



**US Army Corps
of Engineers**
Philadelphia District

Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390
ATTN: CENAP-OP-R

Public Notice

Public Notice No.
CENAP-OP-R-2018-00649

Date
October 3, 2018

Application No.

File No.

In Reply Refer to:
REGULATORY BRANCH

This District has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344).

The purpose of this notice is to solicit comments and recommendations from the public concerning issuance of a Department of the Army permit for the work described below.

APPLICANT: Camden County Municipal Utilities Authority
Attn: Andy Kricun
1645 Ferry Avenue
Camden, New Jersey 08104

WATERWAY: Delaware River

LOCATION: 1645 Ferry Avenue, City of Camden, Camden County, New Jersey

ACTIVITY: The applicant, Camden County Municipal Utilities Authority, has requested Department of the Army authorization for a proposed bank protection/wetland and mussel habitat establishment project in the Delaware River. The proposed project would include wetland creation component, mussel pen component, and engineered rock sill/breakwater component.

Creation of approximately 2.33 acres of wetlands waterward of an existing steel bulkhead would involve the discharge of approximately 9,222 cubic yards of fill material to create the appropriate elevation and slope to establish vegetated wetlands. Wetland plant species proposed would include *Peltandra virginica*, *Pontedaria cordata*, *Sagittaria latifolia*, and *Schoenoplectus fluviatilis*, arranged in clusters of 20-30; and *Nuphar lutea*.

Twenty-five wooden mussel pens would be constructed below the mean lower low water line. Pens are approximately 30-feet by 30-feet and would be arranged in various configurations. Drift logs will be used to construct the wooden pens and would be held in place using screw ground anchors and/or concrete weights. The pens would contain Eastern elliptio mussels (*Elliptio complanata*).

Several rock sill/break water structures would be constructed along the filled area, covering approximately 0.47 acres total with 2,212 cubic yards of material. The rock sills would be constructed with the purpose of dampening wave energy, providing protection for the mussel pens and to prevent erosion of the wetland.

A temporary turbidity curtain would be used to minimize turbidity and sedimentation during construction. The project would involve the temporary use of barges, tug boats, barge mounted cranes and track hoes and small work vessels.

PURPOSE: The stated purpose of this project is shore stabilization and erosion protection, enhance water quality, and enhance fish and wildlife habitat.

The decision whether to issue a permit will be based on an evaluation of the activity's probable impact including its cumulative impacts on the public interest. The decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the work must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the work will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, cultural values, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs and welfare of the people. A Department of the Army permit will be granted unless the District Engineer determines that it would be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Comments on the proposed work should be submitted, in writing, within 30 days to the District Engineer, U.S. Army Corps of Engineers, Philadelphia District, Wanamaker Building, 100 Penn Square East, Philadelphia, Pennsylvania 19107-3390.

The USACE Cultural Resource Specialist is currently reviewing the proposed permit action for potential impacts to Historic Properties eligible for or listed on the National Register of Historic Places. A determination of effects will be coordinated with the State Historic Preservation Office, the Tribes and other consulting parties.

A preliminary review of this application indicates that the proposed work is not likely to adversely affect NOAA Fisheries listed species or their critical habitat pursuant to Section 7 of the Endangered Species Act, as amended. Consultation will be concluded prior to the final decision of this permit application in accordance to the procedures outlined set forth under the 2017 NLAA program that the Corp has established with NOAA Fisheries protective resource division.

The Magnuson-Stevens Fishery Conservation and Management Act requires all federal agencies to consult with the NOAA Fisheries all actions, or proposed actions, permitted, funded, or undertaken by the agency that may adversely affect Essential Fish Habitat (EFH). A preliminary review of this application indicates that EFH is present within the project area. The Philadelphia District will evaluate the potential effects of the proposed actions on EFH and will consult with NOAA Fisheries as appropriate. Consultation will be concluded prior to the final decision on this permit application.

Compensatory mitigation: In accordance with the June 9, 2008 U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (33 CFR 325 and 332 and 40 CFR 230), the applicant has stated that the proposed project has been designed to avoid and minimize adverse effects on the aquatic environment to the maximum extent practicable. Because the purpose of the project is habitat enhancement, compensatory mitigation is not proposed.

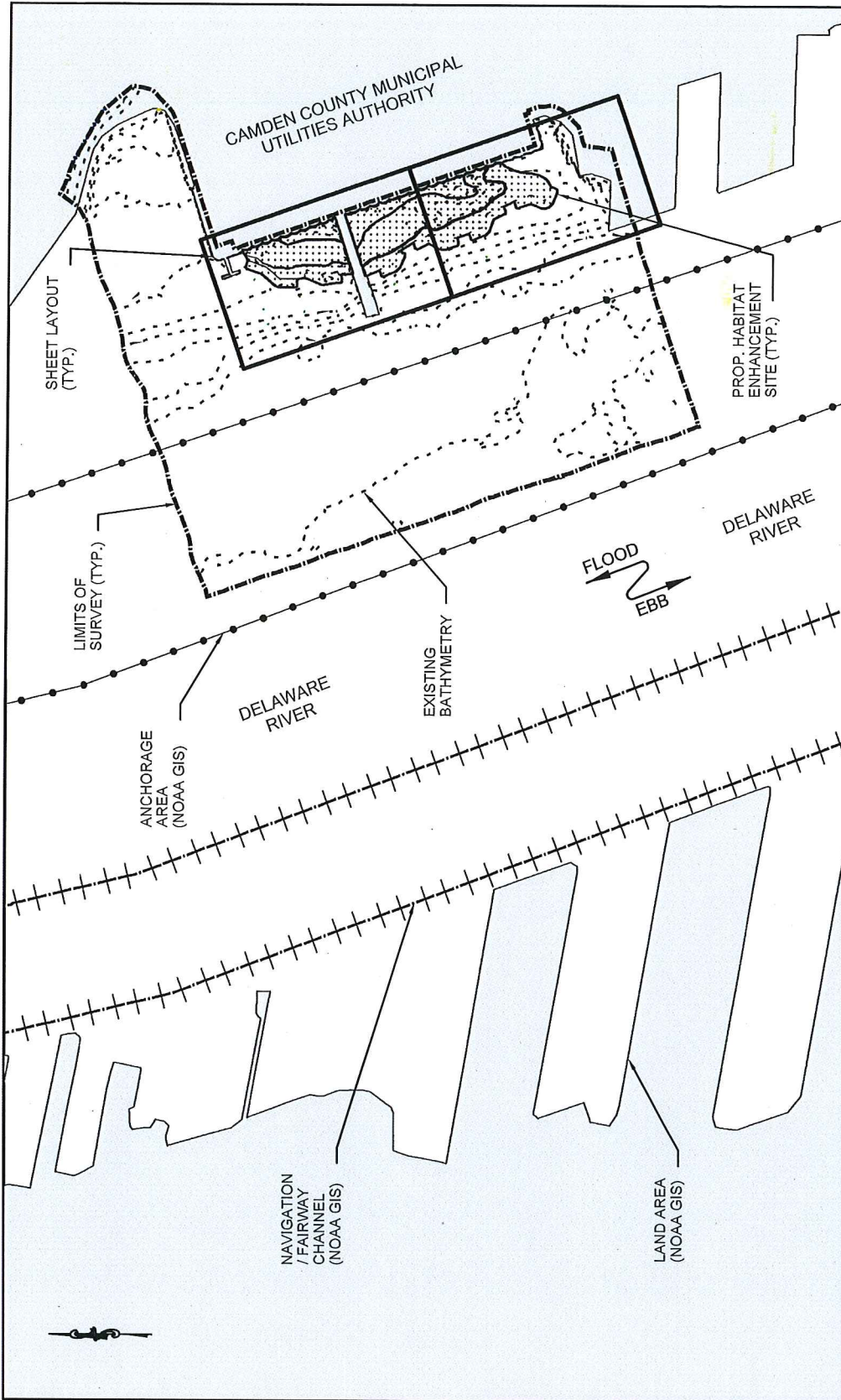
In accordance with Section 307(c) of the Coastal Zone Management Act of 1972, applicants for Federal Licenses or Permits to conduct an activity affecting land or water uses in a State's coastal zone must provide certification that the activity complies with the State's Coastal Zone Management Program. The applicant has stated that the proposed activity complies with and will be conducted in a manner that is consistent with the approved State Coastal Zone Management (CZM) Program. No permit will be issued until the State has concurred with the applicant's certification or has waived its right to do so. Comments concerning the impact of the proposed and/or existing activity on the State's coastal zone should be sent to this office, with a copy to the State's Office of Coastal Zone Management.

The evaluation of the impact of the work described above on the public interest will include application of the guidelines promulgated by the Administrator, U.S. Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act.

