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

Appendix B5:

Maryland Avenue SW to L'Enfant Interlocking Clearance Assessment

Long Bridge Project

Environmental Impact Statement (EIS)

Maryland Avenue SW to L'Enfant Interlocking Clearance Assessment

September 6, 2018

District Department of Transportation

U.S. Department of Transportation
Federal Railroad Administration

Long Bridge Project EIS

Maryland Avenue SW to L'Enfant Interlocking Clearance Assessment

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1.0 Executive Summary

The Federal Railroad Administration (FRA), jointly with the District Department of Transportation (DDOT), is preparing an Environmental Impact Statement (EIS) in accordance with the National Environmental Policy Act (NEPA) for the Long Bridge Project (Project).[1] The Project consists of proposed improvements to the Long Bridge and related railroad infrastructure located between the RO Interlocking near Long Bridge Park in Arlington, Virginia, and the L'Enfant (LE) Interlocking near 10th Street SW in the District (collectively, the Long Bridge Corridor, as shown on the Location Map in **Appendix A** of this report).

The existing two-track Long Bridge Corridor is owned and operated by CSX Transportation (CSXT), a Class I freight railroad, and serves freight (CSXT), intercity passenger (Amtrak), and commuter rail (VRE). Maryland Area Regional Commuter (MARC) rail, which currently terminates at Union Station in the District, has plans to expand into the corridor. Norfolk Southern, also a Class I freight railroad, has trackage rights on the Long Bridge, but does not currently exercise those rights. CSXT, Amtrak, VRE, MARC, and Norfolk Southern are railroad stakeholders of the Project.

Throughout the southern limits of the Long Bridge Corridor, 15 feet track spacing is being proposed with 9 feet or greater lateral clearance to structures to meet minimum design standards as defined by the corridor owner and operator, CSXT. Between Maine Avenue SW and L'Enfant Interlocking, several bridges and retaining walls present significant obstacles to meeting these standards and would require extensive structural modifications to the bridges, buildings, and walls with major impacts to local roads, business, and public and private properties.

The purpose of this report is to provide an assessment of the existing and proposed horizontal within this segment of the project to determine the feasibility of various four-track alignment options between the north end of Maine Avenue and L'Enfant Interlocking using the Plate-H clearance envelope (See **Figure 1-2**). The placement of the tracks for each option are referenced with respect to the four spans under the Maryland Avenue SW overbuild as identified in **Figure 1-1**.

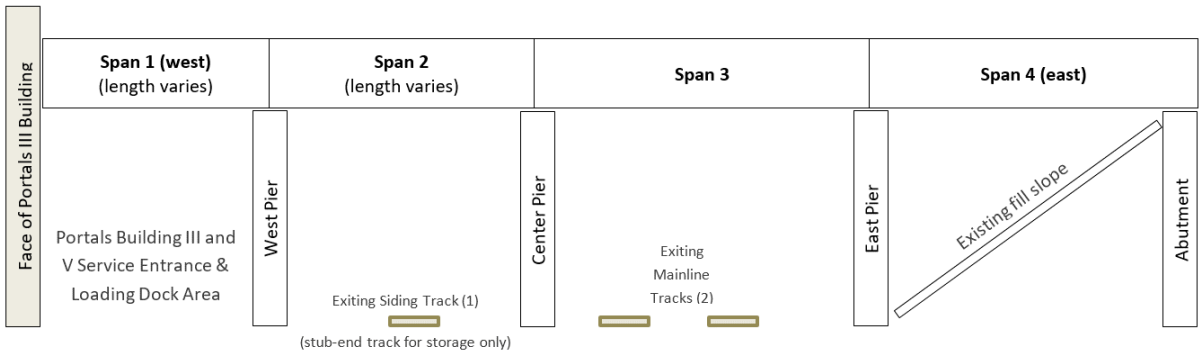
The existing conditions and five options evaluated are as follows:

- **Existing Conditions** – two mainline tracks spaced at 13 feet on center in Span 3.
- **Option 1** – four tracks spaced at 15 feet on center with two each in Span 2 and 3.
- **Option 2** – four tracks at 13 feet on center with one track in Span 2 and three tracks in Span 3.
- **Option 3** – two tracks spaced at 12.5 feet in Span 2 and two tracks spaced at 15 feet in Span 3.
- **Option 4** – one track each in Span 1 and 2 with two tracks spaced at 15 feet in Span 3.
- **Option 5** – two tracks spaced at 13 feet in Span 2 and two tracks spaced at 15 feet in Span 3.

Lateral clearance assessments along with potential structural implications were assessed at Maryland Avenue SW, 12th Street SW, 12th Street Expressway, and L'Enfant Plaza.

[1] Note that "RO" is the proper name of this interlocking. It is not an acronym.

Figure 1-1 | Existing Maryland Avenue Bridge (looking north)



During the completion of this analysis, multiple meetings were held with CSXT, Amtrak, VRE, and the Virginia Division of Rail & Public Transportation (DRPT) to discuss the assessment approach and initial results. During these discussions, CSXT requested their minimum 15 feet track spacing design standard be maintained for freight tracks. However, CSXT, Amtrak, VRE, and DRPT operators all agreed and requested the analysis to evaluate 13 feet spacing for passenger tracks. In addition, CSXT, Amtrak, and VRE all indicated that a minimum of 8.5 feet lateral clearance should be maintained.

The clearance assessment report and summary matrix discuss the analysis of the five options that the have been evaluated. Challenges include the construction durations, impacts to adjacent structures, and the escalated project cost that would result from each of the other four options in the report and matrix. Based on the five design options for the Maryland Avenue area, Option 2 (13-feet track spacing and a minimum of 8.5-feet horizontal clearances) meets the project's requirements to fit four tracks underneath and adjacent to existing buildings, occupied buildings, and retaining walls with minimal or no significant obstacles. The Option 2 dimensions outlined in the report have been identified as the minimum acceptable geometry by current operators and support letters have been received from Amtrak, VRE, and DRPT, which are included in the attached Report appendix. Additionally, proceeding with any other option than Option 2 presents a significant risk to public finance for the project.

Additional support information to advance the design exception request for Option 2 track spacing and minimum horizontal clearances over this segment of the project is detailed below:

- Reference Section 2.6 Horizontal Geometry of the Project Basis of Design (BOD) Report.
- Applying BOD criteria and implementing Option 1 would result in extensive impacts to railroad operations, adjacent property owners, and adjacent public and private transportation and utility infrastructure resulting in construction costs and durations well beyond the scope of this project, which would most likely result in a termination of the project as currently envisioned.
- Option 2 provides track spacing and clearances that meet existing conditions and result in no structural modifications required for the bridges or walls from Maryland Ave SW through the L'Enfant Interlocking segment of the project.
- Benefits of exception include significantly reduced impacts and costs while meeting the Project's Purpose and Need criteria within available funding thresholds.
- Graphical representation of each option are provided in the plan sheets as an appendix to the report

- Order-of-Magnitude cost savings between Option 1 and 2 for structural modifications to bridges and walls is estimated at $250,000,000 and is provided in **Table 1-1**. This high-level planning estimate is for comparison purposes only without any detailed engineering completed or property owner input received and has been prepared using an analogous estimating method comparing square foot costs and percentages of past projects to determine an estimated order-of-magnitude cost. Due to the lack of design at this stage, care should be taken to properly understand the potential variability of these costs.

Table 1-1 provides a summary of the track spacing, lateral clearances, and impacts associated with each option and the subsequent sections of this report to follow describe the existing conditions and proposed impacts in more detail. Conceptual plans are located in **Appendix B** of this report to further depict the existing and proposed conditions for the various options. Based on maintaining the minimum 13 feet track spacing and 8.5 feet lateral clearance thresholds, Options 3 and 4 fall below these criterion as shown in **Table 1-1**.

Table 1-1| Clearance Assessment Matrix

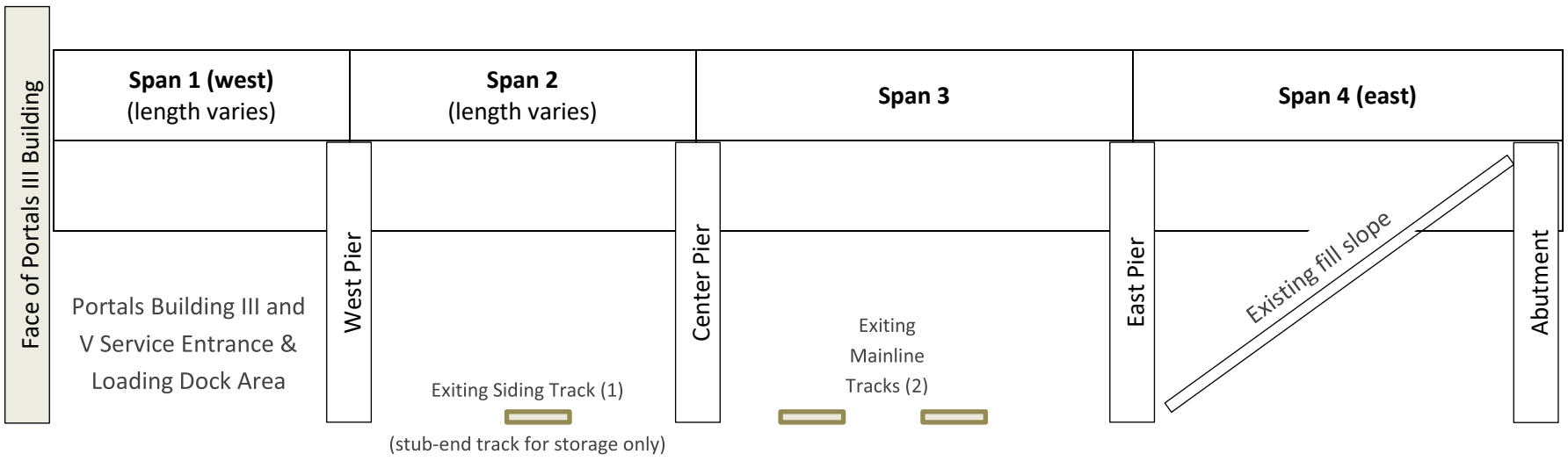
Configuration	Number of tracks in each span below MD Avenue SW Overbuild Bridge (see diagram this sheet)			Track Spacing		Lateral Clearance		General Notes	Construction Duration for Structural Components (only) (see Note 1)	Order of Magnitude Estimate (for structural improvements) (see note 2)
	Span 1	Span 2	Span 3	Freight (ft)	Passenger (ft)	Freight (ft)	Passenger (ft)			
Existing Condition	0	1	2	13		8.5		• Existing track conditions	NA	NA
Option 1	0	2	2	15		9.0		• Track spacing and lateral clearance at preferred minimums for all operators • Relocate approximately 720 ft. length of west and center piers along MD Avenue SW • Replace approximately 720 ft. of MD Ave bridge superstructure spans on each side of piers being relocated • Closes Maryland Avenue SW (private road) for approximately 6 months • Maryland Avenue SW (private road) lane closures for approximately 30 months • Replace 12th St SW bridge & 12th St Expressway bridge using phased construction one lane at a time • Replace approximately 200 ft. of retaining walls from MD Avenue SW to L'Enfant • Significant access impacts to 25+ businesses along street frontage, many without alternate public access • Relocate approximately 75 ft. of retaining wall at Portals V • Extended road closures and mobility impacts for all users on MD Ave SW, 12th St SW, 12th St Expressway • Anticipated major multi-year mobility impacts to surrounding street networks for all users • Major impacts to rail operations during construction	66 months	$250M
Option 2	0	1	3	13		8.5		• Track spacing and lateral clearance acceptable to passenger operators. • No impacts to Maryland Avenue SW, 12th St SW bridge or 12th St Expressway bridge • No access limitations to businesses along street frontage • Minor impact to Portals V property at retaining wall • No anticipated surrounding street network impacts • No impacts to rail operations during construction	0 months	$0
Option 3	0	2	2	15	12.5	9.0	8.0	• Track spacing and lateral clearance undesirable to all operators • Relocate approximately 490 ft. length of west and center piers along MD Avenue SW • Replace approximately 490 ft. of MD Ave bridge superstructure spans on each side of piers being relocated • Replace 12th St SW bridge using phased construction one lane at a time • Replace approximately 100 ft. of retaining walls from MD Avenue SW to L'Enfant • Significant access impacts to 12+ businesses along street frontage, many without alternate public access • Relocate approximately 75 ft. of retaining wall at Portals V • Extended road closures and mobility impacts for all users on MD Ave SW & 12th St SW • Anticipated multi-year mobility impacts to surrounding street networks for all users • Impacts 4,200 SF of Portal V parking lot & service entrances • Moderate impacts to rail operations during construction **Does not meet minimum 13 ft. spacing or 8.5 ft. clearance*	50 months	$110M

Note 1: Construction duration is estimated for completion of structural work exclusive to the Maryland Avenue SW overbuild, 12th Street SW bridge, 12th Street SW Expressway bridge, and retaining walls only, which in some cases requires extensive sequencing of track, roadway, and bridge activities take place sequentially rather than in parallel to minimize combined traffic network impacts with multiple road closures.

Note 2: The order-of-magnitude cost estimates for the structural improvements are for comparison purposes only without any detailed engineering completed or property owner input received and has been prepared using an analogous estimating method comparing square foot costs and percentages of past projects to determine an estimated order-of-magnitude cost. Due to the lack of design at this stage, care should be taken to properly understand the potential variability of these costs for a selected option.

Table 1-1| Clearance Assessment Matrix

Configuration	Number of tracks in each span below MD Avenue SW Overbuild Bridge (see diagram this sheet)			Track Spacing		Lateral Clearance		General Notes	Construction Duration for Structural Components (only) (see Note 1)	Order of Magnitude Estimate (for structural improvements) (see note 2)
	Span 1	Span 2	Span 3	Freight (ft)	Passenger (ft)	Freight (ft)	Passenger (ft)			
Option 4	1	1	2	15	NA	9.0	*7.25*	• Track lateral clearance undesirable to all operators • Relocate approximately 400 ft. length of west piers along MD Avenue SW • Replace approximately 400 ft. of MD Ave superstructure spans on each side of west pier being relocated • Replace 12th St SW bridge & 12th St Expressway bridge using phased construction one lane at a time • Replace approximately 200 ft. of retaining walls from MD Avenue SW to L'Enfant • Significant access impacts to 12+ businesses along street frontage, many without alternate public access • Relocate approximately 100 ft. of retaining wall at Portals V • Extended road closures and mobility impacts for all users on MD Ave SW & 12th St SW • Anticipated multi-year mobility impacts to surrounding street networks for all users • Operates passenger trains below new Portal V terrace • Impacts 13,200 SF of Portal V parking lot, requires alternative Portals III and V service road, reconstructs 4,500 SF of Portal V residence entrance, reconstructs Portals III foundation and walls • Moderate impacts to rail operations during construction **Does not meet minimum 13 ft. spacing or 8.5 ft. clearance*	48 months	$100M
Option 5	0	2	2	15	13	9.0	8.5	• Track spacing and lateral clearance acceptable to passenger operators • Relocate approximately 700 ft. length of west and center piers • Replace approximately 700 ft. of the superstructure spans on each side of the pier segment being relocated • Maryland Avenue SW (private road) lane closures for approximately 36 months • Replace 12th St SW bridge using phased construction one lane at a time • Replace approximately 100 ft. of retaining walls from MD Avenue SW to 12th ST Expressway • Significant access impacts to 12+ businesses along street frontage, many without alternate public access • Relocate approximately 75 ft. of retaining wall at Portals V • Extended road closures and mobility impacts for all users on MD Ave SW & 12th St SW • Anticipated major multi-year mobility impacts to surrounding street networks for all users • Major ROW impacts Portal III & Portals V buildings, service entrance & docks • Significant impacts to Portal V new service entrance and relocation of new terrace support columns • Moderate impacts to rail operations during construction	40 months	$140M



Existing Maryland Ave SW Bridge Elevation View (looking north) (track direction is south to north)

2.0 Existing Conditions

Between Maryland Avenue SW and L'Enfant Interlocking (the "segment"), three tracks exist: Tracks 2, 3, and 4, numbered from east to west. Track 4 is a stub-ended track that terminates at the south end of the Maryland Avenue SW structure, and is used for Virginia Railway Express (VRE) equipment storage. The evaluated segment of railroad passes beneath overhead bridges at Maryland Avenue SW, 12th Street SW, 12th Street Expressway, and L'Enfant Plaza and over an undergrade bridge at 9th Street SW. Retaining walls are also in place to support the embankments along both sides of the tracks between 12th Street SW and the L'Enfant Plaza bridge. The retaining wall on the west side of the corridor continues north of the L'Enfant Plaza bridge ending at 9th Street SW. There is a 140-foot long gabion wall on the east side of the corridor, north of L'Enfant Plaza. Each of the structures to be assessed are described below.

2.1. Maryland Avenue SW

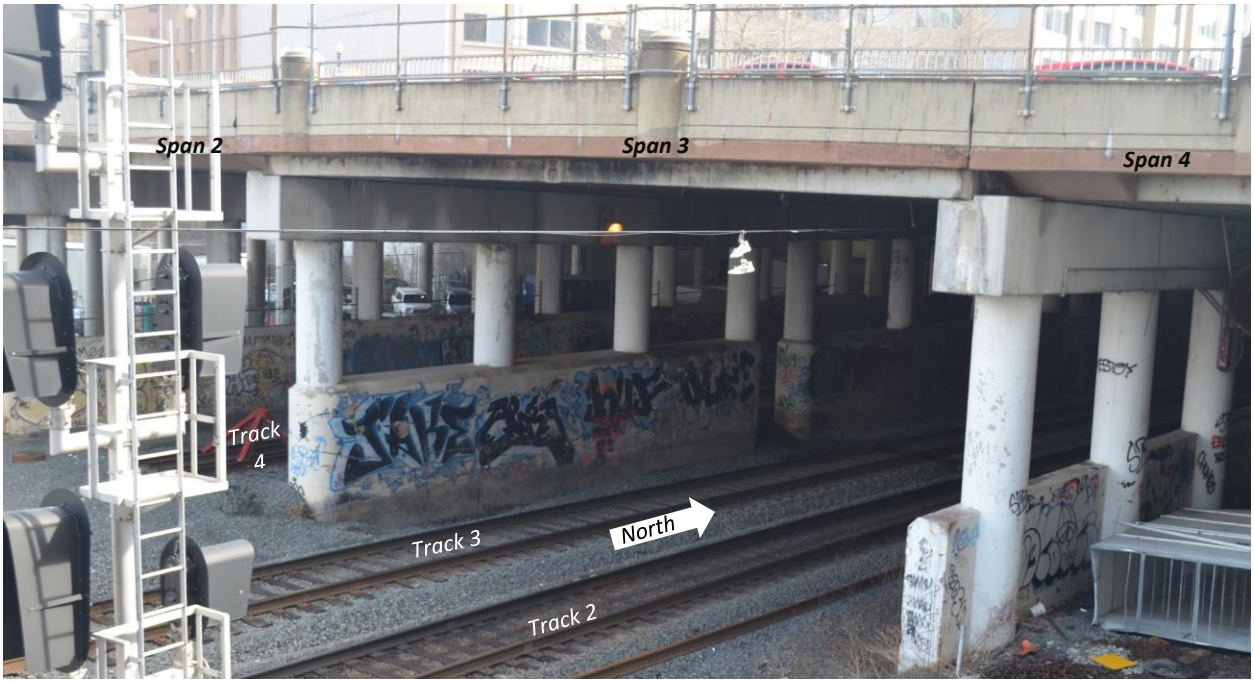
The Maryland Avenue SW bridge is the largest and most significant of the structures in the segment, having four spans extending over the railroad (see **Figure 1-1**) and is approximately 670-feet in length that runs parallel with the railroad. The structure carries two lanes of traffic from 12th Street SW south towards the Mandarin Oriental Hotel and Portals V development, where there is a landscaped traffic circle. Both the traffic lanes and circle are surrounded by parking along the perimeter to serve adjacent properties. There is a landscaped plaza located between the traffic lanes and brick-paved sidewalks and pedestrian access are maintained throughout the surface of the structure.

The bridge is central to The Portals development, which surrounds the traffic circle and the length of the structure. Multiple buildings have storefronts and main entrances along the Maryland Avenue SW bridge, including the Mandarin Oriental Hotel, the United States Department of Agriculture, and several other significant buildings. A new mixed-use building development called Portals V is under construction at the southwest corner of the Maryland Avenue SW traffic circle, where it will also have its main entrance.

Above the railroad track area, the roads, sidewalks, plazas, and planters are built up on the bridge superstructure which is composed of a combination of reinforced concrete slab beam flooring and steel girders. The majority of the superstructure in spans 2 and 3 consists of slab beams that span transversely above the tracks and are simply-supported on reinforced concrete pier bents. Nearest the 12th Street SW bridge, continuous steel girders span the tracks to make up a trapezoidal shape, with an approximate length of 37-feet parallel to the railroad tracks. Outside of the track area, in spans 1 and 4, the bridge superstructure is comprised of steel girder framing with a reinforced concrete deck.

Beneath the Maryland Avenue SW bridge, three tracks traverse the structure. Tracks 2 and Track 3 pass under span 3, and Track 4 (storage track) is located under span 2 until it terminates at the south end of the Maryland Avenue SW bridge (see **Figure 2-3**). Crashwalls extend parallel to the tracks, protecting the pier columns from potential train impacts. The governing lateral railroad clearances span transversely between the pier crashwalls. This lateral clearance is evaluated in subsequent sections of this document.

Figure 2-2 | Maryland Avenue SW Looking Northwest



2.2. 12th Street SW

The bridge at 12th Street SW spans the railroad at the northern terminus of Maryland Avenue SW. The bridge carries three lanes of vehicular traffic with a sidewalk on both sides. Additionally, the bridge provides turning access onto Maryland Avenue SW where it adjoins with the Maryland Avenue SW bridge.

The roadway is supported on steel girders composite with the reinforced concrete deck. The two-span continuous structure is supported on concrete abutments and a center concrete pier located between tracks 3 and 4. Each of the substructure units is generally parallel to the tracks.

Consistent with Maryland Avenue SW, Track 2 and Track 3 pass beneath the east span and Track 4 (storage track) beneath the west span. A crashwall is provided around the center pier for protection from train impacts. The limiting lateral clearance between existing walls for additional tracks will be measured between the abutment faces and the pier crashwall.

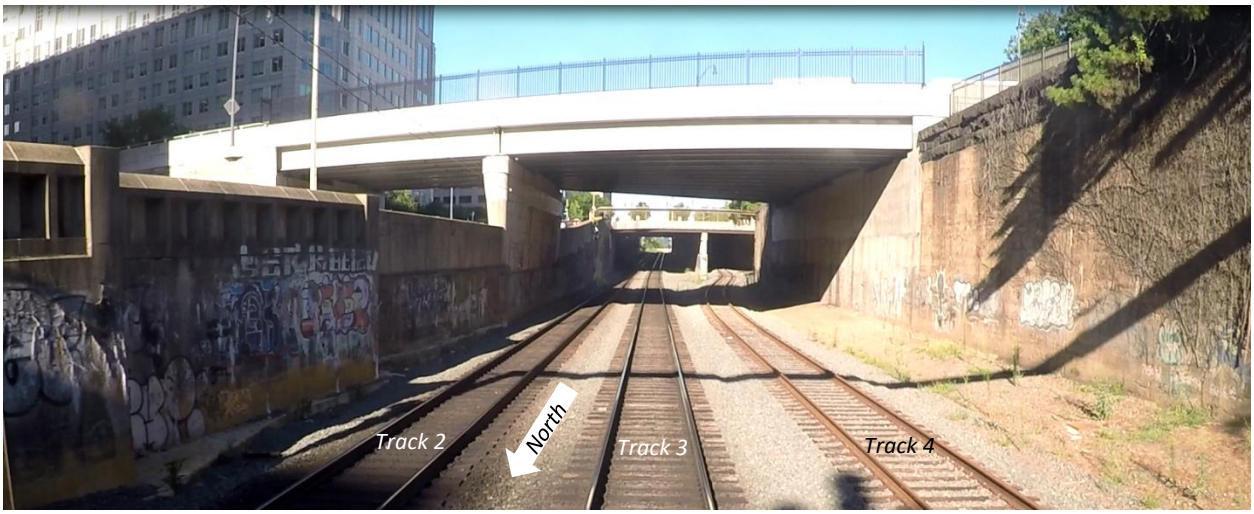
Figure 2-4 | 12th Street SW Looking South

2.3. 12th Street Expressway

The 12th Street Expressway passes over the railroad and D Street SW on a two-span, simply-supported steel girder bridge with a composite deck. The bridge also contains a curved section that leads the roadway to a ramp down to 12th Street SW. A sidewalk and center island median are provided, although pedestrian access does not exist.

The bridge carrying the 12th Street Expressway varies from the preceding bridges in that all three tracks cross beneath a single span, with no piers obstructing the existing clearance envelope. The concrete bridge pier is integrated with the retaining wall along the east side of the tracks. At this bridge, the limiting lateral clearance will be determined between the concrete abutment face and the concrete pier.

