

**SAFETY REGULATIONS**

ALL EXCAVATION AND METHODS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MARYLAND OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (MOSHA) STANDARDS AS SET FORTH IN THE LATEST VERSION OF THE CODE OF MARYLAND REGULATIONS

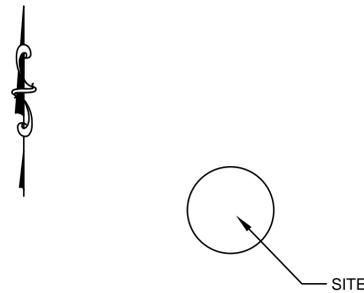
# LANDOWNER/PROJECT

## 747 - DENITRIFYING BIOREACTOR

587 - STRUCTURE FOR WATER CONTROL

606 - SUBSURFACE DRAINAGE

# DISTRICT SOIL CONSERVATION DISTRICT



**VICINITY MAP**  
N.T.S.



**Know what's below.  
Call before you dig.**

"The Soil Conservation District makes no representation as to the existence or Non-existence of any utilities at the construction site. Shown on these construction drawings are those utilities which have been identified. It is the responsibility of the landowners or operators and contractors to assure themselves that no hazard exists or damage will occur to utilities"

**AS-BUILT STATEMENT**

**THE CONSERVATION PRACTICE(S) MEETS OR EXCEEDS NRCS STANDARDS AND SPECIFICATIONS**

INSPECTED BY	SIGNATURE _____	DATE _____
CONSTRUCTION APPROVAL	SIGNATURE _____	DATE _____
VERIFIED DISTRICT CONSERVATIONIST	SIGNATURE _____	DATE _____

MM/YY	Designed	Drawn	Checked	Approved _____ Date _____	Job _____ Class _____
LANDOWNER					
747 DENITRIFYING BIOREACTOR TRACT					
City, Maryland					
Maryland Department of Agriculture					
DISTRICT Soil Conservation District					
United States Department of Agriculture					
Natural Resources Conservation Service					
REVISIONS	Date	Description	Approved		
File No. *.DWG					
Sheet 1 of 4					

**MATERIALS LIST**

OWNER/CONTRACTOR STATEMENT	
I CERTIFY THAT THIS DESIGN HAS BEEN EXPLAINED TO ME BY A REPRESENTATIVE OF THE _____ DISTRICT SOIL CONSERVATION DISTRICT, AND I UNDERSTAND THE CONTENTS. ALL CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS AND SPECIFICATIONS. I FURTHER UNDERSTAND THAT ALL CONSTRUCTION WILL BE UNDER THE INSPECTION OF THIS OFFICE.	
OWNER'S SIGNATURE _____	DATE _____
CONTRACTOR'S SIGNATURE _____	DATE _____

THERE WILL BE NO CHANGES IN SPECIFICATION, DIMENSIONS, OR MATERIALS UNLESS APPROVED BY THE ENGINEER RESPONSIBLE FOR THIS DRAWING.

THE DRAWINGS ARE PREPARED COOPERATIVELY BY THE NATURAL RESOURCE CONSERVATION SERVICE FOR THE NAMED LANDOWNER. CONSTRUCTION FOUND NOT IN ACCORDANCE WITH THESE DRAWINGS AND SPECIFICATIONS SHALL VIOLATE THE COOPERATIVE AGREEMENT AND ALL DRAWINGS, SPECIFICATIONS, AND QUANTITIES ESTIMATE SHALL IMMEDIATELY BE RETURNED TO THE LOCAL NRCS OFFICE.

