

SEDIMENT AND STORMWATER MANAGEMENT PLANS STOCKLEY CENTER CAMPUS PARKING LOT UPGRADES

GEORGETOWN HUNDRED, SUSSEX COUNTY, DELAWARE
TAX MAP #133-7.00-8.00



DRAWING SCALE 1" = 200'

HYDROLOGICAL GROUP	SOIL ABBREVIATION	SOIL NAME
A	FhA	EVESBORO LOAMY SAND, 5 TO 15% SLOPES
A	FhB	FORT MOTT-HENLOPEN COMPLEX, 5 TO 15% SLOPES
A	P&A	FORT MOTT-HENLOPEN COMPLEX, 2 TO 5% SLOPES
A/D (MODELED AS D)	AsA	PEPPERBOX-ROSEDALE COMPLEX, 0 TO 2% SLOPES
A/D (MODELED AS D)	Pk	ASKECKSY LOAMY SAND, 0 TO 2% SLOPES
B/D (MODELED AS D)	LO	PUCKUM MUCK, FREQUENTLY FLOODED
-	W	LONGMARSH AND INDIANTOWN SOILS, FREQUENTLY FLOODED
		WATER

NOTES:

- THE PURPOSE OF THIS LAND DEVELOPMENT PLAN IS TO RECONFIGURE AND REPAVE 4 PARKING AREAS.
- PROPERTY BOUNDARY AND TOPOGRAPHIC INFORMATION (OUTSIDE OF SURVEY LIMITS) PROVIDED IN THIS DRAWING ARE TAKEN FROM SUSSEX COUNTY PARCELS AND SUSSEX COUNTY GIS.
- THIS SITE LIES PARTIALLY WITHIN A 100-YEAR FLOODPLAIN, PER FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAPS (FIRM) FOR UNINCORPORATED AREAS OF SUSSEX COUNTY, DELAWARE MAP NUMBERS 10005C0325K (REVISED MARCH 16, 2015), 10005C0452J (REVISED JANUARY 6, 2005), AND 10005C0456K (REVISED MARCH 16, 2015). THE AREA OF CONSTRUCTION DOES NOT LIE WITHIN THE KNOWN FLOODPLAIN.
- THIS SITE DOES CONTAIN WATER RESOURCE PROTECTION AREAS (WRPA) IN THE FORM OF WELLHEAD PROTECTION. THE DATA CONTAINED HEREIN WAS COMPILED AS PART OF THE SOURCE WATER ASSESSMENT AND PROTECTION PROGRAM WITHIN THE DIVISION OF WATER RESOURCES OF THE DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (2007). THE AREA OF CONSTRUCTION DOES NOT LIE WITHIN THE KNOWN WRPA.
- WETLANDS ARE PRESENT ON THIS SITE, PER GIS DATA COMPILED BY DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL (DNREC), DIVISION OF WATERSHED STEWARDSHIP (2011). THE AREA OF CONSTRUCTION DOES NOT LIE WITHIN THE KNOWN AREAS CONTAINING WETLANDS OR WITHIN THEIR RIPARIAN BUFFERS.
- THE SITE DOES NOT INCLUDE ANY CRITICAL NATURAL AREA (CNA), PER THE STATE INVENTORY OF NATURAL AREAS COMPILED BY DELAWARE DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL, 2006.

OWNER'S 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 PROPOSED CONSTRUCTION GENERAL PERMIT, AS REFERENCED ON THIS COVER SHEET.

DATE: 3/4/16 NAME: Daniel Episcopo Date: 3/4/16

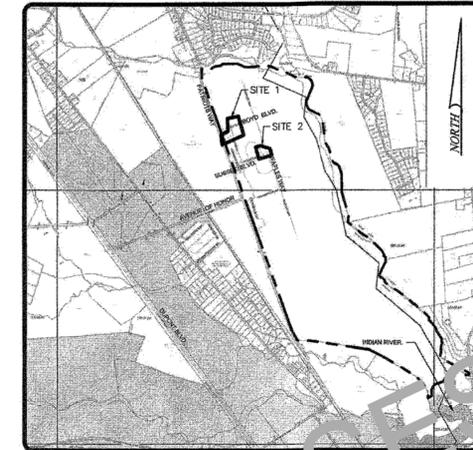
SITE DESIGNER CERTIFICATION

I, STEPHEN J. GORSKI, P.E., 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.

DATE: 3/4/16 NAME: Stephen J. Gorski

PLAN APPROVAL

DNREC
Sediment and Stormwater Management Plan
No.: 2015-032, REV #1
By: [Signature]
Title: EIT
Original Approval Date: 11/25/15
Revision Date: 4/14/16
Expiration Date: 11/25/18



NCC ZONING MAP NO. 53 & 58 LOCATION MAP SCALE: 1" = 1/2 MILE

SITE DATA

- APPLICATION NO.: 15-032
- TAX PARCEL NO.: 133-7.00-8.00
- SITE ADDRESS: 26351 PATRIOTS WAY, GEORGETOWN, DE, 19847
- OWNER/DEVELOPER: STATE OF DELAWARE OMB/FM, MS. TERRI MCCALL, 540 SOUTH DUPONT HIGHWAY, SUITE 1, DOVER, DE 19901, 302-739-5644
- DESIGNER: DUFFIELD ASSOCIATES, INC., STEPHEN J. GORSKI, P.E., 5400 LIMESTONE ROAD, WILMINGTON, DE 19808, (302) 239-6634
- AGENCY: DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL, MR. RANDELL GREER, P.E., 89 KINGS HIGHWAY, DOVER, DE 19901, (302) 739-9821
- SOURCE OF TITLE: PROPERTY BOUNDARY INFORMATION TAKEN FROM SUSSEX COUNTY PARCELS
- ZONING: AGRICULTURAL/RESIDENTIAL
- SITE ACREAGE: 780.11± AC. (EXISTING AND PROPOSED)
- EXIST. MONUMENTS: 0 PERMANENT MONUMENT MARKERS
- PROP. MONUMENTS: 0 PERMANENT MONUMENT MARKERS
- BENCHMARK: MAGNETIC NAIL SET #1 (AS SHOWN) NORTHING: 226206.6239 EASTING: 684391.9174 ELEV.: 29.82; MAGNETIC NAIL SET #2 (AS SHOWN) NORTHING: 228325.2173 EASTING: 684165.0022 ELEV.: 31.86
- DATUM: HORIZONTAL: NAD 83 DE STATE PLAN GRID; VERTICAL: NAVD 1988
- PROPOSED DISCHARGE LOCATIONS: MILLSBORO POND
- PROPOSED TOTAL LIMIT OF DISTURBANCE PER DISCHARGE: 0.828± ACRES
- WATER SUPPLY: ON-SITE WELL
- SANITARY SEWER: TOWN OF GEORGETOWN
- WATERSHED: INDIAN RIVER
- EXISTING WETLAND AREA: NONE WITHIN PROJECT LIMITS

INDEX OF SHEETS

- SHEET 1 COVER SHEET AND GENERAL NOTES
- SHEET 2 PRE-CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN
- SHEET 3 CONSTRUCTION SITE STORMWATER MANAGEMENT PLAN
- SHEET 4 STORMWATER MANAGEMENT FACILITY PLAN, SECTIONS AND DETAILS
- SHEET 5 SEDIMENT AND EROSION DETAILS
- SHEET 6 SEDIMENT AND EROSION DETAILS
- SHEET 7 SEDIMENT AND EROSION DETAILS

RECEIVED
MAR 14 2016

DUFFIELD ASSOCIATES
Soil, Water & the Environment
5400 LIMESTONE ROAD
WILMINGTON, DE 19808-1232
TEL: 302.239.6634
FAX: 302.239.8485

OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY
WEB: HTTP://DUFFIELD.COM
E-MAIL: DUFFIELD@DUFFIELD.COM
STATE DELAWARE P.E. #12625

CHK'D BY	DATE	REVISION	DESCRIPTION
		1	BIORETENTION REMOVED

OWNER: DELAWARE DEPARTMENT OF HEALTH AND SOCIAL SERVICES
540 SOUTH DUPONT HIGHWAY
DOVER, DE 19901

**SEDIMENT AND STORMWATER
MANAGEMENT PLANS
COVER SHEET AND GENERAL NOTES
STOCKLEY CENTER CAMPUS
PARKING LOT UPGRADES
GEORGETOWN HUNDRED--SUSSEX COUNTY--DELAWARE**

