

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 _____
 Title _____ Job _____ Class _____

LANDOWNER
 646 - SHALLOW WATER DEVELOPMENT & MANAGEMENT TRACT
 City, Maryland
 Maryland Department of Agriculture
 DISTRICT Soil Conservation District

United States Department of Agriculture
 Natural Resources Conservation Service

REVISIONS	Approved
Description	_____
Date	_____

File No. *DWG
 Sheet 1 of 4

SAFETY REGULATIONS

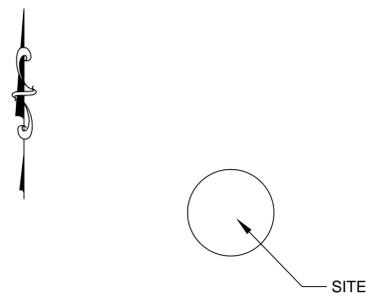
ALL EXCAVATION AND METHODS OF CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MARYLAND OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (MOSHA) STANDARDS AS SET FORTH IN THE LATEST VERSION OF THE CODE OF MARYLAND REGULATIONS

LANDOWNER/PROJECT

646 - SHALLOW WATER DEVELOPMENT & MANAGEMENT

& MANAGEMENT

(DISTRICT SOIL CONSERVATION DISTRICT)



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.

VICINITY MAP
 N.T.S.

SHEET	TITLE
2.....	PLAN VIEW/PROFILES/SOIL DESCRIPTIONS
3.....	DESIGN CUT SHEETS
4.....	SEEDING



**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"

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 _____

CONSTRUCTION NOTIFICATION

The Contractor/Owner is to notify the _____ DISTRICT SOIL CONSERVATION DISTRICT at least 72 hours prior to construction to facilitate any scheduling, layout, or preliminary mobilization necessary to ensure proper construction inspection to enable appropriate certification of the project.

It is the Landowner's responsibility to obtain all County, State, and Federal permits that may be needed, and to maintain this structure and related regulations.

GENERAL NOTES:

- PLEASE CONTACT THE DISTRICT SOIL 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

PIPE SIZE _____"
 STRUCTURE HEIGHT _____' (INCLUDES 1FT STUB)
 _____' OF _____" SCH 40 PVC PIPE INLET PIPE
 _____' X _____' ANTI-SEEP COLLAR
 CLEARING _____ AC
 CONCRETE _____ CY (MIN 3500 PSI)
 FILL _____ CY
 SLOPE _____ FT/FT

TYPICAL DRAIN STRUCTURE

CROSS SECTION

EMERGENCY SPILLWAY

MINIMUM SIDE SLOPE COMBINATION OF 6:1 (NO SIDE STEEPER THAN 2:1)

ANTI-SEEP COLLAR

SCH 40 PVC PIPE

OUTLET RODENT GUARD

1FT STUB BELOW INLET

1 CY CONCRETE 3500PSI

ROCK PLUNGE POOL (SEE DESIGN)

*ALL DRAWINGS NOT TO SCALE

NRCS INLET WATER CONTROL STRUCTURE

Designed _____
 Drawn _____
 Checked _____
 Approved _____

Date _____ File No. _____
 Drawing No. _____
 Sheet _____ of _____

**STATE HIGHWAY ADMINISTRATION
 GEOTEXTILE REQUIREMENTS**

Maryland Application Class	Type of Geotextile	Grab Strength Lb D 4632	Puncture Strength Lb D 4833	Permittivity Sec ⁻¹	Apparent Opening Size, Max Mm D 4751	Trapezoid Tear Strength Lb D 4533
SD	NONWOVEN	160	55	0.50	0.43	55
	WOVEN MONOFILAMENT	250	90	0.50	0.43	90
SD	NONWOVEN	160	55	0.20	0.25	55
	WOVEN MONOFILAMENT	250	90	0.20	0.25	90
PE	NONWOVEN	200	80	0.70	0.43	80
	WOVEN MONOFILAMENT	250	90	0.70	0.43	90
PE	NONWOVEN	200	80	0.20	0.25	80
	WOVEN MONOFILAMENT	250	90	0.20	0.25	90
PE	NONWOVEN	200	80	0.10	0.22	80
	WOVEN	250	90	0.10	0.22	90
SE	NONWOVEN	200	80	0.20	0.30	80
	WOVEN	250	90	0.20	0.30	90
ST	WOVEN	300*	110	0.05	0.15**	110
F	WOVEN	100	-	0.05	0.60	-
E	NONWOVEN	90	30	0.05	0.30	30

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 4355).
 * Minimum 15 percent elongation.
 ** This is a minimum apparent opening size, not a maximum.

