one (1) spare jet fan

Egress

The means of Egress shall include the following:

- Egress signage shall be provided throughout the tunnel at required intervals, the emergency escape shaft, headhouses and tunnel support building. Emergency signage shall be in accordance with NFPA 130 and the USBC. Additional signage shall be provided as necessary at locations such as areas of refuge. Evacuation destinations shall be clearly indicated and identified.
- The ConOps shall establish when and how a train evacuation is directed after receipt of alarm.
- The ConOps document shall document the anticipated egress strategy.
- Fire department access and equipment locations shall be coordinated such that tunnel evacuees are not impeded by the presence of this equipment.
- Egress doors adjacent to the trackway shall be rated for repeated pressure swings of +10 in.w.g. to -10 in.w.g.

Tunnel Fire Protection

Tunnel Fire Protection System shall meet the following requirements:

- Utilize a dry standpipe system in accordance with the Basis of Design and the preliminary 30% Preliminary Engineering drawings.
- The dry standpipe shall be constructed of ductile iron with mechanical Victaulic type couplings.
- Remote air relief valves shall be provided at appropriate locations and the dry pipe shall be drainable after use.
- Minimum water supply shall be capable of proving 1-hour of water with 2-hose streams active. Freeze protection shall be provided in the water storage tank and any wet lines to the fire pump room.
- Fire department connections and fire hose valves 4" and less shall be bronze or brass construction.
- Hose connections shall have 2-1/2-inch valves and shall be of the pressure-reducing type.
- Fire pumps shall be provided with normal and emergency backup power.
- Fire department connections shall be provided at the tunnel support building such that the fire department may pressurize the standpipe system.

Tunnel Drainage

Existing tunnel structures contain weep holes and allow for entrapped water to pass through the tunnel liner and exist through the tunnel portals. Ability to process drainage shall not be hindered from the proposed tunnel modifications. The Tunnel drainage shall be designed to accommodate expected additional water flows during a fire emergency, fire flows from 2 fire hoses (500 gpm) must be drained. Tunnel water flows shall be designed to not exceed the height of the bottom of rail in the tunnel.

Tunnel Support Building and Headhouse HVAC and Fire Protection

The ambient outdoor design conditions documented in the ASHRAE Fundamentals Handbook shall be used based upon the 0.4% summer and 99.6% winter annual frequency of occurrence.

The following table provides a guide for the application of HVAC and Fire Protection. The HVAC systems shall be designed in accordance with the following criteria:

Rooms	Heating (Min Temp. in deg F dry bulb)	Cooling (Max Temp. in deg F dry bulb)	Ventilation	Fire Protection
Electrical Room	40	104	Positively pressurized	Fire detection only
Emergency Electrical Room	40	104	Positively pressurized	Fire detection only
UPS Room	60	Note 1	Negatively pressurized	Note 2
Communications Room	60	80	Positively pressurized	Note 2
Storage Room	40	104		Sprinklered
Fire Pump Room	40	104		Sprinklered
Air compressor room	40	104		Sprinklered
Clean Agent Room	40	104		Sprinklered

Fire Command Center	60	80		Sprinklered
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1. As required by Manufacturer to maintain maximum service life of the batteries.
2. Fire protection shall be in accordance with applicable codes and standards.

Due to the potentially infrequent nature of the electrical equipment operating, heat loads from electrical equipment shall not be part of the heating calculations.

Sheet metal ducts shall be constructed of lock formed, quality galvanized steel with joints that are airtight. Ducts shall be sized such that the pressure drop does not exceed 0.1 in.w.g. per 100 ft of duct.

Portable fire extinguishers shall be provided for each space in accordance with the requirements of NFPA 10, the SFPC, and the USBC.

HVAC calculations shall be submitted supporting the cooling and heating loads for the ancillary support building.

FIRE AND LIFE SAFETY DELIVERABLES

- Updated Basis of Design for the Fire and Life Safety Design elements
- Provide 60% Engineering Design drawings and specifications, including the following:
 - Calculations
 - Design Reports
 - Updated BODR
 - Full Technical Specifications
 - ConOps
 - QA/QC Documentation

3.2.3 TUNNEL SUPPORT BUILDING, HEADHOUSES, AND BUILDING INFRASTRUCTURE

The Consultant shall continue development of the 60% Engineering Design Plans for the Project based on 30% Preliminary Engineering plans. Plans for the Tunnel Support Building and headhouse buildings include: civil, architectural, structural, electrical, lighting, communications, public address, CCTV, Plumbing, landscape architecture, mechanical, and fire protection plans.

TUNNEL SUPPORT BUILDING, HEADHOUSES, AND BUILDING INFRASTRUCTURE DELIVERABLES

- Updated Engineering Basis of Design for the Tunnel Support Building, Headhouse buildings, and Building Infrastructures design elements.
- Civil Plans for the Tunnel Support Building, Headhouse Buildings, including access roadways.
- Grading Plans and Proposed locations for drainage solutions
- Hydrology and Hydraulics Report
- Hydraulic Structures Plans and details
- E&S Plans
- Plans and details for retaining walls (if required)

- Quantities will be developed to support the cost estimate based on the level of detail included in the design plans, but these will not be presented on plan sheets.

3.3 ROW ACQUISITION DOCUMENTATION

The Consultant must follow VPRA process to notify abutting landowners of entry onto their property for the purpose of performing studies related to the project. VPRA must approve all notice letters prior to the Consultant sending to the landowners.

The Consultant shall identify ROW impacts to adjacent landowners based on the 60% Engineering Design and shall prepare the ROW Acquisition Plans for all additional properties with a ROW impact. The ROW Acquisition Plans will be based on field survey work and will be used to acquire ROW. A ROW impact is described as a parcel where land acquisition, temporary easement, or permanent easement is required. Permanent easements shall include utility, drainage, right of way and line of sight easements as well as access, construction, and maintenance easements. Temporary easements shall include construction, staging and laydown area easements. The Consultant shall identify temporary easements as part of the 60% Engineering Design and make every effort to minimize all property easements, including temporary construction easements. The Consultant shall present all impacts in a ROW Impacts Matrix.

The ROW Matrix prepared during 30% Preliminary Engineering is provided in Appendix O.

ROW Acquisition Documentation Deliverables

- Updated ROW Impacts Matrix

Task 4: Cinnabar Road Layover Facility

This task includes advancing the existing 30% Preliminary Engineering plans (Appendix C) of two (2) project components: Cinnabar Road Layover Access Road and Amtrak Layover Facility to a 60% Engineering Design plan set for all elements of the Project. The two (2) project components will be designed to 60% Engineering Design unless VPRA decides to end project development for certain or all components in this SOW. Note, this scope does not include the station building itself, but all improvements needed for the station building construction are included.

[Appendix S contains geotechnical information relevant to Task 4 that was obtained as part of the 30% Preliminary Engineering phase.](#)

Submittal Process:

The Consultant shall provide two (2) design submissions: draft 60% Engineering Design and final 60% Engineering Design.

At VPRA's discretion, the Consultant shall advance to Final Design (Optional). Should the design progress to final construction documents, submittals at 90%, 100%, and final are expected and will follow this same process.

