# THORNTON WOODS OVERLOOK

## LOTS 1-10 AND OPEN SPACE LOT 11 & 12
## FINAL ROAD CONSTRUCTION PLAN
## HOWARD COUNTY, MARYLAND

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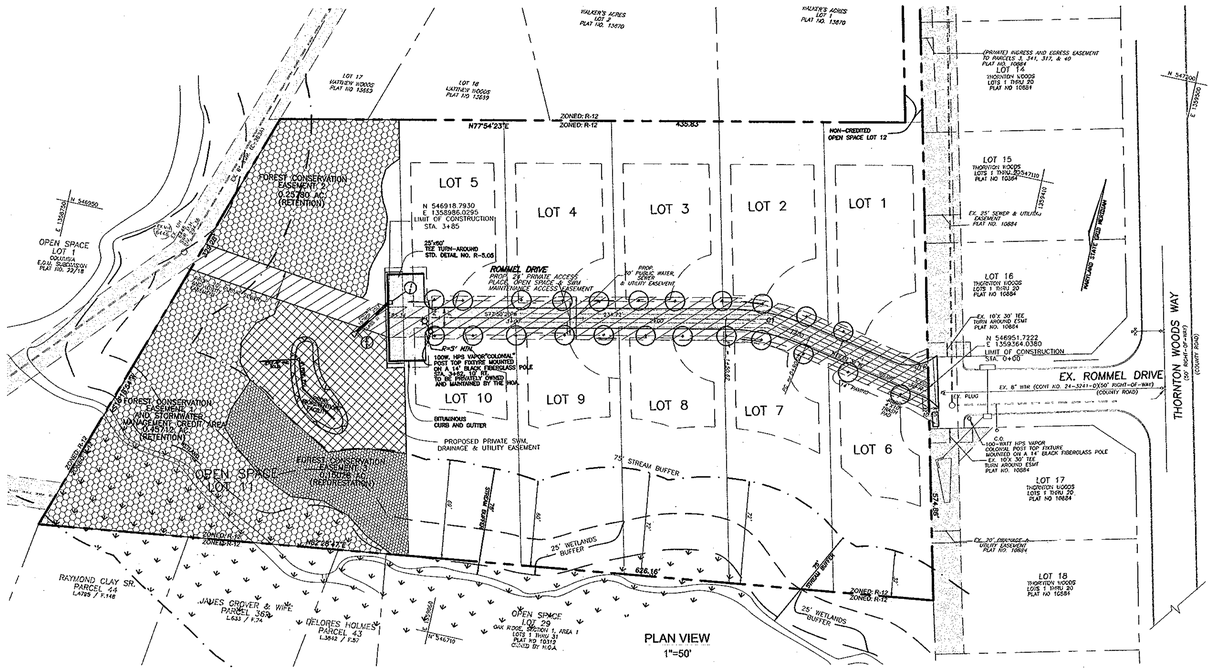
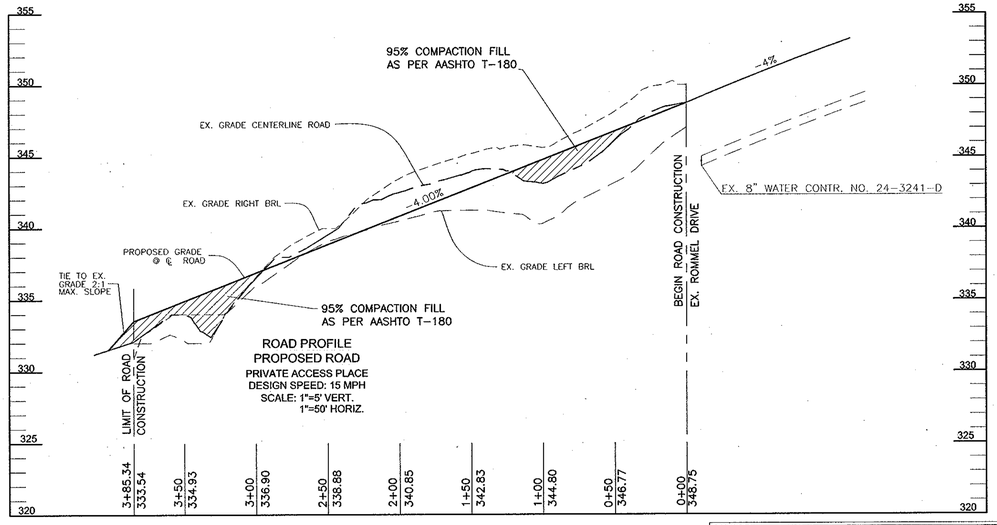
| 3 | SEDIMENT AND EROSION CONTROL DETAILS BIORETENTION SOIL SPECIFICATION |
| 4 | LANDSCAPING, FOREST CONSERVATION, AND SUPPLEMENTAL INFORMATION SHEET |
| 5 | FINAL DRAINAGE AREA MAP |

| CURVE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| CURVE | LENGTH | RADIUS | DELTA ANGLE | TANGENT | CHORD DIRECTION | CHORD LENGTH |
| C1 | 60.57' | 150.00' | 23°8'3" | 30.70' | S89°24'22"W | 60.15' |




ROAD PROFILE
PROPOSED ROAD
PRIVATE ACCESS PLACE
DESIGN SPEED: 15 MPH
SCALE: 1"=5' VERT.
1"=50' HORIZ.

## STORMWATER MANAGEMENT REQUIREMENTS

PRIOR TO CREDITS

DRAINAGE AREA 1:(NO DEVELOPMENT)

| WQv | Cpv | Rev |
|---|---|---|
| N/A | N/A | N/A |

DRAINAGE AREA 2:

| WQv | Cpv | Rev |
|---|---|---|
| 3,235 CF | N/A* | 842 CF |

*Cpv NOT REQUIRED SINCE THE 1YR. DEVELOPED DISCHARGE IS LESS THEN 2CFS.

DRAINAGE AREA 3:(NO DEVELOPMENT)

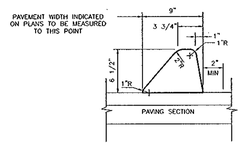
| WQv | Cpv | Rev |
|---|---|---|
| N/A | N/A | N/A |

## SITE DATA

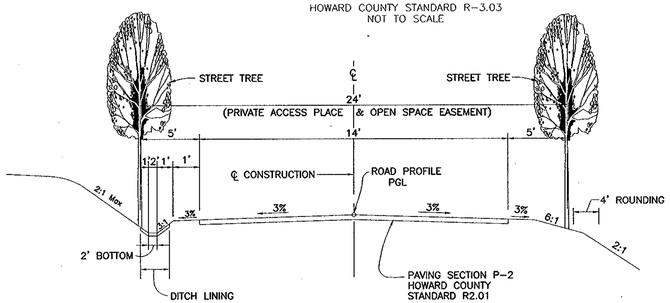
LOCATION: TAX MAP 42 , BLOCK 16, PARCELS 41 & 3
6TH ELECTION DISTRICT
EXISTING ZONING: R-12
GROSS AREA OF PARCEL: 169938 SQ.FT. (3.9057 ACRES)
AREA OF RIGHT OF WAY: 0.00
AREA OF FLOODPLAIN: 0.00
AREA OF STEEP SLOPES: 7939 SQ. FT. (0.1822 ACRES)
NET AREA OF PROJECT: 161999 SQ. FT. (3.7235 ACRES)
NUMBER OF PROPOSED RESIDENTIAL LOTS: 10
AREA OF PROPOSED RESIDENTIAL LOTS: 113412 SQ. FT. (2.67 ACRES)
AREA OF SMALLEST BUILDABLE LOT PROPOSED: 9972 SQ. FT (LOT 2)
NUMBER OF PROPOSED OPEN SPACE LOTS: 2
CREDITED OPEN SPACE: 1.1508 ACRES(293%)
NON-CREDITED OPEN SPACE: 0.0785 ACRES
AREA OF OPEN SPACE REQUIRED: 20% OF GROSS AREA OF PARCEL (0.780 AC.)
TOTAL AREA OF OPEN SPACE PROPOSED: 1.2293 ACRES

## LEGEND

Stream
Stream Buffer
Wetlands
Wetlands Buffer
Spot Elevation +82.53
Direction of Flow
Proposed Street Trees




STANDARD BITUMINOUS CURB
HOWARD COUNTY STANDARD R-3.03
NOT TO SCALE

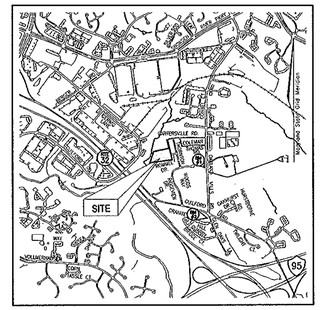



ROMMEL DRIVE
TYPICAL ROADWAY SECTION
CLASSIFICATION : PRIVATE ACCESS PLACE
DESIGN SPEED 15 MPH
STATION 0+00 TO STATION 3+85.34
HOWARD COUNTY STANDARD FIGURE 2.09b
NOT TO SCALE

## BENCHMARKS

BENCHMARK NO. 1: COUNTY CONTROL #42R5
N. 548,777.0609, E. 1,360,3609768
ELEV. = 391.54

BENCHMARK NO. 2: COUNTY CONTROL #42R6
N. 546,822.0895, E. 1,360,340.6529
ELEV. =389.12




## GENERAL NOTES

1. ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. PROJECT BACKGROUND:
   LOCATION: TAX MAP 42 & 3 BLOCK 16 PARCEL '41'
   6TH ELECTION DISTRICT
   ZONING: R-12
   TOTAL TRACT AREA: 3.90 AC
   DEED REFERENCE : PARCEL 41: 6212/418, PARCEL 3: 6212/415
   NUMBER OF PROPOSED LOTS: 10 RESIDENTIAL LOTS, 2 OPEN SPACE LOTS
   APPLICABLE DPZ FILE NUMBERS: WP-01-85, S-01-07, P-01-26
3. THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY VOGEL & ASSOCIATES DATED FEB. 10, 1999.
4. THE TOPOGRAPHY SHOWN HEREON IS BASED ON FIELD RUN TOPOGRAPHY PREPARED BY VOGEL & ASSOCIATES DATED FEB. 10, 1999.
5. WATER AND SEWER FOR THIS PROJECT WILL BE PUBLIC.
   WATER WILL BE ACCESSED THROUGH CONTRACT NO. 24-3241-D.
   SEWER WILL BE ACCESSED THROUGH CONTRACT NO. C-383A
6. STORMWATER MANAGEMENT TO BE PROVIDED FOR THE DEVELOPMENT BY BIORETENTION.
   THE FACILITY WILL BE LOCATED ON OPEN SPACE LOT 11 AND WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
   THE WATERSHED IS THE PATUXENT RIVER AREA, 02-13-11 AND THE STREAM USE IS CLASS I-P.
7. WETLANDS DELINEATED BY ECO-SCIENCES 09-27-00.
8. THERE ARE NO FLOODPLAINS ON SITE.
9. FOREST STAND DELINEATION PLAN PREPARED BY VOGEL & ASSOCIATES, INC. DATED OCTOBER 18, 2000.
10. APFO TRAFFIC STUDY PREPARED BY THE TRAFFIC GROUP DATED OCTOBER 2000.
11. THERE ARE NO STEEP SLOPES ONSITE WITH A CONTIGUOUS AREA OF 20,000 SF OR GREATER.
12. STREET LIGHTS ARE PROVIDED IN THIS DEVELOPMENT IN AND ARE TO BE PRIVATELY OWNED AND MAINTAINED BY THE HOA.
13. EXISTING UTILITIES WERE LOCATED PER COUNTY DRAWINGS AND FIELD RUN SURVEY.
14. THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
15. OPEN SPACE LOTS 11 & 12 WILL BE OWNED BY THE HOMEOWNERS ASSOCIATION.
16. TRASH COLLECTION AND RECYCLING WILL BE CURBSIDE PICKUP AT COUNTY ROADWAY. THE TRASH PAD AND PLANTINGS IS TO BE MAINTAINED BY THE HOA.
17. SECTION 16.120(c)(2)(i) OF THE ZONING REGULATIONS WAIVED AS PER WP-01-85 TO PERMIT THE MINIMUM PUBLIC ROAD FRONTAGE OF 20 FT FOR A NON-PIPESTEM RESIDENTIAL LOT THAT CANNOT BE FURTHER SUBDIVIDED TO BE REDUCED TO 10.4 FT FOR LOT 1 AND 14 FT FOR LOT 6. SECTION 16.121(a)(1) WAIVED AS PER WP-01-85 TO PERMIT THE REQUIRED 40 FT OF PUBLIC ROAD FRONTAGE FOR OPEN SPACE 11 WHERE PEDESTRIAN AND MAINTENANCE VEHICLE ACCESS WILL OCCUR TO BE REDUCED TO ZERO FEET. WAIVER IS SUBJECT TO COMPLIANCE WITH THE FOLLOWING CONDITIONS:
   A. THE 24'-35' PRIVATE ACCESS PLACE SHALL PROVIDE VEHICULAR AND PEDESTRIAN ACCESS TO LOTS 1-10 AND HOA OWNED OPEN SPACE LOT 11.
   B. THE 24'-35' PRIVATE ACCESS PLACE EASEMENT AT THE T-TURNAROUND ON LOTS 5 & 10 SHALL BE WIDENED 2-5 FT EASTWARD IN ORDER TO PROVIDE AN ADEQUATE EASEMENT AREA FOR THE PURPOSE OF MAINTAINING THE T-TURN AROUND AREA ON THESE LOTS.
   WP-01-85 APPROVAL DATED MARCH 9, 2001.
   S-01-07 APPROVAL DATED APRIL 20, 2001.
18. BASED ON THIS PLAN BEING SUBMITTED PRIOR TO 11/15/01, ON 06/28/01, IT (AND THE SUBDIVISION) IS "GRANDFATHERED" AND SUBJECT TO COMPLIANCE WITH THE FOURTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. IN ADDITION, BECAUSE THIS PLAN WAS NOT APPROVED PRIOR TO 11/01/01, IT (AND THE SUBDIVISION) IS SUBJECT TO COMPLIANCE WITH COUNTY COUNCIL BILL 50-2001, WHICH AMENDS PORTIONS OF THE ZONING REGULATIONS.
19. FOREST CONSERVATION PLAN WAS PREPARED BY FREDERICK WARD ASSOCIATES, INC DATED JUNE, 2002. FOREST CONSERVATION OBLIGATIONS FOR THIS SITE HAVE BEEN MET BY THE RETENTION OF 0.71AC., FEE-IN-LIEU-OF REFORESTATION FOR 0.30 AC AND 0.15 AC. OF REFORESTATION. SEE SHEET 4 FOR SURETY AND FEE AMOUNTS.
20. ALL LANDSCAPING REQUIREMENTS, AS SET FORTH IN THE LANDSCAPE MANUAL SHALL BE COMPLIED WITH PERIMETER LANDSCAPING REQUIREMENTS AND WILL BE POSTED AS PART OF THE D.P.W. DEVELOPER'S AGREEMENT. THE LANDSCAPE PLAN IS PROVIDED UNDER THIS PLAN.
21. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING IN THE AMOUNT OF $3,900 FOR 13 SHADE TREES SHOWN ON LOTS 1-4, 6 & 10 MUST BE POSTED AS PART OF THE BUILDER'S GRADING PERMIT (with SDP). FINANCIAL SURETY IN THE AMOUNT OF $7,200.00 ($6,600 FOR THE 22 PRIVATE ACCESS PLACE STREET TREES AND $600.00 FORTHE TRASH PAD SHURBS) SHALL BE POSTED AS A LANDSCAPE SUTETY WITH THE DEVELOPER'S AGREEMENT. (Sec. 16.124 of the Code).
22. DRIVEWAY ENTRANCES ARE TO BE PER HOWARD COUNTY DETAIL R6.06. CURB AND GUTTER AT END OF TURN AROUND TO BE PER HOWARD COUNTY DETAIL R3.03.
23. COORDINATES: HORIZONTAL DATUMS BASED ON NAD 83 HO. CO. GEODETIC CONTROL STATIONS 42R5 AND 42R6.
24. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES; OR PLACEMENT OF NEW STRUCTURES IS PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, OR THEIR BUFFERS AND FOREST CONSERVATION EASEMENT AREAS, EXCEPT AS SHOWN ON THE APPROVED ROAD PLANS.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

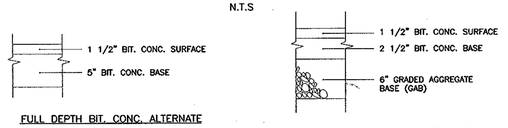
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 12/19/02

CHIEF, DIVISION OF LAND DEVELOPMENT DATE 12/20/02

P-2 LIGHT DUTY PAVING SECTION
N.T.S




OWNER/DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SUITE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

| NO. | REVISION | DATE |
|---|---|---|

ROAD CONSTRUCTION PLAN
THORNTON WOODS OVERLOOK
LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — PARCELS 41 & 3
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia


STATE OF MARYLAND — ROBERT H. VOGEL — NO. 16193 — PROFESSIONAL ENGINEER
ROBERT H. VOGEL P.E. No. 16193 — DATE 12/19/02

| | |
|---|---|
| DESIGN BY: | MHM |
| DRAWN BY: | MHM |
| CHECKED BY: | JCO |
| DATE: | DECEMBER 3, 2002 |
| SCALE: | AS SHOWN |
| W.O. NO.: | 2019034 |

SHEET 1 OF 5

F-02-126

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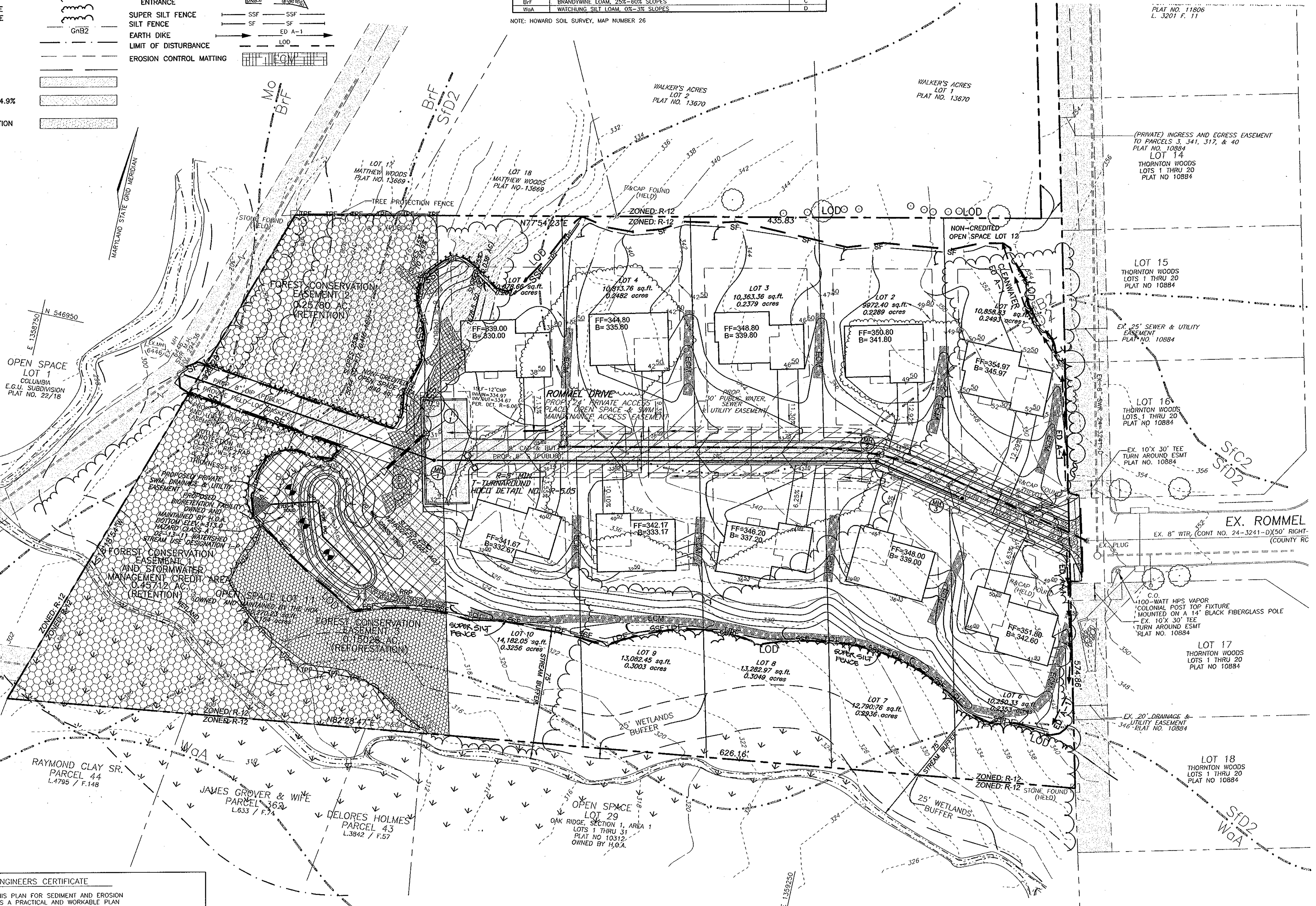
## LEGEND

| | |
|---|---|
| EXISTING CONTOUR | 382 |
| PROPOSED CONTOUR | 82 |
| EXISTING TREELINE | |
| EXISTING BRUSHLINE | |
| PROPOSED TREELINE | |
| SOIL BOUNDRY | GnB2 |
| STREAM BUFFER | |
| WETLAND BUFFER | |
| WETLAND | |
| SLOPES 25% > | |
| SLOPES 15% TO 24.9% | |
| FOREST CONSERVATION EASEMENT | |
| TREE PROTECTION FENCE | TPF |
| STABILIZED CONSTRUCTION ENTRANCE | SCE |
| SUPER SILT FENCE | SSF |
| SILT FENCE | SF |
| EARTH DIKE | ED A-1 |
| LIMIT OF DISTURBANCE | LOD |
| EROSION CONTROL MATTING | ECM |

