

ESC LEGEND

- LOD - LIMIT OF DISTURBANCE
- SSF - SUPER SILT FENCE
- SF - SILT FENCE
- DF - DIVERSION FENCE
- PERMANENT EROSION CONTROL MATTING IN SWALE
- SIP - STANDARD INLET PROTECTION

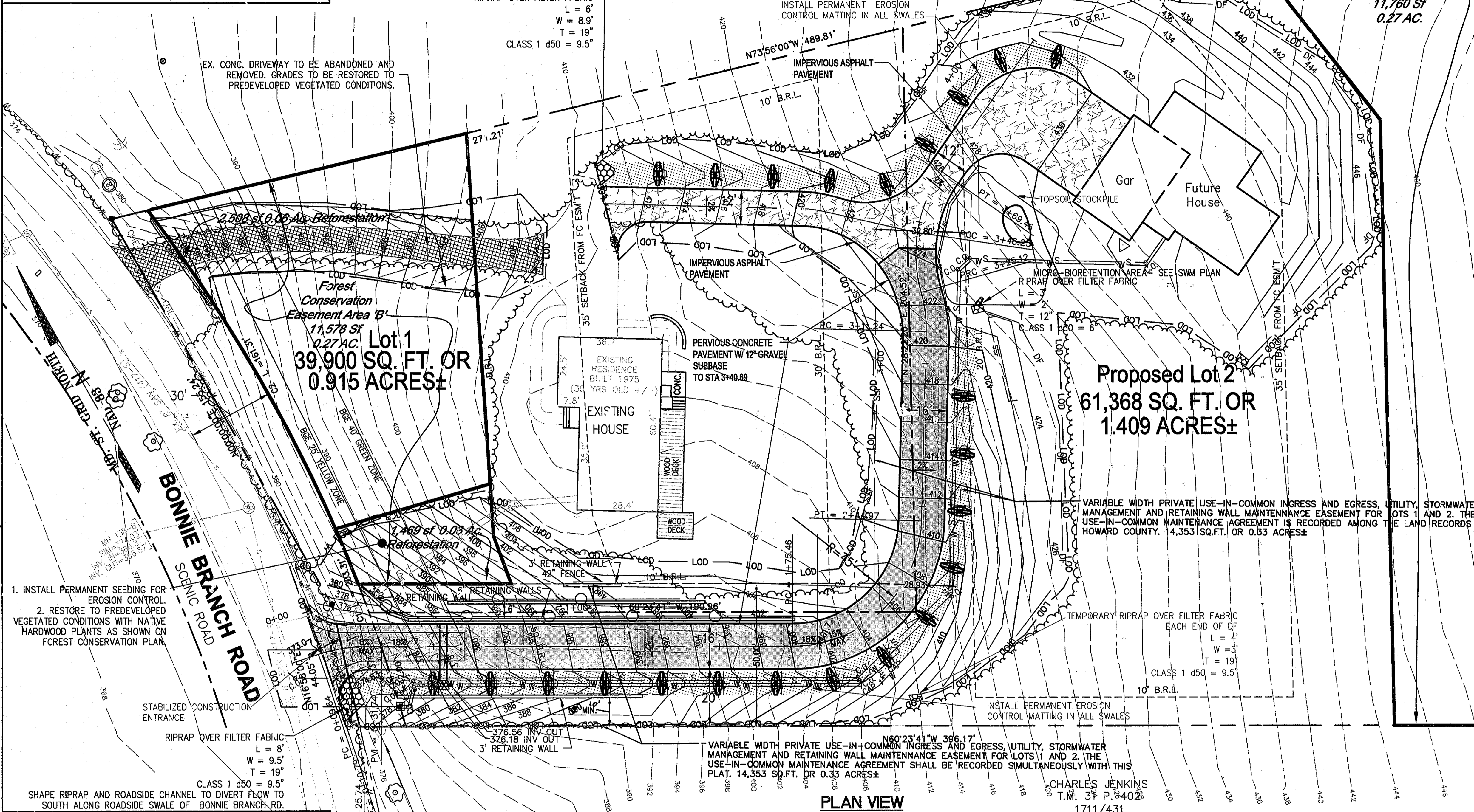
STABILIZED CONSTRUCTION ENTRANCE
NOTE: ALL SF AND SSF TO HAVE 3' HOOK AT EACH END OF RUN.

SHEET INDEX

NO.	DESCRIPTION
1	SUPPLEMENTAL PLAN: PROPOSED CONDITIONS, GRADING AND ESC
2	STORMWATER MANAGEMENT PLAN
3	DRIVEWAY PROFILE
4	RETAINING WALL PROFILES
5	FOREST CONSERVATION PLAN
6	FOREST CONSERVATION DETAILS
7	LANDSCAPE PLAN
8	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

- UTILITY NOTES:**
- ALL PROPOSED WATER SERVICE LATERALS SHALL BE 1" MINIMUM COPPER, TYPE "K", WITH 42" MINIMUM COVER.
 - PROPOSED WATER FROM MAIN TO METER SHALL BE 1-1/2" COPPER, TYPE "K", 42" MINIMUM COVER.
 - ALL PROPOSED SANITARY SEWER LATERALS SHALL BE 4" PVC SDR-35 PIPE CONSTRUCTED AT A MINIMUM SLOPE OF 2.08% WITH 36" MINIMUM COVER.
 - PROPOSED TWIN SANITARY SEWER HOUSE CONNECTION SHALL BE 6" PVC SDR-35 PIPE CONSTRUCTED AT A MINIMUM SLOPE OF 2.08% WITH 36" MINIMUM COVER.
 - PROPOSED SEWER LATERAL IN COMMON TRENCH SHALL BE A MINIMUM OF 1'-0" DEEPER THAN WATER LATERAL.

TEMPORARY RIPRAP OVER FILTER FABRIC EACH END OF DF
L = 4'
W = 3'
T = 19"
CLASS 1 d50 = 9.5'



- INSTALL PERMANENT SEEDING FOR EROSION CONTROL.
- RESTORE TO PREDEVELOPED VEGETATED CONDITIONS WITH NATIVE HARDWOOD PLANTS AS SHOWN ON FOREST CONSERVATION PLAN.

LEGEND

- GRASS SWALE WITH WOOD CHECK DAMS SEE SWM PLAN FOR DETAIL
- ASPHALT DRIVEWAY
- PERVIOUS CONCRETE COMMON DRIVEWAY
- EXISTING UTILITY POLE, OVERHEAD ELECTRIC LINE AND GUY WIRE
- EXISTING TREELINE
- PROPOSED TREELINE
- LOD - LIMIT OF DISTURBANCE
- 42" FENCE
- PROPERTY BOUNDARY LINE
- LOT LINES
- BUILDING RESTRICTION LINE
- MAJOR CONTOURS
- MINOR CONTOURS
- VARIABLE WIDTH PRIVATE USE-IN-COMMON INGRESS AND EGRESS, UTILITY, SWM AND RET WALL MAINT ESMT FOR LOTS 1 AND 2

UTILITY LEGEND

- S - PROPOSED 4" SANITARY SEWER
- C.O. - PROPOSED CLEAN OUT
- W - PROPOSED 1" WATER
- PROPOSED TWIN 1" WATER METER DETAIL W-3.32

NOTE: CONTRACTOR SHALL GRADE ENTRANCE TO ENSURE FLOW IS DIRECTED TOWARD EXISTING CULVERT.

CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	CHORD
C1	203.31	530.00	21°58'43"	102.92	N03°11'49"E	202.06
C2	161.31	530.00	17°26'19"	81.28	N00°55'37"E	160.69
C3	42.00	530.00	4°32'24"	21.01	N11°54'58"E	41.99

TWO 6" X 20" PERFORATED PVC SCH 40 @ 2% UNDERDRAINS IN SUBBASE, WRAP WITH FILTER CLOTH, 2' SPACING BETWEEN PIPES
OUTLET: RIPRAP OVER FILTER FABRIC
L = 3'
W = 4'
T = 12"
CLASS 1 d50 = 6"

OWNER/DEVELOPER:
JAMES AND PATRICIA FAWCETT
4941 BONNIE BRANCH ROAD
ELLICOTT CITY, MD 21043
410-744-0657

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

James M. Fawcett 11/3/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

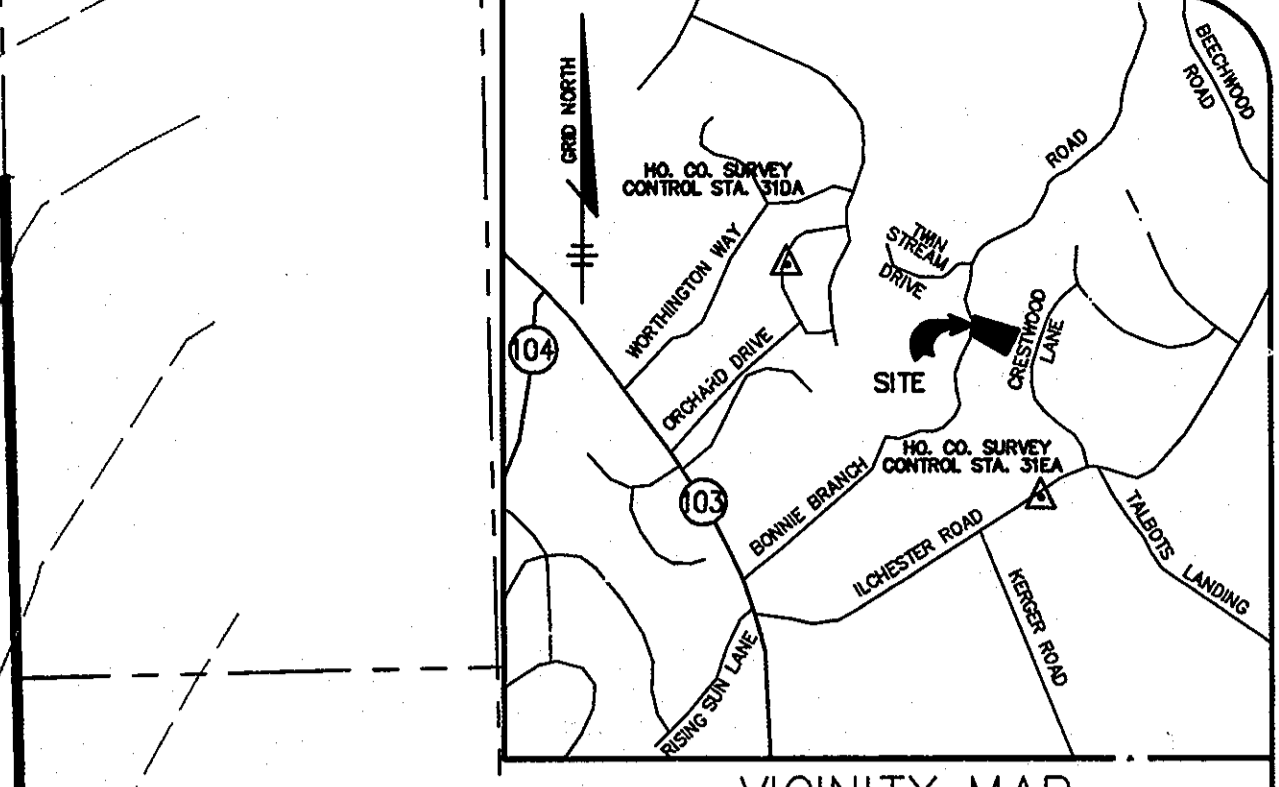
Louis Bernstein 11/3/10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

PROFESSIONAL CERTIFICATION:
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 14671, EXPIRATION DATE: 11-09-11.

Louis Bernstein 10/14/10
LOUIS BERNSTEIN DATE

GENERAL NOTES:

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- N/A
- A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH "TWO FOOT CONTOUR INTERVALS PREPARED BY THE RBA GROUP, INC DATED FEBRUARY 15, 2005.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 31DA AND 31EA WERE USED FOR THIS PROJECT.
- WATER IS PUBLIC.
- SEWER IS PUBLIC.
- STORMWATER MANAGEMENT WILL BE PROVIDED BY ENVIRONMENTAL SITE DESIGN TO THE MAXIMUM EXTENT PRACTICABLE. STORMWATER MANAGEMENT FOR LOT 1 IS MET THROUGH A COMBINATION OF PERVIOUS PAVEMENT AND GRASS SWALES. STORMWATER MANAGEMENT FOR LOT 2 IS MET THROUGH A COMBINATION OF PERVIOUS PAVEMENT, GRASS SWALES, ROOFTOP DISCONNECTION AND MICRO-BIORETENTION.
- OWNERSHIP AND MAINTENANCE RESPONSIBILITY OF ALL STORMWATER MANAGEMENT DEVICES IS PRIVATE BY THE LOT OWNERS.
- EXISTING UTILITIES ARE BASED ON FIELD RUN SURVEY PREPARED BY THE RBA GROUP, INC DATED FEBRUARY 15, 2005.
- THERE ARE NO FLOODPLAINS ON THIS SITE PER FEMA FIRM PANEL 240044 0029 B REVISED 12/4/86.
- THERE ARE NO WETLANDS ON THIS SITE.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- PROJECT BACKGROUND INFORMATION: TAX MAP 31, GRID 5, PARCEL 321, ZONING R-20, TOTAL GROSS AREA OF SITE: 2,394 AC OR 104,285 SF
2ND ELEC. DISTRICT - NUMBER OF PROPOSED LOTS = 2, DPZ REFERENCE NUMBER F-07493.
REFER TO SITE DATA ANALYSIS, THIS SHEET, FOR WAIVERS AND VARIANCES.
- THIS PLAN CONFORMS TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.



SITE ANALYSIS DATA SHEET:

TOTAL GROSS AREA OF SITE: 2,394 AC OR 104,285 SF
TOTAL NET AREA OF LOTS: 2,325 AC OR 101,268 SF
TOTAL AREA OF RIGHT OF WAY DEDICATION: 0.069 AC OR 3,017 SF
TOTAL NUMBER OF LOTS TO BE RECORDED: 2
AREA OF 25% SLOPES ON SITE: 16,380 SF
AREA OF 25% SLOPES ON SITE & CONTIGUOUS PARCELS: 18,727 SF

ZONING: R-20, DENSITY 1 DU/20,000 SF
EXISTING USE: RESIDENTIAL, 1 DU
PROPOSED USE: RESIDENTIAL, 2 DU

THE SOIL TYPES SHOWN ON THIS SITE ARE AS SHOWN IN THE "HOWARD COUNTY SOILS SURVEY", AND ARE GLDSTONE LEGORE COMPLEX, AND SASSAFRAS AND CROOM, AND ARE HSG TYPE B.

THERE ARE NO WETLANDS ON THIS SITE.
THERE ARE NO FLOODPLAINS ON THIS SITE PER FEMA FIRM PANEL 240044 0029 B REVISED 12/4/86.

A FEE-IN-LIEU OF OPEN SPACE OF \$1,500 HAS BEEN PROVIDED.

DISTURBED AREA = 46,132 SF OR 1.06 AC
IMPERVIOUS AREA = 9,805 SF OR 0.23 AC
BUILDING COVERAGE AREA = 4,337 SF OR 0.10 AC = 4.3% OF SITE.

PREVIOUS CASE NUMBERS:
WP-06-107 (APPEAL DENIED 7/21/06)
WP-07-115 (WAIVERS TO SECTION 16.116(b)(1) AND SECTION 16.117(b))
DENIED 5/9/07
BA-607-D (DENIED 11/15/07)
WP-10-111 (WAIVERS TO SECTION 16.144(r)(3), SECTION 16.120(b)(4)(iii), SECTION 16.1205(a) APPROVED 3/25/10)
BA-10-010 (VARIANCE TO ZONING SECTION 108.D.4.a(1)(i) APPROVED 6/15/10)
ALTERNATIVE COMPLIANCE TO DESIGN MANUAL VOL IV, DETAIL R-6.06 (APPROVED 7/12/10)

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

James M. Fawcett 10/14/10
JAMES M. FAWCETT DATE

BY THE ENGINEER
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Louis Bernstein 10/14/10
LOUIS BERNSTEIN DATE
LID PE 14671

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

John R. ... 11/10
HOWARD SOIL CONSERVATION DISTRICT DATE

NOTE:
WP-10-111 (WAIVERS TO SECTION 16.144(r)(3), SECTION 16.120(b)(4)(iii), SECTION 16.1205(a) APPROVED 3/25/10, SUBJECT TO THE FOLLOWING CONDITIONS)

- REACTIVATION OF THE FINAL PLAN F07-193 IS APPROVED. ADDITIONAL COMMENTS FROM OLD AND DED MUST BE ADDRESSED PRIOR TO SUBMISSION OF THE REVISED PLAN.
- A 35' B.R.L. FROM THE FC EASEMENTS ON LOTS 1 AND 2 SHALL BE SHOWN ON THE FINAL PLAN IN ACCORDANCE WITH FC SECT 16.120(b)(4)(iii).
- SPECIMEN TREES NOS. 1 AND 5 AS SHOWN ON THE APPROVED FOREST STAND DELINEATION PLAN MAY BE REMOVED IN CONJUNCTION WITH THE CONSTRUCTION OF THE SHARED DRIVEWAY. ALL OTHER SPECIMEN TREES AS SHOWN ON THE APPROVED FOREST STAND DELINEATION PLAN SHALL BE RETAINED.
- TREE AND VEGETATIVE REMOVAL AND GRADING ALONG BONNIE BRANCH ROAD SHALL BE THE MINIMUM REQUIRED TO CONSTRUCT THE SHARED DRIVEWAY, IN ACCORDANCE WITH SECTION 16.125(b)(1). ANY NEW DEVELOPMENTS LOCATED ALONG A SENIC ROAD MUST MAINTAIN AT LEAST A 35' BUFFER OF EXISTING FOREST OR WOODED AREA BETWEEN THE ROAD AND THE NEW DEVELOPMENT.
- APPROVAL OF THE AFOREMENTIONED WAIVER PETITION REQUESTS SHALL NOT BE CONSTRUED TO ALLOW THE CONSTRUCTION OF ANY RETAINING WALLS WITHIN BUILDING RESTRICTION SETBACKS AS APPLICABLE NOR NEGATE ANY FURTHER DESIGN MANUAL WAIVERS AS MAY BE NECESSARY TO CONSTRUCT THE SHARED DRIVEWAY.
- ANY PROJECTS NOT HAVING AN APPROVED SWM PLAN AND EROSION CONTROL PLAN BY 5/4/10 WILL REQUIRE REVISED PLANS TO MEET CURRENT REGULATIONS.