Figure 2-5 | 12th Street Expressway Looking South



2.4. L'Enfant Plaza

L'Enfant Plaza crosses the railroad corridor on a single span, simply-supported prestressed adjacent (butted) box beam bridge. The bridge includes two 29-foot-wide sidewalks, two travel lanes, two parking lanes, and a 40-ft median. The fascia of the bridge includes 8.25 feet wide architectural parapets on each side for an overall bridge width of 166.5 feet.

The span over the railroad is supported on an abutment to the west and on a pier to the east. The structure continues southeast as a viaduct structure with a combination of simply-supported and continuous span segments. All three existing tracks cross beneath a single span, with no piers obstructing the existing clearance envelope. A concrete bridge pier is integrated with the retaining wall along the east side of the tracks. At this bridge, the limiting lateral clearance is measured between the concrete abutment face and the concrete pier. The span is approximately 83 feet, however, due to the skew and the stepped face of the abutment, the lateral through clearance for the railroad is 62 feet.

A Washington Metropolitan Area Transit Authority (WMATA) tunnel crosses under the railroad within the limits of L'Enfant Plaza. No impacts to the tunnel are anticipated.

Figure 2-6 | L'Enfant Plaza Looking South

2.5. 9th Street SW

The 9th Street SW bridge carries the CSXT corridor over the 9th Street Expressway. It is a single-span deck girder structure consisting of 21 parallel steel girders with a steel plate deck and a 53.75-foot span. The ballasted deck is approximately 54 feet wide.

Figure 2-7 | 9th Street SW Undergrade Bridge Looking South

2.6. Retaining Walls

Extending along both sides of the railroad, the adjacent embankments are supported by retaining walls between 12th Street SW and L'Enfant Plaza, interrupted only at the 12th Street Expressway bridge substructures. North of L'Enfant Plaza, a wall supports the adjacent embankment on the west side of the corridor only. The walls are constructed of concrete and are capped with stone masonry blocks in some locations. The walls generally align with the faces of the bridge abutments at 12th Street SW and L'Enfant Plaza.

Along the west side of the track alignment, the walls generally only support earth embankment; however, along the east side of the track alignment, the wall supports D Street SW and a sidewalk. Also, between 12th Street Expressway and L'Enfant Plaza, along the east side of the track alignment, the retaining wall is shaped in a sawtooth configuration and includes a concrete staircase up to L'Enfant Plaza. Lateral clearances are measured transversely between the retaining walls on each side of the tracks.

Figure 2-8 | Retaining Walls Looking North from L'Enfant Plaza

3.0 Option 1 Lateral Clearance: 15-foot Track Spacing

3.1. Lateral Clearance Assessment

For the proposed track alignments with 15-foot track spacing, Track 1 and Track 2 will pass beneath span 3 (the east span of Maryland Avenue SW), and Track 3 and Track 4 will pass beneath span 2 (the west span). This concept is similar at 12th Street SW, with two tracks passing beneath each of the two spans. At the 12th Street Expressway bridge and L'Enfant Plaza, the proposed configuration is similar to existing, with all tracks passing beneath a single span, but the alignment is widened out to accommodate four tracks spaced at 15 feet.

Existing lateral clearances have been measured and compared to the clearance necessary to fit 15-foot track spacings. The required clearances are based on 15-foot track spacing, with 9-foot minimum from centerline of track to the nearest obstruction in accordance with CSXT design standards. Additional clearance is required in some locations to account for train tilt due to superelevation and carbody inswing/outswing from track curvature. The dimensions for each of the assessed bridges are described as follows:

Table 3-1 | Maryland Avenue SW Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing	Right Clearance (East)
Span 2 (Existing)	28'-6" typical	10'-11" min.	None	11'-0" min.
Span 2 (Proposed)	36'-0" typical	10'-0" min.	15'-0"	9'-7" min.
Span 3 (Existing)	43'-6" typical	12'-5" min.	13'-0"	8'-6" min.
Span 3 (Proposed)	36'-0" typical	9'-0" min.	15'-0"	10'-4" min.

Table 3-2 | 12th Street SW Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing	Right Clearance (East)
West Span (Existing)	26'-1" min.	16'-0" min.	---	9'-11" min.
West Span (Proposed)	34'-3" min.	9'-11" min.	15'-0"	9'-9" min.
East Span (Existing)	43'-6" typical	23'-6" min.	13'-0"	11'-2" min.
East Span (Proposed)	40'-6" typical	9'-0"	15'-0"	16'-1" min.

Table 3-3 | 12th Street Expressway Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing			Right Clearance (East)
Single Span (Existing)	59'-9" typical	17'-5" min.	14'-0"	13'-0"	---	10'-9"
Single Span (Proposed)	63'-3" min.	9'-6"	15'-0"	15'-0"	15'-0"	10'-4" min.

Table 3-4 | L'Enfant Plaza Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing			Right Clearance (East)
Single Span (Existing)	62'-8" min.	22'-0" min.	14'-0"	13'-0"	---	13'-8" min.
Single Span (Proposed)	62'-8" min.	8'-10"	15'-0"	15'-0"	15'-0"	8'-7" min.

Each of the overhead bridges, except L'Enfant Plaza, contains insufficient lateral clearances in their existing configurations to allow 15-foot track spacing. As a result, the bridges at Maryland Avenue SW, 12th Street SW, and 12th Street Expressway require modifications to increase the existing clearances.

3.2. Required Structural Modifications

To accommodate 15-foot track spacing and 9-foot lateral clearance between Maryland Avenue SW and L'Enfant Interlocking, significant structural changes and bridge reconstruction are necessary. The required structural modifications are described in the following sections.

3.2.1. Maryland Avenue SW

At the Maryland Avenue SW bridge, span 2 (the existing west span) has inadequate lateral clearance between the pier crash walls to fit two tracks spaced at 15 feet. The least invasive solution to modifying the clearance is to relocate the existing middle pier between proposed Track 2 and Track 3. By shifting the pier location 7.5 feet to the east, two track alignments can be made to fit through span 2 and two tracks through span 3, for a total of four tracks. Due to the configuration of the superstructure within the concrete plank beams area, relocating the bridge piers requires the superstructure of both adjacent spans to be removed and replaced to span to the new pier location. This has significant implications to the Maryland Avenue SW plaza and roadway. All the southbound lanes and one lane of the traffic circle would be temporarily closed to replace the superstructure, and the plaza would have to be demolished and rebuilt upon completion.

Additionally, at the northwest corner of the structure, the end four columns and crashwall are skewed towards the tracks (to the east). To fit the proposed tracks, the piers must be moved to the west and rotated parallel to the tracks. The superstructure at this area consists of continuous steel girders and the relocation of the northwest piers would require a detailed structural analysis to determine if the existing superstructure could be field modified or if replacement is necessary. This would likely require full replacement of the concrete bridge deck to modify the reinforcing steel layouts to accommodate the new location for negative bending over the piers. To accommodate this work, it is anticipated that all lanes in each direction must be closed during construction. The plazas would have to be completely removed in this area and rebuilt after construction of the superstructure is completed.

3.2.2. 12th Street SW

To accommodate the proposed 15-foot track spacing at 12th Street SW, the existing bridge pier requires relocation. A relocation of 8.67 feet to the east results in sufficient clearance for the proposed Track 3 and 4 alignments in the west span. A detailed structural analysis can be performed on the two-span continuous girders to determine if the existing superstructure can remain with modification; however, the proposed pier location would be near the existing girder splices. This significantly complicates

reconstructing the existing steel girders for reuse as the splice area would be supporting bearing loads and carrying increased negative moments. Similar to Maryland Avenue SW, this will likely require a full replacement of the concrete bridge deck to modify the reinforcing steel layouts to accommodate the new location for negative bending over the piers. As such, the existing superstructure will likely require replacement and it is anticipated that access to Maryland Avenue SW would be eliminated for an extended period of time to perform this work.

3.2.3. 12th Street Expressway

At the 12th Street Expressway, the three existing tracks pass under a single span of the bridge. This span has insufficient clearance to fit four proposed tracks at 15-foot spacing and 9-foot desired lateral clearance. To increase the clearance, the west abutment requires relocation further west, at a distance up to 10-feet away. As a result of relocating the substructure units and lengthening the structure, the entire superstructure must be replaced for the span over the track area.

3.2.4. L'Enfant Plaza

No modification of the L'Enfant Plaza overhead bridge is proposed. The existing span can accommodate 8.83 feet lateral clearances with four tangent tracks at 15-foot track centers. Although slightly under the target 9-foot clearance, it is believed the existing bridge can remain.

3.2.5. 9th Street SW

While 9th Street SW is beyond the limits of this project, to accommodate the increased track centers, the east side of the 9th Street SW bridge requires widening. Modifications to lengthen the abutment and add deck-girders would be required to widen the ballasted deck approximately 6 feet.

In addition to lengthening the abutment, modified wingwalls are required, which will impact the adjacent General Services Building parking lot. It is believed that the existing roadway profile under the bridge does not require modification.

3.2.6. Retaining Walls

The retaining walls require reconfiguration to provide the required clearances for the proposed track alignments. While the overall wall-to-wall clearance is sufficient for 15-foot track spacings, the locations of the walls are governed by the track alignments and the proposed abutment and pier configurations. As such, the two retaining walls along the west side of the track alignment between 12th Street SW and L'Enfant Plaza (interrupted at 12th Street Expressway) require relocation to accommodate the new track alignments and necessitate the complete removal of the existing walls and construction of new ones in the proposed location.

Similarly, the wider track spacing may require modifications to the existing 7th Street SW wingwall at the southeast corner of the bridge (geographic location is southwest). The track centers begin to widen from the existing 13 feet and will require lengthening or raising this wingwall. No changes to the 7th Street SW undergrade bridge are anticipated.

3.3. Structural Staging Considerations

As a result of widening throughout the segment to achieve horizontal clearances for the 15-foot track centers, each of the structures require some significant modifications. An approximate construction duration of sixty-six months is anticipated to complete the necessary structural modifications between Maryland Avenue SW and L'Enfant Plaza. Construction is expected to maintain two-track railroad operations, ensure railroad safety and protection of the traveling public, and minimize impacts to roadways and adjacent properties as much as possible. The expected staging of the structural work is described in the following section and corresponds to the overall track construction staging.

During construction for Option 1, extended duration lane closures and track outages are necessary; however, two tracks may be maintained during construction with the exception of overnight track tie-in work and overhead activities such as girder erection. Several construction stages will necessitate the closure of Maryland Avenue SW to vehicular access entirely. A Critical Path Method (CPM) construction schedule is included in **Appendix C** of this report and a summary of the major work activities is provided below.

3.3.1. Relocate West Retaining Wall and West Abutment at 12th Street Expressway

Significant Roadway and Railroad Outages

- 24 months phased reconstruction of 12th Street Expressway bridge to relocate west abutment further west and lengthen superstructure span
- Maintain two through lanes and one turning lane on 12th Street Expressway during construction
- 6 months 12th Street Expressway ramp closed
- Minimum 12 months Track 4 out of service (existing Tracks 2 and 3 in service)

Replace 12th Street Expressway

1. Close portion of bridge and divert traffic to alternate lanes
2. Remove segment of bridge superstructure
3. Remove existing Track 4 from service (service remains on Tracks 2 and 3)
4. Demolish portion of west abutment and retaining wall between 12th St Expressway and L'Enfant Plaza
5. Construct new abutment and retaining wall segments
6. Construct new bridge superstructure span segment over tracks
7. Repeat phases until completion, reopen bridge to traffic

3.3.2. Relocate Segments of Maryland Avenue SW Center and West Piers

Significant Roadway and Railroad Outages

- 24 months phased reconstruction of 12th Street SW to relocate abutment and pier
- 9-12 months Maryland Avenue SW closed to traffic for north end pier/superstructure work
- 6-9 months existing Track 4 out of service (existing Tracks 2 and 3 in service)
- 6 months existing Track 3 out of service (existing Tracks 2 and 4 in service)
- Note Track 4 becomes temporary mainline

Relocate Northwest Pier at Maryland Avenue SW

1. Close portion 12th Street SW and Maryland Avenue SW to traffic (pedestrian access to remain on Maryland Avenue SW south of work area)
2. Remove portion of 12th Street SW bridge superstructure, both spans (reuse not feasible)
3. Remove bridge superstructure over north end of Maryland Avenue SW (reuse not feasible)
4. Remove existing Track 4 from service (service to remain on existing Tracks 2 and 3)
5. Demolish northwest portion of pier at Maryland Avenue SW
6. Construct new, realigned northwest pier and superstructure at Maryland Avenue SW
7. Restore service to existing Track 4 and remove service from existing Track 3

Relocate Middle Pier at Maryland Avenue SW and 12th Street SW

1. Demolish middle pier at north end of Maryland Avenue SW and pier at 12th Street SW
2. Construct new piers in proposed locations for both bridges
3. Restore service to all existing tracks
4. Reconstruct bridge superstructures
5. Reopen portion of 12th Street SW and Maryland Avenue SW to vehicles and pedestrians

3.3.3. Structural Stage 3 – Relocate Middle Pier at Maryland Avenue SW

Significant Roadway and Railroad Outages

- 12-18 months Maryland Avenue SW southbound lanes closed to traffic and pedestrians
- 24-30 months existing Track 3 out of service (existing Tracks 2 and 4 in service)

Relocate Middle Pier along Maryland Avenue SW

1. Modify northbound lanes of Maryland Avenue SW for bidirectional traffic
2. Close Maryland Avenue SW southbound lanes to traffic and pedestrians
3. Remove existing superstructure over tracks between traffic circle and 12th Street SW
4. Remove existing Track 3 from service
5. Remove existing middle pier between traffic circle and 12th Street SW
6. Construct new middle pier in proposed location
7. Reconstruct bridge superstructure
8. Reopen southbound lanes of Maryland Avenue SW to vehicles and pedestrians

Relocate Middle Pier beneath Traffic Circle at Maryland Avenue SW

1. Reduce traffic circle to one lane of traffic access
2. Remove existing superstructure over tracks within traffic circle
3. Remove remainder of existing middle pier
4. Construct new middle pier in proposed location
5. Reconstruct bridge superstructure
6. Reopen second lane of Maryland Avenue SW on traffic circle for vehicles and pedestrians

Repeat above steps for additional phases of bridge replacement while minimizing railroad and roadway lane closures and associated transportation network impacts.

As discussed in the conceptual staging sequences above, the proposed bridge and retaining wall modifications require multiple stages with varying impacts to railroad operations, vehicular traffic, and pedestrian access. The reconstruction of the 12th Street Expressway and the retaining walls requires

12th Street Expressway to be reduced down to a single lane at times. At 12th Street SW and Maryland Avenue SW, various stages require temporary lane adjustments, reconfigurations, and complete closures. Access to the properties along Maryland Avenue SW and the traffic circle will be significantly reduced during several stages of construction for as long as 12 months.

3.4. Right-of-Way Impacts Assessment

Additional right-of-way is required to achieve the 15-foot track center option. Approximate limits of additional right-of-way are shown in **Table 3-5**.

Table 3-5 | Approximate Limits of Additional Right-of-Way

Side of Alignment	Between	Length (*)	Width (**)	Owner
West (Left)	Maine Avenue SW and Maryland Avenue SW	175	10	Portals V
East (Right)	Maine Avenue SW and Maryland Avenue SW	50	10	Portals V
West (Left)	12th Street SW and 12th Street Expressway	365	10	DDOT
West (Left)	12th Street Expressway and L'Enfant Plaza	60	10	USA
East (Right)	9th Street SW to 7th Street SW	160	10	USA

(*) – Length Measured Along Tracks (in feet)
(**) – Width Measured Perpendicular to Tracks (in feet)

4.0 Option 2 Lateral Clearance: 13-Foot Track Spacing

4.1. Lateral Clearance Assessment

The track alignment with 13-foot track spacing was conceptualized to minimize impacts and reconstruction requirements to the existing bridges and retaining walls, and provide 8.5-foot minimum lateral clearance. The configuration includes Tracks 1, 2, and 3 located in span 3 and Track 4 located in span 2. The existing and proposed lateral track clearances are summarized in **Table 4-1**, **Table 4-2**, and **Table 4-3**.

Table 4-1 | Maryland Avenue SW Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing		Right Clearance (East)
Span 2 (Existing)	28'-6" typical	10'-11" min.	None	None	11'-0" min.
Span 2 (Proposed)	28'-6" typical	8'-11" min.	13'-0"	None	13'-6" min.
Span 3 (Existing)	43'-6" typical	12'-5" min.	13'-0"	None	8'-6" min.
Span 3 (Proposed)	43'-6" typical	8'-6" min.	13'-0"	13'-0"	8'-6" min.

Table 4-2 | 12th Street SW Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing		Right Clearance (East)
West Span (Existing)	26'-1" min.	16'-0" min.	None	None	9'-11" min.
West Span (Proposed)	26'-1" min.	17'-11" min.	13'-0"	None	8'-6" min.
East Span (Existing)	43'-6" typical	23'-6" min.	13'-0"	None	11'-2" min.
East Span (Proposed)	43'-6" typical	9'-8" min.	13'-0"	13'-0"	13'-1" min.

Table 4-3 | 12th Street Expressway Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing			Right Clearance (East)
Single Span (Existing)	59'-9" typical	17'-5" min.	14'-0"	13'-0"	---	10'-9"
Single Span (Proposed)	59'-9" typical	9'-5" min.	13'-0"	13'-0"	13'-0"	10'-11"

4.2. Required Structural Modifications

The proposed 13-foot track spacings fit within the existing lateral clearances at all locations between Maryland Avenue SW and L'Enfant Interlocking. There is no structural work anticipated and therefore the construction duration is 0 months. There is some work that would be required to the retaining wall along the Portals V property, however, that work will be completed outside of the current track operations and is not included in the construction duration.

4.3. Right-of-Way Impacts Assessment

For the 13-foot track spacing concept, the proposed right-of-way matches the existing conditions at all but one location. Along the west side of the alignment, just south of the Maryland Avenue SW bridge, the Portals V wall will be impacted and may require modifications to accommodate Track 4. This small area of right-of-way is needed for the proposed track alignment. Beyond this location, no further assessment is required between Maryland Avenue SW and L'Enfant Interlocking.

Table 4-4 | Approximate Limits of Additional Right-of-Way

Side of Alignment	**Between**	**Length (in feet)**	**Width (in feet)**	**Owner**
West	Maine Avenue SW and Maryland Avenue SW	200	10	Portals V

5.0 Option 3 Lateral Clearance: 15-Foot Track Spacing for Tracks 1 & 2, 12.5-Foot Track Spacing for Tracks 3 & 4

5.1. Lateral Clearance Assessment

For Option 3, the proposed track alignment includes providing two tracks at 15-foot freight track spacing with 9-foot horizontal clearance in Span 3 and two tracks at 12.5-foot passenger track spacing with 8.0-foot horizontal clearance in Span 2. Both the track spacing and lateral clearance falls below the baseline minimums of 13-foot spacing and 8.5-foot clearance established by operators. There is also a significant amount of structural work anticipated for this option, including extensive pier relocation, superstructure replacement and modifications, and reconstructing a retaining wall. The construction duration is estimated to be 50 months. Plan sheets depicting clearance results as well as estimated construction schedules are provided in the Appendix to this report. Although the freight spacing meets CSXT's criteria, both the passenger track spacing and horizontal clearance are less than minimum thresholds and therefore no further analysis of this option is discussed in this report.

6.0 Option 4 Lateral Clearance: 15-Foot Track Spacing for Tracks 1 & 2, Varied Spacing & Clearance for Tracks 3 & 4

For Option 4, the proposed track alignment includes providing two tracks at 15-foot freight track spacing with 9-foot horizontal clearance in Span 3 and one track in Span 2 and one track in Span 1 with as little as 7.25-foot horizontal clearance. Similar to Option 3, both the track spacing and lateral clearance falls below the baseline minimums of 13-foot spacing and 8.5-foot clearance established by operators. There is again a significant amount of structural work anticipated for this option, including pier replacement, superstructure replacement, retaining wall reconstruction, and relocation of the Portals service entrance. The construction duration is estimated to be 49 months. Plan sheets depicting clearance results as well as estimated construction schedules are provided in the Appendix to this report. Although the freight spacing meets CSXT's criteria, both the passenger track spacing and horizontal clearance are undesirable and therefore further vetting of this option has been eliminated.

7.0 Option 5 Lateral Clearance: 15-Foot Track Spacing for Tracks 1 & 2, 13-Foot Track Spacing for Tracks 3 & 4

7.1. Lateral Clearance Assessment

For Option 5, two separate track spacings have been evaluated, 15-foot spacing for freight and 13-foot spacing for passenger. The 15-foot track alignment includes Tracks 1 and 2 passing beneath span 3 (the east span) of Maryland Avenue SW and continuing through the east span of 12th Street SW towards L'Enfant Plaza. Tracks 3 and 4 will maintain 13-foot track centers, passing beneath span 2 (the west span) of Maryland Avenue SW and continuing through the west span of 12th Street SW.

The existing lateral clearances are measured and compared to the clearance necessary to fit the proposed 13-foot and 15-foot track spacings. To meet minimum lateral clearance requirements for CSXT, VRE and Amtrak, the proposed alignments for Track 1 and Track 2 will primarily be used for freight traffic while the proposed alignments for Track 3 and Track 4 will primarily be use for passenger traffic. The required clearances are based on: the freight tracks having a 15-foot track spacing and 9-foot minimum from centerline of track to the nearest obstruction in accordance with CSXT design standards; and the passenger tracks having a 13-foot track spacing in accordance with Amtrak and VRE preferences along with 8'-6" minimum from centerline of track to the nearest obstruction. Additional clearance is required in some locations to account for train tilt due to superelevation and car body inswing/outswing from track curvature, which has been accounted for in assessing available minimum clearances in this report. The dimensions for each of the assessed bridges are described as follows:

Table 5-1 | Maryland Avenue SW Lateral Clearances

	Total Clearance (min.)	Left Clearance (West)	Track Spacing	Right Clearance (East)
Span 2 (Existing)	19'-6"	9'-3" min.	None	10'-3" min.
Span 2 (Proposed)	30'-0"	8'-6" min.	13'-0"	8'-6" min.
Span 3 (Existing)	43'-0"	21'-6" min.	13'-0"	8'-6" min.
Span 3 (Proposed)	33'-0"	9'-0" min.	15'-0"	9'-0" min.

Table 5-2 | 12th Street SW Lateral Clearances

	Total Clearance (min.)	Left Clearance (West)	Track Spacing	Right Clearance (East)
West Span (Existing)	24'-6"	14'-6" min.	None	10'-0" min.
West Span (Proposed)	23'-9"	1'-7" min.	15'-0"	8'6" min.
East Span (Existing)	48-9"	24'-3" min.	13'-0"	11'-6" min.
East Span (Proposed)	48'-9"	20'-3" min.	15'-0"	13'-6" min.

Table 7-3 | 12th Street Expressway Lateral Clearances

	Total Clearance (min.)	Left Clearance (West)	Track Spacing	Right Clearance (East)
Single Span (Existing)	58'-9"	22'-0" min.	13'-0"	10'-9"
Single Span (Proposed)	68'-6"	8'-6"	15'-0"	9'-0" min.

Table 5-4 | L'Enfant Plaza Lateral Clearances

	Total Clearance	Left Clearance (West)	Track Spacing	Right Clearance (East)
Single Span (Existing)	47'-6"	28'-9" min.	13'-0"	18'-9" min.
Single Span (Proposed)	66'-3"	11'-6"	15'-0"	9'-9" min.

Each of the overhead bridges, except L'Enfant Plaza, contain insufficient lateral clearances in their existing configurations to allow the minimum track spacing. As a result, the bridges at Maryland Avenue SW, 12th Street SW, and 12th Street Expressway require modifications to increase the existing clearances and establish minimum track spacing.

7.2. Required Structural Modifications

To accommodate 15-foot freight track spacing with 9-feet later clearance and 13-foot passenger track spacing with 8.5-feet later clearance between Maryland Avenue SW and L'Enfant Interlocking, significant structural changes and bridge reconstruction are necessary. The required structural modifications are described in the following sections.

7.2.1. Maryland Avenue SW

At the Maryland Avenue SW bridge, the existing spans have inadequate lateral clearance between the pier crash walls to fit two tracks spaced at 13 feet in Span 2. The proposed solution to achieve the desired clearance is to relocate 700 to 800 feet of the existing piers under the bridge. The majority of the work is to relocate Pier 1 further west, towards the Portals development, by approximately 3-feet, with some additional relocation required at pier 2. The relocation of the bridge piers will require reconstruction of the superstructure spans on each side of the proposed piers, however, it is assumed that Span 1 or the westernmost span under the traffic circle can be left in place with approximately 20 feet of the concrete deck superstructure removed to allow the ends of the steel beams to be modified to accommodate pier relocation. The simple span concrete superstructure that makes up span 2 will require full replacement with longer beams.

The pier and superstructure work has significant implications to the Maryland Avenue SW plaza and roadway and will require the southbound lanes and one lane of the traffic circle be temporarily closed for 12-24 months. The plaza will have to be demolished and rebuilt upon completion.