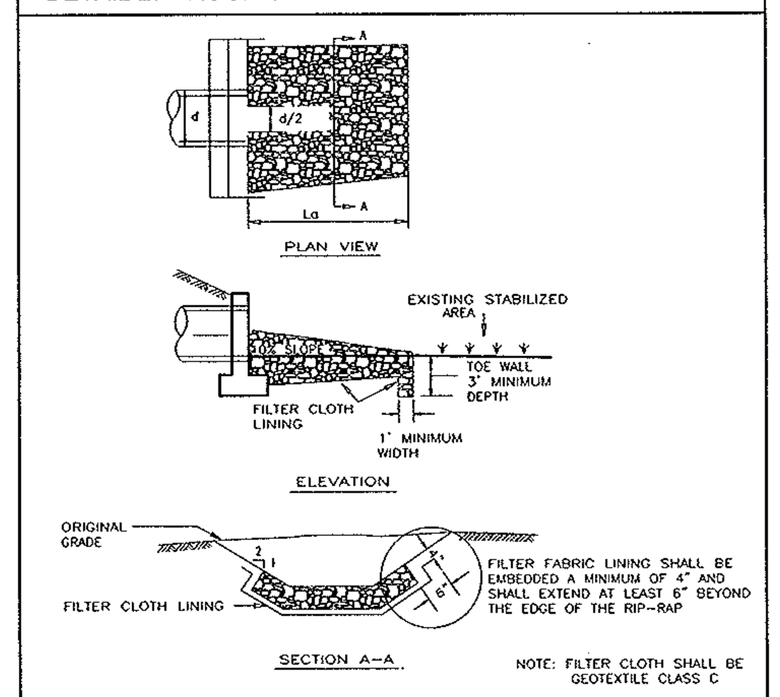
## SOILS LEGEND

| SYMBOL | NAME / DESCRIPTION | TYPE |
|---|---|---|
| SfD2 | SASSAFRAS GRAVELLY SANDEY LOAM, 10%-15% SLOPES, MODERATLEY ERODED. | B |
| SfB2 | SASSAFRAS GRAVELLY SANDEY LOAM, 1%-5% SLOPES, MODERATLEY ERODED. | B |
| BrF | BRANDYWINE LOAM, 25%-60% SLOPES | C |
| WaA | WATCHUNG SILT LOAM, 0%-3% SLOPES | D |

NOTE: HOWARD SOIL SURVEY, MAP NUMBER 26




## DETAIL 27 - ROCK OUTLET PROTECTION III




| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE F - 18 - 10 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

## ROCK OUTLET PROTECTION

Construction Specifications

1. The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.

2. The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.

3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE F - 18 - 8A | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
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### 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 OF ENGINEER — DATE 12/3/03
ROBERT H. VOGEL

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/19/02

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/20/02

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.

Jim Myers — 12/10/02
USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE

THESE PLANS FOR SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson — 12/10/02
HOWARD SOIL CONSERVATION DISTRICT — DATE

### DEVELOPER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE 12/4/02


OWNER/DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SIUTE 301
ELLICOTT CITY, MD 21043
(410) 480-0023


| NO. | REVISION | DATE |
|---|---|---|
| | | |

# GRADING & SEDIMENT AND EROSION CONTROL PLAN

# THORNTON WOODS OVERLOOK

## LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland — Columbia, Maryland — Warrenton, Virginia


STATE OF MARYLAND PROFESSIONAL ENGINEER No. 16193
ROBERT H. VOGEL, PE No.16193

| | |
|---|---|
| DESIGN BY: | RHV |
| DRAWN BY: | MHM |
| CHECKED BY: | JCO |
| DATE: | DECEMBER 3, 2002 |
| SCALE: | 1"=30' |
| W.O. NO.: | 2019034 |

SHEET 2 OF 5

F-02-126

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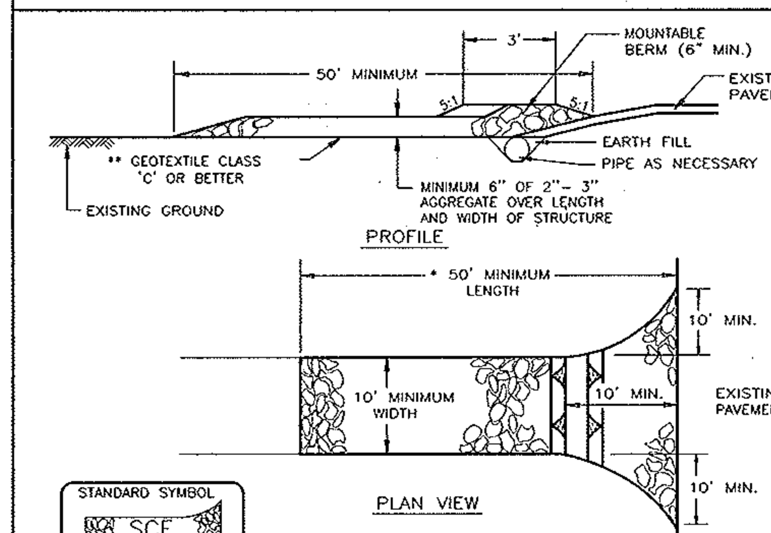
## DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE




Construction Specification

1. Length – minimum of 50' (* 30' for a single residence lot).
2. Width – 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. ** The plan approval authority may not require single family residences to use geotextile.
4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water – all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE 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. A 6" minimum will be required.
6. 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.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE F - 17 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
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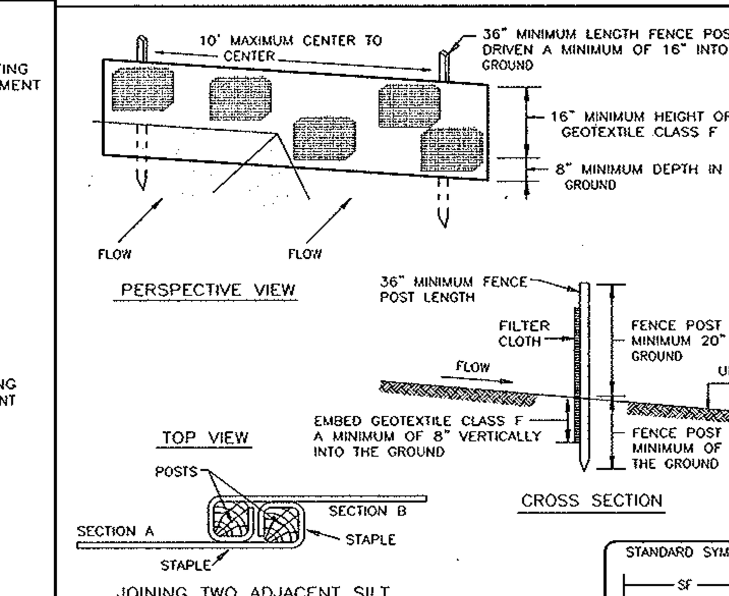
## DETAIL 22 - SILT FENCE




Construction Specifications

1. Fence posts shall be a minimum of 36" long, driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

| | | |
|---|---|---|
| Tensile Strength | 50 lbs/in (min.) | Test: MSMT 509 |
| Tensile Modulus | 20 lbs/in (min.) | Test: MSMT 509 |
| Flow Rate | 0.3 gal ft /minute (max.) | Test: MSMT 322 |
| Filtering Eggeciency | 75% (min.) | Test: MSMT 322 |

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of the fabric height.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE E - 15 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
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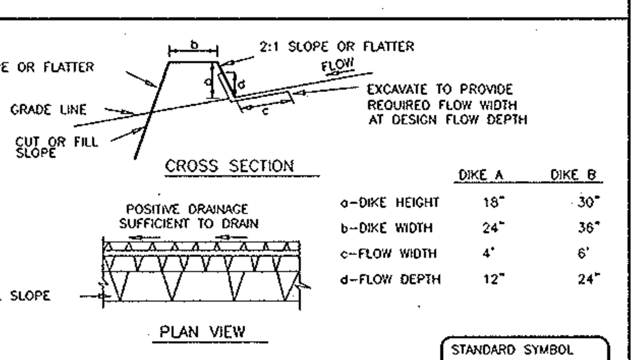
## DETAIL 1 - EARTH DIKE




| | DIKE A | DIKE B |
|---|---|---|
| a–DIKE HEIGHT | 18" | 30" |
| b–DIKE WIDTH | 24" | 36" |
| c–FLOW WIDTH | 4' | 6' |
| d–FLOW DEPTH | 12" | 24" |

STANDARD SYMBOL A-2 B-3

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" – 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike 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.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE A - 1 - 6 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
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## 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, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

CONDITIONS WHERE PRACTICE APPLIES

I. 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 CONTINUING SUPPLIES 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.

II. 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

I. TOPSOIL SALVAGED FROM THE EXISTING SITE MAY BE USED PROVIDED THAT IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-SCS IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENTAL STATION.

II. TOPSOIL SPECIFICATIONS – SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:

I. 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 A 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, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAT 1 AND 1/2" IN DIAMETER.

II. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.

III. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 4-8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.

II. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:

I. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION – SECTION I – VEGETATIVE STABILIZATION METHODS AND MATERIALS.

III. FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES:
I. ON SOIL MEETING TOPSOIL SPECIFICATIONS, OBTAIN TEST RESULTS DICTATING FERTILIZER AND LIME AMENDMENTS REQUIRED TO BRING THE SOIL INTO COMPLIANCE WITH THE FOLLOWING:
A. PH FOR TOPSOIL SHALL BE BETWEEN 6.0 AND 7.5. IF THE TESTED SOIL DEMONSTRATES A PH OF LESS THAN 6.0, SUFFICIENT LIME SHALL BE PRESCRIBED TO RAISE THE PH TO 6.5 OR HIGHER.
B. ORGANIC CONTENT OF TOPSOIL SHALL BE NOT LESS THAN 1.5 PERCENT BY WEIGHT.
C. TOPSOIL HAVING SOLUBLE SALT CONTENT GREATER THAN 500 PARTS PER MILLION SHALL NOT BE USED.
D. NO SOD OR SEED SHALL BE PLACED ON SOIL SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.
NOTE: TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.
II. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMMENDMENTS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION-SECTION I-VEGETATIVE STABILIZATION METHODS AND MATERIALS.

V. TOPSOIL APPLICATION

I. WHEN TOPSOILING, MAINTAIN NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE AND SEDIMENT TRAPS AND BASINS.

II. GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBEIT 4" – 8" HIGHER IN ELEVATION.

III. TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN A 4" – 8" LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.

IV. TOPSOIL SHALL NOT BE PLACE 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 SEEDBED PREPARATION.

## SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSE AND PERMITS SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
2. ALL VEGETATION AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: (A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3:1, (B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 7, HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING, SOD, TEMPORARY SEEDING, AND MULCHING (SEC. G). TEMPORARY STABILIZATION WITH MULCH ALONE SHALL BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. 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.
7. SITE ANALYSIS :

| | |
|---|---|
| TOTAL AREA | 3.91 ACRES |
| AREA DISTURBED | 2.35 ACRES |
| AREA TO BE ROOFED OR PAVED | 0.63 ACRES |
| AREA TO BE VEGETATIVELY STABILIZED | 0.93 ACRES |
| TOTAL CUT | 2200 CY |
| TOTAL FILL | 5000 CY |
| OFFSITE WASTE/BORROW AREA LOCATION | * |

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

* TO BE 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 FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

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

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

1) PREFERRED-APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/100 SQ.FT.) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS./1000 SQ.FT.) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT THE TIME OF SEEDING, APPLY 400 LBS. PER ACRE 30-0-0 UREAFORM FERTILIZER (9 LBS/1000 SQ.FT.)
2) ACCEPTABLE-APPLY 2 TONS PER ACRE DOLOMATIC 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. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS. KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS. PER ACRE (.05 LBS./1000 SQ.FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 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 FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ.FT.) FOR ANCHORING.

MAINTENANCE: INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

## TEMPORARY SEEDING NOTES

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

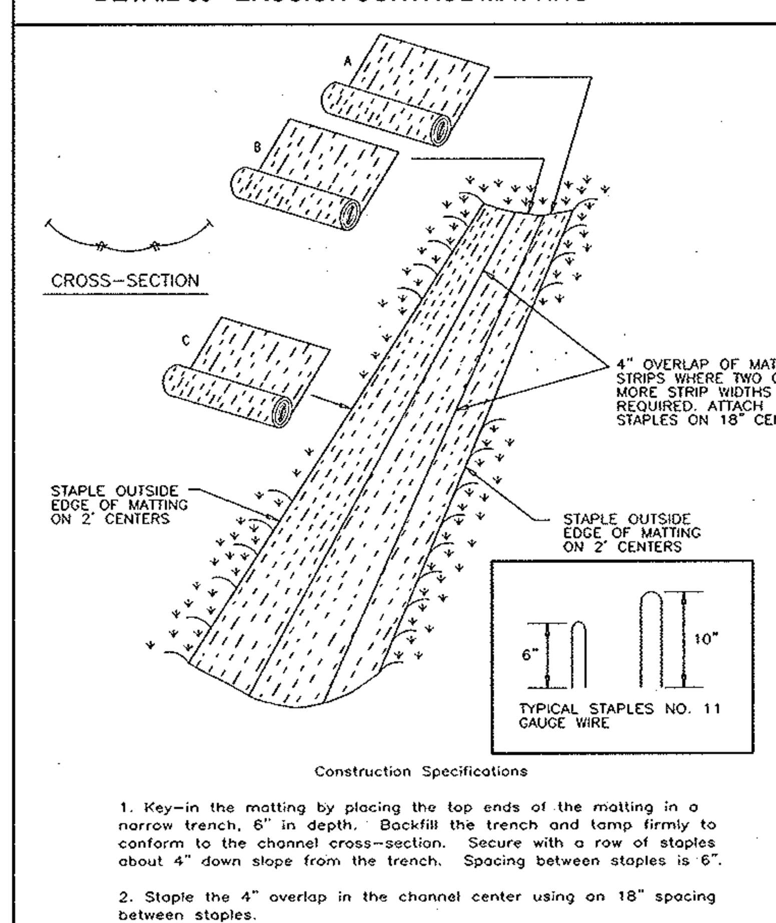
SOIL AMENDMENTS: APPLY 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS./1000 SQ.FT).

SEEDING: FOR PERIODS MARCH 1 THRU APRIL 30 AND FROM AUGUST 15 THRU NOVEMBER 15, SEED WITH 2 1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS./1000 SQ.FT.) FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS. PER ACRE OF WEEPING LOVEGRASS (.07 LBS./1000 SQ.FT.). FOR THE PERIOD NOVEMBER 1 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 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 FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ.FT.) FOR ANCHORING.

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

## DETAIL 30 - EROSION CONTROL MATTING




Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".
2. Staple the 4" overlap in the channel center using an 18" spacing between staples.
3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.
4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
5. 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", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.
6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE G - 22 - 2 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
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## MARYLAND 378
## STORMWATER MANAGEMENT POND CONSTRUCTION SPECIFICATIONS

CONSTRUCTION SPECIFICATIONS

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the tow of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

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

Earth Fill

Material – The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

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

Compaction – The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

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

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

Embankment Core – The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operated closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi; 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of the structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill (flowable fill)zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section.

Corrugated Metal Pipe – All of the following criteria shall apply for corrugated metal pipe:

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

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

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

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

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

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

Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

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

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

Reinforced Concrete Pipe – All of the following criteria shall apply for reinforced concrete pipe:

1. Materials – Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed . ASTM C-361.

2. Bedding – Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe – Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform tStructure Backfill ".

5. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings.

Plastic Pipe – The following criteria shall apply for plastic pipe:

1. Materials – PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" –10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding – The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform tStructure Backfill ".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

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

Concrete

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

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction Materials, Section 311.

Geotexile shall be placed under all riprap and shall meet requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

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

Stabilization

All borrow areas shall be graded to provide proper drainage and left I a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

Erosion and Sediment Control

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

POND BOTTOM SOIL CONDITIONS

If broken rock fragments are encountered at finished pond bottom, under cut a minimum of 12" below basin grade and to a horizontal distance of at least 18" beyond each edge of the broken rock and backfill with fine-grained ML or CL soils compacted to a firm condition. This procedure should be performed under the supervision of the project Geotechnical Engineer.

## SEQUENCE OF CONSTRUCTION

| SEQUENCE OF CONSTRUCTION | DURATION |
|---|---|
| 1. OBTAIN GRADING PERMIT. | |
| 2. NOTIFY HOWARD COUNTY BUREAU OF INSPECTIONS AND PERMITS (313-1880) AT LEAST 24 HOURS BEFORE STARTING ANY WORK. | |
| 3. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AND INSTALL PERIMETER SILT FENCE, TREE PROTECTION FENCE, TREE PROTECTION SIGNS & CLEAN WATER DIKES. | 3 DAYS |
| 4. WITH INSPECTOR'S APPROVALS CLEAR AND GRUB SITE TO LOD. | 1 DAY |
| 5. GRADE ROAD TO SUB-BASE AND PAVE ROAD AND INSTALL STREET TREES. | 3 WEEKS |
| 6. WITH INSPECTOR'S APPROVAL AND WITH ROAD PAVING COMPLETE, STABILIZE CONTRIBUTING DRAINAGE AREAS AND CONSTRUCT BIORETENTION FACILITY. | 1 WEEK |
| 7. WITH INSPECTOR'S APPROVAL AND WITH BIORETENTION FACILITY COMPLETE, STABILIZE AREA AND INSTALL LANDSCAPING. | 3 DAYS |
| 8. WITH INSPECTOR'S APPROVAL REMOVE SEDIMENT CONTROL MEASURES NOT NOT NEEDED FOR SITE DEVELOPMENT PLAN STAGE. | 3 DAYS |

## NOTES

1. DURING GRADING AND AFTER EACH RAINFALL, THE CONTRACTOR SHALL INSPECT AND PROVIDE THE NECESSARY MAINTENANCE ON THE SEDIMENT AND EROSION CONTROL MEASURES SHOWN HEREON.
2. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLIED WITH:
   A. 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, SWALES, DITCH PERIMETER SLOPES SLOPES AND ALL SLOPES GREATER THAN 3:1.
   B. 14 CALENDAR DAYS FOR ALL OTHER DISTURBED AREAS.

## BIORETENTION AREA SOIL SPECIFICATIONS

### A. PLANTING SOIL

THE BIORETENTION AREAS SHALL CONSIST OF A PLANTING SOIL HAVING A COMPOSITION OF AT LEAST 10 TO 25 PERCENT CLAY AND SHALL BE OF A SANDY LOAM OR LOAMY SAND TEXTURE. LOAMY SOILS MAY BE UTILIZED FOR THE PLANTING SOIL BUT MUST CONSIST OF 35% SAND. IN ADDITION, THE FURNISHED PLANTING SOIL SHALL BE OF UNIFORM COMPOSITION, FREE OF STONES, STUMPS, ROOTS OR SIMILAR OBJECTS LARGER THAN ONE INCH, BRUSH, OR ANY OTHER MATERIAL OR SUBSTANCE WHICH MAY BE HARMFUL TO PLANT GROWTH, OR A HINDERANCE TO PLANTING OR MAINTENANCE OPERATIONS.