**GENERAL NOTES:**

- PLEASE CONTACT THE DISTRICT SOIL & WATER CONSERVATION DISTRICT AT LEAST 3 DAYS PRIOR TO CONSTRUCTION TO ARRANGE A PRE-CONSTRUCTION MEETING @PHONE #
- A CONSERVATION TECHNICIAN SHALL VERIFY CUT/GRADE STAKES AT THE CONTRACTORS REQUEST
- A CONSERVATION TECHNICIAN MUST BE PRESENT AT THE TIME OF PIPE INSTALLATION, IF REQUIRED
- A CONSERVATION TECHNICIAN MUST BE PRESENT AT THE TIME OF THE CARBON SOURCE INSTALLATION

PLAN VIEW

CROSS-SECTION

PROFILE VIEW

REVISIONS		Approved
Date	Description	

File No.  
\*.DWG

Sheet 2 of 4



United States  
Department of  
Agriculture  
**Natural Resources  
Conservation Service**

LANDOWNER  
747 DENITRIFYING BIOREACTOR  
TRACT  
City, Maryland

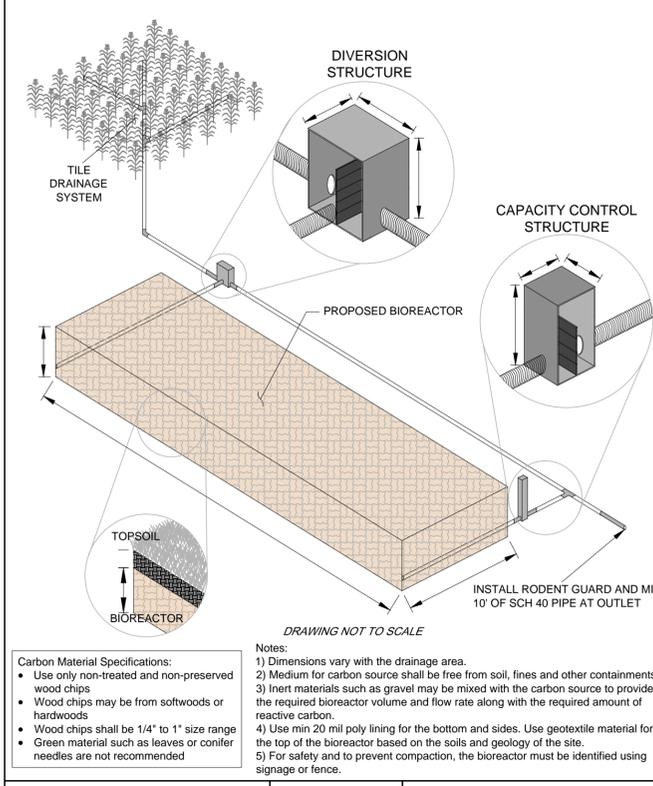