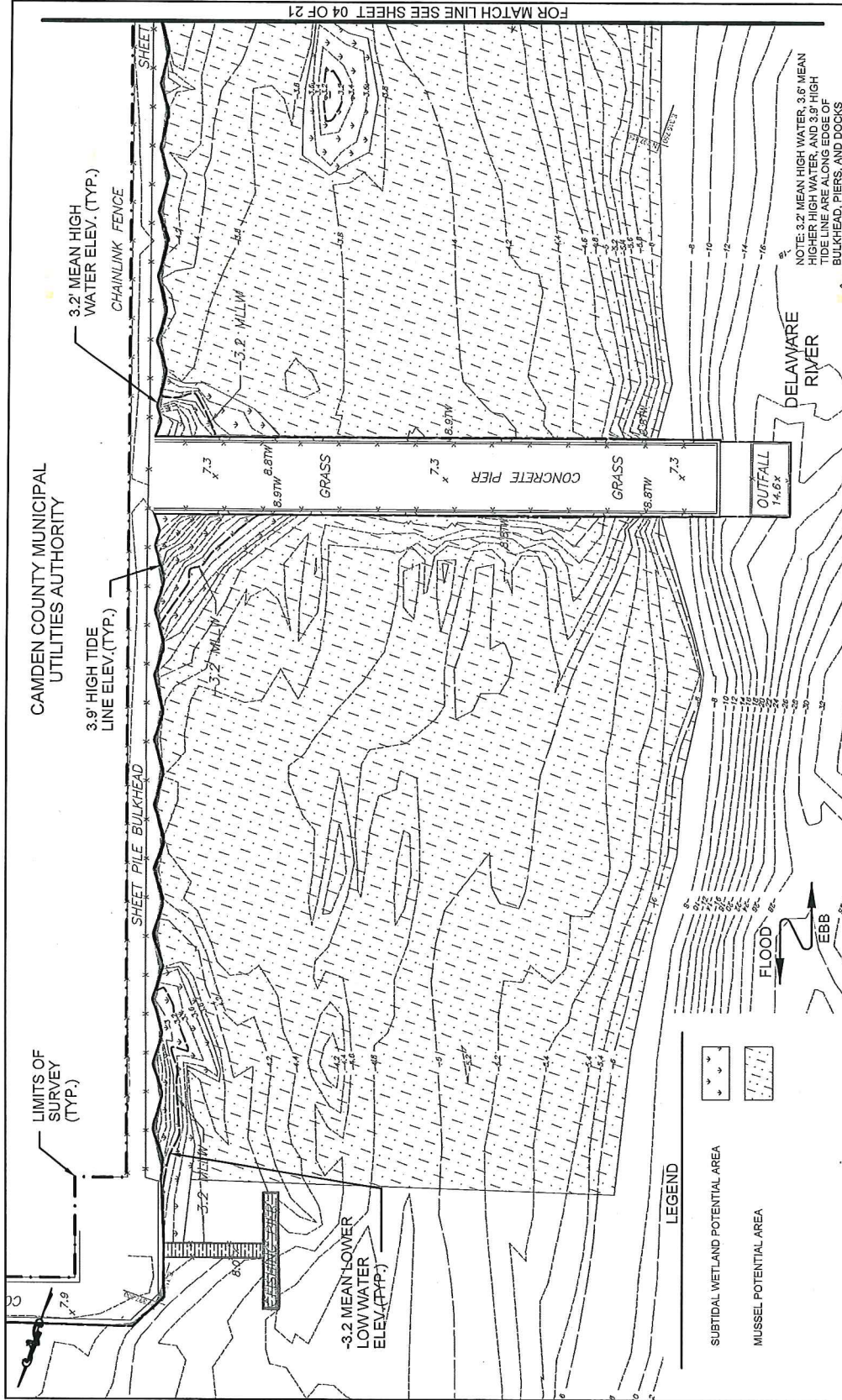
Any person may request, in writing, to the District Engineer, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for a public hearing shall state in writing, with particularity, the reasons for holding a public hearing.

Additional information concerning this permit application may be obtained by contacting Ms. Kendall Miller of my staff at via email at Kendall.L.Miller@usace.army.mil, or by writing this office at the above address.

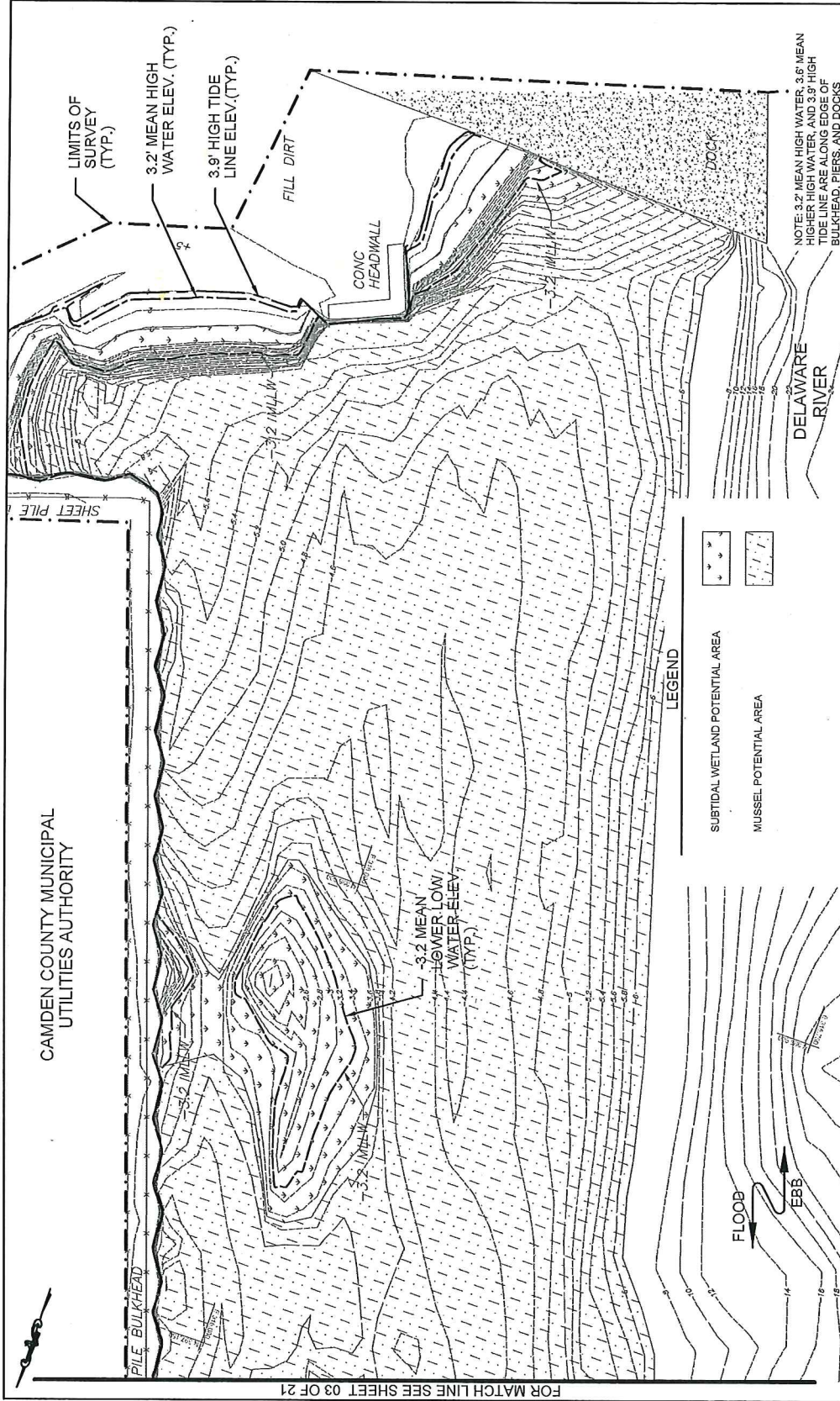
Edward E. Bonner
Chief, Regulatory Branch



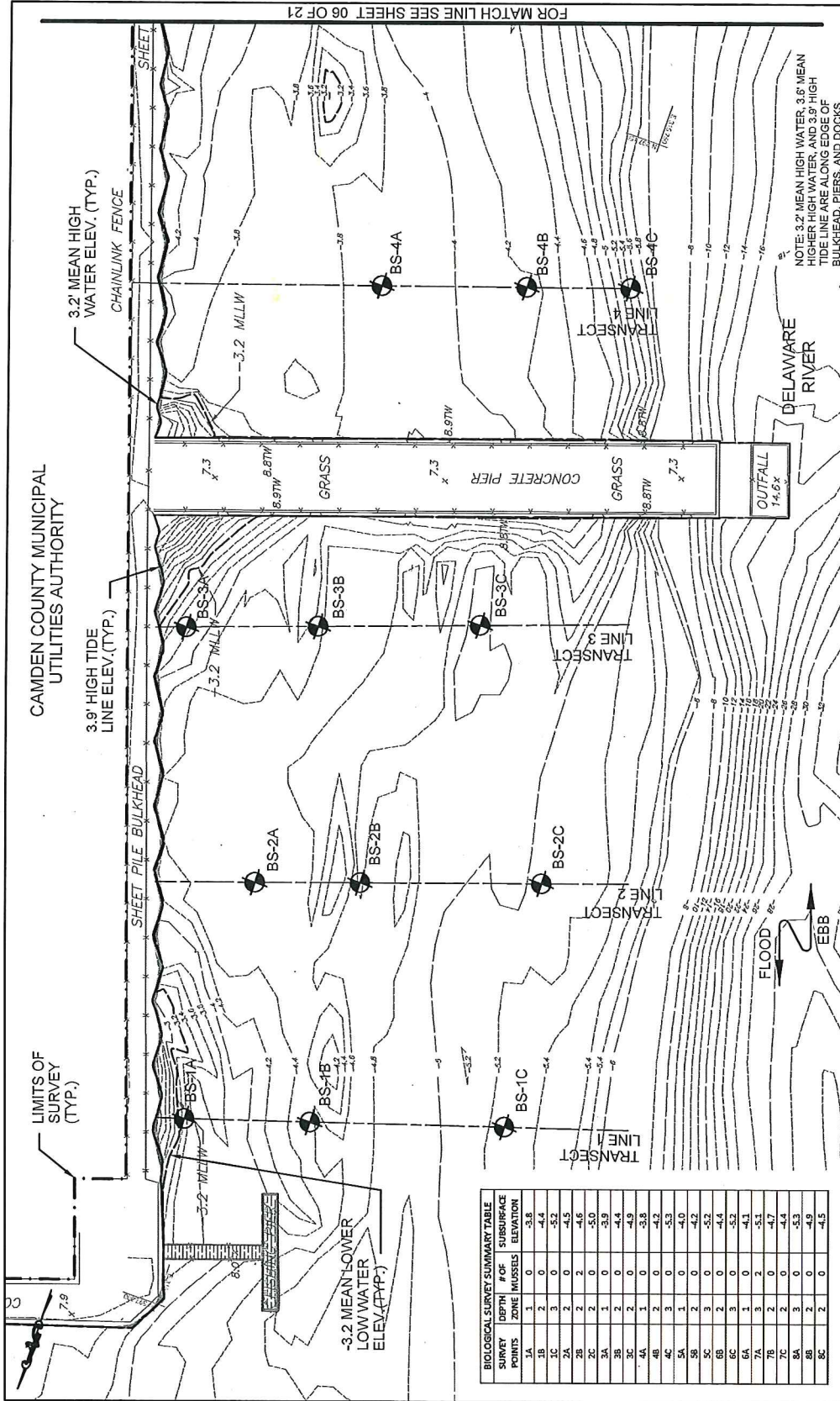
STANTEC, INC. 5110 FROST PLACE, LAUREL, MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4990 FAX: (302) 665-4991		CCMUA DELAWARE RIVER HABITAT ENHANCEMENT OVERALL SITE & SHEET LAYOUT PLAN		DATE: MAY 2018 SCALE: 1" = 500' SHEET: 02 OF 21
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN		
DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'				



