LONG BRIDGE PROJECT
NORTH PACKAGE

PROGRESSIVE DESIGN-BUILD
REQUEST FOR QUALIFICATIONS

RFQ No.: 1-001-23-0001

LONG BRIDGE PROJECT
Connecting North and South Through our Nation's Capital

Table of Contents

1. INTRODUCTION 1
1.1. Project Information 1
1.2. Project Goals 4
1.3. Progressive Design-Build Process 4
1.4. Single Point of Contact 7
1.5. Rules of Contact 7
1.6. Conflict of Interest 8
1.7. Legal Authority 9
1.8. Federal Funding and Requirements 9
1.9. Disadvantaged Business Enterprises 10
1.10. Respondent Composition 10
1.11. Licensing Requirements 11
1.12. Quality Management 11
2. PROCUREMENT PROCESS 11
2.1. Procurement Schedule 11
2.2. Requests for Clarification 12
2.3. RFQ Addenda 12
2.4. Respondents Responsible for All Costs 13
3. SOQ SUBMISSION INSTRUCTIONS 13
3.1. SOQ Deadline and Instructions 13
3.2. SOQ Format 13
3.3. Additional Requirements 13
4. CONTENTS OF STATEMENT OF QUALIFICATIONS 14
4.1. Cover Letter and Form A 15
4.2. Legal, Financial, Safety, and DBE Information 15
4.3. Executive Summary 18
4.4. Experience of Respondent 18
4.5. Key Personnel and Organization 19
4.6. Quality Management 28
4.7. Understanding of Project and Progressive Design-Build 29
4.8. Additional Forms 29
5. EVALUATION CRITERIA 30
5.1. SOQ Evaluation 30
5.2. Shortlisting 33
5.3. Debriefings 33
6. PROCUREMENT DECISION APPEALS 33
7. VIRGINIA FREEDOM OF INFORMATION ACT 33

8. RESERVED RIGHTS....34
9. COMPLIANCE WITH LAW IN VIRGINIA....35
10. ETHICS IN PUBLIC CONTRACTING....35
11. REPRESENTATIONS....35
12. NO ASSUMPTION OF LIABILITY....36
13. APPLICABLE COST PRINCIPLES; ACCOUNTING REQUIREMENTS....36

Exhibits

A: Railroad Operator Indemnification Provisions
B: Project Information
C: Draft Phase 1 Services Scope of Work
D: Draft Quality Management Technical Provisions
E: Performance and Payment Bonds
F: Forms

Form ID	Form
A	Acknowledgement of Receipt of RFQ, Addenda, and Responses to Questions
B	Respondent's Organization Information
C	Legal and Disputes History
D	Principal Participant and Lead Designer Certification
E	Conflict of Interest Disclosure
F	Safety Questionnaire
G	Record of DBE Performance
H	Project Experience Description
I	Key Personnel
J	Subcontractor Information
K	Affidavit of Non-Collusion
L	Lobbying Certificate
M	Respondent's Clarification Request
N	Proprietary/Confidential Information Identification

Appendix

1: Definitions
2: List of Representative Material Changes

1. INTRODUCTION

The Virginia Passenger Rail Authority ("VPRA") is issuing this Request for Qualifications ("RFQ") to obtain Statements of Qualification ("SOQs") from firms interested in serving as the Design-Builder under a Progressive Design-Build Agreement ("PDBA") for the North Package of the Long Bridge project. The procurement process for this Project will consist of two steps: (1) a RFQ step to identify a Shortlist of qualified firms; and (2) a Request for Proposals ("RFP") step during which the Shortlisted firms will each be invited to submit a Proposal to serve as the Design-Builder. The overall process will identify the firm with the best qualifications, approach, and Evaluative Price Components (defined below) to collaborate with VPRA to design and construct the Project.

In the first step of this procurement process, interested firms will submit SOQs detailing the firm's relevant project experience, Key Personnel, and summary approach to the Project and quality management. In the second step of the process, firms named to the Shortlist will be invited to submit Proposals containing a detailed approach to the Work, including approach to the Phase 1 and Phase 2 Services, risk management, quality management, and approach to negotiating a Construction Price for the Phase 2 Services. Additionally, VPRA anticipates that Proposals will contain a price component consisting of (i) the Proposer's not-to-exceed price to perform the Phase 1 Services and (ii) the Proposer's proposed markup for profit and home office overhead to perform the Construction Work ((i) and (ii) collectively the "Evaluative Price Components"). The RFP will contain the Contract Documents, including the PDBA, that will provide the terms and conditions for the Work.

SOQs must meet all requirements established by this RFQ. Requirements of this RFQ generally will use the words "shall", "will", or "must" (or equivalent terms) to identify a required item that must be submitted with the SOQ. Failure to meet a RFQ requirement may render a SOQ non-responsive, while the extent to which a Respondent meets or exceeds evaluation criteria will be rated by the VPRA Evaluation Team and be reflective of the VPRA Evaluation Team's scoring (in its sole discretion) of SOQs.

1.1. Project Information

The Long Bridge corridor is a vital link connecting the local, regional, and national transportation networks, and the project is critical to ensuring that the Long Bridge corridor can meet future rail needs. Current service along the corridor does not provide sufficient capacity and redundancy to meet projected future demand for railroad services in the region. The overall Long Bridge project will add capacity to a busy rail travel corridor through construction of a modern rail bridge from Washington, D.C. into Virginia.

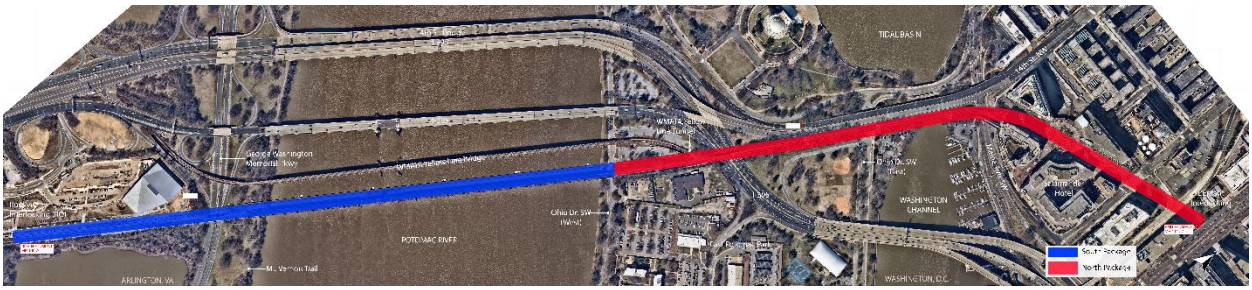
The corridor is a 1.8-mile railroad corridor between Rosslyn (RO) interlocking in Arlington, Virginia and L'Enfant (LE) Interlocking near 10th Street SW in the District of Columbia. The primary component of the Long Bridge project is a new two-track bridge upstream of the existing Long Bridge. The existing bridge will be retained to create a four-track crossing. The Long Bridge project additionally consists of environmental mitigation measures including a new bike-pedestrian shared use path across the George Washington Memorial Parkway and the Potomac River.

The Long Bridge project will allow for the separation of passenger and freight traffic while maintaining interoperability of passenger and freight rail for all four tracks. The existing eastern pair of tracks will be used primarily for CSX Transportation, Inc. ("CSXT") freight rail, while the western pair of tracks will be used primarily for passenger rail, including the National Railroad Passenger Corporation ("Amtrak") and Virginia Railway Express ("VRE").

At the southern end of the project in Virginia, a new two-track railroad bridge will be constructed over the George Washington Memorial Parkway, Mount Vernon Trail, Potomac River, and Ohio Drive SW (West) to the west of the existing Long Bridge. The project will continue through East Potomac Park, crossing over the portal to the Washington Metropolitan Area Transit Authority ("WMATA") Yellow Line tunnel and I-395 with a new two-track bridge, while retaining the existing I-395 rail bridge. After crossing I-395, the project will continue with four-track bridges, replacing the existing two-track bridges at Ohio Drive SW (East), the Washington Channel, and Maine Avenue SW.

The four tracks will continue underneath the Maryland Avenue SW overbuild, travel along the existing corridor underneath 12th Street SW and the 12th Street Expressway and tie into the four tracks proposed at L'Enfant Interlocking under a separate project led by VRE. Construction will occur within the Potomac River and Washington Channel. The project scope will require the Design-Builder to perform the work necessary for CSXT to design and install signal and communication systems. The project will also include potential early works packages for utility relocations and soil improvements.

The overall Long Bridge project consists of two primary construction packages, referred to as the North Package and South Package. The Project that is the subject of this RFQ is the North Package shown in red in the graphic below (the South Package is shown in blue).



The North Package Project Limits include:

(a) Northern terminus: south end of L'Enfant Interlocking (the interlocking is not included in this package); and

(b) Southern terminus: New Long Bridge northern abutment (the northern abutment is not included in this package).

The North Package will consist of the following major scope items:

(a) early and enabling work (i.e., demolition, sitework, soil improvements, utility relocations, etc.);

(b) phased construction of railroad embankment fills;

(c) geotechnical ground improvements;

(d) new non-CSXT-owned trackwork[1];

(e) new rail bridge over the WMATA Portal/I-395;

(f) replacement of the existing two-track Ohio Drive SW Rail Bridge with a four-track bridge;

(g) replacement of the existing two-track Washington Channel Rail Bridge with a four-track bridge;

(h) replacement of the existing two-track Maine Avenue SW Rail Bridge with a four-track bridge;

(i) replacement of the Maine Avenue SW Pedestrian Bridge;

(j) new retaining walls and associated embankments and ground improvements;

(k) landscaping;

(l) railroad crashwalls;

(m) Stormwater Management Facilities;

(n) erosion and sediment control;

(o) maintenance of traffic and roadway work;

(p) utility coordination and adjustment work;

(q) Right-of-Way coordination that includes providing VPRA with information VPRA will use to acquire right-of-way[2];

(r) coordination with regulatory agencies and property owners;

(s) securing of applicable permits;

(t) public and stakeholder outreach; and

(u) coordination with adjacent projects and owners.

VPRA is delivering the Project in partnership with CSXT, Amtrak, VRE, District Department of Transportation ("DDOT"), National Park Service ("NPS"), and other local agencies with jurisdiction over the Project area. VPRA and the Design-Builder will work closely with these agencies to coordinate the Work and ensure that design and construction conform to applicable specifications and requirements. CSXT and Amtrak will participate in the design review process and will have approval authority over design packages that impact certain portions of the Project. Other agencies may also participate and have approval authority over certain aspects of the Design. As part of VPRA's delivery of the Project, VPRA is obligated to provide certain indemnifications to CSXT and Amtrak that will be passed-through to the Design-Builder. These indemnification obligations are attached as Exhibit A.

[1] CSXT track and signals work will be performed by CSXT.

[2] VPRA anticipates that it will obtain all necessary right-of-way, including right-of-way for permanent incorporation into the Project and temporary construction easements.

The Project received a Final Environmental Impact Statement and Record of Decision ("ROD") from the Federal Railroad Administration ("FRA") on August 12, 2020. The ROD outlines FRA's reviews and approval of the Preferred Alternative and the bike-pedestrian crossing. The environmental documents are available for review here:

https://vapassengerrailauthority.org/longbridgeproject/#doc-library.

Additional information and details about the Project are included in Exhibit B.

1.2. Project Goals

VPRA's goals for the Project are as follows:

(a) commencement of the Phase 2 Services at time of award of FTA's Full Funding Grant Agreement (FFGA), projected to be the first quarter of 2025;

(b) substantial completion of Construction Work before or during 2030;

(c) managing costs and completing the Project within budget;

(d) maximizing the innovation potential and collaboration of the progressive design-build method;

(e) safe construction of the Project, including ensuring worker safety and the safety of the traveling public in a congested, urban area;

(f) maximizing community engagement and the use of Disadvantaged Business Enterprise ("DBE") firms;

(g) minimizing the impacts of construction to the public, stakeholders, CSXT, VRE, Amtrak, Authorities Having Jurisdiction ("AHJs"), and government agencies; and

(h) enhancement of access to rail services in Virginia by creating an efficient gateway between Washington, D.C. and Virginia.

1.3. Progressive Design-Build Process

1.3.1. Overview

VPRA will deliver the Project using the Progressive Design-Build ("PDB") method, which consists of the following two Phases:

Phase 1 (Design and Preconstruction):

During Phase 1, the Design-Builder will prepare the Design of the Project using information provided by VPRA, including a 30% design prepared prior to this procurement. The Design-Builder's Design will be subject to oversight, input, and acceptance by VPRA. In addition to preparation of the Design, the Design-Builder will provide other preconstruction services identified in Exhibit C. The Design-Builder will be required to submit a 60% design to VPRA and other stakeholders, including but not limited to CSXT, Amtrak, NPS, and DDOT, each of which will have the opportunity to provide comments on the deliverable.

At intervals to be specified in the PDBA, the Design-Builder will submit estimates of the cost to construct the Project and a Construction Schedule for completion of the Work. VPRA and the Design-Builder, on an Open Book basis, will participate in Construction Price Negotiations consisting of workshops to reconcile price differences with the goal of negotiating a Construction Price. As part of the Construction Price Negotiations, Design-Builder may perform further design or other activities and update its Binding Construction Price Proposal.

In addition, during Phase 1, VPRA and the Design-Builder will have the opportunity to identify Early Work that can be separately negotiated and performed by the Design-Builder. The Design-Builder's performance of Early Work does not guarantee that the Design-Builder will perform the entirety of the remaining Construction Work.

If VPRA and the Design-Builder cannot agree on a Construction Price or VPRA otherwise decides in its sole discretion not to execute a Phase 2 Amendment with the Design-Builder, VPRA may terminate the Design-Builder's services, take possession of all Work Product, and seek bids from other contractors to perform the Construction Work. VPRA may also contract separately with the Lead Designer to complete the in-process design, pursuant to the Tri-Party Agreement.

If VPRA terminates the Design-Builder's services without execution of a Phase 2 Amendment, neither the Design-Builder nor any Principal Participant thereof may bid or propose in any subsequent procurement for the Construction Work. In the event of termination, if Design-Builder is performing Early Work, Design-Builder shall continue such Early Work in accordance with the negotiated terms thereof, which shall be subject to VPRA's right to terminate the Early Work for convenience.

Phase 2 (Final Design and Construction):

If VPRA and the Design-Builder agree to a Construction Price and Construction Schedule, VPRA and the Design-Builder will execute a Phase 2 Amendment to the PDBA. Phase 2 (Final Design and Construction) contemplates that the Design-Builder will complete the Released for Construction Plans ("RFC"), achieve Final Acceptance, and perform all design, construction, and other obligations required under the Contract Documents. If VPRA and the Design-Builder agree to a Construction Price, VPRA and the Design-Builder will execute a Phase 2 Amendment to the PDBA. For the avoidance of doubt, the Design-Builder's performance of the Phase 2 Services is expressly contingent upon VPRA and the Design-Builder agreeing upon and executing a Phase 2 Amendment.

1.3.2. Construction Price Negotiations

The Construction Price Negotiations are a critical component of the Phase 1 Services. The Design-Builder will submit an Opinion of Probable Construction Cost ("OPCC") within 90 days of commencing the Phase 1 Services based primarily on the 30% design provided by VPRA. The OPCC is a non-binding estimate that will aid VPRA and the Design-Builder in evaluating design parameters and, as needed, to clarify the final scope of construction. Thereafter, following the resolution of comments (including comments from CSXT, Amtrak, NPS, DDOT, and other stakeholders) on the Design-Builder's 60% design submittal, the Design-Builder will submit a Binding Construction Price Proposal for VPRA's consideration.

VPRA will use an Independent Cost Estimator ("ICE") to prepare independent cost estimates of the Construction Work to assist VPRA with the evaluation of whether to accept the Design-

Builder's Binding Construction Price Proposal. The Design-Builder, ICE, and VPRA will participate in workshops to reconcile differences between the Design-Builder's Binding Construction Price Proposal and the ICE's estimate. To facilitate reconciliation, the Design-Builder shall provide all cost estimates to perform the Phase 2 Services on an Open Book basis, which entails providing all assumptions and substantiation to build the Construction Cost Estimates. The Design-Builder shall work collaboratively with VPRA to reconcile price differences and to ensure that VPRA is receiving a fair and reasonable price for the Construction Work.

VPRA will not execute a Phase 2 Amendment with the Design-Builder if the Design-Builder's estimated Construction Price exceeds the ICE's estimate by 10% or more. If the Design-Builder submits a Binding Construction Price Proposal that exceeds the ICE's estimate by 10%, VPRA and the Design-Builder will work through the price reconciliation process with the goal of reaching the acceptable price threshold. Design-Builder may continue to advance all or portions of the Design during this process. VPRA may elect to terminate the Construction Cost Negotiations if it appears that the Construction Price will not be within 10% of the ICE's estimate or if the Design-Builder's Binding Construction Price Proposal is not reasonable, balanced, or aligned with the Phase 2 Services.

As part of the Construction Price Negotiations, VPRA and the ICE will also evaluate whether the Construction Schedule submitted by Design-Builder aligns with the Construction Price and will result in on-time completion of the Work. If VPRA agrees to a Binding Construction Price Proposal submission, including after any adjustments made during the Construction Price Negotiations, Design-Builder shall submit a Final Construction Price Proposal containing the Construction Price and terms of the Phase 2 Amendment, which will include the baseline Construction Schedule.

If specific Project risks are preventing the Design-Builder and VPRA from successfully concluding Construction Price Negotiations, then VPRA reserves the right (but not the duty) to employ Allowances.

1.3.3. Self-Performance

The Design-Builder and Major Subcontractors will be required to self-perform Construction Work comprising at least 50% of the value of the Construction Work with its own employees and forces. The Construction Work comprising the 50% minimum requirement shall be negotiated between VPRA and the Design-Builder and will not be subject to competitive bidding requirements. Work to be performed by Major Subcontractors must be included in, and shall be counted towards, the 50% limitation on self-performed work not subject to competitive bidding requirements. For the sake of clarity, this means that Major Subcontractors must perform the scope of work for which they are identified in the SOQ and that scope of work must be part of the self-performed work for which the price is negotiated and is not subject to competitive bidding.

VPRA will permit the Design-Builder to self-perform up to 70% of the value of Construction Work, however, the self-performed portion in excess of 50% (up to the limit of 70%) will be subject to competitive bidding requirements. Major Subcontractors may perform additional Construction Work beyond the scope identified in the SOQ and the 50% threshold on self-performed work not subject to competitive bidding requirements, provided that such additional scope is subject to competitive bidding.

All other Construction Work not self-performed by the Design-Builder will be subject to competitive bidding. The competitive bidding process will generally require that the Design-Builder select the price offered by the lowest responsive bidder for incorporation into the Construction Price, with

the exception that VPRA may permit the Design-Builder to deviate from the lowest responsive bid requirement for certain scopes of work that may be performed by DBE firms. Other than the requirements that the Design-Builder self-perform no less than 50% of the value of the Construction Work, that Major Subcontractors perform the work for which they are identified in the SOQ, and DBEs perform allocated scope, the self-performance and competitive bidding requirements apply only to the price negotiations. If VPRA and the Design-Builder agree to the Construction Price and execute a Phase 2 Amendment, the Design-Builder is not required to use the lowest responsive bid in the performance of the Construction Work. For specific scopes of work that the Design-Builder negotiates to have performed by DBEs, the Design-Builder will be required to use the DBEs whose bids are incorporated into the Construction Price.

For purposes of calculating the value of the self-performed work, the direct cost of materials will be excluded. All other costs to perform the Construction Work will be included in calculating the value of self-performed work, including markup and construction costs not allocable to specific activities (i.e., general conditions costs, field indirect costs, etc.). The remaining services included in the Construction Price that are not Construction Work will be excluded from the calculation of self-performed work, including design, engineering, and other professional services.

1.4. Single Point of Contact

VPRA's single point of contact ("Point of Contact") for matters relating to this procurement shall be:

John Kostyniuk, Director of Procurement
919 E. Main Street, Suite 2400
Richmond, VA 23219
(804) 339-2604
procurement@vpra.virginia.gov

All communications regarding the procurement shall be directed to the Point of Contact. Only written communications received from the Point of Contact may be relied on throughout this procurement, subject to any limitations under the PDBA regarding reliance on certain materials provided. VPRA is not responsible for oral communications or other communications that occur outside the communications protocol established by this RFQ.

1.5. Rules of Contact

As of the date of issuance of this RFQ, no Respondent shall contact any employee or representative of VPRA concerning this RFQ or the Project, including members of VPRA's Board of Directors, except for the Point of Contact as specifically permitted in this RFQ. This prohibition does not apply to discussions with VPRA not related to this RFQ or the Project.

The following entities are considered "representatives" of VPRA during this procurement and may not be contacted by any means whatsoever concerning this RFQ or the Project:

(a) WSP USA Inc.
(b) Vanase Hangen Brustlin, Inc.
(c) Kimley-Horn and Associates, Inc.
(d) Rummel, Klepper, and Kahl, LLP
(e) Modjeski & Masters, Inc.

(f) Michael Baker International
(g) Gannett Fleming, Inc.
(h) Mott MacDonald, Inc.
(i) Hardesty & Hanover, LLC
(j) Jacobs Solutions, Inc.

In addition, Respondents are prohibited from contact with the following stakeholders concerning this RFQ or the Project:

(a) CSXT
(b) Amtrak
(c) VRE
(d) DDOT
(e) NPS
(f) Utility owners
(g) Other governmental agencies with jurisdiction
(h) Adjacent landowners
(i) Business owners in the vicinity of the Project

Further, no Respondent, or any constituent entity or personnel thereof may communicate with another Respondent or members thereof with regards to this RFQ or the Project. However, notwithstanding the foregoing, Respondents may communicate with Subcontractors that have been identified as part of multiple Respondents (where membership on multiple Respondents is not prohibited under the terms of this RFQ), provided that Respondents establish a protocol to ensure that the prospective Subcontractor will not impermissibly share information between Respondents or otherwise allow for collusion or the appearance thereof. It is incumbent on Respondents to verify whether a potential Subcontractor is participating with another Respondent and whether such potential Subcontractor may belong to more than one Respondent.

These rules of contact shall apply until the earliest of the following:

(a) amendment to the rules of contact by VPRA, or superseding of these rules in the RFP;

(b) the execution of the PDBA and the expiration of any applicable protest period or resolution of any protest then pending; or

(c) notification by VPRA of cancellation of the procurement.

Any communication prohibited by these rules may be grounds for a firm's disqualification from further participation in the procurement. VPRA may disqualify any Person for violation of these rules in its sole discretion.

1.6. Conflict of Interest

VPRA's procurement of the Project is governed by VPRA's Organizational Conflict of Interest Policy, available at: https://vapassengerrailauthority.org/wp-content/uploads/2022/09/VPRA-Organizational-Confict-of-Interest-Policy_Executed-FINAL_Effective-08_24_2022_V1.pdf. Prior to submission of a SOQ, a Respondent may request that VPRA determine whether a specific conflict of interest exists by following the process in VPRA's Organizational Conflict of Interest Policy.

Respondents are required to provide information concerning potential organizational conflicts of interest in their SOQs. Respondents must state how their interests, or those of their Principal

Participants, Affiliates, chief executives, directors, Key Personnel, or any proposed consultant, contractor or Subcontractor may result, or could be viewed as, an organizational conflict of interest. The information shall be submitted on Form E.

VPRA will review the information submitted and make a written determination of whether the Respondent's interests create an actual or apparent organizational conflict of interest. VPRA may award the PDBA to a Respondent where an organizational conflict of interest is determined to exist, provided that VPRA determines that the conflict can be avoided, neutralized, or mitigated.

If, after award of the PDBA, an organizational conflict of interest is discovered, the Design-Builder must make an immediate and full written disclosure to VPRA, including a description of the action taken to avoid, neutralize or mitigate the conflict. If it is determined that the Design-Builder was aware, or should have been aware, of an organizational conflict of interest prior to award of the PDBA and did not disclose the conflict to VPRA, VPRA may terminate the contract for default and/or exercise any other remedies available.

1.6.1. Ineligible Firms

The following Persons assisted with the development of the Project, including preliminary engineering, preparation of technical specifications, Project scope of work, and consultation in the development of the qualifications and evaluation criteria for the SOQs and Proposals:

(a) WSP USA Inc.
(b) Vanasse Hangen Brustlin, Inc.
(c) Kimley-Horn and Associates, Inc.
(d) Rummel, Klepper, and Kahl, LLP
(e) Modjeski & Masters, Inc.
(f) Michael Baker International
(g) Gannett Fleming, Inc.
(h) Mott MacDonald, Inc.
(i) Hardesty & Hanover, LLC
(j) Jacobs Solutions, Inc

These Persons are not eligible to participate in this procurement on any Respondent team in any capacity. VPRA made this determination in accordance with its Organizational Conflict of Interest Policy. If any firm listed above desires to appeal this determination of its ineligibility, such appeal must be made accordance with the procedures set forth in Section 8.4 of the Organizational Conflict of Interest Policy.

1.7. Legal Authority

VPRA is conducting this procurement in accordance with the Procurement Rules adopted by VPRA pursuant to Va. Code § 33.2-299.1 and intends to execute the PDBA pursuant to its powers granted under Va. Code § 33.2-292. This procurement is not subject to the Virginia Public Procurement Act (Va. Code § 2.2-4300 *et seq*.) or any of its companion acts (e.g., Chapter 43.1 of Title 2 of the Code of Virginia, "Construction Management and Design-Build Contracting").

1.8. Federal Funding and Requirements

VPRA anticipates receiving financial assistance from the U.S. Department of Transportation ("DOT") in the form of grant(s) and/or cooperative agreement(s) through a DOT Component,

including the Federal Transit Administration ("FTA") and the Federal Railroad Administration ("FRA"). Accordingly, this procurement and the PDBA shall be subject to all requirements associated with DOT federal financial assistance provided by a DOT Component. Additional details concerning federal requirements will be specified in the RFP and PDBA documents.

1.9. Disadvantaged Business Enterprises

In accordance with 49 C.F.R. Part 26, VPRA seeks to maximize opportunities for the participation of DBE firms on the Project. To facilitate the use of DBE firms, the RFP will require Proposers to submit a plan to utilize DBE firms during the Phase 1 Services, which will be part of the overall RFP scoring. As part of the Phase 1 Services, the Design-Builder will prepare and submit for VPRA's approval a DBE utilization plan for the Phase 2 Services. Design-Builder will implement the approved DBE utilization plan as part of the Phase 2 Services. Unless otherwise mandated by the DOT or a DOT Component, neither Phase 1 nor Phase 2 will include DBE contract goals.

To qualify as a DBE for the Phase 1 Services, a firm must be certified as such by the Department of Small Business and Supplier Diversity ("DSBSD") or the Metropolitan Washington Airports Authority ("MWAA") at the time Respondent submits its Proposal. To qualify as a DBE for the Phase 2 Services, a firm must be certified as such by the foregoing entities prior to commencement of the proposed DBE's work. A list of certified DBE firms is maintained on the DSBSD website (www.sbsd.virginia.gov) under the DBE/SWAM Certification Directory link.

VPRA is in the process of obtaining FTA approval of its DBE Program Plan and related items. The use of DBE firms during the Work will be subject to the DBE Program Plan once approved by the FTA.

1.10. Respondent Composition

Principal Participants, Major Subcontractors, the Lead Designer, Independent Design Quality Manager ("IDQM") firms, and Key Personnel identified in the SOQ may not be removed, replaced, or added without written approval from VPRA, except that Respondents may add IDQM firms after notification of the Shortlist without obtaining VPRA's approval. A written request from a Respondent to change Respondent's organization must document the proposed change, identify good cause for the change, and demonstrate that the change will be equal to or better than the Principal Participant, Major Subcontractor, Lead Designer, IDQM, or Key Personnel submitted in the SOQ. If Respondent requests to change a Principal Participant, Major Subcontractor, the Lead Designer, IDQM, or Key Personnel after notification of the Shortlist, and VPRA approves the change, VPRA will re-assess and re-score the qualifications of the Respondent and determine whether the substitution affects eligibility to be named to the Shortlist. Notwithstanding the foregoing, VPRA will not re-assess and re-score the Respondent's qualifications if the Respondent adds IDQM firms after notification of the Shortlist.

If VPRA determines that the approved, amended organization remains qualified to be named to the Shortlist, VPRA's re-assessed SOQ score for the Respondent organization will be the score

carried forward to the RFP phase. If VPRA determines that the new Respondent organization is not qualified for the Shortlist, VPRA may remove the Respondent from the Shortlist.

Requests to change Respondent's organization must be accompanied by all forms required to be submitted by the RFQ with the new organization's information.

Additionally, VPRA may disqualify a Respondent if any of its Principal Participants, Lead Designer, or Major Subcontractor(s) belongs to more than one Respondent organization, or if any Affiliate of Respondent or any of its Principal Participants, Lead Designer, or Major Subcontractor(s) is a member of another Respondent organization.

1.11. Licensing Requirements

Respondents are advised that the Project may involve the multi-jurisdictional practice of professional services (Virginia and the District of Columbia). It is incumbent upon each Respondent to investigate all applicable licensure requirements and possess such qualifications as may be required for the performance of the Work. Failure to comply with applicable law with regard to any registration or licensure requirements, whether business, individual, or professional in nature may result in VPRA declining to execute the PDBA, in the sole and reasonable discretion of VPRA.

Respondents shall be required to have all required licenses at the time of execution of the PDBA and will be required to submit evidence that Key Personnel and other specified individuals have all required licenses as a pre-condition to execution of the PDBA.

1.12. Quality Management

Quality is a key priority for the Project. For the Design, VPRA anticipates that quality management will be performed by having the Design-Builder perform Quality Control and Quality Assurance (through the IDQM), while VPRA will perform Independent Quality Assurance ("IQA"). For the Construction Work, the Design-Builder will perform Quality Control and VPRA will perform Quality Assurance. A draft of the Technical Provision section concerning quality management is attached to this RFQ as Exhibit D. VPRA encourages Respondents to consider Exhibit D in forming their organization and approach to quality management.

2. PROCUREMENT PROCESS

2.1. Procurement Schedule

Below is VPRA's planned schedule for this procurement. VPRA reserves the right to amend these

dates in its sole discretion.

Event	Date
Request for Letters of Interest Issued	November 17, 2022
Due date for Letters of Interest	December 31, 2022
Industry Forum	February 24, 2023
Release of RFQ	March 24, 2023
Request for Clarifications Due	April 10, 2023
SOQ Due Date	May 5, 2023
Shortlist Announced	June 21, 2023
Release of RFP	July 7, 2023
Proposals Due	September 15, 2023
Announcement of Preferred Proposer	October 20, 2023
Execution of Progressive Design-Build Agreement	December 2023
NTP for Phase 1 Services	December 2023
Start of Construction (other than Early Work)	Q1 2025
Substantial Completion of Construction	2030

2.2. Requests for Clarification

Respondents may submit questions to VPRA pertaining to the RFQ. Questions must be submitted via e-mail to the Point of Contact by the deadline in the Procurement Schedule. All questions must contain the following information, to the extent applicable, and shall be on Form M, which Respondents shall submit in Microsoft Word format:

(a) RFQ Section Number or Form Number;

(b) Question; and

(c) Space for VPRA Response (to be added by VPRA).

Respondents submitting a question that contains proprietary or other confidential information may identify the question as confidential by submitting Form N with the question(s). VPRA will review questions marked confidential and if it concurs that the question contains confidential information, will not make the question or response public. If VPRA disagrees that the question contains confidential information, VPRA will notify the Respondent submitting the question and provide the option to withdraw the question, amend the question, or allow the question to remain submitted without confidentiality protection.

Except for questions containing proprietary or confidential information, VPRA will post all questions received and VPRA's responses on the VPRA Website.

2.3. RFQ Addenda

VPRA may amend the RFQ from time to time in its sole discretion. Any such amendments shall be incorporated into the RFQ through an addendum that will be published on the VPRA Website. Upon submission of a SOQ, Respondents will be required to affirm receipt of all issued addenda using Form A.

2.4. Respondents Responsible for All Costs

Respondents shall be responsible for all costs associated with participation in this procurement process, including but not limited to the preparation of SOQs and Proposals, submission of questions, participation in public forums or other meetings established pursuant to the procurement process, and any other efforts or costs arising from or related to this procurement.

3. SOQ SUBMISSION INSTRUCTIONS

3.1. SOQ Deadline and Instructions

SOQs must be submitted to VPRA on or before **May 5, 2023 at 2:00 p.m. Eastern Time**. VPRA will not accept a late SOQ for any reason. Respondents shall submit their SOQ by e-mail to proposals@vpra.virginia.gov. VPRA will respond with a confirmation of receipt. All SOQs shall be submitted in searchable (i.e., not scanned) portable document format (.pdf). The file name for the SOQ shall be: [Respondent Name/LB NP SOQ/Date].

VPRA's e-mail system can receive file sizes up to 150 MB. If a Respondent must submit multiple e-mails to accommodate file size limitations, the transmission e-mail shall state the number of e-mails that Respondent will send to complete the SOQ package. Additionally, each file shall state, after the information required by the paragraph above, the file number out of the total number submitted (i.e., 1 of 2, 2 of 3, etc.).

Respondents may submit financial statements and confidential or proprietary information using a password-protected file. If Respondent sends information in a password-protected file, Respondent must state as such in the transmission e-mail. Respondent shall send the password in a separate e-mail. Respondents may not password protect their entire SOQ and may only do so for financial statements or other information identified on Form N.

3.2. SOQ Format

Each Respondent shall organize its SOQ as stated in Section 4. The information that must be contained in each Tab, in addition to the page limit (if any) for each Tab or portion thereof, is further described in Section 4.

Text shall be in English in a standard font, a minimum of 12 points, single-spaced. Pages shall be 8 ½-inch x 11-inch, with lettered/numbered dividers between each Tab. Graphic presentations may be submitted on 11-inch x 17-inch pages. Respondents shall be limited to a total of 2 (two) 11-inch by 17-inch pages for the entirety of the SOQ, each of which shall count as a single page. Pages must be numbered consecutively and include the Tab number in which the page is included (i.e., 1-1, 1-2; 2-1, 2-2, etc.).

3.3. Additional Requirements

SOQs shall be signed by an authorized representative of the Respondent. If the Respondent is a Joint Venture, partnership, or other form of consortium, the SOQ must be signed by authorized representatives of each Principal Participant. All information requested must be submitted. Failure to submit all information requested may result in VPRA requiring prompt submission of missing information and/or giving a lowered evaluation of the SOQ. SOQs that are substantially

incomplete or lack key information may be rejected as non-responsive by VPRA at its sole discretion.

4. CONTENTS OF STATEMENT OF QUALIFICATIONS

The SOQ shall be organized as shown in the table below. The information required under each tab is described in further detail in this Section 4.

Tab Number	Content	Required Submissions/ Page Limits
1	Section 4.1: Cover Letter	• Cover letter (2 Pages) • Form A (Acknowledgement and Receipt of RFQ, Addenda, and Responses to Questions)
2	Section 4.2: Legal, Financial, Safety, and DBE information	• Form B (Respondent's Organization Information) • Organizational agreement or material terms • Form C (Legal and Disputes History) • Form D (Principal Participant and Lead Designer Certification) • Form E: (Conflict of Interest Disclosure) • Financial statements • Surety Letter • Material change disclosure • Form F (Safety Questionnaire) plus required documents • Form G (Record of DBE Performance)
3	Section 4.3: Executive Summary	• 2 Pages
4	Section 4.4: Respondent Experience	• Form H (Project Experience Description) (2 pages each) • Narrative (2 pages)
5	Section 4.5: Key Personnel and Organization	• Form I (Key Personnel) • Key Personnel resumes (2 pages each) • Form J (Subcontractor Information) • Subcontractor description (1 page) • Organizational Chart and description (2 pages)
6	Section 4.6: Quality Management	• Narrative (3 pages)
7	Section 4.7: Understanding of Project and Progressive Design-Build	• Narrative (3 pages)
8	Additional Forms	• Form K (Affidavit of Non-Collusion) • Form L (Lobbying Certificate) • Form N (Proprietary / Confidential Information Designation), if needed

4.1. Cover Letter and Form A

Respondent shall provide a cover letter stating its desire to be considered for the Project and stating the official names and roles of all Principal Participants, the Lead Designer (if not a Principal Participant), IDQM firm(s), and Major Subcontractors. Respondents shall be comprised only of teams or organizations that are capable of designing and constructing the Project in its entirety. Individual firms or potential Subcontractors that are not capable of performing the entirety of the Work shall not be eligible to submit a SOQ. Additionally, except for the Lead Designer (if not a Principal Participant), Major Subcontractors, and IDQM firms, Respondents may not identify any Subcontractors to perform work during the Phase 2 Services. Respondents may, however, identify Subcontractors that will perform work during the Phase 1 Services.

In the cover letter, Respondent shall identify a single point of contact for the Respondent (the "Designated Contact") and the e-mail address, physical address, and telephone number where questions may be directed. The letter shall be signed by authorized representatives of the Respondent's organization. If Respondent is a Joint Venture, partnership, or other consortium, the letter shall be signed by authorized representatives of each member.

In addition, Respondent shall submit Form A.

4.2. Legal, Financial, Safety, and DBE Information

4.2.1. Legal Information

4.2.1.1. Legal Structure

(a) Using Form B, identify Respondent's legal name, legal structure, and relevant state(s) of organization. Provide the legal structure and state of organization for each Principal Participant, the Lead Designer (if not a Principal Participant), IDQM firm(s), and Major Subcontractors, and the % of equity interest of each Principal Participant. For Major Subcontractors, provide the scope of work that the Major Subcontractor will perform, and for IDQM firm(s), state the technical discipline in which the IDQM firm will provide specialized expertise, if applicable.

(b) If Respondent is a Joint Venture, partnership, or other consortium, provide a copy of the agreement between the constituent entities. If such agreement has not yet been executed, provide a copy of the anticipated key terms of the agreement. The agreement or the key terms must include, at a minimum, the percentages of ownership of each constituent entity, roles of the various entities, a stated commitment to execute an agreement prior to submission of a Proposal, and the provisions concerning joint and several liability stated in part (c) below.

(c) If the Respondent is a Joint Venture, partnership, or other consortium, each constituent entity of the Respondent must agree to be jointly and severally liable for the Respondent's obligations with respect to the Project.

4.2.1.2. Legal/Disputes History

(a) Submit Form C for the Respondent, Principal Participants, Major Subcontractors, and

Lead Designer, as applicable, in accordance with the instructions on the Form.

(b) Provide Form D for each Principal Participant and the Lead Designer (if not a Principal Participant).

(c) Using Form E, provide the conflict of interest disclosure discussed in Section 1.6. If there is no conflict of interest, affirmatively state as such on Form E.

4.2.2. Financial Information

Submit the following information:

(a) Financial Statements

Financial statements for the Principal Participant(s) for the three (3) most recently completed fiscal years. Financial Statements must include:

(i) Opinion Letter (Auditor's Report)
(ii) Balance Sheet
(iii) Income Statement
(iv) Statement of Changes in Cash Flow; and
(v) Footnotes

In addition, financial statements must meet the following requirements:

GAAP or IFRS Compliant

Financial statements must be prepared in accordance with U.S. Generally Accepted Accounting Principles ("U.S. GAAP") or International Financial Reporting Standards ("IFRS"). If financial statements are prepared in accordance with principles other than U.S. GAAP or IFRS, a letter must be provided from a certified public accountant identifying and discussing the areas of the financial statements that would be affected by a conversion to U.S. GAAP or IFRS. A restatement of the financial information in accordance with U.S. GAAP or IFRS is not required.

U.S. Dollars

Financial statements shall be provided in U.S. dollars, if available. If financial statements are not available in U.S. dollars, the Respondent must include summaries of the income statements, statements of cash flow, and balance sheets for the applicable time periods converted to U.S. dollars, within one month of the SOQ due date, by a certified public accountant.

Audited

Financial statements must be audited by an independent party qualified to render audit opinions (e.g., a certified public accountant). If audited financials are not available for an entity, the Respondent shall include unaudited financial statements for such entity, certified as true, correct, and accurate by the chief executive officer, chief financial officer, or treasurer (or by such equivalent position or role) of the entity.
English

Financial statement information must be prepared in English. If audited financial statements are prepared in a language other than English, translations of all financial statement information must be provided with the original financial statement information.

SEC Filings

If the Respondent or any other entity for whom financial information is submitted in the SOQ files reports with the Securities and Exchange Commission, then such financial statements shall be provided by including the entity's most recent Form 10-K. For all subsequent quarters, provide a copy of any report filed on Form 10-Q or Form 8-K that has been filed since the latest filed 10-K.

(b) Bonding Capacity and Eligibility

Provide a letter from a surety or insurance company stating that the Respondent is capable of obtaining Performance and Payment Bonds in the amount of $700,000,000, each in the forms attached hereto as Exhibit E. The surety or insurance company submitting such letter must be rated AA-/Aa3 by two nationally recognized rating agencies or at least A-VII by A.M. Best and Company, be listed on Treasury Department Circular 570, and be on the list of companies approved by the Commonwealth. The letter should recognize the Respondent's backlog and work-in-progress in relation to its bonding capacity. **Letters indicating "unlimited" bonding/security capability are not acceptable.**

(c) Material Changes in Financial Condition

Respondent shall provide information regarding any material changes in financial condition for each Principal Participant, and, if applicable, each Guarantor for the past three fiscal years and anticipated for the next fiscal year. For the avoidance of doubt, if any of the foregoing entities is a Joint Venture, partnership, or other consortium, Respondent shall provide this information for all members. If no material change has occurred and none is pending, each of these entities shall provide a letter from their respective chief executive officer, chief financial officer, or treasurer (or equivalent position or role) so certifying.

In instances where a material change has occurred, or is anticipated, the affected entity shall provide a statement describing each material change in detail, the likelihood that the factors underlying the change will continue during the period of performance of the Project, and the projected full extent of the changes likely to be experienced in the periods ahead. Estimates of the impact on revenues, expenses, and the change in equity shall be provided separately for each material change certified by the chief executive officer, chief financial officer, or treasurer (or equivalent position or role). References to the notes in the financial statements are not sufficient to address the requirement to discuss the impact of material changes.

Where a material change will have a negative financial impact, the affected entity shall additionally provide a discussion of measures that it will undertake to insulate the Project from such negative material changes, and those currently in progress or reasonably anticipated in the future. If the financial statements indicate that expenses and losses exceed income in each of the three completed fiscal years (even if there has not been a material change), the affected entity shall

provide a discussion of measures that will be undertaken to make the entity profitable in the future and an estimate of when the entity will be profitable.

Set forth at Appendix 2 is a representative list of events intended to provide examples of a material change in financial condition. This list is intended to be indicative only and is not exhaustive.

At the sole discretion of VPRA, any failure to disclose a prior or pending material change may result in disqualification from further participation in the selection process.

(d) Guarantor

VPRA may in its discretion, based upon the review of the financial information provided, specify that an acceptable Guarantor is required as a condition of shortlisting and award of the PDBA. If VPRA requires a Guarantor, VPRA will require Respondent to provide the Guarantor's financial statements for the preceding three (3) years by a time specified in VPRA's notice to a Respondent that a Guarantor is required.

If a Guarantor is required, Respondent must comply with all other requirements in the RFQ for the submission of financial information. VPRA reserves the right to review a proposed Guarantor's financial capacity and reject the proposed Guarantor if there is a material risk that it would be unable to fulfill its obligations. VPRA additionally reserves the right to permit the Design-Builder to perform the Phase 1 Services without a Guarantor, but require a Guarantor as a condition to execution of a Phase 2 Amendment.

4.2.3. Safety Record

Submit Form F, Safety Questionnaire, for each Principal Participant, in addition to the documentation specified in Form F. If the Lead Designer is a Principal Participant, the Lead Designer is not required to submit Form F.

4.2.4 DBE Participation Record

Submit Form G, Record of DBE Performance, for each Principal Participant reflecting the record of DBE participation in their contracts for the past three (3) years. If the Lead Designer is a Principal Participant, the Lead Designer is not required to submit Form G.

4.3. Executive Summary

Respondent shall submit an executive summary that provides an overview of the information presented in the SOQ. The purpose of the executive summary is to familiarize reviewers with the content of the SOQ in plain language and to provide an introduction to the SOQ.

4.4. Experience of Respondent

Respondent shall identify projects performed by the Principal Participants, the Lead Designer (if not a Principal Participant), Major Subcontractors, and IDQM firms demonstrating that they have the experience, knowledge, and capability to execute the Project successfully. Respondents should identify projects using alternative delivery methods (progressive design-build, design-build, Construction Manager/General Contractor ("CM/GC"), or methods with early contractor involvement) with a similar scope of work, risks, third-party considerations, and that have collaborative approaches to design, construction, and successful price negotiation similar to that

anticipated for the PDB method to be used on this Project. Respondents shall provide the following information to demonstrate its experience:

(a) Using Form H, Project Experience Description, provide at least two (2) projects, but no more than three (3) projects, for each (i) Principal Participant and (ii) the Lead Designer (if not a Principal Participant). Additionally, for each Major Subcontractor identified, provide one (1) representative project and for each IDQM firm, at least one (1) representative project. All project descriptions should highlight experience in the last ten (10) years relevant to the Project and comply with the following:

(i) for the projects submitted for the Principal Participants, the projects must have reached final acceptance as defined by the requirements of the submitted projects, except that for each Principal Participant, Respondent may identify no more than one (1) project that has not reached final acceptance provided that at least 50% of the value of the construction work has been completed,

(ii) for the projects submitted for the Lead Designer and IDQM, design on the project must be complete such that all final design plans have been submitted and accepted by the owner and all design packages have been released for construction. A project may be considered complete even if the Lead Designer continues to perform ancillary design services, such as responding to requests for information, preparing notices of design change, and similar services, and

(iii) for the projects submitted for the Major Subcontractor(s), the projects must have reached final acceptance as defined by the requirements of the submitted projects.

(b) Provide a narrative explaining how Respondent's project experience identified in Section 4.4(a) qualifies it to perform the work on the Project, with an emphasis on how Respondent's experience equips it to collaborate with VPRA during Phase 1 and to construct the Project during Phase 2. Explain how Respondent's project experience will help it address the Project's risks and challenges and to complete the Project on time or early. Discuss whether the members of Respondent's organization have previously worked together and how this experience will benefit the Project.

4.5. Key Personnel and Organization

4.5.1. Key Personnel

Respondent shall identify Key Personnel with the qualifications and experience to create a collaborative environment that maximizes use of the PDB delivery method and will result in a high quality Project. Respondent shall submit Form I containing the identity of individuals proposed to fill the Key Personnel positions identified in the table below. Additionally, Respondent shall submit a resume for each Key Personnel. Each resume shall highlight the following information:

(a) Proposed role on Project and experience in area of responsibility;

(b) History of employment;

(c) Experience on projects with a scope similar as the Project; and

(d) Work on the Projects identified in response to Section 4.4.

VPRA may request that the Design-Builder commit additional resources and personnel to the Project as a condition to executing a Phase 2 Amendment. Such positions shall be the subject of the Construction Price Negotiations.

Respondents may not substitute identified Key Personnel without VPRA's written consent. If a Respondent requests substitution of a Key Personnel position at any time prior to execution of the PDBA, Respondent shall submit a request in writing. Such request must identify a substitute. VPRA may re-assess the qualifications of the Respondent and determine whether the substitution affects eligibility to be named to the Shortlist and submit a Proposal. Substitutions of Key Personnel after execution of the PDBA will be subject to the terms therein, and in certain circumstances may be subject to the assessment of liquidated damages.

Key Personnel	Requirements and Preferred Qualifications	Time Commitment
Project Manager	The Project Manager will manage the overall Project for the Design-Builder, including both the Phase 1 and Phase 2 Work. This person will be the main point of communication for the Design-Builder and VPRA's primary point of contact. The Project Manager will be responsible to ensure adequate personnel and other resources are made available for the Project, will handle contractual matters, and will be responsible for quality and timeliness of the team performance. Preferred Qualifications: • 20 years managing similar projects • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	Phase 1: 100% Phase 2: 100%
Design Manager	The Design Manager is responsible for coordinating all aspects of the Design, including coordinating between the design disciplines. The Design Manager will be responsible for ensuring that the overall Project Design is completed in accordance with the Contract Documents. The Design Manager must be an employee of the Lead Designer and must be a registered Professional Engineer in the Commonwealth and Washington, D.C. Preferred Qualifications: • 20 years managing or performing design for similar projects	Phase 1: 100% Phase 2: 100% until final RFC by VPRA of the last set of plans; thereafter as needed to resolve design matters

	• Managing and/or preparing designs for alternative delivery projects or delivery methods with early contractor involvement, including, for example, progressive design-build, CM/GC, and design-build	
Construction Manager	During Phase 1, the Construction Manager will lead constructability reviews and provide input on the Design to ensure that the Design is constructible within the constraints of the Construction Work. During Phase 2 and any Early Work, the Construction Manager is responsible for coordinating and overseeing all aspects of Construction Work. Preferred Qualifications: • 20 years managing construction of similar projects • Providing constructability reviews of designs • CMAA Certification • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	Phase 1: 50% Phase 2: 100%
Quality Manager	The Quality Manager will be in charge of the Design-Builder's quality program. During Phase 1, the Quality Manager will be responsible for development of the Design-Builder's quality program and Quality Plan and provide inputs to the Design where appropriate to address quality-related concerns. During Phase 2, the Quality Manager will oversee that the Project is built in conformance with the approved Quality Plan and the Contract Documents. The Quality Manager will be the primary liaison with VPRA's Design IQA and Construction Quality Acceptance program. The Quality Manager must work for the Design-Builder under the direct supervision of an executive officer above the level of and under a line of authority independent of the Project Manager. The individual must have the ability to stop design or construction at any time and in the individual's sole discretion.	Phase 1: 100% Phase 2: 100%

	Preferred Qualifications: • 20 years of quality management experience for similar projects • Licensed Professional Engineer in the Commonwealth and Washington, D.C.	
Independent Design Quality Manager Director	The Independent Design Quality Manager Director ("IDQMD") shall be an employee of one of the IDQM firm(s) identified as part of Respondent's organization. During Phase 1, the IDQMD shall perform reviews of Design-Builder's Design to ensure conformance to the Contract Documents, environmental commitments, permit conditions, and conformance with the Design Quality Plan. During Phase 2, the IDQMD shall review each set of RFC plans submitted by Design-Builder to ensure conformance to the Technical Provisions. The IDQMD shall oversee and supervise the reconciliation and resolution of comments between the IDQM and Design-Builder. After review of the Design and resolution of comments, the IDQMD shall cause the RFC plans to be signed and stamped by a qualified member of the IDQM before submission to VPRA. The stamp shall attest that, under the supervision of the IDQMD, the RFC plans have been reviewed and inspected, conform to the Technical Provisions and the Design Quality Plan, and represent good industry practice. The IDQMD must be a registered Professional Engineer in the Commonwealth and Washington, D.C. Preferred Qualifications: • Twenty (20) years of experience in the analysis and design of rail systems and bridge structures. Emphasize experience with rail design, bridges, retaining structures, drainage structures, and projects of similar size and type of work.	Phase 1: 100% Phase 2: 100% until final RFC by VPRA of last set of plans; thereafter as needed to resolve design matters

Structures Design Manager	The Structures Design Manager ("SDM") will be in charge of all structural design work on the Project and ensuring that the structural design is prepared in conformance with the Contract Documents. THE SDM will be responsible for the design of all structures on the Project. The SDM must be a registered Professional Engineer in the Commonwealth and Washington, D.C. Preferred Qualifications: • 20 years of demonstrated experience in bridge engineering, design and analysis, including projects of similar size, type of work, and complexity as the Project. • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	Phase 1: 100% Phase 2: 100% until final RFC by VPRA of the last set of plans; thereafter as needed to resolve design matters
Geotechnical Design Manager	The Geotechnical Design Manager ("GDM") will be in charge of all geotechnical design work on the Project and ensuring that the geotechnical design is prepared in conformance with the Contract Documents. The GDM will be responsible for geotechnical design of the retaining walls, foundations, cut and fill slopes, embankment materials and construction, geotechnical instrumentation, and pavement subgrade and structure. The GDM must be a registered Professional Engineer in the Commonwealth and Washington, D.C. Preferred Qualifications: • 20 years of experience including planning and overseeing subsurface exploration programs for bridge structures and roadways, including	Phase 1: 100% Phase 2: 100% until final RFC by VPRA of the last set of plans; thereafter as needed to resolve design matters

	projects of similar size, type of work, and complexity as this Project. • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	
Environmental Compliance Manager	The Environmental Compliance Manager is responsible for ensuring that all Work complies with all environmental laws and environmental requirements specific to the Project. During Phase 1, the Environmental Compliance Manager may review designs to ensure compliance with environmental requirements. During Phase 2, the Environmental Compliance Manager will oversee construction operations to ensure compliance with environmental requirements. Preferred Qualifications: • 10 years of overseeing environmental compliance for similar projects	Phase 1: As needed Phase 2: 100%
Lead Cost Estimator	The Lead Cost Estimator is responsible for the cost estimating process during Phase 1. This person shall be a construction cost estimator with experience assessing price and risk and must be capable of clearly articulating the assumptions used to prepare a Construction Cost Estimate. The Lead Cost Estimator will be charged with maintaining and ensuring that the Design-Builder provides its Construction Cost Estimates on an Open Book basis. Preferred Qualifications: • 10 years of preparing construction cost estimates for similar projects • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	Phase 1: 100% Phase 2: As needed
Lead Scheduler	The Lead Scheduler is responsible for preparing the proposed Construction	Phase 1: 50%

	Schedule for Phase 2, accounting for applicable constraints on the Construction Work. The schedule prepared by the Lead Scheduler will be the schedule on which the Construction Cost Estimates are based. Preferred Qualifications: • 10 years of preparing construction schedules for similar projects • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	Phase 2: As needed
Utility Coordinator	The Utility Coordinator is responsible for coordinating with impacted Utility Owners, negotiating the terms of utility agreements, resolving utility conflicts, and managing the utility relocation process. During Phase 1, the Utility Coordinator will hold meetings with impacted Utility owners to develop relocation plans and ensure that such plans are incorporated into the Project's design and the Construction Schedule. During Phase 2, the Utility Coordinator will ensure compliance with the terms of utility agreements, coordinate utility relocation work, and manage the progress of utility work. Preferred Qualifications: • 15 years of managing utility work for similar projects • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	Phase 1: 100% Phase 2: 100%
Third-Party Coordinator	The Third-Party Coordinator is responsible for engaging with third-parties and stakeholders as needed to manage construction and other Project operations. During Phase 1, this Person will meet with third-parties to understand and manage concerns, establish schedules, and serve as point person for the Design-Builder. During Phase 2, this Person will communicate	Phase 1: 100% Phase 2: 100%

	progress with third-parties and manage the resolution of conflicts. Preferred Qualifications: • 10 years of experience with third-party coordination for similar projects • Experience with alternative delivery methods or projects with early contractor involvement, including progressive design-build, CM/GC or design-build for example	
Public Information Coordinator	The Public Information Coordinator is responsible for coordinating and managing information provided to stakeholders and the public. During Phase 1, the Public Information Coordinator will engage with the public, obtain feedback, and provide such information to the Design-Builder and VPRA. During Phase 1 and Phase 2, the Public Information Coordinator will work with VPRA to ensure that information about the Project is consistent and accurate. During Phase 2, the Public Information Coordinator will act as the Design-Builder's liaison to the public and with stakeholders. Preferred Qualifications: • 10 years of experience with public information management for similar projects	Phase 1: 50% Phase 2: 50%
Safety Manager	The Safety Manager shall oversee and be responsible for safety on the Project site. During Phase 1, the Safety Manager shall be responsible for preparation of Design-Builder's Safety Management Plan and may assist with constructability review to verify that construction can be performed safely. During Phase 2, the Safety Manager shall ensure that all Construction Work is performed safely and in compliance with the Contract Documents and Design-Builder's Safety Management Plan. The Safety Manager must be on site during all major construction operations. Preferred Qualifications: • 15 years of managing safety for similar types of construction work,	Phase 1: 25% Phase 2: 100%

	with an emphasis on rail construction and construction in a dense, urban environment	
Additional Value Personnel*(see note below)		

*Additional Value Personnel: Respondent may name up to two (2) other individuals that the Respondent considers as key to the success of the Project. Their resumes shall describe their anticipated role, relevant experience, registration(s), education, and other elements of qualification applicable to this Project, as well as how much time they will dedicate to the Project.

4.5.2. Major Subcontractors

Respondents may include Major Subcontractors as part of their Respondent organization that Respondent believes would enhance their qualifications. Major Subcontractors are firms proposed to perform specified Phase 2 Services and, together with the Lead Designer and IDQM firms, are the only Subcontractors that may be identified in the SOQ that will perform a portion of the Phase 2 Services. If identifying a Major Subcontractor, Respondent shall identify the type of work that the Major Subcontractor will perform in sufficient detail to enable an understanding of the Major Subcontractor's expertise (e.g., excavation, roadway, geotechnical). Additionally, to the extent possible, Respondent shall identify the work items on which the Major Subcontractor will perform its work. This information shall be provided where indicated on Form B and may be discussed further in the narrative provided in response to Section 4.5.4.

Major Subcontractors may only be identified as part of a single Respondent organization. Additionally, Major Subcontractors may not be removed from the Respondent, a Proposer, or the Design-Builder, except as otherwise provided herein and the PDBA.

If the Design-Builder identifies Major Subcontractor(s) as part of its organization, the Major Subcontractor must perform the scope of work for which it was identified in the SOQ. The scope of work to be performed by a Major Subcontractor shall not be subject to competitive bidding and shall be included in the negotiated scope of work included in the Construction Price. The value of negotiated work to be performed by Major Subcontractor(s) shall count toward the 50% maximum limitation on negotiated (i.e., not competitively bid) self-performed work. Design-Builder will be subject to liquidated damages under the PDBA due to the failure of a Major Subcontractor to perform the work for which it is identified in the SOQ.

Subcontractors may be identified to perform Phase 1 Work and shall not be considered Major Subcontractors or subject to these conditions, unless such Subcontractor is also a Major Subcontractor.

4.5.3. Independent Design Quality Manager

Respondents shall identify the IDQM firm(s) in their SOQ. The IDQM firm(s) shall be retained by the Design-Builder but have no contractual relationship with the Lead Designer or any subconsultant to the Lead Designer.

The IDQM shall have the responsibilities identified in Exhibit D, which shall be to provide independent design reviews and certification that the submitted RFC plans comply with the

Contract Documents, the Design-Builder's Quality Plan, and represent good industry practice. The IDQM's review shall be in addition to the Design-Builder's internal Quality Control and assurance procedures and shall not replace the Design-Builder's Quality Control responsibilities. The IDQM firm signing and certifying compliance of designs with the Contract Documents must hold the same professional licensure and applicable certifications as those required for the Lead Designer. Prior to submission of a RFC design package to VPRA, Design-Builder shall obtain signed certification from the IDQM. Respondents may identify multiple firms to serve in the IDQM role if Respondent believes that specialized expertise in different technical disciplines will benefit the Project.

The IDQM firm(s) may not be removed after submission of the SOQ, except as otherwise provided herein and the PDBA. Work performed by the IDQM firm(s) is not subject to the competitive bidding process for the Phase 2 Services, nor does the work performed by IDQM firm(s) count toward the 50% limitation on negotiated self-performed work. IDQM Firms are not required to be exclusive to a single Respondent.

4.5.4. Organization

Provide the following information about Respondent's organization:

(a) Using Form J, except for the Lead Designer, IDQM, and Major Subcontractors, identify Subcontractors the Respondent plans to use for the Phase 1 Services. Respondent may not identify proposed Subcontractors for the Phase 2 Services other than Major Subcontractors, the Lead Designer, and IDQM firms (which are not required to be identified on Form J).

(b) Submit a summary describing the Subcontractors identified in Form J.

(c) Provide an organizational chart identifying Key Personnel and participating firms responsible for major functions to be performed in designing, constructing, and providing quality management services for the Respondent's organization. All Key Personnel, Principal Participants, the Lead Designer (if not a Principal Participant), Major Subcontractors, IDQM firms, and known Phase 1 Subcontractors must be identified on the chart. Provide a brief description of the significant functional relationships among these firms.

4.6. Quality Management

Respondent shall demonstrate its approach to ensure that the design and construction work is prepared and performed with a focus on quality. Respondent shall provide a narrative of its approach to quality management and how Respondent intends to interact with VPRA's Design IQA and Construction Quality Acceptance programs. Respondent shall address Quality Control for both design and construction and specify the key processes it will employ in its Quality Plan, including the role to be played by the IDQM firm(s) for design Quality Assurance. Respondent shall discuss such issues as the use of independent checks, stop work authority, resolution of nonconformance reports, and other critical quality issues. Respondent shall identify past

successes with its approach to quality management, as well as key lessons learned from its experience.

Note that the RFP will require Proposers to submit an in-depth discussion of quality management and a draft of the Quality Plan.

4.7. Understanding of Project and Progressive Design-Build

Respondent shall demonstrate its preliminary understanding of the Project, key risks and challenges, and how it will use the PDB delivery method to improve the Project and mitigate risk. Respondent shall describe the following:

(a) Respondent's understanding of the Project, VPRA's goals, and Respondent's preliminary approach to completing the Project on time and within budget;

(b) Respondent's preliminary approach to using the PDB delivery method;

(c) Respondent's preliminary approach to coordinating with and receiving Design acceptance from VPRA's partners, including CSXT and Amtrak;

(d) How Respondent's identified experience demonstrates its ability to use the PDB method to benefit the Project;

(e) Respondent's method to identify and perform Early Work and the benefit that Early Work will bring to the overall Project;

(f) Preliminary major risks and challenges associated with the Project and how the Respondent would plan to mitigate those risks and overcome those challenges, including how Respondent would use the PDB method to mitigate risk; and

(g) Respondent's understanding of the Project's significant technical challenges, approach to their resolution, and how Respondent's experience demonstrates its capability to achieve such resolution.

4.8. Additional Forms

Submit the following forms:

(a) Form K: Affidavit of Non-Collusion;

(b) Form L: Lobbying Certificate; and

(c) Form N: Proprietary/Confidential Information Designation (if applicable).

5. EVALUATION CRITERIA

5.1. SOQ Evaluation

SOQs will be evaluated in two steps:

(a) Pass/Fail Review; and

(b) Qualitative Review.

VPRA will first conduct a Pass/Fail review of all SOQs received. SOQs that receive a "Pass" for all categories of the Pass/Fail criteria will proceed to the qualitative review and be scored. SOQs that receive a "Fail" in any category of the Pass/Fail criteria will be removed from further consideration. VPRA will notify Respondents whose SOQ receive a "Fail."

5.1.1. Pass/Fail Review

The pass/fail review consists of the following:

(a) **Responsiveness**: The SOQ complies with the following:

(i) the SOQ conforms to the RFQ instructions regarding organization and format and Respondent has submitted all required information,
(ii) the Respondent's qualifications and other information provided are responsive to the requirements set forth in the RFQ, and
(iii) the SOQ does not contain any material misrepresentations.

In performing the responsiveness review, VPRA reserves the right to waive minor informalities, irregularities, and apparent clerical mistakes that are unrelated to the substantive content of the SOQ.

(b) **Legal**: The SOQ complies with and meets or exceeds the minimum requirements listed in Section 4.2.1 and there are no identified issues presenting a material risk that the Respondent is unable to complete the Phase 1 or Phase 2 Services.

(c) **Financial Capacity**: The SOQ complies with and meets or exceeds the minimum requirements listed in Section 4.2.2 and there are no identified issues presenting a material risk that the Respondent is unable to complete the Phase 1 or Phase 2 Services.

(d) **Safety**: Respondent possesses a comprehensive safety program, performs regular safety training for employees, and, through its responses on Form F, demonstrates a commitment to a safety culture within the organization as evidenced by its processes, procedures, and outcomes. In addition, there are no identified issues presenting a material risk that the Respondent would not be able to perform the Phase 1 and Phase 2 Services safely and with due regard for the health and safety of its employees, VPRA, and the general public.

(e) **DBE Participation**: The Respondent demonstrates a history of successful compliance with DBE requirements and does not present a material risk of failing to use DBE firms in the Work.

5.1.2. Qualitative Review

SOQs will be evaluated and scored as follows:

Category	Total Points Possible
Experience of Respondent	30
Key Personnel and Organization	40
Quality Management	15
Understanding of Project and Progressive Design-Build	15
Total	**100**

Respondents are advised that a Respondent's "Experience of Respondent" and "Key Personnel and Organization" qualifications scores will be carried forward to the RFP step and considered as part of the Proposal scoring of shortlisted Proposers. Respondent organizations that receive written approval from VPRA to change compositions will have their qualifications re-evaluated as stated in Section 1.10.

VPRA will conduct the SOQ evaluations based on the following criteria:

Category	Evaluation Criteria
Experience of Respondent	The extent to which the Respondent's organization shows that it has successfully performed similar prior work that demonstrates its qualifications and ability to design and build the Project. This includes the Respondent's prior successes at maximizing services similar to both the Phase 1 and Phase 2 Services by creating a collaborative environment with project owners and maximizing the value of alternative delivery approaches that include early contractor involvement.
Key Personnel and Organization	The extent to which Respondent's Key Personnel and organization have the background and experience to be successful at delivering a quality Project that meets VPRA's goals, as demonstrated by the prior successes of the Key Personnel and Respondent's organization.
Quality Management	The extent to which Respondent demonstrates a thorough commitment to quality, evidenced by the presence of a robust quality control process that incorporates production staff, contains procedures to identify and correct nonconforming work, vests quality staff with sufficient authority to stop work, uses the IDQM to make the design review process as efficient as possible, and will interact with VPRA's design IQA and construction Quality Acceptance program in a manner that facilitates cooperation and improves the overall quality of the Work.
Understanding of Project and Progressive Design-Build	The extent to which Respondent demonstrates an approach that: maximizes the value of the PDB delivery

	method, understands key risks and mitigation strategies, proposes a logical and innovative methodology for the Work, understands VPRA's Project goals, and has demonstrated that its prior work provides the experience for a successful Project outcome.

5.1.3. Evaluation Methodology

The Evaluation Team will evaluate each of the four categories in Section 5.1.2 using the following adjectival ratings: Exceptional, Good, Acceptable, Weak, and Unacceptable. The Evaluation Team may differentiate within each adjectival rating by adding a plus (+) or minus (–) to the rating, except that (Exceptional +) and (Weak –) shall not be available ratings. To rank the SOQs, the Evaluation Team will reach a consensus adjectival rating for each of the four categories. The consensus adjectival ratings will be converted to the numerical scale identified in Section 5.1.2 to assign a score to each SOQ. The adjectival ratings will be assigned on the following basis:

Adjectival Rating	Rating Description
Exceptional (E)	The SOQ offers universally better than acceptable quality and the greatest likelihood of successful results for the Work. There are essentially no weaknesses or deficiencies requiring correction.
Good (G)	The SOQ offers generally better than acceptable quality and a high likelihood of successful results for the Work. Deficiencies and/or weaknesses in the SOQ are minor and correctable.
Acceptable (A)	The SOQ offers an acceptable level of quality and a reasonable likelihood of successful results for the Work. Deficiencies and/or weaknesses in the SOQ are generally correctable with minor to some significant changes.
Weak (W)	The SOQ minimally complies with stated criteria and offers a low likelihood of successful results for the Work. The SOQ includes deficiencies and/or weaknesses that are not correctable without significant changes.
Unacceptable (U)	The SOQ does not meet the stated criteria and has significant weaknesses, deficiencies, and/or unacceptable quality. Essential information is not provided or is conflicting and/or unproductive. Deficiencies and weaknesses are so major and/or extensive that a major revision to the SOQ would be necessary to meet the objectives of the Project.

A Respondent that receives a consensus adjectival rating of "Unacceptable" in any of the categories identified in Section 5.1.2 may, in VPRA's sole discretion, be eliminated from further consideration.

5.2. Shortlisting

Respondents shall be ranked from highest to lowest in order of their SOQ scores. VPRA intends to name no more than four (4) Respondents to the Shortlist in order to ensure adequate competition. Upon shortlisting by the Evaluation Team, only those Respondents named to the Shortlist shall remain eligible for participation in the RFP step. Neither the overall scoring nor the ranking of the Respondents on the Shortlist will be disclosed to Respondents until the procurement process is complete and a PDBA is executed.

5.3. Debriefings

All Respondents submitting SOQs will be notified in writing of the Shortlist. Respondents not named to the Shortlist may request a debriefing. If requested, debriefings shall be provided at the earliest feasible time after announcement of the Shortlist, subject to applicable law. The debriefing shall be conducted by VPRA's Point of Contact or designee, who may be accompanied by other VPRA officials familiar with the rationale for the selection decision.

Debriefings shall:

(a) be limited to discussion of the unsuccessful Respondent's SOQ and will not include specific discussion of a competing SOQ;

(b) be factual and consistent with the evaluation of the unsuccessful Respondent's SOQ; and

(c) provide information on areas in which the unsuccessful Respondent's SOQ had weaknesses or deficiencies.

Debriefing will not include discussion or dissemination of the identities, thoughts, or notes of individual members of the Evaluation Team, but may include a summary of the rationale for the selection decision.

6. PROCUREMENT DECISION APPEALS

Any Respondent who desires to file a procurement decision appeal (other than matters involving organizational conflicts of interest) must do so in accordance with sections 7.3, 7.4, and 7.5 of the Procurement Rules. Procurement decision appeals will be administered in accordance with the Procurement Rules.

7. VIRGINIA FREEDOM OF INFORMATION ACT

All SOQs submitted to VPRA become the property of VPRA and are subject to the disclosure requirements of the Virginia Freedom of Information Act (VFOIA) (Va. Code § 2.2-3700 *et seq*.). Respondents are advised to familiarize themselves with the provisions of VFOIA to ensure that documents identified as confidential will not be subject to disclosure under VFOIA. In no event shall the Commonwealth or VPRA be liable to a Respondent for the disclosure of all or a portion of an SOQ submitted pursuant to this request.

If a Respondent has special concerns about information that it desires to make available to VPRA (including information submitted in a SOQ), but that it believes constitutes a trade secret, proprietary information, or other confidential information exempted from disclosure, such Respondent should specifically and conspicuously designate that information as such in its

SOQ and state in writing why protection of that information is needed in accordance with Form N (Proprietary/Confidential Information Identification), and submit Form N in Tab 8 of the SOQ.

Blanket designations that do not identify the specific information are not acceptable and may be cause for VPRA to treat the entire SOQ as public information. Nothing contained in this provision shall modify or amend requirements and obligations imposed on VPRA by applicable law, and the applicable law(s) shall control in the event of a conflict between the procedures described above and any applicable law(s).

In the event VPRA receives a request for public disclosure of all or any portion of a SOQ identified as confidential, VPRA will attempt to notify the Respondent of the request, providing an opportunity for such Respondent to assert, in writing, claimed exemptions under the VFOIA or other Commonwealth law. VPRA will come to its own determination whether the requested materials are exempt from disclosure.

8. RESERVED RIGHTS

In connection with this procurement, VPRA reserves to itself all rights (which rights shall be exercised by VPRA in its sole discretion) available to it under applicable law, including without limitation, the following, with or without cause and with or without notice:

(a) the right to cancel, withdraw, postpone, or extend this RFQ in whole or in part at any time prior to the execution by VPRA of the PDBA, without incurring any obligations or liabilities;

(b) the right to issue a new RFQ or RFP;

(c) the right to reject any and all submittals, responses, and SOQs received at any time;

(d) the right to modify all dates set or projected in this RFQ;

(e) the right to suspend and terminate the procurement process for the Project, at any time;

(f) the right to waive or permit corrections to data submitted with any response to this RFQ until such time as VPRA declares in writing that a particular stage or phase of its review of the responses to this RFQ has been completed and closed;

(g) the right to issue addenda, supplements, and modifications to this RFQ;

(h) the right to permit submittal of addenda and supplements to data previously provided with any response to this RFQ until such time as VPRA declares in writing that a particular stage or phase of its review of the responses to this RFQ has been completed and closed;

(i) the right to hold meetings and conduct discussions and correspondence with one or more of the Respondents responding to this RFQ to seek an improved understanding of the responses to this RFQ;

(j) the right to seek or obtain data from any source that has the potential to improve the understanding and evaluation of the responses to the RFQ, including the right to seek clarifications from Respondents;

(k) the right to permit Respondents to add or delete firms and/or key personnel until such time as VPRA declares in writing that a particular stage or phase of its review has been completed and closed;

(l) the right to add or delete Respondent responsibilities from the information contained in this RFQ;

(m) the right to waive deficiencies, informalities, and irregularities in a SOQ, accept and review a non-conforming SOQ or seek clarifications or supplements to a SOQ;

(n) the right to disqualify any Respondent that changes its submittal without VPRA approval;

(o) the right to change the method of award at any time prior to submission of the Proposals; and

(p) the right to respond to all, some, or none of the inquiries, questions and/or request for clarifications received relative to the RFQ.

9. COMPLIANCE WITH LAW IN VIRGINIA

Failure to comply with the law with regard to those legal requirements in Virginia (whether federal or state) regarding the Respondent's ability to lawfully offer and perform any services proposed or related to the Project may be cause for rejection of a Respondent's SOQ, in the sole and reasonable discretion of VPRA, and in that event a Respondent's SOQ submittal may be returned without any consideration for selection of contract award.

10. ETHICS IN PUBLIC CONTRACTING

By submitting their SOQs and Proposals, Respondents certify that their submissions are made without collusion or fraud and that they have not offered or received any kickbacks or inducements from any other Respondent, supplier, manufacturer or subcontractor in connection with their submissions, and that they have not conferred on any public employee having official responsibility for this procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value was exchanged.

11. REPRESENTATIONS

Respondent hereby represents and warrants that (1) as of the date hereof, and on and as of the date of the provision of goods or services contemplated herein, the Respondent (or where applicable, its Principal Participants) is duly organized, validly existing and in good standing under the laws of its jurisdiction of organization; and (2) the Respondent has the full right, power and authority and has taken all necessary action under the laws of its jurisdiction of organization to authorize it to execute and deliver the PDBA, to consummate the transactions contemplated hereby and in the PDBA and to perform its obligations thereunder. Respondent hereby agrees to furnish to VPRA any and all certificates of governmental authorities and/or officers or directors of Respondent (or where applicable, its Principal Participants) that VPRA may reasonably require in order to confirm the due authorization and execution of the SOQ, Proposal, and the PDBA and Respondent's right, title, and authority to perform its obligations thereunder.

12. NO ASSUMPTION OF LIABILITY

VPRA assumes no obligations, responsibilities, and liabilities, fiscal or otherwise, to reimburse all or part of the costs incurred or alleged to have been incurred by parties considering a response to and/or responding to this RFQ. All of such costs shall be borne solely by each Respondent and its team members. In no event shall VPRA be bound by, or liable for, any obligations with respect to the RFQ until such time (if at all) a contract, in form and substance satisfactory to VPRA, has been executed and authorized by VPRA and, then, only to the extent set forth therein.

13. APPLICABLE COST PRINCIPLES; ACCOUNTING REQUIREMENTS

The PDBA will be performed and audited in accordance with 2 C.F.R. Part 200, Uniform Administrative Requirements, Cost Principles and Audit Requirements for Federal Awards, which provisions were adopted by DOT at 2 C.F.R. Part 1201 and are incorporated herein by reference. To be eligible for reimbursement, Respondent's costs must comply with cost principles set forth in 2 C.F.R. Part 200. All Respondents submitting SOQs and Proposals must have internal control systems in place that meet federal requirements for accounting. These systems must comply with requirements of 2 C.F.R. Part 200 and be sufficient to exclude unallowable cost items from Project invoicing to VPRA.

Where applicable, certain costs and reimbursement under the PDBA must also comply with 48 C.F.R. Part 31 ("FAR Part 31"). All Respondents submitting SOQs and Proposals must have internal control systems in place that meet federal requirements for accounting. These systems must comply with requirements of FAR Part 31 and be sufficient to exclude unallowable cost items from Project invoicing to VPRA.

EXHIBIT A

RAILROAD OPERATOR INDEMNIFICATION PROVISIONS

I. INDEMNIFICATION DUTIES

A. CSXT. Design-Builder shall indemnify, defend, and hold harmless CSXT Indemnitees to the same extent to which VPRA is entitled to indemnity and defense under Section [●] of the Progressive Design-Build Agreement.

B. Amtrak. Subject to applicable law, including Va. Code § 11-4.1, Design-Builder shall indemnify and defend Amtrak for all losses or claims arising from the acts or omissions of Design-Builder in performing the Progressive Design-Build Agreement, whether or not Design-Builder is negligent and irrespective of any negligence or fault of Amtrak, *provided that,* Design-Builder's indemnity and duty to defend shall not extend to Amtrak-Assumed Individuals and/or Amtrak-Assumed Property.

II. DEFINITIONS

"**Affiliate**" means, when used to indicate a relationship with a specified Person, Person that: (a) directly or indirectly, through one or more intermediaries has a 10% or more voting or economic interest in such specified Person or (b) controls, is controlled by or is under common control with such specified Person, and a Person is deemed to be controlled by another Person, if controlled in any manner whatsoever that results in control in fact by that other Person (or that other Person and any Person or Persons with whom that other Person is acting jointly or in concert), whether directly or indirectly and whether through share ownership, a trust, a contract, or otherwise.

"**Amtrak-Assumed Individuals**" means:

(i) an employee of Amtrak;
(ii) any person who is on an Amtrak train other than a Commonwealth-Introduced Individual;
(iii) any person other than a Commonwealth-Introduced Individual at or adjacent to a passenger station located on the rail lines used for Amtrak service who is at such passenger station for the purpose of boarding or detraining from an Amtrak train, meeting an Amtrak train, purchasing a ticket for an Amtrak train, making a reservation for an Amtrak train, or obtaining information about Amtrak service or conducting business with Amtrak (including a vendor from whom Amtrak receives compensation);
(iv) any person at or adjacent to a passenger station who is providing local transportation to or accompanying a person described in (iii) above; and
(v) any person injured or killed by the collision of a vehicle or person with an Amtrak train on or adjacent to the rail lines on which Amtrak operates, including the collision of a derailed Amtrak train or any part thereof beyond the Commonwealth's railroad right-of-way.

"**Amtrak-Assumed Property**" means:

(i) the property of any Amtrak-Assumed Individual;
(ii) any locomotive, passenger car, or any other property or equipment owned by, leased to, used by or otherwise in control, custody, or possession of Amtrak (except that Amtrak's dispatching of trains, which trains are not otherwise in control, custody, or possession of Amtrak, by itself shall not be deemed to place such trains into Amtrak's control, custody, or possession); and
(iii) property of parties other than Amtrak and VPRA, to which damage is caused by fuel oil which is demonstrated to have spilled from an Amtrak engine and for fuel oil which is demonstrated to have spilled by Amtrak's employees, agents, or contractors (but excluding CSXT) while fueling an Amtrak train.

"**Commonwealth-Introduced Individual**" means any employee, invitee, or agent of the Commonwealth or the Commonwealth's contractor in the course of his employment or agency, except when such employee, invitee, or agent is a fare-paying passenger of Amtrak.

"**CSXT Indemnitees**" means CSXT, any Affiliate of CSXT, and any of the officers, directors, shareholders, employees, agents, successors, or assigns of such entities.

III. INCLUSION IN SUBCONTRACTS

Design-Builder agrees to have the foregoing terms flow down to each subconsultant agreement and lower tier subcontract issued under the Progressive Design-Build Agreement, modified only to identify the subconsultant or subcontractor that will be subject to the provisions.

EXHIBIT B

Project Information

***The information included in this Exhibit B is preliminary and subject to change. These materials have been submitted to VPRA's project delivery partners for comment and may be amended based on those and other comments. VPRA will provide additional information as the procurement progresses and once the Design-Builder is selected and work begins.**

VIRGINIA PASSENGER RAIL AUTHORITY

Basis of Design Report

Draft – February 2023

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Table of Contents

TABLE OF CONTENTS I
1 INTRODUCTION 1
1.1 Engineering Limits 2
1.2 Project Approach 5
1.3 Planning Considerations 6
1.3.1 Operational Capacity 6
1.3.2 Permitting Overview 6
1.4 Utilization of Standards 7
2 RAILROAD 8
2.1 Safety 8
2.2 References 8
2.3 Design Life 9
2.4 Design Speeds 9
2.5 Horizontal Geometry 10
2.5.1 Track Centers 10
2.5.2 Tangent Alignment 11
2.5.3 Horizontal Curve Alignment 11
2.6 Vertical Geometry 14
2.6.1 Grades 14
2.6.2 Vertical Curvature 14
2.7 Clearances 15
2.7.1 Bridges 16
2.8 Roadbed Section 17
2.8.1 Ballast Depth 17
2.8.2 Subballast Depth 17
2.8.3 Shoulder Width 17
2.8.4 TRACK Drainage 17
2.9 Special Trackwork 18
2.9.1 Speeds Through Turnouts and Crossovers 18
2.9.2 Turnouts and Crossovers 18
2.10 Track Gauge 19
2.11 Rail 19
2.12 Rail Anchoring 19

DRAFT

2.13 Tie Plates 19
2.14 Ties 19
2.14.1 Concrete Ties 19
2.14.2 Timber Ties 20
2.15 Communications and Signals 20
3 RAILROAD BRIDGES AND RETAINING WALL STRUCTURES 21
3.1 Overview 21
3.1.1 Ownership 21
3.1.2 References 21
3.2 Special Requirements 22
3.2.1 Span Configuration 22
3.2.2 Design Speed 22
3.2.3 Design Life 22
3.2.4 Distribution of Axle Loads 22
3.2.5 Bridge Deck 23
3.2.6 Bearings and Bearing Replacement Considerations 23
3.2.7 Track Geometrics and Clearances 24
3.2.8 Bridge Drainage 25
3.2.9 Utilities 25
3.2.10 Navigation lighting 26
3.2.11 Communications and Signals 26
3.3 Loads 26
3.3.1 Dead Loads 26
3.3.2 Live Load 27
3.3.3 Impact Loads & Rocking Effect 27
3.3.4 Vessel Impact 28
3.3.5 Effect of Scour 28
3.3.6 Buoyancy 28
3.4 Design Method 29
3.4.1 Steel Design 29
3.4.2 Substructure Design 29
3.4.3 Retaining Wall and Crashwall Design 29
3.5 Fatigue 29
3.6 Seismic Design 30
3.6.1 Structure Importance Classification 30

DRAFT

3.6.2 Performance Criteria 30
3.6.3 Site Coefficient 30
3.6.4 Analysis Procedure 30
3.6.5 Detailing Provisions 31
3.6.6 Damping Adjustment Factor 31
3.6.7 Load Combinations 31
3.7 Materials and Equipment 31
3.7.1 General 31
3.7.2 Concrete 31
3.7.3 Structural Steel 31
3.7.4 Reinforcing Steel 32
3.7.5 Fasteners 32
3.7.6 Welding Electrodes 33
3.7.7 Anchor Rods and Bolts 33
3.8 Retaining Walls 33
3.8.1 General 33
3.8.2 Loads 33
3.8.3 Embankments 34
3.9 Foundation Design 34
3.9.1 General 34
3.9.2 References 34
3.9.3 Design LIFE 34
3.9.4 Approach Slabs 35
3.9.5 Driven Pile Foundations 35
3.9.6 Drilled Shafts 36
3.9.7 Micropiles 36
4 PEDESTRIAN/BICYCLE FACILITIES 37
4.1 Overview 37
4.2 Trail Design 37
4.2.1 References 37
4.2.2 Design Speed 38
4.2.3 Trail Width 38
4.2.4 Minimum Horizontal Curve Radius 39
4.2.5 Cross-Slope 39
4.2.6 Stopping Sight Distance 40

DRAFT

4.2.7 Intersection Sight Distance 40
4.2.8 Trail Grade 40
4.2.9 Vertical Curve 40
4.2.10 Vertical Clearances 41
4.2.11 Bridge Horizontal Clearance from Railroad 41
4.2.12 Railings and Screens 42
4.2.13 Adjacent Roadway Offsets and Barriers 42
4.2.14 Emergency Vehicle Access and Accommodations 42
4.2.15 Drainage 42
4.2.16 Special Considerations 43
4.3 Other Pedestrian Facilities Design 43
4.3.1 References 43
4.3.2 Design width 43
4.3.3 Sidewalk/Ramp Grade 44
4.3.4 Vertical Clearances 44
4.3.5 Drainage 44
4.4 Structural Design of Pedestrian-Bicycle Bridges 45
4.4.1 References 45
4.4.2 Design method 45
4.4.3 Special Design Considerations 45
4.4.4 Design Life 45
4.4.5 Dead Load 46
4.4.6 Live Loads 46
4.4.7 Wind Loads 46
4.4.8 Railing Loads 46
4.4.9 Thermal Loads 47
4.4.10 Stream Pressure and Buoyancy Loads 47
4.4.11 Seismic Loads 47
4.4.12 Vehicular Collision Load 47
4.4.13 Vessel Collision Load 47
4.4.14 Deflections and Vibrations 47
4.4.15 Construction Loads 47
4.4.16 Materials 47
4.4.17 Foundations 48
4.4.18 Retaining Walls 48

DRAFT

5 ROADWAY 49
5.1 Project Background 49
5.2 Safety 49
5.3 Design Criteria 49
5.3.1 Roadway Standards 49
5.3.2 Design Content 50
5.4 Maintenance of Traffic 50
5.4.1 Allowable Work Hours 51
5.4.2 Temporary Condition Design Criteria 51
5.4.3 Pedestrian and Bicycle Access 52
6 BRIDGE HYDRAULICS 53
6.1 References and Resources 53
6.1.1 Regulatory Approval 53
6.1.2 Design Guidelines 53
6.1.3 ENVIRONMENTAL IMPACT STATEMENT 53
6.2 Data Collection 53
6.2.1 Survey and As-builts 53
6.2.2 Effective Fema study 54
6.3 Level of Analysis/Method of Analysis 54
6.4 Hydrology 54
6.4.1 Previous Hydrologic Studies 54
6.4.2 Tidal Hydrology 54
6.5 Hydraulic Design Criteria 55
6.5.1 Vertical Clearances And Navigation 55
6.6 Hydraulic Analysis 55
6.6.1 Duplicate Effective Analysis 55
6.6.2 Existing Conditions Analysis 55
6.6.3 Proposed Analysis 56
6.7 Coastal Analysis 56
6.7.1 Previous Coastal Studies 56
6.7.2 Coastal Analysis Update 56
6.7.3 Impact of Storm Surge 56
6.7.4 Impact of Sea level Rise 57
6.7.5 Compound Flooding 57
6.8 Scour Analysis and Countermeasures 57

DRAFT

6.8.1 Design Criteria 57
6.8.2 Methodology 57
6.9 Hydrodynamic and Wave Loading 57
6.9.1 Design Criteria 57
7 DRAINAGE AND STORMWATER MANAGEMENT 58
7.1 References 58
7.2 Design Criteria 58
7.2.1 Closed Drainage Systems 58
7.2.2 Open Channel Flow 59
7.2.3 CULVERT Design 59
7.3 Stormwater Management 59
7.3.1 References 60
7.3.2 BMP Design Criteria 60
7.4 Erosion and Sediment Control 61
7.4.1 References 61
8 UTILITIES 62
8.1 References 63
8.2 Impacts and Relocation Approach 63
9 LANDSCAPE DESIGN 64
9.1 References 64
9.2 Vegetation Protection Plan 66
9.2.1 Approach 66
9.2.2 Tree Surveying Criteria 66
9.2.3 Tree Protection Criteria 66
9.2.4 NAMA Headquarters 66
9.2.5 Construction Area Screening 66
9.3 Vegetation Restoration Plan 66
9.3.1 Approach 66
9.3.2 Restoration Planting Palette 66
9.3.3 Mitigation Ratio 67
9.4 Proposed Landscape Plan 67
9.4.1 Approach 67
9.4.2 Invasive Species Management 67
9.4.3 Vegetative Screening 67
10 APPROVALS AND DESIGN EXCEPTIONS 68

DRAFT

10.1 Design Exceptions 68
10.2 Design Waivers 69
11 ADDITIONAL CONSIDERATIONS 70

Appendices

Appendix A – Definitions

Appendix B – Permit Tracker

Appendix C – EIS BOD

Appendix D – FEIS Navigation Study

Appendix E – Section 106 Programmatic Agreement

Appendix F – DRPT-NPS Mitigation Agreement

Appendix G – Project Commitments (Record of Decision) & Tracker

DRAFT

1 Introduction

The Long Bridge Project (The Project) consists of improvements to the Long Bridge and related railroad infrastructure located between the Rosslyn (RO) Interlocking near Long Bridge Park in Arlington, Virginia and the L'Enfant (LE) Interlocking near 10th Street SW in Washington, DC (see Figure 1-1). The existing Long Bridge is currently owned and operated by CSX Transportation (CSXT), a Class I freight railroad, which also operates the Long Bridge Corridor (Corridor). In addition to CSXT freight, the Corridor is utilized by Amtrak and the Virginia Railway Express (VRE). The Virginia Passenger Rail Authority (VPRA) has agreed to purchase infrastructure and approximately half of the right-of-way in the Corridor from CSXT and currently has a permanent easement on the property until the title transfers.

As part of the project, the evaluation of improvements along the 1.8-mile Corridor to increase the current two-track capacity to four-tracks was completed at the conclusion of the National Environmental Policy Act (NEPA) process. The land and infrastructure transaction between VPRA and CSXT along with the build out of the four-track corridor will allow for the separation of passenger and freight traffic while maintaining interoperability for all four tracks. The proposed improvements along the Corridor include, but are not limited to, the following:

- Adding two new tracks adjacent to the existing two-track alignment;
- Adding a new two-track bridge upstream of the existing Long Bridge for a four-track crossing;
- Retaining the existing two-track Long Bridge over the Potomac River;
- Corridor-wide upgrades to track, signal, and interlockings;
- New and replacement bridges along the Corridor to achieve four-track capacity;
- New retaining walls along the Corridor to minimize impacts and facilitate phasing;
- New crashwalls and modifications to reinforce bridge piers and other structures;
- New Pedestrian Bridge crossing Maine Avenue SW; and
- New Bicycle-Pedestrian (Bike-Ped) Bridge crossing of the Potomac River and George Washington Memorial Parkway (GWMP) upstream of the new two-track rail bridge.

This Basis of Design (BOD) Report was prepared to document supporting technical criteria utilized in the development of the Project's Engineering plans, considering the various stakeholders within the Project limits. Those stakeholders included CSXT, Amtrak, VRE, and VPRA.

The BOD is applicable only to areas where new construction or major reconfiguration is anticipated to occur. Areas that do not require track structure replacement, including areas where existing tracks are maintained, are exempt from the design criteria as well as the approvals and design exception process in *Chapter 10* of this document. It is anticipated that portions of the existing track may need to be modified or upgraded for improved rail geometrics as well as to be included in modifications to the signal system.

During the previous Project phase, the Environmental Impact Statement (EIS) phase, the BOD was closely coordinated and developed with input from the major project stakeholders, including the District Department of Transportation (DDOT); Federal Railroad Administration (FRA); VPRA; CSXT; Amtrak; and VRE. The Project Sponsor for preliminary and final design, construction, future infrastructure, and corridor ownership is VPRA. Maintenance responsibilities are described in *Exhibit M – Joint Operating and Maintenance Agreement of the Virginia*

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Department of Rail and Public Transportation (DRPT) CSXT Comprehensive Rail Agreement. Further discussions between CSXT and VPRA will determine maintenance responsibilities for shared structures. CSXT and VPRA have agreed that all rail improvements will be conceptually designed consistent with CSXT design standards; FRA standards; and as described in the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering.

This BOD has expanded upon the EIS BOD. It is considered a living document that will be updated throughout the Preliminary Engineering phase based upon additional input and decisions made in project development. The primary goal of this version of the BOD is to provide sufficient technical criteria to complete Preliminary Engineering (PE) design of the Preferred Alternative. Preliminary Engineering (PE) typically includes 30 percent design and engineering. Engineering disciplines that will progress further than 30 percent design in this PE phase are described in the respective discipline sections.

1.1 Engineering Limits

The Engineering Limits extend approximately 1.8 miles within the RF&P Subdivision (previously the Richmond, Fredericksburg and Potomac Railroad) of the CSXT Central Zone (see Error! Reference source not found.). The Engineering Limits extend approximately from L'Enfant (LE) Interlocking near milepost (MP) CPF 111.5 in the District of Columbia (District) to beyond the Rosslyn (RO) Interlocking at MP CPF 109.76 in Arlington, Virginia. The Engineering Limits northern terminus adjoins the proposed station capacity improvements to the VRE L'Enfant Station; and the Engineering Limits southern terminus in Arlington adjoins the northern limits of VPRA's Alexandria Fourth Track project.

The Study Area is surrounded by diverse land uses between the District and Arlington County, Virginia, including local and national parks, residential mixed use, and commercial development. These land uses constrain the operational considerations. In general, the Project intent is to create a four-track corridor by increasing the number of tracks as recommended by the capacity modeling over the Potomac River and into the District. Operational speeds will be maintained within the narrow railroad Corridor. The Engineering Limits include multiple transportation structures. Capacity increases will impact the configuration of three existing undergrade bridges and one existing overgrade viaduct within the Corridor:

- CSXT bridge over Ohio Drive SW (East) (DDOT Br # 512);
- CSXT bridge over Washington Channel (DDOT Br #513);
- CSXT bridge over Maine Avenue SW (DDOT Br # 514); and
- Republic Properties Maryland Avenue SW viaduct over CSXT (Unknown).

The following existing undergrade bridges will not require reconfiguration and are anticipated to remain in place:

- CSXT bridge over GWMP (Unknown);
- CSXT Long Bridge over Potomac River, Mount Vernon Trail, and Ohio Drive SW (West) (DDOT Br #510); and
- CSXT bridge over Interstate 395 (I-395) (DDOT Br # 1135).

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FIGURE 1-1. LONG BRIDGE PROJECT LIMITS.

Additional work includes the following new structures or alterations to existing:

- A new undergrade bridge over GWMP, the Potomac River, and Ohio Drive SW (West) (MP 110.24);
- A new undergrade bridge over the Washington Metropolitan Area Transit Authority (WMATA) Yellow Line Tunnel and I-395 (MP 110.91);
- A new undergrade bridge over Ohio Drive SW (East) (MP 111.14);
- A new undergrade bridge over Washington Channel (MP 111.21);
- A rehabilitated undergrade bridge over Maine Avenue SW (MP 111.29);
- A new bike-ped bridge over GWMP and the Potomac River;
- A new pedestrian bridge over Maine Avenue SW that connects the Salamander Hotel and the SW Riverfront;
- New signal bridges will be incorporated along the Corridor;
- New crashwalls and modifications to reinforce bridge piers and other structures; and
- New retaining walls will be constructed throughout the Corridor to limit property impacts.

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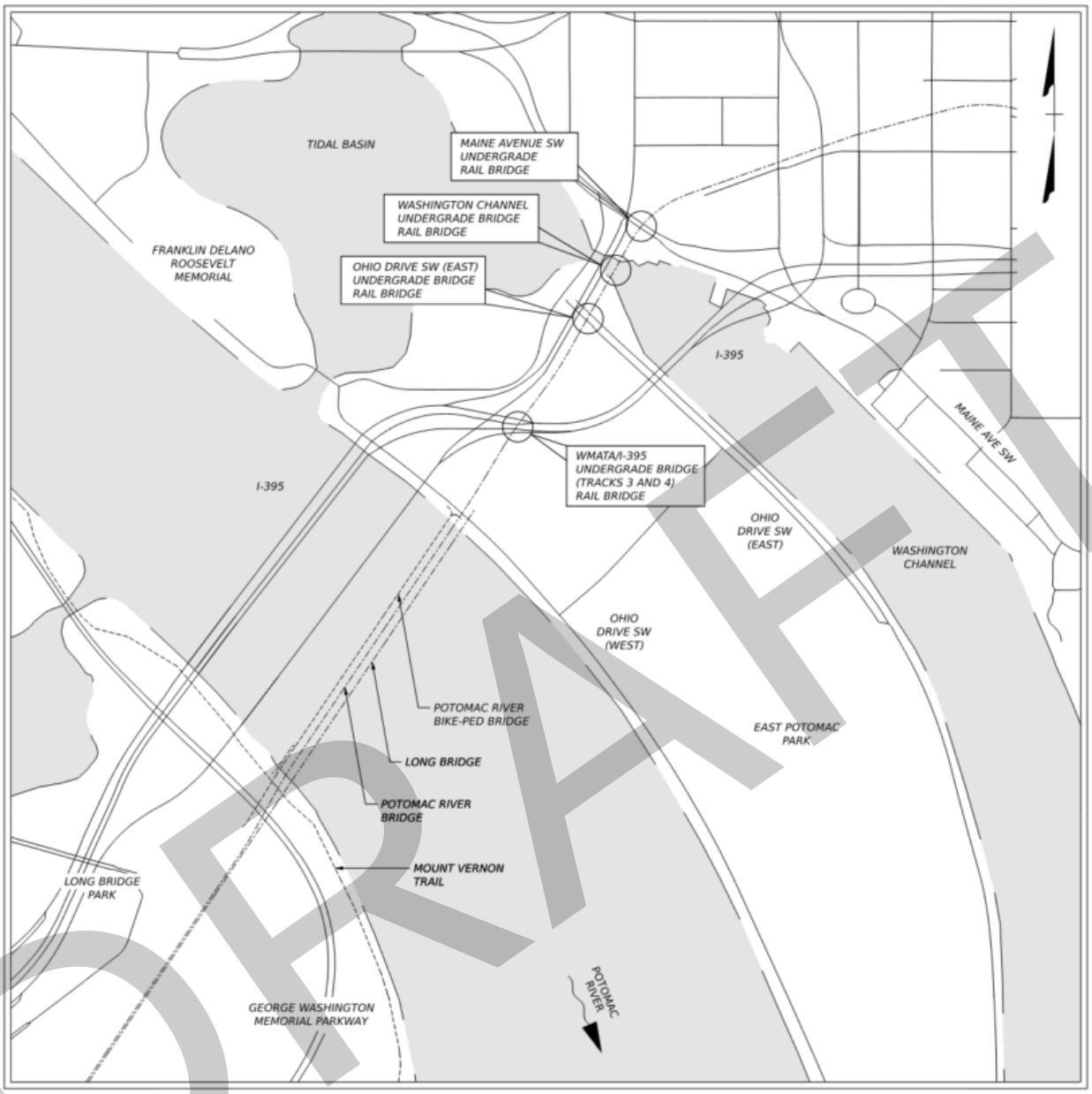

FIGURE 1-2. BRIDGE LOCATIONS.

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1.2 Project Approach

The BOD Report documents the design standards applied to the preliminary engineering design. Additional criteria, definitions, and specifications are expected to be added during the development of the preliminary design and final design. These modifications shall be approved through a technical process based on sound engineering judgment, practice, and economics. A general review process is described in *Chapter 10, Approvals and Design Exceptions*.

Key Project development principles reflected in the BOD include the following:

- All mainline tracks will be designed to meet or exceed the existing speeds through the project area.
- Preliminary design is not to preclude future electrification along the passenger tracks. Future catenary structures can be installed by widening the substructure units of the bridge or on the embankments on the approaches.
- Both new and existing mainline tracks will be designed for resiliency, redundancy, interoperability, and connectivity between all passenger and freight service.
- Utilization of ongoing and previously completed studies, concept development, and rail improvement designs in the Corridor to the extent feasible and practicable.

1.3 Planning Considerations

1.3.1 OPERATIONAL CAPACITY

The Project objective is to provide additional long-term railroad capacity and to improve the reliability of railroad service through the Long Bridge Corridor. Capacity increases are needed to meet projected demand for passenger and freight rail services of stakeholders; improve operational flexibility and resiliency; and provide redundancy for this critical link in the local, regional, and national railroad network. To increase capacity, the two-track Corridor is to be updated to four-tracks through the project area. Capacity improvements were focused on obtaining one or more of the following objectives:

- Improved travel time;
- Increase and/or improve reliability and resiliency;
- Provide flexibility to recover during periods of higher demand and service delays, including track maintenance(resiliency);
- Increase in frequency of service;
- Increase in length of train/consistency; and
- Additional infrastructure to support improvements listed above.

1.3.2 PERMITTING OVERVIEW

The Long Bridge Project traverses through various historic areas, the viewshed of the Monumental Core of the District, private and federal properties, and environmentally sensitive areas. The evaluation of these features under NEPA is complete and included the following considerations:

- Stakeholder, cooperating agencies, participating agencies, and public input on the various alternatives;
- Focus on minimizing impacts to adjacent private and federal properties;
- Focus on minimizing environmental impacts;
- Influences on visual viewshed, noise mitigation, and aesthetic improvements;
- Improvements to railroad operational benefits and safety;
- Constructability of the proposed improvements; and
- Compatibility of proposed improvements with regional planning efforts.

Additionally, construction related permits, geotechnical permits, and other permits are required to construct the project and will be pursued during the Preliminary Design phase through

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construction. *Appendix B* includes a list of all identified Permits and current status as of the date of this document.

1.4 Utilization of Standards

The design will include the use of applicable agency standard drawings, materials, and specifications for applicable improvements within the Authority Having Jurisdiction (AHJ). The utilization of standard practices and materials promotes understanding of the intended improvements with the benefit of expediting the design and construction. All new construction must conform to current and applicable AHJ standards or criteria, as detailed within specific design sections within this document. In the situation of multiple relevant standards, the more restrictive criteria will have precedence, unless otherwise specified and/or agreed upon.

Design Criteria and utilization of Standards may vary in accordance with the agency who will own and maintain the structure. Ownership and maintenance responsibilities for joint structures will be determined during the design phase of the project.

This basis of design will use Customary U.S. Units such as feet/inches, pounds/kips, degrees Fahrenheit (°F), etc. Horizontal datum references North American Datum of 1983/2011 (NAD83(2011)) and vertical datum references North American Vertical Datum of 1988 (NAVD88).

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2 Railroad

Railroad geometric design is to be developed to provide safe, economical, and efficient freight and passenger service along the rail Corridor. The geometric design configurations must be developed to mutually maintain the operation and rolling stock stability for both freight and passenger operations.

The design criteria within the Basis of Design (BOD) reflects a combination of accepted and recommended engineering practices utilized by CSX Transportation (CSXT), Amtrak and Virginia Railway Express (VRE), as well as those contained in the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (MRE).

2.1 Safety

Safety of freight and passenger operations, freight and passenger employees, and the public above, under, and adjacent to the railroad Corridor represents the critical priority of the design. Railroad safety promotion and regulation is governed by the Federal Railroad Administration's (FRA) Office of Railroad Safety, which includes FRA Track Safety Standards – 49 CFR Part 213. As the operator of the railroad Corridor, CSXT reserves the right to review and approve proposed railroad improvements.

The Project will maintain the existing posted speeds for freight and passenger trains along the existing railroad Corridor. If speeds are proposed to be increased by the Project due to improved geometry, FRA regulations require preparation of a system safety plan.

2.2 References

The design parameters for the Environmental Impact Statement (EIS) phase originated with the engineering and operating standards of CSXT. The following additional agency criteria were reviewed for more restrictive criteria or general compliance:

- AREMA Manual for Railway Engineering, 2022 Edition
- Amtrak Standards
- Applicable FRA safety requirements
- Federal laws
- District of Columbia general laws
- Commonwealth of Virginia general laws

For preliminary and final design documents, the latest edition of the code, regulation, standard, and specification applicable to the Project in effect on the day of engineering Notice-to-Proceed (NTP) is applicable to the Project design. Revisions to code, regulation, standard and specification made during engineering design are to be presented to the District Department of Transportation (DDOT), CSXT, or the Authority Having Jurisdiction (AHJ) and approved prior to incorporating revisions.

This BOD is based on industry standards, governmental regulations, AREMA recommended practices, and railroad standards. The following publications and documents are current references for Preliminary Engineering:

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- CSXT Engineering and Operating Standards (in effect as of September 15, 2016)
- CSXT Design and Construction Standard Specifications – Pipeline Occupancies (Rev. June 5, 2018)
- CSXT Design and Construction Standard Specifications Vol. 1 (March 1, 2021)
- CSXT Design & Construction Standard Specifications – Wireline Occupancies
- AREMA Manual for Railway Engineering, 2021 Edition
- FRA Track and Rail and Infrastructure Integrity Compliance Manual (in effect as of January 2017)
- FRA Railroad Corridor Transportation Plans Guidelines (July 2005)
- District of Columbia Municipal Regulations (DCMR), Chapter 24-31. OCCUPATIONAL SAFETY: RAILROAD CLEARANCES, Title 24. PUBLIC SPACE AND SAFETY.
- U.S. Code of Federal Regulations (CFR)
- Absolute maximum/minimum values for any track design element will comply with 49 CFR 213 for the applicable class of track. (On CSXT-owned and maintained track, CSXT will not allow any proposed track design element that does not comply with FRA class of track standards.)
- Strategic Rail Corridor Network (STRACNET) and Defense Connector Lines (December 1998) - http://www.tea.army.mil/DODProg/RND/default.htm

2.3 Design Life

The design life for the new railroad related features and facilities are:

- Embankment: 100 years minimum
- Ballast and subballast: 35 years minimum
- Track structure (rail, ties, and fasteners): 35 years minimum

It is anticipated that facilities will require regular maintenance and some degree of component repairs and replacement over the course of the design life. Additional decisions made on the preferred materials, fabrication, and installation of infrastructure will be made during the Final Design stage based upon AHJ requirements.

Temporary facilities used to accommodate construction of permanent systems are to be designed for a period up to five years. Examples include temporary tracks and facilities during construction.

2.4 Design Speeds

The Corridor design speed is intended to maintain and improve the existing freight and passenger speeds reflective of constraints due to the existing topographic and environmental features. New alignments will meet or exceed FRA Class 3 track design speeds. See *Section* 2.9 for additional design speed information at track turnouts and crossovers along the Corridor.

Horizontal curves are to be designed to the highest speeds possible for mixed traffic based on the design criteria, train performance models, and local conditions. Design speeds are to be established by optimizing the horizontal curve (reducing the degree of curvature).

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2.5 Horizontal Geometry

Mainline horizontal track alignments are to be stationed along the centerlines of the existing CSXT alignment. Engineering stationing (ES) increases from south to north. Station equations are to be used to correlate Project ES with CSXT Valuation Maps stationing, CSXT mileposts, and any identifiable bridges and relevant topographic or structural features referenced on the Valuation Maps.

Track horizontal curvature and superelevation will be designed to maximize speed for mixed traffic considering both CSXT and AREMA standards.

All mainline tracks within proximity of the existing Right-of-Way (ROW) are to be designed in accordance with the existing AHJ railroad speeds. Engineering alternatives include meeting or matching the existing speeds throughout the Corridor, with Track 3 and 4 to be designed for a minimum speed of 40 mph for passenger operations and a minimum speed of 25 mph for freight operations on Tracks 1 and 2. Existing sidings are to be assigned stations matching the mainline stations and station equations referencing the Valuation Maps.

2.5.1 TRACK CENTERS

Track centers (distance between the centerlines of two adjacent tracks) for mainline, lead tracks, tangent tracks, and tracks parallel to mainline tracks that are not being relocated or modified will remain at existing track centerline widths. Unless agreed upon within the Comprehensive Rail Agreement, on tracks to be owned and maintained by CSXT, mainline track centers will meet or exceed CSXT's standard track centers of 15 feet. Track centers less than 15 feet will require design exception justification and formal approval by CSXT. The justification must include explanation of extenuating circumstance, limits of the standard deviation (exception), implications of not complying with the CSXT standard, and recommended infrastructure or installations to mitigate the impacts associated with the proposed exception. Exhibit E-4 of the Comprehensive Rail Agreement between CSXT and Virginia Department of Rail and Public Transportation (DRPT) specifies agreed upon Confirmed Track Separation Distances Less Than 15 feet. For the Long Bridge Project, due to the overbuild of Maryland Avenue, reduced track centers of 14 feet between mileposts 111.2 to 111.7 have been approved and will not require design exception justification and additional formal approvals. Corridor safety must be maintained in all circumstances, and in no case will track centers be reduced below their existing minimums in the same block of track.

District of Columbia Codes and Regulations specifies minimum track centers for use in the District, although the CSXT minimums are more restrictive. Track centers will be based on **Table** 2-1 below and in accordance with Virginia Passenger Rail Authority (VPRA) approval or per established agreements (e.g., Exhibit E-4 of the DRPT/CSXT Comprehensive Rail Agreement). Deviations from these values will be in accordance with *Chapter 10*.

TABLE 2-1. MINIMUM TRACK CENTERS.

Track Type	CSXT Minimum	DCMR Minimum
Main	**15 ft**	14 ft
Other Tracks	**14 ft**	14 ft
Other Track Adjacent to Main Tracks	**20 ft**[1]	15 ft

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> ***Note:*** *1 – Track centers will follow the DPRT/CSXT Comprehensive Rail Agreement and locations not specifically identified will follow the standards in this table.*

The Long Bridge Project utilized the following typical sections for conceptual evaluation. Refer to *CSXT Standard Drawing 2600* series for additional track configuration details.

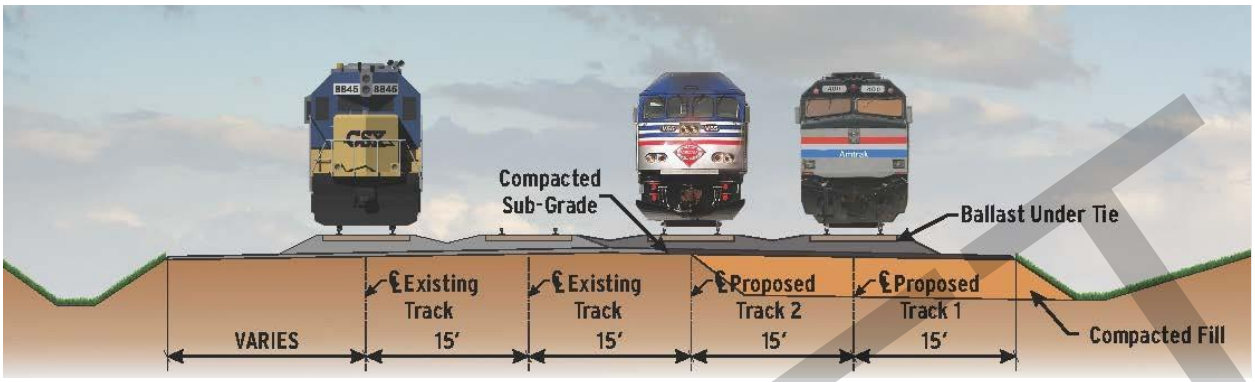

FIGURE 2-1. FOUR TRACK TYPICAL SECTION.

2.5.2 TANGENT ALIGNMENT

In compliance with AREMA, the AHJ's operating preference and passenger railway design best practices, the track geometry must maintain a minimum tangent length between designed track features. For mainline passenger tracks, the desired minimum tangent length (L) between curves can be determined by the following formula:

$$L = 3V$$

Where: L = minimum tangent length, feet
V = passenger design speed through the curve, miles per hour

The tangent length formula is based on the rail car traveling at least two seconds on tangent track between two curves. The preferred and absolute minimum tangent track lengths are reflected in **Table 2-2** for predominate track circumstances. These minimums will be met unless a design exception is formally approved by the AHJ in accordance with *Chapter 10*.

TABLE 2-2. MINIMUM TANGENT LENGTH - MAIN TRACK.

Tangent Location on Mainline Tracks	Minimum Tangent Length (Feet)	
	Preferred	Absolute MINIMUM
Between Curves	3V	200
Between Point of Switches (PS) of Turnouts (TOs)	200	100
Between PS and Curve	200	100
Between PS and Bridge	500	100
Between PS and Last Long Tie of TO	**200**	100

2.5.3 HORIZONTAL CURVE ALIGNMENT

Superelevation

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Superelevation (sometimes referred to as cant internationally), is defined as the algebraic height difference in profile elevations between the low rail (curve interior rail) and high rail (curve exterior rail) for a specific track. The height difference is used to counteract, or partially counteract, the lateral forces on a train through a horizontal curve. Additional benefits include distribution of load on the rails, improved ride quality for passenger comfort, and reduced asset wear on the rail and wheel. All mainline curves will be superelevated at a minimum of one half inch. See *CSXT Standard Drawings 2510 and 2511* for further superelevation requirements. For passenger operations, AREMA recommended practices will apply.

Circular Curves

Circular curves will be defined by the chord definition of curvature. Track curvature will be compliant with the host railroad. Any existing curves will be improved to the extent possible within the constraints of the Corridor. Horizontal curvature will be adjusted between parallel tracks to accommodate additional horizontal clearance where possible.

Generally, turnouts will be placed outside of a horizontal curve in accordance with minimum tangent lengths. Single radius horizontal curves with transition spiral curves are preferred. The utilization of compound circular curves and circular curves joined by a transitional spiral will be minimized within the Project limits and if needed, the most restrictive (longest) will be used. Existing curves of these nature will be evaluated for the application of a single circular curve with transitional spiral curves.

Spiral Transition Curves

A clothoid spiral transition curve will be used on mainline tracks to connect tangents to circular curves. Curves associated with a turnout that connect the tangent from frog to a parallel track, or siding, are excluded from transitional spirals. Spirals will be designed to meet or exceed the existing spiral criteria, spirals that do not meet CSXT's requirements will require a design exception and formal approval from the AHJ. Spiral lengths will also be verified by AREMA standards to accommodate increased unbalance from passenger trains.

The graphical configuration and components are reflected in **Figure 2-2** and **Table 2-3**.

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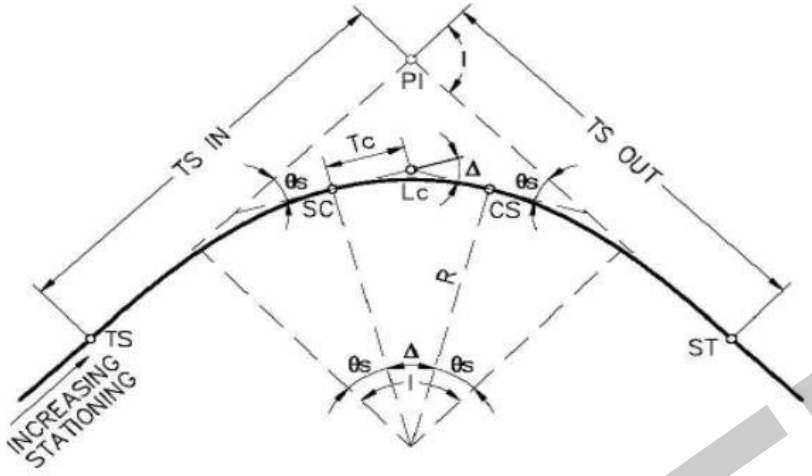

FIGURE 2-2. CIRCULAR CURVE WITH SPIRAL TRANSITION.

Table 2-3. Degree of Curvature.

D_C	Degree of Curvature
I	Total Intersection Angle
Θ_S	Spiral Angle = (L_S D_C) / 200
Δ	Central Angle of Circular Curve = I - 2 Θ_S
R	Radius of Circular Curve
T_C	Tangent Length of Circular Curve = R Tan (Δ/ 2)
L_C	Length of Circular Curve = (Δ/ 180) R
L_S	Length of Spiral
TS	Tangent to Spiral
SC	Spiral to Curve
CS	Curve to Spiral
ST	Spiral to Tangent

All mainline track will be configured with a length of spiral preferred by passenger services for passenger comfort. The length of spiral will be based on the desirable length of spiral stated in *AREMA MRE Chapter 5, Section 3.1* formula, as the longest distance as determined from the following formulas:

1. $L_S = 1.63E_UV$; or $Ls = 1.22E_UV$
2. $L_S = 1.2E_aV$

Where: E_U = unbalanced superelevation
E_a = actual superelevation applied to the curve, inches
V = passenger train design speed, mph

All spirals used on the project will require approval by the AHJ in accordance with *Chapter 10*. The desirable lengths of spiral will be reflected in 31-foot intervals.

DRAFT

For passenger train operations, the active total length of spiral in feet will be defined by the following formula:

$$L_s = 1.46\ Vt$$

Where: V = design speed, mph
t = time required to tilt, seconds

L_s is rounded to the nearest 100 feet (but not less than 100 feet). The criteria determining t is established on a case by case basis dependent on physical constraints along the corridor.

Acknowledging the Project Corridor has a variety of constraints, including the availability of property, historic districts, monumental districts, environmental features, commercial development, and existing retaining walls, the absolute minimum length of spiral will be based on *CSXT Plan 2511* and VRE and Amtrak Recommendations for passenger comfort.