Additionally, at the northwest corner of Maryland Avenue SW, the end columns and crashwall are skewed to the east, as noted in other options. To accommodate the proposed tracks, the piers must be

moved to the west and aligned with the remainder of the new pier locations further south so they will be parallel to the tracks. The superstructure at this end is comprised of a continuous steel girder superstructure over three spans. The relocation of the northwest pier requires a detailed structural analysis to determine if the existing superstructure could be field modified to handle the modified design loading. This would as a minimum, likely require full replacement of the concrete bridge deck to modify the reinforcing steel layouts to accommodate the new location of negative bending over the piers. To accommodate this work, it is anticipated that all lanes in each direction must be closed during construction and this work would be completed using accelerated bridge construction. The plazas would have to be completely removed in this area and rebuilt after construction of the superstructure is completed.

7.2.2. 12th Street SW

The existing west bridge abutment requires relocation further to the west to accommodate the track spacing. A relocation of 8.67 feet results in sufficient clearance for the proposed track alignments. The girders are two-span continuous over the center pier. A detailed structural analysis can be performed to determine if the existing superstructure may remain with modification; however, the proposed pier location would be near the existing steel girder splices, and significant steel strengthening will be required as a minimum. This significantly complicates reconstructing the existing steel girders for reuse as the splice area would support bearing loads and carry increased negative moment. Similar to Maryland Avenue SW, this will likely require full replacement of the concrete bridge deck to modify the reinforcing steel layouts to accommodate the new location for negative bending over the piers. As such, the existing superstructure will more than likely require replacement, thus resulting in potentially higher loading and reconstruction of the east abutment. It is anticipated that access to Maryland Avenue SW would be eliminated for an extended period of time to perform this work.

7.2.3. 12th Street Expressway

At the 12th Street Expressway, all the existing tracks pass under a single span of the bridge. This span has insufficient clearance to fit the proposed 13-foot and 15-foot track spacings. To increase the clearance, the west abutment must be relocated further west. As a result of relocating the substructure units, the entire superstructure must be replaced for the span over the track area.

7.2.4. L'Enfant Plaza

No modification of the L'Enfant Plaza overhead bridge is proposed. The existing span can accommodate 8.83 feet lateral clearances with four tangent tracks at 15-foot track centers. Although slightly under the target 9-foot clearance, it is believed the existing bridge can remain.

7.2.5. Retaining Walls

In addition to modifying the bridges, the retaining walls need to be reconfigured and moved further west to accommodate the required alignments and clearances. The portions of the retaining walls along the west side of the track alignment from Maryland Avenue SW through 12th Street SW and 12th Street Expressway must be relocated. The relocation will necessitate removal of portions of the existing walls and construction of new ones in the new locations. The anticipated removal and reconstruction of these retaining walls is approximately 100-feet in length.

Similarly, the proposed track spacing require modifications to the existing retaining walls at Portals V. The anticipated relocation of the retaining walls within this area is approximately 75-feet in length.

7.3. Structural Staging Considerations

As a result of clearance widening throughout the track alignment, each of the structures require some significant modifications. An approximate construction duration of 40 months is anticipated to complete the structural modifications between Maryland Avenue SW and L'Enfant Plaza. During this time, extended duration lane closures and track outages are necessary; however, two tracks may be maintained during construction with the exception of overnight track tie-in work. Several construction stages will necessitate the closure of 12th Street SW and Maryland Avenue SW to vehicular access entirely.

The construction stages required are very similar to Option 1 for the 15-foot track centers, with the exception that a majority of the pier replacement is along Pier 1, which is further west of Tracks 1 and 2. However, the work is adjacent to the Portals III and Portals V developments and will include impacts to the supporting columns for the new Portals V building terrace.

7.4. Right-of-Way Impacts Assessment

Additional right-of-way is required to achieve the 13-foot and 15-foot track center option. Approximate limits of additional right-of-way are shown in **Table 4-5**.

Table 7-5 | Approximate Limits of Additional Right-of-Way

Side of Alignment	**Between**	**Length (*)**	**Width (**)**	**Owner**
West (Left)	Maine Avenue SW and Maryland Avenue SW	175	15	Portals V
West(Left)	Maryland Avenue SW	700	10	Portals III
East (Right)	Maine Avenue SW and Maryland Avenue SW	50	10	Portals V
West (Left)	12th Street SW and 12th Street Expressway	375	10	DDOT
West (Left)	12th Street Expressway and L'Enfant Plaza	60	10	USA
East (Right)	9th Street SW to 7th Street SW	160	10	USA

(*) – Length Measured Along Tracks (in feet)
(**) – Width Measured Perpendicular to Tracks (in feet)

8.0 Vertical Clearance Assessment

A recent clearance improvement project increased vertical clearances through the project area to permit operation of Plate H equipment (double-stacked intermodal containers, see **Figure 1-2**)) on existing Track 2 and Track 3 only (span 3), which was primarily achieved by lowering the track. The minimum clearance of 21.14 feet will be used. All four tracks will be made capable of accommodating Plate H equipment.

9.0 Additional Considerations

9.1. Drainage

An existing CSXT-owned drainage system was installed as part of the recent clearance improvement project, which increased vertical clearances through the project area to permit operation of Plate H equipment (double-stacked intermodal containers). As part of that project, a new collector system was installed to bring water from the cut section to a city sewer located between 14th Street SW and Maryland Avenue SW, near the intersection of Maine Avenue SW. In order to increase the number of tracks in the cut section to four, this system will have to be modified to accommodate the new track centers. Although the design would be different for each option, both the 13-foot and 15-foot track centers will require similar modifications of this storm sewer system. The drainage system does not appear to be a differentiator between the two track-center options; once a track spacing is selected, this element will be further evaluated.

9.2. Communication and Signal Facilities

The overall four-track alignment for the Long Bridge requires reconfiguration of the existing L'Enfant (LE) Interlocking. Both track-center options will require a similar modification, and these are not seen as differentiators between the two options. The existing signal locations can remain (northbound home signals south of Maryland Avenue SW and southbound home signals north of 9th Street SW), but the signals will have to be relocated to accommodate the greater number of tracks. If required, additional space appears to be available within the right-of-way on the east side of the corridor, north of and under L'Enfant Plaza.

Existing signal and communications lines running through the corridor may need to be relocated for either option.

Long Bridge Project

Environmental Impact Statement (EIS)

Maryland Avenue SW to L'Enfant Interlocking Clearance Assessment

Appendix A – Location Map


Constitution Ave NW
National Mall
Independence Ave SW
Memorial Bridge
West Potomac Park
Tidal Basin
LE Interlocking
VRE L'Enfant Station
VA Interlocking
Maine Ave SW to LE Interlocking Clearance Assessment Limits
George Washington Memorial Pkwy
George Mason Bridge
Rochambeau Bridge
14th Street Bridge
Metrorail Bridge
Long Bridge
Ohio Dr SW
East Potomac Park
Washington Channel
Southwest Waterfront
Pentagon
District of Columbia
Virginia
RO Interlocking
VRE Crystal City Station
Potomac River
Ronald Reagan Washington National Airport
LEGEND
VRE Station
Metrorail Station
Interlocking
Other Bridges
Long Bridge Corridor
Railroads
Metrorail
Feet
0 1,000 2,000
Service Layer Credits: public/GLUP GIS Mapping Center, NAIP 2016, VHB

Long Bridge Project

Environmental Impact Statement (EIS)

Maryland Avenue SW to L'Enfant Interlocking Clearance Assessment

Appendix B – Clearance Assessment Plans

INDEX OF SHEETS

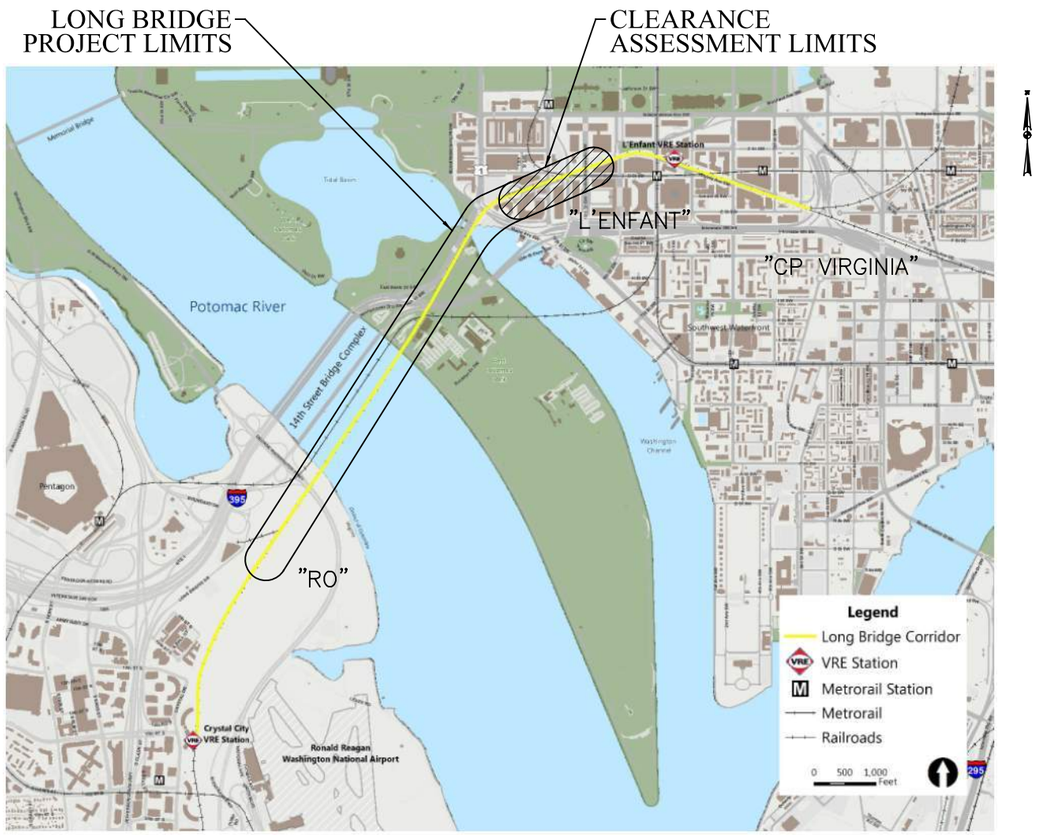
DISTRICT OF COLUMBIA

DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED

LONG BRIDGE PROJECT EIS

MARYLAND AVENUE SW TO L'ENFANT INTERLOCKING CLEARANCE ASSESSMENT



KEY MAP

SEPTEMBER 6, 2018

NO.	DESCRIPTION	NAME	DATE

REVISIONS

D.C. DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE PROJECT MANAGEMENT ADMINISTRATION
PROJECT MANAGEMENT DIVISION

LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

COVER SHEET

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
DIVISION CHIEF
DATE
FILE
SHEET OF

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
	D.C.			

THE PORTALS

685'-0" ±

D STREET SW

THE PORTALS

12TH STREET SW

RAMP

12TH ST. EXPRESSWAY

PROPOSED BRIDGE PIER

EXISTING PIER (TO BE RELOCATED)

10'-6"

10'-0"

15'-0"

PROPOSED RELOCATED BRIDGE PIERS

SUPERSTRUCTURE REPLACEMENT

PROPOSED RETAINING WALL

PROPOSED RELOCATED BRIDGE ABUTMENT

PROPOSED RETAINING WALL

THE PORTALS

TRACK 4

TRACK 3

TRACK 2

TRACK 1

386+00

388+00

390+00

392+00

394+00

396+00

398+00

384+00

TRACK 4

TRACK 3

TRACK 2

TRACK 1

D STREET SW

D STREET SW

EXISTING PIER

PROPOSED RELOCATED BRIDGE PIERS

SUPERSTRUCTURE REPLACEMENT

MARYLAND AVE. SW

12'-0"

15'-0"

9'-0"

68'-0" ±

MANDARIN ORIENTAL

THE PORTALS

12TH STREET SW

12TH ST. EXPRESSWAY

LEGEND:

PROPOSED BRIDGE

PROPOSED RETAINING WALL

PROPOSED CENTERLINE OF TRACK

0 50 100

SCALE: 1" = 50'-0"

SEPTEMBER 6, 2018

vhb HNTB

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INFRASTRUCTURE PROJECT MANAGEMENT ADMINISTRATION
PROJECT MANAGEMENT DIVISION

LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT INTERLOCKING CLEARANCE ASSESSMENT

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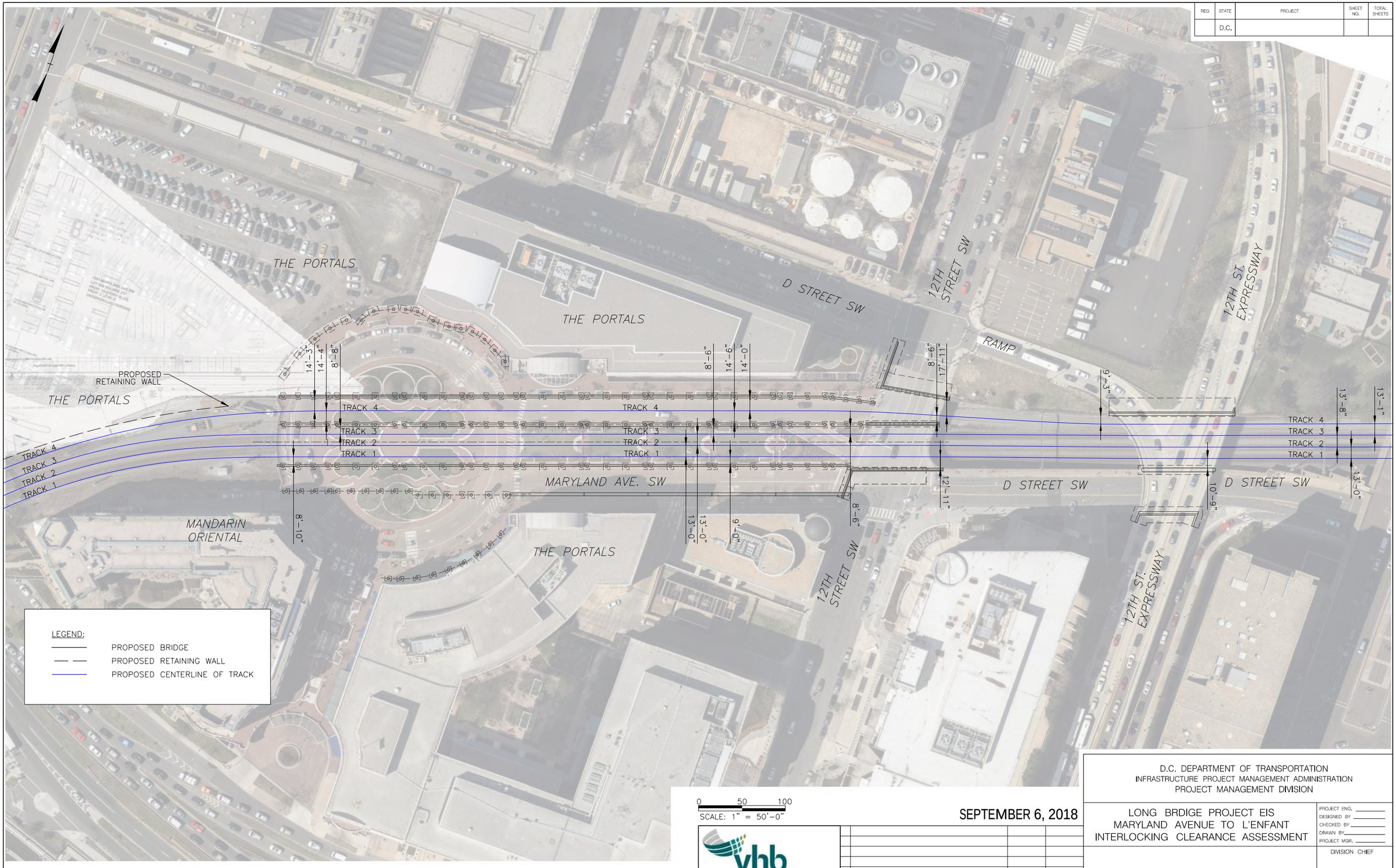
FILE _____

OPTION 1 PLAN

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
	D.C.			



LEGEND:

- PROPOSED BRIDGE
- PROPOSED RETAINING WALL
- PROPOSED CENTERLINE OF TRACK

0 50 100

SCALE: 1" = 50'-0"

SEPTEMBER 6, 2018

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LONG BRDIGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

OPTION 2 PLAN

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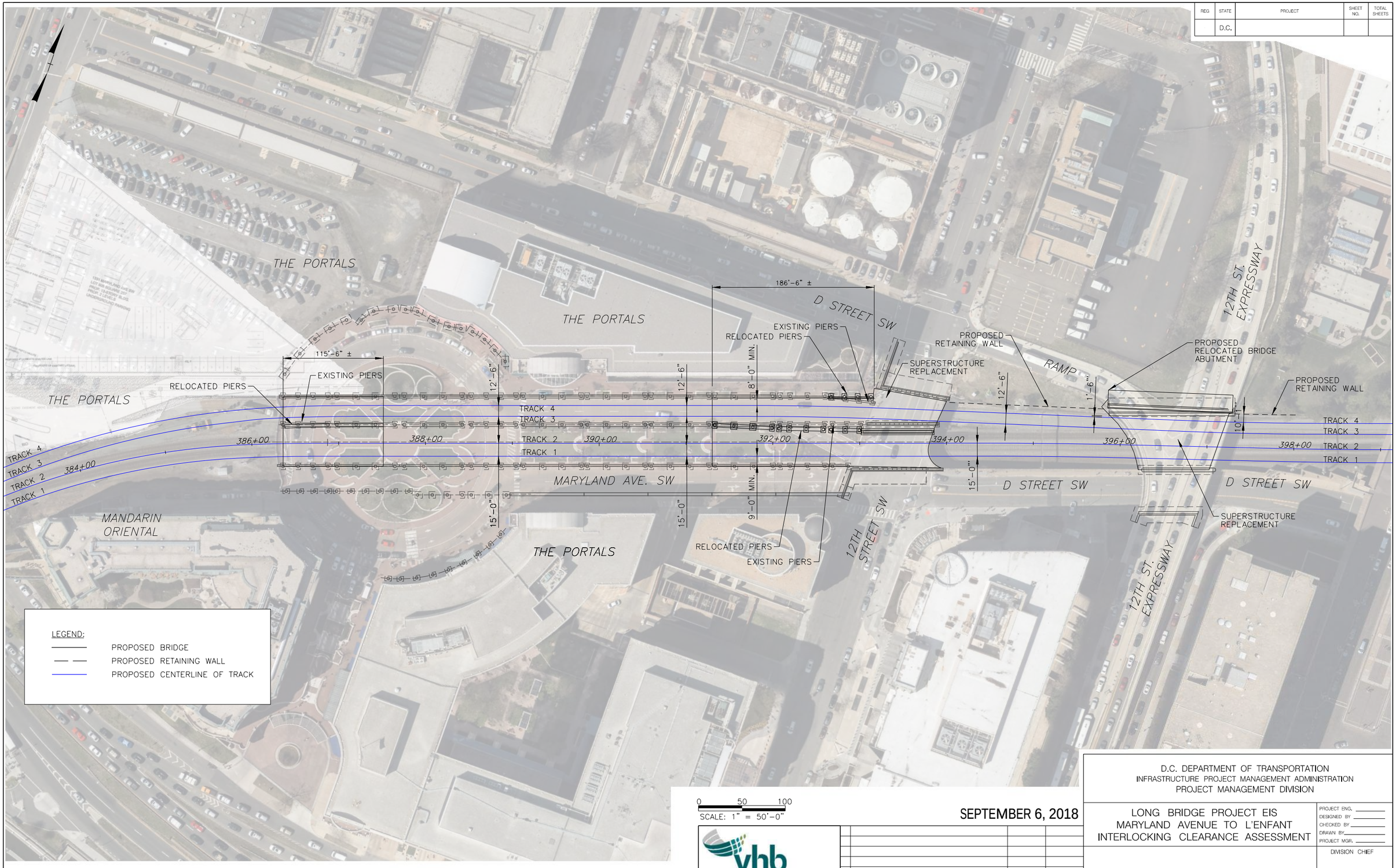
DATE _____
FILE _____

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
	D.C.			



LEGEND:

- PROPOSED BRIDGE
- PROPOSED RETAINING WALL
- PROPOSED CENTERLINE OF TRACK

0 50 100

SCALE: 1" = 50'-0"

SEPTEMBER 6, 2018

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LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

OPTION 3 PLAN

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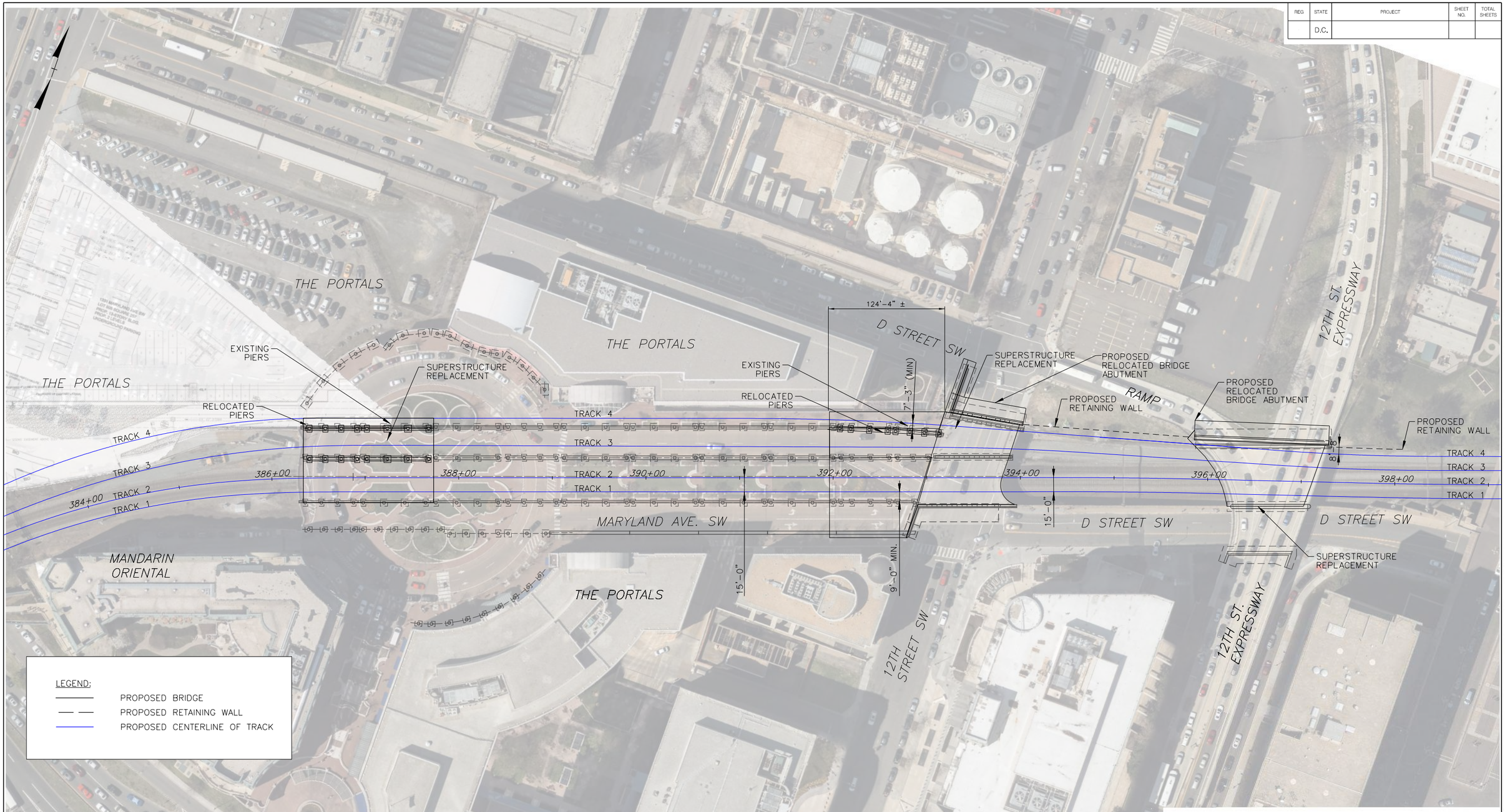
	D.C.			



