

PROJECT SUMMARY

WETLANDS AND A POND SHALL BE CREATED WITHIN A RETIRED AGRICULTURAL FIELD AT CEDAR POINT WILDLIFE MANAGEMENT AREA (WMA). CREATED WETLANDS WILL INCLUDE A MINIMUM OF 3.70 ACRES (169,884 SF) OF FORESTED NONTIDAL WETLANDS (PFO), EMERGENT NONTIDAL WETLANDS (PEM), AND A 0.5-ACRE (21,780 SF) OPEN WATER POND (PUB). THE PROPOSED WETLANDS ARE IN-KIND REPLACEMENT FOR FORESTED AND EMERGENT NONTIDAL WETLAND IMPACTS INCURRED BY THE NAVY THROUGH MDE NONTIDAL WETLAND PERMIT 14-NT-0269/201461196 AND DEPARTMENT OF THE ARMY PERMIT CENAB-OP-RMS 2014-61196, AND SATISFY A MEMORANDUM OF AGREEMENT (MOA) BETWEEN THE NAVY AND MD DEPARTMENT OF NATURAL RESOURCES. GROUNDWATER WILL PROVIDE WATER FOR THE WETLANDS AND POND. THE POND IS EXPECTED TO BE INUNDATED YEAR-ROUND. THE WETLANDS ARE EXPECTED TO BE INUNDATED OR SATURATED IN THE WINTER AND SPRING. IN THE SUMMER AND EARLY FALL, THE WETLANDS WILL BE DRY OR MOIST.

SEQUENCE OF CONSTRUCTION

1. LOCATE UTILITIES.
2. NOTIFY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT COMPLIANCE DIVISION (410)-537-3510 AND MISS UTILITY A MINIMUM OF 7 CALENDAR DAYS BEFORE THE START OF WORK.
3. PRIOR TO INITIATING WORK, A PRE-CONSTRUCTION MEETING MUST BE CONDUCTED ON-SITE SO THAT PROJECT OBJECTIVES, ON-SITE CONDITIONS, EROSION AND SEDIMENT CONTROL, ACCESS, SPOIL AREA, STAGING AND STOCKPILE AND GRADING PRACTICES MAY BE DISCUSSED AND FINALIZED WITH A NAVY REPRESENTATIVE, DNR REPRESENTATIVE, MDE INSPECTOR, CONTRACTORS, AND THE RESTORATION SPECIALIST.
4. THE LIMITS OF DISTURBANCE AND BOUNDARY OF THE ARCHEOLOGICAL SITE MUST BE FIELD MARKED USING STAKES AND FLAGGING PRIOR TO INSTALLATION OF SEDIMENT CONTROL MEASURES, CONSTRUCTION, OR OTHER LAND DISTURBING ACTIVITIES.
5. PROVIDE CONSTRUCTION STAKE OUT WITH HORIZONTAL AND VERTICAL STATION AND ELEVATION REFERENCES.
6. INSTALL STABILIZED CONSTRUCTION ENTRANCE (SCE), SILT FENCE, AND OTHER SEDIMENT CONTROL DEVICES PER THE PLANS.
7. PERFORM MAINTENANCE TO ACCESS ROAD PER ACCESS ROAD NOTES.
8. OBTAIN APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR.
9. THE SITE IS A AGRICULTURAL FIELD. MOW OR REMOVE VEGETATION AS/IF NEEDED. SAPLINGS MAY BE PRESENT. WOODCHIPS AND OTHER VEGETATIVE DEBRIS GENERATED MAY BE USED TO MEET ORGANIC SUPPLEMENT REQUIREMENTS. STOCKPILE WOODY DEBRIS.
10. STRIP AND SALVAGE TOPSOIL ACROSS SITE AND STOCKPILE FOR LATER USE. ONLY STRIP TOPSOIL AS NEEDED FOR IMMEDIATE CONSTRUCTION. WETLAND CELLS SHALL BE OVERGRADE TO 6" OF FINAL GRADE, AND SALVAGED TOPSOIL WILL BE USED TO ACHIEVE FINAL GRADE. SOIL SHALL NOT BE COMPACTED TO THE EXTENT THAT IT LIMITS PLANT ESTABLISHMENT OR HYDROLOGY.
11. INSTALL POND, BERM, AND OUTLET PER PLAN AND DETAILS. WHILE CONSTRUCTING POND, PUMP POOLED WATER OFF-SITE THROUGH A FILTER BAG. MONITOR WATER LEVEL IN THE POND THROUGHOUT ENTIRE CONSTRUCTION PROJECT. IF WATER RISES TO WITHIN A FOOT OF THE OUTLET ELEVATION, PUMP WATER THROUGH FILTER BAG CONTINUOUSLY.
12. OVERGRADE CELLS B AND C BY 6" AND CONSTRUCT BERM AND OUTLET PER PLAN AND DETAILS. DECOMPACT ALL GRADED SOILS IN CELLS B AND C TO A DEPTH OF 8" USING A CHISEL PLOW. APPLY 2.5 TONS PER ACRE OF LIMESTONE TO WETLAND CELLS SOILS PER MATERIAL SPECIFICATIONS AND INCORPORATE USING A ROTOTILLER IN THE OPPOSITE DIRECTION AS THE CHISEL PLOW. DEWATERING MAY BE REQUIRED.
13. THOROUGHLY MIX SALVAGED TOPSOIL AND SUPPLIED TOPSOIL WITH STRAW AND LEAFMO, COMPRO OR EQUIVALENT APPROVED BY RESTORATION SPECIALIST PER AMENDED TOPSOIL IN THE MATERIAL SPECIFICATIONS.
14. ACHIEVE FINAL GRADES IN CELLS B AND C USING USING AMENDED TOPSOIL TO A MINIMUM DEPTH OF 6". DO NOT FINE GRADE THE SURFACE OF THE MITIGATION AREA. LEAVE DEPRESSIONS AND MOUNDS UP TO 0.4' IN HEIGHT (MICROTOPOGRAPHY) THROUGHOUT THE MITIGATION AREA TO CREATE A VARIETY OF MOISTURE REGIMES AND HABITATS. NO MORE THAN 25% OF EACH WETLAND CELL SHALL BE AT DESIGN ELEVATION.
15. BEGINNING IN CELL E, COMPLETE STEPS 12 THRU 14 ABOVE FOR CELLS E AND D. PUMP POOLED WATER THAT ACCUMULATES OFF-SITE THROUGH A FILTER BAG.
16. EXCAVATED SOIL SHALL BE SPREAD ACROSS THE SPOIL AREA PER PLAN. APPLY 2.5 TONS PER ACRE OF LIMESTONE TO SPOIL AREA PER MATERIAL SPECIFICATIONS AND INCORPORATE USING A ROTOTILLER. THEN SOILS SHALL BE CAPPED WITH NO LESS THAN 3" OF TOPSOIL.
17. THE CONTRACTOR SHALL ARRANGE FOR A GRADING INSPECTION BY THE NAVY REPRESENTATIVE, DNR REPRESENTATIVE, AND RESTORATION SPECIALIST TO ENSURE THAT THE WORK IS ACCEPTABLE.
18. THE CONTRACTOR SHALL PERFORM ALL NECESSARY REPAIRS IDENTIFIED DURING THE INSPECTION. ALL REPAIRS ARE TO BE COMPLETED WITHIN 7 DAYS FOLLOWING THE INSPECTION.
19. PERMANENTLY SEED AND STABILIZE ALL DISTURBED AREAS PER PLANTING PLAN. INSTALL SOIL STABILIZATION MATING ON BERMS PER DETAILS.
20. INSTALL LARGE WOODY DEBRIS AT A RATE OF 30 CUBIC YARDS PER ACRE IN WETLAND CELLS. WOODY DEBRIS IS TO BE IMPORTED IF NECESSARY. INSTALL AT LEAST TWO BASKING LOGS PERPENDICULAR TO THE POND SHORELINE WITH ONE END OUT OF THE WATER ON SHORE AND THE OTHER WITHIN THE WATER.
21. REMOVE ALL CONSTRUCTION DEBRIS, EQUIPMENT, AND TRASH.
22. MAKE ANY NECESSARY REPAIRS TO THE ACCESS ROAD. ROAD SHALL BE IN AS GOOD AS, OR IN BETTER THAN, THE INITIAL CONDITION.
23. ONE MONTH PRIOR TO PLANTING OF WOODY SPECIES, SPOT SPRAY 2% RODEO™ ON ARTHRAXON HISPIDUS, MICROSTEGIUM VINIPECE, AND OTHER INVASIVE SPECIES AS PRESCRIBED BY RESTORATION SPECIALIST.
24. AFTER HYDROLOGY HAS STABILIZED (MINIMUM OF 6 MONTHS), THE RESTORATION SPECIALIST SHALL INSPECT SITE CONDITIONS, PROVIDE THE FINAL TREE PLANTING SCHEDULE, AND FLAG ZONES FOR PLANTING BASED ON SITE CONDITIONS AND WETLAND INDICATOR STATUS.
25. PERFORM PLANTING OF WOODY SPECIES PER PLANTING SCHEDULE AND PLANTING NOTES.
26. REMOVE ALL DEBRIS, EQUIPMENT, AND TRASH FROM PLANTINGS.
27. WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR AND NAVY, REMOVE ESC DEVICES, AND PERMANENTLY STABILIZE REMAINING AREAS.
28. CONTACT MDE COMPLIANCE INSPECTOR FOR CONFIRMATION THAT THE SITE HAS BEEN STABILIZED.

RESPONSIBLE PERSONNEL CERTIFICATION FOR

Project Title:
NAVFAC Project #:
Contractor:
MDE Permit #:

RESPONSIBLE PERSONNEL CERTIFICATION

"I/WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION WILL BE DONE IN ACCORDANCE WITH THE SEDIMENT CONTROL PLANS AND THAT THE RESPONSIBLE PERSONNEL WILL OBTAIN CERTIFICATION BY REGISTERING FOR AND/OR COMPLETING THE MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR SEDIMENT AND EROSION CONTROL, BEFORE ANY CLEARING OR EARTHWORK FOR THE PROJECT MAY BEGIN."

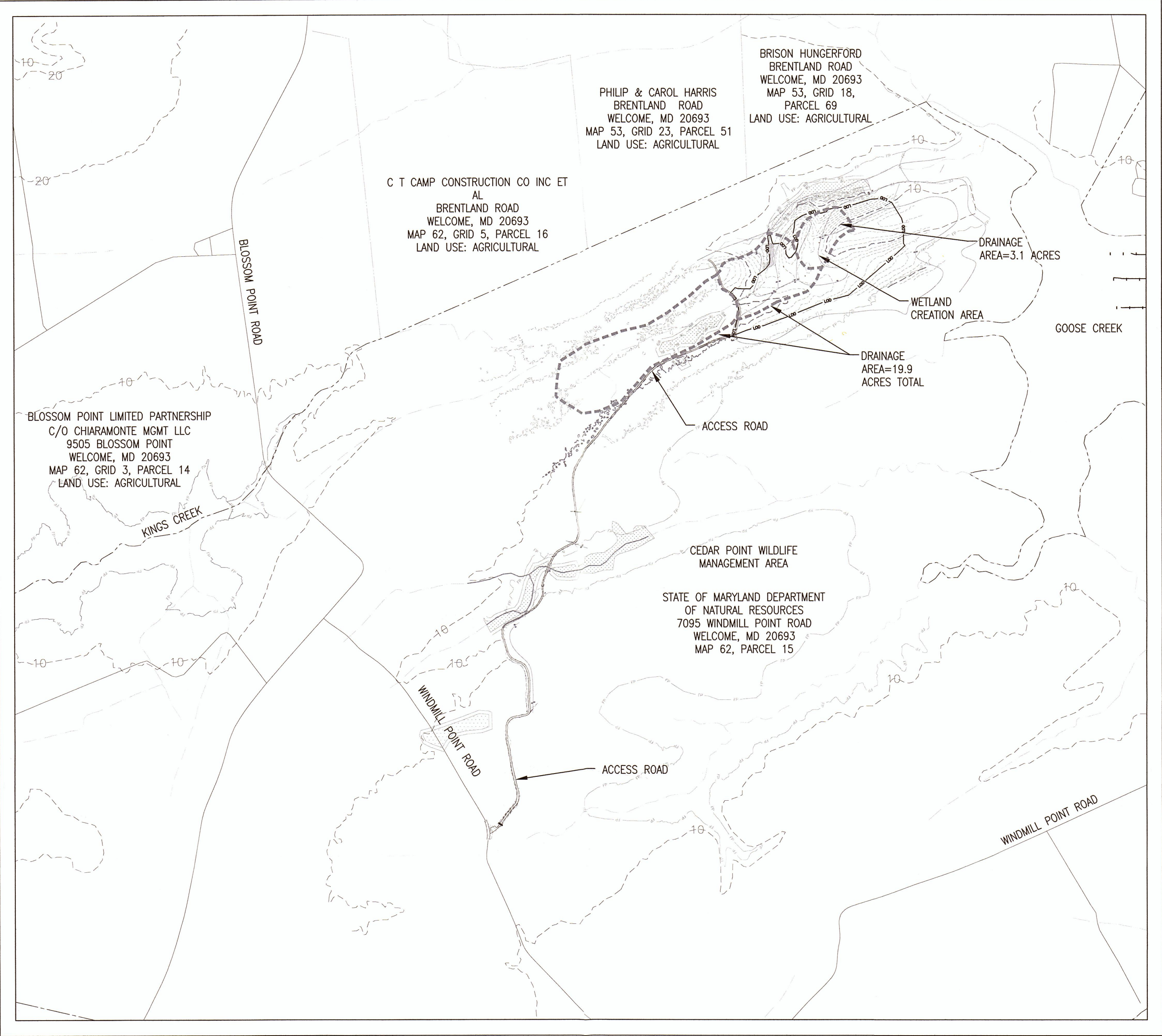
DATE RESPONSIBLE PERSONNEL SIGNATURE
GREEN CARD NO. PRINTED NAME AND TITLE

THE CONTRACTOR SHALL HAVE AN ASSIGNED "RESPONSIBLE PERSONNEL" SIGN THE BLOCK ABOVE PRIOR TO BEGINNING ANY EARTHWORK.