Designed  
Drawn  
Checked

MM/YY  
Date  
Job Class

Maryland Department of Agriculture  
DISTRICT Soil Conservation District

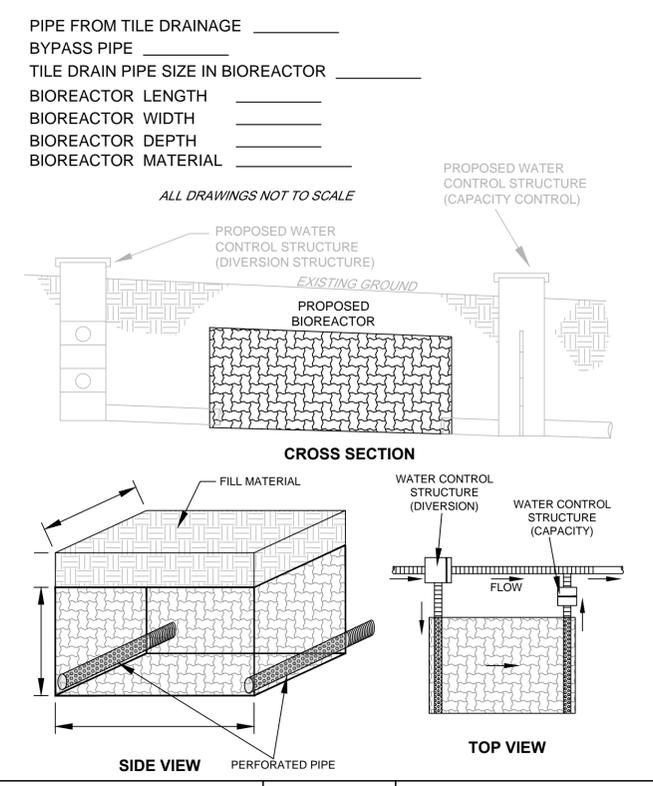
Approved  
Title

**MARYLAND STANDARDS FOR AGRICULTURAL BMPS  
DETAIL - DENITRIFYING BIOREACTOR**



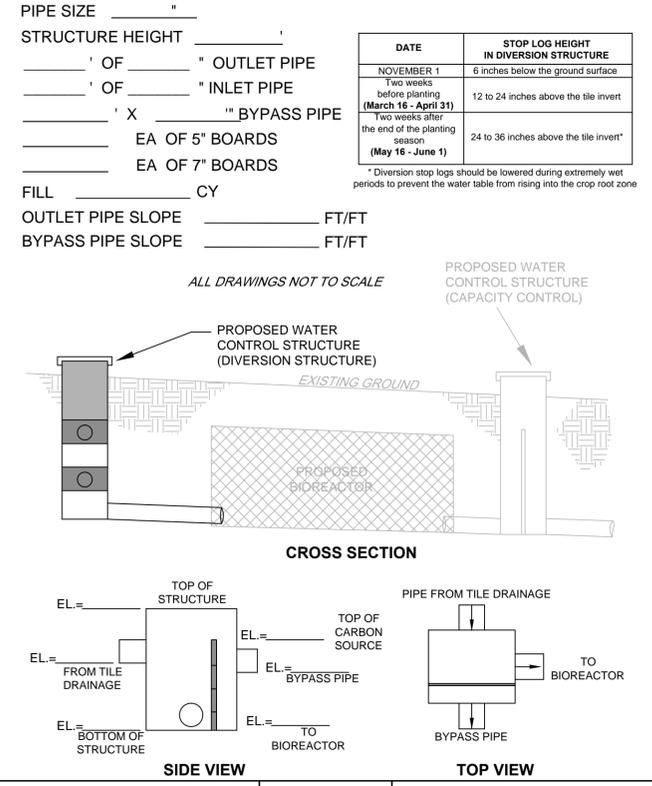
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | BIOREACTOR.dwg | MARYLAND DEPARTMENT OF AGRICULTURE MARYLAND SOIL CONSERVATION DISTRICTS

**MARYLAND STANDARDS FOR AGRICULTURAL BMPS  
DETAIL - BIOREACTOR DIMENSIONS**



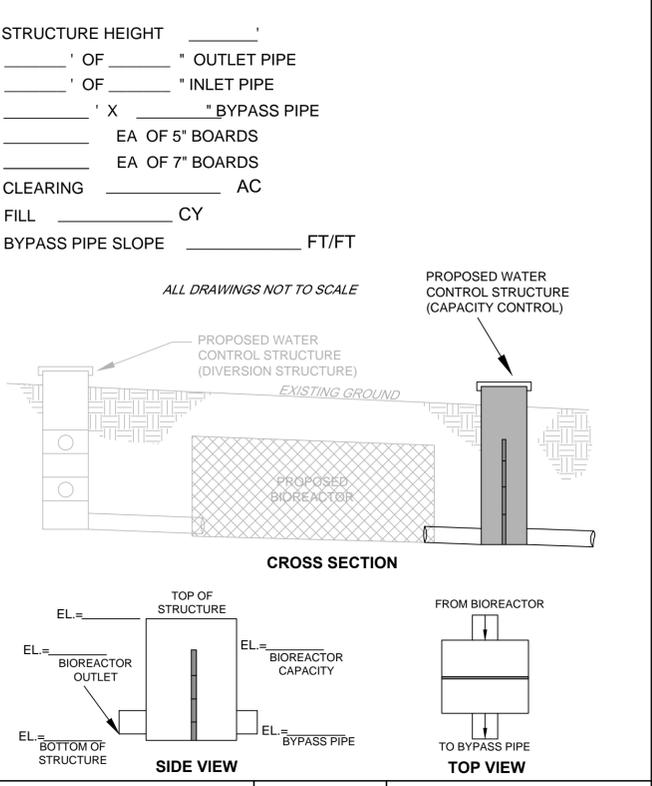
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | MD\_BIOREACTOR\_747.dwg | MARYLAND DEPARTMENT OF AGRICULTURE MARYLAND SOIL CONSERVATION DISTRICTS

