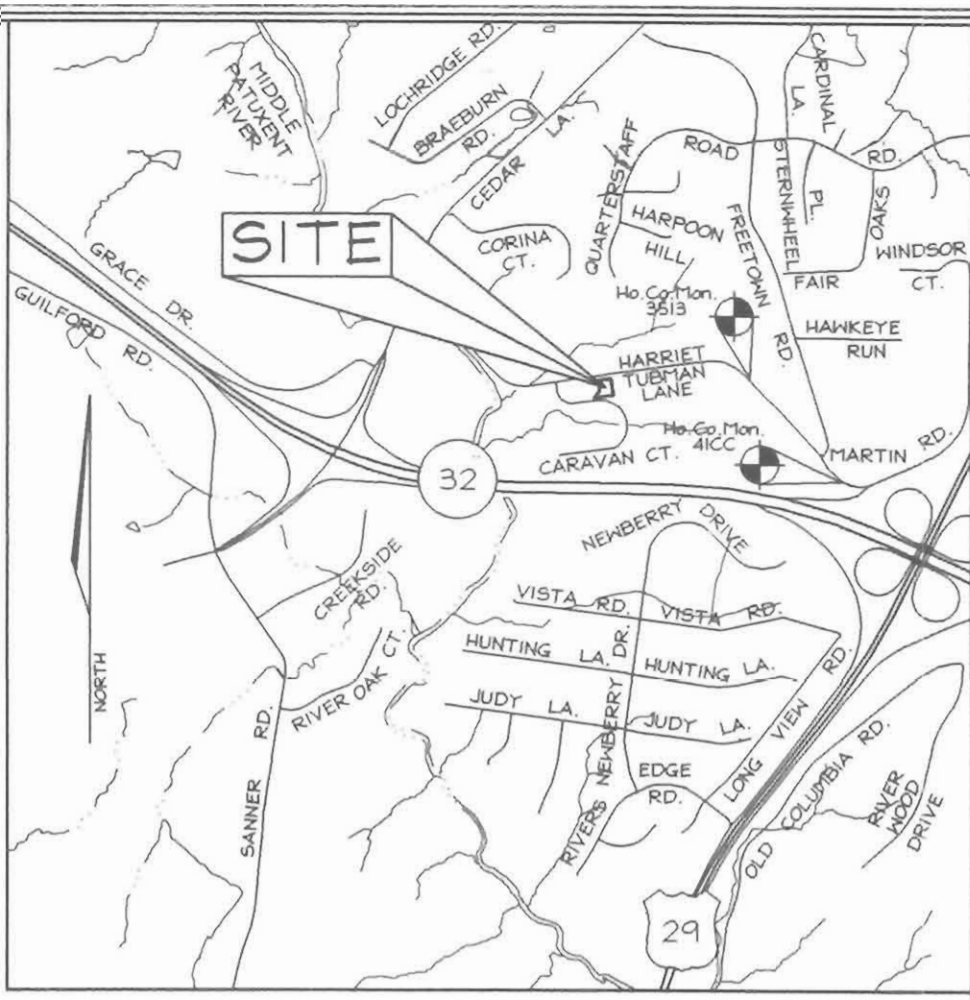


**LEGEND**

- Existing Contour
- Proposed Contour
- Existing Spot Elevation
- Proposed Spot Elevation
- Direction of Flow
- Existing Trees to Remain
- Existing Cleanout to be Removed
- Proposed Cleanout
- Utility Poles



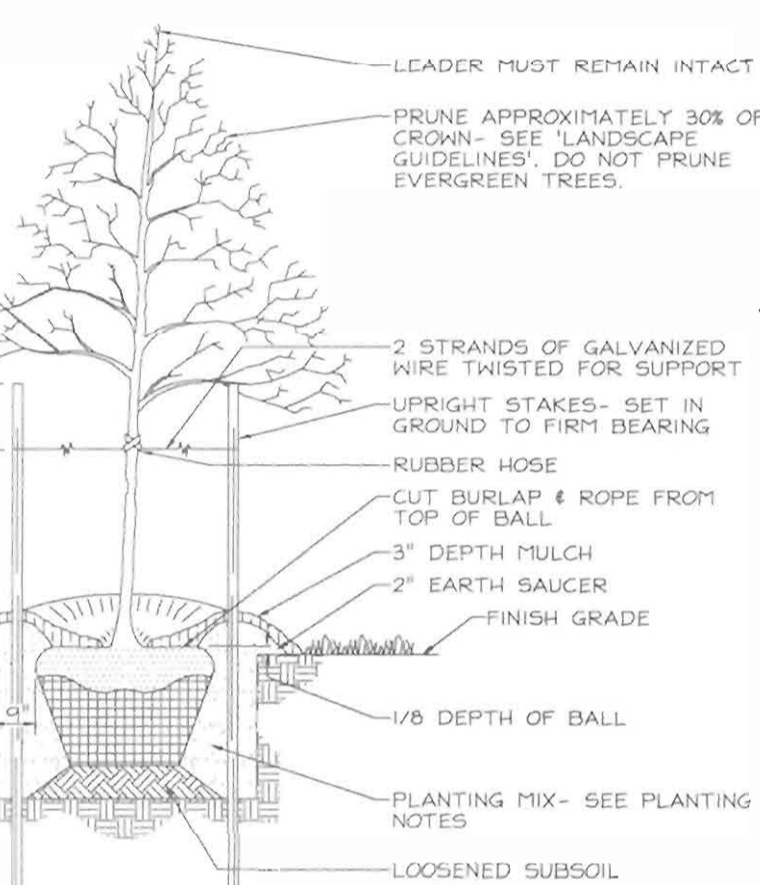
**SHEET INDEX**

DESCRIPTION	SHEET No.
Site Development Plan and Landscaping Details	1 of 3
Sediment and Erosion Control, SOILS, Landscaping Plan and Details	2 of 3
Bioretention Facility Construction Notes and Details	3 of 3

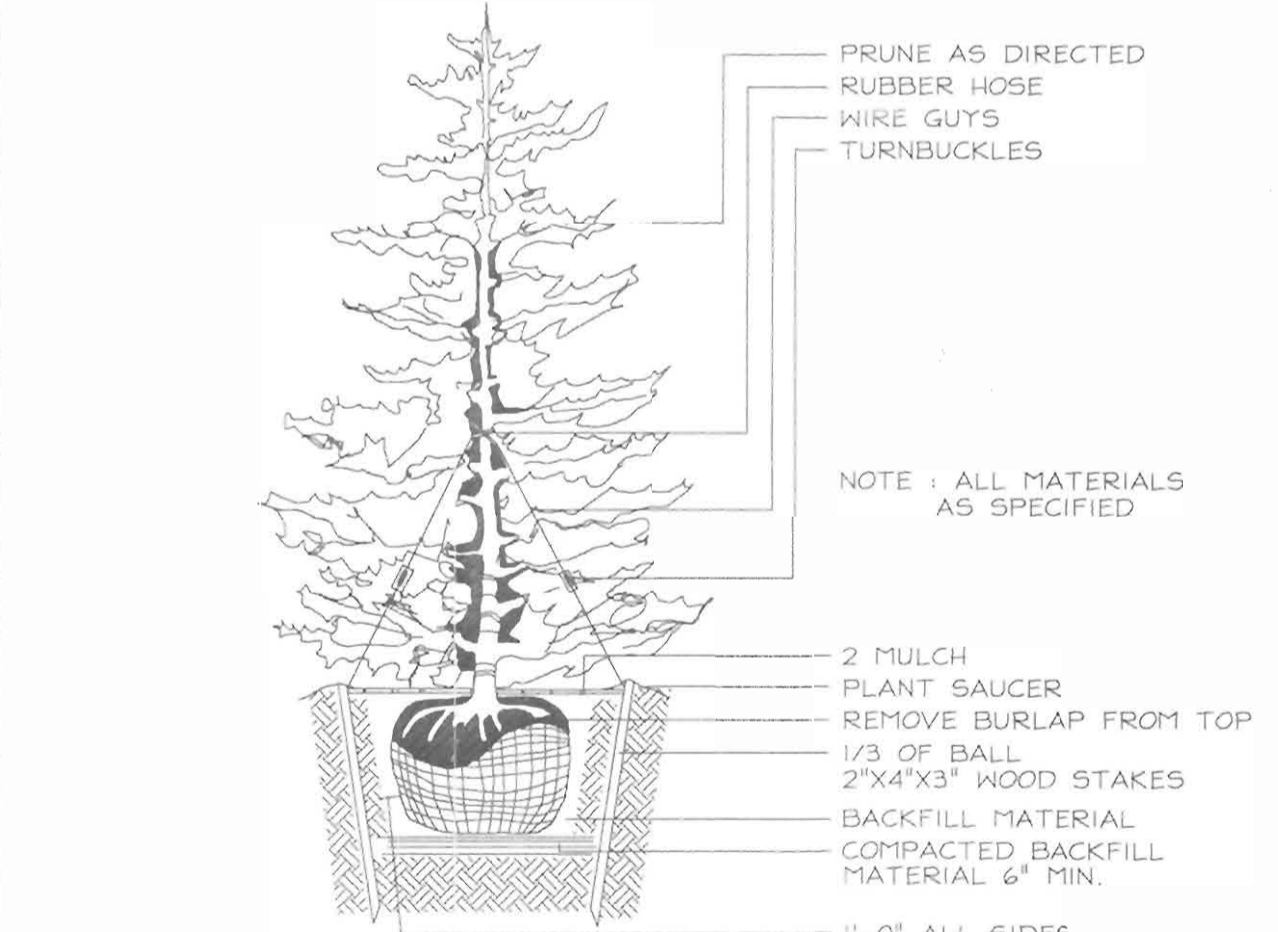
**BENCHMARKS**

Sta. 351B	N 168,729.6007	E 410,291.5227	El.: 126.8187 (meters)
Sta. 41CC	N 553,573.6798	E 1,346,098.104	El.: 416.071 (feet)
	N 168,400.5855	E 410,585.4444	El.: 122.1282 (meters)
	N 552,494.254	E 1,347,062.412	El.: 400.686 (feet)