STANTEC, INC. 2110 FIRST PLACE LAUREL, MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4990 FAX: (302) 665-4991		CCMUA DELAWARE RIVER HABITAT ENHANCEMENT EXISTING CONDITIONS PLAN - 1		DATE: MAY 2018 SCALE: 1" = 80' SHEET: 03 OF 21
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN		DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'
NO.	REVISION	DESCRIPTION	DATE	



STANTEC, INC. 110 FROST PLACE, LAUREL, MD 20707 PHONE: (301) 342-3120 FAX: (301) 220-2483		CCMUA DELAWARE RIVER HABITAT ENHANCEMENT EXISTING CONDITIONS PLAN - 2		DATE: MAY 2018 SCALE: 1" = 80'
PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4990 FAX: (302) 655-4991		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN		SHEET: 04 OF 21
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'		
NO.	REVISION	DESCRIPTION	DATE	



BIOLOGICAL SURVEY SUMMARY TABLE

SURVEY POINTS	DEPTH	# OF ZONE MUSSELS	SUBSURFACE ELEVATION
1A	1	0	-3.8
1B	2	0	-4.4
1C	3	0	-5.2
2A	2	0	-4.5
2B	2	2	-4.6
2C	2	0	-5.0
3A	1	0	-3.9
3B	2	0	-4.4
3C	2	0	-4.9
4A	1	0	-5.8
4B	2	0	-5.2
4C	3	0	-5.0
5A	1	0	-4.0
5B	2	0	-5.2
5C	3	0	-4.4
6A	1	0	-4.1
6B	2	0	-5.2
6C	3	0	-5.2
7A	3	2	-5.1
7B	2	0	-4.7
7C	2	0	-4.4
8A	3	0	-5.3
8B	2	0	-4.9
8C	2	0	-4.5

STANTEC, INC.
 6110 FROST PLACE LAUREL, MD 20707
 PHONE: (301) 542-3120 FAX: (301) 220-2483

PARTNERSHIP FOR THE DELAWARE ESTUARY
 110 POPLAR STREET, WILMINGTON, DE 19801
 PHONE: (302) 655-4990 FAX: (302) 655-4991

CCMUA DELAWARE RIVER HABITAT ENHANCEMENT
 BIOLOGICAL SURVEY PLAN - 1

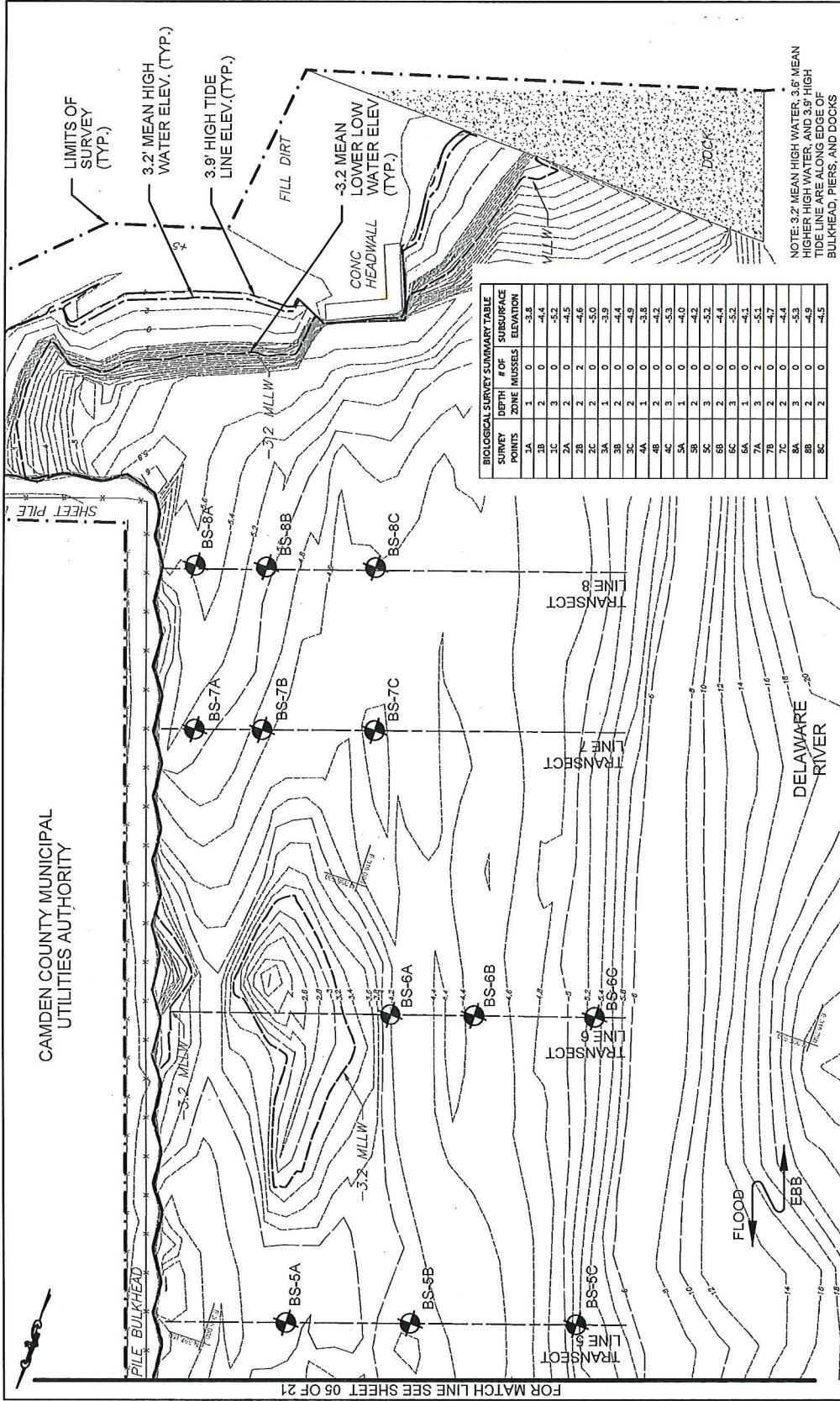
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2)
 IN: DELAWARE RIVER
 CITY OF CAMDEN
 STATE OF NEW JERSEY

DATE: MAY 2018
 SCALE: 1" = 80'

