

LIVING SHORELINE  
RESTORATION AREA

MATCH TO PLT-12A



PROP. LIVING  
SHORELINE  
BOUNDARY

N 1688700  
E 1569000

N 688850  
E 1569400

MHW

SAV

MATCH TO PLT-Ø13

17

16

15

14

13

EXISTING BRIDGE

WC25 - SUSQUEHANNA RIVER

100-YR FLOODPLAIN



No.	Revisions	Date	By
1	ADDED MHHW AND MHW BOUNDARIES	11/13/23	MJF



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

EXISTING CONDITIONS IMPACT PLATE

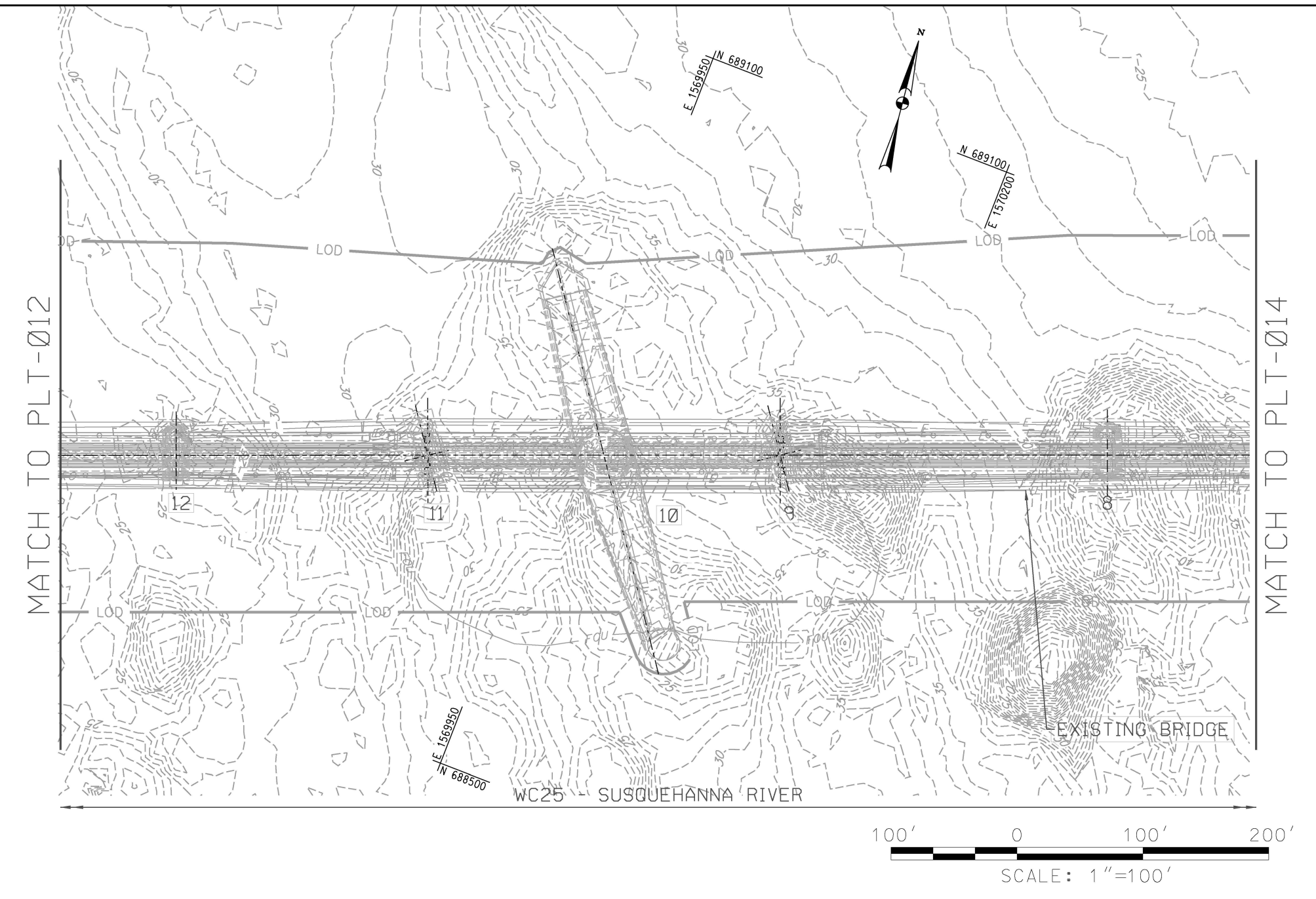
Job No:	50625
Sheet No.	15 OF 32

Date: May 2024

PLT-012

PLOT SCALE: AS SHOWN  
7/8/2024 11:04:32 AM pWP-15ex\_50625 Susquehanna River.dgn

PLOT SCALE: AS SHOWN  
7/8/2024 12:26:13 PM pWP-17ex\_50625 Susquehanna River.dgn



No.	Revisions	Date	By

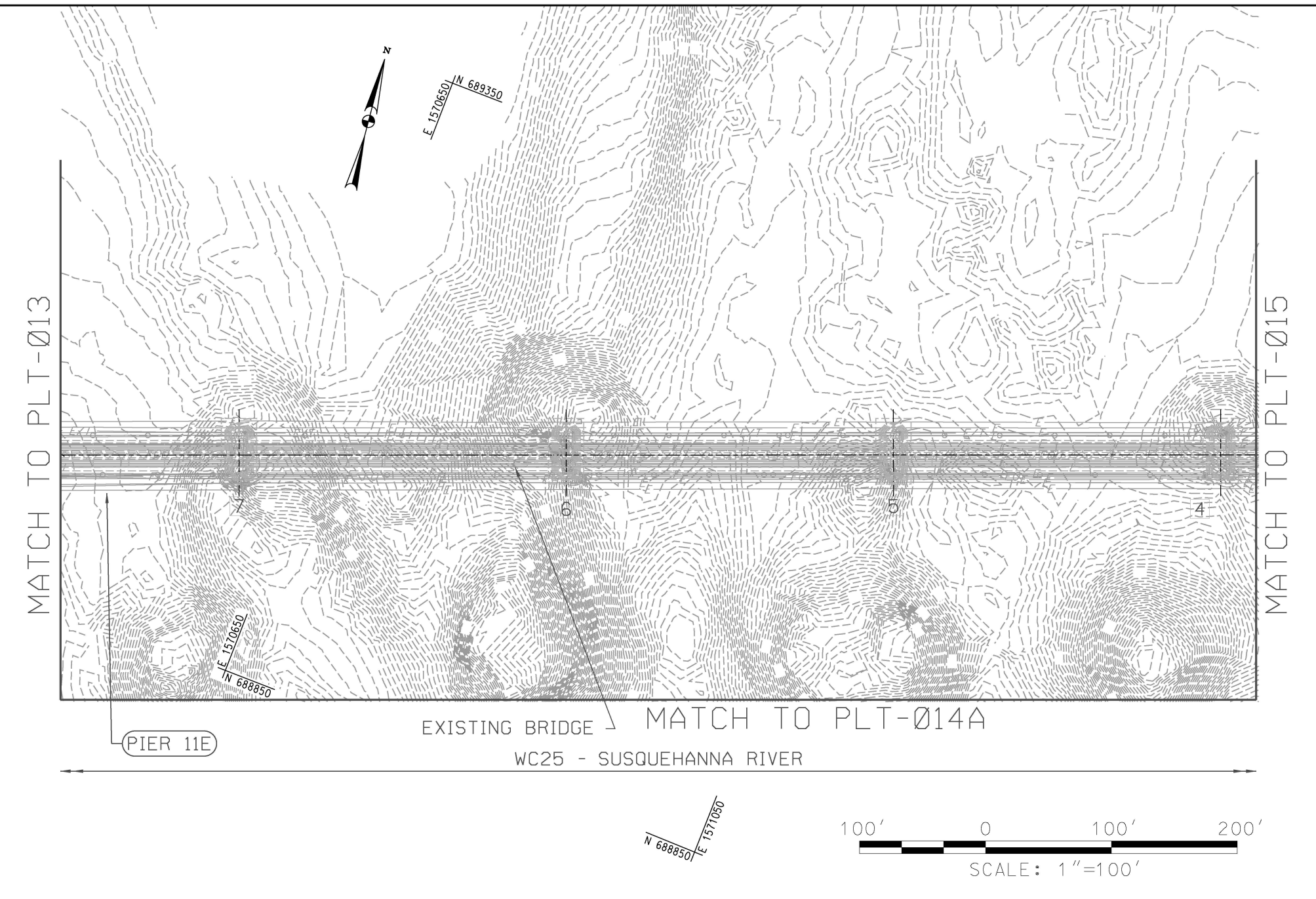


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
EXISTING CONDITIONS IMPACT PLATE

Job No:	50625
Sheet No.	17 OF 32
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PLT-013	



PLOT SCALE: AS SHOWN  
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No.	Revisions	Date	By
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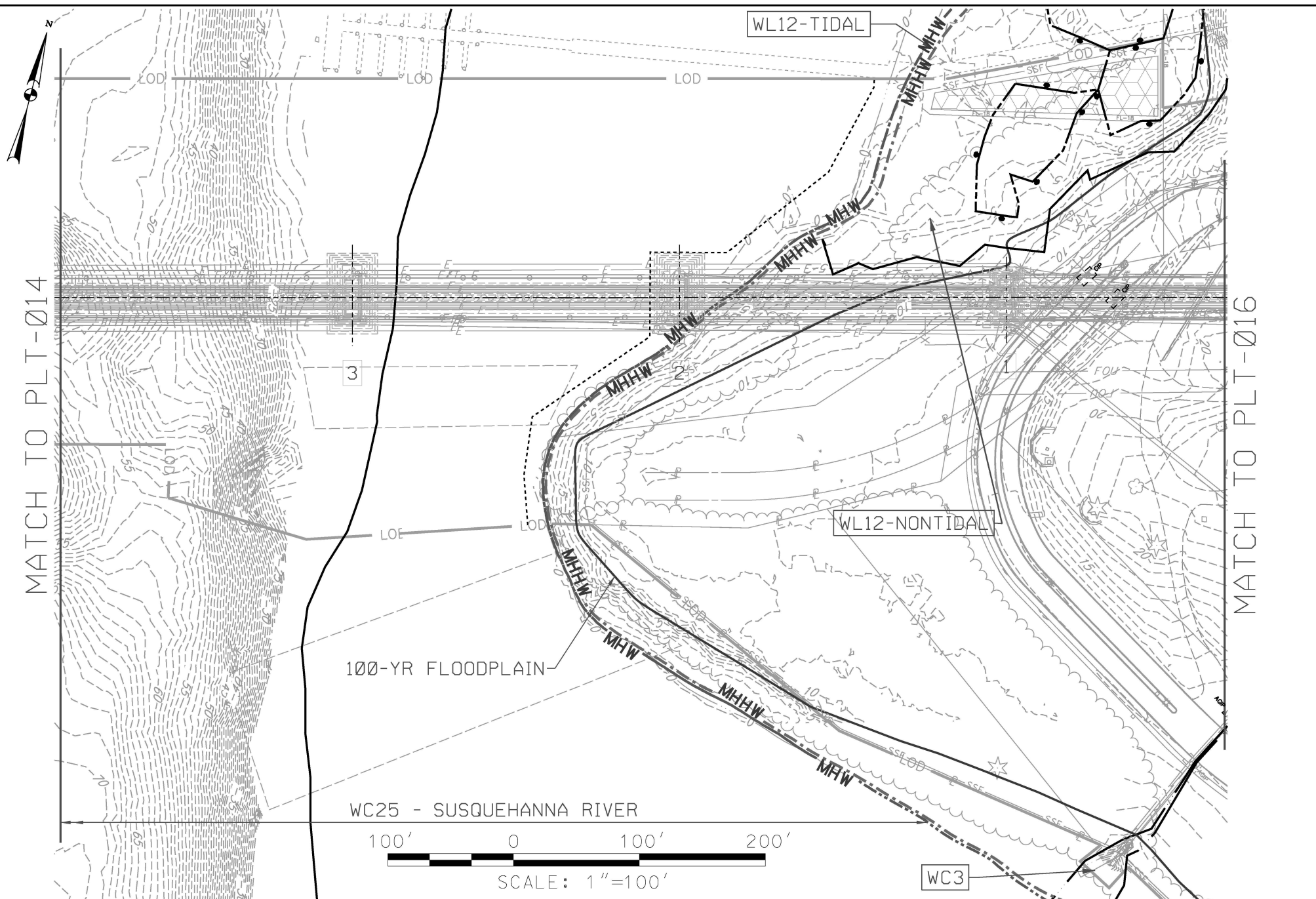
**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
EXISTING CONDITIONS IMPACT PLATE

Job No:	50625
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PLT-014	

PLOT SCALE: AS SHOWN  
7/8/2024 12:45:08 PM pWP-20ex\_50625 Susquehanna River.dgn



No.	Revisions	Date	By
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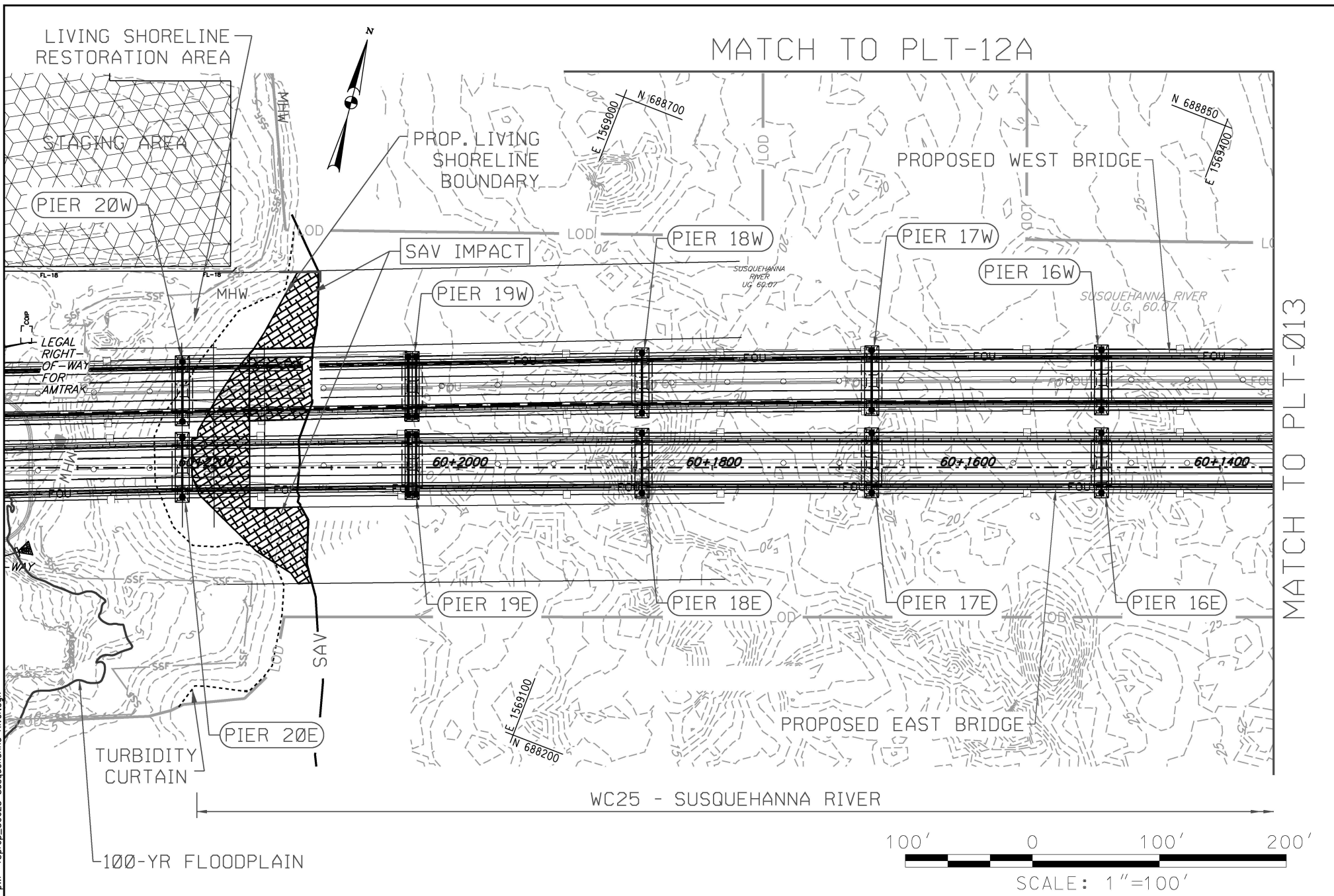
**HNTB**





PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
EXISTING CONDITIONS IMPACT PLATE

Job No:	50625
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Date:	May 2024
PLT-015	

PLOT SCALE: AS SHOWN  
7/8/2024 1:30:49 PM  
pWP-15prop\_50625 Susquehanna River.dgn



No.	Revisions	Date	By
1	ADDED MHHW AND MHW BOUNDARIES	11/13/23	MJF



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

PROPOSED CONDITIONS IMPACT PLATE

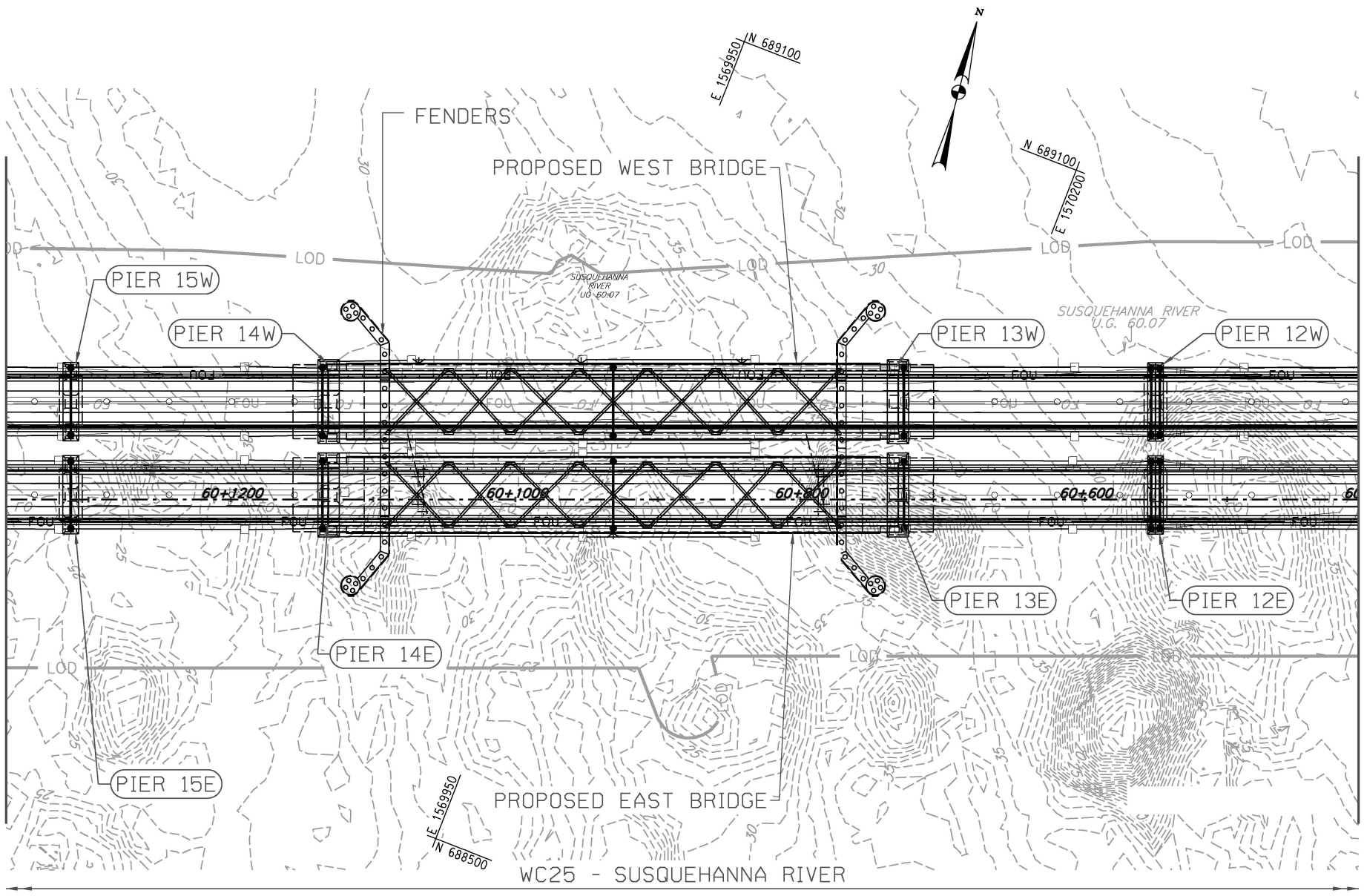
Job No:	50625
Sheet No.	15 OF 32
Date:	May 2024

PLT-012

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MATCH TO PLT-012

MATCH TO PLT-014



No.	Revisions	Date	By

**HNTB**



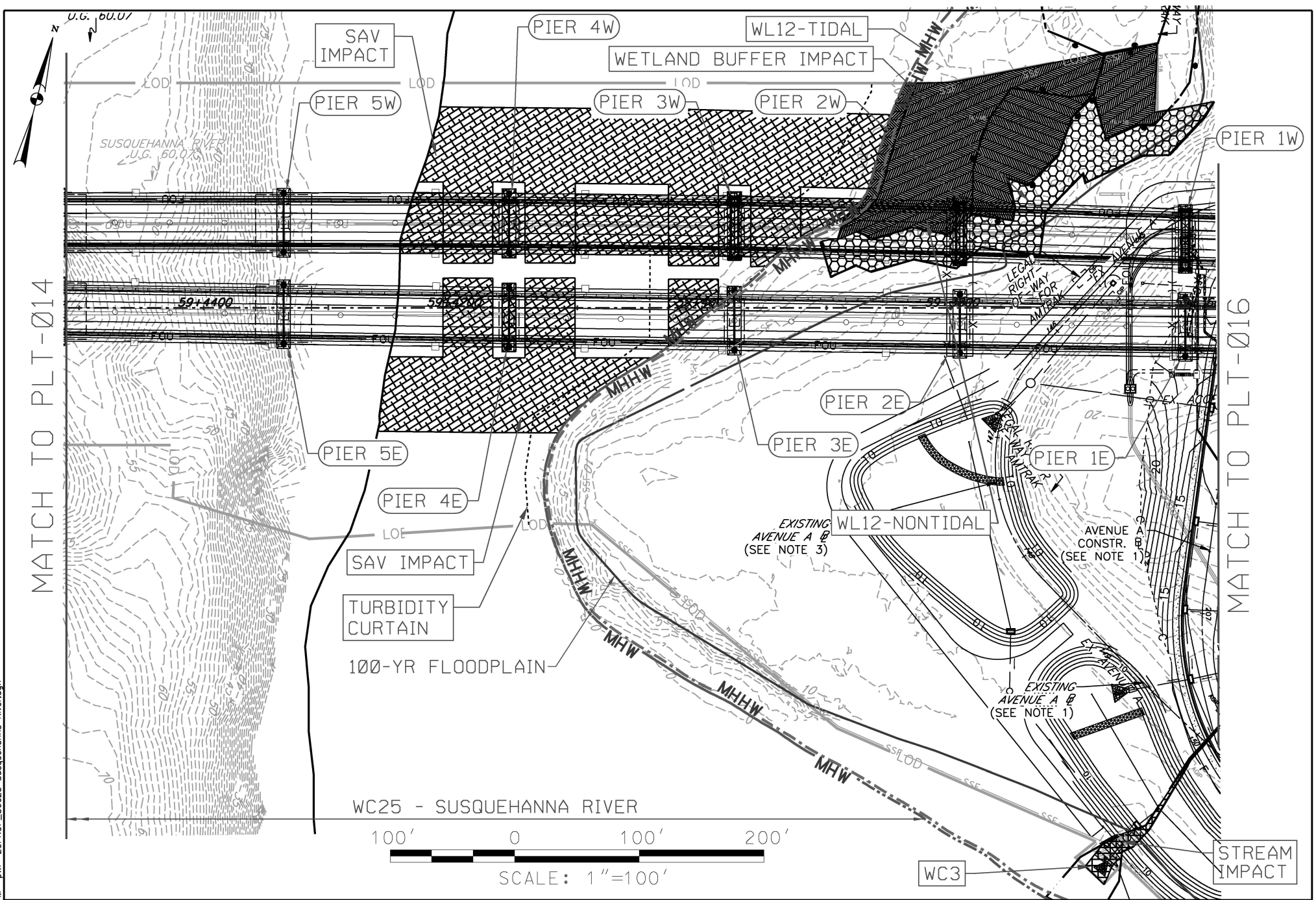
PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
PROPOSED CONDITIONS IMPACT PLATE