All plan submittals must go through the Project's previously established QA/QC process prior to submission. The following process, a similar process using Bluebeam, or a Consultant-proposed electronic comment-resolution process shall be followed for the Engineering Plans:

- VPRA will compile all comments from stakeholders and provide a comment matrix to the Consultant after each review has been completed.
- The Consultant shall respond to the comments using the VPRA-provided comment matrix and submit to VPRA for use during the comment-resolution meeting.
- If needed the Consultant shall conduct a comment-resolution meeting with VPRA and project stakeholders to discuss comments and responses, gather additional background to better understand comments, and provide backup to responses as necessary to reach agreement on the path forward for the submittal comments.
- The Consultant shall submit the updated comment-resolution matrix to document all agreed-to comment responses.
- The agreed-to comments shall be incorporated into the subsequent submittal.

The final 60% Engineering Design plans shall incorporate all agreed-to comments developed from the reviewers and stakeholders of the project. VPRA will confirm that all comments were properly incorporated as agreed to during the comment-resolution meeting and documented in the updated comment-resolution matrix. The Consultant is responsible for updating the Final 60% Engineering Design Plans to incorporate any previous comments that were not incorporated, but no new comments will be issued during the check of the Final 60% Engineering Design Plans.

Submittal Quantities:

The Consultant shall provide VPRA with one (1) electronic PDF copy of the plans, cost estimate, schedule, and specification deliverables at each submission. The Consultant shall provide all CAD and other native files with each submission.

4.1 SURVEY, SUE, AND GEOTECHNICAL

A survey and preliminary Geotech exploration were performed under the 30% Preliminary Engineering development phase. VPRA will provide Consultant with all available data and findings. A list of recommendations for additional survey, SUE, and geotechnical work that was developed by the Preliminary Engineering Firm is attached as [Appendix F](#). The Consultant shall follow the [VDOT Survey Manual](#) to perform a survey denoting the existing field conditions to adequately support the design of the project. VPRA will provide the Consultant with available rail corridor information from Norfolk Southern.

Geotechnical exploration plans, borings, and lab testing of existing soils were performed under the 30% Preliminary Engineering development phase. During this phase of the Project, the Consultant shall develop loadings and provide them to the geotechnical engineer. The Consultant shall develop a final geotechnical report outlining the foundation recommendations for the project. This report should include but is not limited to bridge and retaining wall foundations, platform foundations, pavement design, slope stability, and slope protection. This detailed report shall be submitted to VPRA for review and approval with the 60% Engineering Design plan set.

SUE investigation (Level C) was performed as a deliverable of the 30% Preliminary Engineering plans. This ~~optional~~ task will include advancing SUE to Level B.

60% Engineering Design plans shall include plan view outline for the locations of all performed borings and include boring findings on the plans.

Survey, SUE, and Geotechnical Deliverables

- Survey, SUE, and Geotechnical Deliverables
- Additional Topographic Existing survey and aerial features (CADD)
- Level B SUE investigation (Field locate logs and CADD)
- Final PE Geotechnical Engineering Report

4.2 ROW ACQUISITION DOCUMENTATION

The Consultant must follow the VPRA process to notify abutting landowners of entry onto their property for the purpose of performing studies related to the Project. VPRA must approve all notice letters prior to the Consultant sending to the landowners.

The Consultant shall identify ROW impacts to adjacent landowners based on the 60% Engineering Design and shall prepare the ROW Acquisition Plans for all additional properties with a ROW impact. The ROW Acquisition Plans will be based on field survey work and will be used to acquire ROW. A ROW impact is described as a parcel where land acquisition, temporary easement, or permanent easement is required. Permanent easements shall include utility, drainage, right of way and line of sight easements as well as access, construction, and maintenance easements. Temporary easements shall include construction, staging and laydown area easements. The Consultant shall identify temporary easements as part of the 60% Engineering Design and make every effort to minimize all property easements, including temporary construction easements. The Consultant shall present all impacts in a ROW Impacts Matrix.

The ROW Matrix prepared during 30% Preliminary Engineering is provided in Appendix O.

ROW Acquisition Documentation Deliverables

- Updated ROW Impacts Matrix

4.3 RAILROAD DESIGN

Railroad design work shall include horizontal and vertical track alignments for the purpose of providing a safe, low-maintenance track infrastructure to support passenger service, station operations, and access to the layover facility. The Consultant shall review 30% Preliminary Engineering plans, conduct analysis, and continue the development of the track plans. Design will include general layout of signals and consider the access for maintenance of signal and positive train control facilities to ensure accommodation and consideration of the required signal system that has been incorporated into the design.

The design shall follow Amtrak Design Criteria, Amtrak Platform Guidelines, Amtrak Track Design Specification Manual, NS Standards and Public Projects Manual (current version), and the most current version of AREMA's recommended practices. The design shall comply with all FRA regulations. If applicable, the Consultant shall incorporate the survey information developed as a part of the previously completed 30% Preliminary Engineering design.

The railroad design shall include, but not be limited to, the following elements:

- Horizontal alignments
- Vertical profiles
- Track geometry

- Horizontal and vertical clearances to obstructions
- Typical sections
- Cross sections (for verification of drainage, earthwork, right-of-way impacts, and constructability)
- Grading and Drainage
- Utility Impacts
- Retaining wall locations
- Special trackwork (such as turnouts, at-grade crossings, etc.)
- ROW impacts
- Construction limits

Railroad Design Deliverables

- Updated Engineering Basis of Design for the Railroad Design Elements.
- Track Geometry Data Sheets
- Railroad Plan and Profile Sheets (50' horizontal/10' vertical scale)
- Alignments with stations, tangent bearings, and curve data (chord definition)
- Profiles with stations, proposed grades, and curve data
- Horizontal and vertical clearances
- Special trackwork (such as turnouts, at-grade crossings, etc.)
- Survey and aerial feature lines gathered as part of this scope and previously gathered gray-scaled in the background on the plan view
- ROW impacts on adjacent properties
- Updated Utility Impacts
- Fencing to enclose VPRA and Amtrak facilities
- Typical Sections Plan Sheets
- Cross-Sections at 50' intervals

4.4 CIVIL ENGINEERING

Proper drainage from railroads is critical to providing safe conditions and maintaining transportation infrastructure. The Consultant shall adequately design drainage and stormwater management structures to adequately convey design flows. All designs shall consider environmental concerns including considerations for water oil separators, floodplain impacts, erosion and sediment control measures, and the protection of structures.

All current federal and Commonwealth of Virginia regulations pertinent to the design of drainage and stormwater management shall be followed, which may include Best Management Practices (BMPs) from the Virginia Stormwater BMP Clearinghouse. Additionally, within the railroad corridor, special attention shall be paid to the surface drainage, grading, and stormwater management best practices and standards found within the latest editions of the *AREMA Manual for Railway Engineering*, NS Standards and Public Projects Manual, and the *Virginia Stormwater Management Handbook*. If differences exist between the above-stated regulations, the more stringent of the regulations shall apply. Outside the immediate railroad footprint, i.e., for access roads, parking lots, other site work, etc., drainage design shall be in accordance with VDOT's *Drainage Manual*, revised January 2021.

In conjunction with the development of the track plans, grading plans shall be prepared. The Consultant shall document hydrologic and hydraulic analysis illustrating the existing and proposed capacity of hydraulic structures and establishing the need for improvements, if any, in a Hydrology

and Hydraulics Report. The Consultant shall design and provide plans for the proposed hydraulic structures. If a bridge structure is required, the Consultant shall bring it to the attention of VPRA prior to starting design. The Consultant also shall prepare a Soil Erosion and Sediment Control (E&S) Plan showing the site's existing topography, indicating how it will be altered, identifying the control measures that will be installed, and describing how and when these controls will be implemented and maintained. All erosion and sediment control measures shall follow VDOT's *Drainage Manual*, revised January 2021 and VDOT's *Road and Bridge Standards*, revised September 2022, and shall be supplemented if required by the current *Virginia Department of Environmental Quality Erosion and Sediment Control Handbook*.