SHEET: 05 OF 21

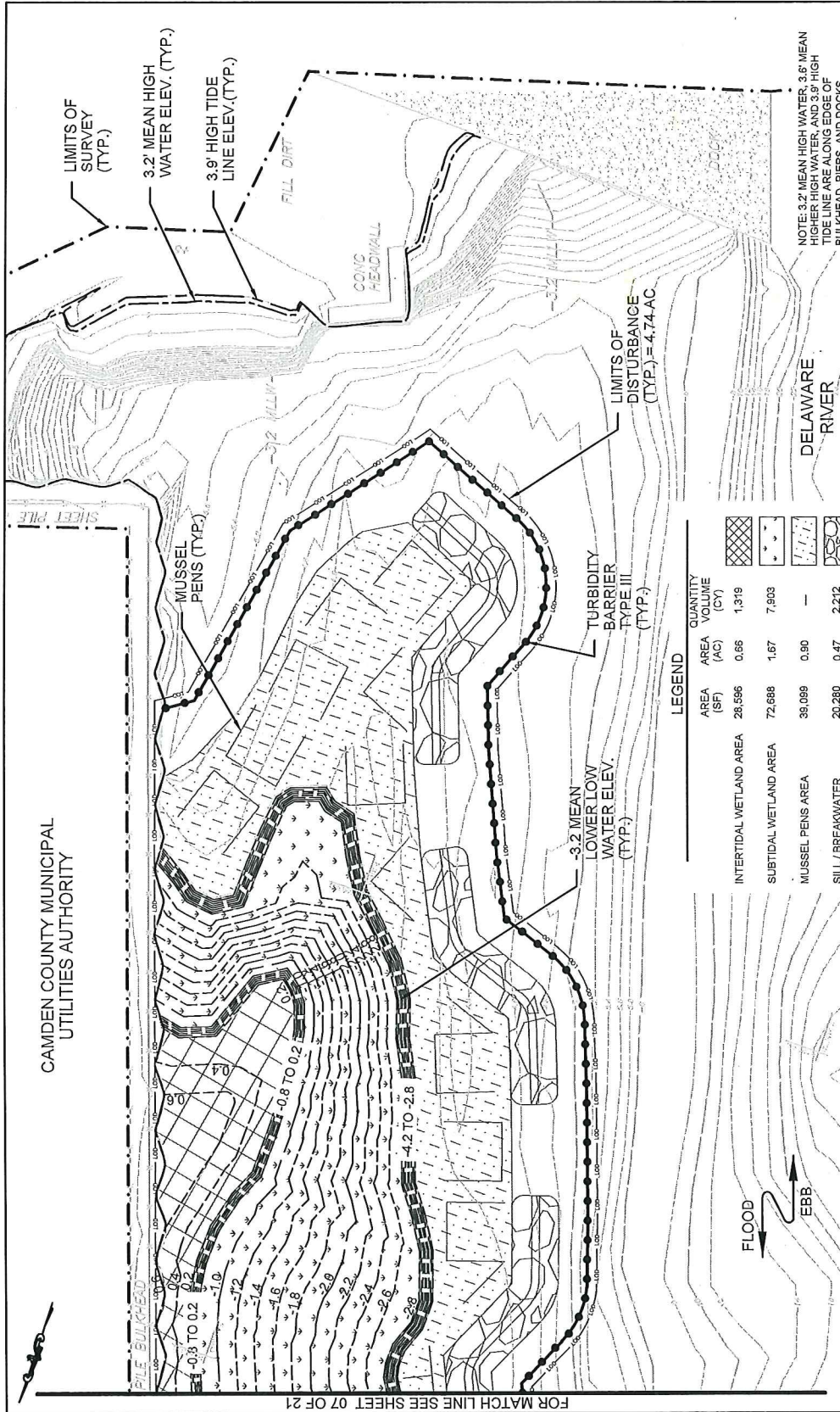
APPLICATION BY: STANTEC, INC.
 PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE
 DESIGNED BY: JEFF TABAR
 DRAWN BY: KHIEM NGUYEN

DATUM: NAVD 88
 (NGVD 29 CONVERSION: + 0.115)
 MLLW: -3.2' MHHW: 3.6'



BIOLOGICAL SURVEY SUMMARY TABLE			
SURVEY POINTS	DEPTH	ZONE	# OF MUSSELS
1A	1	0	-3.8
1B	2	0	-4.4
1C	3	0	-5.2
2A	2	2	-4.5
2B	2	2	-4.6
2C	2	2	-5.0
3A	1	0	-3.9
3B	2	0	-4.4
3C	2	0	-4.9
4A	1	0	-3.8
4B	2	0	-4.2
4C	3	0	-5.3
5A	1	0	-4.0
5B	2	0	-4.2
5C	3	0	-5.2
6A	1	0	-4.1
6B	2	0	-4.7
6C	3	0	-5.3
7A	1	0	-4.1
7B	2	0	-4.4
7C	3	0	-4.9
8A	1	0	-4.9
8B	2	0	-4.9
8C	3	0	-4.5

STANTEC, INC. 310 FROST PLACE, LAUREL, MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483		CCMUA DELAWARE RIVER HABITAT ENHANCEMENT BIOLOGICAL SURVEY PLAN - 2		DATE: MAY 2018 SCALE: 1" = 80'
PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4960 FAX: (302) 655-4991		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN		SHEET: 06 OF 21
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'		
NO.	REVISION	DESCRIPTION	DATE	



NOTE: 3.2' MEAN HIGH WATER, 3.6' MEAN HIGHER HIGH WATER, AND 3.9' HIGH TIDE LINE ARE ALONG EDGE OF BULKHEAD, PIERS, AND DOCKS

DATE:	MAY 2018	SCALE:	1" = 80'
SHEET:	08 OF 21		
DATUM:	NAVD 88		
(NGVD 29 CONVERSION: + 0.115)			
MLLW: -3.2'			MHHW: 3.6'

CCMUA DELAWARE RIVER HABITAT ENHANCEMENT		APPLICATION BY: STANTEC, INC.
EROSION & SEDIMENT CONTROL PLAN - 2		PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE
DESIGNED BY: JEFF TABAR		
DRAWN BY: KHIEM NGUYEN		
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2)		
IN: DELAWARE RIVER		
CITY OF CAMDEN		
STATE OF NEW JERSEY		

STANTEC, INC.		
6110 FROST PLACE, LAUREL, MD 20707		
PHONE: (301) 542-3120 FAX: (301) 220-2483		
PARTNERSHIP FOR THE DELAWARE ESTUARY		
110 POPLAR STREET, WILMINGTON, DE 19801		
PHONE: (302) 665-4990 FAX: (302) 655-4991		
NO.	REVISION	DATE
	DESCRIPTION	

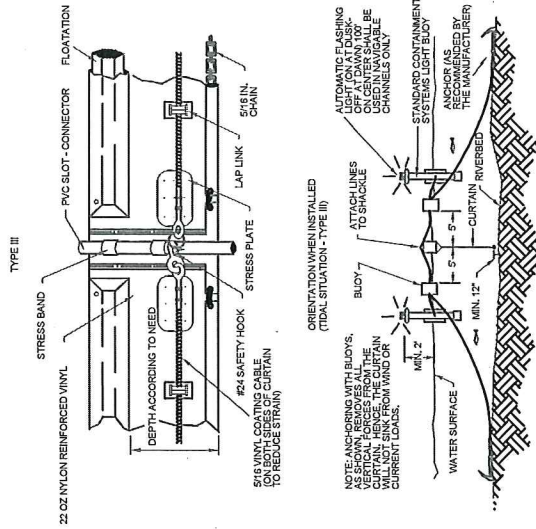
LEGEND		QUANTITY
AREA (SF)	AREA (AC)	VOLUME (CY)
INTERSTITIAL WETLAND AREA	28,596	0.66
SUBTIDAL WETLAND AREA	72,688	1.67
MUSSEL PENS AREA	38,099	0.90
SILL / BREAKWATER	20,280	0.47
		2,212



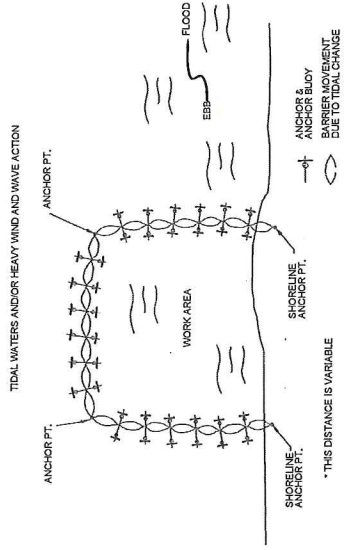
SILT FENCE CONSTRUCTION AND INSTALLATION DETAILS - ATTACHING FABRIC TO POSTS AND TRENCHING

SILT FENCE CONSTRUCTION AND
INSTALLATION DETAILS -
POST SPACING AND ATTACHING
TWO SILT FENCES

STANTEC, INC. 6110 FROST PLACE, LAUREL, MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483		DATE: MAY 2018		SCALE: N.T.S.	
PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 655-4990 FAX: (302) 655-4981		CCMUA DELAWARE RIVER HABITAT ENHANCEMENT			
REVISION		EROSION AND SEDIMENT CONTROL DETAILS			
NO.		REVISION		APPLICATION BY: STANTEC, INC.	
DESCRIPTION		DATE		PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE	
				DESIGNED BY: JEFF TABAR	
				DRAWN BY: KHIEU NGUYEN	
				DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'	
				SHEET: 09 OF 21	

