STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. BOX 778
DOVER, DELAWARE 19903

SHANTÉ A. HASTINGS
SECRETARY

August 7th, 2025

Mr. Matt Jones

DNRC Wetlands and Subaqueous Lands

89 Kings Highway

Dover, DE 19901

Dear Mr. Jones,

Enclosed you will find a copy of the Subaqueous Lands Permit Application for the **BR 1-447 on N449 Taylors Bridge Road over Blackbird Creek Bridge Replacement, Contract #T201907102**, in New Castle County, Delaware. This project involves the removal of existing Bridge 1-447 and construction of a new structure.

BR 1-447 on N449 Taylors Bridge Road over Blackbird Creek Bridge Replacement is located on Taylors Bridge Road in Townsend, Delaware (39°24'17.8"N, 75°35'58.1"W). State mapped wetland map 351. The new bridge will consist of multi-span concrete girders on newly placed wall pier foundations. The proposed bridge will be located slightly south of the existing alignment to avoid overhead utility lines. A full road closure with a posted detour is the preferred alternative for maintenance of traffic currently. The present structure was built in 1964 and is currently in fair condition but requires improvements to meet current standards. Due to its existing configuration, the current structure cannot be updated and requires a replacement. The bridge was identified by the Delaware Department of Transportation's Bridge Management System as needing work.

DelDOT will be replacing BR 1-447 with a more structurally sound bridge that is about 31-feet longer than the current. The measurement for the new structure sits at about 441-feet and 6-inches. As stated above, this lengthening will accommodate for the current utility lines as well as open up the waterway. A variety of riprap will be installed. R-4 will be placed on the side slopes, R-5 will be placed by the abutments, and R-6 will be placed in the water. Channel bed fill will also be installed under the bridge's footprint for scour protection.

There will be permanent impacts to both wetlands and open water on this project. Wetland identification markers regarding permanent wetland impacts pertain to work including roadway, embankment, retaining wall, aerial coverage (bridge deck), and riprap. The total permanent wetland impacts are 5,150.94 square feet, 0.1182 acres, and 381.55 cubic yards. Open water identification markers regarding permanent open water impacts pertain to work including pier and riprap placement. The total permanent open water impacts are 3,823.73 square feet, 0.0878 acres, and 283.24 cubic yards. A breakdown of these impacts can be found on Sheet No. 56 within the attached project plans.

Proper erosion and sediment control methods will be set in place for this project. Before construction starts, silt fence will be installed to ensure it isolates sediment. Once construction is done, stabilization of the disturbed areas will be addressed. Stabilization will most be achieved via item 908019 – Permanent Grass Seeding, Stream Bank. Stabilization of the disturbed areas must be achieved before the removal of the silt fence can happen.

Mitigation will be required for this project and the complete plans are included in this package as well. This will be completed on site within the footprint of the old bridge. Identification markers 3-E-08, 3-E-09, and 3-E-10 refer to wetland creation. There is a total wetland creation of 0.5321 acres, 23,177.99 square feet, and 572.58 cubic yards. Identification markers 3-WR-04 and 3-WR-05 refer to wetland restoration. There is a total wetland restoration of 0.5809 acres, 25,306.16 square feet, and 625.16 cubic yards. DelDOT will be planting 12,129 Smooth Cord Grass (*Spartina alterniflora*) in 2-inch peat pots for mitigation. All temporary impact areas will be seeded and stabilized per Delaware Erosion and Sediment Control guidelines.

According to the Species Conservation and Research Program (SCRP) letter dated June 1st, 2023, the project site is within Blackbird Creek Reserve, a Delaware National Estuarine Research Reserve (DNERR) which are identified as "Designated Critical Resource Waters" by the Army Corps of Engineers (ACOE), and as such are subject to the restrictions and limitations imposed through Nationwide Permit General Condition No. 22.

According to the SCRP letter, a review of the database has revealed that the marsh to the southwest of the project site is mapped as Bishop-weed Mixed Species Brackish Marsh, a Habitat of Conservation Concern (HCC). These communities are rare within the state and have the potential to harbor a high diversity of Species of Greatest Conservation Need (SGCN). A visit to the project site on May 2nd, 2022, by state botanist Bill McAvoy revealed that the HCC is likely outside of the limits of disturbance (LOD) and unlikely to be impacted. They had no further concerns at this time.

There are several times of year restrictions issued for this project:

- Fisheries – Blackbird Creek provides spawning habitat for anadromous species including Blueback Herring (*Alosa aestivalis*) and Alewife (*Alosa pseudoharengus*), collectively referred to as "River Herring," as well as potentially American Shad (*Alosa sapidissima*). To protect these species during spawning and migratory activities, a time-of-year restriction of **March 1st – June 30th** is requested during which no in-water work should be performed.
- Fisheries – USACE Nationwide Permit Regional Condition G-6(8), in order to protect diadromous fish migrations, spawning activities, and EFH, in-water work shall be avoided from **March 1st – June 30th** in all waters. Work within cofferdams that fully enclose and

dewater the project area can proceed any time during the year provided the cofferdams are installed or removed outside of the seasonal work restriction and do not preclude the free movement of migrating or spawning aquatic species to ensure compliance with NWP General Condition 2 and 3.

- Migratory Birds – Bridge 1-447 has not been surveyed for the presence of nesting migratory birds, which are protected by Title 7, Delaware Code, Chapter 7, Sections 734 and 735. If work is proposed during the breeding season (**April 15th – August 1st**), a survey should be completed prior to the start of work to determine if one or more pairs of Barn Swallow (*Hirundo rustica*) and/or Eastern Phoebe (*Sayornis phoebe*) nests are present under the bridge. If a survey detects nesting activity, the following steps should be taken to avoid nest destruction and take, which is a violation of state law:
    - Perform construction activities from **August 1st – April 15th**.
    - If construction cannot be performed in this time period, a deterrent such as mesh netting should be used to block access the nesting sites on the underside of the bridge(s). The material would need to be **in place no later than April 15th**, the underside of the bridge(s) would need to be fully encapsulated, and the material should be left in place until construction begins. If active nests are discovered during the course of work activities should be halted immediately and SCRP contacted for further guidance.
- Marsh Nesting Birds – The area surrounding the project site is mapped as quality marsh habitat, and it has the potential to support nesting marsh birds. DNREC requests a time-of-year restriction for work conducted in the surrounding marsh from **April 1st – July 31st** to protect marsh nesting birds and their young.
- Eels – Blackbird Creek is used by large numbers of American Eel (*Anguilla rostrata*), DNEC requests that in-stream work not take place from **March 1st – May 15th** to allow upstream passage of elvers (young eels).
- For non-tidal locations, no in-water work can be done below the ordinary high water (OHW) line.
- For tidal locations, no in-water work can be done below the mean high water line (MHWL).
- This project will require a "soft start" for when driving piles. If pile driving is occurring during a time of year when ESA-listed species may be present, and the anticipated noise is above the behavioral noise threshold, a "soft start" is required to allow animals an opportunity to leave the project vicinity before sound pressure levels increase.
    - Use a soft start each day of pile driving, after a break of 30 minutes or more, and if any increase in pile installation or removal intensity is required. Build up power slowly from a low energy start-up over a 20-minute period to warn fish to leave the vicinity. This buildup shall occur in uniform stages to provide a constant increase in output.

After consultation with United States Fish and Wildlife regarding Section 7 of the Endangered Species Act, no further Section 7 consultation will be required for this project. The United State Fish and Wildlife Service responded stating that our proposed action will have no effect on the Monarch Butterfly (*Danaus plexippus*) as it is a candidate species. USFWS stated that no consultation is required for this species on May 31st, 2023.

The bridge replacement on Taylors Bridge Road is clear for cultural resources and will have no adverse effects from the State Historic Preservation Office. SHPO concurred with DelDOT's archaeological investigation and findings for this project on 09/13/2022. SHPO also concurred with DelDOT's finding of no historic properties affected issued on 12/16/2022. There are no archaeological or architectural concerns as long as the project scope is not modified, and all staging and stockpiling remain within the existing roadway footprint.

If you have any questions or require any additional information, please call me at (302) 244-3023. Thank you for your time and continued cooperation.

Sincerely,

Maia Lee

Maia Lee
Environmental Specialist II
DelDOT Environmental Studies Office

WETLANDS AND SUBAQUEOUS LANDS SECTION PERMIT APPLICATION FORM

For Subaqueous Lands, Wetlands, Marina and 401 Water Quality Certification Projects

State of Delaware
Department of Natural Resources and Environmental Control
Division of Water

Wetlands and Subaqueous Lands Section

APPLICATION FOR APPROVAL OF
SUBAQUEOUS LANDS, WETLANDS, MARINA
AND WATER QUALITY CERTIFICATION PROJECTS

Last Revised on: March 28, 2017

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

Application Instructions:

1. Complete each section of this basic application and appropriate appendices as thoroughly and accurately as possible. Incomplete or inaccurate applications will be returned.

2. All applications must be accompanied by a scaled plan view and cross-section view plans that show the location and design details for the proposed project. Full construction plans must be submitted for major projects.

3. All applications must have an original signature page and proof of ownership or permitted land use agreement.

4. Submit an original and two (2) additional copies of the application (total of 3) with the appropriate application fee and public notice fee* (prepared in separate checks) to:

Department of Natural Resources and Environmental Control
Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901

*Application and public notice fees are non-refundable regardless of the Permit decision or application status.

5. No construction may begin at the project site before written approval has been received from this office.

Helpful Information:

1.	Tax Parcel Information:	New Castle County	(302) 395-5400
		Kent County	(302) 736-2010
		Sussex County	(302) 855-7878
2.	Recorder of Deeds:	New Castle County	(302) 571-7550
		Kent County	(302) 744-2314
		Sussex County	(302) 855-7785

3. A separate application and/or approval may be required through the Army Corps of Engineers. Applicants are strongly encouraged to contact the Corps for a determination of their permitting requirements. For more information, contact the Philadelphia District Regulator of the Day at (215) 656-6728 or visit their website at: http://www.nap.usace.army.mil/Missions/Regulatory.aspx.

4. For questions about this application or the Wetlands and Subaqueous Lands Section, contact us at (302) 739-9943 or visit our website at: http://www.dnrec.delaware.gov/wr/Services/Pages/WetlandsAndSubaqueousLands.aspx. Office hours are Monday through Friday 8:00 AM to 4:30 PM, except on State Holidays.

APPLICANT'S REVIEW BEFORE MAILING

DID YOU COMPLETE THE FOLLOWING?

_X_	Yes	BASIC APPLICATION
_X_	Yes	SIGNATURE PAGE (Page 3)
_____	Yes	APPLICABLE APPENDICES
_X_	Yes	SCALED PLAN VIEW
_X_	Yes	SCALED CROSS-SECTION OR ELEVATION VIEW PLANS
_X_	Yes	VICINITY MAP
_____	Yes	COPY OF THE PROPERTY DEED & SURVEY
_____	Yes	THREE (3) COMPLETE COPIES OF THE APPLICATION PACKET
_____	Yes	APPROPRIATE APPLICATION FEE & PUBLIC NOTICE FEE (Separate checks made payable to the State of Delaware)

Submit 3 complete copies of the application packet to:

Department of Natural Resources and Environmental Control
Wetlands and Subaqueous Lands Section
89 Kings Highway
Dover, Delaware 19901

Before signing and mailing your application packet, please read the following:

The Department requests that the contractor or party who will perform the construction of your proposed project, if other than the applicant, sign the application signature page along with the applicant in the spaces provided. When the application is signed by the contractor as well as the applicant, the Department will issue the Permit to both parties. For Leases, the contractor will receive a separate construction authorization that will make them subject to all of the terms and conditions of the Lease relating to the construction

Section 1: Applicant Identification

1. Applicant's Name: Maia Lee
   Mailing Address: 800 S Bay Road Dover, DE 19901
   Telephone #: 302-244-3023
   Fax #: _____
   E-mail: _____

2. Consultant's Name: _____
   Mailing Address: _____
   Company Name: _____
   Telephone #: _____
   Fax #: _____
   E-mail: _____

3. Contractor's Name: _____
   Mailing Address: _____
   Company Name: _____
   Telephone #: _____
   Fax #: _____
   E-mail: _____

Section 2: Project Description

4. Check those that apply:
☐ New Project/addition to existing project? ☒ Repair/Replace existing structure? (If checked, must answer #16)

5. Project Purpose (attach additional sheets as necessary):
The present structure was built in 1964 and is currently in fair condition but requires improvements to meet current standards. Due to its existing configuration, the current structure cannot be updated and requires a replacement. The bridge was identified by the Delaware Department of Transportation's Bridge Management System as needing work.

6. Check each Appendix that is enclosed with this application:

	A. Boat Docking Facilities		G. Bulkheads		N. Preliminary Marina Checklist
	B. Boat Ramps		H. Fill		O. Marinas
	C. Road Crossings		I. Rip-Rap Sills and Revetments		P. Stormwater Management
	D. Channel Modifications/Dams		J. Vegetative Stabilization		Q. Ponds and Impoundments
	E. Utility Crossings		K. Jetties, Groins, Breakwaters		R. Maintenance Dredging
	F. Intake or Outfall Structures		M. Activities in State Wetlands		S. New Dredging

Section 3: Project Location

7. Project Site Address: _____
39°24'17.8"N 75°35'58.1"W
_____
County: ☒ N.C. ☐ Kent ☐ Sussex
Site owner name (if different from applicant): _____
Address of site owner: _____
_____

8. Driving Directions: Coming from Dover, take DE-1 North and head toward Wilmington for approximately 13.6 miles. Bear right, the turn left onto Smyrna Landing Road for 2 miles. Turn right onto Paddock Road for 0.8 mile. Turn left onto Walker School Road for 4.4 miles. Turn left onto DE-9 / Flemings Landing Road for 0.5 mile. Turn left to stay on DE-9 / Taylors Bridge Road for 0.6 mile. You will arrive at DE-9 / Taylors Bridge Road on the left.
(Attach a vicinity map identifying road names and the project location)

9. Tax Parcel ID Number: Right-of-way
Subdivision Name: _____

WSLS Use Only: **Permit #s:** _____ _____ _____ _____

Type **SP** ☐ **SL** ☐ **SU** ☐ **WE** ☐ **WQ** ☐ **LA** ☐ **SA** ☐ **MP** ☐ **WA** ☐

Corps Permit: SPGP 18 ☐ **20** ☐ **Nationwide Permit #:** _____ **Individual Permit #** _____
Received Date: _____ **Project Scientist:** _____
Fee Received? Yes ☐ **No** ☐ **Amt: $** _____ **Receipt #:** _____
Public Notice #: _____ **Public Notice Dates: ON** _____ **OFF** _____

Section 3: Project Location (Continued)

10. Name of waterbody at Project Location: Blackbird Creek waterbody is a tributary to: Delaware Bay

11. Is the waterbody: X Tidal ☐ Non-tidal Waterbody width at mean low or ordinary high water 206' - 8 1/4"

12. Is the project: ☐ On public subaqueous lands? ☐ On private subaqueous lands?*
X In State-regulated wetlands? ☐ In Federally-regulated wetlands?

*If the project is on private subaqueous lands, provide the name of the subaqueous lands owner:

(Written permission from the private subaqueous lands owner must be included with this application)

13. Present Zoning: ☐ Agricultural ☐ Residential ☐ Commercial ☐ Industrial ☐ Other

Section 4: Miscellaneous

14. A. List the names and complete mailing addresses of the immediately adjoining property owners on all sides of the project (attach additional sheets as necessary):

A. State of Delaware	89 KINGS HIGHWAY	DOVER DE 19903
B. CLEAVER FREDERICK R TRUSTEE	BOX 153	Odessa DE 19730

B. For wetlands and marina projects, list the names and complete mailing addresses of property owners within a 1,000 foot radius of the project (attach additional sheets as necessary):

John and Rebecca Unruh	1015 Taylors Bridge Road	Townsend	DE19734
Mary Reed Unruh	1027 Taylors Bridge Road	Townsend	DE19734
Evan Edwards & Kathy Beisner	1091 Taylors Bridge Road	Townsend	DE19734

15. Provide the names of DNREC and/or Army Corps of Engineers representatives whom you have discussed the project with:
Jamie Colligan USACE, Katie Esposito DNREC
Mike Yost USACE, Matt Jones DNREC

A. Have you had a State Jurisdictional Determination performed on the property? ☐ Yes X No
B. Has the project been reviewed in a monthly Joint Permit Processing Meeting? X Yes ☐ No
*If yes, what was the date of the meeting? 9/18/2024

16. Are there existing structures or fill at the project site in subaqueous lands? X Yes ☐ No
*If yes, provide the permit and/or lease number(s):
N/A

*If no, were structures and/or fill in place prior to 1969? ☐ Yes ☐ No

17. Have you applied for or obtained a Federal permit from the Army Corps of Engineers?
☐ No X Pending ☐ Issued ☐ Denied Date: _____

Type of Permit: NWP 23 - PCN required Federal Permit or ID #: _____

18. Have you applied for permits from other Sections within DNREC?
☐ No ☐ Pending ☐ Issued ☐ Denied Date: _____ Permit or ID #: _____

Type of permit (circle all that apply): Septic Well NPDES Storm Water

Other: _____

Section 5: Signature Page

19. Agent Authorization:

If you choose to complete this section, all future correspondence to the Department may be signed by the duly authorized agent. In addition, the agent will become the primary point of contact for all correspondence from the Department.

I do not wish to authorize an agent to act on my behalf X

I wish to authorize an agent as indicated below ☐

I, _____, hereby designate and authorize _____
(Name of Applicant) (Name of Agent)
to act on my behalf in the processing of this application and to furnish any additional information requested by the Department.

Authorized Agent's Name: _____ Telephone #: _____
Mailing Address: _____ Fax #: _____
_____ E-mail: _____
_____

20. Agent's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application.

_____ _____
Agent's Signature Date

21. Applicant's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge and that I am required to inform the Department of any changes or updates to the information provided in this application. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application. I grant permission to authorized Department representatives to enter upon the premises for inspection purposes during working hours.

Maia Lee _____ 8/7/2025
Applicant's Signature Date

Maia Lee
Print Name

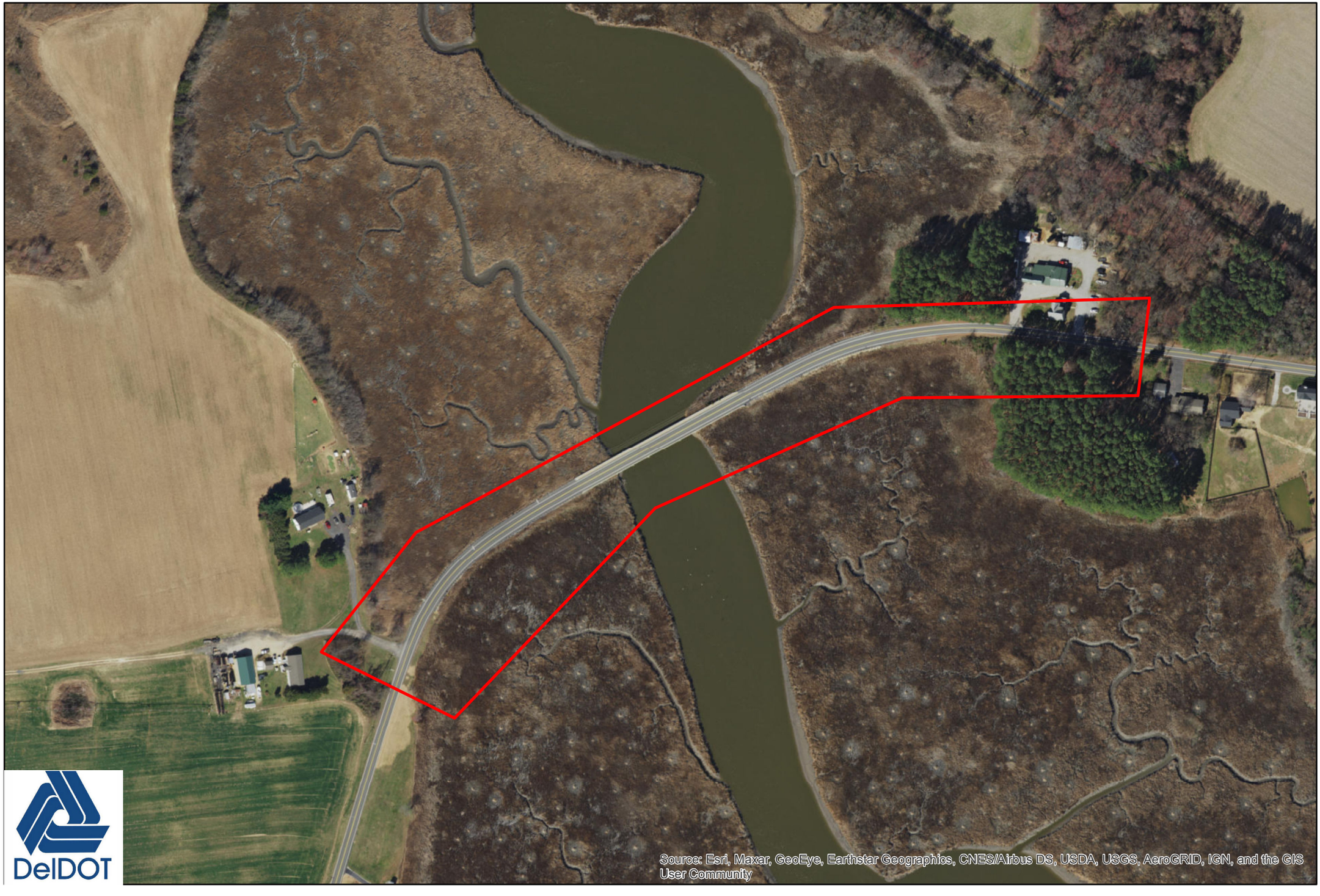
22. Contractor's Signature:

I hereby certify that the information on this form and on the attached plans are true and accurate to the best of my knowledge, and that I am required to inform the Department of any changes or updates to the information provided in this application. I further understand that the Department may request information in addition to that set forth herein if deemed necessary to appropriately consider this application.

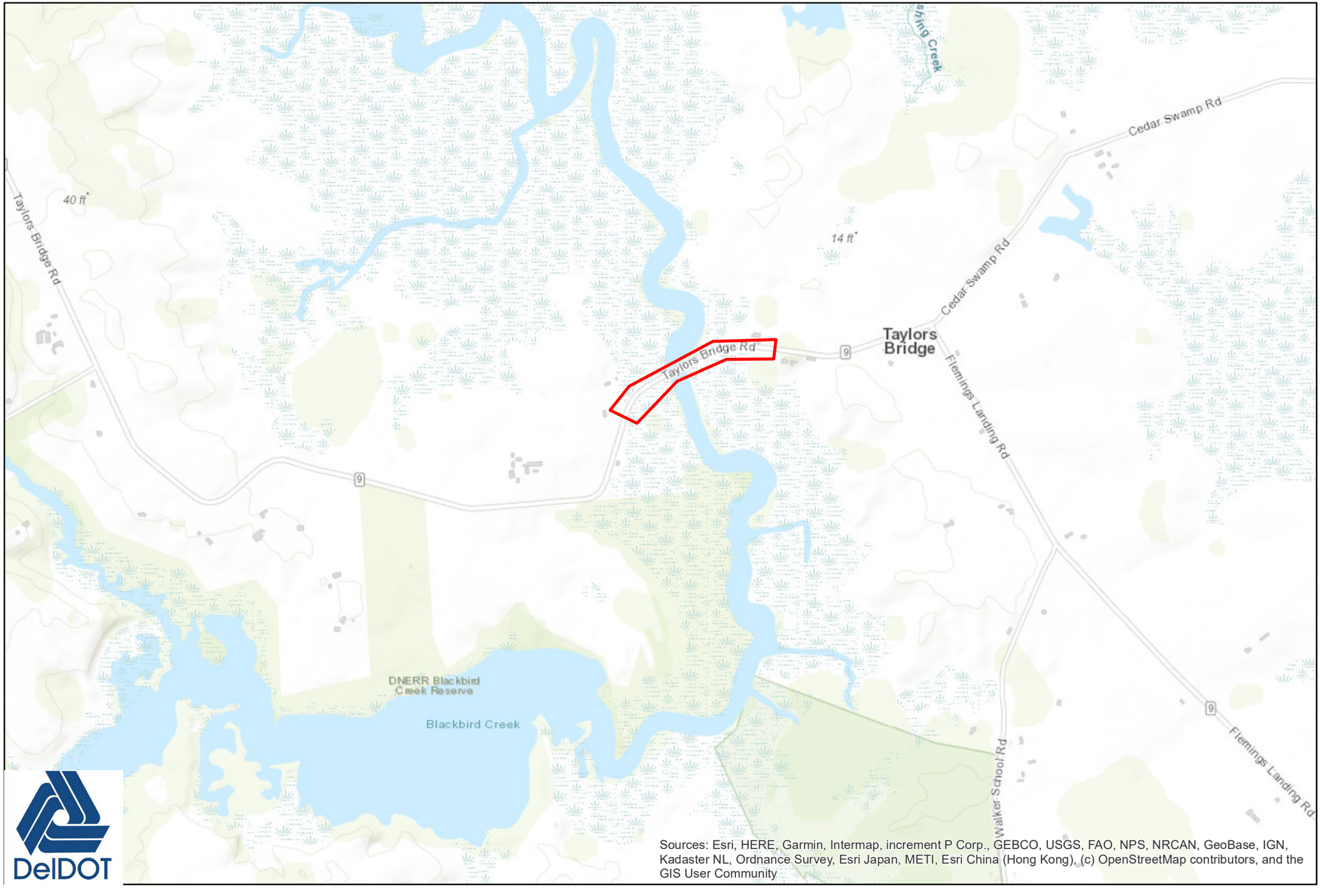
TBD _____
Contractor's Name Date

_____
Print Name

BR 1-447 on Taylors Bridge Road over Blackbird Creek (T201907102)
Aerial Map

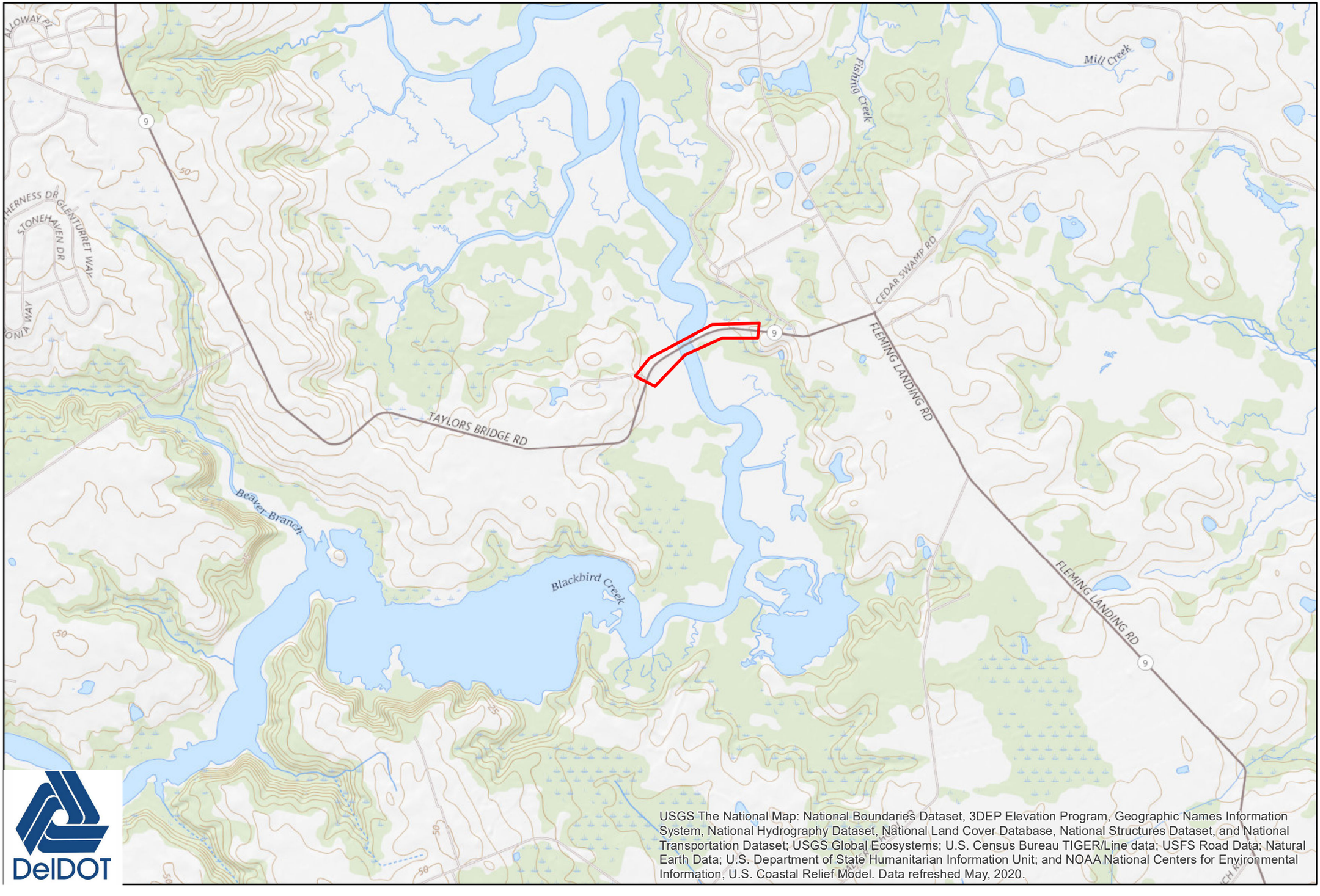


BR 1-447 on Taylors Bridge Road over Blackbird Creek (T201907102)
Location Map



DelDOT

BR 1-447 on Taylors Bridge Road over Blackbird Creek (T201907102)
Topographic Map

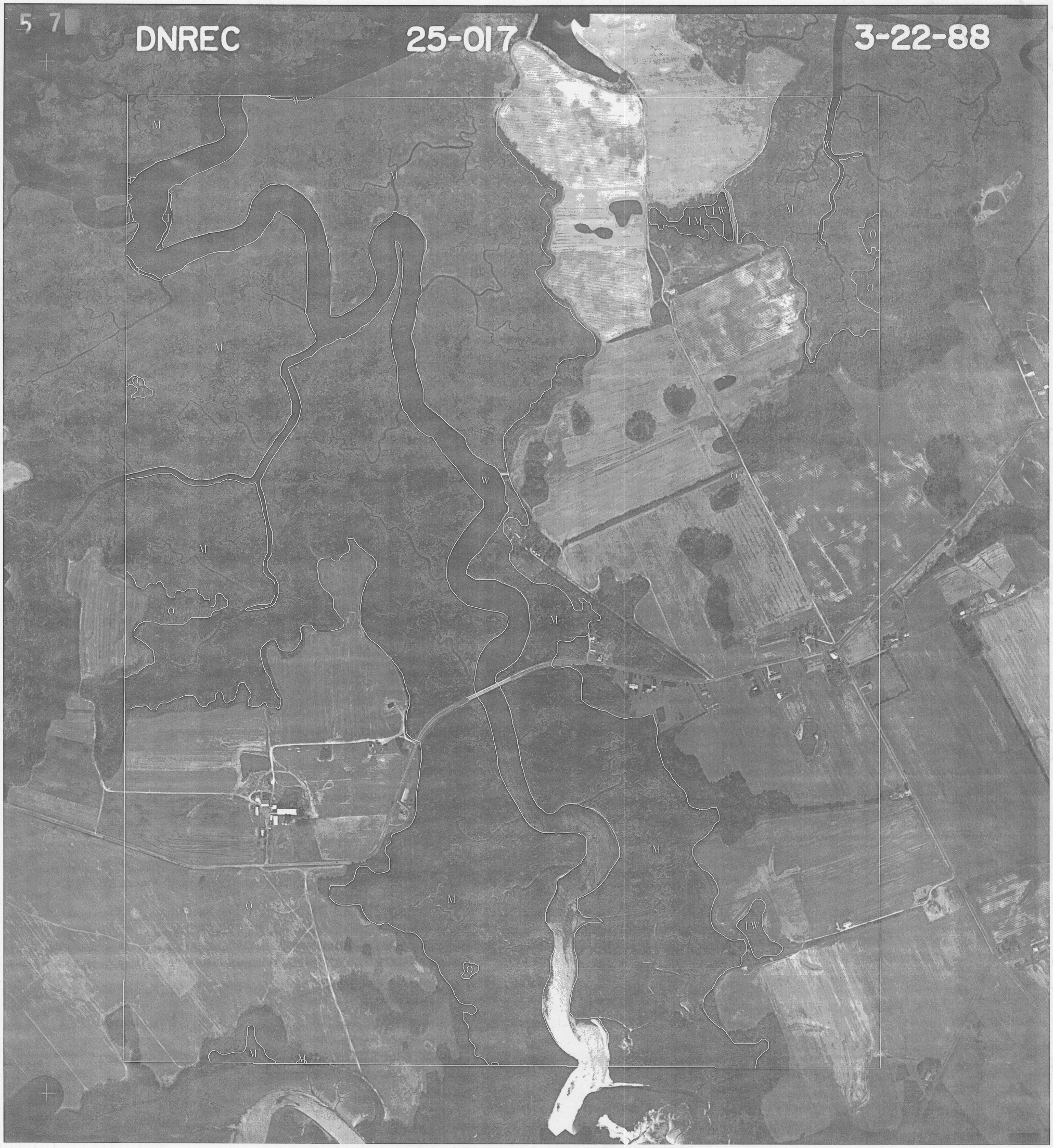


DelDOT

USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed May, 2020.

PHOTO # 25-017

FILENAME - DNR351



300 0 300 600 900 1200 1500 1800 2100 Feet

SCALE 1:3600

State of Delaware Wetlands
NEW CASTLE COUNTY, DELAWARE

(in Accordance with the Delaware Wetlands Act # 6607)
Approximate Scale (1:3600)

Prepared for: DEPARTMENT OF NATURAL RESOURCES
and ENVIRONMENTAL CONTROL

Produced by: SALISBURY STATE UNIVERSITY
IMAGE PROCESSING & REMOTE SENSING CENTER
SALISBURY, MARYLAND

Legend for Delaware Tidal Wetland Delineations:

B - Beach
DF - Disturbed Forested Swamp
DM - Disturbed Marsh (vegetation removed for agricultural activities)
F - Tidal Forested Swamp
IF - Impounded Forested Wetland
ILM - Impounded Low Marsh
IM - Impounded Marsh
IS - Impounded Scrub-Shrub Wetland
IW - Impounded Water
LM - Low Marsh
M - Marsh
MS - Marsh in spoil areas
N - Non-tidal wetlands (400 acres+, including tidal forested swamps)
O - Other (Upland or Non-tidal wetlands less than 400 acres)
S - Tidal Scrub-Shrub Swamps
SS - Areas flooded by tidal storm surges
SS* - Areas flooded by storm surges at a higher flood plain elevation
T - Tidal Mudflats (in some cases vegetated)/ sand bars
W - Water
WS - Water in a spoil area
/ - complexes among different commmunity types (ex. M/S)

121 Continental Drive
Suite 207
Newark, DE 19713

www.pennoni.com

October 2, 2020

DEDOT 200020

Scott Walls, PE, Project Manager – DelDOT Bridge Design
Delaware Department of Transportation
P.O. Box 778 - 800 Bay Road
Dover, Delaware 19903

Re: Finding of Wetlands Letter
Bridge 1-447 on Taylors Bridge Road (SR 9) over Blackbird Creek
Bridge Replacement Project (Project No. T201907102; Agreement 1813F)
Middletown, New Castle County, Delaware

Dear Mr. Walls,

On June 26, 2020, Pennoni conducted a wetland and watercourse investigation within and adjacent to the area of the proposed replacement of Taylor's Bridge (Bridge 1-447) on Taylors Bridge Road (SR 9) over Blackbird Creek to determine if wetlands and watercourses are present within the project area located in Middletown, New Castle County, Delaware. The center of the project area is located at approximately 39.427541° north latitude and -75.631853° west longitude according to the Taylors Bridge, DE-NJ USGS 7.5' Quadrangle. The presence/absence of wetlands and watercourses were investigated within approximately twenty-five (25) feet from the proposed limit of disturbance. The accompanying mapping, photographs, and wetland determination data forms depict the project location and associated project study area.

Bridge 1-447 is located in New Castle County, DE approximately five (5) miles southeast of Odessa and carries Taylors Bridge Road (SR-9) over Blackbird Creek (See Appendix A for a location map). The bridge is in the Coastal Plain region of New Castle County, DE in the Blackbird Creek Watershed. Blackbird Creek discharges to the Delaware River just upstream of the Delaware Bay and exhibits both riverine and tidal flows. The drainage area to the crossing is approximately 24.5 square miles and consists primarily of forests, wetlands, and agricultural lands.

Potential wetland and watercourse habitats located within the project study area were reviewed through the combined use of existing published data and a field investigation. Existing published data included 7.5-minute quadrangle USGS topographic mapping (Taylors Bridge, Delaware – New Jersey quadrangle); NRCS Web Soil Survey website (http://websoilsurvey.nrcs.usda.gov); New Castle County, Delaware Soil Survey; U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping; and the New Castle County Hydric Soils List.

The NRCS Web Soil Survey website was reviewed in order to determine the soil types within the project study area. According to the website, the Broadkill-Appoquinimink complex, very frequently flooded, tidal (Ba), Leipsic silt loam, 0 to 2 percent slopes (LeA), and Reybold silt loam, 5 to 10 percent slopes

(ReC) soils are mapped within the project study area. The Ba soils are listed as hydric soils; however, the LeA and ReC soils are not listed as hydric, according to the NRCS Web Soil Survey.

During the field survey, the presence of wetland habitats within the project study area were evaluated using the Routine Wetland Delineation Method for small areas described in the US Army Corps of Engineers (USACE) Wetland Delineation Manual, Technical Report Y-87-1 (1987), USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region – Version 2.0 (November 2010).

The presence of waters of the United States was also evaluated during the field investigation. Waters of the United States is defined by the Navigable Waters Protection Rule (NWPR) as the territorial seas and traditional navigable waters; perennial and intermittent tributaries that contribute surface water flow to such waters; certain lakes, ponds, and impoundments of jurisdictional waters; and wetlands adjacent to other jurisdictional waters. A tributary is defined in the NWPR as a river, stream, or similar naturally occurring surface water channel that contributes surface water flow to a territorial sea or traditional navigable water in a typical year either directly or indirectly through other tributaries, jurisdictional lakes, ponds, or impoundments, or adjacent wetlands. A tributary must be perennial or intermittent in a typical year.

On-site field investigations conducted on June 26, 2020 identified one (1) freshwater tidal wetland and one (1) perennial, freshwater tidal water of the US (Blackbird Creek) within the project study limits. A summary of our evaluation is as follows:

Wetland 1:

Wetland 1 is located within the floodplain of Blackbird Creek, extending for several hundred feet along the eastern and western banks of the creek on both the upstream and downstream sides of Taylor's Bridge (Bridge 1-447). According to the Cowardin Wetland and Deepwater Habitats Classification System, Wetland 1 is classified as an Estuarine intertidal persistent emergent wetland, regularly flooded (E2EM1N) wetland, which is described as a salt-to brackish-water marsh with persistent vegetation, and topographically low (Cowardin and others, 1979). Wetland 1 is identified as Estuarine Vegetated Wetlands on the Delaware 2007 State Wetlands layer in all four (4) bridge quadrants, and along the eastern and western bridge approaches. Wetland 1 is illustrated on the attached project plan.

Vegetation – Vegetation within Wetland 1 is dominated by common reed (*Phragmites australis* (FACW)) as documented in data sampling points DP2-SEBW, DP4-NEBW, DP6-SWBW, and DP8-NWBW. A narrow zone of transitional mixed forested-scrub/shrub and emergent wetland was recorded along the border of two (2) upland forest habitats in the eastern portion of the project study area; one (1) area to the south of Taylors Bridge Road, and one (1) area to the north of Taylors Bridge Road. These areas are dominated by red maple (*Acer rubrum* (FAC)), blackgum (*Nyssa sylvatica* (FAC)), eastern baccharis (*Baccharis halmifolia*, FAC)), common reed (*Phragmites australis*, FACW)), poison ivy (*Toxicodendron radicans*, FAC)), and cat greenbrier (*Smilax glauca*, FAC) as documented in data sampling points DP10-SEFW and DP12-NEFW.

Soils – During the onsite investigation, six (6) soil borings were advanced within the wetland, to an approximate depth of eighteen (18) to twenty (20) inches. Soils within Wetland 1 typically consisted of a soil profile of 2.5 Y 4/2 silt loam soils with high organic matter content throughout the entire profile. The soils observed in all of the borings taken in Wetland 1 are considered histosols (Hydric Soil Indicator A1). The only exception was observed in the DP10-SEFW data pit, where soils exhibited the Depleted Matrix (F3) Hydric Soil Indicator. Soils in this data pit ranged from 2.5 Y 4/2 at the soil surface to a depth of seven (7) inches, and 2.5 Y 5/2 from seven (7) to eighteen (18) inches in depth, with redox depletions of 2.5 Y 5/1 and redox concentrations of 10 YR 5/8. See attached wetland determination data forms for specific soil information.

Hydrology – Hydrology within Wetland 1 is attributed to its location in low lying elevations subject to the ebb and flow of the tide in and adjacent to Blackbird Creek. During the onsite investigation, Wetland 1 exhibited soil saturation (A3) in all of the data pits ranging from the soil surface to a depth of seven (7) inches. A high water table (A2) was observed in five (5) out of six (6) of the data pits, ranging in depth from four (4) inches to eight (8) inches below the soil surface. Other primary wetland hydrology indicators observed were hydrogen sulfide odor (C1) and oxidized rhizospheres on living roots (C3). Crayfish/Crab burrows (C8) were observed as a secondary indicator at Data Pit DP12-NEFW.

Uplands:

Upland Meadow

A narrow band of fill material consisting of riprap and soil extends along the Taylors Bridge Road (SR 9) roadway embankment throughout the project study area. Vegetation within this narrow upland band surrounding the immediate roadway consists of common reed (*Pragmites australis*, FACW)), red fescue (*Festuca rubra*, FACU)), eastern baccharis (*Baccharis halmifolia*, FAC)), poison ivy (*Toxicodendron radicans*, FAC)), southern arrowwood (*Viburnum dentatum* (FAC)), Virginia creeper (*Parthenocissus quinquefolia*, FACU)), meadow brome (*Bromus commutatus*, NL (UPL), and staghorn sumac (*Rhus typhina*, NL (UPL). Soils within this upland area consist of fill deposited for the roadway, ranging from 2.5 Y and 10 YR 4/3 to 10 YR 5/6 matrix chromas from a depth of zero (0) to eighteen (18) inches. Hydrology includes saturation from eight (8) inches to fifteen (15) inches below the surface. Some of the data pits within the upland meadow habitat had positive wetland vegetation or hydrology with two (2) out of three (3) technical wetland criteria met, but none of the data pits taken in the Upland Meadow met the technical wetland criteria for soil (no hydric soil indicators were present).

Upland Residential and Commercial

Upland maintained lawn is located in the residential portion of the project study area to the west of Wetland 1 along the western bridge approach, consisting of typical lawn grasses such as Kentucky bluegrass (*Poa pratensis*). Soils mapped in this area are Broadkill-Appoquinimink complex, very frequently flooded, tidal (Ba). However, this area has been modified by fill for the development of residences along Taylors Bridge Road (SR 9). A commercial property and residences are located along the eastern bridge approach in an area mapped as Leipsic silt loam, 0 to 2 percent slopes (LeA), and Reybold silt loam, 5 to 10 percent slopes (ReC) soils, which are not hydric. These areas consist of a combination of upland maintained lawn and upland mature forest (described below) plant communities.

Upland Mature Forest

On the eastern bridge approach, forested areas originally mapped as wetland in the Delaware 2007 State Wetlands layer consist of forestland dominated by blackgum (*Nyssa sylvatica* (FAC)), loblolly pine (*Pinus taeda* (FAC)), black cherry (*Prunus serotina* (FACU)), southern arrowwood (*Viburnum dentatum*, FAC)), multiflora rose (*Rosa multifora,* FACU), white avens (*Geum canadense*, FAC), japanese honeysuckle (*Lonicera japonica*, FAC), trumpet creeper (*Campsis radicans*, FAC), and Virginia creeper (*Parthenocissus quinquefolia*, FACU)). The soils mapped in these areas consist of Leipsic silt loam, 0 to 2 percent slopes (LeA), and Reybold silt loam, 5 to 10 percent slopes (ReC) soils, which are not hydric. Soils observed in the forested portions of the project study area were hard, compacted, and dry, ranging from 10 YR 3/3 and 4/3 from zero (0) to eight (8) inches, to 10 YR 5/6 down to a depth of eighteen (18) inches. No wetland hydrology was observed in any of the data pits taken in the upland mature forest plant community.

Waters of the United States:

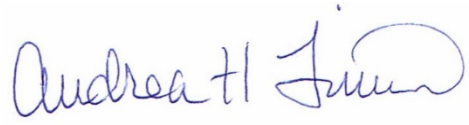
WOUS 1

WOUS 1 is Blackbird Creek that flows from south to the north through the project study area. Watercourse 1 is classified as a Estuarine subtidal unconsolidated bottom, subtidal (E1UBL) watercourse described as Estuarine open water according to the Cowardin Wetland and Deepwater Habitats Classification System (Cowardin and others, 1979). Based on its physical characteristics, the watercourse is subject to Federal and State jurisdiction. Watercourse 1 is illustrated on the attached project plan as Blackbird Creek.

If you have any questions, please contact me at afinn@pennoni.com or (717) 620-5964.

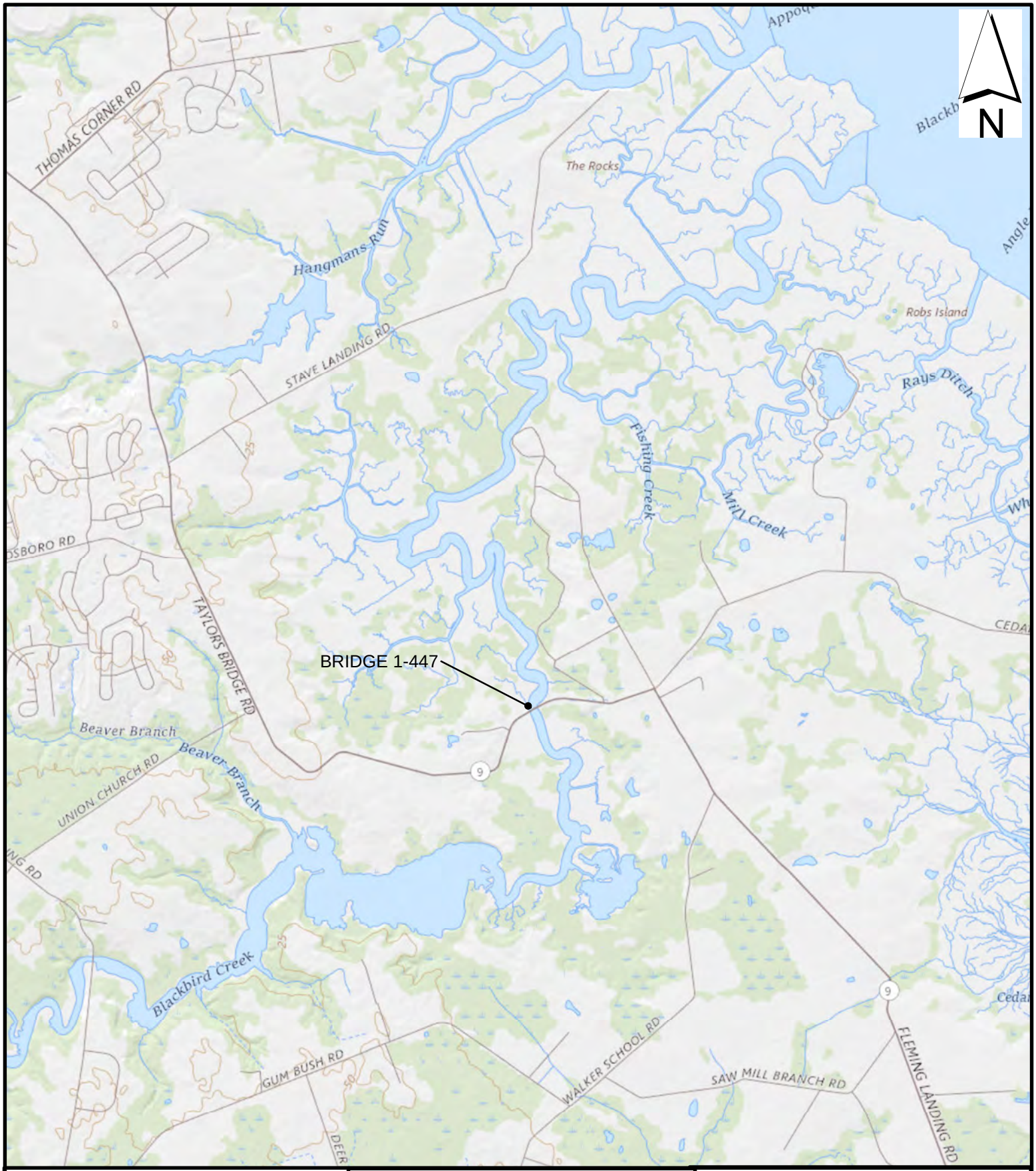
Sincerely,

PENNONI ASSOCIATES, INC.



Andrea H. Finn, PWS
Senior Environmental Scientist

APPENDIX A- Project Mapping



SOURCE BASE MAP: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program,

JOB NO. : DEDOT19005
SCALE: 1 inch = 3,000 feet

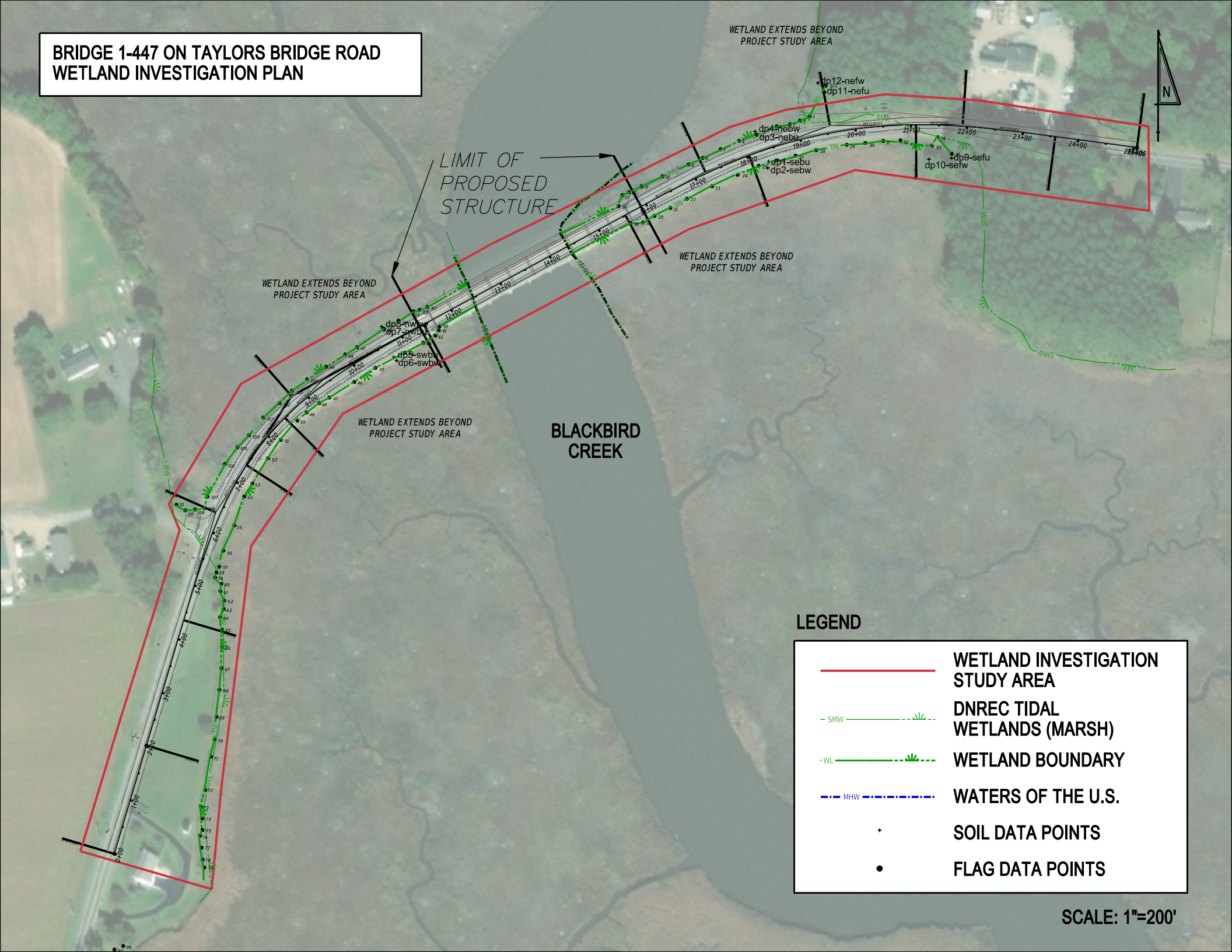
LOCATION MAP

DELDOT BRIDGE 1-447
TAYLORS BRIDGE RD OVER BLACKBIRD CREEK

NEW CASTLE COUNTY, DE

Pennoni

121 CONTINENTAL DR., SUITE 207
NEWARK, DE 19713


BRIDGE 1-447 ON TAYLORS BRIDGE ROAD
WETLAND INVESTIGATION PLAN
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
LIMIT OF PROPOSED STRUCTURE
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
BLACKBIRD CREEK
dp12-nefw
dp11-nefu
dp4-nebw
dp3-nebu
dp1-sebu
dp2-sebw
dp9-sefu
dp10-sefw
dp8-nwbw
dp7-nwbu
dp5-swbu
dp6-swbw
N
LEGEND
WETLAND INVESTIGATION STUDY AREA
DNREC TIDAL WETLANDS (MARSH)
WETLAND BOUNDARY
WATERS OF THE U.S.
SOIL DATA POINTS
FLAG DATA POINTS
SCALE: 1"=200'

APPENDIX B- Project Photographs

Photograph 1. Looking west across Taylors Bridge along Estuarine Tidal Wetlands (Wetland 1). Photo taken 6-26-2020.

Photograph 2. View to the east along SR 9 (Taylors Bridge Road) toward forested areas delineated as upland. Photograph Taken 6-26-2020.

Photograph 3. View across Estuarine Tidal Wetlands (Wetland 1) toward Blackbird Creek. Photo taken 6-26-2020

Photograph 4. View to the west along the western approach of Taylor's Bridge. Photo taken 6-26-2020

APPENDIX C- Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 0206/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP1-SEBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40544328 Long: -75.59783485 Datum: NAD 83

Soil Map Unit Name: Broadkill- Apponquinimink Complex (Ba) NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 14"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturated soil conditions 12 in. (30 cm) or less from the soil surface not observed. No primary or secondary hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP1 - SEBU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1. Baccharis halmifolia	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: 7.5 20% of total cover: 3

Herb Stratum (Plot size: 30')			
1. Phragmites australis	45	Y	FACW
2. Festuca rubra	40	Y	FACU
3. Bromus commutatus	5	N	NL
4. Lactuca canadensis	2	N	FACU
5. Medicago sativa	4	N	UPL
6. Poa pratensis	2	N	FACU
7. Solidago altissima	1	N	FACU
8. Typha latifolia	1	N	OBL
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 30')			
1. Toxicodendron radicans	10	Y	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		

50% of total cover: 5 20% of total cover: 2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic Vegetation Indicator Present

SOIL

Sampling Point: DP1- SEBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	2.5 Y 4/3	80	2.5 Y 4/2	20	D	M	sal	fill on roadway
12 - 14	2.5 Y 4/3	50	10 YR 6/6	35	C	M	sal	fill on roadway
			2.5 Y 4/2	15	D	M		
14 - 21	10 YR 6/6	50	2.5 Y 4/3	25	D	M	sacl	fill on roadway
			2.5 Y 4/2	15	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP2-SEBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40541165 Long: -75.59783953 Datum: NAD 83

Soil Map Unit Name: Broadkill-Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrologic indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP-SEBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicators present

SOIL

Sampling Point: DP2-SEBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10"	2.5 Y 4/2	100					sasil	Root masses- ORZ
10 - 20 "	2.5 Y 4/2	100					cl	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☑ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP3-NEBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40557248 Long: -75.59790755 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 15"
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water table 12 in. (30 cm) or less from the soil surface not observed. No primary or secondary hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP3- NEBU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1. Viburnum dentatum	10	Y	FAC
2. Baccharis halmifolia	15	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum (Plot size: 30')			
1. Phragmites australis	75	Y	FACW
2. Bromus commutatus	15	N	NL (UPL)
3. Asclepias syriaca	2	N	UPL
4. Festuca rubra	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	97 = Total Cover		

50% of total cover: 48.5 20% of total cover: 19.4

Woody Vine Stratum (Plot size: 30')			
1. Parthenocissus quinquefolia	5	Y	FACU
2.			
3.			
4.			
5.			
	5 = Total Cover		

50% of total cover: 2.5 20% of total cover: 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (If observed, list morphological adaptations below).

NL species assumed to be upland (UPL) species. Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP3-NEBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18"	10 YR 4/3	100					sal	
18 - 24"	2.5 Y 5/3	80	2.5 Y 4/1	20	D	M	sal	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP4-NEBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR U; MLRA 153C Lat: 39.40558998 Long: -75.5979215 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): -
Water Table Present?	Yes X	No _____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP4-NEBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP4-NEBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20"	2.5 Y 4/2	100					Sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [x] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] Organic Bodies (A6) **(LRR P, T, U)**
- [ ] 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- [ ] Muck Presence (A8) **(LRR U)**
- [ ] 1 cm Muck (A9) **(LRR P, T)**
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Coast Prairie Redox (A16) **(MLRA 150A)**
- [ ] Sandy Mucky Mineral (S1) **(LRR O, S)**
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7) **(LRR P, S, T, U)**
- [ ] Polyvalue Below Surface (S8) **(LRR S, T, U)**
- [ ] Thin Dark Surface (S9) **(LRR S, T, U)**
- [ ] Loamy Mucky Mineral (F1) **(LRR O)**
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Marl (F10) **(LRR U)**
- [ ] Depleted Ochric (F11) **(MLRA 151)**
- [ ] Iron-Manganese Masses (F12) **(LRR O, P, T)**
- [ ] Umbric Surface (F13) **(LRR P, T, U)**
- [ ] Delta Ochric (F17) **(MLRA 151)**
- [ ] Reduced Vertic (F18) **(MLRA 150A, 150B)**
- [ ] Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- [ ] 1 cm Muck (A9) **(LRR O)**
- [ ] 2 cm Muck (A10) **(LRR S)**
- [ ] Reduced Vertic (F18) **(outside MLRA 150A,B)**
- [ ] Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- [ ] Red Parent Material (TF2)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP5-SWBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40447987 Long: -75.60020026 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 8"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP5-SWBU

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	70	Y	FACW
2. Lactuca canadensis	3	N	FACU
3. Bromus commutatus	25	Y	NL (UPL)
4. Commelina virginica	2	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1. Vitis labrusca	15	Y	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

NL species assumed to be upland (UPL) species. Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP5-SWBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18"	10 YR 5/8	75	10 YR 4/2	25	D	M	gr sal	fill
18 - 20"	2.5 Y 4/2	75	2.5 Y 4/1	15	D	M	gr sal	
			10 YR 5/8	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP6-SWBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR t; MLRA 153C Lat: 39.40446371 Long: -75.60018391 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): -
Water Table Present?	Yes X	No _____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP6-SWBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP6-SWBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20"	2.5Y 4/2	100					sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [x] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] Organic Bodies (A6) **(LRR P, T, U)**
- [ ] 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- [ ] Muck Presence (A8) **(LRR U)**
- [ ] 1 cm Muck (A9) **(LRR P, T)**
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Coast Prairie Redox (A16) **(MLRA 150A)**
- [ ] Sandy Mucky Mineral (S1) **(LRR O, S)**
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7) **(LRR P, S, T, U)**
- [ ] Polyvalue Below Surface (S8) **(LRR S, T, U)**
- [ ] Thin Dark Surface (S9) **(LRR S, T, U)**
- [ ] Loamy Mucky Mineral (F1) **(LRR O)**
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Marl (F10) **(LRR U)**
- [ ] Depleted Ochric (F11) **(MLRA 151)**
- [ ] Iron-Manganese Masses (F12) **(LRR O, P, T)**
- [ ] Umbric Surface (F13) **(LRR P, T, U)**
- [ ] Delta Ochric (F17) **(MLRA 151)**
- [ ] Reduced Vertic (F18) **(MLRA 150A, 150B)**
- [ ] Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- [ ] 1 cm Muck (A9) **(LRR O)**
- [ ] 2 cm Muck (A10) **(LRR S)**
- [ ] Reduced Vertic (F18) **(outside MLRA 150A,B)**
- [ ] Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- [ ] Red Parent Material (TF2)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP7-NWBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hilslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40461095 Long: -75.60026399 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____	
Water Table Present?	Yes _____	No X	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 8"	**Wetland Hydrology Present?** Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP7-NWBU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1. Rhus typhina	20	Y	NL (UPL)
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	75	Y	FACW
2. Rumex crispus	2	N	FAC
3. Lactuca canadensis	2	N	FACU
4. Althaea officinalis	5	N	FACW
5. Allium vineale	1	N	FACU
6. Ambrosia artemisiifolia	1	N	FACU
7. Poa pratensis	10	N	FACU
8. Festuca rubra	5	N	FACU
9.			
10.			
11.			
12.			
	101 = Total Cover		
50% of total cover: 50.5	20% of total cover: 20.2		
Woody Vine Stratum (Plot size: 30')			
1. Parthenocissus quinquefolia	10	Y	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (If observed, list morphological adaptations below).

NL species assumed to be upland (UPL) species. No hydrophytic vegetation indicators present.

SOIL

Sampling Point: DP7-NWBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 14"	10 YR 5/6	75	20 YR 5/4	25	D	M	gr sal	fill
14 - 20"	2.5 Y 5/3	85	2.5 Y 6/8	15	C	M	gr sal	fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP8-NWBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA153C Lat: 39.40462867 Long: -75.60027894 Datum: NAD 83

Soil Map Unit Name: Broadkill-Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 4"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP8-NWBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP8-NWBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	2.5 Y 4/2	100					Sil	High Organic Material (Muck)
8 - 18	2.5 Y 4/1	100					Sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☑ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

Hydric Soil Indicator Present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP9-SEFU

Investigator(s): AHF Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40546045 Long: -75.59667802 Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrolgy indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP9-SEFU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica	35	Y	FAC
2. Pinus taeda	35	Y	FAC
3. Prunus serotina	20	Y	FACU
4. Prunus pennsylvanica	10	N	FACU
5.			
6.			
7.			
8.			
	100	= Total Cover	
50% of total cover: 50	20% of total cover: 20		
Sapling/Shrub Stratum (Plot size: 30')			
1. Viburnum dentatum	75	Y	FAC
2. Rosa multiflora	10	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	85	= Total Cover	
50% of total cover: 42.5	20% of total cover: 17		
Herb Stratum (Plot size: 30')			
1. Geum canadense	3	Y	FAC
2. Lonicera japonica	10	Y	FACU
3. Toxicodendron radicans	2	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	
50% of total cover: 7.5	20% of total cover: 3		
Woody Vine Stratum (Plot size: 30')			
1. Campsis radicans	20	Y	FAC
2. Parthenocissus quinquefolia	10	Y	FACU
3.			
4.			
5.			
	30	= Total Cover	
50% of total cover: 15	20% of total cover: 6		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 62.5 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP9-SEFU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8"	10 YR 4/3	100					sil	
8 - 18"	10 YR 5/6	100					sil	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP10 - SEFW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40545528 Long: -75.59682118 Datum: NAD 83

Soil Map Unit Name: Broadkill Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 7"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicator present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP10-SEFW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	25	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1. Baccharis halmifolia	25	Y	FAC
2. Rosa multiflora	7	N	FACU
3. Sambucus canadensis	3	N	FACW
4.			
5.			
6.			
7.			
8.			
	37 = Total Cover		
50% of total cover: 18.5	20% of total cover: 7.4		
Herb Stratum (Plot size: 30')			
1. Solidago altissima	15	N	FACU
2. Juncus effusus	15	N	OBL
3. Phragmites australis	45	Y	FACW
4. Eupatorium perfoliatum	3	N	FACW
5. Epilobium coloratum	2	N	OBL
6. Euthamia graminifolia	15	N	FAC
7. Toxicodendron radicans	30	Y	FAC
8.			
9.			
10.			
11.			
12.			
	125 = Total Cover		
50% of total cover: 62.5	20% of total cover: 25		
Woody Vine Stratum (Plot size: 30')			
1. Smilax glauca	15	Y	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP10-SEFW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 7"	2.5 Y 4/2	100					sil	
7 - 18"	2.5 Y 5/2	55	2.5 Y 5/1	35	D	M	sil	
			10 YR 5/8	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP11- NEFU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40578386 Long: -75.59748043 Datum: NAD 83

Soil Map Unit Name: Leipsic Silt Loam (LeA) NWI classification: PF04A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP11-NEFU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	20	Y	FACU
2. Pinus taeda	40	Y	FAC
3. Viburnum lantanoides	10	N	FAC
4. Juniperus virginiana	15	N	FACU
5.			
6.			
7.			
8.			
	85	= Total Cover	
50% of total cover: 42.5		20% of total cover: 17	

Sapling/Shrub Stratum (Plot size: 30')			
1. Viburnum dentatum	20	Y	FAC
2. Rosa multiflora	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	25	= Total Cover	
50% of total cover: 12.5		20% of total cover: 5	

Herb Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		= Total Cover	
50% of total cover:		20% of total cover:	

Woody Vine Stratum (Plot size: 30')			
1. Campsis radicans	40	Y	FAC
2. Lonicera japonica	40	Y	FAC
3. Parthenocissus quinquefolia	5	N	FACU
4.			
5.			
	85	= Total Cover	
50% of total cover: 42.5		20% of total cover: 17	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP11- NEFU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 7"	10 YR 3/3	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Hard Pack - Dry

Depth (inches): 7" +

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP12-NEFW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40582858 Long: -75.59752488 Datum: NAD 83

Soil Map Unit Name: Broadkill Appoquinimink Complex (BA) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three wetland technical parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): Surface

Water Table Present? Yes X No _____ Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary and secondary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP12-NEFW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP12-NEFW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20"	2.5 Y 4/2						sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☑ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

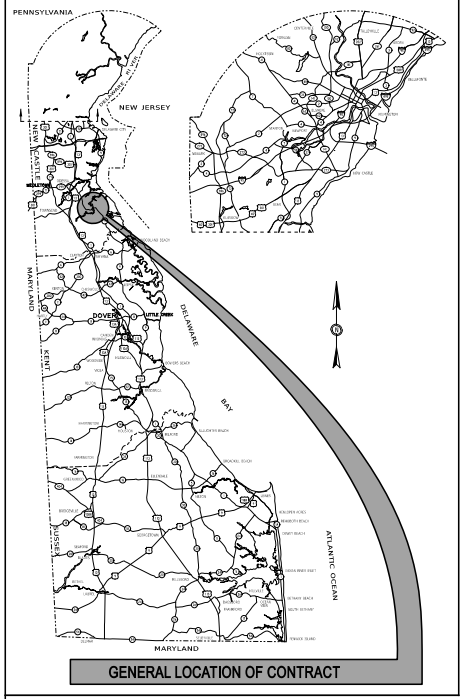
Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.



GENERAL LOCATION OF CONTRACT

PREPARED BY
PENNONI ASSOCIATES INC.

Pennoni

2/24/25
DATE

THIS SEAL APPLIES TO ALL SHEETS BEARING THE "PAI" SECTION DESIGNATION.

HOUSTON A. BROWN
LICENSE
No. 18197
DELAWARE
PROFESSIONAL ENGINEER

SEAL

THE STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

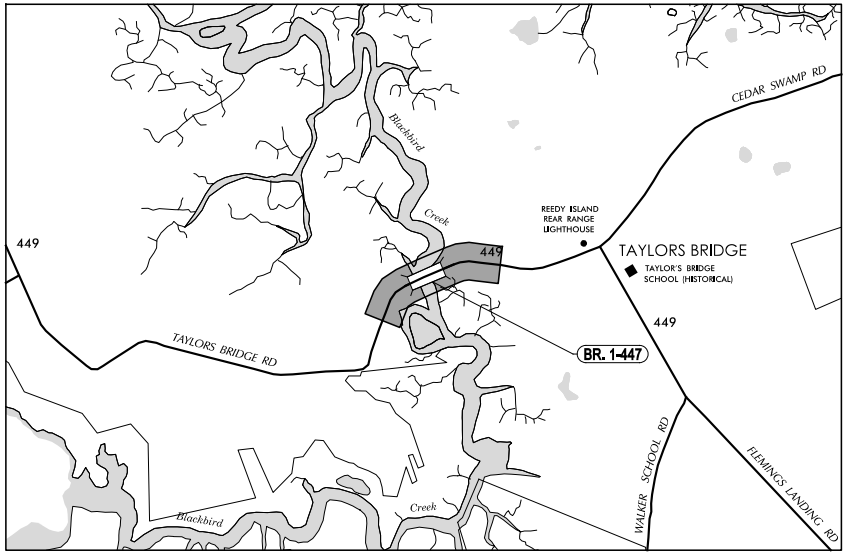
U.S. CUSTOMARY UNITS

CONSTRUCTION AND RIGHT OF WAY PLANS FOR:

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT NUMBER: T201907102
FEDERAL AID PROJECT NUMBER: EBROS-N449 (2)

COUNTY: NEW CASTLE M.R. #: N449



LOCATION MAP
NOT TO SCALE

DESIGN DESIGNATION

MRD #: N449	ROAD NAME: TAYLORS BRIDGE ROAD		
FUNCTIONAL CLASS: RURAL MAJOR COLLECTOR		D.H.V. PROJECTED: 260	YEAR: 2050
TYPE OF CONSTRUCTION: BRIDGE REPLACEMENT		DESIGN SPEED: 45 M.P.H.	
A.A.D.T. CURRENT: 900	YEAR: 2020	TRUCKS: 7 %	
A.A.D.T. PROJECTED: 2000	YEAR: 2050	DIRECTION OF DISTRIBUTION: 61%	

APPROVED DESIGN EXCEPTIONS

DESIGN PARAMETER	REQUIRED	PROVIDED	DATE

ADDENDA / REVISIONS

ASSOCIATED CONTRACTS

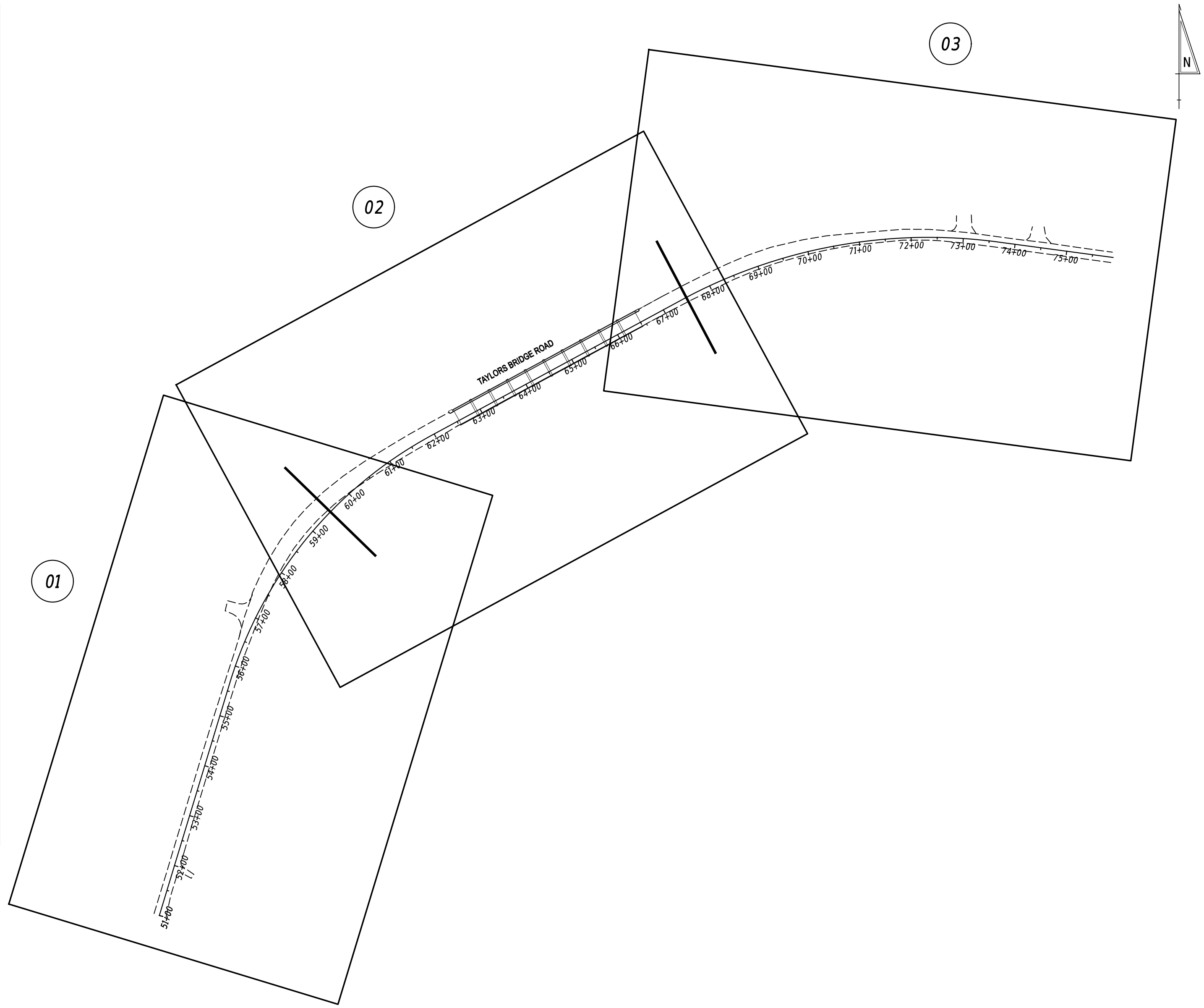
CONTRACT NO.	CONTRACT NAME
1090	BRIDGE 447 (TAYLORS BRIDGE) ON SR 9 OVER BLACKBIRD CREEK

APPROVED FOR ADVERTISEMENT

DIRECTOR OF TRANSPORTATION SOLUTIONS

DATE

INDEX OF SHEETS



ADDENDA / REVISIONS

SCALE
0 100 200 300
FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	O. GREEN

INDEX OF SHEETS

SECTION	PAI
SHEET NO.	2

ADDENDA / REVISIONS

NOT TO SCALE

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	O. GREEN

ADDENDA AND REVISIONS

SECTION	
SHEET NO.	3

PENNONI ASSOCIATES INC.
FILE NAME: $FILEA$
MICROSTATION VERSION: $VERSION$
MICROSTATION WORKSPACE: $WORKSPACE$
PEN TABLE: $PENTBL$$
PLOT DRIVER: $PLTDRV$$
DATE PLOTTED: $DATE$ @ $TIME$
USER NAME: $USER$ OFFICE LOCATION: $OFFICENAME$

MANMADE ROADSIDE FEATURES

FEATURE DESCRIPTION	EXISTING	PROPOSED	ID
BOLLARD - STEEL POLE			
BOLLARD - WOOD POST			
CURB, TYPE 1 AND TYPE 3	CURB, TYPE "X"		C XXX
CURB, TYPE 2			
CURB & GUTTER, TYPE 1			
CURB & GUTTER, TYPE 2	C&G, TYPE "X"		
CURB & GUTTER, TYPE 3			
CURB OPENING - SUMP / ON GRADE			C O
CURB OPENING WITH SIDEWALK			CO SW
FENCE - CHAINLINK OR STRANDED			F XXX
FENCE - STOCKADE OR SPLIT RAIL			
FLAG POLE	F.P.		
GUARDRAIL - STEEL BEAM, TYPE 1			GR XXX
GUARDRAIL - STEEL BEAM, TYPE 2			
GUARDRAIL - STEEL BEAM, TYPE 3			
GUARDRAIL - WIRE ROPE			
GUARDRAIL - END ANCHORAGE			
GUARDRAIL - END TREATMENT, TYPE 1			
GUARDRAIL - END TREATMENT, TYPE 2			
GUARDRAIL - END TREATMENT, TYPE 3			
GUARDRAIL - IMPACT ATTENUATOR			
LAMP AND POST - RESIDENTIAL	LAMP		
MAILBOX	MB	MB	
PARKING METER AND POST	P.M.		
PAVEMENT - FLEXIBLE			
PAVEMENT - RIGID			
PILE - BRIDGE			
PILLAR OR MISCELLANEOUS POST			
TRAFFIC SIGN AND POST			
WALL - BRICK OR BLOCK			
WALL - STONE			

DRAINAGE FEATURES

FEATURE DESCRIPTION	EXISTING	PROPOSED	ID
BIOFILTRATION SWALE		BFS	
DITCH OR STREAM CENTERLINE			
DIRECTIONAL STREAM FLOW ARROW			
DRAINAGE INLET	C.B. / D.I.		DI XXX
DRAINAGE JUNCTION BOX	J.B.		JB XXX
DRAINAGE MANHOLE			MH XXX
DRAINAGE PIPE AND FLOW ARROW	SIZE/TYPE LABEL		P XXX
FLARED END SECTION			FES XXX
RIPRAP - AREA FEATURE*			RR XXX
RIPRAP - LINEAR FEATURE			
SAFETY END SECTION			SES XXX
UNDERDRAIN			UD XXX
UNDERDRAIN OUTLET			UDO XXX

UTILITY FEATURES

FEATURE DESCRIPTION	EXISTING	PROPOSED
COMMUNICATIONS DISTRIBUTION BOX	CD TV	
COMMUNICATIONS MANHOLE		
COMMUNICATIONS TEST POINT	CT T	
COMMUNICATIONS - UNDERGROUND	COMM(A)	COMM
ELECTRIC - UNDERGROUND	E(A)	E
ELECTRIC MANHOLE		
ELECTRIC METER	EM	
ELECTRIC TRANSFORMER	E	
GAS - UNDERGROUND	G(A)	G
GAS MANHOLE		
GAS METER	G.M.	
GAS VALVE	G.V.	
GAS PUMP - SERVICE STATION	G.P.	
IRRIGATION - UNDERGROUND	IR(A)	IR
ITMS - UNDERGROUND	ITMS(A)	ITMS
LIGHTING - UNDERGROUND	LI(A)	LI
LUMINAIRE - POLE MOUNTED		
MANHOLE - UNDETERMINED OWNER		
RAILROAD TRACKS		
SANITARY - UNDERGROUND	S(A)	S
SANITARY SEWER MANHOLE		
SANITARY SEWER VALVE	S.V.	
SANITARY SEWER CLEANOUT OR VENT	S.C.O.	
SEPTIC DRAIN FIELD	S.D.F.	
SIGNALIZATION - UNDERGROUND	SIG(A)	SIG
SOIL BORING LOCATION		
TELEPHONE BOOTH	B	
TRAFFIC - CONDUIT JUNCTION WELL	J.W.	
TRAFFIC - LIGHT POLE AND BASE		
TRAFFIC - PEDESTRIAN POLE & BASE		
TRAFFIC - SIGNAL CABINET & BASE		
TRAFFIC - SIGNAL POLE AND BASE		
UTILITY BOX	U	
UTILITY MARKER	UM	
UTILITY POLE GUY WIRE ANCHOR		
UTILITY POLE		
UTILITY TEST HOLE LOCATION		
WATER - UNDERGROUND	W(A)	W
WATER - FIRE HYDRANT	F.H.	F.H.
WATER METER	W.M.	
WATER VALVE	W.V.	W.V.
WELL HEAD	WELL	

PAVEMENT SECTION(S)

OVERLAY PAVEMENT - SEE TYPICAL SECTIONS FOR MATERIALS AND DEPTHS	
RECONSTRUCTED PAVEMENT - SEE TYPICAL SECTIONS FOR MATERIALS AND DEPTHS	
DRIVEWAY, ENTRANCE, AND GUARDRAIL MAINTENANCE STRIP PAVEMENT - SEE NOTES FOR MATERIALS AND DEPTHS	

NATURAL ROADSIDE FEATURES

FEATURE DESCRIPTION	EXISTING	PROPOSED
HEDGEROW OR THICKET		
MARSH BOUNDARY LINE		
TREE - CONIFEROUS		
TREE - DECIDUOUS		
TREE STUMP		
SHRUBBERY		
WETLAND BOUNDARY - DELINEATED	WL	
WOODS LINE BOUNDARY		
TOP OF BANK		

RIGHT-OF-WAY FEATURES

FEATURE DESCRIPTION	EXISTING	PROPOSED
DENIAL OF ACCESS	DA	DA
EASEMENT - OTHERS	EASEMENT TYPE	
PERMANENT EASEMENT	PE	PE
PROPERTY LINE		
PROPERTY MARKER - CONCRETE	C.M.	
PROPERTY MARKER - IRON PIPE	I.P.	
RIGHT-OF-WAY BASELINE	100+00	100+00
RIGHT-OF-WAY LINE	R/W	R/W
RIGHT-OF-WAY BY PE	R/W•PE	
RIGHT-OF-WAY & DENIAL OF ACCESS	R/W•DA	R/W-DA
RIGHT-TO-ENTER		RTE
TEMPORARY CONSTRUCTION EASEMENT		TCE

SURVEY CONTROL & MONUMENTATION

FEATURE DESCRIPTION	EXISTING
POINT OF CURVATURE OR TANGENCY	
POINT OF INTERSECTING TANGENTS	
SURVEY BENCHMARK LOCATION	B.M.
SURVEY NGS POINT LOCATION	
SURVEY TIE POINT LOCATION	T.P.
SURVEY TRAVERSE POINT	

MISCELLANEOUS FEATURES

FEATURE DESCRIPTION	PROPOSED
BARRIER, DOUBLE-FACED, PERMANENT	
BARRIER, SINGLE-FACED, PERMANENT, TEST LEVEL 4 / TEST LEVEL 5	
BRICK PATTERNED SURFACE	
BUTT JOINT	
CLEAR ZONE	CZ
CONSTRUCTION BASELINE	100+00
LATERAL OFFSET	LO
LIMIT OF CONSTRUCTION	LOC
PAVEMENT PATCH	
PAVEMENT REMOVAL - TOPSOIL, SEED AND MULCH	
P.C.C. SIDEWALK - 4"	
P.C.C. SIDEWALK - 6" (USE 8" DEPTH FOR CHANNELIZATION ISLANDS.)	

