CONSTRUCTION PLANS

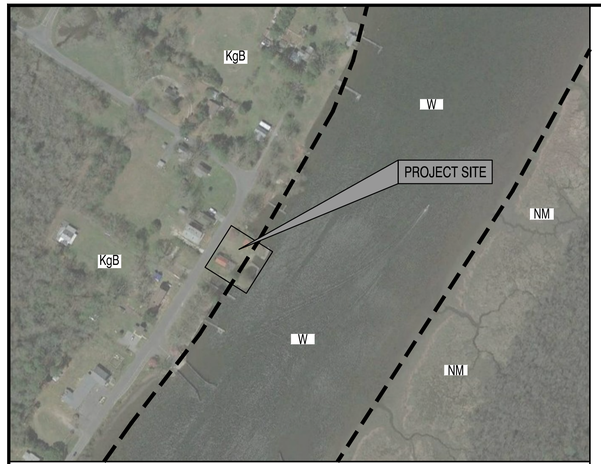
FOR

DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK

T.P. 531-18.00-5.00

5115 WOODLAND FERRY RD, SEAFORD, DE 19973

SEAFORD HUNDRED, SUSSEX COUNTY

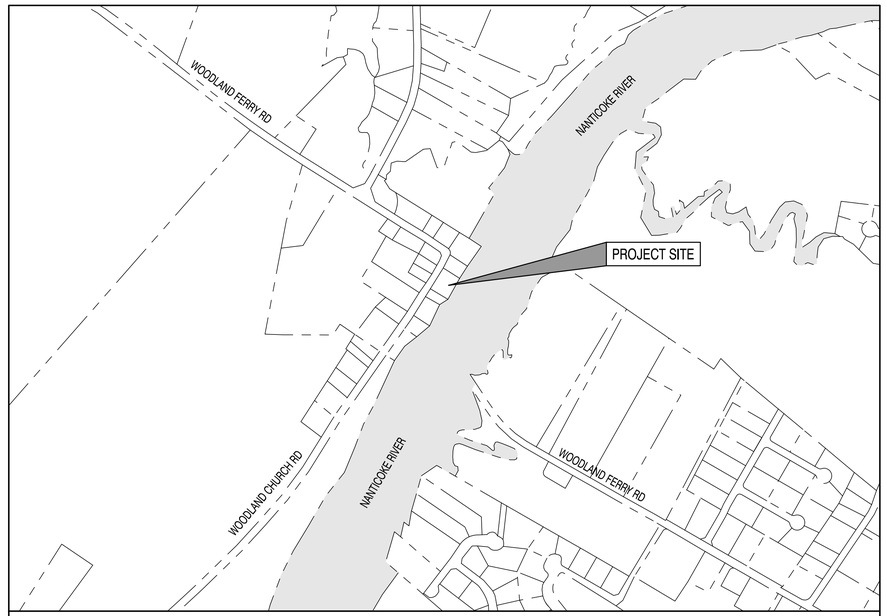


SOIL MAP SCALE: 1" = 200'

SOIL LEGEND

KgB = KLEJ–GALLOWAY COMPLEX, 0 TO 5 PERCENT SLOPES, SOIL GROUP A/D
NM = NANTICOKE AND MANNINGTON SOILS, VERY FREQUENTLY FLOODED, TIDAL, SOIL GROUP C/D
W = WATER

WETLAND MAP SCALE: 1" = 300'



LOCATION MAP

0' 500' 1000' 1500'
SCALE: 1" = 500'

DATA COLUMN

1. TAX PARCEL NUMBER: 531–18.00–5.00
2. SUSSEX COUNTY FILE NUMBER: _____
3. ADDRESS OF SITE: 5115 WOODLAND FERRY RD, SEAFORD, DE 19973
4. ZONING: ST
5. SOURCE OF TITLE: D.B. 4026–211
6. NUMBER OF LOTS: 1
7. LOT AREA: 0.45± ACRES (BASED ON COMPASS POINT SURVEY DATED JUNE, 2016)
8. EXISTING USE: RECREATIONAL AREA
9. PROPOSED USE: RECREATIONAL AREA
10. TOTAL NUMBER OF LOTS: 1 (NO NEW BUILDING LOTS OR OR DWELLINGS PROPOSED BY THIS PLAN)
11. PROPOSED BUILDING SQUARE FOOTAGE: 0 SF
12. MONUMENTS:
    EXISTING: 2 (CONCRETE MONUMENTS)
    PROPOSED: NONE
13. ELECTRIC PROVIDER: DELAWARE ELECTRIC COOPERATIVE
14. SEWER PROVIDER: NO SEWER PROPOSED FOR SITE
15. WATER PROVIDER: NO WATER SERVICE, OR ON–SITE WELL PROPOSED FOR SITE
16. PARKING:
    REQUIRED: N/A
    PROPOSED: 6 STANDARD + 1 VAN–ACCESIBLE = 7 TOTAL
17. SITE BREAKDOWN:

EXISTING SITE	
GRAVEL:	1,110± S.F.
BUILDINGS:	1,514± S.F.
WATER:	5,551± S.F.
OPEN SPACE:	11,398± S.F.
OVERALL TOTAL:	19,573± S.F.

PROPOSED SITE	
GRAVEL PARKING:	4,999± S.F.
OPEN SPACE:	8,913± S.F.
WATER	5,661± S.F.
OVERALL TOTAL:	19,573± S.F.

% PROPOSED IMPERVIOUS COVERAGE:
4,999± S.F. / 19,573± S.F. = 25.5%

19. WETLANDS:
    ALL WETLANDS WORK INCLUDING DELINEATIONS AND PERMITTING ARE TO BE COMPLETED BY THE OWNER. THE CONTRACTOR SHALL ENSURE MAINTAINED COMPLIANCE WITH ALL TERMS OF THE DNREC & USACE PERMITS BEFORE, DURING, & AFTER PROJECT CONSTRUCTION.
20. FLOODPLAIN:
    ACCORDING TO FIRM NO. 10005C0381K, & 10005C0382K DATED MARCH 16, 2015, PORTIONS OF THE SUBJECT PARCEL IS DETERMINED TO BE WITHIN ZONE AE. (BASE FLOOD ELEVATION DETERMINED: ELEV. 6 FEET).
21. STORMWATER MANAGEMENT:
    THIS SITE HAS BEEN APPROVED FOR STORMWATER MANAGEMENT BY THE DNREC DIVISION OF WATERSHED STEWARDSHIP UNDER THE STANDARD PLAN FOR NON–RESIDENTIAL CONSTRUCTION (<1.0 ACRE DISTURBED). DNREC APPROVAL NUMBER 2016–045 (EXPIRATION MAY 24, 2019).
22. GROWTH ZONE:
    THE SUBJECT PARCEL LIES OUTSIDE THE DESIGNATED SUSSEX COUNTY GROWTH ZONE, BUT WITHIN THE HALF MILE PRIORITY AREA.
23. BOUNDARY:
    RIGHT OF WAY, LOCATIONS, PROPERTY LINES PROVIDED BY DELAWARE DIVISION OF FISH & WILDLIFE. CENTURY ENGINEERING, INC. TAKES NO RESPONSIBILITY FOR THEIR ACCURACY.
24. TOPOGRAPHY:
    EXISTING TOPOGRAPHY BASED UPON SURVEY COMPLETED BY COMPASS POINT SURVEYING (UPDATED JUNE, 2016), AND PROVIDED BY DELAWARE DIVISION OF FISH & WILDLIFE. ADDITIONAL BATHYMETRIC AND TOPOGRAPHIC SURVEY DATA PROVIDED BY CENTURY ENGINEERING INC. (DATED APRIL, 2018).
25. HORIZONTAL DATUM: NAD83
    VERTICAL DATUM: NAVD88
26. TOTAL LOD OF SITE: 0.30 ACRES
27. SITE BENCHMARK: CONCRETE MONUMENT (FRONT SOUTHWEST CORNER OF SITE)
28. OWNER/APPLICANT:
    STATE OF DELAWARE
    DIVISION OF FISH & WILDLIFE
    89 KINGS HIGHWAY
    DOVER, DE 19901
    JOHN CLARK
    (302) 739–9914
29. ENGINEER:
    CENTURY ENGINEERING, INC.
    4134 N. DUPONT HIGHWAY
    DOVER, DE 19901
    ALEXANDER SCHMIDT, P.E.
    (302) 734–9188

INDEX OF SHEETS

C100-C112 CONSTRUCTION PLANS

WETLANDS PERMITTING

THIS PLAN IS PURSUING A STATE PROGRAMMATIC GENERAL PERMIT(SPGP)–20 FROM THE UNITED STATES ARMY CORPS OF ENGINEERS TO PERMIT THE DISTURBANCES TO EXISTING FEDERALLY REGULATED WATERS OF THE UNITED STATES. THIS PLAN ALSO IS PURSUING A SUBAQUEOUS LANDS PERMIT FROM THE DNREC WETLANDS AND SUBAQUEOUS LANDS SECTION FOR IMPACTS TO THE EXISTING STATE SUBAQUEOUS LANDS.

CERTIFICATION OF OWNERSHIP

I, JOHN CLARK, HEREBY CERTIFY THAT DELAWARE DIVISION OF FISH & WILDLIFE IS THE OWNER OF THE PROPERTY DESCRIBED AND SHOWN ON THIS PLAN, THAT THE PLAN WAS MADE AT MY DIRECTION, AND THAT I ACKNOWLEDGE THE SAME TO ME BY ACT AND DESIRE THE PLAN TO BE DEVELOPED AS SHOWN IN ACCORDANCE WITH ALL APPLICABLE LAWS AND REGULATIONS.

7/26/2018
JOHN CLARK – FISHERIES SECTION ADMINISTRATOR DATE
DELAWARE DIVISION OF FISH & WILDLIFE
89 KINGS HIGHWAY
DOVER, DE 19901
PHONE: (302) 739–9914

CERTIFICATION OF PLAN ACCURACY

I, HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED UNDER MY SUPERVISION AND TO THE BEST OF MY KNOWLEDGE COMPLIES WITH THE APPLICABLE STATE AND LOCAL REGULATIONS AND ORDINANCES.

ALEXANDER E. SCHMIDT LICENSE No. 16139 DELAWARE PROFESSIONAL ENGINEER

7/26/2018
ALEXANDER E. SCHMIDT, P.E., DE NO. 16139 DATE
CENTURY ENGINEERING, INC.
4134 NORTH DUPONT HIGHWAY
DOVER, DELAWARE 19901
PHONE: (302) 734–9188 / FAX: (302) 734–4589

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9188 F: (302) 734-4589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD, SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
COVER SHEET

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN DFS / MDS
CHK'D/DESIGNER AES
SCALE VARIES
SHEET NO. C100
PROJECT NO. 175013.13

Q:\PROJECTS\175013.00 (DNREC 2017 Engineering RFP)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C100 - COVER SHEET.dwg 7/26/2018 11:02 AM

TABLE OF CONTENTS

C100 - COVER SHEET

C101 - LEGEND, PROJECT NOTES & TYPICAL SECTIONS

C102 - EXISTING CONDITIONS & DEMOLITION PLAN

C103 - CONSTRUCTION LAYOUT PLAN

C104 - SITE GRADES & GEOMETRICS PLAN

C105 - CROSS SECTION - GANGWAY

C106 - CROSS SECTION - TRANSIENT VESSEL DOCK

C107 - CONSTRUCTION DETAILS

C108 - STRUCTURAL DETAILS

C109 - EROSION & SEDIMENT CONTROL DETAILS

C110 - EROSION & SEDIMENT CONTROL DETAILS

C111 - EROSION & SEDIMENT CONTROL DETAILS

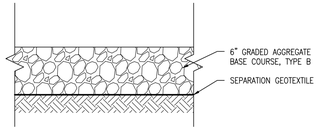
C112 - EROSION & SEDIMENT CONTROL DETAILS

ITEMS LEGEND

ITEM 301001 – GRADED AGGREGATE BASE COURSE, TYPE B

ITEM 708002 – SEPARATION GEOTEXTILE

ITEM NUMBERS UTILIZE THE CURRENT 2016 DELDOT STANDARD SPECIFICATIONS. ITEM NUMBERS THAT HAVE A "0" FOR THE FOURTH DIGIT, REFER TO DELDOT "STANDARD SPECIFICATIONS". IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THE DELDOT STANDARD SPECIFICATIONS EITHER ONLINE OR HARD COPY FROM DELDOT TO REFERENCE THESE ITEMS.



GRAVEL DRIVE/PARK SECTION:
(N.T.S.)

HIERARCHY OF CONTRACT DOCUMENTS

ELEMENTS UNDER THIS CONTRACT SHALL BE CONSTRUCTED UTILIZING THE FOLLOWING INFORMATION IN THE HIERARCHY LISTED BELOW:

1. CONTRACT AGREEMENT BETWEEN OWNER AND CONTRACTOR.
2. APPROVED PLANS.
3. PROJECT MANUAL AND ENCLOSED TECHNICAL SPECIFICATIONS.
4. STATE OF DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL EROSION AND SEDIMENT CONTROL HANDBOOK, APRIL 2014 OR MOST CURRENT AT DATE OF ADVERTISEMENT.
5. DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD CONSTRUCTION DETAILS, 2017, OR MOST CURRENT AT ADVERTISEMENT.
6. DELAWARE DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS FOR BRIDGE AND ROAD CONSTRUCTION, 2016, OR MOST CURRENT AT DATE OF ADVERTISEMENT.

GENERAL NOTES

1. THE BASE BID SHALL INCLUDE ALL WORK REQUIRED TO INSTALL BULKHEAD, GANGWAYS, SUPPORT PILES, GUIDE PILES, AND FLOATING DOCK. THE BASE BID SHALL ALSO INCLUDE ALL REMAINING SITE WORK INCLUDING BUT NOT LIMITED TO ENTRANCE CONSTRUCTION, EARTHWORK, INSTALLATION OF PARKING AREAS AND WALKWAYS. INSTALLATION OF SITE FEATURES SUCH AS SIGNAGE, BOLLARDS, BENCHES, AND BIKE RACK SHALL BE INCLUDED WITH THE BASE BID.
2. CONTRACTOR SHALL CONTACT MISS UTILITY OF DELMARVA AT 1-800-282-8555 48 HOURS PRIOR TO ANY EXCAVATION ACTIVITIES.
3. CONTRACTOR SHALL CONTACT DELAWARE ELECTRIC COOPERATIVE AT 1-855-332-9090 TO REQUEST A SERVICE DISCONNECTION FROM POLE NUMBER 60218 PRIOR TO REMOVAL OF EXISTING SITE ELECTRICAL FEATURES.
4. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION WITH WORKING DRAWINGS PROVIDED BY THE DOCK MANUFACTURER.
5. CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN AND PAY FOR ANY FEES ASSOCIATED WITH THE BUILDING PERMIT.
6. THE CONTRACTOR SHALL CONTACT THE OWNER AND THE ENGINEER AT LEAST 48 HOURS PRIOR TO SHEET PILE, SUPPORT PILE, AND GUIDE PILE INSTALLATION AS WELL AS FOR ALL MEETINGS, INCLUDING PRE-CONSTRUCTION MEETINGS, AS REQUIRED IN THE CONSTRUCTION SPECIFICATIONS.
7. CONTRACTOR SHALL LOAD TEST ALL SUBGRADE SOIL PRIOR TO THE PLACEMENT OF THE SUBBASE COURSE. ALL UNSUITABLE MATERIAL FOUND SHALL BE EXCAVATED TO THE DEPTH OF STABLE SOIL AND BACKFILLED WITH APPROVED MATERIAL. THE CONTRACTOR SHALL COMPACT ALL MATERIALS TO MEET THE DELDOT STANDARD SPECIFICATIONS.
8. BORROW, TYPE B, SHALL BE UTILIZED FOR ALL UNDERCUT LOCATIONS AS DIRECTED BY ENGINEER IN THE FIELD.
9. NO ALTERNATIVES INCLUDING CRUSHED STONE, CRUSHED CONCRETE, AND HOT-MIX MILLINGS SHALL BE USED AS A SUBSTITUTE FOR GRADED AGGREGATE BASE COURSE (DELDOT ITEM #301001).
10. IMPACTS TO SUBAQUEOUS LANDS HAVE BEEN PERMITTED WITHIN THE LOC LINE SHOWN. WORK BEYOND THE LOC IS STRICTLY PROHIBITED.
11. ALL FLOATING DOCKS, HANDRAILS, GANGWAYS, ALUMINUM HEADER SUPPORT CHANNELS, AND ANCILLARY ITEMS TO BE PROVIDED BY OWNER AND INSTALLED BY THE CONTRACTOR PER MANUFACTURERS' SPECIFICATIONS AND RECOMMENDATIONS.
12. THESE DRAWINGS DO NOT INCLUDE NECESSARY ELEMENTS OF CONSTRUCTION SAFETY. ALL CONSTRUCTION, INCLUDING EXCAVATION, MUST BE COMPLETED IN ACCORDANCE WITH THE RULES AND REGULATIONS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT, AND ALL FEDERAL, STATE AND LOCAL REQUIREMENTS. CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL SITE SAFETY.
13. MEAN HIGH WATER (MHW = 2.37) AND MEAN LOW WATER (MLW = -0.38) ELEVATIONS BASED UPON A TIDAL STUDY COMPLETED BY COMPASS POINT SURVEYING BETWEEN AUG 2015 AND SEPT 2015.
14. RIGHT OF WAY, LOCATIONS, PROPERTY LINES BASED ON COMPASS POINT SURVEY DATA, PROVIDED BY DELAWARE DIVISION OF FISH & WILDLIFE. CENTURY ENGINEERING, INC. TAKES NO RESPONSIBILITY FOR THEIR ACCURACY.
15. SEE STRUCTURAL DETAIL SHEETS FOR STRUCTURAL SPECIFICATIONS.

LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	N/A
R/W	RIGHT OF WAY	N/A
P/L	STATE GIS PARCEL LINE	N/A
150	CONTOUR	150
N/A	LIMITS OF CONSTRUCTION	LOC
MHW	MEAN HIGH WATER LINE	N/A
	BUILDING OUTLINE	N/A
X X	FENCE	
	BULKHEAD	
	TREE	N/A
N/A	TO BE REMOVED	
N/A	SAWCUT	SAW
C.M.	CONCRETE MONUMENT	N/A
	UTILITY POLE	N/A
N/A	SIGN	
E	ELECTRIC JUNCTION BOX	N/A
	LIGHTING	N/A
EOP EOP	FULL DEPTH PAVEMENT	N/A
	GRAVEL DRIVE/PARK	
	RIPRAP	N/A

IDENTIFIERS:

RM C — REMOVE BY CONTRACTOR

RM O — REMOVE BY OTHERS

SEDIMENT & STORMWATER MANAGEMENT:

STABILIZED CONSTRUCTION ENTRANCE	SCE
LIMITS OF DISTURBANCE	LOD LOD
SILT FENCE	SF SF
TURBIDITY CURTAIN	TC
SENSITIVE AREA PROTECTION	SAP SAP
SOIL STOCKPILE AREA	SP SP

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS

ADDRESS: 4134 NORTH DUPONT HIGHWAY
DOVER, DE 19901
P: (302) 734-9168 F: (302) 734-6589

WEBSITE: www.centuryeng.com

EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT

CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD, SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE

LEGEND, PROJECT NOTES & TYPICAL SECTIONS

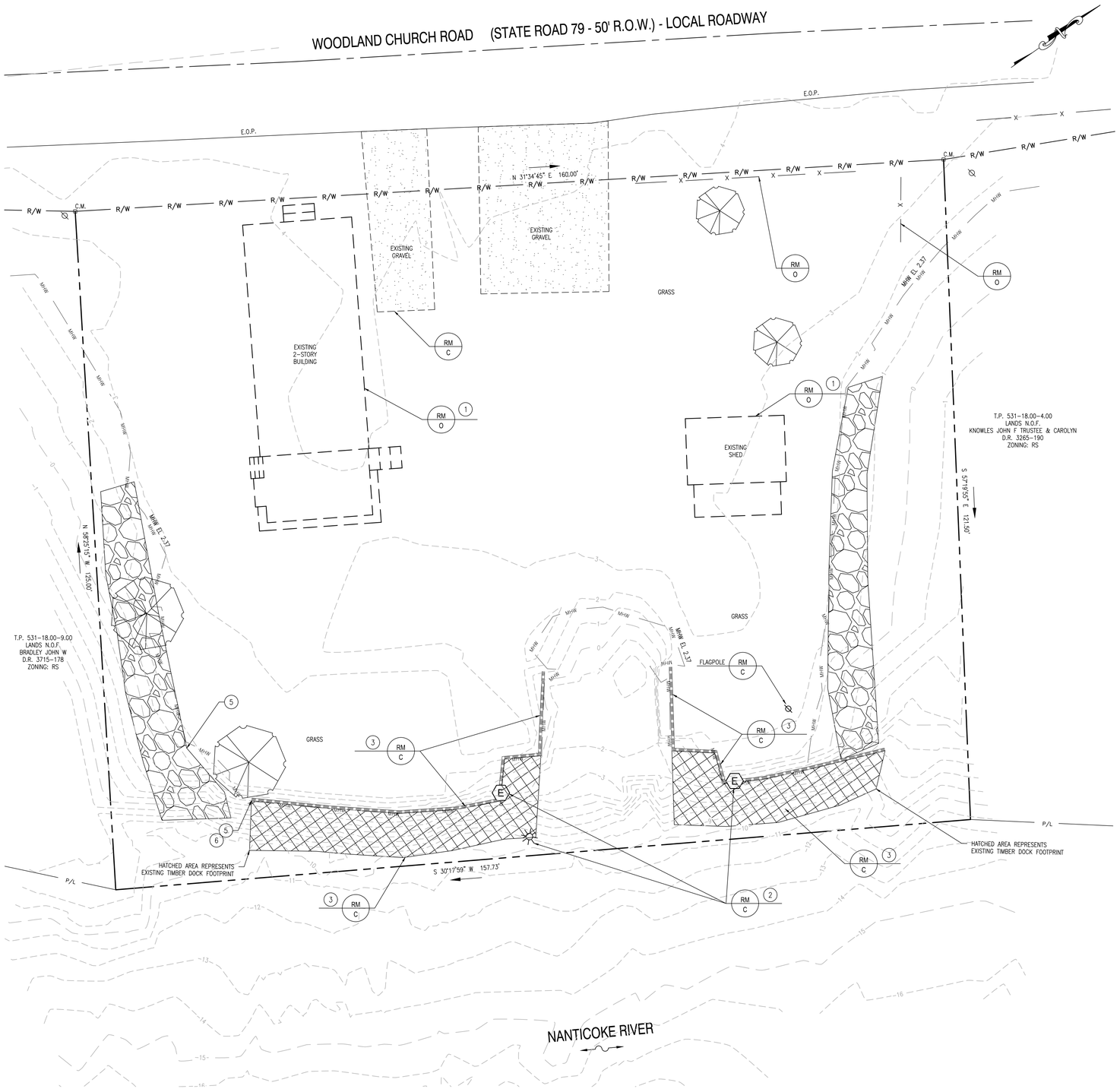
DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN	CHK'D/DESIGNER
DFS / MDS	AES

SCALE	SHEET NO.
NONE	C101

PROJECT NO. 175013.13

G:\PROJECTS\175013.00 (NAVSEC 2017 Engineering ASY)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C101 - LEGEND, PROJECT NOTES & TYPICAL SECTIONS.dwg, 7/19/2018 12:24 PM



DEMOLITION NOTES: (X)

1. EXISTING 2-STORY BUILDING & SHED INCLUDING ATTACHED STRUCTURES & UTILITIES SHALL BE REMOVED BY OTHERS PRIOR TO THE START OF CONSTRUCTION.
2. DEMOLISH AND REMOVE EXISTING ELECTRIC INCLUDING POLE LIGHTS, ELECTRICAL OUTLETS, UNDERGROUND WIRES, ETC. (ABANDON CONDUIT IN PLACE.)
3. EXISTING TIMBER BULKHEAD & DOCK SHALL NOT BE REMOVED UNTIL AFTER CONSTRUCTION OF NEW BULKHEAD. SUCCESSFUL REMOVAL OF TIMBER BULKHEAD MATERIALS SHALL BE DETERMINED BY THE OWNER BASED UPON VISUAL OBSERVATIONS AT LOW TIDE.
4. DISPOSE OF ALL DEMOLISHED MATERIALS OFFSITE AND IN ACCORDANCE WITH ALL DNREC AND STATE OF DELAWARE REGULATIONS.
5. TIMBER BULKHEAD SOUTH OF THE PROPOSED STEEL BULKHEAD SHALL REMAIN IN PLACE.
6. CONTRACTOR SHALL NOT DISTURB EXISTING PIPE NEAR TIMBER BULKHEAD TO REMAIN IN PLACE.

0' 10' 20' 30'
SCALE: 1" = 10'

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901
P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

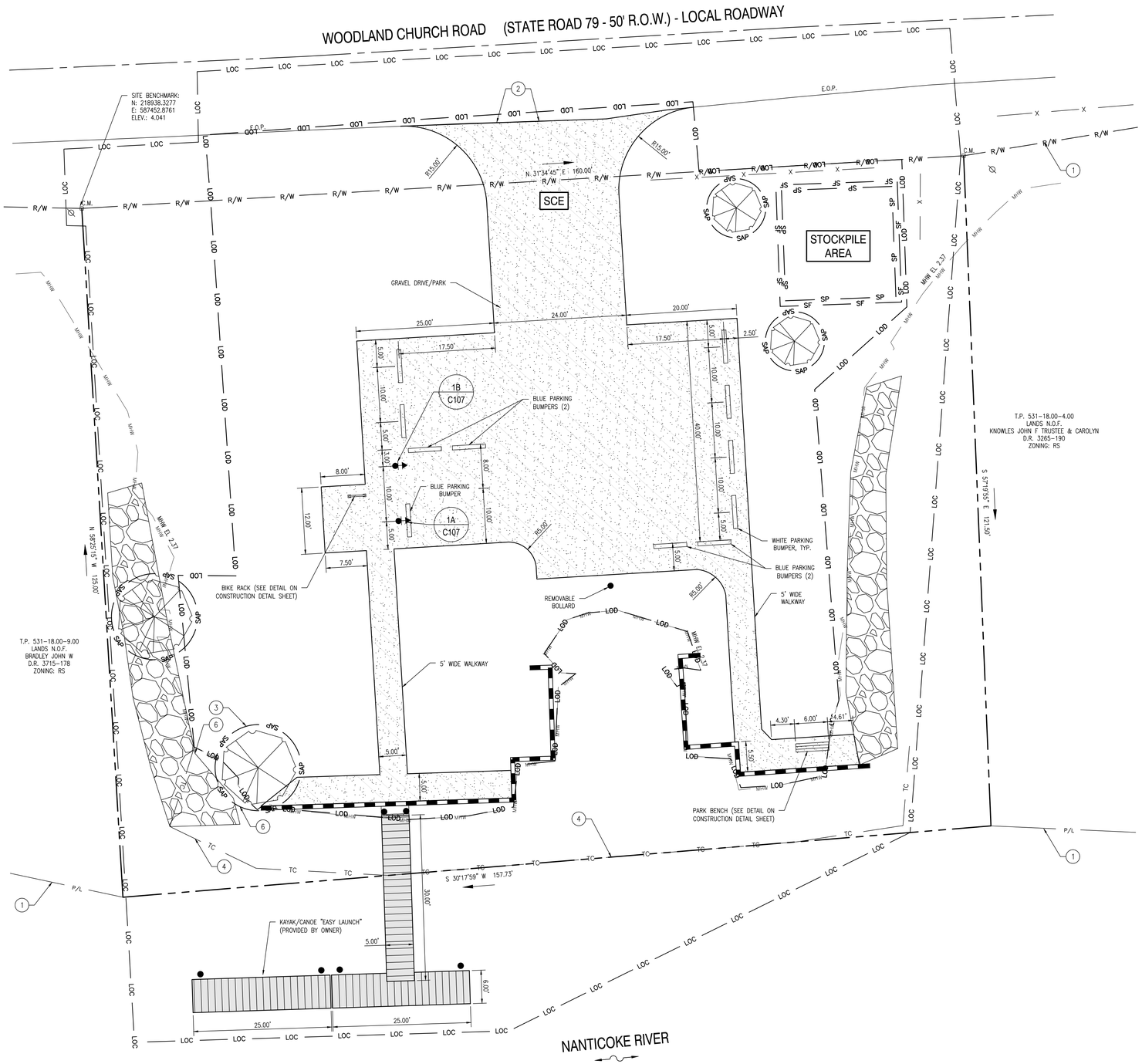
PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD, SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
EXISTING CONDITIONS & DEMOLITION PLAN

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN: DFS / MDS
CHK'D/DESIGNER: AES
SCALE: 1" = 10'
SHEET NO. C102
PROJECT NO. 175013.13

G:\PROJECTS\175013.00 DNREC 2017 Engineering (IE)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C102 - EXISTING CONDITIONS & DEMOLITION PLAN.dwg, 7/13/2018 1:10 PM



LEGEND

EXISTING		PROPOSED
	PROPERTY LINE	N/A
R/W	RIGHT OF WAY	N/A
P/L	STATE GIS PARCEL LINE	N/A
150	CONTOUR	150
N/A	LIMITS OF CONSTRUCTION	LOC
MHW	MEAN HIGH WATER LINE	N/A
	BUILDING OUTLINE	N/A
X	FENCE	
	BULKHEAD	
	TREE	N/A
N/A	TO BE REMOVED	
N/A	SAWCUT	SAW
C.M.	CONCRETE MONUMENT	N/A
	UTILITY POLE	N/A
N/A	SIGN	
E	ELECTRIC JUNCTION BOX	N/A
	LIGHTING	N/A
EOP EOP	FULL DEPTH PAVEMENT	N/A
	GRAVEL DRIVE/PARK	
	RIPRAP	N/A

IDENTIFIERS:

RM/C — REMOVE BY CONTRACTOR

RM/O — REMOVE BY OTHERS

SEDIMENT & STORMWATER MANAGEMENT:

STABILIZED CONSTRUCTION ENTRANCE	SCE	
LIMITS OF DISTURBANCE	LOD	LOD
SILT FENCE	SF	SF
TURBIDITY CURTAIN	TC	
SENSITIVE AREA PROTECTION	SAP	SAP
SOIL STOCKPILE AREA	SP	SP

NOTE:

1. PARCEL LINES REFERENCED FROM STATE OF DELAWARE GIS DATA.
2. THE CONTRACTOR SHALL BE RESPONSIBLE PLACING CONES AND APPLICABLE WARNING SIGNS AS REQUIRED BY THE DELAWARE DEPARTMENT OF TRANSPORTATION TYPICAL APPLICATION 3, WORK ON THE SHOULDER OF A TWO-LANE ROAD.
3. A CERTIFIED ARBORIST SHALL PERFORM ROOT PRUNING AND LIMB TRIMMING IN ACCORDANCE WITH ISA STANDARDS AS DIRECTED PRIOR TO CONSTRUCTION OF THE NEW BULKHEAD.
4. TURBIDITY CURTAIN SHALL REMAIN IN PLACE UNTIL ALL IN-WATER WORK IS COMPLETED. IF THE CONTRACTOR ELECTS TO REMOVE THE TURBIDITY CURTAIN FOLLOWING ALL IN-WATER WORK, SILT FENCE MAY BE INSTALLED SURROUNDING THE PROJECT AREA FOR THE REMAINDER OF THE SITE WORK.
5. PLEASE NOTE THAT THE LOD LINE FOLLOWS THE MEAN HIGH WATER LINE WHERE THE PROJECT AREA EXTENDS BEYOND THE MEAN HIGH WATER LINE PER THE DELAWARE SEDIMENT & STORMWATER MANAGEMENT REGULATIONS. THE CONTRACTOR SHALL BE ABLE TO DISTURB THESE AREAS BELOW MHW LINE PROVIDED THAT ALL EROSION AND SEDIMENT CONTROLS ARE INSTALLED CORRECTLY. ALL WORK SHALL BE CONTAINED WITH THE LOC.
6. TIMBER BULKHEAD SOUTH OF THE PROPOSED STEEL SHEET PILES SHALL REMAIN IN PLACE.