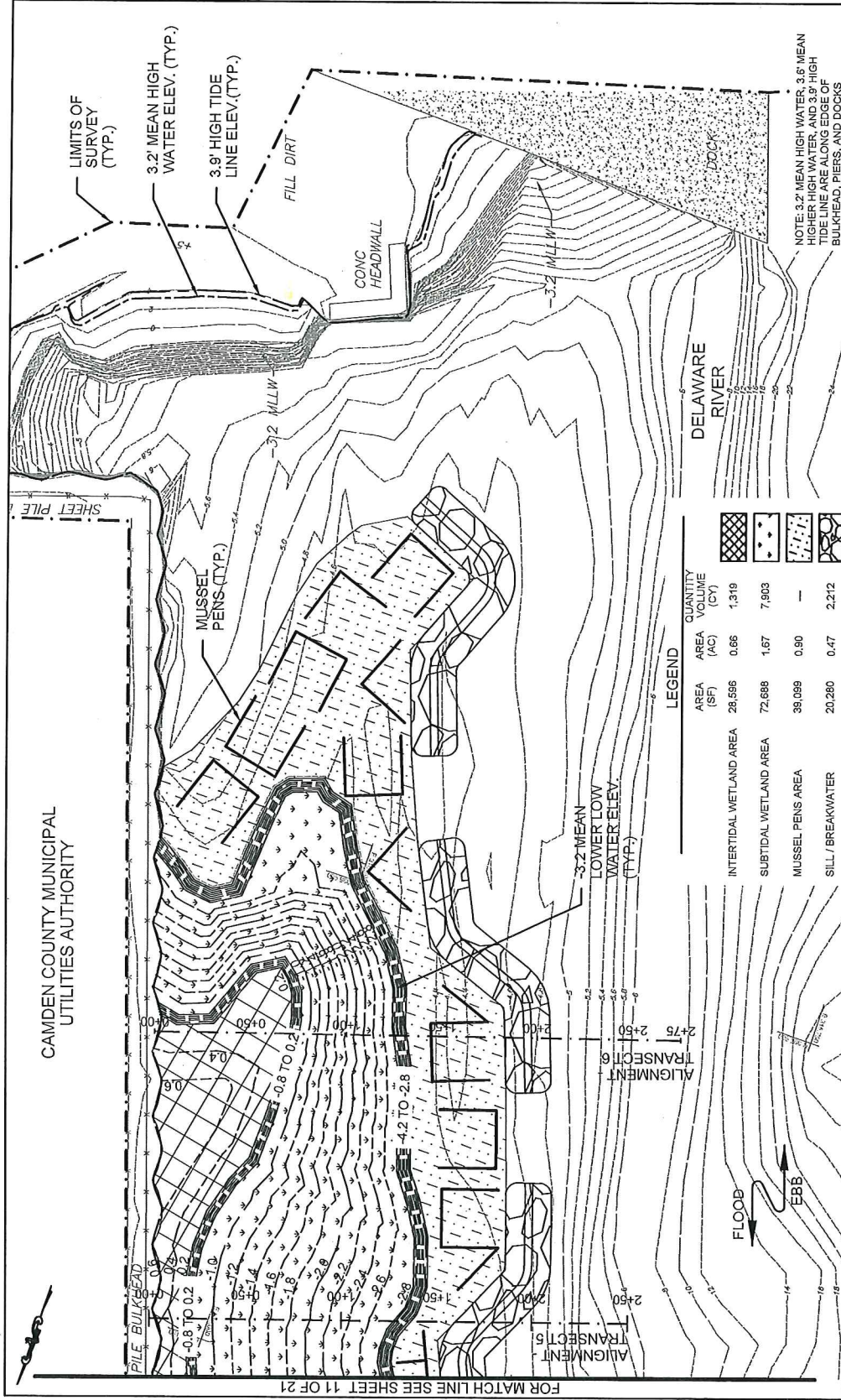


FLOATING TURBIDITY BARRIER TYPE III



TYPICAL INSTALLATION LAYOUT OF FLOATING TURBIDITY BARRIERS

STANTEC, INC. 6110 PROSPECT PLACE, LAUREL, MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4990 FAX: (302) 655-4991		DATE: MAY 2018	SCALE: N.T.S.
CCMUA DELAWARE RIVER HABITAT ENHANCEMENT EROSION AND SEDIMENT CONTROL DETAILS		SHEET: 10 OF 21	
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEW NGUYEN	
NO. _____ REVISION _____ DESCRIPTION _____ DATE _____		DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'	



STANTEC, INC.
 8110 FROST PLACE, LAUREL, MD 20707
 PHONE: (301) 542-3120 FAX: (301) 220-2483
PARTNERSHIP FOR THE DELAWARE ESTUARY
 110 POPULAR STREET, WILMINGTON, DE 19801
 PHONE: (302) 655-4990 FAX: (302) 655-4991

CCMUA DELAWARE RIVER HABITAT ENHANCEMENT
PROPOSED GRADING & DESIGN PLAN - 2

AT: CAMDEN - CCMUA (BLOCK 454, LOT 2)
 IN: DELAWARE RIVER
 CITY OF CAMDEN
 STATE OF NEW JERSEY

APPLICATION BY: STANTEC, INC.
 PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE
 DESIGNED BY: JEFF TABAR
 DRAWN BY: KHIEW NGUYEN

DATE: MAY 2018
 SCALE: 1" = 80'
 SHEET: 12 OF 21

DATUM: NAVD 88
 (NGVD 29 CONVERSION: + 0.115)
 MLLW: -3.2' MHHW: 3.6'

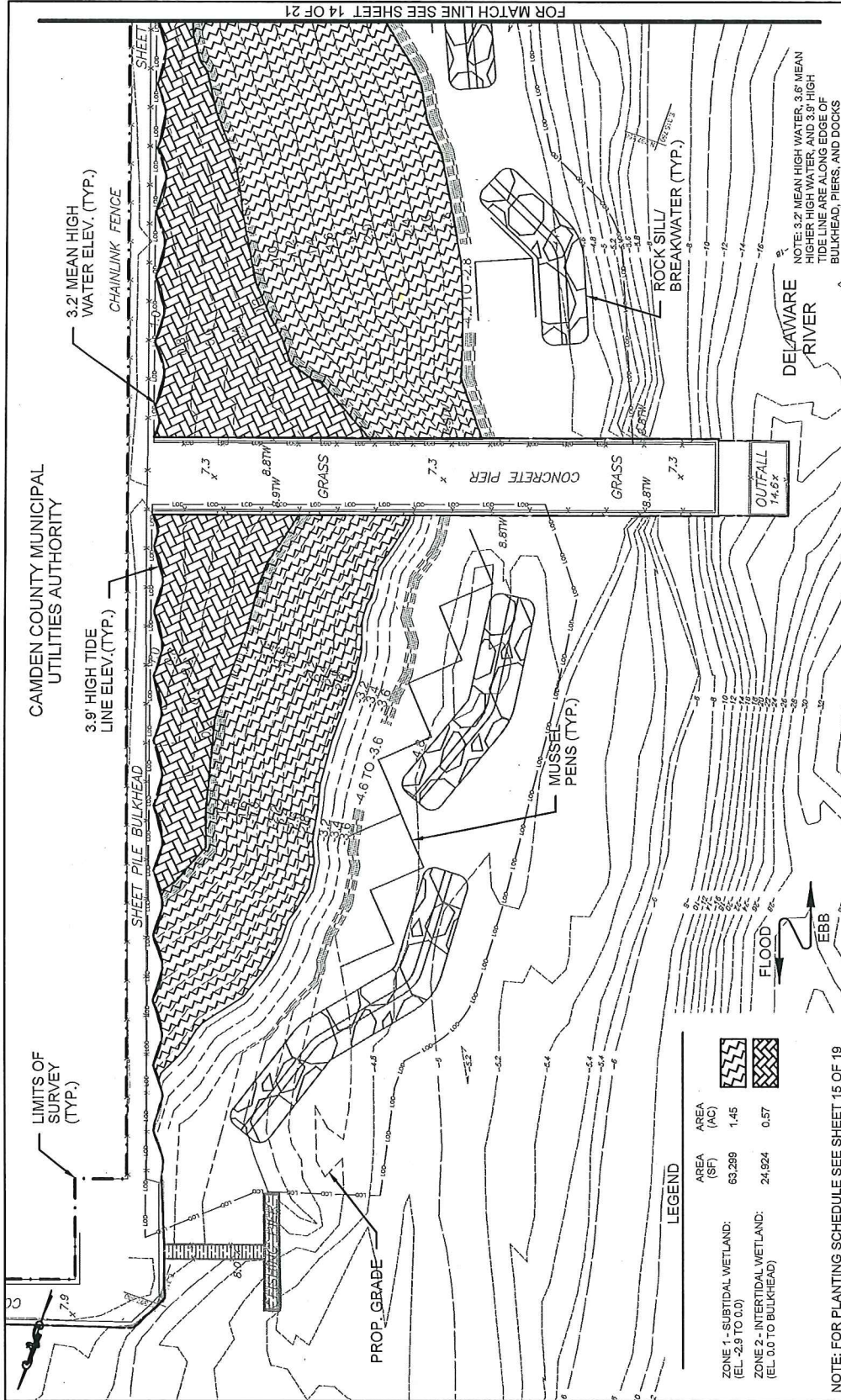
NO.	REVISION	DATE

LEGEND

	AREA (SF)	AREA (AC)	QUANTITY VOLUME (CY)
INTERSTITIAL WETLAND AREA	28,596	0.66	1,319
SUBTIDAL WETLAND AREA	72,686	1.67	7,903
MUSSEL PENS AREA	39,099	0.90	—
SILL / BREAKWATER	20,280	0.47	2,212