THE PLANTING SOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE OR OTHERS AS SPECIFIED.

IT SHALL NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH.

### THE PLANTING SOIL SHALL MEET THE FOLLOWING CRITERIA:

| | |
|---|---|
| PH RANGE | 5.5 – 6.5 |
| ORGANIC MATTER | 1.5 – 3.0% |
| MAGNESIUM – Mg | 35 lbs / ACRE |
| PHOSPHORUS – P205 | 100 lbs / ACRE |
| POTASIUM – K20 | 85 lbs / ACRE |
| SOLUBLE SALTS | NOT TO EXCEED 500 ppm |

### B. MULCH LAYER SPECIFICATIONS (3" THICK)

A MULCH LAYER SHALL BE PROVIDED ON TOP OF THE PLANTING SOIL. AN ACCEPTABLE MULCH LAYER SHALL INCLUDE SHREDDED HARDWOOD OR SHREDDED WOOD CHIPS OR OTHER SIMILAR PRODUCT.

ALL MULCH PRODUCTS MUST BE WELL AGED, UNIFORM IN COLOR, AND FREE OF FOREIGN MATERIAL INCLUDING PLANT MATERIAL. WELL AGED MULCH IS DEFINED AS MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST TWELVE (12) MONTHS.

### C. SAND SPECIFICATIONS(1' MIN.)

THE SAND SHALL BE FREE OF DELETERIOUS MATERIAL AND ROCKS GREATER THAN 1 INCH IN DIAMETER.

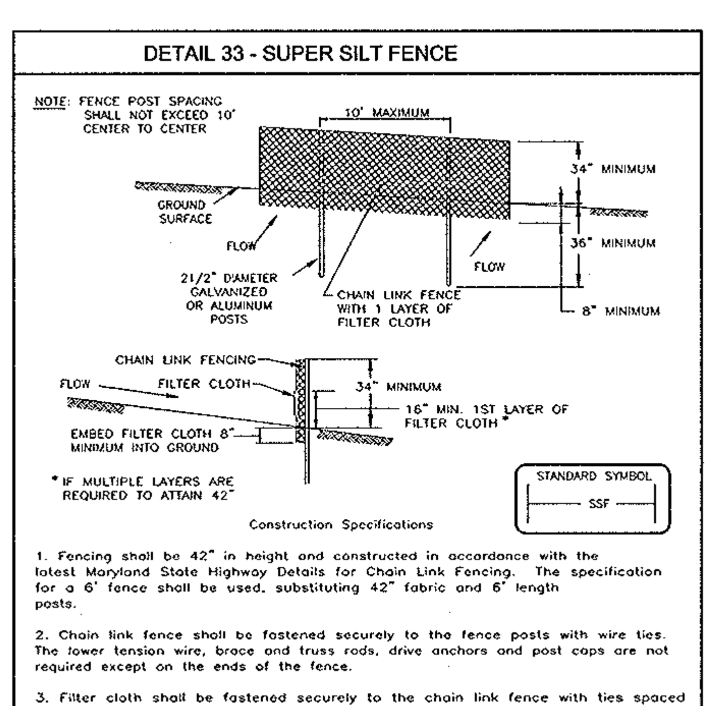
### D. COMPACTION

SOIL SHALL BE PLACED IN LIFTS LESS THAN 18 INCHES AND LIGHTLY COMPACTED (MINIMAL COMPACTIVE EFFORT) BY TAMPING WITH A BUCKET FROM A DOZER OR A BACKHOE.

### OPERATION AND MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS 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.
2. 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 DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

## DETAIL 33 - SUPER SILT FENCE



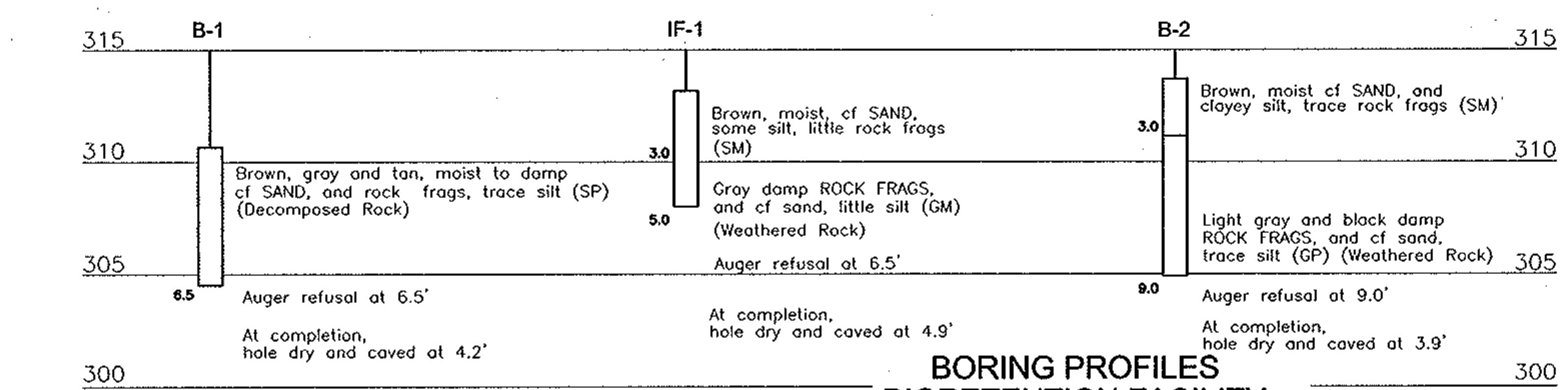

Construction Specifications

1. 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 6' fence shall be used, substituting 42" fabric and 6' length posts.
2. 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 ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

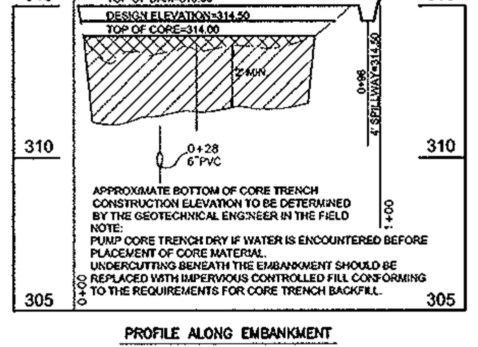
| | | |
|---|---|---|
| Tensile Strength | 50 lbs/in (min.) | Test: MSMT 509 |
| Tensile Modulus | 20 lbs/in (min.) | Test: MSMT 509 |
| Flow Rate | 0.3 gal/ft²/minute (max.) | Test: MSMT 322 |
| Filtering Efficiency | 75% (min.) | Test: MSMT 322 |

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE H - 26 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

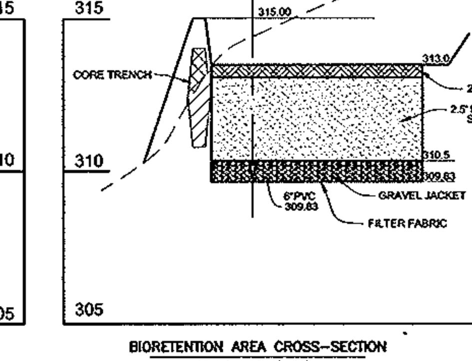

OWNER/DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SIUTE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

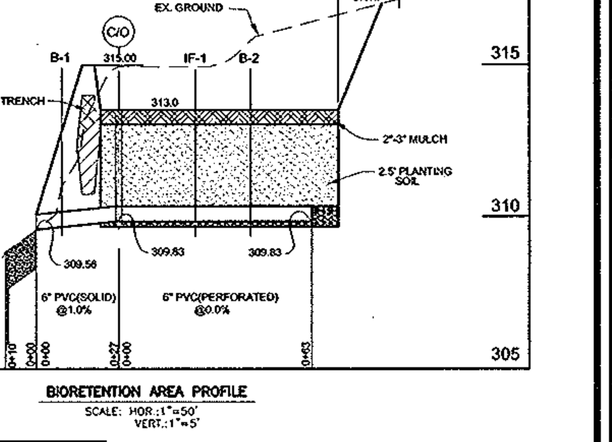

BORING PROFILES
BIORETENTION FACILITY
NOT TO SCALE




PROFILE ALONG EMBANKMENT
SCALE: HOR.:1"=50' VERT.:1"=5'




BIORETENTION AREA CROSS-SECTION
SCALE: HOR.:1"=50' VERT.:1"=5'




BIORETENTION AREA PROFILE
SCALE: HOR.:1"=50' VERT.:1"=5'

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.

12/3/03
SIGNATURE OF ENGINEER — DATE
ROBERT H. VOGEL

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

12/19/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

12/20/02
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.

12/10/02
USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE

THESE PLANS FOR SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

12/10/02
HOWARD SOIL CONSERVATION DISTRICT — DATE

DEVELOPER'S CERTIFICATE

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

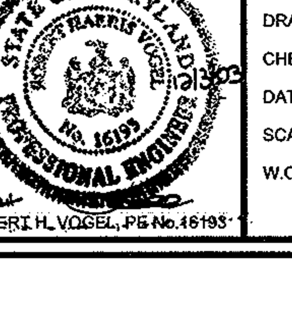
12/04/02
SIGNATURE OF DEVELOPER — DATE

| NO. | REVISION | DATE |
|---|---|---|

# SEDIMENT AND EROSION CONTROL DETAILS
# THORNTON WOODS OVERLOOK
## LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland — Columbia, Maryland — Warrenton, Virginia


ROBERT H. VOGEL, PE No.16193

| | |
|---|---|
| DESIGN BY: | MHM |
| DRAWN BY: | MHM |
| CHECKED BY: | JCO |
| DATE: | DECEMBER 3, 2002 |
| SCALE: | AS SHOWN |
| W.O. NO.: | 2019034 |





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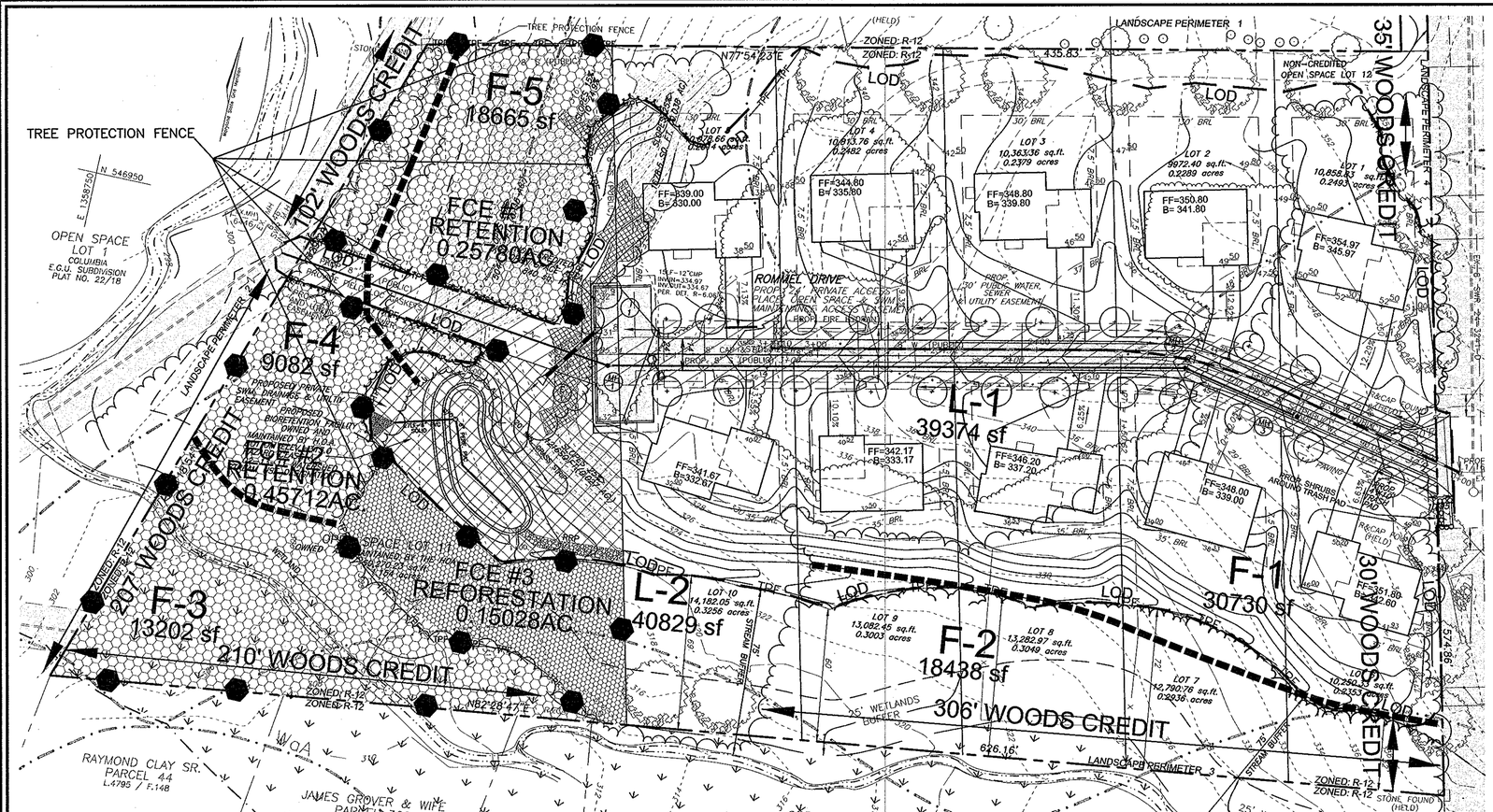
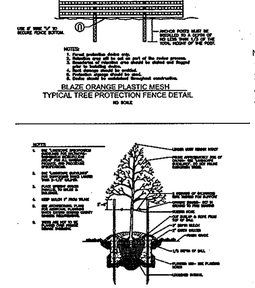
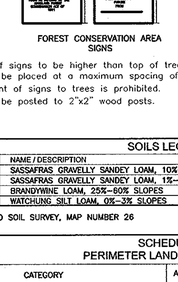



## PLAN VIEW
SCALE: 1"=30'




BLAZE ORANGE PLASTIC MESH
TYPICAL TREE PROTECTION FENCE DETAIL
NO SCALE




FOREST CONSERVATION AREA SIGNS

Note:
1. Bottom of signs to be higher than top of tree protection fence.
2. Signs to be placed at a maximum spacing of 50' – 100' feet apart.
3. Attachment of signs to trees is prohibited.
4. Signs to be posted to 2"x2" wood posts.




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

### SOILS LEGEND

| SYMBOL | NAME / DESCRIPTION | TYPE |
|---|---|---|
| SfD2 | SASSAFRAS GRAVELLY SANDEY LOAM, 10%–15% SLOPES, MODERATLEY ERODED. | B |
| SfB2 | SASSAFRAS GRAVELLY SANDEY LOAM, 1%–5% SLOPES, MODERATLEY ERODED. | B |
| BrF | BRANDYWINE LOAM, 25%–60% SLOPES | C |
| WoA | WATCHUNG SILT LOAM, 0%–3% SLOPES | D |

NOTE: HOWARD SOIL SURVEY, MAP NUMBER 26

### SCHEDULE A
### PERIMETER LANDSCAPE EDGE

| CATEGORY | ADJACENT TO ROADWAYS | ADJACENT TO PERIMETER PROPERTIES | | | |
|---|---|---|---|---|---|
| PERIMETER/FRONTAGE DESIGNATION | NONE | 1 | 2 | 3 | 4 |
| LANDSCAPE TYPE | | A | A | A | A |
| LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER | | 436 | 329 | 626 | 344 |
| CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED) | | *YES 83 | *YES 309 | *YES 516 | *YES 65 |
| CREDIT FOR WALL, FENCE OT BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED) | | NO | NO | NO | NO |
| NUMBER OF PLANTS REQUIRED (LF REMAINING) | | 353 | 20 | 110 | 279 |
| SHADE TREES | | 1:60 6 | 1:60 0 | 1:60 2 | 1:60 5 |
| EVERGREEN TREES | | – | – | – | – |
| SHRUBS | | – | – | – | – |
| NUMBER OF PLANTS PROVIDED | | | | | |
| SHADE TREES | | 6 | 0 | 2 | 5 |
| EVERGREEN TREES | | – | – | – | – |
| OTHER TREES (2:1 SUBSTITUTION) | | – | – | – | – |
| SHRUBS (10:1 SUBSTITUTION) | | – | – | – | – |
| DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED) | | – | – | – | – |

* EXISTING WOODS TO REMAIN

### SCHEDULE D
### STORMWATER MANAGEMENT AREA LANDSCAPING

| LINEAR FEET OF PERMITER | 240 |
|---|---|
| CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET) | YES 240 |
| CREDIT FOR OTHER LANDSCAPING (NO, YES AND %) | YES 100%* |
| NUMBER OF TREES REQUIRED | |
| SHADE TREES 1:50 | 5 |
| EVERGREEN TREES 1:40 | 6 |
| NUMBER OF TREES PROVIDED | |
| SHADE TREES | N/A |
| EVERGREEN TREES | N/A |
| SHRUBS | N/A |

* CREDIT IS TAKEN FOR THIS FACILITY BASED ON THE PROPOSED BIORETENTION PLANTING.

| STREET TREE CHART 2.5" CAL. B&B AUTUMN PURPLE ASH | | | |
|---|---|---|---|
| STREET NAME | LINEAR FEET | NO. REQUIRED | NO. PROVIDED |
| ROMMEL DRIVE | 880/40 | 22 | 23 |

NOTES:
1. THE PROPERTY IS BASED ON A BOUNDARY SURVEY PERFORMED BY VOGEL & ASSOCIATES, INC. IN FEBRUARY, 1999.
2. THE EXISTING FEATURES AND CONTOURS SHOWN HEREON ARE BASED ON FIELD RUN TOPOGRAPHY PERFORMED BY VOGEL & ASSOCIATES, INC. IN FEBRUARY, 1999.
3. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
4. THE TYPE 'A' PERIMETER LANDSCAPE INFORMATION INDICATED ON THIS PLAN FOR LOTS LOTS 1–5 AND 7–10 IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. IT SHALL BE SHOWN ON THE REQUIRED FUTURE SITE DEVELOPMENT PLAN. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING MUST BE POSTED AS PART PART OF THE BUILDER'S GRADING PERMIT IN THE AMOUNT OF $3,900.00 FOR THE 13 SHADE TREES SHOWN ON LOTS 1–4, 6 & 10.
   - LOT 1: 3 SHADE TREES = $900.00
   - LOT 2: 2 SHADE TREES = $600.00
   - LOT 3: 1 SHADE TREES = $300.00
   - LOT 4: 2 SHADE TREES = $600.00
   - LOT 6: 3 SHADE TREES = $900.00
   - LOT 10: 2 SHADE TREES = $600.00
5. THE FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202 OF THE HOWARD COUNTY CODE; FOREST CONSERVATION ACT, FOR THIS SUBDIVISION HAVE BEEN FULFILLED THROUGH:
   A.) THE FOREST RETENTION OF 0.71 ACRE LOCATED ON FCE–1 AND FCE–2.
   B.) REFORESTATION FOR 0.15 ACRE ON FCE–3.
   B.) FEE–IN–LIEU OF REFORESTATION FOR 0.30 ACRE.
6. LANDSCAPE SURETY IN THE AMOUNT OF $7,200.00 ($6,600.00 FOR THE 22 PRIVATE ACCESS PLACE STREET TREES AND $600.00 FOR THE TRASH PAD SHRUBS) SHALL BE POSTED AS A LANDSCAPE SURETY WITH THE DEVELOPER'S AGREEMENT.
7. THE MAINTENANCE OF THE TRASH PAD AND TRASH PAD LANDSCAPE PLANTING IS THE RESPONSIBILITY OF THE HOA.

### DEVELOPER'S/BUILDER'S CERTIFICATE

I CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND HOWARD COUNTY LANDSCAPE MANUAL.

DEVELOPER/BUILDER — DATE 12/04/02

### FOREST PROTECTION NOTES

PRE–CONSTRUCTION ACTIVITES
1. Install blaze orange fence and retention signs before construction begins.
2. Fencing shall be maintained in good condition and promptly repaired or restored as the situation warrants.