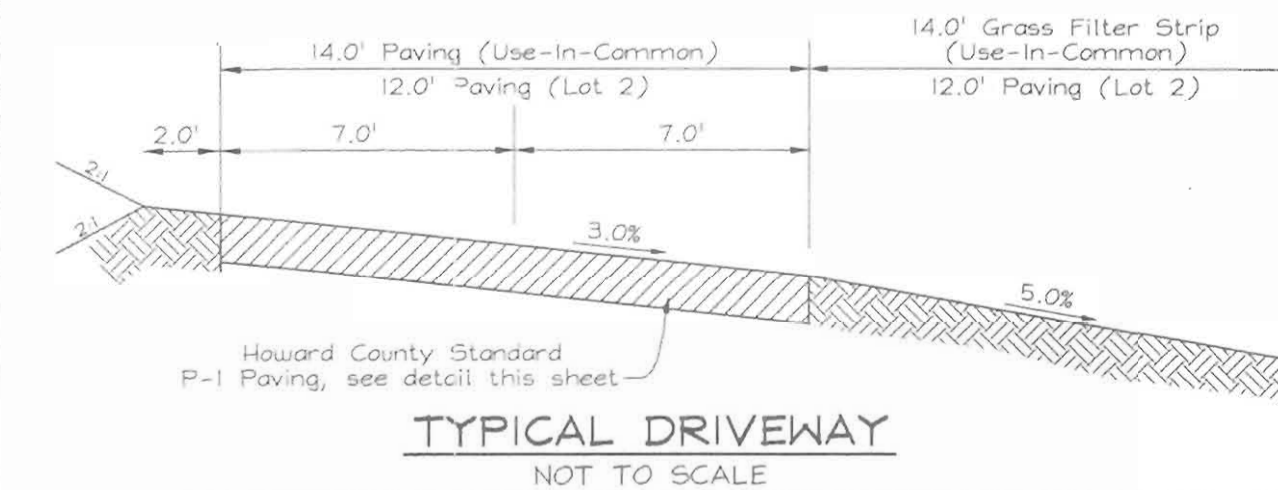
- NOTES**
- SEE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS" FOR ALL MATERIAL, PRODUCT, AND PROCEDURE SPECIFICATIONS.
  - SEE "LANDSCAPE GUIDELINES FOR SUPPORTING TREES LARGER THAN 2-1/2" CALIPER.
  - PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
  - KEEP MULCH 1" FROM TRUNK.
  - SEE ARCHITECTURAL PLANS FOR ADDITIONAL PLANTINGS WHICH EXCEED HOWARD COUNTY MINIMUM REQUIREMENTS.
  - TREES ARE NOT TO BE PLANTED OVER PRIVATE SEWAGE EASEMENT.



**TYPICAL TREE PLANTING AND STAKING**  
DECIDUOUS TREES UP TO 2-1/2" CALIPER NOT TO SCALE

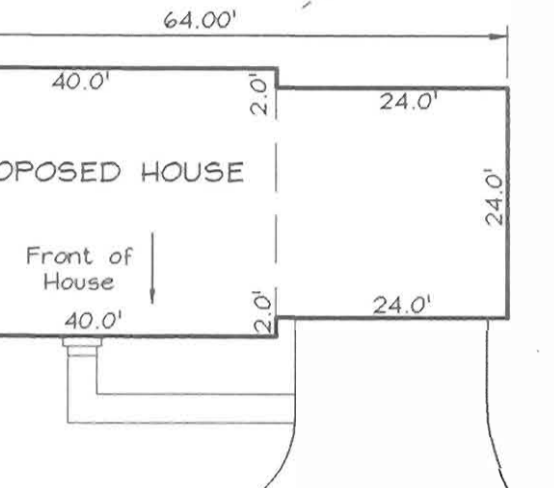


**TYPICAL EVERGREEN TREE PLANTING DETAIL**  
NOT TO SCALE



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signatures]*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DIRECTOR



**HOUSE TEMPLATES**  
SCALE: 1"=20'

**LANDSCAPE SCHEDULE**

KEY	QUAN.	BOTANICAL NAME	SIZE	NOTE
1	1	Quercus coccinea "Scarlet Oak"	2 1/2"-3" Cal.	B # B
2	2	Acer rubrum October Glory Red Maple	2 1/2"-3" Cal.	B # B
3	3	Thuja occidentalis "Eastern Arborvitae"	6'-8" HI.	B # B

- LANDSCAPE NOTES**
- At the time of installation, 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 Landscaping 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.
  - The owner, tenant, and/or their agents shall be responsible for maintenance of the required landscaping, including both plant materials and berms, fences and walls. All plant materials shall be maintained in good growing condition, and when necessary, replaced with new materials to ensure continued compliance with applicable regulations. All other required landscaping shall be permanently maintained in good condition, and when necessary, repaired or replaced.
  - Posting of surety for required landscaping in accordance with Section 16.124 of the Landscape Manual in the amount of \$1,350.00 for 3 shade trees and 3 evergreen trees on Lot 2.

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

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE(1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

*[Signatures]*  
SIGNATURE OF DEVELOPER/BUILDER  
DATE

**PLAN VIEW**  
SCALE: 1"=20'

**SCHEDULE A PERIMETER LANDSCAPE EDGE**

CATEGORY	ADJACENT TO ROADWAYS		ADJACENT TO PERIMETER PROPERTIES	
	2	4	3	1
Perimeter/Frontage Designation	N/A	N/A	A	N/A
Linear Feet of Roadway	-	112.4	179.9	-
Frontage/Perimeter	-	Yes***	Yes*	-
Credit for Existing Vegetation (Yes, No, Linear Feet)	-	0	88.4	-
Remaining Perimeter Length (Yes, No, Linear Feet)	-	(107)	(91.6)	-
Remaining Perimeter Length (Yes, No, Linear Feet)	-	NO	NO	-
Number of Plants Required				
Shade Trees	1:50	2	1:60	2
Evergreen Trees	1:40	3	-	-
Shrubs	-	-	-	-
Number of Plants Provided				
Shade Trees	-	1***	2	-
Evergreen Trees	-	3	-	-
Other Trees (2:1 Substitution)	-	-	-	-
Shrubs (10:1 Substitution)	-	-	-	-
(Describe Plant Substitution Credits Below if needed)	-	-	-	-

**OWNER**  
DAVE & JENNIFER MERKE  
7823 Whistling Pines  
Ellicott City, MD 21043

**DEVELOPER**  
JULIUS GROUP LLC  
1263 Beags Road  
Westminster, Maryland 21157  
410.259.2093

**ADDRESS CHART**

LOT	STREET
2	6511 Caravan Court

**SITE ANALYSIS DATA CHART**

- Total project area 0.58 Acres
- Area of plan submission: 0.65 Acres
- Limit of disturbed area 0.48 Acres
- Subject property zoned R-20 per 02/02/04 Comprehensive Zoning Plan
- Proposed uses for site: structures: single family detached
- Floor space on each level of building(s) per use: See house templates this sheet
- Total number of units allowed: 1
- Total number of units proposed: 1
- Proposed building coverage of site: 0.09 acres; 15% of gross lot area
- Existing building coverage of site: 0.05 acres; 9% of gross lot area
- Howard County file references: Contr.#34-1928-D; Contr.#34-1985-D; Contr.#34-3273; Contr.# 44-3305-D; F-05-046

**PERMIT INFORMATION CHART**

Subdivision Name:	Section/Area	Lot No.
B. Johnson Property	N/A	2
Plot #	Grid	Zoning
17544	23	R-20
Water Code	Tax Map No.	Elect. District
	35	5th
	Sewer Code	Census Tract
		6056.02
		6580000

**GENERAL NOTES**

- Property is within the Metropolitan District.
- Public water and sewer will be used within this site.
- The Contractor shall notify the following utility companies or agencies at least five(5) working days before starting work shown on these plans:
 

