STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
DIVISION OF PARKS AND RECREATION

WCCSP TRI-VALLEY TRAIL, PHASE II

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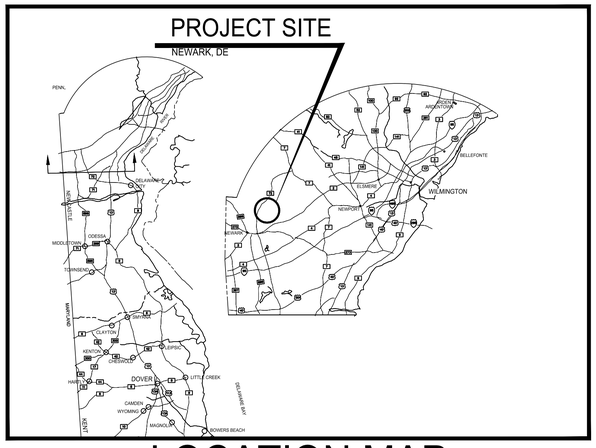


LOCATION MAP

DNREC STATE CONTRACT NO.: 2017-WCCSP-07A

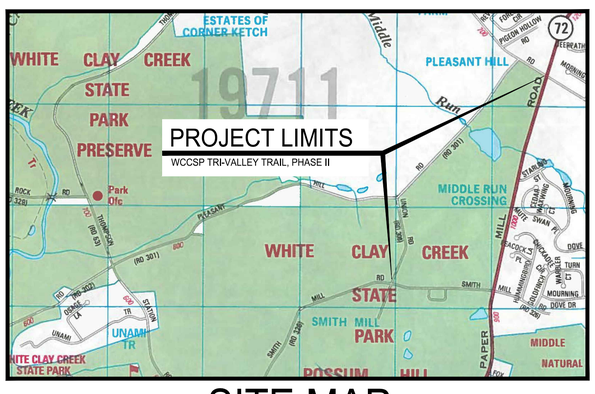
PROJECT NO. WCCSP-07A

FEBRUARY 2018

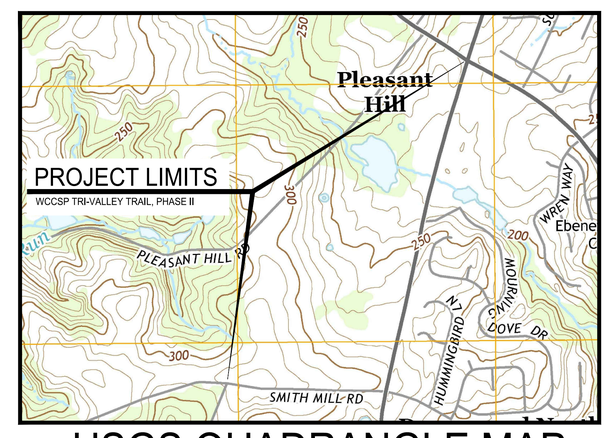
NOT FOR BID

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

FINAL CONSTRUCTION PLANS



SITE MAP



USGS QUADRANGLE MAP

CIVIL ENGINEER

PREPARED BY:

CENTURY ENGINEERING
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SIGNATURE DATE

WALTER J. HOEY, III REGISTERED NO. 11204 DELAWARE PROFESSIONAL ENGINEER
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NOT FOR BID

PROJECT NOTES

1. THE INTENT OF THIS PROJECT IS TO PROVIDE THE FOLLOWING IMPROVEMENTS AT WHITE CLAY CREEK STATE PARK:
   - 1.1. CONSTRUCTION OF A NEW ASPHALT MULTI–USE TRAIL BETWEEN SMITH MILL ROAD AND THE INTERSECTION OF CORNER KETCH ROAD AND PAPER MILL ROAD (ROUTE 72). OVERALL TRAIL LENGTH TO BE 5,964 LINEAR FEET (1.129 MILES).
   - 1.2. IMPROVEMENTS TO THE EXISTING CURB CUT AND SIDEWALK LANDING AT THE INTERSECTION OF CORNER KETCH ROAD AND PAPER MILL ROAD.
   - 1.3. CONSTRUCTION OF ONE (1) BRIDGE OVER MIDDLE RUN.
   - 1.4. MISCELLANEOUS CONSTRUCTION AND SITE WORK, AS SHOWN ON THESE PLANS.
2. THESE PLANS HAVE BEEN DEVELOPED IN ACCORDANCE WITH THE CURRENT EDITION OF THE "ACCESSIBILITY STANDARDS FOR FEDERAL OUTDOOR DEVELOPED AREAS".
3. PARCEL AND BOUNDARY LINES TAKEN FROM GIS INFORMATION. NO BOUNDARY SURVEY WAS REQUESTED OR PERFORMED FOR THIS PROJECT.
4. THESE PLANS WERE DEVELOPED FROM AERIAL SURVEY PROVIDED BY DNREC PARKS. CONVENTIONAL FIELD SURVEY WAS PROVIDED FOR THE AREA OF THE BRIDGE CROSSING AND THE NORTHERN HALF OF THE TRAIL BY CENTURY ENGINEERING. CONTROL POINTS FOR THE CONVENTIONAL SURVEY HAVE BEEN INCLUDED IN THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL ADDITIONAL PHYSICAL CONTROL AS REQUIRED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
5. EXISTING UTILITIES SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE AT THE TIME THIS PLAN WAS DEVELOPED. COMPLETENESS OR CORRECTNESS OF THE UTILITIES SHOWN THEREOF IS NOT GUARANTEED. THE CONTRACTOR IS RESPONSIBLE FOR EMPLOYING AN UNDERGROUND UTILITY LOCATOR TO LOCATE AND MARK EXISTING UTILITIES WITHIN THE LIMIT OF DISTURBANCE PRIOR TO BEGINNING CONSTRUCTION.
6. THE CONTRACTOR SHALL STAKE OUT THE ALIGNMENT FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO BEGINNING CONSTRUCTION. MINOR ADJUSTMENT IN THE ALIGNMENT AND/OR PROFILE MAY BE REQUIRED BY THE ENGINEER IN THE FIELD TO AVOID EXISTING FEATURES TO REMAIN, INCLUDING TREES, OR TO PROVIDE OPTIMUM ALIGNMENT. INDIVIDUAL TREES WERE NOT SURVEY LOCATED FOR THE ENTIRE LENGTH OF THE PROPOSED TRAIL.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TEMPORARY RELOCATION OR SUPPORT OF ELECTRICAL AND COMMUNICATION LINES, AND ELECTRICAL/COMMUNICATION PEDESTALS THAT INTERFERE WITH THE PROPOSED WORK AT NO ADDITIONAL COST TO THE PROJECT, AS DIRECTED BY THE ENGINEER. WORK SHALL INCLUDE, BUT IS NOT LIMITED TO, EXCAVATION/TRENCHING, MATERIALS, AND ALL LABOR.
8. PORTIONS OF THIS CONTRACT ARE TO BE CONSTRUCTED IN ACCORDANCE WITH DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (STANDARD SPECIFICATIONS) DATED AUGUST 2016 INCLUDING ALL REVISIONS UP TO ADVERTISEMENT OF THIS PROJECT, UNLESS NOTED OTHERWISE IN THESE PLANS OR THE SPECIFICATIONS. ITEMS INCLUDING, BUT NOT LIMITED TO, ASPHALT PAVEMENT, AND EXCAVATION AND EMBANKMENT, ARE TO REFER TO THE "STANDARD SPECIFICATIONS" FOR MATERIALS AND METHOD OF CONSTRUCTION.
9. TOPSOIL SHALL BE STRIPPED, STOCKPILED, AND STABILIZED FOR FUTURE USE IN ACCORDANCE WITH THE DELAWARE EROSION & SEDIMENT CONTROL HANDBOOK, CURRENT EDITION. STOCKPILE AREAS TO BE WITHIN WHITE CLAY CREEK STATE PARK AT LOCATIONS SHOWN ON THESE PLANS, OR AT AREAS DETERMINED BY THE ENGINEER IN THE FIELD.
10. EXCAVATED SOILS THAT ARE SUITABLE FOR FILL WITHIN THIS PROJECT SHALL BE STOCKPILED, AND STABILIZED FOR FUTURE USE IN ACCORDANCE WITH THE DELAWARE EROSION & SEDIMENT CONTROL HANDBOOK, CURRENT EDITION. STOCKPILE(S) TO BE WITHIN WHITE CLAY CREEK STATE PARK AT LOCATIONS SHOWN ON THESE PLANS.
11. EXCESS EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE LEGALLY DISPOSED OF OFF SITE. APPROXIMATELY 1,100 CUBIC YARDS OF EXCESS MATERIAL IS ANTICIPATED TO BE GENERATED FROM THIS CONSTRUCTION.
12. CLEARING AND GRUBBING IS ASSUMED TO EXTEND A MINIMUM OF EIGHTEEN (18) INCHES BELOW EXISTING GRADE FOR FOR ALL NEW PAVED AREAS. CLEARING AND GRUBBING WITHIN THE LIMITS OF DISTURBANCE (LOD) SHALL CONSIST OF CLEARING, GRUBBING, REMOVING AND DISPOSING OF ALL TREES, ROOTS, VEGETATION AND DEBRIS OFF SITE, UNLESS OTHERWISE INDICATED AND/OR EXCEPT SUCH OBJECT(S) THAT ARE DESIGNATED TO REMAIN.
13. ALL TREE REMOVAL AND TREE TRIMMING WITHIN THE LIMITS OF DISTURBANCE, REGARDLESS OF SIZE, SHALL BE INCIDENTAL TO THE CONTRACT. INDIVIDUAL TREES ARE NOT SHOWN ON THE DRAWINGS BUT MAY BE REMOVED BY THE CONTRACTOR AS NECESSARY WITHIN THE LIMITS OF DISTURBANCE. TREES GREATER THAN 6" IN DIAMETER SHALL BE FLAGGED BY THE CONTRACTOR FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO REMOVAL. THE ENGINEER WILL NOT ACCEPT REMOVAL OF TREES INTENDED TO BE PROTECTED.
14. TREES NOT DESIGNATED TO BE REMOVED SHALL BE PROTECTED FROM CONSTRUCTION EQUIPMENT AND COMPACTION OF SOIL WITHIN THE DRIP LINE BY MEANS OF 3'–0" HIGH SENSITIVE AREA PROTECTION (SAP) FENCE, AS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS.
15. ENDS OF THE PROPOSED ROADWAY SHALL BE TRANSITIONED AS NECESSARY TO MEET THE EXISTING GRADES OF THE EXISTING PAVEMENT.
16. CROSS SLOPE OF ALL NEW WALKWAYS SHALL NOT EXCEED A SLOPE OF 1:50. LONGITUDINAL SLOPES OF ALL NEW WALKWAYS SHALL NOT EXCEED 1:20, UNLESS AS SHOWN ON THE CONTRACT PLANS.
17. THE CONTRACTOR MAY STORE AND/OR STOCKPILE EQUIPMENT AND MATERIALS WITHIN THE PROJECT SITE LIMIT OF DISTURBANCE (LOD) SHOWN ON PLAN. REFER TO THE SEDIMENT AND EROSION CONTROL PLANS FOR ADDITIONAL INFORMATION.
18. THE CONTRACTOR IS ADVISED THAT CONTRACTOR EMPLOYEE PARKING SHALL BE LIMITED TO THE EXISTING PAVED PARK PARKING AREAS, UNLESS APPROVED BY THE ENGINEER. VEHICLE PARKING SHALL NOT BE ALLOWED ON UNPAVED AREAS.
19. FEATURES NOT SPECIFICALLY DESIGNATED FOR DEMOLITION OR REMOVAL THAT ARE DAMAGED BY THE CONTRACTOR OR THE CONTRACTOR'S SUBCONTRACTORS SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE. THE COST FOR REPAIRS OR REPLACEMENT SHALL BE ESTABLISHED BY THE STATE INSURANCE PROVIDER.
20. NO WORK, INCLUDING MACHINERY, TEMPORARY SHORING, OR WORKERS, SHALL NOT BE ALLOWED IN THE WATER. THE CONTRACTOR SHALL PREVENT DEBRIS FROM FALLING IN THE WATER.
21. REMOVAL OF VEGETATION WITHIN WETLANDS SHALL CONSIST OF CUTTING DOWN TO WITHIN SIX (6) INCHES OF EXISTING GRADE. NO GRUBBING SHALL BE ALLOWED.
22. NO CONSTRUCTION, EQUIPMENT, WORK, OR TEMPORARY FILLS SHALL BE ALLOWED WITHIN THE WETLANDS.

GENERAL NOTES

1. THE TERM "ENGINEER," "STATE," AND/OR "ARCHITECT" NOTED THROUGHOUT THE CONTRACT PLANS AND SPECIFICATIONS SHALL REFER TO DNREC / STATE PARKS, OR THEIR APPOINTED REPRESENTATIVE. THE TERM "SITE" AND "PARK" MAY BE USED INTERCHANGEABLY THROUGHOUT THESE DOCUMENTS AS A MEANS OF IDENTIFYING WHITE CLAY CREEK STATE PARK.
2. THE CONTRACTOR SHALL RESTORE ALL AREAS AFFECTED BY THE CONSTRUCTION SHOWN HEREON AS SHOWN ON THESE PLANS AND SPECIFICATIONS, TO A CONDITION COMPARABLE TO THAT EXISTING PRIOR TO CONSTRUCTION, AND TO THE SATISFACTION OF DNREC.
3. THE CONTRACTOR SHALL PROVIDE NECESSARY FACILITIES, INCLUDING BUT NOT LIMITED TO RESTROOMS, AND CONSTRUCTION TRAILER DURING CONSTRUCTION. PARK FACILITIES SHALL NOT BE USED.
4. THE CONTRACTOR SHALL NOTE THAT IN CASE OF DISCREPANCY BETWEEN THE SCALED AND THE FIGURED DIMENSIONS SHOWN ON THE PLANS, THE FIGURED DIMENSIONS SHALL GOVERN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING ALL DIMENSIONS.
5. BEFORE EXCAVATION IS STARTED, THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES. ALL EXISTING UTILITIES SHALL BE PROTECTED AND TEMPORARILY SUPPORTED OR RELOCATED AS NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THE PERTINENT OWNER/UTILITY COMPANY REQUIREMENTS. ANY UTILITIES DAMAGED BY THE CONTRACTOR SHALL BE PROMPTLY AND FULLY RESTORED TO THE SATISFACTION OF THE OWNER.
6. THE CONTRACTOR SHALL DESIGNATE A PERSON WHO SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING THE EROSION AND SEDIMENT CONTROL PLANS, A PERSON WHO SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING THE TRAFFIC CONTROL, AND A PERSON WHO SHALL BE RESPONSIBLE FOR WORKER SAFETY. THE PERSON RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING THE EROSION AND SEDIMENT CONTROL PLANS SHALL BE CERTIFIED BY DNREC FOR EROSION AND SEDIMENT CONTROL RESPONSIBILITY (CERTIFIED CONSTRUCTION REVIEWER).
7. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THE AREA WITHIN THE LIMITS OF CONSTRUCTION TO PROHIBIT PUBLIC ACCESS UNTIL COMPLETION OF THE PROJECT. THE CONTRACTOR'S PROCEDURE/METHOD FOR LIMITING ACCESS SHALL BE REVIEWED BY, AND COORDINATED WITH DNREC PRIOR TO THE START OF WORK. THE COST TO INSTALL, RELOCATE, AND MAINTAIN SITE SECURITY SHALL BE INCIDENTAL TO THE CONTRACT.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR OBTAINING OFF–SITE SPOIL AREAS FOR LEGAL DISPOSAL OF EXCESS MATERIAL NOT ACCEPTED BY THE PARK AND/OR UNSUITABLE MATERIALS AS NECESSARY IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. ALL COST FOR RECYCLING, TRANSPORTING TO, PROCURING AND UTILIZING THE OFF–SITE SPOIL AREAS ARE TO BE INCIDENTAL TO THE CONTRACT.
9. IN CASE OF CONFLICT BETWEEN THE "MANUFACTURER'S RECOMMENDATIONS" FOR AN APPROVED MATERIAL AND THE GOVERNING "CONTRACT SPECIFICATIONS" FOR THE MATERIAL, THE MORE RESTRICTIVE OF THE TWO SHALL PREVAIL, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
10. THE CONSTRUCTION PLANS PRESENT A CONCEPT OF THE RELATIONSHIP BETWEEN TRAFFIC CONTROL, EROSION CONTROL, ETC. ANY REVISION TO THE DETAILS OR SEQUENCE SHOWN ON THE CONSTRUCTION PLANS SHALL BE PREPARED BY THE CONTRACTOR ON STANDARD DNREC PLAN SHEETS AND SUBMITTED FOR REVIEW AND APPROVAL BY THE ENGINEER. THE PLANS SHALL BE PREPARED IN ACCORDANCE WITH CURRENT DNREC STANDARDS FOR TRAFFIC CONTROL, EROSION AND SEDIMENT CONTROL (PREPARED BY A CERTIFIED CONSTRUCTION REVIEWER), STORM WATER MANAGEMENT, ETC. AND SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE. ALL REQUIRED CALCULATIONS, REPORTS, ETC. SHALL ALSO ACCOMPANY THE SUBMISSION. THE NUMBER OF COPIES REQUIRED TO BE SUBMITTED FOR REVIEW SHALL BE DETERMINED BY DNREC, DEPENDING ON THE NATURE OF THE PROPOSED REVISION. THE CONTRACTOR SHALL NOTE THAT THE REVISIONS TO THE CONSTRUCTION PLANS, AS WELL AS REVIEW TIME BY DNREC, WILL NOT JUSTIFY A DELAY IN THE CONSTRUCTION SCHEDULE. REVISIONS INVOLVING UTILITIES WILL REQUIRE THE COMPLETION OF A UTILITY STATEMENT APPROVED BY THE RESPECTIVE UTILITIES AS PART OF THE PLAN DOCUMENTS. ALL COSTS INVOLVED IN PREPARING THE PLAN REVISIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
11. 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, CFR §1926.652(b)(2), AND ALL FEDERAL, STATE AND LOCAL REQUIREMENTS. CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL SITE SAFETY.
12. NO DEBRIS SHALL BE BURIED OR BURNED ON THE SITE UNLESS SPECIFICALLY NOTED WITHIN THESE PLANS OR SPECIFICATIONS.
13. THE CONTRACTOR SHALL CONTACT MISS UTILITY TWO (2) CONSECUTIVE WORKING DAYS PRIOR TO EXCAVATION, OR AS REQUIRED BY LAW, AT 1–800–282–8555.

TRAFFIC CONTROL NOTES:

1. ALL WORK SHALL BE PERFORMED IN A MANNER THAT WILL REASONABLY PROVIDE THE LEAST PRACTICABLE OBSTRUCTION TO ROAD USERS, INCLUDING VEHICULAR TRAFFIC, BICYCLE TRAFFIC AND PEDESTRIAN TRAFFIC. NO WORK, STORAGE OF MATERIALS, OR PARKING OF VEHICLES SHALL BE ALLOWED WITHIN TEN (10) FEET OF THE EDGE OF THE ROADWAY.
2. ANY TEMPORARY TRAFFIC CONTROL AND TEMPORARY TRAFFIC CONTROL DEVICES DEEMED NECESSARY BY THE CONTRACTOR OR AS REQUIRED BY DELDOT, SHALL BE IN ACCORDANCE WITH:
   - 2.1. THE CONTRACT DOCUMENTS, THE LATEST EDITION OF THE MANUAL TITLED "STATE OF DELAWARE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)" (HEREINAFTER REFERRED TO AS THE "DELAWARE MUTCD"),
   - 2.2. CURRENT STATE OF DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND SUPPLEMENTAL SPECIFICATIONS, INCLUDING ALL REVISIONS AS OF THE DATE OF THE ENTRANCE PERMIT APPROVAL.
3. THE DEPARTMENT RESERVES THE RIGHT TO STOP THE CONTRACTOR'S OPERATIONS, IF, IN THE OPINION OF THE DEPARTMENT'S REPRESENTATIVE, THE CONTRACTOR'S OPERATIONS ARE NOT IN COMPLIANCE WITH THE DELAWARE MUTCD, THE SPECIFICATIONS OR THE PLANS OR IF THE CONTRACTOR'S OPERATIONS ARE DEEMED UNSAFE.
4. IF THE CONTRACTOR REQUIRES WORK OR OTHER ACTIVITY WITHIN TEN (10) FEET OF THE STATE ROAD, THE CONTRACTOR SHALL SUBMIT A TEMPORARY TRAFFIC CONTROL PLAN (TTCP) TO THE DELDOT DISTRICT SAFETY OFFICER FOR APPROVAL PRIOR TO THE START OF WORK AT EACH AND EVERY LOCATION. THE TTCP SHALL BE PREPARED, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE AND SHALL BE PREPARED IN ACCORDANCE WITH ALL APPLICABLE DELDOT STANDARDS. THE TTCP SHALL BE SUBMITTED 14 CALENDAR DAYS IN ADVANCE OF STARTING WORK.
5. TYPICAL APPLICATIONS PER THE DELAWARE MUTCD SHALL BE INCORPORATED TO ACHIEVE REQUIRED TEMPORARY TRAFFIC CONTROL AND SAFETY REQUIREMENTS. THIS PROJECT IS SUBJECT TO THE FOLLOWING TYPICAL APPLICATIONS, AS NOTED ABOVE, UNLESS DIRECTED OTHERWISE BY THE DELDOT DISTRICT SAFETY OFFICER:
   - 5.1. TYPICAL APPLICATION 6 – SHOULDER WORK WITH MINOR ENCROACHMENT ON A TWO–LANE, LOW–SPEED ROAD (≤40 MPH): "WORK WITHIN THE RIGHT OF WAY SHOULDER OF HOPKINS ROAD (TA–6)".
   - 5.2. TYPICAL APPLICATION 10 – LANE CLOSURE ON A TWO–LANE ROAD USING FLAGGERS: "WORK WITHIN THE TRAVEL LANE OF HOPKINS ROAD (TA–10)".
6. ALL ROADWAY CLOSURES OR LANE CLOSURES BEYOND THOSE SPECIFIED AND APPROVED IN THE PLANS SHALL BE APPROVED BY THE DISTRICT SAFETY OFFICER A MINIMUM OF TWO WEEKS IN ADVANCE OF THE PROPOSED RESTRICTION.
7. TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE MAINTAINED IN GOOD CONDITION IN ACCORDANCE WITH THE BROCHURE ENTITLED "QUALITY GUIDELINES FOR TEMPORARY TRAFFIC CONTROL DEVICES", PUBLISHED BY THE AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA). ANY TEMPORARY TRAFFIC CONTROL DEVICES THAT DO NOT MEET THE QUALITY GUIDELINES SHALL BE REMOVED AND REPLACED WITH ACCEPTABLE DEVICES. FAILURE TO COMPLY WILL RESULT IN WORK STOPPAGE.
8. TEMPORARY TRAFFIC CONTROL DEVICES USED ON ALL ROADWAYS OPEN TO THE PUBLIC IN DELAWARE SHALL CONFORM TO THE DELAWARE MUTCD AND SHALL BE IN NEW OR REFURBISHED CONDITION. ALL DEVICES SHALL BE CRASHWORTHY IN ACCORDANCE WITH THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP) REPORT 350 AND/OR IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), PUBLISHED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO). THE CONTRACTOR SHALL SUBMIT CERTIFICATION FOR ALL TEMPORARY TRAFFIC CONTROL DEVICES USED SPECIFICALLY ON THIS PROJECT TO THE DISTRICT SAFETY OFFICER AT OR PRIOR TO THE PRE–CONSTRUCTION MEETING. THE CONTRACTOR SHALL NOT BEGIN WORK OR PLACE ANY TEMPORARY TRAFFIC CONTROL DEVICES UNTIL THE CERTIFICATION OF DEVICES HAS BEEN APPROVED BY THE DISTRICT SAFETY OFFICER.
9. ANY DEFICIENCIES RELATED TO TEMPORARY TRAFFIC CONTROL THAT ARE REPORTED TO THE CONTRACTOR IN WRITING SHALL BE CORRECTED WITHIN 24 HOURS OR AS DIRECTED BY THE DISTRICT SAFETY OFFICER. CORRECTIVE ACTIONS ON SEVERE DEFICIENCIES SHALL BE TAKEN IMMEDIATELY. FAILURE TO COMPLY WILL RESULT IN THE SUSPENSION OF WORK UNTIL DEVICES ARE BROUGHT BACK INTO COMPLIANCE.
10. WITH THE EXCEPTION TO THE PARK OFFICE, ACCESS TO ALL BUSINESSES AND RESIDENCES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED THROUGHOUT THE DURATION OF THIS CONTRACT. ANY TEMPORARY CLOSURE OF A DRIVEWAY OR ENTRANCE FOR TIE–IN PURPOSES SHALL BE COORDINATED WITH THE ENGINEER AND THE PROPERTY OWNER IN ADVANCE OF THE CLOSURE.
11. ACCESS TO ALL TRANSIT STOPS LOCATED WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED UNLESS OTHERWISE DIRECTED BY THE PLANS OR THE ENGINEER. MAINTAINING ACCESS TO THE TRANSIT STOP SHALL INCLUDE MAINTAINING AN AREA OF THE TRANSIT VEHICLE TO STOP TO PICK–UP AND DISCHARGE PASSENGERS AND ALSO AN ACCESSIBLE PATH FOR PEDESTRIANS TO SAFELY ACCESS THE TRANSIT STOP.
12. THE CONTRACTOR SHALL PROVIDE ALL PROPERTY OWNERS AND RESIDENTS WHO LIVE ADJACENT TO THE WORK ZONE [illegible] WRITTEN NOTICE, 48 HOURS IN ADVANCE OF THE START OF CONSTRUCTION WORK. THIS NOTIFICATION SHALL [illegible]LUDE SCOPE OF WORK, WORKING HOURS, ANTICIPATED START AND COMPLETION DATES; A SUMMARY OF CONSTR[illegible] ACTIV[illegible] WHICH MAY INTERFERE WITH ACCESS TO THE PROPERTY INCLUDING A SCHEDULE AND ACCESS [illegible]DINATION P[illegible] CONTRACTOR'S NAME AND ADDRESS AND A DELDOT CONTACT PHONE NUMBER. FAILURE TO GIVE PRO[illegible]OTICE WILL RESU[illegible] IN A SUSPENSION OF THE WORK REQUIRING NOTICE, UNTIL PROPER NOTICE IS PROVIDED. THE CONT[illegible]OR SHALL [illegible]VIDE WRITTEN VERIFICATION TO THE ENGINEER THAT THE PROPERTY OWNERS AND RESIDENTS WERE NOTIFIED.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE LOCAL 911 CENTER [illegible] SCHOOLS AND [illegible]ELDOT PUBLIC INFORMATION CENTER OF ALL ROADS AND LANES TO BE CLOSED A MINIM[illegible] SEVEN CALENDAR D[illegible] BEFORE THE CLOSURE.
14. THE CONTRACTOR SHALL NOTIFY THE LOCAL 911 CENTER IF ACCESS TO A FIRE HYD[illegible] IS TEMPORARILY RESTRICTED.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING [illegible]PORTATION [illegible]GEMENT CENTER IS NO[illegible]IED EACH AND EVERY DAY WHEN WORK IS BEING PERFORMED IN [illegible] RIGHT–O[illegible]Y. THE C[illegible]CTOR SHALL ID[illegible]IFY THE TYPE OF WORK, ANY LANE(S) OR SHOULDERS CLOSED, THE L[illegible]H OF TIME [illegible] WORK, WHE[illegible]E LANE [illegible]STRICTIONS ARE IN PLACE AND WHEN LANE RESTRICTIONS ARE [illegible]FTED, [illegible]ONTACT PERS[illegible]HONE NUMBER AND [illegible]STATE INSPECTOR. THE TRANSPORTATION MANAGEMENT CENTER CAN BE REACHED AT (302) 659–4600.
16. AT THE END OF EACH WORKDAY, [illegible]TRACTO[illegible]ALL [illegible] VERTICAL [illegible]FERENCES IN ACCORDANCE WITH TABLE 6G–1 OF THE DELAWARE MUTCD, [illegible] TO M[illegible]AIN TRA[illegible]
17. AT THE END OF EACH DAY'S OPERAT[illegible] AND BE[illegible]FIC IS RET[illegible]ED TO UNRESTRICTED ROADWAY USE, TEMPORARY PAVEMENT MARKINGS SHA[illegible] APPLIED [illegible] ACCORDA[illegible]E WITH THE DELAWARE MUTCD AND DELDOT'S TEMPORARY PAVEMENT MARKINGS POLICY.
18. WHEN SIDE ROADS INTERSECT THE WOR[illegible] ZONE, A[illegible]ITIONAL TRAFFIC CONTROL DEVICES SHALL BE ERECTED INCLUDING PERMANENT WARNING SIGNS.
19. ALL STORAGE OF EQUIPMENT AND MATERIAL SHALL COMPLY WITH SECTION 6G.21 OF THE DELAWARE MUTCD.
20. ALL FLAGGERS SHALL COMPLY WITH CHAPTER 6E OF THE DELAWARE MUTCD.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS/HER WORK WITH OTHER CONTRACTORS IN THE AREA.
22. ALL PERSONS WORKING WITHIN THE STATE RIGHT–OF–WAY SHALL WEAR A MINIMUM OF AN ANSI CLASS II SAFETY VEST MEETING OR EXCEEDING THE ANSI 107–2004 REQUIREMENTS, AS SPECIFIED IN THE DELAWARE MUTCD.
23. ALL PAVEMENT MARKINGS THAT ARE NO LONGER IN USE AND CONFLICT WITH TEMPORARY PAVEMENT MARKINGS SHALL BE REMOVED AND COMPLETELY OBLITERATED BY A METHOD APPROVED BY THE ENGINEER. PAINTING OVER THE CONFLICTING PAVEMENT MARKINGS WILL NOT BE ACCEPTED AS A METHOD OF REMOVAL.
24. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF EXISTING PAVEMENT WITHIN THE PROJECT LIMITS FOR THE DURATION OF THE CONTRACT OR AS DIRECTED BY THE ENGINEER.
25. ALL ROADWAYS AND ENTRANCES NOT OPEN TO TRAFFIC SHALL BE CLOSED USING TYPE III BARRICADES AND SHALL BE INSTALLED PER THE DELAWARE MUTCD.

LEGEND

EXISTING		PROPOSED
	PROPERTY LINE / R.O.W.	R/W
FP	FLOODPLAIN	
150	CONTOUR MAJOR	150
148	CONTOUR MINOR	148
	TREELINE	
	STREAM BOUNDARY	N/A
	WETLAND BOUNDARY	N/A
	SOILS BOUNDARY	N/A
	FENCE	
N/A	TO BE REMOVED	
N/A	SAWCUT	SAW SAW
	UTILITY POLE	N/A
	SIGN	
	DRAINAGE INLET	
J.W.	CONDUIT JUNCTION WELL	
G.V.	GAS VALVE	N/A
N/A	FULL DEPTH PAVEMENT	
N/A	P.C.C. SIDEWALK	

IDENTIFIERS

RM / C	REMOVE BY CONTRACTOR
RL / O	RELOCATE BY OTHERS
DI	DRAINAGE INLET
P	PIPE
JW	JUNCTION WELL

NOTE: REFER TO THE SEDIMENT & STORMWATER MANAGEMENT PLANS FOR ADDITIONAL LEGEND INFORMATION.

DATA COLUMN

1. COUN[illegible]TAX MAP: 08–035.00–021, 08–035.00–022, 08–035.00–023, 08–035.00–024, 08–041.00–027
2. DNREC PROJECT NUMBER: WCCSP–07A
3. ADDRESS OF SITE: SMITHS MILL ROAD, NEWARK, DE 19711
4. SITE COORDINATES AT CENTER OF PROJECT SITE: LATITUDE: 39.7154 N; LONGITUDE: –75.7409 W
5. ZONING: EXISTING: SR–SUBURBAN RESERVE; PROPOSED: SR–SUBURBAN RESERVE

LOT AREA:

TAX PARCEL NO.	EXISTING	PROPOSED
08–035.00–021	14.43 ACS.	14.43 ACS.
08–035.00–022	63.50 ACS.	63.50 ACS.
08–035.00–023	17.18 ACS.	17.18 ACS.
08–035.00–024	23.76 ACS,	23.76 ACS.
08–041.00–027	47.83 ACS.	47.83 ACS.

SOURCE OF TITLE:

TAX PARCEL NO.	DEED RECORD/INSTRUMENT NUMBER
08–035.00–021	2491–49
08–035.00–022	20020814–0078868
08–035.00–023	2491–49
08–035.00–024	20020814–0078868
08–041.00–027	20020814–0078868

6. EXISTING USE: STATE PARK
7. PROPOSED USE: STATE PARK WITH TRAIL IMPROVEMENTS
8. DATUM: EXISTING; VERTICAL – NAVD 88; HORIZONTAL – NAD 83

   BENCHMARK: – EXISTING DRAINAGE MANHOLE, INTERSECTION THOMPSON STATION ROAD AND NINE FOOT ROAD, ELEV. 342.39
9. SITE CONDITIONS WITHIN LIMITS OF DISTURBANCE (ACRES)

EXISTING CONDITIONS		PROPOSED CONDITIONS	
BUILDING	0.00 ACRES	BUILDING	0.00 ACRES
PAVEMENT/CONCRETE	0.00 ACRES	PAVEMENT/CONCRETE	1.08 ACRES
TREES	0.94 ACRES	TREES	0.54 ACRES
OPEN SPACE	2.03 ACRES	OPEN SPACE	1.35 ACRES
TOTAL	2.97 ACRES		2.97 ACRES

   IMPERVIOUS CONDITIONS: EXISTING 0% PROPOSED 36.4%
10. FLOOD PLAIN MAP: PER FIRM MAP NUMBER 10003C0130K, DATED FEBRUARY 4, 2015, THIS SITE LIES WITHIN ZONE X, AREA DETERMINED TO BE OUTSIDE THE ANNUAL 0.2% CHANCE OF FLOODPLAIN. A 100 YEAR FLOODPLAIN HAS BEEN CALCULATED AND THE BASE FLOOD ELEVATION (BFE) IS 227.00.
11. WATER RESOURCE PROTECTION: ACCORDING TO THE WATER RESOURCE PROTECTION MAP FOR NEW CASTLE COUNTY, MAP 1 OF 3, DATED 1987, LAST REVISED DECEMBER 2011, THIS SITE DOES NOT LAY WITHIN A RECHARGE WATER RESOURCE PROTECTION AREA.
12. TOTAL LAND DISTURBANCE: THE TOTAL LAND DISTURBANCE PROPOSED BY THIS PLAN IS 2.97± ACRES (129,334± S.F.)
13. LIMITS OF CONSTRUCTION: THE TOTAL LIMITS OF CONSTRUCTION FOR THE SITE IS 2.97± ACRES (129,334± S.F.)
14. LENGTH OF PROPOSED TRAIL: 5,964 LINEAR FEET (1.129 MILES).
15. WETLANDS: THE TOTAL WETLANDS EXISTING WITHIN THE LIMITS OF DISTURBANCE IS 0.00± ACRES (000± S.F.)
16. OWNER/DEVELOPER: STATE OF DELAWARE, DNREC, DIVISION OF PARKS & RECREATION, 89 KINGS HIGHWAY, DOVER, DE 19901, PHONE: 302–739–9210, FAX: 302–739–3817
17. CIVIL ENGINEER: CENTURY ENGINEERING, INC., 4134 NORTH DUPONT HIGHWAY, DOVER, DE 19901, WALTER J. HOEY,III, P.E., PHONE: (302) 734–9188, FAX: (302) 734–4589

FIRE MARSHAL NOTES

NAME OF PROJECT:	WHITE CLAY CREEK STATE PARK TRI–VALLEY TRAIL
ADDRESS:	SMITHS MILL ROAD NEWARK, DE 19711
TAX MAP NUMBER:	08–035.00–021 08–035.00–022 08–035.00–023 08–035.00–024 08–041.00–027
OWNER'S NAME AND ADDRESS:	STATE OF DELAWARE DELAWARE STATE PARKS 89 KINGS HIGHWAY DOVER, DE 19901
ENGINEER:	CENTURY ENGINEERING, INC. 4134 N. DUPONT HWY. DOVER, DE 19901
APPLICANT:	WALTER J. HOEY, III, P.E. (CENTURY ENGINEERING, INC.)
INTENDED USE OF SITE:	MULTI–USE TRAIL
WATER SUPPLIER:	NONE
NUMBER OF FIRE HYDRANTS:	NONE
BUILDING USE:	NONE
MAXIMUM HEIGHT OF BUILDING:	N/A
BUILDING(S) SIZE:	N/A
PROPOSED BUILDING CONSTRUCTION;	N/A
AUTOMATIC SPRINKLER PROTECTION:	N/A
FIRE LANES:	NONE

NOTES:

1. ALL FIRE LANES, FIRE HYDRANTS, AND FIRE DEPARTMENT CONNECTIONS SHALL BE MARKED IN ACCORDANCE WITH THE STATE FIRE PREVENTION REGULATIONS.
2. ALL PROPOSED FIRE HYDRANTS AND WATER MAINS SHALL BE INSTALLED IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE DELAWARE STATE FIRE REGULATIONS. (DSFPR REGULATION 702, CHAPTER 6 & 7.
3. FIRE HYDRANTS SHALL BE COLOR CODED IN ACCORDANCE WITH THE DSFPR REGULATION 703, CHAPTER 3, SECTION 4. THIS INCLUDES BOTH COLOR CODING THE BONNET AND 2 INCH REFLECTIVE TAPE AROUND THE BARREL UNDER THE TOP FLANGE.
4. ALL THREADS PROVIDED FOR FIRE DEPARTMENT CONNECTIONS, TO SPRINKLER SYSTEMS, STANDPIPES, HARD HYDRANTS OR ANY OTHER FIRE HOSE CONNECTIONS SHALL BE UNIFORM TO THOSE USED BY THE FIRE DEPARTMENT IN WHOSE DISTRICT THEY ARE LOCATED. (DSFRP REGULATION 703, CHAPTER 1, SECTION 1.5)
5. THE STEAMER CONNECTION OF ALL FIRE HYDRANTS SHALL BE SO POSITIONED SO AS TO BE FACING THE STREET OR FIRE LANE. (DSFPR REGULATION 705, CHAPTER 5, SECTION 10)

REVISIONS: DATE: | DESCRIPTION: | BY:

WCCSP TRI-VALLEY TRAIL, PHASE II CONSTRUCTION PLANS

PROJECT NOTES & LEGEND

SEAL: WALTER J. HOEY, III REGISTERED NO. 11204 DELAWARE PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY:	WJH
DRAWN BY:	DFS
CHECKED BY:	AES
DATE:	FEBRUARY 2018
SCALE:	NONE
SHEET NO.:	C1.1
CONTRACT NO.:	2017-WCCSP-07A

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CONSTRUCT NEW BRIDGE
(80' SPAN)

CONSTRUCT NEW ELEVATED TRAIL
(8' WIDE BOARDWALK, APPROX. 108 L.F.)