CONSTRUCTION PHASE
1. No disturbance or dumping is allowed inside the tree retention area.
2. No equipment shall be operated inside the tree retention area including tree canopies.
3. In the event of drought, the protected trees shall be monitored for signs of stress and watered as needed.

POST–CONSTRUCTION ACTIVITIES
1. At the direction of a qualified tree care expert, damages to retained trees shall be repaired by the contractor.
2. Fence removal and stabilization shall be as per the sediment and erosion control plan, except for the selection of grasses for stabilization.
3. Do not remove signs.

### AFFORESTATION NOTES

1. AT COMPLETION OF HOUSE CONSTRUCTION, THE DISTURBED AREAS WITHIN THE CONSERVATION EASEMENT WILL BE VEGETATIVELY STABILIZED WITH ANNUAL RYE AND BIRDSFOOT TREFOIL.
2. EXISTING TALL GRASSES WITHIN THE CONSERVATION EASEMENT SHALL BE MOWED TO A HEIGHT OF 3 INCHES.
3. RANDOMLY SPACE SEEDLINGS / WHIPS SO THAT NO MORE THAN 5 OF ANY PARTICULAR SPECIES ARE PLANTED IN SUCCESSION.
4. ALL PROPOSED PLANT MATERIAL TO BE NATIVE PLANT SPECIES. NO ORNAMENTAL CULTIVARS TO BE USED. USE LOCAL GENETIC STOCK UP TO A 100 MILE RADIUS.
5. REFORESTATION MANAGEMENT RECORDS SHOULD BE KEPT FOR HOWARD COUNTY REVIEW.
6. YEAR 1: INSPECT TREES FOR HEALTH AND VIGOR AT: A. BEGINNING OF GROWING SEASON, B. MIDSUMMER AND C. FALL. ADJUST WATERING, PEST CONTROL, WEEDING AND FEEDING AS NEEDED. AFTER ONE–YEAR REPLACE ANY 1" CAL. OR 6' HT.TREES THAT DID NOT SURVIVE DURING THE NEXT PLANTING SEASON.
7. YEAR 2: INSPECT TREES FOR HEALTH AND VIGOR IN APRIL & OCTOBER. ADJUST WATERING, PEST CONTROL, WEEDING AND FEEDING AS NEEDED. REPLACE ANY 1"cal/6'ht TREES THAT DID NOT SURVIVE YEAR 2 DURING THE NEXT PLANTING SEASON. SEEDLINGS SHALL BE REPLACED UP TO 50 PERCENT DURING THE NEXT PLANTING SEASON.
8. CONTRACTOR TO FOLLOW ALL STATE AND COUNTY GUIDELINES FOR AFFORESTION & REFORESTATION.
9. IN ORDER TO INSURE SURVIVABILITY, THE PERSON RESPONSIBLE FOR INSTALLATION SHALL INSPECT AND AMEND THE SOILS PRIOR TO PLANTING, PROVIDE WATER DURING DROUGHT PERIODS, AND REMOVE ANY PESTS OR WEEDS DURING THE 2 YEAR MAINTENANCE PERIOD.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/19/02

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/20/02

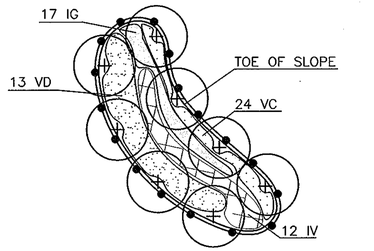
### PERIMETER LANDSCAPE SCHEDULE

| KEY | QUAN. | BOTANICAL NAME | SIZE | CAT |
|---|---|---|---|---|
| ◯ | 13 | Acer Rubrum 'October Glory' October Glory Red Maple | 2 1/2"–3" Cal. | B & B |
| O | 20 | Taxus Cuspidata 'Nana'/Dwarf Japanese Yew | 18" – 24" sp. | – |

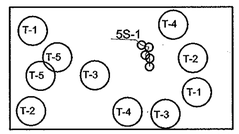
1. ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH LCAMW PLANTING SPECIFICATIONS.
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
3. FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
4. CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

### BIORETENTION PLANTING SCHEDULE

| KEY | QTY | BOTANICAL NAME/ COMMON NAME | SIZE | ROOT |
|---|---|---|---|---|
| + | 8 | ACER RUBRUM/RED MAPLE | 1 1/2"–2" CAL | B & B |
| VC | 24 | VACCINIUM CORYMBOSUM HIGHBUSH BLUEBERRY | 12"–15" HEIGHT | CONT |
| IV | 12 | ILEX VERTICILLATA WINTERBERRY | 2'–3' HEIGHT | B & B OR CONT |
| VD | 13 | VIBURNUM DENTATUM ARROW WOOD | 3'–4' HEIGHT | B & B OR CONT |
| IG | 17 | ILEX GLABRA INKBERRY | 18"–24" HEIGHT | B & B OR CONT |
| ●—● | 300 | LIRIOPE SPICATA CREEPING LILY TURF | 2" POT | 18" O/C |

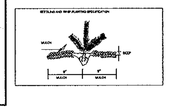



## BIORETENTION PLANTING DETAIL
SCALE: 1"=20'–0"




TYPICAL RANDOM PLANT SPACING DETAIL & CHART

NOTE:
1). Plant mix to be 1/3 pioneer & 2/3 mid to late successional species
2). Plant larger stock and evergreens around perimeter to protect interior smaller stock.
3). When shrubs are specified, plant them in clusters
4). Do not plant trees in a grid pattern.



### GENERAL SITE NOTES

1. WETLANDS AND THEIR BUFFERS ARE TO BE RETAINED.
2. THERE ARE NO ENDANGERED SPECIES ON THIS SITE.
3. STEEP SLOPES ARE SUBSTANTIALLY RETAINED IN EASEMENT.
4. THERE ARE NO SPECIMEN TREES 30" IN DIAMETER OR LARGER ON THIS SITE.
5. THERE ARE NO HISTORIC STRUCTURES ON THIS SITE.
6. THIS PROPERTY IS SURROUNDED ON THREE SIDES BY RESIDENTIAL DEVELOPMENT AND ONE SIDE BY AN OPEN SPACE LOT.
7. ALL AREAS IDENTIFIED ON THIS PLAN AS "RETENTION EASEMENTS" SHALL REMAIN UNDISTURBED UNLESS OTHERWISE STATED ON THIS PLAN OR ANY SUBSEQUENT APPROVED AMENDMENTS.
8. NO ADDITIONAL CLEARING OF ANY FORESTED AREA ON THE SUBJECT PROPERTY SHALL BE PERMITTED WITHOUT PRIOR APPROVAL FROM THE HOWARD COUNTY OFFICE OF PLANNING AND ZONING.
9. ALL TREE CONSERVATION/PROTECTION MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AND CONSTRUCTION SCHEDULE AS SHOWN ON THIS SHEET OF THE APPROVED FOREST CONSERVATION PLAN.
10. SITE CONSTRUCTION IN THE AREAS NEAR LIMIT OF DISTURBANCE SHALL NOT BEGIN UNTIL THE ABOVE TREE PROTECTION MEASURES HAVE BEEN INITIATED AND APPROVED BY THE HOWARD COUNTY OFFICE OF PLANNING AND ZONING.
11. ALL FENCED AREAS WILL BE MAINTAINED AND REPAIRED BY THE CONTRACTOR FOR THE DURATION OF THE CONTRACT.
12. ANY SELECTIVE PRUNING AND UNDERGROWTH REMOVAL WITHIN FENCED AREAS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE PROJECT ECOLOGIST.
13. ALL CONSTRUCTION DUMPING WITHIN STAND F-5 (NOW FOREST RETENTION EASEMENTS AND A UTILITY EASEMENT) IS TO BE REMOVED. NATURAL DOWNED WOODY DEBRIS SHALL REMAIN.
14. PROTECT RETAINED WOODS FROM FURTHER DISTURBANCE BY INSTALLING 82 FEET OF PERMANENT FENCING AND FOREST RETENTION SIGNS AT PROPERTY LINE CONTIGUOUS WITH MATHEW WOODS LOTS 17 & 18 AS SHOWN.

### SEQUENCE OF CONTRUCTION
### FOREST CONSERVATION

1. PRECONSTRUCTION MEETING /SITE WALK WITH CONTRACTORS AND OTHER RESPONSIBLE PARTIES TO DEFINE PROTECTION MEASURES TO BE UTILIZED AND TO POINT OUT PARTICULAR TREES TO BE SAVED.
2. STAKE OUT LIMITS OF DISTURBANCE AND TREE PROTECTION FENCING LOCATIONS.
3. INSTALL TREE PROTECTION FENCING: FENCING TO BE INSPECTED BY THE PROJECT ENGINEER OR THE PROJECT ECOLOGIST AND HOWARD COUNTY PLANNING AND ZONING.
4. PROCEED WITH TREE REMOVAL AND SITE IMPROVEMENTS AS PER APPROVED SEDIMENT CONTROL PLAN - TO BE INSPECTED BY HOWARD COUNTY PLANNING AND ZONING.
5. TEMPORARY TREE PROTECTION DEVICES SHALL BE REMOVED AFTER ALL FINISHED GRADING AND UTILITY CONSTRUCTION HAS OCCURED AND WITH APPROVAL FROM THE HOWARD COUNTY OFFICE OF PLANNING AND ZONING.

### FCE-3 PLANT SCHEDULE

| QUAN. | BOTANICAL NAME | SIZE |
|---|---|---|
| 25 | Acer Rubrum Red Maple | Seedlings |
| 20 | Platanus occidentalis Sycamore | Seedlings |
| 20 | Prunus serotino Black Cherry | Seedlings |
| 20 | Quercus palustris Pin Oak | Seedlings |
| 20 | Sassafras albidum Sassafras | Seedlings |

### DENSITY CHART

| SIZE | QTY. PER ACRE | AVERAGE SPACING |
|---|---|---|
| SEEDLINGS | 700 | 8'x8' |

### FOREST CONSERVATION WORKSHEET

NET TRACT AREA:

| | |
|---|---|
| A. TOTAL TRACT AREA | 3.91 AC |
| B. AREA WITHIN 100 YEAR FLOODPLAIN | 0.00 AC |
| C. AREA TO REMAIN IN AGRICULTURAL PRODUCTION | 0.00 AC |
| D. NET TRACT AREA | 3.91 AC |

LAND USE CATEGORY (FROM TABLE 3.2.1, PAGE 40, MANUAL)

INPUT THE NUMBER "1" UNDER THE APPROPRIATE LAND USE ZONING, AND LIMIT TO ONLY ONE ENTRY.

| ARA | MDR | IDA | HDR | MPD | CIA |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 |

| | | |
|---|---|---|
| E. AFFOREST THRESHOLD | 15% X D = | 0.59 AC |
| F. CONSERVATION THRESHOLD | 20% X D = | 0.78 AC |

EXISTING FOREST COVER:

| | | |
|---|---|---|
| G. EXISTING FOREST COVER (EXCLUDING FLOODPLAIN) | = | 2.07 AC |
| H. AREA OF FOREST ABOVE AFFORESTATION THRESHOLD | = | 1.48 AC |
| I. AREA OF FOREST ABOVE CONSERVATION THRESHOLD | = | 1.29 AC |

BREAK EVEN POINT:

| | | |
|---|---|---|
| J. FOREST RETENTION WITH NO MITIGATION | = | 1.04 AC |
| K. CLEARING PERMITTED WITHOUT MITIGATION | = | 1.03 AC |

PROPOSED FOREST CLEARING:

| | | |
|---|---|---|
| L. TOTAL AREA OF FOREST TO BE CLEARED | = | 1.35508 AC |
| M. TOTAL AREA OF FOREST TO BE RETAINED | = | 0.71492 AC |

PLANTING REQUIREMENTS:

| | | |
|---|---|---|
| N. REFORESTATION FOR CLEARING ABOVE CONSERVATION THRESHOLD 1*0.25 | = | 0.32 AC |
| P. REFORESTATION FOR CLEARING BELOW CONSERVATION THRESHOLD (L-J)*2 | = | 0.13 AC |
| Q. CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD | = | 0.00 AC |
| R. TOTAL REFORESTATION REQUIRED | = | 0.45 AC |
| S. TOTAL AFFORESTATION REQUIRED | = | 0.00 AC |
| T. TOTAL REFORESTATION AND AFFORESTATION REQUIRED | = | 0.45 AC |

REFORESTATION OF 0.15028 AC(6546 SF) PLUS FEE–IN–LIEU FOR 0.29972 AC.(13056 SF) EQUALS 0.45 ACRE)

COST ESTIMATE: (For bonding purposes, only)

SURETY NOTE

FINANCIAL SURETY IN THE AMOUNT OF $9,501.40 WILL BE POSTED WITH THE FC INSTALLATION AND MAINTENANCE AGREEMENT.

| | | |
|---|---|---|
| RETENTION | 31,142 SF X 0.20= | $6,228.40 |
| REFORESTATION | 6,546 SF X 0.50= | $3,273.00 |
| FEE–IN–LIEU | 13,056 SF X 0.50= | $6,528.00 |

### LEGEND

- EXISTING CONTOUR — 382
- PROPOSED CONTOUR — 82
- SPOT ELEVATION — +82.53
- DIRECTION OF FLOW
- WALK OUT BASEMENT — WO
- EXISTING TREELINE
- EXISTING BRUSHLINE
- PROPOSED TREELINE
- SOIL BOUNDRY — GnB2
- STREAM BUFFER
- WETLAND BUFFER
- WETLAND
- SLOPES 25% >
- SLOPES 15% TO 24.9%
- FOREST CONSERVATION EASEMENT
- LANDSCAPE PERIMETER — LANDSCAPE PERIMETER 3
- TREE PROTECTION FENCE — TPF
- SHADE TREES
- FOREST CONSERVATION AREA SIGN
- STAND DELINEATION LINE — F-1

OWNER / DEVELOPER
MICHAEL PRALI
3675 PARK AVENUE, SUITE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

# FOREST CONSERVATION, LANDSCAPING AND SUPPLEMENTAL INFORMATION PLAN
# THORNTON WOODS OVERLOOK
## LOTS 1- 10 AND OPEN SPACE LOT 11

TAX MAP #42 GRID 16 — PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS / ARCHITECTS / SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046–2354
Phone: 410–290–9550 Fax: 410–720–6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia


STATE OF MARYLAND — MARY HAMILTON MCKENNA — No. 2039 — REGISTERED LANDSCAPE ARCHITECT — 11-21-02
MARY H.McKENNA, RLA No.2039

DESIGN BY: MHM
DRAWN BY: MHM
CHECKED BY: MHM
DATE: DECEMBER 3, 2002
SCALE: AS SHOWN
W.O. NO.: 2019034

SHEET 4 OF 5

F-02-126

M:\PROJECTS\2019034\ENGR\dwg\Final\WOSUPP_INFO.dwg Tue Dec 03 07:56:21 2002 E4

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/19/02

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/20/02

## LEGEND

- EXISTING CONTOUR — 380 / 385
- EXISTING TREELINE
- EXISTING BRUSHLINE
- PROPOSED TREELINE
- SOIL BOUNDRY — GnB2
- STREAM BUFFER
- WETLAND BUFFER
- WETLAND
- SLOPES 25% >
- SLOPES 15% TO 24.9%
- FOREST CONSERVATION EASEMENT
- LANDSCAPE PERIMETER — LANDSCAPE PERIMETER 3
- TREE PROTECTION FENCE — TPF

### DRAINAGE AREA TABULATIONS

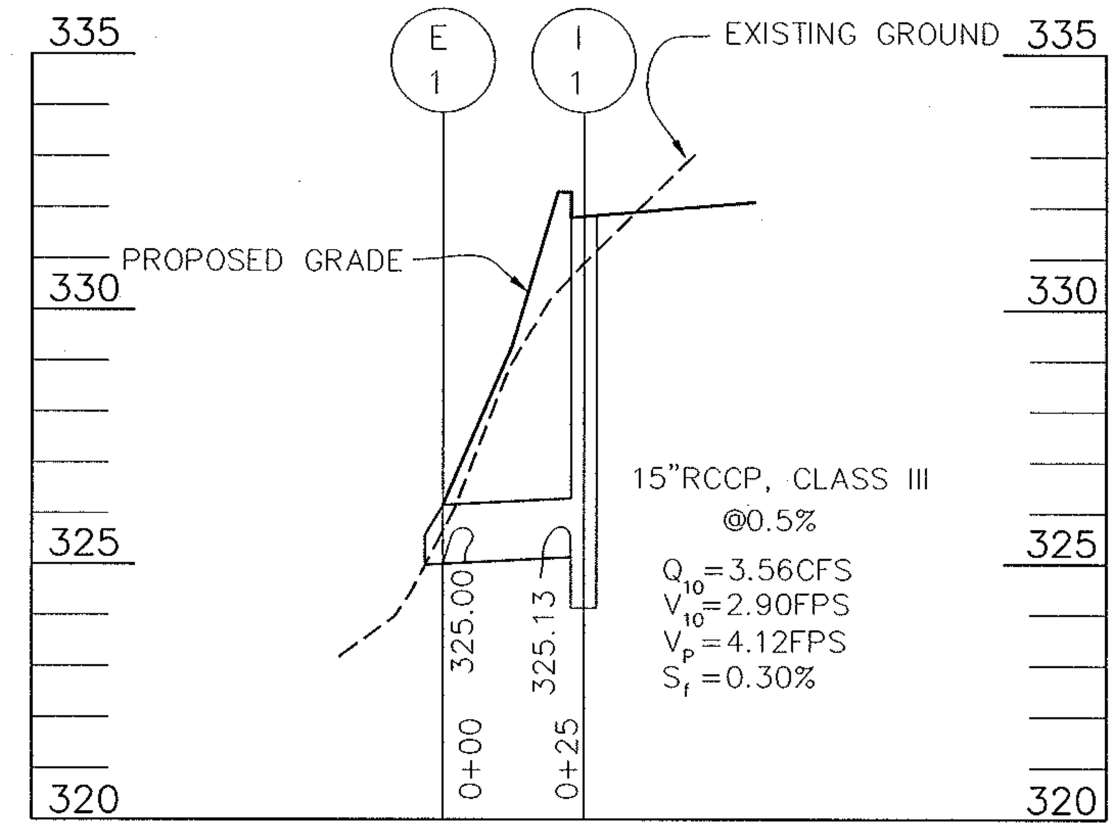
| No. | Area | 'C' | % Imp. | Soil Types | Zone |
|---|---|---|---|---|---|
| 1 | 1.60 Ac. | 0.29 | 38 | B | R-12 |

### PIPE SCHEDULE

| SIZE | TYPE | LENGTH |
|---|---|---|
| 15" | RCCP | 25 LF |

### STRUCTURE SCHEDULE

| NO. | TYPE | LOCATION | TOP ELEV. | INV. IN | INV. OUT | REMARKS |
|---|---|---|---|---|---|---|
| I-1 | Type 'S' Inlet | N 546929.4 E 1358984.9 | 331.80 | – | 325.13 | SD 4.22 |
| E-1 | Concrete End Section | N 546904.4 E 1358966.2 | 326.38 | – | 325.00 | SD 5.52 |




## STORM DRAIN PROFILE

SCALE: 1" = 50' HORZ.
1" = 5' VERT.