SPECIFICATIONS

Erosion and Sediment Control – Construction operations shall be carried out in such a manner that erosion will be controlled and water and air pollution minimized both on-site and off-site. State and local laws concerning pollution abatement shall be followed. Construction plans shall detail erosion and sediment control measures to be employed during the construction process.

Site Preparation – Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other debris shall be removed from embankment fill.

A sufficient quantity of topsoil shall be stockpiled in a suitable location for use on the embankment and other designated areas.

Embankment Earth Fill – The following specifications shall be used:

- Material** – The fill material shall be taken from approved designated borrow areas. It shall be free of vegetation, roots, stumps, wood, rubbish, stones greater than 6 inches, frozen or other objectionable materials.
- Placement** – Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in layers which are a maximum 8 inches thick before compaction. These layers shall be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The spillway must be installed concurrently with fill placement and not excavated into the embankment.
- Compaction** – The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one track tread of the equipment or compaction shall be achieved by a minimum of four complete passes of a sheepfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.
- Structural Backfill** – Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to completely fill all spaced under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24 inches or greater over the structure or pipe.

DETAIL E-3 SUPER SILT FENCE

ELEVATION

CROSS SECTION

CONSTRUCTION SPECIFICATIONS

- INSTALL 2 3/8 INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
- FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2 1/2 INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
- FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
- WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
- EXTEND BOTH ENDS OF THE SUPER 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 SUPER SILT FENCE.
- PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
- REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE 2011 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

PIPE SIZE _____"
 STRUCTURE HEIGHT _____'
 _____' OF _____" SCH 40 PVC PIPE OUTLET PIPE
 _____' OF _____" SCH 40 PVC PIPE INLET PIPE
 _____' X _____' ANTI-SEEP COLLAR
 EA OF 5" BOARDS
 EA OF 7" BOARDS
 CLEARING _____ AC
 CONCRETE _____ CY (MIN 3500 PSI)
 FILL _____ CY
 SLOPE _____ FT/FT

TYPICAL DRAIN STRUCTURE

CROSS SECTION

EMERGENCY SPILLWAY

MINIMUM SIDE SLOPE COMBINATION OF 6:1 (NO SIDE STEEPER THAN 2:1)

INLET BAR GUARD

ANTI-SEEP COLLAR

SCH 40 PVC PIPE

OUTLET RODENT GUARD

1 CY CONCRETE 3500PSI

ROCK PLUNGE POOL (SEE DESIGN)

*ALL DRAWINGS NOT TO SCALE

NRCS INLINE WATER CONTROL STRUCTURE

Designed _____
 Drawn _____
 Checked _____
 Approved _____

Date _____ File No. _____
 Drawing No. _____
 Sheet _____ of _____

FRONT VIEW

SIDE VIEW

POSITION THE RODENT GUARD FAR ENOUGH IN THE PIPE TO ALLOW IT TO SWIVEL UP AND LET THE TRASH PASS WITHOUT EXPOSING THE RODENT GUARD BEYOND THE PIPE.

SCH 40 PIPE OR EQUAL

NOTE: A HOLE MUST BE DRILLED IN THE TOP OF THE PIPE IN ORDER TO ATTACH THE RODENT GUARD WITHIN.

2EA NUT AND BOLT MAY BE USED AS AN ALTERNATIVE AS SHOWN ABOVE

ALL DRAWINGS NOT TO SCALE

USDA UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE MARYLAND

RODENT GUARD - OUTLET DETAIL

DRAWING NO. RG-OUTLET

ISSUE DATE: 12/2014

Bar Guards

Eliminate plugged inlets with Bar Guard Intakes.

- Fights trash to keep intakes flowing freely.
- The Bar Guard intake is an excellent choice in any situation where a low profile, high capacity intake is required.
- Its unique design helps keep intakes from plugging with crop residue or any other type of trash.
- The Bar Guard may also protect a pond tube from rodent entry.
- Yellow powder coated finish resists corrosion and is brighter for better visibility.