IDENTIFIERS

FEATURE DESCRIPTION	ID
ABANDON BY CONTRACTOR	AB C
ABANDON BY OTHERS	AB O
ADJUST BY CONTRACTOR	A C
ADJUST BY OTHERS	A O
BEST MANAGEMENT PRACTICE	BMP XXXX
BUS STOP PAD / TYPE	BSP X
BUS STOP WITH SHELTER PAD / TYPE	BSSP X
CONCRETE SAFETY BARRIER	B XXX
CONVERT TO JUNCTION BOX	CJB XXX
CONVERT TO DRAINAGE MANHOLE	CMH XXX
DO NOT DISTURB	DND
ENERGY DISSIPATOR	ED XXX
FILL WITH FLOWABLE FILL	FF C
LANDSCAPE PLANTINGS	LS XXX
PEDESTRIAN CONNECTION / TYPE	PC XX
PEDESTRIAN CONNECTION / TYPE WITHOUT DETECTABLE WARNING SYSTEM	PC-N XXX
RELOCATE BY CONTRACTOR	RL C
RELOCATE BY OTHERS	RL O
RELOCATE BY PROPERTY OWNER	RL PO
REMOVE BY CONTRACTOR	RM C
REMOVE BY OTHERS	RM O
REMOVE BY TRAFFIC CONTRACTOR	RM TC
RIGHT-OF-WAY MONUMENT	M XXX

ADDENDA / REVISIONS

NOT TO SCALE

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	E. HARASTY
COUNTY		
NEW CASTLE	CHECKED BY:	O. GREEN

LEGEND

SECTION PAI
SHEET NO. 4

GENERAL NOTES

1. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS", DATED JANUARY 2024 AND THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD CONSTRUCTION DETAILS", DATED 2024, INCLUDING ALL REVISIONS UP TO THE DATE OF ADVERTISEMENT.

2. ELECTRONIC DESIGN DATA FILES THAT WILL BE MADE AVAILABLE TO THE BIDDERS INCLUDE:

( )	NONE
(X)	ASCII DATA FILES WITH COORDINATES AND ELEVATIONS FOR PROPOSED POINTS AS SELECTED BY THE ENGINEER.
(X)	DESIGN FILE, IN .DGN FILE FORMAT, THAT CONTAINS 3D TRIANGLES REPRESENTING THE EXISTING SURFACE.
(X)	DESIGN FILE, IN .DGN FILE FORMAT, THAT CONTAINS 3D FEATURE LINES FOR THE PROPOSED DESIGN. 3D FEATURE LINES ARE FOR THE PROPOSED TOP SURFACE ELEVATION ONLY.

NOTE: THE DOCUMENT ENTITLED "ELECTRONIC FILE SHARING RELEASE" MUST BE SIGNED BY ALL PARTIES PRIOR TO THE DELIVERY OF ANY ELECTRONIC PROJECT FILES.

NOTE: THERE MAY BE SOME AREAS OF THE PROJECT NOT INCLUDED IN THE ELECTRONIC DESIGN DATA FILE(S). IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE DESIGN DATA FILE AND DETERMINE THE LIMITS OF THE PROJECT INCLUDED.

3. PROJECT FILES THAT WILL BE MADE AVAILABLE TO THE CONTRACTOR, INCLUDE:

(X)	CROSS SECTIONS
(X)	RIGHT-OF-WAY PLANS (INCLUDED IN PLANS)

PROJECT NOTES

SECTION 100

1. ANY DAMAGE TO ITEMS NOTED TO BE RELOCATED OR RESET BY THE CONTRACTOR, AT THE DISCRETION OF THE ENGINEER, SHALL BE REPAIRED AND/OR REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.

2. THE CONTRACTOR WILL CONTACT THE DELAWARE TMC AT 302-659-4600 PRIOR TO ANY UNMANNED AERIAL VEHICLE (UAV) FLIGHTS. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE THE FOLLOWING INFORMATION: THE REGISTRATION NUMBER OF THE UAV, THE FLIGHT TIME, LOCATION OF THE FLIGHT, THE PILOT'S NAME AND THE PILOT'S CONTACT NUMBER DURING THE FLIGHT.

3. NIGHT WORK IS NOT PERMITTED ON THIS PROJECT UNLESS THE CONTRACTOR OBTAINS: APPROVAL FROM THE ENGINEER, ACCEPTABLE RESPONSES ON NIGHT WORK SURVEYS, AND ACCEPTANCE FROM THE MUNICIPALITY. METHOD AND FORMAT OF NIGHT WORK SURVEYS WILL BE PROVIDED BY THE ENGINEER UPON REQUEST. NIGHT WORK, SURVEYS, AND COORDINATION WITH MUNICIPALITIES IS NOT COMPENSABLE AND THE TIME TO COMPLETE THE SURVEYS IS NOT EXCUSABLE.

SECTION 200

4. THE CONTRACTOR SHALL REMOVE AND RESET ALL MAILBOXES TO MAINTAIN MAIL SERVICE AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL RELOCATE MAILBOXES AS REQUIRED BY THE PROPOSED GEOMETRICS AND AS DIRECTED BY THE ENGINEER. WHEN RELOCATING MAILBOXES IN OPEN SECTIONS, THE FACE OF THE MAILBOX SHALL SET BACK 8 INCHES FROM THE EDGE OF THE PAVED SHOULDER. THE BOTTOM OF THE MAILBOX SHALL BE POSITIONED IN ACCORDANCE WITH THE LATEST VERSION OF THE UNITED STATES POSTAL SERVICE GUIDELINES. MAILBOXES LOCATED AT DRIVEWAY ENTRANCES SHALL BE PLACED ON THE FAR SIDE OF THE DRIVEWAY IN THE DIRECTION OF TRAVEL. ACCEPTABLE POST SHALL BE 4 INCH X 4 INCH WOOD POST OR 4 INCH DIAMETER WOOD POST. FOR RELOCATING MULTIPLE MAILBOXES TOGETHER ALL POST SHALL BE SEPARATED BY A DISTANCE OF NO LESS THAN 3/4 OF THEIR FULL HEIGHT ABOVE THE GROUND. MULTIPLE MAILBOXES ATTACHED TO A SINGLE HORIZONTAL BOARD SHALL NOT BE LOCATED INSIDE THE CLEARZONE. EACH MAILBOX SHALL BE PLACED ON AN INDIVIDUAL POST MEETING THE CRITERIA ABOVE. ALL MAILBOXES SHALL BE SET NOT TO IMPEDE THE MINIMUM PAR (PEDESTRIAN ACCESS ROUTE) WIDTH AS DETERMINED BY THE CURRENT EDITION OF THE PEDESTRIAN ACCESSIBILITY STANDARDS FOR FACILITIES IN THE PUBLIC RIGHT OF WAY. IF MAILBOXES ARE NOT SET IN ACCORDANCE WITH THE ABOVE DIRECTIONS, RESETTING OF THE MAILBOXES WILL BE AT THE COST OF THE CONTRACTOR. COST FOR ALL WORK AND MATERIALS SHALL BE PAID UNDER ITEM 201000 - CLEARING AND GRUBBING.

5. ITEMS TO BE REMOVED UNDER ITEM 211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
   a. SUPERSTRUCTURE INCLUDING BARRIERS, DECK, BEAMS, AND BEARINGS.
   b. SUBSTRUCTURE INCLUDING ABUTMENTS, PIER CAPS. CONTRACTOR HAS THE OPTION TO PULL EXISTING PILES OR CUT OFF DOWN TO 2-FEET BELOW THE MUDLINE. DO PULL PILES FOR EXISTING PIER 5 (LOCATED AT PROPOSED PROPOSED PIER 2) AND BOTH EXISTING ABUTMENTS.

6. ITEMS TO BE REMOVED UNDER ITEM 211002 - REMOVAL OF GUARDRAIL AND FENCE SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
   a. ALL EXISTING GUARDRAIL WITHIN THE PROJECT LIMITS UNLESS OTHERWISE SPECIFIED ON THE CONSTRUCTION PLANS.

7. ONLY EXISTING FEATURES WITHIN THE LOC IDENTIFIED WITH REMOVE BY CONTRACTOR OR BY OTHER METHODS ARE TO BE REMOVED OR DISTURBED.

SECTION 400

8. THE PAVEMENT SECTION FOR FLEXIBLE PAVEMENT RESIDENTIAL DRIVEWAYS SHALL BE 2" BITUMINOUS CONCRETE, TYPE 'C' OVER 8" GRADED AGGREGATE BASE COURSE, TYPE 'B', UNLESS OTHERWISE NOTED ON THE PLANS OR AS DETERMINED BY ENGINEER IN THE FIELD AS NEEDED TO MATCH EXISTING.

SECTION 600

9. ALL DEBRIS ASSOCIATED WITH DEMOLITION OF THE STRUCTURES SHALL BE PREVENTED FROM ENTERING BLACKBIRD CREEK. A DEMOLITION PLAN INCLUDING BUT NOT LIMITED TO THE DEMOLITION PROCEDURE, TOOLS, EQUIPMENT, AND SHIELDING SHALL BE SUBMITTED FOR APPROVAL BY THE ENGINEER. THE CONTRACTOR'S DEMOLITION PLAN SHALL BE SEALED BY A DELAWARE PROFESSIONAL ENGINEER PRIOR TO SUBMISSION FOR APPROVAL. ALL WORK ASSOCIATED TO THE DEMO PLAN AND DEMO WORK SHALL BE PAID UNDER ITEM 604001.

10. PORTLAND CEMENT CONCRETE:
USE PORTLAND CEMENT CONCRETE FOR CAST-IN-PLACE ELEMENTS AS FOLLOWS:
(f'c = 28-DAY COMPRESSIVE STRENGTH)
CLASS A - ABUTMENT PILE CAP, PIER WALLS, PIER CAP, BRIDGE PARAPET, SHEET PILE COPING (f'c = 4.5 ksi)
CLASS B - PIER FOOTINGS (f'c = 3.0 ksi)
CLASS D - BRIDGE DECK SLAB, APPROACH SLAB, APPROACH BARRIERS, MOMENT SLABS (f'c =4.5 ksi)

SUPPLY THE CONCRETE FOR THE BRIDGE DECK, APPROACH SLAB, AND PARAPETS THAT INCLUDES A SHRINKAGE REDUCING / COMPENSATING ADMIXTURE. THE ADMIXTURE MAY BE SUPPLIED BY ONE PRODUCT THAT PROVIDES BOTH EXPANSION AND PORE WATER SURFACE TENSION OF TWO SEPARATE PRODUCTS EACH ADDED AT THE DOSAGE RECOMMENDED BY THE MANUFACTURERS TECHNICAL DATA SHEETS AND HAVING THE FOLLOWING CHARACTERISTICS:
(a.) DESIGNED TO PROVIDE BOTH OF THE FOLLOWING CHARACTERISTICS:
(i.) EXPANDS AT A RATE THAT CLOSELY COMPENSATES FOR THE SHRINKAGE OF THE CONCRETE MIX
(ii.) REDUCES THE CAPILLARY SURFACE TENSION OF THE CONCRETE PORE WATER
(b.) PROVIDES AT LEAST 80% SHRINKAGE REDUCTION AS MEASURED AND DOCUMENTED BY FIE PERFORMANCE
(c.) FORMULATED FOR USE IN FREEZING AND THAWING WEATHER
- ALL ADMIXTURES MUST BE COMPATIBLE WITH ALL OTHER CONCRETE-MIX DESIGN CONSTITUENTS. CALCIUM CHLORIDE IS NOT PERMITTED; CHEMICAL ADMIXTURES THAT CONTAIN MORE THAN 0.1% CHLORIDE BY WEIGHT WILL NOT BE PERMITTED FOR USE. DOSAGE RATE AND MIXING SEQUENCE WILL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
(d.) DOCUMENTED PERFORMANCE OF ASTM C1581, RING TEST, RUN WITH CONCRETE (MAXIMUM AGGREGATE SIZE NOT TO EXCEED 0.5 INCHES): NO CRACKING FOR MINIMUM 120 DAYS.
(e.) CERTIFIED BY NSF/ANSI STANDARD 61: DRINKING WATER SYSTEM COMPONENTS - HEALTH EFFECTS. CONTRACTORS AND SUPPLIERS THAT DO NOT HAVE DOCUMENTED EXPERIENCE WITH SHRINKAGE COMPENSATING ADMIXTURES SHALL INCLUDE SUFFICIENT TIME FOR LABORATORY TESTING AND A TRIAL BATCH TO CONFIRM DOSAGE AND ADMIXTURES WILL PERFORM AS INTENDED TO MEET THE DESIGN INTENT.

11. USE PORTLAND CEMENT CONCRETE FOR PRECAST ELEMENTS AS FOLLOWS:
(f'c = 28-DAY COMPRESSIVE STRENGTH)
(f'ci = COMPRESSIVE STRENGTH AT INITIAL PRESTRESS)
PRESTRESSED GIRDERS:
f'c = 8 ksi, f'ci = 6.4 ksi
DESIGN ASSUMPTIONS: THE PRESTRESSED CONCRETE BEAMS WERE DESIGNED FOR NORMAL EXPOSURE.

12. THE ABUTMENTS, PIER CAPS, AND PIER WALLS ARE DESIGNATED AS MASS CONCRETE POURS. A TEMPERATURE CONTROL PLAN IS REQUIRED FOR THESE ELEMENTS. REFER TO SECTIONS 610.3.1.A.2 AND 610.3.4.D.3 OF THE STANDARD SPECIFICATIONS FOR MORE INFORMATION.

13. DECK SLAB:
- THE DECK SLAB THICKNESS INCLUDES ½" INTEGRAL WEARING SURFACE.

14. BAR REINFORCEMENT:
- PROVIDE REINFORCING STEEL CONFORMING TO AASHTO M31 (ASTM A615), GRADE 60.
- PROVIDE A 3" CLEAR COVER FOR ALL REINFORCING STEEL PLACED IN CONCRETE CAST AGAINST EARTH OR A 2" CLEAR COVER ELSEWHERE, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- ALL REINFORCEMENT SHALL BE EPOXY COATED UNLESS NOTED OTHERWISE

- WITH APPROVAL OF THE BRIDGE DESIGN ENGINEER, GALVANIZED REINFORCING STEEL MAY BE SUBSTITUTED FOR EPOXY-COATED REINFORCING STELL AT NO ADDITIONAL COST TO THE DEPARTMENT.

15. PRECAST BEAMS AND PIER DIAPHRAGMS:
- TIME FROM CASTING OF BEAMS TO POURING OF PIER DIAPHRAGMS MUST BE MORE THAN 90 DAYS. IF THIS TIME FRAME IS NOT SUFFICIENT, THE CONTRACTOR MUST SUBMIT FOR APPROVAL THE DESIGN SHOWING STRUCTURAL CALCULATIONS TO ACCOUNT FOR RESTRAINT MOMENTS.

16. INTERMEDIATE DIAPHRAGMS:

- THE PRECASTER AND/OR THE CONTRACTOR MAY USE A PRECAST CONCRETE OR GALVANIZED STEEL ALTERNATE FOR THE INTERMEDIATE DIAPHRAGMS. IF THIS OPTION IS CHOSEN, INCLUDE NEW CONNECTION DETAILS IN THE PRECAST PRESTRESSED BEAM WORKING DRAWINGS FOR APPROVAL.

17. CONCRETE SEALER:
- REFER TO DIAGRAMS CONTAINING CONCRETE SEALER LIMITS.

18. COFFERDAMS:
-TO BE PROVIDED AND PAID FOR IN ACCORDANCE WITH ITEM 604002 - COFFERDAMS.
-CONTRACTOR WILL SELECT THE TYPE OF COFFERDAM TO BE CONSTRUCTED, HOWEVER, DESIGN AND CONSTRUCT THE COFFERDAM IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF SECTION 604 OF THE STANDARD SPECIFICATIONS.
-THE CONTRACTOR MAY SUBMIT FOR APPROVAL PROPRIETARY DIVERSION DEVICES SUCH AS PORTADAM, AQUA-BARRIER OR APPROVED EQUAL.

SECTION 700

19. ALL PAVED AREAS TO BE RECONSTRUCTED OR WIDENED SHALL BE SAWCUT AT THE POINT WHERE THE NEW PAVEMENT IS TO TIE INTO THE EXISTING PAVEMENT.

SECTION 900

20. THIS PROJECT IS COVERED UNDER AN NPDES GENERAL PERMIT FOR CONSTRUCTION. UNDER THE GENERAL PERMIT, COMPLIANCE WITH DELDOT'S APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLANS WILL CONSTITUTE COMPLIANCE WITH THE NPDES INDUSTRIAL PERMITTING REQUIREMENTS FOR THIS CONSTRUCTION PROJECT. A COPY OF THE NPDES GENERAL PERMIT AND NOI IS KEPT ON FILE IN EACH OF THE CONSTRUCTION OFFICES AND THE DEPARTMENT'S STORMWATER SECTION. A COPY OF THE GENERAL PERMIT OR THE NOI CAN BE OBTAINED UPON REQUEST FROM EITHER THE DEPARTMENT'S STORMWATER ENGINEER OR THE APPROPRIATE CONSTRUCTION ENGINEER.

MISCELLANEOUS

21. THE CONTRACTOR SHALL NOTIFY DART FIRST STATE AT DOT_DETOURS@DELAWARE.GOV AT LEAST 14 DAYS PRIOR TO THE START OF ANY DETOURS OR CONSTRUCTION, AND DOT_DTC_PROJECTDEVELOPMENT@DELAWARE.GOV AT SUCH TIME THE FACILITY IS COMPLETED AND OPERABLE FOR TRANSIT OPERATIONS. FOR EMERGENCY DETOUR INFORMATION ONLY, PLEASE CONTACT DTC'S CHIEF SCHEDULER AT 302-576-6019.

22. DESIGN SPECIFICATIONS:
(A) DELDOT BRIDGE DESIGN MANUAL, 2024 EDITION
(B) AASHTO LRFD BRIDGE SPECIFICATIONS, 2017, 8TH EDITION, CUSTOMARY U.S. UNITS

23. -DEAD LOADS INCLUDE 25 PSF FOR FUTURE WEARING SURFACE ON DECK SLAB AND 15 PSF FOR STAY-IN-PLACE FORMS (INCLUDES CONCRETE IN FORM CORRUGATIONS).
-DESIGN LIVE LOADS INCLUDE HL-93 LOADING.
-FATIGUE DESIGN IS BASED ON THE FOLLOWING ONE DIRECTIONAL TRAFFIC VOLUMES: ADTT = 1,738 (2019).
-LIVE LOAD DISTRIBUTION TO THE GIRDERS IS BASED ON THE AASHTO SIMPLIFIED METHOD.
-LIVE LOAD DEFLECTION IS L/800.
-BARRIERS ON RETAINING WALL HAVE BEEN DESIGNED FOR (MASH) TEST LEVEL 4 (TL-4).
-BARRIERS ON SIDEWALK HAVE BEEN DESIGNED FOR (MASH) TEST LEVEL 2 (TL-2).

24. HYDRAULIC DATA:

DRAINAGE AREA:	24.5 sq. miles	DESIGN FREQUENCY:	50-YEAR
DESIGN DISCHARGE:	29,317 cfs	100-YEAR DISCHARGE:	32,214 cfs
EXISTING 50-YEAR WSE:	EL. 7.75 ft	PROPOSED 50-YEAR WSE:	EL. 7.68 ft
EXISTING 50-YEAR VELOCITY:	7.01 fps	PROPOSED 50-YEAR VELOCITY:	6.71 fps
EXISTING 100-YEAR WSE:	EL. 8.25 ft	PROPOSED 100-YEAR WSE:	EL. 8.17 ft
EXISTING 100-YEAR VELOCITY:	7.56 fps	PROPOSED 100-YEAR VELOCITY:	7.09 fps
EXISTING WATERWAY OPENING:	4656 sq. ft	PROPOSED WATERWAY OPENING:	5293 sq. ft

HYDRAULIC DATA BASED ON UNSTEADY STORM SURGE SCENARIO FOR BLACKBIRD CREEK. PROPOSED WATERWAY OPENING IS THE FLOW AREA FOR THE DESIGN STORM.

25. SCOUR ANALYSIS:
SCOUR DESIGN FREQUENCY: 200 YEARS (AS PER GUIDANCE OF SECTION 104.4 - 'SCOUR EVALUATION AND PROTECTION' FIGURE 104-8)
SCOUR DESIGN FLOOD DISCHARGE: 36,069 cfs
SCOUR DESIGN FLOOD VELOCITY: 7.37 fps (AT BRIDGE OUTLET)
WATER SURFACE ELEVATION: 9.18 ft (IMMEDIATELY UPSTREAM OF BRIDGE)
TOTAL CALCULATED SCOUR DEPTH AT WEST ABUTMENT: 14.8'
TOTAL CALCULATED SCOUR DEPTH AT PIER 1: 13.8'
TOTAL CALCULATED SCOUR DEPTH AT PIER 2: 14.7'
TOTAL CALCULATED SCOUR DEPTH AT PIER 3: 19.2'
TOTAL CALCULATED SCOUR DEPTH AT EAST ABUTMENT: 4.9'

NOTE FOR TIDAL AREAS THE FOLLOWING ADDITIONAL INFORMATION IS REQUIRED:
MEAN HIGH WATER ELEVATION: 2.55'
MEAN LOW WATER ELEVATION: -2.79'
VERTICAL UNDER CLEARANCE: 10.28'

SCOUR COUNTERMEASURES HAVE BEEN DESIGNED FOR THE SCOUR DESIGN FLOOD IN ACCORDANCE WITH HEC 23 - BRIDGE SCOUR AND STREAM INSTABILITY COUNTERMEASURES.

26. ANY STAGING AND/OR STOCKPILE AREA(S) OUTSIDE THE PROJECT'S LIMIT OF CONSTRUCTION (LOC) THAT INDIVIDUALLY OR CUMULATIVELY ARE LARGER THAN 10,000 SQUARE FEET, MUST BE APPROVED BY DELDOT'S ARCHAEOLOGIST. CONTACT THE CONSTRUCTION AREA ENGINEER WHO WILL COORDINATE WITH DELDOT'S ARCHAEOLOGIST.
WITHIN 30 DAYS, DELDOT WILL;
1) APPROVE THE USE OF THE PROPOSED STAGING AND STOCKPILE AREA(S);
2) REJECT THE REQUEST; OR
3) PERFORM AN ARCHAEOLOGICAL SURVEY TO DETERMINE WHETHER TO APPROVE OR REJECT THE REQUEST, WHICH MAY TAKE UP TO 3 MONTHS. IF AN ARCHAEOLOGICAL SURVEY IS NECESSARY, DELDOT OR A CONSULTANT ON ITS BEHALF WILL UNDERTAKE THE SURVEY.

27. UTILITIES:
SEE UTILITY STATEMENT AND UTILITY RELOCATION PLAN SHEETS FOR FURTHER INFORMATION ON UTILITY COORDINATION.

28. THE BRIDGE PLANS WERE DEVELOPED FROM A 3D MODEL USING THE ALLPLAN BRIDGE SOFTWARE AS PART OF A PILOT PROJECT WITH THE DEPARTMENT. THE PRESENTATION STYLE OF THE DETAILS AND REINFORCEMENT MAY NOT BE CONSISTENT WITH THE DRAWING PRESENTATION STANDARDS OF THE DEPARTMENT.

BRIDGE 1-447 LOAD RATING SUMMARY

DESIGN VEHICLE	RATING FACTOR	RATING WEIGHT (TONS)	CONTROLLING MEMBER	CONTROLLING POINT	LOAD EFFECT
HL-93 TRUCK (INVENTORY)	1.25	N/A	SPAN 1/4, INT.	MIDSPAN	SERVICE III
HL-93 TANDEM (INVENTORY)	1.45	N/A	SPAN 1/4, INT.	MIDSPAN	SERVICE III
HS20 (INVENTORY)	1.77	63.86	SPAN 1/4, INT.	MIDSPAN	SERVICE III
HL-93 TRUCK (OPERATING)	2.06	N/A	SPAN 1/4, EXT.	PIER 1/3	STRENGTH I
HL-93 TANDEM (OPERATING)	2.43	N/A	SPAN 1/4, EXT.	PIER 1/3	STRENGTH I
HS20 (OPERATING)	3.23	116.28	SPAN 1/4, EXT.	PIER 1/3	STRENGTH I
DE S220	2.44	48.80	SPAN 1/4, INT.	MIDSPAN	SERVICE III
DE S335	1.37	47.95	SPAN 1/4, INT.	MIDSPAN	SERVICE III
DE S437	1.30	48.10	SPAN 1/4, INT.	MIDSPAN	SERVICE III
DE T330	1.85	55.50	SPAN 1/4, INT.	MIDSPAN	SERVICE III
DE T435	1.61	56.35	SPAN 1/4, INT.	MIDSPAN	SERVICE III
DE T540	1.43	57.20	SPAN 1/4, INT.	MIDSPAN	SERVICE III
EV2	1.71	49.16	SPAN 1/4, INT.	MIDSPAN	SERVICE III
EV3	1.13	48.59	SPAN 1/4, INT.	MIDSPAN	SERVICE III
SU4	1.77	47.79	SPAN 1/4, INT.	MIDSPAN	SERVICE III
SU5	1.59	49.29	SPAN 1/4, INT.	MIDSPAN	SERVICE III
SU6	1.42	49.35	SPAN 1/4, INT.	MIDSPAN	SERVICE III
SU7	1.30	50.38	SPAN 1/4, INT.	MIDSPAN	SERVICE III

NOTE: LOAD RATING INCLUDES FUTURE WEARING SURFACE AS NOTED IN THE PLANS.

EARTHWORK SUMMARY

EXCAVATION	
EXCAVATION FROM CROSS SECTIONS	5389 C.Y.
ROCK EXCAVATION FOR ROADWAY AND TRENCHES	0 C.Y.
TOPSOIL STRIPPING	0 C.Y.
TOTAL EXCAVATION	5389 C.Y.
EXCAVATION AVAILABLE FOR EMBANKMENT	
EXCAVATION MEETING BORROW TYPE 'A'	0 C.Y.
EXCAVATION MEETING BORROW TYPE 'F'	0 C.Y.
EXCAVATION MEETING TOPSOIL	0 C.Y.
EMBANKMENT REQUIREMENTS	
BORROW TYPE 'C' REQUIRED (INCLUDING UNDERCUT)	16469 C.Y.
BORROW TYPE 'F' REQUIRED	0 C.Y.
TOPSOIL REQUIRED	295 C.Y.
MATERIAL BALANCE ("+"= EXCESS, "-"= NEED)	
BORROW TYPE 'C'	-16469 C.Y.
BORROW TYPE 'F'	0 C.Y.
TOPSOIL	-295 C.Y.
UNSUITABLE MATERIAL	5389 C.Y.

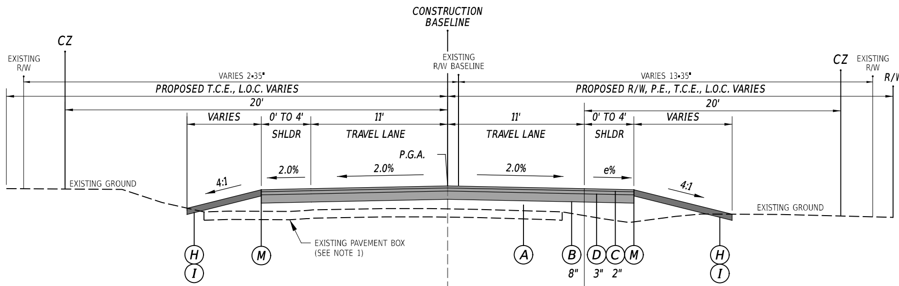
NOTES:

1) THE VALUES LISTED IN THE EARTHWORK SUMMARY ARE APPROXIMATE AND ARE NOT TO BE USED AS A BASIS OF PAYMENT. THE EARTHWORK SUMMARY IS CONSIDERED FOR INFORMATIONAL PURPOSES ONLY.

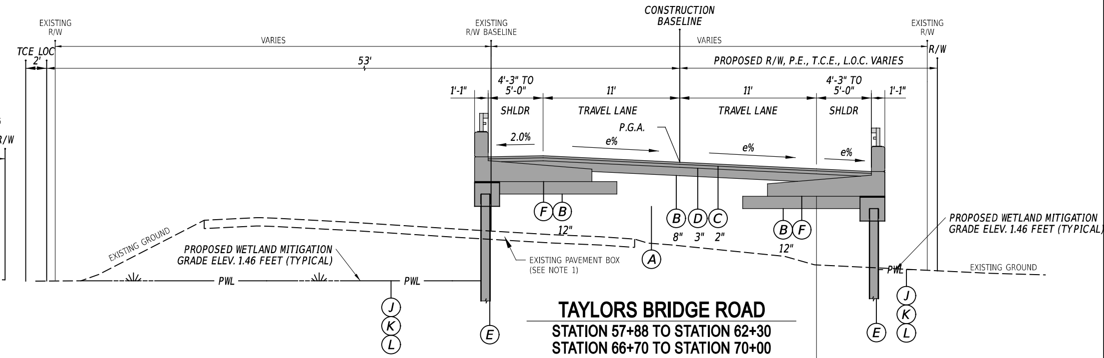
2) OTHER SOURCES OF EXCAVATION MAY INCLUDE PIPE TRENCH EXCAVATION, STRUCTURE EXCAVATION, UNDERCUT EXCAVATION, STORMWATER MANAGEMENT POND EXCAVATION, ENVIRONMENTAL SITE EXCAVATION, MAINTENANCE OF TRAFFIC EXCAVATION, ETC.

3) UNSUITABLE MATERIALS INCLUDE UNDERCUT SOILS, BITUMINOUS PAVEMENT, ETC.

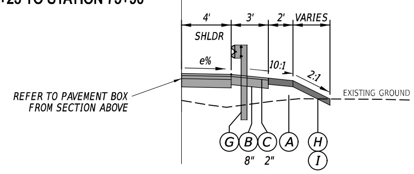
PENNONI ASSOCIATES INC.
FILE NAME: $FILEA$
MICROSTATION VERSION: $VERSION$
MICROSTATION WORKSPACE: $WORKSPACE$
PEN TABLE: $PENTBL$$
PLOT DRIVER: $PLTDRV$$
DATE PLOTTED: 20-FEB-2025 @ 10:11
USER NAME: $USER$ OFFICE LOCATION: $OFFICENAME$



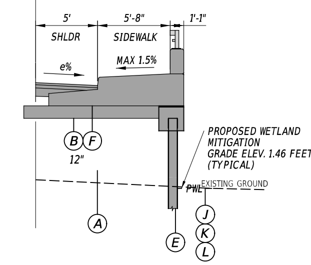
TAYLORS BRIDGE ROAD
STATION 51+00 TO STATION 57+20
STATION 72+25 TO STATION 75+90



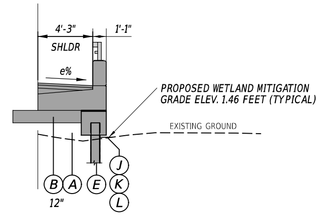
TAYLORS BRIDGE ROAD
STATION 57+88 TO STATION 62+30
STATION 66+70 TO STATION 70+00



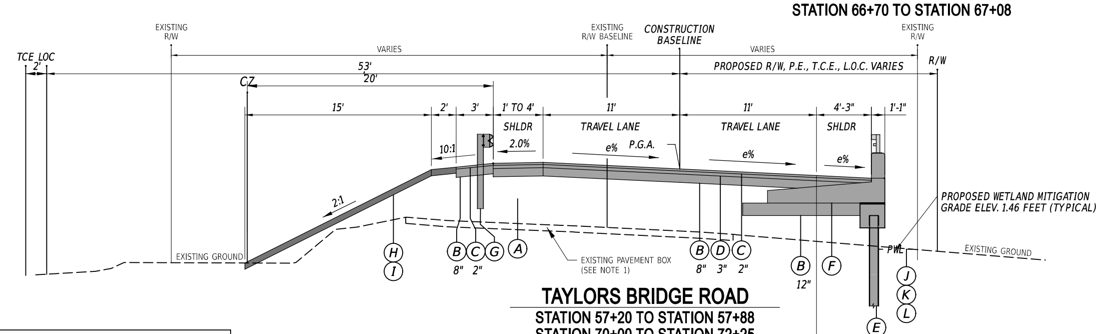
TAYLORS BRIDGE ROAD
STATION 55+00 TO STATION 56+24
STATION 72+75 TO STATION 73+40



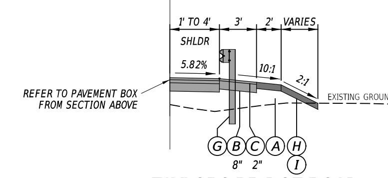
TAYLORS BRIDGE ROAD
STATION 61+93 TO STATION 62+30
STATION 66+70 TO STATION 67+08



TAYLORS BRIDGE ROAD
STATION 56+24 TO STATION 57+20



TAYLORS BRIDGE ROAD
STATION 57+20 TO STATION 57+88
STATION 70+00 TO STATION 72+25



TAYLORS BRIDGE ROAD
STATION 72+00 TO STATION 72+75

NOTES:

1. EXISTING PAVEMENT SECTION PER ARCHIVE CONTRACT 1090 (REFER TO ROAD CORE SCHEDULES ON CONSTUCTION PLANS FOR MORE INFORMATION).

MATERIAL TYPE	BINDER GRADE	LIFT THICKNESS (IN) MINIMUM	LIFT THICKNESS (IN) MAXIMUM
TYPE C (4.75 MM MIX)	ALL	0.5	1.0
TYPE C (9.5 MM MIX)	ALL	1.25	2.0
TYPE C (12.5 MM MIX)	ALL	1.5	2.0
TYPE B (19 MM MIX)	76-22, 70-22	2.25	4.0
TYPE B (19 MM MIX)	64-22	2.25	6.0
TYPE BCBC (25 MM MIX)	64-22	3.0	6.0
GABC	-	4.0	8.0

LEGEND

- (A) ITEM 209004 - BORROW, TYPE C
- (B) ITEM 301001 - GABC
- (C) ITEM 401005 - SUPERPAVE TYPE C, PG 64-22 (CARBONATE STONE)
- (D) ITEM 401014 - SUPERPAVE TYPE B, PG 64-22
- (E) ITEM 608000 - STEEL SHEET PILES, PZ 22
- (F) ITEM 610017 - PCC MASONRY SUPERSTRUCTURE, CLASS D
- (G) ITEM 720021 - GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31
- (H) ITEM 908004 - TOPSOIL, 6" DEPTH
  ITEM 908014 - PERMANENT GRASS SEEDING, DRY GROUND
- (I) ITEM 908020- EROSION CONTROL BLANKET MULCH
- (J) ITEM 202000 - EXCAVATION AND EMBANKMENT
- (K) ITEM 911000 - PLANTINGS
- (L) ITEM 908515 - TEMPORARY GRASS SEEDING, WET GROUND (IF AND WHEN DIRECTED)
- (M) SAFETY EDGE FOR ROADWAY PAVEMENT

ADDENDA / REVISIONS

NOT TO SCALE

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	T201907102	BRIDGE NO.	1-447
COUNTY	NEW CASTLE	DESIGNED BY:	E. HARASTY
		CHECKED BY:	O. GREEN

TYPICAL SECTIONS

SECTION PAI

SHEET NO. 7

CIRCULAR CURVE NO. 7

		STATION	NORTHING	EASTING
PC	(10016)	55+68.68	511130.0774	603937.8088
PI	(10017)	58+97.18	511444.4141	604033.2462
CC			510897.6614	604703.3039
PT	(10018)	61+92.10	511600.9702	604322.0472

Radius: 800.00'
Delta: 44°38'57.24" Right
Degree of Curvature (Arc): 23°29'50.06"
Length: 623.42'
Tangent: 328.51'
Chord: 607.77'
Middle Ordinate: 59.96'
External: 64.82'
Tangent Direction: N 16°53'20.73"E
Radial Direction: S 73°06'39.27"E
Chord Direction: N 39°12'49.35"E
Radial Direction: S 28°27'42.03"E
Tangent Direction: N 61°32'17.97"E

SPIRAL CURVE NO. 1

		STATION	NORTHING	EASTING
TS	(10001)	3+33.73	511098.2236	603927.9712
SPI	(10002)	5+34.60	511290.7883	603985.1523
SC	(10003)	6+33.73	511375.2863	604040.1068

Entrance Radius: 0.00'
Exit Radius: 520.87'
Length: 300.00'
Angle: 16°29'59.92" Right
Constant: 395.30'
Long Tangent: 200.88'
Short Tangent: 100.80'
Long Chord: 298.89'
Xs: 297.52'
Ys: 28.63'
P: 7.18'
K: 149.59'
Tangent Direction: N 16°32'18.72" E
Radial Direction: S 73°27'41.28" E
Chord Direction: N 22°02'04.76" E
Radial Direction: S 56°57'41.36" E
Tangent Direction: N 33°02'18.64" E

CIRCULAR CURVE NO. 2

		STATION	NORTHING	EASTING
SC	(10003)	6+33.73	511375.2863	604040.1068
PI	(10004)	6+88.47	511421.1797	604069.9542
CC	(10018)		511091.3064	604476.7542
CS	(10005)	7+42.82	511459.8646	604108.6912

Radius: 520.87'
Delta: 11°59'59.92" Right
Degree of Curvature (Arc): 11°00'00.05"
Length: 109.09'
Tangent: 54.75'
Chord: 108.89'
Middle Ordinate: 2.85'
External: 2.87'
Tangent Direction: N 33°02'18.75" E
Radial Direction: S 56°57'41.25" E
Chord Direction: N 39°02'18.71" E
Radial Direction: S 44°57'41.33" E
Tangent Direction: N 45°02'18.67" E

SPIRAL CURVE NO. 3

		STATION	NORTHING	EASTING
CS	(10005)	7+42.82	511459.8646	604108.6912
SPI	(10006)	8+43.62	511531.0903	604180.0129
ST	(10007)	10+42.82	511626.8209	604356.6097

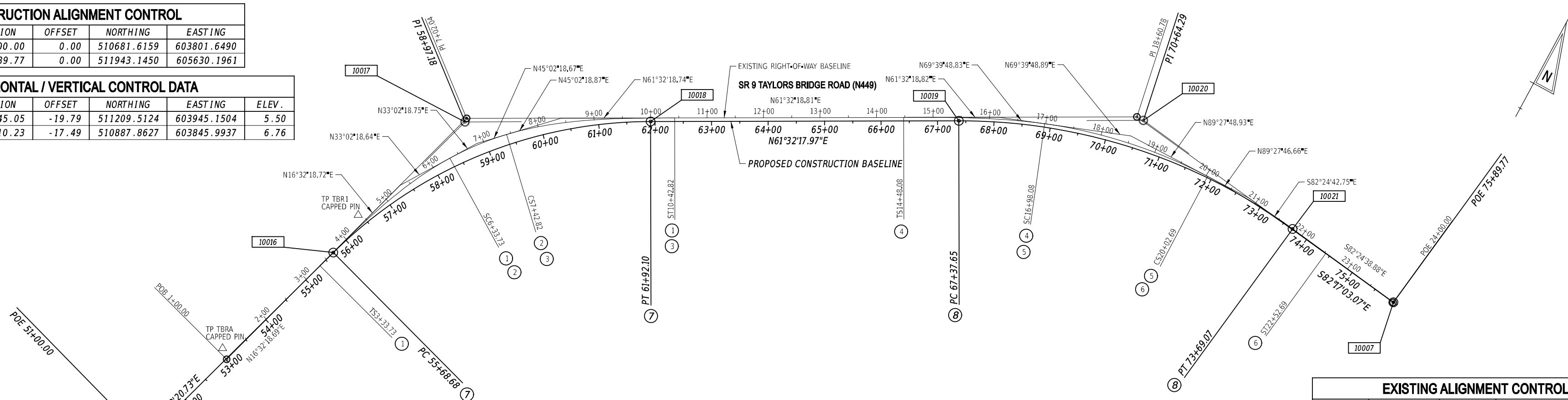
Entrance Radius: 520.87'
Exit Radius: 0.00'
Length: 300.00'
Angle: 16°29'59.87" Right
Constant: 395.30'
Long Tangent: 200.88'
Short Tangent: 100.80'
Long Chord: 298.89'
Xs: 297.52'
Ys: 28.63'
P: 7.18'
K: 149.59'
Tangent Direction: N 45°02'18.87" E
Radial Direction: S 44°57'41.13" E
Chord Direction: N 56°02'32.71" E
Radial Direction: S 28°27'41.26" E
Tangent Direction: N 61°32'18.74" E

CONSTRUCTION ALIGNMENT CONTROL

POINT NO.	STATION	OFFSET	NORTHING	EASTING
10000	51+00.00	0.00	510681.6159	603801.6490
10007	75+89.77	0.00	511943.1450	605630.1961

HORIZONTAL / VERTICAL CONTROL DATA

POINT NO.	STATION	OFFSET	NORTHING	EASTING	ELEV.
TBR1	56+45.05	-19.79	511209.5124	603945.1504	5.50
TBRA	53+10.23	-17.49	510887.8627	603845.9937	6.76



EXISTING ALIGNMENT CONTROL

POINT NO.	STATION	OFFSET	NORTHING	EASTING
10000	1+00.00	0.00	510874.1641	603861.4378
10008	6+88.27	-50.69	511451.2962	604032.8144
10016	18+50.38	-48.60	512016.6364	605075.7144
10017	24+00.00	0.00	511942.6823	605630.8313

DATUM REFERENCE:
HORIZONTAL - THIS PROJECT IS REFERENCED TO THE DELAWARE STATE PLANE COORDINATE SYSTEM, NORTH AMERICAN DATUM OF 1983/2011 (NAD 83/2011).

VERTICAL - THIS PROJECT IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

CIRCULAR CURVE NO. 8

		STATION	NORTHING	EASTING
PC	(10019)	67+37.65	511860.9659	604801.6645
PI	(10020)	70+64.29	512016.6296	605088.8193
CC			510981.8298	605277.2353
PT	(10021)	73+69.07	511972.7760	605412.4950

Radius: 1000.00'
Delta: 36°10'38.96" Right
Degree of Curvature (Arc): 18°47'52.054"
Length: 631.42'
Tangent: 326.63'
Chord: 620.98'
Middle Ordinate: 49.42'
External: 51.99'
Tangent Direction: N 61°32'17.97"E
Radial Direction: S 28°27'42.03"E
Chord Direction: N 79°37'37.45"E
Radial Direction: S 07°42'56.93"W
Tangent Direction: S 82°17'03.07"E

SPIRAL CURVE NO. 4

		STATION	NORTHING	EASTING
TS	(10009)	14+48.08	511819.9537	604712.8877
SPI	(10010)	16+14.92	511899.4651	604859.5648
SC	(10011)	16+98.08	511928.4816	604937.8535

Entrance Radius: 0.00'
Exit Radius: 881.47'
Length: 250.00'
Angle: 8°07'30.01" Right
Constant: 469.43'
Long Tangent: 166.84'
Short Tangent: 83.49'
Long Chord: 249.78'
Xs: 249.50'
Ys: 11.80'
P: 2.95'
K: 124.92'
Tangent Direction: N 61°32'18.82" E
Radial Direction: S 28°27'41.18" E
Chord Direction: N 64°14'47.16" E
Radial Direction: S 20°20'11.17" E
Tangent Direction: N 69°39'48.83" E

CIRCULAR CURVE NO. 5

		STATION	NORTHING	EASTING
SC	(10011)	16+98.08	511928.4816	604937.8535
PI	(10012)	18+51.92	511981.9463	605082.1055
CC	(10019)		511101.9551	605244.1923
CS	(10013)	20+02.69	511983.3865	605235.9400

Radius: 881.47'
Delta: 19°48'00.00" Right
Degree of Curvature (Arc): 6°30'00.09"
Length: 304.61'
Tangent: 153.84'
Chord: 303.10'
Middle Ordinate: 13.13'
External: 13.32'
Tangent Direction: N 69°39'48.89" E
Radial Direction: S 20°20'11.11" E
Chord Direction: N 79°33'48.91" E
Radial Direction: S 00°32'11.07" E
Tangent Direction: N 89°27'48.93" E

SPIRAL CURVE NO. 6

		STATION	NORTHING	EASTING
CS	(10013)	20+02.69	511983.3865	605235.9400
SPI	(10014)	20+86.18	511984.1691	605319.4309
ST	(10015)	22+52.69	511962.1370	605484.8151

Entrance Radius: 881.47'
Exit Radius: 0.00'
Length: 250.00'
Angle: 8°07'30.58" Right
Constant: 469.44'
Long Tangent: 166.84'
Short Tangent: 83.49'
Long Chord: 249.78'
Xs: 249.50'
Ys: 11.80'
P: 2.95'
K: 124.92'
Tangent Direction: N 89°27'46.66" E
Radial Direction: S 00°32'13.34" E
Chord Direction: S 85°07'11.29" E
Radial Direction: S 07°35'17.25" W
Tangent Direction: S 82°24'42.75" E

ADDENDA / REVISIONS

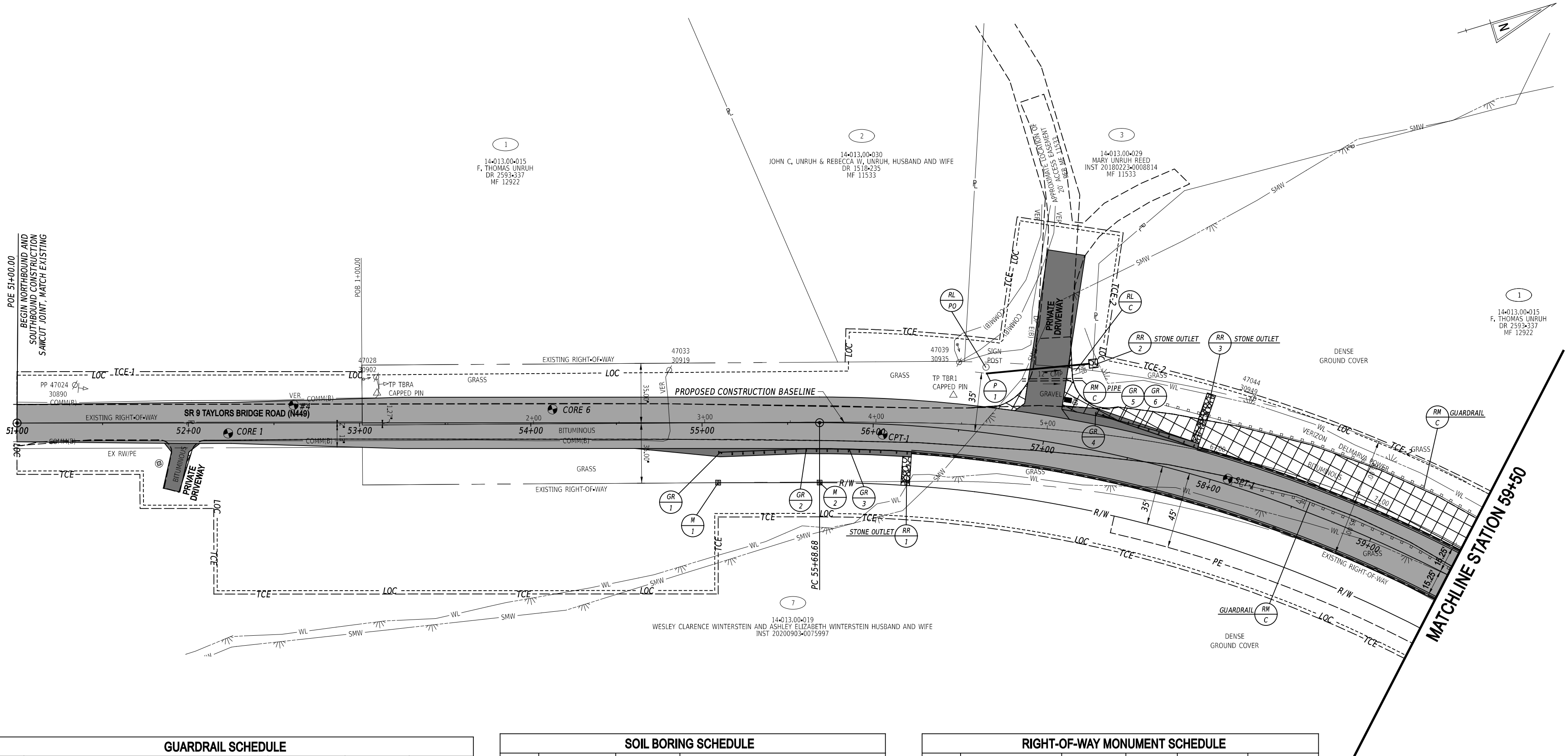
SCALE 0 100 200 300 FEET

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	E. HARASTY
COUNTY		
NEW CASTLE	CHECKED BY:	O. GREEN

HORIZONTAL AND VERTICAL CONTROL

SECTION: PAI
SHEET NO. 8



GUARDRAIL SCHEDULE

NO.	ITEM DESCRIPTION / TYPE	BEGIN STA.	OFFSET	LENGTH
1	GUARDRAIL END TREATMENT, TYPE 1-31, TL3	55+08.00	17.08	50.00
2	STEEL BEAM GUARDRAIL, TYPE 1-31	55+58.00	15.10	25.00
3	GR TO BARRIER CONNECTION, APPROACH TYPE 3-31	55+83.00	15.17	43.56
4	GUARDRAIL END ANCHORAGE, TYPE 31, TL3	57+26.55	21.89	14.17
5	STEEL BEAM GUARDRAIL, TYPE 1-31	57+40.72	19.21	12.50
6	GR TO BARRIER CONNECTION, APPROACH TYPE 3-31	57+53.22	16.07	43.56

DRAINAGE PIPE SCHEDULE

NO.	SIZE / TYPE	CLASS	LENGTH	SLOPE	INVERT EL.	DIS. EL.
1	15" RCP	III	60.00	0.0150	3.90	3.00

SOIL BORING SCHEDULE

NO.	STATION	OFFSET	DESCRIPTION
SPT-1	58+09.68	-3.26	5.5" ASPHALT, 20" GABC
CPT-1	56+05.82	6.01	6" COMBINED ASPHALT AND GABC

ROAD CORE SCHEDULE

NO.	STATION	OFFSET	DESCRIPTION
1	52+23.00	6.10	1" SURFACE TREATMENT, 6" ASPHALT
6	54+13.00	-7.90	1" SURFACE TREATMENT, 6.5" ASPHALT

RIPRAP SCHEDULE

NO.	TYPE	AREA (SY)
1*	R-4	9.33
2*	R-4	2.78
3*	R-4	16.50

* REFER TO STANDARD DETAIL E-21 (2024)

RIGHT-OF-WAY MONUMENT SCHEDULE

NO.	TYPE	STATION	OFFSET	NORTHING	EASTING
1	CONCRETE MONUMENT	55+09.43	35.00	511063.2140	603954.0857
2	CONCRETE MONUMENT	55+68.68	35.00	511119.9092	603971.2992

PENNONI ASSOCIATES INC.
FILE NAME: $FILEA$
MICROSTATION VERSION: $VERSION$
MICROSTATION WORKSPACE: $WORKSPACE$
PEN TABLE: $PENTBL$
PLOT DRIVER: $PLTDRV$
DATE PLOTTED: 20-FEB-2025 @ 10:12
USER NAME: $USER$ OFFICE LOCATION: $OFFICENAME$

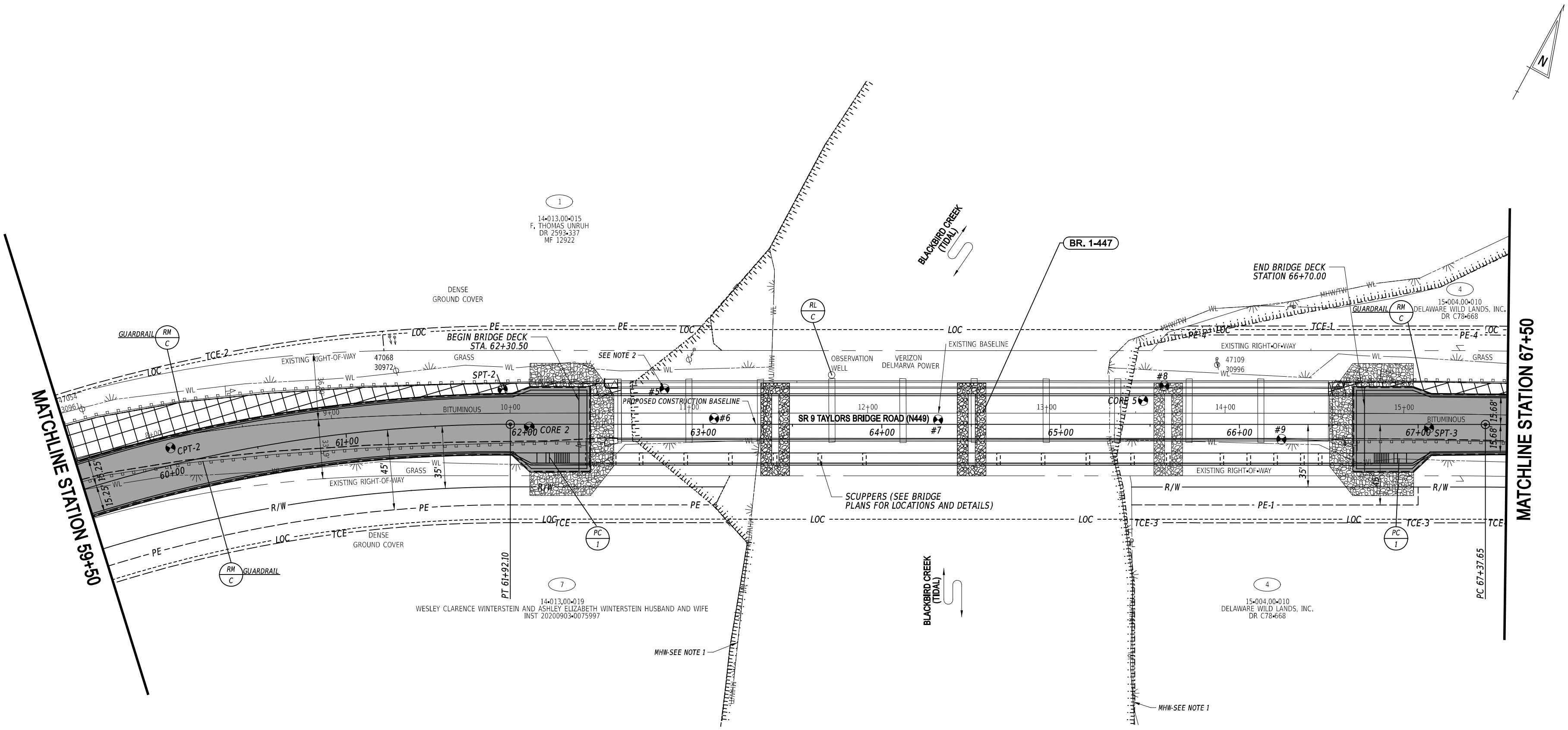
ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	E. HARASTY
COUNTY		
NEW CASTLE	CHECKED BY:	O. GREEN

CONSTRUCTION PLAN



ROAD CORE SCHEDULE

NO.	STATION	OFFSET	DESCRIPTION
2	62+03.00	1.55	1.75" SURFACE TREATMENT, 25.75" ASPHALT
5	65+46.00	-13.40	1" SURFACE TREATMENT, 11" ASPHALT

SOIL BORING SCHEDULE

NO.	STATION	OFFSET	DESCRIPTION
SPT-2	61+87.91	-19.56	20" ASPHALT, 14.4" GABC
SPT-3	67+06.11	1.88	15" ASPHALT, 8.4" GABC
CPT-2	60+02.43	-8.39	6" COMBINED ASPHALT AND GABC

NOTES:

1. MEAN HIGH WATER LINEWORK SHOWN WAS DEVELOPED USING ELEVATIONS AND TIDE GAUGE DATA
2. SEE SOIL BORING SHEETS FOR HISTORICAL BORING INFORMATION: BORINGS #5, #6, #7, #8, #9

PENNONI ASSOCIATES INC. | PEN TABLE: $PENTBL$
FILE NAME: $FILEA$ | PLOT DRIVER: $PLTDRV$
MICROSTATION VERSION: $VERSION$ | DATE PLOTTED: 20-FEB-2025 @ 10:12
MICROSTATION WORKSPACE: $WORKSPACE$ | USER NAME: $USER$ OFFICE LOCATION: $OFFICENAME$

ADDENDA / REVISIONS

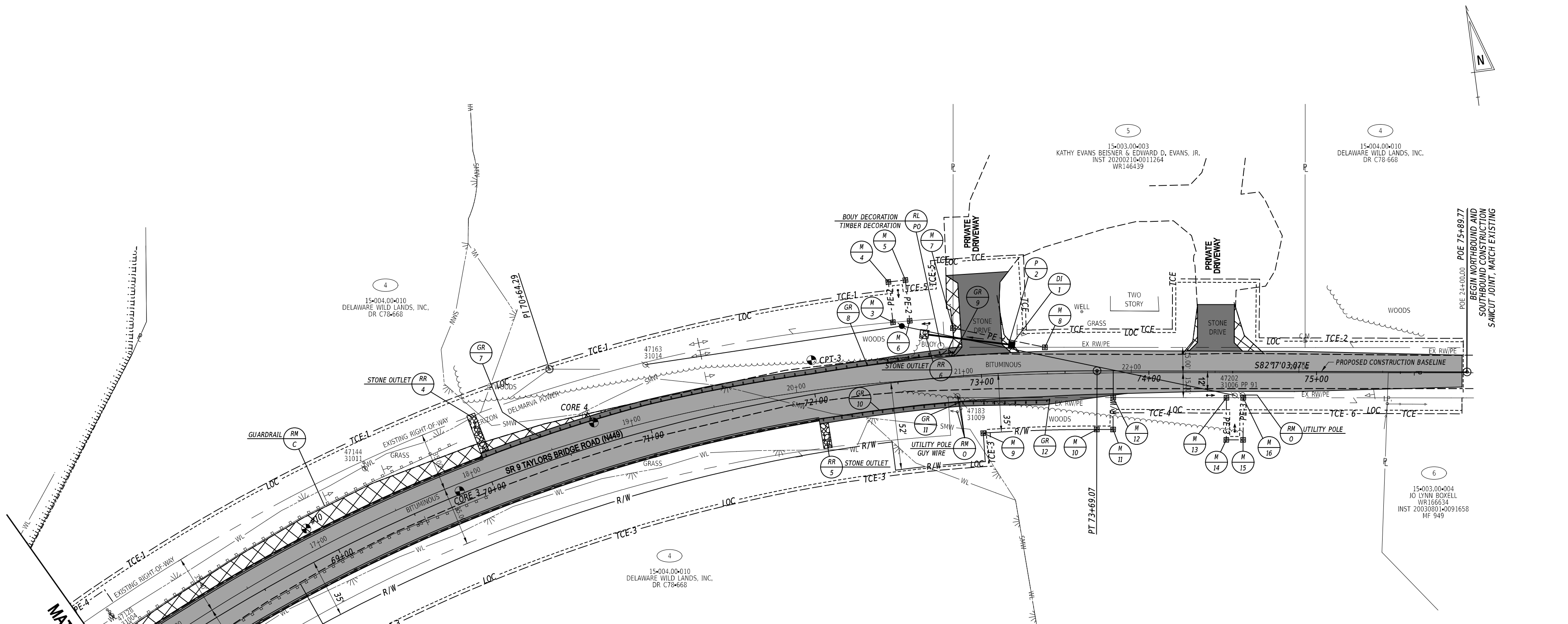
SCALE 0 30 60 90 FEET

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	O. GREEN

CONSTRUCTION PLAN

CP-02
SECTION PAI
SHEET NO. 10



RIGHT-OF-WAY MONUMENT SCHEDULE

NO.	TYPE	STATION	OFFSET	NORTHING	EASTING
3	CAPPED REBAR	72+51.22	-35.78	512017.4586	605295.6529
4	CAPPED REBAR	72+51.22	-60.00	512041.6799	605296.0602
5	CAPPED REBAR	72+60.87	-60.00	512041.4584	605306.2922
6	CAPPED REBAR	72+60.87	-35.55	512017.0150	605305.6450
7	CAPPED REBAR	72+85.38	-28.80	512009.2960	605330.6566
8	CAPPED REBAR	73+38.38	-14.41	511990.7659	605383.5191
9	CONCRETE MONUMENT	73+03.06	35.00	511944.8296	605340.3675
10	CONCRETE MONUMENT	73+69.07	35.00	511938.0929	605407.7959
11	CONCRETE MONUMENT	73+78.79	35.00	511936.7882	605417.4257
12	CONCRETE MONUMENT	73+78.79	15.98	511955.6429	605419.9803
13	CAPPED REBAR	74+46.32	15.82	511946.7231	605486.9267
14	CAPPED REBAR	74+46.32	40.94	511921.8394	605483.5504
15	CAPPED REBAR	74+56.32	40.94	511920.4948	605493.4596
16	CAPPED REBAR	74+56.32	15.80	511945.4024	605496.8392

RIPRAP SCHEDULE

NO.	TYPE	AREA (SY)
4*	R-4	13.33
5*	R-4	8.33
6*	R-4	2.78

* REFER TO STANDARD DETAIL E-21 (2024)

GUARDRAIL SCHEDULE

NO.	ITEM DESCRIPTION / TYPE	BEGIN STA.	OFFSET	LENGTH
7	GR TO BARRIER CONNECTION, APPROACH TYPE 3-31	70+36.56	15.25	43.56
8	STEEL BEAM GUARDRAIL, TYPE 1-31	72+36.56	15.16	200.00
9	GUARDRAIL END TREATMENT, TYPE 1-31, TL3	72+86.56	12.00	50.00
10	GR TO BARRIER CONNECTION, APPROACH TYPE 3-31	72+00.03	15.25	43.56
11	STEEL BEAM GUARDRAIL, TYPE 1-31	72+36.59	15.16	50.00
12	GUARDRAIL END TREATMENT, TYPE 1-31, TL3	72+86.59	17.25	50.00

DRAINAGE PIPE SCHEDULE

NO.	SIZE / TYPE	CLASS	LENGTH	SLOPE	INVERT EL.	DIS. EL.
2	12" RCP	III	48.00	0.0146	7.70	7.00

DRAINAGE INLET SCHEDULE

NO.	STATION	OFFSET	BOX SIZE	GRATE	T.G. EL.	INV. EL.
1	73+19.20	16.73	34" x 24"	2	9.92	7.70

ROAD CORE SCHEDULE

NO.	STATION	OFFSET	DESCRIPTION
3	69+80.00	-1.90	0.75" SURFACE TREATMENT, 4.25" ASPHALT
4	70+69.00	-13.70	1" SURFACE TREATMENT, 6" ASPHALT

SOIL BORING SCHEDULE

NO.	STATION	OFFSET	DESCRIPTION
CPT-3	72+01.33	-20.15	6" COMBINED ASPHALT AND GABC

NOTES:

1. SEE SOIL BORING SHEETS FOR HISTORICAL BORING INFORMATION: BORING #10.

ADDENDA / REVISIONS

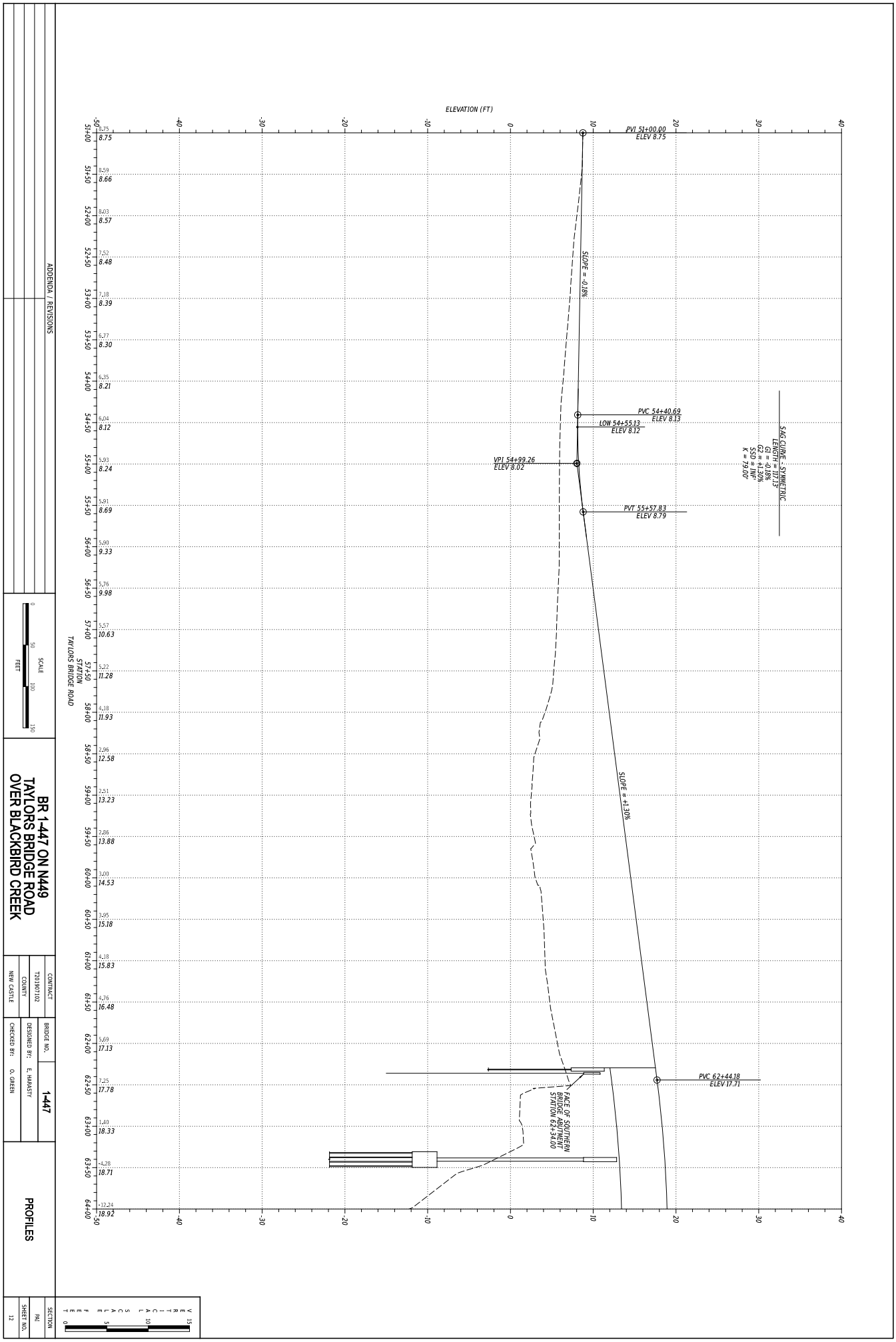
SCALE 0 30 60 90 FEET

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	T201907102	BRIDGE NO.	1-447
COUNTY	NEW CASTLE	DESIGNED BY:	E. HARASTY
		CHECKED BY:	O. GREEN

CONSTRUCTION PLAN

PENNONI ASSOCIATES INC.	PEN TABLE: $PENTBL$$
FILE NAME: $FILE$$	PLOT DRIVER: $PLTDRV$$
MICROSTATION VERSION: $VERSION$$	DATE PLOTTED: 20-FEB-2025 @ 10:12
MICROSTATION WORKSPACE: $WORKSPACE$$	USER NAME: $USER$$ OFFICE LOCATION: $OFFICENAME$$



ADDENDA / REVISIONS

SCALE FEET 0 50 100 150

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

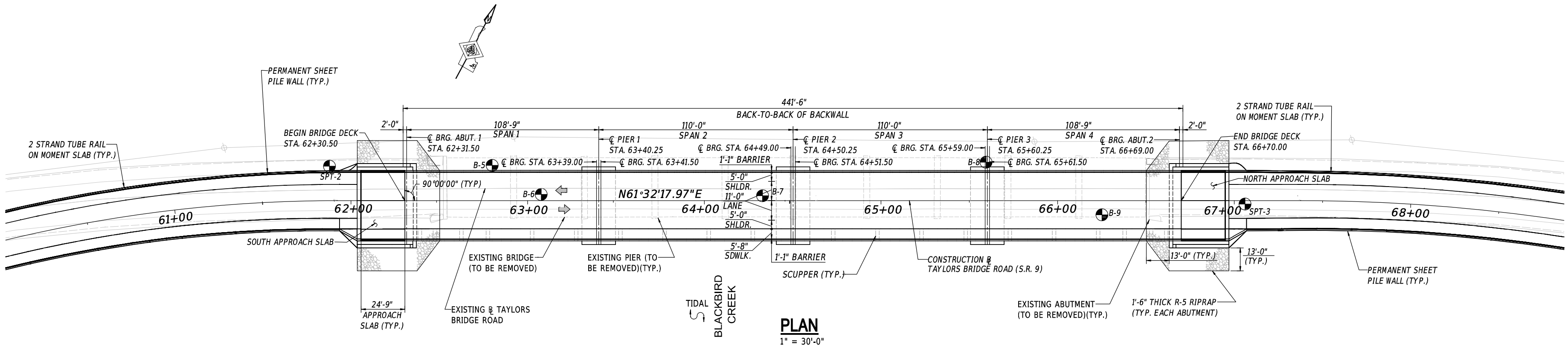
CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	D. GREEN

PROFILES

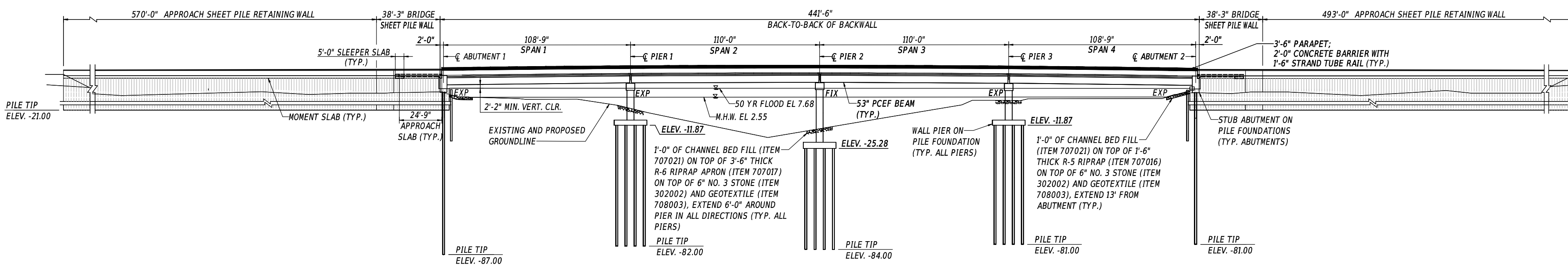
SECTION	PA1
SHEET NO.	12

VERTICAL EXAGGERATION 0 5 10 15

PENNONI ASSOCIATES INC. | PEN TABLE: $PENTBLS$
FILE NAME: ..\1-447 Taylors Bridge 2023-09-26\1-PLAN AND ELEVATION | PLOT DRIVER: $PLTDRVS$
ALLPLAN VERSION: Allplan 2023 | DATE PLOTTED: 2/19/2025 @ 11:53
MICROSTATION WORKSPACE: | USER NAME: BMarshall OFFICE LOCATION:



PLAN
1" = 30'-0"



ELEVATION
1" = 30'-0"

NOTES:

1. FOR PROJECT NOTES, SEE SHEETS 5-6.
2. EXISTING BRIDGE TO BE REMOVED, SEE CONTRACT NO. 1090 FOR DETAILS OF EXISTING BRIDGE.
3. FOR SCUPPER LOCATIONS, SEE SHEET 37.

