

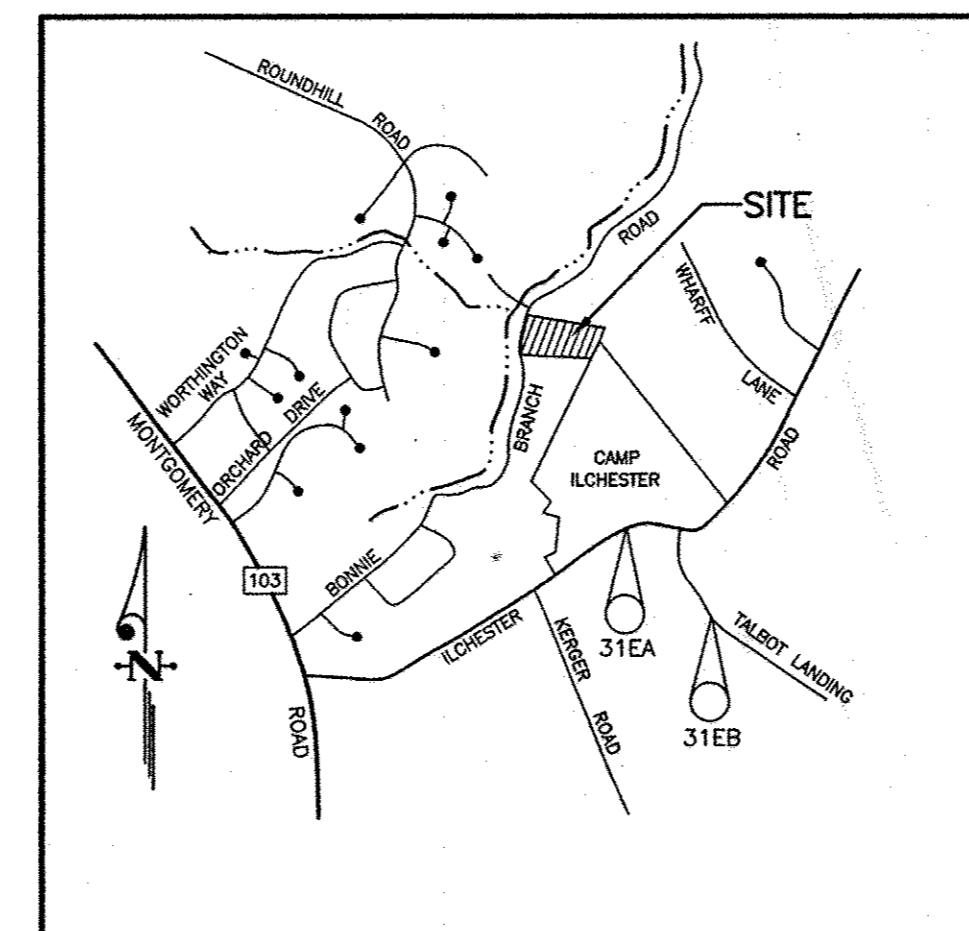
# STORMWATER MANAGEMENT CONSTRUCTION PLANS

## BONNIELASS LOTS 1-4

### GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING, CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
- PROJECT BACKGROUND:  
ZONING: R-20  
TOTAL TRACT AREA: 5.6308 AC.  
NUMBER OF PROPOSED LOTS: 2 BUILDABLE, 2 OPEN SPACE
- TRAFFIC CONTROL DEVICES, MARKINGS, AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- TOPOGRAPHIC SURVEY WAS FIELD RUN AT 2' CONTOUR INTERVALS BY CLARK, FINEFROCK & SACKETT, INC., DATED FEBRUARY, 2001.
- HORIZONTAL AND VERTICAL CONTROL BASED ON HOWARD COUNTY CONTROL STATIONS 31EA-ELEV. 469.603 AND 31EB-ELEV. 453.396.
- STREET LIGHTS WILL NOT BE REQUIRED IN THIS DEVELOPMENT IN ACCORDANCE WITH THE DESIGN MANUAL.
- PUBLIC WATER AND SEWER ARE TO BE UTILIZED.
- STORMWATER MANAGEMENT FOR THIS PROJECT IS BEING PROVIDED ON SITE FOR QUANTITY AND QUALITY. QUALITY CONTROL FOR THIS SITE IS A SURFACE SAND FILTER. QUANTITY CONTROL FOR THIS SITE IS EXTENDED DETENTION. THE STORMWATER MANAGEMENT FACILITY WILL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.

SHEET INDEX	
SHEET	DESCRIPTION
1	COVER SHEET
2	SITE DEVELOPMENT PLAN, STORMWATER MANAGEMENT PLAN AND GRADING PLAN
3	SEDIMENT EROSION CONTROL PLAN
4	SEDIMENT AND EROSION CONTROL DETAILS
5	STORM DRAIN AND PAVING DETAILS
6	STORMWATER MANAGEMENT POND DETAILS
7	SURFACE SAND FILTER DETAILS
8	LANDSCAPE PLAN
9	DRAINAGE AREA MAP
10	FOREST STAND DELINEATION (EXISTING CONDITIONS)
11	BORING LOGS AND STORMWATER POND LANDSCAPE PLAN
12	WALL ELEVATION AND RETAINING WALL DESIGN
13	WALL ELEVATION AND ROAD PROFILE
14	FOREST CONSERVATION PLAN
15	REFORESTATION PLANTING PLAN
16	PRIVATE ACCESS PLACE PLAN AND PROFILE
17	SITE DEVELOPMENT PLAN PER SDP-05-04



VICINITY MAP  
SCALE: 1" = 2000'

### BENCH MARKS

MONUMENT	DESCRIPTION	ELEVATION	NORTHING	EASTING
31EA	MONUMENT	469.603	569641.123	1,374,815.935
31EB	MONUMENT	453.396	568730.984	1,376,273.491

### SITE ANALYSIS DATA CHART

- Total Project Area: 5.6308 acres or 245,277 square feet
- Area of Plan Submission: 5.6308 acres
- Limit of Disturbed Area: 2.81 acres
- Present Zoning: R-20
- Proposed Uses for Site and Structures: Residential
- Open Space: Lot 1 = 1.2634 AC.  
Lot 4 = 1.0000 AC.  
TOTAL = 2.2634 AC.

OPTION 5:		FOREST CONSERVATION DATA SUMMARY					
File Number: P-01-208		Project/Subdivision Name: Bonnielass, Lots 1 thru 4					
Land Use Residential	Subwatershed Number 2130906	On-site MD Grid N (1) 511,400	On-site MD Grid E (1) 862,000	Net Tract Area (Ac.) 5.63	Total Site Disturbance (Ac.) 4.69		
Priority Disturbance within Total Disturbed Area (2) N/A	% of Priority Disturbance (3) N/A	Existing Forest (Ac.) (4) 5.13	On-site Retention (Ac.) 0.94	Off-site Retention (Ac.) (5) N/A	Cleared Forest (Ac.) (4) 4.19		
On-site Reforestation (Ac.) (5) 0.11	Off-site Reforestation (Ac.) (5) 1.26	On-site Afforestation (Ac.) N/A	Off-site Afforestation (Ac.) (5) N/A	Off-site MD Grid N (1) 528,000	Off-site MD Grid E (1) 828,000		
Total Acres in Easement 2.32	Total Acres of Priority Area Within Total Easement N/A	% of Priority Area Within Total Easement N/A	Amount of Surety Posted \$38,028	Cash Receipt No. for Fee (6) N/A	Off-site Subwatershed Number 213106		

- These 6 digit coordinates can be taken from ADC's Street Map of Howard County.
- Provide the acreage of the total site disturbance which occurs in priority areas (wetlands, wetland buffers, stream buffers, steep slopes, floodplain).
- Provide the percentage of the total site disturbance which occurs within priority areas.
- These figures apply to the acreage of existing forest in the Net Tract Area and to the acreage of the forest which will be cleared.
- These figures apply to off-site planting and/or retention not associated with a Forest Conservation Bank
- This receipt number is completed by DPZ staff.

1	REV. SHEET NUMBER 15 TO 17	3-28-03
15	REVISION	DATE

OWNER / DEVELOPER  
BONNIELASS LLC  
8835-P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045



**CLARK · FINEFROCK & SACKETT, INC.**  
ENGINEERS · PLANNERS · SURVEYORS  
7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

DESIGNED PC	COVER SHEET	SCALE AS SHOWN
DRAWN ZAH/CRH2		DRAWING 1 of 17
CHECKED AS	TAX MAP 31 PARCEL 254 GRID 9 ZONING R-20 FIRST (1ST) ELECTION DISTRICT HOWARD COUNTY, MARYLAND	JOB NO. 00-098
DATE 6-23-03		FILE NO. 00-098-D

APPROVED: DEPARTMENT OF PUBLIC WORKS  
NA  
DATE

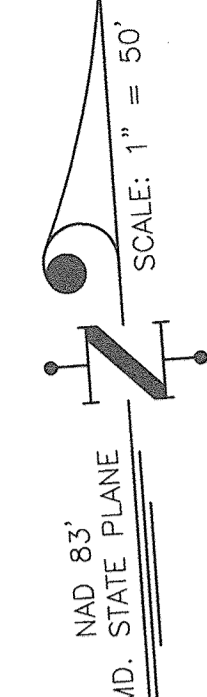
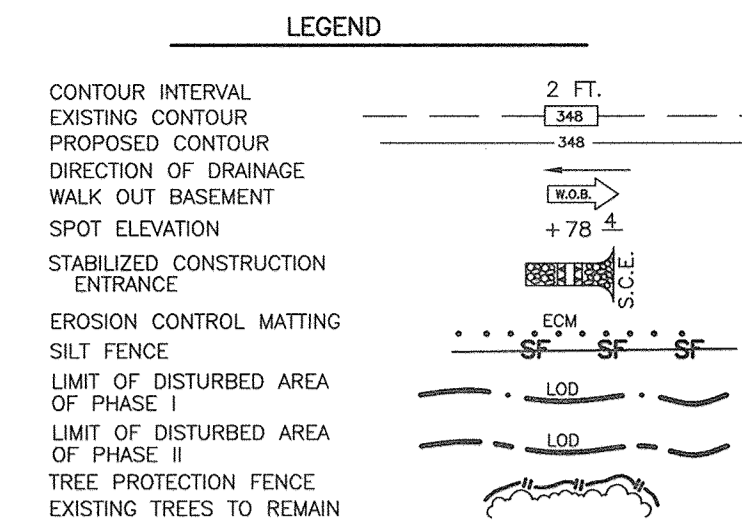
APPROVED: DEPARTMENT OF PLANNING & ZONING  
8/15/03  
DATE  
8/15/03  
DATE

NO.	REVISION	DATE
1	REV. PROPOSED STREET GRADES AND RET. WALLS TO DRAINAGE POND	8-18-02
2	REV. TO SHOW PROPOSED TREE MAINTENANCE EASEMENT AND PROPOSED 30'x30' TURNAROUND PER 200-05-04A REV. PROP. STREET GRADES	9-27-02
3	Rev. to show pond + sand filter as built.	10-21-03

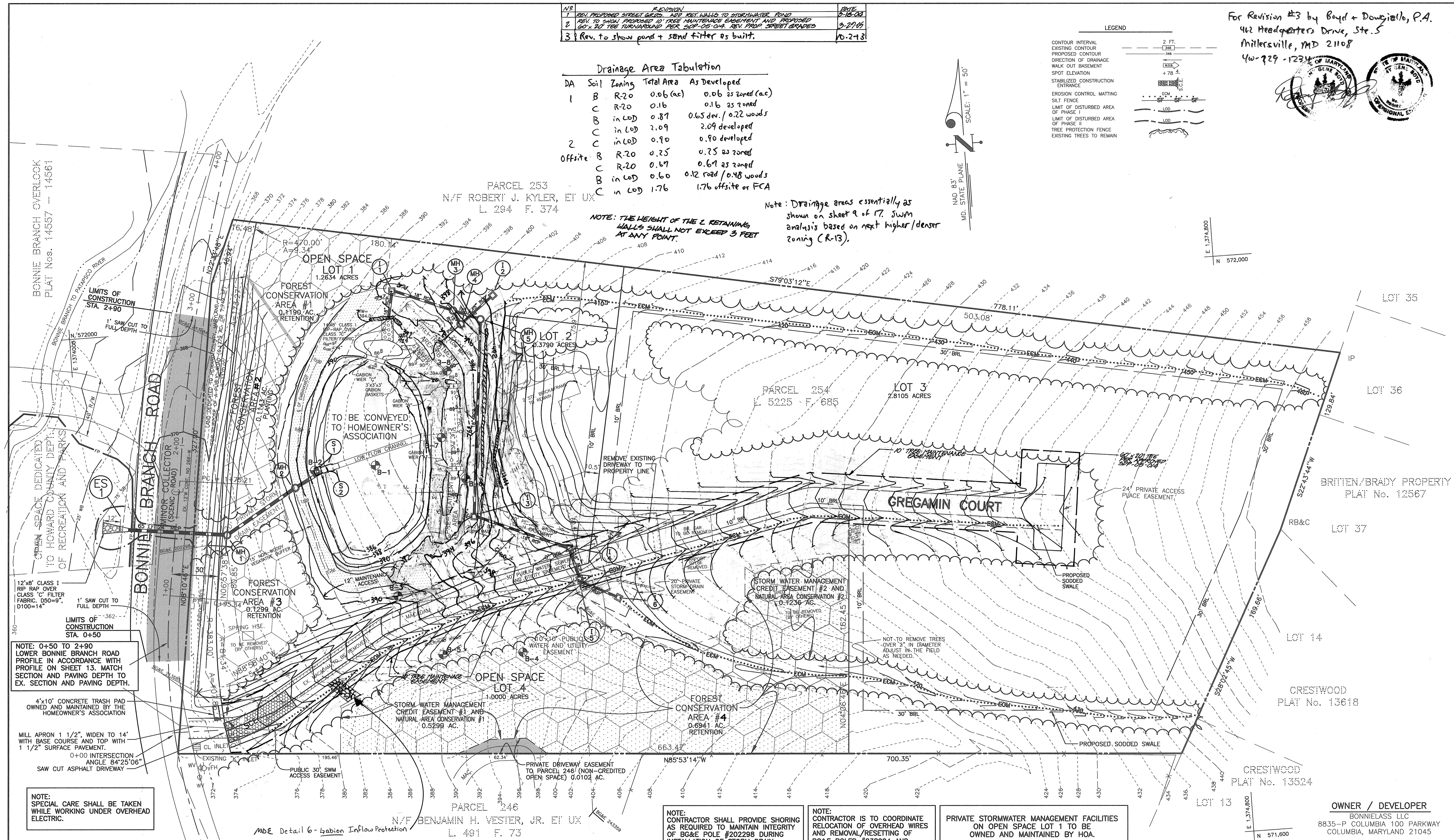
Drainage Area Tabulation				
DA	Soil	Zoning	Total Area	As Developed
1	B	R-20	0.06 (ac)	0.06 as zoned (ac)
	C	R-20	0.16	0.16 as zoned
	B in LOD		0.81	0.65 dev. / 0.22 woods
2	C	in LOD	2.09	2.09 developed
	C	in LOD	0.90	0.90 developed
	C	in LOD	0.25	0.25 as zoned
Offsite	B	R-20	0.67	0.67 as zoned
	B	in LOD	0.60	0.12 road / 0.48 woods
	C	in LOD	1.76	1.76 offsite or FCA

Note: Drainage areas essentially as shown on sheet 9 of 17. SWM analysis based on next higher/denser zoning (R-13).

NOTE: THE HEIGHT OF THE 2 RETAINING WALLS SHALL NOT EXCEED 3 FEET AT ANY POINT.



For Revision #3 by Boyd + Dangiello, P.A.  
422 Headquarters Drive, Ste. 5  
Millersville, MD 21108  
410-729-1234



NOTE: 0+50 TO 2+90 LOWER BONNIE BRANCH ROAD PROFILE IN ACCORDANCE WITH PROFILE ON SHEET 13. MATCH SECTION AND PAVING DEPTH TO EX. SECTION AND PAVING DEPTH.

4'x10' CONCRETE TRASH PAD OWNED AND MAINTAINED BY THE HOMEOWNER'S ASSOCIATION

MILL APRON 1 1/2" WIDEN TO 14' WITH BASE COURSE AND TOP WITH 1 1/2" SURFACE PAVEMENT.

0+00 INTERSECTION ANGLE 84°25'06" SAW CUT ASPHALT DRIVEWAY

NOTE: SPECIAL CARE SHALL BE TAKEN WHILE WORKING UNDER OVERHEAD ELECTRIC.

NOTE: CONTRACTOR SHALL PROVIDE SHORING AS REQUIRED TO MAINTAIN INTEGRITY OF BG&E POLE #202298 DURING INSTALLATION OF STORM DRAIN.

NOTE: CONTRACTOR IS TO COORDINATE RELOCATION OF OVERHEAD WIRES AND REMOVAL/RESETTING OF BG&E POLES #238994 AND #213685 WITH UTILITY COMPANY

PRIVATE STORMWATER MANAGEMENT FACILITIES ON OPEN SPACE LOT 1 TO BE OWNED AND MAINTAINED BY HOA.

APPROVED: DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS  
DATE: 8/15/03

APPROVED: DEPARTMENT OF PLANNING & ZONING  
CHIEF, DIVISION OF DEVELOPMENT  
DATE: 8/17/03

By The Developer:  
I certify that all development and/or construction will be done according to these plans, 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 shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District.

Signature of Developer: [Signature]  
Date: 7-1-03

By the Engineer:  
I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion.

Signature of Engineer: [Signature]  
Date: 6-25-03

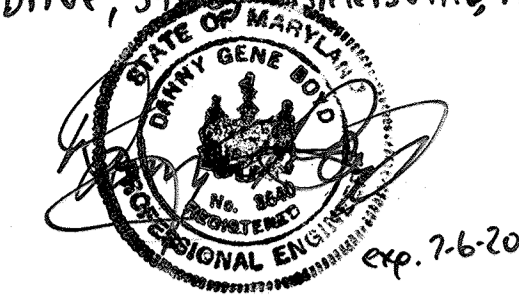


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ENGINEERS · PLANNERS · SURVEYORS  
7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

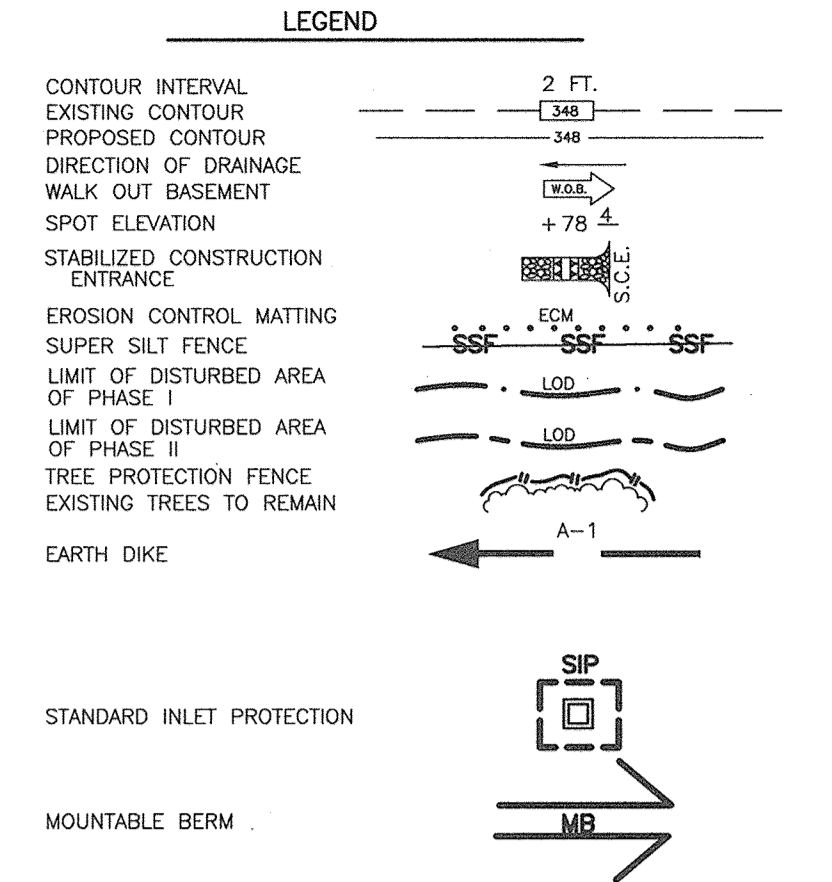
DESIGNED PC/AS	SITE DEVELOPMENT, STORMWATER MANAGEMENT AND GRADING PLAN <b>BONNIELASS</b> TAX MAP 31 PARCEL 254 GRID 9 ZONING R-20 FIRST (1ST) ELECTION DISTRICT HOWARD COUNTY, MARYLAND	SCALE 1"=30'
DRAWN ZAH/CRH2		DRAWING 2 of 17
CHECKED AS		JOB NO. 00-098
DATE 2-10-03		FILE NO. 00-098-D

NO	REVISION	DATE
1	REV. PROP. STREET GRADES, ADD RETAINING WALLS TO STORMWATER POND	5-22-03
2	REV. TO SHOW PROPOSED TREE MAINTENANCE EASEMENT AND POND	5-29-05
3	REV. TO SHOW POND + SAND FILTER AS BUILT.	10-2-13

For Revision #3 by Boyd + Dowgiello, P.A.  
 412 Headquarters Drive, State Millersville, MD 21108  
 410-229-1234



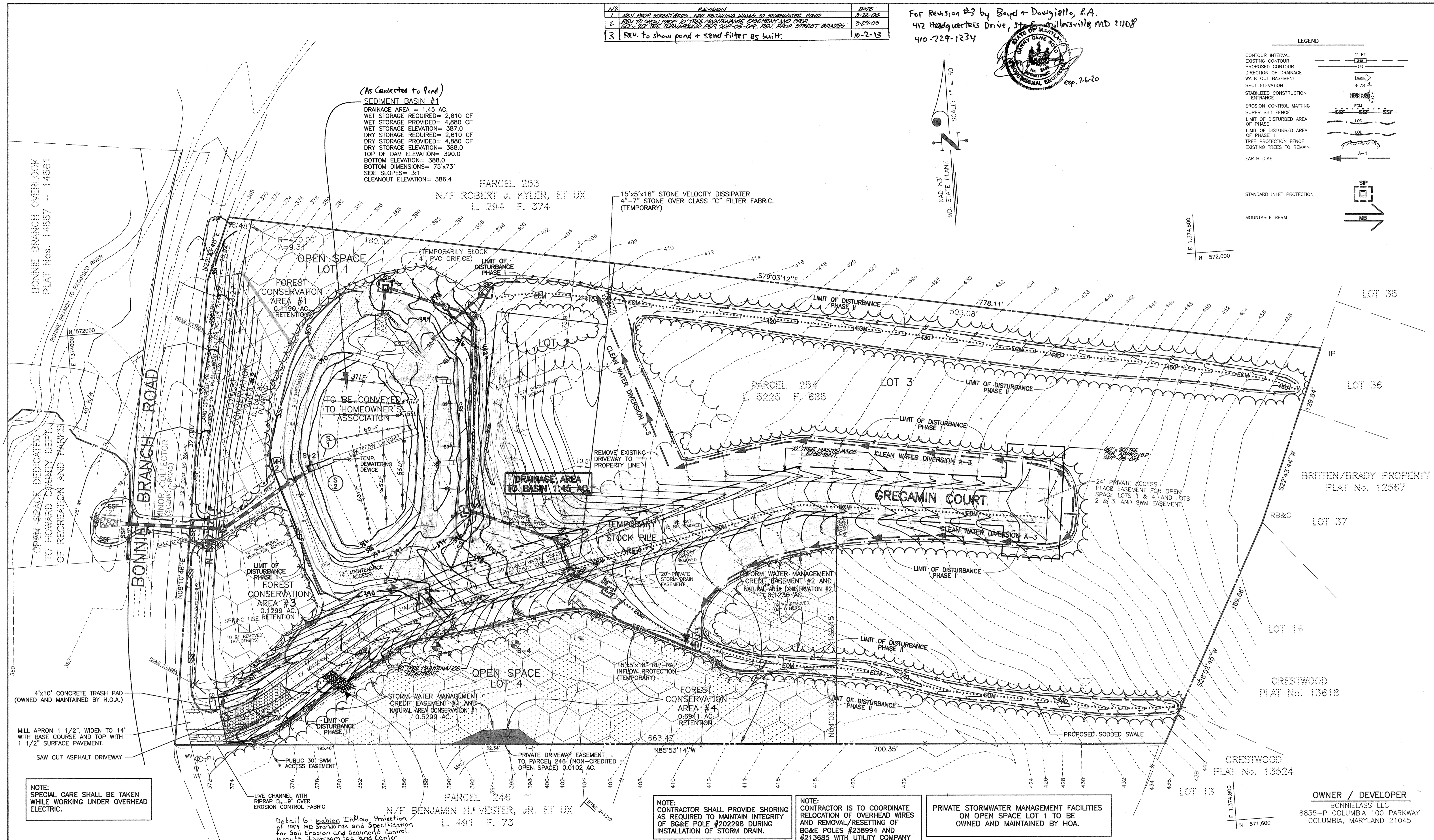
NAD 83  
 MD. STATE PLANE  
 SCALE: 1" = 50'



(As Converted to Pond)  
**SEDIMENT BASIN #1**  
 DRAINAGE AREA = 1.45 AC  
 WET STORAGE REQUIRED = 2,610 CF  
 WET STORAGE PROVIDED = 4,880 CF  
 WET STORAGE ELEVATION = 387.0  
 DRY STORAGE REQUIRED = 2,610 CF  
 DRY STORAGE PROVIDED = 4,880 CF  
 DRY STORAGE ELEVATION = 388.0  
 TOP OF DAM ELEVATION = 390.0  
 BOTTOM ELEVATION = 388.0  
 BOTTOM DIMENSIONS = 75'x73'  
 SIDE SLOPES = 3:1  
 CLEANOUT ELEVATION = 386.4

PARCEL 253  
 N/V ROBERT J. KYLER, ET UX  
 L. 284 F. 374

15'x5'x18" STONE VELOCITY DISSIPATER  
 4"-7" STONE OVER CLASS "C" FILTER FABRIC.  
 (TEMPORARY)



NOTE:  
 SPECIAL CARE SHALL BE TAKEN WHILE WORKING UNDER OVERHEAD ELECTRIC.

Detail 6 - Inflow Protection of 1994 MD Standards and Specification for Soil Erosion and Sediment Control. Inflow Protection to be installed at center of existing swale.

NOTE:  
 CONTRACTOR SHALL PROVIDE SHORING AS REQUIRED TO MAINTAIN INTEGRITY OF BG&E POLE #202298 DURING INSTALLATION OF STORM DRAIN.

NOTE:  
 CONTRACTOR IS TO COORDINATE RELOCATION OF OVERHEAD WIRES AND REMOVAL/RESETTING OF BG&E POLES #238994 AND #213685 WITH UTILITY COMPANY

PRIVATE STORMWATER MANAGEMENT FACILITIES ON OPEN SPACE LOT 1 TO BE OWNED AND MAINTAINED BY HOA.