DATE: 04 MARCH 2016
SCALE: AS NOTED
PROJECT NO. 5858.CG
SHEET: 1 OF 7

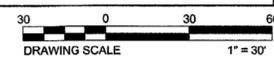
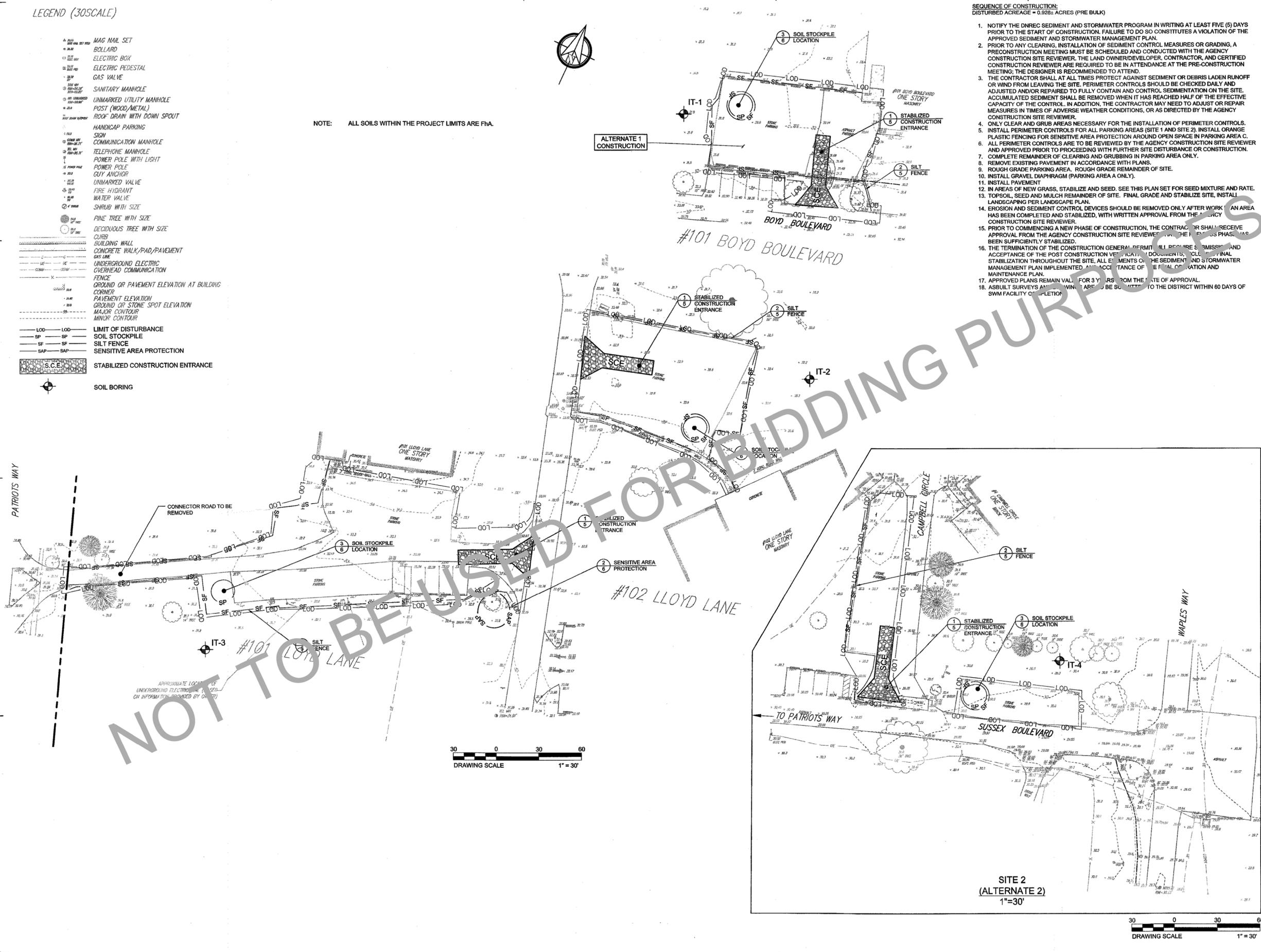
LEGEND (30SCALE)

- ▲ MAG NAIL SET
- BOLLARD
- ELECTRIC BOX
- ELECTRIC PEDESTAL
- GAS VALVE
- SANITARY MANHOLE
- UNMARKED UTILITY MANHOLE
- POST (WOOD/METAL)
- ROOF DRAIN WITH DOWN SPOUT
- HANDICAP PARKING
- SIGN
- COMMUNICATION MANHOLE
- TELEPHONE MANHOLE
- POWER POLE WITH LIGHT
- GUY ANCHOR
- UNMARKED VALVE
- FIRE HYDRANT
- WATER VALVE
- SHRUB WITH SIZE
- PINE TREE WITH SIZE
- DECIDUOUS TREE WITH SIZE
- CURB
- BUILDING WALL
- CONCRETE WALK/PAD/PAVEMENT
- GUY LINE
- UNDERGROUND ELECTRIC
- OVERHEAD COMMUNICATION
- FENCE
- GROUND OR PAVEMENT ELEVATION AT BUILDING CORNER
- PAVEMENT ELEVATION
- GROUND OR STONE SPOT ELEVATION
- MAJOR CONTOUR
- MINOR CONTOUR
- LOD — LOD LIMIT OF DISTURBANCE
- SP — SP SOIL STOCKPILE
- SF — SF SILT FENCE
- SAP — SAP SENSITIVE AREA PROTECTION
- S.C.E. — S.C.E. STABILIZED CONSTRUCTION ENTRANCE
- SOIL BORING

NOTE: ALL SOILS WITHIN THE PROJECT LIMITS ARE F1a.

SEQUENCE OF CONSTRUCTION:
DISTURBED ACREAGE = 0.9281 ACRES (PRE BULK)

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 PRE-CONSTRUCTION MEETING MUST BE SCHEDULED AND CONDUCTED WITH THE AGENCY CONSTRUCTION SITE REVIEWER, THE LAND OWNER/DEVELOPER, CONTRACTOR, AND CERTIFIED CONSTRUCTION REVIEWER ARE REQUIRED TO BE IN ATTENDANCE AT THE PRE-CONSTRUCTION MEETING; THE DESIGNER IS RECOMMENDED TO ATTEND.
3. 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.
4. ONLY CLEAR AND GRUB AREAS NECESSARY FOR THE INSTALLATION OF PERIMETER CONTROLS.
5. INSTALL PERIMETER CONTROLS FOR ALL PARKING AREAS (SITE 1 AND SITE 2). INSTALL ORANGE PLASTIC FENCING FOR SENSITIVE AREA PROTECTION AROUND OPEN SPACE IN PARKING AREA C.
6. ALL PERIMETER CONTROLS ARE TO BE REVIEWED BY THE AGENCY CONSTRUCTION SITE REVIEWER AND APPROVED PRIOR TO PROCEEDING WITH FURTHER SITE DISTURBANCE OR CONSTRUCTION.
7. COMPLETE REMAINDER OF CLEARING AND GRUBBING IN PARKING AREA ONLY.
8. REMOVE EXISTING PAVEMENT IN ACCORDANCE WITH PLANS.
9. ROUGH GRADE PARKING AREA. ROUGH GRADE REMAINDER OF SITE.
10. INSTALL GRAVEL DIAPHRAGM (PARKING AREA A ONLY).
11. INSTALL PAVEMENT.
12. IN AREAS OF NEW GRASS, STABILIZE AND SEED. SEE THIS PLAN SET FOR SEED MIXTURE AND RATE.
13. TOPSOIL, SEED AND MULCH REMAINDER OF SITE. FINAL GRADE AND STABILIZE SITE, INSTALL LANDSCAPING PER LANDSCAPE PLAN.
14. EROSION AND SEDIMENT CONTROL DEVICES SHOULD BE REMOVED ONLY AFTER WORK IN AN AREA HAS BEEN COMPLETED AND STABILIZED, WITH WRITTEN APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER.
15. PRIOR TO COMMENCING A NEW PHASE OF CONSTRUCTION, THE CONTRACTOR SHALL RECEIVE APPROVAL FROM THE AGENCY CONSTRUCTION SITE REVIEWER FOR THE PREVIOUS PHASE. WORK SHALL BE SUFFICIENTLY STABILIZED.
16. THE TERMINATION OF THE CONSTRUCTION GENERAL PERMIT SHALL REQUIRE SUBMISSION AND ACCEPTANCE OF THE POST CONSTRUCTION VERIFICATION DOCUMENTS, INCLUDING FINAL STABILIZATION THROUGHOUT THE SITE. ALL ELEMENTS OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN IMPLEMENTED AND ACCEPTANCE OF THE FINAL OPERATION AND MAINTENANCE PLAN.
17. APPROVED PLANS REMAIN VALID FOR 3 YEARS FROM THE DATE OF APPROVAL.
18. ASBUILT SURVEYS AND DRAWINGS ARE TO BE SUBMITTED TO THE DISTRICT WITHIN 60 DAYS OF SWM FACILITY COMPLETION.