CONSTRUCT NEW ELEVATED TRAIL
(8' WIDE BOARDWALK, APPROX, 60 L.F.)

CONSTRUCT NEW TRAIL
STA. 13[illegible] - 159+[illegible]
(8' WID[illegible] ASPH[illegible]T PAVEM[illegible]T)

CONSTRUCT NEW TRAIL
STA. 100+00 - 136+95
(8' WIDE ASPHALT PAVEMENT)

NOT FOR BID

PLEASANT HILL ROAD

PRIVATE DRIVE

MIDDLE RUN

CORNER KETCH ROAD

POLLY DRUMMOND HILL ROAD

PAPER MILL ROAD

UNION ROAD (UNPAVED, CLOSED)

SMITH MILL ROAD (TRI-VALLEY TRAIL PHASE 1)

0' 200' 400' 600'
SCALE: 1" = 200'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

PROJECT SCOPE

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=200'

SHEET NO.: C1.2

CONTRACT NO.: 2017-WCCSP-07A

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NOTE:

1. TRAVERSE POINT CONTROL SET BY CENTURY ENGINEERING ON JUNE 15, 2017. CENTURY ENGINEERING SHALL NOT BE RESPONSIBLE FOR CONTROL THAT HAS BEEN DISTURBED BETWEEN THE DATE OF SURVEY AND THE ISSUANCE OF THESE PLANS.

2. ALL TRAVERSE POINTS ARE CAPPED REBAR.

TRAVERSE POINT LAYOUT

POINT NO.	DESCRIPTION	NORTHING	EASTING	ELEVATION
1	JU4130	630118.0074	568664.0029	275.991
2	TP-18	629472.2455	568270.8582	299.423
3	TP-19	629774.1775	567966.7657	298.939
4	TP-100	631845.6812	567874.3380	245.256
5	TP-101	631595.7900	567449.5443	279.484
6	TP-102	631707.6105	568336.3017	231.736
7	TP-103	631774.4492	568752.5123	226.573
8	TP-104	630978.7654	567722.2884	274.383
9	TP-105	632082.0170	567981.0021	238.193
10	TP-106	630484.9390	567152.0643	312.664
11	TP-107	633654.2518	569433.8374	230.468
12	TP-108	633413.7104	569395.3483	232.561
13	TP-109	632851.8534	568969.9302	219.722
14	TP-110	632459.3737	568962.1437	217.575
15	TP-111	631369.4735	568639.7529	243.123
16	TP-112	630939.3839	568475.4190	259.260
17	TP-700	633230.1232	569060.3133	227.748
18	TP-701	633130.3879	568731.2913	233.570
19	TP-702	633357.5732	568469.3234	264.033
20	TP-703	633074.4300	568264.2791	253.691
21	TP-704	632710.0540	567954.7702	233.147
22	TP-705	632464.0008	567925.7597	235.417
23	TP-706	632251.0823	567925.5326	239.895

0' 200' 400' 600'
SCALE: 1" = 200'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II CONSTRUCTION PLANS

SITE CONTROL PLAN

SEAL:

WALTER J. HOES, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=200'

SHEET NO.: C1.3

CONTRACT NO.: 2017-WCCSP-07A

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REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

OVERALL SHEET LAYOUT

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=200'

SHEET NO.: C1.4

CONTRACT NO.: 2017-WCCSP-07A

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1 / C2.1 TRI-VALEY, PHASE II INTERSECTION DETAIL
SCALE: 1" = 10'

NOTES: (X)

1. CLEAR AND GRUB TREES & VEGETATION. REMOVE ALL OBSTRUCTIONS.
   A. CONSULT WITH DNREC FOR WIDTH OF CORRIDOR TO BE CLEARED
   B. DNREC TO MARK TREES TO REMAIN PRIOR TO DEMOLITION.
   C. TREES TO BE REMOVED OUTSIDE OF THE TRAIL SHOULDERS SHALL BE CUT FLUSH WITH EXISTING GRADE WITHOUT THE REMOVAL OF STUMPS.

WETLAND NOTES:

1. REMOVAL OF VEGETATION WITHIN WETLANDS SHALL BE DONE BY HAND. VEGETATION SHALL BE REMOVED SUCH THAT STUMPS ARE FLUSH WITH THE EXISTING GROUND ELEVATION. NO GRUBBING OF STUMPS OR OTHER VEGETATION SHALL OCCUR WITHIN THE WETLAND LIMITS.
2. NO CONSTRUCTION, WORK, OR TEMPORARY FILLS SHALL BE ALLOWED WITHIN THE WETLANDS.

0' 60' 90' 120'
SCALE: 1" = 60'

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

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II CONSTRUCTION PLANS

DEMOLITION PLAN

SEAL: WALTER J. HOEY, III · REGISTERED · NO. 11204 · DELAWARE · PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: C2.1
CONTRACT NO.: 2017-WCCSP-07A

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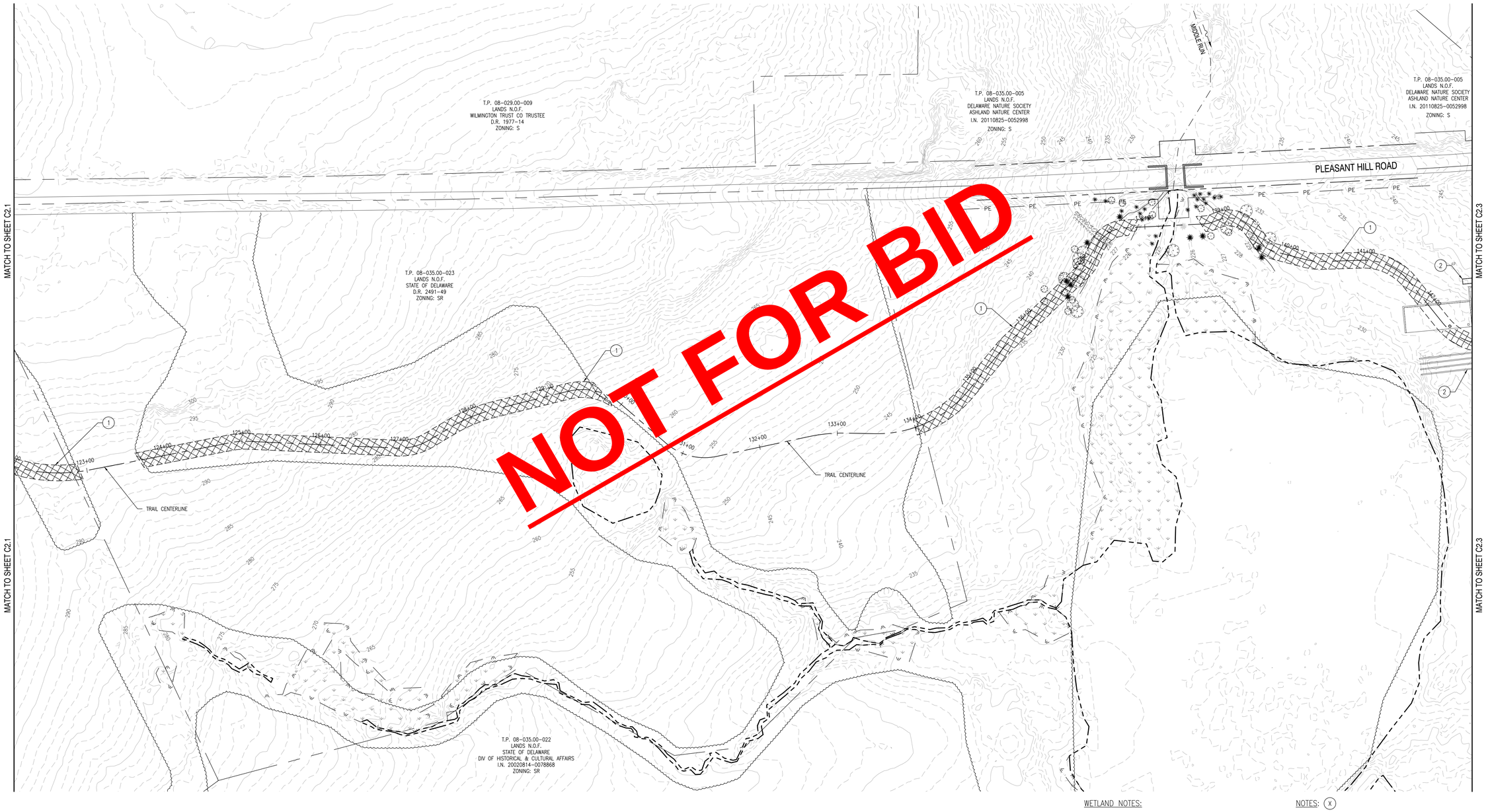

WETLAND NOTES:

1. REMOVAL OF VEGETATION WITHIN WETLANDS SHALL BE DONE BY HAND. VEGETATION SHALL BE REMOVED SUCH THAT STUMPS ARE FLUSH WITH THE EXISTING GROUND ELEVATION. NO GRUBBING OF STUMPS OR OTHER VEGETATION SHALL OCCUR WITHIN THE WETLAND LIMITS.
2. NO CONSTRUCTION, WORK, OR TEMPORARY FILLS SHALL BE ALLOWED WITHIN THE WETLANDS.

NOTES: (X)

1. CLEAR AND GRUB TREES & VEGETATION. REMOVE ALL OBSTRUCTIONS.
   A. CONSULT WITH DNREC FOR WIDTH OF CORRIDOR TO BE CLEARED
   B. DNREC TO MARK TREES TO REMAIN PRIOR TO DEMOLITION
   C. TREES TO BE REMOVED OUTSIDE OF THE TRAIL SHOULDERS SHALL BE CUT FLUSH WITH EXISTING GRADE WITHOUT THE REMOVAL OF STUMPS.
2. MONITOR THE ARCHAEOLOGY SITE IN VICINITY AND ACROSS THE NEWARK CHINA CLAY CO. SITE, WITHIN THE WOODED PORTION OF THE PROJECT IS REQUIRED DURING CONSTRUCTION. DO NOT DISTURB EXISTING FOUNDATIONS AT STA.142+00 – STA.142+50. TRAIL IS TO BE CONSTRUCTED ENTIRELY ON TOP OF THEM.

0' 60' 90' 120'
SCALE: 1" = 60'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

DEMOLITION PLAN

SEAL:
WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=60'
SHEET NO.: C2.2
CONTRACT NO.: 2017-WCCSP-07A

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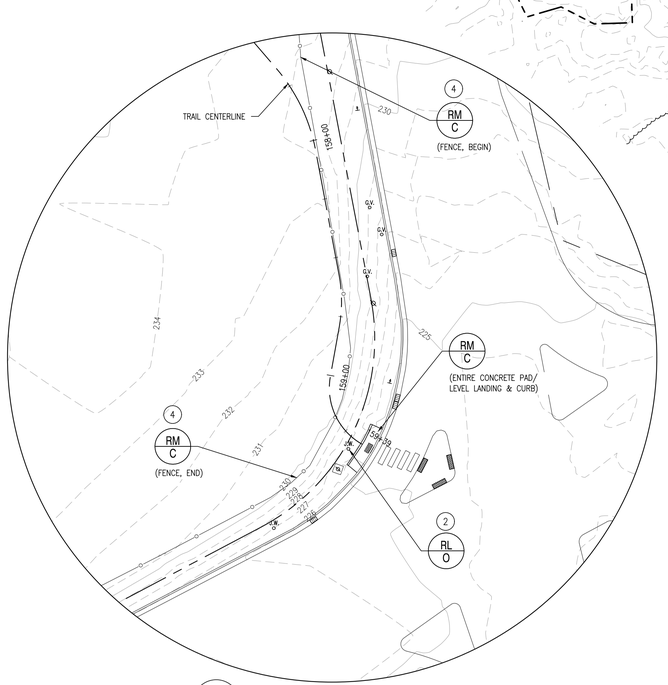

1 / C2.3 INTERSECTION / TRAIL ENDING DETAIL
SCALE: 1" = 30'

NOTES: (X)

1. CLEAR AND GRUB TREES & VEGETATION. REMOVE ALL OBSTRUCTIONS.
   A. CONSULT WITH DNREC FOR WIDTH OF CORRIDOR TO BE CLEARED
   B. DNREC TO MARK TREES TO REMAIN PRIOR TO DEMOLITION
   C. TREES TO BE REMOVED OUTSIDE OF THE TRAIL SHOULDERS SHALL BE CUT FLUSH WITH EXISTING GRADE WITHOUT THE REMOVAL OF STUMPS.

4. CONTRACTOR SHALL DISCONNECT EXISTING HOME-RUN DETECTION CABLES AT SPLICE TUBE, PULL BACK CABLES SO NOT TO GET DAMAGED, ADJUST JUNCTION WELL (TO AVOID PATHWAY AND LOWER TO BE FLUSH WITH FINISHED GRADE), REDUCE AND EXTEND PERTINENT CONDUIT RUNS (WITH LIKE MATERIAL, SIZE AND COUPLING), RE-INSTALL HOME-RUN CABLES AND SPLICE INTO EXISTING DETECTION LOOP WITH APPROVED SPLICE TUBE. CONTRACTOR SHALL CONTACT THE DELAWARE TRANSPORTATION MANAGEMENT CENTER (TMC) 48-HOURS PRIOR TO PERFORMING WORK. IT IS REQUIRED THAT THE CONTRACTOR SUBCONTRACT THIS WORK TO AN APPROVED DELDOT ELECTRICAL CONTRACTOR.
5. MONITOR THE ARCHAEOLOGY SITE IN VICINITY AND ACROSS THE NEWARK CHINA CLAY CO. SITE, WITHIN THE WOODED PORTION OF THE PROJECT IS REQUIRED DURING CONSTRUCTION. DO NOT DISTURB EXISTING FOUNDATIONS AT STA.142+00 – STA.142+50. TRAIL IS TO BE CONSTRUCTED ENTIRELY ON TOP OF THEM.
6. SPLIT-RAIL FENCE SHALL BE REMOVED TO NEAREST POST. POST SHALL BE FITTED WITH TENSION BAR AND RAIL ENDS TO FUNCTION AS A TERMINAL POST.

WETLAND NOTES:

1. REMOVAL OF VEGETATION WITHIN WETLANDS SHALL BE DONE BY HAND. VEGETATION SHALL BE REMOVED SUCH THAT STUMPS ARE FLUSH WITH THE EXISTING GROUND ELEVATION. NO GRUBBING OF STUMPS OR OTHER VEGETATION SHALL OCCUR WITHIN THE WETLAND LIMITS.
2. NO CONSTRUCTION, WORK, OR TEMPORARY FILLS SHALL BE ALLOWED WITHIN THE WETLANDS.

0' 60' 90' 120'
SCALE: 1" = 60'

0' 30' 60' 90'
SCALE: 1" = 30'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

DEMOLITION PLAN

SEAL: WALTER J. HOEY, III REGISTERED NO. 11204 DELAWARE PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: C2.3
CONTRACT NO.: 2017-WCCSP-07A

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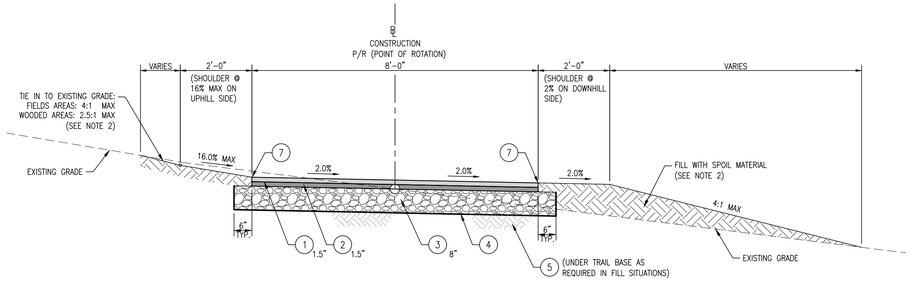
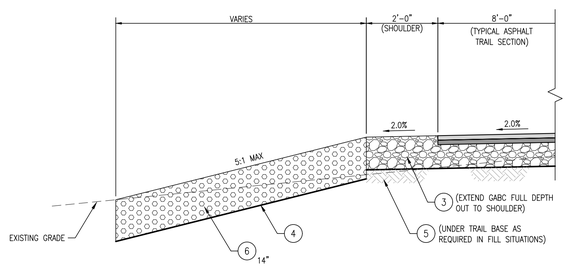


1 / C3.1 TYPICAL ASPHALT TRAIL SECTION
SCALE: 1/2" = 1'-0"

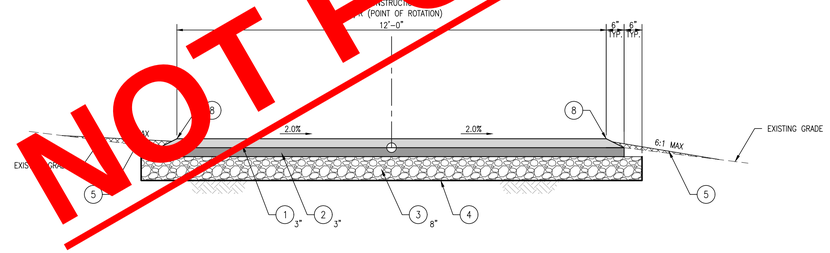
NOTE:
TYPICAL SECTION(ABOVE) SHOWS RIGHT CROSS-SLOPE. A SPECIFIC LIST OF CROSS-SLOPE DIRECTIONS IS PROVIDED BELOW IN TABLE TITLED "TRAIL CROSS-SLOPE DIRECTION"

TRAIL CROSS-SLOPE DIRECTION	
100+00(START) – 119+90	LEFT
119+90 – 120+00	TRANS
120+00 – 136+95	RI
136+95 – 13	FLAT
139+20 – +60	RIGHT
156+60 – 80	TRA
156+80 –	
157+70 – 15	TRANSITION
157+80 – 159+	RIGHT

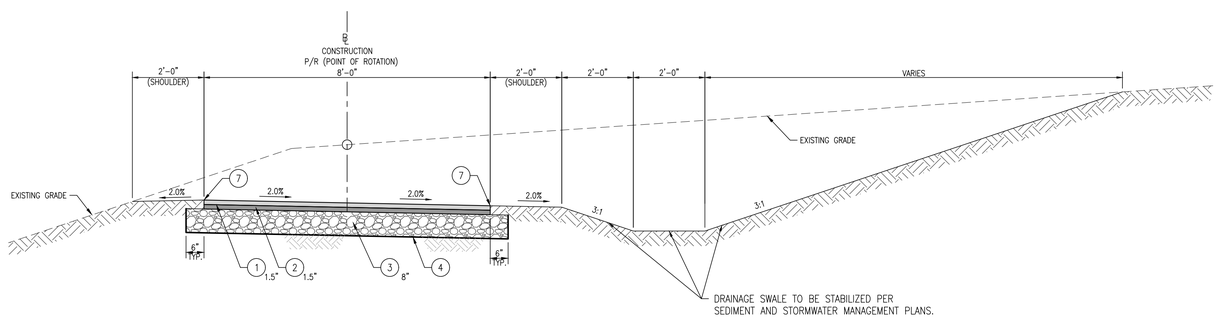
NOT FOR BID



2 / C3.1 MODIFIED SHOULDER SECTION
SCALE: 1/2" = 1'-0"



3 / C3.1 FARM CROSSING TRAIL SECTION
SCALE: 1/2" = 1'-0"



4 / C3.1 TRAIL SECTION WITH DRAINAGE SWALE
STA. 158+00 - 159+42
SCALE: 1/2" = 1'-0"

LEGEND

1. ITEM 401002 – BITUMINOUS CONCRETE, SUPERPAVE TYPE C, 160 GYRATIONS PG 64-22 (CARBONATE STONE)
2. ITEM 401011 – BITUMINOUS CONCRETE, SUPERPAVE TYPE B, 160 GYRATIONS PG 64-22
3. ITEM 301001 – GRADED AGGREGATE BASE COURSE, TYPE B
4. ITEM 708002 – SEPARATION GEOTEXTILE
5. ITEM 209006 – BORROW, TYPE F
6. ITEM 707010 – RIPRAP, R-4
8. SAFETY EDGE (SEE DETAIL 5/C3.1)
9. SAFETY EDGE (SEE DETAIL 6/C3.1)

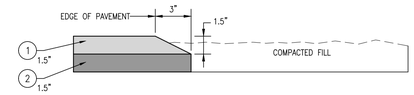
NOTES

1. 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.
2. REQUIREMENTS WHEN GRADING TO EXISTING:

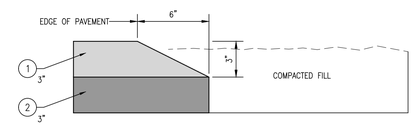
   SLOPES STEEPER THAN 3:1:
   FILL WITH EXCAVATED MATERIAL, PERMANENT SEEDING, MULCHING

   SLOPES FLATTER THAN 3:1:
   FILL WITH EXCAVATED MATERIAL, PERMANENT SEEDING, STABILIZATION MATTING

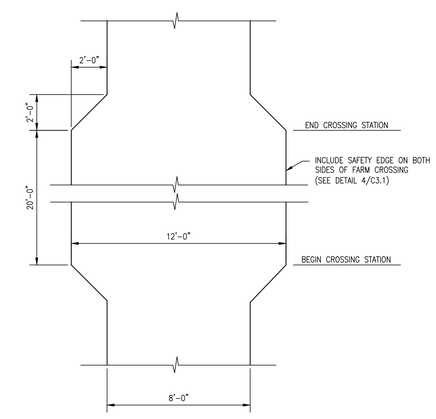
   WHEN IN CUT, OVER EXCAVATE 6" TO APPLY 6" OF TOPSOIL UNLESS SUFFICIENT TOPSOIL DEPTH OF 6" EXISTS.
3. DRAINAGE SWALE TO BE STABILIZED PER SEDIMENT AND STORMWATER MANAGEMENT PLANS.
4. CONTRACTOR HAS THE OPTION TO SUBSTITUTE ITEM 401002 – BITUMINOUS CONCRETE, SUPERPAVE TYPE C FOR ITEM 401011 – BITUMINOUS CONCRETE SUPERPAVE TYPE B AT NO ADDITIONAL COST TO THE OWNER.
5. THREE(3) FARM CROSSING LOCATIONS TO BE DETERMINED IN THE FIELD BY DNREC.



5 / C3.1 TRAIL SAFETY EDGE
SCALE: NONE



6 / C3.1 FARM CROSSING SAFETY EDGE
SCALE: NONE



7 / C4.1 PLAN: FARM CROSSING
SCALE: 1/4" = 1'-0"

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

TYPICAL SECTIONS

SEAL:
WALTER J. HUEY III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: C3.1
CONTRACT NO.: 2017-WCCSP-07A

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TRI-VALLEY PHASE 2 ALIGNMENT (LINE & CURVE TABLE)						
ID	LENGTH/ARC	CHORD LENGTH	RADIUS	LINE/CORD BEARING	START NORTHING	START EASTING
L1	340.90			N19° 33' 48"E	629569.7199	566455.8681
C1	68.33	65.93	74.00	N46° 01' 04"E	629890.9427	566570.0180
L2	34.86			N72° 28' 21"E	629936.7284	566617.4602
C2	37.61	37.21	74.00	N57° 54' 46"E	629947.2270	566650.7019
L3	66.07			N43° 21' 10"E	629966.9911	566682.2242
C3	95.02	85.40	60.00	N2° 00' 56"W	630015.0316	566727.5791
L4	16.40			N47° 23' 02"W	630100.3754	566724.5757
C4	67.16	63.71	60.00	N15° 19' 04"W	630111.4825	566712.5037
L5	61.77			N16° 44' 53"E	630172.9268	566695.6738
C5	25.04	24.92	74.00	N7° 03' 11"E	630232.0813	566713.4752
L6	60.70			N2° 38' 32"W	630256.8169	566716.5356
C6	12.02	12.01	100.00	N6° 05' 06"W	630317.4534	566713.7373
L7	379.02			N9° 31' 39"W	630329.3955	566712.4642
C7	74.49	69.80	60.00	N26° 02' 27"E	630703.1883	566649.7285
L8	55.41			N61° 36' 33"E	630765.9030	566680.3719
C8	209.03	199.65	200.00	N31° 40' 02"E	630792.2486	566729.1157
L9	178.24			N1° 43' 30"E	630962.1728	566833.9283
C9	226.94	214.96	200.00	N34° 13' 53"E	631140.3312	566839.2940
L10	179.12			N66° 44' 15"E	631318.0513	566960.2143
C10	114.12	112.58	200.00	N50° 23' 26"E	631388.7939	567124.7727
L11	182.81			N34° 02' 38"E	631460.5695	567211.5056
C11	23.66	23.61	100.00	N40° 49' 23"E	631612.0509	567313.8497
L12	188.64			N47° 36' 09"E	631629.9166	567329.2837
C12	42.04	41.44	72.00	N30° 52' 36"E	631757.1091	567468.5894
L13	31.97			N14° 09' 03"E	631792.6777	567489.8571
C13	59.51	59.29	200.00	N22° 40' 29"E	631823.6762	567497.6727
L14	97.30			N31° 11' 55"E	631878.3823	567520.5285
C14	70.72	68.05	74.00	N58° 34' 29"E	631961.6114	567570.9312
L15	76.73			N85° 57' 04"E	631997.0942	567629.0040
C15	68.54	66.11	74.00	N59° 25' 05"E	632002.5122	567705.5452
L16	119.76			N32° 53' 06"E	632036.1489	567762.4626

NOTES:

1. TRAIL ALIGNMENT & GRADING THROUGH WOODS TO BE FINALIZED BY PARKS WITH CONSIDERATION OF EXISTING GRADING & LOCATION OF TREES TO REMAIN.

0' 60' 90' 120'
SCALE: 1" = 60'

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

HORIZONTAL ALIGNMENT

SEAL:
WALTER J. HOEY III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=60'
SHEET NO.: C4.1
CONTRACT NO.: 2017-WCCSP-07A

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TRI-VALLEY PHASE 2 ALIGNMENT (LINE & CURVE TABLE)						
ID	LENGTH/ARC	CHORD LENGTH	RADIUS	LINE/CORD BEARING	START NORTHING	START EASTING
C16	46.40	46.30	200.00	N39° 31' 54"E	632136.7158	567827.4846
L17	36.99			N46° 10' 42"E	632172.4250	567856.9542
C17	135.52	130.96	150.00	N20° 17' 43"E	632198.0344	567883.6393
L18	67.55			N5° 35' 17"W	632320.8656	567929.0642
C18	12.13	12.12	100.00	N2° 06' 52"W	632388.0989	567922.4861
L19	132.07			N1° 21' 34"E	632400.2088	567922.0390
C19	16.89	16.77	40.00	N10° 44' 25"W	632532.2464	567925.1723
L20	16.73			N22° 50' 24"W	632548.7217	567922.0472
C20	45.33	42.94	40.00	N9° 37' 33"E	632564.1401	567915.5532
L21	102.00			N42° 05' 30"E	632606.4793	567922.7340
C21	12.59	12.52	36.00	N32° 04' 28"E	632682.1707	567991.1067
L22	5.00			N22° 03' 25"E	632692.7832	567997.7573
C22	48.69	45.06	36.00	N60° 48' 11"E	632697.4172	567999.6349
L23	17.20			S80° 27' 03"E	632719.3993	568038.9724
C23	25.15	24.64	36.00	N79° 32' 09"E	632716.5451	568055.9388
L24	39.50			N59° 31' 21"E	632721.0204	568080.1702
C24	21.06	20.99	74.00	N51° 22' 08"E	632741.0549	568114.2126
L25	50.97			N43° 12' 55"E	632754.1595	568130.6101
C25	68.38	65.98	74.00	N69° 41' 18"E	632791.3054	568165.5110
L26	66.57			S83° 50' 18"E	632814.2071	568227.3841
C26	63.63	61.69	74.00	N71° 31' 46"E	632807.0623	568293.5654
L27	101.85			N46° 53' 49"E	632826.6054	568352.0733
C27	13.72	13.70	74.00	N52° 12' 34"E	632896.1998	568426.4357
L28	19.77			N57° 31' 19"E	632904.5966	568437.2645
C28	32.19	31.94	74.00	N45° 03' 31"E	632915.2110	568453.9398
L29	100.83			N32° 35' 42"E	632937.7734	568476.5484
C29	58.76	57.92	100.00	N49° 25' 42"E	633022.7219	568530.8650
L30	301.45			N66° 15' 41"E	633060.3913	568574.8585
C30	22.48	22.40	74.00	N57° 33' 28"E	633181.7426	568850.8006
L31	16.80			N48° 51' 15"E	633193.7569	568869.7013
C31	28.86	28.68	74.00	N60° 01' 38"E	633204.8122	568882.3538
L32	21.26			N71° 12' 01"E	633219.1396	568907.1968
C32	109.19	103.85	100.00	N39° 55' 07"E	633225.9914	568927.3239
L33	84.92			N8° 38' 13"E	633305.6390	568993.9637
C33	14.86	14.84	74.00	N14° 23' 30"E	633389.5998	569006.7171
L34	309.79			N20° 08' 47"E	633403.9738	569010.4055
C34	114.03	103.08	74.00	N64° 17' 26"E	633694.8087	569117.1024
L35	34.66			S71° 33' 55"E	633739.5244	569209.9755
C35	18.18	18.13	74.00	S78° 36' 06"E	633728.5644	569242.8559
L36	67.69			S85° 38' 18"E	633724.9813	569260.6286
C36	38.75	38.31	74.00	S70° 38' 18"E	633719.8334	569328.1217
L37	53.15			S55° 38' 18"E	633707.1340	569364.2606
C37	21.79	21.67	60.00	S45° 14' 04"E	633677.1354	569408.1353
L38	21.27			S34° 49' 50"E	633661.8750	569423.5211
C38	33.16	31.11	27.00	S70° 00' 37"E	633644.4172	569435.6684
L39	5.02			N74° 48' 35"E	633633.7816	569464.9058

NOTES:

1. TRAIL ALIGNMENT & GRADING THROUGH WOODS TO BE FINALIZED BY PARKS WITH CONSIDERATION OF EXISTING GRADING & LOCATION OF TREES TO REMAIN.