**MARYLAND STANDARDS FOR AGRICULTURAL BMPS  
DETAIL - BIOREACTOR DIVERSION STRUCTURE**

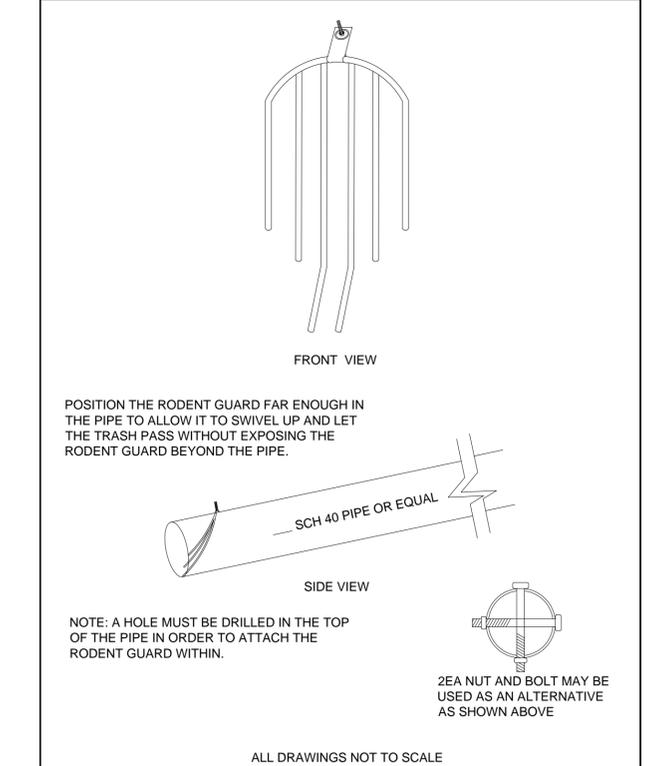


U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | MD\_INLINWCWS\_587 (DIVERSION).dwg | MARYLAND DEPARTMENT OF AGRICULTURE MARYLAND SOIL CONSERVATION DISTRICTS

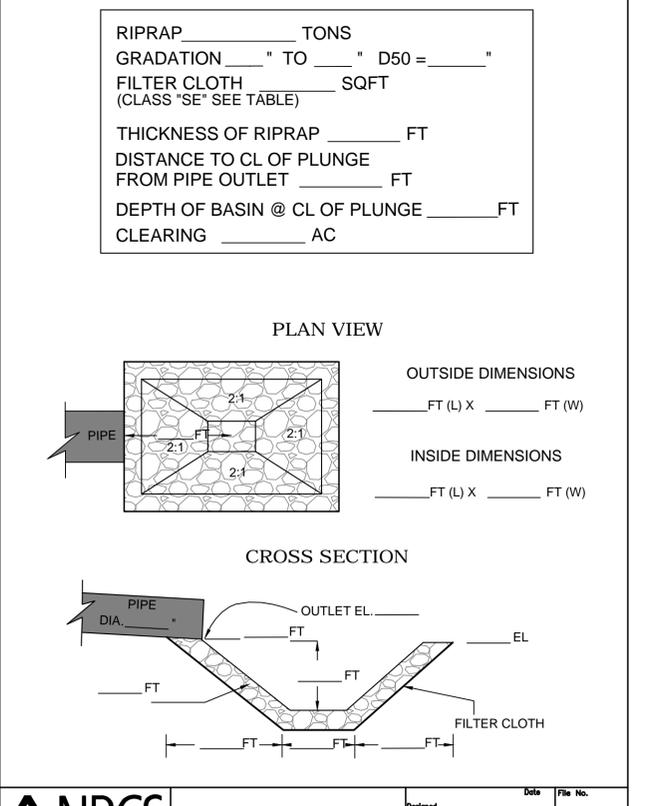
**MARYLAND STANDARDS FOR AGRICULTURAL BMPS  
DETAIL - WATER CONTROL STRUCTURE (CAPACITY)**