### TC PATH INFORMATION

DRAINAGE AREA '1'
Area : 1.0 Acres
CN : 0.29
TC : 0.11

| A–B | B–C | C–D |
|---|---|---|
| Sheet Flow | Shallow Concentrated | Open Channel |
| 50' @ 6.0% | 36' @ 5.0% | 276' @ 3.4 FPS |

OWNER/DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SIUTE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

| NO. | REVISION | DATE |
|---|---|---|
| | | |

# DRAINAGE AREA MAP

# THORNTON WOODS OVERLOOK

## LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — . PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia


STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.16193

DESIGN BY: JCO
DRAWN BY: JCO
CHECKED BY: RHV
DATE: DECEMBER 3, 2002
SCALE: 1" = 30'
W.O. NO.: 2019034

SHEET 5 OF 5

F-02-126

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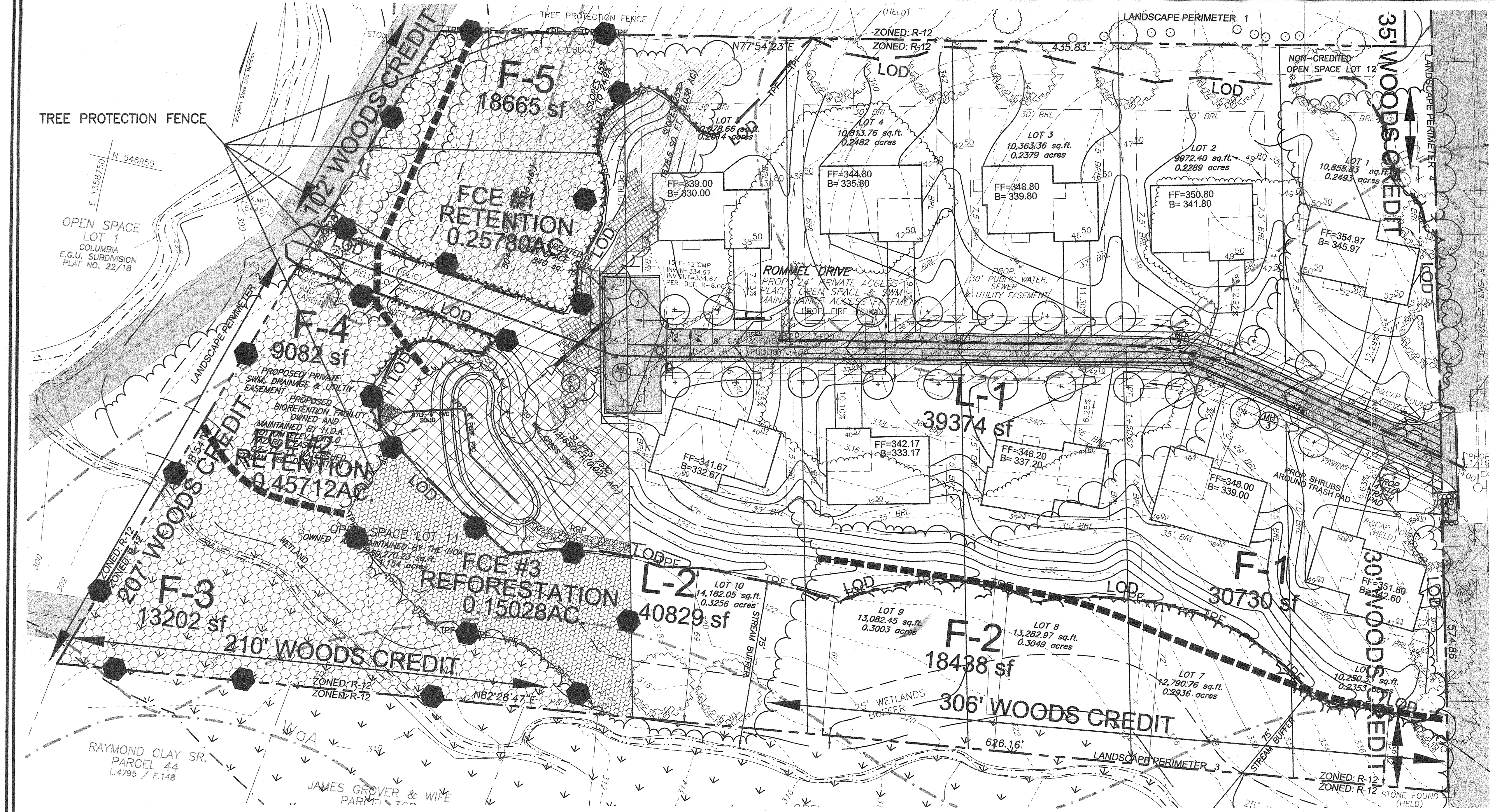



# PLAN VIEW

SCALE: 1"=30'

## PERIMETER LANDSCAPE SCHEDULE

| KEY | QUAN. | BOTANICAL NAME | SIZE | CAT |
|---|---|---|---|---|
| (shade tree symbol) | 13 | Acer Rubrum 'October Glory' October Glory Red Maple | 2 1/2"-3" Cal. | B & B |
| O | 20 | Taxus Cuspidata 'Nana'/Dwarf Japanese Yew | 18" - 24" sp. | - |

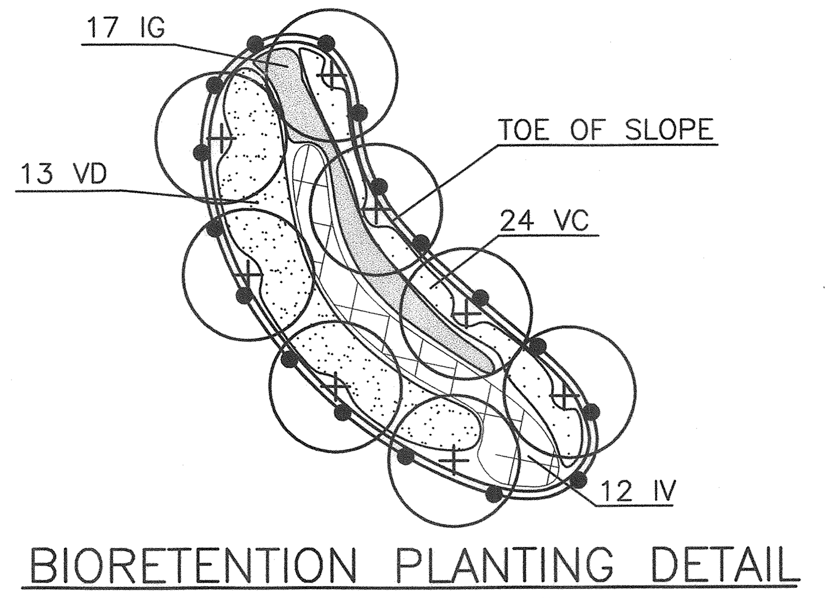
1. ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH LCAMW PLANTING SPECIFICATIONS.
2. CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
3. FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
4. CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

## LEGEND

- EXISTING CONTOUR (382)
- PROPOSED CONTOUR (82)
- SPOT ELEVATION (+82 53)
- DIRECTION OF FLOW
- WALK OUT BASEMENT (WOB)
- EXISTING TREELINE
- EXISTING BRUSHLINE
- PROPOSED TREELINE
- SOIL BOUNDRY (GnB2)
- STREAM BUFFER
- WETLAND BUFFER
- WETLAND
- SLOPES 25% >
- SLOPES 15% TO 24.9%
- FOREST CONSERVATION EASEMENT
- LANDSCAPE PERIMETER (LANDSCAPE PERIMETER 3)
- TREE PROTECTION FENCE (TPF)
- SHADE TREES
- FOREST CONSERVATION AREA SIGN
- STAND DELINEATION LINE (F-1)

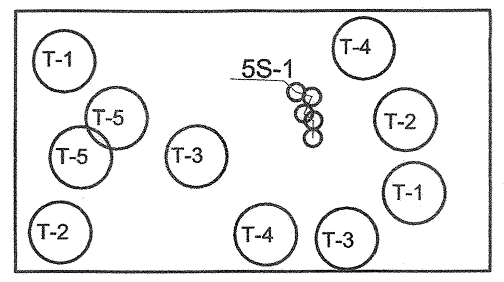
## BIORETENTION PLANTING SCHEDULE

| KEY | QTY | BOTANICAL NAME/ COMMON NAME | SIZE | ROOT |
|---|---|---|---|---|
| (+) | 8 | ACER RUBRUM/RED MAPLE | 1 1/2"-2" CAL | B & B |
| VC | 24 | VACCINIUM CORYMBOSUM HIGHBUSH BLUEBERRY | 12"-15" HEIGHT | CONT |
| IV | 12 | ILEX VERTICILLATA WINTERBERRY | 2'-3' HEIGHT | B & B OR CONT |
| VD | 13 | VIBURNUM DENTATUM ARROW WOOD | 3'-4' HEIGHT | B & B OR CONT |
| IG | 17 | ILEX GLABRA INKBERRY | 18"-24" HEIGHT | B & B OR CONT |
| ●—● | 300 | LIRIOPE SPICATA CREEPING LILY TURF | 2" POT | 18" O/C |

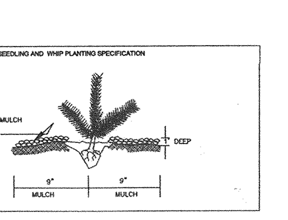



## BIORETENTION PLANTING DETAIL

SCALE: 1"=20'-0"




TYPICAL RANDOM PLANT SPACING DETAIL & CHART




NOTE:
1). Plant mix to be 1/3 pioneer & 2/3 mid to late successional species
2). Plant larger stock and evergreens around perimeter to protect interior smaller stock.
3). When shrubs are specified, plant them in clusters
4). Do not plant trees in a grid pattern.

## GENERAL SITE NOTES

1. WETLANDS AND THEIR BUFFERS ARE TO BE RETAINED.
2. THERE ARE NO ENDANGERED SPECIES ON THIS SITE.
3. STEEP SLOPES ARE SUBSTANTIALLY RETAINED IN EASEMENT.
4. THERE ARE NO SPECIMEN TREES 30" IN DIAMETER OR LARGER ON THIS SITE.
5. THERE ARE NO HISTORIC STRUCTURES ON THIS SITE.
6. THIS PROPERTY IS SURROUNDED ON THREE SIDES BY RESIDENTIAL DEVELOPMENT AND ONE SIDE BY AN OPEN SPACE LOT.
7. ALL AREAS IDENTIFIED ON THIS PLAN AS "RETENTION EASEMENTS" SHALL REMAIN UNDISTURBED UNLESS OTHERWISE STATED ON THIS PLAN OR ANY SUBSEQUENT APPROVED AMENDENTS.
8. NO ADDITIONAL CLEARING OF ANY FORESTED AREA ON THE SUBJECT PROPERTY SHALL BE PERMITTED WITHOUT PRIOR APPROVAL FROM THE HOWARD COUNTY OFFICE OF PLANNING AND ZONING.
9. ALL TREE CONSERVATION/PROTECTION MEASURES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS AND CONSTRUCTION SCHEDULE AS SHOWN ON THIS SHEET OF THE APPROVED FOREST CONSERVATION PLAN.
10. SITE CONSTRUCTION IN THE AREAS NEAR LIMIT OF DISTURBANCE SHALL NOT BEGIN UNTIL THE ABOVE TREE PROTECTION MEASURES HAVE BEEN INITIATED AND APPROVED BY THE HOWARD COUNTY OFFICE OF PLANNING AND ZONING.
11. ALL FENCED AREAS WILL BE MAINTAINED AND REPAIRED BY THE CONTRACTOR FOR THE DURATION OF THE CONTRACT.
12. ANY SELECTIVE PRUNING AND UNDERGROWTH REMOVAL WITHIN FENCED AREAS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE PROJECT ECOLOGIST.
13. ALL CONSTRUCTION DUMPING WITHIN STAND F-5 (NOW FOREST RETENTION EASEMENTS AND A UTILITY EASEMENT) IS TO BE REMOVED. NATURAL DOWNED WOODY DEBRIS SHALL REMAIN.
14. PROTECT RETAINED WOODS FROM FURTHER DISTURBANCE BY INSTALLING 82 FEET OF PERMANENT FENCING AND FOREST RETENTION SIGNS AT PROPERTY LINE CONTIGUOUS WITH MATHEW WOODS LOTS 17 & 18 AS SHOWN.

## SEQUENCE OF CONTRUCTION FOREST CONSERVATION

1. PRECONSTRUCTION MEETING /SITE WALK WITH CONTRACTORS AND OTHER RESPONSIBLE PARTIES TO DEFINE PROTECTION MEASURES TO BE UTILIZED AND TO POINT OUT PARTICULAR TREES TO BE SAVED.
2. STAKE OUT LIMITS OF DISTURBANCE AND TREE PROTECTION FENCING LOCATIONS.
3. INSTALL TREE PROTECTION FENCING: FENCING TO BE INSPECTED BY THE PROJECT ENGINEER OR THE PROJECT ECOLOGIST AND HOWARD COUNTY PLANNING AND ZONING.
4. PROCEED WITH TREE REMOVAL AND SITE IMPROVEMENTS AS PER APPROVED SEDIMENT CONTROL PLAN - TO BE INSPECTED BY HOWARD COUNTY PLANNING AND ZONING.
5. TEMPORARY TREE PROTECTION DEVICES SHALL BE REMOVED AFTER ALL FINISHED GRADING AND UTILITY CONSTRUCTION HAS OCCURED AND WITH APPROVAL FROM THE HOWARD COUNTY OFFICE OF PLANNING AND ZONING.

FCE-3 PLANTING SCHEDULE
200 TPA × 0.15028 AC= 30 TREES TOTAL
30 TREES - 9 (CREDIT FOR EX.) = 21 TREES REQUIRED

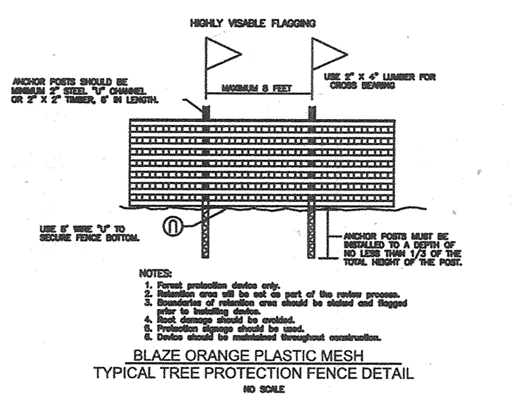
## FCE-3 PLANT SCHEDULE

| QUAN. | BOTANICAL NAME | SIZE |
|---|---|---|
| 5 | Acer Rubrum Red Maple | 1"CAL. |
| 8 | Platanus occidentalis Sycamore | 1"CAL. |
| 4 | Liquidambar Styracifflia Sweetgum | 1"CAL. |
| 4 | Quercus palustris Pin Oak | 1"CAL. |

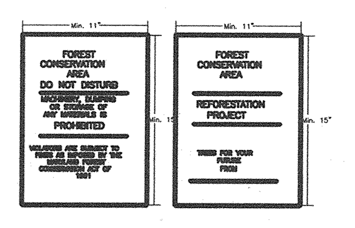
## DENSITY CHART

| SIZE | QTY. PER ACRE | AVERAGE SPACING |
|---|---|---|
| 1" CALIPER | 200 | 15' x 15' |

| | | |
|---|---|---|
| 1 | REVISE FCE PLANT SCHEDULE | 11/23/04 |

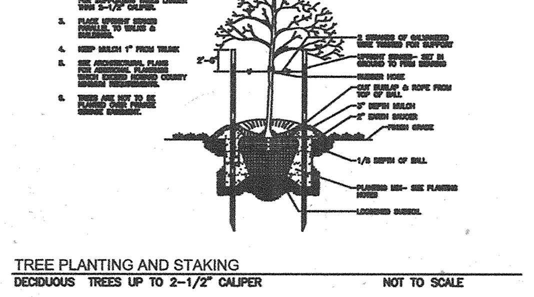



TYPICAL TREE PROTECTION FENCE DETAIL
NO SCALE




FOREST CONSERVATION AREA SIGNS

Note:
1. Bottom of signs to be higher than top of tree protection fence.
2. Signs to be placed at a maximum spacing of 50' - 100' feet apart.
3. Attachment of signs to trees is prohibited.
4. Signs to be posted to 2"x2" wood posts.



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

## SOILS LEGEND

| SYMBOL | NAME / DESCRIPTION | TYPE |
|---|---|---|
| SfD2 | SASSAFRAS GRAVELLY SANDEY LOAM, 10%-15% SLOPES, MODERATLEY ERODED. | B |
| SfB2 | SASSAFRAS GRAVELLY SANDEY LOAM, 1%-5% SLOPES, MODERATLEY ERODED. | B |
| BrF | BRANDYWINE LOAM, 25%-60% SLOPES | C |
| WaA | WATCHUNG SILT LOAM, 0%-3% SLOPES | D |

NOTE: HOWARD SOIL SURVEY, MAP NUMBER 26

## SCHEDULE D
STORMWATER MANAGEMENT AREA LANDSCAPING

| | |
|---|---|
| LINEAR FEET OF PERMITER | 240 |
| CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET) | YES 240 |
| CREDIT FOR OTHER LANDSCAPING (NO, YES AND %) | YES 100%* |
| NUMBER OF TREES REQUIRED | |
| SHADE TREES 1:50 | 5 |
| EVERGREEN TREES 1:40 | 6 |
| NUMBER OF TREES PROVIDED | |
| SHADE TREES | N/A |
| EVERGREEN TREES | N/A |
| SHRUBS | N/A |

* CREDIT IS TAKEN FOR THIS FACILITY BASED ON THE PROPOSED BIORETENTION PLANTING.

## SCHEDULE A
PERIMETER LANDSCAPE EDGE

| CATEGORY | ADJACENT TO ROADWAYS | ADJACENT TO PERIMETER PROPERTIES | | | |
|---|---|---|---|---|---|
| PERIMETER/FRONTAGE DESIGNATION LANDSCAPE TYPE | NONE | 1 A | 2 A | 3 A | 4 A |
| LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER | | 436 | 329 | 626 | 344 |
| CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED) | | *YES 83 | *YES 309 | *YES 516 | *YES 65 |
| CREDIT FOR WALL, FENCE OT BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED) | | NO | NO | NO | NO |
| NUMBER OF PLANTS REQUIRED (LF REMAINING) | | 353 | 20 | 110 | 279 |
| SHADE TREES | | 1:60 6 | 1:60 0 | 1:60 2 | 1:60 5 |
| EVERGREEN TREES | | - | - | - | - |
| SHRUBS | | - | - | - | - |
| NUMBER OF PLANTS PROVIDED SHADE TREES | | 6 | 0 | 2 | 5 |
| EVERGREEN TREES | | - | - | - | - |
| OTHER TREES (2:1 SUBSTITUTION) | | - | - | - | - |
| SHRUBS (10:1 SUBSTITUTION) | | - | - | - | - |
| DESCRIBE PLANT SUBTITUTION CREDITS BELOW IF NEEDED) | | - | - | - | - |

* EXISTING WOODS TO REMAIN

## STREET TREE CHART 2.5" CAL. B&B AUTUMN PURPLE ASH

| STREET NAME | LINEAR FEET | NO. REQUIRED | NO. PROVIDED |
|---|---|---|---|
| ROMMEL DRIVE | 880/40 | 22 | 23 |

## NOTES:

1. THE PROPERTY IS BASED ON A BOUNDARY SURVEY PERFORMED BY VOGEL & ASSOCIATES, INC. IN FEBRUARY, 1999.
2. THE EXISTING FEATURES AND CONTOURS SHOWN HEREON ARE BASED ON FIELD RUN TOPOGRAPHY PERFORMED BY VOGEL & ASSOCIATES, INC. IN FEBRUARY, 1999.
3. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
4. THE TYPE 'A' PERIMETER LANDSCAPE INFORMATION INDICATED ON THIS PLAN FOR LOTS LOTS 1-5 AND 7-10 IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. IT SHALL BE SHOWN ON THE REQUIRED FUTURE SITE DEVELOPMENT PLAN. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING MUST BE POSTED AS PART PART OF THE BUILDER'S GRADING PERMIT IN THE AMOUNT OF $3,900.00 FOR THE 13 SHADE TREES SHOWN ON LOTS 1-4, 6 & 10.
   - LOT 1: 3 SHADE TREES = $900.00
   - LOT 2: 2 SHADE TREES = $600.00
   - LOT 3: 1 SHADE TREES = $300.00
   - LOT 4: 2 SHADE TREES = $600.00
   - LOT 6: 3 SHADE TREES = $900.00
   - LOT 10: 2 SHADE TREES = $600.00
5. THE FOREST CONSERVATION REQUIREMENTS PER SECTION 16.1202 OF THE HOWARD COUNTY CODE; FOREST CONSERVATION ACT, FOR THIS SUBDIVISION HAVE BEEN FULFILLED THROUGH:
   - A.) THE FOREST RETENTION OF 0.71 ACRE LOCATED ON FCE-1 AND FCE-2.
   - B.) REFORESTATION FOR 0.15 ACRE ON FCE-3.
   - B.) FEE-IN-LIEU OF REFORESTATION FOR 0.30 ACRE.
6. LANDSCAPE SURETY IN THE AMOUNT OF $7,200.00 ($6,600.00 FOR THE 22 PRIVATE ACCESS PLACE STREET TREES AND $600.00 FOR THE TRASH PAD SHRUBS) SHALL BE POSTED AS A LANDSCAPE SURETY WITH THE DEVELOPER'S AGREEMENT.
7. THE MAINTENANCE OF THE TRASH PAD AND TRASH PAD LANDSCAPE PLANTING IS THE RESPONSIBILITY OF THE HOA.