0' 60' 90' 120'

SCALE: 1" = 60'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II CONSTRUCTION PLANS

HORIZONTAL ALIGNMENT

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=60'

SHEET NO.: C4.2

CONTRACT NO.: 2017-WCCSP-07A

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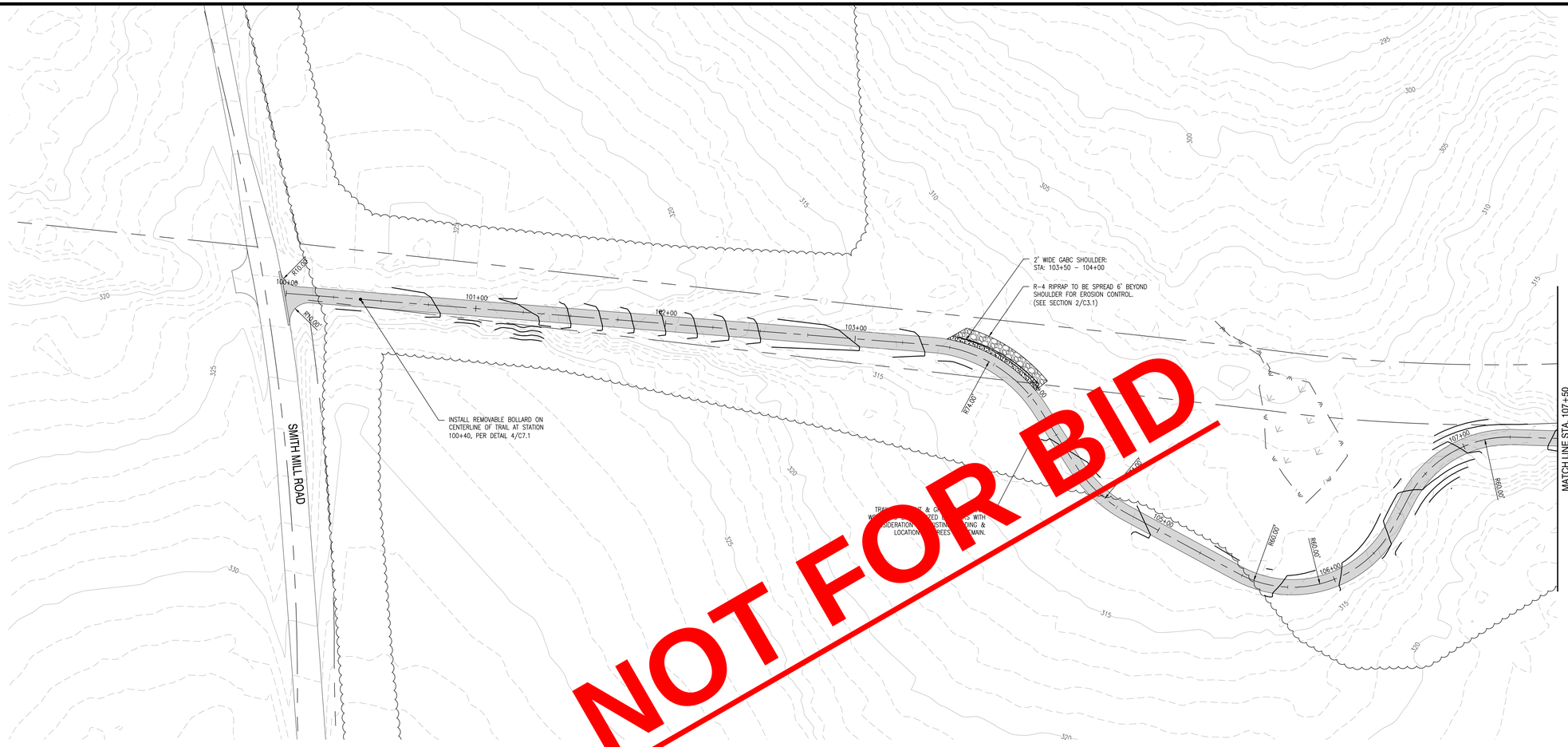

0' 30' 60' 90'
PLAN / HORZ. SCALE: 1" = 30'

0' 3' 6' 9'
VERT. SCALE: 1" = 3'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

SHEET NO.: C5.1

CONTRACT NO.: 2017-WCCSP-07A

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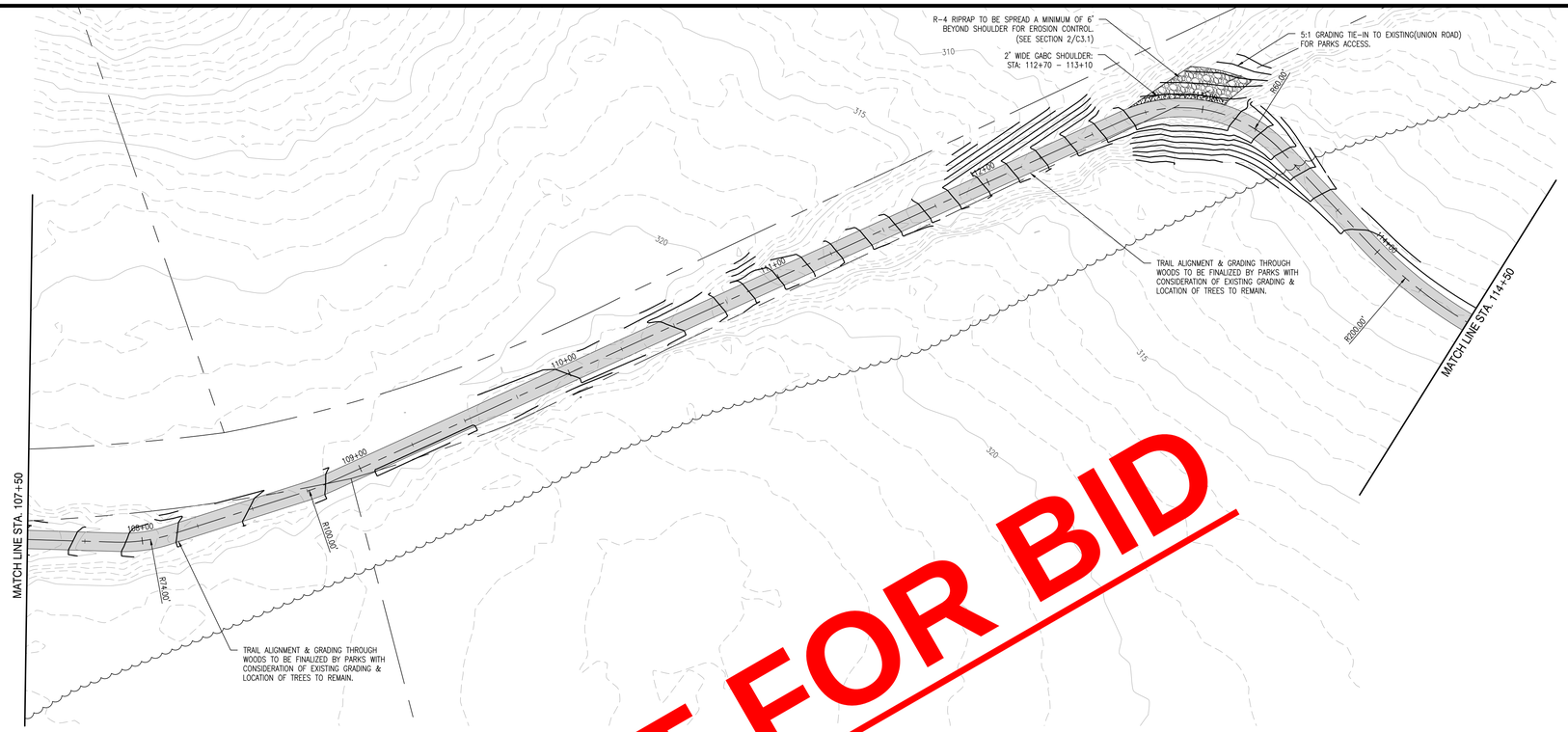

NOT FOR BID

0' 30' 60' 90'
PLAN / HORZ. SCALE: 1" = 30'

0' 3' 6' 9'
VERT. SCALE: 1" = 3'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

SHEET NO.: C5.2

CONTRACT NO.: 2017-WCCSP-07A

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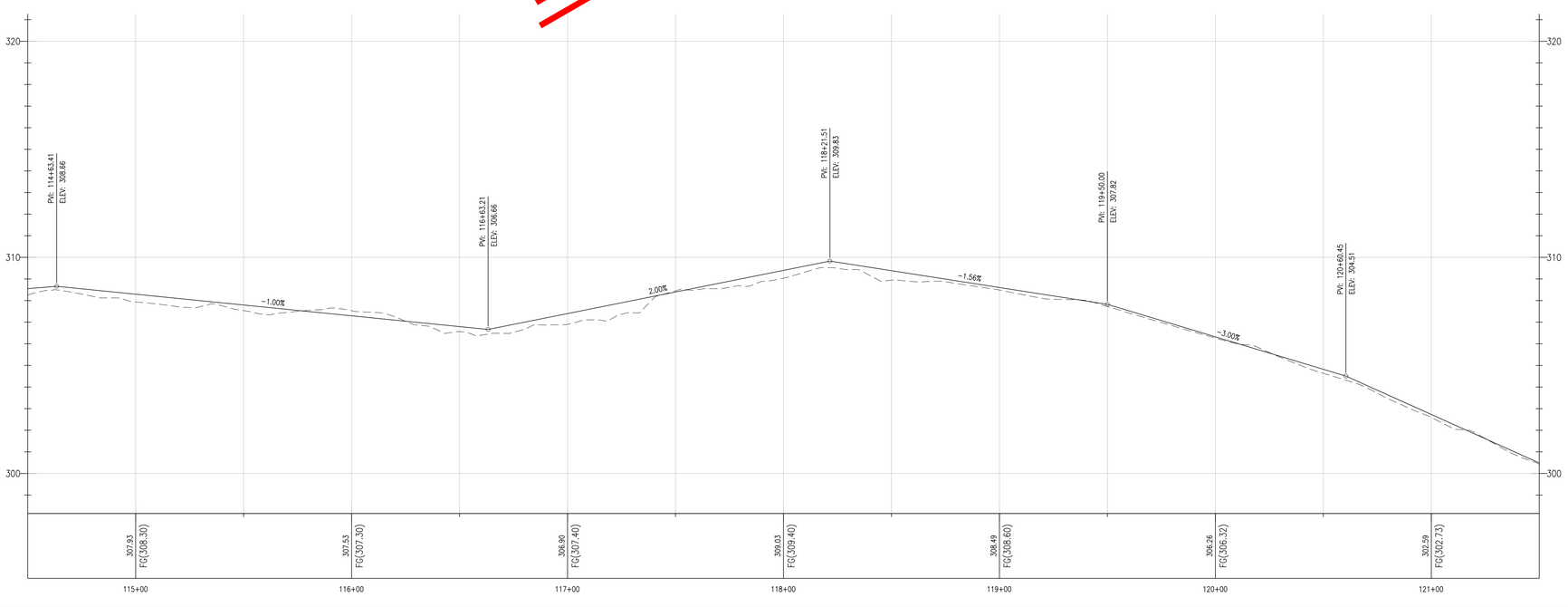

0' 30' 60' 90'
PLAN / HORZ. SCALE: 1" = 30'

0' 3' 6' 9'
VERT. SCALE: 1" = 3'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

SHEET NO.: C5.3

CONTRACT NO.: 2017-WCCSP-07A

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NOT FOR BID

0' 30' 60' 90'
PLAN / HORZ. SCALE: 1" = 30'

0' 3' 6' 9'
VERT. SCALE: 1" = 3'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL:
WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=30'
SHEET NO.: C5.4
CONTRACT NO.: 2017-WCCSP-07A

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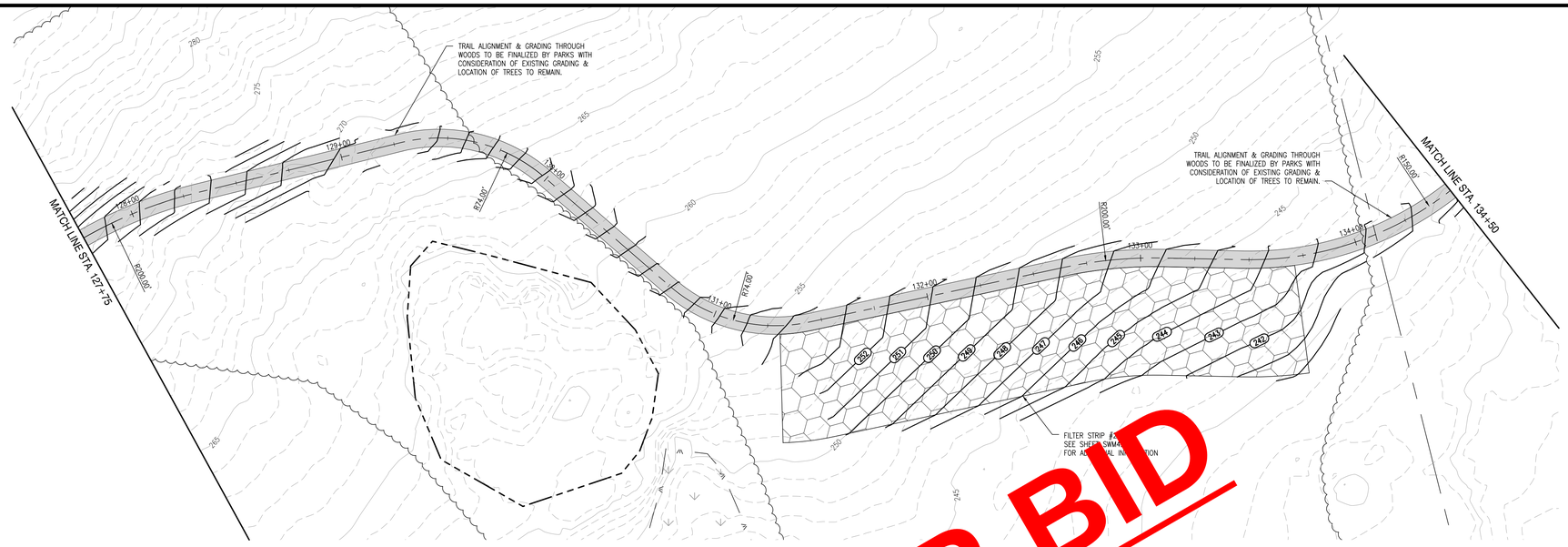

NOT FOR BID

0' 30' 60' 90'
PLAN / HORZ. SCALE: 1" = 30'

0' 3' 6' 9'
VERT. SCALE: 1" = 3'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL:
WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=30'
SHEET NO.: C5.5
CONTRACT NO.: 2017-WCCSP-07A

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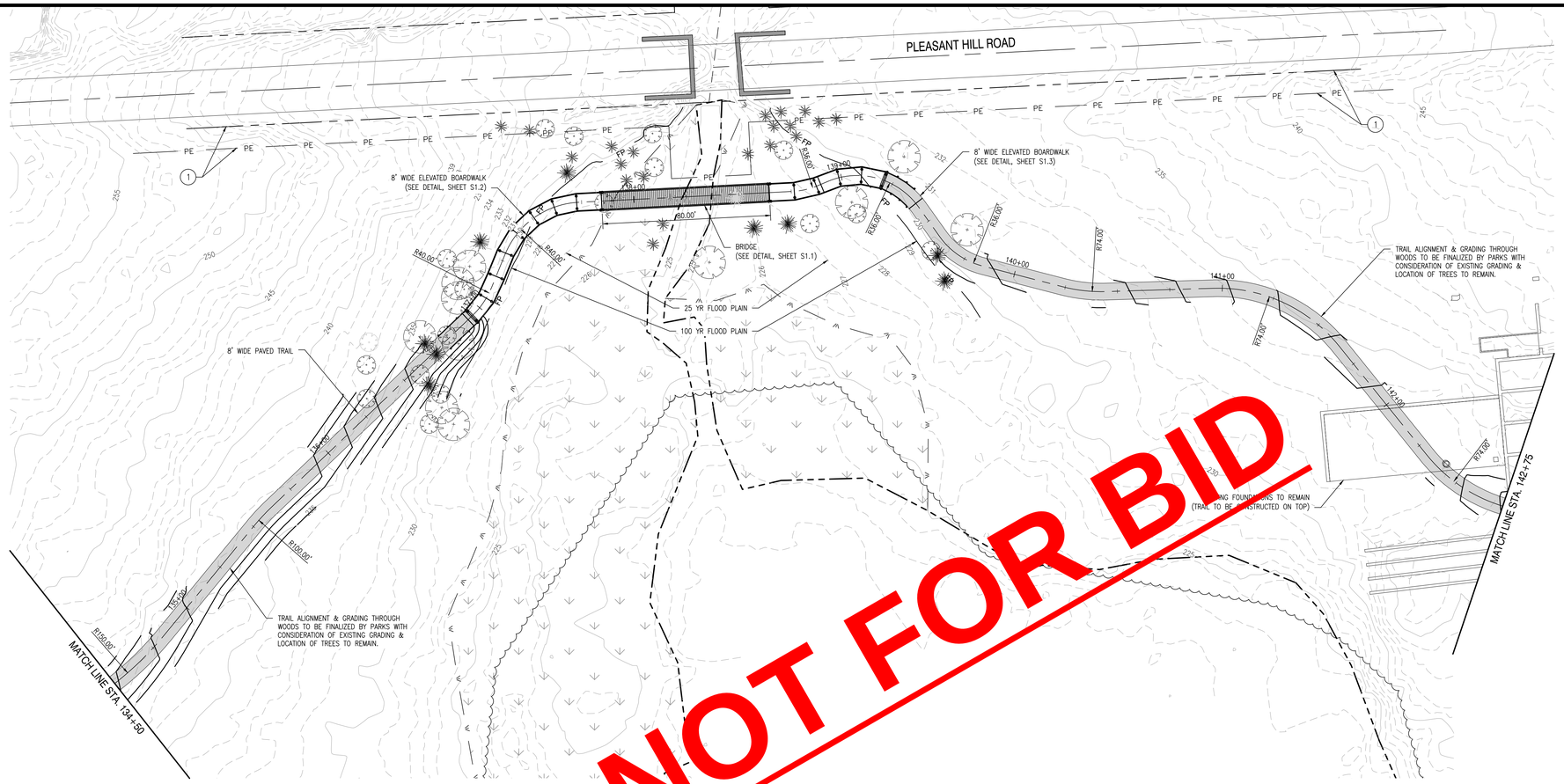

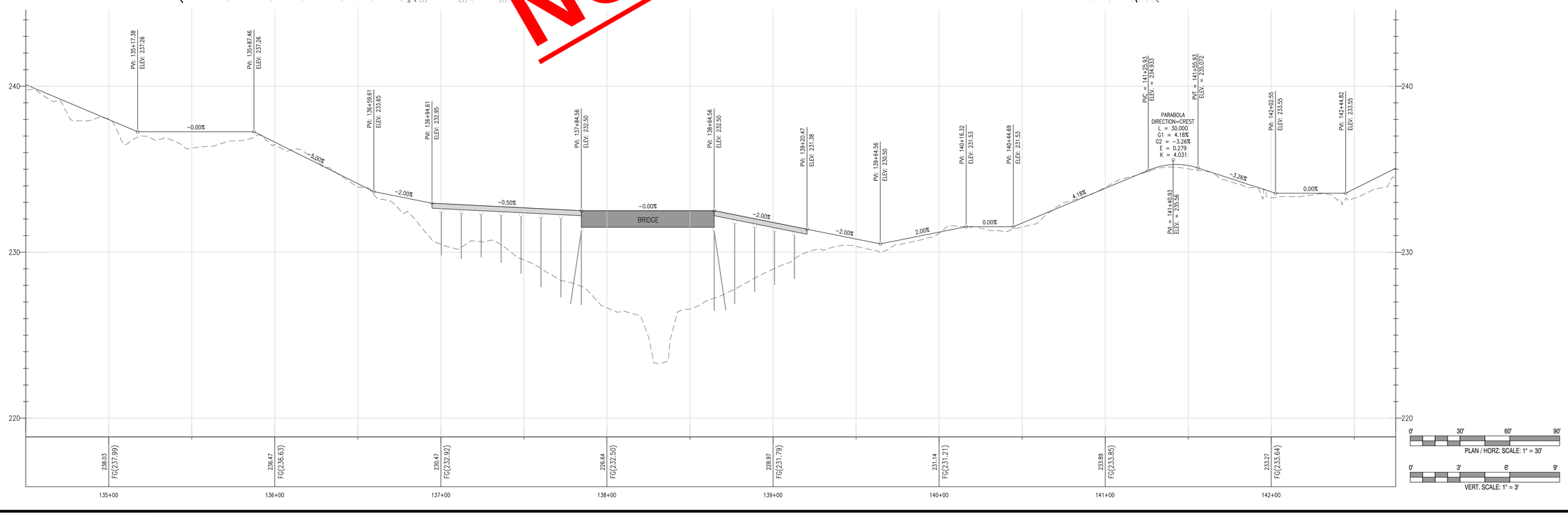

NOTE:

1. RIGHT OF WAY & PE LINES TAKEN FROM "BR 1-221 ON N301 PLEASANT HILL ROAD OVER MIDDLE RUN" CONTRACT NUMBER T201007103.

0' 30' 60' 90'
PLAN / HORZ. SCALE: 1" = 30'

0' 3' 6' 9'
VERT. SCALE: 1" = 3'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL:

WALTER J. HOEF, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

SHEET NO.: C5.6

CONTRACT NO.: 2017-WCCSP-07A

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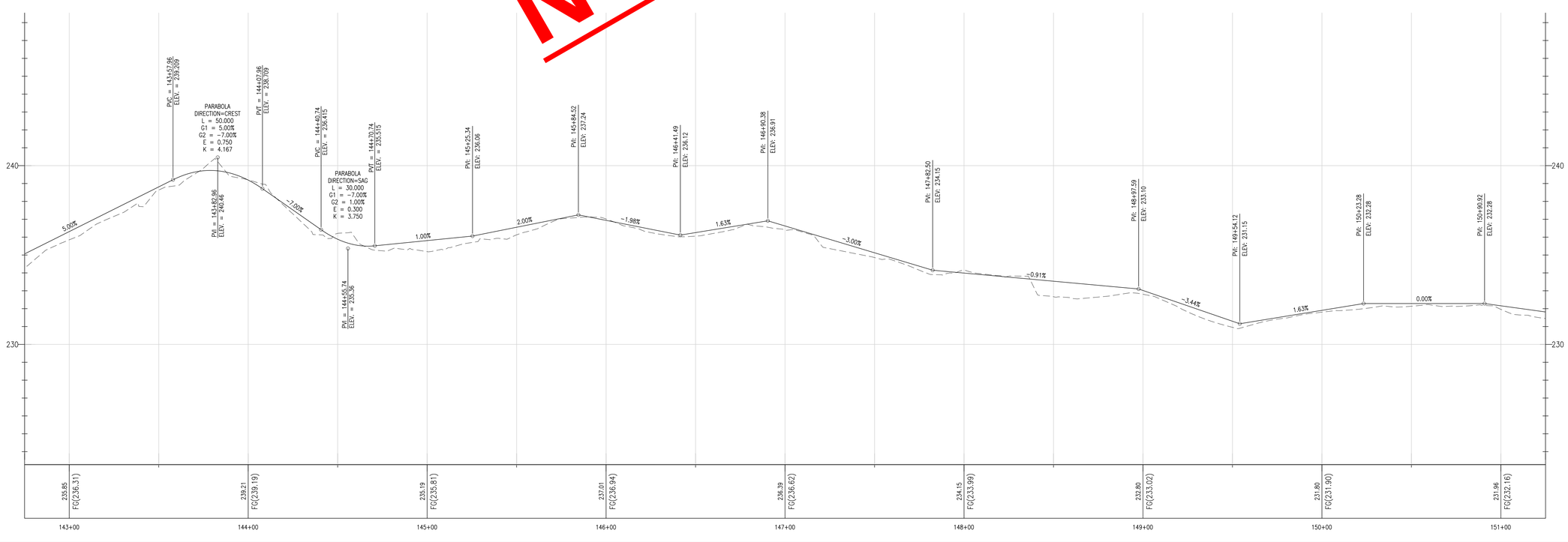
NOT FOR BID



REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

SHEET NO.: C5.7

CONTRACT NO.: 2017-WCCSP-07A

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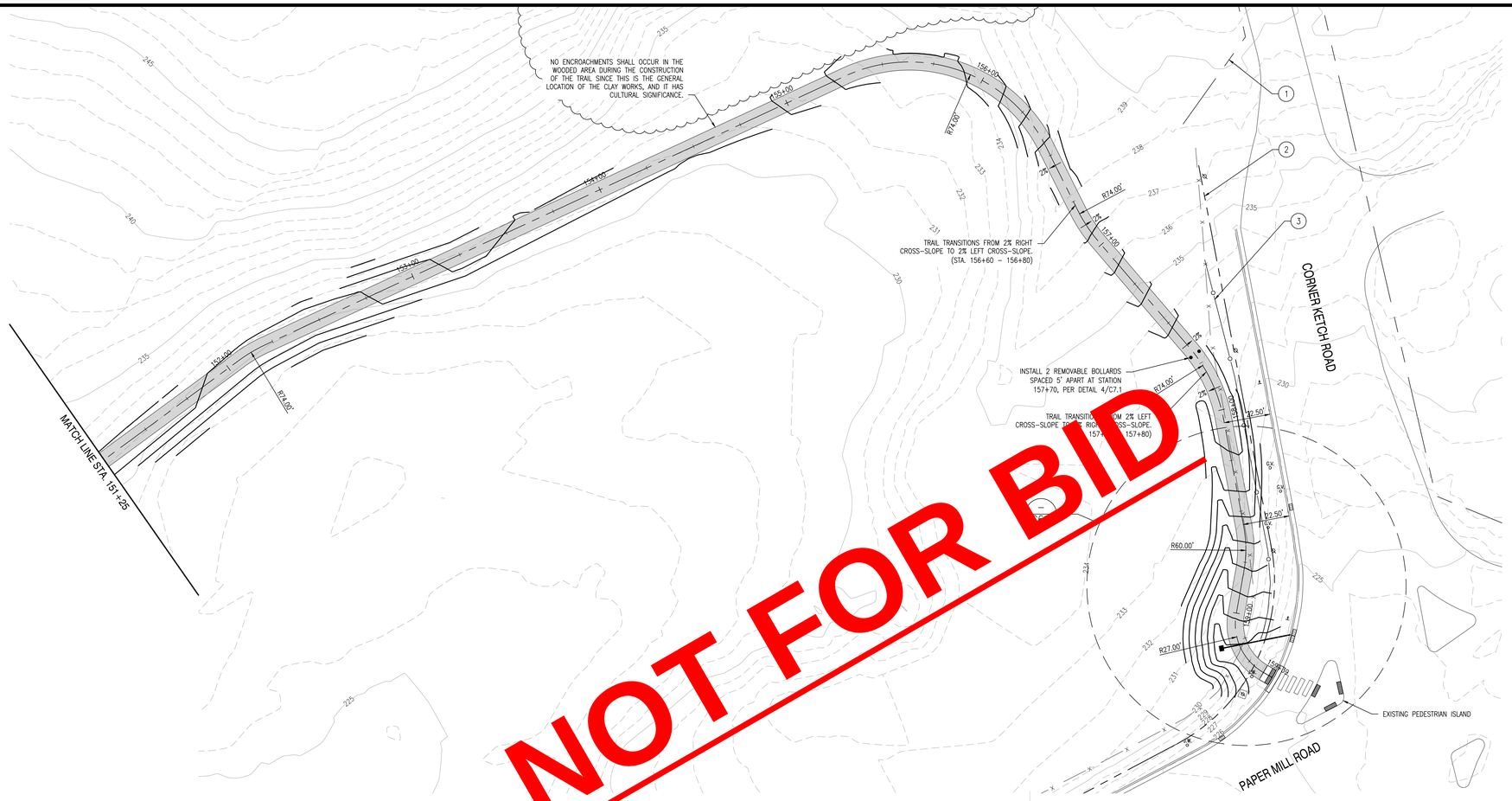
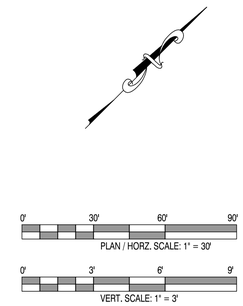
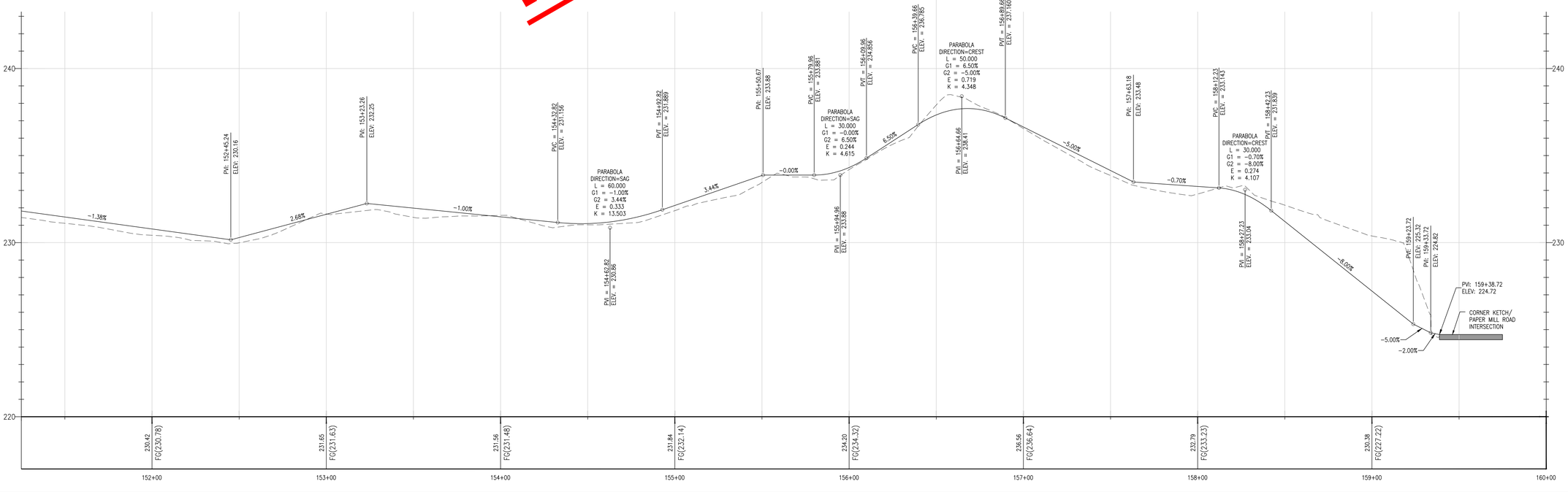




NOTE:

1. RIGHT OF WAY LINES TAKEN FROM STATE GIS INFORMATION.
2. RIGHT OF WAY LINES TAKEN FROM DELDOT PLANS "PAPER MILL ROAD SIDEWALK IMPROVEMENTS" CONTRACT T200920002.
3. CONSTRUCT 190 L.F. OF SPLIT RAIL FENCE.(SEE DETAIL 1/C7.1)



REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II CONSTRUCTION PLANS

SITE PLAN AND PROFILE

SEAL: WALTER J. HOEY III REGISTERED NO. 11204 DELAWARE PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

SHEET NO.: C5.8

CONTRACT NO.: 2017-WCCSP-07A

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DRAINAGE PIPE SCHEDULE						
NO.	SIZE / TYPE	CLASS	LENGTH	SLOPE	INLET EL.	DIS. EL.
1	15" RCP	III	32.73'	3.00%	222.00	221.02

DRAINAGE INLET SCHEDULE						
NO.	BOX	GRATE	T.G. EL.	INV. EL.	STATION	OFFSET
1*	34 x 24"	TYPE 3	225.50	222.00	159+14.55	8.77

* STATION AND OFFSET ARE TO CENTER OF GRATE

JUNCTION WELL SCHEDULE				
NO.	ITEM NUMBER	TYPE	SIZE	NOTE: LOCATION TO BE DETERMINED BY DELDOT TRAFFIC
1	830001	1	20x20	

NOTE:

1. RIGHT OF WAY LINES TAKEN FROM STATE GIS INFORMATION.
2. RIGHT OF WAY LINES TAKEN FROM DELDOT PLANS "PAPER MILL ROAD SIDEWALK IMPROVEMENTS" CONTRACT T200920002.
3. CONSTRUCT 190 L.F. OF SPLIT RAIL FENCE.(SEE DETAIL 1/C7.1)
4. CONTRACTOR SHALL DISCONNECT EXISTING HOME-RUN DETECTION CABLES AT SPLICE TUBE, PULL BACK CABLES SO NOT TO GET DAMAGED, ADJUST JUNCTION WELL (TO AVOID PATHWAY AND LOWER TO BE FLUSH WITH FINISHED GRADE), REDUCE AND EXTEND PERTINENT CONDUIT RUNS (WITH LIKE MATERIAL, SIZE AND COUPLING), RE-INSTALL HOME-RUN CABLES AND SPLICE INTO EXISTING DETECTION LOOP WITH APPROVED SPLICE TUBE. CONTRACTOR SHALL CONTACT THE DELAWARE TRANSPORTATION MANAGEMENT CENTER (TMC) 48-HOURS PRIOR TO PERFORMING WORK. IT IS REQUIRED THAT THE CONTRACTOR SUBCONTRACT THIS WORK TO AN APPROVED DELDOT ELECTRICAL CONTRACTOR.
5. DO NOT DISTURB EXISTING SIGN & GAS VALVES.

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

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II CONSTRUCTION PLANS

ENTRANCE PLAN

SEAL:

WALTER J. HOEY III REGISTERED NO. 11204 DELAWARE PROFESSIONAL ENGINEER

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=10'

SHEET NO.: C6.1

CONTRACT NO.: 2017-WCCSP-07A

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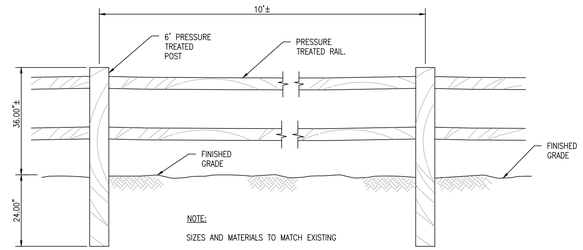


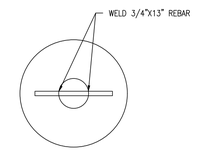
NOTE:

SIZES AND MATERIALS TO MATCH EXISTING

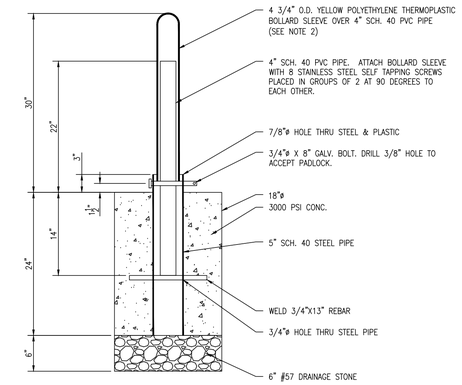
1 / C7.1 SPLIT RAIL FENCES DETAIL
SCALE: NONE

NOTES:

1. ALL STEEL SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
2. REMOVABLE BOLLARD SLEEVE IS MODEL #BPD-YL-3 1/2-66-S DISTRIBUTED BY BOLLARDS AND SLEEVES, LLC (1-800-914-4771).
3. BOLLARD TO BE PROVIDED BY THE CONTRACTOR PER DNREC PARKS SPECIFICATIONS.

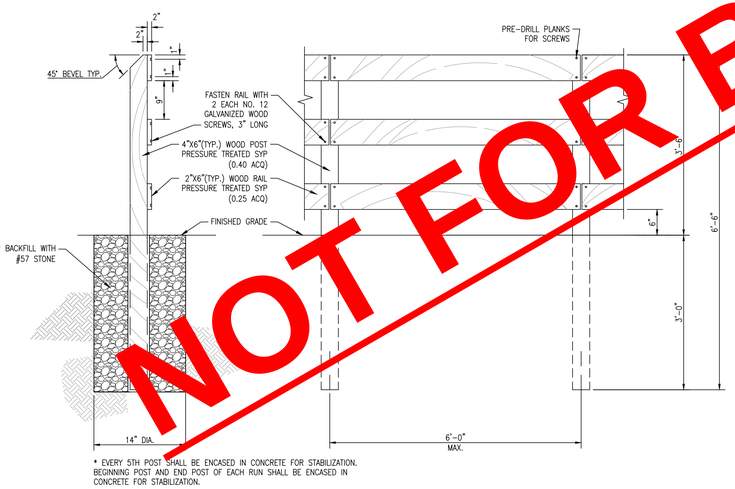


PLAN VIEW



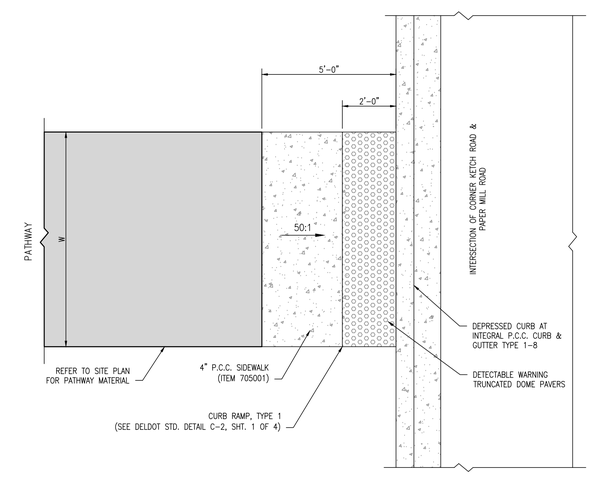
SECTION

4 / C7.1 REMOVABLE BOLLARD DETAIL
SCALE: 1" = 1'-0"

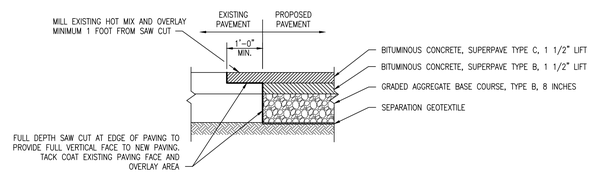


* EVERY 5TH POST SHALL BE ENCASED IN CONCRETE FOR STABILIZATION. BEGINNING POST AND END POST OF EACH RUN SHALL BE ENCASED IN CONCRETE FOR STABILIZATION.

2 / C7.1 TIMBER FENCE DETAIL
SCALE: NONE



5 / C7.1 CURB RAMP TO TRAIL ENTRANCE DETAIL
SCALE: 3/8" = 1'-0"



3 / C7.1 PAVEMENT TIE-IN DETAIL
SCALE: NONE

NOT FOR BID

NOTES

1. 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.

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

DETAILS

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: C7.1
CONTRACT NO.: 2017-WCCSP-07A

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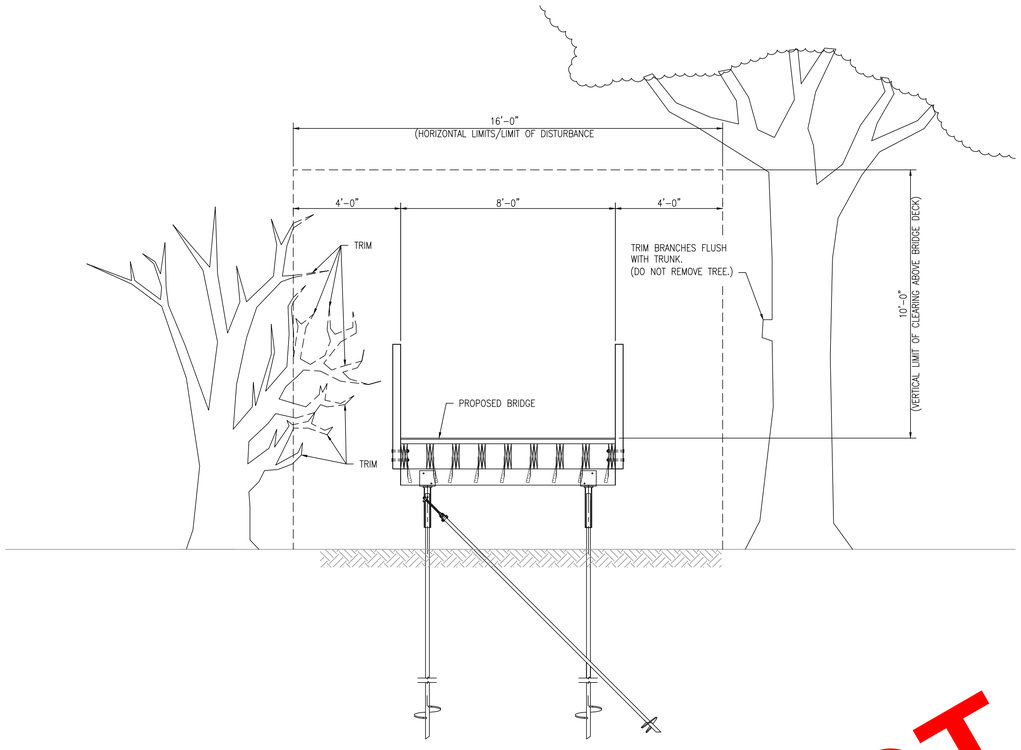
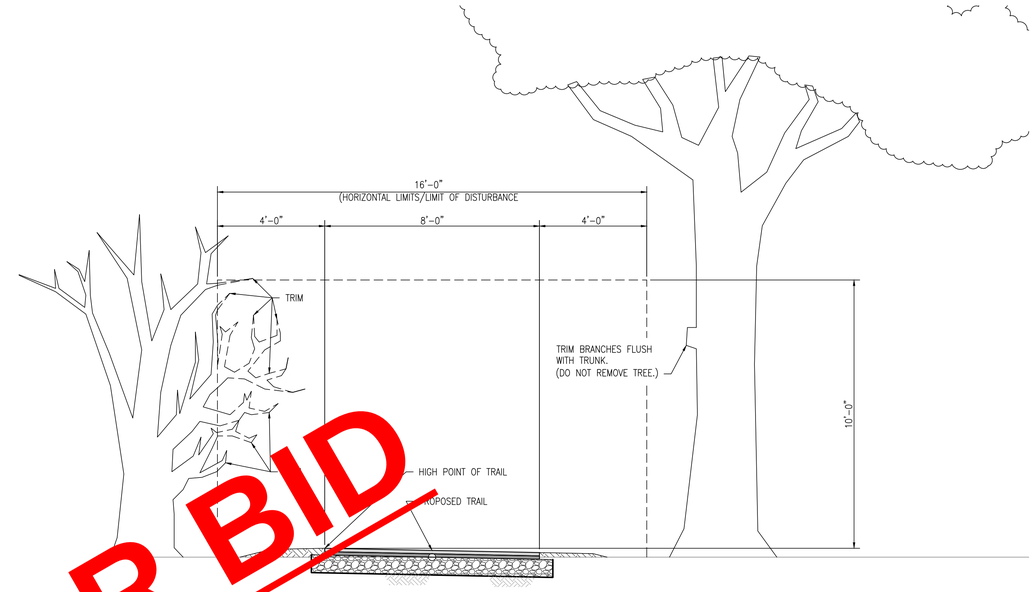


1 / C7.2 CLEARING LIMITS - BOARDWALK & BRIDGE
SCALE: NONE



2 / C7.2 CLEARING LIMITS - AT GRADE TRAIL
SCALE: NONE

NOT FOR BID

CLEARING AND PRUNING NOTES:

1. IN AREAS WHERE TREES AND/OR SHRUBS WILL BE OVERHANGING OR ENCROACHING ON THE PROPOSED TRAIL OR PEDESTRIAN BRIDGE, PRUNING MAY BE NECESSARY TO ACHIEVE A VERTICAL AND/OR HORIZONTAL CLEAR SPACE AS SHOWN ON THESE DETAILS. THE CONTRACTOR SHALL PRUNE EXISTING TREE AND SHRUB BRANCHES IN ACCORDANCE WITH THE INTERNATIONAL SOCIETY OF ARBORICULTURE (I.S.A.) STANDARDS.
2. THE INTENT OF THIS WORK IS NOT TO REMOVE LARGE TREES. THE CONTRACTOR SHALL COORDINATE AN ON-SITE MEETING WITH THE OWNER A MINIMUM OF 7 WORK DAYS PRIOR TO THE PRUNING OPERATION. THE OWNER AND CONTRACTOR SHALL IDENTITY AND CLEARLY MARK ANY TREE TO BE REMOVED AND REVIEW PRUNING PROCEDURES. IF IN THE OPINION OF THE OWNER, THE INDICATED PRUNING WILL BE EXCESSIVE AND HAVE UNACCEPTABLE IMPACT ON THE APPEARANCE OR VIABILITY OF THE TREE, THE OWNER MAY DIRECT THE CONTRACTOR TO REMOVE AND DISPOSE OF THE TREE, IN LIEU OF PRUNING, AT NO ADDITIONAL COST TO THE OWNER.
3. CLEARING OPERATIONS SHALL NOT INCLUDE GRUBBING IN WETLAND AREAS. CLEARED VEGETATION IN WETLAND AREAS SHALL BE CUT FLUSH WITH THE GROUND AND THERE SHALL BE NO DISTURBANCE OF THE ROOT MAT.
4. ALL MATERIAL RESULTING FROM PRUNING AND REMOVAL OF TREES, SHRUBS, AND OTHER VEGETATION, SHALL BE LEGALLY DISPOSED OF OFFSITE BY THE CONTRACTOR.
5. ALL TREE REMOVAL AND PRUNING NECESSARY FOR THE CONSTRUCTION, AS DIRECTED BY THE OWNER, SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT AND SHALL BE DONE AT NO ADDITIONAL COST TO THE OWNER.
6. THE LIMITS OF CLEARING AND DISTURBANCE SHOWN ARE NOT INTENDED TO RESTRICT OR OBSTRUCT PROPER PRUNING PROCEDURES IN ACCORDANCE WITH THE STANDARDS REFERENCED IN NOTE 1.