ADDENDA / REVISIONS

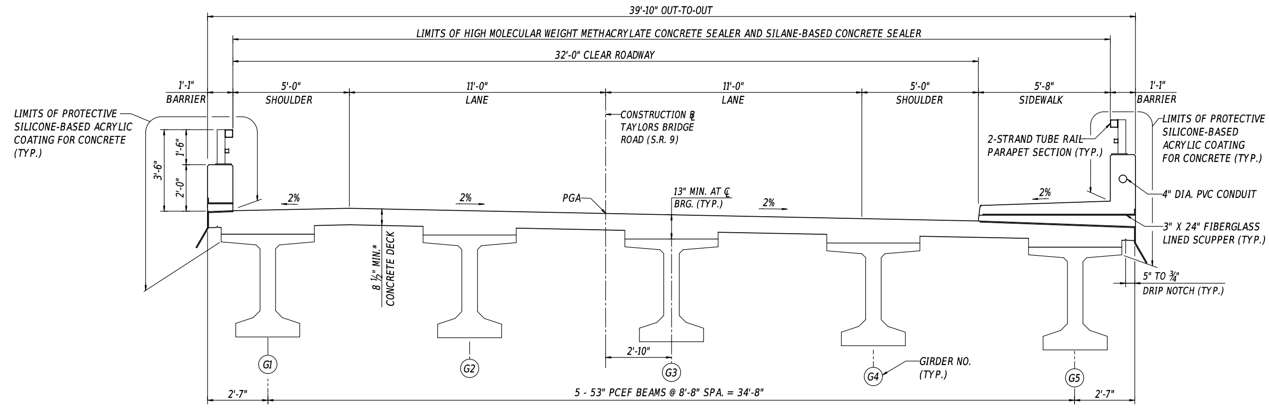
SCALE AS NOTED

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	B.MARSHALL
COUNTY		
NEW CASTLE	CHECKED BY:	H.BROWN

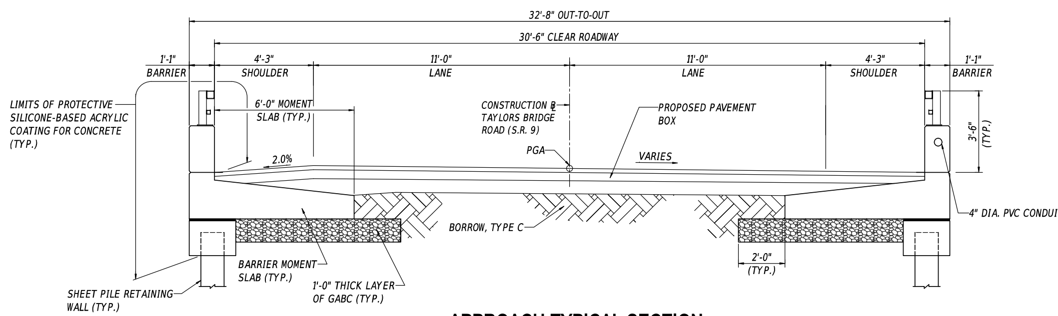
PLAN AND ELEVATION

SECTION: PAI
SHEET NO. 17



BRIDGE TYPICAL SECTION
3/8" = 1'-0"

*INCLUDES 1/2" INTEGRAL WEARING SURFACE.

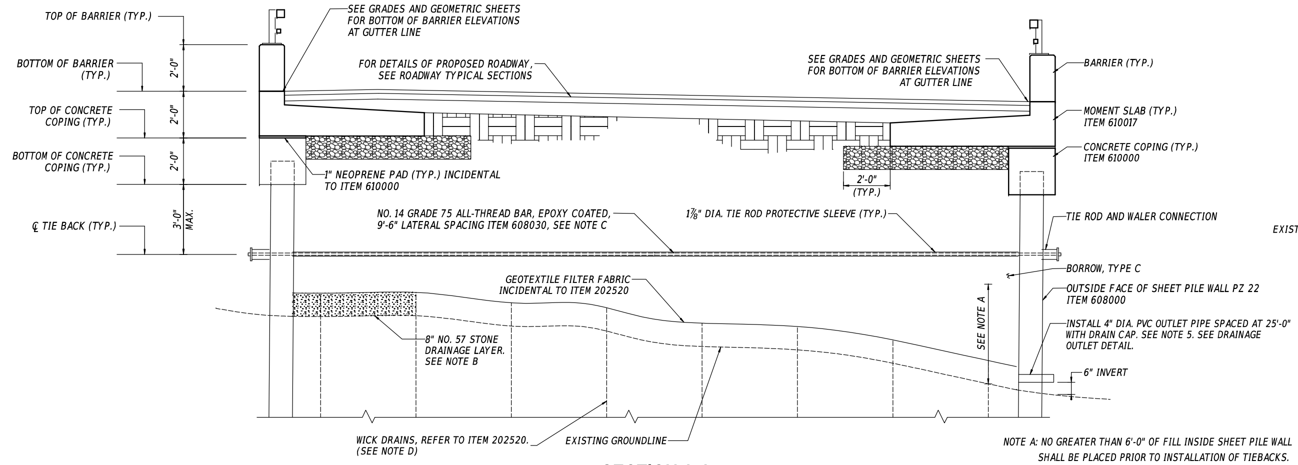


APPROACH TYPICAL SECTION
3/8" = 1'-0"

NOTES:

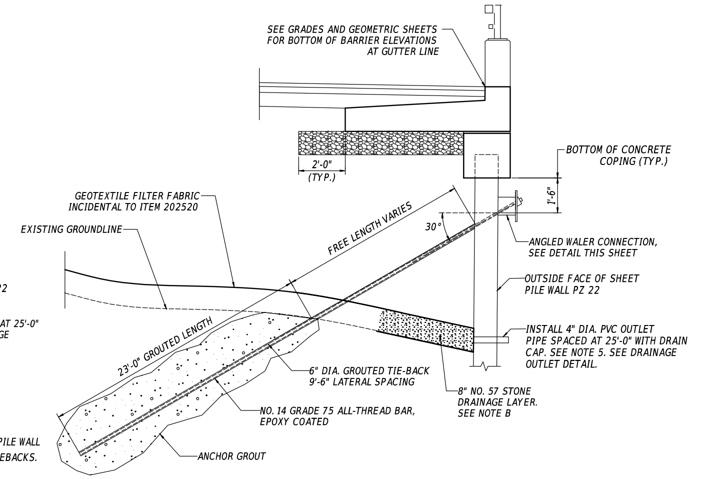
1. BARRIER REFLECTORS SHALL BE INSTALLED ALONG EACH PARAPET, INCIDENTAL TO ITEM 610008 - PCC MASONRY, PARAPET, CLASS A.
2. FOR SHEET PILE RETAINING WALL DETAILS, SEE SHEETS 22 AND 23.
3. FOR SIDEWALK AND PARAPET DETAILS, SEE SHEETS 41 AND 42.
4. FOR DRAINAGE SCUPPER DETAILS, SEE SHEET 43.
5. FOR RAILING DETAILS, SEE SHEET 44.
6. FOR MOMENT SLAB DETAILS, SEE SHEET 49.

ADDENDA / REVISIONS	SCALE AS NOTED	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT	BRIDGE NO.	1-447	BRIDGE AND APPROACH TYPICAL SECTIONS	SECTION
			T201907102	DESIGNED BY:	B.MARSHALL		PAI
			COUNTY	CHECKED BY:	H.BROWN		SHEET NO.
			NEW CASTLE				18



SECTION A-A

(STATION 57+88.00 TO STATION 61+93.50)
(STATION 67+01.00 TO STATION 70+00)
3/8" = 1'-0"



SECTION B-B

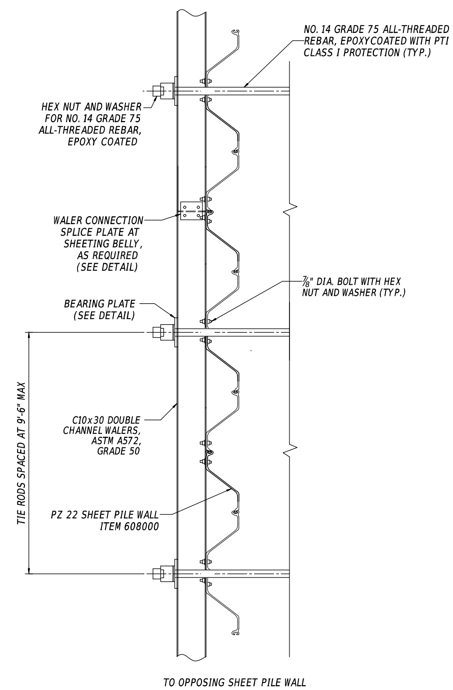
(STATION 56+23.50 TO STATION 57+88.00)
(STATION 70+00 TO STATION 72+00)
3/8" = 1'-0"

NOTE A: NO GREATER THAN 6'-0" OF FILL INSIDE SHEET PILE WALL SHALL BE PLACED PRIOR TO INSTALLATION OF TIEBACKS.

NOTE B: INSTALL 8" THICK DRAINAGE LAYER PRIOR TO INSTALLATION OF WICK DRAINS. INDICENTAL TO ITEM 202520. (SEE NOTE 7)

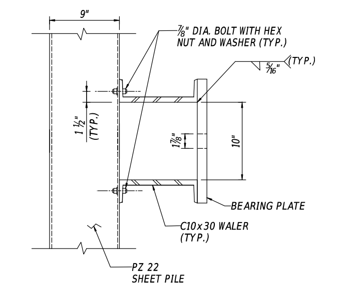
NOTE C: PROVIDE ARTICULATED TIE ROD CONNECTION AT EACH END OF TIE ROD ADJACENT TO SHEET PILE. THE CONNECTION SHALL BE STRUCTURAL STEEL AND GALVANIZED IN ACCORDANCE WITH SECTION 1039, AND HAVE A TENSILE CAPACITY GREATER THAN 120 KIPS. CONTRACTOR TO SUBMIT A PRODUCT FOR APPROVAL. PAYMENT INCIDENTAL TO ITEM 608030.

NOTE D: WICK DRAINS SHALL BE SPACED AT 4 FEET ON CENTER SPACING IN A TRIANGLE PATTERN THROUGHOUT THE WIDTH OF THE ROADWAY (30 FEET) AND INSTALLED 40 FEET BELOW EXISTING GRADE BETWEEN THE FOLLOWING STATIONS: 56+23.50 TO 62+30.50 AND 66+70.00 TO 72+00.00.



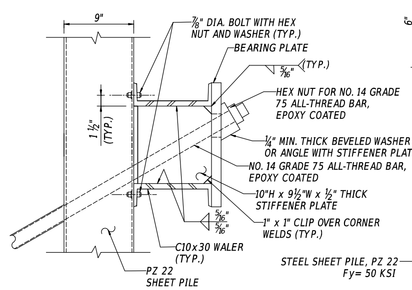
TYPICAL TIE ROD DETAIL BETWEEN WALLS, PLAN

⅜" = 1'-0"



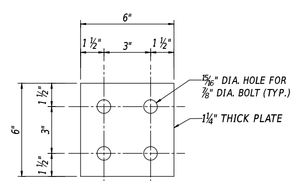
WALER DETAIL

SCALE: 1½" = 1'-0"



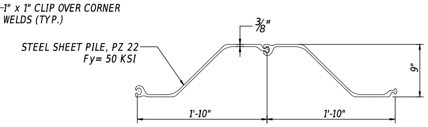
ANGLED CONNECTION DETAIL

SCALE: 1½" = 1'-0"



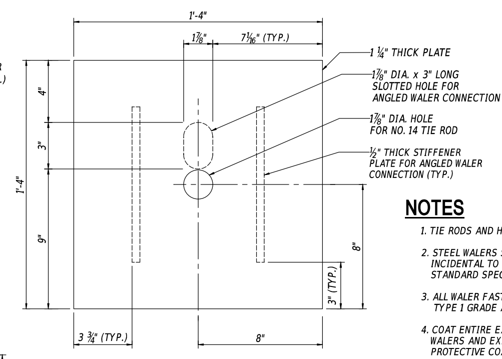
WALER SPLICE DETAIL

3" = 1'-0"



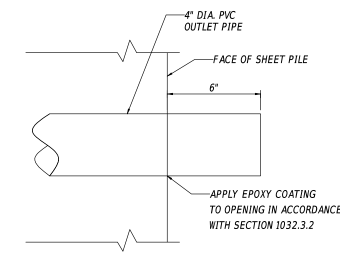
TYPICAL SHEET PILE

NOT TO SCALE



BEARING PLATE DETAIL

3" = 1'-0"

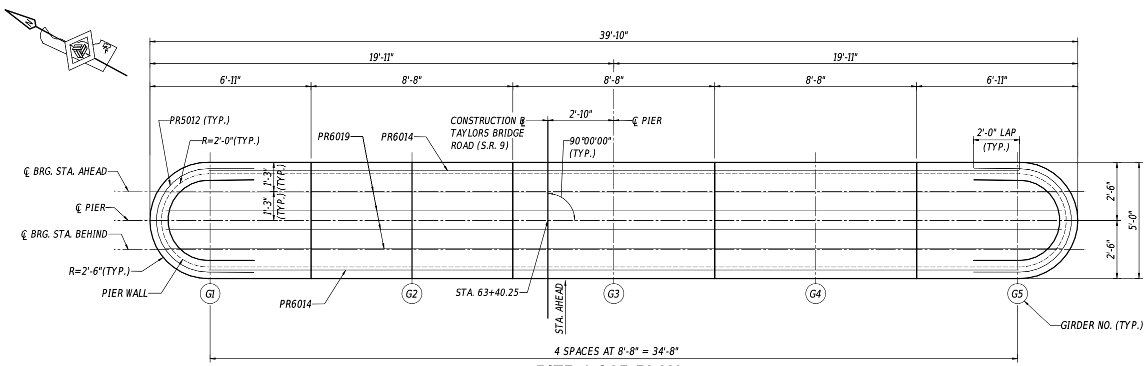


DRAINAGE OUTLET DETAIL

3" = 1'-0"

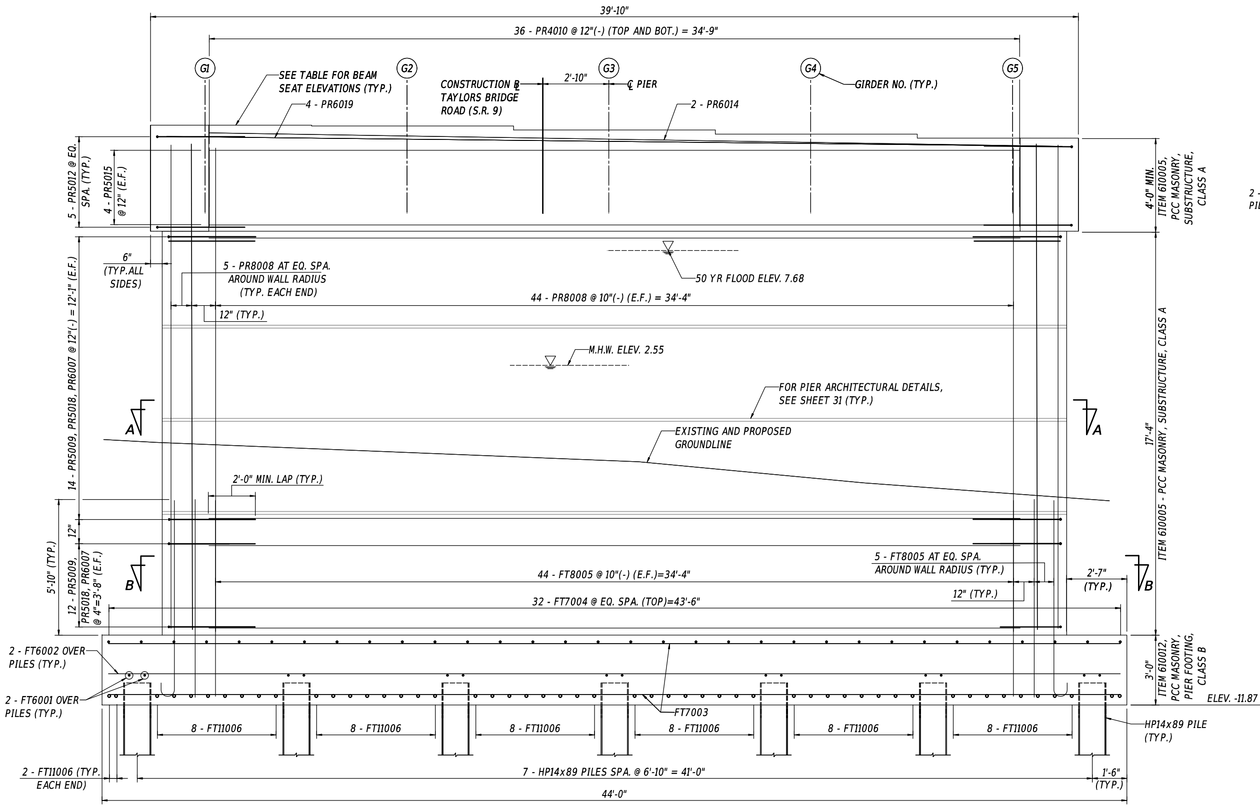
NOTES

1. TIE RODS AND HARDWARE SHALL BE GALVANIZED GRADE 75 AND CONFORM TO SECTION 1039.
2. STEEL WALERS SHALL BE GRADE 50 STEEL CONFORMING TO SECTION 1039 AND ARE INCIDENTAL TO ITEM 608000. STEEL WALERS TO BE COATED PER SECTION 616 OF THE STANDARD SPECIFICATIONS WITH COLOR TO MATCH PROPOSED STEEL SHEET PILE WALLS.
3. ALL WALER FASTENERS ARE GALVANIZED ⅞" DIAMETER ASTM F3125 HIGH STRENGTH BOLTS, TYPE 1 GRADE A325, UNLESS OTHERWISE NOTED.
4. COAT ENTIRE EXTERIOR FACE AND INTERIOR FACE OF SHEET PILE WALLS, AND WALERS AND EXPOSED SURFACES OF TIE-RODS IN ACCORDANCE WITH SECTION 1032.3.2 THE PROTECTIVE COATING IS INCIDENTAL TO ITEM 608000.
5. REFER TO SPECIAL PROVISIONS FOR MORE INFORMATION OF ITEM 202520 - WICK DRAINS, ITEM 608502 - GROUTED TIE-BACK SYSTEM, AND ITEM 202517 - SETTLEMENT PLATFORMS.
6. AT COMPLETION OF CONSTRUCTION, PVC OUTLET DRAINS SHALL BE CAPPED.
7. FOR MOMENT SLAB DETAILS SEE SHEET 49.
8. CONTRACTOR MAY SUBMIT AN ALTERNATIVE WICK DRAIN DESIGN AT NO ADDITIONAL COST TO THE DEPARTMENT.



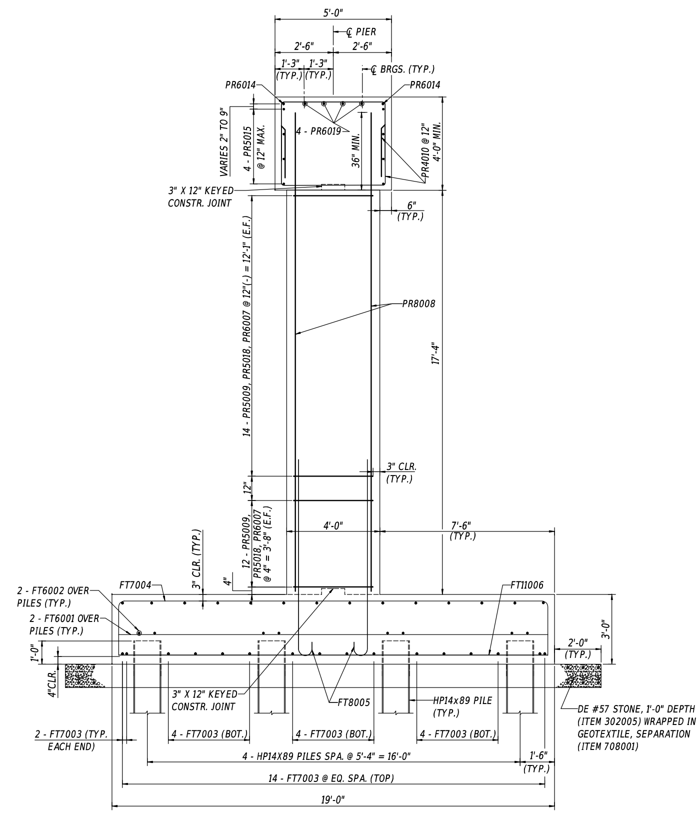
PIER 1 CAP PLAN

3/8" = 1'-0"



PIER 1 ELEVATION

3/8" = 1'-0"



PIER 1 TYPICAL SECTION

3/8" = 1'-0'

PIER 1

BEAM SEAT ELEVATIONS

GIRDER NO.	ELEVATION (FT)
G1	13.02
G2	12.99
G3	12.82
G4	12.64
G5	12.47

REFERENCE:

1. FOR PROJECT NOTES, SEE SHEETS 5-6.
2. FOR FOUNDATION LAYOUT PLAN, SEE SHEET 19.
3. FOR FOOTING AND PILE LAYOUT PLAN, SEE SHEET 20.
4. FOR SECTIONS A-A AND B-B, SEE SHEET 31.

Pennoni

ADDENDA / REVISIONS

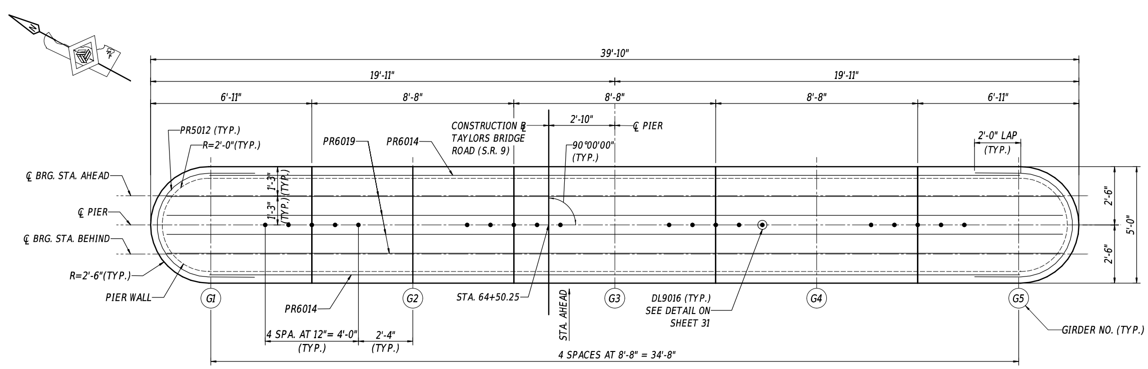
SCALE AS NOTED

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102	BRIDGE NO.	1-447
COUNTY	NEW CASTLE	DESIGNED BY:	B.MARSHALL
		CHECKED BY:	H.BROWN

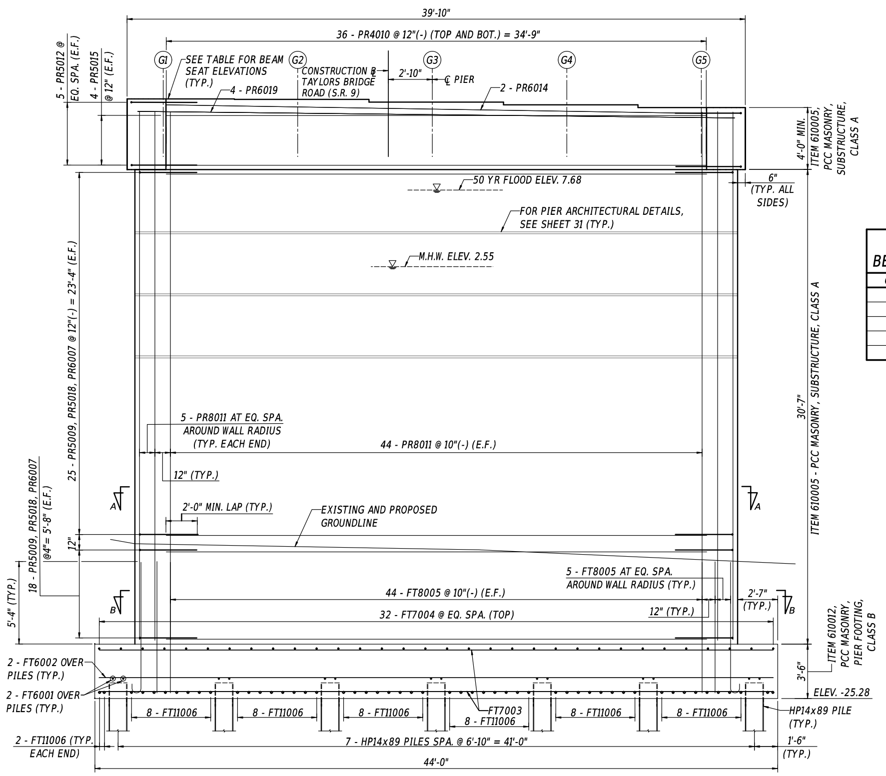
PIER 1 DETAILS

SECTION
PAI
SHEET NO.
28


39'-10"
19'-11"
19'-11"
6'-11"
8'-8"
8'-8"
8'-8"
6'-11"
PR5012 (TYP.)
R=2'-0"(TYP.)
PR6019
PR6014
CONSTRUCTION ℄ TAYLORS BRIDGE ROAD (S.R. 9)
2'-10"
℄ PIER
90°00'00" (TYP.)
2'-0" LAP (TYP.)
℄ BRG. STA. AHEAD
℄ PIER
℄ BRG. STA. BEHIND
R=2'-6"(TYP.)
PIER WALL
1'-3" (TYP.)
1'-3" (TYP.)
2'-6"
2'-6"
5'-0"
PR6014
G1
G2
G3
G4
G5
STA. 64+50.25
STA. AHEAD
DL9016 (TYP.) SEE DETAIL ON SHEET 31
GIRDER NO. (TYP.)
4 SPA. AT 12"= 4'-0" (TYP.)
2'-4" (TYP.)
4 SPACES AT 8'-8" = 34'-8"

PIER 2 CAP PLAN

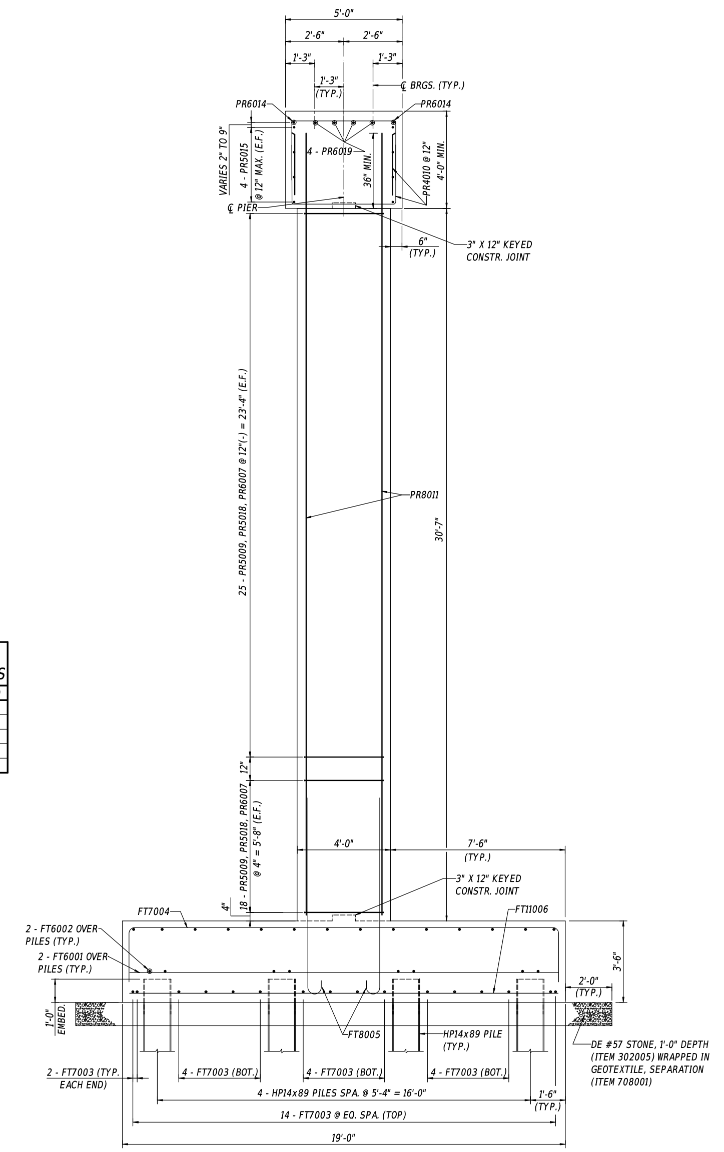
3/8" = 1'-0"


39'-10"
36 - PR4010 @ 12"(-) (TOP AND BOT.) = 34'-9"
G1
G2
G3
G4
G5
SEE TABLE FOR BEAM SEAT ELEVATIONS (TYP.)
CONSTRUCTION ℄ TAYLORS BRIDGE ROAD (S.R. 9)
2'-10"
℄ PIER
4 - PR6019
2 - PR6014
5 - PR5012 @ EQ. SPA. (E.F.)
4 - PR5015 @ 12" (E.F.)
4'-0" MIN.
ITEM 610005, PCC MASONRY, SUBSTRUCTURE, CLASS A
50 YR FLOOD ELEV. 7.68
6" (TYP. ALL SIDES)
FOR PIER ARCHITECTURAL DETAILS, SEE SHEET 31 (TYP.)
M.H.W. ELEV. 2.55
25 - PR5009, PR5018, PR6007 @ 12"(-) = 23'-4" (E.F.)
30'-7"
ITEM 610005 - PCC MASONRY, SUBSTRUCTURE, CLASS A
5 - PR8011 AT EQ. SPA. AROUND WALL RADIUS (TYP. EACH END)
44 - PR8011 @ 10"(-) (E.F.)
12" (TYP.)
2'-0" MIN. LAP (TYP.)
EXISTING AND PROPOSED GROUNDLINE
A
A
B
B
18 - PR5009, PR5018, PR6007 @4"= 5'-8" (E.F.)
12"
5'-4" (TYP.)
5 - FT8005 AT EQ. SPA. AROUND WALL RADIUS (TYP.)
44 - FT8005 @ 10"(-) (E.F.)
32 - FT7004 @ EQ. SPA. (TOP)
12" (TYP.)
2'-7" (TYP.)
3'-6"
ITEM 610012, PCC MASONRY, PIER FOOTING, CLASS B
2 - FT6002 OVER PILES (TYP.)
2 - FT6001 OVER PILES (TYP.)
ELEV. -25.28
8 - FT11006
FT7003
8 - FT11006
HP14x89 PILE (TYP.)
2 - FT11006 (TYP. EACH END)
7 - HP14x89 PILES SPA. @ 6'-10" = 41'-0"
1'-6" (TYP.)
44'-0"

PIER 2 ELEVATION

1/4" = 1'-0"

PIER 2 BEAM SEAT ELEVATIONS	
GIRDER NO.	ELEVATION (FT)
G1	13.36
G2	13.32
G3	13.15
G4	12.98
G5	12.80

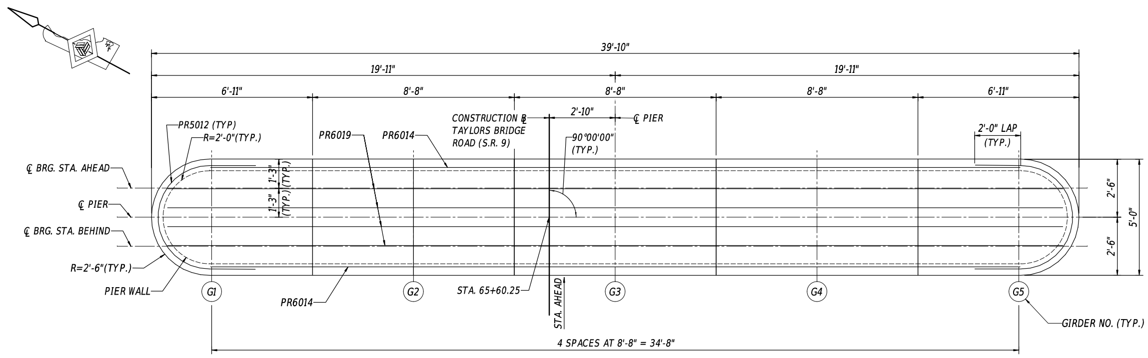

5'-0"
2'-6"
2'-6"
1'-3"
1'-3"
1'-3" (TYP.)
℄ BRGS. (TYP.)
PR6014
PR6014
VARIES 2" TO 9"
4 - PR5015 @ 12" MAX. (E.F.)
4 - PR6019
36" MIN.
PR4010 @ 12"
4'-0" MIN.
℄ PIER
6" (TYP.)
3" X 12" KEYED CONSTR. JOINT
25 - PR5009, PR5018, PR6007 @ 12"(-) = 23'-4" (E.F.)
PR8011
30'-7"
12"
18 - PR5009, PR5018, PR6007 @ 4" = 5'-8" (E.F.)
4'-0"
7'-6" (TYP.)
4"
FT7004
FT11006
2 - FT6002 OVER PILES (TYP.)
2 - FT6001 OVER PILES (TYP.)
3'-6"
2'-0" (TYP.)
1'-0" EMBED.
FT8005
HP14x89 PILE (TYP.)
DE #57 STONE, 1'-0" DEPTH (ITEM 302005) WRAPPED IN GEOTEXTILE, SEPARATION (ITEM 708001)
2 - FT7003 (TYP. EACH END)
4 - FT7003 (BOT.)
4 - FT7003 (BOT.)
4 - FT7003 (BOT.)
4 - HP14x89 PILES SPA. @ 5'-4" = 16'-0"
1'-6" (TYP.)
14 - FT7003 @ EQ. SPA. (TOP)
19'-0"

PIER 2 TYPICAL SECTION

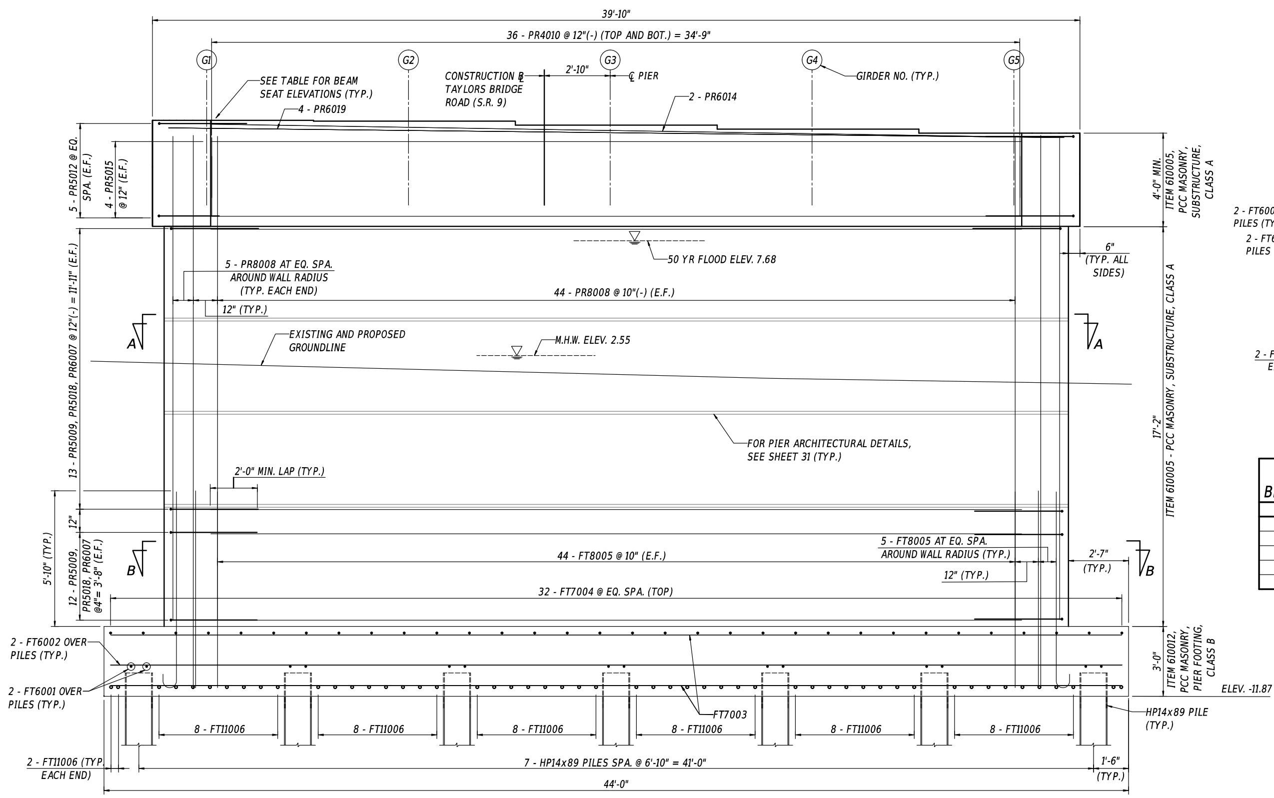
3/8" = 1'-0"

REFERENCE:

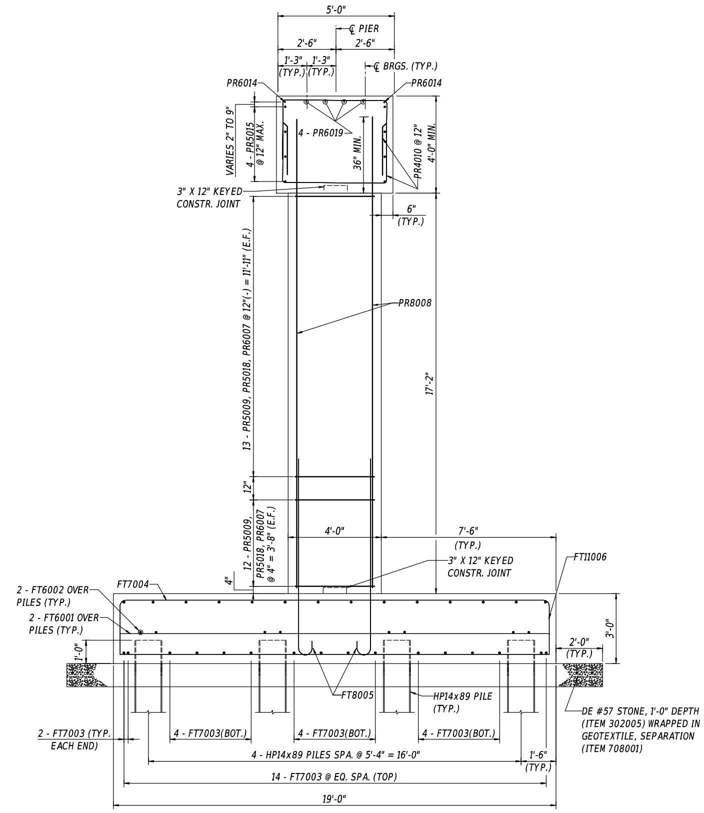
1. FOR PROJECT NOTES, SEE SHEETS 5-6.
2. FOR FOUNDATION LAYOUT PLAN, SEE SHEET 19.
3. FOR FOOTING AND PILE LAYOUT PLAN, SEE SHEET 20.
4. FOR SECTIONS A-A AND B-B, SEE SHEET 31.



PIER 3 CAP PLAN
3/8" = 1'-0"



PIER 3 ELEVATION
3/8" = 1'-0"



PIER 3 TYPICAL SECTION
3/8" = 1'-0'

PIER 3 BEAM SEAT ELEVATIONS	
GIRDER NO.	ELEVATION (FT)
G1	12.86
G2	12.83
G3	12.65
G4	12.48
G5	12.30

REFERENCE:

1. FOR PROJECT NOTES, SEE SHEETS 5-6.
2. FOR FOUNDATION LAYOUT PLAN, SEE SHEET 19.
3. FOR FOOTING AND PILE LAYOUT PLAN, SEE SHEET 20.
4. FOR SECTIONS A-A AND B-B, SEE SHEET 31.

ADDENDA / REVISIONS

SCALE AS NOTED

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	B.MARSHALL
COUNTY		
NEW CASTLE	CHECKED BY:	H.BROWN

PIER 3 DETAILS

SECTION PAI

SHEET NO. 30

ENVIRONMENTAL COMPLIANCE NOTES

1. GENERAL NOTES:

   A. THE PURPOSE OF THIS SHEET IS TO IDENTIFY THOSE ITEMS ASSOCIATED WITH ENVIRONMENTAL COMPLIANCE. IMPACT CALCULATIONS ARE FOR THE AGENCY PERMIT REPORTING PURPOSES ONLY AND ARE NOT TO BE USED FOR BIDDING PURPOSES.

   B. IF A DEPARTURE FROM THE APPROVED PLANS (WHICH WOULD AFFECT ANY NATURAL AND/OR CULTURAL RESOURCES) IS NECESSARY, CONTACT THE ENVIRONMENTAL STUDIES SECTION AT (302) 760-2264 OR DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV) TO ALLOW FOR COORDINATION WITH THE APPROPRIATE RESOURCE AGENCIES AND APPROVAL.

   C. USE OF THIS SHEET DOES NOT ALLEVIATE THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL CONDITIONS SET FORTH IN THE ENVIRONMENTAL STATEMENT AND PERMITS.

2. NATURAL RESOURCE ISSUES:

   A. PERMIT REQUIREMENTS/APPROVALS *:
   U.S. ARMY CORPS OF ENGINEERS (COE): NATIONWIDE PERMIT NWP 23 WITH PRECONSTRUCTION NOTIFICATION (PCN)
   DNREC - WETLANDS & SUBAQUEOUS LANDS (WLSL): WETLANDS & SUBAQUEOUS LANDS PERMIT
   DNREC - WATER QUALITY (WQC) & COASTAL ZONE CONSISTENCY (CZM): ISSUED NWP 23
   NCC DEPT. OF LAND USE (NCC):
   US COAST GUARD (USCG): N/A

   * THE PERMITS/APPROVALS LISTED ARE THOSE REQUIRED FOR THIS PROJECT. THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING AND/OR OBTAINING THESE APPROVALS.
   ** THE CONTRACTOR MUST ENSURE THAT THESE PERMITS/APPROVALS ARE IN THEIR POSSESSION PRIOR TO BEGINNING CONSTRUCTION IN THE PERMITTED AREA(S) AND ENSURE THEY ARE DISPLAYED ON-SITE DURING THE ENTIRE CONSTRUCTION PERIOD.
   *** USCG Note: PRIOR TO BRIDGE CONSTRUCTION, THE BRIDGE OWNER (DELDOT) SHOULD SUBMIT A BRIDGE MAINTENANCE PROJECT PLAN TO THE USCG OFFICE AT LEAST 30 DAYS (PREFERABLY 90 DAYS) PRIOR TO WORK COMMENCING ON OR OVER THE NAVIGABLE WATERWAY.

   AT NO TIME DURING THE PROJECT WILL THE WATERWAY BE CLOSED TO NAVIGATION WITHOUT THE PRIOR NOTIFICATION AND APPROVAL OF THE COAST GUARD. THE BRIDGE OWNER OR CONTRACTOR IS REQUIRED TO MAINTAIN CLOSE AND REGULAR CONTACT WITH COAST GUARD SECTOR DELAWARE AT D05-SMB-SECDELBAY-WWM@USCG.MIL TO KEEP INFORMED OF ACTIVITIES ON THE WATERWAY.

   B. CONSTRUCTION RESTRICTIONS:
   FISHERIES-BLACKBIRD CREEK PROVIDES SPAWNING HABITAT FOR ANADROMOUS SPECIES INCLUDING BLUEBACK HERRING (ALOSA AESTIVALIS) AND ALEWIFE (ALOSA PSEUDOHARENGUS), COLLECTIVELY REFERRED TO AS "RIVER HERRING," AS WELL AS POTENTIALLY AMERICAN SHAD (ALOSA SAPIDISSIMA). TO PROTECT THESE SPECIES DURING SPAWNING AND MIGRATORY ACTIVITIES, A TIME OF YEAR RESTRICTION OF MARCH 1ST TO JUNE 30TH IS REQUESTED DURING WHICH NO IN-WATER WORK SHOULD BE PERFORMED.

   FISHERIES- USACE NATIONWIDE PERMIT REGIONAL GENERAL CONDITION G-6(8), IN ORDER TO PROTECT DIADROMOUS FISH MIGRATIONS, SPAWNING ACTIVITIES, AND EFH, IN-WATER WORK SHALL BE AVOIDED FROM MARCH 1 TO JUNE 30 IN ALL WATERS. WORK WITHIN COFFERDAMS THAT FULLY ENCLOSE AND DEWATER THE PROJECT AREA CAN PROCEED ANY TIME DURING THE YEAR PROVIDED THE COFFERDAMS ARE INSTALLED OR REMOVED OUTSIDE OF THE SEASONAL WORK RESTRICTION AND DO NOT PRECLUDE THE FREE MOVEMENT OF MIGRATING OR SPAWNING AQUATIC SPECIES TO ENSURE COMPLIANCE WITH NWP GENERAL CONDITION 2 AND 3.

   MIGRATORY BIRDS - BRIDGE 1-447 HAS NOT BEEN SURVEYED FOR THE PRESENCE OF NESTING MIGRATORY BIRDS, WHICH ARE PROTECTED BY TITLE 7, DELAWARE CODE, CHAPTER 7, SECTIONS 734 AND 735. IF WORK IS PROPOSED DURING THE BREEDING SEASON (APRIL 15 – AUGUST 1), A SURVEY SHOULD BE COMPLETED PRIOR TO THE START OF WORK TO DETERMINE IF ONE OR MORE PAIRS OF BARN SWALLOW (HIRUNDO RUSTICA) AND/OR EASTERN PHOEBE (SAYORNIS PHOEBE) NESTS ARE PRESENT UNDER THE BRIDGE. IF A SURVEY DETECTS NESTING ACTIVITY, THE FOLLOWING STEPS SHOULD BE TAKEN TO AVOID NEST DESTRUCTION AND TAKE, WHICH IS A VIOLATION OF STATE LAW:

   1. PERFORM CONSTRUCTION ACTIVITIES FROM AUGUST 1 TO APRIL 15.

   2. IF CONSTRUCTION CANNOT BE PERFORMED IN THIS TIME PERIOD, A DETERRENT SUCH AS MESH NETTING SHOULD BE USED TO BLOCK ACCESS TO NESTING SITES ON THE UNDERSIDE OF THE BRIDGE(S). THE MATERIAL WOULD NEED TO BE IN PLACE NO LATER THAN APRIL 15, THE UNDERSIDE OF THE BRIDGE(S) WOULD NEED TO BE FULLY ENCAPSULATED, AND THE MATERIAL SHOULD BE LEFT IN PLACE UNTIL CONSTRUCTION BEGINS. IF ACTIVE NESTS ARE DISCOVERED DURING THE COURSE OF WORK, ACTIVITIES SHOULD BE HALTED IMMEDIATELY AND SCRP CONTACTED FOR FURTHER GUIDANCE.

   MARSH NESTING BIRDS - THE AREA SURROUNDING THE PROJECT SITE IS MAPPED AS QUALITY MARSH HABITAT, AND IT HAS THE POTENTIAL TO SUPPORT NESTING MARSH BIRDS. DNREC REQUESTS A TIME-OF-YEAR RESTRICTION FOR WORK CONDUCTED IN THE SURROUND MARSH FROM APRIL 1 TO JULY 31 TO PROTECT MARSH NESTING BIRDS AND THEIR YOUNG.

   BLACKBIRD CREEK IS USED BY LARGE NUMBERS OF AMERICAN EEL (ANGUILLA ROSTRATA). DNREC REQUESTS THAT IN-STREAM WORK NOT TAKE PLACE FROM MARCH 1ST TO MAY 15TH TO ALLOW UPSTREAM PASSAGE OF ELVERS (YOUNG EELS).

   NO IN-WATER WORK FROM MARCH 1ST TO JUNE 30TH.

   - FOR NON-TIDAL LOCATIONS, NO WORK CAN BE DONE BELOW THE ORDINARY HIGH WATER (OHW) LINE.

   - FOR TIDAL LOCATIONS, NO WORK CAN BE DONE BELOW THE MEAN HIGH WATER TIDE LINE (MHWL).

   **PLEASE NOTE THAT TIDAL LINES (HTL, MHW, MLW) VARY BASED ON DIFFERENT NATURAL OCCURRENCES, THEREFORE THE LINES SHOWN ON PLANS MAY DIFFER FROM ONSITE CONDITIONS. SHOULD YOU HAVE QUESTIONS ABOUT WHERE THE "MHW" TIDE LINE IS, PLEASE CONTACT THE ENVIRONMENTAL STUDIES OFFICE AT DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV.

   THIS PROJECT WILL REQUIRE A "SOFT START" FOR WHEN DRIVING PILES. IF PILE DRIVING IS OCCURRING DURING A TIME OF YEAR WHEN ESA-LISTED SPECIES MAY BE PRESENT, AND THE ANTICIPATED NOISE IS ABOVE THE BEHAVIORAL NOISE THRESHOLD, A "SOFT START" IS REQUIRED TO ALLOW ANIMALS AN OPPORTUNITY TO LEAVE THE PROJECT VICINITY BEFORE SOUND PRESSURE LEVELS INCREASE.

   - USE A SOFT START EACH DAY OF PILE DRIVING, AFTER A BREAK OF 30 MINUTES OR MORE, AND IF ANY INCREASE IN PILE INSTALLATION OR REMOVAL INTENSITY IS REQUIRED. BUILD UP POWER SLOWLY FROM A LOW ENERGY START-UP OVER A 20-MINUTE PERIOD TO WARN FISH TO LEAVE THE VICINITY. THIS BUILDUP SHALL OCCUR IN UNIFORM STAGES TO PROVIDE A CONSTANT INCREASE IN OUTPUT

3. CULTURAL RESOURCE ISSUES:

   A. SHPO HAS CONCURRED WITH DELDOT'S ARCHAEOLOGICAL INVESTIGATION AND FINDINGS FOR THE PROJECT (09/13/2022).
   B. SHPO HAS CONCURRED WITH DELDOT'S FINDING OF NO HISTORIC PROPERTIES AFFECTED (TO BE ISSUED ON/BY 12/10/2022).

ENVIRONMENTAL COMPLIANCE NOTES (CONT'D)

4. PROTECTION OF RESOURCES:
   A. KEEP CLEARING IN WETLAND AREAS TO A MINIMUM ABSOLUTELY NECESSARY FOR CONSTRUCTION ACCESS. SUPPORT ALL EQUIPMENT TRAVERSING WETLANDS AND SUBAQUEOUS LAND ON MATS. PAYMENT FOR MATS WILL BE MADE UNDER ITEM 621500 - TEMPORARY TIMBER MAT. IN WETLAND AREAS THAT ARE CLEARED, NO GRUBBING EXCEPT WHERE NECESSARY TO CONSTRUCT PROJECT COMPONENTS SUCH AS FOUNDATIONS AND RIPRAP PROTECTION IS PERMITTED. CUT VEGETATION FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT). RESTORE TEMPORARILY DISTURBED WETLAND AREAS TO GRADE AND SEED WITH ITEM 908515 - TEMPORARY GRASS SEEDING, WET GROUND.

   B. USE SILT FENCE OR CONSTRUCTION SAFETY FENCE ALONG THE LIMITS OF CONSTRUCTION IN ALL AREAS WHERE WATER WETLANDS ARE BEING IMPACTED (AS SHOWN ON ENVIRONMENTAL COMPLIANCE SHEETS), AND ALSO IN ANY AREA WHERE WATER/WETLANDS EXIST WITHIN 20 FEET OF THE LIMIT OF CONSTRUCTION (AS SHOWN ON CONSTRUCTION PLAN SHEETS). ANY CONTRACTOR ACCESS BEYOND THE LIMIT OF CONSTRUCTION IS STRICTLY PROHIBITED.

   C. USE SANDBAGS OR COMPOST FILTER LOG (CFL) TO SECURE SILT FENCE AT AREAS ADJACENT TO WOODED UPLANDS/ ALL WETLANDS IN LIEU OF TRENCHING UNLESS PROPER EROSION AND SEDIMENT CONTROL CANNOT BE MAINTAINED. REMOVE SANDBAGS AND CFLS (AND CONTENTS) IN THEIR ENTIRETY WHEN NO LONGER NEEDED. SANDBAGS/CFLS USED TO SECURE THE SILT FENCE IS INCIDENTAL TO ITEM 905001 - SILT FENCE. THE ENVIRONMENTAL STUDIES SECTION (302-760-2259 OR DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV) CAN PROVIDE FURTHER GUIDANCE REGARDING THIS METHOD OF INSTALLATION.

   D. CLEARLY MARK ALL TREES TO BE REMOVED WITH PAINT PRIOR TO THE EROSION AND SEDIMENT CONTROL MEETING.

5. STREAM RESTORATION AND RIPRAP TREATMENT:

   A. FOLLOW THE SPECIAL PROVISION FOR ITEM 707021 - CHANNEL BED FILL IN REGARDS TO THE SALVAGING OF ON-SITE NATURAL STREAM BOTTOM MATERIAL OR THE FURNISHING OF OFFSITE MATERIAL. IF USING CHANNEL BED FILL, USE HEAVY GRADATION AS IT WILL WASH AWAY IF YOU USE THE LIGHT GRADATION OF CBF. IF SUFFICIENT SOURCES FOR CHANNEL BED FILL DO NOT EXIST ON-SITE, ANY NEW MATERIAL MUST CONFORM TO THE REQUIREMENTS OF ITEM 707021 - CHANNEL BED FILL. RECESS ALL RIPRAP IN THE CHANNEL BOTTOM (I.E. BELOW THE WATER LINE) ONE FOOT BELOW STREAM BED ELEVATION AND CHOKE WITH BORROW TYPE 'B' SO THAT ALL OF THE VOIDS IN THE RIPRAP ARE FILLED WITH SPECIFIED MATERIAL. PAYMENT UNDER ITEM 209002 - BORROW, TYPE B. COVER THE RIPRAP WITH A MINIMUM OF 12" CHANNEL BED FILL. MATCH THE FINAL CHANNEL ELEVATIONS WITH EXISTING ELEVATIONS AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS WILL BE AS NOTED ON THE PLANS. PAYMENT UNDER ITEM 707021 -CHANNEL BED FILL.

   B. RESTORE OTHER AREAS OF THE CHANNEL BOTTOM AFFECTED BY CONSTRUCTION (INCLUDING, BUT NOT LIMITED TO, THE LOCATION OF SUMP PITS, STABILIZED OUTFALLS, TEMPORARY PIPES AND/OR SANDBAG DIKES AND DIVERSIONS) TO EXISTING CONDITIONS. FILL ANY CAVITIES OR SCOUR HOLES RESULTING FROM CONSTRUCTION ACTIVITIES WITH CHANNEL BED FILL. PAYMENT UNDER ITEM 707021 - CHANNEL BED FILL.

   C. WHEN ALL EROSION AND SEDIMENT CONTROL MEASURES ARE REMOVED AND THE STREAM RETURNS TO ITS NATURAL FLOW CONDITIONS, THE FLOW MUST REMAIN ABOVE GROUND AND ABOVE THE RIPRAP (I.E. THE FLOW CANNOT BE "LOST" IN THE RIPRAP OR BENEATH THE STRUCTURE). IF THIS IS NOT ACHIEVED, THE CONTRACTOR WILL BE REQUIRED TO TAKE CORRECTIVE ACTION AT THE CONTRACTOR'S EXPENSE.

   D. CHOKE ALL RIPRAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, WITH DELAWARE #57 STONE. PLACE JUST ENOUGH CHOKE MATERIAL TO PREVENT THE LOSS OF CHANNEL BED FILL OR TOPSOIL (DEPENDING ON LOCATION AS INDICATED BELOW) THROUGH THE RIPRAP.
      1. BENEATH THE BRIDGE: AFTER PLACING ITEM 302005 - DELAWARE #57 STONE, PERFORM A FINAL CHOKE OF CHANNEL BED FILL SO THAT THE RIPRAP PEAKS ARE BARELY VISIBLE. PAYMENT UNDER ITEM 707021 - CHANNEL BED FILL. DELAWARE #57 STONE IS INCIDENTAL TO THE RIPRAP ITEM.
      2. ALL OTHER LOCATIONS: FINISH FILLING THE VOIDS WITH TOPSOIL SO THAT THE RIPRAP PEAKS ARE BARELY VISIBLE. PLACE AN ADDITIONAL 6-INCH TOPSOIL LAYER ON TOP OF THE RIPRAP. SLOPE SEEDING WILL BE DONE WITH ITEM 908019 - STREAMBANK SEED MIX, SEEDING. FOLLOWING THE SEEDING OPERATION, INSTALL ITEM 908020 - EROSION CONTROL BLANKET (ECB) MULCH, OR OTHER BLANKET AS SHOWN ON THE PLANS. ECB AT TOE OF SLOPE CAN BE EITHER TRENCHED IN OR STAPLED AT 6" ON CENTER. COMPLETE ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL THROUGH THE SEEDING AND MULCHING PRIOR TO ANY RAIN EVENT. DELAWARE #57 STONE IS INCIDENTAL TO THE RIPRAP ITEM. ALL OTHER ITEMS WILL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.

6. THE CONTRACTOR SHALL ACCESS THE STREAM FROM THE STAGING AREAS AND ACCESS ROADS ONLY. CONTRACTOR ACCESS BEYOND THE LOC (AS DEFINED ON THESE PLANS) IS STRICTLY PROHIBITED. ANY CHANGE IN THE LOC MUST BE COORDINATED WITH THE DELDOT ENVIRONMENTAL STUDIES SECTION.

PROJECT AREA DELINEATED BY PENNONI ON 06/26/2020 IN ACCORDANCE WITH THE US ARMY CORPS OF ENGINEERS CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (1987) AND THE EASTERN MOUNTAINS AND PIEDMONT SUPPLEMENT (2012). ORIGINAL SHEET PREPARED BY PENNONI ON 01/22/2021. SHEET LAST UPDATED ON 12/02/2022.

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-E-01	WETLAND CREATION	797.74	0.0183	19.71	USACE/DNREC
1-E-02	WETLAND CREATION	4833.64	0.1110	119.41	USACE/DNREC
2-E-03	WETLAND CREATION	5078.79	0.1166	125.46	USACE/DNREC
2-E-04	WETLAND CREATION	359.54	0.0083	8.88	USACE/DNREC
2-E-05	WETLAND CREATION	2693.09	0.0618	66.53	USACE/DNREC
2-E-06	WETLAND CREATION	173.36	0.0040	4.28	USACE/DNREC
2-E-07	WETLAND CREATION	1256.24	0.0288	31.03	USACE/DNREC
3-E-08	WETLAND CREATION	4638.83	0.1065	114.60	USACE/DNREC
3-E-09	WETLAND CREATION	2381.20	0.0547	58.82	USACE/DNREC
3-E-10	WETLAND CREATION	965.55	0.0222	23.85	USACE/DNREC
PROJECT TOTALS		23177.99	0.5321	572.58	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WR-01	WETLAND RESTORATION	6999.63	0.1607	172.92	USACE/DNREC
2-WR-02	WETLAND RESTORATION	8386.61	0.1925	207.18	USACE/DNREC
2-WR-03	WETLAND RESTORATION	3636.65	0.0835	89.84	USACE/DNREC
3-WR-04	WETLAND RESTORATION	6041.62	0.1387	149.25	USACE/DNREC
3-WR-05	WETLAND RESTORATION	241.65	0.0055	5.97	USACE/DNREC
TOTAL FOR THIS SHEET		25306.16	0.5809	625.16	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
1-W-01	ROADWAY/EMBANKMENT	35.33	0.0008	2.62	USACE/DNREC	LOSS
1-W-02	ROADWAY/EMBANKMENT	163.17	0.0037	12.09	USACE/DNREC	LOSS
1-W-03	ROADWAY/RETAINING WALL	1888.95	0.0434	139.92	USACE/DNREC	LOSS
2-W-04	ROADWAY/RETAINING WALL	962.39	0.0221	71.29	USACE/DNREC	LOSS
2-W-05	ROADWAY/RET. WALL/RIPRAP	731.93	0.0168	54.22	USACE/DNREC	LOSS
2-W-06	RIPRAP	312.34	0.0072	23.14	USACE/DNREC	LOSS
2-W-07	ROADWAY/RET. WALL/RIPRAP	881.52	0.0202	65.30	USACE/DNREC	LOSS
2-W-08	RIPRAP	97.00	0.0022	7.19	USACE/DNREC	LOSS
2-W-09	AERIAL COVERAGE (BR. DECK)	1003.17	0.0230	74.31	DNREC	IMPACT
2-W-10	RIPRAP	15.55	0.0004	1.15	USACE/DNREC	LOSS
2-W-11	RIPRAP	12.12	0.0003	0.90	USACE/DNREC	LOSS
3-W-12	AERIAL COVERAGE (BR. DECK)	325.49	0.0075	24.11	DNREC	IMPACT
2-W-13	AERIAL COVERAGE (BR. DECK)	1004.14	0.0231	74.38	DNREC	IMPACT
3-W-14	ROADWAY/EMBANKMENT	50.65	0.0012	3.75	USACE/DNREC	LOSS
PROJECT TOTALS		5150.94	0.1182	381.55	USACE/DNREC	LOSS

TEMPORARY WETLAND IMPACT AREA SCHEDULE

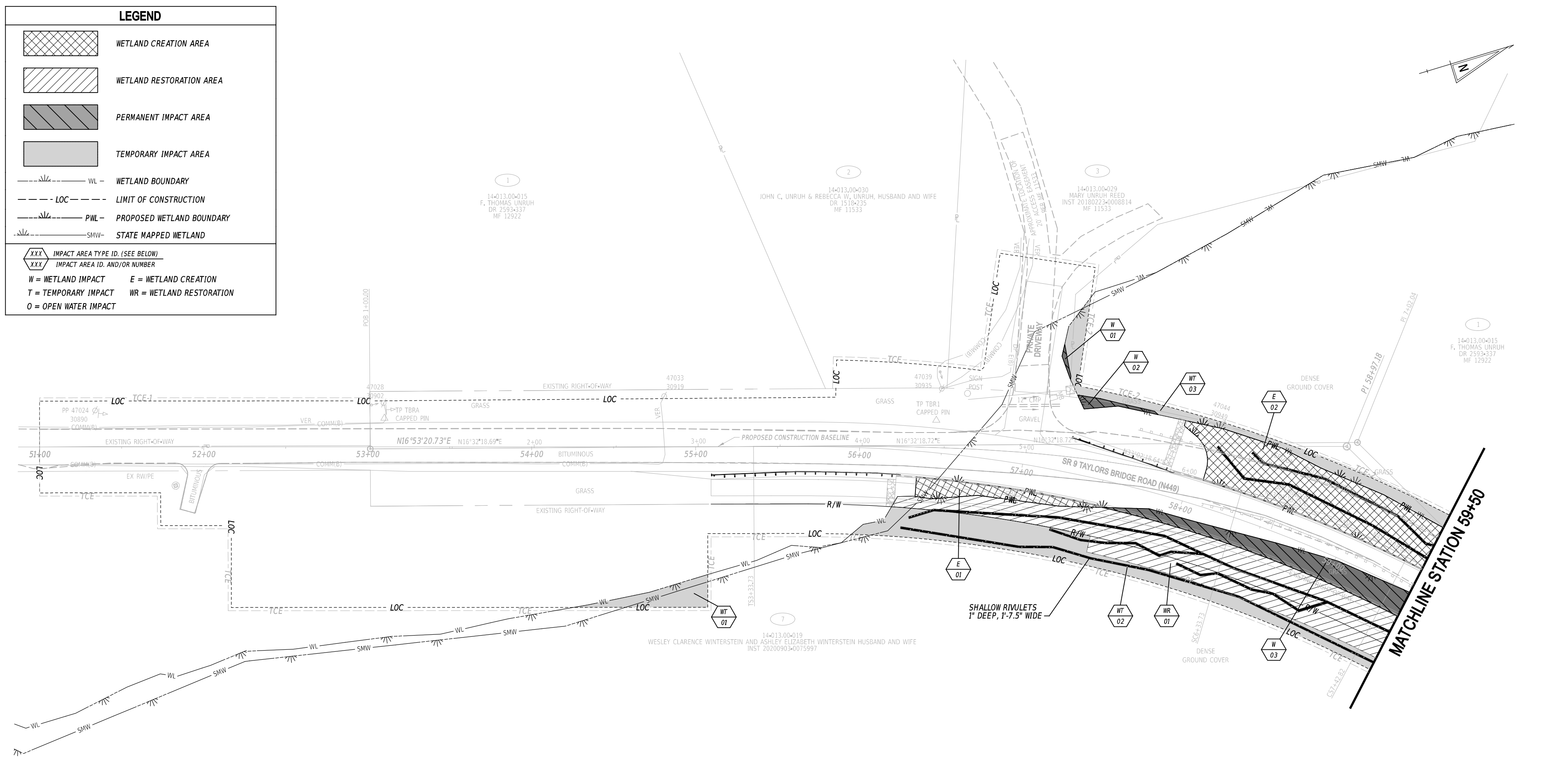
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WT-01	WORK AREA / E&S CONTROLS	726.58	0.0167	53.82	USACE/DNREC
1-WT-02	WORK AREA / E&S CONTROLS	3858.79	0.0886	285.84	USACE/DNREC
1-WT-03	WORK AREA / E&S CONTROLS	1744.35	0.0400	129.21	USACE/DNREC
2-WT-04	WORK AREA / E&S CONTROLS	7531.31	0.1729	557.87	USACE/DNREC
2-WT-05	WORK AREA / E&S CONTROLS	2899.90	0.0666	214.81	USACE/DNREC
2-WT-06	WORK AREA / E&S CONTROLS	4379.58	0.1005	324.41	USACE/DNREC
2-WT-07	WORK AREA / E&S CONTROLS	2204.18	0.0506	163.27	USACE/DNREC
2-WT-08	WORK AREA / E&S CONTROLS	350.50	0.0080	25.96	USACE/DNREC
3-WT-09	WORK AREA / E&S CONTROLS	4770.15	0.1095	353.34	USACE/DNREC
3-WT-10	WORK AREA / E&S CONTROLS	8491.04	0.1949	628.97	USACE/DNREC
PROJECT TOTALS		36956.38	0.8484	2737.51	USACE/DNREC

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-OT-01	WORK AREA / E&S CONTROLS	11094.36	0.2547	274.07	USACE/DNREC
2-OT-02	WORK AREA / E&S CONTROLS	6017.63	0.1381	148.66	USACE/DNREC
PROJECT TOTALS		17111.99	0.3928	422.73	USACE/DNREC

PERMANENT OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-O-01	PIER/RIPRAP	747.77	0.0172	55.39	USACE/DNREC	IMPACT
2-O-02	PIER/RIPRAP	829.33	0.0190	61.43	USACE/DNREC	IMPACT
2-O-03	WORK AREA/E&S CONT.	20.93	0.0005	1.55	USACE/DNREC	IMPACT
2-O-04	WORK AREA/E&S CONT.	1266.16	0.0291	93.79	USACE/DNREC	IMPACT
2-O-05	WORK AREA/E&S CONT.	959.53	0.0220	71.08	USACE/DNREC	IMPACT
PROJECT TOTALS		3823.73	0.0878	283.24	USACE/DNREC	IMPACT



TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WT-01	WORK AREA / E&S CONTROLS	726.58	0.0167	53.82	USACE/DNREC
1-WT-02	WORK AREA / E&S CONTROLS	3858.79	0.0886	285.84	USACE/DNREC
1-WT-03	WORK AREA / E&S CONTROLS	1744.35	0.0400	129.21	USACE/DNREC
TOTAL FOR THIS SHEET		6329.72	0.1453	468.87	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
1-W-01	ROADWAY/EMBANKMENT	35.33	0.0008	2.62	USACE/DNREC	LOSS
1-W-02	ROADWAY/EMBANKMENT	163.17	0.0037	12.09	USACE/DNREC	LOSS
1-W-03	ROADWAY/RETAINING WALL	1888.95	0.0434	139.92	USACE/DNREC	LOSS
TOTAL FOR THIS SHEET		2087.45	0.0479	154.63	USACE/DNREC	LOSS

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-E-01	WETLAND CREATION	797.74	0.0183	19.71	USACE/DNREC
1-E-02	WETLAND CREATION	4833.64	0.1110	119.41	USACE/DNREC
TOTAL FOR THIS SHEET		5631.38	0.1293	139.12	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WR-01	WETLAND RESTORATION	6999.63	0.1607	172.92	USACE/DNREC
TOTAL FOR THIS SHEET		6999.63	0.1607	172.92	USACE/DNREC

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT T201907102 | COUNTY NEW CASTLE

BRIDGE NO. 1-447 | DESIGNED BY: E. HARASTY | CHECKED BY: J. GRAUPENSPERGER

ENVIRONMENTAL COMPLIANCE PLAN

EC-01 | SECTION PAI | SHEET NO. 57

TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-WT-04	WORK AREA / E&S CONTROLS	7531.31	0.1729	557.87	USACE/DNREC
2-WT-05	WORK AREA / E&S CONTROLS	2899.90	0.0666	214.81	USACE/DNREC
2-WT-06	WORK AREA / E&S CONTROLS	4379.58	0.1005	324.41	USACE/DNREC
2-WT-07	WORK AREA / E&S CONTROLS	2204.18	0.0506	163.27	USACE/DNREC
2-WT-08	WORK AREA / E&S CONTROLS	350.50	0.0080	25.96	USACE/DNREC
TOTAL FOR THIS SHEET		17365.47	0.3987	1286.33	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-W-04	ROADWAY/RETAINING WALL	962.39	0.0221	71.29	USACE/DNREC	LOSS
2-W-05	ROADWAY/RET. WALL/RIPRAP	731.93	0.0168	54.22	USACE/DNREC	LOSS
2-W-06	RIPRAP	312.34	0.0072	23.14	USACE/DNREC	LOSS
2-W-07	ROADWAY/RET. WALL/RIPRAP	881.52	0.0202	65.30	USACE/DNREC	LOSS
2-W-08	RIPRAP	97.00	0.0022	7.19	USACE/DNREC	LOSS
2-W-09 *	AERIAL COVERAGE (BR. DECK)	1003.17	0.0230	74.31	DNREC	IMPACT
2-W-10	RIPRAP	15.55	0.0004	1.15	USACE/DNREC	LOSS
2-W-11	RIPRAP	12.12	0.0003	0.90	USACE/DNREC	LOSS
2-W-12 *	AERIAL COVERAGE (BR. DECK)	325.49	0.0075	24.11	DNREC	IMPACT
2-W-13 *	AERIAL COVERAGE (BR. DECK)	1004.14	0.0231	74.38	DNREC	IMPACT
TOTAL FOR THIS SHEET		3012.85	0.0692	223.17	USACE/DNREC	LOSS

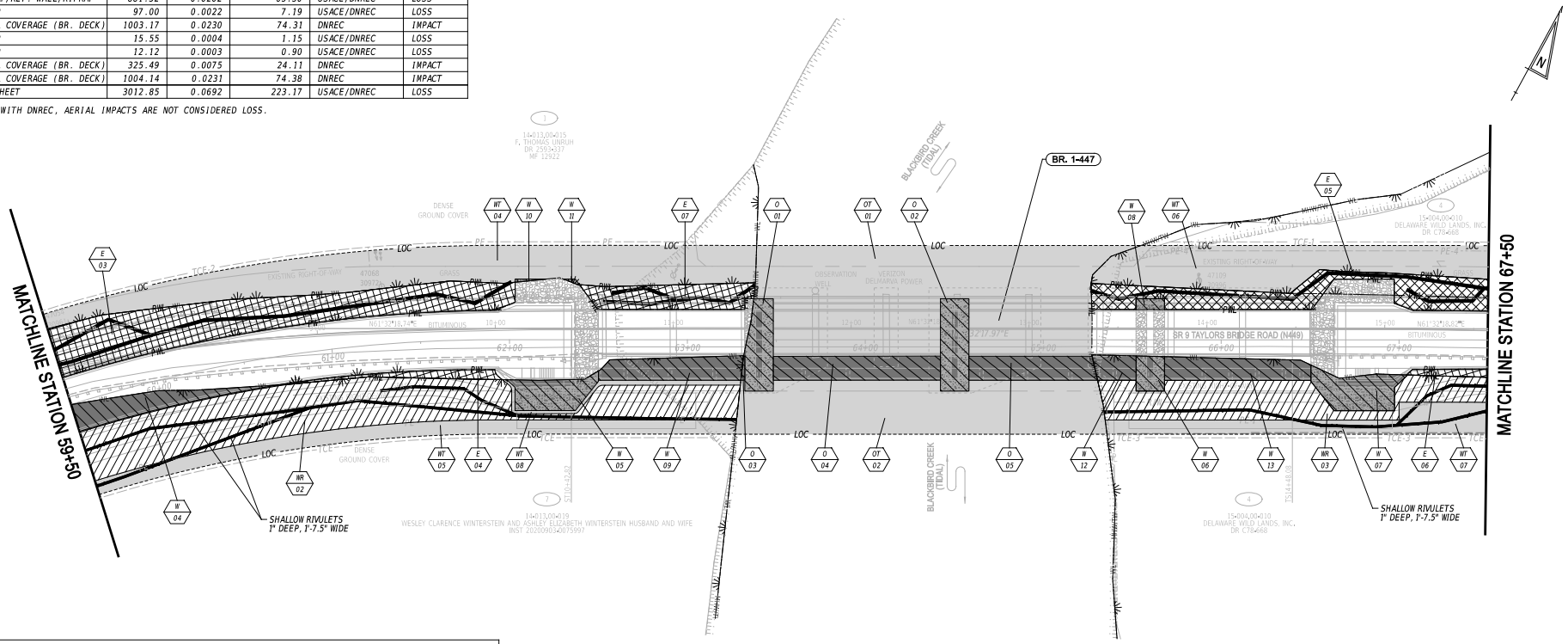
*PER COORDINATION WITH DNREC, AERIAL IMPACTS ARE NOT CONSIDERED LOSS.