Bar Guard Size	Bar Diameter	Bar Spacing	Over-all O.D.	Over-all Height
4"	1/2"	1 1/2"	5 1/2"	17 1/2"
5"	1/2"	1 1/2"	6 1/2"	17 1/2"
6"	1/2"	1 1/2"	7 1/2"	18"
8"	1/2"	1 1/2"	9 1/2"	19 1/2"
8" H"	1/2"	1 1/2"	9 1/2"	19 1/2"
10"	1/2"	1 1/2"	11 1/2"	20"
10" H"	1/2"	1 1/2"	12 1/2"	20 1/2"
12"	1/2"	1 1/2"	13 1/2"	21 1/2"
12" H"	1/2"	1 1/2"	13 1/2"	22"
15"	1/2"	1 1/2"	16 1/2"	22 1/2"
18"	1/2"	1 1/2"	19 1/2"	23 1/2"
24"	1/2"	2"	25 1/2"	26 1/2"
36"	1/2"	2"	31 1/2"	31"
36" H"	1/2"	2"	31 1/2"	33 1/2"
42"	1/2"	2 1/2"	43 1/2"	35 1/2"
48"	1/2"	3 1/2"	49 1/2"	36"

*Special sized Bar Guards to fit Ribbed-bottom intakes.

24" through 30" Bar Guards are in 2 pieces. 36" are in 3 pieces. 42" & 48" are in 4 pieces. (Bolts, washers, and nuts are included)

Manufactured by **Agri Drain** P.O. Box 458 - 1462 340th Street - Adair, Iowa 50002 Phone: 1-800-232-4142 • Fax: 1-800-292-3353 www.agridrain.com • email: info@agridrain.com

USDA UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE MARYLAND

RODENT GUARD - INLET DETAIL

DRAWING NO. RG-INLET

ISSUE DATE: 12/2014

RIPRAP _____ TONS
 GRADATION _____" TO _____" D50 = _____"
 FILTER CLOTH _____ SQFT (CLASS "SE" SEE TABLE)
 THICKNESS OF RIPRAP _____ FT
 DISTANCE TO CL OF PLUNGE FROM PIPE OUTLET _____ FT
 DEPTH OF BASIN @ CL OF PLUNGE _____ FT
 CLEARING _____ AC

PLAN VIEW

CROSS SECTION

OUTSIDE DIMENSIONS _____ FT (L) X _____ FT (W)

INSIDE DIMENSIONS _____ FT (L) X _____ FT (W)

PIPE DIA. _____"

OUTLET EL. _____

EL _____

FT _____

FT _____

FT _____

FT _____

FILTER CLOTH

NRCS PLUNGE POOL

Designed _____
 Drawn _____
 Checked _____
 Approved _____

Date _____ File No. _____
 Drawing No. _____
 Sheet _____ of _____

MM/YY

Designed _____
 Drawn _____
 Checked _____

LANDOWNER
 646 - SHALLOW WATER DEVELOPMENT & MANAGEMENT TRACT
 City, Maryland

Approved _____ Date _____
 Title _____ Job Class _____

Maryland Department of Agriculture
 DISTRICT Soil Conservation District

USDA UNITED STATES DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

REVISIONS

Date	Description	Approved

File No. *DWG

Sheet 3 of 4

GENERAL GUIDELINES OF MANAGEMENT

Seasonal management for natural moist-soil plants. Wild millet, rice cutgrass, smartweeds, beggar-ticks, sedges, rushes, and many other desirable plants can be encouraged through water level manipulations to germinate from existing seed sources in the soil, and produce an abundant source of high quality food for waterfowl.

Drawdown (de-watering) of the area is necessary for germination of moist-soil plants. Annual plants produce the most seeds and provide an abundance of waterfowl food. Therefore, to maintain the site in early successional species (mostly annuals), and to control unwanted species, it is best to de-water and lightly disk the site every 3 years.

Consider the plant seeds that are likely to exist in the soil when determining whether you can manage for the plants you want. What plants have you seen growing on the site in years when you didn't plant a grain crop? Seeds of those plants are probably still viable in the soil. The plant seeds available in the soil, and the timing and rate of the drawdown, will determine which plant species will grow in a particular shallow water site. See Table 3 for the response of common moist-soil plants to the timing of drawdown.