## DEVELOPER'S/BUILDER'S CERTIFICATE

I CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND HOWARD COUNTY LANDSCAPE MANUAL.

(signature) 12/04/02
DEVELOPER/BUILDER — DATE

## FOREST PROTECTION NOTES

PRE-CONSTRUCTION ACTIVITES
1. Install blaze orange fence and retention signs before construction begins.
2. Fencing shall be maintained in good condition and promptly repaired or restored as the situation warrants.

CONSTRUCTION PHASE
1. No disturbance or dumping is allowed inside the tree retention area.
2. No equipment shall be operated inside the tree retention area including tree canopies.
3. In the event of drought, the protected trees shall be monitored for signs of stress and watered as needed.

POST-CONSTRUCTION ACTIVITIES
1. At the direction of a qualified tree care expert, damages to retained trees shall be repaired by the contractor.
2. Fence removal and stabilization shall be as per the sediment and erosion control plan, except for the selection of grasses for stabilization.
3. Do not remove signs.

OWNER / DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SUITE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

## AFFORESTATION NOTES

1. AT COMPLETION OF HOUSE CONSTRUCTION, THE DISTURBED AREAS WITHIN THE CONSERVATION EASEMENT WILL BE VEGETATIVELY STABILIZED WITH ANNUAL RYE AND BIRDSFOOT TREFOIL.
2. EXISTING TALL GRASSES WITHIN THE CONSERVATION EASEMENT SHALL BE MOWED TO A HEIGHT OF 3 INCHES.
3. RANDOMLY SPACE 1" CAL. TREES SO THAT NO MORE THAN 5 OF ANY PARTICULAR SPECIES ARE PLANTED IN SUCCESSION.
4. ALL PROPOSED PLANT MATERIAL TO BE NATIVE PLANT SPECIES. NO ORNAMENTAL CULTIVARS TO BE USED. USE LOCAL GENETIC STOCK UP TO A 100 MILE RADIUS.
5. REFORESTATION MANAGEMENT RECORDS SHOULD BE KEPT FOR HOWARD COUNTY REVIEW.
6. YEAR 1: INSPECT TREES FOR HEALTH AND VIGOR AT: A. BEGINNING OF GROWING SEASON, B. MIDSUMMER AND C. FALL. ADJUST WATERING, PEST CONTROL, WEEDING AND FEEDING AS NEEDED. AFTER ONE-YEAR REPLACE ANY 1" CAL. OR 6' HT.TREES THAT DID NOT SURVIVE DURING THE NEXT PLANTING SEASON.
7. YEAR 2: INSPECT TREES FOR HEALTH AND VIGOR IN APRIL & OCTOBER. ADJUST WATERING, PEST CONTROL, WEEDING AND FEEDING AS NEEDED. REFLACE ANY 1"cal/6'ht TREES THAT DID NOT SURVIVE YEAR 2 DURING THE NEXT PLANTING SEASON. SEEDLINGS SHALL BE REPLACED UP TO 50 PERCENT DURING THE NEXT PLANTING SEASON.
8. CONTRACTOR TO FOLLOW ALL STATE AND COUNTY GUIDELINES FOR AFFORESTION & REFORESTATION.
9. IN ORDER TO INSURE SURVIVABILITY, THE PERSON RESPONSIBLE FOR INSTALLATION SHALL INSPECT AND AMEND THE SOILS PRIOR TO PLANTING, PROVIDE WATER DURING DROUGHT PERIODS, AND REMOVE ANY PESTS OR WEEDS DURING THE 2 YEAR MAINTENANCE PERIOD.

AFFORESTATION NOTES (CONT.):
10. ALL GREENBRIER, JAPANESE HONEYSUCKLE, POISON OAK, AND ANY OTHER INVASIVE SPECIES SHALL BE CLEARED PRIOR TO THE PLANTING OF ANY NEW MATERIAL.
11. CREDIT HAS BEEN TAKEN FOR THE 9 EXISTING TREES 2" OR GREATER WITHIN FCE #3.
12. EXISTING TREES SHALL BE PROTECTED DURING CLEARING.

(signature) 11/23/04
LARRY J. THOMPSON
DNR QUALIFIED PROFESSIONAL

## FOREST CONSERVATION WORKSHEET

### NET TRACT AREA:

| | |
|---|---|
| A. TOTAL TRACT AREA | 3.91 AC |
| B. AREA WITHIN 100 YEAR FLOODPLAIN | 0.00 AC |
| C. AREA TO REMAIN IN AGRICULTURAL PRODUCTION | 0.00 AC |
| D. NET TRACT AREA | 3.91 AC |

### LAND USE CATEGORY (FROM TABLE 3.2.1, PAGE 40, MANUAL)

INPUT THE NUMBER "1" UNDER THE APPROPRIATE LAND USE ZONING, AND LIMIT TO ONLY ONE ENTRY.

| ARA | MDR | IDA | HDR | MPD | CIA |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 0 |

| | | |
|---|---|---|
| E. AFFOREST THRESHOLD | 15% X D = | 0.59 AC |
| F. CONSERVATION THRESHOLD | 20% X D = | 0.78 AC |

### EXISTING FOREST COVER:

| | |
|---|---|
| G. EXISTING FOREST COVER (EXCLUDING FLOODPLAIN) = | 2.07 AC |
| H. AREA OF FOREST ABOVE AFFORESTATION THRESHOLD = | 1.48 AC |
| I. AREA OF FOREST ABOVE CONSERVATION THRESHOLD = | 1.29 AC |

### BREAK EVEN POINT:

| | |
|---|---|
| J. FOREST RETENTION WITH NO MITIGATION = | 1.04 AC |
| K. CLEARING PERMITTED WITHOUT MITIGATION = | 1.03 AC |

### PROPOSED FOREST CLEARING:

| | |
|---|---|
| L. TOTAL AREA OF FOREST TO BE CLEARED = | 1.35508 AC |
| M. TOTAL AREA OF FOREST TO BE RETAINED = | 0.71492 AC |

### PLANTING REQUIREMENTS:

| | |
|---|---|
| N. REFORESTATION FOR CLEARING ABOVE CONSERVATION THRESHOLD I*0.25 = | 0.32 AC |
| P. REFORESTATION FOR CLEARING BELOW CONSERVATION THRESHOLD (L-I)*2 = | 0.13 AC |
| Q. CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD = | 0.00 AC |
| R. TOTAL REFORESTATION REQUIRED = | 0.45 AC |
| S. TOTAL AFFORESTATION REQUIRED = | 0.00 AC |
| T. TOTAL REFORESTATION AND AFFORESTATION REQUIRED = | 0.45 AC |

REFORESTATION OF 0.15028 AC.(6546 SF) PLUS FEE-IN-LIEU FOR 0.29972 AC.(13056 SF) EQUALS 0.45 ACRE)

## COST ESTIMATE: (For bonding purposes, only)

### SURETY NOTE

FINANCIAL SURETY IN THE AMOUNT OF $9,501.40 WILL BE POSTED WITH THE FC INSTALLATION AND MAINTENANCE AGREEMENT.

| | |
|---|---|
| RETENTION | 31,142 SF X 0.20= $6,228.40 |
| REFORESTATION | 6,546 SF X 0.50= $3,273.00 |
| FEE-IN-LIEU | 13,056 SF X 0.50= $6,528.00 |

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
(signature) 12/19/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE
(signature) 12/20/02
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

# FOREST CONSERVATION, LANDSCAPING AND SUPPLEMENTAL INFORMATION PLAN
# THORNTON WOODS OVERLOOK
## LOTS 1- 10 AND OPEN SPACE LOT 11

TAX MAP #42 GRID 16 — PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland — Columbia, Maryland — Warrenton, Virginia

STATE OF MARYLAND — MARY HAMILTON McKENNA — REGISTERED LANDSCAPE ARCHITECT — NO. 2039 — 11-29-02
MARY H.McKENNA, RLA No.2039

| | |
|---|---|
| DESIGN BY: | MHM |
| DRAWN BY: | MHM |
| CHECKED BY: | MHM |
| DATE: | DECEMBER 3, 2002 |
| SCALE: | AS SHOWN |
| W.O. NO.: | 2019034 |

SHEET 4 OF 5

F-02-126

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APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/19/02

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 12/20/02

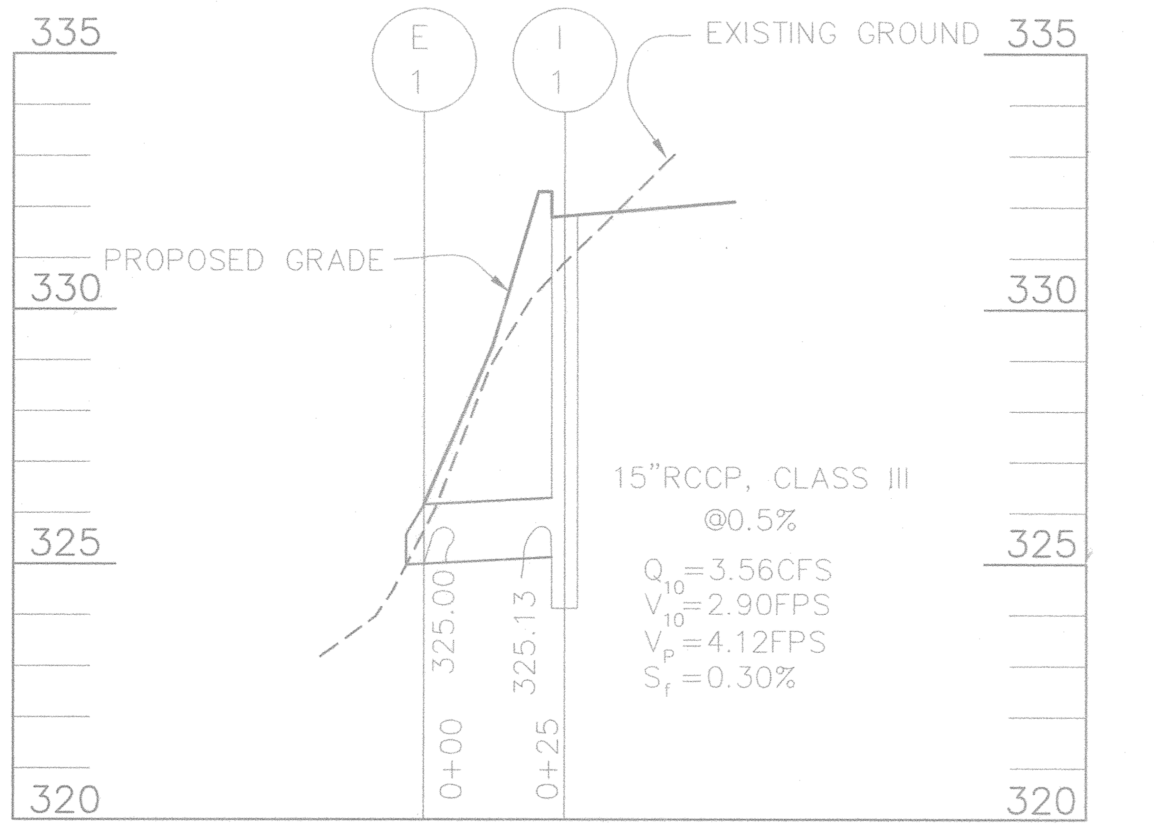
## LEGEND

- EXISTING CONTOUR
- EXISTING TREELINE
- EXISTING BRUSHLINE
- PROPOSED TREELINE
- SOIL BOUNDRY
- STREAM BUFFER
- WETLAND BUFFER
- WETLAND
- SLOPES 25% >
- SLOPES 15% TO 24.9%
- FOREST CONSERVATION EASEMENT
- LANDSCAPE PERIMETER
- TREE PROTECTION FENCE

| DRAINAGE AREA TABULATIONS | | | | | |
|---|---|---|---|---|---|
| No. | Area | 'C' | % Imp. | Soil Types | Zone |
| 1 | 1.60 Ac. | 0.29 | 38 | B | R-12 |

| PIPE SCHEDULE | | |
|---|---|---|
| SIZE | TYPE | LENGTH |
| 15" | RCCP | 25 LF |

| STRUCTURE SCHEDULE | | | | | | |
|---|---|---|---|---|---|---|
| NO. | TYPE | LOCATION | TOP ELEV. | INV. IN | INV. OUT | REMARKS |
| I-1 | Type 'S' Inlet | N 546929.4 E 1358984.9 | 331.80 | – | 325.13 | SD 4.22 |
| E-1 | Concrete End Section | N 546904.4 E 1358966.2 | 326.38 | – | 325.00 | SD 5.52 |




## STORM DRAIN PROFILE

SCALE: 1" = 50' HORZ.
1" = 5' VERT.

### TC PATH INFORMATION

DRAINAGE AREA '1'
Area : 1.0 Acres
CN : 0.29
TC : 0.11

| A–B | B–C | C–D |
|---|---|---|
| Sheet Flow | Shallow Concentrated | Open Channel |
| 50' @ 6.0% | 36' @ 5.0% | 276' @ 3.4 FPS |

OWNER/DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SIUTE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

| NO. | REVISION | DATE |
|---|---|---|

# DRAINAGE AREA MAP

# THORNTON WOODS OVERLOOK

## LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: JCO
DRAWN BY: JCO
CHECKED BY: RHV
DATE: DECEMBER 3, 2002
SCALE: 1" = 30'
W.O. NO.: 2019034

SHEET 5 OF 5

F-02-126

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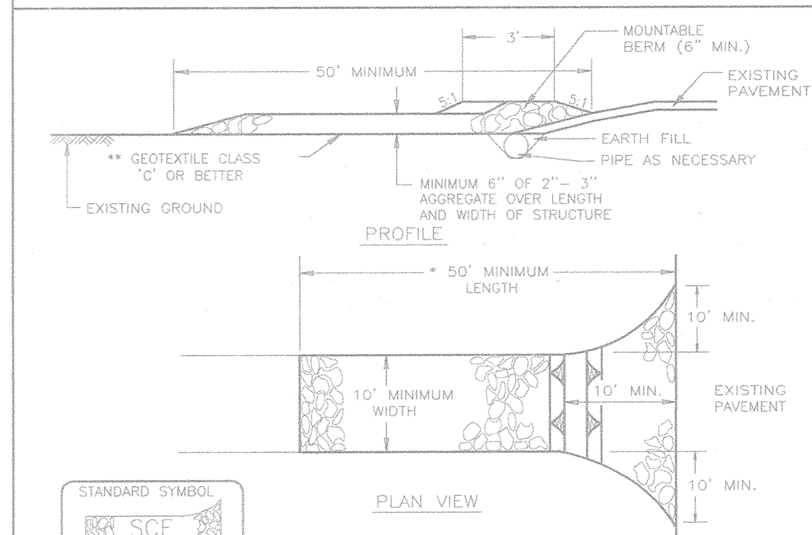
## DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

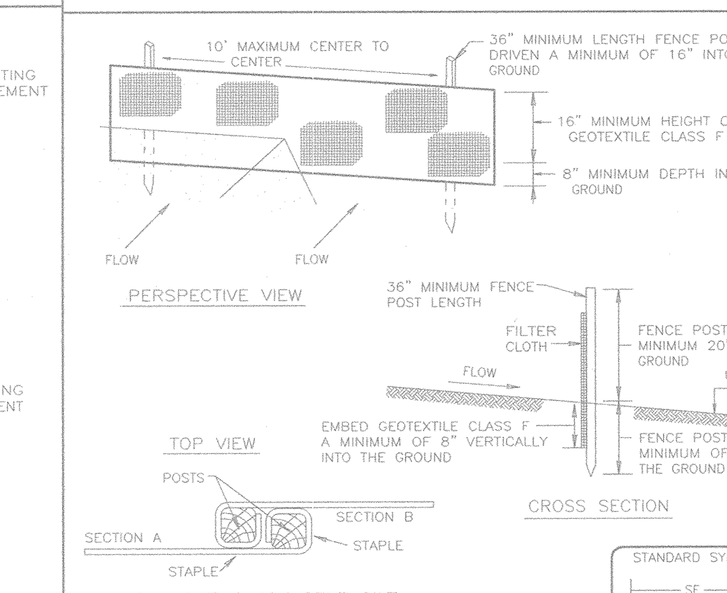



Construction Specification

1. Length – minimum of 50' (* 30' for a single residence lot).
2. Width – 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. ** The plan approval authority may not require single family residences to use geotextile.
4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water – all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE 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. A 6" minimum will be required.
6. 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.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE F - 17 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

## DETAIL 22 - SILT FENCE




Construction Specifications

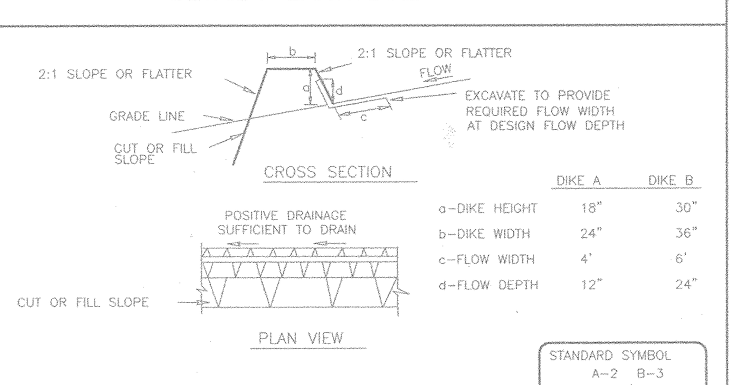
1. Fence posts shall be a minimum of 36" long, driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

| | | |
|---|---|---|
| Tensile Strength | 50 lbs/in (min.) | Test: MSMT 509 |
| Tensile Modulus | 20 lbs/in (min.) | Test: MSMT 509 |
| Flow Rate | 0.3 gal ft /minute (max.) | Test: MSMT 322 |
| Filtering Eggeciency | 75% (min.) | Test: MSMT 322 |

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of the fabric height.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE E - 15 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

## DETAIL 1 - EARTH DIKE




| | DIKE A | DIKE B |
|---|---|---|
| a-DIKE HEIGHT | 18" | 30" |
| b-DIKE WIDTH | 24" | 36" |
| c-FLOW WIDTH | 4' | 6' |
| d-FLOW DEPTH | 12" | 24" |

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" – 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike 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.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE A - 1 - 6 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

## 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, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

CONDITIONS WHERE PRACTICE APPLIES

I. 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 CONTINUING SUPPLIES 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.

II. 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

I. TOPSOIL SALVAGED FROM THE EXISTING SITE MAY BE USED PROVIDED THAT IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-SCS IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENTAL STATION.

II. TOPSOIL SPECIFICATIONS – SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:

I. 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 A 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, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAT 1 AND 1/2" IN DIAMETER.

II. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.

III. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 4-8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.

II. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:

I. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION – SECTION I – VEGETATIVE STABILIZATION METHODS AND MATERIALS.

III. FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES:
I. ON SOIL MEETING TOPSOIL SPECIFICATIONS, OBTAIN TEST RESULTS DICTATING FERTILIZER AND LIME AMENDMENTS REQUIRED TO BRING THE SOIL INTO COMPLIANCE WITH THE FOLLOWING:
A. PH FOR TOPSOIL SHALL BE BETWEEN 6.0 AND 7.5. IF THE TESTED SOIL DEMONSTRATES A PH OF LESS THAN 6.0, SUFFICIENT LIME SHALL BE PRESCRIBED TO RAISE THE PH TO 6.5 OR HIGHER.
B. ORGANIC CONTENT OF TOPSOIL SHALL BE NOT LESS THAN 1.5 PERCENT BY WEIGHT.
C. TOPSOIL HAVING SOLUBLE SALT CONTENT GREATER THAN 500 PARTS PER MILLION SHALL NOT BE USED.
D. NO SOD OR SEED SHALL BE PLACED ON SOIL SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.

NOTE: TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.

II. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMMENDMENTS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION-SECTION I-VEGETATIVE STABILIZATION METHODS AND MATERIALS.

V. TOPSOIL APPLICATION

I. WHEN TOPSOILING, MAINTAIN NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE AND SEDIMENT TRAPS AND BASINS.

II. GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBEIT 4" – 8" HIGHER IN ELEVATION.

III. TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN A 4" – 8" LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.