The Consultant shall continue development of the 60% Engineering Design plans for the Project based on 30% Preliminary Engineering plans. Plans for the Cinnabar Road layover facility include civil, architectural, structural, electrical, lighting, communications, public address, CCTV, Plumbing, landscape architecture, mechanical, and fire protection plans.

Civil Engineering Deliverables

- Updated Engineering Basis of Design for the Civil Engineering design elements.
- Civil Plans for the Cinnabar layover facility, Cinnabar Layover Facility Infrastructure, including access roadways.
- Grading Plans and Proposed locations for drainage solutions
- Hydrology and Hydraulics Report
- Hydraulic Structures Plans and details
- E&S Plans
- Plans and details for retaining walls
- Quantities will be developed to support the cost estimate based on the level of detail included in the design plans, but these will not be presented on plan sheets.

4.5 UTILITY COORDINATION AND DESIGN

The Consultant shall be responsible for the identification of conflicts and design for the utility relocations required for the Project.

The Consultant shall be responsible for the design of water and sanitary sewer utility relocations and new service lines required by the Project and the preparation of Utility Relocation Plans. Proposed lines including relocations of water and/or sanitary sewer facilities shall be designed in accordance with the Utility Owner's requirements and standards. The approximate location of proposed electrical, water and sanitary sewer lines shall be coordinated with the Utility Owner during the PE phase. Approximate easements required and horizontal alignments for water or sanitary sewer and electrical shall be shown on the Utility Relocation Plans. All utility information provided by VPRA shall be shown on the Utility Relocation Plans.

The Consultant shall finalize the matrix of potential impacts to all utilities to determine the cost and impacts to construction schedule.

Utility Relocation Design Deliverables

- Utility Plans
- Utility Relocation Plans
- Utility Coordination
- Updated Utility Impact Matrix

4.6 PERMIT COORDINATION (OPTIONAL)

The Consultant may review the list of environmental permits and commitments identified by VPRA and will provide comments and additional activities needed following completion of early design activities. Environmental permits and commitments include permitting requirements, as well as other environmental approvals, tasks, and plans related to the Project that were committed as part of the National Environmental Policy Act (NEPA) document as minimization, avoidance, or mitigation for the proposed action or that will be required by local, state, or federal agencies.

The Consultant shall prepare permits and thus also be responsible for providing design files, exhibits and cross sections, impact calculations, and material reviews for environmental permits and commitments related to the Project. The Consultant will collaborate with VPRA to gather applicable information and for reviews of the permit applications. VPRA will lead agency coordination, and the Consultant will participate and provide materials for meetings. VPRA will develop any NEPA re-evaluation work, if needed.

Permit Coordination Deliverables

- Permit and environmental commitment support documentation

Task 5: Cinnabar Station Platform and Station Infrastructure

This task includes advancing the existing 30% Preliminary Engineering plans (Appendix D of three (3) project components: Cinnabar Platform, Cinnabar Road Station Infrastructure, and Cinnabar Road Station Access Road to a 60% Engineering Design set for all elements of the Project. All three (3) components will be designed to 60% Engineering Design unless VPRA decides to end project development for certain or all components in this RFP early. Please note that this scope does not include the station building itself, but all improvements needed for the station building construction are included.

[Appendix S contains geotechnical information relevant to Task 5 that was obtained as part of the 30% Preliminary Engineering phase.](#)

Submittal Process:

The Consultant shall provide two (2) design submissions: draft 60% Engineering Design and final 60% Engineering Design.

At VPRA's discretion, the Consultant shall advance to Final Design (Optional). Should the design progress to final construction documents, submittals at 90%, 100%, and final are expected and will follow this same process.

All plan submittals must go through the Project's previously established QA/QC process prior to submission. The following process, a similar process using Bluebeam, or a Consultant-proposed electronic comment-resolution process shall be followed for the Engineering Plans:

- VPRA will compile all comments from stakeholders and provide a comment matrix to the Consultant after each review has been completed.

- The Consultant shall respond to the comments using the VPRA-provided comment matrix and submit to VPRA for use during the comment-resolution meeting.
- If needed the Consultant shall conduct a comment-resolution meeting with VPRA and project stakeholders to discuss comments and responses, gather additional background to better understand comments, and provide backup to responses as necessary to reach agreement on the path forward for the submittal comments.
- The Consultant shall submit the updated comment-resolution matrix to document all agreed-to comment responses.
- The agreed-to comments shall be incorporated into the subsequent submittal.

The final 60% Engineering Design plans shall incorporate all agreed-to comments developed from the reviewers and stakeholders of the project. VPRA will confirm that all comments were properly incorporated as agreed to during the comment-resolution meeting and documented in the updated comment-resolution matrix. The Consultant is responsible for updates to the Final 60% Engineering Design Plans to incorporate any previous comments that were not incorporated but no new comments will be issued during the check of the Final 60% Engineering Design plans.

Submittal Quantities:

The Consultant shall provide VPRA with one (1) electronic PDF copy of the plans, cost estimate, schedule, and specification deliverables at each submission. The Consultant shall provide all CAD and other native files with each submission.

5.1 SURVEY, SUE, AND GEOTECHNICAL-(OPTIONAL)

A survey and preliminary Geotech exploration were performed under the 30% Preliminary Engineering development phase. VPRA will provide Consultant with all available data and findings. A list of recommendations for additional survey, SUE and geotechnical work was developed by the Preliminary Engineering Firm and is attached as Appendix E. The Consultant shall follow the VDOT Survey Manual to perform a survey denoting the existing field conditions to adequately support the design of the project. VPRA will provide the Consultant with available rail corridor information from Norfolk Southern.

Geotechnical exploration plans, borings, and lab testing of existing soils were performed under the 30% Preliminary Engineering development phase. During this phase of the Project, the Consultant shall develop loadings and provide them to the geotechnical engineer. The Consultant shall develop a final geotechnical report outlining the foundation recommendations for the project. This report should include but is not limited to: bridge and retaining wall foundations, platform foundations, pavement design, slope stability, and slope protection. This detailed report shall be submitted to VPRA for review and approval with the 60% Engineering Design plan set.

Subsurface Utility Engineering (SUE) investigation (Level C) was performed as a deliverable of the 30% Preliminary Engineering plans. This ~~optional~~ task will include advancing SUE to Level B.

60% Engineering Design plans shall include plan view and outline the locations of all performed borings and include boring findings on the plans.

Survey, SUE, and Geotechnical Deliverables

- Survey, SUE, and Geotechnical Deliverables
- Additional Topographic Existing survey and aerial features (CADD)
- Level B SUE investigation (Field locate logs and CADD)
- Final PE Geotechnical Engineering Report

5.2 ROW ACQUISITION DOCUMENTATION

The Consultant must follow the VPRA process to notify abutting landowners of entry onto their property for the purpose of performing studies related to the Project. VPRA must approve all notice letters prior to the Consultant sending them to the landowners.