OVERALL SEQUENCE OF CONSTRUCTION:

1. PRIOR TO ANY CLEARING, INSTALLATION OF SEDIMENT CONTROL MEASURES OR GRADING, A PRECONSTRUCTION MEETING MUST BE SCHEDULED AND CONDUCTED. THE LANDOWNER/DEVELOPER AND CONTRACTOR ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING; THE DESIGNER IS RECOMMENDED TO ATTEND.
2. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHOULD BE CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENTATION ON THE SITE. ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT HAS REACHED HALF OF THE EFFECTIVE CAPACITY OF THE CONTROL. IN ADDITION, THE CONTRACTOR MAY NEED TO ADJUST OR REPAIR MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER.
3. INSTALL STABILIZED CONSTRUCTION ENTRANCE. INSTALL TURBIDITY CURTAIN, SENSITIVE AREA PROTECTION, AND SILT FENCE. INSTALL SITE POLLUTION PREVENTION DEVICES PER DNREC STANDARD DETAILS & SPECIFICATIONS.
4. INSTALL NEW STEEL SHEETPILES.
5. REMOVE EXISTING STRUCTURES INCLUDING BULKHEADS AND DOCKS PER THE EXISTING CONDITIONS AND DEMOLITION SHEET. REMOVE EXISTING ELECTRICAL WIRING, LIGHTS, AND FIXTURES. UNDERGROUND ELECTRICAL CONDUIT SHALL REMAIN IN PLACE. CLEAR REMAINING AREAS WITHIN THE LOD.
5. INSTALL TIMBER SUPPORT PILES FOR THE GANGWAY, AND TIMBER GUIDE PILES FOR THE FLOATING DOCK.
6. INSTALL ALUMINUM FLOATING DOCKS, GANGWAYS, AND ALL ASSOCIATED COMPONENTS.
7. COMPLETE ROUGH SITE GRADING.
8. INSTALL FOUNDATIONS FOR REMOVABLE BOLLARDS.
9. PLACE STONE SUBGRADE FOR ALL AREAS.
10. PLACE STONE FOR GRAVEL PARKING AREAS AND WALKWAYS PER THE CONSTRUCTION LAYOUT PLAN.
11. COMPLETE CONSTRUCTION OF GRAVEL ENTRANCE ALONG WOODLAND CHURCH ROAD.
12. INSTALL PARK BENCH, SIGNAGE, BIKE RACK, FENCING AND ALL OTHER SITE ITEMS INDICATED ON THE CONSTRUCTION PLANS.
13. PLACE TOPSOIL, PERFORM FINAL GRADING, SEED, AND MULCH ALL UNPAVED DISTURBED AREAS.
14. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE REMOVED ONLY AFTER ALL WORK IN AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER.

0' 10' 20' 30'
SCALE: 1" = 10'

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT

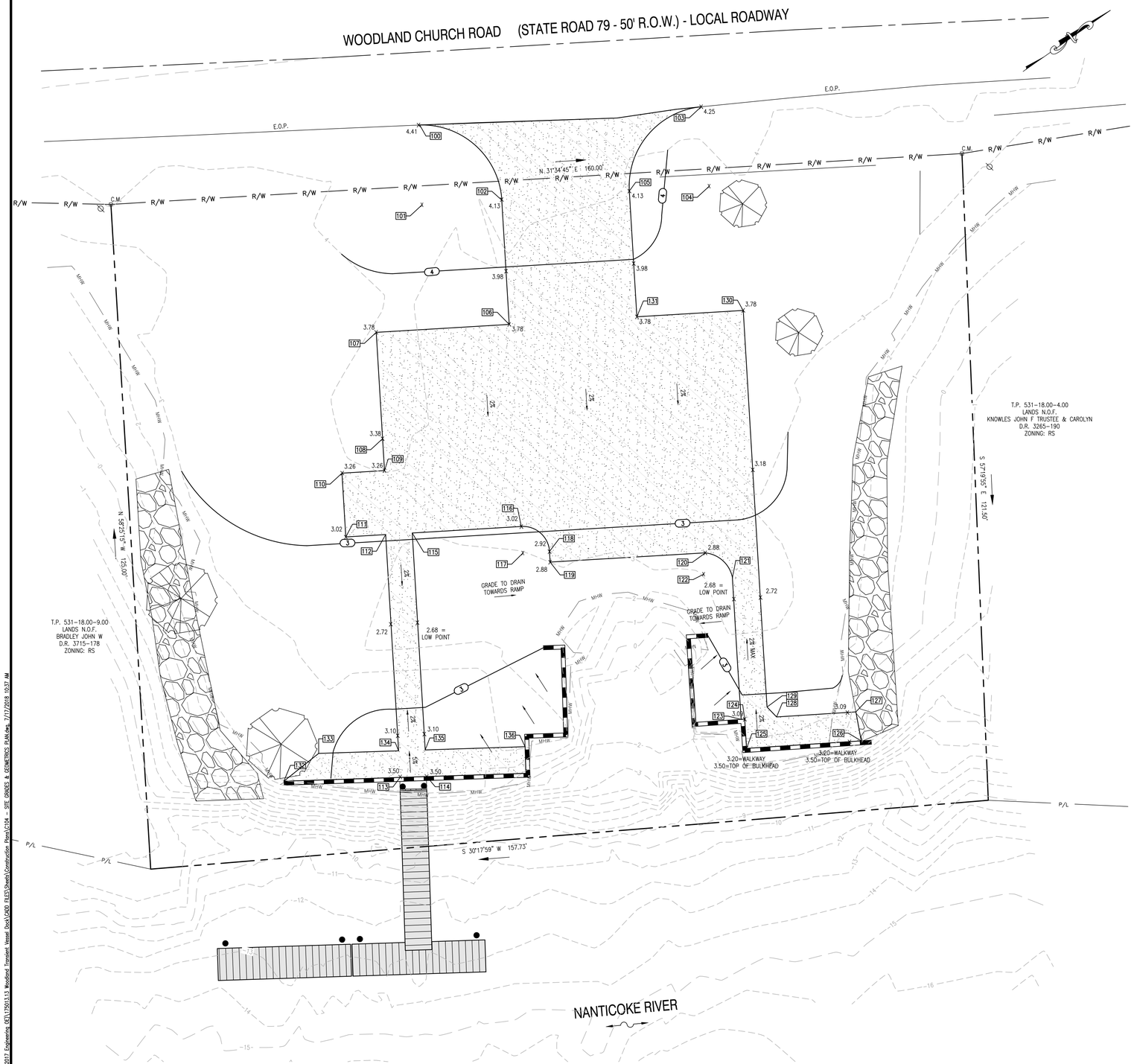
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
CONSTRUCTION LAYOUT PLAN

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN: DFS / MDS
CHK'D/DESIGNER: AES
SCALE: 1" = 10'
SHEET NO. C103
PROJECT NO. 175013.13

G:\PROJECTS\175013.00 (DNREC 2017 Engineering DES)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C103 - CONSTRUCTION LAYOUT PLAN.dwg 7/17/2018 10:54 AM



ENTRANCE & PARKING AREA LAYOUT		
POINT NO.	NORTHING	EASTING
100	218994.3696	587474.0114
101	218986.1149	587486.5358
102	218998.8937	587494.3909
103	219039.5993	587501.5029
104	219032.2596	587514.5846
105	219019.4809	587506.7294
106	218986.6556	587514.2998
107	218965.3577	587501.2080
108	218954.8842	587518.2463
109	218951.7421	587523.3578
110	218944.9268	587519.1684
111	218938.6427	587529.3915
112	218945.0321	587533.3190
113	218921.1245	587572.2120
114	218925.3054	587574.9584
115	218949.2917	587535.9374
116	218966.7560	587546.6727
117	218964.1376	587550.9323
118	218968.3972	587553.5507
119	218967.3499	587555.2545
120	218992.1970	587570.5569
121	218993.6772	587577.3129
122	218989.6510	587573.6374
123	218979.7897	587600.0082
124	218980.3549	587600.3511
125	218977.5002	587605.0549
126	218995.9389	587616.2454
127	218998.2311	587611.2047
128	218985.4920	587603.4488
129	218985.1026	587600.8930
130	219024.1203	587537.3294
131	219007.1017	587526.8680
132	218902.8278	587560.2807
133	218911.1676	587559.7549
134	218923.7367	587567.9625
135	218927.9248	587570.6973
136	218943.6229	587580.9480

0' 10' 20' 30'
SCALE: 1' = 10'

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901
P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

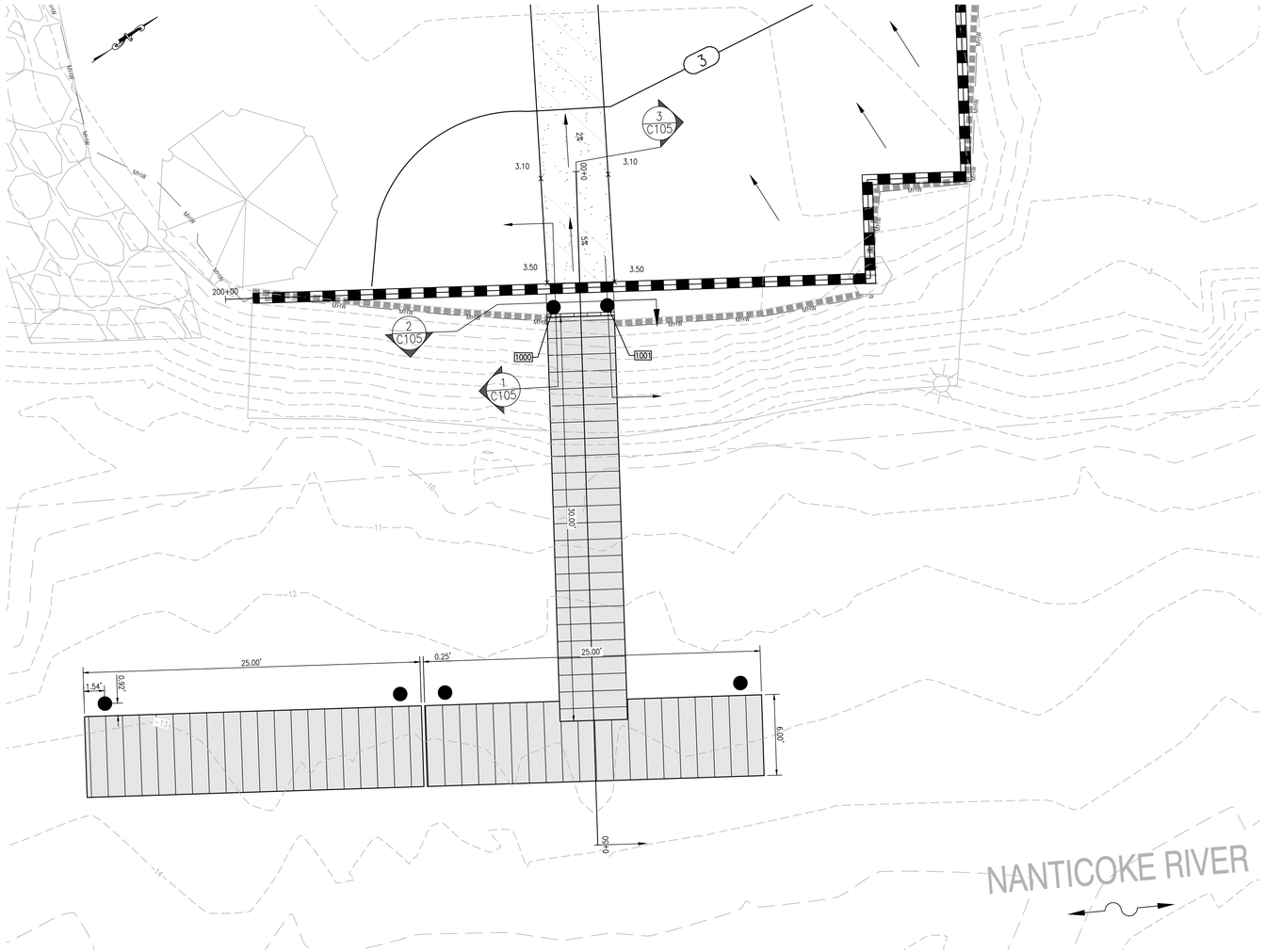
PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD., SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
SITE GRADES & GEOMETRICS PLAN

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN: DFS / MDS
CHK'D/DESIGNER: AES
SCALE: 1" = 10'
SHEET NO.: C104
PROJECT NO.: 175013.13

G:\PROJECTS\175013.00 (NWRC 2017 Engineering DE)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C104 - SITE GRADES & GEOMETRICS PLAN.dwg, 7/17/2018 10:37 AM



PLAN VIEW
SCALE: 1" = 5'

GANGWAY SUPPORT PILE LAYOUT

POINT NO.	DESCRIPTION	NORTHING	EASTING	TOP ELEV.	EST. TIP ELEV.	**PILE LENGTH (FT)	***MIN. EMBEDMENT (FT)
1000	PILE	218920.5063	587573.9132	3.25	-9.0	25.0	5.0
1001	PILE	218923.8554	587576.1004	3.25	-9.0	25.0	5.0

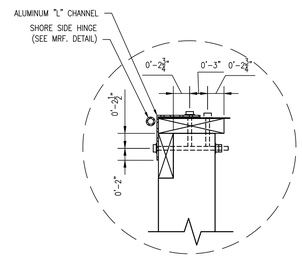
NOTES:

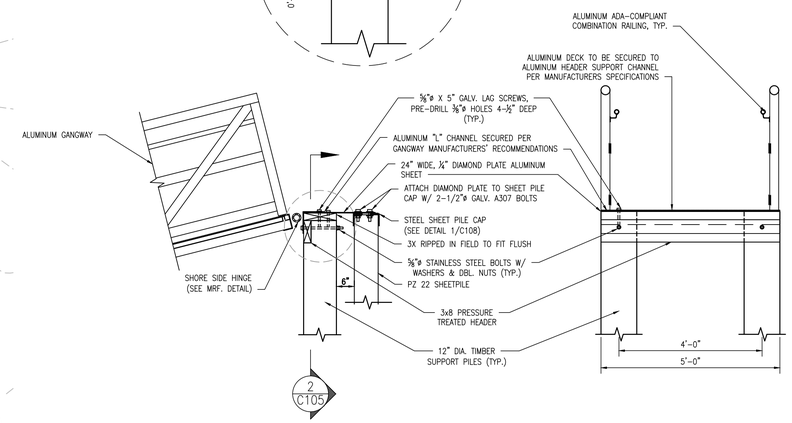
** PILE LENGTH SPECIFIED ABOVE IS RECOMMENDED FOR BIDDING PURPOSES ONLY. LENGTHS PROVIDED ARE BASED UPON MINIMUM EMBEDMENT REQUIREMENTS USING AN IMPACT HAMMER. IF A VIBRATORY HAMMER IS USED, AN ADDITIONAL FIVE (5) FEET OF PILE SHALL BE ORDERED. ACTUAL PILE LENGTH NEEDED MAY VARY BASED ON FIELD CONDITIONS AND INSTALLATION METHODS.

*** MINIMUM EMBEDMENT SHALL BE DEFINED AS THE EMBEDDED DEPTH IN FIRM MATERIAL DEMONSTRATED BY A MINIMUM OF TEN (10) BLOWS PER FOOT WHILE DRIVING WITH AN IMPACT HAMMER DELIVERING A MINIMUM ENERGY OF 10,000 FT-LBS. IF A VIBRATORY HAMMER IS USED FOR INSTALLATION AN ADDITIONAL FIVE (5) FEET OF EMBEDMENT IN FIRM MATERIAL SHALL BE REQUIRED. FIRM MATERIAL WHEN USING THE VIBRATORY SHALL BE DEFINED AS MATERIAL CAPABLE OF SUPPORTING THE DEAD LOAD OF THE PILE AND HAMMER.