Slow drawdowns, over a period of 2 to 3 weeks, are usually more desirable for plant establishment and wildlife use, and will reduce the amount of nutrients leaving the site (See Table 2). If you have a flashboard over, pull one board and let the water drain down. After a few days, pull another board. Or, if you have a PVC standpipe with an elbow, tip it slightly to let just a few inches of water escape at a time. Slow drawdowns provide optimum conditions for germination of moist-soil plants, and result in the greatest quantity of seeds produced by those plants in late summer. In general, only slow drawdowns during April result in germination of smartweeds and sedges, while midseason drawdowns during May produce millets and beggar-ticks.

Shorebirds, such as plovers and sandpipers, feed on mud flats and in very shallow water (up to 3 inches) during the time of an early to midseason drawdown. Therefore, managed shallow water areas can be a very important source of food for shorebirds during their spring migration.

After the moist-soil plants have produced seed in late summer or fall, re-flood the site slowly to coincide with the arrival of fall migrant waterfowl, usually September through November. Flooding the site slowly over a period of 2 to 3 weeks allows new areas of food to become available every day at the preferred water depth as the water is rising. Refer to Table 4 for

the water depths preferred by various waterfowl and wading birds.

Do not fertilize the moist-soil area. To the extent possible, do not use pesticides on the site to avoid harming wildlife that use the shallow water area. See page 6 for more information about controlling undesirable plants on shallow water sites.

Table 2. Effects of fast vs. slow drawdowns on selected resource concerns (adapted from the Waterfowl Management Handbook, Fish and Wildlife Leaflet 13-4-6, 1991).

Resource Concern	Duration of Drawdown	
	Less than 4 days	More than 2 weeks
Time available for seed germination of moist-soil plants	Short	Long
Growth and seed production by moist-soil plants after April drawdown	Good	Excellent
Growth and seed production by moist-soil plants after May or June drawdown	Poor	Excellent
Cocklebur problems	High potential	Lower potential
Availability of snails, soil insects, and earthworms for waterfowl food	Low	High
Waterfowl use of the site during April drawdown	Good	Excellent
Waterfowl use of the site during May or June drawdown	Poor	Good
Nutrients leaving the site	High	Low

Minimal management for natural moist-soil plants.

If you do not want to actively manage water levels or plants on a regular basis, then nature will do it for you. The site will have a natural water regime in which water levels rise and fall seasonally in response to varying natural conditions, such as rainfall, ground-water levels, evaporation rates, etc. The water level may be managed occasionally if needed to control noxious weeds or invasive species, or to make repairs.

Plants on less managed sites will tend to be perennials such as sedges, rushes, and many of the grasses. Perennial plants usually produce fewer seeds than annuals, but they can provide good year-round cover for wildlife nesting, nesting, and rearing young. In addition to seeds, the foliage and rootstocks of these plants can be eaten by waterfowl, wading birds, marsh birds, beavers, and muskrats.

After the moist-soil plants have produced seed in late summer or fall, allow the site to re-flood slowly to coincide with the arrival of fall migrant waterfowl, usually September through November. Flooding the site slowly over a period of 2 to 3 weeks allows new areas of food to become available every day at the preferred water depth as the water is rising. Refer to Table 4 for the water depths preferred by various waterfowl and wading birds.

Do not fertilize the moist-soil area. To the extent possible, do not use pesticides on the site to avoid harming wildlife that use the shallow water area. See page 6 for more information about controlling undesirable plants on shallow water sites.

OPERATION AND MAINTENANCE GUIDELINES

EMBANKMENTS AND WATER CONTROL STRUCTURES

Inspect the condition of all inlet and outlet pipes and related structures. Remove trash or other obstructions that reduce the flow of water. Inspect berms and ditch plugs for evidence of erosion, burrowing by muskrats, or other structural problems. Repair or replace any damaged structures (e.g., berms, pipes, etc.). At a minimum, inspect the site at least once per year and after each major storm.

BUFFERS

In most locations, shallow water areas will benefit from having permanent vegetative buffers. Buffers of grasses, wildflowers, shrubs, or trees can reduce the amount of sediment entering a shallow water site, and also provide additional food and cover for wildlife.

