ROAD CONSTRUCTION PLANS

BONNIE BRANCH OVERLOOK

LOTS 1 THRU 13

SECOND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

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OWNER

RONALD WILDMAN
4747 BONNIE BRANCH
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

BY THE DEVELOPER:

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

Ronald B. Wildman — SIGNATURE OF DEVELOPER — DATE 4/28/00

Ronald B. Wildman — PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF ENGINEER — DATE 4/28/00

R. JACOB HILMAT — PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS. — 5/24/00

USDA – NATURAL RESOURCE CONSERVATION SERVICE — DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. — 5/24/00

HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

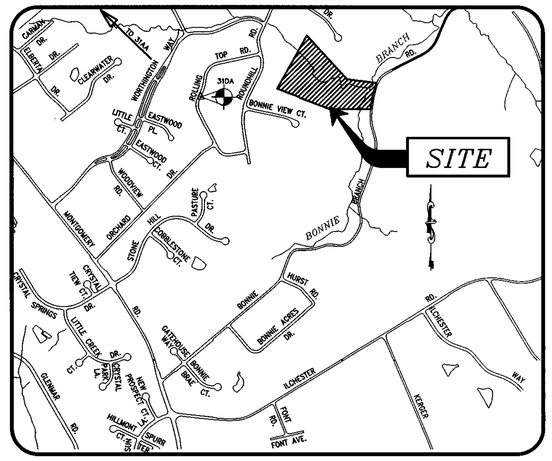
CHIEF BUREAU OF HIGHWAYS — DATE 6/2/00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/9/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

STATE OF MARYLAND — R. JACOB HILMAT — 17948 — PROFESSIONAL ENGINEER



VICINITY MAP

SCALE: 1'=1000'

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE (5) DAYS PRIOR TO ANY EXCAVATION WORK:

MISS UTILITY	1-800-257-7777
C&P TELEPHONE COMPANY	(410) 725-9976
HOWARD COUNTY BUREAU OF UTILITIES	(410) 313-4900
AT&T CABLE LOCATION DIVISION	(410) 393-3533
BALTIMORE GAS & ELECTRIC	(410) 685-0123
STATE HIGHWAY ADMINISTRATION	(410) 531-5533
HOWARD COUNTY DEPT. OF PUBLIC WORKS/ CONSTRUCTION INSPECTION DIVISION	(410) 313-1880

3. PROJECT BACKGROUND:

LOCATION: SECOND ELECTION DISTRICT – TAX MAP 31 – PARCEL 27	
ZONING: R-20	
DEED REFERENCE :	L. 3887 F. 579
TOTAL TRACT AREA :	10.27 ACRES ±
NUMBER OF PROPOSED LOTS:	13 (10 BUILDABLE)
ACREAGE OF PROPOSED BUILDABLE LOTS :	3.76 ACRES ±
OPEN SPACE REQUIRED :	3.08 ACRES ± (30%)
OPEN SPACE PROVIDED :	6.09 ACRES ±
AREA OF RIGHT OF WAY:	0.42 ACRES±
DPZ REFERENCE #: – SP-97-20, WP-98-75, P-99-03, BA 410-D	
WATER AND SEWER CONTRACT #	14-3823-D

4. TOPOGRAPHIC INFORMATION ARE BASED ON AERIAL TOPOGRAPHIC SURVEY BY WINGS AERIAL MAPPING CO., INC. ON MARCH 12, 1997.
5. HORIZONTAL AND VERTICAL DATUMS BASED ON (NAD'83) MARYLAND STATE COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS.

STA No. 31AA	N 573,998.5709 E 1,369,934.229	EL.= 500.157
STA No. 31DA	N 571,982.6701 E 1,372,145.075	EL.= 482.35

6. FLOODPLAIN DELINEATION IS BASED ON STUDY BY MILDENBERG BOENDER AND ASSOCIATES, INC. AND UPDATED JULY 1998. AND UPDATED DECEMBER 1999.
7. PUBLIC WATER AND SEWER WILL BE AVAILABLE UNDER CONTRACT #417-S AND #266-W.
8. STORMWATER MANAGEMENT IS PROVIDED VIA PRIVATE DETENTION FACILITY & STORMCEPTOR STORMWATER MANAGEMENT WILL BE PRIVATELY OWNED AND MAINTAINED. DRY WELLS WILL BE USED FOR LOTS 1-7.
9. TRAFFIC CONTROL DEVICES, MARKINGS, AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
10. COMPACTION IN FILL AREAS TO BE 95% AS DETERMINED PER AASHTO T-180.
11. CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES ON SITE PRIOR TO COMMENCING CONSTRUCTION.
12. FOREST CONSERVATION REQUIREMENTS HAVE BEEN SATISFIED ON SITE VIA RETENTION AND REFORESTATION.

FOREST CONSERVATION AREA =1.79 Ac	SURETY AMOUNT=	$7,797.20
REFORESTATION AREA =0.55 Ac	SURETY AMOUNT=	$7,187.40
	TOTAL SURETY REQUIRED =	$14,984.60

13. WETLANDS STUDY AND FOREST STAND DELINEATION IS WILDMAN ENVIRONMENTAL SERVICES, INC. DATED MARCH 1997.
14. PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
15. OPEN SPACE LOT 13 WILL BE OWNED BY THE HOME OWNER'S ASSOCIATION, LOTS 11 & 12 WILL BE OWNED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
16. SLOPES IN EXCESS OF 25% EXIST AND ARE IDENTIFIED WHERE THEY EXCEED 20,000 SQ. FT.
17. ALL EXISTING STRUCTURES TO BE REMOVED.
18. A MINIMUM OF TWO (2) PARKING SPACES ARE PROVIDED ON EACH LOT. NO OFF-STREET PARKING IS REQUIRED.
19. THE STREET LIGHT LOCATIONS AND TYPES OF LIGHTS ARE AS FOLLOWS :

STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE	NOTES
TWIN STREAM DRIVE (PUBLIC)	0+26	30' R	150-watt HPS VAPOR PENDANT FIXTURE (CUTOFF) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM.	ANGLE ARM AS SHOWN SHEET # 2
TWIN STREAM DRIVE (PUBLIC)	1+61	14' R	100 watt HPS VAPOR "TRADITIONAIRE" POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE	
TWIN STREAM DRIVE (PUBLIC)	3+09	18' L		

20. STREET LIGHTS WILL BE REQUIRED IN THIS DEVELOPMENT IN ACCORDANCE WITH THE DESIGN MANUAL STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SELECTED SHALL BE IN ACCORDANCE WITH THE LATEST HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)." THE JUNE 1993 POLICY INCLUDES GUIDELINES FOR LATERAL AND LONGITUDINAL PLACEMENT. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
21. BASED ON HOWARD COUNTY DATA, NO CEMETERIES OR HISTORIC STRUCTURES EXIST ON SITE.
22. PROJECT IS SUBJECT TO WAIVER PETITION WP-98-75. WAIVER IS TO SECTION 16.116(a)(2)(ii) OF THE SUBDIVISION REGULATIONS. WHICH RESTRICTS GRADING WITHIN STREAM BUFFERS. APPROVES MARCH 25, 1998 WITH THE FOLLOWING CONDITIONS: 1. THE HORIZONTAL ALIGNMENT OF THE PROPOSED PRIVATE ACCESS PLACE SHOULD FOLLOW THE OVERHEAD EASEMENT AS CLOSELY AS POSSIBLE. 2. INSURE THAT CREATED CUT SLOPES ARE NO STEEPER THAN 2:1 VERTICAL, OTHERWISE STRUCTURAL STABILIZATION WILL BE REQUIRED. 3. WAIVER APPROVAL APPLIES ONLY TO THE PROPOSED GRADING AND CLEARING FOR THE CUL-DE-SAC OF ROAD A, AND THE PRIVATE ACCESS PLACE EXTENDING FROM ITS TERMINUS.
23. ALL ROADS AND T-TURN AROUNDS ARE TO HAVE MOUNTABLE CURBS.
24. HOUSES NOT DRAINING TO SWM FACILITIES ARE TO HAVE DRY WELLS FOR WATER QUALITY.
25. EXISTING TREE LINE IS BASED ON AERIAL TOPOGRAPHY AND FOREST STAND DELINEATION.
26. JOINT PERMIT TRACKING NUMBER: 99-NT-0251/199964211.
27. FOR TRAFFIC CONTROL PLAN SEE SHEET 9 OF 12
28. BONNIE BRANCH ROAD IS A SCENIC ROAD.
29. THIS PROJECT IS SUBJECT TO BOARD OF APEALS CASE NO. BA 410-D
30. RETAINING WALLS ON BOTH SIDES OF THE PRIVATE ACCESS PLACE (TWIN STREAM DRIVE) ARE KEYSTONE RETAINING WALLS OR EQUIVALENT.
31. Landscape surety in the amount of $22,200.00 is part of the Developers Agreement.

project	date
96090	APR., 2000
illustration	engineering
MMP/SAA	MMP/SAA
scale	approval
AS SHWN	RJH

no.	description	date
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
COVER SHEET

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0298 Fax.

96090/DWG/FINAL/COVER

F-00-95

LEGEND

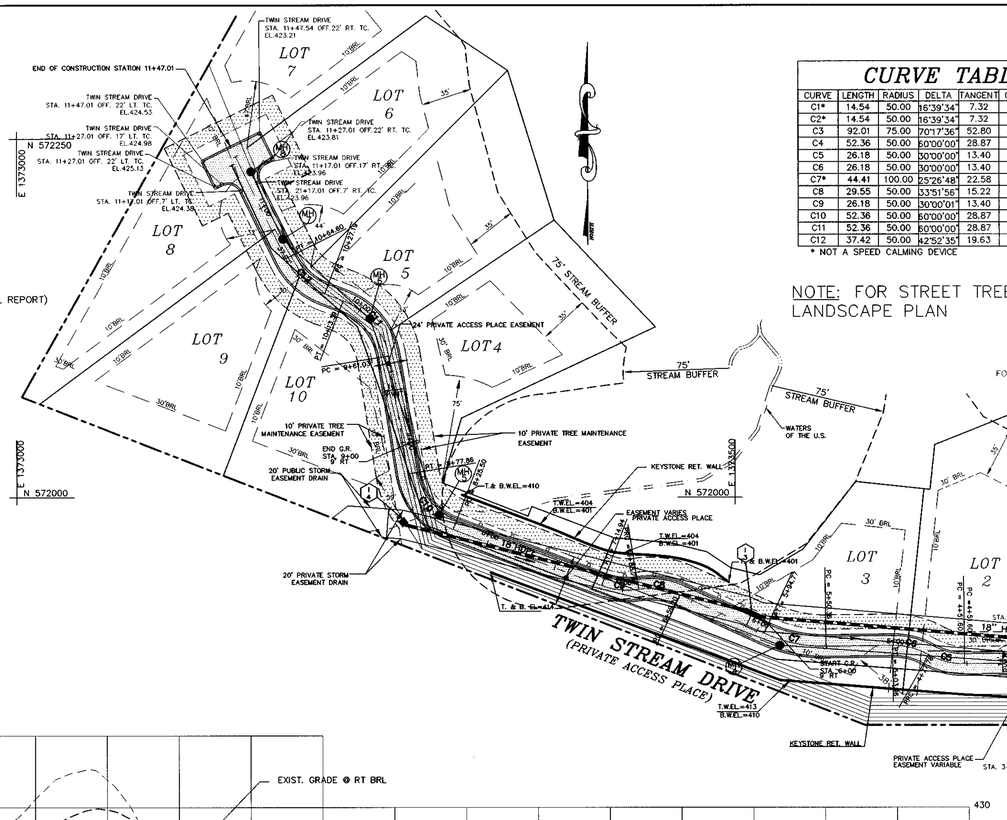
- DENOTES FLOOD PLAIN
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES PAVEMENT
- DENOTES CONCRETE PLATFORM
- DENOTES 95% BACKFILL
- B-1 DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

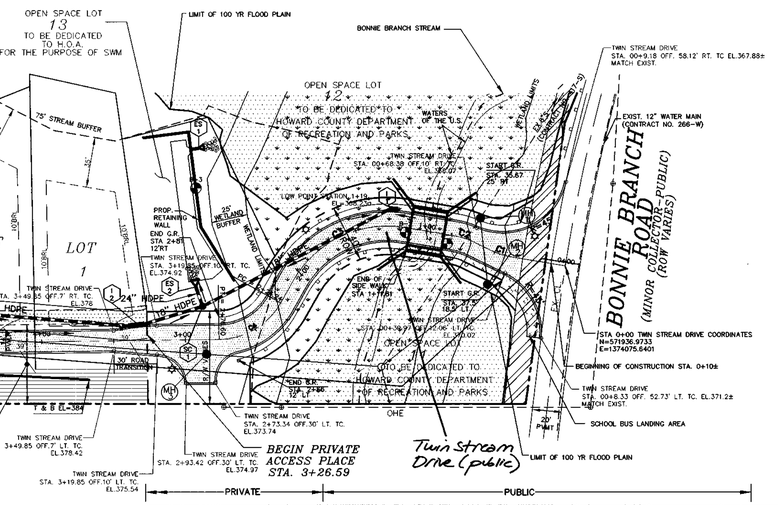
CURVE TABLE

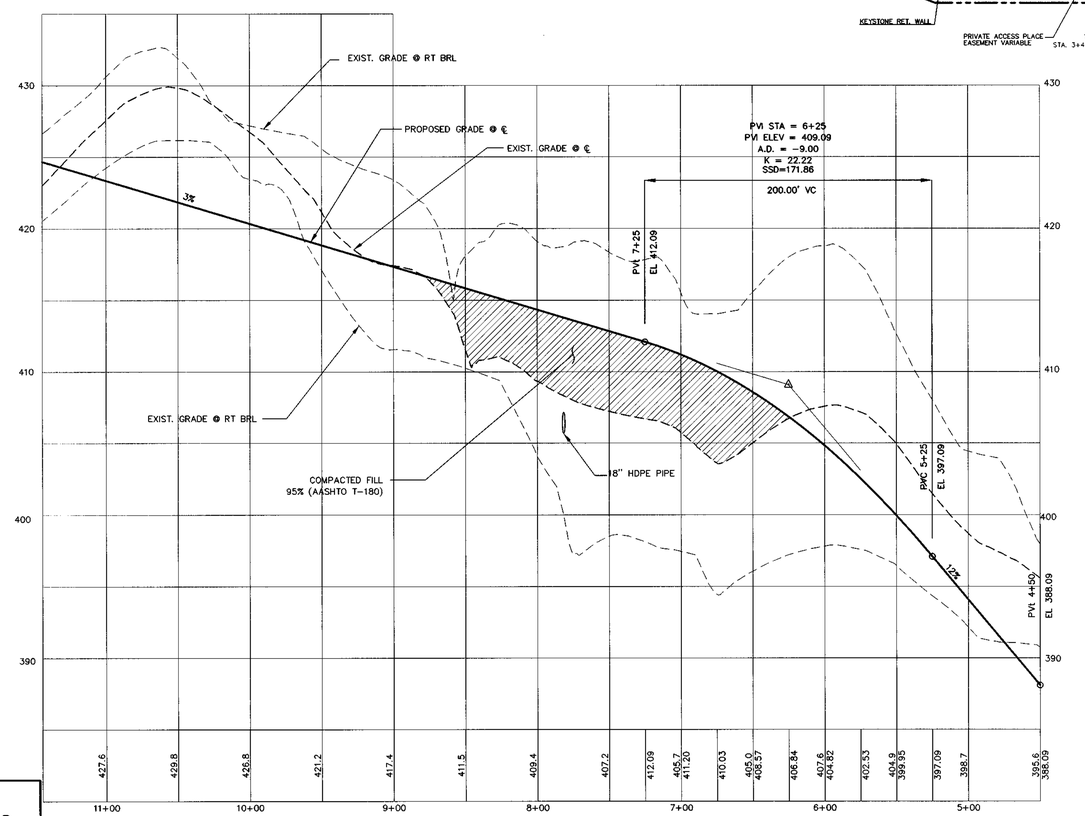
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	BEARING
C1*	14.54	50.00	16°39'34"	7.32	14.49	S72°05'32"E
C2*	14.54	50.00	16°39'34"	7.32	14.49	N72°05'32"W
C3	92.01	75.00	70°17'36"	52.80	86.35	S64°25'52"W
C4	52.36	50.00	60°00'00"	28.87	50.00	N59°17'04"E
C5	26.18	50.00	30°00'00"	13.40	25.88	S75°42'56"E
C6	26.18	50.00	30°00'00"	13.40	25.88	N75°42'56"W
C7*	44.41	100.00	25°26'48"	22.58	44.05	S77°59'32"E
C8	29.55	50.00	33°51'56"	15.22	29.13	N82°12'06"W
C9	26.18	50.00	30°00'01"	13.40	25.88	S84°08'04"E
C10	52.36	50.00	60°00'00"	28.87	50.00	S39°08'04"E
C11	52.36	50.00	60°00'00"	28.87	50.00	N39°08'04"W
C12	37.42	50.00	42°52'35"	19.63	36.55	S47°41'46"E

* NOT A SPEED CALMING DEVICE

NOTE: FOR STREET TREES LOCATION SEE LANDSCAPE PLAN



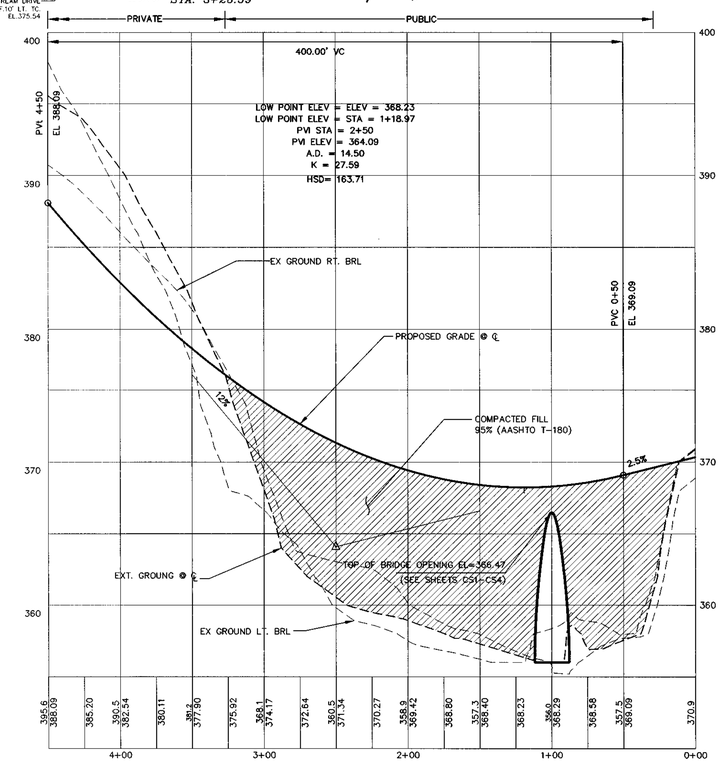




TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE(PRIVAE)
DESIGN SPEED: 25 MPH(VERTICAL)



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DESIGN SPEED: 25 MPH(VERTICAL)

STATE OF MARYLAND — JACOB TWILLEY — 7942 — PROFESSIONAL ENGINEER

APPROVED: DEPARTMENT OF PUBLIC WORKS		
CHIEF, BUREAU OF HIGHWAYS		6-2-00 DATE
APPROVED: DEPARTMENT OF PLANNING AND ZONNING		
CHIEF, DIVISION OF LAND DEVELOPMENT		6/9/00 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION		6/12/00 DATE

96090/DWG/FINAL/RD-PROF

project	96090
date	APR. 2000
illustration	SAA
engineering	MMP
scale	1"=50'
approval	RJH

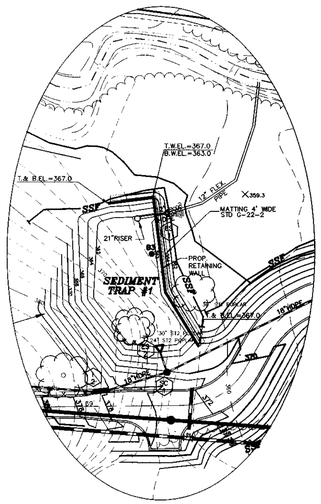
no.	description	date
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
ROAD PLAN AND PROFILES

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0298 Fax.

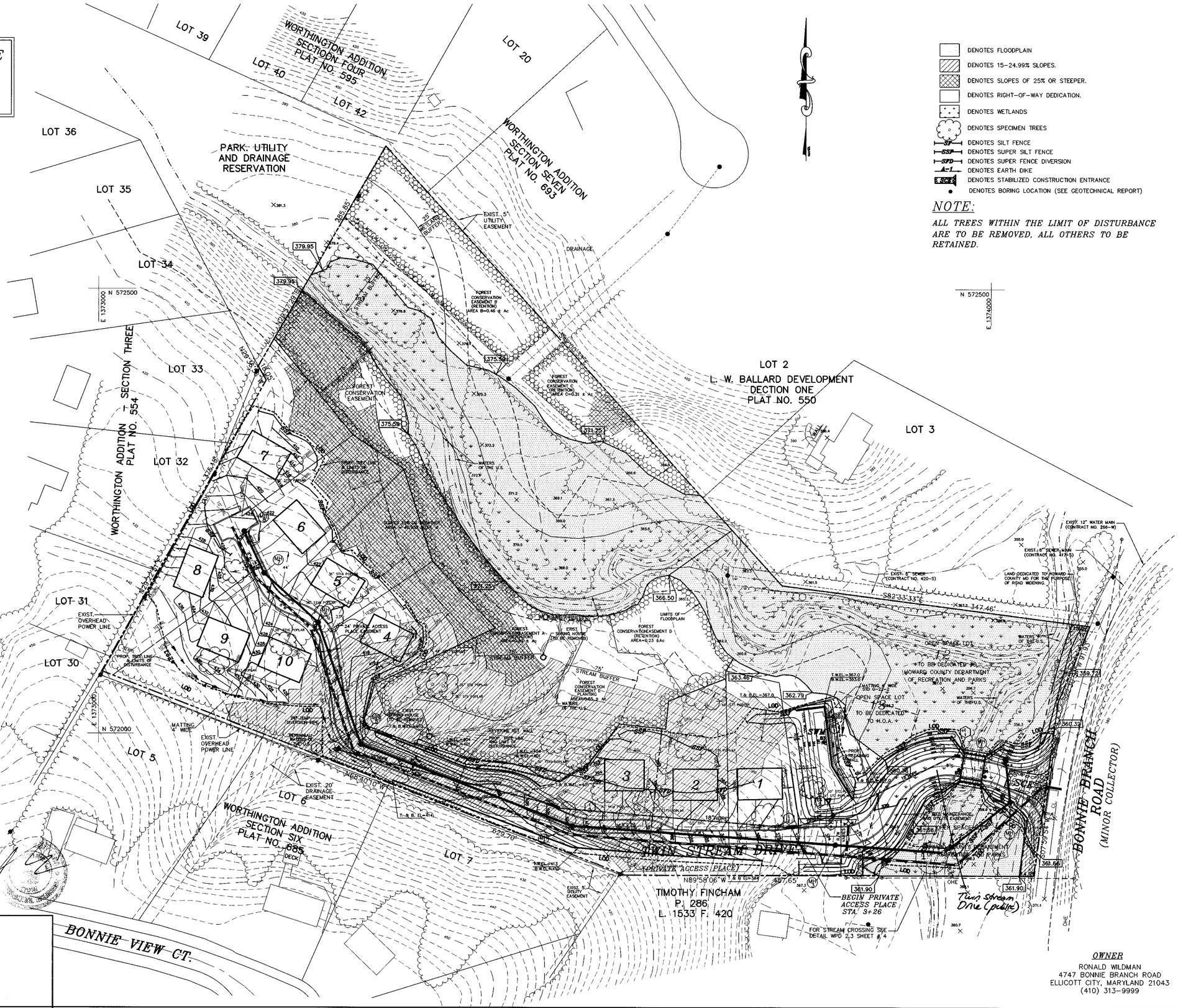
F-00-95

THIS DRAWING IS TO BE USED FOR GRADING PLAN PURPOSES ONLY



SEDIMENT TRAP DATA

TYPE:	ST-I PIPE OUTLET
DRAINAGE AREA:	3.22 ACRES
TOTAL VOLUME REQUIRED:	11,592 C.F.
TOTAL VOLUME PROVIDED:	15,855 C.F.
WET STORAGE REQUIRED:	5,796 C.F.
WET STORAGE PROVIDED:	6,995 C.F.
WET STORAGE EL:	364.5
DRY STORAGE REQUIRED:	5,796 C.F.
DRY STORAGE PROVIDED:	7,860 F.F.
DRY STORAGE EL:	366.0
RISER SIZE	21"
BARREL SIZE:	12"



DENOTES FLOODPLAIN
DENOTES 15-24.99% SLOPES.
DENOTES SLOPES OF 25% OR STEEPER.
DENOTES RIGHT-OF-WAY DEDICATION.
DENOTES WETLANDS
DENOTES SPECIMEN TREES
SF — DENOTES SILT FENCE
SSF — DENOTES SUPER SILT FENCE
SFD — DENOTES SUPER FENCE DIVERSION
E-L — DENOTES EARTH DIKE
S.C.E. — DENOTES STABILIZED CONSTRUCTION ENTRANCE
● DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

NOTE:

ALL TREES WITHIN THE LIMIT OF DISTURBANCE ARE TO BE REMOVED, ALL OTHERS TO BE RETAINED.