BA-10-010 (VARIANCE TO ZONING SECTION 108.D.4.a(1)(i))
APPROVED 6/15/10) TO REDUCE THE 50' STRUCTURE AND USE SETBACK FROM A COLLECTOR PUBLIC STREET ROW TO 0' FOR A 4' HIGH RETAINING WALL AND TO 26' FOR A 6' HIGH RETAINING WALL IN AN R-20 ZONING DISTRICT.

LETTER APPROVING ALTERNATIVE COMPLIANCE TO DESIGN MANUAL VOL IV, DETAIL R-6.06 ISSUED 7/12/10 BY HOWARD COUNTY DED. THE ALTERNATIVE COMPLIANCE PERMITS A DRIVEWAY GRADE OF 18%.

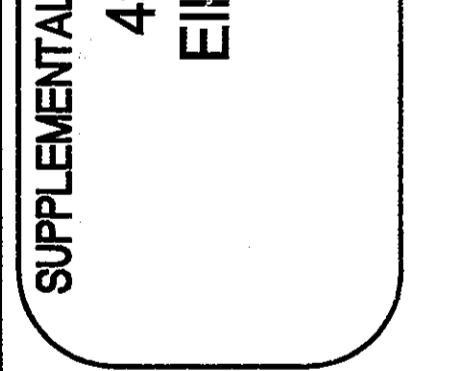
REVISIONS

NO.	DATE	DESCRIPTION
10/7/10		PER HC COMMENTS-LS

PLANS PREPARED FOR:
James and Patricia Fawcett
4941 Bonnie Branch Road
Ellicott City, Maryland 21043
Ph: (410) 744-0657
jpfawcett@comcast.net

PLANS PREPARED BY:
LOUIS BERNSTEIN, PE
Civil Engineer
300 Northern Avenue #5F
Hagerstown, MD 21742
240-220-0340
lo Bernstein@alum.mtl.edu

SUPPLEMENTAL PLAN: PROPOSED CONDITIONS, GRADING + ESC
4941 Bonnie Branch Road
Ellicott City, Maryland 21043
Map 31 - Parcel 321
HOWARD COUNTY, MARYLAND



GRAPHIC SCALE 1"=20'

DATE: 05/29/10
JOB NUMBER: M3741.00
FILE NUMBER:
PLOTTED: [X]
DRAWN BY: LB
DESIGNED BY: LB
CHECKED BY: LB

SUPPLEMENTAL PLAN: PROPOSED CONDITIONS GRADING AND ESC

SHEET 1 of 8
F-07-193

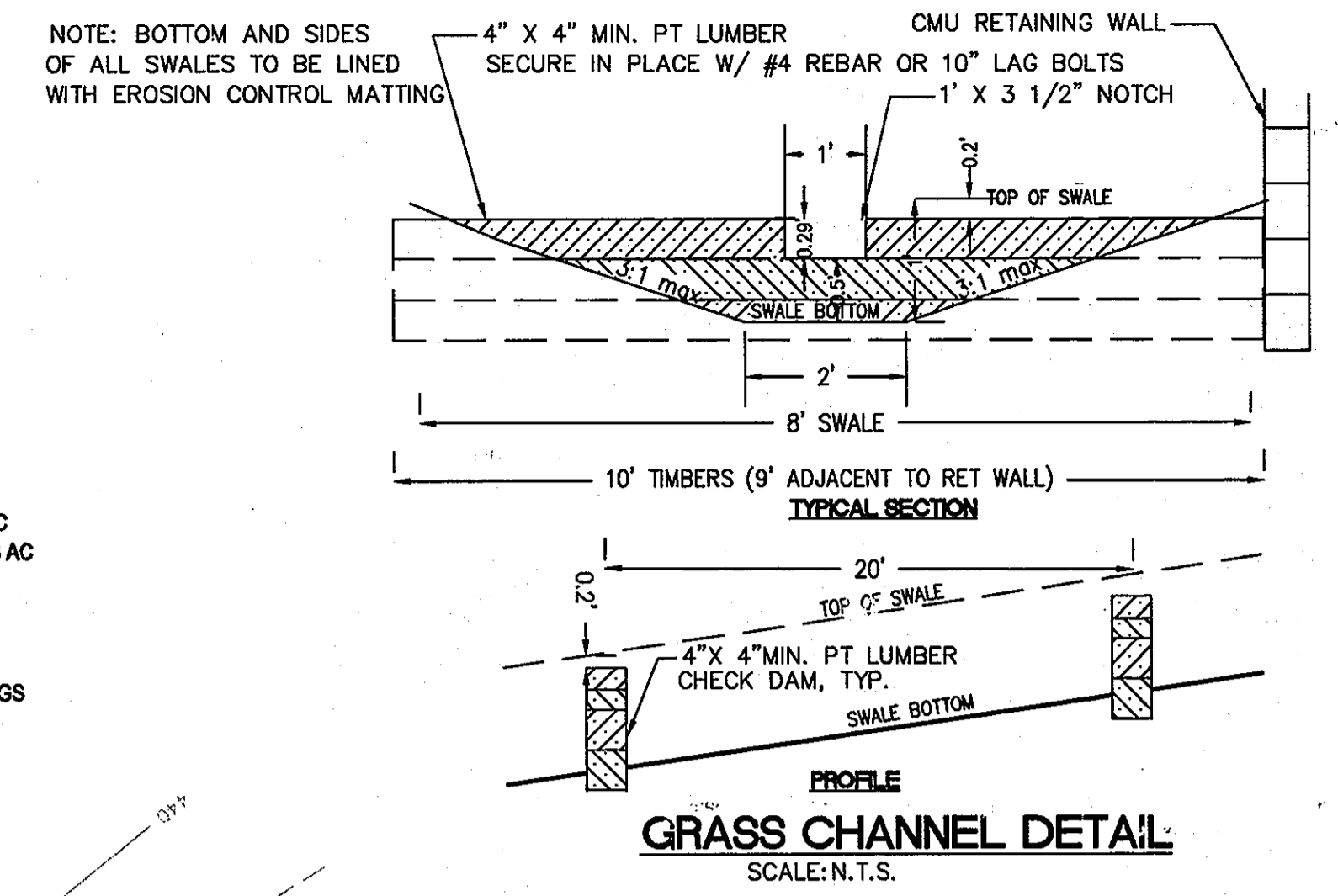
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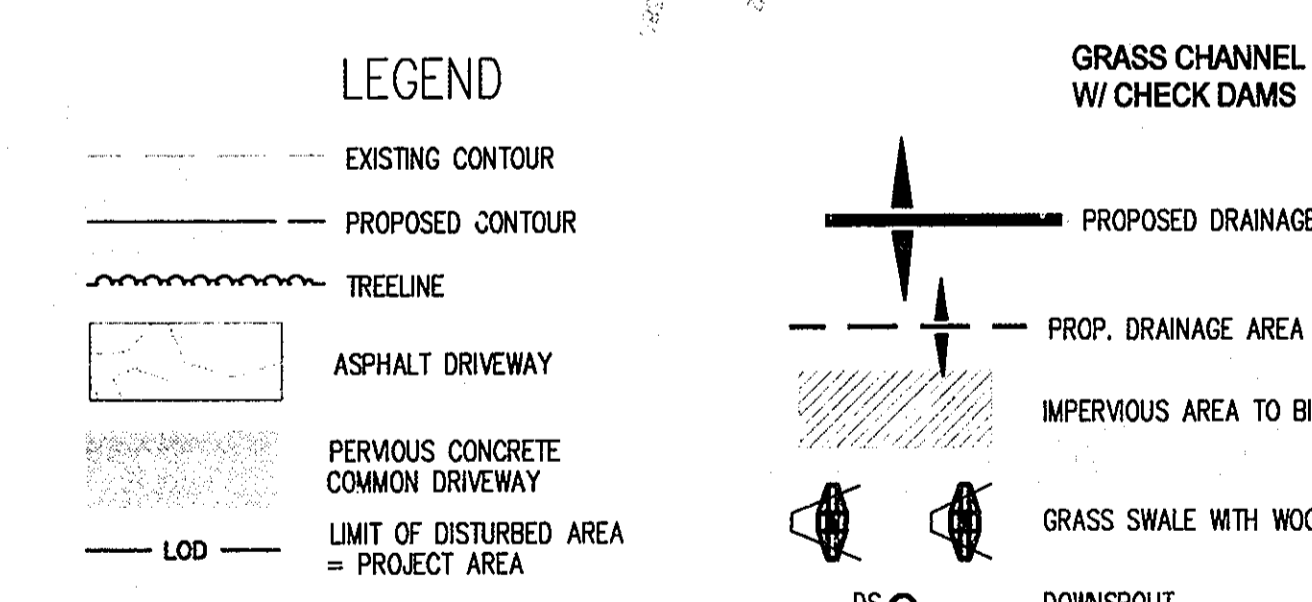
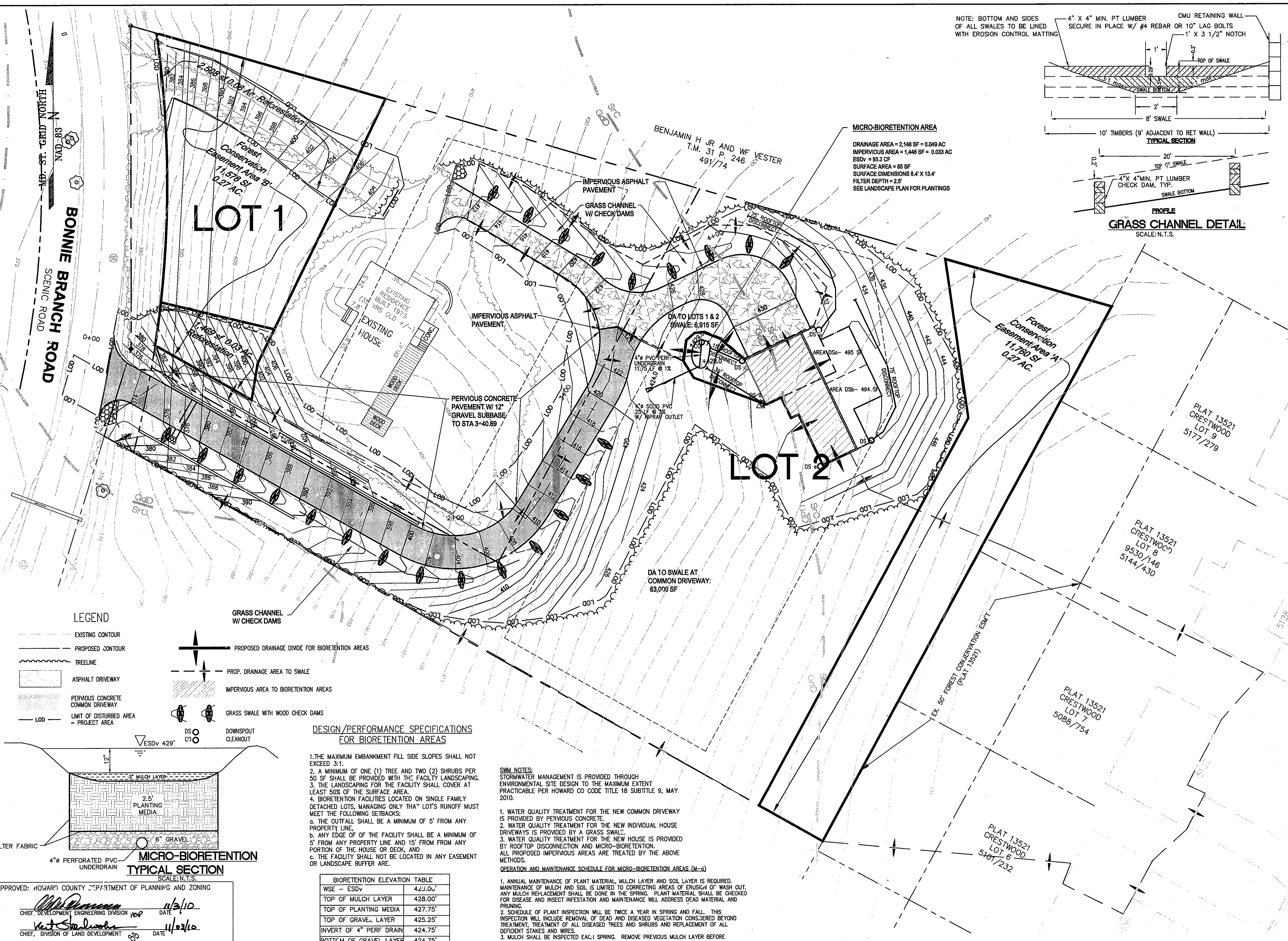
STORMWATER MANAGEMENT PLAN
4941 Bonnie Branch Road
Ellicott City, Maryland 21043
Map 31 - Parcel 321
HOWARD COUNTY, MARYLAND



GRAPHIC SCALE 1"=20'
DATE: 05/21/10
JOB NUMBER: M3741.00
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PLOTTED:
DRAWN BY: LB
DESIGNED BY: LB
CHECKED BY: LB



MICRO-BIORETENTION AREA
DRAINAGE AREA = 2,146 SF = 0.049 AC
IMPERVIOUS AREA = 1,448 SF = 0.033 AC
ESDv = 93.2 CF
SURFACE AREA = 85 SF
SURFACE DIMENSIONS 8.4' X 13.4'
FILTER DEPTH = 2.5'
SEE LANDSCAPE PLAN FOR PLANTINGS



DESIGN/PERFORMANCE SPECIFICATIONS FOR BIORETENTION AREAS

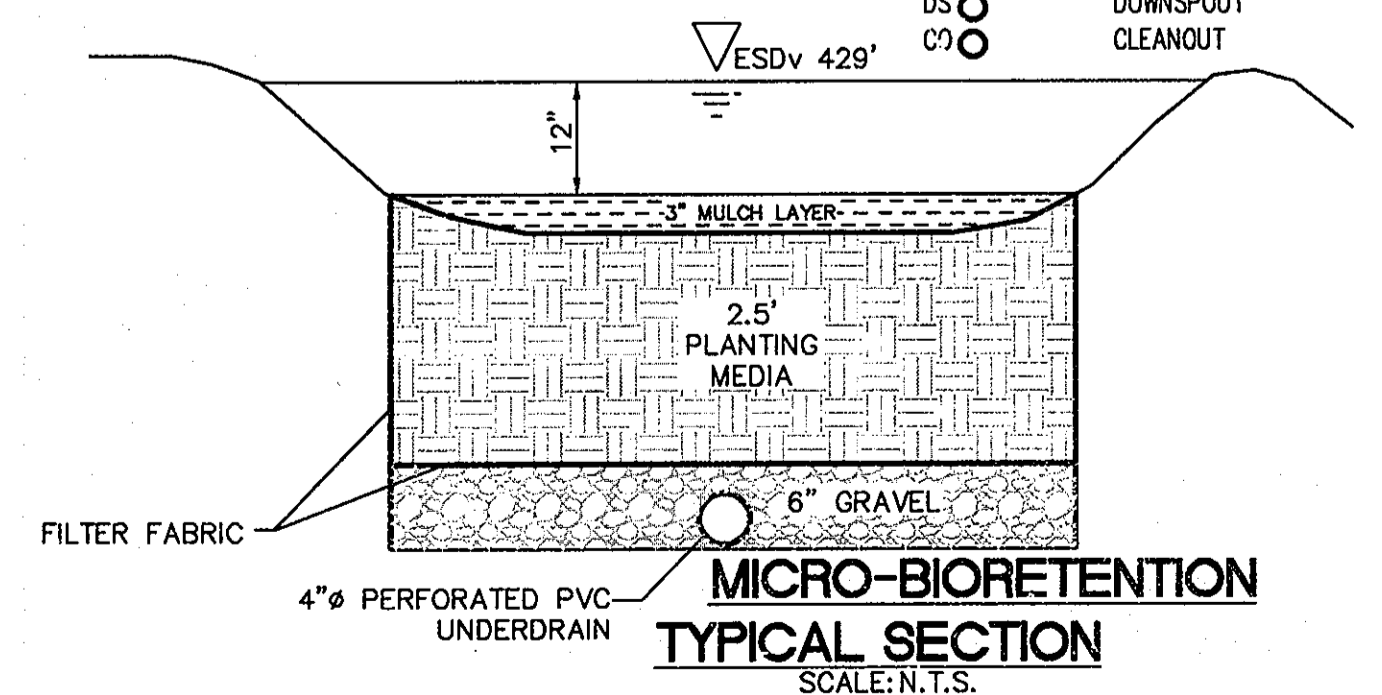
- THE MAXIMUM EMBANKMENT FILL SIDE SLOPES SHALL NOT EXCEED 3:1.
- A MINIMUM OF ONE (1) TREE AND TWO (2) SHRUBS PER 50 SF SHALL BE PROVIDED WITH THE FACILITY LANDSCAPING.
- THE LANDSCAPING FOR THE FACILITY SHALL COVER AT LEAST 50% OF THE SURFACE AREA.
- BIORETENTION FACILITIES LOCATED ON SINGLE FAMILY DETACHED LOTS, MANAGING ONLY THAT LOT'S RUNOFF MUST MEET THE FOLLOWING SETBACKS:
 - THE OUTFALL SHALL BE A MINIMUM OF 5' FROM ANY PROPERTY LINE,
 - ANY EDGE OF THE FACILITY SHALL BE A MINIMUM OF 5' FROM ANY PROPERTY LINE AND 15' FROM ANY PORTION OF THE HOUSE OR DECK, AND
 - THE FACILITY SHALL NOT BE LOCATED IN ANY EASEMENT OR LANDSCAPE BUFFER ARE.