DUFFIELD ASSOCIATES
Soil, Water & the Environment
5400 LINSTONE ROAD
WILMINGTON, DE 19808-1232
TEL: 302.239.6634
FAX: 302.239.8485
OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY
WEB: HTTP://DUFFNET.COM
E-MAIL: DUFFIELD@DUFFNET.COM

CHECKED BY: _____
DESIGNED BY: _____
DRAWN BY: _____
DATE: _____
FILE NAME: S858-CG-STEP 3
STEPHEN J. GORSKI, P.E.
No. 12625
STATE: DELAWARE

NO.	REVISION	DATE	DESCRIPTION
1	BIDDING	03/04/2016	FOR BIDDING PURPOSES

OWNER:
DELAWARE DEPARTMENT OF HEALTH AND SOCIAL SERVICES
THOMAS COLLINS BUILDING
540 SOUTH DUPONT HIGHWAY
DOVER, DE 19901

**SEDIMENT AND STORMWATER MANAGEMENT PLANS
PRE-CONSTRUCTION SITE
STORMWATER MANAGEMENT PLAN
STOCKLEY CENTER CAMPUS
PARKING LOT UPGRADES
GEORGETOWN HUNDRED-SUSSEX COUNTY-DELAWARE**

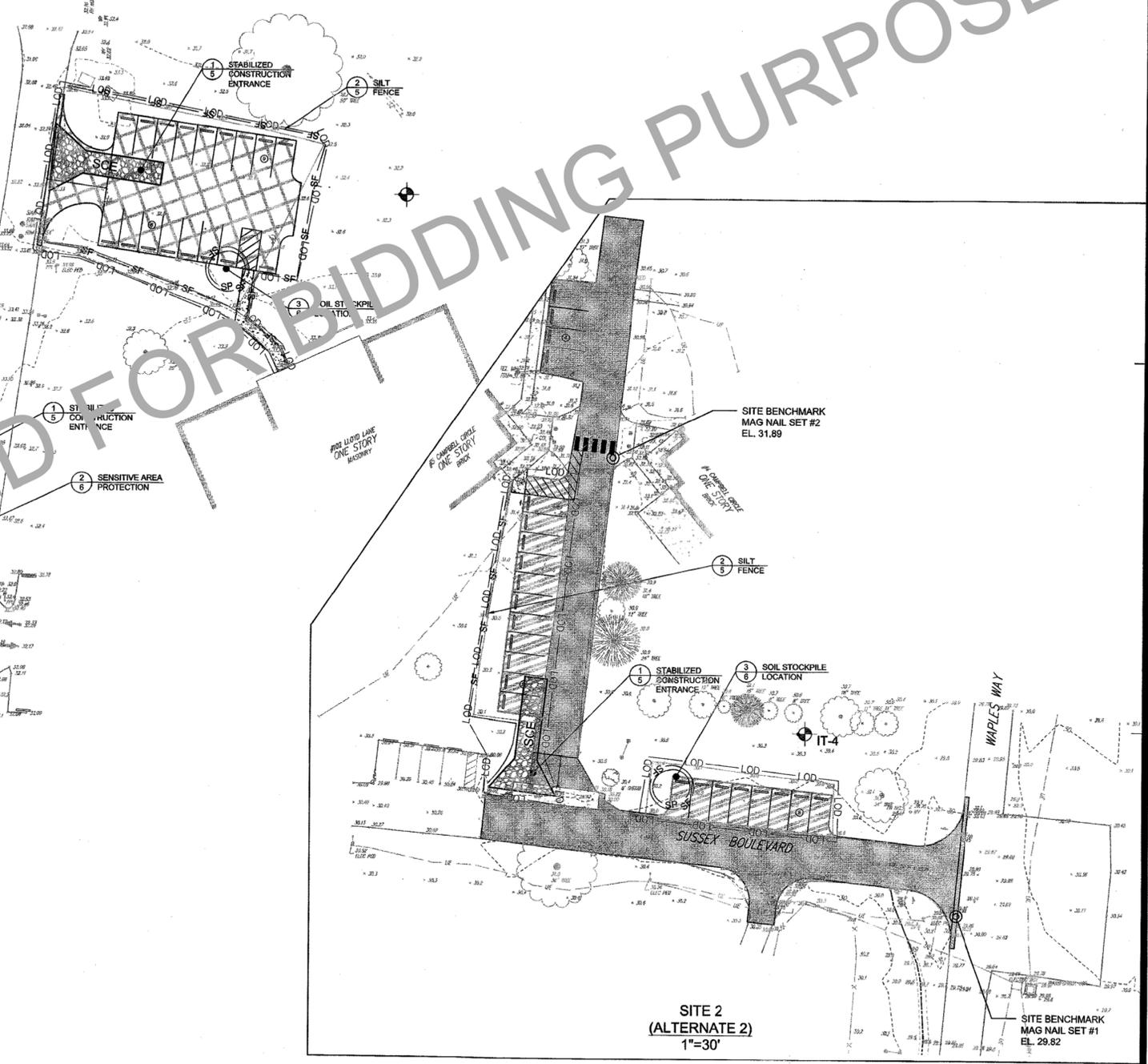
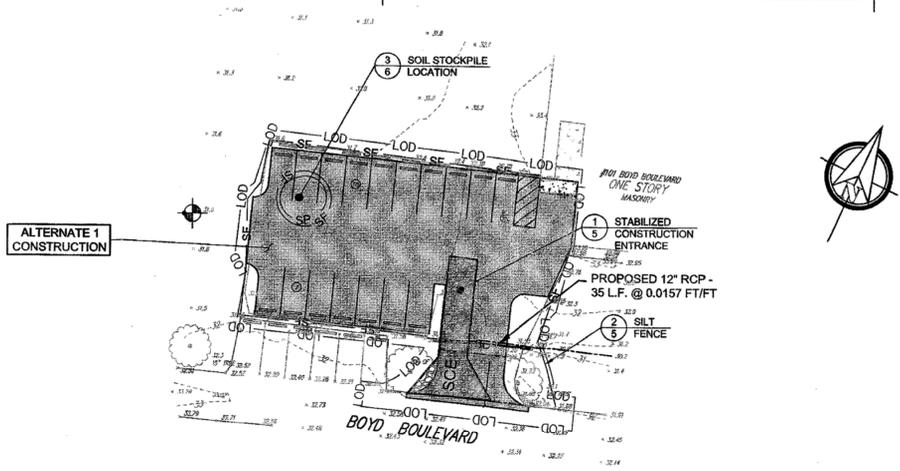
DATE: 04 MARCH 2016
SCALE: 1" = 30'
PROJECT NO. 5858.CG
SHEET: 2 OF 7

LEGEND (30SCALE)

LOD: 1.15± ACRES

- ⊙ MAG NAIL SET
- ⊙ BOLLARD
- ⊙ ELECTRIC BOX
- ⊙ ELECTRIC PEDESTAL
- ⊙ GAS VALVE
- ⊙ SANITARY MANHOLE
- ⊙ UNMARKED UTILITY MANHOLE
- ⊙ POST (WOOD/METAL)
- ⊙ ROOF DRAIN WITH DOWN SPOUT
- ⊙ HANDICAP PARKING
- ⊙ SIGN
- ⊙ COMMUNICATION MANHOLE
- ⊙ TELEPHONE MANHOLE
- ⊙ POWER POLE WITH LIGHT
- ⊙ GUY ANCHOR
- ⊙ UNMARKED VALVE
- ⊙ FIRE HYDRANT
- ⊙ WATER VALVE
- ⊙ SHRUB WITH SIZE
- ⊙ PINE TREE WITH SIZE
- ⊙ DECIDUOUS TREE WITH SIZE
- CURB
- BUILDING WALL
- CONCRETE WALK/PAD/PAVEMENT
- GAS LINE
- UNDERGROUND ELECTRIC
- OVERHEAD COMMUNICATION
- FENCE
- GROUND OR PAVEMENT ELEVATION AT BUILDING
- CORNER
- PAVEMENT ELEVATION
- GROUND OR STONE SPOT ELEVATION
- MAJOR CONTOUR
- MINOR CONTOUR
- LOD — LIMIT OF DISTURBANCE
- — PROPOSED EDGE OF PAVING
- — PROPOSED CONTOUR
- — PROPOSED BIORETENTION AREA
- LOD — LIMIT OF DISTURBANCE
- SP — SOIL STOCKPILE
- SF — SILT FENCE
- SAP — SENSITIVE AREA PROTECTION
- S.C.E. — STABILIZED CONSTRUCTION ENTRANCE
- ⊙ SOIL BORING

NOTE: ALL SOILS WITHIN THE PROJECT LIMITS ARE FhA.