BY THE DEVELOPER:

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

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PRINTED NAME OF DEVELOPER

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USDA – NATURAL RESOURCE CONSERVATION SERVICE — DATE 5/24/00

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 5/24/00

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/GRADE

project	date
96090	APR. 2000
illustration	engineering
MPP/SAA	MMP/SAA
scale	approval
1"=50'	RJH

no.	description	date
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27

BONNIE BRANCH OVERLOOK

HOWARD COUNTY, MARYLAND

SECOND ELECTION DISTRICT

GRADING EROSION AND SEDIMENT CONTROL PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0298 Fax.

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

F-00-95

HOWARD SOIL CONSERVATION DISTRICT

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 , DISKING 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 ACRES DOLOMITIC LIMESTONE (92 LBS/1000 SQ.FT.) AND 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ.FT.) BEFORE SEEDING. HARROW OR DISK INTO UPPER THREE INCHES OF SOIL. AT 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 DOLOMITIC LIMESTONE (92 LBS./1000 SQ.FT.) AND 1000 LBS. PER ACRE 10-10-10 FERTILIZER (23 LBS./1000 SQ.FT.) BEFORE SEEDING. HARROW OR DISK 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 LOBS. 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 OF 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 TONE/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 SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

TEMPORARY SEEDING NOTES

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

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, FOR 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 OCTOBER 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 16 THRU NOVEMBER 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 WEED FREE SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL PER ACRE (5 GAL/1000 SQ.FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GAL PER ACRE (8 GAL/1000 SQ.FT.) FOR ANCHORING.

REFER TO THE 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR ADDITIONAL RATES AND METHODS NOT COVERED.

STANDARD SEDIMENT CONTROL NOTES

1) A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF NAY CONSTRUCTION, (313-1855).
2) ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "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 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5) ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1991 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC.51), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC.52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY 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 OF SITE:	10.27	ACRES
AREA DISTURBED:	3.35	ACRES
AREA TO BE ROOFED OR PAVED:	0.85	ACRES
AREA TO BE VEGITATIVELY STABILIZED:	2.5	ACRES
TOTAL CUT:	8,500	CU. YDS.
TOTAL FILL:	8,500	CU. YDS.
TOTAL WASTE/BORROW AREA LOCATION:	(NOT REQUIRED)	

THESE QUANTITIES ARE FOR PERMIT PURPOSES ONLY.
CONTRACTOR IS REQUIRED TO PROVIDE HIS OWN QUANTITY MEASUREMENTS.

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 CONTROL 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 CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

BY THE DEVELOPER:

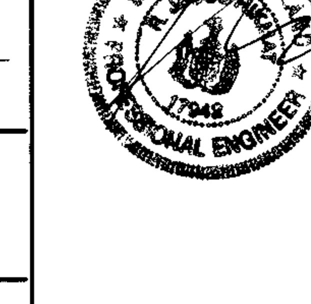
"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION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

Ronald B. Wildman 4/28/00
SIGNATURE OF DEVELOPER DATE
Ronald B. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

4/28/00
SIGNATURE OF ENGINEER DATE
R. JACOB HIKMAT
PRINTED NAME OF ENGINEER



THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

5/24/00
USDA – NATURAL RESOURCE CONSERVATION SERVICE DATE

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

5/24/00
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

6-2-00
CHIEF BUREAU OF HIGHWAYS HS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

6/19/00
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

96090/DWG/FINAL/SEDNO

STANDARD 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 VEGETATIVE 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 SPECIFICATION. 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 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 THAN 1 1/2" IN DIAMETER.

ii. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSON-SON GRASS, 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.

III. 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.

IV. 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 TOPSOILS SHALL BE BETWEEN 6.0 AND 7.5. IF THE TESTED SOIL DEMONSTRATES A pH OF LESS THAN 6.0, SUFFICIENT LIME SHALL BE PERSCRIBED 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 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 AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION – SECTION I – VEGETATIVE STABILIZATION METHODS AND MATERIALS.

V. TOPSOIL APPLLICATION

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" TO 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 PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

VI. ALTERNATIVE FOR PERMANENT SEEDING – INSTEAD OF APPLYING THE FULL AMOUNTS OF LIME AND COMMERCIAL FERTILIZER, COMPOSTED SLUDGE AND AMENDMENTS MAY BE APPLIED AS SPECIFIED BELOW:

i. COMPOSTED SLUDGE MATERIAL FOR USE AS A SOIL CONDITIONER FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES SHALL BE TESTED TO PRESCRIBE AMENDMENTS AND FOR SITES HAVING AREAS UNDER 5 ACRES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

a. COMPOSTED SLUDGE SHALL BE SUPPLIED BY, OR ORIGINATE FROM, A PERSON OR PERSONS WHO ARE PERMITTED (AT THE TIME OF ACQUISITION OF THE COMPOST) BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT UNDER COMAR 26.04.06.

b. COMPOSTED SLUDGE SHALL CONTAIN AT LEASE 1 PERCENT NITROGEN, 1.5 PERCENT PHOSPHOURUS, AND 0.2 PERCENT POTASSIUM AND HAVE A Ph OF 7.0 TO 8.0. IF COMPOST DOES NOT MEET THESE REQUIREMENTS, THE APPROPRIATE CONSTITUENTS MUST BE ADDED TO MEET THE REQUIREMENTS PRIOR TO USE.

c. COMPOSTED SLUDGE SHALL BE APPLIED AT A RATE OF 1 TON/1,000 SQUARE FEET.

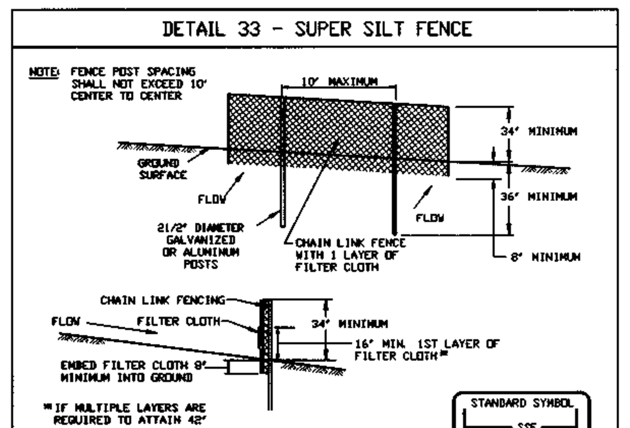
iv. COMPOSTED SLUDGE SHALL BE AMENDED WITH A POTASSIUM FERTILLIZER APPLIED AT THE RATE OF 4 LB/1,000 SQUARE FEET, AND 1/3 THE NORMAL LIME APPLICATION RATE.

REFERENCES: GUIDELINE SPECIFICATIONS, SOIL PREPARATION AND SODDING. MD-VA, PUB. #1, COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF MARYLAND AND VIRGINIA POLYTECHNIC INSTITUTES. REVISED 1973.

SEQUENCE OF CONSTRUCTION

1. OBTAIN GRADING PERMIT
2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE, WITH MOUNTABLE BERM, AT LOCATION SHOWN. (1 DAY)
3. CONSTRUCT SUPER SILT FENCES FROM BONNIE BRANCH ROAD TO STATION 3+50 +/– INCLUDING DOWNSTREAM OF PROPOSED STORM WATER MANAGEMENT FACILITY. (1 DAY)
4. CONSTRUCT STREAM CROSSING BRIDGE, GRADE AND STABILIZE THE AREA OF CROSSING (2 DAYS)
5. CONSTRUCT STORM WATER MANAGEMENT FACILITY TO INTERIM GRADING SHOWN ON DETAIL TO FUNCTION AS SEDIMENT TRAP. (3 DAYS)
   A. CONSTRUCT PERMANENT 12" HDPE PIPE AS SHOWN FOR STORM WATER MANAGEMENT DETAILS. EXTEND PERMANENT 12" HDPE PIPE THROUGH UPSTREAM FACE OF WALL AS NECESSARY TO CONSTRUCT COUPLING FOR SEDIMENT CONTROL RISER.
   B. CONSTRUCT SEDIMENT CONTROL RISER PER STANDARD DETAIL.
   C. ATTACH FLEXIBLE 12" PIPE TO 12" HDPE PIPE WITH WATERPROOF COUPLING. EXTEND FLEXIBLE 12" PIPE AS SHOWN ON PLAN TO STREAM.
6. CONSTRUCT REMAINING SILT FENCE, DIVERSION FENCES AND DIVERSION PIPE. DIVERSION FENCE IN OPEN SPACE LOT 12 IS TO CONSTRUCTED WITHOUT CLEARING OR GRUBBING OF TREE AREAS. (3 DAYS)
7. CLEAR SITE TO LIMITS INDICATED. (3 DAYS)
8. MASS GRADE SITE. (10 DAYS)
9. CONSTRUCT ROADWAY, RETAINIING WALLS, STORM DRAIN AND UTILITIES. (15 DAYS)
10. UPON STABILIZATION OF CONTRIBUTING DRAINAGE AREAS AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, REGRADE SEDIMENT TRAP TO FINAL GRADES PER STORM WATER MANAGEMENT FACILITY. (5 DAYS)
    A. REMOVE SEDIMENT CONTROL RISER.
    B. CUT HDPE PIPE FLUSH WITH UPSTREAM FACE OF WALL.
    C. REMOVE FLEXIBLE PIPE FROM END OF 12" HDPE, ATTACH PERMANENT END SECTION, RIP-RAP AND STABILIZE DISTURBED AREA.
11. WHEN ALL CONTRIBUTING DRAINAGE AREAS TO SEDIMENT CONTROL DEVICES HAVE BEEN STABILIZED AND WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL DEVICES AND STABILIZE REMAINING DISTURBED AREA (4 DAYS)
12. SEDIMENT CONTROL MEASURES FOR UTILITY CONSTRUCTION, FOR AREAS OUTSIDE OF SEDIMENT CONTROL MEASURES:
    A. CLEAR AND GRUB ONLY AS NECESSARY FOR EXCAVATION AND INSTALLATION OF THE UTILITIES, WITHIN THE DESIGNATED EASEMENTS. EXCAVATION AND BACKFILL SHALL BE LIMITED TO THAT WHICH CAN BE STABILIZED WITHIN ONE WORKING DAY. ALL EXCAVATED MATERIAL SHALL BE PLACED ON UPHILL SIDE OF UTILITY TRENCH. IN AREAS OF EXISTING PAVEMENT, STABILIZE WITH STONE AGGREGATE UNTIL PERMANENT PAVING REPAIR CAN BE COMPLETED.
    B. PLACE SILT FENCE AT DOWN STREAM LIMITS OF PREVIOUS DAY'S CONSTRUCTION PRIOR TO COMMENCEMENT OF FUTURE EXCAVATION. SILT FENCE IS TO EXTEND ACROSS THE WIDTH OF DISTURBED AREA.
    C. STABILIZE, SEED AND MULCH ALL DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDING NOTES SHOWN ON THIS SHEET (7 DAYS)
13. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
    A. 7 CALENDAR DAYS FOR ALL PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1.
    B. 14 CALENDAR DAYS FOR ALL OTHER DISTURBED GRADED AREAS ON PROJECT SITE.

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

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SUPER SILT FENCE

Design Criteria

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

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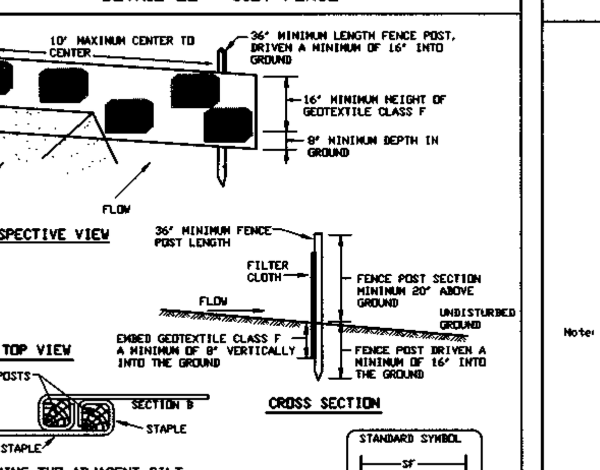
DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond 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 ft²/ minute (max.)	Test: MSMT 322
Filtering Efficiency	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 reached 50% of the fabric height.

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SILT FENCE

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

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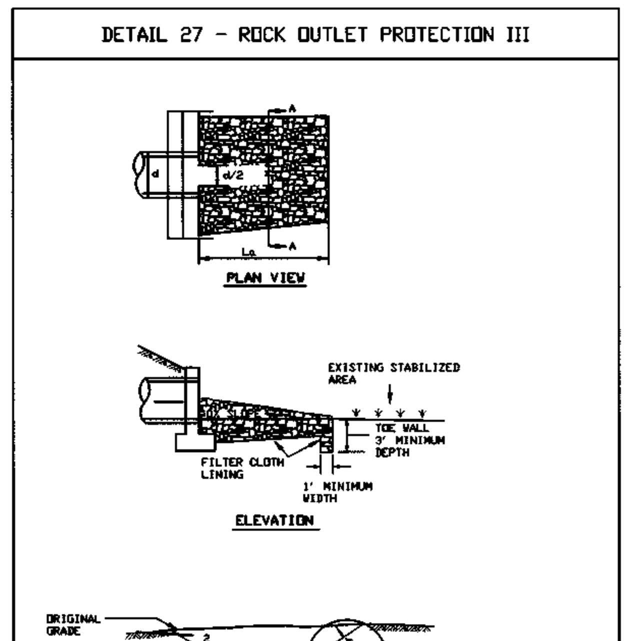
DETAIL 27 - ROCK OUTLET PROTECTION III



NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

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ROCK OUTLET PROTECTION III

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 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 places 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 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.

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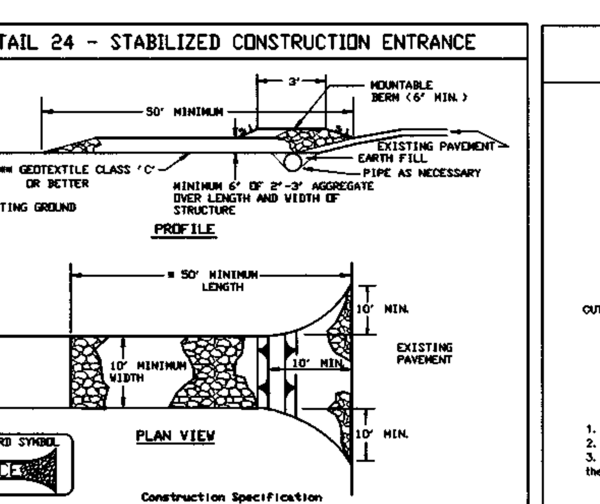
DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length – minimum of 50' (*30' for 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.

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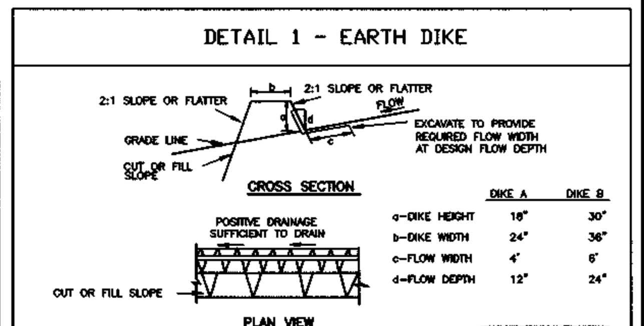
DETAIL 1 - EARTH DIKE



FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

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.

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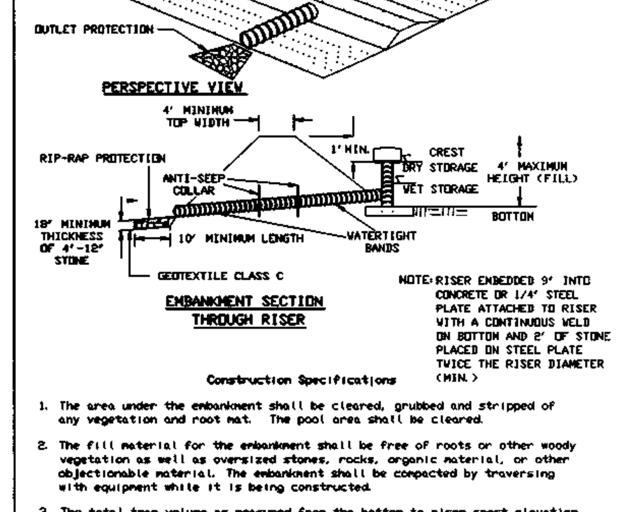
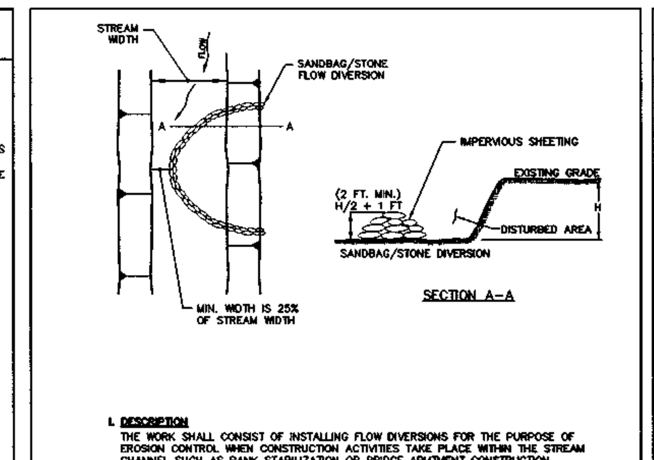
DETAIL 8 - PIPE OUTLET SEDIMENT TRAP - ST I



Construction Specifications

1. The area under the embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. The total trap volume as measured from the bottom to riser crest elevation shall be 3600 cubic feet per acre of drainage area (see Table 9). The top of embankment must be ≥ 1' above the riser crest elevation.
4. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half of the wet storage depth of the trap (900cf/ac). The sediment shall be deposited in a suitable area and in such a manner that it will not erode.
5. The structure shall be inspected periodically and after each rain and repairs made as necessary.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE C - 9 - 7 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



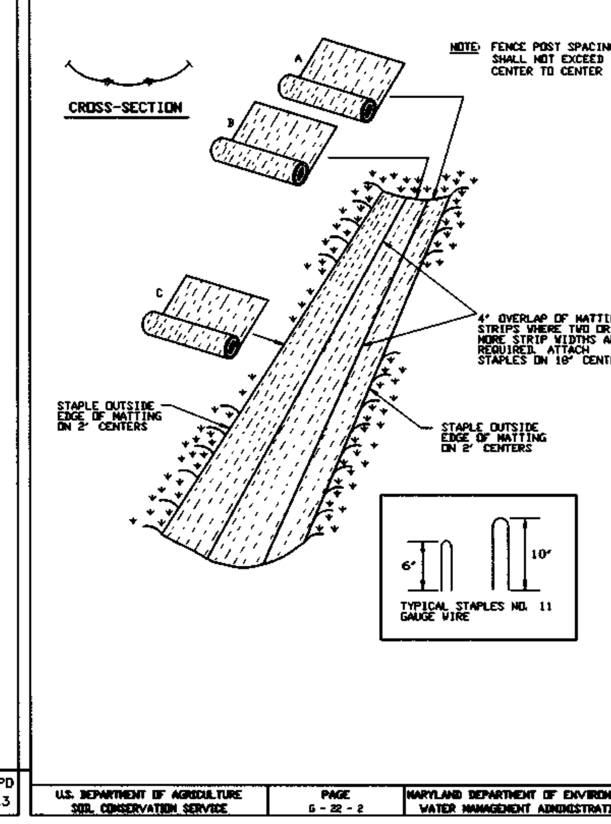
I. DESCRIPTION
THE WORK SHALL CONSIST OF INSTALLING FLOW DIVERSIONS FOR THE PURPOSE OF EROSION CONTROL WHEN CONSTRUCTION ACTIVITIES TAKE PLACE WITHIN THE STREAM CHANNEL SUCH AS BANK STABILIZATION OR BRIDGE ABUTMENT CONSTRUCTION.

II. MATERIAL SPECIFICATIONS
1. SANDBAGS: SANDBAGS SHALL CONSIST OF MATERIALS WHICH ARE RESISTANT TO ULTRAVIOLET RADIATION, TEARING AND PUNCTURE AND WOVEN TIGHTLY ENOUGH TO PREVENT LEAKAGE OF FILL MATERIAL (I.E., SAND, FINE GRAVEL, ETC.)
2. STONE: STONE SHALL BE WASHED AND HAVE A MINIMUM DIAMETER OF 6 INCHES.
3. SHEETING: SHEETING SHALL CONSIST OF POLYETHYLENE OR OTHER MATERIAL WHICH IS IMPERVIOUS AND RESISTANT TO PUNCTURE AND TEARING.

III. CONSTRUCTION REQUIREMENTS
1. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS THE FIRST ORDER OF WORK.
2. THE DIVERSION STRUCTURE SHALL BE INSTALLED FROM UPSTREAM TO DOWNSTREAM.
3. THE HEIGHT OF THE DIVERSION STRUCTURE SHALL BE ONE HALF THE DISTANCE FROM STREAM BED TO STREAM BANK PLUS ONE FOOT, AS INDICATED ON THE CROSS SECTION VIEW.
4. ALL EXCAVATED MATERIALS SHALL BE DISPOSED OF IN A SCD APPROVED DISPOSAL AREA OUTSIDE THE 100-YEAR FLOODPLAIN UNLESS OTHERWISE APPROVED ON THE PLANS BY THE WRA.
5. ALL DEWATERING OF THE CONSTRUCTION AREA SHALL BE PUMPED TO A DEWATERING BASIN PRIOR TO RE-ENTERING THE STREAM.
6. SHEETING SHALL BE OVERLAPPED SUCH THAT THE UPSTREAM PORTION COVERS THE DOWNSTREAM PORTION WITH AT LEAST AN 18-INCH OVERLAP.
7. SEDIMENT CONTROL DEVICES ARE TO REMAIN IN PLACE UNTIL ALL DISTURBED AREAS ARE STABILIZED IN ACCORDANCE WITH AN APPROVED SEDIMENT AND EROSION CONTROL PLAN AND THE INSPECTING AUTHORITY APPROVES THEIR REMOVAL.