NOTE: THIS SHEET SHALL BE INCLUDED WITH THE FINAL "FOR CONSTRUCTION" PLAN SET AND SHALL BE RETAINED AS A PART OF THE RECORD DRAWINGS FOR THE PROJECT.

INDEX OF SHEETS

SHEET 1	COVER SHEET
SHEET 2	DRAINAGE AREA
SHEET 3	EXISTING CONDITIONS
SHEET 4	ACCESS PLAN
SHEET 5-6	GRADING PLAN AND DETAILS
SHEET 7-9	EROSION AND SEDIMENT CONTROL PLAN AND DETAILS
SHEET 10-11	PLANTING PLAN AND DETAILS
SHEET 12	CROSS SECTIONS
SHEET 13	WETLAND MITIGATION AREA



SCALE: 1"=2,000'

FINAL
WETLAND CREATION PLAN AT CEDAR POINT
WILDLIFE MANAGEMENT AREA

APRIL 2020
CONTRACT # N40080-17-2-0001

REVIEWED AND APPROVED FOR SEDIMENT CONTROL AND STORMWATER MANAGEMENT UNDER SECTIONS 4-106 AND 4-205

BY: COLLIN HILTNER

DATE: May 18, 2020
MARYLAND DEPARTMENT OF THE ENVIRONMENT
SEDIMENT & STORMWATER PLAN REVIEW DIVISION

STANDARD STABILIZATION NOTE

FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THREE (3) CALENDAR DAYS AS TO THE SURFACE OF ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES STEEPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1); AND SEVEN (7) DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE NOT UNDER ACTIVE GRADING.

OWNER'S / DEVELOPER'S CERTIFICATION

I / WE HEREBY CERTIFY THAT ALL CLEARING, GRADING, CONSTRUCTION, AND/OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT. I/WE HEREBY AUTHORIZE THE RIGHT OF ENTRY FOR PERIODIC ON-SITE EVALUATION BY APPROPRIATE INSPECTION AND ENFORCEMENT AUTHORITY OR THE STATE OF MARYLAND, DEPARTMENT OF THE ENVIRONMENT. I/WE HEREBY CERTIFY THAT STORMWATER MANAGEMENT FACILITIES WILL BE MAINTAINED IN ACCORDANCE WITH APPROVED PLANS.

4/23/20
Date
Owner / Developer Signature
M.D. DNR-WHS
Responsible Personnel Certification No.
David W. Hiltner
Southern Region Manager
Printed Name and Title

DESIGN CERTIFICATION

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II INCLUDING SUPPLEMENTS, THE ENVIRONMENT ARTICLE SECTIONS 4-101 THROUGH 116 AND SECTIONS 4-201 AND 215, AND THE CODE OF MARYLAND REGULATIONS (COMAR) 26.17.01 AND COMAR 26.17.02 FOR EROSION AND SEDIMENT CONTROL AND STORMWATER MANAGEMENT, RESPECTIVELY.

4/13/2020
Date
Designer's Signature

Md. Registration No. 3752
P.E., R.L.S., (RLS) or R.A. (circle one)

BRIAN WOLFE
Printed Name

WETLAND PERMITS:
14-NT-0269/201461196
CENAB-OP-RMS 2014-61196

MDE NO. 20-SF-0105

Professional Certification.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland, License No. 3752, Expiration Date: 11/18/2021



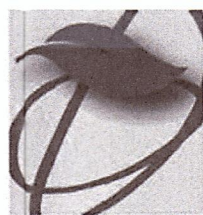
REVISIONS		
NO.	BY	DATE

Prepared for:



NAVFAC Washington
1314 Harwood Street SE
Washington, D.C. 20374
CONTRACT #: N40080-17-2-0001

Prepared by:



Environmental
Systems
Analysis, Inc.



NATURAL RESOURCES MANAGEMENT
ECOLOGICAL RESTORATION

2141 Priest Bridge Drive, Suite 1
Crofton, Maryland 21114



VERSAR, INC.

720 Thimble Shoals Blvd.
Suite 108
Newport News, VA 23606

Survey:

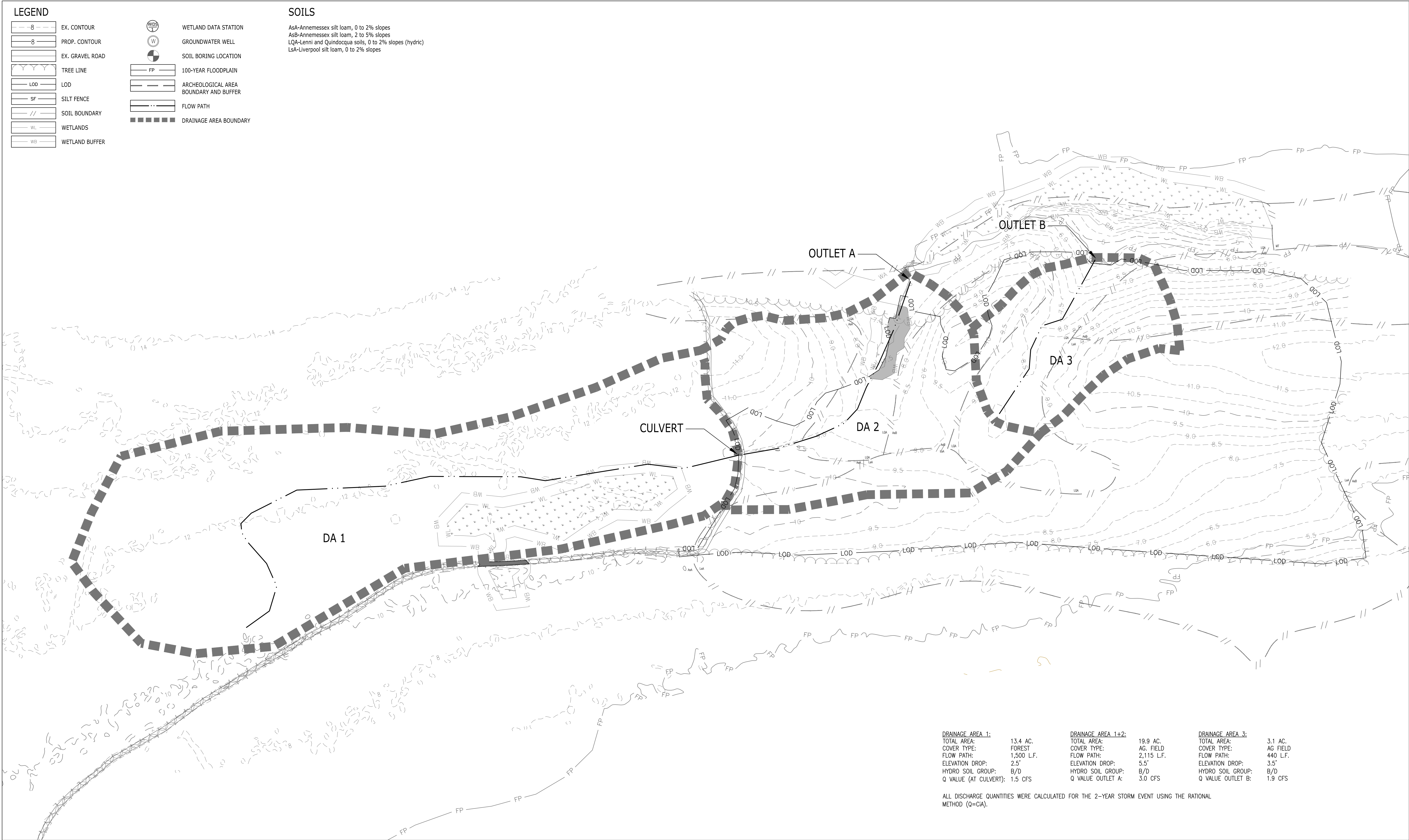


401 Post Office Road
Suite 103
Waldorf, Maryland 20602

COVER SHEET

WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA
WELCOME, CHARLES COUNTY, MARYLAND

SCALE: 1"=200'
DATE: APRIL 2020
ESA PROJECT NAME T:\NEWPROJ\2016\2016-41 Wetland Creation at Cedar Point\ CAD\Individual Drawings
SHEET: 1 of 13



DRAINAGE AREA 1:		DRAINAGE AREA 1+2:		DRAINAGE AREA 3:	
TOTAL AREA:	13.4 AC.	TOTAL AREA:	19.9 AC.	TOTAL AREA:	3.1 AC.
COVER TYPE:	FOREST	COVER TYPE:	AG. FIELD	COVER TYPE:	AG. FIELD
FLOW PATH:	1,500 L.F.	FLOW PATH:	2,115 L.F.	FLOW PATH:	440 L.F.
ELEVATION DROP:	2.5'	ELEVATION DROP:	5.5'	ELEVATION DROP:	3.5'
HYDRO SOIL GROUP:	B/D	HYDRO SOIL GROUP:	B/D	HYDRO SOIL GROUP:	B/D
Q VALUE (AT CULVERT):	1.5 CFS	Q VALUE OUTLET A:	3.0 CFS	Q VALUE OUTLET B:	1.9 CFS

ALL DISCHARGE QUANTITIES WERE CALCULATED FOR THE 2-YEAR STORM EVENT USING THE RATIONAL METHOD (Q=CIA).

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NO.	BY	DATE		

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NAVFAC Washington
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Washington, D.C. 20374
CONTRACT #: N40080-17-2-0001

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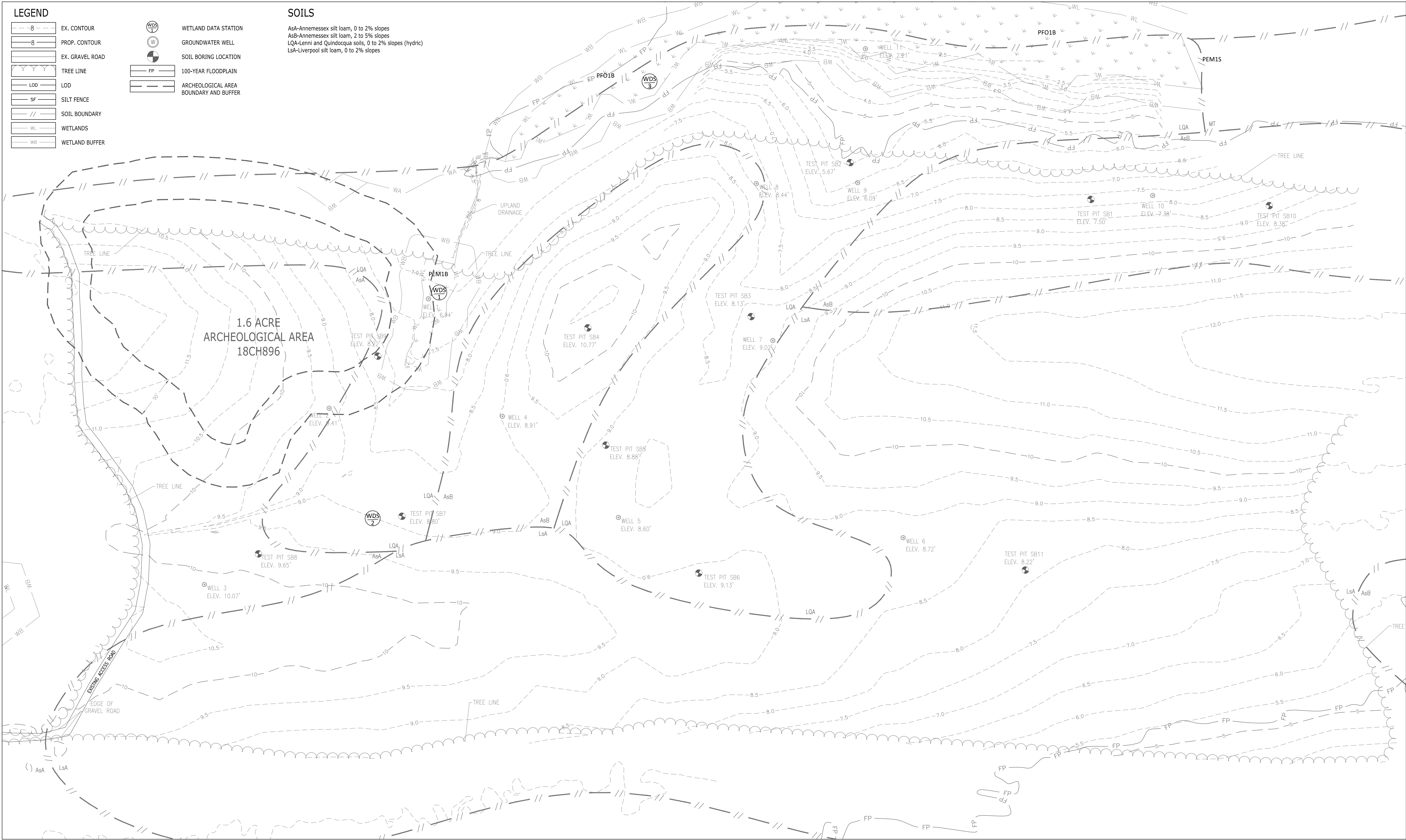
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DRAINAGE AREA	
WETLAND CREATION AT CEDAR POINT WILDLIFE MANAGEMENT AREA	
WELCOME, CHARLES COUNTY, MARYLAND	
	SCALE: 1"= 100'
	DATE: APRIL 2020
SCALE: 1"=100'	ESA PROJECT NAME T:\NEWPROJ\2016\2016-41 Wetland Creation at Cedar Point\CAD\Individual Drawings
	SHEET: 2 of 13