APPROVED: DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: N/A

APPROVED: DEPARTMENT OF PLANNING & ZONING  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 6/15/03

Reviewed for HOWARD S.C.D. and meets Technical Requirements  
 Signature: [Signature] Date: 7/21/03  
 U.S. Natural Resources Conservation Service

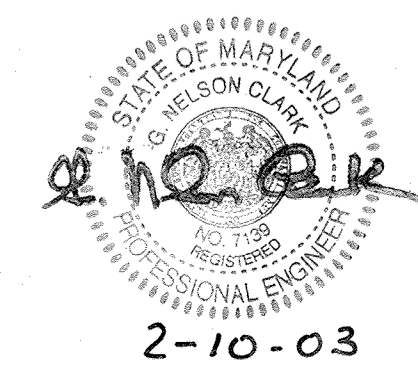
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

By The Developer:  
 "I/We certify that all development and/or construction will be done according to these plans, 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 shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

Signature of Developer: [Signature] Date: 7-1-03

By the Engineer:  
 "I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

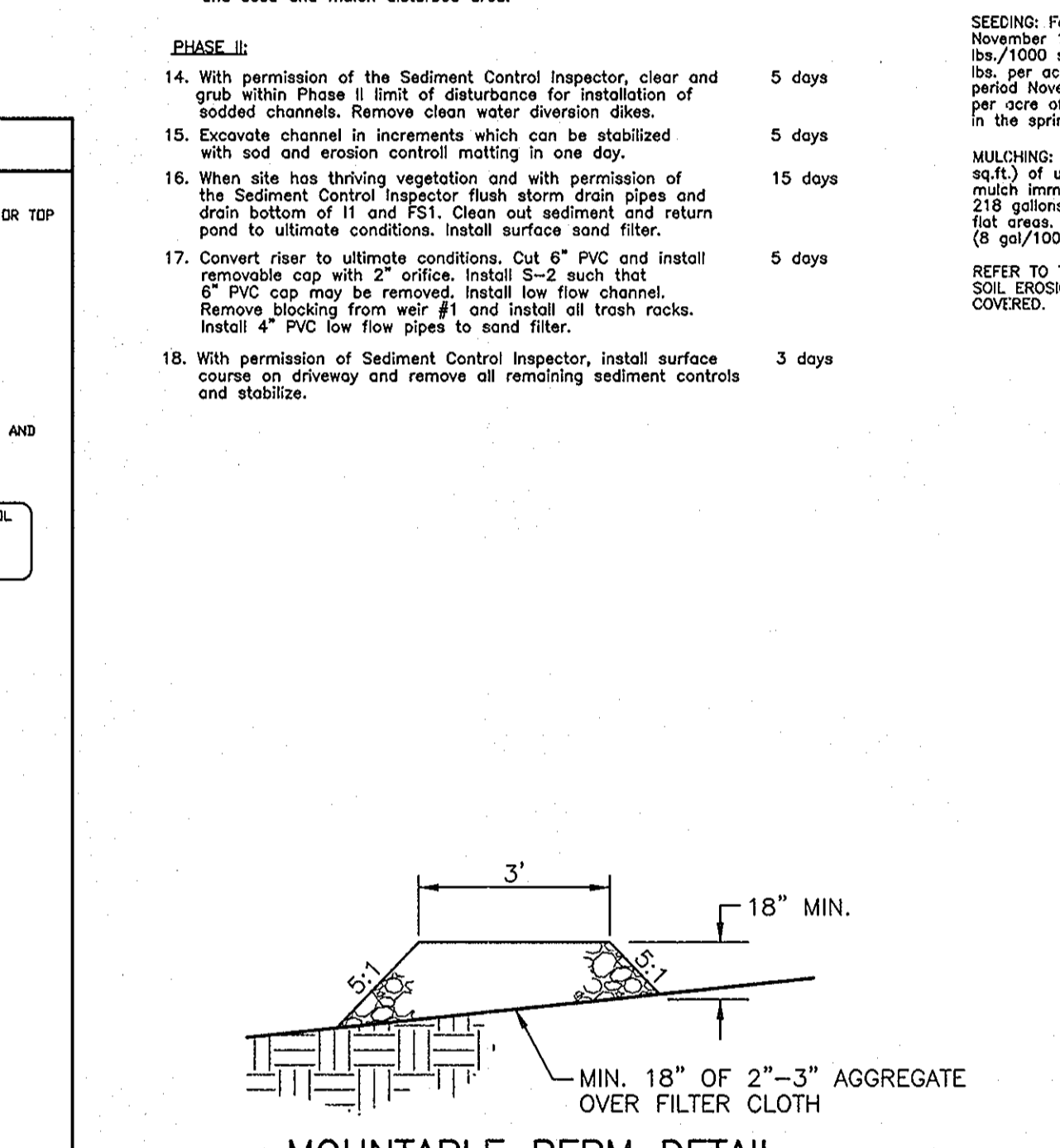
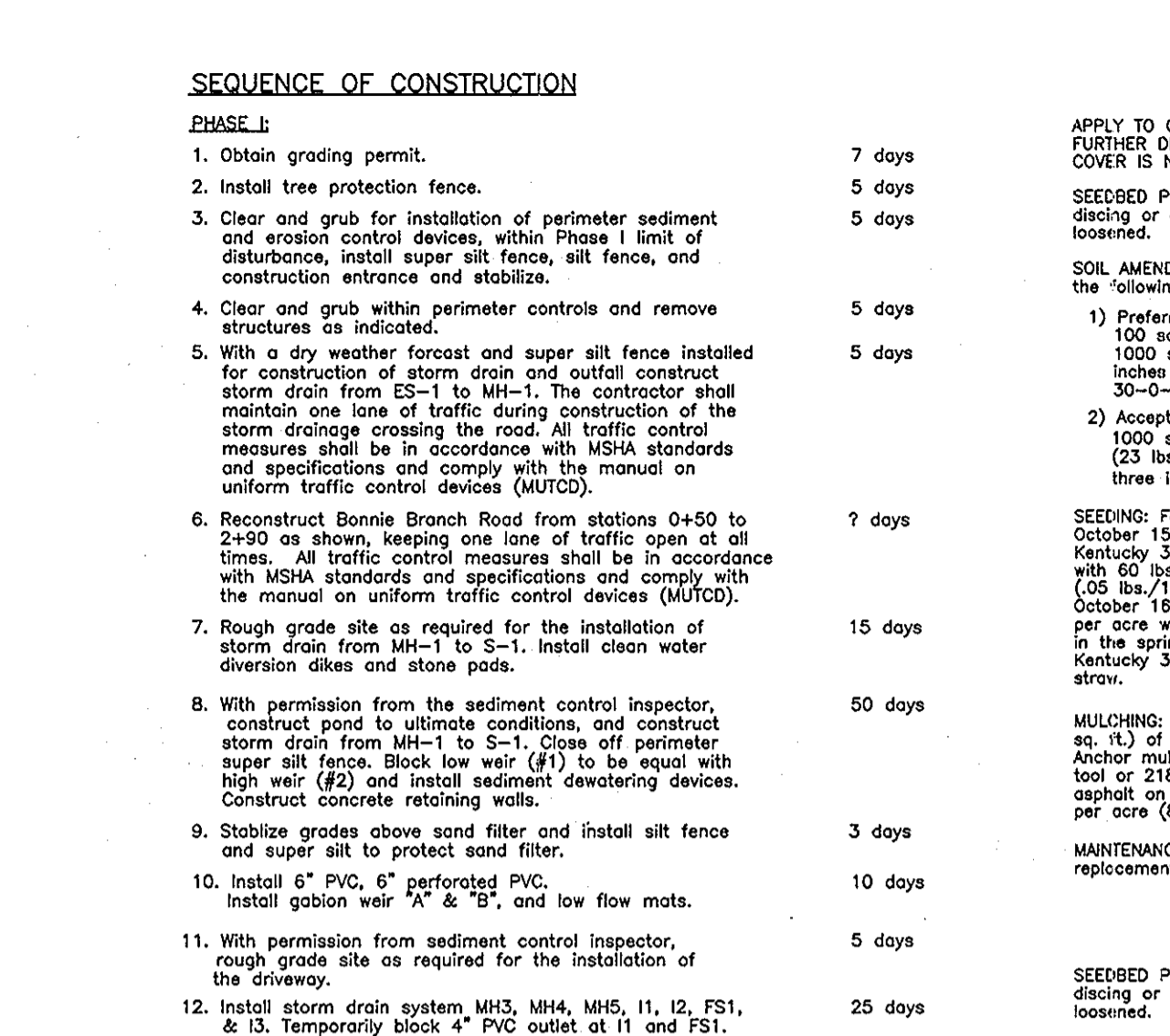
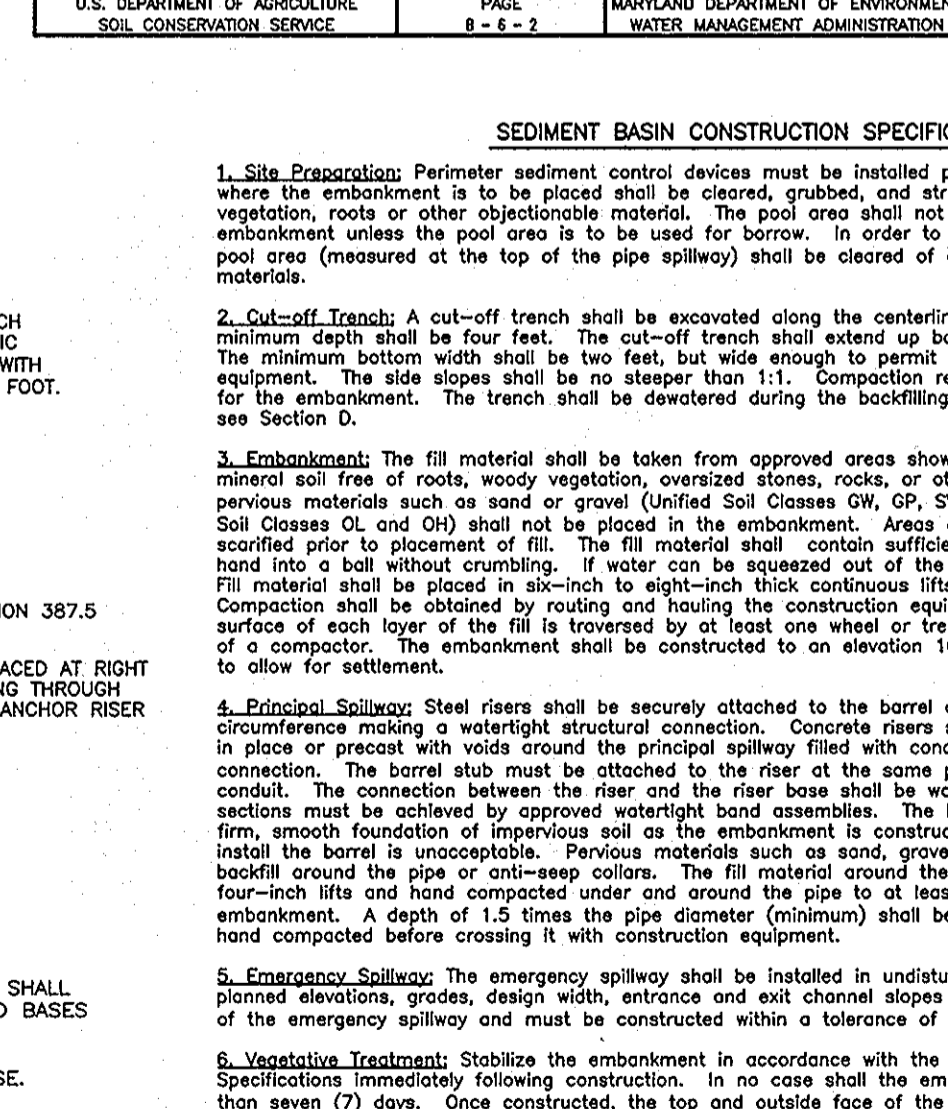
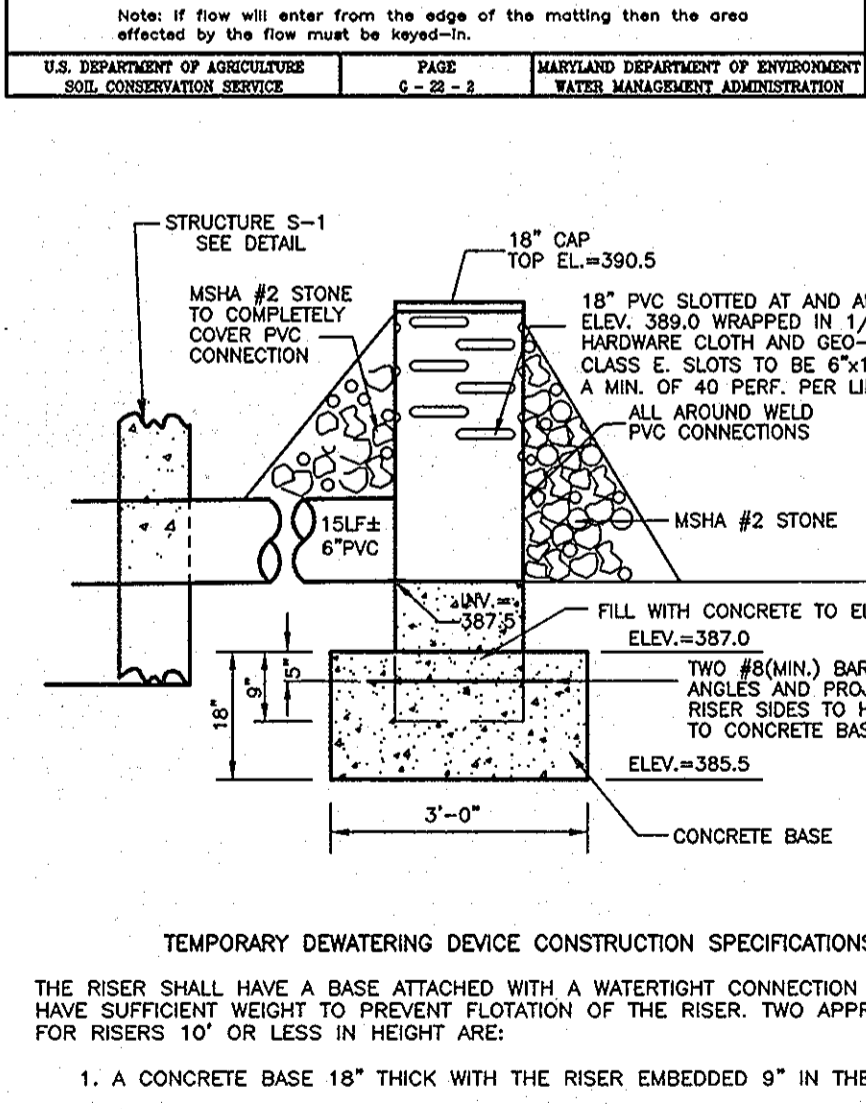
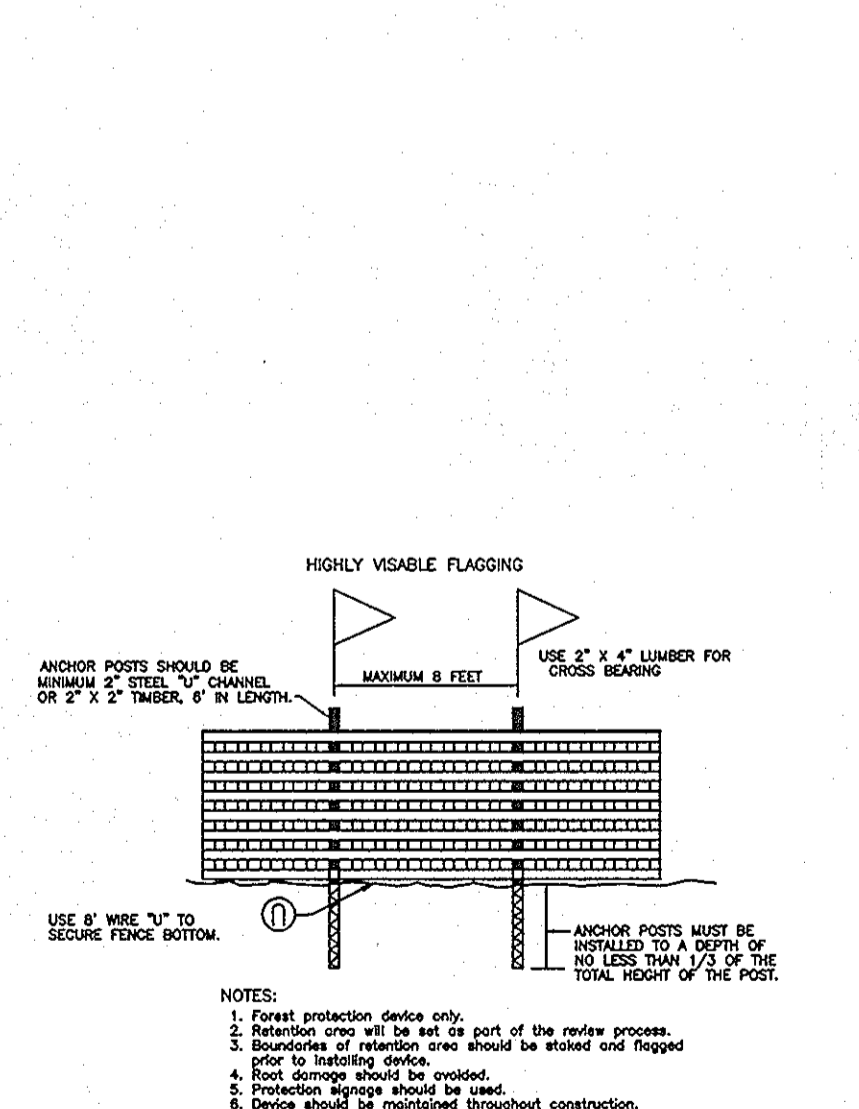
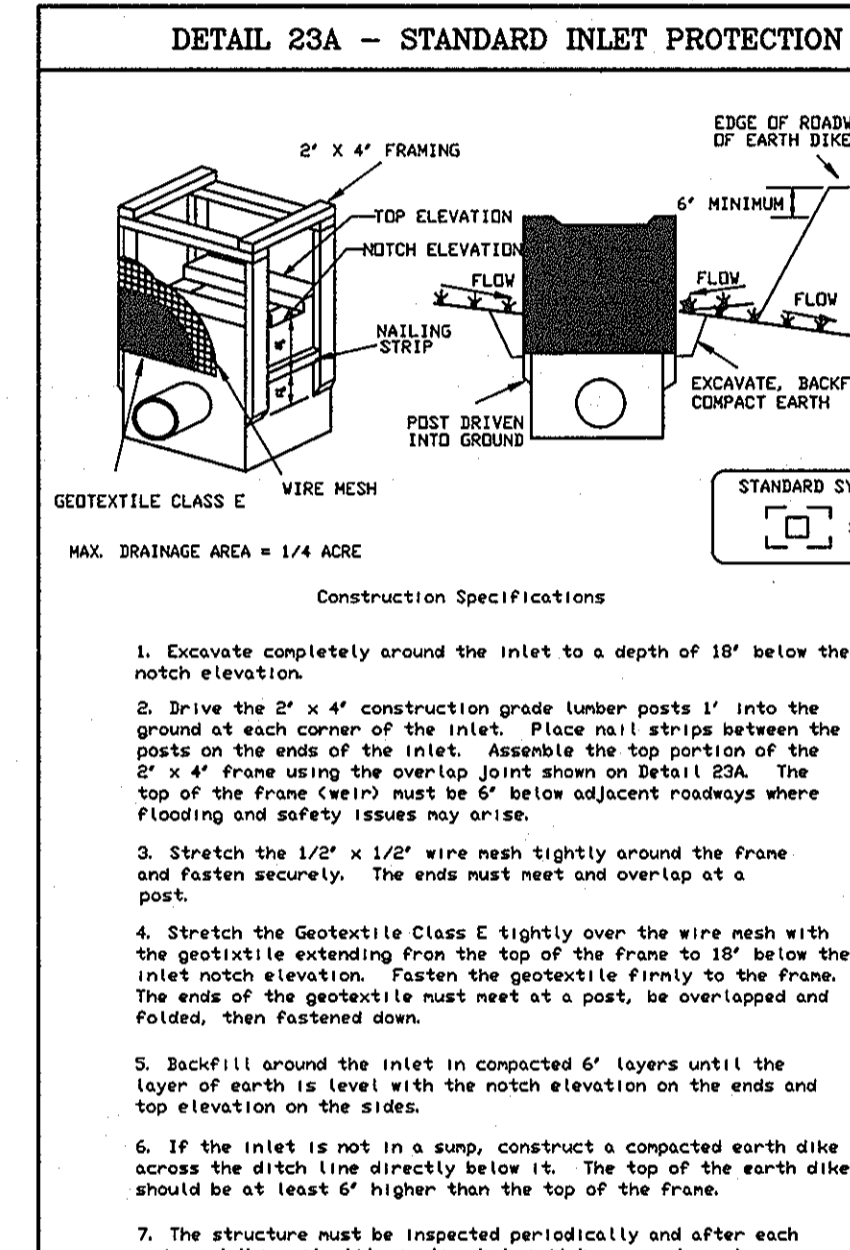
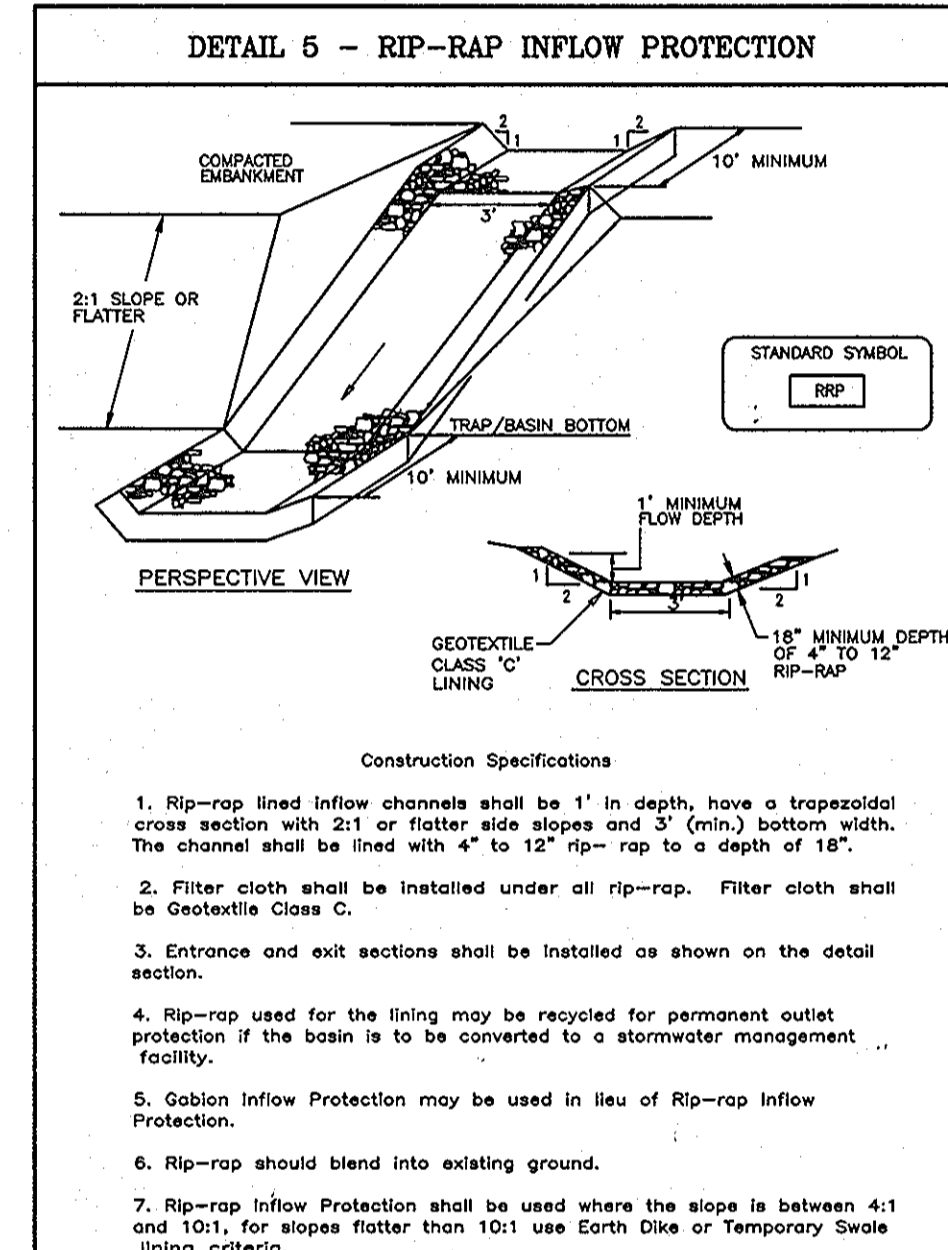
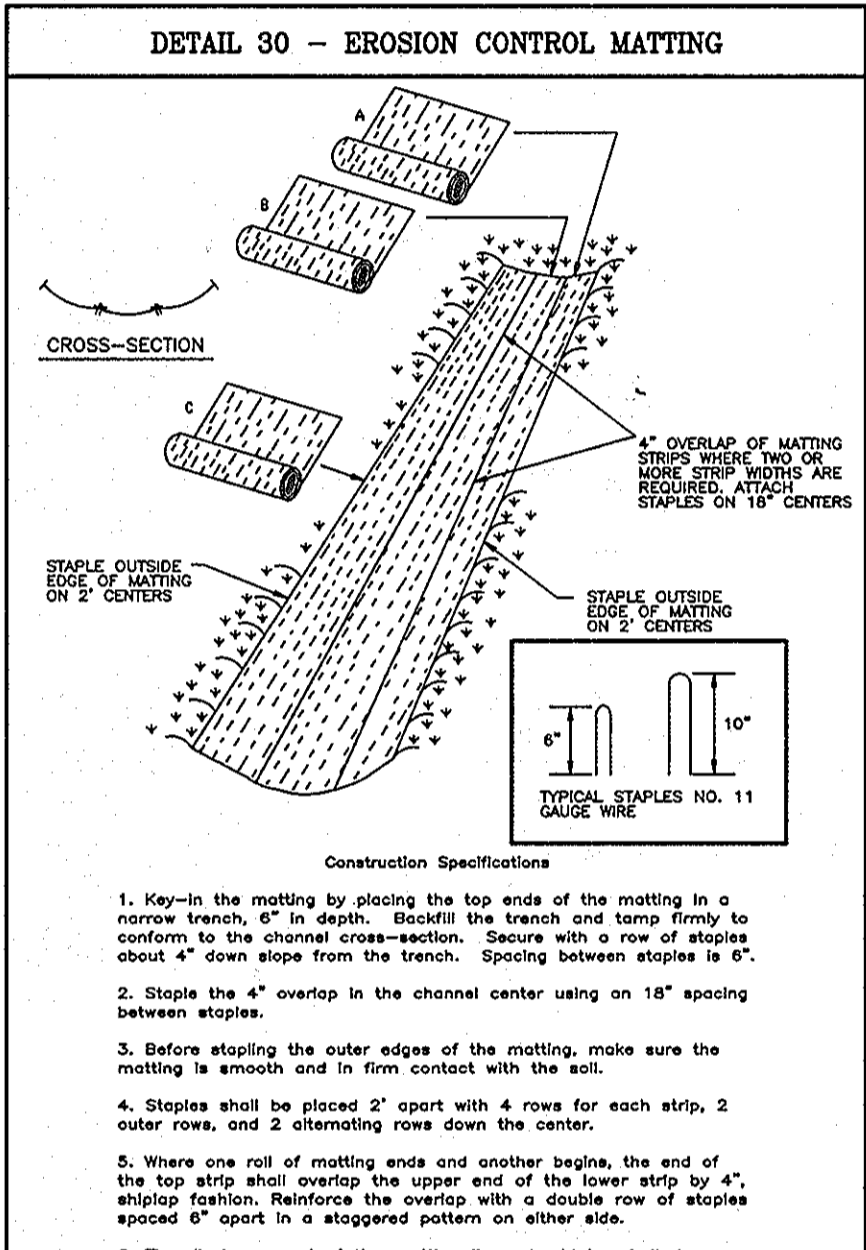
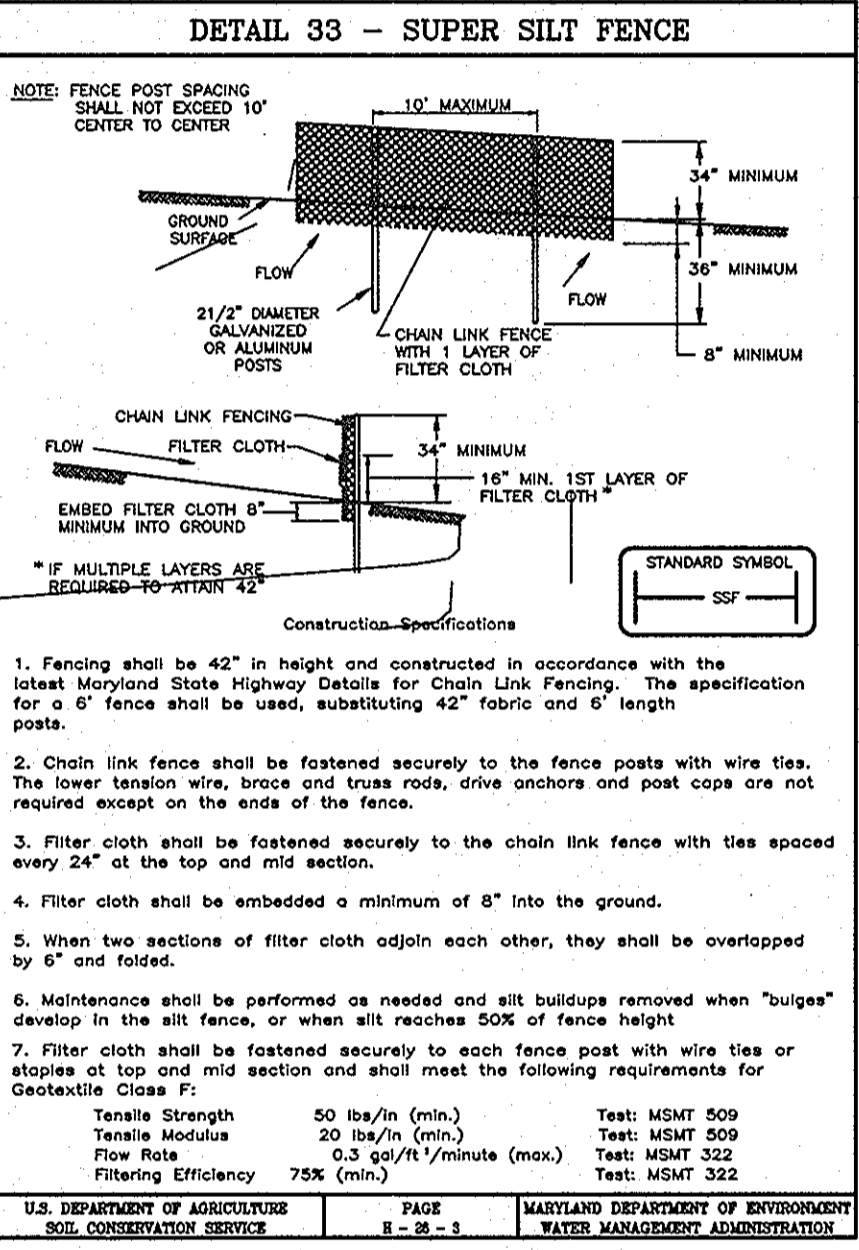
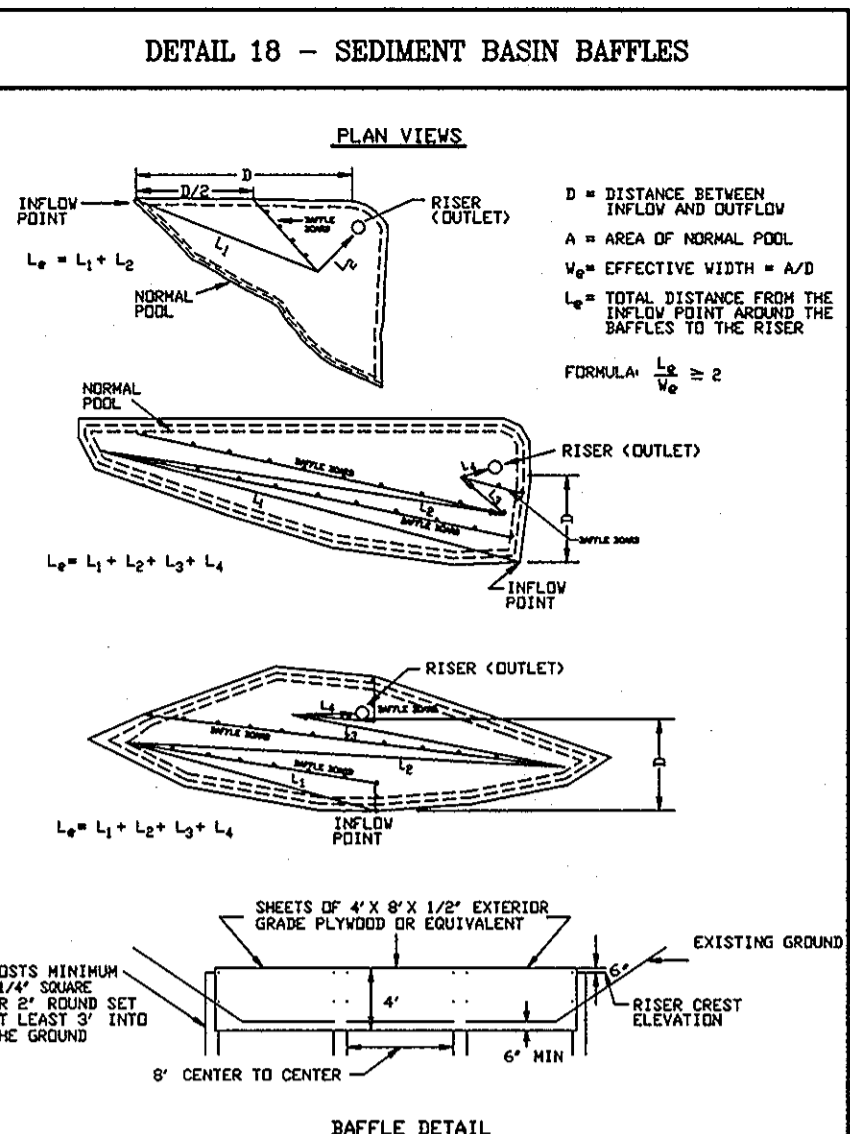
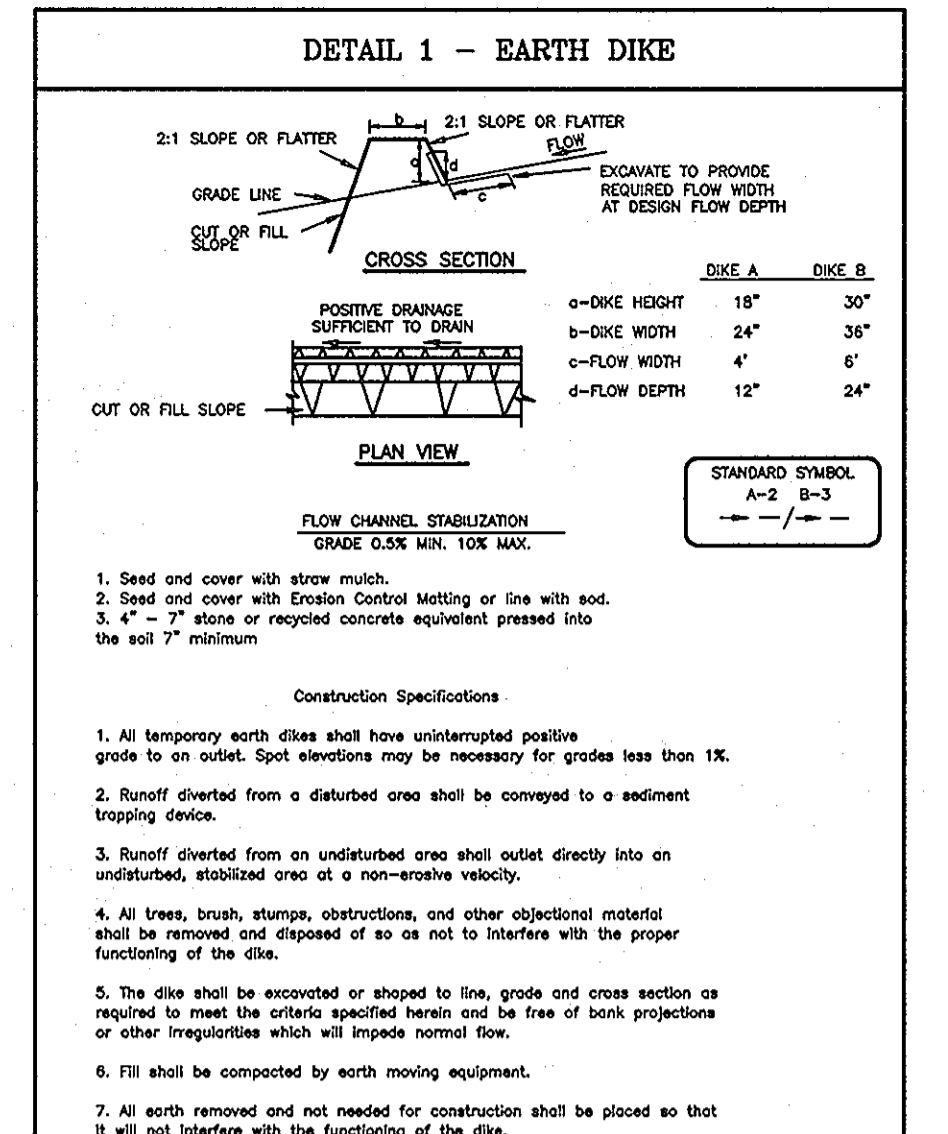
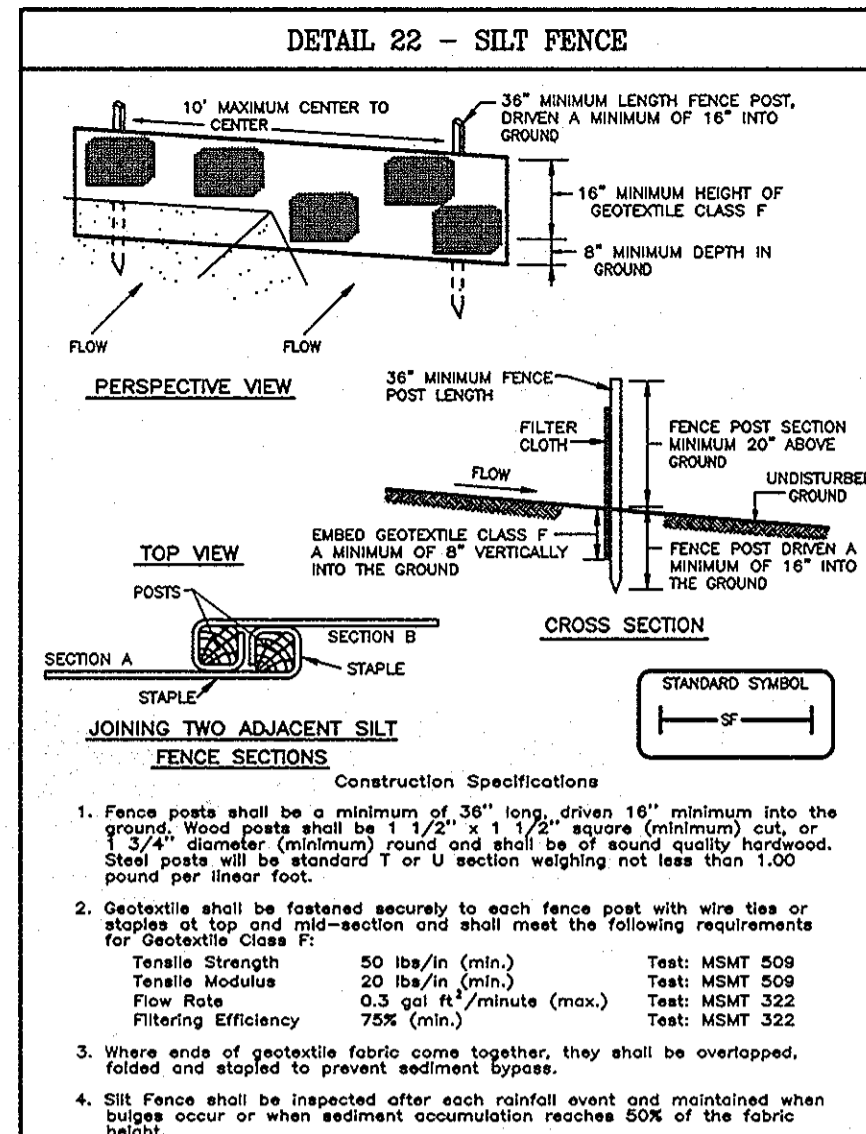
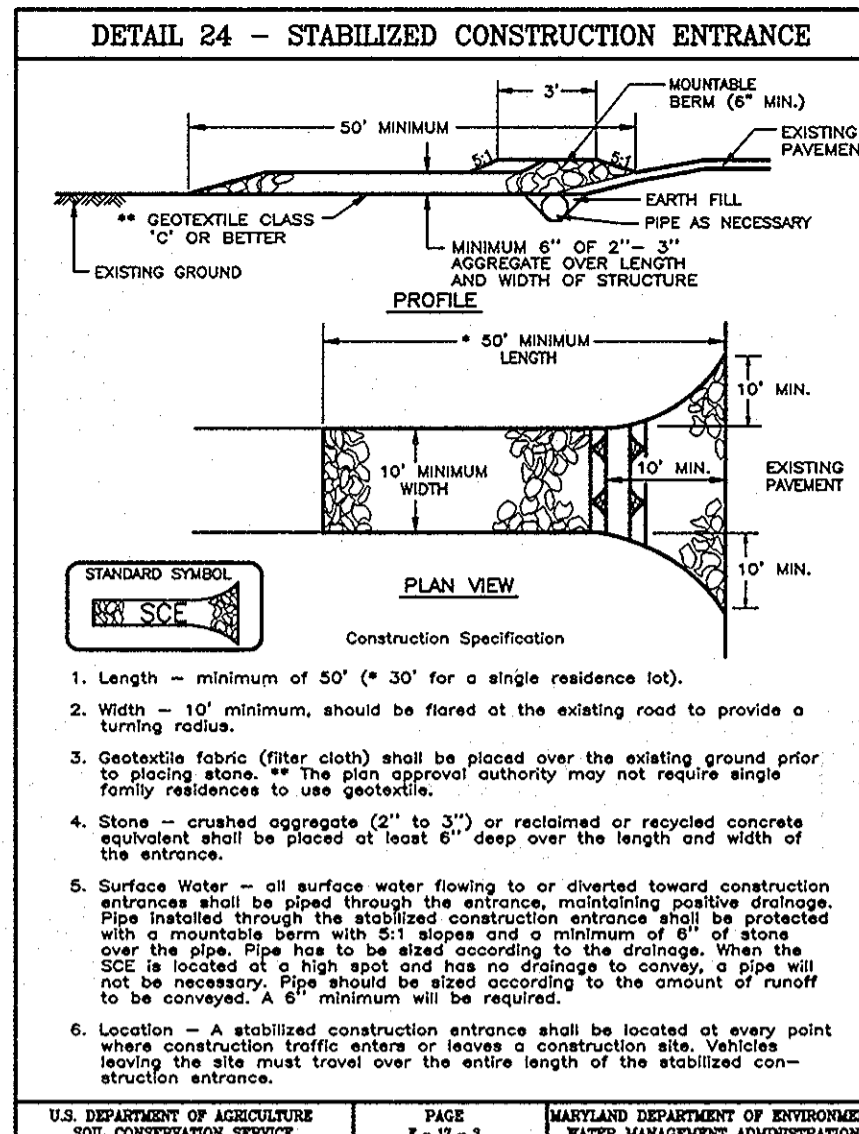
Signature of Engineer: [Signature] Date: 6-25-03