LEGEND:

- PROPOSED BRIDGE
- PROPOSED RETAINING WALL
- PROPOSED CENTERLINE OF TRACK

0 50 100

SCALE: 1" = 50'-0"

SEPTEMBER 6, 2018

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LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

OPTION 4 PLAN

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DATE
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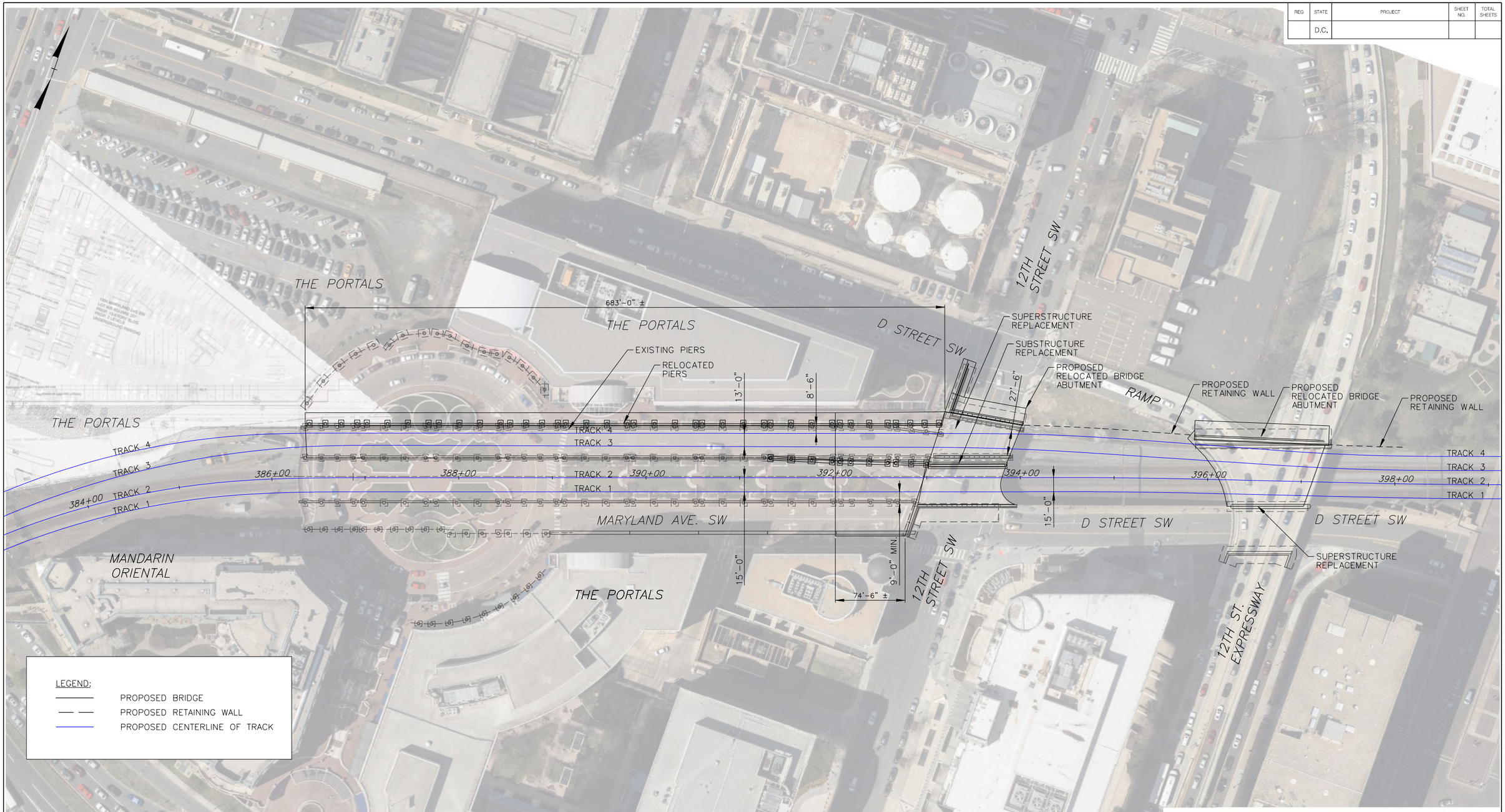
	D.C.			



LEGEND:

- PROPOSED BRIDGE
- PROPOSED RETAINING WALL
- PROPOSED CENTERLINE OF TRACK

0 50 100

SCALE: 1" = 50'-0"

SEPTEMBER 6, 2018

vhb HNTB

NO.	DESCRIPTION	NAME	DATE

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INFRASTRUCTURE PROJECT MANAGEMENT ADMINISTRATION
PROJECT MANAGEMENT DIVISION

LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

OPTION 5 PLAN

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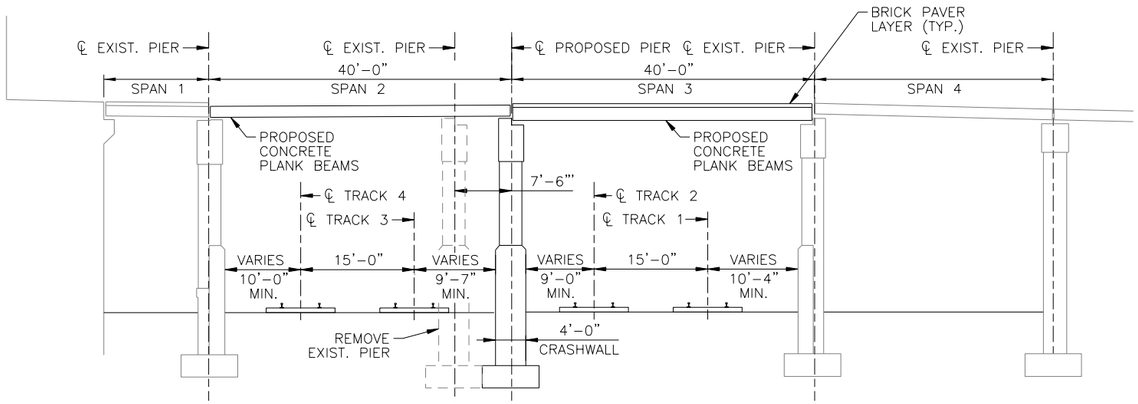
CHECKED BY _____
DRAWN BY _____
PROJECT MGR. _____

DIVISION CHIEF

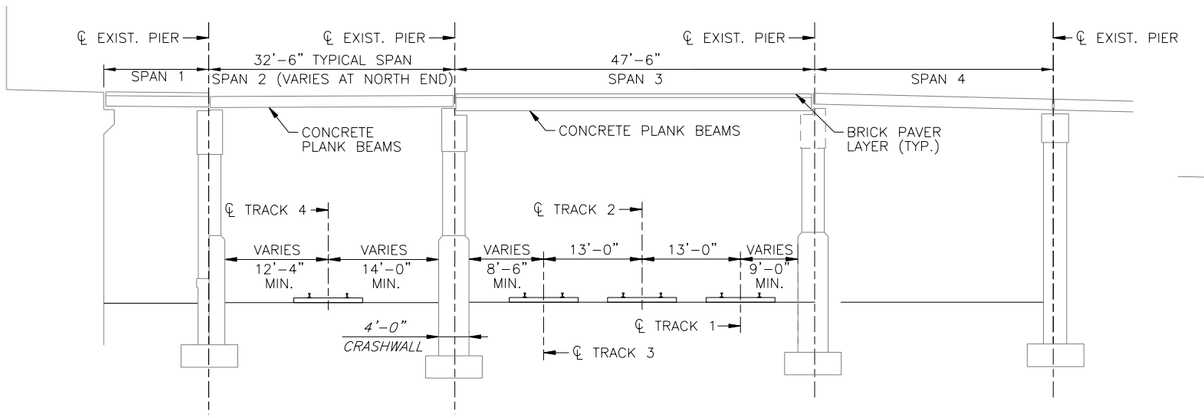
DATE _____

FILE _____

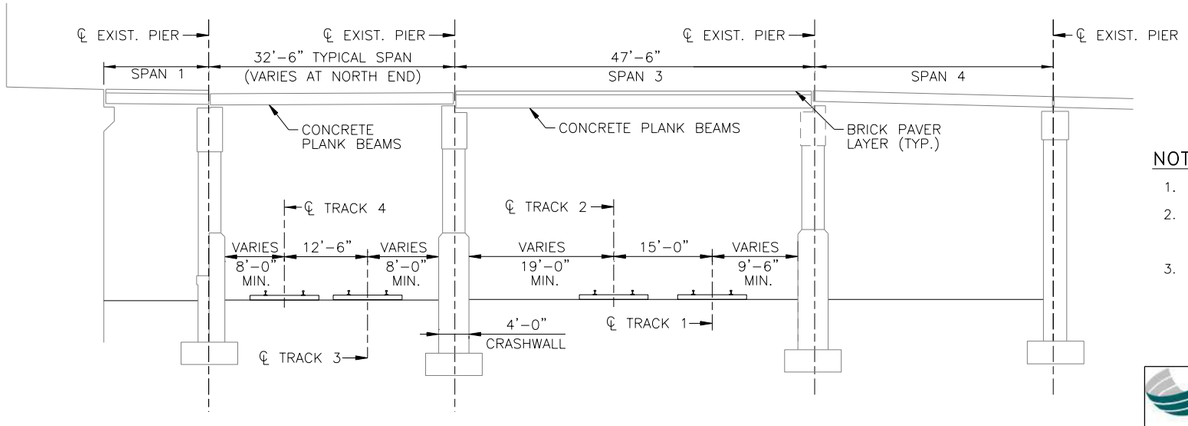
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
	D.C.			



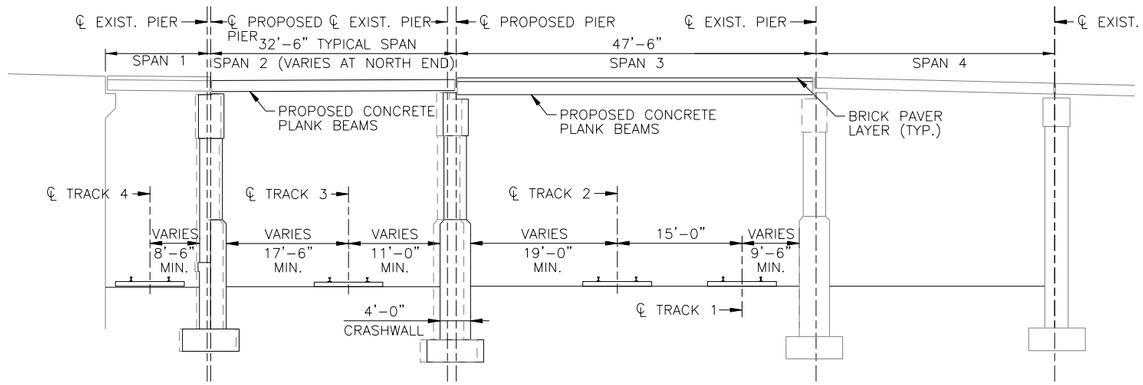
OPTION 1 - MARYLAND AVENUE
N.T.S



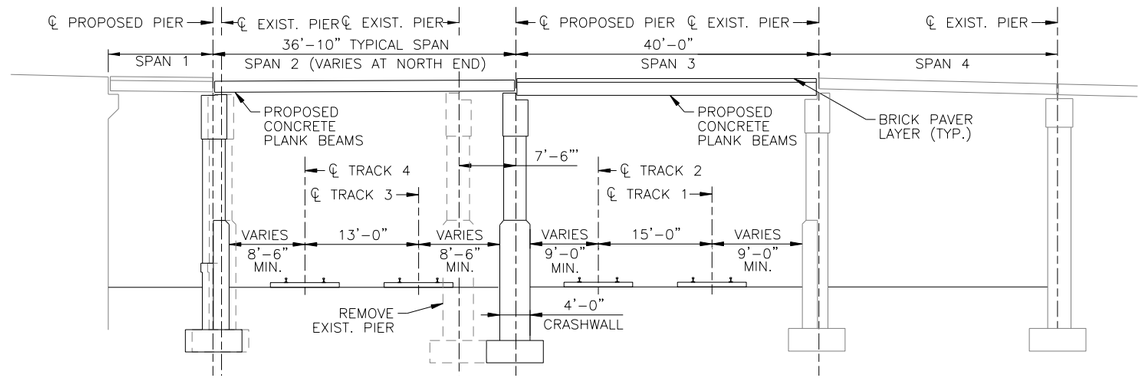
OPTION 2 - MARYLAND AVENUE
(NO CHANGE TO EXISTING BRIDGE)
N.T.S.



OPTION 3 - MARYLAND AVENUE
N.T.S



OPTION 4 - MARYLAND AVENUE
N.T.S



OPTION 5 - MARYLAND AVENUE
N.T.S

VERTICAL CLEARANCES				
ALIGNMENT	TRACK 1	TRACK 2	TRACK 3	TRACK 4
EXISTING	---	21.14'	21.27'	18.75'
15' TRACK SPACING	21.14'	21.14'	21.27'	21.14'
13' TRACK SPACING	21.14'	21.14'	21.27'	21.14'

NOTES:

1. SECTIONS ARE LOOKING NORTH.
2. VERTICAL CLEARANCES ARE APPROXIMATE AND ARE MEASURED FROM TOP OF RAIL TO BOTTOM OF SUPERSTRUCTURE.
3. PROPOSED TRACKS IN SPAN 2 TO BE LOWERED TO MATCH THE EXISTING CSXT CLEARANCES IN SPAN 3.

0 10 20
SCALE: 1" = 10'-0"

SEPTEMBER 6, 2018

vhb HNTB

NO.	DESCRIPTION	NAME	DATE

REVISIONS

D.C. DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE PROJECT MANAGEMENT ADMINISTRATION
PROJECT MANAGEMENT DIVISION

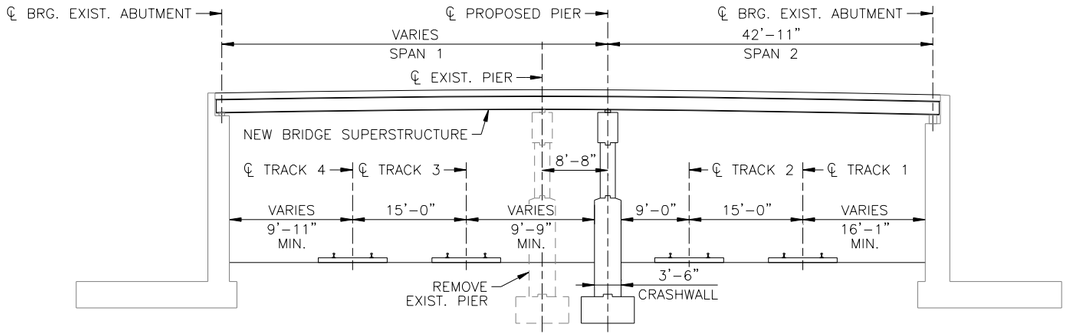
LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

PROJECT ENG. _____
DESIGNED BY _____
CHECKED BY _____
DRAWN BY _____
PROJECT MGR. _____

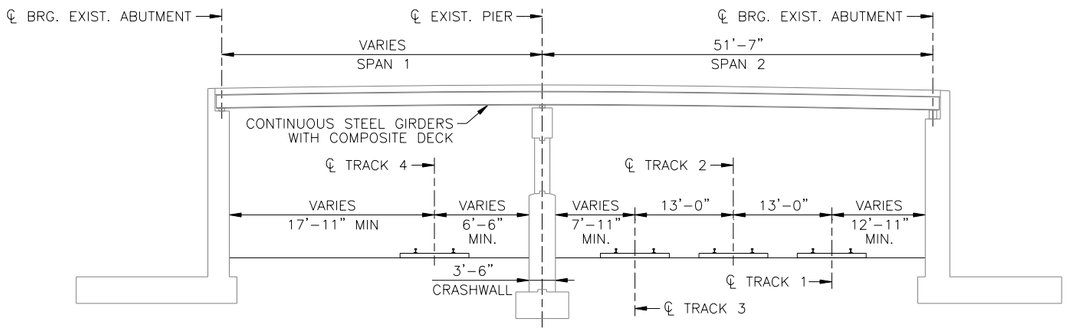
TYPICAL TRACK SECTIONS
MARYLAND AVENUE OVERBUILD
SOUTH END

DIVISION CHIEF
DATE _____
FILE _____
SHEET OF

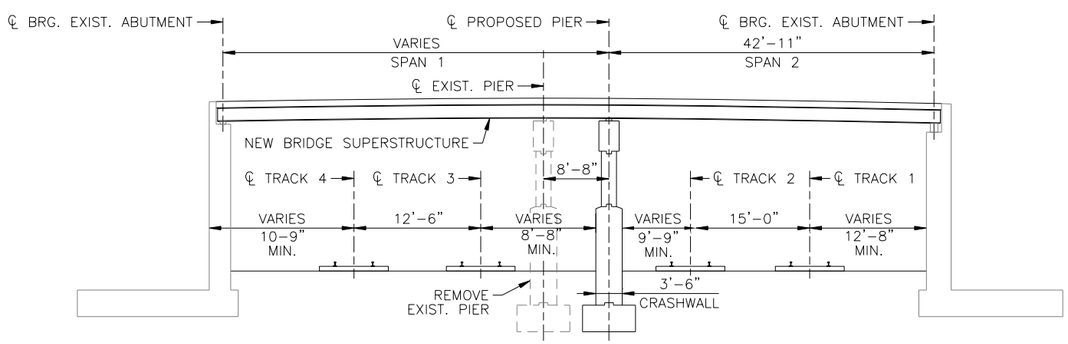
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
	D.C.			



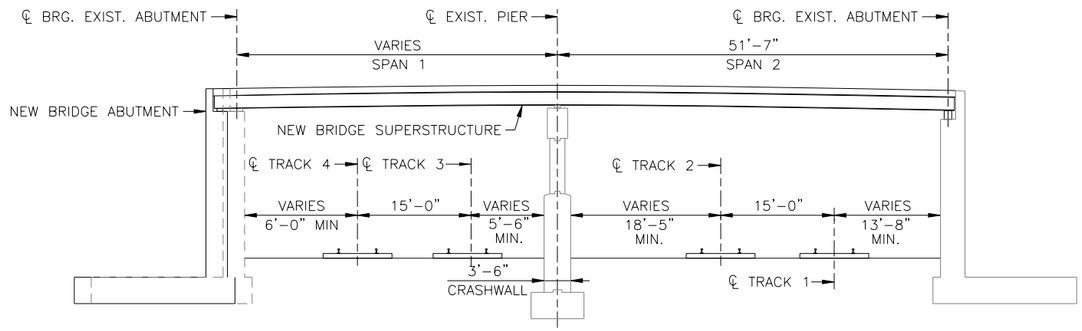
OPTION 1 - 12TH STREET VIEW
N.T.S



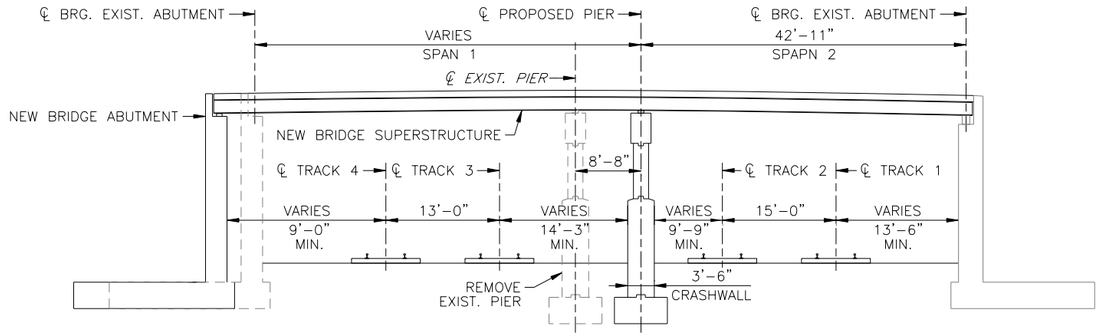
OPTION 2 - 12TH STREET VIEW
(NO CHANGE TO EXISTING BRIDGE)
N.T.S.



OPTION 3 - 12TH STREET VIEW
N.T.S



OPTION 4 - 12TH STREET VIEW
N.T.S.



OPTION 5 - 12 STREET SW
N.T.S.

NOTES:

1. SECTIONS ARE LOOKING NORTH.
2. VERTICAL CLEARANCES ARE APPROXIMATE AND ARE MEASURED FROM TOP OF RAIL TO BOTTOM OF SUPERSTRUCTURE.
3. PROPOSED TRACKS IN SPAN 2 TO BE LOWERED TO MATCH THE EXISTING CSXT CLEARANCES IN SPAN 3.

VERTICAL CLEARANCES

ALIGNMENT	TRACK 1	TRACK 2	TRACK 3	TRACK 4
EXISTING	---	22.40'	22.42'	19.25'
15' TRACK SPACING	22.40'	22.40'	22.42'	22.40'
13' TRACK SPACING	22.40'	22.40'	22.42'	22.40'

0 10 20
SCALE: 1" = 10'–0"

SEPTEMBER 6, 2018

NO.	DESCRIPTION	NAME	DATE

REVISIONS

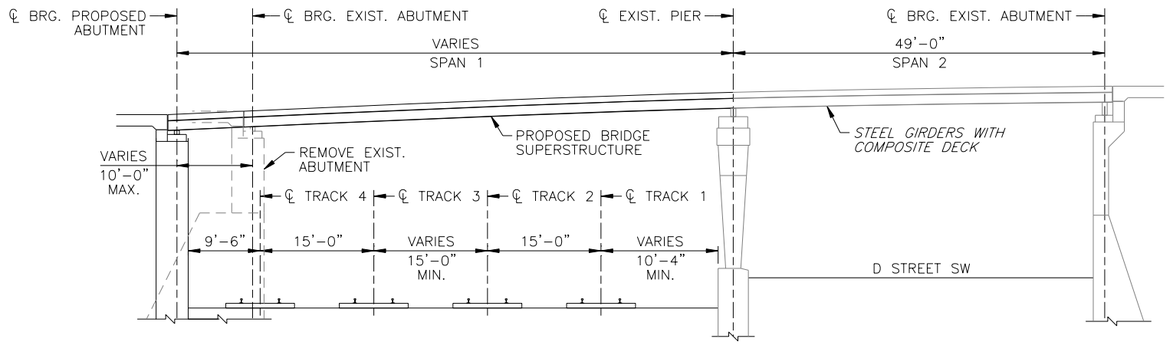
D.C. DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE PROJECT MANAGEMENT ADMINISTRATION
PROJECT MANAGEMENT DIVISION

LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

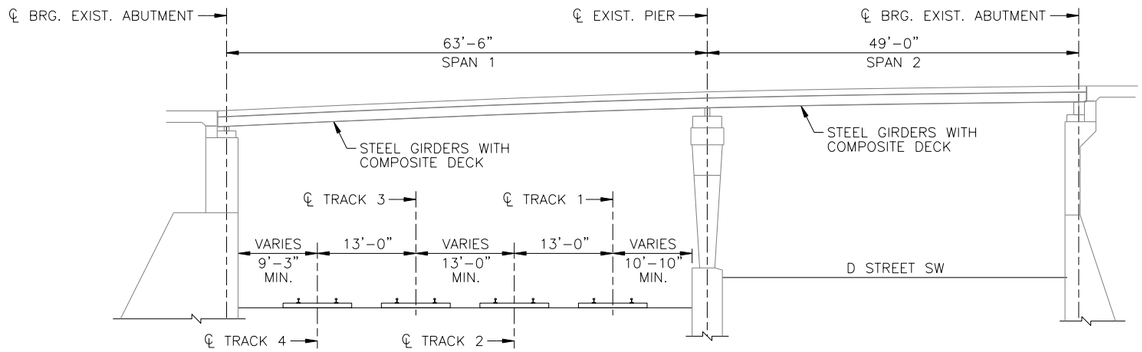
TYPICAL TRACK SECTIONS
12TH STREET SW

PROJECT ENG.
DESIGNED BY
CHECKED BY
DRAWN BY
PROJECT MGR.
DIVISION CHIEF
DATE
FILE
SHEET OF

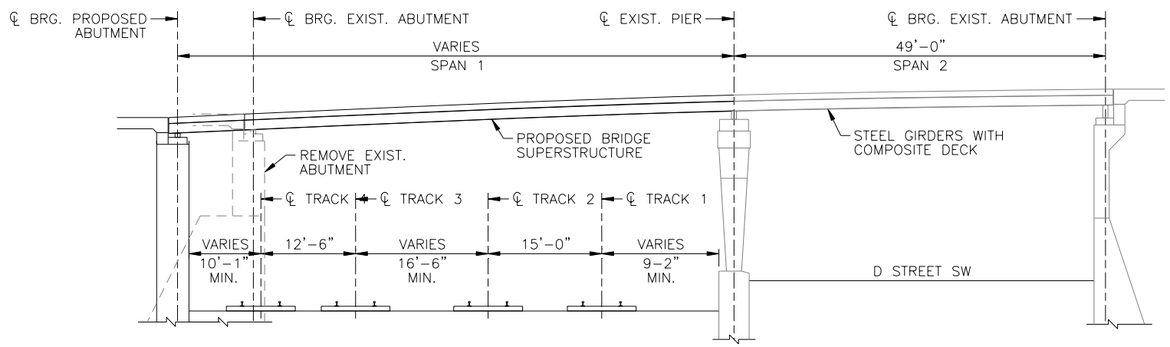
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
	D.C.			