2.6 Vertical Geometry

Vertical geometry will be based on the top of the low rail. Track profile will reflect the existing rail elevation where possible.

Individual track profiles will be developed during continued phases of the Project. Turnouts and switches are to be placed outside the limits of the vertical curve in accordance with minimum tangent lengths displayed in **Table 2-2**.

2.6.1 GRADES

Track grades reflected with the vertical geometry will represent the effective grade of the track. All track grades will be evaluated in accordance with AREMA compensated gradients. The compensation factor will be 0.04 percent per horizontal degree of curvature. The maximum grade allowed without compensated grade is 1.5 percent. Compensated gradients are not to exceed 1.50 percent for new construction without formal approval and an accepted design exception from CSXT. Any deviation will be subject to review and acceptance of the operating railroad with the design exception process detailed in *Chapter 10*.

For mainline track, the desired length of constant track grade between vertical curves will be the greater of either 100 feet or the result of the following formula:

$$L = 3V$$

Where: L = minimum tangent length, feet
V = freight design speed in the area, mph

2.6.2 VERTICAL CURVATURE

All changes in track grades will be connected with a parabolic curve in accordance with *AREMA MRE, Chapter 5, Section 3.6*. Mainline tracks will utilize the following equation for both crest and sag curves.

$$L = \frac{2.15(DV^2)}{A}$$

Where: L = length of vertical curve, feet (rounded up to the next 10 feet, minimum length of 100 feet)

DRAFT

D = Absolute value of the algebraic difference in rates of grades (expressed as a decimal)
V = Speed of freight train, mph
A = vertical acceleration, ft/sec/sec (ft/sec^2)

The recommended vertical accelerations (A) for passenger and freight trains for both crest and sag curve are as follows (**Table 2-4**):

Table 2-4. Recommended Vertical Acceleration.

Train Type	Acceleration
Passenger Train	0.60
Freight Train	0.10

The longest vertical curve length resulting from the vertical accelerations will be applied to the track profile. Vertical lengths will be rounded to the next 10 feet with a minimum length of 100 feet. Special track work must be in accordance with minimum tangent lengths displayed in **Table 2-2**.

2.7 Clearances

Railroad clearances refer to the recommended minimum separation between tracks in both a horizontal and vertical component. Horizontal clearances are references from the track centers to obstructions on either side of the track. Vertical clearances are referenced from the top of rail to the vertical obstruction. In track conditions with superelevation, the vertical clearance is referenced from the high rail. Since the Project does not include station work, clearance requirements associated with pedestrian access are not included.

Railroad clearance standards are defined by *CSXT Standard Plans 2604 and 2605 (s)* and *DCMR, Title 24. Public Space and Safety, Chapter 24-31. Occupational Safety: Railroad Clearances*. These clearances are applicable to all new construction or design, including temporary construction or design. Clearances will also be verified per passenger requirements based on Amtrak and VRE standards for the corridor.

The lateral or horizontal clearance (distance between the track centerline and closest horizontal obstruction) will meet or be greater than CSXT's standard clearance of nine feet unless noted otherwise and/or agreed to within the DRPT/CSXT Comprehensive Rail Agreement and will include considerations for curvature and superelevation. For obstructions that are buildings normally occupied by people or that support a bridge, the lateral track distance will be 25 feet unless protected by a crash wall. Horizontal clearances must be shown from the centerline of track to the nearest obstruction if within 25 feet of the centerline of any track. Additional clearance for curvature and superelevation will be taken into account when determining the horizontal clearance. New tracks with horizontal clearance less than 9 feet to any obstruction including curvature and superelevation (other than buildings or bridge supports where it is 25 feet) will require design exceptions and formal approval by CSXT. The justification must include explanation of the extenuating circumstance, limits of the standard deviation (exception), implications of not complying with the CSXT standard, and recommended infrastructure or installations to mitigate the impacts associated with the proposed exception. Exceptions include reduced clearances between mileposts 111.2 to 111.7 due to the overbuild of Maryland Avenue in accordance with Exhibit E-4 of the DRPT/CSXT Comprehensive Rail Agreement. This

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agreement allows a minimum clearance of 7.5 feet from the existing horizontal obstruction and will not require design exception justification and additional formal approvals from CSXT.

DCMR, Title 24. Public Space and Safety, Chapter 24-31. Occupational Safety: Railroad Clearances specifies minimum clearances for use in the District although the CSXT minimums are more restrictive. Lateral clearances will be based on **Table 2-5** below in accordance with VPRA approval and as detailed in the DRPT/CSXT Comprehensive Rail Agreement. Deviations from these values will be in accordance with *Chapter 10* of this BOD.

Table 2-5. Minimum Clearances.

Clearance Type	CSXT Minimum[1]	DCMR Minimum
Lateral Clearance, General	9'-0"	8'-0"
Lateral Clearance, Piers and Abutments, Without Crash Wall	25'-0"	N/A
Signals and Poles	8'-6" minimum	10-6" DESIRED
Overhead	23'-0"	22'-0"
NOTE: 1 - INCLUDING CURVATURE AND SUPERELEVATION		

Vertical roadway clearances are determined using the limited topographical information and track structure design assumptions, as well as design criteria per relevant CSXT references listed in *Section* 2.2. Any deviation from the standards will be subject to review and approval of a formal design exception. The track structure height is determined using the structure depths combined with the following criteria:

TABLE 2-6. TRACK ITEM DEPTHS.

Track Item	Height (ft)
Waterproofing and deck protection	0.10[1]
Ballast	1.00[2]
Conc. Tie + rail seat pad	0.76
Rail (136 RE)	0.61
Notes: 1 - Waterproofing thickness is 80 mils and deck protection thickness is 0.25 inches, therefore the total thickness of waterproofing and deck protection is 0.10 feet. 2 – All structures will be designed for 24 inches of total ballast, 12 inches of initial ballast and 12 inches of future ballast.	

For new structures, vertical clearance from a horizontal plane at the top of the high rail to the nearest overhead obstruction will be at least 23 feet.

2.7.1 BRIDGES

For bridge specific design criteria beyond clearances cited, refer to *Chapter 3, Railroad Bridges and Retaining Wall Structures* of this document. Actual structure depth shall be used to determine vertical clearance.

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2.8 Roadbed Section

Track roadbed criteria will be compliant with *CSXT Plan 2601*. The following general criteria is applicable to the track's roadbed section. Any discrepancy between criteria and standards will be approved by DDOT, CSXT, and other federal and local agencies having jurisdictions and compliance to the NEPA documents.

2.8.1 BALLAST DEPTH

The ballast depth will extend not less than 12 inches below the low rail to the track subballast. Ballast depths are to increase proportionally for the full length of the tie in relationship to the track superelevation. All ballast materials are to be compliant with CSXT specifications and originate from a CSXT approved quarry.

2.8.2 SUBBALLAST DEPTH

Subballast depth will be a minimum of 6 inches below the ballast on mainline tracks and sidings. Subballast is to conform with CSXT specifications and is not required on ballast deck bridges.

2.8.3 SHOULDER WIDTH

Ballast shoulder width will extend beyond the end of the tie in accordance with *CSXT Plan 2602*.

2.8.4 TRACK DRAINAGE

All track construction must have drainage and stormwater management facilities designed in accordance with *CSXT Plan 2601 - Roadbed Sections*.

Track requires a decentralized approach to stormwater management because the track is a linear feature with nearly negligible width, as compared to its length, and no centralized location where stormwater BMPs can be constructed. The existing track infrastructure in cut sections generally includes ditches along one or both sides of the track for drainage. These ditches will be reconstructed to conform to the proposed typical track section in order to maintain proper drainage.

Under both existing and proposed conditions, stormwater will be conveyed via overland flow or through a drainage system consisting of underdrains installed in the rail ballast or drainage ditches alongside the tracks. Ditches and underdrains will be required to direct stormwater to safe discharge locations and to keep the ballast dry and stable.

All track construction will meet the specific drainage criteria below:

- Existing drainage patterns will be maintained wherever possible.
- To the maximum extent possible, drainage of the roadbed will be handled by a gravity system.
- Do not drain areas from beyond the track bed through the track structure. Typically, a ditch or subdrain will lie between the track and the adjacent ground area to intercept fines from an adjacent slope which would foul the ballast.
- Track drainage system, including underdrains (subdrains), will be designed to accommodate peak flows produced by a 100-year design storm without the ponding of water against the roadbed.

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- Pipes and culverts shall conform to AREMA Recommendations and ASTM Specifications.
- Perforated pipe underdrains will be used in locations where the track corridor is constrained or where the adjacent grading does not allow open channel flow.
- The minimum pipe size for underdrains parallel to the tracks is 12 inch HDPE.
- Underdrains will be bedded in a trench filled with ¾-inch crushed stone wrapped in a geotextile filter fabric. Cleanouts will be spaced no more than 300 feet apart.
- The track underdrain invert will maintain a minimum depth of 4'-0" from the top of rail and its centerline will be at least 6'-6" from the track centerline.
- Underdrains under railroad tracks will be designed for Cooper E-80 loading and will have a minimum cover of 2 feet from bottom of tie to the top of pipe. Segments of underdrain crossing below track will be solid wall pipe, no perforations.

See *Chapter 7, Drainage & Stormwater Management* for additional requirements.

2.9 Special Trackwork

Special trackwork refers to trackwork units that are used for tracks to converge, diverge, or cross each other through turnouts, and crossovers. All special trackwork will be designed according to CSXT standard drawings or to pre-approved standard CSXT supplier drawings.

2.9.1 SPEEDS THROUGH TURNOUTS AND CROSSOVERS

Passenger and freight speeds for turnouts and crossovers are governed by CSXT operating rules including CSXT signal aspects and current CSXT engineering standards. **Table 2-7** shows the speeds for the turnouts and crossovers that are expected as part of the Long Bridge Project. However, a speed less than those shown may be warranted based on the nearby track geometry and final railroad signal design and will be reevaluated by VPRA and CSXT during the final design phase.

TABLE 2-7. TURNOUT DIVERGING SPEEDS.

Turnout Data	Switch Length & Type	Passenger (MPH)	Freight (MPH)
#15	26'–0" Curved	30	30
#20	39'–0" Curved	45	45

2.9.2 TURNOUTS AND CROSSOVERS

All turnouts and crossovers will meet the criteria below:

- All turnouts, including those within a crossover, are intended to be constructed of new 136-RE Continuous Welded Rail (CWR) and concrete ties. Turnouts incorporated into existing timber track or industrial sidings are to be constructed of new 136-RE CWR and timber ties. Turnout components, including switch points, stock rails, closure rails, guard rails, and frog wing rails are to be fabricated from new, high strength HH rail.
- A minimum of 30 feet will be provided from PS to Insulated Joint.
- Crossovers are to be located on parallel tracks only.
- Standard crossovers are preferred to be on 15-feet track centers.

DRAFT

The application of non-standard turnouts and crossovers, such as equilateral turnouts, require approval in accordance with *Chapter 10*. The following situations may warrant non-standard turnouts and crossovers:

- Crossovers in non-parallel tracks; and
- Crossovers with track centers less than 15 feet.

2.10 Track Gauge

The standard track gauge is 4 feet-8.5 inches. Track gauge is measured between the gauge inside of the heads of rails at 5/8 inch below the top of rails.

2.11 Rail

The rail section to be used will be new 136RE Continuous Welded Rail (CWR). Premium rail may be required according with CSXT engineering standards depending on final track geometry alignments, including curvature and expected traffic.

2.12 Rail Anchoring

Rail anchors are to be applied on conventional ballasted track construction utilizing concrete ties, tie plates, and tie clips.

2.13 Tie Plates

Tie plates and fasteners will be double shoulder tie plates with tie clips.

2.14 Ties

2.14.1 CONCRETE TIES

All new mainline track, turnouts, and crossovers construction is intended to utilize concrete ties. In areas where track is existing and to remain, timber ties may be utilized for proposed connections. The following criteria is applicable:

- Concrete tie spacing is 20 inches, center of tie to center of tie, except as noted in CSXT Plans for special trackwork.
- Concrete ties are to be compliant with the type and material specification of CSXT.
- Concrete ties will transition to timber north of the RO Interlocking.
- Typical concrete tie dimensions to be 9 feet long, 10 inches high, and 13 inches wide
- Concrete tie rail seat shall be a flat smooth surface +/- 1/32 inch
- Concrete tie rail seat shall provide a cant of 1 in 40 +/- 5 toward center line of tie unless otherwise specified

DRAFT

2.14.2 TIMBER TIES

The application of timber ties is at the discretion of VPRA and CSXT. Timber ties are to meet the following criteria:

TABLE 2-8. TIMBER TIE DIMENSIONS.

Parameter	Dimension
Length	8.5 feet
Height	7 inches
Width	9 inches

The maximum center of tie to center of tie spacing is 20 inches; the minimum is 18 inches.

2.15 Communications and Signals

The project delivery Contract will coordinate directly with CSXT to develop conceptual and preliminary communications and signals (C&S) designs and agreements. This separate design contract will run concurrently and share a similar timeline with the Long Bridge Project consultant team contract and work efforts. The consultant team will incorporate the C&S design information into the Long Bridge Project as appropriate and will coordinate directly with CSXT and DDOT throughout the Project.

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3 Railroad Bridges and Retaining Wall Structures

3.1 Overview

The Long Bridge Project contains a variety of structural elements including undergrade bridges, pedestrian/bicycle bridges, and retaining walls. This chapter provides design criteria for rail related structures, including bridges and retaining walls. *Chapter 4* provides design criteria for pedestrian/bicycle facilities.

American Railway Engineering and Maintenance-of-Way Association (AREMA) Design Criteria will be utilized for structures supporting railroad live loading unless otherwise referenced within this document.

3.1.1 OWNERSHIP

Ownership for bridges is as follows:

- Potomac River Undergrade Bridge VPRA
- WMATA/I-395 Undergrade Bridge VRPA
- Ohio Drive SW Undergrade Bridge VPRA
- Washington Channel Undergrade Bridge VPRA
- Maine Avenue SW Undergrade Bridge VPRA

3.1.2 REFERENCES

- AREMA Manual for Railway Engineering (MRE), 2022 Edition
- CSX Transportation (CSXT) Design and Construction Standard Specification Vol. 1, March 1, 2021
- CSXT MWI 2800 Series
- CSX Public Projects Information Manual
- District Department of Transportation (DDOT) Design and Engineering Manual (DEM), January 2019
- DDOT Standard Specifications for Highways and Structures, October 2020
- Virginia Department of Transportation (VDOT) Modifications to the American Association of State Highway and Transportation Officials (AASHTO) Load and Resistance Factor Design (LRFD) Bridge Design Specifications, 8th Edition, 2017
- Note: this reference is only applicable to the Potomac River Undergrade Bridge
- VDOT Manual of the Structure and Bridge Division, Part 2, Design Aids and Typical Details, 2021
- Note: this reference is only applicable to the Potomac River Undergrade Bridge
- AASHTO LRFD Bridge Design Specifications, 9th Edition, 2020
- AASHTO Standard Specifications for Highway Bridges, 17th Edition, 2002
- AASHTO Vessel Collision Design, 2009

DRAFT

- Washington Metropolitan Area Transit Authority (WMATA) Adjacent Construction Project Manual, September 2015
- AASHTO/AWS Bridge Welding Code D1.5, 8th Edition
- AASHTO Guide Specifications for Seismic Isolation Design, 4th Edition
- Virginia Railway Express (VRE) Standards
- Amtrak Standards
- AISC Steel Construction Manual – 13th Edition
- USCG, Bridge Lighting and Other Signals

3.2 Special Requirements

3.2.1 SPAN CONFIGURATION

All spans will be simple spans. Continuous spans are prohibited (CSXT X-A). Piers will generally align with existing substructures and shall maintain existing navigational clearances.

Skewed spans shall be avoided where practical. Where skewed spans are necessary, the skew shall be minimized to the extent practicable. Skewed spans shall be designed such that the dead load counteracts computed live load uplift by a factor of 1.5.

Through plate girders (TPGs) are only permitted for up to two track bridges, except through plate girders will be allowed at Ohio Drive SW and Maine Avenue SW. Intermediate girders are not permitted for double track bridges. Stringers, if required, will frame into floorbeams. All stringers will have top and bottom flanges clipped at an angle not greater than 45 degrees to permit field removal and installation. Intermediate floorbeams will frame into the girder web using double angle connection angles and high strength bolts. (CSXT X-D)

Through plate girder web depths are to be consistent for all spans of the Potomac River Undergrade Bridge. Web depths shall also be consistent for all spans of the WMATA/I-395 Undergrade Bridge.

Concrete superstructures are not permitted over roadways.

3.2.2 DESIGN SPEED

The design maximum allowable speed (MAS) is 60 mph for the purpose of bridge design. Actual speeds may vary. See *Chapter 2, Railroad* for additional speed information.

3.2.3 DESIGN LIFE

Design Service Life.....100 years

3.2.4 DISTRIBUTION OF AXLE LOADS

For the design of ballast deck beams and girders spaced symmetrically about the centerline of tangent track, the axle loads will be distributed equally to all beams or girders whose centroids are within a lateral width equal to the length of tie plus twice the minimum distance from bottom of tie to top of beams or girders. Distribution of loads to transverse floorbeams will be in accordance with AREMA 15 – 1.3.4.2.3. Distribution for loads for other conditions will be determined by a recognized method of structural analysis.

DRAFT

3.2.5 BRIDGE DECK

The rail bridges will use ballasted deck construction.

All bridges will be designed with non-composite interaction between the superstructure and deck. (CSXT V-C)

Concrete deck shall not be used on through girder spans due to unintended composite behavior causing deck cracking.

Steel deck shall be a minimum of one inch thick.

Shear studs are not permitted. (CSXT IX-F1)

Waterproofing membrane shall be spray applied and shall be PPG, Eliminator, or approved equal. The waterproofing membrane shall be a minimum of 80 mils with a minimum 0.25 inch thick integrated ballast mat. If a thicker waterproofing membrane is used, the integrated ballast mat may be optional at the approval of CSXT. Concrete underlayment may be required to slope the ballast mat and waterproofing toward the provided drainage structures.

One foot (1'-0") minimum ballast depth below the tie (measured from top of deck waterproofing to bottom of tie, at the centerline of the low rail) plus an additional one foot (1'-0") for future track reprofiling will be used for calculating dead load on the structure to accommodate future track raises. (CSXT V-D, CSXT IV-B).

Rail and ties will meet criteria specified in *Chapter 2, Railroad*.

Walkways

Three-foot walkways shall be provided along the project corridor as described below:

- One walkway on bridges carrying two tracks;
    - The walkway is preferred on the upstream (track left) side of the Potomac River Undergrade Bridge and the WMATA/I-395 Undergrade Bridge;
    - The walkway may be located on the inside of the girder (on the ballast section) in lieu of an external "catwalk" walkway for the Potomac River Undergrade Bridge and the WMATA/I-395 Undergrade Bridge;
- Two walkways, one on each side of the bridge, on bridges carrying four tracks;
    - The proposed walkways on the Ohio Drive SW and Maine Avenue SW Undergrade bridges may have isolated points with less than 3 feet of width;
- Walkways shall be provided adjacent to retaining walls.

3.2.6 BEARINGS AND BEARING REPLACEMENT CONSIDERATIONS

Bearing stiffeners shall be CJP welded or finish to bear with fillet welds for both top and bottom flanges.

DRAFT

Intermediate stiffeners shall be on both sides of the web (in pairs). They shall be extended to the bottom flange with a tight fit or light driving fit with no weld on the tension flange, except any intermediate stiffeners within a distance of D from the centerline of bearing, which must be fastened to tension flange per AREMA 15-1.7.8e, or any intermediate stiffeners at knee brace locations which shall also be fastened to both flanges.

Anticipated bearing types are described in respective TS&L Reports. Shock pads shall be provided at each bearing. Shock pads shall be ½" thick, 31 ply preformed elastomeric bearing pads conforming to Federal Specifications MIL-C-882C. The shock pads shall be placed between the masonry plate and concrete substructure.

Provisions shall be made for bearing replacements.

Jacking locations shall be provided at each end floorbeam or end diaphragm. Jacking loads for the bearing replacement condition shall accommodate full dead load including future ballast and need not include live load on the bridge. (CSXT X-B, X-D).

3.2.7 TRACK GEOMETRICS AND CLEARANCES

Use MWI 2604 for clearance envelopes.

Navigational clearance over the Potomac River: Any new structures located over the Potomac River are subject to meeting the navigational requirements for the area set by the United States Coast Guard. The minimum vertical clearance has been set at 20 feet above the current mean high water (MHW) elevation of 1.54 per the United States Coast Guard (USCG) Preliminary Navigation Clearance Determination (PNCD) dated March 5th, 2020.

Minimum vertical clearance for undergrade bridges to be replaced will be as follows:

- Potomac River Undergrade Bridge over GWMP Span 14'-6"
- Potomac River Undergrade Bridge Navigational Channel Span 20'-0"
- Potomac River Undergrade Bridge over Ohio Drive SW (West) Span 14'-6"
- WMATA/I-395 Undergrade Bridge over I-395 Span 16'-6"
- Ohio Drive SW Undergrade Bridge 12'-6"
- Washington Channel Undergrade Bridge TBD
- Maine Avenue SW Undergrade Bridge 14'-6"

All construction activities will comply with FAA and MWAA requirements.

Refer to *Section 2.7* of this document for information regarding clearance between track centers.

Crashbeams

Crashbeams will be integrated with steel fascia beam TPGs for Ohio Drive SW (East) and Maine Avenue SW Undergrade Bridges. A superficial fascia beam and barrier system will be provided at these locations to protect main load carrying elements from vehicular impact and meet aesthetics requirements. This beam will be designed to mimic the look of a typical steel TPG which will include a small overlapping gap between the bottom and top section. The bottom section acts as a sacrificial crash beam while the top section carries a walkway with a steel parapet connected to the main load carrying girders. Design will follow MWI 1911 Design and Construction Standard Specifications - Section 070330.

DRAFT

3.2.8 BRIDGE DRAINAGE

- For bridge spans over land, bridge drainage shall be carried off structure through an on-structure drainage system to outfalls at the bridge ends or connection into the track drainage system. For spans of the Potomac River Undergrade Bridge and Washington Channel Undergrade Bridge over water, bridge drainage may be conveyed via on-structure drainage systems to downspouts at pier locations which outfall directly into the water below.
- Free-fall systems that outlet bridge drainage directly onto land or roadways shall not be permitted.
- There are additional retaining wall drainage outlets throughout the corridor which outlet into either drainage structures or surface ditches.

See *Chapter 7, Drainage & Stormwater Management* for additional requirements.

3.2.9 UTILITIES

Below is a comprehensive list of impacted utility owners on a per structure basis for coordination:

- Potomac River Undergrade Bridge
    - CSXT
    - DC Water
    - Dominion Power
    - National Park Service (NPS)
    - Potomac Electric Power Company (PEPCO)
    - Verizon
    - WMATA
- WMATA/I-395 Undergrade Bridge
    - AT&T
    - CSXT
    - DC Water
    - DDOT
    - NPS
    - Verizon
    - WMATA
- Ohio Drive SW Undergrade Bridge
    - CSXT
    - NPS
    - PEPCO
    - Verizon
    - Washington Gas
- Washington Channel Undergrade Bridge

DRAFT

  - AT&T
  - CSXT
  - DDOT
  - Verizon

- Maine Avenue SW Undergrade Bridge

  - AT&T
  - Capital Transit Company
  - CSXT
  - DC Water
  - DDOT
  - General Services Administration (GSA)
  - PEPCO
  - Verizon

See *Chapter 8, Utilities* for additional requirements.

3.2.10 NAVIGATION LIGHTING

Navigation lighting shall be provided for the Potomac River Undergrade Bridge and Potomac River Bike-Ped Bridge, as they are bridges that cross waterways, which support nighttime navigation. Navigation lights are required for display and shall be in accordance with Part 118 Bridge Lighting and Other Signals of Title 33 Navigation and Navigable Waterways, CFR.

Approval of navigation lights and other required signals shall be obtained, prior to construction, from the Coast Guard District Commander (Bridge Office) with jurisdiction over the bridge project area.

3.2.11 COMMUNICATIONS AND SIGNALS

Refer to *Section 2.15* and coordinate with CSXT on communication and signal designs and their respective foundations, and how it will relate with proposed foundations along the project corridor.

3.3 Loads

3.3.1 DEAD LOADS

TABLE 3-1. STRUCTURAL COMPONENTS.

Steel	490 pcf
Normal Weight Reinforced Concrete	150 pcf
Ballast	120 pcf, 12 inch minimum depth beneath tie plus additional future 12 inch depth
Timber	60 pcf

See AREMA 15.1.3.2 for additional items not listed.

A 10 percent increase will be considered as an allowance for the dead load of splice and fill plates, stiffeners, nuts and bolts, welds, and other miscellaneous components during analysis for

DRAFT

all structural steel components. Designer shall verify reinforced concrete unit weight for densely reinforced concrete elements and adjust accordingly.

TABLE 3-2. NON-STRUCTURAL ELEMENTS.

Track rails, inside guard rails and their fastenings (AREMA Chapter 15 Section 1.3.2.b)	200 plf/track
Concrete ties	800 lbs each
Utilities	To be based on specific utilities on each individual bridge
Drainage	To be based on the specific system on each bridge

3.3.2 LIVE LOAD

Superstructure elements will be designed for Cooper E-80 Loading or the Alternate Live Load with full diesel impact, whichever produces the greatest stress, per *AREMA Chapter 15 Section 1.3.3*. Proposed substructure elements will be designed for Cooper E-90 loading at the following locations:

- Ohio Drive SW Undergrade Bridge
- Washington Channel Undergrade Bridge
- Maine Avenue SW Undergrade Bridge

All other undergrade bridge substructure elements and temporary structural elements will be designed for Cooper E-80 loading.

Any structure carrying the Tracks 3 & 4 access road from Ohio Drive SW (West) will be designed for a singular AASHTO HS-20 vehicle.

3.3.3 IMPACT LOADS & ROCKING EFFECT

Full diesel impact loads based on 60 mph will be calculated as per *AREMA Chapter 15 Section 1.3.5*. Impact forces will be considered for strength design and will also contribute to the fatigue stress range with the appropriate fatigue impact factor applied.

Impact forces due to rocking effects will be considered for strength design and will also contribute to the fatigue stress range.

The distribution of rocking loads to members supporting the track will be based on the configuration and spacing of members supporting the track. For live load acting on multiple tracks, force couples will be applied in the manner that will produce the worst-case response.

CENTRIFUGAL FORCE

Centrifugal force based on a 60 mph operating speed will be calculated as per *AREMA Chapter 15 Section 1.3.6*. The sharpest degree of curvature on the span will be used when the span carries multiple tracks. Centrifugal force will be considered for strength design and determining the fatigue stress range.

DRAFT

3.3.4 VESSEL IMPACT

For the purposes of computing vessel impact risk analysis, the Potomac River Undergrade Bridge will be considered "Critical." Design of the pier protection (fender system) adjacent to piers adjacent to the Potomac River Navigation Channel shall be in accordance with AREMA 8-23.

Design of the piers away from the Potomac River Navigation Channel shall be in compliance with AASHTO 2020 Design Specifications 9th Edition and AASHTO Vessel Collision Design 2009.

The vessel data required for bridge design includes type of vessels and size distributions, travel frequencies, typical vessel speeds, and loading conditions. To determine the vessel size distribution at the bridge site, information on both present and projected future vessel traffic is needed. Waterway information including alignment, channel width, currents, depths, and river stages are also needed. *Appendix D* includes current vessel use through the study area.

The vessel impact analysis will be performed based on the findings of the navigational study and scour evaluation study. The combination of vessel impact and scour shall be evaluated for two cases potentially during storm and high-water conditions:

- Minimum impact loads associated with a drifting empty barge breaking loose from its moorings and hitting the bridge. The design barge will be a 300 ton unloaded hopper barge as defined by AREMA or a AASHTO 200 ton barge.
    - The water surface elevation for the design flood shall be used to perform the drifting barge impact risk assessment.
    - The drifting barge impact speed shall be set equal to the estimated design flood event current values at each individual pier location.
    - The drifting barge impact load will be combined with 50 percent of the predicted long-term scour plus 50 percent of the predicted short-term scour.
- Maximum impact loads associated with the design vessel class while transiting the navigation channel under typical waterway conditions.

3.3.5 EFFECT OF SCOUR

The rail bridge substructures in or adjacent to waterways will be designed to safely support the structure subjected to the design scour. Substructures subjected to scour will be designed in accordance with *AREMA Chapter 8* and may include pile foundations, foundations on rock, foundations located below the maximum estimated scour depth, or any other means and provide adequate scour protection. Scour depths shall be checked for the design flood, overtopping flood, and any other events that could produce worse scour following *AREMA Chapter 8 Section 5.6.3*. The worst-case scour shall be designed for. Where it is possible scour cones overlap, the total scour shall be considered. Refer to *Chapter 6* for additional scour considerations.

3.3.6 BUOYANCY

Buoyancy will be considered as it affects the design of either the substructures and foundations.

DRAFT

3.4 Design Method

3.4.1 STEEL DESIGN

Steel superstructures will be designed per AREMA criteria using the Allowable Stress Design Method.

Fracture Critical Members, as defined by AREMA 15 – 1.14.2, shall comply with requirements provided in AREMA 15-1.14. Serviceability criteria such as fatigue and deflection shall comply with AREMA Chapter 15.

3.4.2 SUBSTRUCTURE DESIGN

Concrete substructures, H-piles, and micropiles will be designed per AREMA criteria using the Load Factor Design Method.

All substructure stability design will follow the Allowable Stress Design Method.

Pipe piles and drilled shafts will follow the Allowable Stress Design Method for load calculations and Load Factor Design Method for reinforcing.

Substructure Design will include provisions set forth by *CSXT Criteria for Undergrade Railroad Bridges (CSXT XI)*.

Substructure shall be designed for Vehicular Impact per AASHTO 3.6.5 (CT – 600K) and/or AASHTO 2.3.2.2.1 (Redirect or Absorb) with the following load combinations:

- D+E+CT @150 Allowable – Service Load Design
- 1.0D+1.0E+1.0CT – Load Factor Design

3.4.3 RETAINING WALL AND CRASHWALL DESIGN

Retaining walls shall be designed per AREMA criteria using Allowable Stress Method and the stability requirements outlined in *AREMA 8-5.4*.

Crashwalls shall be detailed per *AREMA 8-2.1.5, CSXT Overhead Bridge Criteria* and *DDOT DEM 16.7*.

3.5 Fatigue

The lowest acceptable fatigue detail category shall be stress category C (10 ksi).

Number of constant stress cycles, N, will be greater than 2,000,000.

The stress range (algebraic difference between maximum and minimum stress in a member subjected to cyclic loading that results in net tension) will be less than the allowable fatigue stress range defined in *AREMA Table 15-1-9* for a number of cycles greater than 2,000,000.

For members receiving load from more than one track, the impact load will be applied on the number of tracks designated in *AREMA Table 15-1-5*.

DRAFT

3.6 Seismic Design

3.6.1 STRUCTURE IMPORTANCE CLASSIFICATION

Immediate Safety: 4.0

Occupancy Factor: 4 (More than 10 Passenger Trains per Day)

Hazardous Material Factor: 4 (minimum value permitted)

Community Life Factor: 4 (maximum value permitted)

Immediate Value: 4.0

Railroad Utilization Factor: 4 (Over 50 million gross tons annual traffic)

Detour Availability Factor: 1.00 (No Detour Available)

Replacement Value: 4.0

Span Length Factor: 3 (Span length between 125 ft and 250 ft)

Bridge Length Factor: 2.0 (over 1,000 ft)

Bridge Height Factor: 0.75 (Less than 20 ft)

Bridge Height Factor: 1.00 (Between 25 and 40 ft)

3.6.2 PERFORMANCE CRITERIA

The performance criteria for each of the limit states listed below are described in *AREMA Chapter 9, Sections 1.3.2* and *1.3.3* and utilizing the USGS Interactive Hazard Tool for B/C Soil classification.

TABLE 3-3. PERFORMANCE CRITERIA.

Limit State	Return Period (Years)	Peak Ground Acceleration (% Gravity)
Serviceability	100	A_{100} = 0.7
Ultimate	475	A_{475} = 2.4
Survivability	2,475	A_{2475} = 6.9

3.6.3 SITE COEFFICIENT

Site Class: Soil Profile as determined by boring exploration and geotechnical analysis and recommendations in accordance with AREMA MRE.

3.6.4 ANALYSIS PROCEDURE

Multi-Modal Analysis Procedure, without soil structure interaction.

Load combinations using the Alternate Method, 100% + 30% procedure.

DRAFT

3.6.5 DETAILING PROVISIONS

Detailing Provisions as per *AREMA 9-1.4.7* will be used where applicable, with the exception that Continuous Welded Rail (CWR) will not be relied upon for redundant load path for seismic forces.

3.6.6 DAMPING ADJUSTMENT FACTOR

The damping adjustment factor will be computed with the values that are given in *AREMA Chapter 9, Table 9-C-1*:

- Concrete: D = 1.00
- Structural Steel: D = 1.18

3.6.7 LOAD COMBINATIONS

Only one track will be loaded with full live load in any seismic load combination, regardless of the number of tracks actually supported by the structure being designed.

3.7 Materials and Equipment

3.7.1 GENERAL

All materials will be in accordance with *CSXT Design and Construction Standard Specifications, Division 7 – Structures*.

3.7.2 CONCRETE

All concrete materials and properties shall be in accordance with CSXT Design and Construction Standard Specifications, Division 7 - Structures.):

3.7.3 STRUCTURAL STEEL

All steel members to be detailed and fabricated to place the rolled direction of the member in the direction of primary stress.

Structural steel will conform to requirements of ASTM A709, Grade 50W (AASHTO M270) unless otherwise noted. Grade HPS 70W requires approval per CSXT 0701252.1B. (AREMA 15.1.2.1)

Steel for miscellaneous secondary elements will conform to the requirements of ASTM A709, Grade 36 (AASHTO M270).

All structural steel will meet Charpy impact test requirements for Zone 2.

Flange-to-web welds shall be complete joint penetration (CJP) per CSXT Public Projects Manual, derivation from this requires CSXT approval.

Plate girder flanges shall not exceed 4 inch thickness.

Weathering steel will be used for all undergrade bridges. Weathering steel shall be unpainted, except as noted otherwise in the plans.

DRAFT

3.7.4 REINFORCING STEEL

All reinforcing steel shall be deformed bars conforming to the requirements of ASTM A615, Grade 60 (AASHTO M31, Grade 60), and shall be hot-dip galvanized conforming to the requirements of ASTM A767, unless otherwise specified. Reinforcing steel shall be fabricated prior to galvanizing.

All reinforcing splices of deformed bars will be achieved by lap splices or galvanized full-mechanical splices, in accordance with AREMA.

#4 reinforcing bars shall be the minimum bar size used in main load carrying members. Reinforcing shall be spaced to meet the requirements of VDOT (Potomac River Undergrade Bridge only), DDOT, AREMA, or CSXT, whichever is more stringent.

Minimum clear cover to reinforcing steel will be as noted below:

Top of deck slab	2 1/2 in
Bottom of deck slab	1 1/2 in
Pier caps (main steel and secondary steel)	3 in
CIP piers and precast pier segments	
External surface	3 in
Internal surface	2 in
Pier footings	3 in
All other principal reinforcement	2 1/2 in
All other stirrups and ties	2 in

Minimum cover for reinforcing steel in concrete pier surfaces exposed to seawater or spray at or below elevation +10 shall be 4 inches.

3.7.5 FASTENERS

All bolts will be 7/8-inch minimum diameter high-strength bolts (unless otherwise specified) conforming to ASTM F3125, Grade A325 (AASHTO M164) Type 3 (slip critical connection Class B) and shall be hot-dip galvanized.

Contact surfaces of bolt parts will meet Class B requirements for Slip Critical Joints in accordance with AREMA specifications.

All bolted connections will use a minimum of three (3) bolts as per AREMA (15.1.5.9.c)

All steel nuts shall conform to ASTM A563 (AASHTO M291), hardened washers shall conform to ASTM F436 (AASHTO M293) and be hot-dip galvanized in accordance with AASHTO A153 (AASHTO M232) unless otherwise specified, and bolts shall be coated after installation. (AREMA 15.1.2.1)

DRAFT

3.7.6 WELDING ELECTRODES

All welding electrodes will conform to the requirements of AASHTO/AWS D1.5. All welding electrodes will have a minimum tensile strength of 70 ksi unless otherwise noted. (DDOT, VDOT, AREMA)

All welds will be subject to non-destructive testing.

Welding of Fracture Critical Members (FCMs) shall be in accordance with Section 12 of AWS D1.5, except as modified in AREMA Chapter 15 Section 1.14 and DDOT Amendments.

3.7.7 ANCHOR RODS AND BOLTS

Anchorage of the superstructure will consist of anchor rods, couplers and anchor bolts as specified by rocking effects. All anchor rods will be swedged and in accordance with ASTM F1554 (AASHTO M314), Grade 55. The anchor rods will be grouted into circumferentially corrugated galvanized steel or plastic sleeves cast in the concrete. Anchor couplers will be capable of developing 150 percent of the minimum yield strength of the anchor bolts or rods. Heavy hex nuts will conform to ASTM A563 (AASHTO M291). Hardened washers will conform to ASTM F436 (AASHTO M293), plate washers will conform to ASTM A709 (AASHTO M270) Grade 36. Anchor rods, bolts, couplers, nuts, and washers will be hot-dip galvanized in accordance with ASTM A153 (AASHTO M232).

3.8 Retaining Walls

3.8.1 GENERAL

Retaining wall systems under consideration include reinforced concrete cantilever walls, soldier pile and lagging walls, and proprietary gravity type retaining walls (T-Walls or comparable prefabricated modular walls). Mechanically stabilized earth retaining systems and sheet pile walls are not permitted for permanent structures(CSXT XI-B2). Sheet pile walls may be used in temporary construction, such as for support of excavation, or for specifically approved permanent applications.

Walls with an exposed height greater than 30 inches will be installed with a fence, handrail, or barrier to prevent workers from falling. Height of fences, handrails, or barrier will meet the minimum requirements of *AREMA 15-8.5*. The wall height shall include additional height for future ballast depth.

Adjacent tracks with more than one foot of elevation difference shall be separated by a wall.

Wall drainage will be provided in accordance with geotechnical and manufacturer's recommendations.

3.8.2 LOADS

Cooper E-90 loads (without impact) will be utilized for live load track surcharge. Live load track surcharge will be applied through fill using a 1H:2V distribution starting from the base of the tie.

Earth pressures from external loads from adjacent structures will be computed using pressure distributions from *AREMA 8-5.3*.

DRAFT

Horizontal earth pressure will be calculated from boring data and the geotechnical analysis and recommendations.

Horizontal and vertical earth pressures will include an additional 1 foot of ballast. (CSXT V-D)

Passive resistance from fill in front of wall will be neglected for design.

3.8.3 EMBANKMENTS

Earth embankments shall have a maximum slope of 2:5 horizontal to 1 vertical (2H:1V) or flatter.

3.9 Foundation Design

3.9.1 GENERAL

Foundations are anticipated to be supported on drilled shafts, steel pipe piles, steel H-piles, micropiles, or as determined by the results of the Supplemental Geotechnical Investigation. Foundations will be designed from boring data and geotechnical analysis and recommendations. Precast concrete driven piles are prohibited. Piers within waterways will be shaped to minimize turbulent flow. The impact of the new foundations on the existing foundations shall be investigated and minimizing such impact shall be considered in foundation selection.

3.9.2 REFERENCES

In addition to those mentioned in *Section 3.1.2*, the following references below apply:

- Unified Facilities Criteria (UFC) Soil Mechanics, UFC 3-220-10N, 2005
- AASHTO Guide Specifications for Seismic Isolation Design, 3rd Edition
- Federal Highway Administration (FHWA) Drilled Shafts: Construction Procedures and Design Methods, FHWA-NHI-18-024, September 2018
- FHWA Design and Construction of Driven Pile Foundations Reference Manual, Volume I and II, FHWA-NHI-16-009, July 2016
- FHWA Geotechnical Engineering Circular No. 4, Ground Anchors and Anchored Systems, FHWA-IF-99-015, 1999
- FHWA Ground Improvement Methods, Volume I and II, FHWA-SA-98-086, 1998
- FHWA Geotechnical Engineering Circular No. 3, Design Guidance: Geotechnical Earthquake Engineering for Highways, Volume I and II, FHWA-SA-97-076 and 077, 1997
- UFC Geotechnical Engineering Procedures for Foundation Design of Buildings and Structures, UFC 3-220-01N, 2005
- FHWA Micropile Design and Construction Reference Manual, FHWA-NHI-05-039, December 2005
- AASHTO Standard Specifications for Highway Bridges, 17th Edition, 2002
    - Note: this reference is for geotechnical design parameters

3.9.3 DESIGN LIFE

Foundations shall be designed for a 100-year service life.

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3.9.4 APPROACH SLABS

Approach Slabs are required to support E-80 Loading and will be included as dead load on the foundation. Minimum length of approach slab will be 25 feet along the track alignment.

3.9.5 DRIVEN PILE FOUNDATIONS

Steel piles (pipe, H-piles, taper tube) or treated timber piles will be considered and assessed based on cost, constructability, and adequacy. Timber piles will not be considered in locations where any portion of the pile is within the water table or otherwise exposed to water. Timber piles are prohibited for structures supporting freight traffic.

Design considerations will be given to foundation alternatives including the use of steel piles within District Waters to account for the potential of Microbiologically Influenced Corrosion (MIC). Design consideration to mitigate potential MIC will consist of the following:

- Use of sacrificial steel; and
- Protection systems, such as cathodic protection applied to the steel casing for any left-in-place steel casing with reinforced concrete core.
    - Epoxy coating is permitted for retaining wall foundations, but is prohibited for bridge foundations.
    - Coal tar is prohibited.

The use of battered piles will be considered for structures with lateral loads up to a maximum batter of 3:12 (horizontal:vertical).

Factor of safety shall be 2.25 with dynamic load testing performed.

Within the zone of scour, lateral support will be ignored in determining allowable axial pile capacity in compression. Additional lateral loads due to flow will be applied within the zone of scour.

Negative side friction due to settlement of upper compressive soils will be considered in determining allowable axial pile capacity in compression. Liquefaction induced settlements will only be considered for seismic analysis.

Concrete Filled Pipe Piles

Steel pipe piles may be filled with concrete. Concrete filled pipe piles shall include proper detailing to ensure composite action. If details cannot be included, pipe piles shall be designed as non-composite.

Concrete filled pipe piles within the zone of scour to five feet below the design scour elevation shall be designed to support all applied loads without the steel pipe. In this zone, the pipe pile is considered a form with no structural carrying capacity.

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3.9.6 DRILLED SHAFTS

Design of drilled shaft foundations will conform to *AREMA 8-24*.

Within the zone of scour, lateral soil support will be ignored in determining allowable axial pile capacity in compression.

Factor of safety shall be 2.5 for axial capacity.

Negative side friction due to settlement of upper compressive soils will be considered in determining allowable axial pile capacity in compression. Liquefaction induced settlements will only be considered for seismic analysis.

3.9.7 MICROPILES

Requirements related to micropile foundations will conform to *AREMA 8-4.4.6* and *FHWA-NHI-05-039*.

Micropiles are not recommended for any foundations susceptible to scour.

Negative side friction due to settlement of upper compressive soils and liquefaction induced settlements will be considered in determining allowable axial pile capacity in compression.

Factor of safety for axial capacity shall be 2.0 with load testing performed.

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4 Pedestrian/Bicycle Facilities

4.1 Overview

The Pedestrian and Bicycle Facilities include at-grade and on-structure facilities in both Virginia and Washington, DC. Primarily, these facilities include two pedestrian-bicycle bridges and the ramps/sidewalks/trails connecting these structures to existing facilities. The following are descriptions of the three main parts of this basis of design section:

Trail Design (Part 4.2): Includes Mount Vernon Trail (MVT, both temporary and permanent trails), as well as geometrics of the pedestrian-bicycle bridge over the Potomac River ("River Bridge"), and its ramps. Trail Design includes all project's shared-use pathways, which are designed to accommodate both bicyclists and pedestrians.

Other Pedestrian Facility Design (Part 4.3): Includes the geometrics of the new pedestrian bridge over Maine Avenue SW ("Maine Avenue Bridge") and the sidewalks along Ohio Drive SW (West) and Maine Avenue SW.

Structural Design of Pedestrian/Bicycle Bridges (Part 4.4): Includes the structural design of the "River Bridge" which spans George Washington Memorial Parkway (GWMP)/MVT/Potomac River/Ohio Drive SW (West) and the "Maine Avenue Bridge" spanning Maine Avenue/Maiden Lane, as well as the ramp, stair, and wall structures connecting to the bridges.

The criteria included herein are project-specific criteria and standard criteria highlights and modifications. Additional criteria and design methods are included within the specified references and structural calculations for individual components.

4.2 Trail Design

4.2.1 REFERENCES

Design specifications used in the Trail Design include the following:

- Americans with Disabilities Act Standards for Accessible Design (ADA)
- District Department of Transportation (DDOT) Design and Engineering Manual (DEM), January 2019
- DDOT Bicycle Facility Design Guide, 2020 (DDOT Bike Guide)
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, 2012 (AASHTO Bike Guide)
- Advanced Notice of Proposed Rulemaking on Accessibility Guidelines for Shared Use Paths (ANPRM)
- Navigation Study, 2019 (Nav Study)
- Hazard Analysis, 2019
- National Park Service (NPS) Active Transportation Guidebook

Additional documentation is anticipated and may be referenced in subsequent drafts.

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4.2.2 DESIGN SPEED

Design speed varies by facility and project area. Design speed is based on the *AASHTO Bike Guide, Section 5.2.4*. Considerations for design speed include the horizontal and vertical geometry of the trail, expected user volume and type, and the overall context of the trail corridor and its surrounding areas.

The following design speeds are used for each project area:

TABLE 4-1. DESIGN SPEED.

Project Area	Design Speed	Notes
MVT	**18 mph**	Standard shared-use path design speed
MVT (temporary)	**12 mph**	A reduced design speed will be used for the temporary trail based on its alignment and expected proximity to active work zones
River Bridge	**18 mph**	Standard shared-use path design speed
River Bridge Ramps	**12 mph**	A reduced speed will be used due to the horizontal alignment and intersections at either ends of the ramps

4.2.3 TRAIL WIDTH

The trail width varies by facility and project area. Citing available guidance and standards, the at-grade trail width for the project is set at a minimum 12 feet of paved width, with 2-foot shoulders on both sides of the trail. The trail width is based on the *AASHTO Bike Guide, Section 5.2.1*. Considerations for width include the existing and expected user volumes, site conditions, and the overall context and functionality of the project area.

A recovery area is defined as a graded shoulder area with a maximum cross-slope of 16.67 percent (1V:6H) that is recoverable in all weather conditions. A recovery area of 5 feet is generally preferred for trails (this preferred recovery area is inclusive of the 2-foot shoulder). At a minimum, a 2-foot shoulder/recovery area will be maintained from the trail's paved edge to any lateral obstructions. Refer to the *AASHTO Bike Guide, Section 5.2.1*, for more detail.

The following tables include the design widths for each project area:

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TABLE 4-2. TRAIL WIDTH - AT-GRADE TRAILS.

Project Area	Pavement	Shoulders	Recovery Area	Notes
MVT	**12'-0"**	**2'-0"**	**2'-0" min. 5'-0" pref.**	Known high user volume shared-use path and available width along project corridor
MVT (temporary)	**10'-0"**	**2'-0"**	**2'-0" min.**	Reduced width proposed given site constraints and desire to slow users along work zones

For the future Anacostia Riverwalk Trail width, see *Section 4.3*. This facility is considered a sidewalk with potential for future development during this phase of design.

The River Bridge represents a standalone structure as it is not a continuation of a trail or sidewalk/sidepath, but rather a connection between a trail and a sidewalk. As such, the required bridge width needs to meet DEM minimum width requirements. *Section 20.9 of the DEM* requires the minimum width between railings to be 12 feet. Based on known and anticipated trail volumes, and site conditions, the rail-to-rail with of the River Bridge will be 14 feet.

TABLE 4-3. TRAIL WIDTH – STRUCTURES.

Project Area	Total Between Railings	Notes
River Bridge	**16'-0"**	Satisfying recommended minimum widths for two-way shared-use paths
River Bridge Ramps	**16'-0"**	Match bridge width

4.2.4 MINIMUM HORIZONTAL CURVE RADIUS

The minimum horizontal curve radii of the proposed trails vary based on the design speed (see **Table 4-1**) and site conditions. In general, a minimum horizontal radius of 27 feet is required for the 12-mph design speed, and a minimum horizontal radius of 60 feet is required for a design speed of 18 mph. *Section 5.2.5 of the AASHTO Bike Guide* shall be referenced for all other details pertaining to horizontal alignment requirements.

4.2.5 CROSS-SLOPE

Shared-use paths must be accessible to all individuals, including those with disabilities. As such, these facilities need to follow ADA Standards and not exceed a cross-slope of 2 percent.

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4.2.6 STOPPING SIGHT DISTANCE

Stopping sight distance along a trail is determined by the following factors: travel speed, coefficient of friction, and trail grade. Stopping sight distance will adhere to requirements in the *AASHTO Bike Guide, Section 5.2.8*. The following formula is used to determine stopping sight distance along a trail (Table 5-4 of the *AASHTO Bike Guide*):

U.S. Customary		
$S = \frac{V^2}{30(f \pm G)} + 3.67V$		
where:		
S	=	stopping sight distance (ft)
V	=	velocity (mph)
f	=	coefficient of friction (use 0.16 for a typical bike)
G	=	grade (ft/ft) (rise/run)

FIGURE 4-1. STOPPING SIGHT DISTANCE.

Source: AASHTO Bike Guide, Table 5-4. Minimum Stopping Sight Distance

4.2.7 INTERSECTION SIGHT DISTANCE

The trail along the project corridor will only intersect with other trails and/or pedestrian walkways. As such, guidance provided in *Figure 5-16* within *Section 5.3.2* of the *AASHTO Bike Guide* will be followed.

4.2.8 TRAIL GRADE

Trail longitudinal profile grades will adhere to ADA standards, as trails (also known as shared-use paths) must be accessible to all users. The maximum grade of the trails within the project will not exceed 5 percent. If site conditions constrain compliance with the 5 percent maximum grade, refer to the U.S. Access Board website for current information regarding accessibility provisions.

4.2.9 VERTICAL CURVE

A minimum vertical curve length of 6 feet is required to accommodate the average length of a bicycle. Additional detail for vertical curve design can be found in *Section 5.2.8 of the AASHTO Bike Guide*, including the use of Table 5-5 which establishes the following equation to calculate necessary vertical curve length based on stopping sight distance:

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U.S. Customary		
$S < L \quad L = 2S - \frac{200\left(\sqrt{h_1} + \sqrt{h_2}\right)^2}{A}$ $S < L \quad L = 2S - \frac{AS^2}{100\left(\sqrt{2h_1} + \sqrt{2h_2}\right)^2}$		
where:		
L	=	minimum length of vertical curve (ft)
A	=	algebraic grade difference (percent)
S	=	stopping sight distance (ft)
h_1	=	eye height (4.5 ft for a typical bicyclist)
h_2	=	object height (0 ft)

FIGURE 4-2. CREST VERTICAL CURVE LENGTH.

Source: AASHTO Bike Guide, Table 5-5. Length of Crest Vertical Curve to Provide Sight Distance

4.2.10 VERTICAL CLEARANCES

The vertical clearances above the trails to overhead obstructions will be 10 feet minimum per the *AASHTO Bike Guide, Section 5.2.10*. It is assumed that equestrian accommodations are not required on any trails. Furthermore, it is assumed no special overhead clearances are required for maintenance equipment.

The vertical underclearances of the River Bridge will be as follows:

TABLE 4-4. RIVER BRIDGE UNDERCLEARANCE.

Facility Below	Min. Vert. Clearance	Notes
GWMP	**17'-6"**	1'-0" greater than adjacent bridges. ***(Note this is less than the standard 17'-6" in DEM 13.3.1.*)***
MVT	**10'-0"**	Overhead clearance for trail users
Potomac River	**1'-0"** over design storm	Freeboard requirement per DEM 28.4.1, refer to Bridge Hydraulics Section for additional information.
Potomac River (Nav. Channel)	**20'-0"** over mean high water	Per Nav Study Table 1-2

For underclearance of the Maine Avenue Bridge, see *Section 4.3*.

4.2.11 BRIDGE HORIZONTAL CLEARANCE FROM RAILROAD

Chapter 22 of the Draft Environmental Impact Statement (DEIS) states that 25 feet of separation between the River bridge and the railroad bridge structures is required for construction and maintenance over the river. Figure 22-4 of the DEIS (also Figure 2-4 of the Section 106

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Programmatic Agreement, Final Environmental Impact Statement (FEIS) Appendix B) shows the River Bridge 25 feet from the railroad bridge, measured from the inside face of the River Bridge railing to the outside face of the railroad bridge's railing.

4.2.12 RAILINGS AND SCREENS

Railings will be used in all locations where there is a 45-degree (1V:1H) or steeper drop-off of greater than 1 foot in height within a horizontal distance of five feet from the edge of trail. Additionally, railings will be used based on trail side slopes per *AASHTO Bike Guide 5.2.1*.

The railings will have a minimum height of 3.5 feet per *DEM 20.3*.

Railing openings will not exceed 6 inches per *AASHTO Bike Guide 5.2.10* and will include a smooth rub rail at 3.5 feet above ground and shall not impede stormwater runoff, per *DEM Chapter 36*.

For railing design forces see *Section 4.3*. Railings on pedestrian/bicycle facilities are not designed for vehicular collision forces.

Screens will be used on the River Bridge over the Potomac River in accordance with the recommendations of the Hazard Analysis and DDOT Standard Drawings. Chain-link fence will not be used per *DEM 20.8*.

4.2.13 ADJACENT ROADWAY OFFSETS AND BARRIERS

The temporary MVT will be separated from the GWMP by a vehicular barrier. Additionally, the temporary MVT will be offset from the vehicular barrier by the greater of the following:

- The design deflection of the barrier
- 2 feet

4.2.14 EMERGENCY VEHICLE ACCESS AND ACCOMMODATIONS

Emergency vehicle access will be provided to the River Bridge per the Hazard Analysis. Access will be provided from both sides of the river, with a clear path accommodating an ambulance with a 42-foot turning radius. Physical barriers will be located to prevent motorized vehicles from entering the River Bridge and ramps, but the barriers will be removeable to allow access by emergency vehicles. The removable barriers will be designed in accordance with the AASHTO Bike Guide.

4.2.15 DRAINAGE

The relocated permanent MVT and the temporary MVT drainage design are to use a minimum cross-slope of **1 percent** per the *AASHTO Bike Guide (Section_5.2.11)*. Special considerations may be necessary where the temporary MVT crosses under the existing railroad bridge and runs between the GWMP and the bridge abutment.

The River Bridge deck drainage over the Potomac River is designed for sheet flow across the deck and off the bridge. A cross-slope and free-draining curb system will be used in coordination with the truss manufacturer.

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For the bridge spans over GWMP, the MVT, and Ohio Drive, as well as the bridge ramps, drainage is designed as a closed drainage system with flow across the deck to a curb and down grade to a scupper and downspout. The curb, scupper, downspout components must be coordinated with the truss manufacturer (for truss spans) or deck design (for deck-slab spans).

Refer to *Chapter 7, Drainage and Stormwater Management* for additional information.

4.2.16 SPECIAL CONSIDERATIONS

The River Bridge structure is subject to aesthetic review and approval by various agencies, including but not limited to the Commission of Fine Arts (CFA), National Capital Planning Commission (NCPC), NPS, and the District of Columbia State Historic Preservation Office (DC SHPO). The structures will be designed to meet the approved aesthetics and will comply with the EIS and Section 106.

Advisory, wayfinding, and interpretive signage accommodations will be included in final design.

Deck lighting and navigation lighting will be provided on the River Bridge and are anticipated to be owned and maintained by DDOT.

Navigation lighting, signage, and markings will meet USCG regulations.

Lightning arrestors and grounding plan shall be included in final design.

4.3 Other Pedestrian Facilities Design

4.3.1 REFERENCES

Design specifications used for Other Pedestrian Facilities Design include the following:

- Americans with Disabilities Act Standards for Accessible Design (ADA)
- DDOT Design and Engineering Manual (DEM), January 2019
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 2021 (AASHTO Ped Guide)
- 2010 ADA Standards for Accessible Design (ADAAG)

4.3.2 DESIGN WIDTH

Pedestrian facility design width will vary based on the facility type and location within the project area. Generally, proposed facilities shall tie into existing facilities at a width equal to or greater than the existing facility.

The following table represents pedestrian-specific site locations, and the subsequent minimum and preferred widths for each project area:

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TABLE 4-5. DESIGN WIDTH.

Project Area	Design Width	Notes
Maine Avenue Bridge	**8'-0"**	The DEM cites the minimum sidewalk width in this land-use as 8'-0", and the AASHTO Ped Guide confirms the 8'-0" minimum
Maine Avenue Bridge Ramps and Stairs	**8'-0"**	The DEM cites the minimum sidewalk width in this land-use as 8'-0", and the AASHTO Ped Guide confirms the 8'-0" minimum
Maine Avenue sidewalk	**Varies**	Measured face of abutment wall to back of curb. This an over-built sidewalk to match the sidewalk beneath the adjacent structure, with consideration for a future trail (12'-0" trail with 5'-0" buffer from curb could be one future layout, or a barrier could be added for a different layout)
Potomac River Bridge Optional Stairs	**8'-0"**	This inclusion of these optional stairs (at the ramps on either end of the River Bridge) in the design is TBD. 8'-0" matches the AASHTO Ped Guide

4.3.3 SIDEWALK/RAMP GRADE

Sidewalk and ramp grades will adhere to ADA standards and DDOT DEM Section 31.2.1.3. The maximum grade of the trails within the project will be **5 percent**. If site conditions constrain compliance with the 5 percent maximum grade, 8.33 percent grade is acceptable over short distances in accordance with ADAAG 2010. Refer to the U.S. Access Board website for current information regarding accessibility provisions.

4.3.4 VERTICAL CLEARANCES

The vertical clearances above the pedestrian facilities to overhead obstructions will be **10 feet minimum** per *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities*.

The vertical underclearances of the Maine Avenue Bridge will be as follows:

TABLE 4-6. MAINE AVENUE BRIDGE UNDERCLEARANCE.

Facility Below	Min. Vert. Clearance	Notes
Maine Avenue	**17'-6"**	DEM 13.3.1
Maiden Lane	**17'-6"**	DEM 13.3.1

4.3.5 DRAINAGE

Sidewalks will be sloped to match adjacent sidewalks with a minimum cross-slope of 1 percent.

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The Maine Avenue Bridge deck drainage (including ramps) is designed for closed drainage across the deck to a curb and down grade to a scupper and downspout. The curb, scupper, downspout components must be coordinated with the truss manufacturer.

Refer to *Chapter 7, Drainage and Stormwater Management* for additional information.

4.4 Structural Design of Pedestrian-Bicycle Bridges

4.4.1 REFERENCES

Design specifications used in the structural design of the pedestrian-bicycle structures include the following:

- DDOT Design and Engineering Manual (DEM), January 2019
- AASHTO LRFD Guide Specification for the Design of Pedestrian Bridges, 2009 2nd Edition with 2015 interims (AASHTO Ped Bridge Guide)
- AASHTO LRFD Bridge Design Specifications (AASHTO Bridge), 9th Edition, 2020
- AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition, 2013 with 2015, 2019, and 2020 interims (AASHTO Signs)
- AASHTO Guide Specifications for LRFD Seismic Bridge Design, 2011 2nd Edition with 2012, 2014, and 2015 interims (AASHTO Seismic)

Other references that may be included in the structural design of the pedestrian-bicycle structures include the following:

- AASHTO Guide Specifications for Seismic Isolation Design, 2014 4th Edition
- AASHTO/AWS Bridge Welding Code D1.5, 2008
- International Building Codes (IBC)
- Federal Highway Administration (FHWA) Guides

4.4.2 DESIGN METHOD

Structures will be designed in accordance with Load and Resistance Factor Design (LRFD) method.

4.4.3 SPECIAL DESIGN CONSIDERATIONS

- Material specifications and details will comply with the agency approval requirements as they relate to aesthetics. Per the EIS, the Pedestrian-Bicycle bridge over the GWMP, MVT and the Potomac River will consist primarily of prefabricated truss spans.
- Structures will be designed to accommodate all components and attachments, such as screening, drainage, and lights, as applicable.
- Other considerations may include future jacking, construction loads, and maintenance requirements.

4.4.4 DESIGN LIFE

Design service life is 100 years.

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4.4.5 DEAD LOAD

The self-weight of the prefabricated trusses will be taken as the largest weight estimate from a minimum of two suppliers plus a 10 percent contingency for the potential to increase during the final design and fabrication of the trusses. For design cases that reduce dead load, the lightest weight estimate without contingency will be considered.

In addition to the self-weight of the truss, dead load of the deck, railings, lighting, and all components and attachments not accounted for in the truss self-weight must be included in the design of the bridge's superstructure, bearings, substructure, and foundations. The components included in the manufacturer's estimated dead load and those calculated by the design engineer must be clearly defined and closely coordinated.

Additional dead load considerations may include future overlay, additional aesthetic features not determined at this phase, and/or future utility allowances (specifications TBD).

4.4.6 LIVE LOADS

Structures will be designed for the greater of truck loading or pedestrian loading *per AASHTO Ped Bridge Guide*. See **Table 4-7**.

Equestrian patch loading for decks will be checked.

No special heavy emergency vehicle (for example fire truck) or heavy maintenance vehicle loading above the *AASHTO Ped Bridge Guide* will be accommodated.

TABLE 4-7. LIVE LOADS.

Live Load	Magnitude	Notes
Pedestrian Loading (PL)	**90 psf (No allowance for reduction)**	Load will be patterned to produce the maximum load effect (*AASHTO Ped Bridge Guide 3.1*)
Vehicle Load (LL)	**H10 Truck**	AASHTO Ped Bridge Guide 3.2

4.4.7 WIND LOADS

Structures will be design for horizontal wind load in accordance with *AASHTO Signs 3.8 and 3.9*, including an Importance Factor of 1.15 per *AASHTO Ped Bridge Guide 3.4*.

Additionally, a concurrent uplift force of 0.020 ksf over the full deck will be applied at the windward quarter point of the deck per *AASHTO Ped Bridge Guide*.

4.4.8 RAILING LOADS

Railings will be designed for pedestrian loads of 0.050 klf vertically, plus 0.50 klf horizontally, plus 0.20 kip concentrated load in any direction per *AASHTO Bridge 13.8.2*.

Railings are not designed for vehicular collision loads.

For railing height and detailing requirements see *Section 4.2*.

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Curbs, deck, and/or bridge components supporting railings will be designed and detailed to accommodate the railing loads and transfer those loads into the deck, as applicable.

4.4.9 THERMAL LOADS

Thermal forces and movements will be in accordance with the *DDOT DEM 19.7* and *AASHTO Bridge 3.12.2 and 14.4*.

4.4.10 STREAM PRESSURE AND BUOYANCY LOADS

Bridge and ramp anchor bolts will be designed for stream pressure and buoyancy loads for the design storm elevation and checked for the 100-year storm elevation and in accordance with DDOT DEM.

4.4.11 SEISMIC LOADS

Structures will be designed for seismic loads in accordance with AASHTO Seismic and DDOT DEM.

Soil class, profile, and site parameters shall be based on site specific boring exploration and geotechnical analysis and recommendations.

4.4.12 VEHICULAR COLLISION LOAD

Substructure units and walls within roadway clear zones will be designed for vehicular collision loads in accordance with AASHTO Bridge.

4.4.13 VESSEL COLLISION LOAD

For the navigation channel, an independent fender system will be designed and included as part of the Potomac River Undergrade Bridge. Refer to the Railroad Bridge section for specifications.

For all piers, including those away from the navigation channel, piers, foundations, and superstructures as applicable shall be designed for the minimum empty barge load at mean river velocity, as specified in *AASHTO Bridge 3.14.1*.

4.4.14 DEFLECTIONS AND VIBRATIONS

Bridge deflections due to live loads and wind loads will meet the recommendations of *AASHTO Ped Bridge Guide Sections 5 and 6.*

4.4.15 CONSTRUCTION LOADS

Construction live loads and erection loads will be determined by the final design team.

4.4.16 MATERIALS

Materials will comply with *AASHTO Bridge*, *DDOT DEM,* and *DDOT Standard Specifications for Highways and Structures*.

Concrete cover to reinforcement will follow *DEM Table 13-1*.

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Structural steel HSS members shall meet CVN test requirements per DDOT DEM.

The railing and screen material is TBD (stainless or galvanized steel under review).

See plan general notes for additional material specifications.

4.4.17 FOUNDATIONS

Foundations shall be designed based on geotechnical analysis and recommendations in accordance with AASHTO Bridge and DDOT DEM.

4.4.18 RETAINING WALLS

Refer to retaining wall section in *Chapter 3*. With the following exceptions:

The Live Load Surcharge equivalent heigh of soil will be 2 feet for parallel retaining walls and abutments per AASHTO Bridge C3.11.6.4. This section's commentary states that the "traditional value" of 2 feet corresponds to an H10 truck, which is the design live load for these structures.

Mechanically Stabilized Earth (MSE) walls will be allowed adjacent to pedestrian/bicycle bridges only and will be designed for 100-year service life.

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5 Roadway

5.1 Project Background

The roadway improvements are limited and based on the approved Operator Signoff Plans developed during the Environmental Impact Statement (EIS) phase. They generally consist of the following proposed and temporary improvements:

- Proposed
    - 14th Street SW off ramp to Maine Avenue SW will be realigned to facilitate the construction of the proposed railroad bridge.
    - Pavement mill and overlay treatments along all roadways where maintenance of traffic layouts modify the existing pavement markings.
- Temporary
    - The temporary George Washington Memorial Parkway (GWMP) median widening to support the temporary median crossover into the proposed construction staging area south of the existing CSX Transportation (CSXT) railroad bridge over the GWMP and the Potomac River.
    - Minor temporary widening of I-395 on-ramp to GWMP for construction access.
    - All other temporary traffic shifts are anticipated to occur within the existing curb lines and edge of existing pavement where the restoration as identified above in the proposed section.

5.2 Safety

Roadway design intentions are to provide a safe and reliable roadway infrastructure attaining the highest level of service within the physical and economical Project constraints. Design goals will be to apply the standard roadway design criteria. Designers are to provide justification for any physical, environmental, or economic constraints preventing standard criteria. Standard criteria deviations are to be collaborated with the Authority Having Jurisdiction (AHJ), and approved by the AHJ, prior to implementing minimum criteria.

The Virginia Passenger Rail Authority (VPRA)and the host railroad (CSXT) reserves the rights to review, approve, deny, and/or issue a permit for all improvements either passing over or under the rail Corridor. Roadway design shall be attentive to rail operation safety, traveling public safety, and the safety of the neighboring communities and commercial businesses.

5.3 Design Criteria

5.3.1 ROADWAY STANDARDS

Roadway designs are to be compliant with the AHJ. AHJ approval is required for alternate or "minimum" design criteria prior to application in accordance with *Chapter 10*. In the absence of a design criteria standard, the designs are to be applicable to the *American Association of*

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State Highway and Transportation Officials (AASHTO) Policy on Geometric Design of Highways and Streets, 7th Edition, 2018.

The designs will consider the latest edition of the following:

- District Department of Transportation (DDOT) Design and Engineering Manual (DEM), January 2019
- DDOT Standard Specifications for Highways and Structures, 2013
- AASHTO, A Policy on Geometric Design of Highways and Streets
- AASHTO Roadside Design Guide, 4th Edition 2011
- National Park Service (NPS) Active Transportation Guidebook
- Virginia Department of Transportation (VDOT) Road Design Manual
- Arlington County Design guidance documents

Where the proposed roadway designs are primarily a result of replacing the roadway infrastructure due to construction impacts associated with bridge and railroad infrastructure construction improvements, the intent of the roadway designs is to replace-in-kind the existing roadway conditions and layout.

5.3.2 DESIGN CONTENT

The design content is to be compliant with the AHJ. The following roadway design elements are expected for all designs based on the design stage:

- Layout (Reflecting existing topographic features and proposed features)
- Right-of-way
- Typical Sections
- Traffic signing, lighting, and striping
- Traffic signalization
- Horizontal and vertical alignments
- Vertical profile of primary roadway and relevant connecting roadways
- Drainage structures and networks
- Erosion and sediment control
- Existing and proposed structural improvements (bridges and retaining walls)
- Utility conflicts/relocations
- Cross-sections (50-foot intervals and critical locations)
- Construction phasing and maintenance of traffic during construction

5.4 Maintenance of Traffic

The temporary work zones for the project will be designed in accordance with *Part 6 of the Manual of Uniform Traffic Control Devices (MUTCD), Roadside Design Guide,* and the *D.C. Temporary Traffic Control Manual* to provide for the safe and efficient movement of vehicles, pedestrians, and bicyclists through each phase of construction. On travel ways within VDOT or Virginia locality jurisdiction, work zones will be designed in accordance with the *Virginia Work Area Protect Manual (VWAPM, 2011 Edition, Version 2)*.

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5.4.1 ALLOWABLE WORK HOURS

This section will define the allowable work hours and road closures after traffic analysis and coordination with DDOT and NPS is complete during the design build phase of the project.

5.4.2 TEMPORARY CONDITION DESIGN CRITERIA

Temporary conditions vary based on facility and work requirements. Duration of allowable closures will be coordinated with the appropriate agency.

Maintenance of traffic criteria for 14th Street SW/I-395 will be based on Interstate criteria with a design speed of 40 mph. The following requirements will be used for maintenance of traffic:

TABLE 5-1. ALLOWABLE TEMPORARY CONDITION DESIGN CRITERIA – INTERSTATE.

Minimum Number of Lanes	2
Minimum Lane Width	11 feet
Minimum Shoulder Width	0 feet
Minimum Ramp Width	16 feet
Minimum Ramp Shoulder Width	0 feet
Minimum Clear Zone	14 feet

Maintenance of traffic criteria for GWMP will be based on Other Freeway or Expressway criteria with a design speed of 40 mph. The following requirements will be used for maintenance of traffic:

TABLE 5-2. ALLOWABLE TEMPORARY CONDITION DESIGN CRITERIA - GEORGE WASHINGTON MEMORIAL PARKWAY.

Minimum Number of Lanes	1
Minimum Lane Width	11 feet
Minimum Shoulder Width	N/A
Minimum Ramp Width	16 feet
Minimum Ramp Shoulder Width	0 feet
Minimum Clear Zone	14 feet

Maintenance of traffic criteria for Ohio Drive SW will be based on Local Street criteria with a design speed of 25 mph. The following requirements will be used for maintenance of traffic:

TABLE 5-3. ALLOWABLE TEMPORARY CONDITION DESIGN CRITERIA - OHIO DRIVE SW.

Minimum Number of Lanes	1 with temporary flagging or temporary traffic signals
Minimum Lane Width	10 feet
Minimum Shoulder Width	N/A
Minimum Clear Zone	12 feet

Maintenance of traffic criteria for Maine Avenue SW will be based on Principal Arterial criteria with a design speed of 15 mph. The following requirements will be used for maintenance of traffic:

DRAFT

TABLE 5-4. ALLOWABLE TEMPORARY CONDITION DESIGN CRITERIA - MAINE AVENUE SW.

Minimum Number of Lanes	2
Minimum Lane Width	9 feet
Minimum Shoulder Width	N/A
Minimum Clear Zone	12 feet

5.4.3 PEDESTRIAN AND BICYCLE ACCESS

This section will define the minimum sidewalk widths and allowable detours to be determined in coordination with DDOT.

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6 Bridge Hydraulics

6.1 References and Resources

A variety of sources were referenced in the design of the Long Bridge Project. These references included design documents developed by the regulatory agencies involved in review and approval of the project, industry accepted references such as the Federal Highway Administration (FHWA) and Hydraulic Engineering Circular (HEC) manuals that provide the foundation of the design, and previous studies of the project area.

6.1.1 REGULATORY APPROVAL

The proposed design of the bridge will go through the approval process from several different entities. These include the Department of Energy and the Environment (DOEE), Federal Emergency Management Agency (FEMA), the United States Coast Guard (USCG), United States Army Corps of Engineers (USACE), National Park Service (NPS), and the District Department of Transportation (DDOT).

6.1.2 DESIGN GUIDELINES

Design guidelines, specifications, and manuals include the following:

- Applicable FHWA HEC manuals
- DDOT Design and Engineering Manual (DEM), January 2019
- Environmental Impact Statement (EIS)

6.1.3 ENVIRONMENTAL IMPACT STATEMENT

Hydraulic design criteria provided herein reference the Environmental Impact Statement (EIS) created through DDOT and the Federal Railroad Administration (FRA) for the Long Bridge project on June 11, 2018. The purpose of the study was to obtain and document information related to present and future navigation uses and the needs of the waterways near the Long Bridge, for the purpose of developing and evaluating alternatives for the Project.

USCG issued a Preliminary Navigation Clearance Determination (PNCD) on March 5th, 2020, specifying a 20-foot minimum vertical clearance for the Navigational Channel of the Proposed Potomac River Structures.

6.2 Data Collection

Information collected for this project includes topographic surveys, existing plans and/or as-builts, previous studies, flood data, and channel characteristics.

6.2.1 SURVEY AND AS-BUILTS

A survey was performed in the vicinity of the bridge, and survey points were collected to create the bathymetry (below water surface elevations) in the surrounding area upstream and downstream of the bridge.

DRAFT

As-built plans of the three bridges just upstream of the rail bridge include the 14th Street bridge titled "Superstructure for New West Highway Bridge Over Potomac River, Vicinity 14th Street" dated 7/14/1959, "New West Highway Bridge and Approaches Over Potomac River, Vicinity of 14th Street" dated 3/11/1964, and "Substructure for New West Highway Bridge Over Potomac River, Vicinity 14th Street" dated 7/14/1959.

6.2.2 EFFECTIVE FEMA STUDY

The current FEMA Flood Insurance Study (FIS) and associated Flood Insurance Rate Map (FIRM) panels of the study area are effective as of September 27, 2010. The FIRM panels that cover the project area are: 1100010018C, 1100010019C, 1100010056C, and 1100010057C. After these documents became effective, additional Letter of Map Revisions (LOMRs) within the study area became effective which include 15-03-2388P-110001 and 20-03-0337P-110001.

6.3 Level of Analysis/Method of Analysis

A "no rise" determination was concluded to incorporate the proposed design. HEC-RAS 6 was used to complete the hydraulic analyses.

6.4 Hydrology

The following sections detail the proposed hydrologic analysis used to calculate the 10-, 50-, 100-, and 500-year storm frequency discharges.

6.4.1 PREVIOUS HYDROLOGIC STUDIES

Hydrologic information is provided in the latest FEMA study of the Potomac River within the project area and is dated September 27, 2010. Riverine Hydrologic Analysis Update was performed to validate the flood levels from the previous study.

For the riverine portions of the Potomac River, the effective FIS is based on a flood frequency analysis of annual peak discharge data collected at USGS gage for the Potomac River near the Washington, DC Little Falls Pumping Station (USGS Station No. 01646500), which is not tidally influenced. The years of data covered are from 1931 – 2020. Flood frequencies are developed using the program PeakFQ and the Bulletin 17B method.

Additional documents include:

- Climate Change Adaptation Plan for the District of Columbia (2015 DOEE) to account for Sea Level Rise (SLR);
- Climate Ready DC (DOEE, 2016);
- DDOT Climate Change Action Plan (DDOT, 2013)

6.4.2 TIDAL HYDROLOGY

For the tidally influenced portions of the Potomac River, the effective hydrology is based on a stage-frequency analysis of measured water-surface elevations recorded at National Ocean Service (NOS) gage no. 8594900, which is located at Haines Point, near the confluence of the Potomac and Anacostia Rivers. The update to the tidal hydrology uses this same location as a

DRAFT

point of analysis. Highest water surface elevations at this location were used to determine the water surface elevations used in the downstream boundary conditions of the hydraulic model.

6.5 Hydraulic Design Criteria

6.5.1 VERTICAL CLEARANCES AND NAVIGATION

Storm surge was considered in the design of the bridge including riverine and coastal surge for the full length of the structures. Both bridges navigational superstructures are above the 100-year event storm surge elevation. The Potomac River Undergrade Bridge and Potomac River Bike-Ped Bridge ramps on both sides meet the 1 foot freeboard DDOT requirement with ramp structures over edges of the river for the 10-year event storm surge. The north end of the ramp for the Bike/Pedestrian Bridge and their fill sections is within the 100-year event, however these volumes are very small relative to the main channel opening.

The USCG is requiring 20 feet above MHW (Elevation 1.54 NAVD88) for the proposed bottom (low chord) of the superstructure elevations for both bridges. The navigation channel spans for both bridges meet this clearance requirement by meeting or exceeding the elevation of 21.54.

6.6 Hydraulic Analysis

The hydraulics of the bridge were evaluated using HEC-RAS version 6 (USACE, 2021). The analysis includes the development of the Duplicate Effective, Existing Conditions, and Proposed Conditions Models.

6.6.1 DUPLICATE EFFECTIVE ANALYSIS

The Effective HEC-RAS Model was created for FEMA as part of the June 1, 2020, LOMR report 20-03-0337P-110001. This hydraulic model became effective on October 19, 2020, for Washington D.C. A duplicate effective model was created from the current effective model in order to conclude a "no-rise" determination for the proposed design..

6.6.2 EXISTING CONDITIONS ANALYSIS

The Existing Conditions model includes the latest available datasets of topography and bathymetry, updating the cross section elevations while maintaining the extent and overbanks of the Effective model. Information added or modified in the Existing Conditions model includes:

- The Yellow Line Metro Bridge geometry
- Two new cross sections for the Potomac-Anacostia junction to account for the widening in the intersection
- Hydrologic revisions
- New boundary conditions to evaluate a combination of scenarios that reflect riverine and coastal influences

A seamless high-resolution topo-bathymetric dataset was assembled from publicly available sources and current in-terrain surveys obtained for the project. This dataset was used in the HEC-RAS hydraulic modeling as well as in the ADCIRC coastal modeling.

Topobathymetry sources:

DRAFT

- LiDAR Topography (USGS), post-Sandy - 2014
- Latest Hydrographic Survey Activity (USACE), 2015-2020
- Lidar and bathymetry, Coastal National Elevation Dataset CoNED (USGS), post-Sandy – 2015
- NCEI Coastal Relief Model (NOAA), 1998
- General Bathymetric Chart of the Oceans GEBCO - open data contributors
- Current terrain survey

Five different resolution topobathymetry DEM's were created for different extents:

- High resolution 1-meter for Washington D.C. including the Potomac riverbed (from Little Falls, MD. to Alexandria, VA.)
- Medium resolution 30-meter DEM for the Lower Potomac River (Downstream from D.C.) to the Chesapeake Bay (Lewisetta, VA.)
- Low resolution 100-meter DEM for the Chesapeake Bay.
- Low resolution 500-meter DEM for the Chesapeake Bay connection with the Atlantic Ocean.
- Coarse Bathymetry for Atlantic Ocean and Gulf of Mexico Bed

6.6.3 PROPOSED ANALYSIS

The Proposed Conditions Model incorporates the Potomac River Undergrade and Bike-Ped bridges and any proposed physical changes within the floodplain near Long Bridge. The model updates the Existing Conditions geometry with the Proposed Conditions geometry and keeps the existing hydrology and boundary conditions.

6.7 Coastal Analysis

6.7.1 PREVIOUS COASTAL STUDIES

Existing coastal studies and observational data include the following:

- North Atlantic Comprehensive Coastal Study (NACCS)
- FEMA coastal studies
- Analyses of National Oceanic and Atmospheric (NOAA) gage data
- Others as appropriate

6.7.2 COASTAL ANALYSIS UPDATE

An analysis of the applicability of data from existing coastal studies was used to develop design criteria and identify the required updates for the coastal analysis.

6.7.3 IMPACT OF STORM SURGE

The impacts of storm surge on design conditions at the bridge site were analyzed by specifying downstream boundary conditions reflective of storm surge at various return intervals (25-, 50-, 100-year for example). The storm surge driven water surface elevations at the downstream boundary were obtained from previous coastal studies or the NOAA observation stations at Haines Point and Lewisetta.

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6.7.4 IMPACT OF SEA LEVEL RISE

The impact of sea level rise shall be considered for the project location and incorporated as appropriate into the storm surge estimates discussed in *Section* 6.7.3. NOAA Station #8594900 is within one mile of the Project and provides long-term record of water levels since 1924. The USACE Sea-Level Change Calculator (Version 2021.12) will be used to generate scenarios projecting future changes to sea level to this Station.

6.7.5 COMPOUND FLOODING

Finally, design water surface elevation and currents were obtained by analyzing the HEC-RAS results and quantifying the combined impacts of pluvial and fluvial flooding, and storm surge.

6.8 Scour Analysis and Countermeasures

6.8.1 DESIGN CRITERIA

The latest HEC-18 and HEC-25 guidelines were used to calculate the scour estimates at each structure of the bridge for the 100-year storm event.

6.8.2 METHODOLOGY

Estimation of total scour considers three primary components: (1) Long-term degradation of the riverbed, (2) Contraction scour at the bridge, and (3) Local scour at the piers. Scour evaluations will focus on piers since abutments will be constructed on the overbanks and outside of the main channel. Scour shall be considered for each pier location assuming the proposed ground elevation.

A D50 value of 0.02 millimeters shall be assumed for the scour analysis.

6.9 Hydrodynamic and Wave Loading

6.9.1 DESIGN CRITERIA

Coastal hydrodynamic and wave simulations were carried out to determine the 100-year flood elevations, wave conditions, and currents using the *American Association of State Highway and Transportation Officials (AASHTO) Guide Specifications for Bridges Vulnerable to Coastal Storms (2008)*.

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7 Drainage and Stormwater Management

7.1 References

The overall project limits are located in multiple jurisdictions that have unique drainage design requirements and regulations. The following standards and manuals be used as reference for the drainage design in accordance with the specific jurisdiction.

- District Department of Transportation (DDOT) Design and Engineering Manual (DEM), January 2019
- DDOT Standard Drawings
- DC Water Standard Design Guidelines, Drawings, and Specifications
- Virginia Department of Transportation (VDOT) Drainage Manual
- VDOT Road and Bridge Standards
- VDOT Road and Bridge Specifications
- American Association of State Highway and Transportation Officials (AASHTO) Highway Drainage Guidelines
- Federal Highway Administration (FHWA) Hydraulic Engineering Circular-14Hydraulic Design of Energy Dissipators for Culverts and Channels (HEC-14)
- HEC-22 Urban Drainage Design Manual

7.2 Design Criteria

Storm drainage systems will be designed to provide safe roadway and trackbed conditions and adequately convey design flows. The existing storm drain system will be maintained where feasible. Existing survey, utilities, and other information needs to be obtained and confirmed prior to the drainage design. See Chapter 2-Railroad Section 2.8.4-Track Drainage and Chapter 3 Section 3.2.8 -Bridge Drainage for drainage design criteria for proposed track roadbed and bridge structures.

7.2.1 CLOSED DRAINAGE SYSTEMS

Design frequency, sizing, location, and spacing for storm drain system are based on the stormwater drainage calculations, spread, bypass flow, and efficiency requirements for the jurisdiction. Horizontal clearance will be maintained between the proposed drainage system and all underground structures. Culverts and closed drainage systems are designed and sized to accommodate the design flows.

Drainage from bridge superstructures or embankments must not discharge across a railroad right-of-way, National Park Services lands, public property, or private property without property owner approval.

The following criteria applies to the closed drainage system design of the Long Bridge project:

- Design Frequency Highway: 25-year storm event with pipes flowing full

DRAFT

- Design Frequency Railroad: 100-year storm event
- Sag Conditions: Must design for 50-year event for pipes draining to a sag condition
- Minimum Highway Drainage Pipe Size: 18 inches
- Minimum Railroad Drainage Pipe Size: 12 inches
- Basin Connect Pipe Size: 15 inches
- Minimum Pipe Flow Velocity: 3 feet per second
- Minimum Pipe Cover: 3 feet
- Hydraulic Grade Lines: Must not rise above crown of pipe
- Manholes for Highway Drainage: required at each slope/grade change or change in alignment
- Manhole Connections: No more than 3 total pipes allowed entering or leaving
- Maximum Highway Manhole Spacing: 400 feet, connecting pipe must be 50 feet or less

Also, much of the downtown District Columbia area falls within the Combines Sewer Watershed. Additional design criteria apply to those watersheds and sub-watersheds which are regulated by DC Water.

7.2.2 OPEN CHANNEL FLOW

Open channels are designed to provide positive flow that has non-erosive velocities. Open channels shall be designed to meet the following criteria:

- Hydraulic calculations are required for all proposed open channels
- The final channel design must provide 6 inches of freeboard above the design flow elevation
- Channel inverts and top of bank elevations are required for all open channels
- Typical cross sections are required for each reach of open channel
- Channel lining design will be provided for non-erosive velocities
- Channel design shall also incorporate a pilot channel to handle lower flow events

7.2.3 CULVERT DESIGN

Culverts shall be sized to accommodate the following design flows based upon the roadway classification:

Railroad Corridor	100 year storm event
Freeways	50 year storm event
Principal Arterials	50 year storm event
Minor Arterials/Collectors	25 year storm event
Local Streets	10 year storm event

Also, adequate inlet and outfall protection for all culverts will be evaluated and designed in accordance with HEC-14.

7.3 Stormwater Management

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Within the Washington, DC area, stormwater retention volume (SWR_V) will be calculated for all major land disturbing activities in accordance with the Department of Energy and the Environment (DOEE) Stormwater Management Guidebook. For most areas of Washington, DC, this retention volume (called SRV) is calculated using a 1.2-inch rainfall event. An additional volume of storage for water quantity control will be required by DOEE to reduce the post development discharge to pre-existing (typically "meadow") conditions. Portions of the Project within the Anacostia Waterfront Development Zone (AWDZ) as defined in the DOEE Stormwater Management Guidebook are subject to additional restrictions as defined in the DOEE Stormwater Management Regulations.

For project areas within Virginia, stormwater quality control and stormwater quantity control will be required in accordance with the Virginia Stormwater Management Handbook.

In accordance with DOEE practice, railroad ballast (both existing and new) is considered impervious because the underlying soil interface typically does not infiltrate. Railroad bridges crossing waterways and locations in Virginia are excluded from this practice. In addition, existing rail lines are eligible for Maximum Extent Practical (MEP) considerations. Underdrain may be considered a detention practice provided a dead storage stone area is located below the invert of the underdrain. Additional coordination is required to establish appropriate stormwater management in ballasted areas the context of this project. Refer to *Chapter 11, Additional Considerations* for additional discussion.

7.3.1 REFERENCES

Proposed stormwater management will be designed in accordance with the latest edition of the following standards and manuals:

- DOEE 2020 Stormwater Management Guidebook
- DDOT Design and Engineering Manual (DEM), January 2019
- DDOT 2014 Green Infrastructure Standards
- DC Water Green Infrastructure Utility Protection Guidelines
- VDOT Drainage Manual
- Virginia Department of Environmental Quality (DEQ) Stormwater Design Specifications

7.3.2 BMP DESIGN CRITERIA

Important considerations for the design of all stormwater management facilities (also known as BMPs) are as follows:

- Any proposed BMP must have soil borings and field infiltration tests within the proposed BMP limits.
- Groundwater levels must be at least 4-feet below the proposed BMP bottom elevation.
- BMP facilities cannot be located within existing floodplain limits.
- BMP facilities must meet certain pollutant removal requirements.

DOEE is also considering changes to their current floodplain regulations with the 500-year event becoming the regulated floodplain rather than the current 100-year floodplain limits. This proposed change will have an impact on any proposed BMP location as well as its design. The proposed regulation changes have not yet been made law but could be in effect at the time the Long Bridge Project goes under construction.

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Since the project area consists of the National Park Service (NPS) George Washington Memorial Parkway (GWMP), NPS National Mall and Memorial Parks (NAMA), and DDOT Right-of-Way (ROW), the design criteria for BMP Facilities for these three areas are subject to different review agencies, which follows:

- BMP Facilities in NPS GWMP – Virginia DEQ
- BMP Facilities in NPS NAMA – DC DOEE
- BMP Facilities in DDOT ROW – DC DOEE & DDOT

7.4 Erosion and Sediment Control

Within the District of Columbia and Virginia, Erosion and Sediment Control (ESC) design is required to temporarily protect water resources from sediment pollution and increases in runoff associated with active land disturbance, clearing, and grading activities. Therefore, ESC Plans are required for all portions of a construction project and need to be properly phased to provide the maximum amount of protection to the receiving waterways.

7.4.1 REFERENCES

The latest edition of the following codes and standards specific to ESC design are followed in the development of the ESC plans:

- DOEE 2020 Stormwater Management Guidebook
- DOEE 2017 Erosion and Sediment Control Manual
- DOEE Soil Erosion and Sediment Control Handbook
- DOEE Soil Erosion and Sediment Control General Notes
- Review Checklist for Soil Erosion and Sediment Control Plans
- Virginia Erosion and Sediment Control Handbook
- VDOT Road and Bridge Standards

The project area consists of the NPS George Washington Memorial Parkway (GWMP), NPS National Mall and Memorial Parks (NAMA), and DDOT ROW. The design criteria for these three areas are subject to different review agencies, which are listed as follows:

- ESC in NPS GWMP – Virginia Department of Environmental Quality (DEQ)
- ESC in NPS NAMA – DC Department of Energy and Environment (DOEE)
- ESC in DDOT ROW – DC DOEE and the District Department of Transportation (DDOT)

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8 Utilities

Available utility records have been received from the existing utilities owners within the project limit. This phase of design is based on existing utilities records, which will be verified by survey. Existing utilities and owners within the vicinity of the project limits include:

- Railroad owned utilities
- Franchise utilities in the railroad Right-of-Way (ROW)
- District Department of Transportation (DDOT) owned utilities
- DC Water utilities
- National Park Service (NPS) owned utilities
- Washington Metropolitan Area Transit Authority (WMATA) owned utilities
- Dark Fiber (no record, federal/military lines may run within the project area)

TABLE 8-1. UTILITY AGENCIES

Utility Agency	Area
AOC Connect	DC
AT&T Local	DC/VA
AT&T Corporation and AT&T Network Operations	DC
AT&T Core/AT&T Legacy/AT&T Long Distance	DC
Lumen Engineering (Formerly Century Link National)	DC/VA
Comcast	DC/VA
DC Water and DC Clean Rivers	DC
DDOT Signals and Streetlights	DC
Dominion VA Power	VA
Excelon Corp (PEPCO / PEPCO Network Cable)	DC
Fiberlight (Formerly Espire)	DC/VA
Jones Utilities	VA
MWAA	VA
NPS - GWMP	VA
NPS - NAMA	DC
Openband of Virginia	VA
PEPCO	VA
RCN	DC
Sprint / T Mobile	DC
Verizon	DC/VA
Verizon Business (MCI)	DC
Washington Gas	DC/VA
Windstream-KDL	VA
WMATA	DC/VA
X-O Communications (Verizon)	DC
Zayo Group (Formerly Above Net)	DC/VA

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8.1 References

The latest edition of the following codes and standards specific to utilities will be followed:

- DDOT Design and Engineering Manual (DEM), January 2019
- ASCE Standard Guidelines for the Collection and Depiction of Existing Subsurface Utility Data
- DC Water Project Design Manual, Volume 3, Linear Asset Design
- DC Water Standard Details and Specifications

8.2 Impacts and Relocation Approach

Any existing utilities impacted by the project will require close coordination to determine where those lines can be relocated to as well as overall sequencing and phasing of the relocation work. Experience indicates that the affected utility owner can take as long as 2-years or more to design and construct any proposed relocations which could impact the overall Long Bridge Project construction schedule.

Also, shall a particular utility need to be relocated, the utility owner will require that utility designation (Quality Level B) and test hole data (Quality Level A) information be provided to them so they can evaluate their relocation options.

Utility relocations as well as new utility systems must be designed to limit impacts to the critical root zone areas of any existing trees. This is an extremely important consideration for both DDOT and NPS.

Finally, the Maine Avenue SW area of the project has other legacy utility items including abandoned foundations, abandoned streetcar (trolley) tracks, and an abandoned GSA steam tunnel which may also be impacted by the project.

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9 Landscape Design

Landscape design for this project includes protection and restoration on both the George Washington Memorial Parkway (GWMP) and National Mall and Memorial Parks (NAMA) parkland adjacent to the Potomac River. Section 106 Programmatic Agreement requires two components for planting mitigation resulting from construction activities.

Vegetation Protection Plan Includes areas within the Limits of Disturbance (LOD) wherever vegetation is to be removed, impacted, or protected. Existing vegetation will be surveyed, and specific measures will be outlined to protect trees during temporary and permanent construction activities.

Vegetation Restoration Plan Includes areas within the LOD where vegetation will be replaced to reestablish historic planting plans, while incorporating guidance from historic and recent Cultural Landscape Inventories (CLIs). Plantings are prohibited from the railroad roadbed.

Proposed Landscape Plan Incorporates elements from the Vegetation Protection and Restoration plans, with additional plantings for screening, mitigating potential erosion issues, and compliance with BMPs planting requirements.

9.1 References

Design specifications and mitigation commitments used in the Landscape Protection and Restoration Plans include the following:

- Combined Final Environmental Impact Statement/Record of Decision and Final Section 4(f) Evaluation
- Vegetation at Long Bridge Interim Assessment
- Section 106 Programmatic Agreement
- Virginia Department of Rail and Public Transportation (DRPT)-National Park Service (NPS) Mitigation Agreement

CLIs:

- 2010 Cultural Landscape Inventory for Lady Bird Johnson Park
- 2014 Mount Vernon Memorial Highway - South of Alexandria Cultural Landscape Inventory
- 2016 Theodore Roosevelt Island Cultural Landscape Inventory

GWMP Vegetation Cultural Landscape Report (CLR):

- 2009 Vegetation of the GWMP Central Section (Alexandria to Arlington Memorial Bridge) Vegetation Information (Volumes One and Two)

Historic American Buildings Surveys (HABS) and Historic American Landscapes Surveys (HALS):

- Historic American Engineering Record for Mount Vernon Memorial Highway - George Washington Memorial Parkway portion
- Historic American Landscapes Survey of Mount Vernon Memorial Highway, George Washington Memorial Parkway along Potomac River from McLean to Mount Vernon, VA

DRAFT

Mount Vernon Memorial Highway (MVMH) Cultural Landscape Report:

- Mount Vernon Memorial Highway Cultural Landscape Report – Volume 1 History
- Mount Vernon Memorial Highway Cultural Landscape Report – Volume 2 – Design Documentation

National Register:

- Lyndon Baines Johnson Memorial Grove National Register of Historic Places Registration Form
- George Washington Memorial Parkway National Register of Historic Places Registration Form

National Mall and Memorial Parks (NAMA) CLIs:

- 2008 Constitution Gardens Cultural Landscapes Inventory
- 2017 East Potomac Golf Course Cultural Landscape Inventory
- 2015 Thomas Jefferson Memorial Cultural Landscape Inventory

CLR – Treatment:

- 1999 Lincoln Memorial Grounds Cultural Landscape Report
- NPS Golf Courses Cultural Landscape report and Treatment Guidelines
- 018 Rock Creek and Potomac Parkway, Potomac Waterfront Section Cultural Landscape Report
- 1996 Thomas Jefferson Memorial Landscape Overview
- 2020 Tidal Basin Viewshed Analysis

HABS:

- Hains Point - East Potomac Park Historic American Buildings Survey
- Hains Point - East Potomac Park Historic American Buildings
- West Potomac Park Historic American Buildings Survey

HALS:

- Tidal Basin - West Potomac Park Historic American Landscaping Survey
- Historic American Landscape Survey - 1910 Japanese Flowering Cherry Trees in East Potomac Park

History and Architecture:

- Chappell 1973 West Potomac Park History Historic Resource Study
- East Potomac Park HSR Final 508c 2019
- Lincoln Memorial Historic Structure Assessment Report

National Register:

- National Mall National Register of Historic Places Registration Form

Other References:

- Protecting Historic Trees During Construction. National Center for Preservation Technology and Training, March 2021

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9.2 Vegetation Protection Plan

9.2.1 APPROACH

In close collaboration with the National Park Service (NPS), a Vegetation Protection Plan will provide documentation of the site's existing conditions, including existing tree species, caliper, and health. The Vegetation Protection Plan will identify which trees may be impacted by construction activities.

Specifications will indicate protection measures necessary to mitigate construction damage in temporary staging and permanent construction areas. The Vegetation Protection Plan will be provided during the Preliminary Engineering Phase, and further refined through the project.

9.2.2 TREE SURVEYING CRITERIA

During the August 2021 site walk, the NPS confirmed that a 6-inch diameter at breast height (DBH) would be the minimum tree size required to be surveyed. Existing shrubs would be recorded as massings, not individual specimens.

9.2.3 TREE PROTECTION CRITERIA

Tree protection will be recommended based on collaboration with arborist recommendations and NPS tree protection standards. Primary attention will be placed to minimize soil compaction, severing of roots, trunk and limb injury, and limb breakage around all trees in the LOD.

9.2.4 NAMA HEADQUARTERS

During the July 2021 site walk, NAMA staff informed the design team that a historic cherry tree was located near the NPS trailer. Species is Okame Cherry (Prunus 'Okame') near where the temporary construction impacts will occur.

9.2.5 CONSTRUCTION AREA SCREENING

Screening around construction staging areas and planting will be provided as part of the Vegetation Protection Plan, incorporating standard NPS screen fencing.

9.3 Vegetation Restoration Plan

9.3.1 APPROACH

Combining available references, specifically CLIs and CLRs, a Vegetation Restoration Plan will be developed to mitigate trees removed as part of this project. The restoration area for this project will occur within the Project Limits of Work.

9.3.2 RESTORATION PLANTING PALETTE

The proposed plant palette will be based on historic NPS planting plans, drawing on NPS recommended cultivars if alternate species are preferred for availability, disease resistance, or maintenance considerations. The GWMP portion of the project has had three historic plantings plans: 1932, 1965, and 1980s.

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9.3.3 MITIGATION RATIO

Per the Section 106 Programmatic Agreement, restoration will be for the same number of caliper inches removed. For example, if three 24-inch trees are removed, then 72 inches of caliper would need to be restored by new tree plantings.

9.4 Proposed Landscape Plan

9.4.1 APPROACH

The Proposed Landscape Plan will incorporate relevant drainage and stormwater designs, including any Best Management Practices (BMP) planting and revegetation to mitigation erosion. The Landscape Plan will be reviewed by the Signatories to the Section 106 Programmatic Agreement, as stipulated in the agreement.

9.4.2 INVASIVE SPECIES MANAGEMENT

The design team will work closely with the NPS to specify an appropriate management strategy for invasive species. Application of herbicide treatment(s), species targeted for removal, and schedule have been coordinated with NPS during multiple meetings.

9.4.3 VEGETATIVE SCREENING

NPS reiterated the importance of viewsheds during each site walk. With vegetation being cleared and new structures being built, there are opportunities to selectively screen or frame views that may have not previously been possible.

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10 Approvals and Design Exceptions

10.1 Design Exceptions

The designer is expected to adhere to the practices and criteria specified in the Basis of Design (BOD). The Virginia Passenger Rail Authority (VPRA) and Federal Railroad Administration (FRA) recognize that design exceptions may be required for criteria not met on the National Highway System. These deviations may be necessary for avoidance of environmental impacts or due to physical constraints. These changes must be approved by the Authority Having Jurisdiction (AHJ) prior to implementing the criteria change.

All design exceptions are to be submitted by the design team in writing to VPRA and FRA for distribution to the AHJ. Each variation request will be logged for tracking and distributed to the appropriate AHJ for consideration. Those stakeholders having jurisdiction will provide a written response to the variance request.

The designer is requested to provide adequate information for the exception. Adequate information includes, but is not limited to:

- Applicable BOD Chapter and Section
- Implications of applying BOD criteria
- Rationale and justification for the request and the location(s) and/or length where the exception may apply
- Benefits of exception
- Graphical representation through plan/profile/typical section
- Cost estimate reflecting increases or savings
- Identification of exception regarding the minimum standard and its relevance to the desirable standard
- Identification of effects of the exception to the freight and intercity passenger rail system operations and maintenance, if any, and appropriate potential mitigation measures
- Supporting documentation, including a description of the specific design element and the applicable criteria
- Professional engineer signature and seal of the design engineer of record
- Elements proposed to be constructed or installed to mitigate the risks associated with not constructing the items to applicable standards and that warrant a requested for an exception

The AHJ reserves the right to request additional information to understand the implications of the variance.

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10.2 Design Waivers

Design waivers are required for potential for deviations to the technical criteria presented in the BOD or other controlling AHJ criteria that are not considered design exceptions. The designer is requested to provide adequate information for the design waiver request to the AHJ.

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11 Additional Considerations

The Basis of Design (BOD) is intended to be a living document. As such, several specific considerations or criteria remain outstanding throughout the document and as listed below.

- In accordance with the Department of Energy and the Environment (DOEE) practice, railroad ballast (both existing and new) is considered to be impervious because the underlying soil interface typically does not infiltrate. However, existing rail lines are considered eligible for Maximum Extent Practical (MEP) considerations and properly designed underdrains may be considered an approved detention practice for water quantity control attenuation. Further coordination regarding final Best Management Practices (BMPs) design and detailing is required to define water quality and quantity criteria.
    - The Virginia Department of Environmental Quality (DEQ) officials considers railroad ballast as pervious on the Virginia side of the project.
- Bridge decks over existing water bodies do not trigger a stormwater obligation. However, DOEE may require mitigation measures to mitigate stream impacts.

As information becomes available and coordination with stakeholders continues, this section may be removed in future drafts.

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Appendices

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Appendix A - Definitions

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Key abbreviations used for terms for this Project are identified in **Table A-1**.

Table A-1. Definitions

ABBREVIATION	DEFINITION
AAR	Association of American Railroads
AASHTO	American Association of State Highway Transportation Officials
AHJ	Authority Having Jurisdiction
AMTRAK	National Railroad Passenger Corporation and Subsidiaries
AREMA	American Railway Engineering and Maintenance-Of-Way Association
BOD	Basis of Design
CFA	Commission of Fine Arts
CFS	Cubic Feet Per Second
CSXT	CSX Transportation
DC SHPO	District of Columbia State Historic Preservation Office
DDOT	District Department of Transportation
DEQ	Virginia Department of Environmental Quality
DHR	Virginia Department of Historic Resources
DOEE	District Department of Energy and the Environment
DRPT	Virginia Department of Rail And Public Transportation
EIS	Environmental Impact Statement
ES	Engineering Stationing
F/S	Feet per Second
FHWA	Federal Highway Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HEC-18	Hydraulic Engineering Circular No. 18
HEC-RAS	Hydrologic Engineering Center – River Analysis System
HY-8	Culvert Hydraulics Analysis Program
KLF	Kips per Linear Foot
KSI	Kips per Square Inch
LBS	Pounds
MAS	Maximum Allowable Speed
MPH	Miles Per Hour
MP	Mile Post
MRE	Manual for Railway Engineering
MT-1, MT-2, MT-3	Main Track #1, #2 And #3
MUTCD	Manual of Uniform Traffic Control Devices
NCPC	National Capital Planning Commission
NPS	National Park Service
PCF	Pounds per Cubic Foot
PLF	Pounds per Linear Foot
PSF	Pounds per Square Foot
ROW	Right-Of-Way
SCC	Virginia State Corporation Commission, Division of Utility and Railroad Safety

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Table A-1. Definitions (Cont.)

ABBREVIATION	DEFINITION
US-ACOE	United States Army Corps of Engineers
VDOT	Virginia Department of Transportation
VRE	Virginia Railway Express
VPRA	Virginia Passenger Rail Authority
WMATA	Washington Metropolitan Area Transit Authority

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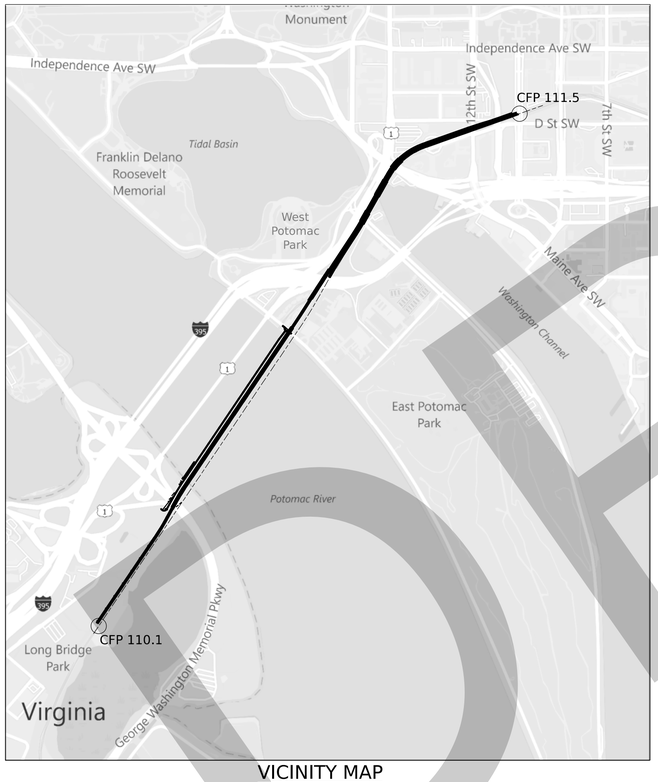
VIRGINIA PASSENGER RAIL AUTHORITY

ARLINGTON, VA TO WASHINGTON, DC

PROPOSED IMPROVEMENTS

BETWEEN ROSSLYN (RO) INTERLOCKING (MP CFP 110.1) AND L'ENFANT (LE) INTERLOCKING (MP CFP 111.5)

FEBRUARY 13, 2023



VICINITY MAP
SCALE 1" = 1000'

CENTRAL DIVISION
RF&P SUBDIVISION
MP CFP 109.76 TO MP CFT 111.57

FOR REFERENCE ONLY

DRAFT 30% SUBMISSION

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY E. LAWES
DRAWN BY E. LAWES
CHECKED BY S. WELLER
APPROVED BY M. COLGAN
DATE 2/8/2023

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TITLE SHEET

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. G-001
REV. N/A
SHEET NO. 1 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
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Plotted By: sgeary 2/8/2023
R02A_G001_ls North Package
Title Sheet

DRAWING INDEX - NORTH CONTRACT

GENERAL

1	G-001	TITLE SHEET
2	G-002	DRAWING INDEX
3	G-003	GENERAL NOTES
4	G-004	KEY PLAN

SITE DEMOLITION PLANS

5	SDM-001	SITE DEMOLITION NOTES AND LEGEND
6	SDM-002	SITE DEMOLITION PLAN (1 OF 8)
7	SDM-003	SITE DEMOLITION PLAN (2 OF 8)
8	SDM-004	SITE DEMOLITION PLAN (3 OF 8)
9	SDM-005	SITE DEMOLITION PLAN (4 OF 8)
10	SDM-006	SITE DEMOLITION PLAN (5 OF 8)
11	SDM-007	SITE DEMOLITION PLAN (6 OF 8)
12	SDM-008	SITE DEMOLITION PLAN (7 OF 8)
13	SDM-009	SITE DEMOLITION PLAN (8 OF 8)

UTILITY DEMOLITION PLANS

14	UDM-001	UTILITY DEMOLITION NOTES AND LEGEND
15	UDM-002	UTILITY DEMOLITION PLAN (1 OF 8)
16	UDM-003	UTILITY DEMOLITION PLAN (2 OF 8)
17	UDM-004	UTILITY DEMOLITION PLAN (3 OF 8)
18	UDM-005	UTILITY DEMOLITION PLAN (4 OF 8)
19	UDM-006	UTILITY DEMOLITION PLAN (5 OF 8)
20	UDM-007	UTILITY DEMOLITION PLAN (6 OF 8)
21	UDM-008	UTILITY DEMOLITION PLAN (7 OF 8)
22	UDM-009	UTILITY DEMOLITION PLAN (8 OF 8)

TRACK

23	RR-001	TRACK DEFINITIONS, EQUATIONS, ABBREVIATIONS, AND SYMBOLS
24	RR-002	TRACK GEOMETRY TABLES (1 OF 4)
25	RR-003	TRACK GEOMETRY TABLES (2 OF 4)
26	RR-004	TRACK GEOMETRY TABLES (3 OF 4)
27	RR-005	TRACK GEOMETRY TABLES (4 OF 4)
28	RR-006	TRACK SCHEMATICS
29	RR-101	TRACK 1 PLAN AND PROFILE (1 OF 4)
30	RR-102	TRACK 1 PLAN AND PROFILE (2 OF 4)
31	RR-103	TRACK 1 PLAN AND PROFILE (3 OF 4)
32	RR-104	TRACK 1 PLAN AND PROFILE (4 OF 4)
33	RR-201	TRACK 2 PLAN AND PROFILE (1 OF 4)
34	RR-202	TRACK 2 PLAN AND PROFILE (2 OF 4)
35	RR-203	TRACK 2 PLAN AND PROFILE (3 OF 4)
36	RR-204	TRACK 2 PLAN AND PROFILE (4 OF 4)
37	RR-301	TRACK 3 PLAN AND PROFILE (1 OF 9)
38	RR-302	TRACK 3 PLAN AND PROFILE (2 OF 9)
39	RR-303	TRACK 3 PLAN AND PROFILE (3 OF 9)
40	RR-304	TRACK 3 PLAN AND PROFILE (4 OF 9)
41	RR-305	TRACK 3 PLAN AND PROFILE (5 OF 9)
42	RR-306	TRACK 3 PLAN AND PROFILE (6 OF 9)
43	RR-307	TRACK 3 PLAN AND PROFILE (7 OF 9)
44	RR-308	TRACK 3 PLAN AND PROFILE (8 OF 9)
45	RR-309	TRACK 3 PLAN AND PROFILE (9 OF 9)
46	RR-401	TRACK 4 PLAN AND PROFILE (1 OF 9)
47	RR-402	TRACK 4 PLAN AND PROFILE (2 OF 9)
48	RR-403	TRACK 4 PLAN AND PROFILE (3 OF 9)
49	RR-404	TRACK 4 PLAN AND PROFILE (4 OF 9)
50	RR-405	TRACK 4 PLAN AND PROFILE (5 OF 9)
51	RR-406	TRACK 4 PLAN AND PROFILE (6 OF 9)
52	RR-407	TRACK 4 PLAN AND PROFILE (7 OF 9)
53	RR-408	TRACK 4 PLAN AND PROFILE (8 OF 9)
54	RR-409	TRACK 4 PLAN AND PROFILE (9 OF 9)
55	RR-501	TRACK TYPICAL SECTIONS
56	RR-502	TRACK CRITICAL SECTIONS (1 OF 2)
57	RR-503	TRACK CRITICAL SECTIONS (2 OF 2)
58	RR-601	TRACK DETAILS SPECIAL TRACKWORK (1 OF 2)
59	RR-602	TRACK DETAILS SPECIAL TRACKWORK (2 OF 2)
60	RR-603	PERMANENT ACCESS ROAD
61	RR-701	CROSS SECTIONS (1 OF 22)
62	RR-702	CROSS SECTIONS (2 OF 22)
63	RR-703	CROSS SECTIONS (3 OF 22)
64	RR-704	CROSS SECTIONS (4 OF 22)
65	RR-705	CROSS SECTIONS (5 OF 22)
66	RR-706	CROSS SECTIONS (6 OF 22)
67	RR-707	CROSS SECTIONS (7 OF 22)
68	RR-708	CROSS SECTIONS (8 OF 22)
69	RR-709	CROSS SECTIONS (9 OF 22)
70	RR-710	CROSS SECTIONS (10 OF 22)

TRACK (CONTINUED)

71	RR-711	CROSS SECTIONS (11 OF 22)
72	RR-712	CROSS SECTIONS (12 OF 22)
73	RR-713	CROSS SECTIONS (13 OF 22)
74	RR-714	CROSS SECTIONS (14 OF 22)
75	RR-715	CROSS SECTIONS (15 OF 22)
76	RR-716	CROSS SECTIONS (16 OF 22)
77	RR-717	CROSS SECTIONS (17 OF 22)
78	RR-718	CROSS SECTIONS (18 OF 22)
79	RR-719	CROSS SECTIONS (19 OF 22)
80	RR-720	CROSS SECTIONS (20 OF 22)
81	RR-721	CROSS SECTIONS (21 OF 22)
82	RR-722	CROSS SECTIONS (22 OF 22)

STRUCTURES

83	B-001	STRUCTURAL GENERAL NOTES (1 OF 2)
84	B-002	STRUCTURAL GENERAL NOTES (2 OF 2)

WMATA/I-395 UNDERGRADE BRIDGE (TRACKS 3 AND 4)

85	B-301	KEY PLAN AND PROFILE
86	B-302	PLAN AND LONGITUDINAL SECTION
87	B-303	TRANSVERSE SECTION
88	B-304	ABUTMENT A PLAN, ELEVATION, AND SECTION
89	B-305	PIER 1 PLAN, ELEVATION, AND SECTION
90	B-306	PIER 2 PLAN, ELEVATION, AND SECTION
91	B-307	PIER 3 PLAN, ELEVATION, AND SECTION
92	B-308	PIER 4 PLAN, ELEVATION, AND SECTION
93	B-309	ABUTMENT B PLAN, ELEVATION, AND SECTION
94	B-310	FRAMING PLAN (1 OF 2)
95	B-311	FRAMING PLAN (2 OF 2)
96	B-312	APPROACH SLAB DETAILS
97	B-313	UTILITY BRIDGE DETAILS (1 OF 2)
98	B-314	UTILITY BRIDGE DETAILS (2 OF 3)
99	B-315	UTILITY BRIDGE DETAILS (3 OF 3)

OHIO DRIVE SW (EAST) UNDERGRADE BRIDGE

100	B-501	KEY PLAN AND PROFILE
101	B-502	PLAN AND LONGITUDINAL SECTION
102	B-503	TRANSVERSE SECTION
103	B-504	DEMOLITION PLAN (1 OF 2)
104	B-505	DEMOLITION PLAN (2 OF 2)
105	B-506	ABUTMENT A PLAN, ELEVATION, AND SECTION
106	B-507	PIER PLAN, ELEVATION, AND SECTION
107	B-508	ABUTMENT B PLAN, ELEVATION, AND SECTION
108	B-509	FRAMING PLAN
109	B-510	APPROACH SLAB DETAILS
110	B-511	PHASING PLANS (1 OF 3)
111	B-512	PHASING PLANS (2 OF 3)
112	B-513	PHASING PLANS (3 OF 3)

WASHINGTON CHANNEL UNDERGRADE BRIDGE

113	B-601	KEY PLAN AND PROFILE
114	B-602	PLAN AND LONGITUDINAL SECTION
115	B-603	TRANSVERSE SECTIONS
116	B-604	DEMOLITION PLAN (1 OF 3)
117	B-605	DEMOLITION PLAN (2 OF 3)
118	B-606	DEMOLITION PLAN (3 OF 3)
119	B-607	ABUTMENT A PLAN, ELEVATION, AND SECTION
120	B-608	PIER PLAN, ELEVATION, AND SECTION
121	B-609	ABUTMENT B PLAN, ELEVATIONS, AND SECTION
122	B-610	FRAMING PLAN
123	B-611	APROACH SLABS
124	B-612	PHASING PLANS (1 OF 3)
125	B-613	PHASING PLANS (2 OF 3)
126	B-614	PHASING PLANS (3 OF 3)

MAINE AVENUE SW UNDERGRADE BRIDGE

127	B-701	KEY PLAN AND PROFILE
128	B-702	PLAN
129	B-703	LONGITUDINAL SECTION
130	B-704	TRANSVERSE SECTIONS
131	B-705	DEMOLITION PLAN (1 OF 4)
132	B-706	DEMOLITION PLAN (2 OF 4)
133	B-707	DEMOLITION PLAN (3 OF 4)
134	B-708	DEMOLITION PLAN (4 OF 4)
135	B-709	FOUNDATION LAYOUT
136	B-710	ABUTMENT A PLAN, ELEVATION, AND SECTION
137	B-711	ABUTMENT A WINGWALLS
138	B-712	ABUTMENT A DETAILS

MAINE AVENUE SW UNDERGRADE BRIDGE (CONTINUED)

139	B-713	PIER 1 PLAN, ELEVATION, AND SECTION
140	B-714	PIER 2 PLAN, ELEVATION, AND SECTION
141	B-715	PIER DETAILS
142	B-716	ABUTMENT B PLAN, ELEVATION, AND SECTION
143	B-717	ABUTMENT B WINGWALLS
144	B-718	FRAMING PLAN
145	B-719	APPROACH SLABS
146	B-720	PHASING PLANS (1 OF 8)
147	B-721	PHASING PLANS (2 OF 8)
148	B-722	PHASING PLANS (3 OF 8)
149	B-723	PHASING PLANS (4 OF 8)
150	B-724	PHASING PLANS (5 OF 8)
151	B-725	PHASING PLANS (6 OF 8)
152	B-726	PHASING PLANS (7 OF 8)
153	B-727	PHASING PLANS (8 OF 8)

WALLS

154	W-001	RETAINING WALL TYPICAL DETAILS (1 OF 2)
155	W-002	RETAINING WALL TYPICAL DETAILS (2 OF 2)
156	W-003	RETAINING WALLS "C", "M", AND "N" PLAN
157	W-004	RETAINING WALLS "C", "M", AND "N" SECTIONS
158	W-005	RETAINING WALLS "F", "G", AND "T" PLAN AND SECTION (1 OF 2)
159	W-006	RETAINING WALLS "F", "G", AND "T" PLAN AND SECTION (2 OF 2)
160	W-007	RETAINING WALLS "F", "G", AND "T" PHASING PLAN AND SECTIONS (1 OF 2)
161	W-008	RETAINING WALLS "F", "G", AND "T" PHASING PLAN AND SECTIONS (2 OF 2)
162	W-009	RETAINING WALLS "H" AND "I" PLAN AND SECTION
163	W-010	RETAINING WALLS "J" AND "K" PLAN AND SECTION
164	W-011	RETAINING WALL "L" PLAN AND SECTION
165	W-012	CRASHWALLS GENERAL PLAN (1 OF 2)
166	W-013	CRASHWALLS GENERAL PLAN (2 OF 2)
167	W-014	CRASHWALLS PLAN (1 OF 2)
168	W-015	CRASHWALLS PLAN (2 OF 2)
169	W-016	CRASHWALL "A" ELEVATION AND SECTION
170	W-017	CRASHWALL "B" ELEVATION AND SECTION
171	W-018	CRASHWALLS "C", "D", & "E" SECTIONS (1 OF 2)
172	W-019	CRASHWALLS "C", "D", & "E" SECTIONS (2 OF 2)
173	W-020	CRASHWALL "C" ELEVATION (1 OF 3)
174	W-021	CRASHWALL "C" ELEVATION (2 OF 3)
175	W-022	CRASHWALL "C" ELEVATION (3 OF 3)
176	W-023	CRASHWALL "D" ELEVATION
177	W-024	CRASHWALL "E" ELEVATION
178	W-025	CRASHWALL "F" ELEVATION AND SECTION
179	W-026	CRASHWALL "G" ELEVATION AND SECTION

MAINE AVENUE SW PEDESTRIAN BRIDGE

180	D-301	PLAN, PROFILE, AND TRANSVERSE SECTION

ROADWAY

181	R-001	TYPICAL SECTION - PAVEMENT OVERLAY - OHIO DRIVE SW AND NPS PARKING LOT C
182	R-002	TYPICAL SECTION - PAVEMENT OVERLAY - I-395 AND RAMPS
183	R-003	TYPICAL SECTION - 14TH ST OFF RAMP
184	R-004	TYPICAL SECTION - PAVEMENT OVERLAY - MAINE AVENUE AND MAIDEN LANE
185	R-005	GENERAL PLAN - OHIO DRIVE SW (WEST) (1 OF 2)
186	R-006	GENERAL PLAN - OHIO DRIVE SW (WEST) (2 OF 2)
187	R-007	GENERAL PLAN - I-395 (1 OF 3)
188	R-008	GENERAL PLAN - I-395 (2 OF 3)
189	R-009	GENERAL PLAN - I-395 (3 OF 3)
190	R-010	GENERAL PLAN - OHIO DRIVE SW (EAST)
191	R-011	GENERAL PLAN - MAINE AVENUE SW (1 OF 2)
192	R-012	GENERAL PLAN - MAINE AVENUE SW (2 OF 2)
193	R-013	GENERAL PLAN - 14TH STREET OFF RAMP

MAINTENANCE OF TRAFFIC

194	MOT-001	MAINTENANCE OF TRAFFIC NOTES (1 OF 3)
195	MOT-002	MAINTENANCE OF TRAFFIC NOTES (2 OF 3)
196	MOT-003	MAINTENANCE OF TRAFFIC NOTES (3 OF 3)
197	MOT-004	OHIO DRIVE SW (WEST) (1 OF 2)
198	MOT-005	OHIO DRIVE SW (WEST) (2 OF 2)
199	MOT-006	I-395
200	MOT-007	I-395 (1 OF 6)
201	MOT-008	I-395 (2 OF 6)
202	MOT-009	I-395 (3 OF 6)
203	MOT-010	I-395 (4 OF 6)
204	MOT-011	I-395 (5 OF 6)
205	MOT-012	I-395 (6 OF 6)
206	MOT-013	OHIO DRIVE SW (EAST) (1 OF 2)

MAINTENANCE OF TRAFFIC (CONTINUED)

207	MOT-014	OHIO DRIVE SW (EAST) (2 OF 2)
208	MOT-015	MAINE AVE SW TYPICAL CROSS SECTION (1 OF 2)
209	MOT-016	MAINE AVE SW TYPICAL CROSS SECTION (2 OF 2)
210	MOT-017	MAINE AVENUE SW SOUTH ABUTMENT WORKZONE PHASE (1 OF 2)
211	MOT-018	MAINE AVENUE SW SOUTH ABUTMENT WORKZONE PHASE (2 OF 2)
212	MOT-019	MAINE AVENUE SW MEDIAN WORKZONE PHASE (1 OF 2)
213	MOT-020	MAINE AVENUE SW MEDIAN WORKZONE PHASE (2 OF 2)
214	MOT-021	MAIDEN LANE MEDIAN WORKZONE PHASE (1 OF 2)
215	MOT-022	MAIDEN LANE MEDIAN WORKZONE PHASE (2 OF 2)
216	MOT-023	MAINE AVENUE SW NORTH ABUTMENT WORKZONE PHASE (1 OF 2)
217	MOT-024	MAINE AVENUE SW NORTH ABUTMENT WORKZONE PHASE (2 OF 2)
218	MOT-025	WASHINGTON CHANNEL
219	MOT-026	14TH ST RAMP DETOUR

UTILITY RELOCATION PLANS

220	URP-001	UTILITY RELOCATION NOTES/SYMBOLS
221	URP-002	UTILITY RELOCATION TABLES (1 OF 2)
222	URP-003	UTILITY RELOCATION TABLES (2 OF 2)
223	URP-004	UTILITY RELOCATION PLAN (1 OF 8)
224	URP-005	UTILITY RELOCATION PLAN (2 OF 8)
225	URP-006	UTILITY RELOCATION PLAN (3 OF 8)
226	URP-007	UTILITY RELOCATION PLAN (4 OF 8)
227	URP-008	UTILITY RELOCATION PLAN (5 OF 8)
228	URP-009	UTILITY RELOCATION PLAN (6 OF 8)
229	URP-010	UTILITY RELOCATION PLAN (7 OF 8)
230	URP-011	UTILITY RELOCATION PLAN (8 OF 8)

STORMWATER MANAGEMENT CONCEPT PLANS

231	SW-001	STORMWATER MANAGEMENT SUMMARY AND NOTES
232	SW-002	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (1 OF 8)
233	SW-003	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (2 OF 8)
234	SW-004	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (3 OF 8)
235	SW-005	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (4 OF 8)
236	SW-006	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (5 OF 8)
237	SW-007	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (6 OF 8)
238	SW-008	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (7 OF 8)
239	SW-009	STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (8 OF 8)
240	SW-010	STORMWATER MANAGEMENT BMP TYPICAL DETAILS
241	SW-011	STORMWATER COMPUTATION WORKSHEETS (VIRGINIA DEQ)
242	SW-012	STORMWATER COMPUTATION WORKSHEETS (DOEE)

LANDSCAPING

243	LA-001	LANDSCAPE GENERAL NOTES
244	LA-002	TREE PROTECTION DETAILS
245	LA-003	OVERALL LANDSCAPE PLAN
246	LA-100	VEGETATION REMOVAL AND PROTECTION PLAN (1 OF 9)
247	LA-101	VEGETATION REMOVAL AND PROTECTION PLAN (2 OF 9)
248	LA-102	VEGETATION REMOVAL AND PROTECTION PLAN (3 OF 9)
249	LA-103	VEGETATION REMOVAL AND PROTECTION PLAN (4 OF 9)
250	LA-104	VEGETATION REMOVAL AND PROTECTION PLAN (5 OF 9)
251	LA-105	VEGETATION REMOVAL AND PROTECTION PLAN (6 OF 9)
252	LA-106	VEGETATION REMOVAL AND PROTECTION PLAN (7 OF 9)
253	LA-107	VEGETATION REMOVAL AND PROTECTION PLAN (8 OF 9)
254	LA-108	VEGETATION REMOVAL AND PROTECTION PLAN (9 OF 9)
255	LA-200	VEGETATION RESTORATION PLAN (1 OF 9)
256	LA-201	VEGETATION RESTORATION PLAN (2 OF 9)
257	LA-202	VEGETATION RESTORATION PLAN (3 OF 9)
258	LA-203	VEGETATION RESTORATION PLAN (4 OF 9)
259	LA-204	VEGETATION RESTORATION PLAN (5 OF 9)
260	LA-205	VEGETATION RESTORATION PLAN (6 OF 9)
261	LA-206	VEGETATION RESTORATION PLAN (7 OF 9)
262	LA-207	VEGETATION RESTORATION PLAN (8 OF 9)
263	LA-208	VEGETATION RESTORATION PLAN (9 OF 9)
264	LA-300	EXISTING TREE INVENTORY TABLE (1 OF 6)
265	LA-301	EXISTING TREE INVENTORY TABLE (2 OF 6)
266	LA-302	EXISTING TREE INVENTORY TABLE (3 OF 6)
267	LA-303	EXISTING TREE INVENTORY TABLE (4 OF 6)
268	LA-304	EXISTING TREE INVENTORY TABLE (5 OF 6)
269	LA-305	EXISTING TREE INVENTORY TABLE (6 OF 6)
270	LA-306	TREE MITIGATION CALCULATIONS
271	LA-400	TREE PLANTING DETAILS
272	LA-401	PROPOSED PLANTING SCHEDULES

RENDERINGS

273	RE-001	UNDERGRADE BRIDGE RENDERINGS

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: E. LAWES
DRAWN BY: E. LAWES
CHECKED BY: S. WELLER
APPROVED BY: M. COLGAN
DATE: 2/13/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA
Michael Baker INTERNATIONAL
H&H

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

DRAWING INDEX

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. G-002
REV. N/A
SHEET NO. 2 OF 273
SCALE AS SHOWN

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Plotted By: sgeary 2/13/2023
gR02A_G002_North Contract Index.dgn
DRAWING INDEX

DRAFT

GENERAL NOTES

CODES AND STANDARDS

THE WORK OF THIS PROJECT SHALL COMPLY WITH THE FOLLOWING:
2022 AREMA MANUAL FOR RAILWAY ENGINEERING
CSXT DESIGN AND CONSTRUCTION STANDARD SPECIFICATIONS VOL. 1
CSXT MWI 2800 SERIES
2019 DISTRICT DEPARTMENT OF TRANSPORTATION (DDOT) DESIGN AND ENGINEERING MANUAL (DEM)
2020 DDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND STRUCTURES
VDOT MODIFICATIONS TO THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, 2017
2021 VDOT MANUAL OF THE STRUCTURE AND BRIDGE DIVISION, PART 2, DESIGN AIDS AND TYPICAL DETAILS
2020 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION
2009 AASHTO VESSEL COLLISION DESIGN
2015 WMATA ADJACENT CONSTRUCTION PROJECT MANUAL
AASHTO/AWS BRIDGE WELDING CODE D1.5, 8TH EDITION
AASHTO GUIDE SPECIFICATIONS FOR SEISMIC ISOLATION DESIGN, 4TH EDITION
VIRGINIA RAILWAY EXPRESS (VRE) STANDARDS
AMTRAK STANDARDS

THE CONTRACTOR SHALL COMPLY WITH CSXT PUBLIC PROJECTS INFORMATION MANUAL AND WITH ALL VPRA, LOCAL, STATE, AND FEDERAL SAFETY AND ENVIRONMENTAL REGULATIONS.

