

STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

Vegetation as cover for barren soil to protect it from forces that cause erosion. 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 erode and more likely to allow infiltration of rainfall, thereby reducing sediment loads and runoff to downstream areas, and improving water habitat and water quality.

CONDITIONS WHERE PRACTICE APPLIES
This practice shall be used on denuded areas as specified in the plan 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 (up to one year), and Permanent Seeding, for long term vegetative cover. Examples of applicable areas for Temporary Seeding are temporary Soil Erosion Control Areas, cleared areas being left idle between construction phases, steep slopes, etc. and for Permanent Seeding are lawns, dms, 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 volume 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 help protect groundwater supplies by assimilating those substances present within the root zone.

Sediment control devices must remain in place during grading, seeded 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

A. Site Preparation

1. Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms, wireways, or sediment control basins.
2. Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding operations. After the soil is loosened it should not be reworked.
3. Schedule soil tests to determine soil amendment composition and application rates for sites having disturbed areas over 2 acres.

B. Soil Amendments (Fertilizer and Lime Specifications)

1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 2 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 analysis.
2. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Nitrogen may be substituted for fertilizer with prior approval from the appropriate authority. Fertilizers shall be delivered to the site in labeled containers according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warranty of the producer.
3. Lime products shall be ground limestone (hydrated or burnt lime) may be substituted which contains at least 50% total oxide calcium oxide plus magnesium oxide. Limestone shall be ground to such fineness that at least 50% will pass through a #20 mesh sieve and 90-95% will pass through a #40 mesh sieve.
4. Lime and fertilizer into the top 3-5" of soil by discing or other suitable means.

C. Seeded Preparation

1. Temporary Seeding
 - a. Seeded 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 similar equipment, or other 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) shall be tracked with 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 discing or other suitable means.
2. Permanent Seeding
 - a. Minimum conditions required for permanent vegetative establishment:
 1. Soil pH shall be between 6.0 and 7.0.
 2. Soluble phosphorus shall be less than 500 parts per million (ppm).
 3. The soil shall contain less than 40% clay, but enough fine grained material to hold plus clay to provide the capacity to hold a moderate amount of moisture. An exception is if loess or silt loess impede it to be planted, then a sandy soil (50% silt plus clay) would be acceptable.
 4. Soil shall contain 1.5% minimum organic matter by weight.
 5. Soil must be sufficiently loose to permit adequate root penetration.
 6. If these conditions cannot be met by soils on site, adding topsoil is required.
 - b. Areas previously eroded or otherwise loosened to a depth of 3-5" to permit bonding of the topsoil to the subsoil and to create horizontal erosion check slots to prevent 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 discing or other suitable means. Lawn areas shall be prepared to permit adequate root penetration. Discing shall be done 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 subsoil and to create horizontal erosion check slots to prevent topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.

D. Seed Specifications

1. 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 6 months immediately preceding the date of sowing such material on the job.
2. Note: Seed tags shall be made available to the inspector to verify type and rate of seed used.
3. Inoculant (fungicide) shall be prepared for the species. Inoculant shall not be used until the date indicated on the container. Fresh inoculant is directed on product to be used and the recommended rate when necessary is as indicated on the container as well as possible until such time as temperatures above 75-80°F. can weaken bacteria and make the inoculant less effective.

E. Methods of Seeding

1. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer, broadcast in water).
 - 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./acre, total of soluble nitrogen P205 (phosphorus) 200 lbs./acre, K2O (potassium) 200 lbs./acre.
 - b. Lime: use only ground agricultural limestone (fine) to 3 tons per acre may be applied by hydroseeding. Normally, not more than 2 tons are applied by hydroseeding at any one time.
 - c. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.
2. Dry Seeding: The use of conventional drop or broadcast spreaders.
 - a. Seed spread rate shall be incorporated into the subsoil at the rates prescribed on the Temporary or Permanent Seeding Summaries or Tables 205 or 206.
 - b. Where practical, should be applied in two directions perpendicular to each other.
 - c. Apply half the seeding rate in each direction.
3. Drill or Cultivator Seeding: Mechanized seeders that apply and cover seed with soil.
 - a. Cultivating seeders are required to apply the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seeded must be firm after planting.
 - b. Where practical seed should be applied in two directions perpendicular to each other.

