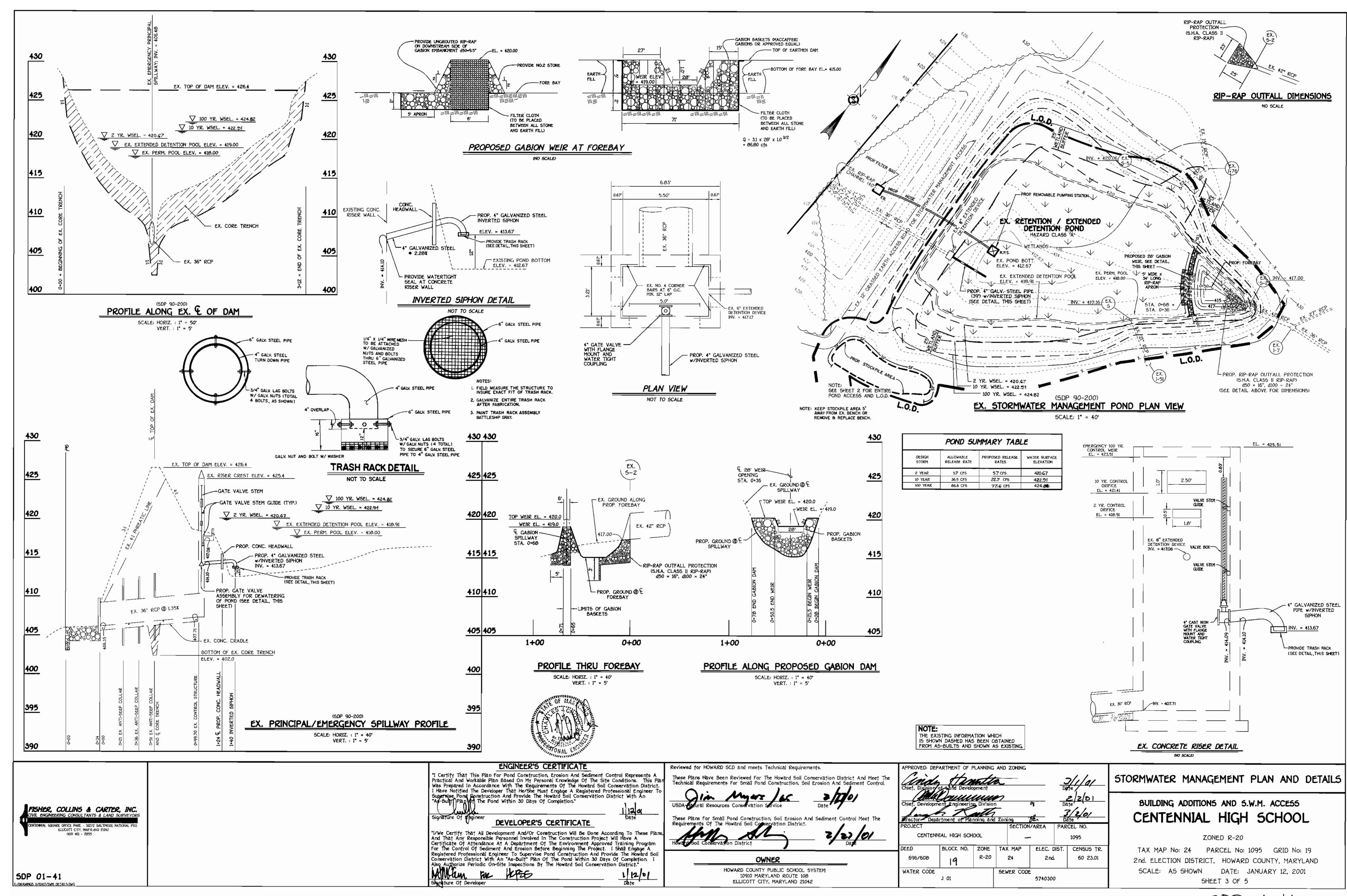