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 ENGINEERS · PLANNERS · SURVEYORS  
 7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

DESIGNED PC/AS	SEDIMENT AND EROSION CONTROL PLAN	SCALE 1"=30'
DRAWN CRH2	<b>BONNIELASS</b>	DRAWING 3 of 17
CHECKED AS	TAX MAP 31 PARCEL 254 GRID 9 ZONING R-20 FIRST (1ST) ELECTION DISTRICT HOWARD COUNTY, MARYLAND	JOB NO. 00-098
DATE 2-10-03		FILE NO. 00-098-D

F-01-208



**PERMANENT SEEDING NOTES**

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE UNDER A PERMANENT LONG-TERM VEGETATIVE COVER IS REQUIRED AT THE START OF ANY CONSTRUCTION (1313-1856).

SEEDING PREPARATION: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously loosened. Soil shall be tested and recommendations, use one of the following schedules:

- 1) Preferred - Apply 2 tons per acre dolomitic limestone (92 lbs./1000 sq.ft.) and 600 lbs. per acre (1.4 lbs./1000 sq.ft.) of Kentucky 31 Tall Fescue per acre and 2 lbs. per acre (0.5 lbs./1000 sq.ft.) of ureaform fertilizer (9 lbs./1000 sq.ft.) before seeding. Harrow or disc into upper three inches of soil.
- 2) Acceptable - Apply 2 tons per acre dolomitic limestone (92 lbs./1000 sq.ft.) and apply 1000 lbs. per acre 10-10-10 fertilizer (23 lbs./1000 sq.ft.) before seeding. Harrow or disc into upper three inches of soil.

SEEDING: For the periods March 1 thru April 30, and August 1 thru October 15, seed with 60 lbs. per acre (1.4 lbs./1000 sq.ft.) of Kentucky 31 Tall Fescue per acre and 2 lbs. per acre (0.5 lbs./1000 sq.ft.) of ureaform fertilizer (9 lbs./1000 sq.ft.) before seeding. For the period May 1 thru July 31, seed with 60 lbs. per acre (1.4 lbs./1000 sq.ft.) of Kentucky 31 Tall Fescue per acre and 2 lbs. per acre (0.5 lbs./1000 sq.ft.) of ureaform fertilizer (9 lbs./1000 sq.ft.) before seeding. For the period November 1 thru February 28, protect site by Option (1) 2 tons per acre well anchored straw mulch and seed as soon as possible in the spring. Option (2) Use sod. Option (3) Seed with 60 lbs./acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.

MULCHING: Apply 1 1/2 to 2 tons per acre (70 to 90 lbs./1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq.ft.) of emulsified asphalt on full anchored straw mulch and seed as soon as possible in the spring, or use sod.

MAINTENANCE: Inspect all seeded areas and make needed repairs, replacements and reseedings.

**TEMPORARY SEEDING NOTES**

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./1000 sq.ft.).

SEEDING: For the periods March 1 thru April 30, and August 1 thru November 15, seed with 2 1/2 bushel per acre of a limited three pipe lengths, (1.4 lbs./1000 sq.ft.) for the period May 1 thru August 14, seed with 3 tons per acre of well anchored straw mulch and seed as soon as possible in the spring, or use sod.

MULCHING: Apply 1 1/2 to 2 tons per acre (70 to 90 lbs./1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq.ft.) of emulsified asphalt on full anchored straw mulch and seed as soon as possible in the spring, or use sod.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

PHASE I:

1. Obtain grading permit. 7 days
2. Install tree protection fence. 5 days
3. Clear and grub for installation of perimeter sediment and erosion control devices within Phase I limit of disturbance, install super silt fence, silt fence, and construction entrance and stabilize. 5 days
4. Clear and grub within perimeter controls and remove structures as indicated. 5 days
5. With a dry weather forecast and super silt fence installed for construction of storm drain and outlet construct storm drain from E5-1 to M4-1. The contractor shall maintain one lane of traffic during construction of the storm drainage crossing the road. All traffic control measures shall be in accordance with MSHA standards and specifications and comply with the manual on uniform traffic control devices (MUTCD). 5 days
6. Reconstruct Bonnie Branch Road from stations 0+50 to 2+90 as shown, keeping one lane of traffic open at all times. All traffic control measures shall be in accordance with MSHA standards and specifications and comply with the manual on uniform traffic control devices (MUTCD). 7 days
7. Rough grade site as required for the installation of storm drain from M4-1 to S-1. Install clean water diversion dikes and stone pads. 15 days
8. With permission from the sediment control inspector, construct pond to ultimate conditions, and construct storm drain from M4-1 to S-1. Close off perimeter super silt fence. Block low wall (B1) to be equal with high wall (B2) and install sediment dewatering devices. Construct concrete retaining walls. 50 days
9. Stabilize grades above sand filter and install silt fence and super silt to protect sand filter. 3 days
10. Install 6" PVC, 6" perforated PVC. Install gabion weir "A" & "B", and low flow mats. 10 days
11. With permission from sediment control inspector, rough grade site as required for the installation of the driveway. 5 days
12. Install storm drain system M33, M44, M45, 11, 12, F51, & B3. Temporarily block 4" PVC outlet of 11 and F51. 25 days
13. Install base pavement and sodded side channel. Fine grade and seed and mulch disturbed area. 5 days

PHASE II:

14. With permission of the Sediment Control Inspector, clear and grub within Phase II limit of disturbance for installation of sodded channels. Remove clean water diversion dikes. 5 days
15. Excavate channel in increments which shall be stabilized with sod and erosion control matting in one day. 5 days
16. When site has thriving vegetation and with permission of the Sediment Control Inspector flush storm drain pipes and drain bottom of 11 and F51. Clean out sediment and return pond to ultimate conditions. Install surface sand filter. 15 days
17. Convert riser to ultimate conditions. Cut 6" PVC and install removable cap with 2" orifice. Install S-2 such that 6" PVC cap may be removed, install low flow channel. Remove blocking from weir #1 and install all trash racks. Install 4" PVC low flow pipes to sand filter. 5 days
18. With permission of Sediment Control Inspector, install surface course on driveway and remove all remaining sediment controls and stabilize. 3 days

**21.0 STANDARDS AND SPECIFICATIONS FOR TOPSOIL**

**Definition**

Placement of Topsoil over a prepared subsoil prior to establishment of permanent vegetation.

**Purpose**

To provide a suitable soil medium for vegetable growth. Soils of concern have low moisture content, different levels, low pH, materials toxic to plants, and/or unacceptably low soil organic matter.

**Conditions Where Practice Applies**

1. This practice is limited to areas having 2:1 or flatter slopes where:
  - a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
  - b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish sufficient supply of moisture and plant nutrients.
  - c. The original soil to be vegetated contains material toxic to plant growth.
  - d. The soil is so acidic that treatment with limestone is not feasible.
2. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require 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**

1. 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 can be found in the respective soil conservation plan section in the Soil Survey published by USDA-SSCS in cooperation with Maryland Agricultural Experiment Station.
2. Topsoil Specifications - Soil to be used as topsoil must meet the following:
  - a. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy 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 contain less than 5% by volume of cinders, stones, slag, coarse fragments, roots, trash, or other materials larger than 1 1/2" in diameter.
  - b. Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, johnsongrass, nutsedge, poison ivy, thistle, or others as specified.
  - c. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-6 one/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.
  - d. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seeded preparation.
3. Topsoil shall be uniformly distributed in a 4"-8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that seeding or sodding can proceed with a minimum of additional soil preparation. Any irregularities in the surface resulting from topsoil spreading shall be corrected in order to prevent the formation of depressions or water pockets.
4. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seeded preparation.

**OWNER / DEVELOPER**

BONNIELASS LLC  
8835-P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045

APPROVED: DEPARTMENT OF PUBLIC WORKS  
N/A  
DATE: 8/15/03

APPROVED: DEPARTMENT OF PLANNING & DEVELOPMENT  
DATE: 8/15/03

**TEMPORARY DEWATERING DEVICE**

NOT TO SCALE

16" PVC RISER WITH CONCRETE BASE HAS BEEN SHOWN. THE CONTRACTOR MAY PROVIDE AN EQUIVALENT COPPER RISER WITH STEEL PLATE PROVIDING A WATER TIGHT COUPLING IS INSTALLED WHEN CONNECTING RISER TO 6" PVC OUTFALL.

**SEDIMENT BASIN CONSTRUCTION SPECIFICATIONS**

1. Site Preparation: Perimeter sediment control devices must be installed prior to clearing and grubbing. Areas where the embankment is to be placed shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation and other objectionable material. The pool area must be cleared of all brush, trees and other objectionable material.

2. Cut-off Trench: A cut-off trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be four feet. The cut-off trench shall extend up both abutments to the riser crest elevation. The maximum depth shall be two feet, but wide enough to permit operation of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for the embankment. The trench shall be dewatered during the backfilling-compaction operations. For dewatering see Section D.

3. Embankment: The fill material shall be taken from approved areas shown on the plans. It shall be clean mineral soil free of roots, woody vegetation, oversized stones, rocks, or other objectionable material. Relatively pervious materials such as sand or gravel (Unified Soil Classes G1, G2, SW & SP) or organic material (Unified Soil Classes OL and OH) shall not be placed in the embankment. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in six-inch to eight-inch thick continuous lifts over the entire length of the fill. Compaction shall be obtained by rolling and tamping the construction equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel or tread track of the equipment or by the use of a compactor. The embankment shall be constructed to an elevation 10 percent higher than the design height to allow for settlement.

4. Principal Spillway: Steel risers shall be securely attached to the barrel or barrel stub by welding the full circumference making a watertight structural connection. Concrete risers shall be poured with the principal spillway in place or placed with voids around the principal spillway filled with concrete or thick grout for watertight connection. The barrel stub must be attached to the riser of the same percent (angle) of grade as the outlet conduit. The connection between the riser and the barrel stub must be watertight. All connections between barrel sections must be achieved by approved watertight barrel assemblies. The barrel and riser shall be placed on a firm, smooth foundation of impervious soil as the embankment is constructed. Breaching the embankment to install the barrel is unacceptable. Pervious materials such as sand, gravel, or crushed stone shall not be used as backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be placed in four-inch lifts and compacted around the pipe and extend the same density as the adjacent embankment. A depth of 1.5 times the pipe diameter (minimum) shall be backfilled over the principal spillway and hand compacted before crossing it with construction equipment.

5. Emergency Spillway: The emergency spillway shall be installed in undisturbed ground. The achievement of planned elevations, grades, design and exit channel slopes are critical to the successful operation of the emergency spillway and must be constructed within a tolerance of +/- 0.2 feet.

6. Vegetative Treatment: Stabilize the embankment in accordance with the appropriate vegetative Standard and Specifications immediately following construction. In no case shall the embankment be stabilized for more than seven (7) days. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon basin completion and monitored over an undisturbed erosion free during the life of the basin.

7. Safety: Local requirements concerning fencing and signs shall be met, warning the public of hazards of soft sediment and floodwater.

8. Maintenance: Repair all damage caused by soil erosion and construction equipment at or before the end of each working day. Sediment shall be removed from the basin when it reaches the specified distance below the top of the embankment. The pool area shall be shown on the plans and the embankment shall be maintained to the top of the embankment. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain. Dispose of excess material.

9. Final Disposal: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site after other site disposal of the basin and sediment control structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with approved stormwater management design plans. Additional grading may also be necessary to provide the required minimum free board in the basin. Conversion can only take place after all disturbed areas have been permanently stabilized to the satisfaction of the inspection authority and storm drains have been flushed.

10. Conversion to Stormwater Management Structure: After permanent stabilization of all disturbed contributing drainage areas, temporary sediment basins, if initially built and certified to meet permanent standards, may be converted to permanent stormwater structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with approved stormwater management design plans. Additional grading may also be necessary to provide the required minimum free board in the basin. Conversion can only take place after all disturbed areas have been permanently stabilized to the satisfaction of the inspection authority and storm drains have been flushed.

**DEVELOPER'S/BUILDER'S CERTIFICATE**

"I/We certify that all development and construction will be done according to this plan of development and 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 or their authorized agents, as we deemed necessary."

NAME: [Signature] DATE: 7-1-03

**ENGINEER'S CERTIFICATE**

I hereby 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 Soil Conservation District.

G. NELSON CLARK  
DATE: 6-30-03

**CLARK • FINEFROCK & SACKETT, INC.**  
ENGINEERS • PLANNERS • SURVEYS

7135 MINSTREL WAY • COLUMBIA, MD 21045 • (410) 381-7500 BALT. • (301) 621-8100 WASH.

DESIGNED: PC/AS  
DRAWN: ZAH/CRH2  
CHECKED: AS  
DATE: 2-10-03

SCALE: 4 of 17  
JOB NO: 00-098  
FILE NO: 00-098-D

SEDIMENT AND EROSION CONTROL DETAILS

BONNIELASS  
TAX MAP 31 PARCEL 254  
GRID 9 ZONING R-20  
FIRST (1ST) ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

#6 D:\DRAWINGS\00098-BONNIELASS\1ST-RE-SUB\504-SEC-DETS.DWG

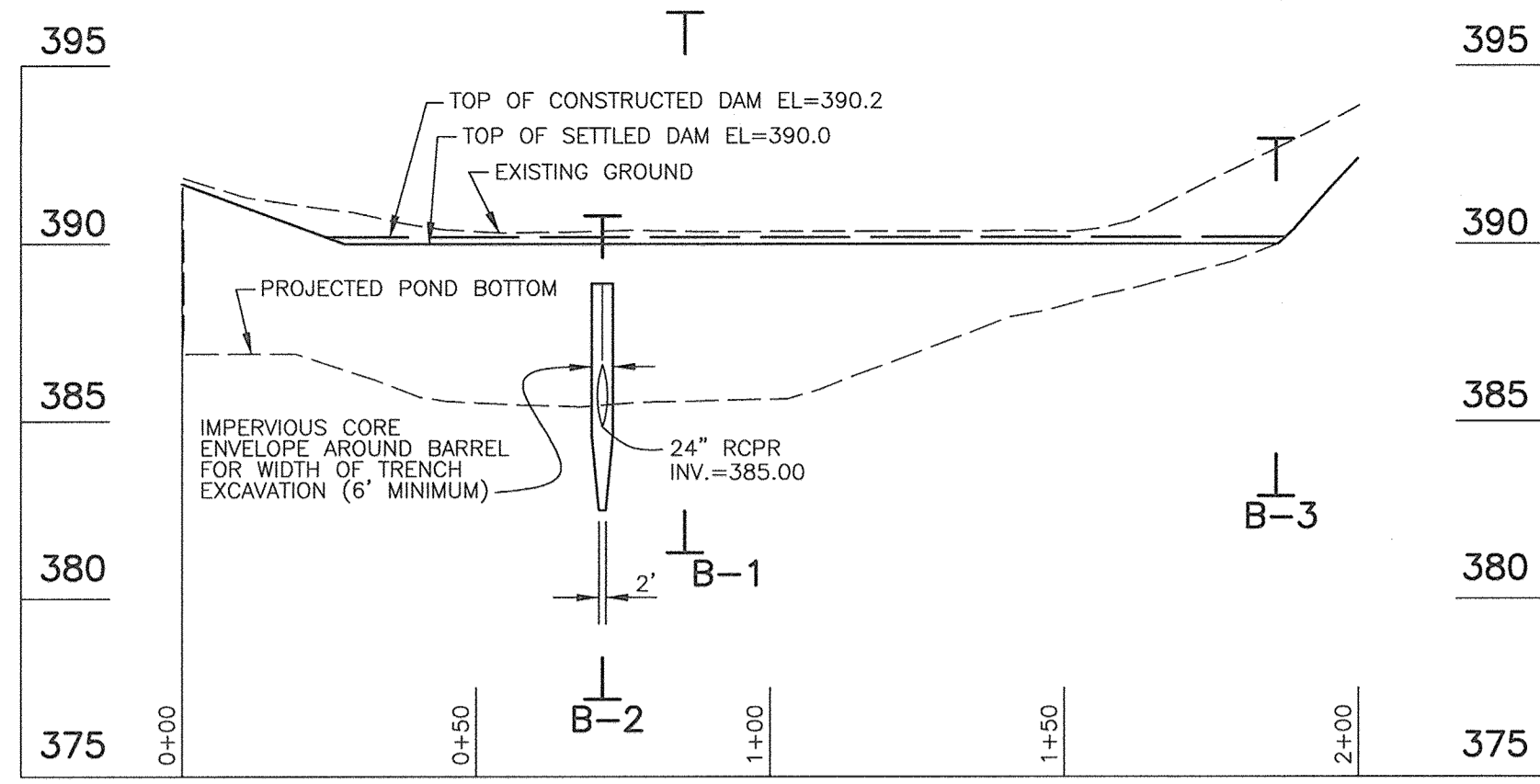
**HOWARD SOIL CONSERVATION DISTRICT**

Reviewed for HOWARD S.C.D. and meets Technical Requirements  
Signature: [Signature] Date: 7/1/03  
U.S. Natural Resources Conservation Service

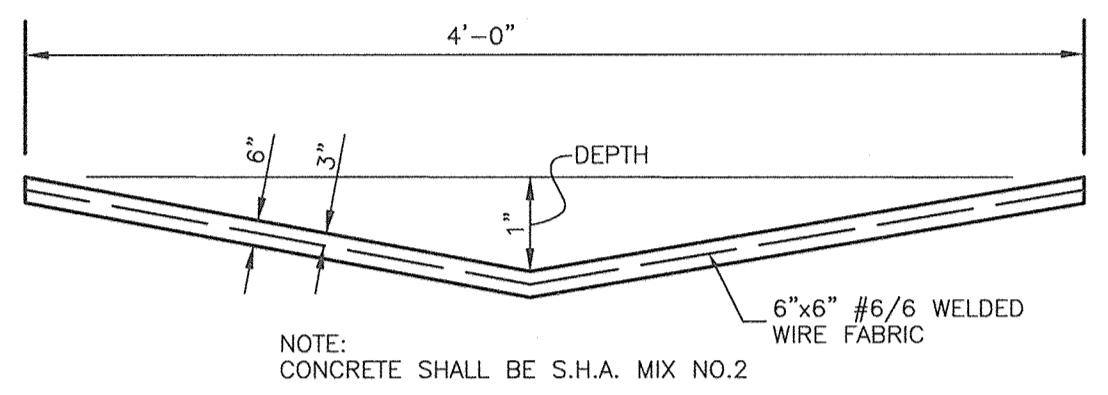
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

Signature: [Signature] Date: 7/1/03  
HOWARD S.C.D.