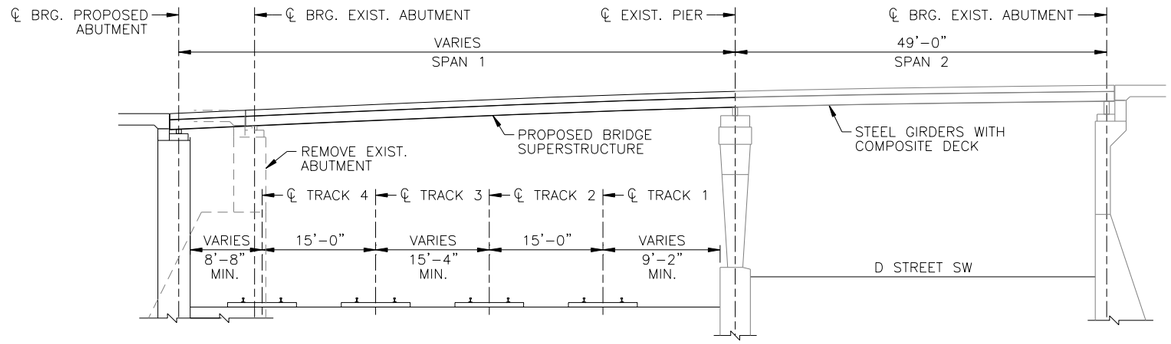
OPTION 1 - 12TH STREET EXPRESSWAY
N.T.S.



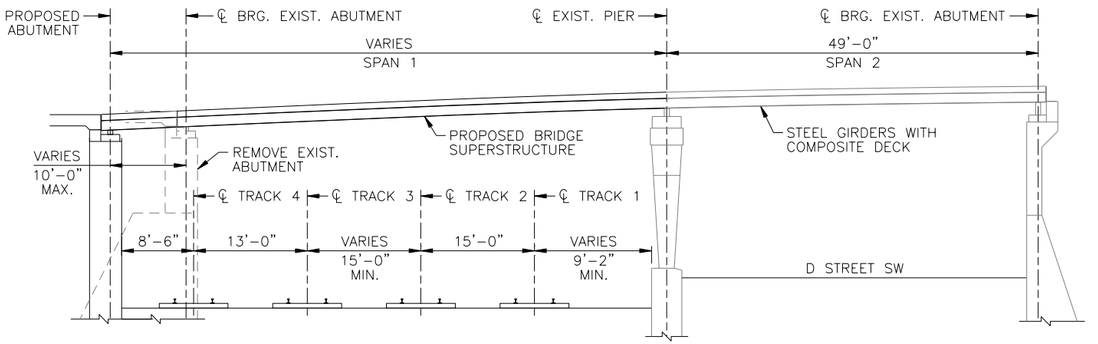
OPTION 2 - 12TH STREET EXPRESSWAY
(NO CHANGE TO EXISTING BRIDGE)
N.T.S.



OPTION 3 - 12TH STREET EXPRESSWAY
N.T.S.



OPTION 4 - 12TH STREET EXPRESSWAY
N.T.S.



OPTION 5 - 12TH STREET EXPRESSWAY
N.T.S.

VERTICAL CLEARANCES				
ALIGNMENT	TRACK 1	TRACK 2	TRACK 3	TRACK 4
EXISTING	---	22.01'	21.54'	21.02'
15' TRACK SPACING	21.54'	22.01'	21.54'	21.54'
13' TRACK SPACING	21.54'	22.01'	21.54'	21.54'

NOTES:

1. SECTIONS ARE LOOKING NORTH.
2. VERTICAL CLEARANCES ARE APPROXIMATE AND ARE MEASURED FROM TOP OF RAIL TO BOTTOM OF SUPERSTRUCTURE.
3. PROPOSED TRACK 4 TO BE LOWERED TO MATCH THE EXISTING CSXT CLEARANCE IMPROVEMENT PROJECT.

0 10 20
SCALE: 1" = 10'–0"

SEPTEMBER 6, 2018

NO.	DESCRIPTION	NAME	DATE

REVISIONS

D.C. DEPARTMENT OF TRANSPORTATION
INFRASTRUCTURE PROJECT MANAGEMENT ADMINISTRATION
PROJECT MANAGEMENT DIVISION

LONG BRIDGE PROJECT EIS
MARYLAND AVENUE TO L'ENFANT
INTERLOCKING CLEARANCE ASSESSMENT

TYPICAL TRACK SECTIONS
12TH STREET EXPRESSWAY

PROJECT ENG. _____
DESIGNED BY _____
CHECKED BY _____
DRAWN BY _____
PROJECT MGR. _____
DIVISION CHIEF
DATE _____
FILE _____
SHEET OF

Long Bridge Project

Environmental Impact Statement (EIS)

Maryland Avenue SW to L'Enfant Interlocking Clearance Assessment

Appendix C – CPM Construction Schedules

Summary of Options

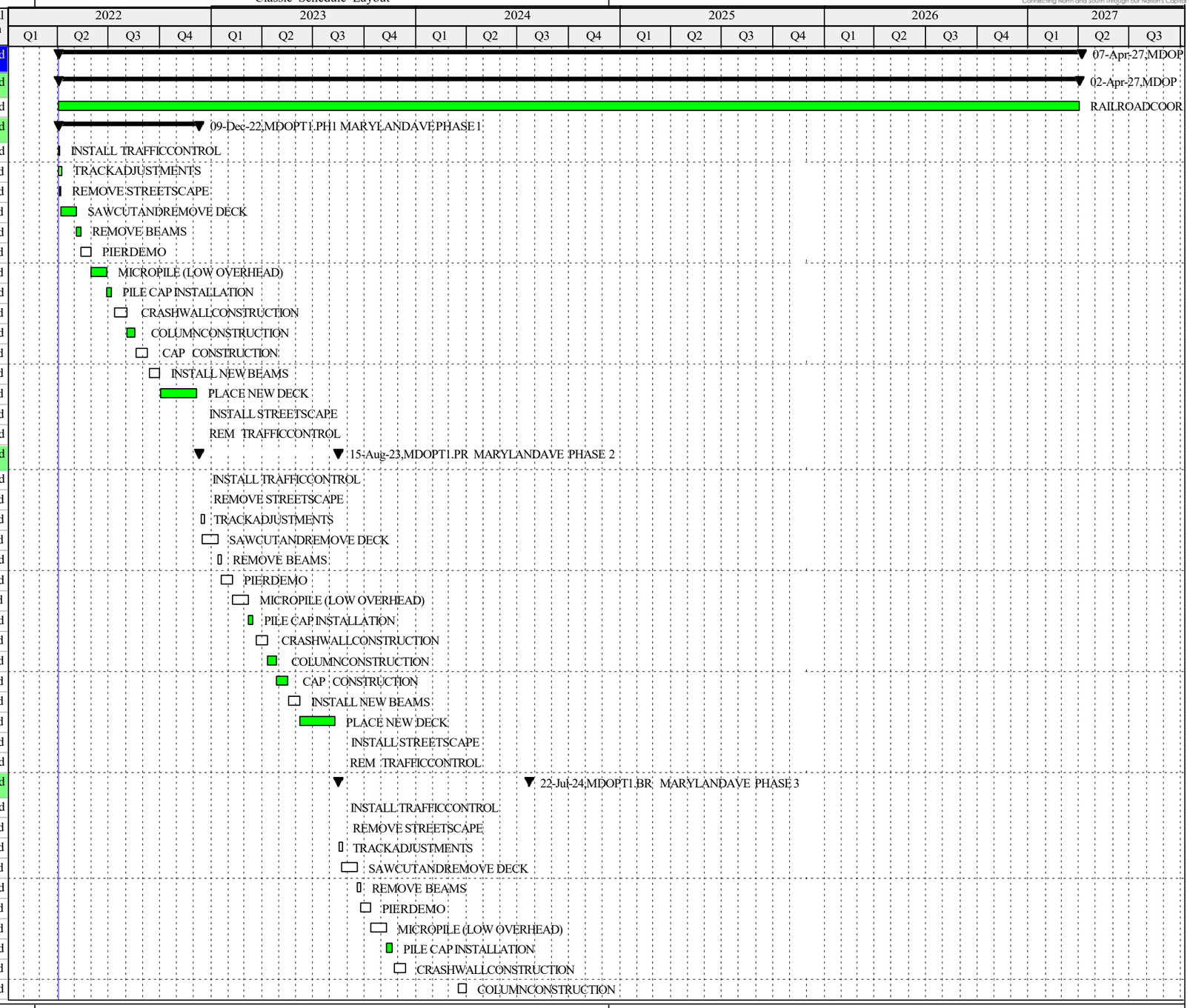
The schedules for Options 1, 3, 4, and 5 are provided in this appendix and are based on the following assumptions:

- **Option 1:** Providing 15 ft freight / 15 ft passenger track spacing with 9 ft freight / 9 ft passenger lateral clearance for a **60-month** construction duration.
- **Option 2:** Providing 13 ft freight / 13 ft passenger track spacing with 8.5 ft freight / 9 ft passenger lateral clearance for a **0-month** construction duration (no schedule included).
- **Option 3:** Providing 15 ft freight / 12.5 ft passenger track spacing with 9 ft freight / 8 ft passenger lateral clearance for a **50-month** construction duration.
- **Option 4:** Providing 15 ft freight / NA ft passenger track spacing with 9 ft freight / 7.25 ft passenger lateral clearance for a **49-month** construction duration.
- **Option 5:** Providing 15 ft freight/ 13 ft passenger track spacing with 9 ft freight / 8.5 ft passenger lateral clearance for a **40-month** construction duration.
    - There is potential that additional work will be needed in Option 5 due to increased span lengths and loading, but it cannot be determined prior to additional engineering and final design.

Option 1 Lateral Clearance: 15 ft Track Spacing

Option 1: All Tracks 15 ft Spacing — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
Option 1: All Tracks 15 ft Spacing	04-Apr-22	07-Apr-27	956d
STAKEHOLDER COORDINATION	04-Apr-22	02-Apr-27	953d
RAILROADCOORDINATION	04-Apr-22	02-Apr-27	953d
MARYLAND AVE PHASE 1	04-Apr-22	09-Dec-22	175d
INSTALL TRAFFIC CONTROL	04-Apr-22	05-Apr-22	2d
TRACK ADJUSTMENTS	04-Apr-22	08-Apr-22	5d
REMOVE STREETSCAPE	06-Apr-22	07-Apr-22	2d
SAWCUT AND REMOVE DECK	07-Apr-22	05-May-22	20d
REMOVE BEAMS	05-May-22	12-May-22	5d
PIER DEMO	12-May-22	31-May-22	13d
INSTALL MICROPILES (LOW OVERHEAD)	31-May-22	29-Jun-22	21d
PILE CAP INSTALLATION	29-Jun-22	07-Jul-22	6d
CRASHWALL CONSTRUCTION	13-Jul-22	03-Aug-22	15d
COLUMN CONSTRUCTION	03-Aug-22	18-Aug-22	11d
CAP CONSTRUCTION	19-Aug-22	09-Sep-22	15d
INSTALL NEW BEAMS	12-Sep-22	30-Sep-22	15d
PLACE NEW DECK	03-Oct-22	06-Dec-22	45d
INSTALL STREETSCAPE	07-Dec-22	08-Dec-22	2d
REMOVE TRAFFIC CONTROL	09-Dec-22	09-Dec-22	1d
MARYLAND AVE PHASE 2	09-Dec-22	15-Aug-23	107d
INSTALL TRAFFICCONTROL	09-Dec-22	13-Dec-22	2d
REMOVE STREETSCAPE	13-Dec-22	15-Dec-22	2d
TRACK ADJUSTMENTS	13-Dec-22	20-Dec-22	5d
SAWCUT AND REMOVE DECK	15-Dec-22	12-Jan-23	20d
REMOVE BEAMS	12-Jan-23	19-Jan-23	5d
PIER DEMO	19-Jan-23	07-Feb-23	13d
INSTALL MICROPILES (LOW OVERHEAD)	07-Feb-23	08-Mar-23	21d
PILE CAP INSTALLATION	08-Mar-23	16-Mar-23	6d
CRASHWALL CONSTRUCTION	22-Mar-23	12-Apr-23	15d
COLUMN CONSTRUCTION	12-Apr-23	27-Apr-23	11d
CAP CONSTRUCTION	28-Apr-23	18-May-23	15d
INSTALL NEW BEAMS	19-May-23	08-Jun-23	15d
PLACE NEW DECK	09-Jun-23	10-Aug-23	45d
INSTALL STREETSCAPE	11-Aug-23	14-Aug-23	2d
REMOVE TRAFFIC CONTROL	15-Aug-23	15-Aug-23	1d
MARYLAND AVE PHASE 3	15-Aug-23	22-Jul-24	172d
INSTALL TRAFFIC CONTROL	15-Aug-23	17-Aug-23	2d
REMOVE STREETSCAPE	17-Aug-23	21-Aug-23	2d
TRACK ADJUSTMENTS	17-Aug-23	24-Aug-23	5d
SAWCUT AND REMOVE DECK	21-Aug-23	18-Sep-23	20d
REMOVE BEAMS	18-Sep-23	25-Sep-23	5d
PIER DEMO	25-Sep-23	12-Oct-23	13d
INSTALL MICROPILES (LOW OVERHEAD)	12-Oct-23	10-Nov-23	21d
PILE CAP INSTALLATION	10-Nov-23	20-Nov-23	6d
CRASHWALL CONSTRUCTION	24-Nov-23	15-Dec-23	15d
COLUMN CONSTRUCTION	18-Mar-24	01-Apr-24	11d



(NewBar) Actual Work Critical Remaining Work
Actual Level of Effort Remaining Work Milestone

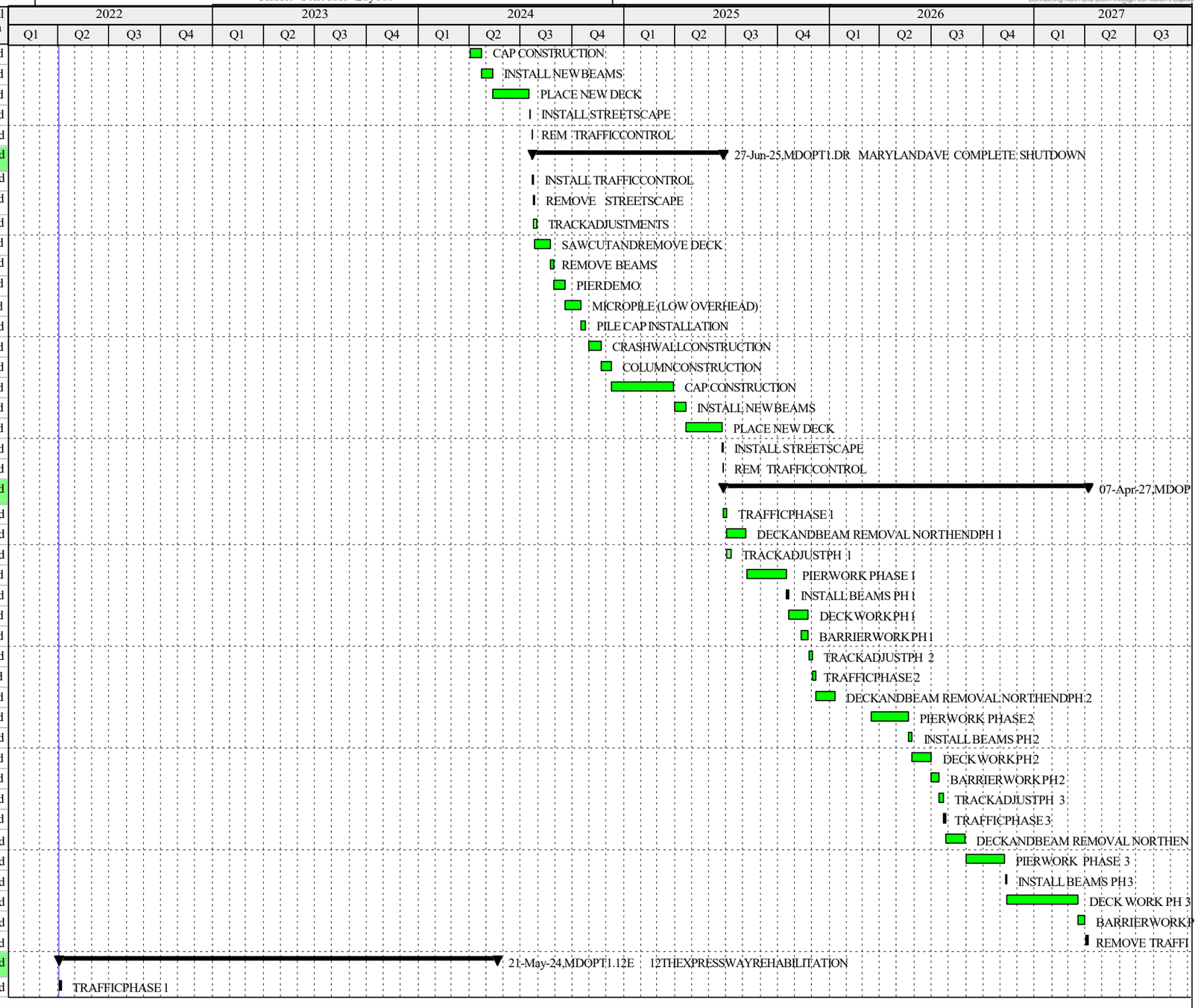
Page 1 of 3

TASK filter: All Activities

Option 1 Lateral Clearance: 15 ft Track Spacing

Option 1: All Tracks 15 ft Spacing — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
CAP CONSTRUCTION	02-Apr-24	22-Apr-24	15d
INSTALL NEW BEAMS	23-Apr-24	13-May-24	15d
PLACE NEW DECK	14-May-24	17-Jul-24	45d
INSTALL STREETSCAPE	18-Jul-24	19-Jul-24	2d
REMOVE TRAFFIC CONTROL	22-Jul-24	22-Jul-24	1d
MARYLAND AVE COMPLETE SHUTDOWN	22-Jul-24	27-Jun-25	174d
INSTALL TRAFFIC CONTROL	22-Jul-24	24-Jul-24	2d
REMOVE STREETSCAPE	24-Jul-24	26-Jul-24	2d
TRACK ADJUSTMENTS	24-Jul-24	31-Jul-24	5d
SAWCUT AND REMOVE DECK	26-Jul-24	23-Aug-24	20d
REMOVE BEAMS	23-Aug-24	30-Aug-24	5d
PIER DEMO	30-Aug-24	18-Sep-24	13d
INSTALL MICROPILES (LOW OVERHEAD)	18-Sep-24	17-Oct-24	21d
PILE CAP INSTALLATION	17-Oct-24	25-Oct-24	6d
CRASHWALL CONSTRUCTION	31-Oct-24	21-Nov-24	15d
COLUMN CONSTRUCTION	22-Nov-24	09-Dec-24	11d
CAP CONSTRUCTION	10-Dec-24	31-Mar-25	15d
INSTALL NEW BEAMS	01-Apr-25	21-Apr-25	15d
PLACE NEW DECK	22-Apr-25	24-Jun-25	45d
INSTALL STREETSCAPE	25-Jun-25	26-Jun-25	2d
REMOVE TRAFFIC CONTROL	27-Jun-25	27-Jun-25	1d
12TH STREET DECK REM AND REP	27-Jun-25	07-Apr-27	328d
TRAFFIC PHASE 1	27-Jun-25	02-Jul-25	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 1	02-Jul-25	06-Aug-25	25d
TRACK ADJUST PHASE 1	03-Jul-25	10-Jul-25	5d
PIER WORK PHASE 1	07-Aug-25	16-Oct-25	50d
INSTALL BEAMS PHASE 1	16-Oct-25	21-Oct-25	3d
DECK WORK PHASE 1	21-Oct-25	25-Nov-25	25d
BARRIER WORK PHASE 1	11-Nov-25	25-Nov-25	10d
TRACK ADJUST PHASE 2	26-Nov-25	03-Dec-25	5d
TRAFFIC PHASE 2	03-Dec-25	08-Dec-25	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 2	08-Dec-25	12-Jan-26	25d
PIER WORK PHASE 2	16-Mar-26	22-May-26	50d
INSTALL BEAMS PHASE 2	22-May-26	27-May-26	3d
DECK WORK PHASE 2	27-May-26	01-Jul-26	25d
BARRIER WORK PHASE 2	01-Jul-26	15-Jul-26	10d
TRACK ADJUST PHASE 3	16-Jul-26	22-Jul-26	5d
TRAFFIC PHASE 3	22-Jul-26	27-Jul-26	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	28-Jul-26	31-Aug-26	25d
PIER WORK PHASE 3	01-Sep-26	09-Nov-26	50d
INSTALL BEAMS PHASE 3	10-Nov-26	12-Nov-26	3d
DECK WORK PHASE 3	13-Nov-26	18-Mar-27	25d
BARRIER WORK PHASE 3	18-Mar-27	30-Mar-27	8d
REMOVE TRAFFIC CONTROL	02-Apr-27	07-Apr-27	3d
12TH EXPRESSWAY REHABILITATION	04-Apr-22	21-May-24	412d
TRAFFIC PHASE 1	04-Apr-22	06-Apr-22	3d



(New Bar) Actual Work Critical Remaining Work
Actual Level of Effort Remaining Work Milestone

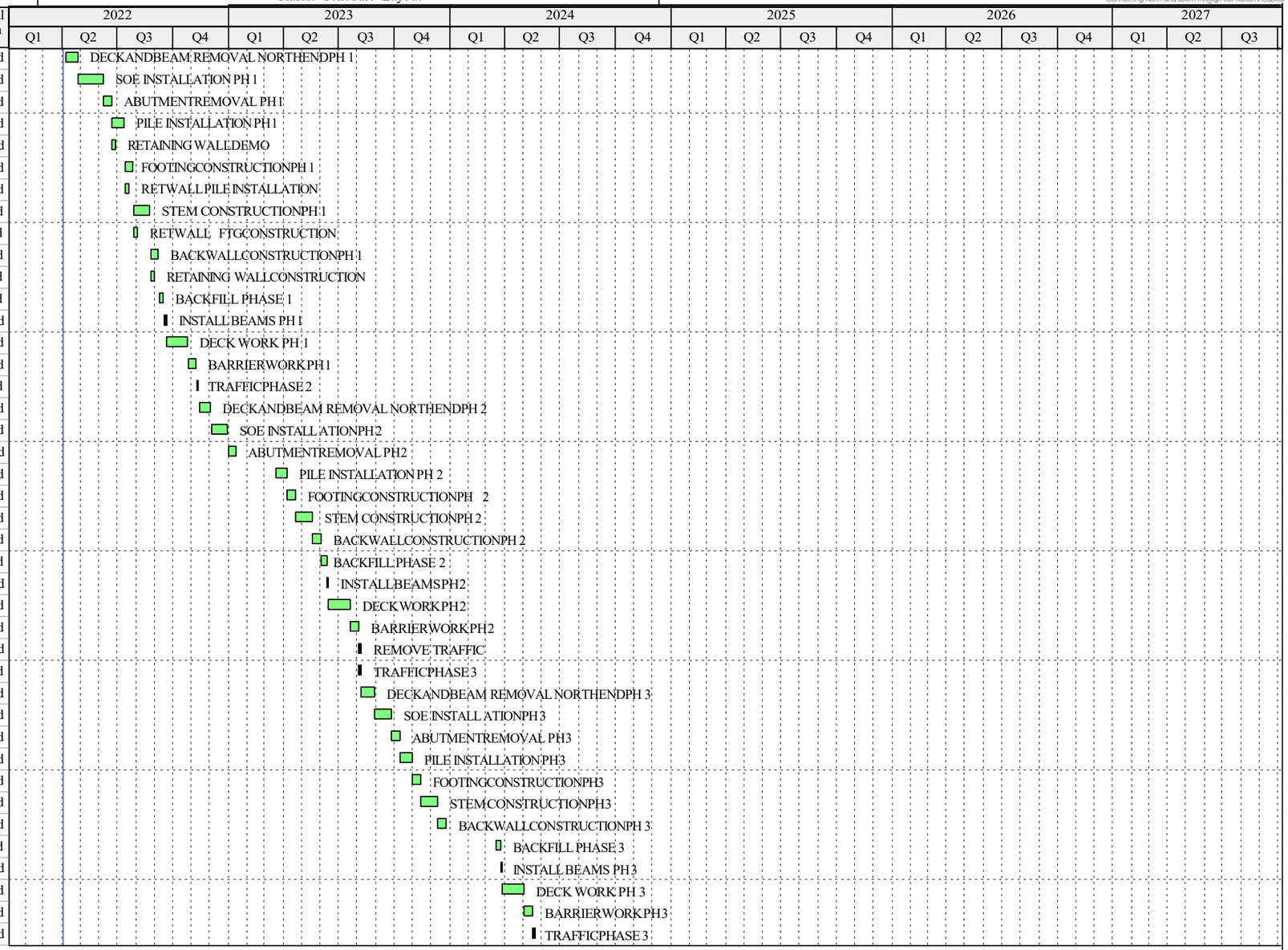
Page 2 of 3

TASK filter: All Activities

Option 1 Lateral Clearance: 15 ft Track Spacing

Option 1: All Tracks 15 ft Spacing — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
DECK AND BEAM REMOVAL NORTHEND PHASE 1	07-Apr-22	27-Apr-22	15d
SOE INSTALLATION PHASE 1	28-Apr-22	08-Jun-22	30d
ABUTMENT REMOVAL PHASE 1	09-Jun-22	22-Jun-22	10d
PILE INSTALLATION PHASE 1	23-Jun-22	13-Jul-22	15d
RETAINING WALL DEMO	23-Jun-22	29-Jun-22	5d
FOOTING CONSTRUCTION PHASE 1	14-Jul-22	27-Jul-22	10d
RETWALL PILE INSTALLATION	14-Jul-22	20-Jul-22	5d
STEM CONSTRUCTION PHASE 1	28-Jul-22	24-Aug-22	20d
RETWALL FTG CONSTRUCTION	28-Jul-22	03-Aug-22	5d
BACKWALL CONSTRUCTION PHASE 1	25-Aug-22	07-Sep-22	10d
RETAINING WALL CONSTRUCTION	25-Aug-22	31-Aug-22	5d
BACKFILL PHASE 1	08-Sep-22	15-Sep-22	6d
INSTALL BEAMS PHASE 1	16-Sep-22	20-Sep-22	3d
DECK WORK PHASE1	21-Sep-22	25-Oct-22	25d
BARRIER WORK PHASE 1	26-Oct-22	08-Nov-22	10d
TRAFFIC PHASE 2	09-Nov-22	11-Nov-22	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 2	14-Nov-22	02-Dec-22	15d
SOE INSTALLATION PHASE 2	05-Dec-22	30-Dec-22	20d
ABUTMENT REMOVAL PHASE 2	02-Jan-23	13-Jan-23	10d
PILE INSTALLATION PHASE 2	20-Mar-23	07-Apr-23	15d
FOOTING CONSTRUCTION PHASE 2	07-Apr-23	21-Apr-23	10d
STEM CONSTRUCTION PHASE 2	21-Apr-23	19-May-23	20d
BACKWALL CONSTRUCTION PHASE 2	19-May-23	02-Jun-23	10d
BACKFILL PHASE 2	02-Jun-23	12-Jun-23	6d
INSTALL BEAMS PHASE 2	12-Jun-23	15-Jun-23	3d
DECK WORK PHASE2	15-Jun-23	20-Jul-23	25d
BARRIER WORK PHASE 2	20-Jul-23	03-Aug-23	10d
REMOVE TRAFFIC	03-Aug-23	08-Aug-23	3d
TRAFFIC PHASE 3	03-Aug-23	08-Aug-23	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	08-Aug-23	29-Aug-23	15d
SOE INSTALLATION PHASE 3	29-Aug-23	26-Sep-23	20d
ABUTMENT REMOVAL PHASE 3	26-Sep-23	10-Oct-23	10d
PILE INSTALLATION PHASE 3	10-Oct-23	31-Oct-23	15d
FOOTING CONSTRUCTION PHASE 3	31-Oct-23	14-Nov-23	10d
STEM CONSTRUCTION PHASE 3	14-Nov-23	12-Dec-23	20d
BACKWALL CONSTRUCTION PHASE 3	12-Dec-23	26-Dec-23	10d
BACKFILL PHASE 3	18-Mar-24	25-Mar-24	6d
INSTALL BEAMS PHASE 3	25-Mar-24	28-Mar-24	3d
DECK WORK PHASE3	28-Mar-24	02-May-24	25d
BARRIER WORK PHASE 3	02-May-24	16-May-24	10d
TRAFFIC PHASE 3	16-May-24	21-May-24	3d