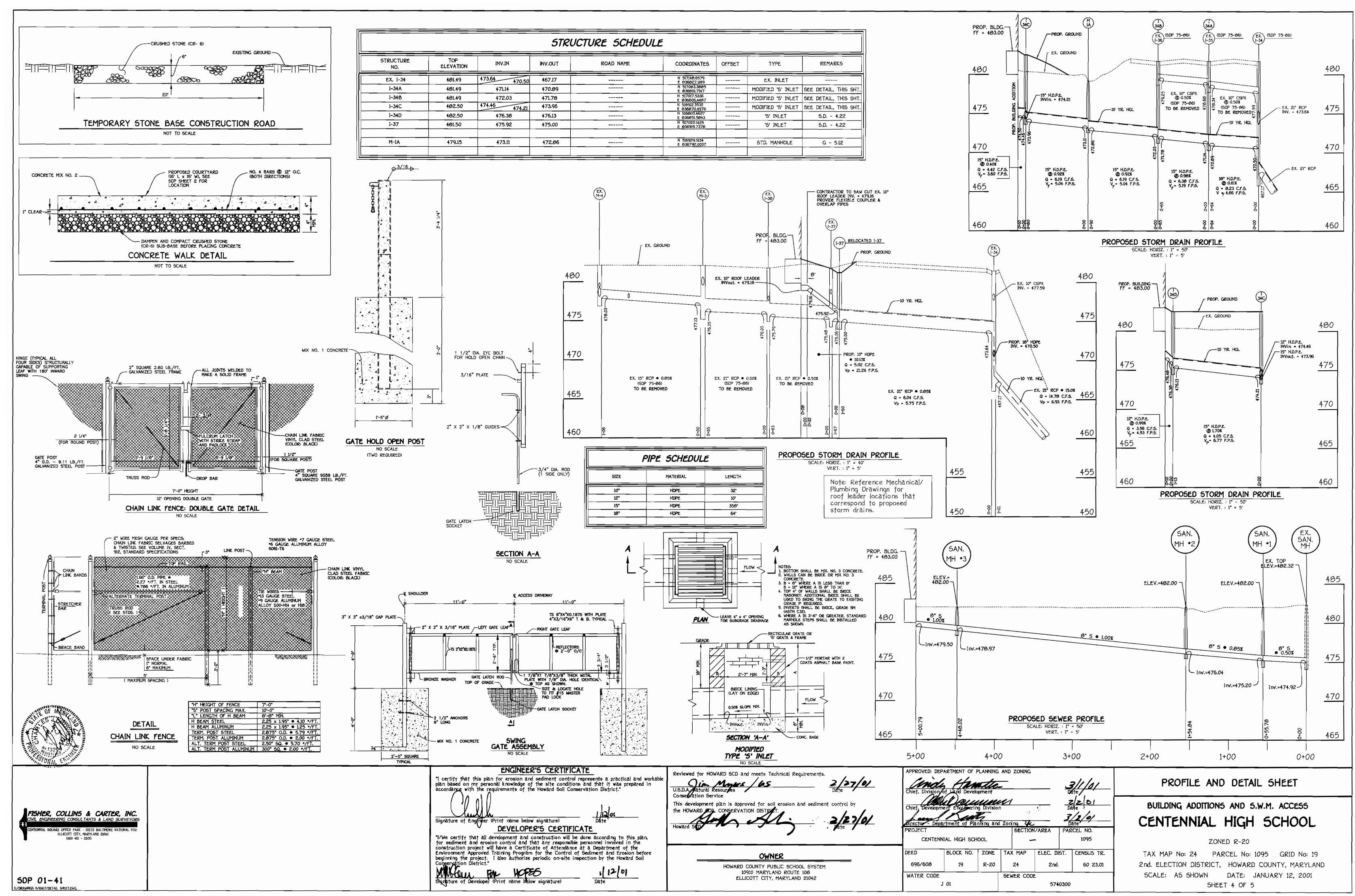