SWM NOTES:
STORMWATER MANAGEMENT IS PROVIDED THROUGH ENVIRONMENTAL SITE DESIGN TO THE MAXIMUM EXTENT PRACTICABLE PER HOWARD CO CODE TITLE 18 SUBTITLE 9, MAY 2010.

- WATER QUALITY TREATMENT FOR THE NEW COMMON DRIVEWAY IS PROVIDED BY PERVIOUS CONCRETE.
 - WATER QUALITY TREATMENT FOR THE NEW INDIVIDUAL HOUSE DRIVEWAYS IS PROVIDED BY A GRASS SWALE.
 - WATER QUALITY TREATMENT FOR THE NEW HOUSE IS PROVIDED BY ROOFTOP DISCONNECTION AND MICRO-BIORETENTION. ALL PROPOSED IMPERVIOUS AREAS ARE TREATED BY THE ABOVE METHODS.
- OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION AREAS (M-6)**

- 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.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND FALL. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DISEASED TREES AND SHRUBS AND REPLACEMENT OF ALL DEFICIENT STAKES AND WIRES.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

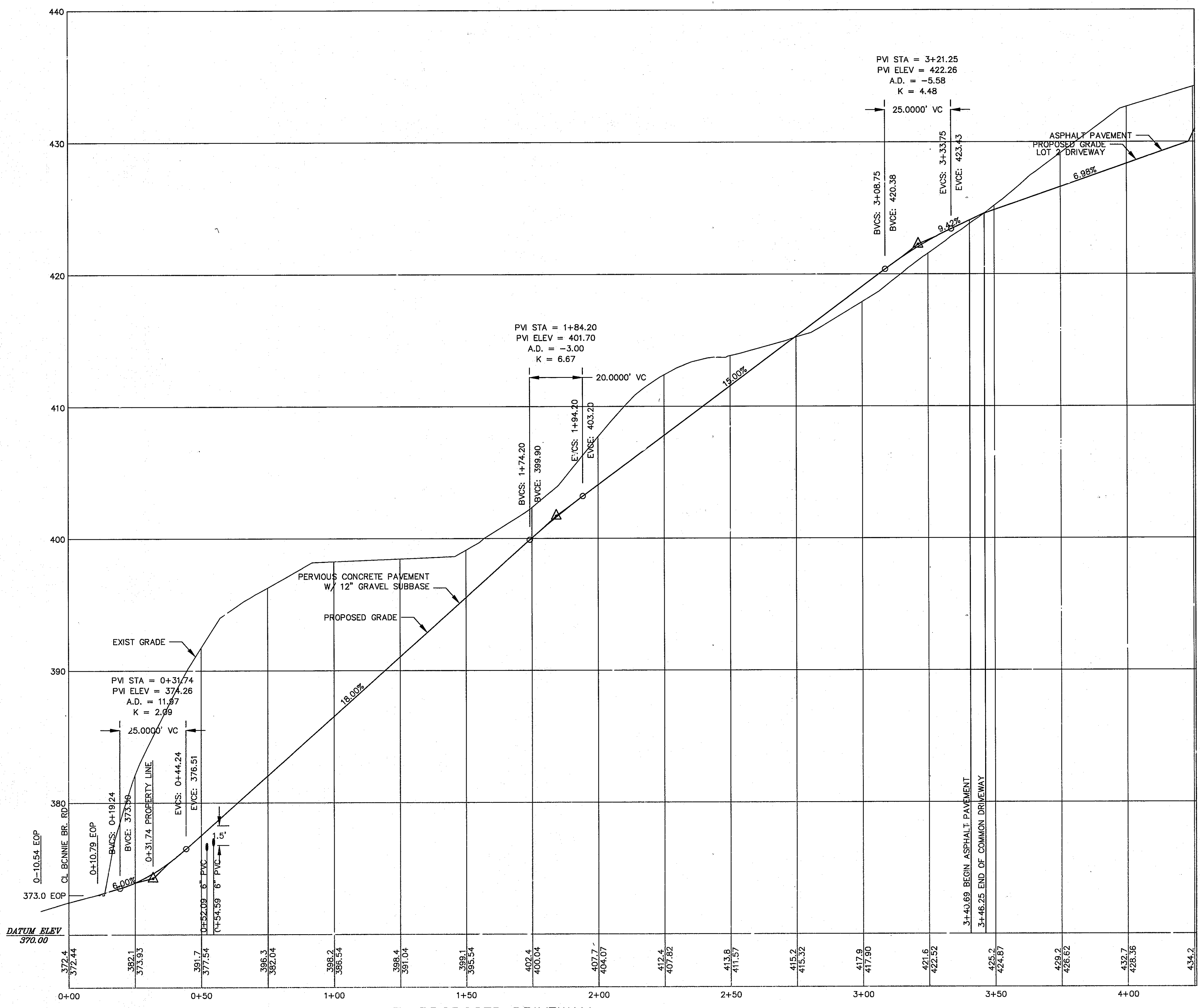
BIORETENTION ELEVATION TABLE	
WSE - ESDv	423.00'
TOP OF MULCH LAYER	428.00'
TOP OF PLANTING MEDIA	427.75'
TOP OF GRAVEL LAYER	425.25'
INVERT OF 4" PERF DRAIN	424.75'
BOTTOM OF GRAVEL LAYER	424.75'
4" SOLID PVC OUTLET	424.00'



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/2/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 11/2/10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE



PROFILE: PROPOSED DRIVEWAY
 SCALE: 1" = 20' (HORIZ)
 1" = 4' (VERT)

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/3/10
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 11/03/10
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

PERVIOUS CONCRETE SPECIFICATIONS

Design Thickness - Pervious concrete applications shall be designed so that the thickness of the concrete slab shall support the traffic and vehicle types that will be carried. Applications may be designed using either standard pavement procedures (e.g., AASHTO, ACI 325.9R, ACI 330R) or using structural values derived from flexible pavement design procedures.

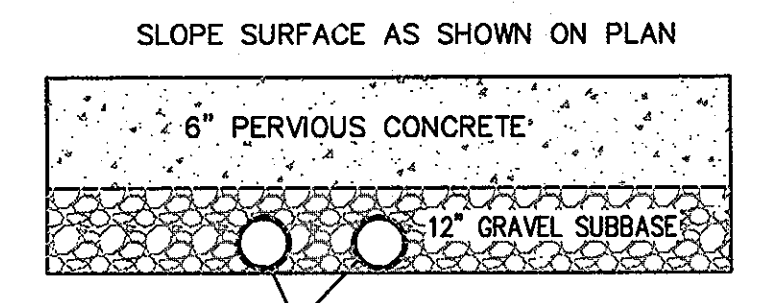
Mix & Installation - Traditional Portland cements (ASTM C 150, C 1157) may be used in pervious concrete applications. Phosphorus admixtures may also be used. Materials should be tested (e.g., trial batching) prior to construction so that critical properties (e.g., setting time, rate of strength development, porosity, permeability) can be determined.

Aggregate - Pervious concrete contains a limited fine aggregate content. Commonly used gradations include ASTM C 33 No. 67 (3/4 in. to No. 4), No. 8 (3/8 in. to No. 16) and No. 89 (3/8 in. to No. 50) sieves. Single-sized aggregate (up to 1 inch) may also be used.

Water Content - Water-to-cement ratios between 0.27 and 0.30 are used routinely with proper inclusion of chemical admixtures. Water quality should meet ACI 30a. As a general rule, potable water should be used although recycled concrete production water meeting ASTM C 94 or AASHTO M 157 may also be used.

Admixtures - Chemical admixtures (e.g., retarders or hydration-stabilizers) are used to obtain special properties in pervious concrete. Use of admixtures should meet ASTM C 494 (chemical admixtures) and ASTM C 260 (air entraining admixtures) and closely follow manufacturer's recommendations.

Base Course - The base course shall be AASHTO No. 3 or 4 course aggregate with an assumed open pore space of 30% (n = 0.30).



REFER TO SPECIFICATIONS ABOVE FOR PERVIOUS CONCRETE AND FOR BASE COURSE.

PERVIOUS CONCRETE MUST BE CURED BY COVERING AND SEALING WITH POLY SHEETING FOR 5 DAY MINIMUM.

PERVIOUS CONCRETE DRIVEWAY
TYPICAL SECTION
 SCALE: N.T.S.

REVISIONS

NO.	DATE	DESCRIPTION
10/7/10	PER HC COMMENTS-LB	

PLANS PREPARED FOR:

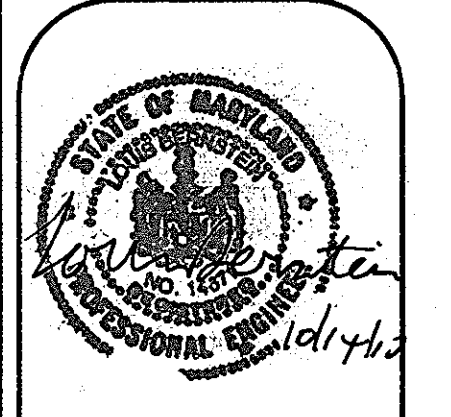
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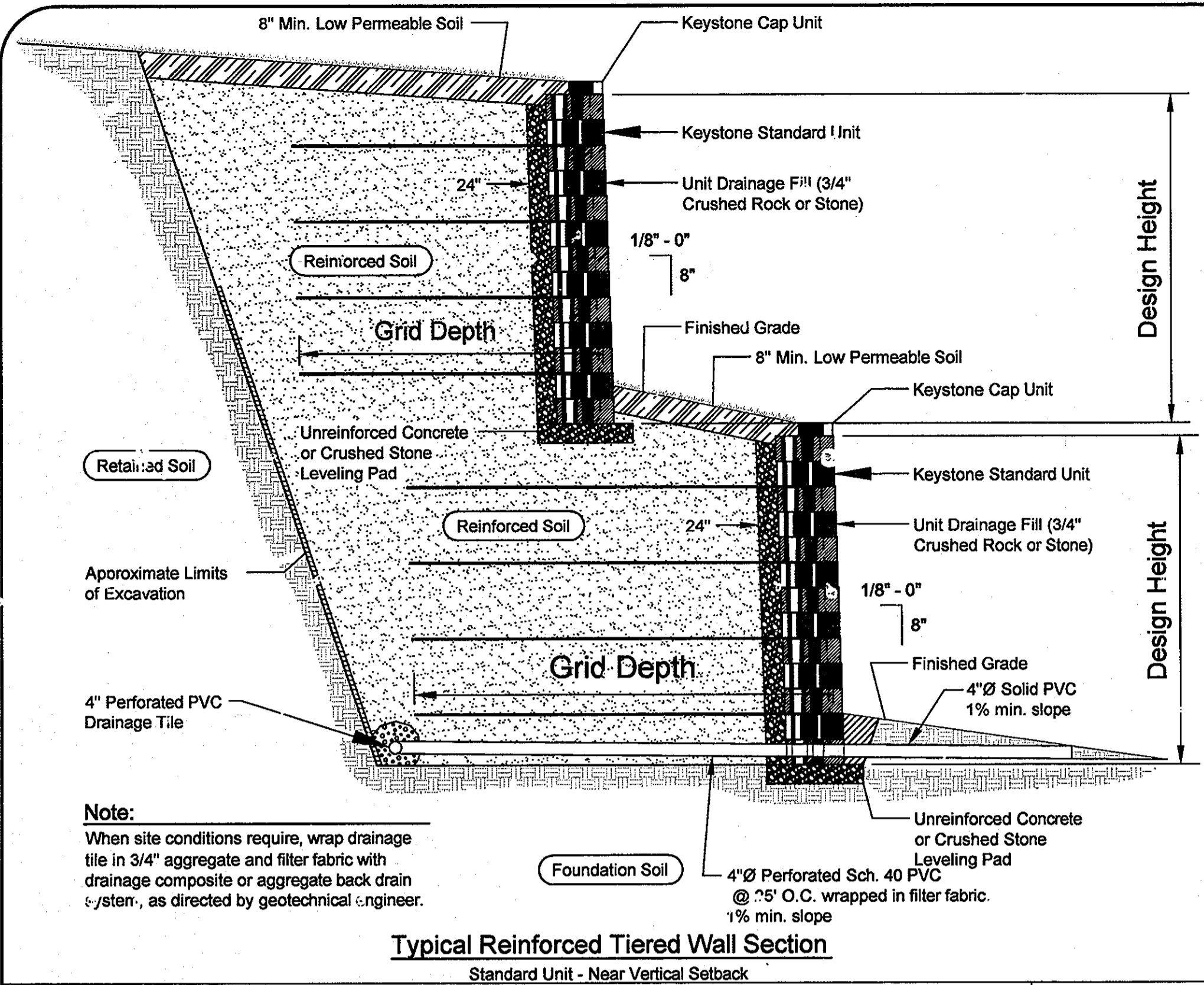
DRIVEWAY PROFILE

4941 Bonnie Branch Road
Ellicott City, Maryland 21043
 Map 31 - Parcel 321
 HOWARD COUNTY, MARYLAND

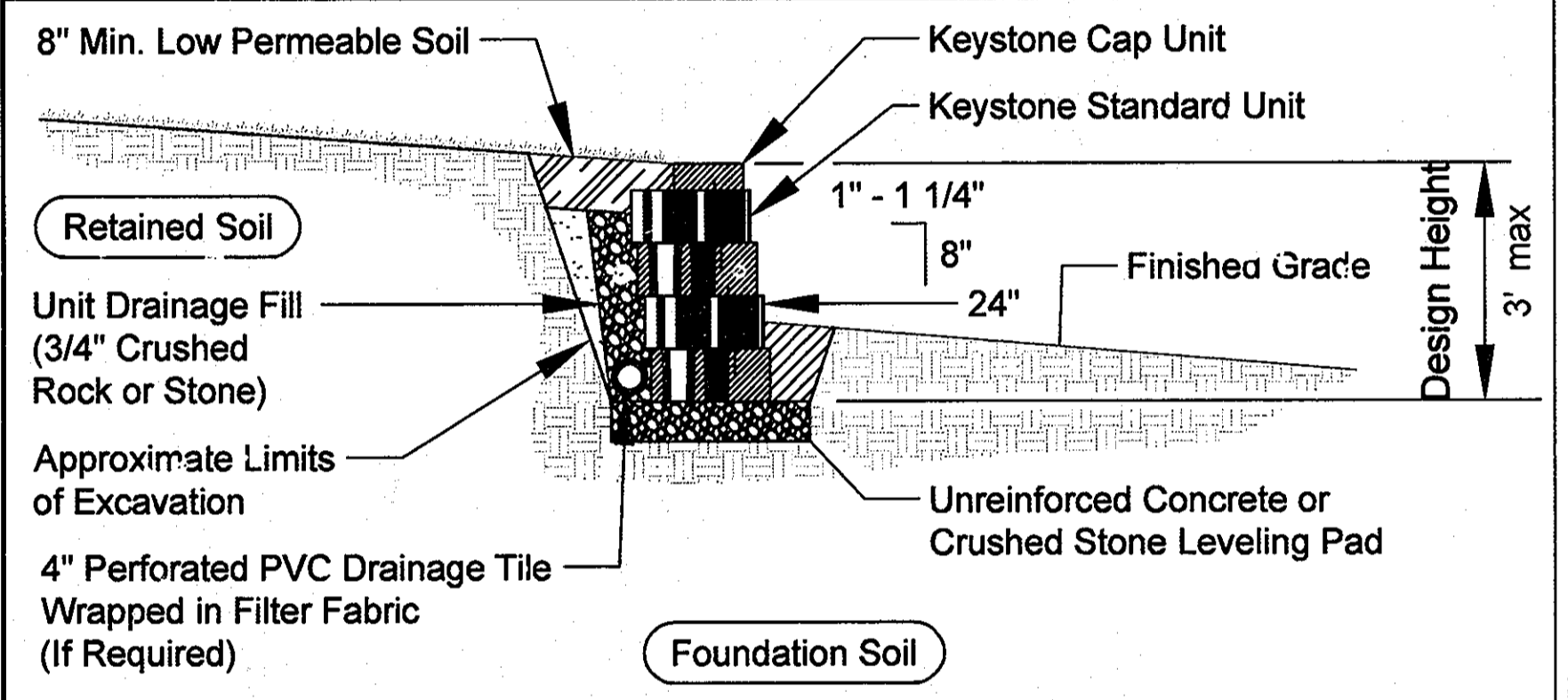


GRAPHIC SCALE 1"=20'