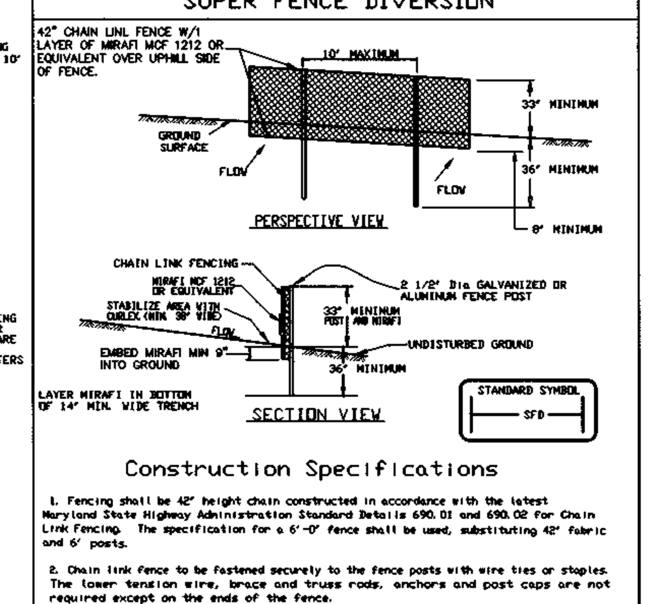
WATER RESOURCES ADMINISTRATION | SANDBAG/STONE DIVERSION | APPROVED ON ______ CHIEF, WATERWAY PERMITS | WPD 2.3

DETAIL 30 - EROSION CONTROL MATTING



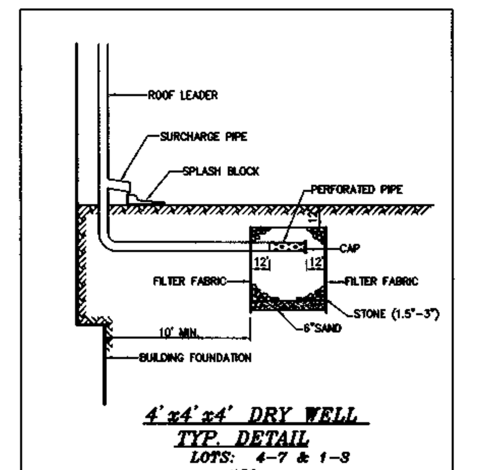
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE G - 22 - 2 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SUPER FENCE DIVERSION



Construction Specifications

1. Fencing shall be 42" height chain constructed in accordance with the latest Maryland State Highway Administration Standard Details 690.01 and 690.02 for Chain Link Fencing. The specification for a 6'-0" fence shall be used, substituting 42" fabric and 6' posts.
2. Chain link fence to be fastened securely to the fence posts with wire ties or staples. The lower tension wire, brace and truss rods, anchors and post caps are not required except on the ends of the fence.
3. Filter cloth to 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 diverson cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed.



4'x4'x4' DRY WELL
TYP. DETAIL
LOTS: 4-7 & 1-3
N.T.S.

NOTES:
1. ALL DRY WELL BOTTOMS ARE TO BE PLACED ON INSITU SOIL
2. DRY WELL ARE TO BE PROVIDED AT EACH DOWNSPOUT DRAINING AWAY FROM THE ROAD.

project	date
96090	APR. 2000
illustration	engineering
MMP/SAA	MMP/SAA
scale	approval
NTS	RJH

no.	description	date
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

POND 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

AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED TO THE PLANS. TREES, BRUSH AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE. FOR DRY STORMWATER MANAGEMENT PONDS, A MINIMUM OF A 50 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 QUALITY 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. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGN AND CONSTRUCTION ARE SUPERVISED BY A GEOTECHNICAL ENGINEER.

PLACEMENT– AREAS ON WHICH FILL IS TO BE 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 AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSE BY NOT LESS THAN ONE TREAD TRACK OF THE 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.

WHERE A MINIMUM REQUIRED DENSITY IS SPECIFIED, IT SHALL NOT BE LESS 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

CUT OFF TRENCH– THE CUFF OFF 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.

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 MATERIAL 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 OPERATE 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 FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.

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– (STEEL PIPE)– THIS PIPE AND ITS APPURTENANCE SHALL BE GALVANIZED AND FULLY BITUMINOUS COATED AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M–190 TYPE A WITH WATERTIGHT COUPLING BANDS. ANY BITUMINOUS COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND. STEEL PIPES WITH POLYMERIC COATINGS SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (10 MIL) ON BOTH SIDES OF THE PIPE. THE FOLLOWING COATINGS OR AN APPROVED EQUAL MAY BE USED: NEXON, PLASTI–COTE, BLAC–KLAD, AND BETH–CU–LOY. COATED CORRUGATED STEEL PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M–245 AND M–246.

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. ANY ALUMINUM COATING DAMAGED OF OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND.?

MATERIALS–(ALUMINUM PIPE)– THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M–196 OR M–211 WITH WATERTIGHT COUPLINGS BANDS OR FLANGES. ALUMINUM SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER. 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 AS THE PIPE. METALS MUST BE INSULATED FROM DISSIMILAR MATERIALS WITH USE RUBBER OR PLASTIC INSULATING MATERIALS AT LEAST 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–STEEP 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 OF NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE–ROLLED AND ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BAND WIDTH. THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPE LESS THAN 24" IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE, A 12" WIDE STANDARD LAP TYPE BAND WITH 12" WIDE BY 3/8" THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12" WIDE HUGGER TYPE BAND WITH O–RING GASKETS HAVING MINIMUM DIAMETER OF 1/2" GREATER THAN THE CORRUGATION DEPTH. PIPES 24: IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24" LONG ANNULAR CORRUGATED BAND USING RODS AND LUGS. A 12" WIDE BY 3/8" THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED ON THE END OF EACH PIPE FOR A TOTAL OF 24"

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 TO "STRUCTURE 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 DESIGNATION C–361.

2. BEDDING– ALL REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING FOR THEIR ENTIRE LENGTH. THIS BEDDING SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 10% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 3 INCHES, OR AS SHOWN ON THE DRAWINGS.

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 2 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL."

5. OTHER DETAILS (ANTI–SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

POLYVINYL CHLORIDE (PVC) PIPE– ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR POLYVINYL CHLORIDE (PVC) PIPE:

1. MATERIALS–PVC PIPE SHALL BE PVC–1120 OR PVC–1220 CONFORMING TO ASTM D–1785 OR ASTM D–2241.

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 TO "STRUCTURE BACKFILL."

5. OTHER DETAILS (ANTI–SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

CONCRETE

CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 905.

THE RIPRAP SHALL BE PLACED TO THE REQUIRED THICKNESS IN ONE OPERATION. THE ROCK SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THE RIPRAP IN PLACE SHALL BE REASONABLY HOMOGENOUS WITH THE LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT ONE TO ANOTHER WITH THE SMALLER ROCKS FILLING THE VOIDS BETWEEN THE LARGER ROCKS. FILTER CLOTH SHALL BE REPLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 919.12.?

CARE OF WATER DURING CONSTRUCTION

ALL WORK ON THE 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 THE AREAS 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 THE 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 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 OF THE REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL AND 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 TO SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

STABILIZATION

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SLIGHTLY 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 MARYLAND SOIL 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 TO BE EMPLOYED DURING THE CONSTRUCTION PROCESS.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED DETENTION POND

ROUTINE MAINTENANCE

1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETARMINE IS THE POND IS FUNCTIONING PROPERLY.

2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO TIMES PER YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED.

3. DEBRIS AND LETTER SHALL BE REMOVED DURING REGULAR MOWEING OPERATIONS AND AS NEEDED.

4. VISUAL SIGNS OF EROSION IN THE POND AS WELL AS THE RIP–RAP OR GABION OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON–ROUTINE MAINTENANCE

1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.

2. SEDIMENT SHALL BE REMOVED FROM THE BOND, AND FOREBAY, NO LATER THAN WHEN THE CAPACITY OF THE POND, AND FOREBAY, IS HALF FULL WITH SEDIMENT, OR, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, UPON APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS.

OPERATION AND MAINTENANCE SCHEDULE FOR STORMCEPTOR WATER QUALITY DEVICE

1. THE STORMCEPTOR WATER QUALITY STRUCTURE SHALL BE PERIODICALLY INSPECTED AND CLEANED TO MAINTAIN OPERATION AND FUNCTION. THE OWNER SHALL INSPECT THE STORMCEPTOR UNIT YEARLY AT MINIMUM, UTILIZING THE STORMCEPTOR INSPECTION/MONETORING FORM. INSPECTIONS SHALL BE DONE BY USING A CLEAR PLEXIGLASS TUBE ("SLUDGE JUDGE") TO EXTRACT A WATER COLUMN SAMPLE. WHEN SEDIMENT DEPTHS EXCEED THE LEVEL SPECIFIED IN TABLE 6 OF THE STORMCEPTOR TECHNICAL MANUAL, THE UNIT SHALL BE CLEANED.

2. THE STORMCEPTOR WATER QUALITY STRUCTURE SHALL BE CHECKED AND CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES.

3. THE MAINTENANCE OF THE STORMCEPTOR UNIT SHALL BE DONE USING THE VACUUM TRUCK WHICH WILL REMOVE THE WATER, SEDIMENT, DEBRIS, FLOATING HYDROCARBONS AND OTHER MATERIALS IN THE UNIT. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.

4. THE INLET AND OUTLET PIPES SHALL ME CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX MONTHS. IF OBSTRUCTIONS ARE FOUND THE OWNER SHALL HAVE THEM REMOVED. STRUCTURAL PARTS OF THE STORMCEPTOR UNIT SHALL BE REPAIRED AS NEEDED.

5. THE OWNER SHALL RETAIN AND MAKE THE STORMCEPTOR INSPECTION/MONITORING FORMS AVAILABLE TO THE HOWARD COUNTY OFFICIALS UPON THEIR REQUEST.

BY THE DEVELOPER:

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

Ronald B. Wildman 4/12/00
SIGNATURE OF DEVELOPER DATE
Ronald B. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

4/12/00
SIGNATURE OF ENGINEER DATE
R. JACOB HILBAST
PRINTED NAME OF ENGINEER

STATE OF MARYLAND R. JACOB HILBAST No. 17943 PROFESSIONAL ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS. 5/24/00
USDA – NATURAL RESOURCE CONSERVATION SERVICE DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. 5/24/00
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
CHIEF, DIVISION OF LAND DEVELOPMENT DATE 6/19/00

6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

96090/DWG/FINAL/SWM-SPEC

HILLIS – CARNES
ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION
PROJECT NAME: BONNIE BRANCH BORING # B–1
LOCATION: HOWARD COUNTY, MARYLAND JOB # 99475A
DATUM ____ HAMMER WT. 140LBS. HOLE DIAMETER 3" FOREMAN G. STONESIFER
SURF. ELEV. ____ HAMMER DROP 30 INCHES ROCK CORE DIA. ____ INSPECTOR ____
DATE STARTED 11–30–99 PIPE SIZE 2 INCHES OD BORING METHOD CFA DATE COMPLETE 11–30–99

ELEV.	SOIL DESCRIPTION COLOR,MOISTURE,DENSITY,SIZE,PROPORTION	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC	BORING & SAMPLING NOTES
	SURFACE		0.0					
	BROWN, MOIST VERY STIFF, SILT,LITTLE FINE SAND AND MICA, TRACE ORGANICS (ML)			1	5–7–10	1	5"	GROUNDWATER ENCOUNTERED AT 3.0' WHILE DRILLING
	BROWN, WET, MEDIUM DENSE, FINE TO COARSE SAND AND GRAVEL, LITTLE SILT (SW–GM)	3.0	5	D	25–11–13	2	3"	CAVED TO 4.0' AT COMPLETION
	ORANGE BROWN, WET, DENSE, FINE SANDY SILT, LITTLE MICA (ML)	5.5		D	10–14–17	3	8"	BORING OFFSET 5.0' AND REFUSED AT 7.2'
	AUGER REFUSAL AT 7.2' BOTTOM OF HOLE AT 7.5'	7.5	10					
			15					
			20					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED, PT–PRESSED SHELBY TUBE, CA–CONTINUOUS FLIGHT AUGER, RC–ROCK CORE
SAMPLER CONDITIONS: D–DISINTEGRATED, I–INTACT, U–UNDISTURBED, L–LOST
GROUND WATER DEPTH: AT COMPLETION ____FT., AFTER ____FT., AFTER ____FT.
BORING METHOD: HSA–HOLLOW STEM AUGERS, CFA–CONT. FLIGHT AUGERS, DC–DRIVING CASING, MD–MUD DRILLING
STANDARD PENETRATION TEST–DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

HILLIS – CARNES
ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION
PROJECT NAME: BONNIE BRANCH BORING # B–2
LOCATION: HOWARD COUNTY, MARYLAND JOB # 99475A
DATUM ____ HAMMER WT. 140LBS. HOLE DIAMETER 3" FOREMAN G. STONESIFER
SURF. ELEV. ____ HAMMER DROP 30 INCHES ROCK CORE DIA. ____ INSPECTOR ____
DATE STARTED 11–30–99 PIPE SIZE 2 INCHES OD BORING METHOD CFA DATE COMPLETE 11–30–99

ELEV.	SOIL DESCRIPTION COLOR,MOISTURE,DENSITY,SIZE,PROPORTION	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC	BORING & SAMPLING NOTES
	SURFACE		0.0					
	BROWN, VERY MOIST TO WET, VERY STIFF, SILT, LITTLE FINE SAND AND CLAY, TRACE MICA AND ORGANICS (ML)			1	3–8–13	1	5"	GROUNDWATER ENCOUNTERED AT 2.0' WHILE DRILLING
	BROWN, WET, VERY DENSE, FINE TO COARSE, SILTY SAND AND GRAVEL (SW–GM)	3.0	5	D	50/5"	2	3"	CAVED TO 3.0' AT COMPLETION
	BROWN, WET, VERY DENSE, FINE TO COARSE, SILTY SAND AND GRAVEL (SW–GM)	4.0						BORING OFFSET 5.0' AND REFUSED AT 3.0'
	AUGER REFUSAL AT 4.0'		10					
			15					
			20					

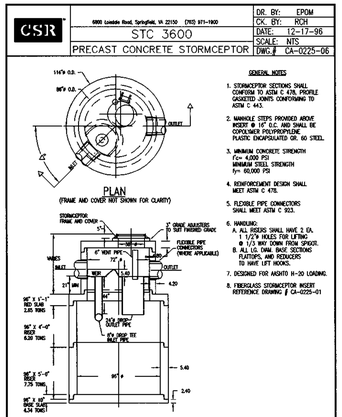
SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED, PT–PRESSED SHELBY TUBE, CA–CONTINUOUS FLIGHT AUGER, RC–ROCK CORE
SAMPLER CONDITIONS: D–DISINTEGRATED, I–INTACT, U–UNDISTURBED, L–LOST
GROUND WATER DEPTH: AT COMPLETION ____FT., AFTER ____FT., AFTER ____FT.
BORING METHOD: HSA–HOLLOW STEM AUGERS, CFA–CONT. FLIGHT AUGERS, DC–DRIVING CASING, MD–MUD DRILLING
STANDARD PENETRATION TEST–DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

HILLIS – CARNES
ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION
PROJECT NAME: BONNIE BRANCH BORING # B–3
LOCATION: HOWARD COUNTY, MARYLAND JOB # 99475A
DATUM ____ HAMMER WT. 140LBS. HOLE DIAMETER 3" FOREMAN G. STONESIFER
SURF. ELEV. ____ HAMMER DROP 30 INCHES ROCK CORE DIA. ____ INSPECTOR ____
DATE STARTED 11–30–99 PIPE SIZE 2 INCHES OD BORING METHOD CFA DATE COMPLETE 11–30–99

ELEV.	SOIL DESCRIPTION COLOR,MOISTURE,DENSITY,SIZE,PROPORTION	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC	BORING & SAMPLING NOTES
	SURFACE		0.0					
	BROWN, MOIST , MEDIUM DENSE, FINE SANDY SILT/SILTY SAND, SOME MICA (ML–SM)			1	5–9–8	1	10"	GROUNDWATER ENCOUNTERED AT 4.0' WHILE DRILLING
	BROWN, WET, VERY DENSE, MICACEOUS SILTY SAND (SM)	3.0	5	D/I	6–23–30	2	8"	CAVED TO 7.5' AT COMPLETION
	BROWN, WET, STIFF, SILT, LITTLE FINE SAND AND CLAY (ML)	5.5		D	2–6–8	3	8"	BORING OFFSET 5.0' AND REFUSED AT 9.0'
	AUGER REFUSAL AT 9.0'	8.0	10					
			15					
			20					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED, PT–PRESSED SHELBY TUBE, CA–CONTINUOUS FLIGHT AUGER, RC–ROCK CORE
SAMPLER CONDITIONS: D–DISINTEGRATED, I–INTACT, U–UNDISTURBED, L–LOST
GROUND WATER DEPTH: AT COMPLETION ____FT., AFTER ____FT., AFTER ____FT.
BORING METHOD: HSA–HOLLOW STEM AUGERS, CFA–CONT. FLIGHT AUGERS, DC–DRIVING CASING, MD–MUD DRILLING
STANDARD PENETRATION TEST–DRIVING 2" OD SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS

CSR
5000 Lonsdale Road, Springfield, VA 22150 (703) 971-1900
STC 3600
PRECAST CONCRETE STORMCEPTOR
DR. BY: EPOM
CK. BY: RCH
DATE: 12-17-96
SCALE: NTS
DWG.# CA-0225-06



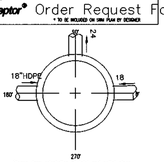
GENERAL NOTES
1. STORMCEPTOR SECTIONS SHALL CONFORM TO ASTM C 478, PROFILE GASKETED JOINTS CONFORMING TO ASTM C 443.
2. MANHOLE STEPS PROVIDED ABOVE INVERT IN 16" O.C. AND SHALL BE COPOLYMER POLYPROPYLENE PLASTIC ENCAPSULATED OR 60 STEEL.
3. MINIMUM CONCRETE STRENGTH f'c= 4,000 PSI MINIMUM STEEL STRENGTH fy= 60,000 PSI
4. REINFORCEMENT DESIGN SHALL MEET ASTM C 478.
5. FLEXIBLE PIPE CONNECTORS SHALL MEET ASTM C 923.
6. WARNING: A. ALL RISERS SHALL HAVE 2 EA. 1 1/2"ø HOLES FOR LIFTING. & 1/3 WAY DOWN FROM SPIGOT. B. ALL U.L. DWG. BASE SECTIONS FLATTOPS, AND REDUCERS TO HAVE LIFT HOOKS.
7. DESIGNED FOR AASHTO H–20 LOADING.
8. FIBERGLASS STORMCEPTOR INSERT REFERENCE DRAWING # CA–0225–01

REV.	DESCRIPTION	BY:	DATE

Precast Concr Stormceptor® Order Request Form
* TO BE INCLUDED ON SITE PLAN BY DESIGNER

Contractor Information
Name ____
Address ____
City ____
State ____
Zip Code ____
Contact ____
Phone ____
Fax ____

Owner Information
Name ____
Phone ____
Fax ____



Please draw orientation of inlet and outlet pipes on diagram along with the pipe inside diameter (in), and invert elevation (ft). Clearly mark inlet pipes with an "I" and outlet pipes with an "O". Please provide the inlet/outlet pipe angle in degrees.