GANGWAY NOTES:

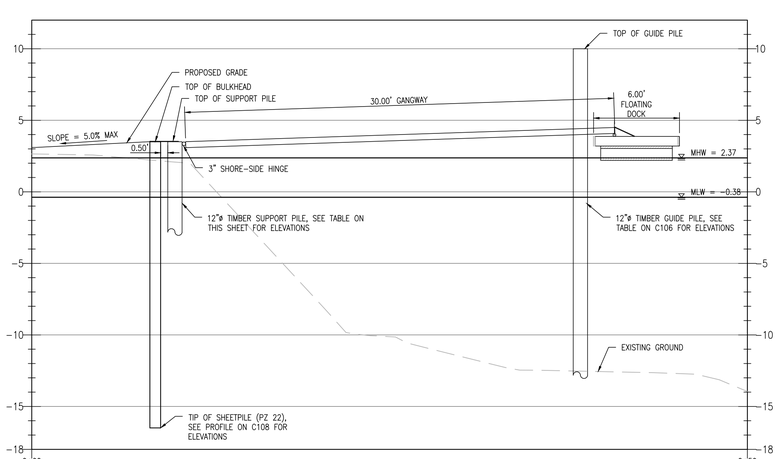
1. FINAL GANGWAY CONFIGURATION, INCLUDING TOP AND TIP ELEVATIONS TO BE CONFIRMED WITH OWNER.
2. ALL STRUCTURAL ALUMINUM IS TO BE ALLOY 6061-T6.
3. ALL DOCK HARDWARE IS TO BE STAINLESS STEEL, SERIES 304.
4. FLOATING DOCKS DESIGNED FOR AN 18" UNLOADED FREEBOARD AND AN 8" LOADED FREEBOARD (MAX. DESIGN LIVE LOAD = 40 PSF).
5. DIMENSIONS SHOWN ARE NOMINAL FROM ALUMINUM TO ALUMINUM FRAME. FINAL FINISHED DIMENSIONS WILL VARY ACCORDING TO INSTALLED FENDERS & BUMPERS.
6. ALL DOCKS, GANGWAYS, RAILING, AND ANCILLARY ITEMS SHALL BE PROVIDED BY THE OWNER.
7. SEE SHEET C106 FOR GUIDE PILE LAYOUT INFORMATION, AND C108 FOR SHEET PILE LAYOUT INFORMATION.
8. GANGWAY SHALL FEATURE DECKING WITH GAPS OF 0.375", 0.50, 0.75" OR 1" BETWEEN PLANKS SIZED 4", 6" 8-10", OR 12" WIDTHS, RESPECTIVELY TO COMPLY WITH ENVIRONMENTAL PERMITTING REQUIREMENTS.





1 C105 GANGWAY SECTION AT SUPPORT PILE
SCALE: 1"= 1'-0"

2 C105 GANGWAY ELEVATION AT SUPPORT PILE
SCALE: 1"= 1'-0"



3 C105 GANGWAY PROFILE (UNLOADED @ MHW)
SCALE: 1" = 5'

0' 5' 10' 15'
SCALE: 1" = 5'

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

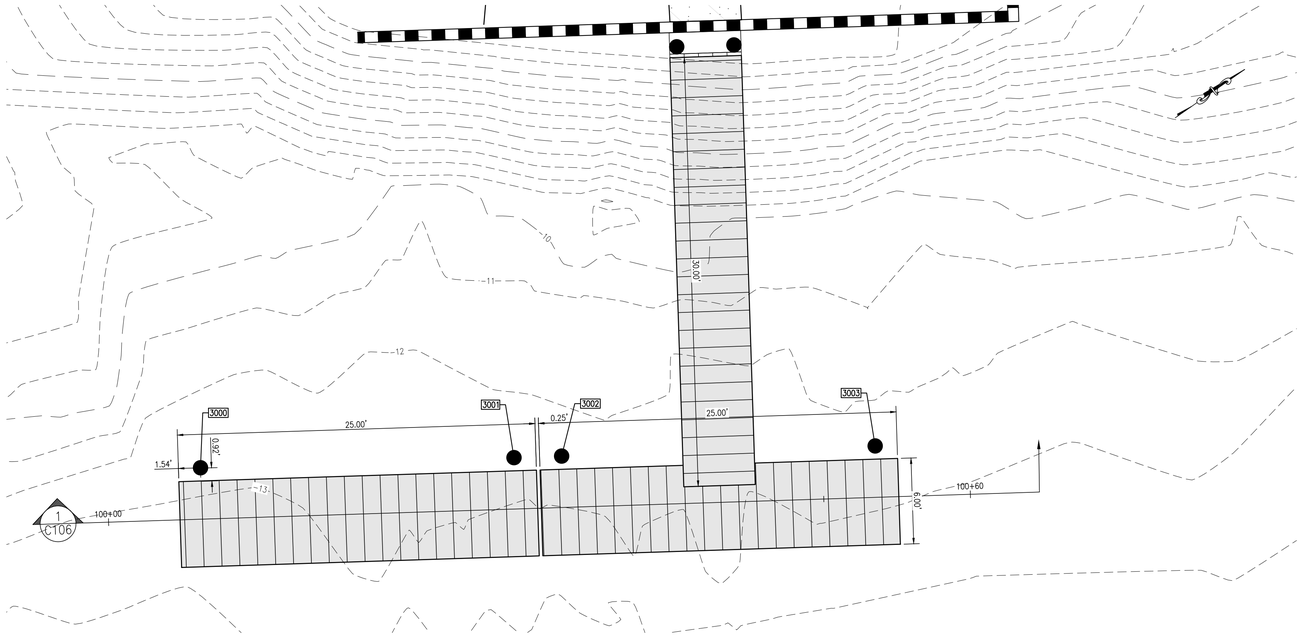
PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
CROSS SECTION - GANGWAY

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN: DFS / MDS
CHK'D/DESIGNER: AES
SCALE: AS NOTED
SHEET NO.: C105
PROJECT NO.: 175013.13

O:\PROJECTS\175013.00 (NMRC 2017 Engineering RFP)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C105 - CROSS SECTION - GANGWAY.dwg, 7/13/2018 1:17 PM



PLAN VIEW
SCALE: 1" = 5'

FLOATING DOCK GUIDE PILE LAYOUT							
POINT NO.	DESCRIPTION	NORTHING	EASTING	TOP ELEV.	EST. TIP ELEV.	**PILE LENGTH (FT)	***MIN. EMBEDMENT (FT)
3000	PILE	218876.3738	587578.9280	10.0	−23.5	45.0	10
3001	PILE	218894.7246	587590.9123	10.0	−23.5	45.0	10
3002	PILE	218897.5138	587592.7338	10.0	−23.5	45.0	10
3003	PILE	218915.8645	587604.7180	10.0	−23.5	45.0	10

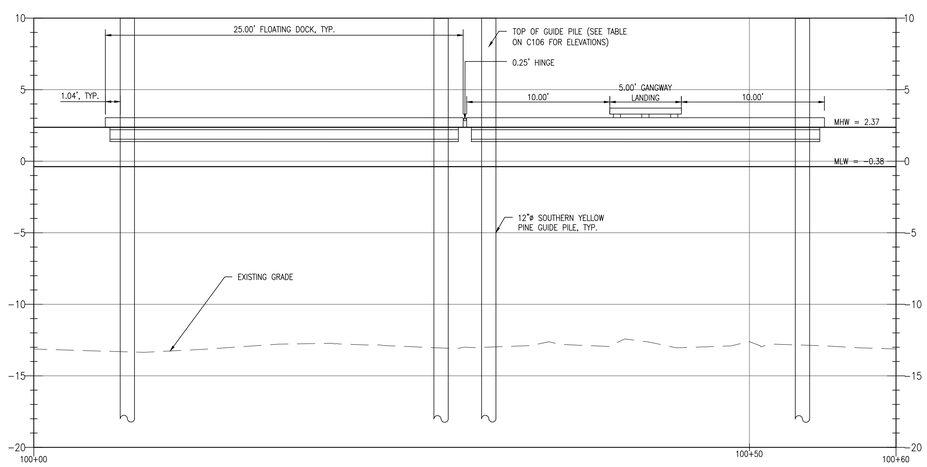
NOTES:

** PILE LENGTH SPECIFIED ABOVE IS RECOMMENDED FOR BIDDING PURPOSES ONLY. LENGTHS PROVIDED ARE BASED UPON MINIMUM EMBEDMENT REQUIREMENTS USING AN IMPACT HAMMER. IF A VIBRATORY HAMMER IS USED, AN ADDITIONAL TEN (10) FEET OF PILE SHALL BE ORDERED. ACTUAL PILE LENGTH NEEDED MAY VARY BASED ON FIELD CONDITIONS AND INSTALLATION METHOD.

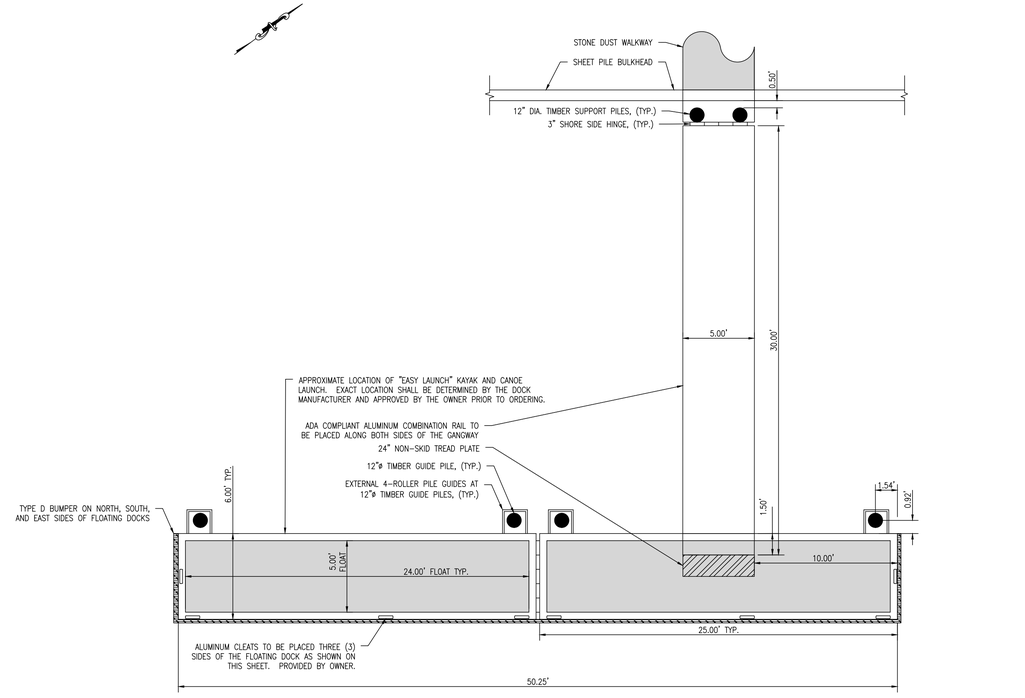
*** MINIMUM EMBEDMENT SHALL BE DEFINED AS THE EMBEDDED DEPTH IN FIRM MATERIAL DEMONSTRATED BY A MINIMUM OF TEN (10) BLOWS PER FOOT WHILE DRIVING WITH AN IMPACT HAMMER DELIVERING A MINIMUM ENERGY OF 10,000 FT−LBS. IF A VIBRATORY HAMMER IS USED FOR INSTALLATION AN ADDITIONAL TEN (10) FEET OF EMBEDMENT IN FIRM MATERIAL SHALL BE REQUIRED. FIRM MATERIAL WHEN USING THE VIBRATORY SHALL BE DEFINED AS MATERIAL CAPABLE OF SUPPORTING THE DEAD LOAD OF THE PILE AND HAMMER.

FLOATING DOCK NOTES:

1. FINAL GANGWAY CONFIGURATION, INCLUDING TOP AND TIP ELEVATIONS TO BE CONFIRMED WITH OWNER.
2. ALL STRUCTURAL ALUMINUM IS TO BE ALLOY 6061−T6.
3. ALL DOCK HARDWARE IS TO BE STAINLESS STEEL, SERIES 304.
4. FLOATING DOCKS DESIGNED FOR AN 18" UNLOADED FREEBOARD AND AN 8" LOADED FREEBOARD (MAX. DESIGN LIVE LOAD = 40 PSF).
5. DIMENSIONS SHOWN ARE NOMINAL FROM ALUMINUM TO ALUMINUM FRAME. FINAL FINISHED DIMENSIONS WILL VARY ACCORDING TO INSTALLED FENDERS & BUMPERS.
6. ALL DOCKS, GANGWAYS, RAILING, AND ANCILLARY ITEMS SHALL BE PROVIDED BY THE OWNER.
7. SEE SHEET C105 FOR SUPPORT PILE LAYOUT INFORMATION, AND C108 FOR SHEET PILE LAYOUT INFORMATION.



1
C106
FLOATING DOCK PROFILE
SCALE: 1" = 1'-0"



FLOATING DOCK & GANGWAY DETAILED PLAN VIEW
SCALE: 1" = 5'

0' 5' 10' 15'
SCALE: 1" = 5'

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9168 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
CROSS SECTION - TRANSIENT VESSEL DOCK

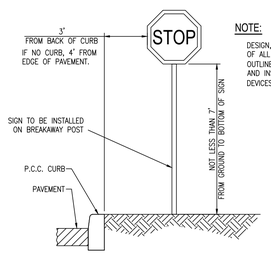
DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN: DFS / MDS
CHK'D/DESIGNER: AES
SCALE: AS NOTED
SHEET NO.: C106
PROJECT NO.: 175013.13

C:\PROJECTS\175013.00 (NAVEC 2017 Engineering RFP)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C106 - CROSS SECTION - TRANSIENT VESSEL DOCK.dwg, 7/13/2018 1:19 PM

1A / C107 HANDICAP ACCESSIBLE SIGN
SCALE: 1" = 1'

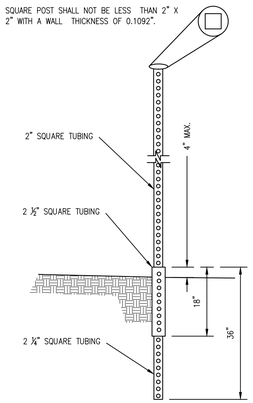
1B / C107 NO PARKING ANYTIME SIGN
SCALE: 1" = 1'



NOTE:

DESIGN, FABRICATION AND INSTALLATION OF ALL PERMANENT SIGNING SHALL BE AS OUTLINED IN THE 'GUIDE FOR FABRICATION AND INSTALLATION OF TRAFFIC CONTROL DEVICES' LATEST EDITION.

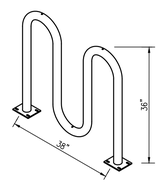
2 / C107 TYPICAL SIGN DETAIL
SCALE: N.T.S.



NOTES:

1. SQUARE TUBES ARE TO BE FORMED FROM GALVANIZED SHEET STRUCTURAL (PHYSICAL) QUALITY, ASTM A 446, GRADE A, COATING DESIGNATION G 90, REGULAR SPANGLE, OR HOT ROLLED CARBON SHEET STEEL STRUCTURAL (PHYSICAL) QUALITY, ASTM A 570, GRADE 33.
   A. NOMINAL OUTSIDE DIMENSION, (INCHES):
      2 X 2
      2 1/4 X 2 1/4
      2 1/2 X 2 1/2
   B. ALL FOUR SIDES ARE TO HAVE EVENLY SPACED 7/16" DIAMETER HOLES ON 1" CENTERS THE ENTIRE LENGTH OF THE TUBE.
   C. TOLERANCE ON HOLE SIZE IS ± 1/64". TOLERANCE ON HOLE SPACING IS ± 1/8" IN 20 FEET.
   D. STANDARD CORNER RADIUS SHALL BE 5/32" ± 1/64".
   E. THE FASTENERS TO BE SUPPLIED UNDER THIS SPECIFICATION SHALL BE 5/16" GRADE 5 UNC CORNER BOLTS WITH CADMIUM OR ZINC PLATING, INSTALLATION OF SIGNS SHALL BE WITH 3/8" X 2.5" BOLT WITH LOCKNUT AND WASHER.
2. REGULATORY SIGNS WIDER THAN 30" SHALL BE MOUNTED ON TWO POSTS. WHEN MORE THAN ONE REGULATORY SIGN IS TO BE INSTALLED ON THE SAME POST ASSEMBLY, THE MOUNTING HOLES SHALL BE DRILLED IN THE FIELD AS THE ASSEMBLY IS BEING CONSTRUCTED.

3 / C107 TELESCOPING STEEL SIGN POST BREAK AWAY ASSEMBLY
SCALE: N.T.S.