Verizon	1.800.743.0033/410.224.9210
AT&T	1.800.252.1133
State Highway Administration	410.531.5533
BGE(Contractor Services)	410.850.4620
BGE(Underground Damage Control)	410.787.9068
Gas Utility	1.800.257.7777
Colonial Pipeline Company	410.785.1940
Howard County, Dept. of Public Works, Bureau of Utilities	410.313.4900
Howard County Health Department	410.313.2640
- The contractor shall notify Miss Utility at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
- 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 lots shown herein comply with the minimum ownership, width and lot area as required by the Maryland State Department of the Environment.
- Boundary and Topographic Survey prepared by FSH Associates in May, 2001.
- Contractor to confirm all dimension, utilities and topography in the field. If any conflicts arise, contact Engineer before beginning any work.
- Howard County Soil Map #24.
- There are no floodplains, streams, cemeteries or wetlands on site.
- Wetlands and stream evaluation conducted on October 7, 2004 by Exploration Research, Inc.
- The project is in conformance with the latest Howard County Standards unless waivers have been approved.
- The coordinates shown herein are based upon the Howard County Geodetic Control which is based on the Maryland State Plane Coordinate system. Howard County monument numbers 3513 and 41CC were used for this project.
- In accordance with section 128 of the Howard County Zoning Regulations, bay windows, chimneys, or exterior stairways not more than 16 feet in width may project not more than 4 feet into any setbacks. Porches, or decks, open or enclosed may project not more than 10 feet into the front or rear yard setback. B.R.L.'s shown taken from Howard County Zoning Regulation for the Zoning District.
- Driveway(s) shall be provided prior to issuance of a use and occupancy permit for any new dwelling to insure safe access for fire and emergency vehicles per the following (minimum) requirements:
  - Width-12 feet (14' serving more than one residence).
  - Surface-6 inches of compacted crusher run base with 1 1/2" Min. tar and chip coating.
  - Geometry-max. 14% grade, max. 10% grade change, and 45 foot turning radius.
  - Structures (bridges/culverts)-capable of supporting 25 gross tons (H25-loading).
  - Drainage elements-capable of safely passing 100 year flood with no more than one foot depth over driveway surface
  - Structure clearance-minimum 12 feet.
  - Maintenance-sufficient to insure all weather use.
- All Sewer House Connections to be a minimum of 1% and a maximum of 3%. If no slope is shown, 2.0% may be assumed.
- This project is subject to the Amended Fifth Edition of the Subdivision and Land Development Regulations. Development or Construction on this parcel must comply with Setback and Buffer Regulations in effect at the time of submission of the SDP, Waiver Petition Application, or Building / Grading Permit.
- 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 required landscaping is part of the developer's agreement in the amount of \$1,350.00 (3 shade trees @ \$300.00 each and 3 evergreens @ \$150.00 each).
- In accordance with section 16.1202.(b).(1).(viii) of the subdivision and land development regulations, this subdivision is exempt from the requirements of Section 16.1200 of the Howard County Code for Forest Conservation.
- The Subject Property is zoned R-20 per the 02/02/04 Comprehensive Zoning Plan per Council Bill 75-2003.
- Stormwater Management for this site is provided as follows:
  - This site is exempt from providing protection (Cpv).
  - Water Quality (N/Qv) and Recharge (Rev) for Lot 2 are provided by two bioretention facilities, these facilities are privately owned and maintained by lot 2.
- Provide Residential Driveway Apron per Howard County Standard Detail R-6.03.
- The existing accessory structure on Lot 2 is to remain. The intended use of the building is for storage. A Temporary Use (TU-05-003) was granted by the Dept. of Planning and Zoning to allow the building to remain on Lot 2 while undergoing subdivision.
- Forest Conservation requirements have been provided for under F-05-046.
- The existing block retaining wall to remain is less than 3.0 feet high.
- Steep slopes (25% or greater) occupy 370 square feet of area on Lot 2.
- A letter of permission for the off-site grading was signed by the owner of Lot 1 of the B. Johnson Property subdivision.

**SITE DEVELOPEMENT PLAN AND LANDSCAPING DETAILS**  
**B. JOHNSON PROPERTY**  
LOT 2

TAX MAP 35 GRID 23  
5TH ELECTION DISTRICT

PARCEL 118  
HOWARD COUNTY, MARYLAND

**FSH Associates**  
Engineers Planners Surveyors  
8318 Forrest Street Ellicott City, MD 21043  
Tel: 410-750-2251 Fax: 410-750-7350  
E-mail: info@fsh.biz

DESIGN BY: PS  
DRAWN BY: HK  
CHECKED BY: ZYF  
SCALE: As Shown  
DATE: Dec 14, 2005  
I.C. No.: 3304  
SHEET No. 1 of 3



**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 vegetation growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

**Conditions Where Practice Applies:**

- The practice is limited to areas having 21% or flatter slopes where:
  - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
  - The soil moisture is so shallow that the rooting zone is deep enough to sustain annual perennials and/or shrubs.
  - The original soil to be treated contains materials toxic to plant growth.
  - The soil is so acidic that vegetation with lime tolerance is not feasible.
- For the purpose of these Standards and Specifications, areas having slopes greater than 21% require special consideration and design for adequate stabilization. Areas having slopes steeper than 21% shall have the appropriate stabilization shown on the plans.

**Construction and Material Specifications:**

- 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 representative soil profile section in the Soil Survey published by USDA-NRCS in cooperation with Maryland Agricultural Experiment Station.
- Topsoil Specifications - soil to be used as topsoil must meet the following:
  - Topsoil shall be free of stumps or plant parts such as Bermuda grass, quackgrass, johnsongrass, nutgrass, poison ivy, or other noxious weeds.
  - Where the subsoil is either highly acidic or composed of other materials, the topsoil shall be spread at the rate of 4-8 tons/acre (2000-4000 pounds per 1000 square feet) prior to the placement of topsoil. It shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following practices.

**SEDIMENT CONTROL NOTES**

- A minimum of 48 hours notice must be given to the Howard County Department of Inspection, Licenses and Permits, Sediment Control Division prior to the start of any construction (313-1955).
- All vegetation and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1993 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
- Following initial soil disturbance or radiolandscape, permanent or temporary stabilization shall be completed within (a) calendar days for all perimeter stabilization structures, dikes, perimeter slopes, and all slopes greater than 3:1 (b) 14 days for all other disturbed or graded areas on the project site.
- All sediment traps/basins shall be fenced and warning signs posted around their perimeter in accordance with Vol. 1, Chapter 7, HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
- All disturbed areas must be stabilized within the time period specified above in accordance with STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding and mulching (see 6.0). Temporary stabilization with mulch or other means shall be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
- All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
- Site Analysis:
 

Total Area	0.584 Acres
Area Disturbed	0.476 Acres
Area to be roofed or paved	0.290 Acres
Area to be vegetatively stabilized	0.604 Acres
Total Cut	2644 CY
Total Fill	122 CY
- On-site water/borrow area location
- Any sediment control practice which is disturbed by grading activity for utilities or other purposes shall be replaced and/or repaired prior to the start of any construction.
- On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment control structures, but in any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until the inspection agency has approved the project.
- Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and one working day, whichever is shorter.
- Earthwork quantities are solely for the purpose of calculating fees. Contractor to verify all quantities prior to the start of construction.
- As determined by contractor with pre-approval of the Sediment Control Inspector with an approved and active grading permit.

**PERMANENT SEEDING NOTES**

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE EARTH DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

**SEEDBED PREPARATION:** Loosen upper three inches of soil by raking, grading or other acceptable means before seeding, if not previously loosened.

**SOIL AMENDMENTS:** In lieu of soil test recommendations, use one of the following schedules:

- Preferential - Apply 2 tons per acre dolomitic limestone (92 lbs/100 sq ft.) and 600 lbs per acre 10-10-10 fertilizer (14 lbs/100 sq ft.) before seeding. Harrow or disc into upper three inches of soil. At the time of seeding, apply 400 lbs per acre 32-0-0 urea/ammonia fertilizer (14 lbs/100 sq ft.).
- Acceptable - Apply 2 tons per acre dolomitic limestone (92 lbs/100 sq ft.) and apply 600 lbs per acre 10-10-10 fertilizer (14 lbs/100 sq ft.) before seeding. Harrow or disc into upper three inches of soil.

**SEEDING:** For seed periods March 1 thru April 30 and August 1 thru October 15, seed with 80 lbs. per acre (1.4 lbs/100 sq ft.) of Kentucky 31 Tall Fescue per acre and 2 lbs. per acre (0.04 lbs/100 sq ft.) of annual ryegrass. For seed periods from October 15 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 seed 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 100 lbs/1000 sq ft.) of certified small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 20 gallons per acre (5 gal/1000 sq ft.) of emulsified asphalt on flat areas. On slopes 6 feet or higher, use 340 gallons per acre (8 gal/1000 sq ft.) of emulsified asphalt.

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

**TEMPORARY SEEDING NOTES**

**SEEDBED PREPARATION:** Loosen upper three inches of soil by raking, grading or other acceptable means before seeding, if not previously loosened.

**SOIL AMENDMENTS:** Apply 600 lbs. per acre 10-10-10 fertilizer (14 lbs/100 sq ft.).

**SEEDING:** For seed periods March 1 thru April 30 and from August 15 thru November 15, seed with 2 1/2 bushel per acre of annual ryegrass (3.2 lbs/1000 sq ft.) for the period May 1 thru August 15, seed with 3 lbs. per acre of urea/ammonia fertilizer (14 lbs/1000 sq ft.). For the period November 15 thru February 28, protect site by applying 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring, or use seed.

**MULCHING:** Apply 1 1/2 to 2 tons per acre (70 to 100 lbs/1000 sq ft.) of certified small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 20 gallons per acre (5 gal/1000 sq ft.) of emulsified asphalt on flat areas. On slopes 6 feet or higher, use 340 gallons per acre (8 gal/1000 sq ft.) of emulsified asphalt for anchoring.

REFER TO THE 1993 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATES AND METHODS NOT COVERED.