Job No:	50625
Sheet No.	17 OF 32
Date:	May 2024
PLT-013	





PLOT SCALE: AS SHOWN  
7/8/2024 2:06:22 PM  
pWP-20PROP\_50625 Susquehanna River.dgn



No.	Revisions	Date	By
1	ADDED MHW AND MHHW BOUNDARIES	11/13/23	MJF



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

PROPOSED CONDITIONS IMPACT PLATE

Job No: 50625  
Sheet No. 20 OF 32  
Date: May 2024

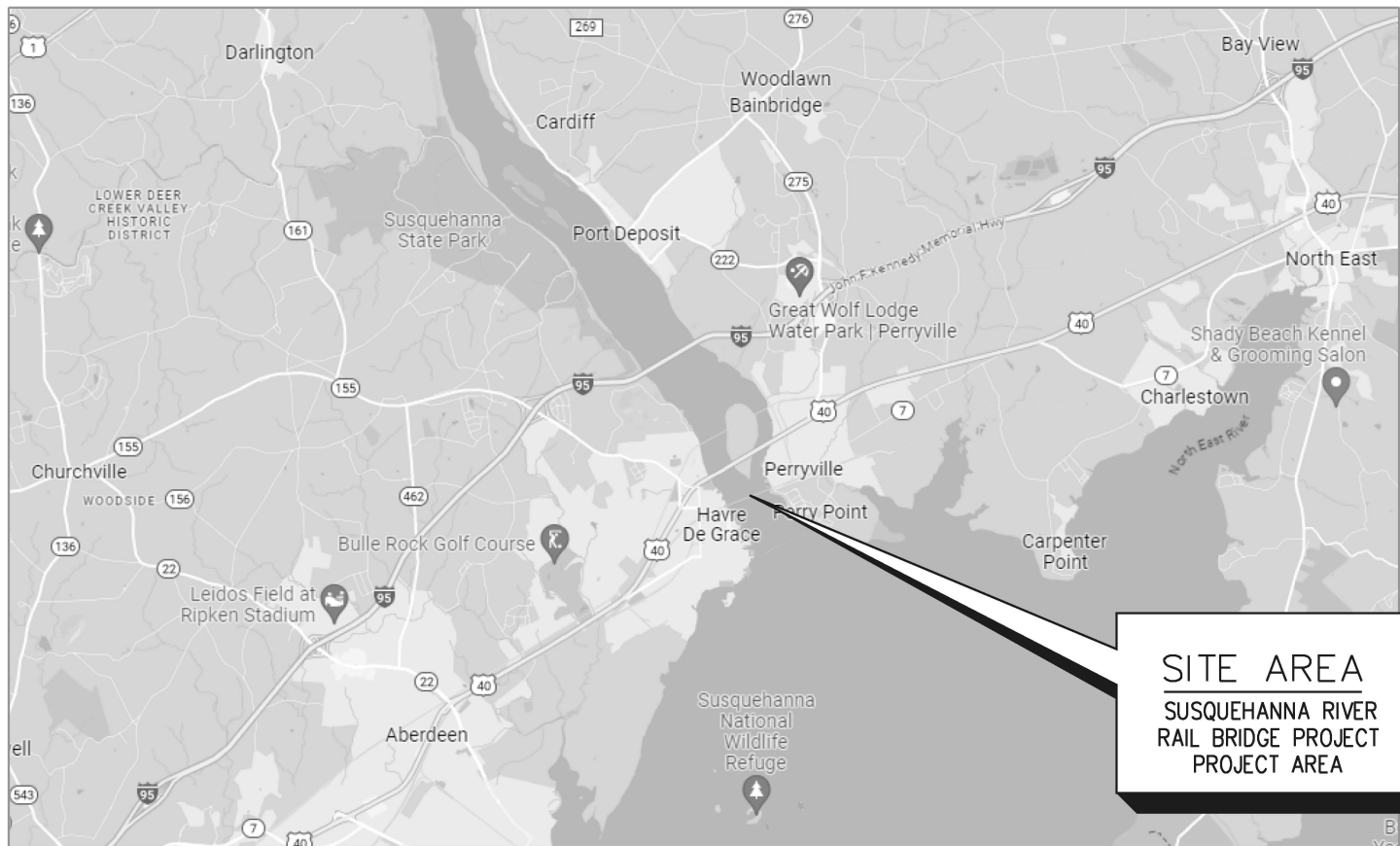
PLT-015



# AMTRAK

## SUSQUEHANNA RIVER RAIL BRIDGE PROJECT

### IMPACT PLATES



SCALE: 1"=10,000'

VICINITY MAP

LOCATION: CECIL AND HARFORD COUNTIES

**SITE AREA**  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
PROJECT AREA

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

VICINITY MAP

Job No: 50625  
Sheet No. 1 OF 32

Date: May 2024

VCN-001

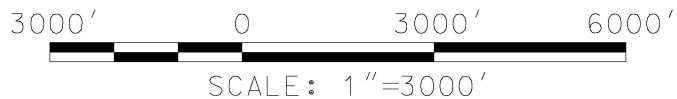
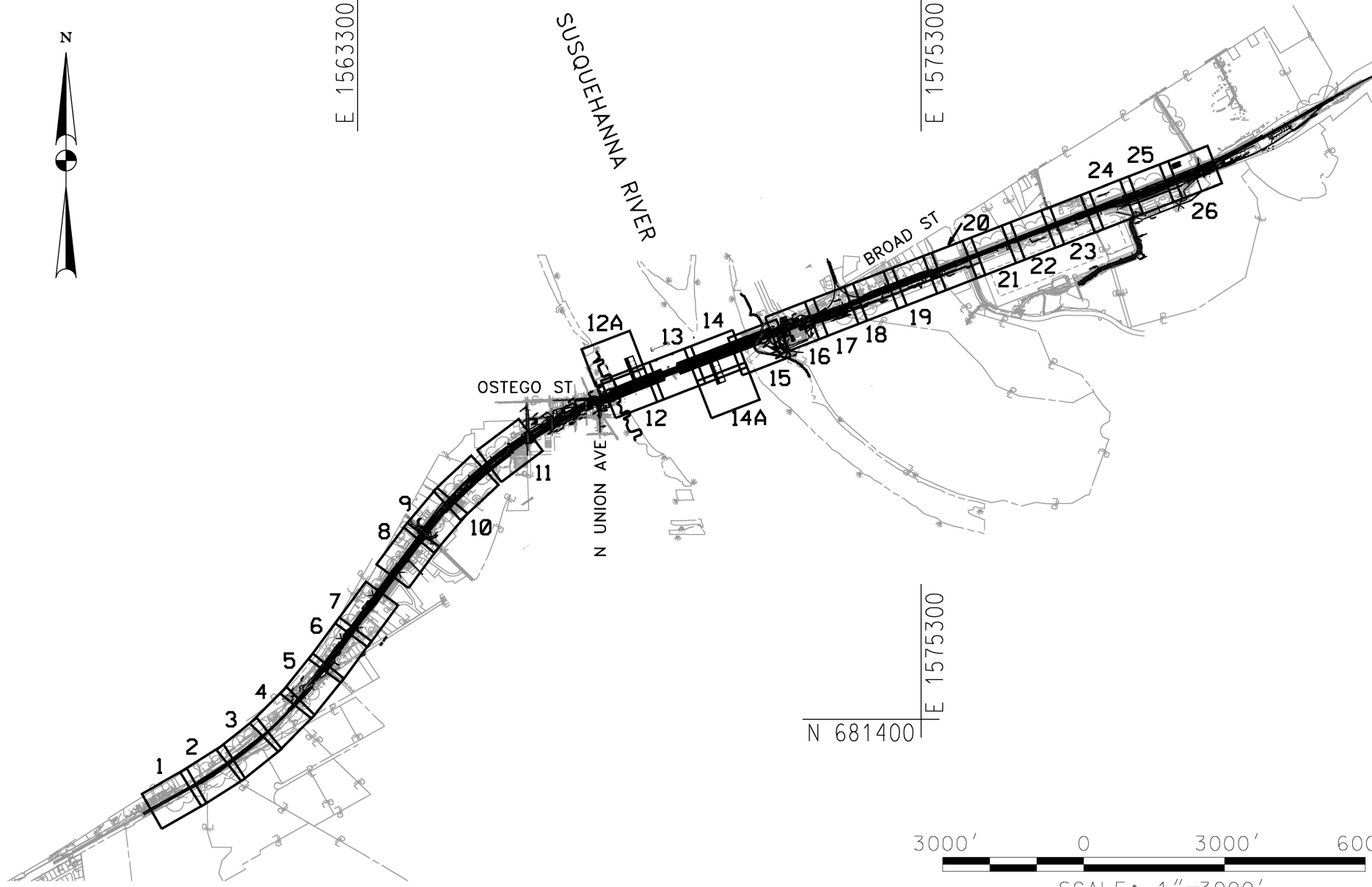
No.	Revisions	Date	By



N 696800  
E 1563300

N 696800  
E 1575300

N 681400  
E 1575300



PLOT SCALE: AS SHOWN  
5/13/2024 11:26:49 AM pWP-02\_50625 Susquehanna River.dgn

No.	Revisions	Date	By

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

KEY MAP

Job No:	50625
Sheet No.	2 OF 32
Date:	May 2024
KM-001	

## LEGEND

## LIMIT OF DISTURBANCE

— LOD —

100-YR FLOODPLAIN

———— 100 YR ————


WATERS OF THE US

\_\_\_\_\_ WUS \_\_\_\_\_

STREAM

---

WETLAND



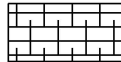
WETLAND BUFFER

\_\_\_\_\_ B \_\_\_\_\_

SUBMERGED AQUATIC  
VEGETATION (SAV)

\_\_\_\_\_ SAV \_\_\_\_\_

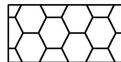
## STREAM IMPACTS



## WETLAND IMPACTS



## WETLAND BUFFER IMPACTS



## SAV IMPACTS



MEAN HIGH WATER

--- MHW ---

MEAN HIGH HIGH WATER

--- MHHW ---

No.	Revisions	Date	By
1	ADDED MHW AND MHHW BOUNDARY	11-13-23	MJF

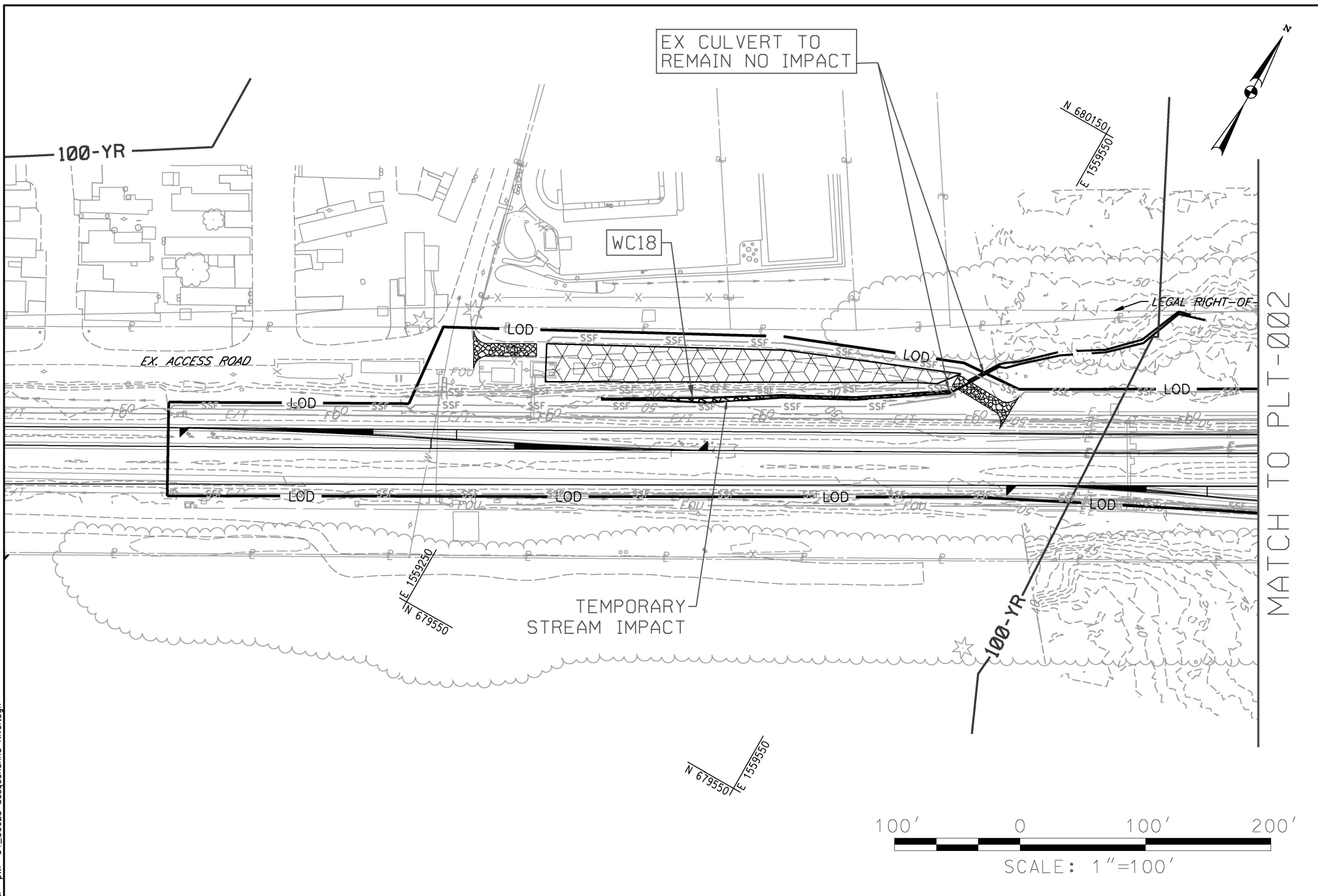


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

## LEGEND

Job No:	50625
Sheet No.	3 OF 32
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LGN-001	

PLOT SCALE: AS SHOWN  
4/27/2024 1:01:44 PM  
pWP-04\_50625 Susquehanna River.dgn



No.	Revisions	Date	By

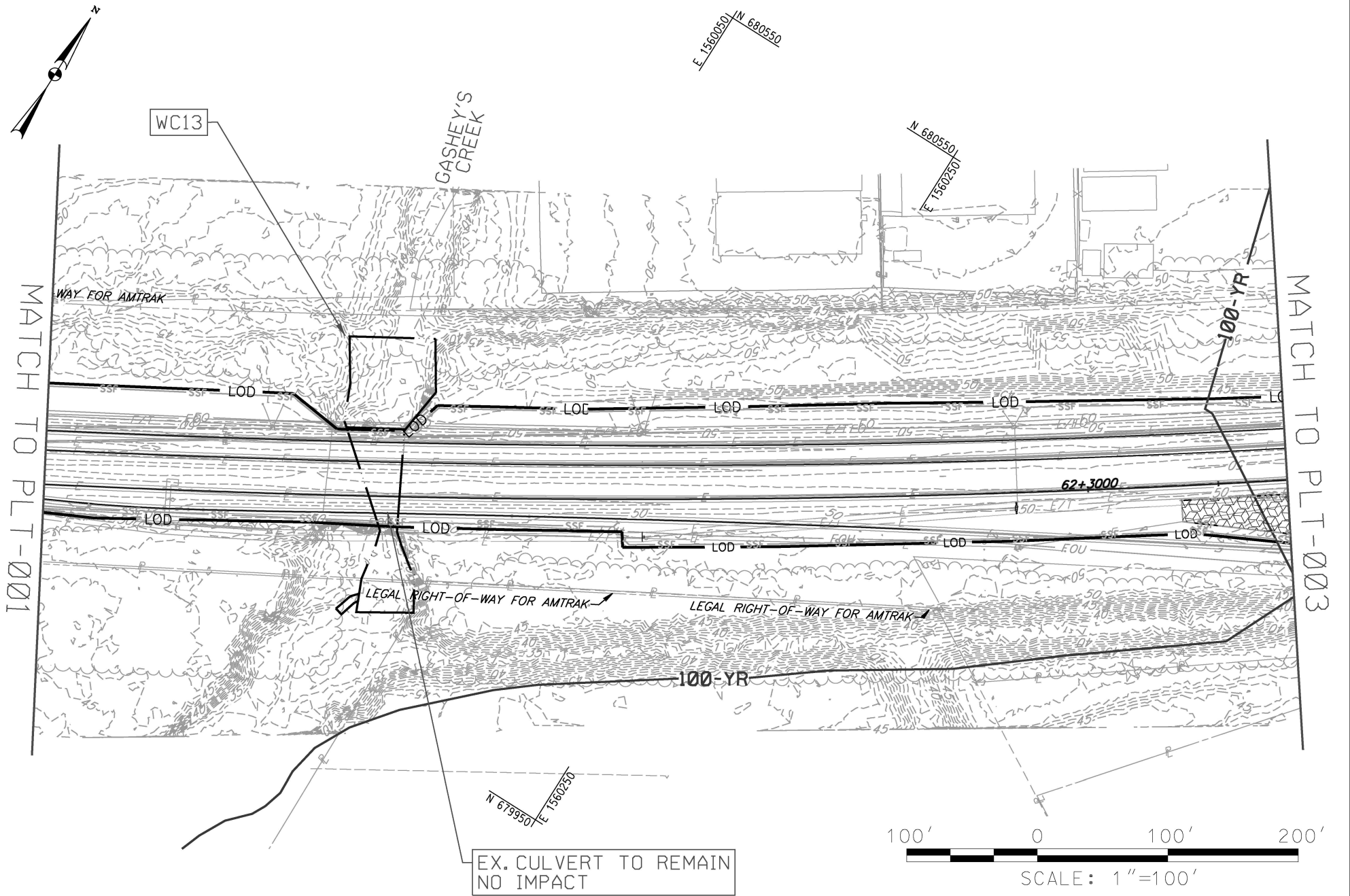


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
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PLT-001	



PLOT SCALE: AS SHOWN  
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No.	Revisions	Date	By

**HNTB**

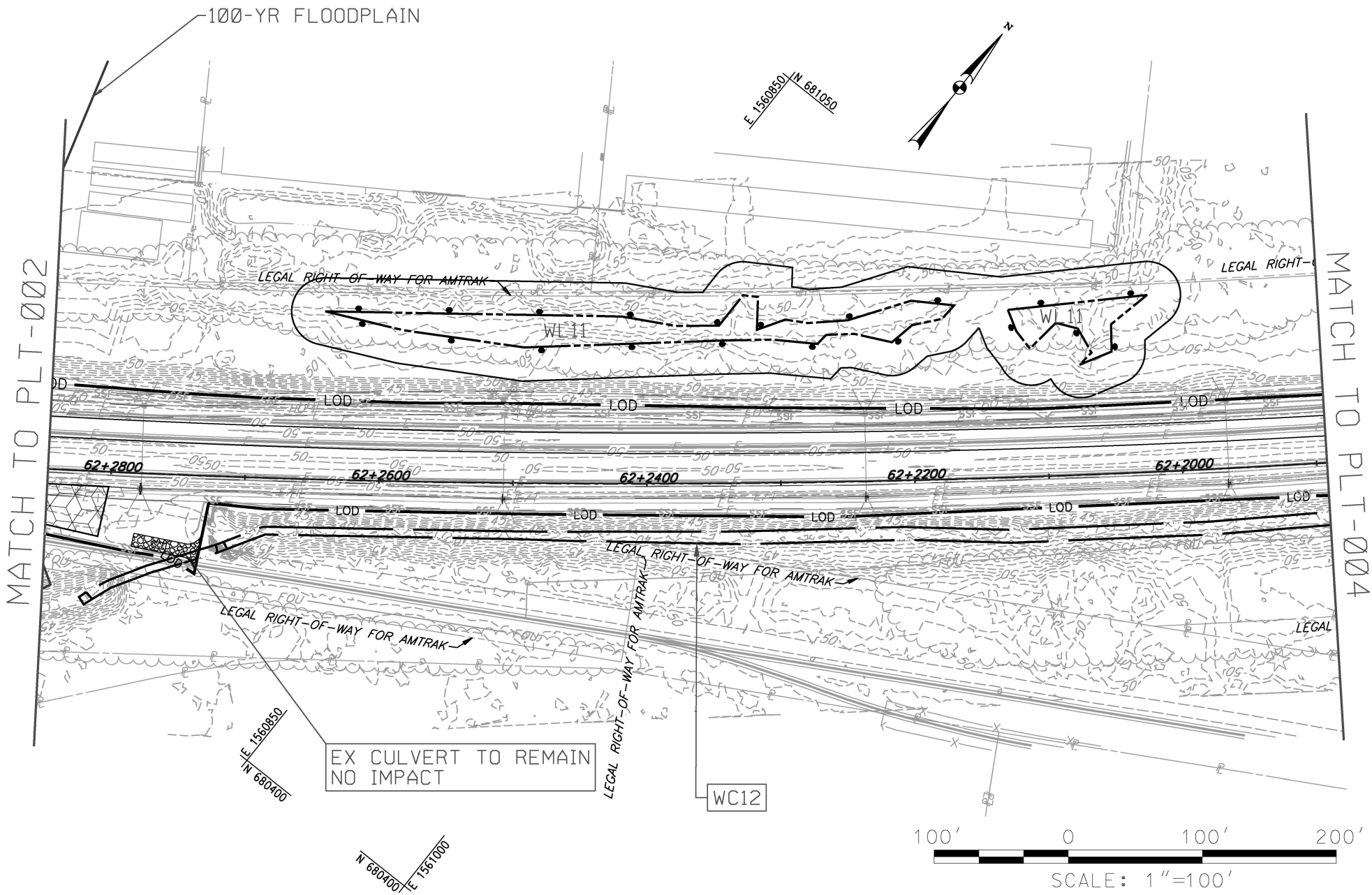


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

IMPACT PLATE

Job No:	50625
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Date:	May 2024
PLT-002	

PLOT SCALE: AS SHOWN  
4/27/2024 1:09:54 PM  
pWP-06\_50625 Susquehanna River.dgn