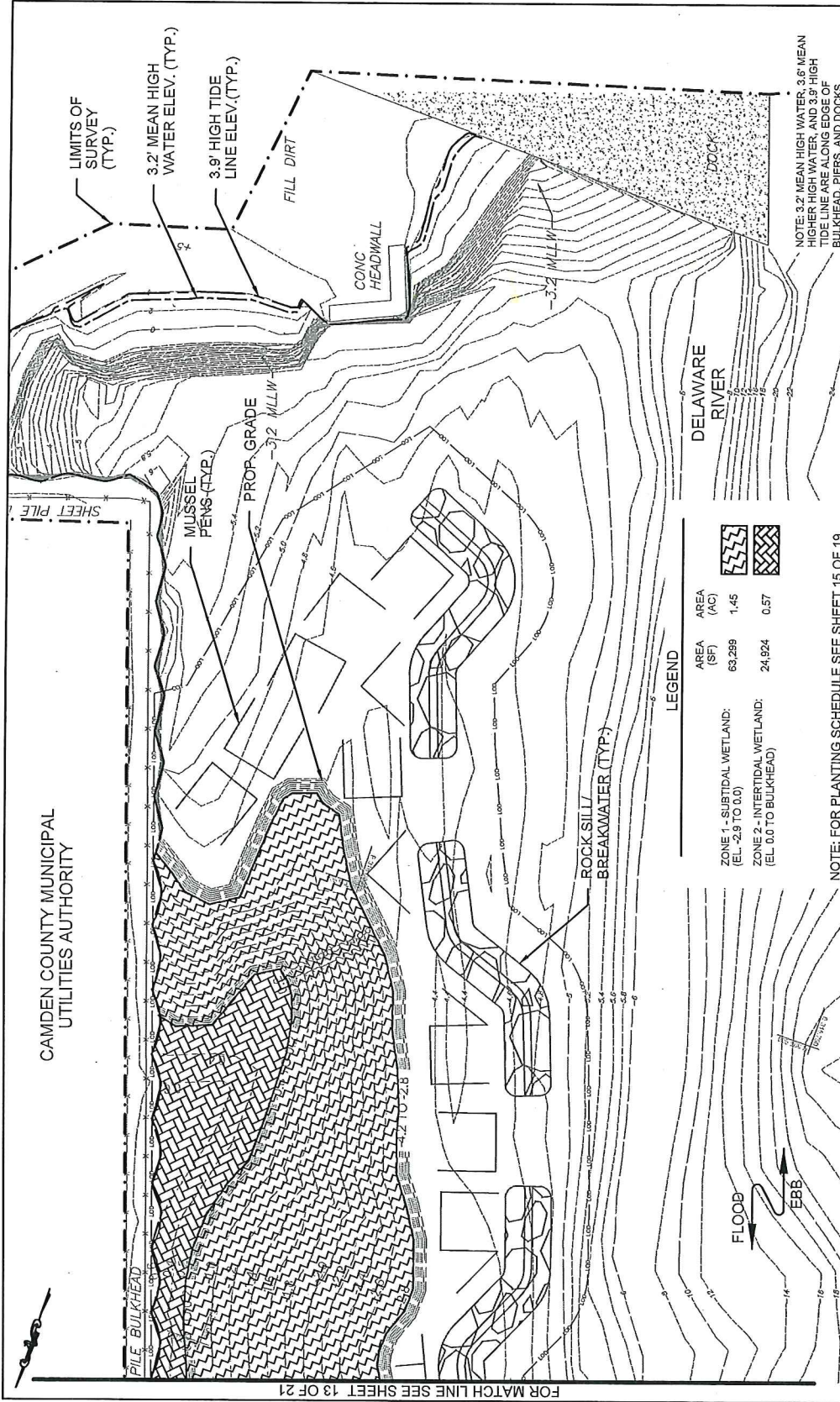
CAMDEN COUNTY MUNICIPAL UTILITIES AUTHORITY

FOR MATCH LINE SEE SHEET 11 OF 21



CCMUA DELAWARE RIVER HABITAT ENHANCEMENT PLANTING PLAN - 1		DATE: MAY 2018 SCALE: 1" = 80' SHEET: 13 OF 21
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY	APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN	DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'
NO. _____ REVISION _____ DESCRIPTION _____ DATE _____		

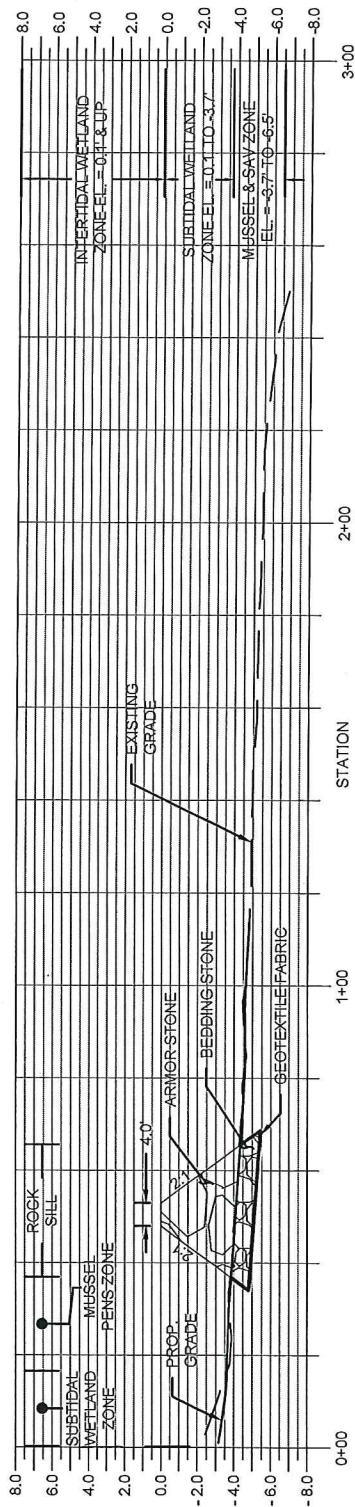
NOTE: FOR PLANTING SCHEDULE SEE SHEET 15 OF 19
STANTEC, INC.
 6110 FROST PLACE, LAUREL, MD 20707
 PHONE: (301) 542-3120 FAX: (301) 220-2483
PARTNERSHIP FOR THE DELAWARE ESTUARY
 110 POPLAR STREET, WILMINGTON, DE 19801
 PHONE: (302) 665-4990 FAX: (302) 655-4991



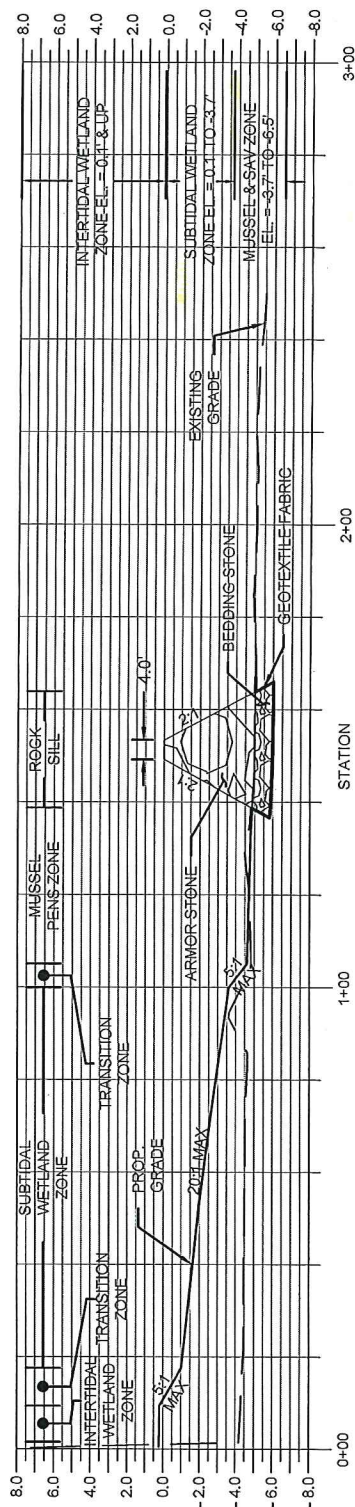
STANTEC INC. 6110 FROST PLACE LAUREL, MD 20707 PHONE: (301) 542-5120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4990 FAX: (302) 655-4991		CCMUA DELAWARE RIVER HABITAT ENHANCEMENT PLANTING PLAN - 2		DATE: MAY 2018 SCALE: 1" = 80' SHEET: 14 OF 21
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN		DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'
NO.	REVISION			
	DESCRIPTION			
	DATE			

LEGEND		
AREA (SF)	AREA (AC)	
63,299	1.45	ZONE 1 - SUBTIDAL WETLAND: (EL. -2.8 TO 0.0)
24,924	0.57	ZONE 2 - INTERTIDAL WETLAND: (EL. 0.0 TO BULKHEAD)

STANTEC, INC. 210 FROST PLACE, LAUREL, MD 20707 PHONE: (301) 342-3120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4990 FAX: (302) 665-4991		CCMUA DELAWARE RIVER HABITAT ENHANCEMENT PLANTING SCHEDULE		DATE: MAY 2018 SCALE: N.T.S. SHEET: 15 OF 21																																																																													
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN		DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'																																																																													
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ALIGNMENT - TRANSECT 1



ALIGNMENT - TRANSECT 2

NOTE: FOR TRANSECT LINE 1 & 2, REFER TO SHEET 11 OF 21

STANTEC INC.
 6110 FROST PLACE LAUREL, MD 20707
 PHONE: (301) 542-3120 FAX: (301) 220-2483
PARTNERSHIP FOR THE DELAWARE ESTUARY
 110 POPLAR STREET, WILMINGTON, DE 19801
 PHONE: (302) 655-4990 FAX: (302) 655-4991