**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	SOIL GROUP
MgB2	Minor gravelly loam, 3 to 8 percent slopes, moderately eroded	B
MID2	Minor loam, 15 to 25 percent slopes, moderately eroded	B
MID3	Minor loam, 15 to 25 percent slopes, severely eroded	B
MtF	Minor very stony loam, 25 to 60 percent slopes	B

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

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE(1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

Signature: *[Signature]* DATE: 12/15/05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Signature: *[Signature]* DATE: 1/4/06  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

Signature: *[Signature]* DATE: 1/4/06  
 CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *[Signature]* DATE: 1/16/06  
 DIRECTOR

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

Signature: *[Signature]* DATE: 1/5/06  
 USA-NATURAL RESOURCES CONSERVATION SERVICE

Signature: *[Signature]* DATE: 1/5/06  
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT

Signature: *[Signature]* DATE: 1/5/06  
 HOWARD SCD

**ENGINEERS 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 SOIL CONSERVATION DISTRICT.

Signature: *[Signature]* DATE: 12.15.05  
 SIGNATURE OF ENGINEER

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

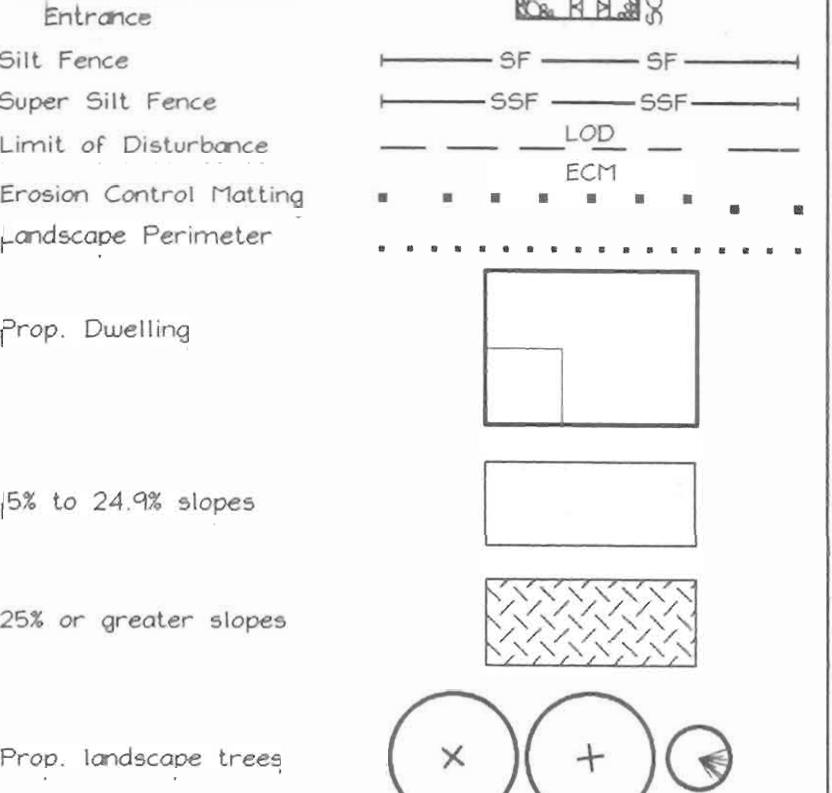
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

Signature: *[Signature]* DATE: 12/15/05  
 SIGNATURE OF DEVELOPER/BUILDER

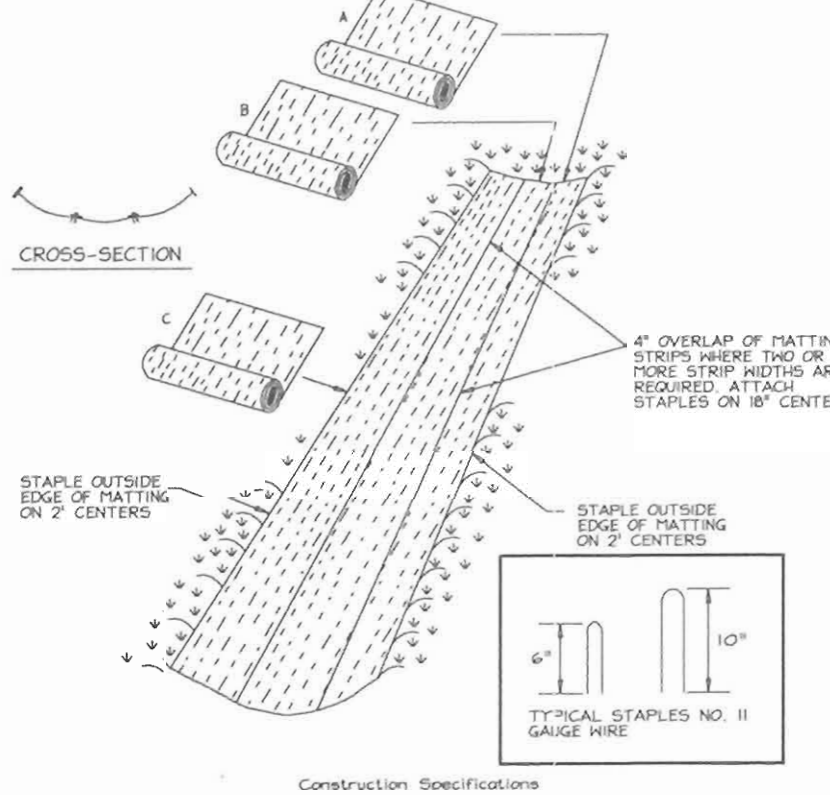
**SEQUENCE OF CONSTRUCTION**

- Obtain grading permit.
- Notify Howard County Department of Inspections, License and Permits at (410) 313-1880 at least 24 hours before starting any work.
- Install Stabilized Construction Entrance, Silt Fence and Super Silt Fence, (1 week).
- Begin house construction, construct driveway, fine grade site, construct Bio Retention Facilities and install Erosion Control Matting. (3 months)
- During grading and after each rainfall, contractor will inspect and provide necessary maintenance to the sediment control measures on this plan.
- Upon stabilization of all disturbed areas and with the permission of the Sediment Control Inspector, remove all sediment control measures and stabilize any remaining disturbed area. (1 week)
- Temporary stabilization shall be completed within:
  - 7 calendar days for all perimeter stabilization control structures, dikes, silt fences and all slopes greater than 3:1
  - 14 calendar days for all other disturbed areas

**LEGEND**

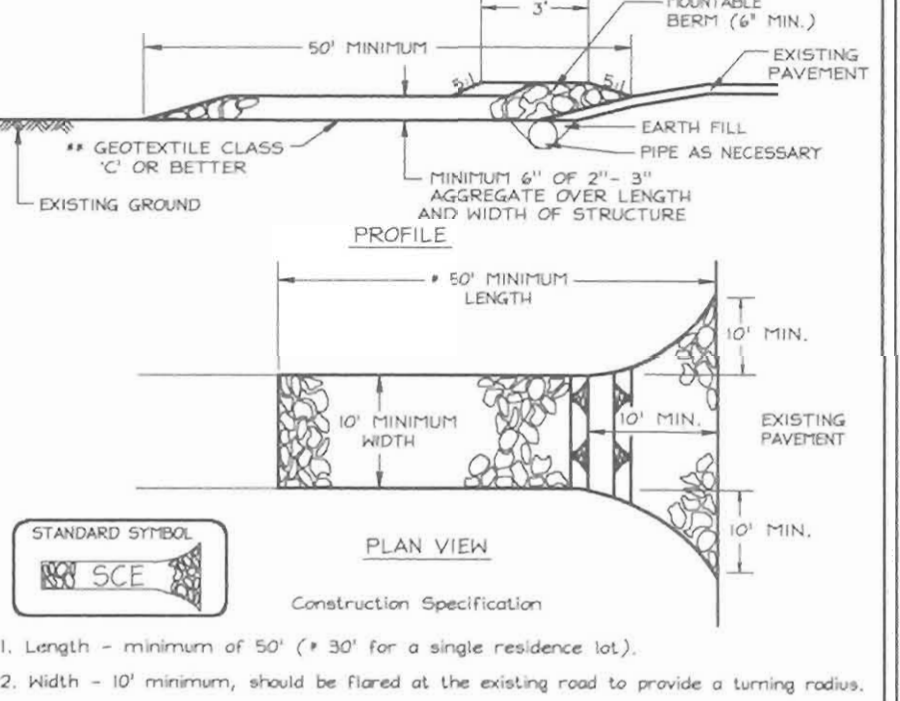


**DETAIL 30 - EROSION CONTROL MATTING**



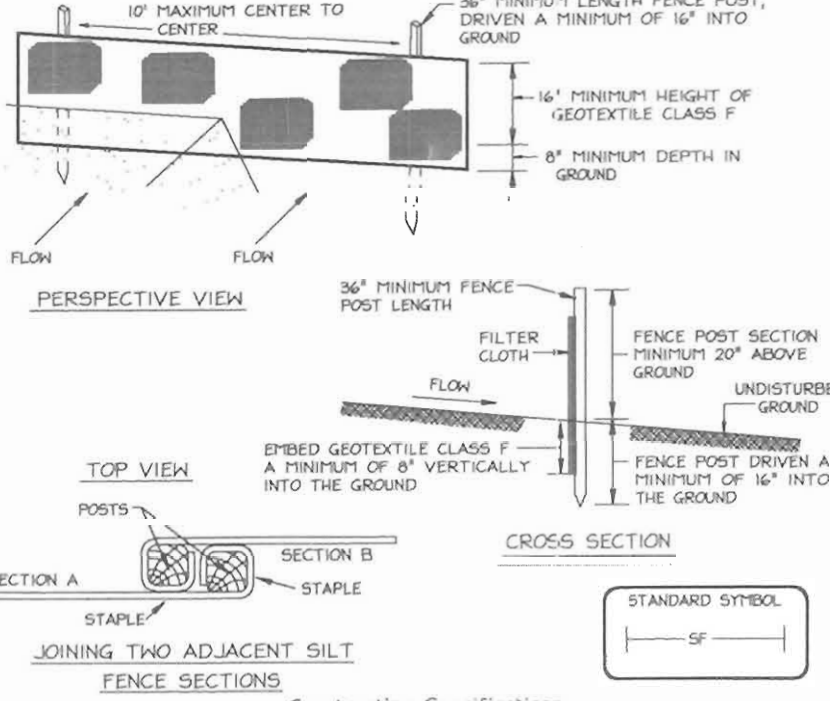
- Construction Specifications:**
- Key-in the matting by placing the top ends of the matting in a narrow trench 4" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with 10" staples about 4" down slope from the trench. Spacing between staples is 6" between staples.
  - Staple the 4' overlap in the channel center using an 10" spacing between staples.
  - Staple the outer edges of the matting, make sure the matting is taut and in firm contact with the soil.
  - Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
  - Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4" shingle fashion. Reinforce the overlap with a double row of staples spaced 4" apart on a staggered system on each side.
  - The discharge end of the matting roll should be similarly secured with 2 double rows of staples.
- Note: If flow will enter from the edge of the matting then the area affected by the flow must be marked with a 'P'.

**DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE**



- Construction Specifications:**
- Length - minimum of 50' (+30' for a single residence lot).
  - Width - 10' minimum, shall be flared at the existing road to provide a turning radius.
  - Geotextile filter (filter cloth) shall be placed over the existing ground prior to placing aggregate. The plan approval authority may not require single family residences to use geotextile.
  - Staples - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent and placed at least 4" deep over the length and width of the entrance.
  - Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 4" of stone over the pipe. Pipe shall be sized according to the drainage when the S.C.E. is located at a high spot and has no drainage to convey, a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed on each side.
  - Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

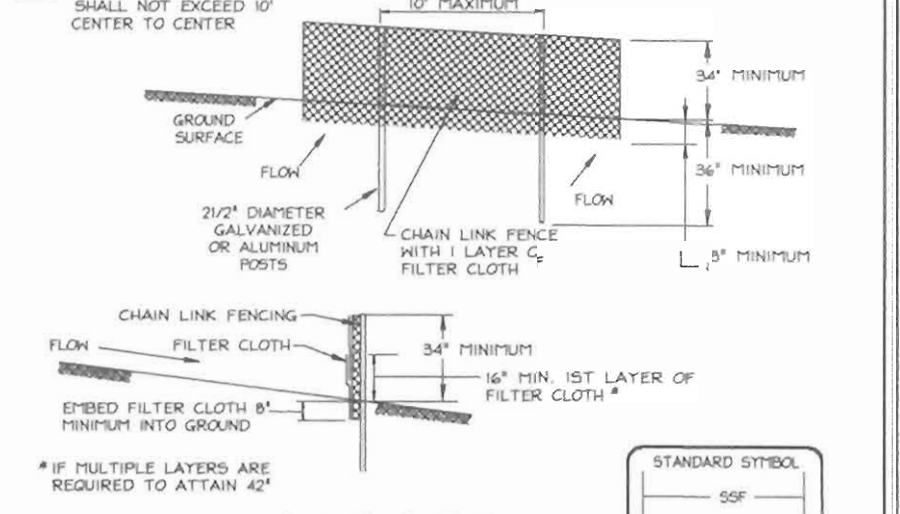
**DETAIL 22 - SILT FENCE**



- Construction Specifications:**
- Fence posts shall be a minimum of 30" long, driven 12" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" (2" vertical) and shall be of sound quality hardwood. Steel posts will be standard 1" x 1" section weighing 100 lbs.
  - Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements:
 

Tensile Strength	50 lbs/in (min.)	Test: TSPST 504
Tensile Modulus	20 lbs/in (min.)	Test: TSPST 504
Flow Rate	0.3 gal ft <sup>2</sup> /minute (max.)	Test: TSPST 522
Filtering Efficiency	75% (min.)	Test: TSPST 522
  - Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
  - Silt Fence shall be inspected after each rainfall event and maintained when needed or when sediment accumulation reaches 50% of the fabric's height.

**DETAIL 33 - SUPER SILT FENCE**



- Construction Specifications:**
- Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 4' fence shall be used, substituting 42" fabric and 6" length posts.
  - Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the end.
  - Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
  - Filter cloth shall be embedded a minimum of 6" into the ground.
  - When two sections of filter cloth adjoin each other, they shall be overlapped by 4" and folded.
  - Maintenance shall be performed as needed and silt buildup removed when 'bulges' develop in the silt fence, or when silt reaches 50% of fence height.
  - Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:
 

Tensile Strength	50 lbs/in (min.)	Test: TSPST 504
Tensile Modulus	20 lbs/in (min.)	Test: TSPST 504
Flow Rate	0.3 gal ft <sup>2</sup> /minute (max.)	Test: TSPST 522
Filtering Efficiency	75% (min.)	Test: TSPST 522
  - Silt Fence shall be inspected after each rainfall event and maintained when needed or when sediment accumulation reaches 50% of the fabric's height.

**SEDIMENT AND EROSION CONTROL, SOILS, LANDSCAPING PLAN AND DETAILS**

**B. JOHNSON PROPERTY**

LOT 2  
 TAX MAP 35 GRID 23  
 5TH ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND  
 PARCEL 118

**OWNER**  
 DAVE & JENNIFER MERKE  
 7823 Whistling Pines  
 Ellicott City, MD 21043

**DEVELOPER**  
 JULIUS GROUP LLC  
 1263 Beags Road  
 Westminister, Maryland 21157  
 410.254.2033

**DESIGN BY:** PS  
**DRAWN BY:** HK  
**CHECKED BY:** ZYF  
**SCALE:** As Shown  
**DATE:** Dec 14, 2005  
**N.O. No.:** 3304  
**SHEET No.:** 2 of 3

**FSH Associates**  
 Engineers Planners Surveyors  
 8318 Forest Street  
 Beltsville, MD 21043  
 Tel: 410-750-2251 Fax: 410-750-7350  
 E-mail: info@fsa.biz

**STATE OF MARYLAND PROFESSIONAL ENGINEER**  
 No. 32025



**SPECIFICATIONS FOR BIORETENTION**

Taken from the Maryland Stormwater Design Manual Volumes I & II, Section B.3.B

**1. Material Specifications**  
The allowable materials to be used in bioretention area are detailed in Table B.3.2 of the 2000 Maryland Storm Water Design Manual, Volumes I & II.

**2. Planting Soil**  
The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05.

The planting soil shall be tested and shall meet the following criteria:  
pH range 5.2 - 7.0  
organic matter 1.5 - 4% (by weight)  
magnesium 35 lb./ac.  
phosphorus (phosphate - P<sub>2</sub>O<sub>5</sub>) 75 lb./ac.  
potassium (potash - K<sub>2</sub>O) 95 lb./ac.  
soluble salts not to exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the standard soil test for pH, phosphorus, and potassium and additional tests of organic matter and soluble salts. A texture analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.

Since different labs calibrate their testing equipment differently, all testing results shall come from the same testing facility.

Should the pH fall out of acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

**3. Compaction**  
It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, using excavation hoes to remove original soil. If bioretention areas are excavated using a loader, the contractor should use wide track or marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and is not acceptable. Compaction will significantly contribute to design failure.

Compaction can be alleviated at the base of the bioretention facility by using a primary tilling operation such as a chisel plow, ripper or subsoiler. These tilling operations are to refracture the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment.

Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the required sand layer. Pump any ponded water before preparing (rototilling) base.

When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rototill the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.

When backfilling the bioretention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grassy bioretention materials with light equipment, such as a compact loader or a dozer/loader with marsh tracks.

**4. Plant Material**  
Recommended plant material for bioretention areas can be found in Appendix A, Section A.2.3, of the 2000 Maryland Storm Water Design Manual, Volumes I & II.

**5. Plant Installation**  
Mulch should be placed to a uniform thickness of 2" to 3". Shredded hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Root stock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so that the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing season only. Stakes should be to equally spaced on the outside of the tree ball.

Grasses and legume seed should be drilled into the soil to a depth of at least one inch. Grass and legume plugs shall be planted following the non-grass ground cover planting specifications.

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water fertility. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rototill urea fertilizer at a rate of 2 pounds per 1000 square feet.

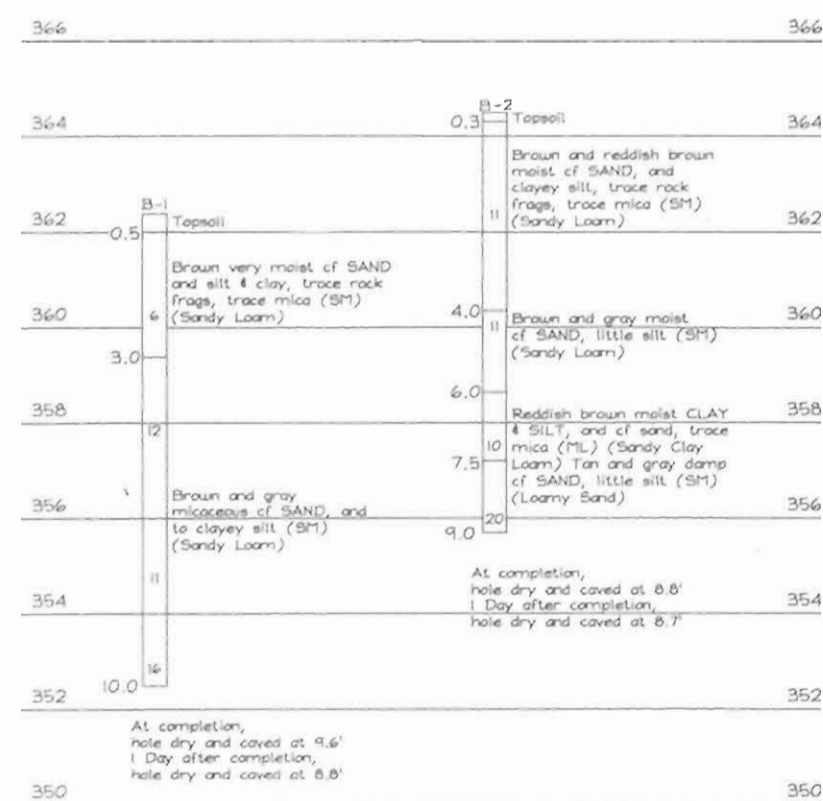
**6. Underdrains**  
Underdrains are to be placed on a 3'-0" wide section of filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of underdrain pipes not terminating in an observation well shall be capped.

The main collector pipe for underdrain systems shall be constructed at a minimum slope of 0.5%. Observation wells and/or clean-out pipes must be provided (one minimum per every 1000 square feet of surface area).