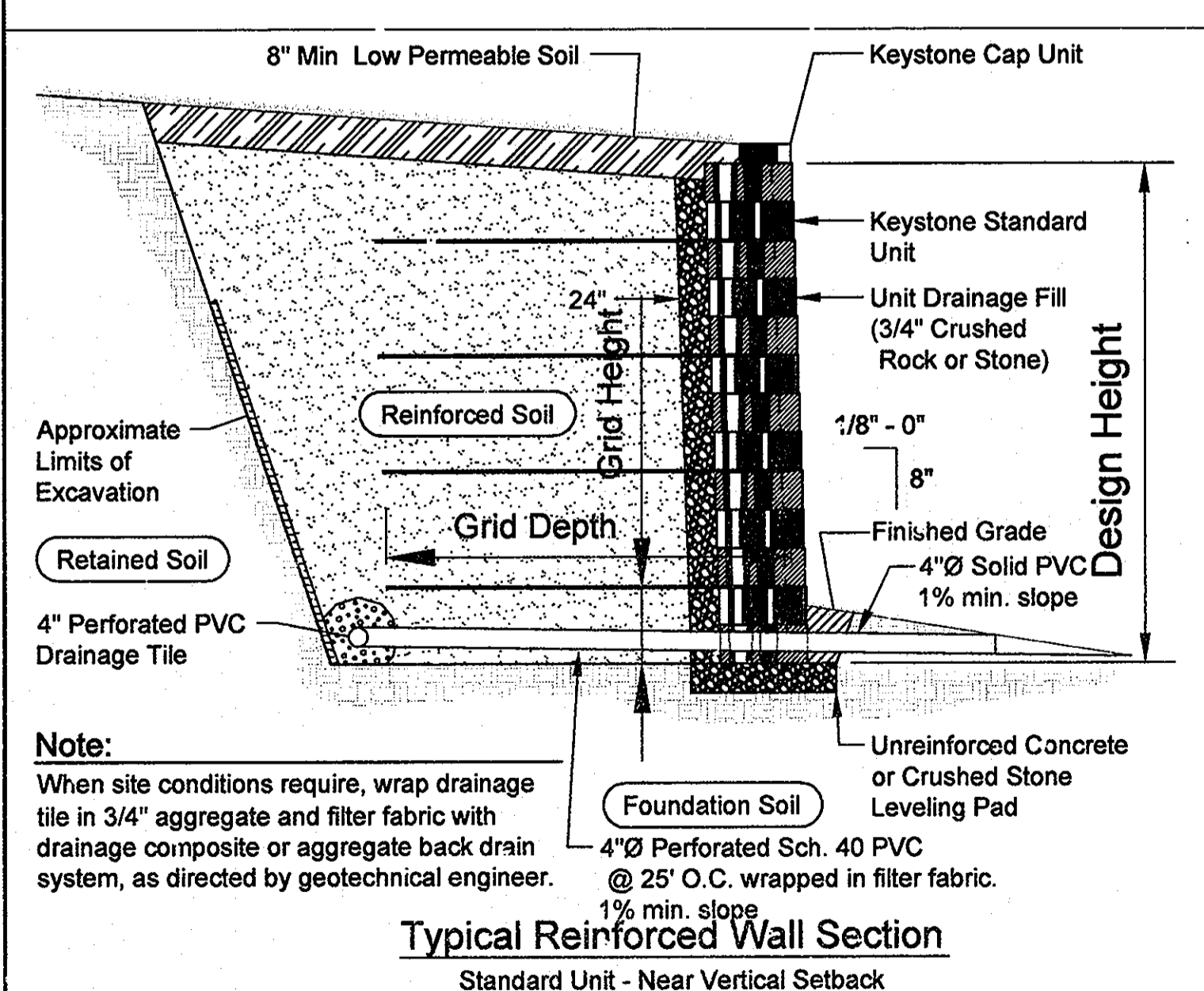
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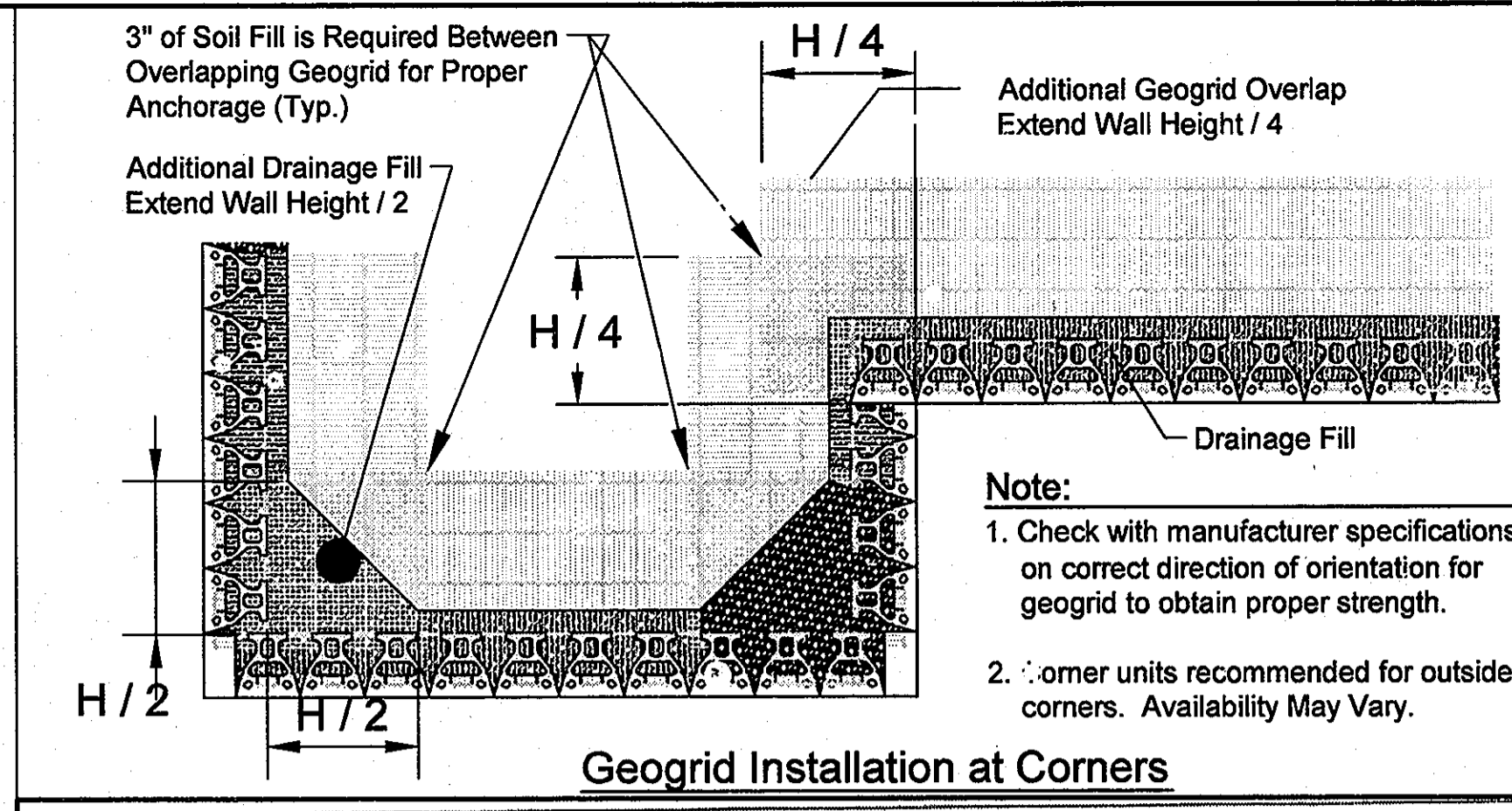
Typical Reinforced Tied Wall Section
Standard Unit - Near Vertical Setback



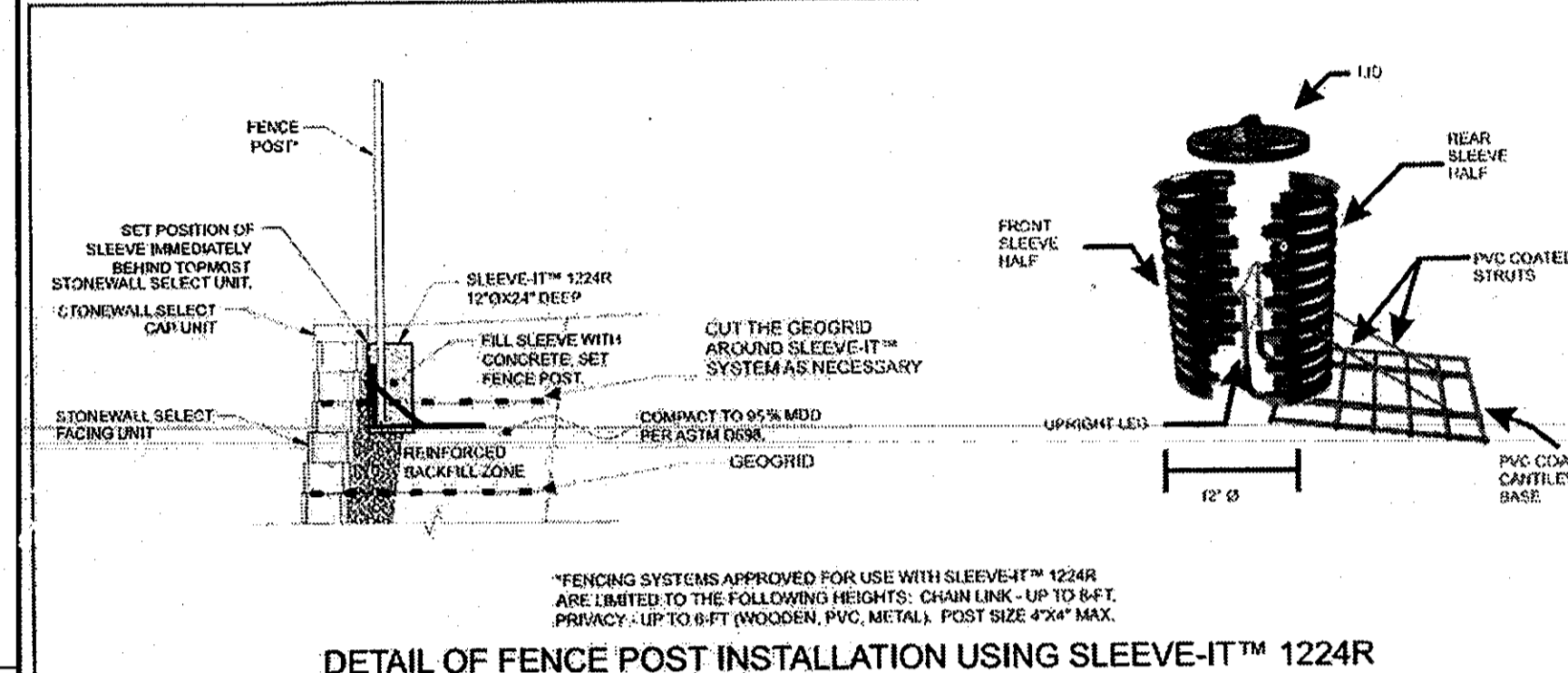
Typical Gravity Wall Section
Standard Unit - 1" Setback



Typical Reinforced Wall Section
Standard Unit - Near Vertical Setback



Geogrid Installation at Corners



DETAIL OF FENCE POST INSTALLATION USING SLEEVE-IT™ 1224R

NOTE:
1. General - 1/2\"/>

Important Note: Sleeve-It™ 1224R is not intended for use in applications where the retaining wall is subjected to lateral forces from wind or seismic activity. Consult the manufacturer's literature for specific limitations related to the use of Sleeve-It™ 1224R in such applications.

Step 1: Prepare a hole in the retaining wall. The hole should be 2\"/>

Step 2: Insert the sleeve into the hole. The sleeve should be inserted into the hole from the top of the wall. The sleeve should be inserted into the hole from the top of the wall. The sleeve should be inserted into the hole from the top of the wall.

Step 3: Insert the fence post into the sleeve. The fence post should be inserted into the sleeve from the top of the wall. The fence post should be inserted into the sleeve from the top of the wall.

Step 4: Fill the sleeve with concrete. The concrete should be poured into the sleeve from the top of the wall. The concrete should be poured into the sleeve from the top of the wall.

Step 5: Cure the concrete. The concrete should be allowed to cure for a minimum of 24 hours before the wall is subjected to lateral forces.

Step 6: Repeat the process for all fence posts.

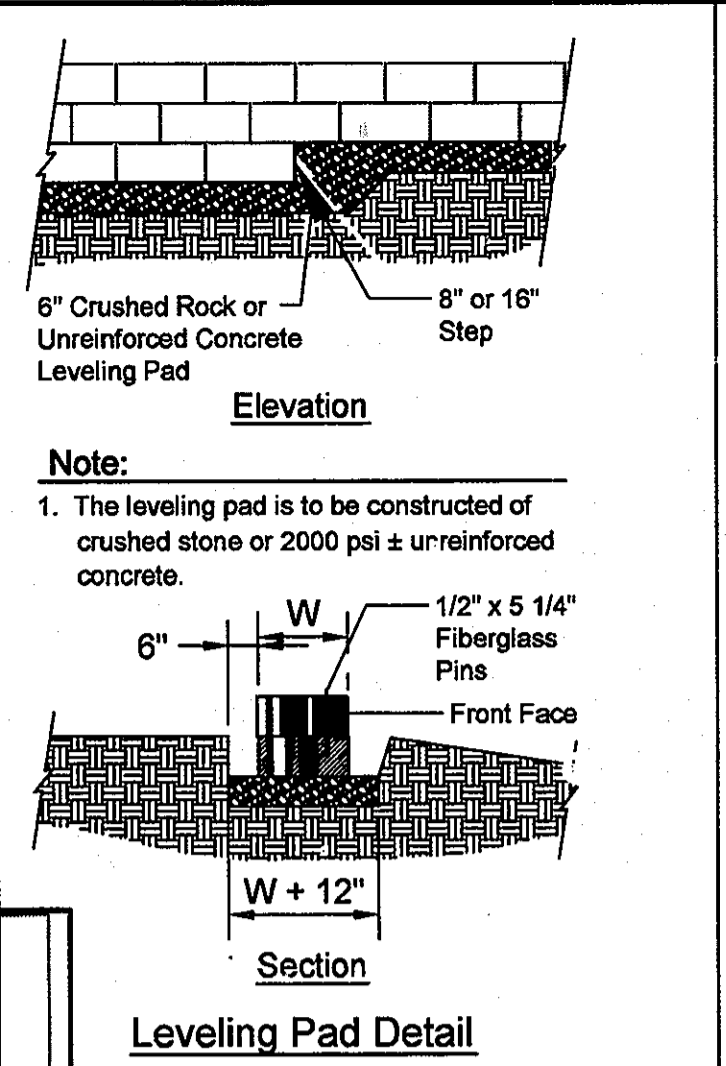
Step 7: The finished wall should be inspected for proper installation.

Step 8: The finished wall should be inspected for proper installation.

Step 9: The finished wall should be inspected for proper installation.

Step 10: The finished wall should be inspected for proper installation.