WETLAND PERMITS:
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CENAB-OP-RMS 2014-61196

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3752, Expiration Date:
11/18/2021



REVISIONS			DESCRIPTION
NO.	BY	DATE	

Prepared for:



NAVFAC Washington
1314 Harwood Street SE
Washington, D.C. 20374
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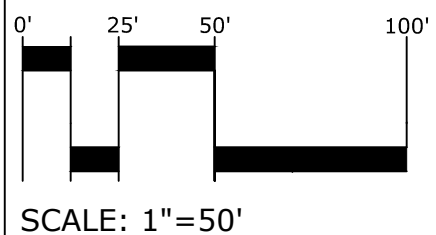
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EXISTING CONDITIONS

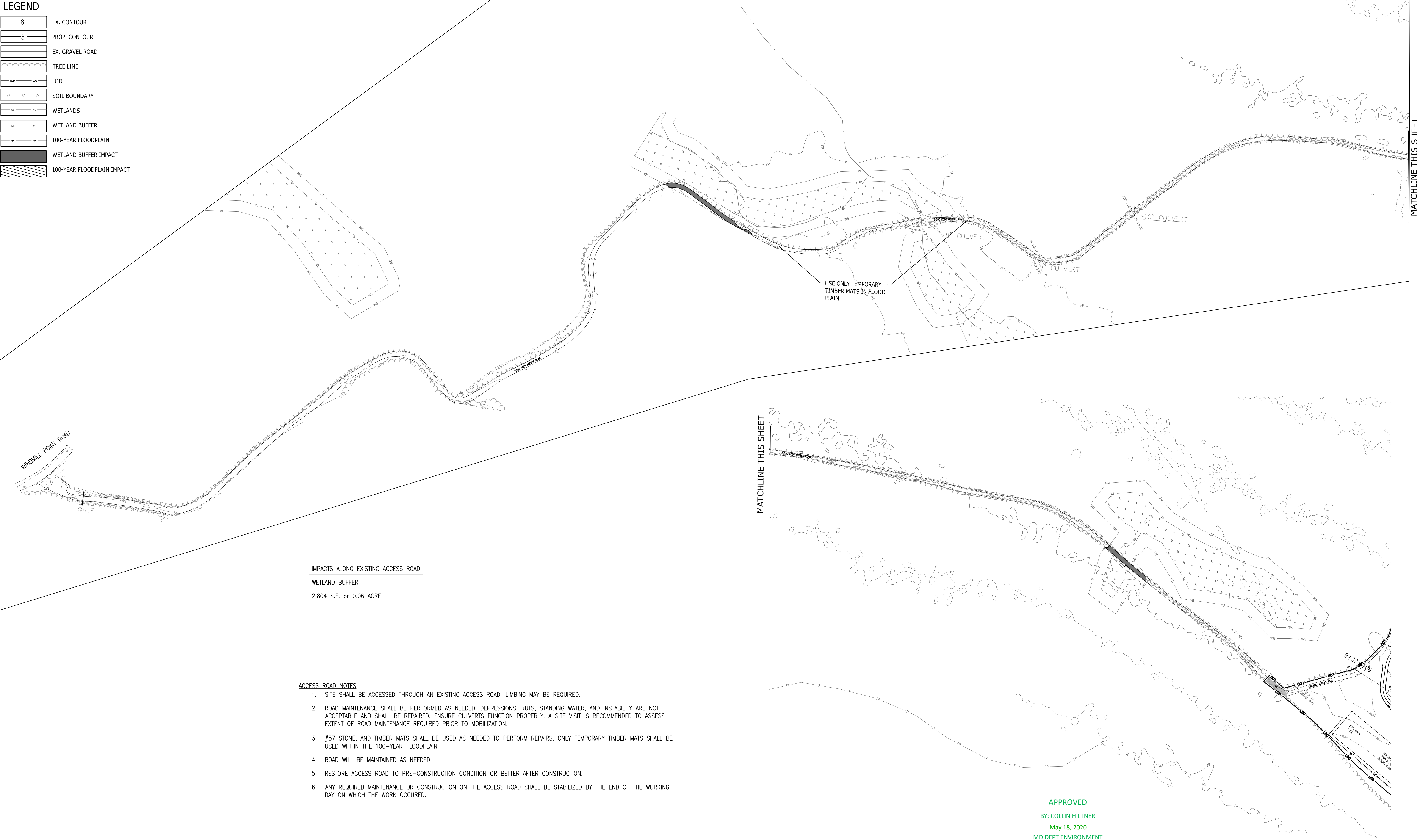
**WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA**
WELCOME, CHARLES COUNTY, MARYLAND



SCALE: 1"= 50'
DATE: APRIL 2020
ESA PROJECT NAME T:\NEWPROJ\2016\
2016-41 Wetland Creation at Cedar Point\
CAD\Individual Drawings
SHEET: 3 of 13

LEGEND

-
- EX. CONTOUR
-
- PROP. CONTOUR
-
- EX. GRAVEL ROAD
-
- TREE LINE
-
- LOD
-
- SOIL BOUNDARY
-
- WETLANDS
-
- WETLAND BUFFER
-
- 100-YEAR FLOODPLAIN
-
- WETLAND BUFFER IMPACT
-
- 100-YEAR FLOODPLAIN IMPACT



IMPACTS ALONG EXISTING ACCESS ROAD
WETLAND BUFFER
2,804 S.F. or 0.06 ACRE

ACCESS ROAD NOTES

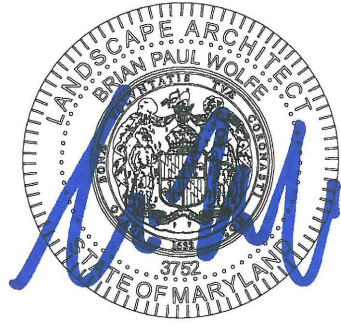
1. SITE SHALL BE ACCESSED THROUGH AN EXISTING ACCESS ROAD, LIMBING MAY BE REQUIRED.
2. ROAD MAINTENANCE SHALL BE PERFORMED AS NEEDED. DEPRESSIONS, RUTS, STANDING WATER, AND INSTABILITY ARE NOT ACCEPTABLE AND SHALL BE REPAIRED. ENSURE CULVERTS FUNCTION PROPERLY. A SITE VISIT IS RECOMMENDED TO ASSESS EXTENT OF ROAD MAINTENANCE REQUIRED PRIOR TO MOBILIZATION.
3. #57 STONE, AND TIMBER MATS SHALL BE USED AS NEEDED TO PERFORM REPAIRS. ONLY TEMPORARY TIMBER MATS SHALL BE USED WITHIN THE 100-YEAR FLOODPLAIN.
4. ROAD WILL BE MAINTAINED AS NEEDED.
5. RESTORE ACCESS ROAD TO PRE-CONSTRUCTION CONDITION OR BETTER AFTER CONSTRUCTION.
6. ANY REQUIRED MAINTENANCE OR CONSTRUCTION ON THE ACCESS ROAD SHALL BE STABILIZED BY THE END OF THE WORKING DAY ON WHICH THE WORK OCCURED.

APPROVED
BY: COLLIN HILTNER
May 18, 2020
MD DEPT ENVIRONMENT
SEDIMENT & STORMWATER
PLAN REVIEW DIVISION

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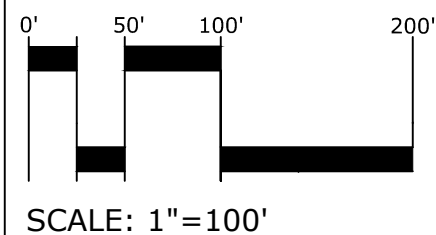
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ACCESS PLAN

WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA
WELCOME, CHARLES COUNTY, MARYLAND



SCALE: 1"= 100'
DATE: APRIL 2020
ESA PROJECT NAME T:\NEWPROJ\2016\
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SHEET: 4 of 13

LEGEND

8

EX. CONTOUR

8

PROP. CONTOUR

EX. GRAVEL ROAD

TREE LINE

LOD

LOD

//

SOIL BOUNDARY

WL

WETLANDS

WB

WETLAND BUFFER

SOIL STABILIZATION MATTING

WDS

WETLAND DATA STATION

W

GROUNDWATER WELL

SOIL BORING LOCATION

FP

100-YEAR FLOODPLAIN

ARCHEOLOGICAL AREA
BOUNDARY AND BUFFER

WETLAND AND WETLAND
BUFFER IMPACTS*

* WETLAND IMPACTS = 1260 SF
WETLAND BUFFER IMPACTS = 7789 SF
(INCLUDES HAUL ROAD)

WETLAND CELL		AREA (SF)
POND	OPEN WATER	21,758
CELL B	HERBACEOUS	24,396
CELL C	FORESTED WETLAND	35,462
CELL D	FORESTED WETLAND	90,691
CELL E	FORESTED WETLAND	53,575

The map illustrates a wetland creation project at Cedar Point Wildlife Management Area. It features five wetland cells (A-E) with various vegetation types, a central pond, and a 1.6-acre archeological area. Engineering details include a 10" corrugated plastic outfall pipe, a water control structure, and a 10' x 12' class I riprap apron. The map also shows existing gravel roads, soil boundaries, and wetland buffers. Elevation contours and spot elevations for wells and test pits are provided. Cross-sections A, B, and C are indicated. The map is bordered by a matchline to sheet 6 on the right.

APPROVED
BY: COLLIN HILTNER
May 18, 2020
MD DEPT ENVIRONMENT
SEDIMENT & STORMWATER
PLAN REVIEW DIVISION

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NATURAL RESOURCES MANAGEMENT
ECOLOGICAL RESTORATION
2141 Priest Bridge Drive, Suite 1
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VERSAR

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GRADING PLAN

WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA
WELCOME, CHARLES COUNTY, MARYLAND

0' 20' 40' 80'

SCALE: 1"=40'