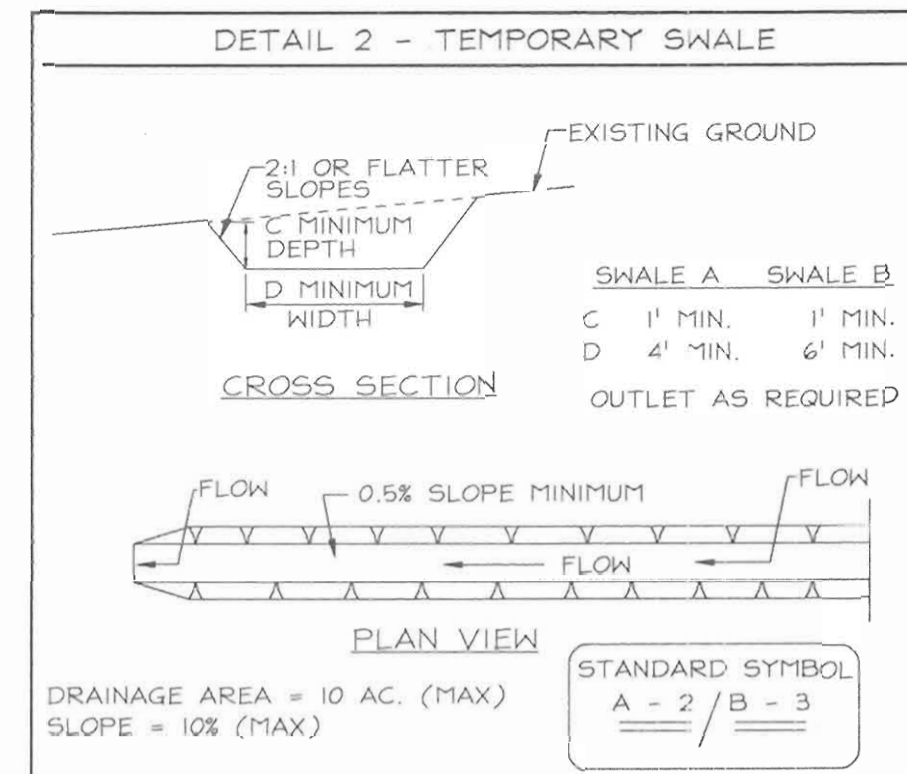
**7. Miscellaneous**  
The bioretention facility may not be constructed until all contributing drainage area has been stabilized.

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS (F-6)**

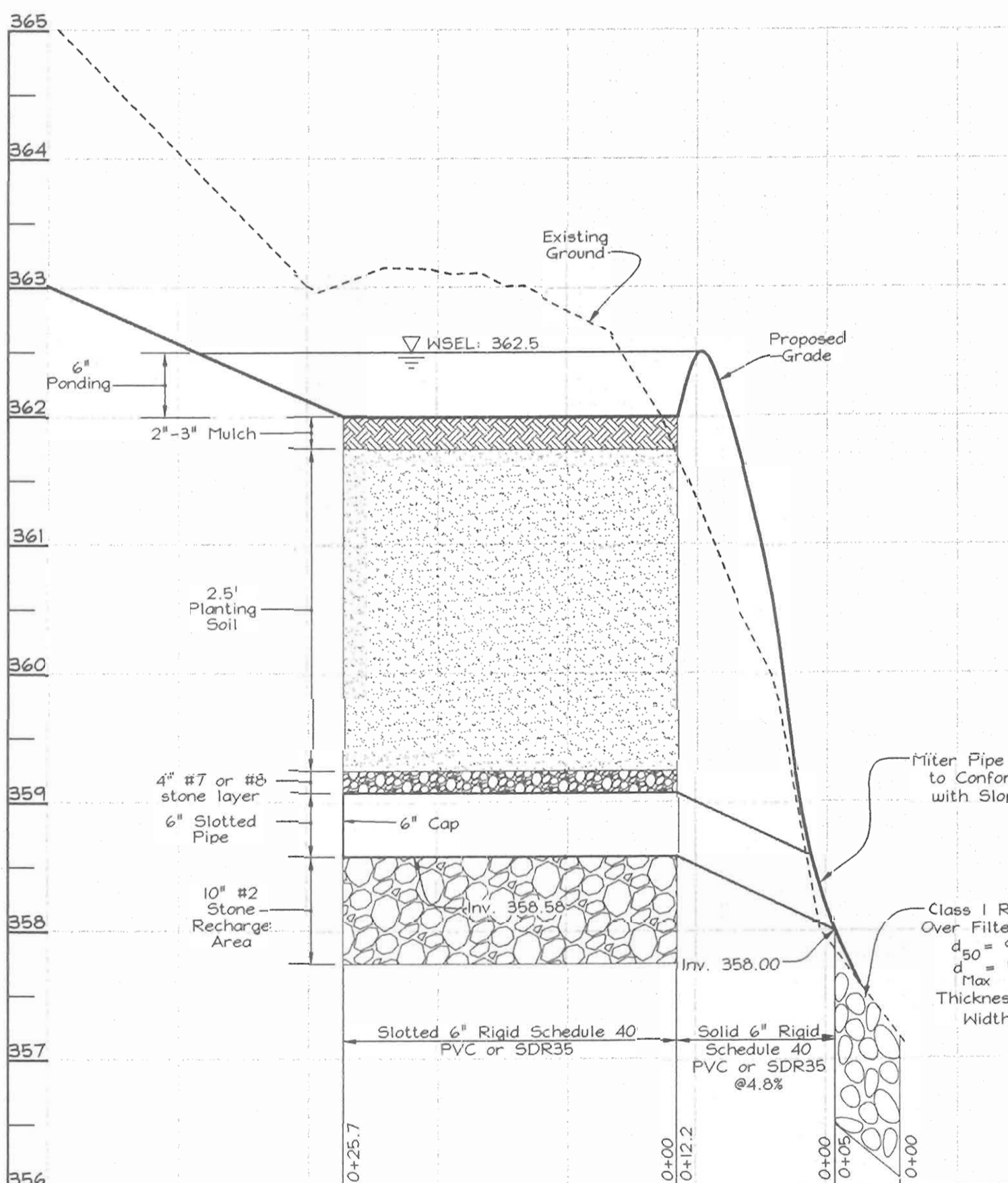
- Annual maintenance of plant material, mulch layer and soil layer if required. Maintenance of mulch and soil is limited to correcting areas of erosion or wash out. Any mulch replacement shall be done in the spring. Plant material shall be checked for disease and insect infestation and maintenance will address dead material and pruning.
- Schedule of plant inspection will be twice a year in spring and fall. This inspection will include removal of dead and diseased vegetation considered beyond treatment, treatment of all diseased trees and shrubs and replacement of all deficient stakes and wires.
- Mulch shall be inspected each spring. Remove previous mulch layer before applying new layer once 2 to 3 years.
- Soil erosion to be addressed on an as needed basis, with a minimum of once per month and after heavy storm events.



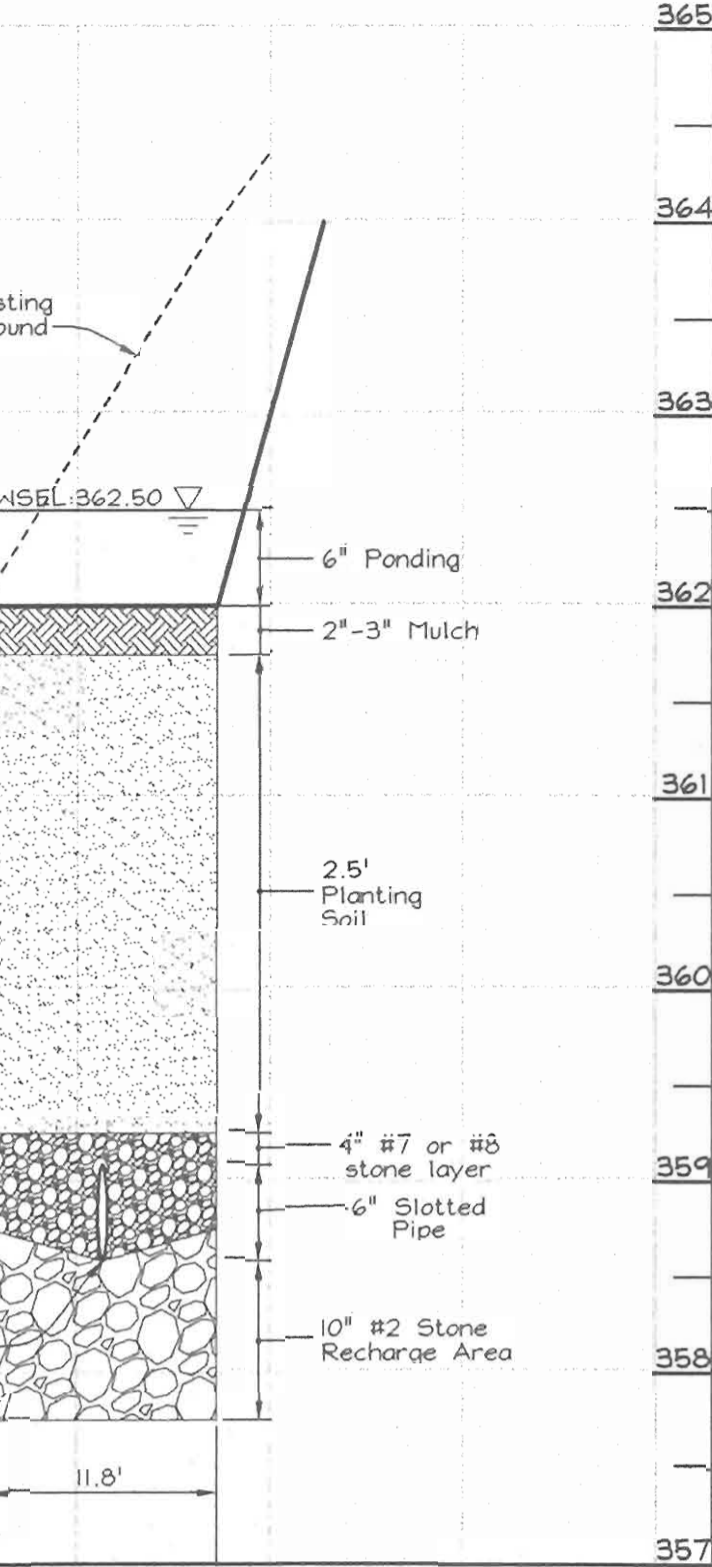
**S.W.M. BORING PROFILES**  
NOT TO SCALE