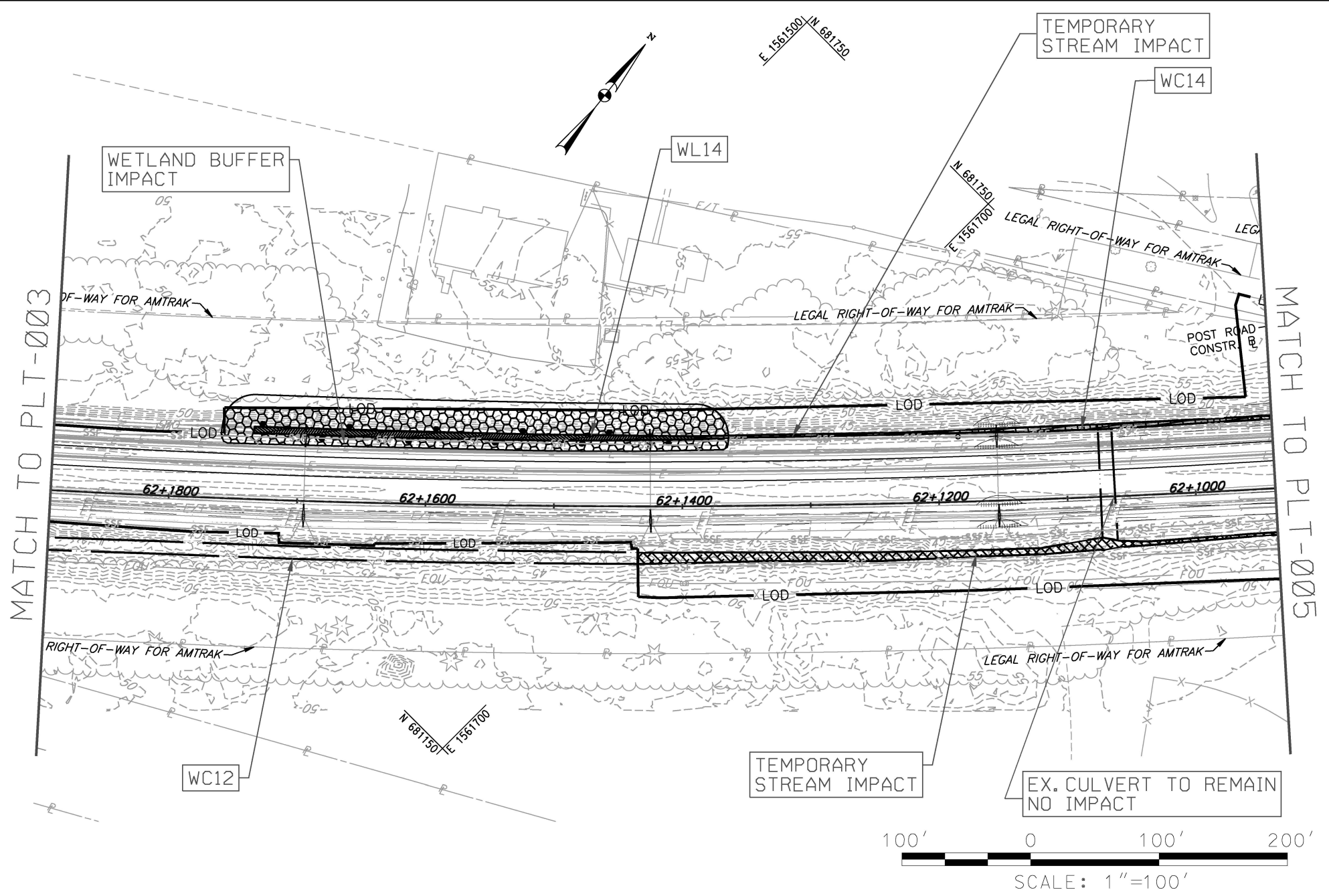
No.	Revisions	Date	By



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
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Date:	May 2024
PLT-003	

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No.	Revisions	Date	By

**HNTB**



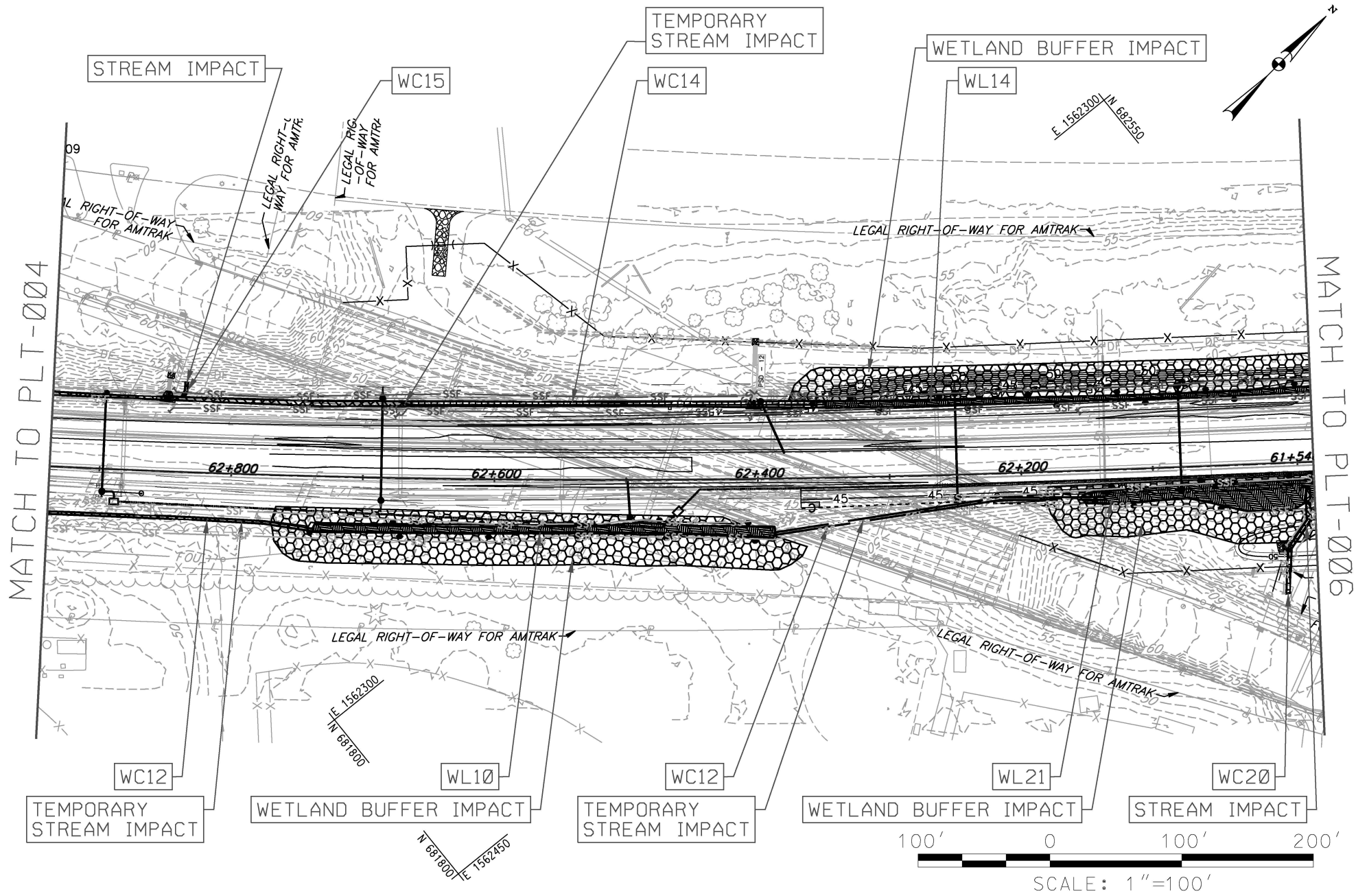
PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
Sheet No.	7 OF 32
Date:	May 2024
PLT-004	

PLOT SCALE: AS SHOWN  
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MATCH TO PLT-004

MATCH TO PLT-006



No.	Revisions	Date	By



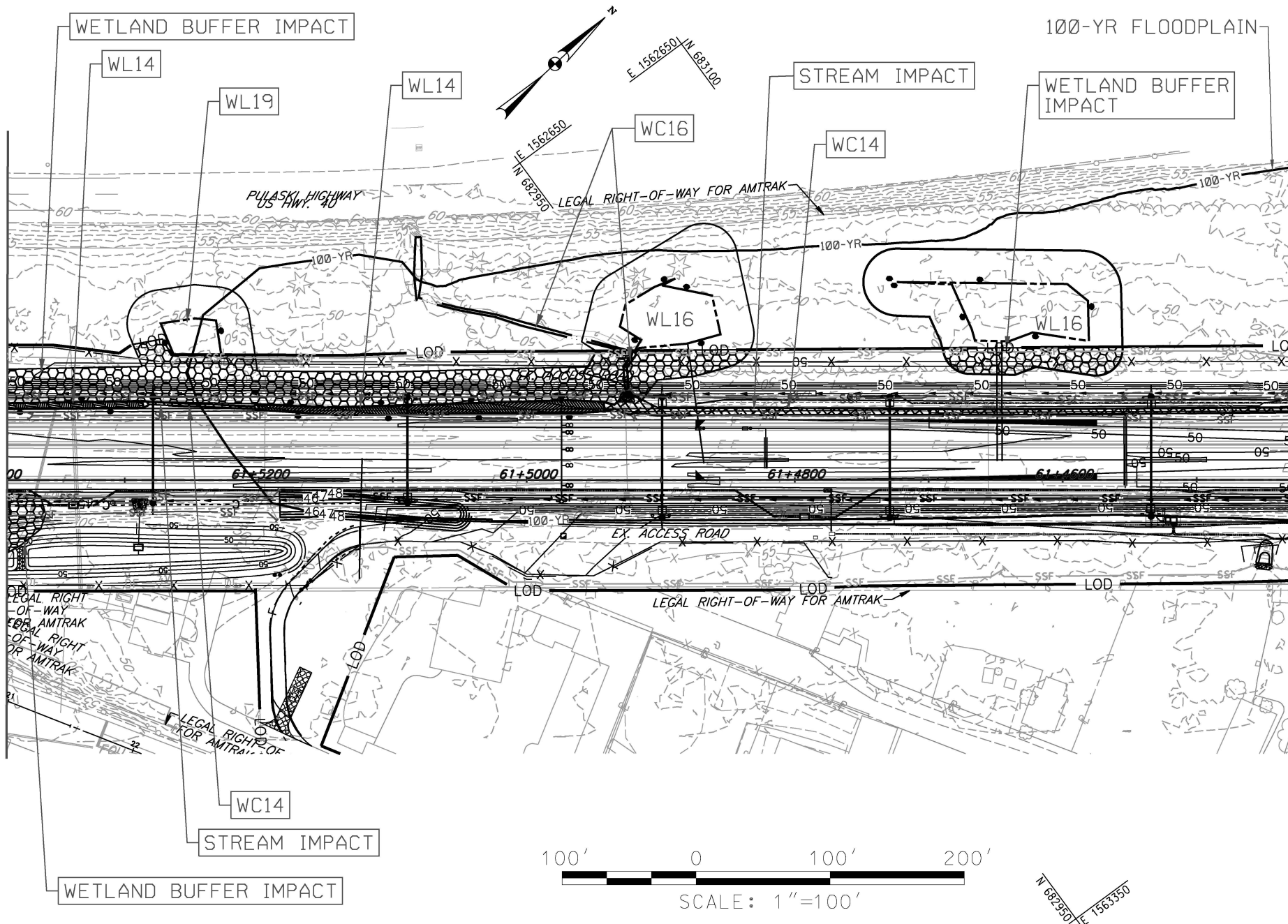
PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
Sheet No.	8 OF 32
Date:	May 2024
PLT-005	

PLOT SCALE: AS SHOWN  
5/13/2024 1:22:53 PM  
pwp-09\_50625 Susquehanna River.dgn

MATCH TO PLT-005

MATCH TO PLT-007



No.	Revisions	Date	By

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

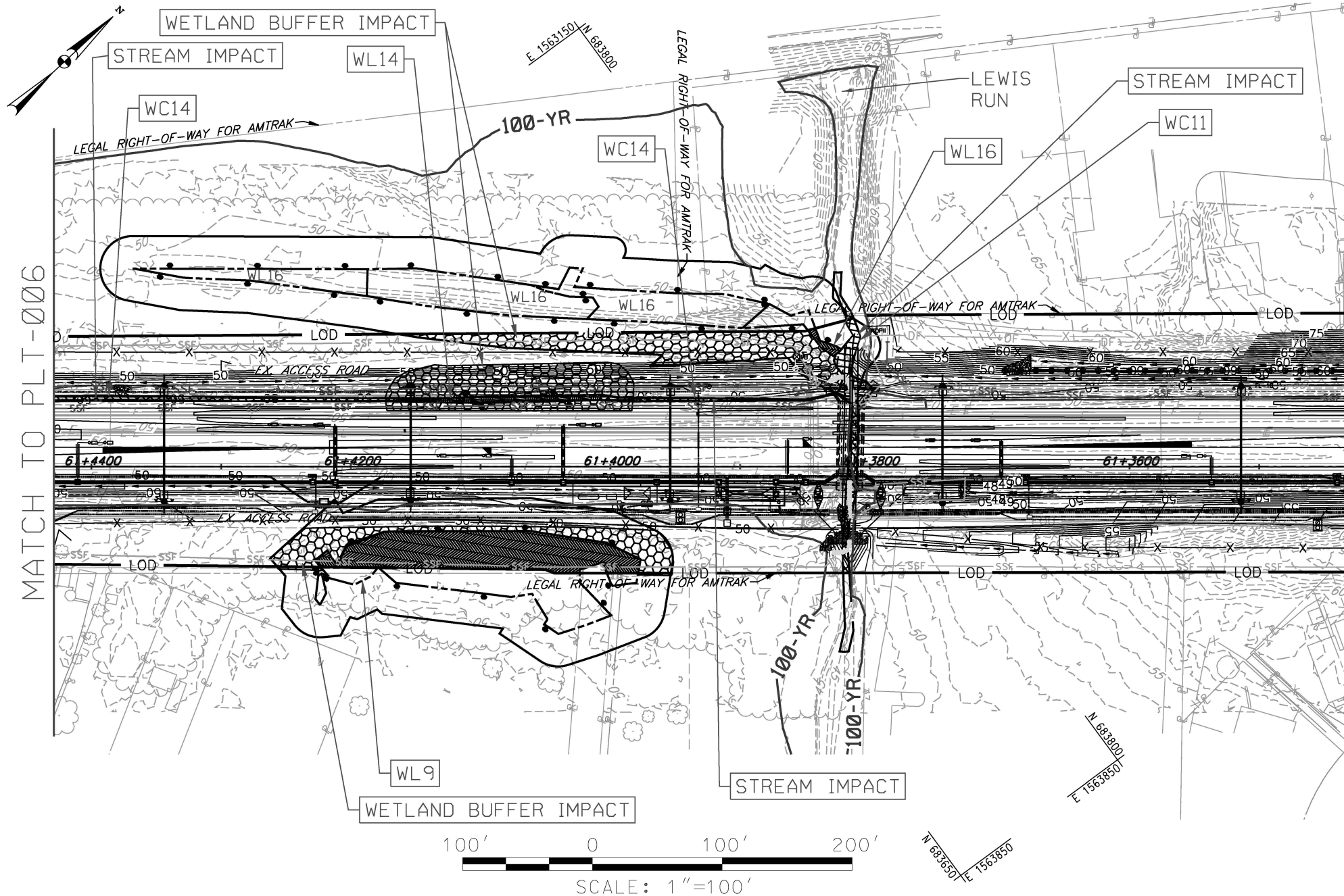
IMPACT PLATE

Job No:	50625
Sheet No.	9 OF 32
Date:	May 2024
PLT-006	



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MATCH TO PLT-006



No.	Revisions	Date	By

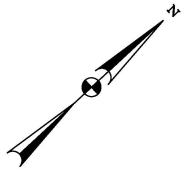
**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

IMPACT PLATE

Job No:	50625
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PLT-007	



E 1564050 / N 685100

WL20

WETLAND BUFFER  
IMPACT

STREAM IMPACT

WC9

E 1564050  
N 684850

WC9

LEGAL RIGHT-OF-  
WAY FOR AMTRAK

61+2800

61+2600

61+2400

61+2200

61+2000

LEGAL RIGHT-OF-  
WAY FOR AMTRAK

LEGAL RIGHT-OF-  
WAY FOR AMTRAK

FOU

WEBB LANE

N 685100  
E 1564800

100' 0 100' 200'

SCALE: 1"=100'

MATCH TO PLT-009

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

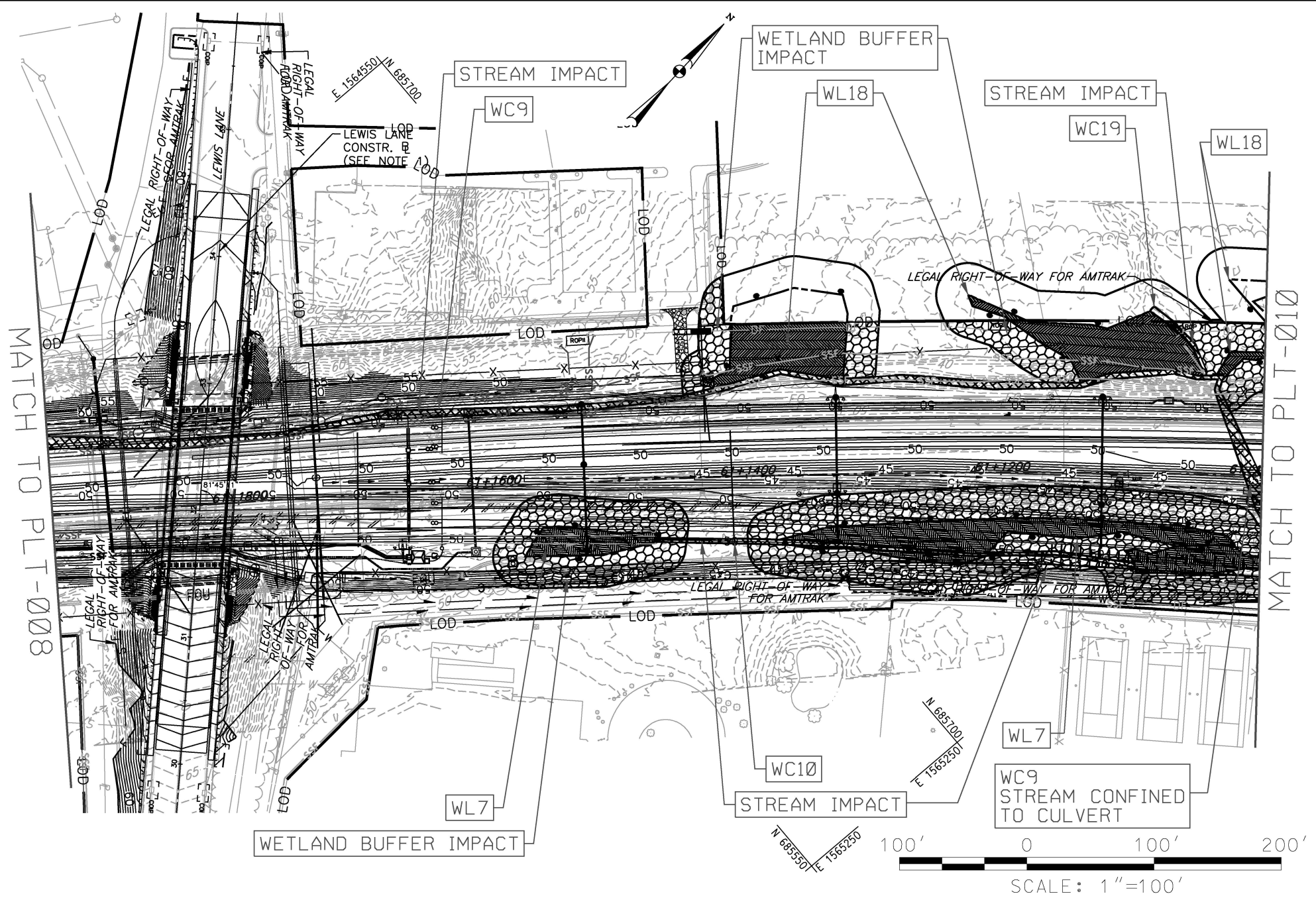
IMPACT PLATE

Job No:	50625
Sheet No.	11 OF 32
Date:	May 2024
PLT-008	

No.	Revisions	Date	By

PLOT SCALE: AS SHOWN  
5/1/2024 3:34:01 PM  
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PLOT SCALE: AS SHOWN  
5/13/2024 2:13:37 PM  
pWP-12\_50625 Susquehanna River.dgn



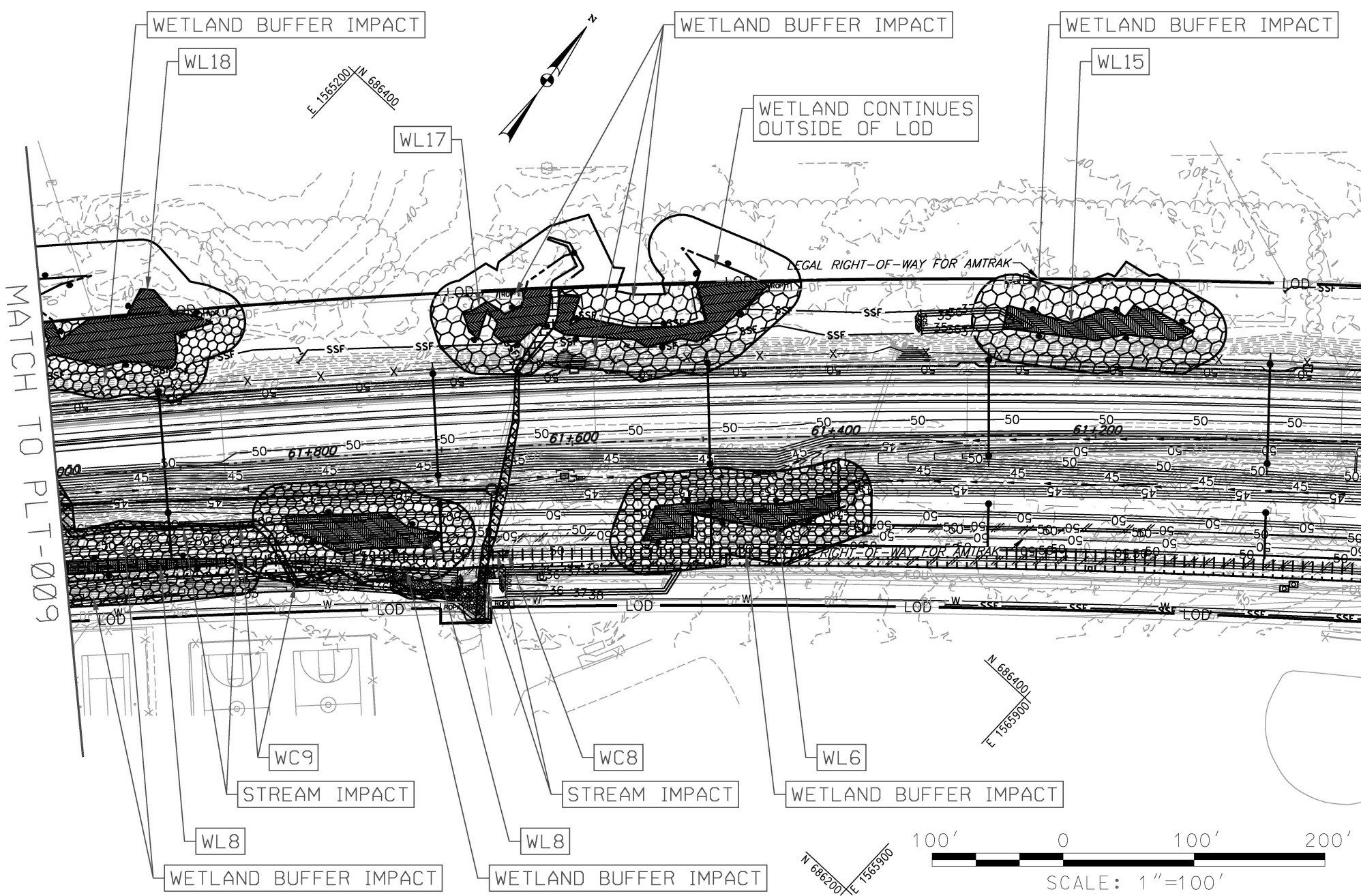
No.	Revisions	Date	By



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
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PLT-009	

PLOT SCALE: AS SHOWN  
4/27/2024 1:57:02 PM  
pwp-13\_50625 Susquehanna River.dgn