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

DETAILS

SEAL:
WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
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4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: C7.2
CONTRACT NO.: 2017-WCCSP-07A

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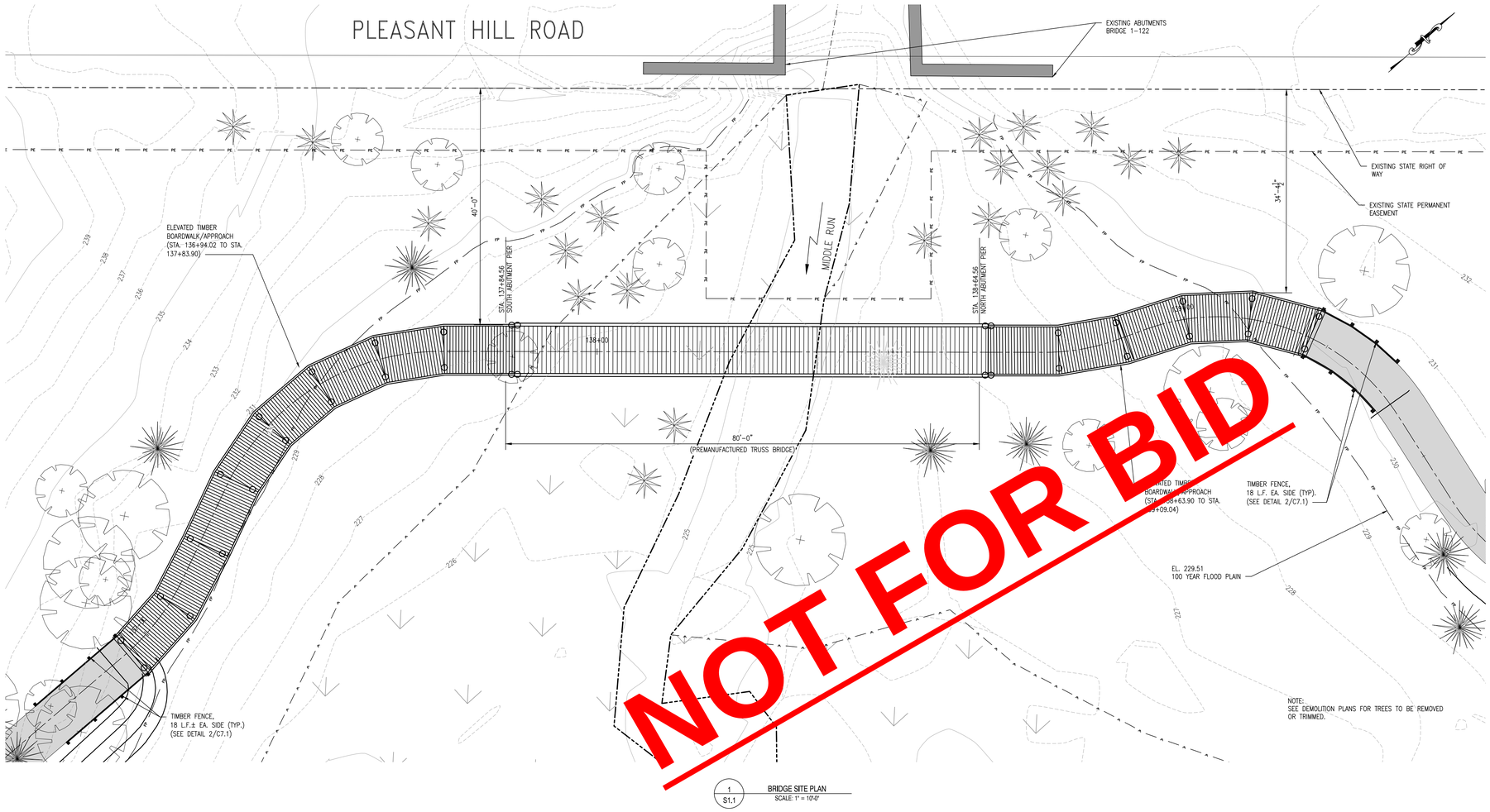


1 / S1.1 BRIDGE SITE PLAN
SCALE: 1" = 10'-0"

BRIDGE GENERAL NOTES:

DESIGN AND CONSTRUCTION SPECIFICATIONS:

AASHTO LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES (CURRENT EDITION)

DELAWARE STANDARD SPECIFICATIONS (WITH REVISIONS AND MODIFICATIONS)

DESIGN:

LOADS:
LIVE LOAD – IN ACCORDANCE WITH AASHTO GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES, EXCEPT AS NOTED.

VEHICLE LOAD – H5 TRUCK (10,000 POUNDS)

MATERIALS:
BRIDGE SUPERSTRUCTURE SHALL BE HOLLOW STRUCTURAL STEEL (HSS) SECTIONS, AS NOTED IN THE TECHNICAL SPECIFICATIONS. FIELD CONNECTIONS SHALL BE MADE WITH ASTM A325 BOLTS, HOT-DIPPED IN ACCORDANCE WITH ASTM A-153, WITH LOCK WASHERS AND NUTS. ALL STEEL TUBING SHALL BE ASTM A847 WEATHERING STEEL, OR APPROVED EQUAL.

ALL REINFORCING STEEL SHALL BE AASHTO M31, GRADE 60 (ASTM A615).

PULTRUDED FIBERGLASS APPROACH DECKING:
INDIVIDUAL DECKING PANELS SHALL BE ORIENTED WITH MAIN BARS TRANSVERSE TO THE JOISTS, AND SPAN THE FULL WIDTH OF THE BOARDWALK WITH NO JOINTS. DECKING MATERIAL SHALL CONSIST OF PULTRUDED HIGH LOAD CAPACITY FIBERGLASS GRATING AS MANUFACTURED BY STRONGWELL CORPORATION, OR APPROVED EQUAL, WITH THE FOLLOWING CHARACTERISTICS:

- LIVE LOAD DEFLECTION:
  - <0.033 INCHES WITH A 7,500 LB/FT LINE LOAD.
  - <0.033 INCHES WITH A 11,400 LB/SQ.FT UNIFORM LOAD OVER 12 INCH SPAN.
- RATE OF BURN – ASTM D 635.
- FLAME SPREAD RATING OF 25 OR LESS IN ACCORDANCE WITH ASTM E-84.
- VISUAL QUALITY – ASTM D4385.
- MANUFACTURER – ISO-9001:2008 CERTIFIED.
- SURFACE WEAR INDEX – LESS THAN 1.0 PER ASTM D4060.
- MODULUS OF ELASTICITY (E) – 3,790,000 PSI, MINIMUM.
- THICKNESS – 1 1/2 INCHES, MINIMUM.
- SPACING BETWEEN GRATING – 1/2 INCH MAXIMUM.
- COLOR – GREY OR BROWN.

[THE CONTRACTOR SHALL PROVIDE AN ADDITIONAL 24 LINEAR FEET OF 8 FOOT WIDE PULTRUDED FIBERGLASS DECK MATERIAL TO THE OWNER FOR FUTURE MAINTENANCE NEEDS.]

FASTENERS:
ALL PULTRUDED DECKING CLAMPS AND SCREWS SHALL BE TYPE 316L STAINLESS STEEL. INSTALL CLIPS IN ACCORDANCE WITH THE DECK MANUFACTURER'S REQUIREMENTS WITH A MINIMUM OF FOUR (4) CLIPS PER PANEL.

STEEL:
STEEL FOR SUBSTRUCTURE SHALL WEATHERING STEEL CONFORMING TO ASTM A847 COLD FORMED WELDED SQUARE OR RECTANGULAR TUBING AND/OR ASTM A588, OR ASTM A242, ASTM A606PLATE AND STRUCTURAL STEEL SHAPES, GR. 50 (50,000 PSI MINIMUM YIELD STRESS).

BRIDGE DESIGN AND CONSTRUCTION:
THE BRIDGE SHALL BE PRATT TRUSS SYSTEM, WITH ONE DIAGONAL PER PANEL, OR AN APPROVED EQUAL. ALL END POSTS AND INTERMEDIATE POSTS SHALL BE PLUMB (VERTICAL). ANY REQUEST FOR APPROVAL SHALL BE SUBMITTED AS A REQUEST FOR SUBSTITUTION PRIOR TO SUBMITTING BIDS, IN ACCORDANCE WITH SPECIFICATION SECTION 016000 OF THE PROJECT MANUAL.

DESIGN AND MANUFACTURE OF THE BRIDGE SHALL BE IN ACCORDANCE WITH SECTION 132950 – PREFABRICATED STEEL BRIDGE. THE CONTRACTOR SHALL SUBMIT AN ERECTION PLAN TO THE ENGINEER FOR REVIEW A MINIMUM OF 30 CALENDAR DAYS PRIOR TO ANY SCHEDULED BRIDGE ERECTION. NECESSARY REVISIONS AND ADDITIONS TO THE ERECTION PLAN AS DEEMED NECESSARY BY THE ENGINEER SHALL BE PREPARED BY THE CONTRACTOR AND SUBMITTED FOR REVIEW. THE ENGINEER MUST APPROVE AN ERECTION PLAN BEFORE ANY TRUSS PLACEMENT WORK SHALL BE PERMITTED. THE SUBMITTAL MUST CONTAIN, BUT IS NOT LIMITED TO, THE FOLLOWING:

1. CALCULATIONS SHOWING THE WEIGHT OF MATERIALS AND LIFTING EQUIPMENT.
2. TYPE AND POSITIONING OF EQUIPMENT, INCLUDING MOVEMENTS.
3. LOCATION OF STAGING AREA(S).

CONTRACTOR/FABRICATOR SHALL CONSIDER SITE ACCESSIBILITY AND ERECTION PATH IN DETERMINING MAXIMUM BRIDGE SPLICE LENGTHS FOR PREFABRICATION. SHOP DRAWINGS AND CALCULATIONS SHALL SHOW THE SPLICE LOCATIONS. ALL PLANS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE.

CONTRACTOR SHALL PROVIDE DEWATERING SYSTEM AS NECESSARY FOR CONSTRUCTION OF BRIDGE ABUTMENTS. DEWATERING SYSTEM SHALL BE INCIDENTAL TO THE CONTRACT. CONTRACTOR SHALL OBTAIN ANY NECESSARY DEWATERING PERMITS.

PROVIDE 1/2 INCH THICK WEATHERING STEEL COVER PLATES WITH 1/4 INCH BEVEL ON TOP FACES, AS SPECIFIED IN THE PROJECT MANUAL, TO COVER GAP BETWEEN TIMBER DECKING AND THE TIMBER BOARDWALK. COVER PLATES TO BE ATTACHED TO BRIDGE DECK WITH 1/2 INCH DIAMETER STAINLESS STEEL BEVEL HEAD BOLTS WITH HEADS COUNTERSUNK FLUSH WITH PLATE. COVER PLATES TO BE ONE PIECE FABRICATED TO FIT THE FULL WIDTH OF THE DECK.

CONTRACTOR TO PROVIDE AND INSTALL 3/4 INCH DIAMETER A325 STEEL ANCHOR BOLTS, DOUBLE NUTS, AND WASHERS AS REQUIRED BY THE BRIDGE MANUFACTURER.

BOLTED CONNECTIONS THAT ARE EXPOSED TO PEDESTRIANS ON THE BRIDGE SHALL BE POSITIONED SUCH THAT THE BOLT HEADS FACE THE DECK AND NUTS FACE AWAY FROM THE CENTERLINE OF THE BRIDGE.

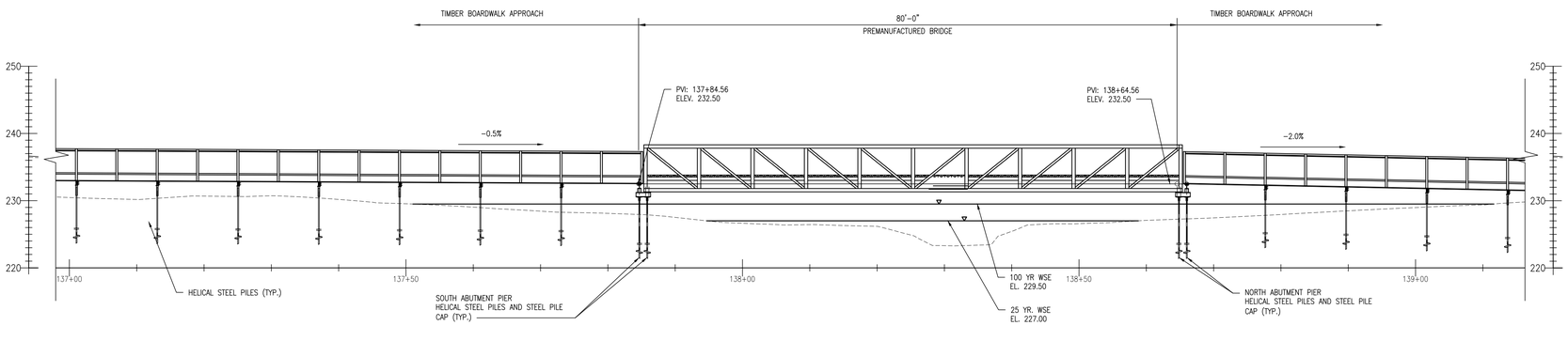
NO FILL, TEMPORARY SCAFFOLDING, MATTING, PERSONNEL, OR EQUIPMENT IS/ARE TO BE PLACED WITHIN STREAM BED.

TRANSPORTING OF MACHINERY OR VEHICLES ACROSS STREAM SHALL NOT BE ALLOWED.

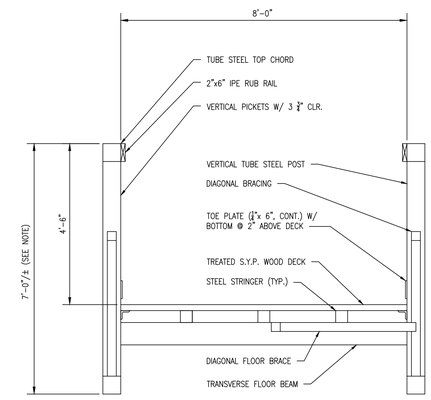
CONSTRUCTION VEHICLES SHALL BE PROHIBITED FROM PASSING OVER THE PROPOSED BRIDGE UNLESS APPROVED BY THE STATE.

HYDRAULIC DATA AT BRIDGE LOCATION:

ORDINARY LOW FLOW WATER ELEVATION 224.00
25 YR. STORM WATER ELEVATION 227.00
100 YR. STORM WATER ELEVATION 229.50



2 / S1.1 BRIDGE ELEVATION
SCALE: 1" = 10'-0"



NOTE:
OVERALL TRUSS HEIGHT TO BE DETERMINED BY BRIDGE MANUFACTURER.

3 / S1.1 BRIDGE CROSS SECTION
SCALE: 1/2" = 1'-0"

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

BRIDGE PLAN, ELEVATION & SECTION

SEAL:
WALTER J. HOEY III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
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CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
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CONTRACT NO.: 2017-WCCSP-07A

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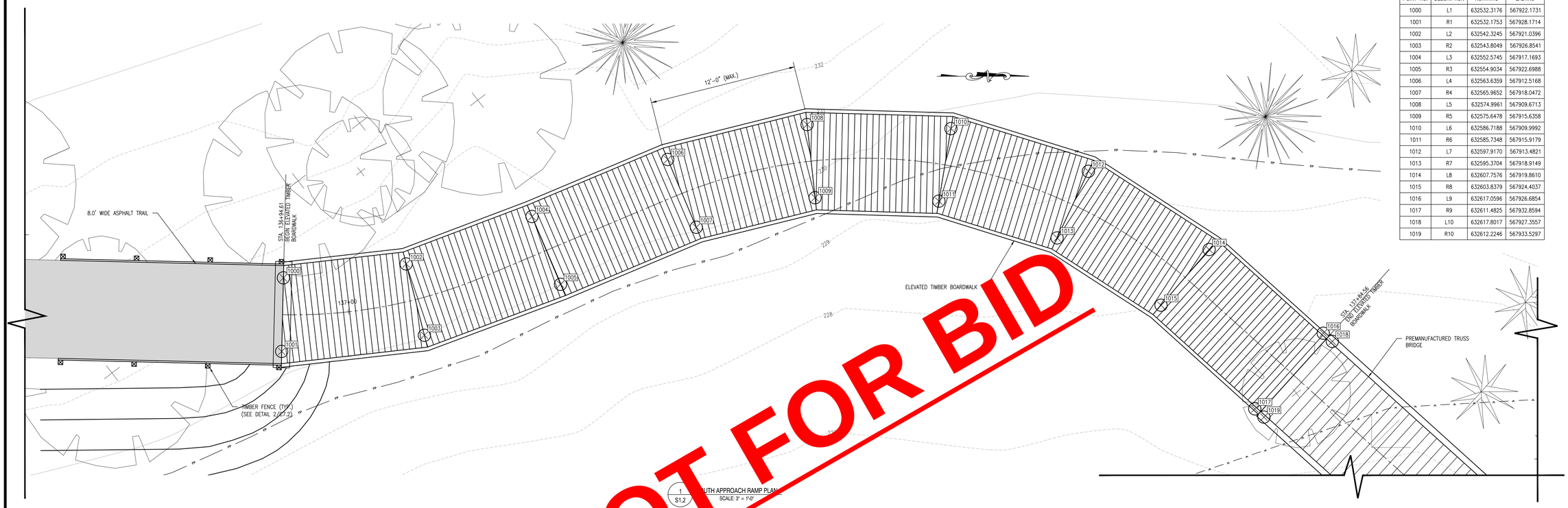
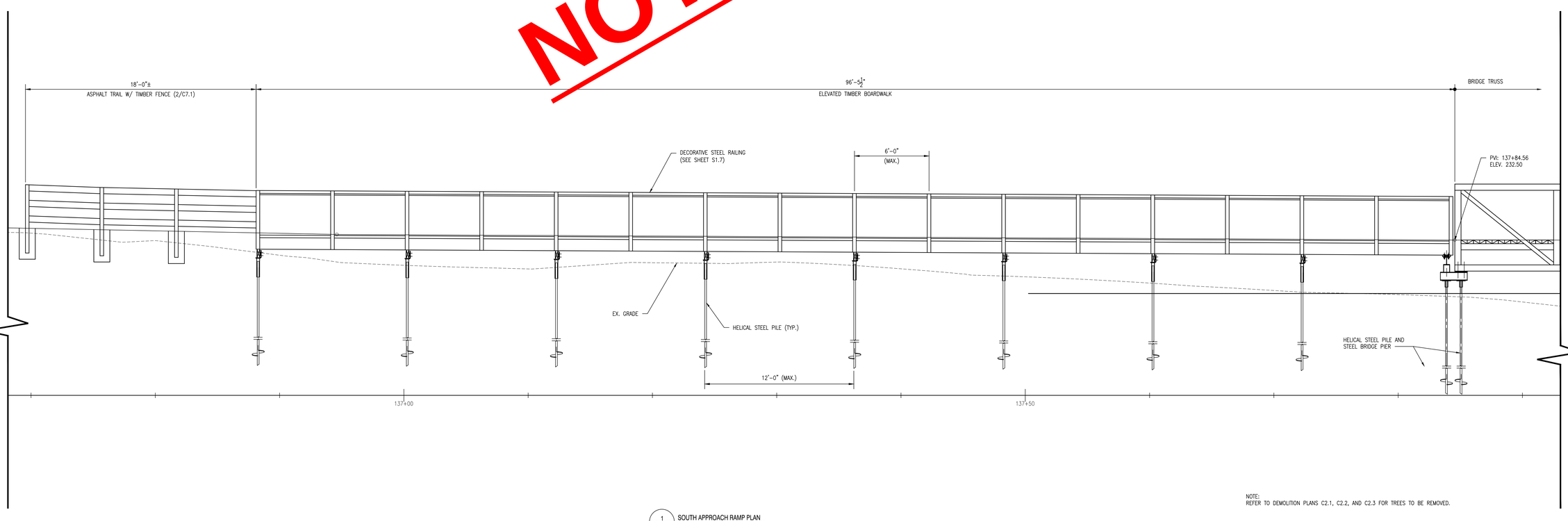


1 / S1.2 SOUTH APPROACH RAMP PLAN
SCALE: 3" = 1'-0"

NOT FOR BID

BOARDWALK PILES			
POINT NO.	DESCRIPTION	NORTHING	EASTING
1000	L1	632532.3176	567922.1731
1001	R1	632532.1753	567928.1714
1002	L2	632542.3245	567921.0396
1003	R2	632543.8049	567926.8541
1004	L3	632552.5745	567917.1693
1005	R3	632554.9034	567922.6988
1006	L4	632563.6359	567912.5168
1007	R4	632565.9652	567918.0472
1008	L5	632574.9961	567909.6713
1009	R5	632575.6478	567915.6358
1010	L6	632586.7188	567909.9992
1011	R6	632585.7348	567915.9179
1012	L7	632597.9170	567913.4821
1013	R7	632595.3704	567918.9149
1014	L8	632607.7576	567919.8610
1015	R8	632603.8379	567924.4037
1016	L9	632617.0596	567926.6854
1017	R9	632611.4825	567932.8594
1018	L10	632617.8017	567927.3557
1019	R10	632612.2246	567933.5297



1 / S1.2 SOUTH APPROACH RAMP PLAN
SCALE: 3" = 1'-0"

NOTE:
REFER TO DEMOLITION PLANS C2.1, C2.2, AND C2.3 FOR TREES TO BE REMOVED.

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

SOUTH BRIDGE APPROACH

SEAL:
WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
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DESIGNED BY: WJH
DRAWN BY: DFS
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DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: S1.2
CONTRACT NO.: 2017-WCCSP-07A

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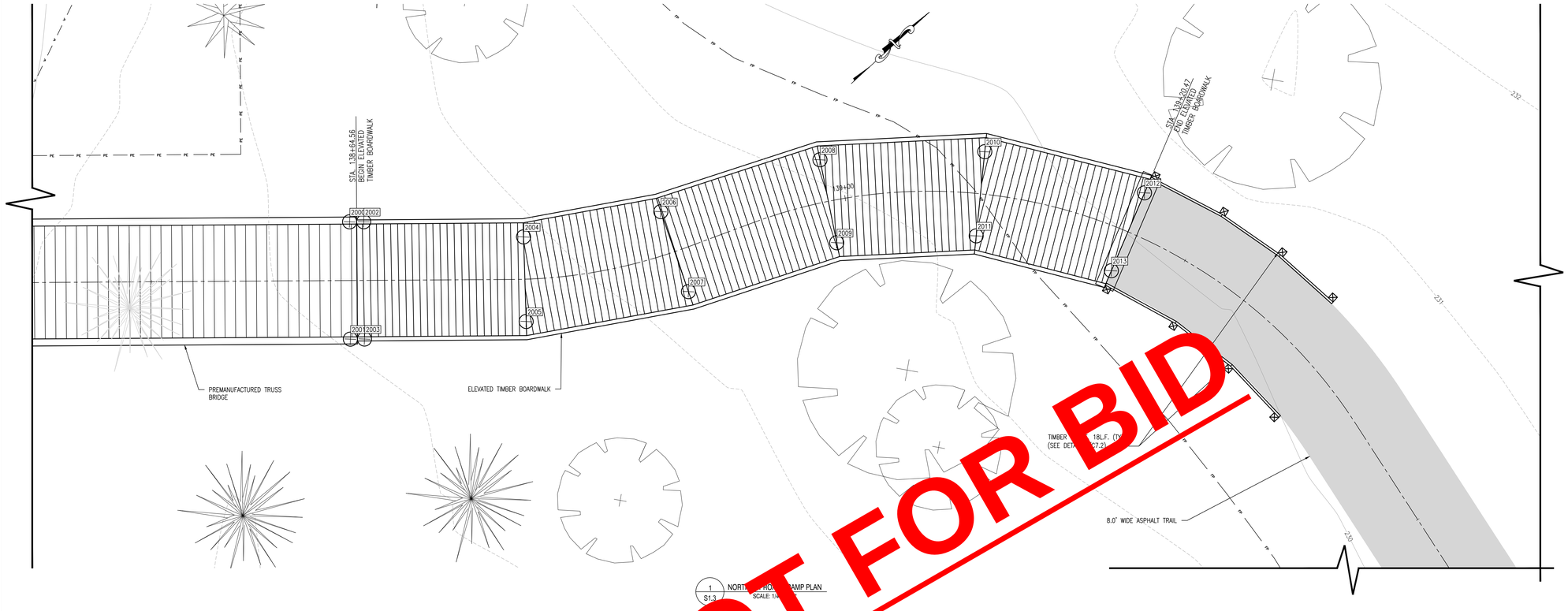
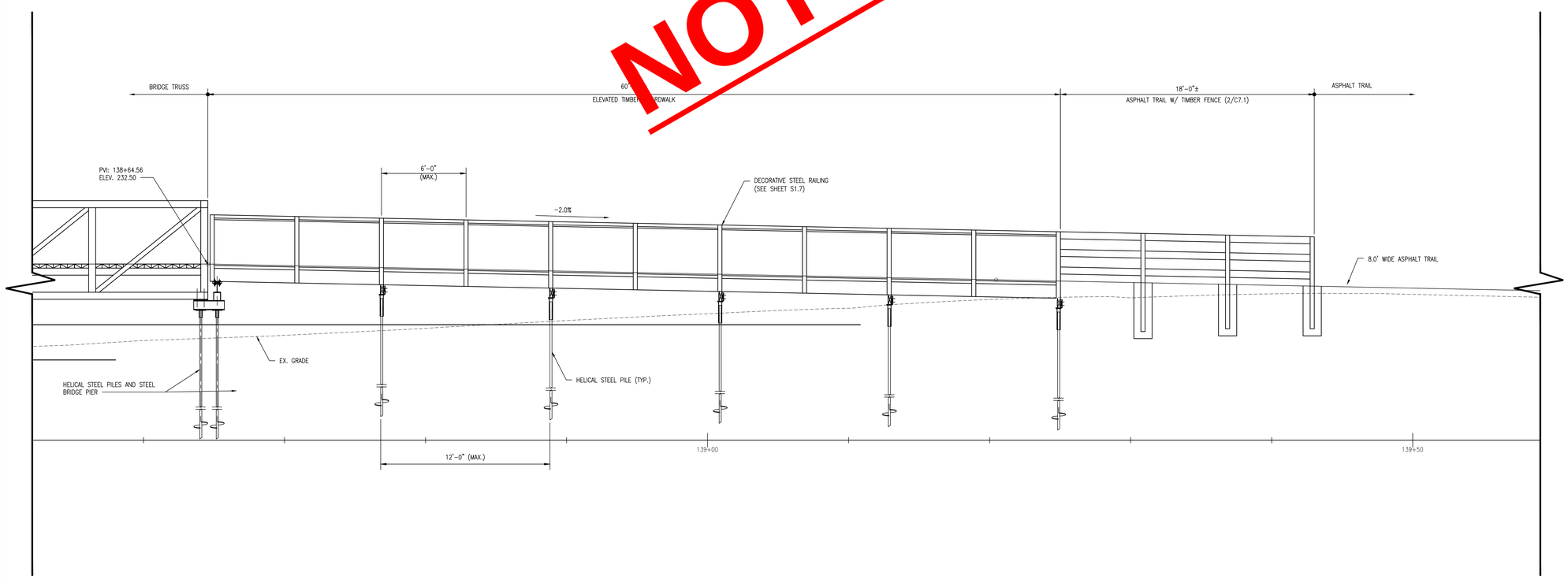


1 / S1.3 NORTH APPROACH RAMP PLAN
SCALE: 1/4"=1'-0"

NOT FOR BID



1 / S1.3 NORTH APPROACH RAMP ELEVATION
SCALE: 3" = 1'-0"

BOARDWALK PILES

POINT NO.	DESCRIPTION	NORTHING	EASTING
2000	L20	632676.4254	567980.3110
2001	R20	632670.8483	567986.4850
2002	L21	632677.1674	567980.9813
2003	R21	632671.5904	567987.1553
2004	L22	632684.8008	567989.4258
2005	R22	632680.8914	567993.9774
2006	L23	632693.1935	567994.6768
2007	R23	632690.8101	568000.1831
2008	L24	632704.0004	567999.5800
2009	R24	632700.9077	568004.7216
2010	L25	632713.0084	568007.0464
2011	R25	632708.5299	568011.0392
2012	L26	632719.3958	568016.8472
2013	R26	632713.9346	568019.3323

NOTE:
REFER TO DEMOLITION PLANS C2.1, C2.2, AND C2.3 FOR TREES TO BE REMOVED.

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

NORTH BRIDGE APPROACH

SEAL:
WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: S1.3
CONTRACT NO.: 2017-WCCSP-07A

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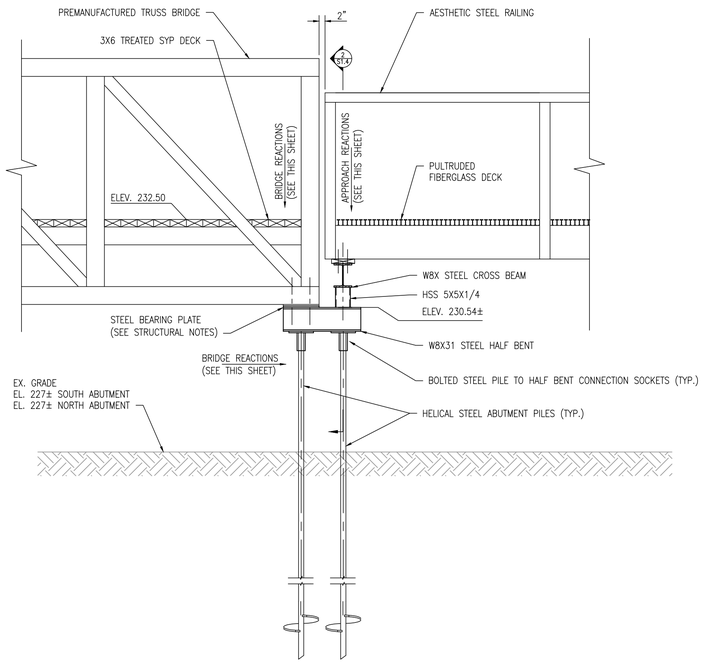
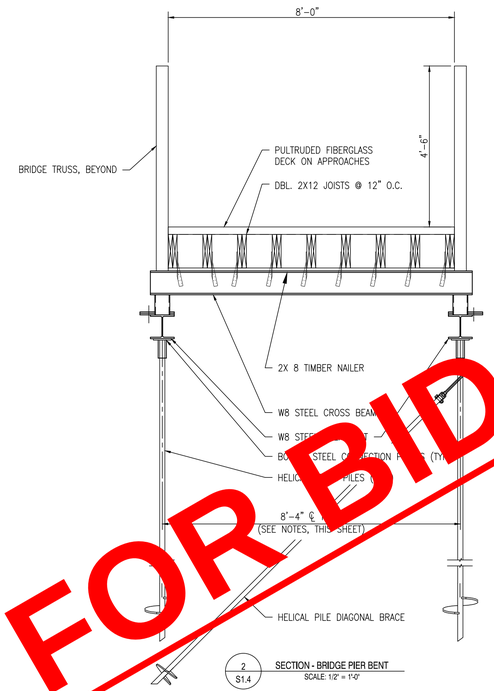
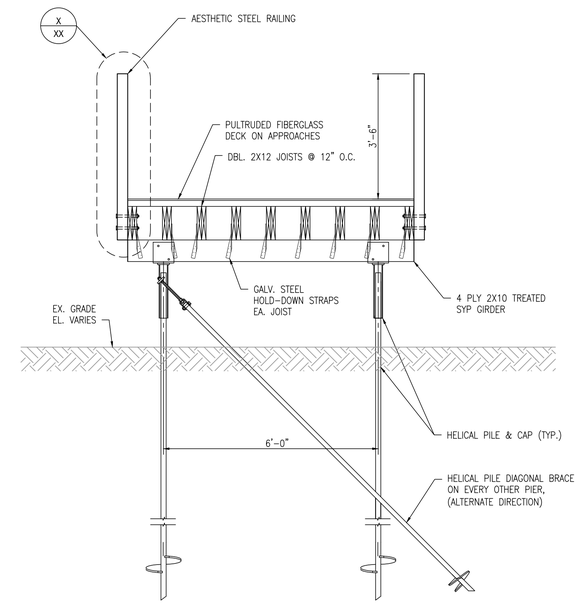


1 S1.4 ELEVATION - BRIDGE PIER BENT
SCALE: 1/2" = 1'-0"

APPROACH BOARDWALK PIER REACTIONS	
LIVE LOAD	4320 LBS
DEAD LOAD	900 LBS



2 S1.4 SECTION - BRIDGE PIER BENT
SCALE: 1/2" = 1'-0"



3 S1.4 SECTION - BOARDWALK
SCALE: 1/2" = 1'-0"

NOT FOR BID

BRIDGE ABUTMENT HELICAL PILES:

1. PILE RECOMMENDATION
   1.1. VERTICAL PILE – INSTALL AN RS3500.300 WITH A HELICAL CONFIGURATION OF 10/12/14 TO AN INSTALLATION TORQUE OF 7,500 FT–LBS. ESTIMATED EMBEDMENT (INTO SOIL, REVEAL NOT INCLUDED) IS 18 TO 23 FEET. MINIMUM EMBEDMENT 10 FEET BELOW SURFACE.
   1.2. BATTER PILE (25 DEGREES FROM VERTICAL) – INSTALL AN RS3500.300 WITH A HELICAL CONFIGURATION OF 10/12 TO AN INSTALLATION TORQUE OF 1,600 FT–LBS. ESTIMATED EMBEDMENT (INTO SOIL, REVEAL NOT INCLUDED) IS 10 TO 15 FEET. MINIMUM EMBEDMENT 10 FEET BELOW SURFACE (ALONG THE AXIS OF THE SHAFT).

2. ASSUMPTIONS
   2.1. SOIL IS BASED ON BORING B–1 THRU B–3 PERFORMED BY J.D. HYNES AND ASSOCIATES. PROJECT # JDH–10/17/1470.
   2.2. MINIMUM SAFETY FACTOR OF 2 FOR DESIGN.
   2.3. 3/8" DEFLECTION ALLOWED AT THE PILE CAP. (APPROX. 1/8" CALCULATED).
   2.4. 2.5 FT OF REVEAL HEIGHT.
   2.5. TORQUE TO CAPACITY RATIO FOR RS3500.300 IS 7:1.