**CENTERLINE OF EMBANKMENT PROFILE POND**  
SCALE: HOR. 1"=30'  
VER. 1"=5'



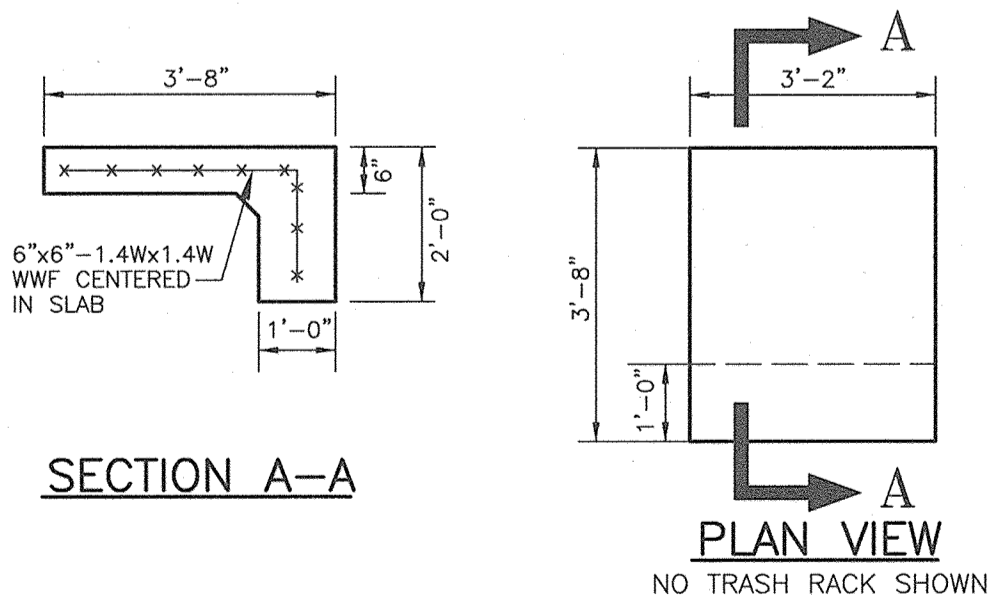
**LOW FLOW CHANNEL**  
NO SCALE

SWM POND DESIGN SUMMARY					
DESIGN STORM	ALLOWABLE * RELEASE RATE	FACILITY IN FLOW	FACILITY DISCHARGE	WATER SURFACE ELEVATION	STORAGE VOLUME (AC. FT.)
1 YEAR	1.9 CFS	4.8 CFS	0.1 CFS	387.14 FT.	0.20 ac-ft
10 YEAR	10.6 CFS	16.2 CFS	6.7 CFS	388.12 FT.	0.40 ac-ft
100 YEAR	20.1 CFS	27.0 CFS	20.9 CFS	388.64 FT.	0.52 ac-ft

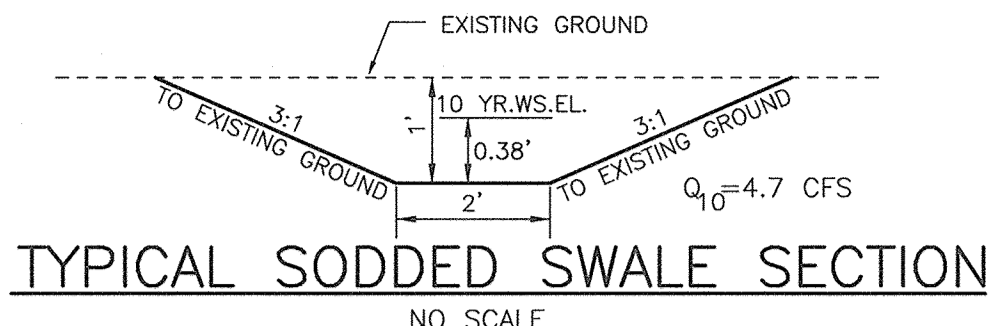
HAZARD CLASSIFICATION: A  
STORAGE - HEIGHT PRODUCT (392.0-387.5)(0.58)=2.6 ac-ft  
WATERSHED AREA TO FACILITY (ACRES): 4.08 AC  
LEVEL OF MANAGEMENT PROVIDED BY FACILITY: QUALITY MANAGEMENT TO TREAT 90% OF RUNOFF  
QUALITY MANAGEMENT: SURFACE SAND FILTER

\* Allowable based on TR-55 (TR-20 analysis of pre-development condition of observed drainage to pond.)

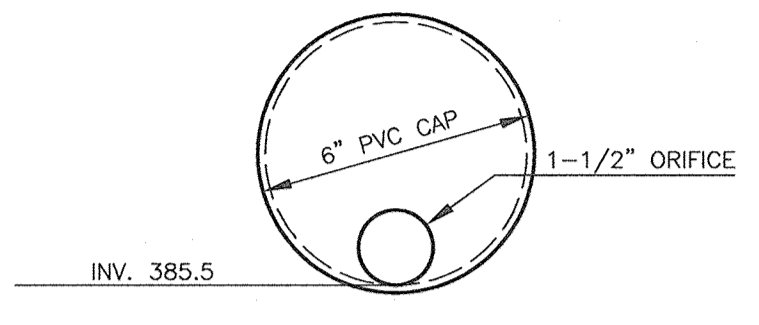
GENERAL SWM POND STORAGE REQUIREMENTS			
STEP	REQUIREMENT	VOLUME REQUIRED	NOTES
1	Water Quality Volume (WQv)	0.078 ac-ft	Provided by surface sand filter (0.097 ac-ft)
2	Recharge Volume (Rev)	0.017 ac-ft	Treated non-structurally via grass channels
3	Channel Protection Volume (Cpv)	0.14 ac-ft	Cpv release rate is 0.1 CFS WSEL=387.14
4	Overbank Flood Protection Volume (Opv)	13.8 CFS	10-year Protection Volume (Opv)
5	Extreme Flood volume (Q1)	N/A	safe passage for the 100 year event provided.



**S-2 LOW FLOW TRASH RACK BASE**  
NO SCALE



**TYPICAL SODDED SWALE SECTION**  
NO SCALE



**REMOVABLE 6\"/>**

**HOME OWNERS' ASSOCIATION MAINTENANCE SCHEDULE FOR SWM FACILITY**

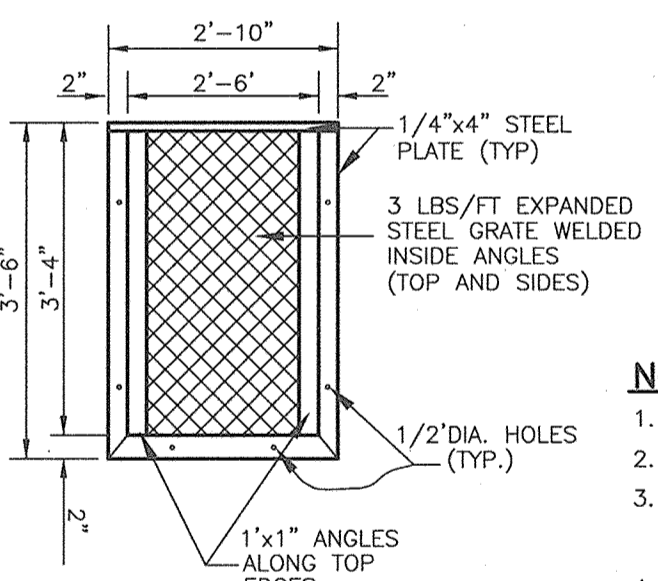
- FACILITY IS TO BE INSPECTED ONCE A MONTH AND EXCESSIVE GROWTH CUT OR MOVED AS REQUIRED. NO GROWTH ABOVE 18\"/>
- POND SLOPES, TOP & BENCH ARE TO BE MOWED ONCE EVERY MONTH DURING GROWN SEASON.
- TRASH TO BE REMOVED AFTER EACH MAJOR STORM OR EVERY MONTH, AND DURING REGULAR MOWING OPERATIONS.
- AN ANNUAL INSPECTION OF THE POND IS TO BE DONE.
- REMOVE SEDIMENT WHEN DEPTH EXCEEDS 2\"/>
- CORRECTIVE MAINTENANCE IS TO BE DONE AS NEEDED IF THE POND IS FOUND TO BE UNFUNCTIONAL. WATER DOES NOT DRAIN WITHIN 60 HOURS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
- VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIP-RAP OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

**OPERATION, MAINTENANCE & INSPECTION**

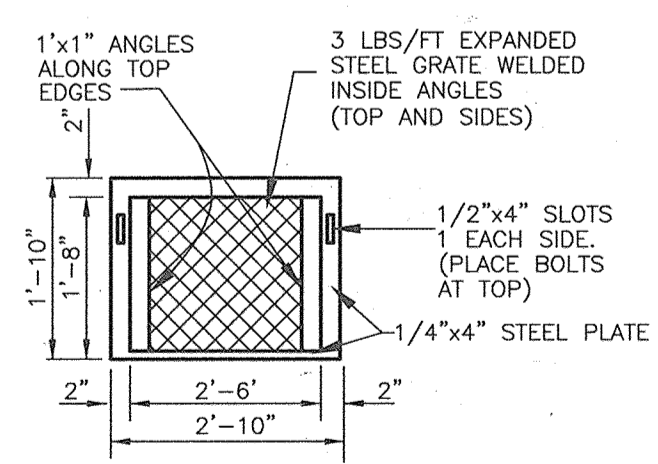
INSPECTION OF THE POND SHOWN SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENT CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATION FOR PONDS" (MD-378). THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING. IT SHOULD BE NOTED THAT THIS STRUCTURE DOES NOT MEET THE DEFINITION OF A MD-378 POND, HOWEVER THIS DOES NOT EXEMPT THE OWNER FROM FOLLOWING THE ABOVE REFERENCED MAINTENANCE INSPECTION.

**NON-ROUTINE MAINTENANCE**

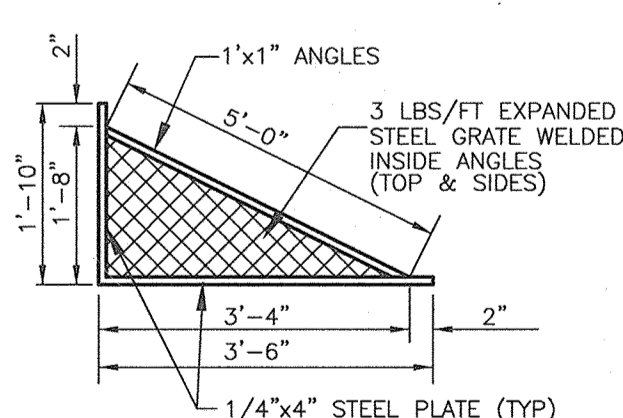
- STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
- SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE. INTERFERS 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.



**TOP VIEW**



**FRONT VIEW**

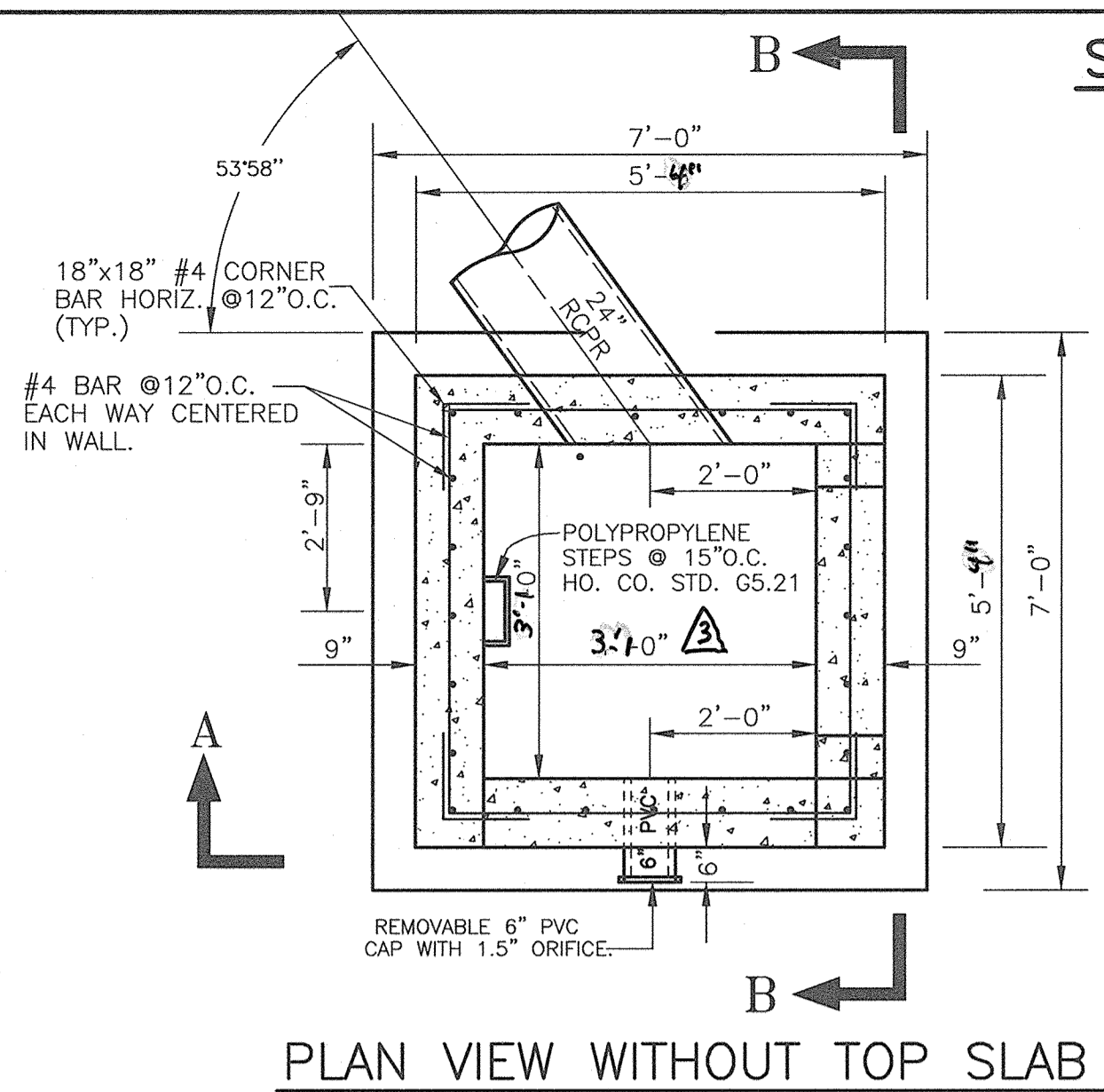


**SIDE VIEW**

**LOW FLOW TRASH RACK**  
NO SCALE

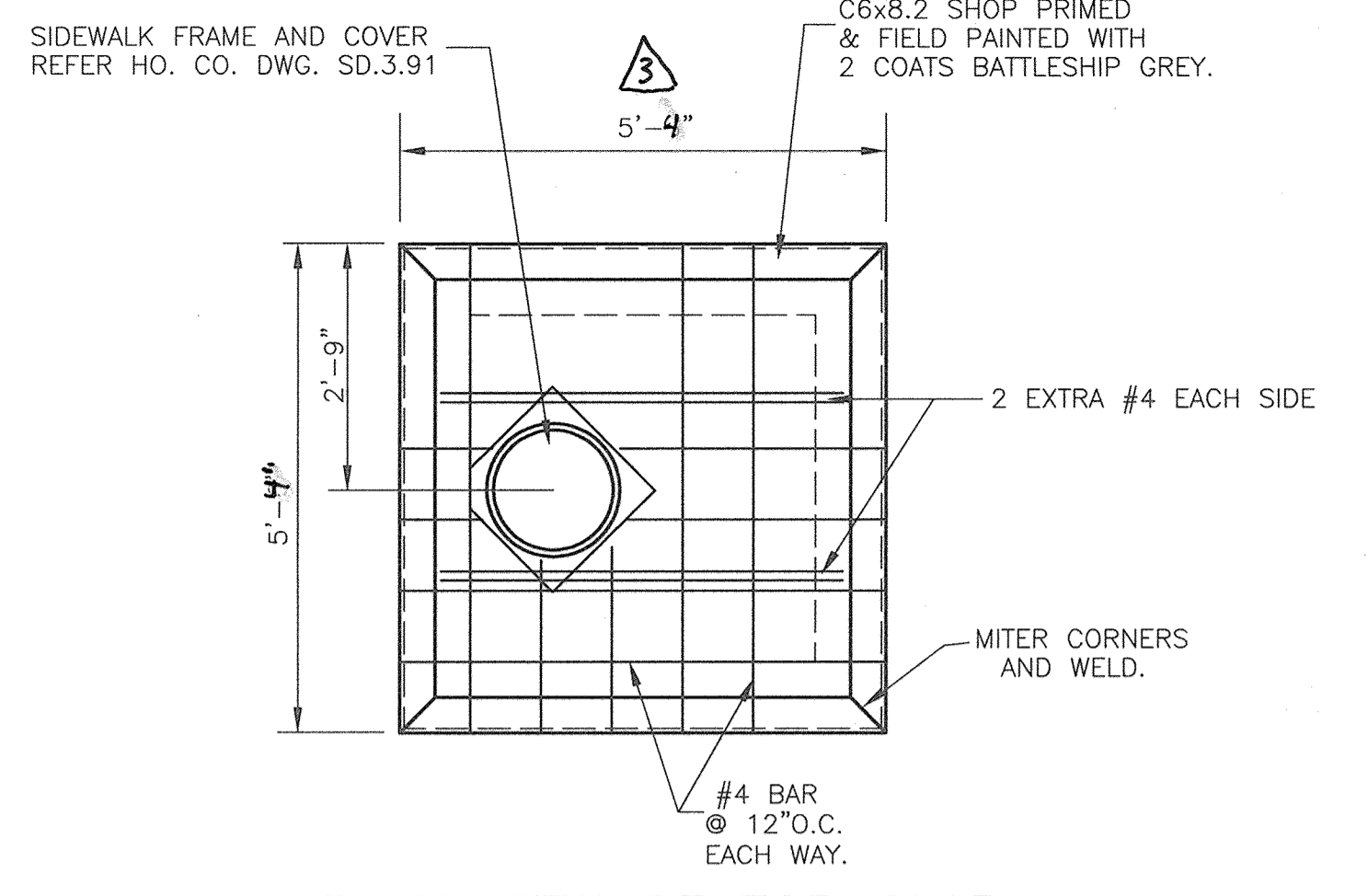
**NOTES FOR TRASH RACK**

- TRASH RACK TO BE CENTERED OVER OPENING.
- STEEL TO CONFORM TO ASTM-A36.
- ALL SURFACES TO BE COATED WITH ZRC COLD GALVANIZING COMPOUND AFTER WELDING AND PAINTED WITH 2 COATS OF BATTLESHIP GREY.
- TRASH RACK TO BE FASTENED TO THE WALL AND BASE WITH 1/2\"/>



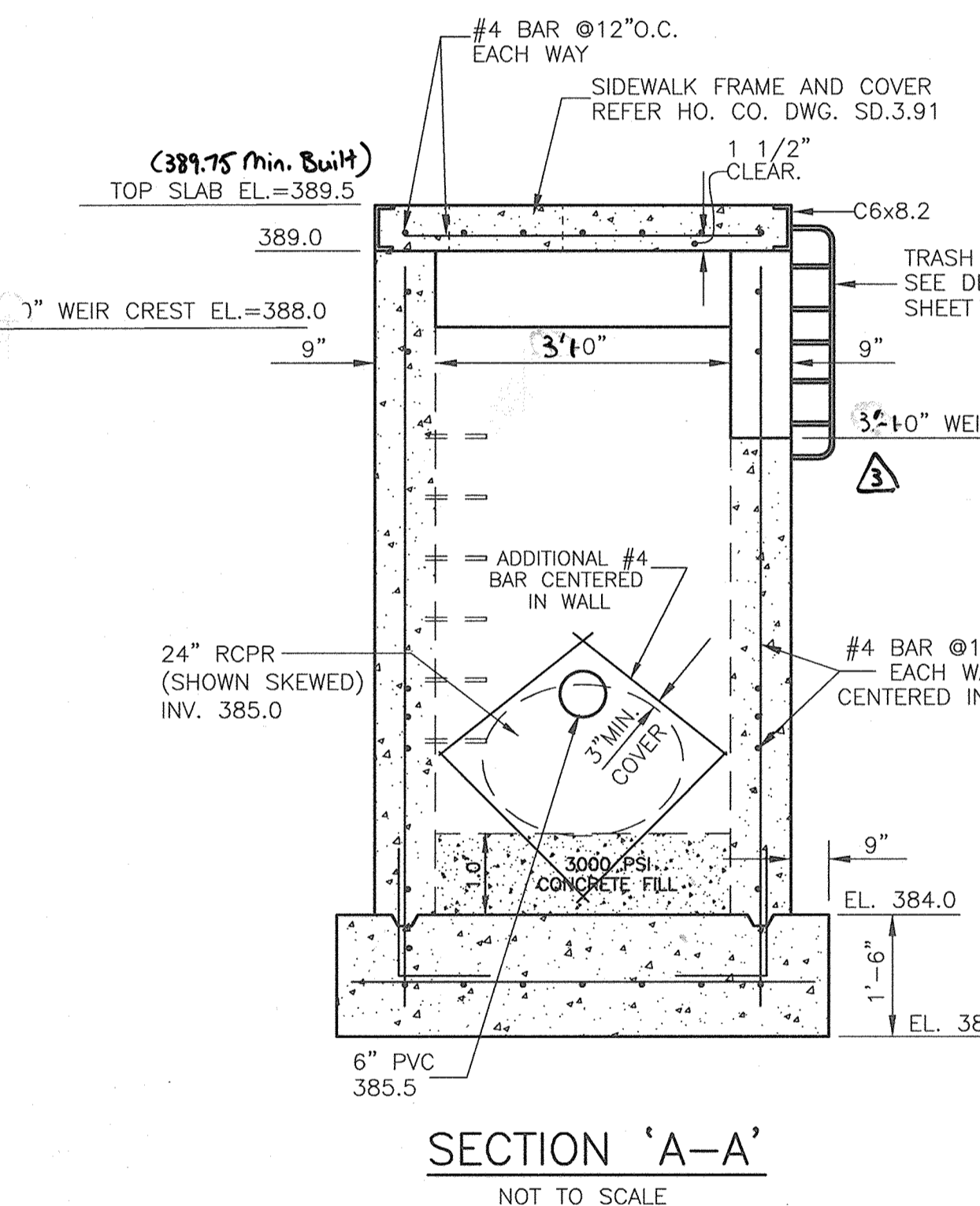
**PLAN VIEW WITHOUT TOP SLAB**  
NOT TO SCALE  
(TRASH RACKS NOT SHOWN FOR CLARITY)

**S-1 RISER DETAIL**

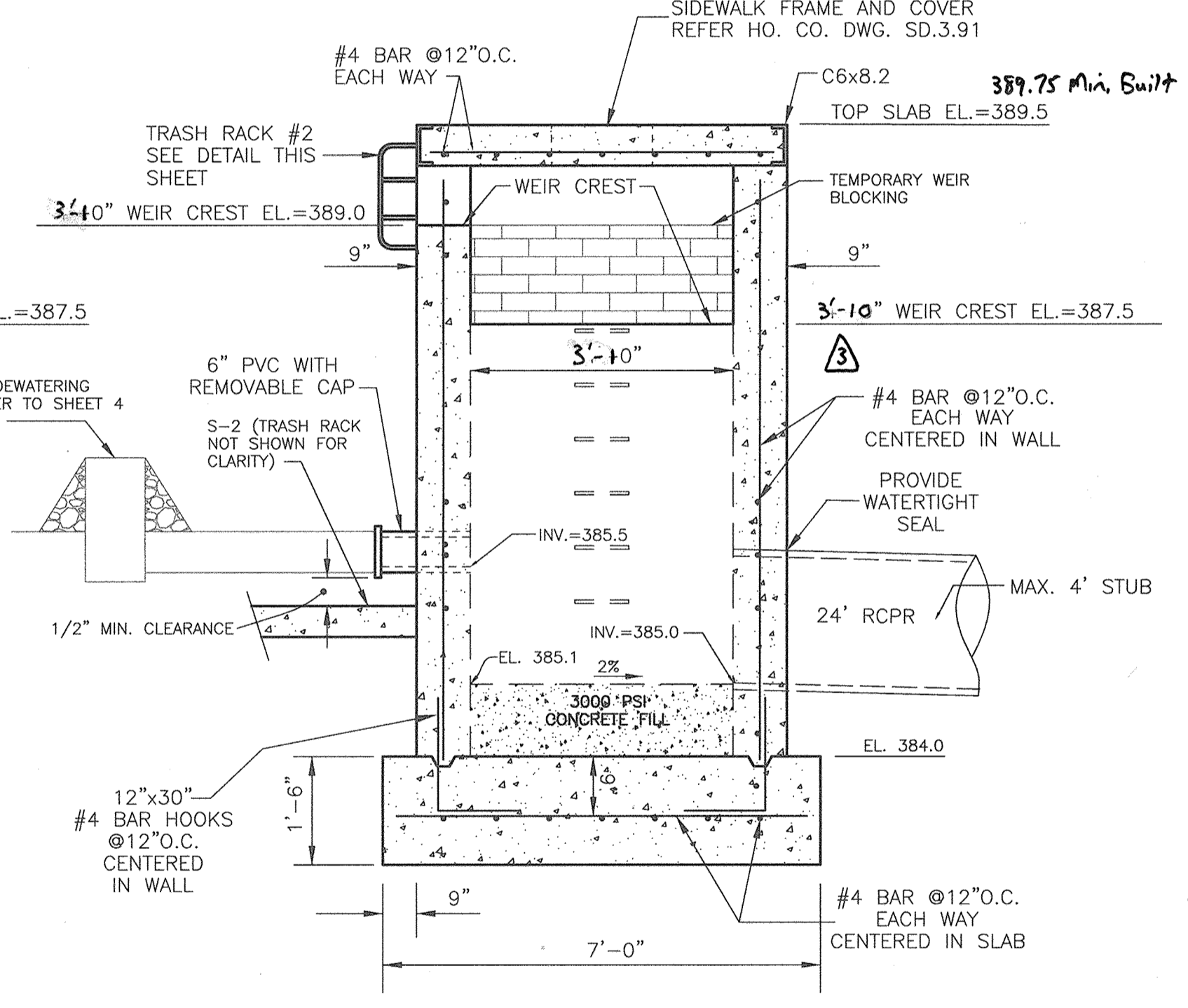


**PLAN VIEW OF TOP SLAB**  
NOT TO SCALE

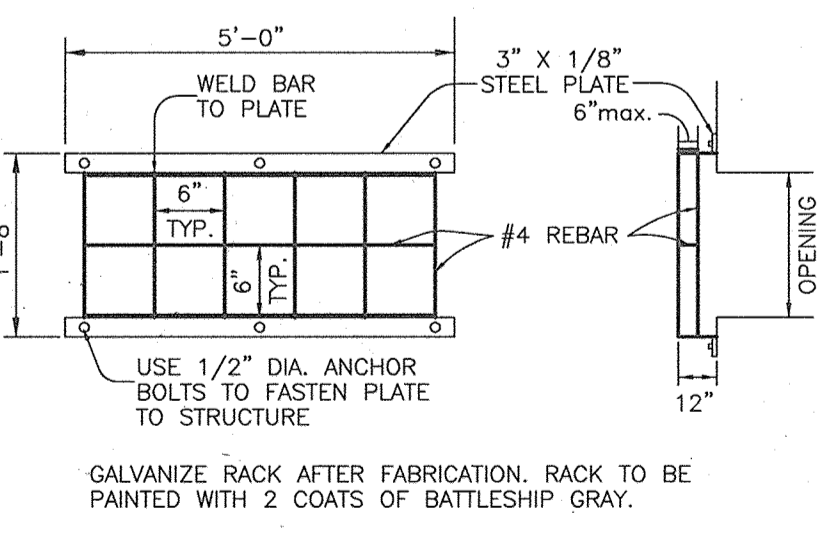
- NOTE:
- ALL WORK SHALL BE SUPERVISED BY A QUALIFIED GEOTECHNICAL ENGINEER.
  - ALL CONCRETE TO BE 3500 PSI @ 28 WITH AIR ENTRAINMENT.
  - ALL REINFORCING STEEL SHALL BE ASTM 615 GRADE 60.
  - STRUCTURE MAYBE PRECAST. SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED BY ENGINEER PRIOR TO FABRICATION.
  - RISER SHALL BE PLACED ON APPROVED SUBGRADE. NO STONE IS PERMITTED UNDER RISER.
  - ANY OVER EXCAVATION SHALL BE A MINIMUM OF 4\"/>



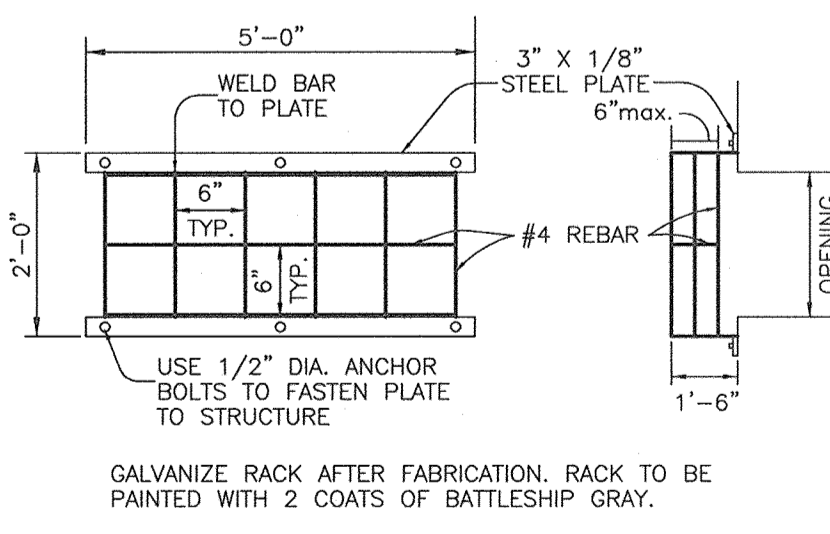
**SECTION 'A-A'**  
NOT TO SCALE



**SECTION 'B-B'**  
NOT TO SCALE

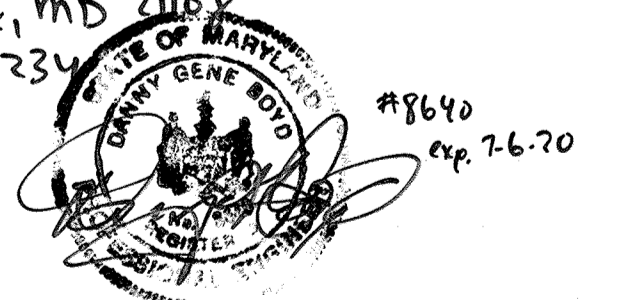


**TRASH RACK #2 DETAIL**  
NO SCALE



**TRASH RACK #1 DETAIL**  
NO SCALE

For Revision #3 by Boyd + Dowgiallo, P.A. (BMDPA)  
412 Headquarters Drive, Ste. 5  
Millersville, MD 21108  
410-729-1231



APPROVED: DEPARTMENT OF PUBLIC WORKS  
N/A  
DATE

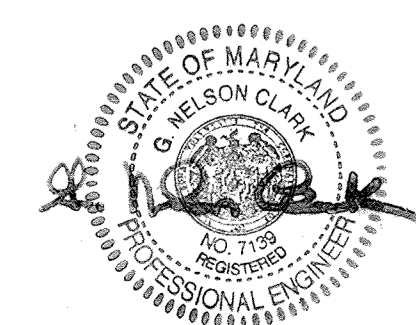
APPROVED: DEPARTMENT OF PLANNING & ZONING  
5/15/03  
DATE

Reviewed for HOWARD S.C.D.  
and meets Technical Requirements  
Signature: [Signature] Date: 7/31/03  
S. Natural Resources Conservation Service

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
Signature: [Signature] Date: 7/31/03  
HOWARD S.C.D.