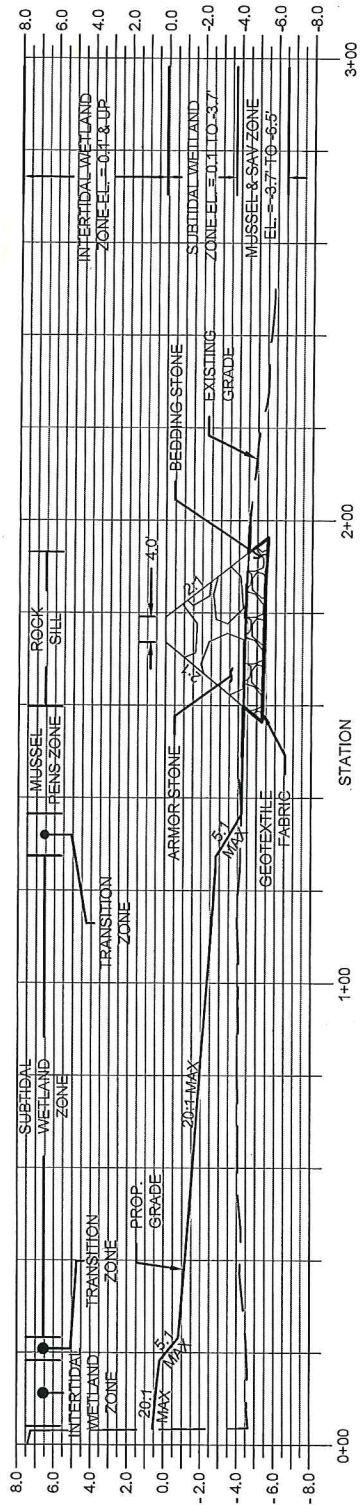
CCMUA DELAWARE RIVER HABITAT ENHANCEMENT SITE CROSS SECTIONS

DATE: MAY 2018	SCALE: V: 1" = 10' H: 1" = 40'
SHEET: 16 OF 21	

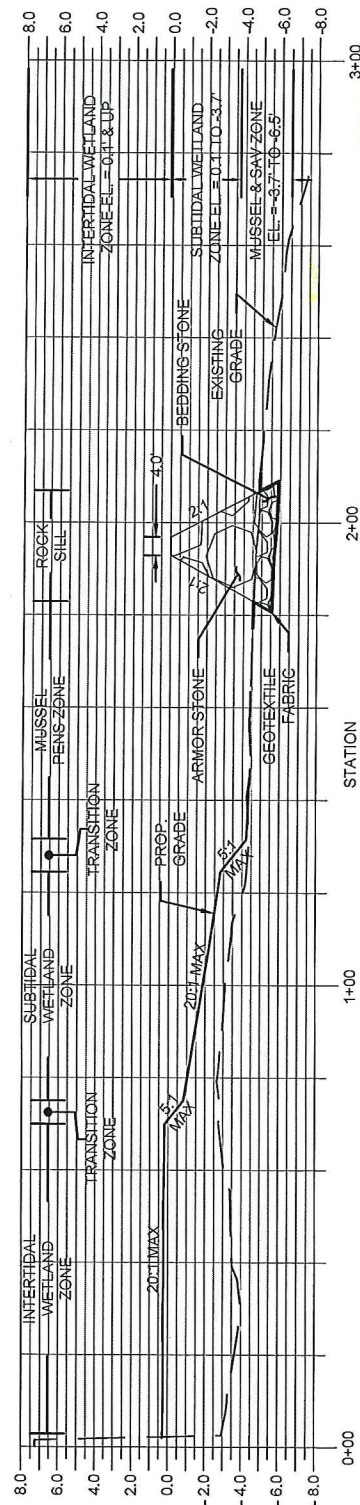
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2)	APPLICATION BY: STANTEC, INC.
IN: DELAWARE RIVER	PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE
CITY OF CAMDEN	DESIGNED BY: JEFF TABAR
STATE OF NEW JERSEY	DRAWN BY: KHIEM NGUYEN

NO.	REVISION	DESCRIPTION	DATE

DATUM: NAVD 88
 (NGVD 29 CONVERSION: + 0.115)
 MLLW: -3.2' MHHW: 3.6'



ALIGNMENT - TRANSECT 3



ALIGNMENT - TRANSECT 4

NOTE: FOR TRANSECT LINE 3 & 4, REFER TO SHEET 11 OF 21

STANTEC, INC.
6110 FROST PLACE, LAUREL, MD 20707
PHONE: (301) 542-3120 FAX: (301) 220-2483
PARTNERSHIP FOR THE DELAWARE ESTUARY
1100 POPLAR STREET, WILMINGTON, DE 19801
PHONE: (302) 665-4960 FAX: (302) 655-4991

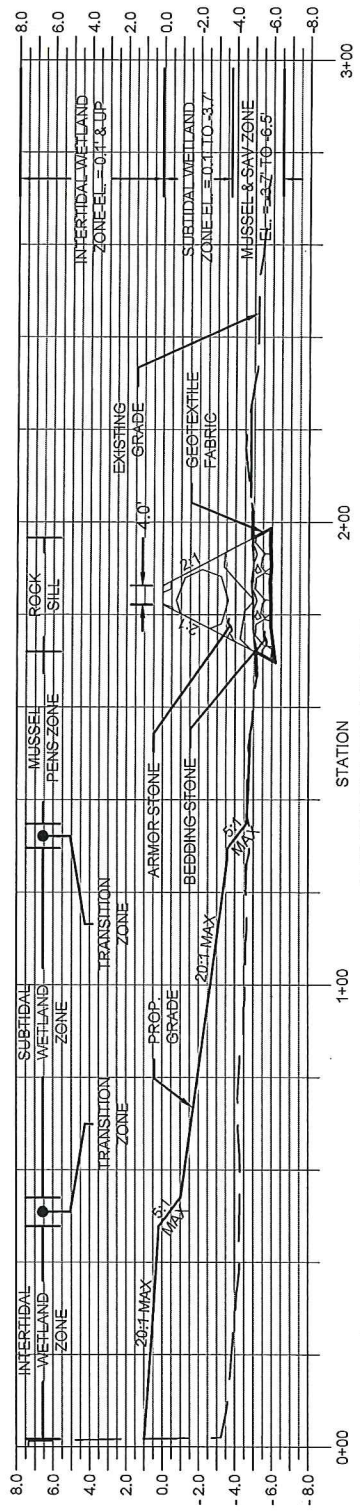
CCMUA DELAWARE RIVER HABITAT ENHANCEMENT SITE CROSS SECTIONS

AT: CAMDEN - CCMUA (BLOCK 454, LOT 2)
IN: DELAWARE RIVER
CITY OF CAMDEN
STATE OF NEW JERSEY

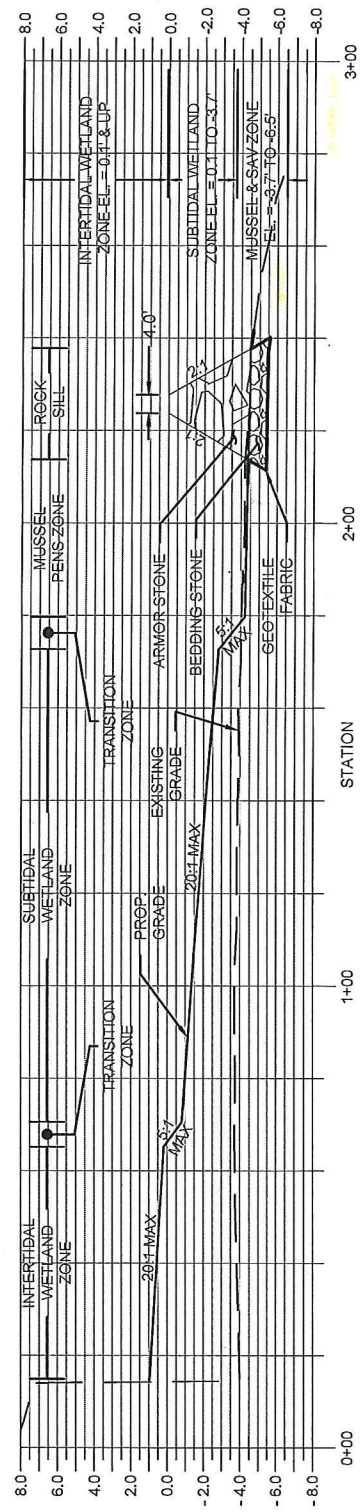
APPLICATION BY: STANTEC, INC.
PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE
DESIGNED BY: JEFF TABAR
DRAWN BY: KHIEM NGUYEN

DATE: MAY 2018	SCALE: V: 1" = 10' H: 1" = 40'
SHEET: 17 OF 21	
DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'	

NO.	REVISION	DATE
	DESCRIPTION	



ALIGNMENT - TRANSECT 5



ALIGNMENT - TRANSECT 6

NOTE: FOR TRANSECT LINE 5 & 6, REFER TO SHEET 12 OF 21

STANTEC, INC.
 9110 FROST PLACE, LAUREL, MD 20707
 PHONE: (301) 342-3120 FAX: (301) 220-2483
PARTNERSHIP FOR THE DELAWARE ESTUARY
 110 POPULAR STREET, WILMINGTON, DE 19801
 PHONE: (302) 655-4890 FAX: (302) 655-4991

NO.	REVISION	DATE

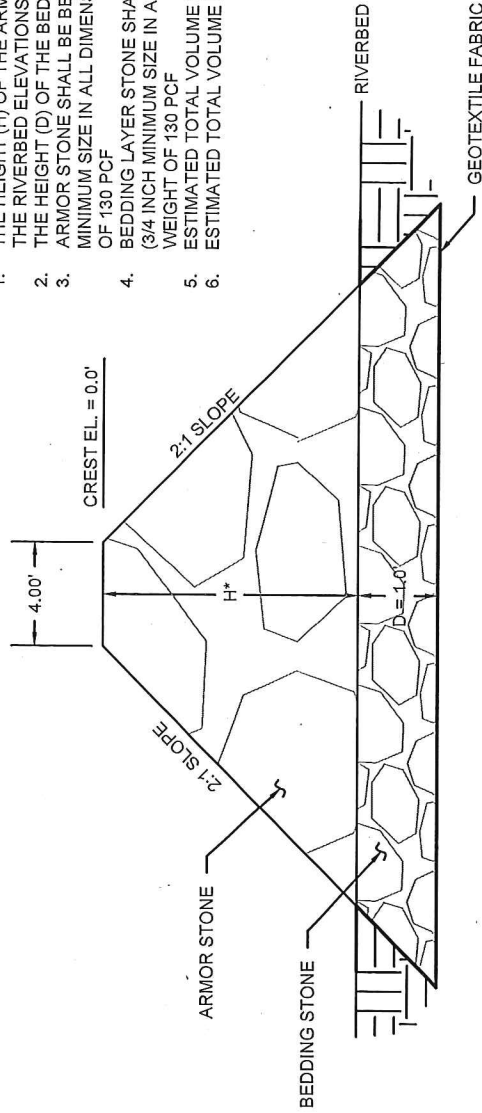
CCMUA DELAWARE RIVER HABITAT ENHANCEMENT SITE CROSS SECTIONS

AT: CAMDEN - CCMUA (BLOCK 454, LOT 2)
 IN: DELAWARE RIVER
 CITY OF CAMDEN
 STATE OF NEW JERSEY

APPLICATION BY: STANTEC, INC.
 PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE
 DESIGNED BY: JEFF TABAR
 DRAWN BY: KHIEM NGUYEN