The Consultant shall identify ROW impacts to adjacent landowners based on the 60% Engineering Design and shall prepare the ROW Acquisition Plans for all additional properties with a ROW impact. The ROW Acquisition Plans will be based on field survey work and will be used to acquire ROW. A ROW impact is described as a parcel where land acquisition, temporary easement, or permanent easement is required. Permanent easements shall include utility, drainage, right of way and line of sight easements as well as access, construction, and maintenance easements. Temporary easements shall include construction, staging and laydown area easements. The Consultant shall identify temporary easements as part of the 60% Engineering Design and make every effort to minimize all property easements, including temporary construction easements. The Consultant shall present all impacts in a ROW Impacts Matrix.

The ROW Matrix prepared during 30% Preliminary Engineering is provided in Appendix O.

ROW Acquisition Documentation Deliverables

- Updated ROW Impacts Matrix

5.3 RAILROAD DESIGN

Railroad design work shall include horizontal and vertical track alignments for the purpose of providing a safe, low-maintenance track infrastructure to support passenger service, station operations, and potential access to the layover facility. The Consultant shall review 30% Preliminary Engineering plans, conduct analysis, and continue the development of the track plans. Design will include general layout of signals and consider the access for maintenance of signal and positive train control facilities to ensure accommodation and consideration of the required signal system has been incorporated into the design.

The design shall follow Amtrak Design Criteria, Amtrak Platform Guidelines, Amtrak Track Design Specification Manual, NS Standards and Public Projects Manual (current version), and the most current version of the American Railway Engineering and Maintenance-of-Way Association's (AREMA) recommended practices. The design shall comply with all FRA regulations. The Consultant shall incorporate the survey information developed as a part of the current contract if applicable.

The railroad design shall include, but not be limited to, the following elements:

- Horizontal alignments
- Vertical profiles
- Track geometry
- Horizontal and vertical clearances to obstructions
- Typical sections

- Cross sections (for verification of drainage, earthwork, right-of-way impacts, and constructability)
- Grading and drainage
- Utility impacts
- Retaining wall locations
- Special trackwork (such as turnouts, at-grade crossings, etc.)
- ROW impacts
- Construction limits

Railroad Design Deliverables

- Updated Engineering Basis of Design for the Railroad Design Elements.
- Track Geometry Data Sheets
- Railroad Plan and Profile Sheets (50' horizontal/10' vertical scale)
- Alignments with stations, tangent bearings, and curve data (chord definition)
- Profiles with stations, proposed grades, and curve data
- Horizontal and vertical clearances
- Special trackwork (such as turnouts, at-grade crossings, etc.)
- Survey and aerial feature lines gathered as part of this scope and previously gathered gray-scaled in the background on the plan view
- ROW impacts on adjacent properties
- Updated Utility Impacts
- Fencing to enclose VPRA and Amtrak facilities
- High-level passenger platform and connection to site facilities
- Typical Sections Plan Sheets
- Cross-Sections at 50' intervals

5.4 CIVIL ENGINEERING

Proper drainage from railroads is critical to providing safe conditions and maintaining transportation infrastructure. The Consultant shall adequately design drainage and stormwater management structures to adequately convey design flows. All designs shall consider environmental concerns including considerations for water oil separators, floodplain impacts, erosion and sediment control measures, and the protection of structures.

All current federal and Commonwealth of Virginia regulations pertinent to the design of drainage and stormwater management shall be adhered to, which may include best management practices (BMPs) from the Virginia Stormwater BMP Clearinghouse. Additionally, within the railroad corridor, special attention shall be paid to the surface drainage, grading, and stormwater management best practices and standards found within the latest editions of the *AREMA Manual for Railway Engineering*, NS Standards and Public Projects Manual, and the *Virginia Stormwater Management Handbook*. If differences exist between the above-stated regulations, the more stringent of the regulations shall apply. Outside the immediate railroad footprint, i.e., for access roads, parking lots, other site work, etc., drainage design shall be in accordance with VDOT's *Drainage Manual*, revised January 2021.

In conjunction with the development of the track plans, grading plans shall be prepared. The Consultant shall document hydrologic and hydraulic analysis illustrating the existing and proposed capacity of hydraulic structures and establishing the need for improvements, if any, in a Hydrology and Hydraulics Report. The Consultant shall design and provide plans for the proposed hydraulic

structures. If a bridge structure is required, the Consultant shall bring it to the attention of VPRA prior to starting design. The Consultant also shall prepare a Soil Erosion and Sediment Control (E&S) Plan showing the site's existing topography, indicating how it will be altered, identifying the control measures that will be installed, and describing how and when these controls will be implemented and maintained. All erosion and sediment control measures shall follow VDOT's *Drainage Manual*, revised January 2021 and VDOT's *Road and Bridge Standards*, revised September 2022, and shall be supplemented if required by the current *Virginia Department of Environmental Quality Erosion and Sediment Control Handbook*.

The Consultant shall continue development of the 60% Engineering Design plans for the Project based on 30% Preliminary Engineering plans. The platform shall be designed as a high-level platform with a minimum of 1,000 feet long. Canopy shall be provided on approximately two-thirds of the length of the platform.

Civil Engineering Deliverables

- Plans for the Cinnabar Road Station; including, civil, architectural, structural, electrical, lighting, communications, public address, CCTV, Plumbing, landscape architecture, mechanical, and fire protection plans.
- Updated Engineering Basis of Design for the Civil Engineering design elements.
- Civil Plans for the Cinnabar Road Platform, Cinnabar Road Station Infrastructure, including access roadways.
- Grading Plans and Proposed locations for drainage solutions
- Hydrology and Hydraulics Report
- Hydraulic Structures Plans and details
- E&S Plans
- Plans and details for retaining walls at the Cinnabar Road Station
- Quantities will be developed to support the cost estimate based on the level of detail included in the design plans, but these will not be presented on plan sheets.

5.5 UTILITY COORDINATION AND DESIGN

The Consultant shall be responsible for the identification of conflicts and design for the utility relocations required for the Project.

The Consultant shall be responsible for the design of water and sanitary sewer utility relocations and new service lines required by the Project and the preparation of Utility Relocation Plans. Proposed lines including relocations of water and/or sanitary sewer facilities shall be designed in accordance with the Utility Owner's requirements and standards. The approximate location of proposed electrical, water and sanitary sewer lines shall be coordinated with the Utility Owner during the PE phase. Approximate easements required and horizontal alignments for water or sanitary sewer and electrical shall be shown on the Utility Relocation Plans. All utility information provided by VPRA shall be shown on the Utility Relocation Plans.

The Consultant shall finalize the matrix of potential impacts to all utilities to determine the cost and impacts to construction schedule.

Utility Relocation Design Deliverables

- Utility Plans
- Utility Relocation Plans

- Utility Coordination
- Updated Utility Impact Matrix

5.6 PERMIT COORDINATION (OPTIONAL)

The Consultant will review the list of environmental permits and commitments identified by VPRA and will provide comments and additional activities needed following completion of early design activities. Environmental permits and commitments include permitting requirements as well as other environmental approvals, tasks, and plans related to the Project that were committed as part of the NEPA document as minimization, avoidance, or mitigation for the proposed action or that will be required by local, state, or federal agencies.

The Consultant shall prepare permits and thus also be responsible for providing design files, exhibits and cross sections, impact calculations, and material reviews for environmental permits and commitments related to the Project. The Consultant will collaborate with VPRA to gather applicable information and for reviews of the permit applications. VPRA will lead agency coordination, and the Consultant will participate and provide materials for meetings. VPRA will develop any NEPA re-evaluation work, if needed.