By The Developer:  
"I/We certify that all development and/or construction will be done according to these plans, 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 shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion." I also authorize periodic on-site inspections by the Howard Soil Conservation District."  
Signature: [Signature] Date: 7.1.03

By the Engineer:  
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."  
Signature: [Signature] Date: 6-25-03

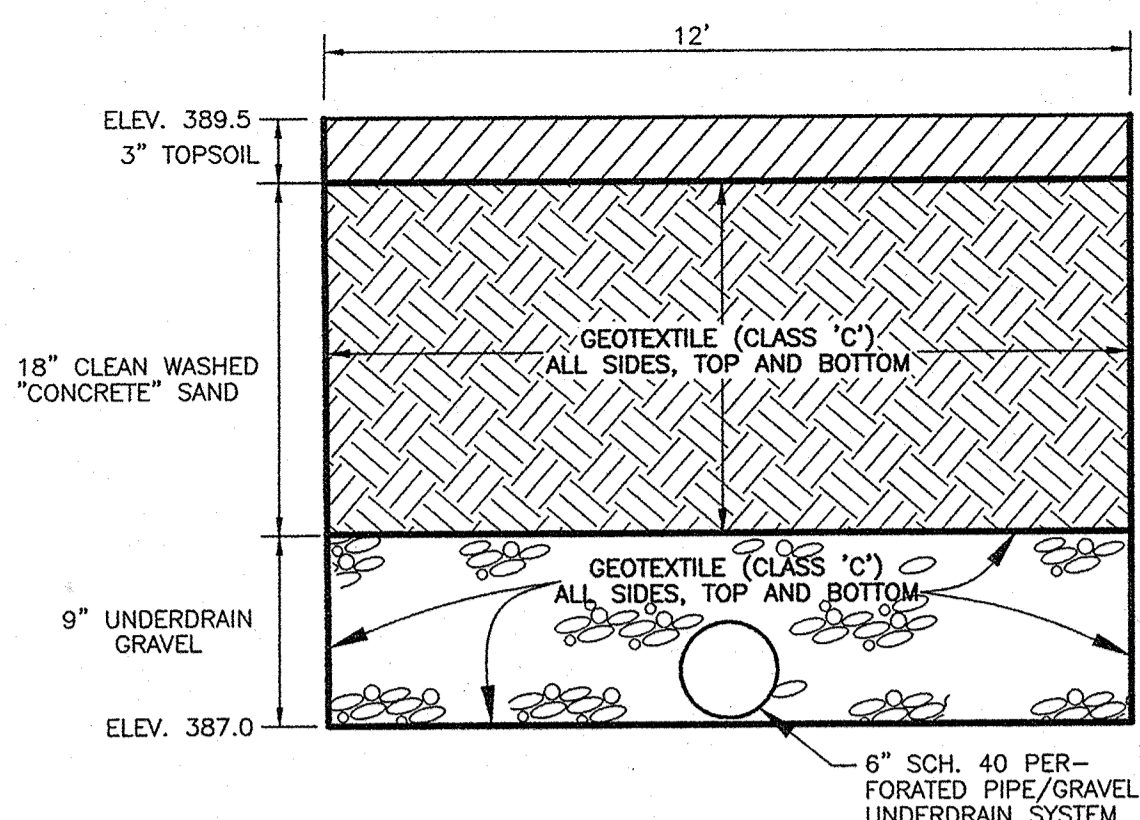


3	Rev. to show pond + sand filter as built. (By BMDPA)	10-2-13
1	REV. SHEET NUMBER 6 OF 15 TO 16 OF 17	4-1-05
N/A	REVISION	DATE

**CLARK · FINEFROCK & SACKETT, INC.**  
ENGINEERS · PLANNERS · SURVEYORS  
7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

DESIGNED PC/AS	SCALE AS SHOWN
DRAWN ZAH/CRH2	DRAWING 6 OF 17
CHECKED AS	JOB NO. 000-98
DATE 2-10-03	FILE NO. 00-098-D

STORMWATER MANAGEMENT POND DETAILS  
**STRUCTURE S-1**  
**BONNIELASS**  
TAX MAP 31 PARCEL 254  
GRID 9 ZONING R-20  
FIRST (1ST) ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND



NOTE: SURFACE AREA SHALL MATCH THE PLAN VIEW. (30'x12')

**MATERIAL SPECIFICATIONS FOR SAND FILTERS**  
THE ALLOWABLE MATERIALS FOR SAND FILTER CONSTRUCTION ARE DETAILED IN TABLE B.3.1

**SAND FILTER TESTING SPECIFICATIONS**

1. UNDERGROUND SAND FILTERS, FACILITIES WITHIN SENSITIVE GROUNDWATER AQUIFERS, AND FILTERS DESIGNED TO SERVE URBAN HOT SPOTS ARE TO BE TESTED FOR WATER TIGHTNESS PRIOR TO PLACEMENT OF FILTER MEDIA. ENTRANCES AND EXITS SHOULD BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO LEAKAGE FOR A PERIOD OF 8 HOURS.
2. ALL OVERFLOW WEIRS, MULTIPLE ORIFICES AND FLOW DISTRIBUTION SLOTS ARE TO BE FIELD TESTED TO VERIFY ADEQUATE DISTRIBUTION OF FLOWS.

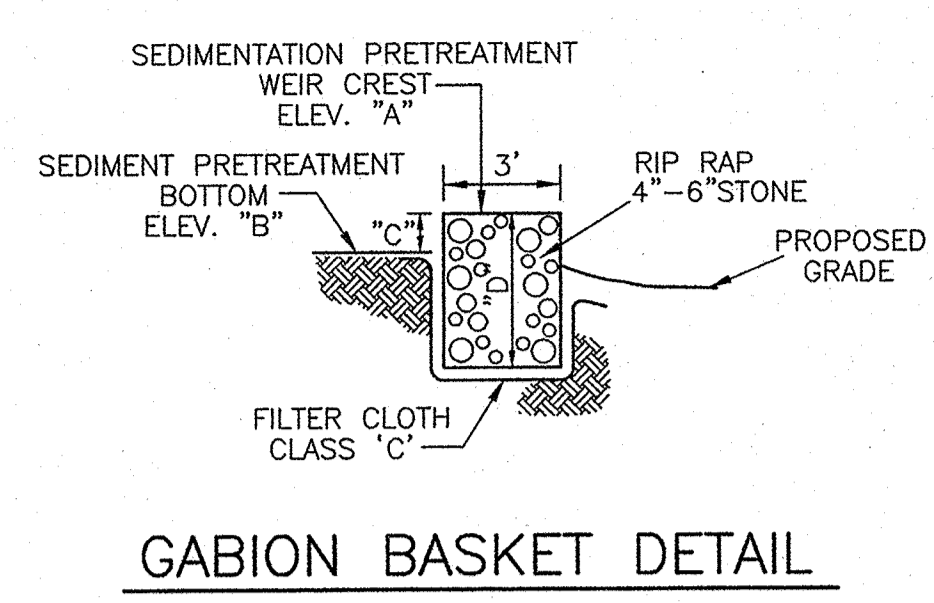
**SAND FILTER CONSTRUCTION SPECIFICATIONS**

1. ABSOLUTELY NO RUNOFF IS TO ENTER THE FILTER UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED.
2. SURFACE OF FILTER BED IS TO BE LEVEL.
3. ALL UNDERGROUND SAND FILTERS SHOULD BE CLEARLY DELINEATED WITH SIGNS SO THAT THEY MAY BE LOCATED WHEN MAINTENANCE IS DUE.
4. SURFACE SAND FILTERS SHALL BE PLANTED WITH APPROPRIATE GRASSES, CRESTED SEDGE OR APPROVED EQUAL.

**FILTERING MAINTENANCE CRITERIA**

1. THE SEDIMENT CHAMBER OUTLET DEVICES SHALL BE CLEANED/REPAIRED WHEN DRAWDOWN TIMES WITHIN THE CHAMBER EXCEED 36 HOURS. TRASH AND DEBRIS TO BE REMOVED AS NECESSARY.
2. SEDIMENT SHOULD BE CLEANED OUT OF THE SEDIMENTATION CHAMBER WHEN IT ACCUMULATES TO A DEPTH OF MORE THAN SIX INCHES. VEGETATION WITHIN THE SEDIMENTATION CHAMBER SHOULD BE LIMITED TO A HEIGHT OF 18 INCHES.
3. WHEN THE FILTERING CAPACITY OF THE FILTER DIMINISHES SUBSTANTIALLY (e.g., WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS), THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REMOVED AND SHALL BE REPLACED WITH FRESH MATERIAL. THE REMOVED SEDIMENTS SHOULD BE DISPOSED IN AN ACCEPTABLE MANNER (e.g., LANDFILL). SILT/SEDIMENT SHOULD BE REMOVED FROM THE FILTER BED WHEN THE ACCUMULATION EXCEEDS ONE INCH.
4. ORGANIC FILTERS (F-4) OR SURFACE SAND FILTERS (F-1) THAT HAVE A GRASS COVER SHOULD BE MOWED A MINIMUM OF 3 TIMES PER GROWING SEASON TO MAINTAIN MAXIMUM GRASS HEIGHTS LESS THAN 12 INCHES.
5. A DROP OF AT LEAST 6 INCHES SHALL BE PROVIDED AT THE INLET OF BIOTREATMENT FACILITIES (F-6) (STONE DIAPHRAGM). DEAD OR DISEASED PLANT MATERIAL SHALL BE REPLACED. AREAS DEVOID OF MULCH SHOULD BE RE-MULCHED ON AN ANNUAL BASIS.

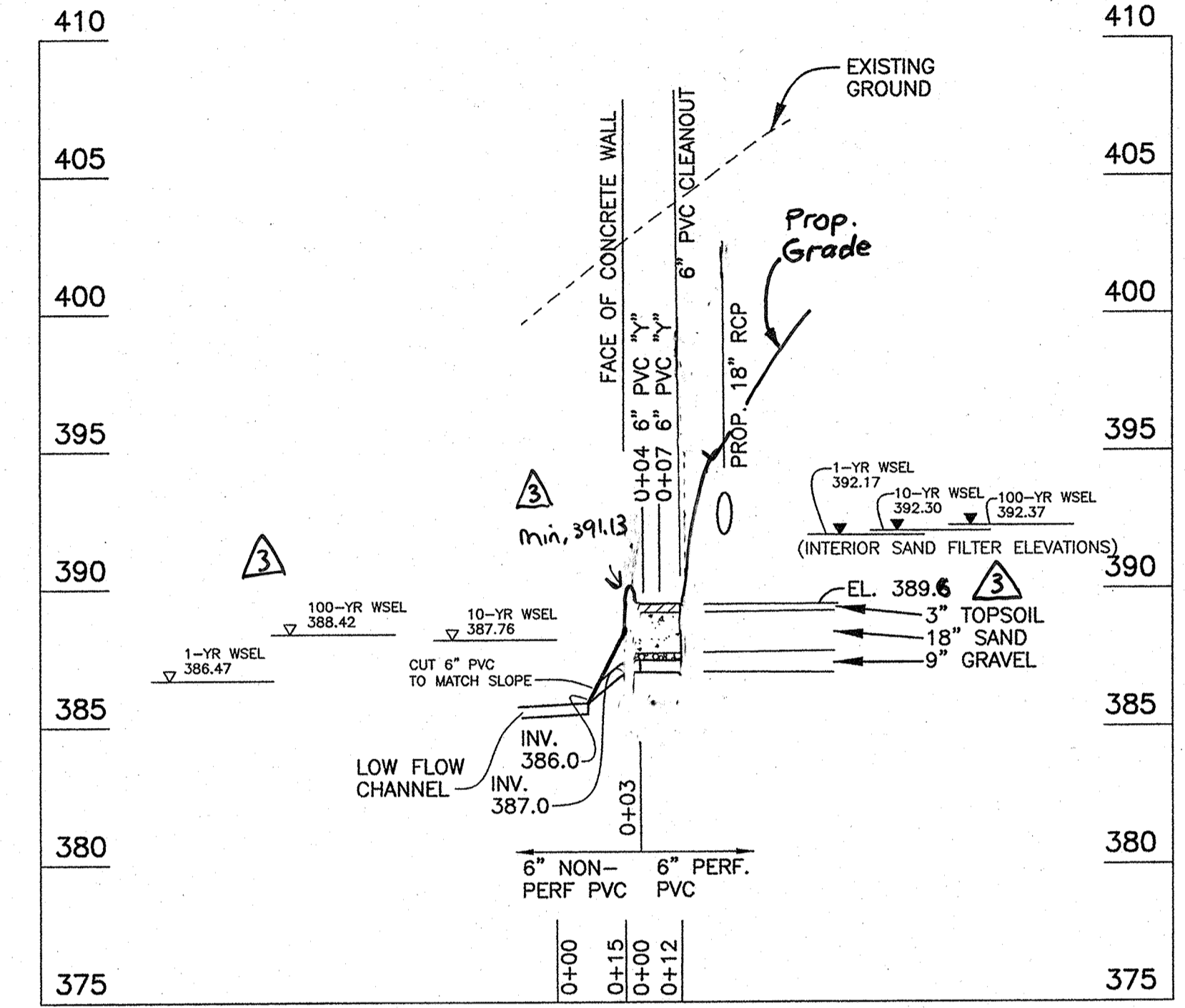
**SAND FILTER DETAIL**  
NO SCALE



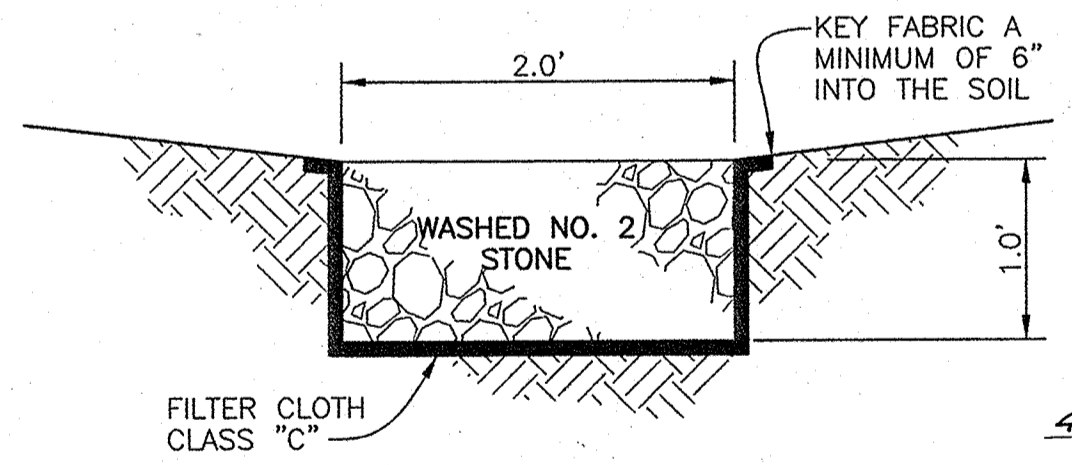
GABION BASKET DETAIL

GABION BASKET SCHEDULE					
	ELEV. "A"	ELEV. "B"	HEIGHT "C"	MIN. HEIGHT "D"	LOCATION
GABION WEIR "A"	391.5	389.7	1.8'	4.8'	PRE-TREATMENT AREA "A"
GABION WEIR "B"	391.5	389.8	1.7'	4.7'	PRE-TREATMENT AREA "B"
GABION WEIR "C"	387.8	386.8	1.0'	4.0'	FOREBAY

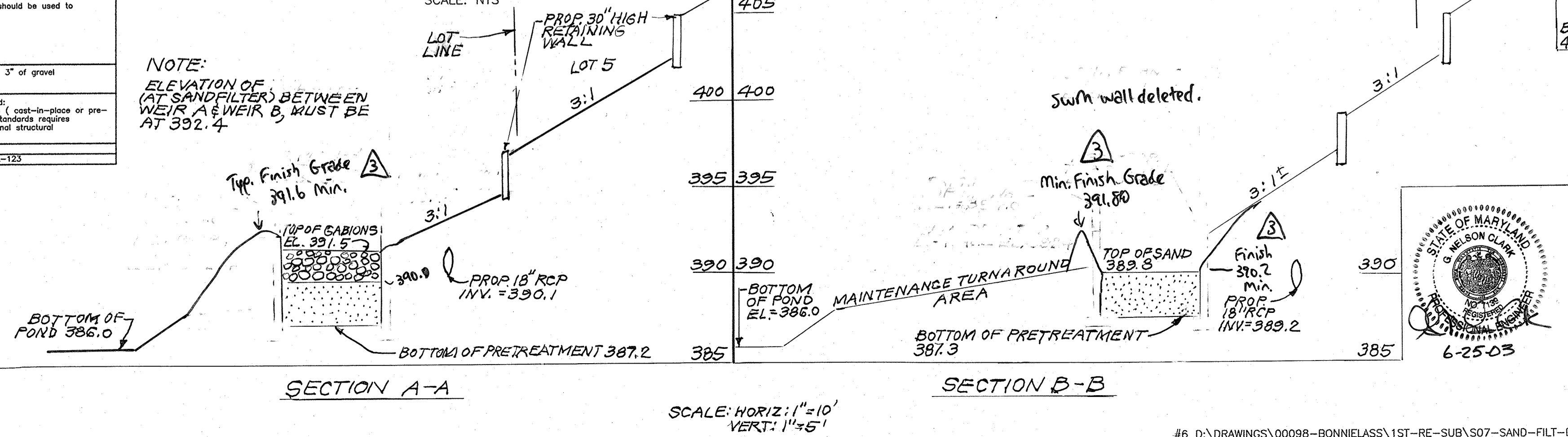
Note: Walls on sides of sand filter structure not installed. Surface inverts essentially per plan.



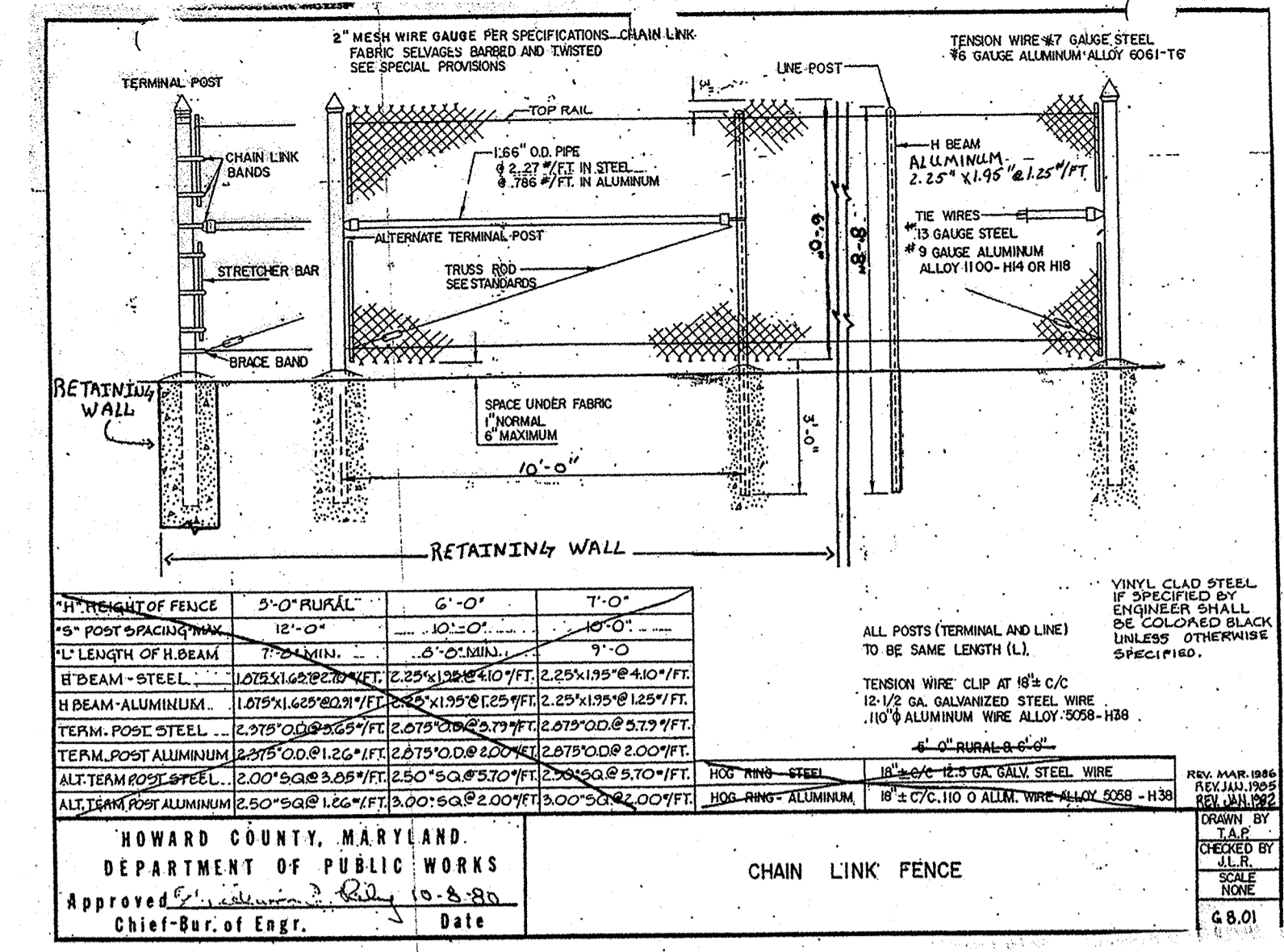
CROSS-SECTION THROUGH SAND FILTER  
SCALE: HOR. 1"=30'  
VER. 1"=5'



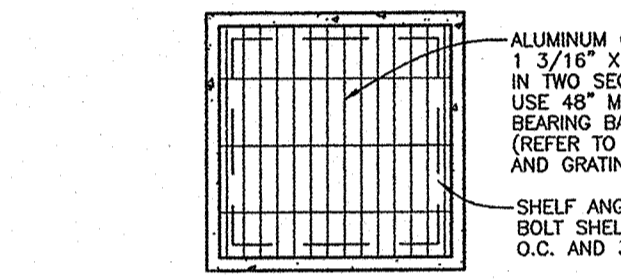
LOW FLOW MAT DETAIL  
SCALE: N.T.S.



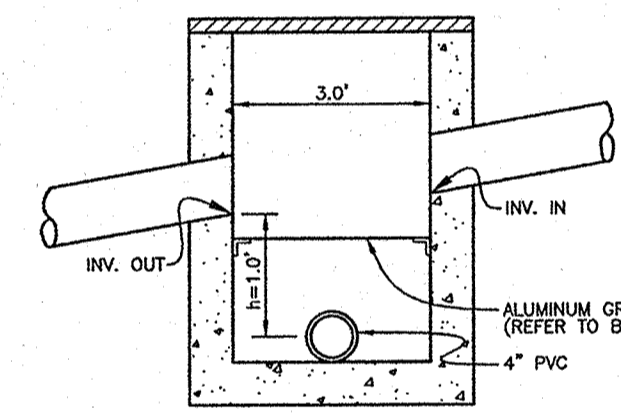
SCALE: HORIZ. 1"=10'  
VERT. 1"=6'



CHAIN LINK FENCE DETAIL  
SCALE: N.T.S.



GRATING PLAN  
N.T.S.

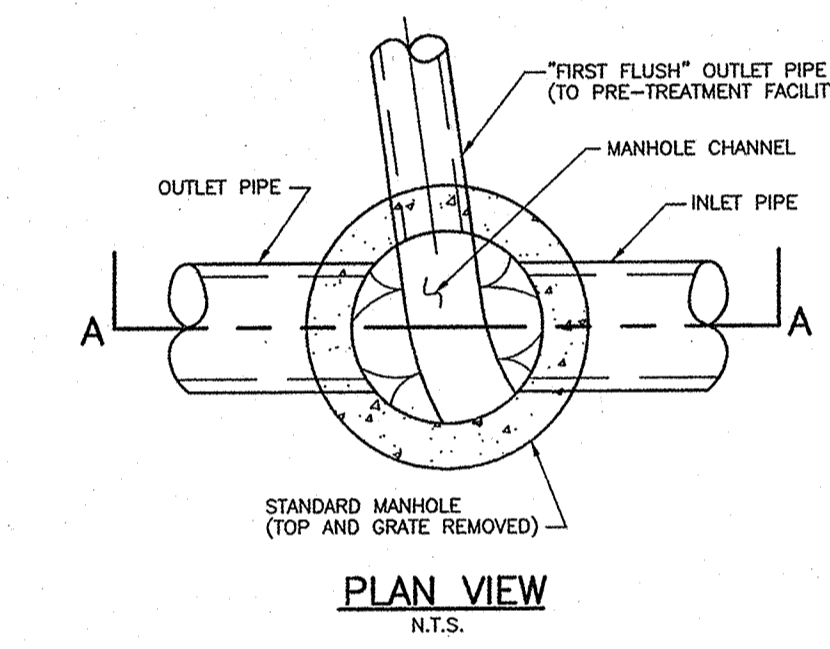


MODIFIED TYPE "S" INLET  
N.T.S.

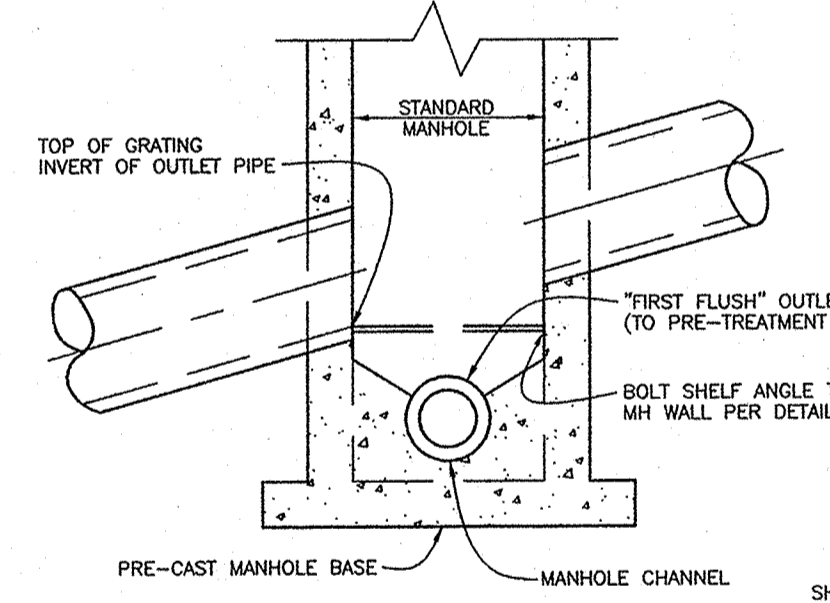
**FLOW SPLITTER SCHEDULE**

STRUCTURE	ACTUAL DIMENSION BETWEEN OVERFLOW PIPE ELEVATION AND LOW FLOW PIPE INVERT (PVC)
1-3	1'-2"
MH-4	1'-2"

THE CONTRACTOR IS TO VERIFY THE DIMENSION BETWEEN THE LOW FLOW PIPE AND THE OVERFLOW SLOT PRIOR TO BACKFILLING AROUND THE STRUCTURE. NOTIFY THE DESIGN ENGINEER IMMEDIATELY IF THERE IS A DISCREPANCY.

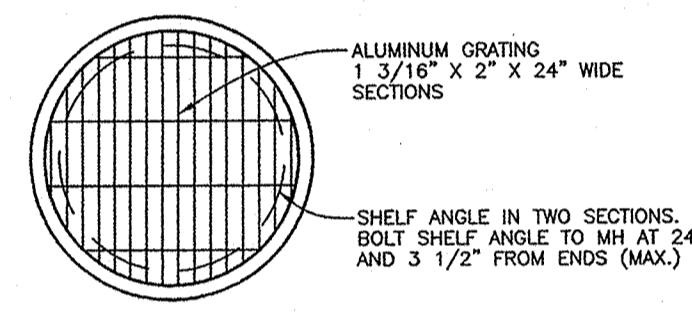


PLAN VIEW  
N.T.S.

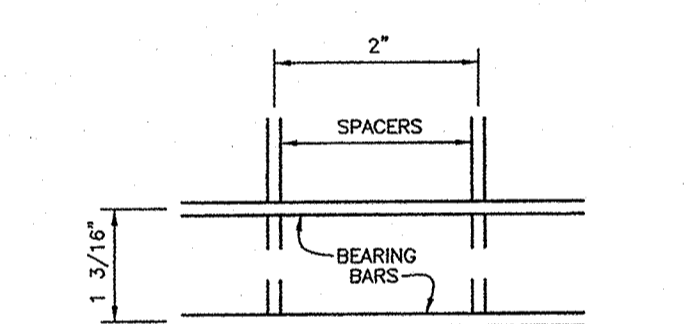


SECTION A-A  
N.T.S.