3. NOTES
   3.1. ACTUAL EMBEDMENT MAY VARY. DESIGN SHALL ADHERE TO TORQUE REQUIREMENTS.

INFORMATION SHOWN ABOVE WAS DEVELOPED BY CHANCE FOUNDATION SOLUTIONS. THIS INFORMATION SHOWN FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL PROVIDE WORKING DRAWINGS AND COMPUTATIONS SEALED BY AN ENGINEER LICENSED IN THE STATE OF DELAWARE FOR ALL HELICAL PILE APPLICATIONS.

NOTES:

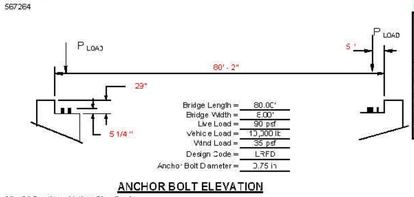
1. A STEEL PICKET RAILING WITH CLEAR SPACING OF 3 $\frac{3}{4}$ INCHES SHALL BE INCLUDED ON THE BRIDGE AND APPROACH BOARDWALKS. (PICKETS NOT SHOWN FOR CLARITY.)
2. THE CONTRACTOR SHALL ADJUST THE HEIGHT OF THE HSS 5X5X$\frac{1}{4}$ MEMBER AT THE BRIDGE PIER BENTS TO PROVIDE A LEVEL TRANSITION BETWEEN THE APPROACH BOARDWALKS AND THE BRIDGE DECK.
3. BRIDGE LOADING, APPROACH LOADING, AND HELICAL ANCHOR PILE INFORMATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
4. CONTRACTOR IS RESPONSIBLE FOR DESIGNING HELICAL PILES BASED ON ACTUAL BRIDGE LOADING AND SOILS INFORMATION OBTAINED IN THE FIELD. SEE SECTION 132550 – HELICAL ANCHOR FOUNDATIONS, FOR ADDITIONAL INFORMATION.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY PRE–DRILLING, AS REQUIRED BY THE MANUFACTURER OR ENGINEER, TO INSTALL HELICAL PILES.
6. HELICAL PILES TO BE INSTALLED A MINIMUM DEPTH OF 10.0 FEET INTO THE GROUND FOR LATERAL CAPACITY.
7. HELICAL PILES SHALL BE INSTALLED WITH A MINIMUM FACTOR OF SAFETY OF 2.0.

PROJECT: T-r-Valley Trail Phase 2
LOCATION: Newark DE
CONTECH #: 567264
SITE DESIGNATION:

CONTECH ENGINEERED SOLUTIONS

PRELIMINARY ONLY NOT FOR CONSTRUCTION OR FINAL DESIGN

These details and values are being provided for reference use only. All dimensions and values are subject to change after final design.



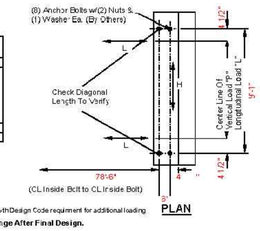
Bridge Length =	80.00'
Bridge Width =	6.00'
Live Load =	90 psf
Vehicle Load =	13,300 lb
Wind Load =	35 psf
Design Code =	LRFD
Anchor Bolt Diameter =	0.75 in

ANCHOR BOLT ELEVATION

3" x8" Southern Yellow Fire Deck
COMBINE REACTIONS AS PER LOCAL OR GOVERNING BUILDING CODES AS REQUIRED

BRIDGE REACTIONS	+ Downward Load - Upward Load		
	P (LBS)	H (LBS)	L (LBS)
Dead Load	6775		
Uniform Live Load	14,400		
Vehicle Load	5,000		
Wind Uplift 20 PSF	-5200		
Wind	+-4510	9,453	
Temp			2,375

'P' - Vertical Load at Each Base Plate (4 per Bridge)
'H' - Horizontal Load at Each Footing (2 per Bridge)
'L' - Longitudinal Load at Each Bearing (4 per Bridge)



**Note: If bridge is in Seismic region, please contact CONTECH Rep with Design Code requirement for additional loading.
NOTE: All Dimensions And Values Are Subject To Change After Final Design.

Bridge Lifting Weight: **27,100** LBS

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

STRUCTURE DETAILS

SEAL: WALTER J. HOEY, III · REGISTERED · NO. 11204 · DELAWARE · PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: S1.4
CONTRACT NO.: 2017-WCCSP-07A

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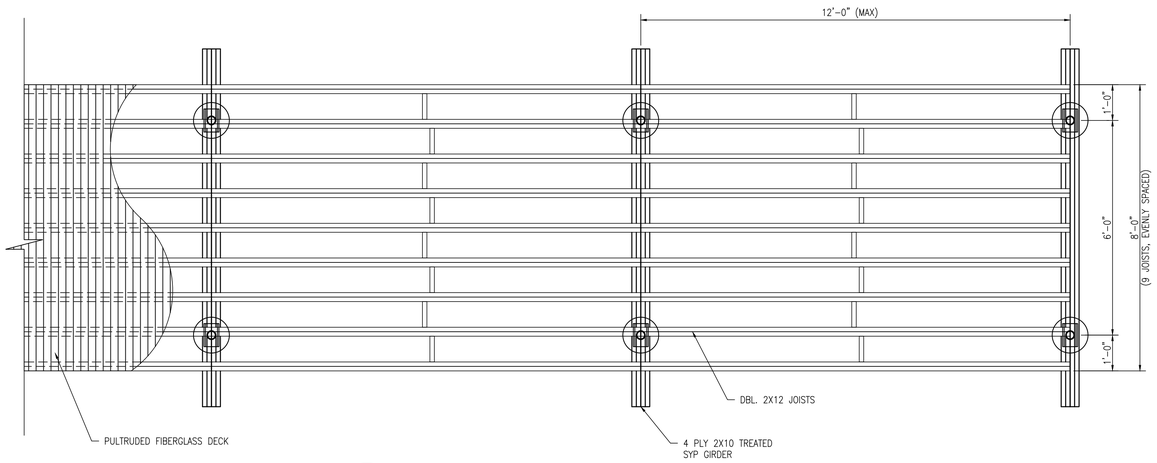
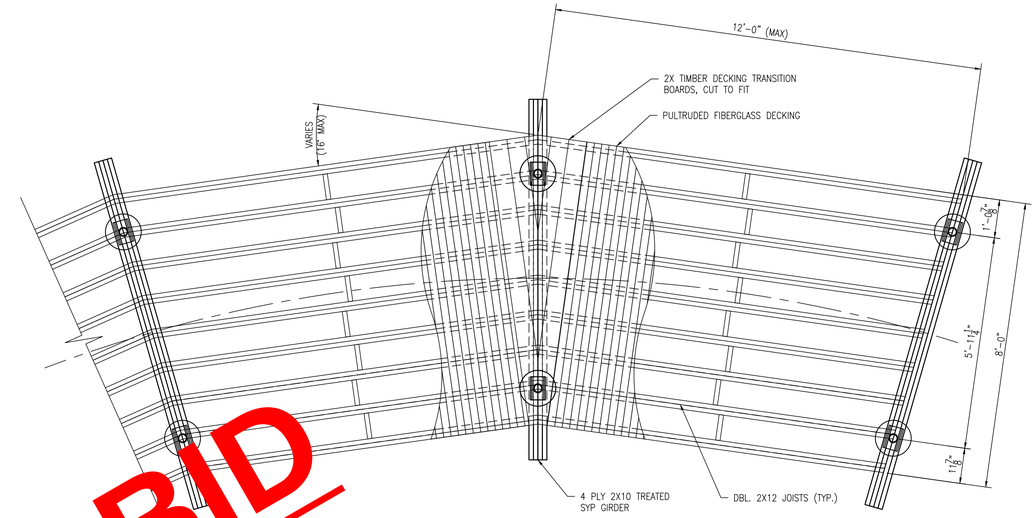
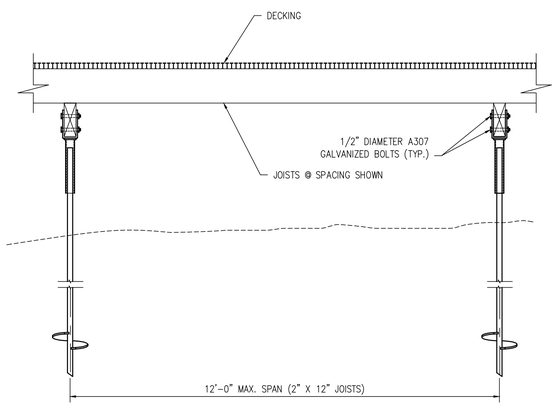


1 #### TYPICAL BOARDWALK FRAMING PLAN
SCALE: 1/2" = 1'-0"



2 #### TYPICAL CURVED BOARDWALK FRAMING PLAN
SCALE: 1/2" = 1'-0"

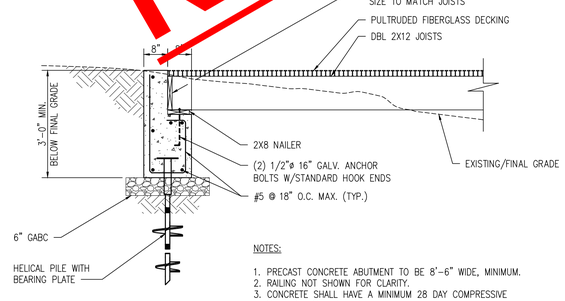
NOT FOR BID



NOTES:

1. DIAGONAL ANCHORS NOT SHOWN FOR CLARITY.
2. REFER TO SHEET 3 FOR TYPICAL CONNECTIONS.

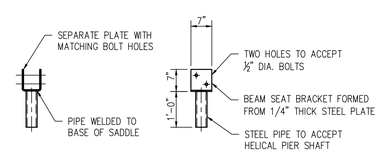
3 #### BOARDWALK ELEVATION
SCALE: 1/2" = 1'-0"



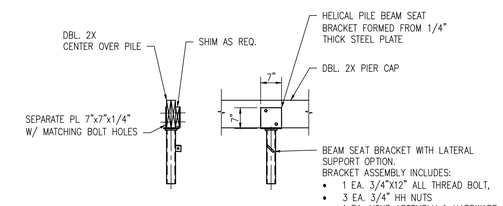
NOTES:

1. PRECAST CONCRETE ABUTMENT TO BE 8'-6" WIDE, MINIMUM.
2. RAILING NOT SHOWN FOR CLARITY.
3. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI.

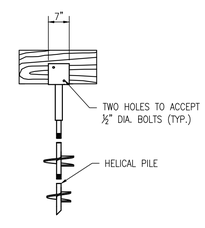
4 #### PRECAST CONCRETE ABUTMENT
SCALE: 1/2" = 1'-0"



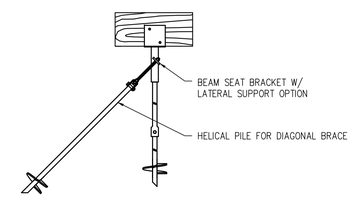
STANDARD BEAM SEAT BRACKET



BEAM SEAT BRACKET @ DIAGONAL CONNECTION



TYPICAL PILE AND BEAM SEAT BRACKET



PILE WITH DIAGONAL BRACE AND BEAM SEAT BRACKET

5 S1.4 CONNECTION BRACKET DETAILS
SCALE: 1/2" = 1'-0"

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

STRUCTURE DETAILS

SEAL: WALTER J. HOEY, III · REGISTERED · NO. 11204 · DELAWARE · PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: S1.5
CONTRACT NO.: 2017-WCCSP-07A

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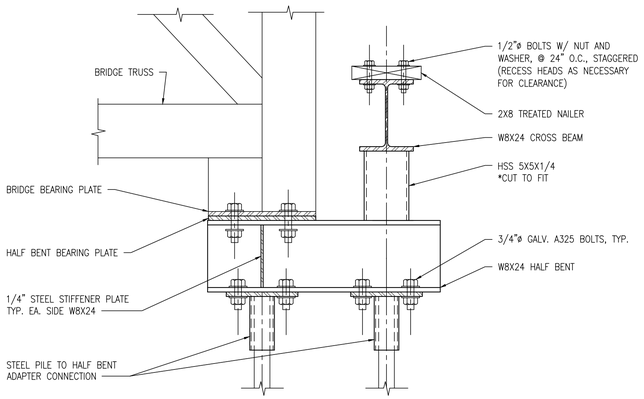
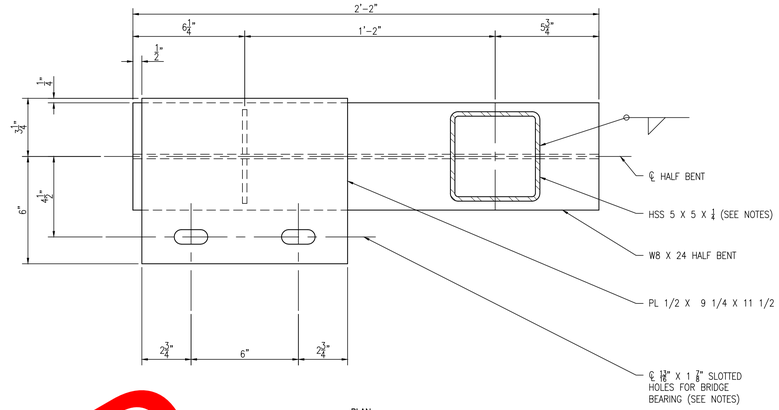
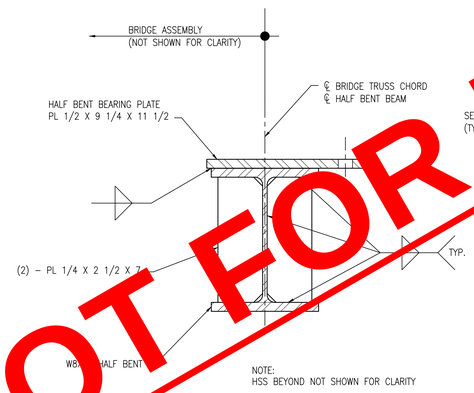
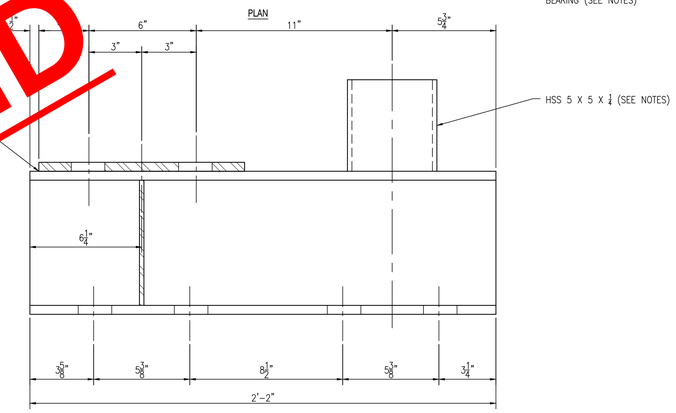


1 / S1.6 BRIDGE PIER BENT - SIDE ELEVATION
SCALE: 1 1/2" = 1'-0"



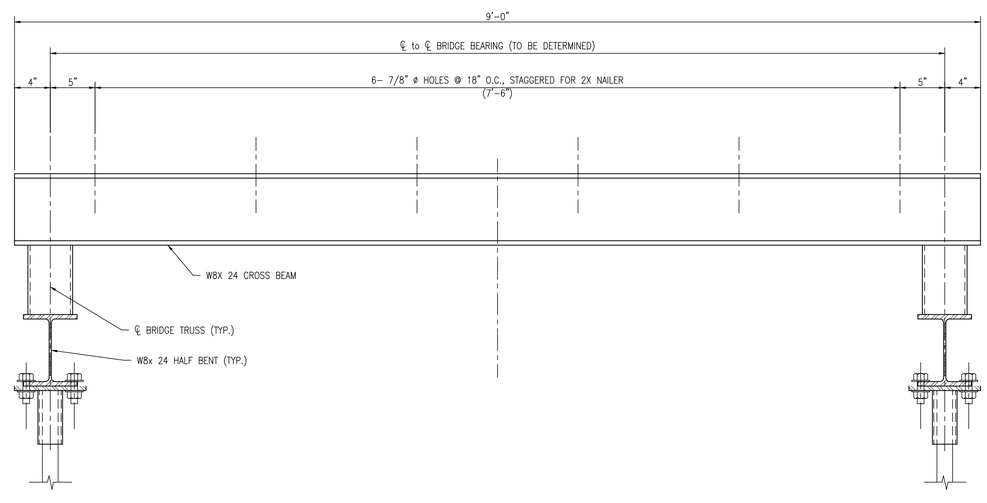


END VIEW



SIDE ELEVATION

2 / S1.6 BRIDGE PIER BENT
SCALE: 3" = 1'-0"



3 / S1.6 BRIDGE PIER BENT END ELEVATION
SCALE: 1 1/2" = 1'-0"

NOTES:

1. PILE SPACING AT BRIDGE ABUTMENT SHALL MATCH CENTER TO CENTER SPACING OF BRIDGE END POSTS. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR BRIDGE WITH STRUCTURAL STEEL SHOP DRAWINGS FOR CROSS REFERENCE REVIEW.

NOT FOR BID

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

STRUCTURE DETAILS

SEAL:

WALTER J. HOEY, III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: S1.6
CONTRACT NO.: 2017-WCCSP-07A

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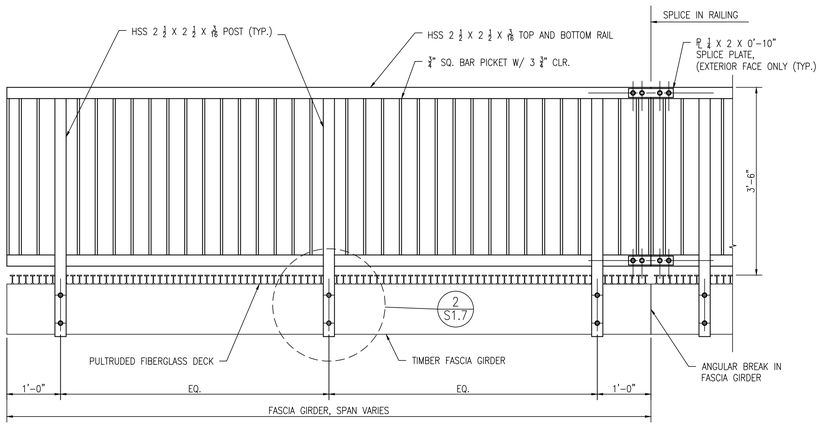
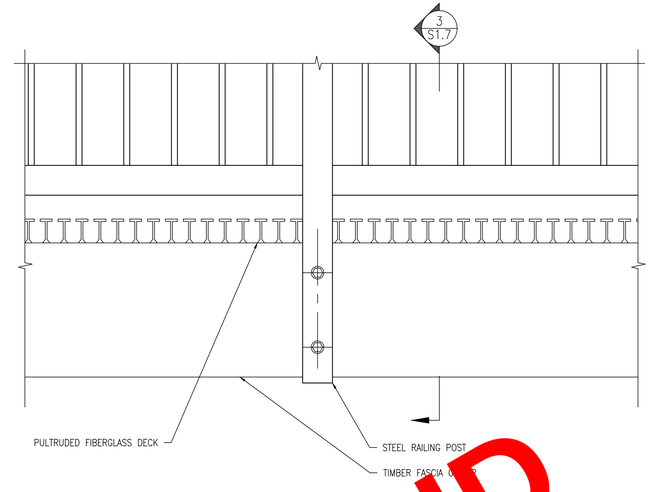
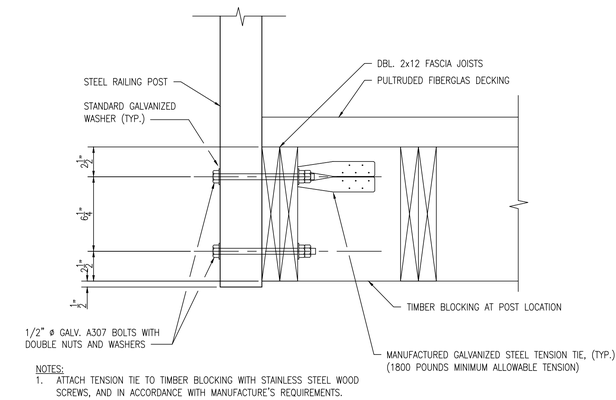


1 S1.7 AESTHETIC STEEL RAILING ELEVATION
SCALE: 3/4" = 1'-0"

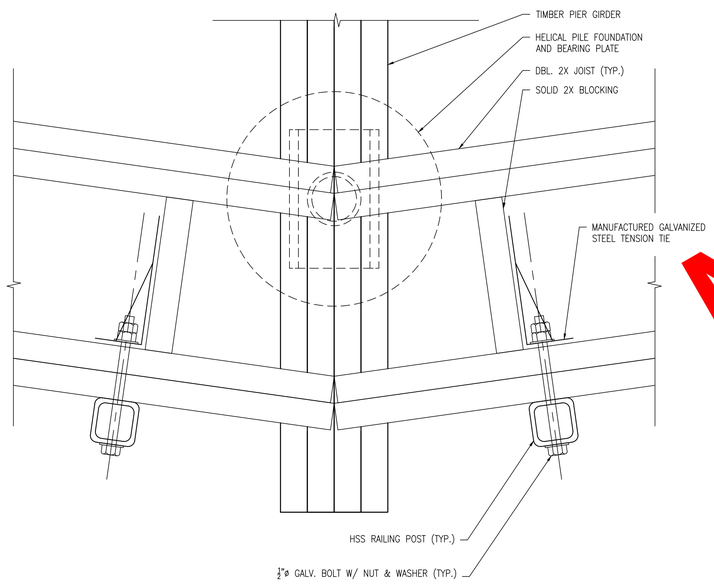


2 S1.7 RAILING POST CONNECTION F
SCALE: 2" = 1'

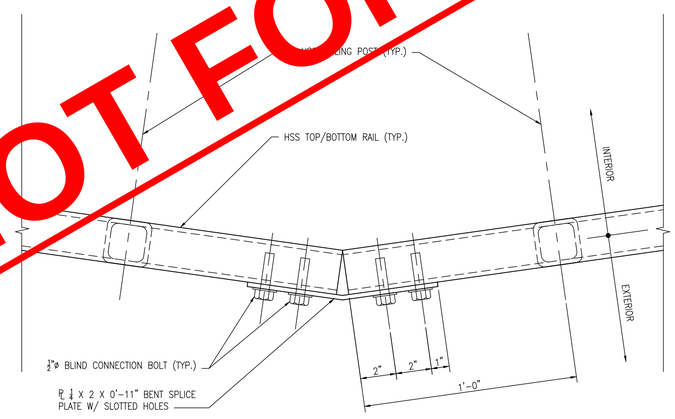


NOTES:
1. ATTACH TENSION TIE TO TIMBER BLOCKING WITH STAINLESS STEEL WOOD SCREWS, AND IN ACCORDANCE WITH MANUFACTURE'S REQUIREMENTS.

3 S1.7 RAILING POST CONNECTION SECTION
SCALE: 2" = 1'-0"



4 S1.7 RAILING POST CONNECTION PLAN
SCALE: 3" = 1'-0"



NOTES:
1. BENT SPLICE PLATE AND ATTACHMENT BOLTS SHALL BE PLACED ON THE OUTSIDE FACE OF THE TOP AND BOTTOM RAILS.
2. CONTRACTOR SHALL SUBMIT METHOD OF ATTACHING BENT SPLICE PLATE TO RAILS.

5 S1.7 RAILING TOP & BOTTOM RAIL SPLICE
SCALE: 3" = 1'-0"

NOTES:
1. ALL WORK SHALL BE IN ACCORDANCE WITH SECTION 055213 – PIPE AND TUBE RAILINGS.
2. ALL RAILING ELEMENTS TO BE WEATHERING STEEL CONFORMING TO THE FOLLOWING:
   2.1. TUBING: ASTM A588 OR A847.
   2.2. BARS, PLATES AND SHAPES: ASTM A242 OR ASTM A606.
3. BOLTED CONNECTIONS SHALL BE ASTM A536, GRADE C3 OR GRADE D, UNLESS NOTED OTHERWISE.
4. GALVANIZED STEEL TENSION TIES SHALL HAVE A MINIMUM ALLOWABLE TENSION OF 1000 POUNDS.

NOT FOR BID

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

STRUCTURE DETAILS

SEAL:
WALTER J. HOEY II
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901
CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: S1.7
CONTRACT NO.: 2017-WCCSP-07A

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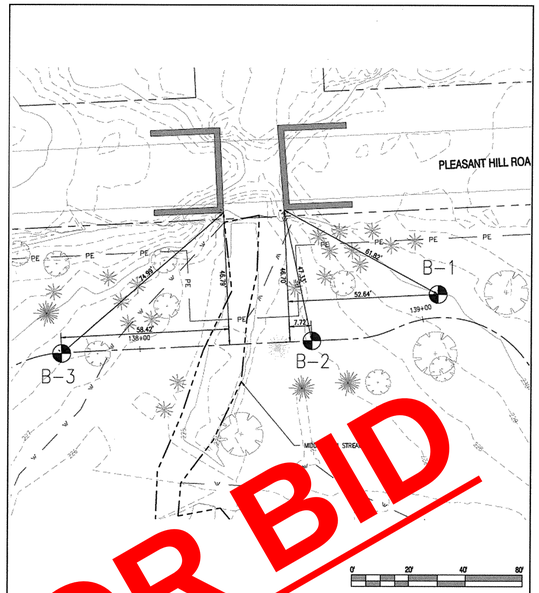
NOTE:
SOIL BORINGS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING CONDITIONS PRIOR TO DESIGNING OR ORDERING HELICAL PILES.



NOT FOR BID

HYNES & JOHN D. HYNES & ASSOCIATES, INC.
321 Beaver Run Drive • Salisbury, Maryland 21804
410-546-[illegible]62 / Fax: 410-548-5346

Boring Location Plan
Century – White Clay Creek State Park – Tri-Valley Trail, Phase II
Newark, Delaware

Date: January 5, 2018
Scale: 1 in. ≈ 34 ft.
Drawn: Century Eng.
DWG. No.
JDH-10/17/470-B

LOG OF BORING B-1

(Page 1 of 1)

HYNES & ASSOCIATES

Century Engineering, Inc.
4134 North DuPont Highway
Dover, Delaware 19901
Century - Tri-Valley Trail, Phase II
Project No.: JDH-10/17/470

Date Completed: : December 28, 2017
Logged By: : J. Lindsey
Drilled By: : M. Hynes
Drilling Method: : HSA (Geoprobe 7822 DT)
Total Depth: : 25.8 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Blow Count	REMARKS
0–2	Brown, wet, very soft, silty CLAY, with little fine to medium sand		CL	1	1-1-1-1	Scale 1" ~ 4.5 feet Approximately 12 inches of organic bearing soil was encountered at the ground surface. Groundwater was encountered at 15 feet during drilling operations. At completion water was at 7 feet; boring caved in at 12 feet.
2–4	Brown, wet, very stiff, clayey SILT, with little fine to coarse sand		ML	2	3-12-15	
4–6				3	5-9-7	
6–8	Brown, wet, stiff to medium stiff, clayey SILT, with little mica fragments, trace fine sand (decomposed rock)		ML	4	3-5-8	
8–10				5	2-4-7	
10–12				6	2-3-6	
12–14	Dark brown, wet to saturted, stiff to very stiff, clayey SILT, with little mica fragments, little fine sand (decomposed rock)		ML	7	3-6-8	
14–16				8	4-6-11	
16–18				9	7-5-8	
18–20	Brown, saturated, hard, clayey SILT, with little mica fragments, little fine to medium sand (decomposed rock)		ML	10	13-24-27	
20–22				11	24-50/4"	
22–24	Auger refusal at 25.8 feet.					
24–26						
26–28						
28–30						

LOG OF BORING B-2

(Page 1 of 1)

HYNES & ASSOCIATES

Century Engineering, Inc.
4134 North DuPont Highway
Dover, Delaware 19901
Century - Tri-Valley Trail, Phase II
Project No.: JDH-10/17/470

Date Completed: : December 28, 2017
Logged By: : J. Lindsey
Drilled By: : M. Hynes
Drilling Method: : HSA (Geoprobe 7822 DT)
Total Depth: : 23.3 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Blow Count	REMARKS
0–2	Brown, wet, soft, silty CLAY, with little fine to coarse sand		CL	1	1-1-2-2	Scale 1" ~ 4.5 feet Approximately 12 inches of organic bearing soil was encountered at the ground surface. Groundwater was encountered at 12 feet during drilling operations. At completion water was at 7 feet; boring caved in at 11 feet.
2–4				2	1-2-2	
4–6	Brown, wet to saturated, stiff to very stiff, clayey SILT, with little fine sand, little mica fragments (decomposed rock)		ML	3	3-5-7	
6–8				4	3-5-6	
8–10				5	3-7-7	
10–12				6	3-6-8	
12–14				7	3-7-7	
14–16				8	5-7-10	
16–18						
18–20	Dark brown, saturted, very stiff to hard, clayey SILT, with some fine sand, little mica fragments (decomposed rock)		ML	9	5-7-9	
20–22				10	24-50/3"	
22–24	Auger refusal at 23.3 feet.					
24–26						
26–28						
28–30						

LOG OF BORING B-3

(Page 1 of 1)

HYNES & ASSOCIATES

Century Engineering, Inc.
4134 North DuPont Highway
Dover, Delaware 19901
Century - Tri-Valley Trail, Phase II
Project No.: JDH-10/17/470

Date Completed: : December 28, 2017
Logged By: : J. Lindsey
Drilled By: : M. Hynes
Drilling Method: : HSA (Geoprobe 7822 DT)
Total Depth: : 25.9 feet

Depth in Feet	DESCRIPTION	GRAPHIC	USCS	Sample No.	Blow Count	REMARKS
0–2	Brown, wet, very soft, clayey SILT, with little fine to medium sand		ML	1	1-1-1-1	Scale 1" ~ 4.5 feet Approximately 12 inches of organic bearing soil was encountered at the ground surface. Groundwater was encountered at 7 feet during drilling operations. At completion water was at 7 feet; boring caved in at 12 feet.
2–4	Brown, wet, stiff, clayey SILT, with little fine sand, trace fine gravel		ML	2	4-6-8	
4–6	Brown, wet, stiff, clayey SILT, with little mica fragments, little fine sand (decomposed rock)		ML	3	3-5-6	
6–8	Brown, wet, very stiff, clayey SILT, with trace mica fragments, trace fine to medium sand		ML	4	4-7-10	
8–10	Brown, saturted, very stiff to hard, clayey SILT, with little mica fragments, little fine to medium sand (decomposed rock)		ML	5	3-6-11	
10–12				6	7-12-16	
12–14				7	5-11-13	
14–16				8	8-14-19	
16–18	Dark brown, saturated, hard, clayey SILT, with little mica fragments, trace fine sand (decomposed rock)		ML	9	7-15-20	
18–20				10	15-18-28	
20–22				11	22-50/5"	
22–24	Auger refusal at 25.9 feet.					
24–26						
26–28						
28–30						

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
CONSTRUCTION PLANS

BORING LOGS

SEAL:
WALTER J. HOEY III
REGISTERED
NO. 11204
DELAWARE
PROFESSIONAL ENGINEER

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO.: 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: WJH
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: AS SHOWN
SHEET NO.: S1.8
CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.02 (DNREC Coll Engineering Services – 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Construction Plans\S1.8_Boringlogs.dwg, 3/13/2018 4:18 PM

NOTES:

1. TERMINAL ENDS OF SILT FENCE SHALL BE TURNED IN TO THE TRAIL.
2. SLOPES REQUIRING SLOPE STABILIZATION MATTING ARE NOT IDENTIFIED ON THIS SHEET. ALL SLOPES STEEPER THAN 3:1 SHALL RECEIVE STABILIZATION MATTING. REFER TO DETAIL FOR EXAMPLE PRODUCTS.
3. FILTER STRIPS SHALL RECEIVE SLOPE STABILIZATION MATTING. REFER TO DETAIL FOR EXAMPLE PRODUCTS.
4. REINFORCED SILT FENCE TO BE PLACED ON LOD UNLESS OTHERWISE SHOWN.
5. STOCK PILE AREAS SHALL HAVE SILT FENCE INSTALLED ALONG PERIMETER.

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

0' 60' 120' 180'
SCALE: 1" = 60'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN 1

SEAL:

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=60'
SHEET NO.: SWM2.1
CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.00 (DNREC Civil Engineering Services - 2017)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 2.0-2.3 Const Sed&SWMPlan.dwg, 3/13/2018 3:39 PM

WCCSP TRI-VALLEY TRAIL, PHASE II

SEDIMENT & STORMWATER MANAGEMENT PLANS

WHITE CLAY CREEK HUNDRED
WHITE CLAY CREEK WATERSHED
PLEASANT HILL ROAD, NEW CASTLE COUNTY, DELAWARE

NOT FOR BID

DATA COLUMN

1. COUNTY TAX MAP: 08-035.00-021, 08-035.00-022, 08-035.00-023, 08-035.00-024, 08-041.00-027

2. DNREC PROJECT NUMBER: 2017-XXX

3. ADDRESS OF SITE: SMITHS MILL ROAD, NEWARK, DE 19711

4. SITE COORDINATES AT CENTER OF PROJECT SITE: LATITUDE: 39.7154 N, LONGITUDE: -75.7409 W

5. ZONING: EXISTING: SR-SUBURBAN RESERVE; PROPOSED: SR-SUBURBAN RESERVE

LOT AREA:

TAX PARCEL NO.	EXISTING	PROPOSED
08-035.00-021	14.43 ACS.	14.43 ACS.
08-035.00-022	63.50 ACS.	63.50 ACS.
08-035.00-023	17.18 ACS.	17.18 ACS.
08-035.00-024	23.76 ACS.	23.76 ACS.
08-041.00-027	47.83 ACS,	47.83 ACS.

SOURCE OF TITLE:

TAX PARCEL NO.	DEED RECORD/INSTRUMENT NUMBER
08-035.00-031	2491-49
08-035.00-022	20020814-0078868
08-035.00-023	2491-49
08-035.00-024	20020814-0078868
08-041.00-027	20020814-0078868

6. EXISTING USE: STATE PARK

7. PROPOSED USE: STATE PARK WITH TRAIL & BRIDGE

8. DATUM: VERTICAL – NAVD 88; HORIZONTAL – NAD 83

BENCHMARK: – EXISTING TRAFFIC SIGNAL POLE FOUNDATION (TP #11) INTERSECTION CORNER KETCH RD AND PAPER MILL RD ELEV. 230.468

9. SITE CONDITIONS WITHIN LIMITS OF DISTURBANCE (ACRES)

EXISTING CONDITIONS		PROPOSED CONDITIONS	
BUILDING	0.00 ACRES	BUILDING	0.00 ACRES
PAVEMENT/CONCRETE	0.00 ACRES	PAVEMENT/CONCRETE	1.05 ACRES
TREES	1.34 ACRES	TREES	0.77 ACRES
OPEN SPACE	2.11 ACRES	OPEN SPACE	1.63 ACRES
TOTAL	3.45 ACRES		3.45 ACRES

IMPERVIOUS CONDITIONS
EXISTING 0% PROPOSED 30.6%

10. FLOOD PLAIN MAP
PER FIRM MAP NUMBER 10003C0130K, DATED FEBRUARY 4, 2015, THIS SITE LIES WITHIN ZONE X, AREA DETERMINED TO BE OUTSIDE THE ANNUAL 0.2% CHANCE OF FLOODPLAIN.

11. WATER RESOURCE PROTECTION
ACCORDING TO THE WATER RESOURCE PROTECTION MAP FOR NEW CASTLE COUNTY, MAP 1 OF 3, DATED 1987, LAST REVISED DECEMBER 2011, THIS SITE DOES NOT LAY WITHIN A RECHARGE WATER RESOURCE PROTECTION AREA.

12. TOTAL LAND DISTURBANCE
THE TOTAL LAND DISTURBANCE PROPOSED BY THIS PLAN IS 3.45± ACRES (150,282± S.F.)

13. LIMITS OF CONSTRUCTION
THE TOTAL LIMITS OF CONSTRUCTION FOR THE SITE IS 3.45± ACRES (150,282± S.F.)

14. WETLANDS
THE TOTAL WETLANDS EXISTING WITHIN THE LIMITS OF DISTURBANCE IS 0.00± ACRES (000± S.F.)

15. PROPOSED DISCHARGE LOCATIONS
1.) POA 1A – NATURAL CHANNEL: CONTRIBUTING LOD AREA = 13.27 ACRES
2.) POA 1B – ROADSIDE SWALE: CONTRIBUTING LOD AREA = 17.76 ACRES
3.) POA 2A – SHALLOW DEPRESSION: CONTRIBUTING LOD AREA = 20.10 ACRES
4.) POA 2B – OVERLAND FLOW: CONTRIBUTING LOD AREA = 3.86 ACRES
5.) POA 2C – OVERLAND FLOW: CONTRIBUTING LOD AREA = 29.80 ACRES
7.) POA 3A – DRAINAGE INLET: CONTRIBUTING LOD AREA = 1.70 ACRES

16. OWNER/DEVELOPER:
STATE OF DELAWARE
DNREC, DIVISION OF PARKS & RECREATION
89 KINGS HIGHWAY, DOVER, DE 19901
PHONE: 302-739-9210
FAX: 302-739-3817
EMAIL: CINDY.TODD@STATE.DE.US

17. REVIEW AGENCY:
DNREC, DIVISION OF WATERSHED STEWARDSHIP
89 KINGS HIGHWAY, DOVER, DE 19901
PHONE: (302) 739-9921
FAX: (302) 739-6724

18. CIVIL ENGINEER:
CENTURY ENGINEERING, INC.
4134 NORTH DUPONT HIGHWAY, DOVER, DE 19901
ALEX SCHMIDT, P.E.
PHONE: (302) 734-9188
FAX: (302) 734-4589
EMAIL: ASCHMIDT@CENTURYENG.COM

GENERAL NOTES

1. THE DNREC SEDIMENT AND STORMWATER MANAGEMENT PROGRAM MUST BE NOTIFIED IN WRITING FIVE (5) DAYS PRIOR TO COMMENCING WITH CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.