DATE: MAY 2018	SCALE: V: 1" = 10' H: 1" = 40'
SHEET: 18 OF 21	
DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHHW: 3.6'	

- NOTES:
1. THE HEIGHT (H) OF THE ARMOR SECTION OF THE ROCK SILL VARIES BASED ON THE RIVERBED ELEVATIONS
 2. THE HEIGHT (D) OF THE BEDDING SECTION OF THE ROCK SILL IS 1.0 FT
 3. ARMOR STONE SHALL BE BETWEEN 24 INCH AND 35 INCH STONE (24 INCH MINIMUM SIZE IN ALL DIMENSIONS) AND SHALL HAVE A MINIMUM UNIT WEIGHT OF 130 PCF
 4. BEDDING LAYER STONE SHALL BE BETWEEN 3/4 INCH AND 1 1/2 INCH STONE (3/4 INCH MINIMUM SIZE IN ALL DIMENSIONS) AND SHALL HAVE A MINIMUM UNIT WEIGHT OF 130 PCF
 5. ESTIMATED TOTAL VOLUME FOR ARMORED STONE = 2,212 CY
 6. ESTIMATED TOTAL VOLUME FOR BEDDING STONE = 824 CY

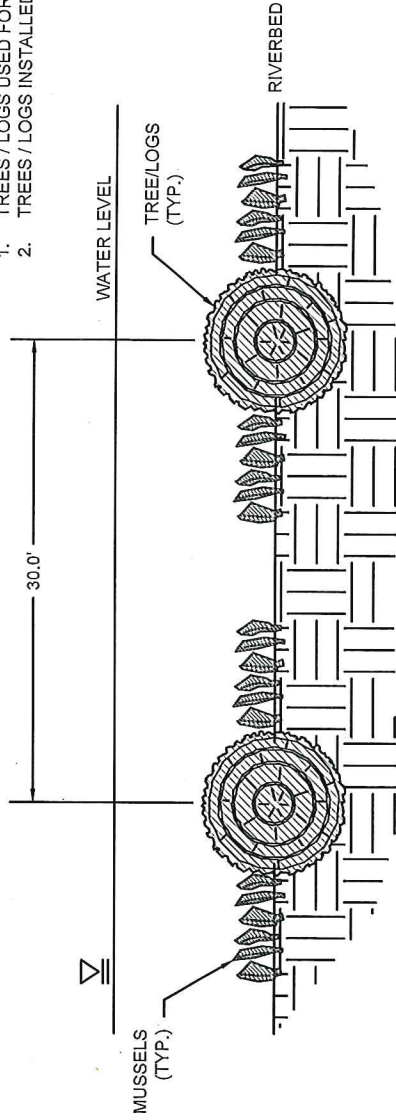


ROCK SILL TYPICAL DETAIL

N.T.S.

STANTEC, INC. 6110 FROST PLACE LAUREL MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 655-4990 FAX: (302) 655-4991		DATE: MAY 2018 SCALE: N.T.S.												
CCMUA DELAWARE RIVER HABITAT ENHANCEMENT DETAIL PLAN		SHEET: 19 OF 21												
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY	APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN	DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MLLW: -3.2' MHW: 3.6'												
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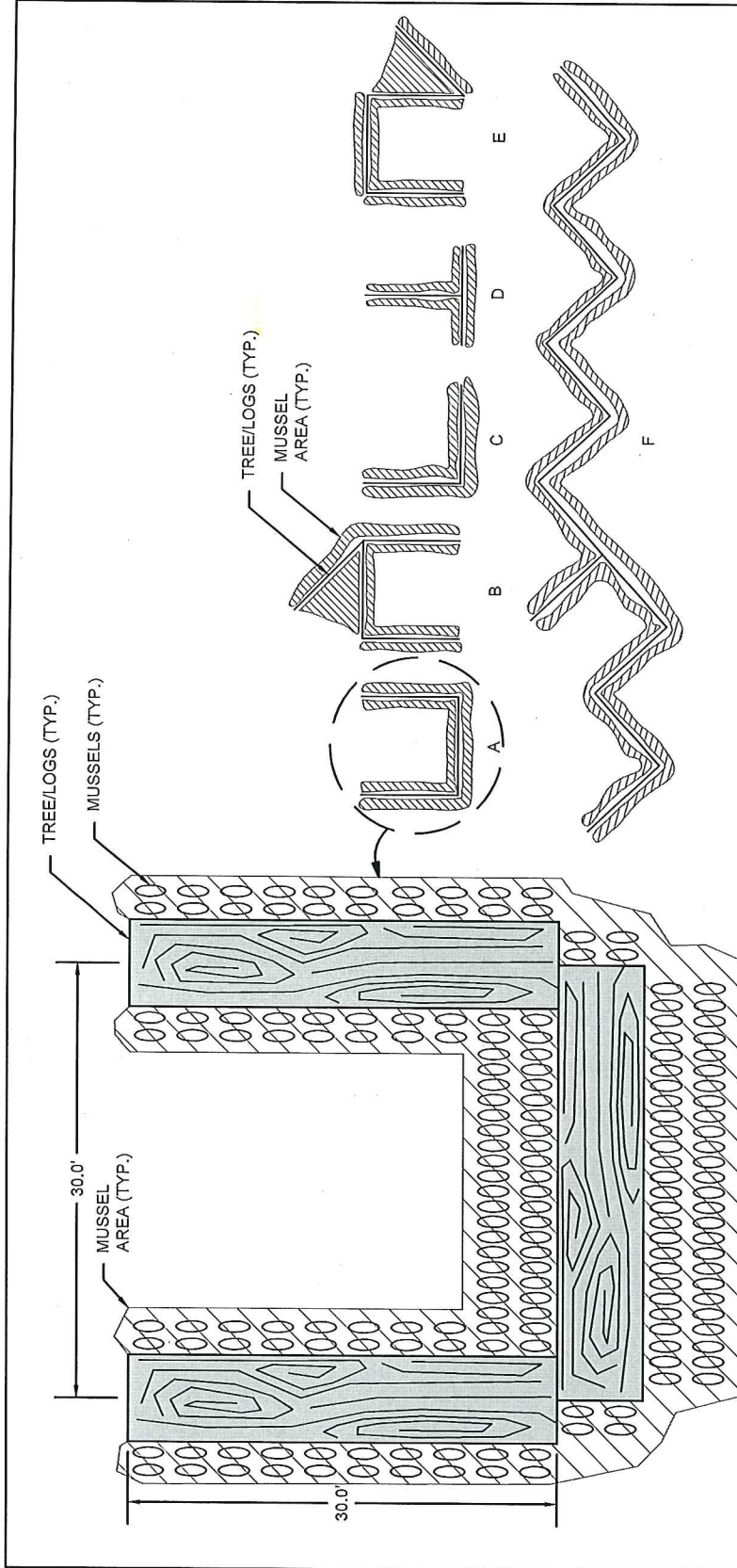
- NOTES:
1. TREES / LOGS USED FOR PENS SHOULD BE APPROXIMATELY 36" IN DIAMETER
 2. TREES / LOGS INSTALLED AT SITE SHOULD BE HALF SUBMERGED INTO SEDIMENT



MUSSEL PENS TYPICAL DETAIL

N.T.S.

STANTEC, INC. 6110 FROST PLACE, LAUREL, MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 1110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4960 FAX: (302) 655-4991		DATE: MAY 2018 SCALE: N.T.S.	SHEET: 20 OF 21
CCMUA DELAWARE RIVER HABITAT ENHANCEMENT DETAIL PLAN		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN	
AT: CAMDEN - CCMUA (BLOCK 454, LOT 2) IN: DELAWARE RIVER CITY OF CAMDEN STATE OF NEW JERSEY		DATUM: NAVD 88 (NGVD 29 CONVERSION: + 0.115) MILLW: -3.2' MHHW: 3.6'	
NO.	REVISION	DATE	
	DESCRIPTION		



MUSSEL PEN "A" PLAN VIEW

MUSSEL PENS CONFIGURATIONS

MUSSEL PENS TYPICAL DETAIL

N.T.S.

STANTEC, INC. 6110 FROST PLACE LAUREL, MD 20707 PHONE: (301) 542-3120 FAX: (301) 220-2483 PARTNERSHIP FOR THE DELAWARE ESTUARY 110 POPLAR STREET, WILMINGTON, DE 19801 PHONE: (302) 665-4990 FAX: (302) 665-4991		DATE: MAY 2018 SCALE: N.T.S.	SHEET: 21 OF 21
CCMUA DELAWARE RIVER HABITAT ENHANCEMENT DETAIL PLAN		APPLICATION BY: STANTEC, INC. PURPOSE: PROVIDE HABITAT ENHANCEMENT AT SITE DESIGNED BY: JEFF TABAR DRAWN BY: KHIEM NGUYEN	
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