IMPERVIOUS DRAINAGE AREA FOR THIS UNIT ____

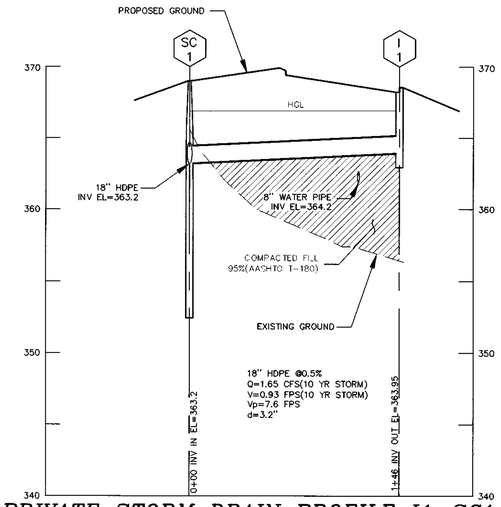
Stormceptor® Model

STC			
900	☐	3600	■
1200	☐	4800	☐
1800	☐	6000	☐
2400	☐	7200	☐

Invert Size

DOC	☐		
22"	☐		
32"	■		
44"	☐		
CUSTOM ____			

Manhole Number	SC–1
Top Elevation (ft)	270.0
Inlet Pipe Invert (ft)	263.2
Outlet Pipe Invert (ft)	262.95
Pipe Type	HDPE
Inlet Pipe Inside Diameter (ID)	18"
Inlet Pipe Outside



PRIVATE STORM DRAIN PROFILE I1-SC1

SCALE: HOR. 1"=50'
VER. 1"=5'

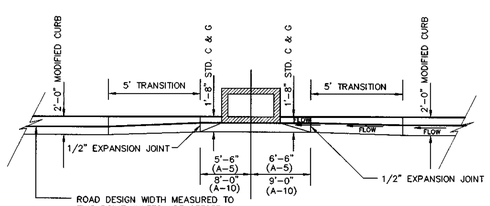
PRIVATE STRUCTURES SCHEDULE

NO.	LOCATION	TOP	INV. IN	INV. OUT	COMMENTS
PRIVATE SC-1	TWIN STREAM DR, STA 2+87.74 RT. 23.22	370.00	363.20 363.20	362.95	STORM CEPTOR 4800
PRIVATE E-2	TWIN STREAM DR, STA 2+92.18 RT. 36.99	----	362.00	----	END SECTION STANDARD SD 5.61
PRIVATE I-1*	TWIN STREAM DR, STA 1+19 RT. 10.44	368.52	----	363.95	TYPE "A-5" INLET STANDARD SD 4.01
PRIVATE I-2*	TWIN STREAM DR, STA 3+33.83 RT. 9.05	376.93	367.20	367.10	TYPE "A-10" INLET STANDARD SD 4.02
PRIVATE I-3*	TWIN STREAM DR, STA 6+08.27 RT. 7.44	405.83	397.20	397.10	TYPE "A-10" INLET STANDARD SD 4.02
PRIVATE I-4	TWIN STREAM DR, STA 8+52.37 LT. 14.51	414.00	----	409.40	K TYPE (OPEN END GRATE) SD 4.36

NOTES:
1. TOP OF "K" INLETS = TOP OF GRATE.
2. HGL EQUALS TOP OF PIPE UNLESS OTHERWISE NOTED.
3. * DENOTES CURB TRANSITION INLET(SEE DETAIL)

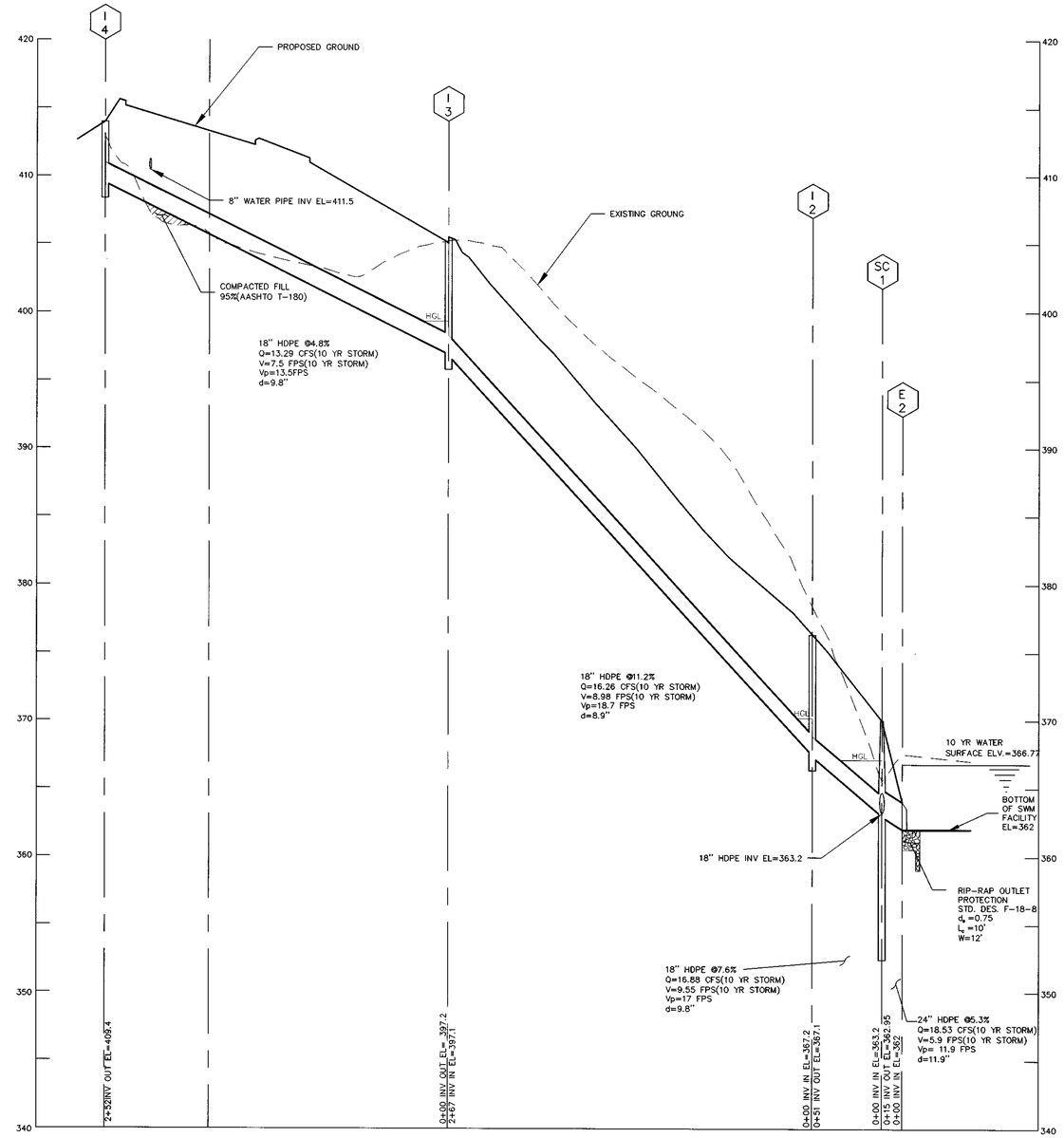
PIPE SCHEDULE

PIPE SIZE	LENGTH
12" HDPE	6.64 FT
18" HDPE	719 FT
24" HDPE	15 FT



CURB TRANSITION - INLETS

NTS



PRIVATE STORM DRAIN PROFILE I4-E1

SCALE: HOR. 1"=50'
VER. 1"=5'

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

Ronald B. Wildman 4/12/00
SIGNATURE OF DEVELOPER DATE
Ronald B. Wildman
PRINTED NAME OF DEVELOPER

BY THE ENGINEER:

"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION."

4/12/00
SIGNATURE OF ENGINEER DATE
K. JACOB HIKMAT
PRINTED NAME OF ENGINEER

STATE OF MARYLAND K. JACOB HIKMAT 17945 PROFESSIONAL ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

5/24/00 5/24/00
USDA - NATURAL RESOURCE CONSERVATION SERVICE DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. 5/24/00 5/24/00
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

6-2-00
CHIEF BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

6/7/00
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

96090/DWG/FINAL/SD-PUBF

OWNER
RONALD WILDMAN
9444 FREDERICK ROAD
ELLICOTT CITY, MARYLAMD 21043
(410) 313-9999

project	date
96090	APR 2000
illustration	engineering
SAA	SAA
scale	approval
AS SHWN	RJH

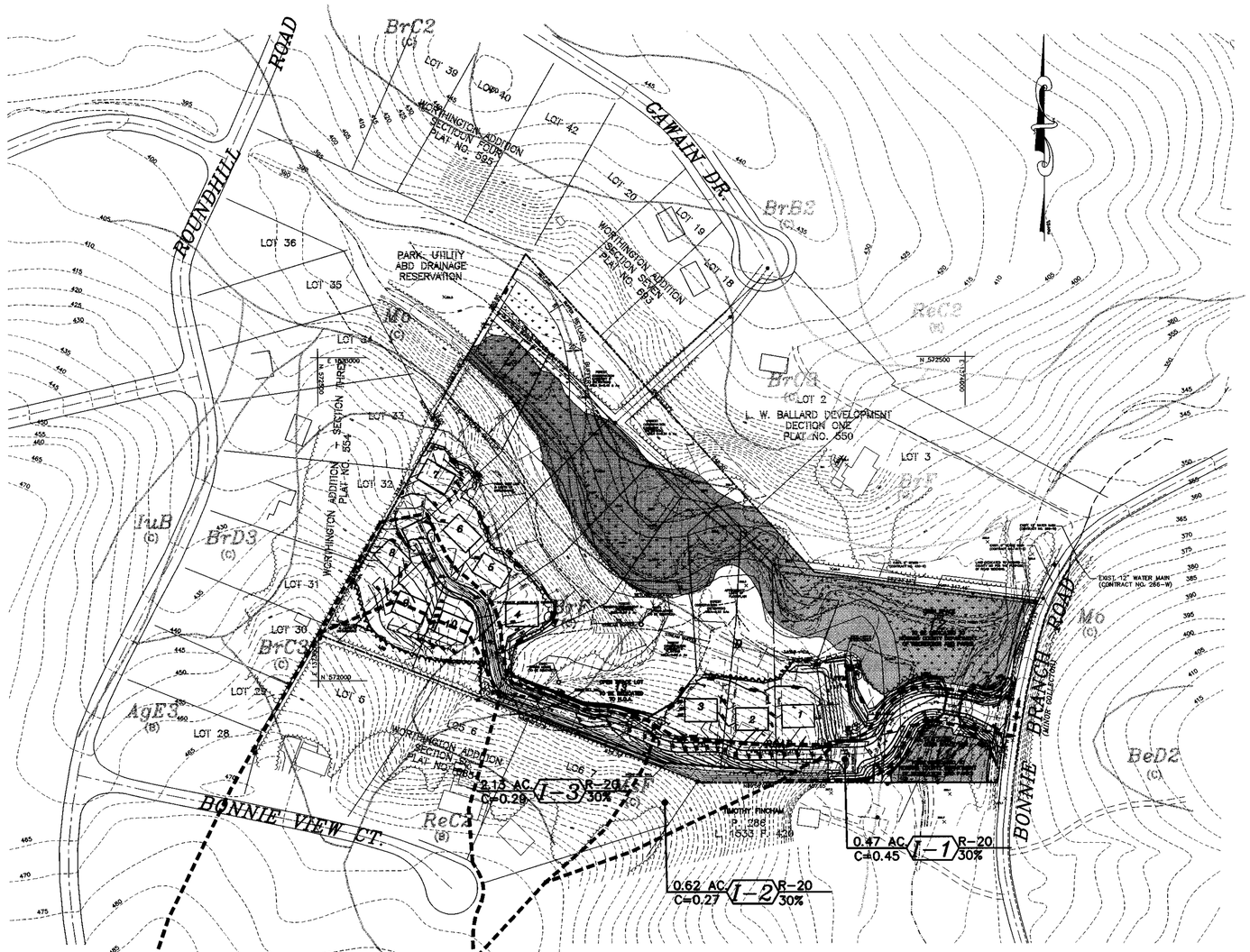
no.	description	date
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
STORM DRAIN PROFILES & DETAILS

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0298 Fax.

F-00-95

THIS PLAN IS FOR DEVELOPED DRAINAGE AREA ONLY



DENOTES FLOODPLAIN

DENOTES WETLANDS

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 4/28/00

PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF ENGINEER — DATE 4/28/00

P. JACK WIKAN

PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

SCD – NATURAL RESOURCE CONSERVATION SERVICE — DATE 5/24/00 5/26/00

THIS DEVELOPMENT PLAN IS APPROVED FOR EROSION AND SEDIMENT CONTROL ON THE

HOWARD SOIL CONSERVATION DISTRICT — DATE 5/24/00 5/26/00

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/9/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/DRAIN-DAM

STATE OF MARYLAND — R. JACOB WIKAN — 17266 — PROFESSIONAL ENGINEER

SOILS DESCRIPTION

AgE3	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED
BeD2	BELTSVILLE SILT LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED
BrB2	BRANDYWINE LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
BrC3	BANDYWINE LOAM, 8 TO 15 PERCENT SLOPES, SEVERLY ERODED
BrD3	BRANDYWINE LOAM, 15 TO 25 PERCENT SLOPES, SEVERLY ERODED
BrF	BRANDYWINE LOAM, 25 TO 60 PERCENT SLOPES
IuB	IUKA LOAM, LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES
Mo	MIXED ALLUVIAL LAND
MsF	MONTALTO AND RELAY VERY STONY SILT LOAMS, 25 TO 60 PERCENT SLOPES
ReC2	RELAY SILT LOAM, 3 TO 15 PERCENT SLOPES, MODERATELY ERODED

project	date	
96090	APR 2000	engineering
illustration	MMP	approval
MMP	scale	1"=100'

no.	description	date
	revisions	

TAX MAP 31, PARCEL 27

BONNIE BRANCH OVERLOOK

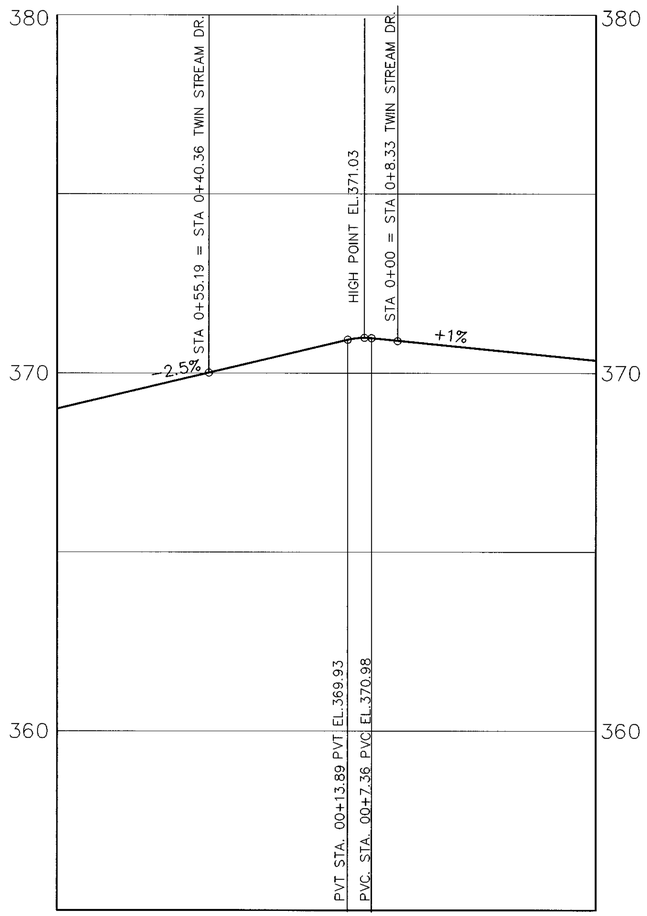
HOWARD COUNTY, MARYLAND

SECOND ELECTION DISTRICT

DRAINAGE AREA MAP

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax

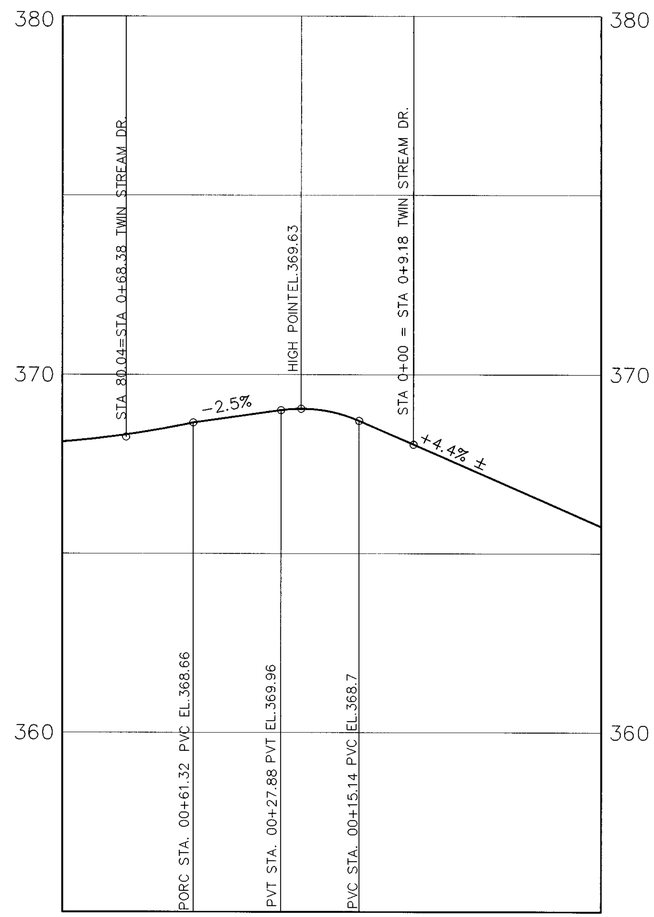
F-00-95



BONNIE BRANCH RD TURN TO TWIN STREAM DR.

LEFT-FILLET- FLOW LINE PROFILE

SCALE: HOR. 1" = 20'
VER. 1" = 2'



BONNIE BRANCH RD TURN TO TWIN STREAM DR.

RIGHT-FILLET- FLOW LINE PROFILE

SCALE: HOR. 1" = 20'
VER. 1" = 2'

STATE OF MARYLAND
A. JACOB HIKAKI
17042
PROFESSIONAL ENGINEER
4/12/00

96090/DWG/FINAL/FIL-PROF

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

project	date
96090	APR. 2000
illustration	engineering
SAA/MMP	MMP/SAA
scale	approval
AS SHWN	RJH

no.	description	date
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27

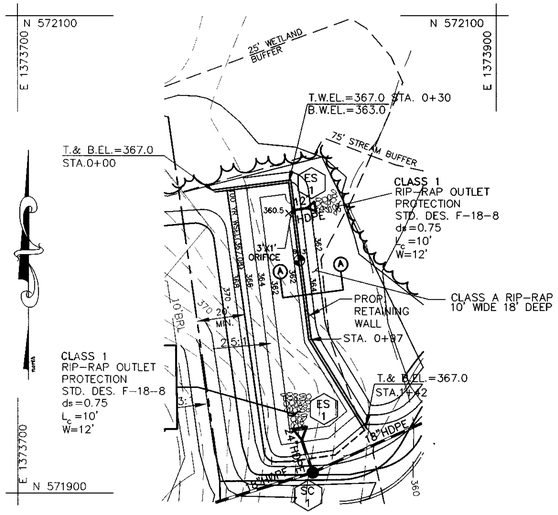
BONNIE BRANCH OVERLOOK

SECOND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FILLET PROFILES

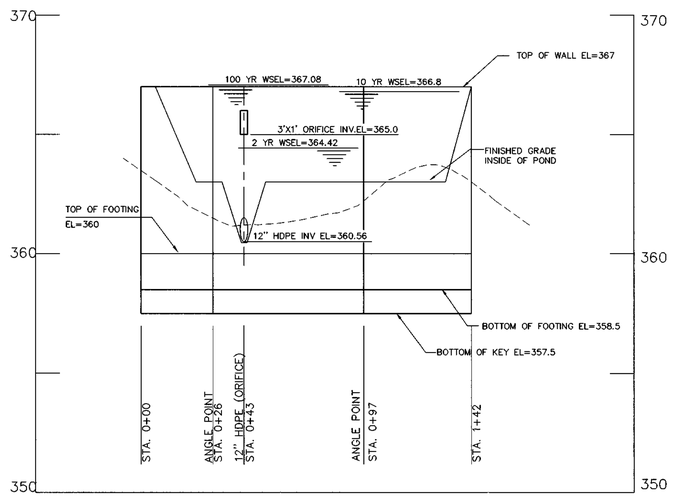
MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95



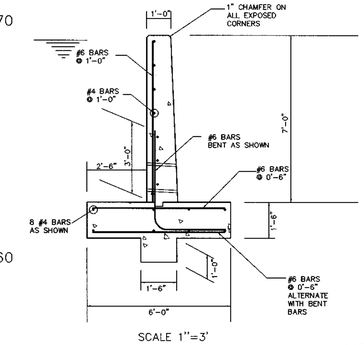
SWM PLAN

SCALE: 1"=30'



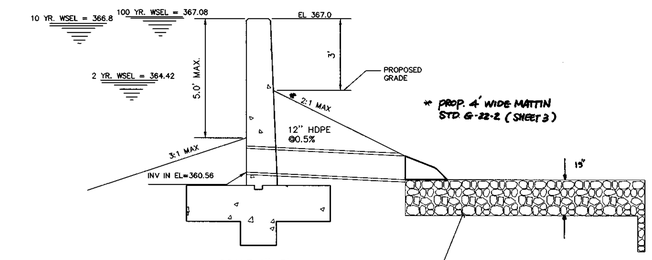
PROPOSED RETAINING WALL PROFILE

SCALE: HOR. 1"=30'
VER. 1"=3'



SCALE 1"=3'

SECTION A-A

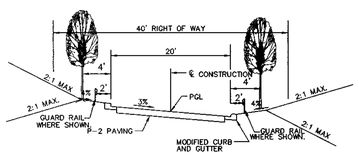


SCALE 1"=3'

CLASS 1
RIP-RAP OUTLET
PROTECTION
STD. DET. F-18-8
d =0.75
L =10'
W=12'

GENERAL NOTES:

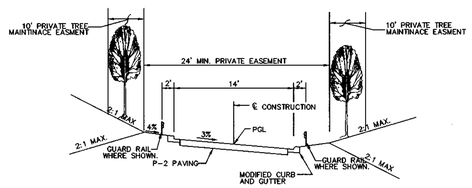
1. ALL CONCRETE AND REINFORCING STEEL SHALL CONFORM TO HOWARD COUNTY STANDARD SPECIFICATIONS.
2. F'c= 2,000 PSI; Fy = 60,000 PSI
3. SOIL BACKFILL UNIT WEIGHT NOT TO EXCEED 110 PCF
4. ALLOWABLE BEARING PRESSURE GREATER THAN OR EQUAL TO 3,750 PSF (BEARING CAPACITY TO BE TESTED IN THE FIELD PRIOR TO CONSTRUCTION.
5. DURING CONSTRUCTION, WALL MUST BE BACKFILLED EQUALLY ON BOTH SIDES.
6. PROVIDE MSHA MIX NUMBER 3, NON-REINFORCED CONCRETE FROM BEDROCK TO BOTTOM OF FOOTING. NON-REINFORCED CONCRETE SHALL EXTEND 6" ON EITHER SIDE OF THE FOOTING.
7. ALL CONCRETE SHALL BE MSHA MIX NO. 3



TYPICAL ROADWAY SECTION

N.T.S.

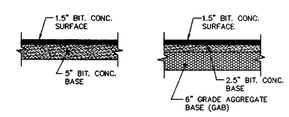
CLASSIFICATION: ACCESS PLACE (PUBLIC)
DESIGN SPEED: 15 MPH
FROM STA. 0+00 TO STA. 3+26.00



TYPICAL ROADWAY SECTION

N.T.S.

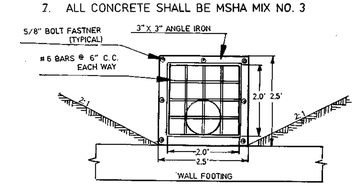
CLASSIFICATION: ACCESS PLACE (PRIVATE)
DESIGN SPEED: 15 MPH
FROM STA. 3+25.00 TO STA. 11+39.88



ALTERNATE "A" *ALTERNATE "B"*

PAVING SECTION - P2

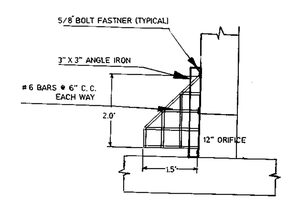
N.T.S.



TRASH RACK DETAIL

SCALE 1" = 2'

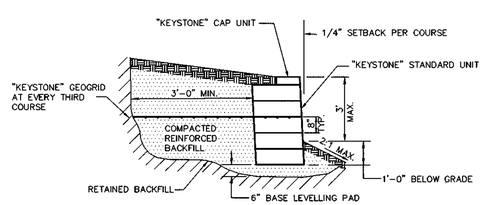
NOTE
TRASH RACK TO BE GALVENIZED AFTER FABRICATION AND PAINTED WITH TWO COATS OF BATTLESHIP GRAY PAINT



TRASH RACK DETAIL

SCALE 1" = 2'

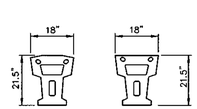
NOTE
TRASH RACK TO BE GALVENIZED AFTER FABRICATION AND PAINTED WITH TWO COATS OF BATTLESHIP GRAY PAINT



RETAINING WALL DETAIL

N.T.S.

NOTE: 1. ALL FOOTING AND DESIGN SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. COMPACTED REINFORCED BACKFILL SHALL CONSISIT OF GRAVEL OR CRUSHED STONE (1/2" TO 3/4") AT 95% STANDARD PROCTOR COMPACTION.



"KEYSTONE" STANDARD UNIT

N.T.S.