2. REVIEW AND APPROVAL OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN SHALL NOT RELIEVE THE CONTRACTOR FROM HIS OR HER RESPONSIBILITIES FOR COMPLIANCE WITH THE REQUIREMENTS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS, NOR SHALL IT RELIEVE THE CONTRACTOR FROM ERRORS OR OMISSIONS IN THE APPROVED PLAN.

3. IF THE APPROVED PLAN NEEDS TO BE MODIFIED, ADDITIONAL SEDIMENT AND STORMWATER CONTROL MEASURES MAY BE REQUIRED AS DEEMED NECESSARY BY DNREC OR THE DELEGATED AGENCY.

4. FOLLOWING THE SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED FOR ALL PERIMETER SEDIMENT CONTROLS, SOIL STOCKPILES, AND ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE WITHIN 14 CALENDAR DAYS UNLESS MORE RESTRICTIVE FEDERAL REQUIREMENTS APPLY.

5. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL COMPLY WITH THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, LATEST EDITION.

6. AT ANY TIME A DEWATERING OPERATION IS USED, IT SHALL BE PREVIOUSLY APPROVED BY THE AGENCY CONSTRUCTION SITE REVIEWER FOR A NON-EROSIVE POINT OF DISCHARGE, AND A DEWATERING PERMIT SHALL BE APPROVED BY THE DNREC WELL PERMITTING BRANCH.

7. APPROVED PLANS REMAIN VALID FOR 5 YEARS FROM THE DATE OF APPROVAL.

8. POST CONSTRUCTION VERIFICATION DOCUMENTS ARE TO BE SUBMITTED TO THE DNREC SEDIMENT AND STORMWATER PROGRAM WITHIN 60 DAYS OF STORMWATER MANAGEMENT FACILITY COMPLETION.

9. APPROVAL OF A SEDIMENT AND STORMWATER PLAN DOES NOT GRANT OR IMPLY A RIGHT TO DISCHARGE STORMWATER RUNOFF. THE OWNER/DEVELOPER IS RESPONSIBLE FOR ACQUIRING ANY AND ALL AGREEMENTS, EASEMENTS, ETC., NECESSARY TO COMPLY WITH STATE DRAINAGE AND OTHER APPLICABLE LAWS.

10. THE NOTICE OF INTENT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITY UNDER NPDES GENERAL PERMIT FOR THIS PROJECT IS # . AT ANY TIME THE OWNERSHIP FOR THIS PROJECT CHANGES, A TRANSFER OF AUTHORIZATION OR A CO-PERMITEE APPLICATION MUST BE SUBMITTED TO DNREC. THE PERMITTEE OF RECORD SHALL NOT BE RELIEVED OF THEIR RESPONSIBILITIES UNTIL A NOTICE OF TERMINATION HAS BEEN PROCESSED BY DNREC.

11. THE OWNER SHALL BE FAMILIAR WITH AND COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION GENERAL PERMIT ASSOCIATED WITH THE PROJECT, INCLUDING, BUT NOT LIMITED TO, PERFORMING WEEKLY SITE INSPECTIONS DURING CONSTRUCTION AND AFTER RAIN EVENTS, AND MAINTAINING WRITTEN LOGS OF THESE INSPECTIONS.

12. BEFORE ANY EARTHWORK OR EXCAVATION TAKES PLACE, THE CONTRACTOR SHALL CALL MISS UTILITY AT 811 OR 1.800.282.8555 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, TO HAVE ALL EXISTING UTILITIES MARKED ONSITE.

13. THE CONTRACTOR SHALL AT ALL TIMES PROTECT AGAINST SEDIMENT OR DEBRIS LADEN RUNOFF OR WIND FROM LEAVING THE SITE. PERIMETER CONTROLS SHALL BE CHECKED DAILY AND ADJUSTED AND/OR REPAIRED TO FULLY CONTAIN AND CONTROL SEDIMENT FROM LEAVING 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 ALTER MEASURES IN TIMES OF ADVERSE WEATHER CONDITIONS, OR AS DIRECTED BY THE AGENCY CONSTRUCTION SITE REVIEWER.

14. BEST AVAILABLE TECHNOLOGY (BAT) SHALL BE EMPLOYED TO MANAGE TURBID DISCHARGES IN ACCORDANCE WITH REQUIREMENTS OF 7 DEL C. CHAPTER 60, REGULATIONS GOVERNING THE CONTROL OF WATER POLLUTION, SECTION 9.1.02, KNOWN AS SPECIAL CONDITIONS FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES AND DEPARTMENT POLICIES, PROCEDURES, AND GUIDANCE.

15. DOCUMENTATION OF SOIL TESTING AND MATERIALS USED FOR TEMPORARY OR PERMANENT STABILIZATION INCLUDING BUT NOT LIMITED TO SOIL TEST RESULTS, SEED TAGS, SOIL AMENDMENT TAGS, ETC. SHALL BE PROVIDED TO THE DEPARTMENT OR DELEGATED AGENCY TO VERIFY THAT THE PERMANENT OR TEMPORARY STABILIZATION HAS BEEN COMPLETED IN ACCORDANCE WITH THE APPROVED PLAN. THE DEPARTMENT OR DELEGATED AGENCY MAY REQUIRE ADDITIONAL SOIL TESTING AND REAPPLICATION OF PERMANENT OR TEMPORARY STABILIZATION IN ACCORDANCE WITH SPECIFICATIONS PROVIDED IN THE DELAWARE EROSION AND SEDIMENT CONTROL HANDBOOK, OR ALTERNATIVE MEASURES THAT PROVIDE FUNCTIONAL EQUIVALENCY.

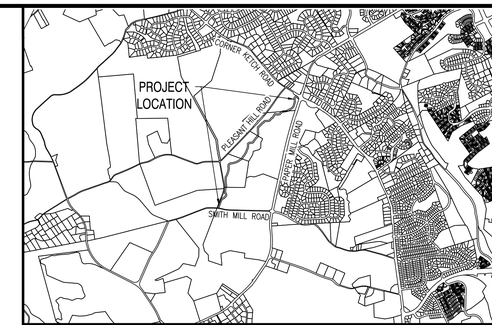
16. CONTRACTOR SHALL ONLY EXCAVATE AS MUCH TRAIL ALIGNMENT AS CAN BE BACKFILLED WITH BASE COURSE STONE AND STABILIZED IN ONE DAY. DO NOT EXCAVATE IF IT WILL NOT BE STABILIZED IN THE SAME DAY.

LEGEND

EXISTING RIGHT OF WAY
PARCEL BOUNDARY
PROPOSED RIGHT OF WAY — R/W
EXISTING FLOODPLAIN — FP
EXISTING CONTOUR MAJOR — 148
EXISTING CONTOUR MINOR
PROPOSED CONTOUR — 150
EXISTING TREELINE
PROPOSED TREELINE
STREAM BOUNDARY
WETLAND BOUNDARY
LIMIT OF DISTURBANCE — LOD
SILT FENCE — SF
REINFORCED SILT FENCE — RSF
STABILIZED CONSTRUCTION ENTRANCE — SCE
INLET PROTECTION — IP-1, IP-2
CONCRETE WASHOUT — CW
COMPOST FILTER LOG — CFL
SENSITIVE AREA PROTECTION — SAP
FILTER STRIP
SOIL STOCKPILE AREA — SP
EARTH BERM — TB-A1
DRAINAGE AREA
TC PATH — >TC
EXISTING IMPERVIOUS
PROPOSED IMPERVIOUS

SHEET INDEX

SWM 1.0	STORMWATER MANAGEMENT COVER SHEET
SWM 2.0	OVERALL CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN
SWM 2.1	CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN 1
SWM 2.2	CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN 2
SWM 2.3	CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN 3
SWM 3.0-3.4	CONSTRUCTION SITE DETAILS AND NOTES
SWM 4.0	OVERALL POST CONSTRUCTION STORMWATER MANAGEMENT SHEET LAYOUT
SWM 4.1	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN, FILTER STRIP #1
SWM 4.2	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN, FILTER STRIP #2
SWM 4.3	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN, FILTER STRIP #3
SWM 4.4	POST CONSTRUCTION STORMWATER MANAGEMENT PLAN, FILTER STRIP #4
SWM 5.0	CONTRIBUTING DRAINAGE AREA DETAILS AND NOTES
SWM 5.1	BMP CONTRIBUTING DRAINAGE AREA PLAN 1
SWM 5.2	BMP CONTRIBUTING DRAINAGE AREA PLAN 2
SWM 6.1	PRE-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 1
SWM 6.2	PRE-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 2
SWM 7.1	POST-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 1
SWM 7.2	POST-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 2



LOCATION MAP SCALE: 1" = ½ MILE

OWNER/DEVELOPER CERTIFICATION

I, THE UNDERSIGNED, CERTIFY THAT ALL LAND CLEARING, CONSTRUCTION AND DEVELOPMENT SHALL BE DONE PURSUANT TO THE APPROVED PLAN AND THAT RESPONSIBLE PERSONNEL (I.E. BLUE CARD HOLDER) INVOLVED IN THE LAND DISTURBANCE WILL HAVE A CERTIFICATION OF TRAINING PRIOR TO INITIATION OF THE PROJECT, AT A DNREC SPONSORED OR APPROVED TRAINING COURSE FOR THE CONTROL OF EROSION AND SEDIMENT DURING CONSTRUCTION. IN ADDITION, I GRANT THE DNREC SEDIMENT AND STORMWATER PROGRAM AND/OR THE RELEVANT DELEGATED AGENCY THE RIGHT TO CONDUCT ON-SITE REVIEWS, AND I UNDERSTAND MY RESPONSIBILITIES UNDER THE NPDES CONSTRUCTION GENERAL PERMIT, AS REFERENCED ON THIS COVERSHEET.

CYNTHIA A. TODD, RLA — DATE
CONSTRUCTION PROJECT ADMINISTRATOR
OFFICE OF DESIGN AND DEVELOPMENT
DNREC – DIVISION OF PARKS AND RECREATION
89 KINGS HIGHWAY, DOVER, DE 19901
PHONE: 302-739-9210
FAX: 302-739-3817

WETLAND CERTIFICATION

THIS PROPERTY, TAX MAP #'S 08-035.00-032, 08-040.00-054, 08-040.00-055, 08-041.00-027, 08-041.00-028, 08-041.00-029, 08-041.00-030 AND 08-047.00-097, HAVE BEEN EXAMINED BY CENTURY ENGINEERING, INC FOR THE PRESENCE OF WATERS OF THE UNITED STATES, INCLUDING WETLANDS (SECTION 404 AND SECTION 10), STATE SUBAQUEOUS LANDS AND STATE REGULATED WETLANDS AS ESTABLISHED BY THE REVIEWING AGENCIES IN THE FORM OF MANUALS, POLICIES AND PROCEDURES IN PLACE AT THE TIME THAT THE INVESTIGATION WAS CONDUCTED. THE WETLAND INFORMATION CONTAINED IN THIS PLAN SET IS IN ACCORDANCE WITH THIS CRITERIA.

TJ AUSTIN — DATE
ENVIRONMENTAL SCIENTIST
CENTURY ENGINEERING, INC.
4134 NORTH DUPONT HIGHWAY
DOVER, DELAWARE 19901
PHONE: (302) 734-9188
FAX: (302) 734-4589

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.

ALEX 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

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

STORMWATER MANAGEMENT COVER SHEET

SEAL:

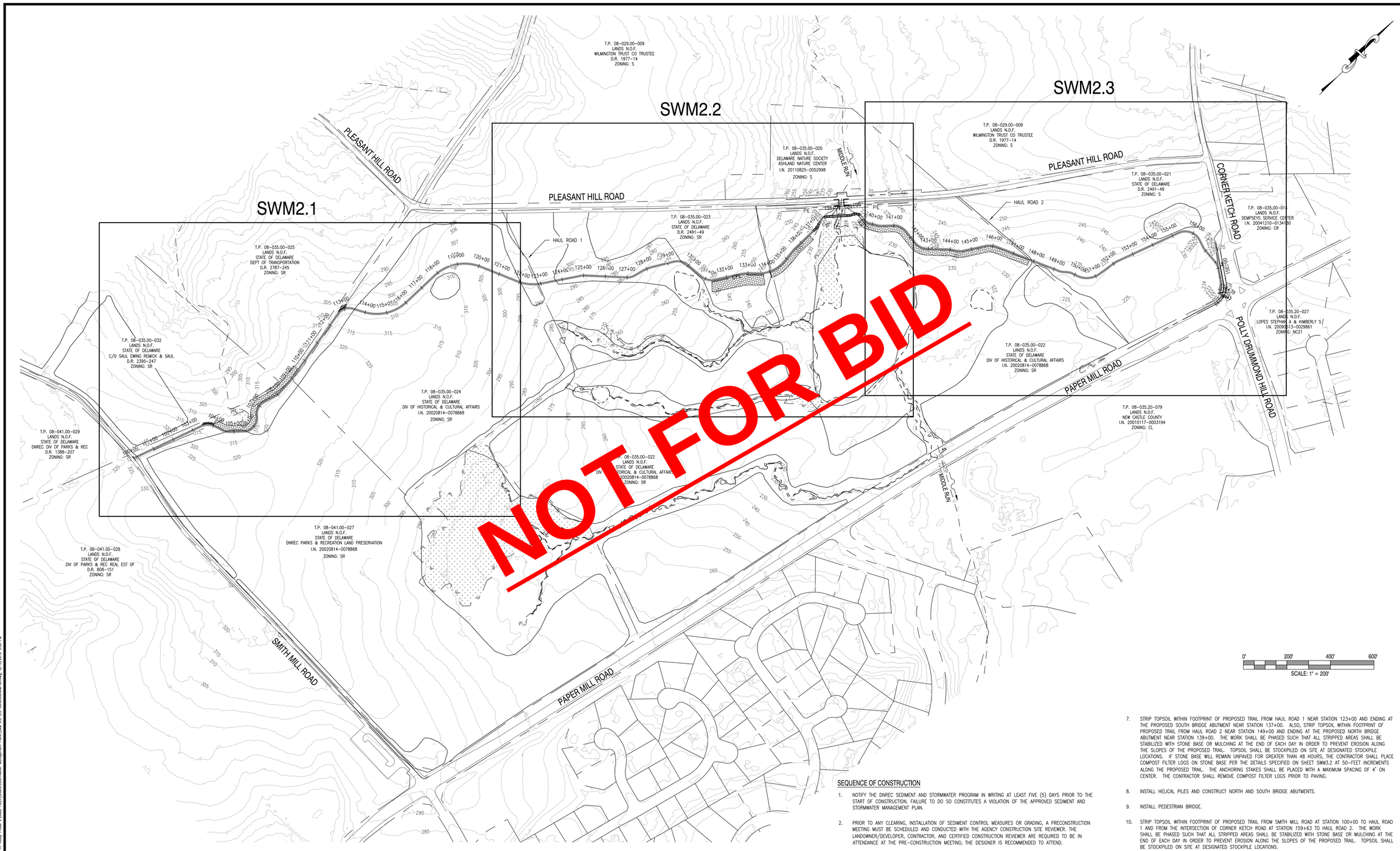
CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: NONE
SHEET NO.: SWM1.0
CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.DE DNREC Civil Engineering Services - 2012\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 1.0 CoverSheet.dwg, 3/13/2018 3:38 PM



PROJECT NOTES

1. TOTAL LOD AREA = 3.45 ACRES (150,282± S.F.)
2. TOTAL WETLAND AREA WITHIN LOD = 0.0 ACRES (0.0± S.F.)
3. THE ENTIRE LOD IS OUTSIDE THE 100-YR FLOODPLAIN.
4. EXCAVATION VOLUMES: SPOIL: 1,129 CY
5. GEOTEXTILE FOR THE STABILIZED CONSTRUCTION ENTRANCE SHALL MEET DNREC TYPE GS-1 SPECIFICATIONS.
   EXAMPLE PRODUCTS INCLUDE:
   - MIRAFI 600X
   - AMOCO 2006
   - GEOTEX 315ST
6. ALL DISTURBED AREAS WITHIN THE LOD SHALL BE STABILIZED WITH 6" TOPSOIL, SEED, AND MULCH. TEMPORARY SEEDING SHALL MEET SPECIFICATIONS OF DNREC TEMPORARY SEED MIX #3, 5, OR 6. TOPSOIL SHALL NOT BE REQUIRED FOR TEMPORARY SEEDING. PERMANENT SEEDING SHALL MEET SPECIFICATIONS OF DNREC PERMANENT SEED MIX #3. VEGETATED FILTER STRIP AREAS SHALL USE VEGETATED FILTER STRIP SEED MIX. MULCH SHALL BE BLOWN STRAW PER MULCHING DETAILS, OR STABILIZATION MATTING-SLOPE PER SWM DETAIL SHEETS.
   EXAMPLE PRODUCTS INCLUDE:
   - NORTH AMERICAN GREEN S75BN
   - AMERICAN EXCELSIOR CURLEX I
   - PPS PACKAGING XCEL STRAW REGULAR SR1
   - EAST COAST EROSION BLANKETS ECS-1B
7. SPRINKLING SHALL BE THE STABILIZATION MEASURE INITIATED IF DUST CONTROL BECOMES A PROBLEM.
8. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN AND REPAIR ALL EROSION AND SEDIMENT CONTROL PRACTICES DURING CONSTRUCTION.
9. LOCATIONS OF DUMPSTER AND STAGING AREAS ARE SHOWN ON PLANS. IF THESE LOCATIONS MUST BE MOVED, THE NEW LOCATION SHALL BE APPROVED BY THE AGENCY CONSTRUCTION SITE REVIEWER.
10. CONTRACTOR SHALL ONLY EXCAVATE AS MUCH TRAIL ALIGNMENT AS CAN BE BACKFILLED WITH BASE COURSE STONE AND STABILIZED IN ONE DAY. DO NOT EXCAVATE IF IT WILL NOT BE STABILIZED IN THE SAME DAY.

SEQUENCE OF CONSTRUCTION

1. NOTIFY THE DNREC SEDIMENT AND STORMWATER PROGRAM IN WRITING AT LEAST FIVE (5) DAYS PRIOR TO THE START OF CONSTRUCTION. FAILURE TO DO SO CONSTITUTES A VIOLATION OF THE APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLAN.
2. PRIOR TO ANY CLEARING, INSTALLATION OF SEDIMENT CONTROL MEASURES OR GRADING, A PRECONSTRUCTION MEETING MUST BE SCHEDULED AND CONDUCTED WITH THE AGENCY CONSTRUCTION SITE REVIEWER. THE LANDOWNER/DEVELOPER, CONTRACTOR, AND CERTIFIED CONSTRUCTION REVIEWER ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING; THE DESIGNER IS RECOMMENDED TO ATTEND.
3. CLEAR AND GRUB AS REQUIRED TO INSTALL STABILIZED CONSTRUCTION ENTRANCE. INSTALL STABILIZED CONSTRUCTION ENTRANCE. CLEAR AND GRUB AS REQUIRED TO INSTALL SILT FENCE. INSTALL SILT FENCE. ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY THE AGENCY CONSTRUCTION SITE REVIEWER AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION.
4. AT THE OWNER'S DIRECTION, THE CONTRACTOR SHALL PLACE SENSITIVE AREA PROTECTION AROUND ALL TREES WITHIN THE LIMITS OF DISTURBANCE THAT ARE TO REMAIN FOLLOWING CONSTRUCTION.
5. 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.
6. STAKE OUT PROPOSED TRAIL, FILTER STRIPS, DRAINAGE INLET, AND PEDESTRIAN BRIDGE.
7. STRIP TOPSOIL WITHIN FOOTPRINT OF PROPOSED TRAIL FROM HAUL ROAD 1 NEAR STATION 123+00 AND ENDING AT THE PROPOSED SOUTH BRIDGE ABUTMENT NEAR STATION 137+00. ALSO, STRIP TOPSOIL WITHIN FOOTPRINT OF PROPOSED TRAIL FROM HAUL ROAD 2 NEAR STATION 149+00 AND ENDING AT THE PROPOSED NORTH BRIDGE ABUTMENT NEAR STATION 139+00. THE WORK SHALL BE PHASED SUCH THAT ALL STRIPPED AREAS SHALL BE STABILIZED WITH STONE BASE OR MULCHING AT THE END OF EACH DAY IN ORDER TO PREVENT EROSION ALONG THE SLOPES OF THE PROPOSED TRAIL. TOPSOIL SHALL BE STOCKPILED ON SITE AT DESIGNATED STOCKPILE LOCATIONS. IF STONE BASE WILL REMAIN UNPAVED FOR GREATER THAN 48 HOURS, THE CONTRACTOR SHALL PLACE COMPOST FILTER LOGS ON STONE BASE PER THE DETAILS SPECIFIED ON SHEET SWM3.2 AT 50-FEET INCREMENTS ALONG THE PROPOSED TRAIL. THE ANCHORING STAKES SHALL BE PLACED WITH A MAXIMUM SPACING OF 4' ON CENTER. THE CONTRACTOR SHALL REMOVE COMPOST FILTER LOGS PRIOR TO PAVING.
8. INSTALL HELICAL PILES AND CONSTRUCT NORTH AND SOUTH BRIDGE ABUTMENTS.
9. INSTALL PEDESTRIAN BRIDGE.
10. STRIP TOPSOIL WITHIN FOOTPRINT OF PROPOSED TRAIL FROM SMITH MILL ROAD AT STATION 100+00 TO HAUL ROAD 1 AND FROM THE INTERSECTION OF CORNER KETCH ROAD AT STATION 159+63 TO HAUL ROAD 2. THE WORK SHALL BE PHASED SUCH THAT ALL STRIPPED AREAS SHALL BE STABILIZED WITH STONE BASE OR MULCHING AT THE END OF EACH DAY IN ORDER TO PREVENT EROSION ALONG THE SLOPES OF THE PROPOSED TRAIL. TOPSOIL SHALL BE STOCKPILED ON SITE AT DESIGNATED STOCKPILE LOCATIONS.
11. INSTALL DRAINAGE INLET AND PROPOSED STORM PIPE NEAR STATION 159+40.
12. PERMANENTLY GRADE AND STABILIZE ALL DISTURBED AREAS INCLUDING COMPLETE CONSTRUCTION OF ALL FILTER STRIPS. FILTER STRIPS SHALL BE CONSTRUCTED PER THE SEQUENCE OF CONSTRUCTION SPECIFIED ON SWM DETAIL SHEETS. EXCESS TOPSOIL WILL BE STOCKPILED ON SITE.
13. USING THE APPROPRIATE TRAFFIC CONTROL PROCEDURES PERFORM PAVING OF TRAIL SURFACES AS SHOWN. PLACE PAVEMENT MARKINGS AND STRIPING WHERE APPROPRIATE.
14. EROSION AND SEDIMENT CONTROL DEVICES SHALL BE REMOVED ONLY AFTER WORK IN AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER.
15. THE TERMINATION OF THE CONSTRUCTION GENERAL PERMIT WILL REQUIRE SUBMISSION AND ACCEPTANCE OF THE POST CONSTRUCTION VERIFICATION DOCUMENTS, INCLUDING FINAL STABILIZATION THROUGHOUT THE SITE, AND ALL ELEMENTS OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN IMPLEMENTED.

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

OVERALL CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=200'

SHEET NO.: SWM2.0

CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.00 DNREC Civil Engineering Services - 2017\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 2.0-2.3 Const\SwMPlan.dwg, 3/13/2018 3:36 PM

NOTES:

1. TERMINAL ENDS OF SILT FENCE SHALL BE TURNED IN TO THE TRAIL.
2. SLOPES REQUIRING SLOPE STABILIZATION MATTING ARE NOT IDENTIFIED ON THIS SHEET. ALL SLOPES STEEPER THAN 3:1 SHALL RECEIVE STABILIZATION MATTING. REFER TO DETAIL FOR EXAMPLE PRODUCTS.
3. FILTER STRIPS SHALL RECEIVE SLOPE STABILIZATION MATTING. REFER TO DETAIL FOR EXAMPLE PRODUCTS.
4. REINFORCED SILT FENCE TO BE PLACED ON LOD UNLESS OTHERWISE SHOWN.
5. STOCK PILE AREAS SHALL HAVE SILT FENCE INSTALLED ALONG PERIMETER.

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

0' 60' 120' 180'
SCALE: 1" = 60'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN 1

SEAL:

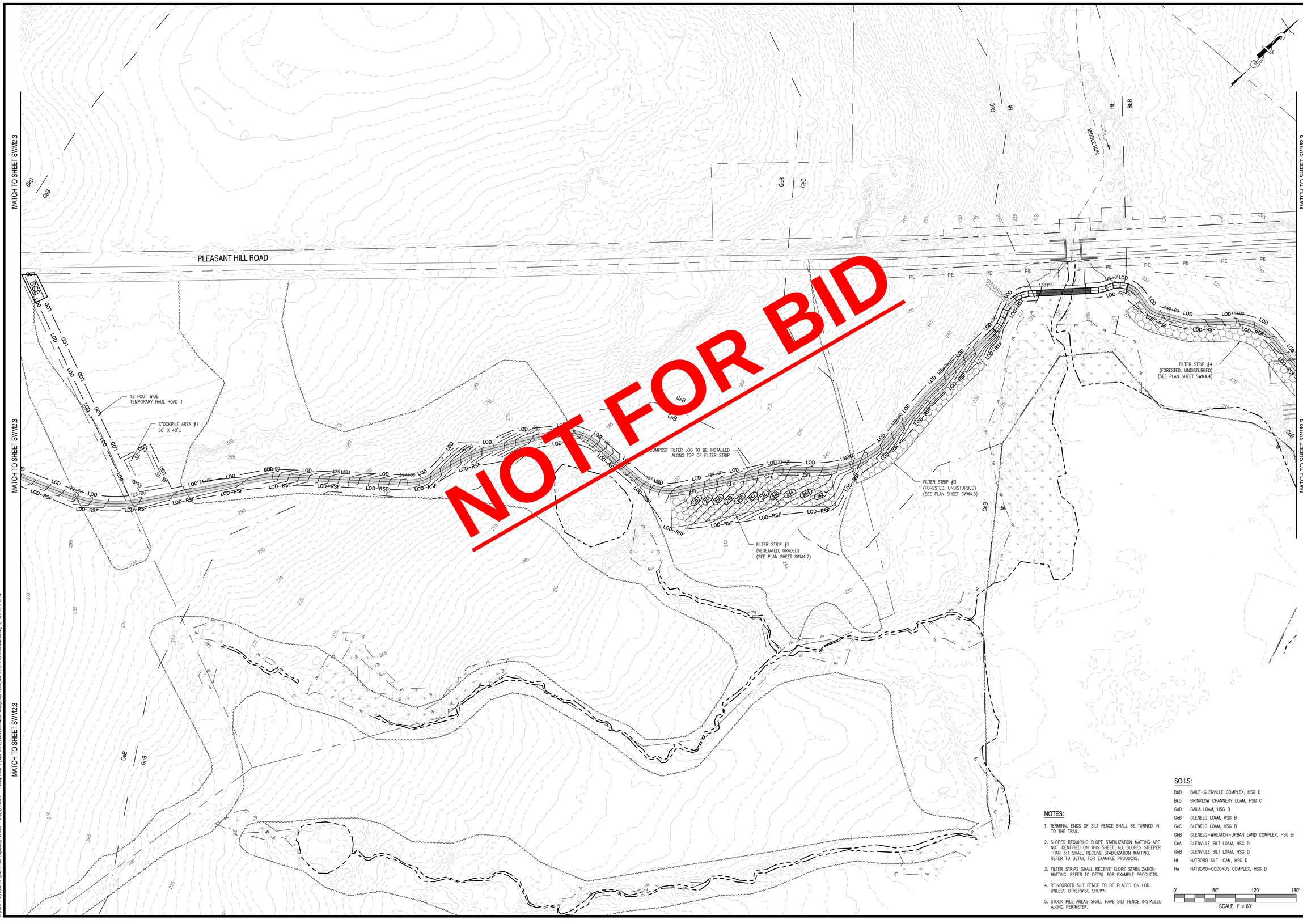
CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=60'
SHEET NO.: SWM2.1
CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.00 (DNREC Civil Engineering Services - 2017)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 2.0-2.3 Const Sed&SWMPlan.dwg, 3/13/2018 3:39 PM



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SOILS:

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BkD	BRINKLOW CHANNERY LOAM, HSG C
GoD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

0' 60' 120' 180'
SCALE: 1" = 60'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS
CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN 2

SEAL:

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901
CEI CONTRACT NO. 125002.25

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=60'
SHEET NO.: SWM2.2
CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.0E (NVBC: Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 2.0-2.3 Const\ConSWMPlan.dwg, 3/13/2018 3:39 PM

NOTES:

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2. SLOPES REQUIRING SLOPE STABILIZATION MATTING ARE NOT IDENTIFIED ON THIS SHEET. ALL SLOPES STEEPER THAN 3:1 SHALL RECEIVE STABILIZATION MATTING. REFER TO DETAIL FOR EXAMPLE PRODUCTS.
3. FILTER STRIPS SHALL RECEIVE SLOPE STABILIZATION MATTING. REFER TO DETAIL FOR EXAMPLE PRODUCTS.
4. REINFORCED SILT FENCE TO BE PLACED ON LOD UNLESS OTHERWISE SHOWN.
5. STOCK PILE AREAS SHALL HAVE SILT FENCE INSTALLED ALONG PERIMETER.
6. PROPOSED SWALE AT STA. 158+00 TO 159+42 TO BE STABILIZED PER "STABILIZATION MATTING – CHANNEL" DETAIL PROVIDED ON SWM DETAIL SHEETS.

SOILS:

BbB	BAILE–GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG–WHEATON–URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO–CODORUS COMPLEX, HSG D

0' 60' 120' 180'
SCALE: 1" = 60'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN 3

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=60'

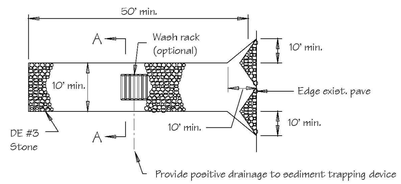
SHEET NO.: SWM2.3

CONTRACT NO.: 2017-WCCSP-07A

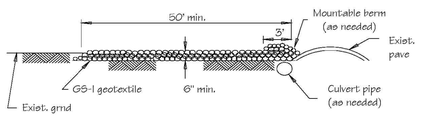
G:\PROJECTS\125002.00 (DNREC Civil Engineering Services – 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 2.0-2.3 Const\SwSWMPlan.dwg, 3/13/2018 3:39 PM

Standard Detail & Specifications

Stabilized Construct. Entrance



Plan



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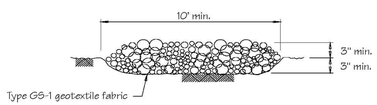


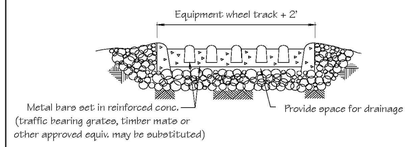
Section A-A (Std.)

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



Section A-A (Opt.)

Construction Notes:

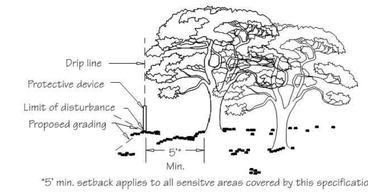
1. Stone size - Use DE #3 stone.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than size (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Geotextile - Type GS-1; 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

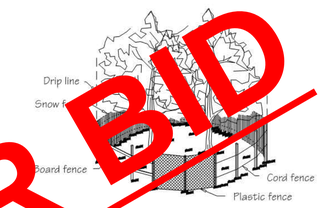
Standard Detail & Specifications

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 protection, 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

NOTE: PLASTIC FENCING SHALL BE USED FOR SENSITIVE AREA PROTECTION

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:

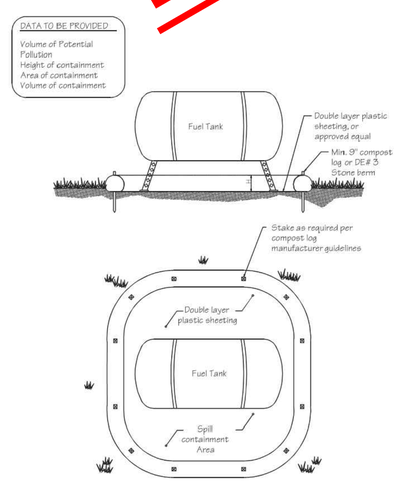
Fencing and armoring devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

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

Effective April 2016

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

NOT FOR BID

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE DETAILS AND NOTES

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: NOT TO SCALE

SHEET NO.: SWM3.0

CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.DE (DNREC Civil Engineering Services – 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 3.0-3.4 ConstSiteDetailsNotes.dwg, 3/13/2018 3:39 PM

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

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 [illegible] 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 [illegible]. The depth of topsoil to be salvaged shall be no more than the depth [illegible] as a representative profile for that particular soil type as described in the soil survey published by USDA-SCS in cooperation with Delaware Agricultural Experiment 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.