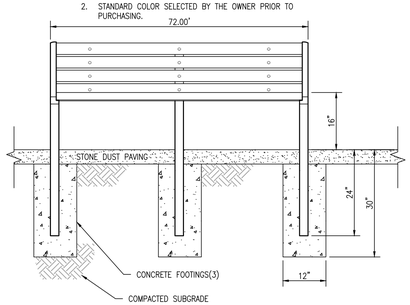
NOTES:

1. 3-LOOP WAVE STYLE BIKE RACK, SIZED TO ACCOMMODATE PARKING FOR 5 BIKES. EXAMPLE MANUFACTURERS INCLUDE:
   U-LINE
   GLOBAL INDUSTRIALS
   PARK-IT BIKE RACKS
2. FINISH SHALL BE A STANDARD COLOR SELECTED BY THE OWNER PRIOR TO PURCHASING.
3. INSTALL PER MANUFACTURERS' REQUIREMENTS.

4 / C107 BIKE RACK
SCALE: N.T.S.

NOTES:

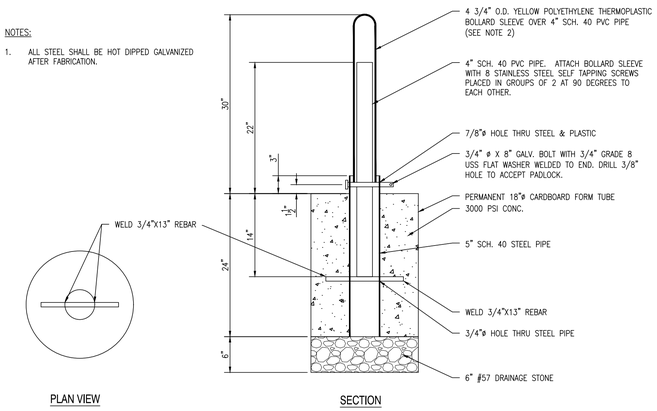
1. RECYCLED PLASTIC PARK BENCH WITH PROTECTED EDGES. EXAMPLE MANUFACTURES INCLUDE:
   MALIBU BENCH
   THE BENCH FACTORY
   JAYHAWK PLASTICS
2. STANDARD COLOR SELECTED BY THE OWNER PRIOR TO PURCHASING.



5 / C107 PARK BENCH
SCALE: N.T.S.

NOTES:

1. ALL STEEL SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.



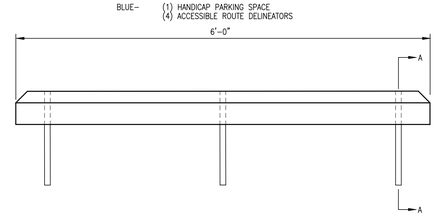
PLAN VIEW

SECTION

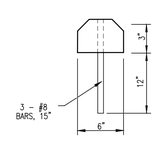
6 / C107 REMOVABLE BOLLARD DETAIL
SCALE: 1" = 1'

NOTES:

1. RECYCLED PLASTIC PARKING BUMPER. EXAMPLE MANUFACTURERS INCLUDE:
   U-LINE
   SPEED BUMPS AND HUMPS
   THE TRAFFIC SAFETY STORE
2. COLOR:
   WHITE– (6) REGULAR PARKING SPACES
   BLUE– (1) HANDICAP PARKING SPACE
   (4) ACCESSIBLE ROUTE DELINEATORS



ELEVATION



SECTION A-A

7 / C107 PARKING BUMPER DETAIL
SCALE: N.T.S.

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

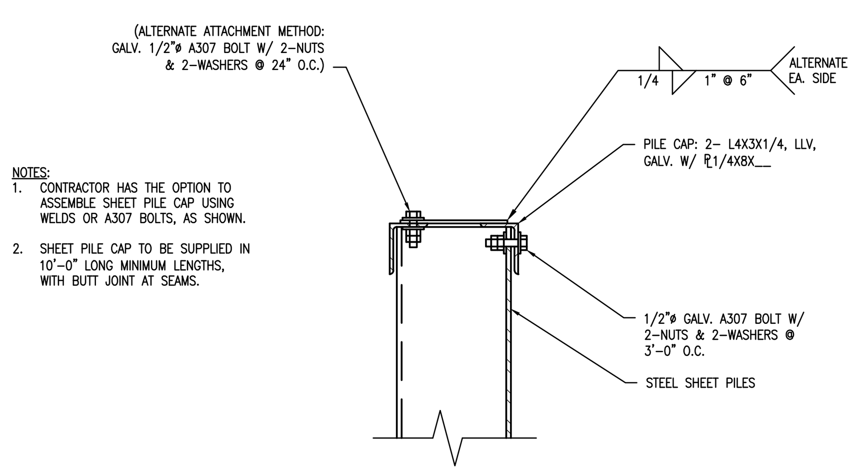
PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
CONSTRUCTION DETAILS

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

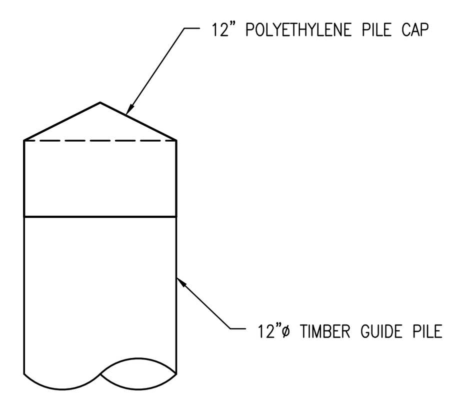
DRAWN: DFS / MDS
CHK'D/DESIGNER: AES
SCALE: AS NOTED
SHEET NO.: C107
PROJECT NO.: 175013.13

G:\PROJECTS\175013.00 (DNREC 2017 Engineering QE)\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C107 - CONSTRUCTION DETAILS.dwg, 7/13/2018 1:20 PM



NOTES:
1. CONTRACTOR HAS THE OPTION TO ASSEMBLE SHEET PILE CAP USING WELDS OR A307 BOLTS, AS SHOWN.
2. SHEET PILE CAP TO BE SUPPLIED IN 10'-0" LONG MINIMUM LENGTHS, WITH BUTT JOINT AT SEAMS.

1/C108 SHEET PILE CAP
SCALE: 1"= 1'-0"



2/C108 TYPICAL GUIDE PILE CAP
SCALE: 1"= 1'-0"

GENERAL NOTES

1. THE NOTES ON THESE DRAWINGS ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO GENERAL NOTES. FOR INCONSISTENCIES BETWEEN THESE DRAWINGS AND THE SPECIFICATIONS, THE STRICTER REQUIREMENT SHALL APPLY, AND THE ENGINEER SHALL BE NOTIFIED PRIOR TO PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.

2. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH JOB SPECIFICATIONS AND ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, AND SITE DRAWINGS. CONSULT THESE DRAWINGS FOR LOCATIONS AND DIMENSIONS OF OPENINGS, CHASES, INSERTS, REGLETS, SLEEVES, DEPRESSIONS, AND OTHER DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS. ALL DIMENSIONS AND CONDITIONS MUST BE VERIFIED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.

3. THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE AFTER THE STRUCTURE IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCE TO INSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING, GUYS OR TIEDOWNS. PROVIDE ALL SHORING AND BRACING REQUIRED TO STABILIZE AND PROTECT EXISTING AND ADJACENT STRUCTURES AND SYSTEMS DURING COURSE OF DEMOLITION AND CONSTRUCTION. SUCH MATERIAL SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER COMPLETION OF THE PROJECT.

4. SECTIONS AND DETAILS SHOWN ON ANY STRUCTURAL DRAWINGS SHALL BE CONSIDERED TYPICAL FOR SIMILAR CONDITIONS.

5. ALL APPLICABLE FEDERAL, STATE AND MUNICIPAL REGULATIONS SHALL BE FOLLOWED, INCLUDING THE FEDERAL DEPARTMENT OF LABOR OCCUPATIONAL SAFETY AND HEALTH ACT.

6. ANY AND ALL MODIFICATIONS TO THE STRUCTURAL ELEMENTS INDICATED ON THESE DRAWINGS MUST BE APPROVED IN ADVANCE BY CENTURY ENGINEERING.

DESIGN LOADS

1. BUILDING CODE, INTERNATIONAL BUILDING CODE (2018 OR LATEST EDITION).

2. SOIL PARAMETERS:

   TYPE F BORROW TO BE USED AS BACKFILL BEHIND SHEET PILES AS NEEDED..

EXISTING CONDITIONS

I. EXISTING CONDITIONS INDICATED ARE OBTAINED FROM AVAILABLE SOURCES (EXISTING DRAWINGS, FIELD SURVEYS, ETC.) AND ARE NOT GUARANTEED TO BE TRUE AND EXACT. CONTRACTOR(S) SHALL FIELD VERIFY EXISTING CONDITIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE AFFECTED PORTION OF THE WORK.

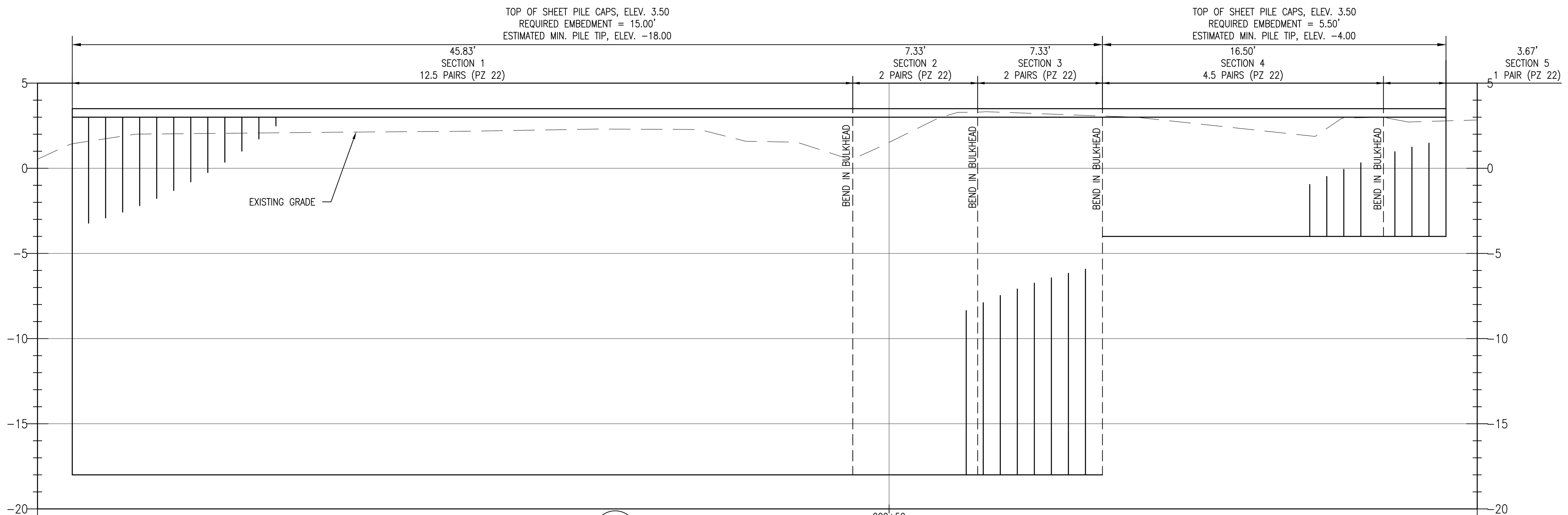
PILES

1. FULL TIME INSPECTION OF THE PILE INSTALLATION SHALL BE PROVIDED BY OWNER AND PERFORMED BY AN ENGINEER OR AN EXPERIENCED FOUNDATION INSPECTOR REGISTERED AS A PROFESSIONAL ENGINEER IN THE STATE OF DELAWARE TO ESTABLISH AN ACCURATE RECORD OF PILE DRIVING. INSPECTION SHALL VERIFY THAT SUITABLE PILES ARE BEING INSTALLED. RECORDS SHALL INCLUDE PROJECT NAME AND NUMBER, NAME OF CONTRACTOR, PILE LOCATION AND NUMBER. COMPUTED PILE CAPACITY, TYPE AND SIZE OF HAMMER USED, TYPE OF PILE DRIVING CAP USED, RATE OF OPERATION OF PILE DRIVING EQUIPMENT, PILE DIMENSIONS, ELEVATION OF TIP, ELEVATION OF BUTT BEFORE AND AFTER CUT-OFF, GROUND ELEVATION, CONTINUOUS RECORD OF NUMBER OF BLOWS FOR EACH FOOT OF PENETRATION, PILE DEVIATION, PILE UPLIFT AND REACTION AND ANY UNUSUAL OCCURRENCES DURING PILE DRIVING.

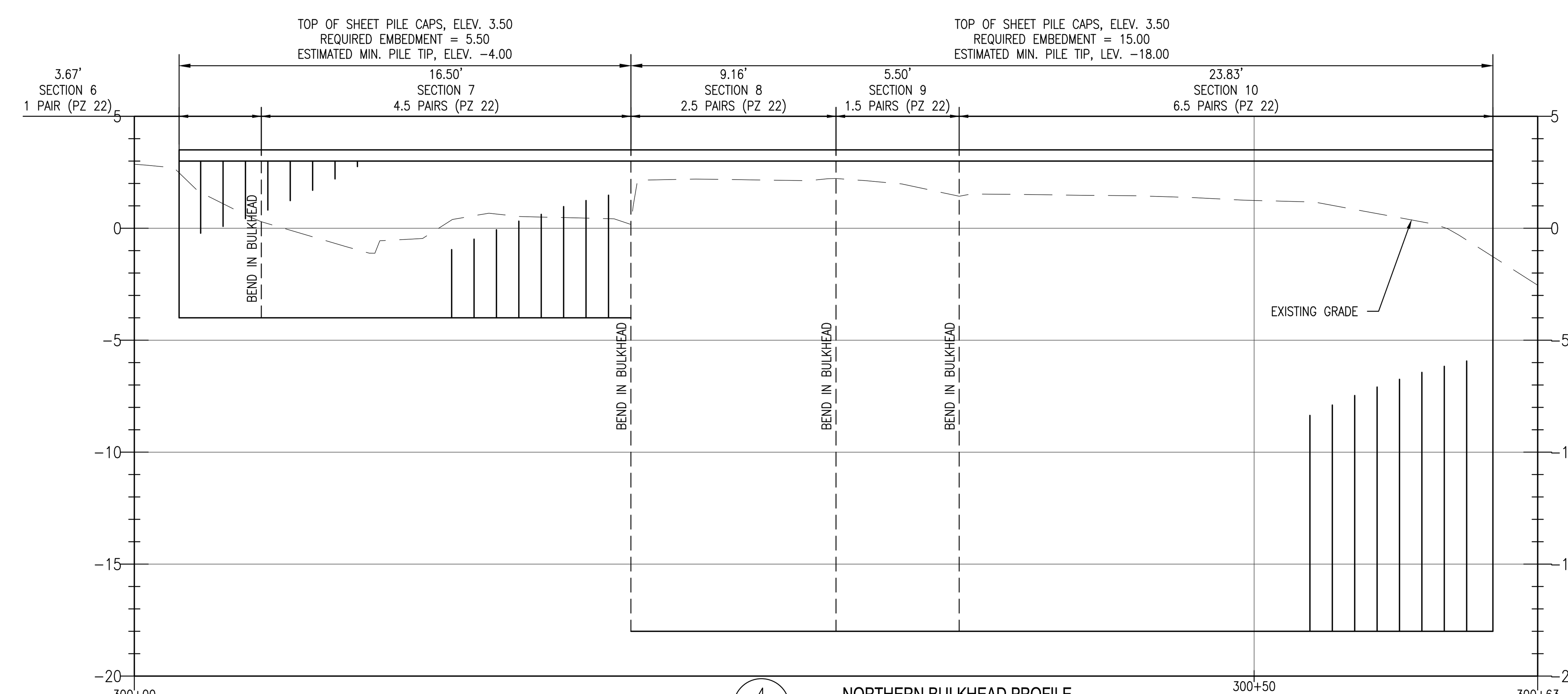
2. CARE SHALL BE TAKEN TO MINIMIZE DISTURBANCES TO EXISTING STRUCTURES. COORDINATE WITH OWNER'S REPRESENTATIVE TO SCHEDULE WORK IN ORDER TO MINIMIZE DISTURBANCES. DRIVING PROCEDURES MAY BE ALTERED IF DISTURBANCES ARE EXPERIENCED.

3. CONTRACTOR SHALL VERIFY UTILITY LOCATIONS AND COORDINATE WITH OWNER'S REPRESENTATIVE FOR PILE LOCATIONS, UTILITY LOCATIONS, BUILDING LOCATIONS, AND ANY INTERFERENCES ENCOUNTERED.

