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 Resources Conservation Service (NRCS) 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.

The contractor/owner is to notify the SOIL CONSERVATION DISTRICT at least 72 hours prior to construction to schedule a pre-construction meeting, facilitate any scheduling, layout, or preliminary mobilization necessary to ensure proper construction inspection to enable appropriate certification of the project. A conservation technician shall verify cut/grade stakes at the contractors request.

The owner/operator gives permission for Maryland Department of the Environment (MDE) and U.S. Army Corps of Engineers (COE) inspection.

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.

All excavation and methods of construction shall be in accordance with the Maryland Occupational Safety and Health (MOSH) standards as set forth in the latest version of the code of Maryland regulations.

GENERAL NOTES:

- Please contact the SOIL CONSERVATION DISTRICT AT PHONE # at least 3 days prior to construction to arrange a pre-construction meeting
- A conservation technician shall set cut/grade stakes at the contractors request
- A conservation technician must be present at the time of pipe installation, if required

811 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"

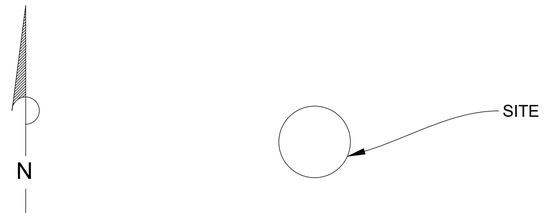
CRITICAL INSPECTION ITEMS for WETLAND CREATION
1/20/2020

1. The landowner will arrange for a pre-construction meeting between the contractor, NRCS and landowner to review the plans, standards and specifications prior to the start of construction.
2. There will be no changes in specifications, dimensions, or materials unless approved by the engineer responsible for this drawing.
3. The drawings are prepared cooperatively by the Natural Resources Conservation Service for named owner/operator. 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.
4. The following is a list of items that must be inspected by the Technician-in-Charge. If cost share is involved, payment may be forfeited if the Technician-in-Charge does not inspect all of the below:

- Preconstruction Meeting Date: _____ Initials: _____
- Verify layouts: Date: _____ Initials: _____
- Verify all subgrades: Date: _____ Initials: _____
- Core Trench: Date: _____ Initials: _____
- Dam Material Date: _____ Initials: _____
- Liner Material (Pool Area) Date: _____ Initials: _____
- Water Control Structure:
  - Size: Date: _____ Initials: _____
  - Placement: Date: _____ Initials: _____
  - Concrete Anti-Floatation: Date: _____ Initials: _____
  - Backfill: Date: _____ Initials: _____
- Barrel Pipe:
  - Material: Date: _____ Initials: _____
  - Size Date: _____ Initials: _____
  - Placement Date: _____ Initials: _____
  - Backfill: Date: _____ Initials: _____
- Anti-Seep Collars:
  - Material: Date: _____ Initials: _____
  - Size Date: _____ Initials: _____
  - Placement Date: _____ Initials: _____
- Emergency Spillway:
  - Control section elevation and size: Date: _____ Initials: _____
  - Exit channel slope and grading: Date: _____ Initials: _____
- Complete of Backfill and compaction Date: _____ Initials: _____
- Installation of riprap outlet
  - Riprap size and gradation: Date: _____ Initials: _____
  - Outlet size and elevation: Date: _____ Initials: _____
- Final Grading Date: _____ Initials: _____
- Fencing (If Applicable): Date: _____ Initials: _____
  - Type and Materials: Date: _____ Initials: _____
  - Proper location: Date: _____ Initials: _____
  - Installation: Date: _____ Initials: _____
- Other items as shown on the plan: Date: _____ Initials: _____
- All disturbed areas seeded and mulched: Date: _____ Initials: _____

LANDOWNER - SITE NAME

658 - WETLAND CREATION



REVISED 7/1/2021

LOCATION MAP

200 0 200 400
Scale in Feet

USER TO INSERT SHEET LIST TABLE

USER TO ENTER SHEET NAMES

SHEET	TITLE
2	Topo survey/Plan map/Soils descriptions
3	Profile/Cross sections/Details
4	Anti-seep collars/Erosion & sediment control details

ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST NRCS SPECIFICATIONS FOR EACH CONSERVATION PRACTICE LISTED ON THE PLANS. IF NOT PROVIDED IN THE PLANS AND SPECIFICATIONS, THE SPECIFICATIONS FOR EACH CONSERVATION PRACTICE CAN BE FOUND IN SECTION IV OF THE MARYLAND ELECTRONIC FIELD OFFICE TECHNICAL GUIDE (eFOTG) LOCATED AT: https://efotg.sc.egov.usda.gov/#/state/MW UNDER 'Conservation Practice Standards & Support Documents'.

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

AS BUILT CONTRACT ITEMS:

PRACTICE	Reportable Amount	Contract Amount

USER TO ENTER PRACTICES

OWNER/CONTRACTOR STATEMENT

I CERTIFY THAT THIS DESIGN HAS BEEN EXPLAINED TO ME BY A REPRESENTATIVE OF THE COUNTY 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/OPERATOR SIGNATURE DATE

CONTRACTOR'S SIGNATURE DATE

All disturbed areas to be stabilized within 7 days of completion, using the following recommendations.

Seeding Recommendations

Tall Fescue	65 lb/ac
Perennial Ryegrass or	5 lb/ac
Redtop (tolerates moist sites)	2 lb/ac
White Clover	5 lb/ac
20-40-40 Fertilizer	500 lb/ac
Ground lime 50% oxides	3 tons /ac
Straw Mulch	2 tons/ac

Dates listed are for plant hardiness Zone 6B, dates will need to be changed for other zones.

Seeding Dates
March 1 thru May 15
August 1 thru October 1

It is the landowner responsibility to obtain All County, State, and Federal permits that may be needed, and to maintain this structure and those regulations.

USER TO ENTER SEEDING INFO

MATERIALS LIST

* For bidding purposes only

SITE DATA:

LANDOWNER INFORMATION: STREAM CLASSIFICATION:

USER TO ENTER INFORMATION

CONTACT PERSON: STREAM CLOSURE DATE(S):

SITE DETAILS:
Total Disturbed Acres = ±
Total Disturbed Sqft = ±

Construction supervision by NRCS/MDA/SCD personnel.
Landowner's permission for MDE and COE inspection.

Date ---- ---- ---- ----
Designed ---- Drawn ---- Checked ---- Approved ----

LANDOWNER – SITE NAME
658 - WETLAND CREATION
COUNTY Soil Conservation District
----, Maryland
JOB CLASS #
TRACT #

United States Department of Agriculture
Natural Resources Conservation Service

File Name
MD_0055_ShallowWaterDevelopment.dwg

Drawing No.
MD_0055

Sheet 1 of 4

N

USER TO ENTER INFO AS NEEDED

DESIGN CRITERIA:
Total disturbed acres.....X ac (X ft²) Total area
X ac (X ft²) Contract arces
Total cut.....X c.y.
Total fill.....X c.y.
Total pool area.....X ac (X ft²)
Total pool area below inlet.....X (X ft²) 20% Min for CREP
Total filter area.....X ac (36,418 ft²)
Total dam length.....X ft

PLAN MAP

40 0 40 80
Scale in Feet

BENCH MARK DESCRIPTIONS

TBM #1 (IP): Elev = ???.??
Top of 1" X 2" wooden hub, marked by witness lath.

TBM #2: Elev = ???.??
Top of 1" X 2" wooden hub, marked by witness lath, near NW corner of building.

TBM #3: Elev = ???.??
Top of bolt in NW corner of concrete.