No.	Revisions	Date	By

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

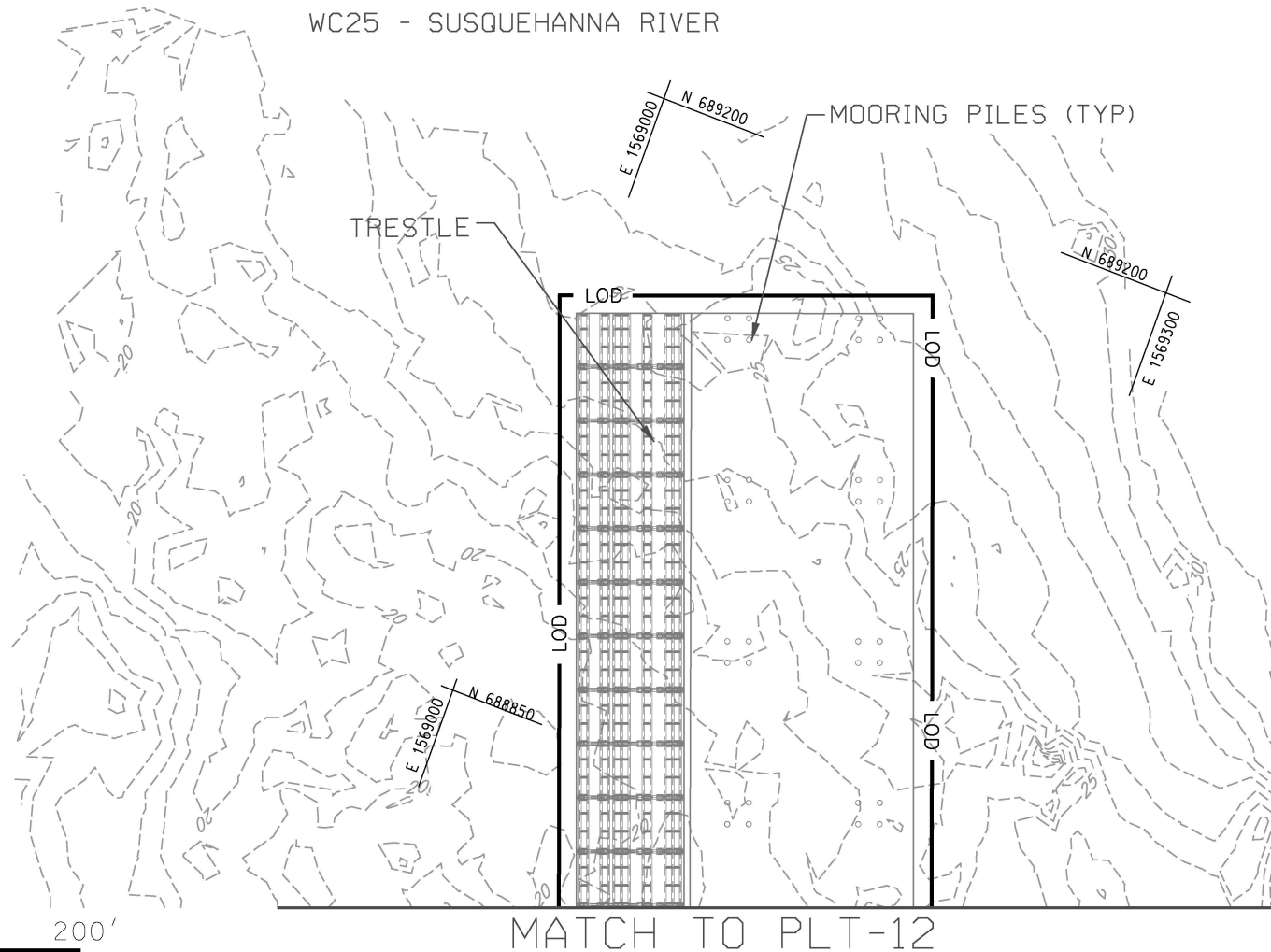
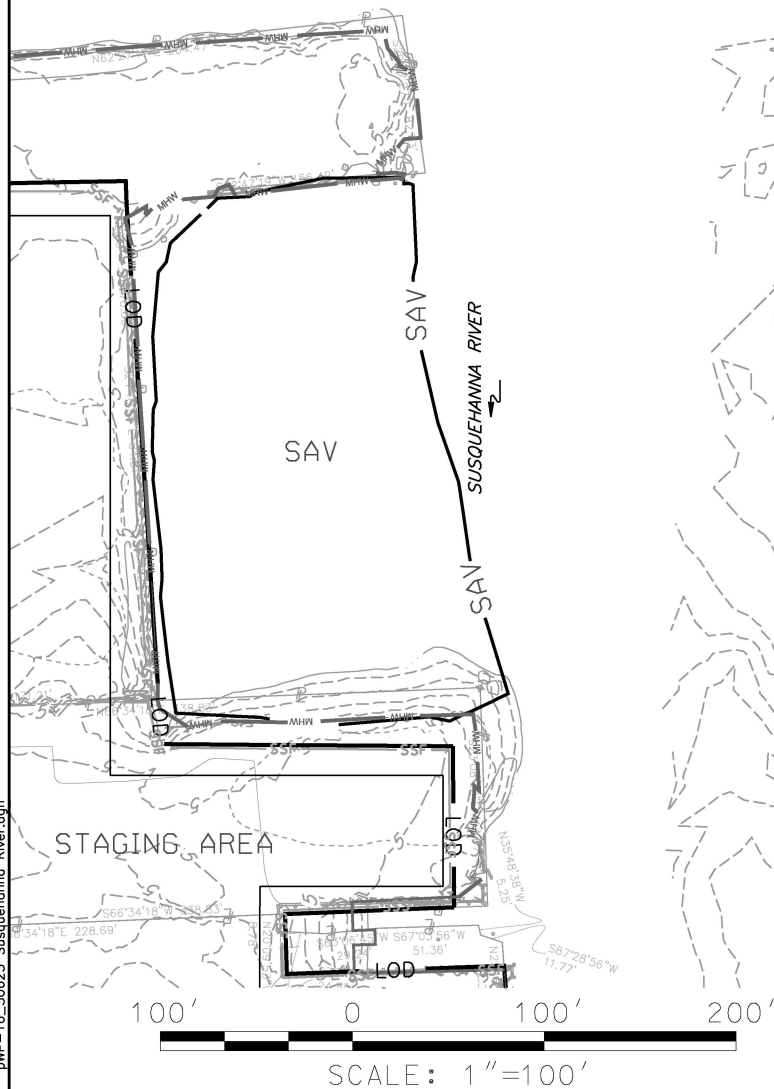
Job No:	50625
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PLT-010	









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# HNTB



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

IMPACT PLATE

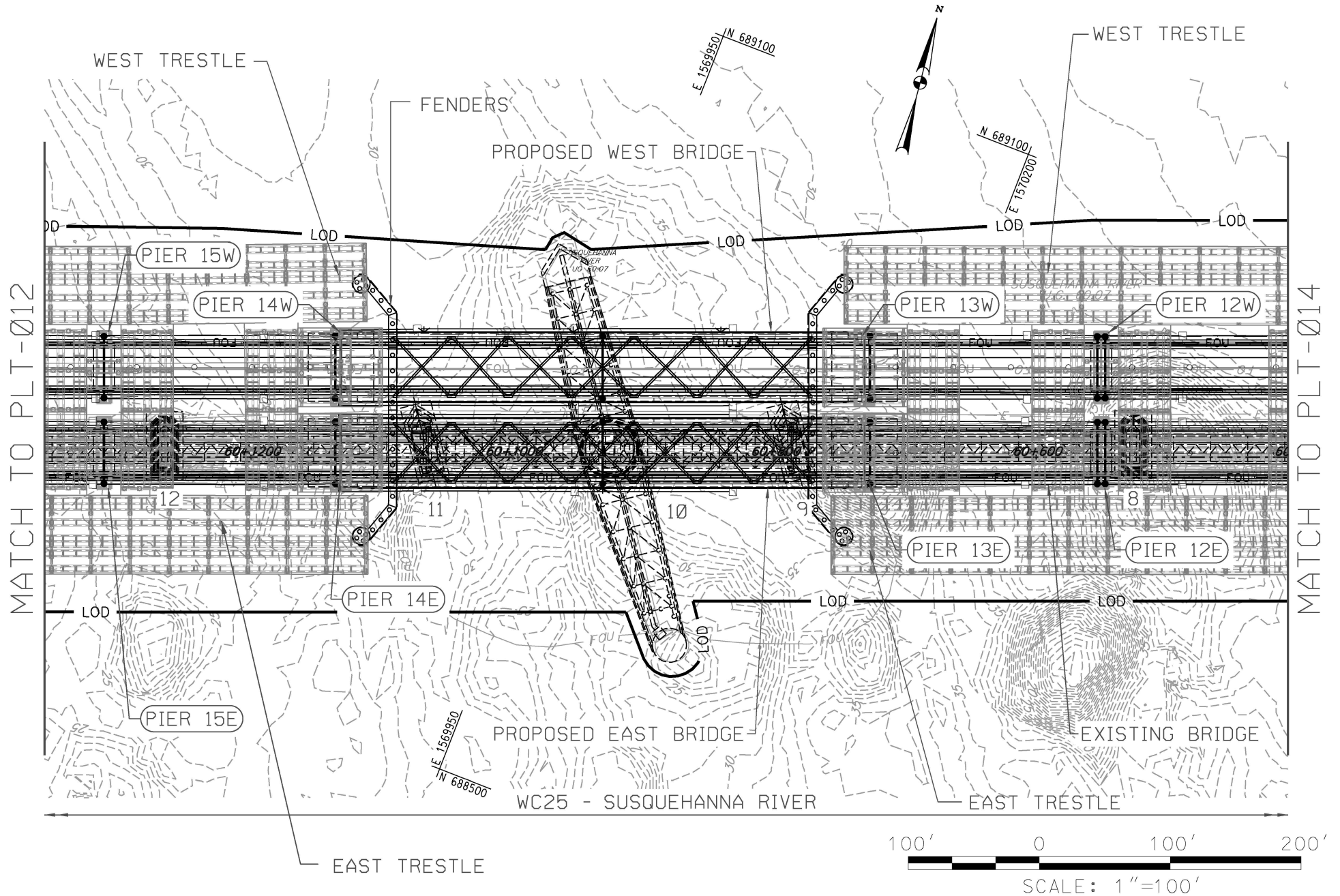
Job No:	50625
Sheet No.	16 OF 32
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PLT-012A	

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Date: May 2024

PLT-012A

PLOT SCALE: AS SHOWN  
5/15/2024 7:06:39 AM  
pWP-17\_50625 Susquehanna River.dgn



No.	Revisions	Date	By

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

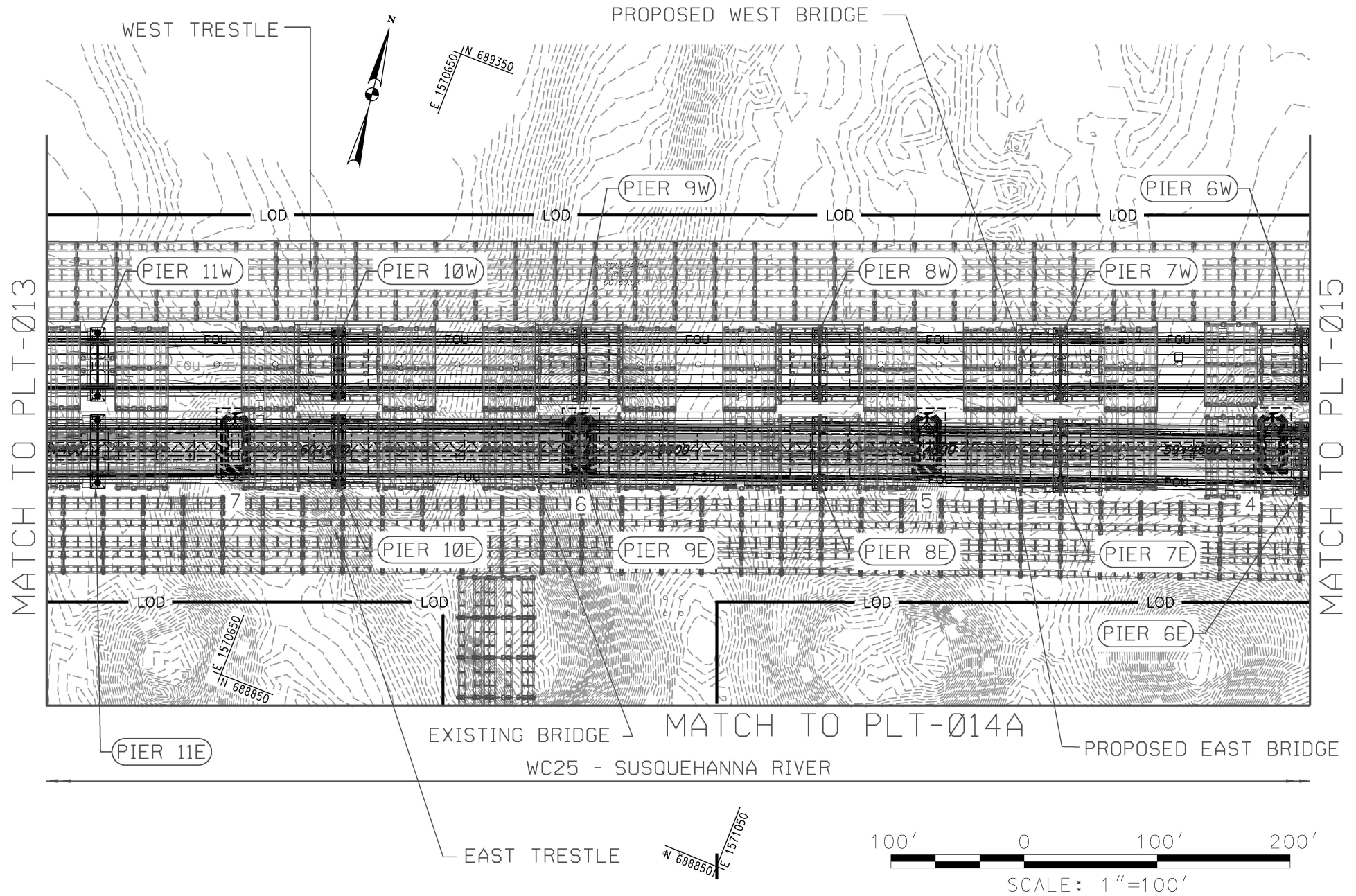
IMPACT PLATE

Job No: 50625  
Sheet No. 17 OF 32

Date: May 2024

PLT-013

PLOT SCALE: AS SHOWN  
7/9/2024 4:12:34 PM  
pWP-18\_50625 Susquehanna River.dgn



No.	Revisions	Date	By
1	ADDED MOORINGS	11/13/23	MJF

**HNTB**

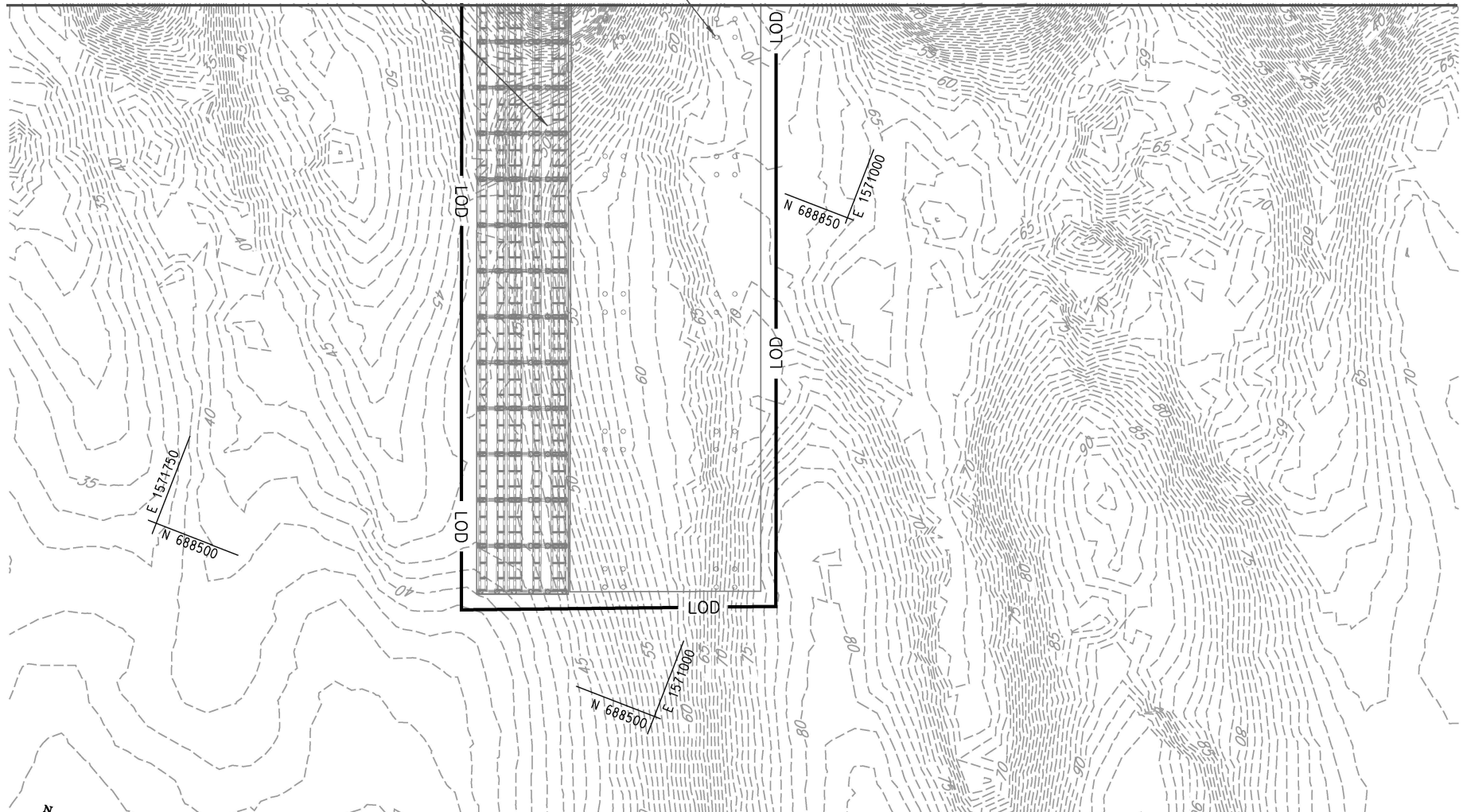


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
Sheet No.	18 OF 32
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PLT-014	

PLOT SCALE: AS SHOWN  
5/15/2024 7:21:22 AM  
pWP-19\_50625 Susquehanna River.dgn

TRESTLE  
MOORINGS (TYP)  
MATCH TO PLT-014



WC25 - SUSQUEHANNA RIVER



No.	Revisions	Date	By

**HNTB**

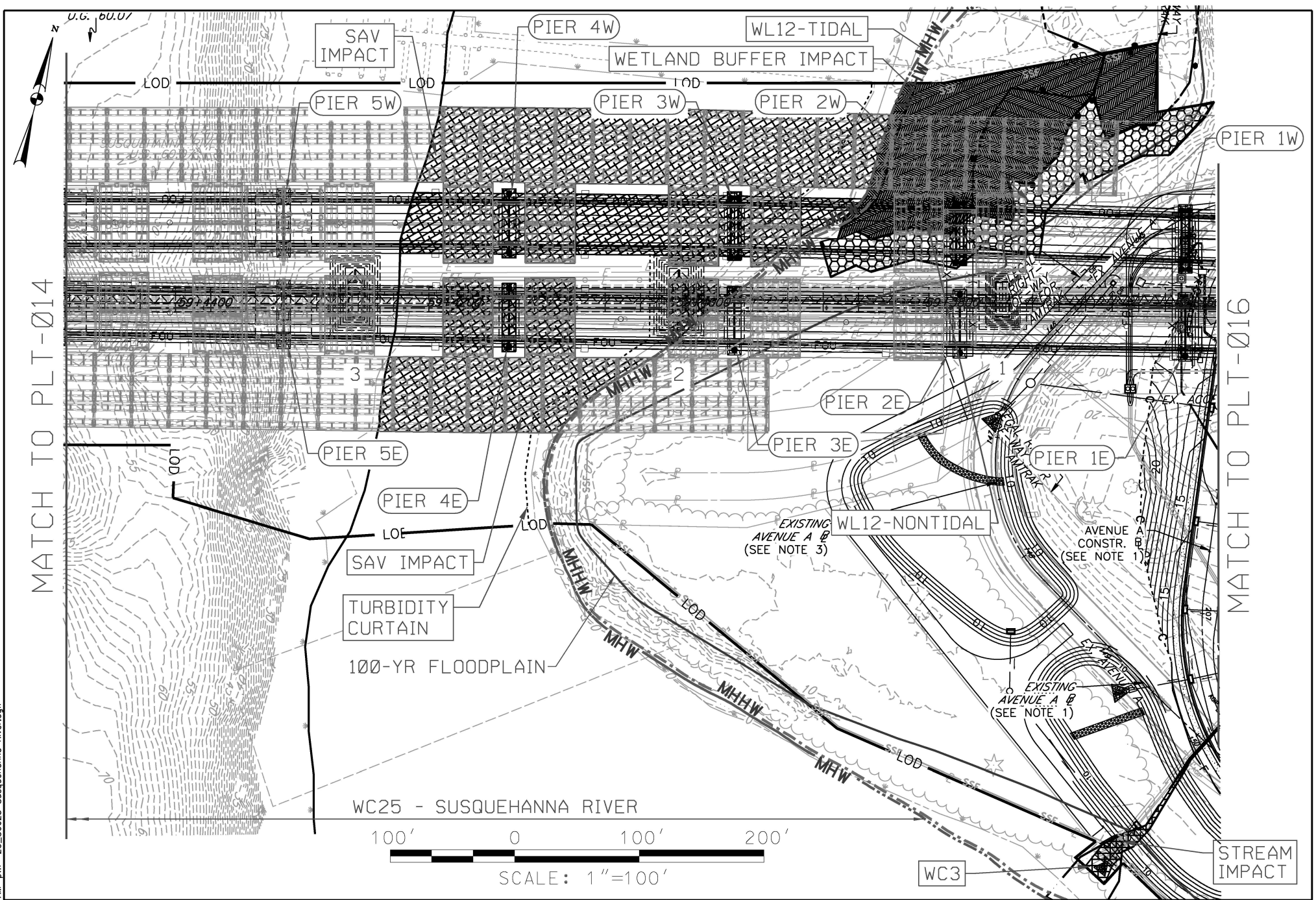


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
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PLT-014A	



PLOT SCALE: AS SHOWN  
5/15/2024 11:54:41 AM pWP-20\_50625 Susquehanna River.dgn



No.	Revisions	Date	By
1	ADDED MHW AND MHHW BOUNDARIES	11/13/23	MJF



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

IMPACT PLATE

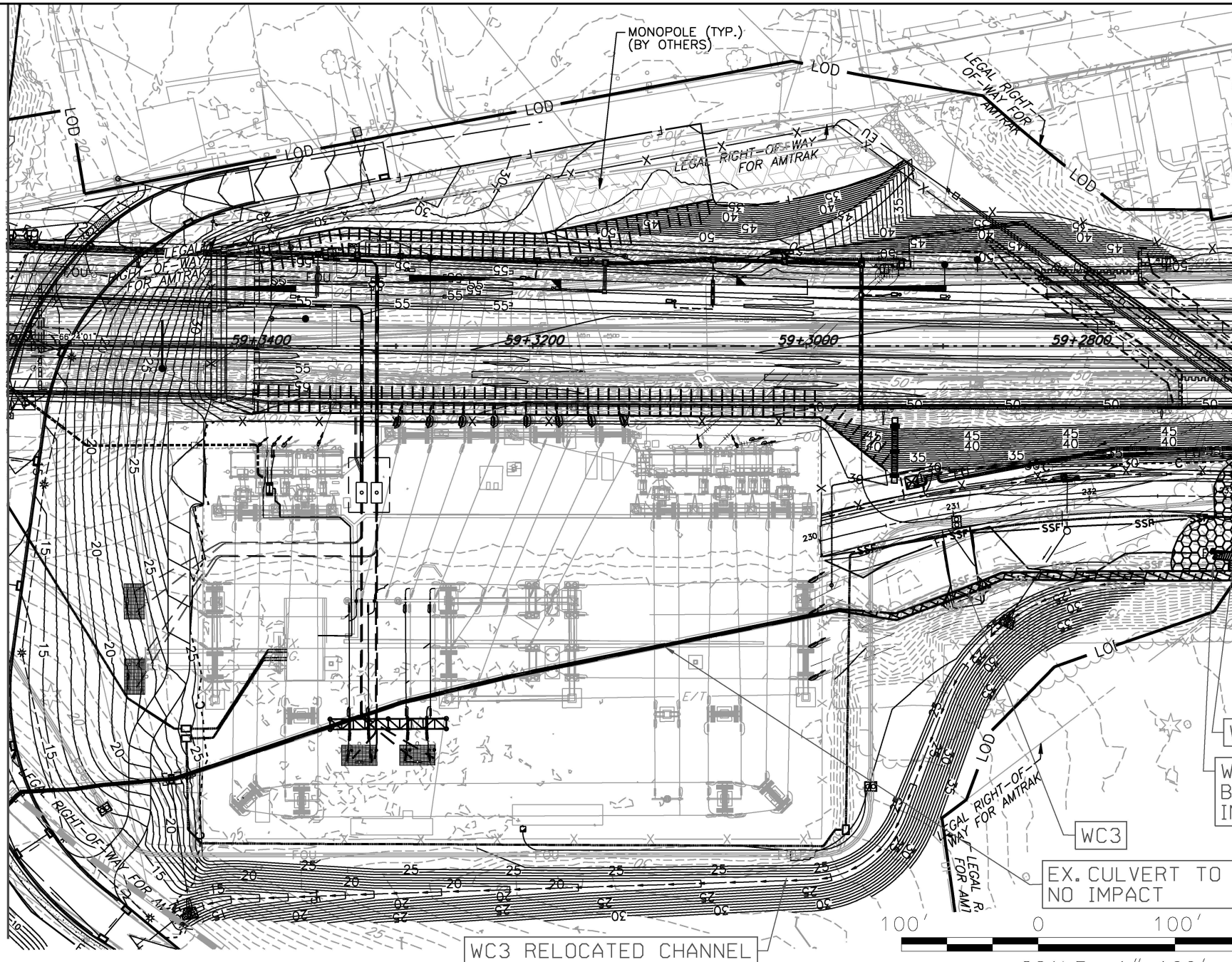
Job No:	50625
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PLT-015