IV. TOPSOIL SHALL NOT BE PLACE 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 SEEDBED PREPARATION.

## SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSE AND PERMITS SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
2. ALL VEGETATION AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: (A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3:1, (B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 7, HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING, SOD, TEMPORARY SEEDING, AND MULCHING (SEC. G). TEMPORARY STABILIZATION WITH MULCH ALONE SHALL BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. 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.
7. SITE ANALYSIS :

| | |
|---|---|
| TOTAL AREA | 3.91 ACRES |
| AREA DISTURBED | 2.35 ACRES |
| AREA TO BE ROOFED OR PAVED | 0.63 ACRES |
| AREA TO BE VEGETATIVELY STABILIZED | 0.93 ACRES |
| TOTAL CUT | 2200 CY |
| TOTAL FILL | 3000 CY |
| OFFSITE WASTE/BORROW AREA LOCATION | * |

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

* TO BE 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 FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

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

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

1) PREFERRED-APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/100 SQ.FT.) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS./1000 SQ.FT.) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT THE TIME OF SEEDING, APPLY 400 LBS. PER ACRE 30-0-0 UREAFORM FERTILIZER (9 LBS/1000 SQ.FT.)
2) ACCEPTABLE-APPLY 2 TONS PER ACRE DOLOMATIC 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. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS. KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS. PER ACRE (.05 LBS./1000 SQ.FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 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 FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ.FT.) FOR ANCHORING.

MAINTENANCE: INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

## TEMPORARY SEEDING NOTES

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

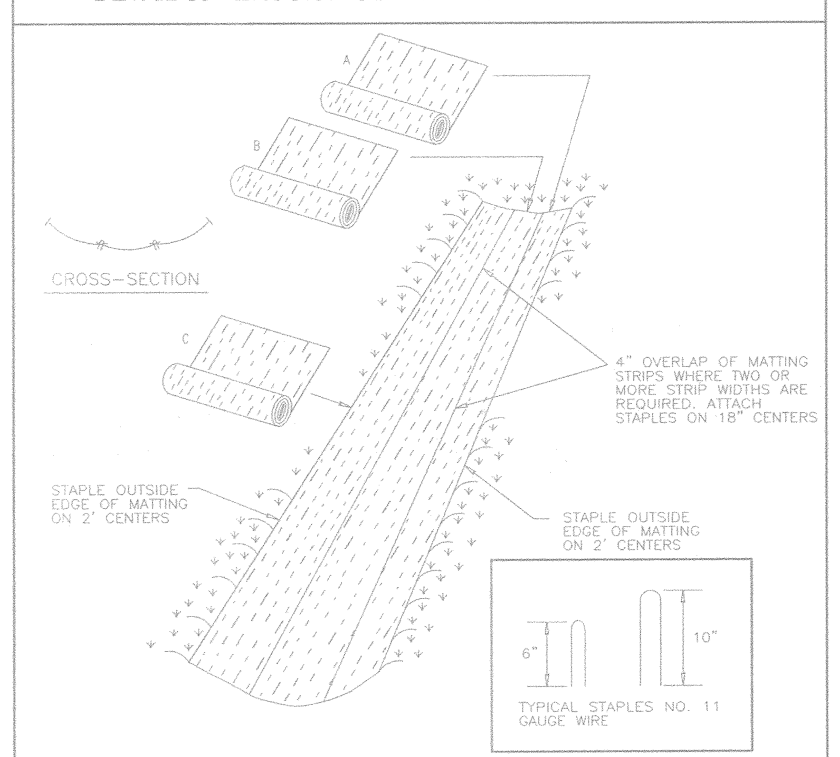
SOIL AMENDMENTS: APPLY 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS./1000 SQ.FT).

SEEDING: FOR PERIODS MARCH 1 THRU APRIL 30 AND FROM AUGUST 15 THRU NOVEMBER 15, SEED WITH 2 1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS./1000 SQ.FT.) FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS. PER ACRE OF WEEPING LOVEGRASS (.07 LBS./1000 SQ.FT.). FOR THE PERIOD NOVEMBER 1 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 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 FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ.FT.) FOR ANCHORING.

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

## DETAIL 30 - EROSION CONTROL MATTING




Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".
2. Staple the 4" overlap in the channel center using an 18" spacing between staples.
3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.
4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
5. 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", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.
6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE G - 22 - 2 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

## MARYLAND 378
## STORMWATER MANAGEMENT POND CONSTRUCTION SPECIFICATIONS

CONSTRUCTION SPECIFICATIONS

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent version.

Site Preparation

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the tow of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

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

Earth Fill

Material – The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and must have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

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

Compaction – The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

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

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

Embankment Core – The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operated closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi; 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of the structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill (flowable fill)zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section.

Corrugated Metal Pipe – All of the following criteria shall apply for corrugated metal pipe:

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

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

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

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

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

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

Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

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

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

Reinforced Concrete Pipe – All of the following criteria shall apply for reinforced concrete pipe:

1. Materials – Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding – Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe – Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform tStructure Backfill ".

5. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings.

Plastic Pipe – The following criteria shall apply for plastic pipe:

1. Materials – PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" -10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding – The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform tStructure Backfill ".

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

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

Concrete

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

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction Materials, Section 311.

Geotexile shall be placed under all riprap and shall meet requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

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

Stabilization

All borrow areas shall be graded to provide proper drainage and left I a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

Erosion and Sediment Control

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.

POND BOTTOM SOIL CONDITIONS

If broken rock fragments are encountered at finished pond bottom, under cut a minimum of 12" below basin grade and to a horizontal distance of at least 18" beyond each edge of the broken rock and backfill with fine-grained ML or CL soils compacted to a firm condition. This procedure should be performed under the supervision of the project Geotechnical Engineer.

## SEQUENCE OF CONSTRUCTION

| SEQUENCE OF CONSTRUCTION | DURATION |
|---|---|
| 1. OBTAIN GRADING PERMIT. | |
| 2. NOTIFY HOWARD COUNTY BUREAU OF INSPECTIONS AND PERMITS (313-1880) AT LEAST 24 HOURS BEFORE STARTING ANY WORK. | |
| 3. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AND INSTALL PERIMETER SILT FENCE, TREE PROTECTION FENCE, TREE PROTECTION SIGNS & CLEAN WATER DIKES. | 3 DAYS |
| 4. WITH INSPECTOR'S APPROVALS CLEAR AND GRUB SITE TO LOD. | 1 DAY |
| 5. GRADE ROAD TO SUB-BASE AND PAVE ROAD AND INSTALL STREET TREES. | 3 WEEKS |
| 6. WITH INSPECTOR'S APPROVAL AND WITH ROAD PAVING COMPLETE, STABILIZE CONTRIBUTING DRAINAGE AREAS AND CONSTRUCT BIORETENTION FACILITY. | 1 WEEK |
| 7. WITH INSPECTOR'S APPROVAL AND WITH BIORETENTION FACILITY COMPLETE, STABILIZE AREA AND INSTALL LANDSCAPING. | 3 DAYS |
| 8. WITH INSPECTOR'S APPROVAL REMOVE SEDIMENT CONTROL MEASURES NOT NOT NEEDED FOR SITE DEVELOPMENT PLAN STAGE. | 3 DAYS |

## NOTES

1. DURING GRADING AND AFTER EACH RAINFALL, THE CONTRACTOR SHALL INSPECT AND PROVIDE THE NECESSARY MAINTENANCE ON THE SEDIMENT AND EROSION CONTROL MEASURES SHOWN HEREON.
2. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLIED WITH:
   A. 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, SWALES, DITCH PERIMETER SLOPES SLOPES AND ALL SLOPES GREATER THAN 3:1.
   B. 14 CALENDAR DAYS FOR ALL OTHER DISTURBED AREAS.

## BIORETENTION AREA SOIL SPECIFICATIONS

### A. PLANTING SOIL

THE BIORETENTION AREAS SHALL CONSIST OF A PLANTING SOIL HAVING A COMPOSITION OF AT LEAST 10 TO 25 PERCENT CLAY AND SHALL BE OF A SANDY LOAM OR LOAMY SAND TEXTURE. LOAMY SOILS MAY BE UTILIZED FOR THE PLANTING SOIL BUT MUST CONSIST OF 35% SAND. IN ADDITION, THE FURNISHED PLANTING SOIL SHALL BE OF UNIFORM COMPOSITION, FREE OF STONES, STUMPS, ROOTS OR SIMILAR OBJECTS LARGER THAN ONE INCH, BRUSH, OR ANY OTHER MATERIAL OR SUBSTANCE WHICH MAY BE HARMFUL TO PLANT GROWTH, OR A HINDERANCE TO PLANTING OR MAINTENANCE OPERATIONS.

THE PLANTING SOIL SHALL BE FREE OF PLANTS OR PLANT PARTS OF BERMUDA GRASS, QUACK GRASS, JOHNSON GRASS, MUGWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE OR OTHERS AS SPECIFIED.

IT SHALL NOT CONTAIN TOXIC SUBSTANCES HARMFUL TO PLANT GROWTH.

### THE PLANTING SOIL SHALL MEET THE FOLLOWING CRITERIA:

| | |
|---|---|
| PH RANGE | 5.5 – 6.5 |
| ORGANIC MATTER | 1.5 – 3.0% |
| MAGNESIUM – Mg | 35 lbs / ACRE |
| PHOSPHORUS – P205 | 100 lbs / ACRE |
| POTASIUM – K20 | 85 lbs / ACRE |
| SOLUBLE SALTS | NOT TO EXCEED 500 ppm |

### B. MULCH LAYER SPECIFICATIONS (3" THICK)

A MULCH LAYER SHALL BE PROVIDED ON TOP OF THE PLANTING SOIL. AN ACCEPTABLE MULCH LAYER SHALL INCLUDE SHREDDED HARDWOOD OR SHREDDED WOOD CHIPS OR OTHER SIMILAR PRODUCT.

ALL MULCH PRODUCTS MUST BE WELL AGED, UNIFORM IN COLOR, AND FREE OF FOREIGN MATERIAL INCLUDING PLANT MATERIAL. WELL AGED MULCH IS DEFINED AS MULCH THAT HAS BEEN STOCKPILED OR STORED FOR AT LEAST TWELVE (12) MONTHS.

### C. SAND SPECIFICATIONS(1' MIN.)

THE SAND SHALL BE FREE OF DELETERIOUS MATERIAL AND ROCKS GREATER THAN 1 INCH IN DIAMETER.

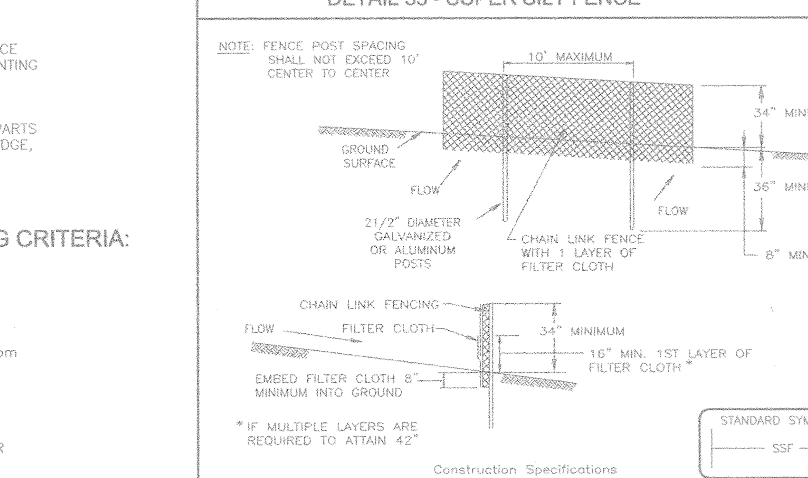
### D. COMPACTION

SOIL SHALL BE PLACED IN LIFTS LESS THAN 18 INCHES AND LIGHTLY COMPACTED (MINIMAL COMPACTIVE EFFORT) BY TAMPING WITH A BUCKET FROM A DOZER OR A BACKHOE.

### OPERATION AND MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS 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.
2. 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 DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
4. SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

## DETAIL 33 - SUPER SILT FENCE

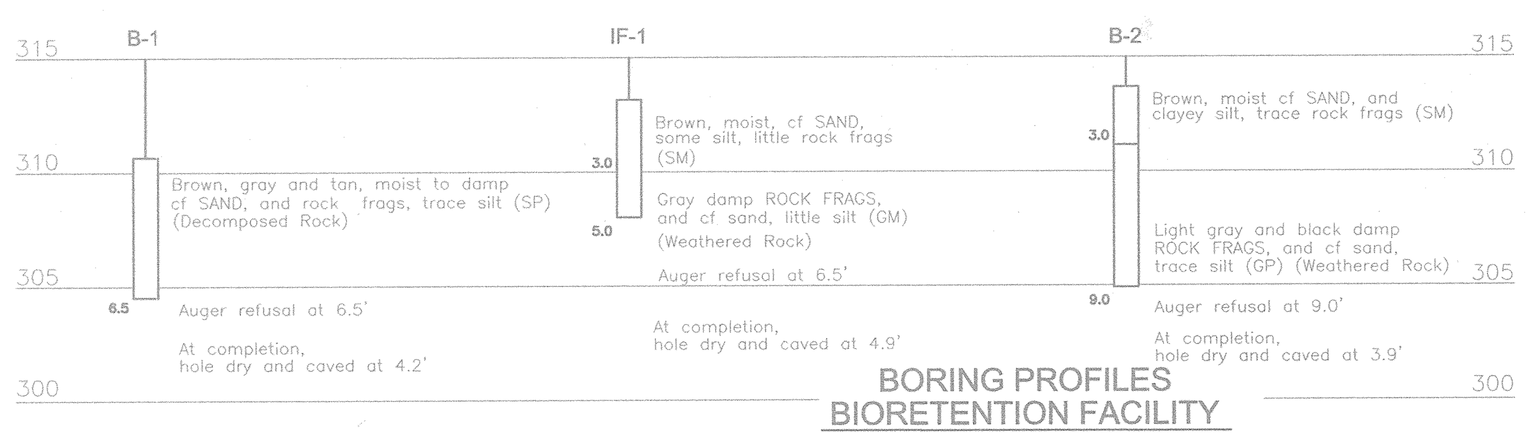



Construction Specifications

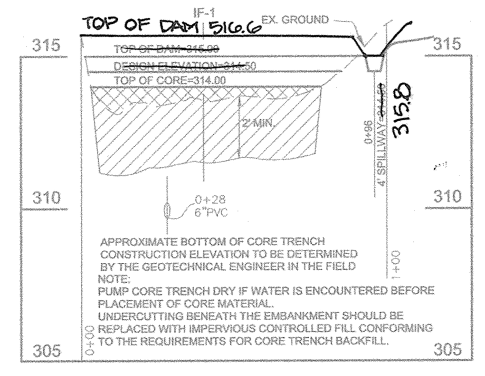
1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height.
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

| | | |
|---|---|---|
| Tensile Strength | 50 lbs/in (min.) | Test: MSMT 509 |
| Tensile Modulus | 20 lbs/in (min.) | Test: MSMT 509 |
| Flow Rate | 0.3 gal/ft ²/minute (max.) | Test: MSMT 322 |
| Filtering Efficiency | 75% (min.) | Test: MSMT 322 |

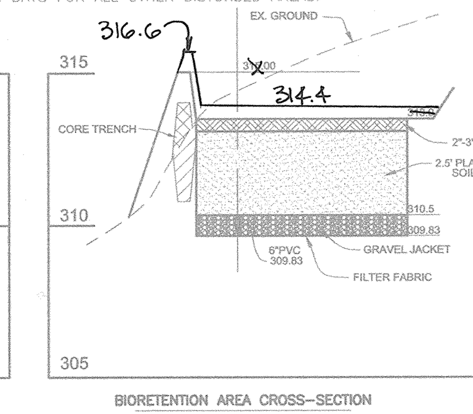
| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE H - 26 - 3 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|



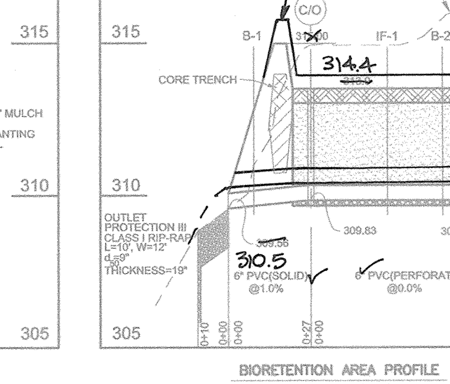

BORING PROFILES
BIORETENTION FACILITY
NOT TO SCALE




PROFILE ALONG EMBANKMENT
SCALE: HOR.:1"=50' VERT.:1"=5'




BIORETENTION AREA CROSS-SECTION
SCALE: HOR.:1"=50' VERT.:1"=5'




BIORETENTION AREA PROFILE
SCALE: HOR.:1"=50' VERT.:1"=5'

OWNER / DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SIUTE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

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 OF ENGINEER — 12/3/03 DATE
ROBERT H. VOGEL

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 12/19/02 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT — 12/20/02 DATE

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.

USDA-NATURAL RESOURCES CONSERVATION SERVICE — 12/10/02 DATE

THESE PLANS FOR SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT — 12/10/02 DATE

DEVELOPER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — 12/04/02 DATE

ROBERT H. VOGEL, P.E. #16193
AS - BUILT

| NO. | REVISION | DATE |
|---|---|---|

# SEDIMENT AND EROSION CONTROL DETAILS
# THORNTON WOODS OVERLOOK
## LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia


| | |
|---|---|
| DESIGN BY: | MHM |
| DRAWN BY: | MHM |
| CHECKED BY: | JCO |
| DATE: | DECEMBER 3, 2002 |
| SCALE: | AS SHOWN |
| W.O. NO.: | 2019034 |

SHEET 3 OF 5

ROBERT H. VOGEL, P.E. No. 16193

AS-BUILT 10.19.04 F-02-126

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## LEGEND

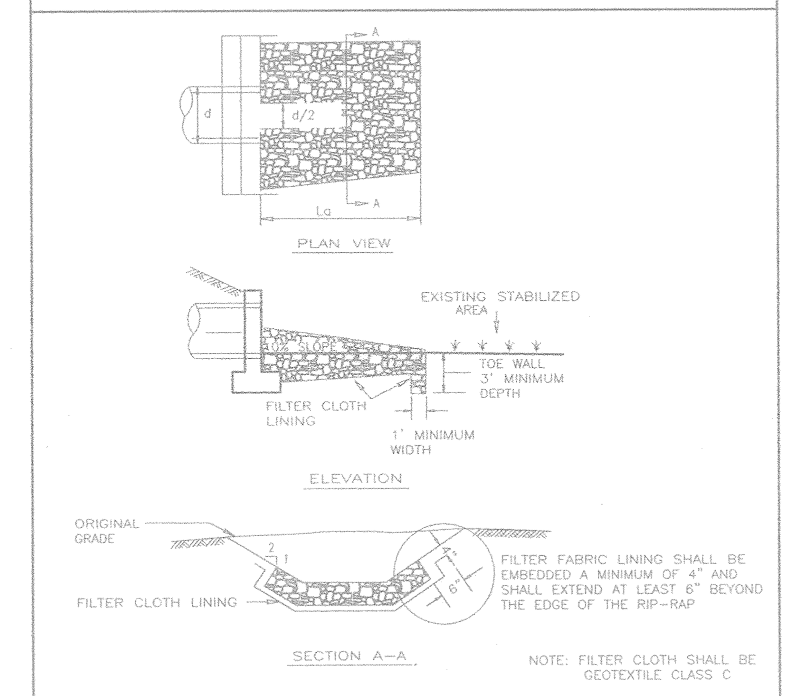
| | |
|---|---|
| EXISTING CONTOUR | 382 |
| PROPOSED CONTOUR | 82 |
| EXISTING TREELINE | |
| EXISTING BRUSHLINE | |
| PROPOSED TREELINE | |
| SOIL BOUNDRY | GnB2 |
| STREAM BUFFER | |
| WETLAND BUFFER | |
| WETLAND | |
| SLOPES 25% > | |
| SLOPES 15% TO 24.9% | |
| FOREST CONSERVATION EASEMENT | |
| TREE PROTECTION FENCE | TPF |
| STABILIZED CONSTRUCTION ENTRANCE | SCE |
| SUPER SILT FENCE | SSF |
| SILT FENCE | SF |
| EARTH DIKE | ED A-1 |
| LIMIT OF DISTURBANCE | LOD |
| EROSION CONTROL MATTING | ECM |

## SOILS LEGEND

| SYMBOL | NAME / DESCRIPTION | TYPE |
|---|---|---|
| SfD2 | SASSAFRAS GRAVELLY SANDEY LOAM, 10%-15% SLOPES, MODERATLEY ERODED. | B |
| SfB2 | SASSAFRAS GRAVELLY SANDEY LOAM, 1%-5% SLOPES, MODERATLEY ERODED. | B |
| BrF | BRANDYWINE LOAM, 25%-60% SLOPES | C |
| WaA | WATCHUNG SILT LOAM, 0%-3% SLOPES | D |

NOTE: HOWARD SOIL SURVEY, MAP NUMBER 26

## DETAIL 27 - ROCK OUTLET PROTECTION III




| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE F - 18 - 10 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

## ROCK OUTLET PROTECTION

Construction Specifications

1. The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.

2. The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.

3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

| U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE F - 18 - 8A | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION |
|---|---|---|

### 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] 12/3/03
SIGNATURE OF ENGINEER — DATE
ROBERT H. VOGEL

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 12/19/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

Cindy Hamilton 12/20/02
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SOIL EROSION AND SEDIMENT CONTROL.