(NewBar) Actual Level of Effort | Actual Work | Remaining Work | Critical Remaining Work | Milestone

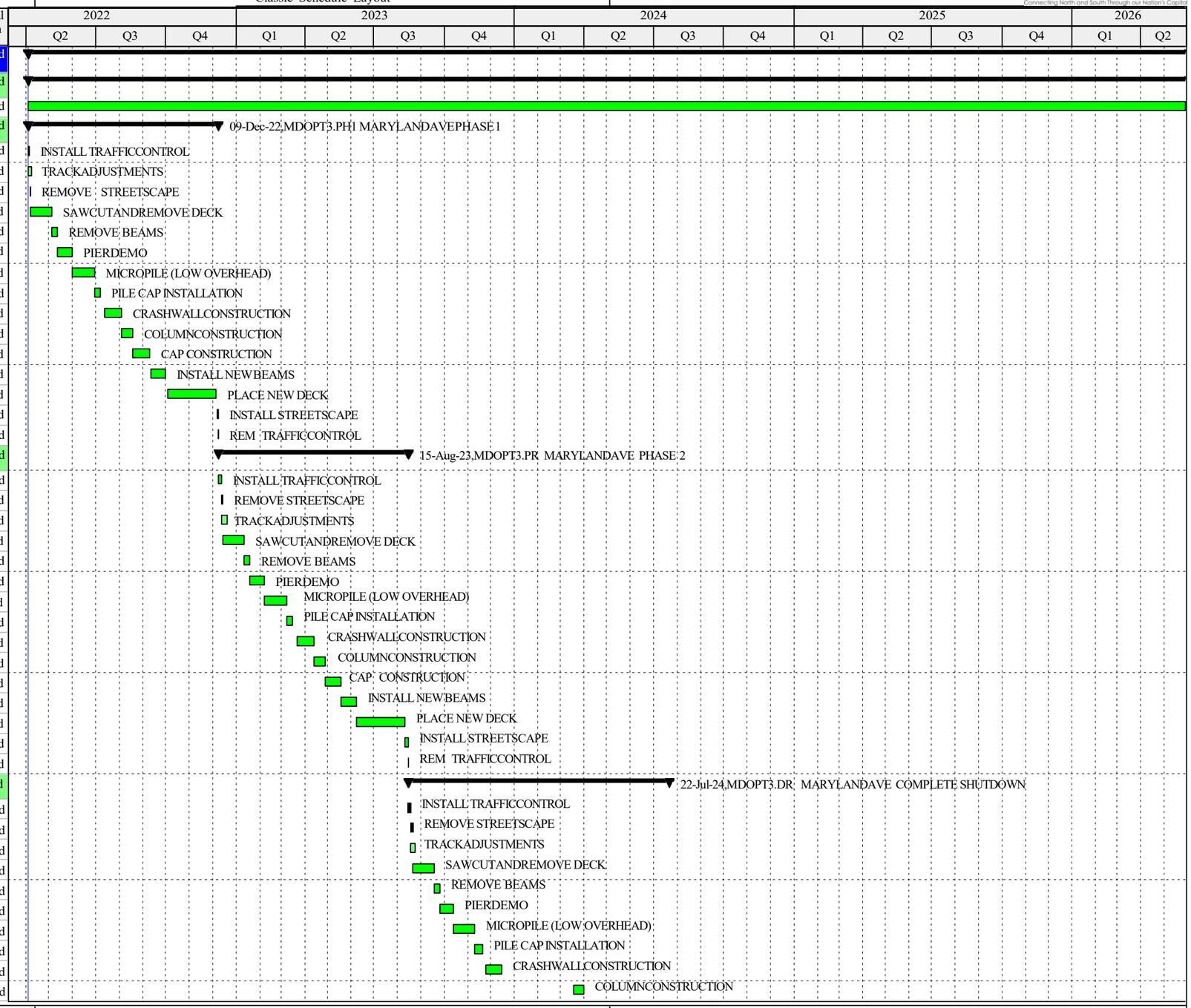
Page 3 of 3

TASK filter: All Activities

Option 3 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, 12.5 ft. Track Spacing for Tracks 3 & 4

Option 3: 15 Ft Freight, 12.5 Ft Passenger — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
Option 3: 15 Ft Freight, 12 Ft Passenger	04-Apr-22	02-Jun-26	800d
STAKEHOLDER COORDINATION	04-Apr-22	02-Jun-26	800d
RAILROAD COORDINATION	04-Apr-22	02-Jun-26	800d
MARYLAND AVE PHASE 1	04-Apr-22	09-Dec-22	175d
INSTALL TRAFFIC CONTROL	04-Apr-22	05-Apr-22	2d
TRACK ADJUSTMENTS	04-Apr-22	08-Apr-22	5d
REMOVE STREETSCAPE	06-Apr-22	07-Apr-22	2d
SAWCUT AND REMOVE DECK	07-Apr-22	05-May-22	20d
REMOVE BEAMS	05-May-22	12-May-22	5d
PIER DEMO	12-May-22	31-May-22	13d
INSTALL MICROPILES (LOW OVERHEAD)	31-May-22	29-Jun-22	21d
PILE CAP INSTALLATION	29-Jun-22	07-Jul-22	6d
CRASHWALL CONSTRUCTION	13-Jul-22	03-Aug-22	15d
COLUMN CONSTRUCTION	03-Aug-22	18-Aug-22	11d
CAP CONSTRUCTION	19-Aug-22	09-Sep-22	15d
INSTALL NEW BEAMS	12-Sep-22	30-Sep-22	15d
PLACE NEW DECK	03-Oct-22	06-Dec-22	45d
INSTALL STREETSCAPE	07-Dec-22	08-Dec-22	2d
REMOVE TRAFFIC CONTROL	09-Dec-22	09-Dec-22	1d
MARYLAND AVE PHASE 2	09-Dec-22	15-Aug-23	177d
INSTALL TRAFFIC CONTROL	09-Dec-22	13-Dec-22	2d
REMOVE STREETSCAPE	13-Dec-22	15-Dec-22	2d
TRACK ADJUSTMENTS	13-Dec-22	20-Dec-22	5d
SAWCUT AND REMOVE DECK	15-Dec-22	12-Jan-23	20d
REMOVE BEAMS	12-Jan-23	19-Jan-23	5d
PIER DEMO	19-Jan-23	07-Feb-23	13d
INSTALL MICROPILES (LOW OVERHEAD)	07-Feb-23	08-Mar-23	21d
PILE CAP INSTALLATION	08-Mar-23	16-Mar-23	6d
CRASHWALL CONSTRUCTION	22-Mar-23	12-Apr-23	15d
COLUMN CONSTRUCTION	12-Apr-23	27-Apr-23	11d
CAP CONSTRUCTION	27-Apr-23	18-May-23	15d
INSTALL NEW BEAMS	18-May-23	08-Jun-23	15d
PLACE NEW DECK	08-Jun-23	10-Aug-23	45d
INSTALL STREETSCAPE	10-Aug-23	14-Aug-23	2d
REMOVE TRAFFIC CONTROL	14-Aug-23	15-Aug-23	1d
MARYLAND AVE COMPLETE SHUTDOWN	15-Aug-23	22-Jul-24	172d
INSTALL TRAFFIC CONTROL	15-Aug-23	17-Aug-23	2d
REMOVE STREETSCAPE	17-Aug-23	21-Aug-23	2d
TRACK ADJUSTMENTS	17-Aug-23	24-Aug-23	5d
SAWCUT AND REMOVE DECK	21-Aug-23	18-Sep-23	20d
REMOVE BEAMS	18-Sep-23	25-Sep-23	5d
PIER DEMO	25-Sep-23	12-Oct-23	13d
INSTALL MICROPILES (LOW OVERHEAD)	12-Oct-23	10-Nov-23	21d
PILE CAP INSTALLATION	10-Nov-23	20-Nov-23	6d
CRASHWALL CONSTRUCTION	24-Nov-23	15-Dec-23	15d
COLUMN CONSTRUCTION	18-Mar-24	01-Apr-24	11d



(NewBar) Actual Work Critical Remaining Work
Actual Level of Effort Remaining Work Milestone

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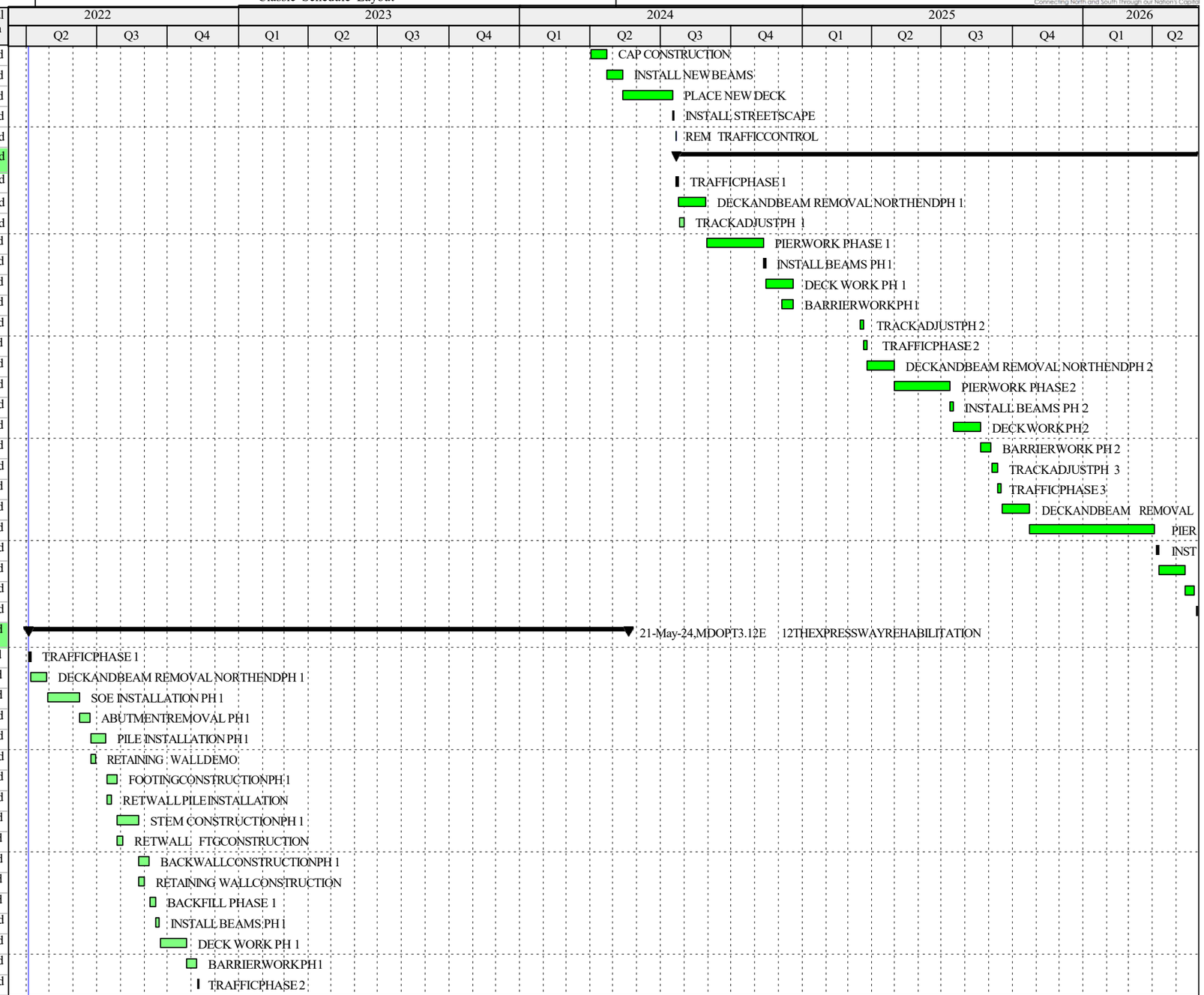
TASK filter: All Activities

Option 3 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, 12.5 ft. Track Spacing for Tracks 3 & 4

Option 3: 15 Ft Freight, 12.5 Ft Passenger — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
CAP CONSTRUCTION	02-Apr-24	22-Apr-24	15d
INSTALL NEW BEAMS	23-Apr-24	13-May-24	15d
PLACE NEW DECK	14-May-24	17-Jul-24	45d
INSTALL STREETSCAPE	18-Jul-24	19-Jul-24	2d
REMOVE TRAFFIC CONTROL	22-Jul-24	22-Jul-24	1d
12TH STREET DECK REMOVE AND REPLACE	22-Jul-24	02-Jun-26	346d
TRAFFIC PHASE 1	22-Jul-24	25-Jul-24	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 1	25-Jul-24	29-Aug-24	25d
TRACK ADJUST PHASE 1	26-Jul-24	01-Aug-24	5d
PIER WORK PHASE 1	30-Aug-24	12-Nov-24	50d
INSTALL BEAMS PHASE 1	12-Nov-24	15-Nov-24	3d
DECK WORK PHASE 1	15-Nov-24	20-Dec-24	25d
BARRIER WORK PHASE 1	06-Dec-24	20-Dec-24	10d
TRACK ADJUST PHASE 2	17-Mar-25	21-Mar-25	5d
TRAFFIC PHASE 2	21-Mar-25	26-Mar-25	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 2	26-Mar-25	30-Apr-25	25d
PIER WORK PHASE 2	01-May-25	11-Jul-25	50d
INSTALL BEAMS PHASE 2	11-Jul-25	16-Jul-25	3d
DECK WORK PHASE 2	16-Jul-25	20-Aug-25	25d
BARRIER WORK PHASE 2	20-Aug-25	03-Sep-25	10d
TRACK ADJUST PHASE 3	04-Sep-25	11-Sep-25	5d
TRAFFIC PHASE 3	11-Sep-25	16-Sep-25	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	17-Sep-25	22-Oct-25	25d
PIER WORK PHASE 3	23-Oct-25	03-Apr-26	50d
INSTALL BEAMS PHASE 3	06-Apr-26	08-Apr-26	3d
DECK WORK PHASE 3	09-Apr-26	13-May-26	25d
BARRIER WORK PHASE 3	13-May-26	25-May-26	8d
REMOVE TRAFFIC CONTROL	28-May-26	02-Jun-26	3d
12TH EXPRESSWAY REHABILITATION	04-Apr-22	21-May-24	412d
TRAFFIC PHASE 1	04-Apr-22	06-Apr-22	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 1	07-Apr-22	27-Apr-22	15d
SOE INSTALLATION PHASE 1	28-Apr-22	08-Jun-22	30d
ABUTMENT REMOVAL PHASE 1	09-Jun-22	22-Jun-22	10d
PILE INSTALLATION PHASE 1	23-Jun-22	13-Jul-22	15d
RETAINING WALL DEMO	23-Jun-22	29-Jun-22	5d
FOOTING CONSTRUCTION PHASE 1	14-Jul-22	27-Jul-22	10d
RETWALL PILE INSTALLATION	14-Jul-22	20-Jul-22	5d
STEM CONSTRUCTION PHASE 1	28-Jul-22	24-Aug-22	20d
RET WALL FTG CONSTRUCTION	28-Jul-22	03-Aug-22	5d
BACKWALL CONSTRUCTION PHASE 1	25-Aug-22	07-Sep-22	10d
RETAINING WALL CONSTRUCTION	25-Aug-22	31-Aug-22	5d
BACKFILL PHASE 1	08-Sep-22	15-Sep-22	6d
INSTALL BEAMS PHASE 1	16-Sep-22	20-Sep-22	3d
DECK WORK PHASE 1	21-Sep-22	25-Oct-22	25d
BARRIER WORK PHASE 1	26-Oct-22	08-Nov-22	10d
TRAFFIC PHASE 2	09-Nov-22	11-Nov-22	3d



(NewBar) Actual Work Critical Remaining Work
Actual Level of Effort Remaining Work Milestone

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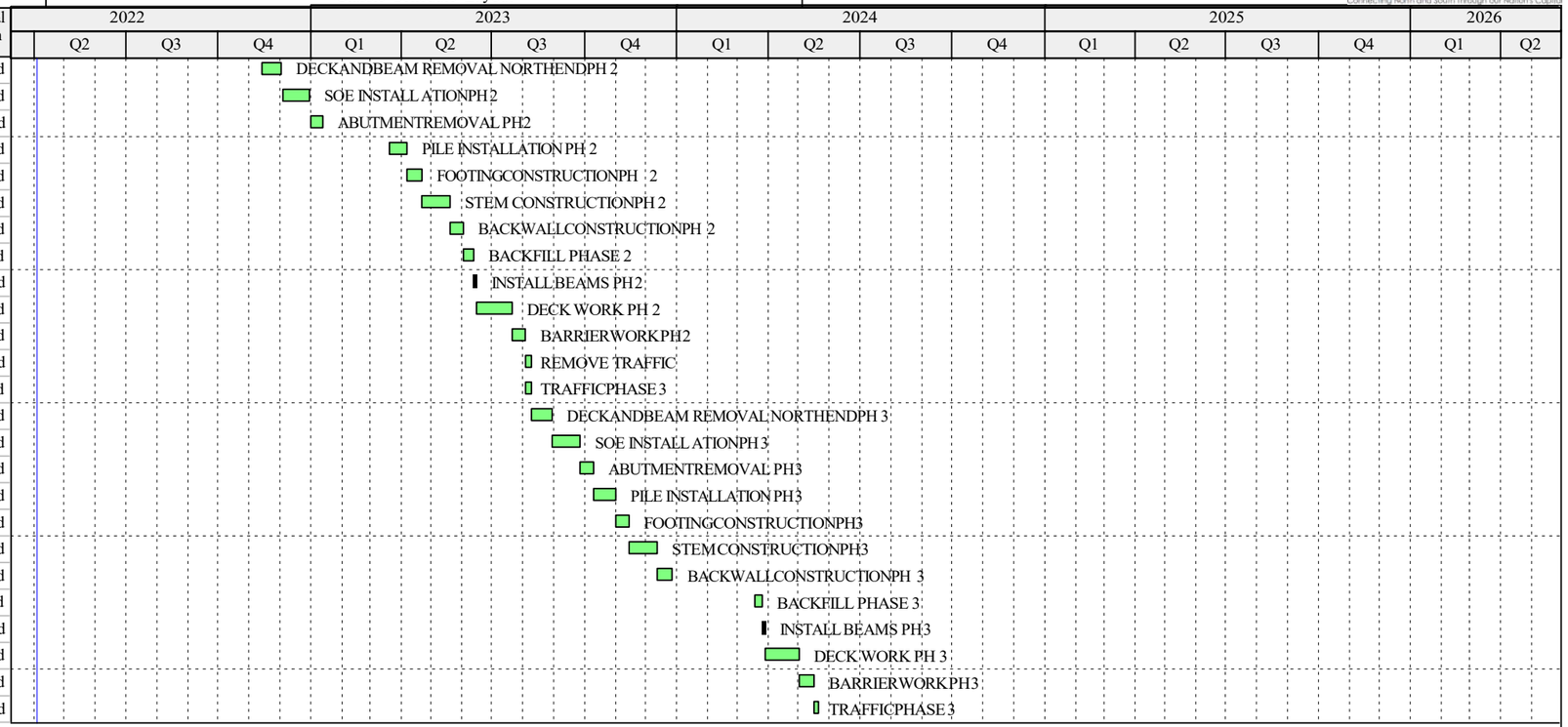
TASK filter: All Activities

Option 3 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, 12.5 ft. Track Spacing for Tracks 3 & 4

Option 3: 15 Ft Freight, 12.5 Ft Passenger

Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
DECK AND BEAM REMOVAL NORTHEND PHASE 2	14-Nov-22	02-Dec-22	15d
SOE INSTALLATION PHASE 2	05-Dec-22	30-Dec-22	20d
ABUTMENT REMOVAL PHASE 2	02-Jan-23	13-Jan-23	10d
PILE INSTALLATION PHASE 2	20-Mar-23	07-Apr-23	15d
FOOTING CONSTRUCTION PHASE 2	07-Apr-23	21-Apr-23	10d
STEM CONSTRUCTION PHASE 2	21-Apr-23	19-May-23	20d
BACKWALL CONSTRUCTION PHASE 2	19-May-23	02-Jun-23	10d
BACKFILL PHASE 2	02-Jun-23	12-Jun-23	6d
INSTALL BEAMS PHASE 2	12-Jun-23	15-Jun-23	3d
DECK WORK PHASE2	15-Jun-23	20-Jul-23	25d
BARRIER WORK PHASE 2	20-Jul-23	03-Aug-23	10d
REMOVE TRAFFIC CONTROL	03-Aug-23	08-Aug-23	3d
TRAFFIC PHASE 3	03-Aug-23	08-Aug-23	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	08-Aug-23	29-Aug-23	15d
SOE INSTALLATION PHASE3	29-Aug-23	26-Sep-23	20d
ABUTMENT REMOVAL PHASE 3	26-Sep-23	10-Oct-23	10d
PILE INSTALLATION PHASE3	10-Oct-23	31-Oct-23	15d
FOOTING CONSTRUCTION PHASE 3	31-Oct-23	14-Nov-23	10d
STEMCONSTRUCTION PHASE 3	14-Nov-23	12-Dec-23	20d
BACKWALL CONSTRUCTION PHASE 3	12-Dec-23	26-Dec-23	10d
BACKFILL PHASE 3	18-Mar-24	25-Mar-24	6d
INSTALL BEAMS PHASE3	25-Mar-24	28-Mar-24	3d
DECK WORK PHASE 3	28-Mar-24	02-May-24	25d
BARRIER WORK PHASE 3	02-May-24	16-May-24	10d
TRAFFIC PHASE 3	16-May-24	21-May-24	3d



(NewBar) Actual Level of Effort | Actual Work Remaining Work | Critical Remaining Work Milestone