F. Mulch Specifications (in order of preference)

1. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonable bright in color, and shall not be overly moldy, chaff, dented, or excessively dusty and shall be free of noxious weed seeds as specified in the Maryland Seed Law.
2. Wood Cellulose Fiber Mulch (WCM)
 - a. WCM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state.
 - b. WCM shall be dried green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniform spread slurry.
 - c. WCM (including dye) shall contain no ornamentation or growth inhibiting factors.
 - d. WCM material shall be produced 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.
 - e. WCM material shall be produced in such a manner that the wood cellulose fiber mulch will have moisture absorption and percolation properties and shall cover and hold gas seed or fertilizer in the soil without inhibiting the growth of the grass species.
 - f. WCM material shall contain no elements or compounds at concentrations levels that will be phytotoxic.
 - g. WCM must conform to the following physical requirements: fiber length to be 1/8" to 1/4" and a minimum of two (2) inches. The practice is most effective on slopes of 1:1 to 2:1.
 - h. WCM must contain a minimum of 10% ash content of 100 mesh and water holding capacity of 90% minimum.
3. Mulching Seeded Areas - Mulch shall be applied to all seeded areas immediately after seeding.
 - a. If grading is completed outside of the seeding season, mulch 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.
 - b. 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 over the surface. If a mulch application tool is used, the rate should be increased to 2.5 tons/acre.
 - c. Wood cellulose fiber shall be applied at a net dry weight of 1500 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.
4. Securing Straw Mulch (Mulch Anchoring) - 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 (used by preference, depending upon size of area and erosion hazard):
 - a. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil to 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 areas, the mulch shall be applied to the slope.
 - b. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 150 pounds per acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 20 pounds of wood cellulose fiber per 100 gallons of water.
 - c. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in ditches and crest of bank. The practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping areas, the mulch shall be applied to the slope.
 - d. Terra Tack AK or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.
 - e. Lightweight plastic netting may be applied 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.

PERMANENT SEEDING NOTES

ALL DISTURBED AREAS SHALL BE STABILIZED AS FOLLOWS:

SEEDING PREPARATION:
LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING.

SOIL AMENDMENTS:
APPLY TWO TONS PER ACRE DOLOMITE LIMESTONE (92 LBS./1,000 SQ.FT.) AND 600 LBS. PER ACRE 0-20-20 FERTILIZER (14 LBS./1,000 SQ.FT.) BEFORE SEEDING BARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS. PER ACRE 30-0-0 UREA/BORON FERTILIZER (9 LBS./1,000 SQ.FT.) AND 500 LBS. PER ACRE (11.5 LBS./1,000 SQ.FT.) OF 10-20-20 FERTILIZER.

SEEDING:
FOR THE PERIODS MARCH 1 THROUGH APRIL 30, AND AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 100 LBS. PER ACRE (2.3 LBS./1,000 SQ.FT.) OF KENTUCKY 31 TALL FESCUE FOR THE PERIOD MAY 1 THROUGH JULY 31, SEED WITH 60 LBS./ACRE (1.4 LBS./1,000 SQ.FT.) KENTUCKY 31 TALL FESCUE AND 1 LBS. PER ACRE (200 LBS./1,000 SQ.FT.) OF WEEDING LOVEGRASS. DURING THE PERIOD OF OCTOBER 15 THROUGH FEBRUARY 28, PREPARE SITE BY OPTION D - TWO TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION D - USE 500 OPTION C - SEED WITH 100 LBS./ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH TWO TONS/ACRE WELL ANCHORED STRAW. ALL SLOPES SHOULD BE HYDROSEEDED.

MULCHING:
APPLY 1 TO 2 TONS PER ACRE (2 TO 4 LBS./1,000 SQ.FT.) OF UNBROKEN SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHORING TOOL OR 200 GALLONS PER ACRE (5 GALLONS/1,000 SQ.FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS ON SLOPES OF 1:1 OR HIGHER USE 340 GALLONS PER ACRE (34 GALLONS/1,000 SQ.FT.) FOR ANCHORING.

MAINTENANCE:
INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND SUBSTITUTIONS.

FOR PUBLIC PONDS SUBSTITUTES CHEMUNG CROWNWEED AT 15 LBS./ACRE AND KENTUCKY 31 TALL FESCUE AT 40 LBS./ACRE AS THE SEEDING REQUIREMENT. OPTIMUM SEEDING DATE FOR THIS MIXTURE IS MARCH 1 TO APRIL 30.

TEMPORARY SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE RE-DISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDING PREPARATION:
LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS:
APPLY 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS./1,000 SQ.FT.)