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-OT-01	WORK AREA / E&S CONTROLS	11094.36	0.2547	821.80	USACE/DNREC
2-OT-02	WORK AREA / E&S CONTROLS	6017.63	0.1381	445.75	USACE/DNREC
TOTAL FOR THIS SHEET		17111.99	0.3928	1267.55	USACE/DNREC

PERMANENT OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-O-01	PIER/RIPRAP	747.77	0.0172	55.39	USACE/DNREC	IMPACT
2-O-02	PIER/RIPRAP	829.33	0.0190	61.43	USACE/DNREC	IMPACT
2-O-03	DNREC AERIAL COVERAGE	20.93	0.0005	1.55	DNREC	IMPACT
2-O-04	DNREC AERIAL COVERAGE	1266.16	0.0291	93.79	DNREC	IMPACT
2-O-05	DNREC AERIAL COVERAGE	959.53	0.0220	71.08	DNREC	IMPACT
TOTAL FOR THIS SHEET		3823.73	0.0878	283.24	USACE/DNREC	IMPACT



LEGEND

- WETLAND CREATION AREA
- WETLAND RESTORATION AREA
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA

- TOP OF BANK
- WL – WETLAND BOUNDARY
- LOC – LIMIT OF CONSTRUCTION
- PWL – PROPOSED WETLAND BOUNDARY
- SMW – STATE MAPPED WETLAND

XXX / XXX — IMPACT AREA TYPE ID. (SEE BELOW) / IMPACT AREA ID. AND/OR NUMBER

W = WETLAND IMPACT
E = WETLAND CREATION
T = TEMPORARY IMPACT
WR = WETLAND RESTORATION
O = OPEN WATER IMPACT

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-E-03	WETLAND CREATION	5078.79	0.1166	125.46	USACE/DNREC
2-E-04	WETLAND CREATION	359.54	0.0083	8.88	USACE/DNREC
2-E-05	WETLAND CREATION	2693.09	0.0618	66.53	USACE/DNREC
2-E-06	WETLAND CREATION	173.36	0.0040	4.28	USACE/DNREC
2-E-07	WETLAND CREATION	1256.24	0.0288	31.03	USACE/DNREC
TOTAL FOR THIS SHEET		9561.02	0.2195	236.19	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-WR-02	WETLAND RESTORATION	8386.61	0.1925	207.18	USACE/DNREC
2-WR-03	WETLAND RESTORATION	3636.65	0.0835	89.84	USACE/DNREC
TOTAL FOR THIS SHEET		12023.26	0.2760	297.02	USACE/DNREC

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	J. GRAUPENSPERGER

ENVIRONMENTAL COMPLIANCE PLAN

EC-02
SECTION
PAI
SHEET NO.
58

TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-WT-09	WORK AREA / E&S CONTROLS	4770.15	0.1095	353.34	USACE/DNREC
3-WT-10	WORK AREA / E&S CONTROLS	8491.04	0.1949	628.97	USACE/DNREC
TOTAL FOR THIS SHEET		13261.19	0.3044	982.31	USACE/DNREC

WETLAND CREATION AREA SCHEDULE

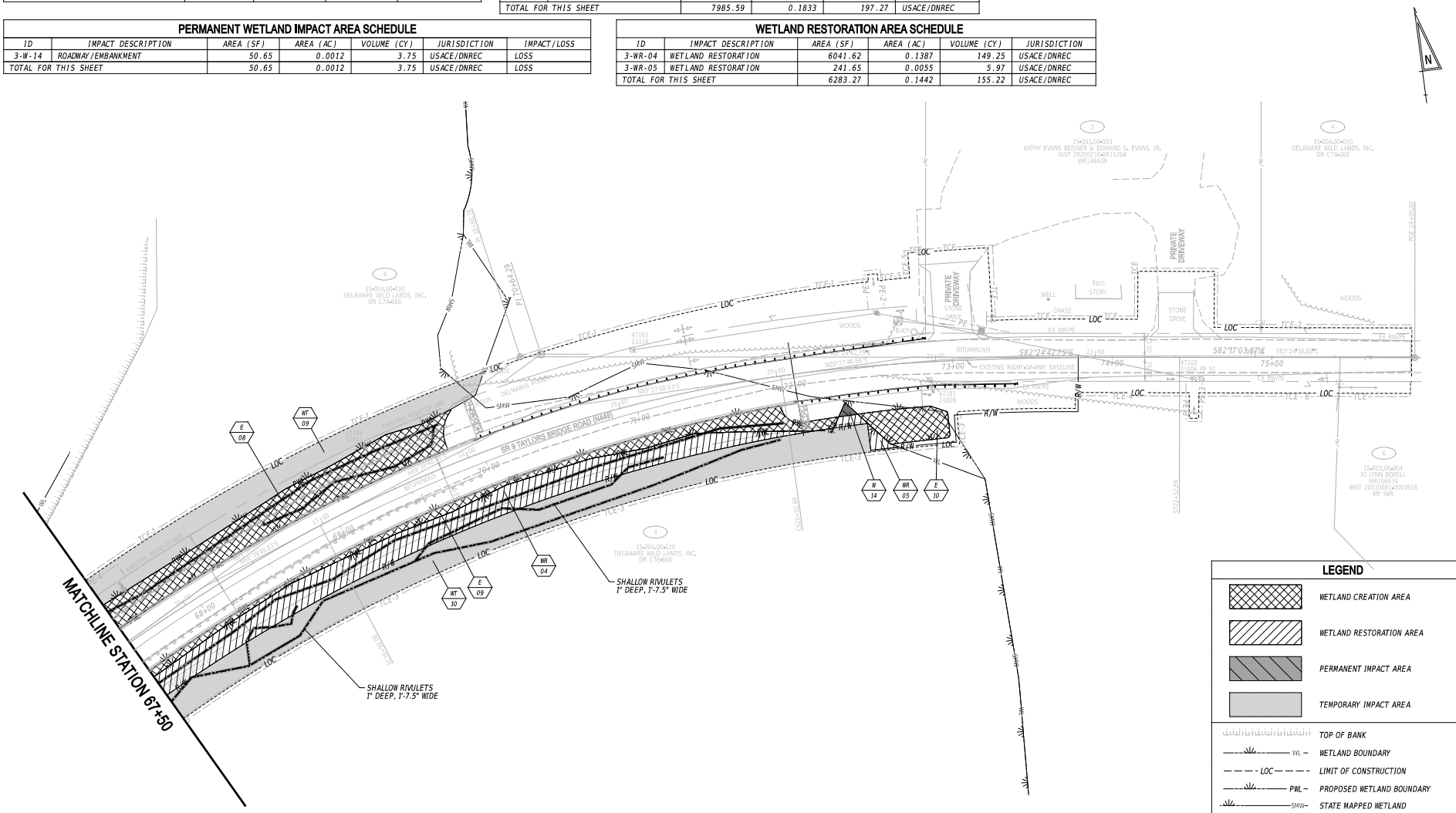
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-E-08	WETLAND CREATION	4638.83	0.1065	114.60	USACE/DNREC
3-E-09	WETLAND CREATION	2381.20	0.0547	58.82	USACE/DNREC
3-E-10	WETLAND CREATION	965.55	0.0222	23.85	USACE/DNREC
TOTAL FOR THIS SHEET		7985.59	0.1833	197.27	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
3-W-14	ROADWAY/EMBANKMENT	50.65	0.0012	3.75	USACE/DNREC	LOSS
TOTAL FOR THIS SHEET		50.65	0.0012	3.75	USACE/DNREC	LOSS

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-WR-04	WETLAND RESTORATION	6041.62	0.1387	149.25	USACE/DNREC
3-WR-05	WETLAND RESTORATION	241.65	0.0055	5.97	USACE/DNREC
TOTAL FOR THIS SHEET		6283.27	0.1442	155.22	USACE/DNREC



LEGEND

- WETLAND CREATION AREA
- WETLAND RESTORATION AREA
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA
- TOP OF BANK
- WETLAND BOUNDARY (WL)
- LIMIT OF CONSTRUCTION (LOC)
- PROPOSED WETLAND BOUNDARY (PWL)
- STATE MAPPED WETLAND (SMW)
- XXX / XXX — IMPACT AREA TYPE ID. (SEE BELOW) / IMPACT AREA ID. AND/OR NUMBER
- W = WETLAND IMPACT
- E = WETLAND CREATION
- T = TEMPORARY IMPACT
- WR = WETLAND RESTORATION
- O = OPEN WATER IMPACT

ADDENDA / REVISIONS

SCALE: 0 30 60 90 FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	J. GRAUPENSPERGER

ENVIRONMENTAL COMPLIANCE PLAN

SECTION	EC-03
	PAI
SHEET NO.	59

WETLAND MITIGATION NOTES

SECTION 200

1. THIS WORK INCLUDES THE EXCAVATION, REMOVAL AND DISPOSAL OF MIXTURES OF SOIL, PEATS, AND ORGANIC MATTER. THE METHOD OF EXCAVATION SHALL MINIMIZE THE COMPACTION OF EXISTING AND CREATED WETLANDS AND SUBAQUEOUS LANDS. ALL EQUIPMENT WITHIN EXISTING AND CREATED WETLANDS AND SUBAQUEOUS LANDS SHALL BE LOW GROUND-CONTACT (LGP) EQUIPMENT OR SHALL BE SUPPORTED ON MATS. ALL EXCAVATION EQUIPMENT, LGP EQUIPMENT, AND MATS ARE SUBJECT TO APPROVAL BY THE ENGINEER. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE MATS WILL SUPPORT THE EQUIPMENT. MANUFACTURERS SPECIFICATIONS AND ADVERTISED MATERIALS FOR LGP EQUIPMENT AND MATS SHALL BE FORWARDED TO THE ENGINEER FOR APPROVAL WITHIN THIRTY (30) DAYS OF THE AWARD OF THE CONTRACT. ALL PAGES FROM THE APPROPRIATE PERFORMANCE REFERENCE HANDBOOK DETAILING GROUND PRESSURE FOR ALL THE PROPOSED EQUIPMENT SHALL BE SUPPLIED WITHOUT EDIT HANDBOOK COVER PAGE, COMPLETE PAGES, AND COMPLETE TABLES. ANY PIECE OF EQUIPMENT NOT CONSIDERED LOW GROUND-CONTACT PRESSURE BY THE ENGINEER SHALL ONLY BE UTILIZED ON MATS. ALL OFF-MAT EQUIPMENT SHALL BE ADVERTISED BY THE MANUFACTURER AS LGP EQUIPMENT. SHOE WIDTH SHALL BE THE LARGEST AVAILABLE FOR THE MODEL AS MANUFACTURED BY THE MANUFACTURER. THE ENGINEER MAY REQUIRE THE USE OF MATS IF THE GROUND PRESSURE EXCEEDS 10 PSI EVEN IF THE MAXIMUM SHOE WIDTH IS UTILIZED. EXCAVATION WILL BE STAGED SUCH THAT LGP EQUIPMENT, MATS, AND MAT-SUPPORTED EQUIPMENT SHALL NOT OPERATE ON EXCAVATED AREAS AFTER FINAL GRADE IS REACHED, I.E. EXCAVATION SHALL BACK OUT OF THE SITE. PAYMENT FOR ALL MATERIALS (MATS, ETC.), EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED FOR EXCAVATION OF THE WETLAND MITIGATION AREAS SHALL BE INCIDENTAL TO ITEM 202000 EXCAVATION AND EMBANKMENT. NO SEPARATE PAYMENT WILL BE MADE UNDER ITEM 621500 - TEMPORARY TIMBER MAT.

2. THE GRADING TOLERANCE FOR THE WETLAND MITIGATION IS PLUS OR MINUS ONE TENTH (0.1) OF A FOOT OF THE PLAN GRADES AND LINES. THIS WETLAND MITIGATION GRADING REQUIREMENT SHALL BE STRICTLY ADHERED TO FOR ALL EXCAVATION/GRADING OPERATIONS UNLESS OTHERWISE DIRECTED IN WRITING BY THE ENGINEER. ONLY AT THE WRITTEN DIRECTION OF THE ENGINEER SHALL THE CONTRACTOR MODIFY THE GRADING SPECIFIED IN THESE DESIGN PLANS. THE GRADE FOR THE WETLAND MITIGATION IS SHOWN ON SHEETS 61-63.

SECTION 700

3. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE POSITIVE DRAINAGE AT ALL TIMES DURING WORK ACTIVITIES REQUIRING ANY EXCAVATION WITHIN THE WETLAND MITIGATION. NO WORK IS ALLOWED THAT WOULD POND THE WETLAND MITIGATION OR RESTRICT THE TIDAL PRISM. FOR ALL WORK, INCLUDING WORK OUTSIDE THE WETLAND MITIGATION, THE CONTRACTOR SHALL ALSO PROVIDE NECESSARY DEWATERING TO STABILIZE SLOPE EXCAVATION DURING CONSTRUCTION UNTIL THE SLOPES STABILIZE AS DETERMINED BY THE ENGINEER. IN ADDITION, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO GATHER ALL NECESSARY DATA AND INFORMATION TO OBTAIN ANY PERMITS FOR PUMPING GROUNDWATER THAT MAY BE REQUIRED FOR THEIR OPERATIONS. PUMPING PERMITS ARE OBTAINABLE FROM THE DNREC DIVISION OF WATER RESOURCES, WATER SUPPLY WELL PERMITTING AND LICENSING BRANCH. ALL COSTS SHALL BE INCIDENTAL TO ITEM 763501 - CONSTRUCTION ENGINEERING.

4. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE MASTER BENCHMARK DURING THE CONSTRUCTION. THE MASTER BENCHMARK SHALL NOT BE RE-SET OR RE-EVALUATED FOR ELEVATIONS. ALL GRADING ELEVATIONS SHALL BE REFERENCED TO THE MASTER BENCHMARK DATUM. AT A MINIMUM, PROTECTION SHALL INCLUDE PROTECTION FENCING AROUND THE BENCHMARK. MATERIALS AND METHODS FOR PROTECTION SHALL BE INCIDENTAL TO ITEM 736501 - CONSTRUCTION ENGINEERING.

SECTION 900

5. IF DIRECTED BY THE ENGINEER, ITEM 908515 - TEMPORARY GRASS SEEDING, WET GROUND WILL BE BROADCAST OR HYDROSEEDED. THIS WOULD OCCUR OVER THE WETLAND MITIGATION, AS DIRECTED BY THE ENGINEER.

ADDITIONAL WETLAND MITIGATION NOTES INCLUDING SEQUENCE OF CONSTRUCTION

1. ALL WORK FOR THE WETLAND MITIGATION SHALL BE COMPLETED IN ONE CONSTRUCTION SEASON. APPROVAL OF THE FINAL GRADING AS-BUILT DRAWINGS SHALL OCCUR SO ITEM NO. 911000 - PLANTINGS MAY BE INSTALLED BETWEEN APRIL 1ST TO MAY 15TH OR SEPTEMBER 15TH AND OCTOBER 15TH AS NOTED BELOW. THE WETLAND MITIGATION INCLUDES ALL AREAS DESIGNATED FOR ITEM 911000 - PLANTINGS, PLUS AS DETERMINED BY THE ENGINEER.

2. DELDOT MAY ELECT TO CONDUCT PHRAGMITES CONTROL SPRAYING DURING THE WORK. WHILE THIS WORK IS BEING CONDUCTED, OTHER WORK MAY BE TEMPORALLY SUSPENDED IN PART OR WHOLE BY THE ENGINEER.

3. INSTALL OR INSPECT AND MAINTAIN ANY EROSION AND SEDIMENT CONTROL ITEMS.

4. INSTALL OR INSPECT AND MAINTAIN ITEM NO. 908023 - STABILIZED CONSTRUCTION ENTRANCES AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS.

5. PERFORM THE CLEARING AND GRUBBING OF THE SITE SO THE WORK ONLY DISTURBS AREAS THAT WILL BE EXCAVATED TO THE GRADE ELEVATION WITHIN THE NEXT FOURTEEN CALENDAR DAYS.

6. AT LOW TIDE THE WETLAND MITIGATION SHALL DRAIN OF SURFACE WATER, AS SOLELY DETERMINED BY THE ENGINEER. SHALLOW RIVULETS 1-INCH DEEP, 12-INCHES WIDE WILL BE ALLOWED TO PROMOTE DRAINAGE. DEEPER RIVULETS ARE NOT ALLOWED. AT THE INTERSECTION OF THE MARSH PLAIN AND THE CREEK, THE MARSH PLAIN SHOULD BE ABLE TO FREELY DRAIN INTO THE CREEK, AS SOLELY DETERMINED BY THE ENGINEER. THE CONTRACTOR NEEDS TO PROVIDE THESE DRAINAGE ELEMENTS. THESE DRAINAGE ELEMENTS MAYBE HAND EXCAVATED. DRAINAGE ELEMENTS WILL BE ESTABLISHED AT THE DIRECTION OF THE ENGINEER. ALL COSTS SHALL BE INCIDENTAL TO ITEM NO. 202000 EXCAVATION AND EMBANKMENT.

7. EXCAVATE THE WETLAND MITIGATION SITE TO THE DESIGN ELEVATIONS. THE EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED. THIS EXCAVATION AND THE DISPOSAL OF THE MATERIAL SHALL BE PAID UNDER ITEM NO. 202000 - EXCAVATION AND EMBANKMENT. THIS MATERIAL MAY BE IMMEDIATELY REMOVED FROM THE PROJECT, BUT TEMPORARY STOCKPILE LOCATIONS MAY BE APPROVED BY THE ENGINEER. THIS EXCAVATED MATERIAL SHALL BE COMPLETELY REMOVED FROM THE PROJECT LOCATION PRIOR THE CONTRACTOR PERFORMING THE AS-BUILT SURVEY AND DELDOT APPROVING THE GRADING ELEVATION AND AS-BUILT SUBMITTAL. THESE STOCKPILES SHALL ONLY BE PLACED IN UPLAND LOCATIONS APPROVED BY THE ENGINEER. THIS MATERIAL WILL NOT BE USED TO ESTABLISH ANY TOPSOIL ON THE PROJECT. THE ENGINEER MAY REQUIRE TEMPORARY SEEDING AND EROSION CONTROL ELEMENTS TO BE PLACED. THIS STABILIZATION WORK WOULD BE INCIDENTAL TO ITEM NO. 202000 - EXCAVATION AND EMBANKMENT.

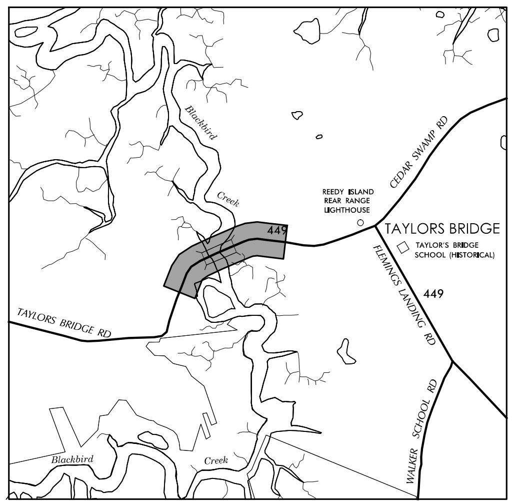
8. THE CONTRACTOR SHALL PREPARE AND SUBMIT AS-BUILT TOPOGRAPHIC PLANS FOR THE GRADING. ALL AS-BUILT SUBMITTALS WILL BE TIED TO THE HORIZONTAL/VERTICAL MASTER BENCHMARK, TBRA (SHEET 8, HORIZONTAL AND VERTICAL CONTROL). THE MAXIMUM HORIZONTAL DISTANCE BETWEEN SPOT ELEVATIONS SHALL BE 20 FEET AND ADDITIONAL SPOT ELEVATIONS SHALL BE OBTAINED AS NECESSARY TO IDENTIFY ALL BREAKS IN GRADE AND OTHER FEATURES. SPOTS ELEVATIONS SHALL EXTEND A MINIMUM OF 50 FEET BEYOND THE EXCAVATED AREAS.

9. ESTABLISH THE PERIMETER OF THE WETLAND MITIGATION EXCAVATION. THESE LIMITS SHALL BE SHOWN ON THE AS-BUILTS. SPOT ELEVATIONS SHALL BE ESTABLISHED ON MAXIMUM 20 CENTERS STARTING WITHIN 1-FOOT OF THE OUTER LIMITS OF THE WETLAND MITIGATION EXCAVATION IN ALL DIRECTIONS AND LINES (TO THE INSIDE OF THE EXCAVATION); THEN ADD INTERIOR AND EXTERIOR SPOTS AS NEED TO MEET THE SPOT DISTANCE AND SURVEY REQUIREMENTS. SPOT ELEVATIONS SHALL BE OBTAINED AND SHOWN ON THE AS-BUILT PLAN TO ONE-HUNDRETH OF A FOOT. THE DRAWINGS SHALL BE SUBMITTED TO DELDOT IN BOTH DIGITAL AND PAPER FORMAT CONFORMING TO CURRENT DELDOT CADD STANDARDS. DIGITAL INFORMATION SHALL BE SUBMITTED IN .DGN FORMAT AND .DTM FORMAT AND SHALL INCLUDE ALL SURVEY DATA IN .TXT FORMAT. THE DRAWINGS SHALL BE AT 30 SCALE. CONTOURS SHALL BE SHOWN AT 0.1 INTERVALS AND THE CONTOUR LINES SHALL BE LABELED FREQUENTLY ENOUGH THAT IT IS POSSIBLE TO CLEARLY ASCERTAIN THE ELEVATION OF ANY PARTICULAR CONTOUR LINE ANYWHERE ON THE PLAN SHEET. SPOT ELEVATIONS ON THE AS-BUILTS SHALL BE LABELED AND SHALL BE SUCH THAT THE PLAN SHEET TEXT SHALL BE LEGIBLE, SOLID BLACK CHARACTERS, IN SIZE APPROPRIATE TO THE SCALE OF THE DRAWINGS AND SEPARATED, NOT SUPERIMPOSED, ON TOP OF ONE ANOTHER. A PROFESSIONAL ENGINEER OR LAND SURVEYOR REGISTERED IN THE STATE OF DELAWARE SHALL SIGN AND SEAL THE AS-BUILTS. THE CONTRACTOR SHALL SUBMIT THE AS-BUILTS WITHIN SEVEN CALENDAR DAYS OF REACHING FINAL GRADE. ALL COSTS FOR PREPARING THE AS-BUILT PLANS SHALL BE PAID FOR UNDER ITEM NO. 763501 - CONSTRUCTION ENGINEERING.

10. DELDOT SHALL REVIEW THE SUBMITTED AS-BUILT DRAWINGS TO ENSURE THE PROJECT IS GRADED IN ACCORDANCE WITH THE LINE AND GRADES OF THE PLANS AND SHALL RESPOND TO THE CONTRACTOR WITHIN TEN CALENDAR DAYS. IF THE SITE IS NOT PROPERLY GRADED, DELDOT SHALL MARK THE ERRORS ON THE DRAWINGS AND RETURN THEM TO THE CONTRACTOR. THE CONTRACTOR SHALL GRADE ANY DEFECTIVE AREAS WITHIN SEVEN CALENDAR DAYS OF RECEIVING THE MARKED PLANS FROM DELDOT. IF FILL IS NEEDED, THE FILL MATERIAL SHALL BE A MEDIUM SAND OR COARSE SAND, AS SOLELY DETERMINED BY THE ENGINEER. THE FILL MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. NO ADDITIONAL COMPENSATION WILL BE PAID FOR THIS FILL PLACEMENT. THE CONTRACTOR THEN SHALL PREPARE AND SUBMIT TO DELDOT A NEW SET OF PAPER AND ELECTRONIC AS-BUILT PLANS FOR THE ENTIRE SITE SHOWING THE CORRECTIVE WORK AREAS WITHIN SEVEN CALENDAR DAYS OF COMPLETING THE CORRECTIVE WORK. DELDOT SHALL REVIEW AND, IF NECESSARY, RETURN THE PLANS TO THE CONTRACTOR WITH ANY ERRORS AGAIN MARKED ON THE PLANS WITHIN FIVE CALENDAR DAYS. THIS PROCESS SHALL CONTINUE UNTIL THE PROJECT AND AS-BUILT DRAWINGS CONFORM TO THE PLANS AND ALL OTHER REQUIREMENTS OF THE CONTRACT DOCUMENTS. ALL COSTS FOR PREPARING THE FINAL AS-BUILT PLANS SHALL BE PAID FOR UNDER ITEM NO. 763501 - CONSTRUCTION ENGINEERING.

11. TWO OR THREE DAYS PRIOR TO STARTING THE WETLAND PLANTING, THE GRADED MARSH PLAIN AND THE LOC WILL BE INSPECTED AT LOW TIDE IN THE PRESENCE OF THE ENGINEER. DURING THE LOW-TIDE CYCLE, THE MARSH PLAIN SHALL FREELY DRAIN TO THE CREEK CHANNEL, AS SOLELY DETERMINED BY THE ENGINEER. WATER SHALL NOT POND ON THE MARSH PLAIN DURING THE FALLING TIDE, AS SOLELY DETERMINED BY THE ENGINEER. PRIOR TO PLANTING, ALL DEBRIS, STRAW AND ANY VEGETATION RACK SHALL BE REMOVED FROM THE WETLAND MITIGATION AND LOC, AND PROPERLY DISPOSED OF, AS SOLELY DETERMINED BY THE ENGINEER. AT THE DIRECTION OF THE ENGINEER, THE TURBIDITY CURTAIN SHALL BE REMOVED PRIOR TO CONDUCTING THE PLANTING.

12. AFTER ACCEPTANCE OF THE WETLAND MITIGATION GRADING BY DELDOT, THE CONTRACTOR SHALL PLANT THE WETLAND MITIGATION, ITEM 911000 - PLANTINGS. THIS ELEVATION SHOULD BE INUNDATED ON THE DAILY HIGH TIDE. THE REQUIREMENT FOR SALINITY ACCLIMATION IS WAIVED (MATERIALS, (C)). PRIOR TO PEAT-POT PLACEMENT, TWO 21-GRAM 20-10-5 AGIFORM SLOW-RELEASE FERTILIZER TABLETS SHALL BE PLACED AT THE BOTTOM OF EACH PLANTING HOLE. THIS FERTILIZER PLACEMENT IS INCIDENTAL TO ITEM 911000 - PLANTINGS.



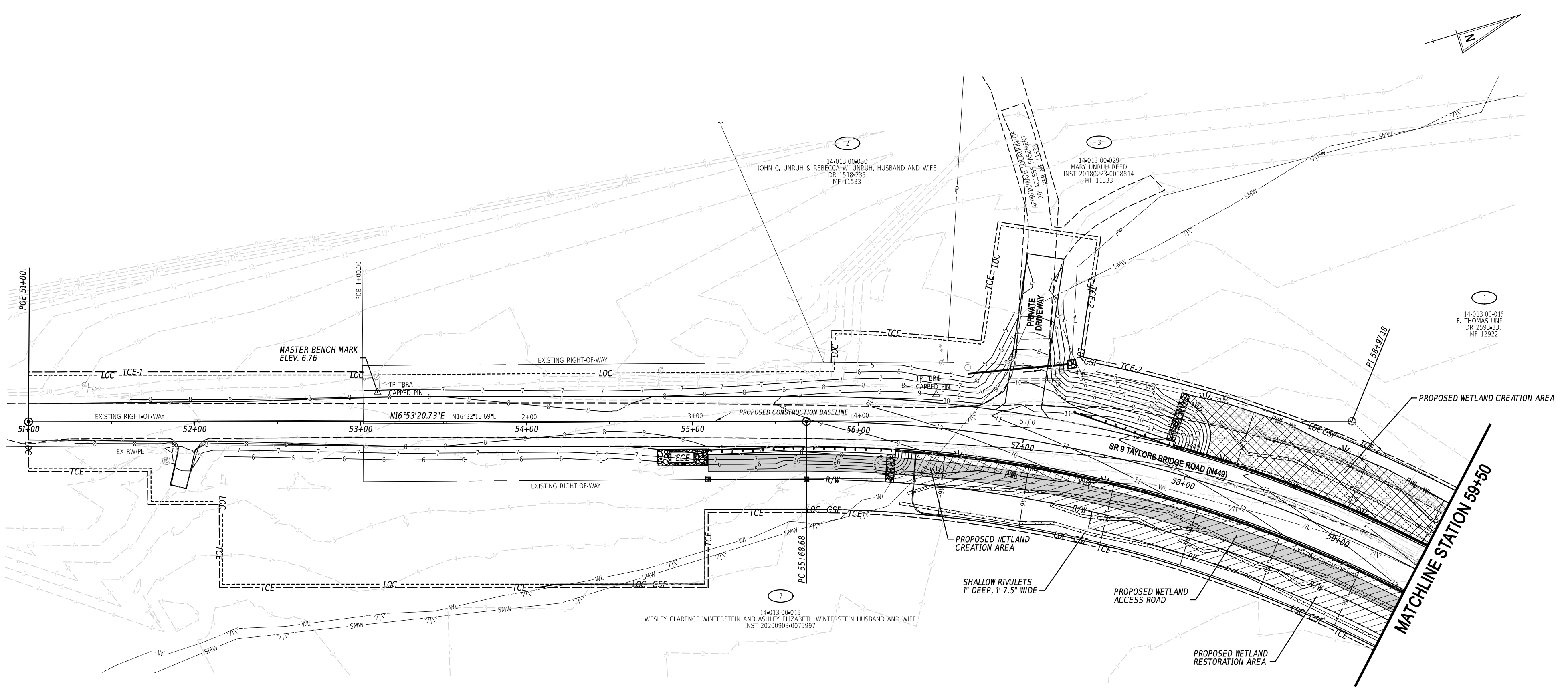
WETLAND CREATION SITE EARTHWORK SUMMARY

EXCAVATION	
EXCAVATION FROM CROSS SECTIONS	4430 C.Y.
ROCK EXCAVATION FOR ROADWAY AND TRENCHES	0 C.Y.
TOPSOIL STRIPPING	0 C.Y.
TOTAL EXCAVATION	4430 C.Y.
EXCAVATION AVAILABLE FOR EMBANKMENT	
EXCAVATION MEETING BORROW TYPE 'A'	0 C.Y.
EXCAVATION MEETING BORROW TYPE 'C'	0 C.Y.
EXCAVATION MEETING BORROW TYPE 'F'	0 C.Y.
EXCAVATION MEETING TOPSOIL	0 C.Y.
EMBANKMENT REQUIREMENTS	
BORROW TYPE 'A' REQUIRED (INCLUDING UNDERCUT)	0 C.Y.
BORROW TYPE 'C' REQUIRED	0 C.Y.
BORROW TYPE 'F' REQUIRED	0 C.Y.
TOPSOIL REQUIRED (TOPSOILING, 6 INCH)	0 C.Y.
MATERIAL BALANCE ("+"= EXCESS, "-"= NEED)	
BORROW TYPE 'A'	0 C.Y.
BORROW TYPE 'C'	0 C.Y.
BORROW TYPE 'F'	0 C.Y.
TOPSOIL	0 C.Y.
UNSUITABLE MATERIAL	4430 C.Y.

NOTES:
1) THE VALUES LISTED IN THE EARTHWORK SUMMARY ARE APPROXIMATE AND ARE NOT TO BE USED AS A BASIS OF PAYMENT. THE EARTHWORK SUMMARY IS CONSIDERED FOR INFORMATIONAL PURPOSES ONLY.
2) OTHER SOURCES OF EXCAVATION MAY INCLUDE PIPE TRENCH EXCAVATION, STRUCTURE EXCAVATION, UNDERCUT EXCAVATION, STORMWATER MANAGEMENT POND EXCAVATION, ENVIRONMENTAL SITE EXCAVATION, MAINTENANCE OF TRAFFIC EXCAVATION, ETC.
3) UNSUITABLE MATERIALS INCLUDE UNDERCUT SOILS, BITUMINOUS PAVEMENT, ETC.

NOTES:
1) THE VALUES LISTED ABOVE ARE ALSO INCLUDED IN THE EARTHWORK SUMMARY FOR THE ENTIRE PROJECT. SEE THE PROJECT EARTHWORK SHEET FOR THIS INFORMATION.

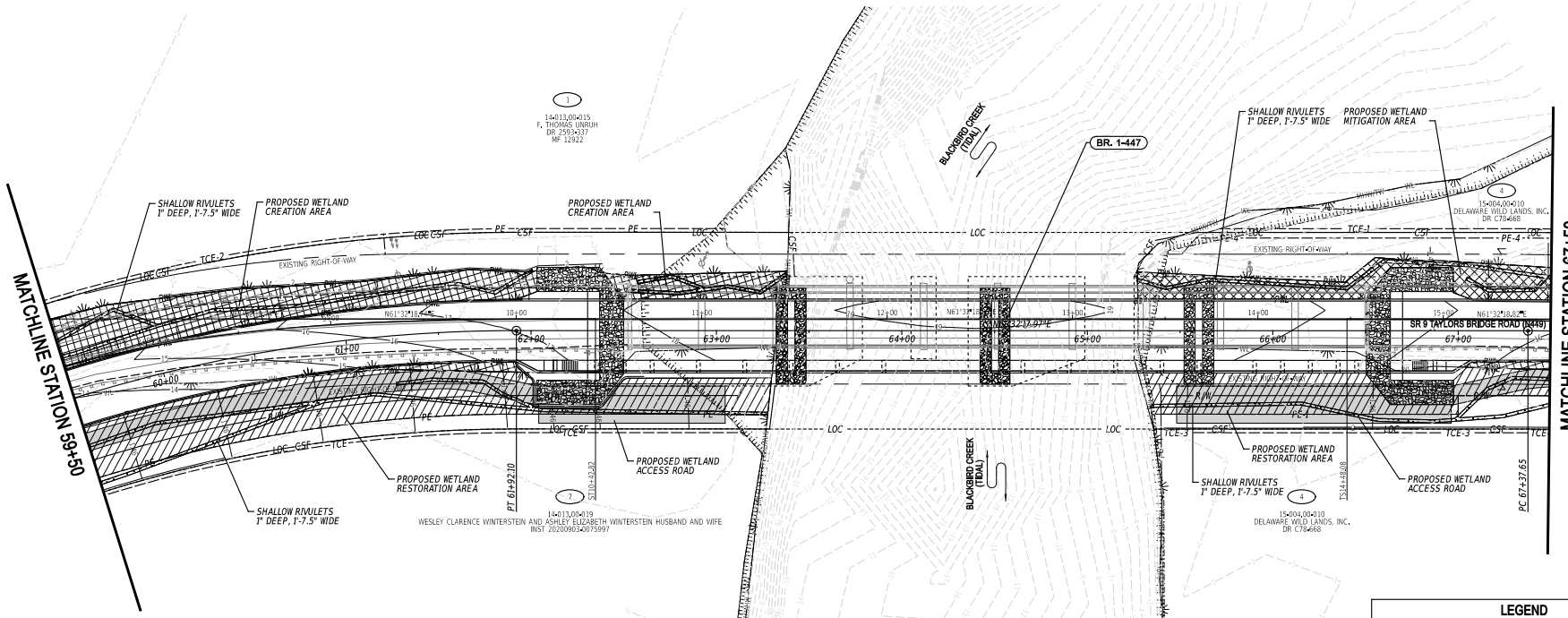
PROJECT NOTES (SECTION NOTES RELATING TO WETLAND MITGATION) ARE SHOWN ON SHEETS 60 AND 67.



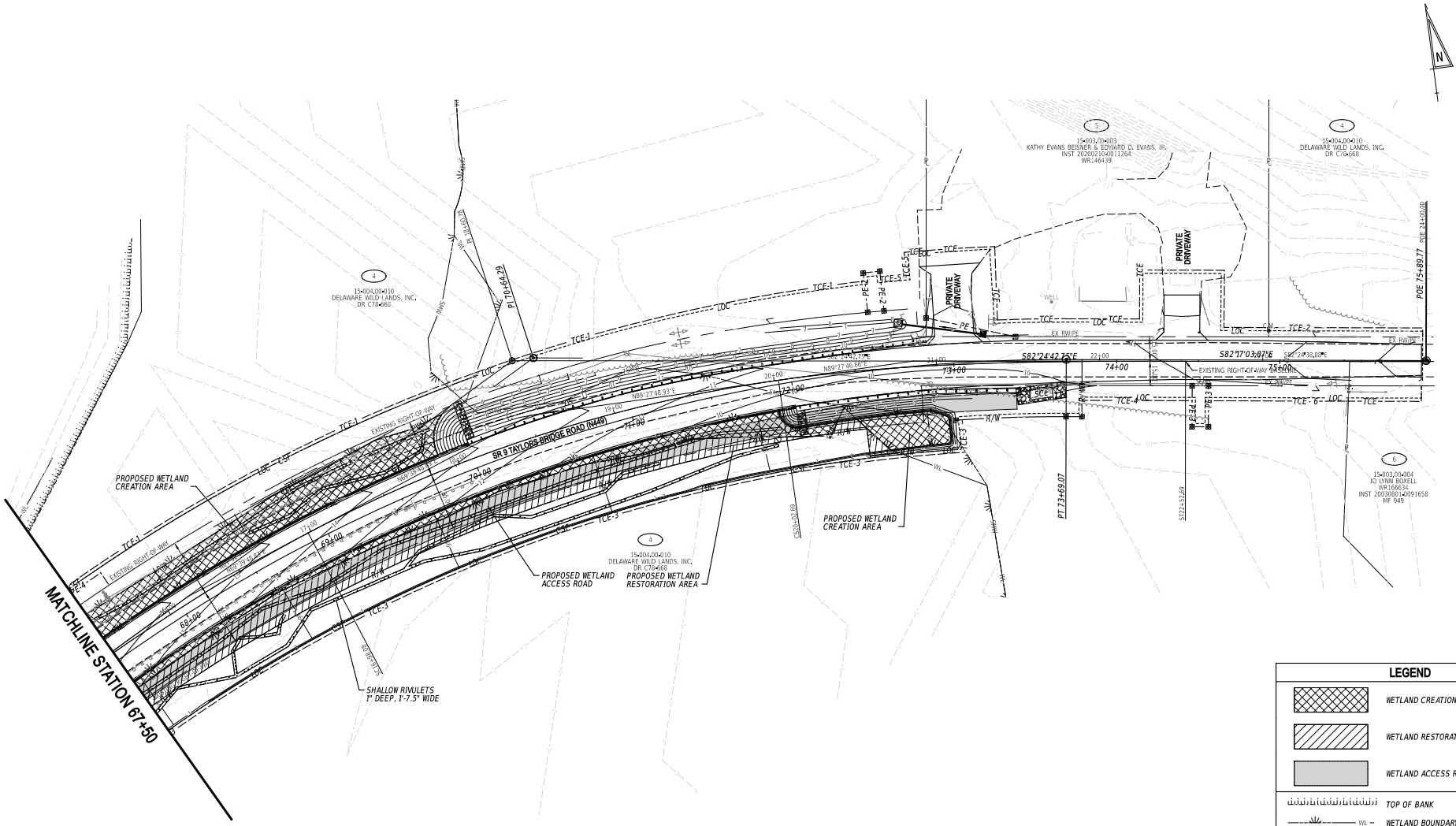
LEGEND

- WETLAND CREATION AREA
- WETLAND RESTORATION AREA
- WETLAND ACCESS ROAD
- WL — WETLAND BOUNDARY
- LOC — LIMIT OF CONSTRUCTION
- PWL — PROPOSED WETLAND BOUNDARY
- SMW — STATE MAPPED WETLAND

ADDENDA / REVISIONS	SCALE 0 30 60 90 FEET	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	WETLAND MITIGATION SITE GRADING PLAN	WM-01
			COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY		SECTION PAI
				CHECKED BY: J. GRAUPENSPERGER		SHEET NO. 61



ADDENDA / REVISIONS		SCALE 0 30 60 90 FEET	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	WETLAND MITIGATION SITE GRADING PLAN	WM-02
				COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY		SECTION PAI
					CHECKED BY: J. GRAUPENSPERGER		SHEET NO. 62



ADDENDA / REVISIONS		SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT	BRIDGE NO. 1-447	WETLAND MITIGATION SITE GRADING PLAN	WM-03
		0 30 60 90 FEET		T201907102	DESIGNED BY: E. HARASTY		SECTION
				COUNTY			PAI
				NEW CASTLE	CHECKED BY: J. GRAUPENSPERGER		SHEET NO. 63

HORIZONTAL / VERTICAL CONTROL DATA

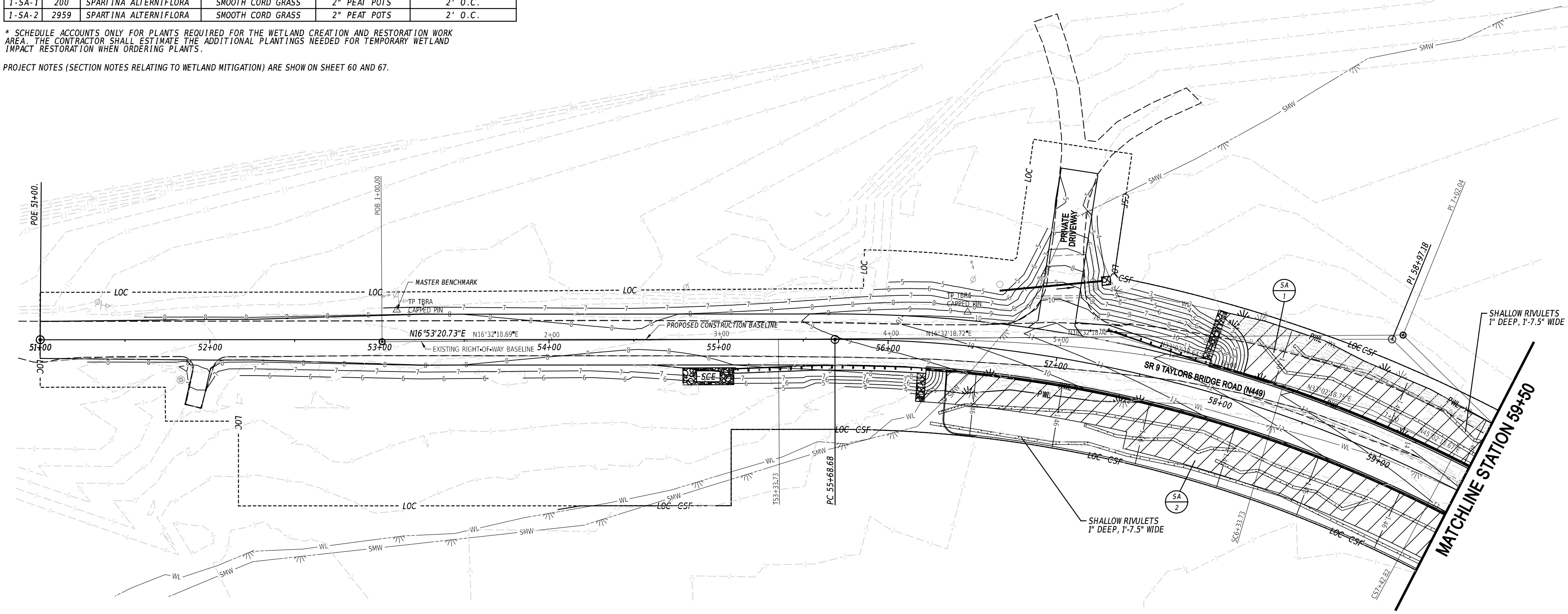
POINT NO.	STATION	OFFSET	NORTHING	EASTING	ELEV.
TBR1	56+45.05	-19.79	511209.5124	603945.1504	5.50
TBRA	53+10.23	-17.49	510887.8627	603845.9937	6.76

PLANT SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
1-SA-1	200	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
1-SA-2	2959	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.

PROJECT NOTES (SECTION NOTES RELATING TO WETLAND MITIGATION) ARE SHOW ON SHEET 60 AND 67.



LEGEND

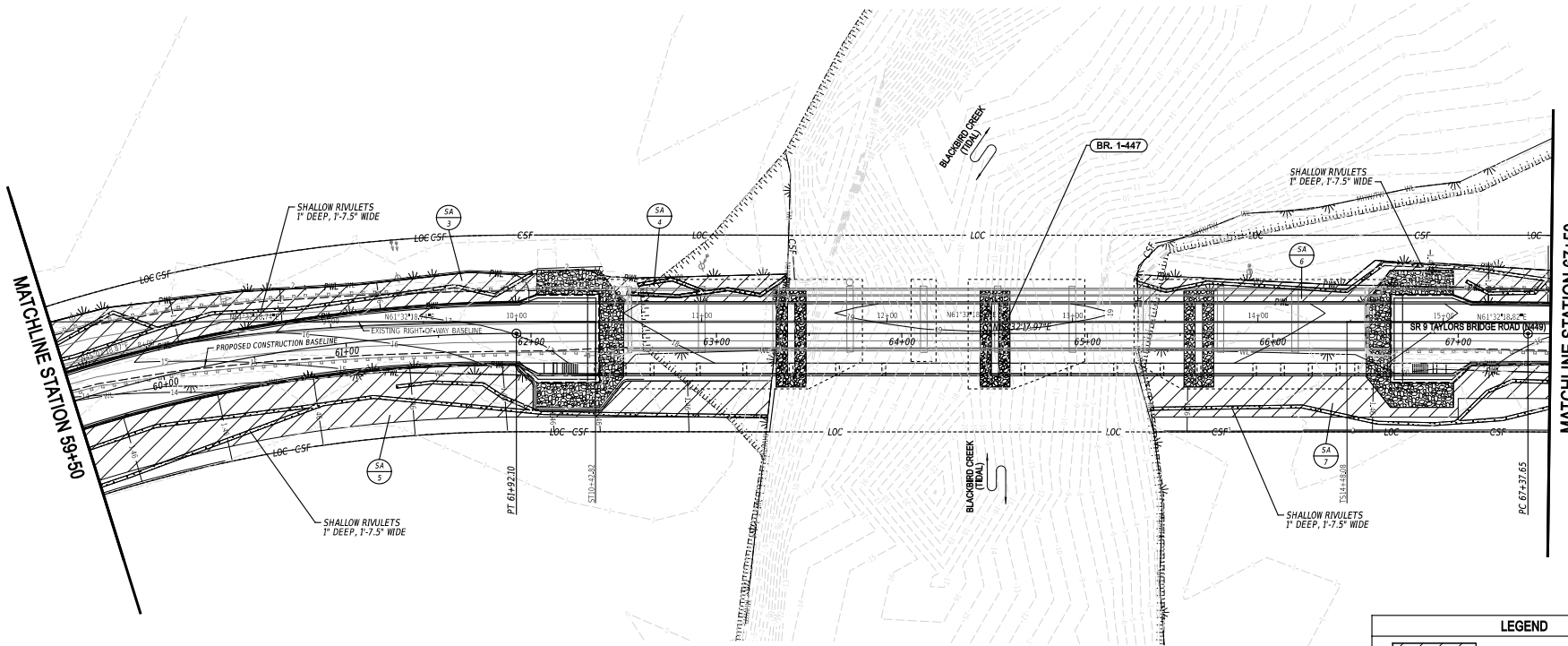
- PLANTING AREA
- WL — WETLAND BOUNDARY
- LOC — LIMIT OF CONSTRUCTION
- PWL — PROPOSED WETLAND BOUNDARY
- SMW — STATE MAPPED WETLAND
- XXX / XXX — PLANTING IDENTIFIER / PLANTING ID NUMBER

SA = SPARTINA ALTERNIFLORA

ADDENDA / REVISIONS	SCALE (FEET) 0 30 60 90	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	WETLAND MITIGATION SITE LANDSCAPING PLANS	WM-04
			COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY		SECTION PAI
				CHECKED BY: J. GRAUPENSPERGER		SHEET NO. 64

PLANT SCHEDULE					
KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
2-SA-3	1270	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-4	315	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-5	2187	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-6	674	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-7	954	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.



LEGEND

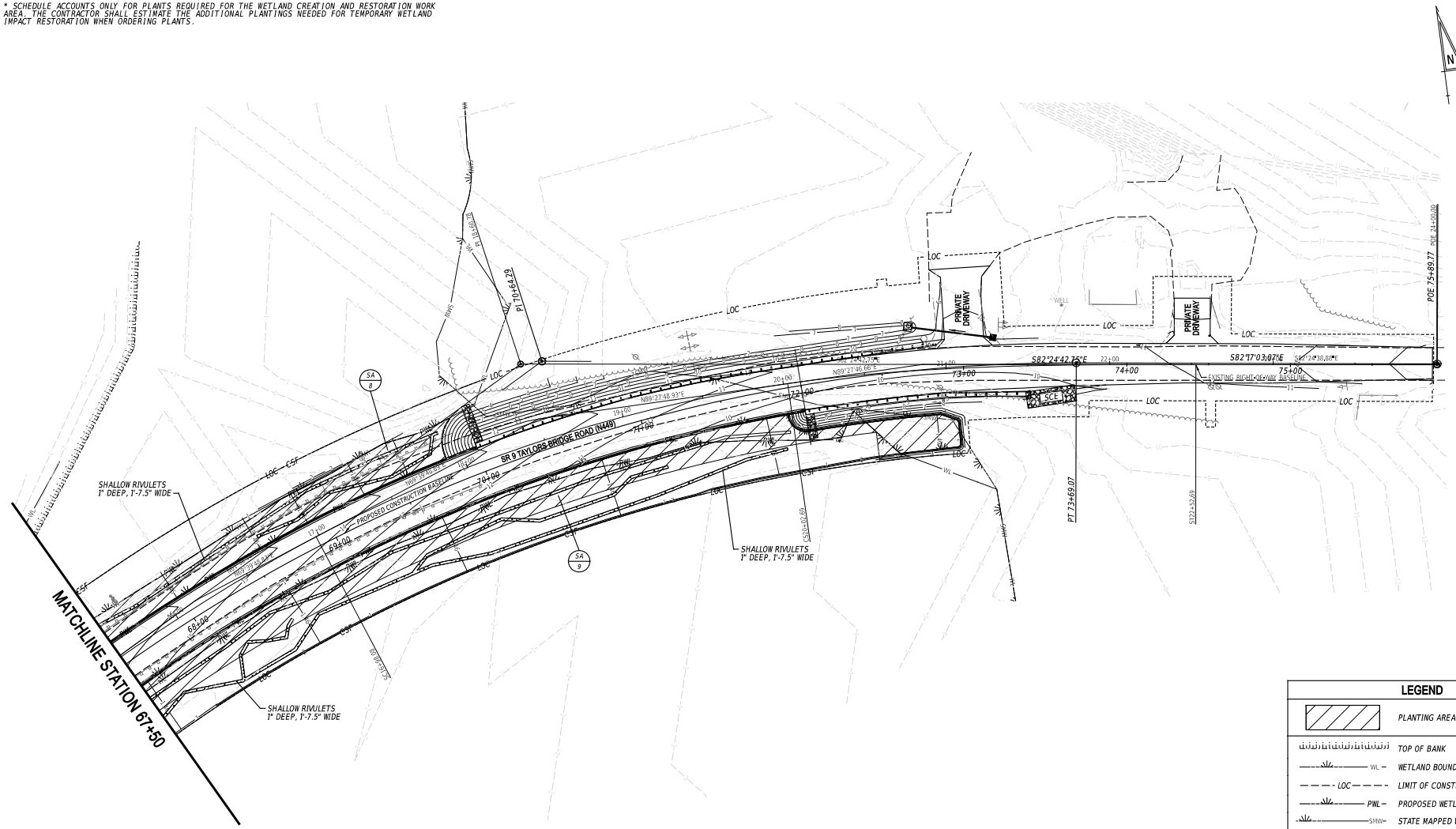
- PLANTING AREA
- TOP OF BANK
- WL – WETLAND BOUNDARY
- LOC – LIMIT OF CONSTRUCTION
- PWL – PROPOSED WETLAND BOUNDARY
- SMW – STATE MAPPED WETLAND
- XXX / XXX – PLANTING IDENTIFIER / PLANTING ID NUMBER

SA = SPARTINA ALTERNIFLORA

ADDENDA / REVISIONS		SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT	BRIDGE NO.	1-447	WETLAND MITIGATION SITE LANDSCAPING PLANS	WM-05
		0 30 60 90 FEET		T201907102	DESIGNED BY:	E. HARASTY		SECTION
				COUNTY	CHECKED BY:	J. GRAUPENSPERGER		PAI
				NEW CASTLE				SHEET NO. 65

PLANT SCHEDULE					
KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
3-SA-8	1160	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
3-SA-9	2410	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.



LEGEND	
	PLANTING AREA
	TOP OF BANK
WL	WETLAND BOUNDARY
LOC	LIMIT OF CONSTRUCTION
PWL	PROPOSED WETLAND BOUNDARY
SMW	STATE MAPPED WETLAND
XXX / XXX	PLANTING IDENTIFIER / PLANTING ID NUMBER

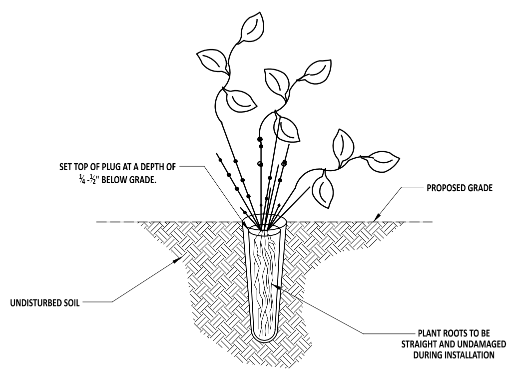
SA = SPARTINA ALTERNIFLORA

ADDENDA / REVISIONS		SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT	BRIDGE NO.	1-447	WETLAND MITIGATION SITE LANDSCAPING PLANS	WM-06
		0 30 60 90 FEET		T201907102	DESIGNED BY:	E. HARASTY		SECTION
				COUNTY	CHECKED BY:	J. GRAUPENSPERGER		PAI
				NEW CASTLE				SHEET NO.
								66

PLANT SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
SA	12,129*	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.



SECTION VIEW

NOTES:
1). PLANT USING A DIBBLE BAR, STEEL STAKE OR SIMILAR APPROVED PLANTING DEVICE.
2). PLANTING PIT SHALL BE SLIGHTLY LARGER THAN THE PLANT ROOT MASS.
3). DO NOT DAMAGE LEAVES, ROOTS OR STAKES DURING CONSTRUCTION.
4). PLANT AQUATIC PLUGS IN GROUPS OF 50 PLANTS MIN, PER SPECIES.

AQUATIC PLANTING DETAIL - 2" PLUG
NOT TO SCALE

GENERAL PLANTING NOTES

1. THE PEAT-POTTED STOCK SHALL HAVE BEEN GROWN IN 2-INCH SIDED PEAT POTS LONG ENOUGH AND UNDER PROPER CONDITIONS FOR THE ROOT SYSTEM TO BE SUFFICIENTLY WELL DEVELOPED THROUGH THE SIDES AND BOTTOM OF THE POT TO A PREVENT EASY REMOVAL OF THE PLANT FROM THE POT. PLANTS THAT CAN BE REMOVED FROM THE POTS BY HOLDING THE STEM GROWTH AND GENTLY PULLING ON THE POTS SHALL BE REJECTED WITHOUT COMPENSATION. EACH PEAT POT SHALL CONTAIN A MINIMUM TWO STEMS PER POT, NOT LESS THAN 40MM TALL.
2. FROM THE TIME THE SPARTINA LEAVES THE NURSEY UNTIL IT IS INSTALLED AND NORMAL HYDROLOGIC REGIME (I.E., UNRESTRICTED TIDAL FLOW OF NORMAL WATER LEVELS) IS ESTABLISHED, ALL STOCK SHALL BE WATERED WITH FRESH WATER. SALINE OR BRACKISH WATER SHALL NOT BE USED FOR WATERING.

3. THE PLANTING WINDOWS FOR SPARTINA ALTERNIFLORA ARE APRIL 1ST TO MAY 15TH AND SEPTEMBER 1ST TO OCTOBER 15TH. A SPRING PLANTING IS PREFERRED.

4. FOR EACH SPARTINA PLUG, PLACE TWO 21-GRAM AGRIFROM 20-10-5 SLOW RELEASE TABLETS (OR APPROVED EQUAL) AT THE BOTTOM OF THE PLANTING HOLE.

5. MAINTENANCE WATERING IS NOT REQUIRED FOR THE SPARTINA AFTER INSTALLATION.

GENERAL MAINTENANCE OF TRAFFIC NOTES:

1. AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA) CERTIFIED TRAFFIC CONTROL SUPERVISOR REQUIREMENT FOR THIS PROJECT.

(X)	THE CONTRACTOR SHALL NOT BE REQUIRED TO HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT.
( )	THE CONTRACTOR SHALL HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT. THE CONTRACTOR'S GENERAL SUPERINTENDENT FOR THIS PROJECT OR ANOTHER ATSSA CERTIFIED MEMBER OF THE CONTRACTOR'S PROJECT STAFF MAY BE THE ATSSA SUPERVISOR. PAYMENT FOR ATSSA SUPERVISOR IS INCIDENTAL TO ITEM 801500.

2. THE USE OF MILLINGS AND GRADED AGGREGATE BASE COURSE (GABC) IN THE TRAVEL WAY, TEMPORARY TRAVEL WAY, HIGH VOLUME ENTRANCES AND ACCESS RAMP FOR THE PURPOSE OF PROVIDING A TEMPORARY ROADWAY SURFACE, POTHOLE REPAIR, TAPERED EDGE FOR UTILITIES, BUTT JOINTS, AND LONGITUDINAL DROP-OFFS (MILLING AND PAVING OPERATIONS) IS PROHIBITED UNLESS IT IS OTHERWISE DESIGNATED TO BE USED IN THE CONTRACT PLANS. USE COLD PATCH, BITUMINOUS CONCRETE, BITUMINOUS CONCRETE WEDGE, OR TAPER MILL, AS NOTED IN THE CONTRACT DOCUMENTS OR APPROVED BY THE ENGINEER. PAYMENT FOR COLD PATCH, BITUMINOUS CONCRETE OR BITUMINOUS CONCRETE WEDGE SHALL BE PAID AS NOTED IN THE CONTRACT DOCUMENTS. TAPER MILL BITUMINOUS CONCRETE SHALL BE PAID UNDER THE BITUMINOUS CONCRETE MILLING ITEM.

   MILLINGS OR GABC SHALL BE USED AT THE FOLLOWING LOCATIONS WHERE ACCESS TO A BUSINESS, RESIDENCE, OR EDGE DROP OFF NEEDS TO BE MAINTAINED UNLESS OTHERWISE NOTED IN THE PLANS OR DIRECTED BY THE ENGINEER TO USE BITUMINOUS CONCRETE OR COLD PATCH. ALL MILLINGS AND GABC WILL BE ROLLED AND COMPACTED TO HELP PREVENT THE MATERIAL FROM UNRAVELLING:

   a. DRIVEWAYS
   b. ENTRANCES
   c. LOW VOLUME ACCESS RAMPS (IDENTIFIED IN THE CONTRACT DOCUMENTS)
   d. EDGE DROP-OFFS ADJACENT TO LIVE ROADWAY(LANES AND SHOULDER) AND THE PROPOSED ROAD CONSTRUCTION
   e. EDGE OF ROADWAY DROP-OFF

   GRADING AND MAINTAINING BASE COURSE THAT IS BEING USED FOR ROADWAY WEDGE/FILLET BETWEEN TRAVEL LANES AND PAVEMENT BOX, EDGE OF TRAVELWAY, DRIVEWAY OR ENTRANCE ACCESS SHALL BE INCIDENTAL TO ITEM NO. 801500 - MAINTENANCE OF TRAFFIC - ALL INCLUSIVE. THE BASE COURSE MATERIAL SHALL BE PLACED AT NO GREATER THAN THE SLOPE SPECIFIED IN TABLE 6G-1 AND SHALL BE COMPACTED. EXCESS BASE COURSE MATERIAL SHALL BE PUSHED AHEAD AND USED IN THE NEXT SEGMENT AND SHALL BE INCIDENTAL TO THE PARTICULAR BASE COURSE PAY ITEM. NO SEPARATE PAYMENT SHALL BE MADE FOR MILLINGS OR GABC TEMPORARY ROADWAY MATERIAL (TRM) USED TO PROTECT EDGE DROP-OFFS, UNLESS THE MATERIAL IS EVENTUALLY UTILIZED AS PART OF A PERMANENT ROADWAY AT WHICH TIME THE MATERIAL WOULD BE PAID FOR UNDER THE RESPECTIVE CONTRACT MATERIAL ITEM.

   VERTICAL DIFFERENCES SHALL BE CORRECTED IN ACCORDANCE WITH TABLE 6G-1 OF THE DELAWARE MUTCD.

3. ALL NECESSARY SIGNS, PAVEMENT MARKINGS AND ROADSIDE APPURTENANCES SHALL BE INSTALLED PRIOR TO THE OPENING/REOPENING OF A ROADWAY OR RAMP. A WALKTHROUGH WITH THE ENGINEER, TRAFFIC SAFETY, TRAFFIC CONSTRUCTION AND OTHER PERSONNEL SHALL OCCUR NO LESS THAN 48 HOURS PRIOR TO THE OPENING/REOPENING OF ANY ROAD OR RAMP.

4. THE CONTRACTOR WILL MAINTAIN ACCESS TO ALL DRIVEWAYS WITHIN THE PROJECT LIMITS THROUGHOUT THE DURATION OF CONSTRUCTION. DURING THE PAVING OPERATIONS OF THE APPROACH ROADWAYS, THE CONTRACTOR WILL NOTIFY THE PROPERTY OWNERS OF THE WORK AND ASSOCIATED LIMITED ACCESS AT LEAST A WEEK PRIOR TO BEGINNING WORK. PEDESTRIAN ACCESS TO PROPERTIES WILL BE MAINTAINED, UNIMPEDED THROUGHOUT THE DURATION OF THE PROJECT.

CONSTRUCTION PHASING & M.O.T	
	BARRICADE, TYPE 3
	CONCRETE SAFETY BARRIER - PORTABLE
CSF XXX	CONSTRUCTION SAFETY FENCE / LENGTH
—— CSF ——	CONSTRUCTION SAFETY FENCE
	CONSTRUCTION WARNING SIGN LOCATION
END ROAD WORK	CONSTRUCTION WARNING SIGN
	CRASH CUSHION ARRAY
	DRUM - TRAFFIC CONTROL
	FLAGGER LOCATION
	PHASING TRAFFIC FLOW ARROW
	TEMPORARY CONSTRUCTION
	TEMPORARY PAVEMENT MARKING ARROW
	TRUCK WITH MOUNTED ATTENUATOR
	WORK AREA - ACTIVE PHASE

GENERAL EROSION AND SEDIMENT CONTROL NOTES:

1. THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN APPROVED BY DELDOT'S STORMWATER ENGINEER UNDER DELDOT'S DELEGATED AUTHORITY. PLAN APPROVAL IS VALID FOR A ONE YEAR PERIOD BEGINNING ON THE DATE OF THE STORMWATER ENGINEER'S SIGNATURE. ANY DEVIATIONS TO THE SWPPP NEED APPROVAL FROM THE ENGINEER.

   Steven Sisson — 2/20/2025
   DELDOT STORMWATER ENGINEER — DATE

   "I CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THESE PLANS MEET THE REQUIREMENTS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS AND THAT ALL CLEARING, GRADING, AND CONSTRUCTION WILL BE ACCOMPLISHED PURSUANT TO THE PLAN."

AMOUNT OF DISTURBED AREA FOR THE PROJECT	4.91 AC
ADDED IMPERVIOUS FOR THE PROJECT	10,019 SF
HUC-10 WATERSHED	APPOQUINIMINK RIVER - DELAWARE RIVER

2. ASSIGN A RESPONSIBLE PERSON TO BE ON SITE DURING ALL EARTH DISTURBING ACTIVITIES AND BE AN ACTIVE DNREC BLUE CARD HOLDER AS DEFINED IN SECTION 6.2 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS (DSSR). BE FAMILIAR WITH AND COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION GENERAL PERMIT.

3. FILE AS A CO-PERMITTEE IN ACCORDANCE WITH SECTION 901 OF THE STANDARD SPECIFICATIONS. POSTING AND MAINTENANCE OF THE NOI PERMIT COVERAGE IS INCIDENTAL TO THE CONTRACT.

4. REVISIONS TO THE SWPPP OR ENVIRONMENTAL COMPLIANCE PLAN SHEET(S) SHALL BE APPROVED PRIOR TO INITIATION IN THE FIELD. THE ENGINEER IS RESPONSIBLE FOR APPROVING ALL REDLINES AND REVISIONS TO THE SWPPP.

5. IMPLEMENTING AND MAINTAINING POLLUTION PREVENTION DEVICES AND PRACTICES IS REQUIRED UNDER THE DELAWARE CONSTRUCTION GENERAL PERMIT AND THE DSSR AND ARE INCIDENTAL TO THE CONTRACT.

6. A SOIL STOCKPILE, AS DESCRIBE IN DELDOT STANDARD SPECIFICATIONS AND DEFINED IN THE DELAWARE EROSION & SEDIMENT CONTROL HANDBOOK, IS ANY LOCATION WITHIN THE LIMITS OF CONSTRUCTION WHERE A TEMPORARY DEPOSIT OF EXCAVATED SOIL IS BEING RESERVED FOR FUTURE USE. A SOIL STOCKPILE SHALL BE LOCATED A MINIMUM OF 50 FEET FROM A STORM DRAIN INLET, OPEN CHANNEL, WETLAND, OR WATERBODY. A REQUEST MAY BE MADE TO THE ENGINEER TO PERMIT LOCATING A SOIL STOCKPILE LESS THAN 50 FEET FROM A STORM DRAIN INLET OR OPEN CHANNEL. UPON APPROVAL, IF ANY PART OF A SOIL STOCKPILE IS LESS THAN 50 FEET FROM A STORM DRAIN INLET OR OPEN CHANNEL, INSTALL A SUPER SILT FENCE PERIMETER TO PROTECT THE SOIL STOCKPILE. THE SUPER SILT FENCE MUST BE CONSTRUCTED IN ACCORDANCE WITH 905.3.B.3 OF THE STANDARD SPECIFICATIONS. THE COST FOR INSTALLATION AND MAINTENANCE OF THE STOCKPILE SUPER SILT FENCE IS INCIDENTAL TO THE CONTRACT.

7. PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF FROM LEAVING THE SITE. CHECK PERIMETER CONTROLS DAILY AND ADJUST OR REPAIR TO FULLY CONTAIN AND CONTROL SEDIMENT FROM LEAVING THE SITE. REMOVE ACCUMULATED SEDIMENT BEFORE IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. ADJUST OR ALTER MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE ENGINEER.

8. ANY SEDIMENT LADEN DISCHARGE LEAVING THE LIMIT OF CONSTRUCTION SHALL IMMEDIATELY BE ADDRESSED THROUGH BEST AVAILABLE TECHNOLOGIES TO CONTROL ANY FURTHER SEDIMENT LADEN DISCHARGE. REMEDIATION MAY INCLUDE STANDARD E&S PRACTICES OR OTHER METHODS AS APPROVED BY THE ENGINEER.

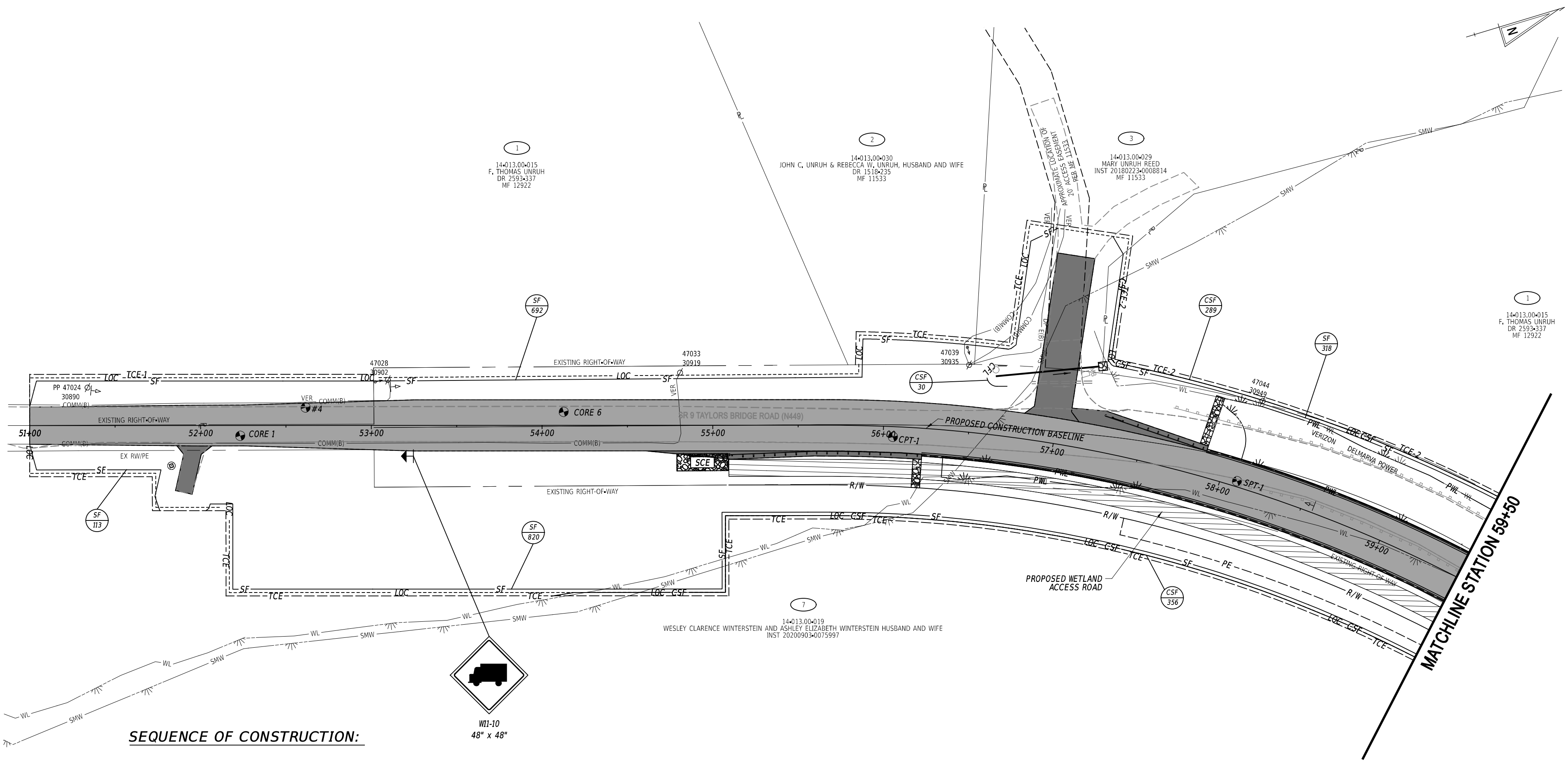
9. ALL TEMPORARY CONCENTRATED FLOW AREAS INCLUDING CHANNEL SIDE SLOPES SHALL HAVE EROSION CONTROL BLANKET MULCH AS DIRECTED BY THE ENGINEER. INSTALL WITHIN SEVEN CALENDAR DAYS UPON CONSTRUCTION INITIATION. A TEMPORARY CONCENTRATED FLOW AREA MAY INCLUDE DITCHES, SWALES, BERMS, CONCENTRATED RUNOFF AREAS, ETC.

10. MAINTAIN POSITIVE DRAINAGE IN EXISTING AND PROPOSED DRAINAGE SYSTEMS BY EXECUTING CONSTRUCTION, CLEANING EXISTING DRAINAGE SYSTEMS, AND PROPERLY DISPOSING OF SEDIMENT THROUGHOUT THE DURATION OF THE PROJECT.

11. PER SIDEWALK, TRAIL, OR OTHER LINEAR IMPERVIOUS SURFACES STANDARD PLAN APPROVAL, NO MORE THAN 1.0 ACRE MAY BE DISTURBED AT ANY TIME. FURTHER DISTURBANCE MAY NOT PROCEED UNTIL TEMPORARY OR PERMANENT STABILIZATION OF THE PREVIOUSLY DISTURBED AREA IS COMPLETED TO THE SATISFACTION OF AND AS APPROVED BY THE ENGINEER.