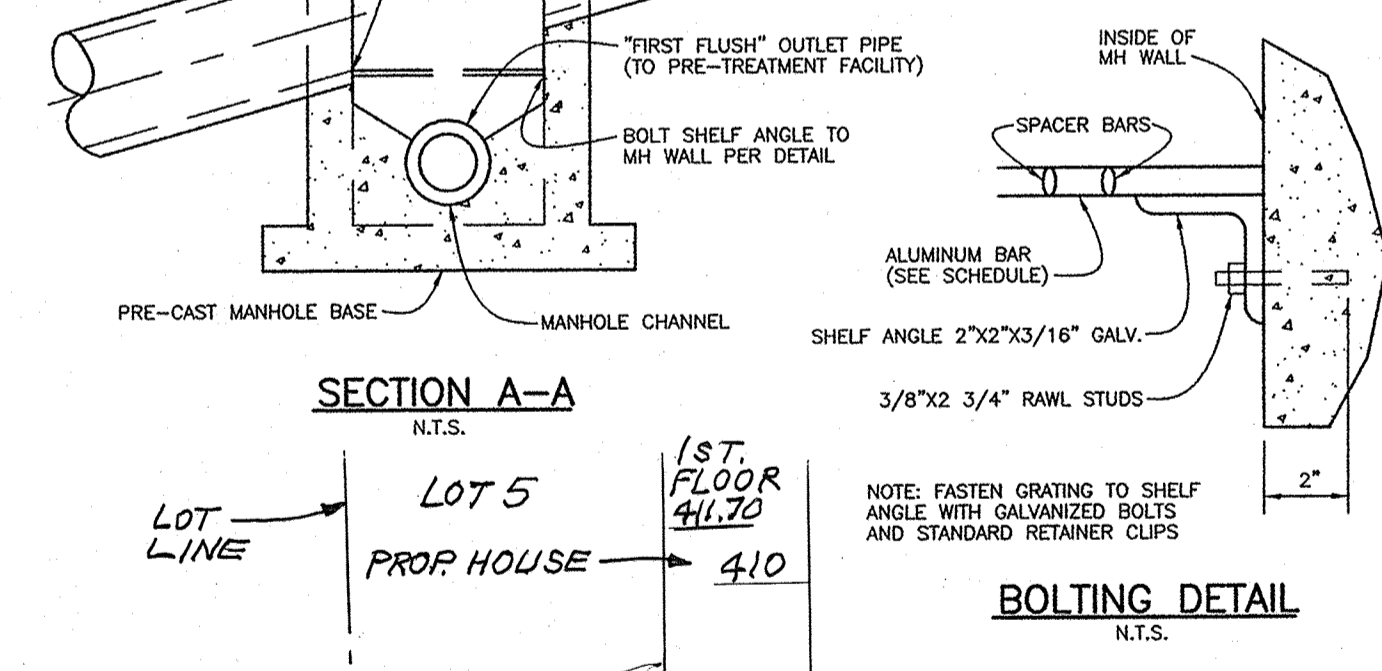
GRATING SCHEDULE	
MH DIA.	BEARING BAR
48"	1-1/4" x 1/2"
60", 66", 72"	1-1/4" x 3/16"
78"	1-1/2" x 3/16"
84"	1-3/4" x 3/16"
96"	2" x 3/16"



GRATING PLAN  
N.T.S.



GRATING DETAIL  
N.T.S.



BOLTING DETAIL  
N.T.S.

TABLE B.3.1 MATERIAL SPECIFICATIONS FOR SAND FILTERS

Material	Specification/Test Method	Size	Notes
sand	clean AASHTO-M-6 or ASTM-C-33 concrete sand	0.075" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonate or dolomite sand substitutions are acceptable. No "rock dust" can be used for sand.
peat	ash content: < 15% pH range: 5.2 to 6.9 loss bulk density: 0.12 to 0.15 g/cc	n/a	The material must be need-seed hemic peat, shredded, uncompacted, uniform and clean.
leaf compost		n/a	
underdrain gravel	AASHTO-M-43	0.375" to 0.75"	
geotextile fabric (if required)	ASTM-D-4833 (puncture strength-125 lb.) ASTM-D-4832 (Tensile Strength-350 lb.)	0.005" min. equivalent opening size of #80 sieve	Must maintain 125 gpm per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to "separate" sand filter layers.
impermeable liner (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tensile strength) 1,100 lb., elongation 200% ASTM-D-524 (tear resistance - 150 lb./in.) ASTM-D-471 (water adsorption: +8 to -2% mass)	30 mil thickness	Liner to be ultraviolet resistant. A geotextile fabric should be used to protect the liner from puncture.
underdrain piping	F 758, Type PS 28 or AASHTO-M-278	4" - 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" o.c., 4 holes per row; minimum of 3" of gravel over pipes; not necessary under mesh pipes
concrete (cast-in-place)	MSHA Standards and Specs. Section 802, Mix No. 3, f'c=3500 psi, normal weight, air entrained; referencing to meet ASTM-C15-50	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump tests; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland
concrete (pre-cast)	per pre-cast manufacturer	n/a	SEE ABOVE NOTE
non-rebar steel	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM-A-123

APPROVED: DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS  
DATE: N/A

APPROVED: DEPARTMENT OF PLANNING & ZONING  
CHIEF, PLANNING AND DEVELOPMENT  
DATE: 6/10/03

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 6/10/03

**CLARK · FINEFROCK & SACKETT, INC.**  
ENGINEERS · PLANNERS · SURVEYORS  
7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

DESIGNED: PC/AS  
DRAWN: ZAH/CRH2  
CHECKED: AS  
DATE: 2-10-03

SCALE: 1"=30'  
DRAWING: 7 OF 17  
JOB NO.: 00-098  
FILE NO.: 00-098-D

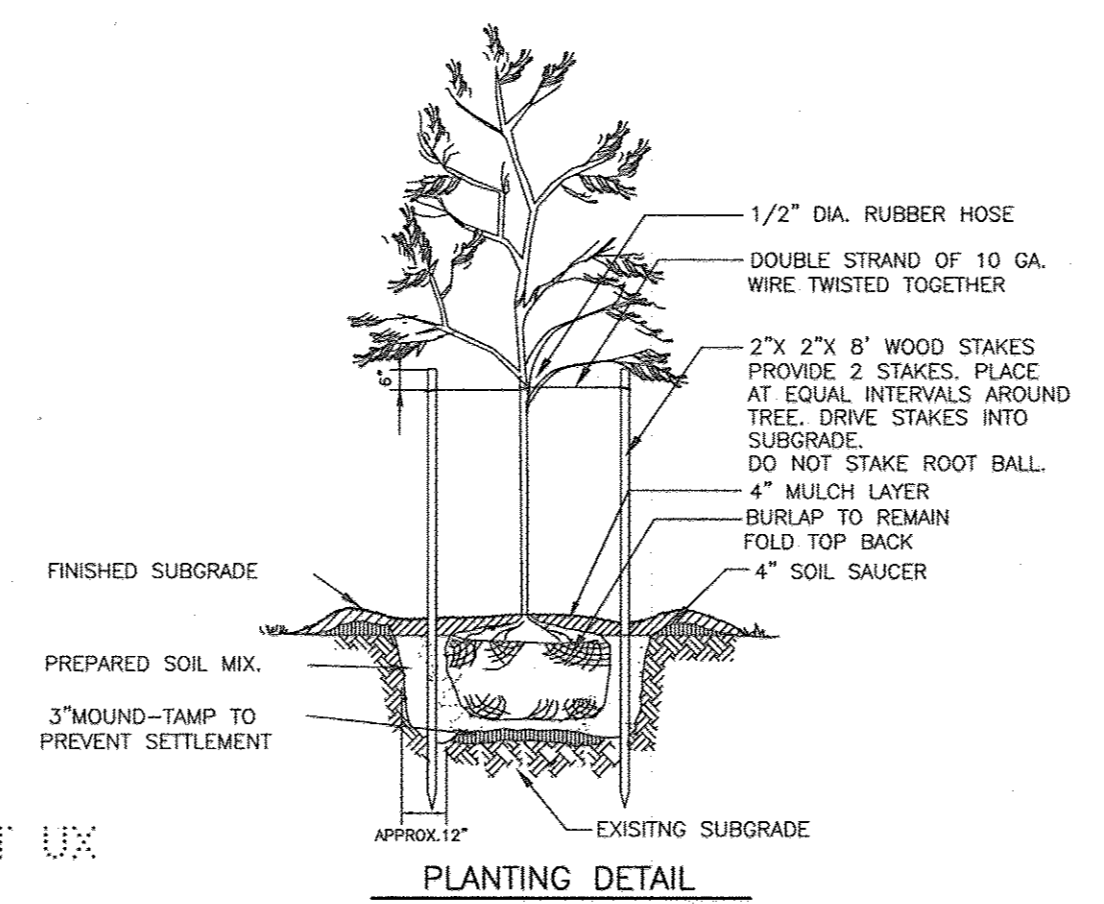
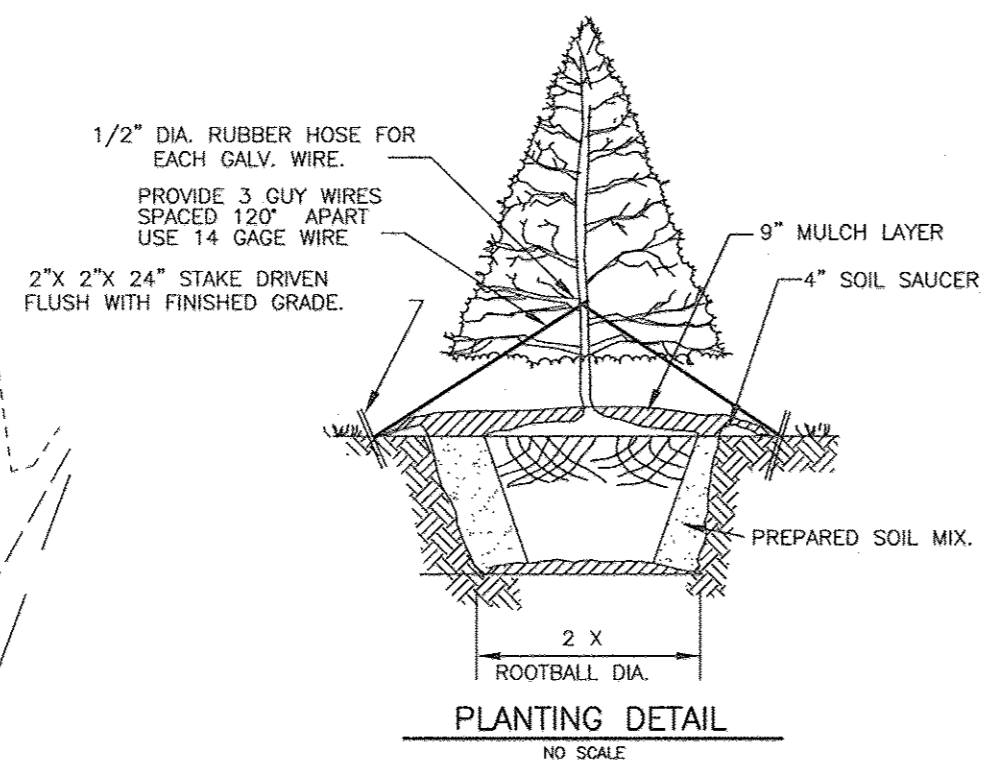
**BONNIELASS**  
TAX MAP 31 PARCEL 254  
GRID 9 ZONING R-20  
FIRST (1ST) ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

OWNER / DEVELOPER  
BONNIELASS LLC  
8835-P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045

For Revision #3 by  
Boyd + Dougietto, P.A.  
412 Headquarters Drive, Ste 5  
millersville, MD 21108  
410.278.2224

STATE OF MARYLAND  
BOB CLARK  
Professional Engineer  
6-25-03

**BONDING NOTE:**  
 THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.  
 FINANCIAL SURETY FOR THE TREES IN SCHEDULE D, TRASH PAD SCREENING, AND STREET TREES IN THE AMOUNT OF \$12,180.00 SHALL BE PART OF THE DEVELOPERS AGREEMENT.

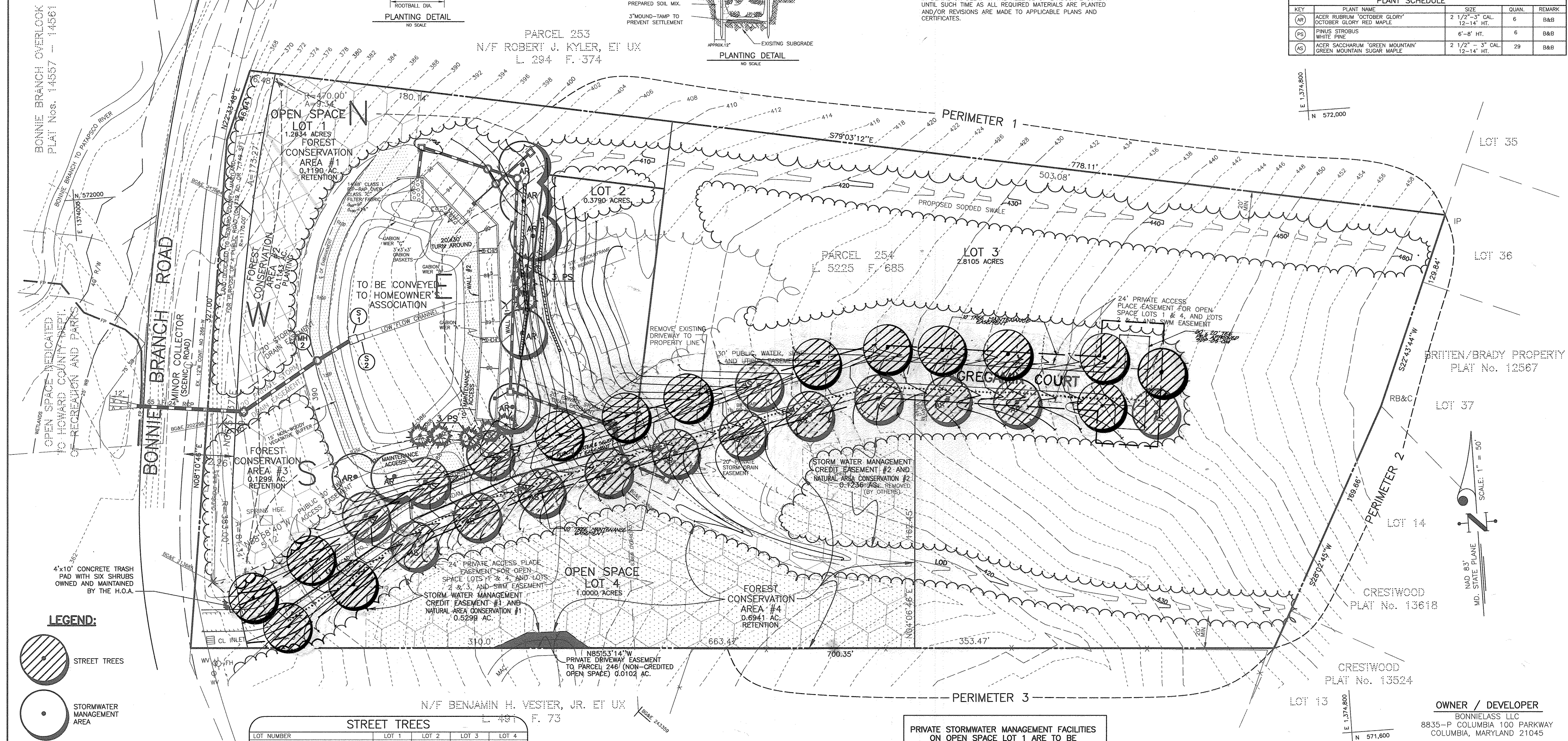


**NOTES:**  
 1. ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HRD PLANTING SPECIFICATIONS.  
 2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.  
 3. FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.  
 4. AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.

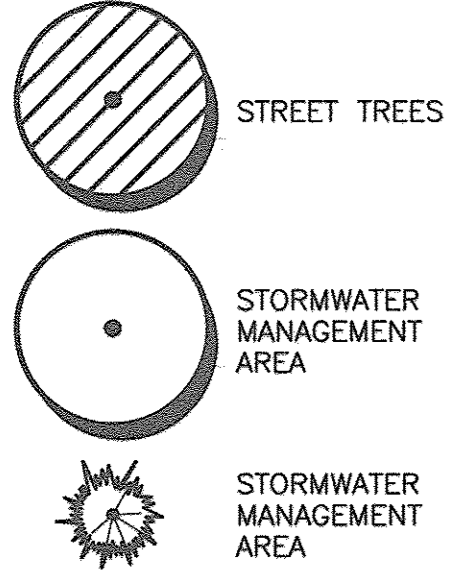
SCHEDULE A PERIMETER LANDSCAPE EDGE		PERIMETER 1	PERIMETER 2	PERIMETER 3
Category	Adjacent Perimeter Properties	A	A	A
Frontage/Perimeter		581.49'	299.50'	353.47'
Number of Plants Required				
Shade Trees (1/50)		0 *	0 *	0 *
Evergreen Trees (1/40)		0 *	0 *	0 *
Number of Plants Provided		0	0	0
Shade Trees		0	0	0
Evergreen Trees		0	0	0
Surety Amounts		0	0	0

\* 100% credit for existing vegetation to remain. Total Surety = \$0,000.00

PLANT SCHEDULE				
KEY	PLANT NAME	SIZE	QUAN.	REMARK
AR	ACER RUBRUM 'OCTOBER GLORY'	2 1/2"-3" CAL. 12-14' HT.	6	B&B
PS	PINUS STROBUS WHITE PINE	6"-8" HT.	6	B&B
AS	ACER SACCHARUM 'GREEN MOUNTAIN'	2 1/2" - 3" CAL. 12-14' HT.	29	B&B



**LEGEND:**



LOT NUMBER	LOT 1	LOT 2	LOT 3	LOT 4
LINEAR FEET OF FRONTAGE	199.71	85.0'	485.0'	341.22
NUMBER OF TREES REQUIRED @ 1/40	5	2	12	9
NUMBER OF TREES PROPOSED	5	2	12	10
SURETY AMOUNT	\$1,500	\$600	\$3,600	\$3,000

SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING					
EDGE	N	E	S	W	TOTAL
LINEAR FEET OF PERIMETER	180.00	227.15	199.71	342.86	949.72
NUMBER OF TREES REQUIRED					
SHADE TREES @ 1/50	4	5	4	7	19
EVERGREEN TREES @ 1/40	4	6	5	9	24
CREDIT FOR EXISTING VEGETATION (NO, YES, AND %)	YES, 100%	YES, 8.8%	YES, 45%	YES, 100%	YES, 66.2%
CREDIT FOR OTHER LANDSCAPING (NO, YES, AND %)	NO	NO	NO	NO	YES, 9.6%
NUMBER OF TREES PROVIDED					
SHADE TREES		5	2		7
EVERGREEN TREES		5	3		8
SURETY AMOUNT					\$3,300

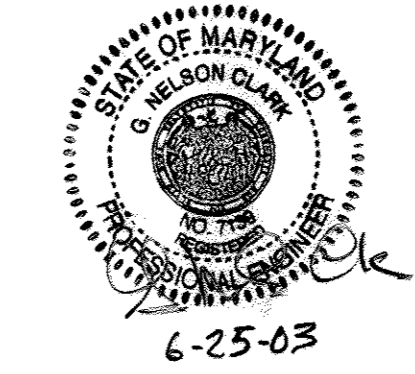
TRASH PAD PLANTING SCHEDULE			
QUANTITY	6	VW	VIBURNUM x RHYTIDOPHYLLOIDES 'WILLOWOOD'
SIZE			2-3' B&B
WILLOWOOD VIBURNUM			

PRIVATE STORMWATER MANAGEMENT FACILITIES ON OPEN SPACE LOT 1 ARE TO BE OWNED AND MAINTAINED BY HOA.

**DEVELOPER'S/BUILDERS CERTIFICATE**

I/We certify that the landscaping shown on this plan will be done according to plan, section 16.124 of the Howard County Code and the Howard County Landscape Manual. I/We further certify that upon completion a Certificate of Landscape Installation, accompanied by an executed one year guarantee of plant materials, will be submitted to the Department of Planning and Zoning.

Date: 7-1-03



APPROVED: DEPARTMENT OF PUBLIC WORKS  
 N/A  
 DATE

APPROVED: DEPARTMENT OF PLANNING & ZONING  
 Andy Kinnitt  
 DATE: 8/15/03

**CLARK · FINEFROCK & SACKETT, INC.**  
 ENGINEERS · PLANNERS · SURVEYORS  
 7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

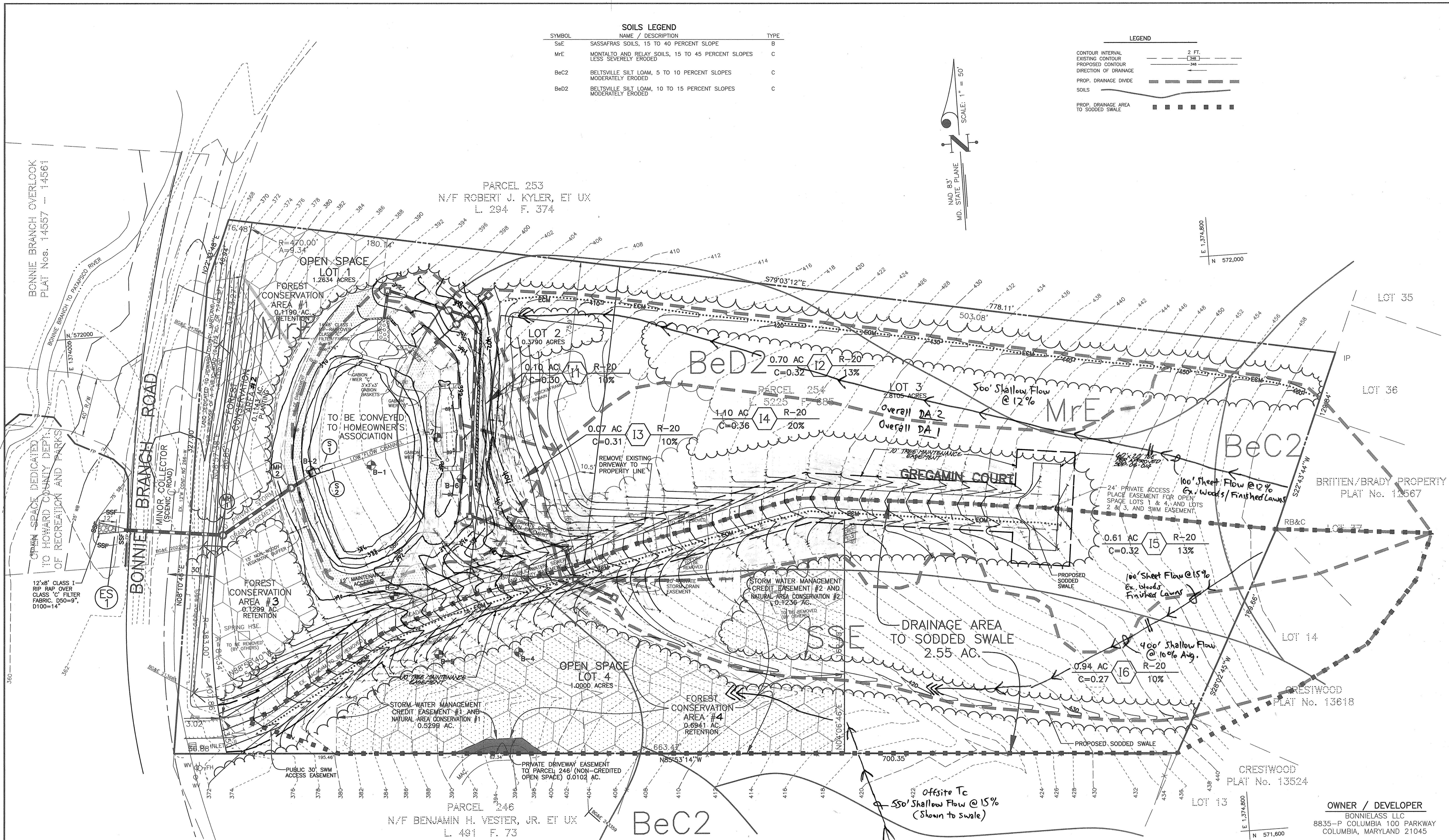
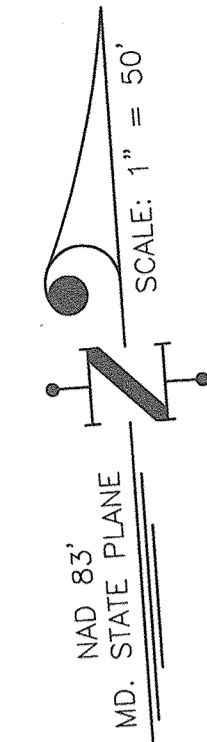
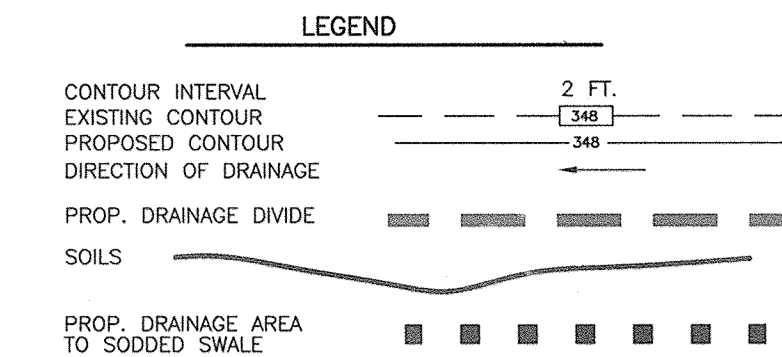
**BONNIELASS**  
 TAX MAP 31 PARCEL 254  
 GRID 9 ZONING R-20  
 FIRST (1ST) ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

DESIGNED: LANDSCAPING PLAN  
 DRAWN: ZAH/CRH2  
 CHECKED: AS  
 DATE: 4-1-03

SCALE: 1"=30'  
 DRAWING: 8 of 17  
 JOB NO.: 00-098  
 FILE NO.: 00-098LS



SYMBOL	NAME / DESCRIPTION	TYPE
SsE	SASSAFRAS SOILS, 15 TO 40 PERCENT SLOPE	B
MrE	MONTALTO AND RELAY SOILS, 15 TO 45 PERCENT SLOPES LESS SEVERELY ERODED	C
BeC2	BELTSVILLE SILT LOAM, 5 TO 10 PERCENT SLOPES MODERATELY ERODED	C
BeD2	BELTSVILLE SILT LOAM, 10 TO 15 PERCENT SLOPES MODERATELY ERODED	C



BONNIE BRANCH OVERLOOK  
PLAT Nos. 14557 - 14561

PARCEL 253  
N/F ROBERT J. KYLER, ET UX  
L 284 F. 374

OWNER / DEVELOPER  
BONNIELASS LLC  
8835-P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045

APPROVED: DEPARTMENT OF PUBLIC WORKS  
N/A  
DATE

APPROVED: DEPARTMENT OF PLANNING & ZONING  
C. Hanat  
8/15/03  
DATE

APPROVED: DEPARTMENT OF PLANNING & ZONING  
C. Hanat  
8/15/03  
DATE

3	REV. TO SHOW SAND + SAND FILTER AS-BUILT.	10-2-13
2	REV. TO SHOW PROPOSED 10' TREE MAINTENANCE EASEMENT AND PROP. 60' x 20' TREE TURNAROUND PER SDB-05-014 REV. PROP. STREET GRADE??	3-27-09
1	REV. PROP. STREET GRDES. ADD RETAINING WALLS TO STORMWATER POND REVISION	3-23-04
NS		2002

For Revision #3 by Boyd + Douglass, P.A.  
412 Headquarters Drive, Ste 5  
Millersville, MD 21088  
410-729-1234

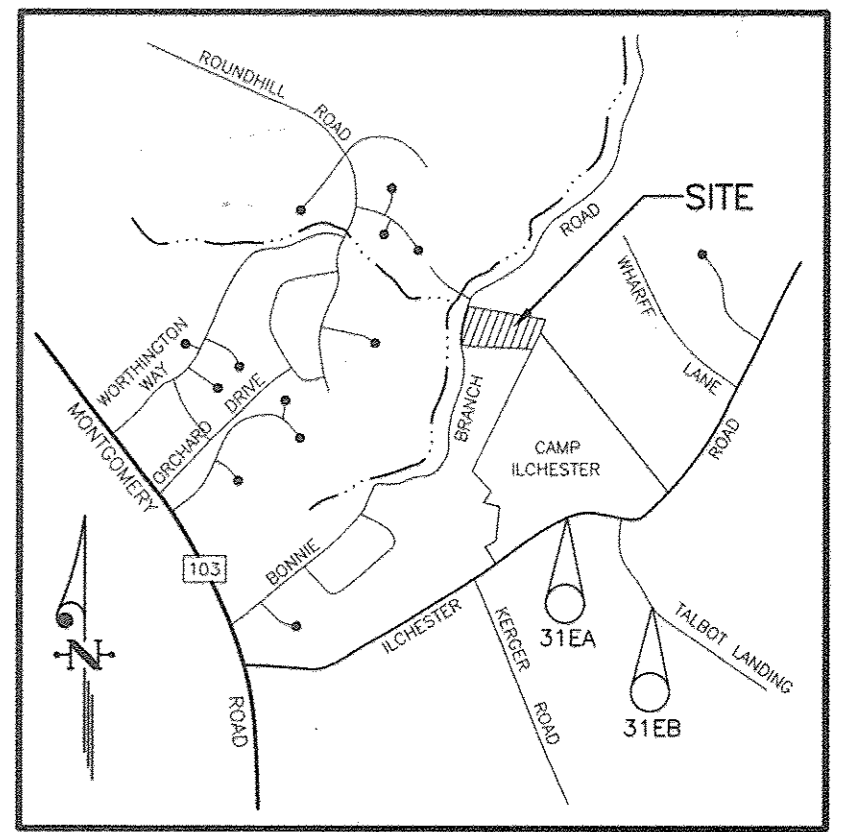


**CLARK · FINEFROCK & SACKETT, INC.**  
ENGINEERS · PLANNERS · SURVEYORS  
7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