5DP-01-41

CENTENNI/ LAKE





VEGETATIVE STABILIZATION DEFINITION Using vegetation as cover for barren soil to protect it from forces that cause erosion PURPOSE

Vegetative stabilization specifications are used to promote the establishment of vegetation on exposed soil. When soil is stabilized with vegetation, the soil is less likely to crode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and run-off to downstream areas, and improving wildlife habitat and visual resources. CONDITIONS WHERE PRACTICE APPLIES

This practice shall be used on denuded areas as specified on the plans and may be used on highly erodible or critically eroding areas. This specification is divided into Temporary Seeding, to quickly establish vegetative cover for short duration Out to one year), and Permanent Seeding, for long term vegetative cover. Examples of applicable areas for Temporary Seeding are temporary foil Stockpiles, cleared areas being left idle between construction phases, earth dikes, etc. and for Permanent Seeding are lawns, dams, cut and fill slopes and other areas at final grade, former stockpile and staging areas, etc. EFFECTS ON WATER QUALITY AND QUANTITY

Planting vegetation in disturbed areas will have an effect on the water budget, especially on volumes and rates of runoff. infiltration evaporation, transpiration, percolation, and groundwater recharge. Vegetation, over time, will increase organic matter content and improve the water holding capacity of the soil and subsequent plant growth. Vegetation will help reduce the movement of sediment, nutrients, and other chemicals carried by runoff to receiving waters. Plants will also belo protect aroundwater supplies by assimilating those substances present within the root zone. Sediment control devices must remain in place during grading, seedbed preparation, seeding, mulching and vegetative establishment to prevent large quantities of sediment and associated chemicals and nutrients from washing into surface waters.

- SECTION 1 VEGETATIVE STABILIZATION METHODS AND MATERIALS Install erosion and sediment control structures (either temporary of 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 seeding.

 iii. Schedule required soil tests to determine soil amendment composition and application rates for sites
- having disturbed area over 5 acres.

 Soil Amendments (Fertilizer and Lime Specifications) 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. Fertilizers shall be uniform in composition free flowing and suitable for accurate application b
- 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 o the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrante
- 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 90-100% will pass through a *20 iv. Incorporate lime and fertilizer into the top 3-5" of soil by disking or other suitable means.
- Seedbed Preparation

 i. Temporary Seeding

 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") should be tracked leading the procedure of the condition with the state of the condition.
- 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. In corporate lime and fertilizer into the top 3-5" of soil by disking or other suitable means.

 ii. Permanent Seeding

 a. Minimum soil conditions required for permanent vegetative establishment:

 5. Soil pH shall be between 6.0 and 7.0.
 - Soluble salts shall be less than 500 parts per million (ppm). The soil shall contain less than 40% clay, but enough fine grained material 030% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lovegrass of serecia lespedezas is to be planted, then a sandy soil (30% sill plus clay) would be acceptable. Soil shall contain 1.5% minimum organic matter by weight.
- Soil must contain sufficient pore space to permit adequate root penetration. If these conditions cannot be met by soils on site, adding topsoil is required n accordance with Section 21 Standard and Specification for Tonsoil 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 o the surface area and to create horizontal erosion check slots to prevent topsoil from
- Apply soil amendments as per soil test or as included on the plans.

 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 and 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 3:0 should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the compour of the slope. top 1-3" of soil should be loose and friable. Seedbed loosening may not be necessary on
- D. Seed Specifications 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.
- 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 the 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.
- Methods of Seeding

 i. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeded, or a cultipacter seeder.

 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/ac; K20 (portassium): 200 lbs/ac; K20 (portassi
- 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. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without internation.
- of the content of the

SEDIMENT CONTROL NOTES

A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LISCENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1255).

ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED

ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS

CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICAT. FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.

3) FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: 3) 7

CALENDAR DAY'S FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1, b) 14 DAY'S AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.

1) ALL SEDIMENT TRAPS/BASING SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH YOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.

1) ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. 50), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50), AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABILISHMENT OF GRASSES.

LL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT

TO BE VEGETATIVELY STABILIZED

SAME DAY OF DISTURBANCE.

ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED

NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR

10) ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES,
APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON

COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH

DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL

BY THE INSPECTION AGENCY IS MADE. X

D TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGHTS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER X

OFFSITE WASTE/BORROW AREA LOCATION CUYDS.

ANY SEDMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE

66.16 ACRES

1,200 CU.YDS. 1,200 CU.YDS.

- iii. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.

 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.
- Mulch Specifications (In order of preference) traw shall consist of thoroughly threshed wheat, rive or oat straw, reasonable bright in color, and shall not be musty, modify caked decayed or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law.
- Wood Cellulose Fiber Mulch (WCFM)

 a. WCFM shall consist of specially prepared wood cellulose processed into a uniform
- 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 surry. WCFM, including dye, shall contain no germination or growth inhibiting factors. 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. WCFM material shall contain no elements or compounds at concentration levels that will be phyto-toxic.
- will be phytol-toxic.

 f. WCFM must conform to the following physical requirements: fiber length to approximately 10 mm., diameter approximately 1 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.

 Mulching Seeded Areas Mulch shall be applied to all seeded areas immediately after seeding.

 i. If grading is completed outside of the seeding season, mulch along 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 much shall be applied at a net dry weight of 1,500 bs. per acre. The wood cellulose fiber shall be mixed with water, and the mixture shall contain a maximum of 50 bs. of wood cellulose fiber per 100 gallons of water. Securing Straw Mulch Mulch Anchorings: 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:
- 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. It used on sloping land, this practice should be used on the contour if possible.
 i. 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.
- of water.

 iii. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys and creat of banks. The remainder of area should be appear uniform after binder application. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70 Petroset, Terra Tax II., Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.
- Lightweight plastic netting may be stapled over the mulch according to manufacturer's recom-mendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3,000 feet long. Incremental Stabilization - Cut Slopes

 i. All cuts slopes shall be dressed, prepared, seeded and misched 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):
- 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 d. Perform final phase excavation, dress and stabilize. Overseed previously seeded

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 int he operation of completing the operation

- 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
 iii. At the end of each day, femporary 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-crosive manner to address transition devices.
- of the enarkment to intercept surface runoff and convey it down the slope in a non-escaive a sediment trapping device.

 Construction sequence: Refer to Figure 4 (below).

 a. Excavate and stabilize all temporary swales, side ditches, or berms that will be used to divert runoff around the fill. Construct slope silt tence 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.

 d. Place an excession.

Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of and placement of topsoil lif required grading 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.

SECTION 2 - TEMPORARY SEEDING Vegetation - annual grass or grain used to provide cover on disturbed areas for up to 12 months. For longer duration of vegetative cover, Permanent Seeding is required.

A. Seed mixtures - Temporary Seeding

i. Select one or more of the species or mixtures listed in Table 26 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Temporary seeding summary below, along with application rates, seeding dates and seeding depths. If this summary is not put on the plans and completed, then Table 26 must be put on the plans.

ii. For sites having soil tests performed, the rates shown on this table shall be dejeted and the rates recommended by the testing agency shall be written in Soil tests are not required for Temporary Seeding.

5e	ed Mixture (Härd From	Fertilizer Rațe	Lime Rate			
No.	Species	Application Rate (b/ac)	Seeding Dates	Seeding Depths	(10-10-10)	
1	BARLEY OATS RYE	122 96 140	3/1 - 5/15, 6/15 - 10/15	1" - 2" 1" - 2" 1" - 2"	600 lb/ac 05 lb/1000sf)	2 tons/ac 000 b/1000st

SECTION 3 - PERMANENT SEEDING

Incremental Stabilization of Embankments - fill Slopes

Seeding grass and legumes to establish groung cover for a minimum of one year on disturbed areas generally receiving low maintenance.