EROSION & SEDIMENT CONTROL	
	COFFERDAM
—— CFL ——	COMPOST FILTER LOG
CFL	COMPOST FILTER LOG / LENGTH
DWBAG	DEWATERING BAG
DWB	DEWATERING BASIN
ED	EARTH DIKE
	INLET SEDIMENT CONTROL
	PERIMETER DIKE/SWALE
PST	PORTABLE SEDIMENT TANK
SBD	SANDBAG DIKE
SB	SANDBAG DIVERSION
	STONE CHECK DAM
SCE	STABILIZED CONSTRUCTION ENTRANCE
SF	SILT FENCE / LENGTH
—— SF ——	SILT FENCE
RSF	REINFORCED SILT FENCE / LENGTH
—— RSF ——	REINFORCED SILT FENCE
SSF	SUPER SILT FENCE / LENGTH
—— SSF ——	SUPER SILT FENCE
SP	SUMP PIT
ST	SEDIMENT TRAP / NUMBER
ST	SEDIMENT TRAP
ST	SEDIMENT TRAP WITH INLET AS OUTLET
ST	SEDIMENT TRAP PIPE OUTLET
SW	STILLING WELL
	TEMPORARY SWALE
TSD	TEMPORARY SLOPE DRAIN
T XXX	TURBIDITY CURTAIN / LENGTH
—— T ——	TURBIDITY CURTAIN

ADDENDA / REVISIONS	NOT TO SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLAN	SECTION PAI
			COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY		SHEET NO. 68
				CHECKED BY: O. GREEN		



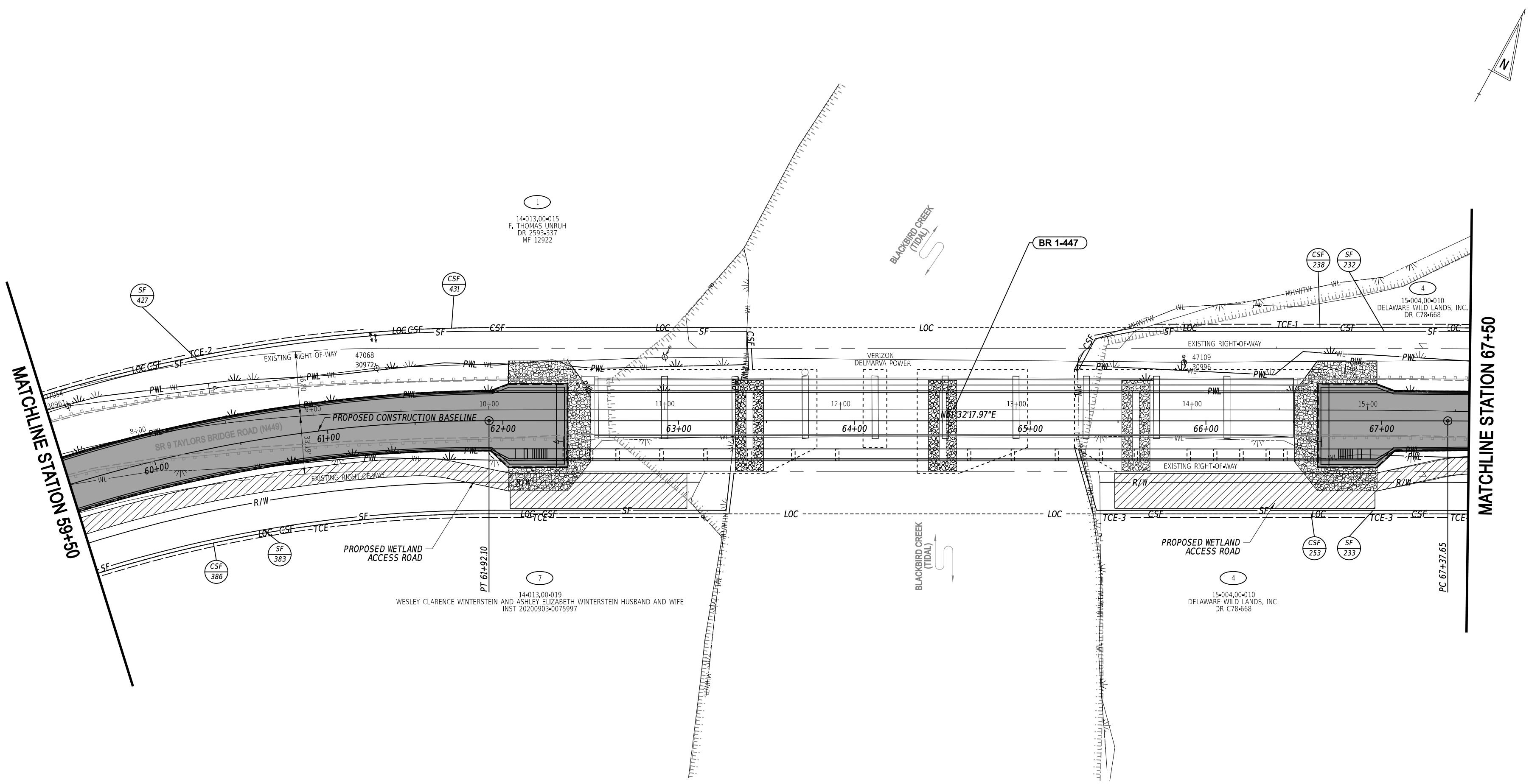
SEQUENCE OF CONSTRUCTION:

1. COORDINATE WITH UTILITY COMPANIES IN ACCORDANCE WITH THE UTILITY STATEMENT. COORDINATE WITH DNREC TO REMOVE THE MONITORING WELL PRIOR TO THE START OF CONSTRUCTION, WHILE ROAD IS STILL OPEN (REFER TO SPECIAL PROVISION 601520 REMOVAL AND INSTALLATION OF MONITORING WELL).
2. INSTALL EROSION AND SEDIMENT CONTROL MEASURES. COFFERDAMS MAY BE INSTALLED OR REMOVED DEPENDING ON THE CONTRACTORS SEQUENCE OF CONSTRUCTION. COFFERDAM INSTALLATION AND REMOVAL MUST BE DONE IN ACCORDANCE WITH TIME OF YEAR RESTRICTIONS IF BELOW THE MHW (IN WATER WORK).
3. INSTALL MOT DEVICES IN ACCORDANCE WITH THE DETOUR PLAN OR AS DIRECTED BY THE ENGINEER.
4. PERFORM DEMOLITION OF EXISTING BRIDGE AND INSTALL PIERS 1 THROUGH 3. INSTALL DEWATERING BAGS AND SUMP PITS AS NEEDED TO DEWATER WORK AREAS. INSTALL 10' L X 10' W AREA OF R-5 RIPRAP AT OUTLET OF DEWATERING PIPE (PAYMENT INCIDENTAL TO ITEM 906002).
5. INSTALL STEEL SHEETING ON APPROACHES BETWEEN STATIONS 56+00 AND ABUTMENT 1 AND ABUTMENT 2 AND STATION 72+00. REMOVE EXISTING PAVEMENT, INSTALL WICK DRAINS, FILL AREA WITH BACKFILL, AND INSTALL LATERAL TIES. GRADE APPROACH AS REQUIRED TO MAINTAIN ACCESS TO PRIVATE DRIVEWAYS. STABILIZE ALL IMPACTED AREAS SO THAT DISTURBANCE LIMITS ARE NOT EXCEEDED (SEE NOTES 12 AND 13).
6. AFTER SETTLEMENT IS ACHIEVED, PLACE COMPACTED GRADED AGGREGATE BASE COURSE AND INSTALL ABUTMENT.
7. PLACE BRIDGE BEAMS AND DECK AND COMPLETE APPROACH ROADWAY CONSTRUCTION ACTIVITIES.
8. UPON COMPLETION OF THE BRIDGE, CREATE AND/OR RESTORE WETLANDS AND STABILIZE ALL DISTURBED AREAS AS SHOWN ON THE PLANS.
9. REMOVE SEDIMENT CONTROL AFTER FINAL STABILIZATION OF ALL DISTURBED AREAS AND AS APPROVED BY THE ENGINEER.
10. COMPLETE FINAL ROADWAY PAVING AND STRIPING.
11. REMOVE ALL MOT DEVICES AND REOPEN THE ROADWAY. REMOVAL OF MOT DEVICES MAY OCCUR PRIOR TO THE REMOVAL OF TEMPORARY EROSION AND SEDIMENT CONTROL DEVICES.
12. THE CONTRACTOR SHALL LIMIT AREAS OF DISTURBANCE TO BE LESS THAN 1.0 ACRE AT ALL TIMES. IF AN ALTERNATE SEQUENCE OF CONSTRUCTION IS DESIRED, A SUBMISSION INCLUDING PLANS CLEARLY SHOWING PHASING AND CORRESPONDING DISTURBANCE LIMITS MUST BE MADE TO AND APPROVED BY THE ENGINEER.
13. DISTURBED AND STABILIZED AREAS ARE DETERMINED IN ACCORDANCE WITH DNREC DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK AND THE SPECIFICATIONS.

NOTES:

THE CONTRACTOR MAY CONSTRUCT A WETLAND ACCESS ROAD AS SHOWN ON THESE PLANS FOR CONSTRUCTION ACCESS, ITEM 604505, WETLAND ACCESS ROAD, TYPE II. THE CONTRACTOR SHALL RESTORE THE DISTURBED AREA FOR THIS ACCESS ROAD TO PRE-EXISTING CONDITIONS FOLLOWING REMOVAL OF THE ACCESS ROAD. THE ACCESS ROAD AND CONSTRUCTION MEASURES NECESSARY SHALL FIT WITHIN THE LIMIT OF CONSTRUCTION WIDTH AS SHOWN ON THESE PLANS. AT NO TIME SHALL THE STREAM CHANNEL AS DEFINED BY THE MHW DEPICTED ON THESE PLANS BE DISTURBED. SEE SPECIAL PROVSIONS FOR ITEM 604505. PLACE AND MAINTAIN WETLAND ACCESS WORKING SURFACE ABOVE THE 2-YEAR STORM WATER SURFACE ELEVATION OF 2.60'.

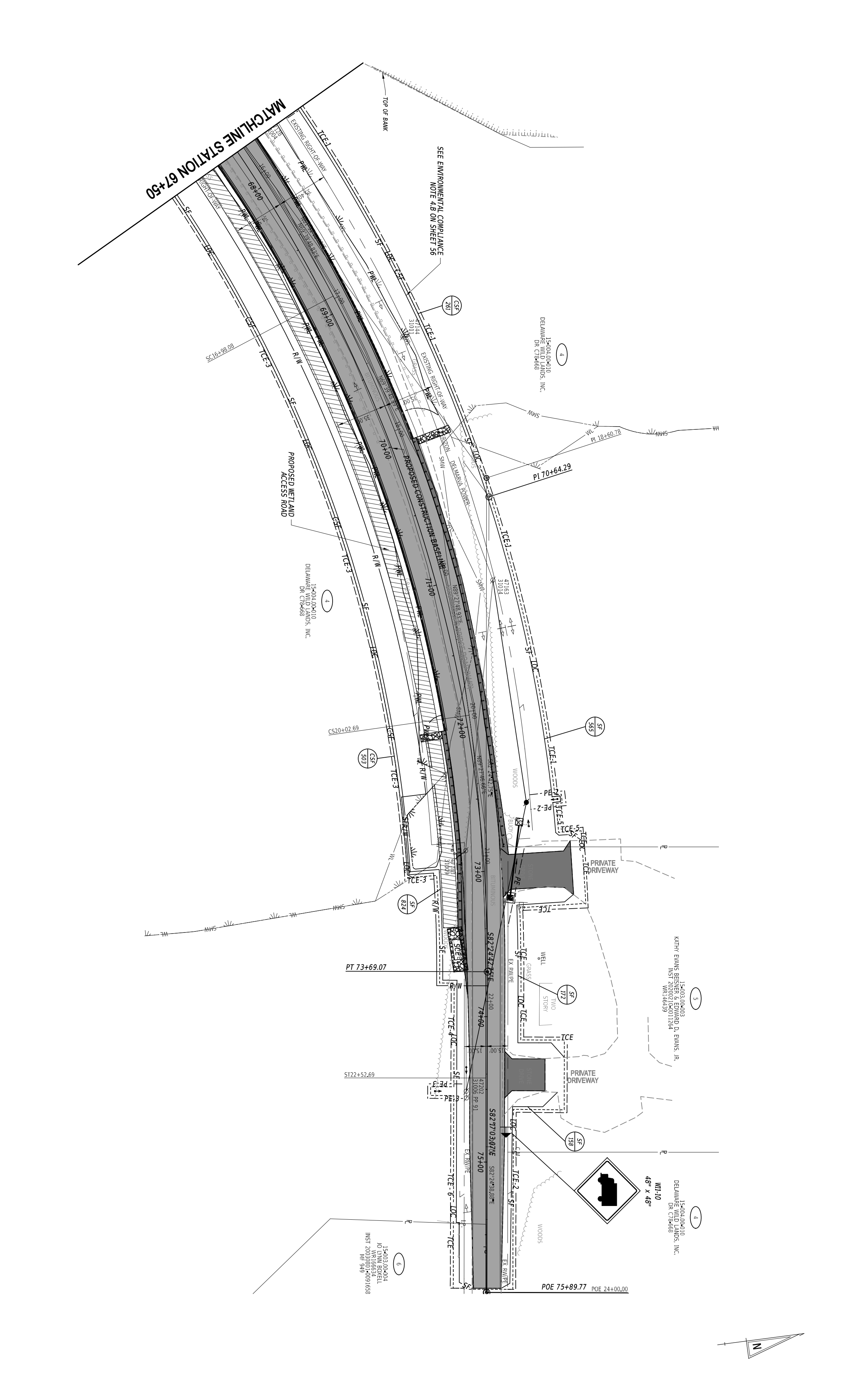
ADDENDA / REVISIONS	SCALE 0 30 60 90 FEET	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLAN	SECTION PAI
			COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY		SHEET NO. 69
				CHECKED BY: O. GREEN		



NOTES:

COFFERDAMS SHOWN ON PLANS ARE CONCEPTUAL. CONTRACTOR SHALL SUBMIT FOR APPROVAL A PROPOSED COFFERDAM LAYOUT USED TO FACILITATE REMOVAL OF EXISTING BRIDGE PIERS AND CONSTRUCTION OF PROPOSED PIERS. INSTALLATION AND REMOVAL OF COFFERDAMS SHOULD CONSIDER TIME OF YEAR RESTRICTIONS. THE PROPOSED TOP OF COFFERDAMS SHALL BE AT A MINIMUM OF ELEVATION 3.6. THIS ELEVATION WAS DETERMINED TO PREVENT WATER IN THE WORKZONE DURING MEAN HIGH WATER COMBINED WITH A 2-YEAR PREDICTED RIVERINE FLOW OF 774 CFS. IN-WATER WORK BLOCKING MORE THAN 50% OF THE BLACKBIRD CREEK CHANNEL AT ANY GIVEN TIME IS PROHIBITED.

ADDENDA / REVISIONS	SCALE 0 30 60 90 FEET	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLAN	SECTION PAI
			COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY CHECKED BY: O. GREEN		SHEET NO. 70



ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

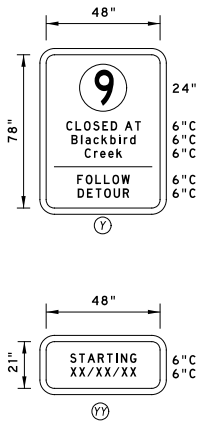
CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	O. GREEN

CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLAN

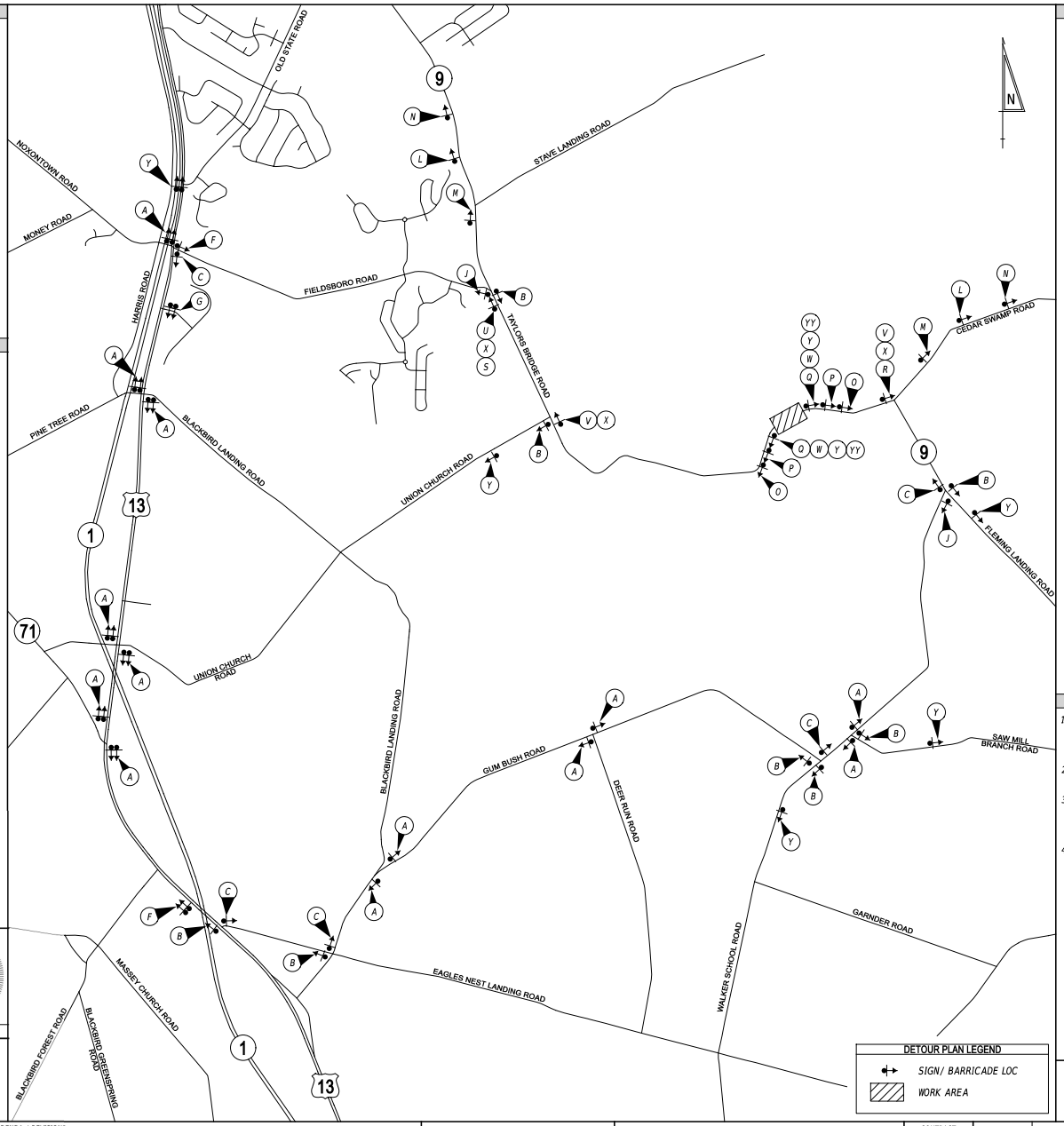
SECTION	PA1
SHEET NO.	71

PORTABLE CHANGEABLE MESSAGE SIGNS

SPECIAL SIGNS

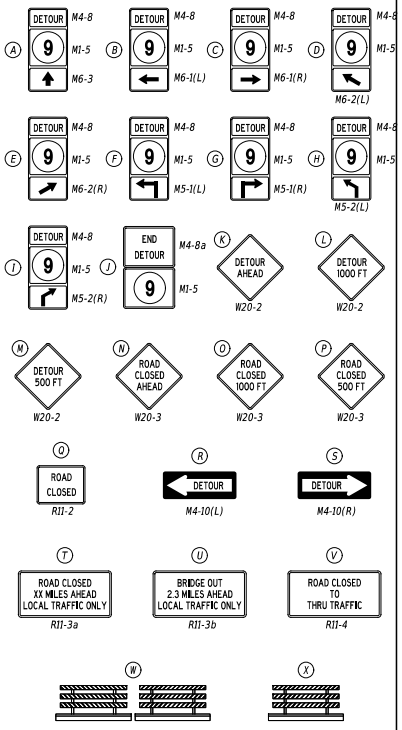


1. DISPLAY (Y) SIGNS, ALONG WITH THE (YY) PLAQUE, FOR 10 DAYS PRIOR TO THE IMPLEMENTATION OF THE DETOUR. (YY) PLAQUE TO COMPLETELY COVER "FOLLOW DETOUR" LEGEND ON (Y) SIGNS. UPON IMPLEMENTATION OF THE DETOUR, REMOVE (YY) PLAQUE FROM (Y) SIGNS AND RELOCATE (Y) SIGNS TO A LOCATION OUTSIDE OF THE CLOSURE AREA.
2. ALL SIGNS SHALL HAVE A BLACK LEGEND AND BORDER ON A RETROREFLECTIVE, PRISMATIC, FLUORESCENT ORANGE BACKGROUND. DELAWARE ROUTE SYMBOL SHALL HAVE A BLACK LEGEND ON A WHITE BACKGROUND.



DETOUR PLAN LEGEND
- SIGN/ BARRICADE LOC
- WORK AREA

LEGEND



GENERAL NOTES

1. ALL TEMPORARY TRAFFIC CONTROL DEVICES ARE TO BE SUPPLIED AND MAINTAINED BY THE GENERAL CONTRACTOR AND SHALL BE IN COMPLIANCE WITH THIS PLAN AND THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (DE MUTCD) LATEST EDITION.
2. SIGNS "N" THROUGH "Q" AND "T" AND "V", THE WORD "ROAD" SHALL BE CHANGED TO "RAMP", "RR XING" OR "BRIDGE" WHERE APPLICABLE.
3. "W" TYPE 3 BARRICADES AT A ROAD CLOSURE SHALL BE PLACED COMPLETELY ACROSS THE ROADWAY, FROM CURB TO CURB, OR FROM EDGE OF ROAD TO EDGE OF ROAD, WITH THE STRIPES POSITIONED DOWNWARD TOWARD THE CENTER OF THE ROADWAY.
4. BARRICADES SHALL BE A MINIMUM OF 6 FEET WIDE UNLESS DIRECTED BY THE ENGINEER.

PREPARED BY
PENNONI ASSOCIATES INC.

Pennoni

Teresa Lord — 2/1/2023
THIS SEAL APPLIES TO ALL SHEETS BEARING THE "PAI" SECTION DESIGNATION. — DATE

TERESA M. LORD LICENSE No. 24274 DELAWARE PROFESSIONAL ENGINEER
SEAL

2/1/2023
QA/QC — DATE

"I CERTIFY TO THE BEST OF MY KNOWLEDGE AND BELIEF THAT THIS DETOUR PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."

CONCURRENCE FOR IMPLEMENTATION

TRAFFIC SAFETY — 2-3-23 DATE

ADDENDA / REVISIONS							
		NOT TO SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	PERMIT NO. N/A	DETOUR PLAN - VEHICULAR DE 9 @ BR1-447	SECTION PAI
				COUNTY NEW CASTLE	DESIGNED BY: T. LORD		SHEET NO. 72
					CHECKED BY: Z. BRANDER		

Taylors Bridge Mitigation Site Report

Compensatory Wetland Mitigation Plan for
BR 1-447 on N449 Taylors Bridge over Blackbird Creek Reconstruction Project

T201907102

Townsend
New Castle County, Delaware

Table of Contents

Appendices

Executive Summary

The purpose of this report is to present the design, proposed construction, and monitoring plan for the Taylors Bridge Road Wetland Mitigation site. The report includes an overview of site performance standards, preconstruction tidal water monitoring data, design methodology, site information and a summary of the proposed impacts to existing wetlands and function losses withing the project limits.

The Bridge 1-447, Taylors Bridge Replacement project will improve the bridge integrity, sight line for traffic, and raise the road to combat sea level rise. The project includes a total bridge replacement while shifting the road and bridge off current alignment by approximately 31 feet to the south. This work will result in the loss of 0.1182 acres of wetlands and 0.0878 acres of permanent impact to open waters. This loss will be compensated through estuarine emergent wetland creation and enhancement on site. There will be a total 0.5321 acres of wetland creation along with 0.5809 acres of wetland enhancement done on this project. However, while the aforementioned numbers reflect all of the wetland creation and enhancement that will be undertaken in the course of this project, the numbers found in the ratio table in Appendix G are those that will count towards the mitigation needed.

The Taylors Bridge Wetland Mitigation site will be constructed in one phase towards the end of construction. Once clearing and grubbing is complete and excavation starts, the grading and planting must be complete by closest planting window. Planting window for the *Spartina alterniflora* is April 1st to May 15th and September 1st to October 15th. Spring plantings are the preferred option.

In order to confirm compliance with United States Army Corps of Engineers (USACE), mitigation requirements and monitoring guidelines are provided. Unless otherwise directed by the USACE, there will be a 5-year monitoring period with reports submitted annually. The annual mitigation site monitoring reports will include a summary of each of the three parameters: hydrology, vegetation and soils. Photographs from pre-determined location, summaries of the data collection process, and a narrative of the site success, failures and any necessary remedial work will also be included in the annual report.

Introduction

DelDOT proposes to establish the Taylors Bridge Wetland Mitigation site to provide effective on-site compensation for impacts to the Waters of the United States subject to regulations pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbor Act of 1899, that cannot be practically avoided as the result of the BR 1-447 Taylors Bridge Replacement project. The project location can be found in Appendix A. Appendix A of this document depicts the general location of the proposed Taylors Bridge Wetland Mitigation site, as well as accompanying maps detailing the local watershed, USGS, and aerial views of the project location.

Mitigation Goals and Objectives

Bridge 1-447 Taylors Bridge Replacement project will involve the re-construction of the current bridge. This will include shifting the alignment south due to utility pole interference, raising the profile of the bridge and opening the waterway by reducing the number of piers. Detailed information for improvements can be found in the permit support documents.

Work will require filling tidal (Section 10) Waters of the United States and placing structures in the Traditional Navigable Waterway (TNW). As a result of unavoidable impacts, this project will also include construction of a wetland mitigation site to compensate for the loss of Waters of the U.S. (WOTUS).

Design considerations have minimized the impacts to wetlands and Waters of the United States to the maximum extent practical while achieving the project goals. Below, Table 1 summarizes the total impacts associated with the project.

Waters if the U.S impacts	
Total Permanent WOTUS Impacts	0.206
Total Temporary WOTUS Impacts	1.2412
Total WOTUS LOSS	0.1544

Table 1: *Details the Temporary and Permanent Impacts for 1-447.*

Bridge 1-447 is located within the Blackbird Creek Watershed (Hydrologic Unit Code 12: 020402050803; Appendix A) Bridge 1-447 allows traffic to travel over Blackbird Creek with is a Traditional Navigable Waterway and directly outputs to the Delaware Bay, which is to the East. This project will cause losses to a portion of Blackbird Creek (0.0363 acres). There were four identified wetlands within the project area. These estuarine emergent wetlands are on all four corners of the bridge and will have a total of 0.1182 acres of impacts. Below is Table 2, a list of the Waters of the U.S Loss and Mitigation Compensation needed for these losses.

ID	Existing Resource	Impact	Acre of Loss	Acres of Impact	Mitigation Ratio	Mitigation Need
1-W-01	Tidal Marsh	Embankment	0.0008		3 to 1	0.0024
1-W-02	Tidal Marsh	Embankment	0.0037		3 to 1	0.0111
1-W-03	Tidal Marsh	Retaining Wall-Fill	0.0434		3 to 1	0.1302
2-W-04	Tidal Marsh	Retaining Wall-Fill	0.0221		3 to 1	0.0663
2-W-05	Tidal Marsh	Riprap/Fill	0.0168		3 to 1	0.0504
2-W-06	Tidal Marsh	Riprap	0.0072		3 to 1	0.0216
2-W-07	Tidal Marsh	Riprap/Fill	0.0202		3 to 1	0.0606
2-W-08	Tidal Marsh	Riprap	0.0022		3 to 1	0.0066
2-W-10	Tidal Marsh	Riprap	0.0004		3 to 1	0.0012
2-W-11	Tidal Marsh	Riprap	0.0003		3 to 1	0.0009
3-W-14	Tidal Marsh	Embankment	0.0012		3 to 1	0.0036
2-O-01	Tidal Waterway	Pier/Riprap	n/a	0.0172	n/a	n/a
2-O-02	Tidal Waterway	Pier/Riprap	n/a	0.019	n/a	n/a
Totals			0.1183	0.0362		0.3549

Table 2: *This table details the specific acreage of loss and impact of the line items found in the Final Plans of the project. This includes the Mitigation Ratio as well as the requisite mitigation acreage that is needed for each individual line item.*

Mitigation for these impacts will be accomplished through construction of the on-site Taylors Bridge Wetland Mitigation site. This mitigation site will include creation and enhancement. There will be a total of 0.5321 acres of creation and 0.5809 acres of enhancement, however due to utility easements and a buffer extending from the side of the road measuring 4 feet, only 0.3592 acres of Wetland Creation will be attributed to the conservation area. This still leaves the project with a ratio of 3.04:1 creation which, as can be seen above in Table 2, still meets the mitigation requirements. Whilst the creation alone is sufficient for the ratio, the inclusion of the additional 0.5809 acres of enhancement area adds additional acreage that assists in the overall mitigation ratio.

Baseline Information

Bridge 1-447 Taylors Bridge Road Replacement project impacts 1 TNW, Blackbird Creek, and 4 estuarine emergent wetlands in the project area. Individual descriptions of the wetlands and waters located in the project area can be found within the Wetland Delineation Memo (Appendix B). A brief description of each resource areas can be found below.

Estuarine Emergent Wetland (EEM): All 4 of the EEM wetlands have two distinct areas of dominated vegetation.

- **Area 1** runs right along Taylors Bridge Road, and is dominated by common reed (*Phragmites australis*, FACW). Common Reed extends approximately 20-30 feet until smooth cordgrass (*Spartina alterniflora*, OBL) becomes the dominate vegetation. Hydric Soil indicator for this area is F6: Redox Dark Surface.
- **Area 2** starts anywhere between 15-40 feet past the common reed domination and is dominated by *Spartina alterniflora*, OBL. Soils meet the hydric soil indicator A4: Hydrogen Sulfide.
- Soils in both areas consisted of 2.5Y 3/2 soils. Hydrology is influenced by a TNW.

Traditionally Navigable Water: Blackbird Creek is a TNW. The feature has a natural channel shape and stable side slopes that are 4:1. The channel is approximately 200 feet wide and 3 to 10 feet deep. Wetlands encompass both the right and left banks.

Mitigation Site Selection and Justification

During the design of the replacement project, areas on-site were identified as possible wetland creation sites. These creation sites were available due to the shift of the bridge off its current alignment. Wetlands will be created on the current existing roadway alignment. There was plenty of room in the creation areas to account for the impact ratio (3:1) given by the USACE and DNREC due to permanent impacts. To give these created wetlands an opportunity to remain quality wetlands and not turn into a phragmites stand, wetland enhancement will also be done on the current wetlands where there are temporary impacts. The created and restored wetlands will mirror the surrounding smooth cordgrass dominated wetlands. Small rivulets will be placed throughout the creation and enhancement sites to ensure proper drainage to Blackbird Creek.

A meeting was held with USACE and DNREC in September 2022 to get concurrence that on-site mitigation was an acceptable practice. Email confirmation from USACE and DNREC can be found in Figures 1 & 2 below.

From: Smith, Anna (DelDOT) <Anna.Smith@delaware.gov>
Sent: Thursday, September 15, 2022 1:49 PM
To: Esposito, Katie (DNREC) <Katie.Esposito@delaware.gov>; Rachel Ward (rachel.j.ward@usace.army.mil) <rachel.j.ward@usace.army.mil>
Cc: Smith, Anna (DelDOT) <Anna.Smith@delaware.gov>; Adams, Van (DelDOT) <Van.Adams@delaware.gov>; Jones, Matthew R. (DNREC) <Matthew.Jones@delaware.gov>
Subject: Formal Concurrence request for Mitigation at 1-447 on Taylors Bridge Road

As discussed at the meeting on September 1, 2022, the mitigation for the impacts to the wetlands at Bridge 1-447 on Taylors Bridge Road will need to occur after the new bridge and retaining walls construction is completed.

This email is to request a formal confirmation that both the US Army Corps of Engineers and DNREC's Wetlands and Waterways section are in agreement of the on-site mitigation to occur after the construction of the bridge.

Thanks,
Anna

Anna Maria Smith
DelDOT, Environmental Stewardship
Environmental Specialist Supervisor
Natural Resources Permitting
302-760-2126
anna.smith@delaware.gov

Figure 1: *Beginning of correspondence regarding on-site mitigation.*

RE: Formal Concurrence request for Mitigation at 1-447 on Taylors Bridge Road

WR Ward, Rachel J CIV USARMY CENAP (USA) <Rachel.J.Ward@usace.army.mil>
To Esposito, Katie (DNREC); Smith, Anna (DelDOT)
Cc Adams, Van (DelDOT); Jones, Matthew R. (DNREC)

Hi Anna – The Corps also concurs.

Thanks,
Rachel

From: Esposito, Katie (DNREC) <Katie.Esposito@delaware.gov>
Sent: Thursday, September 15, 2022 2:18 PM
To: Smith, Anna (DelDOT) <Anna.Smith@delaware.gov>; Ward, Rachel J CIV USARMY CENAP (USA) <Rachel.J.Ward@usace.army.mil>
Cc: Adams, Van (DelDOT) <Van.Adams@delaware.gov>; Jones, Matthew R. (DNREC) <Matthew.Jones@delaware.gov>
Subject: [Non-DoD Source] Re: Formal Concurrence request for Mitigation at 1-447 on Taylors Bridge Road

Hi Anna,

Concurred. Thank you.

Katie Esposito | Wetlands and Waterways Section

Department of Natural Resources and Environmental Control

Division of Water-Wetlands and Waterways Section

89 Kings Hwy | Dover, DE 19901 | Office: 302.739.9943

Figure 2: *This figure details the written concurrence of both DNREC and USACE regarding on-site mitigation and their approval of said practice.*

Tidal Info:

Delaware National Estuarine Research Reserve (DNERR) had a tide gage located on the bridge until mid-2021. Data was compiled from 2019-2021 to gain a comprehensive understanding of the local tides and inundation times for the surrounding marsh. Rummel Klepper & Kahl (RK&K) calculated tidal inundation elevations on behalf of Delaware Department of Transportation (DelDOT) at the BR 1-447 on Taylors Bridge Road in Townsend, Delaware. Raw tidal data from January 1st, 2019 - May 17th, 2021, was obtained from the Delaware National Estuarine Research Reserve (DNERR) tidal gage at the bridge. Tidal data was not available for some time periods within this range due to the removal of the gage, therefore those time periods were removed from the analysis.

The maximum range of tide elevations was determined by graphing the raw tidal data and calculating maximum and minimum values which resulted in a range of approximately -0.90 to 1.70 NAVD88 feet. RK&K examined the length of inundation time at various positive tide elevations. The average daily inundation in hours was calculated at these elevations by determining the total time a specific elevation was inundated and dividing this total by the total number of days in the dataset (approximately 548 days). Elevations that were inundated for approximately 3.5 to 10.5 hours per day are presented in Table 3 below.

	Gage height, NAVD88					
	0.90	0.95	1.00	1.05	1.10	1.15
Average Daily Inundation (hr.)	10.67	9.39	7.97	6.42	4.85	3.43

Table 3: *The two above charts represent both the average daily inundation as well as corresponding gage height for said inundation.*

	Gage height, NAVD88																			
	-1	-0.9	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70
Average Daily Inundation (hr)	23.99	23.99	23.04	22.52	21.78	20.77	19.48	18.05	16.45	14.74	12.87	10.67	7.97	4.85	2.18	0.62	0.14	0.04	0.01	0.00

Table 3 (cont.): *This represents a full 24-hour span, similar to the previous charts in Table 3 that preceded this more comprehensive view.*

The elevation difference between the average inundation values is narrower than anticipated which may be a result of the tidal pattern at the site. An example of the typical tidal data is displayed in **Figure 3**.

Figure 3 – Example Tidal Values (10 days)

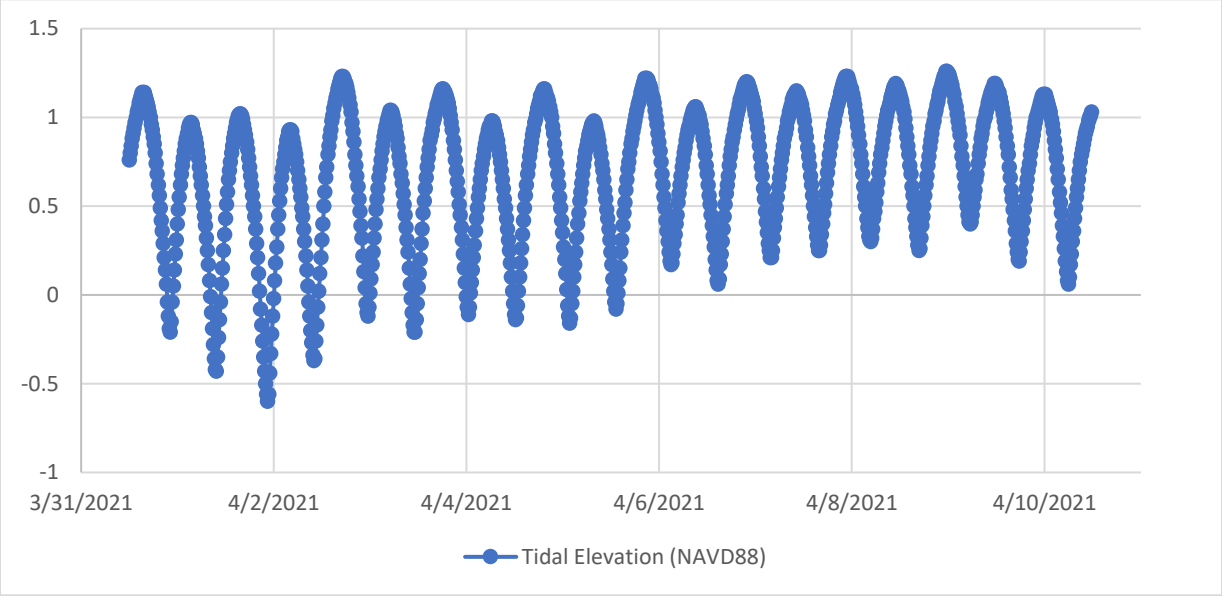


Figure 3: *The above figure details the expected tidal values of an area over a 10-day span.*

The tide patterns at this location are irregular since the site does not experience a typical slack low tide period. The high tide elevation and full tidal range is frequently erratic throughout the data record. **Figure 4** shows an example of irregularities that occur throughout the data.

Figure 4 – Irregular Tidal Data (9 days)

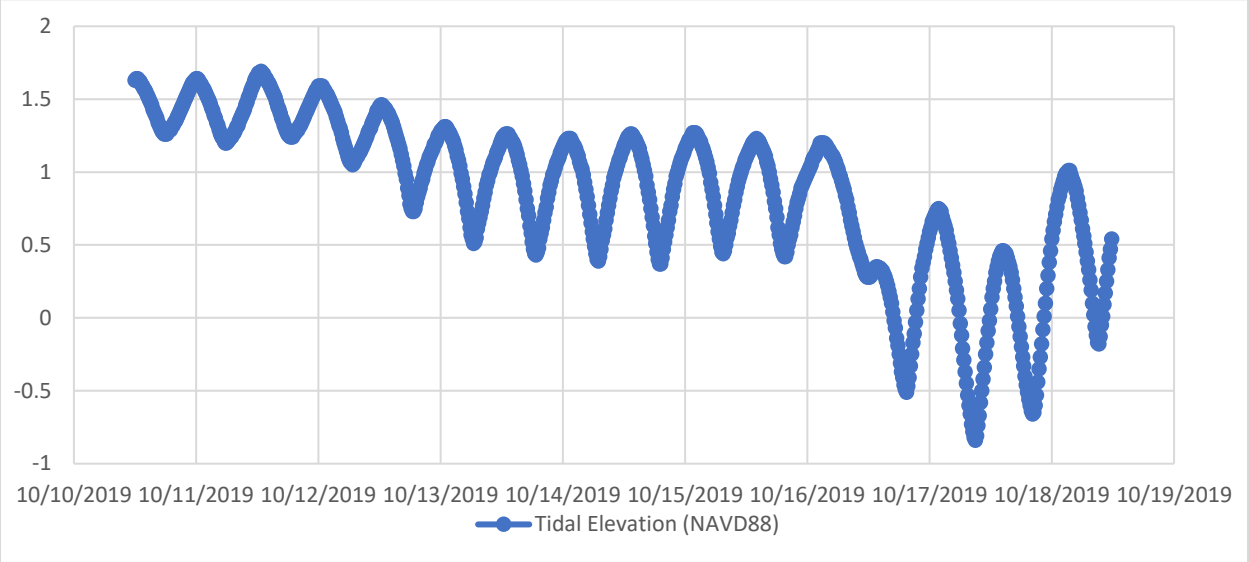


Figure 4: *This figure details the irregular tidal activity of the area wherein the project will be taking place. As can be noted against Figure 1, the tidal irregularities are clear to see.*

The tide irregularity at this location is likely caused by the narrow channel servicing a large drainage area located relatively far away from the larger tidal waterbody (the Delaware Bay). The use of bio-benchmark elevation data in addition to tidal data is recommended to determine target tidal restoration elevations at this location due to the tidal pattern irregularity.

Bio Benchmark Data:

Plant communities in the surrounding marsh were studied to find out best growing elevations of quality marsh vegetation. These elevations were then cross referenced to the inundation times to find out the best elevation to grade the wetland creation and enhancement sites. Three quadrants were studied along with 51 total points of plant communities. Quadrant A was located on the Northwest section of the bridge and included 18 total sample points.

Below is a map of Quadrant A and field notes of each benchmark ID.

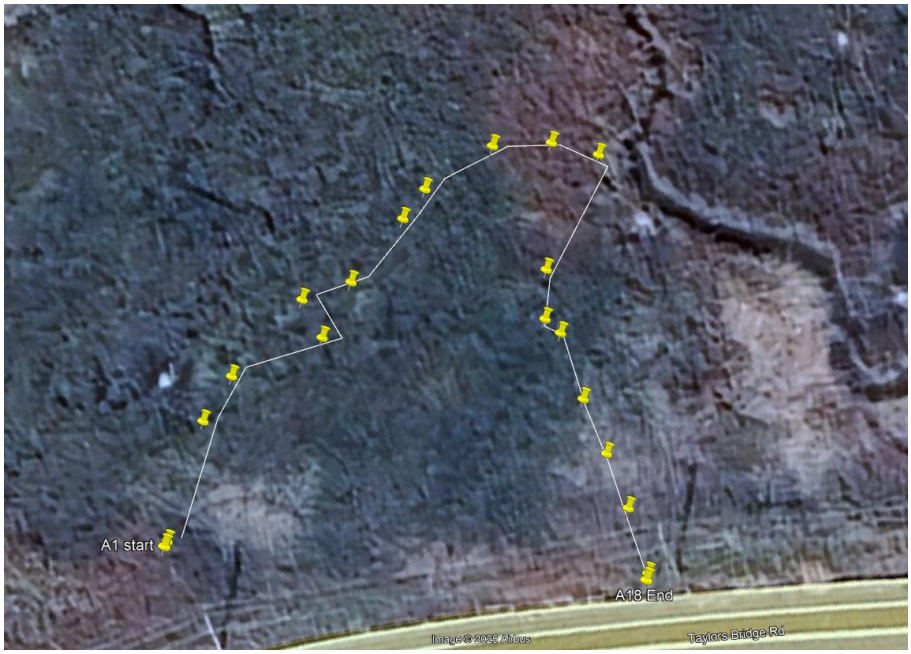


Figure 4: *The above image depicts Quadrant A and the Bio-Bench markers that were determined at the location.*

Benchmark ID	Elevation	Notes
A1	1.2275	Boundary of phrag and spartina. 50/50. not ideal. Near road
A2	1.102	no phrag, good spartina. Good woody herbaceous plants. Clusters and channels. Spartina growing on clusters
A3	0.5591	mud flat, no vegetation in between spartina clusters
A4	1.1798	good thick spartina. Ideal elevation. Some woody herbaceous plants
A5	1.2764	dense spartina on clusters in non vegetative drain channels. Good elevation
A6	1.2952	new spartina growth, not much old growth, not bad. No old most likely due to muskrats
A7	1.402	ok elevation, not as dense, 50% coverage
A8	1.3027	taller vegetation/dense. Few herbaceous woodies. Good
A9	1.5258	vegetation break between spartina and sedges and taller grasses (native phrag?? Switch grass??) not phrag
A10	1.2716	in middle of tall grasses. No channels through clumps. Same elevation. Mostly taller grasses (native phrag?? Switch grass) not phrag)
A11	1.4396	Approx 5 feet from water channel. Dense tall grass (native phrag, switch grass??) sparse sedges throughout.
A12	1.3282	new veg growth due to muskrat. Spartina. Channels all around. Few woody herbaceous plants
A13	1.1503	getting close to edge of spartina and phrag. Phrag is sparse but starting to get more dense as you get closer to road.
A14	-0.3719	bottom of channel. No veg. surface water
A15	1.6008	start of phrag. Spotting more phrag. Bad
A16	1.6213	middle of phrag near road. Bad. Nothing above this elevation.
A17	1.6345	middle of phrag. Bad
A18	1.9	edge of road. Start of phrag. Trash. Juniper or cedar trash tree in area. No bueno

Table 4: *The above chart details the conditions found at each Bio-Bench mark point found in Quadrant A.*

Quadrant B was located on the Southwest side of the project and included 18 benchmark points.

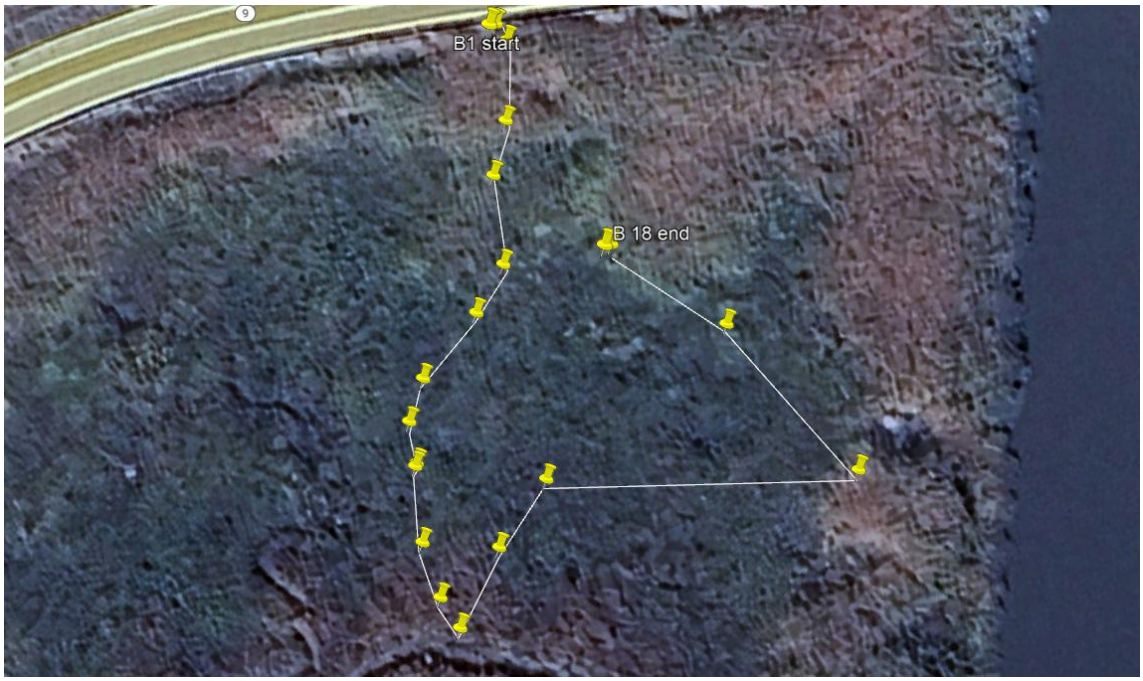


Figure 5: *The above image depicts Quadrant B and the Bio-Bench markers that were determined at the location.*

B1	2.809	edge of road. Not wetland. Road fill. Junk
B2	1.3234	bottom of road slope. Upland transition to wetland. Phrag stand, little bit of drainage ditch
B3	1.2652	transition to dense phrag. Channels not holding water
B4	1.4456	short sparse phrag. New phrag growth. Some spartina
B5	1.2646	moderate spartina. 30% woody herbaceous, 30% phrag, 40% spartina. Clusters of vegetation and channels with water
B6	1.4325	woody herbaceous 50% spartina 50%. Veg on clusters with channels
B7	1.3585	dense spartina on clusters. More water retention. Little bit of woody herb. Good
B8	1.3119	dense spartina clusters with channels throughout. Good
B9	1.3585	muskrat hut destroyed old spartina growth. New spartina veg. Good.
B10	0.4709	bottom of channel between cluster.
B11	1.1214	transition spartina to tall grass, not phrag (native phrag? Switch grass)
B12	1.1726	sparse tall grass. Some new growth of tall grass. 50 % mud flat. Near channel. Similar to A channel (A11)
B13	0.9745	edge of channel. Sparse tall grass. Lots of mud. "Soupy as fuck"- TM
B14	0.9114	very sparse veg. Little spartina. Low point in marsh. Veg covered in mud but not a mud flat
B15	1.2412	dense spartina on clusters. Good.
B16	1.1422	transition from spartina to phrag. About 25ft to channel
B17	1.535	moderate small phrag. Spartina near
B18	1.3977	woody herb plan with seed bulb. Trans from phrag to spartina.

Table 5: *The above chart details the conditions found at each Bio-Bench mark point found in Quadrant B.*

Quadrant C was located on the Southeast side of the project and contained 15 data points. These data points were the best out of all three due to the dense *Spartina alterniflora* and low amounts of common reed.

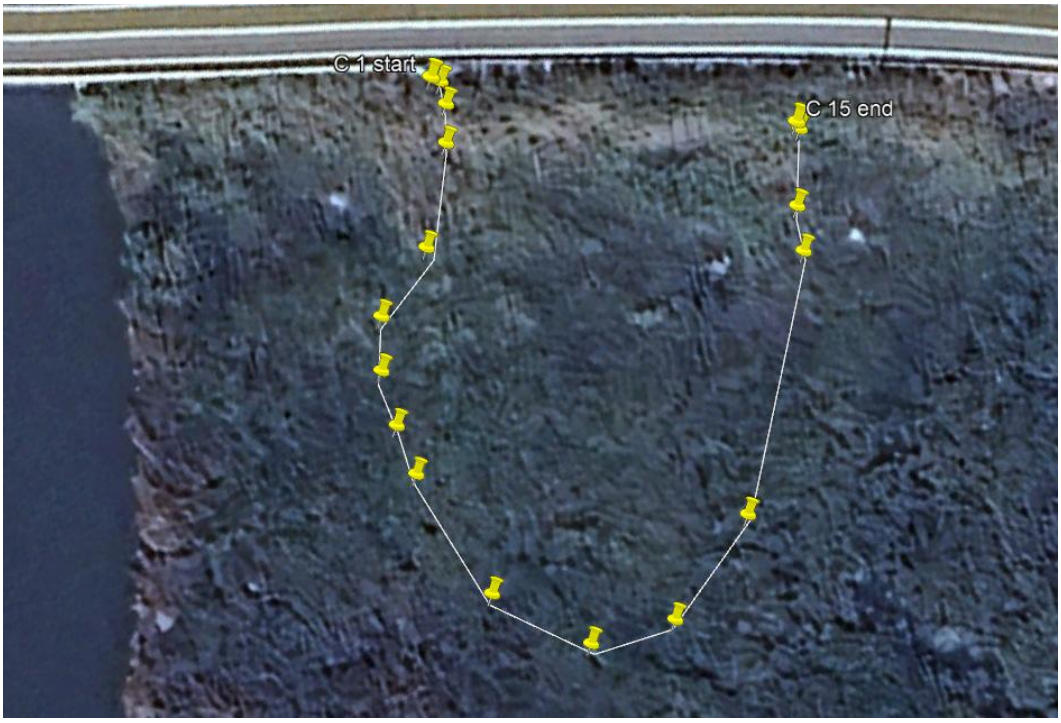


Figure 5: *The above image depicts Quadrant C and the Bio-Bench markers that were determined at the location.*

C1	2.6403	bottom of slope, transition into phrag
C2	1.3286	middle of phrag stand next to road. Bad
C3	1.2788	transition from phrag to spartina. Not idea
C4	1.3601	ok spartina. Few small phrag. Just ok.
C5	1.3981	dense spartina on clusters. Good channeling. Not bad
C6	1.4381	good spartina
C7	0.3313	bottom of channel
C8	1.3519	muskrat hut, old spartina destroyed. Good new growth
C9	1.1601	dense spartina with new growth on clusters with channels surrounding. Good
C10	1.053	good dense spartina
C11	1.1401	good dense spartina
C12	1.2003	good dense spartina. Little woody herbaceous plants
C13	1.4376	woody herbaceous and spartina transitioning to phrag
C14	1.3248	spartina, small phrag. 25% phrag 75% spartina. Transitioning from spartina to phrag
C15	1.2245	transition to medium size phrag 50% phrag, 50% spartina. Not good.

Table 6: *The above chart details the conditions found at each Bio-Bench mark point found in Quadrant C.*

A full copy of the report and maps can be found in Appendix E.

By analyzing the bio benchmark data, the best elevation for quality vegetation was found between elevation 1.054 and 1.4381 ft (NAVD88). Quality *Spartina alterniflora* was also seen where the water was easily able to drain and not pool. While there was some phragmites found in this elevation, most of the common reed was located near the road, which could be attributed to roadway construction when this road was originally put in. Possible contaminated fill or the raising of the road with fill made these slopes favorable for phragmites growth.

When cross referencing the bio benchmark elevations to the tidal inundation data, the wetland creation and enhancement areas will be graded to elevation 1.22. This will allow for approximately 2 hours of inundation time according to the tidal data. There was a difference of 0.24 between the master benchmark and when it was shot with the GPS rover during bio benchmark collection. The selected elevation of 1.22 was corrected to align with the master benchmark, that all survey will be shot from. The corrected elevation is 1.46. There is a +/- 0.1-foot error allowed for grading. This error allowance will put the grading from 1.12 to 1.32 elevations, which was still found to have good inundation times and well vegetated areas in the study area. To help the site have positive drainage and ensure ponding does not occur, there will be shallow rivulets throughout the entire creation and enhancement sites. These shallow rivulets will be 1-inch deep by 1-foot 7.5-inches wide.

Due to the loss impacts of wetlands and waters on this project, DelDOT is required to mitigate at a 3:1 ratio. Total losses for the bridge replacement equal 0.1182 acres, and with a 3:1 ratio we will need to create 0.3546 acres of new wetlands. The Taylors Bridge Mitigation Site will include 0.5321 acres of creation and 0.5809 acres of restoration, totaling 1.113 acres of wetlands. As has been previously stated, the final mitigation total for the creation of wetlands does not reflect that which will be counted towards the mitigation total. The acreage (0.3592 acres of creation vs 0.1182 acres of impact) that is counted towards the mitigation ratio results in a 3.04:1 ratio, which gives the project the requisite total. In addition, the restoration area will act as a safeguard to increase the threshold, though it is not necessary.

The Taylors Bridge Road Mitigation Site will be placed in a conservation easement, so that no new construction activities can occur on it.

Reference Wetlands

The creation and enhancement areas of the Taylors Bridge Road Mitigation site will mirror the surrounding quality Estuarine Emergent Wetlands. The bio benchmark data and tidal inundation data collected on these reference wetlands will ensure a replica wetland will be created and enhanced.

Mitigation Work Plan

Construction of the Taylors Bridge Mitigation Site will be constructed after the old bridge is demolished and the new bridge is completed. This will occur within one construction season. The contractor will grade the wetland mitigation site to the proper elevation. If the wetlands, for any reason such as construction, removal of hall road, timber mats sinking, etc., the difference will be filled with a medium or coarse sand. This will provide and ensure proper stabilization and drainage. Once the proper grade has been met, the contractor will prepare as-builts for DelDOT to review for errors. Should there be no errors and no additional grading needed, the small rivulets are added if needed, it will be planted in the next closest planting season. Prior to planting, the site will be inspected at the low tide cycle to ensure it drains freely and no additional work is needed. The site shall be inundated on the high tide cycle. After plantings are complete and accepted, it will enter mitigation monitoring protocol.

Performance Standards

The following performance standards will be assessed to confirm that the stated objectives and goals are being achieved at the mitigation site:

1. Hydrology: Tidal inundation will occur twice daily for the proposed marsh plain elevations under normal tide conditions.
2. Native Vegetation: The marsh plain will develop 80% coverage by non-invasive emergent wetland plant species by the fifth growing season, unless USACE requires longer monitoring.

Objective	Performance Standard
Saltmarsh re-establishment	80% coverage by non-invasive emergent wetland plant species by fifth growing season
	Twice-daily tidal inundation under normal tidal conditions

Site Protection and Maintenance

DelDOT will place a permanent deed restriction of the Taylors Bridge Mitigation site. Due to the location of the site, DelDOT is likely to hold the deed restriction. Easement language will be modeled after deed restrictions provided to DelDOT by the USACE. There will be a small 4-foot buffer on both sides of the road not included in the deed restriction to allow for future bridge reconstruction, should it be needed. The Thompsonville Cartanza deed restriction has been included in Appendix F and will serve as an example of what the Taylors Bridge Mitigation Site will be modeled after. More examples of previously approved deed restrictions can be available upon request. Should non-native species start to encroach in the mitigation site, DelDOT shall spot treat the invasives during the monitoring period to ensure 80% coverage by the end of the fifth year.

Monitoring Plan

DelDOT will monitor the wetland mitigation site for a minimum of five full growing seasons after construction. Annual monitoring will involve general site observations, vegetation monitoring and hydrological monitoring with a tide gage. Annual monitoring reports will be submitted to the USACE and DNREC by December 31st of the year following the first full growing season. If remedial measures are needed to meet the criteria for successful completion of the mitigation site, additional annual reports may be required. The reports will describe existing conditions, any problems occurring at the wetland mitigation site, prescribed remedial actions and a time frame for such actions. The monitoring reports will include, at a minimum, the following information:

- A narrative description of the mitigation site,
- A narrative description of any problems observed within the mitigation site,
- Proposed remedial measures to correct problems noticed within the mitigation site,
- Descriptions of species and measurements of vegetative cover,
- Description of hydrological graph representation of recorded tide data,
- Photographic documentation, in digital form, taken during each monitoring year from pre-determined points and,
- Monitoring year and date of wetland mitigation efforts and/or if remedial actions were completed.

DelDOT will prepare a post-construction report/assessment after the required monitoring period is completed where conclusions and evidence relating to the overall success of the mitigation project will be addressed and presented. This assessment will include the mitigation target goals, the level of attainment of these goals, a “lessons learned” section including any significant problems encountered, any solutions developed, mitigation functional assessments, and any recommendations that could be used to make improvements for similar projects in the future.

Adaptive Management Plan

The adaptive management plan will be implemented if any of the success criteria are not met by the fifth year, or earlier if monitoring indicates that any of the success criteria will not be met by the fifth year.

Adaptive management may be necessary to address potential and unforeseen issues that hinder the success of the mitigation site. DelDOT shall be responsible for implementing this adaptive management plan. USACE and DNREC will be consulted immediately when adaptive management is determined necessary, and corrective measures will be approved prior to implementation. The objectives and success criteria outlined in the mitigation plan provide the basis to determine if the site is trending towards successful establishment of desired conditions. If monitoring indicates that the site is not trending towards desired conditions, the following adaptive management steps will be implemented:

1. DelDOT will notify USACE and DNREC of the issues, probable causes, and suggested solutions.
2. USACE and DNREC will work with DelDOT to agree upon and approve corrective measures and timeframe for completion.
3. DelDOT will implement the corrective measure within the agreed upon timeframe.
4. If the success criteria are not met, DelDOT will work with the Agencies to adjust the monitoring period/timeframe as appropriate.

Some potential issues that may require adaptive management have been identified. *Phragmites* is common in the marshes in the watershed. It is also possible that common reed will invade the mitigation site. Should common reed or other invasive species threaten the achievement of any of the success criteria, chemical and/or physical control shall be used to control the invasives.

Financial Assurances

DelDOT is a government agency charged with supporting highway infrastructure within the State of Delaware. In accepting the USACE and DNREC authorization for Taylors Bridge Replacement Project, DelDOT acknowledges its long-term responsibility to ensure that the Taylors Bridge Wetland Mitigation Site is successfully completed in conformance with the performance standards of this mitigation plan. This commitment includes not only the completion of the mitigation project, but also the preparation of written documentation, monitoring reports and plans as required herein and by conditions of the USACE and DNREC authorizations for the project. In the event DelDOT fails to perform under the requirements of this plan, the USACE and DNREC may elect to impose requirements for more formal financial assurances or other permits.

Appendix A

Maps

Taylors Bridge Road Aerial

2/25/2025, 11:31:01 AM

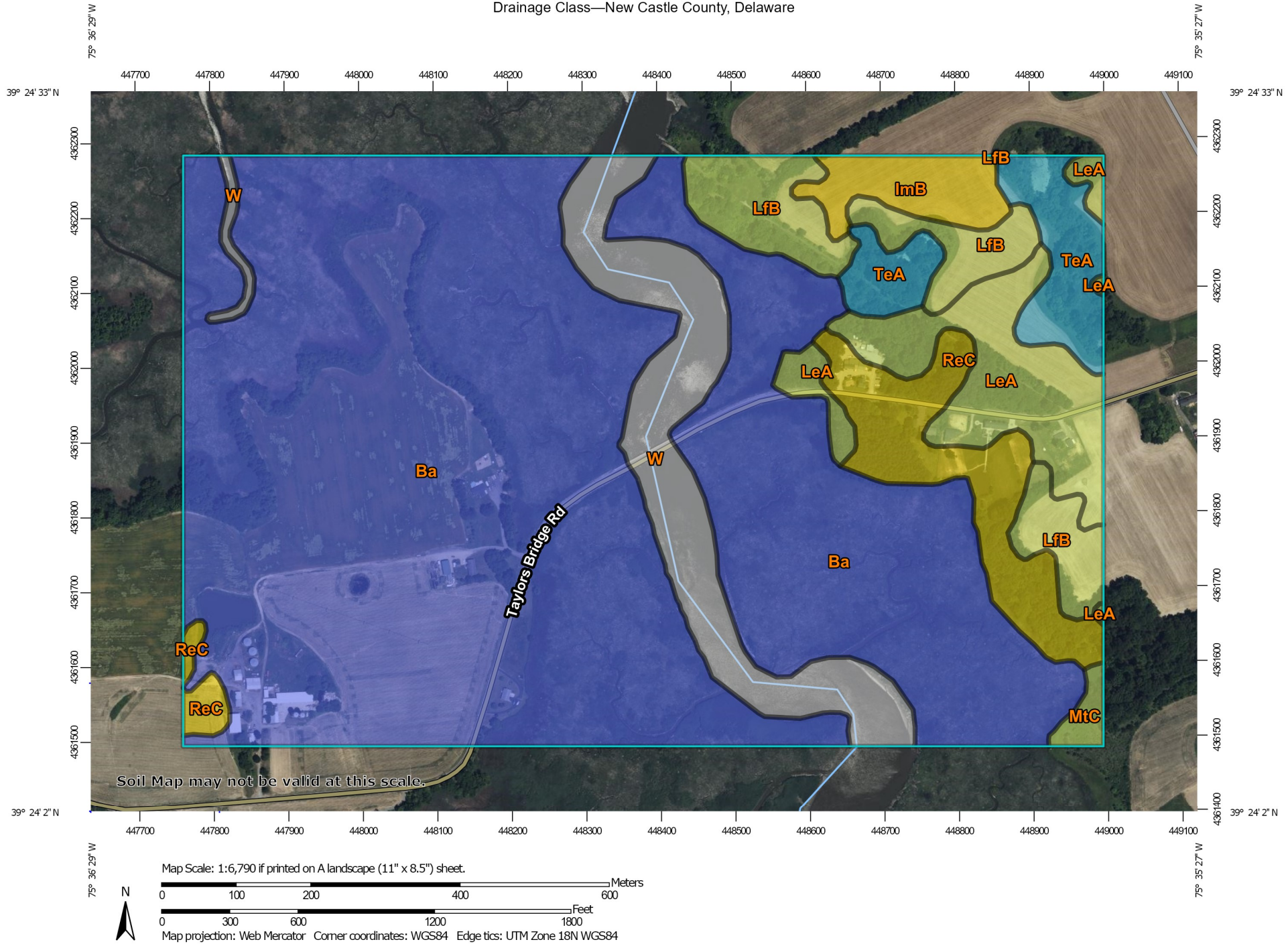
1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Maxar

Drainage Class—New Castle County, Delaware



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Lines

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Soil Rating Points

- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Subaqueous
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: New Castle County, Delaware
Survey Area Data: Version 19, Aug 31, 2024

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 5, 2022—Jul 4, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Drainage Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ba	Broadkill-Appoquinimink complex, very frequently flooded, tidal	Very poorly drained	163.6	67.6%
ImB	Ingleside-Hammonton-Fallsington complex, 0 to 5 percent slopes	Well drained	5.2	2.2%
LeA	Leipsic silt loam, 0 to 2 percent slopes	Moderately well drained	15.1	6.2%
LfB	Leipsic-Reybold complex, 2 to 5 percent slopes	Moderately well drained	13.5	5.6%
MtC	Mattapex silt loam, 5 to 10 percent slopes	Moderately well drained	1.1	0.5%
ReC	Reybold silt loam, 5 to 10 percent slopes	Well drained	13.9	5.7%
TeA	Tent silt loam, 0 to 2 percent slopes	Poorly drained	9.1	3.8%
W	Water		20.6	8.5%
Totals for Area of Interest			**242.1**	**100.0%**

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

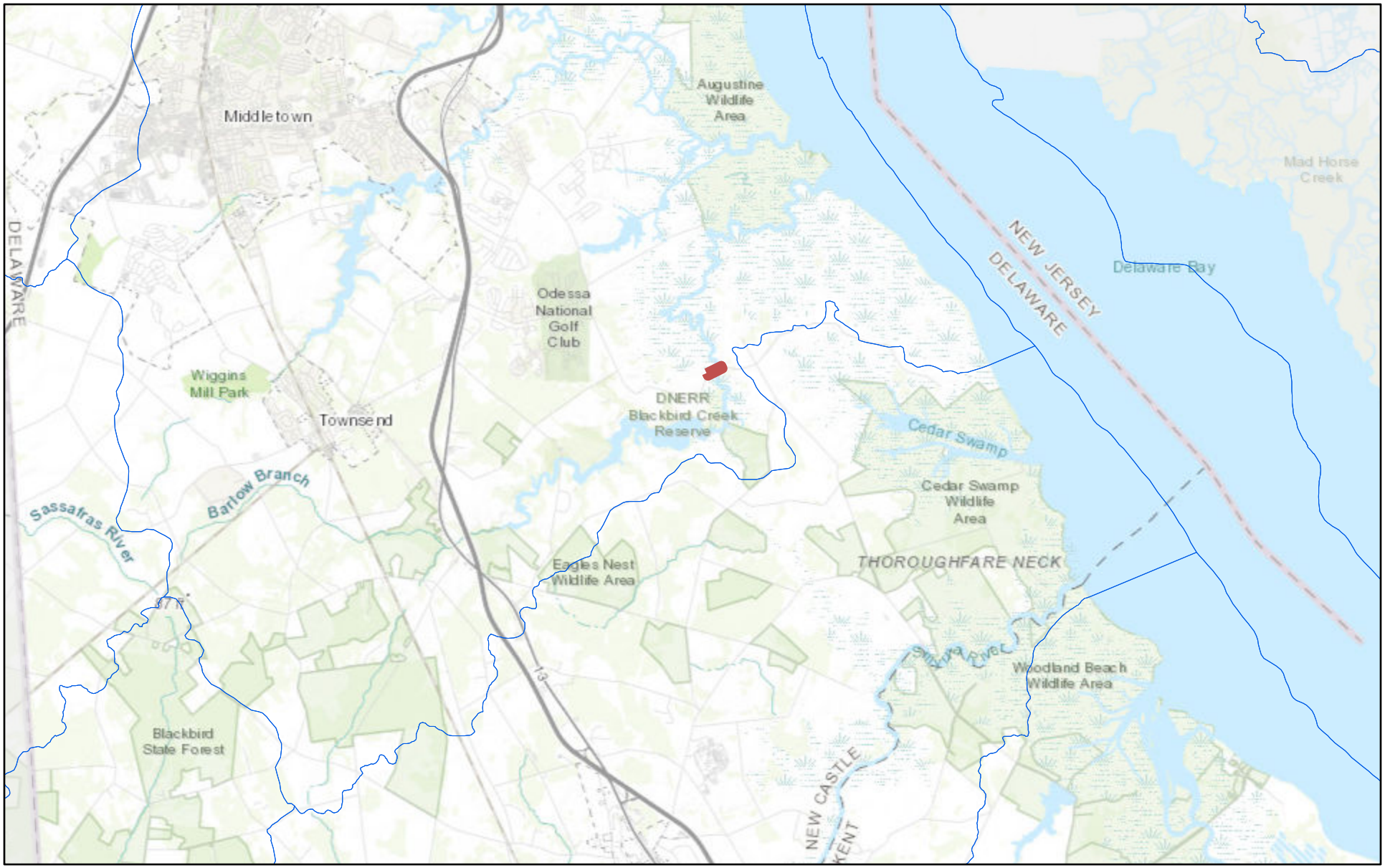
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

HUC 10- Appo River- Delaware River



2/25/2025, 11:42:15 AM

1:144,448

0 0.75 1.5 3 mi

0 1.5 3 6 km

Watersheds - HUC 10

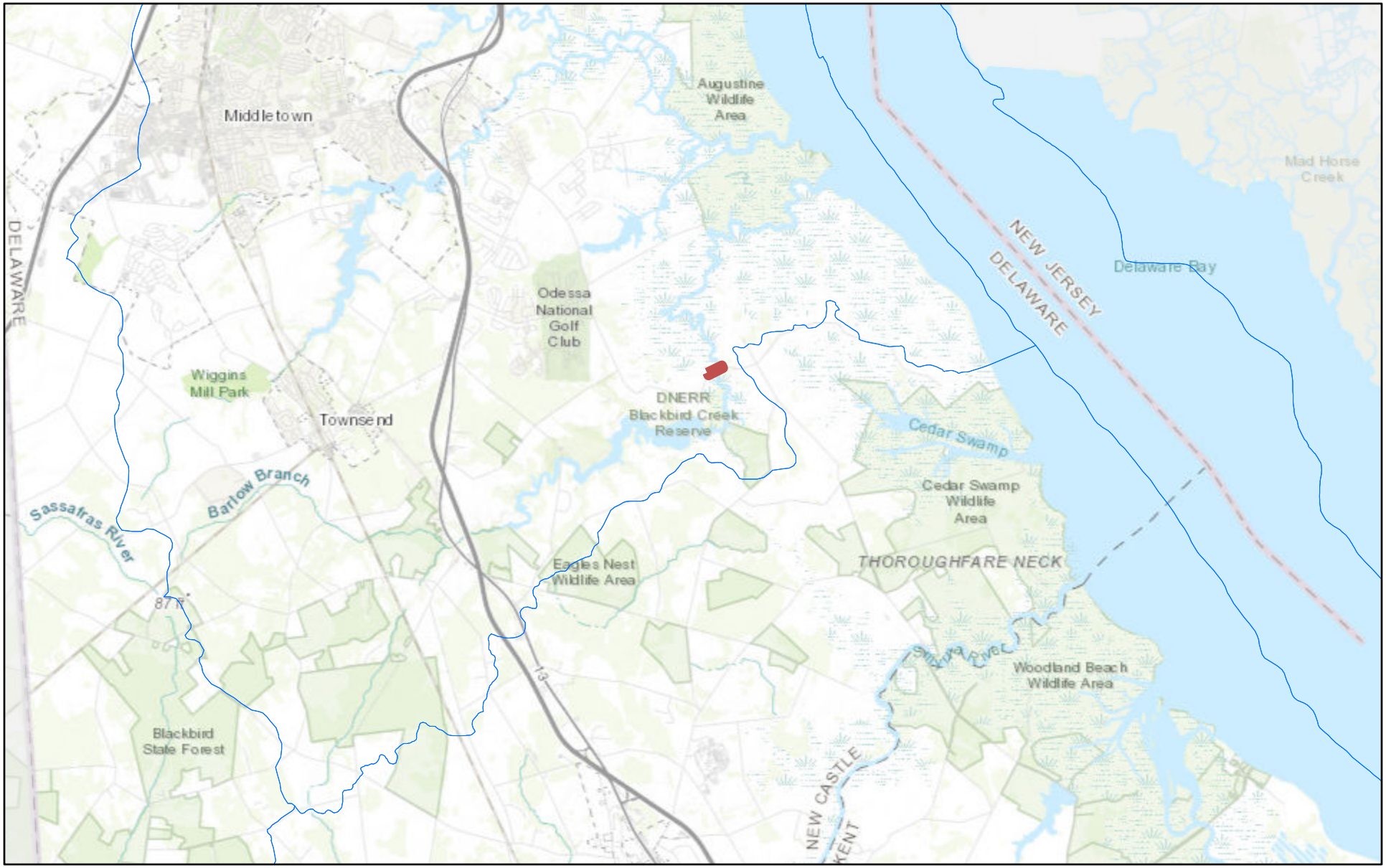
State Boundaries

New Castle County, Delaware FirstMap, VITA, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

ArcGIS Web AppBuilder

USGS WBD - Watershed Boundary Dataset. Data refreshed January, 2025. | USGS TNM – National Hydrography Dataset Plus High Resolution (NHDPlus HR). Data refreshed October, 2022. | EPA OFA, OMS, US Army Corps | U.S. Fish & Wildlife Service | U.S. Fish &

HUC 8- Brandywine-Christina



2/25/2025, 11:39:03 AM

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0 0.75 1.5 3 mi

0 1.5 3 6 km

Watersheds - HUC 8

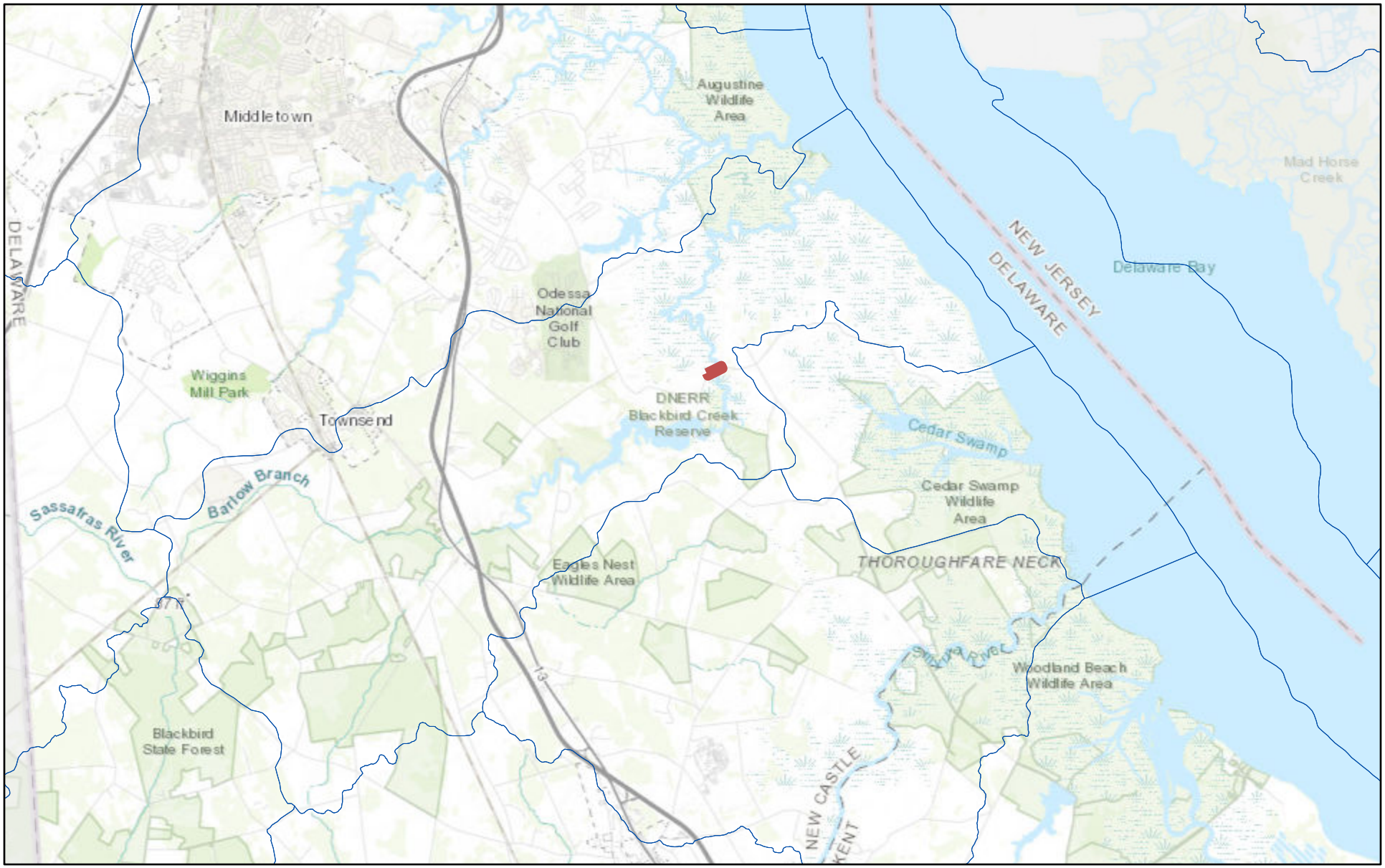
State Boundaries

New Castle County, Delaware FirstMap, VITA, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

ArcGIS Web AppBuilder

USGS WBD - Watershed Boundary Dataset. Data refreshed January, 2025. | USGS TNM – National Hydrography Dataset Plus High Resolution (NHDPlus HR). Data refreshed October, 2022. | EPA OFA, OMS, US Army Corps | U.S. Fish & Wildlife Service | U.S. Fish &

HUC 12- Blackbird Creek



2/25/2025, 11:42:59 AM

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0 0.75 1.5 3 mi

0 1.5 3 6 km

Watersheds - HUC 12

State Boundaries

New Castle County, Delaware FirstMap, VITA, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS

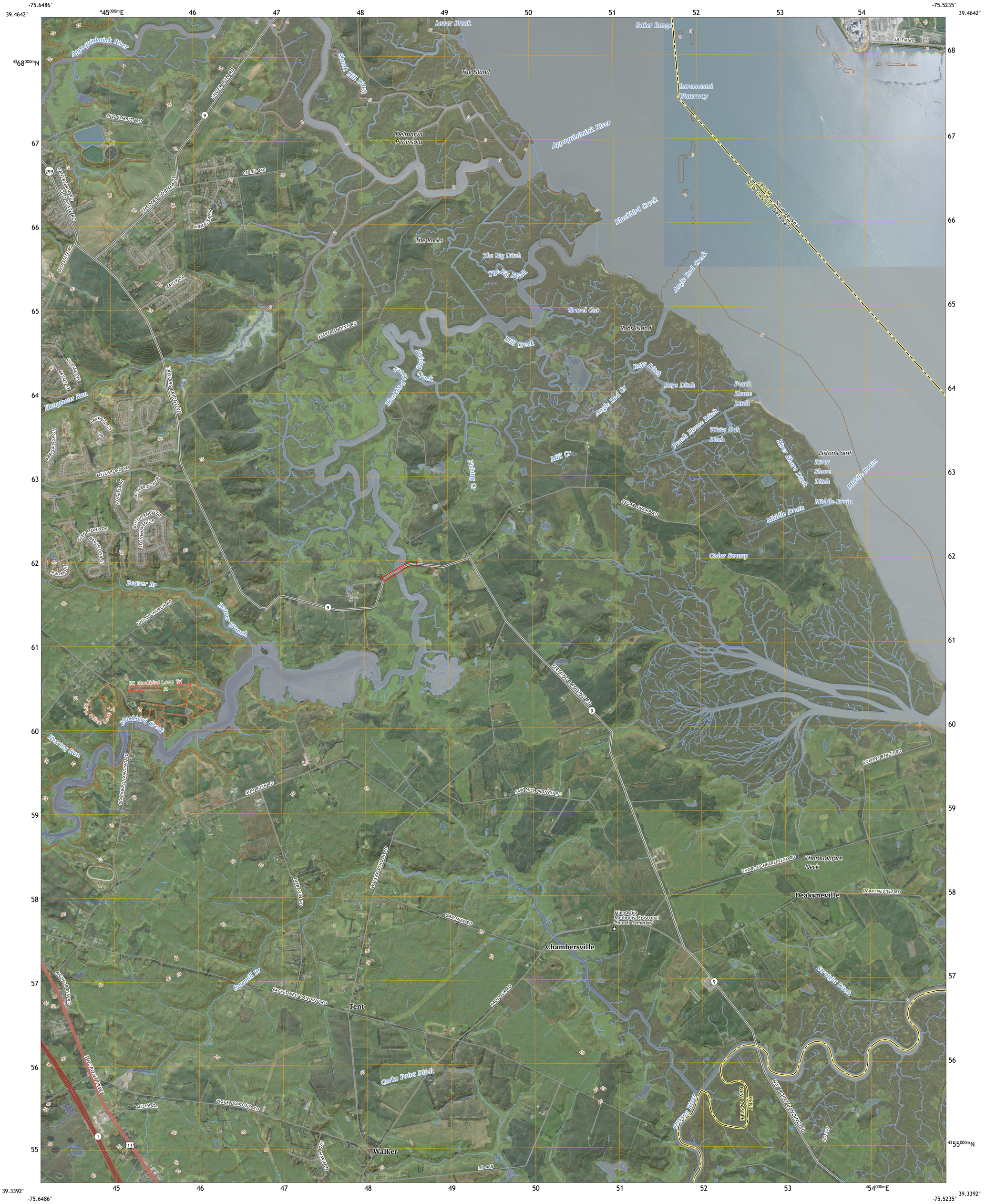
ArcGIS Web AppBuilder

USGS WBD - Watershed Boundary Dataset. Data refreshed January, 2025. | USGS TNM – National Hydrography Dataset Plus High Resolution (NHDPlus HR). Data refreshed October, 2022. | EPA OFA, OMS, US Army Corps | U.S. Fish & Wildlife Service | U.S. Fish &

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

The National Map
OnDemand Topo

7.5-MINUTE TOPO QUADRANGLE
Custom Extent
7.5-MINUTE TOPO

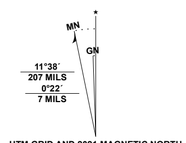


Produced by the United States Geological Survey
North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and
1 000-meter grid:Universal Transverse Mercator, Zone 18S

Data is provided by The National Map (TNM), is the best available at the time of map generation, and includes data content from supporting themes of Elevation, Hydrography, Geographic Names, Boundaries, Transportation, Structures, Land Cover, and Orthoimagery. Refer to associated Federal Geographic Data Committee (FGDC) Metadata for additional source data information.