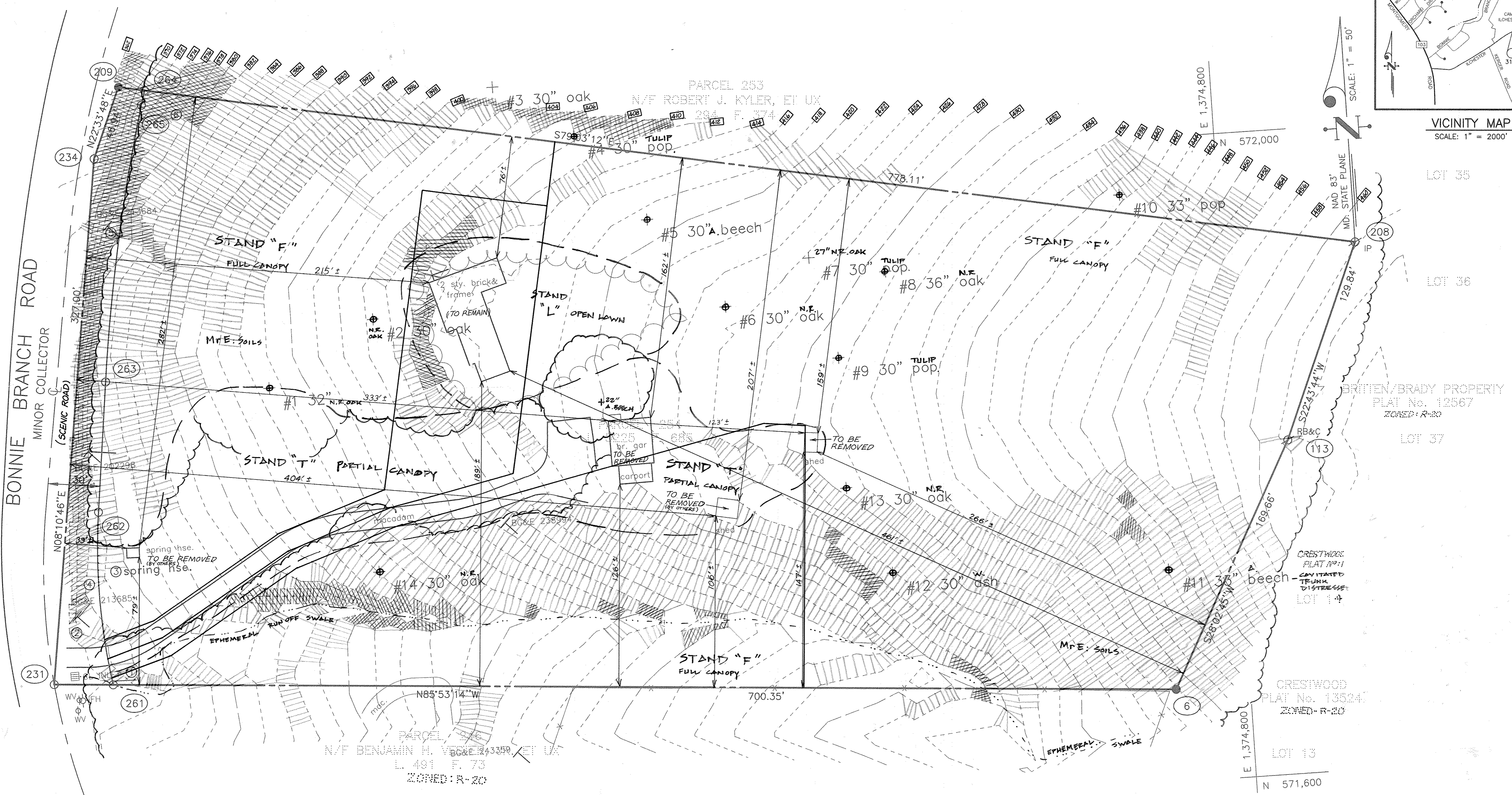
DESIGNED PC/AS	DRAINAGE AREA MAP	SCALE 1"=30'
DRAWN ZAH/CRH2	<b>BONNIELASS</b>	DRAWING 9 of 17
CHECKED AS	TAX MAP 31 PARCEL 254 GRID 9 ZONING R-20 FIRST (1ST) ELECTION DISTRICT HOWARD COUNTY, MARYLAND	JOB NO. 00-098
DATE 2-10-03		FILE NO. 00-098-D

F-01-208

#6 D:\DRAWINGS\00098-BONNIELASS\1ST-SUB-SUB\509-DRAIN-MAP.DWG



VICINITY MAP  
SCALE: 1" = 2000'



- + OTHER SIGNIFICANT TREES
- ⊕ SPECIMEN TREES (SEE LIST)
- EX. CANOPY EDGE - TREES
- MPE: MONTAUTO & RELAY SOILS
- STAND BOUNDARIES  
SEE "FOREST STAND NARRATIVE"
- ▨ STREET SLOPES 15-25%
- ▨ STREET SLOPES > 25%

APPROVED: DEPARTMENT OF PUBLIC WORKS  
 CHIEF, BUREAU OF PERMITS  
 DATE: N/A

APPROVED: DEPARTMENT OF PLANNING & ZONING  
 CHIEF, DIVISION OF DEVELOPMENT  
 DATE: 8/15/02

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 8/18/02

By The Developer:

"I/We certify that all development and/or construction will be done according to these plans, 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 shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

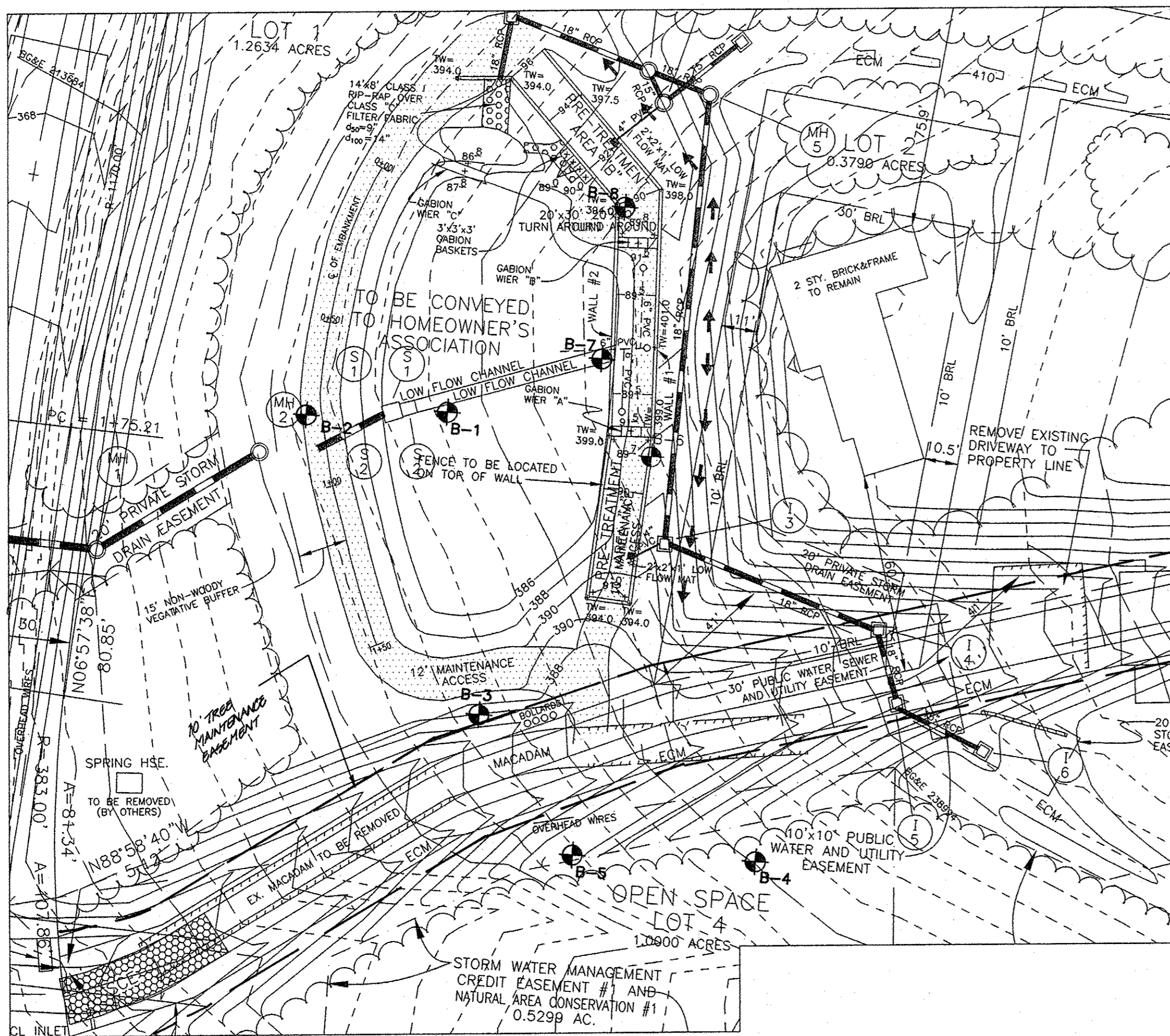
By the Engineer:

"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan, based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

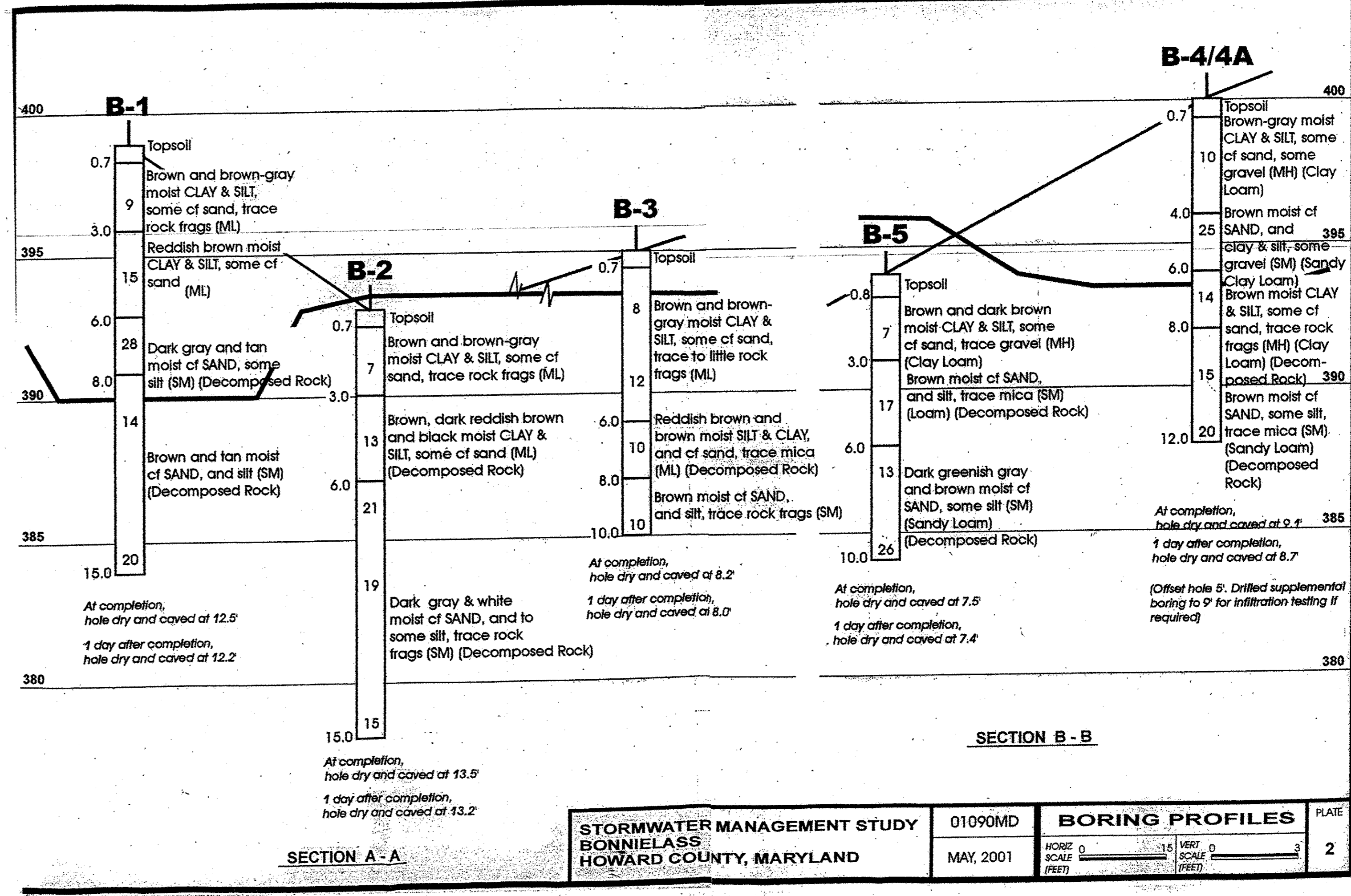
Signature of Developer \_\_\_\_\_ Date \_\_\_\_\_ Signature of Engineer \_\_\_\_\_ Date \_\_\_\_\_

NOTE: THERE ARE NO WETLANDS OR WATERS OF THE U.S. IN PARCEL 254

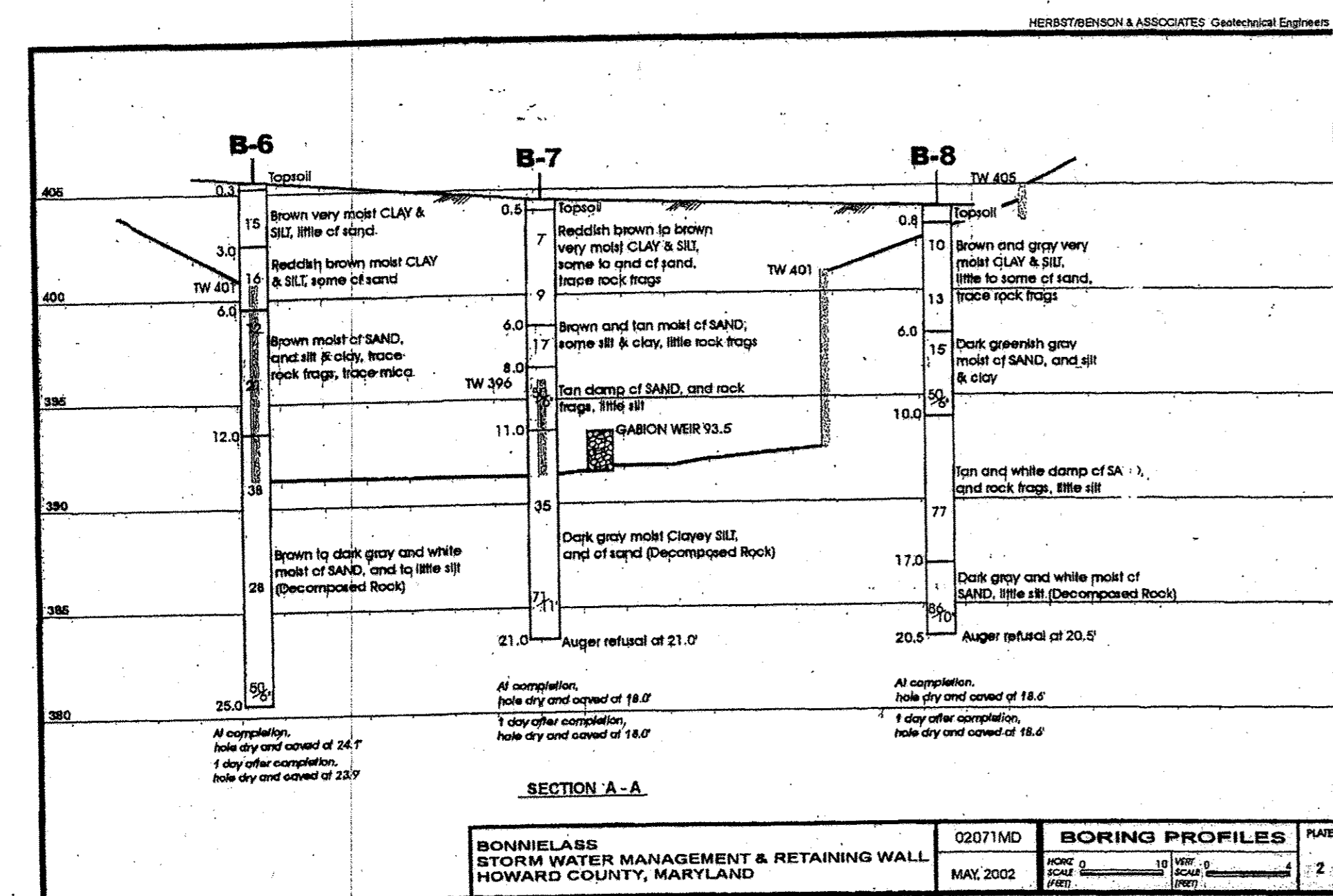
REV. SHEET NUMBER 10 OF 16 TO 10 OF 17	4-1-05
NO. REVISION	PAGE
<b>CLARK · FINEFROCK &amp; SACKETT, INC.</b> ENGINEERS · PLANNERS · SURVEYORS	
7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.	
DESIGNED BHK	A SIMPLIFIED FOREST STAND DELINEATION (EXISTING CONDITIONS)
DRAWN CFS/BHK	<b>BONNIELASS</b>
CHECKED BHK	<b>TAX MAP 31 PARCEL 254</b>
DATE 4/20/01	5.0 ACRES / 217,000 SF.
3/8/01	FIRST (1st) ELECTION DISTRICT
10-10-02	HOWARD COUNTY, MARYLAND
FOR: BRANTLY DEVELOPMENT GROUP	SCALE: 1" = 30'
	DRAWING: 10 of 17
	JOB NO.: 00-098
	FILE NO.: 00-098-D



**BORING LOCATIONS**  
SCALE: 1" = 30'



**SECTION B-B**  
**BORING PROFILES**  
STORMWATER MANAGEMENT STUDY  
BONNIELASS  
HOWARD COUNTY, MARYLAND  
01090MD  
MAY, 2001  
SCALE: 1" = 30'



**SECTION A-A**  
**BORING PROFILES**  
BONNIELASS  
STORMWATER MANAGEMENT & RETAINING WALL  
HOWARD COUNTY, MARYLAND  
02071MD  
MAY, 2002  
SCALE: 1" = 30'



**STORMWATER POND LANDSCAPE PLAN**  
SCALE: 1" = 30'

**WETLAND SEED MIX**

SPECIES	COMMON NAME	RATE
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	2 LBS. / AC.
ELYMUS RIPARIUS	RIVERBANK WILD RYE	1 LBS. / AC.
CAREX VULPINOIDEA	FOX SEDGE	1 LBS. / AC.
BIDENS FRONDOSA	BEGGAR-TICKS	1 LBS. / AC.
POA TRIVIALIS	ROUGH BLUEGRASS	10 LBS. / AC.
LOLIUM MULTIFLORUM	ANNUAL RYEGRASS	10 LBS. / AC.
GLYCERIA TRIARIATA	FOWL MANNAGRASS	2 LBS. / AC.
ASTER NOVAE ANGLIAE	NEW ENGLAND ASTER	1 1/2 LBS. / AC.

**UPLAND GRASS SEED MIX**

SPECIES	COMMON NAME	RATE
AGROSTIS PALUSTRIS (SEE NOTE 1)	CREeping BENTGRASS	2 LBS. / AC.
FESTUCA ARUNDINACEA	TALL FESCUE	40 LBS. / AC.
FESTUCA RUBRA VAR. RUBRA (SEE NOTE 2)	CREeping RED FESCUE	20 LBS. / AC.
LOLIUM PERENNE (SEE NOTE 3)	PERENNIAL RYEGRASS	25 LBS. / AC.
PANICUM VIRGATUM (SEE NOTE 4)	SWITCHGRASS	10 LBS. / AC.
POA TRIVIALIS	ROUGH BLUEGRASS	15 LBS. / AC.
TRIFOLIUM REPENS	WHITE CLOVER	5 LBS. / AC.
NURSE CROP FOR SITE STABILIZATION		
AVENA SATIVA	OATS	28 LBS. / AC.
LOLIUM PERENNE SSP. MULTIFLORUM	ANNUAL RYEGRASS	5 LBS. / AC.
SETARIA ITALICA	FOXTAIL MILLET	5 LBS. / AC.

- NOTES:**
1. RECOMMENDED CULTIVAR: SEASIDE
  2. RECOMMENDED CULTIVARS: PENNLAWN, FLYER, FORTRESS, RUBY, OR SALEM.
  3. RECOMMENDED CULTIVARS: BLAZER(II) OR PENNFINE
  4. RECOMMENDED CULTIVARS: BLACKWELL, CARTHAGE, CAVE-IN-ROCK, OR SHELTER

**STORMWATER POND PLANT SCHEDULE**

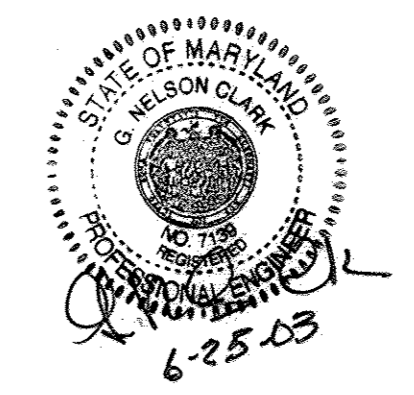
KEY	QTY	BOTANICAL NAME	COMMON NAME	WATER DEPTH	INDICATOR STATUS	ROOT	SPACING	SIZE
SHRUBS								
AR	18	ARONIA ARBUTIFOLIA	RED CHOKEBERRY	IRREGULARLY INUNDATED	FACW	CONT.	CLUMPS	18-24"
CS	13	CORNUS SERICEA	RED-OSIER DOGWOOD	IRREGULARLY INUNDATED	FACW+	CONT.	CLUMPS	18-24"
TREES								
SB	2	SALIX BABYLONICA	WEeping WILLOW	IRREGULARLY INUNDATED	FACW	B&B	30' O.C.	2 1/2" - 3" CAL

APPROVED: DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS  
DATE: N/A

APPROVED: DEPARTMENT OF PLANNING & ZONING  
CHIEF, DIVISION OF DEVELOPMENT  
DATE: 8/15/02

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 8/15/02

OWNER / DEVELOPER  
BONNIELASS LLC  
8835-P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045

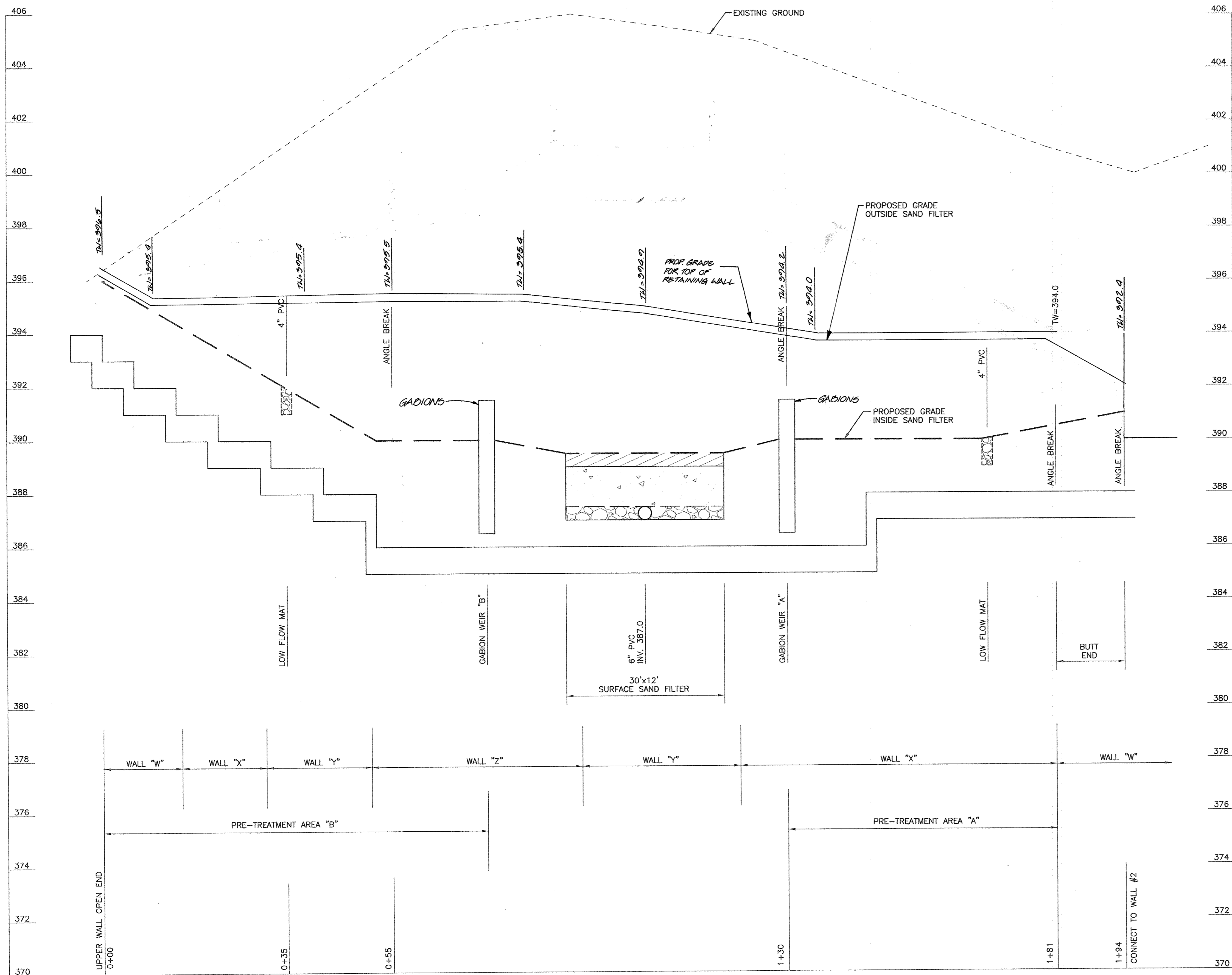


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ENGINEERS · PLANNERS · SURVEYORS  
7135 MINTREL WAY · COLUMBIA, MD 21045 · (410) 381-7500 BALT. · (301) 621-8100 WASH.

DESIGNED: PC/AS  
DRAWN: CRH2  
CHECKED: AS  
DATE: 2-10-03

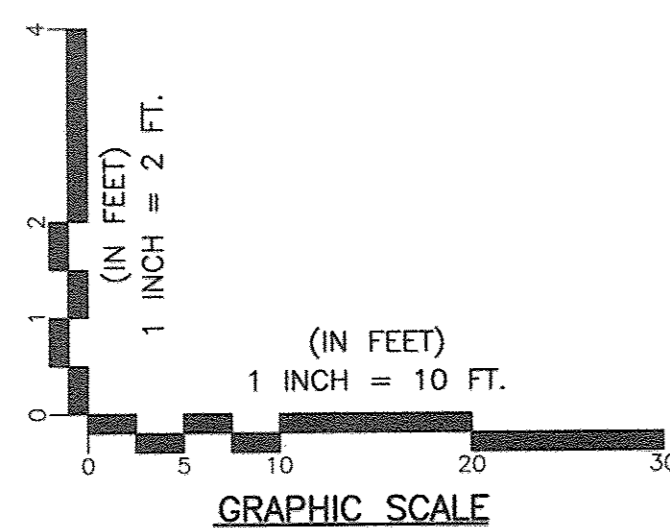
BORING LOGS AND STORMWATER POND LANDSCAPE PLAN  
**BONNIELASS**  
TAX MAP 31 PARCEL 254  
GRID 9 ZONING R-20  
FIRST (1ST) ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

SCALE: 1" = 30'  
DRAWING: 11 of 17  
JOB NO.: 00-098  
FILE NO.: 00-098-D



**SURFACE SAND FILTER WALL #1 ELEVATION**

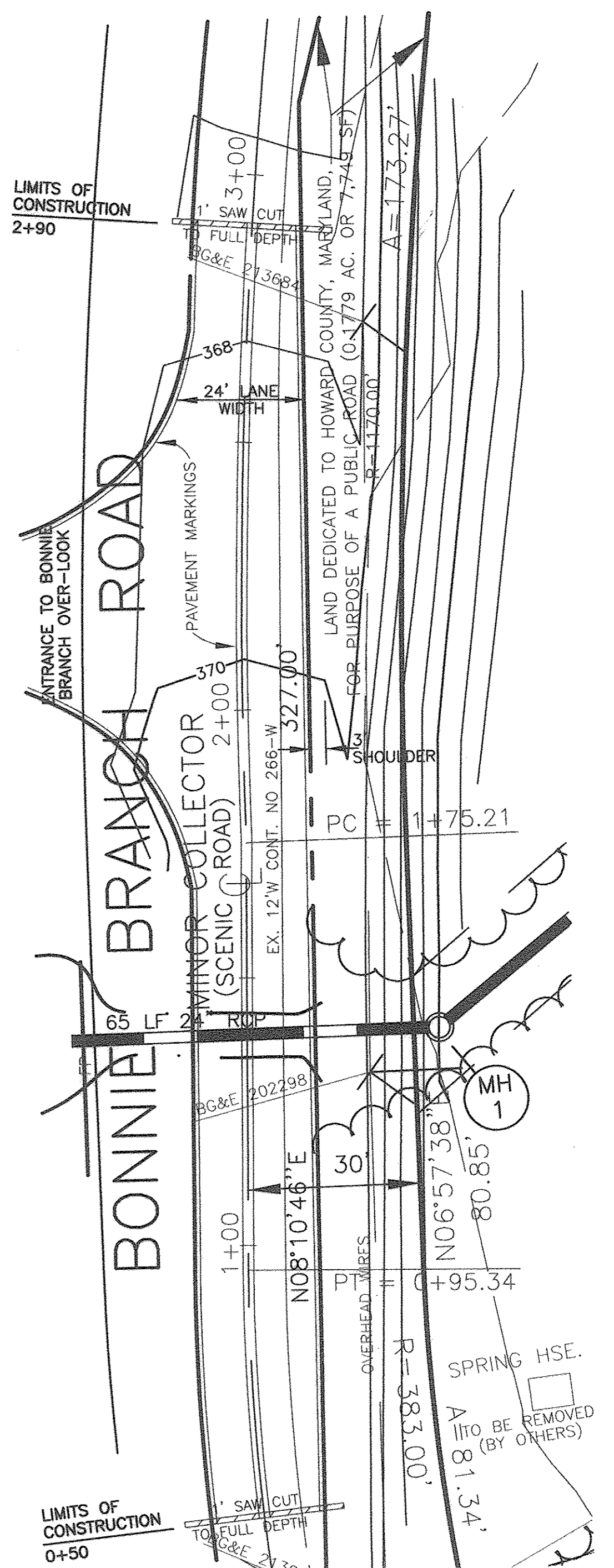
SCALE: HOR. 1"=10'  
VER. 1"=2'



NOTE: THE SUITABILITY OF FILL MATERIAL MUST BE CONFIRMED BY THE ON-SITE GEOTECHNICAL PROFESSIONAL. EACH 8 INCH LEFT MUST BE COMPACTED TO 95% STANDARD PROCTOR DENSITY AND A TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.

NOTE: THE REQUIRED BEARING PRESSURE BENEATH THE FOOTING OF THE WALL SHALL BE VERIFIED IN THE FIELD BY A GEOTECHNICAL PROFESSIONAL. TESTING DOCUMENTATION MUST BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION.