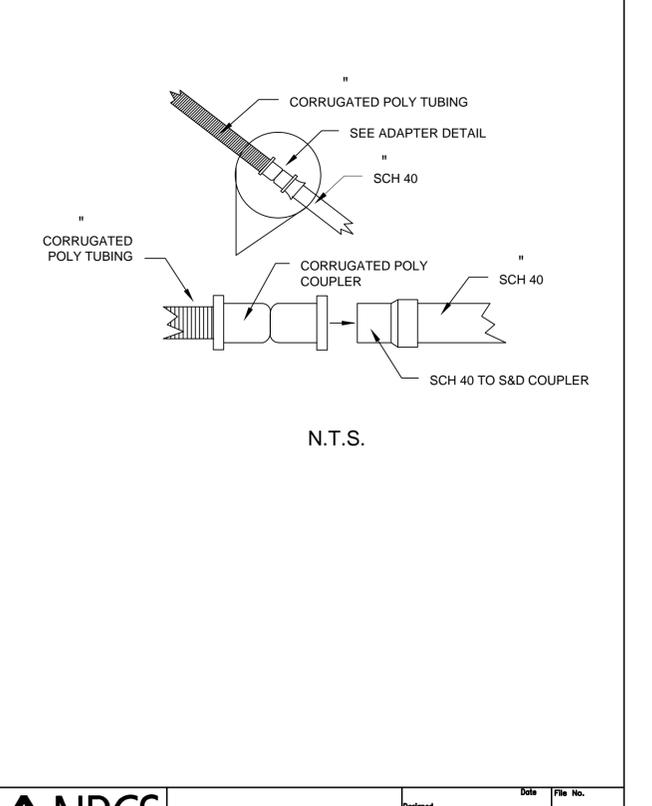
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | MD\_INLINWCWS\_587 (CAPACITY STR).dwg | MARYLAND DEPARTMENT OF AGRICULTURE MARYLAND SOIL CONSERVATION DISTRICTS



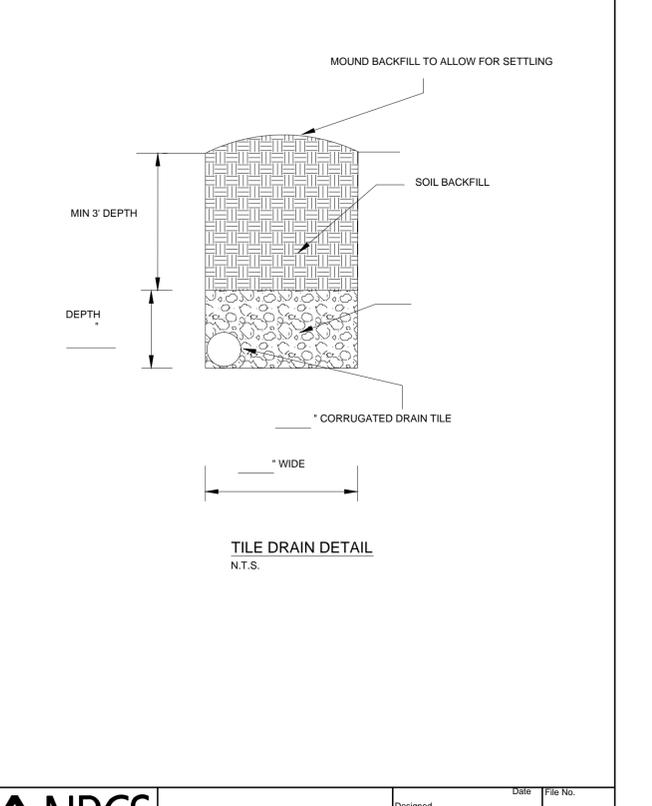
ALL DRAWINGS NOT TO SCALE | RODENT GUARD - OUTLET DETAIL | DRAWING NO. RG-OUTLET | ISSUE DATE: 12/2014



NRCS | PLUNGE POOL | Design, Draw, Check, Approved | Date, File No., Drawing No., Sheet of



NRCS | ADAPTER DETAIL | Design, Draw, Check, Approved | Date, File No., Drawing No., Sheet of



NRCS | TILE DRAIN DETAIL | Design, Draw, Check, Approved | Date, File No., Drawing No., Sheet of