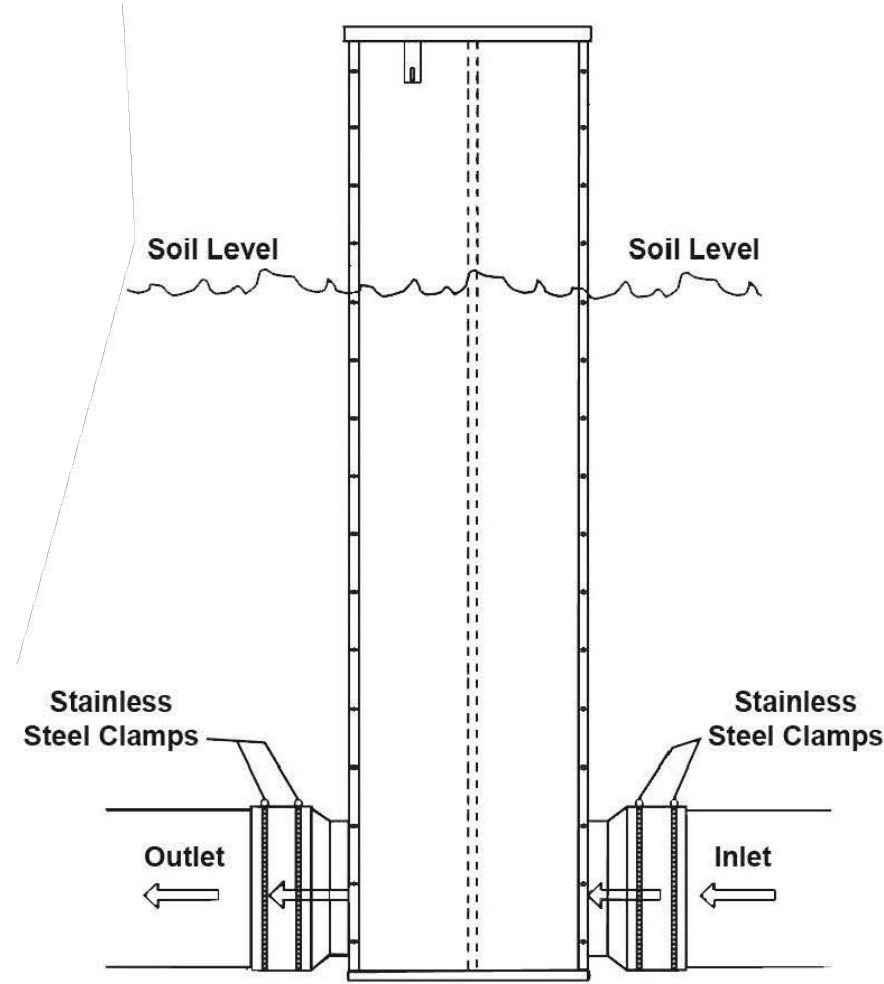
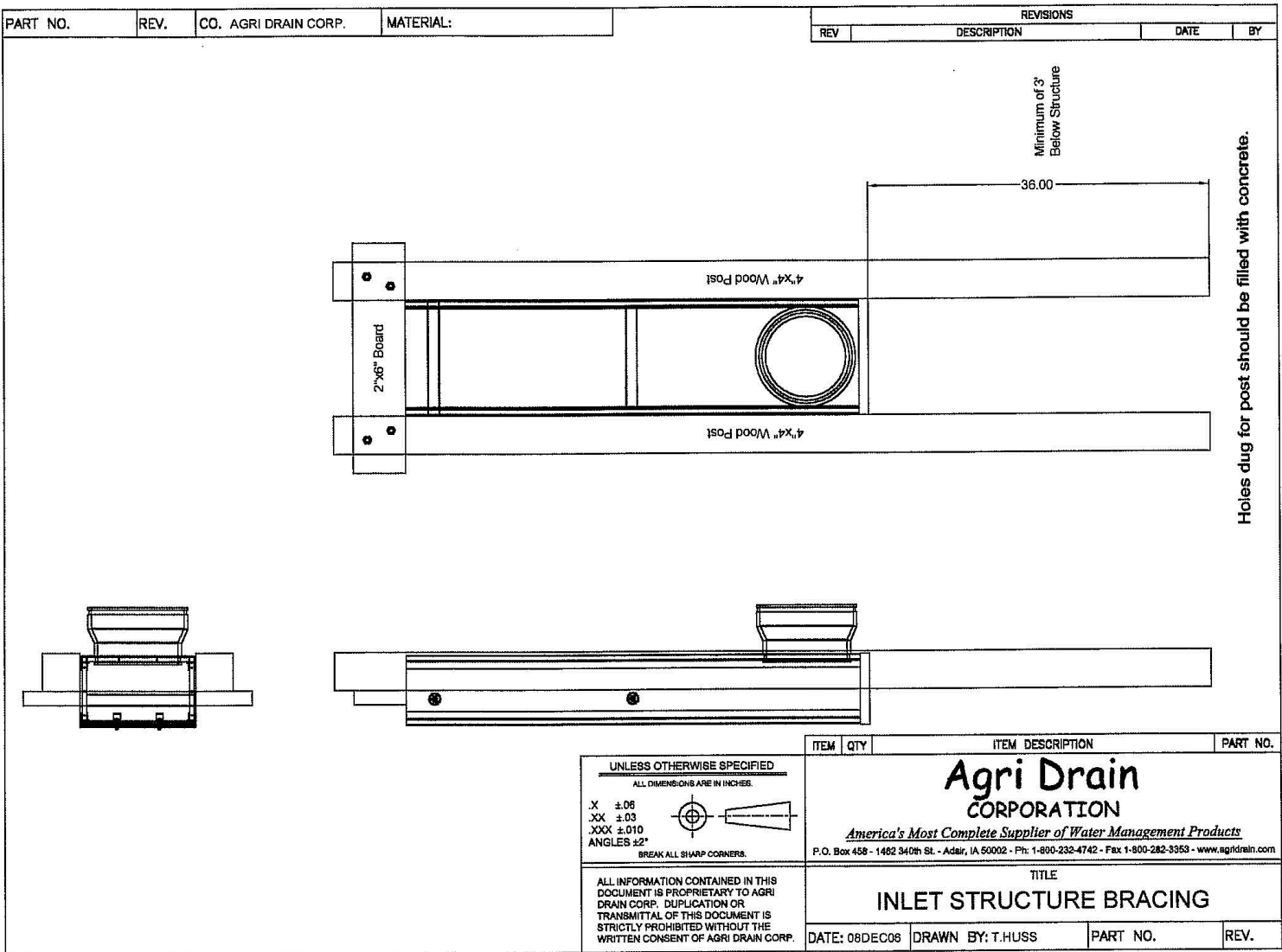
NORTH

SCALE: 1"= 40

DATE: APRIL 2020

ESA PROJECT NAME T:\NEWPROJ\2016\2016-41 Wetland Creation at Cedar Point\CAD\Individual Drawings

SHEET: 5 of 13



AGRI DRAIN INLINE WATER LEVEL CONTROL STRUCTURE SEQUENCE

1. COMPACT SOIL TO PROVIDE A FIRM, FLAT LEVEL SURFACE FOR INLET WATER LEVEL STRUCTURE BASE . INSTALL BASE OF STRUCTURE, INLET PIPE AND OUTLET PIPE AT ELEVATION 5.5 FEET.
2. CONNECT 10" DIAMETER CORRUGATED PLASTIC OUTLET PIPE TO 2" TALL AGRI DRAIN INLINE WATER LEVEL CONTROL STRUCTURE. REMOVE STAINLESS STEEL CLAMPS FROM INSIDE STRUCTURE. PLACE PIPE INSIDE FLEX COUPLER AND TIGHTEN STAINLESS STEEL CLAMPS. THE FLEX COUPLER MUST BE PLACED DIRECTLY OVER THE OUTSIDE DIAMETER OF THE PIPE, THEN SECURED BY TIGHTENING THE STAINLESS STEEL CLAMPS, AS SHOWN IN THE ILLUSTRATION. STOPLOGS SHALL REMAIN IN TRACK DURING STRUCTURE INSTALLATION. SEAL ON STOPLOG FACES DOWNSTREAM/OUTLET SIDE OF STRUCTURE.
3. INSTALL AGRI DRAIN ASCO3 ANTI-SEEP COLLAR, 3' X 3', PER INSTRUCTIONS (OR USE BELOW).
 - a. UNROLL ANTI-SEEP COLLAR AND ALIGN BOARDS TO FORM A SQUARE. ATTACH METAL BRACKETS TO CORNER OF THE BOARDS WITH SCREWS PROVIDED. ATTACH RUBBER TO FRAME WITH NAILS PROVIDED.
 - b. CUT A ROUND HOLE IN THE CENTER OF RUBBER THAT IS SMALLER THAN PIPE SIZE (APPROX. 33% SMALLER). THIS WILL ALLOW RUBBER TO STRETCH OVER PIPE WHEN ANTI-SEEP COLLAR IS INSTALLED ON PIPE. THIS WILL PROVIDE A TIGHT SEAL BETWEEN PIPE AND ANTI-SEEP COLLAR. CUTTING AN "X" OR SLIT WILL CAUSE THE RUBBER TO TEAR.
 - c. SLIP PIPE THROUGH ANTI-SEEP COLLAR, INSPECT SEAL BETWEEN PIPE AND ANTI-SEEP COLLAR, CAREFULLY BACKFILL AND COMPACT WITH SUITABLE SOIL. EXCESSIVE COMPACTION OR DOWNWARD PRESSURE ON WOODEN FRAME WILL CAUSE RUBBER TO STRETCH AND DISTORT RESULTING IN LOSS OF SEAL BETWEEN RUBBER AND PIPE.
4. LEVEL STRUCTURE VERTICALLY BEFORE PERMANENTLY ANCHORING. ANCHOR STRUCTURE PER INLET STRUCTURE BRACING DETAIL.
5. BACKFILL AROUND CONTROL STRUCTURE BY HAND IN 6" LIFTS. HAND TAMP ONLY - DO NOT MECHANICALLY COMPACT. DO NOT USE A BACKHOE OR BLADE TO PLACE BACKFILL DIRECTLY AGAINST THE WATER CONTROL STRUCTURE.
6. INSTALL NARROW STOPLOG RETAINER TO INNER BRACE BAR . LIFT ALL STOPLOGS TO ALLOW WATER FLOW AT 5.5 FEET ELEVATION.
7. INSTALL AGRI DRAIN RAT GUARD ON DOWNSTREAM END OF OUTLET PIPE.
 - a. DRILL 5/16" HOLE AT TOP OF PIPE, APPROXIMATELY ONE FOOT FROM END OF PIPE.
 - b. PLACE BOLT THAT COMES WITH RAT GUARD THROUGH THE HOLE FROM THE INSIDE OF THE PIPE. PLACE WASHER ON BOLT AND TIGHTEN NUT.
8. INSTALL BLACK BAR GUARD ON INLET PIPE.

CLASS I RIPRAP APRON

1. OVER-EXCAVATE 10' X 12' APRON TO 19" FOR CLASS I RIPRAP.
2. INSTALL GEOTEXTILE FABRIC IN APRON.
3. PLACE CLASS I RIPRAP ON TOP OF GEOTEXTILE. TOP OF RIPRAP SHOULD BE AT FINAL GRADE.
4. BACKFILL VOIDS BETWEEN RIPRAP.

DISCLAIMER

THE DESIGNS CONTAINED IN THESE PLANS ARE BASED ON THE MOST CURRENT SCIENCE AVAILABLE. HOWEVER, DUE TO UNPREDICTABLE CIRCUMSTANCES, SUCH AS MATERIAL VARIABILITY, CONTRACTOR EXPERIENCE, AND "ACTS OF GOD" (SEVERE WEATHER, GROWTH OF VEGETATION, SOIL AGGRADATION IN WETLAND CREATION AREAS DUE TO FLOODING, WILDLIFE DAMAGE, ETC.) ENVIRONMENTAL SYSTEMS ANALYSIS, INC. (ESA, INC.) DOES NOT PROVIDE ANY GUARANTEE OR WARRANTY, EXPRESS OR IMPLIED, FOR ANY MATERIAL OR PRODUCT ASSOCIATED WITH THIS PROJECT, OR FOR THE SUCCESS OF THIS MITIGATION PROJECT. ALSO, ESA, INC. IS NOT RESPONSIBLE FOR ANY DAMAGE TO PUBLIC OR PRIVATE PROPERTY RESULTING FROM THE INSTALLATION OF THIS PROJECT.

MATERIAL SPECIFICATIONS

OUTLET PIPE: 10" CORRUGATED PLASTIC PIPE APPROXIMATELY 75' LONG

CLASS I STONE STONE SHALL BE OF NATURAL GRANITE AND THE COLOR SHALL BE GREY OR BROWN IN COLOR. OTHER STONE TYPES OR COLORS WILL BE REJECTED. CONTRACTOR SHALL SUPPLY A STONE SAMPLE FOR REVIEW AND APPROVAL PRIOR TO ANY DELIVERY OF STONE TO PROJECT SITE.

TOPSOIL: APPLY TOPSOIL THAT HAS 3%-10% ORGANIC MATTER, AND MEETS THE STANDARD: TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE NAVY. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS, AND SHALL CONTAIN LESS THAN 5% BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2" IN DIAMETER.

SELECT FILL- SANDY CLAY OR SILTY CLAY MATERIAL USED FOR THE EARTH BERM SHALL BE FREE OF COARSE FRAGMENTS, STICKS, ROOTS, TRASH OR OTHER MATERIALS LARGER THAN 0.5".

SOIL STABILIZATION MATTING - MATTING SHALL BE MADE OF CERTIFIED WEED-FREE STRAW STITCHED BETWEEN NATURAL, NON-SYNTHETIC WOVEN NETS AND INTENDED TO LAST APPROXIMATELY 12 MONTHS. AN ACCEPTABLE PRODUCT IS BIOD-STRAW (ROLANKA).

GEOTEXTILE FABRIC - WOVEN GEOTEXTILE FABRIC WILL BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDROCARBONS, WILL BE ROT AND MILDEW RESISTANT, AND SHALL ALSO RESIST DETERIORATION FROM ULTRAVIOLET RADIATION.

INLINE WATER LEVEL CONTROL STRUCTURE- AGRI DRAIN PRODUCT, PIPE SIZE OF 10", HEIGHT OF 2', WIDTH OF 14", DEPTH OF 16".

NARROW STOPLOG RETAINER- AGRI DRAIN PRODUCT 701300 STAINLESS STEEL RETAINER HOOKS AND NYLON ROPE. INSTALL INSIDE WATER LEVEL CONTROL STRUCTURE.