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before entering private lands. Temporal changes may have occurred since these data were collected and some data may no longer represent actual surface conditions.

Learn About The National Map: https://nationalmap.gov



UTM GRID AND 2021 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

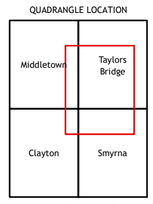
U.S. National Grid
100,000 - m Square ID
VJ
Grid Zone Designation 18S

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 5 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988
CONTOUR SMOOTHNESS = Medium

QUADRANGLE LOCATION



ADJOINING QUADRANGLES

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD

Interstate Route · US Route · State Route

7.5-MINUTE TOPO, DE
2025

Appendix B

Waters of the United States Report

121 Continental Drive
Suite 207
Newark, DE 19713

www.pennoni.com

October 2, 2020

DEDOT 200020

Scott Walls, PE, Project Manager – DelDOT Bridge Design
Delaware Department of Transportation
P.O. Box 778 - 800 Bay Road
Dover, Delaware 19903

Re: Finding of Wetlands Letter
Bridge 1-447 on Taylors Bridge Road (SR 9) over Blackbird Creek
Bridge Replacement Project (Project No. T201907102; Agreement 1813F)
Middletown, New Castle County, Delaware

Dear Mr. Walls,

On June 26, 2020, Pennoni conducted a wetland and watercourse investigation within and adjacent to the area of the proposed replacement of Taylor's Bridge (Bridge 1-447) on Taylors Bridge Road (SR 9) over Blackbird Creek to determine if wetlands and watercourses are present within the project area located in Middletown, New Castle County, Delaware. The center of the project area is located at approximately 39.427541° north latitude and -75.631853° west longitude according to the Taylors Bridge, DE-NJ USGS 7.5' Quadrangle. The presence/absence of wetlands and watercourses were investigated within approximately twenty-five (25) feet from the proposed limit of disturbance. The accompanying mapping, photographs, and wetland determination data forms depict the project location and associated project study area.

Bridge 1-447 is located in New Castle County, DE approximately five (5) miles southeast of Odessa and carries Taylors Bridge Road (SR-9) over Blackbird Creek (See Appendix A for a location map). The bridge is in the Coastal Plain region of New Castle County, DE in the Blackbird Creek Watershed. Blackbird Creek discharges to the Delaware River just upstream of the Delaware Bay and exhibits both riverine and tidal flows. The drainage area to the crossing is approximately 24.5 square miles and consists primarily of forests, wetlands, and agricultural lands.

Potential wetland and watercourse habitats located within the project study area were reviewed through the combined use of existing published data and a field investigation. Existing published data included 7.5-minute quadrangle USGS topographic mapping (Taylors Bridge, Delaware – New Jersey quadrangle); NRCS Web Soil Survey website (http://websoilsurvey.nrcs.usda.gov); New Castle County, Delaware Soil Survey; U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping; and the New Castle County Hydric Soils List.

The NRCS Web Soil Survey website was reviewed in order to determine the soil types within the project study area. According to the website, the Broadkill-Appoquinimink complex, very frequently flooded, tidal (Ba), Leipsic silt loam, 0 to 2 percent slopes (LeA), and Reybold silt loam, 5 to 10 percent slopes

(ReC) soils are mapped within the project study area. The Ba soils are listed as hydric soils; however, the LeA and ReC soils are not listed as hydric, according to the NRCS Web Soil Survey.

During the field survey, the presence of wetland habitats within the project study area were evaluated using the Routine Wetland Delineation Method for small areas described in the US Army Corps of Engineers (USACE) Wetland Delineation Manual, Technical Report Y-87-1 (1987), USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region – Version 2.0 (November 2010).

The presence of waters of the United States was also evaluated during the field investigation. Waters of the United States is defined by the Navigable Waters Protection Rule (NWPR) as the territorial seas and traditional navigable waters; perennial and intermittent tributaries that contribute surface water flow to such waters; certain lakes, ponds, and impoundments of jurisdictional waters; and wetlands adjacent to other jurisdictional waters. A tributary is defined in the NWPR as a river, stream, or similar naturally occurring surface water channel that contributes surface water flow to a territorial sea or traditional navigable water in a typical year either directly or indirectly through other tributaries, jurisdictional lakes, ponds, or impoundments, or adjacent wetlands. A tributary must be perennial or intermittent in a typical year.

On-site field investigations conducted on June 26, 2020 identified one (1) freshwater tidal wetland and one (1) perennial, freshwater tidal water of the US (Blackbird Creek) within the project study limits. A summary of our evaluation is as follows:

Wetland 1:

Wetland 1 is located within the floodplain of Blackbird Creek, extending for several hundred feet along the eastern and western banks of the creek on both the upstream and downstream sides of Taylor's Bridge (Bridge 1-447). According to the Cowardin Wetland and Deepwater Habitats Classification System, Wetland 1 is classified as an Estuarine intertidal persistent emergent wetland, regularly flooded (E2EM1N) wetland, which is described as a salt-to brackish-water marsh with persistent vegetation, and topographically low (Cowardin and others, 1979). Wetland 1 is identified as Estuarine Vegetated Wetlands on the Delaware 2007 State Wetlands layer in all four (4) bridge quadrants, and along the eastern and western bridge approaches. Wetland 1 is illustrated on the attached project plan.

Vegetation – Vegetation within Wetland 1 is dominated by common reed (*Phragmites australis* (FACW)) as documented in data sampling points DP2-SEBW, DP4-NEBW, DP6-SWBW, and DP8-NWBW. A narrow zone of transitional mixed forested-scrub/shrub and emergent wetland was recorded along the border of two (2) upland forest habitats in the eastern portion of the project study area; one (1) area to the south of Taylors Bridge Road, and one (1) area to the north of Taylors Bridge Road. These areas are dominated by red maple (*Acer rubrum* (FAC)), blackgum (*Nyssa sylvatica* (FAC)), eastern baccharis (*Baccharis halmifolia*, FAC)), common reed (*Phragmites australis*, FACW)), poison ivy (*Toxicodendron radicans*, FAC)), and cat greenbrier (*Smilax glauca*, FAC) as documented in data sampling points DP10-SEFW and DP12-NEFW.

Soils – During the onsite investigation, six (6) soil borings were advanced within the wetland, to an approximate depth of eighteen (18) to twenty (20) inches. Soils within Wetland 1 typically consisted of a soil profile of 2.5 Y 4/2 silt loam soils with high organic matter content throughout the entire profile. The soils observed in all of the borings taken in Wetland 1 are considered histosols (Hydric Soil Indicator A1). The only exception was observed in the DP10-SEFW data pit, where soils exhibited the Depleted Matrix (F3) Hydric Soil Indicator. Soils in this data pit ranged from 2.5 Y 4/2 at the soil surface to a depth of seven (7) inches, and 2.5 Y 5/2 from seven (7) to eighteen (18) inches in depth, with redox depletions of 2.5 Y 5/1 and redox concentrations of 10 YR 5/8. See attached wetland determination data forms for specific soil information.

Hydrology – Hydrology within Wetland 1 is attributed to its location in low lying elevations subject to the ebb and flow of the tide in and adjacent to Blackbird Creek. During the onsite investigation, Wetland 1 exhibited soil saturation (A3) in all of the data pits ranging from the soil surface to a depth of seven (7) inches. A high water table (A2) was observed in five (5) out of six (6) of the data pits, ranging in depth from four (4) inches to eight (8) inches below the soil surface. Other primary wetland hydrology indicators observed were hydrogen sulfide odor (C1) and oxidized rhizospheres on living roots (C3). Crayfish/Crab burrows (C8) were observed as a secondary indicator at Data Pit DP12-NEFW.

Uplands:

Upland Meadow

A narrow band of fill material consisting of riprap and soil extends along the Taylors Bridge Road (SR 9) roadway embankment throughout the project study area. Vegetation within this narrow upland band surrounding the immediate roadway consists of common reed (*Pragmites australis*, FACW)), red fescue (*Festuca rubra*, FACU)), eastern baccharis (*Baccharis halmifolia*, FAC)), poison ivy (*Toxicodendron radicans*, FAC)), southern arrowwood (*Viburnum dentatum* (FAC)), Virginia creeper (*Parthenocissus quinquefolia*, FACU)), meadow brome (*Bromus commutatus*, NL (UPL), and staghorn sumac (*Rhus typhina*, NL (UPL). Soils within this upland area consist of fill deposited for the roadway, ranging from 2.5 Y and 10 YR 4/3 to 10 YR 5/6 matrix chromas from a depth of zero (0) to eighteen (18) inches. Hydrology includes saturation from eight (8) inches to fifteen (15) inches below the surface. Some of the data pits within the upland meadow habitat had positive wetland vegetation or hydrology with two (2) out of three (3) technical wetland criteria met, but none of the data pits taken in the Upland Meadow met the technical wetland criteria for soil (no hydric soil indicators were present).

Upland Residential and Commercial

Upland maintained lawn is located in the residential portion of the project study area to the west of Wetland 1 along the western bridge approach, consisting of typical lawn grasses such as Kentucky bluegrass (*Poa pratensis*). Soils mapped in this area are Broadkill-Appoquinimink complex, very frequently flooded, tidal (Ba). However, this area has been modified by fill for the development of residences along Taylors Bridge Road (SR 9). A commercial property and residences are located along the eastern bridge approach in an area mapped as Leipsic silt loam, 0 to 2 percent slopes (LeA), and Reybold silt loam, 5 to 10 percent slopes (ReC) soils, which are not hydric. These areas consist of a combination of upland maintained lawn and upland mature forest (described below) plant communities.

Upland Mature Forest

On the eastern bridge approach, forested areas originally mapped as wetland in the Delaware 2007 State Wetlands layer consist of forestland dominated by blackgum (*Nyssa sylvatica* (FAC)), loblolly pine (*Pinus taeda* (FAC)), black cherry (*Prunus serotina* (FACU)), southern arrowwood (*Viburnum dentatum*, FAC)), multiflora rose (*Rosa multifora,* FACU), white avens (*Geum canadense*, FAC), japanese honeysuckle (*Lonicera japonica*, FAC), trumpet creeper (*Campsis radicans*, FAC), and Virginia creeper (*Parthenocissus quinquefolia*, FACU)). The soils mapped in these areas consist of Leipsic silt loam, 0 to 2 percent slopes (LeA), and Reybold silt loam, 5 to 10 percent slopes (ReC) soils, which are not hydric. Soils observed in the forested portions of the project study area were hard, compacted, and dry, ranging from 10 YR 3/3 and 4/3 from zero (0) to eight (8) inches, to 10 YR 5/6 down to a depth of eighteen (18) inches. No wetland hydrology was observed in any of the data pits taken in the upland mature forest plant community.

Waters of the United States:

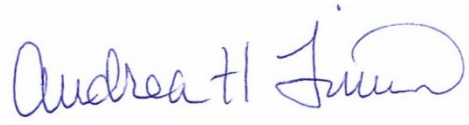
WOUS 1

WOUS 1 is Blackbird Creek that flows from south to the north through the project study area. Watercourse 1 is classified as a Estuarine subtidal unconsolidated bottom, subtidal (E1UBL) watercourse described as Estuarine open water according to the Cowardin Wetland and Deepwater Habitats Classification System (Cowardin and others, 1979). Based on its physical characteristics, the watercourse is subject to Federal and State jurisdiction. Watercourse 1 is illustrated on the attached project plan as Blackbird Creek.

If you have any questions, please contact me at afinn@pennoni.com or (717) 620-5964.

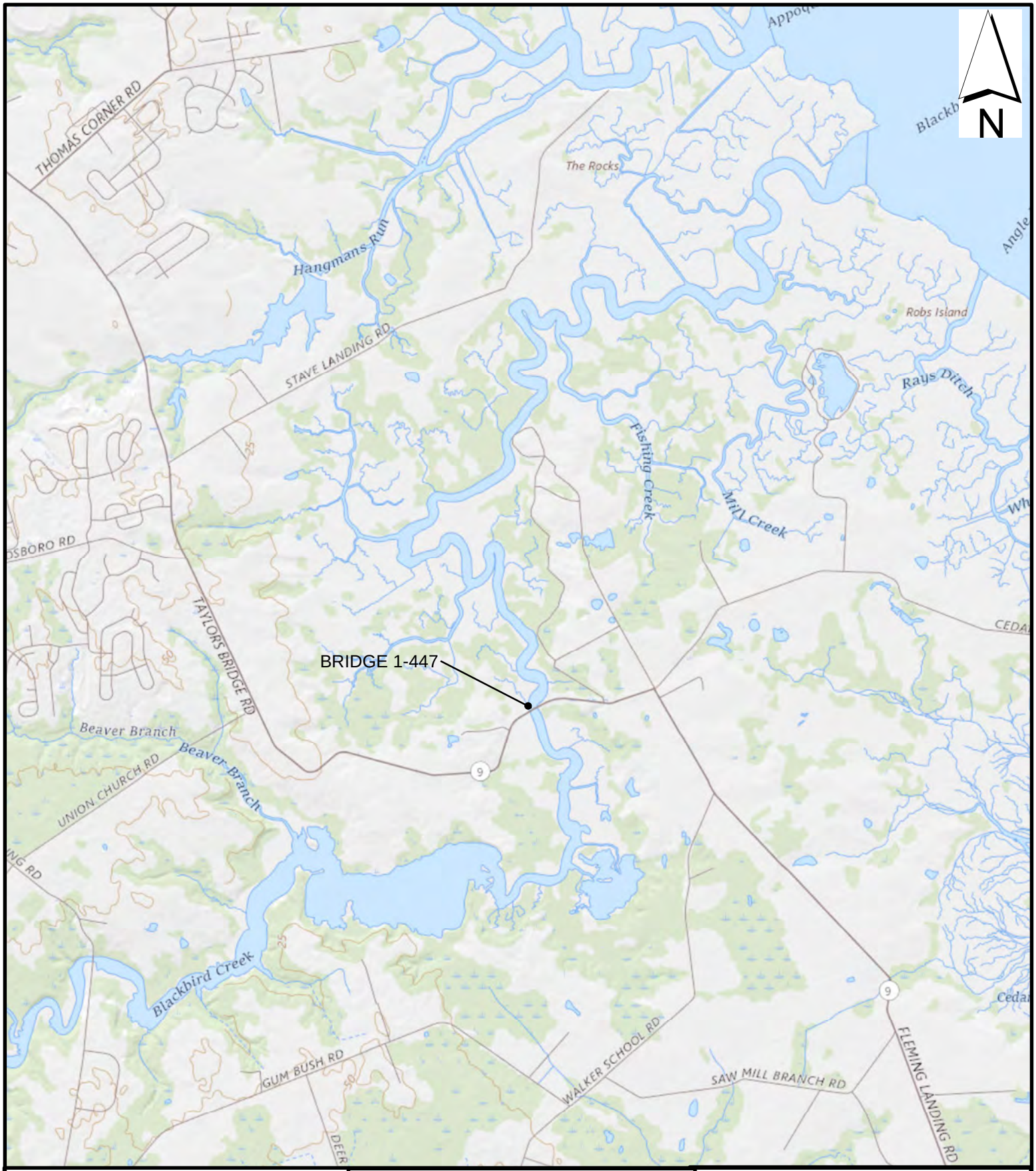
Sincerely,

PENNONI ASSOCIATES, INC.



Andrea H. Finn, PWS
Senior Environmental Scientist

APPENDIX A- Project Mapping



SOURCE BASE MAP: USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program,

JOB NO. : DEDOT19005
SCALE: 1 inch = 3,000 feet

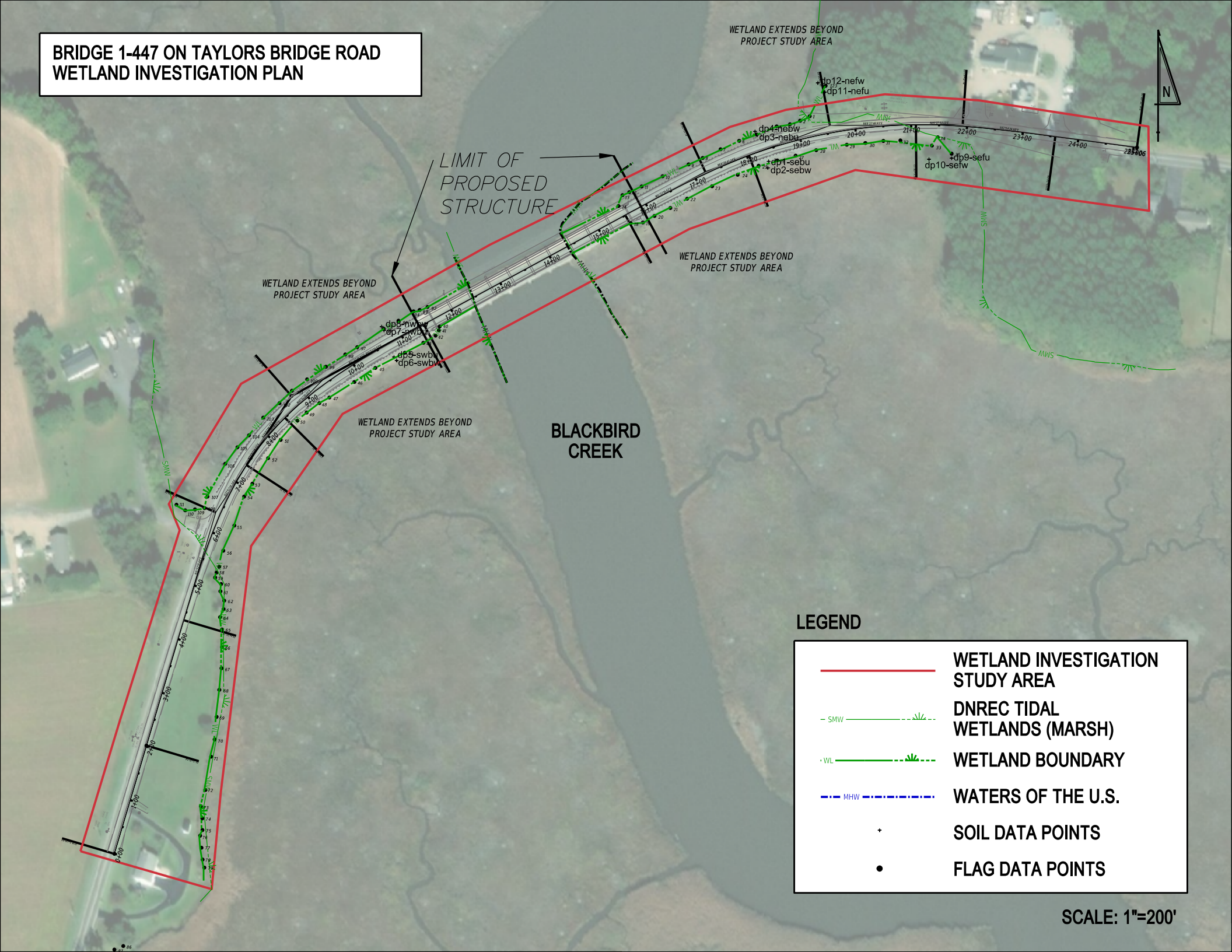
LOCATION MAP

DELDOT BRIDGE 1-447
TAYLORS BRIDGE RD OVER BLACKBIRD CREEK

NEW CASTLE COUNTY, DE

Pennoni

121 CONTINENTAL DR., SUITE 207
NEWARK, DE 19713


BRIDGE 1-447 ON TAYLORS BRIDGE ROAD
WETLAND INVESTIGATION PLAN
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
LIMIT OF PROPOSED STRUCTURE
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
WETLAND EXTENDS BEYOND PROJECT STUDY AREA
BLACKBIRD CREEK
dp12-nefw
dp11-nefu
dp4-nebw
dp3-nebu
dp1-sebu
dp2-sebw
dp9-sefu
dp10-sefw
dp8-nwbw
dp7-nwbu
dp5-swbu
dp6-swbw
N
LEGEND
WETLAND INVESTIGATION STUDY AREA
DNREC TIDAL WETLANDS (MARSH)
WETLAND BOUNDARY
WATERS OF THE U.S.
SOIL DATA POINTS
FLAG DATA POINTS
SCALE: 1"=200'

APPENDIX B- Project Photographs

Photograph 1. Looking west across Taylors Bridge along Estuarine Tidal Wetlands (Wetland 1). Photo taken 6-26-2020.

Photograph 2. View to the east along SR 9 (Taylors Bridge Road) toward forested areas delineated as upland. Photograph Taken 6-26-2020.

Photograph 3. View across Estuarine Tidal Wetlands (Wetland 1) toward Blackbird Creek. Photo taken 6-26-2020

Photograph 4. View to the west along the western approach of Taylor's Bridge. Photo taken 6-26-2020

APPENDIX C- Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 0206/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP1-SEBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40544328 Long: -75.59783485 Datum: NAD 83

Soil Map Unit Name: Broadkill- Apponquinimink Complex (Ba) NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 14"

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturated soil conditions 12 in. (30 cm) or less from the soil surface not observed. No primary or secondary hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP1 - SEBU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1. Baccharis halmifolia	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: 7.5 20% of total cover: 3

Herb Stratum (Plot size: 30')			
1. Phragmites australis	45	Y	FACW
2. Festuca rubra	40	Y	FACU
3. Bromus commutatus	5	N	NL
4. Lactuca canadensis	2	N	FACU
5. Medicago sativa	4	N	UPL
6. Poa pratensis	2	N	FACU
7. Solidago altissima	1	N	FACU
8. Typha latifolia	1	N	OBL
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: 30')			
1. Toxicodendron radicans	10	Y	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		

50% of total cover: 5 20% of total cover: 2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic Vegetation Indicator Present

SOIL

Sampling Point: DP1- SEBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 12	2.5 Y 4/3	80	2.5 Y 4/2	20	D	M	sal	fill on roadway
12 - 14	2.5 Y 4/3	50	10 YR 6/6	35	C	M	sal	fill on roadway
			2.5 Y 4/2	15	D	M		
14 - 21	10 YR 6/6	50	2.5 Y 4/3	25	D	M	sacl	fill on roadway
			2.5 Y 4/2	15	D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP2-SEBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40541165 Long: -75.59783953 Datum: NAD 83

Soil Map Unit Name: Broadkill-Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary hydrologic indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP-SEBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		

50% of total cover: 50 20% of total cover: 20

Woody Vine Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicators present

SOIL

Sampling Point: DP2-SEBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 10"	2.5 Y 4/2	100					sasil	Root masses- ORZ
10 - 20 "	2.5 Y 4/2	100					cl	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☑ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP3-NEBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40557248 Long: -75.59790755 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 15"
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water table 12 in. (30 cm) or less from the soil surface not observed. No primary or secondary hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP3- NEBU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1. Viburnum dentatum	10	Y	FAC
2. Baccharis halmifolia	15	Y	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	25 = Total Cover		

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum (Plot size: 30')			
1. Phragmites australis	75	Y	FACW
2. Bromus commutatus	15	N	NL (UPL)
3. Asclepias syriaca	2	N	UPL
4. Festuca rubra	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	97 = Total Cover		

50% of total cover: 48.5 20% of total cover: 19.4

Woody Vine Stratum (Plot size: 30')			
1. Parthenocissus quinquefolia	5	Y	FACU
2.			
3.			
4.			
5.			
	5 = Total Cover		

50% of total cover: 2.5 20% of total cover: 1

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (If observed, list morphological adaptations below).

NL species assumed to be upland (UPL) species. Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP3-NEBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18"	10 YR 4/3	100					sal	
18 - 24"	2.5 Y 5/3	80	2.5 Y 4/1	20	D	M	sal	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP4-NEBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR U; MLRA 153C Lat: 39.40558998 Long: -75.5979215 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): -
Water Table Present?	Yes X	No _____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP4-NEBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP4-NEBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20"	2.5 Y 4/2	100					Sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [x] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] Organic Bodies (A6) **(LRR P, T, U)**
- [ ] 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- [ ] Muck Presence (A8) **(LRR U)**
- [ ] 1 cm Muck (A9) **(LRR P, T)**
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Coast Prairie Redox (A16) **(MLRA 150A)**
- [ ] Sandy Mucky Mineral (S1) **(LRR O, S)**
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7) **(LRR P, S, T, U)**
- [ ] Polyvalue Below Surface (S8) **(LRR S, T, U)**
- [ ] Thin Dark Surface (S9) **(LRR S, T, U)**
- [ ] Loamy Mucky Mineral (F1) **(LRR O)**
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Marl (F10) **(LRR U)**
- [ ] Depleted Ochric (F11) **(MLRA 151)**
- [ ] Iron-Manganese Masses (F12) **(LRR O, P, T)**
- [ ] Umbric Surface (F13) **(LRR P, T, U)**
- [ ] Delta Ochric (F17) **(MLRA 151)**
- [ ] Reduced Vertic (F18) **(MLRA 150A, 150B)**
- [ ] Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- [ ] 1 cm Muck (A9) **(LRR O)**
- [ ] 2 cm Muck (A10) **(LRR S)**
- [ ] Reduced Vertic (F18) **(outside MLRA 150A,B)**
- [ ] Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- [ ] Red Parent Material (TF2)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP5-SWBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40447987 Long: -75.60020026 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 8"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP5-SWBU

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	70	Y	FACW
2. Lactuca canadensis	3	N	FACU
3. Bromus commutatus	25	Y	NL (UPL)
4. Commelina virginica	2	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1. Vitis labrusca	15	Y	FAC
2.			
3.			
4.			
5.			
	25 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

NL species assumed to be upland (UPL) species. Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP5-SWBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18"	10 YR 5/8	75	10 YR 4/2	25	D	M	gr sal	fill
18 - 20"	2.5 Y 4/2	75	2.5 Y 4/1	15	D	M	gr sal	
			10 YR 5/8	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP6-SWBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR t; MLRA 153C Lat: 39.40446371 Long: -75.60018391 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): -
Water Table Present?	Yes X	No _____	Depth (inches): 8"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP6-SWBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP6-SWBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 20"	2.5Y 4/2	100					sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- [x] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [ ] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [ ] Organic Bodies (A6) **(LRR P, T, U)**
- [ ] 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- [ ] Muck Presence (A8) **(LRR U)**
- [ ] 1 cm Muck (A9) **(LRR P, T)**
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Coast Prairie Redox (A16) **(MLRA 150A)**
- [ ] Sandy Mucky Mineral (S1) **(LRR O, S)**
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7) **(LRR P, S, T, U)**
- [ ] Polyvalue Below Surface (S8) **(LRR S, T, U)**
- [ ] Thin Dark Surface (S9) **(LRR S, T, U)**
- [ ] Loamy Mucky Mineral (F1) **(LRR O)**
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)
- [ ] Marl (F10) **(LRR U)**
- [ ] Depleted Ochric (F11) **(MLRA 151)**
- [ ] Iron-Manganese Masses (F12) **(LRR O, P, T)**
- [ ] Umbric Surface (F13) **(LRR P, T, U)**
- [ ] Delta Ochric (F17) **(MLRA 151)**
- [ ] Reduced Vertic (F18) **(MLRA 150A, 150B)**
- [ ] Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- [ ] 1 cm Muck (A9) **(LRR O)**
- [ ] 2 cm Muck (A10) **(LRR S)**
- [ ] Reduced Vertic (F18) **(outside MLRA 150A,B)**
- [ ] Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- [ ] Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- [ ] Red Parent Material (TF2)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP7-NWBU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Hilslope Local relief (concave, convex, none): Convex Slope (%): 1-2%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40461095 Long: -75.60026399 Datum: NAD 83

Soil Map Unit Name: Broadkill - Appoquinimink Complex NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____	
Water Table Present?	Yes _____	No X	Depth (inches): _____	
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 8"	**Wetland Hydrology Present?** Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP7-NWBU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1. Rhus typhina	20	Y	NL (UPL)
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 4		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	75	Y	FACW
2. Rumex crispus	2	N	FAC
3. Lactuca canadensis	2	N	FACU
4. Althaea officinalis	5	N	FACW
5. Allium vineale	1	N	FACU
6. Ambrosia artemisiifolia	1	N	FACU
7. Poa pratensis	10	N	FACU
8. Festuca rubra	5	N	FACU
9.			
10.			
11.			
12.			
	101 = Total Cover		
50% of total cover: 50.5	20% of total cover: 20.2		
Woody Vine Stratum (Plot size: 30')			
1. Parthenocissus quinquefolia	10	Y	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
50% of total cover: 5	20% of total cover: 2		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (If observed, list morphological adaptations below).

NL species assumed to be upland (UPL) species. No hydrophytic vegetation indicators present.

SOIL

Sampling Point: DP7-NWBU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 14"	10 YR 5/6	75	20 YR 5/4	25	D	M	gr sal	fill
14 - 20"	2.5 Y 5/3	85	2.5 Y 6/8	15	C	M	gr sal	fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP8-NWBW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA153C Lat: 39.40462867 Long: -75.60027894 Datum: NAD 83

Soil Map Unit Name: Broadkill-Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 4"
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP8-NWBW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

50% of total cover: _____ 20% of total cover: _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP8-NWBW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8	2.5 Y 4/2	100					Sil	High Organic Material (Muck)
8 - 18	2.5 Y 4/1	100					Sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☑ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** _____

Remarks:

Hydric Soil Indicator Present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP9-SEFU

Investigator(s): AHF Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40546045 Long: -75.59667802 Datum: NAD 83

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No wetland hydrolgy indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP9-SEFU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica	35	Y	FAC
2. Pinus taeda	35	Y	FAC
3. Prunus serotina	20	Y	FACU
4. Prunus pennsylvanica	10	N	FACU
5.			
6.			
7.			
8.			
	100	= Total Cover	
50% of total cover: 50	20% of total cover: 20		
Sapling/Shrub Stratum (Plot size: 30')			
1. Viburnum dentatum	75	Y	FAC
2. Rosa multiflora	10	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	85	= Total Cover	
50% of total cover: 42.5	20% of total cover: 17		
Herb Stratum (Plot size: 30')			
1. Geum canadense	3	Y	FAC
2. Lonicera japonica	10	Y	FACU
3. Toxicodendron radicans	2	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	15	= Total Cover	
50% of total cover: 7.5	20% of total cover: 3		
Woody Vine Stratum (Plot size: 30')			
1. Campsis radicans	20	Y	FAC
2. Parthenocissus quinquefolia	10	Y	FACU
3.			
4.			
5.			
	30	= Total Cover	
50% of total cover: 15	20% of total cover: 6		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 62.5 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP9-SEFU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 8"	10 YR 4/3	100					sil	
8 - 18"	10 YR 5/6	100					sil	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP10 - SEFW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40545528 Long: -75.59682118 Datum: NAD 83

Soil Map Unit Name: Broadkill Appoquinimink Complex (Ba) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three technical wetland parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 7"

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary wetland hydrology indicator present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP10-SEFW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	25	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 30')			
1. Baccharis halmifolia	25	Y	FAC
2. Rosa multiflora	7	N	FACU
3. Sambucus canadensis	3	N	FACW
4.			
5.			
6.			
7.			
8.			
	37 = Total Cover		
50% of total cover: 18.5	20% of total cover: 7.4		
Herb Stratum (Plot size: 30')			
1. Solidago altissima	15	N	FACU
2. Juncus effusus	15	N	OBL
3. Phragmites australis	45	Y	FACW
4. Eupatorium perfoliatum	3	N	FACW
5. Epilobium coloratum	2	N	OBL
6. Euthamia graminifolia	15	N	FAC
7. Toxicodendron radicans	30	Y	FAC
8.			
9.			
10.			
11.			
12.			
	125 = Total Cover		
50% of total cover: 62.5	20% of total cover: 25		
Woody Vine Stratum (Plot size: 30')			
1. Smilax glauca	15	Y	FAC
2.			
3.			
4.			
5.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP10-SEFW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 7"	2.5 Y 4/2	100					sil	
7 - 18"	2.5 Y 5/2	55	2.5 Y 5/1	35	D	M	sil	
			10 YR 5/8	10	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP11- NEFU

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40578386 Long: -75.59748043 Datum: NAD 83

Soil Map Unit Name: Leipsic Silt Loam (LeA) NWI classification: PF04A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

All three technical parameters not present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes _____	No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No X	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP11-NEFU

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Prunus serotina	20	Y	FACU
2. Pinus taeda	40	Y	FAC
3. Viburnum lantanoides	10	N	FAC
4. Juniperus virginiana	15	N	FACU
5.			
6.			
7.			
8.			
	85	= Total Cover	
50% of total cover: 42.5		20% of total cover: 17	

Sapling/Shrub Stratum (Plot size: 30')			
1. Viburnum dentatum	20	Y	FAC
2. Rosa multiflora	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	25	= Total Cover	
50% of total cover: 12.5		20% of total cover: 5	

Herb Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		= Total Cover	
50% of total cover:		20% of total cover:	

Woody Vine Stratum (Plot size: 30')			
1. Campsis radicans	40	Y	FAC
2. Lonicera japonica	40	Y	FAC
3. Parthenocissus quinquefolia	5	N	FACU
4.			
5.			
	85	= Total Cover	
50% of total cover: 42.5		20% of total cover: 17	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP11- NEFU

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 7"	10 YR 3/3	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Hard Pack - Dry

Depth (inches): 7" +

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

No hydric soil indicators present.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: Taylors Bridge Road City/County: New Castle County Sampling Date: 6/26/2020

Applicant/Owner: DelDOT State: DE Sampling Point: DP12-NEFW

Investigator(s): AHF Section, Township, Range:

Landform (hillslope, terrace, etc.): Terace Local relief (concave, convex, none): None Slope (%): 0%

Subregion (LRR or MLRA): LRR T; MLRA 153C Lat: 39.40582858 Long: -75.59752488 Datum: NAD 83

Soil Map Unit Name: Broadkill Appoquinimink Complex (BA) NWI classification: E2EM1N

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks:

All three wetland technical parameters present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☑ Surface Water (A1)
- ☑ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☑ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): Surface

Water Table Present? Yes X No _____ Depth (inches): 8"

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Primary and secondary wetland hydrology indicators present.

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: DP12-NEFW

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa sylvatica	15	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15 = Total Cover		
50% of total cover: 7.5	20% of total cover: 3		
Sapling/Shrub Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum (Plot size: 30')			
1. Phragmites australis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
50% of total cover: 50	20% of total cover: 20		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (If observed, list morphological adaptations below).

Hydrophytic vegetation indicator present.

SOIL

Sampling Point: DP12-NEFW

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20"	2.5 Y 4/2						sil	High Organic Material (Muck)

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☑ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

Hydric soil indicator present.

Appendix C

Environmental Compliance Sheets

ENVIRONMENTAL COMPLIANCE NOTES

1. GENERAL NOTES:

   A. THE PURPOSE OF THIS SHEET IS TO IDENTIFY THOSE ITEMS ASSOCIATED WITH ENVIRONMENTAL COMPLIANCE. IMPACT CALCULATIONS ARE FOR THE AGENCY PERMIT REPORTING PURPOSES ONLY AND ARE NOT TO BE USED FOR BIDDING PURPOSES.

   B. IF A DEPARTURE FROM THE APPROVED PLANS (WHICH WOULD AFFECT ANY NATURAL AND/OR CULTURAL RESOURCES) IS NECESSARY, CONTACT THE ENVIRONMENTAL STUDIES SECTION AT (302) 760-2264 OR DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV) TO ALLOW FOR COORDINATION WITH THE APPROPRIATE RESOURCE AGENCIES AND APPROVAL.

   C. USE OF THIS SHEET DOES NOT ALLEVIATE THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL CONDITIONS SET FORTH IN THE ENVIRONMENTAL STATEMENT AND PERMITS.

2. NATURAL RESOURCE ISSUES:

   A. PERMIT REQUIREMENTS/APPROVALS *:
   U.S. ARMY CORPS OF ENGINEERS (COE): NATIONWIDE PERMIT NWP 23 WITH PRECONSTRUCTION NOTIFICATION (PCN)
   DNREC - WETLANDS & SUBAQUEOUS LANDS (WLSL): WETLANDS & SUBAQUEOUS LANDS PERMIT
   DNREC - WATER QUALITY (WQC) & COASTAL ZONE CONSISTENCY (CZM): ISSUED NWP 23
   NCC DEPT. OF LAND USE (NCC):
   US COAST GUARD (USCG): N/A

   * THE PERMITS/APPROVALS LISTED ARE THOSE REQUIRED FOR THIS PROJECT. THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING AND/OR OBTAINING THESE APPROVALS.
   ** THE CONTRACTOR MUST ENSURE THAT THESE PERMITS/APPROVALS ARE IN THEIR POSSESSION PRIOR TO BEGINNING CONSTRUCTION IN THE PERMITTED AREA(S) AND ENSURE THEY ARE DISPLAYED ON-SITE DURING THE ENTIRE CONSTRUCTION PERIOD.
   *** USCG Note: PRIOR TO BRIDGE CONSTRUCTION, THE BRIDGE OWNER (DELDOT) SHOULD SUBMIT A BRIDGE MAINTENANCE PROJECT PLAN TO THE USCG OFFICE AT LEAST 30 DAYS (PREFERABLY 90 DAYS) PRIOR TO WORK COMMENCING ON OR OVER THE NAVIGABLE WATERWAY.

   AT NO TIME DURING THE PROJECT WILL THE WATERWAY BE CLOSED TO NAVIGATION WITHOUT THE PRIOR NOTIFICATION AND APPROVAL OF THE COAST GUARD. THE BRIDGE OWNER OR CONTRACTOR IS REQUIRED TO MAINTAIN CLOSE AND REGULAR CONTACT WITH COAST GUARD SECTOR DELAWARE AT D05-SMB-SECDELBAY-WWM@USCG.MIL TO KEEP INFORMED OF ACTIVITIES ON THE WATERWAY.

   B. CONSTRUCTION RESTRICTIONS:
   FISHERIES-BLACKBIRD CREEK PROVIDES SPAWNING HABITAT FOR ANADROMOUS SPECIES INCLUDING BLUEBACK HERRING (ALOSA AESTIVALIS) AND ALEWIFE (ALOSA PSEUDOHARENGUS), COLLECTIVELY REFERRED TO AS "RIVER HERRING," AS WELL AS POTENTIALLY AMERICAN SHAD (ALOSA SAPIDISSIMA). TO PROTECT THESE SPECIES DURING SPAWNING AND MIGRATORY ACTIVITIES, A TIME OF YEAR RESTRICTION OF MARCH 1ST TO JUNE 30TH IS REQUESTED DURING WHICH NO IN-WATER WORK SHOULD BE PERFORMED.

   FISHERIES- USACE NATIONWIDE PERMIT REGIONAL GENERAL CONDITION G-6(8), IN ORDER TO PROTECT DIADROMOUS FISH MIGRATIONS, SPAWNING ACTIVITIES, AND EFH, IN-WATER WORK SHALL BE AVOIDED FROM MARCH 1 TO JUNE 30 IN ALL WATERS. WORK WITHIN COFFERDAMS THAT FULLY ENCLOSE AND DEWATER THE PROJECT AREA CAN PROCEED ANY TIME DURING THE YEAR PROVIDED THE COFFERDAMS ARE INSTALLED OR REMOVED OUTSIDE OF THE SEASONAL WORK RESTRICTION AND DO NOT PRECLUDE THE FREE MOVEMENT OF MIGRATING OR SPAWNING AQUATIC SPECIES TO ENSURE COMPLIANCE WITH NWP GENERAL CONDITION 2 AND 3.

   MIGRATORY BIRDS - BRIDGE 1-447 HAS NOT BEEN SURVEYED FOR THE PRESENCE OF NESTING MIGRATORY BIRDS, WHICH ARE PROTECTED BY TITLE 7, DELAWARE CODE, CHAPTER 7, SECTIONS 734 AND 735. IF WORK IS PROPOSED DURING THE BREEDING SEASON (APRIL 15 – AUGUST 1), A SURVEY SHOULD BE COMPLETED PRIOR TO THE START OF WORK TO DETERMINE IF ONE OR MORE PAIRS OF BARN SWALLOW (HIRUNDO RUSTICA) AND/OR EASTERN PHOEBE (SAYORNIS PHOEBE) NESTS ARE PRESENT UNDER THE BRIDGE. IF A SURVEY DETECTS NESTING ACTIVITY, THE FOLLOWING STEPS SHOULD BE TAKEN TO AVOID NEST DESTRUCTION AND TAKE, WHICH IS A VIOLATION OF STATE LAW:

      1. PERFORM CONSTRUCTION ACTIVITIES FROM AUGUST 1 TO APRIL 15.

      2. IF CONSTRUCTION CANNOT BE PERFORMED IN THIS TIME PERIOD, A DETERRENT SUCH AS MESH NETTING SHOULD BE USED TO BLOCK ACCESS TO NESTING SITES ON THE UNDERSIDE OF THE BRIDGE(S). THE MATERIAL WOULD NEED TO BE IN PLACE NO LATER THAN APRIL 15, THE UNDERSIDE OF THE BRIDGE(S) WOULD NEED TO BE FULLY ENCAPSULATED, AND THE MATERIAL SHOULD BE LEFT IN PLACE UNTIL CONSTRUCTION BEGINS. IF ACTIVE NESTS ARE DISCOVERED DURING THE COURSE OF WORK, ACTIVITIES SHOULD BE HALTED IMMEDIATELY AND SCRP CONTACTED FOR FURTHER GUIDANCE.

   MARSH NESTING BIRDS - THE AREA SURROUNDING THE PROJECT SITE IS MAPPED AS QUALITY MARSH HABITAT, AND IT HAS THE POTENTIAL TO SUPPORT NESTING MARSH BIRDS. DNREC REQUESTS A TIME-OF-YEAR RESTRICTION FOR WORK CONDUCTED IN THE SURROUND MARSH FROM APRIL 1 TO JULY 31 TO PROTECT MARSH NESTING BIRDS AND THEIR YOUNG.

   BLACKBIRD CREEK IS USED BY LARGE NUMBERS OF AMERICAN EEL (ANGUILLA ROSTRATA). DNREC REQUESTS THAT IN-STREAM WORK NOT TAKE PLACE FROM MARCH 1ST TO MAY 15TH TO ALLOW UPSTREAM PASSAGE OF ELVERS (YOUNG EELS).

   NO IN-WATER WORK FROM MARCH 1ST TO JUNE 30TH.

   - FOR NON-TIDAL LOCATIONS, NO WORK CAN BE DONE BELOW THE ORDINARY HIGH WATER (OHW) LINE.

   - FOR TIDAL LOCATIONS, NO WORK CAN BE DONE BELOW THE MEAN HIGH WATER TIDE LINE (MHWL).

   **PLEASE NOTE THAT TIDAL LINES (HTL, MHW, MLW) VARY BASED ON DIFFERENT NATURAL OCCURRENCES, THEREFORE THE LINES SHOWN ON PLANS MAY DIFFER FROM ONSITE CONDITIONS. SHOULD YOU HAVE QUESTIONS ABOUT WHERE THE "MHW" TIDE LINE IS, PLEASE CONTACT THE ENVIRONMENTAL STUDIES OFFICE AT DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV.

   THIS PROJECT WILL REQUIRE A "SOFT START" FOR WHEN DRIVING PILES. IF PILE DRIVING IS OCCURRING DURING A TIME OF YEAR WHEN ESA-LISTED SPECIES MAY BE PRESENT, AND THE ANTICIPATED NOISE IS ABOVE THE BEHAVIORAL NOISE THRESHOLD, A "SOFT START" IS REQUIRED TO ALLOW ANIMALS AN OPPORTUNITY TO LEAVE THE PROJECT VICINITY BEFORE SOUND PRESSURE LEVELS INCREASE.

   - USE A SOFT START EACH DAY OF PILE DRIVING, AFTER A BREAK OF 30 MINUTES OR MORE, AND IF ANY INCREASE IN PILE INSTALLATION OR REMOVAL INTENSITY IS REQUIRED. BUILD UP POWER SLOWLY FROM A LOW ENERGY START-UP OVER A 20-MINUTE PERIOD TO WARN FISH TO LEAVE THE VICINITY. THIS BUILDUP SHALL OCCUR IN UNIFORM STAGES TO PROVIDE A CONSTANT INCREASE IN OUTPUT

3. CULTURAL RESOURCE ISSUES:

   A. SHPO HAS CONCURRED WITH DELDOT'S ARCHAEOLOGICAL INVESTIGATION AND FINDINGS FOR THE PROJECT (09/13/2022).
   B. SHPO HAS CONCURRED WITH DELDOT'S FINDING OF NO HISTORIC PROPERTIES AFFECTED (TO BE ISSUED ON/BY 12/10/2022).

ENVIRONMENTAL COMPLIANCE NOTES (CONT'D)

4. PROTECTION OF RESOURCES:

   A. KEEP CLEARING IN WETLAND AREAS TO A MINIMUM ABSOLUTELY NECESSARY FOR CONSTRUCTION ACCESS. SUPPORT ALL EQUIPMENT TRAVERSING WETLANDS AND SUBAQUEOUS LAND ON MATS. PAYMENT FOR MATS WILL BE MADE UNDER ITEM 621500 - TEMPORARY TIMBER MAT. IN WETLAND AREAS THAT ARE CLEARED, NO GRUBBING EXCEPT WHERE NECESSARY TO CONSTRUCT PROJECT COMPONENTS SUCH AS FOUNDATIONS AND RIPRAP PROTECTION IS PERMITTED. CUT VEGETATION FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT). RESTORE TEMPORARILY DISTURBED WETLAND AREAS TO GRADE AND SEED WITH ITEM 908515 - TEMPORARY GRASS SEEDING, WET GROUND.

   B. USE SILT FENCE OR CONSTRUCTION SAFETY FENCE ALONG THE LIMITS OF CONSTRUCTION IN ALL AREAS WHERE WATER WETLANDS ARE BEING IMPACTED (AS SHOWN ON ENVIRONMENTAL COMPLIANCE SHEETS), AND ALSO IN ANY AREA WHERE WATER/WETLANDS EXIST WITHIN 20 FEET OF THE LIMIT OF CONSTRUCTION (AS SHOWN ON CONSTRUCTION PLAN SHEETS). ANY CONTRACTOR ACCESS BEYOND THE LIMIT OF CONSTRUCTION IS STRICTLY PROHIBITED.

   C. USE SANDBAGS OR COMPOST FILTER LOG (CFL) TO SECURE SILT FENCE AT AREAS ADJACENT TO WOODED UPLANDS/ ALL WETLANDS IN LIEU OF TRENCHING UNLESS PROPER EROSION AND SEDIMENT CONTROL CANNOT BE MAINTAINED. REMOVE SANDBAGS AND CFLS (AND CONTENTS) IN THEIR ENTIRETY WHEN NO LONGER NEEDED. SANDBAGS/CFLS USED TO SECURE THE SILT FENCE IS INCIDENTAL TO ITEM 905001 - SILT FENCE. THE ENVIRONMENTAL STUDIES SECTION (302-760-2259 OR DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV) CAN PROVIDE FURTHER GUIDANCE REGARDING THIS METHOD OF INSTALLATION.

   D. CLEARLY MARK ALL TREES TO BE REMOVED WITH PAINT PRIOR TO THE EROSION AND SEDIMENT CONTROL MEETING.

5. STREAM RESTORATION AND RIPRAP TREATMENT:

   A. FOLLOW THE SPECIAL PROVISION FOR ITEM 707021 - CHANNEL BED FILL IN REGARDS TO THE SALVAGING OF ON-SITE NATURAL STREAM BOTTOM MATERIAL OR THE FURNISHING OF OFFSITE MATERIAL. IF USING CHANNEL BED FILL, USE HEAVY GRADATION AS IT WILL WASH AWAY IF YOU USE THE LIGHT GRADATION OF CBF. IF SUFFICIENT SOURCES FOR CHANNEL BED FILL DO NOT EXIST ON-SITE, ANY NEW MATERIAL MUST CONFORM TO THE REQUIREMENTS OF ITEM 707021 - CHANNEL BED FILL. RECESS ALL RIPRAP IN THE CHANNEL BOTTOM (I.E. BELOW THE WATER LINE) ONE FOOT BELOW STREAM BED ELEVATION AND CHOKE WITH BORROW TYPE 'B' SO THAT ALL OF THE VOIDS IN THE RIPRAP ARE FILLED WITH SPECIFIED MATERIAL. PAYMENT UNDER ITEM 209002 - BORROW, TYPE B. COVER THE RIPRAP WITH A MINIMUM OF 12" CHANNEL BED FILL. MATCH THE FINAL CHANNEL ELEVATIONS WITH EXISTING ELEVATIONS AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS WILL BE AS NOTED ON THE PLANS. PAYMENT UNDER ITEM 707021 -CHANNEL BED FILL.

   B. RESTORE OTHER AREAS OF THE CHANNEL BOTTOM AFFECTED BY CONSTRUCTION (INCLUDING, BUT NOT LIMITED TO, THE LOCATION OF SUMP PITS, STABILIZED OUTFALLS, TEMPORARY PIPES AND/OR SANDBAG DIKES AND DIVERSIONS) TO EXISTING CONDITIONS. FILL ANY CAVITIES OR SCOUR HOLES RESULTING FROM CONSTRUCTION ACTIVITIES WITH CHANNEL BED FILL. PAYMENT UNDER ITEM 707021 - CHANNEL BED FILL.

   C. WHEN ALL EROSION AND SEDIMENT CONTROL MEASURES ARE REMOVED AND THE STREAM RETURNS TO ITS NATURAL FLOW CONDITIONS, THE FLOW MUST REMAIN ABOVE GROUND AND ABOVE THE RIPRAP (I.E. THE FLOW CANNOT BE "LOST" IN THE RIPRAP OR BENEATH THE STRUCTURE). IF THIS IS NOT ACHIEVED, THE CONTRACTOR WILL BE REQUIRED TO TAKE CORRECTIVE ACTION AT THE CONTRACTOR'S EXPENSE.

   D. CHOKE ALL RIPRAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, WITH DELAWARE #57 STONE. PLACE JUST ENOUGH CHOKE MATERIAL TO PREVENT THE LOSS OF CHANNEL BED FILL OR TOPSOIL (DEPENDING ON LOCATION AS INDICATED BELOW) THROUGH THE RIPRAP.
      1. BENEATH THE BRIDGE: AFTER PLACING ITEM 302005 - DELAWARE #57 STONE, PERFORM A FINAL CHOKE OF CHANNEL BED FILL SO THAT THE RIPRAP PEAKS ARE BARELY VISIBLE. PAYMENT UNDER ITEM 707021 - CHANNEL BED FILL. DELAWARE #57 STONE IS INCIDENTAL TO THE RIPRAP ITEM.
      2. ALL OTHER LOCATIONS: FINISH FILLING THE VOIDS WITH TOPSOIL SO THAT THE RIPRAP PEAKS ARE BARELY VISIBLE. PLACE AN ADDITIONAL 6-INCH TOPSOIL LAYER ON TOP OF THE RIPRAP. SLOPE SEEDING WILL BE DONE WITH ITEM 908019 - STREAMBANK SEED MIX, SEEDING. FOLLOWING THE SEEDING OPERATION, INSTALL ITEM 908020 - EROSION CONTROL BLANKET (ECB) MULCH, OR OTHER BLANKET AS SHOWN ON THE PLANS. ECB AT TOE OF SLOPE CAN BE EITHER TRENCHED IN OR STAPLED AT 6" ON CENTER. COMPLETE ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL THROUGH THE SEEDING AND MULCHING PRIOR TO ANY RAIN EVENT. DELAWARE #57 STONE IS INCIDENTAL TO THE RIPRAP ITEM. ALL OTHER ITEMS WILL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.

6. THE CONTRACTOR SHALL ACCESS THE STREAM FROM THE STAGING AREAS AND ACCESS ROADS ONLY. CONTRACTOR ACCESS BEYOND THE LOC (AS DEFINED ON THESE PLANS) IS STRICTLY PROHIBITED. ANY CHANGE IN THE LOC MUST BE COORDINATED WITH THE DELDOT ENVIRONMENTAL STUDIES SECTION.

PROJECT AREA DELINEATED BY PENNONI ON 06/26/2020 IN ACCORDANCE WITH THE US ARMY CORPS OF ENGINEERS CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (1987) AND THE EASTERN MOUNTAINS AND PIEDMONT SUPPLEMENT (2012).
ORIGINAL SHEET PREPARED BY PENNONI ON 01/22/2021. SHEET LAST UPDATED ON 12/02/2022.

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-E-01	WETLAND CREATION	797.74	0.0183	19.71	USACE/DNREC
1-E-02	WETLAND CREATION	4833.64	0.1110	119.41	USACE/DNREC
2-E-03	WETLAND CREATION	5078.79	0.1166	125.46	USACE/DNREC
2-E-04	WETLAND CREATION	359.54	0.0083	8.88	USACE/DNREC
2-E-05	WETLAND CREATION	2693.09	0.0618	66.53	USACE/DNREC
2-E-06	WETLAND CREATION	173.36	0.0040	4.28	USACE/DNREC
2-E-07	WETLAND CREATION	1256.24	0.0288	31.03	USACE/DNREC
3-E-08	WETLAND CREATION	4638.83	0.1065	114.60	USACE/DNREC
3-E-09	WETLAND CREATION	2381.20	0.0547	58.82	USACE/DNREC
3-E-10	WETLAND CREATION	965.55	0.0222	23.85	USACE/DNREC
PROJECT TOTALS		23177.99	0.5321	572.58	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WR-01	WETLAND RESTORATION	6999.63	0.1607	172.92	USACE/DNREC
2-WR-02	WETLAND RESTORATION	8386.61	0.1925	207.18	USACE/DNREC
2-WR-03	WETLAND RESTORATION	3636.65	0.0835	89.84	USACE/DNREC
3-WR-04	WETLAND RESTORATION	6041.62	0.1387	149.25	USACE/DNREC
3-WR-05	WETLAND RESTORATION	241.65	0.0055	5.97	USACE/DNREC
TOTAL FOR THIS SHEET		25306.16	0.5809	625.16	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
1-W-01	ROADWAY/EMBANKMENT	35.33	0.0008	2.62	USACE/DNREC	LOSS
1-W-02	ROADWAY/EMBANKMENT	163.17	0.0037	12.09	USACE/DNREC	LOSS
1-W-03	ROADWAY/RETAINING WALL	1888.95	0.0434	139.92	USACE/DNREC	LOSS
2-W-04	ROADWAY/RETAINING WALL	962.39	0.0221	71.29	USACE/DNREC	LOSS
2-W-05	ROADWAY/RET. WALL/RIPRAP	731.93	0.0168	54.22	USACE/DNREC	LOSS
2-W-06	RIPRAP	312.34	0.0072	23.14	USACE/DNREC	LOSS
2-W-07	ROADWAY/RET. WALL/RIPRAP	881.52	0.0202	65.30	USACE/DNREC	LOSS
2-W-08	RIPRAP	97.00	0.0022	7.19	USACE/DNREC	LOSS
2-W-09	AERIAL COVERAGE (BR. DECK)	1003.17	0.0230	74.31	DNREC	IMPACT
2-W-10	RIPRAP	15.55	0.0004	1.15	USACE/DNREC	LOSS
2-W-11	RIPRAP	12.12	0.0003	0.90	USACE/DNREC	LOSS
3-W-12	AERIAL COVERAGE (BR. DECK)	325.49	0.0075	24.11	DNREC	IMPACT
2-W-13	AERIAL COVERAGE (BR. DECK)	1004.14	0.0231	74.38	DNREC	IMPACT
3-W-14	ROADWAY/EMBANKMENT	50.65	0.0012	3.75	USACE/DNREC	LOSS
PROJECT TOTALS		5150.94	0.1182	381.55	USACE/DNREC	LOSS

TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WT-01	WORK AREA / E&S CONTROLS	726.58	0.0167	53.82	USACE/DNREC
1-WT-02	WORK AREA / E&S CONTROLS	3858.79	0.0886	285.84	USACE/DNREC
1-WT-03	WORK AREA / E&S CONTROLS	1744.35	0.0400	129.21	USACE/DNREC
2-WT-04	WORK AREA / E&S CONTROLS	7531.31	0.1729	557.87	USACE/DNREC
2-WT-05	WORK AREA / E&S CONTROLS	2899.90	0.0666	214.81	USACE/DNREC
2-WT-06	WORK AREA / E&S CONTROLS	4379.58	0.1005	324.41	USACE/DNREC
2-WT-07	WORK AREA / E&S CONTROLS	2204.18	0.0506	163.27	USACE/DNREC
2-WT-08	WORK AREA / E&S CONTROLS	350.50	0.0080	25.96	USACE/DNREC
3-WT-09	WORK AREA / E&S CONTROLS	4770.15	0.1095	353.34	USACE/DNREC
3-WT-10	WORK AREA / E&S CONTROLS	8491.04	0.1949	628.97	USACE/DNREC
PROJECT TOTALS		36956.38	0.8484	2737.51	USACE/DNREC

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-OT-01	WORK AREA / E&S CONTROLS	11094.36	0.2547	274.07	USACE/DNREC
2-OT-02	WORK AREA / E&S CONTROLS	6017.63	0.1381	148.66	USACE/DNREC
PROJECT TOTALS		17111.99	0.3928	422.73	USACE/DNREC

PERMANENT OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-O-01	PIER/RIPRAP	747.77	0.0172	55.39	USACE/DNREC	IMPACT
2-O-02	PIER/RIPRAP	829.33	0.0190	61.43	USACE/DNREC	IMPACT
2-O-03	WORK AREA/E&S CONT.	20.93	0.0005	1.55	USACE/DNREC	IMPACT
2-O-04	WORK AREA/E&S CONT.	1266.16	0.0291	93.79	USACE/DNREC	IMPACT
2-O-05	WORK AREA/E&S CONT.	959.53	0.0220	71.08	USACE/DNREC	IMPACT
PROJECT TOTALS		3823.73	0.0878	283.24	USACE/DNREC	IMPACT

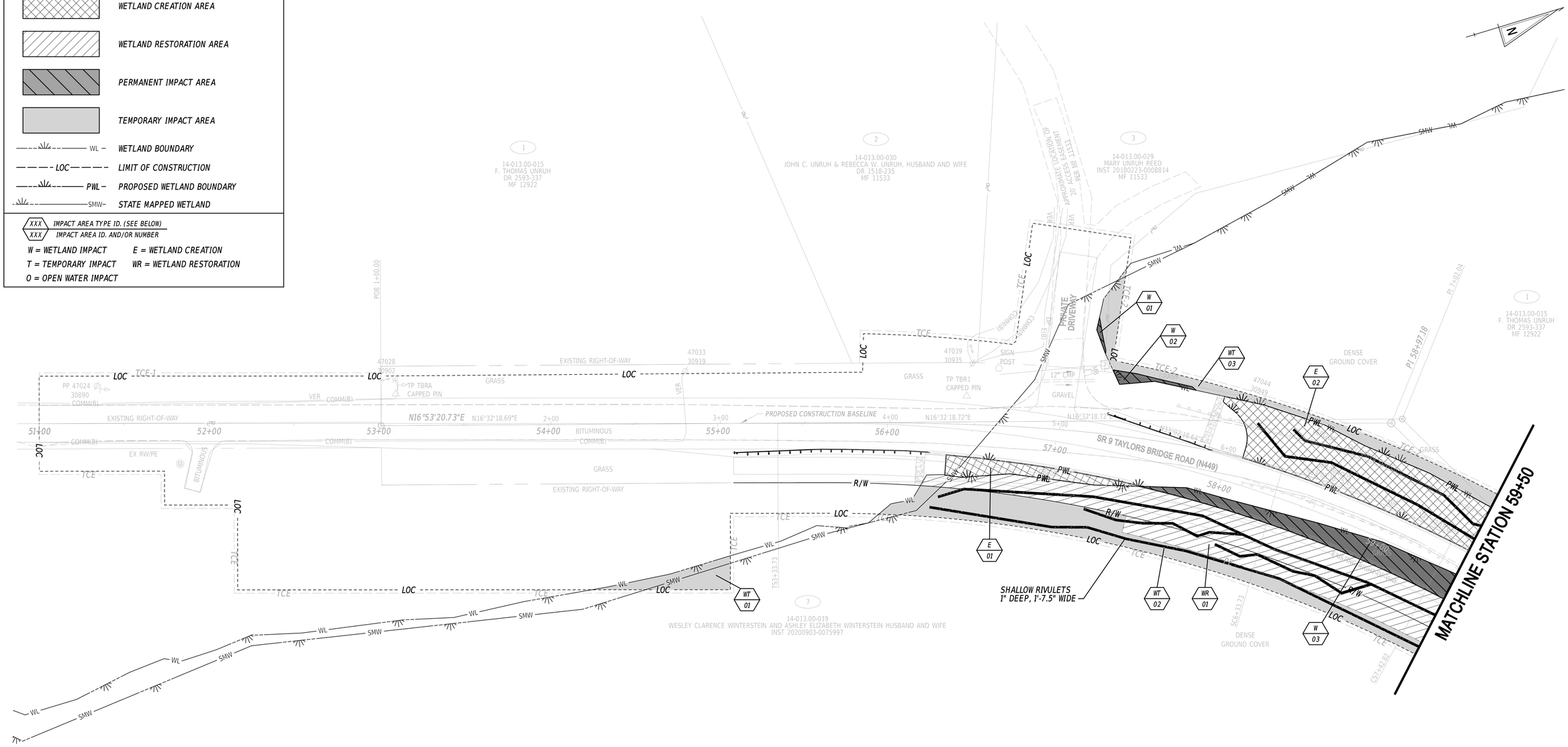
ADDENDA / REVISIONS		NOT TO SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	ENVIRONMENTAL COMPLIANCE NOTES	SECTION PAI
				COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY		SHEET NO. 56
					CHECKED BY: J. GRAUPENSPERGER		

LEGEND

- WETLAND CREATION AREA
- WETLAND RESTORATION AREA
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA
- WL – WETLAND BOUNDARY
- LOC – LIMIT OF CONSTRUCTION
- PWL – PROPOSED WETLAND BOUNDARY
- SMW – STATE MAPPED WETLAND

XXX / XXX — IMPACT AREA TYPE ID. (SEE BELOW) / IMPACT AREA ID. AND/OR NUMBER

W = WETLAND IMPACT
E = WETLAND CREATION
T = TEMPORARY IMPACT
WR = WETLAND RESTORATION
O = OPEN WATER IMPACT



TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WT-01	WORK AREA / E&S CONTROLS	726.58	0.0167	53.82	USACE/DNREC
1-WT-02	WORK AREA / E&S CONTROLS	3858.79	0.0886	285.84	USACE/DNREC
1-WT-03	WORK AREA / E&S CONTROLS	1744.35	0.0400	129.21	USACE/DNREC
TOTAL FOR THIS SHEET		6329.72	0.1453	468.87	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
1-W-01	ROADWAY/EMBANKMENT	35.33	0.0008	2.62	USACE/DNREC	LOSS
1-W-02	ROADWAY/EMBANKMENT	163.17	0.0037	12.09	USACE/DNREC	LOSS
1-W-03	ROADWAY/RETAINING WALL	1888.95	0.0434	139.92	USACE/DNREC	LOSS
TOTAL FOR THIS SHEET		2087.45	0.0479	154.63	USACE/DNREC	LOSS

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-E-01	WETLAND CREATION	797.74	0.0183	19.71	USACE/DNREC
1-E-02	WETLAND CREATION	4833.64	0.1110	119.41	USACE/DNREC
TOTAL FOR THIS SHEET		5631.38	0.1293	139.12	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WR-01	WETLAND RESTORATION	6999.63	0.1607	172.92	USACE/DNREC
TOTAL FOR THIS SHEET		6999.63	0.1607	172.92	USACE/DNREC

PENNONI ASSOCIATES INC.
FILE NAME: $FILE$
MICROSTATION VERSION: $VERSIONS
MICROSTATION WORKSPACE: $WORKSPACES
PEN TABLE: $PENTBL$$
PLOT DRIVER: $PTDRV$$
DATE PLOTTED: 20-FEB-2025 @ 10:12
USER NAME: $USER$
OFFICE LOCATION: $OFFICENAME$

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	J. GRAUPENSPERGER

ENVIRONMENTAL COMPLIANCE PLAN

	EC-01
SECTION	PAI
SHEET NO.	57

TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-WT-04	WORK AREA / E&S CONTROLS	7531.31	0.1729	557.87	USACE/DNREC
2-WT-05	WORK AREA / E&S CONTROLS	2899.90	0.0666	214.81	USACE/DNREC
2-WT-06	WORK AREA / E&S CONTROLS	4379.58	0.1005	324.41	USACE/DNREC
2-WT-07	WORK AREA / E&S CONTROLS	2204.18	0.0506	163.27	USACE/DNREC
2-WT-08	WORK AREA / E&S CONTROLS	350.50	0.0080	25.96	USACE/DNREC
TOTAL FOR THIS SHEET		17365.47	0.3987	1286.33	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-W-04	ROADWAY/RETAINING WALL	962.39	0.0221	71.29	USACE/DNREC	LOSS
2-W-05	ROADWAY/RET. WALL/RIPRAP	731.93	0.0168	54.22	USACE/DNREC	LOSS
2-W-06	RIPRAP	312.34	0.0072	23.14	USACE/DNREC	LOSS
2-W-07	ROADWAY/RET. WALL/RIPRAP	881.52	0.0202	65.30	USACE/DNREC	LOSS
2-W-08	RIPRAP	97.00	0.0022	7.19	USACE/DNREC	LOSS
2-W-09 *	AERIAL COVERAGE (BR. DECK)	1003.17	0.0230	74.31	DNREC	IMPACT
2-W-10	RIPRAP	15.55	0.0004	1.15	USACE/DNREC	LOSS
2-W-11	RIPRAP	12.12	0.0003	0.90	USACE/DNREC	LOSS
2-W-12 *	AERIAL COVERAGE (BR. DECK)	325.49	0.0075	24.11	DNREC	IMPACT
2-W-13 *	AERIAL COVERAGE (BR. DECK)	1004.14	0.0231	74.38	DNREC	IMPACT
TOTAL FOR THIS SHEET		3012.85	0.0692	223.17	USACE/DNREC	LOSS

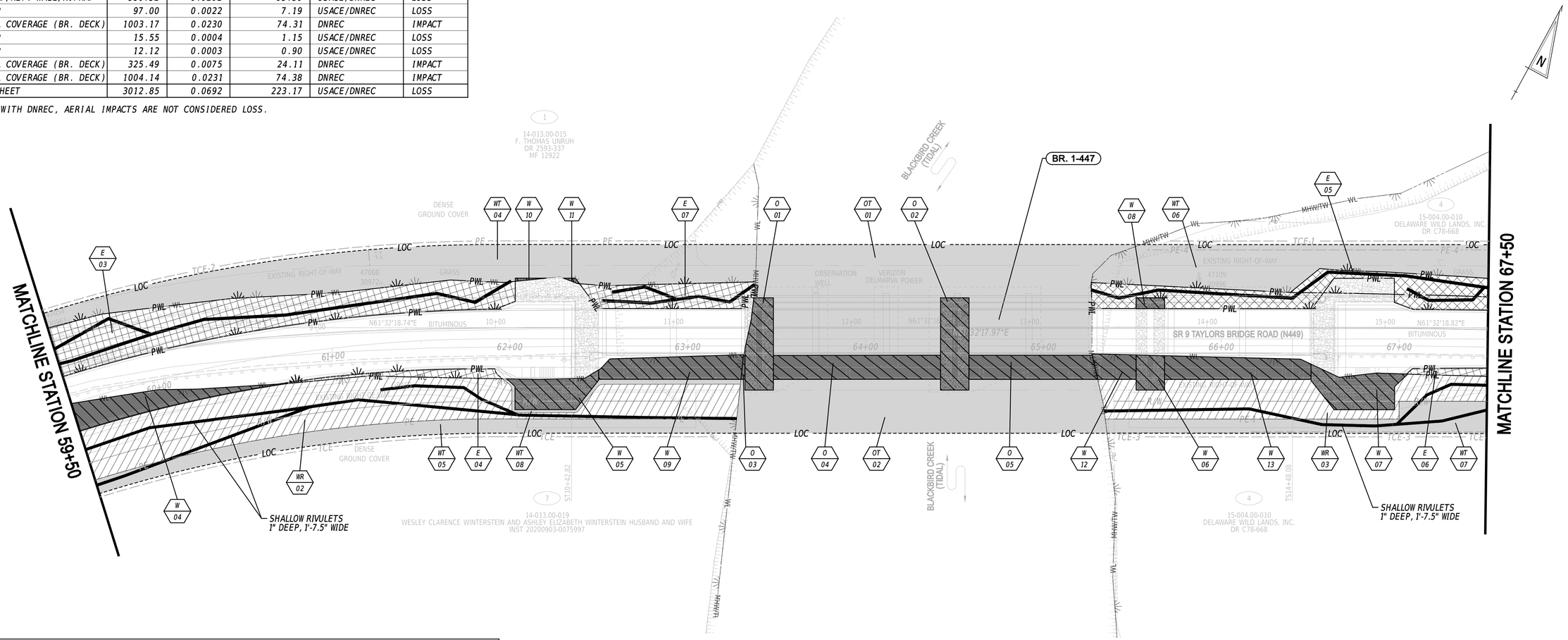
*PER COORDINATION WITH DNREC, AERIAL IMPACTS ARE NOT CONSIDERED LOSS.