MM/YY  
 Designed \_\_\_\_\_  
 Drawn \_\_\_\_\_  
 Checked \_\_\_\_\_  
 Approved \_\_\_\_\_ Date \_\_\_\_\_  
 Title \_\_\_\_\_  
 Job \_\_\_\_\_ Class \_\_\_\_\_

LANDOWNER  
**747 DENITRIFYING BIOREACTOR**  
 City, Maryland  
 TRACT

Maryland Department of Agriculture  
 DISTRICT Soil Conservation District

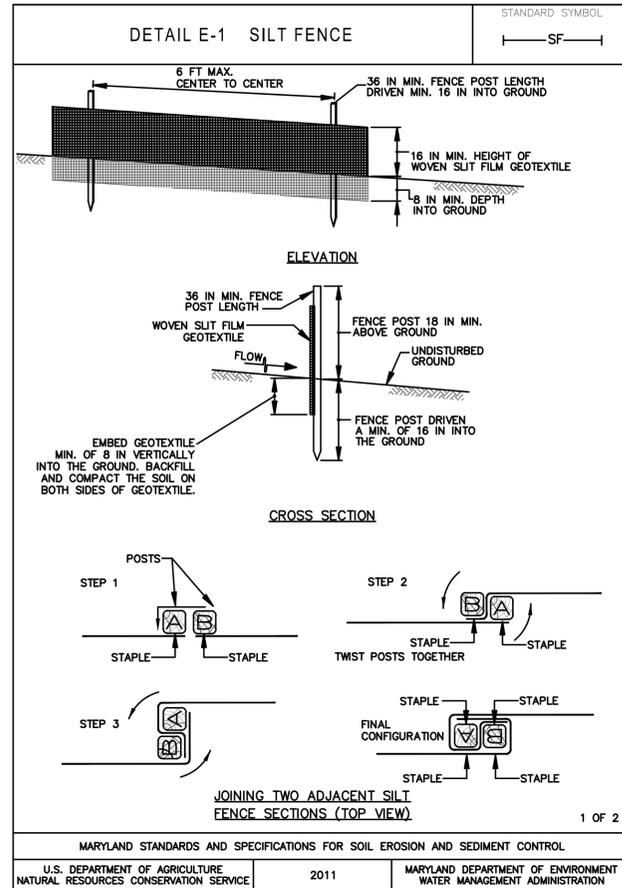
United States Department of Agriculture  
**USDA**  
 Natural Resources Conservation Service

REVISIONS	Date	Description	Approved

File No. \*DWG

STATE HIGHWAY ADMINISTRATION GEOTEXTILE REQUIREMENTS						
Maryland Application Class	Type of Geotextile	Grab Strength Lb D 4832	Puncture Strength Lb D 4833	Permittivity Sec <sup>1</sup>	Apparent Opening Size, Max Mm D 4751	Trapezoid Tear Strength Lb D4533
SD	NONWOVEN	100	65	0.50	0.43	55
TYPE I	WOVEN, MONOFILAMENT	250	90	0.50	0.43	90
	NONWOVEN	160	65	0.20	0.26	55
TYPE II	WOVEN, MONOFILAMENT	250	90	0.20	0.26	90
	NONWOVEN	200	80	0.70	0.43	80
TYPE I	WOVEN, MONOFILAMENT	250	90	0.70	0.43	90
	NONWOVEN	200	80	0.20	0.26	80
TYPE III	WOVEN	300	110	0.05	0.15**	110
	NONWOVEN	200	80	0.10	0.22	80
SE	WOVEN	250	90	0.20	0.30	90
	NONWOVEN	200	80	0.20	0.30	80
ST	WOVEN	300*	110	0.05	0.15**	110
F	WOVEN	100	-	0.05	0.60	-
E	NONWOVEN	90	50	0.05	0.30	50

Note: 1 All property values are based on minimum average roll values in the weakest principle direction, except for apparent opening size.  
 Note: 2 The ultraviolet stability shall be 50 percent after 500 hours of exposure for all classes, except Class F, which shall be 70 percent (D 4855).  
 \* Minimum 15 percent elongation.  
 \*\* This is a minimum apparent opening size, not a maximum.