MATCH TO PLT-015



MATCH TO PLT-017

No.	Revisions	Date	By

**HNTB**

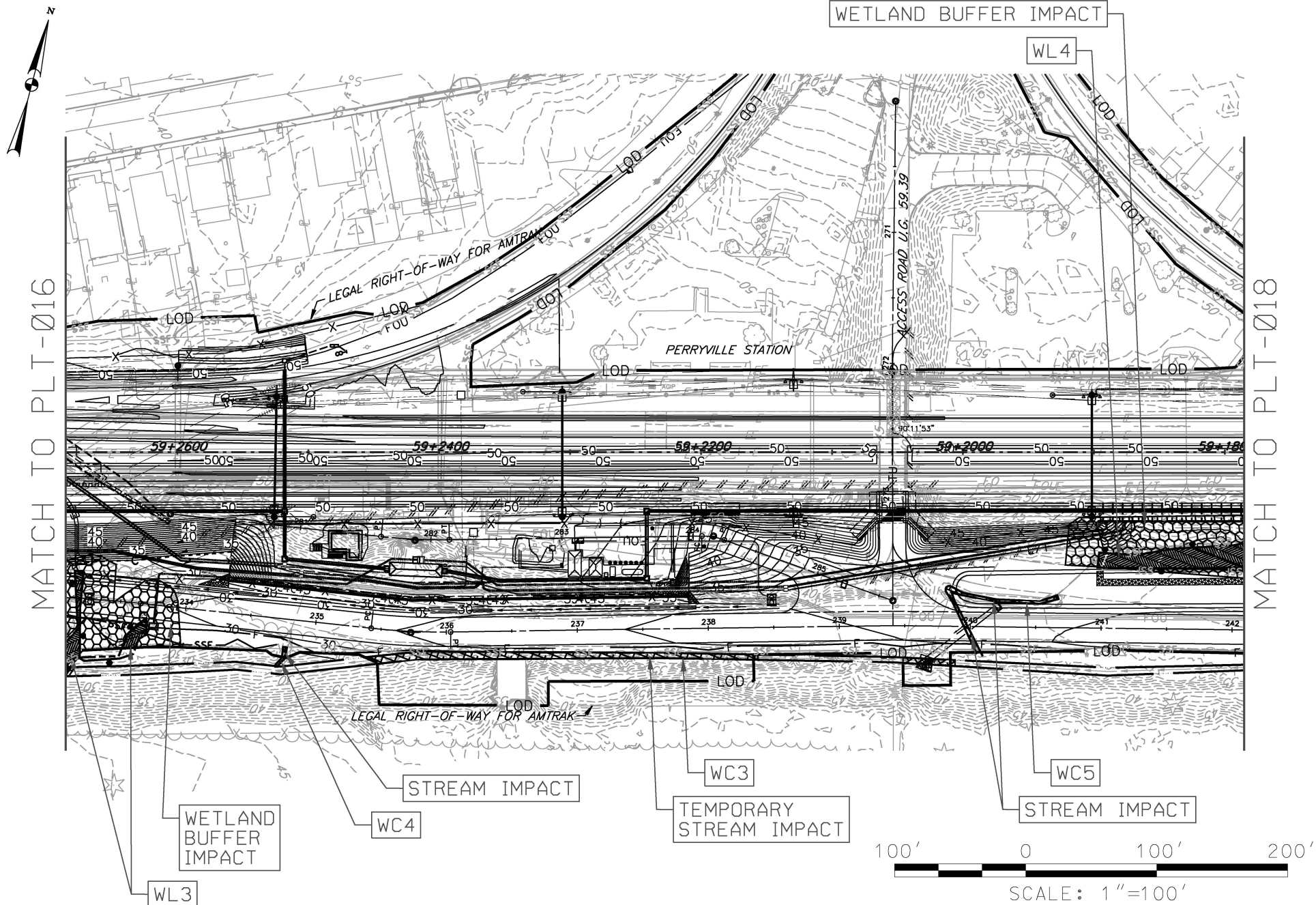


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

IMPACT PLATE

Job No:	50625
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PLT-016	

PLOT SCALE: AS SHOWN  
5/14/2024 12:50:47 PM pWP-22\_50625 Susquehanna River.dgn



No.	Revisions	Date	By

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

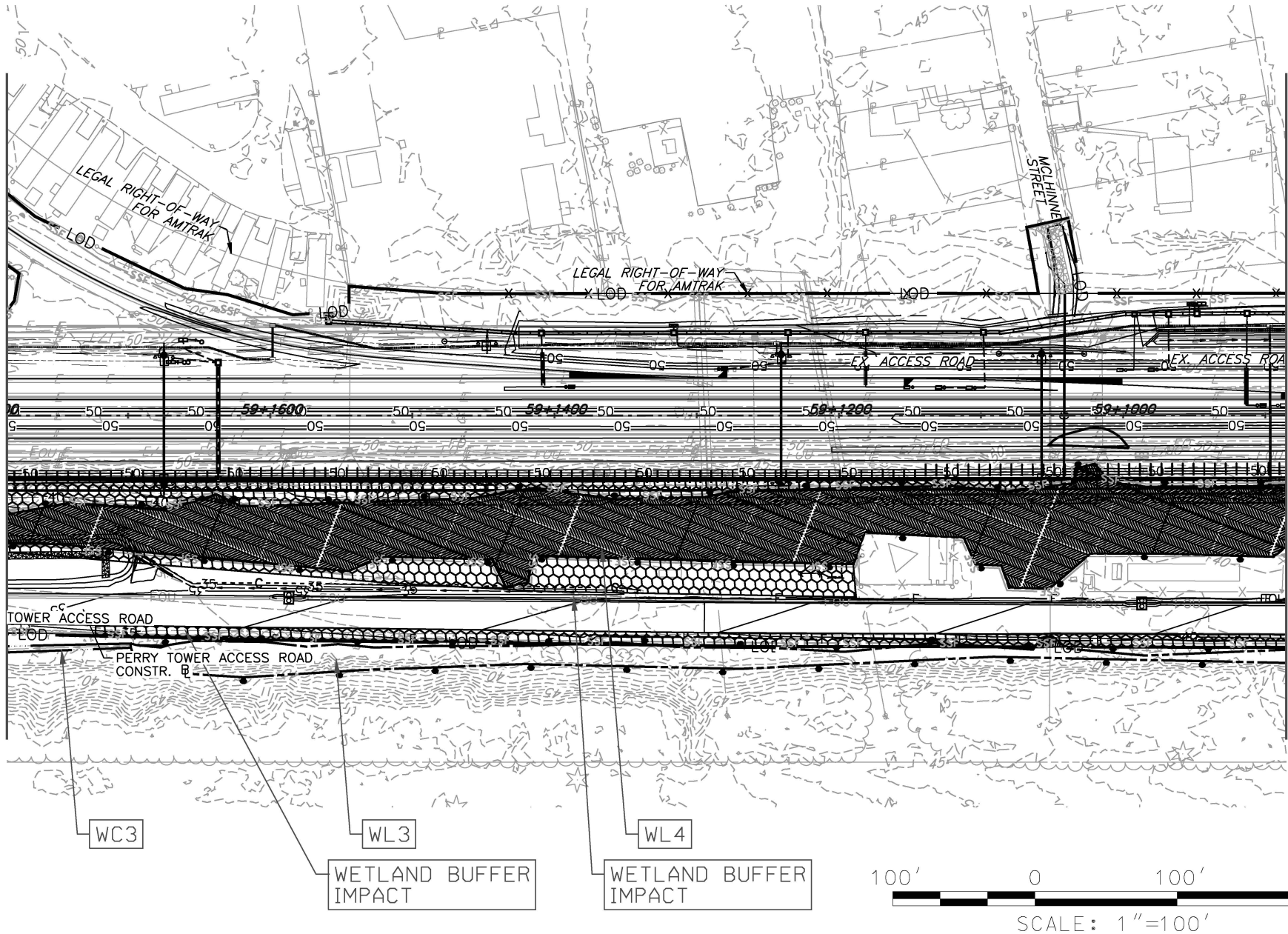
IMPACT PLATE

Job No:	50625
Sheet No.	22 OF 32
Date:	May 2024
PLT-017	

PLOT SCALE: AS SHOWN  
5/14/2024 12:57:21 PM pWP-23\_50625 Susquehanna River.dgn



MATCH TO PLT-017



MATCH TO PLT-019

No.	Revisions	Date	By

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

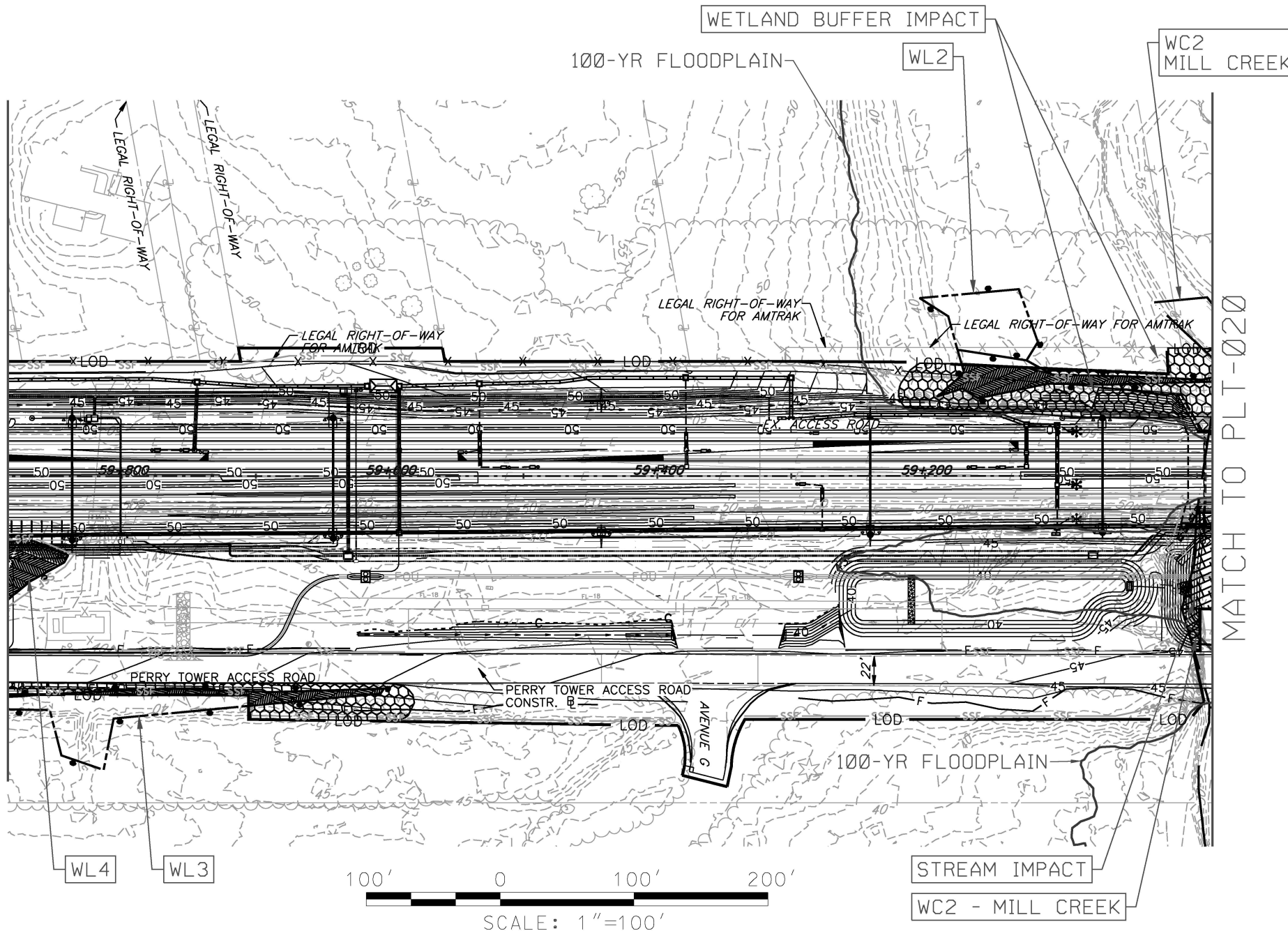
IMPACT PLATE

Job No:	50625
Sheet No.	23 OF 32
Date:	May 2024
PLT-018	

PLOT SCALE: AS SHOWN  
5/14/2024 1:03:19 PM  
pWP-24\_50625-Susquehanna River.dgn



MATCH TO PLT-018



MATCH TO PLT-020

No.	Revisions	Date	By

**HNTB**



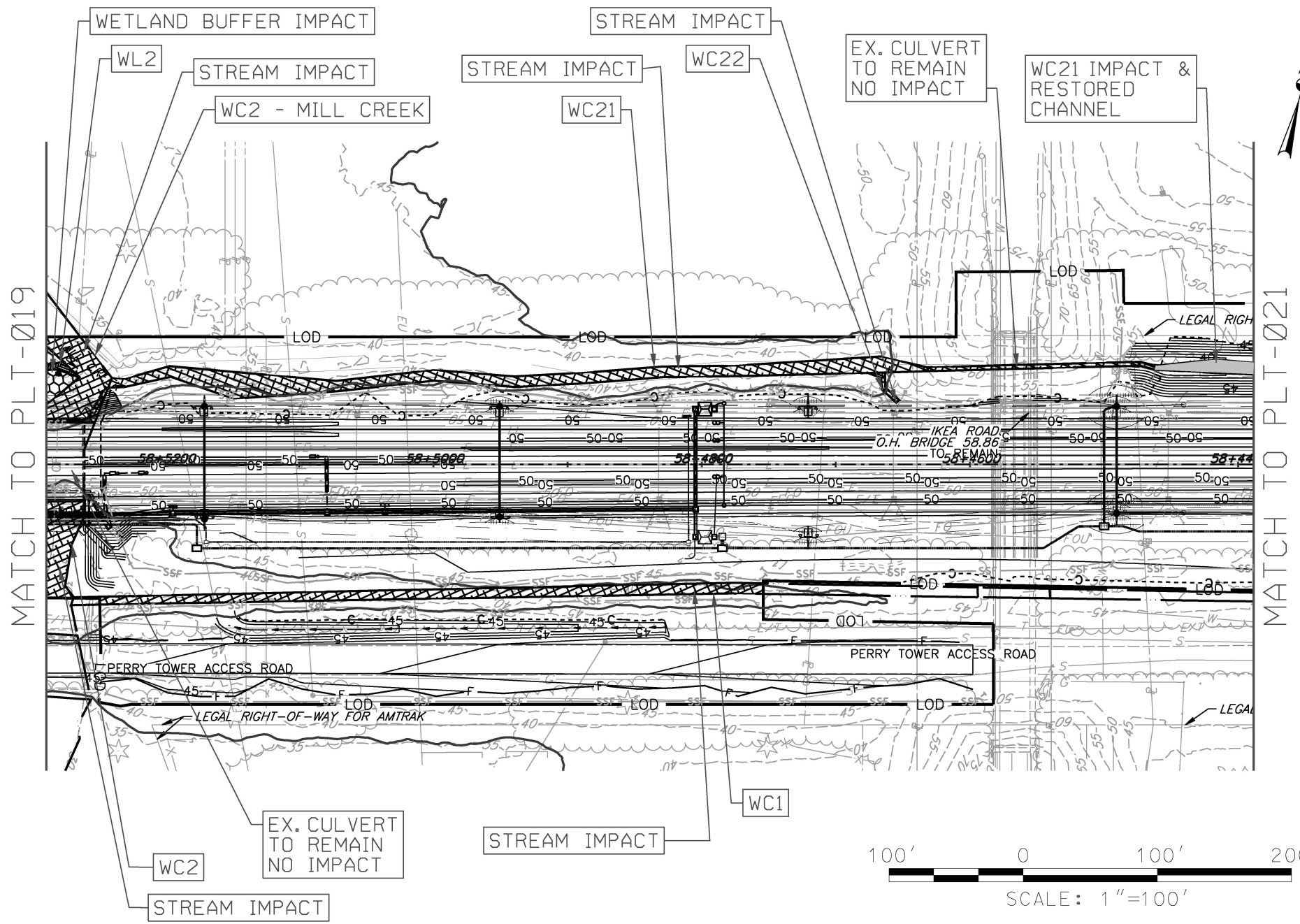
PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

IMPACT PLATE

Job No:	50625
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PLT-019	



PLOT SCALE: AS SHOWN  
5/14/2024 1:11:30 PM  
pWP-25\_50625-Susquehanna River.dgn



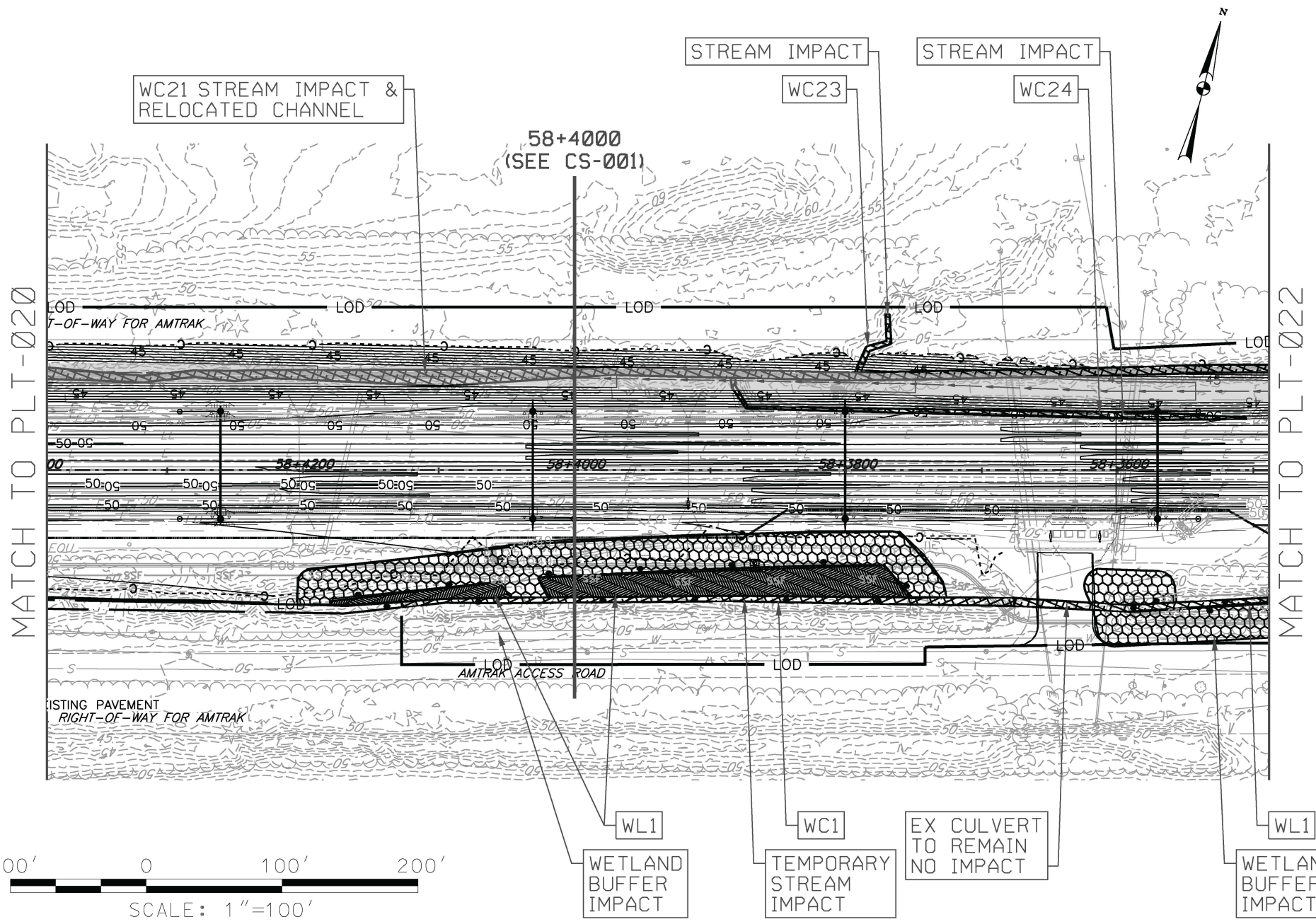
No.	Revisions	Date	By



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
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Date:	May 2024
PLT-020	

PLOT SCALE: AS SHOWN  
5/15/2024 7:49:50 AM  
pWP-26\_50625-Susquehanna River.dgn