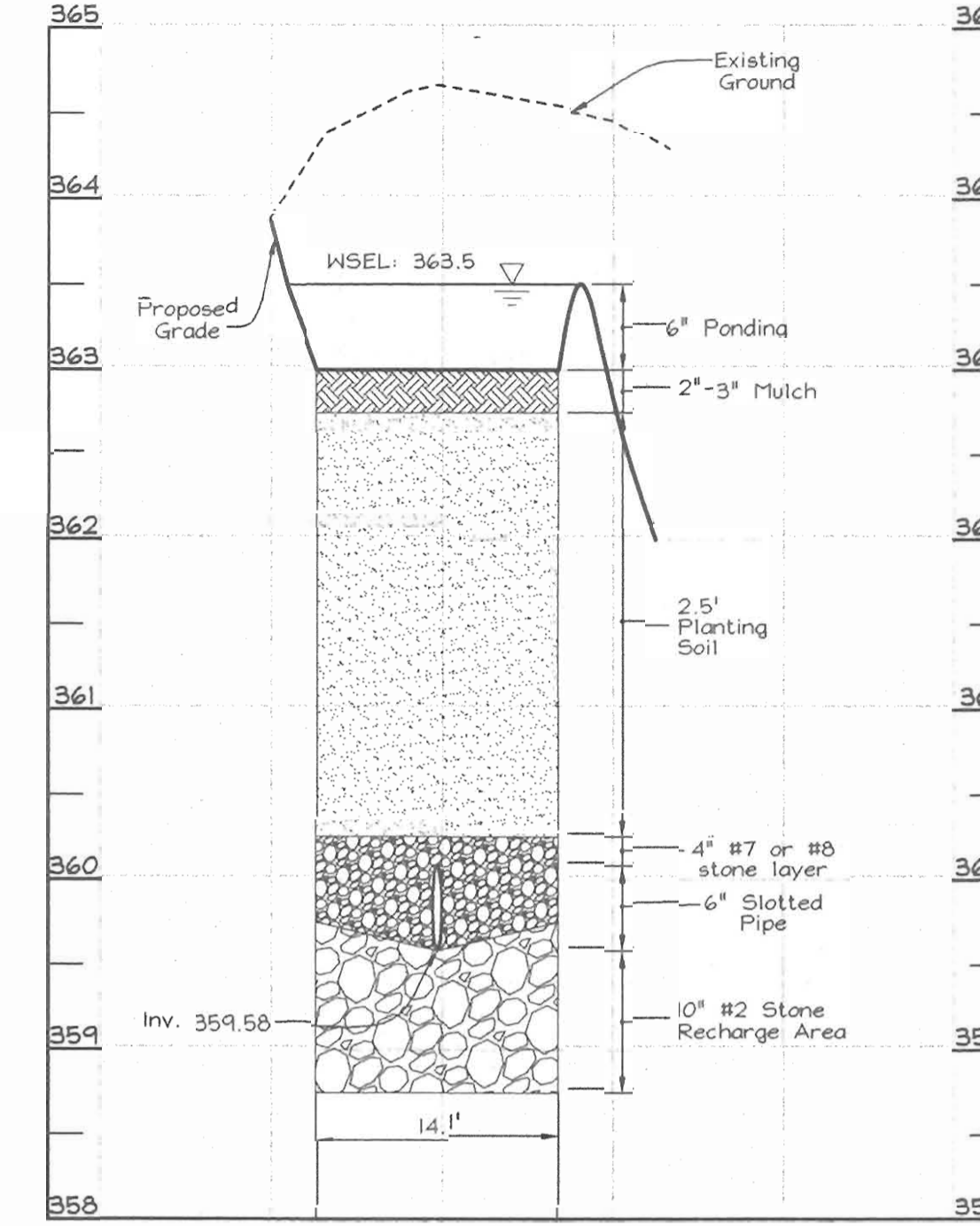
- Construction Specifications**
- Seed and cover with straw mulch.
  - Seed and cover with Erosion Control Matting or line with sod.
  - 4"-7" stone or recycled concrete equivalent pressed into soil in a minimum 7" layer.
- All temporary swales shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
  - Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
  - Runoff diverted from an undisturbed area shall outlet directly into an undisturbed stabilized area at a non-erosive velocity.
  - All trees, brush, stumps, obstructions and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.
  - The swale shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
  - Fill, if necessary, shall be compacted by earth moving equipment.
  - All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the swale.
  - Inspection and maintenance must be provided periodically and after each rain event.
- U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE A-2-4 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



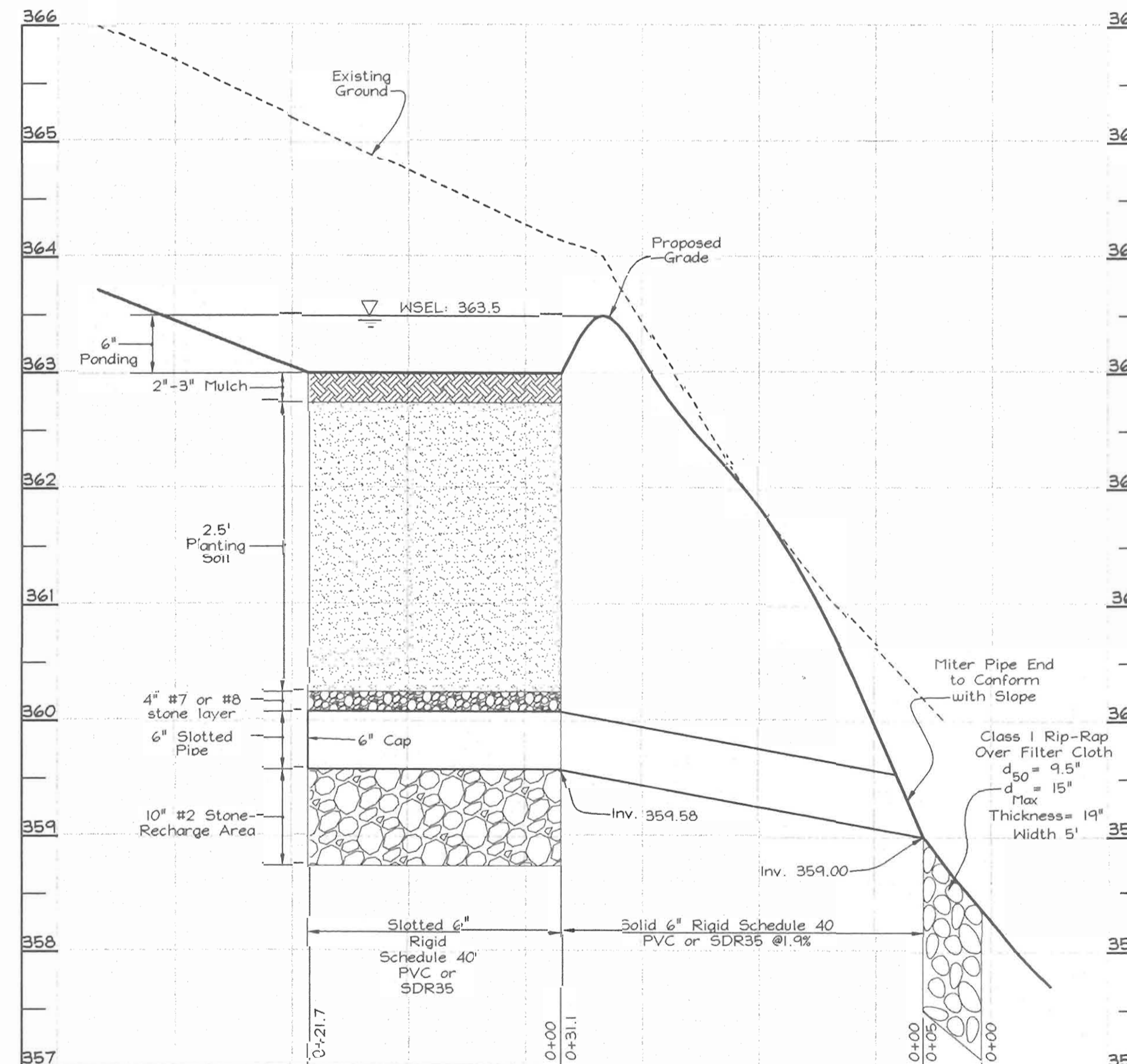
**SECTION B-B**  
Bioretention Facility #1  
Section along Underdrain  
Scale: Hor.: 1"=10'  
Vert.: 1"=1'