SEEDING:
FOR THE PERIODS MARCH 1 THROUGH APRIL 30, AND AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 17 BUSHES PER ACRE OF ANNUAL RYE (1.3 LBS./ACRE OF WEEDING LOVEGRASS (07 LBS./1,000 SQ.FT.) FOR THE PERIOD NOVEMBER 15 THRU FEBRUARY 28. PREPARE SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE 500.

MULCHING:
APPLY 1 TO 2 TONS PER ACRE (70 TO 90 LBS./1,000 SQ.FT.) OF UNBROKEN SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHORING TOOL OR 200 GALLONS PER ACRE (5 GALLONS/1,000 SQ.FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS ON SLOPES OF 1:1 OR HIGHER USE 340 GALLONS PER ACRE (34 GALLONS/1,000 SQ.FT.) FOR ANCHORING.

REFER TO THE 1996 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

SEQUENCE OF CONSTRUCTION

1. OBTAIN GRADING PERMIT.
2. INSTALL SEDIMENT AND EROSION CONTROL DEVICES AS SHOWN ON PLAN.
3. CLEAR AND GRUB TO LIMITS OF DISTURBANCE AND MASS GRADE TO SUB-BASE.
4. INSTALL TEMPORARY SEEDING.
5. CONSTRUCT UTILITIES (STORMDRAIN, WATER AND SEWER).
6. CONSTRUCT BUILDINGS.
7. GRADE ROADS, CURBS, AND SIDEWALK AND INSTALL SUB-BASE AND SIDEWALKS.
8. FINE GRADE SITE AND INSTALL PERMANENT SEEDING AND LANDSCAPE.
9. REMOVE SEDIMENT CONTROL DEVICES AS UPLAND AREAS ARE STABILIZED AND PERMISSION IS GRANTED BY E/S CONTROL INSPECTOR.

ENGINEER'S CERTIFICATE

I certify that this plan for sediment and erosion 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 County Conservation District.

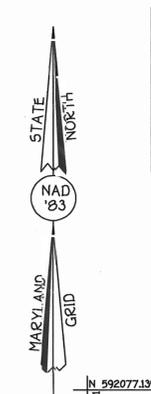
Signature of Engineer: *Earl D. Collins* Date: *4/27/01*

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 all 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.