LANDOWNER – SITE NAME

658 - WETLAND CREATION

COUNTY Soil Conservation District

JOB CLASS #

TRACT #

		Date
Designed	----	----
Drawn	----	----
Checked	----	----
Approved	----	----

----, Maryland

United States Department of Agriculture

Natural Resources Conservation Service

File Name
MD_0055_ShallowWaterDevelopment.dwg

Drawing No.
MD_0055

Sheet 2 of 4

PROFILES/CROSS SECTIONS

40 0 40 80

Scale in Feet

Design Specifications:

Structure height	_____ FT	Pipe slope	_____ FT/FT
Outlet pipe size	_____ IN	Number of 5" boards	___ EA
Outlet pipe length	_____ FT	Number of 7" boards	___ EA
Inlet pipe size	_____ IN	Concrete	_____ CY (min 3500 PSI)
Inlet pipe length	_____ FT	Fill	_____ CY

TYPICAL CROSS SECTION

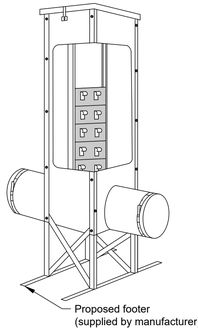
DRAWING NOT TO SCALE

TYPICAL WATER CONTROL STRUCTURE
(as per Agri Drain Corporation)

GENERAL NOTES:

- A conservation technician must be present at the time of pipe installation to verify soil backfill material.
- Water control structure requires additional footer base to allow for concrete anti-floatation device connection. This base is available from the manufacturer.
- Pipe shall be backfilled in minimum 6-8" lifts using compaction equipment.

USER TO CLICK ON BLOCK AND ENTER INFORMATION

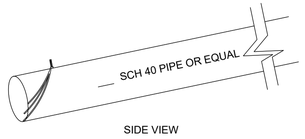


TYPICAL WATER CONTROL STRUCTURE
(as per Agri Drain Corporation)

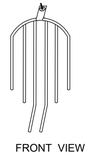
Note: Geotextile to meet the following Maryland State Highway Administration requirements:

Maryland Application Class	Type of Geotextile	Grab Strength Lb D 4632	Puncture Strength Lb D 4833	Permitivity Sec 1	Apparent Opening Size Max Mm D 4751	Trapezoid Tear Strength Lb D 4533
SE	NONWOVEN	200	80	0.2	0.3	80
	WOVEN	250	90	0.2	0.3	90

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.



SIDE VIEW



FRONT VIEW

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

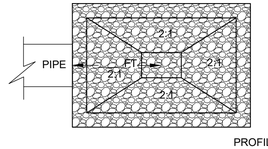
OUTLET DETAIL

Not to scale

USER TO CLICK ON BLOCK AND ENTER INFORMATION

Design Specifications:

Depth of Plunge	_____FT	Rock ____" to ____" d50 = ____ "	
Distance to CL of plunge	_____FT	Riprap Thickness	_____FT
Riprap	_____TONS	Filter Cloth	_____FT²
		Clearing	_____AC