LEGEND

SIGN SUPPORT — FACE OF SIGN — TRAFFIC CONTROL SIGNAGE

CHANNELIZING DEVICE

DIRECTION OF TRAFFIC FLOW

LIMIT OF S.H.A. PAVING SECTION

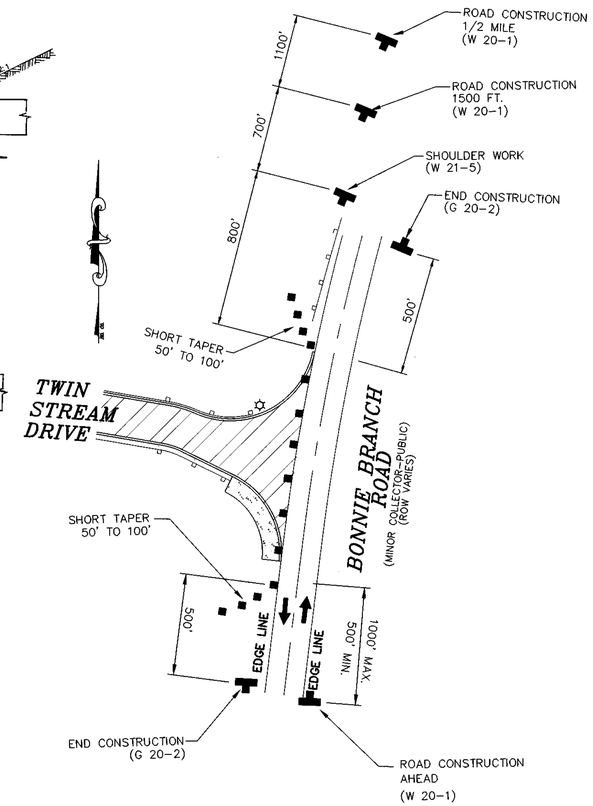
ROAD CONSTRUCTION AHEAD — W 20-1

SHOULDER WORK — W 21-5

END CONSTRUCTION — G 20-2

TRAFFIC CONTROL SIGNAGE

N.T.S.



TRAFFIC CONTROL PLAN

N.T.S.

NOTE: 1. TRAFICE CONTROL PLAN IS TO BE IN COMPLIANCE WITH HOWARD COUNTY STANDARD DETAIL TE - 11.
2. THIS TRAFFIC CONTROL PLAN IS TO BE USED IN COMBINATION WITH THE GENERAL NOTES AT THE BEGIINING OF STANDARDS No. MD 104.00 OF BOOK OF STANDARDS, HIGHWAY & INCIDENAL STRUCTURES ISSUED BY STATE OF MARYLAND, DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION.

BY THE DEVELOPER:

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

Ronald B. Wildman — 4/28/00
SIGNATURE OF DEVELOPER — DATE
Ronald B. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

4/28/00
SIGNATURE OF ENGINEER — DATE
K. JACOB HIKMAT
PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

MSDA - NATURAL RESOURCE CONSERVATION SERVICE — 5/24/00 DATE

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

HOWARD SOIL CONSERVATION DISTRICT — 5/24/00 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF BUREAU OF HIGHWAYS — 6-2-00 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 6/9/00 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 6/12/00 DATE

STATE OF MARYLAND — K. JACOB HIKMAT — 17242 — PROFESSIONAL ENGINEER

96090/DWG/FINAL/SECDET1

project	date	
96090	APR. 2000	engineering
illustration		
scale	AS SHOWN	approval

no.	description / revisions	date

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
TYPICAL SECTIONS AND DETAILS

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0298 Fax

F-00-95

NOTE: THIS DRAWING IS TO BE USED FOR LANDSCAPE PLAN PURPOSES ONLY.

NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL
2. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $ 22,200.00 .

PUBLIC STREET TREE CALCULATIONS

BONNIE BRANCH ROAD - 250 LF OF CREDIT FOR EXISTING TREES
TWIN STREAM DRIVE - 580 / 40 = 14
TOTAL TREES REQUIRED = 14 TREES
TOTAL TREES PROVIDED = 14 TREES

PRIVATE STREET TREE CALCULATIONS

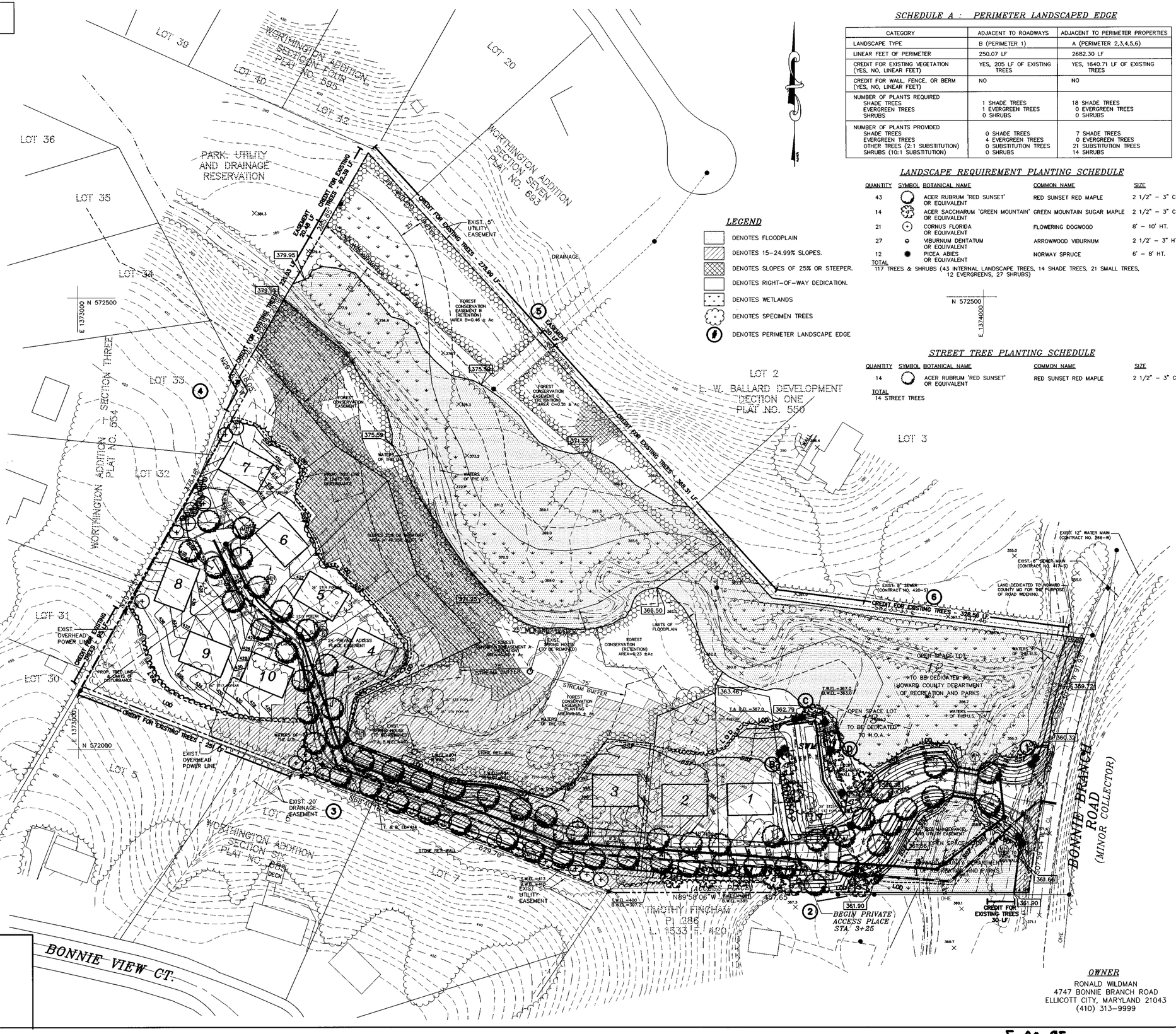
TWIN STREAM DRIVE - 1,694 / 40 = 43
TOTAL TREES REQUIRED = 43 TREES
TOTAL TREES PROVIDED = 43 TREES

SCHEDULE D : STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER	325 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	N/A
NUMBER OF TREES REQUIRED SHADE TREES EVERGREEN TREES	 7 SHADE TREES 9 EVERGREEN TREES
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES OTHER (10:1 SUBSTITUTION)	 7 SHADE TREES 8 EVERGREEN TREES 13 SHRUBS

PERIMETER		EDGE TYPE
PERIMETER 1		
ENTRANCE – 40 LF		N/A
SFD SIDE TO ROAD – 205 LF EXISTING TREES TO REMAIN		B
SFD SIDE TO ROAD TO ROAD – 45.07 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 1 1	B
PERIMETER 2		
OPEN SPACE TO SFD – 30 LF EXISTING TREES TO REMAIN		A
OPEN SPACE TO SFD – 412.74 LF 1 SHADE TREE / 60 LF	 7	A
PERIMETER 3		
SFD TO SFD – 251 LF EXISTING TREES TO REMAIN		A
SFD & OPEN SPACE TO SFD – 378.70 LF 1 SHADE TREE / 60 LF	 7	A
PERIMETER 4		
EASEMENT – 20.48 LF		N/A
SFD & OPEN SPACE TO SFD – 408.42 LF EXISTING TREES TO REMAIN		A
SFD TO SFD – 250.15 LF 1 SHADE TREE / 60 LF	 4	A
PERIMETER 5		
EASEMENTS – 41.57 LF		N/A
OPEN SPACE TO SFD – 622.73 LF EXISTING TREES TO REMAIN		A
PERIMETER 6		
OPEN SPACE TO SFD – 328.56 LF EXISTING TREES TO REMAIN		A
TOTAL PLANTING OBLIGATION		
SHADE TREES	19	
EVERGREEN TREES	1	
SHRUBS	0	

SWM PERIMETER		EDGE TYPE
SWM PERIMETER A – 50 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 1 1	B
SWM PERIMETER B – 110 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 2 3	B
SWM PERIMETER C – 55 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 1 2	B
SWM PERIMETER D – 110 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 3 3	B
TOTAL PLANTING OBLIGATION		
SHADE TREES	7	
EVERGREEN TREES	9	
SHRUBS	0	



LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15–24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT–OF–WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES SPECIMEN TREES
- DENOTES PERIMETER LANDSCAPE EDGE

SCHEDULE A : PERIMETER LANDSCAPED EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	B (PERIMETER 1)	A (PERIMETER 2,3,4,5,6)
LINEAR FEET OF PERIMETER	250.07 LF	2682.30 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	YES, 205 LF OF EXISTING TREES	YES, 1640.71 LF OF EXISTING TREES
CREDIT FOR WALL, FENCE, OR BERM (YES, NO, LINEAR FEET)	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	 1 SHADE TREES 1 EVERGREEN TREES 0 SHRUBS	 18 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) SHRUBS (10:1 SUBSTITUTION)	 0 SHADE TREES 4 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	 7 SHADE TREES 0 EVERGREEN TREES 21 SUBSTITUTION TREES 14 SHRUBS

LANDSCAPE REQUIREMENT PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
43		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.
14		ACER SACCHARUM 'GREEN MOUNTAIN' OR EQUIVALENT	GREEN MOUNTAIN SUGAR MAPLE	2 1/2" – 3" CAL.
21		CORNUS FLORIDA OR EQUIVALENT	FLOWERING DOGWOOD	8' – 10' HT.
27		VIBURNUM DENTATUM OR EQUIVALENT	ARROWWOOD VIBURNUM	2 1/2" – 3" HT.
12		PICEA ABIES OR EQUIVALENT	NORWAY SPRUCE	6' – 8' HT.

TOTAL
117 TREES & SHRUBS (43 INTERNAL LANDSCAPE TREES, 14 SHADE TREES, 21 SMALL TREES, 12 EVERGREENS, 27 SHRUBS)

STREET TREE PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
14		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.

TOTAL
14 STREET TREES

OWNER

RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313–9999

STATE OF MARYLAND REGISTERED PROFESSIONAL ENGINEER

APPROVED: DEPARTMENT OF PUBLIC WORKS CHIEF, BUREAU OF HIGHWAYS	DATE	6-2-00
APPROVED: DEPARTMENT OF PLANNING AND ZONING CHIEF, DIVISION OF LAND DEVELOPMENT	DATE	6/19/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE	6/12/00

96090/DWG/FINAL/FLP

project 96090	date APR 2000		
illustration MPP/SAA	engineering SJD		
scale 1"=50'	approval MMP		
		rev.	description / revisions	date

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
LANDSCAPE PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
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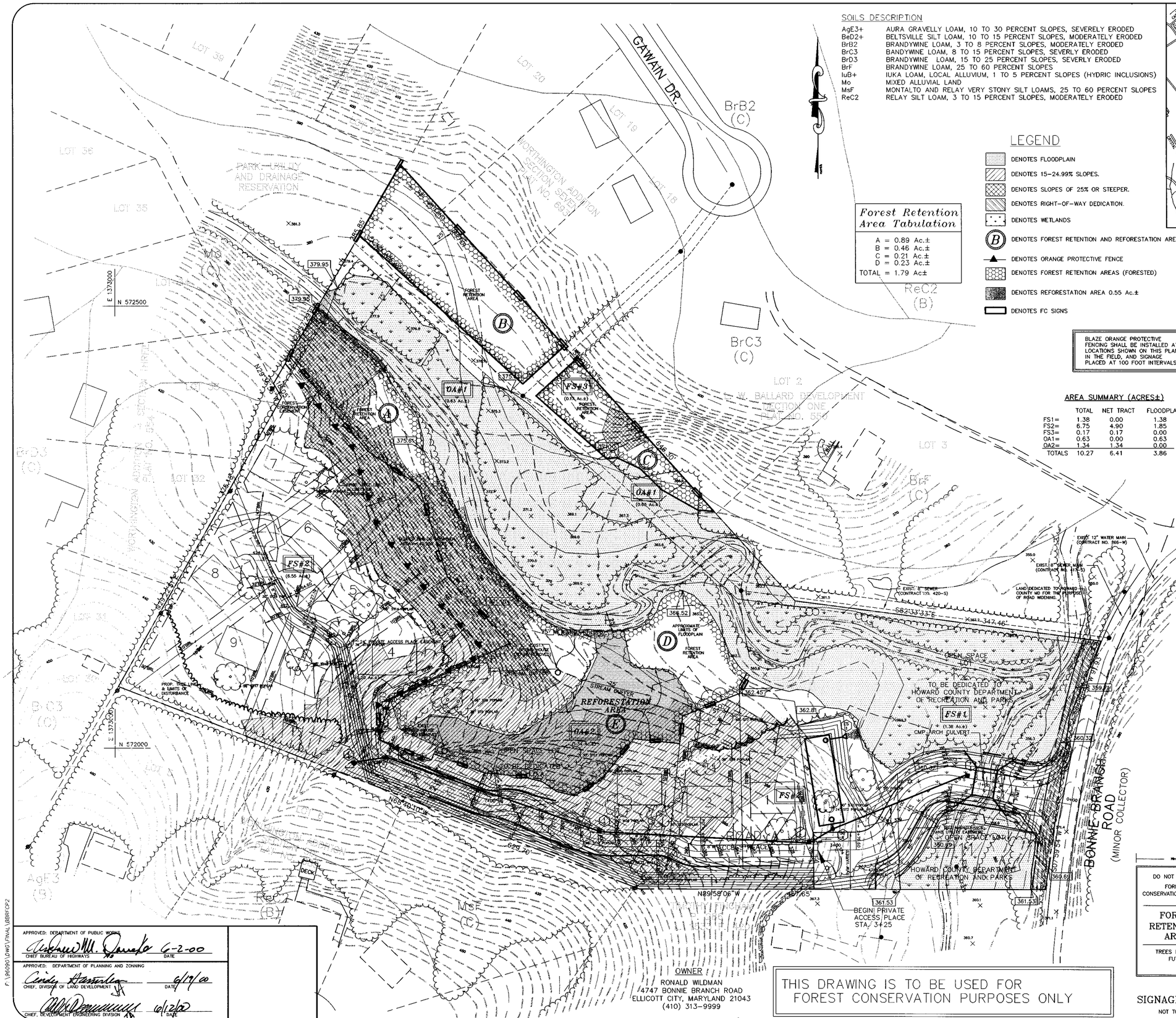


SOILS DESCRIPTION

AgE3+	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED
BeD2+	BELTSVILLE SILT LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED
BrB2	BRANDYWINE LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
BrC3	BANDYWINE LOAM, 8 TO 15 PERCENT SLOPES, SEVERLY ERODED
BrD3	BRANDYWINE LOAM, 15 TO 25 PERCENT SLOPES, SEVERLY ERODED
BrF	BRANDYWINE LOAM, 25 TO 60 PERCENT SLOPES
IuB+	IUKA LOAM, LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES (HYDRIC INCLUSIONS)
Mo	MIXED ALLUVIAL LAND
MsF	MONTALTO AND RELAY VERY STONY SILT LOAMS, 25 TO 60 PERCENT SLOPES
ReC2	RELAY SILT LOAM, 3 TO 15 PERCENT SLOPES, MODERATELY ERODED

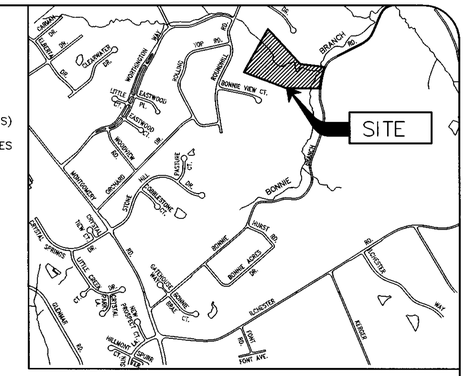
LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15-24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES FOREST RETENTION AND REFORESTATION AREAS
- DENOTES ORANGE PROTECTIVE FENCE
- DENOTES FOREST RETENTION AREAS (FORESTED)
- DENOTES REFORESTATION AREA 0.55 Ac.±
- DENOTES FC SIGNS

Forest Retention Area Tabulation

A =	0.89 Ac.±
B =	0.46 Ac.±
C =	0.21 Ac.±
D =	0.23 Ac.±
TOTAL =	1.79 Ac±

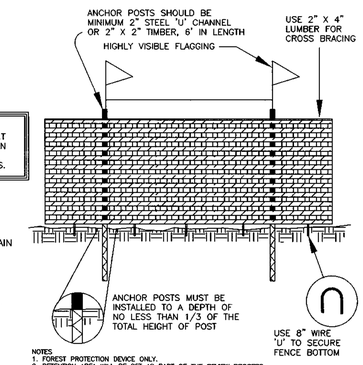
BLAZE ORANGE PROTECTIVE FENCING SHALL BE INSTALLED AT LOCATIONS SHOWN ON THIS PLAN IN THE FIELD, AND SIGNAGE PLACED AT 100 FOOT INTERVALS.



VICINITY MAP
SCALE: 1"=1000'

AREA SUMMARY (ACRES±)

	TOTAL	NET TRACT	FLOODPLAIN
FS1=	1.38	0.00	1.38
FS2=	6.75	4.90	1.85
FS3=	0.17	0.17	0.00
OA1=	0.63	0.00	0.63
OA2=	1.34	1.34	0.00
TOTALS	10.27	6.41	3.86



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

PROTECTIVE FENCE DETAIL
BLAZE ORANGE PLASTIC MESH

FOREST CONSERVATION WORKSHEET

I. BASIC SITE DATA

GROSS TRACT AREA	10.27 Ac.±
AREA WITHIN 100 YEAR FLOODPLAIN	3.40 Ac.±
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL	0.00 Ac.±
NET TRACT AREA	6.87 Ac.±
LAND USE CATEGORY OR ZONING	R-20

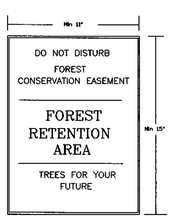
II. INFORMATION FOR CALCULATIONS

A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	AFFORESTATION THRESHOLD (15% x A)	N/A
D.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
E.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
F.	BREAK EVEN POINT (the amount of forest to be retained w/o mitigation)(.{ (E x 0.2) + B}	2.11 Ac.±
G.	NET TRACT AREA FOREST TO BE RETAINED	1.79 Ac.±

III. REFORESTATION CALCULATIONS

A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
D.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
E.	FOREST AREAS TO BE CLEARED	3.28 Ac.±
F.	FOREST AREAS TO BE RETAINED (Net Tract Forest)	1.79 Ac.±
G.	FOREST AREAS CLEARED ABOVE FCT	3.28 Ac.±
H.	FOREST AREAS CLEARED BELOW FCT	0.00 Ac.±
I.	FOREST AREAS RETAINED ABOVE FCT	0.42 Ac.±
J.	OPEN AREA TO BE REFORESTED AND INCLUDED WITH "I" IN A FOREST CONSERVATION EASEMENT	0.55 Ac.±
K.	Clearing Above The Forest Conservation Threshold Only If Forest areas to be retained are at or above the FCT (if H equals or is more than B) the following applies:	
L.	TOTAL REFORESTATION FOR CLEARING ABOVE FCT (G x 1/4)	0.82 Ac.±
M.	CREDIT FOR FOREST RETAINED ABOVE FCT (K)	0.42 Ac.±
N.	TOTAL REFORESTATION REQUIRED	0.40 Ac.±
O.	TOTAL REFORESTATION TO BE PROVIDED ON-SITE WITHIN OA#2	0.55 Ac.±

NOTE: EXTRA REFORESTATION IN THE AMOUNT OF 0.15 ± Ac IS PROVIDED.