SITE 2 (ALTERNATE 2)
1"=30'

DRAWING SCALE
1" = 30'

NOT TO BE USED FOR BIDDING PURPOSES

DUFFIELD ASSOCIATES
Soil, Water & the Environment
5400 LIMESTONE ROAD
WILMINGTON, DE 19808-1232
TEL: 302.239.6634
FAX: 302.239.8485
OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY
WEB: HTTP://DUFFNET.COM
E-MAIL: DUFFIELD@DUFFNET.COM

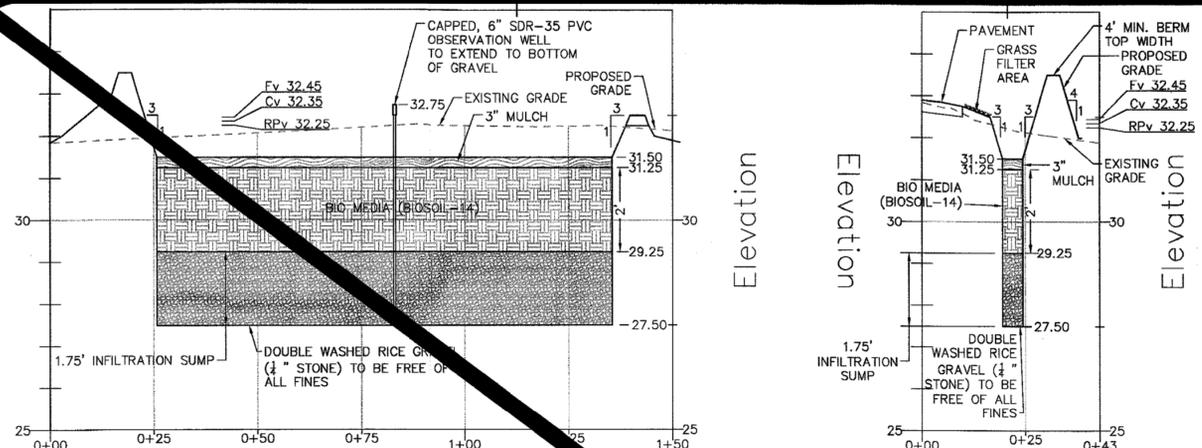
CHECKED BY: _____
DESIGNED BY: _____
DRAWN BY: _____
FILE NAME: S858CG-S&S-STEP 3
STEPHEN J. GORSKI, P.E.
Professional Engineer
No. 12625
STATE OF DELAWARE
P.E.# 12625

NO.	REVISION	DATE	DESCRIPTION
1	BIORETENTION REMOVED		

OWNER:
DELAWARE DEPARTMENT OF
HEALTH AND SOCIAL SERVICES
THOMAS COLLINS BUILDING
540 SOUTH DUFOUR HIGHWAY
DOVER, DE 19901

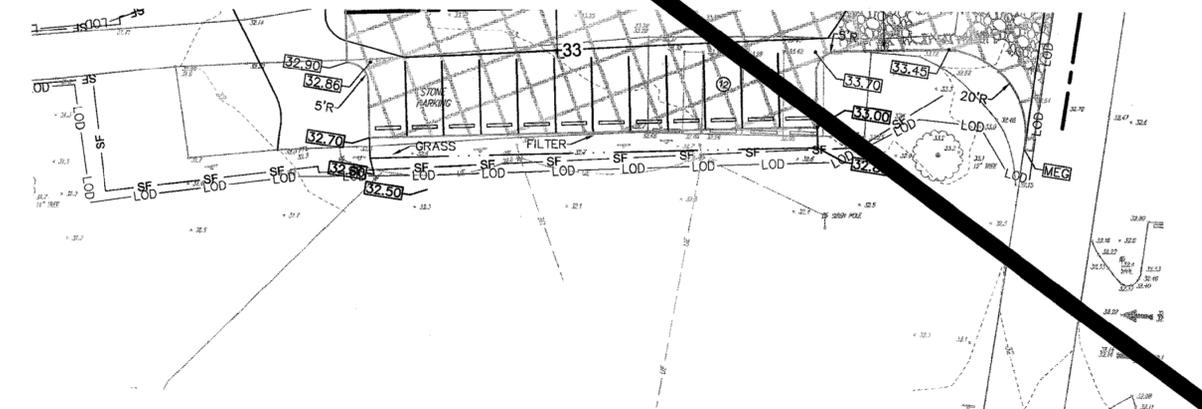
SEDIMENT AND STORMWATER MANAGEMENT PLANS
CONSTRUCTION SITE
STORMWATER MANAGEMENT PLAN
STOCKLEY CENTER CAMPUS
PARKING LOT UPGRADES
GEORGETOWN HUNDRED-SUSSEX COUNTY-DELAWARE

DATE: 04 MARCH 2016
SCALE: 1" = 30'
PROJECT NO. 5858.CG
SHEET: 3 OF 7



SECTION A
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 2'

SECTION B-B
HORIZ. SCALE: 1" = 20'
VERT. SCALE: 1" = 2'



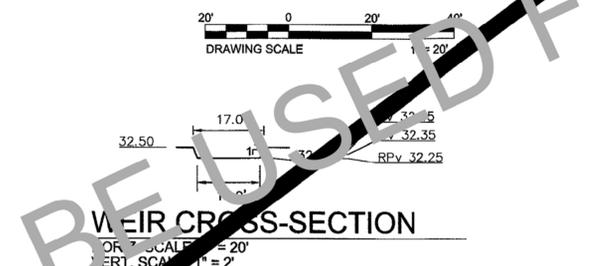
PLAN: SWM FACILITY
SCALE: 1" = 5'

2.8 BIORETENTION CONSTRUCTION SEQUENCE

EROSION AND SEDIMENT CONTROLS, BIORETENTION FACILITIES SHOULD BE FULLY PROTECTED BY SILT FENCE OR CONSTRUCTION FENCING. IDEALLY, BIORETENTION FACILITIES SHOULD REMAIN UNDISTURBED DURING CONSTRUCTION TO PREVENT SOIL COMPACTION BY HEAVY EQUIPMENT. LARGE BIORETENTION FACILITIES MAY BE USED AS SMALL SEDIMENT TRAPS OR BASINS DURING CONSTRUCTION. HOWEVER, THESE MUST BE ACCOMPANIED BY NOTES AND GRAPHIC DETAILS ON THE SEDIMENT & STORMWATER PLAN SPECIFYING THAT (1) THE MAXIMUM EXCAVATION DEPTH OF THE TRAP OR BASIN AT THE CONSTRUCTION STAGE MUST BE AT LEAST 1 FOOT HIGHER THAN THE POST-CONSTRUCTION (FINAL) INVERT (BOTTOM OF THE FACILITY), AND (2) THE BOTTOM OF THE FACILITY SHALL BE RIPPED, TILLED OR OTHERWISE SCARIFIED UPON FINAL EXCAVATION. IF THE FACILITY IS DESIGNED FOR INFILTRATION, THE ORIGINAL FIELD-MEASURED INFILTRATION RATE MUST BE VERIFIED THROUGH RETESTING. THE PLAN MUST ALSO SHOW THE PROPER PROCEDURES FOR CONVERTING THE TEMPORARY SEDIMENT CONTROL PRACTICE TO A PERMANENT BIORETENTION FACILITY, INCLUDING DEWATERING, CLEANOUT AND STABILIZATION.

BIORETENTION INSTALLATION: THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE TO PROPERLY INSTALL A BIORETENTION FACILITY (ALSO SEE FIGURE 2.3). THE CONSTRUCTION SEQUENCE FOR SMALL-SCALE BIORETENTION IS MORE SIMPLIFIED. THESE STEPS MAY BE MODIFIED TO REFLECT DIFFERENT BIORETENTION APPLICATIONS OR EXPECTED SITE CONDITIONS:

- STEP 1.** CONSTRUCTION OF THE BIORETENTION FACILITY MAY ONLY BEGIN AFTER THE ENTIRE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED WITH VEGETATION. IT MAY BE NECESSARY TO BLOCK CERTAIN CURBS OR OTHER INLETS WHILE THE BIORETENTION AREA IS BEING CONSTRUCTED. THE PROPOSED SITE SHOULD BE CHECKED FOR EXISTING UTILITIES PRIOR TO ANY EXCAVATION.
- STEP 2.** THE DESIGNER AND THE INSTALLER SHOULD HAVE A PRECONSTRUCTION MEETING, CHECKING THE BOUNDARIES OF THE CONTRIBUTING DRAINAGE AREA AND THE ACTUAL INLET ELEVATIONS TO ENSURE THEY CONFORM TO THE ORIGINAL DESIGN. SINCE OTHER CONTRACTORS MAY BE RESPONSIBLE FOR CONSTRUCTING PORTIONS OF THE SITE, IT IS COMMON TO FIND SUBTLE DIFFERENCES IN SITE GRADING, DRAINAGE AND PAVING ELEVATIONS THAT CAN PRODUCE HYDRAULICALLY IMPORTANT DIFFERENCES FOR THE BIORETENTION FACILITY. THE DESIGNER SHOULD CLEARLY COMMUNICATE IN WRITING, ANY PROJECT CHANGES DETERMINED DURING THE PRECONSTRUCTION MEETING TO THE INSTALLER AND THE REVIEWING/INSPECTION AUTHORITY.
- STEP 3.** TEMPORARY EROSION AND SEDIMENT CONTROLS (E.G., CONSTRUCTION DIKES, ENFORCED SILT FENCE) ARE NEEDED DURING CONSTRUCTION OF THE BIORETENTION FACILITY TO PREVENT STORMWATER FROM ENTERING THE BIORETENTION FACILITY UNTIL IT IS COMPLETED. SPECIAL PROTECTION MEASURES SUCH AS EROSION CONTROL FABRICS MAY BE NEEDED TO PROTECT VULNERABLE SIDE SLOPES FROM EROSION DURING THE CONSTRUCTION PROCESS.
- STEP 4.** ANY PRE-TREATMENT CELLS SHOULD BE EXCAVATED FIRST.
- STEP 5.** EXCAVATORS OR BACKHOES SHOULD WORK FROM THE SIDE TO EXCAVATE THE BIORETENTION FACILITY TO THE APPROPRIATE DESIGN DEPTH AND DIMENSIONS. EXCAVATING EQUIPMENT SHOULD HAVE ADEQUATE REACH TO BE COMMON TO HAVE TO SIT INSIDE THE FOOTPRINT OF THE BIORETENTION FACILITY. CONTRACTORS SHOULD USE A CELLULAR APPROACH IN LARGER BIORETENTION BASINS, WHEREBY THE BASIN IS SPLIT INTO 500 TO 1,000 SQ. FT. TEMPORARY CELLS WITH A 10-15 FOOT EARTH BRIDGE IN BETWEEN, SO THAT CELLS CAN BE EXCAVATED FROM THE SIDE.
- STEP 6.** IT MAY BE NECESSARY TO RIP OR TILL THE BOTTOM SOILS TO A DEPTH OF 6 TO 12 INCHES TO PROMOTE GREATER INFILTRATION IF A BUCKET WITHOUT TEETH IS USED FOR EXCAVATION.
- STEP 7.** IF A STONE STORAGE LAYER WILL BE USED FOR AN UNDERDRAIN DESIGN, PLACE THE APPROPRIATE DEPTH OF RICE GRAVEL ON THE BOTTOM. INSTALL THE PERFORATED UNDERDRAIN PIPE, PACK RICE GRAVEL TO 3 INCHES ABOVE THE UNDERDRAIN PIPE. A LAYER OF RICE GRAVEL MAY ALSO BE NECESSARY FOR INFILTRATING DESIGN IF THE 24" BIOSOIL MEDIA DOES NOT REACH A PERMEABLE LAYER IN THE SOIL PROFILE.
- STEP 8.** THE BIOSOIL MEDIA MUST COME FROM AN APPROVED SUPPLIER. IT SHOULD NOT BE USED UPON DELIVERY. STORE IT ON AN ADJACENT IMPERVIOUS AREA OR PLASTIC SHEETING. APPLY THE MEDIA IN 12-INCH LIFTS UNTIL THE DESIRED TOP ELEVATION OF THE BIORETENTION FACILITY IS ACHIEVED. WAIT A FEW DAYS FOR SETTLEMENT, AND ADD ADDITIONAL MEDIA, AS NEEDED, TO ACHIEVE THE DESIGN ELEVATION. SPRINKLING WATER DURING LIFTS MAY REDUCE THE AMOUNT OF SETTLING THAT OCCURS.
- STEP 9.** PREPARE PLANTING HOLES FOR ANY SHRUBS AND PLANTS, INSTALL THE VEGETATION, AND WATER ACCORDINGLY. INSTALL ANY TEMPORARY IRRIGATION.
- STEP 10.** PLACE THE SURFACE COVER (MULCH, RIVER ROCK, ETC.), DEPENDING ON THE DESIGN. IF STABILIZATION MATTING WILL BE USED IN AREAS THAT WILL BE PLANTED, THE MATTING WILL NEED TO BE INSTALLED PRIOR TO PLANTING (STEP 9), AND HOLES FOR PLANTS WILL HAVE TO BE CUT IN THE MATTING TO INSTALL THE PLANTS.
- STEP 11.** INSTALL THE PLANTING MATERIALS AS SHOWN IN THE LANDSCAPING PLAN, AND WATER THEM DURING WEEKS OF NO RAIN FOR THE FIRST TWO MONTHS.
- STEP 12.** IF CURBS OR INLETS ARE BLOCKED DURING BIORETENTION INSTALLATION, UNBLOCK THESE AFTER THE DRAINAGE AREAS AND SIDE SLOPES HAVE GOOD VEGETATIVE COVER. IT IS RECOMMENDED THAT UNBLOCKING CURBS CUTS AND INLETS TAKE PLACE AFTER TWO TO THREE STORM EVENTS IF THE DRAINAGE AREA INCLUDES NEWLY INSTALLED ASPHALT. SINCE ASPHALT TENDS TO PRODUCE A LOT OF FINES AND GRIT DURING THE FIRST SEVERAL STORMS.
- STEP 13.** CONDUCT THE FINAL CONSTRUCTION INSPECTION (SEE BELOW), THEN LOG THE GPS COORDINATES FOR EACH BIORETENTION FACILITY AND SUBMIT THEM FOR ENTRY INTO THE LOCAL MAINTENANCE TRACKING DATABASE.



CONSTRUCTION INSPECTION: AN EXAMPLE CONSTRUCTION PHASE INSPECTION CHECKLIST IS AVAILABLE IN THE APPROPRIATE SECTION OF THE TECHNICAL DOCUMENT.

POST CONSTRUCTION VERIFICATION DOCUMENTATION: THE FOLLOWING ITEMS SHALL BE INCLUDED IN THE POST CONSTRUCTION VERIFICATION DOCUMENTATION FOR BIORETENTION PRACTICES:

- SUBSTRATE DIMENSIONS OF BIOSOIL BED.
- VOLUME DIMENSIONS OF ANY PRE-TREATMENT COMPONENT.
- ELEVATIONS OF ANY STRUCTURAL COMPONENTS, INCLUDING INVERTS OF PIPES, WEIRS, ETC.

TABLE 2.6. TYPICAL BIORETENTION MAINTENANCE ITEMS AND FREQUENCY

FREQUENCY	MAINTENANCE ITEMS
DURING ESTABLISHMENT, AS NEEDED (FIRST YEAR)	<ul style="list-style-type: none"> • INSPECT THE SITE AFTER STORM EVENT THAT EXCEEDS 0.5 INCHES OF RAINFALL. • STABILIZE ANY BARE OR ERODING AREAS IN THE CONTRIBUTING DRAINAGE AREA INCLUDING THE BIORETENTION PERIMETER AREA. • WATER TREES AND SHRUBS PLANTED IN THE BIORETENTION PLANTING BED DURING THE FIRST GROWING SEASON. IN GENERAL, WATER EVERY 3 DAYS FOR FIRST MONTH, AND THEN WEEKLY DURING THE REMAINDER OF THE FIRST GROWING SEASON (APRIL - OCTOBER), DEPENDING ON RAINFALL.
QUARTERLY OR AFTER MAJOR STORMS (>1 INCH OF RAINFALL)	<ul style="list-style-type: none"> • REMOVE DEBRIS AND BLOCKAGES • REPAIR UNDERCUT, ERODED, AND BARE SOIL AREAS
TWICE A YEAR	<ul style="list-style-type: none"> • MOWING OF THE BIORETENTION VEGETATED PERIMETER AREA AND BANKS (AS DIRECTED IN APPROVED O&M PLAN) • CLEANUP TO REMOVE TRASH, DEBRIS AND FLOATABLES • A FULL MAINTENANCE REVIEW • CHECK CONDITION OF OUTLET STRUCTURE • REPAIR BROKEN MECHANICAL COMPONENTS, IF NEEDED
ANNUALLY	<ul style="list-style-type: none"> • BIORETENTION PLANTING BED REPLACEMENT/REINFORCEMENT PLANTINGS
ONE TIME - DURING THE SECOND YEAR FOLLOWING CONSTRUCTION	<ul style="list-style-type: none"> • FOREBAY SEDIMENT REMOVAL (AS APPLICABLE) • FLUSH UNDERDRAIN SYSTEM (AS APPLICABLE)
EVERY 5 TO 7 YEARS	<ul style="list-style-type: none"> • REPAIR PIPES, OUTLET STRUCTURE AND SPILLWAY, AS NEEDED • REMOVE ANY ACCUMULATED SEDIMENT WITHIN FACILITY, AS NEEDED
FROM 5 TO 25 YEARS	<ul style="list-style-type: none"> • REPAIR PIPES, OUTLET STRUCTURE AND SPILLWAY, AS NEEDED • REMOVE ANY ACCUMULATED SEDIMENT WITHIN FACILITY, AS NEEDED

Table 9.2 Sheet Flow Design Summary

Conveyance (Section 9.4)	<ul style="list-style-type: none"> • Must receive sheet flow. • Can be achieved by receiving a relatively short flow path (<150' pervious or <75' impervious surfaces), or • Can use an engineered level spreader for concentrated flows (Section 9.6)
Pretreatment (Section 9.5)	Not required
Other Design Elements (Section 9.6)	<ul style="list-style-type: none"> • Gravel diaphragm at top of the slope for sheet flow applications. • Engineered level spreader for concentrated flow • Permeable berm at toe of slope of filter strips • Compost amendments when applied on C soils to increase soil permeability
Landscaping (Section 9.7)	<ul style="list-style-type: none"> • Achieve 90% coverage with herbaceous materials for vegetated filter strips and vegetated open space. • Create an invasive species plan, and damage no native species for all conservation areas. • Requires 80% tree canopy for forested filter strips and conserved open space. • Specific criteria for reforestation. • Maximum velocity versus species type in Table 9.5.