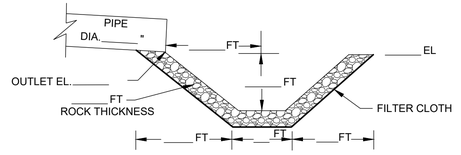
OUTSIDE DIMENSIONS

_____FT (L) X _____FT (W)

INSIDE DIMENSIONS

_____FT (L) X _____FT (W)

PROFILE



CROSS SECTION

DRAWING NOT TO SCALE

MARYLAND STANDARDS FOR AGRICULTURAL BMPS DETAIL
ROCK PLUNGE POOL

USER TO CLICK ON BLOCK AND ENTER INFORMATION

LANDOWNER – SITE NAME

658 - WETLAND CREATION

COUNTY Soil Conservation District

JOB CLASS #

TRACT #

		Date
Designed	----	----
Drawn	----	----
Checked	----	----
Approved	----	----

----, Maryland

United States Department of Agriculture

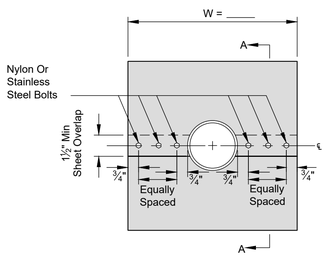
Natural Resources Conservation Service

File Name

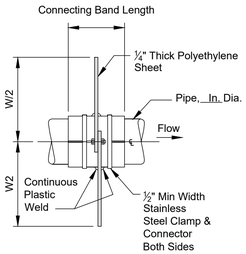
MD_0055_ShallowWaterDevelopment.dwg

Drawing No.
MD_0055

Sheet 3 of 4



ELEVATION

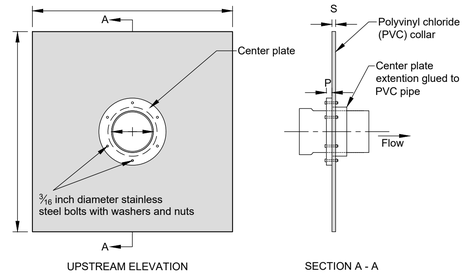


SECTION A-A

DRAWING NOT TO SCALE

NOTES:
1. Pipe, connecting band and seam coating can be either silicon caulk (recommended), or mastic (asphalt or tar based).
2. Apply silicon caulk, tar or mastic to bottom half of connecting band and lay pipe on connecting band.
3. Apply silicon caulk or mastic to top half of collar and set in place, lining up bolt holes.
4. Install clamps on split halves of collar and tighten bolts and clamps.
5. Apply silicon caulk, tar or mastic on seams as needed to insure a good seal so that completed installation is watertight.
6. Backfill and hand tamp soil around completed installation.
7. Polyethylene antiseep collars can be used on corrugated and smooth PVC plastic, smooth steel and galvanized pipes

TABLE OF QUANTITIES					
W FEET	Polyethylene Sheet Sq. Ft.	Stainless Steel Clamp & Connector	Connecting Band Min Length	Bolts & Nuts ⅜"x 1"	No. Of Collars
3	9.5	2	6"	6	
4	16.7	2	6"	6	
5	25.8	2	8"	6	
6	37.0	2	8"	6	
Totals					



UPSTREAM ELEVATION

SECTION A - A

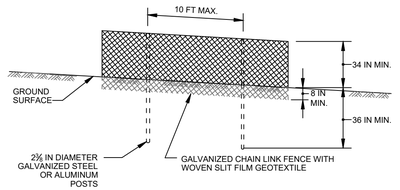
DRAWING NOT TO SCALE

Pipe Diam. (D) (Inches)	Sheet Height (H) (Inches)	Sheet Width (W) (Inches)	Sheet Thickness (S) (Inches)	Pipe Length (L) (Inches)	Plate Thickness (P) (Inches)
6	48	48	3/16	12	¼
8	48	48	3/16	15	¼
10	48	48	¼	17	¼
12	48	48	¼	17	¼

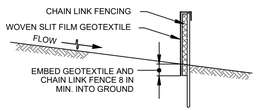
NOTES:
1. The bell end of the pvc pipe in the collar shall point upstream.
2. Make pipe connections as needed to assure a watertight system.
3. Apply silicon caulk on the seams as needed to insure a good seal so that the completed installation is watertight.

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF



ELEVATION



CROSS SECTION

CONSTRUCTION SPECIFICATIONS

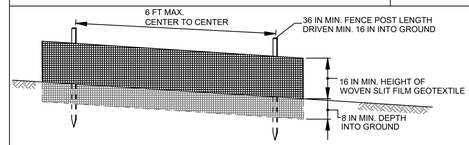
1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. 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.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. 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.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. 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

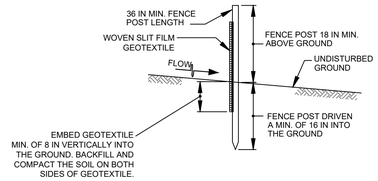
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-1 SILT FENCE