A. Seed mixtures - Permanent Seeding

i. Select one or more of the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Permanent Seeding Summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-SCS Techinical Field Office Guide, Section 342 — Critical Area Planting, For special lawn maintenance areas, see Sections IV Sod and V Turfgrass.

ii. For sites having disturbed area over 5 areas, the rates shown on this table shall be deleted and the rates recommended by the soil testing agency shall be written in iii. For areas receiving low maintenance, apply ureaform fertilizer (46-0-0) at 3 1/2 bs/1000 sq. ft. U50 bs/ac), in addition to the above soil amendments shown in the table below, to be performed at

Seed Mixture (Hardiness Zone6b_) From Table 25						Fertilizer Rate (10-20-20)		
io.	Species	Application Rate (b/ac)	Seeding Dates	Seeding Depths	N	P205	K20	Rate
3	TALL FESCUE (05%) PERENNIAL RYE GRASS (10%) KENTUCKY BLUEGRASS (5%)	125 15 10	3/1 ~ 5/15, 8/15 ~ 10/15	1" - 2"	90 lb/ac (2.0 lb/ 1000ef)	175 lb/åc (4 lb/ 1000sf)	175 lb/&c (4 lb/ 1000sf)	2 tons/ac (100 lb/ 1000sf)
0	TALL FESCUE (80%) HARD FESCUE (20%)	120 30	3/1 - 5/15, 8/15 - 10/15	1" - 2"				

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED EXTENDED DETENTION POND

A. ROUTINE MAINTENANCE

Facility shall be inspected annually and after major storms. Inspections should be performed during wet weather to determine if the pond is

functioning properly. 2. Top and side slopes of the embankment shall be moved a minimum of two (2) times a year, once in June and once in September. Other side slopes, the bottom of

3. Debris and litter next to the outlet structure shall be removed during regular moving operations and as needed

4. Visible signs of erosion in the pond as well as rip-rap putlet area shall be repaired as soon as it is noticed

Structural components of teh pond such as the dam, riser structure and the pipes shall be repaired upon the detectionof any damage. The components should

be inspected during maintenance operations. 2. Sediment should be removed when its accumulation significantly reduces the design

storage, interferes with the function of the riser, when deemed necessary for aesthetic reasons, or when deemed necessary by the Howard County's Department of Public Works. ENGINEER'S CERTIFICATE

Definition c. Topsoil having soluble sait content greater than 500 Placement of topsoil over a prepared subsoil prior to establishment parts per million shall not be used.

d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elaosed To provide a suitable soil medium for vegetative growth. Soils of

(14 days min.) to permit dissipation of phyto-toxic materials.

qualified agronomist or soil scientist and approved by the

appropriate approval authority, may be used in lieu of natural topsoil ii. Place topsoil (if required) and apply soil amendments as specified in 10.0 Vegetative Stabilization - Section I - Venetative Stabilization Methods and Materials. V. Topsoil Application

When topsoiling, maintain needed erosion and sediment control

performed in such a manner that sodding or seeding can proceed with a

surface resulting from topsoiling or other operations shall be corrected

when the subsoil is excessively wet or in a condition that

may otherwise be detrimental to proper grading and seedbed preparation.

VI. Alternative for Permanent Seeding - Instead of applying the full

Composted Sludge Material for use as a soil conditioner for

sites having disturbed areas over 5 acres shall be tested to prescribe

amendments and for sites having disturbed areas under 5 acres

a. Composted sludge shall be supplied by, or originate from a person

c. Composted sludge shall be applied at a rate of 1 ton/1,000

iv. Composted studge shall be amended with a potassium fertilizer

applied at the rate of 4 lb/1,000 square feet, and 1/3 the normal

or persons that are permitted (at the time of acquisition of the compost)

. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent

by the Maryland Department of the Environment under COMAR 26.04.06.

phosphorus, and 0.2 percent potassium and have a Ph of 7.0 to 8.0. If

compost does not meet these requirements, the appropriate constituents

RIP-RAP INFLOW PROTECTION

GEOTEXTILE

CROSS SECTION

CLASS 'C'

Construction Specifications

1 Rip-rap lined inflow channels shall be I' in depth, have a trapezoidal

The channel shall be lined with 4" to 12" rip- rap to a depth of 16".