**OWNER / DEVELOPER**  
BONNIELASS LLC  
8835-P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045



**ROAD CONSTRUCTION ENLARGED PLAN**  
SCALE: 1" = 20'

APPROVED: DEPARTMENT OF PUBLIC WORKS  
CHIEF, BUREAU OF HIGHWAYS  
DATE: N/A

APPROVED: DEPARTMENT OF PLANNING & ZONING  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 8/15/03

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 8/12/03



2	REV SHEET NUMBER 12 OF 15 TO 12 OF 17	4-9-03
1	REV. PROP. GRADED FOR TOP OF RETAINING WALL	5-16-04
N/A	REVISIONS	DATE
<b>CLARK · FINEROCK &amp; SACKETT, INC.</b> ENGINEERS · PLANNERS · SURVEYORS 7135 MINSTREL WAY • COLUMBIA, MD 21045 • (410) 381-7500 BALT. • (301) 621-8100 WASH.		
DESIGNED PC/AS	WALL ELEVATION AND ROAD DETAIL	SCALE AS SHOWN
DRAWN CRH2	<b>BONNIELASS</b>	DRAWING 12 OF 17
CHECKED AS	TAX MAP 31 PARCEL 254 GRID 9 ZONING R-20 FIRST (1ST) ELECTION DISTRICT HOWARD COUNTY, MARYLAND	JOB NO. 00-098
DATE 4-1-03		FILE NO. 00-098-D



REV	DESCRIPTION	DATE
1	REV. PROP. STREET GRAD. 1000 FEET WALKS TO STORMWATER BASIN FOR TO SHOW PROP. TO TREE MAINTENANCE EASEMENT AND PROP. GO' X 20' TO TURN AROUND PER 05-05-01A. REV. PROP. STREET GRAD.	8-20-02
2		3-31-05

**HANDLING AND PLANTING OF SEEDLING(1)**

**HEELING IN BARE ROOT STOCK**

Bare root seedling and stock should be heeled in, if left unplanted for more than 24 hours.

**TREE BANKING**

Tree banking should be used when bare root trees must be held in the open for longer than a few days.

**HANDLING AND PLANTING OF SEEDLING(2)**

**HANDLING SEEDLINGS IN THE FIELD**

NOTE: Seedlings are not very sturdy and, unless they are not handled after handling.

**SEEDLING PLANTING METHODS**

**A. DIBBLE PLANTING**

**B. MATTOCK PLANTING**

**HANDLING AND PLANTING OF SEEDLING(3)**

**C. CORRECT AND INCORRECT PLANTING DEPTH**

**SEEDLING AND WHIP PLANTING SPECIFICATION**

NOTE: Making nearly planted seedlings helps the retention moisture and it protects the seedling from competition and stem injuries.

**FOREST CONSERVATION WORKSHEET**

NET TRACT AREA:

A. TOTAL TRACT AREA.....5.63 AC

B. AREA IN 100 YR FLOODPLAIN.....0.00

C. NET TRACT AREA.....5.63

LAND USE CATEGORY:

D. AFFORESTATION THRESHOLD.....(15 % X D).....0.84

E. CONSERVATION THRESHOLD.....(20 % X D).....1.13

EXISTING FOREST COVER

F. Existing forest cover (excluding floodplain).....5.13

G. Forest area above conservation threshold.....4.00

BREAK EVEN POINT:

H. Min. Forest Retention with no mitigation.....1.93

I. Max. clearing with no mitigation.....3.20

J. Total Forest area to be cleared.....4.19

K. Total Forest area to be retained.....0.94

PLANTING REQUIREMENTS:

L. Reforestation for clearing ABOVE threshold.....1.00

M. Reforestation for clearing BELOW threshold.....0.37

N. Credit for RETENTION above threshold.....0.00

O. Total REFORESTATION required.....1.37

P. Total AFFORESTATION required.....0.00

R. TOTAL PLANTING REQUIREMENT.....1.37 AC

S. Total onsite planting.....0.11 AC

T. Total offsite planting required.....1.26 AC

THE FOREST CONSERVATION REQUIREMENT OF SECTION 16.1206 OF THE HOWARD COUNTY CODE: FOREST CONSERVATION ACT, HAS BEEN MET BY THE REFORESTATION OF 1.26 ACRES OFFSITE. FINANCIAL SURETY FOR THE ONSITE FOREST CONSERVATION OBLIGATIONS FOR THIS SUBDIVISION ARE \$8,189.00 FOR RETENTION OF 0.94 ACRES OF FOREST AND \$2,396.00 FOR ONSITE REFORESTATION OF 0.11 ACRES. FINANCIAL SURETY FOR THE OFF-SITE REFORESTATION IS \$27,443.00.

**FOREST RETENTION AREA - SIGN**

11" MINIMUM

18" MINIMUM

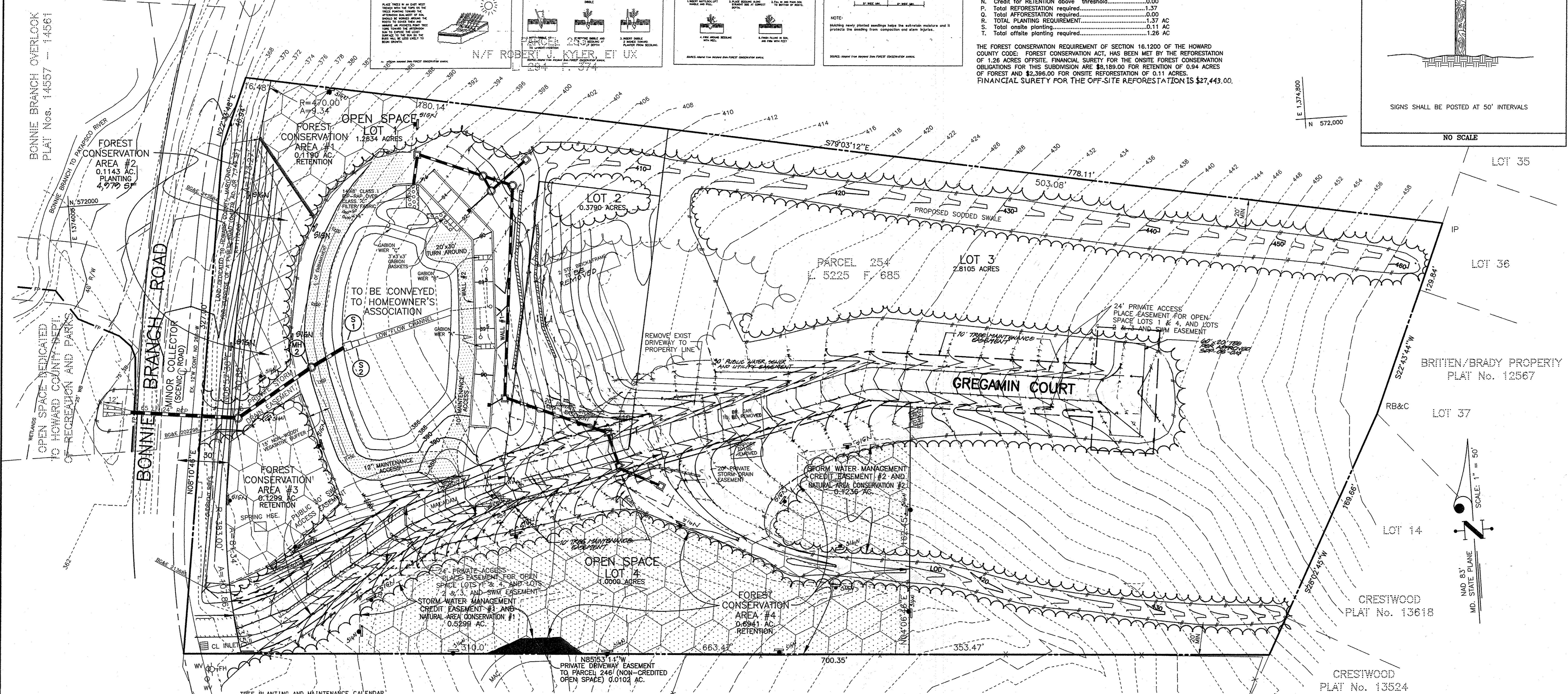
FOREST RETENTION AREA

MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS PROHIBITED

VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991

SIGNS SHALL BE POSTED AT 50' INTERVALS

NO SCALE



**TREE PLANTING AND MAINTENANCE CALENDAR**

TASKS	MONTHS
PLANTING	SEP, OCT, NOV, DEC
MAINTENANCE	JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG

N/F BENJAMIN M. VESTER, JR. ET UX  
L. 481 F. 73

PLANT NAME	SIZE	QUANTITY	SPACING
Acer Rubrum	Red Maple	1/4" - 1" cal. 20%	5' 15'
Cercis Canadensis	Eastern Redbud	1/4" - 1" cal. 20%	5' 15'
Liriodendron Tulipifera	Tulip Poplar	1/4" - 1" cal. 20%	5' 15'
Nyssa Sylvatica	Black Gum	1/4" - 1" cal. 20%	5' 15'
Quercus Rubra	Northern Red Oak	1/4" - 1" cal. 20%	5' 15'

**TREE SUBSTITUTES**

Cornus Florida - Flowering Dogwood  
Fraxinus Pennsylvanica - Green Ash  
Sassafras Albidum - Sassafras

**NOTE**

Deer protection shall be provided for all planted trees to prevent damage from rubbing and browsing. Specific measures to be determined.

**PRIVATE STORMWATER MANAGEMENT FACILITIES ON OPEN SPACE LOT 1 ARE TO BE OWNED AND MAINTAINED BY HOA.**

**DEVELOPER'S/BUILDERS CERTIFICATE**

I/We certify that the landscaping shown on this plan will be done according to plan, section 16.124 of the Howard County Code and the Howard County Landscape Manual. I/We further certify that upon completion a Certificate of Landscape Installation, accompanied by an executed one year guarantee of plant materials, will be submitted to the Department of Planning and Zoning.

Name: \_\_\_\_\_ Date: 7-1-03

APPROVED: DEPARTMENT OF PUBLIC WORKS  
N/A  
DATE: \_\_\_\_\_

APPROVED: DEPARTMENT OF PLANNING & ZONING  
Wanda Hanabusa  
8/15/03  
DATE: 8/15/03

APPROVED: DEPARTMENT OF PLANNING & ZONING  
O. J. M. M. M.  
DATE: 8/15/03

**CLARK · FINEFROCK & SACKETT, INC.**  
ENGINEERS · PLANNERS · SURVEYORS

7135 MINSTREL WAY · COLUMBIA, MD 21045 · (410) 381-7800 BALT. · (301) 621-8100 WASH.

**DESIGNED** TD/AS  
**DRAWN** CRH2  
**CHECKED** AS  
**DATE** 2-10-03

**SCALE** 1"=30'  
**DRAWING** 14 of 17  
**JOB NO.** 00-098  
**FILE NO.** 00-098LS

**FOREST CONSERVATION PLAN**  
**BONNIELASS**  
TAX MAP 31 PARCEL 254  
GRID 9 ZONING R-20  
FIRST (1ST) ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

**OWNER / DEVELOPER**  
BONNIELASS LLC  
8835-P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045

BRANTWOOD  
SECTION TWO - AREA ONE  
LOTS 1-30 & PRESERVATION  
PARCELS "E" AND "F"  
PLAT No. 14132-14135

SENECA CHIEF TRAIL  
(50' R/W)

**PLANTING SPECIFICATIONS AND NOTES**

**SITE PREPARATION AND SOILS**

1. PROTECTION FENCING AND SILT FENCES FOR SEDIMENT AND EROSION CONTROL ARE TO BE INSTALLED AS A FIRST ORDER OF BUSINESS. SEE PLAN FOR LOCATIONS.
2. DISTURBANCE OF SOILS SHOULD BE LIMITED TO THE PLANTING FIELD FOR EACH PLANT. AS SHOWN ON THE DETAIL VIEW, A PLANTING FIELD OF RADIUS = 5 X DIAMETER OF THE ROOT BALL OR CONTAINER IS RECOMMENDED.
3. SOIL MIX FOR ALL PLANTS EXCEPT ERICACEOUS MATERIAL: SOIL MIX SHALL CONSIST OF EXISTING NATIVE TOPSOIL MIXTURE AT EACH PLANTING FIELD LOCATION INTO WHICH THE CONTRACTOR SHALL THOROUGHLY INCORPORATE 25% BY VOLUME OF COMPOSTED SLUDGE. SOIL MIX FOR ERICACEOUS MATERIAL: SOIL MIX SHALL CONSIST OF EXISTING NATIVE TOPSOIL MIXTURE AT EACH PLANTING FIELD LOCATION INTO WHICH THE CONTRACTOR SHALL THOROUGHLY INCORPORATE 25% BY VOLUME PEAT MOSS.
4. ALL MIXING IN 3 AND 4 SHALL BE LIMITED TO CONTAINER GROWN OR BALL AND BURLAP STOCK ONLY AND CONFINED TO THE PLANTING FIELD AND IMMEDIATE ADJACENT SOIL SURFACE AREA AND SHALL BE DONE TO THE SATISFACTION OF THE DESIGN TEAM OR ENGINEER.

**PLANT STORAGE AND INSPECTION**

1. FOR CONTAINER GROWN NURSERY STOCK, PLANTING SHOULD OCCUR WITHIN 2 WEEKS AFTER DELIVERY TO THE SITE.
2. FOR BALL AND BURLAP NURSERY STOCK, PLANTING SHOULD OCCUR WITHIN THREE DAYS AFTER DELIVERY TO THE SITE.
3. PLANTING STOCK SHOULD BE INSPECTED PRIOR TO PLANTING. PLANTS NOT CONFORMING TO STANDARD NURSERYMAN SPECIFICATIONS FOR SIZE, FORM, WIGOR, ROOTS, TRUNK WOUNDS, INSECTS AND DISEASE SHOULD BE REPLACED.
4. UNTIL PLANTED, ALL PLANT STOCK SHALL BE KEPT IN A SHADED, COOL, AND MOISTENED ENVIRONMENT.

**PLANT INSTALLATION**

1. THE PLANTING FIELD SHOULD BE PREPARED AS SPECIFIED (SEE DETAIL). NATIVE STOCKFILLED SOILS SHOULD BE USED FOR SOIL MIX AND BACKFILL FOR PLANTING FIELD. AFTER PLANT INSTALLATION, GRADE SOILS EVENLY OVER THE PLANTING FIELD AND COVER WITH AT LEAST 4 INCHES OF MULCH. WATER, GENEROUSLY, TO SETTLE SOIL BACKFILLED AROUND TREES.
2. PLANTING FIELD DIAMETERS SHOULD BE REDUCED OR PLANTING FIELD MOVED IF IT APPEARS THAT EXCESSIVE EXISTING ROOT DAMAGE MAY OCCUR DURING DIGGING OPERATION NEAR EXISTING FOREST.
3. CARE SHALL BE TAKEN WHEN DIGGING PLANTING FIELDS NOT TO CHOP THRU LARGER EXISTING ROOTS FROM EXISTING MATURE TREES. IF ROOTS GREATER THAN 1/2 INCH ARE ENCOUNTERED PLEASE TRY TO DIG AROUND THEM AS MUCH AS POSSIBLE TO MINIMIZE IMPACT TO EXISTING TREES. THEY WERE HERE FIRST.
4. CONTAINER GROWN STOCK SHOULD BE REMOVED FROM THE CONTAINER AND ROOTS GENTLY LOOSENED FROM THE SOIL. IF THE ROOTS ENIRCLE THE ROOT BALL, SUBSTITUTION IS STRONGLY RECOMMENDED. J-SHAPED OR KINKED ROOT SYSTEMS SHOULD ALSO BE NOTED. ROOTS MAY NOT BE TRIMMED ON SITE, DUE TO THE INCREASED CHANCES OF SOIL BORE DISEASES.
5. FOR BALL AND BURLAP STOCK, PLACE TREE IN PREPARED PLANTING FIELD AND REMOVE WIRE AND/OR STRING FROM ROOT BALL. THEN PEEL BACK BURLAP TO BASE OF ROOT BALL AND COVER ENTIRE ROOT BALL WITH TOPSOIL MIXTURE INDICATED ABOVE AND WATER GENEROUSLY.
6. FOR TREES PLANTED IN THE AFFORESTATION AREA, CONTRACTOR SHALL EVENLY DISPERSE SPECIES IN GROUPS OF TWO (2) TO FOUR (4), PER SPECIES, OVER THE ENTIRE DESIGNATED AREA TO BE PLANTED WHILE MAINTAINING AN AVERAGE RANDOM SPACING OF INDIVIDUAL TREES AT PROPER SPACING INDICATED ON PLANT LIST.
7. AVOID PLANTING IN A STRAIGHT GRID PATTERN. TREES SHALL BE PLANTED ON AN AVERAGE SPACING AS INDICATED ON PLANT LISTS TO OBTAIN A MORE NATURAL APPEARANCE.
8. NEWLY PLANTED TREES MAY NEED WATERING AS MUCH AS ONCE A WEEK FOR THE ENTIRE GROWING SEASON, DUE TO THE WELL DRAINED NATIVE SOILS FOUND ON THIS SITE COMBINED WITH THE LOOSENESS OF THE BACKFILLED AREA WITHIN THE PLANTING FIELD. THE NEXT TWO YEARS MAY REQUIRE WATERING ONLY A FEW TIMES A YEAR DURING SUMMER AND DRY MONTHS. AFTER THAT PERIOD, TREES SHOULD ONLY NEED WATER IN SEVERE DROUGHTS. ANY WATERING PLAN SHOULD COMPENSATE FOR RECENT RAINFALL PATTERNS.

**FERTILIZING**

1. DO NOT FERTILIZE NEWLY PLANTED TREES WITHIN THE FIRST GROWING SEASON AFTER PLANTING. DOING SO MAY CAUSE A SPURT OF CANOPY GROWTH WHICH THE ROOTS CANNOT SUPPORT AND ADD ADDITIONAL SHOCK TO THE ALREADY DISTURBED PLANT.
2. NOTHING SHOULD BE ADDED TO THE SOIL WITHOUT TESTING IT FIRST TO DETERMINE ITS NEEDS.
3. IF AND WHEN IT IS TIME TO FERTILIZE, ORGANIC FERTILIZERS ARE PREFERRED TO SYNTHETIC FERTILIZERS. BONE MEAL OR SEAWEED BASED PRODUCTS ARE AVAILABLE COMMERCIALY AND ARE RECOMMENDED. THEY HAVE THE ABILITY TO SUPPLY NUTRIENTS TO THE PLANT AS NEEDED WHILE MINIMIZING THE RISK OF EXCESS NUTRIENTS ENTERING THE FOREST SYSTEM AND WATER SUPPLY.

**MAINTENANCE SCHEDULE**

1. ANNUAL MAINTENANCE DURING THE GROWING SEASON, FOR A THREE YEAR PERIOD.
2. ASSESS TREE MORTALITY OF PLANTING STOCK, REMOVE AND REPLACE ANY DEAD OR DISEASED PLANTINGS.
3. VOLUNTEER SEEDING OF NATIVE, LOCAL AND ENDEMIC VEGETATION IS TO BE EXPECTED. DO NOT DISCOURAGE THIS EFFORT UNLESS IT IS NEGATIVELY AFFECTING THE PLANTED STOCK.
4. REMOVE THROUGH MANUAL MEANS (GRUBBING, PULLING, CUTTING) AGGRESSIVE, NOXIOUS, INVASIVE SPECIES AND ALL HERBACEOUS VEGETATION WITHIN A 3-FOOT RADIUS SURROUNDING THE PLANTED WOODY NURSERY STOCK.
5. REMOVE AND DISPOSE OF MAN-MADE TRASH, INCLUDING ITEMS CONTAINED WITHIN ENTIRE PLANTING AREA. DO NOT REMOVE DOWN AND DEAD MATERIAL NATURALLY OCCURRING OR ACCUMULATING, UNLESS IT IS SMOTHERING PLANTING STOCK.
6. A 75 PERCENT SURVIVAL OF PLANTED STOCK MUST BE ACHIEVED AT THE END OF THE 24 MONTH MANAGEMENT PERIOD. IF NOT, ADDITIONAL PLANTINGS MAY BE REQUIRED TO ACHIEVE THIS GOAL.



**SUPERVISION**

1. ALL FOREST CONSERVATION ACTIVITIES SHALL BE DONE UNDER THE DIRECT SUPERVISION OF SOMEONE FROM THE DESIGN TEAM OR OTHER "QUALIFIED PROFESSIONAL" AS DETERMINED BY THE REQUIREMENTS OF COMAR 08.19.06.01 AND THE MARYLAND DEPARTMENT OF NATURAL RESOURCES, PUBLIC LANDS AND FORESTRY DIVISION.

REFORESTATION PLANT LIST						
QTY.	SPECIES	SHADE TOL.	MOIST. REGIME	WET. STATUS	MIN. O.C. SPACING	SIZE & REMARKS
50	Prunus serotina Wild Black Cherry	I	M	FACU	11'	CONT/BROOT 3'-5' HEIGHT
50	Robinia pseudoacacia Black Locust	VI	D-M	FACU-	11'	CONT/BROOT 3'-5' HEIGHT
50	Liriodendron tulipifera Tulip Poplar	I	D-M	FAC	11'	CONT/BROOT 3'-5' HEIGHT
50	Quercus rubra Red Oak	MT	D-M	UPL	11'	CONT/BROOT 3'-5' HEIGHT
50	Fraxinus americana White Ash	MT	D-M	FACU	11'	CONT/BROOT 3'-5' HEIGHT
50	Nyssa sylvatica Black Gum	T	M-W	FAC	11'	CONT/BROOT 3'-5' HEIGHT
50	Juglans nigra Black Walnut	VT	M	FACU	11'	CONT/BROOT 3'-5' HEIGHT
50	Acer rubrum Red Maple	VT	D-W	FAC	11'	CONT/BROOT 3'-5' HEIGHT
50	Cercis canadensis Eastern Redbud	T	M	UPL	11'	CONT/BROOT 3'-5' HEIGHT
50	Diospyros virginiana Persimmon	I	D-M	UPL	11'	CONT/BROOT 3'-5' HEIGHT

Quantities Of Individual Species And Species Composition May Change Depending On Availability At Time Of Planting. Total Quantity Of Trees For Entire Easement Area Will Not Change. Any Species Substitutions Must Be Listed On The Howard County Forest Association List And Must Have A Minimum Of Five (5) Different Species As Indicated On The Howard County Forest Association List.

**General Notes**

- 1) The Forest Conservation Easement Has Been Established As An Offsite Forest Mitigation Area, Per Section 16.1216 Of The Howard County Forest Conservation Act. No Clearing, Grading Or Construction Is Permitted Within The Forest Conservation Easement; However, Forest Management Practices As Defined In The Deed Of Forest Conservation Easement Are Allowed.
- 2)  Denotes Forest Conservation Easement.
- 3)  Denotes Protective Fence and Signs.

APPROVED: DEPARTMENT OF PUBLIC WORKS  
N/A  
DATE

APPROVED: DEPARTMENT OF PLANNING & ZONING  
Cindy Herald  
8/15/03  
DATE

APPROVED: DEPARTMENT OF LAND DEVELOPMENT  
Chad Deane  
8/15/03  
DATE

4/2/03 REV. SHEET NUMBER 15 OF 15 TO 15 OF 17

DATE NO. REVISION

PROJECT: BONNIELASS  
LOTS 1 THRU 4  
F-01-208  
\*\*\* ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: OFF-SITE FOREST MITIGATION PLAN

AREA: BRANTWOOD  
SECTION TWO - AREA ONE PRESERVATION PARCEL "G"  
TAX MAP NO'S 16 & 23 - PARCEL "F" - PLAT NO'S 14132-14135  
3 rd (THIRD) ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: REFORESTATION PLANTING PLAN

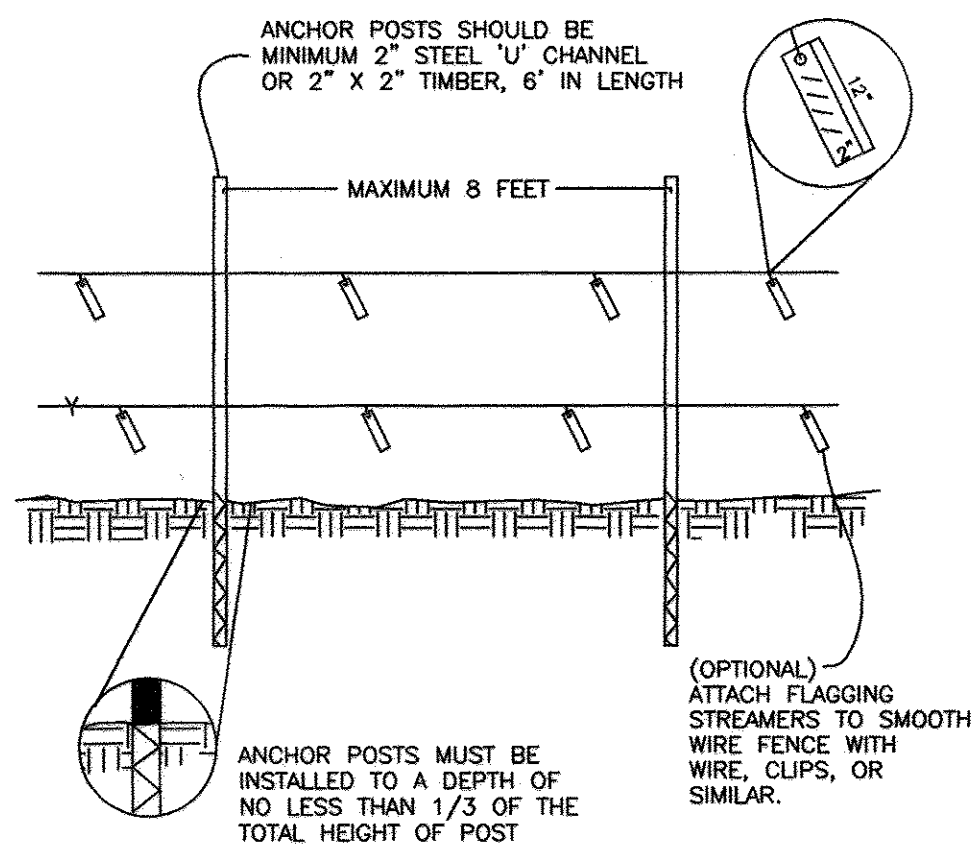
DEVELOPER  
BONNIELASS, LLC  
8835 P - COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045  
410-730-0810

OWNER/GRANTOR  
BRANTWOOD, LLC  
8835 P COLUMBIA 100 PARKWAY  
COLUMBIA, MARYLAND 21045  
410-730-0810

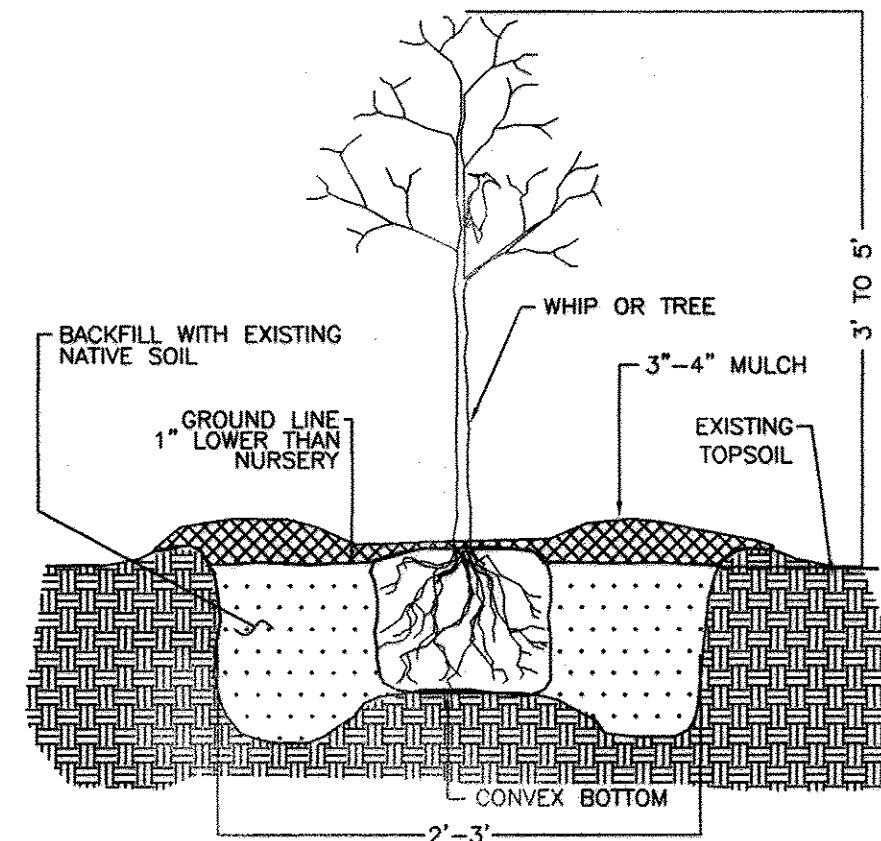
WILDMAN  
ENVIRONMENTAL SERVICES  
4747 BONNIE BRANCH RD.  
ELLCOTT CITY, MD. 21043  
PHONE: (410) 869-9999  
FAX: (410) 869-9901

DESIGNED BY: R.E.W.  
DRAWN BY: J.E.P.  
PROJECT NO.  
DATE: 4/18/03  
SCALE: 1" = 30'  
SHEET NO. 15 OF 17

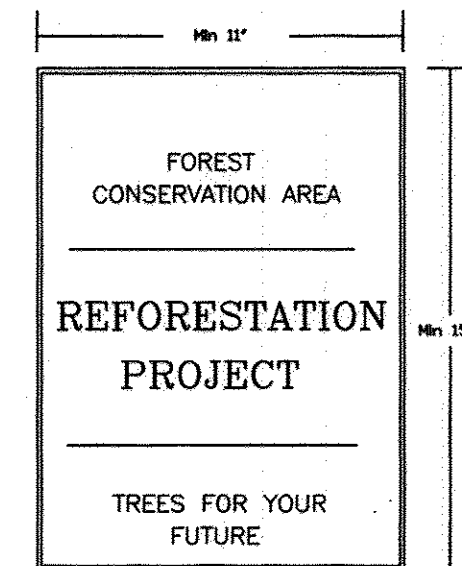
**PROTECTIVE FENCE DETAIL**  
TWO STRAND SMOOTH WIRE



1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.
7. SMOOTH WIRE SHOULD BE ATTACHED SECURELY TO POSTS.



**TREE PLANTING DETAIL**  
CONTAINER GROWN



**SIGNAGE DETAIL**  
NOT TO SCALE

THIS PLAN IS FOR  
FOREST CONSERVATION EASEMENT  
PLANTING PURPOSES ONLY