BAR GUARD - AGRI DRAIN PRODUCT, FITS 10" PIPE, BLACK, OUTER DIAMETER IS 11.5".

RAT GUARD - AGRI DRAIN PRODUCT , FITS 10" PIPE, STAINLESS STEEL.

STRAW - THOROUGHLY THRESHED STEMS OF BARLEY, OATS, RYE WHEAT OR OTHER GRAIN. STRAW SHALL BE FREE OF MOLD, WEEDS AND FOREIGN SUBSTANCES.

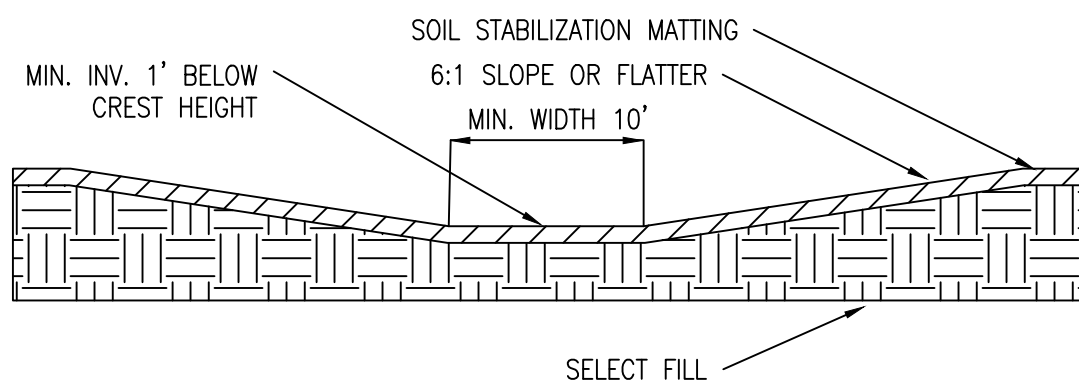
LARGE WOODY DEBRIS - LOGS AND WOOD WITH A MINIMUM SIZE OF 6' LONG AND 4" DIAMETER. CREATE BRUSH PILES IN WETLAND CELLS USING 30 CY PER ACRE LARGE WOODY DEBRIS.

BASKING LOGS - LOGS AT LEAST 20' LONG AND 12" DIAMETER TO BE PLACED PERPENDICULAR TO POND SHORELINE.

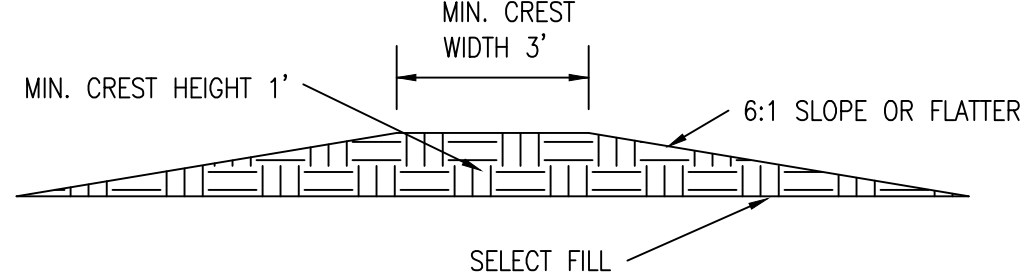
AMENDED TOPSOIL - MIXED SALVAGED AND SUPPLIED TOPSOIL WITH STRAW AND LEAF GRO, COMPRO, OR EQUIVALENT COMPOST APPROVED BY RESTORATION SPECIALIST. FINAL AMENDED TOPSOIL FOR 4.69 ACRES OF WETLAND CELLS SHALL BE 3,783 CY INCLUDING 150 CY LEAFGRO AND 150 CY STRAW.

LIMESTONE - LIMESTONE SHALL BE AN AGRICULTURAL PRODUCT MANUFACTURED AND LABELED FOR SALE IN MARYLAND FOR INCREASING SOIL PH. LIMESTONE SHALL CONTAIN AT LEAST 85 PERCENT CALCIUM AND MAGNESIUM CARBONATES. LIMESTONE SHALL BE SUPPLIED AS A FINE POWDER, OR AS PELLET PRODUCED FROM FINE POWDER THAT CONFORMS TO THE FOLLOWING: 100% PASS THROUGH #10 SIEVE SIZE, 98% THROUGH #20 SIEVE AND 50% THROUGH #100 SIEVE.

TYPICAL EARTH BERM OFFFALL CROSS SECTION



TYPICAL EARTH BERM PROFILE



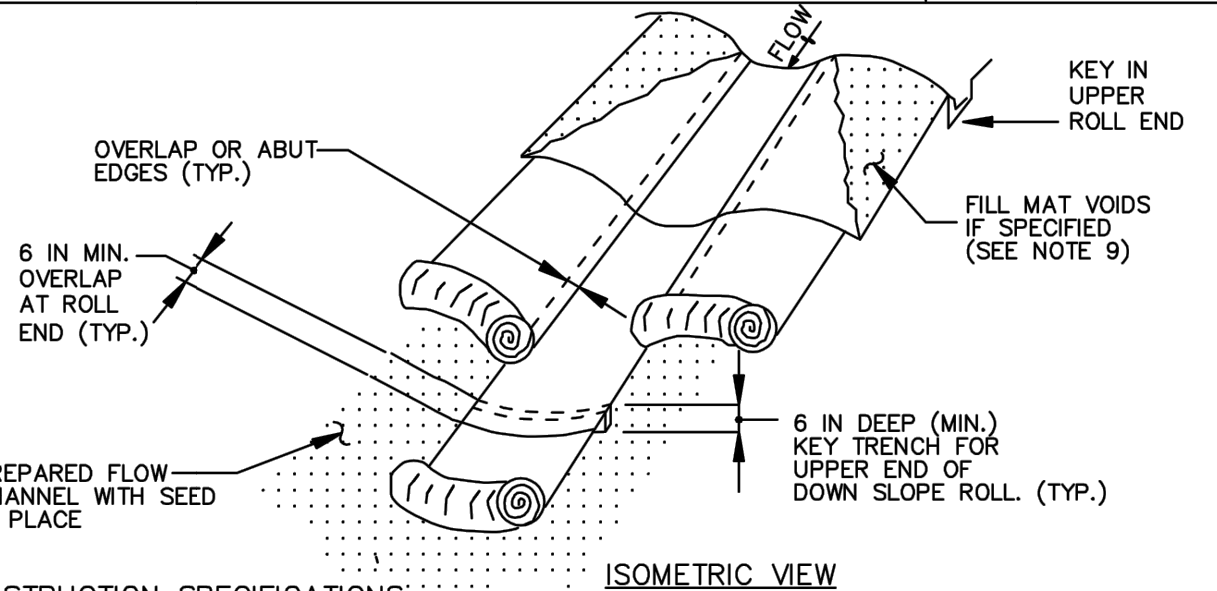
CONSTRUCTION SPECIFICATIONS

1. EXCAVATE OR SHAPE EARTH BERM TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
2. PLACE SELECT FILL IN 6" LIFTS AND COMPACT TO ACHIEVE 95% STANDARD PROCTOR.
3. CONSTRUCT OFFFALL CHANNEL.
4. RAKE TOP 2" OF SOIL AND SEED WITH ERNST SEEDING MIX 733.
5. INSTALL STABILIZATION MATTING ALONG OFFFALL CHANNEL PER DETAILS. SOIL STABILIZATION MATTING SHALL CONTINUE A MIN. OF 3' BEYOND THE OFFFALL CREST ON EITHER SITE. SOIL STABILIZATION MATTING SHALL CONTINUE TO MIN. BASIN ELEV. OF ADJOINING WETLAND CELLS.
6. ALL SEEDING SHALL BE SET BELOW MATTING TO ENSURE GOOD SOIL CONTACT.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH PERMANENT VEGETATIVE STABILIZATION.

MAINTENANCE

THE LINE, GRADE, AND CROSS SECTION MUST BE MAINTAINED. ACCUMULATED SEDIMENT AND DEBRIS MUST BE REMOVED AND POSITIVE DRAINAGE MAINTAINED. THE EARTH BERM AND POINT OF DISCHARGE MUST BE KEPT FREE OF EROSION AND CONTINUOUSLY MEET THE REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH PERMANENT VEGETATIVE STABILIZATION

DETAIL B-4-6-C PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION



CONSTRUCTION SPECIFICATIONS:

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 1/2 INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER LINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDBED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

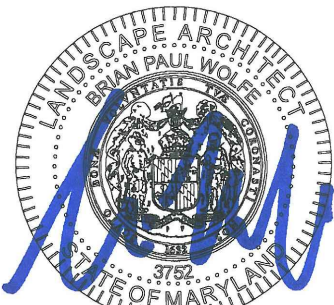
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MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

WETLAND PERMITS:
14-NT-0269/201461196
CENAB-OP-RMS 2014-61196

MDE NO. 20-SF-0105

Professional Certification.
I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland, License No. 3752, Expiration Date: 11/18/2021



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NO.	BY	DATE	

Prepared for:



NAVFAC Washington
1314 Harwood Street SE
Washington, D.C. 20374
CONTRACT #: N40080-17-2-0001

Prepared by:



Environmental
Systems
Analysis, Inc.

NATURAL RESOURCES MANAGEMENT
ECOLOGICAL RESTORATION

2141 Priest Bridge Drive, Suite 1
Crofton, Maryland 21114



VERSAR, INC.

720 Thimble Shoals Blvd.
Suite 108
Newport News, VA 23606

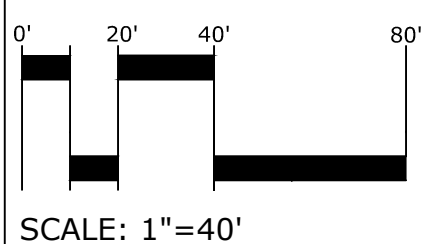
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401 Post Office Road
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Waldorf, Maryland 20602

GRADING PLAN AND CONSTRUCTION DETAILS

WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA
WELCOME, CHARLES COUNTY, MARYLAND



SCALE: 1"= 40'

DATE: APRIL 2020

ESA PROJECT NAME T:\NEWPROJ\2016\2016-41 Wetland Creation at Cedar Point\CAD\Individual Drawings

SHEET: 6 of 13

APPROVED

BY: COLLIN HILTNER

May 18, 2020

MD DEPT ENVIRONMENT
SEDIMENT & STORMWATER
PLAN REVIEW DIVISION

8

EX. CONTOUR

8

PROP. CONTOUR

EX. GRAVEL ROAD

TREE LINE

LOD

LOD

SF

SILT FENCE

SSF

SUPER SILT FENCE

//

SOIL BOUNDARY

WL

WETLANDS

WB

WETLAND BUFFER

SOIL STABILIZATION MATTING

WDS

WETLAND DATA STATION

W

GROUNDWATER WELL

SOIL BORING LOCATION

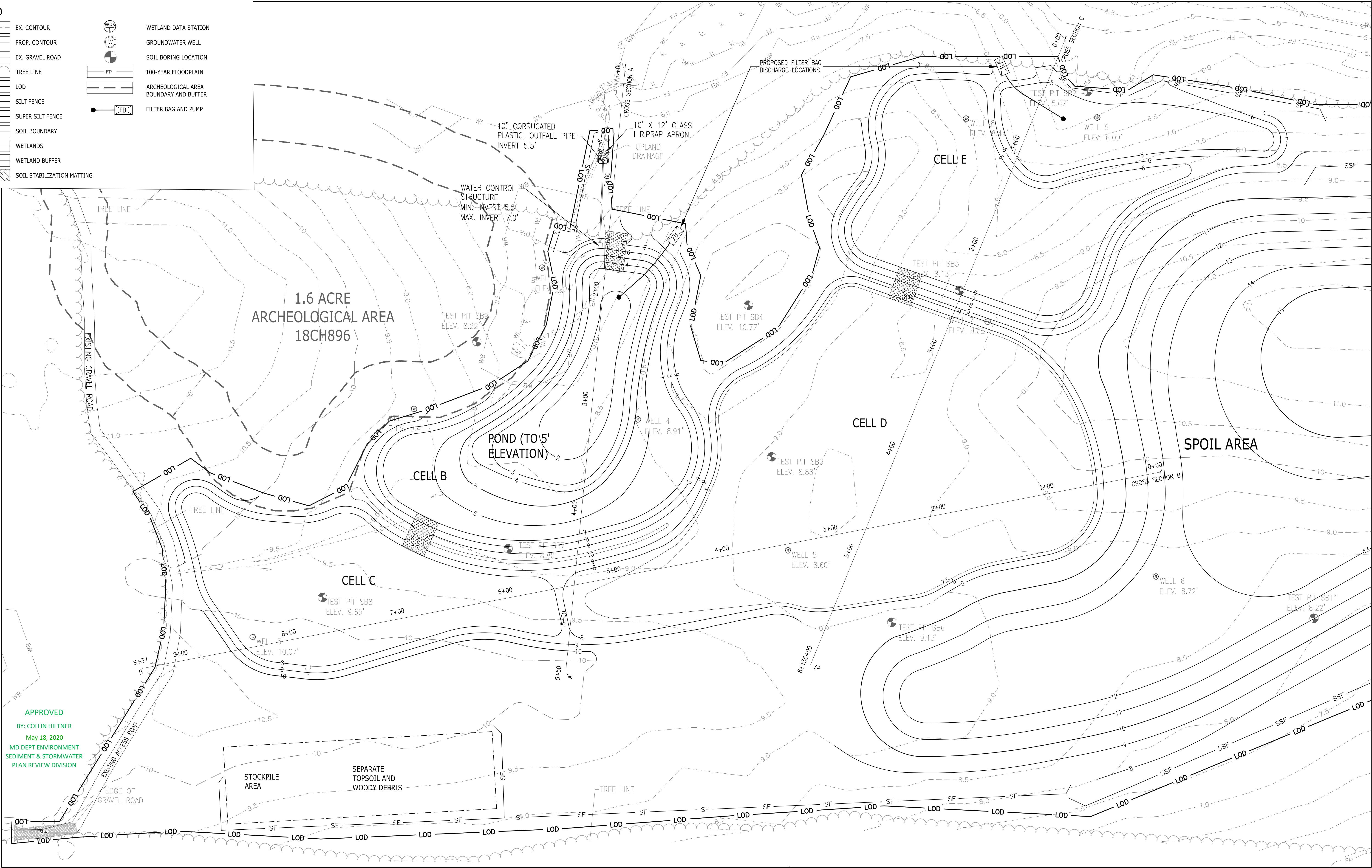
FP

100-YEAR FLOODPLAIN

ARCHEOLOGICAL AREA
BOUNDARY AND BUFFER

FB

FILTER BAG AND PUMP



APPROVED
BY: COLLIN HILTNER
May 18, 2020
MD DEPT ENVIRONMENT
SEDIMENT & STORMWATER
PLAN REVIEW DIVISION

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14-NT-0269/201461196
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Prepared for:



NAVFAC Washington
1314 Harwood Street SE
Washington, D.C. 20374
CONTRACT #: N40080-17-2-0001

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Environmental
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NATURAL RESOURCES MANAGEMENT
ECOLOGICAL RESTORATION

2141 Priest Bridge Drive, Suite 1
Crofton, Maryland 21114



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VERSAR, INC.
720 Thimble Shoals Blvd.
Suite 108
Newport News, VA 23606

Survey:



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Suite 103
Waldorf, Maryland 20602

EROSION AND SEDIMENT CONTROL PLAN
WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA
WELCOME, CHARLES COUNTY, MARYLAND

0' 20' 40' 80'

SCALE: 1"=40'

NORTH

SCALE: 1"= 40
DATE: APRIL 2020
ESA PROJECT NAME T:\NEWPROJ\2016\
2016-41 Wetland Creation at Cedar Point\
CAD\Individual Drawings
SHEET: 7 of 13

APPROVED
BY: COLLIN HILTNER
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Washington, D.C. 20374
CONTRACT #: N40080-17-2-0001

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Environmental Systems Analysis, Inc.
NATURAL RESOURCES MANAGEMENT
ECOLOGICAL RESTORATION
2141 Priest Bridge Drive, Suite 1
Crofton, Maryland 21114



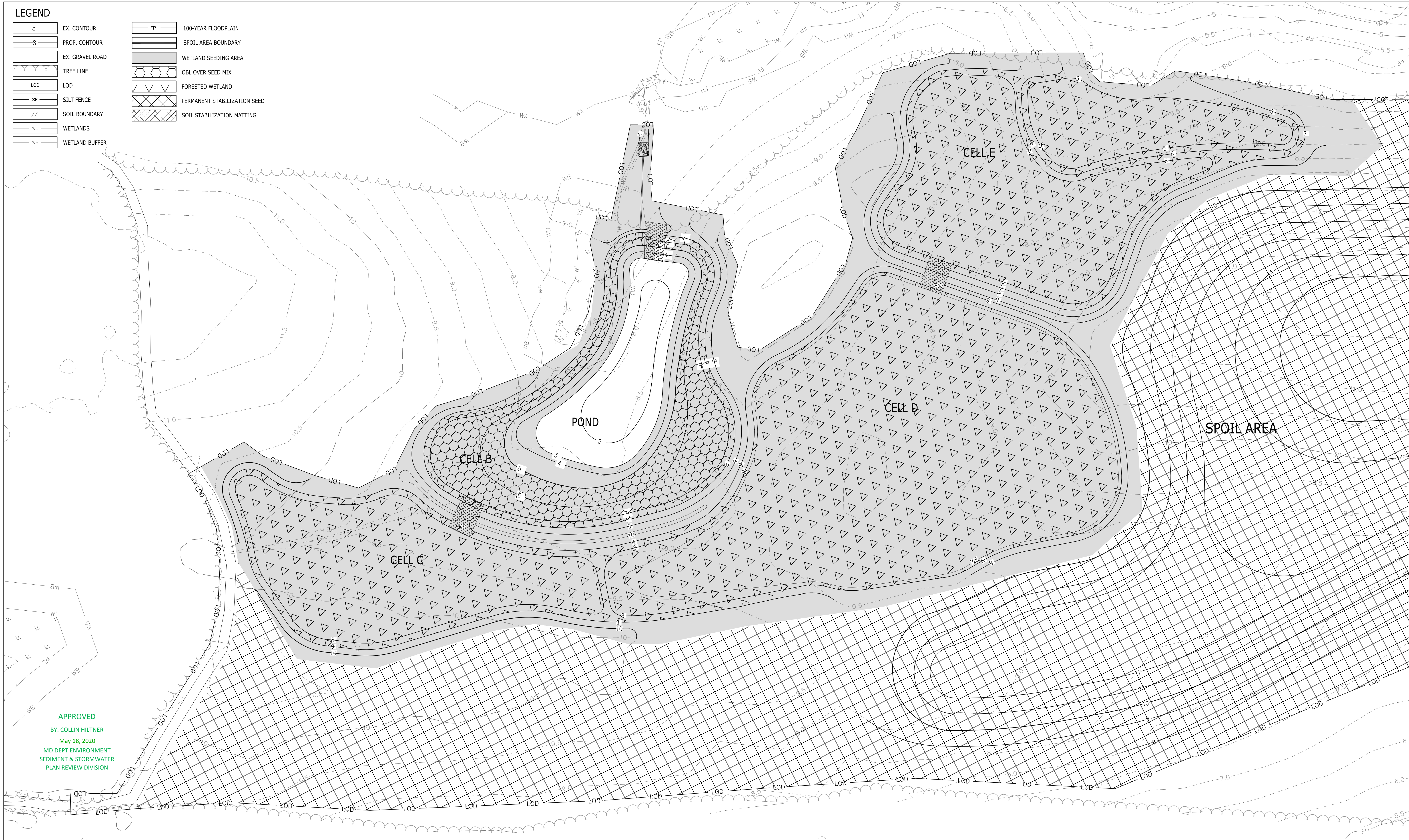
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Suite 108
Newport News, VA 23606

Survey:



SOLTESZ
401 Post Office Road
Suite 103
Waldorf, Maryland 20602

EROSION AND SEDIMENT CONTROL PLAN AND DETAILS	
WETLAND CREATION AT CEDAR POINT WILDLIFE MANAGEMENT AREA WELCOME, CHARLES COUNTY, MARYLAND	
	SCALE: 1"= 40 DATE: APRIL 2020 ESA PROJECT NAME T:\NEWPROJ\2016\2016-41 Wetland Creation at Cedar Point\ CAD\Individual Drawings SHEET: 9 of 13

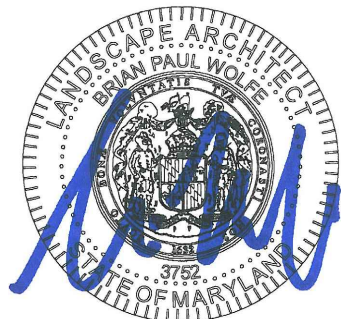


MATCHLINE SHEET 11

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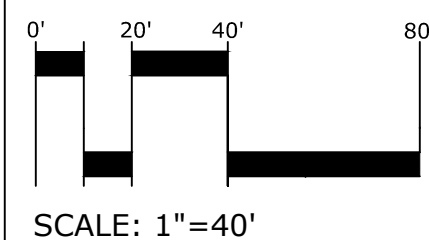
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Waldorf, Maryland 20602

PLANTING PLAN
**WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA**
WELCOME, CHARLES COUNTY, MARYLAND



SCALE: 1"= 40'
DATE: APRIL 2020
ESA PROJECT NAME T:\NEWPROJ\2016\2016-41 Wetland Creation at Cedar Point\ CAD\Individual Drawings
SHEET: 10 of 13

SEEDING INSTALLATION SEQUENCE AND SPECIFICATIONS

1. THE SITE SHALL BE SEEDED AND STABILIZED PER THE PLANTING SCHEDULE AND SEQUENCE OF CONSTRUCTION.
2. WETLAND SEED MIX SHALL BE SPREAD ACROSS ENTIRE WETLAND CREATION AREA.
3. PRIOR TO SEEDED, LOOSEN GRADED SOILS TO A DEPTH OF 1-2 INCHES.
4. APPLY SEED WHEN SOIL IS FRIABLE (SOIL SHOULD BREAK EASILY AND NOT FORM CLODS WHEN WORKED) USING A BROADCAST SEEDER OR A HYDROSEEDER.
5. IF BROADCAST SEEDER IS USED, MIX THE SEED WITH A CARRIER OF SIMILAR WEIGHT (PERLITE, VERMICULITE, SAWDUST, OR SIMILAR) AND MAKE TWO PASSES OVER EACH AREA IN OPPOSITE DIRECTIONS BEING MADE AT A 90-DEGREE ANGLE TO THE FIRST PASS TO ENSURE EVEN SEED DISTRIBUTION. WORK SEED INTO THE SOIL WITH THE BACK OF A HAND RAKE OR OTHER APPROVED METHOD.
6. PRESS THE SEED INTO THE SOIL WITH A HANDROLLER OR CRIMPING FOLLOWING RAKING TO ENSURE GOOD SOIL TO SEED CONTACT.
7. IF USING A HYDROSEEDER, NO CARRIER IS REQUIRED (TO ENSURE SEED TO SOIL CONTACT) AND ONE PASS OVER EACH AREA WILL BE SUFFICIENT PROVIDED THAT ALL PORTIONS OF THE SITE TO BE SEEDED ARE COVERED.
8. MULCH ALL SEEDED AREAS WITH CELLULOSE FIBER MULCH OR STRAW. STRAW SHALL BE APPLIED AT A RATE OF 100 BALES/ACRE OF 16 CUBIC YARDS/ACRE AND HELD IN PLACE WITH EITHER A MULCH ANCHORING TOOL, CELLULOSE FIBER, OR A LIQUID MULCH BINDER. FIBER MULCH SHALL BE APPLIED AT A RATE OF 50 LBS/100 GALLONS OF WATER. IF HYDROSEEDING, FIBER MULCH SHALL NOT BE MIXED WITH THE SEED AND APPLIED AT THE SAME TIME.

PRE-PLANTING SPECIFICATIONS

1. ALLOW AT LEAST SIX (6) MONTHS IN ADVANCE TO ORDER MATERIALS AND PLANTS.
2. SEE INTALLATION SEQUENCE FOR PREFERRED PLANTING TIME. FOR CONTAINER GROWN MATERIALS (TREES, SHRUBS, AND SEEDLINGS). PLANTING SHALL NOT TAKE PLACE IN SUB-FREEZING TEMPERATURES, WHEN THE GROUND IS FROZEN, OR WHEN THE SOIL IS TOO DRY OR WET, OR OTHERWISE IN A CONDITION NOT GENERALLY ACCEPTED AS SATISFACTORY FOR PLANTING AND MAY ADVERSELY AFFECT PLANT MATERIALS.
3. IF CONDITIONS DETRIMENTAL TO PLANT GROWTH ARE ENCOUNTERED, SUCH AS RUBBLE FILL, ADVERSE DRAINAGE CONDITIONS, OR OBSTRUCTIONS, NOTIFY THE RESTORATION SPECIALIST BEFORE PLANTING.
4. ALL BARE SOIL MUST BE STABILIZED AND SEEDED USING THE SEED MIX SPECIFIED ON THE PLANS PRIOR TO PLANTING.
5. PLANTING SHOULD OCCUR WITHIN 24 HOURS OF PLANT MATERIAL DELIVERY TO THE SITE. AFTER BEING DELIVERED TO THE JOB SITE, PLANTS SHALL BE STORED IN A COOL, SHADY LOCATION. PLANT ROOT MASSES SHALL BE KEPT MOIST WITH PERIODIC WATERING UNTIL THE TIME OF PLANTING. PLANT MATERIALS LEFT UNPLANTED FOR MORE THAN 24 HOURS SHALL BE PROTECTED FROM DIRECT SUN AND WEATHER AND KEPT MOIST. NURSERY STOCK SHALL NOT BE LEFT UNPLANTED FOR MORE THAN 4 DAYS.
6. SEED SHALL BE DELIVERED IN CONTAINERS (BOTTLES, JARS, PAPER/CLOTH BAGS/SACKS) HAVING LABELS THAT REPORT THE ORIGIN OF THE SEED, THE PURITY OF THE SEED AND THE GERMINATION PERCENTAGE, AND DATE OF GERMINATION TESTING OF THE SEED.
7. SOIL ROOT MASSES SHALL BE THOROUGHLY MOIST UPON DELIVERY TO THE SITE. DRY OR LIGHT WEIGHT PLANTS SHALL BE REJECTED/REPLACED. IF THE SOIL/ROOT MASSES ARE SUBSTANTIALLY SMALLER THAN THE SPECIFIED CONTAINER SIZE AND LOOSE SOIL EXISTS ON THE BOTTOM OF THE CONTAINERS, THE PLANTS SHALL BE REJECTED/REPLACED.
8. ALL REJECTED PLANTS SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND APPROVED REPLACEMENT PLANTS INSTALLED AT NO COST TO THE NAVY.