3. Entrance and exit sections shall be installed as shown on the detail

4. Rip-rap used for the lining may be recycled for permanent outlet

5. Gabien Inflow Protection may be used in fieu of Rip-rap Inflow

Rip-rap should blend into existing ground.

lining criteria.

projection if the basin is to be converted to a stormwater management

7. Rip-rap Inflow Protection shall be used where the slope is between 4:1

and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Swale

Reviewed for HOWARD SCD and meets Technical Requirements

2. Fifter cloth shall be installed under all rip-rap. Fifter cloth shall

cross section with 21 or flatter side slopes and 3' (min.) bottom width

RRP

amounts of time and commercial fertilizer, composted studge and

amendments may be applied as specified below:

shall conform to the following requirements.

must be added to meet the requirements prior to use.

in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be placed while the topsoil or subsoil is in a

minimum of additional soil preparation and tillage, any irregularities in the

Note: Topsoil substitutes or amendments, as recommended by a

enough to support plants or furnish continuing supplies of moisture practices such as diversions. Grade Stabilization Structures. Earth Dikes Slope Silt Fence and Sediment Traps and Basins. c. The original soil to be vegetated contains material toxic to plant Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation iii. Topsoil shall be uniformly distributed in a 4" - 6" layer and d. The soil is so acidic that treatment with limestone is not feasible. lightly compacted to a minimum thickness of 4". Spreading shall be II. For the purpose of these Standards and Specifications, areas

frozen or muddy condition,

lime application rate.

21 SLOPE OR FLATTER

-3/4" - 11/2" STONE

-GEOTEXTILE CLASS &

MAX. DRAINAGE AREA - 1/4 ACRE

PERSPECTIVE VIEW

special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans. Construction and Material Specifications I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type

Purpose

materials toxic to plants, and/or unacceptable soil gradation.

I. This practice is limited to areas having 2:1 or flatter slopes

a. The texture of the exposed subsoil/parent material is not

adequate to produce vegetative growth.

having slopes steeper than 2:1 require

concern have low moisture content, low nutrient levels, low pH,

Conditions Where Practice Applies

b. The soil material is so shallow that the rooting zone is not deep

of permanent vegetation.

and plant growth.

Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station II. Topsoil Specifications - Soil to be used as topsoil must meet the

Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy

can be found in the representative soil profile section in the Soil

clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall comtain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2" in diameter. ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnsongrass, nutsedge, poison

ivy, thistle, or others as specified. iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at a rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

II. For sites having disturbed areas under 5 acres: i. Place topsoil (if required) and apply soil amendments as specified in 10.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials. III. For sites having disturbed areas over 5 acres: On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into

compliance with the following:

a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher. b. Organic content of topsoil shall be not less than 1.5 percent by weight.

AT GRADE INLET PROTECTION

PLAN/CUT AWAY VIEW

CROSS SECTION

Construction Specifications

1. Lift grate and wrap with Geotextile Class E to completely cover all openings,

2. Place 3/4" to 11/2" stone, 4"-6" thick on the grate to secure the fabric and

GEOTEXTILE CLASS E

STANDARD SYMBOL

he most recent version. Site Preparation

erosion of the embankment.

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be

sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 fe of the toe of the embankment. Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground

surface. For dry stormwater management ponds, a minimum of a 25-toot radius

around the inlet structure shall be cleared. All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas. EARTH FILL

Material - The fill material shall be taken from approved designated borrow areas. it shall be free of roots, stumps, wood, rubbish, stones greater than 5°, frozen o other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the *200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8-inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions the embankment. The principal spillway must be installed concurrently with fill placement and not excavated into the embarkment.