CONTRACTOR IS REQUIRED TO PROVIDE TRAFFIC CONTROL PLAN, STAGING PLAN, WORK AREA SAFETY AND SECURITY PLAN.

CONTRACTOR TO COORDINATE WITH ALL ADJACENT PROJECTS INCLUDING BUT NOT LIMITED TO ALEXANDRIA FOURTH TRACK AND VRE L'ENFANT PROJECTS.

1. DESCRIPTION
THE LONG BRIDGE PROJECT (THE PROJECT) CONSISTS OF IMPROVEMENTS TO THE LONG BRIDGE AND RELATED RAILROAD INFRASTRUCTURE LOCATED BETWEEN THE ROSSLYN (RO) INTERLOCKING NEAR LONG BRIDGE PARK IN ARLINGTON, VIRGINIA AND THE L'ENFANT (LE) INTERLOCKING NEAR 10TH STREET SW IN WASHINGTON, DC.

THE PROPOSED IMPROVEMENTS ALONG THE CORRIDOR INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
• ADDING TWO NEW TRACKS ADJACENT TO THE EXISTING TWO-TRACK ALIGNMENT;
• ADDING A NEW TWO-TRACK BRIDGE UPSTREAM OF THE EXISTING LONG BRIDGE FOR A FOUR-TRACK CROSSING;
• CORRIDOR-WIDE UPGRADES TO TRACK, SIGNAL, AND INTERLOCKINGS;
• NEW AND REPLACEMENT BRIDGES ALONG THE CORRIDOR TO ACHIEVE FOUR-TRACK CAPACITY;
• NEW RETAINING WALLS ALONG THE CORRIDOR TO MINIMIZE IMPACTS AND FACILITATE PHASING; AND
• NEW PEDESTRIAN/BICYCLEBRIDGE CROSSING OF THE POTOMAC RIVER, GEORGE WASHINGTON MEMORIAL PARKWAY (GWMP), UPSTREAM OF THE NEW TWO-TRACK RAIL BRIDGE

2. OWNER NAME:
VIRGINIA PASSENGER RAIL AUTHORITY (VPRA)
919EAST MAIN STREET, SUITE 2400,
RICHMOND, VA 23219

THESE PLANS ARE INCOMPLETE UNLESS ACCOMPANIED BY THE SUPPLEMENTAL SPECIFICATIONS INCLUDED IN THE CONTRACT DOCUMENTS.

GENERAL

1. WORK ON THIS PROJECT REQUIRES WORKING WITHIN AN EXISTING CSXT RIGHT OF WAY. EVERY EFFORT HAS BEEN MADE TO IDENTIFY DISCREPANCIES AND ENSURE PREPARED BASED ON INFORMATION AVAILABLE. HOWEVER, SINCE THIS IS AN EXISTING R.O.W., THE CONTRACTOR CAN EXPECT AND SHOULD PLAN ON ENCOUNTERING VARIANCES AND DEVIATIONS BETWEEN THE INFORMATION FOUND IN THESE DRAWINGS AND EXISTING SITE CONDITIONS. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS IN CONSTRUCTION DETAILS AND QUANTITIES. DRAWING SCALES THAT ARE SHOWN ON THE PROJECT PLANS ARE TO BE CONSIDERED AS BEING APPROXIMATE AND SHALL NOT BE RELIED UPON FOR PURPOSES OF PREPARING BIDS, ORDERING AND FABRICATING MATERIALS, NOR CALCULATING MEASUREMENT FOR PAYMENT. THE CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY ALL DETAILS INCLUDING GEOMETRY AND ELEVATIONS PRIOR TO THE FABRICATION AND INSTALLATION OF ANY MATERIAL. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, OR AUTHORIZED REPRESENTATIVE, COPIES OF FIELD SURVEYS AND VERIFICATIONS FOR INCLUSION INTO THE CONSTRUCTION RECORDS FOR THE PROJECT.
2. ANY DESIGN REVISIONS LOCATED WITHIN THE CSXT RIGHT-OF-WAY, OR WITH THE POTENTIAL TO IMPACT CSXT FACILITIES OR OPERATIONS ARE SUBJECT TO CSXT REVIEW AND APPROVAL.
3. THE CONTRACTOR SHALL COMPLY WITH ALL RAILROAD (CSXT & VRE), LOCAL, STATE, AND FEDERAL SAFETY AND ENVIRONMENTAL REGULATION.
4. RAILROAD SIGNAL DESIGN AT LE INTERLOCKING IS BEING DEVELOPED BY CSXT AND IS NOT SHOWN AS A PART OF THIS DESIGN PACKAGE. THE CONTRACTOR SHALL COORDINATE WITH CSXT ON SIGNAL DESIGN AND LAYOUT OF PROPOSED SIGNAL INFRASTRUCTURE.
5. CONTRACTOR TO COMPLY WITH ALL NOISE ORDINANCES, IF APPLICABLE.
6. THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, EQUIPMENT, TRANSPORTATION AND SERVICES NECESSARY FOR THE SATISFACTORY COMPLETION OR THE WORK. CONSTRUCTION SHALL CONFORM TO ALL APPLICABLE CODES REGULATIONS, AND THE CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL SCHEDULE ALL ACTIVITIES SUCH THAT RAIL TRAFFIC IS NOT DELAYED OR OTHERWISE IMPACTED DUE TO THE WORK BEING PERFORMED. WEEKEND AND NIGHT WORK SHOULD BE EXPECTED.

GENERAL (CONTINUED)

8. THE CONTRACTOR SHALL SUBMIT A DETAILED PROGRESS SCHEDULE AND SEQUENCING A MINIMUM OF 30 DAYS PRIOR TO THE START OF WORK.
9. THE CONTRACTOR SHALL COORDINATE LOCATION AND SCHEDULE OF STAGING AREAS WITH VPRA. THE CONTRACTOR SHALL NOT BE PERMITTED TO USE THE CSXT RIGHT-OF-WAY EXCEPT AREAS SHOWN ON APPROVED PLANS, FOR THE STORAGE OF MATERIALS OR EQUIPMENT DURING CONSTRUCTION WITHOUT PRIOR APPROVAL OF CSXT. THE CSXT RIGHT-OF-WAY MUST REMAIN CLEAR AT ALL TIMES.
10. THE CONTRACTOR SHALL SUBMIT A DETAILED TRAFFIC CONTROL PLAN (IF REQUIRED) A MINIMUM OF 30 DAYS PRIOR TO THE START OF WORK.
11. ANY WORK INSTALLED IN CONFLICT WITH THE ARCHITECTURAL/ENGINEER DRAWINGS SHALL BE CORRECTED BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE AND AT NO ADDITIONAL EXPENSE TO THE OWNER OR ARCHITECT/ENGINEER.
12. REPAIRS TO UTILITIES OR PROPERTY DAMAGE AS A RESULT OF CONTRACTOR'S NEGLIGENCE OR METHOD OF OPERATION SHALL BE MADE AT THE CONTRACTOR'S EXPENSE BEFORE PROCEEDING WITH CONSTRUCTION.
13. THE CONTRACTOR SHALL BE RESPONSIBLE TO RESET ANY SIGN POSTS OR OTHER APPURTENANCES REMOVED DURING THE CONSTRUCTION TO FACILITATE HIS WORK, EXCEPT WHERE SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
14. SPECIAL NOTICE TO CONTRACTORS: ALL CONTRACTORS PERFORMING WORK ON THE PREMISES SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING AND SUPERVISING A REASONABLE AND PRUDENT SAFETY PROGRAM INCLUDING BUT NOT LIMITED TO THE ISOLATION OF WORK AREAS AND THE PROMPT REMOVAL OF ANY DEBRIS OR TOOLS WHICH MIGHT ENDANGER THE GENERAL PUBLIC, VISITORS AND STAFF OF THE OWNER.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED BY GOVERNING JURISDICTIONS.
16. THE CONTRACTOR SHALL SUBMIT A DETAILED TRAFFIC CONTROL PLAN (WHERE REQUIRED) A MINIMUM OF 30 DAYS PRIOR TO THE START OF THE WORK.
17. PROPOSED TRACKS IN THE AREA UNDERNEATH MARYLAND AVENUE EXTENDING RAILROAD NORTH TO THE L'ENFANT INTERLOCKING SHALL HAVE A MINIMUM OF 14-FT TRACK CENTERS AND 7.5-FT LATERAL CLEARANCE (CONSIDERED SUBSTANDARD LATERAL CLEARANCE). ALL OTHER LOCATIONS SHALL MAINTAIN A MINIMUM LATERAL CLEARANCE AND SPACING PER CSXT STANDARD, INCLUDING A MINIMUM OF 15-FT TRACK CENTERS.
18. THERE ARE A NUMBER OF SAFETY-RELATED ITEMS THAT WILL BE FURTHER DEVELOPED AND INCLUDED IN FUTURE SUBMISSIONS IN THE VICINITY OF THE SUBSTANDARD LATERAL CLEARANCE LOCATION, INCLUDING BUT NOT LIMITED TO:
    A. FRICTION MODIFIERS AND GAUGE-FACE LUBRICATION WILL BE INSTALLED ON ALL TRACKS APPROACHING THE SUBSTANDARD LATERAL CLEARANCE AREA TO MITIGATE RAIL WEAR, NOISE, AND VIBRATION.
    B. AUTOMATIC RAILROAD CLEARANCE DETECTORS WILL BE INSTALLED IN ADVANCE OF THE SUBSTANDARD LATERAL CLEARANCE AREA.
    C. LIGHTED AND PROMINENT SIGNS WILL BE INSTALLED INDICATING THE REDUCED LATERAL CLEARANCE AT THE APPROACHES.
    D. ADDITIONAL SAFETY AND SECURITY LIGHTING WILL BE INSTALLED INSIDE ALL OPENINGS UNDER MARYLAND AVENUE AND ANY OTHER STRUCTURES WHERE THERE IS SUBSTANDARD LATERAL CLEARANCES.
    E. ENHANCED SECURITY FENCING WILL BE INSTALLED ALONG THE TRACK.
    F. THE EXISTING MARYLAND AVENUE OVERBUILD WILL BE ANALYZED, VERIFIED, AND CERTIFIED THAT IT MEETS THE CRASH WORTHINESS BASED ON CRITERIA SET-FORTH FROM THE MOST STRINGENT REQUIREMENTS OF DDOT, CSXT, AREMA, AND FHWA SPECIFICATIONS.

RAILROAD (CSXT & VPRA) COORDINATION

1. TEMPORARY CONSTRUCTION CLEARANCES TO BE USED SHALL BE AS SPECIFIED BY THE RAILROAD'S DIVISION MANAGER. CLEARANCES WILL BE COORDINATED THROUGH CSXT CHIEF ENGINEER OR HIS REPRESENTATIVE.
2. THE CONTRACTOR SHALL COORDINATE WITH CSXT & VRE AND OBTAIN APPROVALS PRIOR TO PERFORMING ANY WORK ON OR NEAR THE TRACKS OR CSXT RIGHT-OF-WAY.
3. THE CONTRACTOR WILL BE REQUIRED TO ACQUIRE A RIGHT OF ENTRY AGREEMENT WITH CSXT & VPRA PRIOR TO WORKING ON THEIR RIGHT OF WAY. CSXT MAY TAKE UP TO 60 DAYS TO ISSUE.
4. THE CONTRACTOR MUST COORDINATE CONSTRUCTION ACTIVITIES WITH CSXT & VPRA. FLAGGING SERVICES MAY TAKE UP TO 45 DAYS TO OBTAIN. FLAGMEN ARE PROVIDED BASED ON AVAILABILITY. THERE ARE NO GUARANTEES THAT A FLAGMAN WILL BE PROVIDED IN THE TIME LISTED.
5. RAILROAD TRAFFIC SHALL BE MAINTAINED AND PROTECTED AT ALL TIMES AND THE CONTRACTOR SHALL AT NO TIME DURING CONSTRUCTION OF THIS PROJECT DELAY OR INTERFERE WITH THE SAFE OPERATION OF TRAIN TRAFFIC. ALL METHODS OF HANDLING THE WORK AFFECTING THE DELAY AND SAFETY OF TRAIN TRAFFIC SHALL BE APPROVED BY THE RAILROAD PRIOR TO PROCEEDING WITH THAT PART OF THE WORK.
6. THE CONTRACTOR SHALL MAINTAIN CONTACT WITH THE CSXT FLAGMAN AND FOLLOW HIS INSTRUCTIONS AT ALL TIMES.
7. THE CONTRACTOR WILL SCHEDULE AND COORDINATE ALL FLAGMAN SERVICES WITH CXST.
8. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING EXISTING UTILITIES AND RAILROAD SIGNALS AND FOR MAINTAINING THE UTILITIES AND RAILROAD SIGNALS THROUGHOUT THE DURATION OF THE PROJECT, UNLESS NOTED OTHERWISE. CSXT WILL MARK EXISTING CSXT FACILITIES. CONTRACTOR SHALL COORDINATE WITH CSXT TO HAVE THEIR FACILITIES MARKED IN THE FIELD, PRIOR TO PERFORMING WORK WITH THE POTENTIAL TO IMPACT BELOW-GRADE FACILITIES.
9. THE CONTRACTOR SHALL CONTACT "MISS UTILITY" AT 1-800-552-7001 FOR MARKING THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES (I.E. WATER, SEWER, GAS TELEPHONE, ELECTRIC, AND CABLE TV) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION OR CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO IDENTIFY AND PROTECT ALL OTHER UTILITY LINES FOUND IN THE WORK SITE AREA BELONGING TO OTHER OWNER THAT ARE NOT MEMBERS OF "MISS UTILITY". PLEASE NOTE THAT CSXT'S COMMUNICATIONS AND SIGNALS FACILITIES ARE NOT SUBJECT TO "MISS UTILITY."
10. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING RAILROAD FACILITIES FROM DEBRIS DURING CONSTRUCTION.
11. THE CONTRACTOR MUST PLAN AND PERFORM THE WORK IN A MANNER SUCH THAT THE CSXT TRACKS AT THE PROJECT LOCATION REMAIN FULLY CAPABLE OF CARRYING RAIL TRAFFIC THROUGHOUT THE WORK PERIOD.
12. CONTRACTOR SHALL NOT IMPEDE CSXT ACCESS ALONG ITS TRACK AND RIGHT-OF-WAY.
13. THE CONTRACTOR SHALL NOT REMOVE ANY EXISTING CSXT OWNED MATERIAL (INCLUDING, BUT NOT LIMITED TO, SOIL, STONE, COMMUNICATIONS AND SIGNAL DEVICE COMPONENTS, AND DRAINAGE FACILITIES) FROM CSXT RIGHT-OF-WAY WITHOUT PRIOR AUTHORIZATION FROM CSXT. IN THE EVENT THAT SUCH MATERIAL CANNOT BE RELOCATED WITHIN CSXT'S RIGHT-OF-WAY IN A MANNER SATISFACTORY TO CSXT, THE MATERIAL SHALL BE PROPERLY TESTED BY CSXT FOR CONTAMINATION AND DISPOSED OF IN ACCORDANCE WITH THE CSX DISPOSAL POLICY (SEE SPECIFICATIONS).

TEMPORARY SHORING NOTES

1. TEMPORARY SHORING WILL BE REQUIRED IF THE EXCAVATION WILL ENCROACH WITHIN THE "THEORETICAL RAILROAD EMBANKMENT LINE".
2. THE CONTRACTOR SHALL SUBMIT DETAILED DRAWINGS AND CALCULATIONS TO CSXT FOR APPROVAL. SHOWING SIZES OF ALL STRUCTURAL MEMBERS, DETAILS OF CONNECTIONS, AND DISTANCES FROM THE CENTERLINE OF TRACK TO FACE OF SHORING. DRAWING SHALL INCLUDE A SECTION SHOWING HEIGHT OF SHORING AND TRACK ELEVATION IN RELATION TO BOTTOM OF EXCAVATION THE DRAWING AND CALCULATIONS SHALL BE PREPARED BY A LICENSED PROFESSIONAL ENGINEER IN THE DISTRICT OF COLUMBIA AND SHALL BEAR HIS SEAL AND SIGNATURE.
3. PREFERRED PROTECTION IS THE COFFERDAM TYPE THAT COMPLETELY ENCLOSES THE EXCAVATION, WHERE DICTATED BY CONDITIONS, PARTIAL COFFERDAMS WITH OPEN SIDES AWAY FROM THE TRACK MAY BE USED. COFFERDAMS SHALL BE CONSTRUCTED USING STEEL SHEET PILING OR STEEL SOLDIER PILES WITH TIMBER LAGGING. WALES AND STRUTS SHALL BE PROVIDED AS NEEDED. MANUFACTURED PRODUCTS (I.E. TRENCH BOXES) WILL NOT BE ALLOWED.
4. SHORING SHALL BE DESIGNED TO RESIST A VERTICAL LIVE LOAD SURCHARGE PER AREMA GUIDELINES IN ADDITION TO ACTIVE EARTH PRESSURE.
5. ALLOWABLE STRESSES IN MATERIALS SHALL BE IN ACCORDANCE WITH AREMA MANUAL FOR RAILWAY ENGINEERING, CHAPTERS 7, 8 AND 15.
6. A CONSTRUCTION PROCEDURE FOR TEMPORARY SHORING SHALL BE SHOWN ON THE DRAWING.
7. SAFETY RAILING SHALL BE INSTALLED WHEN TEMPORARY SHORING IS WITHIN 15'-0" OF THE CENTERLINE OF TRACK.
8. A MINIMUM DISTANCE OF 10 FEET FROM THE CENTERLINE OF THE TRACK TO THE FACE OF THE NEAREST POINT OF SHORING SHALL BE MAINTAINED.
9. FOR SHEETING AND SHORING WITHIN 18'-0" OF THE CENTERLINE OF THE TRACK, THE LIVE LOAD INFLUENCE ZONE, AND IN SLOPES, THE CONTRACTOR SHALL USE SHEET PILE. NO SHEET PILE IN SLOPES OR WITHIN 18'-0" OF THE CENTERLINE OF TRACK SHALL BE REMOVED SHEET PILES SHALL BE CUT OFF 3'-0" BELOW FINISHED GROUND LINE THE REMAINING 3'-0" SHALL BE BACKFILLED AND COMPACTED IMMEDIATELY AFTER CUT OFF.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: E. LAWES
DRAWN BY: E. LAWES
CHECKED BY: S. WELLER
APPROVED BY: M. COLGAN
DATE: 2/13/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA
Michael Baker INTERNATIONAL
H&H

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

GENERAL NOTES

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. G-003
REV. N/A
SHEET NO. 3 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
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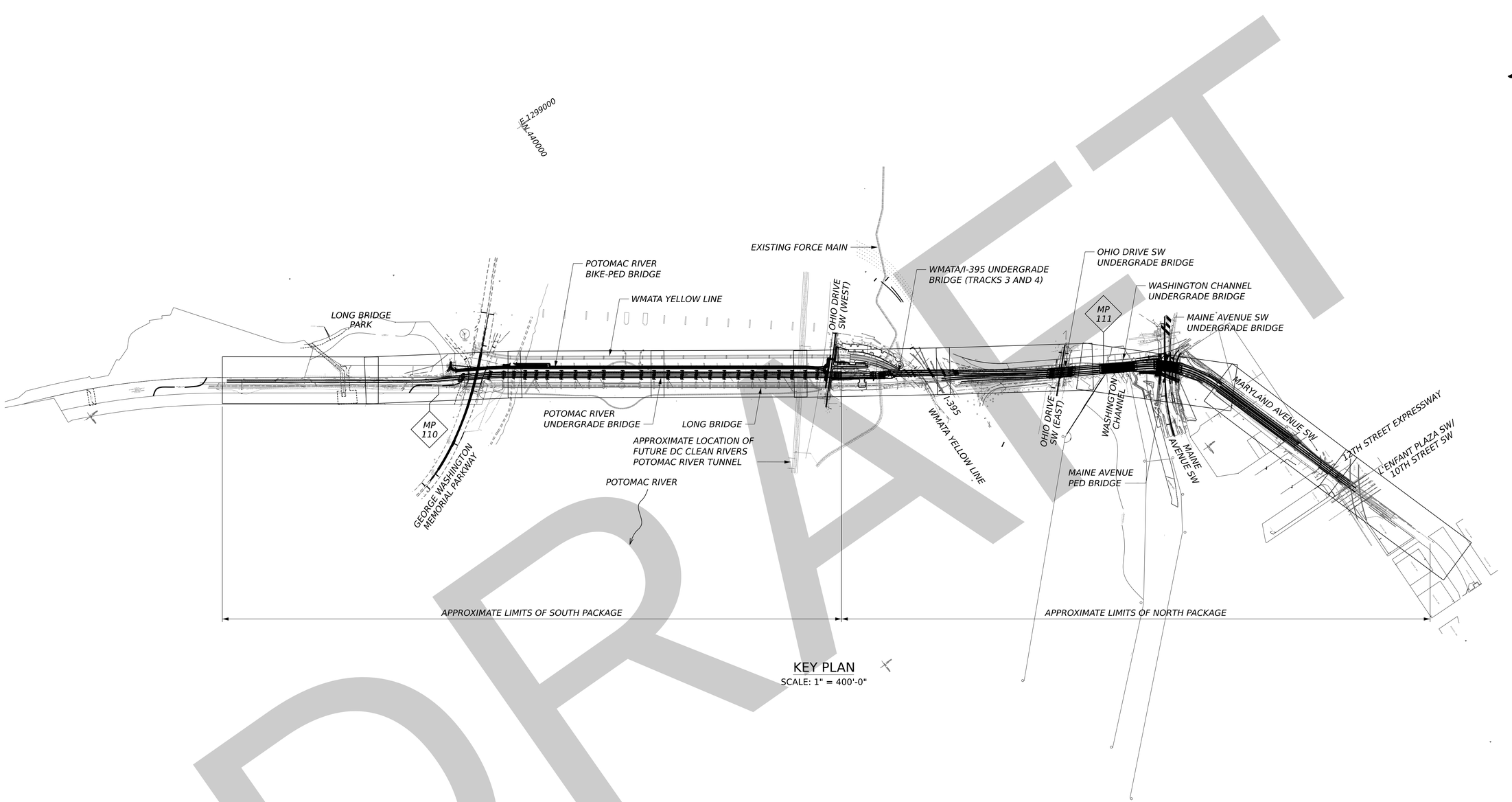
Plotted By: sgeary 2/13/2023
gR02A_G003_notes North.dgn
DRAWING INDEX



KEY PLAN
SCALE: 1" = 400'-0"

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

KEY PLAN

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: G-004
REV.: N/A
SHEET NO.: 4 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: sgeary 2/13/2023
gR02A_G004_keymap North.dgn
KEY PLAN

SITE DEMOLITION NOTES

1. *EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS WERE DIGITIZED FROM AVAILABLE RECORD INFORMATION AND VISIBLE SURFACE FEATURES TO A SUBSTANTIAL EXTENT (QUALITY LEVEL D AND QUALITY LEVEL C). SUBSURFACE UTILITY ENGINEERING (SUE) SOUNDINGS/DESIGNATIONS (QUALITY LEVEL B) INVESTIGATIONS WERE ALSO UNDERTAKEN AND THAT INFORMATION HAS BEEN INCORPORATED INTO THE BASE PLANS.*
2. *OTHER UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THESE PLANS BECAUSE OF THE LACK OF AVAILABLE RECORD DRAWING INFORMATION.*
3. *THE LOCATION OF EXISTING BELOW GRADE WMATA TUNNELS AND FACILITIES WERE TAKEN FROM AVAILABLE RECORDS INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE. APPROXIMATELY 200 FT FROM THE PORTAL FOR WMATA YELLOW LINE TUNNEL IS BASED ON LIDAR DATA.*
4. *THE SHORELINE OF THE POTOMAC RIVER HAS BEEN SHOWN AT THE 1.54-FEET HIGH WATER MARK (NGVD 88) ELEVATION.*
5. *PROPERTY/BOUNDARY LINES SHOWN HEREON ON THESE PLANS WERE TAKEN FROM A CURRENT COMPILATION OF "SURVEY-TO-MARK" RECORDS UNDER REVIEW AND PENDING APPROVAL BY THE OFFICE OF THE SURVEYOR IN THE DISTRICT OF COLUMBIA AND OTHER AVAILABLE PROPERTY RECORDS. SAID LINES ARE TO BE CONSIDERED APPROXIMATE.*
6. *ABANDONED ABUTMENTS SHOWN HEREON FROM PLAN OF THE BALTIMRE AND POTOMAC R.R. AT THE NORTH END OF LONG BRIDGE WASHINGTON DC.*
7. *EXISTING CONTOURS NOT SHOWN FOR PLAN CLARITY.*
8. *SEE VEGETATION REMOVAL AND PROTECTION FOR EXISTING TREE REMOVAL AND PROTECTION LOCATIONS*
9. *ALL WORK SHOWN ON PLANS, EXCEPT AS NOTED TO BE DONE BY OTHERS SHALL BE PERFORMED BY THE CONTRACTOR TO THE SATISFACTION OF VPRA.*
10. *RAILROAD TRAFFIC SHALL BE MAINTAINED AND PROTECTED AT ALL TIMES AND THE CONTRACTOR SHALL AT NO TIME DURING CONSTRUCTION OF THIS PROJECT DELAY OR INTERFERE WITH THE SAFE OPERATION OF TRAIN TRAFFIC. ALL METHODS OF HANDLING THE WORK AFFECTING THE DELAY AND SAFETY OF TRAIN TRAFFIC SHALL BE APPROVED BY THE RAILROAD PRIOR TO PROCEEDING WITH THAT PART OF WORK.*
11. *UNLESS DIRECTED OTHERWISE, CONTRACTOR SHALL COORDINATE THEIR WORK AND DIRECT ALL CORRESPONDENCE TO CSXT OR ITS AUTHORIZED AGENT. DIRECTIVES PROVIDED BY OTHER PARTIES ALTERING THE CONTRACT DOCUMENTS WITHOUT THE CONSENT OF CSXT WILL NOT BE RECOGNIZED FOR REIMBURSEMENT.*
12. *THE CONTRACTOR SHALL COMPLY WITH ALL CSXT, LOCAL, STATE, AND FEDERAL SAFETY AND ENVIRONMENTAL REGULATIONS.*
13. *CONTRACTOR TO COMPLY WITH ALL LOCAL NOISE AND AFTER HOURS PERMIT REQUIREMENT ORDINANCES.*
14. *THE CONTRACTOR SHALL SCHEDULE ALL ACTIVITIES SUCH THAT DISRUPTIONS TO VRE, AMTRAK, AND CSXT OPERATIONS BE MINIMIZED. WEEKEND AND NIGHT WORK SHOULD BE EXPECTED.*
15. *SEE TRACK PLAN AND PROFILE SHEETS FOR LIMITS OF TRACK REMOVAL.*

SITE DEMOLITION LEGEND

ASPHALT AND BASE TO BE REMOVED

ASPHALT MILL AND OVERLAY

SIDEWALK AND BASE TO BE REMOVED

~~XXXXXXXXX~~ *EXISTING TRACK AND TIES TO BE REMOVED*

TREE TO BE REMOVED

TREE TO BE PROTECTED

SITE DEMOLITION LEGEND

Coded Note #	Surface Feature Impact
SD-01	EXISTING ASPHALT CROSSOVER AND BASE TO BE REMOVED
SD-02	EXISTING RAILROAD TRACKS, TIES AND BALLAST TO BE REMOVED
SD-03	EXISTING METAL RAILROAD SHED FOUNDATION, AND ASSOCIATED CONDUIT TO BE REMOVED
SD-04	EXISTING RAILROAD SIGNAL, BASE AND ASSOCIATED CONDUITS TO BE REMOVED
SD-04A	EXISTING RAILROAD SIGNAL, BASE AND ASSOCIATED CONDUITS TO REMAIN AND BE PROTECTED IN PLACE
SD-05	EXISTING RAILROAD SWITCH, BASE AND ASSOCIATED CONDUITS TO BE REMOVED
SD-06	EXISTING TRANSFORMER,BASE AND ASSOCIATED CONDUITS TO BE REMOVED
SD-07	EXISTING UTILITY YARD,FOUNDATION AND ASSOCIATED CONDUITS TO BE REMOVED
SD-08	EXISTING RAILROAD CSXT METAL CABINET TO REMAIN AND BE PROTECTED IN PLACE
SD-09	EXISTING CSXT METAL CABINET TO BE REMOVED
SD-10	EXISTING RETAINING WALL AND FOUNDATION TO REMAIN AND BE PROTECTED IN PLACE
SD-11	EXISTING RETAINING WALL AND FOUNDATION TO BE REMOVED
SD-12	SEE BRIDGE PLANS FOR EXISTING STRUCTURES TO REMAIN AND BE PROTECTED IN PLACE
SD-13	SEE BRIDGE PLANS FOR EXISTING STRUCTURES TO BE REMOVED
SD-13A	ABANDONED ABUTMENTS TO BE REMOVED
SD-14	EXISTING MOUNT VERNON TRAIL AND BASE TO BE REMOVED
SD-15	EXISTING MOUNT VERNON TRAIL TO REMAIN AND BE PROTECTED IN PLACE
SD-16	EXISTING NAVIGABLE CHANNEL TO REMAIN UNOBSTRUCTED DURING CONSTRUCTION
SD-17	EXISTING CURB GUTTER AND BASE TO BE REMOVED
SD-18	EXISTING CURB GUTTER AND BASE TO REMAIN AND BE PROTECTED IN PLACE
SD-19	EXISTING ASPHALT AND BASE TO BE REMOVED
SD-19A	EXISTING ASPHALT AND BASE TO REMAIN AND BE PROTECTED IN PLACE
SD-20	EXISTING SIDEWALK AND BASE TO BE REMOVED
SD-21	EXISTING SIDEWALK AND BASE TO REMAIN AND BE PROTECTED IN PLACE
SD-22	POTOMAC SEA WALL TO REMAIN AND BE PROTECTED IN PLACE
SD-23	EXISTING JERSEY BARRIER TO BE REMOVED
SD-24	EXISTING JERSEY BARRIER TO REMAIN AND BE PROTECTED IN PLACE
SD-25	EXISTING OVERHEAD SIGN STRUCTURE AND BASE TO BE REMOVED
SD-26	NPS NAMA HEADQUARTERS TO REMAIN AND BE PROTECTED IN PLACE
SD-27	ELECTRIC CAR CHARGER, BASE, AND ASSOCIATED CONDUITS TO REMAIN AND BE PROTECTED IN PLACE
SD-28	NPS GAZEBO TO REMAIN AND BE PROTECTED IN PLACE
SD-29	NPS HEAD QUARTERS AIR CONDITIONING UNIT TO REMAIN AND BE PROTECTED IN PLACE
SD-30	NPS FENCING AND POSTS TO REMAIN AND BE PROTECTED IN PLACE
SD-31	NPS FENCING AND BASE TO BE REMOVED
SD-32	DO NOT ANCHOR CABLE CROSSING SIGN TO REMAIN AND BE PROTECTED IN PLACE
SD-33	WASHINGTON CHANNEL SEA WALL TO REMAIN AND BE PROTECTED IN PLACE
SD-34	EXISTING WASHINGTON MARINA SHED TO REMAIN AND BE PROTECTED IN PLACE
SD-35	EXISTING WASHINGTON MARINA FENCE TO REMAIN AND BE PROTECTED IN PLACE
SD-36	EXISTING WASHINGTON MARINA FENCE TO BE REMOVED
SD-37	EXISTING WASHINGTON MARINA DECORATIVE FENCE TO BE REMOVED
SD-38	EXISTING CONCRETE PAD AND BASE TO BE REMOVED
SD-39	EXISTING CURB AND BASE TO BE REMOVED
SD-40	EXISTING PEDESTRIAN BRIDGE, ABUTMENT, PIERS, FOUNDATION, AND IRRIGATION TO BE REMOVED
SD-41	EXISTING STAIR, FOUNDATION, AND ASSOCIATED FIXTURES TO BE REMVOED
SD-42	EXISTING GUARDRAIL TO BE REMOVED
SD-43	EXISTING CHAINLINK FENCE AND BASE TO BE REMOVED
SD-44	EXISTING PARKING METERS TO REMAIN AND BE PROTECTED IN PLACE
SD-45	EXISTING STORMWATER FACILITY AND ASSOCIATED UTILITIES TO BE REMOVED
SD-46	EXISTING ADA RAMP AND BASE TO BE REMOVED
SD-47	EXISTING BURIED TROLLEY TRACKS TO BE REMOVED
SD-48	EXISTING WHEELSTOPS TO BE REMOVED
SD-49	EXISTING RAILROAD EQUIPMENT BASE AND ASSOCIATED CONDUITS TO BE REMOVED
SD-50	EXISTING MARYLAND AVE OVERBUILD PIERS TO REMAIN AND BE PROTECTED IN PLACE
SD-50A	EXISTING 12TH ST OVERBUILD PIERS TO REMAIN AND BE PROTECTED IN PLACE
SD-51	EXISTING CATENARY STRUCTURE TO REMAIN AND BE PROTECTED IN PLACE
SD-52	EXISTING CATENARY STRUCTURE, BASE, FOUNDATION, AND ASSOCIATED CONDUIT TO BE REMOVED
SD-53	EXISTING 12TH ST. EXPRESSWAY PIERS TO REMAIN AND BE PROTECTED IN PLACE
SD-54	EXISTING L'ENFANT PLAZA SW PIERS TO REMAIN AND BE PROTECTED IN PLACE
SD-55	EXISTING MILE MARKER TO BE REMOVED
SD-56	EXISTING SIGNAL BRIDGE AND FOUNDATION TO BE REMOVED

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY A. DOMMEL
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

SITE DEMOLITION NOTES AND LEGEND

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SDM-001
REV. N/A
SHEET NO. 5 OF 273
SCALE AS SHOWN

\VDOT PDF.pltcfg
LBPE_lq_v95.tbl
Plotted By: mbruno
cR02A_sdm-000.dgn
DM-001 (North)
1/26/2023

UTILITY DEMOLITION NOTES

1. *EXISTING UNDERGROUND UTILITIES SHOWN ON THESE PLANS WERE DIGITIZED FROM AVAILABLE RECORD INFORMATION AND VISIBLE SURFACE FEATURES TO A SUBSTANTIAL EXTENT (QUALITY LEVEL D AND QUALITY LEVEL C). SUBSURFACE UTILITY ENGINEERING (SUE) SOUNDINGS/DESIGNATIONS (QUALITY LEVEL B) INVESTIGATIONS WERE ALSO UNDERTAKEN AND THAT INFORMATION HAS BEEN INCORPORATED INTO THE BASE PLANS.*
2. *OTHER UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THESE PLANS BECAUSE OF THE LACK OF AVAILABLE RECORD DRAWING INFORMATION.*
3. *THE LOCATION OF EXISTING BELOW GRADE WMATA TUNNELS AND FACILITIES WERE TAKEN FROM AVAILABLE RECORDS INFORMATION AND SHOULD BE CONSIDERED APPROXIMATE. APPROXIMATELY 200 FT FROM THE PORTAL FOR WMATA YELLOW LINE TUNNEL IS BASED ON LIDAR DATA.*
4. *PROPERTY/BOUNDARY LINES SHOWN HEREON ON THESE PLANS WERE TAKEN FROM A CURRENT COMPILATION OF "SURVEY-TO-MARK" RECORDS UNDER REVIEW AND PENDING APPROVAL BY THE OFFICE OF THE SURVEYOR IN THE DISTRICT OF COLUMBIA AND OTHER AVAILABLE PROPERTY RECORDS. SAID LINES ARE TO BE CONSIDERED APPROXIMATE.*
5. *EXISTING CONTOURS NOT SHOWN FOR PLAN CLARITY.*
6. *SEE VEGETATION REMOVAL AND PROTECTION FOR EXISTING TREE REMOVAL AND PROTECTION LOCATIONS.*
7. *ALL WORK SHOWN ON PLANS, EXCEPT AS NOTED TO BE DONE BY OTHERS SHALL BE PERFORMED BY THE CONTRACTOR TO THE SATISFACTION OF VPRA.*
8. *RAILROAD TRAFFIC SHALL BE MAINTAINED AND PROTECTED AT ALL TIMES AND THE CONTRACTOR SHALL AT NO TIME DURING CONSTRUCTION OF THIS PROJECT DELAY OR INTERFERE WITH THE SAFE OPERATION OF TRAIN TRAFFIC. ALL METHODS OF HANDLING THE WORK AFFECTING THE DELAY AND SAFETY OF TRAIN TRAFFIC SHALL BE APPROVED BY THE RAILROAD PRIOR TO PROCEEDING WITH THAT PART OF WORK.*
9. *UNLESS DIRECTED OTHERWISE, CONTRACTOR SHALL COORDINATE THEIR WORK AND DIRECT ALL CORRESPONDENCE TO CSXT OR ITS AUTHORIZED AGENT. DIRECTIVES PROVIDED BY OTHER PARTIES ALTERING THE CONTRACT DOCUMENTS WITHOUT THE CONSENT OF CSXT WILL NOT BE RECOGNIZED FOR REIMBURSEMENT.*
10. *THE CONTRACTOR SHALL COMPLY WITH ALL CSXT, LOCAL, STATE, AND FEDERAL SAFETY AND ENVIRONMENTAL REGULATIONS.*
11. *CONTRACTOR TO COMPLY WITH ALL LOCAL NOISE AND AFTER HOURS PERMIT REQUIREMENT ORDINANCES.*
12. *THE CONTRACTOR SHALL SCHEDULE ALL ACTIVITIES SUCH THAT DISRUPTIONS TO VRE, AMTRAK, AND CSXT OPERATIONS BE MINIMIZED. WEEKEND AND NIGHT WORK SHOULD BE EXPECTED.*

UTILITY DEMOLITION LEGEND

Coded Note #	Utility Impacts
UD-01	UNKOWN RAILROAD ELECTRIC BOX TO BE REMOVED
UD-02	EXISTING ELECTRIC POLE, BASE AND ASSOCIATED CONDUIT TO BE REMOVED
UD-03	EXISTING ELECTRIC PULL BOX, BASE AND ASSOCIATED CONDUIT TO BE REMOVED
UD-03A	EXISTING ELECTRIC PULL BOX, BASE AND ASSOCIATED CONDUIT TO REMAIN AND BE PROTECTEDED IN PLACE
UD-03B	EXISTING TELEPHONE DUCTBANK TO BE REMOVED
UD-04	EXISTING TELEPHONE DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-04A	EXISTING FIBER-OPTIC LINE TO REMAIN AND BE PROTECTED IN PLACE
UD-04B	EXISTING FIBER-OPTIC LINE TO BE REMOVED
UD-05	EXISTING MOUNTED ELECTRIC PULL BOX, BASE AND ASSOCIATED CONDUITS TO BE REMOVED
UD-06	EXISTING PENTAGON PIPE TO REMAIN AND BE PROTECTED IN PLACE
UD-07	EXISTING LUMEN GOVERNMENT DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-08	EXISTING ELECTRIC DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-08A	EXISTING ELECTRIC DUCTBANK TO BE REMOVED
UD-09	EXISTING CURB INLET TO REMAIN AND BE PROTECTED IN PLACE
UD-10	EXISTING DRAINAGE PIPE TO REMAIN AND BE PROTECTED IN PLACE
UD-11	EXISTING CSXT DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-12	EXISTING ELECTRIC DUCTBANK TO BE REMOVED
UD-13	EXISTING DOMINION ENERGY TO BE REMOVED
UD-14	EXISTING DRAINAGE PIPE TO BE REMOVED
UD-15	EXISTING PEPCO DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-16	EXISTING PEPCO TWIN 69kV DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-17	NOT USED
UD-18	EXISTING NPS STREETLIGHT CIRCUIT TO BE REMOVED
UD-19	EXISTING NPS STREETLIGHT CIRCUIT TO REMAIN AND BE PROTECTED IN PLACE
UD-20	EXISTING VERIZON DUCTBANK TO BE REMOVED
UD-21	EXISTING VERIZON DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-22	EXISTING VERIZON 52 WAY DUCTBANK TO REMAIN AND BE PROTECTED IN PLACE
UD-22A	NOT USED
UD-23	EXISTING FIRE HYDRANT TO REMAIN AND BE PROTECTED IN PLACE
UD-24	EXISTING WATER LINE TO REMAIN AND BE PROTECTED IN PLACE
UD-25	PORTIONS OF EXITING SUBMARINE CABLES TO BE REMOVED DURING FOUNDATION CONSTRUCTION SEE UTILITY RELOCATION PLAN
UD-26	FUTURE DC CLEAN RIVERS POTOMAC RIVER TUNNEL TO BE PROTECTED IN PLACE
UD-27	EXISTING NPS DRAINAGE PIPE TO BE REMOVED
UD-28	EXISTING NPS DRAINAGE PIPE TO REMAIN AND BE PROTECTED IN PLACE
UD-29	EXISTING NPS CURB INLET TO REMAIN AND BE PROTECTED IN PLACE
UD-30	EXISTING NPS CURB INLET TO BE REMOVED
UD-30A	EXISTING NPS YARD INLET TO REMAIN AND BE PROTECTED IN PLACE
UD-31	EXISTING NPS SANITARTY FORCE MAIN TO REMAIN AND BE PROTECTED IN PLACE
UD-32	EXISTING NPS SANITARTY FORCE MAIN TO BE REMOVED
UD-33	EXISTING NPS WATER TO REMAIN AND BE PROTECTED IN PLACE
UD-34	EXISTING NPS WATER TO BE REMOVED
UD-35	EXISTING DC WATER WATER LINE TO REMAIN AND BE PROTECTED IN PLACE
UD-36	EXISTING DC WATER WATER LINE TO BE REMOVED
UD-37	EXISTING DC WATER DRAINAGE PIPE TO REMAIN AND BE PROTECTED IN PLACE
UD-38	EXISTING DC WATER DRAINAGE PIPE TO BE REMOVED
UD-39	EXISTING DC WATER 3' DOGHOUSE PIPING TO REMAIN AND BE PROTECTED IN PLACE
UD-40	EXISTING DC WATER 3' DOGHOUSE PIPING TO BE REMOVED
UD-41	EXSITING DC WATER CURB INLET TO BE REMOVED
UD-42	EXSITING DC WATER YARD INLET TO BE REMOVED
UD-43	EXISTING WMATA DRAINAGE PIPE TO REMAIN AND BE PROTECTED IN PLACE
UD-44	EXISTING DC WATER FORCE MAIN TO REMAIN AND BE PROTECTED IN PLACE
UD-45	EXISTING DC WATER ABANDONED FORCE MAIN TO BE REMOVED
UD-46	PORTIONS OF EXISTING DC WATER FORCE MAIN TO BE REMOVED DURING FOUNDATION CONSTRUCTION
UD-47	EXISTING WMATA DRY WATER MAIN TO BE REMOVED
UD-48	NOT USED
UD-49	EXISTING DDOT STREET LIGHTING, BASE, AND ASSOCIATED CONDUIT TO BE REMOVED
UD-49A	EXISTING DDOT STREET LIGHTING, BASE, AND ASSOCIATED CONDUIT TO REMAIN AND BE PROTECTED IN PLACE
UD-50	EXISTING CSXT DUCTBANK TO BE REMOVED
UD-51	EXISTING WASHINGTON GAS GAS MAIN TO REMAIN AND BE PROTECTED IN PLACE
UD-52	EXISTING WASHINGTON GAS GAS MAIN TO BE REMOVED
UD-53	EXISTING DC WATER SANITARY SEWER MAIN TO REMAIN AND BE PROTECTED IN PLACE
UD-54	EXISTING DC WATER SANITARY SEWER MAIN TO BE REMOVED
UD-55	EXISTING DDOT SIGNAL MANHOLES TO BE REMOVED
UD-56	EXISTING DDOT SIGNAL POLE, BASE, AND ASSOCIATED CONDUIT TO BE REMOVED
UD-57	EXISTING GSA STEAM TUNNEL TO BE REMOVED AND CAPPED
UD-58	EXISTING GENERATOR TANK AND ASSOCIATED UTILITIES TO REMAIN AND BE PROTECTED IN PLACE
UD-59	EXISTING WASHINGTON MARINA LIGHT POLE, BASE, AND ASSOCIATED CONDUIT TO BE REMOVED

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY A. DOMMEL
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY DEMOLITION NOTES AND LEGEND

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. UDM-001
REV. N/A
SHEET NO. 14 OF 273
SCALE AS SHOWN

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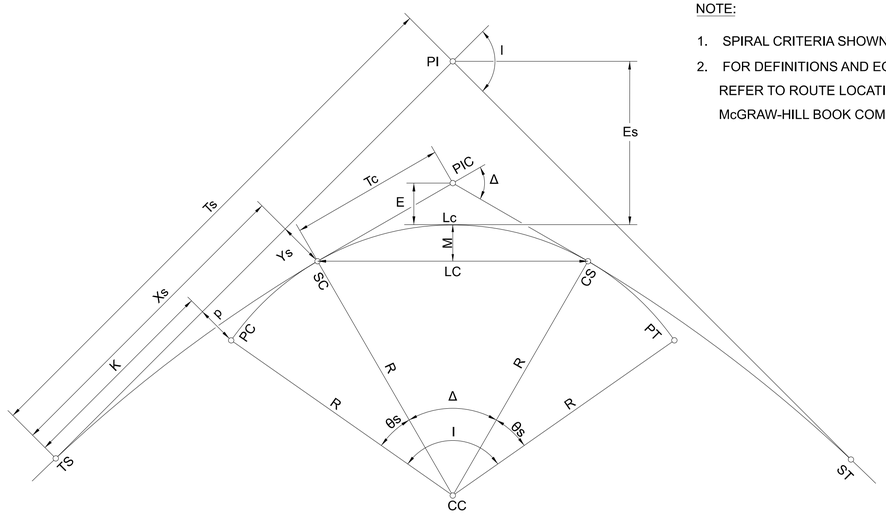
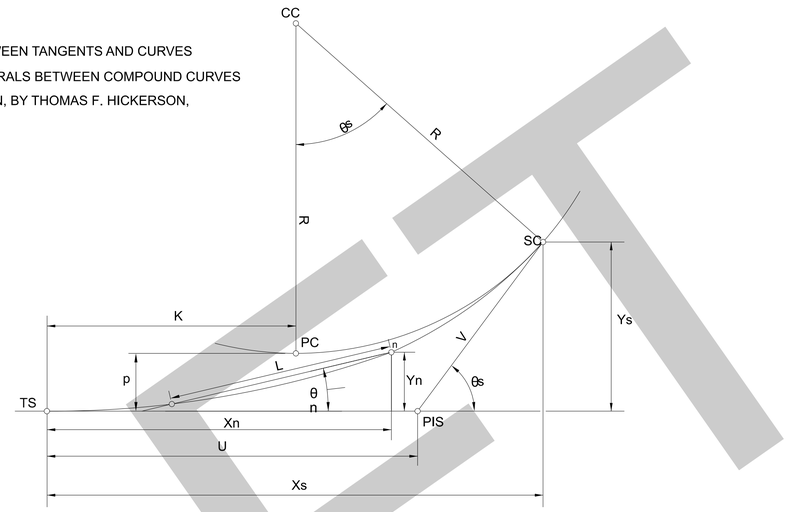
Plotted By: mbruno
1/26/2023
cR02A_udm-000.dgn
DM-001 (North)



NOTE:

1. SPIRAL CRITERIA SHOWN HEREIN IS FOR SPIRALS BETWEEN TANGENTS AND CURVES
2. FOR DEFINITIONS AND EQUATIONS FOR COMBINING SPIRALS BETWEEN COMPOUND CURVES REFER TO ROUTE LOCATION AND DESIGN, FIFTH EDITION, BY THOMAS F. HICKERSON, McGRAW-HILL BOOK COMPANY, 1964.



DEFINITIONS

ALL LENGTHS IN FEET, ALL ANGLES IN DEGREES EXCEPT AS NOTED

MAIN TANGENTS - THOSE LINES TANGENT TO ALIGNMENT AT TS AND ST WHICH INTERSECT AT PI.

CS	CURVE SPIRAL, THE POINT OF CHANGE IN ALIGNMENT FROM CURVE TO SPIRAL.
CC	CENTER OF CIRCULAR CURVE.
Dc	DEGREE OF CURVE DEFINED BY THE 100 FT CHORD DEFINITION.
E	EXTERNAL DISTANCE FROM MIDPOINT OF CIRCULAR CURVE TO PIC.
Es	EXTERNAL DISTANCE FROM CURVE TO PI.
I	ANGLE OF INTERSECTION OF MAIN TANGENTS AT MAIN PI.
K	DISTANCE ALONG MAIN TANGENT FROM TS (OR ST) TO OFFSET PC.
L	THE LENGTH OF EACH EQUAL CHORD.
Lc	LENGTH OF CIRCULAR CURVE BETWEEN SC AND CS MEASURED ALONG 100 FT CHORDS.
LC	CHORD LENGTH OF CIRCULAR CURVE FROM SC TO CS.
Ln	DISTANCE ALONG SPIRAL FROM TS (OR ST) TO POINT n.
Ls	THE LENGTH OF SPIRAL FROM TS TO SC (OR CS TO ST) AS MEASURED ON TEN CONSECUTIVE EQUAL CHORDS.
M	MID-ORDINATE DISTANCE OF CIRCULAR CURVE.
n	A NUMBER BETWEEN 1 AND 10 USED TO IDENTIFY CHORDS.
P	OFFSET FROM MAIN TANGENT TO PC (OR PT).
PC	POINT OF CURVE, THE POINT OF CHANGE IN ALIGNMENT FROM TANGENT TO CIRCULAR CURVE, ON SPIRALED CURVES THIS POINT IS OFFSET A DISTANCE p FROM THE MAIN TANGENT.
PI	POINT OF INTERSECTION OF MAIN TANGENTS.
PIC	POINT OF INTERSECTION OF LINES TANGENT AT SC AND CS.
PIS	POINT OF INTERSECTION OF MAIN TANGENT AND LINE TANGENT AT SC (OR CS).
PT	POINT OF TANGENCY, THE POINT OF CHANGE IN ALIGNMENT FROM CIRCULAR CURVE TO TANGENT, ON SPIRALED CURVES THIS POINT IS OFFSET A DISTANCE p FROM THE MAIN TANGENT.
R	RADIUS OF CIRCULAR CURVE.
SC	SPIRAL CURVE, THE POINT OF CHANGE IN ALIGNMENT FROM SPIRAL TO CURVE.
ST	SPIRAL TANGENT, THE POINT OF CHANGE IN ALIGNMENT FROM SPIRAL TO TANGENT.
Tc	DISTANCE FROM SC OR CS TO PIC IN SPIRALED CURVE OR TANGENT FROM PC OR PT TO PI IN A SIMPLE CURVE.
TS	TANGENT SPIRAL, THE POINT OF CHANGE IN ALIGNMENT FROM TANGENT TO SPIRAL.
Ts	LONG TANGENT, TANGENT DISTANCE FROM TS (OR ST) TO PI (MAIN TANGENTS).
U	LONG TANGENT OF SPIRAL, DISTANCE FROM TS (OR ST) TO PIS.
V	SHORT TANGENT OF SPIRAL, DISTANCE FROM PIS TO CS (OR SC).
Xn	DISTANCE ALONG MAIN TANGENT FROM TS (OR ST) TO OFFSET CHORD POINT n.
Xs	DISTANCE ALONG MAIN TANGENT TO PERPENDICULAR OFFSET FROM CS (OR SC).
Yn	OFFSET FROM MAIN TANGENT TO CHORD POINT n.
Ys	PERPENDICULAR OFFSET FROM MAIN TANGENT TO CS (OR SC).
Δ	(DELTA) ANGLE OF INTERSECTION AT PIC, CENTRAL ANGLE OF CIRCULAR CURVE.
θn	CHORD ANGLE, THE ANGLE BETWEEN THE MAIN TANGENT AND CHORD n.
θs	SPIRAL ANGLE, CENTRAL ANGLE OF SPIRAL.

EQUATIONS

1. $Dc = 2 \text{ ARCSIN } \frac{50}{R}$ $R = \frac{50}{\text{SIN } D/2}$
2. $\theta s = \frac{Ls \cdot Dc}{200}$
3. $L = \frac{Ls}{10}$
4. $\theta n = \frac{3n^2-3n+1}{300} \theta s$ n=1, ... 10
5. $Xn = L \sum_{n=1}^{N} \text{COS } \theta n$ n=1, ... 10
6. $Yn = L \sum_{n=1}^{N} \text{SIN } \theta n$ n=1, ... 10
7. $Xs = X_{10}$
8. $Ys = Y_{10}$
9. $P = Y_s - R(1 - \text{COS } \theta s)$
10. $K = X_s - R \text{ SIN } \theta s$
11. $U = X_s - \frac{Ys}{\text{TAN } \theta s}$
12. $V = \frac{Ys}{\text{SIN } \theta s}$
13. $\Delta = I - 2\theta s$ (WHEN BOTH SPIRALS ARE OF EQUAL LENGTH)
14. $T = R \text{ TAN } \frac{\Delta}{2}$
15. $Lc = 100 \frac{\Delta}{Dc}$
16. $E = R \{ \frac{1}{\text{COS } \Delta/2} - 1 \}$
17. $LC = 2R \text{ SIN } \frac{\Delta}{2}$
18. $M = R \{1\text{-COS } \frac{\Delta}{2}\}$
19. $Ts = K + (R+P) \text{ TAN } \frac{I}{2}$ (WHEN BOTH SPIRALS ARE OF EQUAL LENGTH)
20. $Es = \frac{Ts-K}{\text{SIN } I/2} - R$ (WHEN BOTH SPIRALS ARE OF EQUAL LENGTH)

RAILROAD TRACK / SIGNAL ABBREVIATIONS

CS	CURVE TO SPIRAL
CWR	CONTINUOUSLY WELDED RAIL
Dc	DEGREE OF CURVATURE (CHORD DEFINED)
E	EQUILIBRIUM or Ea + Eu
Ea	ACTUAL SUPERELEVATION
Eu	UNBALANCED SUPERELEVATION
EQ.	EQUAL OR EQUILATERAL
GA.	GAUGE
LVC	LENGTH OF VERTICAL CURVE
LLT	LAST LONG TIE
PC	TANGENT TO CURVE
PINC	POINT OF INTERSECTION NO CURVE
PITO	POINT OF INTERSECTION TURNOUT
POB	POINT OF BEGINNING
POT	POINT OF TANGENT
PS	POINT OF SWITCH
PT	CURVE TO TANGENT
PVC	POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENT
r	RATE OF CHANGE
R	RADIUS
RE	AREMA
SC	SPIRAL TO CURVE
ST	SPIRAL TO TANGENT
STA	STATION
T/O.	TURNOUT
TRK	TRACK
TS	TANGENT TO SPIRAL
T/R	TOP OF RAIL

RAILROAD TRACK / SIGNAL SYMBOLS

EXISTING	PROPOSED	
	———	RAILROAD TRACK CENTERLINE
	(C#)	TRACK HORIZONTAL CURVE NAMING

DRAFT

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LBPE_st_v95.tbl
Plotted By: GBoles 2/8/2023
rrR02A_RR-001_CurveDefinition_north.dgn

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY G. BOLES
DRAWN BY I. NOVAES
CHECKED BY S. KULLEN
APPROVED BY G. BOLES
DATE 2/8/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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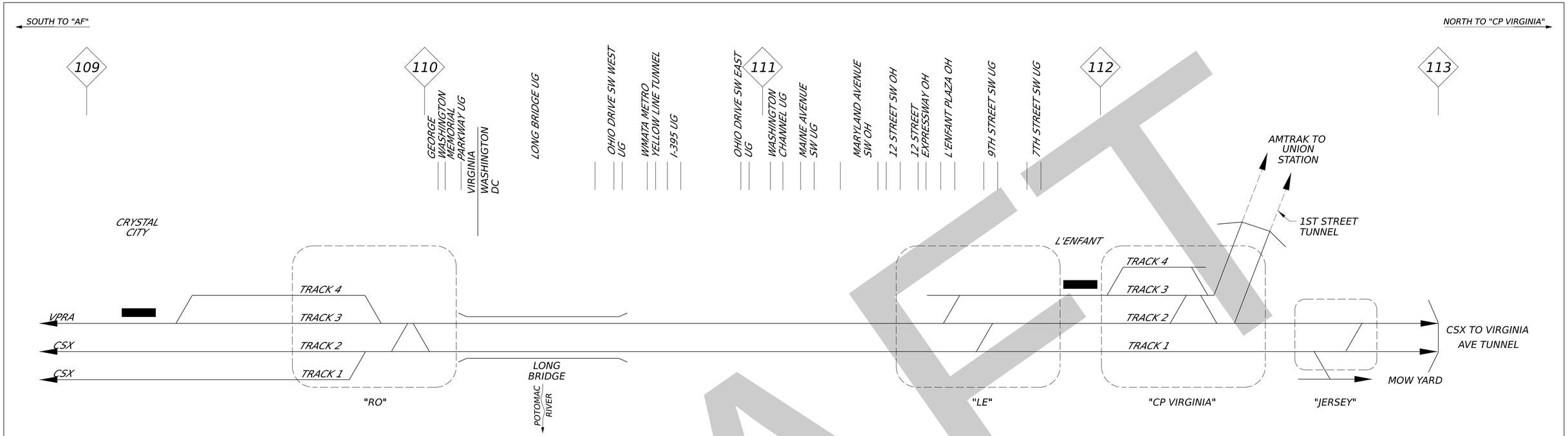
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

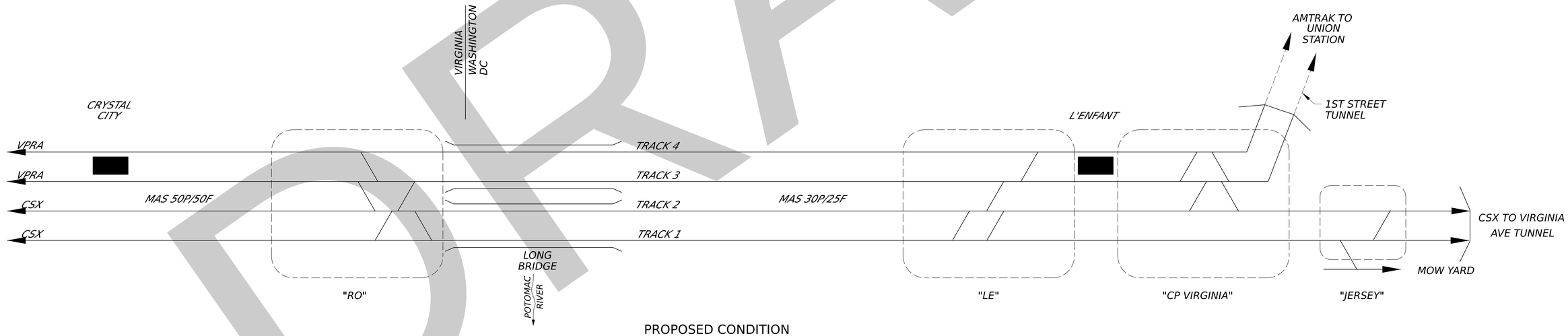
TRACK DEFINITIONS, EQUATIONS, ABBREVIATIONS, AND SYMBOLS

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-001
REV. N/A
SHEET NO. 23 OF 273
SCALE AS SHOWN



EXISTING CONDITION

NOT TO SCALE



PROPOSED CONDITION

NOT TO SCALE

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: I. NOVAES
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/8/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK SCHEMATICS

PROJECT NO.: VPRA R02A / CSXT XXXX
DRAWING NO.: RR-006
REV.: N/A
SHEET NO.: 28 OF 273
SCALE: AS SHOWN

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Plotted By: GBoles
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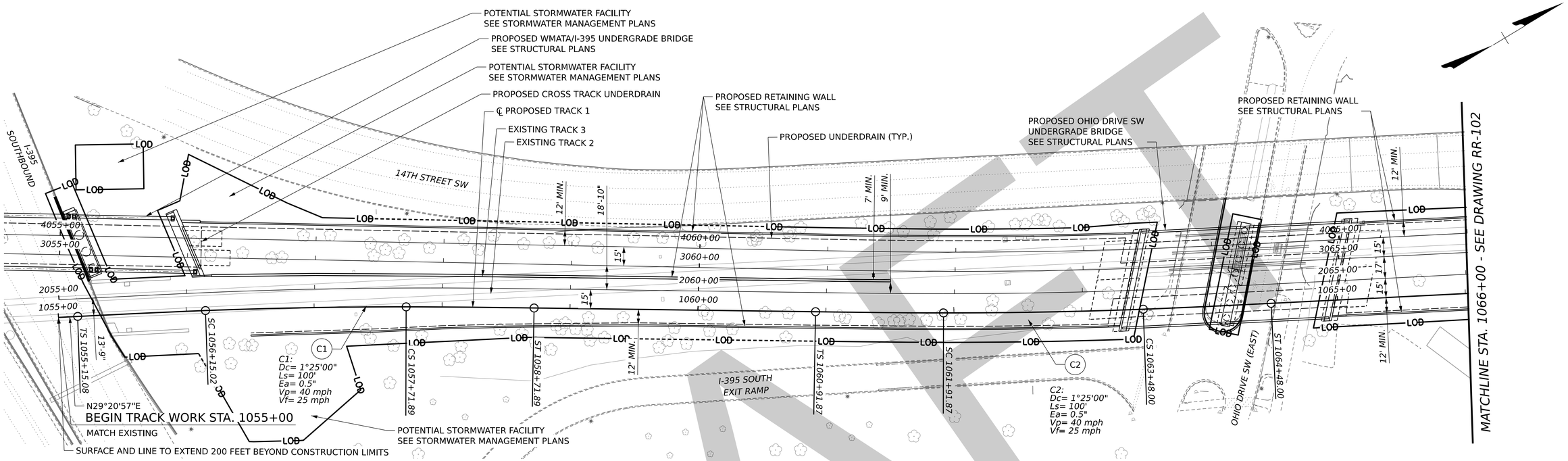
2/8/2023

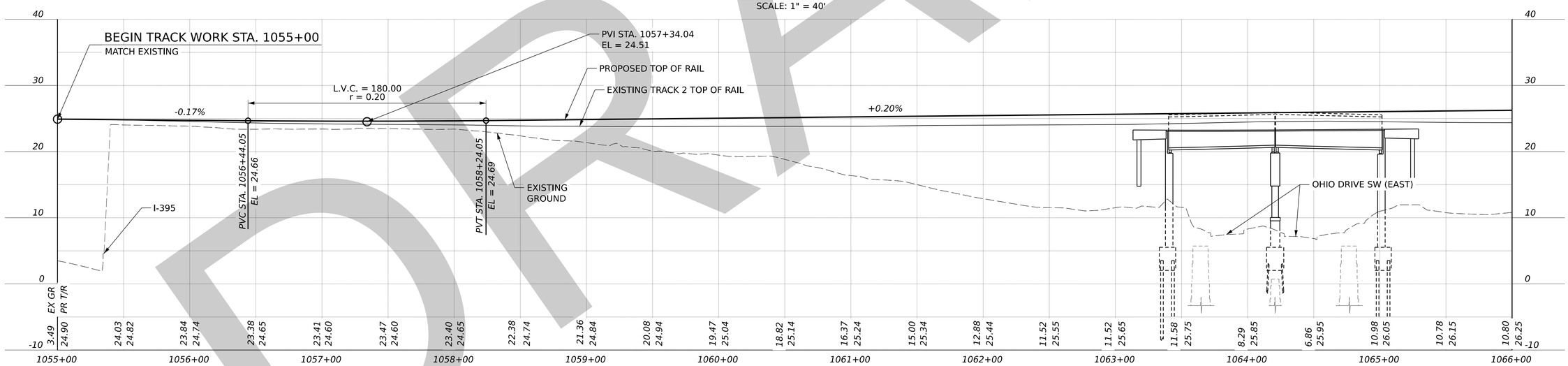
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 1

SCALE: 1" = 40'



PROFILE - TRACK 1

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	G. BOLES
DRAWN BY	I. NOVAES
CHECKED BY	S. KULLEN
APPROVED BY	G. BOLES
DATE	2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 1
PLAN AND PROFILE (1 OF 4)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-101
REV.	N/A
SHEET NO.	29 OF 273
SCALE	AS SHOWN

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Plotted By: cswann 2/9/2023
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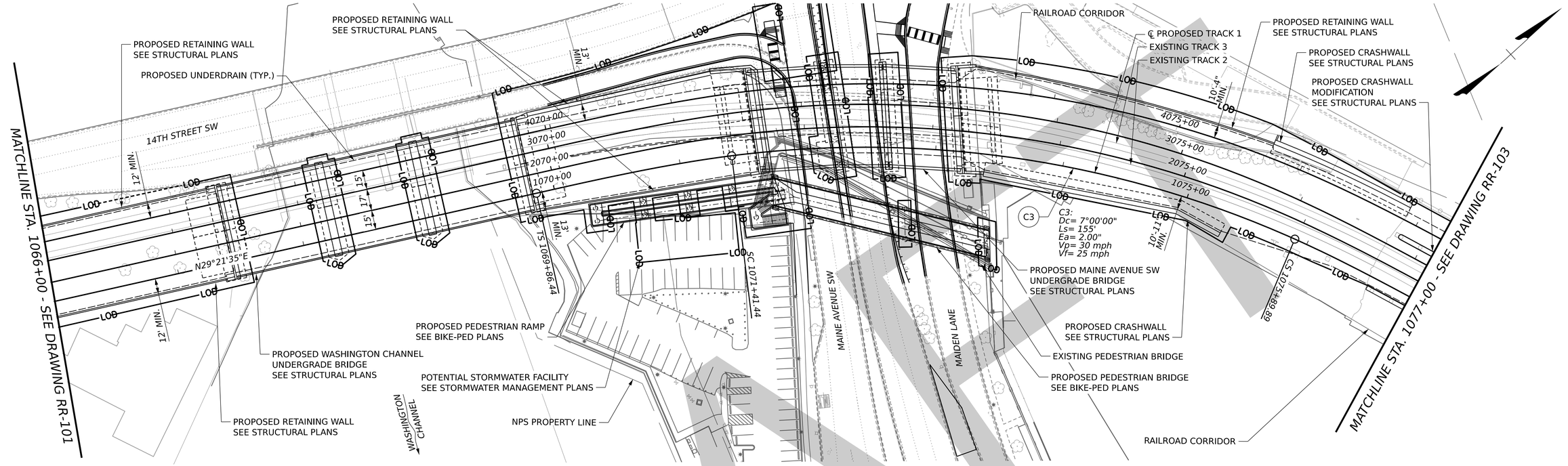
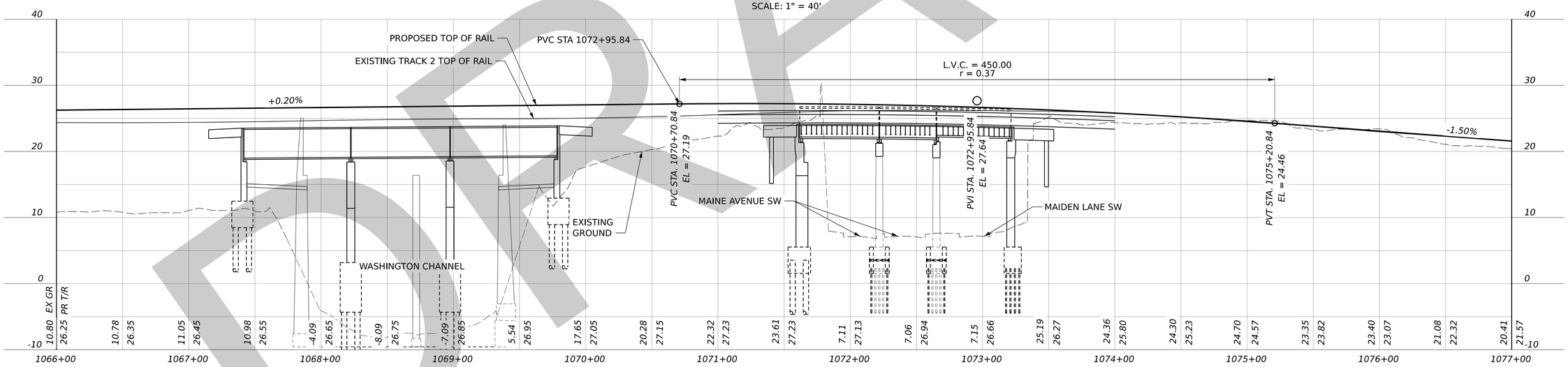
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 1

SCALE: 1" = 40'



PROFILE - TRACK 1

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	G. BOLES
DRAWN BY	I. NOVAES
CHECKED BY	S. KULLEN
APPROVED BY	G. BOLES
DATE	2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 1
PLAN AND PROFILE (2 OF 4)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-102
REV.	N/A
SHEET NO.	30 OF 273
SCALE	AS SHOWN

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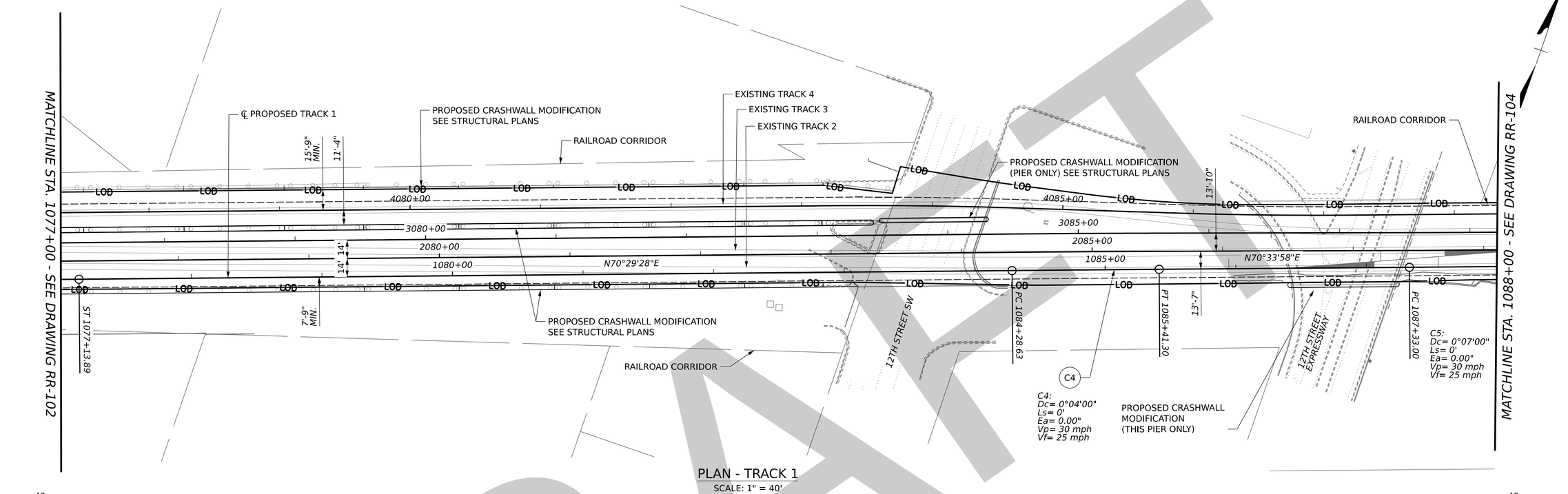
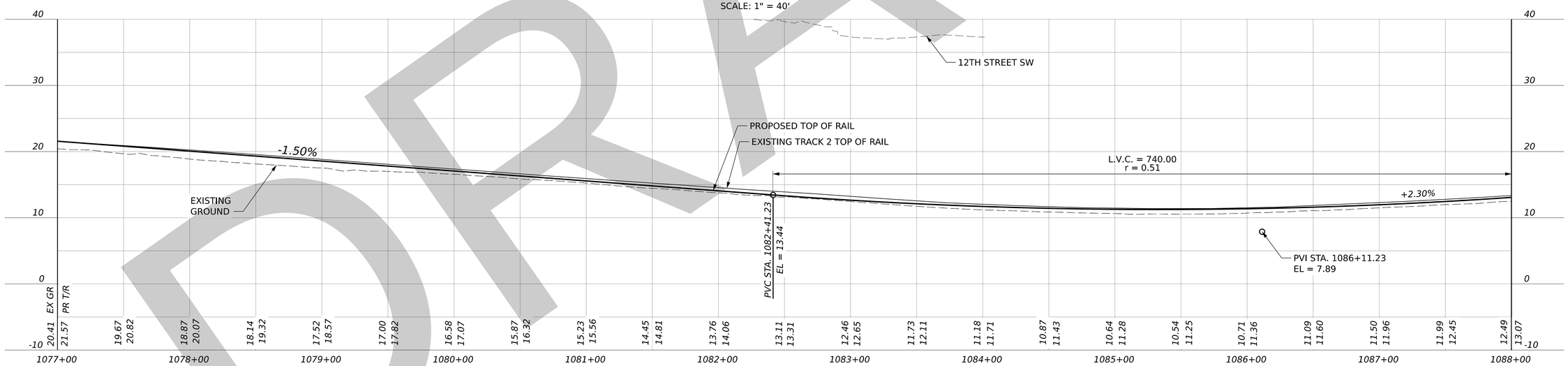
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 1

SCALE: 1" = 40'



PROFILE - TRACK 1

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: I. NOVAES
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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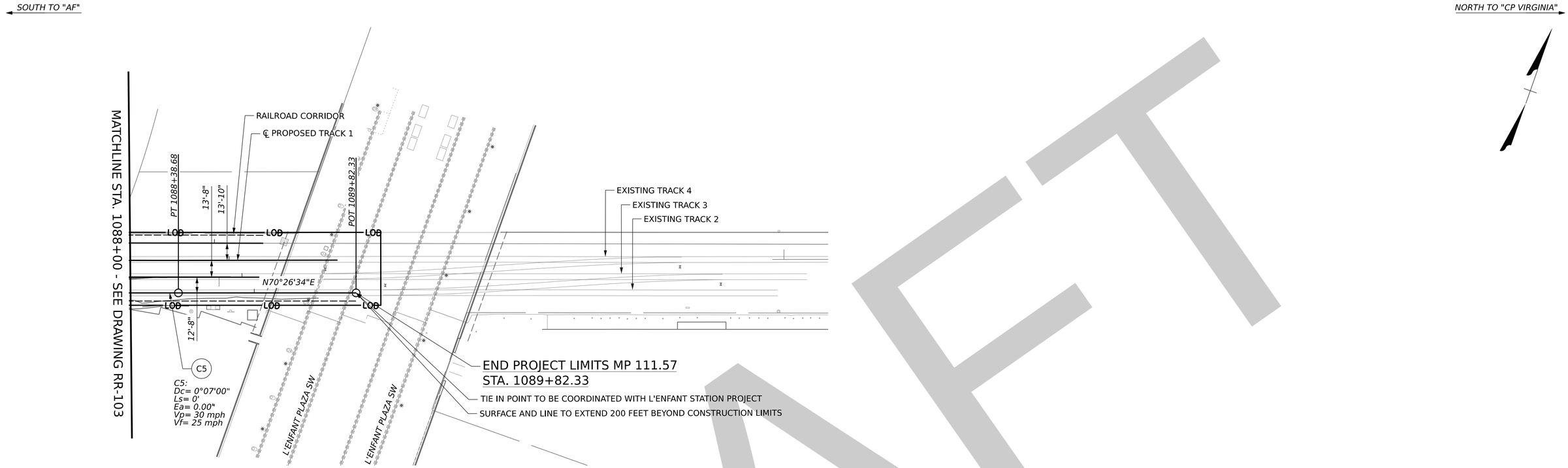
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

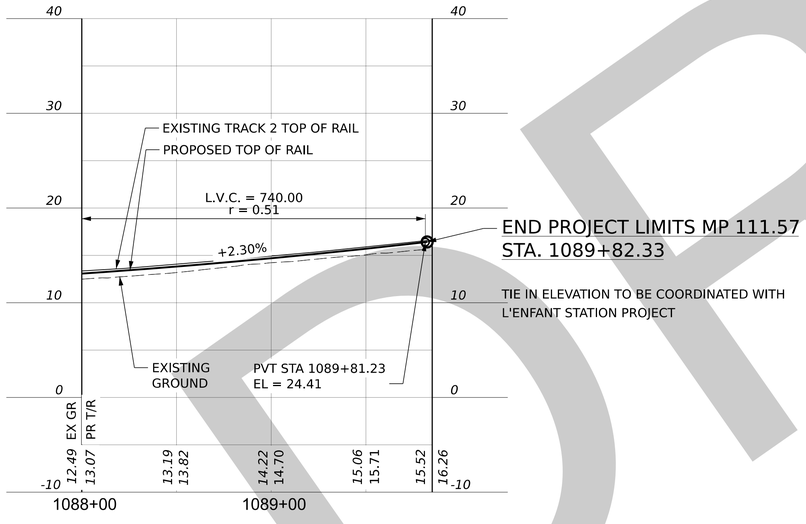
TRACK 1
PLAN AND PROFILE (3 OF 273)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-103
REV. N/A
SHEET NO. 31 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_PPsheets1.dgn
Track 1 Plans - TK-103-4 [Sheet]



PLAN - TRACK 1
SCALE: 1" = 40'



PROFILE - TRACK 1
SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY G. BOLES
DRAWN BY I. NOVAES
CHECKED BY S. KULLEN
APPROVED BY G. BOLES
DATE 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

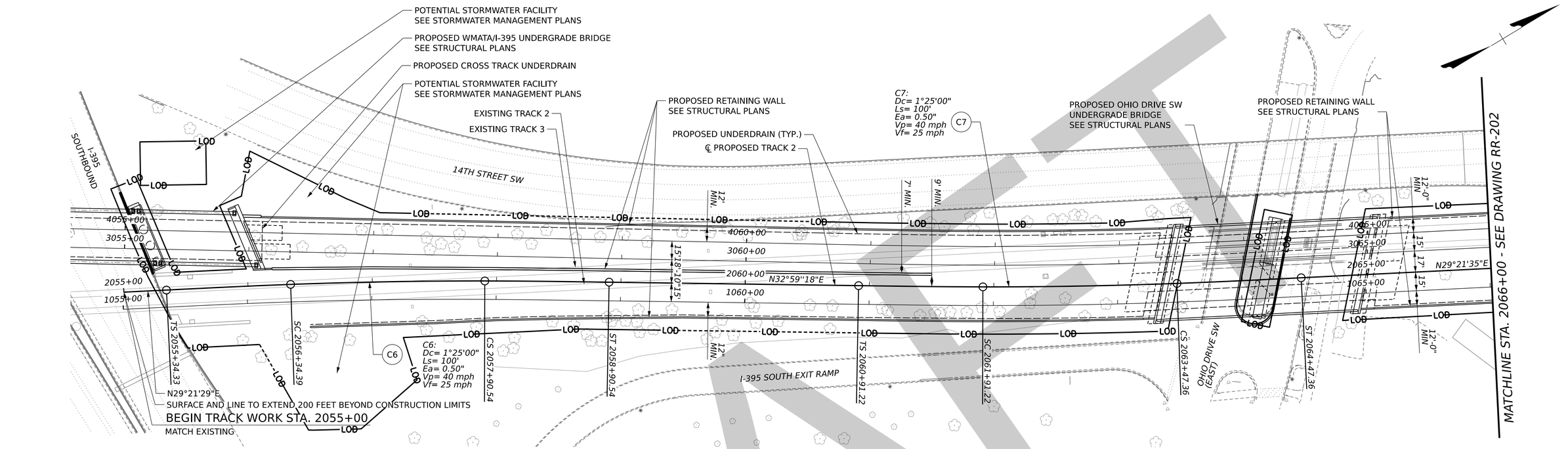
SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 1
PLAN AND PROFILE (4 OF 4)

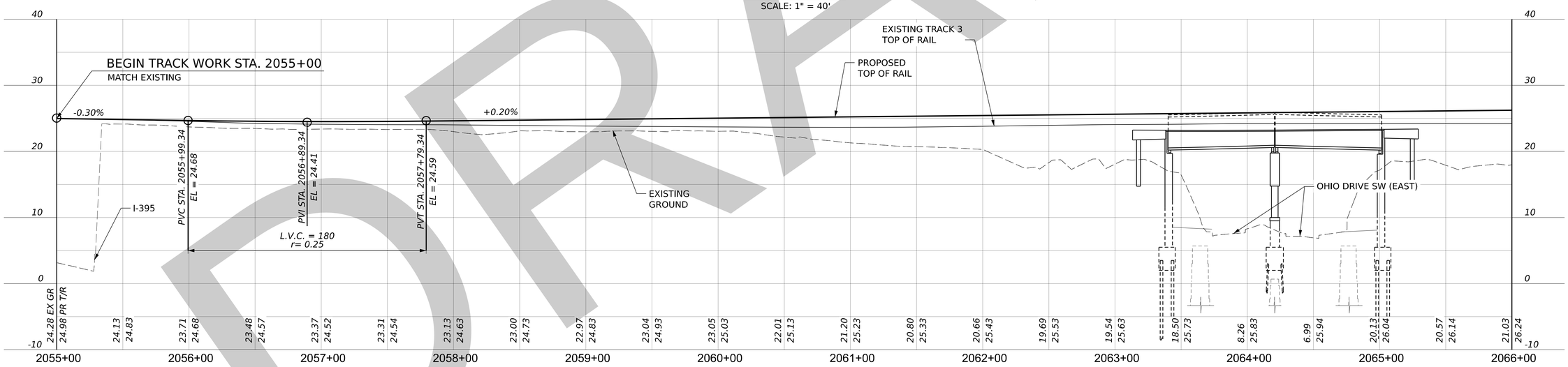
PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-104
REV. N/A
SHEET NO. 32 OF 273
SCALE AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann 2/9/2023
rrR02A_PPsheets1.dgn
Track 1 Plans - TK-104-4 [Sheet]

DRAFT



PLAN - TRACK 2
SCALE: 1" = 40'



PROFILE - TRACK 2
SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	G. BOLES
DRAWN BY	C. SWANN
CHECKED BY	S. KULLEN
APPROVED BY	G. BOLES
DATE	2/9/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 2
PLAN AND PROFILE (1 OF 4)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-201
REV.	N/A
SHEET NO.	33 OF 273
SCALE	AS SHOWN

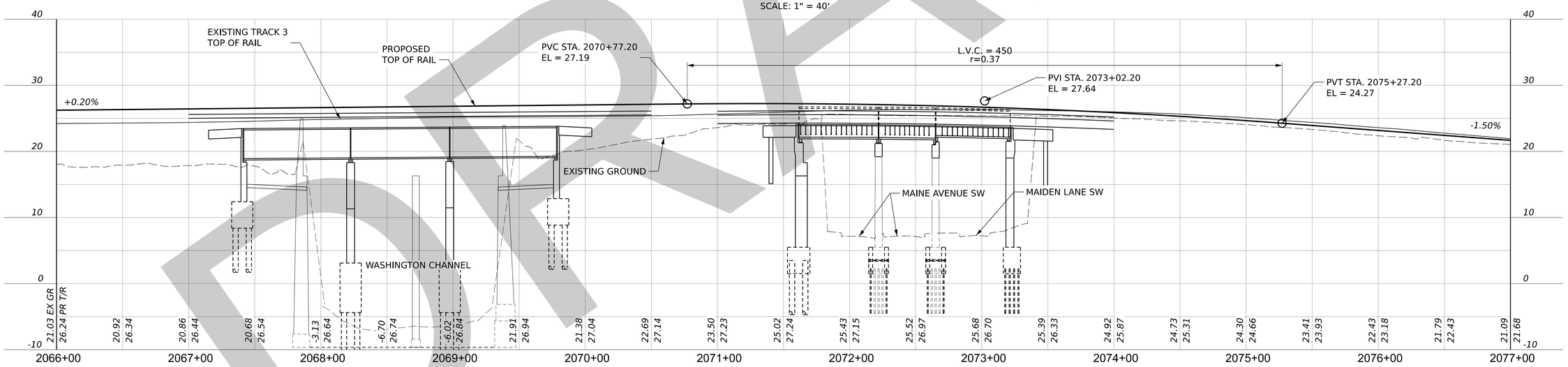
pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann 2/9/2023
rr\R02A_RR-200_PPsheets2.dgn
Track 2 Plans - TK-201 [Sheet]

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

PLAN - TRACK 2

SCALE: 1" = 40'



PROFILE - TRACK 2

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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DRAFT 30% SUBMISSION 2/13/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 2
PLAN AND PROFILE (2 OF 4)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-202
REV. N/A
SHEET NO. 34 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_RR-200_PPsheets2.dgn
Track 2 Plans - TK-202 [Sheet]

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE STA. 2077+00 - SEE DRAWING RR-202

MATCHLINE STA. 2088+00 - SEE DRAWING RR-204

RAILROAD CORRIDOR

PROPOSED CRASHWALL MODIFICATION (TYP.)
SEE STRUCTURAL PLANS

℄ PROPOSED TRACK 2

15'-9" MIN.

11'-3"

7'-9"

PROPOSED CRASHWALL
MODIFICATION PIER ONLY

C10:
Dc= 0°25'00"
Ls= 0'
Ea= 0.00"
Vp= 30 mph
Vf= 25 mph

C10

LOD

4080±00

3080+00

2080+00

1080+00

4085+00

3085+00

2085+00

1085+00

13'-10"

13'-7"

14'

14'

7'-9" MIN.

N70°29'28"E

N70°49'48"E

C9:
Dc= 0°20'00"
Ls= 0'
Ea= 0.00"
Vp= 30 mph
Vf= 25 mph

C9

ST 2077+28.41

12TH STREET SW

PC 2084+44.64

PT 2085+46.29

12TH STREET EXPRESSWAY

PC 2087+43.61

EXISTING TRACK 4

EXISTING TRACK 3

EXISTING TRACK 2

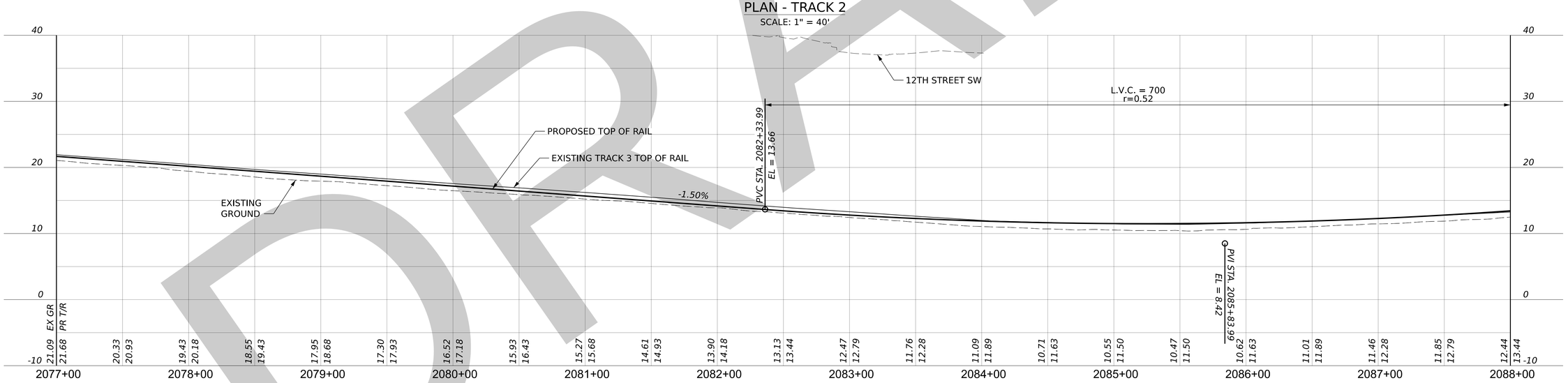
PROPOSED CRASHWALL MODIFICATION (TYP.)
SEE STRUCTURAL PLANS

RAILROAD CORRIDOR

PROPOSED CRASHWALL
MODIFICATION
(THIS PIER ONLY)

PLAN - TRACK 2

SCALE: 1" = 40'



PROFILE - TRACK 2

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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DRAFT 30% SUBMISSION 2/13/2023

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DRAWN BY: C. SWANN
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

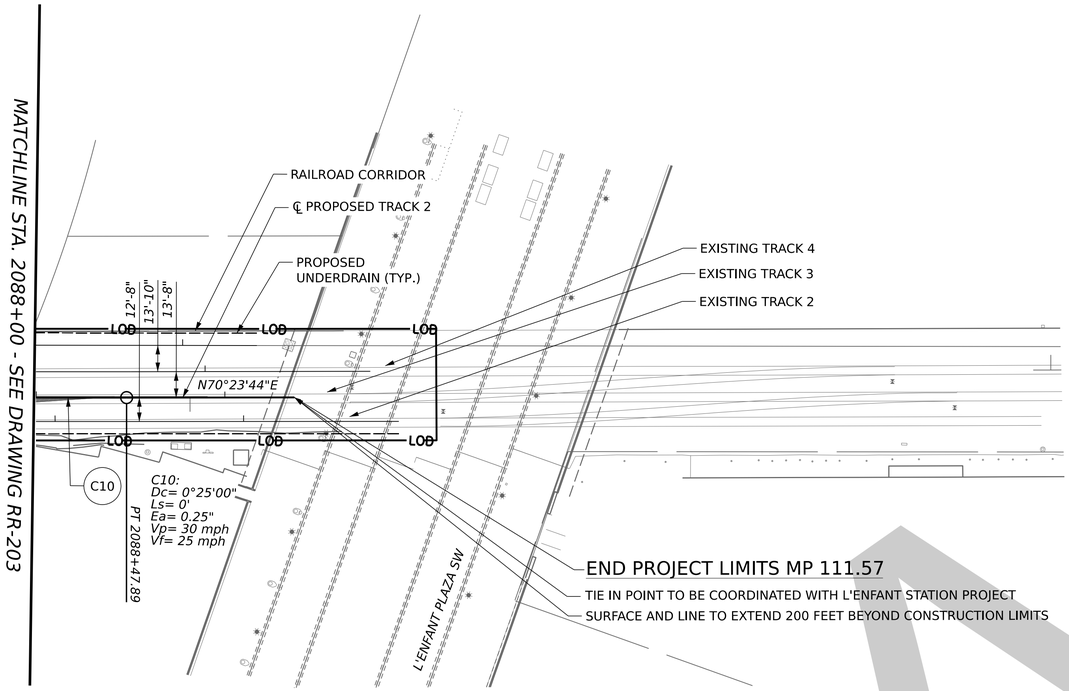
TRACK 2
PLAN AND PROFILE (3 OF 4)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-203
REV. N/A
SHEET NO. 35 OF 273
SCALE: AS SHOWN

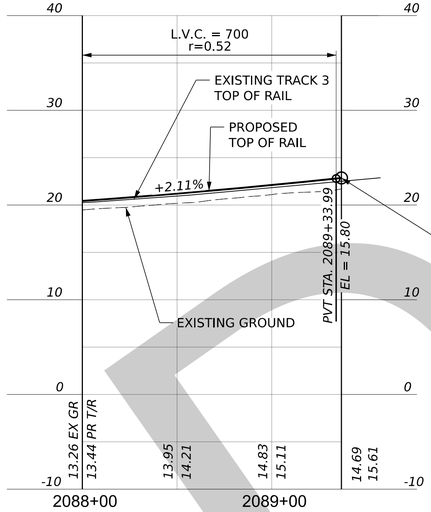
pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_RR-200_PPsheets2.dgn
Track 2 Plans - TK-203 [Sheet]

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 2
SCALE: 1" = 40'



END PROJECT LIMITS
MP 111.57

TIE IN ELEVATION TO BE COORDINATED WITH
L'ENFANT STATION PROJECT

PROFILE - TRACK 2
SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

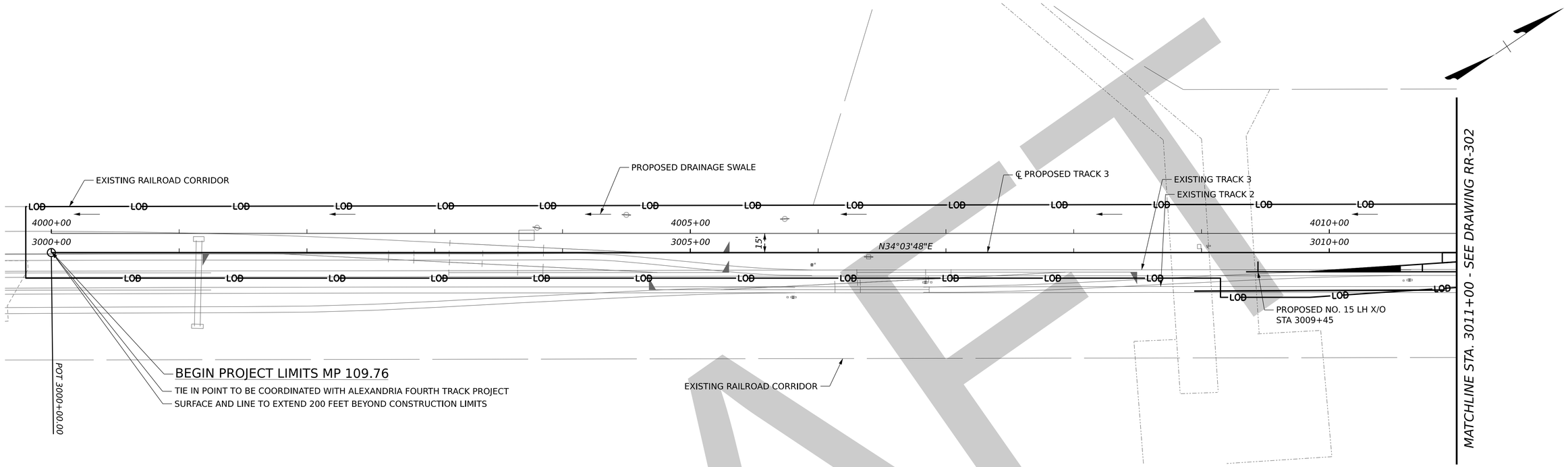
TRACK 2
PLAN AND PROFILE (4 OF 4)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-204
REV. N/A
SHEET NO. 36 OF 273
SCALE AS SHOWN

pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_RR-200_PPsheets2.dgn
Track 2 Plans - TK-204 [Sheet]

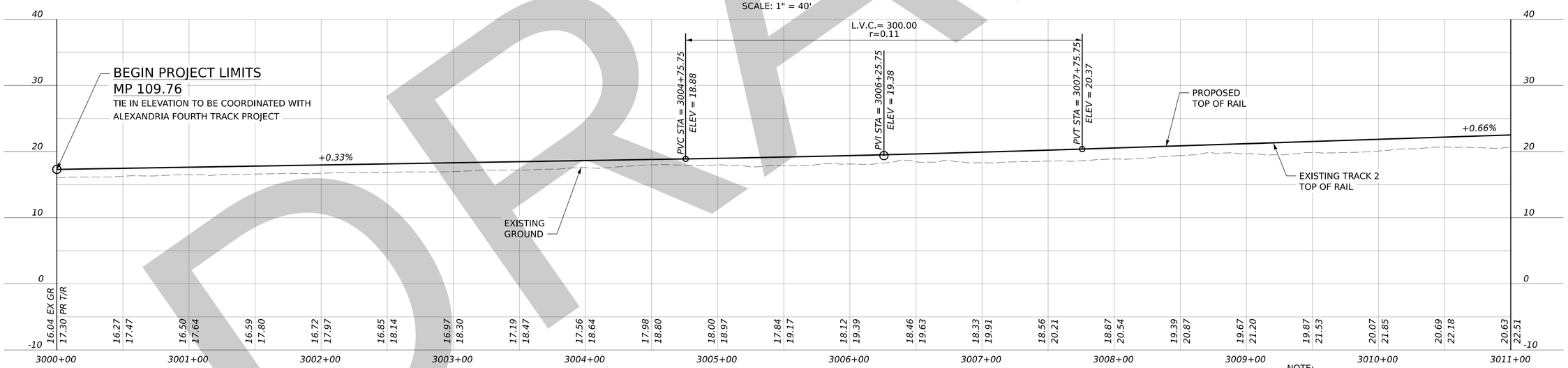
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 3

SCALE: 1" = 40'



PROFILE - TRACK 3

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
SHEET INCLUDED IN NORTH PACKAGE FOR CORRIDOR-WIDE SURFACE AND LINE PURPOSES ONLY.
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DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	G. BOLES
DRAWN BY	I. NOVAES
CHECKED BY	S. KULLEN
APPROVED BY	G. BOLES
DATE	2/9/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 3
PLAN AND PROFILE (1 OF 9)

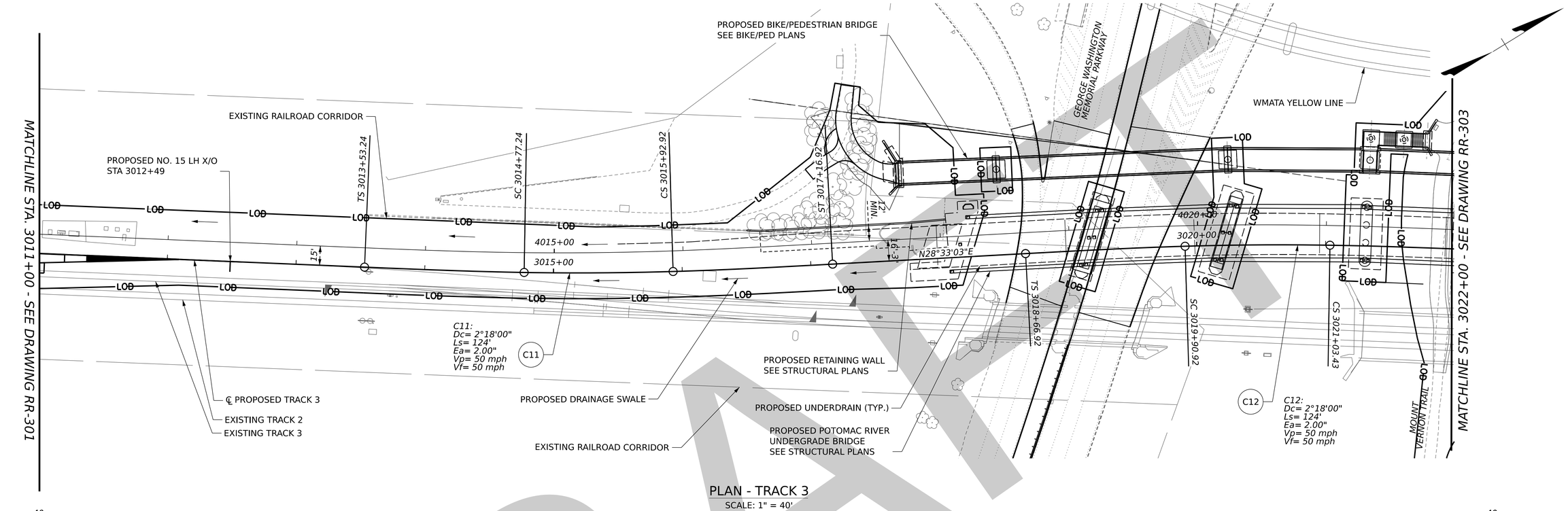
PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-301
REV.	N/A
SHEET NO.	37 OF 273
SCALE	AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: inovaes 2/9/2023
rtR02A_PPsheets3.dgn
$MODELNAME$

DRAFT

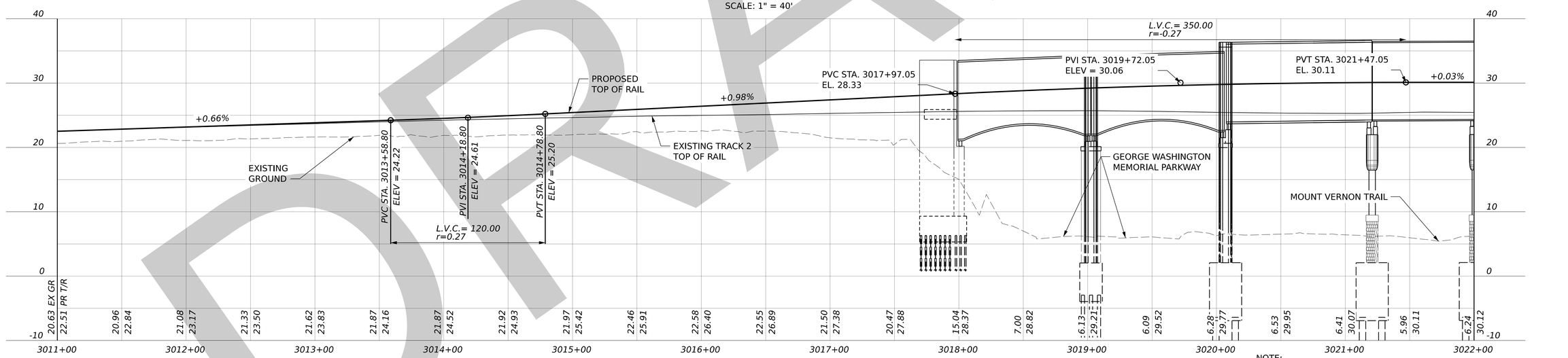
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 3

SCALE: 1" = 40'



PROFILE - TRACK 3

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

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DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: I. NOVAES
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAILINVIRGINIA

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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 3
PLAN AND PROFILE (2 OF 9)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-302
REV.	N/A
SHEET NO.	38 OF 273
SCALE	AS SHOWN

pdf.pltcfg
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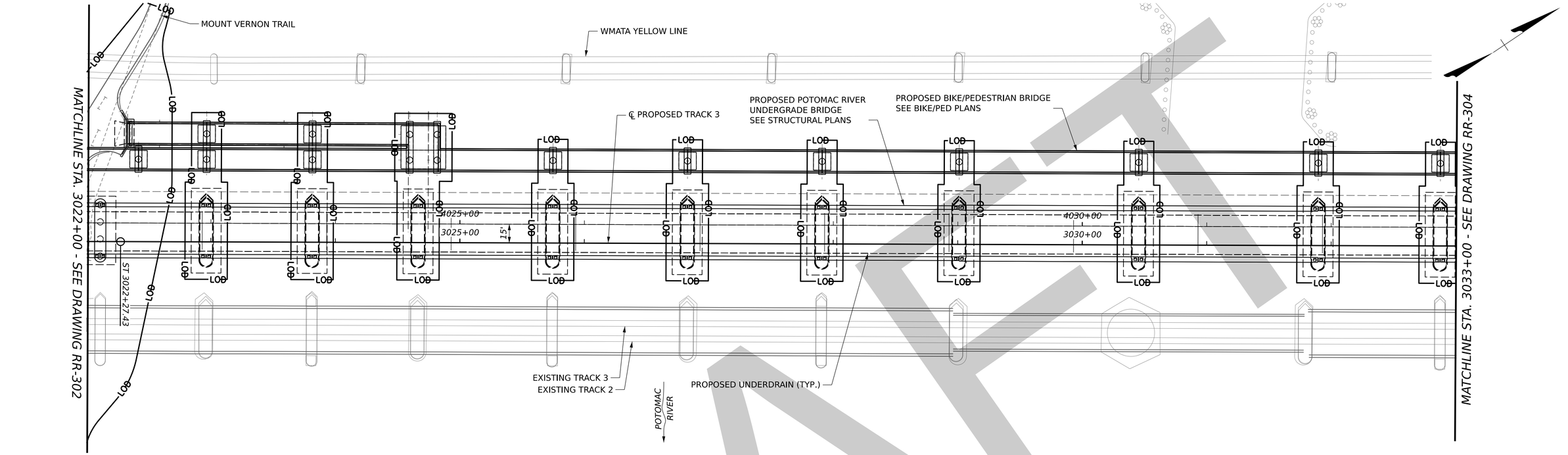
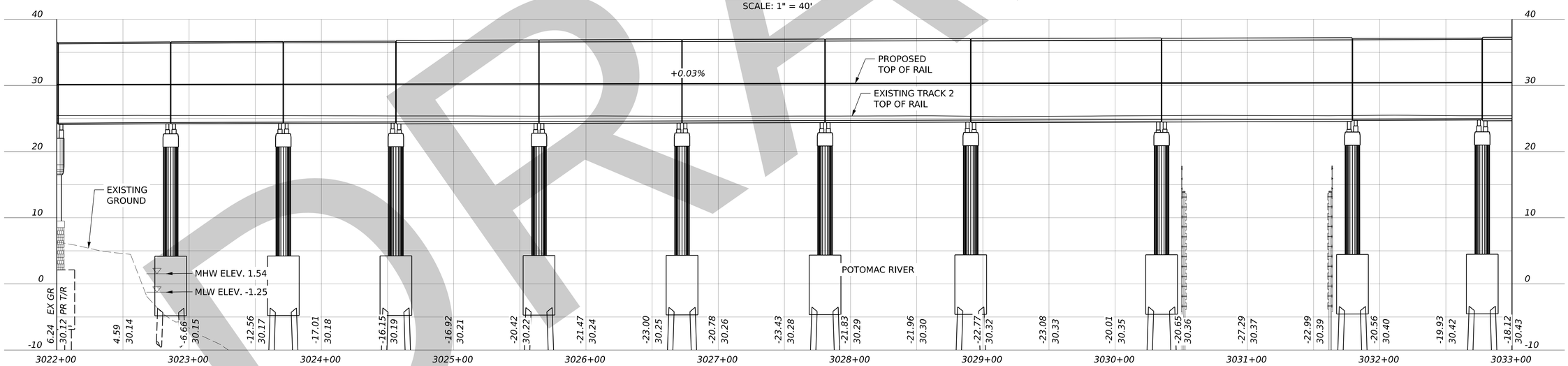
Plotted By: inovaes 2/9/2023
nR02A_PPsheets3.dgn
$MODELNAME$