4. MINIMUM EMBEDMENT SHALL BE DEFINED AS THE EMBEDMENT DEPTH IN FIRM MATERIAL CAPABLE OF SUPPORTING THE DEAD LOAD OF THE PILE AND WEIGHT OF THE HAMMER.



3/C108 SOUTHERN BULKHEAD PROFILE
SCALE: 1"= 5'



4/C108 NORTHERN BULKHEAD PROFILE
SCALE: 1"= 5'

SHEET PILE LAYOUT

POINT NO.	DESCRIPTION	NORTHING	EASTING
3000	PILE	218902.6227	587560.5947
3001	PILE	218940.9981	587585.6535
3002	PILE	218945.0061	587579.5163
3003	PILE	218951.1428	587583.5235
3004	PILE	218960.1644	587569.7078
3005	PILE	218957.0940	587567.7029
4000	PILE	218983.7043	587583.5217
4001	PILE	218980.5669	587581.6176
4002	PILE	218972.0368	587595.6289
4003	PILE	218979.8397	587600.4771
4005	PILE	218997.3547	587617.5430

CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 318 (LATEST EDITION).

2. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS SHALL BE PER DELDOT STANDARDS FOR CLASS A CONCRETE.

3. CONCRETE REINFORCING SHALL CONFORM TO THE FOLLOWING DESIGNATIONS,
   - DEFORMED BARS
   - ASTM A615, GRADE 60

4. LAP DEFORMED BARS 40 DIA., UNO. HOOKS SHALL BE STANDARD HOOKS, UNO.

5. CONCRETE PROTECTION FOR REINFORCEMENT (UNLESS NOTED OTHERWISE): CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3 IN.

6. WELDING OF REINFORCEMENT IS NOT PERMITTED UNLESS SPECIFICALLY INDICATED ON DRAWINGS. WELDING, WELDING ELECTRODES AND FLUXES SHALL CONFORM TO AWS DI .4-92, "STRUCTURAL WELDING CODE - REINFORCED STEEL". ELECTRODES SHALL HAVE A MINIMUM TENSILE STRENGTH OF 70 KSI. ASTM A706 BARS SHALL BE USED IN ALL WELDED APPLICATIONS.

7. COMPLETE SHOP DRAWINGS AND SCHEDULES OF ALL REINFORCING STEEL SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION. REFER TO SPECIFICATIONS.

8. REINFORCEMENT SHALL BE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS. PROVIDE CLASS B TENSION LAP SPLICES FOR ALL HORIZONTAL GRADE BEAM REINFORCING.

9. CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.

10. ANCHOR BOLTS SHALL CONFORM TO ASTM A307 UNLESS NOTED OTHERWISE.

11. TESTING: CONTRACTOR TO PROVIDE CONCRETE TESTING SERVICES.

STRUCTURAL STEEL

1. STRUCTURAL STEEL FABRICATION, ERECTION, AND CONNECTION DESIGN SHALL CONFORM TO AISC "SPECIFICATION FOR THE DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" LATEST EDITION.

2. STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING DESIGNATIONS:
   - STEEL BARS, ANGLES & PLATES: ASTM A36, U.N.O.

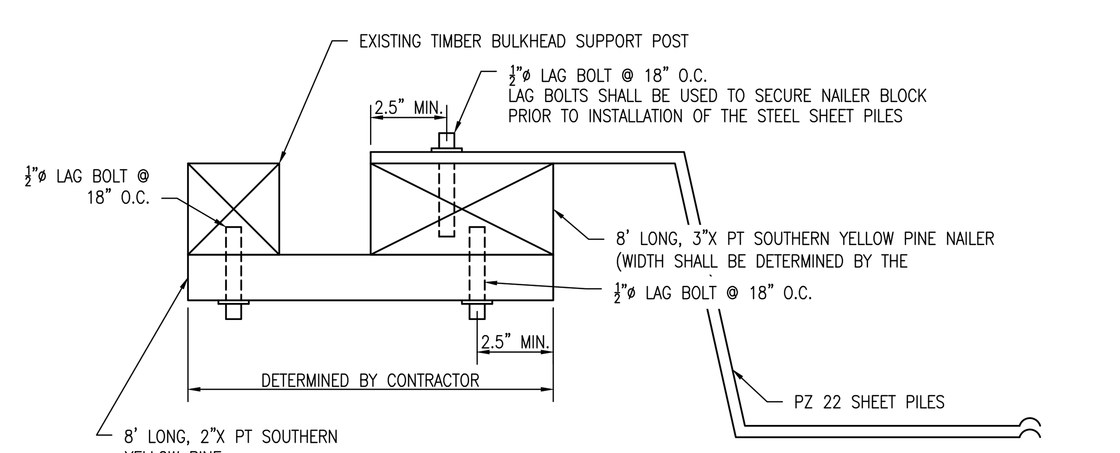
3. ALL WELDING SHALL CONFORM TO DI. I-LATEST EDITION. ELECTRODES SHALL BE E70XX.

4. ALL ALUMINUM AND STEEL MEMBERS TO BE TREATED OR PROPERLY SEPARATED TO PREVENT GALVANIC AND CORROSIVE EFFECTS.

5. SUBMIT ALL STEEL SHOP DRAWINGS FOR APPROVAL PRIOR TO ANY FABRICATION.

6. THERE SHALL BE NO FIELD CUTTING OF STRUCTURAL STEEL MEMBERS FOR THE WORK OF OTHER TRADES WITHOUT THE PRIOR APPROVAL OF THE DESIGN PROFESSIONAL.

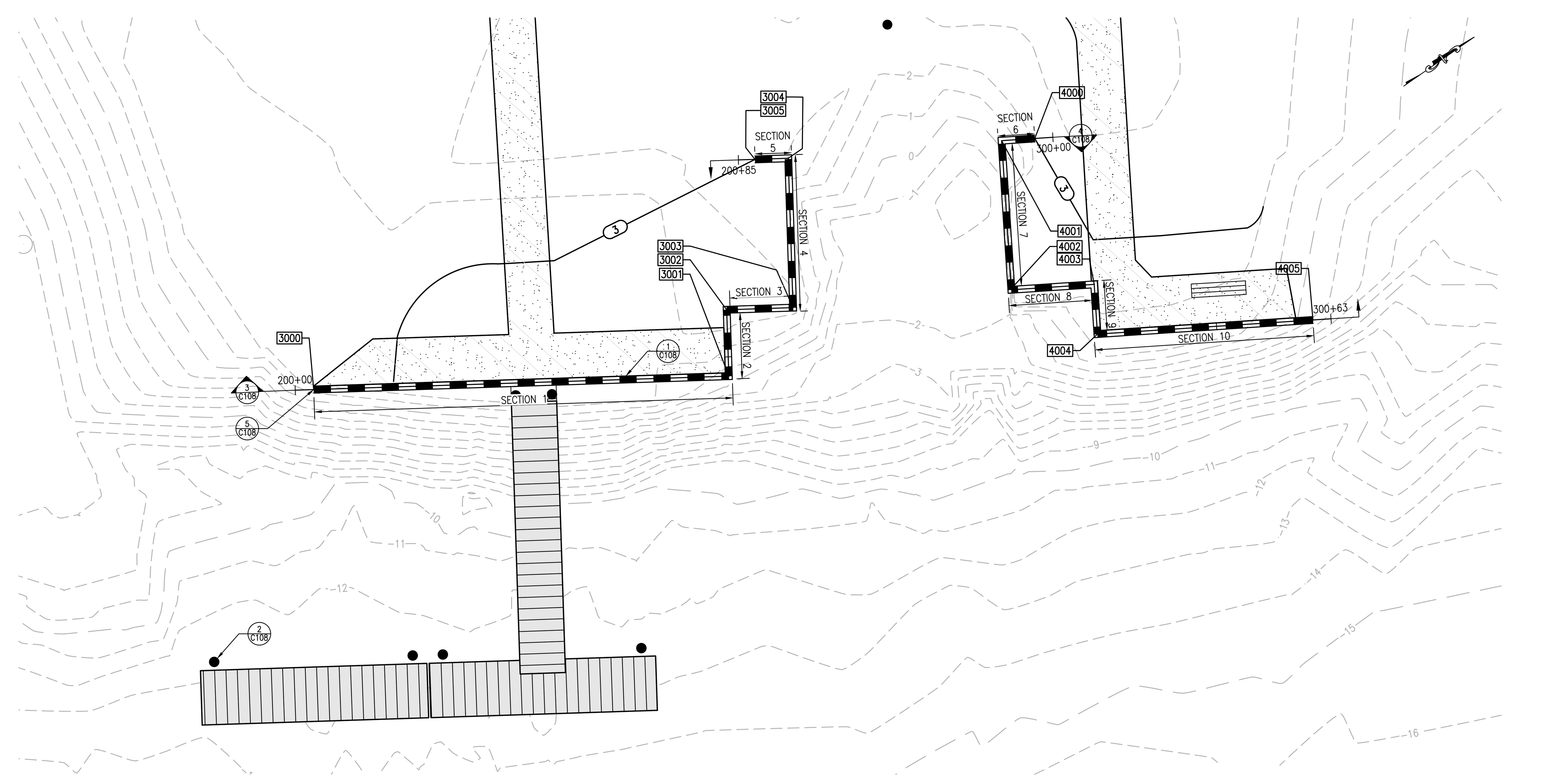
7. ALL STEEL SHEET PILES SHALL BE PAINTED WITH HIGH PERFORMANCE AND HIGH SOLIDS POLYAMINE CURED EPOXY COATING THAT IS DESIGNED TO BE USED AS A PART OF AN ANTICORROSIVE SYSTEM FOR MARINE APPLICATIONS. THE COATING SHALL BE "BUFF" IN COLOR.



NOTE:

1. CONTRACTOR SHALL PRE-DRILL HOLES FOR ALL LAG BOLTS.

5/C108 BULKHEAD TIE-IN DETAIL
SCALE: 1"= 5'



PLAN VIEW
SCALE: 1" = 10'

0' 10' 20' 30'
SCALE: 1' = 10'

C:\PROJECTS\175013.00 DNREC 2017 Engineering OE\175013.13 Woodland Transient Vessel Dock\CADD FILES\Sheets\Construction Plans\C108 - STRUCTURAL DETAILS.dwg, 7/25/2018 9:55 AM

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS:
4134 NORTH DUPONT HIGHWAY
DOVER, DE 19901
P: (302) 734-9188 F: (302) 734-4589
WEBSITE:
www.centuryeng.com
EMAIL:
cei@centuryeng.com

REVISIONS

ADDENDUM

△ DESCRIPTION	DATE

PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

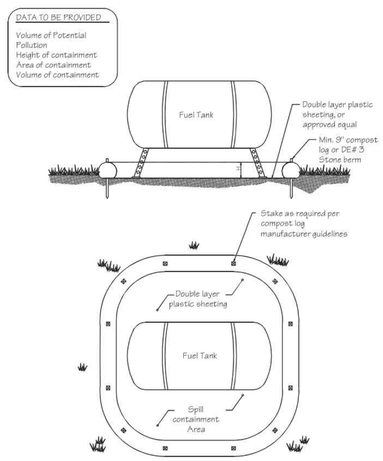
SHEET TITLE
STRUCTURAL DETAILS

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN	CHK'D/DESIGNER
DFS / MDS	AES
SCALE	SHEET NO.
AS NOTED	C108
PROJECT NO.	
175013.13	

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control



Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.6.1** Sheet 1 of 5

Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Pollution Prevention – Spill Prevention

1. Fueling should only take place in signed designated areas, away from downstream drainage facilities and watercourses.
2. Fueling must be with nozzles equipped with automatic shut-off to control drips. Do not top off.
3. Protect the areas where equipment or vehicles are being repaired, maintained, fueled or parked from storm water run-on and runoff.
4. Use barriers such as berms to prevent storm water run-on and runoff, and to contain spills.
5. Place a "Fueling Area" sign next to each fueling area.
6. Store hazardous materials such as fuel, solvents, oil and chemicals in secondary containment.
7. Inspect vehicles and equipment for leaks on each day of use. Repair fluid and oil leaks immediately.
8. Absorbent spill clean-up materials and spill kits must be available in fueling areas and on fuel trucks.
9. If fueling is to take place at night, make sure the fueling area is sufficiently illuminated.
10. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.

CLEAN UP SPILLS

1. If it is safe to do so, immediately contain and clean up any chemical and/or hazardous material spills.
2. Properly dispose of used oil, fluids, lubricants and spill clean-up materials.
3. Do not bury spills or wash them down with water.

LEAKS AND DRIPS

1. Use drip pans or absorbent pads at all times. Place under and around leaky equipment.
2. Do not allow oil, grease, fuel or chemicals to drip onto the ground.
3. Have spill kits and clean up material on-site.
4. Repair leaky equipment promptly or remove problem vehicles and equipment from the site. Clean up contaminated soil immediately.
5. Store contaminated waste in sealed containers constructed of suitable material. Label these containers properly.
6. Clean up all spills and leaks. Promptly dispose of waste and spent clean up materials.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.6.1** Sheet 2 of 5

Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes:

The Construction Site Pollution Prevention Plan should include the following elements:

1. Material Inventory

Document the storage and use of the following materials:

a. Concrete
b. Detergents
c. Paints (enamel and latex)
d. Cleaning solvents
e. Pesticides
f. Wood scraps
g. Fertilizers
h. Petroleum based products

2. Good housekeeping practices

a. Store only enough product required to do the job.
b. All materials shall be stored in a neat, orderly manner in their original labeled containers and covered.
c. Substances shall not be mixed.
d. When possible, all of a product shall be used up prior to disposal of the container.
e. Manufacturers' instructions for disposal shall be strictly adhered to.
f. The site foreman shall designate someone to inspect all BMPs daily.

3. Waste management practices

a. All waste materials shall be collected and stored in securely lidded dumpsters in a location that does not drain to a waterbody.
b. Waste materials shall be salvaged and/or recycled whenever possible.
c. The dumpsters shall be emptied a minimum of twice per week, or more if necessary. The licensed trash hauler is responsible for cleaning out dumpsters.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 3 of 5

Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

d. Trash shall be disposed of in accordance with all applicable Delaware laws.
e. Trash cans shall be placed at all lunch spots and littering is strictly prohibited. Recycle bins shall be placed near the construction trailer.
f. If fertilizer bags can not be stored in a weather-proof location, they shall be kept on a pallet and covered with plastic sheeting which is overlapped and anchored.

4. Equipment maintenance practices

a. If possible, equipment should be taken to off-site commercial facilities for washing and maintenance.
b. If performed on-site, vehicles shall be washed with high-pressure water spray without detergents in an area contained by an impervious berm.
c. Drip pans shall be used for all equipment maintenance.
d. Equipment shall be inspected for leaks on a daily basis.
e. Washout from concrete trucks shall be disposed of in a temporary pit for hardening and proper disposal.
f. Fuel nozzles shall be equipped with automatic shut-off valves.
g. All used products such as oil, antifreeze, solvents and tires shall be disposed of in accordance with manufacturers' recommendations and local, state and federal laws and regulations.

5. Spill prevention practices

a. Potential spill areas shall be identified and contained in covered areas with no connection to the storm drain system.
b. Warning signs shall be posted in hazardous material storage areas.
c. Preventive maintenance shall be performed on all tanks, valves, pumps, pipes and other equipment as necessary.
d. Low or non-toxic substances shall be prioritized for use.

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 4 of 5

Effective April 2016

Standard Detail & Specifications

Construction Site Waste Mgt & Spill Control

Notes (cont.)

e. Contact information for reporting spills through the DNREC 24-Hour Toll Free Number shall be prominently posted.

6. Education

a. Best management practices for construction site pollution control shall be a part of regular progress meetings.
b. Information regarding waste management, equipment maintenance and spill prevention shall be prominently posted in the construction trailer.

CONTACT INFORMATION

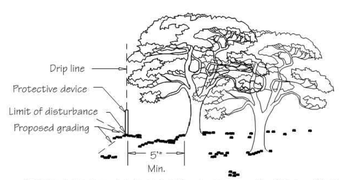
DNREC 24-Hour Toll Free Number	**800-662-8802**
DNREC Solid & Hazardous Waste Branch	**302-739-9403**

Source:	Symbol:	Detail No.
Adapted from USEPA Pub. 840-B-92-002		**DE-ESC-3.6.1** Sheet 5 of 5

Effective April 2016

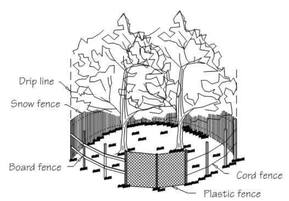
Standard Detail & Specifications

Sensitive Area Protection



*5' min. setback applies to all sensitve areas covered by this specification.