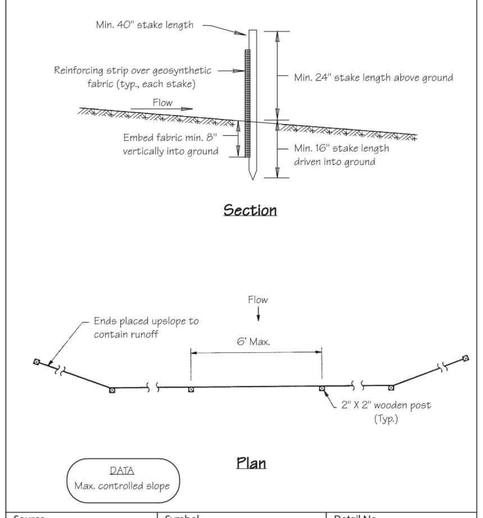
Compost amendments that are intended to meet specific post-construction stormwater management goals shall further meet the requirements of **Appendix 3.06.2 Post Construction Stormwater Management BMP Standards and Specifications, Section 14.0 Soil Amendments.**

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

Effective April 2016

Standard Detail & Specifications

Silt Fence

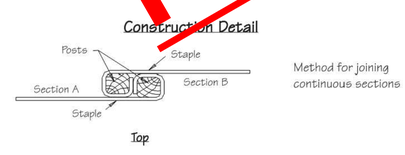


Source:	Symbol:	Detail No.
Adapted form MD Stds. & Specs. for ESC	SF	**DE-ESC-3.1.2.1** Sheet 1 of 2

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:

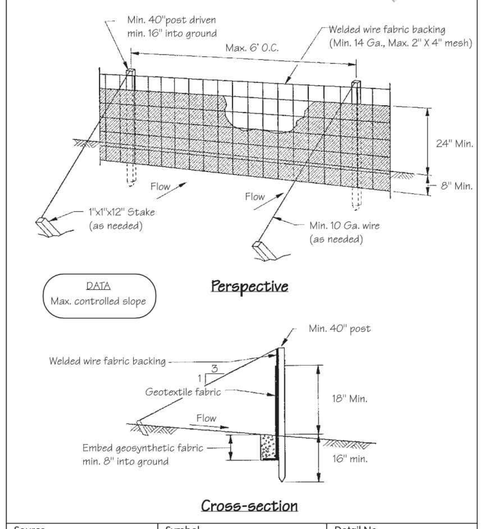
1. Stakes: Steel (either T or U) or 2" x 2" hardwood
2. Geosynthetic Fabric: Type GD-I
3. Reinforcing strip: Wooden lath, plastic strip or other approved equivalent
4. Prefabricated Unit: Geofab, Envirofence, or approved equivalent

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

Standard Detail & Specifications

Reinforced Silt Fence



Source:	Symbol:	Detail No.
Adapted from Transco, Inc.	RSF	**DE-ESC-3.1.2.2** Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications

Reinforced Silt Fence

Construction Notes:

1. Welded wire fabric to be fastened securely to the fence posts with wire ties or staples.
2. Filter cloth to be fastened securely to woven wire fence with ties spaced every 24 inches at top and mid-section.
3. When two sections of fabric adjoin each other, they shall be overlapped by six inches and folded.
4. Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

Materials:

1. Posts: Steel either T or U or 2" x 2" hardwood
2. Geotextile Fabric: Type GD-I
3. Prefabricated Unit: Geofab, Envirofence, or approved equivalent
4. Backing: Woven welded wire, 14 Ga., 2" X 4" mesh opening

Source:	Symbol:	Detail No.
Adapted from Transco, Inc.	RSF	**DE-ESC-3.1.2.2** Sheet 2 of 2

Effective April 2016

NOT FOR BID

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II

SEDIMENT & STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE DETAILS AND NOTES

SEAL:

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901
CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: NOT TO SCALE

SHEET NO.: SWM3.1

CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.00 (DNREC Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 3.0-3.4 ConstDetailsNotes.dwg, 3/13/2018 3:39 PM

Standard Detail & Specifications
Mulching

1. Materials and Amounts

a. *Straw* - Straw shall be unrotted small grain straw applied at the rate of 1-1/2 to 2 tons per acre, or 70 to 90 pounds (two bales) per 1,000 square feet. Mulch materials shall be relatively free of weeds and shall be free of noxious weeds such as; thistles, Johnsongrass, and quackgrass. Spread mulch uniformly by hand or mechanically. For uniform distribution of hand spread mulch, divide area into approximately 1,000 square feet sections and place 70-90 pounds (two bales) of mulch in each section.

b. *Wood chips* - Apply at the rate of approximately 6 tons per acre or 275 pounds per 1,000 square feet when available and when feasible. These are particularly well suited for utility and road rights-of-way. If wood chips are used, increase the application rate of nitrogen fertilizer by 20 pounds of N per acre (200 pounds of 10-10-10 or 66 pounds of 30-0-0 per acre).

c. *Hydraulically applied mulch* -The following conditions apply to hydraulically applied mulch:

i. Definitions:

a. Wood fiber mulch shall consist of specially prepared wood that has been processed to a uniform state, is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment, and consists of a minimum of 70% virgin or recycled wood fiber combined with 30% paper fiber and additives.

b. Blended fiber mulch shall consist of any hydraulic mulch that contains greater than 30% paper fiber. The paper component must consist of specially prepared paper that has been processed to a uniform fibrous state and is packaged for sale as a hydraulic mulch for use with hydraulic seeding equipment.

c. A bonded fiber matrix (BFM) consists of long strand, specially prepared wood fibers that have been processed to a uniform state held together by a water resistant bonding agent. BFMs shall contain no paper (cellulose) mulch but may contain small percentages of synthetic fibers to enhance performance.

d. Refer to **Figure 3.4.5a** for conditions and limitations of use for each of the above categories of hydraulic mulch.

ii. All components of the hydraulically applied mulches shall be pre-packaged by the manufacturer to assure material performance. Field mixing of the mulch components is acceptable, but must be done per manufacturers recommendations to ensure the proper results.

iii. Hydraulic mulches shall be applied with a viable seed and at manufacturer's recommended rates. Increased rates may be necessary based on site conditions.

iv. Hydraulically applied mulches and additives shall be mixed according to manufacturers recommendations.

iv. Materials within this category shall only be used when hydraulically applied mulch has been specified for use on the approved Sediment and Stormwater Plan, or supplemental approval from the plan approval agency has been obtained in writing for a specific area.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 1 of 3

Effective April 2016

Standard Detail & Specifications
Mulching

v. Application:

a. Apply product to geotechnically stable slopes that have been designed and constructed to divert runoff away from the face of the slope.

b. Do not apply to saturated soils, or if precipitation is anticipated within 24-48 hours.

c. During the spring (March 1 to May 31) and fall (September 1 to November 30) seasons, hydraulic mulches may be applied in a one-step process where all components are mixed together in single-tank loads. It is recommended that the product be applied from opposing directions to achieve optimum soil coverage.

d. During the summer (June 1 to August 31) and winter (December 1 to February 28) seasons, the following two-step process is required:

Step One– Mix and apply seed and soil amendments with a small amount of mulch for visual metering.

Step Two – Mix and apply mulch at manufacturers recommended rates over freshly seeded surfaces. Apply from opposing directions to achieve optimum soil coverage.

e. Minimum curing temperature is 40° F (4° C). The best results and more rapid curing are achieved at temperatures exceeding 60° F (15° C). Curing times may be accelerated in high temperature, low humidity conditions on dry soils.

vi. Recommended application rates are for informational purposes only. Conformance with this standard and specification shall be performance-based and requires **100% soil coverage**. Any areas with bare soil showing shall be top dressed until full coverage is achieved.

d. *Compost blanket (CB)* - Loosely applied with a pneumatic blower so that a 1" compost blanket uniformly covers the **soil with 100% coverage**. This application can be used with seed to promote germination by applying the approved seed mix directly into the loosely blown compost. The compost blanket performs best on slopes less than 2:1 and requires no mulch anchoring.

2. Anchoring mulch - Mulch must be anchored immediately to minimize loss by wind or water. This may be done by one of the following methods, depending upon size of area, erosion hazard, and cost.

a. *Crimping* - A crimper is a tractor drawn implement designed to punch and anchor mulch into the top two (2) inches of soil. This practice affords maximum erosion control but is limited to flatter slopes where equipment can operate safely. On sloping land, crimping should be done on the contour whenever possible.

b. *Tracking* - Tracking is the process of cutting mulch (usually straw) into the soil using a bulldozer or other equipment that runs on cleated tracks. Tracking is used primarily on slopes 3:1 or steeper and should be done up and down the slope with cleat marks running across the slope.

c. *Liquid mulch binders* - Applications of liquid mulch binders should be heavier at edges, in valleys, and at crests of banks and other areas where the mulch will be moved by wind or water. All other areas should have a uniform application of binder. The use of synthetic binders is the preferred method of mulch binding and should be applied at the rates recommended by the manufacturer.

d. *Paper fiber* - The fiber binder shall be applied at a net dry weight of 750 lbs/ac. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 lbs. of wood cellulose fiber per 100 gallons.

e. *Nettings* - Synthetic or organic nettings may be used to secure straw mulch. Install and secure according to the manufacturers recommendations.

Source:	Symbol:	Detail No.
Delaware ESC Handbook & Filtrexx™ International		**DE-ESC-3.4.5** Sheet 2 of 3

Effective April 2016

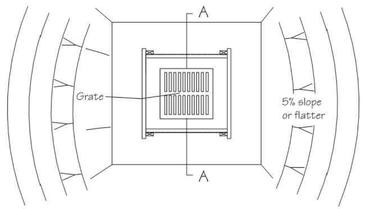
Standard Detail & Specifications
Mulching

MULCHING MATERIAL SELECTION GUIDE

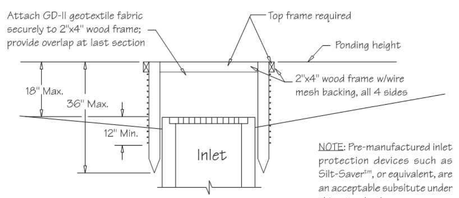
Percent Slope	Mulch / App. Rate*	Dec. 1 to Feb. 28(29)	March 1 to May 31	June 1 to Aug. 31	Sept. 1 to Nov. 30
Less than 2:1	Straw @ 2000 lbs/ac. minimum Straw @ 2 Tons/ac. Max. Straw @ 3000 lbs/ac. min. Straw @ 2 Tons/ac. Max. Straw @ 3 Tons/ac. Max. * Compost Blanket (CB)	xxxx

Standard Detail & Specifications

Inlet Protection - Type 1



Plan



Section A-A

Source:	Symbol:	Detail No.
Adapted from Erosion Draw Manual J. McCullah & Assoc.	IP-1	DE-ESC-3.1.5.1 Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications

Inlet Protection - Type 1

Construction Notes:

1. Excavate completely around inlet to a depth of 18" below grate elevation.
2. Drive 2" x 4" post 1' into ground at four corners of inlet. Place nail strips between posts on ends of inlet. Assemble top portion of 2" x 4" frame using overlap joint shown. Top of frame (weir) must be 6" below edge of roadway adjacent to inlet.
3. Stretch wire mesh tightly around frame and fasten securely. Ends must meet at post.
4. Stretch geotextile fabric tightly over wire mesh, the cloth must extend from top of frame to 18" below inlet grate elevation. Fasten securely to frame. Ends must meet at post, be overlapped and folded, then fastened down.
5. Backfill around inlet in compacted 6" layers until at least 12" of geotextile fabric is buried.
6. If the inlet is not in a low point, construct a compacted earth dike in the ditchline below it. The top of this dike is to be at least 6" higher than the top of frame (weir).
7. This structure must be inspected frequently and the filter fabric replaced when clogged.

Materials:

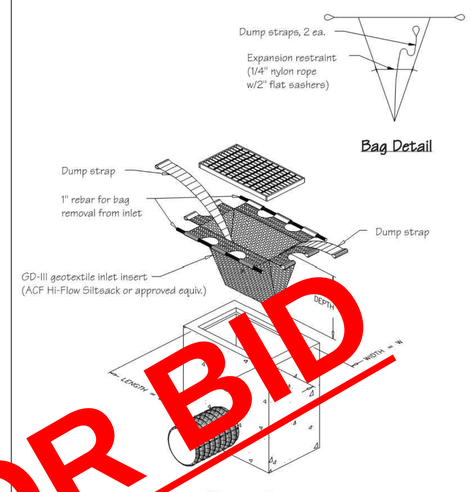
1. Wooden frame is to be constructed of 2" x 4" construction grade lumber.
2. Wire mesh must be of sufficient strength to support filter fabric with water fully impounded against it.
3. Geotextile fabric: Type GD-II

Source:	Symbol:	Detail No.
Adapted. from Erosion Draw Manual J. McCullah & Assoc.	IP-1	DE-ESC-3.1.5.1 Sheet 2 of 2

Effective April 2016

Standard Detail & Specifications

Inlet Protection - Type 2



Perspective

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	IP-2	DE-ESC-3.1.5.2 Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications

Inlet Protection - Type 2

Notes:

1. This practice shall only be used in situations in which Inlet Protection - Type 1 cannot be used due to site constraints. These include, but are not limited to partially completed parking areas, streets, roads, etc.
2. It may be necessary to transition from Type 1 to Type 2 Inlet Protection as construction proceeds.
3. For areas where there is a concern for oil run-off or spills, insert shall meet one of the above specifications with an oil-absorbant pillow or shall be made completely from an oil-absorbant material with a woven pillow.

Materials:

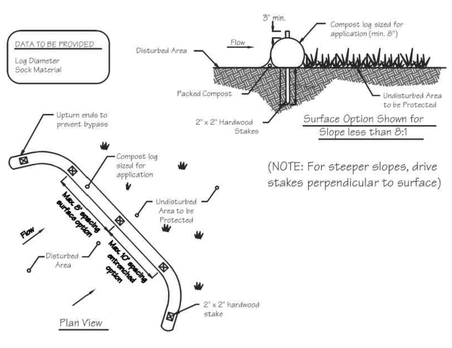
The geotextile inlet insert shall meet or exceed the specifications of Type GD-III geotextile in accordance with Appendix A-3 of the Delaware Erosion & Sediment Control Handbook.

Source:	Symbol:	Detail No.
Adapted from ACF Products, Inc.	IP-2	DE-ESC-3.1.5.2 Sheet 2 of 2

Effective April 2016

Standard Detail & Specifications

Compost Filter Log



(NOTE: For steeper slopes, drive stakes perpendicular to surface)

NOTE:
LOG DIAMETER: 18"
MATERIAL: 3MIL HDPE MIN.

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	DE-ESC-3.1.7 Sheet 1 of 2

Effective April 2016

Standard Detail & Specifications

Compost Filter Log

Construction Notes:

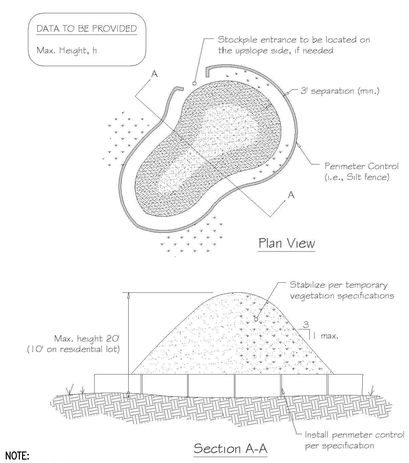
1. Prior to installation, clear bedding area of obstructions including rocks or debris larger than 1 inch and fill in any sharp depression areas.
2. Fill the sock fabric using a pneumatic blower so that the logs are rigid and do not deform. Terminate at the desired length.
3. For trenched applications, excavate 2 to 4 inches below grade along the width and length of the compost filter log.
4. Install the compost filter logs perpendicular to the flow direction and parallel to the slope with the beginning and end of the installation pointing up the slope a minimum of 1 foot elevation difference. On sites where this is not possible, upturn at a minimum length of 10' at a 30 degree angle to prevent runoff bypass.
5. For untrenched applications, blow or hand pack soil, mulch, or compost on the upslope side of the log, filling the bottom void area.
6. Stake the filled log every 10 feet maximum through the center of the sock for trenched applications, or every 8 feet for untrenched. The stake shall be a 2" by 2" hardwood. It should extend 12" below grade and protrude at least 3" above the top of the sock. If located on a slope greater than 8:1, the stake shall be angled downslope at a 45 degree angle to prevent the force of the water from dislodging to log.
7. When the length of the compost filter log needed exceeds the available compost filter sock length, the next sock shall be overlapped a minimum of 12" before being filled, and a stake placed through both socks at the overlap.
8. Remove accumulated sediment when it has reached half of the effective height of the log.
9. Inspect weekly and after rain event. If sock is degrading or the sock is failing, vegetate to secure the compost, replace the log, or reinforce with an additional log. If the log has been crushed due to construction equipment, it can be "fluffed" back to its effective height. If the effective height can no longer be restored, the log shall be replaced or reinforced with an additional compost filter log.

Source:	Symbol:	Detail No.
Adapted from MD Stds & Specs for ESC & Filtrexx™ International	CFL	DE-ESC-3.1.7 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

NOT FOR BID

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE DETAILS AND NOTES

SEAL:

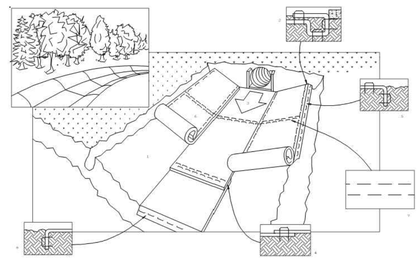
CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901
CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: NOT TO SCALE
SHEET NO.: SWM3.3
CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.00 (DNREC Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 3.3-3.4 Const Det\MCDetails.dwg, 3/13/2018 3:45 PM

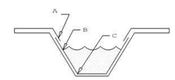
Standard Detail & Specifications
Stabilization Matting - Channel



Perspective

CRITICAL POINTS

A. Overlaps and seams
B. Projected waterline
C. Channel bottom/side slope vertices



Note: Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

Use manufacturer's recommendations for stapling patterns for channel installations.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-C	DE-ESC-3.4.6.1 Sheet 1 of 3

NOTE: SOIL STABILIZATION MATTING TYPE 2 (SSM-2) SHALL BE USED FOR CHANNEL STABILIZATION. EXAMPLE PRODUCTS INCLUDE: NORTH AMERICAN GREEN S150BN, AND EAST COAST EROSION BLANKET ECS-2B.

Effective April 2016

Standard Detail & Specifications
Stabilization Matting - Channel

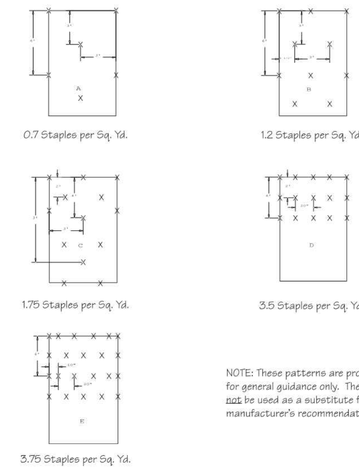
Construction Notes:

1. Prepare soil before installing matting, including application of lime, fertilizer, and seed.
2. Begin at the top of the channel by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact the trench after stapling.
3. Roll center mat in direction of water flow on bottom of channel.
4. Place mats end over end (shingle style) with a 6" overlap, use a double row of staggered staples 4" apart to secure mats.
5. Full Length edge of mats at top of side slopes must be anchored in 6" deep X 6" wide trench; backfill and compact the trench after stapling.
6. Mats on side slopes must be overlapped 4" over the center mat and stapled.
7. In high flow channel applications, a staple check slot should be installed at 30 to 40 foot intervals. Use a row of staples 4" apart over entire width of the channel. Place a second row 4" below the first row in a staggered pattern.
8. The terminal end of the mats must be anchored in a 6" wide trench. Backfill and compact the trench after stapling.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-C	DE-ESC-3.4.6.2 Sheet 2 of 3

Effective April 2016

Standard Detail & Specifications
Stabilization Matting - Channel



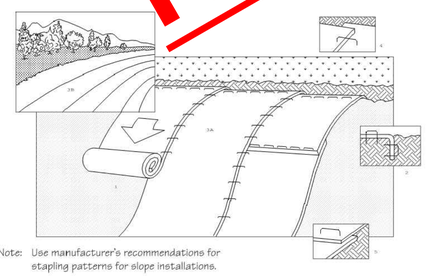
NOTE: These patterns are provided for general guidance only. They shall not be used as a substitute for manufacturer's recommendations.

Stapling Patterns

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-C	DE-ESC-3.4.6.2 Sheet 3 of 3

Effective April 2016

Standard Detail & Specifications
Stabilization Matting - Slope



Note: Use manufacturer's recommendations for stapling patterns for slope installations.

Perspective

Construction Notes:

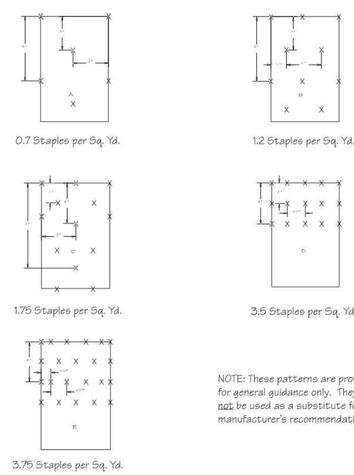
1. Prepare soil before installing matting, including application of lime, fertilizer, and seed.
2. Begin at the top of the slope by anchoring the mat in a 6" deep X 6" wide trench. Backfill and compact trench after stapling.
3. Roll the mats (A) down or (B) horizontally across the slope.
4. The edges of parrallel mats must be stapled with approx. 2" overlap.
5. When mats must be spliced down the slope, place mats end over end (shingle style) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 1 of 2

NOTE: SOIL STABILIZATION MATTING TYPE 1 (SSM-1) SHALL BE USED FOR FILTER STRIP STABILIZATION, AND SLOPES 3:1 AND STEEPER. EXAMPLE PRODUCTS INCLUDE: NORTH AMERICAN GREEN S75BN, AMERICAN EXCELSIOR CURLEX 1, PPS PACKING XCEL STRAW REGULAR SR1, AND EAST COAST EROSION BLANKET ECS-1B.

Effective April 2016

Standard Detail & Specifications
Stabilization Matting - Slope



NOTE: These patterns are provided for general guidance only. They shall not be used as a substitute for manufacturer's recommendations.

Stapling Patterns

Source:	Symbol:	Detail No.
Adapted from North American Green, Inc.	SM-S	DE-ESC-3.4.6.1 Sheet 2 of 2

Effective April 2016

Standard Detail & Specifications
Dust Control

Temporary Methods:

1. Mulches - See **DE-ESC-3.4.5**, Standard Detail and Specifications for Mulching.
2. Vegetative cover - See **DE-ESC-3.4.3**, Std. Detail and Specifications for Vegetative Stabilization.
3. Adhesives - Use on mineral soils only (not effective on muck soils). Keep traffic off these areas. The following table may be used for general guidance.

Type of Emulsion	Water Dilution	Type of Nozzle	Apply Gal/Ac.
Latex emulsion	12.5:1	Fine spray	235
Resin-in-water emulsion	4.1	Fine spray	300
Acrylic emulsion (non-traffic)	7:1	Coarse spray	450
Acrylic emulsion (traffic)	3.5:1	Coarse spray	350

4. Tillage - For emergency temporary treatment, scarify the soil surface to prevent or reduce the amount of blowing dust until a more appropriate solution can be implemented. Begin the tillage operation on the windward side of the site using a chisel-type plow for best results.
5. Sprinkling - Sprinkle site with water until the surface is moist . Repeat as needed.
6. Calcium Chloride - Apply as flakes or granular material with a spreader at a rate that will keep the soil surface moist. Re-apply as necessary.
7. Barriers - Place barriers such as soild board fences, snow fences, hay bales, etc. at right angles to the prevailing air currents at intervals of approx. 10X their height.

Permanent Methods:

1. Vegetative cover - See **DE-ESC-3.4.3**, Std. Detail and Specifications for Vegetative Stabilization.
2. Stone - Apply layer of crushed stone or coarse gravel to protect soil surface.

Source:	Symbol:	Detail No.
Adapted from VA ESC Handbook		DE-ESC-3.4.8 Sheet 1 of 1

Effective April 2016

NOT FOR BID

REVISIONS:
DATE: DESCRIPTION: BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

CONSTRUCTION SITE DETAILS AND NOTES

SEAL:

CIVIL ENGINEER:
CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901
CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: NOT TO SCALE
SHEET NO.: SWM3.4
CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.DE (DNREC Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 3.0-3.4 CoverSheet&Details.dwg, 3/13/2018 3:40 PM

NOTE:
FIVE FOOT CONTOURS SHOWN FOR CLARITY.

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

0' 200' 400' 600'
SCALE: 1" = 200'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

OVERALL POST CONSTRUCTION STORMWATER MANAGEMENT SHEET LAYOUT

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=200'

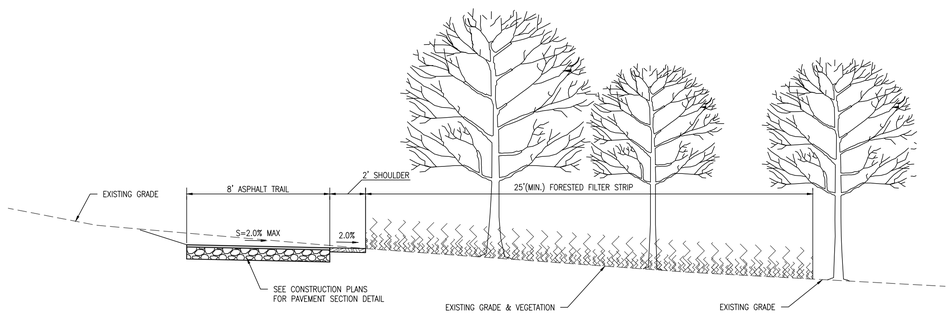
SHEET NO.: SWM4.0

CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.06 (DNREC Civil Engineering Services - 2017)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 4.0-4.4 PostConstrSWMPlan.dwg, 3/13/2018 3:52 PM

FILTER STRIP #1 - PLAN VIEW

SCALE: 1" = 30'



FILTER STRIP #1 (FORESTED, UNDISTURBED)

STA. 104+00 - 109+50

SCALE: 1" = 4'

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GgD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

FORESTED FILTER STRIP NOTES

1. NO GRADING OR CLEARING OF NATIVE VEGETATION IS ALLOWED WITHIN THE FORESTED FILTER STRIP.
2. FORESTED FILTER STRIPS MUST HAVE AT LEAST 80% TREE CANOPY COVERAGE.

FORESTED FILTER STRIP MAINTENANCE

1. REMOVE TRASH AND DEBRIS ON A REGULAR BASIS.

GENERAL NOTES

1. THE DNREC SEDIMENT AND STORMWATER PROGRAM RESERVES THE RIGHT TO ENTER PRIVATE PROPERTY FOR PURPOSES OF PERIODIC SITE REVIEWS.
2. THE DNREC SEDIMENT AND STORMWATER PROGRAM SHALL BE NOTIFIED WITHIN 30 BUSINESS DAYS IF THE PROPERTY OWNERSHIP IS TRANSFERRED TO A NEW PERSON OR ENTITY.
3. THE DNREC SEDIMENT AND STORMWATER PROGRAM MAY SEEK ENFORCEMENT ACTION AGAINST ANY OWNER DEEMED NEGLIGENT IN FULFILLING THE OPERATION AND MAINTENANCE REQUIREMENTS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
4. THE DNREC SEDIMENT AND STORMWATER PROGRAM SHALL BE CONTACTED IF A CONCERN ARISES REGARDING A STORMWATER MANAGEMENT FACILITY, BEFORE ANY NON-ROUTINE MAINTENANCE, OR IF MODIFICATIONS TO THE FACILITY ARE DESIRED.
5. ANY DESIGN MODIFICATIONS MADE TO THE STORMWATER SYSTEM SHALL REQUIRE THE CREATION OF A NEW POST CONSTRUCTION STORMWATER MANAGEMENT PLAN AND/OR OPERATIONS AND MAINTENANCE PLAN, WITH APPROVAL OF THE PLAN(S) BY THE DNREC SEDIMENT AND STORMWATER PROGRAM.
6. FOR ALL STORMWATER EASEMENT AREAS (I.E., ACCESS, MAINTENANCE, OR OFFSITE) AND THE MINIMUM 10-FOOT WIDE ACCESSWAYS TO ALL STORMWATER FACILITIES AND THEIR STRUCTURAL COMPONENTS, REGULAR MOWING SHALL BE PERFORMED TO KEEP THE GRASS 6" OR LESS; NO TREES OR SHRUBS SHALL BE PLANTED, AND ANY FOUND GROWING SHALL BE REMOVED; AND NO PERMANENT STRUCTURES, SUCH AS FENCES OR SHEDS, SHALL BE LOCATED WITHIN THE EASEMENT OR ACCESSWAY.
7. TREES SHALL NOT BE PLANTED, AND SHALL BE REMOVED IF FOUND GROWING, ON AND WITHIN 15 FEET OF ALL POND EMBANKMENTS, ON POND SLOPES OR SAFETY BENCHES, AND WITHIN 10 FEET OF STRUCTURAL COMPONENTS, SUCH AS PIPE INLETS.
8. WHEN THE FACILITY IS EXCAVATED TO REMOVE ACCUMULATED SEDIMENT, THE DISPOSAL AREA SHALL BE PERMANENTLY STABILIZED SO THAT IT DOES NOT RECREATE AN EROSION PROBLEM. ANY MATERIAL TAKEN OFF-SITE SHALL STILL BE UTILIZED OR DISPOSED OF IN AN APPROVED DNREC MANNER.
9. BEFORE ANY EARTHWORK OR EXCAVATION TAKES PLACE, THE CONTRACTOR SHALL CALL MISS UTILITY AT 811 OR 1.800.282.8555 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, TO HAVE ALL EXISTING UTILITIES MARKED ONSITE.

0' 30' 60' 90'

SCALE: 1" = 30'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II

SEDIMENT & STORMWATER MANAGEMENT PLANS

POST CONSTRUCTION STORMWATER MANAGEMENT PLAN, FILTER STRIP #1

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING

CONSULTING ENGINEERS, SURVEYORS

4134 N. DUPONT HWY.

DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

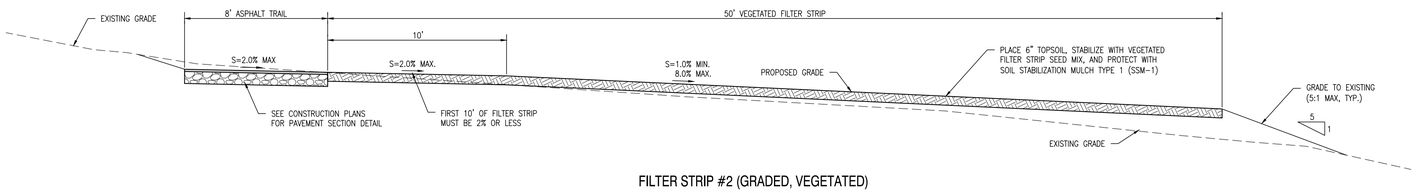
SHEET NO.: SWM4.1

CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.DE (DNREC Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase II\CADD FILES\Sheets\Stormwater Management Plans\SWM 4.0-4.4 PostConstSWMPlan.dwg, 3/13/2018 3:53 PM

FILTER STRIP #2 - PLAN VIEW

SCALE: 1" = 30'



FILTER STRIP #2 (GRADED, VEGETATED)

STA. 131+30 - 133+70

SCALE: 1" = 4'

FILTER STRIP MAINTENANCE

FUNCTION:

FILTER STRIPS SPREAD RUNOFF UNIFORMLY OVER A FILTERING SURFACE OF VEGETATION, PROVIDING INFILTRATION AND POLLUTANT REMOVAL. FILTER STRIPS CAN PROVIDE SUBSTANTIAL TREATMENT AS LONG AS THEY ARE NOT OVERWHELMED BY SEDIMENT AND RUNOFF.

INSPECTION:

SEMI-ANNUAL (SPRING AND FALL) & AFTER STORM EVENTS OF 2 INCHES OR MORE.

TRASH AND DEBRIS:

REMOVE TRASH AND DEBRIS ON A REGULAR BASIS.

SOIL:

SOIL SHOULD BE TESTED ANNUALLY TO ENSURE PROPER PH AND FERTILITY INCLUDING: ORGANIC MATTER, MAGNESIUM (MG), PHOSPHORUS (P_2O_5), NITROGEN (N), POTASSIUM (K2O), AND SOLUBLE SALTS. IF REQUIRED, FERTILIZER SHOULD ONLY BE APPLIED IN THE FALL.

EROSION:

IF BARE SOIL EXISTS WITHIN ANY AREA OF FILTER STRIP, RESEED AND/OR REPLANT AS REQUIRED BASED UPON INSPECTION FINDINGS. STABILIZE APPLICABLE ERODED AREAS WITH ROLLED EROSION CONTROL PRODUCTS (RECP) OR TURF REINFORCING MATS (TRM), AS REQUIRED. IF RECP IS APPLIED, IT IS RECOMMENDED TO USE TRULY BIODEGRADABLE PRODUCTS TO AID IN MOWING MAINTENANCE AND DETER WILDLIFE ENTANGLEMENT. THESE PRODUCTS CAN BE RECOGNIZED AS HAVING "BN" FOR BIONETTING OR "B" FOR BIODEGRADABLE.

MOWING:

MOW AS NEEDED BETWEEN SEPTEMBER 1 AND 30 TO ALLOW FOR REGROWTH OF WINTER COVER WHILE AVOIDING POTENTIAL NEGATIVE EFFECTS ON WILDLIFE SUCH AS NESTING BIRDS. USE MULCHING MOWER TO ENSURE THAT NUTRIENTS ARE RECYCLED. FOR WARM SEASON GRASSES, THE PREVIOUS SEASON'S STALKS SHOULD BE CUT DOWN TO 8-12 INCHES IN EARLY SPRING (MID MARCH), BEFORE NEW SEASON'S GROWTH EMERGES. THE APPROVED PLAN WILL SPECIFY THE MOW HEIGHT. FILTER STRIP VEGETATION SHOULD BE MAINTAINED AT A HEIGHT OF 2 TIMES THE DEPTH OF FLOW DURING THE QUALITY STORM, WHICH IS A MINIMUM 3-INCH HEIGHT.

SEEDING:

VEGETATED FILTER STRIP SEED MIX SHALL BE BEDDED FOR ALL PERMANENT SEEDING IN FILTER STRIP AREAS. SEE SWM DETAIL SHEET FOR SPECIFICATION.

BUFFERS:

NA

FENCING:

NA

SPECIAL CONSIDERATIONS:

CONSULT THE DELAWARE DEPARTMENT OF AGRICULTURE FOR LICENSING REQUIREMENTS PERTAINING TO THE APPLICATION OF CHEMICALS.

HIRE A PROFESSIONAL:

REPAIR OF SEVERE EROSION; VEGETATION CONTROL (CHEMICAL APPLICATION) IF LICENSING REQUIRED BY DE DEPARTMENT OF AGRICULTURE.

GENERAL NOTES

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SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GoD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

FILTER STRIP SEQUENCE OF CONSTRUCTION

1. BEFORE SITE WORK BEGINS, FILTER STRIP BOUNDARIES SHOULD BE CLEARLY MARKED.
2. ONLY VEHICULAR TRAFFIC USED FOR FILTER STRIP CONSTRUCTION SHOULD BE ALLOWED WITHIN THE FILTER STRIP BOUNDARY.
3. IF EXISTING TOPSOIL IS STRIPPED DURING GRADING, IT SHALL BE STOCKPILED FOR LATER USE.
4. CONSTRUCTION RUNOFF SHOULD BE DIRECTED AWAY FROM THE PROPOSED FILTER STRIP SITE, USING PERIMETER SILT FENCE, OR, PREFERABLY, A DIVERSION DIKE.
5. FILTER STRIPS REQUIRE LIGHT GRADING TO ACHIEVE DESIRED ELEVATIONS AND SLOPES. THIS SHOULD BE DONE WITH TRACKED VEHICLES TO PREVENT COMPACTION. TOPSOIL AND OR COMPOST AMENDMENTS SHOULD BE INCORPORATED EVENLY ACROSS THE FILTER STRIP AREA, STABILIZED WITH SEED (VEGETATED FILTER STRIP SEED MIX), AND PROTECTED BY BIODEGRADABLE EROSION CONTROL MATTING OR BLANKETS (SSM TYPE 1).

   EXAMPLE PRODUCTS INCLUDE: NORTH AMERICAN GREEN S75BN, AMERICAN EXCELSIOR CURLEX 1, PPS PACKING XCEL STRAW REGULAR SR1, AND EAST COAST EROSION BLANKET ECS-1B
6. STORMWATER SHOULD NOT BE DIVERTED INTO THE FILTER STRIP UNTIL THE TURF COVER IS DENSE, WELL ESTABLISHED, AND APPROVED BY THE SITE CCR.

0' 30' 60' 90'

SCALE: 1" = 30'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II

SEDIMENT & STORMWATER MANAGEMENT PLANS

POST CONSTRUCTION STORMWATER MANAGEMENT PLAN, FILTER STRIP #2

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING

CONSULTING ENGINEERS, SURVEYORS

4134 N. DUPONT HWY.

DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1"=30'

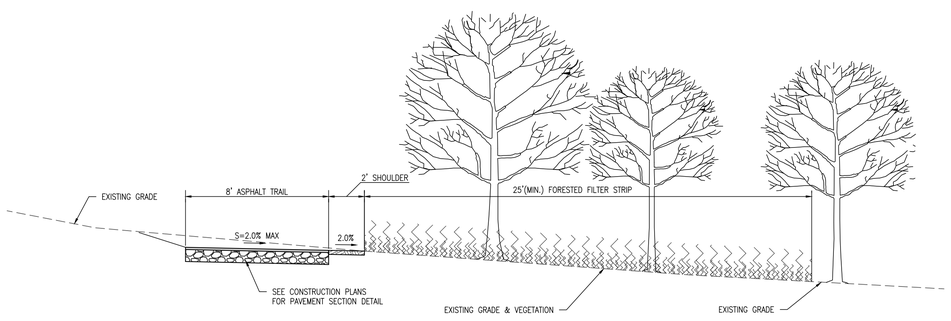
SHEET NO.: SWM4.2

CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.0E (DNREC Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 4.0-4.4 PostConstrSWMPlan.dwg, 3/13/2018 3:53 PM

FILTER STRIP #3 - PLAN VIEW

SCALE: 1" = 30'



FILTER STRIP # 3 (FORESTED, UNDISTURBED)

STA. 134+00-136+50

SCALE: 1" = 4'

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN LAND COMPLEX, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

FORESTED FILTER STRIP NOTES

1. NO GRADING OR CLEARING OF NATIVE VEGETATION IS ALLOWED WITHIN THE FORESTED FILTER STRIP.
2. FORESTED FILTER STRIPS MUST HAVE AT LEAST 80% TREE CANOPY COVERAGE.