For grass buffers, you may need to spot mow or burn them infrequently (not more than once every two to three years) to reduce encroachment of trees and shrubs. To protect nesting wildlife, do not disturb buffers during the primary nesting season (April 15 to August 15).

CONTROL OF UNDESIRABLE PLANTS

Plants that are considered "undesirable" are those that tend to "take over" a site, to the exclusion of other plants. Undesirable plants in Maryland include cocklebur, reed canarygrass, phragmites (common reed), cattails, and all noxious weeds. These plants should be controlled by spot treatment, using mechanical methods or approved herbicides. Control of noxious weeds (specifically, Johnsongrass, shattercane, and various thistles) is required by state law.

The best approach for dealing with undesirable plants is to inspect your site periodically during the growing season and control undesirable invaders before they colonize a large area. Be especially alert if you have undesirable plants nearby that can readily seed into your shallow water site.

Once well-established, most undesirable plants are difficult to control. Cutting, burning, and herbicide applications can work, but you risk damaging desirable wetland plants, too. Removal by hand is a possible solution if the undesirable plants occupy only a small portion of the site. However, plants such as phragmites and cattails have extensive root systems, so digging out more than a few of these plants is difficult.

Water management techniques can sometimes be used to reduce problems with nuisance plants. Seeds of reed canarygrass, phragmites, and cattails germinate best on moist soils, but not under several inches of water. Maintaining high water levels in the spring will help to discourage seed germination of these undesirable plants. If cocklebur volunteers on a moist-soil site, it usually can be controlled by a brief period of reflooding. Most other herbaceous plants that volunteer will be readily utilized by waterfowl.

If woody vegetation is nearby, it may be necessary to spot mow or burn the site infrequently (not more than once every two to three years) if you want to discourage the growth of trees and shrubs.

If woody vegetation is nearby, it may be necessary to spot mow or burn the site infrequently (not more than once every two to three years) if you want to discourage the growth of trees and shrubs.

For more information about controlling specific weeds, contact your local office of Maryland Cooperative Extension, or your local Maryland Department of Agriculture Weed Control Specialist.

DISEASE

Mass die-offs of waterfowl can occur at a particular site due to disease. A common disease that occurs around shallow water areas is avian botulism. It can be rapidly transmitted from dead birds to healthy birds by infected maggots. Prompt removal and disposal of dead birds and fish can control the spread of the disease. Flooding sites that have been dry for a long time, in summer when temperatures are high, is generally not recommended except for shorebird management. Under these conditions the bacterium that causes botulism can flourish.

CONTROL OF UNDESIRABLE ANIMALS

Shallow water sites are intended to attract wildlife, but some wildlife are less welcome than others. Beavers can significantly change a site's water regime and vegetation, and can cause structural failure by raising water levels above the intended design. They are difficult to discourage, and may need to be removed in accordance with state hunting and trapping regulations.

Muskrats can be beneficial because they control cattails and help maintain open water areas. However, muskrats can also cause structural failures by burrowing into berms. Burying chain link material into the berm immediately above and below the waterline can help to discourage their burrowing. Damage can also be minimized by designing berms with gentle slopes to the waterline (5:1), and with a shallow bench adjacent to the berm of the waterline. Muskrats seem to prefer steep banks to burrow in, with an approach that is safely under water. A few steep-bank islands in the water will provide habitat where muskrats can safely burrow. If necessary, muskrats may need to be removed from a site in accordance with state hunting and trapping regulations.

Geese can be discouraged by making the shallow water area and buffer less attractive to them. Geese generally prefer areas of open water and low vegetation for easy access into and out of the site. To discourage geese, manage the shallow water area to minimize open water and favor the growth of tall, dense herbaceous vegetation. In the buffer, tall grasses, shrubs, and trees will be much less attractive to geese than a well-manicured lawn.

For more information about controlling nuisance animals, contact your local office of the Maryland Department of Natural Resources, Wildlife and Heritage Service.

DISURBANCES

Human activities in and around the shallow water area can have a significant impact on the behavior of wildlife. Disturbances cause water birds to move to other feeding grounds, and may lower productivity of nesting or brooding.