Location of Sensitive Area Protection



Methods of Sensitive Area Protection

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SAP	**DE-ESC-3.7.2** Sheet 1 of 3

Effective April 2016

Standard Detail & Specifications

Sensitive Area Protection

Construction Notes:

Fencing shall be installed at the extents of all sensitive areas. For trees, the fencing shall be installed outside the dripline (mature canopy) and at no time within 5 feet of the trunk. Personnel must be instructed to honor protective devices. The devices described are suggested only, and are not intended to exclude the use of other devices which will protect the trees to be retained. If silt fence is to be used for demarcation purposes, appropriate signage shall be provided a minimum of every 20 feet denoting the area as a sensitive area protection zone.

Materials:

1. Snow Fence - Standard 40-inch high snow fence shall be placed at the limits of clearing or construction on standard steel posts set 6 feet apart.
2. Board Fence - Board fencing consisting of 4-inch square posts set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with a minimum of two horizontal boards between posts. For tree proteciton, if it is not practical to erect a fence at the drip line, construct a triangular fence nearer the trunk. The limits of clearing will still be located at the drip line, since the root zone within the drip line will still require protection.
3. Plastic Fencing - 40-inch high "international orange" plastic (polyethylene) web fencing secured to conventional metal "T" or "U" posts driven to a minimum depth of 18 inches on 6-foot minimum centers shall be installed at the limits of clearing. The fence should have the following minimum physical qualities:

a.	Tensile yield:	Average 2,000 lbs. per 4-foot width (ASTM D638)
b.	Ultimate tensile yield:	Average 2,900 lbs. per 4-foot width (ASTM D638)
c.	Elongation at break (%):	Greater than 1000% (ASTM D638)
d.	Chemical resistance:	Inert to most chemicals and acids

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SAP	**DE-ESC-3.7.2** Sheet 2 of 3

Effective April 2016

Standard Detail & Specifications

Sensitive Area Protection

4. Cord Fence - Posts with a minimum size of 2 inches square or 2 inches in diameter set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with two rows of cord 1/4-inch or thicker at least 2 feet apart running between posts with strips of colored surveyor's flagging tied securely to the string at intervals no greater than 3 feet.
5. Earth Berms - Temporary earth berms shall be constructed according to specifications for a Temporary Earth Dike with the base of the berm on the sensitive area side located along the limits of clearing. Earth berms may not be used for this purpose if their presence will conflict with drainage patterns.
6. Trunk Armoring (Tree Protection Only) - As a last resort, a tree trunk can be armored with burlap wrapping and 2-inch studs wired vertically no more than 2 inches apart to a height of 5 feet encircling the trunk. If this alternative is used, the root zone within the drip line will still require protection. Nothing should ever be nailed to a tree.

Maintenance:

Fencing and armoring devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SAP	**DE-ESC-3.7.2** Sheet 3 of 3

Effective April 2016

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901
P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT

CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE

EROSION & SEDIMENT CONTROL DETAILS

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

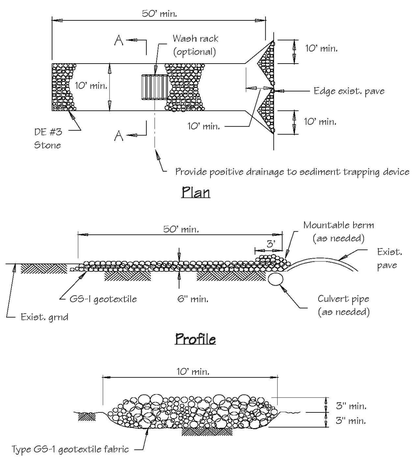
DRAWN	CHK'D/DESIGNER
DFS / MDS	AES

SCALE	SHEET NO.
NONE	C109

PROJECT NO. 175013.13

G:\PROJECTS\175013.00 (DNREC 2017 Engineering JOB)\175013.13 Woodland Terminal Vessel Dock\CADD FILES\Details\Construction Plans\C109 - EROSION & SEDIMENT CONTROL DETAILS.dwg, 7/13/2018 1:22 PM

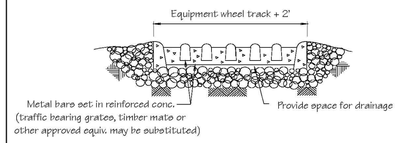
Standard Detail & Specifications
Stabilized Construct. Entrance



Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications
Stabilized Construct. Entrance



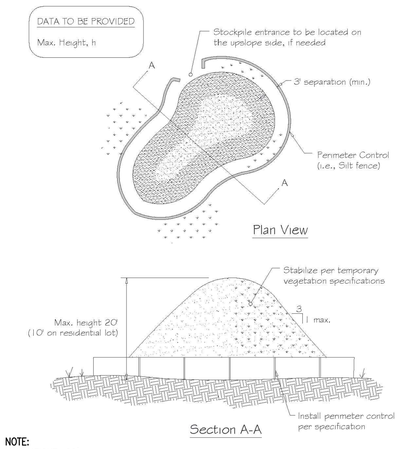
Construction Notes:

1. Stone size - Use DE #3 stone.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than size (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Geotextile - Type GS-I; placed over the entire area prior to placing of stone.
6. Surface Water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. Washing - Vehicle wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. Inspection - Periodic inspection and needed maintenance shall be provided after each rain.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook	SCE	DE-ESC-3.4.7 Sheet 2 of 2

Effective April 2016

Standard Detail & Specifications
Soil Stockpile



NOTE:
MAX HEIGHT: 20'

Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	SP	DE-ESC-3.7.3 Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications
Soil Stockpile

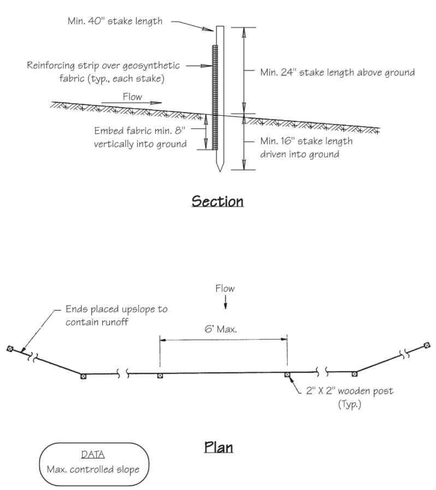
Construction Notes:

1. Locate stockpiles so that they are 50 feet from any storm drain inlet, open channel, wetland or waterbody. Redirect any concentrated flow around the stockpile using an approved erosion and sediment control measure.
2. Secure the perimeter of the stockpile with an approved erosion and sediment control perimeter device.
3. If stockpile is to remain inactive for more than 14 calendar days, the stockpile must be vegetated. Follow the temporary vegetation specifications. The vegetation chosen shall last the duration of the stockpile; the stockpile shall be restabilized if the temporary vegetation dies or erosion results.

Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	SP	DE-ESC-3.7.3 Sheet 2 of 2

Effective April 2016

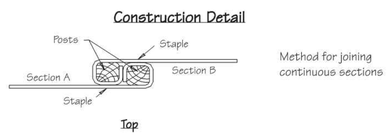
Standard Detail & Specifications
Silt Fence



Source:	Symbol:	Detail No.
Adapted form MD Stds. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications
Silt Fence



Construction Notes:

1. Geosynthetic fabric to be fastened securely to fence posts with wire ties or staples.
2. When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.
3. Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

Materials:

1. Stakes: Steel (either T or U) or 2" x 2" hardwood
2. Geosynthetic Fabric: Type GD-I
3. Reinforcing strip: Wooden lath, plastic strip or other approved equivalent
4. Prefabricated Unit: Geofab, Envirofence, or approved equivalent

Source:	Symbol:	Detail No.
Adapted from MD Stds. & Specs. for ESC	SF	DE-ESC-3.1.2.1 Sheet 2 of 2

Effective April 2016

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
EROSION & SEDIMENT CONTROL DETAILS

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

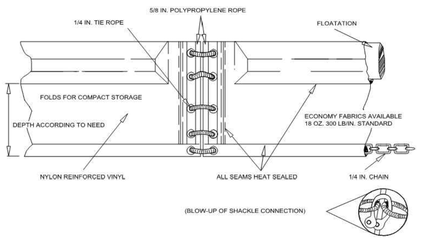
DRAWN	CHK'D/DESIGNER
DFS / MDS	AES

SCALE	SHEET NO.
NONE	C110

PROJECT NO. 175013.13

G:\PROJECTS\175013.00 (DNREC 2017 Engineering GS)\175013.13 Woodland Terminal Vessel Dock\CADD FILES\Details\Construction Plans\C110 - EROSION & SEDIMENT CONTROL DETAILS.dwg, 7/13/2018 1:23 PM

Standard Detail & Specifications
Turbidity Curtain



Typical Section - Type 1

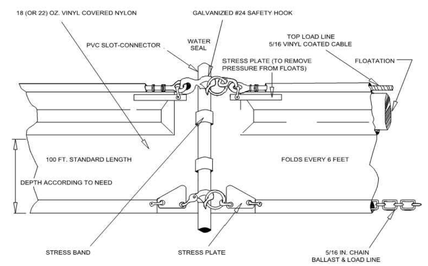
DATA

Curtain type (1,2, or 3)
Layout (Std. or Alt.)

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 1 of 8

Effective April 2016

Standard Detail & Specifications
Turbidity Curtain



Typical Section - Type 2

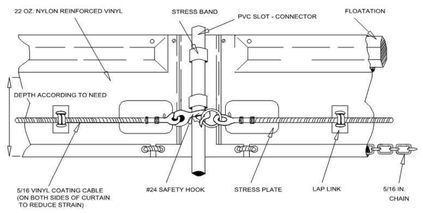
DATA

Curtain type (1, 2, or 3)
Layout (Std. or Alt.)

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 2 of 8

Effective April 2016

Standard Detail & Specifications
Turbidity Curtain



Typical Section - Type 3

DATA

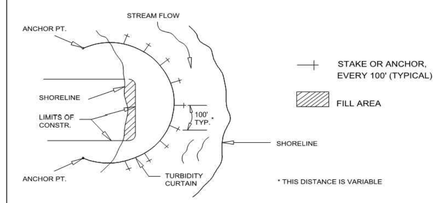
Curtain type (1, 2, or 3)
Layout (Std. or Alt.)

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 3 of 8

Effective April 2016

Standard Detail & Specifications
Turbidity Curtain

NOTE: The standard layout shown is intended for use in streams, ponds and other non-tidal waters



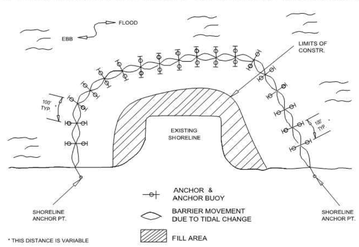
Plan - Std. Layout

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 4 of 8

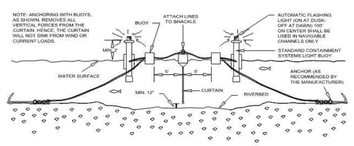
Effective April 2016

Standard Detail & Specifications
Turbidity Curtain

NOTE: The alternative layout shown is intended for tidal waters and/or heavy wind and wave action



Plan - Alt. Layout



Additional Requirements for Navigable Waters

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 5 of 8

Effective April 2016

Standard Detail & Specifications
Turbidity Curtain

Construction Notes:

1. **Materials**
   a. Barriers should be a bright color (yellow or "international" orange are recommended) that will attract the attention of nearby boaters.
   b. The curtain fabric shall meet manufacturer's recommendations for the application.
   c. Seams in the fabric shall be either vulcanized welded or sewn and shall develop the full strength of the fabric.
   d. Floatation devices shall be flexible, buoyant units contained in an individual floatation sleeve or collar attached to the curtain. Buoyancy provided by the floatation units shall be sufficient to support the weight of the curtain and maintain a freeboard of at least 3 inches above the water surface level.
   e. Load lines must be fabricated into the bottom of all floating turbidity curtains. Type II and Type III must have load lines also fabricated into the top of the fabric. The top load line shall consist of woven webbing or vinyl-sheathed steel cable and shall have a break strength in excess of 10,000 pounds. The supplemental (bottom) load line shall consist of a chain incorporated into the bottom hem of the curtain of sufficient weight to serve as ballast to hold the curtain in a vertical position. Additional anchorage shall be provided as necessary. The load lines shall have suitable connecting devices which develop the full breaking strength for connection to load lines in adjacent sections as shown in the detail.
   f. External anchors may consist of wooden or metal stakes (2- x 4-inch or 2-1/2-inch minimum diameter wood or 1.33 lbs/linear foot steel) when Type I installation is used; when Type II or Type III installations are used, bottom anchors should be used.
   g. Bottom anchors must be sufficient to hold the curtain in the same position relative to the bottom of the watercourse without interfering withthe action of the curtain. The anchor may dig into the bottom (grappling hook, plow or fluke-type) or may be weighted (mushroom type) and should be attached to a floating anchor buoy via an anchor line. The anchor line should then run from the buoy to the to load line of the curtain. When used with Type III installations, these lines must contain enough slack to allow the buoy and curtain to float freely with tidal changes without pulling the buoy or curtain down and must be checked regularly to make sure they do not become entangled with debris. As previously noted, anchor spacing will vary with current velocity and potential wind and wave action; manufacturer's recommendations should be followed. See detail for orientation of external anchors and anchor buoys for tidal installations.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 6 of 8

Effective April 2016

Standard Detail & Specifications
Turbidity Curtain

Construction Notes (cont.)

2. **Installation**
   a. In the calm water of lakes or ponds (Type I installation) it is usually sufficient to set the curtain end stakes or anchor points (using anchor buoys if bottom anchors are employed), then tow the curtain in the furled condition out and attach it to the stakes or anchor points. Following this, any additional stakes or buoyed anchors required to maintain the desired location of the curtain may be set and these anchor points made fast to the curtain. Only then shall the furling lines be cut to allow the curtain skirt to drop.
   b. In rivers or in other moving waters (Type II and Type III installations) it is important to set all curtain anchor points. Care must be taken to ensure that anchor points are of sufficient holding power to retain the curtain under the existing current conditions, prior to putting the furled curtain into the water. Anchor buoys should be employed on all anchors to prevent the current from submerging the flotation at the anchor points. If the curtain is being installed into tidal areas which would be subject to currents in both directions, anchors should be provided on both sides of the curtain. This will minimize curtain movement and prevent the curtain from overrunning the anchors during tide reversals. After the anchors have been secured, the furled curtain should be secured to the upstream anchor point and then sequentially attached to each next downstream anchor point until the entire curtain is in position. Before unfurling, the "lay" of the curtain should be assessed and any necessary adjustments made to the anchors. Once the location has been deemed adequate, the furling lines may be cut to allow the skirt to drop.
   c. Anchor lines should be attached to the flotation device, not to the bottom of the curtain. The anchoring line attached to the flotation device on the downstream side will provide support for the curtain. Attaching the anchors to the bottom of the curtain could cause premature failure of the curtain due to the stresses imparted on the middle section of the curtain.
   d. Turbidity curtain shall not be installed across channel flows unless there is a danger of causing sediment deposition to occur in the middle of a watercourse, thereby blocking access or creating a sand bar. In such situations, the curtain may be installed so as to form a long-sided, sharp "V" to deflect clean water around a work site, confining most of the silt-laden water to the work area inside the "V" and directing it to the shoreline. In no case shall the curtain be installed perpendicular to the channel flow.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 7 of 8

Effective April 2016

Standard Detail & Specifications
Turbidity Curtain

Construction Notes (cont.)

3. **Maintenance**
   a. The individual(s) identified on the plan as responsible for maintenance of the curtain shall do so for the duration of the project in order to ensure the continuous protection of the watercourse.
   b. Should repairs to the geotextile fabric become necessary, repair kits are generally available from the manufacturer. The manufacturer's instructions must be followed to ensure the adequacy of the repair.
   c. When the curtain is no longer required as determined by the inspector, the curtain and related components shall be removed in such a manner as to minimize turbidity. Remaining sediment shall be sufficiently settled before removing the curtain. Sediment may be removed and the original depth (or plan elevation) restored. Any spoils must be taken to an approved upland disposal area and stabilized in accordance with the approved plan.