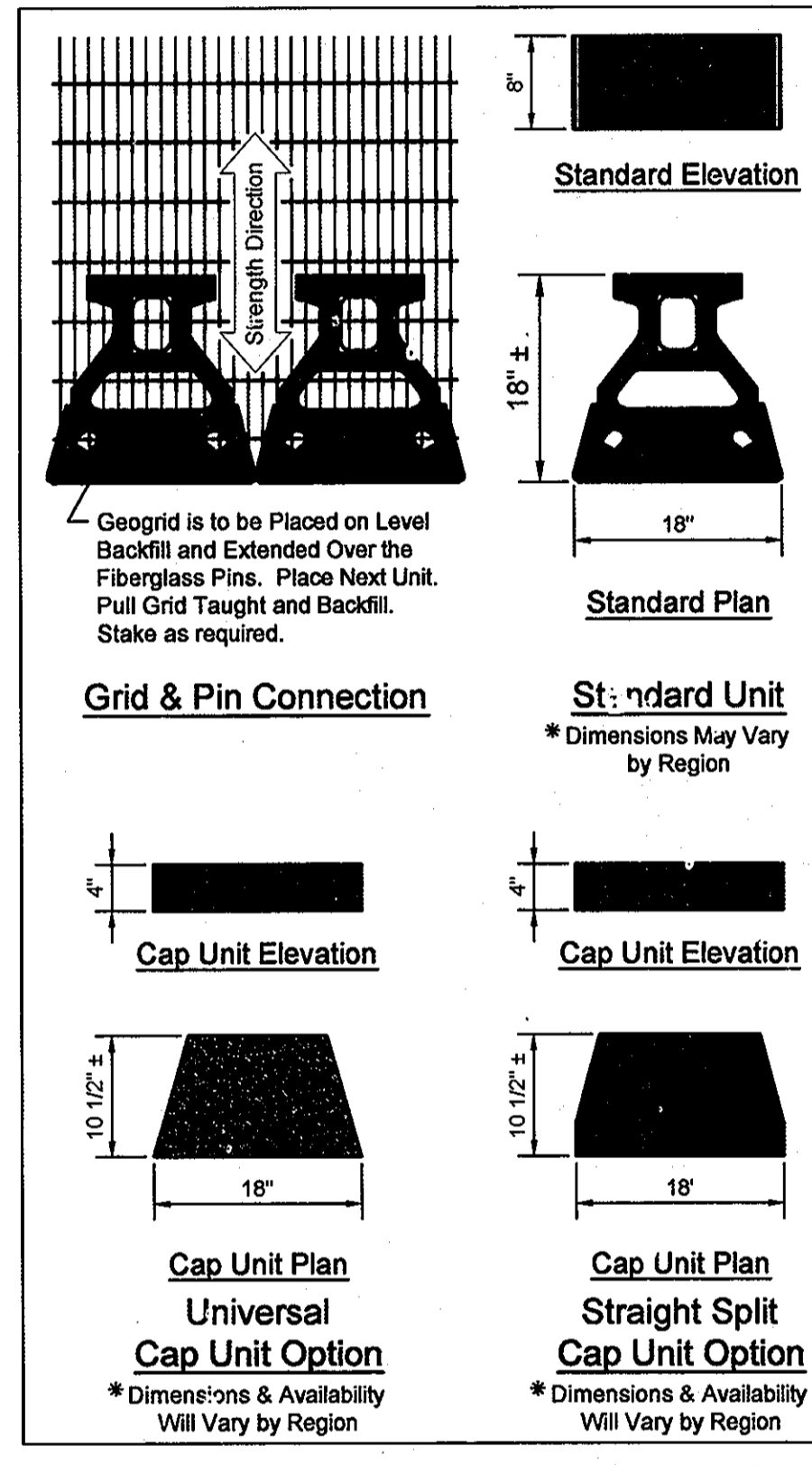
SLEEVE-IT™
FOR MORE INFORMATION CONTACT
ADVANCED HARDSCAPE SOLUTIONS LLC
1-800-863-0900
INFO@ADVANCEDHARDSCAPE.COM



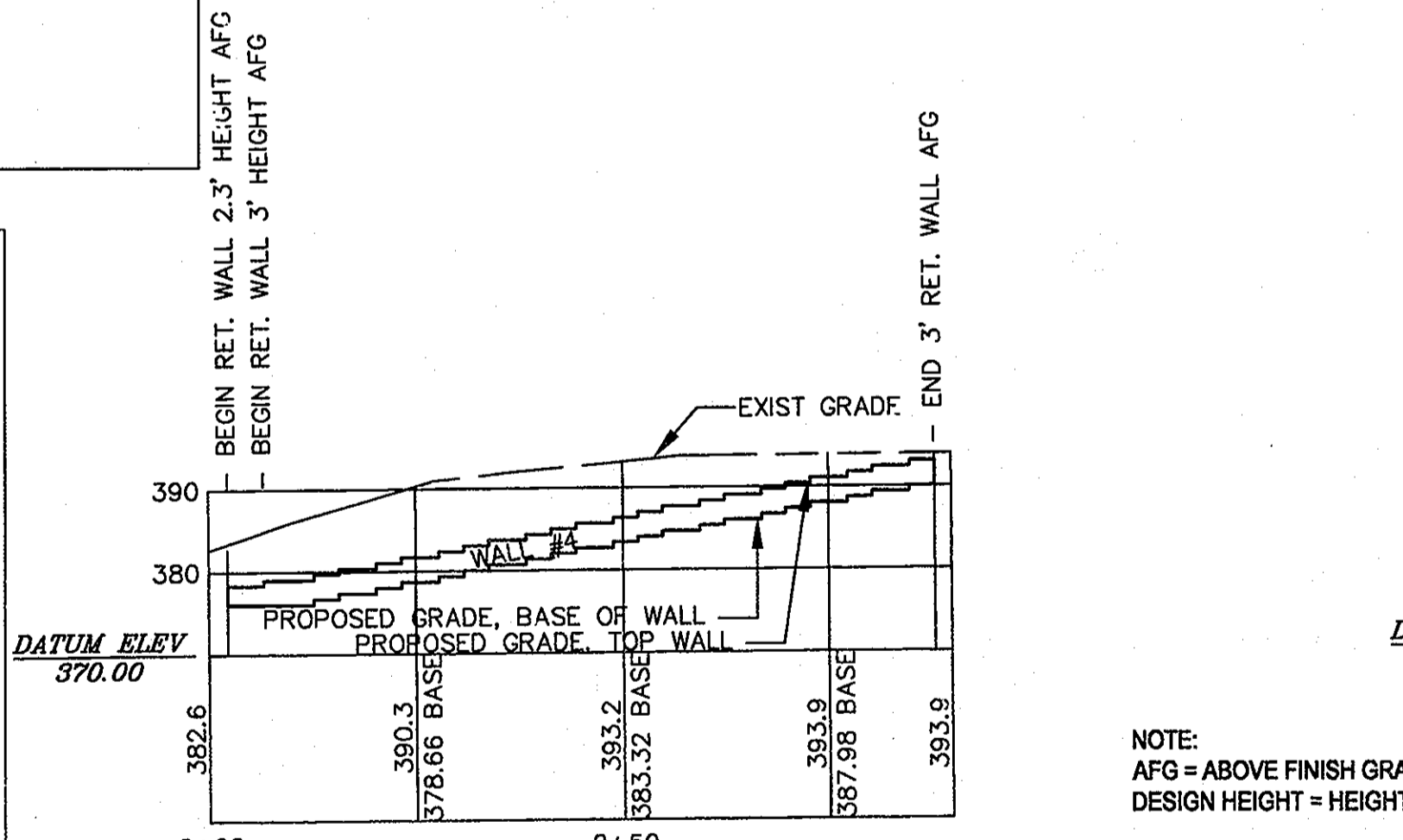
Leveling Pad Detail

RETAINING WALL SPECIFICATIONS:
2.05 Unit Drainage Fill
A. Unit drainage fill shall consist of clean 1\"/>

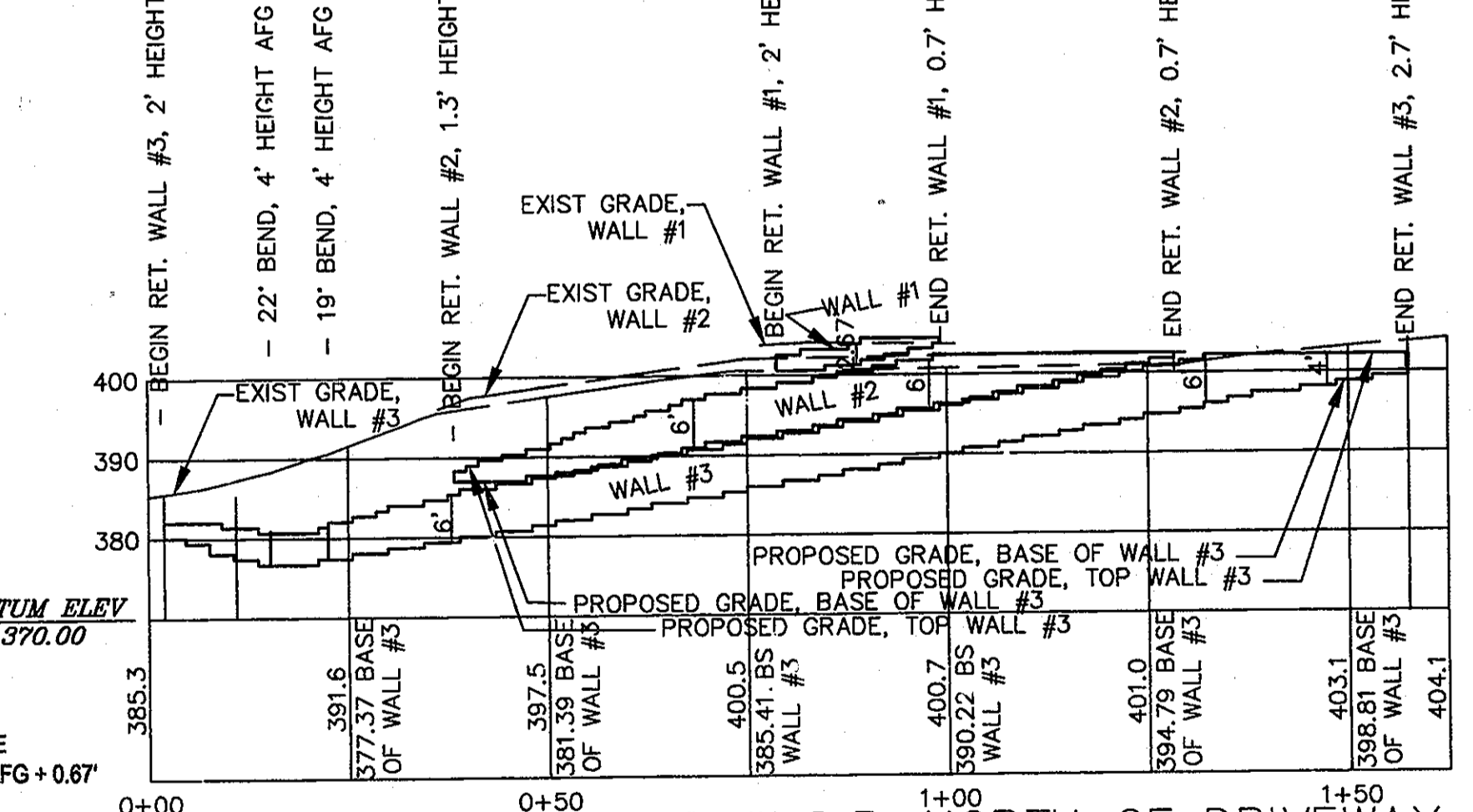
2.06 Reinforced Backfill
A. Reinforced backfill shall be free of debris and meet the following gradation tested in accordance with ASTM D-422:
Slieve Size Percent Passing
2 inch (50 mm) 100
3/4-inch (19 mm) 75-100
No. 4 (4.75 mm) 0-10
No. 50 (300um) 0-5
B. The maximum aggregate size shall be limited to 3/4 inch (19 mm).



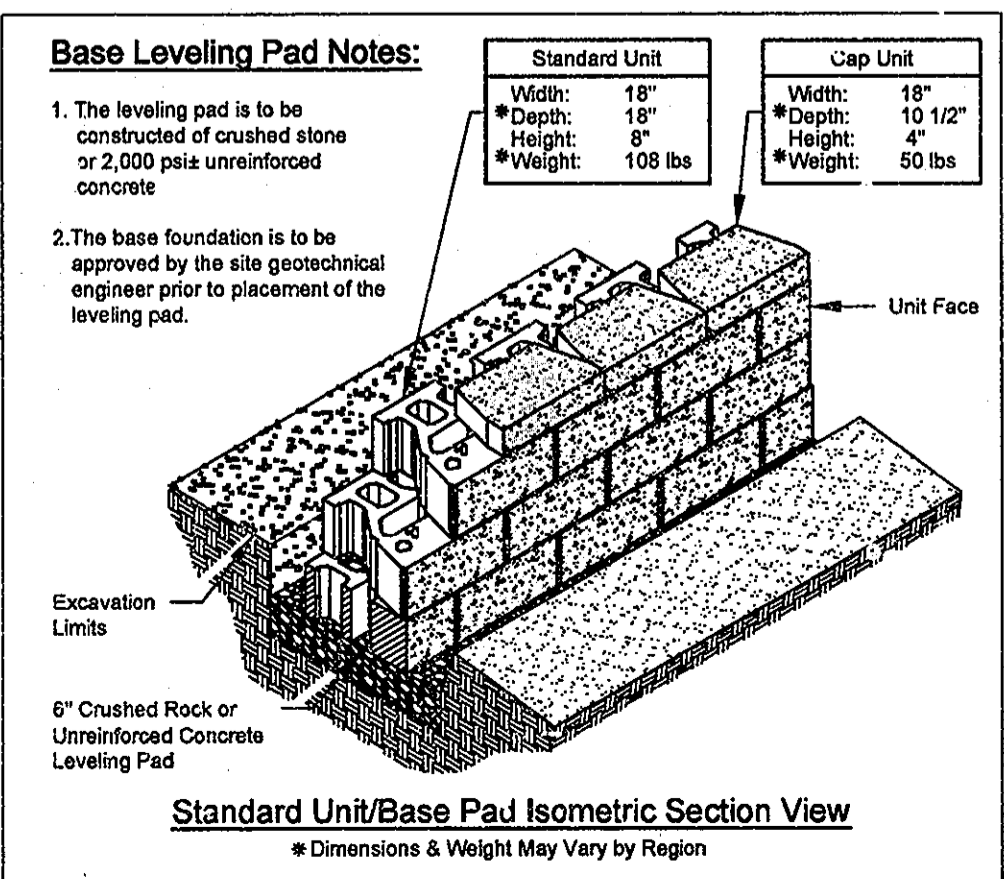
Grid & Pin Connection
Standard Unit
Cap Unit Elevation
Cap Unit Plan
Cap Unit Option



PROFILE: RETAINING WALL #4, SOUTH OF DRIVEWAY
SCALE: 1" = 20' (HORIZ)
1" = 20' (VERT)



PROFILE: RETAINING WALLS #1, 2, 3, NORTH OF DRIVEWAY
SCALE: 1" = 20' (HORIZ)
1" = 20' (VERT)



Standard Unit/Base Pad Isometric Section View
Dimensions & Weight May Vary by Region

RETAINING WALL NOTES:
RETAINING WALLS NUMBER 1, 2, 3 AND 4 SHALL BE MASONRY SEGMENTAL RETAINING WALLS WITH GEOGRID REINFORCEMENT.

E. FENCES
1. FENCES SHALL BE PROVIDED FOR ALL RETAINING WALLS 30" IN HEIGHT OR GREATER ALONG THE ENTIRE LENGTH.
2. FENCES SHALL BE A MINIMUM OF 36" IN HEIGHT, OPENINGS LESS THAN 4" IN WIDTH.
3. FENCES SHALL WITHSTAND 200 LBS LOADING APPLIED HORIZONTALLY AT ANY POINT.
4. IF FENCE IS SETBACK FROM THE WALL, ENDS SHALL BE TAPERED TO PREVENT ACCESS.

G. CONSTRUCTION NOTES:
(A) RETAINING WALLS SHALL ONLY BE CONSTRUCTED UNDER THE OBSERVATION OF A REGISTERED PROFESSIONAL ENGINEER AND A (NICET, WACEL OR EQUIVALENT) CERTIFIED SOILS TECHNICIAN.
(B) THE REQUIRED BEARING PRESSURE BENEATH THE FOOTING OF THE WALL SHALL BE VERIFIED IN THE FIELD BY A CERTIFIED SOILS TECHNICIAN. TESTING DOCUMENTATION SHALL BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION. THE REQUIRED TEST PROCEDURE SHALL BE THE DYNAMIC CONE PENETROMETER TEST ASTM STP-398.
(C) THE SUITABILITY OF FILL MATERIAL SHALL BE CONFIRMED BY THE ONSITE SOILS TECHNICIAN. EACH EIGHT (8) INCH LIFT SHALL BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY AND THE TESTING REPORT SHALL BE MADE AVAILABLE TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.
(D) FOR "CRITICAL" WALLS, ONE SOIL BORING SHALL BE REQUIRED EVERY 100' ALONG THE ENTIRE LENGTH OF THE WALL. COPIES OF ALL BORING REPORTS SHALL BE PROVIDED TO THE HOWARD COUNTY INSPECTOR PRIOR TO THE START OF CONSTRUCTION.
(E) THIS WALL NOT DESIGNED FOR SURCHARGE LOADS.