Permit Coordination Deliverables

- Permit and environmental commitment support documentation

Task 6: New River Valley Station and Connector Track

This task includes advancing the existing preliminary 30% Preliminary Engineering plans (Appendix E) of three (3) project components: New River Valley Mall Platform, Connector Track and Station Infrastructure to a 60% Engineering Design set for all elements of the Project. All three (3) components will be designed to 60% Engineering Design unless VPRA decides to end project development for certain or all components in this statement of work early. Please note that this scope does not include the station building itself, but all improvements needed for the station building construction are included.

[Appendix T contains geotechnical information relevant to Task 6 that was obtained as part of the 30% Preliminary Engineering phase.](#)

Submittal Process:

The Consultant shall provide two (2) design submissions: draft 60% Engineering Design and final 60% Engineering Design.

At VPRA discretion, the Consultant shall advance to Final Design (Optional). Should the design progress to final construction documents, submittals at 90%, 100%, and final are expected and will follow this same process.

All plan submittals must go through the Project's previously established QA/QC process prior to submission. The following process, a similar process using Bluebeam, or a Consultant-proposed electronic comment-resolution process shall be followed for the Engineering Plans:

- VPRA will compile all comments from stakeholders and provide a comment matrix to the Consultant after each review has been completed.
- The Consultant shall respond to the comments using the VPRA-provided comment matrix and submit to VPRA for use during the comment-resolution meeting.
- If needed the Consultant shall conduct a comment-resolution meeting with VPRA and project stakeholders to discuss comments and responses, gather additional background to better understand comments, and provide backup to responses as necessary to reach agreement on the path forward for the submittal comments.
- The Consultant shall submit the updated comment-resolution matrix to document all agreed-to comment responses.
- The agreed-to comments shall be incorporated into the subsequent submittal.

The final 60% Engineering Design plans shall incorporate all agreed-to comments developed from the reviewers and stakeholders of the project. VPRA will confirm that all comments were properly incorporated as agreed to during the comment-resolution meeting and documented in the updated comment-resolution matrix. The Consultant is responsible for updates to the final 60% Engineering Design plans to incorporate any previous comments that were not incorporated but no new comments will be issued during the check of the final 60% Engineering Design plans.

Submittal Quantities:

The Consultant shall provide VPRA with one (1) electronic PDF copy of the plans, cost estimate, schedule, and specification deliverables at each submission. The Consultant shall provide all CAD and other native files with each submission.

6.1 SURVEY, SUE, AND GEOTECHNICAL

A survey and preliminary Geotech exploration were performed under the 30% Preliminary Engineering development phase. The Consultant shall request all available data and findings from VPRA, a list of recommendations for additional survey, SUE, and geotechnical work that was developed by the Preliminary Engineering Firm and attached as [Appendix F](#). The Consultant shall follow the VDOT Survey Manual to perform a survey denoting the existing field conditions to adequately support the design of the project. VPRA will provide the Consultant with available rail corridor information from Norfolk Southern.

Geotechnical exploration plans, borings, and lab testing of existing soils were performed under the 30% Preliminary Engineering development phase. During this phase of the Project, the Consultant shall develop loadings and provide them to the geotechnical engineer. The Consultant shall develop a final geotechnical report outlining the foundation recommendations for the project. This report should include but is not limited to bridge and retaining wall foundations, platform foundations, pavement design, slope stability, and slope protection. This detailed report shall be submitted to VPRA for review and approval with the 60% Engineering Design plan set.

SUE investigation (Level C) was performed as a deliverable of the 30% Preliminary Engineering plans. This ~~optional~~ task will include advancing SUE to Level B.

60% Engineering Design plans shall include plan view outlines of the locations of all performed borings and include boring findings on the plans.

Survey, SUE, And Geotechnical Deliverables

- Survey, SUE, and Geotechnical Recommendation Deliverables
- Additional Topographic Existing survey and aerial features (CADD)
- Level B SUE investigation (Field locate logs and CADD)
- Final PE Geotechnical Engineering Report

6.2 ROW ACQUISITION DOCUMENTATION

The Consultant must follow the VPRA process to notify abutting landowners of entry onto their property for the purpose of performing studies related to the Project. VPRA must approve all notice letters prior to the Consultant sending to the landowners.

The Consultant shall identify ROW impacts to adjacent landowners based on the 60% Engineering Design and shall prepare the ROW Acquisition Plans for all additional properties with a ROW impact. The ROW Acquisition Plans will be based on field survey work and will be used to acquire ROW. A ROW impact is described as a parcel where land acquisition, temporary easement, or permanent easement is required. Permanent easements shall include utility, drainage, right of way and line of sight easements as well as access, construction, and maintenance easements. Temporary easements shall include construction, staging and laydown area easements. The Consultant shall identify temporary easements as part of the 60% Engineering Design and make every effort to minimize all property easements, including temporary construction easements. The Consultant shall present all impacts in a ROW Impacts Matrix.

The ROW Matrix prepared during 30% Preliminary Engineering is provided in Appendix O.

ROW Acquisition Documentation Deliverables

- Updated ROW Impacts Matrix

6.3 RAILROAD DESIGN

Railroad design work shall include horizontal and vertical track alignments for the purpose of providing a safe, low-maintenance track infrastructure to support passenger service and station operations. The Consultant shall review 30% Preliminary Engineering plans, conduct analysis, and continue the development of the track plans. Design will include general layout of signals and consider the access for maintenance of signal and positive train control facilities to ensure accommodation and consideration of the required signal system that has been incorporated into the design.

The design shall follow Amtrak Design Criteria, including Amtrak Platform Guidelines and the Amtrak Track Design Specification Manual, NS Standards and Public Projects Manual (current version), and the most current version of the American Railway Engineering and Maintenance-of-Way Association's (AREMA) recommended practices. The design shall comply with all FRA regulations. The Consultant shall incorporate the survey information developed as a part of the current contract if applicable.

The railroad design shall include, but not be limited to, the following elements:

- Horizontal alignments
- Vertical profiles
- Track geometry
- Horizontal and vertical clearances to obstructions

- Typical sections
- Cross sections (for verification of drainage, earthwork, right-of-way impacts, and constructability)
- Grading and drainage
- Utility impacts
- Retaining wall locations
- Special trackwork (such as turnouts, at-grade crossings, etc.)
- ROW impacts
- Construction limits

Railroad Design Deliverables

- Updated Engineering Basis of Design for the Railroad Design Elements.
- Track Geometry Data Sheets
- Railroad Plan and Profile Sheets (50' horizontal/10' vertical scale)
- Alignments with stations, tangent bearings, and curve data (chord definition)
- Profiles with stations, proposed grades, and curve data
- Horizontal and vertical clearances
- Special trackwork (such as turnouts, at-grade crossings, etc.)
- Survey and aerial feature lines gathered as part of this scope and previously gathered gray-scaled in the background on the plan view
- ROW impacts on adjacent properties
- Updated utility impacts
- Fencing to enclose VPRA and Amtrak facilities
- High-level passenger platform and connection to site facilities
- Typical Sections Plan Sheets
- Cross-Sections at 50' intervals

6.4 CIVIL ENGINEERING

Proper drainage from railroads is critical to providing safe conditions and maintaining transportation infrastructure. The Consultant shall adequately design drainage and stormwater management structures to adequately convey design flows. All designs shall consider environmental concerns including considerations for water oil separators, floodplain impacts, erosion and sediment control measures, and the protection of structures.