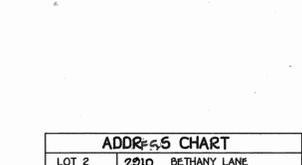
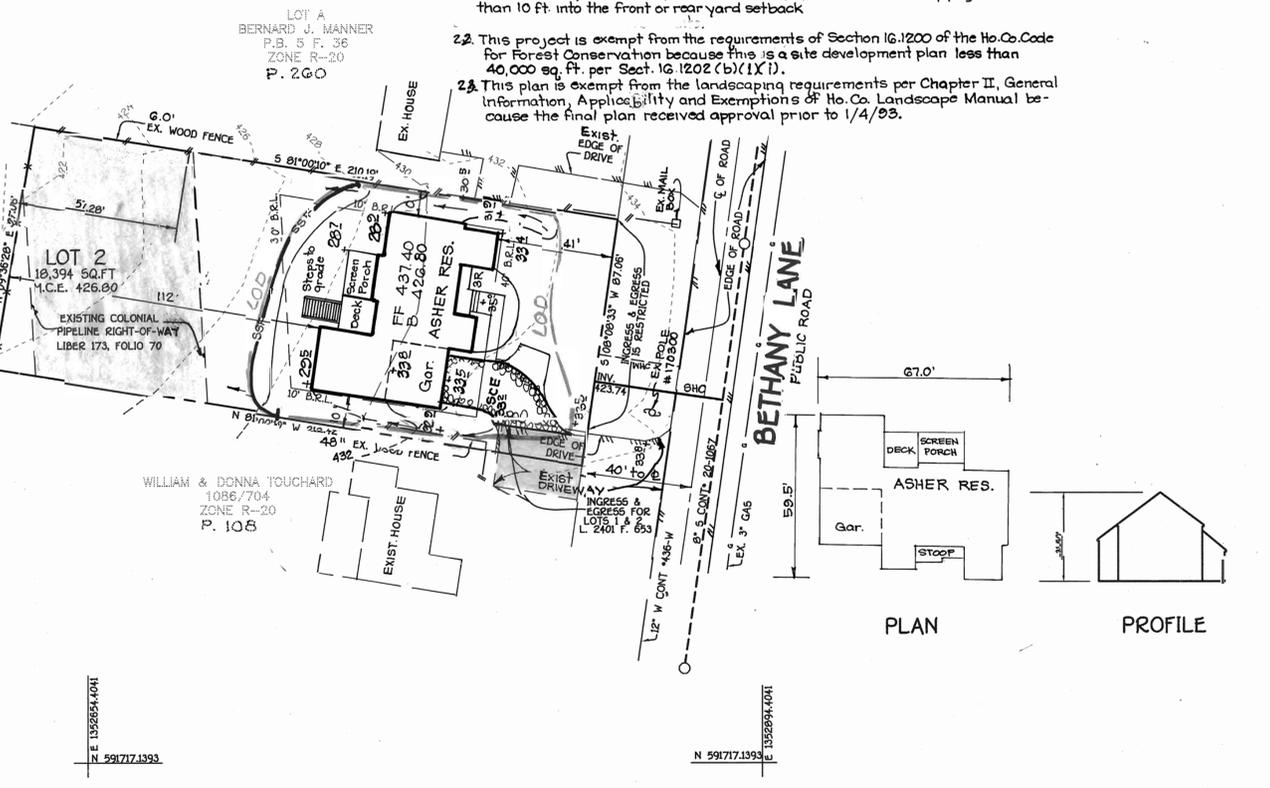
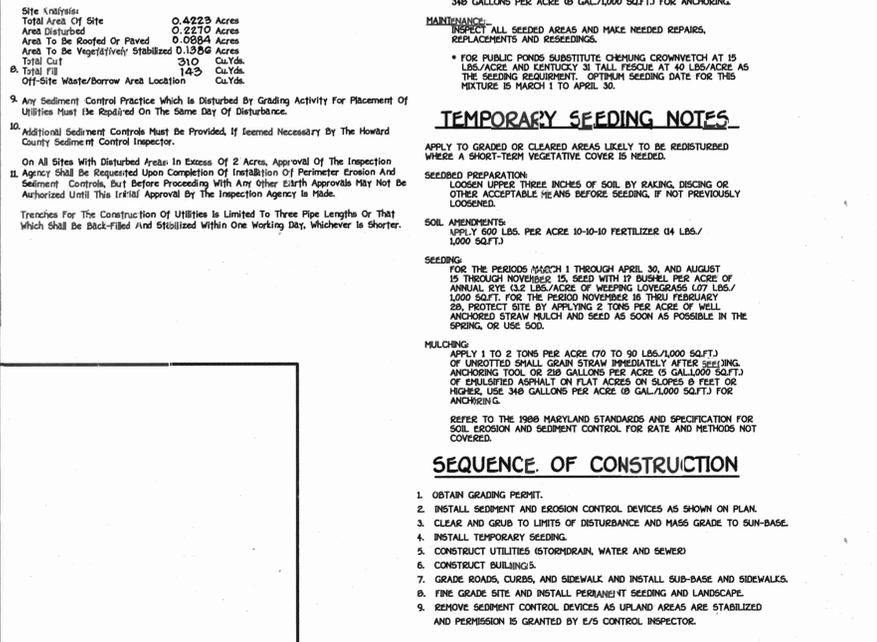
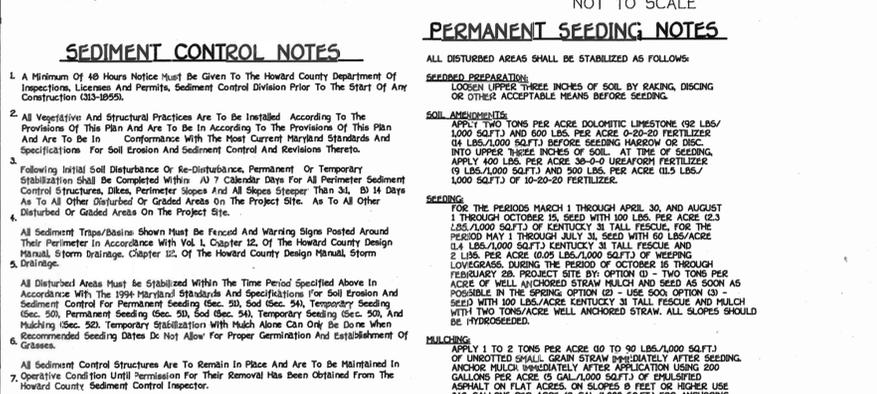
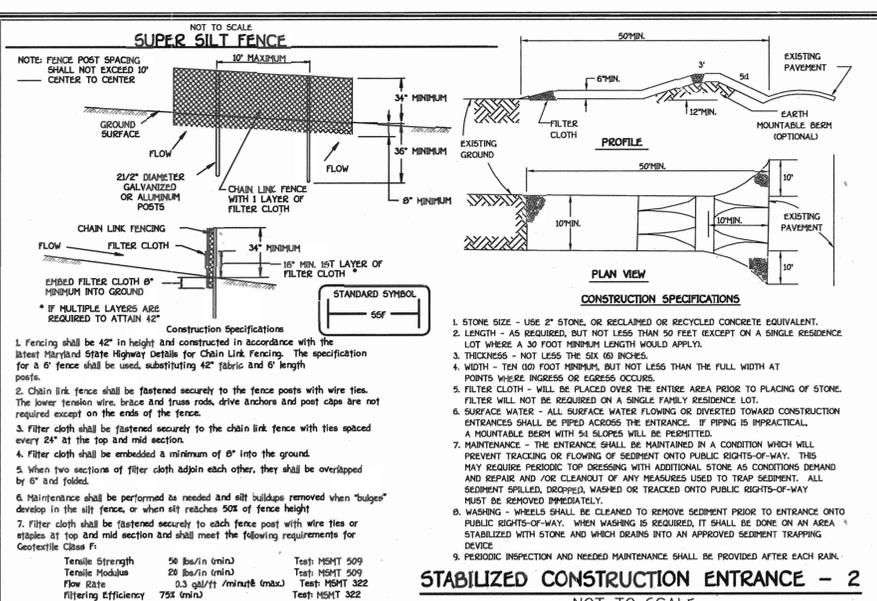
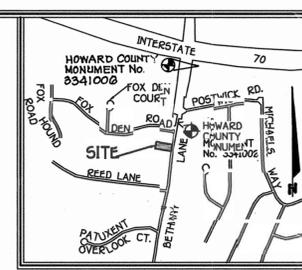
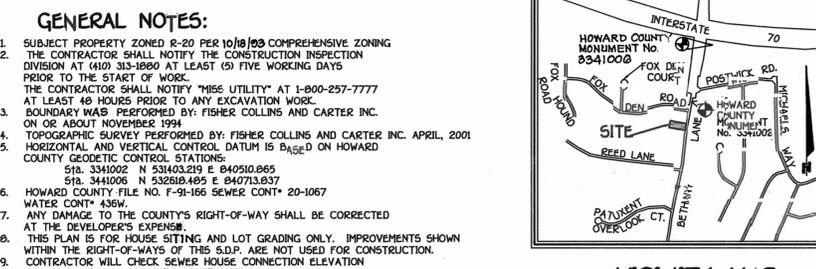
Signature of Developer: *Constance Asher* Date: _____