Conserved Open Space
The most common design applications of Conserved Open Space are on sites that are hydrologically connected to a protected stream buffer, wetland buffer, floodplain, forest conservation area, or other protected lands. Conserved Open Space is an ideal component of the "outer zone" of a stream buffer, which normally receives runoff as sheet flow. Care should be taken to locate all energy dissipaters or flow spreading devices outside of the protected area. Conserved Open Space generally has a less linear configuration and flatter cross-slope than Vegetated Filter Strips. Runoff reduction in Conserved Open Space is achieved mainly through storage and/or extended residence time. These areas therefore require minimal slope or even slight sump conditions to allow shallow ponding to occur. Similar to Vegetated Filter Strips, Conserved Open Space can be either in the form of turf vegetation or preserved forested areas.

Both Vegetated Filter Strips and Conserved Open Space must meet the following requirements:

- **Slopes:** Maximum slope for Vegetated Filter Strips is 8%, in order to maintain sheet flow through the practice. Maximum slope for Conserved Open Space is 12%. In addition, the overall contributing drainage area must likewise be relatively flat to ensure sheet flow draining into the filter. Where this is not possible, alternative measures, such as an engineered level spreader, can be used.
 - **Soils:** Vegetated Filter Strips and Conserved Open Space are appropriate for all soil types, except fill material. As it applies to this practice, fill is defined as any placed soil that requires compaction to meet a design grade or elevation. The runoff reduction rate, however, is dependent on the underlying Hydrologic Soil Groups (see Table 9.1 above) and whether soils receive compost amendments.
 - **Hotspot Land Uses:** Vegetated Filter Strips and Conserved Open Space should not receive hotspot runoff, since the infiltration runoff could cause groundwater contamination.
 - **Proximity of Underground Utilities:** Underground pipes and conduits in a vegetated Filter Strip or Conserved Open Space are acceptable.
 - **Jurisdictional Wetlands:** Restrictions may apply when these practices are located adjacent to jurisdictional wetlands that are sensitive to increased inputs of stormwater runoff (e.g., bogs and fens).
- 9.4 Sheet Flow Conveyance Criteria**
Vegetated Filter Strips and Conserved Open Space are used to treat very small drainage areas of a few acres or less. The limiting design factor is the length of flow directed to the filter. As a sheet flow tends to concentrate after 75 feet of flow length for impervious surfaces, and 150 feet for pervious surfaces (Clayton, 1996). When flow concentrates, it moves too rapidly to be effectively treated, unless an engineered level spreader is used.
- 9.5 Sheet Flow Pretreatment Criteria**
Pretreatment is needed for Sheet Flow to Vegetated Filter Strips or Conserved Open Space.

For Conserved Open Space, the following minimum area is required:

Table 9.3 Minimum Area of Conserved Open Space

Slope of Open Space	Minimum Area
1% Max	1:1 equivalent to impervious area in CDA

Gravel Diaphragms
A gravel diaphragm at the top of the slope is required between filter strips and conserved open space. The gravel diaphragm is created by excavating a 2-foot wide and 1-foot deep trench that runs on the same contour at the top of the filter strip. The diaphragm serves two purposes. First, it acts as a pretreatment device, settling out sediment particles before they reach the practice. Second, it acts as a level spreader, maintaining sheet flow as runoff flows over the filter strip.

- The flow should travel over the impervious area and to the practice as sheet flow and then drop at least 3 inches onto the gravel diaphragm. The drop helps to prevent runoff from running laterally along the pavement edge, where grit and debris tend to build up (thus allowing by-pass of the Filter Strip).
- A layer of filter fabric should be placed between the gravel and the underlying soil trench.
- If the contributing drainage area is steep (6% slope or greater), then larger stone should be used in the diaphragm.
- If the contributing drainage area is solely turf (e.g., sports field), then the gravel diaphragm may be eliminated.

OPEN SPACE CONSTRUCTION AND MAINTENANCE CRITERIA

REFERENCE	VEGETATION	SOIL MEDIA	PHYSICAL MAINTENANCE	VEGETATION MAINTENANCE
BC Ministry of Land, Water, and Air Protection	Erosion resistant, salt & metal tolerant grass species	Native soils with >10% organic content or 50mm compost	Correct erosion problems, remove sediment	Mow grass, remove seedlings. Avoid fertilization unless absolutely necessary
VT Manual	Flood and drought resistant grasses	In berm: sand per dry swale sand, gravel AASHTO M-43. Mix with Approx 25% loam to support grass cover		
WA Manual	Drought tolerant, minimum mowing grasses; dense, low growing groundcover species	4" minimum topsoil over undisturbed native soil	Remove leaves, litter, and city materials. Fertilize, reseed, & regrade.	Mow grass to <4 inches
OR Manual	Native wildflowers, grasses, and ground covers designed not to require mowing		Repair erosion	Should not need mowing more than once or twice annually
Clayton & Schueler (CWP, 1996)	Flood/drought resistant grasses	Dry swale: permeable soil mixture. Wet swale: undisturbed native soil		

Conserved Open Space. No grading or clearing of native vegetation is allowed within the Conserved Open Space. An invasive species management plan should be developed and approved as part of plan review.

Construction Sequence for Vegetated Conserved Open Space
No major disturbance may occur within the Conserved Open Space during or after construction (i.e., no clearing or grading is allowed except temporary disturbances associated with incidental utility construction, restoration operations, or management of nuisance vegetation). The Conserved Open Space area shall not be stripped of topsoil. Some light grading may be needed at the boundary using tracked vehicles to prevent compaction.

The Conserved Open Space must be fully protected during the construction stage of development and kept outside the limits of disturbance on the Sediment and Stormwater Plan.

- The perimeter of the Conserved Open Space shall be protected by super silt fence, chain link fence, orange safety fence, or other means to prevent compaction and sediment discharge.
- The limits of disturbance should be clearly shown on all construction drawings and identified and protected in the field by acceptable signage, silt fence, snow fence or other protective barrier.
- Construction of the gravel diaphragm or engineered level spreader shall not commence until the contributing drainage area has been stabilized and perimeter E&S controls have been removed and cleaned out.
- Stormwater shall not be diverted into the conserved open space until the gravel diaphragm and/or level spreader are installed and stabilized.

Construction Inspection. Construction inspection is critical to ensure compliance with design standards. Inspectors should evaluate the performance of the filter strip or open space after the first big storm to look for evidence of gullies, outflanking, undercutting or sparse vegetative cover. Spot repairs should be made, as needed.

Post Construction Verification Documentation. The following items shall be included in the Post Construction Verification Documentation for Sheet Flow Practices:

- Area of Conserved Open Space
- Cross-slope.
- Volume dimensions of any pre-treatment components.
- Elevations of any structural components, such as gravel diaphragms or engineered level spreaders.

OPERATION AND MAINTENANCE 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 8" 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 CITY OF NEWARK 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 ON-SITE.

DUFFIELD ASSOCIATES
Soil, Water & the Environment
5400 LINNESTONE ROAD
WILMINGTON, DE 19808-1232
TEL: 302.239.6634
FAX: 302.239.8485
OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY
WEB: HTTP://DUFFNET.COM
E-MAIL: DUFFIELD@DUFFNET.COM

CHECKED BY: [Signature]
DESIGNED BY: [Signature]
DATE: 03/26/16
FILE NAME: 585-CG-S&S-STEP 3
DRAWN BY: [Signature]
DATE: 03/26/16
NO. 12025
STATE OF DELAWARE
P.E.# 1925