WOODY SPECIES INSTALLATION SEQUENCE

1. PLANTING OF WOODY SPECIES WILL OCCUR 6 MONTHS TO ONE YEAR FOLLOWING GRADING ACTIVITIES. THIS WILL ALLOW FOR SITE HYDROLOGY TO STABILIZE. THE RESTORATION SPECIALIST WILL DETERMINE QUANTITIES AND FLAG PLANTING ZONES FOR WOODY SPECIES BASED OBSERVED HYDROLOGY AND WETLAND INDICATOR STATUS.
2. PLANTING DATES SHALL BE BETWEEN MARCH 1 TO MAY 15, OR SEPTEMBER 15 TO NOVEMBER 15. PLANTING WILL NOT OCCUR AFTER FROST.
3. REFER TO THE PLANTING PLAN AND PLANT SCHEDULE FOR PLANT MATERIAL, SIZE, LOCATION, AND SPACING.
4. PLANTING SHALL OCCUR IN A PROGRESSIVE MANNER SUCH THAT PREVIOUSLY PLANTED MATERIALS WILL NOT BE NEGATIVELY IMPACTED BY PLANTINGS TO FOLLOW.
5. ALL PLANT INSTALLATION SHALL FOLLOW THE LATEST EDITION OF MD DNR FOREST CONSERVATION TECHNICAL MANUAL.
6. PLANTING HOLES SHOULD BE TRACTOR-DRILLED, RATHER THAN HAND-DUG WHERE POSSIBLE. THE HOLES SHOULD BE TWICE AS WIDE AS THE ROOT BALL, BUT NO LARGER THAN 2.5 TIMES ROOT BALL DIAMETER, AND TO A DEPTH WHICH WILL LEAVE APPROXIMATELY 1/8 OF THE ROOTBALL ABOVE THE FINISHED LANDSCAPE GRADE. SCARIFY THE SIDE OF THE HOLE. IF HAND DIGGING CREATE A SQUARE HOLE THAT FITS THE ROOT BALL.
7. STOCK SHALL BE PLANTED AS SPECIES AGGREGATIONS AND NOT IN ROWS.
8. FOR ALL TREES AND SHRUBS USE AGRIFORM/OSMOCOTE TWO-YEAR TIMED RELEASE TABLETS AT THE RATE RECOMMENDED BY THE MANUFACTURER.
9. REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER. GENTLY LOOSEN THE ROOTS FROM THE SOIL.
10. TO ENCOURAGE OUTWARD ROOT GROWTH OF THE ROOTS, MAKE 4 TO 5 INCH DEEP CUTS ALONG THE LENGTH OF THE ROOT BALL WITH A SHARP KNIFE OR BLADE. INSTALL PLANT IN THE CENTER OF THE HOLE WITH APPROXIMATELY 1/8 OF THE ROOTBALL ABOVE FINISHED LANDSCAPE GRADE.
11. BACKFILL MIXTURE FOR CONTAINERIZED TREES SHALL BE EXISTING SOIL OR 2/3 EXISTING SOIL AND 1/3 ORGANIC MATTER AMENDMENT. DURING THE BACKFILLING PROCEDURE, THOROUGHLY WATER SOIL AROUND THE ROOT MASS WHILE TAMPING THE BACKFILLED MIXTURE TO ELIMINATE ANY AIR POCKETS.
12. ANY SURPLUS SOIL WHICH REMAINS AFTER PLANTING SHALL BE USED TO CREATE A SMALL MOUND AROUND THE EDGE OF THE PLANTING HOLE TO HOLD WATER DURING WATERING OPERATIONS.
13. THOROUGHLY WATER THE INTERIOR OF THE TREE SAUCER UNTIL IT IS FILLED. WATERING SHALL BE UNDERTAKEN EVEN IF IT IS RAINING. A SECOND WATERING MAY BE NECESSARY TO INSURE SATURATION OF THE ROOTBALL AND ELIMINATION OF THE AIR POCKETS.
14. PRUNE ANY AND ALL TREE BRANCHES THAT ARE DEAD, DISEASED, OR DAMAGED.
15. REMOVE ALL TAGS, LABELS, STRINGS, AND WIRE FROM THE TREES.

STANDARDS

1. ALL PLANT MATERIAL SHALL CONFORM TO THE CURRENT ISSUE OF THE AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN AND AS SPECIFIED BELOW.
2. ALL CONTAINER STOCK SHALL BE NURSERY-GROWN WITHIN A 200-MILE RADIUS OF THE SITE. PLANT MATERIALS THAT ARE COLLECTED FROM THE WILD WILL BE REJECTED.
3. PLANT MATERIAL SHALL BE OBTAINED FROM NURSERIES THAT HAVE BEEN INSPECTED AND CERTIFIED BY STATE PLANT INSPECTORS.
4. THE ROOT SYSTEM OF CONTAINER GROWN PLANTS SHALL BE WHITE, WELL-DEVELOPED, AND WELL-DISTRIBUTED THROUGHOUT THE CONTAINER WITH THE ROOTS VISIBLY EXTENDING TO THE INSIDE FACE OF THE GROWING CONTAINER.
5. IF IN LEAF, THE PLANTS SHALL APPEAR HEALTHY WITH NO LEAF SPOTS, LEAF DAMAGE, LEAF DISCOLORATION, LEAF WILTING OR EVIDENCE OF INSECTS ON THE PLANT.
6. THERE SHALL BE NO CHANGE IN THE QUANTITY, SIZE OR SPECIES OF SCHEDULED PLANT MATERIAL WITHOUT THE PRIOR APPROVAL OF THE RESTORATION SPECIALIST.

MAINTENANCE AND GUARANTEE

1. PLANT MATERIAL SHALL BE MAINTAINED BY THE LANDSCAPE CONTRACTOR FOR ONE YEARS FROM THE DATE OF INITIAL INSPECTION AND ACCEPTANCE OF THE PLANTING BY THE RESTORATION SPECIALIST. MAINTENANCE SHALL INCLUDE ALL WATERING, FERTILIZATION AND ANIMAL REPELLENTS NECESSARY TO ENSURE THE SURVIVAL AND GROWTH OF THE PLANTS.
2. THE LANDSCAPE CONTRACTOR SHALL GUARANTEE THAT 100% OF THE PLANTED TREES AND SHRUBS SHALL BE ALIVE AND HEALTHY ONE YEAR AFTER THE INITIAL INSPECTION AND ACCEPTANCE BY THE RESTORATION SPECIALIST. THE LANDSCAPE CONTRACTOR SHALL RE-SEED AND REPLACE ALL TREES AND SHRUBS THAT HAVE BEEN TOPPED OVER, BROWSED, UPROOTED, OR WASHED OUT.
3. PLANT MATERIAL WHICH IS 25% DEAD OR MORE SHALL BE CONSIDERED DEAD.
4. PLANT MATERIAL REPLACEMENTS SHALL BE OF THE SAME SIZE, TYPE, AND VARIETY AS THE PLANTS SPECIFIED IN THE PLANTING SCHEDULE OR AS THE APPROVED SUBSTITUTES FOR THE ORIGINAL PLANTING.
5. PLANTS SHALL BE FURNISHED AND PLANTED AS SPECIFIED IN THESE PLANS.

PLANT SELECTION

THE PLANTING SPECIES COMPOSITION WAS SELECTED TO REFLECT THE FOREST COMMUNITIES EXISTING NEARBY, OR ON SITE, WITH SIMILAR HYDROLOGY TO THE MITIGATION SITE. PLANT SPECIES WERE SELECTED FROM A LIST OF TREES AND SHRUBS THAT WERE IDENTIFIED IN EXISTING FOREST COMMUNITIES, AND REGULARLY AVAILABLE FROM NURSERIES. ANY SPECIES OR SIZE SUBSTITUTIONS MUST BE APPROVED BY THE RESTORATION SPECIALIST.

SEEDING INSTALLATION SEQUENCE AND SPECIFICATIONS

PLANTING SCHEDULE		
WETLAND SEEDING AREA - 6.69 ACRES		
ERNST SEEDS MIX - ERNMIX - 733 - MD COASTAL PLAIN FACW MIX		
APPLIED AT A RATE OF 15 LBS PER ACRE		
% of Mix	SCIENTIFIC NAME	COMMON NAME
32%	<i>Carex vulpinoidea</i>	Tox Sedge
18%	<i>Carex lupulina</i>	Hop Sedge
16%	<i>Elymus virginicus</i>	Virginia Wildrye
8%	<i>Carex scoparia</i>	Blunt Broom Sedge
5%	<i>Juncus effusus</i>	Soft Rush
5%	<i>Panicum anceps</i>	Beaked Panicgrass
4%	<i>Vernonia gigantea</i>	Giant Ironweed
3%	<i>Scirpus cyperinus</i>	Woolgrass
2%	<i>Eupatorium perfoliatum</i>	Boneset
2%	<i>Helenium flexuosum</i>	Purplehead Sneezeweed
2%	<i>Ledwigia maritima</i>	Seaside Primrose Willow
2%	<i>Vernonia noveboracensis</i>	New York Ironweed
1%	<i>Carex crinita</i>	Nodding Sedge

Note: Seed all wetland creation areas except below 3' elevation

OBL SEED MIX - 0.56 ACRES		
APPLIED AT A RATE OF 5 LBS PER ACRE		
% of Mix	SCIENTIFIC NAME	COMMON NAME
15%	<i>Sagittaria latifolia</i>	Duck Potato
15%	<i>Saururus cernuus</i>	Lizard's Tail
15%	<i>Pontederia cordata</i>	Pickersweet
15%	<i>Carex lurida</i>	Lurid Sedge
15%	<i>Spartanium eurycarpum</i>	Giant Bur Reed
15%	<i>Alisma subcordatum</i>	American Water Plantain
10%	<i>Acorus americanus</i>	Sweet Flag

FORESTED WETLAND PLANT SCHEDULE - 4.13 ACRES						
QTY	SCIENTIFIC NAME	COMMON NAME	WETLAND INDICATOR	SIZE	ROOT	SPACING
TREES						
TBD	<i>Acer rubrum</i>	Red Maple	FAC	3 GAL	CONT.	10' O.C.
TBD	<i>Baccharis halimifolia</i>	Groundsel Tree	FACW	3 GAL	CONT.	10' O.C.
TBD	<i>Betula nigra</i>	River Birch	FACW	3 GAL	CONT.	10' O.C.
TBD	<i>Ilex opaca</i>	American Holly	FAC	3 GAL	CONT.	10' O.C.
TBD	<i>Nyssa sylvatica</i>	Black Gum	FAC	3 GAL	CONT.	10' O.C.
TBD	<i>Platanus occidentalis</i>	Sycamore	FACW	3 GAL	CONT.	10' O.C.
TBD	<i>Quercus bicolor</i>	Swamp White Oak	FACW	3 GAL	CONT.	10' O.C.
TBD	<i>Quercus palustris</i>	Pin Oak	FACW	3 GAL	CONT.	10' O.C.
TBD	<i>Quercus phellos</i>	Willow Oak	FACW	3 GAL	CONT.	10' O.C.
TBD	<i>Salix nigra</i>	Black Willow	FACW	3 GAL	CONT.	10' O.C.
SHRUBS						
TBD	<i>Lindera benzoin</i>	Spicebush	FACW	2 GAL	CONT.	10' O.C.
TBD	<i>Alnus serrulata</i>	Hazel alder	FACW	2 GAL	CONT.	10' O.C.
TBD	<i>Cephalanthus occidentalis</i>	Common buttonbush	OBL	2 GAL	CONT.	10' O.C.

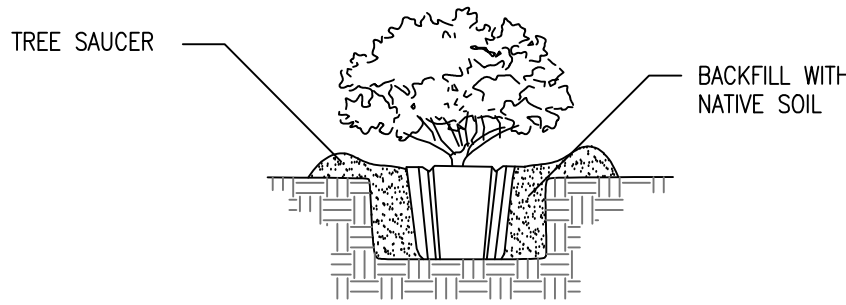
Note: Plant at 500 stems/acre. Quantities of species to be determined by restoration specialist based on site conditions, hydrology and wetland indicator status, 6 to 12 months after final grading. See Sequence of Construction Notes.