No.	Revisions	Date	By



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

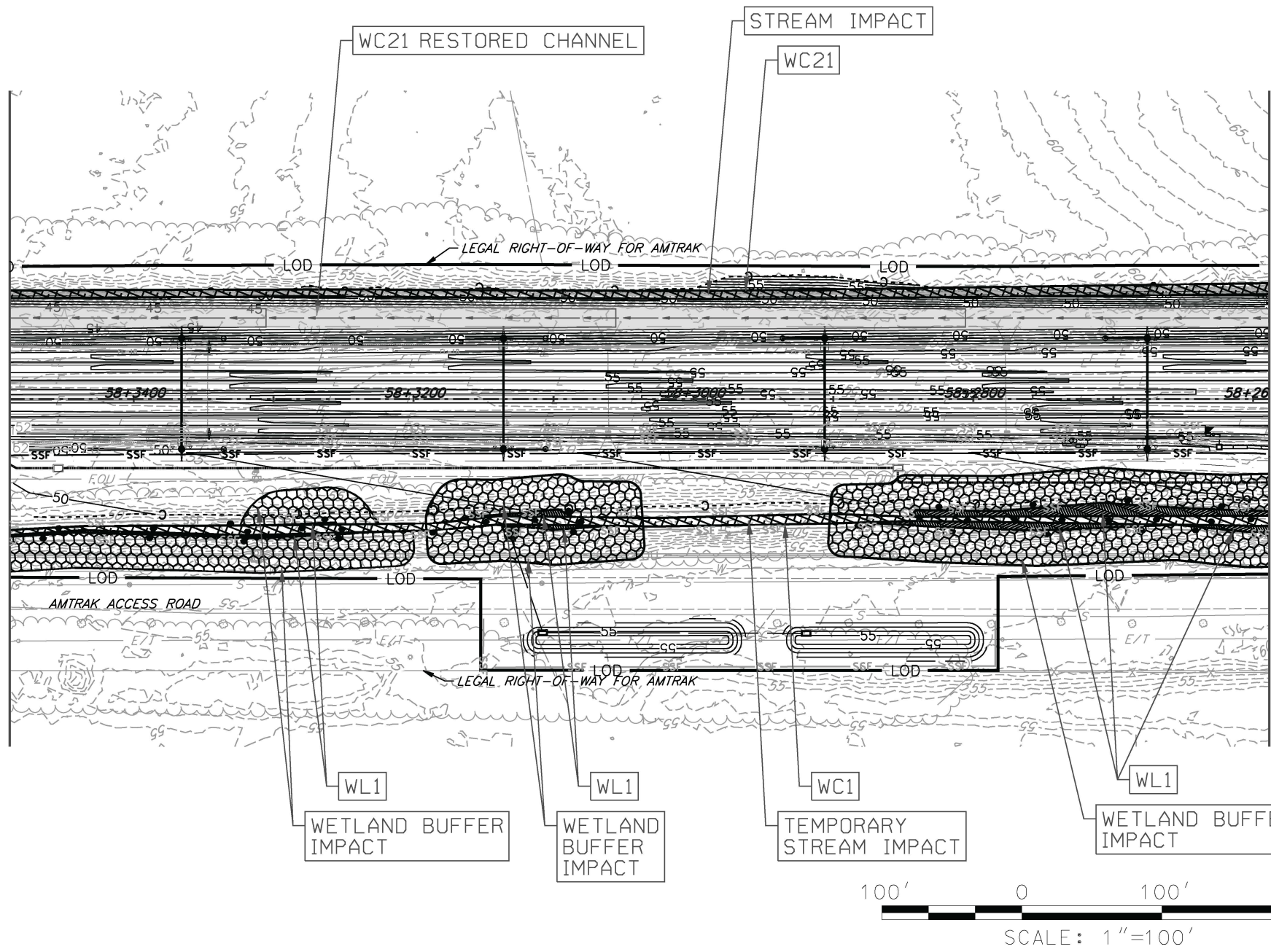
Job No:	50625
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PLT-021	





MATCH TO PLT-021

MATCH TO PLT-023



PLOT SCALE: AS SHOWN  
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pWP-27\_50625-Susquehanna River.dgn

No.	Revisions	Date	By



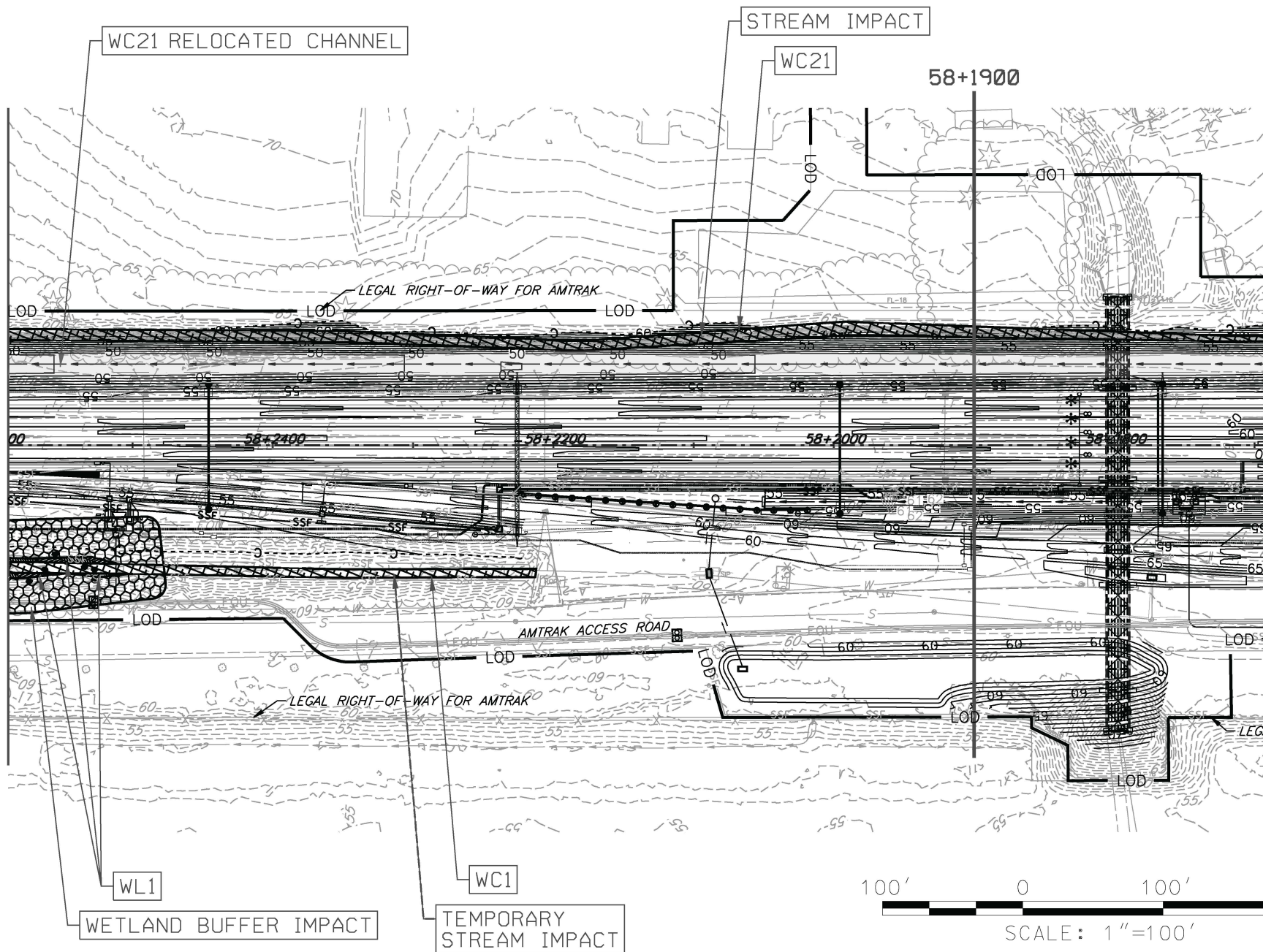
PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

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PLT-022	



MATCH TO PLT-022

MATCH TO PLT-024



100' 0 100' 200'  
SCALE: 1"=100'

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

IMPACT PLATE

Job No: 50625  
Sheet No: 28 OF 32

Date: May 2024

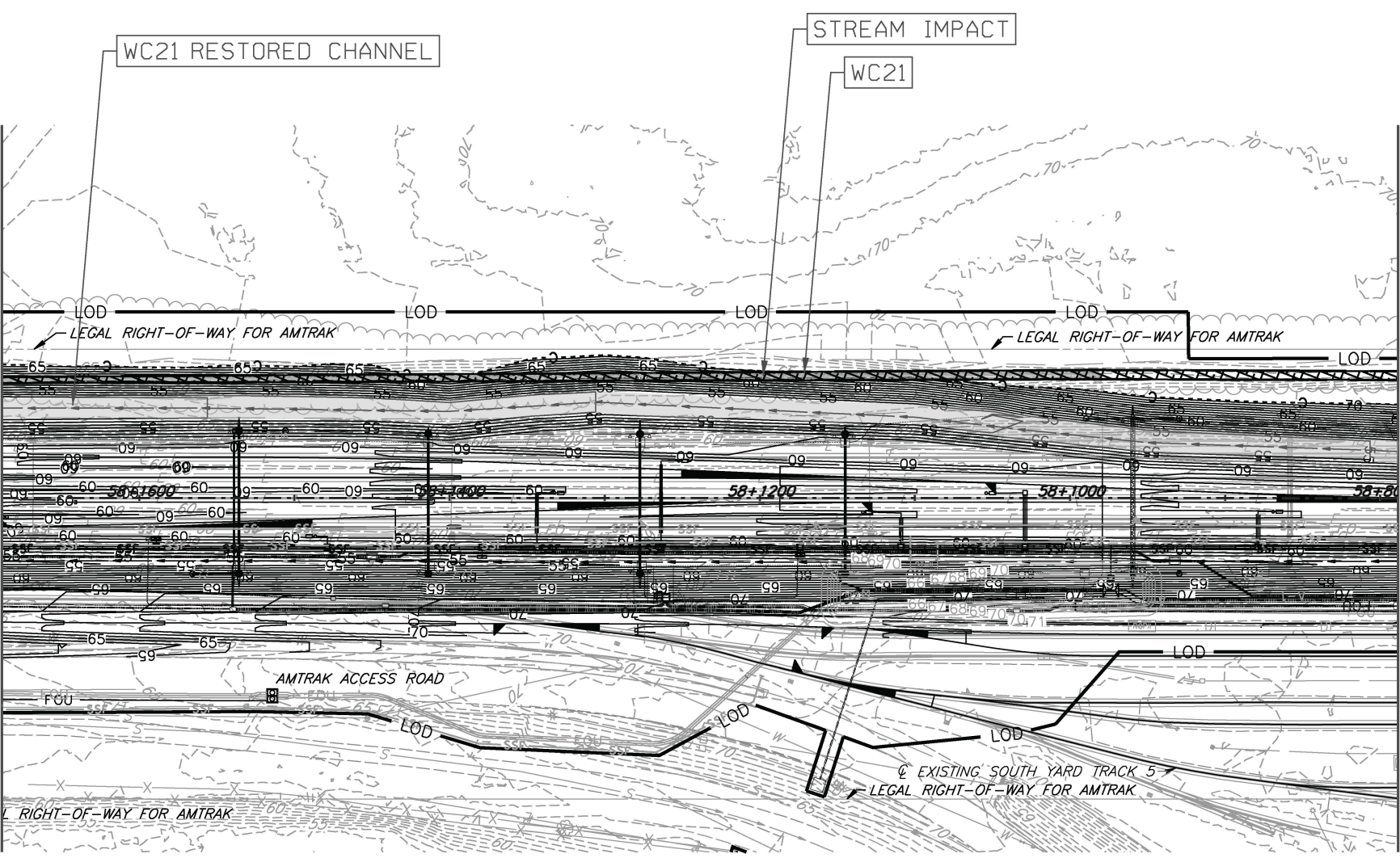
PLT-023

No.	Revisions	Date	By





MATCH TO PLT-023



MATCH TO PLT-025



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No.	Revisions	Date	By

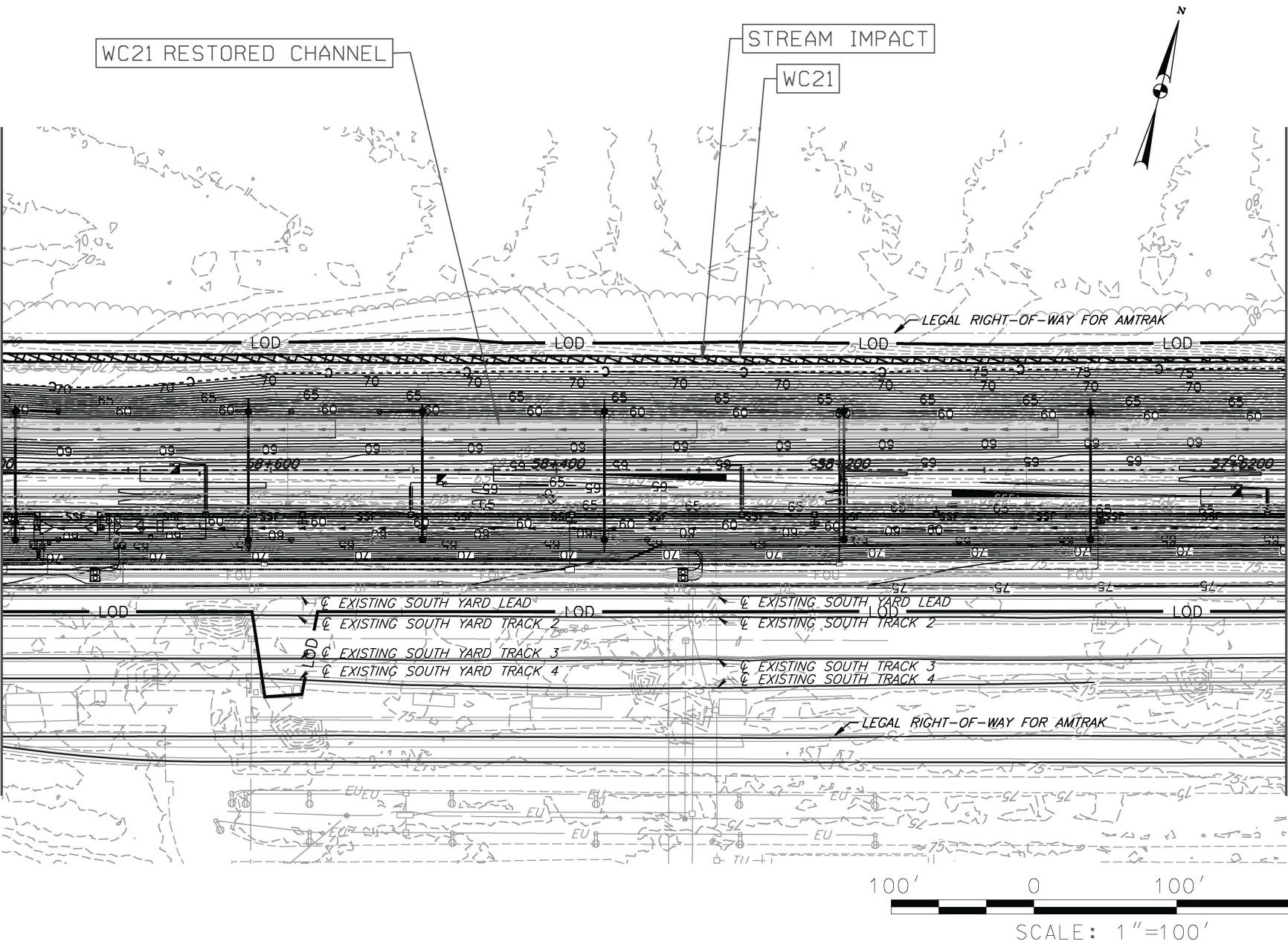


PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
Sheet No.	29 OF 32
Date:	May 2024
PLT-024	

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MATCH TO PLT-024



No.	Revisions	Date	By



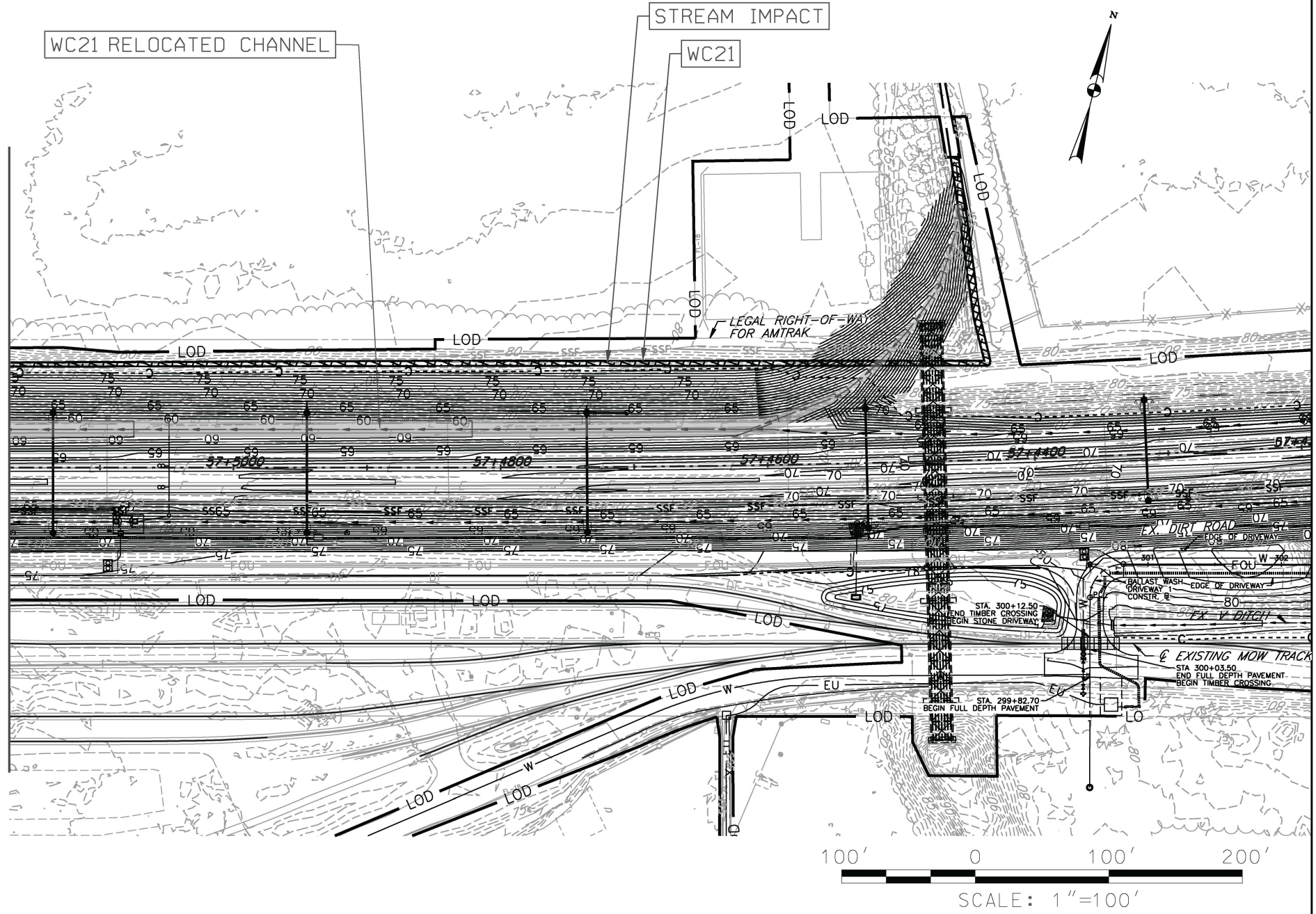
PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
Sheet No.	30 OF 32
Date:	May 2024
PLT-025	



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MATCH TO PLT-025

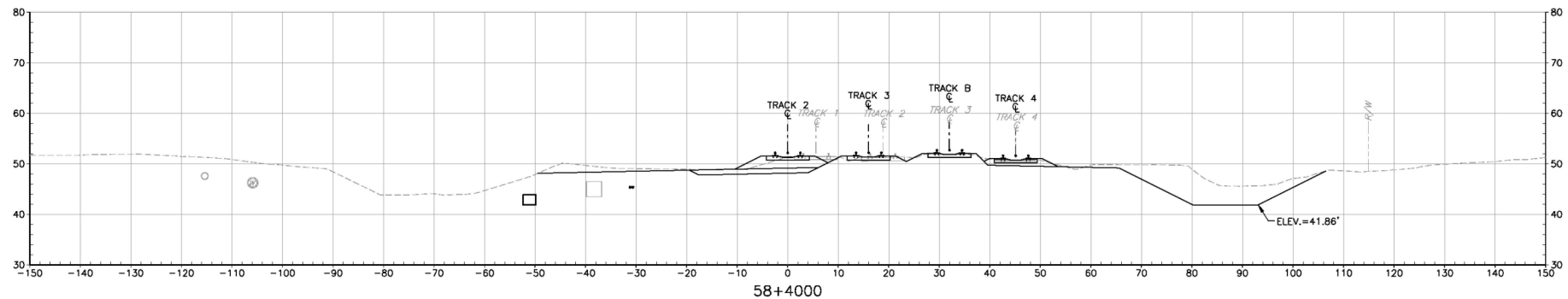
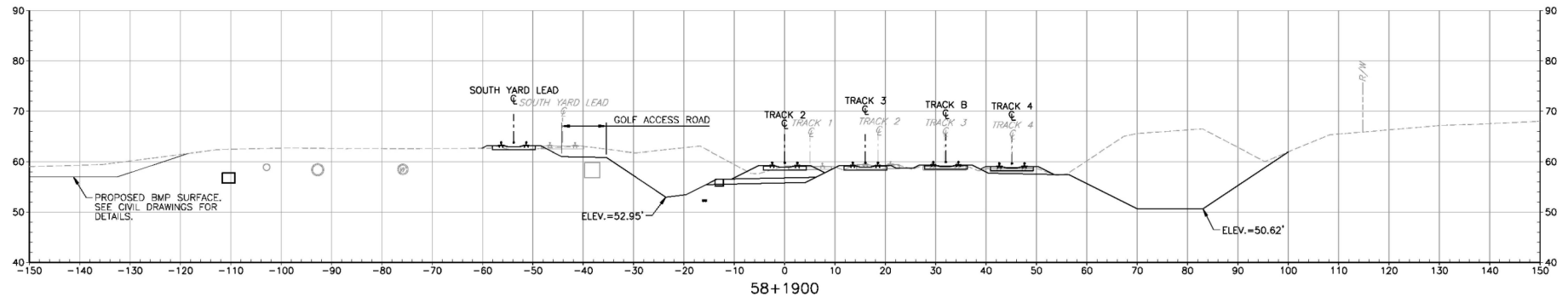


No.	Revisions	Date	By



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
IMPACT PLATE

Job No:	50625
Sheet No.	31 OF 32
Date:	May 2024
PLT-026	



No.	Revisions	Date	By

**HNTB**



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
 SUSQUEHANNA RIVER  
 RAIL BRIDGE PROJECT  
 CROSS SECTIONS

Job No:	50625
Sheet No.	32 OF 32
Date:	May 2024
CS-001	





PLOT SCALE: AS SHOWN  
5/9/2024 4:00:42 PM X-Living Shoreline plate

No.	Revisions	Date	By



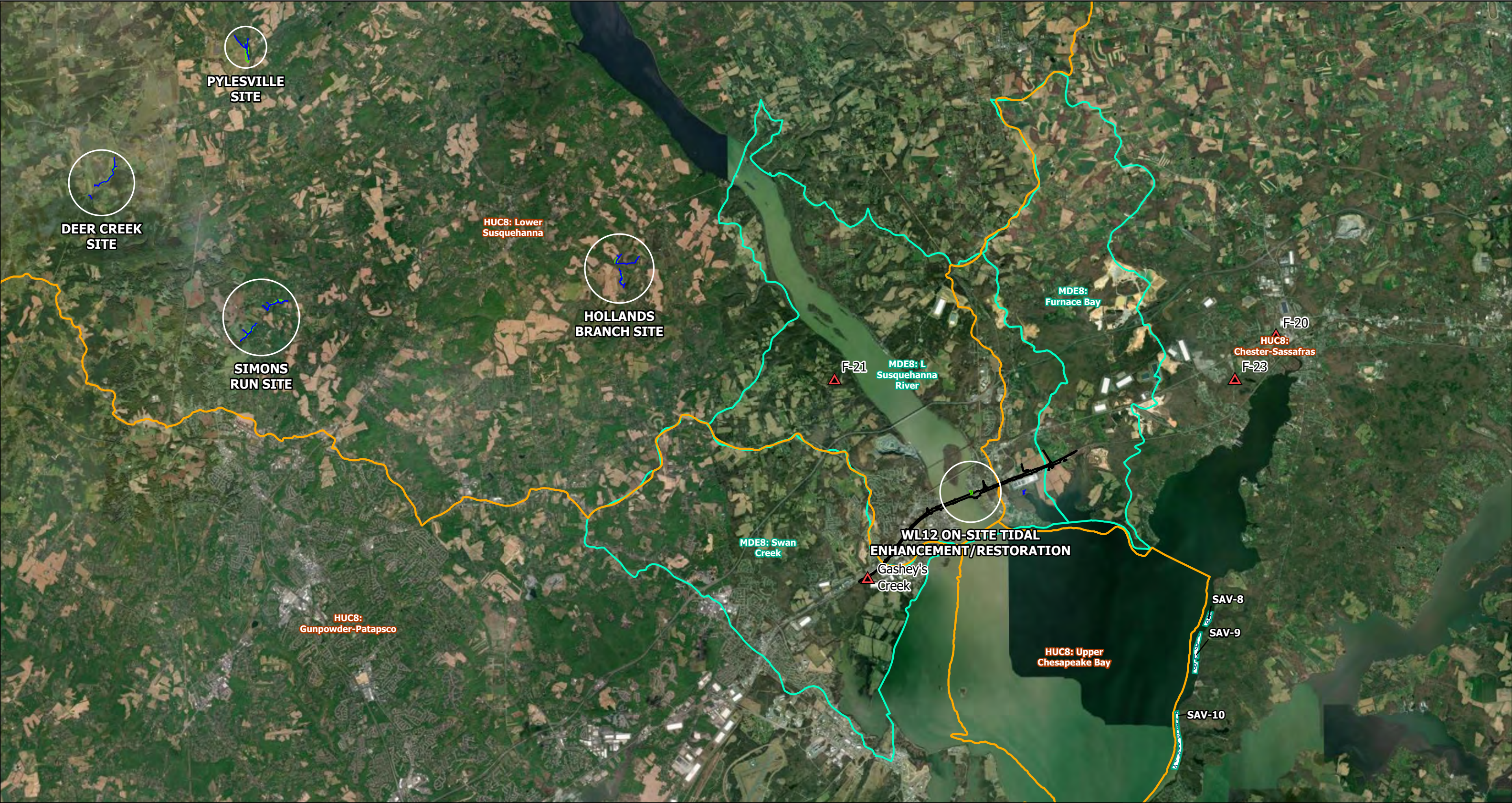
PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT  
HAVRE DE GRACE LIVING SHORELINE IMPACT PLATE



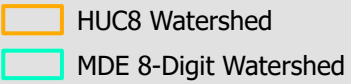
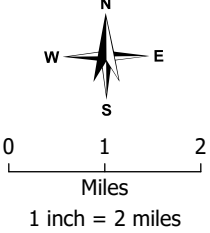
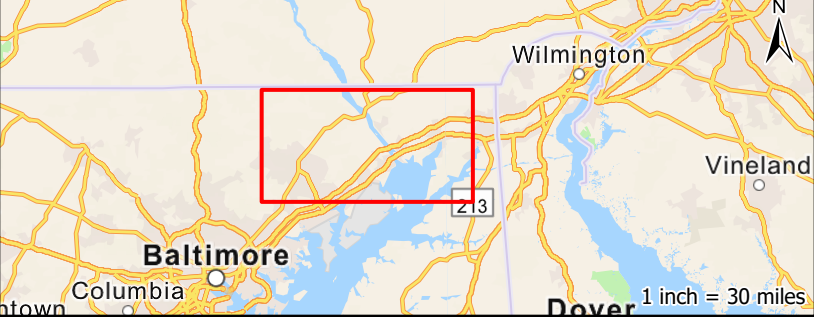
Job No:	50625
Sheet No.	1 OF 1
Date:	May 2024
LVS-001	



**STREAM AND WETLAND CONCEPTUAL MITIGATION MAPS AND  
SUMMARIES**





 <p><b>Susquehanna River Rail Bridge Project</b> <b>SRB Compensatory Mitigation:</b> Wetland, Stream, SAV, and Fish Passage Sites Harford and Cecil Counties, Maryland May 2024</p>	 <p>LOD Fish Blockage Site SAV Restoration Site Stream Mitigation Site Wetland Mitigation Site</p>	 <p>HUC8 Watershed MDE 8-Digit Watershed</p>	 <p>0 1 2 Miles 1 inch = 2 miles Map Center, NAD83 39.5865°, -76.1667°</p>	 <p>Wilmington Vineland Baltimore Columbia Dover 1 inch = 30 miles</p>
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Source: Large-scale frame: Maryland iMAP, DoIT. Imagery flown in 2022 (Eastern Shore) and 2020 (Western Shore). Received 5/8/2024. Small-scale frame: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received 5/8/2024.