4. **Removal**
   a. Care shall be taken to protect the skirt from damage as the turbidity curtain is dragged from the watercourse.
   b. The site selected to bring the curtain ashore should be free of sharp rocks, broken cement, debris, etc. so as to minimize damage when hauling the curtain over the area.
   c. If the curtain has a deep skirt, it can be further protected by running a small boat along its length with a crew installing furling lines before attempting to remove the curtain from the water.

Source:	Symbol:	Detail No.
Adapt. from Amer. Boom and Barrier Corp.	TC-(1/2/3) (Std/Alt)	DE-ESC-3.5.3 Sheet 8 of 8

Effective April 2016

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
EROSION & SEDIMENT CONTROL DETAILS

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN	CHK'D/DESIGNER
DFS / MDS	AES

SCALE	SHEET NO.
NONE	C111

PROJECT NO. 175013.13

G:\PROJECTS\175013.00 (DNREC 2017 Engineering DB)\175013.13 Woodland Terminal Vessel Dock\CADD FILES\Details\Construction Plans\C111 - EROSION & SEDIMENT CONTROL DETAILS.dwg, 7/13/2018 1:23 PM

Standard Detail & Specifications
Topsoiling

Construction Notes:

1. **Site Preparation** (Where Topsoil is to be added)

   Note: When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, waterways and sediment basins.

   a. Grading - Grades on the areas to be topsoiled which have been previously established shall be maintained.

   b. Liming - Where the topsoil is either highly acid or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet). Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

   c. Tilling - After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or by scarifying to a depth of a least 3 inches to permit bonding of the topsoil to the subsoil. Pack by passing a bulldozer up and down over the entire surface area of the slope to create horizontal erosion check slots to prevent topsoil from sliding down the slope.

2. **Topsoil Material and Application**

   Note: Topsoil salvaged from the existing site may often be used but it should meet the same standards as set forth in these specifications. The depth of topsoil to be salvaged shall be no more than the depth described as a representative profile for that particular soil type as described in the soil survey published by USDA-SCS in cooperation with Delaware Agricultural Experimental Station.

Source:	Symbol:	Detail No.
USDA - NRCS		**DE-ESC-3.4.1** Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications
Topsoiling

Construction Notes (cont.)

a. Materials - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand or other soil as approved by an agronomist or soil scientist. It shall not have a mixture of contrasting textured subsoil and contain no more than 5 percent by volume of cinders, stones, slag, coarse fragment, gravel, sticks, roots, trash or other extraneous materials larger than 1-1/2 inches in diameter. Topsoil must be free of plants or plant parts of bermudagrass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistles, or others as specified. All topsoil shall be tested by a reputable laboratory for organic matter content, pH and soluble salts. A pH of 6.0 to 7.5 and an organic content of not less than 1.5 percent by weight is required. If pH value is less than 6.0 lime shall be applied and incorporated with the topsoil to adjust the pH to 6.5 or higher. Topsoil containing soluble salts greater than 500 parts per million shall not be used.

Note: No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed to permit dissipation of toxic materials.

b. Grading - The topsoil shall be uniformly distributed and compacted to a minimum of four (4) inches. Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

Note: Topsoil substitutes or amendments as approved by a qualified agronomist or soil scientist, may be used in lieu of natural topsoil. Compost material used to improve the percentage of organic matter shall be provided by a certified supplier.

Compost amendments that are intended to meet specific post-construction stormwater management goals shall further meet the requirements of **Appendix 3.06.2 Post Construction Stormwater Management BMP Standards and Specifications, Section 14.0 Soil Amendments.**

Source:	Symbol:	Detail No.
USDA - NRCS		**DE-ESC-3.4.1** Sheet 2 of 2

Effective April 2016

Standard Detail & Specifications
Vegetative Stabilization

TEMPORARY SEEDING BY RATES, DEPTHS AND DATES

Mix #	Species[6]	Seeding Rate		Optimum Seeding Dates [1] O = Optimum Planting Period. A = Acceptable Planting Period						Planting Depth[7]
				Coastal Plain			Piedmont		All	
	Certified Seed	lb/Ac[5]	lb/1000 sq.ft.	2/1-4/30	[2] 5/1-8/14	8/15-10/31	3/1-4/30	[2] 5/1-7/31	8/1-10/31	10/31-2/1
1	Barley	125	4	O	A	O	O	A	O	1-2 inches 2-3" sandy soils
2	Oats	125	4	O	A	A	O	A	A	1-2 inches 2-3" sandy soils
3	Rye	125	4	O	A	O	O	A	O	A 1-2 inches 2-3" sandy soils
4	Perennial Ryegrass	125	4	O	A	O	O	A	O	1-2" sandy soils
5	Annual Ryegrass	125	4	O	A	O	O	A	O	A 0.5 inches 1-2" sandy soils
6	Winter Wheat	125	4	O	A	O	O	A	O	A 1-2 inches 2-3" sandy soils
7	[illegible]	[illegible]	[illegible]		[illegible]			[illegible]		1-2" sandy soils
8	Pearl Millet	20 PLS	0.5		O			O		0.5 inches 1-2" sandy soils

1. Winter seeding requires 3 tons per acre of straw mulch for proper stabilization.
2. May be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
3. Applicable on slopes 3:1 or less.
4. Fifty pounds per acre of Annual Lespedeza may be added to 1/2 the seeding rate of any of the above species.
5. Use varieties currently recommended for Delaware. Contact a County Extension Office for information.
6. Warm season grasses such as Millet or Weeping Lovegrass may be used between 5/1 and 9/1 if desired. Seed at 3-5 lbs. per acre. Good on low fertility and acid areas. Seed after frost through summer at a depth of 0.5".

NOTE: TEMPORARY SEED MIX SHALL BE DNREC TEMPORARY MIX #3, #5, OR #6.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 1 of 4

Effective April 2016

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES

Mix No.	Seeding Mixtures / Certified Seed[3]	Seeding Rate[4]		Optimum Seeding Dates [2] O = Optimum Planting Period A = Acceptable Planting Period							Remarks
				Coastal Plain			Piedmont			All[8]	
	Well Drained Soils	lb/Ac	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1	
1	Tall Fescue Weeping Lovegrass	140 10	3.2 0.23	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Lovegrass very difficult to mow; Germinates only in hot weather
2	Overtongue Sheep Fescue Common Lespedeza[5] inoculated	30 30 15	0.69 0.69 0.35	A	O	A	A	O	A	Add 100 lbs./ac Winter Rye	Good erosion control mix Tolerant of low fertility soils Good wildlife cover and food
3	Tall Fescue (Turf-type) **or** Strong Creeping Red Fescue **or** Perennial Ryegrass **plus** Flatpea[5]	50 50 50 15	1.15 1.15 1.15 0.34	O	A	O	O	A	O	Add 100 lbs./ac Winter Rye	Good erosion control mix Tall Fescue for droughty conditions. Creeping Red Fescue for heavy shade. Flatpea to suppress woody vegetation.
4	Strong Creeping Red Fescue Kentucky Bluegrass Perennial Ryegrass **or** Redtop **plus** White Clover[5]	100 70 15 5 3	2.3 1.61 0.35 0.11 0.07	O	A	O	O	A	O	Add 100 lbs./ac Winter Rye	Suitable waterway mix. Canada Bluegrass more drought tolerant. Use Redtop for increased drought tolerance.
5	Switchgrass[5] **or** Coastal Panicgrass Big Bluestem Little Bluestem Indian Grass	10 10 5 5 5	0.23 0.23 0.11 0.11 0.1		O			O			Native warm-season mixture. Tolerant of low fertility soils. Drought tolerant. Poor shade tolerance. N fertilizer discouraged - weeds
6	Tall Fescue (turf-type) (Blend of 3 cultivars)	150	3.5	O	A	O	O	A	O		Managed filter strip for nutrient uptake.
7	Tall Fescue Ky. Bluegrass (Blend) Perennial Ryegrass	150 20 20	3.5 0.46 0.46	O	A	O	O	A	O		Three cultivars of Kentucky Bluegrass. Traffic tolerant.
8	Big Bluestem[5] Indian Grass[5] Little Bluestem[5] Creeping Red Fescue **plus one of:** Partridge Pea Bush Clover Wild Indigo Showy Tick-Trefoil	10 10 8 30 5 3 3 2	0.23 0.23 0.18 0.69 0.11 0.07 0.07 0.05	O	A			O	A		All species are native. Indian Grass and Bluestem have fluffy seeds. Plant with a specialized native seed drill. Creeping Red Fescue will provide erosion protection while the warm season grasses get established.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 2 of 4

Effective April 2016

Standard Detail & Specifications
Vegetative Stabilization

PERMANENT SEEDING AND SEEDING DATES (cont.)

Mix No.	Seeding Mixtures / Certified Seed[3]	Seeding Rate[4]		Optimum Seeding Dates [2] O = Optimum Planting Period A = Acceptable Planting Period							Remarks
				Coastal Plain			Piedmont			All[8]	
	Poorly Drained Soils	lb/Ac	lb/1000 sq.ft.	2/1-4/30	5/1-8/14	8/15-10/31	3/1-4/30	5/1-7/31	8/1-10/31	10/31-2/1	
9	Redtop Creeping Bentgrass Sheep Fescue Rough Bluegrass	75 35 30 45	1.72 0.8 0.69 1	O	A	O	O	A	O	Add 100 lbs./ac Winter Rye	Quick stabilization of disturbed sites and waterways
10	Reed Canarygrass	10	0.23	A		O	A		O		Good erosion control, wildlife cover and wetland revegetation.
	Residential Lawns										
11	Tall Fescue Perennial Ryegrass Kentucky Bluegrass Blend	100 25 30	2.3 0.57 0.69	O	A	O	O	A	O		High value, high maintenance, tight traffic, irrigation necessary. Well drained soils, full sun.
12	Tall Fescue Perennial Ryegrass Sheep Fescue	100 25 25	2.3 0.57 0.57	O	A	O	O	A	O		Moderate value, low maintenance, traffic tolerant
13	Creeping Red Fescue	50	1.15	O	A	O	O	A	O		Shade tolerant
	Chewings Fescue Rough Bluegrass Kentucky Bluegrass	50 20 20	1.15 0.4 0.4								moderate traffic tolerance, moderate maintenance.
14	Creeping Red Fescue Rough Bluegrass **or** Chewings Fescue	50 90	1.15 2.1	O	A	O	O	A	O		Shade tolerant, moisture tolerant.
15	K-31 Tall Fescue	150	3.5	O	A	O	O	A	O		Monoculture; but performs well alone in lawns. Discouraged.

1. When hydroseeding is the chosen method of application, the total rate of seed should be increased by 25%.
2. Winter seeding requires 3 tons per acre of straw mulch. Planting dates listed above are average for Delaware. These dates may require adjustment to reflect local conditions.
3. All seed shall meet the minimum purity and minimum germination percentages recommended by the Delaware Department of Agriculture. The maximum % of weed seeds shall be in accordance with Section 1, Chapter 24, Title 3 of the Delaware Code.
4. Cool season species may be planted throughout summer if soil moisture is adequate or seeded area can be irrigated.
5. All leguminous seed must be inoculated.
6. Warm season grass mix and Reed Canary Grass cannot be mowed more than 4 times per year.
7. Warm season grasses require a soil temperature of at least 50 degrees in order to germinate, and will remain dormant until then.

NOTE: PERMANENT SEED MIX SHALL BE DNREC PERMANENT MIX #9 FOR WET GROUND AREAS, AND SEED MIX #12 FOR DRY GROUND AREAS.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 3 of 4

Effective April 2016

Standard Detail & Specifications
Vegetative Stabilization

Construction Notes:

1. Site Preparation
   a. Prior to seeding, install needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, grassed waterways, and sediment basins.
   b. Final grading and shaping is not necessary for temporary seedings.
2. Seedbed Preparation

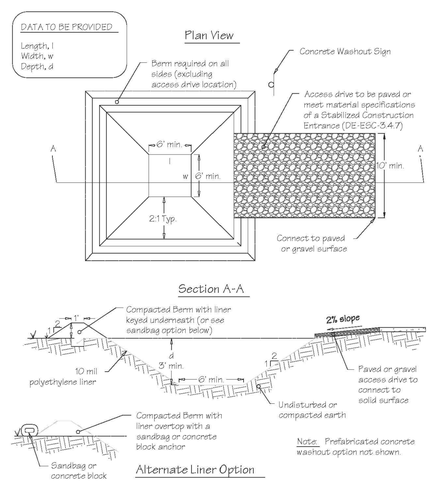
   It is important to prepare a good seedbed to insure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
3. Soil Amendments
   a. Lime - Apply liming materials based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
   b. Fertilizer - Apply fertilizer based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 600 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soils.
4. Seeding
   a. For **temporary stabilization**, select a mixture from **Sheet 1** . For a **permanent stabilization**, select a mixture from **Sheet 2** or **Sheet 3** depending on the conditions.
   b. Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
   c. Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
5. Mulching

   All mulching shall be done in accordance with detail **DE-ESC-3.4.5**.

Source:	Symbol:	Detail No.
Delaware ESC Handbook		**DE-ESC-3.4.3** Sheet 4 of 4

Effective April 2016

Standard Detail & Specifications
Concrete Washout



Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	CW	**DE-ESC-3.6.2** Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications
Concrete Washout

Construction Notes:

1. Locate washout area a minimum of 50 feet from open channels, stormdrain inlets, wetlands or waterbodies.
2. Locate washout area so that it is accessible to concrete equipment (service with a minimum 10 foot wide gravel accessway), but so it is not in a highly active construction area causing accidental damage.
3. Minimum dimensions for prefabricated units are 4 feet by 4 feet by 1 foot deep with a minimum 4mil polyethylene plastic liner. Minimum dimensions for constructed concrete washout areas are 6 feet by 6 feet by 3 feet deep, with a minimum 10mil polyethylene liner, 2:1 side slopes, and a 1 foot high by 1 foot wide compacted fill berm.
4. The liner must be free of tears or holes and placed over smooth surfaces to prevent puncturing. For excavated washouts, anchor the liner underneath the berm or overtop with sandbags or concrete blocks to hold in place.
5. Provide a sign designating the washout area, and for large construction sites, provide signs throughout directing traffic to its location.
6. Allow washed out concrete mixture to harden through evaporation of the wastewater. Once the facility has reached 75 percent of its capacity, remove the hardened concrete by reusing the broken aggregate onsite, recycling, or disposing of offsite. The hardened material can be buried on site with minimum of 1 foot of clean, compacted fill.
7. Apply a new liner before reusing the station for additional washouts after maintenance has occurred.

Source:	Symbol:	Detail No.
Adapted from Colorado Urban Storm Drainage Criteria Manual, Vol 3	CW	**DE-ESC-3.6.2** Sheet 2 of 2

Effective April 2016

This drawing is the property of Century Engineering and is prepared for the exclusive use of its clients at the location indicated. No other use is authorized or intended.

CENTURY ENGINEERING
CONSULTING ENGINEERS ■ SURVEYORS
ADDRESS: 4134 NORTH DUPONT HIGHWAY DOVER, DE 19901 P: (302) 734-9188 F: (302) 734-6589
WEBSITE: www.centuryeng.com
EMAIL: cei@centuryeng.com

REVISIONS

ADDENDUM

DESCRIPTION	DATE

PROJECT
CONSTRUCTION PLANS
FOR
DELAWARE DIVISION OF FISH & WILDLIFE
WOODLAND WHARF TRANSIENT VESSEL DOCK
5115 WOODLAND FERRY RD. SEAFORD, DE 19973
SEAFORD HUNDRED, SUSSEX COUNTY

SHEET TITLE
EROSION & SEDIMENT CONTROL DETAILS

DIVISION OF FISH AND WILDLIFE 100% SUBMISSION
JULY 2018

DRAWN	CHK'D/DESIGNER
DFS / MDS	AES

SCALE	SHEET NO.
NONE	C112

PROJECT NO. 175013.13

G:\PROJECTS\175013.00 (DNREC 2017 Engineering QS)\175013.13 Woodland Terminal Vessel Dock\CADD FILES\Sheets\Construction Plans\C112 - EROSION & SEDIMENT CONTROL DETAILS.dwg, 7/13/2018 1:24 PM