OWNER/BUILDER
CONSTANCE ASHER
10886 ROUTE 20
WOODSTOCK, MD 21163



LEGEND

SYMBOL	DESCRIPTION
---	EXISTING CONTOUR 2' INTERVAL
---	STONE CONSTRUCT. ENT.
• 624	SPOT ELEVATION
---S---S---	SUPER SILT FENCE
-X-X-	TREE PROTECTION
---	EXISTING T&E LINE
---	LIMIT OF DISTURBANCE



FISHER, COLLINS & CARTER, INC.
CIVIL ENGINEERING CONSULTANTS & LAND SURVEYORS
CENTRAL SQUARE OFFICE: 1077 BALTIMORE NATIONAL PIKE
CLOUETT CITY, MARYLAND 21022
TEL: 410-399-0112
LIBRARY/SDPS/SPS/LOT/SDP/BASE

5/31/02
Rev. 9rd. to show Ex. Conditions
DATE DESCRIPTION REVISION BLOCK

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Director: *[Signature]* Date: *7/5/01*

Chief, Planning and Zoning: *[Signature]* Date: *7/5/01*

Chief, Development Engineering: *[Signature]* Date: *7/2/01*

SUBDIVISION
RUNKLES PROPERTY

SECTION/AREA
N/A

LOT NO.
2

TAX MAP No. 17
PARCEL No. 1013

ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: 1"=30'
DATE: APRIL, 2001

SHEET 1 OF 1

SITE DEVELOPMENT SEDIMENT EROSION PLAN

RUNKLES PROPERTY

LOT 2

TAX MAP No. 17
PARCEL No. 1013

ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE: 1"=30'
DATE: APRIL, 2001

SHEET 1 OF 1

SDP 01-129

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