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-OT-01	WORK AREA / E&S CONTROLS	11094.36	0.2547	821.80	USACE/DNREC
2-OT-02	WORK AREA / E&S CONTROLS	6017.63	0.1381	445.75	USACE/DNREC
TOTAL FOR THIS SHEET		17111.99	0.3928	1267.55	USACE/DNREC

PERMANENT OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-O-01	PIER/RIPRAP	747.77	0.0172	55.39	USACE/DNREC	IMPACT
2-O-02	PIER/RIPRAP	829.33	0.0190	61.43	USACE/DNREC	IMPACT
2-O-03	DNREC AERIAL COVERAGE	20.93	0.0005	1.55	DNREC	IMPACT
2-O-04	DNREC AERIAL COVERAGE	1266.16	0.0291	93.79	DNREC	IMPACT
2-O-05	DNREC AERIAL COVERAGE	959.53	0.0220	71.08	DNREC	IMPACT
TOTAL FOR THIS SHEET		3823.73	0.0878	283.24	USACE/DNREC	IMPACT



LEGEND

- WETLAND CREATION AREA
- WETLAND RESTORATION AREA
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA
- TOP OF BANK
- WL – WETLAND BOUNDARY
- LOC – LIMIT OF CONSTRUCTION
- PWL – PROPOSED WETLAND BOUNDARY
- SMW – STATE MAPPED WETLAND
- XXX / XXX — IMPACT AREA TYPE ID. (SEE BELOW) / IMPACT AREA ID. AND/OR NUMBER
- W = WETLAND IMPACT
- T = TEMPORARY IMPACT
- O = OPEN WATER IMPACT
- E = WETLAND CREATION
- WR = WETLAND RESTORATION

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-E-03	WETLAND CREATION	5078.79	0.1166	125.46	USACE/DNREC
2-E-04	WETLAND CREATION	359.54	0.0083	8.88	USACE/DNREC
2-E-05	WETLAND CREATION	2693.09	0.0618	66.53	USACE/DNREC
2-E-06	WETLAND CREATION	173.36	0.0040	4.28	USACE/DNREC
2-E-07	WETLAND CREATION	1256.24	0.0288	31.03	USACE/DNREC
TOTAL FOR THIS SHEET		9561.02	0.2195	236.19	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-WR-02	WETLAND RESTORATION	8386.61	0.1925	207.18	USACE/DNREC
2-WR-03	WETLAND RESTORATION	3636.65	0.0835	89.84	USACE/DNREC
TOTAL FOR THIS SHEET		12023.26	0.2760	297.02	USACE/DNREC

Pennoni

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

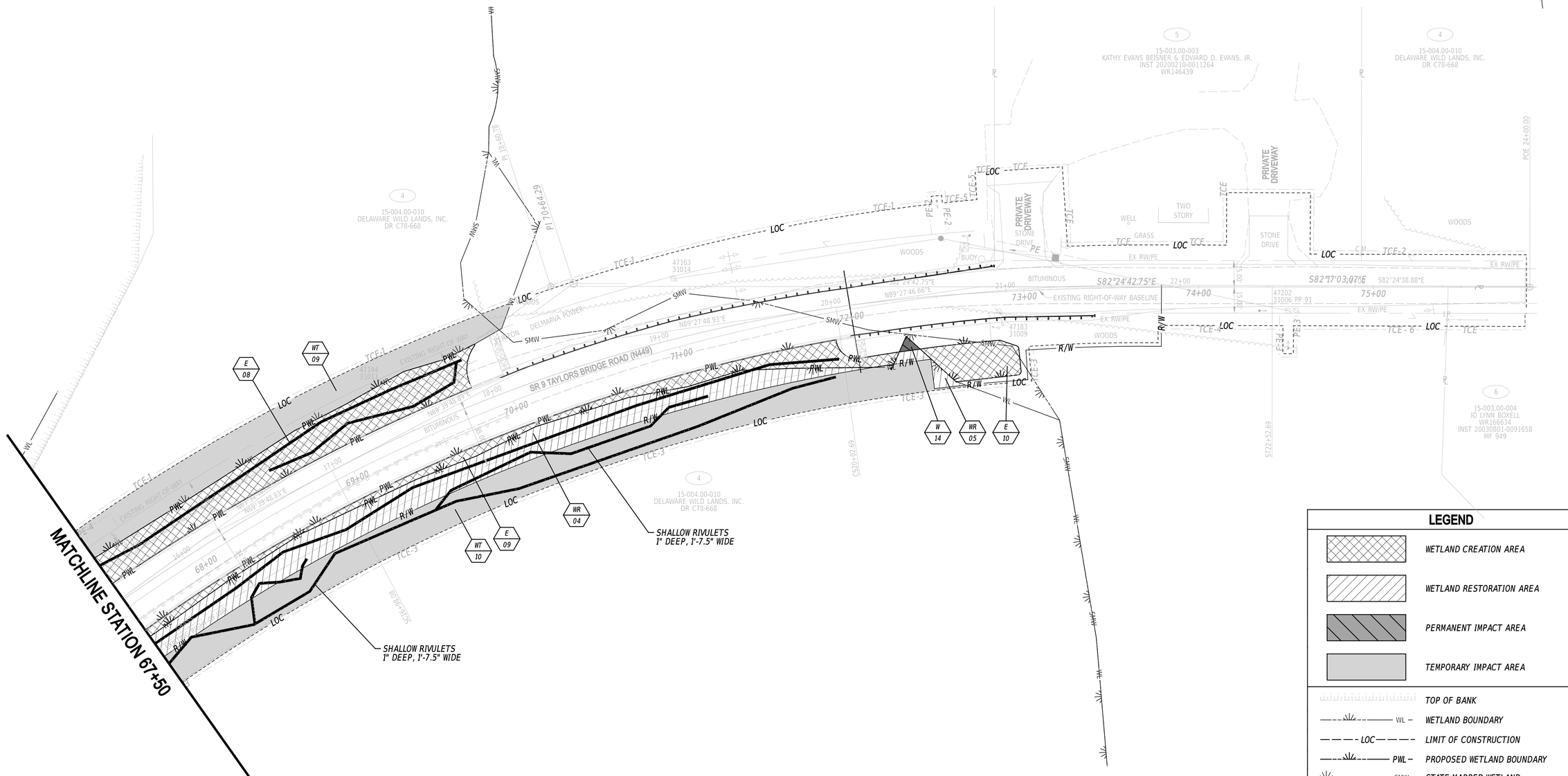
BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	E. HARASTY
COUNTY	CHECKED BY:	J. GRAUPENSPERGER
NEW CASTLE		

ENVIRONMENTAL COMPLIANCE PLAN

EC-02

SECTION	PAI
SHEET NO.	58



TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-WT-09	WORK AREA / E&S CONTROLS	4770.15	0.1095	353.34	USACE/DNREC
3-WT-10	WORK AREA / E&S CONTROLS	8491.04	0.1949	628.97	USACE/DNREC
TOTAL FOR THIS SHEET		13261.19	0.3044	982.31	USACE/DNREC

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-E-08	WETLAND CREATION	4638.83	0.1065	114.60	USACE/DNREC
3-E-09	WETLAND CREATION	2381.20	0.0547	58.82	USACE/DNREC
3-E-10	WETLAND CREATION	965.55	0.0222	23.85	USACE/DNREC
TOTAL FOR THIS SHEET		7985.59	0.1833	197.27	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
3-W-14	ROADWAY/EMBANKMENT	50.65	0.0012	3.75	USACE/DNREC	LOSS
TOTAL FOR THIS SHEET		50.65	0.0012	3.75	USACE/DNREC	LOSS

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-WR-04	WETLAND RESTORATION	6041.62	0.1387	149.25	USACE/DNREC
3-WR-05	WETLAND RESTORATION	241.65	0.0055	5.97	USACE/DNREC
TOTAL FOR THIS SHEET		6283.27	0.1442	155.22	USACE/DNREC

LEGEND

- ▨ WETLAND CREATION AREA
- ▨ WETLAND RESTORATION AREA
- ▨ PERMANENT IMPACT AREA
- ▨ TEMPORARY IMPACT AREA
- TOP OF BANK
- —WL— WETLAND BOUNDARY
- —LOC— LIMIT OF CONSTRUCTION
- —PWL— PROPOSED WETLAND BOUNDARY
- —SMW— STATE MAPPED WETLAND

XXX IMPACT AREA TYPE ID. (SEE BELOW)
XXX IMPACT AREA ID. AND/OR NUMBER

W = WETLAND IMPACT
E = WETLAND CREATION
T = TEMPORARY IMPACT
WR = WETLAND RESTORATION
O = OPEN WATER IMPACT

ADDENDA / REVISIONS

SCALE
0 30 60 90
FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	J. GRAUPENSPERGER

ENVIRONMENTAL COMPLIANCE PLAN

EC-03
SECTION
PAI
SHEET NO.
59

Appendix D

Mitigation Plan Sheets

WETLAND MITIGATION NOTES

SECTION 200

1. THIS WORK INCLUDES THE EXCAVATION, REMOVAL AND DISPOSAL OF MIXTURES OF SOIL, PEATS, AND ORGANIC MATTER. THE METHOD OF EXCAVATION SHALL MINIMIZE THE COMPACTION OF EXISTING AND CREATED WETLANDS AND SUBAQUEOUS LANDS. ALL EQUIPMENT WITHIN EXISTING AND CREATED WETLANDS AND SUBAQUEOUS LANDS SHALL BE LOW GROUND-CONTACT (LGP) EQUIPMENT OR SHALL BE SUPPORTED ON MATS. ALL EXCAVATION EQUIPMENT, LGP EQUIPMENT, AND MATS ARE SUBJECT TO APPROVAL BY THE ENGINEER. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT THE MATS WILL SUPPORT THE EQUIPMENT. MANUFACTURERS SPECIFICATIONS AND ADVERTISED MATERIALS FOR LGP EQUIPMENT AND MATS SHALL BE FORWARDED TO THE ENGINEER FOR APPROVAL WITHIN THIRTY (30) DAYS OF THE AWARD OF THE CONTRACT. ALL PAGES FROM THE APPROPRIATE PERFORMANCE REFERENCE HANDBOOK DETAILING GROUND PRESSURE FOR ALL THE PROPOSED EQUIPMENT SHALL BE SUPPLIED WITHOUT EDIT HANDBOOK COVER PAGE, COMPLETE PAGES, AND COMPLETE TABLES. ANY PIECE OF EQUIPMENT NOT CONSIDERED LOW GROUND-CONTACT PRESSURE BY THE ENGINEER SHALL ONLY BE UTILIZED ON MATS. ALL OFF-MAT EQUIPMENT SHALL BE ADVERTISED BY THE MANUFACTURER AS LGP EQUIPMENT. SHOE WIDTH SHALL BE THE LARGEST AVAILABLE FOR THE MODEL AS MANUFACTURED BY THE MANUFACTURER. THE ENGINEER MAY REQUIRE THE USE OF MATS IF THE GROUND PRESSURE EXCEEDS 10 PSI EVEN IF THE MAXIMUM SHOE WIDTH IS UTILIZED. EXCAVATION WILL BE STAGED SUCH THAT LGP EQUIPMENT, MATS, AND MAT-SUPPORTED EQUIPMENT SHALL NOT OPERATE ON EXCAVATED AREAS AFTER FINAL GRADE IS REACHED, I.E. EXCAVATION SHALL BACK OUT OF THE SITE. PAYMENT FOR ALL MATERIALS (MATS, ETC.), EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED FOR EXCAVATION OF THE WETLAND MITIGATION AREAS SHALL BE INCIDENTAL TO ITEM 202000 EXCAVATION AND EMBANKMENT. NO SEPARATE PAYMENT WILL BE MADE UNDER ITEM 621500 TEMPORARY CONSTRUCTION MAT.

2. THE GRADING TOLERANCE FOR THE WETLAND MITIGATION IS PLUS OR MINUS ONE TENTH (0.1) OF A FOOT OF THE PLAN GRADES AND LINES. THIS WETLAND MITIGATION GRADING REQUIREMENT SHALL BE STRICTLY ADHERED TO FOR ALL EXCAVATION/GRADING OPERATIONS UNLESS OTHERWISE DIRECTED IN WRITING BY THE ENGINEER. ONLY AT THE WRITTEN DIRECTION OF THE ENGINEER SHALL THE CONTRACTOR MODIFY THE GRADING SPECIFIED IN THESE DESIGN PLANS. THE GRADE FOR THE WETLAND MITIGATION IS SHOWN IN SECTION, SHEETS 61-63.

SECTION 700

3. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PROVIDE POSITIVE DRAINAGE AT ALL TIMES DURING WORK ACTIVITIES REQUIRING ANY EXCAVATION WITHIN THE WETLAND MITIGATION. NO WORK IS ALLOWED THAT WOULD POND THE WETLAND MITIGATION OR RESTRICT THE TIDAL PRISM. FOR ALL WORK, INCLUDING WORK OUTSIDE THE WETLAND MITIGATION, THE CONTRACTOR SHALL ALSO PROVIDE NECESSARY DEWATERING TO STABILIZE SLOPE EXCAVATION DURING CONSTRUCTION UNTIL THE SLOPES STABILIZE AS DETERMINED BY THE ENGINEER. IN ADDITION, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO GATHER ALL NECESSARY DATA AND INFORMATION TO OBTAIN ANY PERMITS FOR PUMPING GROUNDWATER THAT MAY BE REQUIRED FOR THEIR OPERATIONS. PUMPING PERMITS ARE OBTAINABLE FROM THE DNREC DIVISION OF WATER RESOURCES, WATER SUPPLY WELL PERMITTING AND LICENSING BRANCH. ALL COSTS SHALL BE INCIDENTAL TO ITEM NO. 763501 - CONSTRUCTION ENGINEERING.

4. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE MASTER BENCHMARK DURING THE CONSTRUCTION. THE MASTER BENCHMARK SHALL NOT BE RE-SET OR RE-EVALUATED FOR ELEVATIONS. ALL GRADING ELEVATIONS SHALL BE REFERENCED TO THE MASTER BENCHMARK DATUM. AT A MINIMUM, PROTECTION SHALL INCLUDE PROTECTION FENCING AROUND THE BENCHMARK. MATERIALS AND METHODS FOR PROTECTION SHALL BE INCIDENTAL TO ITEM 736501 CONSTRUCTION ENGINEERING. Section 900

5. IF DIRECTED BY THE ENGINEER, ITEM 908515 TEMPORARY GRASS SEEDING, WET GROUND WILL BE BROADCAST OR HYDROSEEDED. THIS WOULD OCCUR OVER THE WETLAND MITIGATION, AS DIRECTED BY THE ENGINEER.

ADDITIONAL WETLAND MITIGATION NOTES INCLUDING SEQUENCE OF CONSTRUCTION

1. ALL WORK FOR THE WETLAND MITIGATION SHALL BE COMPLETED IN ONE CONSTRUCTION SEASON. APPROVAL OF THE FINAL GRADING AS-BUILT DRAWINGS SHALL OCCUR SO ITEM NO. 911000 - PLANTINGS MAY BE INSTALLED BETWEEN SEPTEMBER 15TH AND OCTOBER 15TH AS NOTED BELOW. THE WETLAND MITIGATION INCLUDES ALL AREAS DESIGNATED FOR ITEM 911000 - PLANTINGS, PLUS AS DETERMINED BY THE ENGINEER.

2. DelDOT MAY ELECT TO CONDUCT PHRAGMITES CONTROL SPRAYING DURING THE WORK. WHILE THIS WORK IS BEING CONDUCTED, OTHER WORK MAY BE TEMPORALLY SUSPENDED IN PART OR WHOLE BY THE ENGINEER.

3. INSTALL OR INSPECT AND MAINTAIN ANY EROSION CONTROL ITEMS INCLUDING ITEM 909004 -TURBIDITY CURTAIN, FLOATING.

4. INSTALL OR INSPECT AND MAINTAIN ITEM NO. 908023 - STABILIZED CONSTRUCTION ENTRANCES AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS.

5. PERFORM THE CLEARING AND GRUBBING OF THE SITE SO THE WORK ONLY DISTURBS AREAS THAT WILL BE EXCAVATED TO THE GRADE ELEVATION WITHIN THE NEXT FOURTEEN CALENDAR DAYS.

6. AT LOW TIDE THE WETLAND MITIGATION SHALL DRAIN OF SURFACE WATER, AS SOLELY DETERMINED BY THE ENGINEER. SHALLOW RIVULETS 1-INCH DEEP, 12-INCHES WIDE WILL BE ALLOWED TO PROMOTE DRAINAGE. DEEPER RIVULETS ARE NOT ALLOWED. AT THE INTERSECTION OF THE MARSH PLAIN AND THE CREEK, THE MARSH PLAIN SHOULD BE ABLE TO FREELY DRAIN INTO THE CREEK, AS SOLELY DETERMINED BY THE ENGINEER. THE CONTRACTOR NEEDS TO PROVIDE THESE DRAINAGE ELEMENTS. THESE DRAINAGE ELEMENTS MAYBE HAND EXCAVATED. DRAINAGE ELEMENTS WILL BE ESTABLISHED AT THE DIRECTION OF THE ENGINEER. ALL COSTS SHALL BE INCIDENTAL TO ITEM NO. 202000 EXCAVATION AND EMBANKMENT.

7. EXCAVATE THE WETLAND MITIGATION SITE TO THE DESIGN ELEVATIONS. THE EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED. THIS EXCAVATION AND THE DISPOSAL OF THE MATERIAL SHALL BE PAID UNDER ITEM NO. 202000 - EXCAVATION AND EMBANKMENT. THIS MATERIAL MAY BE IMMEDIATELY REMOVED FROM THE PROJECT, BUT TEMPORARY STOCKPILE LOCATIONS MAY BE APPROVED BY THE ENGINEER. THIS EXCAVATED MATERIAL SHALL BE COMPLETELY REMOVED FROM THE PROJECT LOCATION PRIOR THE CONTRACTOR PERFORMING THE AS-BUILT SURVEY AND DELDOT APPROVING THE GRADING ELEVATION AND AS-BUILT SUBMITTAL. THESE STOCKPILES SHALL ONLY BE PLACED IN UPLAND LOCATIONS APPROVED BY THE ENGINEER. THIS MATERIAL WILL NOT BE USED TO ESTABLISH ANY TOPSOIL ON THE PROJECT. THE ENGINEER MAY REQUIRE TEMPORARY SEEDING AND EROSION CONTROL ELEMENTS TO BE PLACED. THIS STABILIZATION WORK WOULD BE INCIDENTAL TO ITEM NO. 202000 EXCAVATION AND EMBANKMENT.

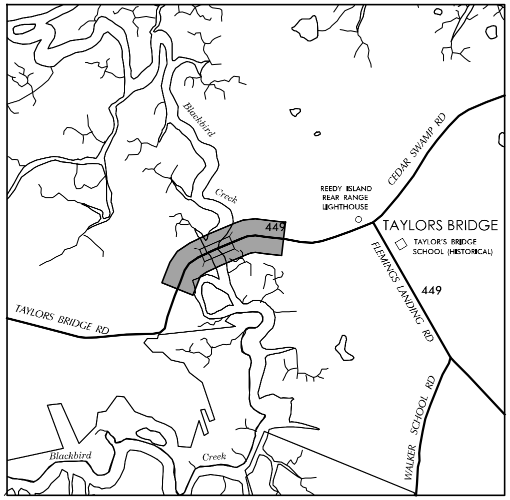
8. THE CONTRACTOR SHALL PREPARE AND SUBMIT AS-BUILT TOPOGRAPHIC PLANS FOR THE GRADING. ALL AS-BUILT SUBMITTALS WILL BE TIED TO THE HORIZONTAL/VERTICAL MASTER BENCHMARK, TBRA (SHEET 08, HORIZONTAL AND VERTICAL CONTROL). THE MAXIMUM HORIZONTAL DISTANCE BETWEEN SPOT ELEVATIONS SHALL BE 20 AND ADDITIONAL SPOT ELEVATIONS SHALL BE OBTAINED AS NECESSARY TO IDENTIFY ALL BREAKS IN GRADE AND OTHER FEATURES. SPOTS ELEVATIONS SHALL EXTEND A MINIMUM OF 50 BEYOND THE EXCAVATED AREAS.

9. ESTABLISH THE PERIMETER OF THE WETLAND MITIGATION EXCAVATION. THESE LIMITS SHALL BE SHOWN ON THE AS-BUILTS. SPOT ELEVATIONS SHALL BE ESTABLISHED ON MAXIMUM 20 CENTERS STARTING WITHIN 1-FOOT OF THE OUTER LIMITS OF THE WETLAND MITIGATION EXCAVATION IN ALL DIRECTIONS AND LINES (TO THE INSIDE OF THE EXCAVATION); THEN ADD INTERIOR AND EXTERIOR SPOTS AS NEED TO MEET THE SPOT DISTANCE AND SURVEY REQUIREMENTS. SPOT ELEVATIONS SHALL BE OBTAINED AND SHOWN ON THE AS-BUILT PLAN TO ONE-HUNDRETH OF A FOOT. THE DRAWINGS SHALL BE SUBMITTED TO DELDOT IN BOTH DIGITAL AND PAPER FORMAT CONFORMING TO CURRENT DELDOT CADD STANDARDS. DIGITAL INFORMATION SHALL BE SUBMITTED IN .DGN FORMAT AND .DTM FORMAT AND SHALL INCLUDE ALL SURVEY DATA IN .TXT FORMAT. THE DRAWINGS SHALL BE AT 30 SCALE. CONTOURS SHALL BE SHOWN AT 0.1 INTERVALS AND THE CONTOUR LINES SHALL BE LABELED FREQUENTLY ENOUGH THAT IT IS POSSIBLE TO CLEARLY ASCERTAIN THE ELEVATION OF ANY PARTICULAR CONTOUR LINE ANYWHERE ON THE PLAN SHEET. SPOT ELEVATIONS ON THE AS-BUILTS SHALL BE LABELED AND SHALL BE SUCH THAT THE PLAN SHEET TEXT SHALL BE LEGIBLE, SOLID BLACK CHARACTERS, IN SIZE APPROPRIATE TO THE SCALE OF THE DRAWINGS AND SEPARATED, NOT SUPERIMPOSED, ON TOP OF ONE ANOTHER. A PROFESSIONAL ENGINEER OR LAND SURVEYOR REGISTERED IN THE STATE OF DELAWARE SHALL SIGN AND SEAL THE AS-BUILTS. THE CONTRACTOR SHALL SUBMIT THE AS-BUILTS WITHIN SEVEN CALENDAR DAYS OF REACHING FINAL GRADE. ALL COSTS FOR PREPARING THE AS-BUILT PLANS SHALL BE PAID FOR UNDER ITEM NO. 763501 - CONSTRUCTION ENGINEERING.

10. DELDOT SHALL REVIEW THE SUBMITTED AS-BUILT DRAWINGS TO ENSURE THE PROJECT IS GRADED IN ACCORDANCE WITH THE LINE AND GRADES OF THE PLANS AND SHALL RESPOND TO THE CONTRACTOR WITHIN TEN CALENDAR DAYS. IF THE SITE IS NOT PROPERLY GRADED, DELDOT SHALL MARK THE ERRORS ON THE DRAWINGS AND RETURN THEM TO THE CONTRACTOR. THE CONTRACTOR SHALL GRADE ANY DEFECTIVE AREAS WITHIN SEVEN CALENDAR DAYS OF RECEIVING THE MARKED PLANS FROM DELDOT. IF FILL IS NEEDED, THE FILL MATERIAL SHALL BE A MEDIUM SAND OR COARSE SAND, AS SOLELY DETERMINED BY THE ENGINEER. THE FILL MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER. NO ADDITIONAL COMPENSATION WILL BE PAID FOR THIS FILL PLACEMENT. THE CONTRACTOR THEN SHALL PREPARE AND SUBMIT TO DELDOT A NEW SET OF PAPER AND ELECTRONIC AS-BUILT PLANS FOR THE ENTIRE SITE SHOWING THE CORRECTIVE WORK AREAS WITHIN SEVEN CALENDAR DAYS OF COMPLETING THE CORRECTIVE WORK. DELDOT SHALL REVIEW AND, IF NECESSARY, RETURN THE PLANS TO THE CONTRACTOR WITH ANY ERRORS AGAIN MARKED ON THE PLANS WITHIN FIVE CALENDAR DAYS. THIS PROCESS SHALL CONTINUE UNTIL THE PROJECT AND AS-BUILT DRAWINGS CONFORM TO THE PLANS AND ALL OTHER REQUIREMENTS OF THE CONTRACT DOCUMENTS. ALL COSTS FOR PREPARING THE FINAL AS-BUILT PLANS SHALL BE PAID FOR UNDER ITEM NO. 763501 - CONSTRUCTION ENGINEERING.

11. TWO OR THREE DAYS PRIOR TO STARTING THE WETLAND PLANTING, THE GRADED MARSH PLAIN AND THE LOC WILL BE INSPECTED AT LOW TIDE IN THE PRESENCE OF THE ENGINEER. DURING THE LOW-TIDE CYCLE, THE MARSH PLAIN SHALL FREELY DRAIN TO THE CREEK CHANNEL, AS SOLELY DETERMINED BY THE ENGINEER. WATER SHALL NOT POND ON THE MARSH PLAIN DURING THE FALLING TIDE, AS SOLELY DETERMINED BY THE ENGINEER. PRIOR TO PLANTING, ALL DEBRIS, STRAW AND ANY VEGETATION RACK SHALL BE REMOVED FROM THE WETLAND MITIGATION AND LOC, AND PROPERLY DISPOSED OF, AS SOLELY DETERMINED BY THE ENGINEER. AT THE DIRECTION OF THE ENGINEER, THE TURBIDITY CURTAIN SHALL BE REMOVED PRIOR TO CONDUCTING THE PLANTING.

12. AFTER ACCEPTANCE OF THE WETLAND MITIGATION GRADING BY DELDOT, THE CONTRACTOR SHALL PLANT THE WETLAND MITIGATION, ITEM 911000 - PLANTINGS. THIS ELEVATION SHOULD BE INUNDATED ON THE DAILY HIGH TIDE. THE REQUIREMENT FOR SALINITY ACCLIMATION IS WAIVED (MATERIALS, (C)).
PRIOR TO PEAT-POT PLACEMENT, TWO 21-GRAM 20-10-5 AGIFORM SLOW-RELEASE FERTILIZER TABLETS SHALL BE PLACED AT THE BOTTOM OF EACH PLANTING HOLE. THIS FERTILIZER PLACEMENT IS INCIDENTAL TO ITEM 911000 - PLANTINGS.



WETLAND CREATION SITE EARTHWORK SUMMARY

EXCAVATION	
EXCAVATION FROM CROSS SECTIONS	4430 C.Y.
ROCK EXCAVATION FOR ROADWAY AND TRENCHES	0 C.Y.
TOPSOIL STRIPPING	0 C.Y.
TOTAL EXCAVATION	4430 C.Y.
EXCAVATION AVAILABLE FOR EMBANKMENT	
EXCAVATION MEETING BORROW TYPE 'A'	0 C.Y.
EXCAVATION MEETING BORROW TYPE 'C'	0 C.Y.
EXCAVATION MEETING BORROW TYPE 'F'	0 C.Y.
EXCAVATION MEETING TOPSOIL	0 C.Y.
EMBANKMENT REQUIREMENTS	
BORROW TYPE 'A' REQUIRED (INCLUDING UNDERCUT)	0 C.Y.
BORROW TYPE 'C' REQUIRED	0 C.Y.
BORROW TYPE 'F' REQUIRED	0 C.Y.
TOPSOIL REQUIRED (TOPSOILING, 6 INCH)	0 C.Y.
MATERIAL BALANCE ("+"= EXCESS, "-"= NEED)	
BORROW TYPE 'A'	0 C.Y.
BORROW TYPE 'C'	0 C.Y.
BORROW TYPE 'F'	0 C.Y.
TOPSOIL	0 C.Y.
UNSUITABLE MATERIAL	0 C.Y.

NOTES:
1) THE VALUES LISTED IN THE EARTHWORK SUMMARY ARE APPROXIMATE AND ARE NOT TO BE USED AS A BASIS OF PAYMENT. THE EARTHWORK SUMMARY IS CONSIDERED FOR INFORMATIONAL PURPOSES ONLY.

2) OTHER SOURCES OF EXCAVATION MAY INCLUDE PIPE TRENCH EXCAVATION, STRUCTURE EXCAVATION, UNDERCUT EXCAVATION, STORMWATER MANAGEMENT POND EXCAVATION, ENVIRONMENTAL SITE EXCAVATION, MAINTENANCE OF TRAFFIC EXCAVATION, ETC.

3) UNSUITABLE MATERIALS INCLUDE UNDERCUT SOILS, BITUMINOUS PAVEMENT, ETC.

NOTES:
1) THE VALUES LISTED IN THE EARTHWORK SUMMARY ARE APPROXIMATE AND ARE NOT TO BE USED AS A BASIS OF PAYMENT.

2) THE VALUES LISTED ABOVE ARE ALSO INCLUDED IN THE EARTHWORK SUMMARY FOR THE ENTIRE PROJECT. SEE THE PROJECT EARTHWORK SHEET FOR THIS INFORMATION.

ADDENDA / REVISIONS

NOT TO SCALE

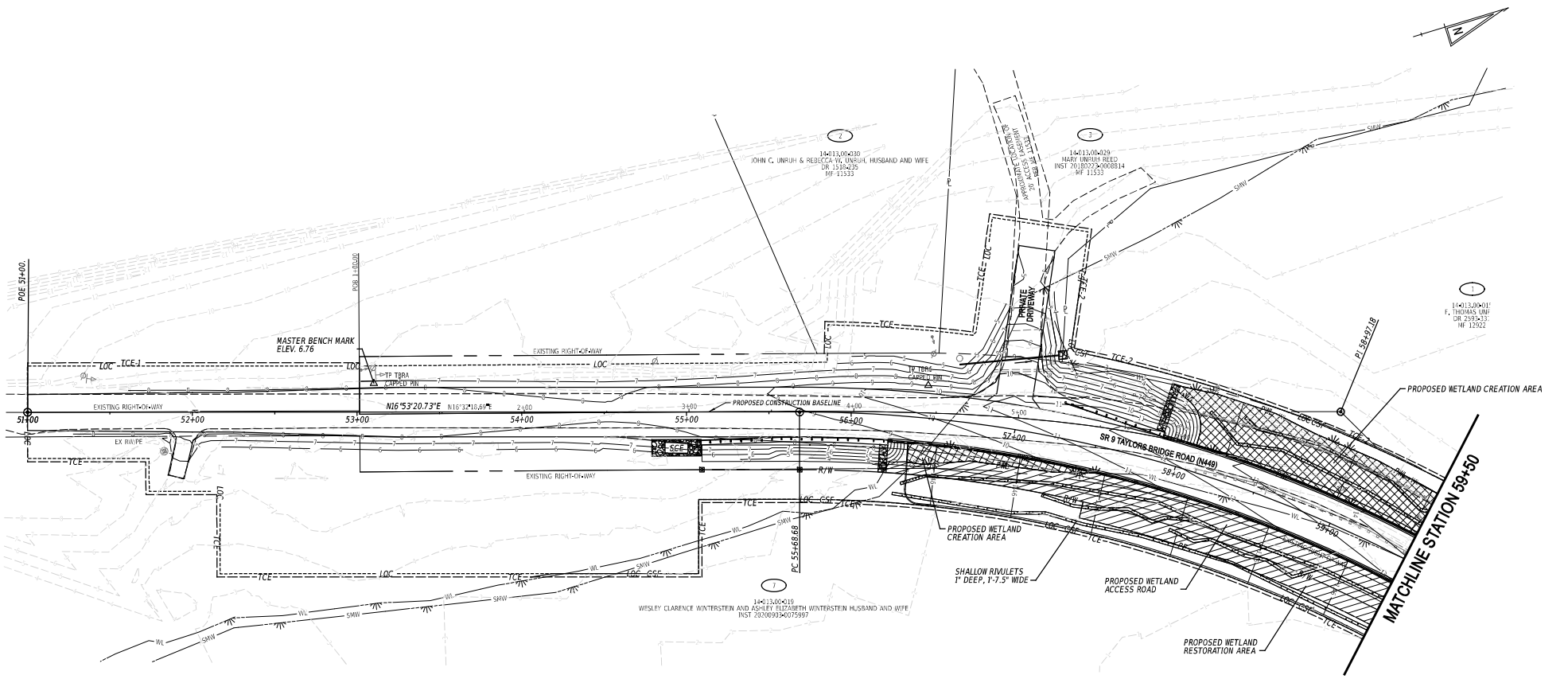
BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102	BRIDGE NO.	1-447
COUNTY	NEW CASTLE	DESIGNED BY:	E. HARASTY
		CHECKED BY:	J. THOMAS

WETLAND MITIGATION SITE NOTES

SECTION	PAI
SHEET NO.	60

PROJECT NOTES (SECTION NOTES RELATING TO WETLAND MITGATION ARE SHOWN ON SHEET 67.



LEGEND	
WL	WETLAND BOUNDARY
LOC	LIMIT OF CONSTRUCTION
PWL	PROPOSED WETLAND BOUNDARY
SMW	STATE MAPPED WETLAND

PENNONI ASSOCIATES INC.
PA DOT DISTRICT 7-0
MICROSTATION VERSION: 8VERSIONS
MICROSTATION WORKSPACE: $WORKSPACE$
PEN TABLE: $PENTABLE$
PLOTTED BY: $USERNAME$
DATE PLOTTED: $DATE$
USER NAME: $USER$
@ $TIME$
OFFICE LOCATION: $OFFICENAME$

Pennoni

ADDENDA / REVISIONS	

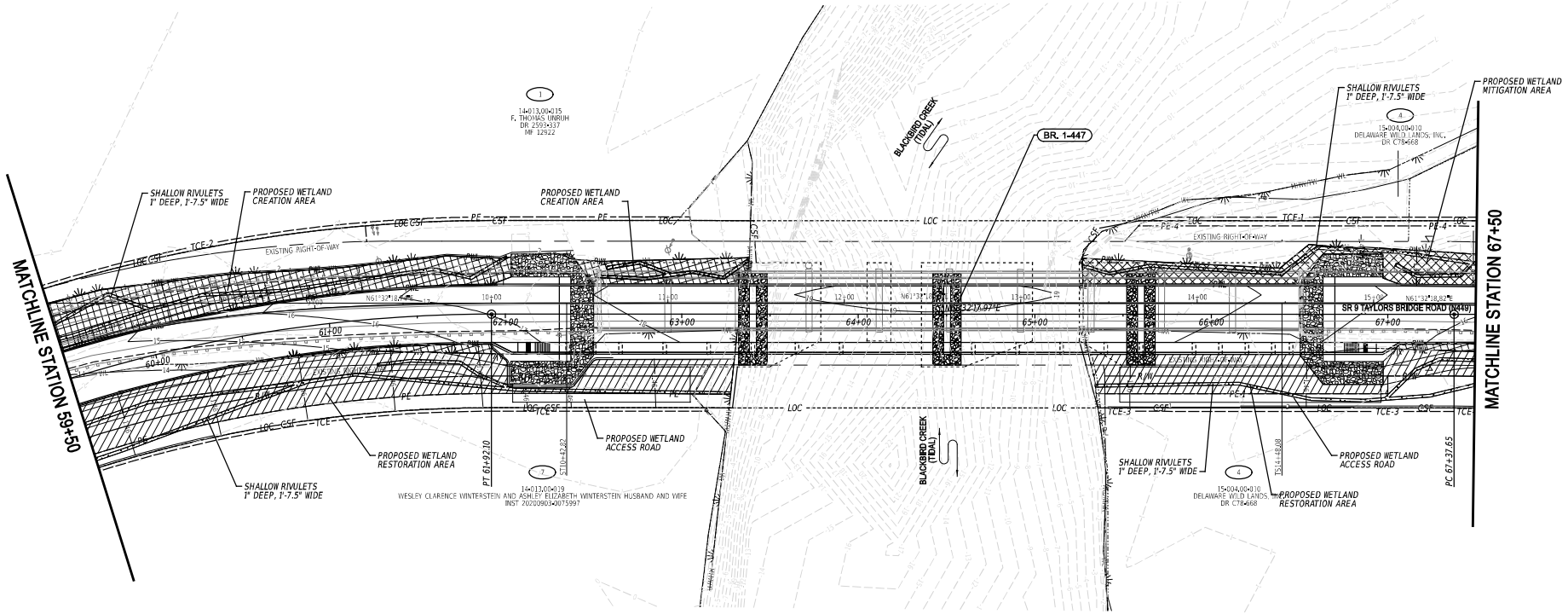
SCALE
0 30 60 90
FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	E. HARASTY
COUNTY	CHECKED BY:	J. THOMAS
NEW CASTLE		

WETLAND MITIGATION SITE GRADING PLAN

WM-01	
SECTION	
PAI	
SHEET NO.	
61	

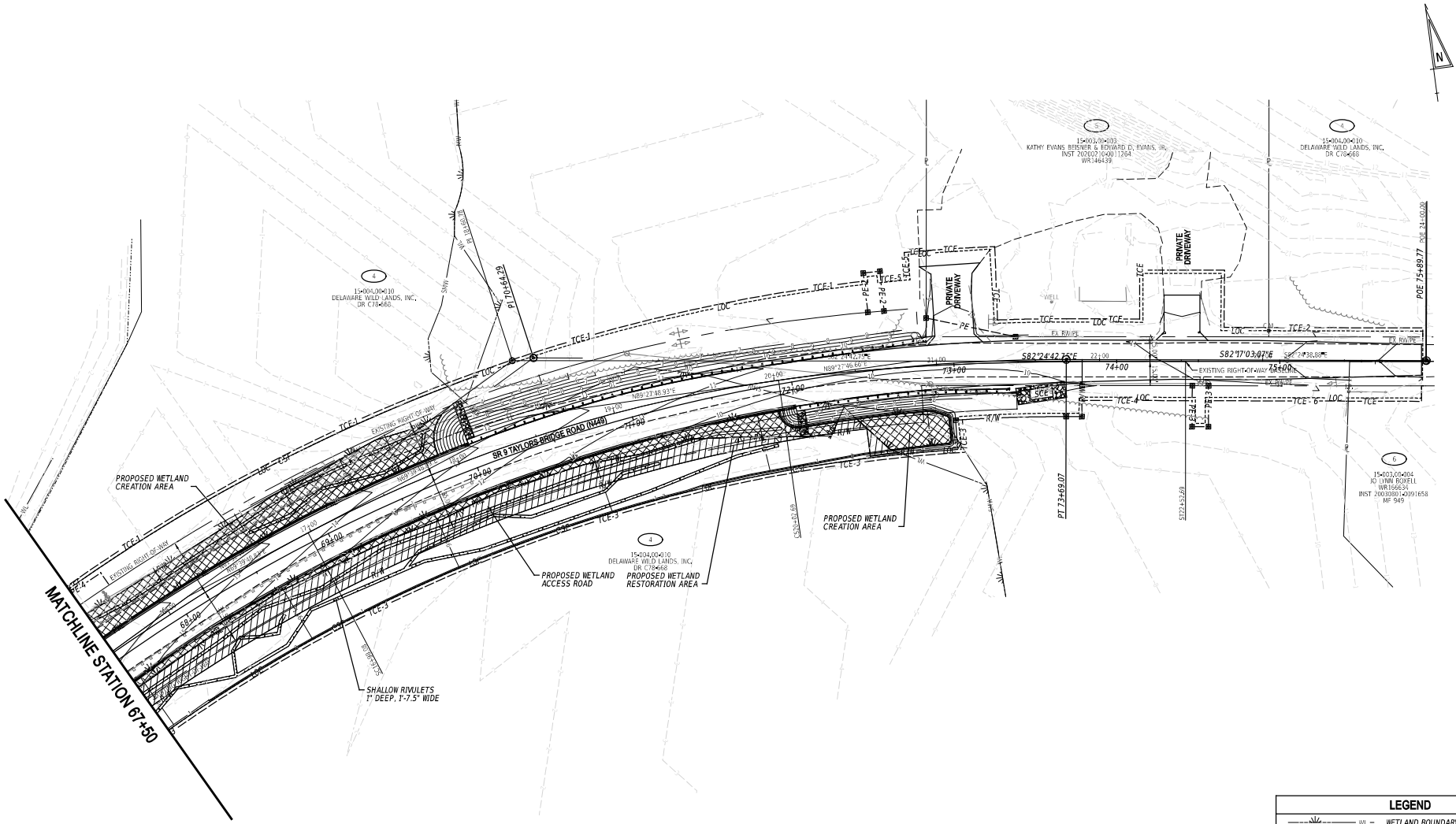


LEGEND

- WL – WETLAND BOUNDARY
- LOC – LIMIT OF CONSTRUCTION
- PWL – PROPOSED WETLAND BOUNDARY
- SMW – STATE MAPPED WETLAND

ADDENDA / REVISIONS	SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT	BRIDGE NO. 1-447	WETLAND MITIGATION SITE GRADING PLAN	WM-02
	0 30 60 90 FEET		T201907102	DESIGNED BY: E. HARASTY		SECTION PAI
			COUNTY NEW CASTLE	CHECKED BY: J. THOMAS		SHEET NO. 62

Pennoni



LEGEND	
WL	WETLAND BOUNDARY
LOC	LIMIT OF CONSTRUCTION
PWL	PROPOSED WETLAND BOUNDARY
SMW	STATE MAPPED WETLAND

ADDENDA / REVISIONS	

SCALE
0 30 60 90
FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	J. THOMAS

WETLAND MITIGATION SITE GRADING PLAN

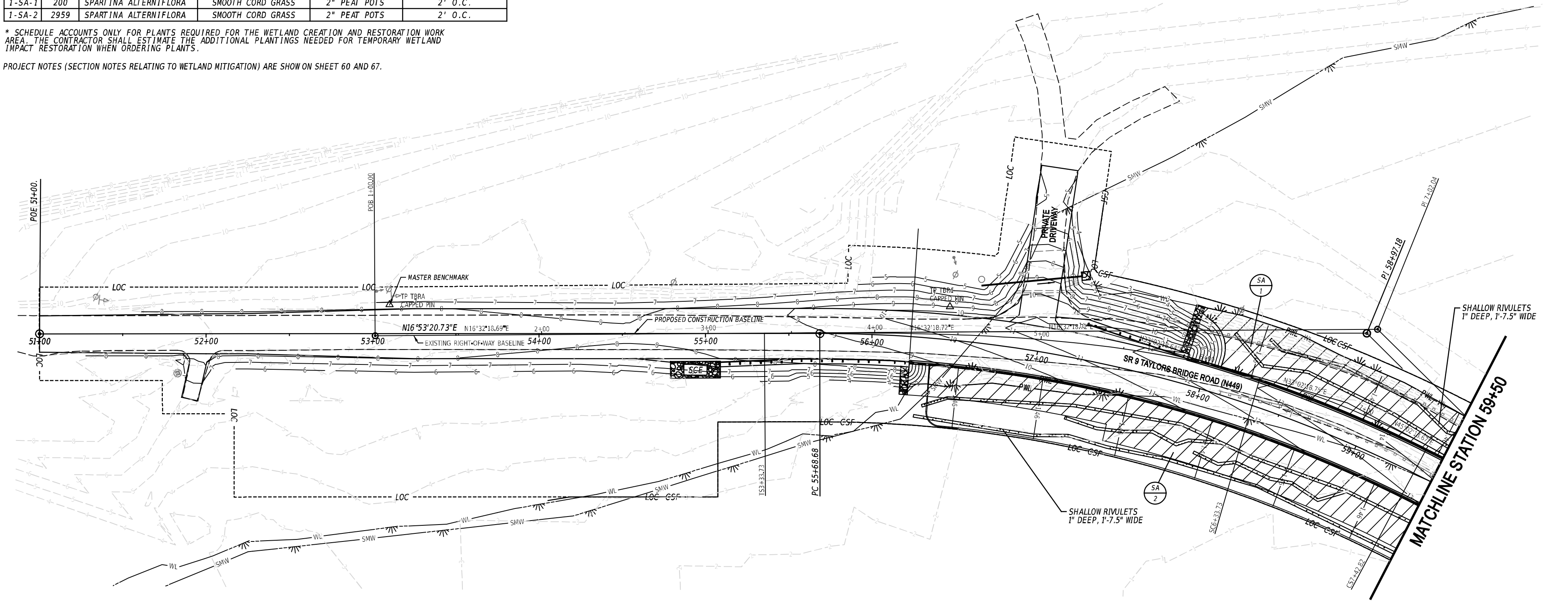
	WM-03
SECTION	PAI
SHEET NO.	63

HORIZONTAL / VERTICAL CONTROL DATA					
POINT NO.	STATION	OFFSET	NORTHING	EASTING	ELEV.
TBR1	56+45.05	-19.79	511209.5124	603945.1504	5.50
TBRA	53+10.23	-17.49	510887.8627	603845.9937	6.76

PLANT SCHEDULE					
KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
1-SA-1	200	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
1-SA-2	2959	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.

PROJECT NOTES (SECTION NOTES RELATING TO WETLAND MITIGATION) ARE SHOW ON SHEET 60 AND 67.



LEGEND	
WL	WETLAND BOUNDARY
LOC	LIMIT OF CONSTRUCTION
PWL	PROPOSED WETLAND BOUNDARY
SMW	STATE MAPPED WETLAND
XXX / XXX	PLANTING IDENTIFIER / PLANTING ID NUMBER

SA = SPARTINA ALTERNIFLORA

ADDENDA / REVISIONS

SCALE 0 30 60 90 FEET

BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	J. THOMAS

WETLAND MITIGATION SITE LANDSCAPING PLANS

WM-01

SECTION PAI

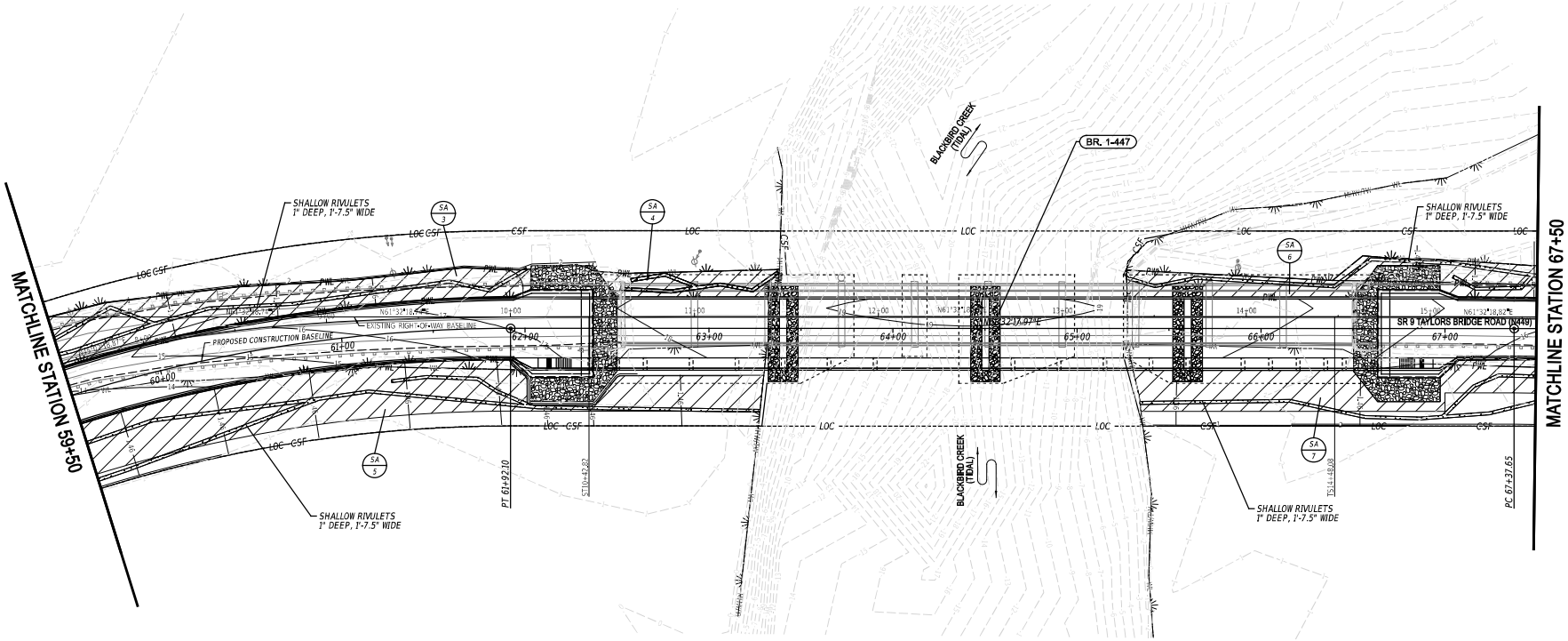
SHEET NO. 64

Pennoni

PENNONI ASSOCIATES INC. / FILE NAME: $FILEA$ / MICROSTATION VERSION: $VERSION$ / MICROSTATION WORKSPACE: $WORKSPACE$ / PEN TABLE: $PENTBL$$ / PLOT DRIVER: $PLTDRV$$ / DATE PLOTTED: $DATE$ @ $TIME$ / USER NAME: $USER$ / OFFICE LOCATION: $OFFICENAME$

PLANT SCHEDULE					
KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
2-SA-3	1270	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-4	315	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-5	2187	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-6	674	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
2-SA-7	954	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.

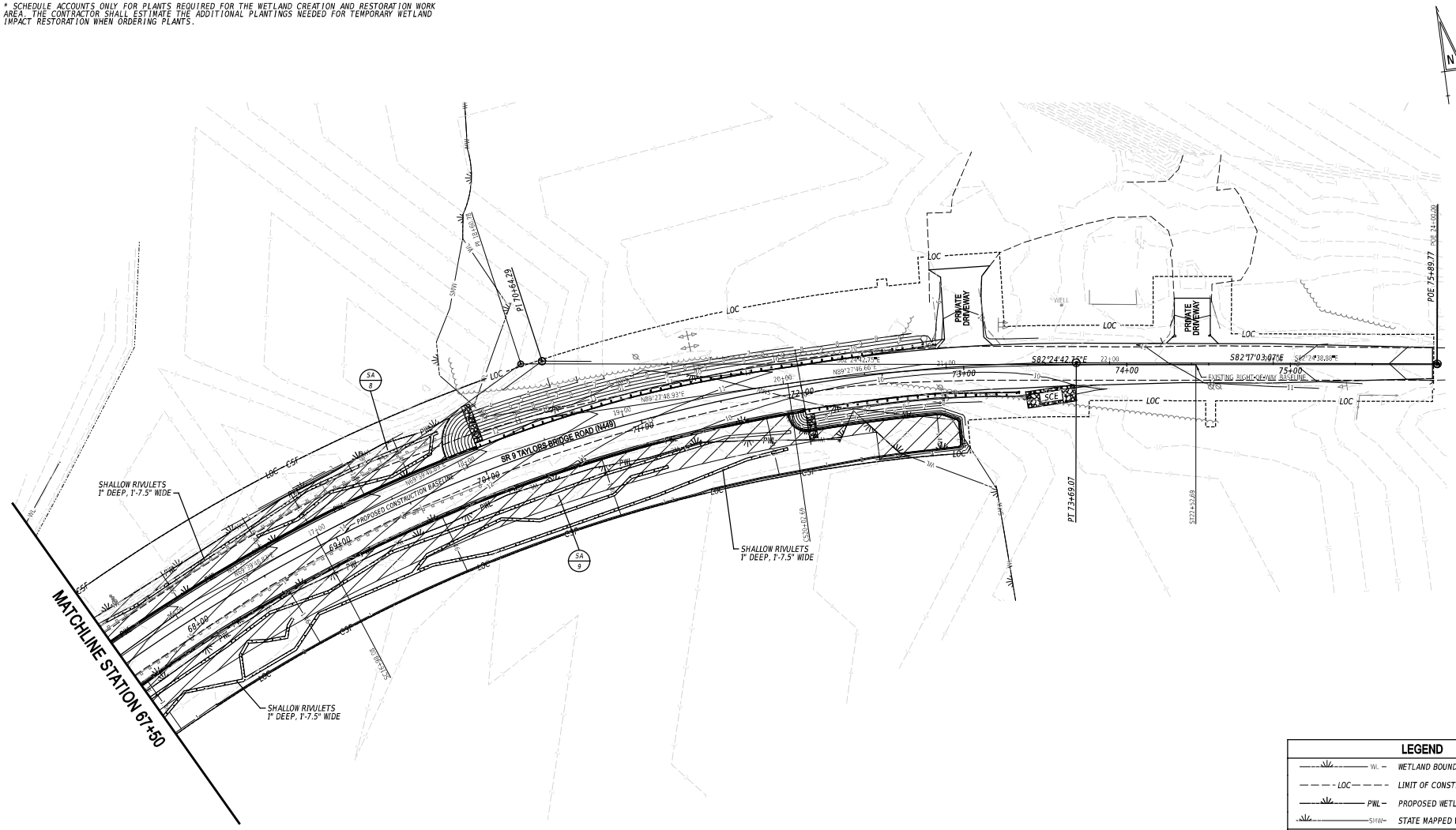


LEGEND	
WL	WETLAND BOUNDARY
LOC	LIMIT OF CONSTRUCTION
PWL	PROPOSED WETLAND BOUNDARY
SMW	STATE MAPPED WETLAND
XXX / XXX	PLANTING IDENTIFIER / PLANTING ID NUMBER
SA = SPARTINA ALTERNIFLORA	

ADDENDA / REVISIONS		SCALE	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT	BRIDGE NO. 1-447	WETLAND MITIGATION SITE LANDSCAPING PLANS	WM-02
		0 30 60 90 FEET		T201907102	DESIGNED BY: E. HARASTY		SECTION
				COUNTY	CHECKED BY: J. THOMAS		PAI
				NEW CASTLE			SHEET NO. 65

PLANT SCHEDULE					
KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
3-SA-8	1160	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.
3-SA-9	2410	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.

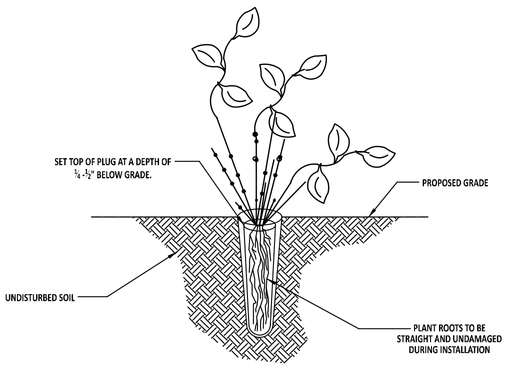


LEGEND	
WL	WETLAND BOUNDARY
LOC	LIMIT OF CONSTRUCTION
PWL	PROPOSED WETLAND BOUNDARY
SMW	STATE MAPPED WETLAND
XXX / XXX	PLANTING IDENTIFIER / PLANTING ID NUMBER
SA = SPARTINA ALTERNIFLORA	

ADDENDA / REVISIONS		SCALE 0 30 60 90 FEET	BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK	CONTRACT T201907102	BRIDGE NO. 1-447	WETLAND MITIGATION SITE LANDSCAPING PLANS	WM-03
				COUNTY NEW CASTLE	DESIGNED BY: E. HARASTY		SECTION PAI
					CHECKED BY: J. THOMAS		SHEET NO. 66

PLANT SCHEDULE					
KEY	QTY	BOTANICAL NAME	COMMON NAME	INITIAL SIZE	NOTES
SA	12,129*	SPARTINA ALTERNIFLORA	SMOOTH CORD GRASS	2" PEAT POTS	2' O.C.

* SCHEDULE ACCOUNTS ONLY FOR PLANTS REQUIRED FOR THE WETLAND CREATION AND RESTORATION WORK AREA. THE CONTRACTOR SHALL ESTIMATE THE ADDITIONAL PLANTINGS NEEDED FOR TEMPORARY WETLAND IMPACT RESTORATION WHEN ORDERING PLANTS.



SECTION VIEW

NOTES:

1). PLANT USING A DIBBLE BAR, STEEL STAKE OR SIMILAR APPROVED PLANTING DEVICE.
2). PLANTING PIT SHALL BE SLIGHTLY LARGER THAN THE PLANT ROOT MASS.
3). DO NOT DAMAGE LEAVES, ROOTS OR STAKES DURING CONSTRUCTION.
4). PLANT AQUATIC PLUGS IN GROUPS OF 50 PLANTS MIN, PER SPECIES.

AQUATIC PLANTING DETAIL - 2" PLUG
NOT TO SCALE

GENERAL PLANTING NOTES

1. THE PEAT-POTTED STOCK SHALL HAVE BEEN GROWN IN 2-INCH SIDED PEAT POTS LONG ENOUGH AND UNDER PROPER CONDITIONS FOR THE ROOT SYSTEM TO BE SUFFICIENTLY WELL DEVELOPED THROUGH THE SIDES AND BOTTOM OF THE POT TO A PREVENT EASY REMOVAL OF THE PLANT FROM THE POT. PLANTS THAT CAN BE REMOVED FROM THE POTS BY HOLDING THE STEM GROWTH AND GENTLY PULLING ON THE POTS SHALL BE REJECTED WITHOUT COMPENSATION. EACH PEAT POT SHALL CONTAIN A MINIMUM TWO STEMS PER POT, NOT LESS THAN 40MM TALL.
2. FROM THE TIME THE SPARTINA LEAVES THE NURSEY UNTIL IT IS INSTALLED AND NORMAL HYDROLOGIC REGIME (I.E., UNRESTRICTED TIDAL FLOW OF NORMAL WATER LEVELS) IS ESTABLISHED, ALL STOCK SHALL BE WATERED WITH FRESH WATER. SALINE OR BRACKISH WATER SHALL NOT BE USED FOR WATERING.
3. THE PLANTING WINDOWS FOR SPARTINA ALTERNIFLORA ARE APRIL 1ST TO MAY 15TH AND SEPTEMBER 1ST TO OCTOBER 15TH. A SPRING PLANTING IS PREFERRED.
4. FOR EACH SPARTINA PLUG, PLACE TWO 21-GRAM AGRIFROM 20-10-5 SLOW RELEASE TABLETS (OR APPROVED EQUAL) AT THE BOTTOM OF THE PLANTING HOLE.
5. MAINTENANCE WATERING IS NOT REQUIRED FOR THE SPARTINA AFTER INSTALLATION.

PENNONI ASSOCIATES INC. | PEN TABLE: $PENTBLS$
FILE NAME: $FILEA$ | PLOT DRIVER: $PLTDRVS$
MICROSTATION VERSION: $VERSION$ | DATE PLOTTED: 17-MAY-2024 @ 15:56
MICROSTATION WORKSPACE: $WORKSPACE$ | USER NAME: $USER$ OFFICE LOCATION: $OFFICENAME$

Pennoni

ADDENDA / REVISIONS							
		NOT TO SCALE	**BR 1-447 ON N449 TAYLORS BRIDGE ROAD OVER BLACKBIRD CREEK**	CONTRACT	BRIDGE NO. **1-447**	**WETLAND MITIGATION PLANTING DETAILS**	SECTION
				T201907102			PAI
				COUNTY	DESIGNED BY: E. HARASTY		SHEET NO.
				NEW CASTLE	CHECKED BY: J. THOMAS		67

Appendix E

Tide Data and Bio Benchmark Data

MEMORANDUM

700 E Pratt Street
Baltimore, MD 21202
Phone 410.728.2900
www.rkk.com

Date: February 21, 2023

To: Van Adams– DelDOT

From: Christina Simini – RK&K

CC: Ken Dunne – DelDOT
Justin Reel – RK&K

Re: BR 1-447 on Taylors Bridge Road Tidal Inundation

Rummel Klepper & Kahl (RK&K) calculated tidal inundation elevations on behalf of Delaware Department of Transportation (DelDOT) at the BR 1-447 on Taylors Bridge Road in Townsend, Delaware. Raw tidal data from January 1st, 2019, to May 17th, 2021, was obtained from the Delaware National Estuarine Research Reserve (DNERR) tidal gage at the bridge. Tidal data was not available for some time periods within this range due to the removal of the gage, therefore those time periods were removed from the analysis.

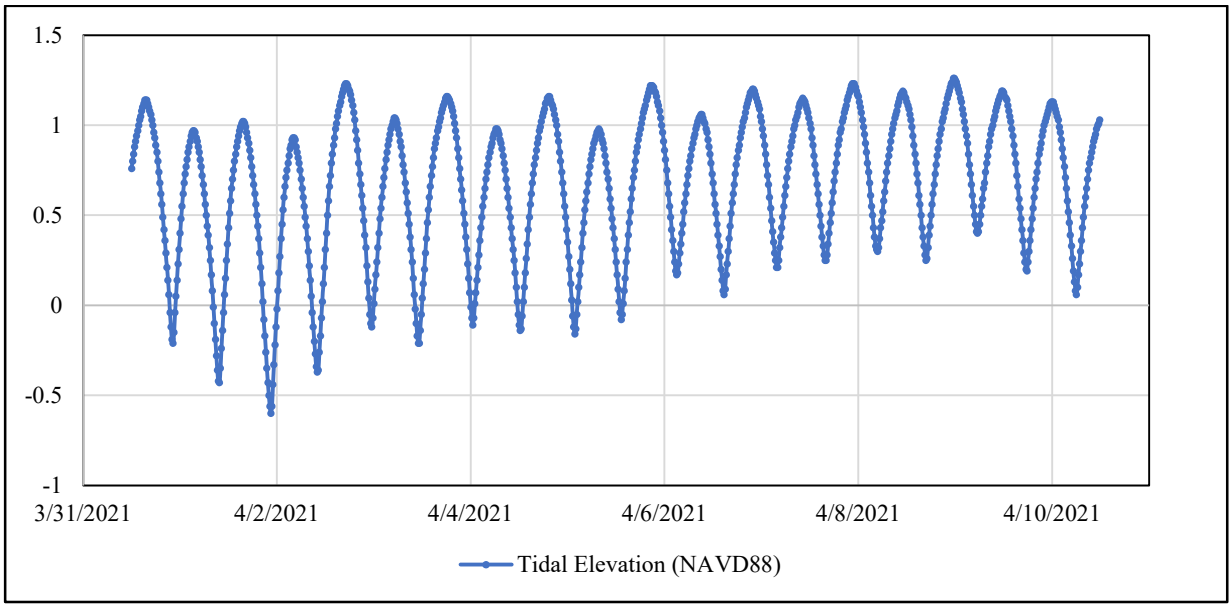
The maximum range of tide elevations was determined by graphing the raw tidal data and calculating maximum and minimum values which resulted in a range of approximately -0.90 to 1.70 NAVD88 feet. RK&K examined the length of inundation time at various positive tide elevations. The average daily inundation in hours was calculated at these elevations by determining the total time a specific elevation was inundated and dividing this total by the total number of days in the dataset (approximately 548 days). Elevations that were inundated for approximately 3.5 to 10.5 hours per day are presented in **Table 1** below.

Table 1 – Average Daily Inundation

	Gage height, NAVD88					
	0.90	0.95	1.00	1.05	1.10	1.15
Average Daily Inundation (hr)	10.67	9.39	7.97	6.42	4.85	3.43

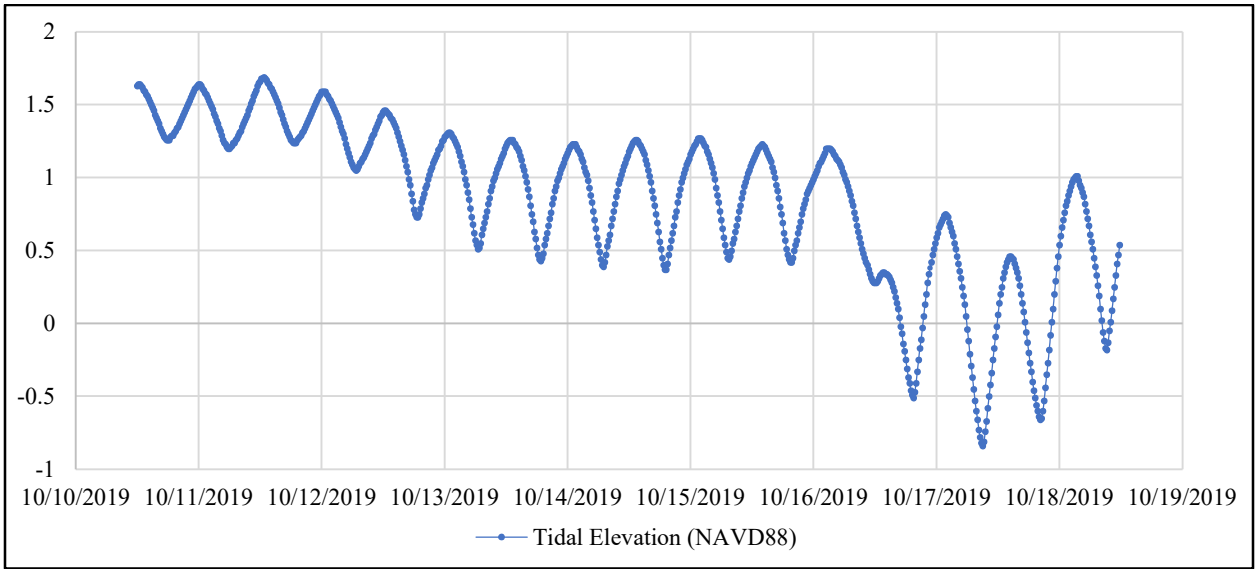
The elevation difference between the average inundation values is narrower than anticipated which may be a result of the tidal pattern at the site. An example of the typical tidal data is displayed in **Figure 1**.

Figure 1 – Example Tidal Values (10 days)



The tide patterns at this location are irregular since the site does not experience a typical slack low tide period. The high tide elevation and full tidal range is frequently erratic throughout the data record. **Figure 2** shows an example of irregularities that occur throughout the data.

Figure 2 – Irregular Tidal Data (9 days)



The tide irregularity at this location is likely caused by the narrow channel servicing a large drainage area located relatively far away from the larger tidal waterbody (the Delaware Bay). The use of bio-benchmark elevation data in addition to tidal data is recommended to determine target tidal restoration elevations at this location due to the tidal pattern irregularity.

Bio Benchmark

ID	Elevation	Notes
A1	1.2275	Boundary of phrag and spartina. 50/50. not ideal. Near road
A2	1.102	no phrag, good spartina. Good woody herbaceous plants. Clusters and channels. Spartina growing on clusters
A3	0.5591	mud flat, no vegetation in between spartina clusters
A4	1.1798	good thick spartina. Ideal elevation. Some woody herbaceous plants
A5	1.2764	dense spartina on clusters in non vegetative drain channels. Good elevation
A6	1.2952	new spartina growth, not much old growth, not bad. No old most likely due to muskrats
A7	1.402	ok elevation, not as dense, 50% coverage
A8	1.3027	taller vegetation/dense. Few herbaceous woodies. Good
A9	1.5258	vegetation break between spartina and sedges and taller grasses (native phrag?? Switch grass??) not phrag
A10	1.2716	in middle of tall grasses. No channels through clumps. Same elevation. Mostly taller grasses (native phrag?? Switch grass) not phrag)
A11	1.4396	Approx 5 feet from water channel. Dense tall grass (native phrag, switch grass??) sparse sedges throughout.
A12	1.3282	new veg growth due to muskrat. Spartina. Channels all around. Few woody herbaceous plants
A13	1.1503	getting close to edge of spartina and phrag. Phrag is sparse but starting to get more dense as you get closer to road.
A14	-0.3719	bottom of channel. No veg. surface water
A15	1.6008	start of phrag. Spotting more phrag. Bad
A16	1.6213	middle of phrag near road. Bad. Nothing above this elevation.
A17	1.6345	middle of phrag. Bad
A18	1.9	edge of road. Start of phrag. Trash. Juniper or cedar trash tree in area. No bueno

B1	2.809	edge of road. Not wetland. Road fill. Junk

B2	1.3234	bottom of road slope. Upland transition to wetland. Phrag stand, little bit of drainage ditch
B3	1.2652	transition to dense phrag. Channels not holding water
B4	1.4456	short sparse phrag. New phrag growth. Some spartina
B5	1.2646	moderate spartina. 30% woody herbaceous, 30% phrag, 40% spartina. Clusters of vegetation and channels with water
B6	1.4325	woody herbaceous 50% spartina 50%. Veg on clusters with channels
B7	1.3585	dense spartina on clusters. More water retention. Little bit of woody herb. Good
B8	1.3119	dense spartina clusters with channels throughout. Good
B9	1.3585	muskrat hut destroyed old spartina growth. New spartina veg. Good.
B10	0.4709	bottom of channel between cluster.
B11	1.1214	transition spartina to tall grass, not phrag (native phrag? Switch grass)
B12	1.1726	sparse tall grass. Some new growth of tall grass. 50 % mud flat. Near channel. Similar to A channel (A11)
B13	0.9745	edge of channel. Sparse tall grass. Lots of mud. "Soupy as fuck"- TM
B14	0.9114	very sparse veg. Little spartina. Low point in marsh. Veg covered in mud but not a mud flat
B15	1.2412	dense spartina on clusters. Good.
B16	1.1422	transition from spartina to phrag. About 25ft to channel
B17	1.535	moderate small phrag. Spartina near
B18	1.3977	woody herb plan with seed bulb. Trans from phrag to spartina.

C1	2.6403	bottom of slope, transition into phrag
C2	1.3286	middle of phrag stand next to road. Bad
C3	1.2788	transition from phrag to spartina. Not idea
C4	1.3601	ok spartina. Few small phrag. Just ok.
C5	1.3981	dense spartina on clusters. Good channeling. Not bad
C6	1.4381	good spartina
C7	0.3313	bottom of channel
C8	1.3519	muskrat hut, old spartina destroyed. Good new growth
C9	1.1601	dense spartina with new growth on clusters with channels surrounding. Good

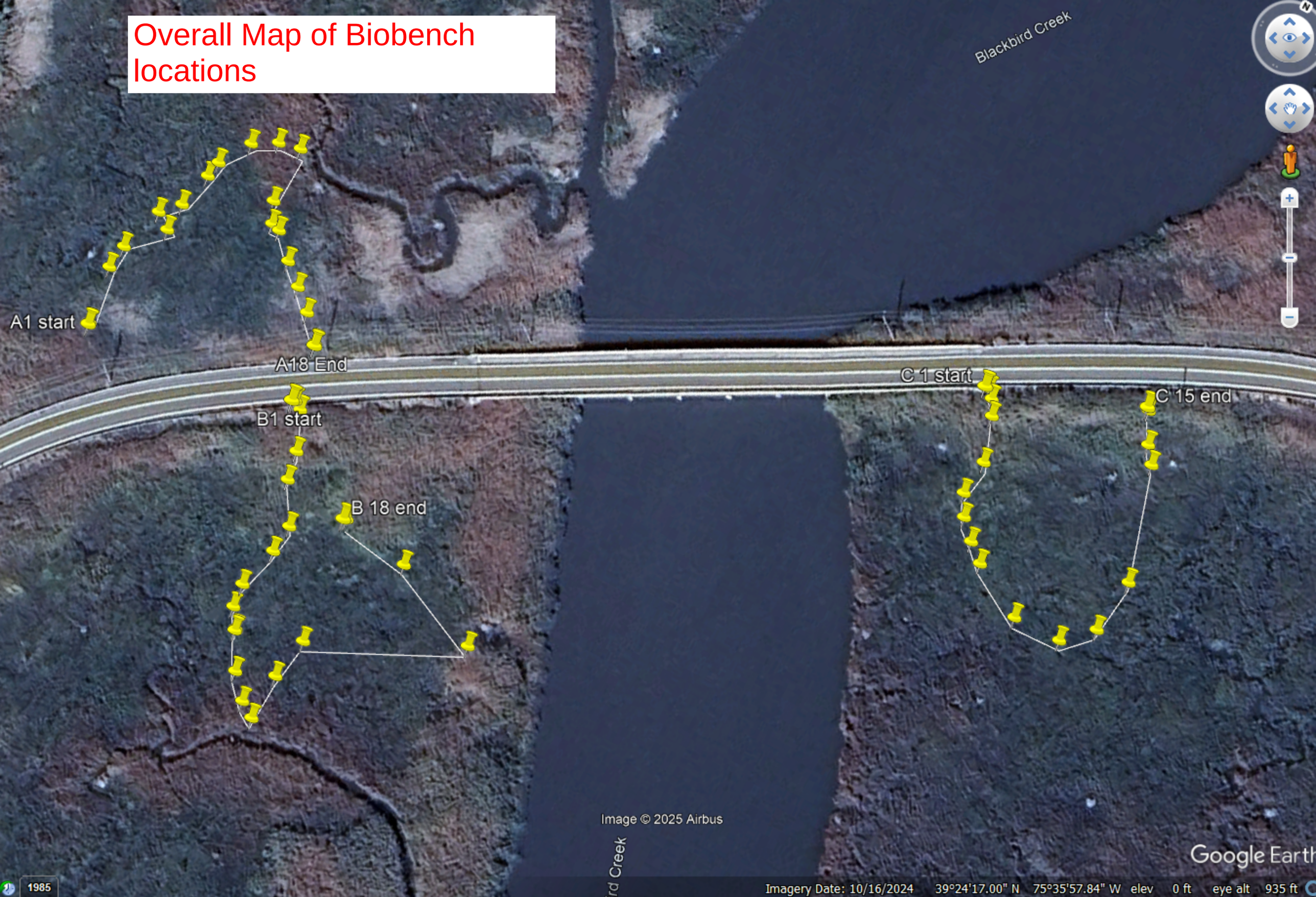
C10	1.053	good dense spartina
C11	1.1401	good dense spartina
C12	1.2003	good dense spartina. Little woody herbaceous plants
C13	1.4376	woody herbaceous and spartina transitioning to phrag
C14	1.3248	spartina, small phrag. 25% phrag 75% spartina. Transitioning from spartina to phrag
C15	1.2245	transition to medium size phrag 50% phrag, 50% spartina. Not good.

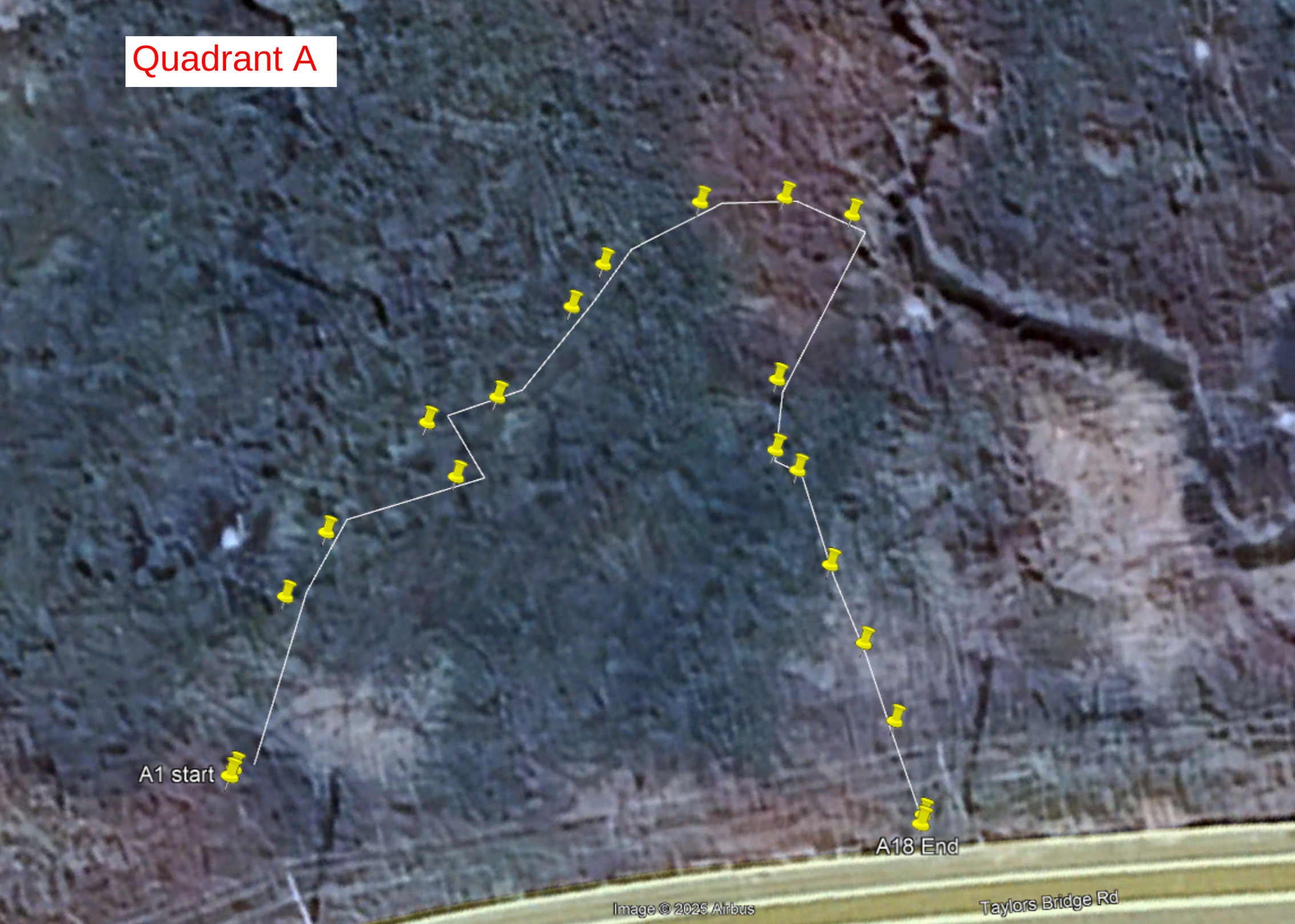
general notes

In the good spartina zones, spartina would grow in clumps with water drain channels surrounding. Woody herbaceous plants typically grew near the transition zones
April 11, 2023 8:30am-11am
sunny, 60, warming up, slight breeze
tall grass referenced in notes is Spartina Cynosuroides
woody herbaceous plants are Marsh Hybiscus (bulbs) and _____
C side was great. Less phrag. Dense spartina
phrag was seen when it didn't have clusters and was just near road. Phrag introduced when road was made it seems?? Good spartina seen from 1.053 to 1.4381?
Biggest thing was drainage and spartina on clumps for it to be best.