DRAFT



PLAN - TRACK 3

SCALE: 1" = 40'



PROFILE - TRACK 3

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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CHECKED BY	S. KULLEN
APPROVED BY	G. BOLES
DATE	2/9/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

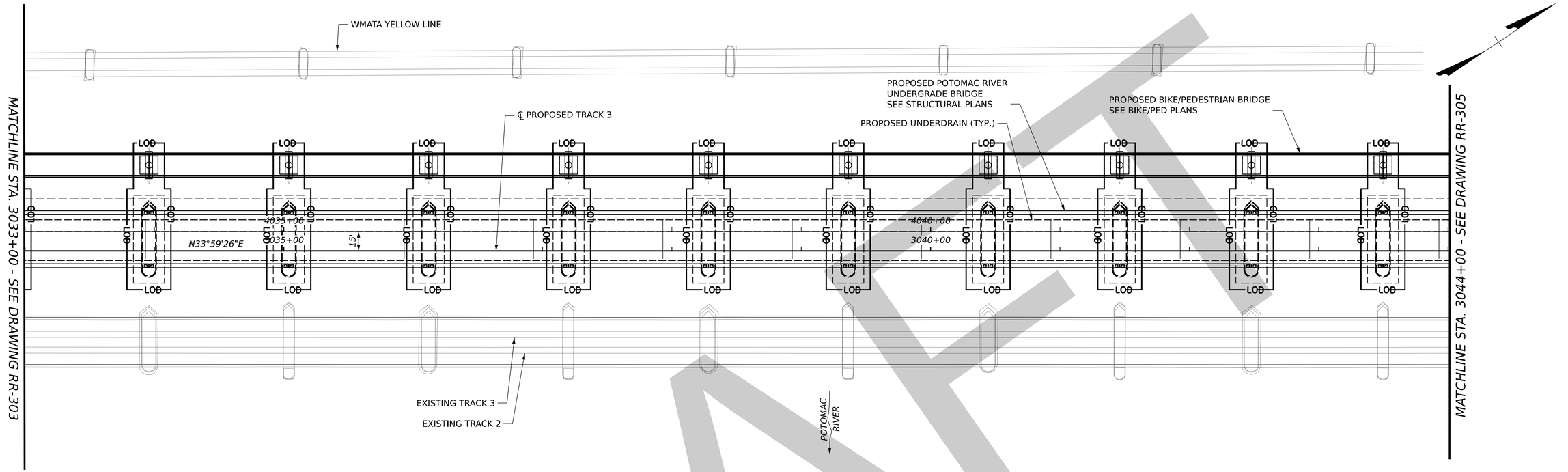
TRACK 3
PLAN AND PROFILE (3 OF 9)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-303
REV.	N/A
SHEET NO.	39 OF 273
SCALE	AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_PPSheets3.dgn
Track 3 Plans - TK-303-1 [Sheet]

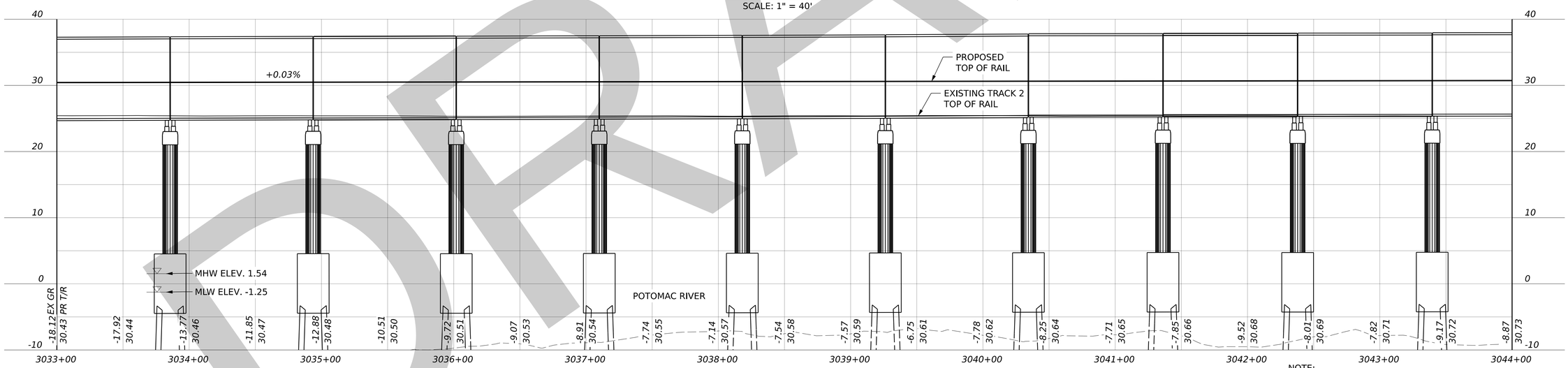
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 3

SCALE: 1" = 40'



PROFILE - TRACK 3

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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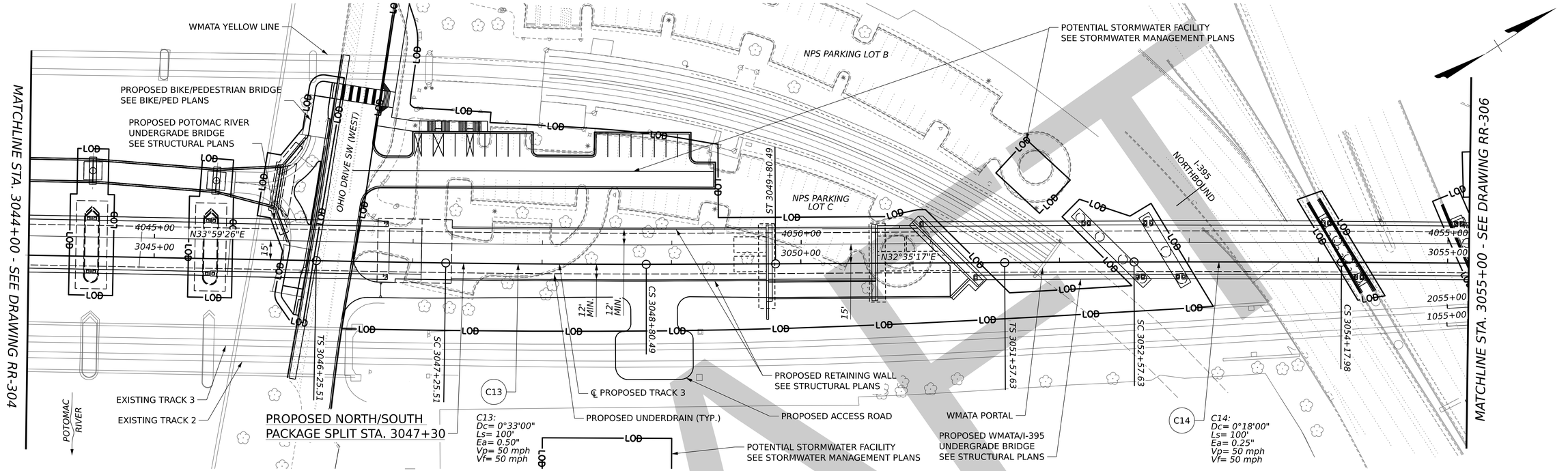
TRACK 3
PLAN AND PROFILE (4 OF 9)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: RR-304
REV.: N/A
SHEET NO.: 40 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: cswann 2/9/2023
rtR02A_PPsheets3.dgn
Track 3 Plans - TK-304-1 [Sheet]

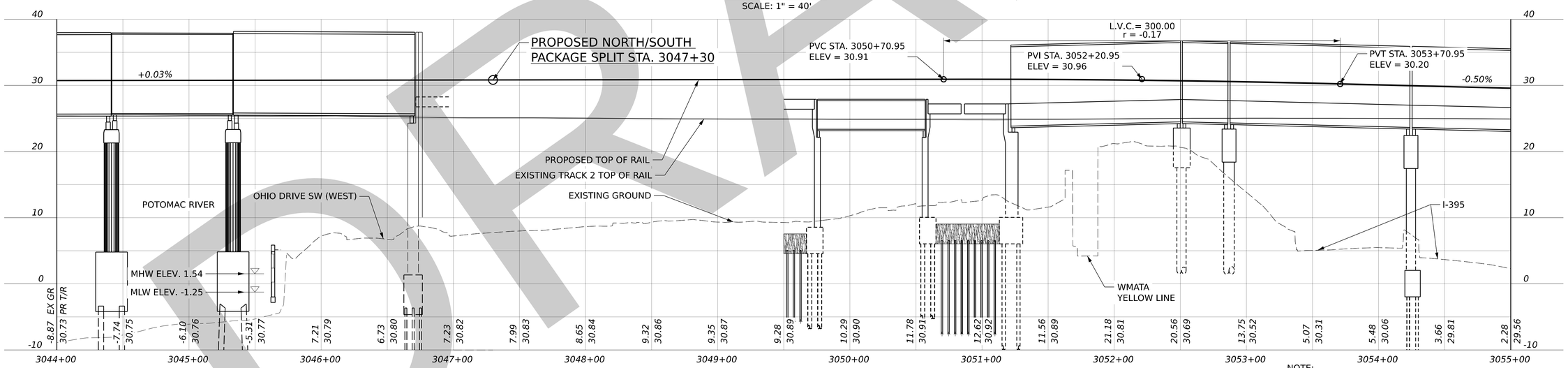
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 3

SCALE: 1" = 40'



PROFILE - TRACK 3

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 3
PLAN AND PROFILE (5 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-305
REV. N/A
SHEET NO. 41 OF 273
SCALE: AS SHOWN

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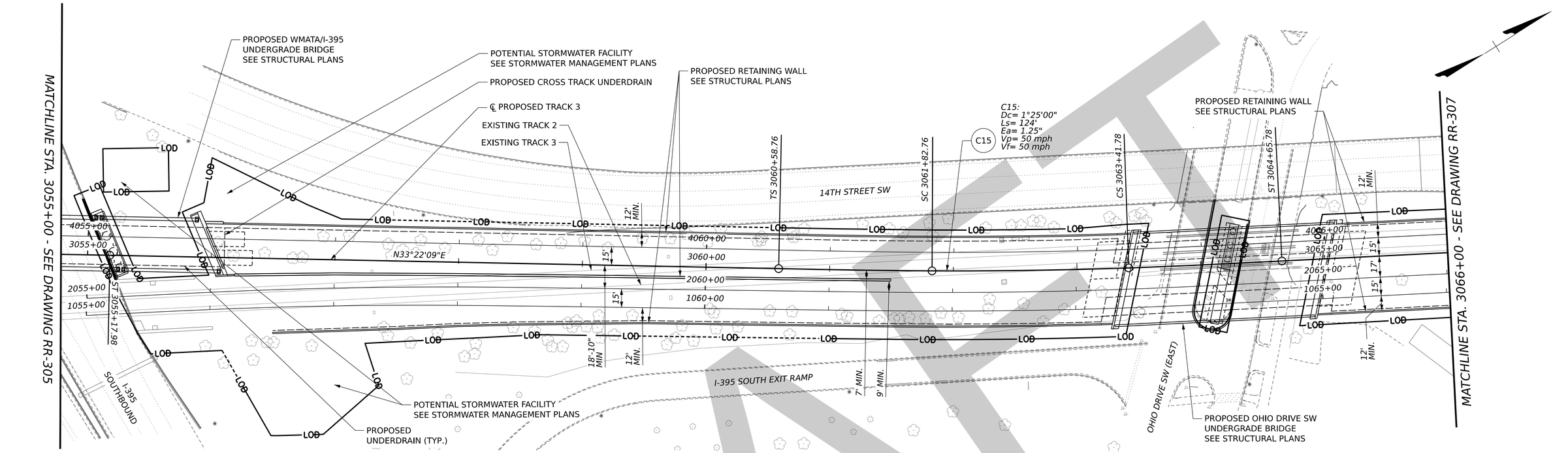
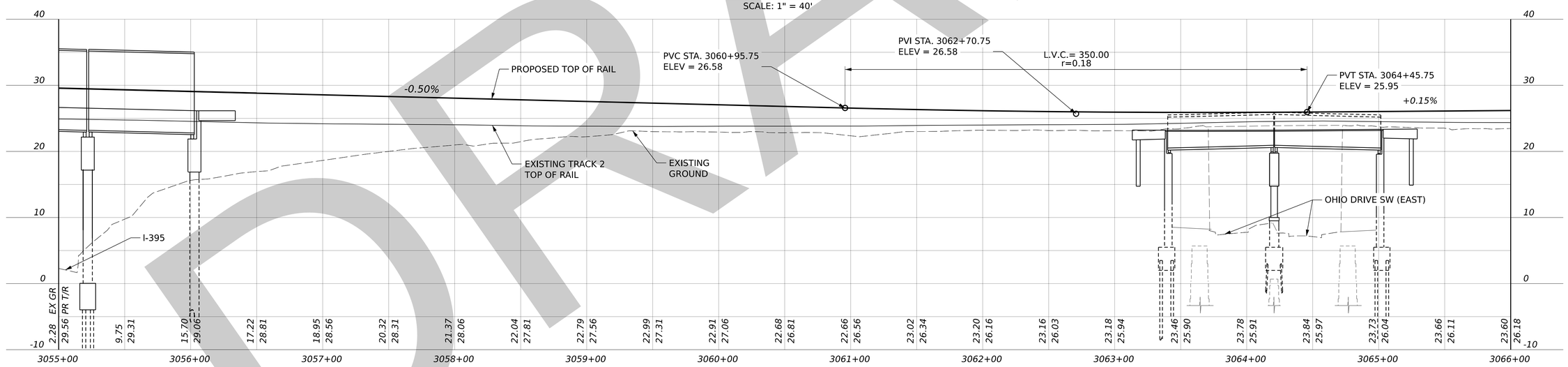
Plotted By: inovaes 2/9/2023
rrR02A_PPsheets3.dgn
$MODELNAME$



PLAN - TRACK 3
SCALE: 1" = 40'



PROFILE - TRACK 3
SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

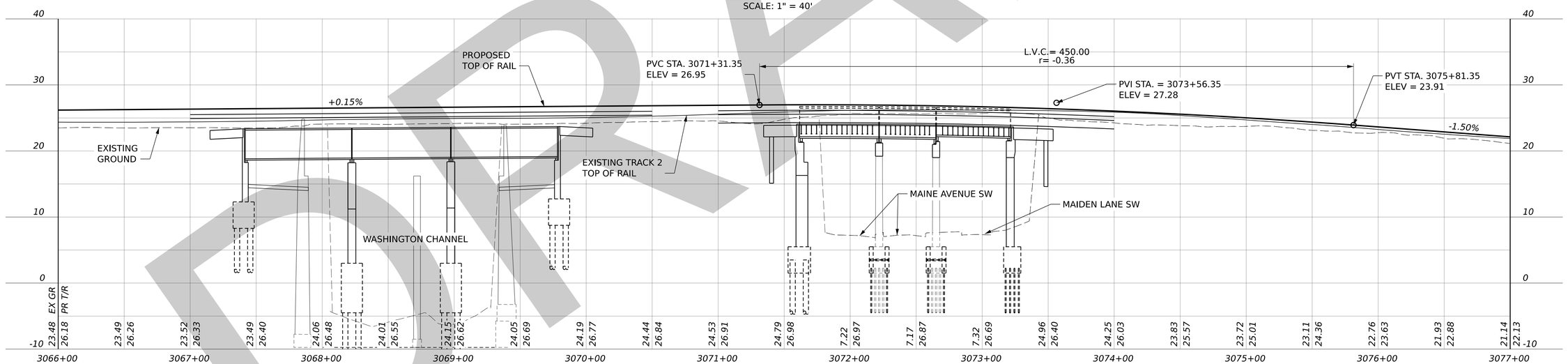
SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 3
PLAN AND PROFILE (6 OF 9)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-306
REV.	N/A
SHEET NO.	42 OF 273
SCALE	AS SHOWN

pdf.pltcfg
LBPE_ltd_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_PPsheets3.dgn
Track 3 Plans - TK-306-1 [Sheet]

PLAN - TRACK 3
SCALE: 1" = 40'



PROFILE - TRACK 3
SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY G. BOLES
DRAWN BY I. NOVAES
CHECKED BY S. KULLEN
APPROVED BY G. BOLES
DATE 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 3
PLAN AND PROFILE (7 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-307
REV. N/A
SHEET NO. 43 OF 273
SCALE AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: inovaes 2/9/2023
rrR02A_PPsheets3.dgn
Track 3 Plans - TK-307-1 [Sheet]

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE STA. 3077+00 - SEE DRAWING RR-307

MATCHLINE STA. 3088+00 - SEE DRAWING RR-309

PROPOSED CRASHWALL MODIFICATION (TYP.)
SEE STRUCTURAL PLANS

RAILROAD CORRIDOR

℄ PROPOSED TRACK 3

EXISTING TRACK 4

EXISTING TRACK 3

EXISTING TRACK 2

15'-9" MIN.

11'-3"

14'

14'

7'-9" MIN.

7'-9" MIN.

LOD

4080±00

3080±00

2080±00

1080±00

N70°29'28"E

ST 3077+25.51

RAILROAD CORRIDOR

12TH STREET SW

PROPOSED CRASHWALL MODIFICATION (PIER ONLY)

C17:
Dc= 0°24'00"
Ls= 0'
Ea= 0.25"
Vp= 30 mph
Vf= 25 mph

C17

4085±00

3085±00

2085±00

1085±00

PC 3084+54.59

PT 3085+57.32

13'-6"

13'-10"

N70°54'07"E

PC 3087+51.76

13'-8"

12TH STREET EXPRESSWAY

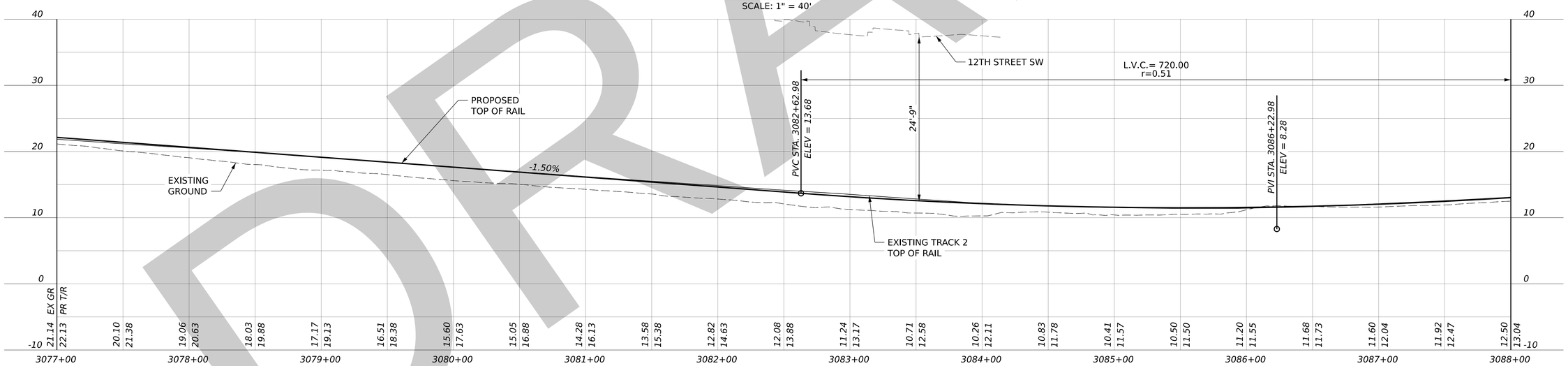
C18

C18:
Dc= 0°30'00"
Ls= 0'
Ea= 0.25"
Vp= 30 mph
Vf= 25 mph

PROPOSED CRASHWALL MODIFICATION
(THIS PIER ONLY)

PLAN - TRACK 3

SCALE: 1" = 40'



PROFILE - TRACK 3

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: I. NOVAES
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

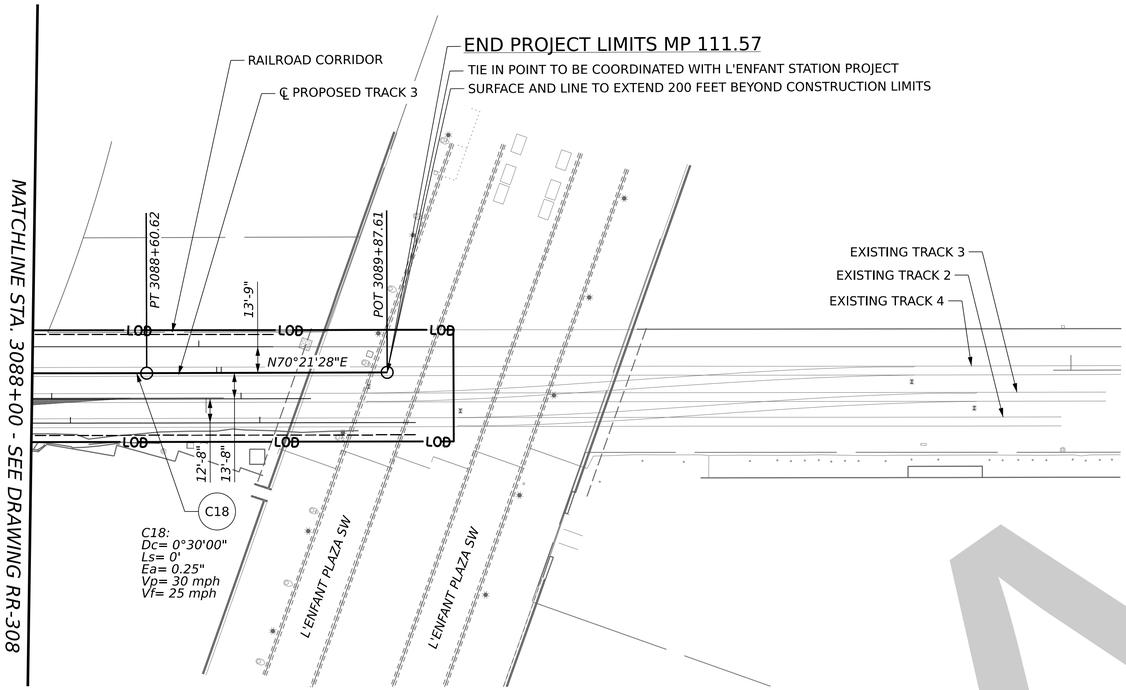
TRACK 3
PLAN AND PROFILE (8 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-308
REV. N/A
SHEET NO. 44 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_PPSheets3.dgn
Track 3 Plans - TK-308-1 [Sheet]

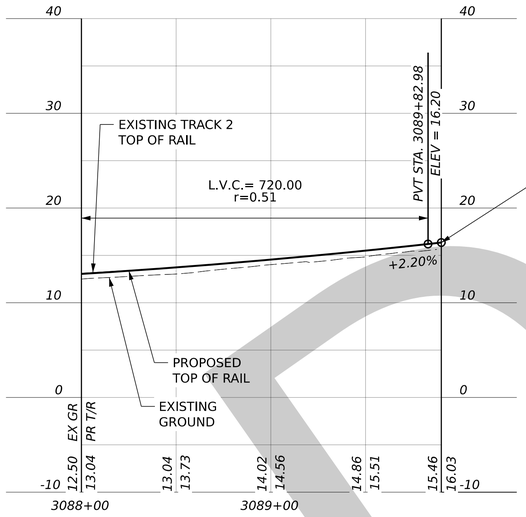
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 3

SCALE: 1" = 40'



END PROJECT LIMITS
MP 111.57

TIE IN ELEVATION TO BE COORDINATED WITH
L'ENFANT STATION PROJECT

PROFILE - TRACK 3

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

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DRAWN BY	I. NOVAES
CHECKED BY	S. KULLEN
APPROVED BY	G. BOLES
DATE	2/9/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

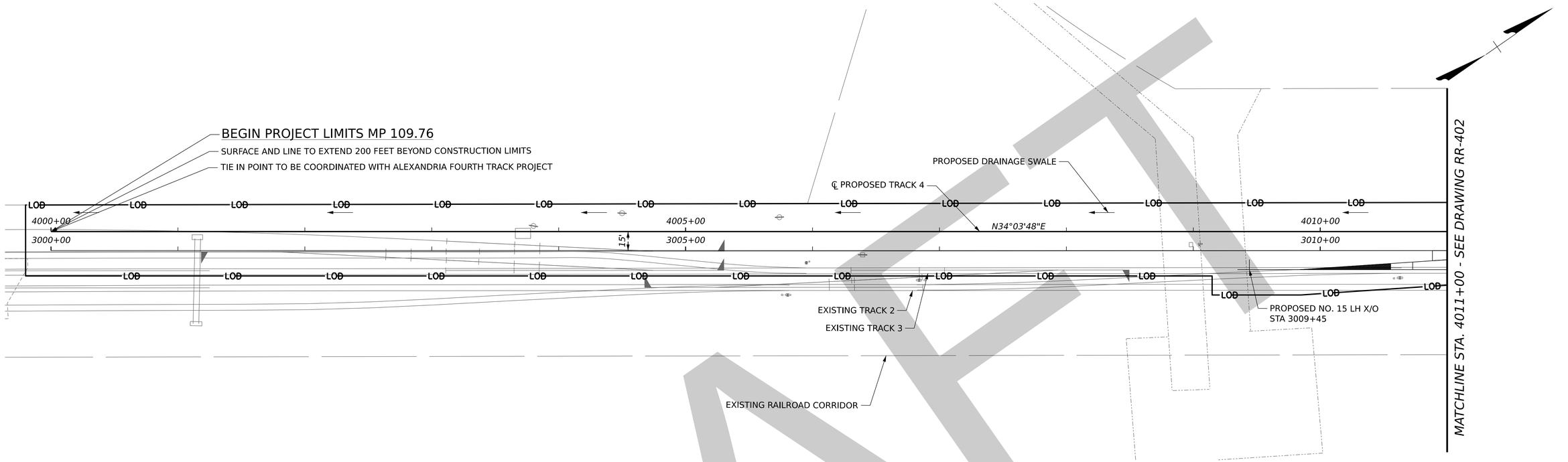
TRACK 3
PLAN AND PROFILE (9 OF 9)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-309
REV.	N/A
SHEET NO.	45 OF 273
SCALE	AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann
2/9/2023
rtR02A_PPsheets3.dgn
Track 3 Plans - TK-309-1 [Sheet]

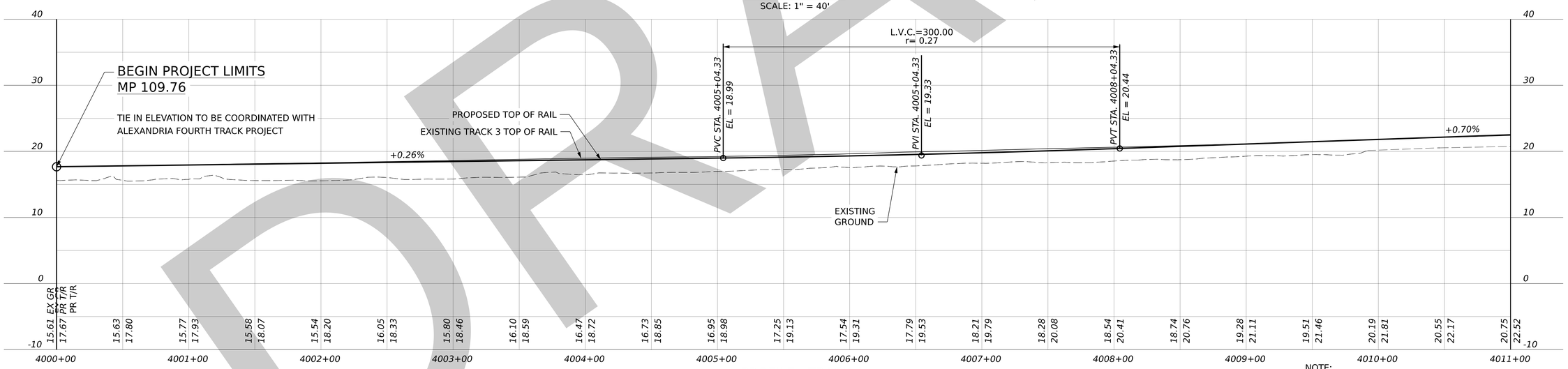
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
SHEET INCLUDED IN NORTH PACKAGE FOR CORRIDOR-WIDE SURFACE AND LINE PROPOSED ONLY.
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DRAWN BY: C. SWANN
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAILINVIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

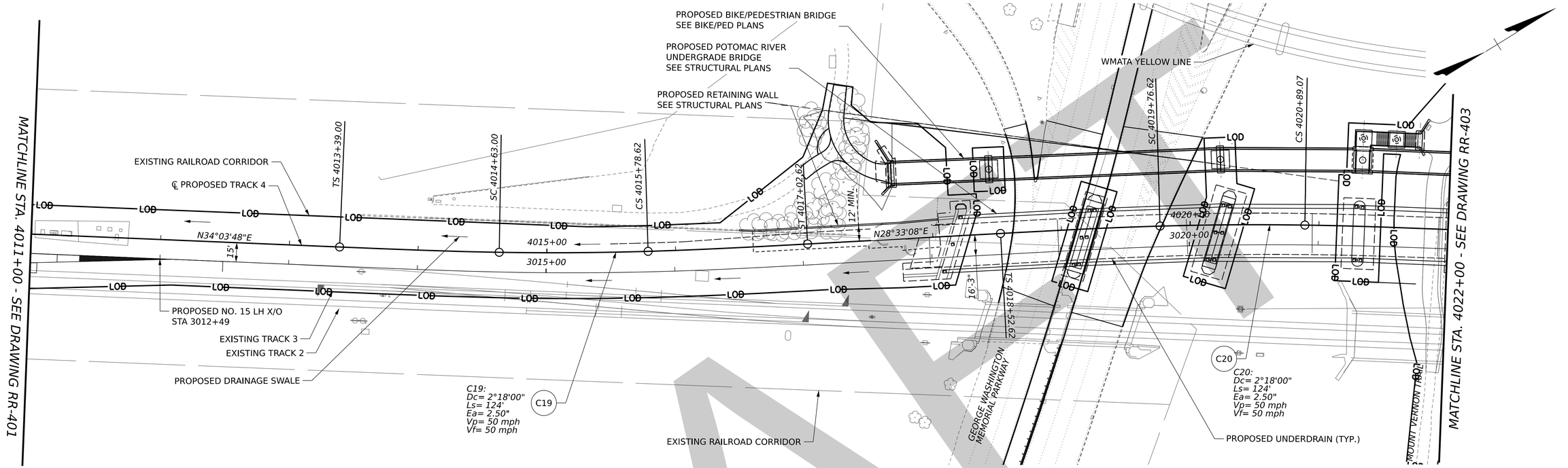
TRACK 4
PLAN AND PROFILE (1 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-401
REV. N/A
SHEET NO. 46 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: inovaes 2/9/2023
nR02A_RR-400_PPsheets4.dgn
$MODELNAME$

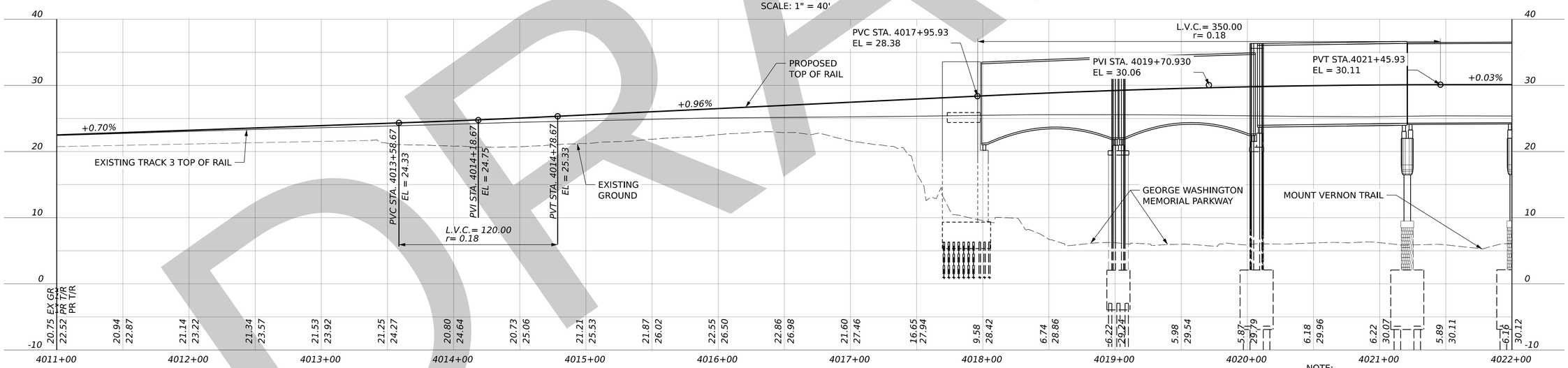
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

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PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: C. SWANN
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 4
PLAN AND PROFILE (2 OF 9)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-402
REV.	N/A
SHEET NO.	47 OF 273
SCALE	AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: inovales 2/9/2023
rrR02A_RR-400_PPsheets4.dgn
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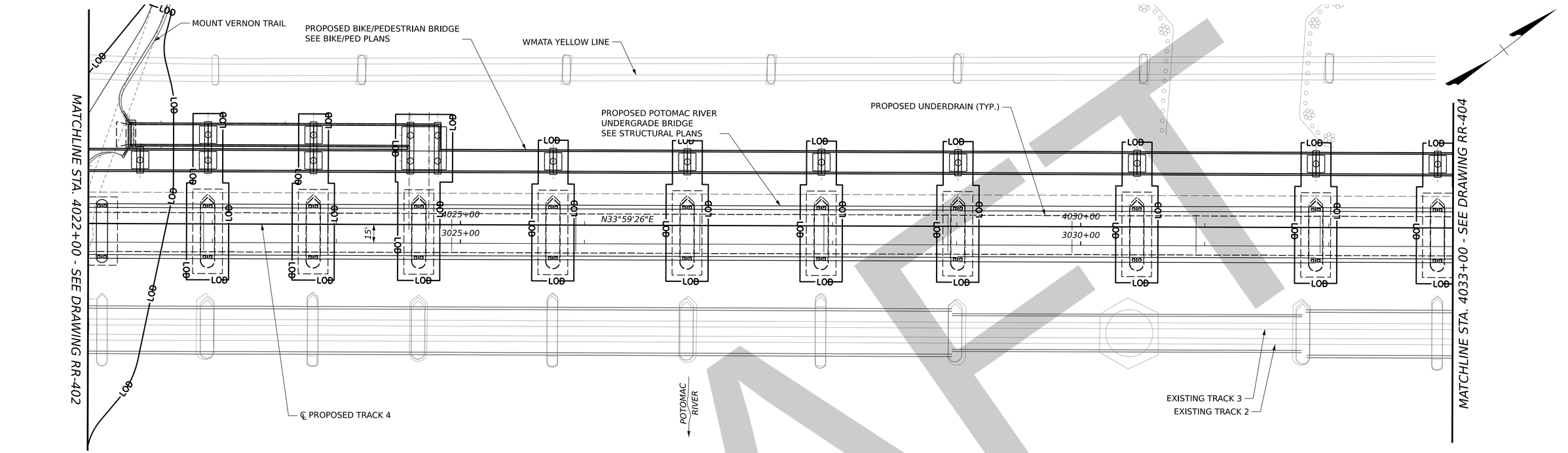
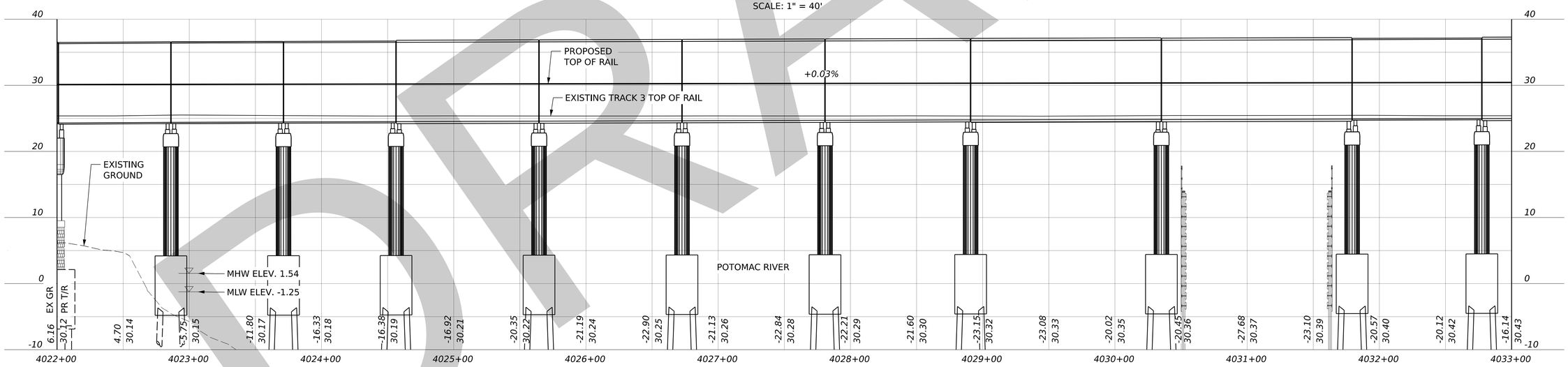


PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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DRAFT 30% SUBMISSION 2/13/2023

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CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

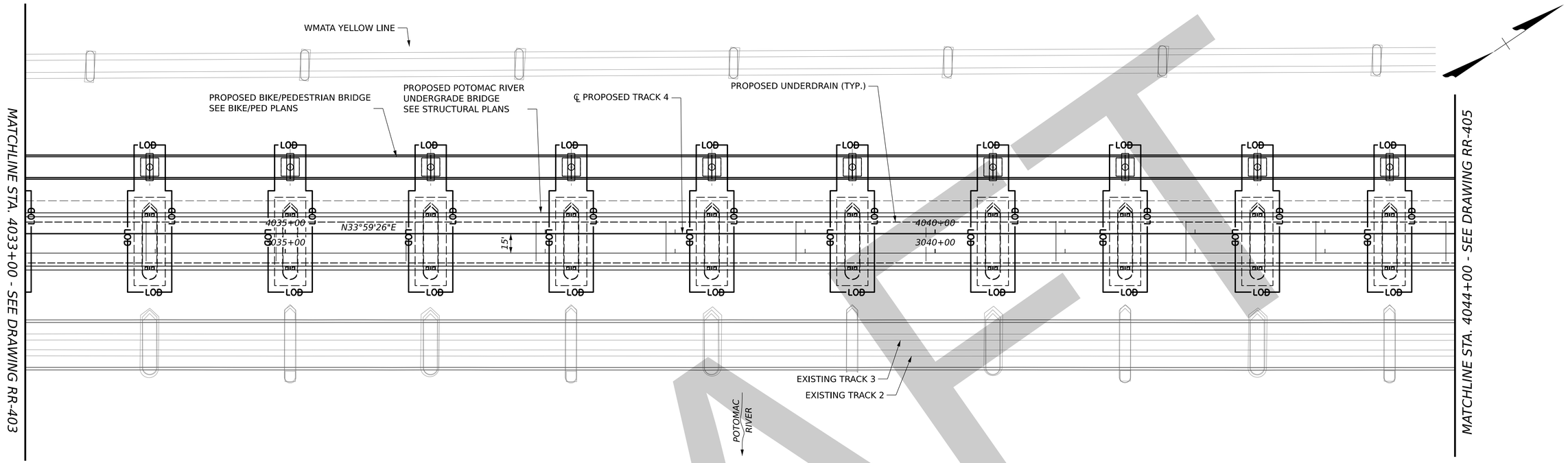
TRACK 4
PLAN AND PROFILE (3 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-403
REV. N/A
SHEET NO. 48 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_RR-400_PPsheets4.dgn
Track 4 Plans - TK-403 [Sheet]

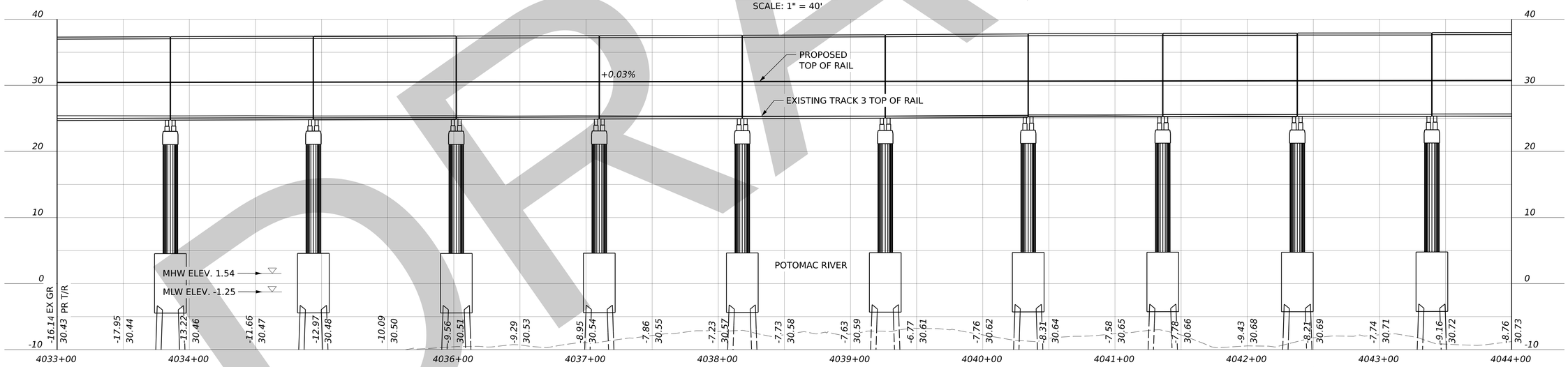
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: C. SWANN
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

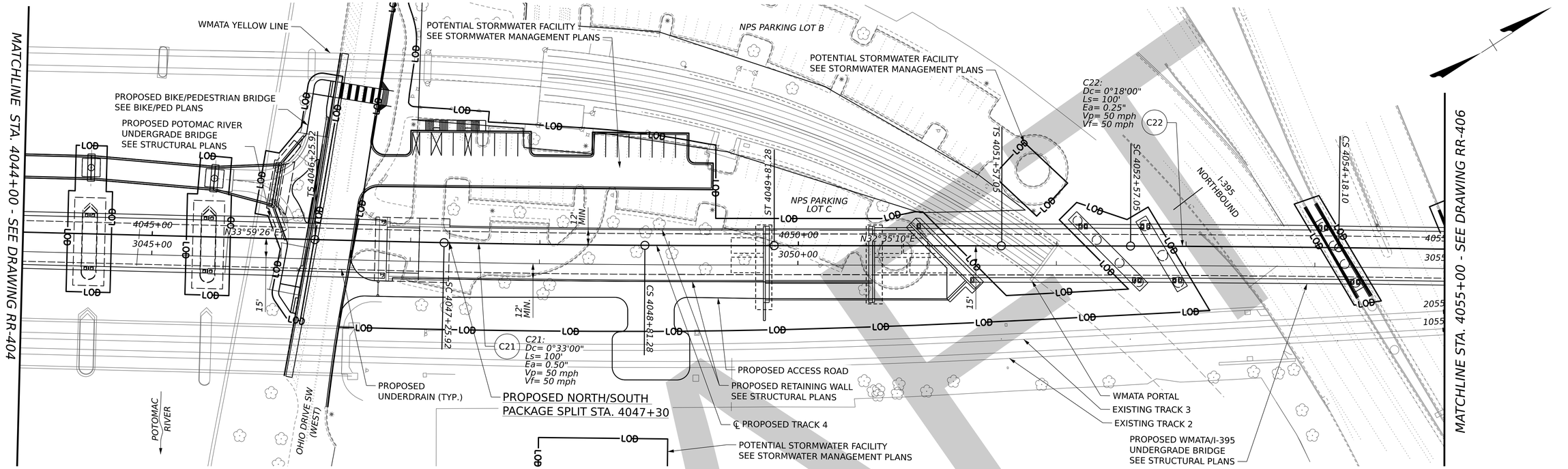
TRACK 4
PLAN AND PROFILE (4 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-404
REV. N/A
SHEET NO. 49 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ltd_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_RR-400_PPsheets4.dgn
Track 4 Plans - TK-404 [Sheet]

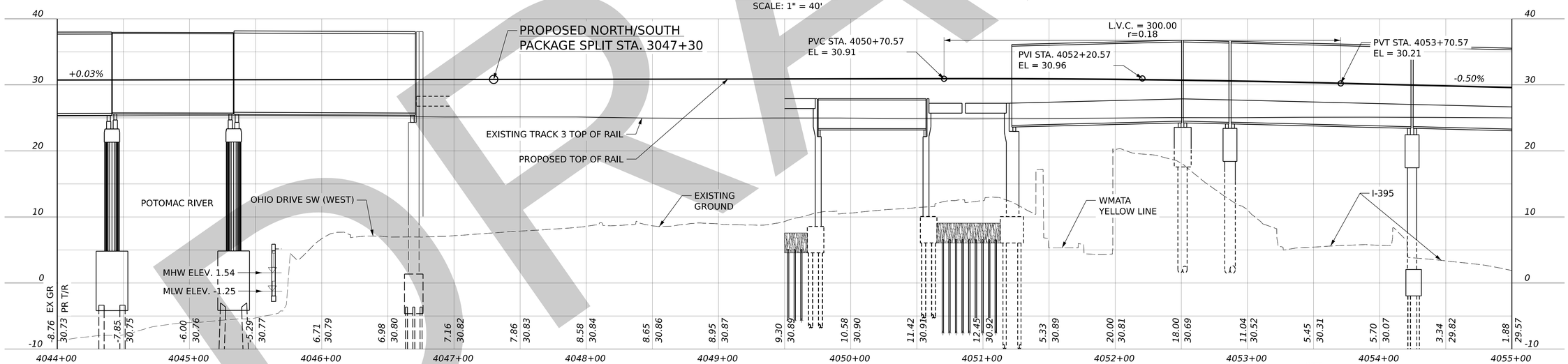
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: C. SWANN
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

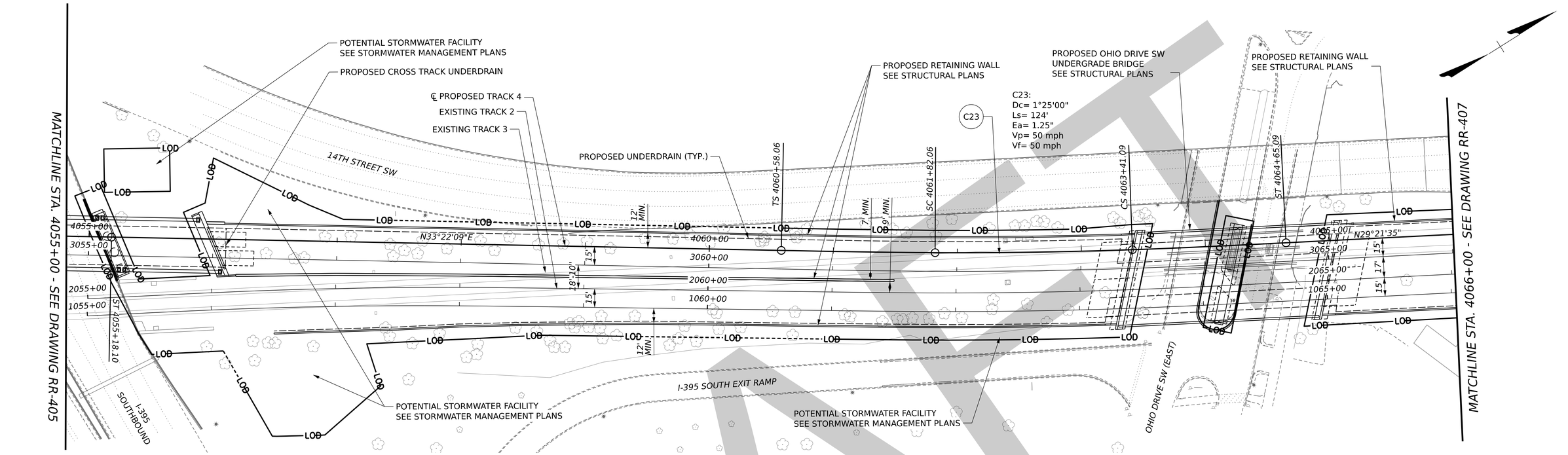
SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 4
PLAN AND PROFILE (5 OF 9)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: RR-405
REV.: N/A
SHEET NO.: 50 OF 273
SCALE: AS SHOWN

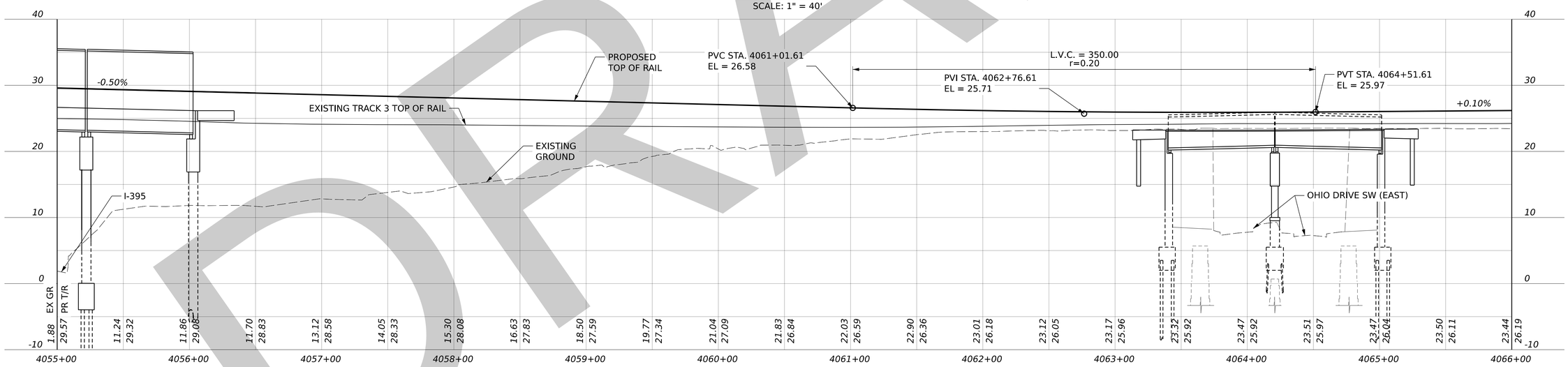
pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: inovaes 2/9/2023
rrR02A_RR-400_PPsheets4.dgn
$MODELNAME$

DRAFT



PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
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DRAFT 30% SUBMISSION 2/13/2023

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CHECKED BY	S. KULLEN
APPROVED BY	G. BOLES
DATE	2/9/2023

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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

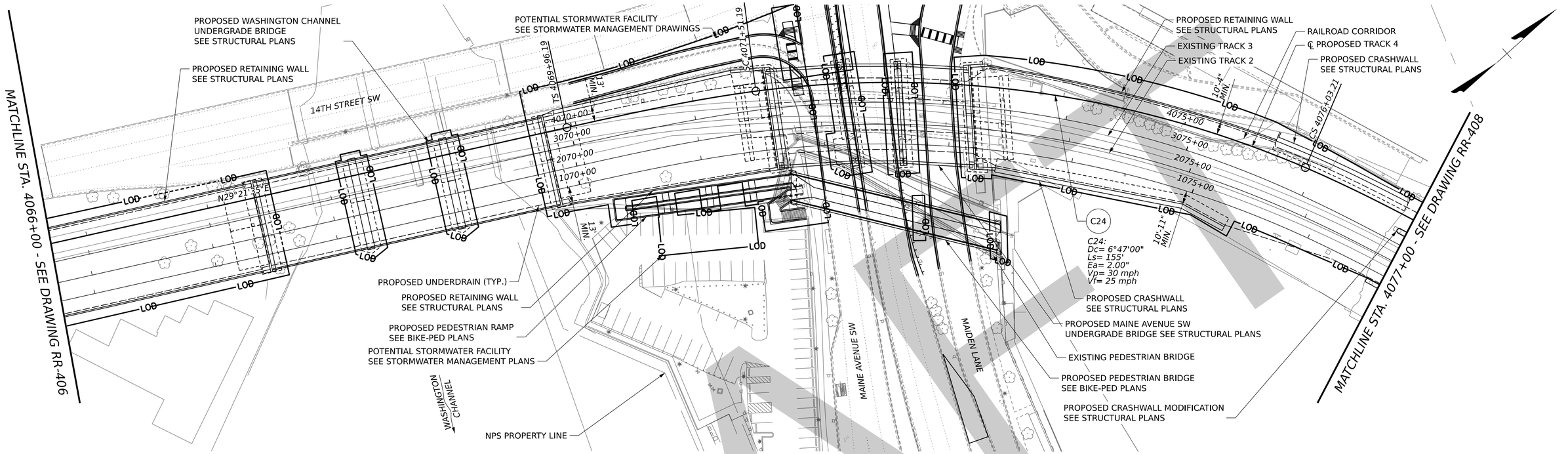
TRACK 4
PLAN AND PROFILE (6 OF 9)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-406
REV.	N/A
SHEET NO.	51 OF 273
SCALE	AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_RR-400_PPsheets4.dgn
Track 4 Plans - TK-406 [Sheet]

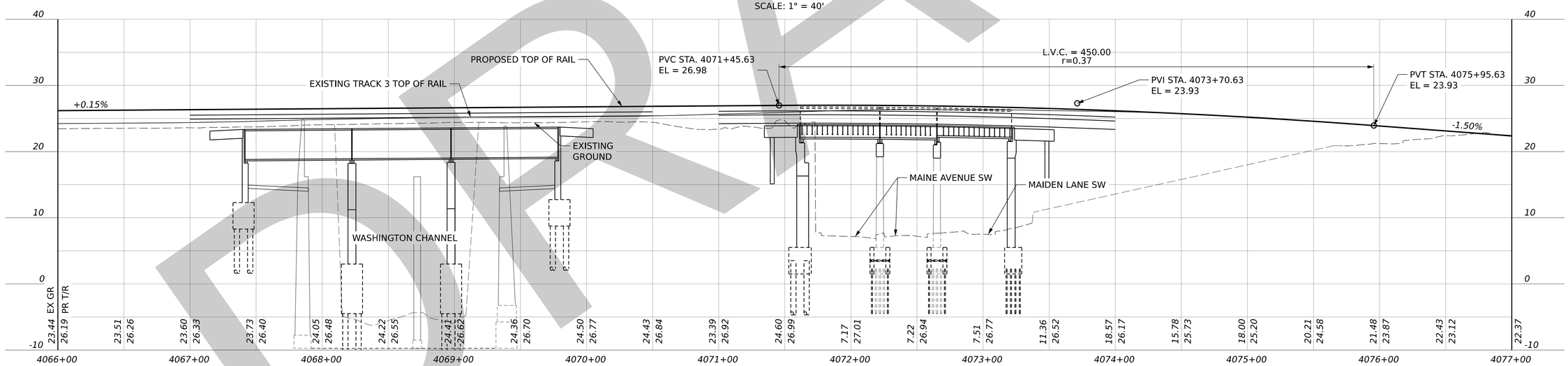
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

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CHECKED BY: S. KULLEN
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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 4
PLAN AND PROFILE (7 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-407
REV. N/A
SHEET NO. 52 OF 273
SCALE: AS SHOWN

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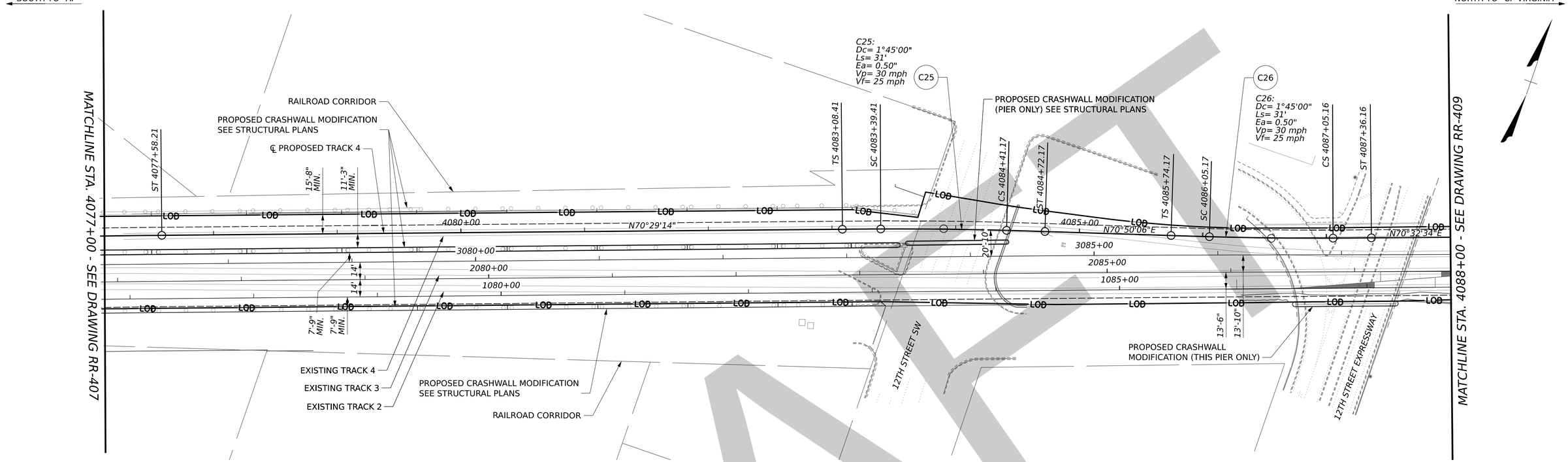
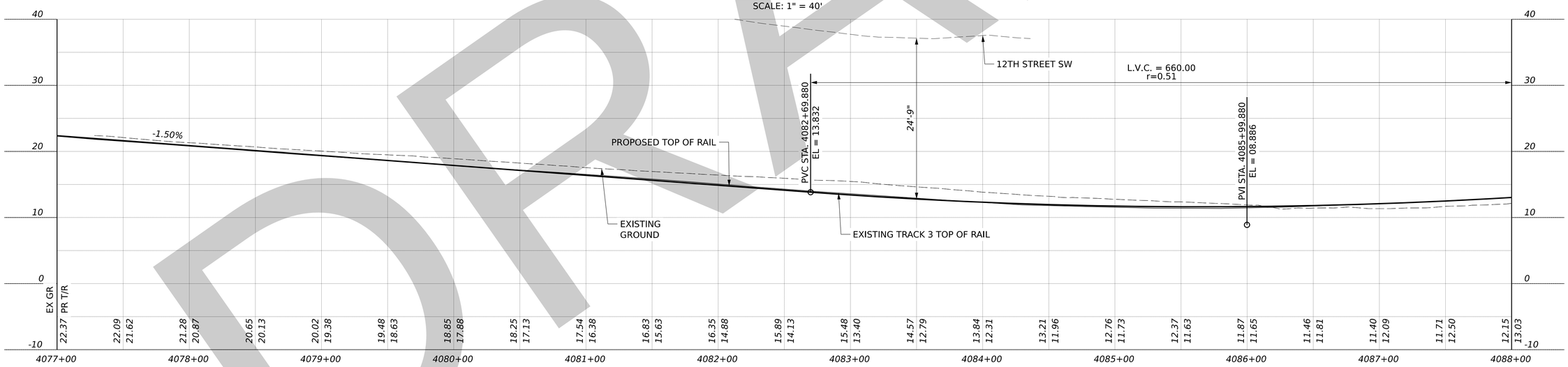
LBPE_ld_v95.tbl
Plotted By: inovaes 2/9/2023
nR02A_RR-400_PPsheets4.dgn
$MODELNAME$

DRAFT



PLAN - TRACK 4

SCALE: 1" = 40'



PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

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PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: G. BOLES
DRAWN BY: C. SWANN
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

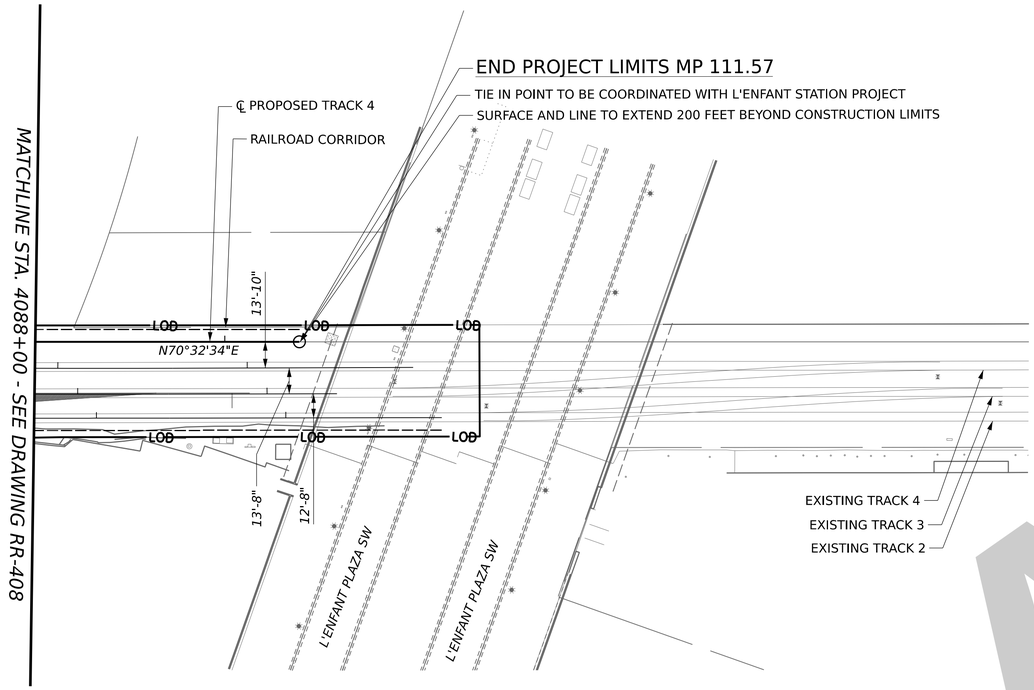
TRACK 4
PLAN AND PROFILE (8 OF 9)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-408
REV. N/A
SHEET NO. 53 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: cswann 2/9/2023
nR02A_RR-400_PPsheet4.dgn
Track 4 Plans - TK-408 [Sheet]

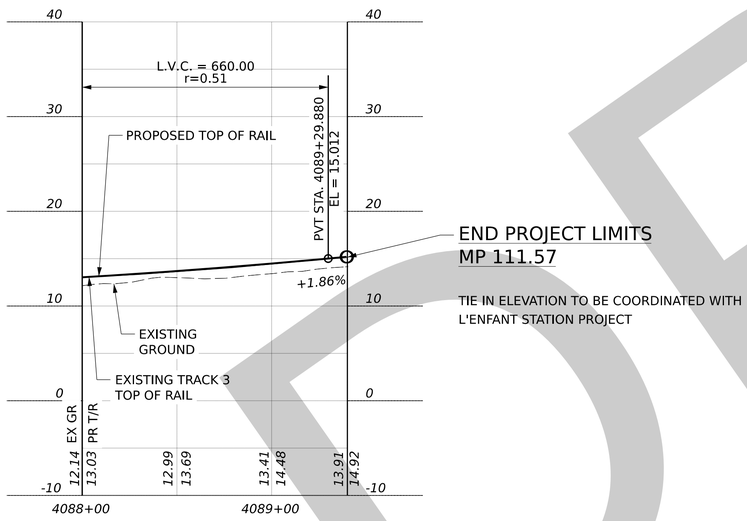
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN - TRACK 4

SCALE: 1" = 40'



END PROJECT LIMITS
MP 111.57

TIE IN ELEVATION TO BE COORDINATED WITH L'ENFANT STATION PROJECT

PROFILE - TRACK 4

SCALE: 1" = 40' (HORIZONTAL)
SCALE: 1" = 8' (VERTICAL)

NOTE:
EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

DRAFT

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DRAFT 30% SUBMISSION 2/13/2023

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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK 4
PLAN AND PROFILE (9 OF 9)

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	RR-409
REV.	N/A
SHEET NO.	54 OF 273
SCALE	AS SHOWN

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Plotted By: cswann 2/9/2023
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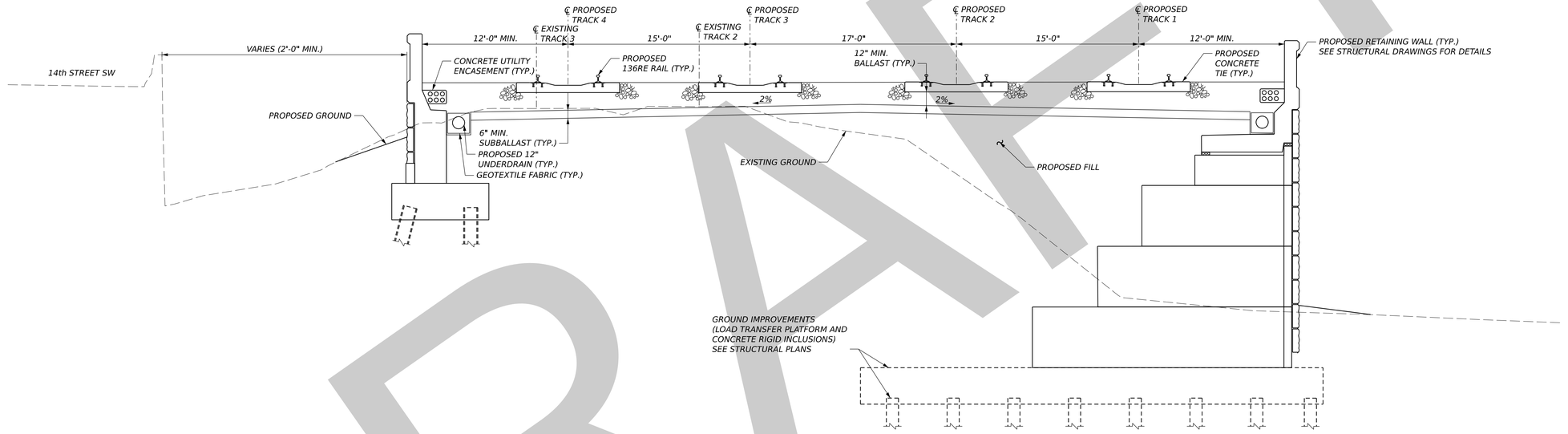
Track 4 Plans - TK-409 [Sheet]



TRACK TYPICAL SECTION - FILL

APPROX. STA. 4056+00 TO 4071+00
STA. 3056+00 TO 3071+00
STA. 2056+00 TO 2071+00
STA. 1056+00 TO 1070+00
N.T.S.

DRAFT

pdf.pltcfg
LBPE_fd_v95.tbl
Plotted By: GBoles 2/8/2023
rrR02A_RR-501_TypicalSection_north.dgn

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

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DRAWN BY: I. NOVAES
CHECKED BY: S. KULLEN
APPROVED BY: G. BOLES
DATE: 2/8/2023

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NORTH PACKAGE
WASHINGTON, DC

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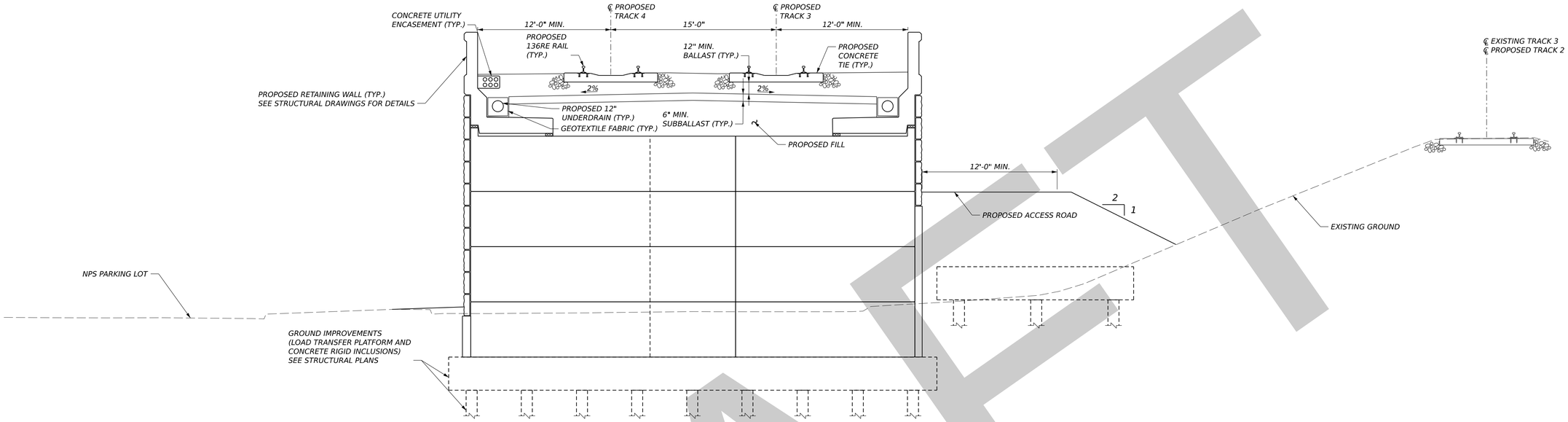
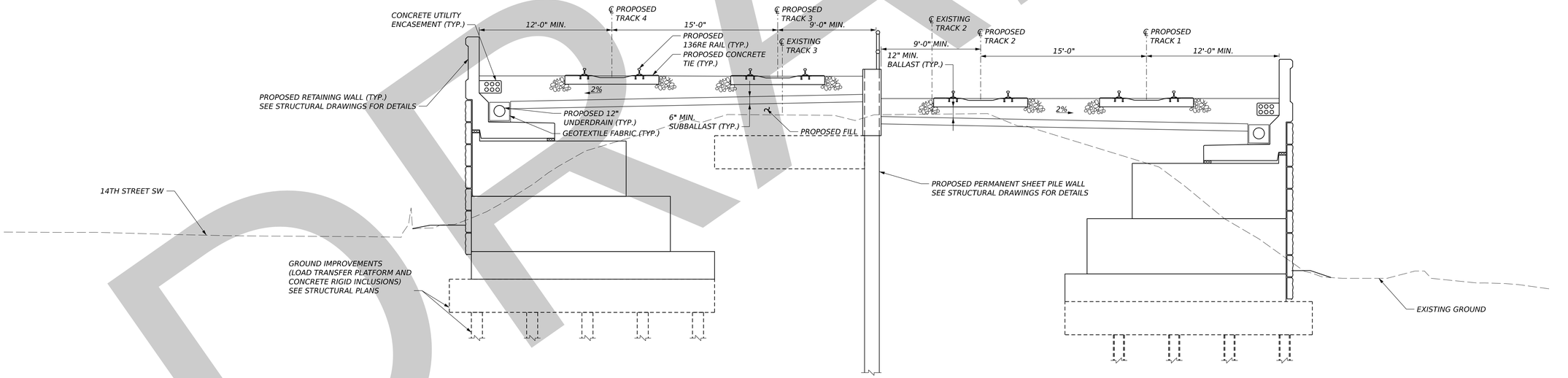
TRACK
TYPICAL SECTIONS

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-501
REV. N/A
SHEET NO. 55 OF 273
SCALE AS SHOWN



CRITICAL SECTION - ACCESS ROAD

STA 3048+00 +/-
N.T.S.



CRITICAL SECTION - INTERTRACK WALL

STA 3060+00 +/-
N.T.S.

DRAFT

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DRAFT 30% SUBMISSION 2/13/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK CRITICAL SECTIONS (1 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-502
REV. N/A
SHEET NO. 56 OF 273
SCALE AS SHOWN

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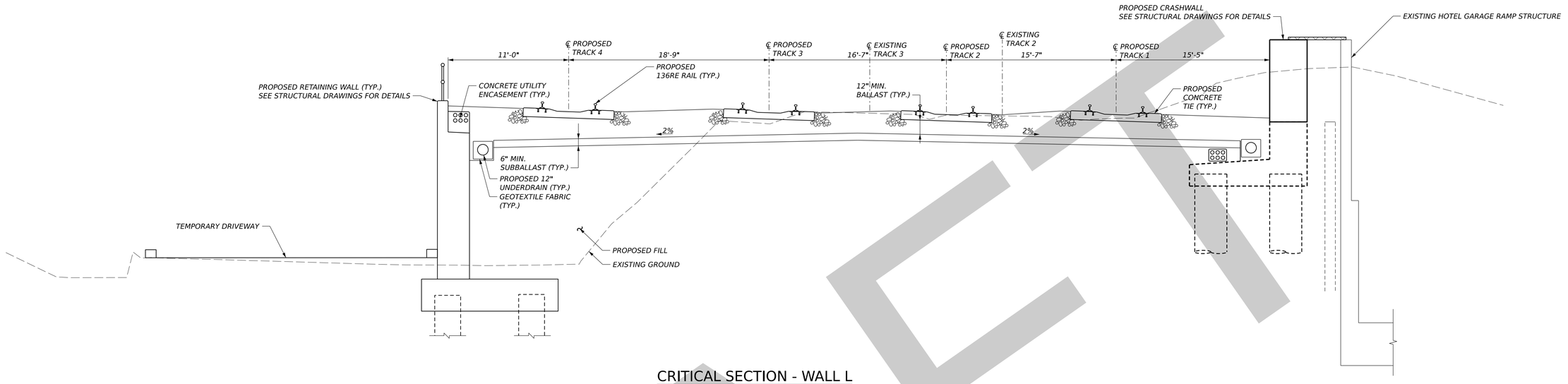
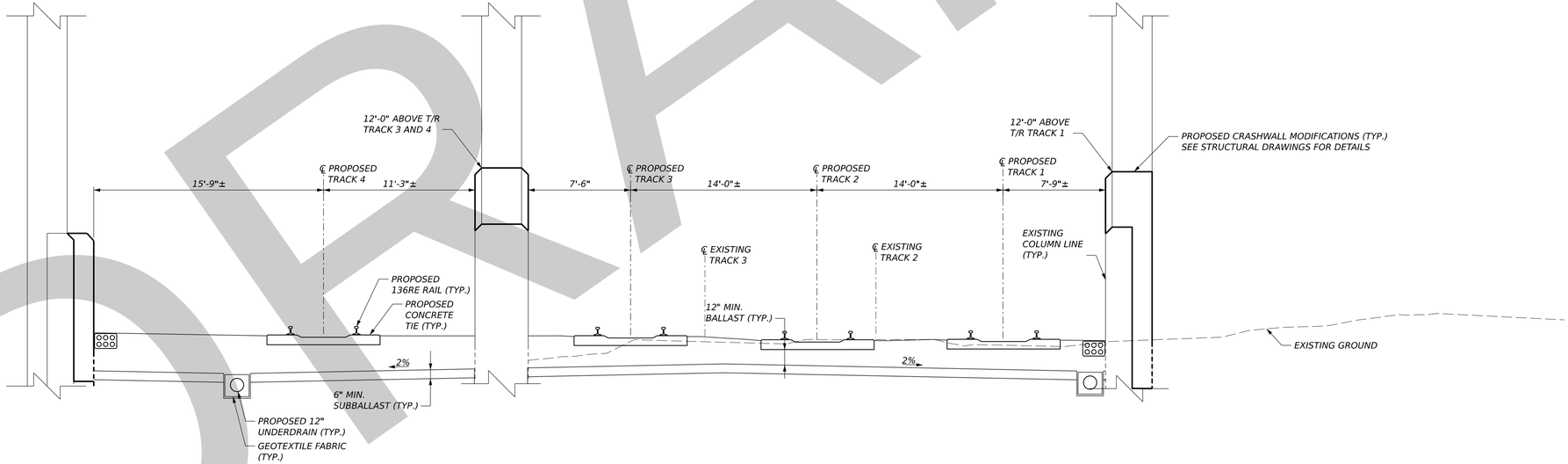
Plotted By: GBoles 2/8/2023
rrR02A_RR-502_CriticalSection_north.dgn



CRITICAL SECTION - WALL L

STA 3074+50 +/-
N.T.S.



CRITICAL SECTION - MARYLAND AVENUE OVERBUILD

STA 3077+00 +/-
N.T.S.

DRAFT

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DRAFT 30% SUBMISSION 2/13/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK CRITICAL SECTIONS (2 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-503
REV. N/A
SHEET NO. 57 OF 273
SCALE AS SHOWN

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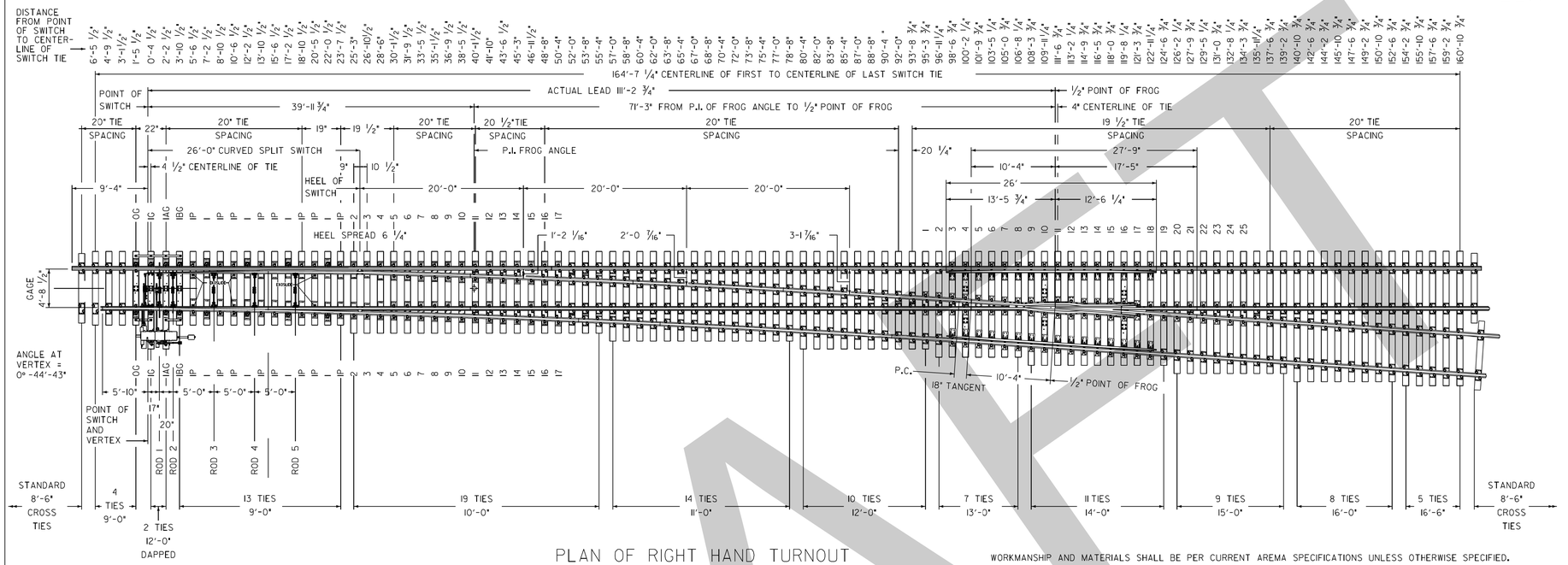
LBPE_id_v95.tbl
Plotted By: GBoles 2/8/2023
nrR02A_RR-503_CriticalSection_north.dgn



PLAN OF RIGHT HAND TURNOUT

TURNOUT DATA							
FROG	NUMBER		15				
	ANGLE		3°-49'-06"				
	TOTAL LENGTH		27'-9"				
	TOE LENGTH		10'-4"				
	HEEL LENGTH		17'-5"				
	TOE SPREAD		7 3/4"				
	HEEL SPREAD		14 7/16"				
SWITCH	LENGTH OF SWITCH POINT		26'-0"				
	HEEL SPREAD		6 1/4"				
	HEEL ANGLE		1°-32'-57"				
	CURVED POINT	THICKNESS OF POINT	0"				
		ANGLE AT POINT	0°-44'-47"				
		RADIUS	1,855.769'				
	STRAIGHT POINT	VERTEX DISTANCE	0"				
		THICKNESS OF POINT	0"				
		ANGLE AT POINT	0°-44'-43"				
		RADIUS	1,851.061'				
		VERTEX DISTANCE	0"				
ACTUAL LEAD			111'-2 3/4"				
TURNOUT CURVE	RADIUS OF CENTERLINE		1,853.415'				
	DEGREE OF CURVE		3°-03'-30"				
	CENTRAL ANGLE - SWITCH		0°-48'-10"				
	CENTRAL ANGLE - CLOSURE		2°-16'-09"				
	CENTRAL ANGLE - TOTAL		3°-04'-19"				
STRAIGHT CLOSURE LENGTH			74'-10 3/4"				
CURVED CLOSURE LENGTH			75'-0"				
TANGENT ADJACENT TOE OF FROG			18"				

BILL OF SWITCH TIES				
LENGTH	TURNOUT ONLY	CROSSOVER TRACK CENTERS 14'-0"	CROSSOVER TRACK CENTERS 15'-0"	
9'-0"	17	34	34	
10'-0"	19	38	38	
11'-0"	14	28	28	
12'-0"	10	20	20	
12'-0" (Dapped)	2	4	4	
13'-0"	7	14	14	
14'-0"	11	26	22	
15'-0"	9	0	18	
16'-0"	8	0	0	
16'-6"	5	0	0	
23'-0"	0	20	15	
TOTAL NO.	102	184	193	
BOARD MEAS.	6,458.1	11,997.5	12,517.3	
ALL SWITCH TIES ARE 7" x 9"				

ORDERING INFORMATION

CLASS	ITEM	DESCRIPTION
10	6650300	TURNOUT PANELED RH 136RE ON WOOD TIES NO 15 W/RBM FROG PER CSX DWG 2217 & 2218
10	6650310	TURNOUT PANELED LH 136RE ON WOOD TIES NO 15 W/RBM FROG PER CSX DWG 2217 & 2218

BILL OF TRACK MATERIAL

QUANTITY	DESCRIPTION
1	NO.15 RAILBOUND MANGANESE STEEL FROG, COMPLETE, PER DWG. 2415 BONDED FOR SIGNALS
2	GUARD RAILS, COMPLETE, (26' ADJUSTABLE)
1	58'-10" STRAIGHT STOCK RAIL PER DRAWING 2322
1	58'-8" BENT STOCK RAIL PER DRAWING 2322
1	38'-5" RAIL W/PREMIUM INSULATED JT.10'-0"-28'-5" LEGS
1	38'-5" RAIL W/PREMIUM INSULATED JT.20'0"-18'-5" LEGS
1	STRAIGHT CLOSURE RAIL: 61'-4 3/4"
260	FEET OF PREMIUM WELDED RAIL
1	26'-0"CURVED SPLIT SWITCH, COMPLETE, WITH UNIFORM RISERS, PER DWGS. 2321, 2322, 2323 2324, 2325, AND 2326
1	FRONT ROD ASSEMBLY PER SS001 AND SS044
12	JOINTS, COMPLETE INCL. J CLIPS AND BOLTS
6	INSULATED JOINTS, COMPLETE INC. E2063B CLIPS
1300	7 1/2" LONG EVERGRIP SPIKES
3	KEG TRACK SPIKES
196	PANDROL TIE PLATES
659	PANDROL CLIPS, REGULAR
1	PANDROL CLIP, LEFT HAND

WORKMANSHIP AND MATERIALS SHALL BE PER CURRENT AREMA SPECIFICATIONS UNLESS OTHERWISE SPECIFIED.

SINCE THE ALLOWABLE VARIATION IN STANDARD LENGTHS OF RAILS, FROGS AND SWITCH POINTS IS GREATER THAN THE NORMAL EXPANSION GAPS AT RAIL JOINTS AND THICKNESS OF INSULATING END POST IN INSULATED JOINTS, NO ALLOWANCE HAS BEEN MADE FOR EXPANSION GAPS AND INSULATION END POSTS IN COMPUTING LENGTHS OF RAIL SHOWN.

USE 26'-0" CURVED SPLIT SWITCH WITH UNIFORM RISERS PER DRAWING 2321.

SEE DRAWING 2218 FOR STRAIGHT AND CURVED CLOSURE RAILS, AND STRAIGHT AND CURVED LEAD RAILS.

MANUFACTURER SHALL VERIFY ALL DIMENSIONS BEFORE FABRICATION.

SWITCH HAS PRS CLAMPTITE BRACE.
ALTERNATE IS NORTRAK CLICKTITE.

FROG USES MILLED SEAT AND FLAT PLATES WITH WELDED PANDROL SHOULDERS PER DRAWING 2415.

EVERY TIE WILL BE BOX ANCHORED FOR A DISTANCE OF 234 FEET AHEAD OF THE SWITCH POINT, AND EVERY TIE ON BOTH TRACKS WILL BE BOX ANCHORED FOR A DISTANCE OF 234 FEET BEYOND THE JOINT OR WELD AT THE HEEL OF FROG.

THE NUMBER OF INSULATED JOINTS REQUIRED DEPENDS ON TURNOUT LOCATION.

USE 7-1/2" EVERGRIP SCREWS ON ALL PLATES.

SWITCH PLATE AND TIE LAYOUT ARRANGED FOR POWER THROW MECHANISM PER TRAIN CONTROL STANDARDS.

ALL FROG PLATES TO BE MILLED SEAT 3/4" UNDER RAIL BASE

CSX TRANSPORTATION

NO. 15 TURNOUT AND CROSSOVER
WITH 26'-0" CURVED SWITCH POINTS FOR 136RE RAIL

APPROVED – DIRECTOR ENGINEERING STANDARDS

APPROVED – ASSISTANT VICE PRESIDENT ENGINEERING

PREPARED BY, M.E. AUSTIN

ISSUED: MARCH 01, 2000
REVISED: DECEMBER 23, 2011

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY G. BOLES
DRAWN BY I. NOVAES
CHECKED BY S. KULLEN
APPROVED BY G. BOLES
DATE 2/8/2023

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CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK DETAILS
SPECIAL TRACKWORK (1 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-601
REV. N/A
SHEET NO. 58 OF 273
SCALE AS SHOWN

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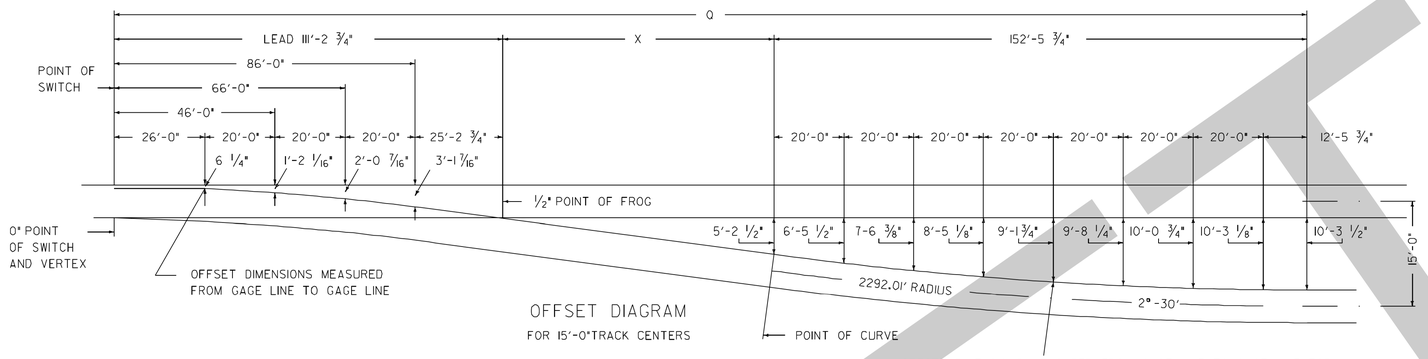
Plotted By: GBoles 2/8/2023
nrR02A_RR-601_TrackDetailsSpecialTrackwork_north.dgn

DRAFT



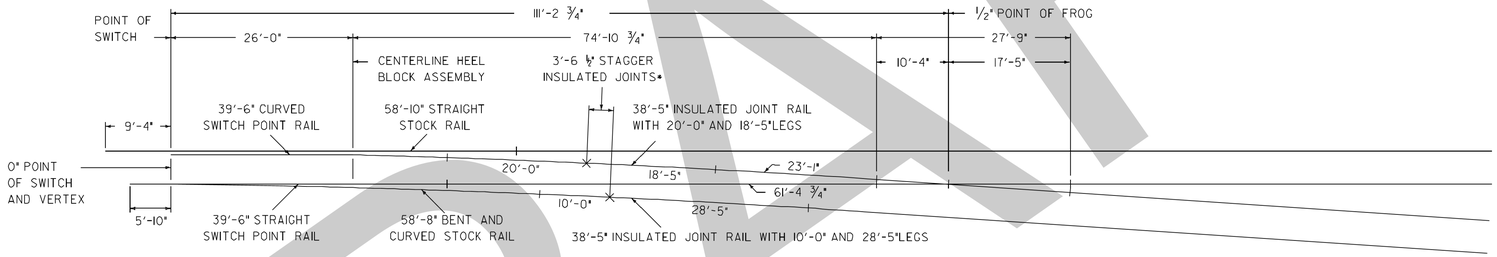
OFFSET DIAGRAM

FOR 15'-0"TRACK CENTERS

OFFSET DIMENSIONS MEASURED FROM GAGE LINE TO GAGE LINE. FOR TRACK CENTERS OTHER THAN 15'-0", INCREASE OR DECREASE OFFSET DIMENSIONS BY SAME AMOUNT THAT TRACK CENTERS ARE INCREASED OR DECREASED FROM 15'-0", AND ADJUST "X"DISTANCE.

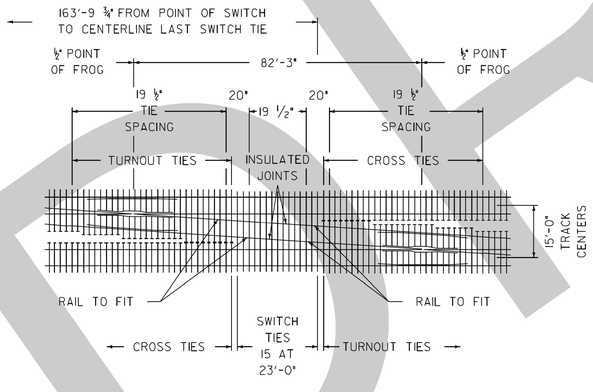
CROSSOVER DATA		
TRACK CENTERS	DISTANCE BETWEEN ½" POINTS OF FROGS	
	MAIN TRACK	CROSSOVER
15'-0"	82'- 3 "	82'-8 31/32"
14'-0"	67'- 3 3/16"	67'-8 25/32"
1'-0"CHANGE	14'-11 13/16"	15'-0 3/16"
1"CHANGE	14.9844"	15.0156"

CURVE DATA		
TRACK CENTERS	DIMENSION	
	Q	X
13'-0"	311'-2"	47'-5 1/2"
14'-0"	326'-1 3/4"	62'-5 1/4"
15'-0"	341'-1 5/8"	77'-5 1/8"
16'-0"	356'-1 3/8"	92'-4 3/8"
1.0"CHANGE	14.9844"	14.9844"

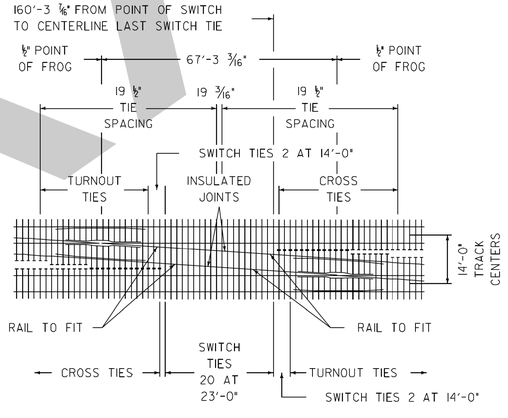


RAIL LAYOUT DIAGRAM

• IF INSULATED JOINTS ARE REQUIRED, USE PREMIUM INSULATED JOINT IN 38'-5" RAIL WITH LEGS AS SHOWN. MAXIMUM STAGGER ANY PAIR OF INSULATED JOINTS IS 4'-6".



CROSSOVER - 15'-0"TRACK CENTERS



CROSSOVER - 14'-0"TRACK CENTERS

CSX TRANSPORTATION

NUMBER 15 OFFSET AND LAYOUT DIAGRAMS FOR 136RE RAIL

APPROVED - DIRECTOR ENGINEERING STANDARDS

APPROVED - ASSISTANT VICE PRESIDENT ENGINEERING

PREPARED BY, M.E. AUSTIN

ISSUED: MARCH 01, 2000
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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TRACK DETAILS
SPECIAL TRACKWORK (2 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-602
REV. N/A
SHEET NO. 59 OF 273
SCALE AS SHOWN

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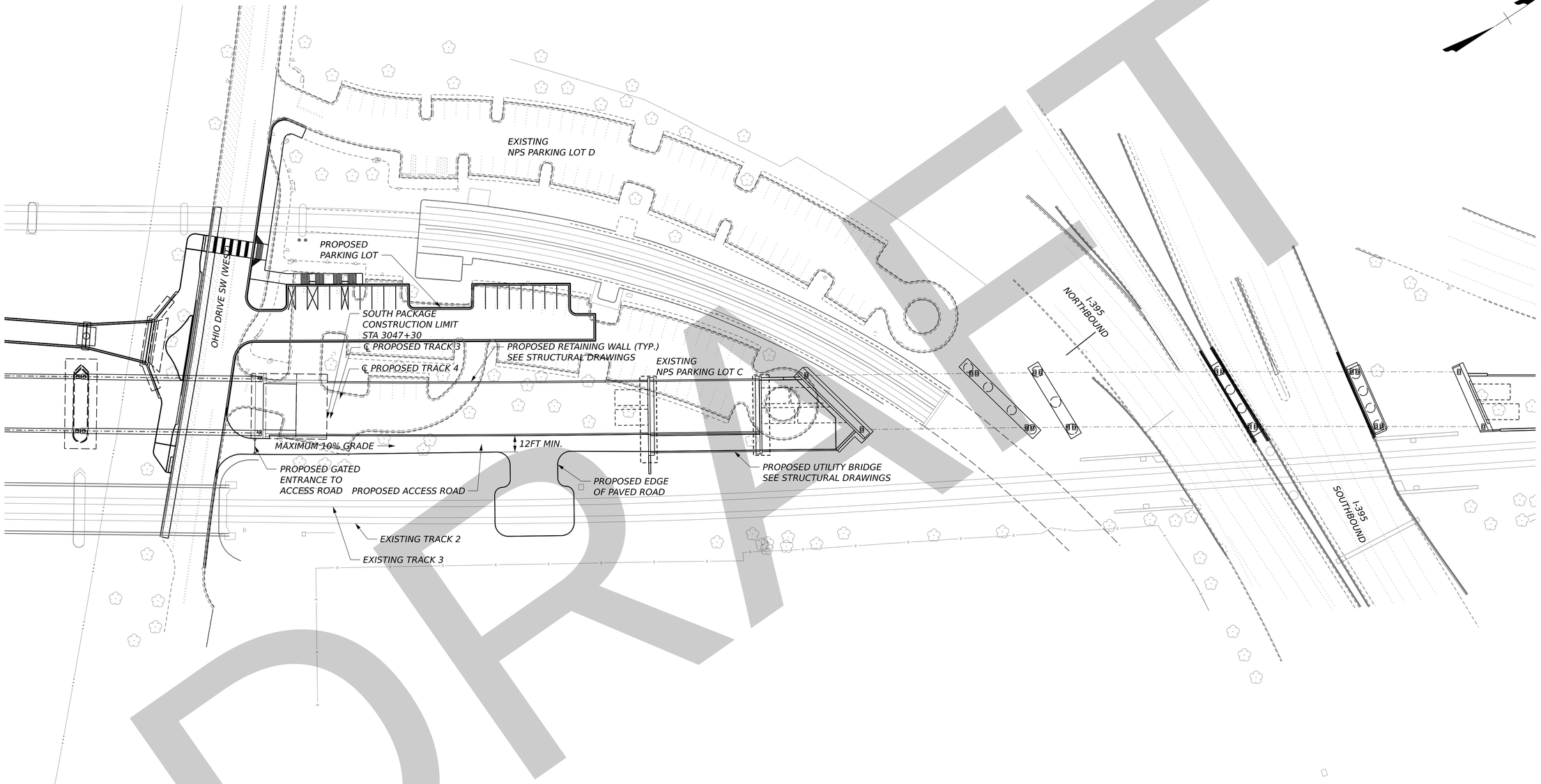
Plotted By: GBoles 2/8/2023
rrR02A_RR-602_TrackDetailsSpecialTrackwork_north.dgn

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PROPOSED ACCESS ROAD

SCALE: 1" = 40'-0"

NOTE: EXISTING AND PROPOSED UTILITIES SHOWN IN UTILITY RELOCATION PLANS

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PERMANENT ACCESS ROAD

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. RR-603
REV. N/A
SHEET NO. 60 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: GBoles
rrR02A_RR-603_PermanentAccessRoad.dgn
2/8/2023

SPECIFICATIONS

1. CONSTRUCTION: CONTRACT SPECIFICATIONS CONSISTING OF GENERAL PROVISIONS AND SPECIAL PROVISIONS.

2. DESIGN SPECIFICATIONS EXCEPT AS MODIFIED BY THE CONTRACT SPECIFICATIONS:
   - A. 2022 AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION (AREMA) MANUAL FOR RAILWAY ENGINEERING.
   - B. CSXT DESIGN AND CONSTRUCTION STANDARD SPECIFICATION VOLUME 1, MARCH 1, 2021.
   - C. CSXT MWI 2800 SERIES.
   - D. DISTRICT DEPARTMENT OF TRANSPORTATION (DDOT) DESIGN AND ENGINEERING MANUAL (DEM), JANUARY 2019.
   - E. DC WATER STANDARD SPECIFICATIONS, FEBRUARY 2020.
   - F. DC WATER PROJECT DESIGN MANUALS (PDM).
   - G. DDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND STRUCTURES, OCTOBER 2013
   - H. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION, 2020
   - I. WMATA ADJACENT CONSTRUCTION PROJECT MANUAL, SEPTEMBER 2015.
   - J. AASHTO/AWS BRIDGE WELDING CODE D1.5, 8TH EDITION.
   - K. AASHTO GUIDE SPECIFICATIONS FOR SEISMIC ISOLATION DESIGN, 4TH EDITION.
   - L. VIRGINIA RAILWAY EXPRESS (VRE) STANDARDS.
   - M. AMTRAK STANDARDS.
   - N. DISTRICT OF COLUMBIA BUILDING CODE, 2017.

3. DESIGN SERVICE LIFE: 100 YEARS.

CONSTRUCTION

1. THE CONTRACTOR SHALL PERFORM WORK AT THE SITE ONLY PER APPROVED SITE SPECIFIC SAFETY WORK PLANS. SEE SPECIFICATIONS.

2. THE CONTRACTOR SHALL TAKE THE PROPER PRECAUTIONS TO ASSURE THE STABILITY OF ALL STRUCTURAL ELEMENTS UNTIL THE TOTAL STRUCTURE IS COMPLETE AND ACCEPTED BY THE OWNER.

3. THE CONTRACTOR SHALL EMPLOY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE DISTRICT OF COLUMBIA AS APPROPRIATE TO DESIGN ALL TEMPORARY SHORING, BRACING, SUPPORTS, FALSEWORK, JACKING, OR OTHER TEMPORARY PROVISION TO ALLOW FOR CONSTRUCTION. ALL CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

4. ERECTION STRESSES SHALL BE LIMITED TO 125% OF AREMA NORMAL ALLOWABLES. CALCULATIONS OF ERECTION STRESSES SHALL BE PREPARED BY A LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE DISTRICT OF COLUMBIA AS APPROPRIATE AND SUBMITTED TO THE ENGINEER FOR REVIEW.

5. DC WATER WILL REQUIRE PRE-AUGERING OR EXCAVATION SUPPORT FOR ANY PROPOSED STRUCTURES THAT FALL WITHIN THE ZONE OF INFLUENCE OF ANY OF THEIR EXISTING UTILITY LINES.

DEFINITIONS

1. MEAN TEMPERATURE: 60 DEGREES FAHRENHEIT.

2. VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

MAINTENANCE OF NAVIGATION

1. DURING CONSTRUCTION, NAVIGATION WITHIN THE CLEARANCES INDICATED ON THE PLANS SHALL BE MAINTAINED AT ALL TIMES, EXCEPT AS THE CONTRACTOR MAY OBTAIN UNITED STATES COAST GUARD PERMISSION FOR TEMPORARY CLOSURE(S). SEE ALSO THE SPECIFICATIONS.

MAINTENANCE OF RAIL OPERATIONS

1. RAILROAD TRAFFIC SHALL BE MAINTAINED AND PROTECTED AT ALL TIMES AND THE CONTRACTOR SHALL AT NO TIME DURING CONSTRUCTION OF THIS PROJECT DELAY OR INTERFERE WITH THE SAFE OPERATION OF TRAIN TRAFFIC. ALL METHODS OF HANDLING THE WORK AFFECTING THE DELAY AND SAFETY OF TRAIN TRAFFIC SHALL BE APPROVED BY THE RAILROAD PRIOR TO PROCEEDING WITH THAT PART OF THE WORK.

TIDAL DATA

1. TIDAL DATA ELEVATIONS IN NORTH AMERICAN VERTICAL DATUM (NAVD) (FEET), PROVIDED BY NOAA GAGE 8594900 WASHINGTON, DC AT THE WASHINGTON CHANNEL UNDERGRADE BRIDGE, ARE AS FOLLOWS:

MEAN HIGHER HIGH WATER (MHHW)	1.77 FEET
MEAN HIGH WATER (MHW)	1.54 FEET
MEAN TIDE LEVEL	0.15 FEET
MEAN SEA LEVEL	0.15 FEET
MEAN LOW WATER	-1.25 FEET
MEAN LOWER LOW WATER	-1.40 FEET

DESIGN LOADS

1. DEAD LOAD
   - 1.1 STRUCTURAL STEEL - 490 PCF
   - 1.2 REINFORCED CONCRETE - 150 PCF
   - 1.3 BALLAST - 120 PCF
   - 1.4 TRACK AND RAILS - 200 PLF

2. LIVE LOAD: COOPER E80 WITH DIESEL IMPACT AND ALTERNATE LIVE LOAD FOR TIES, DECKS, STRINGERS, FLOORBEAMS AND GIRDERS. COOPER E90 FOR SUBSTRUCTURE ELEMENTS.

3. LONGITUDINAL FORCE FROM EQUIPMENT: THE GREATER OF LONGITUDINAL FORCE DUE TO BRAKING OR FORCE DUE TO TRACTION AS PRESCRIBED BY AREMA EQUATIONS. FOR MEMBERS RECEIVING LOAD FROM MORE THAN ONE TRACK, THE DESIGN LOAD ON THE TRACKS SHALL BE AS FOLLOWS:
   - FOR TWO TRACKS, FULL LOAD ON TWO TRACKS
   - FOR FOUR TRACKS, FULL LOAD ON TWO TRACKS, ONE-HALF ON ONE TRACK, AND ONE-QUARTER ON THE REMAINING ONE.

4. DESIGN TRAIN SPEED AND LOAD FOR CENTRIFUGAL FORCE ON STRUCTURE: DESIGNED FOR THE COOPER E80 AT 60 MPH.

5. OTHER LOADS: PER AREMA MANUAL.

CONCRETE

1. ALL CONCRETE PROPERTIES AND MATERIALS SHALL BE IN ACCORDANCE WITH CSXT DESIGN AND CONSTRUCTION STANDARD SPECIFICATIONS, DIVISION 7 - STRUCTURES.

2. EXPOSED EDGES OF CONCRETE SHALL BE BEVELED ¾" x ¾" UNLESS DIMENSIONED OTHERWISE.

3. CONSTRUCTION JOINTS, OTHER THAN THOSE SHOWN ON THE PLANS, WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

4. STRUCTURAL CONCRETE SHALL REACH ITS MINIMUM SPECIFIED DESIGN STRENGTH WITHIN 28 DAYS.

REINFORCEMENT STEEL FOR CONCRETE

1. ALL REINFORCEMENT STEEL FOR CONCRETE SHALL BE GALVANIZED, CONFORMING TO THE REQUIREMENTS OF ASTM A767, AFTER BENDING AND SHALL BE ASTM A615, GRADE 60 (AASHTO M31, GRADE 60). BASIC ALLOWABLE STRESS Fs = 24,000 PSI.

2. UNLESS SHOWN OTHERWISE, BARS AT SPLICES SHALL BE LAPPED IN ACCORDANCE WITH THE DESIGN CRITERIA.

3. CONCRETE COVER FOR REINFORCEMENT BARS SHALL CONFORM TO THE FOLLOWING, UNLESS INDICATED OTHERWISE ON THE DRAWINGS:
   - 3.1. TOP OF DECK SLAB.....2 1/2 IN
   - 3.2. BOTTOM OF DECK SLAB.....1 1/2 IN
   - 3.3. PIER CAPS (MAIN STEEL AND SECONDARY STEEL).....3 IN
   - 3.4. CAST IN PLACE PIERS AND PRECAST PIER SEGMENTS
     - 3.4.1.EXTERNAL SURFACE.....3 IN
     - 3.4.2.INTERNAL SURFACE.....2 IN
   - 3.5. PIER FOOTINGS.....3 IN
   - 3.6. ALL OTHER PRINCIPAL REINFORCEMENT.....2 1/2 IN
   - 3.7. ALL OTHER STIRRUPS AND TIES.....2 IN

4. MINIMUM COVER FOR REINFORCING STEEL IN CONCRETE PIER SURFACES EXPOSED TO SEAWATER OR SPRAY AT OR BELOW ELEVATION +10 SHALL BE 4 INCHES.

5. ALL DIMENSIONS RELATIVE TO REINFORCING STEEL EXCEPT COVER ARE TO CENTERLINE OF BAR, UNLESS NOTED OTHERWISE.

6. BAR BENDS SHALL CONFORM TO THE REQUIREMENTS OF ACI-318.

UTILITIES

1. LOCATIONS OF EXISTING UTILITIES ARE SHOWN BASED ON AVAILABLE EXISTING RECORD DRAWING INFORMATION (QUALITY LEVEL D AND C) AS WELL AS UTILITY DESIGNATION AND TEST PIT INFORMATION (QUALITY LEVEL B AND A).

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY J. HEWKO
DRAWN BY K. WENTWORTH
CHECKED BY G. GOODRICH
APPROVED BY J. KONRAD
DATE 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STRUCTURAL
GENERAL NOTES (1 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-001
REV. N/A
SHEET NO. 83 OF 273
SCALE AS SHOWN

CTDOT_pdf_CONNECT.pltcfg
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Plotted By: kwentworth 2/9/2023
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General Notes 1 Sheet File

STRUCTURAL STEEL GENERAL

1. STRUCTURAL STEEL SHALL CONFORM TO ASTM A709 GRADE 50W (AASHTO M270) UNLESS NOTED OTHERWISE. GRADE HPS 70W REQUIRES APPROVAL PER CSXT 0701252.1B.
2. HIGH STRENGTH BOLTS SHALL CONFORM TO ASTM F3125 TYPE A325, TYPE 3, INSTALLED AS FRICTION-TYPE CONNECTIONS. UNLESS OTHERWISE NOTED, BOLT THREADS SHALL BE EXCLUDED FROM THE SHEAR PLANES.
3. CONNECTIONS SHALL BE CLASS-B SLIP CRITICAL JOINTS UNLESS OTHERWISE NOTED.
4. ANCHOR BOLTS SHALL CONFORM TO ASTM 1554 GRADE 55 AND SHALL BE HOT-DIPPED GALVANIZED.
5. STRUCTURAL STEEL FABRICATOR(S) SHALL BE CERTIFIED UNDER THE AISC QUALITY CONTROL PROGRAM, CATEGORY CBR-F, MAJOR STEEL BRIDGES.
6. THE MAIN GIRDERS OF THE THROUGH GIRDERS ARE NON-REDUNDANT FRACTURE CRITICAL MEMBERS AND SHALL CONFORM TO THE REQUIREMENTS OF AREMA CHAPTER 15, PART 1, SECTION 1.14.
7. ALL STEEL DESIGNATED AS FRACTURE CRITICAL (FCM) AND ALL WELDS THAT JOIN AT LEAST ONE PLATE CONSIDERED FRACTURE CRITICAL, REGARDLESS OF DIRECTION OF STRESS, SHALL MEET AREMA REQUIREMENTS FOR FRACTURE CRITICAL MEMBERS. FCMS SHALL MEET AREMA IMPACT TEST REQUIREMENTS FOR FRACTURE CRITICAL MEMBERS, FURNISHED TO ZONE 2. ALL STEEL DESIGNATED (T) SHALL MEET AREMA IMPACT TEST REQUIREMENTS FOR STRUCTURAL STEEL OTHER THAN FRACTURE CRITICAL MEMBERS. ALL CONNECTION PLATES AND ANGLES FOR FCM SHALL BE CONSIDERED FCM. THIS INCLUDES GIRDER AND FLOORBEAM STIFFENERS.
8. STEEL SHALL MEET CHARPY IMPACT TEST REQUIREMENTS FOR TEMPERATURE ZONE 2. THE CONTRACTOR SHALL SUBMIT CHARPY TEST RESULTS TO THE ENGINEER FOR APPROVAL. SUPPLEMENTARY REQUIREMENTS FOR NOTCH TOUGHNESS FOR ALL FRACTURE CRITICAL MEMBERS SHALL BE PROVIDED TO THE ENGINEER.
9. CHARPY V-NOTCH REQUIREMENTS FOR STRUCTURAL STEEL SHALL BE AS FOLLOWS:

THICKNESS	FCM STEEL	OTHER STEEL
UP TO 1½"	25 FT-LBS @ 40°F	15 FT-LBS @ 40°F
1½" TO 2"	25 FT-LBS @ 40°F	15 FT-LBS @ 40°F
OVER 2"-4" (BOLTED)	25 FT-LBS @ 40°F	15 FT-LBS @ 40°F
OVER 2"-4" (WELDED)	25 FT-LBS @ 40°F	15 FT-LBS @ 40°F

10. STEEL PLATE OF THICKNESS TWO (2) INCHES AND GREATER FOR MAIN LOAD CARRYING MEMBERS, FLOORBEAMS AND GIRDERS SHALL BE TESTED FOR LAMINATIONS PER ASTM A435.
11. WHERE SHIMS ARE CALLED FOR IN THE DRAWINGS, SHIM PACKS SHALL BE PROVIDED. SHIMS SHOWN ON THE DRAWINGS ARE PROVIDED FOR VARIOUS ADJUSTMENTS EXPECTED TO BE REQUIRED FOR ERECTION. ANY ADDITIONAL SHIMS OR HOLES WHICH THE CONTRACTOR ADDS FOR FACILITATING FIELD ADJUSTMENTS SHALL BE SHOWN ON SHOP DRAWINGS.
12. MINIMUM THICKNESS FOR FILL PLATES SHALL BE ¼", EXCEPT IN SHIM PACKS.
13. FIELD SPLICES, OTHER THAN THOSE INDICATED ON THE PLANS, WILL NOT BE ALLOWED.
14. PLATE GIRDER FLANGES SHALL NOT EXCEED 4 INCH THICKNESS.
15. FLANGE-TO-WEB WELDS SHALL BE COMPLETE JOINT PENETRATION (CJP) PER CSXT PUBLIC PROJECTS MANUAL. DERIVATION FROM THIS REQUIRES CSXT APPROVAL.
16. SEE ALSO THE SPECIFICATIONS FOR STRUCTURAL STEEL AND FOLLOWING NOTES FOR FURTHER REQUIREMENTS.

STRUCTURAL STEEL WELDING

1. WELDING DETAILS, PROCEDURES, AND TESTING METHODS SHALL CONFORM TO AWS D1.5, AS MODIFIED OR SUPPLEMENTED BY AREMA, UNLESS OTHERWISE NOTED ON THE PLANS.
2. JOINT WELDING PROCEDURES, OVERALL FABRICATION METHODS, AND QUALITY CONTROL INSPECTION PROCEDURES SHALL BE INCLUDED IN THE WRITTEN PROCEDURE SPECIFICATIONS WITH THE SHOP DRAWING SUBMISSIONS.
3. IN ADDITION TO AWS WELD INSPECTION REQUIREMENTS, ALL WELDS SHALL BE 100% VISUALLY INSPECTED.
4. ALLOWANCE SHALL BE MADE IN THE SHOP FOR SHRINKAGE DUE TO WELDING AND BURNING. IF UNEVEN SHRINKAGE IS ANTICIPATED, CAMBER ORDINATES SHALL BE ADJUSTED ACCORDINGLY.
5. FILLET WELDS SHALL BE $\frac{5}{16}$" MINIMUM, UNLESS OTHERWISE NOTED.
6. ALL WELDING ELECTRODES SHALL BE E70XX LOW HYDROGEN CONFORMING TO AWS D1.5, UNLESS OTHERWISE NOTED.
7. BUTT WELDS SHALL BE FULL PENETRATION WELDS. PROVIDE BACKING BARS AS REQUIRED. ALL BACKING BARS SHALL BE REMOVED.
8. ALL SHOP GROOVE WELDS IN THE WEB PLATES AND FLANGE PLATES SHALL BE FINISHED SMOOTH AND FLUSH WITH THE BASE METAL ON ALL SURFACES BY GRINDING IN THE DIRECTION OF APPLIED STRESS, LEAVING THE SURFACES FREE FROM DEPRESSIONS, AND SHALL BE INSPECTED BY ULTRASONIC TESTING. THE GRINDING SHALL NOT REDUCE THE THICKNESS OF THE BASE METAL BY MORE THAN $\frac{1}{32}$" OR 5% OF THE THICKNESS, WHICHEVER IS SMALLER.
9. ALL WEB TO FLANGE AND WEB TO STIFFENER FILLET WELDS SHALL BE INSPECTED BY THE MAGNETIC PARTICLE METHOD. AT LEAST EVERY ONE FOOT OF EVERY TEN FOOT LENGTH OF FILLET WELD SHALL BE TESTED. AT LEAST ONE FOOT OF FILLET WELDS SHORTER THAN 10 FEET SHALL BE TESTED. IF UNACCEPTABLE DISCONTINUITIES ARE FOUND IN ANY TEST LENGTH OF WELD, THE FULL LENGTH OF WELD OR FIVE FEET ON EITHER SIDE OF THE WELD, WHICHEVER IS LESS, SHALL BE TESTED.
10. MULTIPLE PASS WELDS INSPECTED BY THE MAGNETIC PARTICLE METHOD SHALL HAVE EACH PASS OR LAYER INSPECTED AND ACCEPTED BEFORE PROCEEDING TO THE NEXT PASS OR LAYER AS DETERMINED BY THE ENGINEER.
11. ALL GROOVE WELDS SHALL BE COMPLETE PENETRATION (CP). JOINT PREPARATION IS OPTIONAL WITH THE FABRICATOR, SUBJECT TO AWS REQUIREMENTS. WHERE BACKING BAR STRIPS ARE TO BE LEFT IN PLACE, THEY SHALL BE CONTINUOUS FOR THE FULL LENGTH OF THE WELD. ALL JOINTS IN THE BACKING BARS SHALL BE MADE WITH COMPLETE PENETRATION BUTT WELDS AND INSPECTED BY THE ULTRASONIC METHOD PRIOR TO ASSEMBLY WITH PLATES. SEE DETAILS ON LIFT SPAN NOTES SHEET(S).
12. NO FIELD WELDING WILL BE PERMITTED UNLESS SHOWN ON THE CONTRACT DRAWINGS.
13. NO WELDED ATTACHMENTS WILL BE PERMITTED UNLESS SHOWN ON THE CONTRACT DRAWINGS.
14. WELDED BUILT-UP BEARING ASSEMBLIES SHALL BE STRESS RELIEVED PER AWS D1.5 ARTICLE 4.4.
15. SHOP WEB SPLICES SHALL BE LOCATED A MINIMUM OF SIX (6) INCHES FROM THE FLANGE SPLICES.
16. STIFFENERS AND CONNECTION PLATES SHALL BE LOCATED A MINIMUM OF SIX (6) INCHES FROM FLANGE OR WEB SPLICES.