PROPOSED FORESTED WETLAND PLANTING

CELL C = 405 TREES
CELL D = 1045 TREES
CELL E = 615 TREES

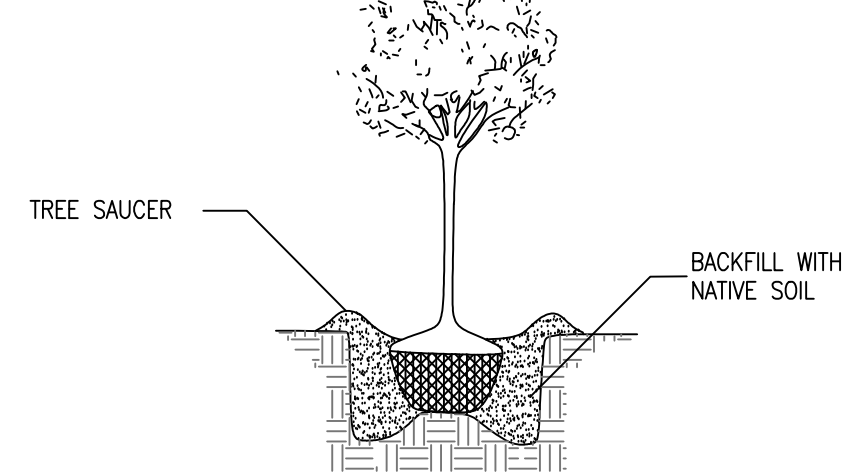
TYPICAL PLANTING DETAIL

CONTAINER SHRUB
CROSS SECTION
Not To Scale



TYPICAL PLANTING DETAIL

CONTAINER TREE
CROSS SECTION
Not To Scale



PERMANENT STABILIZATION OF SPOIL AREA - 9.26 ACRES

APPLIED AT A RATE OF 40 LBS PER ACRE		
% of Mix	SCIENTIFIC NAME	COMMON NAME
20%	<i>Schizachyrium scoparium</i>	Little Bluestem
20%	<i>Chamaecrista fasciculata</i>	Partridge Pea
15%	<i>Dichanthelium clandestinum</i>	Deertongue
15%	<i>Agrostis gigantea</i>	Redtop
10%	<i>Lolium perenne</i>	Annual Ryegrass
10%	<i>Vicia villosa</i>	Hairy Vetch
10%	<i>Panicum virgatum</i>	Switchgrass

PERMANENT STABILIZATION OF SPOIL AREA - 9.26 ACRES

ERNX-125 Mesic to Dry Native Pollinator Mix w/o Grasses Mix Composition		
APPLIED AT A RATE OF 2 LBS PER ACRE		
% of Mix	SCIENTIFIC NAME	COMMON NAME
12%	<i>Coreopsis lanceolata</i>	Lanceleaf Coreopsis
12%	<i>Echinacea purpurea</i>	Purple Coneflower
12%	<i>Penstemon digitalis</i>	Tall White Beardtongue
12%	<i>Rudbeckia hirta</i>	Blackeyed Susan
10%	<i>Chamaecrista fasciculata</i>	Partridge Pea
6%	<i>Helioopsis helianthoides</i>	Oxeye Sunflower
6%	<i>Verbena hastata</i>	Blue Vervain
5%	<i>Aster laevis</i>	Smooth Blue Aster
5%	<i>Liatris spicata</i>	Marsh Blazing Star
3%	<i>Asclepias incarnata</i>	Swamp Milkweed
3%	<i>Aster novae-angliae</i>	New England Aster
2%	<i>Senna hebecarpa</i>	Wild Senna
2%	<i>Tradescantia ohioensis</i>	Ohio Spiderwort
2%	<i>Zizia aurea</i>	Golden Alexanders
2%	<i>Monarda fistulosa</i>	Wild Bergamot
2%	<i>Geum canadense</i>	White Avenis
2%	<i>Pycnanthemum tenuifolium</i>	Narrowleaf Mountainmint
1%	<i>Baptisia australis</i>	Blue False Indigo
1%	<i>Lespedeza capitata</i>	Roundhead Lespedeza
0.5%	<i>Solidago juncea</i>	Early Goldenrod
0.3%	<i>Eupatorium perfoliatum</i>	Boneset
0.2%	<i>Solidago rugosa</i>	Wrinkleleaf Goldenrod
0.2%	<i>Solidago speciosa</i>	Showy Goldenrod
0.1%	<i>Eupatorium fistulosum</i>	Joe Pye Weed
0.1%	<i>Eupatorium rugosum</i>	White Snakeroot



WETLAND PERMITS:
14-NT-0269/201461196
CENAB-OP-RMS 2014-61196

MDE NO. 20-SF-0105

Professional Certification.

I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland, License No. 3752, Expiration Date: 11/18/2021



REVISIONS		
NO.	BY	DATE

Prepared for:



NAVFAC Washington
1314 Harwood Street SE
Washington, D.C. 20374
CONTRACT #: N40080-17-2-0001

Prepared by:



Environmental
Systems
Analysis, Inc.

NATURAL RESOURCES MANAGEMENT
ECOLOGICAL RESTORATION

2141 Priest Bridge Drive, Suite 1
Crofton, Maryland 21114



VERSAR, INC.

720 Thimble Shoals Blvd.
Suite 108
Newport News, VA 23606

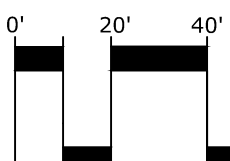
Survey:



401 Post Office Road
Suite 103
Waldorf, Maryland 20602

PLANTING PLAN AND NOTES

WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA
WELCOME, CHARLES COUNTY, MARYLAND



SCALE: 1"=40'



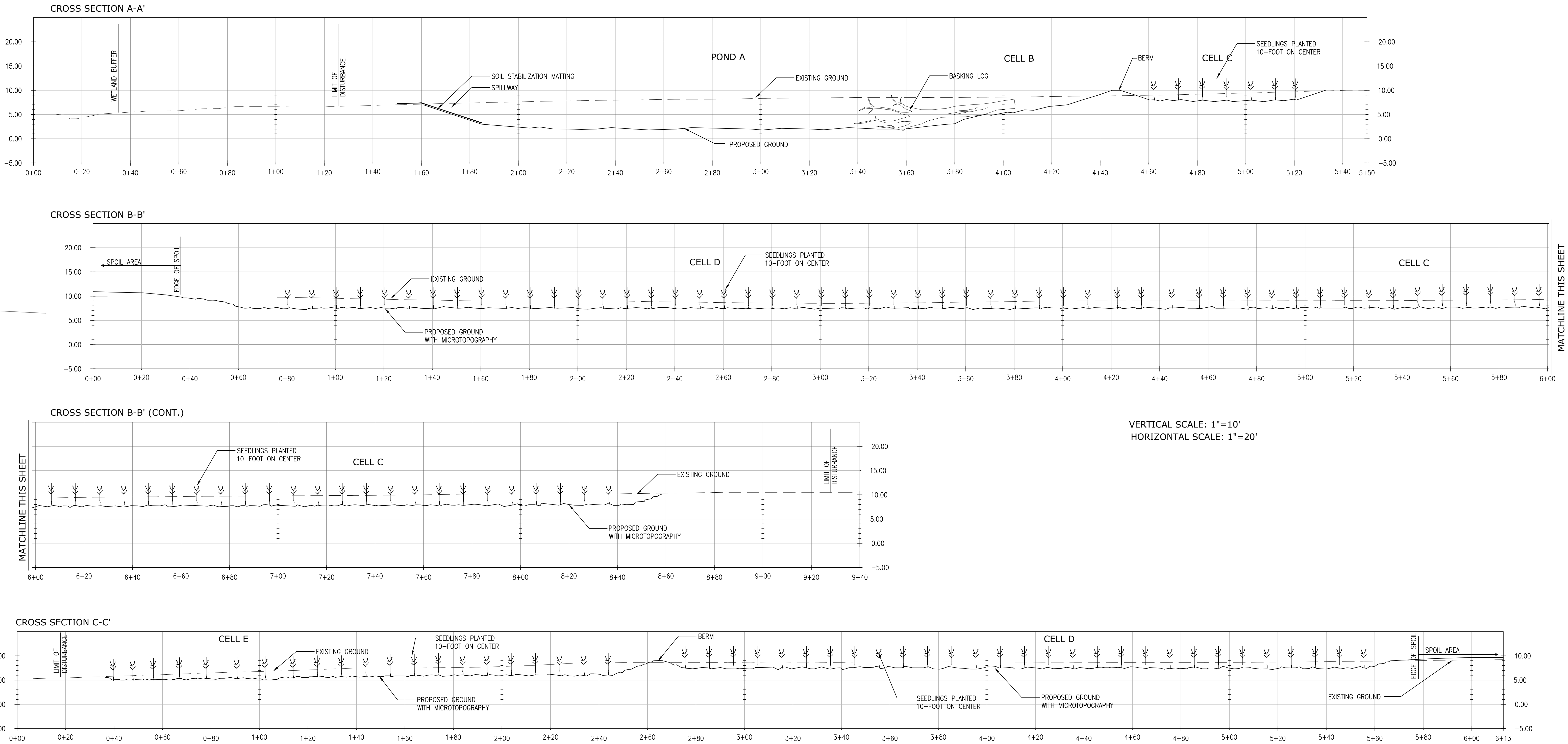
NORTH

SCALE: 1"= 40

DATE: APRIL 2020

ESA PROJECT NAME T:\NEWPROJ\2016\2016-41 Wetland Creation at Cedar Point\ CAD\Individual Drawings

SHEET: 11 of 13



APPROVED
BY: COLLIN HILTNER
May 18, 2020
MD DEPT ENVIRONMENT
SEDIMENT & STORMWATER
PLAN REVIEW DIVISION

WETLAND PERMITS:
14-NT-0269/201461196
CENAB-OP-RMS 2014-61196

MDE NO. 20-SF-0105

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Maryland, License No.
3752, Expiration Date:
11/18/2021



REVISIONS			DESCRIPTION
NO.	BY	DATE	

Prepared for:



NAVFAC Washington
1314 Harwood Street SE
Washington, D.C. 20374
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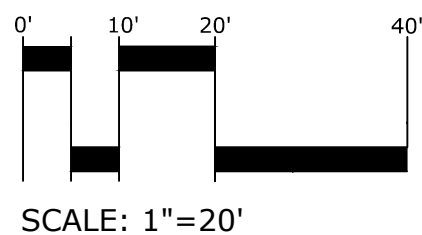
Survey:



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Suite 103
Waldorf, Maryland 20602

CROSS SECTIONS

WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA
WELCOME, CHARLES COUNTY, MARYLAND



SCALE: 1"= 20' H / 1"=10' V
DATE: APRIL 2020
ESA PROJECT NAME T:\NEWPROJ\2016\
2016-41 Wetland Creation at Cedar Point\
CAD\Individual Drawings
SHEET: 12 of 13



APPROVED
BY: COLLIN HILTNER
May 18, 2020
MD DEPT ENVIRONMENT
SEDIMENT & STORMWATER
PLAN REVIEW DIVISION

WETLAND CELL		AREA (SF)
CELL C	FORESTED WETLAND	35,462
CELL D	FORESTED WETLAND	90,691
CELL E	FORESTED WETLAND	53,575

MITIGATION SUMMARY		
IMPACTED RESOURCE	REPLACEMENT RATIO	REQUIRED MITIGATION
FILL OF 13,504 SF PFO	2:1	CREATION OF 27,120 SF PFO
CONVERSION OF 134,165 SF PFO	1:1	CREATION OF 134,165 SF PFO
FILL OF 1,260 SF PEM	1:1	CREATION OF 1,260 SF PEM

WETLAND PERMITS:
14-NT-0269/201461196
CENAB-OP-RMS 2014-61196

MDE NO. 20-SF-0105

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I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional landscape architect under the laws of the State of Maryland, License No. 3752, Expiration Date: 11/18/2021



REVISIONS			DESCRIPTION
NO.	BY	DATE	

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Washington, D.C. 20374
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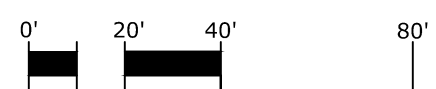
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Survey:



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MITIGATION PLAN
**WETLAND CREATION AT CEDAR POINT WILDLIFE
MANAGEMENT AREA**
WELCOME, CHARLES COUNTY, MARYLAND



SCALE: 1"=40'



NORTH

SCALE: 1"= 40
DATE: APRIL 2020
ESA PROJECT NAME T:\NEWPROJ\2016\
2016-41 Wetland Creation at Cedar Point\
CAD\Individual Drawings
SHEET: 13 of 13