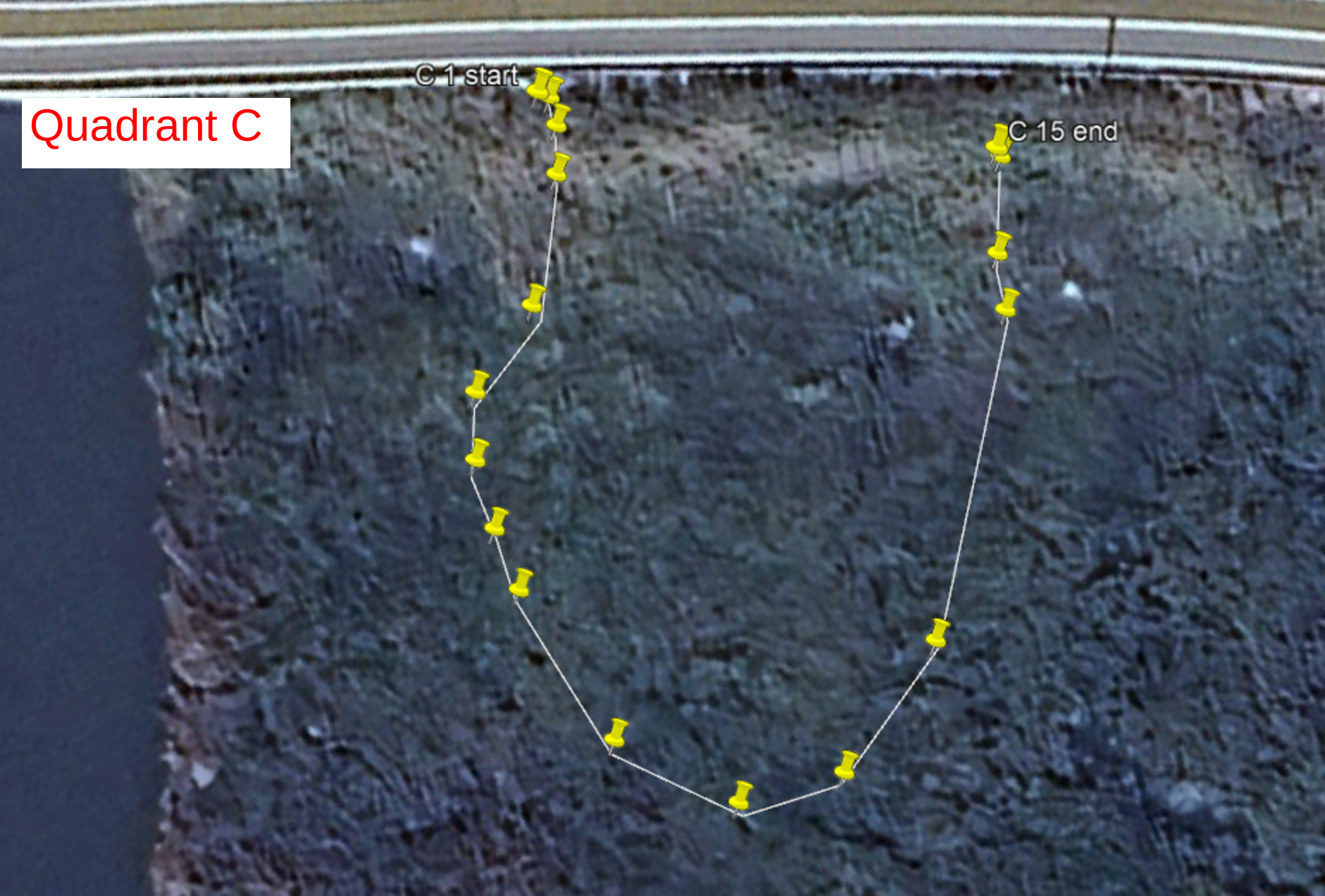
Benchmark	**6.5166**	58,510887.8630,603845.9854,6.5166,BNCH MRK MST,

Overall Map of Biobench locations




Quadrant A
A1 start
A18 End
Image © 2025 Airbus
Taylors Bridge Rd


Quadrant B
B1 start
B 18 end


Quadrant C
C 1 start
C 15 end

Appendix F

Deed Restriction Example

70 2015 00269440

Kent County
Betty Lou McKenna
Recorder of Deeds
Dover, DE 19901

Instrument Number: 2015-269440

Recorded On: February 04, 2015 **As-Miscellaneous Without Notation**

Parties: ST-DEPARTMENT OF TRANSPORTATION

To ST-DEPARTMENT OF TRANSPORTATION **# of Pages: 6**

Comment:

DO NOT REMOVE-THIS PAGE IS PART OF THE RECORDED DOCUMENT

Miscellaneous Without Notatior		81.00
# of Pages	5	
	0	
Total:		**81.00**

I hereby certify that the within and foregoing was recorded in the Recorder's Office in Kent County,

DO NOT REMOVE-THIS PAGE IS PART OF THE RECORDED DOCUMENT

File Information:

Document Number: 2015-269440
Receipt Number: 340753
Recorded Date/Time: February 04, 2015 11:38:50A
Book-Vol/Pg: BK-RE VL-7510 PG-32
User / Station: C Yerkes - Cashier 4

Record and Return To:

DEPARTMENT OF TRANSPORTATION
250 BEAR-CHRISTIANA ROAD
BEAR DE 19701

Betty Lou McKenna

Recorder for Kent County
Doc# 269449
On Feb 04,2015 at 11:38A

5
$ 81

Tax Map No. 2-05-068.00-01-06.01-000
Prepared by: DelDOT Environmental Studies
P.O. Box 778
Dover, DE 19903

DECLARATION OF RESTRICTIONS

THIS DECLARATION OF RESTRICTIONS (hereinafter "**Declaration**"), made as of this 7th day of January, 2015, by State of Delaware, acting by and through the Department of Transportation (hereinafter "**Declarant**");

WHEREAS, Declarant is the fee simple owner of a certain tract of land totaling 92.29 acres located in Kent County, Delaware, of record in the Office of the Recorder of Deeds, in and for Kent County and State of Delaware in Deed Record Q, Volume 49, Page 224, and identified as Kent County Tax Parcel No. 2-05-068.00-01-06.01-000, more particularly shown on Exhibit A which is attached hereto and incorporated herein by reference (hereinafter the "**Property**"); and

WHEREAS, the Property contains a 6.69-acre parcel of land heretofore known as the "**Conservation Area**" lying on the westerly side of the property near its border with SR 1 which shall be subject to this Declaration of Restrictions also shown on Exhibit A and labeled Compensatory Wetland Mitigation Site; and

- The purpose of this Declaration shall be to preserve and maintain the environmental values of the wetlands and uplands within the 6.69 acre Conservation Area in perpetuity as mitigation compensation for construction project T200412201, SR 1 Thompsonville Grade Separated Intersection.

NOW, THEREFORE, Declarant declares that the Conservation Area shall be held in perpetuity and not be sold, subdivided, transferred, leased, occupied and shall be used subject to the covenants, restrictions, conditions, charges, assessments, and obligations hereinafter set forth in this Declaration.

WHEREAS, the United States Department of the Army, Corps of Engineers, Philadelphia District (hereinafter "**USACOE**") has required the Declarant to enter into this Declaration of Restrictions as a condition of Department of the Army Permit Number **CENAP-OP-R-2014-551-23**; and

WHEREAS, said Conservation Area contains existing wetlands worthy of conservation protection, and

WHEREAS, the Declarant intends that the Conservation Area shall be preserved and maintained in its current natural condition in perpetuity;

NOW, THEREFORE, in consideration of the above items, conditions, and restrictions contained herein, and pursuant to the laws of the State of Delaware, Declarant does impose upon the Conservation Area the following restrictions:

1. PURPOSE

It is the purpose of this Declaration to assure that the above terms, conditions, and air space and subsurface, will be retained in perpetuity in its created condition as provided herein and to prevent any use of the Conservation Area that will impair or interfere with its natural resource functions and values. Declarant intends that this Declaration will confine the use of the Conservation Area to such activities as are consistent with the purpose of the Declaration.

2. DURATION

This Declaration shall remain in effect in perpetuity, shall run with the land regardless ownership or use, and is binding upon all subsequent declarants, their heirs, executors, administrators, successors, representatives, devisees, and assigns, as the case may be, as long as said party shall have any interest in any part of the Conservation Area.

3. RESTRICTIONS

Any activity on or use of the Conservation Area inconsistent with the purpose of the Declaration is prohibited. Without limiting the generality of the forgoing, the following activities and uses are expressly prohibited in, on, over, or under the Conservation Area, subject to the express terms and conditions below:

A. No signs, billboards or outdoor advertising structures shall be placed or maintained on the Conservation Area; except for a reasonable number of signs for resource protection safety, boundary identification, and identification of the owner.

B. No improvements, including, but not limited to, buildings, asphalt or concrete pavement, communications towers or antennas, utility lines or conduit, or any other temporary or permanent structure of facility shall be constructed, placed, repaired, reconstructed, or maintained on, under or above the Conservation Area.

C. No storage, dumping, depositing, abandoning, discharging or releasing of any gaseous, liquid, solid or hazardous waste substance, materials or debris of whatever nature on, in, over or under the ground or into surface or ground water shall occur.

D. No loam, peat, gravel, soil, rock, sand or dredged and/or fill materials shall be placed, moved, or discharged within the Conservation Area, nor shall there be made any changes in the topography of the land.

E. There shall be no land clearing, redirection of surface water or groundwater, ditching, extraction, drilling, driving of piles, mining, excavation or removal of loam, peat, gravel, soil, rock, sand, mineral or similar material, nor any change in the topography of the land.

F. There shall be no alteration, removal or destruction of plants, trees, shrubs, wildflowers or other vegetation living or dead except for control of diseases, pests, non-native species, and noxious weeds. Vegetation within the Conservation Area shall be allowed to grow and regrow to maturity and to remain in such state in perpetuity.

G. Intentional introduction of non-native, non-indigenous plant and animal species is prohibited.

H. There shall be no use of pesticides, herbicides, insecticides or other chemicals, except as may be necessary to control invasive species that threaten the natural character of the Conservation Area.

I. No other acts, uses or discharges shall be allowed which adversely affect fish or wildlife habitat or the preservation of land, wetlands, or water areas within the Conservation Area.

4. RESERVED RIGHTS – INTENTIONALLY OMITTED

5. LIMITATION ON PUBLIC ACCESS

This Declaration limits the right of the general public to enter any portion of the Conservation Area if such use and activity is inconsistent with the purpose of this Declaration.

6. COMPLIANCE INSPECTIONS

This Declaration grants to the USACOE and its authorized agents the right to enter upon and inspect the Conservation Area for the purpose of verifying compliance with these restrictive covenants.

7. ENFORCEMENT

Without limiting the legal rights of any other party that may seek enforcement of these restrictive covenants, this Declaration grants to the USACOE and the United States Department of Justice a discretionary right to enforce these restrictive covenants in a judicial action against any person or entity violating or attempting to violate these restrictive covenants; provided, however, that no violation shall result in a forfeiture or reversion of title.

8. RECORDING

This Declaration shall be recorded in the Office of the Recorder of Deeds in and for Kent County, State of Delaware.

9. TRANSFER OF DECLARANT'S INTEREST

Declarant agrees to incorporate this Declaration by reference into any deed or other legal instrument by which Declarant divests itself of any interest in all or a portion of the Property, including, without limitation, a leasehold interest.

10. INTERPRETATION OF DECLARATION

This Declaration shall be liberally construed in favor of the purpose of the Declaration and in accordance with the laws of the State of Delaware.

11. SEVERABILITY

If any portion of this Declaration, or the application thereof to any person or circumstance, is found to be invalid, the remainder of the provisions of this Declaration, or application of such provisions to persons or circumstances other than those as to which it is found to be invalid, as the case may be, shall not be affected thereby.

IN WITNESS WHEREOF, the said State of Delaware, by and through the Department of Transportation, has caused its name by Shailen P. Bhatt, Secretary, to be hereunto set, duly attested by its Acting Director of Technology and Support Services, the day and year aforesaid mentioned.

STATE OF DELAWARE

By: _____(SEAL)
Shailen P. Bhatt, Secretary
Department of Transportation

Attest: _____(SEAL)
Jennifer L. Cohan
Acting Dir. of Technology & Support Services

STATE OF DELAWARE :
: SS.
COUNTY OF KENT :

BE IT REMEMBERED, that on this 7th day of January, 2015, personally came before me, the Subscriber, a Notary Public for the State and County aforesaid, Shailen P. Bhatt, Secretary of the Department of Transportation of the State of Delaware, known to me personally to be such, and acknowledged this Declaration of Restrictions to be his act and deed, and the act and deed of the State of Delaware; that his signature thereto is in his own handwriting, and that the seal affixed thereto is the Seal of the Department of Transportation; and that his act of acknowledging, signing, sealing and delivering this Declaration of Restrictions was duly authorized by the Department of Transportation, pursuant to the authority contained in the Delaware Code, as amended.

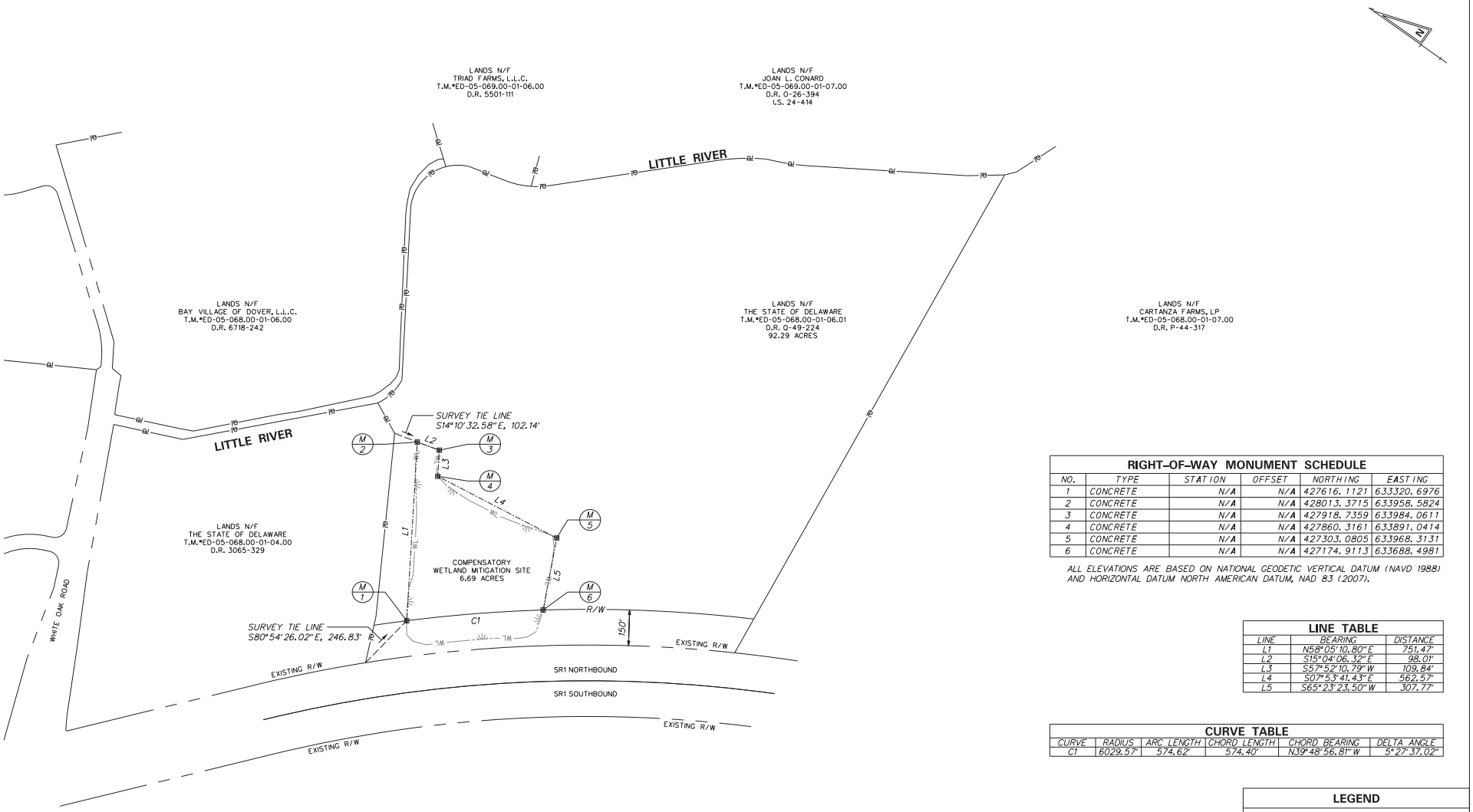
GIVEN under my Hand and Seal of Office, the day and year first above written.

_____
Notary Public Signature

TERESA A. QUEEN
NOTARY PUBLIC, STATE OF DELAWARE
My Commission Expires April 26, 2017

Teresa A. Queen
Notary Name – Printed or Typed

My Commission Expires: April 26, 2017



RIGHT-OF-WAY MONUMENT SCHEDULE

NO.	TYPE	STATION	OFFSET	NORTHING	EASTING
1	CONCRETE	N/A	N/A	427616.1121	633320.6976
2	CONCRETE	N/A	N/A	428013.3715	633958.5824
3	CONCRETE	N/A	N/A	427918.7359	633984.0611
4	CONCRETE	N/A	N/A	427860.3161	633891.0414
5	CONCRETE	N/A	N/A	427303.0805	633968.3131
6	CONCRETE	N/A	N/A	427174.9113	633688.4981

ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM (NAVD 1988) AND HORIZONTAL DATUM NORTH AMERICAN DATUM, NAD 83 (2007).

LINE TABLE

LINE	BEARING	DISTANCE
L1	N58°05'10.80"E	751.47'
L2	S15°04'06.32"E	98.01'
L3	S57°52'10.79"W	109.84'
L4	S07°53'41.43"E	562.57'
L5	S65°23'23.50"W	307.77'

CURVE TABLE

CURVE	RADIUS	ARC LENGTH	CHORD LENGTH	CHORD BEARING	DELTA ANGLE
C1	6029.57'	574.62'	574.40'	N39°48'56.81"W	5°27'37.02"

LEGEND

- EXISTING PROPERTY LINE
- EXISTING RIGHT OF WAY
- PROPOSED RIGHT OF WAY
- EXISTING BOUNDARY OF FORESTED AND EMERGENT WETLANDS
- BOUNDARY OF COMPENSATORY MITIGATION SITE

DELAWARE
DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE
0 200 400 600
FEET

CARTANZA SITE – DELAWARE DEPARTMENT OF TRANSPORTATION, LOCATION OF COMPENSATORY MITIGATION SITE
TAX PARCEL #ED-05-068.00-01-06.01
KENT COUNTY, DELAWARE

CONTRACT	N/A
COUNTY	KENT
BRIDGE NO.	–
DESIGNED BY:	
CHECKED BY:	

EXHIBIT A

SHEET NO.	1
TOTAL SHTS.	1

6/19/2014
G:\PROJECTS\115013.00 (DelDOT Agmt 1583 DOTS Open-End\115013.17 (Task 5A, Little Heaven GSI Permit Services)\CADD FILES\Cartanza Site\d02b.dgn
8:01:51 AM

Appendix G

Easement Lines & Ratio Chart

ENVIRONMENTAL COMPLIANCE NOTES

1. GENERAL NOTES:

   A. THE PURPOSE OF THIS SHEET IS TO IDENTIFY THOSE ITEMS ASSOCIATED WITH ENVIRONMENTAL COMPLIANCE. IMPACT CALCULATIONS ARE FOR THE AGENCY PERMIT REPORTING PURPOSES ONLY AND ARE NOT TO BE USED FOR BIDDING PURPOSES.

   B. IF A DEPARTURE FROM THE APPROVED PLANS (WHICH WOULD AFFECT ANY NATURAL AND/OR CULTURAL RESOURCES) IS NECESSARY, CONTACT THE ENVIRONMENTAL STUDIES SECTION AT (302) 760-2264 OR DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV) TO ALLOW FOR COORDINATION WITH THE APPROPRIATE RESOURCE AGENCIES AND APPROVAL.

   C. USE OF THIS SHEET DOES NOT ALLEVIATE THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH ALL CONDITIONS SET FORTH IN THE ENVIRONMENTAL STATEMENT AND PERMITS.

2. NATURAL RESOURCE ISSUES:

   A. PERMIT REQUIREMENTS/APPROVALS *:
   U.S. ARMY CORPS OF ENGINEERS (COE): NATIONWIDE PERMIT NWP 23 WITH PRECONSTRUCTION NOTIFICATION (PCN)
   DNREC - WETLANDS & SUBAQUEOUS LANDS (WLSL): WETLANDS & SUBAQUEOUS LANDS PERMIT
   DNREC - WATER QUALITY (WQC) & COASTAL ZONE CONSISTENCY (CZM): ISSUED NWP 23
   NCC DEPT. OF LAND USE (NCC):
   US COAST GUARD (USCG): N/A

   * THE PERMITS/APPROVALS LISTED ARE THOSE REQUIRED FOR THIS PROJECT. THE ENVIRONMENTAL STUDIES SECTION IS RESPONSIBLE FOR COORDINATING AND/OR OBTAINING THESE APPROVALS.
   ** THE CONTRACTOR MUST ENSURE THAT THESE PERMITS/APPROVALS ARE IN THEIR POSSESSION PRIOR TO BEGINNING CONSTRUCTION IN THE PERMITTED AREA(S) AND ENSURE THEY ARE DISPLAYED ON-SITE DURING THE ENTIRE CONSTRUCTION PERIOD.
   *** USCG Note: PRIOR TO BRIDGE CONSTRUCTION, THE BRIDGE OWNER (DELDOT) SHOULD SUBMIT A BRIDGE MAINTENANCE PROJECT PLAN TO THE USCG OFFICE AT LEAST 30 DAYS (PREFERABLY 90 DAYS) PRIOR TO WORK COMMENCING ON OR OVER THE NAVIGABLE WATERWAY.

   AT NO TIME DURING THE PROJECT WILL THE WATERWAY BE CLOSED TO NAVIGATION WITHOUT THE PRIOR NOTIFICATION AND APPROVAL OF THE COAST GUARD. THE BRIDGE OWNER OR CONTRACTOR IS REQUIRED TO MAINTAIN CLOSE AND REGULAR CONTACT WITH COAST GUARD SECTOR DELAWARE AT D05-SMB-SECDELBAY-WWM@USCG.MIL TO KEEP INFORMED OF ACTIVITIES ON THE WATERWAY.

   B. CONSTRUCTION RESTRICTIONS:
   FISHERIES-BLACKBIRD CREEK PROVIDES SPAWNING HABITAT FOR ANADROMOUS SPECIES INCLUDING BLUEBACK HERRING (ALOSA AESTIVALIS) AND ALEWIFE (ALOSA PSEUDOHARENGUS), COLLECTIVELY REFERRED TO AS "RIVER HERRING," AS WELL AS POTENTIALLY AMERICAN SHAD (ALOSA SAPIDISSIMA). TO PROTECT THESE SPECIES DURING SPAWNING AND MIGRATORY ACTIVITIES, A TIME OF YEAR RESTRICTION OF MARCH 1ST TO JUNE 30TH IS REQUESTED DURING WHICH NO IN-WATER WORK SHOULD BE PERFORMED.

   FISHERIES- USACE NATIONWIDE PERMIT REGIONAL GENERAL CONDITION G-6(8), IN ORDER TO PROTECT DIADROMOUS FISH MIGRATIONS, SPAWNING ACTIVITIES, AND EFH, IN-WATER WORK SHALL BE AVOIDED FROM MARCH 1 TO JUNE 30 IN ALL WATERS. WORK WITHIN COFFERDAMS THAT FULLY ENCLOSE AND DEWATER THE PROJECT AREA CAN PROCEED ANY TIME DURING THE YEAR PROVIDED THE COFFERDAMS ARE INSTALLED OR REMOVED OUTSIDE OF THE SEASONAL WORK RESTRICTION AND DO NOT PRECLUDE THE FREE MOVEMENT OF MIGRATING OR SPAWNING AQUATIC SPECIES TO ENSURE COMPLIANCE WITH NWP GENERAL CONDITION 2 AND 3.

   MIGRATORY BIRDS - BRIDGE 1-447 HAS NOT BEEN SURVEYED FOR THE PRESENCE OF NESTING MIGRATORY BIRDS, WHICH ARE PROTECTED BY TITLE 7, DELAWARE CODE, CHAPTER 7, SECTIONS 734 AND 735. IF WORK IS PROPOSED DURING THE BREEDING SEASON (APRIL 15 – AUGUST 1), A SURVEY SHOULD BE COMPLETED PRIOR TO THE START OF WORK TO DETERMINE IF ONE OR MORE PAIRS OF BARN SWALLOW (HIRUNDO RUSTICA) AND/OR EASTERN PHOEBE (SAYORNIS PHOEBE) NESTS ARE PRESENT UNDER THE BRIDGE. IF A SURVEY DETECTS NESTING ACTIVITY, THE FOLLOWING STEPS SHOULD BE TAKEN TO AVOID NEST DESTRUCTION AND TAKE, WHICH IS A VIOLATION OF STATE LAW:

      1. PERFORM CONSTRUCTION ACTIVITIES FROM AUGUST 1 TO APRIL 15.

      2. IF CONSTRUCTION CANNOT BE PERFORMED IN THIS TIME PERIOD, A DETERRENT SUCH AS MESH NETTING SHOULD BE USED TO BLOCK ACCESS TO NESTING SITES ON THE UNDERSIDE OF THE BRIDGE(S). THE MATERIAL WOULD NEED TO BE IN PLACE NO LATER THAN APRIL 15, THE UNDERSIDE OF THE BRIDGE(S) WOULD NEED TO BE FULLY ENCAPSULATED, AND THE MATERIAL SHOULD BE LEFT IN PLACE UNTIL CONSTRUCTION BEGINS. IF ACTIVE NESTS ARE DISCOVERED DURING THE COURSE OF WORK, ACTIVITIES SHOULD BE HALTED IMMEDIATELY AND SCRP CONTACTED FOR FURTHER GUIDANCE. 6.

   MARSH NESTING BIRDS - THE AREA SURROUNDING THE PROJECT SITE IS MAPPED AS QUALITY MARSH HABITAT, AND IT HAS THE POTENTIAL TO SUPPORT NESTING MARSH BIRDS. DNREC REQUESTS A TIME-OF-YEAR RESTRICTION FOR WORK CONDUCTED IN THE SURROUND MARSH FROM APRIL 1 TO JULY 31 TO PROTECT MARSH NESTING BIRDS AND THEIR YOUNG.

   BLACKBIRD CREEK IS USED BY LARGE NUMBERS OF AMERICAN EEL (ANGUILLA ROSTRATA). DNREC REQUESTS THAT IN-STREAM WORK NOT TAKE PLACE FROM MARCH 1ST TO MAY 15TH TO ALLOW UPSTREAM PASSAGE OF ELVERS (YOUNG EELS).

   NO IN-WATER WORK FROM MARCH 1ST TO JUNE 30TH.

   - FOR NON-TIDAL LOCATIONS, NO WORK CAN BE DONE BELOW THE ORDINARY HIGH WATER (OHW) LINE.

   - FOR TIDAL LOCATIONS, NO WORK CAN BE DONE BELOW THE MEAN HIGH WATER TIDE LINE (MHWL).

   **PLEASE NOTE THAT TIDAL LINES (HTL, MHW, MLW) VARY BASED ON DIFFERENT NATURAL OCCURRENCES, THEREFORE THE LINES SHOWN ON PLANS MAY DIFFER FROM ONSITE CONDITIONS. SHOULD YOU HAVE QUESTIONS ABOUT WHERE THE "MHW" TIDE LINE IS, PLEASE CONTACT THE ENVIRONMENTAL STUDIES OFFICE AT DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV.

   THIS PROJECT WILL REQUIRE A "SOFT START" FOR WHEN DRIVING PILES. IF PILE DRIVING IS OCCURRING DURING A TIME OF YEAR WHEN ESA-LISTED SPECIES MAY BE PRESENT, AND THE ANTICIPATED NOISE IS ABOVE THE BEHAVIORAL NOISE THRESHOLD, A "SOFT START" IS REQUIRED TO ALLOW ANIMALS AN OPPORTUNITY TO LEAVE THE PROJECT VICINITY BEFORE SOUND PRESSURE LEVELS INCREASE.

   - USE A SOFT START EACH DAY OF PILE DRIVING, AFTER A BREAK OF 30 MINUTES OR MORE, AND IF ANY INCREASE IN PILE INSTALLATION OR REMOVAL INTENSITY IS REQUIRED. BUILD UP POWER SLOWLY FROM A LOW ENERGY START-UP OVER A 20-MINUTE PERIOD TO WARN FISH TO LEAVE THE VICINITY. THIS BUILDUP SHALL OCCUR IN UNIFORM STAGES TO PROVIDE A CONSTANT INCREASE IN OUTPUT

3. CULTURAL RESOURCE ISSUES:

   A. SHPO HAS CONCURRED WITH DELDOT'S ARCHAEOLOGICAL INVESTIGATION AND FINDINGS FOR THE PROJECT (09/13/2022).
   B. SHPO HAS CONCURRED WITH DELDOT'S FINDING OF NO HISTORIC PROPERTIES AFFECTED (TO BE ISSUED ON/BY 12/10/2022).

ENVIRONMENTAL COMPLIANCE NOTES (CONT'D)

4. PROTECTION OF RESOURCES:

   A. KEEP CLEARING IN WETLAND AREAS TO A MINIMUM ABSOLUTELY NECESSARY FOR CONSTRUCTION ACCESS. SUPPORT ALL EQUIPMENT TRAVERSING WETLANDS AND SUBAQUEOUS LAND ON MATS. PAYMENT FOR MATS WILL BE MADE UNDER ITEM 621500 - TEMPORARY TIMBER MAT. IN WETLAND AREAS THAT ARE CLEARED, NO GRUBBING EXCEPT WHERE NECESSARY TO CONSTRUCT PROJECT COMPONENTS SUCH AS FOUNDATIONS AND RIPRAP PROTECTION IS PERMITTED. CUT VEGETATION FLUSH WITH THE GROUND (I.E. NO DISTURBANCE OF THE ROOT MAT). RESTORE TEMPORARILY DISTURBED WETLAND AREAS TO GRADE AND SEED WITH ITEM 908515 - TEMPORARY GRASS SEEDING, WET GROUND.

   B. USE SILT FENCE OR CONSTRUCTION SAFETY FENCE ALONG THE LIMITS OF CONSTRUCTION IN ALL AREAS WHERE WATER WETLANDS ARE BEING IMPACTED (AS SHOWN ON ENVIRONMENTAL COMPLIANCE SHEETS), AND ALSO IN ANY AREA WHERE WATER/WETLANDS EXIST WITHIN 20 FEET OF THE LIMIT OF CONSTRUCTION (AS SHOWN ON CONSTRUCTION PLAN SHEETS). ANY CONTRACTOR ACCESS BEYOND THE LIMIT OF CONSTRUCTION IS STRICTLY PROHIBITED.

   C. USE SANDBAGS OR COMPOST FILTER LOG (CFL) TO SECURE SILT FENCE AT AREAS ADJACENT TO WOODED UPLANDS/ ALL WETLANDS IN LIEU OF TRENCHING UNLESS PROPER EROSION AND SEDIMENT CONTROL CANNOT BE MAINTAINED. REMOVE SANDBAGS AND CFLS (AND CONTENTS) IN THEIR ENTIRETY WHEN NO LONGER NEEDED. SANDBAGS/CFLS USED TO SECURE THE SILT FENCE IS INCIDENTAL TO ITEM 905001 - SILT FENCE. THE ENVIRONMENTAL STUDIES SECTION (302-760-2259 OR DOT_ENVIRONMENTALSTUDIES@DELAWARE.GOV) CAN PROVIDE FURTHER GUIDANCE REGARDING THIS METHOD OF INSTALLATION.

   D. CLEARLY MARK ALL TREES TO BE REMOVED WITH PAINT PRIOR TO THE EROSION AND SEDIMENT CONTROL MEETING.

5. STREAM RESTORATION AND RIPRAP TREATMENT:

   A. FOLLOW THE SPECIAL PROVISION FOR ITEM 707021 - CHANNEL BED FILL IN REGARDS TO THE SALVAGING OF ON-SITE NATURAL STREAM BOTTOM MATERIAL OR THE FURNISHING OF OFFSITE MATERIAL. IF USING CHANNEL BED FILL, USE HEAVY GRADATION AS IT WILL WASH AWAY IF YOU USE THE LIGHT GRADATION OF CBF. IF SUFFICIENT SOURCES FOR CHANNEL BED FILL DO NOT EXIST ON-SITE, ANY NEW MATERIAL MUST CONFORM TO THE REQUIREMENTS OF ITEM 707021 - CHANNEL BED FILL. RECESS ALL RIPRAP IN THE CHANNEL BOTTOM (I.E. BELOW THE WATER LINE) ONE FOOT BELOW STREAM BED ELEVATION AND CHOKE WITH BORROW TYPE 'B' SO THAT ALL OF THE VOIDS IN THE RIPRAP ARE FILLED WITH SPECIFIED MATERIAL. PAYMENT UNDER ITEM 209002 - BORROW, TYPE B. COVER THE RIPRAP WITH A MINIMUM OF 12" CHANNEL BED FILL. MATCH THE FINAL CHANNEL ELEVATIONS WITH EXISTING ELEVATIONS AT THE UPSTREAM AND DOWNSTREAM PROJECT LIMITS. THROUGH THE STRUCTURE, ELEVATIONS WILL BE AS NOTED ON THE PLANS. PAYMENT UNDER ITEM 707021 -CHANNEL BED FILL.

   B. RESTORE OTHER AREAS OF THE CHANNEL BOTTOM AFFECTED BY CONSTRUCTION (INCLUDING, BUT NOT LIMITED TO, THE LOCATION OF SUMP PITS, STABILIZED OUTFALLS, TEMPORARY PIPES AND/OR SANDBAG DIKES AND DIVERSIONS) TO EXISTING CONDITIONS. FILL ANY CAVITIES OR SCOUR HOLES RESULTING FROM CONSTRUCTION ACTIVITIES WITH CHANNEL BED FILL. PAYMENT UNDER ITEM 707021 - CHANNEL BED FILL.

   C. WHEN ALL EROSION AND SEDIMENT CONTROL MEASURES ARE REMOVED AND THE STREAM RETURNS TO ITS NATURAL FLOW CONDITIONS, THE FLOW MUST REMAIN ABOVE GROUND AND ABOVE THE RIPRAP (I.E. THE FLOW CANNOT BE "LOST" IN THE RIPRAP OR BENEATH THE STRUCTURE). IF THIS IS NOT ACHIEVED, THE CONTRACTOR WILL BE REQUIRED TO TAKE CORRECTIVE ACTION AT THE CONTRACTOR'S EXPENSE.

   D. CHOKE ALL RIPRAP ON THE STREAM BANK, OUTSIDE THE CHANNEL BED, WITH DELAWARE #57 STONE. PLACE JUST ENOUGH CHOKE MATERIAL TO PREVENT THE LOSS OF CHANNEL BED FILL OR TOPSOIL (DEPENDING ON LOCATION AS INDICATED BELOW) THROUGH THE RIPRAP.
      1. BENEATH THE BRIDGE: AFTER PLACING ITEM 302005 - DELAWARE #57 STONE, PERFORM A FINAL CHOKE OF CHANNEL BED FILL SO THAT THE RIPRAP PEAKS ARE BARELY VISIBLE. PAYMENT UNDER ITEM 707021 - CHANNEL BED FILL. DELAWARE #57 STONE IS INCIDENTAL TO THE RIPRAP ITEM.
      2. ALL OTHER LOCATIONS: FINISH FILLING THE VOIDS WITH TOPSOIL SO THAT THE RIPRAP PEAKS ARE BARELY VISIBLE. PLACE AN ADDITIONAL 6-INCH TOPSOIL LAYER ON TOP OF THE RIPRAP. SLOPE SEEDING WILL BE DONE WITH ITEM 908019 - STREAMBANK SEED MIX, SEEDING. FOLLOWING THE SEEDING OPERATION, INSTALL ITEM 908020 - EROSION CONTROL BLANKET (ECB) MULCH, OR OTHER BLANKET AS SHOWN ON THE PLANS. ECB AT TOE OF SLOPE CAN BE EITHER TRENCHED IN OR STAPLED AT 6" ON CENTER. COMPLETE ALL WORK, STARTING WITH THE INITIAL CHOKING WITH TOPSOIL THROUGH THE SEEDING AND MULCHING PRIOR TO ANY RAIN EVENT. DELAWARE #57 STONE IS INCIDENTAL TO THE RIPRAP ITEM. ALL OTHER ITEMS WILL BE PAID FOR UNDER THEIR RESPECTIVE ITEMS.

THE CONTRACTOR SHALL ACCESS THE STREAM FROM THE STAGING AREAS AND ACCESS ROADS ONLY. CONTRACTOR ACCESS BEYOND THE LOC (AS DEFINED ON THESE PLANS) IS STRICTLY PROHIBITED. ANY CHANGE IN THE LOC MUST BE COORDINATED WITH THE DELDOT ENVIRONMENTAL STUDIES SECTION.

PROJECT AREA DELINEATED BY PENNONI ON 06/26/2020 IN ACCORDANCE WITH THE US ARMY CORPS OF ENGINEERS CORPS OF ENGINEERS WETLAND DELINEATION MANUAL (1987) AND THE EASTERN MOUNTAINS AND PIEDMONT SUPPLEMENT (2012).
ORIGINAL SHEET PREPARED BY PENNONI ON 01/22/2021. SHEET LAST UPDATED ON 12/02/2022.

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-E-01	WETLAND CREATION	797.74	0.0183	19.71	USACE/DNREC
1-E-02	WETLAND CREATION	4833.64	0.1110	119.41	USACE/DNREC
2-E-03	WETLAND CREATION	5078.79	0.1166	125.46	USACE/DNREC
2-E-04	WETLAND CREATION	359.54	0.0083	8.88	USACE/DNREC
2-E-05	WETLAND CREATION	2693.09	0.0618	66.53	USACE/DNREC
2-E-06	WETLAND CREATION	173.36	0.0040	4.28	USACE/DNREC
2-E-07	WETLAND CREATION	1256.24	0.0288	31.03	USACE/DNREC
3-E-08	WETLAND CREATION	4638.83	0.1065	114.60	USACE/DNREC
3-E-09	WETLAND CREATION	2381.20	0.0547	58.82	USACE/DNREC
3-E-10	WETLAND CREATION	965.55	0.0222	23.85	USACE/DNREC
PROJECT TOTALS		23177.99	0.5321	572.58	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WR-01	WETLAND RESTORATION	6999.63	0.1607	172.92	USACE/DNREC
2-WR-02	WETLAND RESTORATION	8386.61	0.1925	207.18	USACE/DNREC
2-WR-03	WETLAND RESTORATION	3636.65	0.0835	89.84	USACE/DNREC
3-WR-04	WETLAND RESTORATION	6041.62	0.1387	149.25	USACE/DNREC
3-WR-05	WETLAND RESTORATION	241.65	0.0055	5.97	USACE/DNREC
TOTAL FOR THIS SHEET		25306.16	0.5809	625.16	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
1-W-01	ROADWAY/EMBANKMENT	35.33	0.0008	2.62	USACE/DNREC	LOSS
1-W-02	ROADWAY/EMBANKMENT	163.17	0.0037	12.09	USACE/DNREC	LOSS
1-W-03	ROADWAY/RETAINING WALL	1888.95	0.0434	139.92	USACE/DNREC	LOSS
2-W-04	ROADWAY/RETAINING WALL	962.39	0.0221	71.29	USACE/DNREC	LOSS
2-W-05	ROADWAY/RET. WALL/RIPRAP	731.93	0.0168	54.22	USACE/DNREC	LOSS
2-W-06	RIPRAP	312.34	0.0072	23.14	USACE/DNREC	LOSS
2-W-07	ROADWAY/RET. WALL/RIPRAP	881.52	0.0202	65.30	USACE/DNREC	LOSS
2-W-08	RIPRAP	97.00	0.0022	7.19	USACE/DNREC	LOSS
2-W-09	AERIAL COVERAGE (BR. DECK)	1003.17	0.0230	74.31	DNREC	IMPACT
2-W-10	RIPRAP	15.55	0.0004	1.15	USACE/DNREC	LOSS
2-W-11	RIPRAP	12.12	0.0003	0.90	USACE/DNREC	LOSS
3-W-12	AERIAL COVERAGE (BR. DECK)	325.49	0.0075	24.11	DNREC	IMPACT
2-W-13	AERIAL COVERAGE (BR. DECK)	1004.14	0.0231	74.38	DNREC	IMPACT
3-W-14	ROADWAY/EMBANKMENT	50.65	0.0012	3.75	USACE/DNREC	LOSS
PROJECT TOTALS		5150.94	0.1182	381.55	USACE/DNREC	LOSS

TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WT-01	WORK AREA / E&S CONTROLS	726.58	0.0167	53.82	USACE/DNREC
1-WT-02	WORK AREA / E&S CONTROLS	3858.79	0.0886	285.84	USACE/DNREC
1-WT-03	WORK AREA / E&S CONTROLS	1744.35	0.0400	129.21	USACE/DNREC
2-WT-04	WORK AREA / E&S CONTROLS	7531.31	0.1729	557.87	USACE/DNREC
2-WT-05	WORK AREA / E&S CONTROLS	2899.90	0.0666	214.81	USACE/DNREC
2-WT-06	WORK AREA / E&S CONTROLS	4379.58	0.1005	324.41	USACE/DNREC
2-WT-07	WORK AREA / E&S CONTROLS	2204.18	0.0506	163.27	USACE/DNREC
2-WT-08	WORK AREA / E&S CONTROLS	350.50	0.0080	25.96	USACE/DNREC
3-WT-09	WORK AREA / E&S CONTROLS	4770.15	0.1095	353.34	USACE/DNREC
3-WT-10	WORK AREA / E&S CONTROLS	8491.04	0.1949	628.97	USACE/DNREC
PROJECT TOTALS		36956.38	0.8484	2737.51	USACE/DNREC

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-OT-01	WORK AREA / E&S CONTROLS	11094.36	0.2547	274.07	USACE/DNREC
2-OT-02	WORK AREA / E&S CONTROLS	6017.63	0.1381	148.66	USACE/DNREC
PROJECT TOTALS		17111.99	0.3928	422.73	USACE/DNREC

PERMANENT OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-O-01	PIER/RIPRAP	747.77	0.0172	55.39	USACE/DNREC	IMPACT
2-O-02	PIER/RIPRAP	829.33	0.0190	61.43	USACE/DNREC	IMPACT
2-O-03	WORK AREA/E&S CONT.	20.93	0.0005	1.55	USACE/DNREC	IMPACT
2-O-04	WORK AREA/E&S CONT.	1266.16	0.0291	93.79	USACE/DNREC	IMPACT
2-O-05	WORK AREA/E&S CONT.	959.53	0.0220	71.08	USACE/DNREC	IMPACT
PROJECT TOTALS		3823.73	0.0878	283.24	USACE/DNREC	IMPACT

ADDENDA / REVISIONS

DRAFT GRAPHIC FOR COORDINATION

NOT TO SCALE

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	E. HARASTY
COUNTY	CHECKED BY:	J. GRAUPENSPERGER
NEW CASTLE		

ENVIRONMENTAL COMPLIANCE NOTES

SECTION: PAI
SHEET NO.: 56

LEGEND

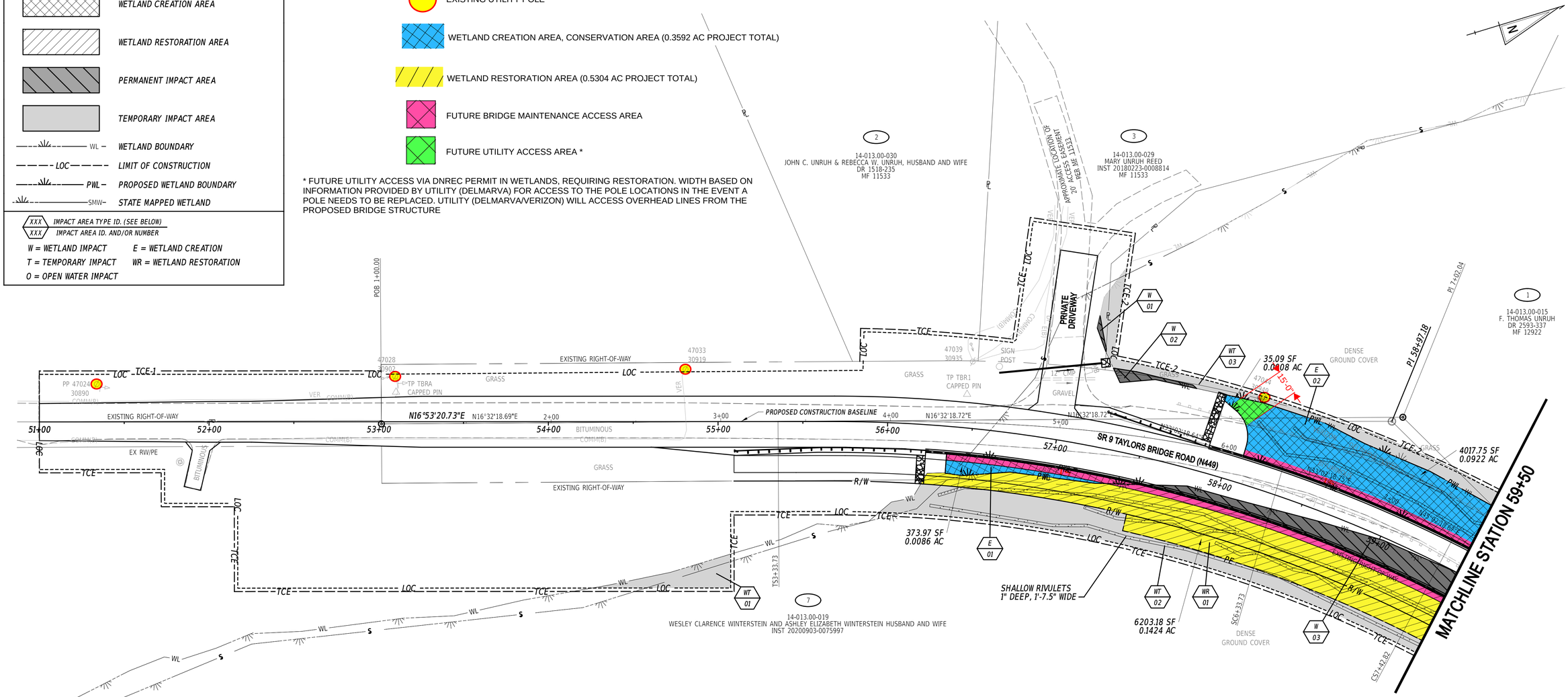
- WETLAND CREATION AREA
- WETLAND RESTORATION AREA
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA
- WL – WETLAND BOUNDARY
- LOC – LIMIT OF CONSTRUCTION
- PWL – PROPOSED WETLAND BOUNDARY
- SMW – STATE MAPPED WETLAND

XXX / XXX — IMPACT AREA TYPE ID. (SEE BELOW) / IMPACT AREA ID. AND/OR NUMBER

W = WETLAND IMPACT E = WETLAND CREATION
T = TEMPORARY IMPACT WR = WETLAND RESTORATION
O = OPEN WATER IMPACT

- EXISTING UTILITY POLE
- WETLAND CREATION AREA, CONSERVATION AREA (0.3592 AC PROJECT TOTAL)
- WETLAND RESTORATION AREA (0.5304 AC PROJECT TOTAL)
- FUTURE BRIDGE MAINTENANCE ACCESS AREA
- FUTURE UTILITY ACCESS AREA *

* FUTURE UTILITY ACCESS VIA DNREC PERMIT IN WETLANDS, REQUIRING RESTORATION. WIDTH BASED ON INFORMATION PROVIDED BY UTILITY (DELMARVA) FOR ACCESS TO THE POLE LOCATIONS IN THE EVENT A POLE NEEDS TO BE REPLACED. UTILITY (DELMARVA/VERIZON) WILL ACCESS OVERHEAD LINES FROM THE PROPOSED BRIDGE STRUCTURE



TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WT-01	WORK AREA / E&S CONTROLS	726.58	0.0167	53.82	USACE/DNREC
1-WT-02	WORK AREA / E&S CONTROLS	3858.79	0.0886	285.84	USACE/DNREC
1-WT-03	WORK AREA / E&S CONTROLS	1744.35	0.0400	129.21	USACE/DNREC
TOTAL FOR THIS SHEET		6329.72	0.1453	468.87	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
1-W-01	ROADWAY/EMBANKMENT	35.33	0.0008	2.62	USACE/DNREC	LOSS
1-W-02	ROADWAY/EMBANKMENT	163.17	0.0037	12.09	USACE/DNREC	LOSS
1-W-03	ROADWAY/RETAINING WALL	1888.95	0.0434	139.92	USACE/DNREC	LOSS
TOTAL FOR THIS SHEET		2087.45	0.0479	154.63	USACE/DNREC	LOSS

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-E-01	WETLAND CREATION	797.74	0.0183	19.71	USACE/DNREC
1-E-02	WETLAND CREATION	4833.64	0.1110	119.41	USACE/DNREC
TOTAL FOR THIS SHEET		5631.38	0.1293	139.12	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
1-WR-01	WETLAND RESTORATION	6999.63	0.1607	172.92	USACE/DNREC
TOTAL FOR THIS SHEET		6999.63	0.1607	172.92	USACE/DNREC

PENNONI ASSOCIATES INC.
FILE NAME: $FILE&$ PEN TABLE: $PENTBL$$
MICROSTATION VERSION: $VERSION$ PLOT DRIVER: $PLTDRV$$
MICROSTATION WORKSPACE: $WORKSPACE$ DATE PLOTTED: $DATE$ @ $TIME$
USER NAME: $USER$ OFFICE LOCATION:

ADDENDA / REVISIONS

DRAFT GRAPHIC FOR COORDINATION

SCALE 0 30 60 90 FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO.	1-447
T201907102	DESIGNED BY:	E. HARASTY
COUNTY	CHECKED BY:	J. GRAUPENSPERGER
NEW CASTLE		

ENVIRONMENTAL COMPLIANCE PLAN

EC-01
SECTION: PAI
SHEET NO.: 57

TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-WT-04	WORK AREA / E&S CONTROLS	7531.31	0.1729	557.87	USACE/DNREC
2-WT-05	WORK AREA / E&S CONTROLS	2899.90	0.0666	214.81	USACE/DNREC
2-WT-06	WORK AREA / E&S CONTROLS	4379.58	0.1005	324.41	USACE/DNREC
2-WT-07	WORK AREA / E&S CONTROLS	2204.18	0.0506	163.27	USACE/DNREC
2-WT-08	WORK AREA / E&S CONTROLS	350.50	0.0080	25.96	USACE/DNREC
TOTAL FOR THIS SHEET		17365.47	0.3987	1286.33	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-W-04	ROADWAY/RETAINING WALL	962.39	0.0221	71.29	USACE/DNREC	LOSS
2-W-05	ROADWAY/RET. WALL/RIPRAP	731.93	0.0168	54.22	USACE/DNREC	LOSS
2-W-06	RIPRAP	312.34	0.0072	23.14	USACE/DNREC	LOSS
2-W-07	ROADWAY/RET. WALL/RIPRAP	881.52	0.0202	65.30	USACE/DNREC	LOSS
2-W-08	RIPRAP	97.00	0.0022	7.19	USACE/DNREC	LOSS
2-W-09 *	AERIAL COVERAGE (BR. DECK)	1003.17	0.0230	74.31	DNREC	IMPACT
2-W-10	RIPRAP	15.55	0.0004	1.15	USACE/DNREC	LOSS
2-W-11	RIPRAP	12.12	0.0003	0.90	USACE/DNREC	LOSS
2-W-12 *	AERIAL COVERAGE (BR. DECK)	325.49	0.0075	24.11	DNREC	IMPACT
2-W-13 *	AERIAL COVERAGE (BR. DECK)	1004.14	0.0231	74.38	DNREC	IMPACT
TOTAL FOR THIS SHEET		3012.85	0.0692	223.17	USACE/DNREC	LOSS

*PER COORDINATION WITH DNREC, AERIAL IMPACTS ARE NOT CONSIDERED LOSS.

TEMPORARY OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-OT-01	WORK AREA / E&S CONTROLS	11094.36	0.2547	821.80	USACE/DNREC
2-OT-02	WORK AREA / E&S CONTROLS	6017.63	0.1381	445.75	USACE/DNREC
TOTAL FOR THIS SHEET		17111.99	0.3928	1267.55	USACE/DNREC

PERMANENT OPEN WATER IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
2-O-01	PIER/RIPRAP	747.77	0.0172	55.39	USACE/DNREC	IMPACT
2-O-02	PIER/RIPRAP	829.33	0.0190	61.43	USACE/DNREC	IMPACT
2-O-03	DNREC AERIAL COVERAGE	20.93	0.0005	1.55	DNREC	IMPACT
2-O-04	DNREC AERIAL COVERAGE	1266.16	0.0291	93.79	DNREC	IMPACT
2-O-05	DNREC AERIAL COVERAGE	959.53	0.0220	71.08	DNREC	IMPACT
TOTAL FOR THIS SHEET		3823.73	0.0878	283.24	USACE/DNREC	IMPACT

EXISTING UTILITY POLE

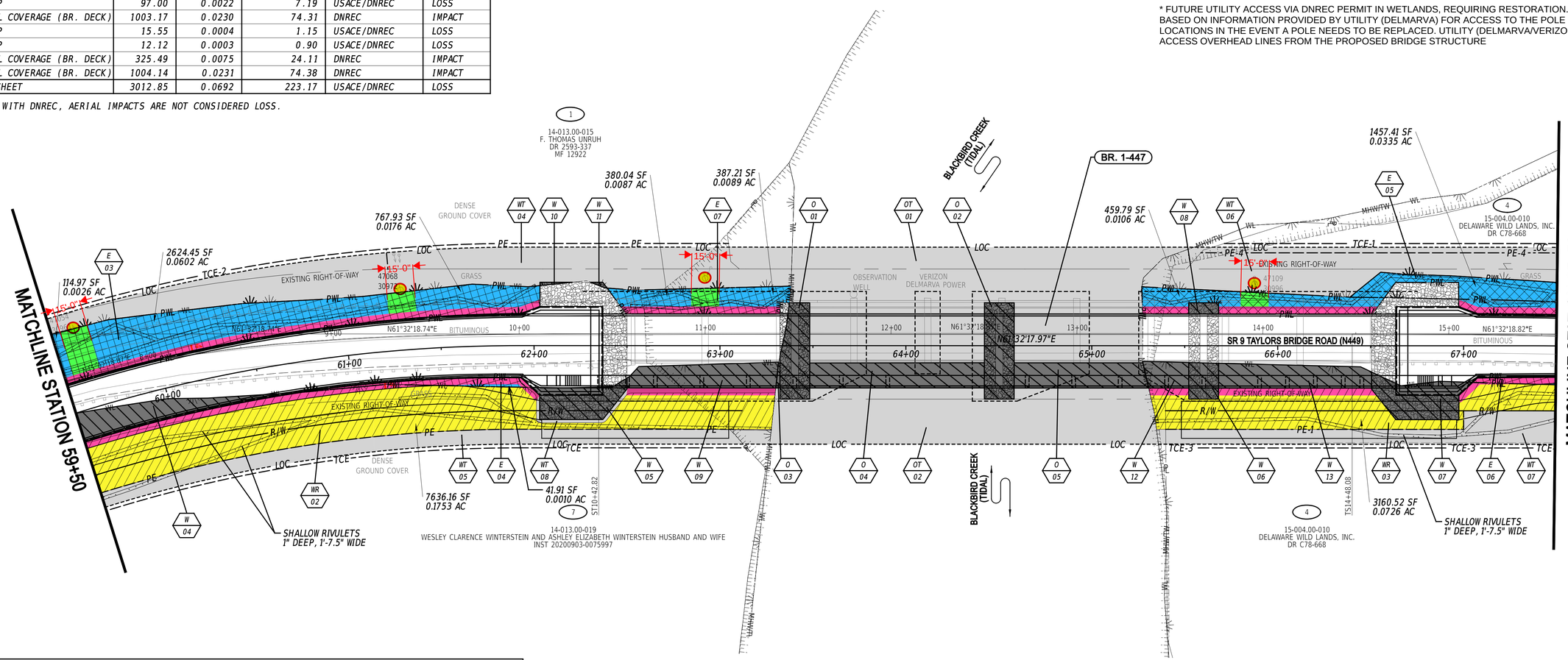
WETLAND CREATION AREA, CONSERVATION AREA (0.3592 AC PROJECT TOTAL)

WETLAND RESTORATION AREA (0.5304 AC PROJECT TOTAL)

FUTURE BRIDGE MAINTENANCE ACCESS AREA

FUTURE UTILITY ACCESS AREA *

* FUTURE UTILITY ACCESS VIA DNREC PERMIT IN WETLANDS, REQUIRING RESTORATION. WIDTH BASED ON INFORMATION PROVIDED BY UTILITY (DELMARVA) FOR ACCESS TO THE POLE LOCATIONS IN THE EVENT A POLE NEEDS TO BE REPLACED. UTILITY (DELMARVA/VERIZON) WILL ACCESS OVERHEAD LINES FROM THE PROPOSED BRIDGE STRUCTURE



LEGEND

- WETLAND CREATION AREA
- WETLAND RESTORATION AREA
- PERMANENT IMPACT AREA
- TEMPORARY IMPACT AREA
- TOP OF BANK
- WL – WETLAND BOUNDARY
- LOC – LIMIT OF CONSTRUCTION
- PWL – PROPOSED WETLAND BOUNDARY
- SMW – STATE MAPPED WETLAND
- XXX / XXX – IMPACT AREA TYPE ID. (SEE BELOW) / IMPACT AREA ID. AND/OR NUMBER
- W = WETLAND IMPACT
- E = WETLAND CREATION
- T = TEMPORARY IMPACT
- WR = WETLAND RESTORATION
- O = OPEN WATER IMPACT

WETLAND CREATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-E-03	WETLAND CREATION	5078.79	0.1166	125.46	USACE/DNREC
2-E-04	WETLAND CREATION	359.54	0.0083	8.88	USACE/DNREC
2-E-05	WETLAND CREATION	2693.09	0.0618	66.53	USACE/DNREC
2-E-06	WETLAND CREATION	173.36	0.0040	4.28	USACE/DNREC
2-E-07	WETLAND CREATION	1256.24	0.0288	31.03	USACE/DNREC
TOTAL FOR THIS SHEET		9561.02	0.2195	236.19	USACE/DNREC

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
2-WR-02	WETLAND RESTORATION	8386.61	0.1925	207.18	USACE/DNREC
2-WR-03	WETLAND RESTORATION	3636.65	0.0835	89.84	USACE/DNREC
TOTAL FOR THIS SHEET		12023.26	0.2760	297.02	USACE/DNREC

Pennoni

ADDENDA / REVISIONS

DRAFT GRAPHIC FOR COORDINATION

SCALE 0 30 60 90 FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	T201907102
COUNTY	NEW CASTLE
BRIDGE NO.	1-447
DESIGNED BY:	E. HARASTY
CHECKED BY:	J. GRAUPENSPERGER

ENVIRONMENTAL COMPLIANCE PLAN

EC-02

SECTION	PAI
SHEET NO.	58

TEMPORARY WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-WT-09	WORK AREA / E&S CONTROLS	4770.15	0.1095	353.34	USACE/DNREC
3-WT-10	WORK AREA / E&S CONTROLS	8491.04	0.1949	628.97	USACE/DNREC
TOTAL FOR THIS SHEET		13261.19	0.3044	982.31	USACE/DNREC

WETLAND CREATION AREA SCHEDULE

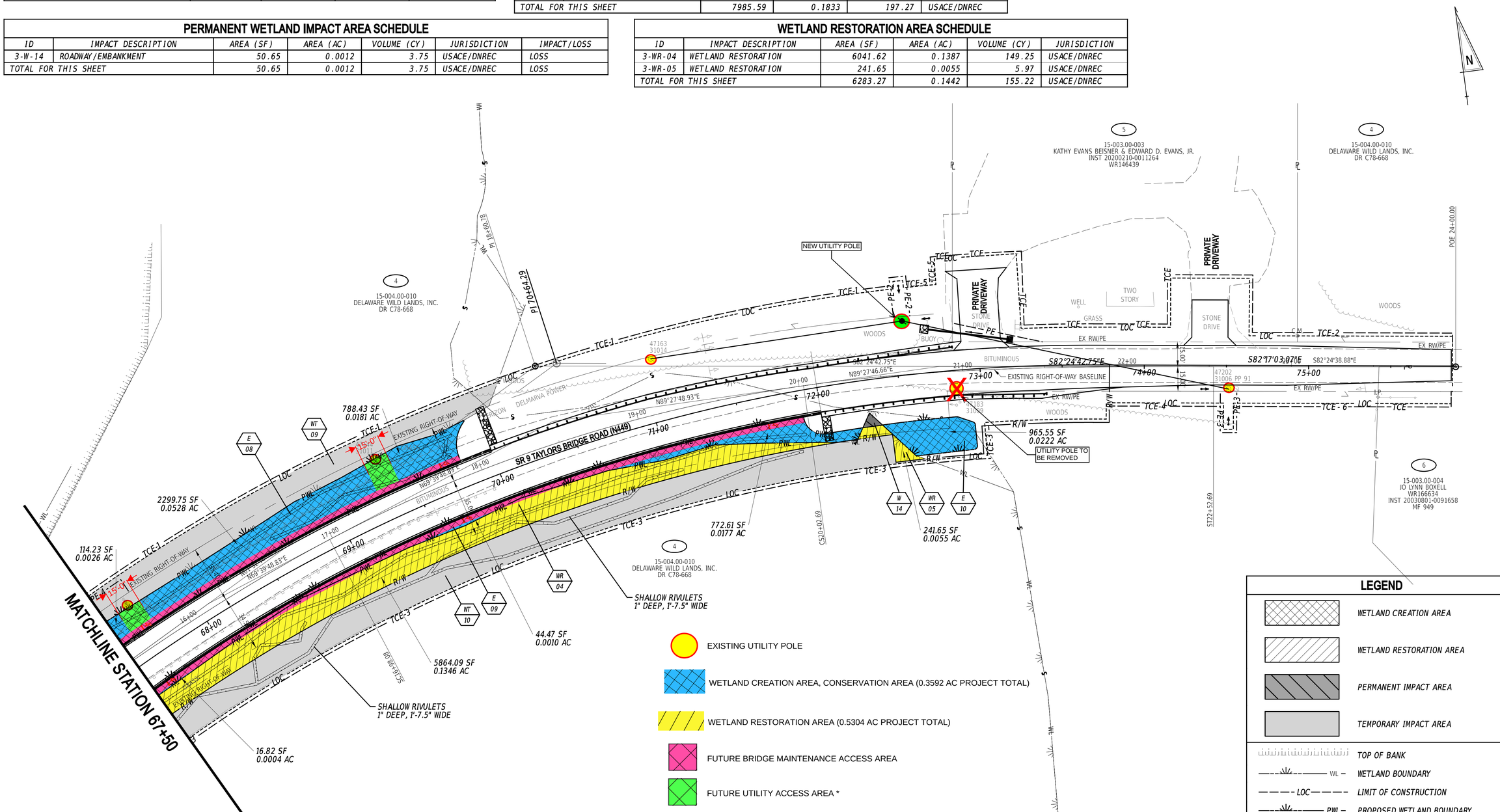
ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-E-08	WETLAND CREATION	4638.83	0.1065	114.60	USACE/DNREC
3-E-09	WETLAND CREATION	2381.20	0.0547	58.82	USACE/DNREC
3-E-10	WETLAND CREATION	965.55	0.0222	23.85	USACE/DNREC
TOTAL FOR THIS SHEET		7985.59	0.1833	197.27	USACE/DNREC

PERMANENT WETLAND IMPACT AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION	IMPACT/LOSS
3-W-14	ROADWAY/EMBANKMENT	50.65	0.0012	3.75	USACE/DNREC	LOSS
TOTAL FOR THIS SHEET		50.65	0.0012	3.75	USACE/DNREC	LOSS

WETLAND RESTORATION AREA SCHEDULE

ID	IMPACT DESCRIPTION	AREA (SF)	AREA (AC)	VOLUME (CY)	JURISDICTION
3-WR-04	WETLAND RESTORATION	6041.62	0.1387	149.25	USACE/DNREC
3-WR-05	WETLAND RESTORATION	241.65	0.0055	5.97	USACE/DNREC
TOTAL FOR THIS SHEET		6283.27	0.1442	155.22	USACE/DNREC



ADDENDA / REVISIONS

DRAFT GRAPHIC FOR COORDINATION

SCALE 0 30 60 90 FEET

BR 1-447 ON N449
TAYLORS BRIDGE ROAD
OVER BLACKBIRD CREEK

CONTRACT	BRIDGE NO. 1-447
T201907102	DESIGNED BY: E. HARASTY
COUNTY	CHECKED BY: J. GRAUPENSPERGER
NEW CASTLE	

ENVIRONMENTAL COMPLIANCE PLAN

EC-03
SECTION PAI
SHEET NO. 59

	Acres	Mitigation Ratio
Permanent Wetland Impacts, Per Plan	0.1182	
Wetland Creation Area, Per Plan	0.5321	4.50 : 1
Wetland Creation Area, "Conservation Area" (Blue Shade on attached graphic)	0.3592	3.04 : 1

STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF FISH & WILDLIFE
RICHARDSON & ROBBINS BUILDING
89 KINGS HIGHWAY
DOVER, DELAWARE 19901

DIRECTOR'S OFFICE

PHONE
(302) 739-9910

June 1, 2023

John Caruano
800 Bay Road
P.O. Box 778
Dover, DE 19903

Re: DelDOT 2023 BR 1-447 on Taylors Bridge Road over Blackbird Creek (T201907102)

Dear John Caruano:

Thank you for contacting the Species Conservation and Research Program (SCRP) about information on rare, threatened and endangered species, unique natural communities, and other significant natural resources as they relate to the above referenced project.

State Natural Heritage Site
The project site is within Blackbird Creek Reserve, a Delaware National Estuarine Research Reserve (DNERR) which are identified as "Designated Critical Resource Waters" by the Army Corps of Engineers (ACOE), and as such are subject to the restrictions and limitations imposed through Nationwide Permit General Condition No. 22. A copy of this letter shall be included in any permit application or pre-construction notification submitted to the Army Corps of Engineers for activities on this property. Please consult with Rachael Phillos, DNERR Reserve Manager at DNREC Coastal Programs for more information about this area for your planning at Rachael.Phillos@delaware.gov or (302) 735-3411.

If you propose to use Nationwide Permit 3, 13, 18, 48, 55, 56, 57, or 58, the State of Delaware has denied Coastal Zone Management concurrence in Designated Critical Resource Waters, including Natural Heritage Sites. To use any of these Nationwide Permits at this site, you must apply for an individual Coastal Zone Management certification from Delaware Coastal Programs (DCP). For more information, please contact DCP at (302) 739-9283 or visit their webpage at https://dnrec.alpha.delaware.gov/coastal-programs/coastal-management/federal-consistency/.

If you propose to use Nationwide Permit 3, 13, or 18, the State of Delaware has denied Water Quality Certification in Designated Critical Resource Waters, including Natural Heritage Sites. To use any of these Nationwide Permits at this site, you must apply for an individual Water Quality Certification from DNREC's Wetlands and Subaqueous Lands Section (WSLS). For

more information, please contact WSLS at (302) 739-9943 or visit their webpage at https://dnrec.alpha.delaware.gov/water/wetlands-subaqueous/permits/.

If you propose to use Nationwide Permit No. 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43,44, 49, 50, 51, 52, 57, or 58, this Designated Critical Resource Water designation may require you to obtain authorization through some other nationwide or general permit, or an individual permit from the Army Corps of Engineers. You should review the Nationwide Permit General Conditions and Regional Conditions for Delaware (see, in particular, Nationwide Permit General Condition No. 22) to determine what notification requirements or restrictions might be applicable for your activity. Please contact the Army Corps of Engineers at (215) 656-6728 if you have questions or require additional information regarding the Nationwide Permit Program.

Habitat of Conservation Concern
The marsh to the southwest of the project site is mapped as Bishop-weed Mixed Species Brackish Marsh, a Habitat of Conservation Concern (HCC). These communities are rare within the state and have the potential to harbor a high diversity of Species of Greatest Conservation Need (SGCN). A visit to the project site on May 2, 2022 by state botanist Bill McAvoy revealed that the HCC is likely outside of the limits of disturbance (LOD) and unlikely to be impacted. We have no further concerns for this community.

Migratory Birds
Bridge 1-447 has not been surveyed for the presence of nesting migratory birds, which are protected by Title 7, Delaware Code, Chapter 7, Sections 734 and 735. It is possible that one or more pairs of barn swallow (*Hirundo rustica*) and/or Eastern phoebe (*Sayornis phoebe*) nest under the bridge(s). If work is proposed during the breeding season (**April 15 – August 1**), a survey should be completed prior to the start of work to determine if nests are present. If a survey detects nesting activity, the following steps should be taken to avoid nest destruction and take, which is a violation of state law:

1. Perform construction activities from **August 1 to April 15**.
2. If construction cannot be performed in this time period, a deterrent such as mesh netting should be used to block access to nesting sites on the underside of the bridge(s). The material would need to be in place no later than **April 15**, the underside of the bridge(s) would need to be fully encapsulated, and the material should be left in place until construction begins.

If active nests are discovered during the course of work, activities should be halted immediately and SCRP contacted for further guidance.

Marsh Nesting Birds
The area surrounding the project site is mapped as quality marsh habitat, and it has the potential to support nesting marsh birds. We request a time-of-year restriction for work conducted in the surround marsh from **April 1st to July 31st** to protect marsh nesting birds and their young.

Fisheries
Blackbird Creek provides spawning habitat for anadromous species including Blueback Herring (*Alosa aestivalis)* and alewife (*Alosa pseudoharengus)*, collectively referred to as "river herring," as well as potentially American shad (*Alosa sapidissima*). To protect these species during

spawning and migratory activities, a time of year restriction of **March 1st to June 30th** is requested during which no in-water work should be performed.

Blackbird Creek is used by large numbers of American Eel (*Anguilla rostrata)*. We request that in-stream work not take place from **March 1st to May 15th** to allow upstream passage of elvers (young eels).

Finally, the Division does not have records of Atlantic (*Acipenser oxyrinchus*) or shortnose sturgeon (*Acipenser brevirostrum*) within Blackbird Creek and would not expect these species to be present.

State Natural Area
The proposed project area occurs within Delaware's Natural Areas Inventory. State Natural Areas are composed of areas of land and/or water, whether in public or private ownership, which have retained or reestablished its natural character (although it need not be undisturbed), has unusual flora or fauna, or has biotic, geological, scenic or archaeological features of scientific or educational value. If you require further information about this area for your planning, please contact Melanie Cucunato at 302-739-9039 or Melanie.Cucunato@delaware.gov.

We are continually updating our records on Delaware's rare, threatened and endangered species, unique natural communities and other significant natural resources. If the start of the project is delayed more than a year past the date of this letter, please contact us again for the latest information.

Please feel free to contact me with any questions or if you require additional information.

Sincerely,

Katie Kadlubar

Katie Kadlubar
Environmental Review Coordinator
Phone: (302) 735-8665
6180 Hay Point Landing Road
Smyrna, DE 19977

United States Department of the Interior
U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573 4575

Online Certification Letter-Routine Highway Maintenance

Today's date: **May 31st, 2023**
Project: **T201907102**

Dear Applicant for online certification:

Thank you for using the U.S. Fish and Wildlife Service (Service) Chesapeake Bay Field Office online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the referenced project in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA).This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

Based on this information and in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), we certify that except for occasional transient individuals, no federally proposed or listed endangered or threatened species are known to exist within the project area. Therefore, no Biological Assessment or further section 7 consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For additional information on threatened or endangered species in Maryland, you should contact the Maryland Wildlife and Heritage Division at (410) 260-8573. For information in Delaware you should contact the Delaware Division of Fish and Wildlife, Wildlife Species Conservation and Research Program at (302) 735-8658. For information in the District of Columbia, you should contact the National Park Service at (202) 339-8309.

The U.S. Fish and Wildlife Service also works with other Federal agencies and states to minimize loss of wetlands, reduce impacts to fish and migratory birds, including bald eagles, and restore habitat for wildlife. Information on these conservation issues and how development projects can avoid affecting these resources can be found on our website (www.fws.gov/chesapeakebay)

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Chesapeake Bay Field Office Threatened and Endangered Species program at (410) 573-4527.

Sincerely,

Genevieve LaRouche
Field Supervisor

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
Phone: (410) 573-4599 Fax: (410) 266-9127

In Reply Refer To:
Project Code: 2023-0087568
Project Name: T201907102

May 31, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Chesapeake Bay Ecological Services Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401-7307
(410) 573-4599

PROJECT SUMMARY

Project Code: 2023-0087568
Project Name: T201907102
Project Type: Bridge - Replacement
Project Description: Bridge 1-447 (Taylors Bridge Rd. over Blackbird Creek) replacement.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.40493725,-75.59916234928886,14z

Counties: New Castle County, Delaware

ENDANGERED SPECIES ACT SPECIES

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 1 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus*	Candidate

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

- The monarch is a candidate species and not yet listed or proposed for listing. There are generally no section 7 requirements for candidate species (FAQ found here: https://www.fws.gov/savethemonarch/FAQ-Section7.html).

Species profile: https://ecos.fws.gov/ecp/species/9743

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency: Delaware Department of Transportation
Name: Nicole Start
Address: 800 S Bay Road
City: Dover
State: DE
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HCA
DELAWARE HISTORICAL & CULTURAL AFFAIRS

Delaware Division of Historical & Cultural Affairs
29 N. State St., Dover, Delaware 19901
Tel. (302) 736-7400 | Fax. (302) 739-5660
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December 16, 2022

John W. Martin
Section 106 Supervisor
Delaware Department of Transportation
800 Bay Road, P.O. Box 778
Dover, DE 19904

Subject: **Finding of No Historic Properties Affected: BR 1-447 Taylors Bridge Road Project, New Castle County, DelDOT Contract No. T201907102, Federal Aid No. EBROS-N449(2) SHPO Review No. 2021.04.29.04**

Dear Mr. Martin,

In response to the letter received on November 10, 2022, the staff of the Delaware State Historic Preservation Office (DE SHPO) has reviewed the material submitted by the Delaware Department of Transportation (DelDOT) regarding the above cited project. This undertaking will be funded by the Federal Highway Administration (FHWA), and as such, is subject to Section 106 compliance under the National Historic Preservation Act of 1966 (as amended).

FHWA and DelDOT have submitted a finding of No Historic Properties Affected for this undertaking. The finding cites prior consultation with DE SHPO regarding the potential to impact archaeological and architectural resources. A Phase I archaeological survey was conducted and submitted to DE SHPO for review. The report, *Phase I Archaeological Survey, BR 1-447 Taylors Bridge Road Project, New Castle County, Delaware*, did not identify any archaeological sites within the Area of Potential Effect (APE). In a letter dated September 13, 2022, DE SHPO concurred that no sites were found, and no further work was necessary.

A Phase I architectural survey was submitted and reviewed by DE SHPO. The survey evaluated four previously identified properties and two newly identified properties within the APE. Four of the contributing structures to the Reedy Island Range Rear Light property had been demolished. The Reedy Island Range Rear Light was previously listed on the National Register of Historic Places and recommended to still be eligible. However, based on the scope of the project, the Reedy Island Range Rear Light will not be affected. DE SHPO concurred with this assessment on April 28, 2022.

In accordance with 36 CFR 800.4(d)(1), DelDOT and FHWA have found there to be No Historic Properties Affected by the proposed undertaking. We concur with this finding. If you have any questions, I can be reached at (302) 736-7431 or sarah.carr@delaware.gov.

Sincerely,

Sarah Carr, Archaeologist
Cultural Preservation Specialist

cc: Gwen Davis, DE SHPO
Luke Pickrahn, DE SHPO
Rebecca Ledebohm, FHWA
Margaret Klejbuk, DelDOT
Scott Walls, DelDOT
Elizabeth Hatch, New Castle County