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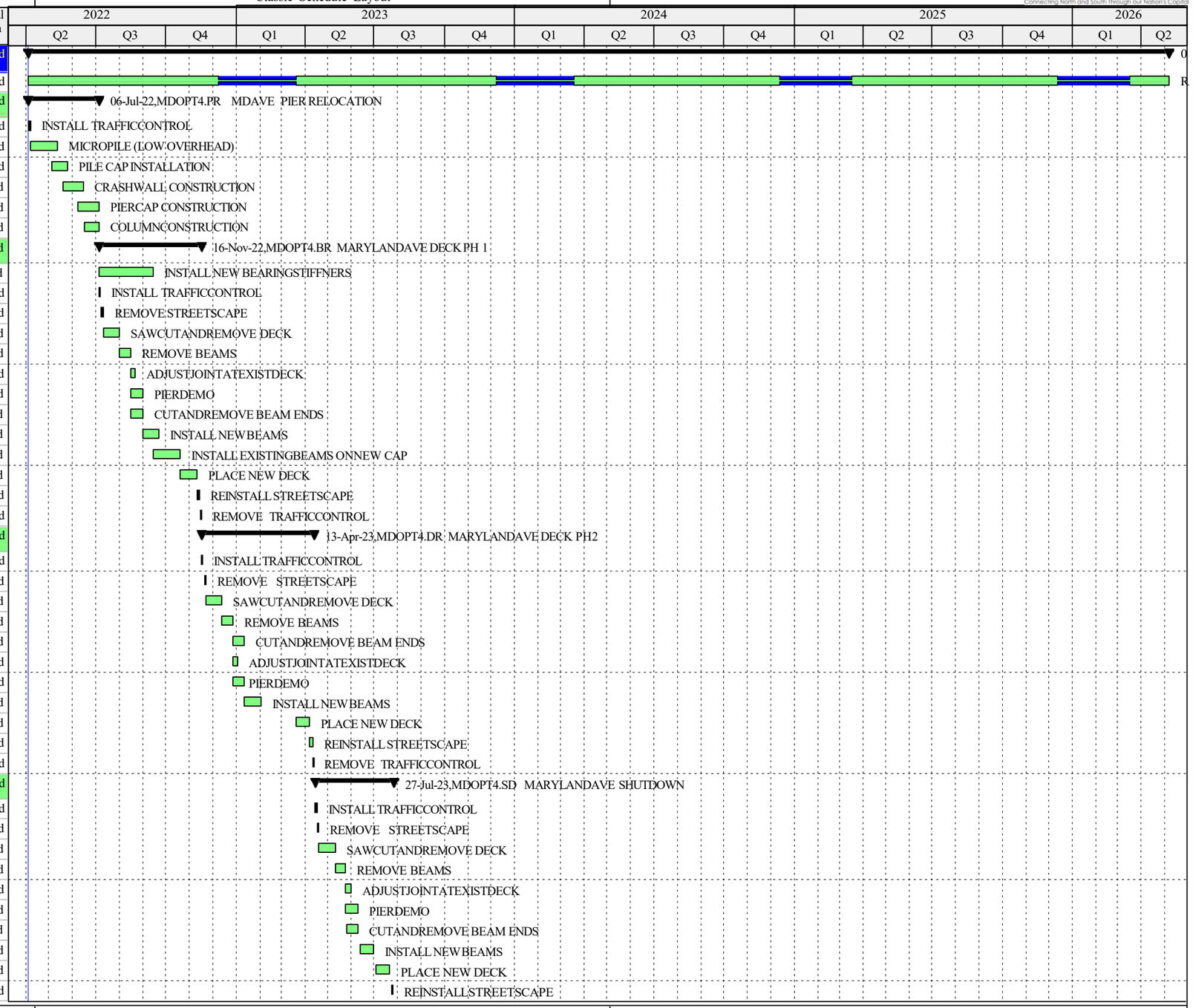
TASK filter: All Activities

Option 3 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, NA ft. Track Spacing for Tracks 3 & 4

Option 4: 15 Ft Freight, Varied Passenger — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
Option 4: 15 Ft Freight, Varied Passenger	04-Apr-22	06-May-26	781d
RAILROAD COORDINATION	04-Apr-22	06-May-26	781d
MD AVE PIER RELOCATION	04-Apr-22	06-Jul-22	65d
INSTALL TRAFFICC ONTROL	04-Apr-22	06-Apr-22	3d
INSTALL MICROPILES (LOW OVERHEAD)	07-Apr-22	11-May-22	25d
PILE CAP INSTALLATION	05-May-22	25-May-22	15d
CRASHWALL CONSTRUCTION	19-May-22	15-Jun-22	20d
PIERCA PCONSTRUCTION	07-Jun-22	06-Jul-22	20d
COLUMN CONSTRUCTION	16-Jun-22	05-Jul-22	14d
MARYLAND AVE DECK PHASE 1	06-Jul-22	16-Nov-22	94d
INSTALL NEW BEARING STIFFNERS	06-Jul-22	14-Sep-22	50d
INSTALL TRAFFIC CONTROL	06-Jul-22	07-Jul-22	2d
REMOVE STREETSCAPE	08-Jul-22	11-Jul-22	2d
SAWCUT AND REMOVE DECK	11-Jul-22	01-Aug-22	15d
REMOVE BEAMS	01-Aug-22	15-Aug-22	10d
ADJUST JOINT AT EXIST DECK	15-Aug-22	22-Aug-22	5d
PIER DEMO	15-Aug-22	31-Aug-22	12d
CUT AND REMOVE BEAM ENDS	16-Aug-22	31-Aug-22	12d
INSTALLNEW BEAMS	01-Sep-22	22-Sep-22	15d
INSTALL EXISTING BEAMS ON NEW CAP	14-Sep-22	19-Oct-22	25d
PLACE NEW DECK	20-Oct-22	10-Nov-22	15d
REINSTALL STREETSCAPE	11-Nov-22	14-Nov-22	2d
REMOVE TRAFFIC CONTROL	15-Nov-22	16-Nov-22	2d
MARYLAND AVE DECK PHASE 2	17-Nov-22	13-Apr-23	35d
INSTALL TRAFFIC CONTROL	17-Nov-22	18-Nov-22	2d
REMOVE STREETSCAPE	21-Nov-22	22-Nov-22	2d
SAWCUT AND REMOVE DECK	22-Nov-22	13-Dec-22	15d
REMOVE BEAMS	13-Dec-22	27-Dec-22	10d
CUT AND REMOVE BEAM ENDS	27-Dec-22	12-Jan-23	12d
ADJUST JOINT AT EXIST DECK	27-Dec-22	03-Jan-23	5d
PIER DEMO	27-Dec-22	12-Jan-23	12d
INSTALLNEW BEAMS	12-Jan-23	02-Feb-23	15d
PLACE NEW DECK	20-Mar-23	07-Apr-23	15d
REINSTALL STREETSCAPE	07-Apr-23	11-Apr-23	2d
REMOVE TRAFFIC CONTROL	11-Apr-23	13-Apr-23	2d
MARYLAND AVE SHUTDOWN	14-Apr-23	27-Jul-23	75d
INSTALL TRAFFIC CONTROL	14-Apr-23	17-Apr-23	2d
REMOVE STREETSCAPE	18-Apr-23	19-Apr-23	2d
SAWCUT AND REMOVE DECK	19-Apr-23	10-May-23	15d
REMOVE BEAMS	10-May-23	24-May-23	10d
ADJUST JOINT AT EXIST DECK	24-May-23	31-May-23	5d
PIERDEMO	24-May-23	09-Jun-23	12d
CUT AND REMOVE BEAM ENDS	25-May-23	09-Jun-23	12d
INSTALLNEW BEAMS	12-Jun-23	30-Jun-23	15d
PLACE NEW DECK	03-Jul-23	21-Jul-23	15d
REINSTALL STREETSCAPE	24-Jul-23	25-Jul-23	2d



(NewBar) Actual Level of Effort | Actual Work Remaining Work | Critical Remaining Work Milestone

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TASK filter: All Activities

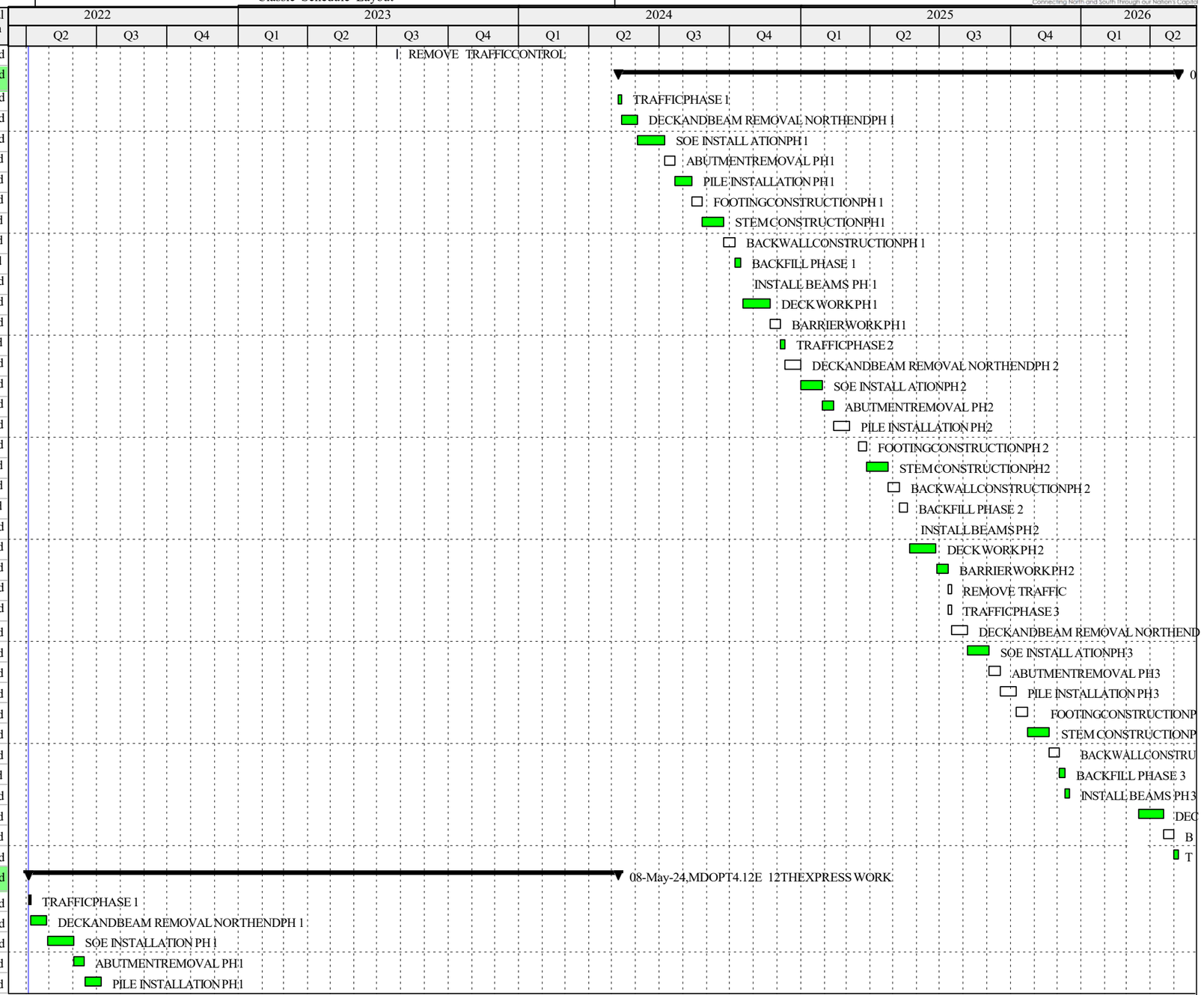
Option 3 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, NA ft. Track Spacing for Tracks 3 & 4

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

Option 4: 15 Ft Freight, Varied Passenger

Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
REMOVE TRAFFIC CONTROL	26-Jul-23	27-Jul-23	2d
12TH STREET DECK REMOVE AND REPLACE	08-May-24	06-May-26	378d
TRAFFIC PHASE 1	08-May-24	13-May-24	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 1	13-May-24	03-Jun-24	15d
SOE INSTALL ATION PHASE 1	03-Jun-24	08-Jul-24	25d
ABUTMENT REMOVAL PHASE 1	08-Jul-24	22-Jul-24	10d
PILE INSTALLATION PHASE 1	22-Jul-24	12-Aug-24	15d
FOOTING CONSTRUCTION PHASE 1	12-Aug-24	26-Aug-24	10d
STEM CONSTRUCTION PHASE 1	26-Aug-24	23-Sep-24	20d
BACKWALL CONSTRUCTION PHASE 1	23-Sep-24	07-Oct-24	10d
BACKFILL PHASE 1	07-Oct-24	15-Oct-24	6d
INSTALL BEAMS PHASE 1	15-Oct-24	18-Oct-24	3d
DECK WORK PHASE 1	18-Oct-24	22-Nov-24	25d
BARRIER WORK PHASE 1	22-Nov-24	06-Dec-24	10d
TRAFFIC PHASE 2	06-Dec-24	11-Dec-24	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 2	11-Dec-24	01-Jan-25	15d
SOE INSTALLATION PHASE2	01-Jan-25	29-Jan-25	20d
ABUTMENT REMOVAL PHASE 2	29-Jan-25	12-Feb-25	10d
PILE INSTALLATION PHASE 2	12-Feb-25	05-Mar-25	15d
FOOTING CONSTRUCTION PHASE 2	17-Mar-25	28-Mar-25	10d
STEM CONSTRUCTION PHASE 2	28-Mar-25	25-Apr-25	20d
BACKWALL CONSTRUCTION PHASE 2	25-Apr-25	09-May-25	10d
BACKFILL PHASE 2	09-May-25	19-May-25	6d
INSTALL BEAMS PHASE 2	19-May-25	22-May-25	3d
DECK WORK PHASE 2	22-May-25	26-Jun-25	25d
BARRIER WORK PHASE 2	27-Jun-25	11-Jul-25	10d
REMOVE TRAFFIC CONTROL	11-Jul-25	16-Jul-25	3d
TRAFFIC PHASE 3	11-Jul-25	16-Jul-25	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	16-Jul-25	06-Aug-25	15d
SOE INSTALLATION PHASE 3	06-Aug-25	03-Sep-25	20d
ABUTMENT REMOVAL PHASE 3	03-Sep-25	17-Sep-25	10d
PILE INSTALLATION PHASE 3	17-Sep-25	08-Oct-25	15d
FOOTING CONSTRUCTION PHASE 3	08-Oct-25	22-Oct-25	10d
STEM CONSTRUCTION PHASE3	22-Oct-25	19-Nov-25	20d
BACKWALL CONSTRUCTION PHASE 3	19-Nov-25	03-Dec-25	10d
BACKFILL PHASE 3	03-Dec-25	11-Dec-25	6d
INSTALL BEAMS PHASE 3	11-Dec-25	16-Dec-25	3d
DECK WORK PHASE 3	16-Mar-26	17-Apr-26	25d
BARRIER WORK PHASE 3	17-Apr-26	01-May-26	10d
REMOVE TRAFFIC CONTROL PHASE 3	01-May-26	06-May-26	3d
12TH EXPRESS WORK	04-Apr-22	08-May-24	403d
TRAFFIC PHASE 1	04-Apr-22	06-Apr-22	3d
DECK AND BEAM REMOVALNORTHEND PHASE1	07-Apr-22	27-Apr-22	15d
SOE INSTALLATION PHASE 1	28-Apr-22	01-Jun-22	25d
ABUTMENT REMOVAL PHASE 1	02-Jun-22	15-Jun-22	10d
PILE INSTALLATION PHASE 1	16-Jun-22	06-Jul-22	15d



(NewBar) Actual Level of Effort | Actual Work Remaining Work | Critical Remaining Work Milestone

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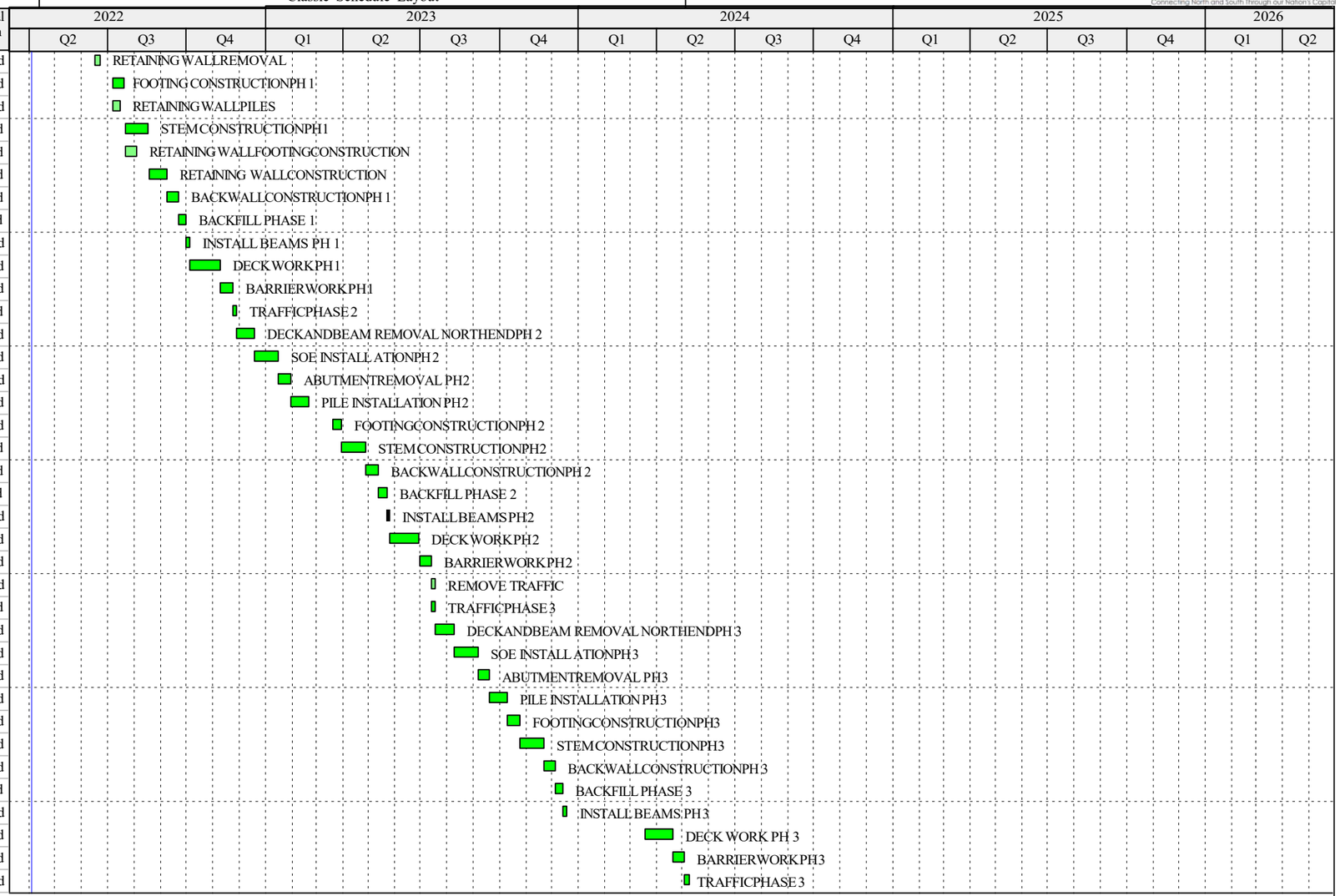
TASK filter: All Activities

Option 3 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, NA ft. Track Spacing for Tracks 3 & 4

Option 4: 15 Ft Freight, Varied Passenger — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
RETAINING WALL REMOVAL	16-Jun-22	22-Jun-22	5d
FOOTING CONSTRUCTION PHASE 1	07-Jul-22	20-Jul-22	10d
RETAINING WALL PILES	07-Jul-22	15-Jul-22	7d
STEM CONSTRUCTION PHASE 1	21-Jul-22	17-Aug-22	20d
RETAINING WALL FOOTING CONSTRUCTION	21-Jul-22	03-Aug-22	10d
RETAINING WALL CONSTRUCTION	18-Aug-22	08-Sep-22	15d
BACKWALL CONSTRUCTION PHASE 1	08-Sep-22	22-Sep-22	10d
BACKFILL PHASE 1	22-Sep-22	30-Sep-22	6d
INSTALL BEAMS PHASE 1	30-Sep-22	05-Oct-22	3d
DECK WORK PHASE 1	05-Oct-22	09-Nov-22	25d
BARRIER WORK PHASE 1	09-Nov-22	23-Nov-22	10d
TRAFFIC PHASE 2	23-Nov-22	28-Nov-22	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 2	28-Nov-22	19-Dec-22	15d
SOE INSTALLATION PHASE 2	19-Dec-22	16-Jan-23	20d
ABUTMENT REMOVAL PHASE 2	16-Jan-23	30-Jan-23	10d
PILE INSTALLATION PHASE 2	30-Jan-23	20-Feb-23	15d
FOOTING CONSTRUCTION PHASE 2	20-Mar-23	31-Mar-23	10d
STEM CONSTRUCTION PHASE 2	31-Mar-23	28-Apr-23	20d
BACKWALL CONSTRUCTION PHASE 2	28-Apr-23	12-May-23	10d
BACKFILL PHASE 2	12-May-23	22-May-23	6d
INSTALL BEAMS PHASE 2	22-May-23	25-May-23	3d
DECK WORK PHASE 2	25-May-23	29-Jun-23	25d
BARRIER WORK PHASE 2	30-Jun-23	13-Jul-23	10d
REMOVE TRAFFIC CONTROL	13-Jul-23	18-Jul-23	3d
TRAFFIC PHASE 3	13-Jul-23	18-Jul-23	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	18-Jul-23	08-Aug-23	15d
SOE INSTALLATION PHASE 3	08-Aug-23	05-Sep-23	20d
ABUTMENT REMOVAL PHASE 3	05-Sep-23	19-Sep-23	10d
PILE INSTALLATION PHASE 3	19-Sep-23	10-Oct-23	15d
FOOTING CONSTRUCTION PHASE 3	10-Oct-23	24-Oct-23	10d
STEM CONSTRUCTION PHASE 3	24-Oct-23	21-Nov-23	20d
BACKWALL CONSTRUCTION PHASE 3	21-Nov-23	05-Dec-23	10d
BACKFILL PHASE 3	05-Dec-23	13-Dec-23	6d
INSTALL BEAMS PHASE 3	13-Dec-23	18-Dec-23	3d
DECK WORK PHASE 3	18-Mar-24	19-Apr-24	25d
BARRIER WORK PHASE 3	19-Apr-24	03-May-24	10d
REMOVE TRAFFIC CONTROL PHASE3	03-May-24	08-May-24	3d



(NewBar) Actual Level of Effort | Actual Work Remaining Work | Critical Remaining Work Milestone

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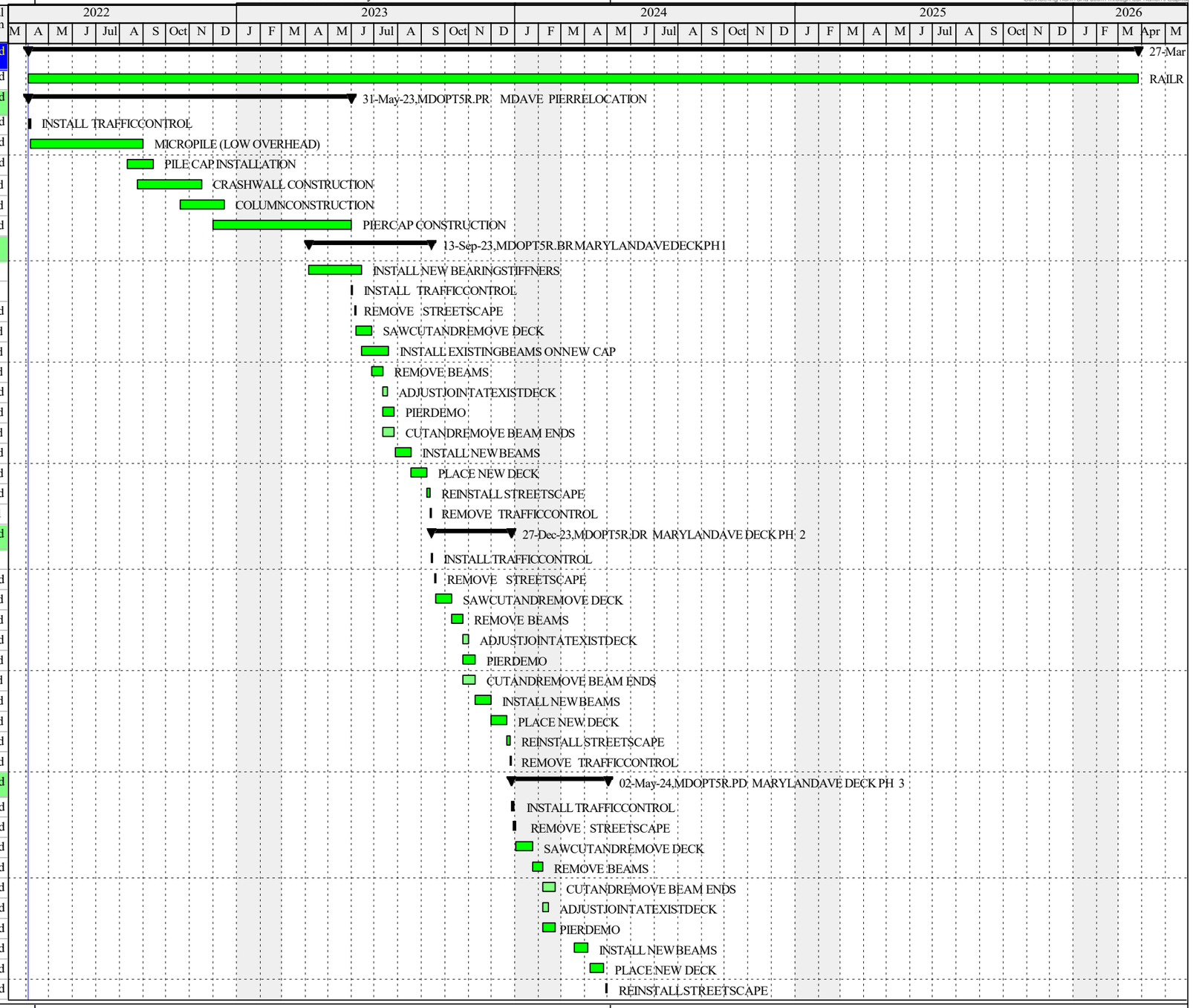
TASK filter: All Activities