Jim Myers 12/10/02
USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE

THESE PLANS FOR SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

John R Robertson 12/10/02
HOWARD SOIL CONSERVATION DISTRICT — DATE

### DEVELOPER'S CERTIFICATE

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

Michael Pfau 12/4/02
SIGNATURE OF DEVELOPER — DATE

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 PROFESSIONAL ENGINEER 10/19/04

ROBERT H. VOGEL, P.E. #16193
AS-BUILT
[signature]

OWNER/DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SIUTE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

| NO. | REVISION | DATE |
|---|---|---|

# GRADING & SEDIMENT AND EROSION CONTROL PLAN
# THORNTON WOODS OVERLOOK
## LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — PARCEL '41'
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland — Columbia, Maryland — Warrenton, Virginia


STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 PROFESSIONAL ENGINEER 12/3/03
ROBERT H. VOGEL, PE No.16193

| | |
|---|---|
| DESIGN BY: | RHV |
| DRAWN BY: | MHM |
| CHECKED BY: | JCO |
| DATE: | DECEMBER 3, 2002 |
| SCALE: | 1"=30' |
| W.O. NO.: | 2019034 |

SHEET 2 OF 5

AS-BUILT 10.19.04. F-02-126

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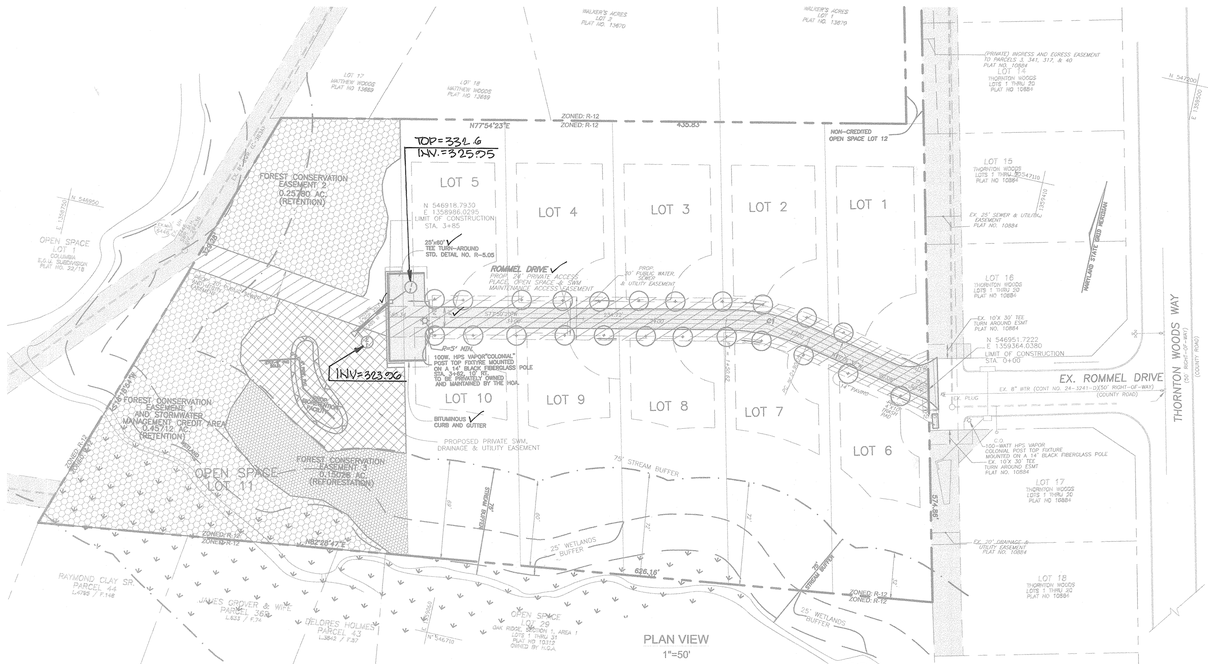
# THORNTON WOODS OVERLOOK

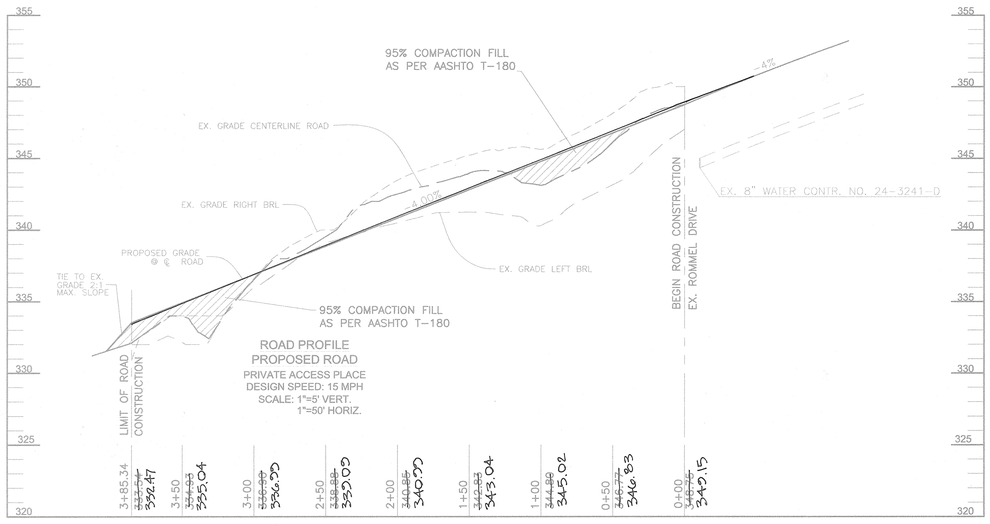
## LOTS 1-10 AND OPEN SPACE LOT 11 & 12
## FINAL ROAD CONSTRUCTION PLAN
## HOWARD COUNTY, MARYLAND

| | SHEET INDEX |
|---|---|
| 1 | ROAD CONTRUCTION PLAN |
| 2 | GRADING & SEDIMENT AND EROSION CONTROL PLAN |
| 3 | SEDIMENT AND EROSION CONTROL DETAILS BIORETENTION SOIL SPECIFICATION |
| 4 | LANDSCAPING, FOREST CONSERVATION, AND SUPPLEMENTAL INFORMATION SHEET |
| 5 | FINAL DRAINAGE AREA MAP |

CURVE TABLE

| CURVE | LENGTH | RADIUS | DELTA ANGLE | TANGENT | CHORD DIRECTION | CHORD LENGTH |
|---|---|---|---|---|---|---|
| C1 | 60.57' | 150.00' | 23°8'3" | 30.70' | S89°24'22"W | 60.15' |




### STORMWATER MANAGEMENT REQUIREMENTS

PRIOR TO CREDITS

DRAINAGE AREA 1:(NO DEVELOPMENT)

| WQv | Cpv | Rev |
|---|---|---|
| N/A | N/A | N/A |

DRAINAGE AREA 2:

| WQv | Cpv | Rev |
|---|---|---|
| 3,236 CF | N/A* | 842 CF |

*Cpv NOT REQUIRED SINCE THE 1YR. DEVELOPED DISCHARGE IS LESS THEN 2CFS.

DRAINAGE AREA 3:(NO DEVELOPMENT)

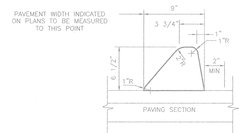
| WQv | Cpv | Rev |
|---|---|---|
| N/A | N/A | N/A |

### SITE DATA

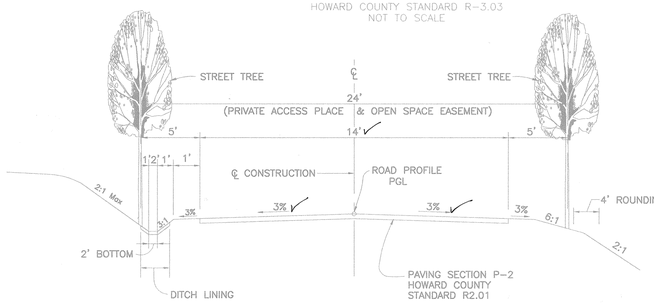
LOCATION: TAX MAP 42 , BLOCK 16, PARCELS 41 & 3
6TH ELECTION DISTRICT
EXISTING ZONING: R-12
GROSS AREA OF PARCEL: 169938 SQ.FT. (3.9057 ACRES)
AREA OF RIGHT OF WAY: 0.00
AREA OF FLOODPLAIN: 0.00
AREA OF STEEP SLOPES: 7939 SQ. FT. (0.1822 ACRES)
NET AREA OF PROJECT: 161999 SQ. FT. (3.7235 ACRES)
NUMBER OF PROPOSED RESIDENTIAL LOTS: 10
AREA OF PROPOSED RESIDENTIAL LOTS: 113412 SQ. FT. (2.67 ACRES)
AREA OF SMALLEST BUILDABLE LOT PROPOSED: 9972 SQ. FT (LOT 2)
NUMBER OF PROPOSED OPEN SPACE LOTS: 2
CREDITED OPEN SPACE: 1.1508 ACRES(29%)
NON-CREDITED OPEN SPACE: 0.0785 ACRES
AREA OF OPEN SPACE REQUIRED: 20% OF GROSS AREA OF PARCEL (0.780 AC.)
TOTAL AREA OF OPEN SPACE PROPOSED: 1.2293 ACRES

### LEGEND

Stream
Stream Buffer
Wetlands
Wetlands Buffer
Spot Elevation +82.53
Direction of Flow
Proposed Street Trees

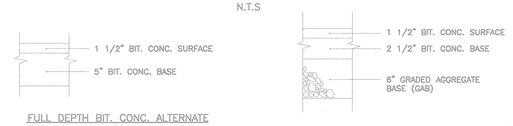



STANDARD BITUMINOUS CURB ✓
HOWARD COUNTY STANDARD R-3.03
NOT TO SCALE




ROMMEL DRIVE
TYPICAL ROADWAY SECTION
CLASSIFICATION : PRIVATE ACCESS PLACE
DESIGN SPEED 15 MPH
STATION 0+00 TO STATION 3+85.34
HOWARD COUNTY STANDARD FIGURE 2.09b
NOT TO SCALE

P-2 LIGHT DUTY PAVING SECTION
N.T.S




APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

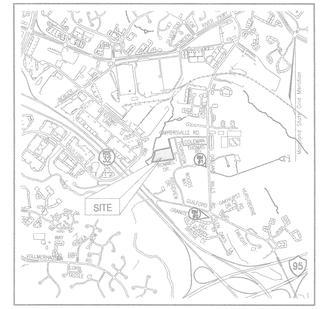
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 12/19/02

CHIEF, DIVISION OF LAND DEVELOPMENT DATE 12/20/02

### BENCHMARKS

BENCHMARK NO. 1: COUNTY CONTROL #42R5
N. 548,777.0609, E. 1,360,3609768
ELEV. = 391.54

BENCHMARK NO. 2: COUNTY CONTROL #42R6
N. 546,822.0895, E. 1,360,340.6529
ELEV. =389.12




### GENERAL NOTES

1. ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. PROJECT BACKGROUND:
   LOCATION: TAX MAP 42 & 3 BLOCK 16 PARCEL '41'
   6TH ELECTION DISTRICT
   ZONING: R-12
   TOTAL TRACT AREA: 3.90 AC
   DEED REFERENCE : PARCEL 41: 6212/418, PARCEL 3: 6212/415
   NUMBER OF PROPOSED LOTS: 10 RESIDENTIAL LOTS, 2 OPEN SPACE LOTS
   APPLICABLE DPZ FILE NUMBERS: WP-01-85, S-01-07, P-01-26
3. THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PREPARED BY VOGEL & ASSOCIATES DATED FEB. 10, 1999.
4. THE TOPOGRAPHY SHOWN HEREON IS BASED ON FIELD RUN TOPOGRAPHY PREPARED BY VOGEL & ASSOCIATES DATED FEB. 10, 1999.
5. WATER AND SEWER FOR THIS PROJECT WILL BE PUBLIC.
   WATER WILL BE ACCESSED THROUGH CONTRACT NO. 24-3241-D.
   SEWER WILL BE ACCESSED THROUGH CONTRACT NO. C-383A
6. STORMWATER MANAGEMENT TO BE PROVIDED FOR THE DEVELOPMENT BY BIORETENTION.
   THE FACILITY WILL BE LOCATED ON OPEN SPACE LOT 11 AND WILL BE OWNED AND MAINTAINED BY THE HOMEOWNERS ASSOCIATION.
   THE WATERSHED IS THE PATUXENT RIVER AREA, 02-13-11 AND THE STREAM USE IS CLASS I-P.
7. WETLANDS DELINEATED BY ECO-SCIENCES 09-27-00.
8. THERE ARE NO FLOODPLAINS ON SITE.
9. FOREST STAND DELINEATION PLAN PREPARED BY VOGEL & ASSOCIATES, INC. DATED OCTOBER 18, 2000.
10. APFO TRAFFIC STUDY PREPARED BY THE TRAFFIC GROUP DATED OCTOBER 2000.
11. THERE ARE NO STEEP SLOPES ONSITE WITH A CONTIGUOUS AREA OF 20,000 SF OR GREATER.
12. STREET LIGHTS ARE PROVIDED IN THIS DEVELOPMENT IN AND ARE TO BE PRIVATELY OWNED AND MAINTAINED BY THE HOA.
13. EXISTING UTILITIES WERE LOCATED PER COUNTY DRAWINGS AND FIELD RUN SURVEY.
14. THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
15. OPEN SPACE LOTS 11 & 12 WILL BE OWNED BY THE HOMEOWNERS ASSOCIATION.
16. TRASH COLLECTION AND RECYCLING WILL BE CURBSIDE PICKUP AT COUNTY ROADWAY. THE TRASH PAD AND PLANTINGS IS TO BE MAINTAINED BY THE HOA.
17. SECTION 16.120(a)(2)(i) OF THE ZONING REGULATIONS WAIVED AS PER WP-01-85 TO PERMIT THE MINIMUM PUBLIC ROAD FRONTAGE OF 20 FT FOR A NON-PIPESTEM RESIDENTIAL LOT THAT CANNOT BE FURTHER SUBDIVIDED TO BE REDUCED TO 10.4 FT FOR LOT 1 AND 14 FT FOR LOT 6. SECTION 16.121(e)(1) WAIVED AS PER WP-01-85 TO PERMIT THE REQUIRED 40 FT OF PUBLIC ROAD FRONTAGE FOR OPEN SPACE 11 WHERE PEDESTRIAN AND MAINTENANCE VEHICLE ACCESS WILL OCCUR TO BE REDUCED TO ZERO FEET. WAIVER IS SUBJECT TO COMPLIANCE WITH THE FOLLOWING CONDITIONS:
   A. THE 24'-35' PRIVATE ACCESS PLACE SHALL PROVIDE VEHICULAR AND PEDESTRIAN ACCESS TO LOTS 1-10 AND HOA OWNED OPEN SPACE LOT 11.
   B. THE 24'-35' PRIVATE ACCESS PLACE EASEMENT AT THE T-TURNAROUND ON LOTS 5 & 10 SHALL BE WIDENED 2-5 FT EASTWARD IN ORDER TO PROVIDE AN ADEQUATE EASEMENT AREA FOR THE PURPOSE OF MAINTAINING THE T-TURN AROUND AREA ON THESE LOTS.
   WP-01-85 APPROVAL DATED MARCH 9, 2001.
   S-01-07 APPROVAL DATED APRIL 20, 2001.
18. BASED ON THIS PLAN BEING SUBMITTED PRIOR TO 11/15/01, ON 06/28/01, IT (AND THE SUBDIVISION) IS "GRANDFATHERED" AND SUBJECT TO COMPLIANCE WITH THE FOURTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. IN ADDITION, BECAUSE THIS PLAN WAS NOT APPROVED PRIOR TO 11/01/01, IT (AND THE SUBDIVISION) IS SUBJECT TO COMPLIANCE WITH COUNTY COUNCIL BILL 50-2001, WHICH AMENDS PORTIONS OF THE ZONING REGULATIONS.
19. FOREST CONSERVATION PLAN WAS PREPARED BY FREDERICK WARD ASSOCIATES, INC DATED JUNE, 2002. FOREST CONSERVATION OBLIGATIONS FOR THIS SITE HAVE BEEN MET BY THE RETENTION OF 0.71AC., FEE-IN-LIEU-OF REFORESTATION FOR 0.30 AC AND 0.15 AC. OF REFORESTATION. SEE SHEET 4 FOR SURETY AND FEE AMOUNTS.
20. ALL LANDSCAPING REQUIREMENTS, AS SET FORTH IN THE LANDSCAPE MANUAL SHALL BE COMPLIED WITH PERIMETER LANDSCAPING REQUIREMENTS AND WILL BE POSTED AS PART OF THE D.P.W. DEVELOPER'S AGREEMENT. THE LANDSCAPE PLAN IS PROVIDED UNDER THIS PLAN.
21. FINANCIAL SURETY FOR THE REQUIRED PERIMETER LANDSCAPING IN THE AMOUNT OF $3,900 FOR 13 SHADE TREES SHOWN ON LOTS 1-4, 6 & 10 MUST BE POSTED AS PART OF THE BUILDER'S GRADING PERMIT (with SDP). FINANCIAL SURETY IN THE AMOUNT OF $7,200.00 ($6,600 FOR THE 22 PRIVATE ACCESS PLACE STREET TREES AND $600.00 FORTHE TRASH PAD SHURBS) SHALL BE POSTED AS A LANDSCAPE SUTETY WITH THE DEVELOPER'S AGREEMENT. (see note 4 on sheet 4).
22. DRIVEWAY ENTRANCES ARE TO BE PER HOWARD COUNTY DETAIL R6.06. CURB AND GUTTER AT END OF TURN AROUND TO BE PER HOWARD COUNTY DETAIL R3.03.
23. COORDINATES: HORIZONTAL DATUMS BASED ON NAD 83 HO. CO. GEODETIC CONTROL STATIONS 42R5 AND 42R6.
24. NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, OR PLACEMENT OF NEW STRUCTURES IS PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAMS, OR THEIR BUFFERS AND FOREST CONSERVATION EASEMENT AREAS, EXCEPT AS SHOWN ON THE APPROVED ROAD PLANS.

ROBERT H. VOGEL, P.E. # 16103 12/9/04
AS-BUILT

OWNER/DEVELOPER
MICHAEL PFAU
3675 PARK AVENUE, SUITE 301
ELLICOTT CITY, MD 21043
(410) 480-0023

| NO. | REVISION | DATE |
|---|---|---|

ROAD CONSTRUCTION PLAN
THORNTON WOODS OVERLOOK
LOTS 1- 10 AND OPEN SPACE LOT 11 & 12

TAX MAP #42 GRID 16 — PARCELS 41 & 3
6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND


FREDERICK WARD ASSOCIATES, INC.
ENGINEERS
ARCHITECTS
SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia


STATE OF MARYLAND — No. 16103 — PROFESSIONAL ENGINEER
ROBERT H. VOGEL, P.E. No. 16103

| | |
|---|---|
| DESIGN BY: | MHM |
| DRAWN BY: | MHM |
| CHECKED BY: | JCO |
| DATE: | DECEMBER 3, 2002 |
| SCALE: | AS SHOWN |
| W.O. NO.: | 2019034 |

SHEET 1 OF 5

AS-BUILT 10.19.04 F-02-126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