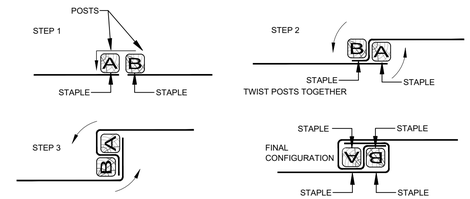
STANDARD SYMBOL: SF



ELEVATION



CROSS SECTION



JOINING TWO ADJACENT SILT FENCE SECTIONS (TOP VIEW)

1 OF 2

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

Bar Guards

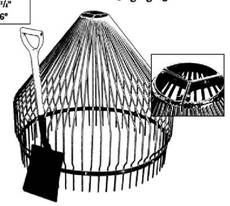
Eliminate plugged inlets with Bar Guard Intakes.

- 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"	½"	1⅛"	5½"	17⅛"
5"	½"	1⅛"	6½"	17⅛"
6"	½"	1⅛"	7½"	18"
8"	½"	1⅛"	9½"	19⅛"
8" H"	½"	1⅛"	9½"	19½"
10"	½"	1⅛"	11½"	20"
10" H"	½"	1⅛"	12½"	20⅛"
12"	½"	1⅛"	13½"	21⅛"
12" H"	½"	1⅛"	15½"	22"
15"	½"	1½"	16½"	22⅛"
18"	½"	1½"	19½"	23⅛"
24"	½"	2"	25½"	26½"
30"	½"	2"	31½"	31"
36"	½"	2"	37½"	33½"
42"	½"	2½"	43½"	35½"
48"	½"	3½"	49½"	36"

*Special sized Bar Guards to fit Hickenbottom 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 CORPORATION

P.O. Box 458 • 1462 340th Street • Adair, Iowa 50002
Phone: 1-800-232-4742 • Fax: 1-800-282-3353
www.agridrain.com • email: info@agridrain.com

GENERAL GUIDELINES OF MANAGEMENT

Seasonal management for natural moist-soil plants. Wild millet, rice cutgrass, smartweeds, beggarticks, 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 riser, 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, early slow drawdowns during April result in germination of smartweeds and sedges, while midseason drawdowns during May produce millets and beggarticks.

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, groundwater 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 resting, 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 germinations 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.

DISTURBANCES

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.

Date ---- ---- ---- ----
Designed ---- Drawn ---- Checked ---- Approved ----

LANDOWNER – SITE NAME
658 - WETLAND CREATION
COUNTY Soil Conservation District ----, Maryland
JOB CLASS # TRACT #

United States Department of Agriculture
USDA
Natural Resources Conservation Service

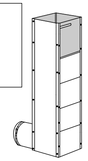
File Name
MD_0055_ShallowWaterDevelopment.dwg

Drawing No.
MD_0055

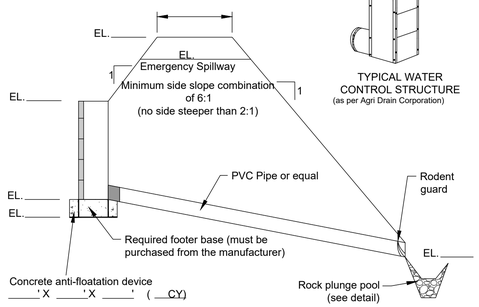
Sheet 4 of 4

Design Specifications:

Structure height	____ FT	Number of 5" boards	___ EA
Outlet pipe size	____ IN	Number of 7" boards	___ EA
Outlet pipe length	____ FT	Concrete _____ CY (min 3500 PSI)	
Pipe slope	_____FT/FT	Fill _____ CY	



TYPICAL WATER
CONTROL STRUCTURE
(as per Agri Drain Corporation)



TYPICAL CROSS SECTION

DRAWING NOT TO SCALE

GENERAL NOTES:

- A conservation technician must be present at the time of pipe installation to verify soil backfill material.
- Water control structure requires additional footer base to allow for concrete anti-floatation device connection. This base is available from the manufacturer.
- Pipe shall be backfilled in minimum 6-8" lifts using compaction equipment.

USER TO CLICK ON BLOCK AND ENTER INFORMATION