SIGNAGE DETAIL
NOT TO SCALE

WILDMAN ENVIRONMENTAL SERVICES
4747 BONNIE BRANCH RD.
ELLICOTT CITY, MD 21043
PHONE: (410) 313-9999

Ronald B. Wildman 4/24/00
QUALIFIED PROFESSIONAL DATE:

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

THIS DRAWING IS TO BE USED FOR FOREST CONSERVATION PURPOSES ONLY

APPROVED: DEPARTMENT OF PUBLIC WORKS
Andrew W. Gunetz 6-2-00
CHIEF BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
Cindy Harrison 6/19/00
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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project	date
96090	APR 2000
illustration	engineering
JEP	RBW
scale	approval
1"=50'	

no.	description	date
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
FOREST CONSERVATION PLAN

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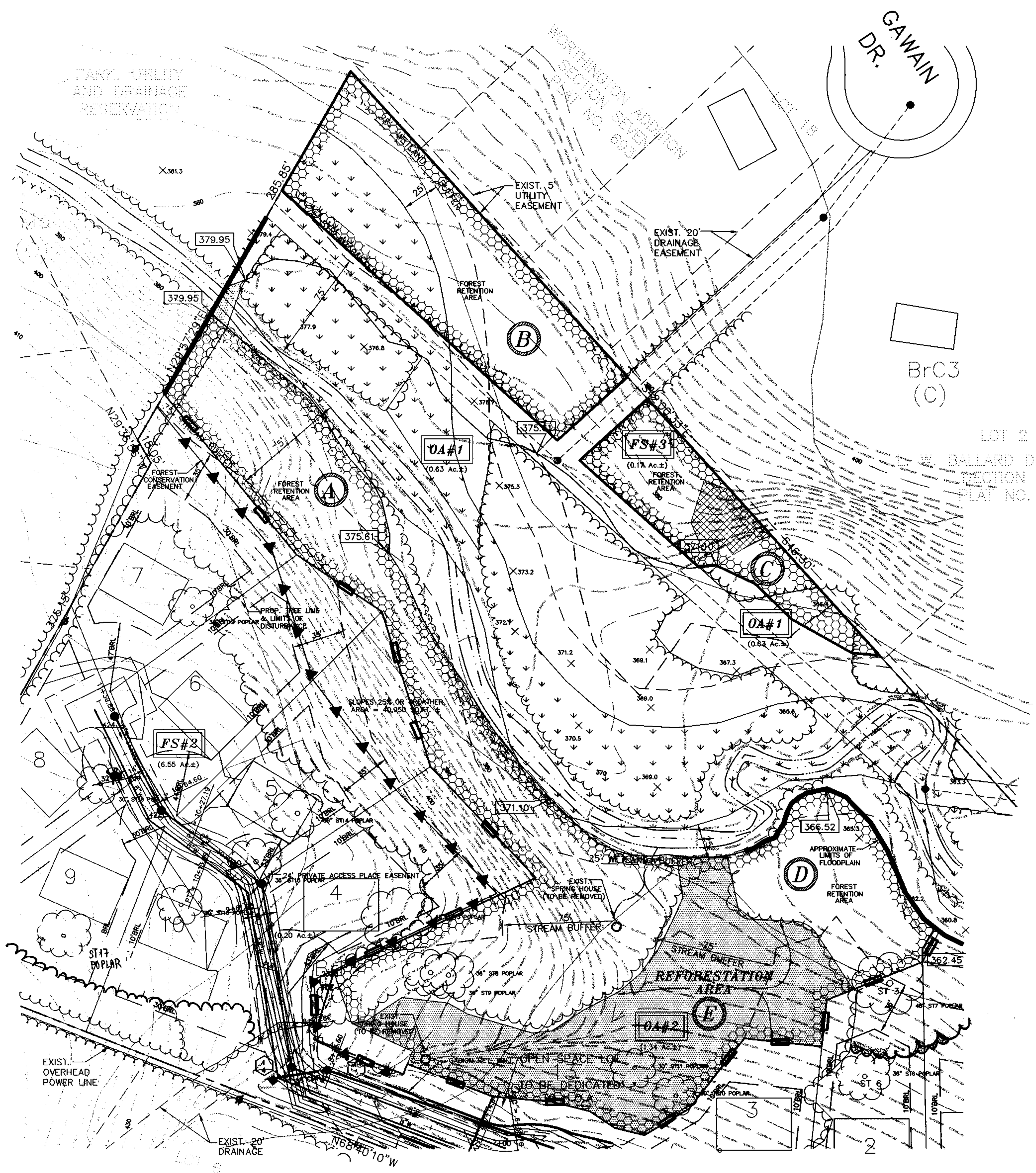

SOILS DESCRIPTION

AgE3+	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED
BeD2+	BELTSVILLE SILT LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED
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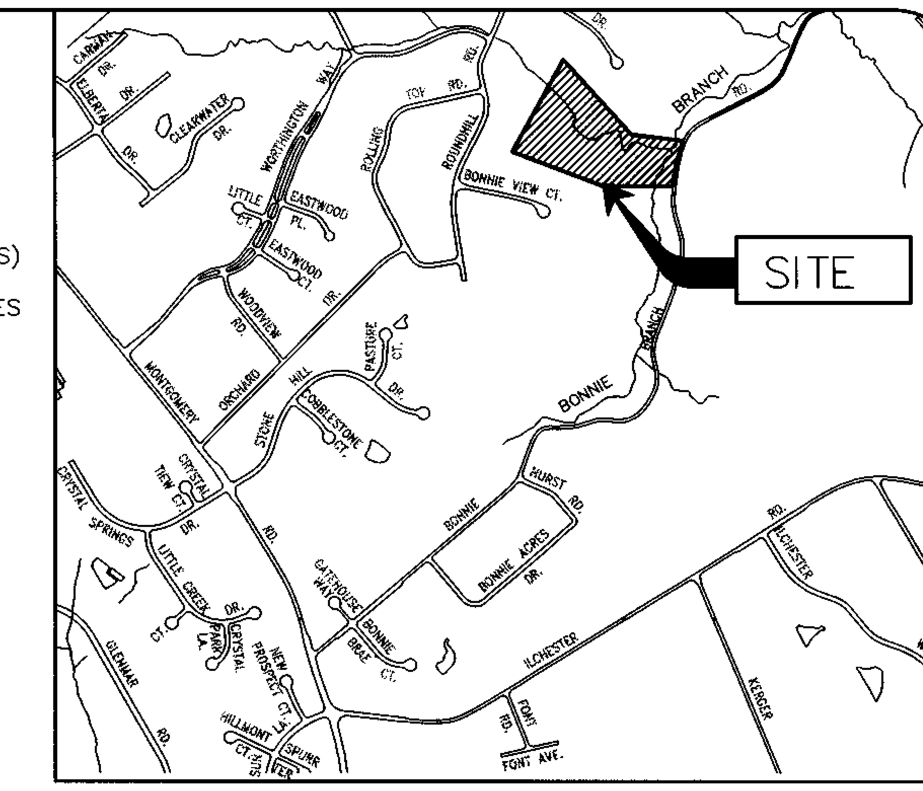
Mo	MIXED ALLUVIAL LAND
MsF	MONTALTO AND RELAY VERY STONY SILT LOAMS, 25 TO 60 PERCENT SLOPES
ReC2	RELAY SILT LOAM, 3 TO 15 PERCENT SLOPES, MODERATELY ERODED

Forest Retention Area Tabulation

A = 0.89 Ac.±
B = 0.46 Ac.±
C = 0.21 Ac.±
D = 0.23 Ac.±
TOTAL=1.79 Ac.±

LEGEND

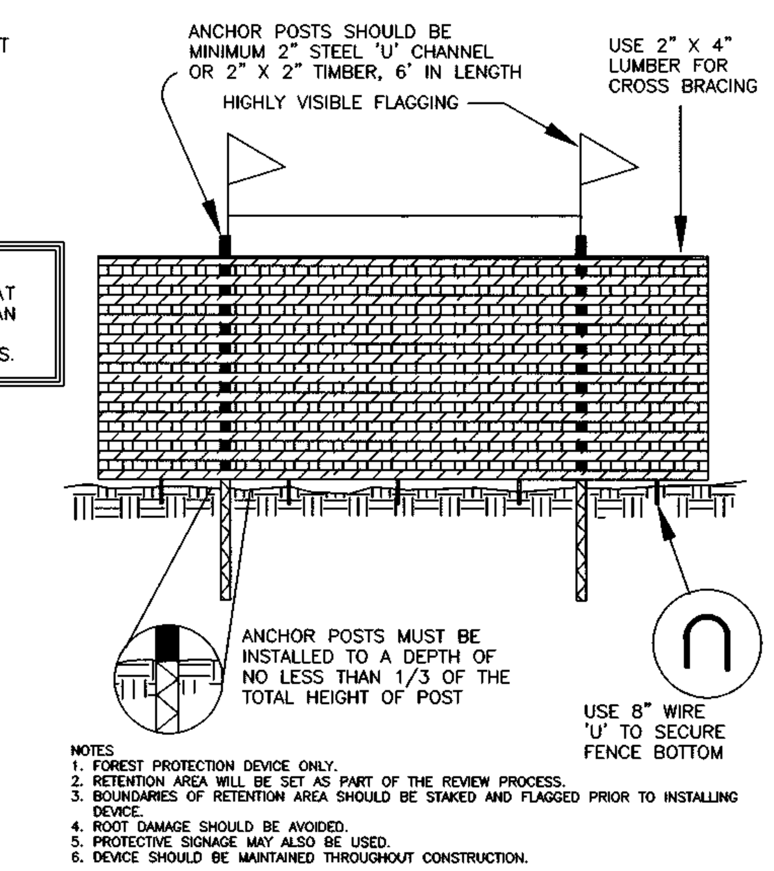
- DENOTES FLOODPLAIN
- DENOTES 15–24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT–OF–WAY DEDICATION.
- DENOTES WETLANDS
- (B) DENOTES FOREST RETENTION AND REFORESTATION AREAS
- DENOTES ORANGE PROTECTIVE FENCE
- DENOTES PROPOSED FOREST CONSERVATION EASEMENT
- DENOTES REFORESTATION AREA 0.55 Ac.±
- DENOTES FC SIGN



VICINITY MAP

SCALE: 1"=1000'

BLAZE ORANGE PROTECTIVE FENCING SHALL BE INSTALLED AT LOCATIONS SHOWN ON THIS PLAN IN THE FIELD, AND SIGNAGE PLACED AT 100 FOOT INTERVALS.



NOTES
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4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

PROTECTIVE FENCE DETAIL

BLAZE ORANGE PLASTIC MESH

PLANTING SPECIFICATIONS AND NOTES

SITE PREPARATION AND SOILS

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

PLANT STORAGE AND INSPECTION

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

PLANT INSTALLATION

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

FERTILIZING

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

MAINTENANCE SCHEDULE

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

SUPERVISION

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

FOREST CONSERVATION WORKSHEET

I. BASIC SITE DATA

GROSS TRACT AREA	10.27 Ac.±
AREA WITHIN 100 YEAR FLOODPLAIN	3.40 Ac.±
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL	0.00 Ac.±
NET TRACT AREA	6.87 Ac.±
LAND USE CATEGORY OR ZONING	R–20

II. INFORMATION FOR CALCULATIONS

A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	AFFORESTATION THRESHOLD (15% x A)	N/A
D.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
E.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
F.	BREAK EVEN POINT (the amount of forest to be retained w/o mitigation)(. {(E x 0.2) + B}	2.11 Ac.±
G.	NET TRACT AREA FOREST TO BE RETAINED	1.79 Ac.±

III. REFORESTATION CALCULATIONS

A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
D.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
E.	FOREST AREAS TO BE CLEARED	3.28 Ac.±
F.	FOREST AREAS TO BE RETAINED (Net Tract Forest)	1.79 Ac.±
G.	FOREST AREAS CLEARED ABOVE FCT	3.28 Ac.±
H.	FOREST AREAS CLEARED BELOW FCT	0.00 Ac.±
I.	FOREST AREAS RETAINED ABOVE FCT	0.42 Ac.±
J.	OPEN AREA TO BE REFORESTED AND INCLUDED WITH "I" IN A FOREST CONSERVATION EASEMENT	0.55 Ac.±
K.	Clearing Above The Forest Conservation Threshold Only: If Forest areas to be retained are at or above the FCT (if H equals or is more than B) the following applies:	
L.	TOTAL REFORESTATION FOR CLEARING ABOVE FCT (G x 1/4)	0.82 Ac.±
M.	CREDIT FOR FOREST RETAINED ABOVE FCT (K)	0.42 Ac.±
N.	TOTAL REFORESTATION REQUIRED	0.40 Ac.±
O.	TOTAL REFORESTATION TO BE PROVIDED ON–SITE WITHIN OA#2	0.55 Ac.±

NOTE: EXTRA REFORESTATION IN THE AMOUNT OF 0.15 ± Ac IS PROVIDED

General Notes

1) The Forest Conservation Easement Has Been Established As An Onsite Forest Mitigation Area, Per Section 16.1216 Of The Howard County Forest Conservation Act. No Clearing, Grading Or Construction Is Permitted Within The Forest Conservation Easement; However, Forest Management Practices As Defined In The Deed Of Forest Conservation easement Are Allowed.

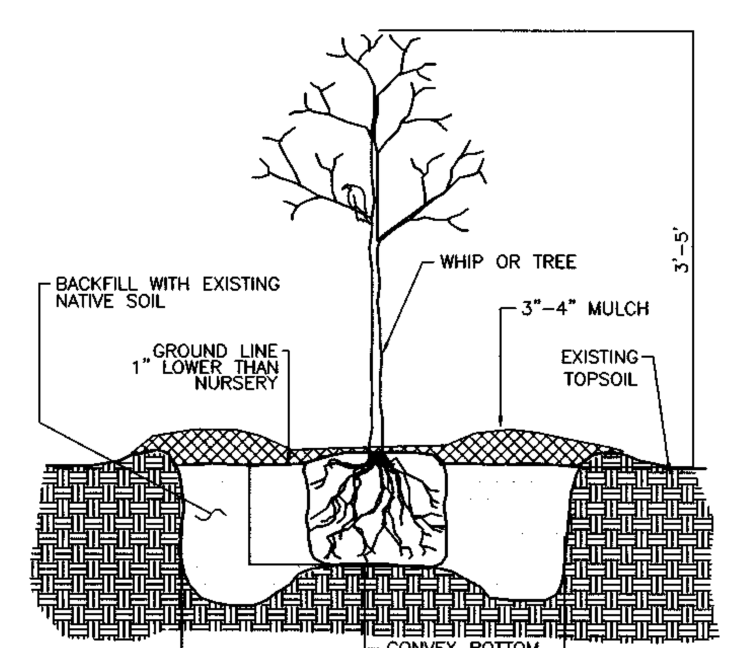
2) Denotes Forest Conservation Easement.

3) Financial Surety For The Required Forest Conservation Retention Areas (1.79 Ac) And Replantings (0.55 Ac) Has Been Posted As Part Of The DPW Developer's Agreement In The Amont Of $14,984.60

REFORESTATION PLANT LISTS

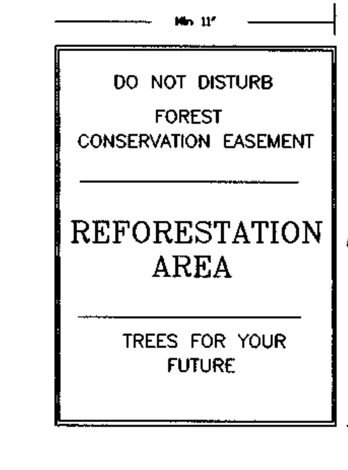
QTY.	SPECIES	SHADE TOL.	MOIST. REGIME	WET. STATUS	MIN.O.C. SPACING	SIZE & REMARKS
	Prunus serotina Wild Black Cherry	I	M	FACU	10'	CONT/BROOT 3'–5' HEIGHT
20	Robinia pseudoacacia Black Locust	VI	D–M	FACU–	10'	CONT/BROOT 3'–5' HEIGHT
20	Quercus alba White Oak	MT	D–M	FACU–	10'	CONT/BROOT 3'–5' HEIGHT
20	Quercus rubra Red Oak	MT	D–M	UPL	10'	CONT/BROOT 3'–5' HEIGHT
20	Fraxinus americana White Ash	MT	D–M	FACU	10'	CONT/BROOT 3'–5' HEIGHT
20	Nyssa sylvatica Black Gum	T	M–W	FAC	10'	CONT/BROOT 3'–5' HEIGHT
20	Juglans nigra Black Walnut	VT	M	FACU	10'	CONT/BROOT 3'–5' HEIGHT
20	Cornus florida Flowering Dogwood	VT	D–M	FACU–	10'	CONT/BROOT 3'–5' HEIGHT
20	Acer rubrum Red Maple	VT	D–W	FAC	10'	CONT/BROOT 3'–5' HEIGHT
20	Cercis canadensis Eastern Redbud	T	M	UPL	10'	CONT/BROOT 3'–5' HEIGHT
20	Carya glabra Pignut Hickory	I	D–M	UPL	10'	CONT/BROOT 3'–5' HEIGHT
20	Diospyros virginiana Persimmon	I	D–M	UPL	10'	CONT/BROOT 3'–5' HEIGHT

Quantities Of Individual Species And Species Composition May Change Depending On Availability At Time Of Planting. Total Quantity Of Trees For Entire Easement Area Will Not Change.



TREE PLANTING DETAIL

CONTAINER GROWN



SIGNAGE DETAIL

NOT TO SCALE

OWNER

RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313–9999

THIS DRAWING IS TO BE USED FOR FOREST CONSERVATION PURPOSES ONLY

WILDMAN
ENVIRONMENTAL SERVICES
4747 BONNIE BRANCH RD.
ELLICOTT CITY, MD 21043
PHONE: (410) 313–9999

Ronald B. Wildman 4/28/00
QUALIFIED PROFESSIONAL DATE:

APPROVED: DEPARTMENT OF PUBLIC WORKS
Andrew M. Daneke 6-2-00
CHIEF BUREAU OF HIGHWAYS DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
Cindy Hamilton 6/19/00
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

C:\DRAWINGS\BONNIE BRANCH\BBRFCP2

project	date
96090	APR. 2000
illustration	engineering
JEP	RBW
scale	approval
1"=50'	

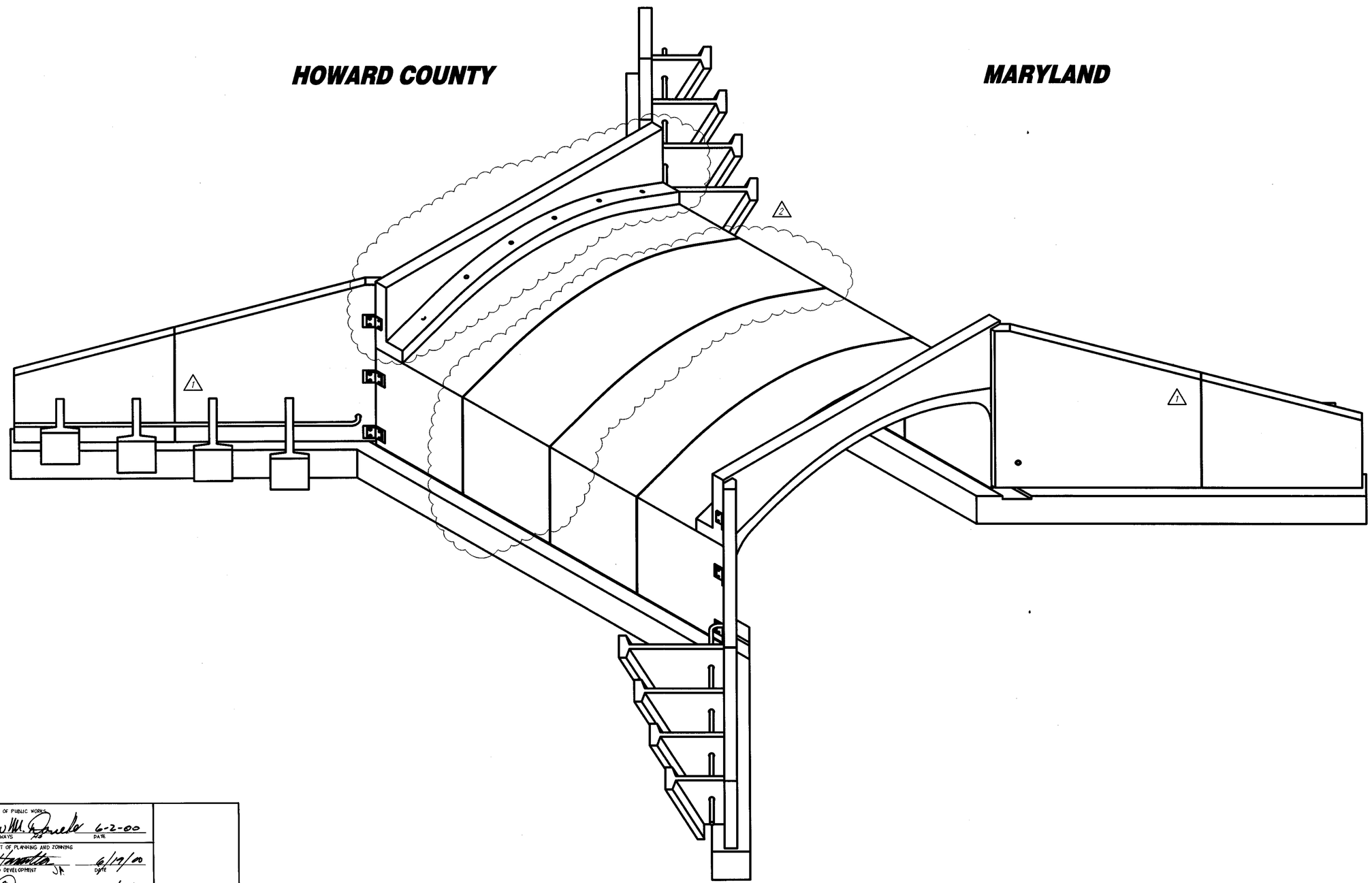
no. | description / revisions | date

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
SECOND ELECTION DISTRICT HOWARD COUNTY, MARYLAND
ONSITE REFORESTATION PLANTING PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997–0296 Balt. (301) 621–5521 Wash. (410) 997–0298 Fax.

F–00–95

BONNIE BRANCH OVERLOOK



APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

Stamp

No.	Date	Description	By
7			
6			
5			
4			
3	2/3/00	REV. HDW PER JK/LENGTHEN STRCT. PER OWNER	JVP
2	1/24/00	REV. WW TO BE TWO PIECE PER JEFF RICKARD	JVP
1			

REVISIONS

Consultant

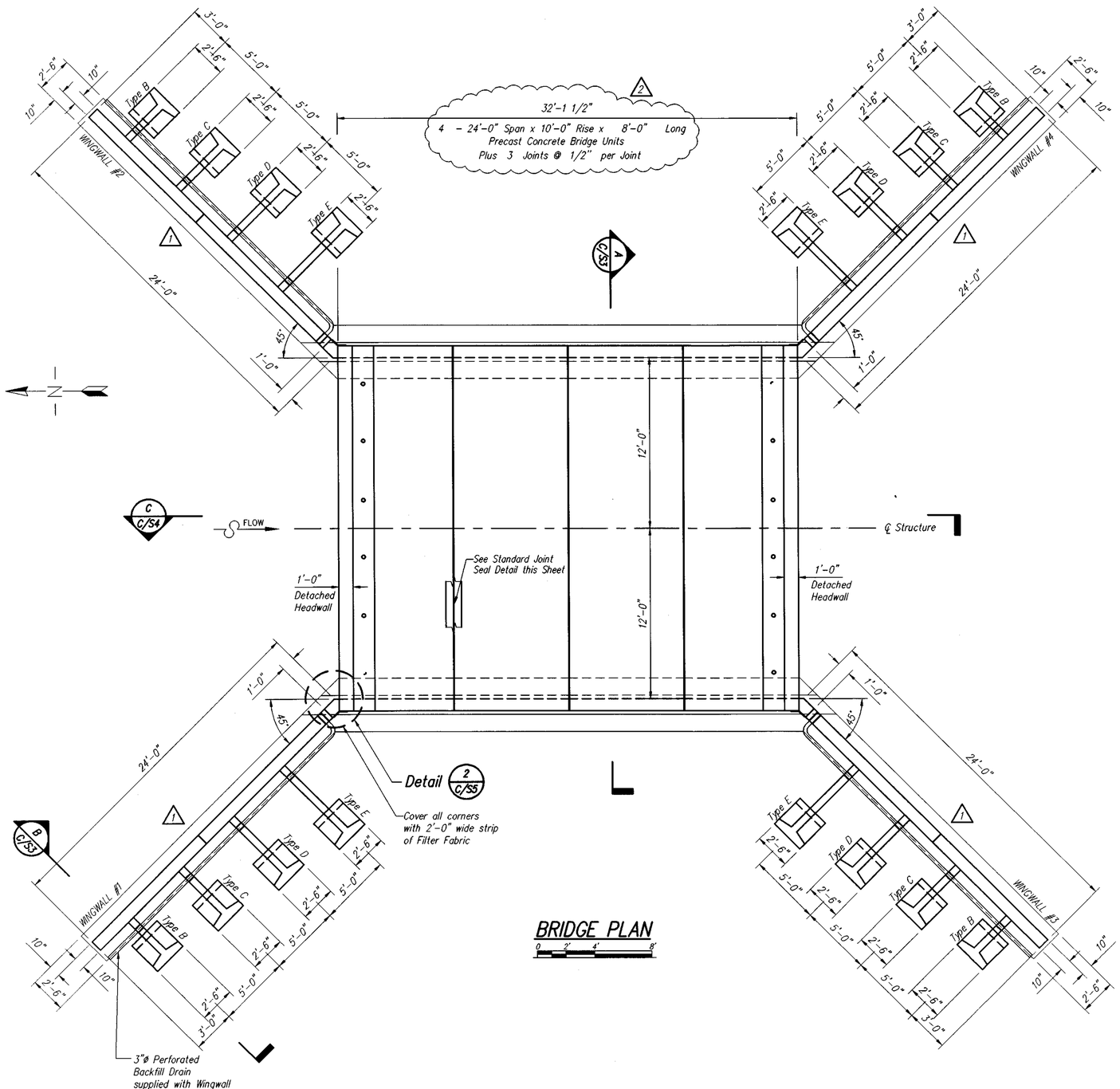
Consultant Project No.