Option 5 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, 13 ft. Track Spacing for Tracks 3 & 4

Option 5: 15 ft Freight, 13 ft Passenger Spacing — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
Option 5: 15 ft Freight, 13 ft Passenger Spacing	04-Apr-22	27-Mar-26	753d
RAILROAD COORDINATION	04-Apr-22	27-Mar-26	753d
MD AVE PIER RELOCATION	04-Apr-22	31-May-23	228d
INSTALL TRAFFIC CONTROL	04-Apr-22	06-Apr-22	3d
INSTALL MICROPILES (LOW OVERHEAD)	07-Apr-22	31-Aug-22	105d
PILE CAP INSTALLATION	11-Aug-22	14-Sep-22	25d
CRASHWALL CONSTRUCTION	25-Aug-22	16-Nov-22	60d
COLUMN CONSTRUCTION	20-Oct-22	16-Dec-22	42d
PIERCAPCONSTRUCTION	01-Dec-22	31-May-23	60d
MARYLAND AVE DECK PHASE 1	06-Apr-23	13-Sep-23	115d
INSTALL NEW BEARINGSTIFFNERS	06-Apr-23	14-Jun-23	50d
INSTALL TRAFFIC CONTROL	01-Jun-23	02-Jun-23	2d
REMOVE STREETSCAPE	05-Jun-23	06-Jun-23	2d
SAWCUT AND REMOVE DECK	06-Jun-23	27-Jun-23	15d
INSTALL EXISTING BEAMS ON NEW CAP	14-Jun-23	19-Jul-23	25d
REMOVE BEAMS	27-Jun-23	11-Jul-23	10d
ADJUST JOINT AT EXISTING DECK	11-Jul-23	18-Jul-23	5d
PIER DEMO	11-Jul-23	27-Jul-23	12d
CUT AND REMOVE BEAM ENDS	12-Jul-23	27-Jul-23	12d
INSTALLNEWBEAMS	28-Jul-23	17-Aug-23	15d
PLACE NEW DECK	18-Aug-23	07-Sep-23	15d
REINSTALL STREETSCAPE	08-Sep-23	11-Sep-23	2d
REMOVE TRAFFIC CONTROL	12-Sep-23	13-Sep-23	2d
MARYLAND AVE DECK PHASE 2	14-Sep-23	27-Dec-23	62d
INSTALL TRAFFIC CONTROL	14-Sep-23	15-Sep-23	2d
REMOVE STREETSCAPE	18-Sep-23	19-Sep-23	2d
SAWCUT AND REMOVE DECK	19-Sep-23	10-Oct-23	15d
REMOVE BEAMS	10-Oct-23	24-Oct-23	10d
ADJUST JOINT AT EXISTING DECK	24-Oct-23	31-Oct-23	5d
PIER DEMO	24-Oct-23	09-Nov-23	12d
CUT AND REMOVE BEAM ENDS	25-Oct-23	09-Nov-23	12d
INSTALLNEW BEAMS	10-Nov-23	30-Nov-23	15d
PLACE NEW DECK	30-Nov-23	21-Dec-23	15d
REINSTALL STREETSCAPE	21-Dec-23	25-Dec-23	2d
REMOVE TRAFFIC CONTROL	25-Dec-23	27-Dec-23	2d
MARYLAND AVE DECK PHASE 3	27-Dec-23	02-May-24	34d
INSTALL TRAFFIC CONTROL	27-Dec-23	29-Dec-23	2d
REMOVE STREETSCAPE	29-Dec-23	02-Jan-24	2d
SAWCUTAND REMOVE DECK	02-Jan-24	23-Jan-24	15d
REMOVE BEAMS	23-Jan-24	06-Feb-24	10d
CUT AND REMOVE BEAM ENDS	06-Feb-24	22-Feb-24	12d
ADJUST JOINT AT EXIST DECK	06-Feb-24	13-Feb-24	5d
PIER DEMO	06-Feb-24	22-Feb-24	12d
INSTALL NEW BEAMS	18-Mar-24	05-Apr-24	15d
PLACE NEW DECK	08-Apr-24	26-Apr-24	15d
REINSTALL STREETSCAPE	29-Apr-24	30-Apr-24	2d



(NewBar) Actual Level of Effort — Actual Work Remaining Work — Critical Remaining Work Milestone

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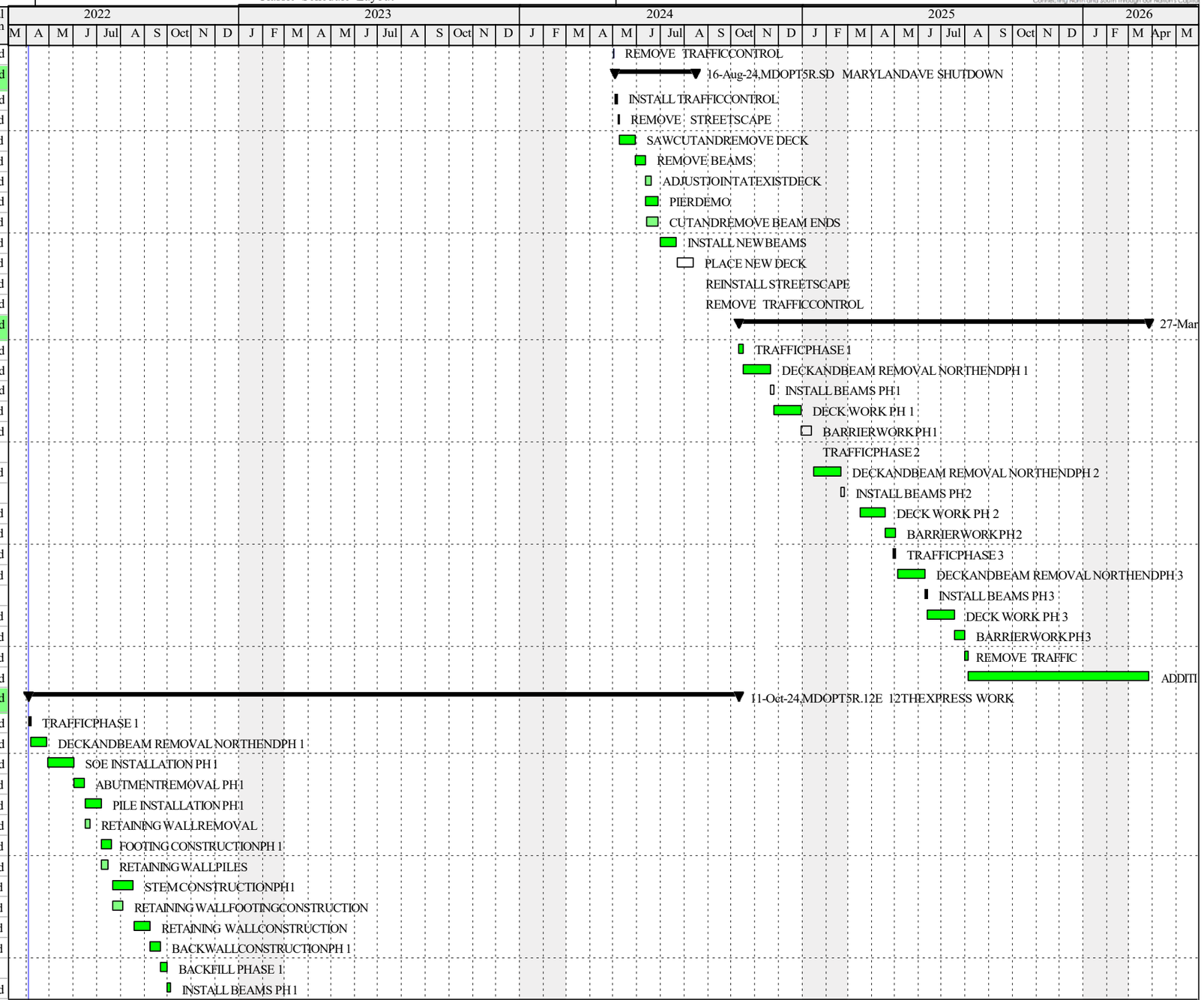
TASK filter: All Activities

Option 5 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, 13 ft. Track Spacing for Tracks 3 & 4

Option 5- Freight Tracks 15' spacing Passenger 13' spacing — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
REMOVE TRAFFIC CONTROL	01-May-24	02-May-24	2d
MARYLAND AVE SHUTDOWN	03-May-24	16-Aug-24	74d
INSTALL TRAFFIC CONTROL	03-May-24	06-May-24	2d
REMOVE STREETSCAPE	07-May-24	08-May-24	2d
SAWCUT AND REMOVE DECK	08-May-24	29-May-24	15d
REMOVE BEAMS	29-May-24	12-Jun-24	10d
ADJUST JOINT AT EXISTING DECK	12-Jun-24	19-Jun-24	5d
PIER DEMO	12-Jun-24	28-Jun-24	12d
CUT AND REMOVE BEAM ENDS	13-Jun-24	28-Jun-24	12d
INSTALL NEW BEAMS	01-Jul-24	22-Jul-24	15d
PLACE NEW DECK	23-Jul-24	12-Aug-24	15d
REINSTALL STREETSCAPE	13-Aug-24	14-Aug-24	2d
REMOVE TRAFFIC CONTROL	15-Aug-24	16-Aug-24	2d
12TH STREET DECK REM AND REP	11-Oct-24	27-Mar-26	241d
TRAFFIC PHASE 1	11-Oct-24	16-Oct-24	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 1	16-Oct-24	20-Nov-24	25d
INSTALL BEAMS PHASE 1	20-Nov-24	25-Nov-24	3d
DECK WORK PHASE1	25-Nov-24	30-Dec-24	25d
BARRIER WORK PHASE 1	30-Dec-24	13-Jan-25	10d
TRAFFIC PHASE 2	13-Jan-25	16-Jan-25	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 2	16-Jan-25	20-Feb-25	25d
INSTALL BEAMS PHASE 2	20-Feb-25	25-Feb-25	3d
DECK WORK PHASE 2	17-Mar-25	18-Apr-25	25d
BARRIER WORK PHASE 2	18-Apr-25	02-May-25	10d
TRAFFIC PHASE 3	29-Apr-25	02-May-25	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	05-May-25	09-Jun-25	25d
INSTALL BEAMS PHASE 3	10-Jun-25	12-Jun-25	3d
DECK WORK PHASE 3	13-Jun-25	18-Jul-25	25d
BARRIER WORK PHASE 3	18-Jul-25	30-Jul-25	8d
REMOVE TRAFFIC	30-Jul-25	04-Aug-25	3d
ADDITIONAL ABUTMENT	05-Aug-25	27-Mar-26	100d
12TH EXPRESS WORK	04-Apr-22	11-Oct-24	512d
TRAFFIC PHASE 1	04-Apr-22	06-Apr-22	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 1	07-Apr-22	27-Apr-22	15d
SOE INSTALL ATION PHASE 1	28-Apr-22	01-Jun-22	25d
ABUTMENT REMOVAL PHASE1	02-Jun-22	15-Jun-22	10d
PILE INSTALLATION PHASE 1	16-Jun-22	06-Jul-22	15d
RETAINING WALL REMOVAL	16-Jun-22	22-Jun-22	5d
FOOTING CONSTRUCTION PHASE 1	07-Jul-22	20-Jul-22	10d
RETAINING WALL PILES	07-Jul-22	15-Jul-22	7d
STEM CONSTRUCTION PHASE 1	21-Jul-22	17-Aug-22	20d
RETAINING WALL FOOTING CONSTRUCTION	21-Jul-22	03-Aug-22	10d
RETAINING WALL CONSTRUCTION	18-Aug-22	08-Sep-22	15d
BACKWALL CONSTRUCTION PHASE 1	08-Sep-22	22-Sep-22	10d
BACKFILL PHASE 1	22-Sep-22	30-Sep-22	6d
INSTALL BEAMS PHASE 1	30-Sep-22	05-Oct-22	3d



(NewBar) Actual Level of Effort — Actual Work Remaining Work — Critical Remaining Work Milestone

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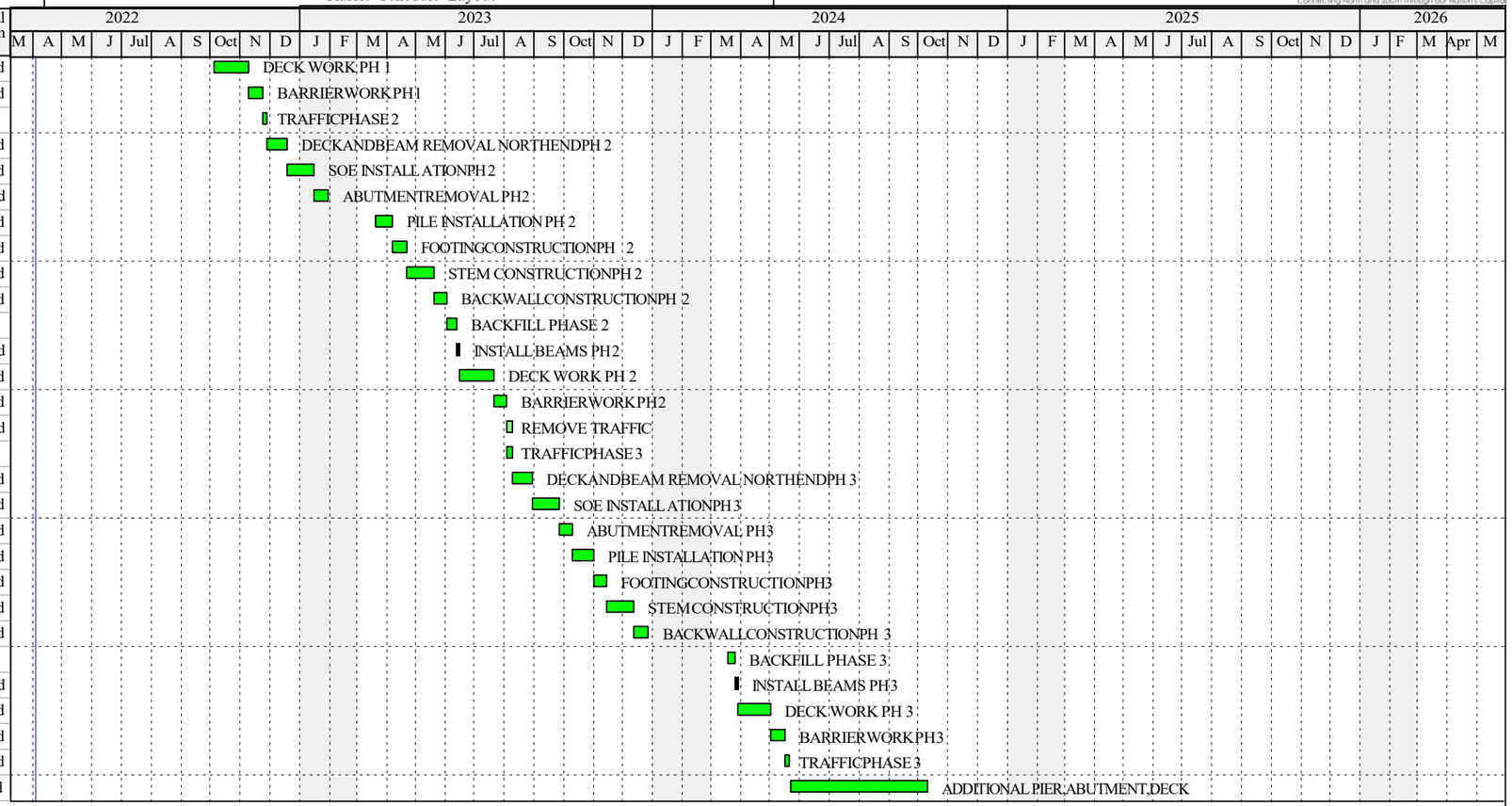
TASK filter: All Activities

Option 5 Lateral Clearance: 15 ft. Track Spacing for Tracks 1& 2, 13 ft. Track Spacing for Tracks 3 & 4

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

Option 5- Freight Tracks 15' spacing Passenger 13' spacing — Classic Schedule Layout

Activity Name	Planned Start	Planned Finish	Original Duration
DECK WORK PHASE 1	05-Oct-22	09-Nov-22	25d
BARRIER WORK PHASE 1	09-Nov-22	23-Nov-22	10d
TRAFFIC PHASE 2	23-Nov-22	28-Nov-22	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 2	28-Nov-22	19-Dec-22	15d
SOE INSTALLATION PHASE 2	19-Dec-22	16-Jan-23	20d
ABUTMENT REMOVAL PHASE 2	16-Jan-23	30-Jan-23	10d
PILE INSTALLATION PHASE 2	20-Mar-23	07-Apr-23	15d
FOOTING CONSTRUCTION PHASE 2	07-Apr-23	21-Apr-23	10d
STEM CONSTRUCTION PHASE 2	21-Apr-23	19-May-23	20d
BACKWALL CONSTRUCTION PHASE 2	19-May-23	02-Jun-23	10d
BACKFILL PHASE 2	02-Jun-23	12-Jun-23	6d
INSTALL BEAMS PHASE 2	12-Jun-23	15-Jun-23	3d
DECK WORK PHASE 2	15-Jun-23	20-Jul-23	25d
BARRIER WORK PHASE 2	20-Jul-23	03-Aug-23	10d
REMOVE TRAFFIC	03-Aug-23	08-Aug-23	3d
TRAFFIC PHASE 3	03-Aug-23	08-Aug-23	3d
DECK AND BEAM REMOVAL NORTHEND PHASE 3	08-Aug-23	29-Aug-23	15d
SOE INSTALLATION PHASE 3	29-Aug-23	26-Sep-23	20d
ABUTMENT REMOVAL PHASE 3	26-Sep-23	10-Oct-23	10d
PILE INSTALLATION PHASE 3	10-Oct-23	31-Oct-23	15d
FOOTING CONSTRUCTION PHASE 3	31-Oct-23	14-Nov-23	10d
STEM CONSTRUCTION PHASE 3	14-Nov-23	12-Dec-23	20d
BACKWALL CONSTRUCTION PHASE 3	12-Dec-23	26-Dec-23	10d
BACKFILL PHASE 3	18-Mar-24	25-Mar-24	6d
INSTALL BEAMS PHASE 3	25-Mar-24	28-Mar-24	3d
DECK WORK PHASE 3	28-Mar-24	02-May-24	25d
BARRIER WORK PHASE 3	02-May-24	16-May-24	10d
REMOVE TRAFFIC CONTROL PHASE 3	16-May-24	21-May-24	3d
ADDITIONAL PIER, ABUTMENT, DECK	22-May-24	11-Oct-24	100d



(NewBar) Actual Work Critical Remaining Work
Actual Level of Effort Remaining Work Milestone

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TASK filter: All Activities

Long Bridge Project

Environmental Impact Statement (EIS)

Maryland Avenue SW to L'Enfant Interlocking Clearance Assessment

Appendix D – Operator Support Letters

NATIONAL RAILROAD PASSENGER CORPORATION
VP & Chief Engineer's Office
2955 Market Street, 4S-014, Philadelphia, PA 19104

August 7, 2018

Mr. Tod Echler
Chief Engineer
CSXT Corporation
CSX Transportation Building
500 Water Street
Jacksonville, FL 32202

Dear Mr. Echler:

Amtrak supports the construction of a new Potomac River Crossing Bridge linking the District of Columbia and Virginia. Amtrak is working with the Virginia Department of Rail and Public Transportation on this matter. The purpose of this letter is to inform you that Amtrak has no objection to 13 ft. track centers as part of the approaches to the bridge.

If you have any questions, please feel free to contact me at verrelr@amtrak.com or 215-349-1907.

Sincerely,

Raymond Verrele, Jr.
Assistant Vice President -
Engineering and Design

cc: Michael McLaughlin, DRPT

COMMONWEALTH of VIRGINIA

Jennifer L. Mitchell
Director

DEPARTMENT OF RAIL AND PUBLIC TRANSPORTATION
600 EAST MAIN STREET, SUITE 2102
RICHMOND, VA 23219-2416

(804) 786-4440
FAX (804) 225-3752
Virginia Relay Center
800-828-1120 (TDD)

August 10, 2018

Mr. Tod Echler
Chief Engineer
CSXT Corporation
CSX Transportation Building
500 Water Street
Jacksonville, FL 32202

Dear Mr. Echler,

The Virginia Department of Rail and Public Transportation (DRPT) is a committed partner in the Long Bridge Environmental Impact Statement (EIS) currently being conducted jointly by the Federal Railroad Administration (FRA) and District Department of Transportation (DDOT). The Commonwealth and CSX have each committed $15 million dollars in funding for the final design of the preferred alternative once the EIS is complete. DRPT is also currently leading other projects in the rail corridor that will help realize the potential of an expanded Long Bridge.

As a good steward of public revenue, DRPT must consider the most cost-efficient method to deliver the largest public benefit to citizens of the Commonwealth, as well as ensure continued safe and efficient freight and passenger rail operations across the Potomac River. DRPT must also consider the opportunity to limit project impacts to adjacent property and existing transportation and utility infrastructure whenever possible to ensure that both the cost and construction schedule are minimized.

DRPT has reviewed the results of an engineering feasibility analysis conducted by DDOT and has concluded that maintaining 15-foot track centers north of the main bridge span over the Potomac will result in significantly higher construction impacts to property and infrastructure adjacent to the rail corridor, resulting in significantly higher project costs and an extended construction schedule. To avoid unnecessary project impacts, DRPT supports the use of 13-foot track centers and asks that CSX consider this exception to their 15-foot track center standard.

We greatly appreciate our continued partnership with CSX to improve freight and passenger rail service in the Commonwealth.

Sincerely,

Jennifer Mitchell

Director, Virginia Department of Rail and Public Transportation

Cc: Michael McLaughlin, DRPT Chief of Rail
Emily Stock, DRPT Manager of Rail Planning

VIRGINIA RAILWAY EXPRESS

August 9, 2018

Mr. Tod Echler
Assistant Vice President, Engineering
CSX Transportation, Inc.
500 Water Street
Jacksonville, Florida 32202

RE: LONG BRIDGE CORRIDOR IMPROVEMENT PROJECT

Dear Mr. Echler:

The Virginia Railway Express (VRE) is currently engaged in the environmental review and preliminary design of the *Long Bridge Corridor Improvement Project*, in conjunction with CSX Transportation (CSXT), the District Department of Transportation (DDOT), the Virginia Department of Rail and Public Transportation (DRPT), and the National Railroad Passenger Corporation (Amtrak). The Project proposes to add a second bridge across the Potomac River and provide other capacity improvements to the CSXT Baltimore Division RF&P Subdivision between L'Enfant Interlocking in the District of Columbia and RO Interlocking in Arlington County, Virginia, a distance of about 1.4 miles.

The timely completion of the proposed improvements will greatly benefit CSXT, VRE, and Amtrak by adding capacity, resiliency, and redundancy to this operational bottleneck, complementing CSXT's soon-to-be-completed Virginia Avenue Tunnel project. We strongly endorse any steps to expedite implementation and minimize costs without compromising safety. The purpose of this letter is to inform you that VRE has no objections to operating with track centers as close as 13 feet and lateral clearances as close as 8½ feet, should a design exception to that effect be approved by CSXT.

Please feel free to contact me at (703) 838-5439 or RDALTON@VRE.ORG with any questions or concerns.

Sincerely,

Rich Dalton
Deputy Chief Executive Officer
Virginia Railway Express

cc: R. Marcus, CSXT
M. McLaughlin, DRPT
R. Verrele, Amtrak
A. Chamberlin, DDOT