DETAIL E-1 SILT FENCE			STANDARD SYMBOL
<p><b>CONSTRUCTION SPECIFICATIONS</b></p> <ol style="list-style-type: none"> <li>USE WOOD POSTS 1 3/4 X 1 3/4 ± 1/16 INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.</li> <li>USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.</li> <li>USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.</li> <li>PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.</li> <li>EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.</li> <li>WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.</li> <li>EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.</li> <li>REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.</li> </ol>			
2 OF 2			
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL			
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE		MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION	

## OPERATION AND MAINTENANCE SCHEDULE FOR DENITRIFYING BIOREACTOR (747)

10 year maintenance life

- Removal of any blockage of trash and debris that could affect flows through the structures.
- Maintain fencing and/or signage around bioreactor to eliminate traffic over the area.
- Inspect diversion structure and water capacity structure levels after each storm event and before and after each growing season. Adjust levels as needed and document for future reference.
- Inspect and assure tile drainage system is functioning as designed, make any repairs as needed.
- Maintain vegetation and soil depth over carbon source. A minimum thickness of 1ft of material shall be over the carbon source. If soil has settled over time, add additional soil as needed to maintain the minimum soil thickness.
- Repairs should be made as soon as possible. Repairs should be made to return the structure to the same condition as it was designed.
- Inspect pipe structures annually and after each storm event. Assure rodent guard is in place and is functioning properly.
- Vegetation shall be mowed a minimum twice a year using small equipment, no large equipment that could possibly compact the carbon source. Remove any woody vegetation in bioreactor area and control noxious weeds as needed.

## OPERATION AND MAINTENANCE PLAN SUBSURFACE DRAINAGE (606)

Maintenance life of practice-10 years

- Inspect drainage line at least twice a year. Make repairs as needed.
- Protect from damage due to livestock and farm equipment.
- Check for leaks and repair immediately.
- Maintain vegetative cover around the system. Mow at least yearly. Provide weed control as needed. Reseed, lime, and fertilize as needed.
- Keep inlets, trash guards, and collection boxes and structures clean and free of materials that can reduce the flow.
- Check outlet pipe and animal guards to ensure proper functioning.

Keep adequate backfill over drainage line.

LANDOWNER TRACT		PRACTICE(S)						
TOTAL AREA	AREA 1	AREA 2		AREA 3				
MATERIALS/RATE	AMOUNT PLANNED	AMOUNT APPLIED	AMOUNT PLANNED	AMOUNT APPLIED	AMOUNT PLANNED	AMOUNT APPLIED		
FERTILIZER 10-20-20 500LBS/AC								
LIME - 2TONS/AC DOLOMITIC								
SEED MIXTURE (SEE BELOW)								
MULCH 2 TONS/AC								
ENTER KINDS AND AMOUNT OF SEED BELOW				NOTE: INOCULATE ALL LEGUMES				
AREA 1 NRCS SEED MIX #	AREA 2 NRCS SEED MIX #		AREA 3 NRCS SEED MIX #					
SITE PREPARATION AND OTHER PERTINENT INFORMATION: DISK ALL DISTURBED AREAS TO A DEPTH OF 4-6" CULTIPACK AFTER SEEDING				SEEDING DATES SPRING: FALL:				
PLAN APPROVED BY:			CHECKED FOR TECHNICAL COMPLIANCE BY:					
TITLE	DATE	TITLE	DATE	TITLE	DATE	TITLE	DATE	
USDA UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE MARYLAND		SEEDING			DRAWING NO. S-1.0 ISSUE DATE: 7/2014			

DESIGNED DRAWN CHECKED	APPROVED TITLE	DATE JOB CLASS	LANDOWNER <b>747 DENITRIFYING BIOREACTOR</b> TRACT City, Maryland Maryland Department of Agriculture DISTRICT Soil Conservation District
UNITED STATES DEPARTMENT OF AGRICULTURE 		NATURAL RESOURCES CONSERVATION SERVICE	
REVISIONS Description	APPROVED Date	FILE NO. *.DWG	
SHEET 4 OF 4			