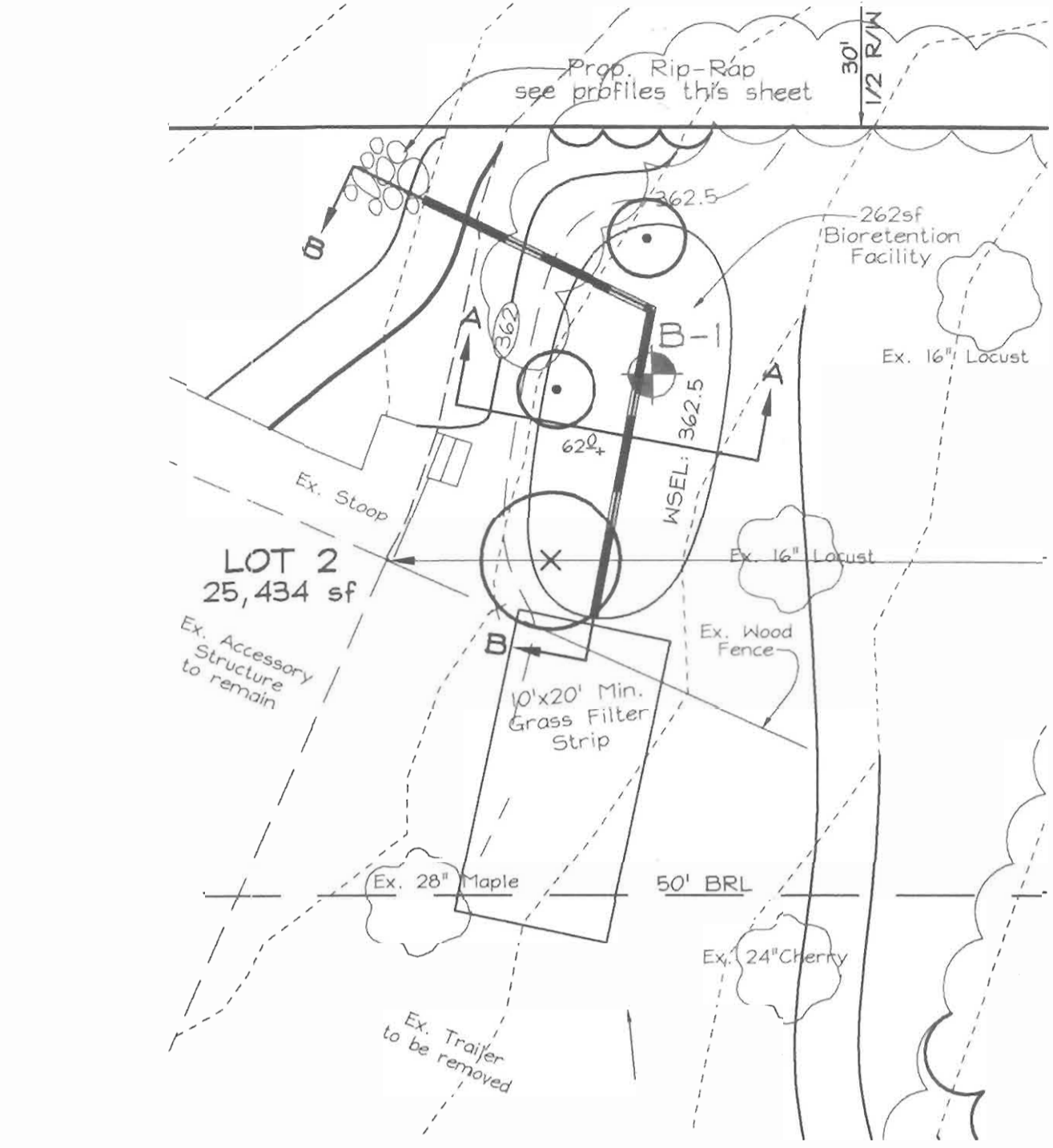
**SECTION A-A**  
Bioretention Facility #1  
Section Through Facility  
Scale: Hor.: 1"=10'  
Vert.: 1"=1'



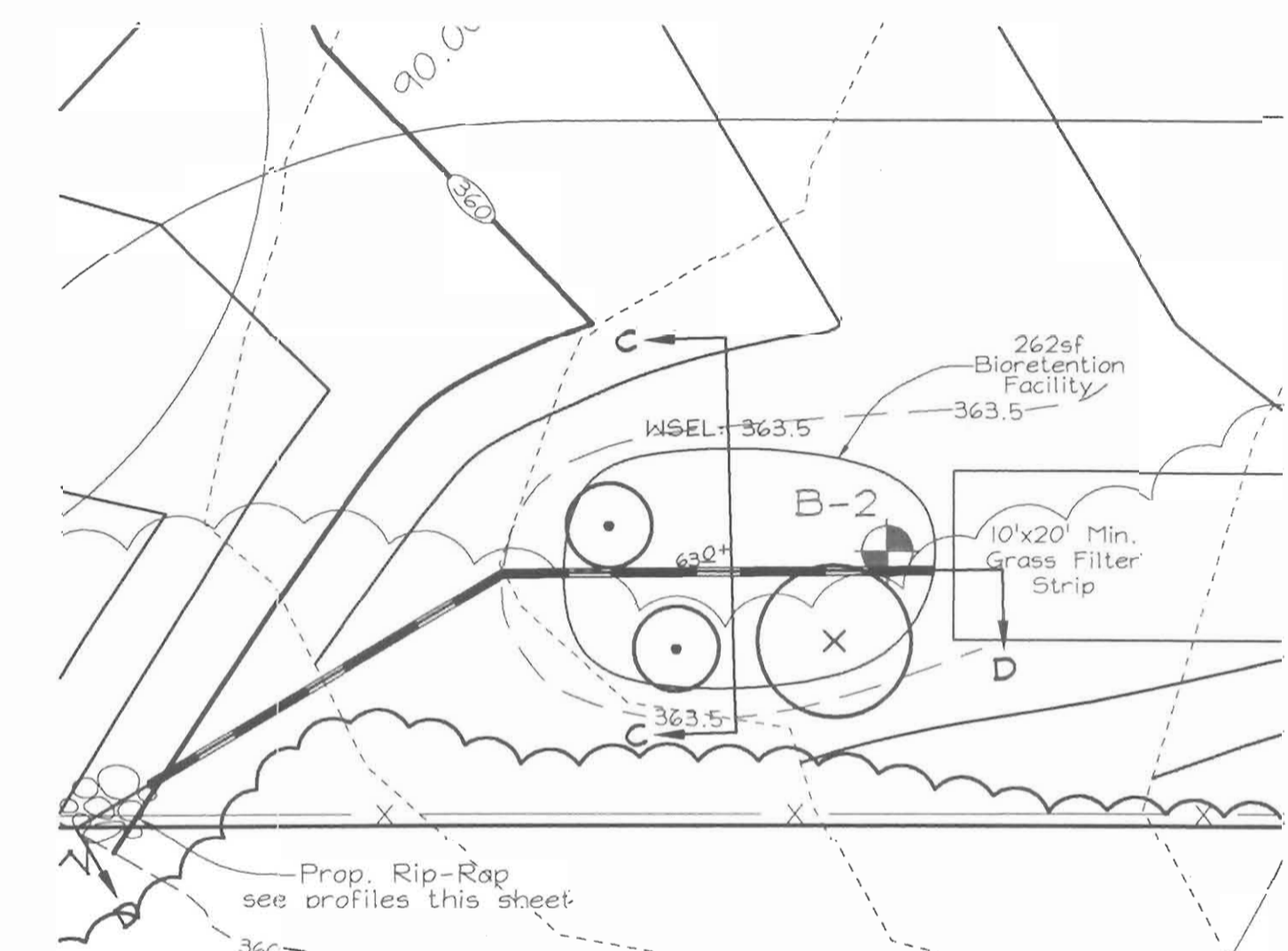
**SECTION C-C**  
Bioretention Facility #2  
Section Through Facility  
Scale: Hor.: 1"=10'  
Vert.: 1"=1'



**SECTION D-D**  
Bioretention Facility #2  
Section along Underdrain  
Scale: Hor.: 1"=10'  
Vert.: 1"=1'



**DETAIL BIORETENTION FACILITY #1**  
Scale: 1"=10'



**DETAIL BIORETENTION FACILITY #2**  
Scale: 1"=10'

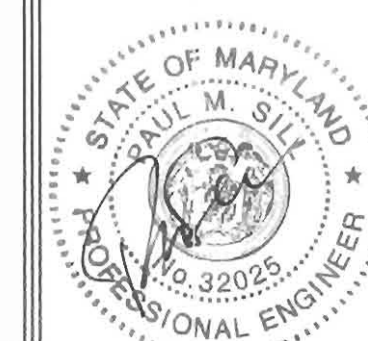
BIORETENTION LANDSCAPE SCHEDULE				
KEY	QUAN.	BOTANICAL NAME	SIZE	NOTE
○	2	Acer rubrum 'October Glory Red Maple'	2 1/2"-3" Cal.	B & B
○	4	Betula nigra 'River Birch'	1 1/2"-2" Cal.	B & B

**BIORETENTION LANDSCAPE NOTES**

- Planting soil mix for Bioretention Facility to be screened topsoil (USDA classified silt loam, sandy loam).
- Bioretention storage area up to elev. 362.5 for Facility #1 and up to elev. 365.0 for Facility #2 to be vegetatively stabilized with Cardinal Flower (Lobelia cardinalis) and Three Square Burchard (Scirpus pungens) to achieve a 50% coverage rate.
- Bioretention storage above elev. 362.5 for Facility #1 and up to elev. 365.0 for Facility #2 to be vegetatively stabilized with Red Top (Agrostis alba) at 1 lb/1000sf.

**BIORETENTION FACILITY CONSTRUCTION NOTES AND DETAILS**  
**B. JOHNSON PROPERTY**  
LOT 2

TAX MAP 35 GRID 23 5TH ELECTION DISTRICT PARCEL 118 HOWARD COUNTY, MARYLAND



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DESIGN BY: PS  
DRAWN BY: HK  
CHECKED BY: ZYF  
SCALE: As Shown  
DATE: Dec. 14, 2005  
W.O. No.: 3304  
SHEET No. 3 OF 3

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division  
*Andy Hamilton* 1/10/06  
Chief, Division of Land Development  
*Mark A. Vogel* 1/10/06  
Director

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

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION, A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.  
*Amelia* 12/15/05

**OWNER**  
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