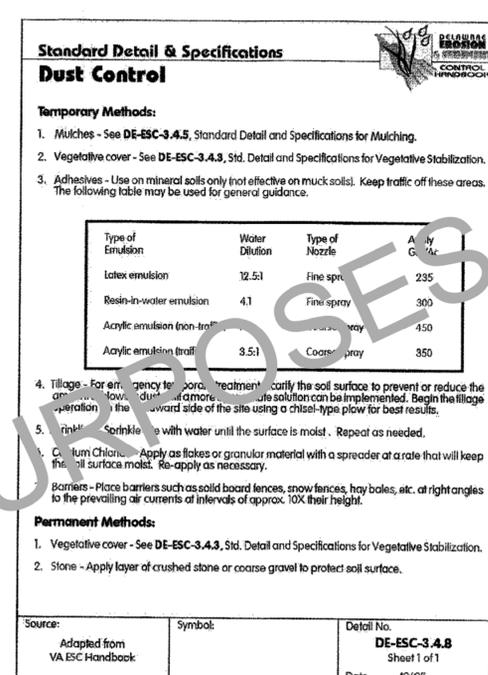
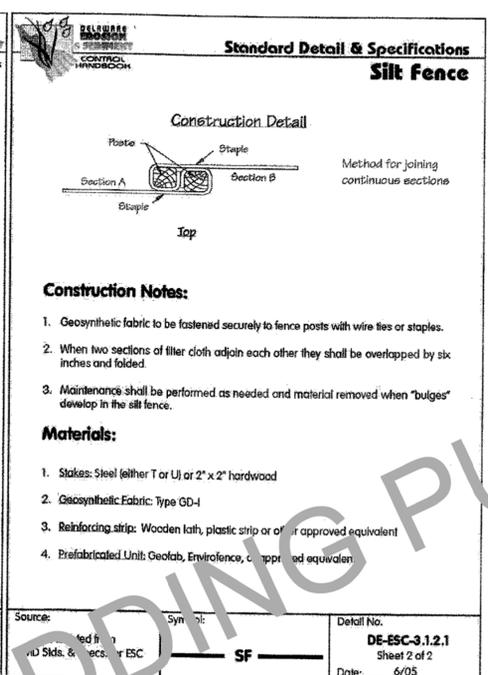
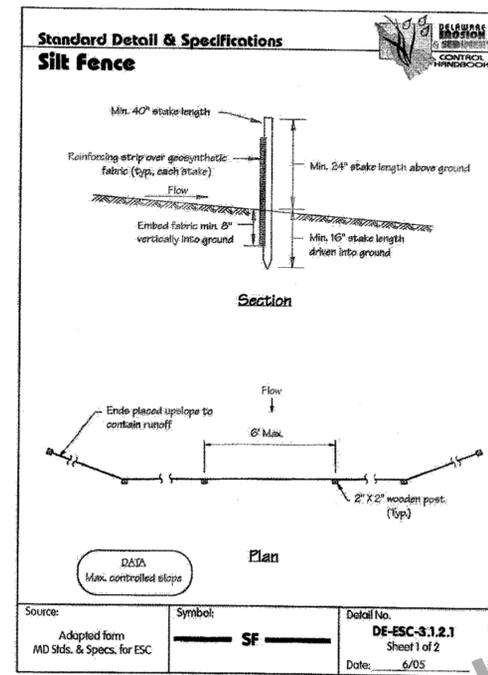
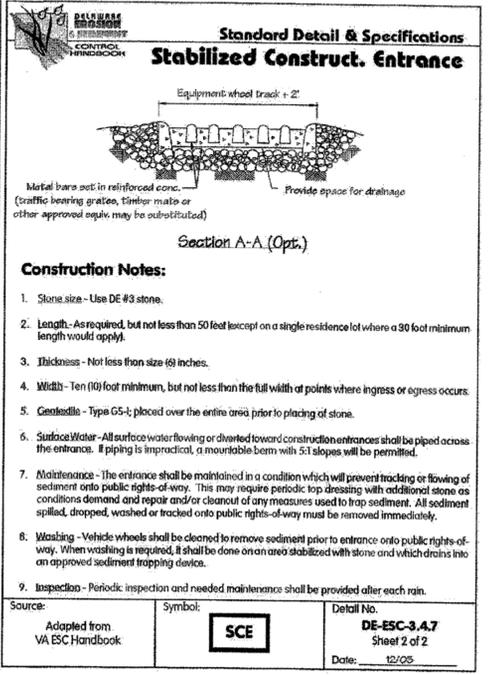
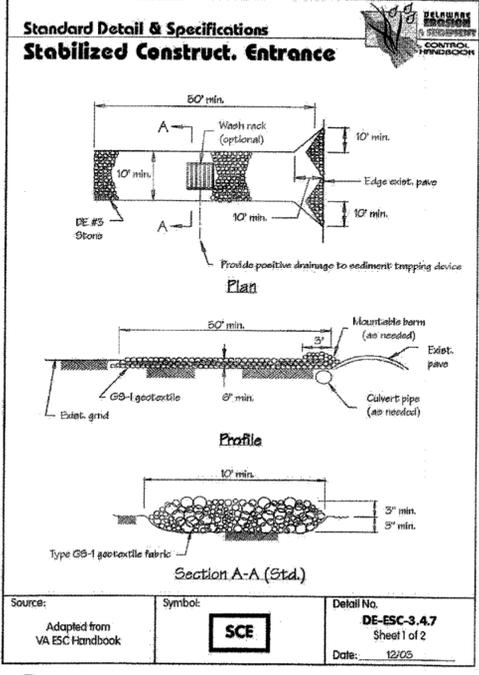
NO.	REVISION	DATE	DESCRIPTION
1	BIORETENTION REMOVED		

OWNER:
DELAWARE DEPARTMENT OF HEALTH AND SOCIAL SERVICES
THOMAS COLLINS BUILDING
500 SOUTH DUPONT HIGHWAY
DOVER, DE 19901

SEDIMENT AND STORMWATER MANAGEMENT PLAN
STORMWATER MANAGEMENT FACILITY

PLAN, SECTIONS AND DETAILS
STOCKLEY CENTER CAMPUS
PARKING LOT UPGRADES
GEORGETOWN HUNDRED-SUSSEX COUNTY-DELAWARE

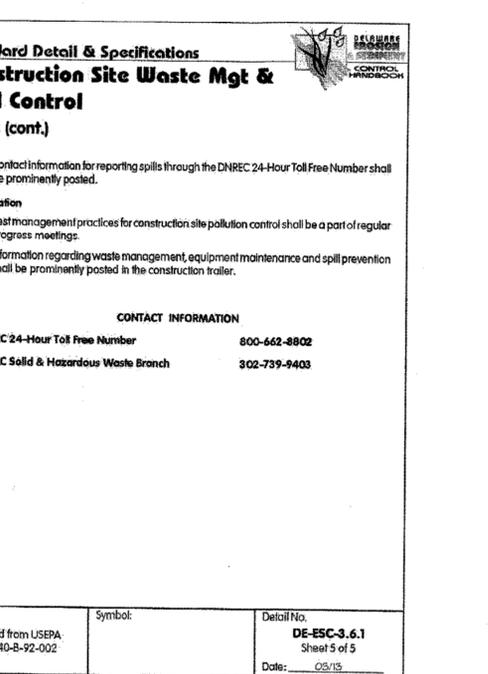
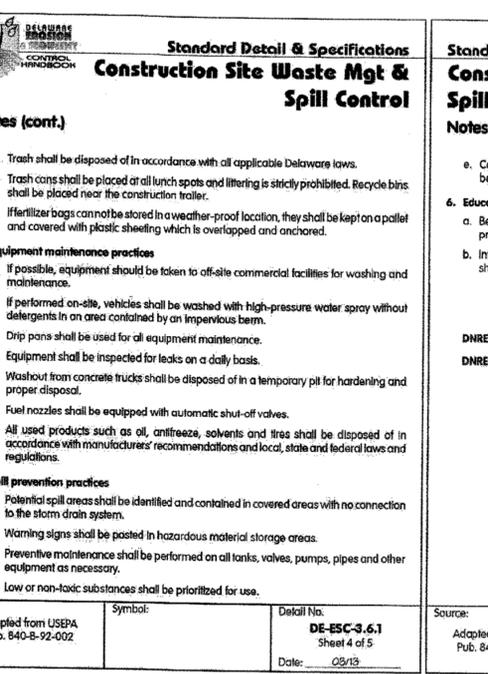
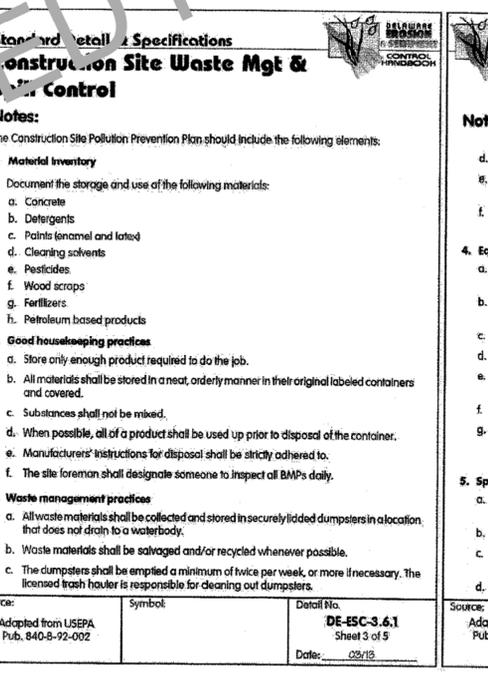
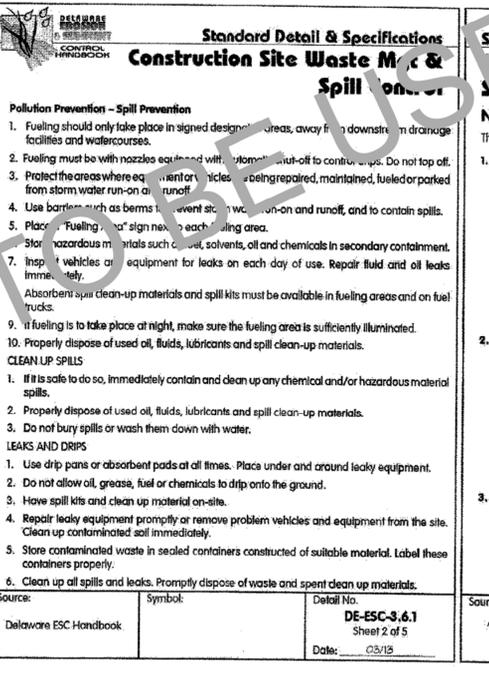
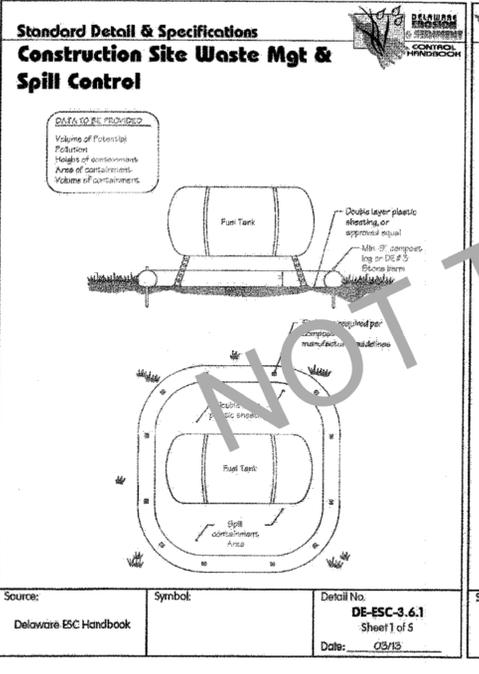
DATE: 04 MARCH 2016
SCALE: AS NOTED
PROJECT NO: 5858.CG
SHEET: 4 OF 7