ABBREVIATIONS

ABUT.	-	ABUTMENT
APPROX.	-	APPROXIMATELY
BRG.	-	BEARING
BTM.	-	BOTTOM
℄	-	CENTERLINE
CONC	-	CONCRETE
DIA.	-	DIAMETER
EXP.	-	EXPANSION
ELEV.	-	ELEVATION
EXIST.	-	EXISTING
FIX.	-	FIXED
FB	-	FLOORBEAM
GWMP	-	GEORGE WASHINGTON MEMORIAL PARKWAY
MAX.	-	MAXIMUM
MHW	-	MEAN HIGH WATER
MIN.	-	MINIMUM
MLW	-	MEAN LOW WATER
MVC	-	MINIMUM VERTICAL CLEARANCE
NB	-	NORTHBOUND
O.C.	-	ON CENTER
O/O	-	OUT TO OUT
PL	-	PLATE
PROP.	-	PROPOSED
REQ.	-	REQUIRED
SB	-	SOUTHBOUND
STA.	-	STATION
SW	-	SOUTHWEST
TBD	-	TO BE DETERMINED
TYP.	-	TYPICAL
U.N.O	-	UNLESS NOTED OTHERWISE

LEGEND

BH-XX	-	BRIDGE BORING
I-XX	-	HISTORIC BORING
L-XX	-	LAND BORING
R-XX	-	RIVER BORING
CPT-XX	-	CONE PENETRATION TEST
	-	DIRECTION OF TRAFFIC
	-	FLOW DIRECTION

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. HEWKO
DRAWN BY: K. WENTWORTH
CHECKED BY: G. GOODRICH
APPROVED BY: J. KONRAD
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STRUCTURAL
GENERAL NOTES (2 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-002
REV. N/A
SHEET NO. 84 OF 273
SCALE AS SHOWN

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Plotted By: kwentworth 2/9/2023
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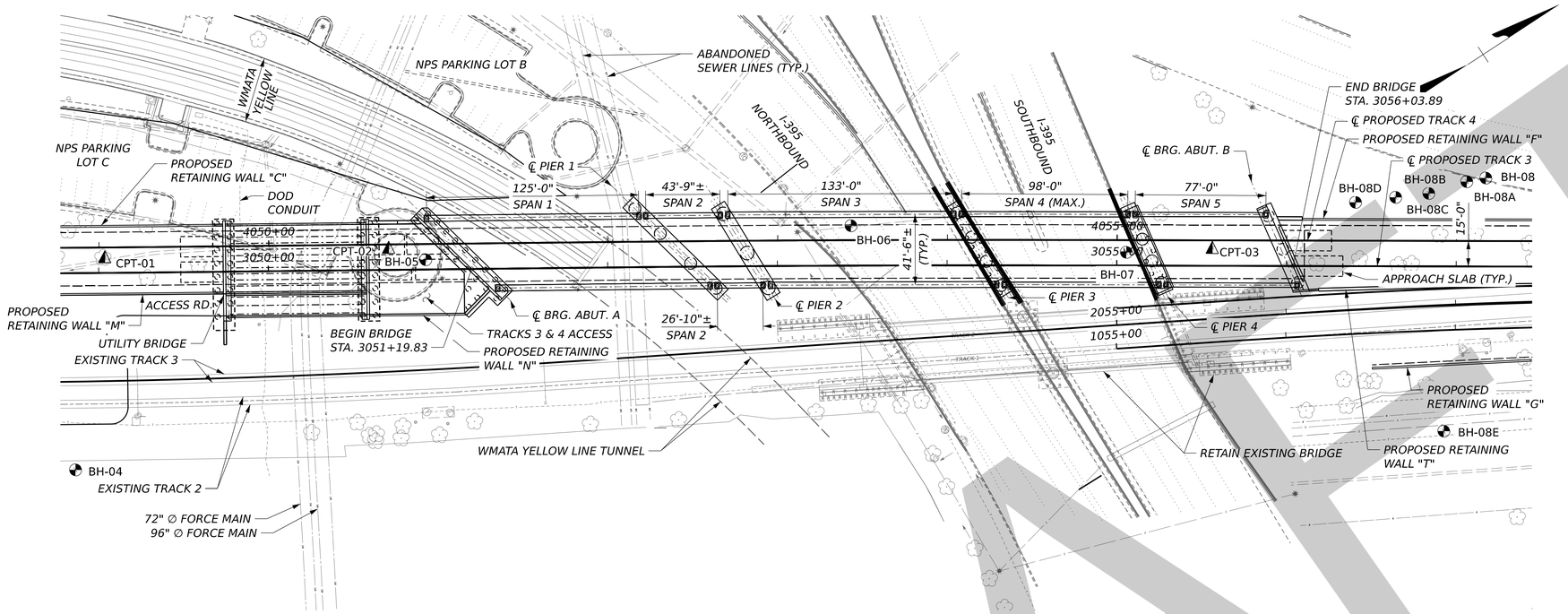
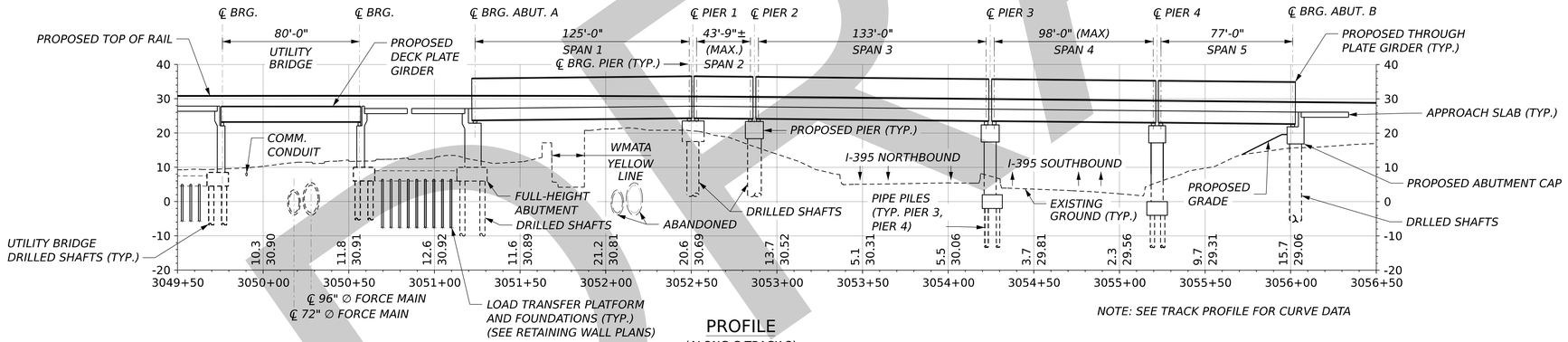
General Notes Sheet File



KEY PLAN
SCALE: 1" = 40'-0"

LOCUS MAP
SCALE 1" = 1000'



PROFILE
(ALONG ℄ TRACK 3)
SCALE: 1" = 40'-0" (HORIZONTAL)
1" = 20'-0" (VERTICAL)

NOTE: SEE TRACK PROFILE FOR CURVE DATA

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. SMIACH
DRAWN BY: K. SMIACH
CHECKED BY: E. LAWES
APPROVED BY: G. GOODRICH
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

WMATA/I-395 UNDERGRADE BRIDGE
KEY PLAN AND PROFILE

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-301
REV. N/A
SHEET NO. 85 OF 273
SCALE: AS SHOWN

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Plotted By: ksmiach 2/7/2023
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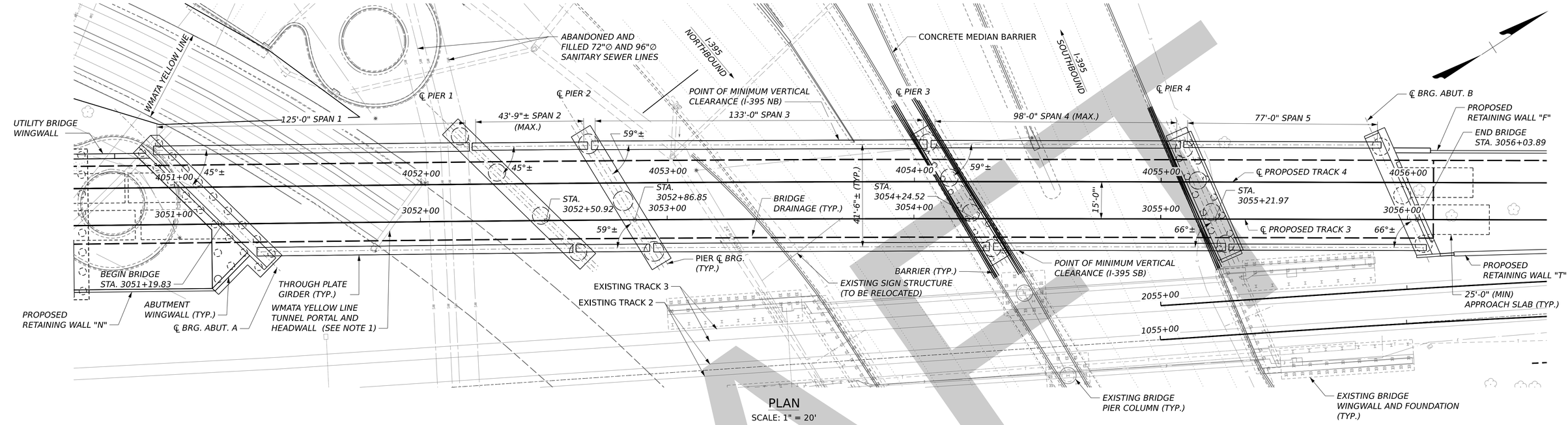
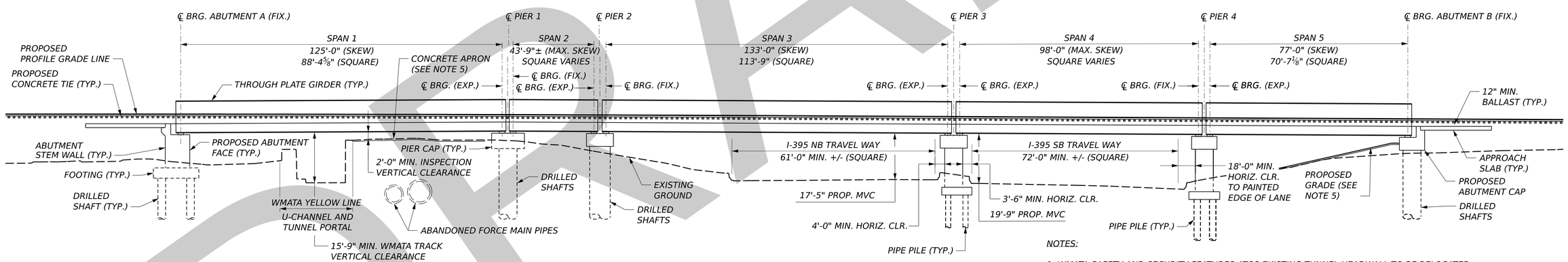
WMATA.I395 PLAN AND PROFILE



PLAN

SCALE: 1" = 20'



LONGITUDINAL SECTION

(ALONG ℄ PROPOSED TRACK 3)
SCALE: 1" = 20'
(SQUARE DIMENSIONS ARE PERPENDICULAR TO CENTERLINES OF BEARING)

NOTES:

1. WMATA SAFETY AND SECURITY FEATURES ATOP EXISTING TUNNEL HEADWALL TO BE RELOCATED. PROVIDE ADDITIONAL FENCING TO PREVENT ACCESS TO WMATA INFRASTRUCTURE.
2. ALL UNDERGROUND UTILITIES NOT SHOWN IN SECTION FOR CLARITY. SEE UTILITY RELOCATION PLANS FOR FURTHER INFORMATION.
3. 1979 WMATA YELLOW LINE CONSTRUCTION PLANS INDICATE THE PRESENCE OF A 'BOAT SLAB' UNDER INTERSTATE I-395. THIS SLAB WAS NOT ENCOUNTERED DURING GEOTECHNICAL EXPLORATIONS. OBSTRUCTIONS WERE ENCOUNTERED ON A POSSIBLE ABANDONED BURIED ROAD IN BORINGS BH-08A TO BH-08D. THE CONTRACTOR IS ALERTED TO THE FACT THAT OBSTRUCTIONS MAY BE ENCOUNTERED DURING ANY DRILLING OR PILE DRIVING.
4. UTILITY BRIDGE NOT SHOWN IN LONGITUDINAL SECTION. SEE DRAWINGS B-313 TO B-315 FOR ADDITIONAL DETAILS.
5. PROVIDE A SLOPED CONCRETE APRON OR PAVER COURSE UNDER THE PROPOSED SPAN 5 BRIDGE FOOTPRINT. PROVIDE A CONCRETE APRON BEHIND THE WMATA PORTAL UNDER SPAN 1, SLOPED TO DRAIN.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY K. SMIACH
DRAWN BY K. SMIACH
CHECKED BY E. LAWES
APPROVED BY G. GOODRICH
DATE 2/8/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

WMATA/I-395 UNDERGRADE BRIDGE
PLAN AND LONGITUDINAL SECTION

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-302
REV. N/A
SHEET NO. 86 OF 273
SCALE AS SHOWN

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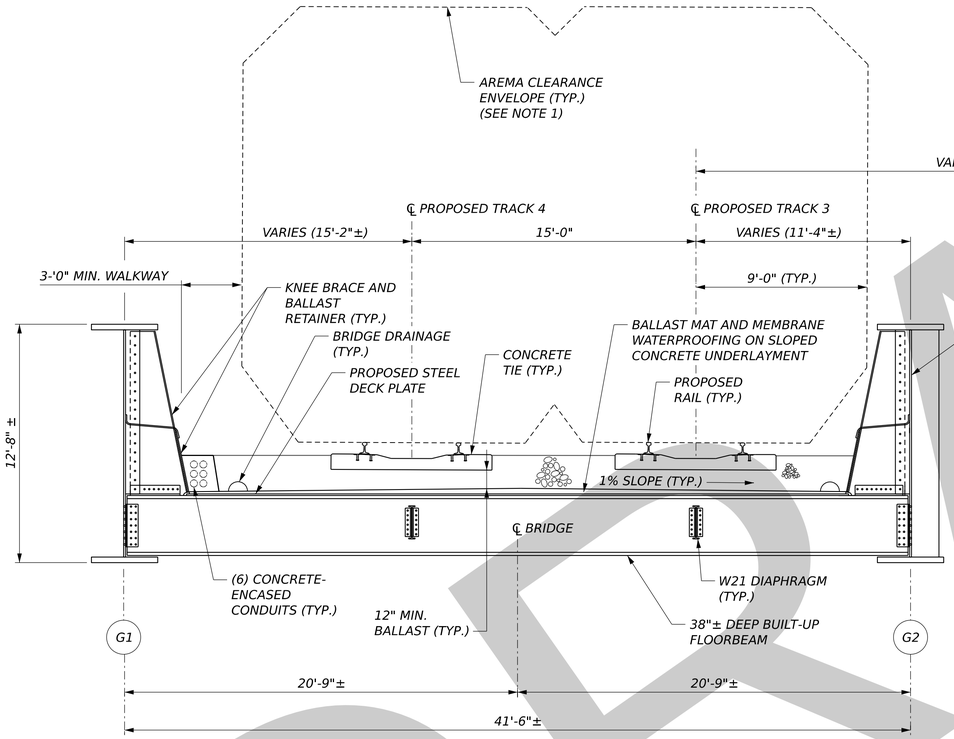

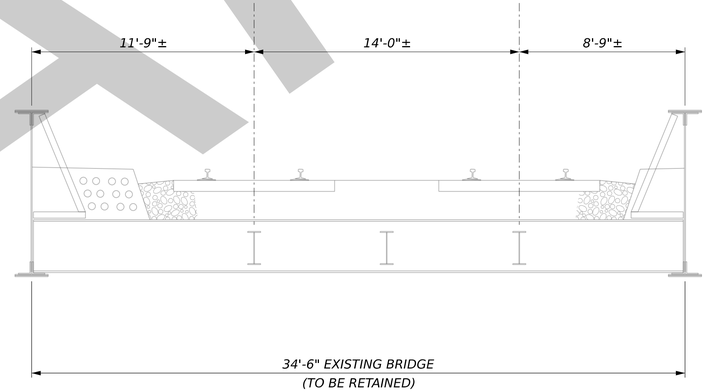

PROPOSED BRIDGE OVER WMATA & I-395 (PROPOSED TRACKS 3 AND 4)

EXISTING BRIDGE OVER I-395 (PROPOSED TRACKS 1 AND 2)

TRANSVERSE SECTION

SCALE: ¼" = 1'-0"

NOTE:

1. *TRACK CLEARANCE ENVELOPE SHALL MEET THE REQUIREMENTS OF AREMA EXCEPT AS SHOWN. ON CURVED SECTIONS OF TRACK, THE LATERAL CLEARANCE EACH SIDE OF TRACK CENTERLINE SHALL BE INCREASED 1.5" PER DEGREE OF CURVATURE.*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. SMIACH
DRAWN BY: K. SMIACH
CHECKED BY: E. LAWES
APPROVED BY: G. GOODRICH
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

WMATA/I-395 UNDERGRADE BRIDGE
TRANSVERSE SECTION

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-303
REV. N/A
SHEET NO. 87 OF 273
SCALE AS SHOWN

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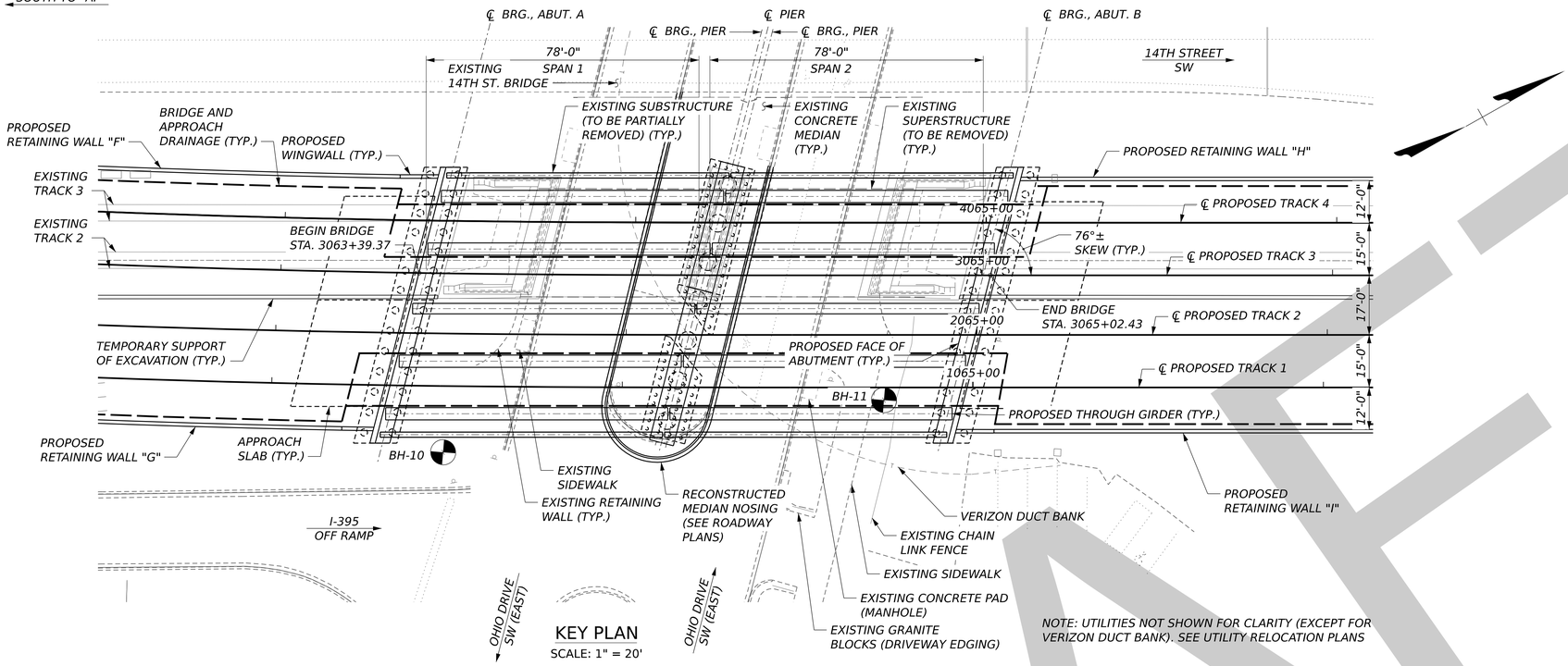
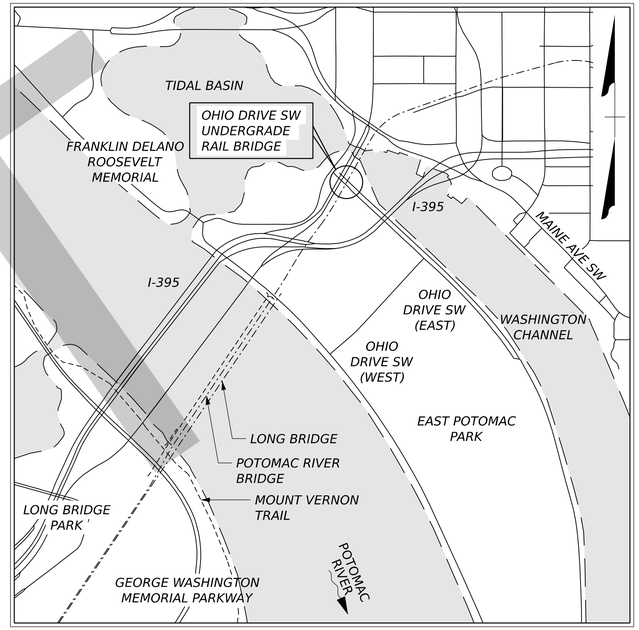
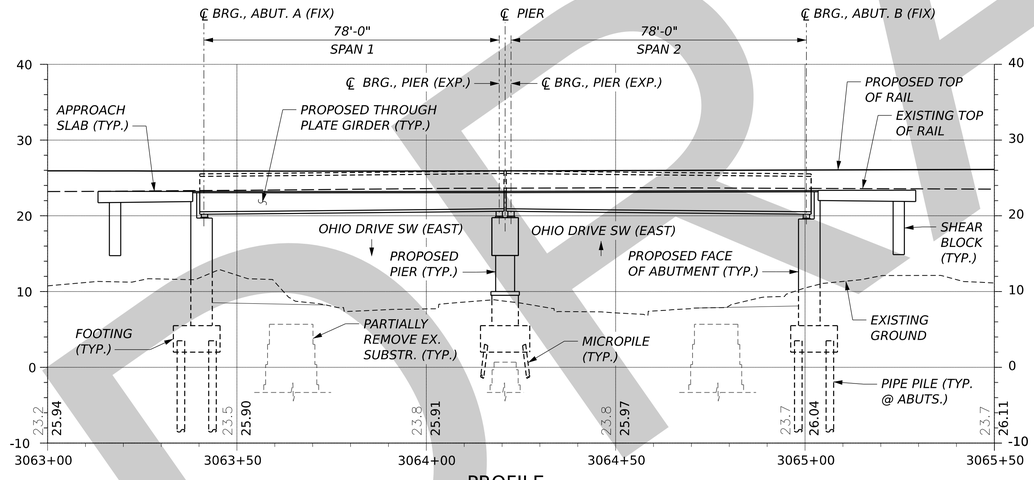


KEY PLAN
SCALE: 1" = 20'



LOCUS MAP
SCALE 1" = 1000'



PROFILE
(ALONG ℄ PROPOSED TRACK 3)
SCALE: 1" = 20' (HORIZONTAL)
1" = 10' (VERTICAL)

NOTE: SEE TRACK PROFILE FOR CURVE DATA

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. SMIACH
DRAWN BY: K. WENTWORTH
CHECKED BY: T. MOORE
APPROVED BY: G. GOODRICH
DATE: 2/7/2023

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL
OHIO DRIVE SW UNDERGRADE BRIDGE
KEY PLAN AND PROFILE

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-501
REV. N/A
SHEET NO. 100 OF 273
SCALE AS SHOWN

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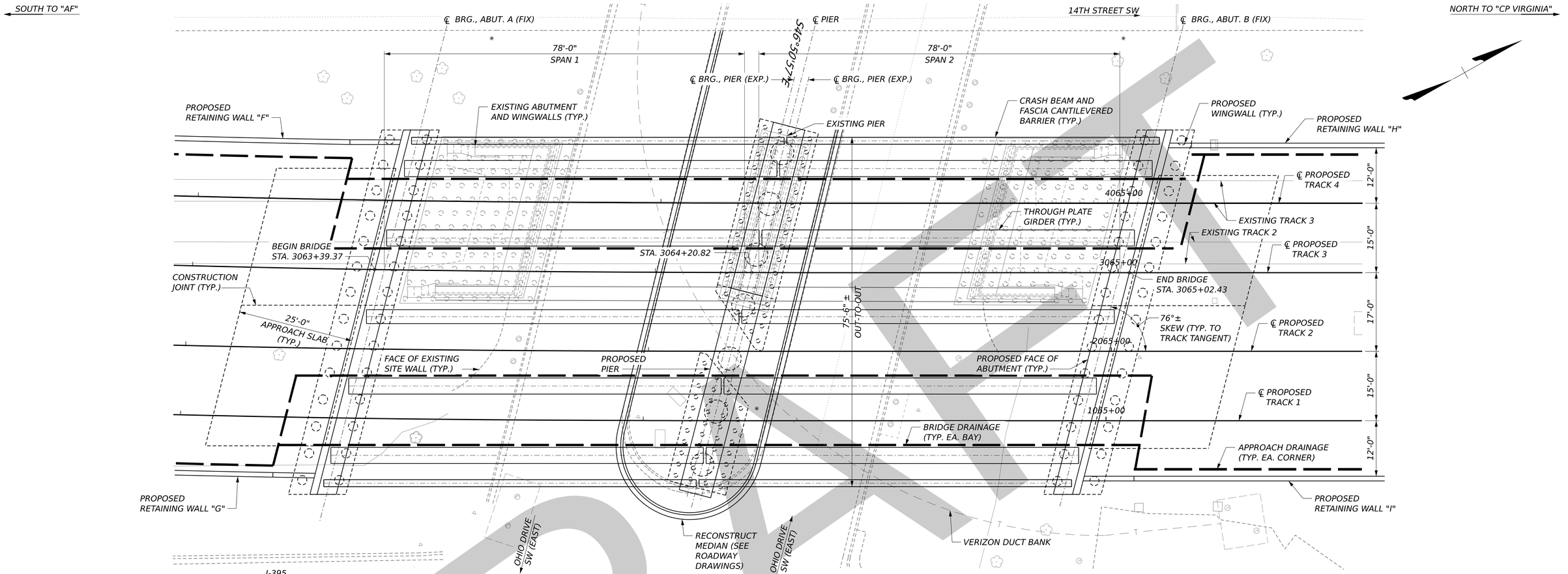
Ohio Drive Plan and Profile

DRAFT

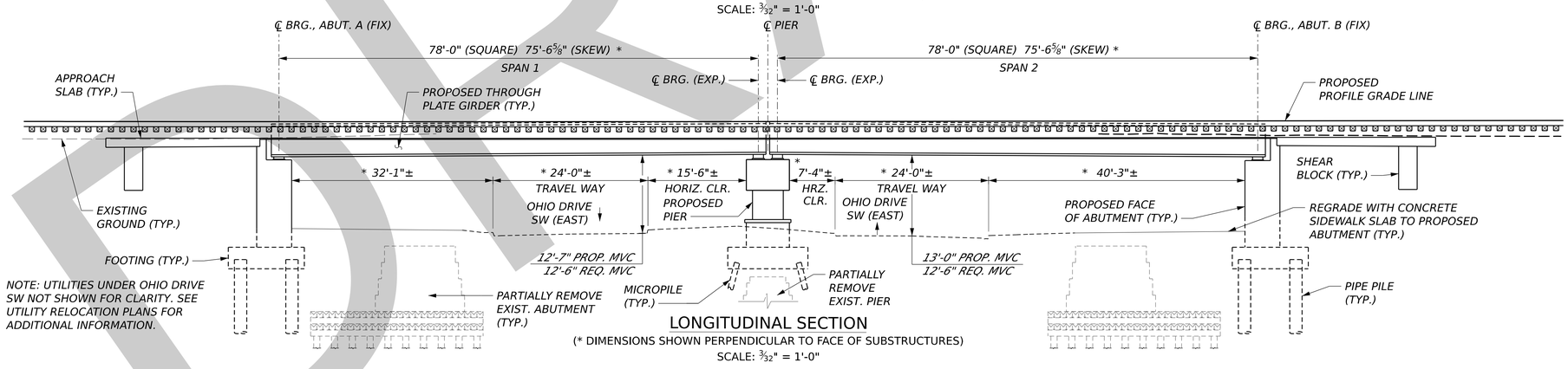


PLAN

(ONLY SUPERSTRUCTURE GIRDERS SHOWN FOR CLARITY)

SCALE: 3/32" = 1'-0"

NOTE: UTILITIES NOT SHOWN FOR CLARITY (EXCEPT FOR VERIZON DUCT BANK). SEE UTILITY RELOCATION PLANS.



NOTE: UTILITIES UNDER OHIO DRIVE SW NOT SHOWN FOR CLARITY. SEE UTILITY RELOCATION PLANS FOR ADDITIONAL INFORMATION.

LONGITUDINAL SECTION

(* DIMENSIONS SHOWN PERPENDICULAR TO FACE OF SUBSTRUCTURES)

SCALE: 3/32" = 1'-0"

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. SMIACH
DRAWN BY: K. WENTWORTH
CHECKED BY: T. MOORE
APPROVED BY: G. GOODRICH
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

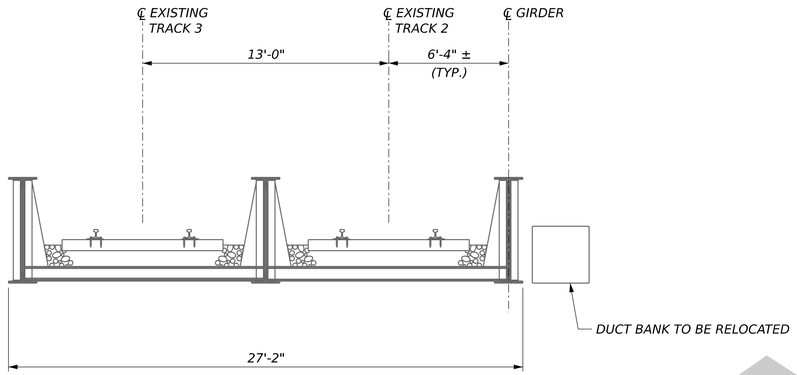
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

OHIO DRIVE SW UNDERGRADE BRIDGE
PLAN AND LONGITUDINAL SECTION

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-502
REV. N/A
SHEET NO. 101 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_-95.tbl
Plotted By: ksmiach 2/7/2023
b05_R02A_B502_pe.dgn
Untitled Sheet

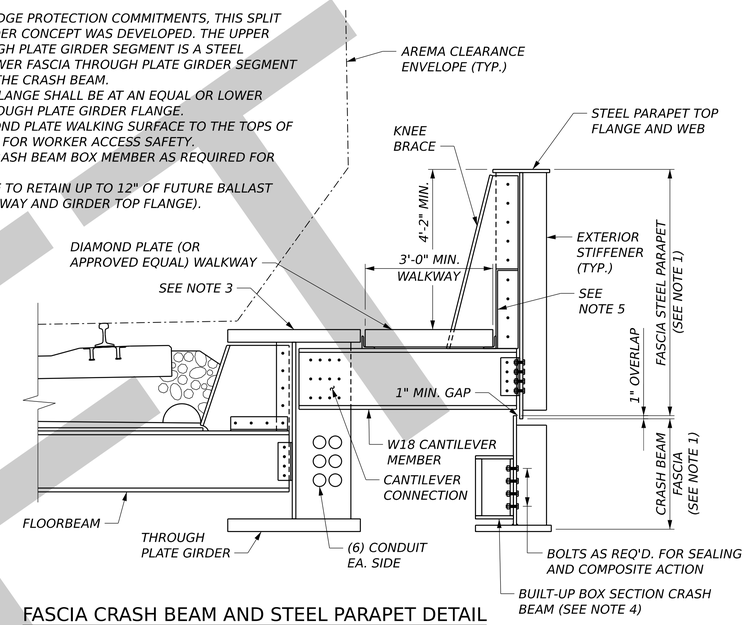


EXISTING TRANSVERSE SECTION

SCALE: ¼" = 1'-0"

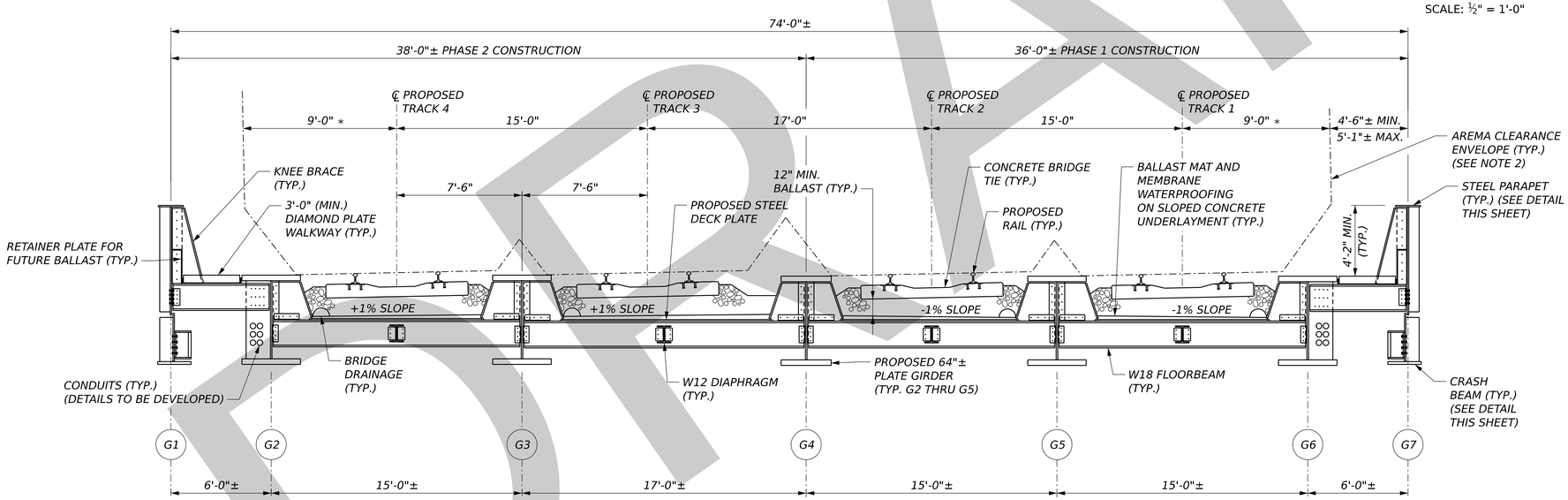
NOTES:

1. TO SATISFY AESTHETIC AND BRIDGE PROTECTION COMMITMENTS, THIS SPLIT EXTERIOR THROUGH PLATE GIRDER CONCEPT WAS DEVELOPED. THE UPPER PORTION OF THE FASCIA THROUGH PLATE GIRDER SEGMENT IS A STEEL PARAPET (RAILING) AND THE LOWER FASCIA THROUGH PLATE GIRDER SEGMENT CONCEALS AND STRENGTHENS THE CRASH BEAM.
2. THE BOTTOM OF CRASH BEAM FLANGE SHALL BE AT AN EQUAL OR LOWER ELEVATION THAN THE MAIN THROUGH PLATE GIRDER FLANGE.
3. PERMANENTLY ADHERE A DIAMOND PLATE WALKING SURFACE TO THE TOPS OF EXTERIOR GIRDER TOP FLANGES FOR WORKER ACCESS SAFETY.
4. PROVIDE HANDHOLES IN THE CRASH BEAM BOX MEMBER AS REQUIRED FOR CONNECTION ACCESS.
5. PROVIDE A BALLAST STOP PLATE TO RETAIN UP TO 12" OF FUTURE BALLAST (BALLAST MAY FLOOD THE WALKWAY AND GIRDER TOP FLANGE).



FASCIA CRASH BEAM AND STEEL PARAPET DETAIL

SCALE: ½" = 1'-0"



TRANSVERSE SECTION

SCALE: ¼" = 1'-0"

** 9'-0" TO CLEARANCE ENVELOPE IS NOMINAL, ROTATED TO THE TRACK SUPERELEVATION*

NOTES:

1. EXISTING UTILITIES TO BE REROUTED TO NEW CONDUITS AS SHOWN. DETAILS TO BE DEVELOPED IN FUTURE PROJECT STAGES.
2. TRACK CLEARANCE ENVELOPE SHALL MEET THE REQUIREMENTS OF AREMA EXCEPT AS SHOWN. ON CURVED SECTIONS OF TRACK, THE LATERAL CLEARANCE EACH SIDE OF TRACK CENTERLINE SHALL BE INCREASED 1.5" PER DEGREE OF CURVATURE.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	K. SMIACH
DRAWN BY	K. WENTWORTH
CHECKED BY	T. MOORE
APPROVED BY	G. GOODRICH
DATE	2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL
OHIO DRIVE SW UNDERGRADE BRIDGE
TRANSVERSE SECTION

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	B-503
REV.	N/A
SHEET NO.	102 OF 273
SCALE	AS SHOWN

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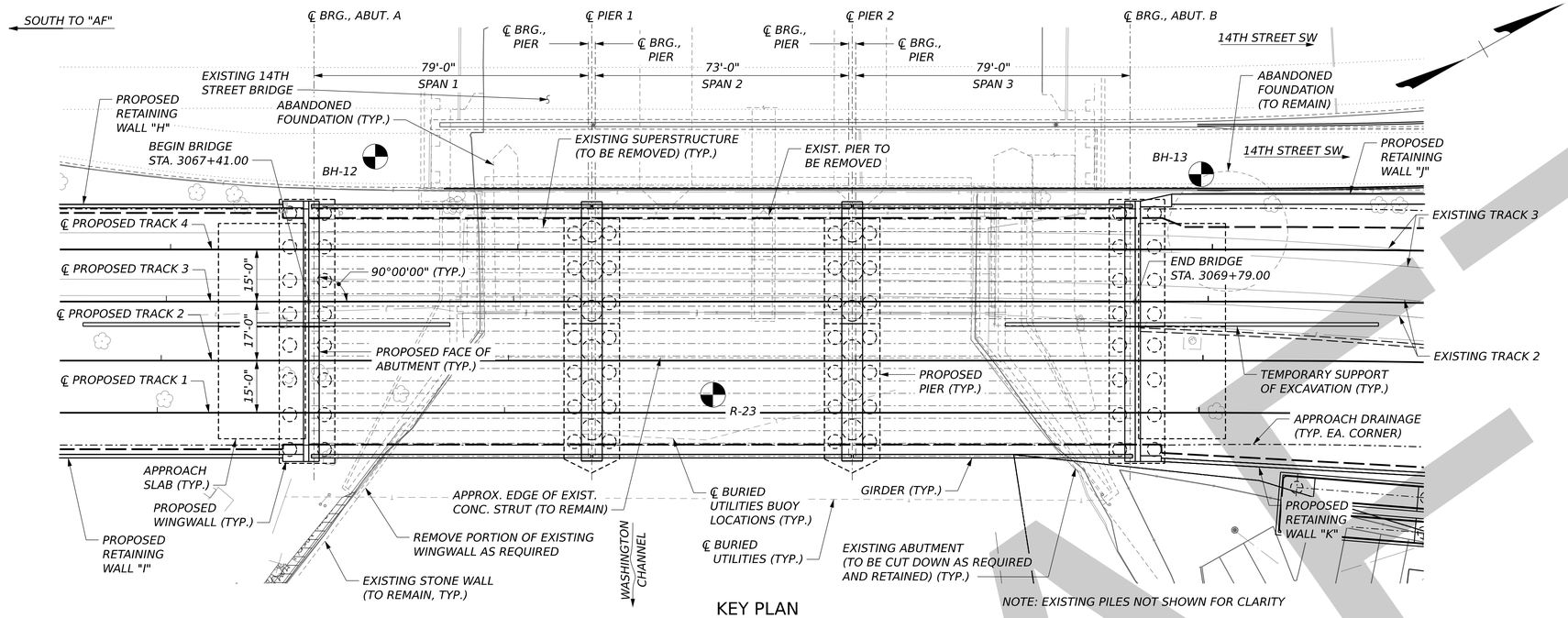
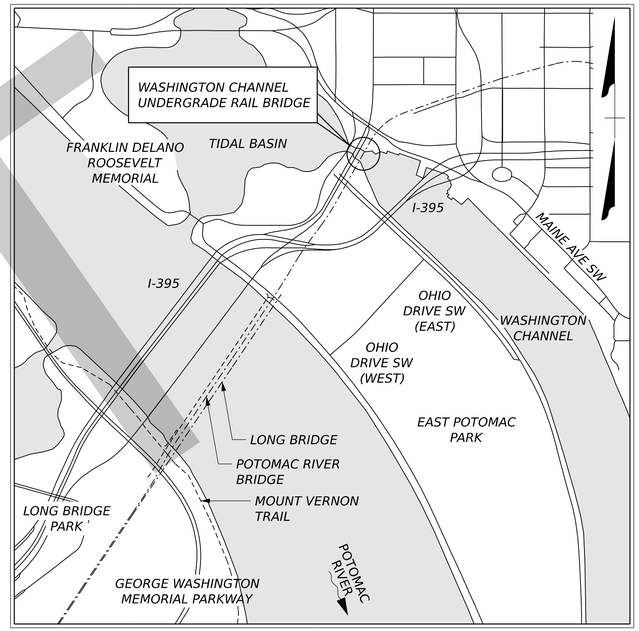
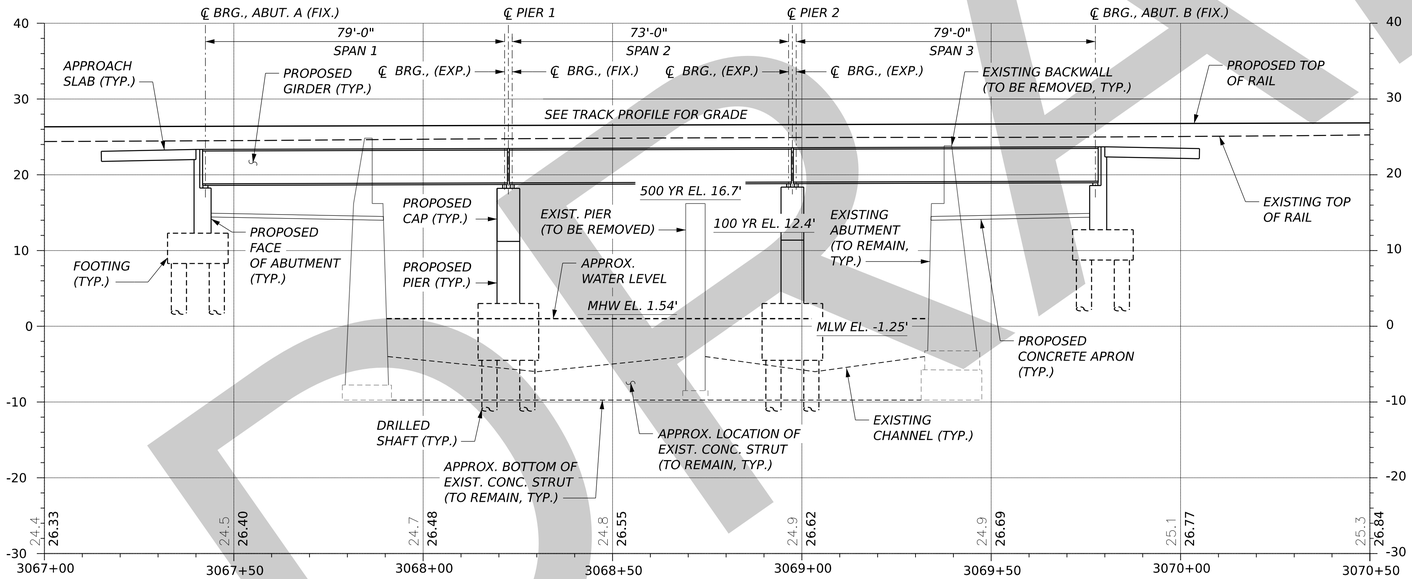
LBPE_Id_v95.tbl
Plotted By: ksmiach 2/7/2023
b05_R02A_B503_typ.dgn
Untitled Sheet



KEY PLAN
SCALE: 1" = 20'-0"



LOCUS MAP
SCALE 1" = 1000'



PROFILE
(ALONG ℄ PROPOSED TRACK 3)
SCALE: 1" = 20' (HORIZONTAL)
1" = 10' (VERTICAL)

NOTE: EXISTING PILES NOT SHOWN FOR CLARITY

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	E. PHELPS
DRAWN BY	E. PHELPS
CHECKED BY	E. LAWES
APPROVED BY	G. GOODRICH
DATE	2/8/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

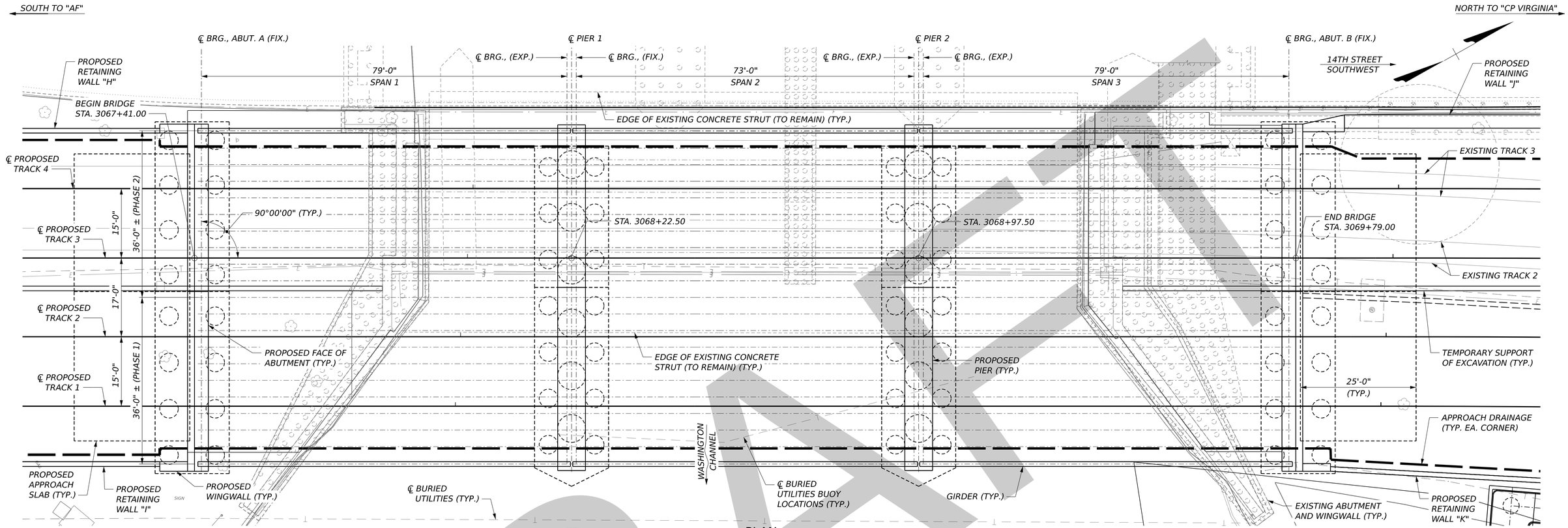
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL
WASHINGTON CHANNEL UNDERGRADE BRIDGE
KEY PLAN AND PROFILE

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	B-601
REV.	N/A
SHEET NO.	113 OF 273
SCALE	AS SHOWN

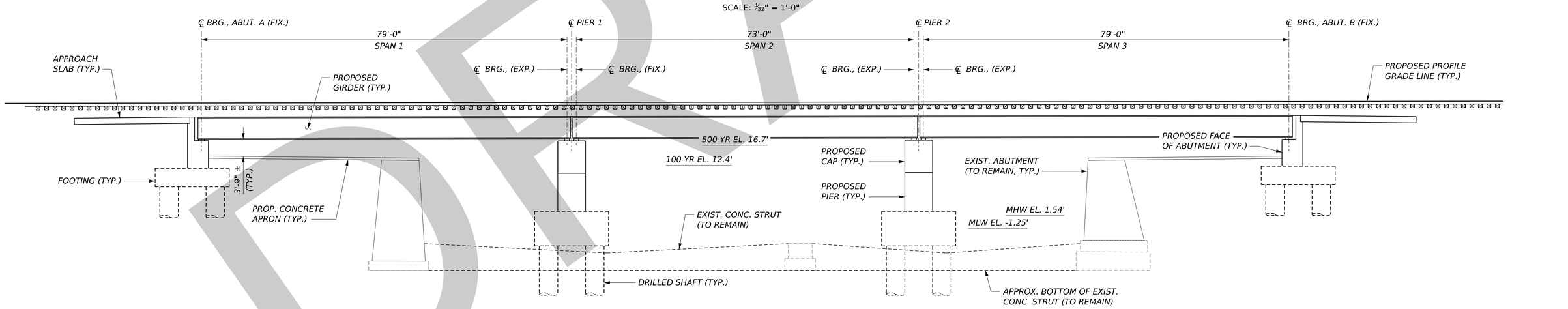
VDOT PDF.pltcfg
LBPE_Id_-95.tbl
Plotted By: kwentworth 2/8/2023
b06_R02A_B601_pro.dgn
Sheet Model

DRAFT



PLAN

SCALE: $\frac{3}{32}$" = 1'-0"



LONGITUDINAL SECTION

SCALE: $\frac{3}{32}$" = 1'-0"

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: E. PHELPS
DRAWN BY: E. PHELPS
CHECKED BY: E. LAWES
APPROVED BY: G. GOODRICH
DATE: 2/8/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

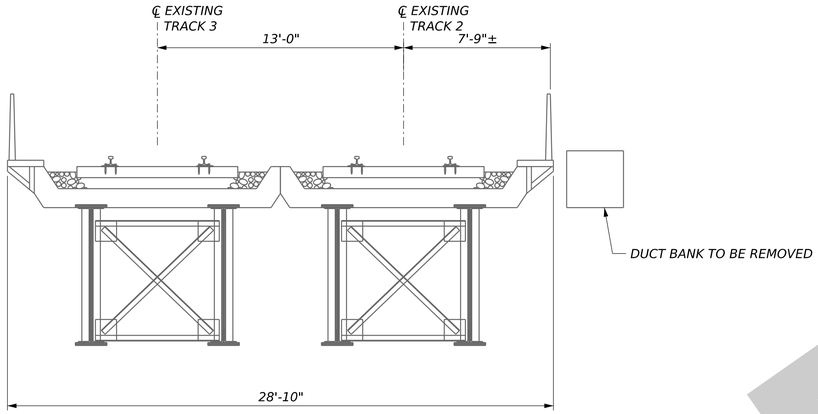
vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL
WASHINGTON CHANNEL UNDERGRADE BRIDGE
PLAN AND LONGITUDINAL SECTION

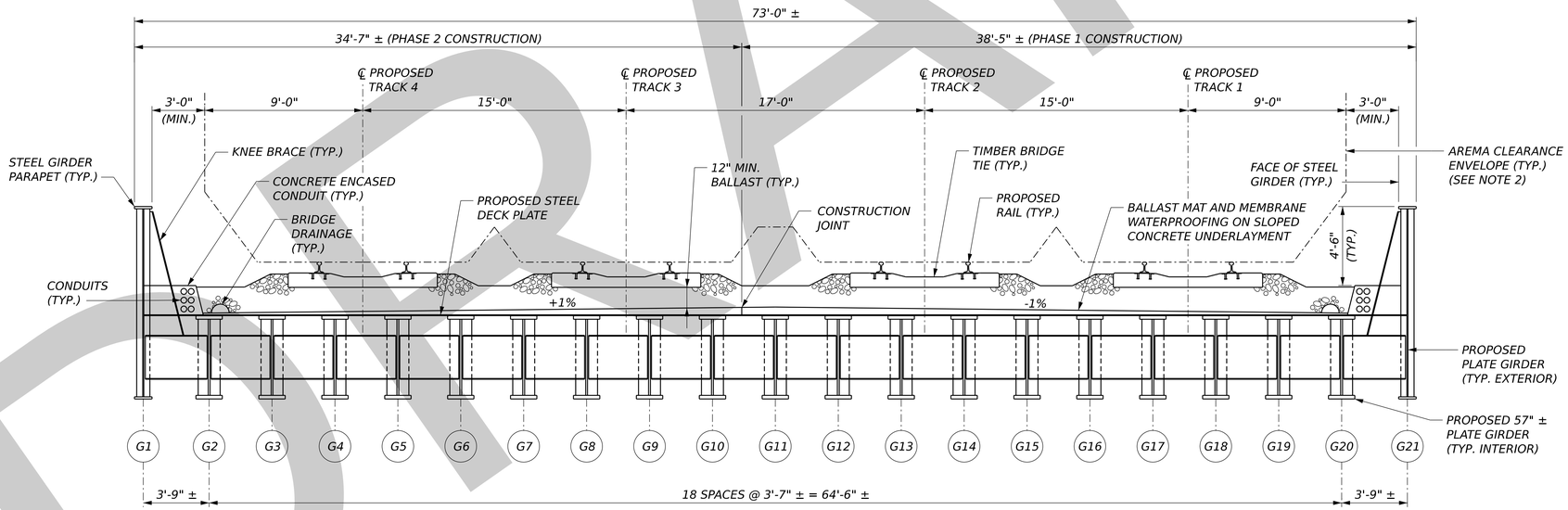
PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: B-602
REV.: N/A
SHEET NO.: 114 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_-95.tbl
Plotted By: kwentworth 2/8/2023
b06_R02A_B602_pe.dgn
Sheet Model



EXISTING TRANSVERSE SECTION

SCALE: ¼" = 1'-0"



TRANSVERSE SECTION

SCALE: ¼" = 1'-0"

NOTE: SPAN 1 SHOWN, SPANS 2 AND 3 SIMILAR

NOTES:

1. *EXISTING UTILITIES TO BE REROUTED TO NEW UTILITY CONDUITS AS SHOWN. DETAILS TO BE DEVELOPED IN FUTURE PROJECT STAGES.*
2. *TRACK CLEARANCE ENVELOPE SHALL MEET THE REQUIREMENTS OF AREMA EXCEPT AS SHOWN. ON CURVED SECTIONS OF TRACK, THE LATERAL CLEARANCE EACH SIDE OF TRACK CENTERLINE SHALL BE INCREASED 1.5" PER DEGREE OF CURVATURE.*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: E. PHELPS
DRAWN BY: E. PHELPS
CHECKED BY: E. LAWES
APPROVED BY: G. GOODRICH
DATE: 2/8/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

WASHINGTON CHANNEL UNDERGRADE BRIDGE
TRANSVERSE SECTION

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: B-603
REV.: N/A
SHEET NO.: 115 OF 273
SCALE: AS SHOWN

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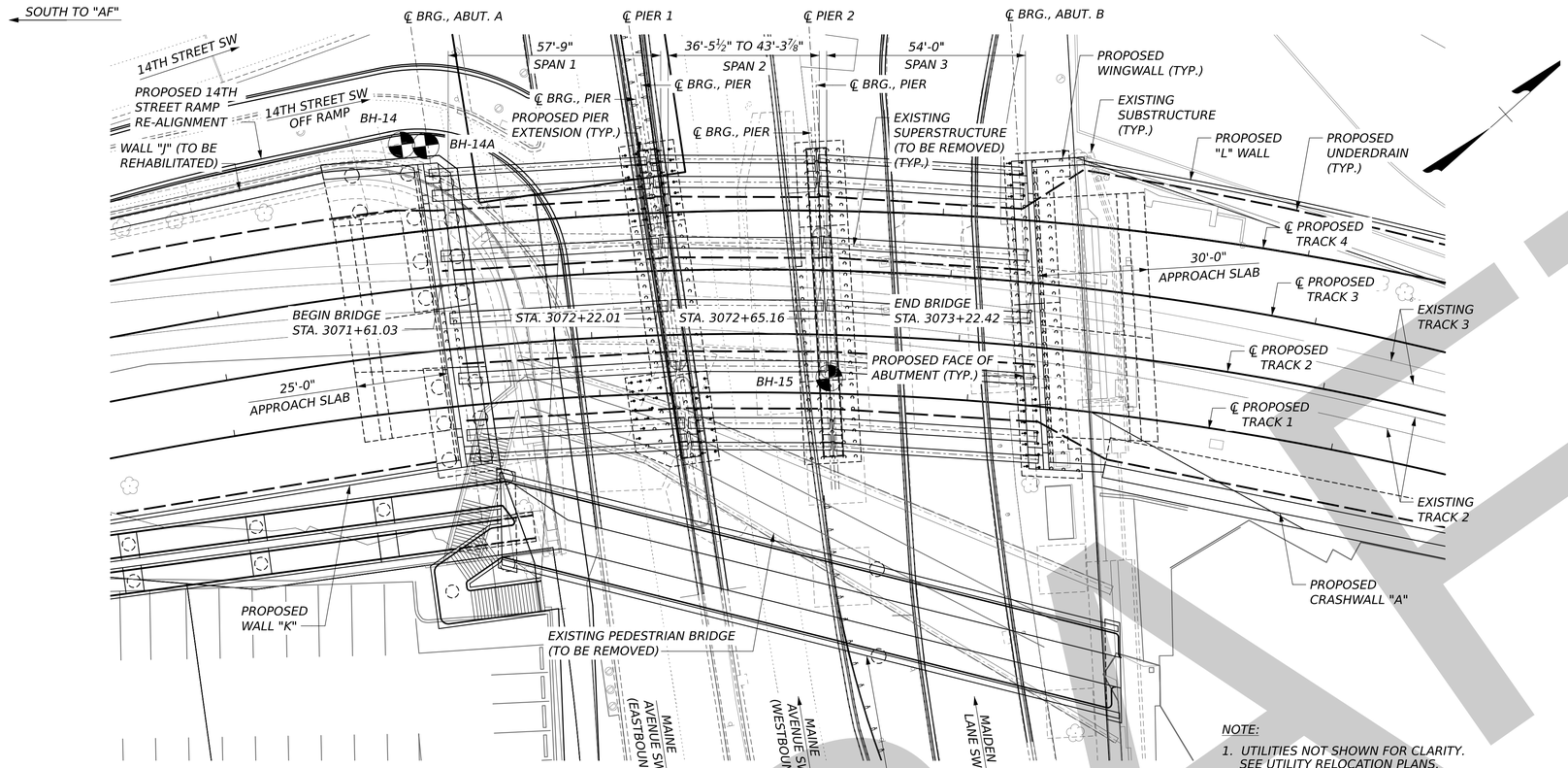
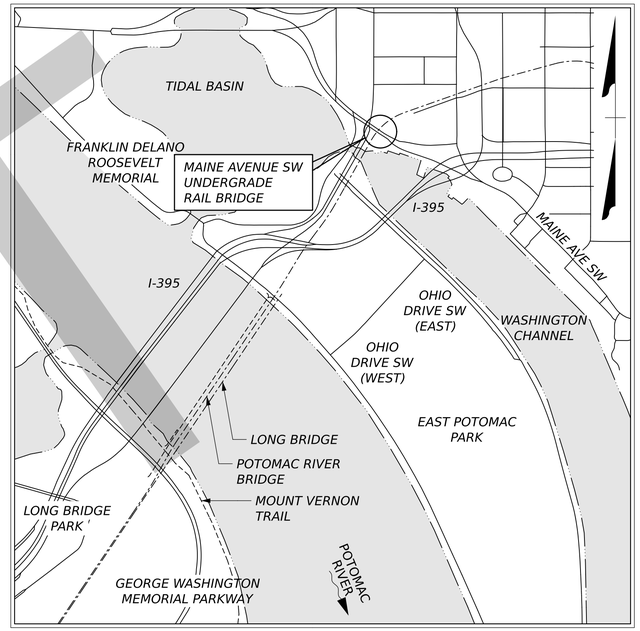
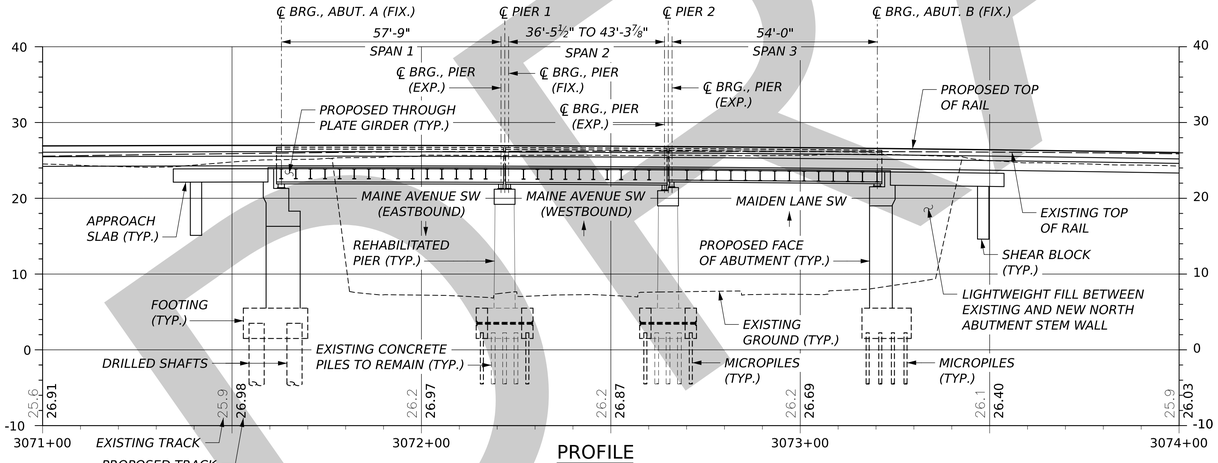
Plotted By: kwentworth 2/8/2023
b06_R02A_B603_typ.dgn
Untitled Sheet



KEY PLAN
SCALE: 1" = 20'



LOCUS MAP
SCALE 1" = 1000'



PROFILE
(ALONG ℄ PROPOSED TRACK 3)
SCALE: 1" = 20' (HORIZONTAL)
1" = 10' (VERTICAL)

NOTE: REFER TO TRACK PROFILES FOR VERTICAL CURVE DATA

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: L. CHERVINCKY
DRAWN BY: K. WENTWORTH
CHECKED BY: A. SPEIR
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL
MAINE AVENUE SW UNDERGRADE BRIDGE
KEY PLAN AND PROFILE

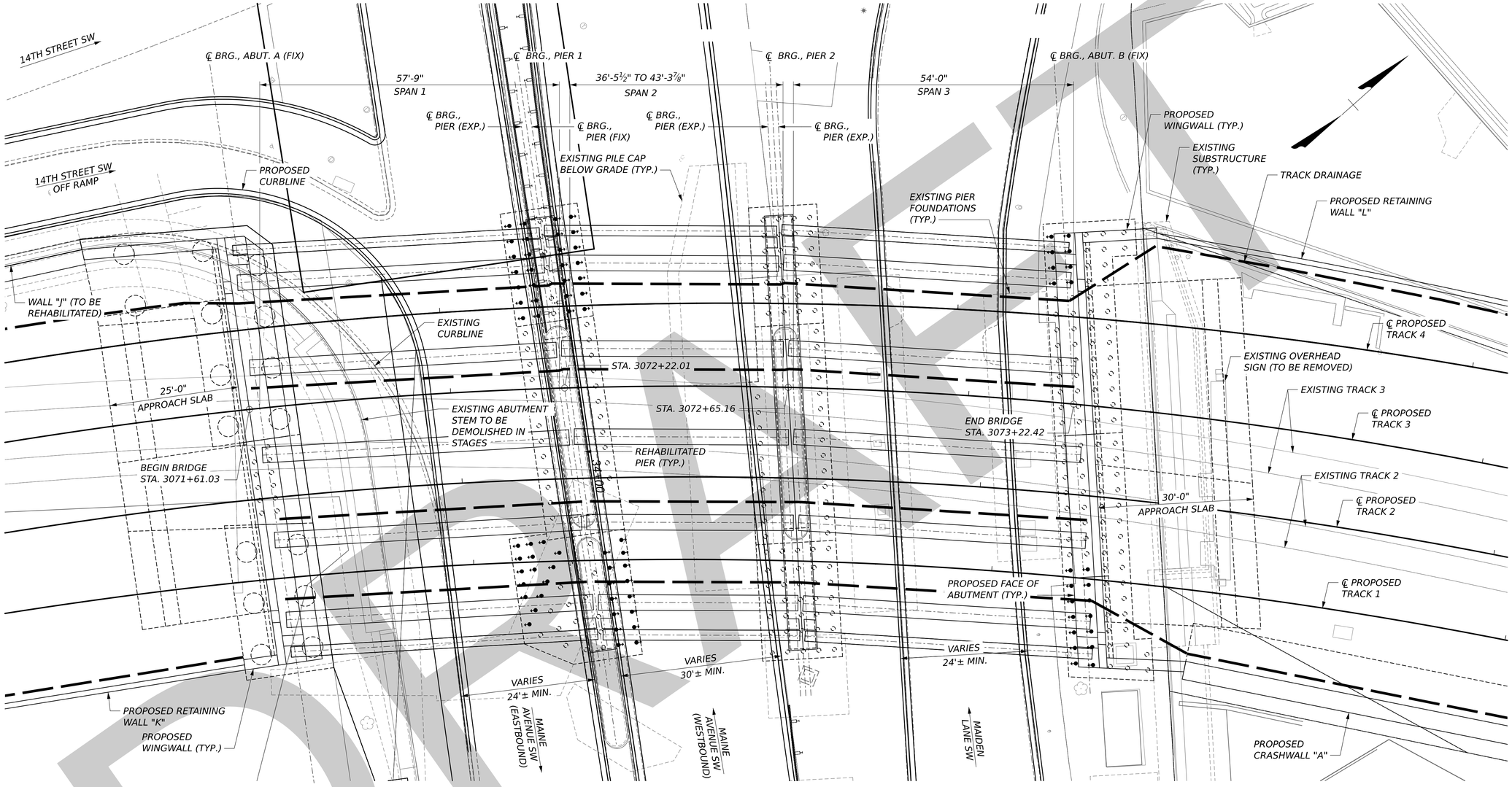
PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-701
REV. N/A
SHEET NO. 127 OF 273
SCALE: AS SHOWN

CTDOT_pdf_CONNECT.pltcfg
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
b07_R02A_B701_pro.dgn
Maine Ave Plan and Profile

DRAFT

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



PLAN

SCALE: $\frac{3}{32}$" = 1'-0"

NOTES:

1. *EXISTING AND PROPOSED PEDESTRIAN BRIDGE NOT SHOWN FOR CLARITY.*
2. *UTILITIES NOT SHOWN FOR CLARITY. SEE UTILITY RELOCATION PLANS.*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	L. CHERVINCKY
DRAWN BY	K. WENTWORTH
CHECKED BY	A. SPEIR
APPROVED BY	G. GOODRICH
DATE	2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

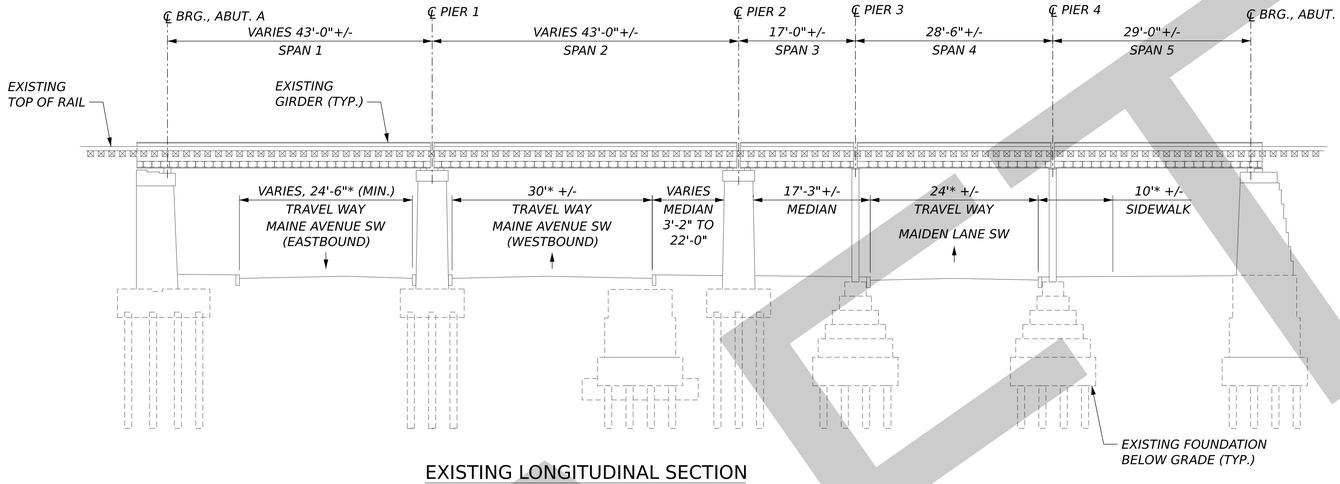
MAINE AVENUE SW UNDERGRADE BRIDGE
PLAN

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	B-702
REV.	N/A
SHEET NO.	128 OF 273
SCALE	AS SHOWN

CTDOT_pdf_CONNECT.pltcfg
LBPE_Id_-95.tbl
Plotted By: kwentworth 2/9/2023
b07_R02A_B702_pe.dgn
Maine Ave Plan and Profile

SOUTH TO "AF"

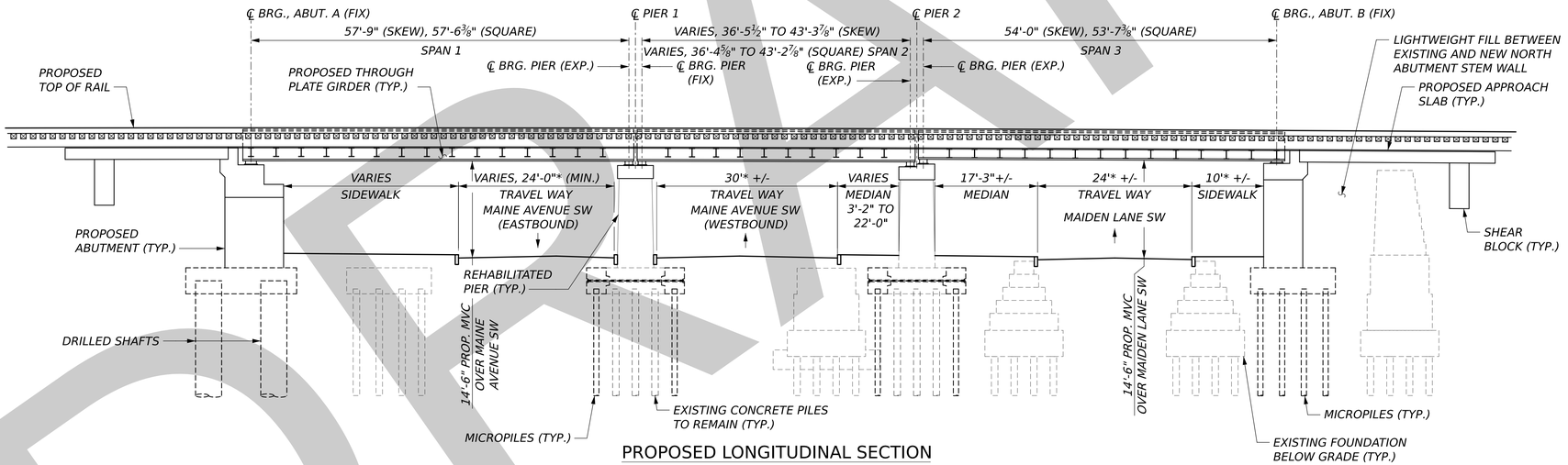
NORTH TO "CP VIRGINIA"



EXISTING LONGITUDINAL SECTION

(* DIMENSIONS SHOWN PERPENDICULAR TO FACE OF SUBSTRUCTURE)

SCALE: 3/32" = 1'-0"



PROPOSED LONGITUDINAL SECTION

(* DIMENSIONS SHOWN PERPENDICULAR TO FACE OF SUBSTRUCTURE)

SCALE: 3/32" = 1'-0"

NOTE:

1. UNDERGROUND UTILITIES NOT SHOWN FOR CLARITY. SEE UTILITY RELOCATION PLANS FOR FURTHER INFORMATION.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: L. CHERVINCKY
DRAWN BY: A. ELLIS
CHECKED BY: A. SPEIR
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

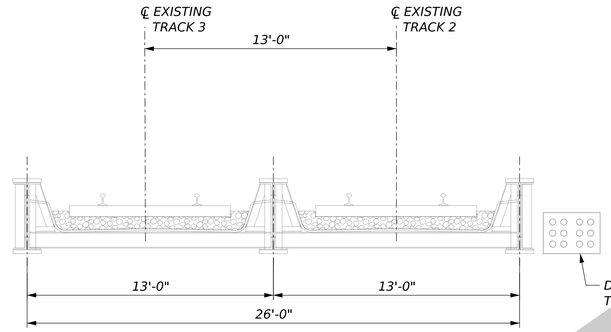
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

MAINE AVENUE SW UNDERGRADE BRIDGE
LONGITUDINAL SECTION

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. B-703
REV. N/A
SHEET NO. 129 OF 273
SCALE: AS SHOWN

CTDOT_pdf_CONNECT.pltcfg
LBPE_Id_-95.tbl
Plotted By: kwentworth 2/9/2023
b07_R02A_B703_ls.dgn
Maine Ave Plan and Profile

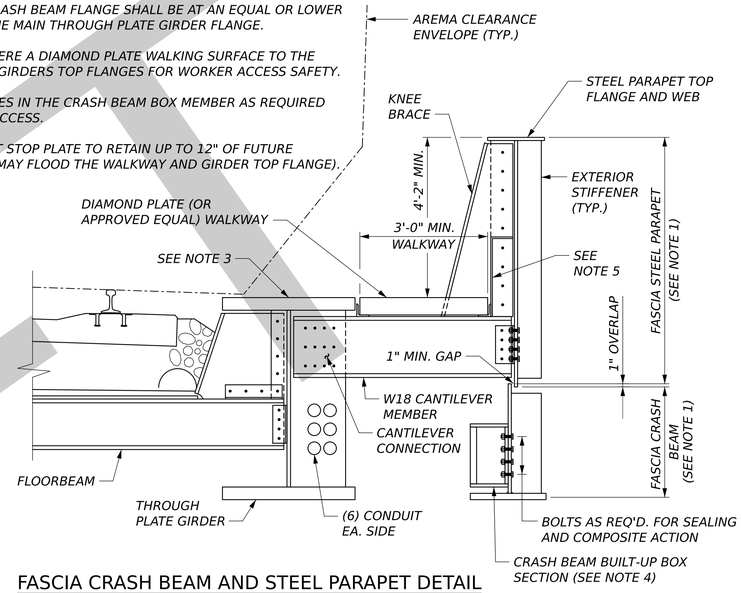


EXISTING SECTION

SCALE 1/4" = 1'-0"

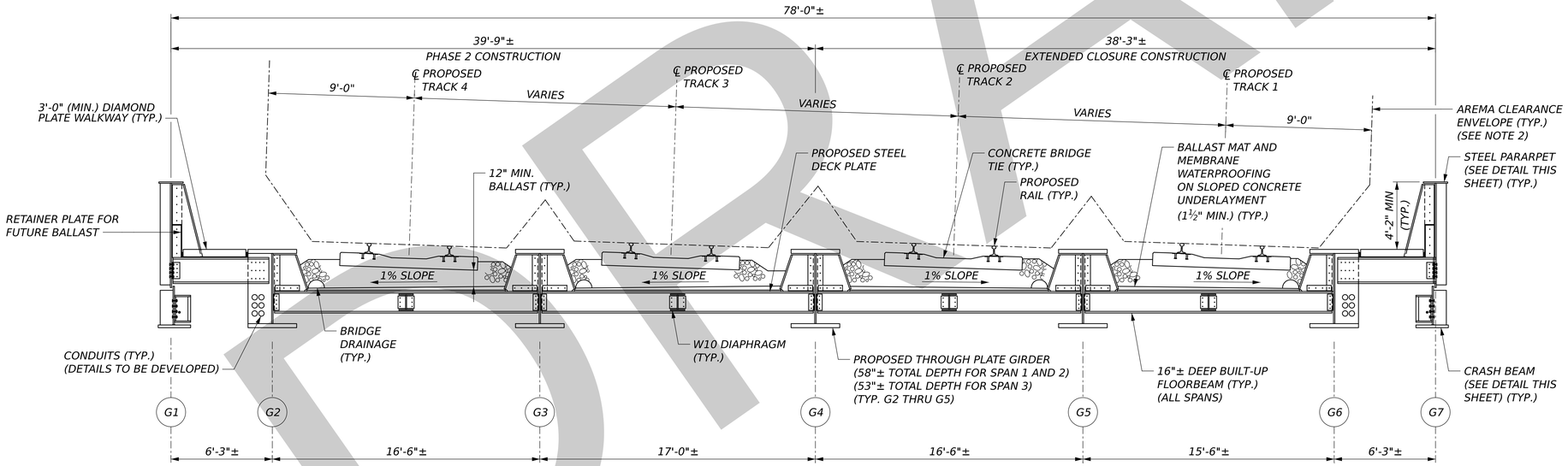
NOTES:

1. *TO SATISFY AESTHETIC AND BRIDGE PROTECTION COMMITMENTS, THIS SPLIT EXTERIOR THROUGH PLATE GIRDER CONCEPT WAS DEVELOPED. THE UPPER PORTION OF THE FASCIA TPG SEGMENT IS A STEEL PARAPET (RAILING) AND THE LOWER FASCIA TPG SEGMENT CONCEALS AND STRENGTHENS THE CRASH BEAM.*
2. *THE BOTTOM OF CRASH BEAM FLANGE SHALL BE AT AN EQUAL OR LOWER ELEVATION THAN THE MAIN THROUGH PLATE GIRDER FLANGE.*
3. *PERMANENTLY ADHERE A DIAMOND PLATE WALKING SURFACE TO THE TOPS OF EXTERIOR GIRDERS TOP FLANGES FOR WORKER ACCESS SAFETY.*
4. *PROVIDE HANDHOLES IN THE CRASH BEAM BOX MEMBER AS REQUIRED FOR CONNECTION ACCESS.*
5. *PROVIDE A BALLAST STOP PLATE TO RETAIN UP TO 12" OF FUTURE BALLAST (BALLAST MAY FLOOD THE WALKWAY AND GIRDER TOP FLANGE).*



FASCIA CRASH BEAM AND STEEL PARAPET DETAIL

SCALE: ½" = 1'-0"



TRANSVERSE SECTION

(SPAN 1 AND 2 SHOWN, SPAN 3 SIMILAR WITH SHALLOWER THRU PLATE GIRDERS)

SCALE: ¼" = 1'-0"

NOTES:

1. *EXISTING UTILITIES TO BE REROUTED TO NEW LOCATIONS AS SHOWN. DETAILS TO BE DEVELOPED IN FUTURE PROJECT STAGES*
2. *TRACK CLEARANCE ENVELOPE SHALL MEET THE REQUIREMENTS OF AREMA EXCEPT AS SHOWN. ON CURVED SECTIONS OF TRACK, THE LATERAL CLEARANCE EACH SIDE OF TRACK CENTERLINE SHALL BE INCREASED 1.5" PER DEGREE OF CURVATURE.*

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	L. CHERVINCKY
DRAWN BY	A. ELLIS
CHECKED BY	A. SPEIR
APPROVED BY	G. GOODRICH
DATE	2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

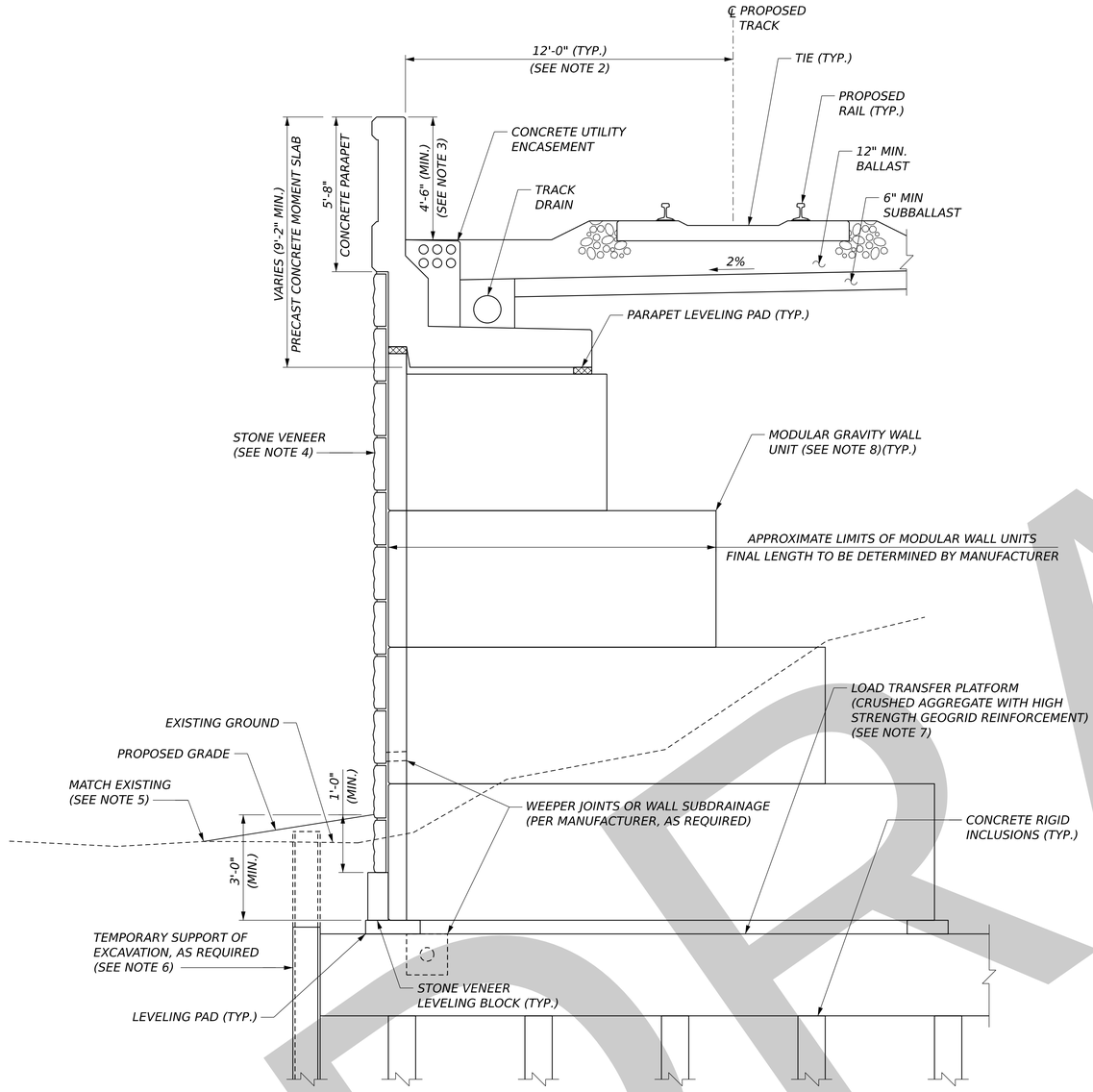
SUBDIVISION: RF&P ZONE: CENTRAL

MAINE AVENUE SW UNDERGRADE BRIDGE
TRANSVERSE SECTIONS

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	B-704
REV.	N/A
SHEET NO.	130 OF 273
SCALE	AS SHOWN

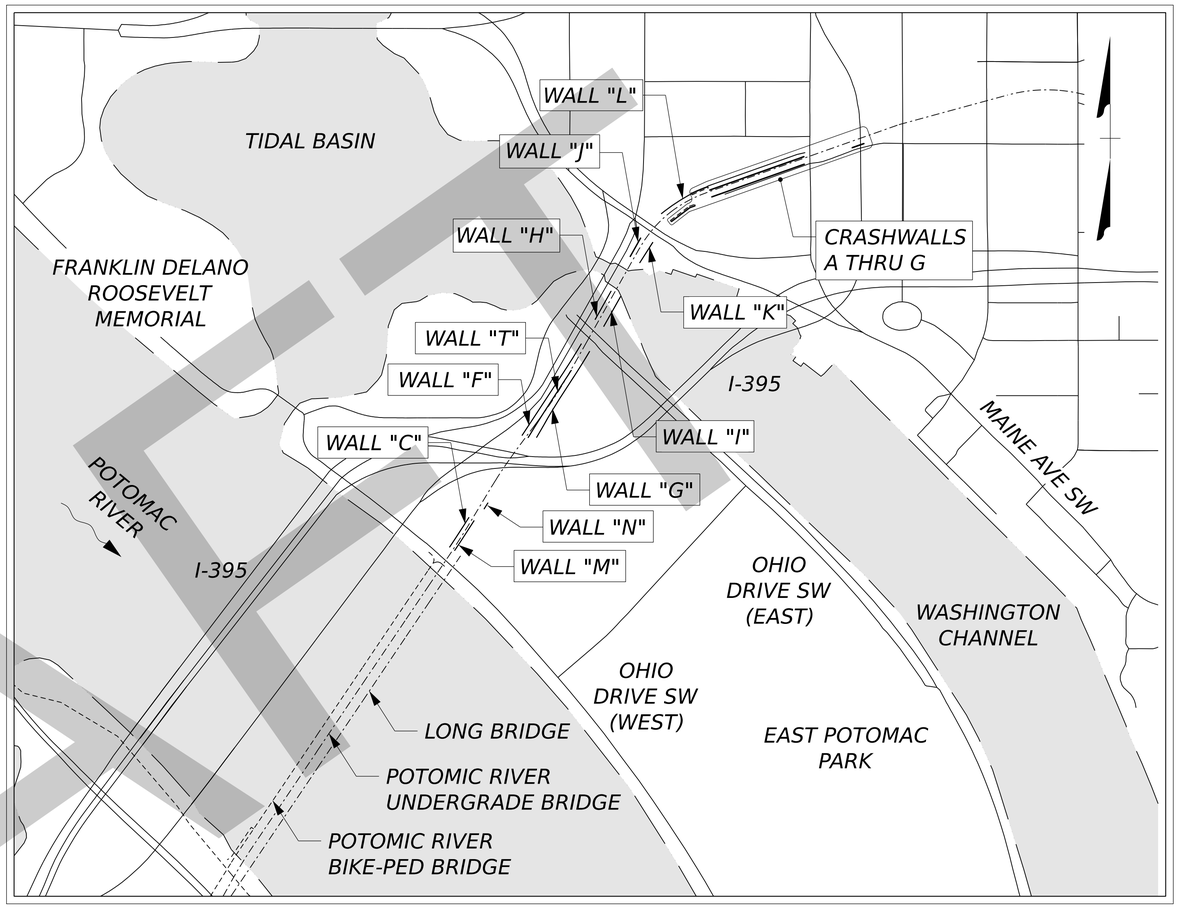
DRAFT

CTDOT_pdf_CONNECT.pltcfg
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
b07_R02A_B704_typ.dgn
Default



TYPICAL MODULAR GRAVITY WALL SECTION

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



LOCUS MAP

SCALE 1" = 500'

RETAINING WALL NOTES:

1. RETAINING WALLS TO BE INCLUDED IN THE NORTH PACKAGE ARE: C, F, G, H, I, J, K, L, M, N AND T. SEE SOUTH PACKAGE FOR WALL A. WALLS B, D, AND E HAVE BEEN ELIMINATED.
2. THE 12'-0" MINIMUM HORIZONTAL CLEARANCE INCLUDES A WALKWAY WIDTH OF APPROXIMATELY 3'-0" BEYOND THE STANDARD CSXT CLEARANCE ENVELOPES.
3. THE 4'-6" MINIMUM HEIGHT FOR WORKER FALL PROTECTION MEETS THE 3'-6" MINIMUM HEIGHT SPECIFIED IN AREMA 15-8.5 PLUS AN ADDITIONAL 12" FOR FUTURE BALLAST.
4. A STONE VENEER FINISH IS PROPOSED AT ALL NEW WALL LOCATIONS, EXCEPT WALLS L AND T. STONE VENEER SHALL BE INSTALLED USING DOVETAIL ANCHORS AS SHOWN IN DDOT STANDARD DRAWING 703.03. FINISH AND APPEARANCE OF WALL L WILL BE DETERMINED DURING FINAL DESIGN BY THE PROGRESSIVE DESIGN-BUILD (PDB) TEAM BASED ON COORDINATION WITH ADJACENT STAKEHOLDERS. WALL T WILL NOT BE VISIBLE FROM EAST POTOMAC PARK OR THE SURROUNDING ROADWAYS AND WILL HAVE A PLAIN CONCRETE COPING.
5. GRADING AROUND RETAINING WALLS SHALL BE KEPT TO A MINIMUM AND SHALL STAY WITHIN THE RIGHT-OF-WAY. GRADING SHALL BE SET TO AVOID EXISTING FEATURES TO REMAIN AND SHALL NOT INTRODUCE ADDITIONAL LOADING ON ADJACENT STRUCTURES.
6. TEMPORARY SUPPORT OF EXCAVATION (TSOE) WILL BE REQUIRED AT VARIOUS LOCATIONS TO MAINTAIN ACTIVE RAIL DURING WALL CONSTRUCTION AND TO AVOID EXISTING FEATURES. TSOE SHALL BE CUT OFF 3'-0" BELOW FINISH GROUND AND ABANDONDED IN PLACE IN ACCORDANCE WITH CSXT REQUIREMENTS. ANTICIPATED LOCATIONS, MEANS, AND METHODS OF TSOE SHOWN ARE CONCEPTUAL. THE FINAL LOCATION, MEANS, AND METHODS WILL BE DETERMINED DURING FINAL DESIGN BY THE PROGRESSIVE DESIGN-BUILD (PDB) TEAM.
7. GROUND IMPROVEMENTS IN THE FORM OF PILES OR RIGID INCLUSIONS BELOW LOAD TRANSFER PLATFORMS MAY BE NECESSARY TO LIMIT SETTLEMENT WHERE PROPOSED GRADE WILL BE RAISED MORE THAN 2 FEET ABOVE EXISTING. LIGHTWEIGHT FILL MAY BE USED WHEN PRACTICAL BUT MAY NOT BE PLACED WITHIN 3 FEET OF THE PROPOSED TRACK SUBGRADE. ANTICIPATED LOCATION AND EXTENTS OF GROUND IMPROVEMENTS AND LIGHTWEIGHT FILL SHOWN ARE CONCEPTUAL. THE FINAL LOCATION AND EXTENTS WILL BE DETERMINED DURING FINAL DESIGN BY THE PROGRESSIVE DESIGN-BUILD (PDB) TEAM.
8. EXCEPT AT SEVERAL DISCRETE LOCATIONS, RETAINING WALLS ARE ANTICIPATED TO BE MODULAR GRAVITY WALLS SUPPORTED ON LOAD TRANSFER PLATFORMS. AT LOCATIONS WHERE GRADE RAISE AND/OR HEIGHT OF RETAINED FILL ARE MINIMAL, PILE SUPPORTED OR DRILLED SHAFT SUPPORTED CANTILEVER RETAINING WALLS ARE ANTICIPATED. SEE INDIVIDUAL WALL SHEETS FOR CONCEPTUAL WALL TYPES AND RETAINING WALL TYPICAL DETAILS (2 OF 2) SHEET FOR CANTILEVER RETAINING WALL DETAILS. THE FINAL LOCATION AND WALL TYPE WILL BE DETERMINED DURING FINAL DESIGN BY THE PROGRESSIVE DESIGN-BUILD (PDB) TEAM.
9. SEE SHEETS W-012 THRU W-026 FOR CRASHWALL PLANS.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. MACPHERSON
DRAWN BY: J. MACPHERSON
CHECKED BY: K. D'URSO
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

RETAINING WALL
TYPICAL DETAILS (1 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. W-001
REV. N/A
SHEET NO. 154 OF 273
SCALE AS SHOWN

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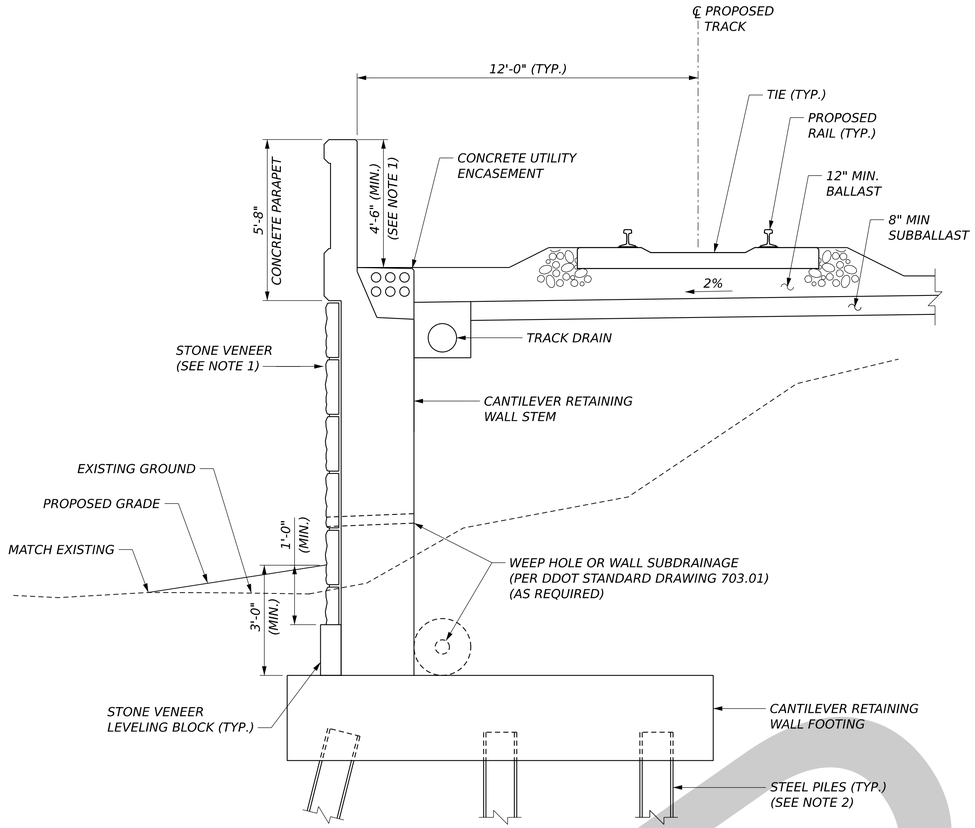
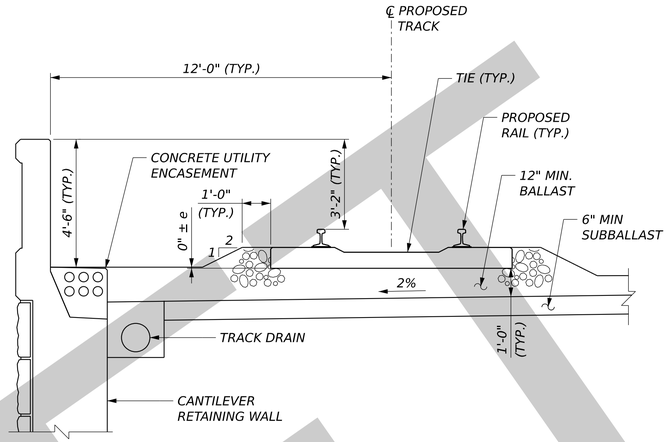
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
w_R02A_w001_typ_wall.dgn
Plan Sheet w001



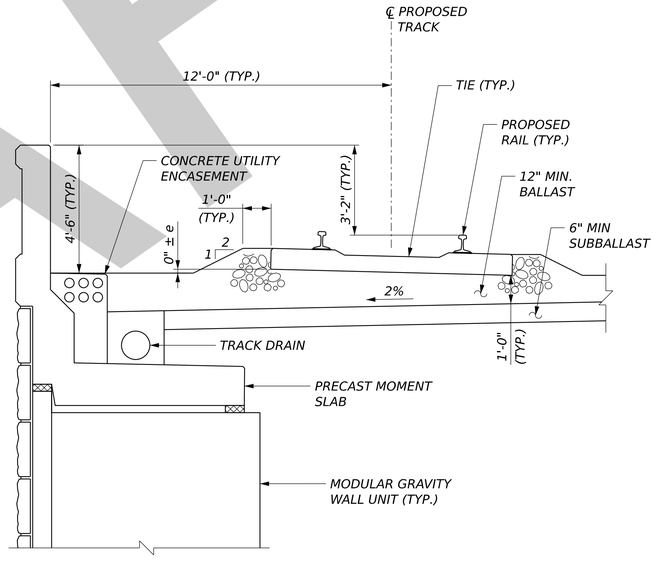
TYPICAL CANTILEVER WALL SECTION

SCALE: $\frac{3}{8}$" = 1'-0"



TYPICAL TRACK DETAILS - CANTILEVER WALL

SCALE: $\frac{3}{8}$" = 1'-0"



TYPICAL TRACK DETAILS - MODULAR GRAVITY WALL

SCALE: $\frac{3}{8}$" = 1'-0"

NOTES:

1. SEE RETAINING WALL TYPICAL DETAILS (1 OF 2) FOR RETAINING WALL NOTES.
2. RETAINING WALL "L" IS PROPOSED TO BE SUPPORTED ON DRILLED SHAFT FOUNDATIONS IN LIEU OF STEEL H-PILES TO REDUCE NOISE DURING CONSTRUCTION.
3. CANTILEVER RETAINING WALLS SHALL CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE DETAILS SHOWN ON DDOT STANDARD DRAWING 703.01 THRU 703.03.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. MACPHERSON
DRAWN BY: J. MACPHERSON
CHECKED BY: K. D'URSO
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

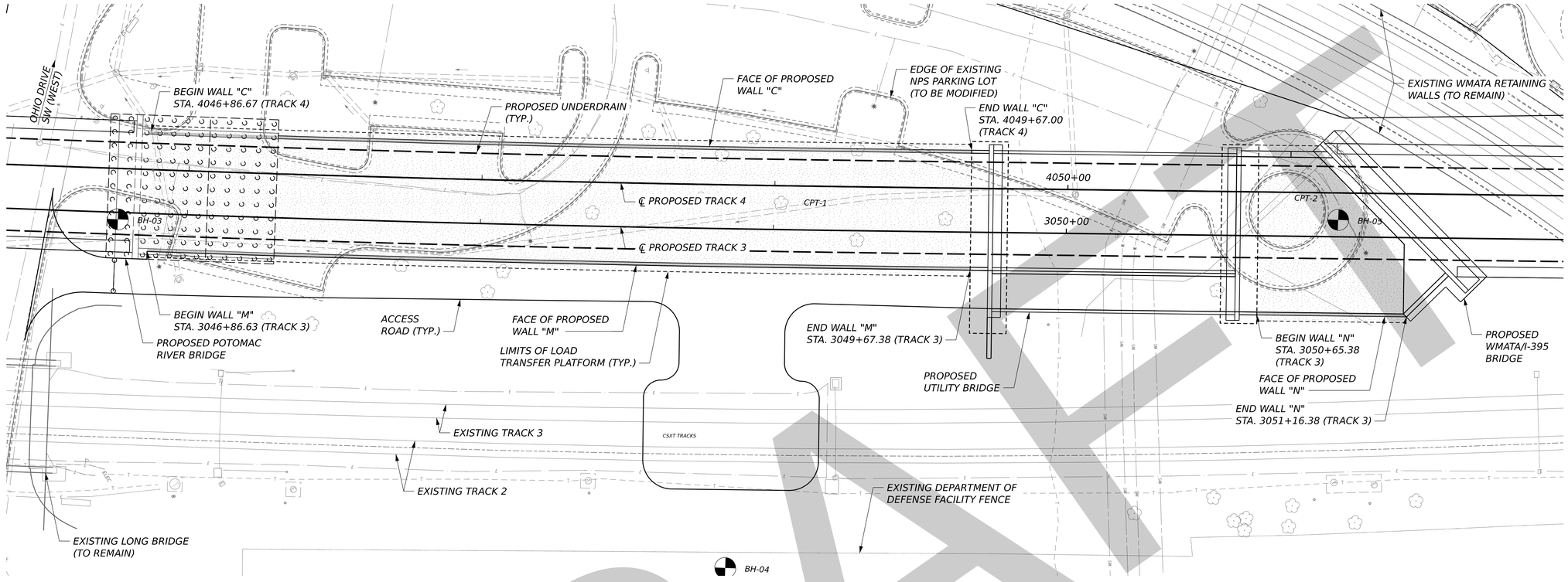
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

RETAINING WALL
TYPICAL DETAILS (2 OF 2)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: W-002
REV.: N/A
SHEET NO.: 155 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: kwentworth 2/9/2023
w_R02A_w001_typ_wall.dgn
Plan Sheet w002



RETAINING WALLS "C", "M" AND "N" PLAN

SCALE: 1" = 20'

WALL TABLE
(SEE NOTE 2)

WALL "C"			WALL "M"			WALL "N"		
STA.	OFFSET	HEIGHT	STA.	OFFSET	HEIGHT	STA.	OFFSET	HEIGHT
4046+86	12.00'	27'±	3046+86	12.00'	27'±	3050+65	26.00'	19'±
4047+00	12.00'	27'±	3047+00	12.00'	26'±	3051+00	26.00'	17'±
4047+50	12.00'	26'±	3047+50	12.00'	22'±	3051+15	26.00'	17'±
4048+00	12.00'	26'±	3048+00	12.00'	18'±			
4048+50	12.00'	26'±	3048+50	12.00'	14'±			
4049+00	12.00'	26'±	3049+00	12.00'	10'±			
4049+50	12.00'	25'±	3049+50	12.00'	6'±			
4049+67	12.00'	25'±	3049+67	12.00'	5'±			

LEGEND

= NEW RETAINING WALL

= LIMITS OF LOAD TRANSFER PLATFORM

NOTES:

1. SEE RETAINING WALL TYPICAL DETAILS SHEET (1 OF 2) FOR GENERAL RETAINING WALL NOTES.
2. WALL OFFSET PROVIDED FROM CENTERLINE OF TRACK TO BACK OF PARAPET. "HEIGHT" IS THE EXPOSED WALL HEIGHT, SEE TYPICAL DETAILS SHEET (1 OF 2).
3. SEE TRACK PLANS FOR TRACK ALIGNMENT DATA AND ADDITIONAL INFORMATION.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. MACPHERSON
DRAWN BY: J. MACPHERSON
CHECKED BY: K. D'URSO
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

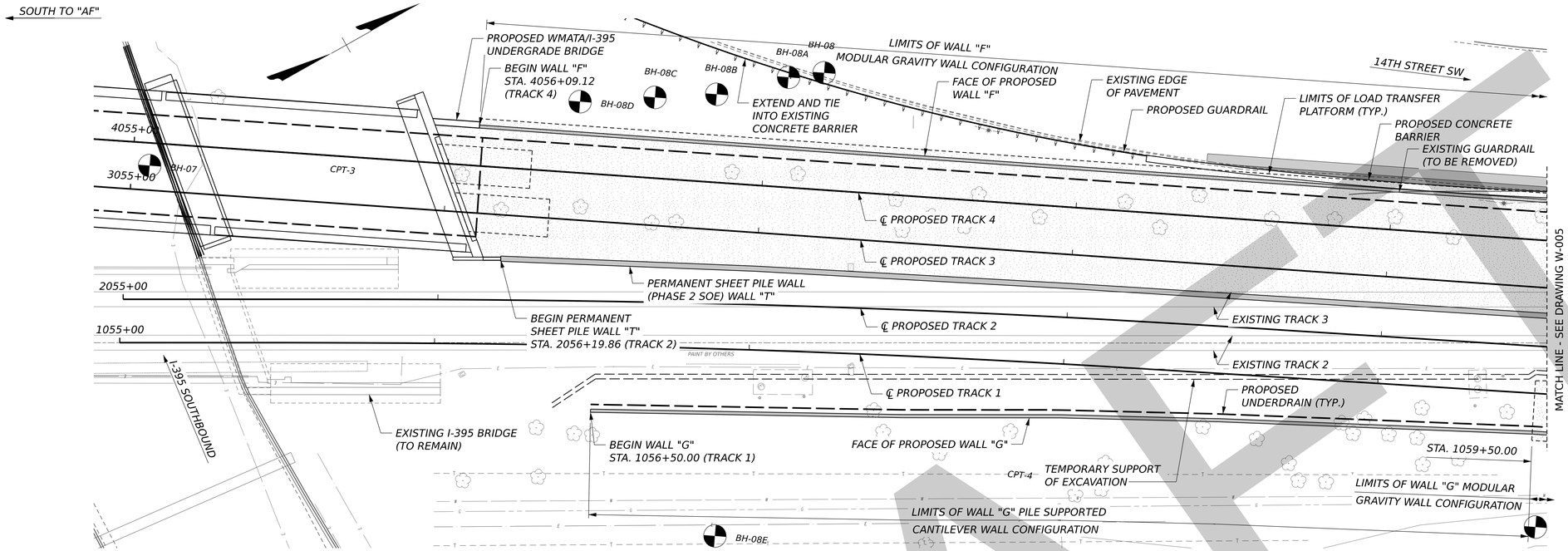
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

RETAINING WALLS "C", "M" AND "N" PLAN

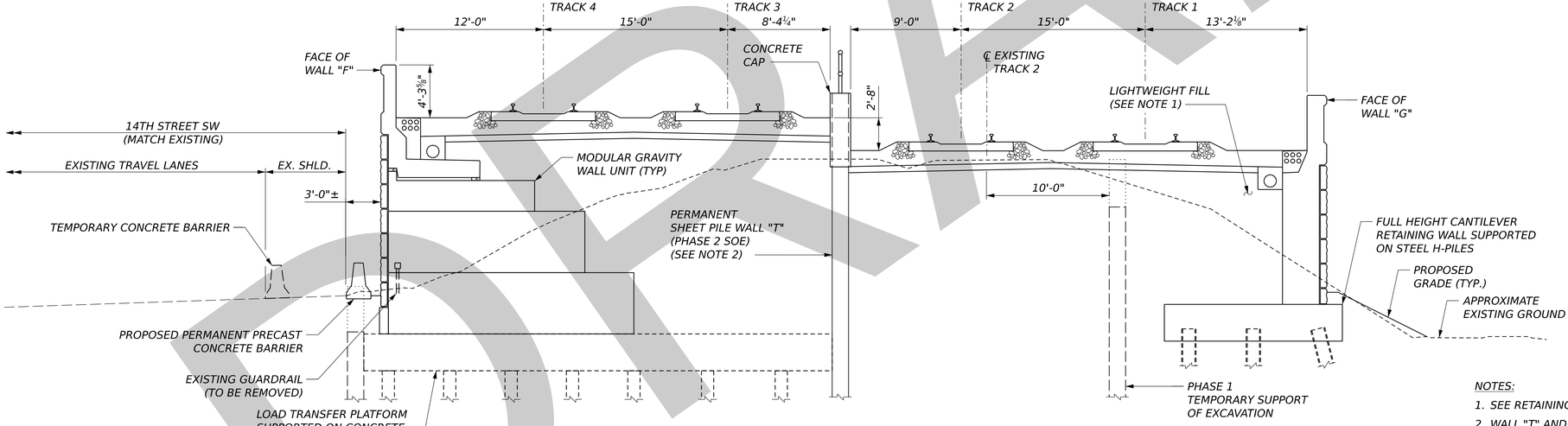
PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. W-003
REV. N/A
SHEET NO. 156 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_ld_v95.tbl
Plotted By: kwentworth 2/9/2023
w_R02A_w004_retwall_C.dgn
Plan Sheet w003



RETAINING WALLS "F", "G", AND "T" PLAN (1 OF 2)

SCALE: 1" = 20'



TYPICAL SECTION
RETAINING WALLS "F", "G", AND "T" (1 OF 2)

(SHOWN AT STA. 1059+00)
SCALE: 3⁄16" = 1'-0"

LEGEND

- = LIMIT OF 2" PAVEMENT MILLING AND RESURFACING (2" DEPTH FROM BARRIER TO TRAVEL WAY)
- = LIMIT OF FULL DEPTH PAVEMENT (MATCH-IN-KIND)
- = *NEW RETAINING WALL*
- = *LIMITS OF LOAD TRANSFER PLATFORM*

WALL "F" TABLE
(SEE NOTE 3)

STA.	OFFSET	HEIGHT
4056+09	12.00'	21'±
4056+50	12.00'	20'±
4057+00	12.00'	20'±
4057+50	12.00'	19'±
4058+00	12.00'	19'±
4058+50	12.00'	18'±
4059+00	12.00'	19'±
4059+50	12.00'	18'±

WALL "G" TABLE
(SEE NOTE 3)

STATION	OFFSET	HEIGHT
1056+50	20.18'	10'±
1057+00	19.72'	11'±
1057+50	18.64'	13'±
1058+00	16.15'	13'±
1058+50	14.35'	13'±
1059+00	13.18'	15'±
1059+50	12.00'	17'±

WALL "T" TABLE
(SEE NOTE 3)

STA.	OFFSET	HEIGHT
2056+19	N/A	4.9'±
2056+50	N/A	4.8'±
2057+00	N/A	4.5'±
2057+50	N/A	4.3'±
2058+00	N/A	4.0'±
2058+50	N/A	3.7'±
2059+00	N/A	3.3'±
2059+50	N/A	3.0'±

NOTES:

1. *SEE RETAINING WALL TYPICAL DETAILS SHEET (1 OF 2) FOR GENERAL RETAINING WALL NOTES.*
2. *WALL "T" AND ANY ASSOCIATED TIEBACKS, DEADMEN, OR TEMPORARY SUPPORTS TO BE DESIGNED DURING FINAL DESIGN BY THE PROGRESSIVE DESIGN-BUILD (PDB) TEAM.*
3. *WALL OFFSET PROVIDED FROM CENTERLINE OF TRACK TO BACK OF PARAPET. "HEIGHT" IS THE EXPOSED WALL HEIGHT, SEE TYPICAL DETAILS SHEET (1 OF 2).*
4. *SEE TRACK PLANS FOR TRACK ALIGNMENT DATA AND ADDITIONAL INFORMATION.*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. MACPHERSON
DRAWN BY: J. MACPHERSON
CHECKED BY: K. D'URSO
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL
RETAINING WALLS "F","G", AND "T"
PLAN AND SECTION
(1 OF 2)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: W-005
REV.: N/A
SHEET NO.: 158 OF 273
SCALE: AS SHOWN

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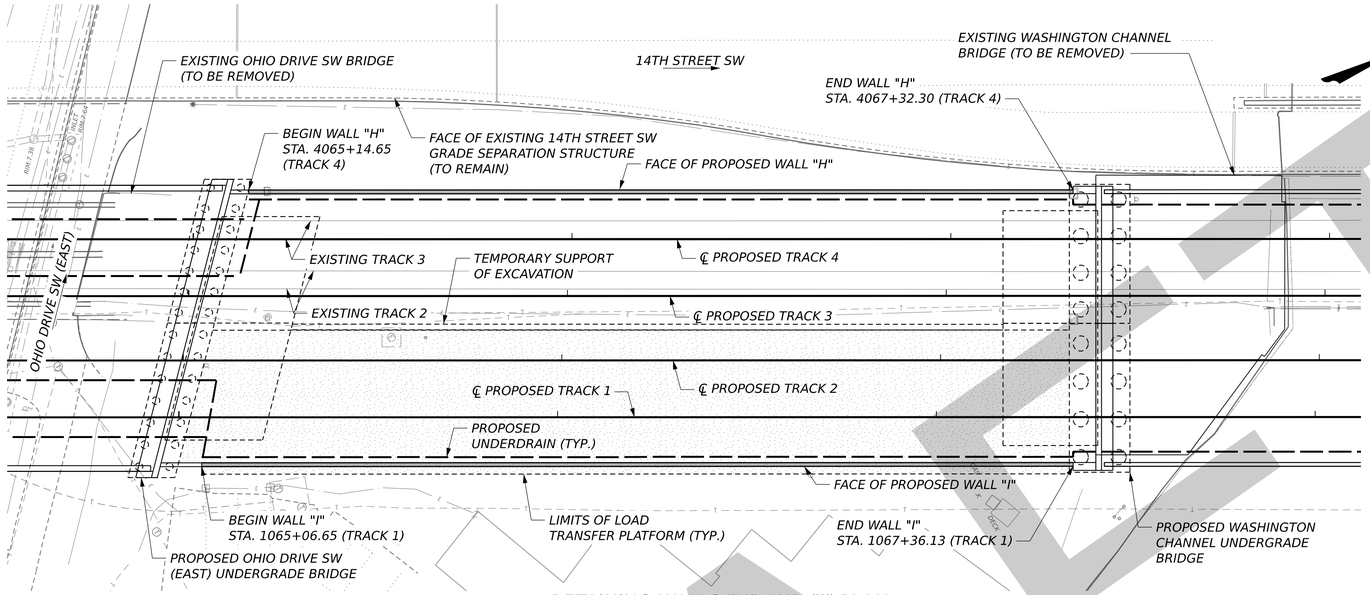
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
w_R02A_w008_retwall_FG.dgn
Plan Sheet w004

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



RETAINING WALLS "H" AND "I" PLAN

SCALE: 1" = 20'

LEGEND

= NEW RETAINING WALL

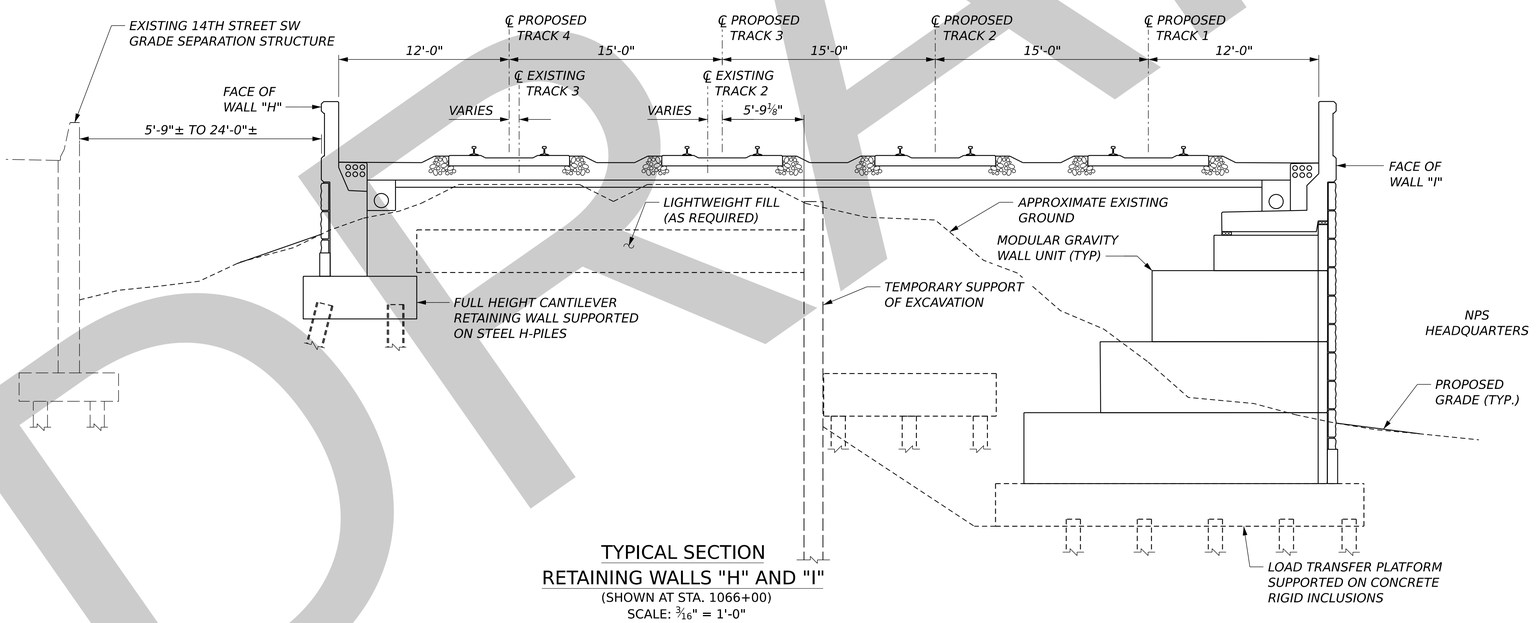
= LIMITS OF LOAD TRANSFER PLATFORM

WALL "H" TABLE
(SEE NOTE 2)