CONSPAN® BRIDGE SYSTEMS
3100 Research Blvd.
P.O. Box 20266
Dayton, Ohio 45420-0266
(937) 254-2233
(800) 526-3999
Fax (937) 254-8385
Email: INFO@CON-SPAN.COM

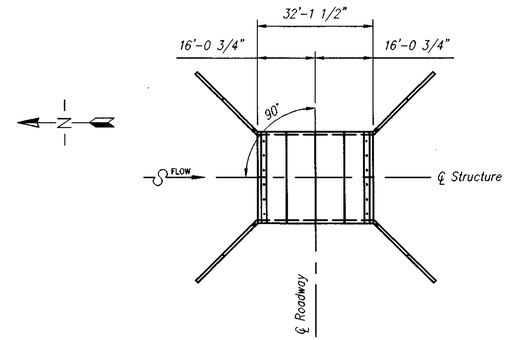
MARYLAND
HOWARD COUNTY
BONNIE BRANCH OVERLOOK

Designed JVP	C\S Project No. 7439
Drawn RPU	
Checked JVP	Sheet No. 13 C/S1
Date 12/15/99	

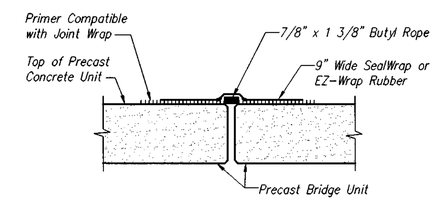
F-00-95



BRIDGE PLAN



LOCATION PLAN



STANDARD JOINT SEAL DETAIL

NOTES

GENERAL NOTES:

1. This bridge has been designed for general site conditions. The project engineer shall be responsible for the structure's suitability to the existing site conditions and for the hydraulic evaluation -- including scour and confirmation of soil conditions.
2. Prior to construction, contractor must verify all elevations shown through the engineer.

DESIGN DATA

Design Loading: HS27-44
Design Fill Height: 2'-0" max. from top of crown to top of pavement.
Design Method: Load factor per AASHTO Specification
Assumed Allowable Soil Bearing: 4000 PSF (Verify)

MATERIALS

Precast units shall be constructed and installed in accordance with CON/SPAN Specifications.
Concrete for Footings and Wingwalls shall have a minimum compressive strength of 4000 psi.
Reinforcing steel for Footings and Wingwalls shall conform to ASTM A615, A616 or A617-Grade 60.

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APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

Stamp

No.	Date	Description	By
7			
6			
5			
4			
3			
2	2/3/00	REV. HDW PER JR/LENGTHEN STRCT. PER OWNER	JVP
1	1/24/00	REV. WW TO BE TWO PIECE PER JEFF RICKARD	JVP

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HOWARD COUNTY MARYLAND

BONNIE BRANCH OVERLOOK

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Checked JVP	Sheet No. C/S2
Date 12/15/99	

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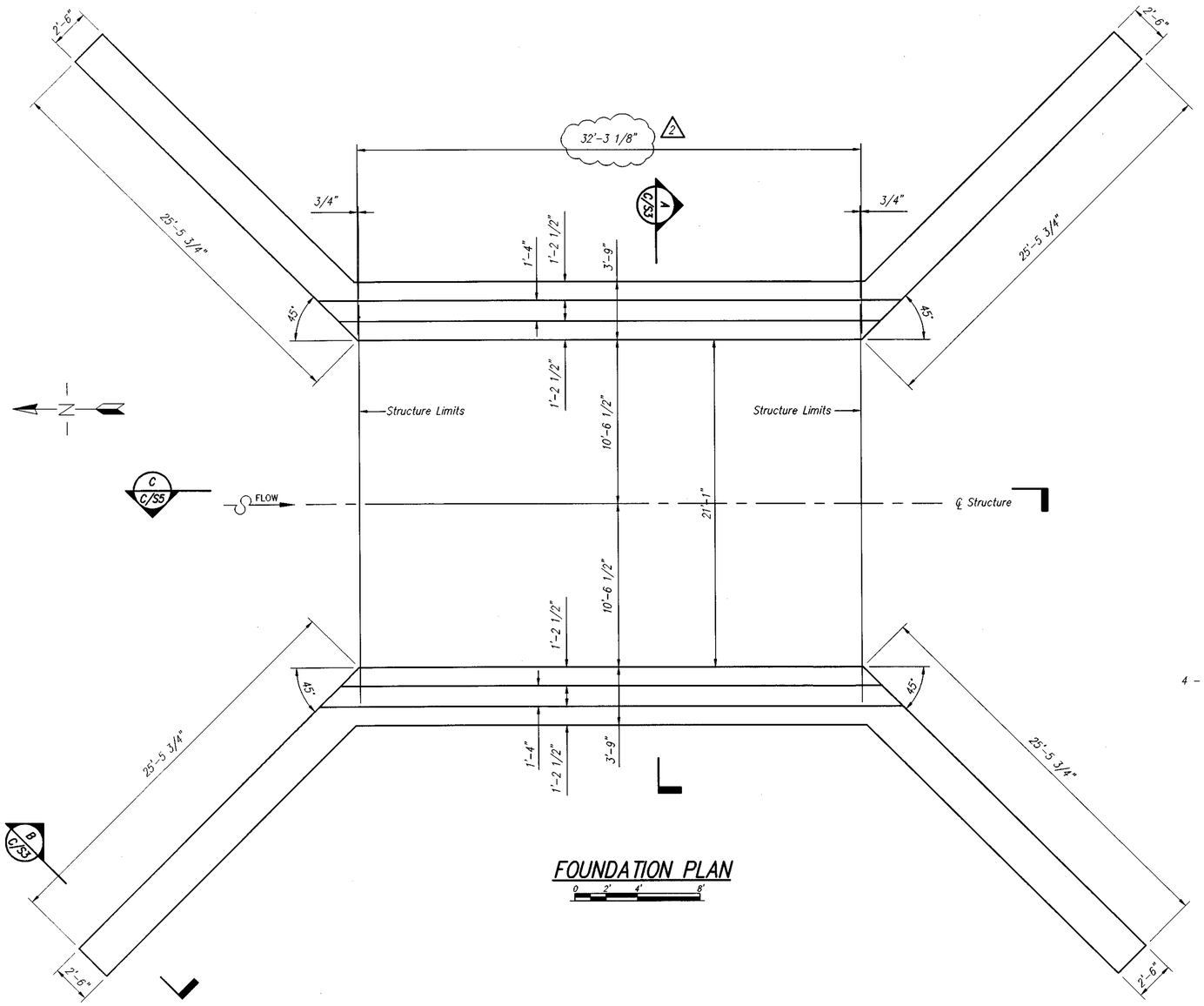
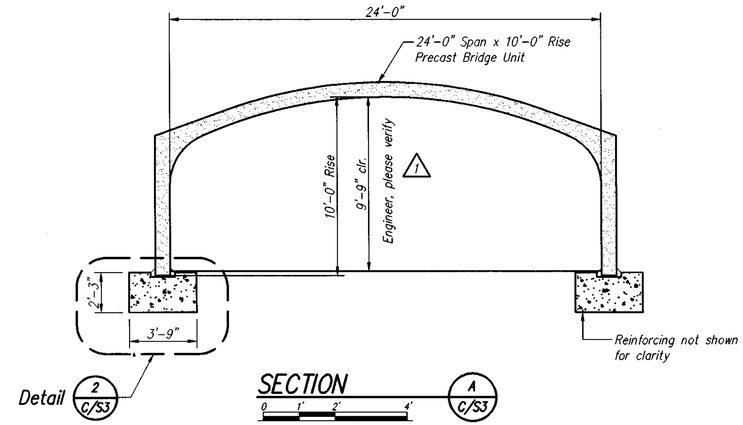


FOUNDATION PLAN

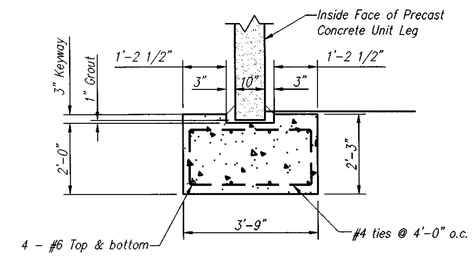
0 2' 4' 8'

Note:
Lap (3'-0") #6 Longitudinal Bars in Wingwall and Bridge Footings to make continuous.



SECTION

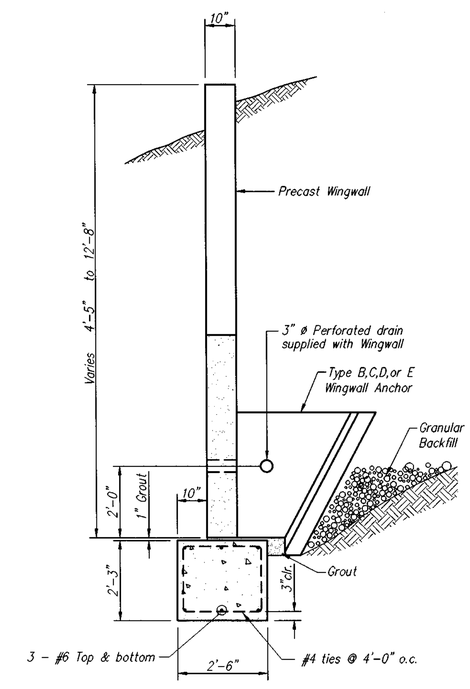
0 1' 2' 4'



DETAIL

0 1' 2'

2 C/S3



SECTION

0 1' 2' 4'

B C/S2

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CHIEF BUREAU OF HIGHWAYS — DATE 10-2-00
APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/2/00

Stamp

No.	Date	Description	By
7			
6			
5			
4			
3			
2	2/3/00	REV. HDW PER JR/LENGTHEN STRCT. PER OWNER	JVP
1	1/24/00	REV. WW TO BE TWO PIECE PER JEFF RICKARD	JVP

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MARYLAND
HOWARD COUNTY

BONNIE BRANCH OVERLOOK

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Date	12/15/99		

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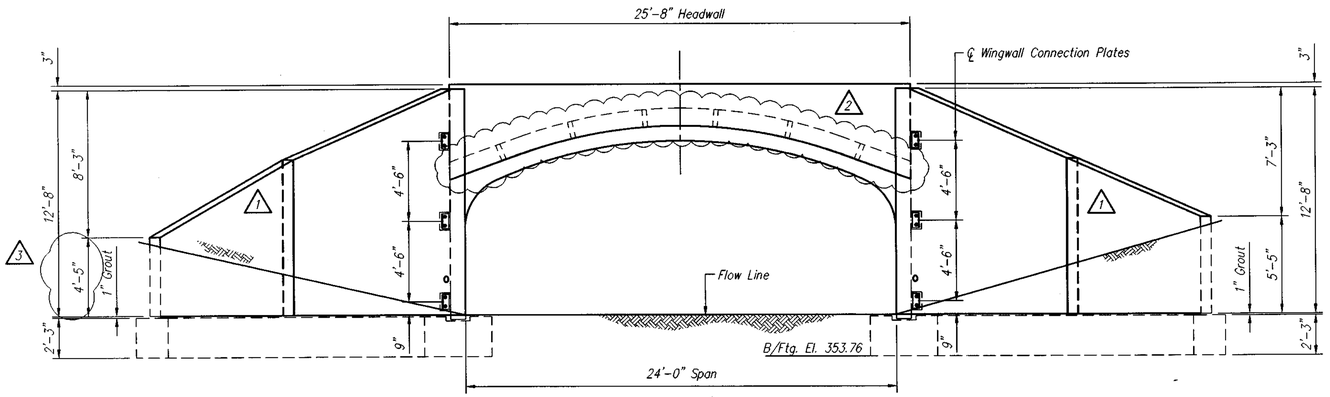
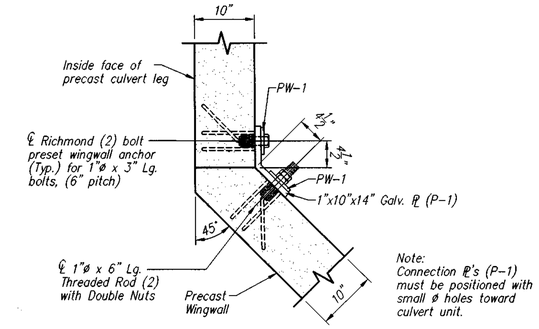


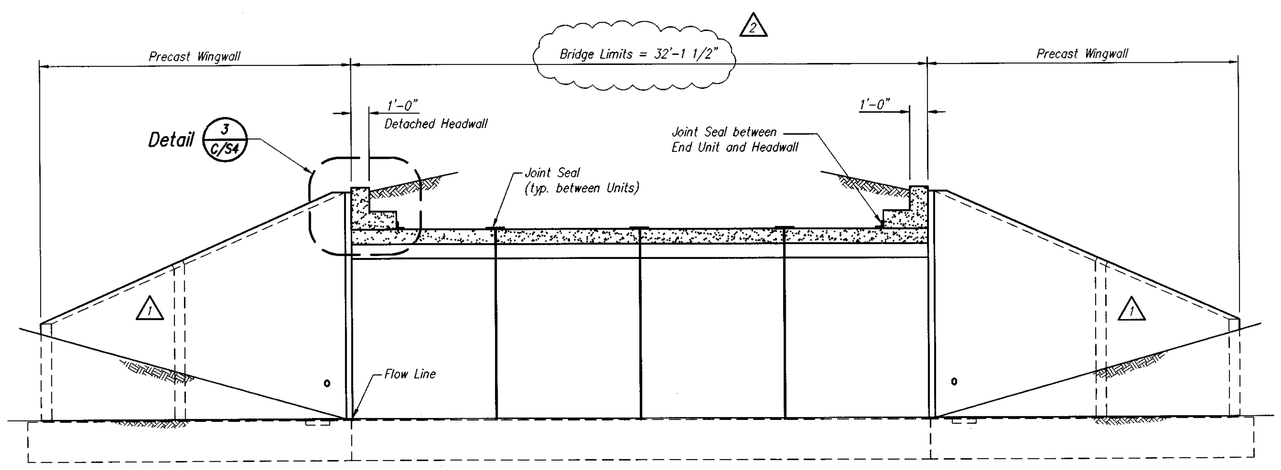
TYPICAL END ELEVATION

0 2' 4' 8'



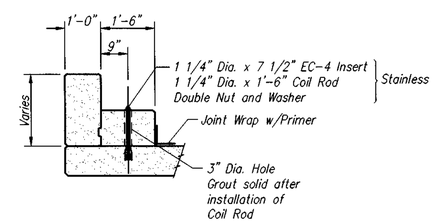
DETAIL 1 / C/S2

0 1' 2'



SECTION C / C/S2

0 2' 4' 8'



DETAIL 3 / C/S4

0 1' 2' 4'

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APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

Stamp

No.	Date	Description	By
7			
6			
5			
4			
3	2/21/00	Wingwall Drop	JVP
2	2/3/00	REV. HDW PER JR/LENGTHEN STRCT. PER OWNER	JVP
1	1/24/00	REV. WW TO BE TWO PIECE PER JEFF RICKARD	JVP

REVISIONS

Consultant

Consultant Project No.

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MARYLAND

HOWARD COUNTY

BONNIE BRANCH OVERLOOK

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Date 12/15/99	

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN BRIDGE SYSTEMS

1. DESCRIPTION

This work shall consist of constructing a Con/Span culvert in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the Engineer.

2. TYPES

Precast reinforced concrete Con/Span culverts manufactured in accordance with this specification shall be designated by span and rise.

3. MATERIALS – CONCRETE

The concrete for the culverts shall be air-entrained when installed in areas subject to freeze-thaw conditions, composed of Portland cement, fine and coarse aggregates, admixtures and water. Concrete shall contain 6 ± 2 percent air. The air entraining admixture shall conform to AASHTO M154.

3.1 Portland Cement – Shall conform to the requirements of ASTM Specifications C150-Type I, Type II, or Type III cement.

3.2 Coarse Aggregate – Shall consist of stone having a maximum size of 1 inch. Aggregate shall meet requirements for ASTM C33.

3.3 Water Reducing Admixture – The manufacturer may submit for approval by the Engineer, a water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.

3.4 Calcium Chloride – The addition to the mix of calcium chloride or admixtures containing calcium chloride will not be permitted.

4. MATERIALS – STEEL REINFORCEMENT AND HARDWARE

All reinforcing steel for the culverts shall be fabricated and placed in accordance with the detailed shop drawings submitted by the manufacturer.

4.1 Steel Reinforcement – Reinforcement shall consist of welded wire fabric conforming to ASTM Specification A 185 or A 497, or deformed billet steel bars conforming to ASTM Specification A 615, Grade 60. Longitudinal distribution reinforcement may consists of welded wire fabric or deformed billet-steel bars.

5. MANUFACTURE

5.1 Mixture – The aggregates, cement and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements of this specification. The proportion of Portland cement in the mixture shall not be less than 564 pounds (6 sacks) per cubic yard of concrete.

5.2 Curing – The precast concrete culvert units shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used:

5.2.1. Steam Curing – The culverts may be low pressure, steam cured by a system that will maintain a moist atmosphere.

5.2.2. Water Curing – The culverts may be water cured by any method that will keep the sections moist.

5.2.3. Membrane Curing – A sealing membrane conforming to the requirements of ASTM Specification C 309 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of application shall be within ± 10 degrees F of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the compounds and shall be damp when the compound is applied.

5.3 Forms – the forms used in manufacture shall be sufficiently rigid and accurate to maintain the culvert dimensions within the permissible variations given in Section 7. All casting surfaces shall be of a smooth material.

5.4 Handling – Handling devices or holes shall be permitted in each culvert for the purpose of handling and setting.

5.5 Storage – The culverts shall be stored in such a manner to prevent cracking or damage. The units shall not be stored in an upright position until the compressive strength is a minimum of 4,000 psi.

6. DESIGN

6.1 The culvert dimension and reinforcement details shall be as prescribed in the plan and the shop drawings provided by the manufacturer subject to the provisions of Section 7. The minimum concrete compressive strength shall be 4,000 psi. The minimum steel yield strength shall be 60,000 psi.

The culverts are designed in accordance with the "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1996. A minimum of one foot of cover above the crown of the culvert is required in the installed condition. (Unless noted otherwise and designed accordingly.)

6.2 Placement of Reinforcement – The cover of concrete over the outside circumferential reinforcement shall be 2 inches minimum. The cover of concrete over the inside circumferential reinforcement shall be 1 1/2 inches minimum. The clear distance of the end circumferential wires shall not be less than one inch nor more than two inches from the ends of the culvert. Reinforcement shall be assembled utilizing single or multiple layers of welded wire fabric, or utilizing a single layer of deformed billet-steel bars. The welded wire fabric shall be composed of circumferential and longitudinal wires meeting the spacing requirements of 6.4 and shall contain sufficient longitudinal wires extending through the culvert to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 6.4. The ends of the longitudinal distribution reinforcement shall be not more than 3 inches from the ends of the culvert.

6.3 Bending of Reinforcement – The outside and inside circumferential reinforcing steel for the corners of the culvert shall be bent to such an angle that is approximately equal to the configuration of the culvert's outside corner.

6.4 Laps, Welds, and Spacing – Tension splices in the circumferential reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of ACI 12.8 and 12.19. For deformed welded wire fabric, the overlap shall meet the requirements of ACI 12.7 and 12.18. For deformed billet-steel bars, the overlap shall meet the requirements of ACI 12.2. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be not less than 2 inches nor more than 4 inches. For the wire fabric, the spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.

7. PERMISSIBLE VARIATIONS

7.1 Internal Dimensions – The internal dimension shall vary not more than 1% from the design dimensions nor more than 1-1/2 inches whichever is less. The haunch dimensions shall vary not more than 3/4 inch from the design dimension.

7.2 Slab and Wall Thickness – The slab and wall thickness shall not be less than that shown in the design by more than 1/4 inch. A thickness more than that required in the design shall not be cause for rejection.

7.3 Length of Opposite Surfaces – Variations in laying lengths of two opposite surfaces of the culvert shall not be more than 5/8 inch in any culvert section, except where beveled ends for laying of curves are specified by the purchaser.

7.4 Length of Section – The underrun in length of a section shall not be more than 1/2 inch in any culvert.

7.5 Position of Reinforcement – The maximum variation in position of the reinforcement shall be + 1/2 inch. In no case shall the cover over the reinforcement be less than 1 inches for the outside circumferential steel or be less than 1 inch for the inside circumferential steel as measured to the external or internal surface of the culvert. These tolerances or cover requirements do not apply to mating surfaces of the joints.

7.6 Area of Reinforcement – The areas of steel reinforcement shall be the design steel areas as shown in the manufacturer's shop drawings. Steel areas greater than those required shall not be cause for rejection. The permissible variation in diameter of any reinforcement shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcement.

8. TESTING AND INSPECTION

8.1 Type of Test Specimen – Concrete compressive strength shall be determined from compression tests made on cylinders or cores. For cylinder testing a minimum of 4 cylinders shall be taken during each production run. For core testing, one core shall be cut from a culvert section selected at random from each group of 15 culverts or less of a particular size and production run. For each continuous production run, each group of 15 culverts of a single size or fraction thereof shall be considered separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 consecutive days.

8.2 Compression Testing – Cylinders shall be made and tested as prescribed by the ASTM C 39 Specification. Cores shall be obtained and tested for compressive strength in accordance with the provisions of the ASTM C 497 Specification.

8.3 Acceptability of Cylinder Tests – Failure of any of the 28 day test cylinders to meet 90 percent of the minimum compressive strength requirement can be cause for rejection.

8.4 Acceptability of Core Tests – The compressive strength of the concrete in each group of culverts as defined in 8.1 is acceptable when the core test strength is equal to or greater than the design concrete strength. When the compressive strength of the core tested is less than the design concrete strength, the culvert from which that core was taken may be recored. When the compressive strength of the recore is equal to or greater than the design concrete strength, the compressive strength of the concrete in that group of culverts is acceptable.

8.4.1 When the compressive strength of any recore is less than the design concrete strength, the culvert from which that core was taken shall be rejected. Two culverts from the remainder of the group shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group of culverts is acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the group of culverts shall be rejected or, at the option of the manufacturer, each culvert of the remainder of the group shall be cored and accepted individually, and any of these culverts that have cores with less than the design concrete strength shall be rejected.

8.4.2 Plugging Core Holes – The core holes shall be plugged and sealed by the manufacturer in a manner such that the culvert will meet all of the test requirements of this specification. Culverts so sealed shall be considered satisfactory for use.

8.4.3 Test Equipment – Every manufacturer furnishing culverts under this specification shall furnish all facilities and personnel necessary to carryout the test required.

9. JOINTS

The culverts shall be produced with flat butt ends. The ends of the culvert shall be such that when the sections are laid together they will make a continuous line of culverts with a smooth interior free of appreciable irregularities, all compatible with the permissible variations – in Section 7. The joint width shall not exceed 3/4 inches.

10. WORKMANSHIP AND FINISH

The culverts shall be substantially free of fractures. The ends of the culverts shall be normal to the walls and centerline of the culvert section, within the limits of the variations given in section 7, except where beveled ends are specified. The surface of the culverts shall be a smooth steel form or troweled surface. Trapped air pockets causing surface defects shall be considered as part of a smooth steel form finish.