# SUSQUEHANNA RIVER RAIL BRIDGE PROJECT

## Simon's Run Stream and Wetland Mitigation Site

### Existing Conditions Summary

#### **Location Information**

**County:** Harford **Watershed:** Lower Susquehanna  
**Coordinates:** 39.615428, -76.367585  
**Location:** Grier Nursery Road (south portion) and Ward Road (northern portion)  
**Property Ownership:** Private (Ishak, Jones, Ward, Cysyk)  
**Constraints:** PDR Easements, Harford County Agricultural Land Preservation Easement

#### **Site Conditions**

**Parcel Area:** 83 Ac, 97 Ac, 71 Ac, 8 Ac, 8 Ac, 7 Ac  
**Existing Land Use:** Agricultural/Pasture  
**Landscape Position:** Stream Valley **Adjacent Land Use:** Residential/Agricultural  
**Drainage Area for Streams:** 0.71, 1.1, 1.3 (Mainstem), 0.06 (Trib 2), 0.19 (Trib 4) sq mi.  
**Drainage Area for Wetlands:** 28, 03, 22, 5, 8, 6 acres  
**Habitat Location:** Contiguous to wetland/upland forest, Flows to Deer Creek  
**Mapped Soils:** Codorus silt loam, Chester silt loam, Glenelg loam, Glenville silt loam, Hatboro silt loam, Manor loam and Manor soils  
**Mapped Wetlands:** NWI wetlands mapped on site  
**Other:** WRR (Wetland/Riparian Restoration Area), 100-year floodplain, just upstream of Targeted Ecological Area and SSPRA

This stream and wetland restoration site is located within agricultural fields and pasture. One portion of the site is located south of Pyle Road, west of Grier Nursery Rd., and the other is on the north and south sides of Ward Road. The site is associated with an unnamed tributary to Stout Bottle Branch and on unnamed tributaries that flow into the unnamed tributary to Stout Bottle Branch. The stream channel lacks a riparian buffer in most regions, is highly sinuous, disconnected from the existing floodplain, and contains actively eroding banks ranging from 3 – 6 feet. A few sections of the mainstem and tributaries have a narrow riparian buffer, although invasives are present and trees are impacted by vines in several areas. The riparian vegetation has been compromised by eroding banks, and invasive shrubs and vines are prevalent through the immediate riparian area in several reaches. Invasive species treatment and native woody plantings throughout the stream and wetland mitigation area is proposed. The stream could benefit from floodplain reconnection by raising the channel invert in an effort to preserve existing trees and stabilizing the banks to eliminate localized bank erosion. Additionally, riparian plantings, and in-stream habitat features will enhance the site. There is also opportunity to exclude/restrict cattle from the stream. Currently, cattle have access to the stream in the southern portion of the site.

The adjacent abandoned floodplain areas along the stream are flat and topographically low within the valley and would require minimal cut in combination with raising the invert of the stream to create wetland hydrology where wetlands are currently not present. The riparian floodplain is dominated by crop fields, pasture, mowed grasses, and scrub-scrub areas with scattered trees. The floodplain is mostly mapped by NRCS as predominantly non-hydric soil. However, there are several existing depressions and swale wetlands along the mainstem and associated tributaries. There is an opportunity to enhance existing emergent wetlands by creating microtopography and planting native tree and shrub species to enhance species diversity and wetland function. The open spaces adjacent to these existing wetlands are suitable for the creation of a groundwater wetland/floodplain wetland creation. At multiple soil test plots and during installation of groundwater wells throughout potential wetland creation/restoration areas, depth to groundwater ranged from approximately 16 to 41 inches. Groundwater wells were installed at 16 locations around the site to monitor hydrology within the floodplain and proposed wetland restoration areas. Well

data will be analyzed and used to determine grading elevations and refine extends of proposed wetlands as the design progresses. Native herbaceous and woody species, including shrubs and trees, will be planted within the restored wetland areas, and along the restored stream.

### **Summary of Opportunities**

- Stream Restoration - Approximately 10,558 Linear Feet
- Wetland Creation/Restoration - Approximately 12.77 Acres
- Wetland Enhancement - Approximately 5.19 Acres

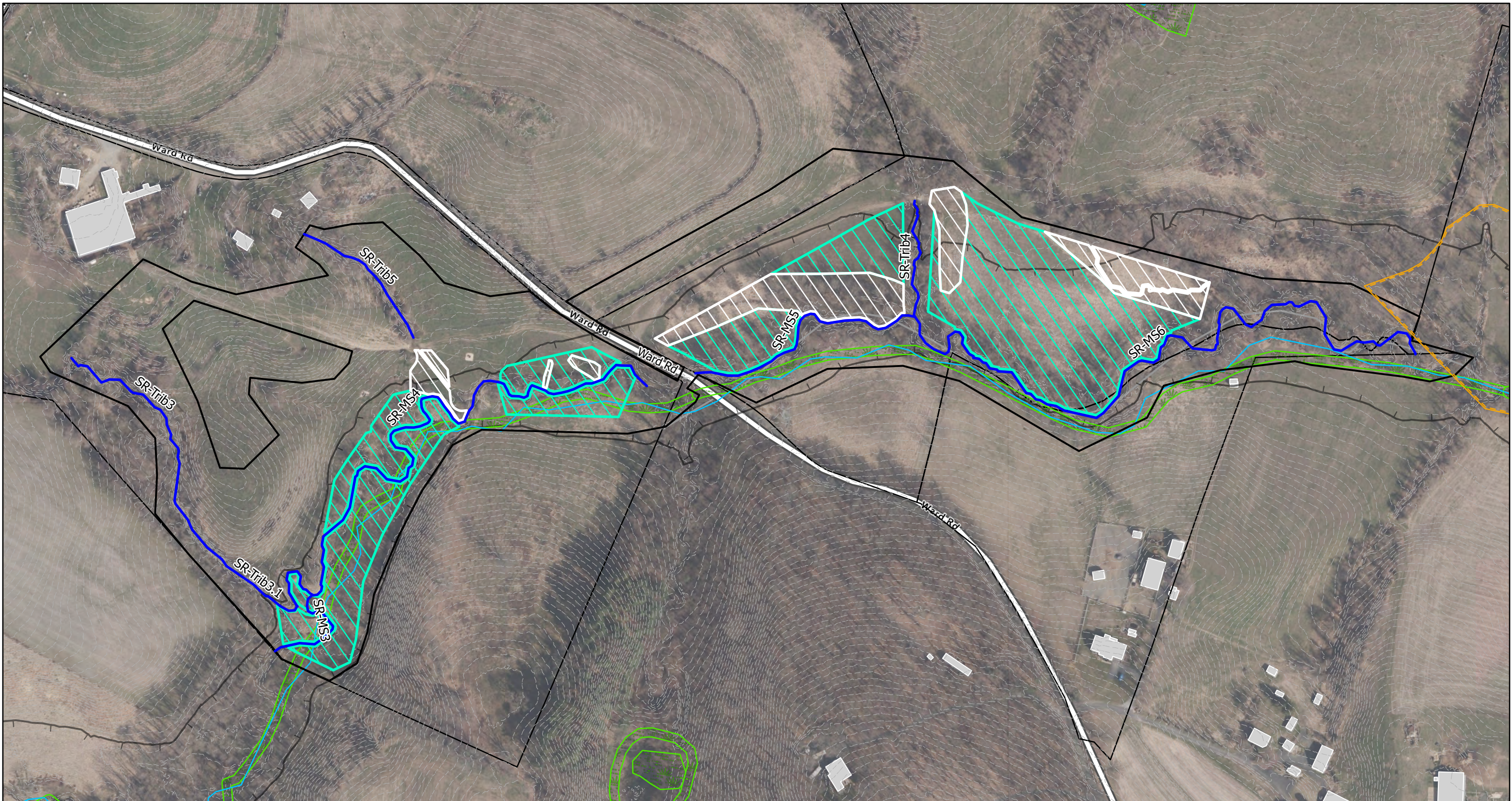
### **Restoration Objectives**

- Floodplain Reconnection & Bank Stabilization
- Establish Riparian Buffer throughout Stream Corridor
- Wetland Creation/Restoration/Enhancement
- Proposed Wetland Functions and Values include: Groundwater recharge/discharge, Floodflow alteration, Sediment/toxicant/pathogen retention, Nutrient removal/retention/transformation, Production export, Sediment/shoreline stabilization, and Wildlife habitat
- Improvement of In-Stream and Riparian Habitat

### **Restoration Concept**

- Combination of raising stream invert to connect to floodplain and establishing floodplain benches & wetlands within open spaces
- Installation of cattle exclusion fencing
- Establish a riparian buffer and preserve existing trees along the stream corridor
- Installation of in-stream structures to provide channel stability and habitat diversity





## Susquehanna River Rail Bridge Project

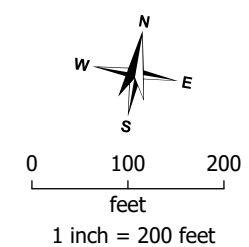
Mitigation Site ID(s): Simon's Run

Sheet 1 of 2

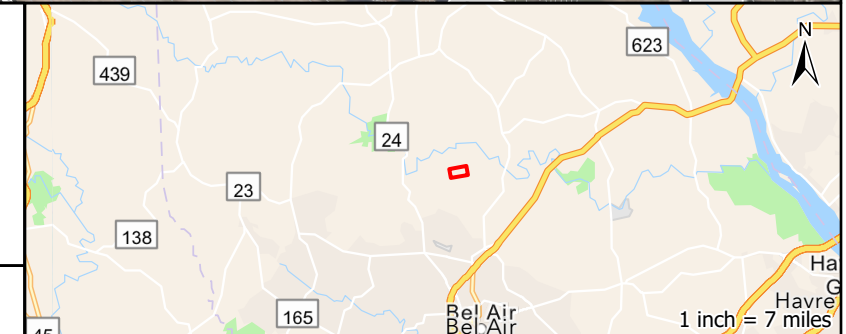
Harford County, Maryland

May 2024

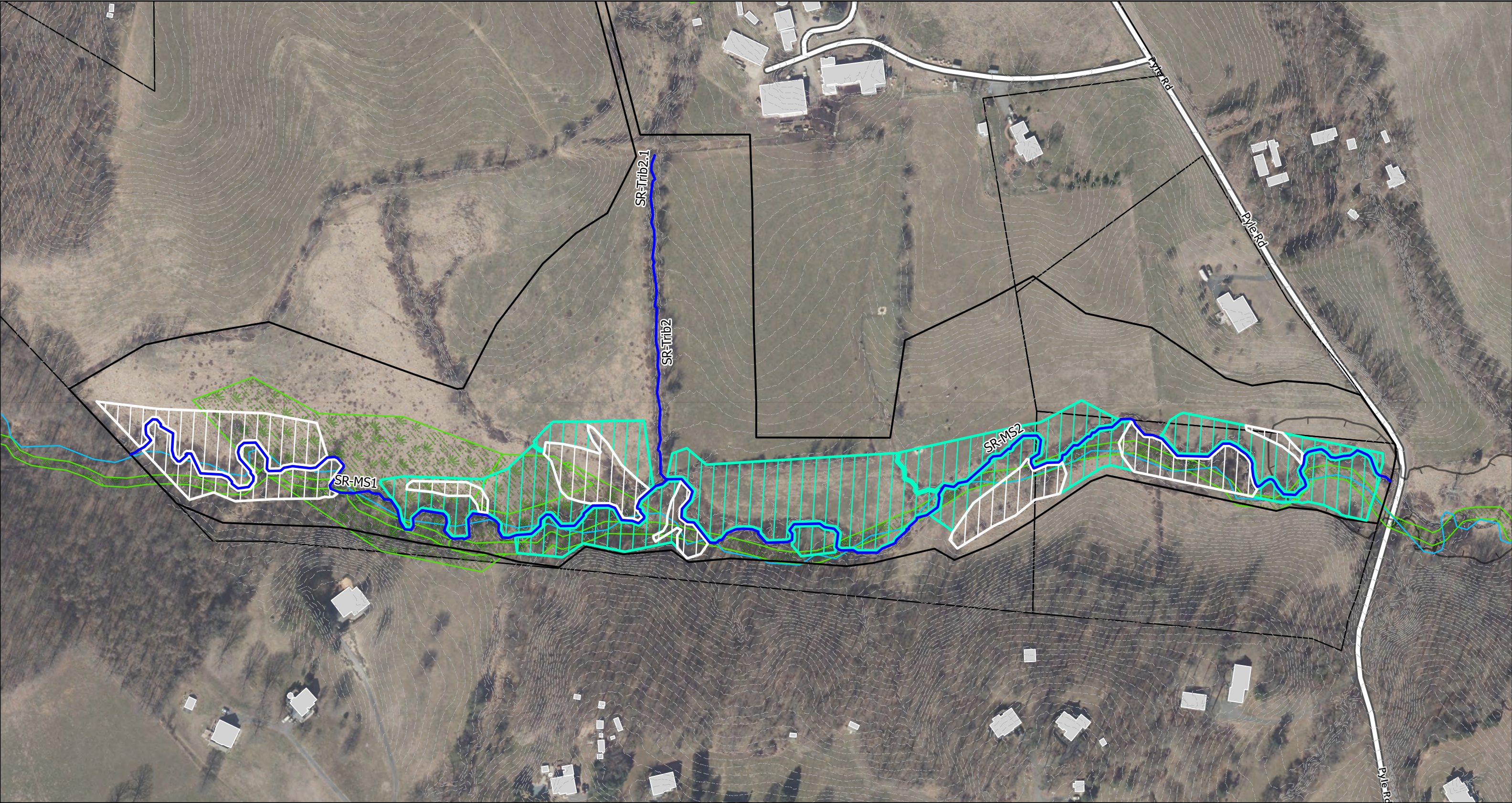
- |                              |                                 |
|------------------------------|---------------------------------|
| Stream Restoration           | Mapped Stream                   |
| Wetland creation/Restoration | NWI Wetland                     |
| Wetland Enhancement          | DNR Wetland                     |
| 100-Year Floodplain          | Partially Hydric (33 - 65%)     |
| Parcel Boundary              | Predominantly Hydric (66 - 99%) |
| 2' Contour                   | Hydric (100%)                   |




Map Center, NAD83  
39.6186°, -76.3629°





















**Susquehanna River Rail Bridge Project**


**Mitigation Site ID(s): Simon's Run**

Sheet 2 of 2

Harford County, Maryland


May 2024

 <b>Stream Restoration</b>	 <b>Mapped Stream</b>
 <b>Wetland creation/Restoration</b>	 <b>NWI Wetland</b>
 <b>Wetland Enhancement</b>	 <b>DNR Wetland</b>
 <b>100-Year Floodplain</b>	 <b>Partially Hydric (33 - 65%)</b>
 <b>Parcel Boundary</b>	 <b>Predominantly Hydric (66 - 99%)</b>
 <b>2' Contour</b>	 <b>Hydric (100%)</b>



0 100 200  
feet  
1 inch = 200 feet

Map Center, NAD83  
39.61°, -76.3744°



1 inch = 7 miles



# **SUSQUEHANNA RIVER RAIL BRIDGE PROJECT**

## **Hollands Branch Stream and Wetland Mitigation Site**

### **(W-57/59 & S-40/41)**

#### **Existing Conditions Summary**

##### ***Location Information***

**County:** Harford **Watershed:** Lower Susquehanna  
**Coordinates:** 39.6289, -76.22055  
**Location:** Trappe Church Rd., between Poole Rd. and Deths Ford Rd., Darlington, MD  
**Property Ownership:** Private (Glenview Family Farm LLC, Hopkins/Cohen)  
**Constraints:** PDR Easement, MIHP

##### ***Site Conditions***

**Parcel Area:** 17 Ac, 107 Ac, 23 Ac, 164 Ac **Existing Land Use:** Agricultural/Pasture  
**Landscape Position:** Stream Valley **Adjacent Land Use:** Residential/Agricultural  
**Drainage Area for Streams:** S-40: 1,939.2 ac. / 3.03 sq. mi. S-41: 115.2 ac. / 0.18 sq. mi.  
**Drainage Area for Wetlands:** W-57: 33.16 ac. / 0.05 sq. mi. W-59: 50.58 ac. / 0.08 sq. mi.  
**Habitat Location:** Contiguous to wetland/upland forest, Flows to Deer Creek  
**Mapped Soils:** Hatboro silt loam  
**Mapped Wetlands:** NWI and MDNR wetlands mapped on site  
**Other:** WRR (Wetland/Riparian Restoration Area), SSPRA (bog turtle), Targeted Ecological Area, Rural Legacy Area, Tier II Watershed

This stream and wetland restoration site is located within agricultural fields and pasture along Trappe Church Rd., between Poole Rd. and Deths Ford Rd and was previously pursued as a TMDL site. The site is associated with Hollands Branch (S-40) and an Unnamed Tributary to Hollands Branch (S-41). The stream channel lacks a riparian buffer, is highly sinuous, disconnected from the existing floodplain, and contains actively eroding banks ranging from 3 – 6 feet. The stream could benefit from floodplain reconnection by raising the channel invert in an effort to preserve existing trees and stabilizing the banks to eliminate localized bank erosion. Additionally, riparian plantings, and in-stream habitat features will enhance the site. There may be an opportunity to daylight stream section(s) along the unnamed tributary and exclude/restrict cattle from the stream. The adjacent abandoned floodplain areas along the stream are flat and topographically low within the valley. It is dominated by crop fields and grasses and is mostly mapped by NRCS as predominantly hydric soil. Portions of the open spaces are suitable for the creation of a groundwater wetland/floodplain wetland creation. At one soil test plot located on the east bank of Hollands Branch, south of Trappe Church Rd., hydric soils were observed beginning at a depth of 28in from the surface, and saturation was observed at 48in. Groundwater wells will be installed to monitoring hydrology within the floodplain and proposed wetland restoration areas. Well data will be analyzed and used to determine grading elevations and refine extends of proposed wetlands as the design progresses. Native herbaceous and woody species, including shrubs and trees, will be planted within the restored wetland areas, and along the restored stream.