STA.	OFFSET	HEIGHT
4065+15	12.00'	7'±
4065+50	12.00'	8'±
4066+00	12.00'	8'±
4066+50	12.00'	7'±
4067+00	12.00'	8'±
4067+32	12.00'	7'±

WALL "I" TABLE
(SEE NOTE 2)

STA.	OFFSET	HEIGHT
1065+06	12.00'	23'±
1065+50	12.00'	23'±
1066+00	12.00'	23'±
1066+50	12.00'	23'±
1067+00	12.00'	23'±
1067+36	12.00'	24'±



TYPICAL SECTION
RETAINING WALLS "H" AND "I"

(SHOWN AT STA. 1066+00)
SCALE: $\frac{3}{16}$" = 1'-0"

NOTES:

1. *SEE RETAINING WALL TYPICAL DETAILS SHEET (1 OF 2) FOR GENERAL RETAINING WALL NOTES.*
2. *WALL OFFSET PROVIDED FROM CENTERLINE OF TRACK TO BACK OF PARAPET."HEIGHT" IS THE EXPOSED WALL HEIGHT, SEE TYPICAL DETAILS SHEET (1 OF 2).*
3. *SEE TRACK PLANS FOR TRACK ALIGNMENT DATA AND ADDITIONAL INFORMATION.*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. MACPHERSON
DRAWN BY: J. MACPHERSON
CHECKED BY: K. D'URSO
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

RETAINING WALLS "H" AND "I"
PLAN AND SECTION

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: W-009
REV.: N/A
SHEET NO.: 162 OF 273
SCALE: AS SHOWN

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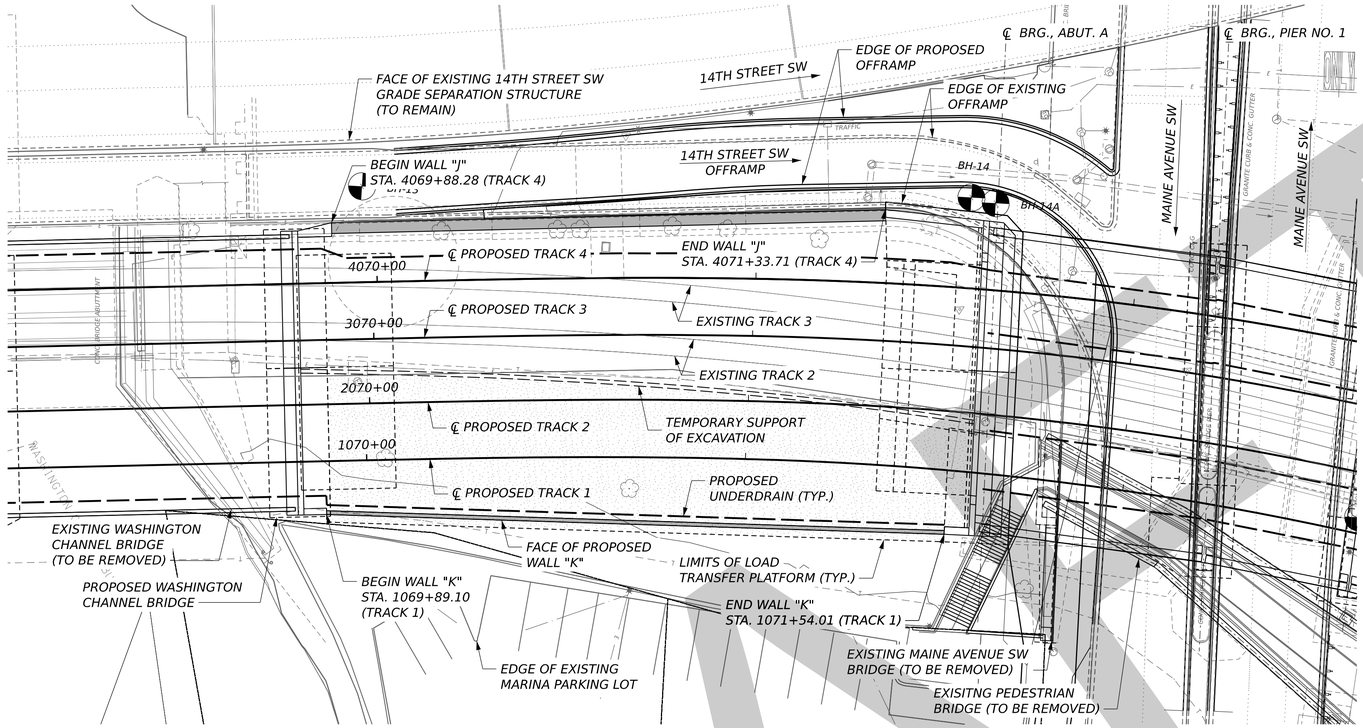
Plotted By: kwentworth 2/9/2023
w_R02A_w010_retwall_H1.dgn
Plan Sheet w006

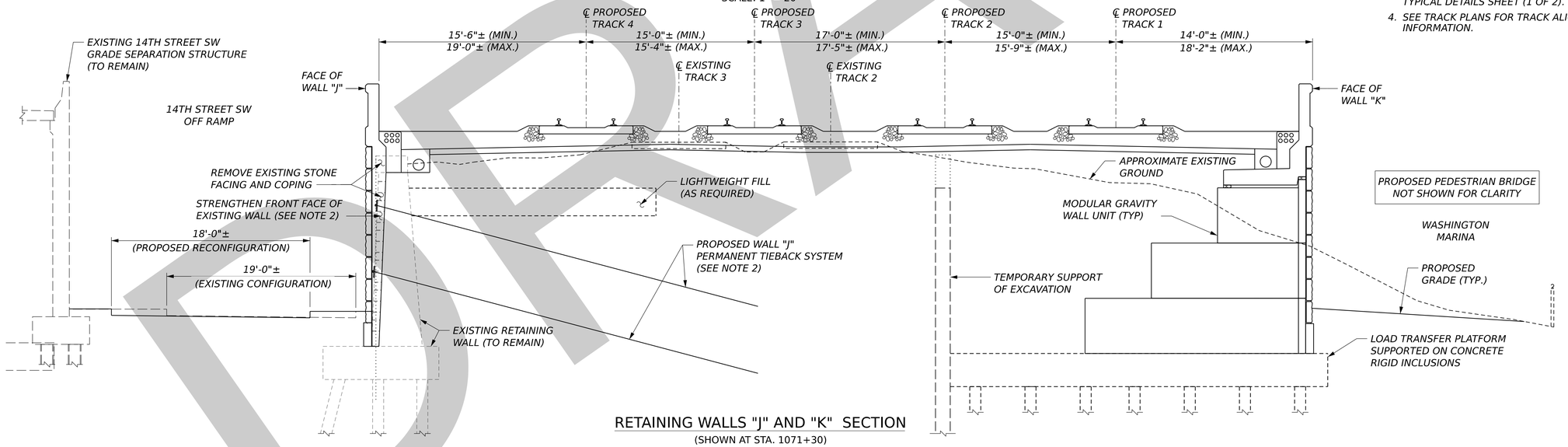
SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



RETAINING WALLS "J" AND "K" PLAN

SCALE: 1" = 20'



RETAINING WALLS "J" AND "K" SECTION

(SHOWN AT STA. 1071+30)

SCALE: 3/16" = 1'-0"

LEGEND

= NEW RETAINING WALL

= LIMITS OF LOAD TRANSFER PLATFORM

WALL "J" TABLE
(SEE NOTE 3)

STA.	OFFSET	HEIGHT
4069+88	14.93'	15'±
4070+00	14.95'	16'±
4070+50	15.16'	19'±
4071+00	16.41'	22'±
4071+33	18.30'	23'±

WALL "K" TABLE
(SEE NOTE 3)

STA.	OFFSET	HEIGHT
1069+89	13.06'	23'±
1070+00	13.62'	23'±
1070+50	16.03'	21'±
1071+00	17.16'	15'±
1071+50	15.84'	10'±

NOTES:

1. SEE RETAINING WALL TYPICAL DETAILS SHEET (1 OF 2) FOR GENERAL RETAINING WALL NOTES.
2. TIEBACKS AND STRENGTHENING OF WALL "J" TO BE DETERMINED DURING FINAL DESIGN BY THE PROGRESSIVE DESIGN-BUILD (PDB) TEAM.
3. WALL OFFSET PROVIDED FROM CENTERLINE OF TRACK TO BACK OF PARAPET. "HEIGHT" IS THE EXPOSED WALL HEIGHT, SEE TYPICAL DETAILS SHEET (1 OF 2).
4. SEE TRACK PLANS FOR TRACK ALIGNMENT DATA AND ADDITIONAL INFORMATION.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. MACPHERSON
DRAWN BY: J. MACPHERSON
CHECKED BY: K. D'URSO
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

RETAINING WALLS "J" AND "K"
PLAN AND SECTION

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. W-010
REV. N/A
SHEET NO. 163 OF 273
SCALE: AS SHOWN

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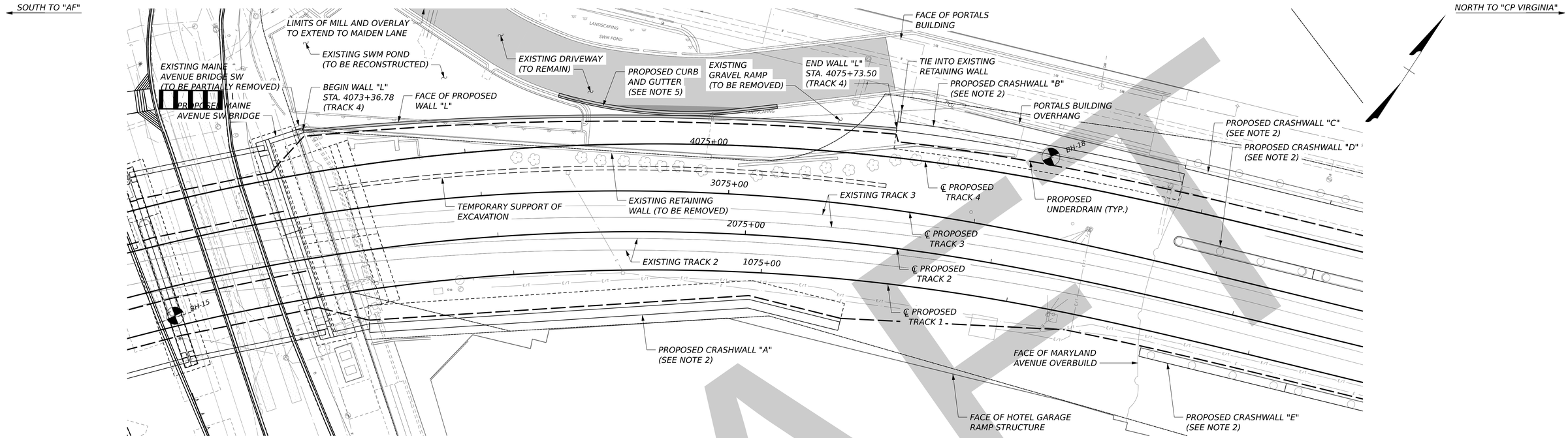
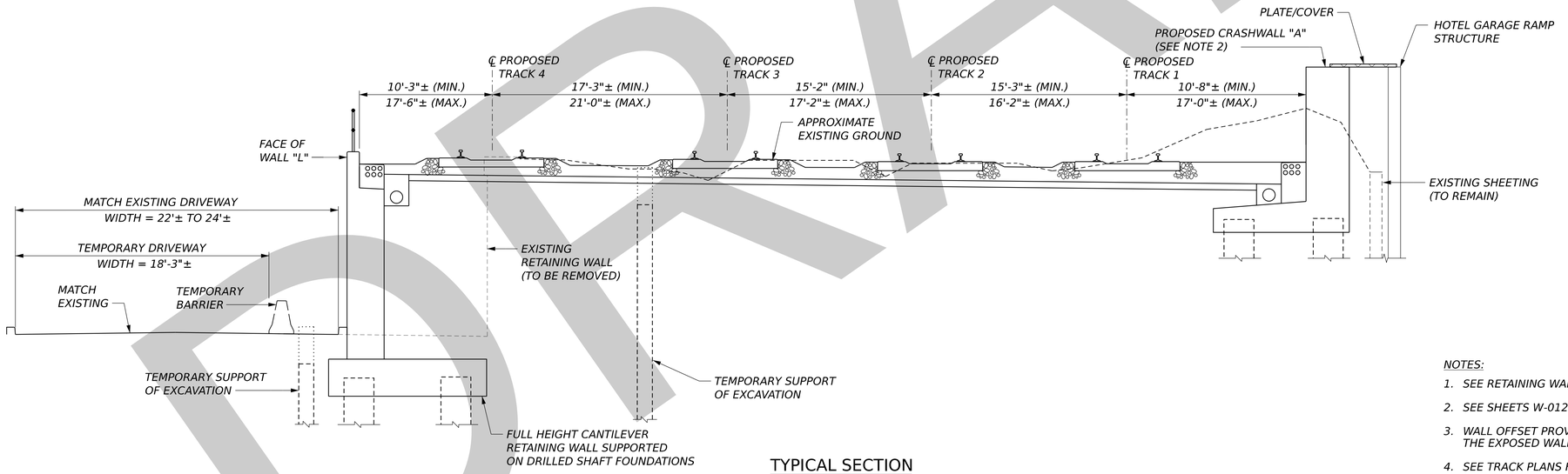
Plotted By: kwentworth 2/9/2023
w_R02A_w011_retWall_JK.dgn
Plan and Section 1 - 30% Sheet



RETAINING WALL "L" PLAN

SCALE: 1" = 20'



TYPICAL SECTION
RETAINING WALL "L"

(SHOWN AT STA. 4074+50)

SCALE: $\frac{3}{16}$" = 1'-0"

WALL "L" TABLE
(SEE NOTE 3)

STA.	OFFSET	HEIGHT
4073+36	16.48'	20'±
4073+50	15.61'	20'±
4074+00	12.92'	22'±
4074+50	11.16'	18'±
4075+00	10.38'	16'±
4075+50	10.59'	14'±
4075+73	10.97'	12'±

LEGEND

= LIMIT OF 2" PAVEMENT MILLING AND RESURFACING (2" DEPTH FROM BARRIER TO TRAVEL WAY)

= LIMIT OF FULL DEPTH PAVEMENT (MATCH-IN-KIND)

= NEW RETAINING WALL

NOTES:

1. *SEE RETAINING WALL TYPICAL DETAILS SHEET (1 OF 2) FOR GENERAL RETAINING WALL NOTES.*
2. *SEE SHEETS W-012 THROUGH W-026 FOR CRASHWALL DETAILS.*
3. *WALL OFFSET PROVIDED FROM CENTERLINE OF TRACK TO BACK OF PARAPET. "HEIGHT" IS THE EXPOSED WALL HEIGHT, SEE TYPICAL DETAILS SHEET (1 OF 2).*
4. *SEE TRACK PLANS FOR TRACK ALIGNMENT DATA AND ADDITIONAL INFORMATION.*
5. *CURB AND GUTTER SHALL BE INSTALLED IN ACCORDANCE WITH DDOT STANDARD DRAWING 606.01*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: J. MACPHERSON
DRAWN BY: J. MACPHERSON
CHECKED BY: K. D'URSO
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

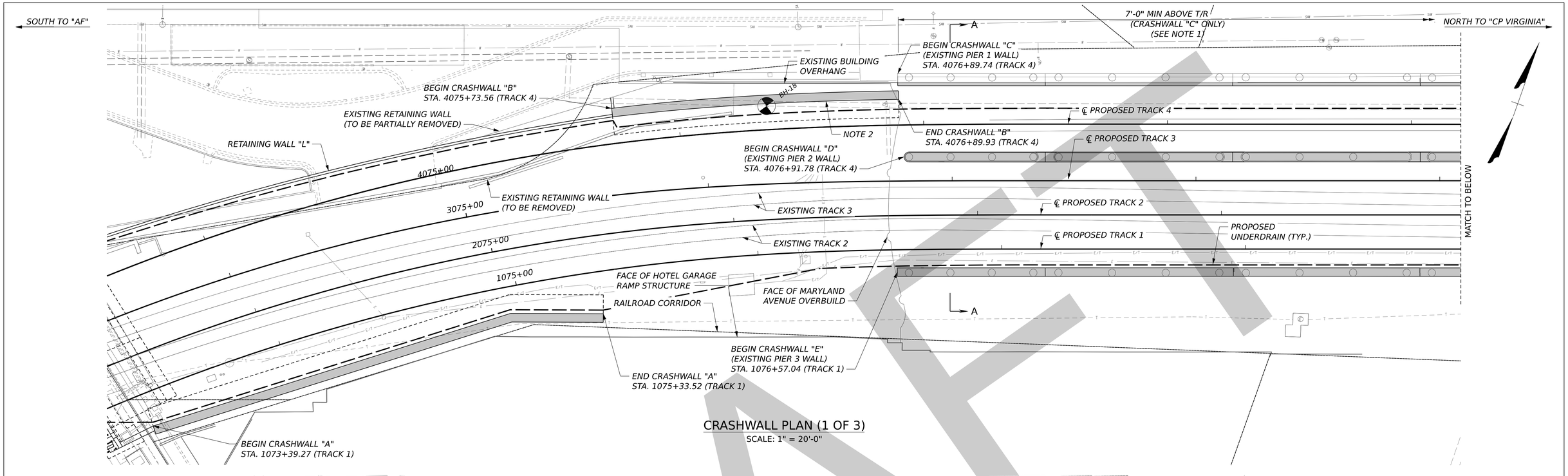
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

RETAINING WALL "L"
PLAN AND SECTION

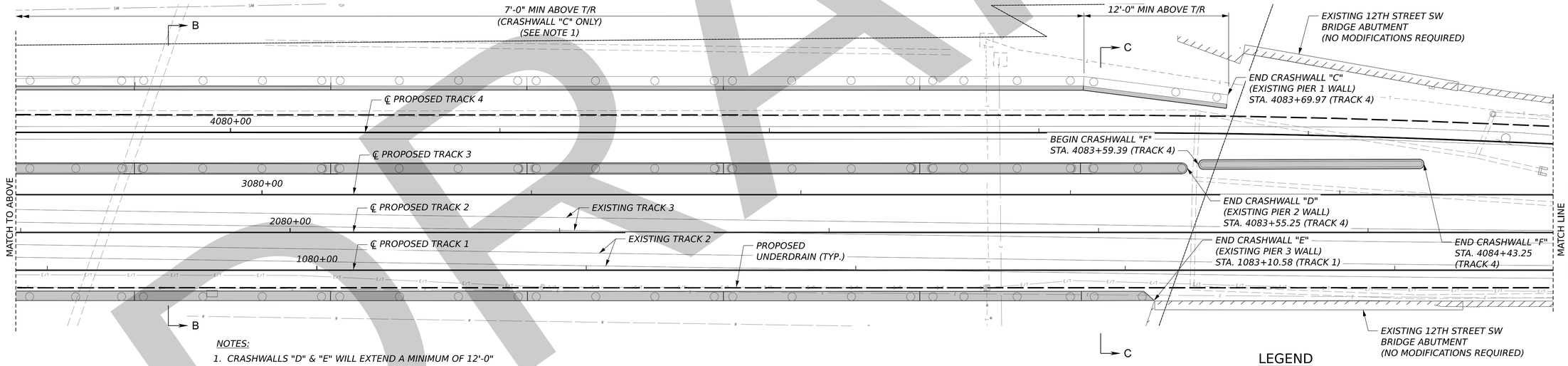
PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. W-011
REV. N/A
SHEET NO. 164 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
w_R02A_w012_retwall_L.dgn
Plan Sheet w012



CRASHWALL PLAN (1 OF 3)

SCALE: 1" = 20'-0"



NOTES:

1. *CRASHWALLS "D" & "E" WILL EXTEND A MINIMUM OF 12'-0" ABOVE T/R THROUGHOUT ENTIRE TUNNEL.*
2. *EXISTING RCP TO BE RELOCATED AT CRASHWALL "B".*

CRASHWALL PLAN (2 OF 3)

SCALE: 1" = 20'-0"

LEGEND

= NEW CRASHWALL OR EXISTING CRASHWALL MODIFICATION

= EXISTING CORRIDOR RETAINING WALL OR BRIDGE ABUTMENT (TO REMAIN)

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. D'URSO
DRAWN BY: K. WENTWORTH
CHECKED BY: T. MOORE
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

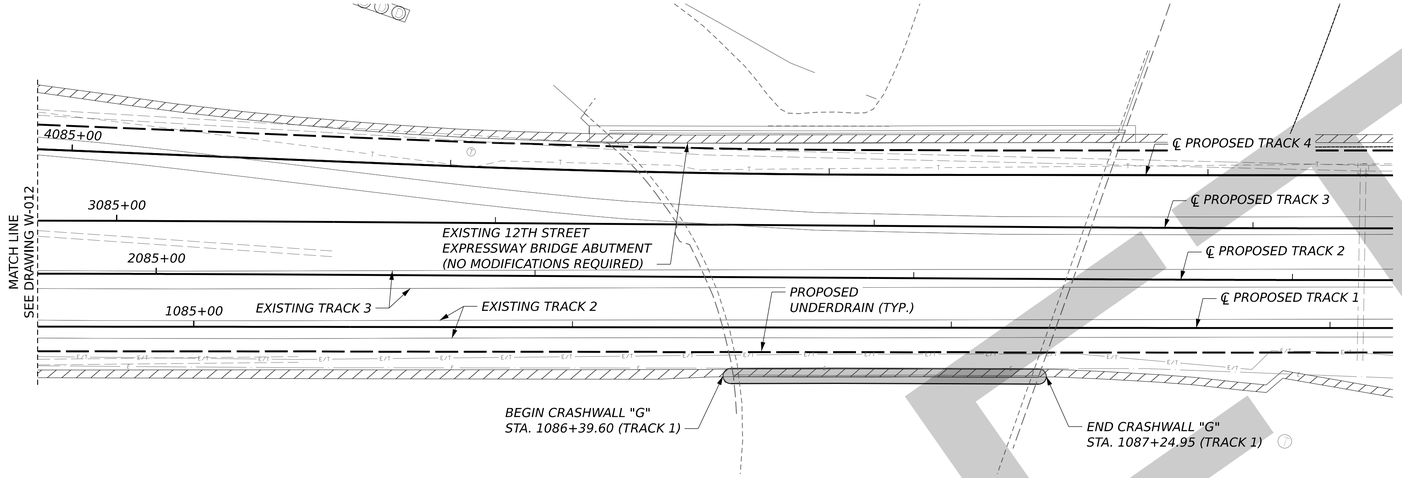
CRASHWALLS
GENERAL PLAN (1 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. W-012
REV. N/A
SHEET NO. 165 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_id_v95.tbl
Plotted By: kwentworth 2/9/2023
c_R02A_W009_genplan.dgn
W-009_Plan Sheet 1

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



CRASHWALL PLAN (3 OF 3)

SCALE: 1" = 20'-0"

LEGEND

= *NEW CRASHWALL OR EXISTING CRASHWALL MODIFICATION*

= *EXISTING CORRIDOR RETAINING WALL OR BRIDGE ABUTMENT (TO REMAIN)*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. D'URSO
DRAWN BY: K. WENTWORTH
CHECKED BY: T. MOORE
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

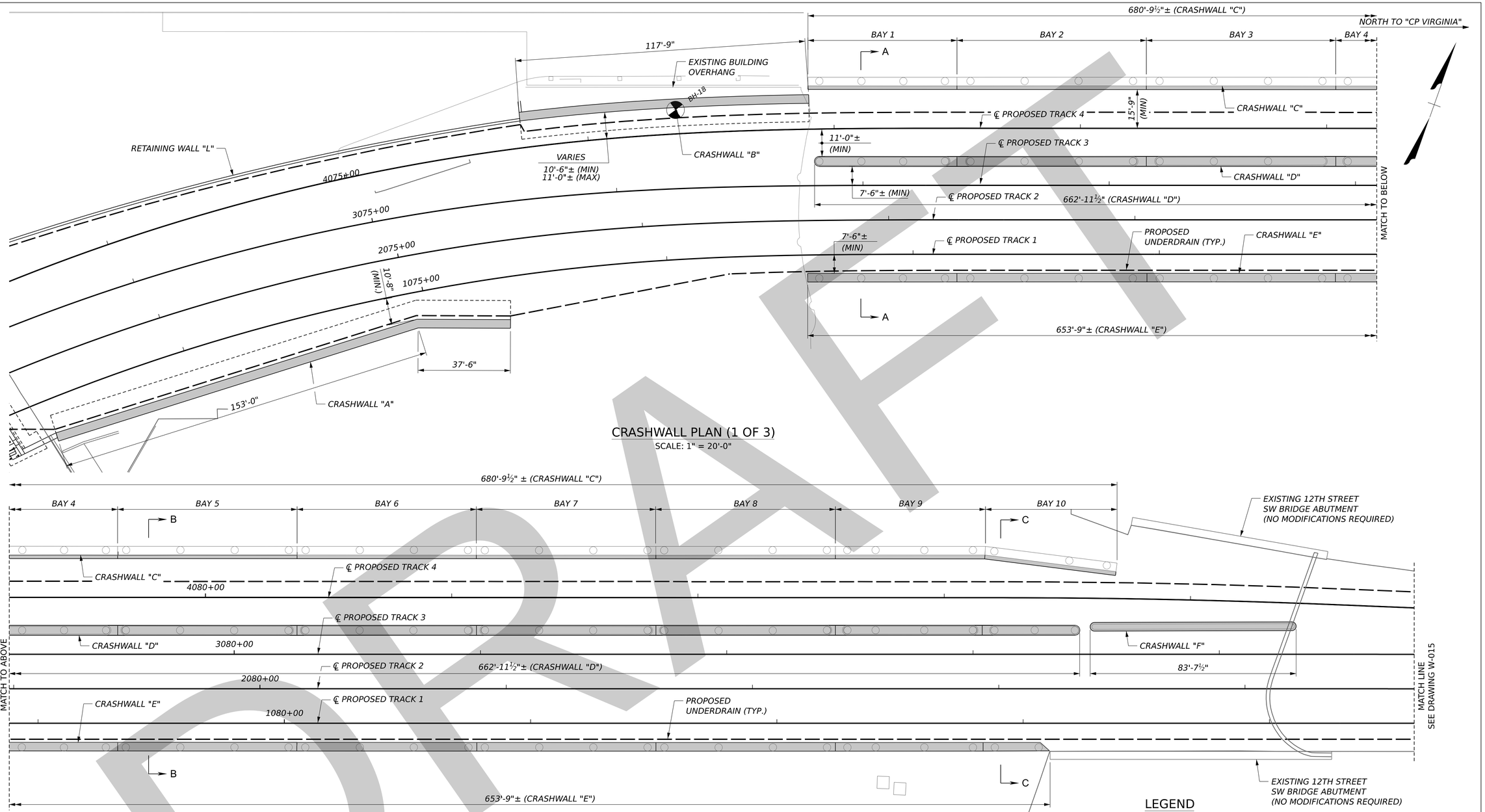
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

CRASHWALLS
GENERAL PLAN (2 OF 2)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: W-013
REV.: N/A
SHEET NO.: 166 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
c_R02A_W009_genplan.dgn
W-010_Plan Sheet 2



CRASHWALL PLAN (1 OF 3)

SCALE: 1" = 20'-0"

CRASHWALL PLAN (2 OF 3)

SCALE: 1" = 20'-0"

LEGEND

= NEW CRASHWALL OR EXISTING CRASHWALL MODIFICATION

= EXISTING CORRIDOR RETAINING WALL OR BRIDGE ABUTMENT (TO REMAIN)

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. D'URSO
DRAWN BY: K. WENTWORTH
CHECKED BY: T. MOORE
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

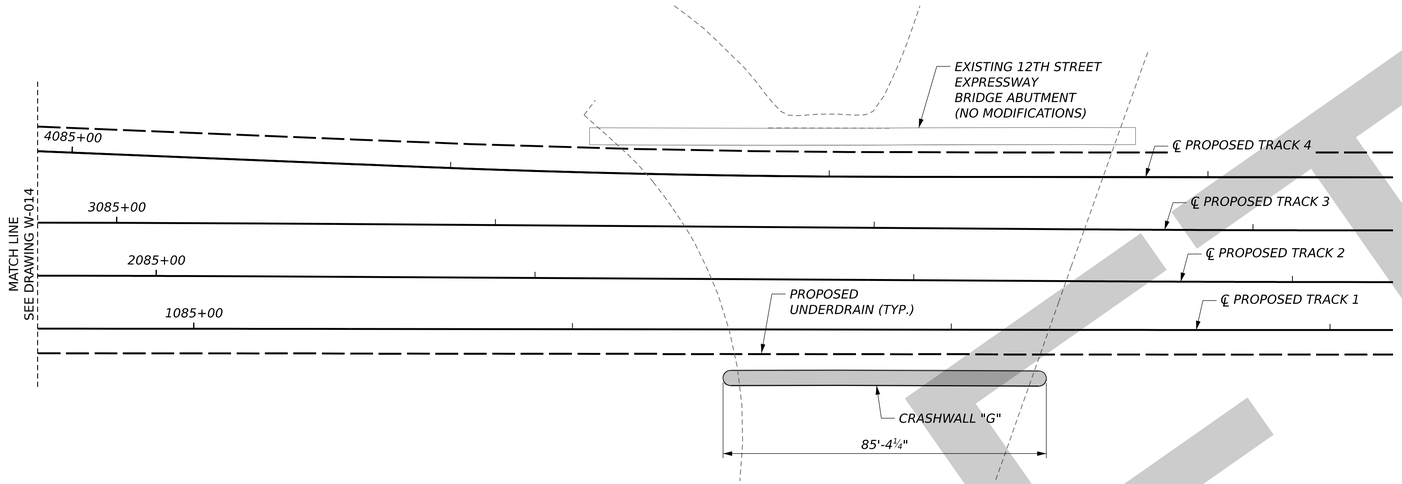
CRASHWALLS PLAN (1 OF 2)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: W-014
REV.: N/A
SHEET NO.: 167 OF 273
SCALE: AS SHOWN

pdf.pltcfg
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
c_R02A_W009_crashplan.dgn
W-009_Plan Sheet 1

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



CRASHWALL PLAN (3 OF 3)

(EXISTING RETAINING WALLS ALONG TRACK CORRIDOR NOT SHOWN FOR CLARITY)
SCALE: 1" = 20'-0"

DRAFT

LEGEND

= NEW CRASHWALL OR EXISTING CRASHWALL MODIFICATION

= EXISTING CORRIDOR RETAINING WALL OR BRIDGE ABUTMENT (TO REMAIN)

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: K. D'URSO
DRAWN BY: K. WENTWORTH
CHECKED BY: T. MOORE
APPROVED BY: G. GOODRICH
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

CRASHWALLS PLAN (2 OF 2)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: W-015
REV.: N/A
SHEET NO.: 168 OF 273
SCALE: AS SHOWN

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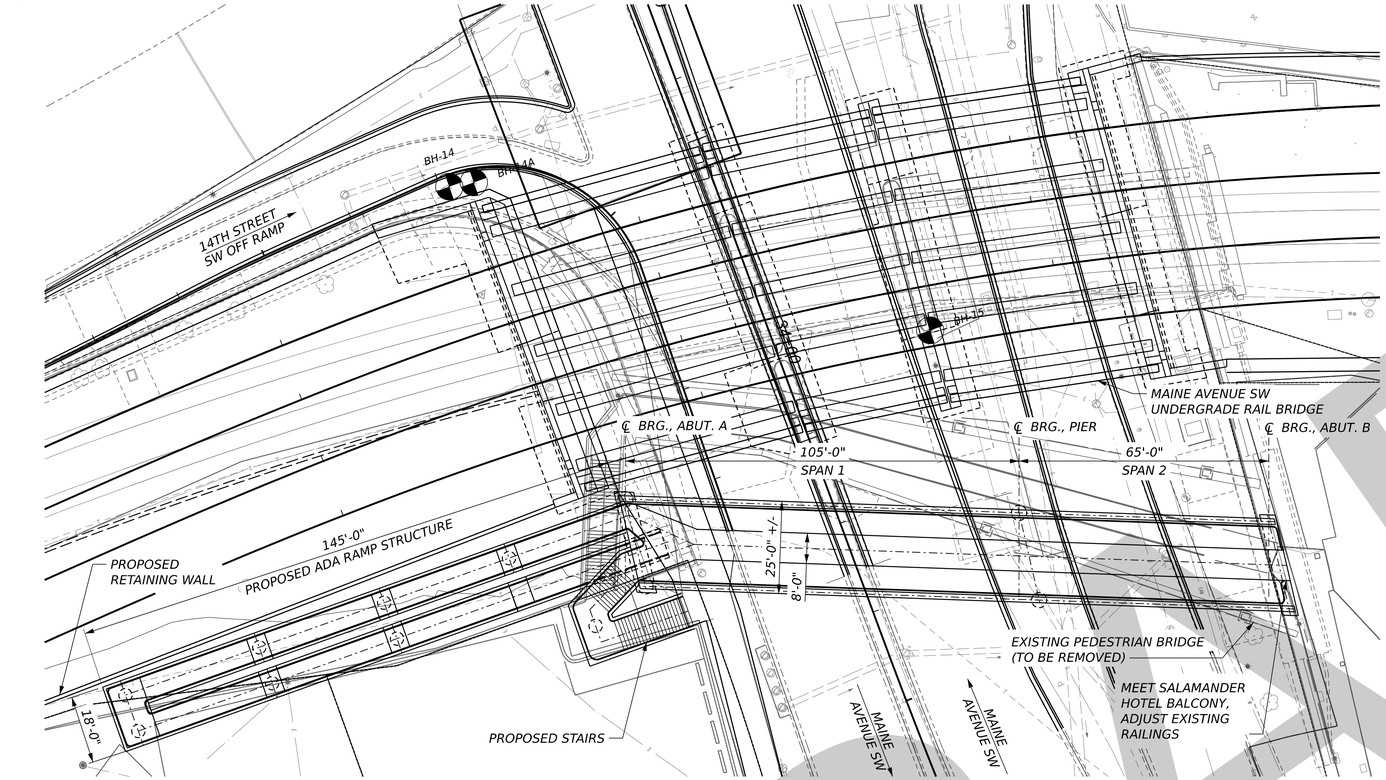
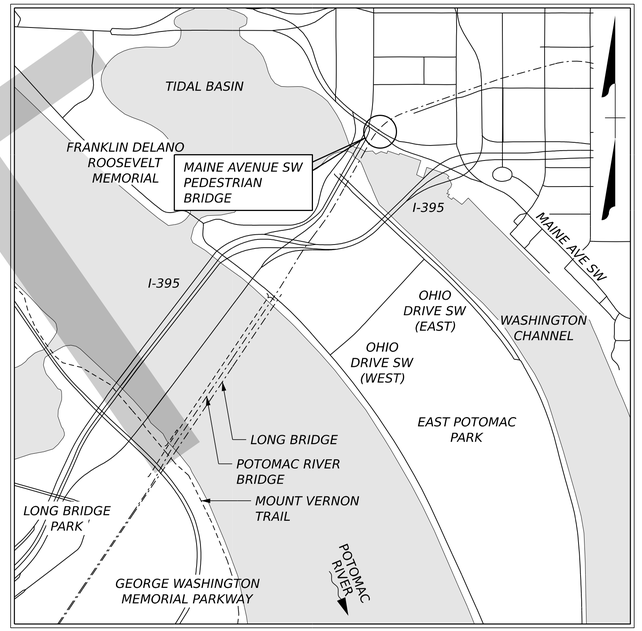
LBPE_Id_v95.tbl
Plotted By: kwentworth 2/9/2023
c_R02A_W009_crashplan.dgn
W-010_Plan Sheet 2



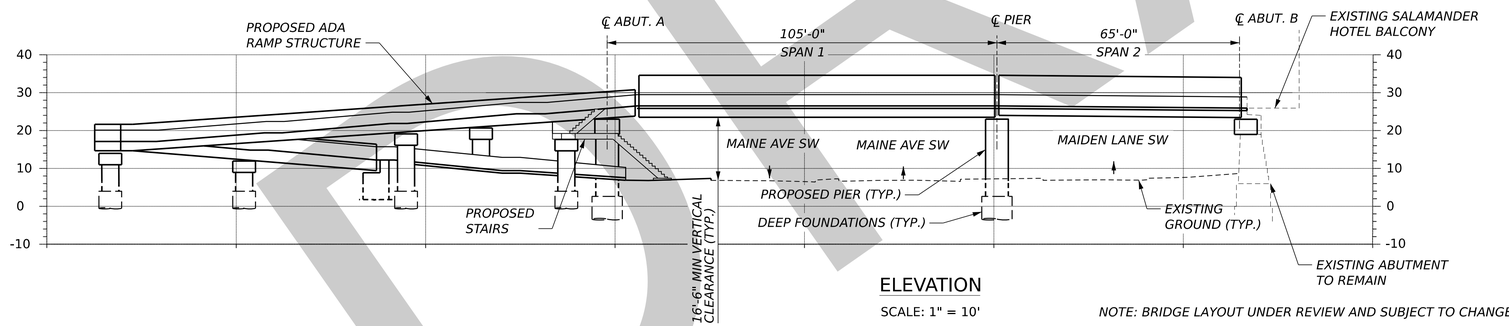
KEY PLAN
SCALE: 1" = 20'

NOTES:

1. EXISTING PEDESTRIAN BRIDGE IS OWNED BY THE PORTALS DEVELOPMENT ASSOCIATES LIMITED PARTNERSHIP AND IS PHYSICALLY CONNECTED TO THE PRIVATELY OWNED SLAMANDER HOTEL WALKWAY. PROPOSED PEDESTRIAN BRIDGE WILL ALSO BE OWNED BY THE LIMITED PARTNERSHIP AND WILL BE CONNECTED TO THE HOTEL WALKWAY IN A SIMILAR LOCATION.
2. DESIGN DEVELOPMENT FOR THE PROPOSED PEDSTRIAN BRIDGE AND RAMP, AS WELL AS THE TEMPORARY BRDIGE DURING CONSTRUCTION, IS CONCEPTUAL ONLY AND SUBJECT TO CHANGE FROM THE DETAILS CURRENTLY SHOWN. ADDITIONAL DESIGN INPUT IS FORTHCOMING THROUGH VPRA COORDINATION WITH THE BRIDGE OWNER, PRIVATE PROPERTY OWNERS, THE SIGNATORIES TO THE LONG BRIDGE PROJECT SECTION 106 PROGRAMMATIC AGREEMENT, THE COMISSION OF FINE ARTS, AND MULTIPLE DISTRICT AGENCIES.

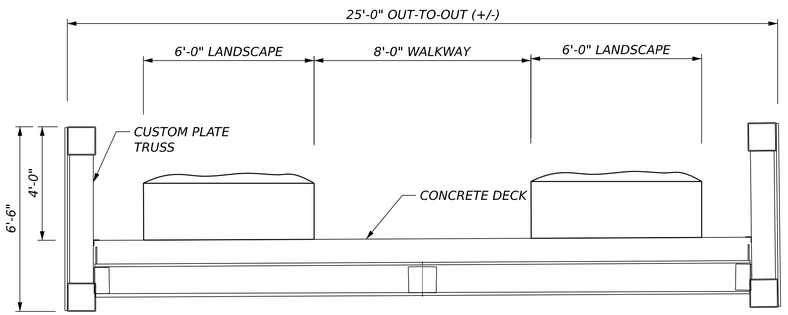


LOCUS MAP
SCALE 1" = 1000'



ELEVATION
SCALE: 1" = 10'

NOTE: BRIDGE LAYOUT UNDER REVIEW AND SUBJECT TO CHANGE.



TRANSVERSE SECTION - BRIDGE SPANS
SCALE: 3/8" = 1'-0"

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. KELLER
DRAWN BY: K. WENTWORTH
CHECKED BY: K.SMIACH
APPROVED BY: M. COLGAN
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

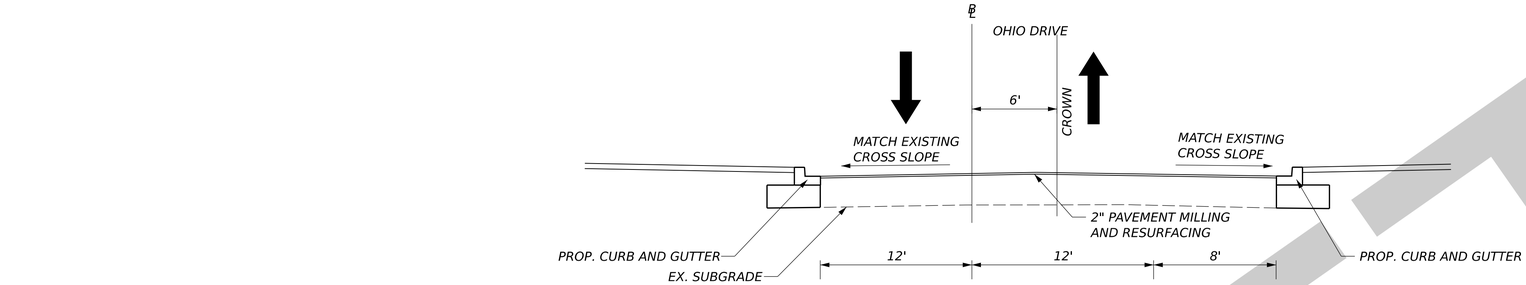
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

MAINE AVE SW PEDESTRIAN BRIDGE
PLAN, PROFILE,
AND TRANSVERSE SECTION

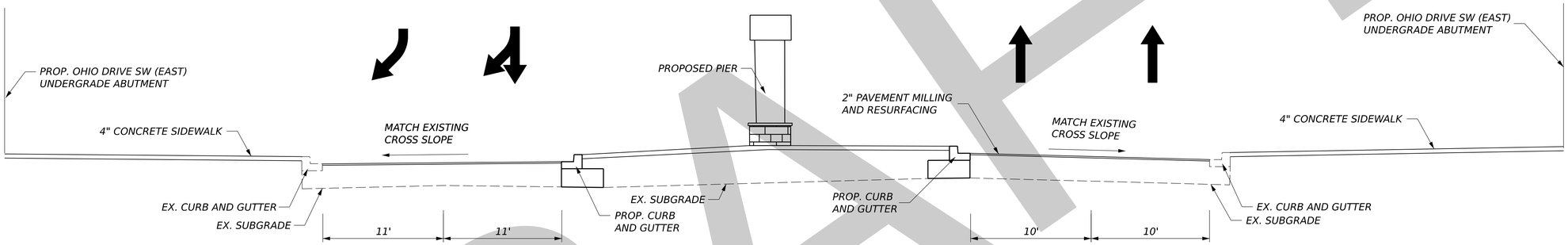
PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: D-301
REV.: N/A
SHEET NO.: 180 OF 273
SCALE: AS SHOWN

pdf,pltcfg
LBPE_Id_v95.tbl
Plotted By: aellis 2/9/2023
d03_R02A_D301_pro.dgn
Maine Ave Ped Bridge Sheet



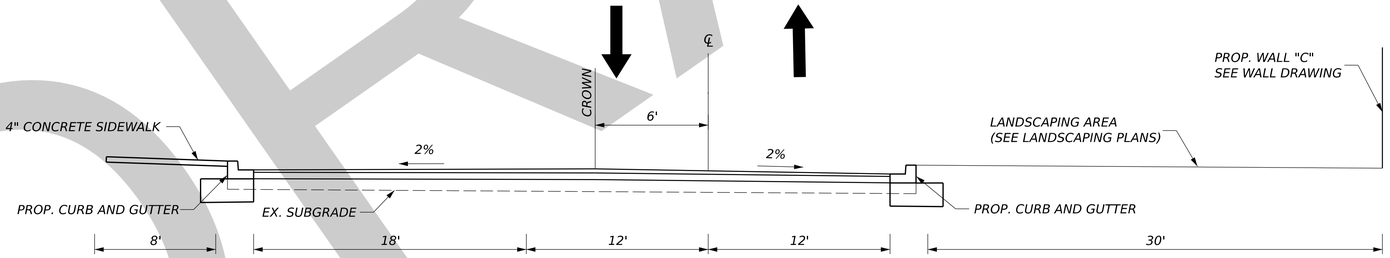
OHIO DRIVE SW (WEST)

LOOKING EAST
STA 33+75 TO STA 34+25
N.T.S.



OHIO DRIVE SW (EAST)

LOOKING EAST
STA 21+75 TO STA 22+50
N.T.S.



NPS PARKING LOT C

LOOKING NORTH
STA 20+50 TO STA 22+50
N.T.S.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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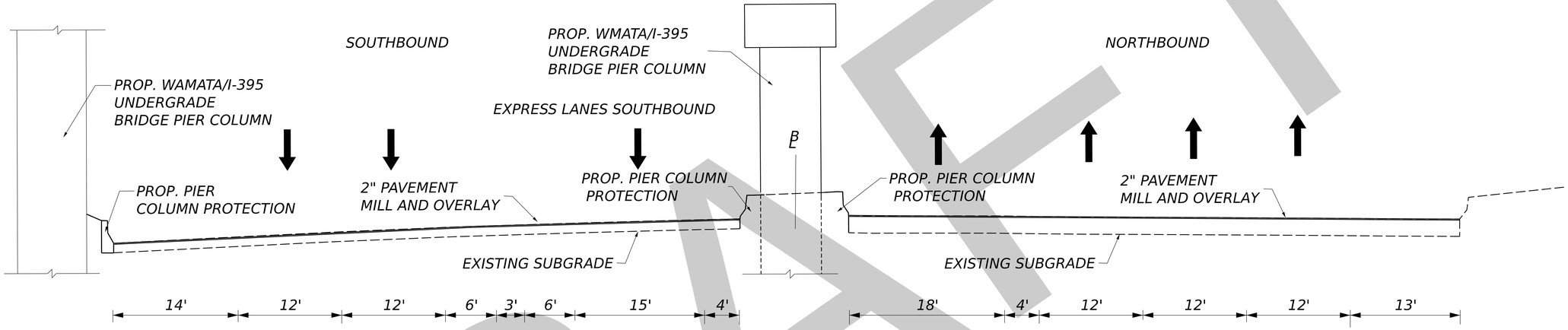
vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL
TYPICAL SECTION-PAVEMENT OVERLAY
OHIO DRIVE SW (EAST AND WEST)
AND NPS PARKING LOT C

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-001
REV. N/A
SHEET NO. 181 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: enavia 2/7/2023
xR02A_typ_Ohio Dr.dgn
N PKG TYP



I-395
STA 50+00 TO STA 56+00
N.T.S.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

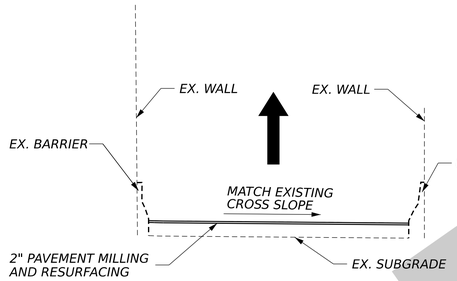
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TYPICAL SECTION-PAVEMENT OVERLAY
I-395 AND RAMPS

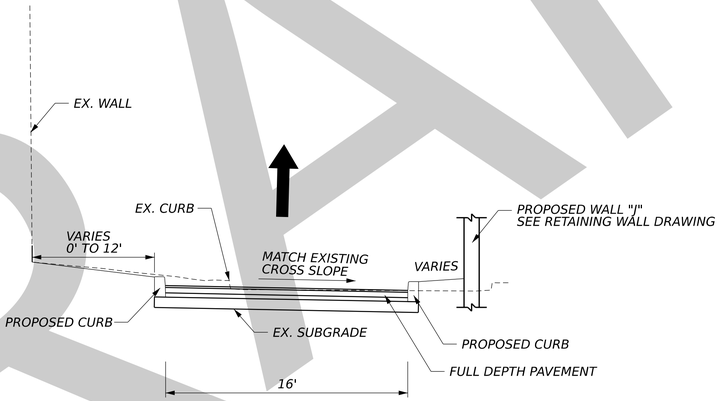
PROJECT NO.: VPRA R02A
CSXT XXXX
DRAWING NO.: R-002
REV.: N/A
SHEET NO.: 182 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_lt_v95.tbl
Plotted By: enavia 2/7/2023
xR02A_RD_typ_I-395.dgn
I-395_TYP_XS_SHEET



14th STREET OFF RAMP

STA 10+00 TO STA 10+50
N.T.S.



14th STREET OFF RAMP

STA 10+50 TO STA 11+50
N.T.S.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

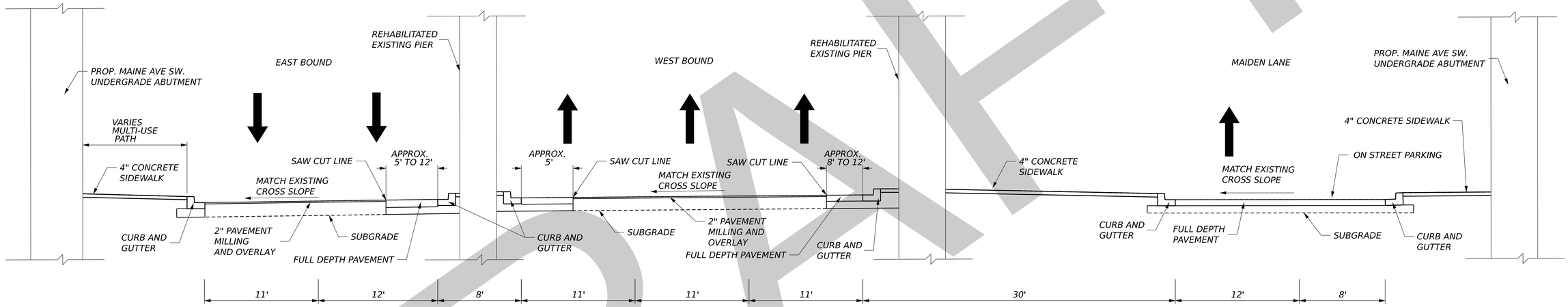
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TYPICAL SECTION
14th STREET OFF-RAMP

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: R-003
REV.: N/A
SHEET NO.: 183 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_ltd_v95.tbl
Plotted By: enavia 2/7/2023
xR02A_RO_3yp_14th St.dgn
14TH ST OFF RAMP



MAINE AVENUE

STA 33+00 TO STA 36+00
N.T.S.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

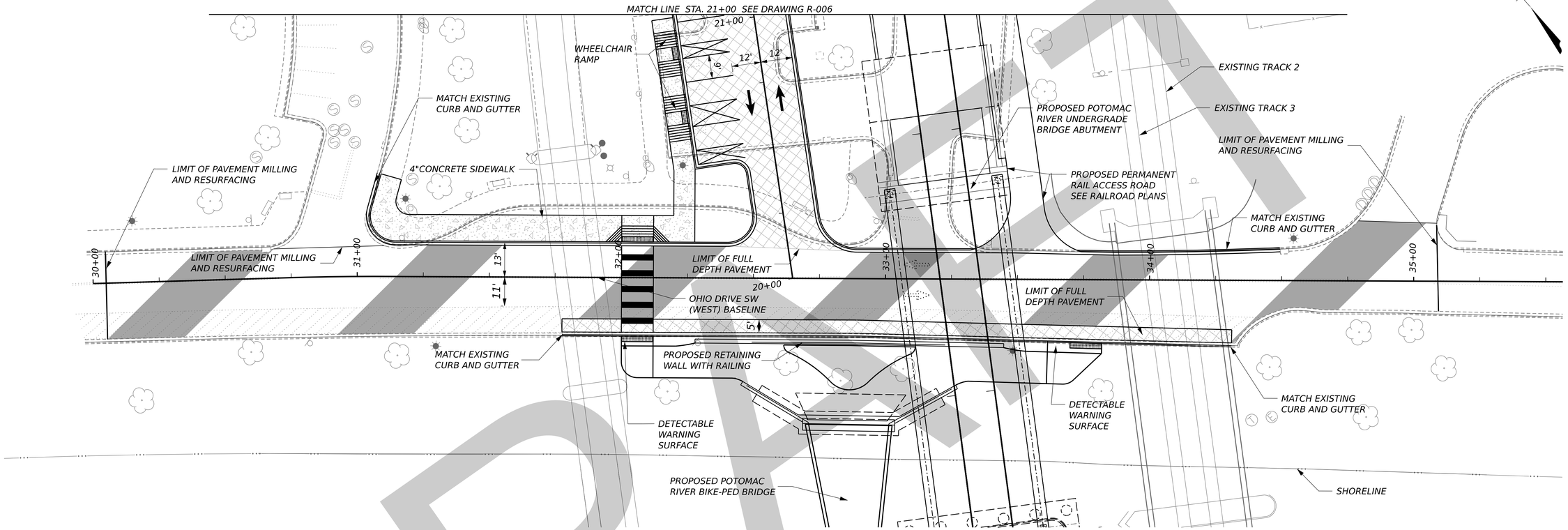
TYPICAL SECTION-PAVEMENT OVERLAY
MAINE AVENUE AND MAIDEN LANE

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-004
REV. N/A
SHEET NO. 184 OF 273
SCALE AS SHOWN

\VDOT PDF.pltcfg
LBPE_fd_v95.tbl
Plotted By: enavia
2/10/2023
xR02A_typ_Maine-Ave.cdgn
Maine Ave. TXS Sheet

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



NOTES

1. THE PROPOSED PAVEMENT MARKINGS ARE TO MATCH THE EXISTING PAVEMENT MARKINGS
2. THE SOUTH PACKAGE INCLUDES THE FULL DEPTH PAVEMENT WORK ALONG OHIO DRIVE ADJACENT TO THE PEDESTRIAN BIKE BRIDGE AND PARKING LOT B WORK ONLY.
3. THE NORTH PACKAGE INCLUDES THE PAVEMENT MILLING AND RESURFACING WORK ALONG OHIO DRIVE, SIDEWALK IMPROVEMENTS, AND PARKING LOT C ONLY.
4. THE ALIGNMENT IS A PAPER BASE LINE AND NOT ESTABLISHED IN THE FIELD.
5. THE DESIGN BUILDER IS RESPONSIBLE TO COORDINATE WITH NPS ON A PROPOSED CYCLE TRACK PROJECT THAT WILL MODIFY THE PAVEMENT MARKING.
6. THE DESIGN BUILDER (SOUTH CONTRACT) AND THE PROGRESSIVE DESIGN BUILDER (NORTH CONTRACT) SHALL COORDINATE WITH THE NPS ON REPAVING, RECONSTRUCTION PAVEMENT, AND RELATED INFRASTRUCTURE TEMPORARILY IMPACTED BY CONSTRUCTION WITHIN THE GWMP, WEST POTOMAC PARK AND EAST POTOMAC PARK (INCLUDING PARKING LOT B AND C AND OHIO DR SW) TO INCLUDE AS A REQUIREMENT IN THE NPS SPECIAL USE PERMIT.

LEGEND:

PAVEMENT MILLING

FULL DEPH PAVEMENT

4" CONCRETE SIDEWALK

SCALE 0 20' 40'

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY S. NAWEED
DRAWN BY E. NAVIA
CHECKED BY B. MCADAMS
APPROVED BY P. CLARY
DATE 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

GENERAL PLAN
OHIO DRIVE SW (WEST) (1 OF 2)

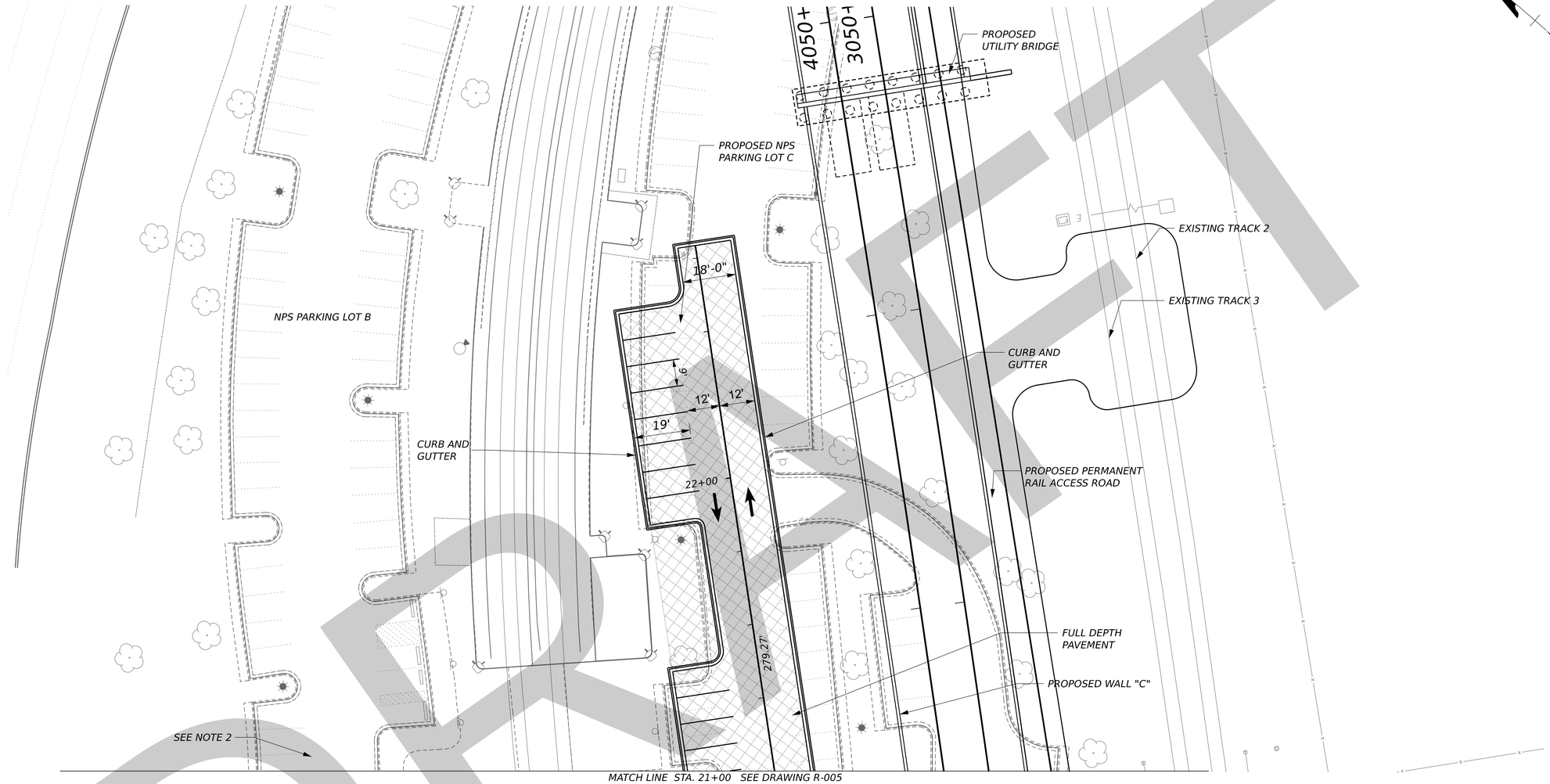
PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-005
REV. N/A
SHEET NO. 185 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_td_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_Ohio Dr. S_01.dgn
NORTH CONTRACT PLOT SHEET

DRAFT

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



NOTES

1. THE PROPOSED PAVEMENT MARKINGS ARE TO MATCH THE EXISTING PAVEMENT MARKINGS
2. PARKING LOT B IS TO BE MILLED AND OVERLAYED 2" DEPTH.
3. THE SOUTH PACKAGE INCLUDES THE FULL DEPTH PAVEMENT WORK ALONG OHIO DRIVE ADJACENT TO THE PEDESTRIAN BIKE BRIDGE AND PARKING LOT B WORK ONLY.
4. THE NORTH PACKAGE INCLUDES THE PAVEMENT MILLING AND RESURFACING WORK ALONG OHIO DRIVE, THE SIDEWALK IMPROVEMENTS, AND PARKING LOT C ONLY.
5. RE-STRIPED ALL PAVEMENT MARKINGS IN ALL AREAS AFTER RESURFACING WORK IS COMPLETED.
6. THE DESIGN BUILDER (SOUTH CONTRACT) AND THE PROGRESSIVE DESIGN BUILDER (NORTH CONTRACT) SHALL COORDINATE WITH THE NPS ON REPAVING, RECONSTRUCTION PAVEMENT, AND RELATED INFRASTRUCTURE TEMPORARILY IMPACTED BY CONSTRUCTION WITHIN THE GWMP, WEST POTOMAC PARK AND EAST POTOMAC PARK (INCLUDING PARKING LOT B AND C AND OHIO DR SW) TO INCLUDE AS A REQUIREMENT IN THE NPS SPECIAL USE PERMIT.

LEGEND:

PAVEMENT MILLING AND RESURFACING

FULL DEPTH PAVEMENT

4" CONCRETE SIDEWALK

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY S. NAWEED
DRAWN BY E. NAVIA
CHECKED BY B. MCADAMS
APPROVED BY P. CLARY
DATE 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

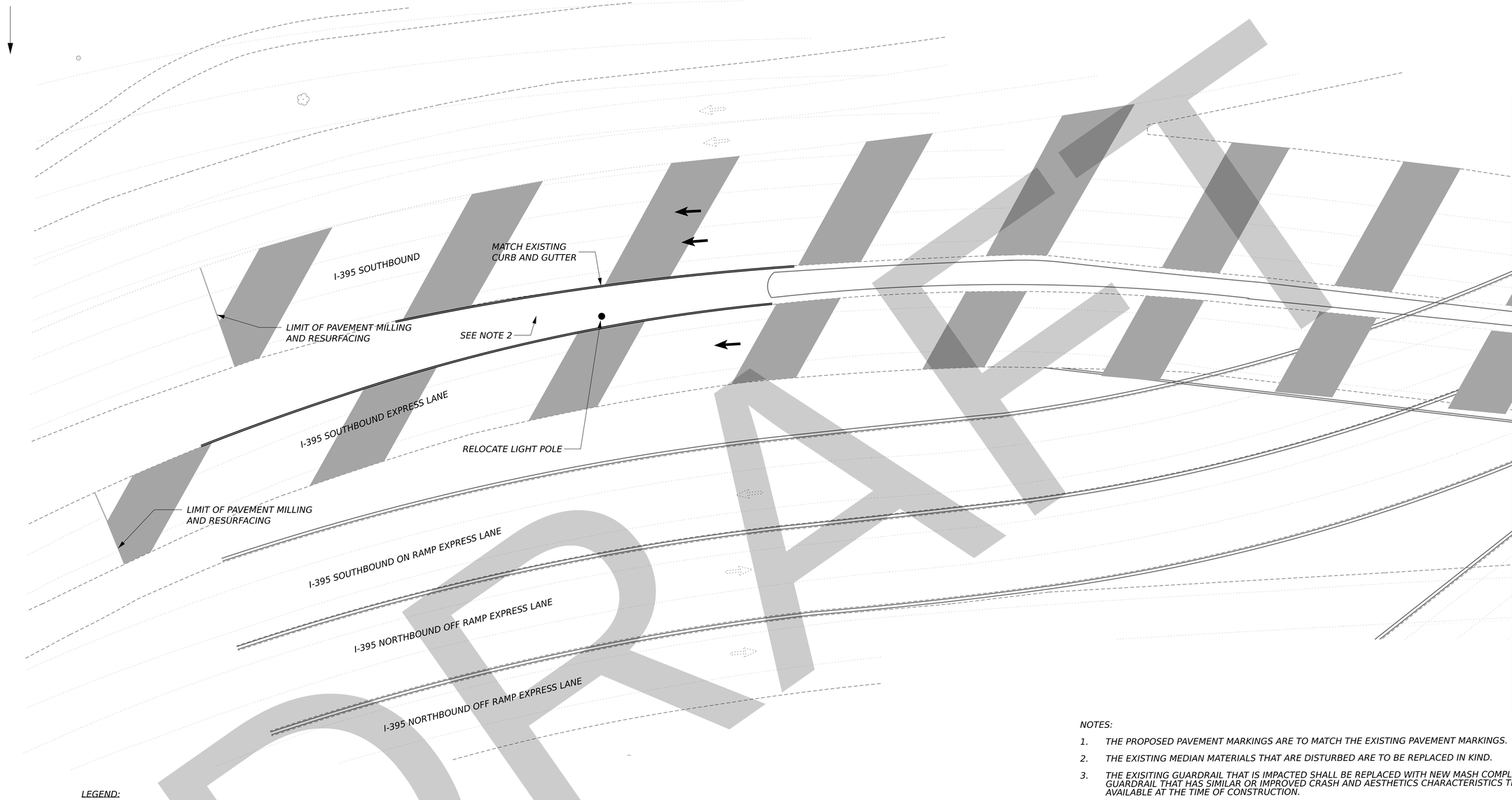
SUBDIVISION: RF&P ZONE: CENTRAL
GENERAL PLAN
OHIO DRIVE SW (WEST)
(2 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-006
REV. N/A
SHEET NO. 186 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_kl_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_Ohio Dr. S_02.dgn
NORTH Package

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



LEGEND:

PAVEMENT MILLING AND RESURFACING

FULL DEPTH PAVEMENT

4" CONCRETE SIDEWALK

NOTES:

1. *THE PROPOSED PAVEMENT MARKINGS ARE TO MATCH THE EXISTING PAVEMENT MARKINGS.*
2. *THE EXISTING MEDIAN MATERIALS THAT ARE DISTURBED ARE TO BE REPLACED IN KIND.*
3. *THE EXISITING GUARDRAIL THAT IS IMPACTED SHALL BE REPLACED WITH NEW MASH COMPLIANT GUARDRAIL THAT HAS SIMILAR OR IMPROVED CRASH AND AESTHETICS CHARACTERISTICS THAT ARE AVAILABLE AT THE TIME OF CONSTRUCTION.*
4. *THE EXISTING MATERIALS THAT ARE DISTURBED BY TEMPORARY WIDENING AND TEMPORARY PAVEMENT SHALL BE REPLACED IN KIND .*

SCALE
0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

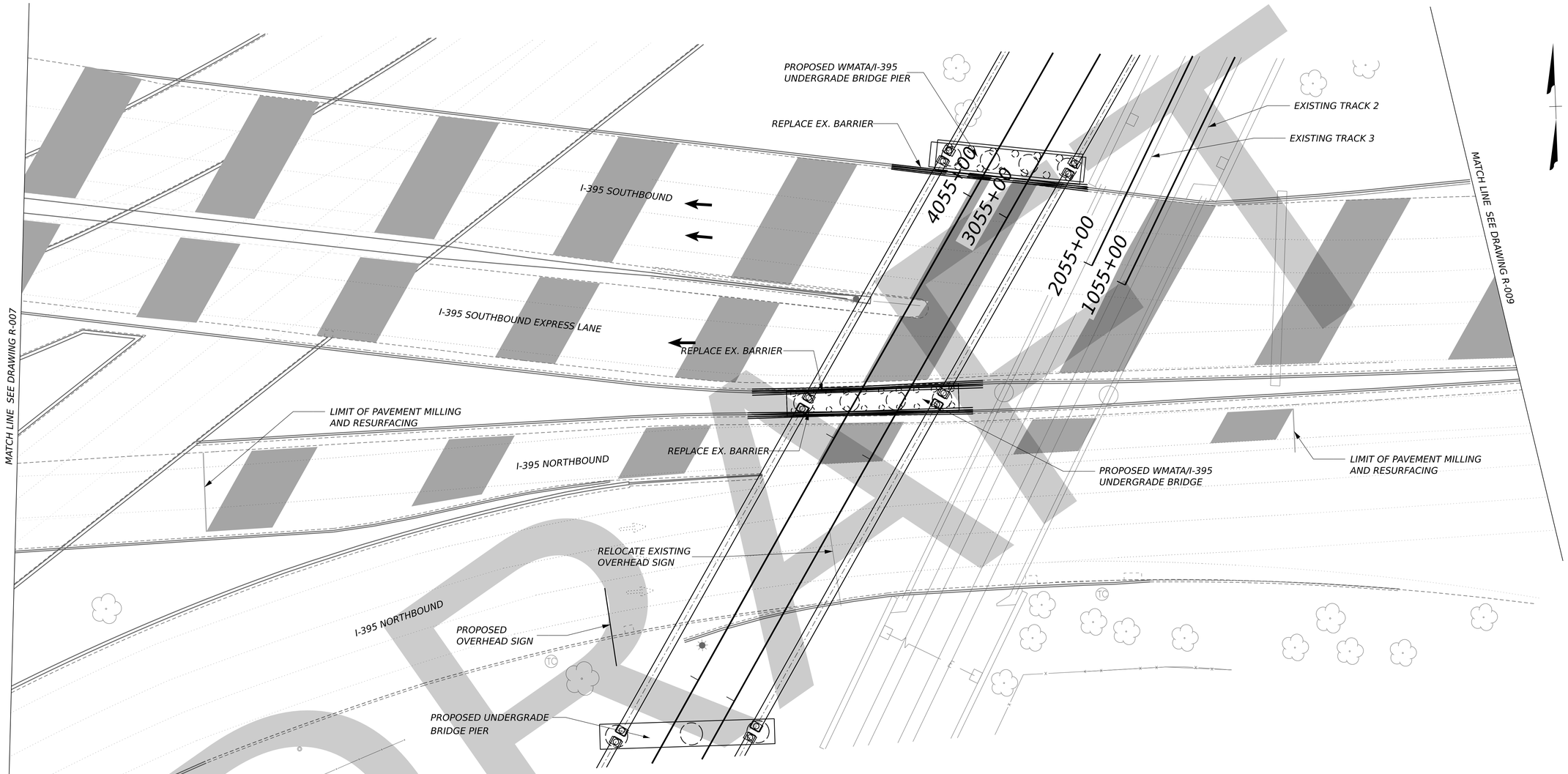
GENERAL PLAN
I-395 (1 OF 3)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-007
REV. N/A
SHEET NO. 187 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_I-395_01.dgn
I-395 plot sheet

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



LEGEND:

PAVEMENT AND MILLING RESURFACING

FULL DEPTH PAVEMENT

4" CONCRETE SIDEWALK

NOTES:

1. *THE PROPOSED PAVEMENT MARKINGS ARE TO MATCH THE EXISTING PAVEMENT MARKINGS.*
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SCALE
0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

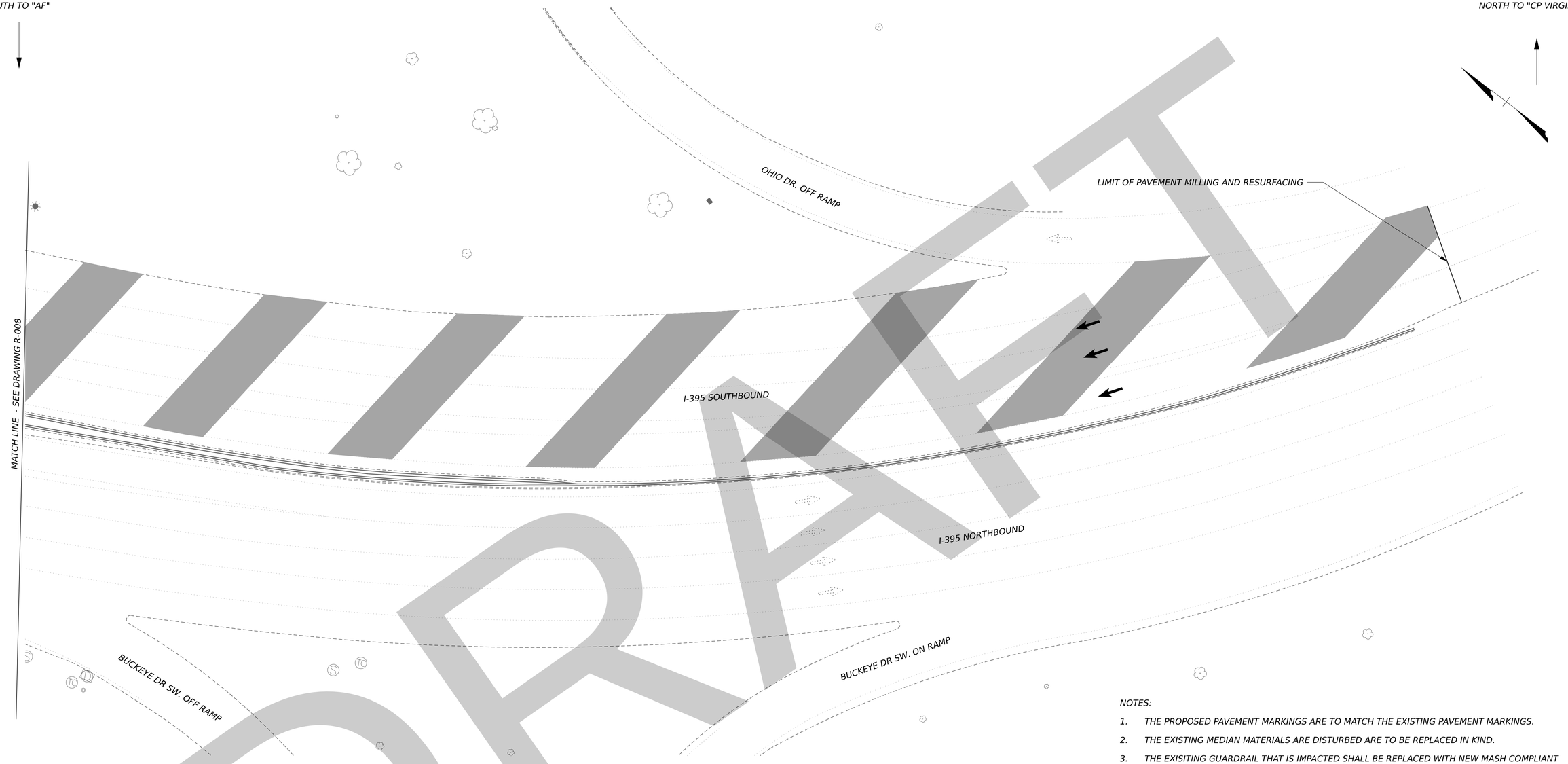
GENERAL PLAN
I-395 (2 OF 3)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-008
REV. N/A
SHEET NO. 188 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_I-395_02.dgn
I-395 plot sheet

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



DRAFT

NOTES:

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2. *THE EXISTING MEDIAN MATERIALS ARE DISTURBED ARE TO BE REPLACED IN KIND.*
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LEGEND:

PAVEMENT MILLING AND RESURFACING

FULL DEPTH PAVEMENT

4" CONCRETE SIDEWALK

SCALE
0 20' 40'

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

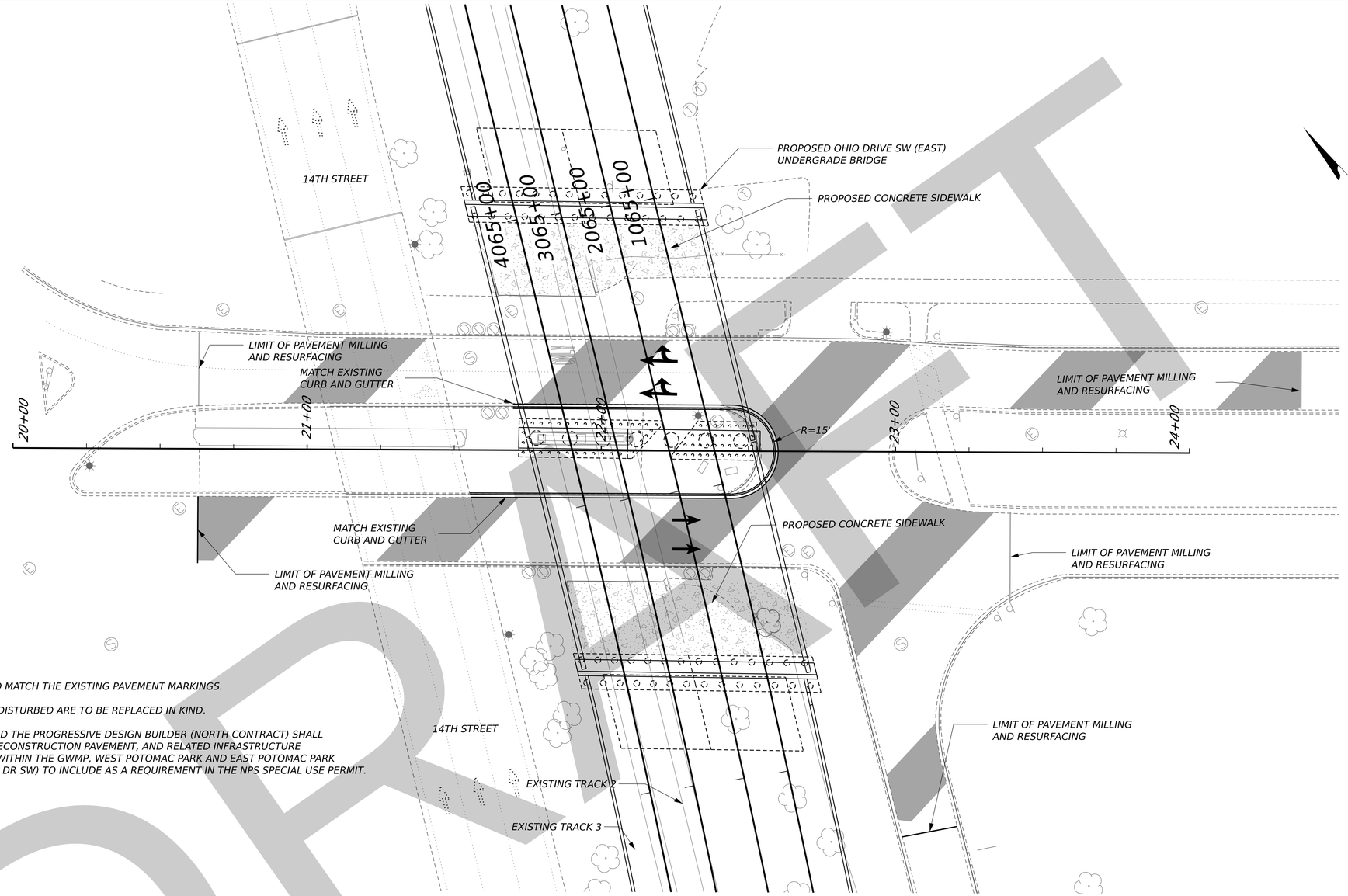
GENERAL PLAN
I-395 (3 of 3)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-009
REV. N/A
SHEET NO. 189 OF 273
SCALE AS SHOWN

VDOT PDF pltcfg
LBPE_td_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_I-395_03.dgn
I-395 plot sheet

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



NOTES:

1. THE PROPOSED PAVEMENT MARKINGS ARE TO MATCH THE EXISTING PAVEMENT MARKINGS.
2. THE EXISTING MEDIAN MATERIALS THAT ARE DISTURBED ARE TO BE REPLACED IN KIND.
3. THE DESIGN BUILDER (SOUTH CONTRACT) AND THE PROGRESSIVE DESIGN BUILDER (NORTH CONTRACT) SHALL COORDINATE WITH THE NPS ON REPAVING, RECONSTRUCTION PAVEMENT, AND RELATED INFRASTRUCTURE TEMPORARILY IMPACTED BY CONSTRUCTION WITHIN THE GWMP, WEST POTOMAC PARK AND EAST POTOMAC PARK (INCLUDING PARKING LOT B AND C AND OHIO DR SW) TO INCLUDE AS A REQUIREMENT IN THE NPS SPECIAL USE PERMIT.

LEGEND:

PAVEMENT MILLING AND RESURFACING

FULL DEPTH PAVEMENT

4" CONCRETE SIDEWALK

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

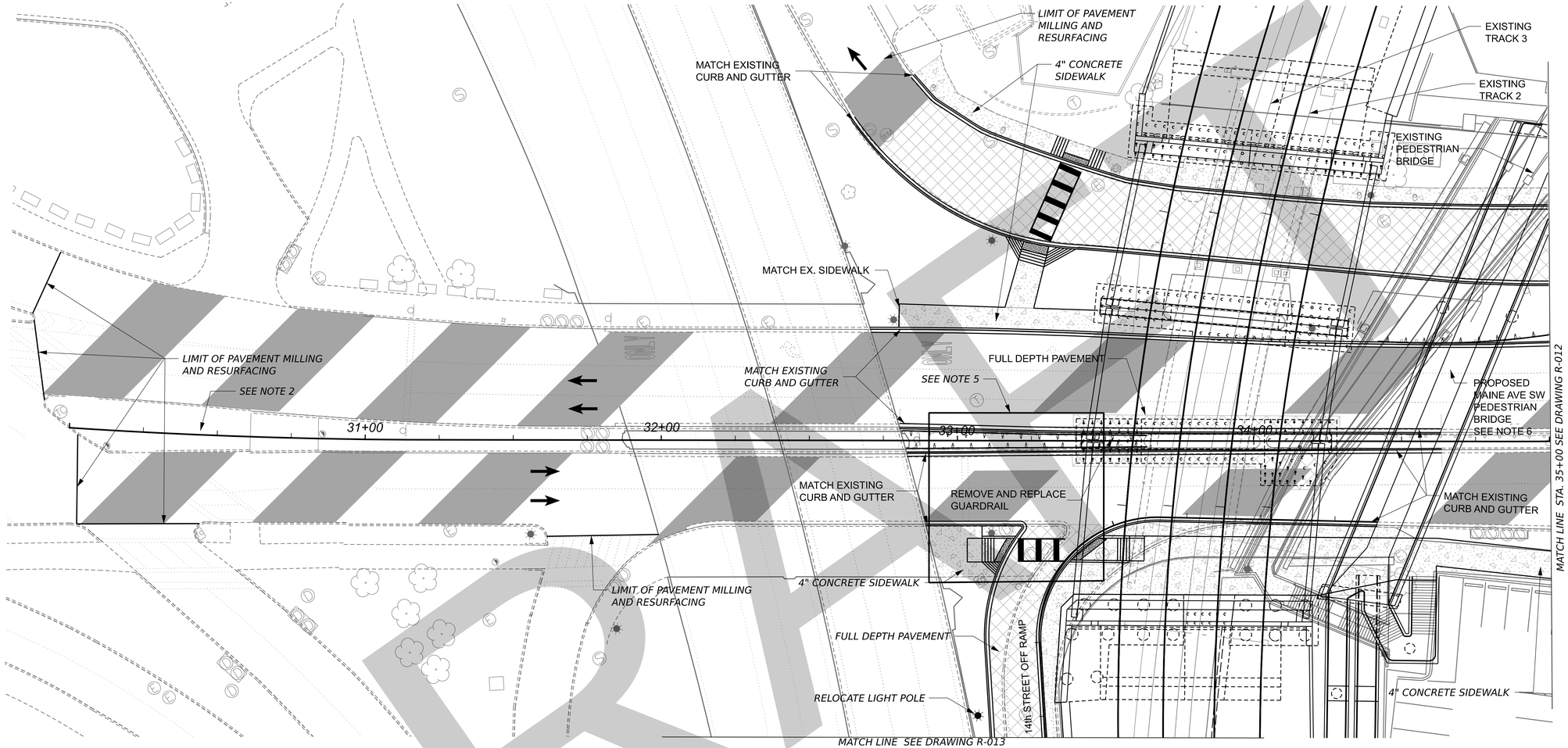
GENERAL PLAN
OHIO DRIVE SW (EAST)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-010
REV. N/A
SHEET NO. 190 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_Ohio Dr. N_01.dgn
Ohio east plot sheet

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



NOTES:

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2. THE EXISTING MEDIAN MATERIALS THAT ARE DISTURBED ARE TO BE REPLACED IN KIND.
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4. THE EXISTING MATERIALS THAT ARE DISTURBED BY TEMPORARY WIDENING AND TEMPORARY PAVEMENT SHALL BE REPLACED IN KIND .
5. PROPOSED TRAFFIC SIGNAL TO BE DESIGNED FOR OFF RAMP INTERSECTION.
6. THE LOCATION OF THE RPOPOSED MAINE AVENUE SW PEDESTRIAN BRIDGE IS TO BE DETERMINED

LEGEND:

PAVEMENT MILLING AND RESURFACING

FULL DEPTH PAVEMENT

4" CONCRETE SIDEWALK

SCALE

0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY S. NAWEED
DRAWN BY E. NAVIA
CHECKED BY B. MCADAMS
APPROVED BY P. CLARY
DATE 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

GENERAL PLAN
MAINE AVENUE SW (1 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-011
REV. N/A
SHEET NO. 191 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_Maine Ave_01.dgn
Plan Sheet

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

NOTES:

1. THE PROPOSED PAVEMENT MARKINGS ARE TO MATCH THE EXISTING PAVEMENT MARKINGS.
2. THE EXISTING MEDIAN MATERIALS THAT ARE DISTURBED ARE TO BE REPLACED IN KIND.
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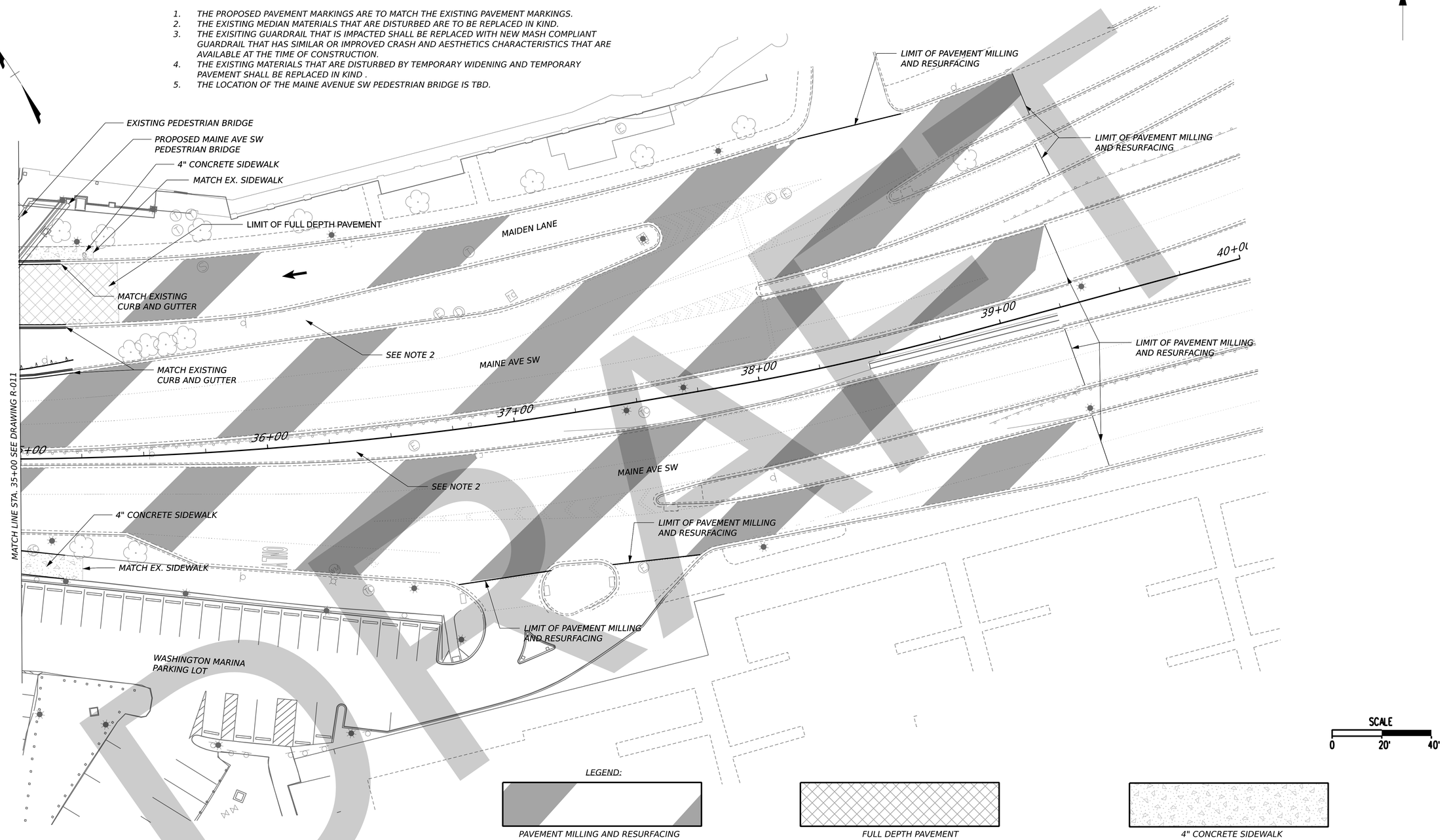
4. THE EXISTING MATERIALS THAT ARE DISTURBED BY TEMPORARY WIDENING AND TEMPORARY PAVEMENT SHALL BE REPLACED IN KIND .
5. THE LOCATION OF THE MAINE AVENUE SW PEDESTRIAN BRIDGE IS TBD.



LEGEND:

PAVEMENT MILLING AND RESURFACING

FULL DEPTH PAVEMENT

4" CONCRETE SIDEWALK

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: S. NAWEED
DRAWN BY: E. NAVIA
CHECKED BY: B. MCADAMS
APPROVED BY: P. CLARY
DATE: 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

GENERAL PLAN
MAINE AVENUE SW (2 OF 2)

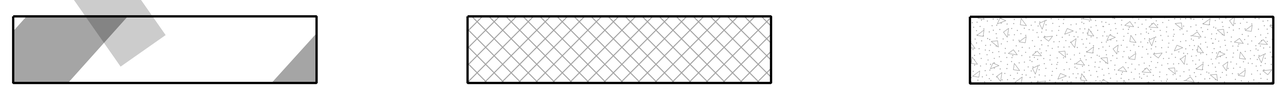
PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-012
REV. N/A
SHEET NO. 192 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_lt_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_Maine Ave_02.dgn
Plan Sheet

NOTES:

1. THE PROPOSED PAVEMENT MARKINGS FOR RE-ALIGNING OF 14TH ST OFF RAMP ARE TO TIE IN TO PAVEMENT MARKINGS.

LEGENDS:



SCALE
0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY S. NAWEED
DRAWN BY E. NAVIA
CHECKED BY B. MCADAMS
APPROVED BY P. CLARY
DATE 2/10/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

GENERAL PLAN
14TH STREET OFF RAMP

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. R-013
REV. N/A
SHEET NO. 193 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: enavia 2/10/2023
xR02A_RD_Maine Ave_03.dgn
14TH OFF RAMP SHEET

APPLICABILITY OF THE MANUAL

1. ALL TRAFFIC CONTROL SHALL CONFORM TO PART VI OF THE 2009 EDITION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), DC TEMPORARY TRAFFIC CONTROL MANUAL. GUIDELINES AND STANDARDS - 2006 EDITION, DDOT DESIGN AND ENGINEERING MANUAL - DC DEPARTMENT OF TRANSPORTATION, IPMD. ADHERE TO DDOT STANDARD SPECIFICATION FOR HIGHWAYS AND STRUCTURES (GOLD BOOK) 2013. REFERENCE SECTION 104.02 MAINTENANCE OF TRAFFIC, 603. GUARDRAILS AND GUARDRAIL TERMINALS (603.01 - 603.09) ,610 TRAFFIC BARRIERS (610.01 - 610.03), 612. TRAFFIC CONTROL (612.01 - 612.21), 616.TRAFFIC SIGNING (616.01 - 616.08), 717. IMPACT ATTENUATORS (617.01 - 617.03), 207 TRENCH EXCAVATION AND BACKFILL (207.01 - 207.07), AND 215. EXCAVATIONS AND RESTORATIONS/ UTILITY LINES/ (215.01 - 215.09)

TRAINING

2. THE CONTRACTOR SHALL MAKE CERTAIN THAT THE PERSON (S) RESPONSIBLE FOR THE IMPLEMENTATION OF THE TRAFFIC CONTROL PLAN HAS SUCCESSFULLY COMPLETED TRAINING IN TEMPORARY TRAFFIC CONTROL AND HIS OR HER NAME AND QUALIFICATIONS SHALL BE SUBMITTED PRIOR TO WORK COMMENCING. ACCEPTED CERTIFYING ORGANIZATIONS ARE ATSSA, MDOT, VDOT OR EQUIVALENT.

OSHA REQUIREMENTS

3. ALL FIELD PERSONNEL SHALL WEAR SAFETY VEST. HARD HATS AND OTHER REQUIRED PERSONAL PROTECTION EQUIPMENT REQUIRED BY THE OCCUPATION SAFETY AND HEALTH ADMINISTRATION (OSHA).

TRAFFIC CONTROL DEVICES

4. ALL TRAFFIC CONTROL DEVICES SHOULD COMPLY WITH NCHRP 350 CRASH TESTING STANDARDS OR THE AASHTO MANUAL FOR ASSESSING HARDWARE (MASH) CRITERIA, AND SHOULD HAVE MARKINGS OF COMPLIANCE ON THE STANDARDS.

5. 36" REFLECTIVE CONES ARE REQUIRED FOR MAINTENANCE OF TRAFFIC (MOT). TRAFFIC CONES ARE USED FOR DAYTIME WORK ONLY. 36" - MINIMUM REFLECTIVE DRUMS SHALL BE USED FOR TAPERS ON FREEWAY SYSTEM OR WHEN INDICATED BY DDOT. ALL TRAFFIC SAFETY DRUMS USED FOR THE MAINTENANCE OF TRAFFIC SHALL BE OF A LOW DENSITY MATERIAL. BALLAST SHALL NOT BE PLACED ON TOP OF DRUM.

6. ADVANCE WARNING SIGNS FOR CONVENTIONAL ROAD SHALL BE 36"x36" BLACK/ORANGE, HIGH PERFORMANCE, WIDE ANGLE, RETRO-REFLECTIVE SHEETING. ROLL-UP SIGNS ARE APPROVED. HOWEVER, SIGN SHEETING SHALL BE FLUORESCENT ORANGE AND SOLID, NOT MESH. USE SIGNS WITH THE DIMENSIONS: 48"x48" ONLY FOR FREE WAY OR EXPRESSWAY. ADVANCE WARNING SIGNS FOR LOCAL - RESIDENTIAL STREETS SHALL NOT BE LESS THAN 30"x30" (THE LARGER SIGNS MAY BE USED WHEREVER NECESSARY FOR GREATER LEGIBILITY OR EMPHASIS).

7. SIGNS SHOULD BE PROPERLY MAINTAINED FOR CLEANLINESS, VISIBILITY, STABILITY, AND CORRECT POSITIONING. SIGN POSITIONING AT THE WORK SITE MAY BE MINIMALLY ADJUSTED BY PUBLIC SPACE INSPECTORS BASED ON SITE CONDITIONS. SIGNS THAT HAVE LOST SIGNIFICANT LEGIBILITY SHOULD BE PROMPTLY REPLACED.

8. WORK ZONE TRAFFIC CONTROL SIGNS AND SIGN SUPPORTS SHOULD NOT BECOME OBSTACLES FOR ALL ROADWAY USERS: PEDESTRIANS, BICYCLISTS, AND VEHICLES.

9. SIGN SUPPORTS SHOULD BE LOCATED SO AS TO ACCOMMODATE PEDESTRIANS AND BICYCLISTS IN AREAS DESIGNATED FOR THEIR USE. A MINIMUM LATERAL WIDTH OF 5 FEET SHOULD BE MAINTAINED FOR PEDESTRIAN PATHWAYS.

10. CONTRACTOR SHALL USE AND ADJUST SPRING - LOADED SIGN STANDS, DUAL SPRING WIND RESISTANT SIGN STANDS, CONSTRUCTION SIGN STANDS WITHOUT SPRINGS, OR PORTABLE WOODEN SIGN SUPPORTS SO THE MOTORISTS CAN SEE AND READ THE SIGNS. THE SIGN STANDS SHOULD COMPLY WITH NCHRP 350 CRASH TESTING STANDARDS AND SHOULD HAVE MARKINGS OF COMPLIANCE ON THE STANDS. NEITHER PORTABLE NOR PERMANENT SIGN SUPPORTS SHOULD BE LOCATED ON SIDEWALKS - PEDESTRIAN ACCESS ROADS (PAR) BICYCLE FACILITIES, OR AREAS DESIGNATED FOR PEDESTRIAN OR BICYCLE TRAFFIC.

11. PORTABLE WOODEN SIGN SUPPORTS CONSISTENT WITH THE DESIGN ON THEIR STANDARD SHEET DO NOT NEED TO BE CERTIFIED AS BEING CRASH TESTED IN ACCORDANCE WITH NCHRP - 350. THE SUPPORTS ARE TYPICALLY SANDBAGGED. (REF. NATIONAL WORK ZONE SAFETY INFORMATION CLEARINGHOUSE. STATE NEW YORK; NEW JERSEY. AS THE CITY ENVIRONMENT, NEW YORK USES ALL SORTS OF TEMPORARY SIGN SUPPORTS).

12. USE WOOD MEMBERS WITH A MAXIMUM 16 (SQUARE INCH) CROSS SECTION FOR BASE CONSTRUCTION 8 (SQUARE INCH) CROSS SECTION FOR UPRIGHTS AND BRACES. THE AXLE, FRAME, SUPPORT ASSEMBLY AND OTHER STRUCTURAL MEMBERS SHOULD NOT EXCEED THE DIMENSIONS OF THE PORTABLE SIGN SUPPORT ASSEMBLY. A SINGLE SANDBAG WEIGHING 50lb. IS THE STANDARD BALLAST DEVICE FOR WOOD SIGN SUPPORT. FOR FULL BALLAST USE A MINIMUM OF 2 SANDBAGS PER PORTABLE SIGN SUPPORT.

13. ALL TEMPORARY SIGNS SHALL BE PLACED IN APPROPRIATE PLACES, BE ADEQUATE FOR EXISTING STREET CONDITIONS, INCLUDING SIGN DIMENSIONS, AND BE STABLE AND FIRMLY INSTALLED (THE SMALL SIZE OF WARNING SIGNS MAY BE USED WHEREVER NECESSARY FOR PROVIDING ADEQUATE AND SAFE ACCESS FOR PEDESTRIANS WITHIN PUBLIC SPACE).

14. THE TEMPORARY SIGNS AND MARKINGS PLACED ADJACENT TO THE WORK ZONE SHALL BE CONSISTENT AND VISIBLE AT ALL TIMES. THE FULL VIEW OF ADVANCE WORK ZONE WARNING SIGNS SHALL BE PROVIDED. SIGNS SHALL BE CLEAR OF OBSTRUCTION ON APPROACH TO WORK ZONE.

15. NO HOMEMADE CONSTRUCTION, REGULATORY, OR GUIDE SIGNS SHALL BE ALLOWED.

16. DAMAGED, DIRTY, OR DEFACED DEVICES, INCLUDING SIGNS, CHANNELIZERS, AND TRAFFIC CONTROL EQUIPMENT ARE NOT APPROVED AND SHALL NOT BE USED.

17. ALL TRAFFIC CONTROL DEVICES NOT IN USE SHALL BE REMOVED FROM THE PUBLIC SPACE OR AS DIRECTED BY DDOT. WHEN APPROVED BY DDOT ALL REGULATORY SIGNS MUST BE COVERED SECURELY TO AVOID MISINFORMATION.

18. SIGN SPACING SHALL BE ADJUSTED TO AVOID CONFLICT WITH THE EXISTING PERMANENT SIGNAGE AND PAVEMENT MARKINGS.

19. IF ANY TEMPORARY PROHIBITING REGULATORY SIGNS ARE PROPOSED BY CONTRACTOR, SUCH AS "NO RIGHT TURN" , "NO LEFT TURN", WHETHER SYMBOLIC OR TEXT MESSAGE, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADVANCE COORDINATION WITH TRAFFIC OPERATION ADMINISTRATION (TOA) TO ENSURE THAT THE ADEQUATE TRAFFIC MOVEMENTS ARE PROVIDED IN THE VICINITY OF CONSTRUCTION SITE.

20. THE CONTRACTOR IS REQUIRED TO COORDINATE PROPOSED WORK ZONE SIGNAGE TO ADJACENT CONSTRUCTION WORK ZONE PROJECT TO AVOID CONFUSING MESSAGES, AND SIGNAGE DUPLICATION.

21. THE CONTRACTOR SHALL COORDINATE HIS MOT/TCP WITH OTHER CONTRACTORS, AND UTILITY COMPANIES WORKING IN THE SAME GENERAL LOCATION TO MAINTAIN CONTINUITY OF TRAFFIC FLOW AND MINIMIZE CONGESTION.

22. THE UTILITY COMPANIES SHALL BE RESPONSIBLE FOR PRODUCTIONS A TRAFFIC CONTROL PLAN FOR THE INSTALLATION OF UTILITIES AND COORDINATING ITS INSTALLATIONS WITH DDOT/ PUBLIC SPACE REGULATION ADMINISTRATION, AND THE GENERAL CONTRACTOR'S MOT/TCP.

23. THE MINIMUM HEIGHT, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE SIDEWALK, LOCATED IN BUSINESS, COMMERCIAL, OR RESIDENTIAL AREAS WHERE PARKING OR PEDESTRIAN MOVEMENTS ARE LIKELY TO OCCUR, OF SIGNS INSTALLED ABOVE SIDEWALKS SHALL BE 7 FEET.

24. FOR SIGNS TO BE USED IN WORK ZONES, ALL OF THE ABOVE REQUIREMENTS MUST BE MET TO THE SATISFACTION OF THE DDOT TRAFFIC ENGINEER.

FLASHING ARROW PANEL

25. PROPOSED LOCATIONS ARE TO BE VERIFIED FOR VISIBILITY AND SIGHT DISTANCE. ARROW PANEL SHOULD BE DELINEATED WITH RETRO-REFLECTIVE TEMPORARY TRAFFIC CONTROL DEVICES, OR WHEN WITHIN THE CLEAR ZONE SHIELDED WITH A BARRIER OR CRASH CUSHION. WHEN AN ARROW PANEL IS NOT BEING USED, IT SHOULD BE REMOVED; IF NOT REMOVED, IT SHOULD BE SHIELDED; OR IF PREVIOUS TWO OPTIONS ARE NOT FEASIBLE, IT SHOULD BE DELINEATED WITH RETRO-REFLECTIVE TEMPORARY TRAFFIC CONTROL DEVICES. FLASHING ARROW PANELS MAY BE DEEMED NECESSARY ON OTHER ROADWAYS.

FLAGGING

26. CONTRACTOR SHALL PROVIDE FLAGGING OPERATIONS FOR CONDITIONS DEEMED NECESSARY BY SELF OR DDOT. ALL FLAGGERS MUST BE CERTIFIED AND HAVE THEIR CERTIFICATION CARD IN THEIR POSSESSION WHEN FLAGGING. THEY SHALL BE EQUIPPED WITH SAFETY VESTS, HARD HATS, HAND SIGNALING DEVICES, AND ELECTRONIC DEVICES FOR COMMUNICATION.

27. ALL FLAGGING OPERATIONS SHALL BE USE A "STOP"/"SLOW" PADDLE OF 24 INCHES IN DIAMETER MOUNTED ON A 6 FT. POLE WITH 6-INCH SERIES "C" LETTERS.

28. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONDUCT FLAGGING OPERATION TO CONTROL PEDESTRIAN TRAFFIC IN SAFETY MANNER WHEN CONSTRUCTING VEHICLES ARE ENTERING - EXITING THE CONSTRUCTION SITE. IF A SAFE ACCOMMODATION FOR PEDESTRIANS OR BICYCLISTS MUST BE CLOSED INTERMITTENTLY DURING OFF-PEAK HOURS DUE TO CONFLICTS WITH CONSTRUCTION ACTIVITIES OR CONSTRUCTION VEHICLES THE MOT/TCP SHALL REQUIRED THAT:

a) FLAGGERS BE POSTED AT EACH END OF THE CLOSED PEDESTRIAN OR BICYCLE ROUTE FOR THE ENTIRE DURATION OF TIME THE INTERMITTENT CLOSURE IS IN PLACE.

b) THE SAFE AND REASONABLE FLOW OF PEDESTRIAN AND BICYCLE TRAFFIC BE MAINTAINED IN PREFERENCE TO CONSTRUCTION ACTIVITIES AND THE FLOW OF CONSTRUCTION VEHICLES.

LANE CLOSURE

29. CONTRACTORS SHALL NOT CLOSE MORE THAN ONE LANE OF TRAFFIC IN ONE DIRECTION UNLESS OTHERWISE APPROVED.

STREET CLOSURE

30. TYPE III BARRICADES SHALL BE USED FOR ROAD CLOSURES. ADEQUATE ROAD CLOSURE AND DETOUR SIGNAGE SHALL BE INSTALLED TO GIVE MOTORIST GUIDANCE. DETOUR DIRECTION SIGNS MUST BE ACCOMPANIED BY MESSAGE SIGNS THAT INDICATE DETOUR STREET NAME. DO NOT USE ABBREVIATIONS ON MESSAGE SIGNS.

31. THE CONTRACTOR IS REQUIRED TO NOTIFY FIRE AND /OR POLICE DEPARTMENTS OF APPROVED ROAD AND ALLEY CLOSURES. PERMITS WITH THEIR APPROVAL MUST BE ON SITE WITH ALL OTHER PERMITS.

32. ALL EXCAVATION OPERATIONS SHALL COMPLY WITH DISTRICT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAYS AND STRUCTURES SECTIONS 207,606, AND 612.

33. TRENCHES SHALL BE BACKFILLED OR STEEL - PLATED. STEEL PLATES SHALL HAVE ASPHALTIC CONCRETE BERM ON ALL EDGES (HOT MIX ASPHALT OR HIGH PERFORMANCE COLD MIX). ALL DIRT, DUST AND DEBRIS SHALL BE REMOVED FROM STREET. THE STREET SHALL BE IN DRIVABLE CONDITION AT ALL TIMES.

34. STEEL PROTECTION PLATES SHALL BE USED BY CONTRACTOR TO PROTECT OPEN EXCAVATED AREA. ALL OPEN TRENCHES OR HOLES IN THE PUBLIC SPACE WHICH ARE NOT BACKFILLED AND COMPACTED BY THE END OF EACH WORK DAY SHALL BE PLATED.

35. THE STEEL PLATE SHALL EXTEND NO LESS THAN 18 INCHES BEYOND THE EDGE OF THE TRENCH ON ALL SIDES. STEEL PLATES SHALL BE ATTACHED TO THE ROADWAY BY A MINIMUM OF 6 SPIKES; 4 SPIKES PREDRILLED INTO THE CORNERS OF THE PLATES AND1 SPIKE PREDRILLED INTO EACH SIDE PARALLEL TO THE TRENCH. SPIKES SHALL BE DRILLED A MINIMUM OF 3 INCHES INTO THE HARD PAVEMENT.

36. A NON-SKID SURFACE TREATMENT SHALL BE APPLIED TO THE ENTIRE SURFACE AREA OF THE STEEL PLATE IN CASES WHERE THE PLATE IS WITHIN DESIGNATED BICYCLE PATH OR A PLATE IS PLACED AT AN INTERSECTION OR WITHIN 75 FEET OF A TRAFFIC SIGNAL OR STOP SIGN/STOP LINE.

37. CONTRACTORS SHALL INSTALL "STEEL PLATE AHEAD" SIGNS WHENEVER PLATES HAVE BEEN INSTALLED.

38. ALL LEADING ENDS OF THE TEMPORARY CONCRETE BARRIERS EXPOSED TO ON-COMING TRAFFIC SHALL BE PROTECTED WITH PORTABLE IMPACT QUADGUARD TRAFFIC ATTENUATOR. ALL ATTENUATORS. ALL ATTENUATORS SHALL HAVE OBJECT MARKERS.

TEMPORARY PAVEMENT MARKING

39. TEMPORARY REFLECTIVE PAVEMENTS TAPE OF THE APPROVED TYPE SHALL BE USED TO DESIGNATE TRAFFIC LANES. THE COLORS OF TEMPORARY PAVEMENTS MARKINGS SHALL FOLLOW THE SAME STANDARD AS PERMANENT MARKINGS. ALL MARKERS SHALL BE WHITE, EXCEPT FOR THE LEFT EDGE OF THE EFFECTIVE ROADWAY, WHICH SHALL BE YELLOW.

TIME OF WORK

40. DAYTIME WORK HOURS ARE BETWEEN 9:30AM-3:30PM OR AS APPROVED. (DON'T PERFORM WORK DURING PEAK TRAFFIC VOLUMES)

41. NIGHTTIME WORK HOURS ARE BETWEEN 7:30PM-4:30AM OR AS APPROVED. (DON'T PERFORM WORK DURING PEAK TRAFFIC VOLUMES)

42. ANY CONSTRUCTION IN RESIDENTIAL AND OR HOTEL ZONES REQUIRES A DAYTIME WORK HOURS PERMIT UNLESS OTHERWISE APPROVED BY DDOT.

PARKING

43. PARKING IS TO BE PROHIBITED IN THE WORK AREA. PARKING IS TO BE RESTRICTED - 72 HOURS IN ADVANCE UNLESS THERE IS AN EMERGENCY.

44. ANY WORK THAT REQUIRES TEMPORARY NO-PARKING RESTRICTIONS FOR A CONTRACTOR TO PERFORM THEIR WORK SHALL REIMBURSE THE DISTRICT OF COLUMBIA ALL LOST REVENUE FOR ALL SPACES OCCUPIED IF THE NO PARKING ZONE AFFECTS PARKING METERS DURING THE LIFE OF THE WORK (DDOT/TOA TELEPHONE NUMBER IS (202-671-2020)

45. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO RECORD METER NUMBERS AFFECTED BY THEIR WORK AND REPORT THOSE METERS OCCUPIED TO PARKING SERVICES.

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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

MAINTENANCE OF TRAFFIC NOTES (1 OF 3)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. MOT-001
REV. N/A
SHEET NO. 194 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg 2/10/2023
LBPE_td_v95.tbl
Plotted By: enavia
MOT Note North.dgn
note.1 plot sheet

HANDICAPPED ACCOMMODATIONS

46. ALL CONTRACTORS SHALL MAINTAIN PEDESTRIAN CROSSWALKS AND WALKWAYS WHETHER PAVED OR UNPAVED UNLESS OTHERWISE INDICATED ON THE PLANS AND APPROVED BY DDOT. TEMPORARY WHEELCHAIR RAMPS SHALL ALSO BE INSTALLED AND MAINTAINED BY THE CONTRACTOR OR AS DEEMED NECESSARY BY DDOT. COMPLIANCE TO THE AMERICAN DISABILITIES ACT (ADA) IS REQUIRED. CONTRACTORS INVOLVED IN WORK ON SIDEWALKS AND RAMPS, BE IT NEW CONSTRUCTION OR RENOVATION, NEED TO HAVE THE APPROPRIATE SIGNAGE PRESENT OFFERING SAFE AND COMPLIANT ALTERNATIVE ROUTES FOR THE DISABLED AND PEDESTRIAN TRAFFIC.

47. MOT/TCP MUST BE ADA COMPLIANT. CONTRACTORS SHALL INSTALL TEMPORARY ADA CURB RAMP FOR WORK ZONE PROJECTS WITHIN R.O.W TO PROVIDE ACCESS FOR WHEELCHAIR USERS. STROLLERS, ETC. PEDESTRIAN ACCESS ROUTE (PAR) IS THE CONTINUOUS AND UNOBSTRUCTED WALKWAY WITHIN THE R.O.W. (PUBLIC SPACE)

48. PEDESTRIAN ACCESS ROUTE (PAR) MUST BE FREE OF OBSTRUCTIONS AND SURFACE HAZARDS, SUCH AS CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, DEBRIS, MUD, HOLES, PUDDLES, AND LOOSE GRAVEL AT ALL TIMES.

49. IF THE TEMPORARY TRAFFIC CONTROL ZONE (TTC) AFFECTS THE MOVEMENT OF PEDESTRIANS, ADEQUATE PEDESTRIAN ACCESS AND WALKWAYS SHALL BE PROVIDED. IF THE TTC ZONE AFFECTS AN ACCESSIBLE AND DETECTABLE PEDESTRIAN FACILITY, THE ACCESSIBILITY, AND DETECTABILITY SHALL BE MAINTAINED ALONG THE ALTERNATE PEDESTRIAN ROUTE.

MATERIAL AND EQUIPMENT

50. A CONTRACTOR WITH VEHICLES AND EQUIPMENT IN PUBLIC SPACE REQUIRES A PERMIT. ANY CONTRACTOR WHO WISH TO LEAVE EQUIPMENT OVERNIGHT IN PUBLIC SPACE ARE SUBJECT TO REIMBURSING THE CITY FOR THE SPACE BEING OCCUPIED, AND MUST HAVE A PERMIT ALLOWING OVERNIGHT STORAGE ON CITY STREETS OR IN CITY SPACE. ALL ITEMS PERMITTED TO BE STORED OVERNIGHT ON CITY STREETS OR IN CITY SPACE MUST BE SECURED AND MUST GIVE CONSIDERATION TO PUBLIC SAFETY. IN THE EVENT OF AN EMERGENCY, THE CITY RESERVES THE RIGHT TO REMOVE ALL ITEMS THAT ARE PERMITTED BY ANY MEANS NECESSARY. EMERGENCY CONTACT INFORMATION SHOULD BE PROVIDED TO DDOT WITH 24-HOUR ACCESS IN THE EVENT SUCH AN EMERGENCY OCCURS.

51. ALL CONSTRUCTION VEHICLES OPERATING IN AND AROUND THE WORK ZONE SHALL OPERATE STROBE OR REVOLVING LIGHTS AT ALL TIMES. THESE LIGHTS SHOULD BE MOUNTED IN SUCH A MANNER THAT THEY ARE VISIBLE 360 DEGREES.

52. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS GARAGES, ALLEYS AND LOADING DOCKS AT ALL TIMES. AS WELL AS ACCESS TO ALL BUSINESSES.

53. CONTRACTOR SHALL NOT BLOCK FIRE HYDRANT, BUS STOP, RESIDENTIAL RPP PARKING SPACES, PARKING METERS (WITHOUT PAYMENT) AND UTILITY STRUCTURES.

CHANGEABLE MESSAGE SIGNS

54. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) MAY BE REQUIRED TO GIVE THE MOTORING PUBLIC ADVANCE NOTIFICATION OF ROAD CONDITIONS. ROADWORK, AND/OR EVENTS. ARROW BOARDS MAY ALSO BE REQUIRED IN WORK ZONES TO AID IN LANE CLOSURES AND, WHERE WORK REQUIRES, TRUCK MOUNTED ATTENUATOR (TMA) CAN BE REQUIRED AS WORK DICTATES.