All current federal and Commonwealth of Virginia regulations pertinent to the design of drainage and stormwater management shall be adhered to, which may include best management practices (BMPs) from the Virginia Stormwater BMP Clearinghouse. Additionally, within the railroad corridor, special attention shall be paid to the surface drainage, grading, and stormwater management best practices and standards found within the latest editions of the *AREMA Manual for Railway Engineering*, NS Standards and Public Projects Manual, and the *Virginia Stormwater Management Handbook*. If differences exist between the above-stated regulations, the more stringent of the regulations shall apply. Outside the immediate railroad footprint, i.e., for access roads, parking lots, other site work, etc., drainage design shall be in accordance with VDOT's *Drainage Manual*, revised January 2021.

In conjunction with the development of the track plans, grading plans shall be prepared. The Consultant shall document hydrologic and hydraulic analysis illustrating the existing and proposed capacity of hydraulic structures and establishing the need for improvements, if any, in a Hydrology

and Hydraulics Report. The Consultant shall design and provide plans for the proposed hydraulic structures. If a bridge structure is required, the Consultant shall bring it to the attention of VPRA prior to starting design. The Consultant also shall prepare a Soil Erosion and Sediment Control (E&S) Plan showing the site's existing topography, indicating how it will be altered, identifying the control measures that will be installed, and describing how and when these controls will be implemented and maintained. All erosion and sediment control measures shall follow VDOT's *Drainage Manual*, revised January 2021 and VDOT's *Road and Bridge Standards*, revised September 2022, and shall be supplemented if required by the current *Virginia Department of Environmental Quality Erosion and Sediment Control Handbook*.

The Consultant shall continue development of the 60% Engineering Design plans for the Project based on 30% Preliminary Engineering platform plans. The platform shall be designed as a high-level platform with a minimum length of 1,000 feet. A canopy shall be provided on approximately two-thirds of the length of the platform.

Civil Engineering Deliverables

- Plans for the New River Valley Mall Station Platform; including civil, architectural, structural, electrical, lighting, communications, public address, CCTV, plumbing, landscape architecture, mechanical, and fire protection plans.
- Updated Engineering Basis of Design for the New River Valley Mall Platform, Connector Track and Station Infrastructure
- Civil Plans for the New River Valley Mall Platform, Connector Track and Station Infrastructure, including access roadways
- Grading Plans and Proposed locations for drainage solutions
- Hydrology and Hydraulics Report
- Hydraulic Structures plans and details
- E&S Plans
- Plans and details for retaining walls at the New River Valley Mall Station and connector track
- Quantities will be developed to support the cost estimate based on the level of detail included in the design plans, but these will not be presented on plan sheets.

6.5 UTILITY COORDINATION AND DESIGN

The Consultant shall be responsible for the identification of conflicts and design for the utility relocations required for the Project.

The Consultant shall be responsible for the design of water and sanitary sewer utility relocations and new service lines required by the Project and the preparation of Utility Relocation Plans. Proposed lines including relocations of water and/or sanitary sewer facilities shall be designed in accordance with the Utility Owner's requirements and standards. The approximate location of proposed electrical, water and sanitary sewer lines shall be coordinated with the Utility Owner during the PE phase. Approximate easements required and horizontal alignments for water or sanitary sewer and electrical shall be shown on the Utility Relocation Plans. All utility information provided by VPRA shall be shown on the Utility Relocation Plans.

The Consultant shall finalize the matrix of potential impacts to all utilities to determine the cost and impacts to construction schedule.

Utility Relocation Design Deliverables

- Utility Plans
- Utility Relocation Plans
- Utility Coordination
- Updated Utility Impact Matrix

6.6 PERMIT COORDINATION (OPTIONAL)

The Consultant may review the list of environmental permits and commitments identified by VPRA and will provide comments and additional activities needed following completion of early design activities. Environmental permits and commitments include permitting requirements as well as other environmental approvals, tasks, and plans related to the Project that were committed as part of the NEPA document as minimization, avoidance, or mitigation for the proposed action or that will be required by local, state, or federal agencies.

VPRA will lead the permitting activities. The Consultant will be responsible for providing design files, exhibits and cross sections, impact calculations, and material reviews for environmental permits and commitments related to the Project. VPRA will also lead development of a NEPA re-evaluation, if needed.

Permit Coordination Deliverables

- Permit and environmental commitment support documentation

Task 7: Cost Estimate, Schedule, & Technical Specifications

7.1 CONSTRUCTION COST ESTIMATE

The Consultant shall use the VPRA Cost Estimate Template to prepare a Construction Cost Estimate based on quantities from each milestone submittal. The cost estimate should be supplemented with estimated quantities for major categories not included in the 30% Preliminary Engineering design and percentage costs for quantity categories that are indeterminate based on the level of design. The cost estimate shall include, but is not limited to, all engineering, ROW acquisition, utility relocation, signals, construction, construction engineering support, construction inspection, agency oversight, other professional services, and contingency reserves. Emphasis should be placed on identifying any high-risk items and applying a contingency appropriate for the level of design at each submission. The construction cost should include, but not be limited to, major items such as railroad, retaining walls, major drainage, environmental mitigation, utilities, and hazardous waste remediation. The Construction Cost Estimate prepared during 30% Preliminary Engineering for the Project is provided in Appendix J.

Additionally, the Consultant shall consider costs commonly associated with railroad-specific work including flagmen, watchmen, force account reviews, prevailing wage, Buy America, and the impacts on productivity when working on an active railroad.

The Consultant shall coordinate with VPRA for guidance on and establishment of third-party costs (i.e., inspection, agency oversight, flagmen and watchmen rates, and utility force account review).

The cost estimate shall be presented in the Standard Cost Category (SCC) format as defined in FRA's Capital Cost Estimating Guidance, August 30, 2016 (<https://www.fra.dot.gov/eLib/Details/L17452>), and Monitoring Procedure 33, SCC Worksheets reference (<https://www.fra.dot.gov/eLib/details/L16055>). Using the VPRA Cost Estimate Template, the Consultant shall report the cost in year of expenditure dollars.

The Consultant shall develop a Cost Estimate and Unit Cost Methodology Memorandum documenting background for costing assumptions, unit costs, contingency, risk-based unit prices, etc. in accordance with FRA's Cost Estimating Guidance for Capital Projects.

The Consultant shall submit an updated Construction Cost Estimate and Cost Estimate and Unit Cost Methodology Memorandum with each milestone submittal.

The Consultant shall request from VPRA the construction cost index forecast for inflation percentages.

Construction Cost Estimate Deliverables

- Opinion of Probable Cost (Engineer's Construction Cost Estimate) with the Draft 60% Engineering Design Plans and Final 60% Engineering Design Plans
- Estimated quantities provided for each task

7.2 CONSTRUCTION SCHEDULE

The Consultant shall develop a milestone Critical Path Method (CPM) schedule for construction of the Project. This schedule shall illustrate how each of the Project Components will be completed to achieve the full construction of the project with minimal impacts to railroad operations. The Consultant shall review the construction schedule developed during the 30% Preliminary Engineering design phase and transfer key milestone completion dates, including for adjacent projects, i.e., Slate Hill tunnel modifications, etc., to develop the most accurate construction schedule. The schedule shall exclude completion of the station building located at the Cinnabar Road Station. The Construction Schedules prepared during 30% Preliminary Engineering are provided in Appendix K.