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 tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepstoot, 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.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within +2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. A compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall b compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

Structure 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 borizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than for , 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° or greater over the structure or pipe.

These specifications are appropriate to all ponds within the scope of the Standard Structure backfill may be flowable fill meeting the requirements of Maryland for practice MD-378. All references to ASTM and AASHTO specifications apply to Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi; 26 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum of 6° (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent coated. Any adjoining soil 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 shall completely fill all voids adjacen to the flowable fill zone. 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 structure or pipe unless there is a compacted fill of 24° or greater over the structure or pipe. Backfill material outside the structural backfill (flowable fill) zone shall be of the type and quality conforming to the specified for the core of the embankment or other embankment materials.

All pipes shall be circular in cross section.

Pipe Conduits

Corrugated Metal Pipe - All of the following criteria shall apply for corrugated

L Materials - (Polymer Coated steel pipe) - Steel pipes with polymeric coatings sha have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or tlanges.

Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with waterticht coupling bands or flanges. Aluminum Coated Stel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability. shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphait.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling banks or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling bands, anti-seep collars, and sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at least 24 mils in

3. Connections- All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be

All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24-inches in diameter: flanges on both ends of the pipe with a circular 3/6 inch closed cell neoprene gasket, prepunched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2-inch greater than the corrugation depth. Pipes 24-inches in diameter and larger shall be connected by a 24-inch long annular corrugated band using a minimum of 4 (four) rods and lugs. 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprepe gasket will be installed with 12-inches on the end of each pipe. Flanced loints with 3/8-inch closed cell caskets the full width of the flance is also acceptable. Helically corrugated pipe shall have either continuously welded seams or have loc

seams with internal cauking or a neoprene bead. 4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to "Structure Backfill". 6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced 1 Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361. 2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high

stump concrete placed under the pipe and up the sides of the pipe at least 50 its outside diameter with a minimum thickness of 6 inches. Where a concrete, cradle is not needed for structural reasons, flowable fill may be used as described in the "Stucture Backfill" section of this standard. Gravel bedding is not permitted 3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Jointe shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser. 4. Backfilling shall conform to "Structure Backfill".

5. Other details (Anti-seep collars, valves, etc.) shall be as shown on the drawings. Plastic Pipe The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" - 10" inch pipe shall meet the requirement of AA6HTO M252 Type 5, and 12" through 24" inch shall meet the requirement of AASHTO M294 Type 5. 2. Joints and connections to anti-seep collars shall be completely watertight.

3. Sedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide 4. Backfilling shall conform to "Structure Backfill". 5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection. Concrete

Concrete shall meet the requirements of Maryland Department of Transportation. State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3. Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation. State Highway Administration Standard Specifications for Construction and

Geotextile shall be placed under all riprap and shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 92109, Class C.

Care of Water during Construction All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish inetall, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain wolld live by the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations

Stabilization All borrow areas shall be graded to provide proper drainage and left in a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and

being refilled shall be maintained below the bottom of the excavation at such

locations which may require draining the water sumps from which the water shall

Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings. Erosion and Sediment Control Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and OPERATION AND MAINTENANCE

An operation and maintenance plan in accordance with Local or State Regulations will be prepared for all ponds. As a minimum, the dam inspection checklist located in Appendix A shall be included as part of the operation and maintenance plan and performed at least annually. Written records of maintenance and major repairs needs to be retained in a file. The issuance of a Maintenance and Repair Permit for any repairs or maintenance that involves the modification of the dam or spillway from its original design and specifications is required. A permit is also

36° minimum length fence post

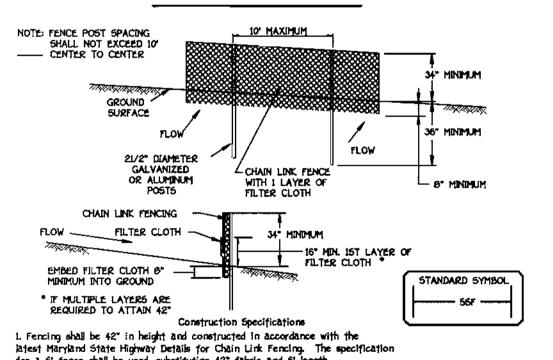
-16" MINIMUM HEIGHT C

GEOTEXTILE CLASS F

DRIVEN A MINIMUM OF 15" INTO

required for any repairs or reconstruction that involve a substantial portion of the structure. All indicated repairs are to be made as soon as practical.