#### **Summary of Opportunities**

- Stream Restoration - Approximately 8,022 Linear Feet
- Wetland Restoration - Approximately 8.12 Acres

#### **Restoration Objectives**

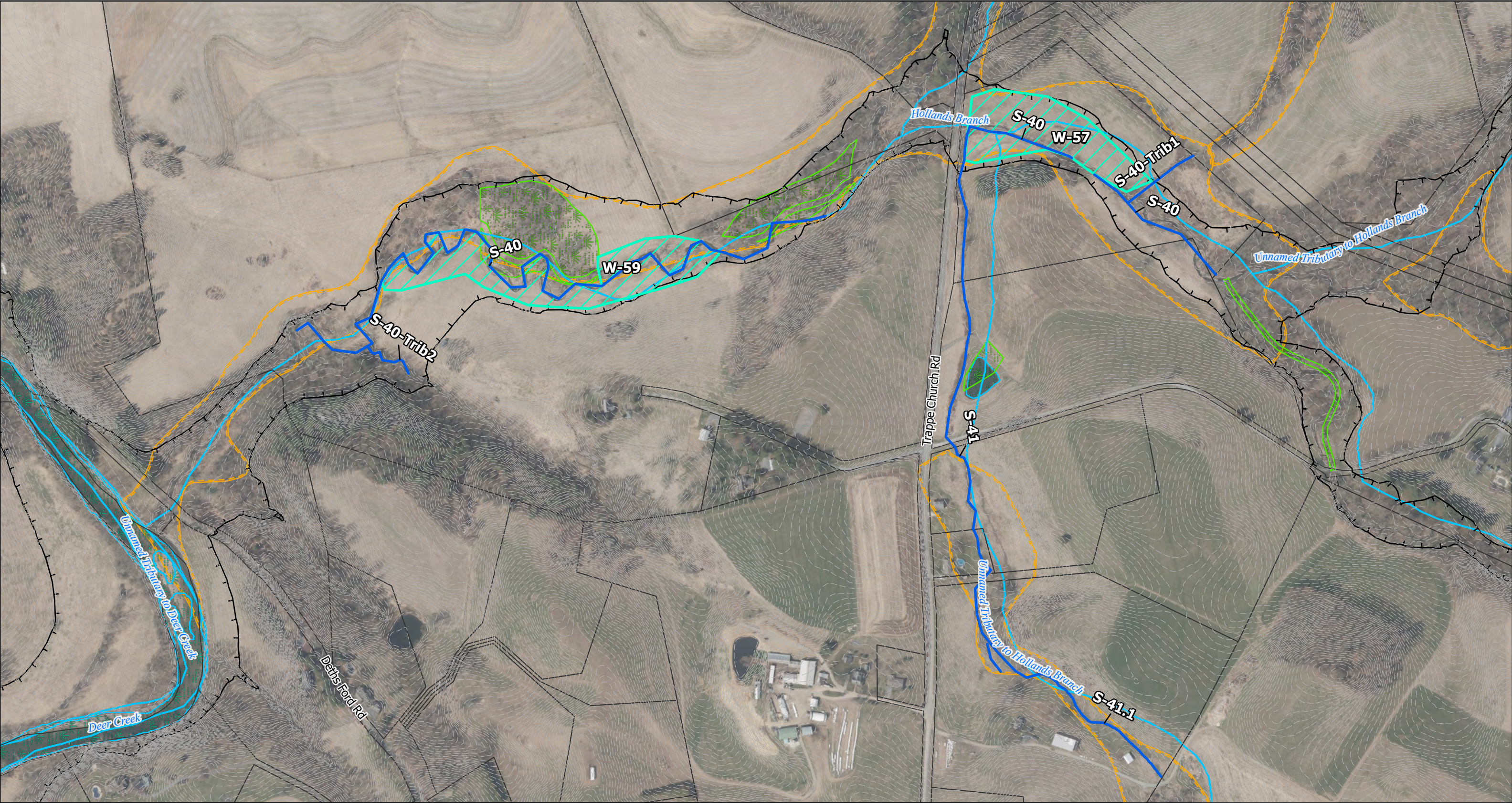
- Floodplain Reconnection & Bank Stabilization
- Establish Riparian Buffer throughout Stream Corridor
- Wetland Creation/Restoration


- Proposed Wetland Functions and Values include: Groundwater recharge/discharge, Floodflow alteration, Sediment/toxicant/pathogen retention, Nutrient removal/retention/transformation, Production export, Sediment/shoreline stabilization, and Wildlife habitat
- Improvement of In-Stream and Riparian Habitat

**Restoration Concept**

- Combination of raising stream invert to connect to floodplain and establishing floodplain benches & wetlands within open spaces
- Installation of cattle exclusion fencing
- Establish a riparian buffer and preserve existing trees along the stream corridor
- Installation of in-stream structures to provide channel stability and habitat diversity







**Susquehanna River  
Rail Bridge Project**  
**Potential Mitigation Sites:**  
Mitigation Site ID(s): Hollands Branch (W-57/59, S-40/41)  
  
Harford County, Maryland  
August 2023

Stream Restoration

Non-Tidal Wetland Restoration

100-Year Floodplain

Parcel Boundary

2' Contour

NWI Wetland

DNR Wetland

Partially Hydric (33 - 65%)

Predominantly Hydric (66 - 99%)

Hydric (100%)

N

S

E

W

0

180


360

feet

1 inch = 380 feet

Map Center, NAD83

39.6282°, -76.2195°



1

1 inch = 8 miles

Source: Large-scale frame: Maryland iMAP, DoIT. Imagery flown in 2022 (Eastern Shore) and 2020 (Western Shore). Received 8/14/2023. Small-scale frame: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received 8/14/2023.



# **SUSQUEHANNA RIVER RAIL BRIDGE PROJECT**

## **Pylesville/Schwartz Stream and Wetland Mitigation Site along Unnamed Tributaries to Broad Creek (W-33 & S-27)**

### **Existing Conditions Summary**

#### **Location Information**

**County:** Harford **Watershed:** Lower Susquehanna  
**Coordinates:** 39.700288, -76.374946  
**Location:** Northeast of the intersection of Pylesville Rd and Jenkins Rd, Pylesville, MD  
**Property Ownership:** Private (Schwartz Family)  
**Constraints:** N/A

#### **Site Conditions**

**Parcel Area:** 70.82 Ac **Existing Land Use:** Agricultural  
**Landscape Position:** Stream Valley **Adjacent Land Use:** Residential/Agricultural  
**Drainage Area for Streams:** Trib 1: 531 Ac. / 0.83 Sq. mi., Trib 3: 768 Ac. / 1.20 Sq. mi., Main Trib: 1,376 Ac. / 2.15 Sq. mi.  
**Drainage Area for Wetlands:** 196 Ac  
**Habitat Location:** Not Contiguous to wetland/upland forest, Farm field  
**Mapped Soils:** Hatboro silt loam; Codorus silt loam  
**Mapped Wetlands:** No NWI and DNR wetlands mapped on site  
**Other:** WRR (Wetland/Riparian Restoration Area), SSPRA, Targeted Ecological Area

This stream and wetland restoration site is located within agricultural fields northeast of the intersection of Pylesville Rd and Jenkins Rd. The site is associated with two unnamed tributaries to Broad Creek (Tributaries 1 and 3) that combine to make the Main Tributary. The stream channel lacks a riparian buffer and erosion is present along meanders, particularly along the right bank that is at a higher elevation. The stream could benefit from riparian planting, bank stabilization, and habitat enhancements. There are narrow floodplain benches and wetlands along the stream that contain reed canary grass. Treatment of invasive species within this riparian area and enhancement of existing wetlands is proposed. The adjacent left field is flat and topographically low within the valley. It is dominated by planted crops, winter wheat, and other grasses. Hydric soils were observed at all test plots. Additionally, saturation was observed at a depth of approximately 20 inches, and a water table was observed at 22 inches about a restrictive layer at 25 inches. The area is suitable for the creation of a groundwater wetland/floodplain wetland creation. Loamy soils with a low percentage of clay underlie the field and are compact in some locations. Minimal grading will be necessary to intercept groundwater in order to restore wetlands. Groundwater wells will be installed to monitoring hydrology within the floodplain and proposed wetland restoration areas. Well data will be analyzed and used to refine grading elevations and extends of proposed wetlands as the design progresses. Native herbaceous and woody species, including shrubs and trees, will be planted within the restored and enhanced wetland areas, and along the restored stream.

### **Summary of Opportunities**

- Stream Restoration - Approximately 4,819 Linear Feet combined.
- Wetland Restoration/Enhancement - Approximately 20.08 Acres

### **Restoration Objectives**

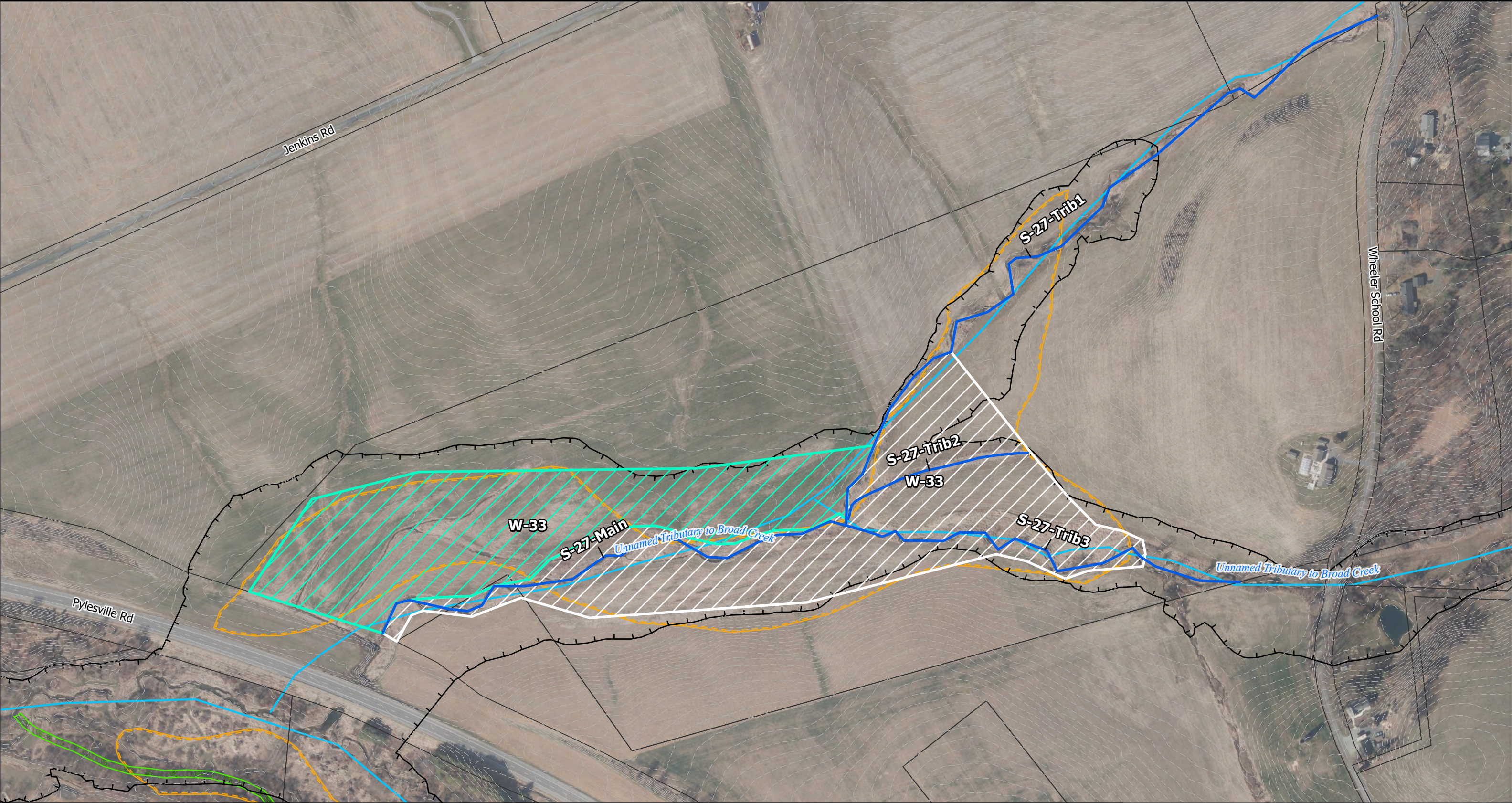
- Bank Stabilization
- Improved Floodplain Connection and Reforestation
- Wetland Restoration and Enhancement


- Proposed Wetland Functions and Values include: Groundwater recharge/discharge, Floodflow alteration, Sediment/toxicant/pathogen retention, Nutrient removal/retention/transformation, Production export, Sediment/shoreline stabilization, and Wildlife habitat
- Non-native Invasive Species Control
- Improvement of In-Stream and Riparian Habitat

**Restoration Concept**

- Minor grading and plugging of created ditches to create floodplain wetlands
- Removal of reed canary grass and installation of riparian plantings
- Reconnection of stream to floodplain where stream has downcut
- Installation of in-stream structures to provide channel stability and habitat diversity

















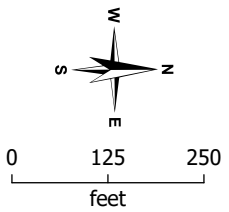


**Susquehanna River  
Rail Bridge Project**

**Potential Mitigation Sites:**  
Mitigation Site ID(s): Pylesville/Schwartz (W-33 and S-27)

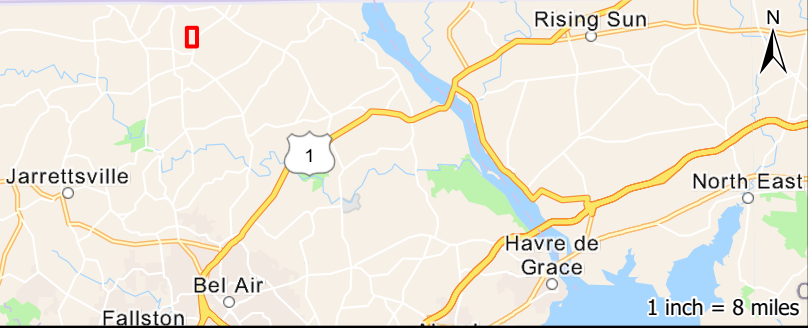
Harford County, Maryland  
August 2023

 Stream Restoration	 Mapped Stream
 Non-Tidal Wetland Restoration	 NWI Wetland
 Non-Tidal Wetland Enhancement	 DNR Wetland
 100-Year Floodplain	 Partially Hydric (33 - 65%)
 Parcel Boundary	 Predominantly Hydric (66 - 99%)
 2' Contour	 Hydric (100%)



0 125 250  
feet  
1 inch = 250 feet

Map Center, NAD83  
39.699°, -76.3752°



1 inch = 8 miles


Source: Large-scale frame: Maryland iMAP, DoIT. Imagery flown in 2022 (Eastern Shore) and 2020 (Western Shore). Received 8/14/2023. Small-scale frame: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received 8/14/2023.



**TIDAL WETLAND CONCEPTUAL MITIGATION MAP**










**Susquehanna River  
Rail Bridge Project**


**Potential Mitigation Sites:**  
Mitigation Site ID(s): WL12  
On-site Tidal Enhancement


Cecil County, Maryland  
August 2023


 Tidal Wetland Enhancement Site


 LOD


 Mean Higher High Water Line

 Mean High Water Line


 Mapped Stream


 100-Year Floodplain


 Parcel Boundary


 2' Contour


**Delineated Wetlands & Waters**


 Perennial Stream

 Palustrine Emergent Wetland


 Palustrine Forested Wetland

 Palustrine Scrub-shrub Wetland

 Tidal Scrub-shrub Wetland

  
0 50 100  
feet  
1 inch = 100 feet

Map Center, NAD83  
39.557°, -76.079°



1 inch = 8 miles

Source: Large-scale frame: Maryland iMAP, DoIT. Imagery flown in 2022 (Eastern Shore) and 2020 (Western Shore). Received 8/14/2023. Small-scale frame: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received 8/14/2023.





PLOT SCALE: AS SHOWN  
5/9/2024 4:00:42 PM X-Living Shoreline plate

No.	Revisions	Date	By



PERRYVILLE/HAVRE DE GRACE, MARYLAND  
SUSQUEHANNA RIVER  
RAIL BRIDGE PROJECT

HAVRE DE GRACE LIVING SHORELINE IMPACT PLATE

Job No:	50625
Sheet No.	1 OF 1
Date:	May 2024
LVS-001	



**SUBMERGED AQUATIC VEGETATION CONCEPTUAL  
MITIGATION MAPS AND SUMMARIES**







**Susquehanna River  
Rail Bridge Project**

**Mitigation Site ID(s): SAV-8**

Sheet 1 of 3

Cecil County, Maryland

August 2023

- Potential SAV Area
- Historical SAV (2007 to 2018)
- SAV 2021
- Chesapeake Bay Contour



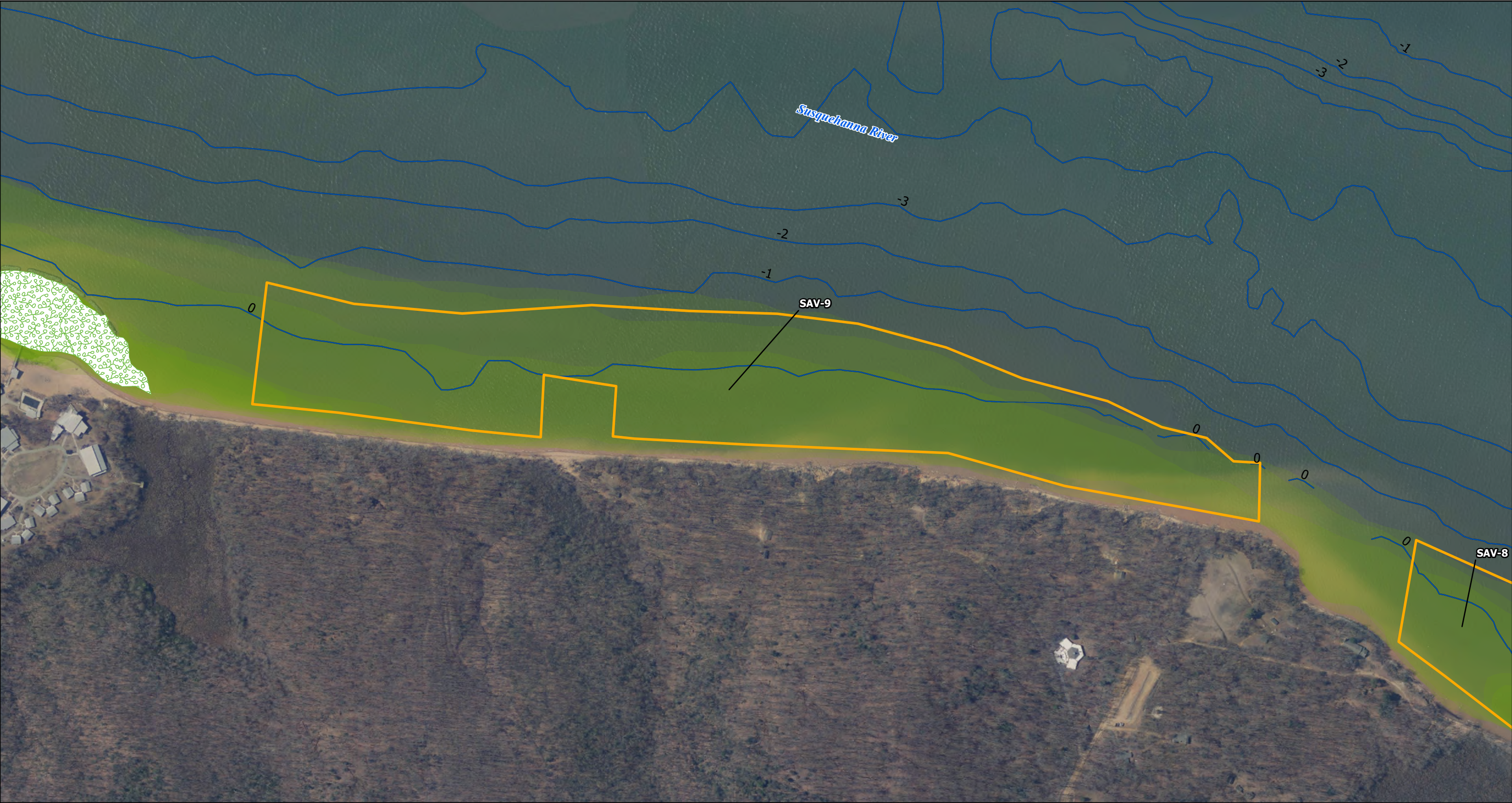
0 100 200  
feet  
1 inch = 201 feet

Map Center, NAD83  
39.5165°, -75.9831°



Source: Large-scale frame: Maryland iMAP, DoIT. Imagery flown in 2022 (Eastern Shore) and 2020 (Western Shore). Received 8/4/2023. Small-scale frame: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received 8/4/2023.

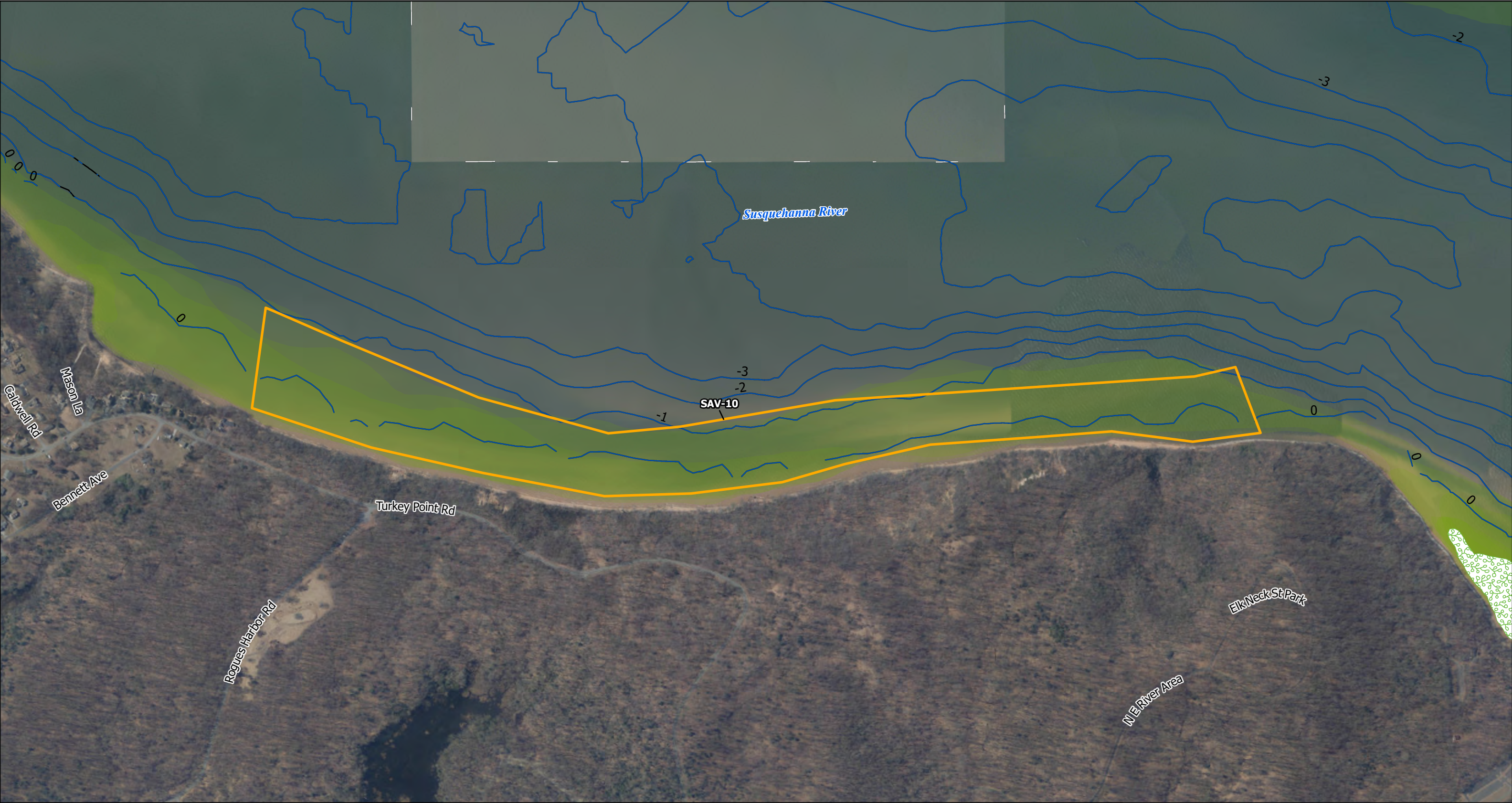




 <p>COASTAL RESOURCES INC.</p>	<p><b>Susquehanna River Rail Bridge Project</b></p> <p><b>Mitigation Site ID(s): SAV-9</b></p> <p>Sheet 2 of 3</p> <p>Cecil County, Maryland</p> <p>August 2023</p>	<ul style="list-style-type: none"><li> Potential SAV Area</li><li> Historical SAV (2007 to 2018)</li><li> SAV 2021</li><li> Chesapeake Bay Contour</li></ul>	 <p>0 230 460 feet 1 inch = 437 feet</p> <p>Map Center, NAD83 39.5057°, -75.9876°</p>	 <p>Grace Aberdeen Cecil 213 SAV-8 SAV-9 SAV-10 1 inch = 5 miles</p>
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Source: Large-scale frame: Maryland iMAP, DoIT. Imagery flown in 2022 (Eastern Shore) and 2020 (Western Shore). Received 8/4/2023. Small-scale frame: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received 8/4/2023.





 <p>COASTAL RESOURCES INC.</p>	<p><b>Susquehanna River Rail Bridge Project</b></p> <p><b>Mitigation Site ID(s): SAV-10</b></p> <p>Sheet 3 of 3</p> <p>Cecil County, Maryland</p> <p>August 2023</p>	<p> Potential SAV Area</p> <p> Historical SAV (2007 to 2018)</p> <p> SAV 2021</p> <p> Chesapeake Bay Contour</p>	 <p>0 325 650 feet 1 inch = 618 feet</p> <p>Map Center, NAD83 39.4782°, -75.9964°</p>	 <p>Grace Aberdeen Cecil 213 SAV-8 SAV-9 SAV-10 1 inch = 5 miles</p>
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Source: Large-scale frame: Maryland iMAP, DoIT. Imagery flown in 2022 (Eastern Shore) and 2020 (Western Shore). Received 8/4/2023. Small-scale frame: Esri, HERE, Garmin, FAO, NOAA, USGS, OpenStreetMap contributors, and the GIS user community. Received 8/4/2023.