NOTE: RETAINING WALLS SHALL BE:
Keystone Retaining Wall Systems
Standard Unit 18 - Straight Face Details
GEOGRID SHALL BE STRATA-GRID SG200
THE CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS FOR RETAINING WALL CONSTRUCTION

RETAINING WALL SCHEDULE*

WALL HEIGHT AFG	DESIGN HEIGHT	MIN # GEORGRID LAYERS	MIN. GRID LENGTH	GEOGRID POSITION FROM BOTTOM OF WALL
2.33'	3'	0	-	-
3'	3.66'	1	4.0'	1.33'
4'	4.66'	2	6.0'	0.67', 3.33'
4.66'	5.33'	2	7.0'	0.67', 3.33'
6'	6.66'	2	6.5'	2.0', 4.67'

NOTE:
AFG = ABOVE FINISH GRADE
DESIGN HEIGHT = HEIGHT AFG + 0.67'
* FOR ADDITIONAL DETAILS, REFER TO RETAINING WALL DESIGN COMPUTATIONS BY DAVID D. WANG, PE DATED 7/16/2010 AND 7/21/2010

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 11/3/10
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 11/03/10

REVISIONS

NO.	DATE	DESCRIPTION
10/7/10		PER HC COMMENTS-LS

PLANS PREPARED FOR:
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PLANS PREPARED BY:
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Civil Engineer
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Hagerstown, MD 21742
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Louisbernstein@aunimail.edu

RETAINING WALL PROFILES
4941 Bonnie Branch Road
Ellicott City, Maryland 21043
Map 31 - Parcel 321
HOWARD COUNTY, MARYLAND

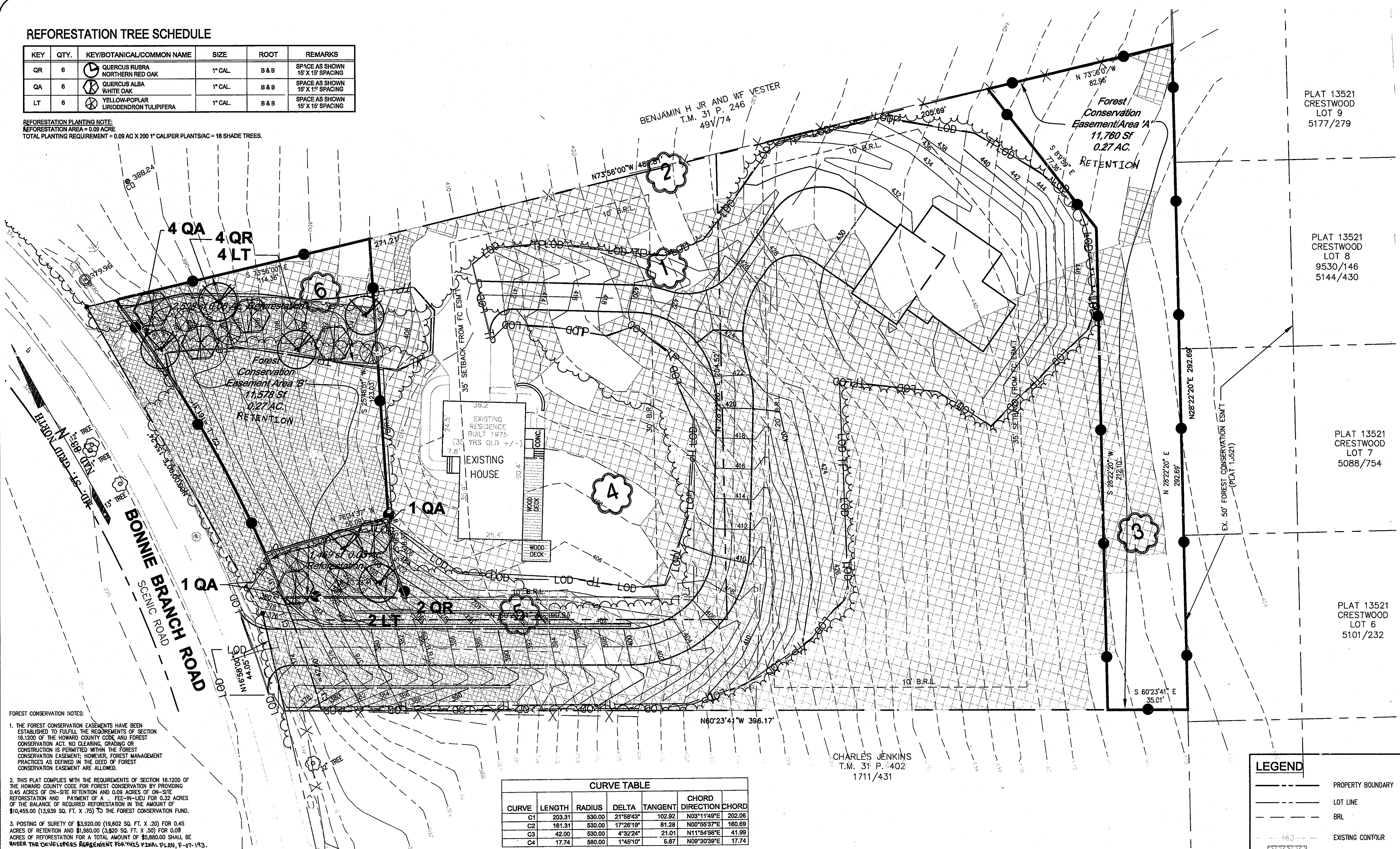


GRAPHIC SCALE 1"=20'
DATE: 04/06/10
JOB NUMBER: M3741.00
FILE NUMBER:
PLOTTED:
DRAWN BY: LB
DESIGNED BY: LB
CHECKED BY: LB
RETAINING WALL PROFILES
SHEET 4 of 8
F-07-193

REFORESTATION TREE SCHEDULE

KEY	QTY.	KEY/BOTANICAL/COMMON NAME	SIZE	ROOT	REMARKS
QR	6	QUERCUS RUBRA NORTHERN RED OAK	1" CAL.	B & B	SPACE AS SHOWN 15' X 15' SPACING
QA	6	QUERCUS ALBA WHITE OAK	1" CAL.	B & B	SPACE AS SHOWN 15' X 15' SPACING
LT	6	YELLOW-POPLAR LIRIODENDRON TULIPIFERA	1" CAL.	B & B	SPACE AS SHOWN 15' X 15' SPACING

REFORESTATION PLANTING NOTE:
REFORESTATION AREA = 0.09 ACRE
TOTAL PLANTING REQUIREMENT = 0.09 AC X 200 1" CALIPER PLANTS/AC = 18 SHADE TREES.



FOREST CONSERVATION NOTES:
1. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION ACT. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT. HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
2. THIS PLAT COMPLIES WITH THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE FOR FOREST CONSERVATION BY PROVIDING 0.45 ACRES OF ON-SITE RETENTION AND 0.09 ACRES OF ON-SITE REFORESTATION AND PAYMENT OF A FEE-IN-LIEU FOR 0.32 ACRES OF THE BALANCE OF REQUIRED REFORESTATION IN THE AMOUNT OF \$10,455.00 (13,939 SQ. FT. X .75) TO THE FOREST CONSERVATION FUND.
3. POSTING OF SURETY OF \$3,920.00 (19,602 SQ. FT. X .20) FOR 0.45 ACRES OF RETENTION AND \$1,960.00 (3,920 SQ. FT. X .50) FOR 0.09 ACRES OF REFORESTATION FOR A TOTAL AMOUNT OF \$5,880.00 SHALL BE UNDER THE DEVELOPERS AGREEMENT FOR THIS FINAL PLAN, P-07-193.

CURVE	LENGTH	RADIUS	DELTA	TANGENT	DIRECTION	CHORD
C1	203.31	630.00	21°58'43"	102.92	N03°11'49"E	202.08
C2	161.31	630.00	17°28'19"	81.28	N00°56'37"E	160.89
C3	42.00	630.00	4°32'24"	21.01	N11°54'56"E	41.98
C4	17.74	680.00	1°45'10"	6.87	N09°30'39"E	17.74

Key	A. Type of Community	B. Area	C. Soils Information			D. Existing Vegetation	E. Stand Characteristics			F. Forest Area in Sensitive Environments	G. Habitat Value
			1. Soil Type	2. Typical Forest Cover for Soil Type	3. Woodland Suitability Index		1. Size (Diam)	2. Age (yrs)	3. General Conditions		
F	Forest	1.9 ac.	GdD: Gladstone-Legore SrC: Sassafras & Croom	Upland Hardwoods Upland Hardwoods	75-95 60-90	Upland Hardwoods	45% at 12"-19.9" 29% at 20"-29.9"	60-90	Dominant species are in good condition	0.41 ac. = 19.4%	
L	Lawn	0.42 ac.	GdD: Gladstone-Legore	N/A	N/A	house, driveway, lawn	N/A	N/A	N/A		
T	Tree Group (This area does not qualify as forest due simply to not meeting the minimum width or area.)	.08 AC.	GdD: Gladstone-Legore	N/A	N/A						

Map Symbol & Soil Name	Map Unit %	Hydrologic Group	Erodibility Factor	Hydric
GdD: Gladstone	55	B	.24	No
Legore	30	B	.02	No
SrC: Sassafras	55	B	.37	No
Croom	35	C	.24	No

Key	Species	DBH	Height	Spread	Condition	Status
1	Black Oak	37"	120'	50'	Good	To Be Removed
2	Red Oak	31"	110'	40'	Good	Save
3	Chestnut Oak	34"	110'	40'	Good	Save
4	White Oak	31"	120'	40'	Good	Save
5	Chestnut Oak	30"	110'	70'	Good	To Be Removed
6	Red Maple	30"	120'	50'	Good	Save

NOTE: IN ACCORDANCE WITH WAIVER PETITION APPROVAL FOR WP 10-111, SPECIMEN TREE NOS. 1 AND 5 MAY BE REMOVED IN CONJUNCTION WITH CONSTRUCTION OF THE SHARED DRIVEWAY.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT & ENGINEERING DIVISION DATE 4/23/10
CHIEF, DIVISION OF LAND DEVELOPMENT DATE 4/23/10

LEGEND

- PROPERTY BOUNDARY
- LOT LINE
- BRL
- EXISTING CONTOUR
- SLOPES (15%-25%)
- SLOPES (>25%)
- REFORESTATION
- EXISTING TREE LINE
- PROPOSED TREE LINE
- SPECIMEN TREE
- FOREST RETENTION SIGN SEE FOREST CONSERVATION DETAIL SHEET FOR DETAIL
- TREE PROTECTION FENCE (FINAL LOCATION TO BE DETERMINED IN FIELD)

REVISIONS
10/7/10 PER HC COMMENTS-LB

PLANS PREPARED FOR:
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FOREST CONSERVATION PLAN:
4941 Bonnie Branch Road
Ellicott City, Maryland 21043
Map 31 - Parcel 321
HOWARD COUNTY, MARYLAND

DATE: 06/29/10
JOB NUMBER: M3741.00
FILE NUMBER:
PLOTTED: []
DRAWN BY: JB
DESIGNED BY: JB
CHECKED BY: LB

GRAPHIC SCALE 1"=20'
10' 0' 20'

FOREST CONSERVATION PLAN
SHEET 5 of 8
F-07-193

FOREST CONSERVATION WORKSHEET
VERSION 1.0
(Enter in Yell - w Cells)

NET TRACT AREA:

A. Total tract area.....	=	2.39
B. Area within 100 year floodplain.....	=	
C. Area to remain in agricultural production.....	=	0.00
D. Net tract area.....	=	2.39

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	CA
0		0	1	0	0

E. Afforestation Threshold.....	15% x D =	0.36
F. Conservation Threshold.....	20% x D =	0.47

EXISTING FOREST COVER:

G. Existing forest cover (excluding floodplain).....	=	1.90
H. Area of forest above afforestation threshold.....	=	1.54
I. Area of forest above conservation threshold.....	=	1.42

BREAK EVEN POINT:

J. Forest retention above threshold with no mitigation.....	=	0.78
K. Clearing permitted without mitigation.....	=	1.14

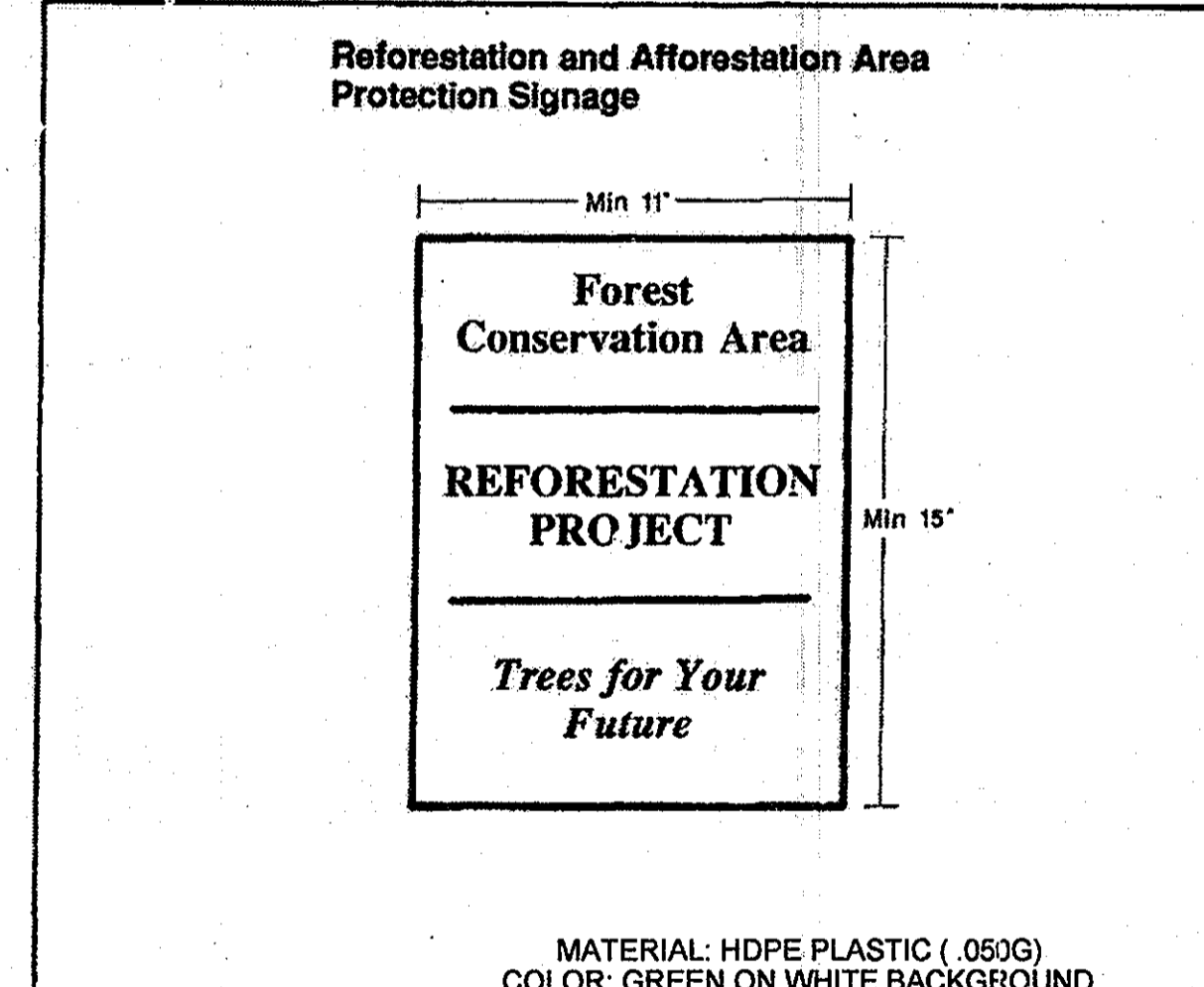
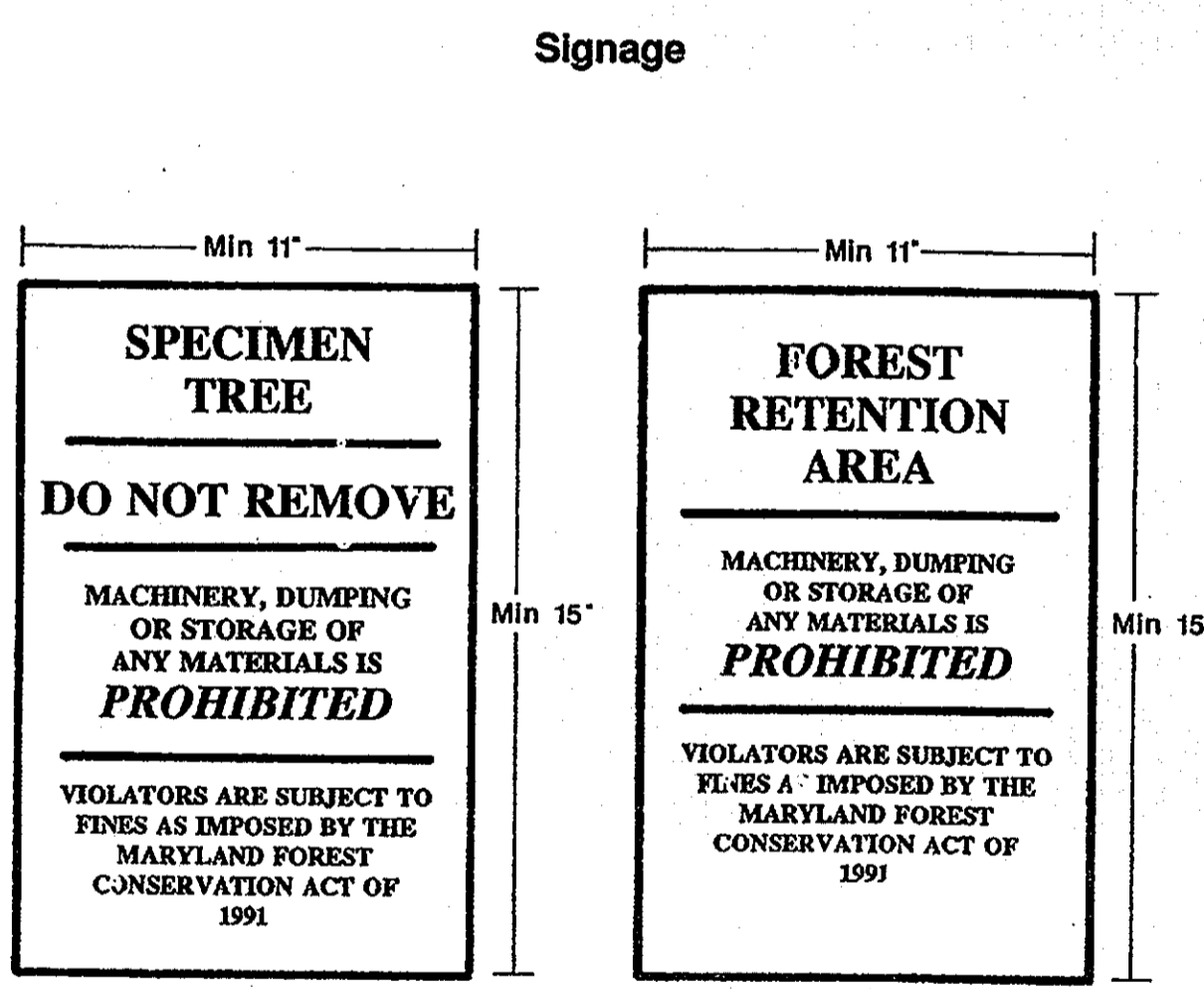
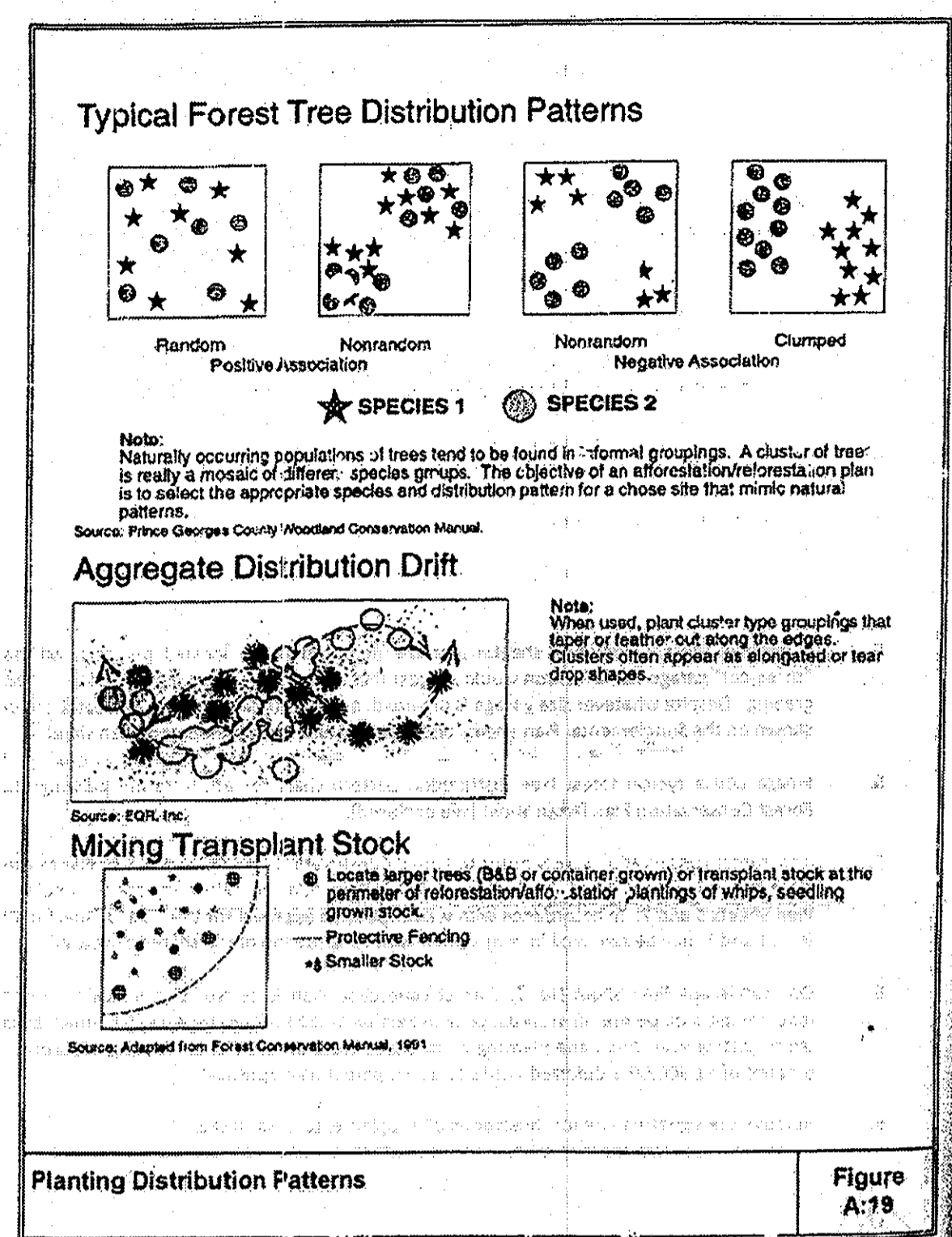
PROPOSED FOREST CLEARING:

L. Total area of forest to be cleared.....	=	1.45
M. Total area of forest to be retained.....	=	0.45

PLANTING REQUIREMENTS:

N. Reforestation for clearing above conservation threshold.....	=	0.38
P. Reforestation for clearing below conservation threshold.....	=	0.00
Q. Credit for retention above conservation threshold.....	=	0.00
R. Total reforestation required.....	=	0.41
S. Total afforestation required.....	=	0.00
T. Total reforestation and afforestation required.....	=	0.41

1.0' 0.0'
1.0' 0.0'



Signs similar to protection signage for Retention Areas can be used on Afforestation and Reforestation Areas. The signs notify construction workers and future residents of the newly planted material, improving the trees' survival rates.

Planting Plan:

- This Forest Conservation Plan will provide 18 - 1" caliper trees of at least 3 tree species from the included Plant List.
- Trees will be planted with 1/2" spacing in a random zig-zag alignment.
- Planting 1" B&B trees will be in accordance with the planting detail included on this plan.
- All trees will be mulched with wood chips to at least a 3ft diameter and 5in depth.
- All tree planting will be supervised by a Licensed Forester or certified Arborist who will be fully responsible for implementing the requirements of the approved PCP including planting techniques, species, and maintenance needs, or requests for modifications of previously approved planting requirements.
- When all planting is complete, the Forester or Arborist will convey to Howard County Department of Planning and Zoning, certification that all plantings have been installed as required by the PCP.

Afforestation Site Specifications:

- Afforestation site preparation prior to planting will include soil augmentation specified by the project forester/arborist.
- Invasive plants will be removed from planting site prior to afforestation plantings.

Selective Clearing & Supplemental Planting Site Specifications:

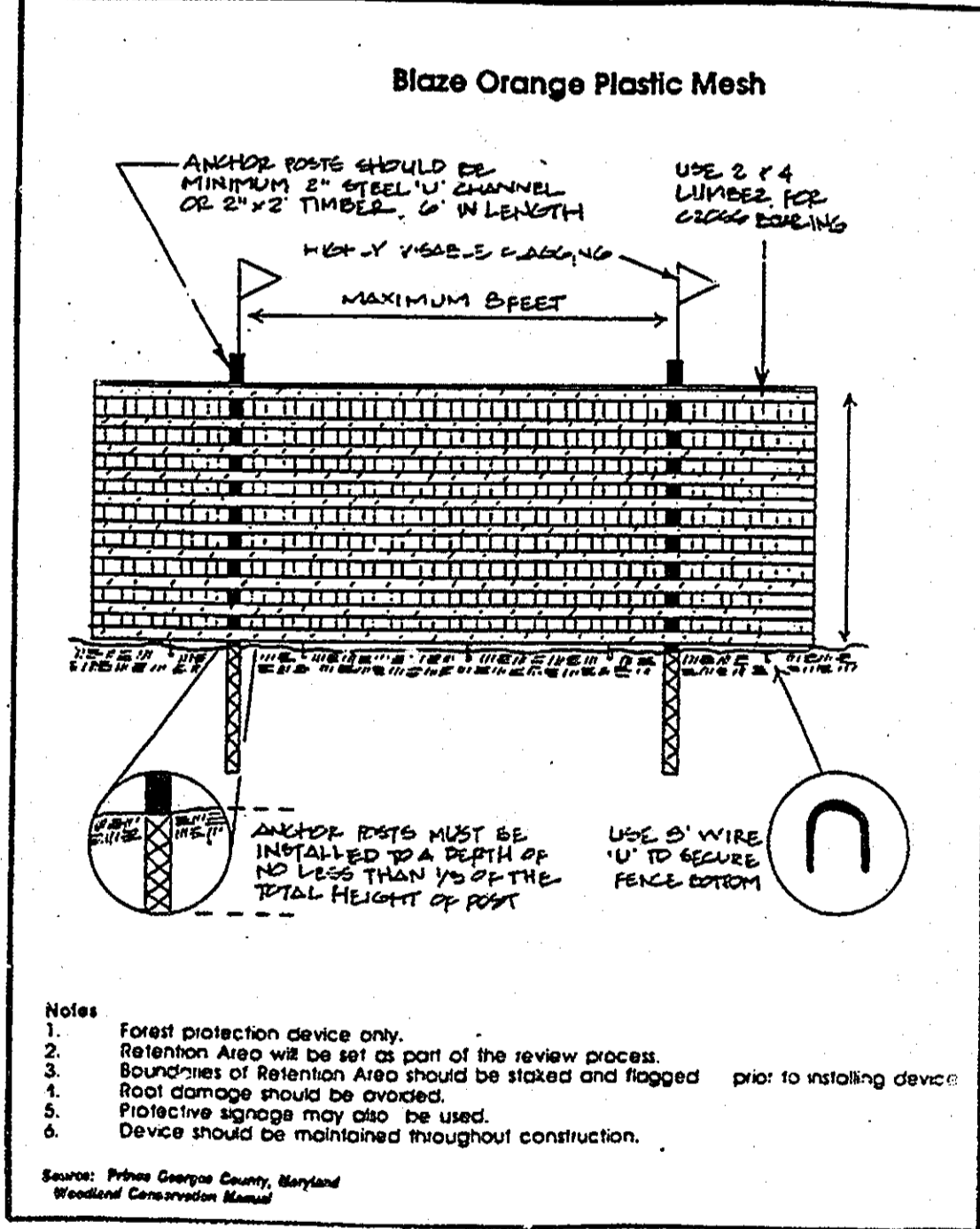
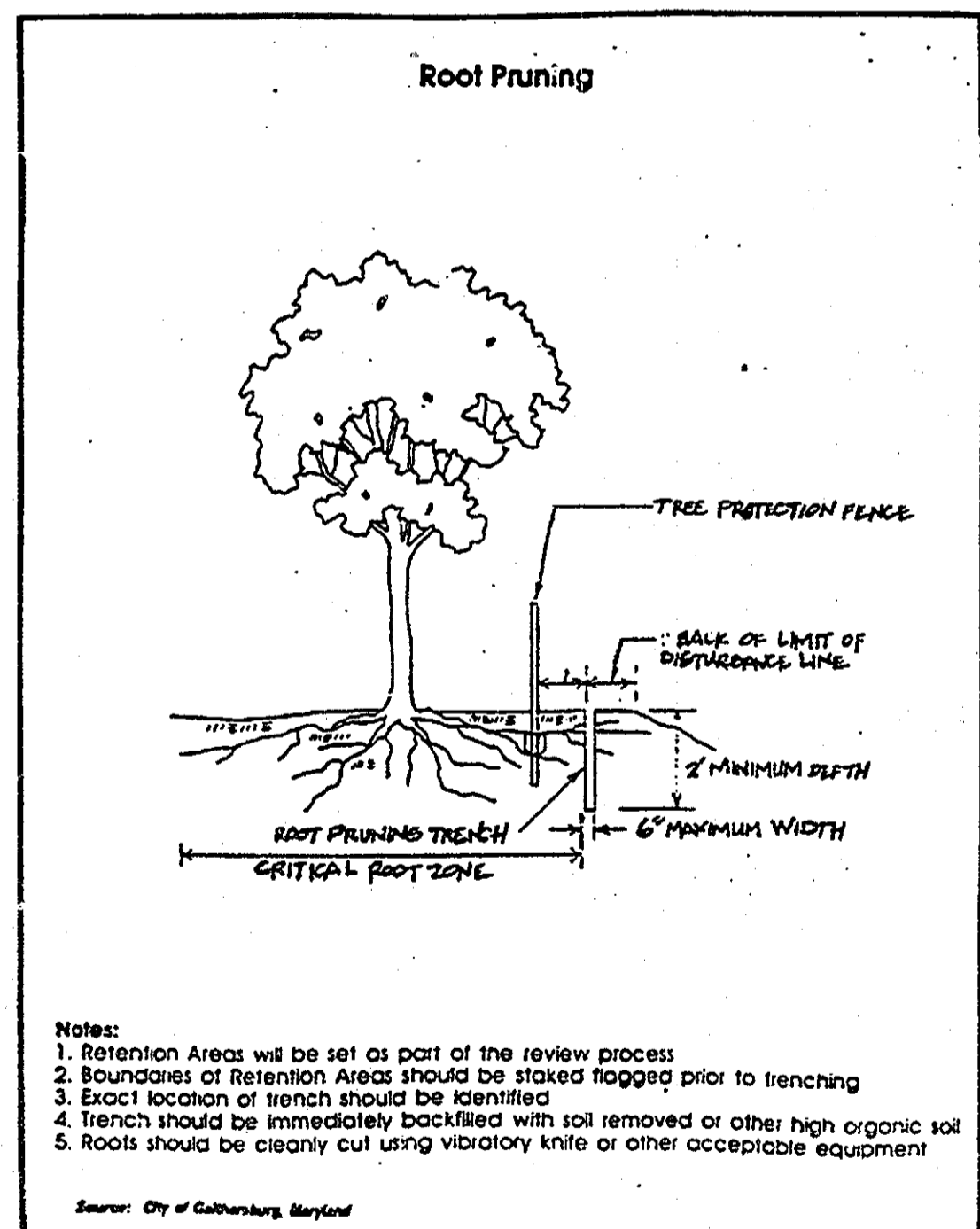
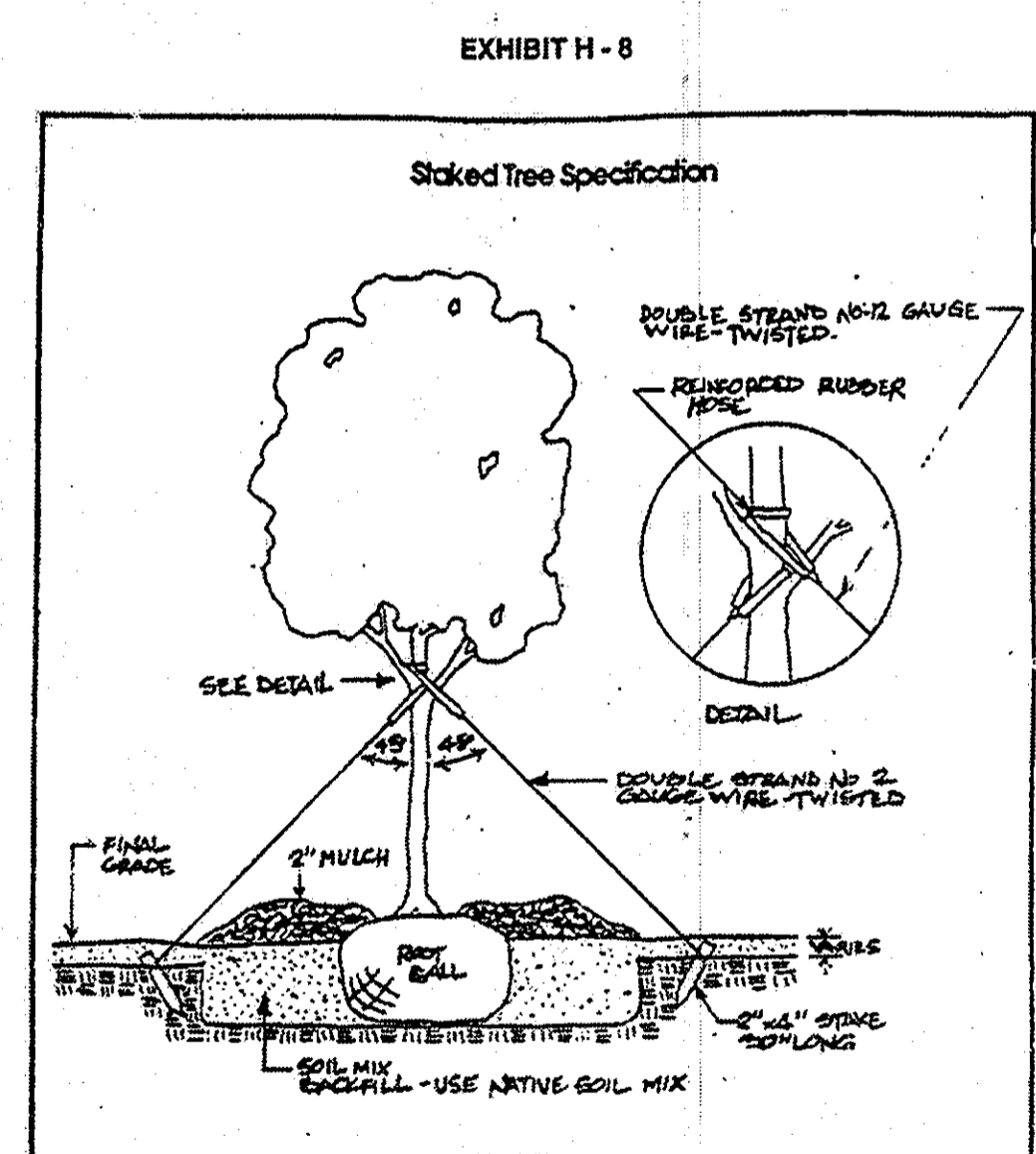
- Supplemental planting site preparation will include selective clearing of existing and future invasive plants, Norway Maple trees as well as other nuisance plants including English and Poison Ivy vines.
- No tree stumps are to be removed, but may be treated to avoid stump sprouting.
- Selective clearing must not disturb the remaining trees and beneficial understorey, areas tagged by a forester or arborist.
- Supplemental planting tree species will be chosen from the Plant List included on this Plan with consideration given to steep slope and floodplain soil conditions.