SILT FENCE



SUPER SILT FENCE

for a 6' fence shall be used, substituting 42" fabric and 6' length 2. Chain link fence shall be fastened securely to the fence posts with wire ties.

required except on the ends of the fence. 3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24° at the too and mid section

The lower tension wire, brace and trues rods, drive anchors and post caps are not

4. Filter cloth shall be embedded a minimum of 8° into the ground. 5. When two sections of filter cloth adjoin each other, they shall be overlapped

6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when allt reaches 50% of fence height 7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for

> Tenslie Modulus 20 bs/in (min.) Test: MSMT 509 0.3 gai/ft /minuté (max.) Test: MSMT 322 Filtering Efficiency 75% (min.)



GROUND 36" MINIMUM FENCE POST LENGTH PERSPECTIVE VIEW FENCE POST SECTION 775-5--FLOW GROUND EMBED GEOTEXTILE CLASS F A MINIMUM OF 8" VERTICALLY - FENCE POST DRIVEN _ THE GROUND CROSS SECTION STANDARD SYMBOL **STAPLE** <u>JOINING TWO ADJACENT SILT</u> FENCE SECTIONS Construction Specifications L Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" diameter minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 100 pond per linear foot. 2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F Tensile Strength Tensile Modulus 20 Jbs/in (min.) Test: MSMT 509 0.3 gal ft / minute (max) * Flow Rate Test: MSMT 322 Filtering Efficiency 75% (min.) 3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass. 4. Silt Fence shall be inspected after each rainfall event and maintained when

FISHER, COLLINS & CARTER, INC. ENGINEERING CONSULTANTS & LAND SURVEYORS MAIAL SQUARE OFFICE PARK - 10272 BALTIMORE NATIONAL PIKE

SDP 01-41

CONTROL INSPECTOR.

7) SITE ANALYSIS:
TOYAL AREA OF SITE
AREA DISTURBED
AREA TO BE ROOFED OR PAVED

BY THE INSPECTION AGENCY IS MADE.

I certify that this plan for erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District."

Signature of Engineer (Print name below signature) DEVELOPER'S CERTIFICATE *I/We certify that all development and construction will be done according to this plan.

for sediment and erosion control and that any responsible personnel involved in the construction project will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspection by the Howard Soil Conservation District." Millian tex

Agniature of Developer (Print nathe below signature)

OWNER HOWARD COUNTY PUBLIC SCHOOL SYSTEM 10910 MARYLAND ROUTE 108 ELLICOTT CITY, MARYLAND 21042

PPROVED: DEPARTMENT OF PLANNING AND ZONING 12 21 cto - Department of Planning and Zoning 40 SECTION/AREA CENTENNIAL HIGH SCHOOL 1095 TAX/ZONE | ELEC. DIST. BLOCK NO. ZONE CENSUS TR. **R-20** 696/608 60 23.01 WATER CODE SEWER CODE 5740300 J 01

SEDIMENT & EROSION CONTROL NOTES AND DETAILS

bulges occur or when sediment accumulation reached 50% of the fabric height

BUILDING ADDITIONS AND S.W.M. ACCESS CENTENNIAL HIGH SCHOOL

ZONED R-20

TAX MAP No: 24 PARCEL No: 1095 GRID No: 19 2nd. ELECTION DISTRICT, HOWARD COUNTY, MARYLAND SCALE: AS SHOWN DATE: JANUARY 12, 2001

SHEET 5 OF 5

SDP-01-41