SAFE ACCOMMODATION FOR PEDESTRIANS AND BICYCLISTS

55. CONTRACTOR SHALL CONSIDER PEDESTRIANS AND BICYCLISTS SAFETY ACCOMMODATION VERY SERIOUSLY INCLUDING THE FOLLOWING:

a) ROUTING PRIORITY; PROVIDED THAT CLOSING A SIDEWALK AND ROUTING PEDESTRIANS TO THE SIDEWALK ON THE OPPOSITE SIDE OF THE STREET SHALL ONLY BE APPROVED AS A LAST RESORT FOR THE DURATION OF TIME NEEDED TO ASSURE PEDESTRIAN SAFETY IN THE ABSENCE OF OTHER PRACTICABLE ROUTING OPTIONS; HERE CONTRACTOR'S DECISION MUST BE BASED ALSO ON MULTIFUNCTIONAL ANALYSIS OF DIFFERENT VARIABLES SUCH AS : FUNCTIONAL CLASSIFICATION OF ROAD UNDER CONSTRUCTION, FUNCTIONAL CLASSIFICATION OF SIDE STREETS, AND ADJACENT STREETS TO THE CONSTRUCTION ,STREET GEOMETRY AND R.O.W, TRAFFIC AND PARKING OPERATIONS, BIKE LANE PRESENTS, BUS ROUTES, DURATION OF CONSTRUCTION, WORK ZONE ACTUAL LOCATION AND COORDINATION WITH OTHER ONGOING CONSTRUCTION PROJECTS WITHIN VICINITY OF ACTUAL WZ, THE LENGTH OF BLOCK, FAR-SIDE AND NEAR-SIDE SIGNALIZED INTERSECTIONS PRESENTS, ETC.

b) CONTRACTOR MUST CONSIDER SIDEWALK CLOSURE AS A REASONABLE OPTION ONLY FOR SOME SPECIFIC PHASES OF CONSTRUCTION INCLUDING THE FOLLOWING:
   1. DEMOLITION/RAZE OF BUILDING /STRUCTURE PHASE OF CONSTRUCTION;
   2. FACADE DEMOLITION;
   3. RECONSTRUCTION OR REHABILITATION OF SIDEWALK;
   4. MOBILE CRANE OPERATION WITHIN R.O.W.;
   5. UTILITY WORK , OR OTHER ACTIVE WORK WITHIN SIDEWALK ZONE INCLUDING EMERGENCY, AND EXCAVATION.

c) ACCORDING TO SAFE ACCOMMODATION FOR PEDESTRIANS AND BICYCLISTS (24 DCMR § 3315 THE MOT/TCP DESIGNER - DEVELOPER IS REQUIRED TO PRIORITIZE THE SAFE ACCOMMODATION FOR BICYCLISTS INCLUDING THE FOLLOWING:
   1. CLOSING A PARKING LANE AND KEEPING THE ADJACENT BICYCLE LANE OPEN;
   2. SHIFTING THE BICYCLE LANE TO A LOCATION ON THE SAME ROADWAY TO BYPASS THE WORK ZONE, AND IF NECESSARY, SHIFTING AND NARROWING THE ADJACENT MOTOR VEHICLE TRAFFIC LANES; PROVIDED THE ADJACENT MOTOR VEHICLE TRAVEL LANES SHALL BE MAINTAINED AT NO LESS THAN TEN FEET (10FT) WIDE.
   3. CLOSING THE ADJACENT MOTOR VEHICLE TRAVEL LANE TO PROVIDE SPACE FOR BICYCLE LANE. PROVIDE THAT A MINIMUM OF ONE (1) MOTOR VEHICLE TRAVEL LANE SHALL REMAIN IN THE SAME DIRECTION OF TRAVEL.
   4. MERGING THE BICYCLE LANE AND THE ADJACENT TRAVEL LANE INTO A SHARED TRAVEL LANE ADJACENT TO THE WORK ZONE. INSTALLING SHARROW LANE PAVEMENT MARKINGS IN THE SHARED TRAVEL LANE AND INSTALLING WORK ZONE SIGNAGE DIRECTING BICYCLISTS TO MERGE INTO THE SHARED TRAVEL LANE. PROVIDED THE SHARED TRAVEL LANE SHALL BE MAINTAINED AT NO LESS THAN 13 (FT) WIDE; AND
   5. AS A LAST RESORT, DETOURING BICYCLISTS ONTO AN ADJACENT ROADWAY, IN WHICH CASE THE DETOUR ROUTE SHALL REPLICATE, AS CLOSELY AS PRACTICABLE, THE LEVEL OF SAFETY FOUND ON THE BICYCLE ROUTE BEING BLOCKED.
   6. SIGNAGE SHALL ADEQUATELY WARN BICYCLISTS AND MOTORISTS ALIKE OF ANY LANE SHIFT OR SHARED LANE CONDITIONS. SIGNAGE INTENDED ONLY FOR BICYCLISTS SHALL DISPLAY THE WORD "BICYCLES" , OR THE BICYCLE SYMBOL AND CLEARLY MARK THE ALTERNATE TEMPORARY ROUTE.

d) BICYCLE LANES, PARKING LANES AND TRAVEL LANES MUST BE FREE OF OBSTRUCTIONS AND SURFACE HAZARDS, SUCH AS CONSTRUCTION EQUIPMENT, CONSTRUCTION MATERIALS, DEBRIS, HOLES, MUD LOSES GRAVEL, MILLED SURFACES AND UNEVEN PAVEMENT AT ALL TIMES.

PEDESTRIAN CONTROL AND PROTECTION WALKWAYS

56. ALL TEMPORARY TRAFFIC CONTROL PLAN SHALL BE DESIGNED IN ACCORDANCE WITH THE MOST RECENT ADA REGULATIONS AND THE REQUIREMENTS OF ACTUAL WORK ZONE STANDARDS.

57. THE CONTROL OF ROAD USERS- MOTORISTS, BICYCLISTS PEDESTRIANS, INCLUDING PERSONS WITH DISABILITIES IN ACCORDANCE WITH THE AMERICAN WITH DISABILITIES ACT (ADA), AND WORKERS THROUGH A TEMPORARY TRAFFIC CONTROL ZONE SHALL BE ESSENTIAL PART OF HIGHWAY CONSTRUCTION, UTILITY WORK , MAINTENANCE OPERATIONS, AND THE MANAGEMENT OF TRAFFIC INCIDENTS.

58. CONTRACTORS SHALL INSTALL COVERED WALKWAYS AT LOCATIONS THAT DDOT DEEMS NECESSARY. CONTRACTOR MAY ALSO BE REQUIRED TO DEVELOP PROTECTED PEDESTRIAN PATHS AROUND THE WORK AREA THAT MAY PLACE PEDESTRIAN TRAFFIC IN THE ROADWAY TEMPORARILY. IN THIS SITUATION CONCRETE BARRIERS OR WATER FILLED BARRIERS WITH STEEL RIBBING WILL BE REQUIRED FOR DDOT APPROVAL.

WORK ZONE SPEED LIMITS

59. WHEN REQUIRED BY DDOT, THE CONTRACTOR MAY BE REQUIRED TO LOWER THE POSTED SPEED LIMIT IN THE WORK ZONE DURING THE LIFE OF THE PROJECT. ALL CHANGES TO REGULATORY SIGNS WILL BE INDICATED TO THE PUBLIC WITH THE ADDITION OF TWO ORANGE WORK ZONE FLAGS, AND WHEN REQUIRED BY DDOT, A TYPE B LIGHT MAY BE NECESSARY.

60. "END CONSTRUCTION" AND "ROAD WORK AHEAD" SIGNS WILL BE REQUIRED AT THE ENDS OF THE WORK ZONE; THIS INCLUDES ANY STREETS AFFECTED THAT WILL LEAD INTO OR OUT OF THE WORK AREA.

LAW ENFORCEMENT

61. CONTRACTOR SHALL HAVE, AT ALL TIMES, COPIES OF THEIR TCP'S AND PERMIT ON SITE AND AVAILABLE FOR THE INSPECTOR'S REVIEW. UNLESS OTHERWISE AUTHORIZED BY DDOT, ANY PROJECT/CONTRACTOR FAILING TO HAVE APPROVED PERMITS AND TCP (S) ON SITE, OR ANY CONTRACTOR FAILING TO FOLLOW THE APPROVED PLAN AND TCP, WILL BE SUBJECT TO FINES AND POSSIBLE IMMEDIATE SUSPENSION OF WORK.

62. CONTRACTORS FAILING TO USE APPROVED DEVICES REQUIRED OR REQUESTED BY DDOT WILL BE SUBJECT TO POSSIBLE FINES OR IMMEDIATE SUSPENSION OF WORK.

63. THE CONTRACTOR SHALL RESPONSIBLE FOR ESTABLISHING A QUEUING AREA THAT WILL SATISFY DDOT/PSRA SAFETY AND EFFICIENCY REQUIREMENTS. CONSTRUCTION VEHICLE QUEUING IS NOT ALLOWED IN ANY PUBLIC STREET AND ALLEY.

64. CONTRACTOR MAY BE REQUIRED TO HIRE POLICE FOR PARKING AND WORK ZONE ENFORCEMENT.

65. ANY KIND OF STRUCTURAL DAMAGE, PROPERTY DAMAGE, WHICH OCCURS DUE TO THE CONSTRUCTION ACTIVITY ON PUBLIC SPACE AND/OR PRIVATE PROPERTY IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR - PERMIT HOLDER WHICH CAUSED THE DAMAGE.

66. ANY PERSON WHO POSTS AN UNAUTHORIZED SIGN OR REMOVES AN AUTHORIZED SIGN IS SUBJECT TO A FINE OF $100.00 OR MORE PER DAY FOR EACH DAY THAT ANY UNAUTHORIZED SIGN THAT REMAINS INSTALLED OR REMOVED DURING ITS AUTHORIZED POSTING PLUS DDOT'S COSTS FOR REMOVING THE UNLAWFUL SIGN REISSUING AN AUTHORIZED SIGN.

67. THE CONTRACTOR SHALL PROVIDE , ERECT, MAINTAIN AND REMOVE ALL BARRICADES, WARNING SIGNS, DELINEATORS, AND FLOGGERS IN ACCORDANCE WITH THE MUTCD-2009, DDOT STANDARD SPECIFICATION FOR HIGHWAYS AND STRUCTURES, SECTION 612-TRAFFIC CONTROL, AND CURRENT MOT/TCP INSPECTION CRITERIA DOCUMENT. FAILURE BY THE CONTRACTOR TO OPEN TRAFFIC LANES WHEN REQUIRED AND TO MAINTAIN DESIGNATED LANES OPEN TO TRAFFIC SHALL BE SUBJECT TO $1,000.00 FINE PER HOUR/PER OCCURRENCE.

NIGHT TIME WORK

68. DURING NIGHT TIME HOURS, THE WORK SITE SHALL BE MADE SAFE FOR TRAFFIC. WARNING SHALL BE PROVIDED, BY INSTALLING ELECTRONICALLY ILLUMINATED TRAFFIC CONTROL DEICES SUCH AS FLASHING ARROW PANELS AND WARNING LIGHTS. THESE DEVICES SHOULD BE USED IN CONJUNCTION WITH OTHER TRAFFIC CONTROL DEVICES AND THEIR FLASHING SEQUENCE AND LIGHT INTENSITY SHALL MEET THEREQUIREMENTS CITED IN THE MUTCD. ALL TRAFFIC. CONTROL DEVICES MUST BE REFLECTORIZED DURING NIGHT TIME HOURS.

69. FREQUENT NIGHT TIME INSPECTIONS ARE TO BE MAKE TO ENSURE THAT THE TRAFFIC DEVICES HAVE THE PROPER REFLECTIVITY OR LIGHTING SO THEY ARE VISIBLE AND MEANINGFUL TO THE TRAVELING PUBLIC.

70. THE CONTRACTOR SHALL OBTAIN A DSRA NOISE PERMIT FOR RESIDENTIAL WEEKEND AND NIGHT-TIME WORK.

WORK COORDINATION

71. THE CONTRACTOR SHALL COORDINATE HIS MAINTENANCE OF TRAFFIC WORK WITH OTHER CONTRACTORS AND UTILITY COMPANIES WORKING IN THE SAME GENERAL LOCATION TO MINIMIZE WORK ZONE LOCATION CONFLICTS, TO MAINTAIN CONTINUITY OF TRAFFIC FLOW AND MINIMIZE CONGESTION.

72. THE CONTRACTOR SHALL GIVE-72 HOURS PRIOR NOTICE TO THE DDOT WHEN MAKING A CHANGE IN TRAFFIC FLOW PATTERNS.

73. THE CONTRACTOR SHALL COORDINATE HIS MAINTENANCE OF TRAFFIC WORK WITH DDOT/TOA/SIGNAL DIVISION, DIVISION FOR SIGNAL TIMING MODIFICATIONS BEFORE BEGINNING WORK AT ANY SIGNALIZED INTERSECTION.

74. THE CONTRACTOR SHALL COORDINATE HIS MAINTENANCE OF TRAFFIC WORK WITH DDOT/TOA/SIGNAL DIVISION, AND SAFETY TEAM FOR THE PLACEMENT OF TEMPORARY STOP SIGNS BEFORE BEGINNING WORK AT ANY SIGNALIZED INTERSECTION.

75. CONTRACTOR SHALL NOTIFY APPROPRIATE ANC CHAIRPERSON AND RESIDENTS AND/OR MERCHANTS IN WRITING; OF PLANNED WORK/TCP THREE WEEKS PRIOR TO STARTING DATE. THE CONTRACTOR WILL BE REQUIRED TO FURNISH DDOT WITH ALL LETTERS AND RESPONSES IN WRITING CONCERNING THEIR PROJECT. THIS DOES NOT APPLY TO CRANES THAT ARE USED FOR DURATION OF 1-2 DAYS.

TREE PROTECTION

76. THE CONTRACTOR SHALL PROVIDE PROTECTION FOR EXISTING TREES WITHIN THEPROJECT LIMITS DURING CONSTRUCTION. WORK SHALL INCLUDE PROTECTION BY FENCING OF ALL TREES. TREE PROTECTION FENCING SHALL CONSIST OF 6 FOOT TALL CHAIN LINK FENCE MATERIAL. FENCING SHALL PROTECT AN AREA NO SMALLER THAN 9FT x 4FT. (GOLD BOOK, REF. SECTION 608.07).

77. ALL TREE AND ROOT PROTECTION MEASURES AND EXCAVATION OPERATIONS SHALL COMPLY WITH THE 2013 DDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND STRUCTURES (GOLD BOOK- REF. SECTION 207.03,608.07 AND 608.08)

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APPROVED BY P. CLARY
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CSX
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MAINTENANCE OF TRAFFIC NOTES (2 OF 3)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. MOT-002
REV. N/A
SHEET NO. 195 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: enavia
MOT Note North.dgn
note.2 plot sheet
2/10/2023

THE FOLLOWING MAINTENANCE OF TRAFFIC NOTES SHALL BE APPLICABLE TO LOCATIONS AS NOTED

78. THE DESIGN BUILDER (SOUTH PACKAGE) AND PROGRESSIVE DESIGN BUILDER (NORTH PACKAGE) SHALL

A. COORDINATE WITH TRANSIT OPERATORS (WMATA, DC CIRCULATOR, ARLINGTON TRANSIT, OMNIRIDE, LOUDOUN COUNTY TRANSIT (MARTZ) TO ENABLE ADJUSTMENTS AS NECESSARY TO MINIMIZE IMPACTS TO BUS ROUTES.

B. COORDINATE WITH VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT), ARLINGTON COUNTY, DDOT, AND NPS ON THEIR DEVELOPMENT OF A PROJECT-WIDE TRAFFIC MANAGEMENT PLAN.

C. COORDINATE WITH PARK OWNERS, INCLUDING ARLINGTON COUNTY AND NPS, ON TRAFFIC CONTROL STRATEGIES TO MINIMIZE TRAFFIC DISRUPTIONS AND MAINTAIN VEHICULAR, PEDESTRIAN, AND BICYCLE MOBILITY ON ROADWAYS DURING CONSTRUCTION.

D. COORDINATE WITH FEDERAL, STATE, AND LOCAL LAW ENFORCEMENT AND SAFETY AGENCIES TO ENSURE ACCESS AND MINIMIZE DELAYS FOR EMERGENCY RESPONSE DURING CONSTRUCTION.

E. DEVELOP, WITH APPROVAL FROM AGENCIES (VDOT, ARLINGTON COUNTY, DDOT, NPS) THAT HAVE JURISDICTION OVER APPLICABLE ROADWAYS, A PROJECT-WIDE TRAFFIC MANAGEMENT PLAN (TMP) THAT INCLUDES TEMPORARY TRAFFIC CONTROL PLANS, ANALYSIS OF TRAFFIC OPERATIONS, AND A PUBLIC OUTREACH CAMPAIGN.

F. DEVELOP MAINTENANCE OF TRAFFIC PLANS FOR APPROVAL BY NPS TO ENSURE CONTINUED THROUGH AND RAMP ACCESS ALONG THE GWMP AS THE BRIDGES, EMBANKMENTS, AND RETAINING WALLS ARE CONSTRUCTED.

G. LIMIT GWMP LANE CLOSURES TO OFF-PEAK HOURS TO EXTENT PRACTICABLE TO REDUCE IMPACT TO MOTORISTS. (SOUTH CONTRACT ONLY)

H. LIMIT CROSSING OF GWMP BY CONSTRUCTION VEHICLES TO HOURS TO BE STIPULATED IN THE NPS SPECIAL USE PERMIT SECURED BY THE DESIGN BUILDER. (SOUTH CONTRACT ONLY)

I. MAINTAIN TWO LANES OF TRAFFIC ON GWMP AT ALL TIMES DURING PEAK DAYTIME HOURS. (SOUTH CONTRACT ONLY)

J. DEVELOP MAINTENANCE OF TRAFFIC PLAN FOR I-395 THAT INCLUDES STRATEGIES FOR DRIVER DIVERSION AND STRATEGIES TO ENCOURAGE USE OF NON-MOTORIZED MODES; IDENTIFIES AND CLEARLY SIGNS POTENTIAL DETOUR ROUTES; AND DEVELOPS DRIVER-AWARENESS CAMPAIGNS REGARDING PROBABLE SEVERE CONGESTION FOR THE DURATION OF THE CONSTRUCTION PERIOD. (NORT CONTRACT ONLY)

K. DEVELOP MAINTENANCE OF TRAFFIC PLAN FOR MAINE AVENUE SW THAT INCLUDES STRATEGIES FOR DRIVER DIVERSION AND STRATEGIES TO ENCOURAGE USE OF NON-MOTORIZED MODES; IDENTIFIES AND PROVIDES CLEAR SIGNS FOR POTENTIAL DETOUR ROUTES; AND DEVELOPS DRIVER-AWARENESS CAMPAIGNS REGARDING PROBABLE SEVERE CONGESTION FOR THE DURATION OF CONSTRUCTION PERIOD.

L. MAINTAIN VISITOR ACCESS TO PARKLAND AND TRAILS DURING CONSTRUCTION; ALL INTERMITTENT CLOSURES AND TRAFFIC CONTROL PLANS WOULD BE INCLUDED IN THE TMP SUBMITTED TO NPS FOR REVIEW AND APPROVAL PRIOR TO IMPLEMENTATION.

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DRAWING NO. MOT-003
REV. N/A
SHEET NO. 196 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
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note.3 plot sheet
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UTILITY LEGEND

- FIRE HYDRANT
- WATER METER
- WATER VALVE
- WATER MANHOLE
- SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER MANHOLE
- STORM SEWER INLET
- STORM DRAINAGE INLET
- PROPOSED STORM DRAINAGE INLET
- PROPOSED RIPRAP INLET PROTECTION
- PROPOSED HEADWALL
- PROPOSED RISER STRUCTURE
- CATCH BASIN
- PROPOSED CATCH BASIN
- STORM DRAINAGE MANHOLE
- PROPOSED STORM DRAINAGE MANHOLE
- PROPOSED STORM DRAINAGE DOWNSPOUT
- GAS VALVE
- GAS MANHOLE
- TRAFFIC CONTROL MANHOLE
- TELEPHONE MANHOLE
- PROPOSED TELEPHONE MANHOLE
- PROPOSED FIBER OPTIC COMMUNICATION MANHOLE
- ELECTRIC PEDESTAL
- ELECTRIC MANHOLE
- UNKNOWN CLEANOUT
- UNKNOWN MANHOLE
- END OF INFORMATION (ALL UTILITIES)
- LIGHT POLE
- DOUBLE PARKING METERS
- WATER MAIN
- PROPOSED WATER MAIN
- SANITARY SEWER MAIN
- PROPOSED SANITARY SEWER MAIN
- GAS MAIN
- PROPOSED GAS MAIN
- FIBER OPTIC LINE
- PROPOSED FIBER OPTIC LINE
- TELEPHONE LINE
- PROPOSED TELEPHONE LINE
- ELECTRIC LINE
- COMBINED ELECTRIC AND TELEPHONE LINE
- PROPOSED STORM PIPE
- PROPOSED DITCH

PLANIMETRIC LEGEND

- BENCHMARK
- TRAFFIC SIGN AND POST
- RAILROAD MILE MARKER
- SINGLE OR DOUBLE PARKING METER(S)
- LIGHT POLE
- TRAFFIC SIGNAL POLE
- FLOW ARROW (STREAMS & RIVERS)
- RAILROAD ELECTRIC POLE
- RAILROAD SIGNAL POLE
- RAILROAD SWITCH
- TREE
- VEGETATION LINE
- ARLINGTON COUNTY PROPERTY LINE
- PROPERTY LINE
- CURB ONLY
- CURB AND GUTTER
- EASEMENT LINE
- FENCE LINE
- 100-YEAR FLOODPLAIN
- GUARDRAIL
- RAILROAD
- RETAINING WALL
- SIDEWALKS
- MAJOR CONTOUR
- MINOR CONTOUR
- PIPE CULVERTS
- OBSCURE AREAS

UTILITY RELOCATION NOTES

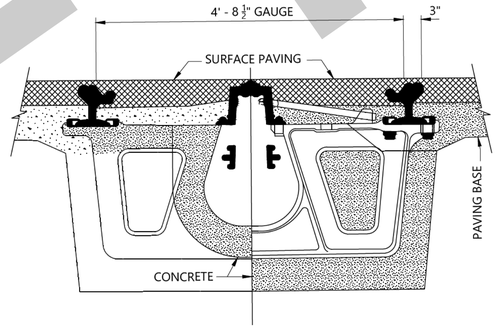
1. *UTILITY RELOCATIONS SHOWN WITHIN THESE PLANS ARE ALL CONCEPTUAL IN NATURE. ALIGNMENTS HAVE BEEN PROVIDED AS POSSIBLE UTILITY ROUTING CORRIDORS AND STORMWATER MANAGMENT FACILITIES ARE PRELIMINARY. UTILITY OWNER INPUT HAS NOT BEEN GIVEN ON THESE ALIGNMENTS AND ADDITIONAL DISCUSSIONS ARE REQUIRED.*
2. *DUE TO PROXIMITY OF LIVE UNDERGROUND UTILITY LINES, VHB IS NOT RESPONSIBLE FOR ANY DAMAGE OR INJURY SUSTAINED DURING CONSTRUCTION BY ANY PERSONS, VEHICLES, OR EQUIPMENT USED ON, OR ADJACENT TO, THE PROJECT SITE.*
3. *BEFORE CONDUCTING ANY WORK IN PUBLIC SPACE, THE CONTRACTOR SHALL CALL "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION OR CONSTRUCTION.*
4. *CLEAR ACCESS TO ALL EXISTING FIRE HYDRANTS, STANDPIPES, AND BUILDING SIAMESE CONNECTIONS SHALL BE MAINTAINED AT ALL TIMES.*

WMATA FACILITY PROTECTION NOTES

1. *EXISTING WMATA FACILITIES SHALL BE PROPERLY PROTECTED DURING CONSTRUCTION AGAINST ANY DUST OR DEBRIS INTRUSION.*
2. *CLEAR ACCESS TO ALL EXISTING FIRE WMATA FIRE DEPARTMENT CONNECTIONS AND STANDPIPES SHALL BE MAINTAINED AT ALL TIMES.*
3. *THE CONTRACTOR SHALL TAKE PRECAUTIONS NOT TO DAMAGE THE EXISTING FACILITIES WHEN CONDUCTING ADJACENT DEMOLITION AND/OR EXCAVATION OPERATIONS.*

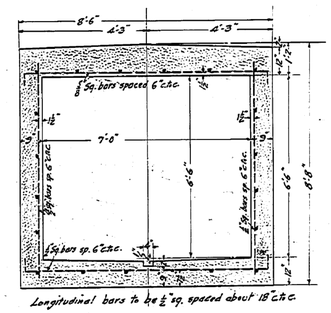
EXISTING MAINE AVE AND MAIDEN LANE TROLLEY TRACK AND STEAM TUNNEL NOTES

1. *THE CONTRACTOR SHOULD TAKE NOTE THAT EXISTING ABANDONED (PAVED-OVER) TROLLEY (STREETCAR) TRACKS EXIST WITHIN THE PROJECT LIMITS.*
2. *THE LOCATION OF THOSE TRACKS SHOWN ON THESE PLANS WAS TAKEN FROM EXISTING AVAILABLE RECORDS AND SHOULD BE CONSIDERED APPROXIMATE.*
3. *EXISTING ABANDONED ELECTRIC MANHOLES, PLOW PITS, SLOT RAIL, CENTER CAVITY AREA WITH T-SHAPED CONDUCTOR BARS, AND OTHER APPURTENRENCES ASSOCIATED WITH THE ABAONDED STREETCAR TRACK SYSTEM ARE ALSO PRESENT.*
4. *RECORDS INDICATE A STEAM TUNNEL WAS CONSTRUCTED IN 1915 IN THIS AREA BUT NEVER PUT INTO OPERATION. A PORTION OF THE GSA STEAM TUNNEL MAY HAVE BEEN WALLED OFF DURING CONSTRUCTION OF THE 14TH STREET SW BRIDGE.*



TYPICAL ABANDONED SINGLE TROLLEY TRACK

NOT TO SCALE



ABANDONED GSA STEAM TUNNEL SECTION

NOT TO SCALE

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY S. HUANG
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/30/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION NOTES/SYMBOLS

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. URP-001
REV. N/A
SHEET NO. 220 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_kl_v95.tbl
Plotted By: mbruno
cR02A_urp-000.dgn
URP-001N
1/30/2023

UTILITY RELOCATION TABLES

UTILITY RELOCATION TABLE		
RELOCATION IDENTIFICATION / SHEET NUMBER	**UTILITY OWNER**	**DESCRIPTION OF REQUIRED RELOCATION**
UR 1-1	CSXT	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO TRACK UNDERDRAIN SYSTEM
UR 1-2	CSXT	NEW STORM DRAINAGE SYSTEM
UR 1-3	CSXT	NEW JACK AND BORE TUNNEL UNDER EXISTING RAILROAD EMBANKMENT FOR NEW STORM DRAIN PIPING
UR 1-4	NPS	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO AND OUTFALL FROM BMP #2
UR 1-5	NPS	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO AND OUTFALL FROM BMP #1
UR 1-6	WMATA	RELOCATION OF EXISTING PARKING LOT LIGHTING SYSTEM
UR 1-7	NPS	RELOCATION OF EXISTING WATERLINE
UR 1-8	CSXT	PORTIONS OF EXISTING ABANDONED SUBMARINE CABLES TO BE REMOVED
UR 1-9	DC CLEAN RIVERS	FUTURE POTOMAC RIVER TUNNEL TO BE PROTECTED IN PLACE
UR 1-10	NPS	RELOCATION OF EXISTING NPS STREETLIGHT CONDIUT
UR 1-11	DOD WASHINGTON HQ SERVICE	EXISTING DOD FIBER OPTIC LINE TO BE PROTECTED IN PLACE
UR 2-1	DDOT	RELOCATION OF EXISTING ROADWAY LIGNTING CONDUT
UR 2-2	CSXT	NEW STORM PIPING AND MANHOLES FOR CONNECTION TO TRACK UNDERDRAIN SYSTEM
UR 2-3	NPS	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO AND OUTFALL FROM BMP #4A
UR 2-4	DC WATER	EXISTING 30-INCH STROM DRAIN TO BE PROTECTED IN PLACE
UR 2-5	NPS	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO AND OUTFALL FROM BMP #3
UR 2-6	DC WATER	PORTIONS OF EXISTING ABANDONED 72-INCH AND 96-INCH FORCE MAINS TO BE REMOVED

UTILITY RELOCATION TABLE		
RELOCATION IDENTIFICATION / SHEET NUMBER	**UTILITY OWNER**	**DESCRIPTION OF REQUIRED RELOCATION**
UR 2-7	WMATA	RELOCATION OF EXISTING WMATA CCTV AND SECURITY EQUIPMENT AT TIUNNEL PORTAL
UR 2-8	CSXT	NEW STORM DRAIN CONNECTION TO TRACK UNDERDRAIN SYSTEM
UR 2-9	DC WATER	EXISTING ACTIVE 72-INCH AND 96-INCH FORCE MAINS TO BE PROTECTED IN PLACE
UR 2-10	DDOT	NEW ROADWAY LIGHTING SYSTEM
UR 3-1	CSXT	NEW STORM DRAIN CONNECTION TO TRACK UNDERDRAIN SYSTEM
UR 3-2	VERIZON	RELOCATION OF EXISTING VERIZON DUCTBANK
UR 3-3	CSXT AND OTHERS	RELOCATION OF EXISTING RAILROAD ELECTRIC, AND TELECOMMUNICATIONS DUCTBANKS AND MANHOLES
UR 3-4	NPS	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO AND OUTFALL FROM BMP #5
UR 3-5	DDOT	NEW ROADWAY LIGHTING SYETEM
UR 4-1	NPS	RELOCATION OF EXISTING 8-INCH SANITARY FORCE MAIN AND APPURTENENCES
UR 4-2	WASHINGTON GAS	RELOCATION OF EXISTING 6-INCH WRAPPED STEEL GAS MAIN AND APPURTENANCES
UR 4-3	NPS	RELOCATION OF EXISTING 8-INCH WATERMAIN AND APPURTENANCES
UR 4-4	UNKNOWN	RELOCATION OF EXISTING FIBER OPTIC LINE
UR 4-5	VERIZON	RELOCATION OF EXISTING VERIZON DUCTBANK
UR 4-6	VERIZON	EXISTING 52-WAY FIBER OPTIC DUCTBANK TO BE PROTECTED IN PLACE
UR 4-7	NPS	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO TRACK UNDERDRAIN SYSTEM
UR 4-8	CSXT AND OTHERS	RELOCATION OF EXISTING RAILROAD ELECTRIC, AND TELECOMMUNICATIONS DUCTBANKS AND MANHOLES

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY S. HUANG
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION TABLES
(1 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. URP-002
REV. N/A
SHEET NO. 221 OF 273
SCALE AS SHOWN

VDOT PDF.oltcfg
LBPE_ld_v95.tbl
Plotted By: shuang
cR02A_urp-000.dgn
URP-002N-1
1/26/2023

UTILITY RELOCATION TABLES

UTILITY RELOCATION TABLE		
RELOCATION IDENTIFICATION / SHEET NUMBER	**UTILITY OWNER**	**DESCRIPTION OF REQUIRED RELOCATION**
UR 4-9	NPS	NEW ROADWAY LIGHTING SYSTEM
UR 4-10	CSXT	NEW STORM DRAIN CONNECTION TO TRACK UNDERDRAIN SYSTEM
UR 5-1	DC WATER	RELOCATION OF EXISTING 30-INCH MASONRY STORM DRAIN AND ASSOCIATED JUNCTION BOXES AND PIPE CONNECTIONS
UR 5-2	DC WATER	RELOCATION OF EXISTING 12-INCH CAST IRON WATERMAIN AND ASSOCIATED CONNECTIONS AND APPURTENANCES
UR 5-3	WORLDCOM / MCI	RELOCATION OF EXISTING TELECOMMUNICATIONS / FIBER OPTIC DUCTBANK AND ASSOCIATED JUNCTION BOXES
UR 5-4	VERIZON	RELOCATION OF EXISTING TELECOMMUNICATIONS / FIBER OPTIC DUCTBANK AND ASSOCIATED JUNCTION BOXES
UR 5-5	DC WATER	RELOCATION OD EXISTING 24-INCH STORM DRAIN AND ASSOCIATED CONNECTIONS AND MANHOLE STRUCTURES
UR 5-6	PEPCO	RELOCATION OF EXISTING TRANSFORMER AND ASSOCIATED CONNECTIONS ANF JUNCTION BOXES
UR 5-7	WASHINGTON GAS	RELOCATION OF EXISTING 6-INCH HIGH PRESSURE PLASTIC GAS MAIN
UR 5-8	DDOT	RELOCATION OF EXISTING CATCH BASINS AND BASIN CONNECTION PIPES
UR 5-9	DDOT	RELOCATION OF EXISTING CATCH BASINS AND BASIN CONNECTION PIPES
UR 5-10	DC WATER	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO BMP #7
UR 5-11	VERIZON	EXISTING 52-WAY FIBER OPTIC DUCTBANK (SUBMARINE CABLES) TO BE PROTECTED IN PLACE
UR 5-12	VERIZON	EXISTING 52-WAY FIBER OPTIC DUCTBANK TO BE PROTECTED IN PLACE
UR 5-13	CSXT	NEW STORM DRAIN PIPING AND MANHOLES FOR CONNECTION TO TRACK UNDERDRAIN SYSTEM
UR 5-14	DDOT	NEW TRAFFIC SIGNAL SYSTEM
UR 5-15	DDOT	NEW ROADWAY LIGHTING SYETEM

UTILITY RELOCATION TABLE		
RELOCATION IDENTIFICATION / SHEET NUMBER	**UTILITY OWNER**	**DESCRIPTION OF REQUIRED RELOCATION**
UR 5-16	VERIZON	EXISTING 52-WAY FIBER OPTIC DUCTBANK TO BE PROTECTED IN PLACE
UR 5-17	DDOT	RELOCATION OF EXISTING STREETLIGHT SYSTEM
UR 5-18	MARINA	RELOCATION OF EXISTING PARKING LOT LIGHTING SYSTEM
UR 5-19	CSXT AND OTHERS	RELOCATION OF EXISTING RAILROAD ELECTRIC, AND TELECOMMUNICATIONS DUCTBANKS AND MANHOLES
UR 5-20	GSA	REMOVAL OF EXISTING ABANDONED STEAM TUNNEL
UR 6-1	CSXT AND OTHERS	RELOCATION OF EXISTING RAILROAD ELECTRIC, AND TELECOMMUNICATIONS DUCTBANKS AND MANHOLES
UR 6-2	DC WATER	EXISTING ABANDONED 2.75' X 4.125' MASONRY STORM DRAIN IN TIMBER BOX TUNNEL TO BE REMOVED
UR 6-3	CSXT	RELOCATION OF EXISTING 24-INCH STORM DRAIN PIPING, MANHOLES, AND APPURTENENCES
UR 6-4	PORTALS	EXISTING MISCELLANEOUS PORTALS UTILITIES TO BE REMOVED
UR 7-1	CSXT AND OTHERS	RELOCATION OF EXISTING RAILROAD ELECTRIC, AND TELECOMMUNICATIONS DUCTBANKS AND MANHOLES
UR 7-2	CSXT	RELOCATION OF EXISTING 24-INCH STORM DRAIN PIPING, MANHOLES, AND APPURTENENCES
UR 7-3	CSXT	RELOCATION OF EXISTING TELEPHONE DUCTBANK
UR 8-1	CSXT AND OTHERS	RELOCATION OF EXISTING RAILROAD ELECTRIC, AND TELECOMMUNICATIONS DUCTBANKS AND MANHOLES
UR 8-2	CSXT	RELOCATION OF EXISTING 24-INCH STORM DRAIN PIPING, MANHOLES, AND APPURTENENCES
UR 8-3	CSXT	RELOCATION OF EXISTING TELEPHONE DUCTBANK
UR 8-4	DC WATER	EXISTING 66-INCH STORM DRAIN LINE AND 27-INCH SANITARY SEWER LINE ON UTILITY BRIDGGE #517 TO BE PROTECTED IN PLACE
UR 8-5	WMATA	ECISTING WMATA BLUE / ORANGE / SILVER LINE TUNNEL TO BE PROTECTED IN PLACE

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY S. HUANG
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION TABLES
(2 OF 2)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. URP-003
REV. N/A
SHEET NO. 222 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_lt_v95.tbl
Plotted By: shuang
1/26/2023
cR02A_urp-000.dgn
URP-J002N-2

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

130+00

129+00

128+00

127+00

PIER 3

PIER 2

PIER 1

PIER 0

APPROXIMATE LOCATION OF FUTURE DC CLEAN RIVERS POTOMAC RIVER TUNNEL

WMATA YELLOW LINE

POTOMAC RIVER

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

4045+00

3045+00

UR 1-9

UR 1-8

UR 1-10

UR 1-5

UR 1-6

UR 1-7

UR 1-2

UR 1-1

UR 1-3

UR 1-4

UR 1-11

WMATA TPSS

BMP-1

NPS PARKING LOT C

METAL CANOPY

SEAWALL

RETAINING WALL

OHIO DRIVE SW (WEST)

ACCESS ROAD

ELECTRIC UTILITY POLES

EXISTING TRACK 3

EXISTING TRACK 2

UTILITY YARD

BMP-2

NPS STREETLIGHT CIRCUIT

3 PARALLEL WIRE ARMORED CABLES IN A SINGLE TRENCH DRAWN FROM THE 1936 GIBBS & HILL DRAWING REDRAWN FROM THE PRIOR 1934 DRAWING

MHW ELEV. 1.54

MATCHLINE - SEE DRAWING URP-005

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

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CHECKED BY: J. LONG
APPROVED BY: J. LONG
DATE: 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION PLAN
(1 OF 8)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: URP-004
REV.: N/A
SHEET NO.: 223 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg 1/26/2023
LBPE_Id_v95.tbl
Plotted By: shuang
uR02A_des_urp.dgn
urp-010N [Sheet]

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING URP-004

MATCHLINE - SEE DRAWING URP-006

NPS PARKING LOT B

BMP-3

BMP-4A

NPS PARKING LOT C

WMATA YELLOW LINE

WMATA TUNNEL PORTAL

UR 2-1

UR 2-2

UR 2-3

UR 2-4

UR 2-5

UR 2-6

UR 2-7

UR 2-8

UR 2-9

UR 2-10

4050+00

4055+00

3050+00

3055+00

2055+00

1055+00

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

EXISTING TRACK 2

EXISTING TRACK 3

I-395 NORTHBOUND

I-395 SOUTHBOUND

OVERHEAD SIGN STRUCTURE

SIGN BRIDGE

ELECTRIC UTILITY POLE

MILE MARKER 111

EXISTING DOD FACILITY

NO CONSTRUCTION OR STAGING AREA WILL BE ALLOWED WITHIN THIS AREA

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY S. HUANG
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/27/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION PLAN
(2 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. URP-005
REV. N/A
SHEET NO. 224 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: shuang
uR02A_des_urp.dgn
urp-011N [Sheet]
1/27/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING URP-005

MATCHLINE - SEE DRAWING URP-007

14TH STREET SW

BMP-4B

BMP-5

UR 3-1

UR 3-2

UR 3-3

UR 3-4

UR 3-5

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

ELECTRIC UTILITY POLE

PAINT BY OTHERS

EXISTING TRACK 3

EXISTING TRACK 2

4060+00

3060+00

2060+00

1060+00

I-395 SOUTH EXIT RAMP

ABANDONED TELEPHONE

ABANDONED WATER

ABANDONED GAS

ABANDONED ELECTRIC

ABANDONED STORM

RED

SCALE

0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

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DRAWN BY: S. HUANG
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APPROVED BY: J. LONG
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION PLAN
(3 OF 8)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: URP-006
REV.: N/A
SHEET NO.: 225 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: mbruno
uR02A_des_urp.dgn
urp-012N [Sheet]
2/7/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING URP-006

MATCHLINE - SEE DRAWING URP-008

OHIO DRIVE SW (EAST)

14TH STREET SW

ELECTRIC UTILITY POLE

UR 4-1

UR 4-2

UR 4-3

UR 4-4

UR 4-5

UR 4-6

UR 4-7

UR 4-8

UR 4-9

UR 4-10

EXISTING TRACK 3

EXISTING TRACK 2

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

4065+00

3065+00

2065+00

1065+00

ELECTRIC MANHOLES

SANITARY SEWER MANHOLE

ELECTRIC MANHOLE

STORM DRAINAGE MANHOLE

ABANDONED WATER

ABANDONED GAS

NPS NAMA PARKING LOT

APPROXIMATE LIMIT OF NPS HEADQUARTERS

RIP-RAP

WASHINGTON CHANNEL

BULKHEAD LINE

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

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APPROVED BY: J. LONG
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION PLAN
(4 OF 8)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: URP-007
REV.: N/A
SHEET NO.: 226 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
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uR02A_des_urp.dgn
urp-01GN [Sheet]
2/7/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING URP-007

MATCHLINE - SEE DRAWING URP-009

WASHINGTON CHANNEL

14TH STREET SW

BURIED TROLLEY TRACKS

SINGLE PARKING METER

UR 5-2

UR 5-14

UR 5-15

ELECTRIC PULL BOX

MAINE AVENUE SW

UR 5-4

MAINE AVENUE SW

UR 5-15

ELECTRIC UTILITY POLE

UR 5-15

ELECTRIC UTILITY POLE

14TH STREET SW OFF RAMP TO MAINE AVENUE SW

UR 5-9

UR 5-8

DOUBLE PARKING METERS

MAIDEN LANE SW

DOUBLE PARKING METERS

UR 5-13

UR 5-5

℄ PROPOSED TRACK 4

EXISTING TRACK 3

UR 5-19

4070+00

ELECTRIC MANHOLE

EXISTING TRACK 2

RAILROAD CORRIDOR "SEE NOTE 1".

3070+00

CSXT TRACKS

UR 5-20

UR 5-13

2070+00

UR 5-19

℄ PROPOSED TRACK 3

UR 5-13

1070+00

UR 5-19

℄ PROPOSED TRACK 2

UR 5-12

DOUBLE PARKING METERS

UR 5-4

UR 5-18

RAILROAD CORRIDOR "SEE NOTE 1".

℄ PROPOSED TRACK 1

UR 5-19

UR 5-11

BMP-6

UR 5-12

LIGHT POLE

UR 5-17

UR 5-17

UR 5-6

UR 5-12

UR 5-11

WASHINGTON MARINA PARKING

UR 5-1

ELECTRICAL VAULT

UR 5-18

SINGLE PARKING METER

WASHINGTON CHANNEL SUBMARINE CABLE DRAWN ACCORDING TO DIVER LOCATED BUOY LOCATIONS

WASHINGTON CHANNEL

UR 5-2

SALAMANDER HOTEL

UR 5-3

SHED

DOUBLE PARKING METERS

COMBINED PIERHEAD AND BULKHEAD LINE

UR 5-10

UR 5-4

LIGHT POLE

UR 5-17

UR 5-16

ELECTRIC MANHOLE

DOUBLE PARKING METERS

UR 5-7

SCALE 0 20' 40'

NOTE:

1. VPRA HAS AN EASEMENT OVER CERTAIN PORTIONS OF CSXT RIGHT OF WAY IN THE DISTRICT OF COLUMBIA. CSXT IS SUCCESSOR BY MERGER TO NYC NEWCO, INC., A VIRGINIA CORPORATION, SUCCESSOR BY MERGER TO NEW YORK CENTRAL LINES LLC, A DELAWARE LIMITED LIABILITY COMPANY, SUCCESSOR BY QUITCLAIM DEED FROM CONSOLIDATED RAIL CORPORATION, SUCCESSOR BY DEED FROM JOHN C. KOHL, TRUSTEE IN BANKRUPTCY OF THE PROPERTY OF THE PHILADELPHIA, BALTIMORE AND WASHINGTON RAILROAD COMPANY, WHICH HELD A RIGHT OF WAY INTEREST IN A PORTION OF THE RAIL CORRIDOR IN THE DISTRICT OF COLUMBIA PURSUANT TO GRANTS BY THE U.S. CONGRESS AS SET FORTH IN 31 STAT. 773, 56TH CONGRESS 2ND SESS. CHAPTER 353 (1901) AND 32 STAT. 909, 57TH CONGRESS 2ND SESS. CHAPTER 856 (1903) AND AS SUCCESSOR BY MERGER TO THE BALTIMORE AND POTOMAC RAILROAD COMPANY, WHICH HELD A RIGHT OF WAY INTEREST IN A PORTION OF THE RAIL CORRIDOR IN THE DISTRICT OF COLUMBIA PURSUANT TO GRANT BY THE U.S. CONGRESS AS SET FORTH IN 31 STAT. 773, 56TH CONGRESS 2ND SESS. CHAPTER 353 (1901).

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: M. BRUNO
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CHECKED BY: J. LONG
APPROVED BY: J. LONG
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

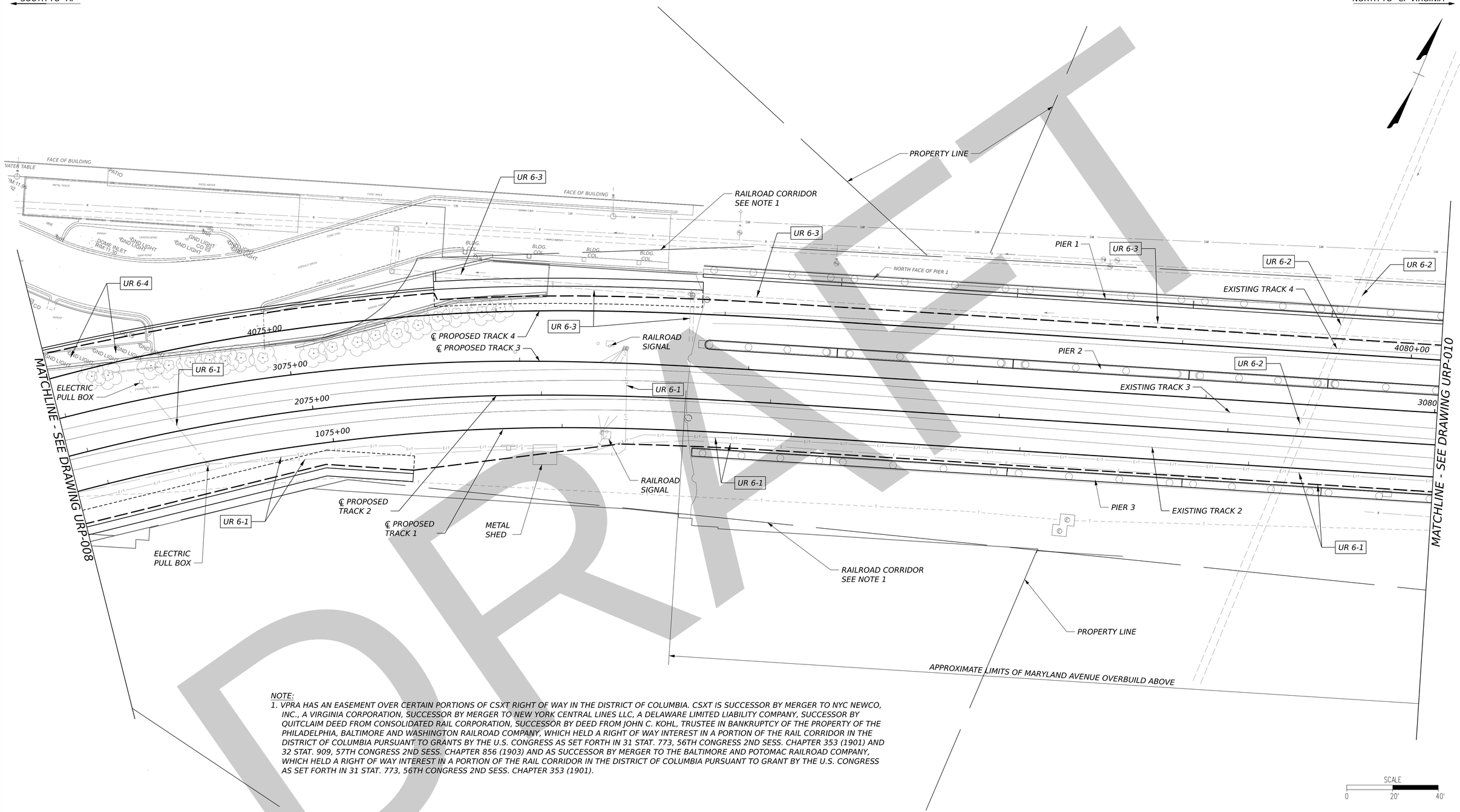
UTILITY RELOCATION PLAN
(5 OF 8)

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: URP-008
REV.: N/A
SHEET NO.: 227 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: mbruno
uR02A_des_urp.dgn
urp-414N [Sheet]
2/7/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



NOTE:

1. VPRA HAS AN EASEMENT OVER CERTAIN PORTIONS OF CSXT RIGHT OF WAY IN THE DISTRICT OF COLUMBIA. CSXT IS SUCCESSOR BY MERGER TO NYC NEWCO, INC., A VIRGINIA CORPORATION, SUCCESSOR BY MERGER TO NEW YORK CENTRAL LINES LLC, A DELAWARE LIMITED LIABILITY COMPANY, SUCCESSOR BY QUITCLAIM DEED FROM CONSOLIDATED RAIL CORPORATION, SUCCESSOR BY DEED FROM JOHN C. KOHL, TRUSTEE IN BANKRUPTCY OF THE PROPERTY OF THE PHILADELPHIA, BALTIMORE AND WASHINGTON RAILROAD COMPANY, WHICH HELD A RIGHT OF WAY INTEREST IN A PORTION OF THE RAIL CORRIDOR IN THE DISTRICT OF COLUMBIA PURSUANT TO GRANTS BY THE U.S. CONGRESS AS SET FORTH IN 31 STAT. 773, 56TH CONGRESS 2ND SESS. CHAPTER 353 (1901) AND 32 STAT. 909, 57TH CONGRESS 2ND SESS. CHAPTER 856 (1903) AND AS SUCCESSOR BY MERGER TO THE BALTIMORE AND POTOMAC RAILROAD COMPANY, WHICH HELD A RIGHT OF WAY INTEREST IN A PORTION OF THE RAIL CORRIDOR IN THE DISTRICT OF COLUMBIA PURSUANT TO GRANT BY THE U.S. CONGRESS AS SET FORTH IN 31 STAT. 773, 56TH CONGRESS 2ND SESS. CHAPTER 353 (1901).

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY S. HUANG
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION PLAN
(6 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. URP-009
REV. N/A
SHEET NO. 228 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_-95.tbl
Plotted By: mbruno
uR02A_des_urp.dgn
urp-015N [Sheet]
2/7/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING URP-009

MATCHLINE - SEE DRAWING URP-011

PROPERTY LINE

D STREET SW

RAILROAD CORRIDOR
SEE NOTE 1

12TH STREET SW

MARYLAND AVENUE SW

℄ PROPOSED
TRACK 4

℄ PROPOSED
TRACK 3

℄ PROPOSED
TRACK 1

℄ PROPOSED TRACK 2

PIER 1

PIER 2

PIER 3

UR 7-1

UR 7-2

UR 7-3

EXISTING TRACK 4

EXISTING TRACK 3

EXISTING TRACK 2

CATENARY STRUCTURE

+00

2080+00

1080+00

3085+00

4085+00

2085+00

1085+00

APPROXIMATE LIMITS OF MARYLAND AVENUE OVERBUILD ABOVE

SCALE
0 20' 40'

NOTE:
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DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
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CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION PLAN
(7 OF 8)

PROJECT NO. VPRA R02A
CSXT XXXX

DRAWING NO. URP-010

REV. N/A

SHEET NO. 229 OF 273

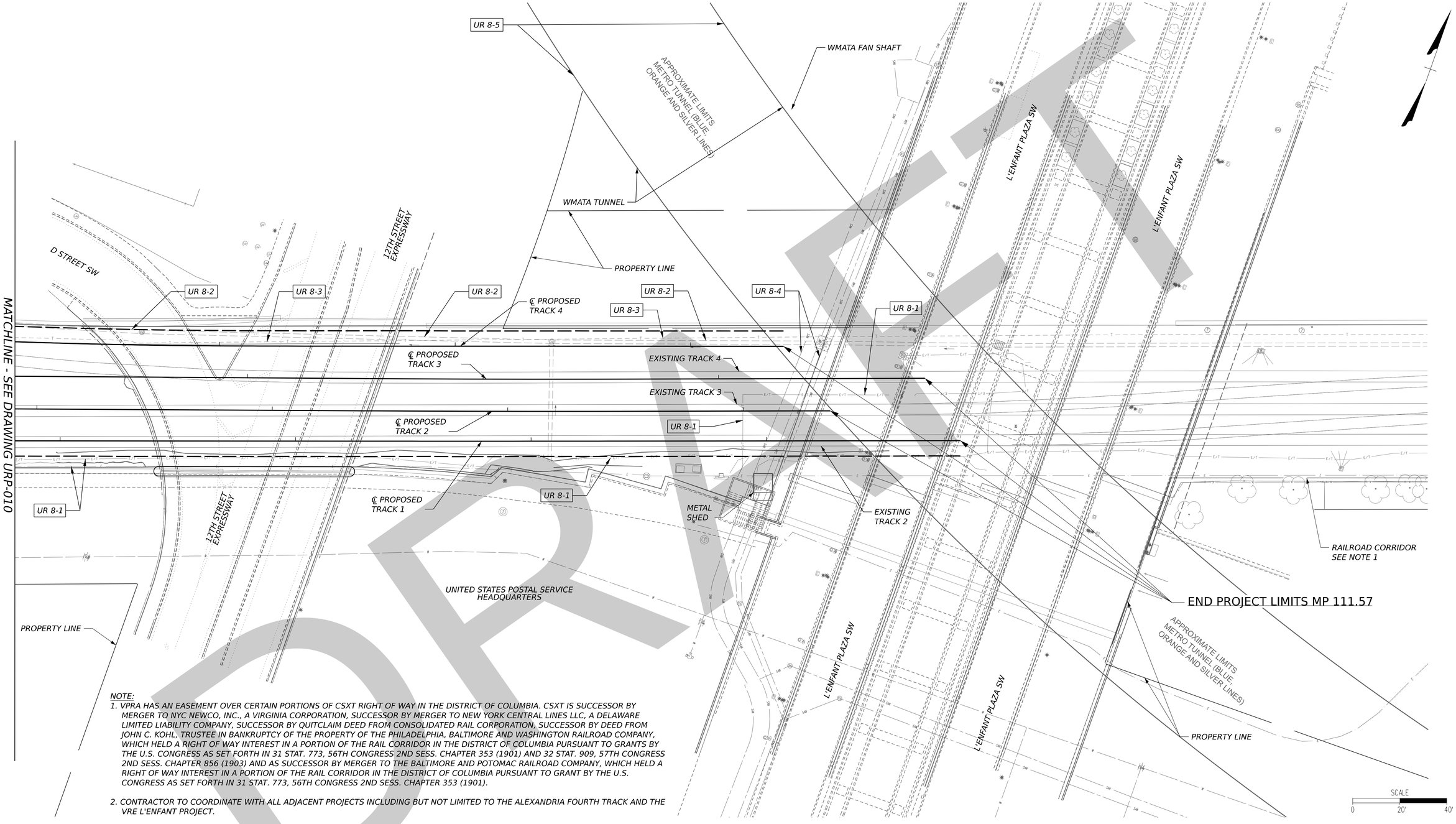
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: mbruno
uR02A_des_urp.dgn
urp-016N [Sheet]
2/7/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING URP-010



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2. CONTRACTOR TO COORDINATE WITH ALL ADJACENT PROJECTS INCLUDING BUT NOT LIMITED TO THE ALEXANDRIA FOURTH TRACK AND THE VRE L'ENFANT PROJECT.

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: M. BRUNO
DRAWN BY: S. HUANG
CHECKED BY: J. LONG
APPROVED BY: J. LONG
DATE: 2/7/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UTILITY RELOCATION PLAN
(8 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. URP-011
REV. N/A
SHEET NO. 230 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: mbruno
uR02A_des_urp.dgn
urp-017N [Sheet]
2/7/2023

LONG BRIDGE REGULATORY LIMIT OF DISTURBANCE FOR SWM SUMMARY TABLE

	COLOR	REGULATORY LOD AREA (SF)	REGULATORY LOD AREA (ACRES)
RAILROAD LAND (VIRGINIA)		104,242	2.39
NPS GWMP		42,008	0.96
ARLINGTON COUNTY		9,792	0.21
VIRGINIA TOTAL		**156,042**	**3.58**
AREA OVER WATER BODIES		83,804	1.92
RAILROAD LAND (DC)		227,679	5.23
NPS NAMA		79,933	1.84
BMP AREA		25,319	0.58
DDOT PROW		23,519	0.54
PRIVATE PROPERTY		7,741	0.18
DISTRICT OF COLUMBIA TOTAL		**447,995**	**10.28**

THESE TOTALS ARE PROVIDED FOR THE ENTIRE PROJECT AND ENCOMPASSES THE SOUTH AND NORTH PACKAGES. THE SOUTH PACKAGE FALLS UNDER BOTH VIRGINIA DEQ AND DOEE JURISDICTION FOR STORMWATER OBLIGATION. THE NORTH PACKAGE IS LOCATED ONLY WITHIN DOEE JURISDICTION FOR STORMWATER OBLIGATION. OUT OF CONTRACT INFORMATION IS PROVIDED FOR ADDITIONAL INFORMATION.

LONG BRIDGE STORMWATER MANAGEMENT SUMMARY TABLE

DOEE STORMWATER RETENTION VOLUME REQUIRED (CF)	DOEE ADDITIONAL VOLUME FOR CURVE NUMBER REDUCTION BACK TO MEADOW CONDITIONS (CF)	VIRGINIA DEQ QUALITY (CF)	VIRGINIA DEQ QUANTITY (CF)	TOTAL ONSITE STORAGE VOLUME REQUIRED (CF)
30,289	39,711	3,986	SEE NOTE 3	**73,986**

1. *SEE STORMWATER COMPUTATION WORKSHEETS FOR FULL ANALYSIS.*
2. *DOEE OBLIGATION INCLUDES BOTH QUALITY AND QUANTITY.*
3. *VIRGINIA DEQ REQUIRES STORMWATER MANAGEMENT FOR LIMIT OF DISTURBANCE GREATER THAN 1 ACRE. DUE TO SITE CONSTRAINTS A BMP FACILITY WASN'T IDENTIFIED AT THIS TIME AND QUANTITY CONTROL WAS NOT INCLUDED IN VIRGINIA.*

SWM OBLIGATION NARRATIVE

1. *THE STORMWATER OBLIGATION IS BASED SOLEY UPON THE REGULATORY LOD SHOWN IN THESE SHEETS.*
2. *THIS SUMMARY DOES NOT INCLUDE ANY REDUCTIONS FOR MEP CONSIDERATIONS.*
3. *AREAS OVER WATER BODIES ARE NOT INCLUDED IN THE STORMWATER OBLIGATION AS DISCUSSED DURING DOEE MEETINGS.*
4. *THE LONG BRIDGE PROJECT IS EXEMPT FROM THE ANACOSTIA WATERFRONT DEVELOPMENT ZONE (AWDZ) AS DISCUSSED DURING DOEE MEETINGS.*
5. *BALLAST AREAS ARE CONSIDERED IMPERVIOUS IN THE DISTRICT OF COLUMBIA AND PERVIOUS IN THE COMMONWEALTH OF VIRGINIA.*

SWM LIMIT OF DISTURBANCE NARRATIVE

1. *THE LIMIT OF DISTURBANCE SHOWN ON THIS PLAN IS FOR THE DETERMINATION OF THE PERMANENT STORMWATER MANAGMENT REQUIREMENTS FOR THE PROJECT.*
2. *LAND DISTURBANCE ACTIVITIES RELATED TO NEW UTILITY CONSTRUCTION AND TRENCHING ACTIVITIES NOT INCLUDED IN STORMWATER MANAGEMENT OBLIGATION.*
3. *LAND DISTURBANCE ACTIVITIES RELATED TO TEMPORARY MAINTENANCE OF TRAFFIC ACTIVITIES NOT INCLUDED IN STORMWATER MANAGEMENT OBLIGATION.*
4. *LAND DISTURBANCE ACTIVITIES RELATED TO TEMPORARY CONSTRUCTION ACCESS ACTIVITIES NOT INCLUDED IN STORMWATER MANAGEMENT OBLIGATION.*
5. *LAND DISTURBANCE ACTIVITIES RELATED TO TEMPORARY STAGING AREA ACTIVITIES NOT INCLUDED IN STORMWATER MANAGEMENT OBLIGATION.*
6. *LAND DISTURBANCE ACTIVITIES RELATED TO UTILITY RELOCATION ACTIVITIES NOT INCLUDED IN STORMWATER MANAGEMENT OBLIGATION.*
7. *LAND DISURBANCE ACTIVITIES RELATED TO TREE PLANTING ACTIVITIES NOT INCLUDED IN STORMWATER MANAGEMENT OBLIGATION.*
8. *LIMIT OF DISUTRBANCE WAS ASSUMED TO BE 5' OFFSET OF ALL STRUCTURES BESIDES RAIL. PROPOSED RAIL OFFSETS ASSUMED TO BE 20' FROM CENTER OF PROPOSED TRACK.*
9. *THE STORMWATER OBLIGATION IS BASED SOLEY UPON THE LOD SHOWN IN THESE SHEETS.*
10. *AREAS OVER WATER BODIES ARE NOT INCLUDED IN THE STORMWATER OBLIGATION AS DISCUSSED DURING DOEE MEETINGS.*
11. *BALLAST AREAS ARE CONSIDERED IMPERVIOUS IN THE DISTRICT OF COLUMBIA AND PERVIOUS IN THE COMMONWEALTH OF VIRGINIA.*

DRAINAGE DIVIDE NARRATIVE

1. *CONTOURS HAVE BEEN TAKEN FROM A VARIETY OF AVAILABLE RESOURCES THROUGHOUT THE PROJECT CORRIDOR AND DIFFER BY LOCATION.*
2. *CONTOURS AND DRAINAGE DIVIDES IN VIRGINIA WERE TAKEN FROM PUBLICLY AVAILABLE GIS INFORMATION.*
3. *CONTOURS WITHIN THE EAST POTOMAC PARK ISLAND WERE TAKEN FROM NPS TOPOGRAPHY MAPPING.*
4. *CONTOURS EAST OF THE WASHINGTON CHANNEL WERE OBTAINED THROUGH HISTORICAL RECORDS.*
5. *RAILROAD DRAINAGE DIVIDES WERE SET BASED ON THE BRIDGE ALIGNMENT HIGH AND LOW POINTS.*
6. *OUTER LIMITS OF THE RAILROAD DRAINAGE DIVIDE WERE SET BY THE PROPOSED RETAINING WALL LOCATIONS.*

OUTFALL NARRATIVES

COMMONWEALTH OF VIRGINIA OUTFALLS

1. *DRAINAGE AREA 1 OUTFALL IS THE POTOMAC RIVER FROM THE VIRGINIA SHORELINE. THE DRAINAGE AREA CONSISTS OF THE VIRGINIA LAND IN AND AROUND GWMP.*
2. *DRAINAGE AREA 2 OUTFALL IS THE LOCATED WITHIN THE LIMITS OF THE RAIL ALIGNMENT TOWARDS THE WEST END THE PROJECT CORRIDOR. THE DRAINAGE AREA CONSISTS OF THE RAIL BRIDGES AND ALIGNMENTS IN AND AROUND GWMP WITHIN VIRGINIA.*

DISTRIC OF COLUMBIA OUTFALLS

3. *DRAINAGE AREA 3 OUTFALL IS THE POTOMAC RIVER FROM THE DISTRICT OF COLUMBIA SHORELINE. THE DRAINAGE AREA CONSISTS OF A LARGE AMOUNT OF I-395, NPS PARKING LOT B, AND A PORTION OF 14TH STREET.*
4. *DRAINAGE AREA 4 OUTFALL IS WITHIN THE LIMITS OF THE WMATA YELLOW LINE PORTAL.*
5. *DRAINAGE AREA 5 OUTFALL IS THE POTOMAC RIVER FROM THE DISTRICT OF COLUMBIA SHORELINE. THE DRAINAGE AREA CONSISTS NPS PARKING LOT C.*
6. *DRAINAGE AREA 6 OUTFALL IS THE POTOMAC RIVER FROM THE DISTRICT OF COLUMBIA SHORELINE. THE DRAINAGE AREA CONSISTS OF THE LIMIT OF THE RAIL ALIGNMENTS IN THE DISTRICT OF COLUMBIA UNTIL THE DRAINAGE DIVIDE LOCATED ABOVE THE NPS HEADQUARTERS.*
7. *DRAINAGE AREA 7 OUTFALL IS THE POTOMAC RIVER FROM THE DISTRICT OF COLUMBIA SHORELINE. THE DRAINAGE AREA CONSISTS OF NPS BUILDINGS LOCATED SOUTH OF THE EXISTING LONG BRIDGE RAIL ALIGNMENT.*
8. *DRAINAGE AREA 8 OUTFALL IS THE WASHINGTON CHANNEL FROM THE EAST POTOMAC PARK SHORELINE. THE DRAINAGE AREA CONSISTS OF I-395, NPS LAND, AND THE I-295 SB RAMP TO OHIO DRIVE.*
9. *DRAINAGE AREA 9 OUTFALL IS DRAINAGE INFRASTRUCTURE LOCATED WITHIN 14TH STREET. THE DRAINAGE AREA CONSISTS OF 14TH STREET AND AREA NORTH OF THE PROPOSED RAIL ALIGNMENT.*
10. *DRAINAGE AREA 10 OUTFALL IS THE WASHINGTON CHANNEL FROM THE EAST POTOMAC PARK SHORELINE. THE DRAINAGE AREA CONSISTS OF THE I-295 SB RAMP TO OHIO DRIVE AND NPS LAND.*
11. *DRAINAGE AREA 11 OUTFALL IS THE WASHINGTON CHANNEL FROM THE EAST POTOMAC PARK SHORELINE. THE DRAINAGE AREA CONSISTS OF I-295 SB RAMP TO OHIO DRIVE, OHIO DRIVE, AND NPS LAND.*
12. *DRAINAGE AREA 12 OUTFALL IS THE LOCATED WITHIN THE LIMITS OF THE RAIL ALIGNMENT TOWARDS THE MARYLAND OVERBUILD. THE DRAINAGE AREA CONSISTS OF THE LIMIT OF THE RAIL ALIGNMENTS IN THE DISTRICT OF COLUMBIA EAST OF THE DRAINAGE DIVIDE LOCATED ABOVE THE NPS HEADQUARTERS.*
13. *DRAINAGE AREA 13 OUTFALL IS AN INLET STRUCTURE LOCATED WITHIN MAINE AVENUE. THE DRAINAGE AREA CONSISTS OF THE 14TH STREET OFF RAMP TO MAINE AVENUE.*
14. *DRAINAGE AREA 14 OUTFALL IS THE WASHINGTON CHANNEL FROM MAINE AVENUE AND THE WASHINGTON MARINA. THE DRAINAGE AREA CONSISTS OF A PORTION OF THE WASHINGTON MARINA.*
15. *DRAINAGE AREA 15 OUTFALL IS THE WASHINGTON CHANNEL FROM MAINE AVENUE. THE DRAINAGE AREA CONSISTS OF MAINE AVENUE AND WASHINGTON MARINA.*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: M. BRUNO
DRAWN BY: M. BRUNO
CHECKED BY: J. LONG
APPROVED BY: J. LONG
DATE: 1/30/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

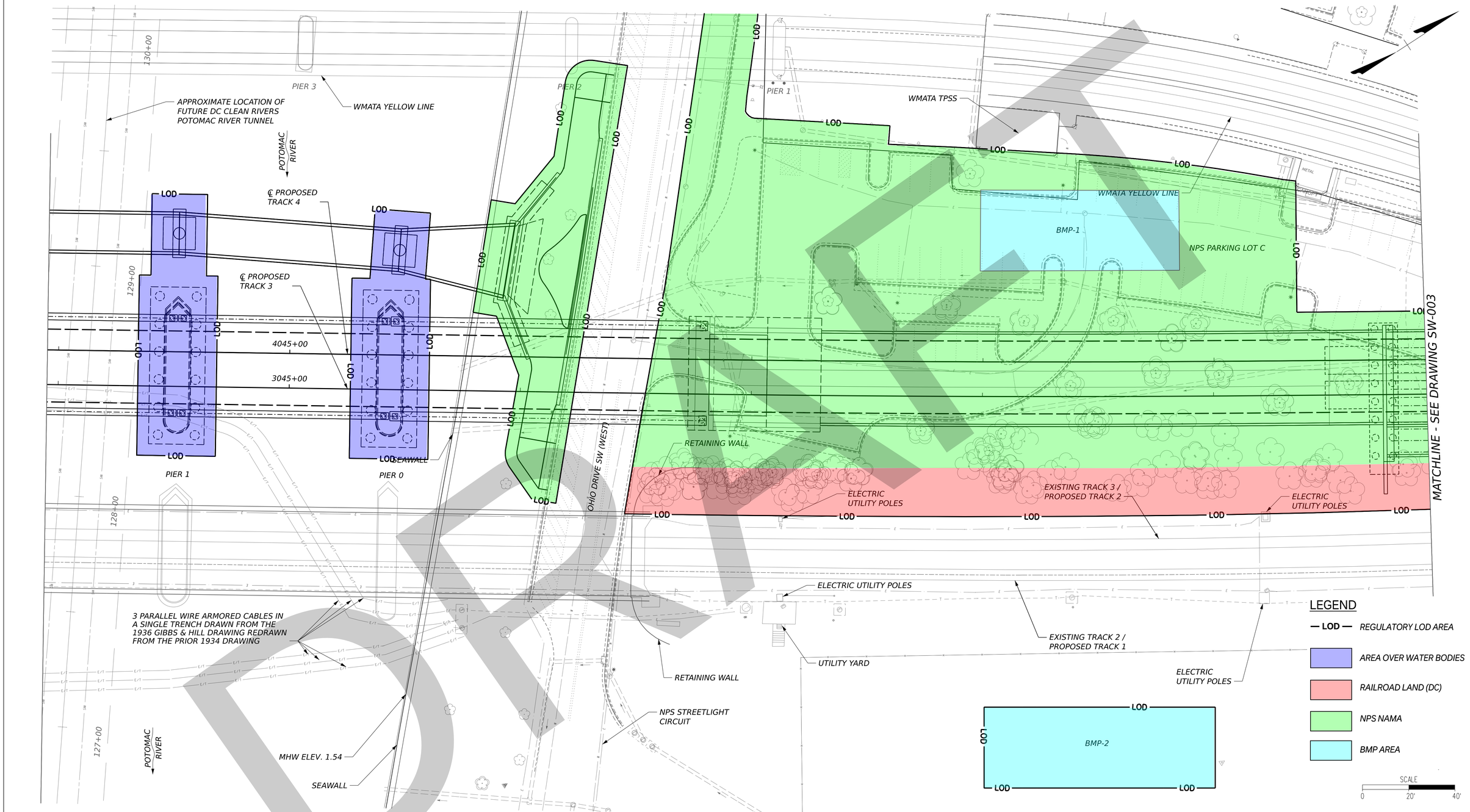
STORMWATER MANAGEMENT SUMMARY AND NOTES

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: SW-001
REV.: N/A
SHEET NO.: 231 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: mbruno 1/30/2023
swmR02A_sum-000.dgn
SW-009(N)

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"



DRAFT

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Rev.	Date	Description

DESIGNED BY M. BRUNO
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DATE 2/7/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (1 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-002
REV. N/A
SHEET NO. 232 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: mbruno 2/7/2023
swmR02A_des_lod.dgn
sw-010N [Sheet]

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING SW-002

MATCHLINE - SEE DRAWING SW-004

NPS PARKING LOT B

BMP-3

BMP-4A

NPS PARKING LOT C

WMATA YELLOW LINE

4050+00

3050+00

4055+00

3055+00

2055+00

1055+00

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

MILE MARKER 111

WMATA TUNNEL PORTAL

OVERHEAD SIGN STRUCTURE

I-395 NORTHBOUND

I-395 SOUTHBOUND

ELECTRIC UTILITY POLE

EXISTING TRACK 2

EXISTING TRACK 3

SIGN BRIDGE

EXISTING DOD FACILITY NO CONSTRUCTION OR STAGING AREA WILL BE ALLOWED WITHIN THIS AREA

LOD

LEGEND

— LOD — REGULATORY LOD AREA

RAILROAD LAND (DC)

NPS NAMA

BMP AREA

DDOT PROW

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

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DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (2 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-003
REV. N/A
SHEET NO. 233 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_-95.tbl
Plotted By: mbruno
swhR02A_des_lod.dgn
sw-011N [Sheet]
1/26/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING SW-003

MATCHLINE - SEE DRAWING SW-005

BMP-4B

BMP-5

LOD

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

14TH STREET SW

ELECTRIC UTILITY POLE

EXISTING TRACK 3

EXISTING TRACK 2

4060+00

3060+00

2060+00

1060+00

PAINT BY OTHERS

ABANDONED TELEPHONE

ABANDONED WATER

ABANDONED GAS

ABANDONED ELECTRIC

ABANDONED STORM

I-395 SOUTHBOUND OFF RAMP

RED

LEGEND

- LOD — REGULATORY LOD AREA
- RAILROAD LAND (DC)
- NPS NAMA
- BMP AREA
- DDOT PROW

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

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CHECKED BY: J. LONG
APPROVED BY: J. LONG
DATE: 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (3 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-004
REV. N/A
SHEET NO. 234 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: mbruno
swmR02A_des_lod.dgn
sw-012N [Sheet]
1/26/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING SW-004

MATCHLINE - SEE DRAWING SW-006

14TH STREET SW

OHIO DRIVE SW (EAST)

ELECTRIC UTILITY POLE

ELECTRIC MANHOLES

SANITARY SEWER MANHOLE

ELECTRIC MANHOLE

STORM DRAINAGE MANHOLE

MILE MARKER 111

EXISTING TRACK 3

EXISTING TRACK 2

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

2065+00

3065+00

1065+00

LOD

ABANDONED WATER

ABANDONED GAS

NPS NAMA PARKING LOT

APPROXIMATE LIMIT OF NPS HEADQUARTERS

RIP-RAP

WASHINGTON CHANNEL

BULKHEAD LINE

LEGEND

— LOD — REGULATORY LOD AREA

RAILROAD LAND (DC)

NPS NAMA

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

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CSX

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NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (4 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-005
REV. N/A
SHEET NO. 235 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: mbruno 1/26/2023
swmR02A_des_lod.dgn
sw-013N [Sheet]

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING SW-005

MATCHLINE - SEE DRAWING SW-007

WASHINGTON CHANNEL

14TH STREET SW

14TH STREET SW OFF RAMP TO MAINE AVENUE SW

MAINE AVENUE SW

MAINE AVENUE SW

MAIDEN LANE SW

BURIED TROLLEY TRACKS

SINGLE PARKING METER

DOUBLE PARKING METERS

DOUBLE PARKING METERS

ELECTRIC PULL BOX

ELECTRIC UTILITY POLE

ELECTRIC UTILITY POLE

℄ PROPOSED TRACK 4

EXISTING TRACK 3

EXISTING TRACK 2

4070+00

3070+00

2070+00

1070+00

ELECTRIC MANHOLE

CSXT TRACKS

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

BMP-6

WASHINGTON MARINA PARKING

WASHINGTON CHANNEL SUBMARINE CABLE DRAWN ACCORDING TO DIVER LOCATED BUOY LOCATIONS

WASHINGTON CHANNEL

COMBINED PIERHEAD AND BULKHEAD LINE

SHED

RAILROAD CORRIDOR "SEE NOTE 1".

DOUBLE PARKING METERS

RAILROAD CORRIDOR "SEE NOTE 1".

LIGHT POLE

ELECTRICAL VAULT

SINGLE PARKING METER

SALAMANDER HOTEL

DOUBLE PARKING METERS

LIGHT POLE

ELECTRIC MANHOLE

DOUBLE PARKING METERS

LOD

LEGEND

- LOD — REGULATORY LOD AREA
- AREA OVER WATER BODIES
- RAILROAD LAND (DC)
- BMP AREA
- DDOT PROW
- PRIVATE PROPERTY

SCALE 0 20' 40'

NOTE:

1. VPRA HAS AN EASEMENT OVER CERTAIN PORTIONS OF CSXT RIGHT OF WAY IN THE DISTRICT OF COLUMBIA. CSXT IS SUCCESSOR BY MERGER TO NYC NEWCO, INC., A VIRGINIA CORPORATION, SUCCESSOR BY MERGER TO NEW YORK CENTRAL LINES LLC, A DELAWARE LIMITED LIABILITY COMPANY, SUCCESSOR BY QUITCLAIM DEED FROM CONSOLIDATED RAIL CORPORATION, SUCCESSOR BY DEED FROM JOHN C. KHOL, TRUSTEE IN BANKRUPTCY OF THE PROPERTY OF THE PHILADELPHIA, BALTIMORE, AND WASHINGTON RAILROAD COMPANY, WHICH HELD A RIGHT OF WAY INTEREST IN A PORTION OF THE RAIL CORRIDOR IN THE DISTRICT OF COLUMBIA PURSUANT TO GRANT BY THE U.S. CONGRESS AS SET FORTH IN 32 STAT. 909 57TH CONGRESS 2ND SESS. CHAPTER 856 (1903) AND AS SUCCESSOR BY MERGER TO THE BALTIMORE AND POTOMAC RAILROAD COMPANY, WHICH HELD A RIGHT OF WAY INTEREST IN A PORTION OF THE RAIL CORRIDOR IN THE DISTRICT OF COLUMBIA PURSUANT TO GRANT BY THE U.S. CONGRESS AS SET FORTH IN 31 STAT. 773, 56TH CONGRESS 2ND SESS. CHAPTER 353 (1901).

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY M. BRUNO
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (5 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-006
REV. N/A
SHEET NO. 236 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_ld_v95.tbl
Plotted By: mbruno
swmR02A_des_lod.dgn
sw-014N [Sheet]
1/26/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING SW-009

MATCHLINE - SEE DRAWING SW-008

PROPERTY LINE

RAILROAD CORRIDOR
SEE NOTE 1

NORTH FACE OF PIER 1

PIER 1

PIER 2

PIER 3

EXISTING TRACK 4

EXISTING TRACK 3

EXISTING TRACK 2

LOD

4075+00

3075+00

2075+00

1075+00

4080+00

3080

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

RAILROAD SIGNAL

ELECTRIC PULL BOX

METAL SHED

RAILROAD CORRIDOR
SEE NOTE 1

MARYLAND OVERBUILD ABOVE

PROPERTY LINE

NOTE:
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LEGEND

— LOD — REGULATORY LOD AREA

RAILROAD LAND (DC)

PRIVATE PROPERTY

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY M. BRUNO
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (6 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-007
REV. N/A
SHEET NO. 237 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: mbruno
swmR02A_des_lod.dgn
sw-015N [Sheet]
1/26/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING SW-007

MATCHLINE - SEE DRAWING SW-009

PROPERTY LINE

D STREET SW

D STREET SW

12TH STREET SW

RAILROAD CORRIDOR
SEE NOTE 1

℄ PROPOSED
TRACK 4

PIER 1

LOD

MARYLAND AVENUE SW

EXISTING TRACK 4

4085+00

℄ PROPOSED
TRACK 3

PIER 2

3085+00

2080+00

MARYLAND AVENUE SW

EXISTING TRACK 3

2085+00

1080+00

1085+00

PIER 3

MARYLAND AVENUE SW

℄ PROPOSED
TRACK 1

℄ PROPOSED TRACK 2

MARYLAND OVERBUILD ABOVE

EXISTING TRACK 2

CATENARY STRUCTURE

D STREET SW

PROPERTY LINE

RAILROAD CORRIDOR
SEE NOTE 1

RAILROAD CORRIDOR
SEE NOTE 1

PROPERTY LINE

12TH STREET SW

NOTE:

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LEGEND

— LOD — *REGULATORY LOD AREA*

RAILROAD LAND (DC)

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY M. BRUNO
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (7 OF 8)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-008
REV. N/A
SHEET NO. 238 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: mbruno
swmR02A_des_lod.dgn
sw-016N [Sheet]
1/26/2023

SOUTH TO "AF"

NORTH TO "CP VIRGINIA"

MATCHLINE - SEE DRAWING SW-008

D STREET SW

12TH STREET EXPRESSWAY

WMATA TUNNEL

APPROXIMATE LIMITS METRO TUNNEL (BLUE, ORANGE AND SILVER LINES)

WMATA FAN SHAFT

PROPERTY LINE

℄ PROPOSED TRACK 4

℄ PROPOSED TRACK 3

℄ PROPOSED TRACK 2

℄ PROPOSED TRACK 1

LOD

EXISTING TRACK 4

EXISTING TRACK 3

EXISTING TRACK 2

METAL SHED

L'ENFANT PLAZA SW

RAILROAD CORRIDOR SEE NOTE 1

UNITED STATES POSTAL SERVICE HEADQUARTERS

END PROJECT LIMITS MP 111.57

PROPERTY LINE

NOTE:

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LEGEND

— LOD — REGULATORY LOD AREA

RAILROAD LAND (DC)

SCALE 0 20' 40'

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

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DRAWN BY M. BRUNO
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY

CSX

TRANSFORMING RAIL IN VIRGINIA

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vhb

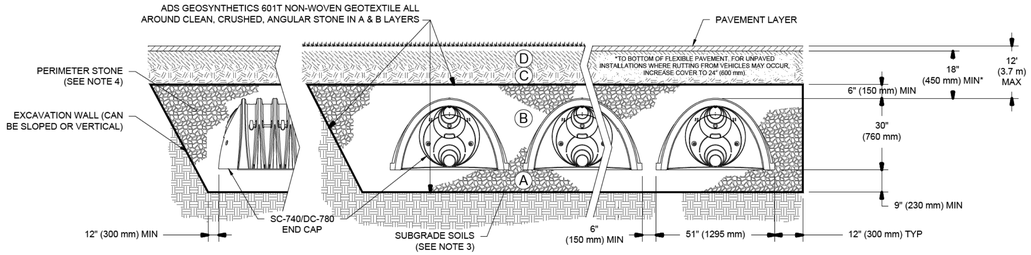
LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT LIMIT OF DISTURBANCE (8 OF 8)

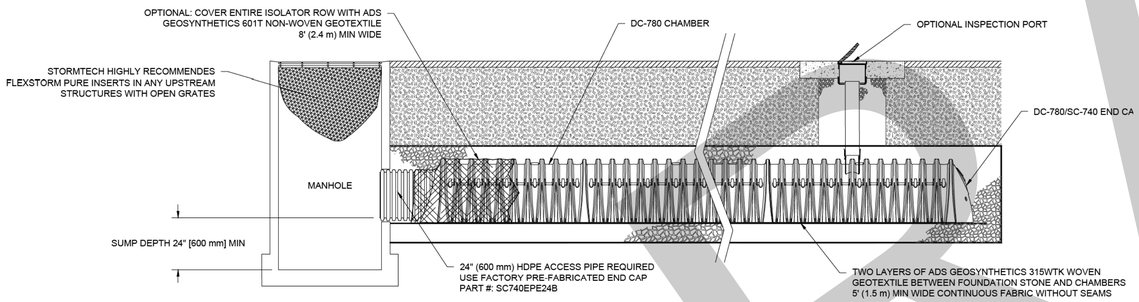
PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-009
REV. N/A
SHEET NO. 239 OF 273
SCALE AS SHOWN

VDOT PDF.pltcfg
LBPE_id_v95.tbl
Plotted By: mbruno 1/26/2023
swmR02A_des_lod.dgn
sw-017N [Sheet]



NOTES:

1. *THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".*
2. *STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.*
3. *WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.*
4. *ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE.*

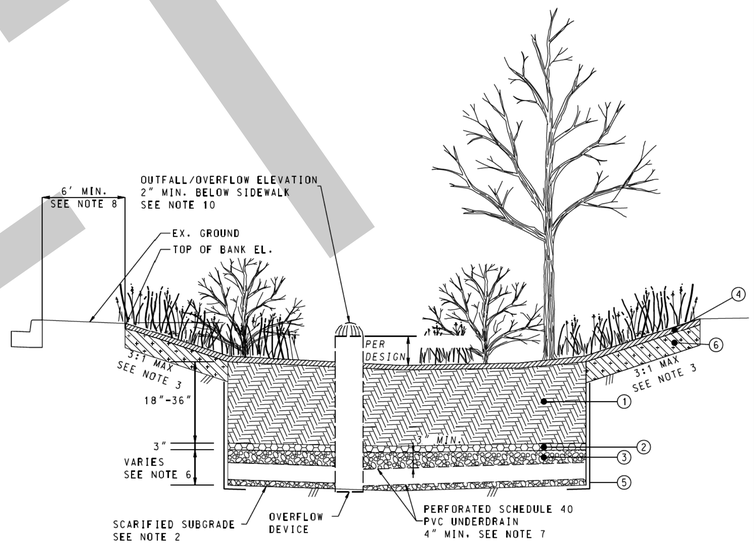


NOTES:

1. *THIS DETAIL IS TAKEN FROM AN ADS STORMTECH DC-780 CHAMBER SYSTEM.*
2. *CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".*
3. *DC-780 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".*
4. *PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.*

NOTES:

1. BIORETENTION MATERIALS AND CONSTRUCTION SHALL MEET CURRENT APPROVED DDOT SPECIFICATION FOR "BIORETENTION, PLANTING, AND STRUCTURAL SOILS".
2. SCARIFY SUBGRADE 3" MIN. BEFORE INSTALLATION.
3. SIDE SLOPES STEEPER THAN 3:1 MAY BE ALLOWED; HOWEVER, MUST BE STABILIZED IN ACCORDANCE WITH DDOT DESIGN REQUIREMENTS.
4. FOR ALTERNATIVE EDGE TREATMENT CONDITIONS, SEE DWG. NOS. 621.30 TO 621.32
5. BOTTOM OF BIOSWALE SHALL BE AT LEAST 2' ABOVE THE SEASONAL HIGH WATER TABLE AND BEDROCK AS DETERMINED BY GEOTECHNICAL INVESTIGATION.
6. STONE DEPTH SHALL VARY PER DESIGN PLANS, TO ACHIEVE A WATER STORAGE LAYER/ INFILTRATION SUMP, WHEN APPLICABLE.
7. PROVIDE UNDERDRAIN WHEN CALLED FOR PER DESIGN PLANS. SEE DWG. 603.01 FOR MIN. BEDDING REQUIREMENT.
8. DISTANCE TO ROADWAY MAY BE REDUCED WHEN SIDE OF PRACTICE IS LINED WITH WATERPROOF MEMBRANE, PER DESIGN PLANS.
9. SEE DWG. NO. 603.01 FOR CLEAN OUT AND OBSERVATION WELL DETAIL.
10. BIORETENTION FACILITY DEPICTED IS ONE WITH AN OVERFLOW STRUCTURE. "OFF-LINE" FACILITIES DESIGNED TO LIMIT INFLOW SO THAT OVERFLOW STRUCTURES ARE NOT REQUIRED ARE ALSO PERMISSIBLE, AS SHOWN ON DESIGN PLANS.
11. IF DEPTH FROM SURROUNDING GRADE TO LOW POINT OF FACILITY EXCEEDS 5 FEET, A FENCE IS REQUIRED AROUND ENTIRE FACILITY.



ELEVATION

LEGEND:

1. BIORETENTION SOIL
2. CHOKER LAYER, SAND & GRAVEL
3. AASHTO #57 STONE, DOUBLE WASHED
4. MULCH, PER PLANTING PLAN
5. GEOTEXTILE, CLASS 2
6. PLANT BED SOIL

DATE	APPR.		RECOMMENDED: _____ DEPUTY CHIEF ENGINEER
REVISED			
ISSUED:			APPROVED: _____
		REFERENCE	CHIEF TRANSPORTATION ENGINEER

BIORETENTION IN OPEN AREA

DISTRICT OF COLUMBIA
DEPARTMENT OF TRANSPORTATION

DWG. NO. 621.20

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY M. BRUNO
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/26/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER MANAGEMENT
BMP TYPICAL DETAILS

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-010
REV. N/A
SHEET NO. 240 OF 273
SCALE AS SHOWN

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LBPE_lg_v95.tbl
Plotted By: mbruno 1/26/2023
swmR02A_swmdtls-000.dgn
SW-014

DEQ Virginia Runoff Reduction Method Re-Development Compliance Spreadsheet - **Version 3.0**

○ 2011 BMP Standards and Specifications ◉ 2013 Draft BMP Standards and Specifications

Project Name:	Long Bridge Preliminary Engineering
Date:	2/7/2023
Linear Development Project?	No

CLEAR ALL (Ctrl+Shift+R)

data input cells | constant values | calculation cells | final results

Site Information

Post-Development Project (Treatment Volume and Loads)

Enter Total Disturbed Area *(acres)* → 3.58

Maximum reduction required:	*20%*
The site's net increase in impervious cover (acres) is:	*0.11*
Post-Development TP Load Reduction for Site (lb/yr):	*0.65*

Check:
BMP Design Specifications List: 2013 Draft Stds & Specs
Linear project? No
Land cover areas entered correctly? ✓
Total disturbed area entered? ✓

Pre-ReDevelopment Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed forest/open space	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be	0.00	0.00	0.00	3.40	3.40
Impervious Cover (acres)	0.00	0.00	0.00	0.18	0.18
					3.58

Post-Development Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals
Forest/Open Space (acres) -- undisturbed, protected forest/open space or reforested	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres) -- disturbed, graded for yards or other turf to be	0.00	0.00	0.00	3.29	3.29
Impervious Cover (acres)	0.00	0.00	0.00	0.29	0.29
Area Check	OK.	OK.	OK.	OK.	3.58

Constants

Annual Rainfall (inches)	43
Target Rainfall Event (inches)	1.00
Total Phosphorus (TP) EMC (mg/L)	0.26
Total Nitrogen (TN) EMC (mg/L)	1.86
Target TP Load (lb/acre/yr)	0.41
Pj (unitless correction factor)	0.90

Runoff Coefficients (Rv)

	A Soils	B Soils	C Soils	D Soils
Forest/Open Space	0.02	0.03	0.04	0.05
Managed Turf	0.15	0.20	0.22	0.25
Impervious Cover	0.95	0.95	0.95	0.95

LAND COVER SUMMARY -- PRE-REDEVELOPMENT

Land Cover Summary-Pre		
Pre-ReDevelopment	**Listed**	**Adjusted[1]**
Forest/Open Space Cover (acres)	0.00	0.00
Weighted Rv(forest)	0.00	0.00
% Forest	0%	0%
Managed Turf Cover (acres)	3.40	3.29
Weighted Rv(turf)	0.25	0.25
% Managed Turf	95%	95%
Impervious Cover (acres)	0.18	0.18
Rv(impervious)	0.95	0.95
% Impervious	5%	5%
Total Site Area (acres)	**3.58**	**3.47**
Site Rv	**0.29**	**0.29**

LAND COVER SUMMARY -- POST DEVELOPMENT

Land Cover Summary-Post (Final)	
Post ReDev. & New Impervious	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	3.29
Weighted Rv (turf)	0.25
% Managed Turf	92%
Impervious Cover (acres)	0.29
Rv(impervious)	0.95
% Impervious	8%
Final Site Area (acres)	**3.58**
Final Post Dev Site Rv	**0.31**

Land Cover Summary-Post	
Post-ReDevelopment	
Forest/Open Space Cover (acres)	0.00
Weighted Rv(forest)	0.00
% Forest	0%
Managed Turf Cover (acres)	3.29
Weighted Rv (turf)	0.25
% Managed Turf	95%
ReDev. Impervious Cover (acres)	0.18
Rv(impervious)	0.95
% Impervious	5%
Total ReDev. Site Area (acres)	**3.47**
ReDev Site Rv	**0.29**

Land Cover Summary-Post	
Post-Development New Impervious	
New Impervious Cover (acres)	0.11
Rv(impervious)	0.95

Treatment Volume and Nutrient Load

Pre-ReDevelopment Treatment Volume (acre-ft)	0.0851	0.0828	
Pre-ReDevelopment Treatment Volume (cubic feet)	3,706	3,606	
Pre-ReDevelopment TP Load (lb/yr)	**2.33**	**2.27**	
Pre-ReDevelopment TP Load per acre (lb/acre/yr)	0.65	0.65	
Baseline TP Load (lb/yr) (0.41 lbs/acre/yr applied to pre-redevelopment area excluding pervious land proposed for new impervious cover)		*1.42*	
Final Post-Development Treatment Volume (acre-ft)	0.0915		
Final Post-Development Treatment Volume (cubic feet)	3,986		
Final Post-Development TP Load (lb/yr)	**2.50**		
Final Post-Development TP Load per acre (lb/acre/yr)	0.70		
Post-ReDevelopment Treatment Volume (acre-ft)	0.0828		
Post-ReDevelopment Treatment Volume (cubic feet)	3,606		
Post-ReDevelopment Load (TP) (lb/yr)*	2.27		
Post-ReDevelopment TP Load per acre (lb/acre/yr)	0.65		
Max. Reduction Required (Below Pre-ReDevelopment Load)	20%		
Post-Development Treatment Volume (acre-ft)		0.0087	
Post-Development Treatment Volume (cubic feet)		379	
Post-Development TP Load (lb/yr)		0.24	
TP Load Reduction Required for Redeveloped Area (lb/yr)	**0.45**		
TP Load Reduction Required for New Impervious Area (lb/yr)		**0.19**	

[1] *Adjusted Land Cover Summary:*
Pre ReDevelopment land cover minus pervious land cover (forest/open space or managed turf) acreage proposed for new impervious cover.

Adjusted total acreage is consistent with Post-ReDevelopment acreage (minus acreage of new impervious cover).

Column I shows load reduction requriement for new impervious cover (based on new development load limit, 0.41 lbs/acre/year).

Post-Development Requirement for Site Area

TP Load Reduction Required (lb/yr)	**0.65**

Nitrogen Loads (Informational Purposes Only)

Pre-ReDevelopment TN Load (lb/yr)	16.66
Final Post-Development TN Load (Post-ReDevelopment & New Impervious) (lb/yr)	17.91

Drainage Area A

Drainage Area A Land Cover (acres)

	A Soils	B Soils	C Soils	D Soils	Totals	Land Cover Rv
Forest/Open Space (acres)	0.00	0.00	0.00	0.00	0.00	0.00
Managed Turf (acres)	0.00	0.00	0.00	3.29	3.29	0.25
Impervious Cover (acres)	0.00	0.00	0.00	0.29	0.29	0.95
			Total		3.58	

CLEAR BMP AREAS

TOTAL IMPERVIOUS COVER TREATED (ac)	0.00	AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.00	AREA CHECK: OK.
TOTAL RUNOFF REDUCTION IN D.A. A (ft^3)	0	
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	2.50	
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00	
TOTAL PHOSPHORUS REMAINING AFTER APPLYING RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	2.50	

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

Total Phosphorus Available for Removal in D.A. A (lb/yr) 2.50

Post Development Treatment Volume in D.A. A (ft^3) 3,986

TOTAL RUNOFF REDUCTION IN D.A. A (ft^3)	0
NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00

SEE WATER QUALITY COMPLIANCE TAB FOR SITE CALCULATIONS (Information Only)

Site Results (Water Quality Compliance)

Area Checks	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	AREA CHECK
FOREST/OPEN SPACE (ac)	0.00	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER (ac)	0.29	0.00	0.00	0.00	0.00	OK.
IMPERVIOUS COVER TREATED (ac)	0.00	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA (ac)	3.29	0.00	0.00	0.00	0.00	OK.
MANAGED TURF AREA TREATED (ac)	0.00	0.00	0.00	0.00	0.00	OK.
AREA CHECK	OK.	OK.	OK.	OK.	OK.	

TOTAL IMPERVIOUS COVER TREATED (ac)	0.00 AREA CHECK: OK.
TOTAL MANAGED TURF AREA TREATED (ac)	0.00 AREA CHECK: OK.
TOTAL PHOSPHORUS REMOVAL REQUIRED ON SITE (lb/yr)	0.65
TOTAL PHOSPHORUS AVAILABLE FOR REMOVAL IN D.A. A (lb/yr)	2.50
TOTAL PHOSPHORUS REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL PHOSPHORUS REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL PHOSPHORUS LOAD REDUCTION ACHIEVED IN D.A. A (lb/yr)	0.00
TOTAL PHOSPHORUS REMAINING AFTER APPLYING BMP LOAD REDUCTIONS IN D.A. A (lb/yr)	2.50

SEE WATER QUALITY COMPLIANCE TAB FOR SITE COMPLIANCE CALCULATIONS

NITROGEN REMOVED WITH RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
NITROGEN REMOVED WITHOUT RUNOFF REDUCTION PRACTICES IN D.A. A (lb/yr)	0.00
TOTAL NITROGEN REMOVED IN D.A. A (lb/yr)	0.00

Site Treatment Volume (ft^3) 3,986

Runoff Reduction Volume and TP By Drainage Area

	D.A. A	D.A. B	D.A. C	D.A. D	D.A. E	TOTAL
RUNOFF REDUCTION VOLUME ACHIEVED (ft^3)	0	0	0	0	0	0
TP LOAD AVAILABLE FOR REMOVAL (lb/yr)	2.50	0.00	0.00	0.00	0.00	2.50
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.00	0.00	0.00	0.00	0.00	0.00
TP LOAD REMAINING (lb/yr)	2.50	0.00	0.00	0.00	0.00	2.50
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00	0.00	0.00	0.00	0.00	0.00

Total Phosphorus

FINAL POST-DEVELOPMENT TP LOAD (lb/yr)	2.50
TP LOAD REDUCTION REQUIRED (lb/yr)	0.65
TP LOAD REDUCTION ACHIEVED (lb/yr)	0.00
TP LOAD REMAINING (lb/yr):	2.50
REMAINING TP LOAD REDUCTION REQUIRED (lb/yr):	0.65

Total Nitrogen (For Information Purposes)

POST-DEVELOPMENT LOAD (lb/yr)	17.91
NITROGEN LOAD REDUCTION ACHIEVED (lb/yr)	0.00
REMAINING POST-DEVELOPMENT NITROGEN LOAD (lb/yr)	17.91

Runoff Volume and Curve Number Calculations

Enter design storm rainfall depths (in):

1-year storm	2-year storm	10-year storm
2.57	3.11	4.78

Use NOAA Atlas 14 (http://hdsc.nws.noaa.gov/hdsc/pfds/)

***Notes (see below):**

[1] The curve numbers and runoff volumes computed in this spreadsheet for each drainage area are limited in their applicability for determining and demonstrating compliance with water quantity requirements. See VRRM User's Guide and Documentation for additional information.

[2] Runoff Volume (RV) for pre- and post-development drainage areas must be in volumetric units (e.g., acre-feet or cubic feet) when using the Energy Balance Equation. Runoff measured in watershed-inches and shown in the spreadsheet as RV(watershed-inch) can only be used in the Energy Balance Equation when the pre- and post-development drainage areas are equal. Otherwise RV(watershed-inch) must be multiplied by the drainage area.

[3] Adjusted CNs are based on runoff reduction volumes as calculated in D.A. tabs. An alternative CN adjustment calculation for Vegetated Roofs is included in BMP specification No. 5.

Drainage Area Curve Numbers and Runoff Depths*

Curve numbers (CN, CNadj) and runoff depths ($RV_{Developed}$) are computed with and without reduction practices.

Drainage Area A		A Soils	B Soils	C Soils	D Soils
Forest/Open Space -- undisturbed, protected forest/open space or reforested land	Area (acres)	0.00	0.00	0.00	0.00
	CN	30	55	70	77
Managed Turf -- disturbed, graded for yards or other turf to be moved/managed	Area (acres)	0.00	0.00	0.00	3.29
	CN	39	61	74	80
Impervious Cover	Area (acres)	0.00	0.00	0.00	0.29
	CN	98	98	98	98
				$CN_{(D.A. A)}$	81

	1-year storm	2-year storm	10-year storm
$RV_{Developed}$ *(watershed-inch)* with no Runoff Reduction*	0.99	1.40	2.79
$RV_{Developed}$ *(watershed-inch)* with Runoff Reduction*	0.99	1.40	2.79
Adjusted CN*	81	81	81

*See Notes above

Total Area (acres):	3.58
Runoff Reduction Volume (ft^3):	0

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY M. BRUNO
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/30/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER COMPUTATION WORKSHEETS (VIRGINIA DEQ)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-011
REV. N/A
SHEET NO. 241 OF 273
SCALE AS SHOWN

VDOT PDF.ctcfg
LBPE_Id_v95.tbl
Plotted By: mbruno 1/30/2023
swmR02A_comps-000.dgn
SW-019(N)

District of Columbia General Retention Compliance Calculator
Site Compliance Calculations

Site Drainage Area 1

Natural Cover (square feet)	0
Compacted Cover (square feet)	61,313
Impervious Cover (square feet)	297,069
BMP (square feet)	5,629
Total Area (square feet)	364,011

SWRv (cubic feet)	30,289
WQTv (cubic feet)	NA

Volume Retained (cubic feet)	42,910
Retention Volume Remaining (cubic feet)	0
Retention Volume Remaining (gallons)	0
At least 50% of SWRv Retained?	**Yes**
Vehicular Access Areas Volume Addressed?	**N/A**

District of Columbia General Retention Compliance Calculator
Site Drainage Area 1 Long Bridge
Built Conditions

Indicate Post-Development Land Cover For SDA 1	Major Land Disturbing	Major Substantial Improvement
Cover Type	**Area (square feet)**	**Area (square feet)**
Natural Cover	0	
Compacted Cover	61,313	
Impervious Cover	297,069	
Vehicular Access Areas*	25,767	
BMP	5,629	
Drainage Area Total	364,011	0

Land Cover Summary	Major Land Disturbing	Major Substantial Improvement
% Natural Cover	0%	0%
% Compacted Cover	17%	0%
% Impervious Cover	83%	0%
Site Rv	**0.83**	**0.00**

Stormwater Retention Volume, SWRv (cubic feet)	**30,289**
Stormwater Retention Volume, SWRv (gallons)	**226,563**
Vehicular Access Volume (cubic feet)	**1,224**

AWDZ Only	
Water Quality Treatment Volume, WQTv (cubic feet)	**NA**
Water Quality Treatment Volume, WQTv (gallons)	**NA**

Rv Coefficients	
Land Cover Type	**Rv**
Natural Cover	0.00
Compacted Cover	0.25
Impervious Cover	0.95

*Vehicular Access areas should be included within the Impervious Cover Category

District of Columbia General Retention Compliance Calculator

data input cells
calculation cells
constant values

Site Data

Site Name: Long Bridge Preliminary Engineering

Site Information

Is Site an "AWDZ Site"?	No
Is Site Located in the MS4?	No
AWDZ only - Regulatory Rain Event for WQTv (inches)	NA

Indicate Post-Development Land Cover

	Disturbed Public Right of Way	Major Land Disturbing	Major Substantial Improvement
Cover Type	**Area (square feet)**	**Area (square feet)**	**Area (square feet)**
Natural Cover	0	0	0
Compacted Cover	0	61,313	0
Impervious Cover	0	297,069	0
BMP	0	5,629	0
Site Total	0	364,011	0
Retention Standard for SWRv (inches)	0.0	1.2	0.0

Land Cover Summary

Cover Type	Disturbed Public Right of Way	Major Land Disturbing	Major Substantial Improvement
% Natural Cover	0%	0%	0%
% Compacted Cover	0%	17%	0%
% Impervious Cover	0%	83%	0%
Site Rv	**0.00**	**0.83**	**0.00**

Rv Coefficients	
Land Cover Type	**Rv**
Natural Cover	0.00
Compacted Cover	0.25
Impervious Cover	0.95

SWRv and WQTv Summary

	Disturbed Public Right of Way	Site Development
Stormwater Retention Volume, SWRv (cubic feet)	**0**	**30,289**
Stormwater Retention Volume, SWRv (gallons)	**0**	**226,563**
Water Quality Treatment Volume, WQTv (cubic feet)	**NA**	**NA**
Water Quality Treatment Volume, WQTv (gallons)	**NA**	**NA**

BMPs

	Pervious Cover Draining to BMP		Impervious Cover Draining to BMP		Vehicular Access Area Draining to BMP		Maximum Retention Volume Received by BMP (cubic feet)	Description of Retention Value	% Retention Value	Maximum Retention Volume Received from Upstream BMPs (cubic feet)	Maximum Retention Volume To BMP (cubic feet)	Surface Area of BMP (square feet)	Storage Volume Provided by BMP (cubic feet)	Retention Value (cubic feet)	Potential Retention Volume Remaining (cubic feet)	Additional Treatment Volume (cubic feet)	Downstream BMP	Vehicular Access Volume Addressed?
	Area (square feet)	Type of Cover	Area (square feet)	Type of Cover	Area (square feet)	Volume (cubic feet)												
B1-5 Bioretention - Enhanced	0	Natural Cover	297,069	Impervious Cover		0	42,910	Subtract 100% of the Sv - the calculated storage volume for the BMP.	100%		42,910	N/A	70,000	42,910	0	0		N/A
	61,313	Compacted Cover	5,629	BMP														

Volume Retained On Site (cubic feet)	**42,910**	**Volume Treated (cubic feet)**	**0**
Retention Volume Remaining (cubic feet)	**0**	**Volume Remaining to Treat 50% of the SWRv (cubic feet)**	**0**
Retention Volume Remaining (gallons)	**0**	**Volume Remaining to Treat 50% of the SWRv (gallons)**	**0**
50% of SWRv Retained?	**Yes**	**Volume Remaining to Treat WQTv (cubic feet)**	**N/A**
Runoff from Vehicular Access Areas Sufficiently Retained or Treated?	**N/A**	**Volume Remaining to Treat WQTv (gallons)**	**N/A**
Treatment Required?	**No**		
Minimum Requirements for Drainage Area Met?	**Yes**		

Congratulations!! You have exceeded the required SWRv by 94401 gallons which may be able to be used to generate SRCs.

District of Columbia General Retention Compliance Calculator
Channel and Flood Protection Calculations

Target Rainfall Event (in)	2-year storm	15-year storm	100-year storm
	3.20	5.20	8.37

SDA 1 (square feet)	364,011
Storage Volume Provided By BMPs (cf)	70,000
Storage Volume Provided By BMPs (gallons)	523,600

Based on the use of stormwater BMPs in the various drainage areas, the spreadsheet calculates an adjusted $RV_{Developed}$ and adjusted Curve Number.

SDA 1

Land Area		Soils		
Natural Cover	Area (sf)	0.0		
	CN	70		
Compacted Cover	Area (sf)	61313.0		
	CN	74		
Impervious Cover and BMPs	Area (sf)	302698.0	Weighted CN	S
	CN	98	94	0.64

	2-year storm	15-year storm	100-year storm
Runoff Volume (in) with no BMPs	2.54	4.50	7.64
Runoff Volume (in) with BMPs	0.23	2.19	5.34
Adjusted CN	54	70	75

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY M. BRUNO
DRAWN BY M. BRUNO
CHECKED BY J. LONG
APPROVED BY J. LONG
DATE 1/30/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

STORMWATER COMPUTATION WORKSHEETS (DOEE)

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. SW-012
REV. N/A
SHEET NO. 242 OF 273
SCALE AS SHOWN

DRAFT

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: mbruno 1/30/2023
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SW-020(N)

NATIONAL MALL AND MEMORIAL PARKS (NAMA)

ROOT PRUNING, STRUCTURAL CRITICAL ROOT ZONE & CRITICAL ROOT ZONE TURF PROTECTION NOTES

1. *EXACT LOCATION OF ROOT PRUNING TRENCH SHALL BE ESTABLISHED AND MARKED BY CONTRACTOR PRIOR TO COMMENCEMENT.*
2. *UNDERGROUND UTILITIES SHALL BE LOCATED AND MARKED PRIOR TO ROOT PRUNING. ANY SUCH UTILITY CONFLICTS MUST BE ADDRESSED SAFELY BY CONTRACTOR. HAND TOOLS MAY BE REQUIRED TO TRENCH AND PRUNE ROOTS.*
3. *ROOT PRUNING SHALL BE PERFORMED PRIOR TO DIGGING WITHIN THE CRITICAL ROOT ZONE (CRZ) OF ANY TREE. THE CRZ IS DETERMINED BY MEASURING THE TRUNK DIAMETER AT BREAST HEIGHT (DBH; 4.5 FEET ABOVE GRADE) AND MULTIPLYING THAT NUMBER BY 1.5 TO GET THE DISTANCE IN FEET FROM THE TRUNK WHERE THE CRZ SHOULD BE ESTABLISHED. THE ROOTS WITHIN THE CRZ ARE CRUCIAL TO THE TREE'S SURVIVAL. THIS AREA IS OFF LIMITS TO ANY PROJECT ACTIVITY UNLESS FURTHER TREE MAINTENANCE IS EXPECTED. NEVER SHALL MORE THAN 25% OF THE ROOTS IN THE CRZ BE PRUNED UNLESS FURTHER MAINTENANCE IS EXPECTED.*
4. *ROOT PRUNING SHALL BE PERFORMED BY MACHINERY AND/OR EQUIPMENT MADE FOR THE PURPOSE (E.G., A VERMEER ROOT PRUNER; AN AIRSPADE PNEUMATIC GUN AND HANDHELD ROOT CUTTING TOOLS, ETC.). A TRENCHER MACHINE (DITCH WITCH, BACKHOE, ETC.) IS NOT AN ACCEPTABLE ROOT PRUNING DEVICE. ALL PRUNING CUTS SHALL BE MADE CLEANLY AND PERPENDICULAR TO ROOT FORM.*
5. *ROOT PRUNING SHALL BE PERFORMED TO A DEPTH OF 24"BELOW GRADE UNLESS SPECIFIC TECHNICAL REQUIREMENT DETAILS ARE MADE IN A PARTICULAR STATEMENT OF WORK (SOW).*
6. *THE LIMIT OF DISTURBANCE (LOD) SHALL BE ESTABLISHED ON ALL PROJECTS THAT REQUIRE SOIL EXCAVATION. TYPICALLY, ROOT PRUNING WILL OCCUR IN THE LOD WHERE PRZ'S ARE FOUND, HOWEVER, EXCEPTIONS MAY BE MADE.*
7. *AN INTERNATIONAL SOCIETY OF ARBORICULTURE (ISA) CERTIFIED ARBORIST SHALL PERFORM OR OVERSEE THE ROOT PRUNING BEFORE ANY DIGGING BEGINS. THE CONTRACTOR SHALL NOTIFY NATIONAL MALL AND MEMORIAL PARKS (NAMA)24 HOURS IN ADVANCE SO NAMA'S ISA CERTIFIED ARBORIST(S) AND OR COR MAY OVERSEE ROOT PRUNING OPERATIONS.*
8. *THE COLLECTED EXCAVATED TOPSOIL, A TOPSOIL/COMPOST MIX, OR ANY OTHER NAMA APPROVED TOPSOIL MUST BE PLACED BACK INTO THE EXCAVATED TRENCH WITHIN 1 HOUR OF DISTURBANCE AND WATERED IMMEDIATELY. UPON BACKFILLING TRENCH WITH APPROVED TOPSOIL, 3" DEEP MULCH (STRAW OR WOODCHIPS ARE ACCEPTABLE) SHOULD COVER THE PARAMETERS OF THE TRENCH AND SHOULD BE WATERED ONCE A WEEK FOR 4 WEEKS. AFTER WEEK 5 THE MULCH CAN BE REMOVED, AND NAMA APPROVED GRASS SEED CAN BE PLANTED.*
9. *IT IS ACCEPTABLE TO INSTALL SOIL RETENTION DEVICES SUCH AS SILT FENCE OR SUPER SILT FENCE IN THE ROOT PRUNING TRENCH PROVIDED SUPPORTING POSTS AND FABRICS DO NOT DAMAGE VITAL ROOTS. CONTRACTOR SHALL SUBMIT DRAWINGS SHOWING LOCATION AND INSTALLATION DETAILS FOR APPROVAL. EXCEPTIONS MAY REQUIRE RETENTION DEVICES INSTALLED WITHIN 1' OF TRENCH ON DISTURBED SIDE.*
10. *APPROPRIATE TURF PROTECTION MATS SHALL BE USED TO PROTECT EXISTING SOILS AND THE CRZ/SCRZ OF TREES WITHIN THE LIMITS OF DISTURBANCE. THESE MATS MUST BE MADE FOR THE PURPOSE (E.G., TRAK-MATS, ALTURNAMATS, ETC.) AND MUST BE APPROPRIATELY SIZED FOR THE EXPECTED WEIGHT.*
11. *ALL EQUIPMENT (TRUCKS, TRAILERS, MACHINERY, ETC.) SHALL BE CONVEYED AND STAGED ON SUCH TURF PROTECTION MATS. AT NO TIME SHALL VEHICLES WITH "OVER THE ROAD"DOT TIRES BE IN DIRECT CONTACT WITH SOIL, TURF OR CRZ/PRZ'S. TURF AND FLOATATION TIRES AND RUBBER TRACKS MADE FOR TURF PROTECTION PURPOSES ARE ACCEPTABLE, HOWEVER, SUPERFICIAL DAMAGE TO THE TURF AND SOILS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPORTED TO THE NAMA POC WITHIN 24 HOURS OF OCCURRENCE.*
12. *EXPENSES ACCRUED TO REMEDIATE DAMAGES THAT OCCUR AS RESULT OF FAILING TO FOLLOW THESE PROTECTIVE MEASURES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.*
13. *INSTALLATION OF FENCE POST OR POSTS OF THE LIKE WITHIN THE PRZ MUST BE HOLLOW AND HAVE A CLEAN AND UNBLEMISHED RIM IN ORDER TO CLEANLY CUT ROOTS WHEN DRIVEN. EXTRACTION OF TEMPORARY FENCE POSTS MUST BE REMOVED BY LIFTING STRAIGHT UPWARDLY WHILE BEING MINDFUL TO NOT DAMAGE TREE ROOTS.*

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY	B. CLAY
DRAWN BY	B. CLAY
CHECKED BY	J. FENNELL
APPROVED BY	J. FENNELL
DATE	2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA
Michael Baker INTERNATIONAL

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vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

LANDSCAPE GENERAL NOTES

PROJECT NO.	VPRA R02A CSXT XXXX
DRAWING NO.	LA-001
REV.	N/A
SHEET NO.	243 OF 273
SCALE	AS SHOWN

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Plotted By: Brian.Clay 2/9/2023
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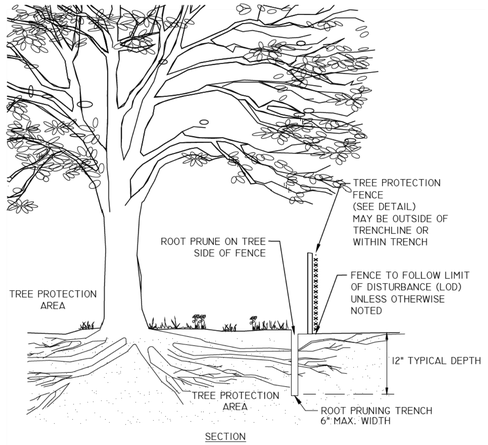


1. ROOT PRUNING SHALL BE DONE WITH A TRENCHER OR VIBRATORY PLOW TO A DEPTH OF 18". ROOTS OVER 1.5" IN DIAMETER SHALL HAVE A CLEAN CUT MADE BY A CLEAN SAW ON THE SURFACE OF THE ROOT, WHICH IS STILL ATTACHED TO THE TREE. DO NOT BREAK OR CHOP. DO NOT PAINT THE CUT ROOT END. IF EXCAVATION IS FOR INSTALLATION OF UNDERGROUND UTILITIES, LEAVE THE ROOT INTACT AND THREAD THE LINES UNDERNEATH.

2. ROOT PRUNING SHALL TAKE PLACE PRIOR TO ANY CLEARING AND GRADING. EXACT LOCATION OF TREE PROTECTION AREAS SHALL BE STAKED OR FLAGGED PRIOR TO TRENCHING AND SHALL BE APPROVED BY NATIONAL PARK SERVICE (NPS) REPRESENTATIVE.

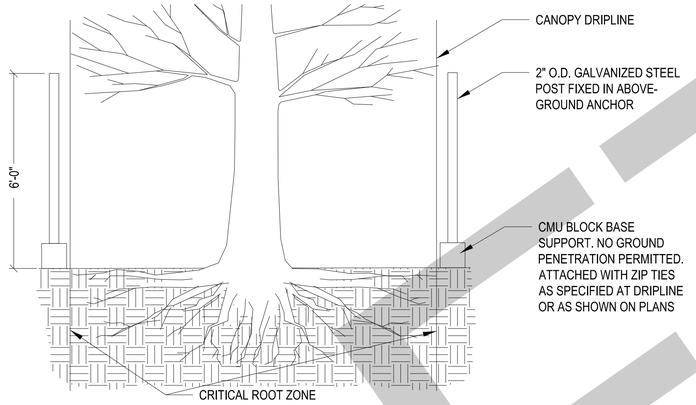
3. ROOT PRUNING SHALL BE CONDUCTED WITH THE SUPERVISION OF AN ISA CERTIFIED ARBORIST.