The project-level construction schedule shall be coordinated with the master program schedule and VPRA's Work Breakdown Structure (WBS).

The Consultant shall submit an updated construction schedule with each milestone submittal.

Construction Schedule Deliverables

- Milestone Critical Path Method Construction Schedule with the draft 60% Engineering Design plans, and final 60% Engineering Design plans

7.3 TECHNICAL SPECIFICATIONS

The design and construction work for the Project shall be performed in accordance with the applicable federal and state laws and VDOT standards, specifications and reference documents to include, but not limited to, the documents listed herein.

If during the design, a specific standard, specification, or reference document is required but is not listed herein, it is the responsibility of the Consultant to identify the pertinent standard, specification, or reference document and submit it for review and approval prior to inclusion in the Contract Documents.

As part of each design submission, the Consultant shall submit a matrix of all standard technical specifications and project-specific performance specifications that are proposed for the Project. The Consultant shall indicate each specification as invoke, delete, or modify to signify which specs are required for the Project, not necessary for the Project, or need modification to be applicable to the Project, respectively. The technical specifications will be part of the bridging documents necessary for the project development and delivery.

The standards and practices to be utilized for the Project are:

General

- AASHTO Guide Specifications for Highway Construction, 9th Edition
- VDOT Materials Approved Lists
- VDOT Construction Manual (2005, revised May 2016)
- VDOT Post Construction Manual (December 2016)
- VDOT Construction Inspection Manual (January 2018)
- VDOT's Minimum Requirements for Quality Assurance & Quality Control on Design- Build & Public-Private Transportation Act Projects (July 2018)
- VDOT Traffic Engineering Design Manual (2020)
- VDOT Right of Way Manual of Instructions, Third Edition (8/18/2020)
- VDOT Utility Manual of Instructions – Utility Relocation Policies and Procedures, Tenth Edition (Rev 08/14/2017)
- VDOT Land Use Permit Regulations 24 VAC 30-151 (11/23/2011)
- VDOT Policy Manual for Public Participation in Transportation Projects (Rev July 2020)
- VDOT Instructional & Information Memorandums (IIM) – All Divisions (as of date of RFP)
- VDOT Road and Bridge Standards, Vol. 1 and Vol. 2 (2016), including all revisions as of the date of the RFP
- 2020 VDOT Road and Bridge Specifications
- VDOT 2022 Supplement to the 2020 VDOT Road and Bridge Specifications
- 2011 VDOT Virginia Work Area Protection Manual with Revision Number 2.1 (Revised November 2020)
- 2010 ADA Standards for Accessible Design
- Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way, dated July 26, 2011
- Americans with Disabilities Act (ADA) and Architectural Barriers Act (ABA) Accessibility Guidelines for Buildings and Facilities dated July 23, 2004, and amended May 7, 2014
- VDOT Policy for Integrating Bicycle and Pedestrian Accommodations, adopted March 18, 2004, by the CTB
- Transportation Research Board Highway Capacity Manual (2010)
- VDOT CADD Manual
- VDOT State Noise Abatement Policy (July 13, 2011)
- ISO 9001 Quality Management Systems September 2015
- AASHTO Guide for Park-and-Ride Facilities, 2nd Edition
- Virginia Uniform Statewide Building Code (2009)

- Uniform Relocation Assistance and Real Property Act of 1970, as amended
- 1950 Code of Virginia, Titles 25.1 and 33.1, as amended
- VDOT Survey Manual 2010 Edition, Issued 2009, Rev. August 2021
- American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering, Current Edition
- Norfolk Southern Standards and Public Project Manual
- Amtrak Platform Guidelines
- Amtrak Track Design Specification Manual

Roadway Design

- VDOT State Bicycling Policy Plan (September 2011)
- VDOT Road Design Manual
- AASHTO A Policy on Geometric Design of Highways and Streets, 7th Edition (2018)
- AASHTO Roadside Design Guide, Fourth Edition, October 2011 (updated chapter 6)
- AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (2012)
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2nd Edition, December 2021
- FHWA 23CFR630 Subpart J Work Zone Safety and Mobility

Geotechnical and Pavement Design

- AASHTO Guide for Design of Pavement Structures (Rigid Pavement and Flexible Pavement) (1993 Edition and subsequent revisions)
- AASHTO Manual on Subsurface Investigations (1988)
- VDOT Pavement Design Guide for Subdivision and Secondary Roads, 2014
- VDOT Manual of Instruction for Material Division including all associated memorandum
- FHWA 23 CFR626 - Part 626 Pavement Policy – April 1, 2011

Structures

- VDOT Manual of the Structure and Bridge Division
- VDOT Supplement to the AASHTO Manual for Bridge Element Inspection, January 2016
- AASHTO Guide Specification for LRFD Seismic Bridge Design, 2nd Edition, 2012, 2014 and 2015 Interim Revisions
- 4. AASHTO LRFD Bridge Design Specifications, 8th Edition, 2017; and VDOT Modifications
- AASHTO Standard Specifications for the Design of Highway Bridges, 16th Edition, 1996; 1997 and 1998 Interim Specifications; and VDOT Modifications
- AASHTO Construction Handbook for Bridge Temporary Works, 2nd Edition, 2017
- AASHTO Guide Design Specifications for Bridge Temporary Works, 2nd Edition, 2017
- AASHTO Manual for Bridge Evaluation, 3rd Edition, 2018 and all interim revisions
- AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, 6th Edition, 2013 with 2015 Interim Revisions

- AASHTO Guide Specifications for Structural Design of Sound Barriers, 1989, with 1992 and 2002 Interim Revisions
- FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, December 1995, including Errata sheets and Revisions
- FHWA 23CFR650 - Subpart C – National Bridge Inspection Standards ("NBIS")
- AASHTO LRFD Bridge Construction Specifications, 4th Edition, 2017
- AASHTO Manual for Bridge Element Inspection, 1st Edition, with 2015 Interim Revisions
- AASHTO Guide Specifications for Wind Loads on Bridges During Construction, 2017
- VDOT Traffic and Ancillary Structures Inventory & Inspection Manual, 2021
- American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering, Current Edition

Drainage

- VDOT 2002 Drainage Manual (including current Errata Sheets) and revisions (Revised 01/2021)
- Virginia Stormwater Management Handbook, Volume I & Volume II, (First Edition – 1999), Virginia Department of Conservation and Recreation
- 2013 Virginia Stormwater Management Handbook, Second Edition, (Draft)
- 2013 BMP Standards and Specifications (Draft)
- Virginia Erosion and Sediment Control Handbook (Third Edition – 1992), Department of Conservation and Recreation
- FHWA Hydraulic Engineering Circular Number 21 (HEC-21), Design of Bridge Deck Drainage Systems, 1993
- FHWA Hydraulic Engineering Circular Number 22 (HEC-22), Urban Drainage Design Manual, 2009, Revised August 2013
- FHWA Culvert Inspection Manual, 1986
- Virginia, Erosion and Sediment Control Law and Regulations, FY 2009
- FEMA National Flood Insurance Program Regulations
- US Army COE, River Analysis System (HEC RAS), Version 4.1
- The Virginia SWM Law dated 2015(as listed in the Code of Virginia)
- The Virginia SWM Regulations dated 2015 (as listed in the Virginia Administrative Code)