Tree Protection Plan:

- Orange mesh fence will be installed along the LOD prior to any site grading.
- Forest Retention signs as specified on the detail included on this plan will be erected on metal posts 4 ft above the ground at 50 to 100 foot intervals along the Limit of Disturbance and around the entire perimeter and corners of the RCE.
- The Forester or Arborist will inspect the LOD prior to site grading to insure that the Critical Root Zones (CRZ) of individual trees adjacent to the LOD are adequately protected.
- The Forester or Arborist will supervise all construction and post construction activities to insure that all existing trees are adequately protected and planted trees are correctly planted and maintained for the first 2 growing seasons.
- After construction is complete, the Forester or Arborist will convey to Howard County Department of Planning and Zoning, certification that all forest retention areas have been preserved and all protection measures required for the post-construction period have been put in place.

Sequence of Planting and Tree Protection:

- Prior to site grading, orange mesh fence and Forest Retention signs will be installed along the LOD in accordance with the construction details included on this plan and the general construction plan for the site.
- The project Forester or Arborist will inspect the LOD and provide field adjustments to the Tree Protection Plan to protect the Critical Root Zone (CRZ) of trees adjacent to the LOD that were not apparent during the development of the PCP.
- Prior to site grading, the Howard County DPZ will be notified to inspect and verify the LOD and Tree Protection fencing and signage.
- After site construction is complete, Tree Protection fencing will be removed. Forest Retention signage will remain in place along the entire perimeter of the RCE in accordance with this plan.
- During the post-construction landscaping of the site, afforestation and Supplemental Planting will be completed in accordance with the planting details included on this plan.
- Post construction management will include routine inspection and maintenance of Retention Signs, and tree watering and replacement if root rot or dead.
- Inspection of the planting site after 2 years to confirm compliance with Howard County tree survival requirements and to identify any additional site maintenance requirements.



REVISIONS

10/7/10	PER HC COMMENTS-LR
---------	--------------------

PLANS PREPARED FOR:

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PLANS PREPARED BY:

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FOREST CONSERVATION PLAN DETAILS:
4941 Bonnie Branch Road
Ellicott City, Maryland 21043
Map 31 - Parcel 321
HOWARD COUNTY, MARYLAND



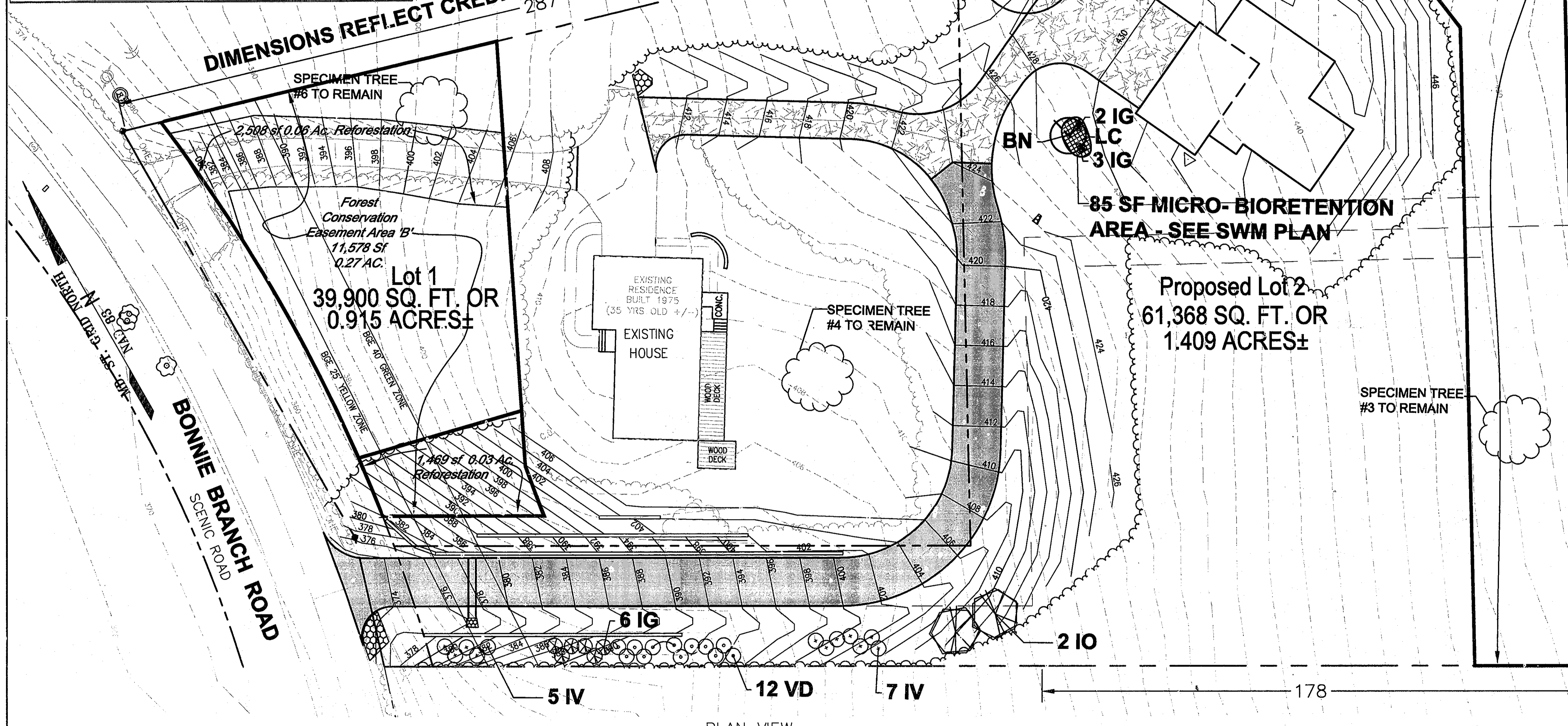
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

John D. ... 10/3/10
CHIEF, DEVELOPMENT ENGINEERING DIVISION

... 10/3/10
CHIEF, DIVISION OF LAND DEVELOPMENT

DATE:	06/29/10
JOB NUMBER:	M3716.00
FILE NUMBER:	
PLOTTED:	
DRAWN BY:	JB
DESIGNED BY:	JB
CHECKED BY:	LB
FOREST CONSERVATION DETAILS	
SHEET 6 of 8	

Material	Specification	Size	Note
Planting soil	see Appendix A, Table A.1	n/a	plantings are site-specific
Planting soil (2" to 4" deep)	heavy sand (60-65%) & compost (35%) or sandy loam (30%), coarse sand (30%) & compost (40%)	n/a	INSA soil types loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2974)		
Mulch	shredded hardwood		aged 6 months, maximum; no pine or wood chips
Per gravel drainage	per ASTM-D443	NO. 8 OR NO. 9 (1/4" TO 3/8")	
Curtain drain	basement stone: washed rubble	stone: 2" to 5"	
Geotextile		n/a	PE Type 1 nonwoven
Gravel (underdrains and infiltration holes)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (1/2" TO 3/4")	
Underdrain pipes	F 751, Type PS 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or HDPE	Slotted or perforated pipe, 1/8" perf. @ 6" on center, 4 holes per row, minimum of 1" of gravel over pipe; if necessary, underdrain pipes shall be wrapped with 16-inch galvanized hardware cloth
Precast in place concrete (if required)	MSHA Min No. 3, F., 3500 psi @ 28 days, normal weight, air-entrained, conforming to meet ASTM-A415-69	n/a	specify grades of precast-in-place concrete required; 28 day strength and slump test; all concrete design cast-in-place or precast not using previously approved form or form standard requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland; design to include meeting ACI Code 308.8R9, wetting, curing, [11-10 c. 7-2] allowable horizontal loading, etc. - if necessary and subject to potential cracking
Sand	AASHTO-M-6 or ASTM-C-33	0.075" to 0.01"	Sand substitutions such as Diabase and Gneiss (AASHTO) #10 are not acceptable. No calcium carbide or dolomite sand substitutions are acceptable. No "rock dust" can be used for sand.



SPECIFICATIONS FOR MICRO-BIORETENTION

1. Material Specifications
The following materials to be used in these practices are detailed in Table B.4.1.

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

The planting soil shall be tested and shall meet the following criteria:
Soil Component - Loamy Sand or Sandy Loam (USDA Soil Textural Classification)
Organic Content - Minimum 10 % by dry weight (ASTM D 2974). In general, this can be met with a mixture of loamy sand (60-65 %) and compost (35 % to 40 %) or sandy loam (30 %), coarse sand (30 %), and compost (40 %).
Clay Content - Must have a clay content of less than 5 %.
pH Range - Should be between 5.5 - 7.0. Amendments (e.g., lime, iron sulfate plus sulfur) may be mixed into the soil to increase or decrease pH.

There shall be at least one soil test per project. Each test shall consist of both the standard soil test for pH, and additional tests of organic matter, and soluble salts. A textual analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the topsoil was excavated.

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

Compaction can be alleviated at the base of the bioretention facility by using a vibrator soil test for pH, and additional tests of organic matter, and soluble salts. These operations are to restructure the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rototillers typically do not till deep enough to reduce the effects of compaction from heavy equipment. Rototill 2 to 3 inches of sand into the base of the bioretention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rototilling) base.

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

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

4. Plant Material
Recommended plant material for micro-bioretention practices can be found in Appendix A, Section A.2.3.

5. Plant Installation
Compost is a better organic material source, is less likely to float, and should be placed in the invert and other low areas. It should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable. Shredded mulch must be well aged (6 to 12 months) for acceptance.

Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball shall be planted so 1/2th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Soil and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation. Trees shall be banded using 2" by 2" stakes only as necessary and for the first growing season only. Stakes are to be equally spaced on the outside of the tree ball.

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

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

6. Underdrains
Underdrains should meet the following criteria:
Pipe - Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTM F 751, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
Perforations - If perforated pipe is used, perforations should be 3/8" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/4" (No. 4 or 4x4) galvanized hardware cloth.
Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain.
The main collector pipe shall be at a minimum 0.5 % slope.
A rigid, non-perforated observation well must be provided (one per every 1,000 square feet) to provide a clean-out port and monitor performance of the filter. A 4" layer of pea gravel (1/8" to 3/8" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 2".

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

7. Miscellaneous
These practices may not be constructed until all contributing drainage area has been stabilized.

PLANT SCHEDULE TREES

KEY	QTY.	KEY/BOTANICAL/COMMON NAME	SIZE	ROOT	REMARKS
FG	2	FAGUS GRANDIFOLIA AMERICAN BEECH	2 - 3 1/2" CAL.	B & B	SPACE AS SHOWN
IO	2	ILEX OPACA 'JERSEY PRINCESS' AMERICAN HOLLY	6" - 8"	B & B	SPACE AS SHOWN

SHRUBS

KEY	QTY.	KEY/BOTANICAL/COMMON NAME	SIZE	ROOT	REMARKS
IG	6	ILEX GLABRA 'SHAMROCK' SHAMROCK INKBERY	30" - 36"	-	SPACE AS SHOWN
IV	12	ILEX VERTICILLATA 'WINTER RED' WINTERBERRY	36" - 42"	-	SPACE AS SHOWN
VD	12	VIBURNUM DENTATUM SOUTHERN ARROWWOOD	36" - 42"	-	SPACE AS SHOWN

BIORETENTION PLANT SCHEDULE

KEY	QTY.	KEY/BOTANICAL/COMMON NAME	SIZE	ROOT	REMARKS
IG	5	ILEX GLABRA 'NANA' DWARF INKBERY	12" - 18"	-	SPACE AS SHOWN
LC	15	LOBELIA CARDINALIS CARDINAL FLOWER	1 QUART	-	30"
BN	1	BETULA NIGRA RIVER BIRCH	7" - 8"	B & B	SPACE AS SHOWN

SCHEDULE A

PERIMETER LANDSCAPE EDGE	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	N/A	A
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	N/A	1377'
CREDIT FOR EXISTING VEGETATION YES, NO, LINEAR FEET	N/A	YES/856'
CREDIT FOR WALL, FENCE, OR BERM YES, NO, LINEAR FEET	N/A	NO
NUMBER OF PLANTS REQUIRED	N/A	6
SHADE TREES	N/A	0
EVERGREEN TREES	N/A	0
SHRUBS	N/A	0
NUMBER OF PLANTS PROVIDED	N/A	2
SHADE TREES	N/A	0
EVERGREEN TREES	N/A	0
OTHER TREES (2:1 SUBSTITUTION)	N/A	2
SHRUBS (10:1 SUBSTITUTION)	N/A	30

TWO EVERGREENS AND 30 SHRUBS ARE SUBSTITUTED FOR 4 REQUIRED SHADE TREES ALONG THE SOUTHERN PROPERTY BOUNDARY.

NOTE: IN ACCORDANCE WITH WAIVER PETITION APPROVAL FOR WP 10-11, SPECIMEN TREES NOS. 1 AND 5 MAY BE REMOVED IN CONJUNCTION WITH CONSTRUCTION OF THE SHARED DRIVEWAY.

DEVELOPER'S/BUILDER'S CERTIFICATE

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

James M. Fawcett 10/14/10
NAME DATE

LANDSCAPE PLAN NOTES:

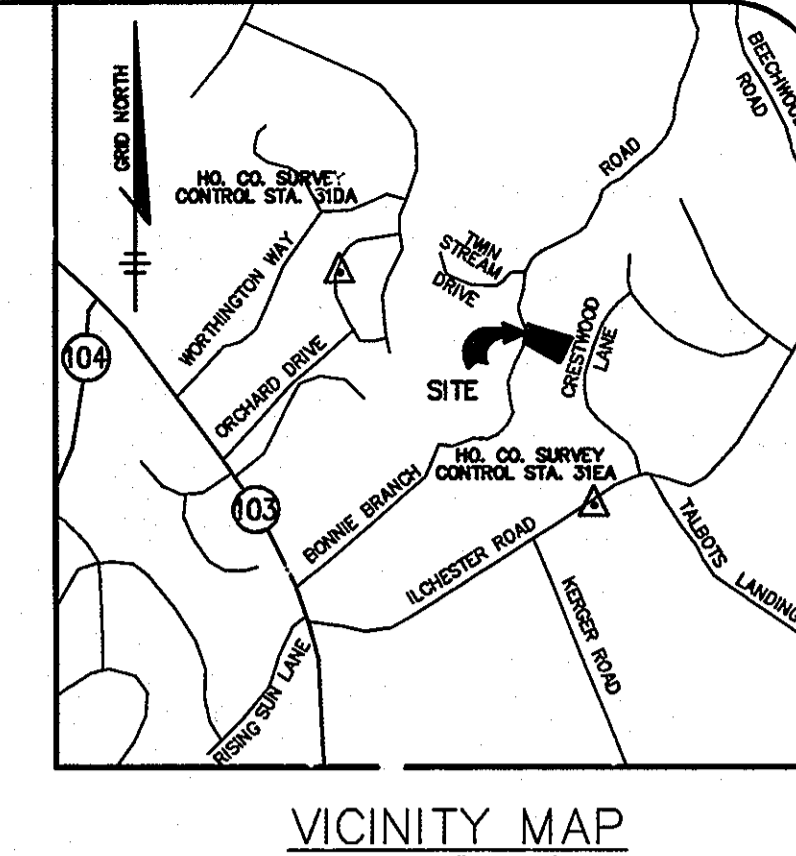
- AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DELAY OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.
- PERIMETER LANDSCAPING SHALL BE MET IN ACCORDANCE WITH SECTION 16.124 OF THE LANDSCAPE MANUAL BY CREDIT FROM EXISTING VEGETATION AND PLANTING OF SIX SHADE TREES ON LOT NO. 2. POSTING OF SURETY IN THE AMOUNT OF \$1,000.00 SHALL BE DEFERRED UNTIL SITE DEVELOPMENT PLAN APPROVAL.

LEGEND

- EXISTING CONTOUR
- SLOPES (15%-25%)
- SLOPES (>25%)
- 15% - 25% SLOPES NOT SHOWN ON PLAN FOR GRAPHIC CLARITY REASONS - SEE SUPPLEMENTAL PLAN FOR SLOPE INFORMATION
- EXISTING TREE LINE
- PROPOSED TREE LINE
- PROPERTY BOUNDARY
- PROPOSED SHADE TREE - See Plant Schedule for species type and size.
- PROPOSED FLOWERING TREE - See Plant Schedule for species type and size.
- PROPOSED SHRUB - See Plant Schedule for species type and size.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division 11/3/10
K. J. Shaheen 11/3/10
Chief, Division of Land Development 88 DATE



REVISIONS
10/7/10 PER HC COMMENTS-LB

PLANS PREPARED FOR:
James and Patricia Fawcett
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PLANS PREPARED BY:
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Civil Engineer
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Hagerstown, MD 21742
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Landscape Plan for:
4941 Bonnie Branch Road
Ellicott City, Maryland 21043
Map 31 - Parcel 921
HOWARD COUNTY, MARYLAND



GRAPHIC SCALE 1"=20'

DATE: 06/29/10
JOB NUMBER: M3741.00
FILE NUMBER:
PLOTTED: [initials]
DRAWN BY: BM
DESIGNED BY: JB
CHECKED BY: LB

LANDSCAPE PLAN
SHEET 7 of 8