Loud activities conducted in or over the water cause the most disturbance, while quiet shoreline activities cause the least. Do not allow mechanized vehicles (e.g., mowing equipment or recreational vehicles) to enter the water or buffer area while water birds are present. Consider establishing screened buffer zones to separate unavoidable disturbances (e.g., busy roads) from the site.

Do not allow livestock, dogs, or cats access to the site.

Promptly remove any trash, debris, or other materials which have entered the area. To the extent possible, do not allow sediment, chemical contaminants, or nutrients to enter the site.

LANDOWNER		PRACTICE(S)					
TRACT							
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" CULTRIPACK AFTER SEEDING				SEEDING DATES <i>SPRING:</i> <i>FALL:</i>			
PLAN APPROVED BY:		CHECKED FOR TECHNICAL COMPLIANCE BY:					
TITLE	DATE	TITLE	DATE				
 UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE MARYLAND		SEEDING		DRAWING NO. S-1.0 ISSUE DATE: 7/2014			

SECTION 1 - VEGETATIVE STABILIZATION METHODS AND MATERIALS

<p>A. Site Preparation</p> <ol style="list-style-type: none"> i. Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms, waterways, or sediment control basins. ii. Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary grading. iii. Schedule required soil tests to determine soil amendment composition and application rates for sites having disturbed area over 5 acres. <p>B. Soil Amendments (Fertilizer and Lime Specifications)</p> <ol style="list-style-type: none"> i. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 5 acres. Soil analysis may be performed by the University of Maryland or a recognized commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses. ii. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers shall all be delivered to the site fully labeled according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrantee of the producer. iii. Lime materials shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50 total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50 will pass through a #100 mesh sieve and 98 - 100% will pass through a #20 mesh sieve. iv. Incorporate lime and fertilizer into the top 3 - 5" of soil by disking or other suitable means. <p>C. Seedbed Preparation</p> <ol style="list-style-type: none"> i. Temporary Seeding <ol style="list-style-type: none"> a. Seedbed preparation shall consist of loosening soil to a depth of 3" to 5" by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened it should not be rolled or dragged smooth but left in the roughened condition. Sloped areas (greater than 3:1) should be tracked leaving the surface in an irregular condition with ridges running parallel to the contour of the slope. b. Apply fertilizer and lime as prescribed on the plans. c. Incorporate lime and fertilizer into the top 3 - 5" of soil by disking or other suitable means. ii. Permanent Seeding <ol style="list-style-type: none"> a. Minimum soil conditions required for permanent vegetative establishment: <ol style="list-style-type: none"> 1. Soil pH shall be between 6.0 and 7.0 2. Soluble salts shall be less than 500 parts per million (ppm). 3. The soil shall contain less than 40 % clay but enough fine grained material (> 30% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lovegrass or sercila lespedeza is to be planted, then a sandy soil (< 30% silt plus clay) would be acceptable. 4. Soil shall contain 1.5% minimum organic matter by weight. 5. Soil must contain sufficient pore space to permit adequate root penetration. 6. If these conditions cannot be met by soils on site, adding topsoil is required with Section 21 Standard and Specification for Topsoil. b. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting. c. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption. d. Dry Seeding: This includes use of conventional drop or broadcast spreaders. <ol style="list-style-type: none"> a. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the Temporary or Permanent Seeding Summaries or Tables 25 or 26. The seeded area shall then be rolled with a weighted roller to provide good seed to soil contact. b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction. iii. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil. <ol style="list-style-type: none"> a. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting. b. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction. 	<ol style="list-style-type: none"> b. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3 - 5" to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope. c. Apply soil amendments as per soil test or as included on the plans. d. Mix soil amendments into the top 3 - 5" of topsoil by disking or other suitable means. Lawn areas should be raked to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Where site conditions will not permit normal seedbed preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 - 3" of soil should be loose and friable. Seedbed loosening may not be necessary on newly disturbed areas. <p>D. Seed Specifications</p> <ol style="list-style-type: none"> i. All seed must meet the requirements of the Maryland State Seed Law. All seed shall be subject to re-testing by a recognized seed laboratory. All seed used shall have been tested within the 6 months immediately preceding the date of sowing such material on this job. Note: Seed tags shall be made available to the inspector to verify type and rate of seed used. ii. Inoculant - The inoculant for treating legume seed in the seed mixtures shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species. Inoculants shall not be used later than the date indicated on the container. Add fresh inoculant as directed on package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75-80° F. can weaken bacteria and make the inoculant less effective. <p>E. Methods of Seeding</p> <ol style="list-style-type: none"> i. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or a cultipacker seeder. <ol style="list-style-type: none"> a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen; maximum of 100 lbs. per acre total of soluble nitrogen; P205 (phosphorous): 200 lbs/acre; K20 (potassium): 200 lbs/acre. b. Lime - use only ground agricultural limestone. (Up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding. ii. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption. <p>F. Mulch Specifications (In order of preference)</p> <ol style="list-style-type: none"> i. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonably bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law. ii. Wood Cellulose Fiber Mulch (WCFM) <ol style="list-style-type: none"> a. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state. b. WCFM shall be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry. c. WCFM, including dye, shall contain no germination or growth inhibiting factors. d. WCFM materials shall be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings. e. WCFM material shall contain no elements or compounds at concentration levels that will be phyto-toxic. f. WCFM must conform to the following physical requirements: fiber length to approximately 10 mm., diameter approximately 16 mm., pH range of 4.0 to 8.5, ash content of 1.6 % maximum and water holding capacity of 90% minimum. Note: Only sterile straw mulch should be used in areas where one species of grass is desired. <p>G. Mulching Seeded Areas - Mulch shall be applied to all seeded areas immediately after seeding.</p> <ol style="list-style-type: none"> i. If grading is completed outside of the seeding season, mulch alone shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications. ii. When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons/acre. Mulch shall be applied to a uniform loose depth of between 1" and 2". Mulch applied shall achieve a uniform distribution and depth so that the soil surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons/acre. iii. Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 lbs. per acre. 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 of water. iv. Securing Straw Mulch - Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area and erosion hazard: <ol style="list-style-type: none"> i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of two (2) inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should be used on the contour if possible. ii. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 pounds/acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water. 	<ol style="list-style-type: none"> iii. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. The remainder of area should be appear uniform after binder application. Synthetic binders - such as Acrylic DLR (Agro-Tack), DCA-70, Petrosel, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch. iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3,000 feet long. <p>I. Incremental Stabilization - Cut Slopes</p> <ol style="list-style-type: none"> i. All cut slopes shall be dressed, prepared, seeded and mulched as the work progresses. Slopes shall be excavated and stabilized in equal increments not to exceed 15'. ii. Construction sequence (Refer to Figure 3 below): <ol style="list-style-type: none"> a. Excavate and stabilize all temporary swales, side ditches, or berms that will be used to convey runoff from the excavation. b. Perform phase 1 excavation, dress, and stabilize. c. Perform phase 2 excavation, dress, and stabilize. Overseed phase 1 areas as necessary. d. Perform final phase excavation, dress, and stabilize. Overseed previously seeded areas as necessary. Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization <p>J. Incremental Stabilization of Embankments - Fill Slopes</p> <ol style="list-style-type: none"> i. Embankments shall be constructed in lifts as prescribed on the plans. ii. Slopes shall be stabilized immediately when the vertical height of the multiple lifts reaches 15', or when the grading operation ceases as prescribed in the plans. iii. At the end of each day, temporary berms and pipe slope drains should be constructed along the top edge of the embankment to intercept surface runoff and convey it down the slope in a non-erosive manner to a sediment trapping device. iv. Construction sequence: Refer to Figure 4 (below). <ol style="list-style-type: none"> a. Excavate and stabilize all temporary swales, side ditches, or berms that will be used to divert runoff around the fill. Construct Slope Silt Fence on low side of fill as shown in Figure 5, unless other methods shown on the plans address this area. b. Place phase 1 embankment, dress and stabilize. c. Place phase 2 embankment, dress and stabilize. d. Place final phase embankment, dress and stabilize. Overseed previously seeded areas as necessary. Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.
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LANDOWNER				646 - SHALLOW WATER DEVELOPMENT & MANAGEMENT			
TRACT				City, Maryland			
LANDOWNER				Maryland Department of Agriculture			
TRACT				DISTRICT Soil Conservation District			
Date	Description	Approved					
File No. *.DWG							
Sheet 4 of 4							