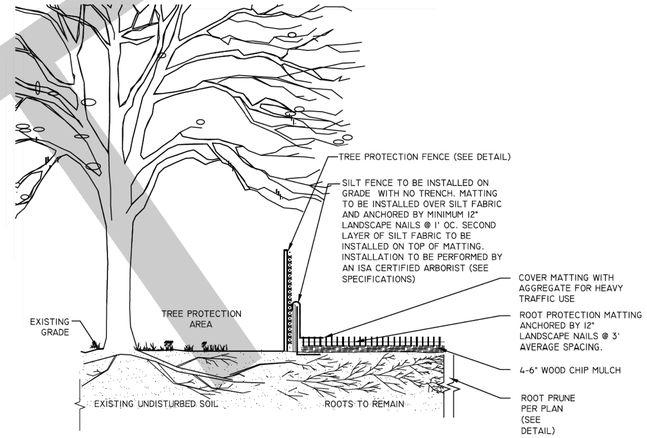
4. BACKFILL THE ROOT-PRUNING TRENCH WITH APPROVED LOOSE TOPSOIL MIX AND TOP WITH 3-4" BARK MULCH AND MARK LOCATION FOR FUTURE REFERENCE. SILT FENCE MAY BE INSTALLED IN TRENCH PRIOR TO BACKFILLING AS LONG AS THE TRENCH IS NOT OPEN FOR LONGER THAN 48 HOURS WITHOUT WATERING.

5. ROOT PRUNING WORK SHALL NOT BE DONE WHEN MORE THAN THE TOP 1 INCH OF SOIL IS FROZEN. ROOT PRUNING SHALL NOT BE UNDERTAKEN WHEN THE SOIL IS WET AND CONDITIONS ARE MUDDY.

6. THE NPS REPRESENTATIVE SHALL BE NOTIFIED 72 HOURS PRIOR TO TRENCHING AND WHEN ALL ROOT PRUNING AND TREE PROTECTION FENCE INSTALLATION IS COMPLETE.

ROOT PRUNING
SCALE: NONE





1. MATTING MATERIAL SHALL BE DOUBLE SIDED GEOCOMPOSITE, GEONET CORE WITH NON-WOVEN COVERING (SUCH AS TENAX TENDRAIN 770/2) OR APPROVED EQUAL.

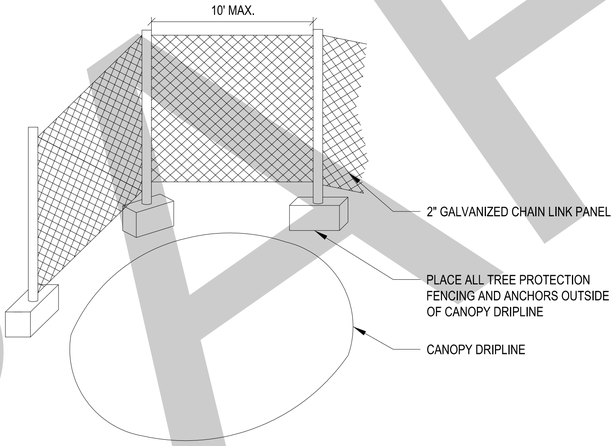
2. ROOT PROTECTION MAT (RPM) SHALL BE INSTALLED BY CERTIFIED ARBORIST.

3. TO BE USED FOR DESIGNATED TEMPORARY CONSTRUCTION ACCESS AND STOCKPILE AREAS.

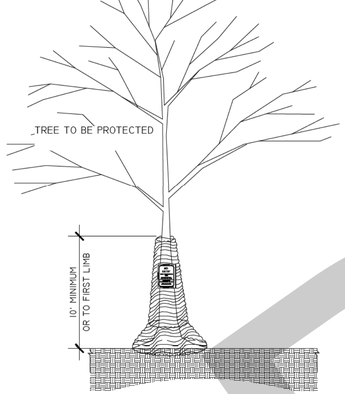
4. MATTING SHALL BE PLACED ON 4-6" WOOD CHIP MULCH UNLESS OTHERWISE DIRECTED.

5. FOR HEAVY TRAFFIC AREAS, MATTING SHALL BE COVERED WITH 6-8" WELL GRADED CRUSHED AGGREGATE. ADDITIONAL LAYERS OF GEOTEXTILE MAY BE NEEDED

TEMPORARY ROOT PROTECTION WITHIN CRITICAL ROOT ZONE (CRZ)
SCALE: NONE



TREE PROTECTION FENCING WITHIN CRZ
SCALE: NONE



1. TRUNK WRAP MATERIAL SHALL BE DOUBLE SIDED GEOCOMPOSITE, GEONET CORE WITH NON-WOVEN COVERING (SUCH AS TENAX TENDRAIN 770/2) OR AN APPROVED EQUAL.

2. WRAP SHALL BE INSTALLED BY A CERTIFIED ARBORIST.

3. WRAP SHALL BE INSTALLED PRIOR TO ANY SITE WORK, CLEARING OR DEMOLITION.

4. WRAP SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. REMOVE WRAP ONLY WITH APPROVAL AND AFTER ALL SITE WORK HAS BEEN COMPLETED. NATIONAL PARK SERVICE (NPS) REPRESENTATIVE SHALL BE NOTIFIED 72 HOURS PRIOR TO REMOVAL.

5. WRAP SHALL BE REMOVED PROMPTLY AFTER CONSTRUCTION.

6. MAJOR SCAFFOLD LIMBS MAY ALSO REQUIRE THIS PROTECTION AS DIRECTED BY NPS REPRESENTATIVE.

7. WRAP SHALL EXTEND AS HIGH AS ADJACENT MACHINERY THAT IS WORKING ADJACENT TO TREES. PROJECT ARBORIST AND NPS REPRESENTATIVE MAY REQUIRE DOUBLE WRAP OR HEAVY DUTY WRAP IN AREAS OF MAJOR EXCAVATION.

TREE TRUNK AND LIMB PROTECTION WRAP
SCALE: NONE

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: B. CLAY
DRAWN BY: B. CLAY
CHECKED BY: J. FENNELL
APPROVED BY: J. FENNELL
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VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA
Michael Baker INTERNATIONAL

THESE PLANS ARE UNFINISHED AND UNAPPROVED AND ARE NOT TO BE USED FOR ANY TYPE OF CONSTRUCTION OR THE ACQUISITION OF RIGHT OF WAY

vhb

LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TREE PROTECTION DETAILS

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. LA-002
REV. N/A
SHEET NO. 244 OF 273
SCALE: AS SHOWN

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Plotted By: Brian.Clay 2/9/2023
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SOUTH TO "AF"

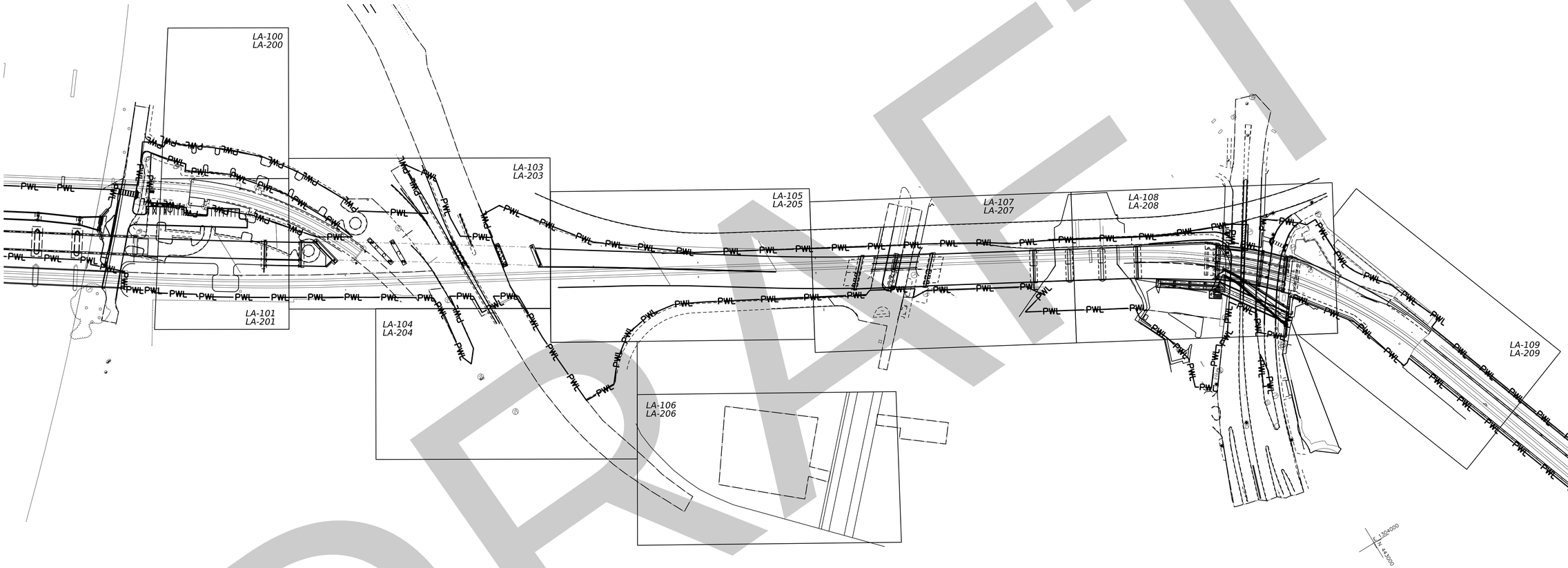
NORTH TO "CP VIRGINIA"

LA-100 SERIES: VEGETATION REMOVAL AND PROTECTION PLANS

LA-200 SERIES: VEGETATION RESTORATION PLANS

LA-300 SERIES: EXISTING TREE INVENTORY TABLE

LA-400 SERIES: TREE PLANTING DETAILS AND PLANT SCHEDULE



DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: B.CLAY
DRAWN BY: B.CLAY
CHECKED BY: J.FENNELL
APPROVED BY: J.FENNELL
DATE: 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

OVERALL LANDSCAPE PLAN

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: LA-003
REV.: N/A
SHEET NO.: 245 OF 273
SCALE: AS SHOWN

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Plotted By: Brian.Clay 2/9/2023
Ia\R02A_Sheets_North.dgn
$MODELNAME$

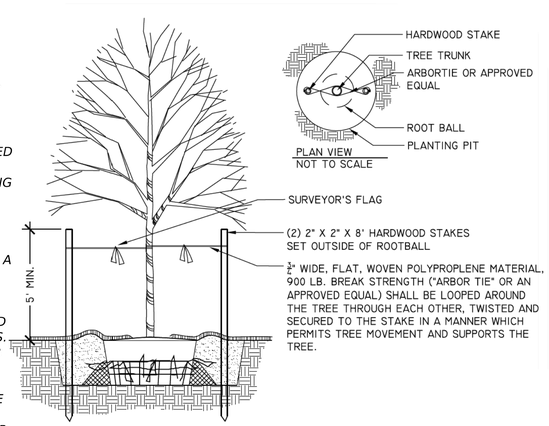
1. *STAKING AND GUYING MAY ONLY BE IMPLEMENTED WHERE SITE CONDITIONS WARRANT THEIR USE. PLANTED TREES WILL BE ASSESSED INDIVIDUALLY BY NATIONAL PARK SERVICE REPRESENTATIVE. STAKING AND GUYING WILL BE INSTALLED ONLY IF REQUIRED BY NPS REPRESENTATIVE. CONDITIONS WHERE STAKING AND GUYING MAY BE NECESSARY TO ENSURE STABILITY INCLUDE: WINDY LOCATIONS, STEEP SLOPES, WHERE VANDALISM MAY BE A CONCERN*

2. *STAKES OR GUYS WILL BE INSTALLED USING ACCEPTED ARBORICULTURE PRACTICES. TREES SHALL STAND PLUMB AFTER STAKING*

3. *INSTALLATION WILL INCLUDE THE REMOVAL OF ALL AND GUYING MATERIAL ONE YEAR AFTER INSTALLATION. ANY HOLES LEFT BY REMOVING STAKING SHALL BE FILLED WITH APPROVED TOPSOIL/BACKFILL MIXTURE.*

4. *REFER TO DETAILS FOR TREE PLANTING INFORMATION.*

5. *EXCAVATE ROOT FLARE IF NECESSARY.*



DECIDUOUS TREE PLANTING

SCALE: NONE

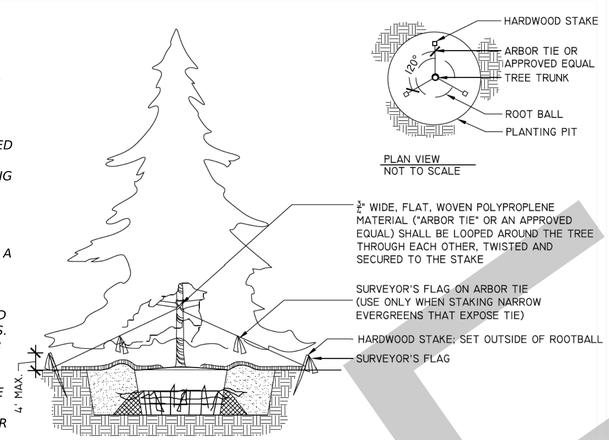
1. *STAKING AND GUYING MAY ONLY BE IMPLEMENTED WHERE SITE CONDITIONS WARRANT THEIR USE. PLANTED TREES WILL BE ASSESSED INDIVIDUALLY BY NATIONAL PARK SERVICE REPRESENTATIVE. STAKING AND GUYING WILL BE INSTALLED ONLY IF REQUIRED BY NPS REPRESENTATIVE. CONDITIONS WHERE STAKING AND GUYING MAY BE NECESSARY TO ENSURE STABILITY INCLUDE: WINDY LOCATIONS, STEEP SLOPES, WHERE VANDALISM MAY BE A CONCERN*

2. *STAKES OR GUYS WILL BE INSTALLED USING ACCEPTED ARBORICULTURE PRACTICES. TREES SHALL STAND PLUMB AFTER STAKING*

3. *INSTALLATION WILL INCLUDE THE REMOVAL OF ALL AND GUYING MATERIAL ONE YEAR AFTER INSTALLATION. ANY HOLES LEFT BY REMOVING STAKING SHALL BE FILLED WITH APPROVED TOPSOIL/BACKFILL MIXTURE.*

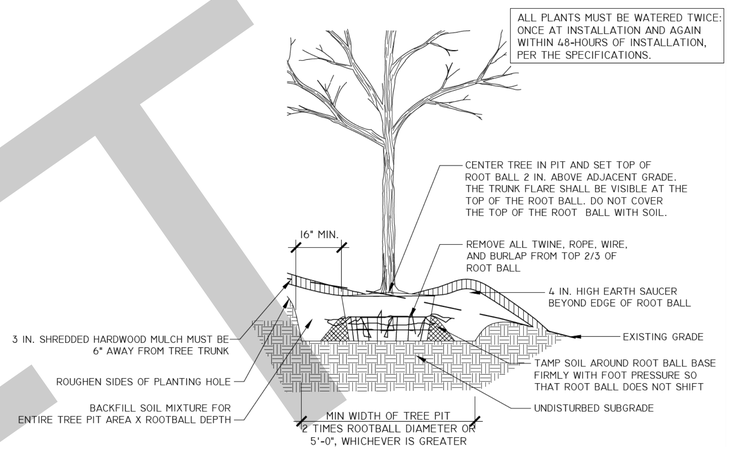
4. *REFER TO DETAILS FOR TREE PLANTING INFORMATION.*

5. *EXCAVATE ROOT FLARE IF NECESSARY.*



EVERGREEN TREE PLANTING

SCALE: NONE



1. *AT PLANTING PRUNE ONLY CROSSING LIMBS, BROKEN OR DEAD BRANCHES, AND ANY BRANCHES THAT POSE A HAZARD TO PEDESTRIANS per ANSI STANDARD A300. DO NOT PRUNE INTO OLD WOOD ON EVERGREENS.*

2. *CONTRACTOR SHALL MAXIMIZE EXCAVATED AREA FOR TREE PIT WITHOUT ADVERSELY IMPACTING ADJACENT SITE FEATURES.*

3. *UNLESS OTHERWISE DIRECTED BY NATIONAL PARK SERVICE (NPS) REPRESENTATIVE, BACKFILL SOIL MIXTURE WILL BE 3/4 EXISTING SOIL CLEANED OF DEBRIS (GRAVEL, ROCKS, STICKS, TRASH, ETC.) AND MIXED WITH 1/4 ORGANIC MATERIAL (COMPOSTED BARK, LEAF MOLD, OR OTHER PLANT DEBRIS PROCESSED TO A POINT OF DECAY AND APPROVED BY THE URBAN FORESTER; PEAT MOSS SHALL NOT BE USED).*

4. *CONTRACTOR SHALL LEGALLY REMOVE EXCESS SOIL & DEBRIS FROM SITE.*

5. *TREES PLANTED WITHOUT THE TRUNK FLARE VISIBLE WILL BE REJECTED.*

6. *TREES MAY ONLY BE STAKED IF REQUIRED BY NPS. REFER TO STAKINGDETAILS.*

TREE PLANTING ON SLOPE

SCALE: NONE

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: B. CLAY
DRAWN BY: B. CLAY
CHECKED BY: J. FENNELL
APPROVED BY: J. FENNELL
DATE: 2/9/2023

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

TREE PLANTING DETAILS

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. LA-400
REV. N/A
SHEET NO. 271 OF 273
SCALE: AS SHOWN

VDOT PDF.pltcfg
LBPE_Id_v95.tbl
Plotted By: Brian.Clay 2/9/2023
\\a\R02A_Details_2_North.dgn
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Schedule - NAMA

Canopy Trees

QUANTITY	SYMBOL	BOTANICAL NAME	CULTIVAR	COMMON NAME	SIZE	TYPE	MIN ROOT BALL DEPTH	MIN ROOT BALL DIAMETER	AVG HEIGHT RANGE	SPACING	NOTES	HISTORIC JUSTIFICATION
0	ARU	*Acer rubrum*		Red Maple	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Thomas Jefferson Memorial CLI, p. 25; RCPP, Potomac Riverfront Section, p. 166
8	AFL	*Aesculus flava*		Yellow Buckeye	2" caliper	2.2.2	14 3/8 in.	24 in.	8 - 12 ft.	PLAN	Strong central leader, specimen quality, full, b&b	East Potomac Park Final, p. 142
2	CGL	*Carya glabra*		Pignut	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Suggested by Kate at NPS as replacement for Zelkova serrata - 03/10/2022
0	DVI	*Diospyros virginiana*		Common Persimmon	2" caliper	2.2.2	14 3/8 in.	24 in.	8 - 12 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Suggested by Kate at NPS as replacement for Zelkova serrata - 03/10/2022
0	FGR	*Fagus grandifolia*		American Beech	2" caliper	2.2.2	14 3/8 in.	24 in.	8 - 12 ft.	PLAN	Strong central leader, specimen quality, full, b&b	East West Potomac Parks, sec. 8 p. 86
0	LST	*Liquidambar styraciflua*		Sweetgum	2" caliper	2.2.2	14 3/8 in.	24 in.	8 - 12 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Potomac Riverfront Section CLR, p. 166
0	LTU	*Liriodendron tulipifera*		Tuliptree	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Thomas Jefferson Memorial CLI, p. 166
2	NSY	*Nyssa sylvatica*		Black Gum	2" caliper	2.2.2	14 3/8 in.	24 in.	8 - 12 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Potomac Riverfront Section CLR, p. 166; Potomac Riverfront Section CLR, p. 86
0	POC	*Platanus occidentalis*		American Sycamore	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Potomac Riverfront Section CLR, p. 166
0	PGR	*Populus grandidentata*		Bigtooth Aspen	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Thomas Jefferson Memorial CLI, p. 25; East Potomac Park CLI, p. 77
0	QAL	*Quercus alba*		White Oak	2" caliper	2.2.2	14 3/8 in.	24 in.	8 - 12 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Potomac Riverfront Section CLR, p. 166; East Potomac Park CLI, p. 141
0	QPH	*Quercus phellos*		Willow Oak	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	East Potomac Park Golf Course CLI, p. 135; East West Potomac Parks, sec. 8 p. 86; Tidal Basin Viewshed Analysis CLR, p. 24, 25; East Potomac Park CLI, p. 95
4	QRI	*Quercus prinus*		Chestnut Oak	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Potomac Riverfront Section CLR, p. 166; East West Potomac Parks, sec. 8 p. 86
0	QRU	*Quercus rubra*		Red Oak	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	East Potomac Park CLI, p. 142
6	QVE	*Quercus vellutina*		Black Oak	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Potomac Riverfront Section CLR, p. 166, East West Potomac Parks, sec. 8 p. 86
0	TAM	*Tilia americana*		American Linden	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Thomas Jefferson Memorial CLI, p. 25
0	UAM	*Ulmus americana*		American Elm	2" caliper	2.1.2	14 3/8 in.	24 in.	12 - 14 ft.	PLAN	Strong central leader, specimen quality, full, b&b	East Potomac Golf Course CLI, p. 135; Thomas Jefferson Memorial CLI, p. 25; East West Potomac Parks, sec. 7 p. 13; Tidal Basin Viewshed Analysis CLR, p. 24, 25

Medium Trees

QUANTITY	SYMBOL	BOTANICAL NAME	CULTIVAR	COMMON NAME	SIZE	TYPE	MIN ROOT BALL DEPTH	MIN ROOT BALL DIAMETER	AVG HEIGHT RANGE	SPACING		HISTORIC JUSTIFICATION

Flowering Trees

QUANTITY	SYMBOL	BOTANICAL NAME	CULTIVAR	COMMON NAME	SIZE	TYPE	MIN ROOT BALL DEPTH	MIN ROOT BALL DIAMETER	AVG HEIGHT RANGE	SPACING		HISTORIC JUSTIFICATION
9	CCA	*Cercis canadensis*		Eastern Redbud	2" caliper	2.3.2	15 5/8 in.	24 in.	n/a	PLAN	Specimen quality, full, max. 4 trunks, b&b	Potomac Riverfront Section CLR, p. 166
16	CVI	*Chionanthus virginicus*		White Fringetree	2" caliper	2.3.2	15 5/8 in.	24 in.	n/a	PLAN	Specimen quality, full, max. 4 trunks, b&b	Suggested by Kate at NPS as replacement for Laegerstroemia indica - 03/10/2022
12	PYE	*Prunus x yedoensis*	Yoshino	Yoshino Cherry	2" caliper	2.3.2	15 5/8 in.	24 in.	n/a	PLAN	Specimen quality, full, single trunk, b&b	East Potomac Park CLI, p. 95, 139, 142;
8	PVI	*Prunus virginiana*		Choke Cherry	2" caliper	2.3.2	15 5/8 in.	24 in.	n/a	PLAN	Specimen quality, full, single trunk, b&b	Suggested by Kate at NPS as replacement for Laegerstroemia indica - 03/10/2022
11	MCO	*Malus coronaria*		Sweet Crabapple	2" caliper	2.5.4	n/a	24 in.	6 - 7 ft.	PLAN	Specimen quality, full, single trunk, b&b	Suggested by Kate at NPS as replacement for Laegerstroemia indica - 03/10/2022

Evergreen Trees

QUANTITY	SYMBOL	BOTANICAL NAME	CULTIVAR	COMMON NAME	SIZE		MIN ROOT BALL DEPTH	MIN ROOT BALL DIAMETER	AVG HEIGHT RANGE	SPACING		HISTORIC JUSTIFICATION
12	IOP	*Ilex opaca*		American Holly	6-8' ht.	5.8.2	15 1/2 in.	26 in.	7 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Lincoln Memorial CLI, p. 133/373; RCPP, Potomac Riverfront Section, p. 166; CLR_Tidal Basin Viewshed Analysis, p. 24, 25; NAMA_East Potomac Park Golf Course, p. 135
9	PST	*Pinus strobus*		Eastern White Pine	6-8' ht.	4.7.2	15 1/2 in.	26 in.	7 ft.	PLAN	Strong central leader, specimen quality, full, b&b	Thomas Jefferson Memorial CLI, p. 33; CLR_Tidal Basin Viewshed Analysis, p. 24, 25

NAMA PLANT SCHEDULE

PLANT PALETTE DERIVED FROM NPS PROVIDED RESOURCES:

NAMA CONSTITUTION GARDENS 2014 CLI
NAMA EAST POTOMAC PARK GOLF COURSE 2017
NAMA THOMAS JEFFERSON MEMORIAL 2015

LINCOLN MEMORIAL CLR COMPLETE CHAPTERS
NPS GOLF COURSES IN THE DISTRICT OF COLUMBIA-TREATMENT GUIDELINES
RCPP POTOMAC WATERFRONT SECTION, CLR 2018
THOMAS JEFFERSON MEMORIAL LANDSCAPE OVERVIEW
TIDAL BASIN VIEWSHED ANALYSIS

HABS DC 692 EAST POTOMAC PARK
HABS DC 693 WEST POTOMAC PARK

HALS DC 59 TIDAL BASIN DRAWINGS FINAL DRAFT
HALS DC 59 TIDAL BASIN HISTORY FINAL DRAFT

HALS DC-8 CHERRY TREES

CHAPPELL 1973 WEST POTOMAC PARK HISTORY HISTORIC RESOURCE STUDY
EAST POTOMAC PARK HSR FINAL 508C 2019
LINCOLN MEMORIAL HISTORIC STRUCTURE ASSESSMENT REPORT 2017

16000805 NATIONAL MALL HISTORIC DISTRICT AMENDED 2016
EAST WEST POTOMAC PARKS NATIONAL REGISTER

DRAFT

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY B. CLAY
DRAWN BY B. CLAY
CHECKED BY J. FENNELL
APPROVED BY J. FENNELL
DATE 2/9/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA
Michael Baker INTERNATIONAL

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

PROPOSED PLANTING SCHEDULES

PROJECT NO. VPRA R02A CSXT XXXX
DRAWING NO. LA-401
REV. N/A
SHEET NO. 272 OF 273
SCALE AS SHOWN

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Plotted By: Brian.Clay 2/9/2023
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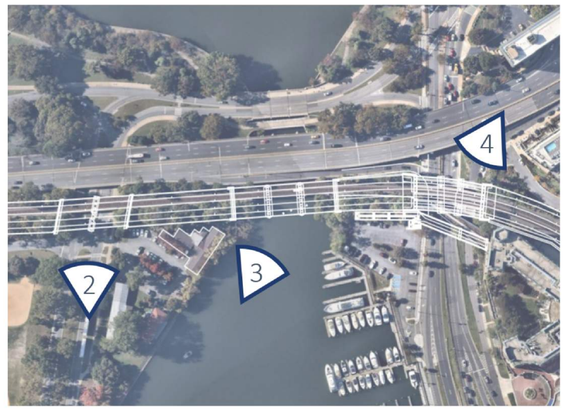
WMATA/I-395 UNDERGRADE BRIDGE (TRACKS 3 AND 4) (1)
(LOOKING NORTHWEST)

WASHINGTON CHANNEL UNDERGRADE BRIDGE (3)
(LOOKING NORTHWEST)

VIEW MAP - 1

OHIO DRIVE SW (EAST) UNDERGRADE BRIDGE (2)
(LOOKING NORTHWEST)

MAINE AVENUE SW UNDERGRADE BRIDGE (4)
(LOOKING SOUTHWEST)



VIEW MAP - 2

PRELIMINARY ENGINEERING
DRAFT 30% SUBMISSION 2/13/2023

Rev.	Date	Description

DESIGNED BY: D. TARANTINO
DRAWN BY: D. TARANTINO
CHECKED BY: S. KELLER
APPROVED BY: T. COOK
DATE: 2/8/2023

VIRGINIA PASSENGER RAIL AUTHORITY
CSX
TRANSFORMING RAIL IN VIRGINIA

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LONG BRIDGE
NORTH PACKAGE
WASHINGTON, DC

SUBDIVISION: RF&P ZONE: CENTRAL

UNDERGRADE BRIDGE RENDERINGS

PROJECT NO.: VPRA R02A CSXT XXXX
DRAWING NO.: RE-001
REV.: N/A
SHEET NO.: 273 OF 273
SCALE: AS SHOWN

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Plotted By: erodolfi 2/8/2023
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EXHIBIT C

***This is a draft Phase 1 scope of work that is subject to modification. The final Phase 1 scope of work will be provided to the Shortlist with the RFP.**

Phase 1 Scope of Work

The below describes the Phase 1 Services. Approximate timelines for submission of required deliverables and workshop participation are provided at the end of this Statement of Work. Timelines and schedule for the Phase 1 Services shall be subject to negotiation with the Design-Builder.

Design Services

1) Design-Builder shall develop a Work Breakdown Structure ("WBS") for the Construction Work. The Design shall conform to the WBS.
2) Design-Builder shall develop design packages that break down the Design into discrete construction packages. The design packages shall be consistent with the WBS and ultimately enable VPRA to release discrete design packages for construction. Design-Builder shall submit the design package breakdown to VPRA for approval prior to submitting design packages to VPRA for review and comment.
3) Design-Builder shall prepare the Design of the Project. Design-Builder shall start with the 30% design and other materials provided by VPRA as a basis for the Design and advance the Design toward completion. The Design shall not deviate from the Minimum Requirements. Design-Builder shall perform constructability reviews and ensure that the Design is constructible.
4) Design-Builder shall submit designs to VPRA for review, comment, and acceptance by VPRA and all other third-parties with the right to review, comment, and accept designs. Design-Builder must receive VPRA's approval of the Design Quality Plan prior to submitting designs for VPRA's review.
5) Design-Builder shall incorporate approved value engineering concepts into the Design.
6) Design-Builder shall coordinate with and align the scope of design work with the Design-Build team selected for the South Project.

Collaborative Sessions

7) Design-Builder shall participate in a kickoff workshop with VPRA. During the kickoff workshop, the Parties will finalize the Phase 1 Services schedule, schedule future workshops, develop a Phase 1 partnering process and the partnering process for the Construction Work, develop a framework for the Design Quality Plan, and agree on other administrative milestones.
8) Design-Builder and VPRA shall hold a design packaging workshop. Design-Builder shall present concepts for design packages to VPRA for feedback. Design-Builder shall incorporate feedback from VPRA before submitting the design packages for VPRA's approval.
9) Design-Builder and VPRA shall hold constructability workshops. During the workshops, Design-Builder shall present its assessment of constructability of the design packages, including any challenges it anticipates and how to address such challenges.

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10) Design-Builder shall participate in a scoping workshop to consider scope items to add or delete from the Construction Work following Design-Builder's submission of the OPCC.
11) Design-Builder shall participate in a general task force meeting on a monthly basis to discuss Project issues.
12) Design-Builder shall participate in discipline specific workshops, including structures, drainage, rail, systems, interface, Maintenance of Traffic, civil works, and other disciplines that warrant such workshops.
13) Design-Builder shall attend a design concept meeting with VPRA on a weekly basis starting upon issuance of the Phase 1 Services NTP. During the design concept workshops, the Parties shall discuss various design concepts for incorporation into the Design, including value engineering concepts that can reduce costs, reduce the duration of the Baseline Schedule, and mitigate risks. Any Party may propose a design concept for discussion.
14) Design-Builder shall participate in workshops to discuss the progression of the Technical Provisions. These meetings will coordinate drafting of various sections, review submitted drafts, and discuss issues for resolution.
15) Design-Builder shall participate in monthly risk workshops with VPRA, starting within 30 days of VPRA's issuance of the Phase 1 Services NTP and ending when VPRA issues a Phase 2 Services NTP or terminates the PDBA in accordance with Section ## therein. VPRA will maintain the master risk register that will be discussed during the workshops and provide access to Design-Builder for input prior to and after the workshops. The risk register will continue to be maintained and updated during the Phase 2 Services.
16) Design-Builder shall evaluate the amount of the Allowance. The Allowance amount shall be a component of the Construction Cost Estimates.

Construction Cost Estimates, Schedule Preparation, and Negotiation

17) Design-Builder shall perform continuous cost estimating of the cost to perform the Phase 2 Services. When requested by VPRA, Design-Builder shall provide its cost estimates to VPRA and participate in Price Reconciliation workshops to discuss the estimates.
18) Design-Builder shall prepare Construction Cost Estimates of the design concepts considered during the design concept meetings described in Paragraph 13. Design-Builder shall also evaluate the impact of such concepts on the Baseline Schedule and provide such analyses to VPRA.
19) Design-Builder shall prepare the Baseline Schedule for performance of the Phase 2 Services. Design-Builder shall submit the proposed Baseline Schedule with each Construction Cost Estimate milestone submission. The Baseline Schedule shall be consistent with the requirements of Section ## of the Technical Provisions. The Baseline Schedule with the Final Construction Price Proposal and incorporated into the Phase 2 Amendment will become the Baseline Schedule for the Phase 2 Services, which shall be updated in accordance with the Technical Provisions.
20) Design-Builder shall prepare and submit to VPRA an Opinion of Probable Construction Cost ("OPCC") within 90 days of Design-Builder's receipt of the Phase 1 Services NTP. The OPCC shall be consistent with Section ## of the PDBA.
21) Design-Builder shall prepare and submit a 60% design package for review and Acceptance by VPRA and approval by CSXT and Amtrak. Design-Builder shall resolve all comments on the 60% design submittal sufficient to receive the required acceptance.

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22) Design-Builder shall prepare and submit the Binding Construction Price Proposal after Acceptance by VPRA and approval by CSXT and Amtrak of the 60% design submittal. The Binding Construction Price Proposal shall be consistent with Section ## of the PDBA. Design-Builder shall submit the Binding Construction Price Proposal to VPRA on or before the date stated in the Phase 1 Schedule.
23) Design-Builder shall participate in Price Reconciliation workshops with VPRA and the ICE to discuss Design-Builder's Construction Cost Estimates. Design-Builder shall be prepared to reconcile differences between the ICE's estimate and the Design-Builder's Construction Cost Estimates, as well as to explain all assumptions that Design-Builder used to develop the estimates for the Phase 2 Services on an Open Book basis.

24) If requested by VPRA, or if Design-Builder's Binding Construction Price Proposal is not within the threshold specified in Section ## of the PDBA, Design-Builder shall update the Binding Construction Price Proposal based on discussions, workshops, and the Price Reconciliation meetings with VPRA and the ICE. Design-Builder may continue to update the Binding Construction Price Proposal based on progression of the Design. Design-Builder shall update the Binding Construction Price Proposal until (i) VPRA accepts the Binding Construction Price Proposal and requests submission of a Final Construction Price Proposal, or (ii) VPRA terminates the PDBA in accordance with Section ## therein.
25) Design-Builder shall submit a Final Construction Price Proposal consistent with Section ## of the PDBA.

Third-Party Coordination and Design Review

26) Design-Builder shall coordinate with all Third-Parties (including Utility Owners, AHJs, Governmental Persons, CSXT, Amtrak, VRE, and others) to obtain all required approvals and permits necessary to perform the Work. Third-Party coordination includes submission of the Design to Third-Parties for their review and comment, and receiving approval of the Design from such Third-Parties consistent with VPRA's commitments to applicable Third-Parties.
27) Design-Builder shall assist VPRA with its efforts to coordinate with Third-Parties. Such assistance shall include preparing presentations of the Design; providing and presenting constructability reviews and construction options; and presenting means and methods, staging, phasing, and other elements of performing the Construction Work in any locations that require Third-Party Approval.

Subcontracting and Competitive Bidding

28) Design-Builder shall prepare a Subcontracting Plan that describes Design-Builder's plan to identify qualified Subcontractors to perform the portions of the Construction Work and the competitive process to procure such Subcontractors. The Subcontracting Plan shall be consistent with Section ## of the Technical Provisions. Except for Subcontractors identified in Design-Builder's Proposal to perform Phase 1 Services, Design-Builder shall not execute any Subcontracts until VPRA approves the Subcontracting Plan.
29) Design-Builder shall perform Subcontractor outreach as necessary to obtain prices for performance of subcontracted Construction Work for use in the Construction Cost Estimates. Design-Builder shall submit all documents and other materials used to perform such outreach and submitted by potential Subcontractors to VPRA for review.

30) Design-Builder shall prepare a DBE Utilization Plan for the Phase 2 Services consistent with Section ## of the Technical Provisions.

Early Work Packages

31) Design-Builder shall identify discrete aspects of the Construction Work that can be performed prior to execution of a Phase 2 Amendment. Design-Builder shall attempt to identify Construction Work that can be performed on its own and without dependence on performance of any other Construction Work. Design-Builder shall identify potential Early Work Packages that mitigate risk and enable timely completion of the remaining Phase 2 Services.
32) For each Early Work Package identified, Design-Builder shall present the following to VPRA:
    a. Design work necessary for construction
    b. Construction Cost Estimate of the Early Work Package, consistent with Section ## of the PDBA.
33) Design-Builder shall participate in Price Reconciliation meetings with VPRA and the ICE to discuss and negotiate the Construction Cost Estimate for the Early Work Packages.
34) Design-Builder shall obtain all required Design approvals necessary to perform Early Work, including acceptance by VPRA and any applicable third-parties.

Other Deliverables

35) Design-Builder shall perform all necessary activities to fulfill the commitments in the Final Environmental Impact Statement and Record of Decision.
36) Design-Builder shall evaluate the Materials needed to complete the Work. Design-Builder shall prepare a memo identifying potential items (including long-lead items) for which early procurement may benefit the Project. Upon VPRA's approval, Design-Builder shall procure such long-lead Materials. Payment for Materials procured during the Phase 1 Services shall be as provided in Section ## of the PDBA.
37) Design-Builder shall prepare the Technical Provisions for the Phase 2 Services and shall incorporate comments from VPRA and other third-parties into the Technical Provisions. The Technical Provisions shall incorporate the Minimum Requirements provided in the RFP and be the contractual requirements for the Final Design and performance of the Construction Work. Design-Builder shall draft sections of the Technical Provisions to be consistent with the Accepted Design and to incorporate all Third-Party requirements and Approvals. The final Technical Provisions shall be incorporated into the Phase 2 Amendment (if executed) and become binding on Design-Builder.
38) Design-Builder shall prepare the following for VPRA's approval:
    a. Project Management Plan
    b. Quality Plan, consisting of:
        i. Design Quality Plan
        ii. Construction Quality Plan
    c. Safety Management Plan
    d. Environmental Management Plan
    e. Maintenance of Traffic Plan
    f. Construction Staging Plan

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Optional Services

The following services are not included in the Phase 1 Services Fee submitted with the Proposal. VPRA may request that Design-Builder perform the following at an agreed-upon price to be paid on a time and materials basis:

39) Geotechnical investigation
40) Utility location
41) Test piles
42) Site preparation
43) Survey
44) Other Site investigation tasks to support completion of the design and risk mitigation
45) Public Information
46) Right-of-way acquisition assistance

Phase 1 Services Schedule

Event/Milestone/Workshop	Day
Phase 1 Services NTP	0
Kickoff Workshop	1
Initial design concept workshop (Recurring weekly)	1
Design packaging workshop	7
Technical Provisions Workshop (Recurring – Schedule to be set)	7
Constructability Workshops (recurring)	14
Initial Monthly Risk Workshop	30
Task Force Meetings (Recurring)	30
Discipline Specific Workshops (Recurring – Schedule to be set)	30
Submission of OPCC	60
Cost Reconciliation for OPCC	75
Post-OPCC Scoping Workshop (Recurring as needed)	75
Submission of Management Plans (Paragraph 35)	100
Submission of 60% Design	150
Comments on 60% Design returned from CSXT and Amtrak	210
Resolution of 60% Design Comments	230
Submission of Binding Construction Price Proposal	**250**
Reconciliation workshops/ Proposed Binding Construction Price Revisions	270
Final Proposed Binding Construction Price submission	370
Issuance of Phase 2 Services NTP (contingent)	400

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EXHIBIT D

Draft Quality Management Technical Provisions

***This is a draft Quality Management scope of work that is subject to modification and is provided at this stage of the procurement for informational purposes only. The final Quality Management scope of work will be provided to the Shortlist with the RFP.**

2.4 Quality Management

2.4.1 General

2.4.1.1 Design-Builder Responsibility

Design-Builder shall develop, implement, and maintain a Quality Program ("QP") meeting the requirements of this Section 2.4 of the Technical Provisions. The QP shall be comprised of Design-Builder's quality policy, quality objectives, design and construction quality plans, environmental compliance, quality procedures, and systems.

Design-Builder shall be responsible for the quality management of all design and construction Work to ensure compliance with the Project's scope of work, Minimum Requirements, and QP.

Design-Builder's executive management shall define and document its policy for quality management, including objectives for quality and its commitment to quality.

2.4.1.2 Overview of VPRA's Role

VPRA will undertake a design oversight role during Phase 1 and for Final Design in Phase 2. During the Construction Work, VPRA will perform all Materials sampling and testing, and inspection for Acceptance of the Work in accordance with the Minimum Frequency of Sampling and Testing, and Inspection Guide.

VPRA's role in the quality program will be incorporated into Design-Builder's Quality Plan and will include the following:

- Perform Independent Quality Assurance design reviews on the design (drawings, calculations, specifications, special provisions, studies, reports, and other design outputs).
- Perform construction inspection and Material sampling and testing, for the Acceptance of all Work.
- Perform Materials sampling and testing, and inspection at off-site facilities for Acceptance.
- Perform auditing on the implementation of Design-Builder's Quality Plan. These audits will be systematic and independent examinations to determine whether quality activities and related results comply with the Quality Plan and whether they are implemented effectively and are suitable to achieving the Quality Management goals. VPRA will review and Accept modifications to the Quality Plan resulting from any shortcomings in the Quality Plan discovered in the audit process.
- Perform additional inspections and Materials samples and tests to investigate possible Nonconforming work.

2.4.1.3 Quality Management Goals

2.4.1.3.1 Integrated Program

Design-Builder shall develop, implement, and maintain a Quality Program that:

- Establishes comprehensive quality management processes and procedures.
- Integrates the quality goals of both the design and construction elements of the Project.
- Defines the minimum standards and procedures for quality management.
- Assigns the responsibilities for specific quality management functions.

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2.4.1.3.2 Continuous Improvement

Design-Builder shall implement improvements to the Quality Plan throughout the delivery of the Project. Design-Builder shall incorporate such improvements based on lessons learned, efficiencies discovered, problems identified, or as Design-Builder discovers new methods of improving quality. Design-Builder shall involve its entire staff and partner with VPRA to ensure overall Project satisfaction.

2.4.2 Design-Builder's Quality Approach

2.4.2.1 General

The overall quality approach defined herein requires Design-Builder to develop, implement, and maintain a Quality Program that encompasses the design and construction quality aspects, as well as documentation requirements for the Project.

Design-Builder shall perform Quality Control and Quality Assurance (IDQM) activities for the design of the Project in accordance with the policies and procedures defined in the Quality Plan described in Section 2.4.2.3 of the Technical Provisions. VPRA's design-related oversight role will include reviews of design packages for Acceptance and audits of the design aspects of the Quality Program.

Design-Builder shall perform Quality Control activities, defined in the Quality Plan, for the construction of the Project, including testing and inspection activities to ensure that Materials and the constructed Work meet the requirements of the Contract Documents.

Design-Builder shall document quality activities and maintain quality data in accordance with the policies and procedures defined in the Quality Plan. VPRA will provide the SharePoint system to store and record all documents generated to fulfill Design-Builder's obligations under the Contract Documents. Design-Builder shall submit all Project documents, including documentation of quality activities, tests, inspections, design submittals, Shop/Working drawings, reports, correspondence, and any other Project submittals/transmittals through SharePoint.

2.4.2.2 Quality Organizational Requirements

In addition to the requirements stated in Exhibit ## to the PDBA, Design-Builder's Quality Manager shall:

- Have overall responsibility for Design Builder's Quality Program.
- Be responsible for the preparation, implementation, and updating of the Quality Plan.
- Not be responsible for the production of the Work.
- Verify and provide documentation that the Work meets the requirements of the Contract Documents.
- Attend the weekly progress meetings and quality meetings and any such other meetings as VPRA may request, including individual meetings between the Quality Manager and VPRA staff.
- Be the primary point of contact to VPRA for all issues relating to Design-Builder's Quality Plan and to resolve Nonconforming Work and Project quality issues with VPRA.
- Be independent of Design-Builder's Quality Control staff and Project Manager.
- Have the authority to stop Work at any time in their sole discretion.

In the Quality Plan, Design-Builder shall also identify additional staff with the authority to stop Work, and ensure they understand the processes to implement their authority.

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All Design-Builder personnel performing quality management roles on the Project shall be independent from the personnel performing the Work and shall have no responsibilities for performance of the Work. Notwithstanding the foregoing, Design-Builder's production staff shall be aware of their obligation to produce quality work and the general procedures in the Quality Plan.

None of Design-Builder's quality staff has the ability to deviate from the requirements of the Contract Documents or to interpret Project specifications. Their role is solely to ensure the finished Work meets the requirements of the Contract Documents.

2.4.2.3 Quality Plan

2.4.2.3.1 Quality Plan – General

Design-Builder shall prepare and submit to VPRA for review and Approval a written Quality Plan that encompasses all requirements of the Contract Documents with regard to design, construction, environmental compliance, and documentation for all quality processes. The Quality Plan shall identify Design-Builder's overall framework for implementation of its Quality Control and Quality Assurance programs across all aspects of the Project.

The Quality Plan shall:

- Include a Design Quality Plan ("DQP") and a Construction Quality Plan ("CQP").
- Include an organizational chart showing all key roles and persons, and lines of communication and authority between Design-Builder and VPRA teams, and with other organizations involved.
- Define a process consistent with the draft Quality Plan presented in Design-Builder's Technical Proposal.
- Be approved and endorsed by Design-Builder's executive management committee.
- Be in effect until all requirements of the Contract Documents have been fulfilled and VPRA issues Notice of Final Acceptance.
- Describe the Quality Manager's accountability for ensuring the effective implementation and maintenance of the Quality Plan.
- Describe all verification resources, such as design verifiers, checkers, inspectors, and testers that Design-Builder will use.
- Depict how Design-Builder's design technical experts are incorporated into the construction phase of the Project.
- Detail how Design-Builder will provide quality management for design and construction, including any supporting administrative activities associated with the Project.
- Detail how Design-Builder will ensure compliance with all environmental requirements and permit conditions.
- Detail the quality management for both design and construction elements to be completed by a Subcontractor, Supplier, vendor, agent, or other entity with contractual obligations to complete the Work.
- Describe procedures for identifying training needs and provide for the training of all personnel performing activities affecting quality.
- Describe the process for performing internal quality audits.

Design-Builder shall submit the Design Quality Plan for VPRA's Approval within the time period stated in Exhibit B to the Progressive Design-Build Agreement. Design-Builder must receive VPRA's

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Approval of the Design Quality Control Plan prior to submission of design submittals to VPRA during the Phase 1 Services. Design-Builder shall submit the Construction Quality Plan for VPRA's Approval within the time period stated in Exhibit B to the Progressive Design-Build Agreement. VPRA's Approval of the overall Quality Plan shall be a condition precedent to execution of a Phase 2 Amendment and issuance of the Phase 2 NTP.

Design-Builder shall revise its Quality Plan and its implementation to reflect current conditions or when either Design-Builder or VPRA identifies a systemic problem. These revisions must be Approved by VPRA prior to implementation. Design-Builder shall submit a conformed copy of the updated Quality Plan with revisions redlined and highlighted.

The structure of the documents describing the Quality Plan shall be: Quality policy (for the entire Quality Program), quality objectives, policies (for each element of the Quality Plan), and procedures.

All written procedures shall clearly describe the purpose of the process, overview of the process, responsibilities, steps of the process, and records resulting from the process.

2.4.2.3.2 Management Review

Design-Builder's executive management committee shall review the performance of the Quality Plan at least quarterly to ensure its continuing suitability in satisfying the requirements of the Contract Documents and Design-Builder's stated quality policy and objectives. The management reviews shall, at a minimum, review the results of internal audits, VPRA audit results, corrective actions taken, trends in Nonconforming Work, and time to resolution.

VPRA may, in its sole discretion, participate in the management reviews and may request data from the management reviews.

The findings of management reviews shall be incorporated into the Quality Plan and documented in an appendix to the plan.

2.4.2.3.3 Internal Quality Audits

Design-Builder shall establish and maintain documented procedures for planning and implementing internal quality audits to verify whether quality activities and related results comply with planned arrangements and to determine the effectiveness of the quality system.

Internal quality audits shall be conducted at least every quarter and in accordance with sound auditing principles. Audits shall be initiated early enough in the life of a Project to assure effective Quality Control during all phases. The audits shall include Project management as well as technical work activities.

Internal quality audits shall be carried out by personnel independent of those having direct responsibility for the activity being audited.

The internal quality audit program shall provide verification that the quality system is operating and being implemented as planned. Audits shall be conducted on a planned and scheduled basis, consistent with the importance of the activities being performed.

The results of the audits shall be recorded and brought to the attention of the personnel having responsibility in the area audited. The management personnel responsible for the area shall take timely corrective action on deficiencies found during the audit. VPRA shall have the right to request and review the audit results.

DRAFT

Follow-up audit activities shall verify and record the implementation and effectiveness of the corrective action taken.

2.4.3 Design Quality Assurance/Quality Control

2.4.3.1 Design Quality Plan

The DQP must be a complete and clear plan to achieve a quality design for all elements and disciplines by all team members, including Subcontractors. All design shall meet the requirements of Design-Builder's Quality Plan and the Contract Documents.

At a minimum, the DQP shall:

- Present the overall organizational plan for design Quality Control and Quality Assurance.
- Define design Quality Control and Quality Assurance review processes to ensure design is in conformance with the Contract Documents.
- Include an organizational structure and reporting requirements demonstrating that Quality Control personnel have sufficient independence to allow them to be primarily concerned with quality, as opposed to the schedule and budget.
- Include quality procedures related to the preparation and checking of calculations, plans and specifications, design coordination procedures, construction coordination procedures, and document control.
- Include Independent Design Quality Management ("IDQM") firm's procedures and process for review and approval of Design-Builder submittals. The DQP shall also include procedures related to coordination between Design-Builder and the IDQM firm(s).
- Include details as to the level of involvement of VPRA, IDQM, CSXT, Amtrak, local agencies, and regulatory agencies in the design development and design review process. Design-Builder is encouraged to involve VPRA in all design development processes.
- Include procedures for review of engineering computations, technical accuracy, form, and content.
- Describe the coordination of the design with construction, including constructability reviews.
- Include quality measures and encourage continuous improvement of the design deliverable products.
- Describe how changes to design are identified, reviewed, and approved by authorized personnel prior to their implementation.

2.4.3.2 Responsibility of Design-Builder

Design-Builder shall be responsible for performing and documenting a complete check of all designs, calculations, plans, and specifications prepared by Design-Builder for the Project prior to review by the IDQM firm(s). Design-Builder's design check shall include both the overall design concept and various design element coordination checks and the detail check of the calculations for each plan and specification.

Design-Builder's design check shall be performed by experienced design professionals licensed in the Commonwealth of Virginia and District of Columbia (as applicable) that have not participated in preparing any of the design prior to the checking process. This review process shall be documented and included in Design-Builder's DQP process.

DRAFT

For structures constructed using conventional construction methods and materials, the accepted DQP procedure may be performed by Design-Builder's own personnel, including members of the Lead Designer. The following types of structures are considered to utilize conventional construction methods and materials:

- Rolled steel beams
- Plate Girders
- Prestressed AASHTO beams, Concrete Slab Panels, or modified bulb-Ts
- Spliced Prestressed AASHTO beams or modified bulb-Ts

2.4.3.3 Design Certification

Design-Builder shall include the following design certifications in their DQP:

2.4.3.3.1 Design Conformance

Within 30 days after the Phase 1 NTP, the corporate officer responsible for quality for Design-Builder and the corporate officer responsible for quality for the Lead Designer shall certify, in writing, that the calculations, plans, specifications, and other technical documents for which they are responsible shall be prepared in conformance with the Contract Documents and the DQP.

2.4.3.3.2 Checker

Within 30 days after the Phase 1 NTP, the corporate officer responsible for quality for Design-Builder and the corporate officer(s) responsible for all firm(s) that will check the design and calculations shall certify, in writing, that the design check shall be performed in conformance with the Contract Documents and the DQP.

2.4.3.3.3 Transmittals

On the transmittal for each submittal of calculations, plans, specifications, shop drawings, as-builts and other technical documents, Design-Builder, the Lead Designer, and the checker shall certify that the documents were prepared and checked in conformance with the Contract Documents and the DQP. All submittals shall be written in the English language.

2.4.3.3.4. Conclusion of Work

At the conclusion of the Work and with the transmittal of the Record Documents to VPRA, Design-Builder shall sign, seal, and certify in writing that all calculations, plans, specifications, and technical documents for which they were responsible were prepared in conformance with the Contract Documents and the DQP.

2.4.3.4 Professional Seals

All calculations, plans, specifications, and other technical documents transmitted to VPRA shall be signed and sealed by the Professional Engineer(s) licensed in the Commonwealth of Virginia and District of Columbia (as applicable) who are responsible for the design and by the Professional Engineer(s) licensed in the Commonwealth of Virginia and District of Columbia (as applicable) who are responsible for the checking of that document. Landscape plans shall be prepared, signed, and sealed by a Landscape Architect licensed in the Commonwealth of Virginia and District of Columbia (as applicable). The certifications at the start and conclusion of the Work shall also be sealed by a Professional Engineer licensed in the Commonwealth of Virginia or the District of Columbia and signed by Design-Builder.

DRAFT

2.4.3.5 Independent Design Quality Management

Design-Builder shall utilize the services of the IDQM firm(s) to review all design elements to ensure they comply with the Contract Documents, Good Industry Practice, environmental commitments, and permit conditions, and that Design-Builder has complied with the requirements of the DQP.

Major structural components, including girders, floorbeams, stringers, abutments, piers, foundations, and retaining walls of multi-girder steel, multi-beam concrete or segmental concrete type bridges shall be reviewed by the IDQM for compliance with the DQP by a qualified engineer having a minimum of 15-years' experience designing similar size and type of structures as proposed.

The IDQM shall check, utilizing independent calculations, for the following foundation and/or structure designs, types and/or detailing:

- Post tensioned concrete girders,
- Spliced concrete girders,
- Segmental concrete superstructures,
- Connection details between precast concrete elements,
- Spans with centerline of bearing to centerline of bearing lengths greater than or equal to 200 feet,
- Highly skewed, curved, and/or splayed girder and/or span arrangements,
- Precast concrete deck designs, and
- Any foundation and/or structure designs, types, and/or detailing modified from the Basis of Design

The independent calculations check shall be performed by a qualified engineer having a minimum of 15 years' experience designing similar size and type of structures. The independent calculations shall be sealed and stamped by the IDQM and submitted to VPRA.

The IDQM shall be responsible to sign, seal, and certify that all Released for Construction design submittals are in conformance with the Contract Documents, environmental commitments, and permit conditions prior to submission to VPRA for VPRA's review and comment. This is in addition to the certifications and seals required of the Lead Designer. The quality management provided by the IDQM firm(s) is in addition to the quality management performed by Design-Builder as part of their DQP. The IDQM certifying compliance with the Contract Documents and the DQP must hold similar Professional Licensure as required by the Section 2.4.3.4 of the Technical Provisions. Design-Builder shall develop its Design Quality Control Plan (DQP) for review and approval by the IDQM firm(s). The approved DQP shall be submitted in the final Quality Plan to VPRA for concurrence.

2.4.3.7.1 Independent Quality Assurance Audit

Upon submission of an IDQM certified Released for Construction design package from Design-Builder to VPRA via SharePoint, VPRA will perform further reviews as determined necessary to ensure the design package is in conformance with the Contract Documents. VPRA will perform an Independent Quality Assurance audit review and provide comments identifying noncompliance with the Contract Documents within 14 Days, such period beginning the day after receipt of the submittal. Additionally, any submittal sent within 7 Days before or after the Memorial Day, July 4th, Labor Day, Thanksgiving or Christmas holiday shall require 7 Day additional review period for VPRA and all other reviewers. Design-Builder shall be solely responsible for the schedule impacts and costs of

revisions or re-work arising from VPRA's review of the drawings, specifications, other design submittals for consistency with the requirements of the Contract Documents.

2.4.4 Construction Quality Control and Quality Assurance

2.4.4.1 General

Design-Builder is responsible for performing Quality Control of the Construction Work. This includes performing the Work in accordance with the Contract documents. Quality Control duties include: making sure staff are qualified and trained, performing work in accordance with the RFC plans and specifications, verifying that the Materials delivered to the Site are in compliance with the requirements of the Contract Documents, managing work performed by Subcontractors and at off-site facilities, developing Construction Work plans and conducting pre-activity meetings, coordinating Work activities with VPRA inspections and testing, conformance with Hold Points, and issuing NCRs for Nonconforming work and developing corrective actions.

VPRA staff will be responsible for Accepting the Work. VPRA staff will perform inspection in accordance with the Inspection & Test Plans, perform Materials sampling and testing in accordance with the Frequency Guide for Materials Sampling and Testing, Approve Materials that are not on the pre-approved Materials list, approve off-site facilities, perform QA inspection at off-site facilities, approve Materials to be shipped to the site, and issue NCRs non-conformance reports for Nonconforming Work.

2.4.4.2 Construction Quality Plan

Design-Builder shall develop a CQP that accomplishes the following:

- Clearly addresses Quality Control procedures to ensure that the Construction Work meets the requirements of the Contract Documents. This includes, at a minimum, procedures for Materials handling and construction quality; inspection, sampling, testing, and acceptance/rejection of Materials, plants, production and construction; Material certifications; calibration and maintenance of Equipment; production process control; and maintaining environmental compliance.
- Provides quality measures and encourages continuous improvement of the Construction Work.
- Educates all construction staff of their role in the Quality Program and ensures they understand that their role is to build the Work in accordance with the Released for Construction Documents and the requirements of the Contract Documents.
- Ensures all construction quality staff understand that their role is to determine whether the Work meets the requirements of the Contract Documents.
- Addresses all construction elements, including those to be completed by a Subcontractor, supplier, vendor, agent, or other entity with contractual obligations to complete the Work.
- Involves VPRA throughout the entire construction process.
- Describes how Design-Builder plans to identify Nonconforming Work, track Nonconforming Work, resolve Nonconforming Work, and prevent similar Nonconforming Work from occurring.

DRAFT

2.4.4.3 Inspection and Testing

Design-Builder shall establish and maintain documented procedures for inspection and testing activities. The required inspection and testing, and the records to be established, shall be detailed in the Construction Quality Plan.

QC inspection and testing shall be performed in accordance with written procedures developed by Design-Builder, or the proper issue of test procedures issued by industry, government, and/or code bodies available to test personnel.

Quality Check Points and Hold Points (Work that must be inspected and approved by VPRA before Work can proceed), shall be clearly established and identified on the Construction Work Plans. QC inspection procedures, logistics, and reporting of results shall be clearly defined, developed, and implemented.

VPRA will perform inspection of work and sampling and testing of Materials in accordance with the Inspection and Test Plans ("ITP") and Minimum Frequency of Material Testing.

2.4.4.4 Material Certifications

During the Phase 1 Services, and to the extent information is known, Design-Builder shall provide to VPRA the sources of supply and item Material types that will be used in the Work. For Materials not initially identified or changes to the initial source provided, the source of supply shall be provided sufficiently in advance of their use. Fabricated structural steel, other metal fabricated structural members, and prestressed/pre-cast structural members can have long lead times for fabrication. The fabricator for these items shall be presented to the VPRA as soon as known. Copies of documentation for all sources of supply shall be provided as soon as known, but shall be provided to the VPRA no less than 30 days prior to delivery of such Materials to the Project.

VPRA maintains a list of qualified manufacturers, producers, and fabricators. Design-Builder is not restricted to use these sources if the Quality Plan details Quality Control procedures and methods for ensuring that Materials meet specifications, including inspection and quality control measures at the manufacturer or fabrication site.

When Design-Builder purchases Materials from suppliers shown on the VPRA's approved Materials or source list, Design-Builder will be provided a Materials Certification (Certificate of Delivery, Certificate of Analysis, or Certificate of Compliance, as required) from the supplier covering the materials and/or the source.

Documentary evidence that Materials and Equipment conform to the procurement requirements shall be made available by Design-Builder at the Site no less than 24 hours prior to installation or use of such Materials and Equipment. This documentary evidence shall be retained at the Site, stored in VPRA's SharePoint site, and shall be sufficient to identify that the specific requirements, such as Working Plans, codes, standards, or Specifications, are fulfilled by the purchased Materials and Equipment. Substitution of specified Materials shall not occur without prior approval by Design Builder's Design Manager, IDQM, and VPRA. Failure to acquire prior substitution approval will result in the issuance of a nonconformance report. Additionally, a copy of all documentary evidence that Materials and Equipment conform to the procurement requirements shall be provided to the VPRA, or its representative, at the same time Design-Builder receives such documentary evidence.

At the completion of the Project, Design-Builder shall submit with the final payment application a certificate of compliance signed by Design-Builder's Project Manager and Quality Manager indicating that all Materials incorporated in the Project conform to the Contract requirements.

DRAFT

2.4.4.5 Incoming Product Inspection

Design-Builder shall ensure that incoming product is not accepted, used or processed until it has been inspected or otherwise verified as conforming to specified requirements. Verification of the specified requirements shall be in accordance with the Quality Plan and/or documented procedures.

The Quality Plan shall include incoming product inspection that shall include but not be limited to:

- Documentation review.
- Physical inspection of materials and/or equipment.
- Identify items per the purchase order and shipping list, tag number or marking.
- Verification of quantity and size.
- Dimensional checks, when applicable.
- Verification of protective coatings if applicable; and
- Examination of item(s) for condition and shipping damage.

2.4.4.6 Handling and Storage of Material

Design-Builder shall establish and maintain documented procedures for transporting, handling and storage of material delivered to the Project.

Material shall be transported, handled and stored in a manner that will minimize segregation, avoid contamination, prevent bending stresses, distortion, cracking, spalling, surface damage and/or prevent any other condition that may result the material to be considered unsuitable for use on the project.

Design-Builder shall use designated storage areas to prevent damage or deterioration of product, pending use. Items requiring protection shall be identified and protected as necessary to prevent loss, damage deterioration or loss of identification. To detect deterioration, the condition of product in stock shall be assessed at appropriate intervals.

2.4.4.7 Construction Work Plans

Design-Builder shall prepare Construction Work Plans (“CWP”) for individual Work elements. The CWPs shall be discussed at the Pre-activity Meetings. The CWP shall be transmitted to VPRA prior to scheduling the pre-activity meeting.

At a minimum, CWPs shall address:

- Description of the Work and applicable Contract specification section.
- Include actions that are defined as "special events" in that the Work may constitute exposing the general public to danger, inconvenience or risk.
- List of required submittals to complete the Work activity.
- Individual(s) and position(s) responsible for supervision of the Work.
- Planned start date of the Work, progress rate expected, and extended Work hours required.
- Prerequisite activities required.
- Include a hazard analysis for the scope of Work.
- Safety issues.
- Inspection and/or tests to be accomplished.

DRAFT

- Inspection Hold Points.
- Critical lifts

2.4.4.8 Pre-Activity Meetings

Design-Builder shall conduct pre-activity meetings with VPRA and Design-Builder's appropriate staff to review Design-Builder's approach to Work at least seven days prior to start of construction of new elements of Work. Design-Builder shall discuss the CWP at these pre-activity meetings.

2.4.4.9 Quality Checkpoints

Quality Check Points ("QCPs") have been established at stages of the construction progress that ensures Work is performed in accordance with Design Builder's Quality Plan and in compliance with the Contract Documents. As QCP's arise, Design Builder's Quality Manager and responsible QC staff shall meet with VPRA's authorized representative to review documentation and procedures for Quality Control, including Material certifications, daily inspection records, Material testing results, survey results, permits, and Material placement records. Design Builder's QC staff shall coordinate group members to ensure that QCPs are accomplished promptly so Design Builder is not delayed. When an identified QCP is accomplished and when notified by the QC staff, VPRA's representative will respond within four working hours to verify whether Work has been completed for the checkpoint. In conjunction with Design-Builder, VPRA may add or delete QCPs during Phase 2 construction.

QCPs will be established at the following stages of construction:

A) Environmental

1) After establishment of erosion and sediment control measures for defined earth disturbance area; and

2) At the end of each month to review weekly and post storm inspections.

B) Embankments

1) After completion of drainage and utility installations and prior to backfill.

2) After clearing, grubbing and excavation to check subgrade.

3) Per specifications for lift requirements and at intervals of embankment construction.

4) After completion of MSE wall panel placement; and

5) At completion of embankment placement to establish the settlement monitoring baseline.

C) Structures

1) At the completion of placement for bridge deck reinforcement and prior to placement of concrete.

2) At the completion of placement for abutment wall reinforcement and prior to placement of concrete.

3) After completion of pile driving at each structure support, including pile driving results and records.

4) At the completion of placement for footing reinforcement steel and prior to placement of concrete.

DRAFT

5) At the completion of excavation for drilled shaft foundations and prior to concrete placement.

6) After setting rails for screed machine and prior to placing concrete overlays.

7) After completion of the first component to receive specified aesthetic wall treatment/form liner and prior to proceeding with construction of subsequent components.

8) After completion of every 500 feet of noise wall posts and panels.

D) Utilities

1) After installation of direct burial ductbanks and prior to backfill operations.

2) For concrete encased ductbanks, after installation of conduits and prior to placement of concrete.

E) Paving, and Sidewalks

1) Before placement of each course above subgrade on permanent roadway components.

2) Before placement of each lift of asphalt or Portland Cement concrete.

3) Prior to placement of concrete for sidewalks.

2.4.4.10 Access and Testing

Representatives of agencies of the federal government and representatives of other agencies of Commonwealth of Virginia and District of Columbia shall have the right to oversight inspections of the Work to the same extent provided for VPRA and as required by Law.

Design-Builder shall provide safe access to the Work, its organization, and all Subcontractor and Supplier organizations to allow VPRA to carry out inspection and oversight activities. This will include the taking of samples for the purposes of testing, the examination of records, and interviews with personnel from Design-Builder's organization and all Subcontractor and Supplier organizations.

Design-Builder shall not use the results of oversight activities carried out by parties other than itself to be used as a substitute for its own quality activities.

2.4.4.11 Control of Nonconforming Product

2.4.4.11.1 General

Design-Builder shall establish and maintain documented procedures to ensure that product that does not conform to specified requirements is prevented from unintended use or installation. This control shall provide for identification, documentation, evaluation, segregation (when practical), and disposition of nonconforming product, and for notification to the functions concerned.

2.2.2.11.2 Review and Disposition of Nonconforming Product

Design-Builder shall define the responsibility for review and authority for the disposition of nonconforming product.

A nonconformance shall be defined as any condition in Equipment, Materials, or processes that does not comply with required plans, specifications, codes, standards, documentation, records, procedures, or the requirements of the Contract Documents that causes the Equipment, Materials, or processes to be unacceptable or indeterminate.

DRAFT

Nonconforming product shall be reviewed in accordance with documented procedures. It may be:

- Reworked to meet the specified requirements; or
- Rejected.

The procedures shall also address the disposition of nonconforming items and the steps necessary to verify that the nonconformances have been adequately addressed and that the item then be characterized as conforming. Repaired and/or reworked product shall be re-inspected in accordance with the Quality Plan and/or documented procedures.

2.4.4.11.3 Corrective and Preventive Action

Design-Builder shall establish and maintain documented procedures for implementing corrective and preventive action.

2.4.4.12 Final Inspection and Testing

Design-Builder shall jointly conduct all final inspection and testing with VPRA in accordance with the Contract Documents and the Quality Plan and/or documented procedures to complete the evidence of conformance of the finished Project to the Contract Documents. Design-Builder shall have documented procedures to ensure that the final observation and testing where applicable have been completed.

Records of final inspection and testing are required to verify that compliance with the Contract Documents has been achieved.

The Quality Plan and/or documented procedures for final inspection and testing shall require that all specified inspection and tests, including those specified either on receipt of product or in-process, have been carried out and that the results meet specified requirements.

DRAFT

EXHIBIT E

Performance and Payment Bonds

FORM OF PERFORMANCE BOND

BOND NO._____

PENAL SUM: $[●]

KNOW ALL MEN BY THESE PRESENTS, THAT:

WHEREAS, the Virginia Passenger Rail Authority ("Owner") has awarded to [●], a [●] duly organized and existing under the laws of the State of [●] ("Design-Builder") a contract ("Contract") for the [●] ("Project") dated [●]; and

WHEREAS, one of the conditions of the Contract is that Design-Builder provide this duly executed instrument ("Bond").

NOW THEREFORE, We, the undersigned Design-Builder and [●], a corporation duly organized and existing under and by virtue of the laws of the State of [●] and authorized to transact business as a surety within the Commonwealth of Virginia ("Surety"), are held and firmly bound unto Owner, as obligee, and its successors and assigns in the sum of [●], lawful money of the United States of America, for the payment of which, well and truly be made to Owner, Design-Builder and Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents. Any reference to the "Surety" in this Bond shall be read as a reference to the Co-Sureties and each of them on the basis of such joint and several liability.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

1. The Contract is hereby incorporated by reference herein as if said Contract were fully set forth herein. Initially capitalized terms not otherwise defined herein shall have the meanings set forth in the Contract.

2. If Design-Builder shall at all times promptly, and faithfully perform the Contract and any alteration in or addition to the obligations of Design-Builder arising thereunder in strict accordance with the terms and conditions of the Contract, including the matter or infringement, if any, of patents or other proprietary rights, and all guarantees and warranties, including the guarantee and warranty periods, established by the Contract, and comply with all of the covenants therein contained, in the manner and within the times provided in the Contract, and shall fully indemnify and save harmless Owner from all costs and damages which it may suffer by reason or failure so to do, and shall fully reimburse and repay Owner all outlay and expenses which it may incur in making good any default, and reasonable counsel fees incurred in the prosecution of or defense of any action arising out of or in connection with any such default, then Surety's obligations under this Bond shall be void; otherwise such obligations shall remain in full force and effect.

3. This Bond shall cover the cost to perform all the obligations of Design-Builder arising out of or required under the Contract, and the obligations covered by this Bond specifically include Design-Builder's liability for liquidated damages as specified in the Contract.

4. Whenever Design-Builder shall be, and is declared by Owner to be in default under the Contract, the Surety shall within thirty (30) days of receipt of a letter from Owner in the form set forth in Schedule A:

(a) remedy such default; or

(b) submit to Owner a proposed plan to procure a new contractor using a delivery method and process acceptable to Owner, and thereafter tender to Owner a proposed contract procured using the Owner-accepted procurement process for completion of the Contract by a contractor acceptable to Owner, secured by performance and payment bonds issued by a qualified surety, combined with payment to Owner of the amount of damages in excess of the remaining Contract balance incurred by Owner as a result of the default, including costs of completion; or

(c) waive the Surety's right to remedy such default or submit to Owner a proposed plan to procure a new contractor and with reasonable promptness under the circumstances, make payment of the full penal sum of the bond to Owner.

5. In the event that Surety disputes its liability under this Bond, which includes any allegations of fraud, such dispute shall be determined in the first instance in accordance with the dispute resolution process ("DRP") attached hereto as Schedule B. If Surety fails to make an election within the thirty (30) days set forth in paragraph 4 of this Bond, then the claim shall be deemed to be in dispute for purposes of this paragraph. A Decision, as defined in Schedule B, shall be rendered within thirty (30) days of the Adjudication Commencement Date, or as otherwise extended pursuant to the DRP. The Decision shall be binding on the Surety, Design-Builder, and Owner as to their respective rights and obligations under this Bond but subject to each party's right to commence a de novo appeal of the Decision to a court of competent jurisdiction at any time. The parties shall immediately begin to comply with the Decision and the terms of this Bond until the Final Completion Date under the Contract notwithstanding of, and during, any appeal de novo of the Decision and unless or until such time as a court of competent jurisdiction issues a final order or ruling vacating or modifying the Decision, either in whole or in part, at the conclusion of any de novo appeal of the Decision (the "Obligation to Comply with the Decision"). Surety's costs to fulfill its Obligation to Comply with the Decision is limited to the penal sum of the Bond.

6. The parties acknowledge that the Obligation to Comply with the Decision is of the essence of the Bond, and the parties agree that Surety's failure to fulfill its Obligation to Comply with the Decision will cause irreparable harm to Owner and Design-Builder. Accordingly, Surety waives and releases any right it may have to initiate any action in court seeking a stay of its obligations arising pursuant to the Decision or seeking a stay of enforcement of the Decision.

Surety's only recourse to court processes in connection with the Decision is to file for a de novo appeal of the Decision while continuing to fulfill its Obligation to Comply with the Decision. In any such de novo appeal or in any action seeking enforcement of the Decision, the Surety (a) waives any right to file for an interim stay of its obligations arising pursuant to the Decision or to seek a stay of enforcement of the Decision, (b) waives any right to object to or contest an action brought to enforce specific performance of Surety's obligations arising pursuant to the Decision and waives all defenses in such an action, and (c) consents to an order or ruling directing and requiring Surety to perform its obligations arising pursuant to the Decision, and that an action for such an order or ruling may be sought on an expedited (emergency) basis under the rules of the court. The parties' Obligation to Comply with the Decision does not alter any party's right to pursue a de novo appeal of the Decision in a court of competent jurisdiction.

7. On the day following the Final Completion Date ("Step-Down Date"), the Penal Sum of [●] shall automatically be reduced to [●], with the understanding that such reduced Penal Sum shall be the aggregate liability of the surety and shall only be applicable to any claims submitted, or suits, or actions brought, after the Step-Down Date. For the avoidance of doubt, the entire Penal Sum of [●] is subject to any claims submitted, or suits or actions brought, against the Bond prior to the Step-Down Date; *provided, however*, that notwithstanding anything to the contrary herein, Surety's aggregate liability hereunder shall in no event exceed the Penal Sum of [●].

8. Surety, for value received, hereby stipulates and agrees that no change, extension of time, alterations, additions, omissions or other modifications of the terms of the Contract, or in the Work to be performed with respect to the Project, or in the specifications or plans, or any change or modification of any terms of payment or extension of time for any payment pertaining or relating to the Contract, or any rescission or attempted rescission by Design-Builder of the Contract, or this Bond, shall in any way affect its obligations on this Bond, and Surety does hereby waive notice of such changes, extension of time, alterations, additions, omissions or other modifications.

9. Correspondence or claims relating to this Bond shall be sent to Surety at the following address: [●]

10. Schedules A and B are an integral part of this Bond and are specifically incorporated herein as if set out in full in the body of this Bond.

11. If any provision of this Bond is found to be unenforceable as a matter of law, all other provisions shall remain in full force and effect.

12. Any provision in this Bond which conflicts with applicable laws, regulations, and ordinances, shall be deemed modified to conform to applicable laws, regulations, and ordinances. This Bond shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia, without regard for conflicts of laws principles, and any action seeking enforcement of the Bond will be litigated exclusively in the courts of the Commonwealth of Virginia.

13. ***[Note: Use in case of multiple sureties ("Co-Sureties") or, otherwise, delete; If Co-Sureties are used, modify the preceding language accordingly to reflect this]*** The Co-Sureties agree to empower and designate a single "Lead Surety" with authority to act on behalf of all of the Co-Sureties with respect to this Bond, so that Owner will have no obligation to deal with multiple sureties hereunder. All correspondence from Owner to the Co-Sureties and all claims under this Bond shall be sent to the Lead Surety and shall be deemed served upon all Co-sureties. The Lead Surety may be changed only by delivery of written notice (by personal delivery or by certified mail, return receipt requested) to Owner designating a new Lead Surety, signed by all of the Co-Sureties. The initial Lead Surety is [●].

[*Signature Page Follows*]

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this _____ day of _____ 20____.

DESIGN-BUILDER (full legal name):
Address:

By: _____
Title:
Contact Name:
Phone: ( )

SURETY (full legal name):
Address:

By: _____
Title:
Contact Name:
Phone: ( )

[Note: Date of this Bond must not be prior to date of Contract.]

[Note: If more than one surety, then add appropriate number of lines to signature block.]

[Note: A copy of a certificate that the Surety (or Co-Sureties) is (are) authorized to transact business in Virginia must be attached.]

[Note: The Bond shall be signed by authorized persons. Where such persons are signing in a representative capacity (*e.g.*, an attorney-in-fact), but are not a members of the firm, partnership, or joint venture, or an officer of the legal entity involved, evidence of authority including the appropriate power of attorney documentation must be attached.]

SCHEDULE A
FORM OF DEMAND

Date

Re: Performance Bond No.: [___] (the "Bond")

Principal: [_____] (the "Principal")

Obligees: Virginia Passenger Rail Authority (the "Obligee")

Contract: The Design-Build Contract, dated [_____] between the Principal as Design-Builder and the Virginia Passenger Rail Authority for the [●] Project (the "Contract")

Dear Sir:

Pursuant to the Bond, the Obligee hereby certifies that:

1. the Principal is and continues to be in default of the Principal's obligations under the Contract;

2. the Obligee has issued a notice of default to the Principal in accordance with the provisions of the Contract; and

3. the Obligee has honored and will continue to honor and perform in all material respects its obligations under the Contract.

We hereby demand that the Surety honor its obligations under the Bond forthwith.

The Obligee acknowledges that if the Surety intends to dispute its liability pursuant to the Bond, then the parties shall proceed immediately with the DRP set forth in Schedule B.

Yours truly,

Virginia Passenger Rail Authority

By: _____
Name:
Title:

SCHEDULE B
DISPUTE RESOLUTION PROCESS

Given the on default nature of the Bond, the Principal, the Surety and the Obligee acknowledge that they may not agree whether the Surety is liable to perform or make payment pursuant to the Bond. To ensure that such disputes are determined quickly so as to allow for the orderly and timely completion of the Contract, the Principal, the Surety and the Obligee agree to submit such disputes to the dispute resolution process set out below. Terms not defined herein shall have the meaning ascribed to them in the body of the Bond. The parties acknowledge that any decision rendered in the dispute resolution process (an "Award") will be binding, but subject to appeal de novo by any party at any time to a court of competent jurisdiction.

1. "Dispute" means a disagreement as to the Surety's liability pursuant to the Bond following an Obligee's Demand.

2. Disputes arising out of or in connection with the Bond shall be submitted for binding resolution to adjudication (the "Adjudication") administered by JAMS – The Resolution Experts! ("JAMS") in accordance with the procedure set out below. The JAMS' Dispute Resolution Rules for Surety Bond Disputes, effective as of the effective date of the Bond shall apply to the resolution of any Dispute unless modified by the provisions herein, in which case, the provisions of this Bond shall govern.

3. The Surety or the Obligee shall demand Adjudication by filing an Adjudication statement electronically with JAMS, and serving electronic copies by email upon the Principal and the Obligee, utilizing the electronic forms and filing directions provided by JAMS on its website at www.jamsadr.com. The Adjudication statement shall set forth in detail the factual and legal issues submitted for Adjudication and shall be sent no later than 10 days following the Obligee's Demand.

4. Within three (3) Business Days after the Adjudication statement is filed and served, the parties shall appoint an adjudicator (the "Adjudicator") who shall be a panelist on the JAMS Global Engineering & Construction Panel ("JAMS GEC Panel") of dispute adjudicators. JAMS shall appoint an Adjudicator administratively from the JAMS GEC Panel if the parties fail to appoint an Adjudicator within the three day period. The Adjudicator shall be under a duty to act impartially and fairly and shall serve as an independent neutral.

5. The Adjudication shall commence on the date that JAMS receives the Adjudication statement and initial deposit of funds, and confirms the appointment of the Adjudicator (the "Adjudication Commencement Date"). Unless the Adjudicator decides otherwise, the Principal, the Surety and the Obligee shall pay the final fees and expenses of Adjudication in accordance with the provisions set forth in the Contract governing the payment of fees and expenses of dispute resolution. In an Adjudication in which the Adjudicator determines that the Principal and Surety are aligned with the same commonality of interest against the Obligee, the Principal and Surety jointly shall be charged with one share and the Obligee will be charged with one share. Should any party fail to deposit funds as required by JAMS, any other party

may advance the deposit, and the amount of that advance deposit will be taken into consideration in the Adjudicator's decision.

6. Upon commencement of the Adjudication, the Adjudicator is empowered to take the initiative in ascertaining the facts and the law, and to exercise sole discretion in managing the Adjudication process. Among other things, the Adjudicator may require the parties to make additional factual submissions such as sworn witness statements and business documents, may interview important witnesses after notice to the parties and affording opportunity to attend, may request and consider expert reports and may call for memoranda on legal issues. Notwithstanding the foregoing, the Adjudicator must decide the following questions:

   a. Is the Principal in default of the Principal's obligations under the Contract?

   b. Is the Surety liable to perform in accordance with Paragraph 4 and/or 5 of the Bond?

7. The Adjudicator shall issue a written decision (the "Decision") which shall be binding upon and enforceable by the parties through the completion of the Principal's obligations under the Contract, subject to any party's right to commence an appeal de novo in a court of competent jurisdiction at any time in accordance with the terms of the Bond. Any payment required in the Decision shall be made immediately. The Decision shall be issued through JAMS as soon as practicable but in no event later than thirty (30) calendar days of the Adjudication Commencement Date or within any later time agreed upon by the parties. Unless the parties agree otherwise, the Decision shall state reasons therefore and shall be admissible in later administrative, arbitral or judicial proceedings solely concerning Surety's liability pursuant to the Bond between the parties.

8. This 30 calendar day period also may be extended by the Adjudicator in its sole discretion up to 14 days in the event that JAMS has requested any party to make an additional fee and expense deposit and such funds have not been deposited as requested or advanced by another party.

9. Any party may request clarification of the Decision within five (5) business days after issuance, and the Adjudicator shall endeavor to respond within an additional five (5) business days, and, subject to any party's right to commence an appeal de novo in a court of competent jurisdiction at any time in accordance with the terms of the Bond. any payment shall be made immediately thereafter. Unless the parties agree otherwise, the Decision shall state reasons therefore and shall be admissible in later administrative, arbitral or judicial proceedings between the parties. The parties shall comply with the Decision, unless and until subsequently vacated or modified, through the completion of the Principal's obligations under the Contract.

10. Upon any settlement by the parties of the Dispute prior to issuance of a Decision, the parties shall jointly terminate the Adjudication. Such removal or termination shall not affect the parties' continuing joint and several obligations for payment to JAMS of unpaid fees and expenses.

If the Decision is that the Surety is liable to perform in accordance with Paragraphs 4 and 5 of the Bond, then notwithstanding the commencement of any appeal de novo of the Decision, the Surety shall perform in accordance with the Decision and with the terms of the Bond until the Principal's Obligations under the Contract are completed, but not to exceed the penal sum of the Bond**.**

FORM OF PAYMENT BOND

BOND NO._____

BOND AMOUNT: $[●]

KNOW ALL MEN BY THESE PRESENTS, THAT:

WHEREAS, the Virginia Passenger Rail Authority ("Owner") has awarded to [●], a [●] duly organized and existing under the laws of the State of [●] ("Design-Builder") a contract ("Contract") for the [●] Project ("Project") dated [●]; and

WHEREAS, one of the conditions of the Contract is that Design-Builder provide this duly executed instrument ("Bond").

NOW THEREFORE, We, the undersigned Design-Builder and [●], a corporation duly organized and existing under and by virtue of the laws of the State of [●] and authorized to transact business as a surety within the Commonwealth of Virginia ("Surety"), are held and firmly bound, jointly and severally, unto Owner, as obligee, and its successors and assigns, in the sum of [●], lawful money of the United States of America, for the payment of which, well and truly be made to Owner and Claimants, Design-Builder and Surety bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

1. The Contract is hereby incorporated by reference herein as if said Contract were fully set forth herein. Initially capitalized terms not otherwise defined herein shall have the meanings set forth in the Contract.

2. If Design-Builder shall: (a) make payments of all sums due to all persons and entities having a direct contract with Design-Builder, or a direct contract with a subcontractor having a direct contract with Design-Builder, for supplying labor, material, and/or supplies used directly or indirectly by Design-Builder in the prosecution of the Work provided in the Contract (such persons and entities hereinafter referred to collectively as "Claimants"); and (b) shall fully indemnify and save harmless Owner from all costs and damages which Owner may suffer by reason of Design-Builder's failure to fulfill its obligations to Claimants under clause (a) above, including but not limited to, fully reimbursing and repaying Owner reasonable counsel fees incurred as a result of any action arising out of or in connection with any such failure, then Surety's obligations under this Bond shall be void; otherwise such obligations shall remain in full force and effect.

3. All Claimants shall have a direct right of action only against Surety and Contractor under this Bond; *provided, however,* that no claim, suit or action shall be brought by any Claimant after the expiration of one (1) year following the date on which Claimant last performed labor or

last furnished or supplied materials to the Project. Any suit or action must be brought in a state or federal court of competent jurisdiction located in the Commonwealth of Virginia.

4. Any Claimant who does not have a direct contractual relationship with Contractor shall, as a condition precedent to bringing such claim, suit or action, provide written notice thereof to Contractor, Surety, and Owner, no later than ninety (90) days from the date Claimant last supplied labor or materials, stating with substantial accuracy the amount claimed, the name of the person for whom the work was performed or to whom the material was furnished, and the dates on which such labor or materials were supplied.

5. Surety shall, after receipt of reasonable notice to Surety of any claim, demand, suit or action brought against Owner by a Claimant, defend, with counsel approved by Owner, indemnify and hold harmless Owner from any and all claims, demands, suits or actions brought by any Claimant. Owner shall have a direct right of action against Surety and Contractor for any breach by Surety of its obligation to defend, indemnify and hold harmless Owner.

6. Surety, for value received, hereby stipulates and agrees that no change, extension of time, alterations, additions, omissions or other modifications of the terms of the Contract, or in the Work to be performed with respect to the Project, or in the specifications or plans, or any change or modification of any terms of payment or extension of time for any payment pertaining or relating to the Contract, or any rescission or attempted rescission by Contractor of the Contract, or this Bond, or any conditions precedent or subsequent in this Bond attempting to limit the right of recovery of Claimants otherwise entitled to recover under this Bond, shall in any way affect its obligations on this Bond, and Surety does hereby waive notice of such changes, extension of time, alterations, additions, omissions or other modifications.

7. Surety acknowledges that the amounts owed to Contractor under the Contract shall first be available for the performance of the Contract, including Owner's superior right to use the funds due for the completion of the Work, and then may be available to satisfy claims arising under this Bond. Owner shall not be liable for the payment of any costs or expenses or claims of any Claimant under this Bond and shall have no obligation to make payments to, or give notice on behalf of, any Claimant.

8. Any provision in this Bond which conflicts with applicable laws, regulations and ordinances shall be deemed modified to conform to applicable laws, regulations and ordinances.

9. Contractor or Owner shall furnish a copy of this Bond or permit a copy to be made upon request by any person or entity who may be a Claimant as defined above.

10. ***[Note: Use in case of multiple sureties ("Co-Sureties") or, otherwise, delete; If Co-Sureties are used, modify the preceding language accordingly to reflect this]*** The Co-Sureties agree to empower and designate a single, "Lead Surety" with authority to act on behalf of all of the Co-Sureties with respect to this Bond, so that Owner and Claimants will have no obligation to deal with multiple sureties hereunder. All correspondence from Owner and Claimants to the Co-Sureties and all claims under this Bond shall be sent to such designated Lead Surety and service of such correspondence or notice upon the Lead Surety shall constitute service upon all co-sureties. The Lead Surety may be changed only by delivery of written notice (by personal delivery or by

certified mail, return receipt requested) to Owner designating a single new Lead Surety, signed by all of the Co-Sureties. The initial Lead Surety shall be [●].

11. This Bond shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia, without regard for conflicts of laws principles, and any action seeking enforcement of the Bond will be litigated exclusively in the courts of the Commonwealth of Virginia.

[*Signature Page Follows*]

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this _____ day of _____ 20____.

DESIGN-BUILDER (full legal name):
Address:

By: _____
Title:
Contact Name:
Phone: ( )

SURETY (full legal name):
Address:

By: _____
Title:
Contact Name:
Phone: ( )

[Note: Date of this Bond must not be prior to date of Contract.]

[Note: If more than one surety, then add appropriate number of lines to signature block.]

[Note: A copy of a certificate that the Surety (or Co-Sureties) is (are) authorized to transact business in Virginia must be attached.]

[Note: The Bond shall be signed by authorized persons. Where such persons are signing in a representative capacity (*e.g.*, an attorney-in-fact), but are not a members of the firm, partnership, or joint venture, or an officer of the legal entity involved, evidence of authority including the appropriate power of attorney documentation must be attached.]

Exhibit F

Forms

FORM A

ACKNOWLEDGMENT OF RECEIPT OF RFQ, ADDENDA, AND RESPONSES TO QUESTIONS

_____
(Name of Respondent)

We hereby acknowledge receipt of RFQ No. 1-001-23-0001 for the North Package of the Long Bridge Project dated March 24, 2023, subsequent amendments, and responses to questions issued by VPRA.

Addendum No.	**Date Issued**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Response to Questions No.	**Date Issued**
_____	_____
_____	_____
_____	_____
_____	_____

_____ _____
(Signed) (Date)

_____
(Printed or Typed Name)

_____
(Title)

FORM B

RESPONDENT'S ORGANIZATION INFORMATION

RESPONDENT (INDIVIDUAL FIRM/JOINT VENTURE / PARTNERSHIP/OTHER)			
Name of Entity and State of Organization (if applicable): Address:			
NAME(S) OF ORGANIZATION MEMBER(S)			
Company Name	**Address/Phone & E-mail**	**State of Organization:**	**% Share of Equity Interest**
Principal Participant(s)			
Lead Designer			

Major Subcontractors and IDQM Firms

Company Name	Address/Phone & E-mail	State of Organization	Proposed Role / Specialty*
Major Subcontractor(s)			

IDQM Firm(s)			

*****For Major Subcontractors, describe the proposed scope of work that the Major Subcontractor would perform during Phase 2 in as much detail as possible. For the IDQM firm(s), identify whether the IDQM firm specializes in a specific technical discipline.

FORM C

LEGAL AND DISPUTES HISTORY

Name of Respondent: _____

Firm Name: _____

Provide the following information. Use additional pages as needed.

Legal Issues to be resolved:

Identify any legal issues that must be resolved by Respondent, any Principal Participant, the Lead Designer (if not a Principal Participant), IDQM firm(s), or Major Subcontractor(s) to permit Respondent to carry out its obligations if awarded the PDBA. If there are no such legal issues, affirmatively state that there are none.

Dispute Resolution Proceedings:

Provide a list of all litigation, arbitration, mediation, dispute review board or other alternative dispute resolution proceedings, each involving amounts in excess of $250,000 and related to performance in which any Principal Participant, Lead Designer (if not a Principal Participant) or other firms required to be identified by Section 4.1 has been involved during the past 5 years. Include all proceedings by project owners. State whether each proceeding was resolved against the firm or its insurers/sureties or resulted in reduction in compensation to the firm. Additionally, provide this information for any unresolved, outstanding proceedings

List	Owner Initiated Proceedings (Y/N)	Resolution/Outcome	Indicate if Unresolved or Outstanding	Current Owner Contact Name, Phone & E-mail.

Liquidated Damages:

Describe any assessment of liquidated damages against any Principal Participant over the past 5 years. Describe the causes/reasons for the assessment and the amounts assessed. Describe any outstanding damage claims by or damages due and owing to any owner/agency.

Project Name	Cause of Delay(s)	Amount Assessed	Describe Outstanding Damage Claims by Any Owner	Current Owner Contact Name, Phone & E-mail.

Termination for Cause:

Describe the conditions surrounding any contract (or portion thereof) entered into by any Principal Participant, Lead Designer (if not a Principal Participant) or other firm required to be identified by Section 4.1 over the past 10 years that has been terminated for cause, or which required completion by another party. Describe the reasons for termination and the amounts involved, and claims lost or won regarding the termination.

Project	Describe Reason for Termination	$ Amount Involved/ Claims Lost or Won	Current Owner Contact Name, Phone & E-mail.

Disciplinary Action:

Explain any disciplinary action taken against any Principal Participant, Lead Designer or other firm required to be identified by Section 4.1 within the past 5 years, including suspension from the right to propose/bid or removal from any Respondent/bid list.

Project	Describe Action Taken	Current Owner Contact Name, Phone & E-mail.

FORM D

PRINCIPAL PARTICIPANT AND LEAD DESIGNER CERTIFICATION

Complete for each Principal Participant and the Lead Designer.

1. Has the firm or any other officer or director thereof been indicted or convicted of bid, procurement, fraud or other contract related crimes or violations or any felony or serious misdemeanor within the past five years? If yes, describe.

2. Has the firm ever sought protection under any provision of any bankruptcy act? If yes, describe.

3. Has the firm ever been debarred or suspended from performing work for the federal government or any state or local government? If yes, describe.

(Must be signed by an authorized representative of each Principal Participant and the Lead Designer)

Firm: _____

By: _____

Title: _____

Name of Respondent: _____

Form E

CONFLICT OF INTEREST DISCLOSURE

Respondent Name: _____

Disclose any actual or potential conflict of interest under VPRA's Organizational Conflict of Interest Policy. If no actual or potential conflict of interest exists, state as such.

Authorized Signature*: _____

Date: _____

Subscribed and sworn to me this _____ day of _____ , 20__

Notary Public _____

My commission expires: _____

* If Respondent is not organized as an organization or is a Joint Venture, partnership, or any form of consortium, then an authorized representative of each Principal Participant must sign this Affidavit.

FORM F

SAFETY QUESTIONNAIRE

Respondent's Name: _____

Firm Name: _____

1. Provide the following information for the preceding three years:

Item	2020	2021	2022
Employee hours worked (Do not include non-work time, even though paid)			
Number of lost workday cases			
Number of restricted workday cases			
Number of cases with medical attention only			
Number of fatalities			
Average Total Recordable Injury/Illness Rate			
Average Lost Work Rate			

2. Are internal accident reports and report summaries sent to management? To what levels and how often?

Position	No	Yes	Monthly	Quarterly	Annually

3. Do you hold site meetings for supervisors? Yes _____ No _____

   How Often?

   Weekly _____ Bi-Weekly _____ Monthly _____ Less often, as needed _____

4. Do you conduct Project Safety Inspections? Yes _____ No _____

   By Whom? _____

   How Often?

   Weekly _____ Bi-Weekly _____ Monthly _____

5. Does the firm have a written Safety Program? Yes _____ No _____

6. Does the firm have an Orientation Program for new hires?

   Yes _____ No _____ If yes, what safety items are included?

7. Does the firm have a program for newly hired or promoted foremen?

   Yes _____ No _____ If yes, does it include instruction of the following?

Topic	Yes	No
Safety Work Practices		
Safety Supervision		
On-site Meetings		
Emergency Procedures		
Accident Investigation		
Fire Protection and Prevention		
New Worker Orientation		

8. Does the firm hold safety meetings which extend to the laborer level?

   Yes _____ No _____

   How often? Daily ____ Weekly ____ Bi-Weekly ____ Less often, as needed ____

9. Describe the firm's approach to safety training for employees, including how new hires are trained, when training is conducted for a project, and how often employees are required to attend safety training:

10. Provide the safety record on the last Project to which the indicated Key Personnel were assigned:

Key Person	Total hours worked by all employees on Project	Number of lost workday cases on Project	Number of restricted workday cases on Project	No. of cases with medical attention only on Project	No. of fatalities on Project
Project Manager					
Construction Manager					
Safety Manager					

11. OSHA Violations

Provide information on any Occupational Safety and Health Administration (OSHA) citations and assessed penalties against the Principal Participants for any violations of its safety or health regulations in the past five (5) years.

Citation/Incident Number	Description/Disposition

Submit a copy of OSHA Form 300a for each of the last three years.

FORM G

RECORD OF DBE PERFORMANCE

Name of Respondent: _____

Firm Name: _____

Provide the information requested below for projects completed within the years 2019, 2020, 2021, and 2022 where the firm was the prime contractor. For each Principal Participant, "prime contractor" includes all projects in which the entity performed greater than or equal to 30% of construction or held an equity interest greater than or equal to 30% of the entity overseeing or responsible for construction of the project. For any project where the DBE goal, if applicable, was not achieved, attach a maximum ½ page explanation.

Project Name	DBE Participation Goal (%), if applicable	DBE Participation Achieved (%)	Current Owner Contact (Name, Phone and E-mail)

Add additional sheets if necessary.

FORM H

PROJECT EXPERIENCE DESCRIPTION

Name of Respondent: _____

Firm Name (Entity that participated on the project): Project name, location, description, and nature of work for which company was responsible:
Describe the project, key risks, and challenges:
Name of Client (Owner/Agency, Contractor, etc.): _____ Address: _____ _____ Contact Name: _____ Telephone:_____ Owner's Project or Contract No.:_____ E-mail: _____ Initial Contract Value (US$): _____ Final Value (US$): _____ Percent of Total Work Performed by Company: _____ Commencement Date: _____ Planned Completion Date: _____ Actual Completion Date: _____ Amount of Claims: _____ Any Dispute Proceedings? Yes* __ No __ *If yes, describe on a separate sheet.

FORM I

KEY PERSONNEL

Name of Respondent: _____

Key Personnel Position	Name of Individual	Years of Experience	Education and Registrations	Employer Name	Reference Name, Title, Phone Number, and E-mail Address*
Project Manager		____ years managing similar projects ____ years of alternative delivery/early involvement experience			1. 2. 3.
Design Manager		____ years of managing or performing design for similar projects ____ years of managing or performing design for alternative delivery/early involvement projects			1. 2. 3.
Construction Manager		____ years managing construction of similar projects ____ years providing constructability reviews of designs ____ years of alternative delivery/early involvement experience			1. 2. 3.
Quality Manager		____ years of quality			1.

		management experience for similar projects			2. 3.
Independent Design Quality Manager Director		___ years of experience in the analysis and design of highways and bridge structures.			1. 2. 3.
Structures Design Manager		___ years of demonstrated experience in bridge engineering, design and analysis, including projects of similar size, type of work, and complexity as this Project. ____ years of alternative delivery/early involvement experience			1. 2. 3.
Geotechnical Design Manager		____ years of experience including planning and overseeing subsurface exploration programs for bridge structures and roadways, including projects of similar size, type of work, and complexity as this Project. ____ years of alternative delivery/early involvement experience			1. 2. 3.
Environmental Compliance		___ years overseeing environmental compliance			1.

Manager		for similar projects			2. 3.
Lead Cost Estimator		____ years preparing cost estimates for similar projects ____ years of alternative delivery/early involvement experience			1. 2. 3.
Lead Scheduler		____ years preparing construction schedules for similar projects ____ years of alternative delivery/early involvement experience			1. 2. 3.
Utility Coordinator		___ years managing utility work for similar projects ____ years of alternative delivery/early involvement experience			1. 2. 3.
Third-Party Coordinator		___ years with third-party coordination for similar projects ____ years of alternative delivery/early involvement experience			1. 2. 3.
Public Information Coordinator		___ years with public information management for similar projects			1. 2. 3.

Safety Manager		___ years managing safety for similar types of construction work			1. 2. 3.
Additional Value Personnel # 1		___ years of relevant experience			1. 2. 3.
Additional Value Personnel # 2		___ years of relevant experience			1. 2. 3.

*Provide at least two (2), but no more than three (3), references for each position.

KEY PERSONNEL COMMITMENT:

Respondent affirms that the Key Personnel identified above are available for the Project and will commit the time necessary to fulfill the duties and responsibilities of the Key Personnel position. In the event that any identified Key Personnel cannot meet such commitment, VPRA will be damaged. Due to the imprecise nature of the damages, Respondent, if chosen as the Design-Builder for the Project, may be subject to liquidated damages as provided in the Progressive Design-Build Agreement due to the failure to commit identified Key Personnel to the Project. Respondent may not substitute or remove identified Key Personnel throughout the duration of this procurement, except as otherwise specified in Section 4.5.1 of the RFQ. The following must be signed by an authorized representative of Respondent. If Respondent has not been formed as of the date of submission of the SOQ or is a consortium, partnership or any type of Joint Venture, an authorized representative of each Principal Participant must sign below. Use additional forms as necessary.

By: _____

Name: _____

Title: _____

Entity Name: _____

FORM J

PHASE 1 SUBCONTRACTOR INFORMATION

Name of Respondent: _____

List of all known Subcontractors that will perform work during the Phase 1 Services, other than the Lead Designer and IDQM.

SUBCONTRACTOR NAME	ADDRESS AND PHONE NUMBER	WORK PLANNED FOR THE PROJECT

FORM K

AFFIDAVIT OF NON-COLLUSION

I swear (or affirm) under the penalty of perjury:

1. That I am the Respondent (if the Respondent is an individual), a partner in the partnership (if the Respondent is a partnership), an equity member of the Respondent (if the Respondent is a joint venture), or an officer or employee of the Respondent corporation having authority to sign on its behalf (if the Respondent is a corporation);

2. That the attached SOQ submitted in response to the Long Bridge North Package Project Progressive Design Build Request for Qualifications has been arrived at by the Respondent independently and has been submitted without collusion with and without any agreement, understanding or planned common course of action with, any other provider of materials, supplies, equipment or services described in the RFQ, designed to limit fair and open competition;

3. That the contents of the SOQ have not been communicated by the Respondent or its employees or agents to any person not an employee or agent of the Respondent and will not be communicated to any such persons prior to the SOQ due date; and

4. That I am fully informed regarding the accuracy of the statements made in this affidavit.

Authorized Signature[†]: _____

Date: _____

Respondent's Firm Name:

Respondent's Federal Employer Identification Number:
_____

(Number used on Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941) (if Respondent does not have an EIN, then the EIN for each Principal Participant)

[†] If Respondent is not organized as an organization or is a Joint Venture, partnership, or any form of consortium, then an authorized representative of each Principal Participant must sign this Affidavit.

Subscribed and sworn to me this _____ day of _____ , 20__

Notary Public _____

My commission expires: _____

FORM L

LOBBYING CERTIFICATE

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) **No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned**, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of **ANY** Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.

(2) **If any funds other than Federal appropriated funds have been paid or will be paid** to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with **THIS** Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions [as amended by "Government-wide Guidance for New Restrictions on Lobbying," 61 Federal Regulations 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, et seq.)].

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. §1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each expenditure or failure.]

The Respondent/Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Respondent/Contractor understands and agrees that the provisions of 31 U.S.C. §3801, et seq., apply to this certification and disclosure, if any.

Date: _____

Company Name: _____

Signature: _____

Name: _____
(Print)

Title: _____

NOTE: CONTRACTORS ARE REQUIRED PURSUANT TO FEDERAL LAW, TO INCLUDE THE ABOVE LANGUAGE IN SUBCONTRACTS OVER $100,000 AND TO OBTAIN THIS LOBBYNG CERTIFICATE FROM EACH SUBCONTRACTOR BEING PAID $100,000 OR MORE UNDER THIS CONTRACT.

FORM M

RESPONDENT'S CLARIFICATION REQUEST

Respondent's Name: _____

RFQ Section No. or Form	Question	Reserved for VPRA Response

FORM N

PROPRIETARY/CONFIDENTIAL INFORMATION IDENTIFICATION

NAME OF RESPONDENT: _____

Pursuant to Va. Code § 33.2-299.7, Respondents may request VPRA to keep confidential trade secrets or confidential proprietary information, not publicly available, provided by a private person or entity pursuant to a promise of confidentiality where if such information were made public, the financial interest of the private person or entity could be adversely affected.

For such information to be excluded from disclosure requirements under the Virginia Freedom of Information Act, Respondent shall make a written request to VPRA:

(1) invoking such exclusion upon submission of the data or other materials for which protection from disclosure is sought;

(2) identifying the data or other materials for which protection is sought; and

(3) stating the reasons why protection is necessary.

The written notice must specifically identify the data or materials to be protected including the section of the SOQ in which it is contained and the page numbers, and state the reasons why protection is necessary. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. In addition, a summary of proprietary information submitted shall be submitted on this form. The classification of an entire SOQ document as proprietary or trade secrets is not acceptable. VPRA will make the final determination of the appropriate scope and nature of the protection afforded to the requested records.

SOQ SECTION/TITLE	PAGE NUMBER(S)	REASON(S) FOR WITHHOLDING FROM DISCLOSURE

APPENDIX 1

Definitions

Defined terms used in this RFQ have the following meanings:

Affiliate	With respect to an entity referenced in this RFQ: a) Any Person that directly or indirectly controls, or is controlled by, or is under common control with, such entity; and b) Any other Person that owns 20% or more of the entity's equity interest.
Allowance	An amount of compensation established by VPRA available to fund a specific Project risk or risks enumerated within the PDBA, which compensation is only available to Design-Builder if such enumerated risk or risks actually materialize on the Project, and otherwise which compensation goes unearned by Design-Builder.
Authorities Having Jurisdiction (AHJ)	Third party agencies that have jurisdiction over any portion of the Project.
Binding Construction Price Proposal	Design-Builder's binding submission of a proposed Construction Price and Construction Schedule to perform the Phase 2 Services, which is then reviewed and negotiated with VPRA.
Commonwealth	The Commonwealth of Virginia.
Construction Cost Estimate	Design-Builder's submission of estimates of the Construction Price to perform the Phase 2 Services, including the Opinion of Probable Construction Cost, Binding Construction Price Proposal, and Final Construction Price Proposal.
Construction Price	The negotiated lump-sum price to perform the Phase 2 Services under a Phase 2 Amendment.
Construction Price Negotiations	The process of VPRA's and Design-Builder's negotiation of the Construction Price, including comparison of the Construction Cost Estimates to the ICE's estimates and the reconciliation of differences in price. Construction Price Negotiations include negotiation of the Construction Schedule.
Construction Quality Plan	Design-Builder's plan for Quality Control of the Construction Work.
Construction Schedule	Design-Builder's schedule for performance of the Construction Work.
Construction Work	The efforts and services necessary to construct the Project.
Contract Documents	The documents that will comprise the entirety of Design-Builder's and VPRA's obligations with respect to the Project, including the PDBA and Technical Provisions.
Design	The design of the Project.
Design Quality Plan	Design-Builder's plan for quality management of the Design.
Design-Builder	The Person selected pursuant to the RFP, which enters into the PDBA with VPRA to perform the Phase 1 Services and, subject to successful Construction Price Negotiations, the Phase 2 Services.

Designated Contact	The individual designated by a Respondent as the point of contact for communications with VPRA during the procurement.
DOT Component	The division, office, or mode within the USDOT awarding Federal financial assistance. This includes the FTA and FRA.
Early Work	Construction Work that is negotiated separately from the overall Construction Work and may be performed by Design-Builder prior to agreement on a Construction Price for the entirety of the Phase 2 Services.
Evaluation Team	The individuals who will perform the evaluation and scoring of SOQs and Proposals.
Final Acceptance	Completion of the Project by Design-Builder in compliance with the Contract Documents and VPRA's acceptance of the Project in full, other than the obligations of Design-Builder that extend beyond Project completion.
Final Construction Price Proposal	The Binding Construction Price Proposal submitted by Design-Builder at VPRA's request containing the agreed-upon lump sum Construction Price and Construction Schedule to perform the Phase 2 Services and the terms and conditions of the Phase 2 Amendment.
Final Design	All design and engineering services to complete the design of the Project and receive RFC disposition of all design packages.
Guarantor	A Person that guarantees the financial and performance obligations of Design-Builder.
Independent Cost Estimator (ICE)	A Person that prepares an independent cost estimate of the cost to perform the Phase 2 Services.
Independent Design Quality Manager (IDQM)	An engineering firm with no contractual relationship with the Lead Designer or any subconsultant to the Lead Designer, retained by the Design-Builder to review design elements, as specified in greater detail in this RFQ.
Independent Quality Assurance (IQA)	All actions performed by VPRA to verify that the Design complies with the Contract Documents, including review and comment on the Design, working with the Design-Builder and IDQM to resolve design comments, and other checks VPRA performs on the Design.
Joint Venture	A combination of two or more Persons for the purposes of undertaking the design and construction of the Project. A Joint Venture is not, itself, a distinct business entity, but may be comprised of a combination of business entities and/or individuals. If a Joint Venture is the successful Proposer, then joint venturers must each be a signatory to the PDBA, and must agree to be jointly and severally liable for the performance thereof.
Key Personnel	The individuals specified in Section 4.5.1 of this RFQ.
Lead Designer	The firm that leads the team performing the Design of the Project. A Lead Designer may be either a Principal Participant or Subcontractor.
Major Subcontractor	The firms described in Section 4.5.2 of this RFQ and the only Subcontractors (other than the Lead Designer and IDQM firms) that may be identified in the SOQ to perform work during the Phase 2 Services.

North Package	The northern portion of the Long Bridge project, as described in greater detail in the RFQ. The North Package is the work that is the subject of this procurement.
Open Book	Design-Builder's provision of information, including pricing, that shows all assumptions, data, and other substantiation supporting the information presented and that allows VPRA to check and verify the accuracy of the material presented. For cost estimates, this entails the provision of all information that Design-Builder used to develop the cost under consideration, including labor, fringe benefits, equipment, materials, productivity, schedule, phasing, estimating factors, allowances, risk, contingency, indirect costs, discount rates, interest rates, inflation, insurance, bonding, fees, overhead, profit, and other items that comprise the cost.
Opinion of Probable Construction Cost	A non-binding cost estimate to perform the Phase 2 Services prepared by the Design-Builder, which shall be based on the preliminary engineering information provided by VPRA and submitted within 90 days after Design-Builder commences the Phase 1 Services.
Organizational Conflict of Interest Policy	VPRA's policy governing conflicts of interest, as described further in Section 1.6 of the RFQ.
Person	Any individual, firm, corporation, company, joint venturer, voluntary association, partnership, trust, or unincorporated organization, or combination thereof.
Phase 1	The first phase of the Progressive Design-Build process, during which the Design-Builder performs the Phase 1 Services and the Construction Price Negotiations.
Phase 1 Services	The services that the Design-Builder will perform during Phase 1 of the Project, which includes the Design of the Project and the additional preconstruction services, as further detailed in Exhibit C.
Phase 2	The second phase of the Progressive Design-Build process, during which the Design-Builder performs the Phase 2 Services. Phase 2 is contingent on VPRA's execution of a Phase 2 Amendment to the PDBA.
Phase 2 Amendment	An amendment to the PDBA that adds all or a portion of the Phase 2 Services to the Design-Builder's scope of work.
Phase 2 Services	The remaining Final Design work necessary to receive RFC disposition for all design packages, together with the Construction Work (but excluding any Early Work).
Point of Contact (POC)	VPRA's single point of contact for the procurement of this Project, identified in Section 1.4 of this RFQ.
Principal Participant	Any of the following entities: the Respondent; individual firms (e.g., corporation, limited liability company, limited liability partnership), general partners, or Joint Venture members of the Respondent; and/or; all Persons and legal entities holding (directly or indirectly) a 15% or greater beneficial or ownership interest in the Respondent.

Procurement Rules	The rules of procurement adopted by VPRA that govern VPRA's procurements, available at: Procurement-Rules.pdf (vapassengerrailauthority.org)
Procurement Schedule	The schedule for this procurement detailed in Section 2.1 of this RFQ.
Progressive Design-Build (PDB)	A method of procurement and project delivery in which VPRA procures a single entity to perform Phase 1 Services, and, subject to successful Construction Price Negotiations, Phase 2 Services.
Progressive Design-Build Agreement (PDBA)	The written agreement executed between VPRA and the Design-Builder containing the terms and conditions governing the Work and all attachments thereto.
Project	The North Package of the Long Bridge project.
Proposal	The response to the RFP submitted by a Proposer.
Proposer	A design-build entity that submits a Proposal in response to the RFP. Where context dictates, Proposer shall also mean a potential Proposer.
Quality Acceptance ("QA")	For the Design, all services provided by the IDQM to verify conformance of the Design with the Contract Documents and the resolution of comments on the Design. For Construction Work, all planned and systematic actions performed by VPRA to ensure that all Work complies with the requirements of the Contract Documents and that all materials incorporated in the Work, all equipment used, and all elements of the Work will perform satisfactorily for the purpose(s) intended. Actions include specification reviews, document control reviews, and working plan reviews; construction inspection; materials sampling and testing at the production site and the Project site; oversight of manufacturing/processing facilities and equipment; oversight of on-site equipment; calibration of test equipment; acceptance or rejection of material; and documentation of all activities.
Quality Control ("QC")	The total of all activities that are performed by the production staff of the Design-Builder, Lead Designer, Subcontractors, producer, or manufacturer to ensure the Work meets the requirements of the Contract Documents. QC may include design reviews and checks; inspection of material handling and construction; calibration and maintenance of sampling and testing equipment; working plan review; document control; production process control; any inspection, sampling, and testing done for these purposes; and documentation of QC activities.
Quality Plan	Design-Builder's plan detailing its approach to design and construction quality management for the Work. The Quality Plan consists of the Design Quality Plan and Construction Quality Plan.
Release for Construction (RFC)	VPRA's acceptance of a design submission by the Design-Builder that allows the Design-Builder to construct only the design submission for which RFC disposition is provided. "Acceptance" for purposes of an RFC disposition is subject to the definition to be provided in the PDBA and is without prejudice to VPRA's rights with

	respect to work that does not comply with the Contract Documents. Acceptance may also entail acceptance by third-parties with the right to review design submissions.
Request for Proposals (RFP)	The request for the submission of Proposals by Shortlisted firms interested in serving as Design-Builder for the Project.
Request for Qualifications (RFQ)	This request for the submission of Statements of Qualification from entities interested in serving as Design-Builder for the Project.
Respondent	A design-build entity that submits a SOQ in response to this RFQ. Where dictated by context, Respondent shall also mean potential Respondent. A Respondent may only be a full team or entity capable of performing all services necessary to design and construct the Project.
Shortlist	The shortlist of Respondents named after evaluation of the SOQs submitted in response to this RFQ.
South Package	The southern portion of the Long Bridge project that will be separately procured and delivered.
Statement of Qualifications (SOQ)	The submission by a Respondent in response to this RFQ.
Subcontractor	A firm under contract with the Design-Builder or another Subcontractor to perform a specified portion of the Work. Subcontractor includes firms under contract at any tier to perform a specified portion of the Work.
Tangible Net Worth	The difference between the (i) the sum of paid-in capital stock plus preferred stock plus retained earnings, less (ii) the sum of treasury stock plus minority interest plus intangible assets, including goodwill, patents, and licenses, all determined in accordance with Generally Accepted Accounting Principles and as interpreted by the Securities and Exchange Commission in connection with financial statements filed pursuant to the Securities Exchange Act of 1934.
Technical Provisions	The portion of the Contract Documents that contains the technical requirements for the Project, including the performance-based and prescriptive specifications. The Technical Provisions include the design requirements provided with the RFP and the final version of the Technical Provisions developed as part of the Phase 1 Services and included in the Contract Documents with the Phase 2 Amendment.
Tri-Party Agreement	The agreement executed by VPRA, the Design-Builder, and the Lead Designer that grants VPRA the right to negotiate a contract with the Lead Designer to complete the Project's design (and other related services) if VPRA decides not to execute a Phase 2 Amendment with Design-Builder.
VPRA Website	VPRA's website on which VPRA posts information about its ongoing procurements, accessible at: https://vapassengerrailauthority.org/working-with-us/procurement/
Work	The efforts and services to be provided by the Design-Builder to complete its obligations under the Contract Documents. Where dictated by context, Work may refer to the Phase 1 Services, the Phase 2 Services, or both.

Work Product	All materials and information generated by or on behalf of Design-Builder in the performance of and to perform the Work.

APPENDIX 2

Representative List of Material Changes

List of Representative Material Changes:

(a) An event of default or bankruptcy involving the affected entity, or an entity directly or indirectly controlling of the affected entity;

(b) A change in Tangible Net Worth of 10% or more of shareholder equity;

(c) A sale, merger or acquisition exceeding 10% of the value of shareholder equity prior to the sale, merger or acquisition that in any way involves the affected entity or an entity directly or indirectly controlling the affected entity;

(d) A downgrade in credit rating for the affected entity or an entity directly or indirectly controlling the affected entity;

(e) Non-payment of any debt service when due;

(f) Inability to meet material conditions of loan or debt covenants by the affected entity or an entity directly or indirectly controlling the affected entity, which has required or will require a waiver or modification of agreed financial ratios, coverage factors or other loan stipulations, or additional credit support from shareholders or other third parties;

(g) In the current and three most recently completed fiscal years, the affected entity or an entity directly or indirectly controlling the affected entity either: (i) incurs a net operating loss; (ii) sustains charges exceeding 5% of the then shareholder equity due to claims, changes in accounting, write-offs or business restructuring; or (iii) implements a restructuring/reduction in labor force exceeding 10% of the workforce or involves the disposition of assets exceeding 10% of the then shareholder equity; or

(h) Other events known to the affected entity that represent a material change in financial condition over the past three fiscal years or may be pending for the next fiscal year.