FORESTED FILTER STRIP MAINTENANCE

1. REMOVE TRASH AND DEBRIS ON A REGULAR BASIS.

GENERAL NOTES

1. THE DNREC SEDIMENT AND STORMWATER PROGRAM RESERVES THE RIGHT TO ENTER PRIVATE PROPERTY FOR PURPOSES OF PERIODIC SITE REVIEWS.
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0' 30' 60' 90'

SCALE: 1" = 30'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

POST CONSTRUCTION STORMWATER MANAGEMENT PLAN,
FILTER STRIP #3

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

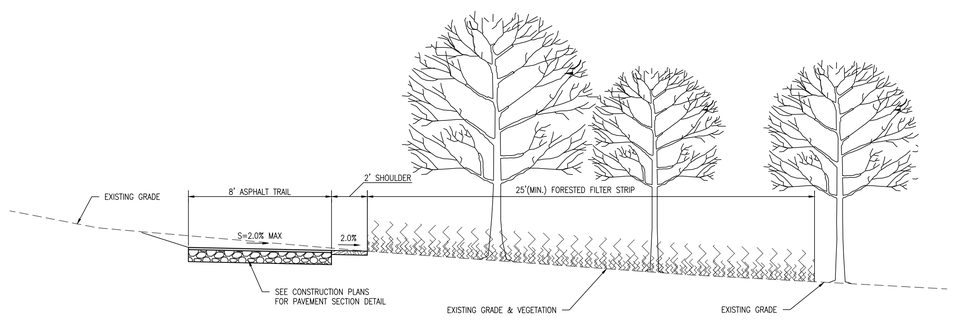
SCALE: 1"=30'

SHEET NO.: SWM4.3

CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.00 (DNREC Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 4.0-4.4 PostConstSWMPlan.dwg, 3/13/2018 4:11 PM

FILTER STRIP #4 - PLAN VIEW
SCALE: 1" = 40'



FILTER STRIP #4 (FORESTED, UNDISTURBED)
(STA. 139+50 - 147+80)
SCALE: 1" = 4'

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
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GnA	GLENVILLE SILT LOAM, HSG D
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FORESTED FILTER STRIP NOTES

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FORESTED FILTER STRIP MAINTENANCE

1. REMOVE TRASH AND DEBRIS ON A REGULAR BASIS.

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3. THE DNREC SEDIMENT AND STORMWATER PROGRAM MAY SEEK ENFORCEMENT ACTION AGAINST ANY OWNER DEEMED NEGLIGENT IN FULFILLING THE OPERATION AND MAINTENANCE REQUIREMENTS OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
4. THE DNREC SEDIMENT AND STORMWATER PROGRAM SHALL BE CONTACTED IF A CONCERN ARISES REGARDING A STORMWATER MANAGEMENT FACILITY, BEFORE ANY NON-ROUTINE MAINTENANCE, OR IF MODIFICATIONS TO THE FACILITY ARE DESIRED.
5. ANY DESIGN MODIFICATIONS MADE TO THE STORMWATER SYSTEM SHALL REQUIRE THE CREATION OF A NEW POST CONSTRUCTION STORMWATER MANAGEMENT PLAN AND/OR OPERATIONS AND MAINTENANCE PLAN, WITH APPROVAL OF THE PLAN(S) BY THE DNREC SEDIMENT AND STORMWATER PROGRAM.
6. FOR ALL STORMWATER EASEMENT AREAS (I.E., ACCESS, MAINTENANCE, OR OFFSITE) AND THE MINIMUM 10-FOOT WIDE ACCESSWAYS TO ALL STORMWATER FACILITIES AND THEIR STRUCTURAL COMPONENTS, REGULAR MOWING SHALL BE PERFORMED TO KEEP THE GRASS 6" OR LESS; NO TREES OR SHRUBS SHALL BE PLANTED, AND ANY FOUND GROWING SHALL BE REMOVED; AND NO PERMANENT STRUCTURES, SUCH AS FENCES OR SHEDS, SHALL BE LOCATED WITHIN THE EASEMENT OR ACCESSWAY.
7. TREES SHALL NOT BE PLANTED, AND SHALL BE REMOVED IF FOUND GROWING, ON AND WITHIN 15 FEET OF ALL POND EMBANKMENTS, ON POND SLOPES OR SAFETY BENCHES, AND WITHIN 10 FEET OF STRUCTURAL COMPONENTS, SUCH AS PIPE INLETS.
8. WHEN THE FACILITY IS EXCAVATED TO REMOVE ACCUMULATED SEDIMENT, THE DISPOSAL AREA SHALL BE PERMANENTLY STABILIZED SO THAT IT DOES NOT RECREATE AN EROSION PROBLEM. ANY MATERIAL TAKEN OFF-SITE SHALL STILL BE UTILIZED OR DISPOSED OF IN AN APPROVED DNREC MANNER.
9. BEFORE ANY EARTHWORK OR EXCAVATION TAKES PLACE, THE CONTRACTOR SHALL CALL MISS UTILITY AT 811 OR 1.800.282.8555 AT LEAST 48 HOURS PRIOR TO CONSTRUCTION, TO HAVE ALL EXISTING UTILITIES MARKED ONSITE.

0' 40' 80' 120'
SCALE: 1" = 40'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

POST CONSTRUCTION STORMWATER MANAGEMENT PLAN,
FILTER STRIP #4

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: 1"=40'
SHEET NO.: SWM4.4
CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.00 (DNREC Civil Engineering Services - 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 4.0-4.4 PostConstrSWMPlan.dwg, 3/13/2018 3:53 PM

Summary Table for Sub-Areas Draining to a Common Point of Interest (POI)[1]

		POI:	POA 1, 2, and 3						
Ref. #	**Sub-Area ID[2]**	**Contributing Area (ac)**	**RPv Runoff Reduction Shortfall(+) or Credit(-) (cu.ft.)[3]**	**Adjusted RPv CN after all reductions[4]**	**Cv RCN for H&H Modeling[4]**	**Fv RCN for H&H Modeling[4]**	**TN Pollutant Load (lb/yr)**	**TP Pollutant Load (lb/yr)**	**TSS Pollutant Load (lb/yr)**
1	DA-1A	8.96	696	63.30	63.30	63.30	32.79	4.43	819.73
2	DA-1A-FS1	4.31	-2420	51.39	56.80	58.31	7.61	1.03	190.14
3	DA-1B	17.76	978	65.16	65.16	65.16	71.92	9.71	1797.89
4	DA-2A	18.49	1115	68.83	68.83	68.83	90.70	12.24	2267.46
5	DA-2A-FS2	1.61	-419	60.29	61.24	63.01	4.97	0.67	124.22
6	DA-2B	2.24	133	65.65	65.65	65.65	9.31	1.26	232.81
7	DA-2B-FS3	1.62	-1009	51.18	57.33	58.87	2.82	0.38	70.41
8	DA-2C	26.02	956	64.75	64.75	64.75	103.06	13.91	2576.61
9	DA-2C-FS4	3.78	-1863	69.57	71.38	73.72	19.25	2.60	481.26
10	DA-3	1.70	258	69.73	69.73	69.73	8.73	1.18	218.17
11									
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Totals to Common POI		**86.49 ac**	**-1575 cu.ft.**	**64.89**	**65.37**	**65.61**	**351.16 lb/yr**	**47.41 lb/yr**	**8778.70 lb/yr**
RPv Runoff Reduction Goal Met?			**YES**						
If Not, Total Offset Volume Required			**N/A**						

Notes:
1. As long as the site lies within the same watershed, all sub-areas within the site can be tallied to reflect global site conditions; or, the summary table can be used to show conditions to a specific POI.
2. Only the most downstream sub-area information should be entered for a series of sub-areas that drain directly into each other, as the upstream areas will already be accounted for in the DURMM computations.
3. A RPv runoff reduction shortfall should be entered as a positive number, as it is the runoff volume still needed to be reduced. A RPv credit should be entered as a negative number, as it indicates the additional volume that was reduced past the requir
4. To portray an accurate total weighted CN value for the RPv, Cv and Fv events, an entry must be made for every defined sub-area. If a sub-area's contributing drainage acreage is entered, but not its corresponding CN value, then the total weighted CN wi

NOT FOR BID

Cv and Fv Compliance Summary

POA	Conveyance Event (Cv)				Flooding Event (Fv)			
	Runoff Volume (Ac-ft)		Peak Discharge (CFS)		Runoff Volume (Ac-ft)		Peak Discharge (CFS)	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST
1A	1.841	1.456	27.65	20.90	4.557	3.933	70.49	60.54
1B	2.796	2.252	31.51	24.38	6.607	5.763	76.69	66.42
1*	4.637	3.708	54.50	41.55	11.165	9.696	136.66	117.54
2A	4.555	2.912	43.90	26.72	9.422	7.094	90.30	68.14
2B	0.512	0.445	9.72	8.29	1.289	1.180	24.84	22.76
2C	5.478	3.956	85.01	59.43	12.232	9.952	189.19	154.77
2*	10.545	7.313	118.81	79.80	22.943	18.226	263.98	211.49
3	0.360	0.268	7.26	5.41	0.764	0.632	14.97	12.70

*Represents cumulative total for all POA 1 and 2 sub-areas

Post-Development Contributing Drainage Area Summary

Subarea ID	BMP	LOD Contributing Area (Ac.)									OLOD Contributing Area (Ac.)												RCN	Total Contributing Area (Ac.)
		HSG B			HSG C			HSG D			HSG B				HSG C				HSG D					
		Meadow	Woods	Impervious	Meadow	Woods	Impervious	Meadow	Woods	Impervious	Meadow	Open Space	Woods	Impervious	Meadow	Open Space	Woods	Impervious	Meadow	Open Space	Woods	Impervious		
1A		0.00	0.12	0.09	0.00	0.00	0.00	0.00	0.00	0.00	1.12	0.02	4.23	0.00	0.00	0.00	1.05	0.00	0.00	0.01	2.32	0.00	63	8.96
1A-FS1	FS-1	0.07	0.11	0.10	0.00	0.00	0.00	0.00	0.01	0.00	3.66	0.00	0.37	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01	59	4.31
1B		0.16	0.04	0.15	0.05	0.00	0.02	0.00	0.00	0.00	4.56	0.00	3.13	0.09	1.66	0.00	7.51	0.29	0.00	0.00	0.08	0.02	65	17.76
2A		0.51	0.00	0.19	0.00	0.00	0.00	0.26	0.00	0.04	8.15	0.11	0.09	0.16	0.00	0.00	0.00	0.00	8.25	0.17	0.56	0.00	69	18.49
2A-FS2	FS-2	0.01	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.02	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	63	1.61
2B		0.00	0.05	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	1.20	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.02	66	2.24
2B-FS3	FS-3	0.00	0.06	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.78	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59	1.62
2C		0.17	0.00	0.14	0.00	0.00	0.00	0.26	0.04	0.03	12.08	0.00	4.72	0.35	0.00	0.00	0.00	0.00	4.25	0.04	3.83	0.11	65	26.02
2C-FS4	FS-4	0.01	0.00	0.00	0.00	0.00	0.00	0.13	0.19	0.15	0.82	0.00	0.06	0.13	0.00	0.00	0.00	0.00	0.31	0.00	1.98	0.00	74	3.78
3		0.13	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.72	0.38	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	70	1.70
Subtotal		1.06	0.38	0.79	0.05	0.00	0.02	0.67	0.24	0.24	33.06	0.52	14.58	1.35	1.66	0.00	8.56	0.29	13.14	0.22	9.50	0.16		86.49
Total		3.45									83.04													86.49

Pre-Development LOD Drainage Area Summary

Subarea ID	Contributing Area (Ac.)				Pre-Development Area Within LOD (Ac.)							Contributing Area RCN
	HSG			Total	HSG B		HSG C		HSG D			
	B	C	D	Area	Woods/Meadow	Impervious	Woods/Meadow	Impervious	Woods/Meadow	Impervious	Total LOD	
1A	5.58	1.05	2.33	8.96	0.12	0.00	0.00	0.00	0.00	0.00	0.21	65
1A-FS1	4.30	0.00	0.01	4.31	0.11	0.00	0.00	0.00	0.01	0.00	0.29	73
1B	8.13	9.53	0.10	17.76	0.04	0.00	0.00	0.00	0.00	0.00	0.42	71
2A	9.21	0.00	9.28	18.49	0.00	0.00	0.00	0.00	0.00	0.00	1.00	80
2A-FS2	1.24	0.00	0.37	1.61	0.00	0.00	0.00	0.00	0.00	0.00	0.07	78
2B	1.48	0.00	0.76	2.24	0.05	0.00	0.00	0.00	0.00	0.00	0.04	67
2B-FS3	1.62	0.00	0.00	1.62	0.07	0.00	0.00	0.00	0.00	0.00	0.12	66
2C	17.46	0.00	8.56	26.02	0.00	0.00	0.00	0.00	0.04	0.00	0.45	74
2C-FS4	1.02	0.00	2.76	3.78	0.00	0.00	0.00	0.00	0.19	0.00	0.48	79
3	1.70	0.00	0.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.18	78
Total	51.74	10.58	24.17	86.49	0.39	0.00	0.00	0.00	0.24	0.00	3.26	-

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

CONTRIBUTING DRAINAGE AREA DETAILS & NOTES

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF
DRAWN BY: DFS
CHECKED BY: AES
DATE: FEBRUARY 2018
SCALE: NONE
SHEET NO.: SWM5.0
CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.0E (DNREC Civil Engineering Services - 2017)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 5.0 Contributing DA Details & Notes.dwg, 3/13/2018 3:54 PM

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

BMP CONTRIBUTING DRAINAGE AREA PLAN 1

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1" = 100'

SHEET NO.: SWM5.1

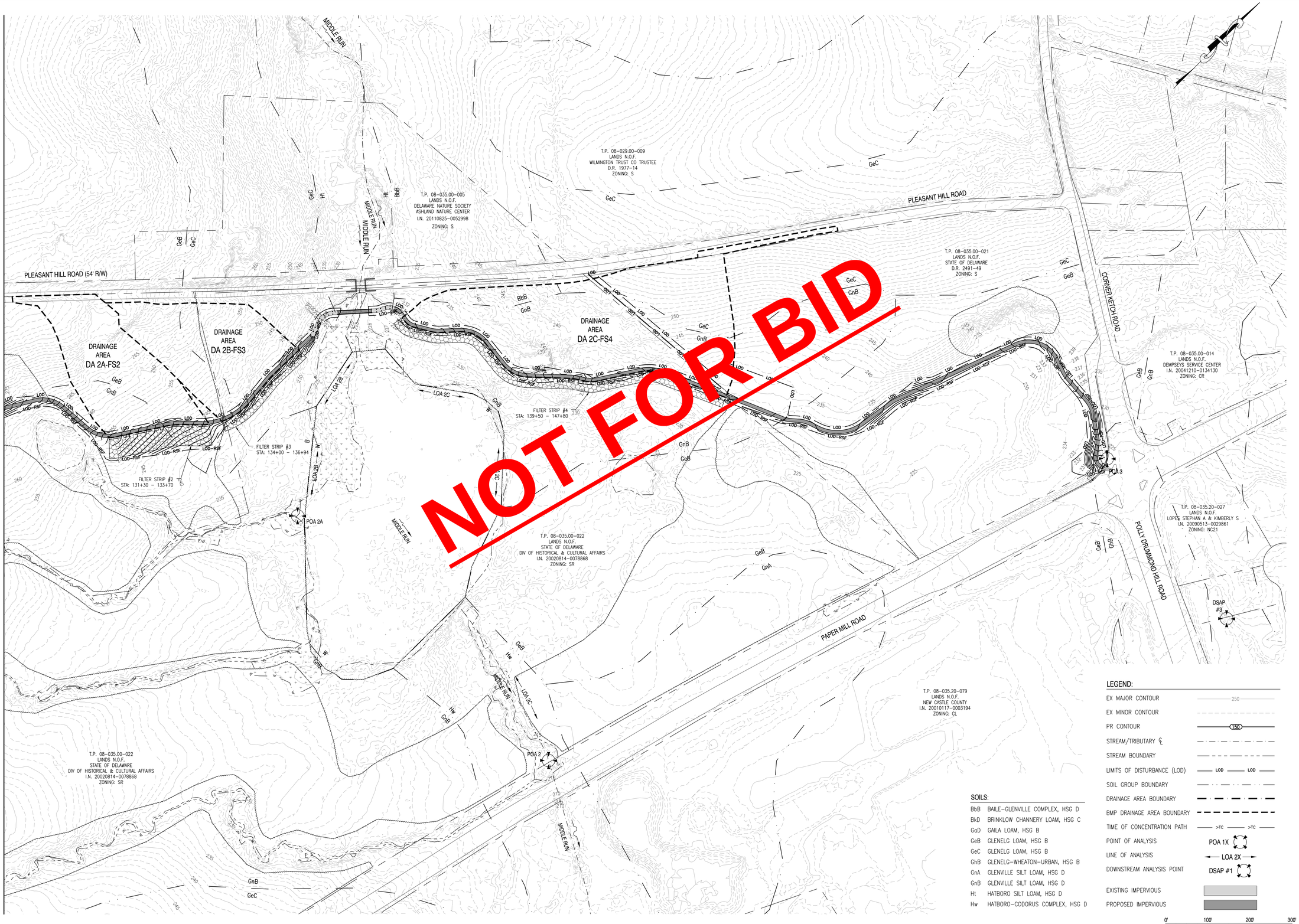
CONTRACT NO.: 2017-WCCSP-07A

O:\PROJECTS\125002.DE DNREC Civil Engineering Services - 2012\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 5.1-5.2 BMP Contributing DA Plans.dwg, 3/13/2018 3:54 PM

MATCH TO SHEET SWM5.1

MATCH TO SHEET SWM5.1

MATCH TO SHEET SWM5.1



SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

LEGEND:

EX MAJOR CONTOUR	250
EX MINOR CONTOUR	
PR CONTOUR	150
STREAM/TRIBUTARY ℄	
STREAM BOUNDARY	
LIMITS OF DISTURBANCE (LOD)	LOD LOD
SOIL GROUP BOUNDARY	
DRAINAGE AREA BOUNDARY	
BMP DRAINAGE AREA BOUNDARY	
TIME OF CONCENTRATION PATH	>TC >TC
POINT OF ANALYSIS	POA 1X
LINE OF ANALYSIS	LOA 2X
DOWNSTREAM ANALYSIS POINT	DSAP #1
EXISTING IMPERVIOUS	
PROPOSED IMPERVIOUS	

0' 100' 200' 300'
SCALE: 1" = 100'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

BMP CONTRIBUTING DRAINAGE AREA PLAN 2

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1" = 100'

SHEET NO.: SMW5.2

CONTRACT NO.: 2017-WCCSP-07A

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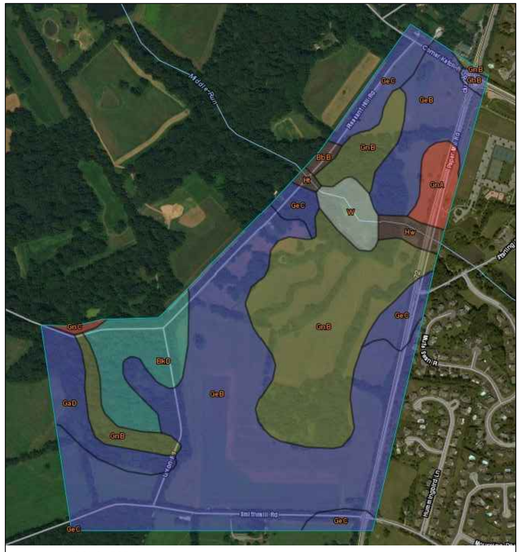
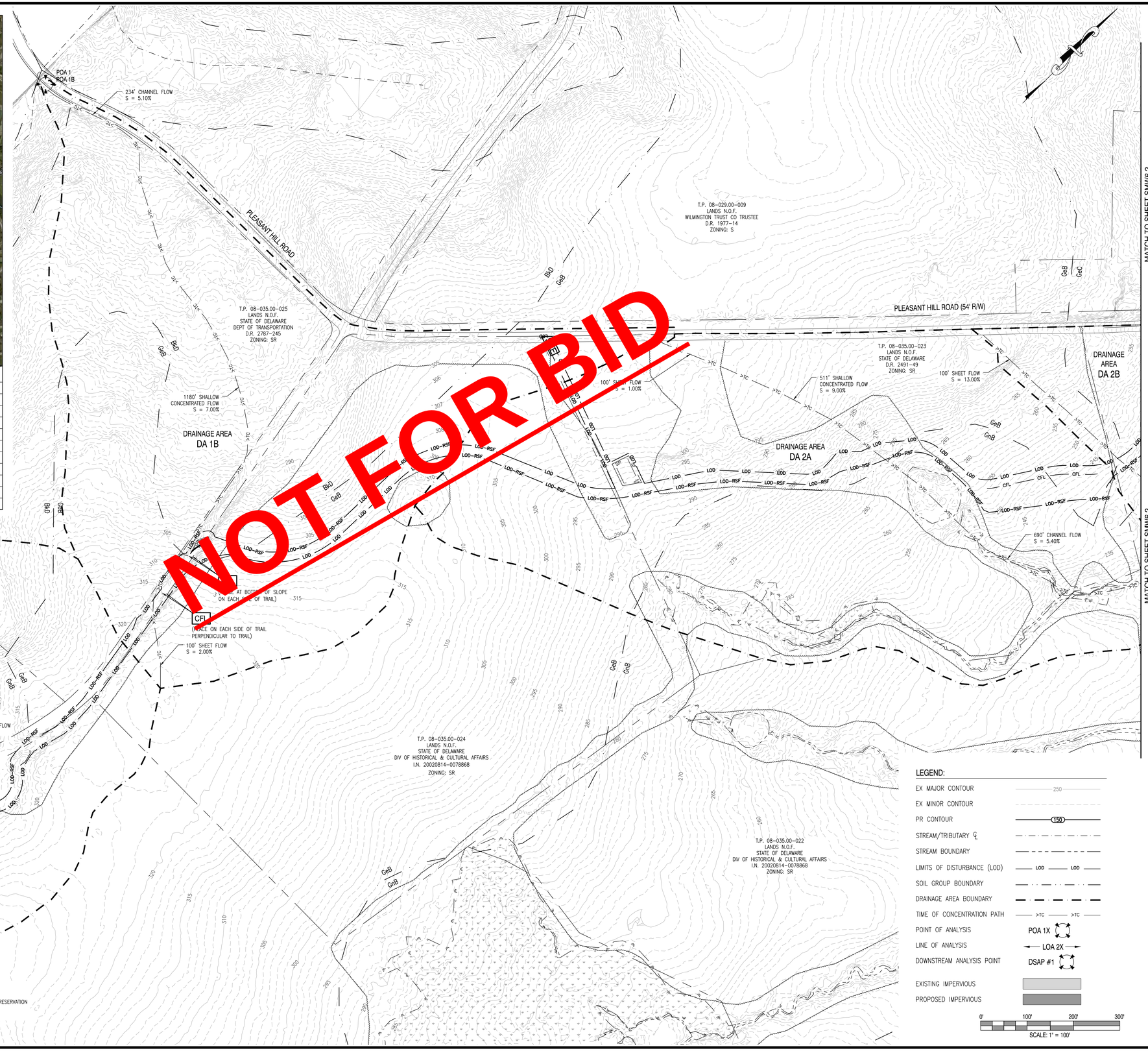


SOILS LEGEND:

ABBR.	SOIL NAME	HSG	WITHIN LOD?
BbB	BAILE-GLENVILLE COMPLEX – 0-8% SLOPES	D	N
BkD	BRINKLOW CHANNERY LOAM – 15-25% SLOPES	C	Y
GaD	GAILA LOAM – 15-25% SLOPES	B	Y
GeB	GLENELG LOAM – 3-8% SLOPES	B	Y
GeC	GLENELG LOAM – 8-15% SLOPES	B	Y
GhB	GLENELG-WHEATON-URBAN – 0-8% SLOPES	B	Y
GnA	GLENVILLE SILT LOAM – 0-3% SLOPES	D	N
GnB	GLENVILLE SILT LOAM – 3-8% SLOPES	D	Y
Ht	HATBORO SILT LOAM – 0-3% SLOPES	D	Y
Hw	HATBORO-CODORUS COMPLEX – 0-3% SLOPES	D	N



REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

PRE-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 1

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

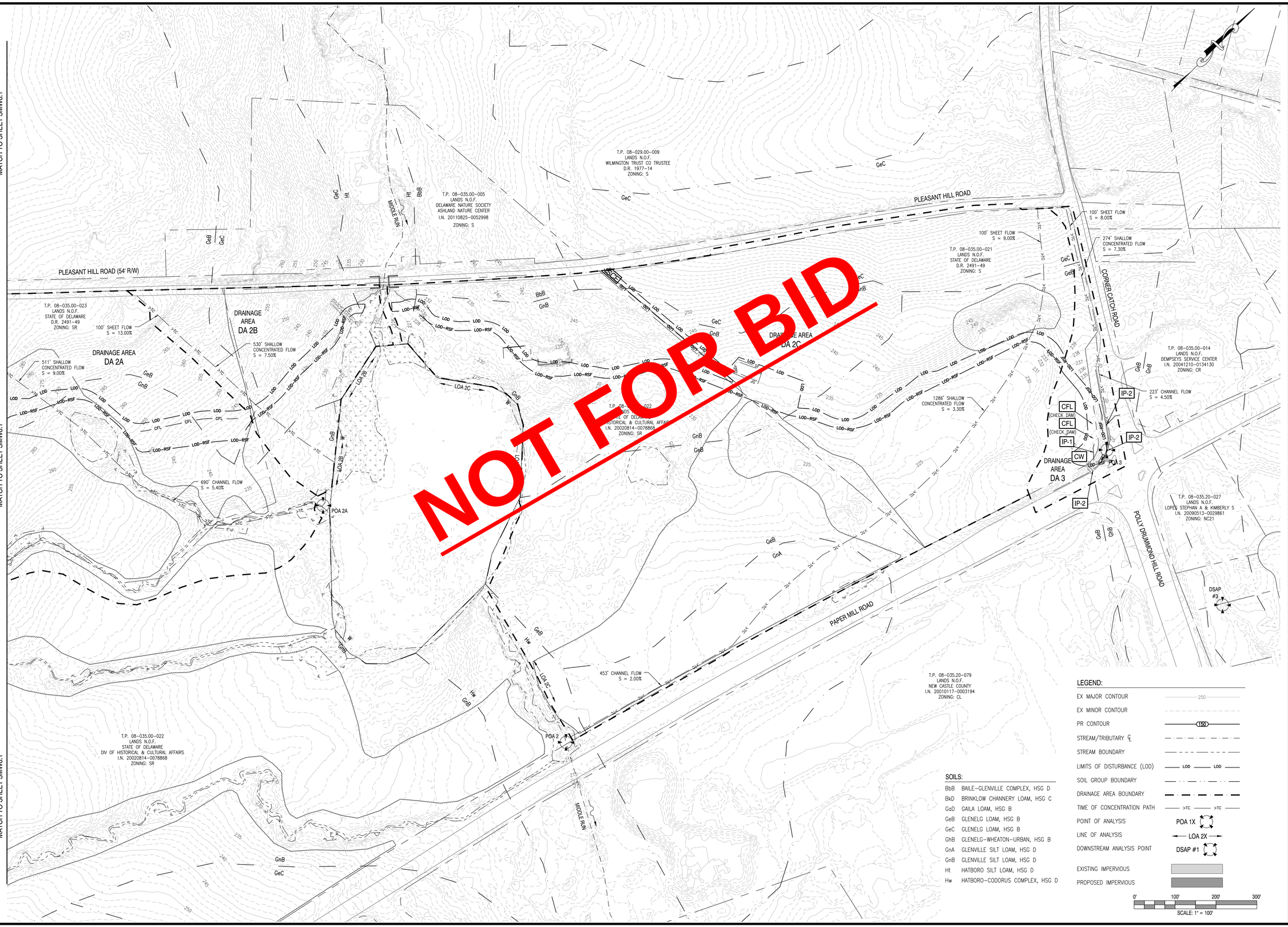
DATE: FEBRUARY 2018

SCALE: 1" = 100'

SHEET NO.: SWM6.1

CONTRACT NO.: 2017-WCCSP-07A

G:\PROJECTS\125002.00 (DNREC Civil Engineering Services – 2012)\125002.25 Tri-Valley Phase 2\CADD FILES\Sheets\Stormwater Management Plans\SWM 6.1-6.2 PRE LOD Drainage Area Plans.dwg, 3/13/2018 3:55 PM



SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

LEGEND:

EX MAJOR CONTOUR	250
EX MINOR CONTOUR	
PR CONTOUR	150
STREAM/TRIBUTARY ℄	
STREAM BOUNDARY	
LIMITS OF DISTURBANCE (LOD)	LOD LOD
SOIL GROUP BOUNDARY	
DRAINAGE AREA BOUNDARY	
TIME OF CONCENTRATION PATH	>TC >TC
POINT OF ANALYSIS	POA 1X
LINE OF ANALYSIS	LOA 2X
DOWNSTREAM ANALYSIS POINT	DSAP #1
EXISTING IMPERVIOUS	
PROPOSED IMPERVIOUS	

0' 100' 200' 300'
SCALE: 1" = 100'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

PRE-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 2

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1" = 100'

SHEET NO.: SWM6.2

CONTRACT NO.: 2017-WCCSP-07A

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SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
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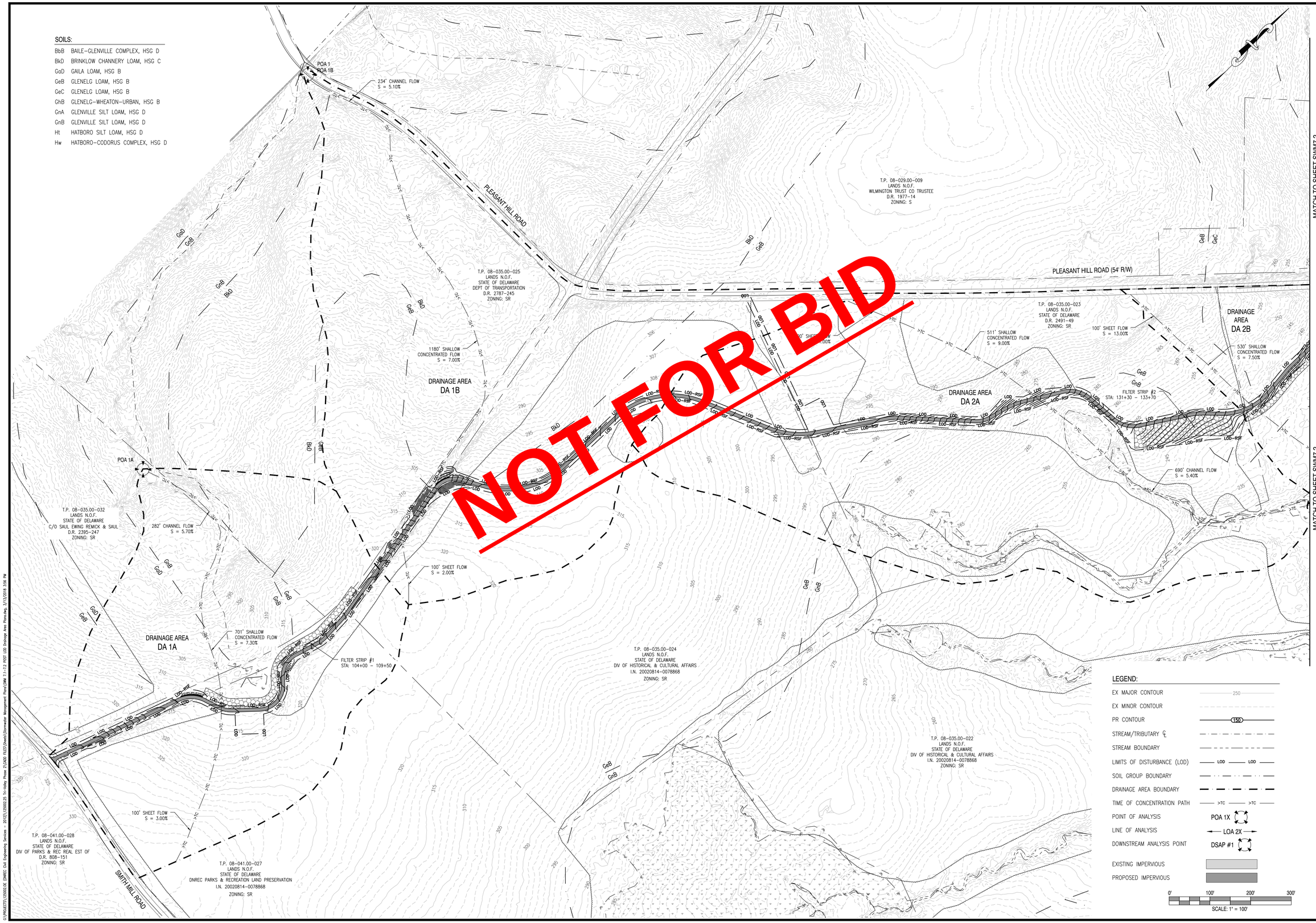
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D



REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

POST-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 1

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1" = 100'

SHEET NO.: SWM7.1

CONTRACT NO.: 2017-WCCSP-07A

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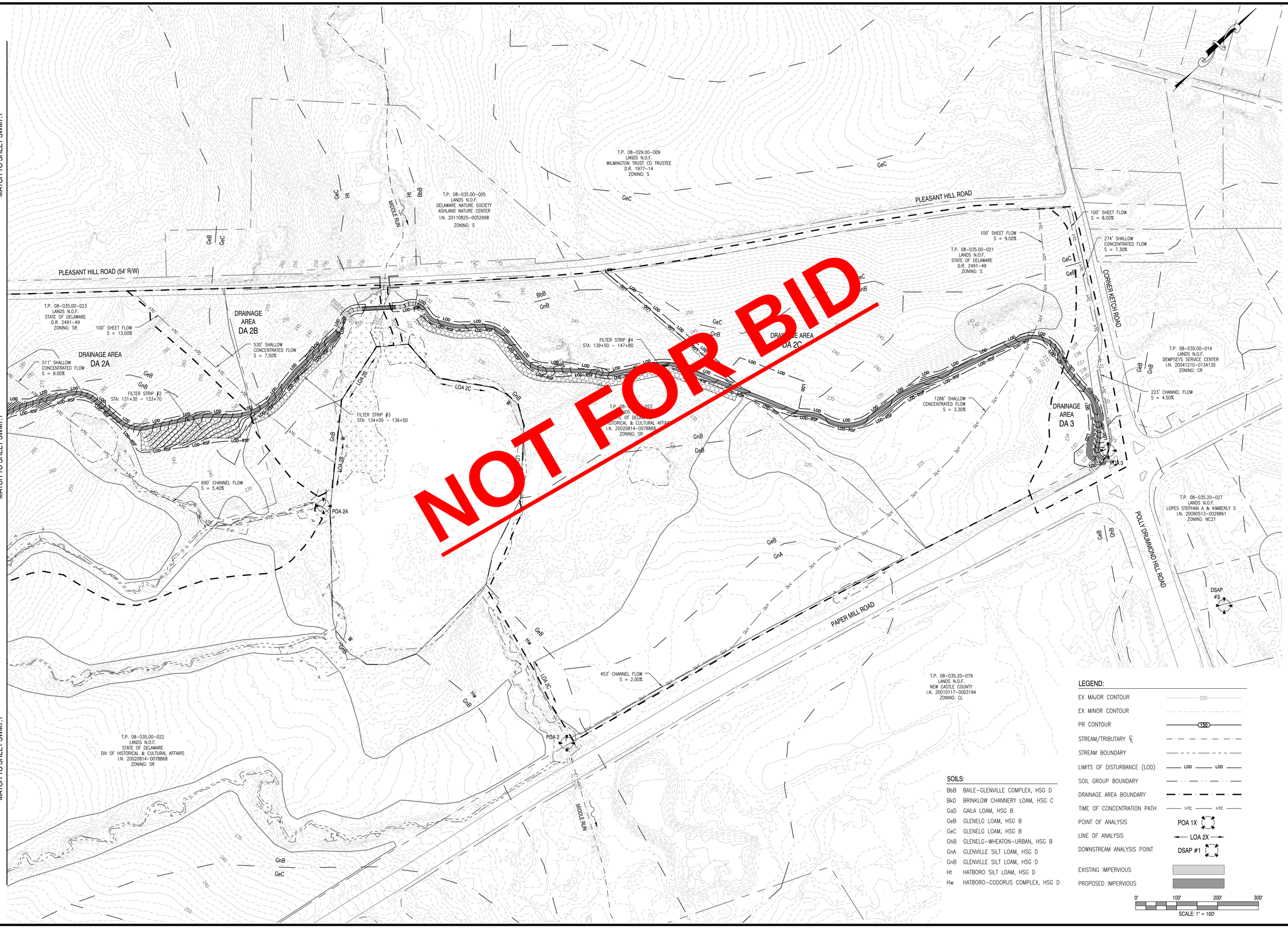

SOILS:

BbB	BAILE-GLENVILLE COMPLEX, HSG D
BkD	BRINKLOW CHANNERY LOAM, HSG C
GaD	GAILA LOAM, HSG B
GeB	GLENELG LOAM, HSG B
GeC	GLENELG LOAM, HSG B
GhB	GLENELG-WHEATON-URBAN, HSG B
GnA	GLENVILLE SILT LOAM, HSG D
GnB	GLENVILLE SILT LOAM, HSG D
Ht	HATBORO SILT LOAM, HSG D
Hw	HATBORO-CODORUS COMPLEX, HSG D

LEGEND:

EX MAJOR CONTOUR	250
EX MINOR CONTOUR	
PR CONTOUR	150
STREAM/TRIBUTARY ℄	
STREAM BOUNDARY	
LIMITS OF DISTURBANCE (LOD)	LOD LOD
SOIL GROUP BOUNDARY	
DRAINAGE AREA BOUNDARY	
TIME OF CONCENTRATION PATH	>TC >TC
POINT OF ANALYSIS	POA 1X
LINE OF ANALYSIS	LOA 2X
DOWNSTREAM ANALYSIS POINT	DSAP #1
EXISTING IMPERVIOUS	
PROPOSED IMPERVIOUS	

0' 100' 200' 300'
SCALE: 1" = 100'

REVISIONS:

DATE:	DESCRIPTION:	BY:

WCCSP TRI-VALLEY TRAIL, PHASE II
SEDIMENT & STORMWATER MANAGEMENT PLANS

POST-LIMIT OF DISTURBANCE DRAINAGE AREA PLAN 2

SEAL:

CIVIL ENGINEER:

CENTURY ENGINEERING
CONSULTING ENGINEERS, SURVEYORS
4134 N. DUPONT HWY.
DOVER, DELAWARE 19901

CEI CONTRACT NO. 125002.25

DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL

DESIGNED BY: ATF

DRAWN BY: DFS

CHECKED BY: AES

DATE: FEBRUARY 2018

SCALE: 1" = 100'

SHEET NO.: SWM7.2

CONTRACT NO.: 2017-WCCSP-07A

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