1 DETAIL: STABILIZED CONSTRUCTION ENTRANCE
5 SCALE: NOT TO SCALE

2 DETAIL: SILT FENCE
5 SCALE: NOT TO SCALE

3 DETAIL: DUST CONTROL
5 SCALE: NOT TO SCALE



4 DETAIL: CONSTRUCTION SITE WASTE MANAGEMENT & SPILL CONTROL
5 SCALE: NOT TO SCALE

DUFFIELD ASSOCIATES
Soil, Water & the Environment
5400 LIMESTONE ROAD
WILMINGTON, DE 19808-1232
TEL: 302.239.6634
FAX: 302.239.8485

OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY
WEB: HTTP://DUFFIELD.COM
E-MAIL: DUFFIELD@DUFFIELD.COM

DESIGNED BY: []
CHECKED BY: []
FILE NAME: 588.CG-S&S-STEP 3
DRAWN BY: MEI
STEPHEN J. COESKEL, P.E.
No. 12263
STATE OF DELAWARE
P.E. # 12625

OWNER: DELAWARE DEPARTMENT OF HEALTH AND SOCIAL SERVICES
THOMAS COLLINS BUILDING
540 SOUTH DUPONT HIGHWAY
DOVER, DE 19901

SEDIMENT AND STORMWATER MANAGEMENT PLAN
SEDIMENT AND EROSION
DETAILS
STOCKLEY CENTER CAMPUS
PARKING LOT UPGRADES
GEORGETOWN HUNDRED-SUSSEX COUNTY-DELAWARE

DATE: 04 MARCH 2016
SCALE: AS SHOWN
PROJECT NO. 5858.CG
SHEET: 5 OF 7

Standard Detail & Specifications

Stabilization Matting - Slope

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

Perspective

Construction Notes:

- Prepare soil before installing matting, including application of lime, fertilizer, and seed.
- 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.
- Roll the mats (A) down or (B) horizontally across the slope.
- The edges of parallel mats must be stapled with approx. 2" overlap.
- When mats must be spliced down the slope, place mats end over end (single style) with approx. 4" overlap. Staple through overlapped area, approx. 12" apart.

Source: Adapted from North American Green, Inc. Symbol: **SM-S** Detail No. **DE-ESC-3.4.6.1** Sheet 1 of 2 Date: 6/05

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: Adapted from North American Green, Inc. Symbol: **SM-S** Detail No. **DE-ESC-3.4.6.1** Sheet 2 of 2 Date: 6/05

1 DETAIL: STABILIZATION MATTING - SLOPE
7 SCALE: NOT TO SCALE

Standard Detail & Specifications

Vegetative Stabilization

Mix #	Species ¹	Seeding Rate	Optimum Seeding Dates ²														
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar			
1	Certified Seed	2000 lbs/acre	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
2	Chia	4	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
3	Rye	125	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
4	Annual Ryegrass	125	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
5	Winter Rye	125	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
7	Perennial Ryegrass	30 PLS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
8	Perennial Ryegrass	30 PLS	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Source: Delaware ESC Handbook Symbol: **DE-ESC-3.4.3** Sheet 1 of 4 Date: 12/05

Standard Detail & Specifications

Vegetative Stabilization

Seeding Rate	Seeding Depth	Optimum Seeding Dates ²															
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar				
100	0.5"	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
150	0.5"	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
200	0.5"	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Source: Delaware ESC Handbook Symbol: **DE-ESC-3.4.3** Sheet 2 of 4 Date: 12/05

2 DETAIL: VEGETATIVE STABILIZATION
7 SCALE: NOT TO SCALE

Standard Detail & Specifications

Vegetative Stabilization

Seeding Rate	Seeding Depth	Optimum Seeding Dates ²															
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar				
100	0.5"	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
150	0.5"	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
200	0.5"	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

Source: Delaware ESC Handbook Symbol: **DE-ESC-3.4.3** Sheet 3 of 4 Date: 12/05

Standard Detail & Specifications

Vegetative Stabilization

Construction Notes:

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

It is important to prepare a good seedbed to insure the success of establishing vegetation. The seedbed should be well prepared, loose, uniform, and free of large clods, rocks, and other objectionable material. The soil surface should not be compacted or crusted.
- Soil Amendments
 - Lime - Apply liming materials based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply dolomitic limestone at the rate of 1 to 2 tons per acre. Apply limestone uniformly and incorporate into the top 4 to 6 inches of soil.
 - Fertilizer - Apply fertilizer based on the recommendations of a **soil test** in accordance with the approved nutrient management plan. If a nutrient management plan is not required, apply a formulation of 10-10-10 at the rate of 500 pounds per acre. Apply fertilizer uniformly and incorporate into the top 4 to 6 inches of soil.
- Seeding
 - For **temporary stabilization**, select a mixture from **Sheet 1**. For a **permanent stabilization**, select a mixture from **Sheet 2** or **Sheet 3** depending on the conditions.
 - Apply seed uniformly with a broadcast seeder, drill, cultipacker seeder or hydroseeder. All seed will be applied at the recommended rate and planting depth.
 - Seed that has been broadcast should be covered by raking or dragging and then lightly tamped into place using a roller or cultipacker. If hydroseeding is used and the seed and fertilizer is mixed, they will be mixed on site and the seeding shall be done immediately and without interruption.
- Mulching

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

Source: Delaware ESC Handbook Symbol: **DE-ESC-3.4.3** Sheet 4 of 4 Date: 12/05

DUFFIELD ASSOCIATES
 Soil, Water & the Environment
 5400 LIMESTONE ROAD
 WILMINGTON, DE 19808-1232
 TEL: 302.239.6634
 FAX: 302.239.8485
 OFFICES IN DELAWARE, MARYLAND, PENNSYLVANIA AND NEW JERSEY
 WEB: HTTP://DUFFIELD.COM
 E-MAIL: DUFFIELD@DUFFIELD.COM

CHECKED BY: [Signature]
 DESIGNED BY: [Signature]
 DRAWN BY: [Signature]
 FILE NAME: S858-CG-S&S-STEP 3
 STATE: DE LA W A R E

OWNER: DELAWARE DEPARTMENT OF HEALTH AND SOCIAL SERVICES
 440 SOUTH DUPONT HIGHWAY
 DOVER, DE 19901

SEDIMENT AND STORMWATER MANAGEMENT PLAN
SEDIMENT AND EROSION
DETAILS
STOCKLEY CENTER CAMPUS
PARKING LOT UPGRADES
GEORGETOWN HUNDRED-SUSSEX COUNTY-DELAWARE

DATE: 04 MARCH 2016
 SCALE: AS SHOWN
 PROJECT NO. 5858.CG
 SHEET: 7 OF 7