Traffic Control Devices

- USDOT FHWA Standard Highway Signs, 2004 Edition and 2012 Supplement
- 2009 Manual of Uniform Traffic Control Devices (MUTCD), Revisions 1 and 2 (May 2012) and 2011 Virginia Supplement to MUTCD, Revision 1 (September 2013)
- National Fire Protection Association NEC Standards, 2008
- Virginia Standard Highway Signs, 2011 Edition
- Virginia Standard Highway Signs, Revision 1, January 2015
- Traffic Operations and Safety Analysis Manual (TOSAM), Version 1.0, February 2020
- VDOT Guardrail Installation Training Manual (GRIT), Revised August 2019

- Virginia Work Area Protection Manual 2011 Edition, Revision 2.1 (November 1, 2020)

Instrumentation, Controls and Automation

- American National Standards Institute (ANSI) / International Society of Automation (ISA) Standards
 - ANSI/ISA-101-2015 Human Machine Interfaces for Process Automation Systems (referred to as ISA-101)
 - ISA-112 (working draft version), SCADA Systems
 - ANSI/ISA-62381-2011 (IEC-62381 Modified), Automation Systems in the Process Industry – Factory Acceptance Test (FAT), Site Acceptance Test (SAT), and Site Integration Test (SIT) (referred to as ISA-62381)
 - ANSI/ISA-18.2-2009, Management of Alarm Systems for the Process Industries
 - ANSI/ISA-62443-1-1 (99.01.01)-2007, Security for industrial automation and control systems Part 1: Terminology, concepts, and models (referred to as ISA-99.01)
 - ANSI/ISA-62443-2-1 (99.02.01)-2009, Security for industrial automation and control systems: Establishing an industrial automation and control systems security program (referred to as ISA-99.02)
 - ANSI/ISA-62443-3-3 (99.03.03)-2013, Security for industrial automation and control systems Part 3-3: System security requirements and security levels (referred to as ISA-99.03)
- National Fire Protection Agency
 - NFPA 70 – National Electrical Code, 2014
 - NFPA 70E – Standard for Electrical Safety in the Workplace, 2015
 - NFPA 72 - National Fire Alarm and Signaling Code
 - NFPA 130 - Standard for Fixed Guideway Transit and Passenger Rail Systems
- American National Standards Institute (ANSI) / Telecommunications Industry Association (TIA) / Electronic Industries Association (EIA)
 - ANSI/TIA/EIA-568-B Commercial Building Telecommunications Cabling Standards.
 - TIA-568C: Generic Telecommunications Cabling for Customer Premises.
 - TIA/EIA 598-C: Optical Fiber Cable Color Coding.
 - TIA/EIA 606-A: Administration Standard for Commercial Telecommunications Infrastructure
- AREMA Communication and Signals Manual (AREMA C&S) of recommended practices
- IEEE 1100: IEEE Recommended Practice for Powering and Grounding Electronic Equipment
- ANSI/BICSI Telecommunications Distribution Methods Manual
- EN 50122-1: Railway Applications, Fixed Installations – Protective Provisions Relating to Electrical Safety and Grounding
- Electronic/Telecommunications Industries Association (EIA/TIA0 Standards)
 - ANSI/TIA-568-C
 - ANSI/TIA-569-A
 - ANSI/TIA-607-B
 - ANSI/TIA-606-B
 - ANSI/TIA-1005 Generic Telecommunication Standards

Technical Specifications Deliverables

- Technical Specification Matrix

Task 8: Public Outreach

The Consultant shall coordinate the public outreach strategy with VPRA External Affairs and Communication department prior to undertaking activities to ensure consistent messaging. The Consultant shall follow guidance established in the VPRA Project Communications and Public Engagement Manual, in addition to prevailing state and local legal requirements for public information:

- VPRA Project Communications and Public Engagement Manual – Consultant should request from VPRA.
- VDOT Public Involvement Manual, Location and Design Division – https://www.virginiadot.org/business/resources/LocDes/Public_Involvement_Manual.pdf

8.1 PUBLIC OUTREACH

Public Meeting

The Consultant shall support VPRA at one (1) public meeting around the time of the 60% Engineering Design submittal. The meeting is intended to present project design plans and receive public comment. The Consultant shall follow guidance provided in the *VPRA Project Communications and Public Engagement Manual* and the *VDOT Public Involvement Manual, Location and Design Division*. VPRA shall secure meeting locations and send out notifications for the public to attend. The Consultant shall provide the materials for the public meeting and outreach. The public meeting format may include display boards, presentations, and informal discussions between project team members and meeting attendees. Information packets containing meeting handouts/fact sheets, maps, and/or comment forms prepared by the Consultant will be available to meeting participants. The Consultant shall apply VPRA Brand Standards on all outreach material.

The Consultant will support VPRA to publicize all public meetings by supplying the materials needed. VPRA will utilize the Project website, newspaper advertisements, press releases, email lists, local distribution of meeting flyers (nearby public facilities, community groups), and/or social media to publicize all public meetings. The public meetings will be accessible to persons with disabilities and persons with Limited English Proficiency (LEP). Special services, such as an interpreter or sign language services, will be made available upon request. VPRA's public notices announcing these meetings will provide instructions for requesting these services. The Consultant will be responsible for providing project- and event-specific content to VPRA to be incorporated into promotional materials for the meetings.

The Consultant shall follow guidelines for Title VI and Environmental Justice Public Involvement as described in the *VPRA Project Communications and Public Engagement Manual*. The Consultant shall determine whether 5% or 1,000 persons, whichever is less, of the total population within ¼-mile of the project limits identify as a LEP language group. If so, the Consultant will work with VPRA to translate key public outreach material for the identified language(s).

The Consultant shall summarize all questions and comments received during the public meetings for the record in public meeting reports. All written comments, including correspondence and comment sheets, shall be scanned and filed in accordance with the Project's procedures for record filing as defined in the PWP.

Public Outreach Deliverables

- Contact Information of In-Person Meeting Attendees

- Public Meeting Materials
- Public Meeting Comment Summary

Appendix A – Slate Hill Tunnel 30% PE Design Plans

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

VPRA reserves the right to refuse to enter an NDA and to deny access to confidential information to any party, who in VPRA's sole discretion, does not have a legitimate business interest in the material.

Appendix B – Merrimac Tunnel 30% PE Design Plans

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix C – Cinnabar Road Layover Station 30% PE Design Plans

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix D – Cinnabar Road Station and Station Infrastructure 30% PE Design Plans

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpva.virginia.gov.

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Appendix E – New River Valley Station 30% PE Design Plans

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Appendix F – Recommendations for Supplemental Work for Final Design

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix G – Slate Hill Geotech Report

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix H – Merrimac Geotech Report

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix I – Basis of Design

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix J – Construction Cost Estimate

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix K – Construction Schedule

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix L – Drainage and SWM Report

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix M – Project Work Plan (PWP)

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix N – Risk Register Matrix

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix O – Right-of-Way (ROW) Matrix

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix P – Slate Hill Tunnel Safety Improvements (TSI) Report

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix Q – Merrimac Tunnel Safety Improvements (TSI) Report

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix R – Amtrak Layover Facility - Review Drawing

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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Appendix S – NRV Layover Facility and Cinnabar Platform Geotech Report

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpva.virginia.gov.

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Appendix T – NRV Platform and Track Improvements Geotech Report

The material contained within this Appendix contains confidential information and will be made available to Offerors upon execution of VPRA's Confidentiality and Non-Disclosure Agreement ("NDA"). To request the NDA, please contact Slade Greenway at procurement@vpra.virginia.gov.

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