11. REPAIRS

Culverts may be repaired, if necessary, because of imperfections in manufacture or handling damage and will be acceptable if, in the opinion of the purchaser, the repairs are sound, properly finished and cured, and the repaired section conforms to the requirements of this specification.

12. INSPECTION

The quality of materials, the process of manufacture, and the finished culverts shall be subject to inspection by the purchaser.

13. REJECTION

Culverts shall be subject to rejection on account of any of the specification requirements. Individual culverts may be rejected because of any of the following:

13.1 Fractures or cracks passing through the wall, except for a single end crack that does not exceed one half the thickness of the wall.

13.2 Defects that indicate proportioning, mixing, and molding not in compliance with Section 5.

13.3 Honeycombed or open texture.

13.4 Damaged ends, where such damage would prevent making a satisfactory joint.

14. MARKING

Each culvert shall be clearly marked by waterproof paint. The following shall be shown on the inside of the vertical leg of the culvert section:

Culvert Section Span X Culvert Rise

Date of Manufacture

Name or trademark of the manufacturer

15. CONSTRUCTION REQUIREMENTS

15.1 Footings – the culverts shall be installed on either precast or cast-in-place concrete footings. The design size and elevation of the footings shall be as determined by the Engineer. A three inch deep keyway shall be formed in the top surface of the footing three inches clear of the inside and outside faces of the culvert, unless specified otherwise on the plans. The footings shall be given a smooth float finish and shall reach a compressive strength of 2,000 psi before placement of the culvert sections. The completed footing surface shall be constructed in accordance with grades shown on the plans. When tested with a 10 foot straight edge, the surface shall not vary more than 1/4 inch in 10 feet. If a precast concrete footing is used, the contractor shall prepare a 4 inch thick layer of compacted granular material the full width of the footing prior to placing the precast footing.

15.2 Placement of the Culverts – The culverts shall be placed as shown on the Engineer's plan drawings. Special care shall be taken in setting the culverts to the true line and grade. The culverts shall be set on 6" X 6" masonite or steel shims. A minimum of 1/2 inch gap shall be provided between the footing and the bottom of the culverts vertical legs. The gap shall be filled with cement grout (Portland cement and water or cement mortar composed of one part Portland cement and three parts of sand, by volume, and water.)

15.3 External Protection of Joints – The butt joint made by two adjoining culverts shall be covered with a 7/8" x 1 3/8" (1 1/4" round equivalent) piece of butyl rope and a minimum of a 9 inch wide joint wrap. The surface shall be free of dirt before applying the joint material. A primer compatible with the joint wrap to be used shall be applied for a minimum width of nine inches on each side of the joint. The external wrap shall be either E2-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION, SEAL WRAP by MAR MAC MANUFACTURING CO. INC. or approved equal. The joint shall be covered continuously from the bottom of one culvert section leg, across the top of the arch and to the opposite culvert section leg. Any laps that result in the joint wrap shall be a minimum of six inches long with the overlap running downhill.

In addition to the joints between units, the joint between the end unit and the headwall shall also be sealed. If using precast wingwalls, the joint between the end bridge unit and the wingwall shall be sealed with this type of wrap or at the discretion of the Engineer, filter fabric shall be substituted.

During the backfilling operation, care shall be taken to keep the joint wrap in its proper location over the joint.

15.4 Backfill – Backfill shall be considered as all replaced excavation and new embankment adjacent to the Con/Span bridge units and wingwalls. The project construction and material specifications which include the specifications for excavation for structures and roadway excavation and embankment construction shall apply except as modified in this section.

No backfill shall be placed against any structural elements until they have been approved by the Engineer.

Backfill against a waterproofed surface shall be placed carefully to avoid damage to the waterproofing material.

Mechanical tampers or approved compacting equipment shall be used to compact all backfill and embankment immediately adjacent to each side of the culvert and over the top of the culvert until it is covered to a minimum depth of one foot. The backfill within four feet of each side of the culvert shall be placed in lifts of eight inches or less (loose depth). Heavy compaction equipment shall not be operated in this area or over the culvert until it is covered to a depth of one foot.

Lightweight dozers and graders may be operated over culverts having one foot of compacted cover, but heavy earth moving equipment (larger than a D-4 Dozer weighing in excess of 12 tons and having track pressures of eight psi or greater) shall require two feet of cover unless the design cover is less than two feet. In no case shall equipment operating in excess of the design load (HS20 or HS25) be permitted over the culvert unless approved by Con/Span.

Any additional fill and subsequent excavation required to provide this minimum cover shall be made at no additional cost to the project.

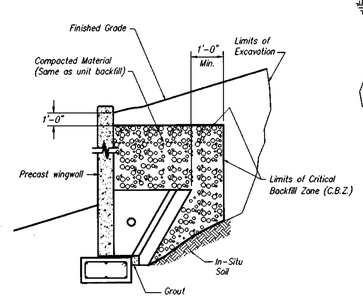
As a precaution against introducing unbalanced stresses in the culvert, when placing backfill at no time shall the difference between the heights of fill on opposite sides of the culvert exceed 24".

Backfill in front of wingwalls shall be carried to ground lines shown in the plans.

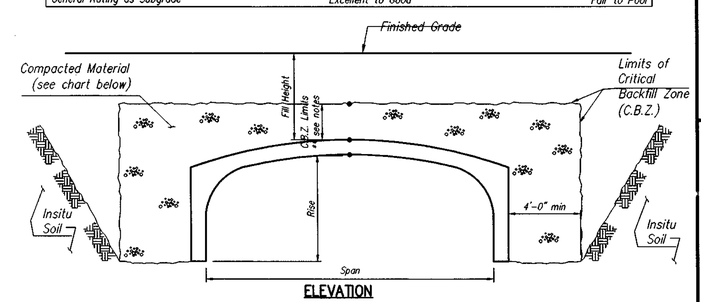
19.2-a Provide MSHA Mix number 3 non-reinforced concretefrom bedrock to bottom of footing, non-reinforced concrete shall exfend 6" on either side of the footing.

BACKFILL DESCRIPTION

Group Classification	A-1		A-3	A-2				A-4
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7	
Sieve Analysis, Percent Passing								
No. 10	50 max.							
No. 40	30 max.	50 max.	51 max.					
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.	35 max.	36 min.
Characteristics of Fraction Passing No. 40								
Liquid Limit				40 max.	41 min.	40 max.	41 min.	40 max.
Plasticity Index	6 max.		N.P.	10 max.	10 max.	11 min.	11 min.	10 max.
Usual Types of Significant Constituent Materials	Stone Fragments, Gravel & Sand		Fine Sand	Silty or Clayey Gravel and Sand				Silty Soils
General Rating as Subgrade	Excellent to Good							Fair to Poor



WINGWALL BACKFILL REQUIREMENTS



ELEVATION

NOTES
1. SEE CON/SPAN SPECIFICATIONS SECTION 15.4 FOR BACKFILL SPECIFICATIONS.
* 2. FOR FILL HEIGHTS LESS THAN 2'-0", THE FINISHED GRADE SHALL BE THE BOUNDARY LINE FOR THE C.B.Z.
3. BACKFILLING OPERATIONS WITHIN THE C.B.Z. SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH).
4. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS.
5. BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY.

SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE C.B.Z.	ACCEPTABLE MATERIAL OUTSIDE C.B.Z.
≤ 24'-0"	> 12'-0"	A1, A3	**
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4	**
> 24'-0"	**	A1, A3	**

** EMBANKMENT MATERIAL PER PROJECT SPECIFICATIONS

BACKFILL REQUIREMENTS

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/9/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

Stamp

No.	Date	Description	By
7			
6			
5			
4			
3	2/3/00	REV. HDW PER JK/LENGTHEN STRCT. PER OWNER	JVP
2	1/24/00	REV. WW TO BE TWO PIECE PER JEFF RICKARD	JVP
1			

REVISIONS

Consultant

Consultant Project No.

CON/SPAN® BRIDGE SYSTEMS
(937) 254-2233
(800) 526-3909
Fax (937) 254-6385
Email: INFO@CON-SPAN.COM
3100 Research Blvd.
P.O. Box 20266
Dayton, Ohio 45420-0266

MARYLAND

HOWARD COUNTY

BONNIE BRANCH OVERLOOK

Designed	JVP	C\S Project No.	7439
Drawn	RPU		
Checked	JVP	Sheet No.	17 C/S5
Date	12/15/99		

F-00-95

ROAD CONSTRUCTION PLANS

BONNIE BRANCH OVERLOOK

LOTS 1 THRU 13

SECOND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SHEET INDEX

COVER SHEET	1
ROAD PLAN AND PROFILES	2
GRADING, EROSION AND SEDIMENT CONTROL PLAN	3
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	4
SWM SPECIFICATIONS AND SOIL BORINGS	5
STROM DRAIN PROFILES AND DETAILS	6
DRAINAGE AREA AND SOILS MAP	7
FILLET PROFILES	8
TYPICAL SECTIONS AND DETAILS	9
LANDSCAPE PLAN	10
FOREST CONSERVATION PLAN	11
FOREST CONSERVATION PLAN	12
CONSPAN BRIDGE DETAILS	13 (C/S1)
CONSPAN BRIDGE DETAILS	14 (C/S2)
CONSPAN BRIDGE DETAILS	15 (C/S3)
CONSPAN BRIDGE DETAILS	16 (C/S4)
CONSPAN BRIDGE DETAILS	17 (C/S5)

OWNER

RONALD WILDMAN
4747 BONNIE BRANCH
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 4/28/00

PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF ENGINEER — DATE 4/28/00

P. JACOB MILMAT
PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS:

USDA - NATURAL RESOURCE CONSERVATION SERVICE — DATE 5/24/00

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 5/24/00

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF BUREAU OF HIGHWAYS — DATE 6/2/00

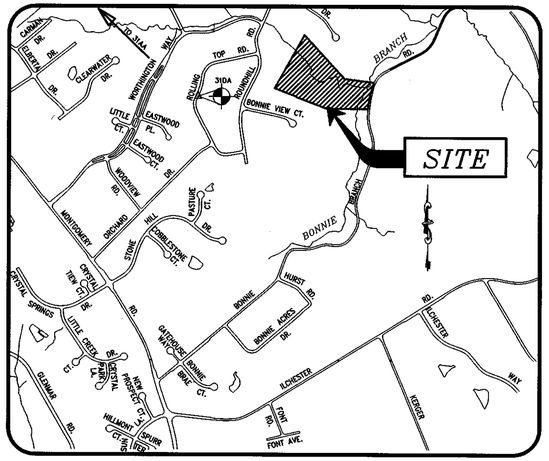
APPROVED: DEPARTMENT OF PLANNING AND ZONNING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/9/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

STATE OF MARYLAND — P. JACOB MILMAT — 17942 — PROFESSIONAL ENGINEER

96090/DWG/FINAL/COVER



VICINITY MAP

SCALE: 1"=1000'

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE (5) DAYS PRIOR TO ANY EXCAVATION WORK:

MISS UTILITY	1-800-257-7777
C&P TELEPHONE COMPANY	(410) 725-9976
HOWARD COUNTY BUREAU OF UTILITIES	(410) 313-4900
AT&T CABLE LOCATION DIVISION	(410) 393-3533
BALTIMORE GAS & ELECTRIC	(410) 685-0123
STATE HIGHWAY ADMINISTRATION	(410) 531-5533
HOWARD COUNTY DEPT. OF PUBLIC WORKS/ CONSTRUCTION INSPECTION DIVISION	(410) 313-1880

3. PROJECT BACKGROUND:

LOCATION: SECOND ELECTION DISTRICT - TAX MAP 31 - PARCEL 27	
ZONING: R-20	
DEED REFERENCE :	L. 3887 F. 579
TOTAL TRACT AREA :	10.27 ACRES ±
NUMBER OF PROPOSED LOTS:	13 (10 BUILDABLE)
ACREAGE OF PROPOSED BUILDABLE LOTS :	3.76 ACRES ±
OPEN SPACE REQUIRED :	3.08 ACRES ± (30%)
OPEN SPACE PROVIDED :	6.09 ACRES ±
AREA OF RIGHT OF WAY:	0.42 ACRES±
DPZ REFERENCE #: - SP-97-20, WP-98-75, P-99-03, BA 410-D	
WATER AND SEWER CONTRACT #	14-3823-D

4. TOPOGRAPHIC INFORMATION ARE BASED ON AERIAL TOPOGRAPHIC SURVEY BY WINGS AERIAL MAPPING CO., INC. ON MARCH 12, 1997.
5. HORIZONTAL AND VERTICAL DATUMS BASED ON (NAD'83) MARYLAND STATE COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS.

STA No. 31AA	N 573,998.5709 E 1,369,934.229	EL.= 500.157
STA No. 31DA	N 571,982.6701 E 1,372,145.075	EL.= 482.35

6. FLOODPLAIN DELINEATION IS BASED ON STUDY BY MILDENBERG BOENDER AND ASSOCIATES, INC. AND UPDATED JULY 1998. AND UPDATED DECEMBER 1999.
7. PUBLIC WATER AND SEWER WILL BE AVAILABLE UNDER CONTRACT #417-S AND #266-W.
8. STORMWATER MANAGEMENT IS PROVIDED VIA PRIVATE DETENTION FACILITY & STORMCEPTOR STORMWATER MANAGEMENT WILL BE PRIVATELY OWNED AND MAINTAINED. DRY WELLS WILL BE USED FOR LOTS 1-7.
9. TRAFFIC CONTROL DEVICES, MARKINGS, AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
10. COMPACTION IN FILL AREAS TO BE 95% AS DETERMINED PER AASHTO T-180.
11. CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES ON SITE PRIOR TO COMMENCING CONSTRUCTION.
12. FOREST CONSERVATION REQUIREMENTS HAVE BEEN SATISFIED ON SITE VIA RETENTION AND REFORESTATION.

FOREST CONSERVATION AREA =1.79 Ac	SURETY AMOUNT=	$7,797.20
REFORESTATION AREA =0.55 Ac	SURETY AMOUNT=	$7,187.40
	TOTAL SURETY REQUIRED =	$14,984.60

13. WETLANDS STUDY AND FOREST STAND DELINEATION IS WILDMAN ENVIRONMENTAL SERVICES, INC. DATED MARCH 1997.
14. PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
15. OPEN SPACE LOT 13 WILL BE OWNED BY THE HOME OWNER'S ASSOCIATION, LOTS 11 & 12 WILL BE OWNED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
16. SLOPES IN EXCESS OF 25% EXIST AND ARE IDENTIFIED WHERE THEY EXCEED 20,000 SQ. FT.
17. ALL EXISTING STRUCTURES TO BE REMOVED.
18. A MINIMUM OF TWO (2) PARKING SPACES ARE PROVIDED ON EACH LOT. NO OFF-STREET PARKING IS REQUIRED.
19. THE STREET LIGHT LOCATIONS AND TYPES OF LIGHTS ARE AS FOLLOWS :

STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE	NOTES
TWIN STREAM DRIVE (PUBLIC)	0+26	30' R	150-watt HPS VAPOR PENDANT FIXTURE (CUTOFF) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM.	ANGLE ARM AS SHOWN SHEET # 2
TWIN STREAM DRIVE (PUBLIC)	1+61	14' R	100 watt HPS VAPOR "TRADITIONAIRE" POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE	
TWIN STREAM DRIVE (PUBLIC)	3+17	15' L		

20. STREET LIGHTS WILL BE REQUIRED IN THIS DEVELOPMENT IN ACCORDANCE WITH THE DESIGN MANUAL STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SELECTED SHALL BE IN ACCORDANCE WITH THE LATEST HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)." THE JUNE 1993 POLICY INCLUDES GUIDELINES FOR LATERAL AND LONGITUDINAL PLACEMENT. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
21. BASED ON HOWARD COUNTY DATA, NO CEMETERIES OR HISTORIC STRUCTURES EXIST ON SITE.
22. PROJECT IS SUBJECT TO WAIVER PETITION WP-98-75. WAIVER IS TO SECTION 16.116(a)(2)(ii) OF THE SUBDIVISION REGULATIONS, WHICH RESTRICTS GRADING WITHIN STREAM BUFFERS, APPROVES MARCH 25, 1998 WITH THE FOLLOWING CONDITIONS: 1. THE HORIZONTAL ALIGNMENT OF THE PROPOSED PRIVATE ACCESS PLACE SHOULD FOLLOW THE OVERHEAD EASEMENT AS CLOSELY AS POSSIBLE. 2. INSURE THAT CREATED CUT SLOPES ARE NO STEEPER THAN 2:1 VERTICAL, OTHERWISE STRUCTURAL STABILIZATION WILL BE REQUIRED. 3. WAIVER APPROVAL APPLIES ONLY TO THE PROPOSED GRADING AND CLEARING FOR THE CUL-DE-SAC OF ROAD A, AND THE PRIVATE ACCESS PLACE EXTENDING FROM ITS TERMINUS.
23. ALL ROADS AND T-TURN AROUNDS ARE TO HAVE MOUNTABLE CURBS.
24. HOUSES NOT DRAINING TO SWM FACILITIES ARE TO HAVE DRY WELLS FOR WATER QUALITY.
25. EXISTING TREE LINE IS BASED ON AERIAL TOPOGRAPHY AND FOREST STAND DELINEATION.
26. JOINT PERMIT TRACKING NUMBER: 99-NT-0251/199964211.
27. FOR TRAFFIC CONTROL PLAN SEE SHEET 9 OF 12
28. BONNIE BRANCH ROAD IS A SCENIC ROAD.
29. THIS PROJECT IS SUBJECT TO BOARD OF APEALS CASE NO. BA 410-D
30. RETAINING WALLS ON BOTH SIDES OF THE PRIVATE ACCESS PLACE (TWIN STREAM DRIVE) ARE KEYSTONE RETAINING WALLS OR EQUIVALENT.
31. Landscape surety in the amount of $22,200.00 is part of the Developers Agreement.
32. CONCRETE TRASH PAD TO BE CONSTRUCTED AT STA: 2+79.85 AND STA: 3+08.85 (4'X10'X6").

project	date
96090	APR. 2000
illustration	engineering
MMP/SAA	MMP/SAA
scale	approval
AS SHWN	RJH

no.	description	date
1	ADD NOTE 32 & CHANGED STREET LIGHT LOCATION	11/20/00

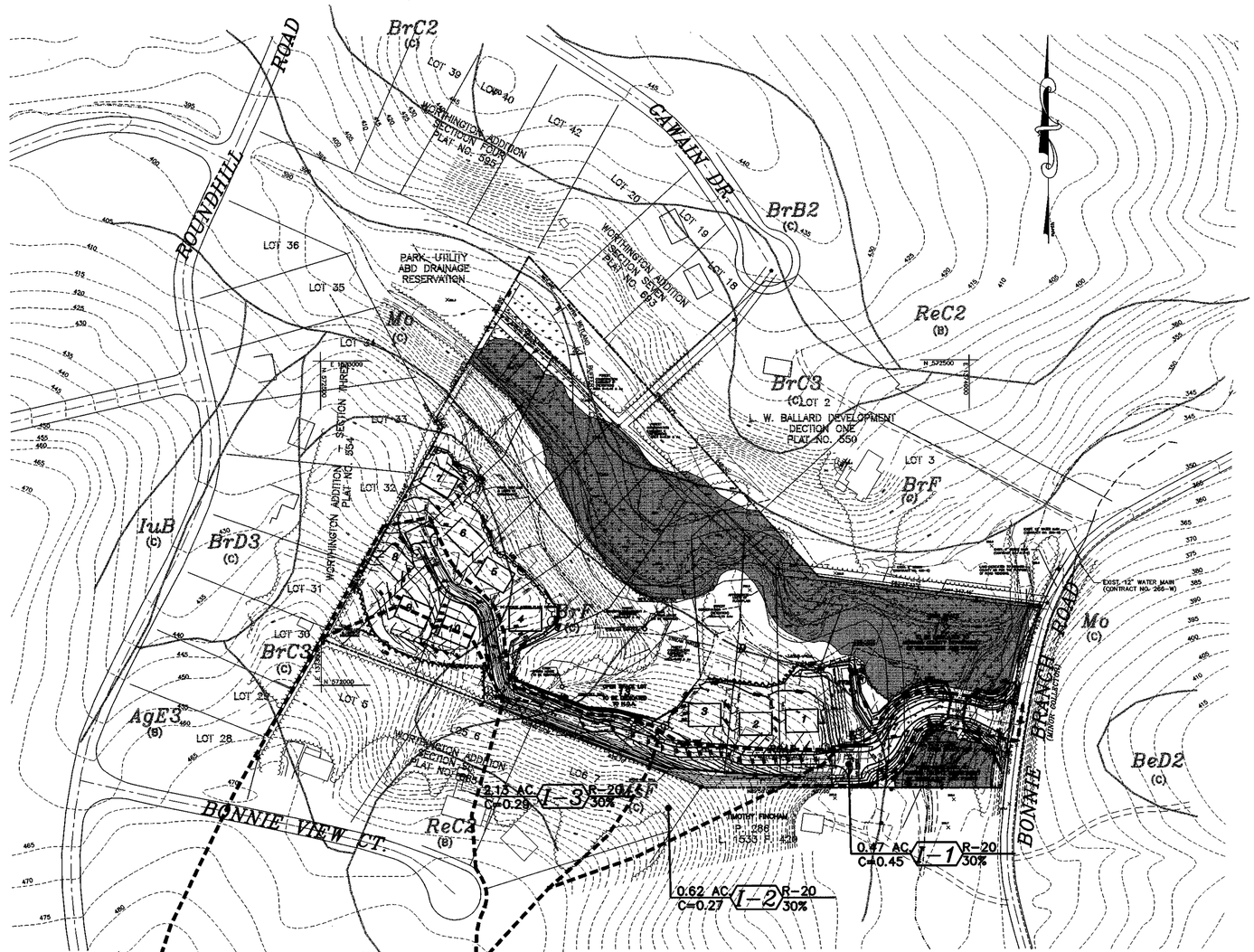
revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
COVER SHEET

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0298 Fax.

F-00-95

THIS PLAN IS FOR DEVELOPED DRAINAGE AREA ONLY



DENOTES FLOODPLAIN

DENOTES WETLANDS

SOILS DESCRIPTION

AgE3	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED
BeD2	BELTSVILLE SILT LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED
BrB2	BRANDYWINE LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
BrC3	BANDYWINE LOAM, 8 TO 15 PERCENT SLOPES, SEVERLY ERODED
BrD3	BRANDYWINE LOAM, 15 TO 25 PERCENT SLOPES, SEVERLY ERODED
BrF	BRANDYWINE LOAM, 25 TO 60 PERCENT SLOPES
IuB	IUKA LOAM, LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES
Mo	MIXED ALLUVIAL LAND
MsF	MONTALTO AND RELAY VERY STONY SILT LOAMS, 25 TO 60 PERCENT SLOPES
ReC2	RELAY SILT LOAM, 3 TO 15 PERCENT SLOPES, MODERATELY ERODED

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 4/28/00

PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF ENGINEER — DATE 4/28/00

P. TACK WIKANT
PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS: — DATE 5/24/00

SCD – NATURAL RESOURCE CONSERVATION SERVICE

THIS DEVELOPMENT PLAN IS APPROVED FOR EROSION AND SEDIMENT CONTROL BY THE SOIL CONSERVATION DISTRICT — DATE 5/24/00

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/DRAIN-DAM

project	date
96090	APR. 2000
illustration	engineering
MMP	MMP
scale	approval
1"=100'	RJH

no.	description	date
1	REVISED BRIDGE	10/25/01

revisions

TAX MAP 31, PARCEL 27

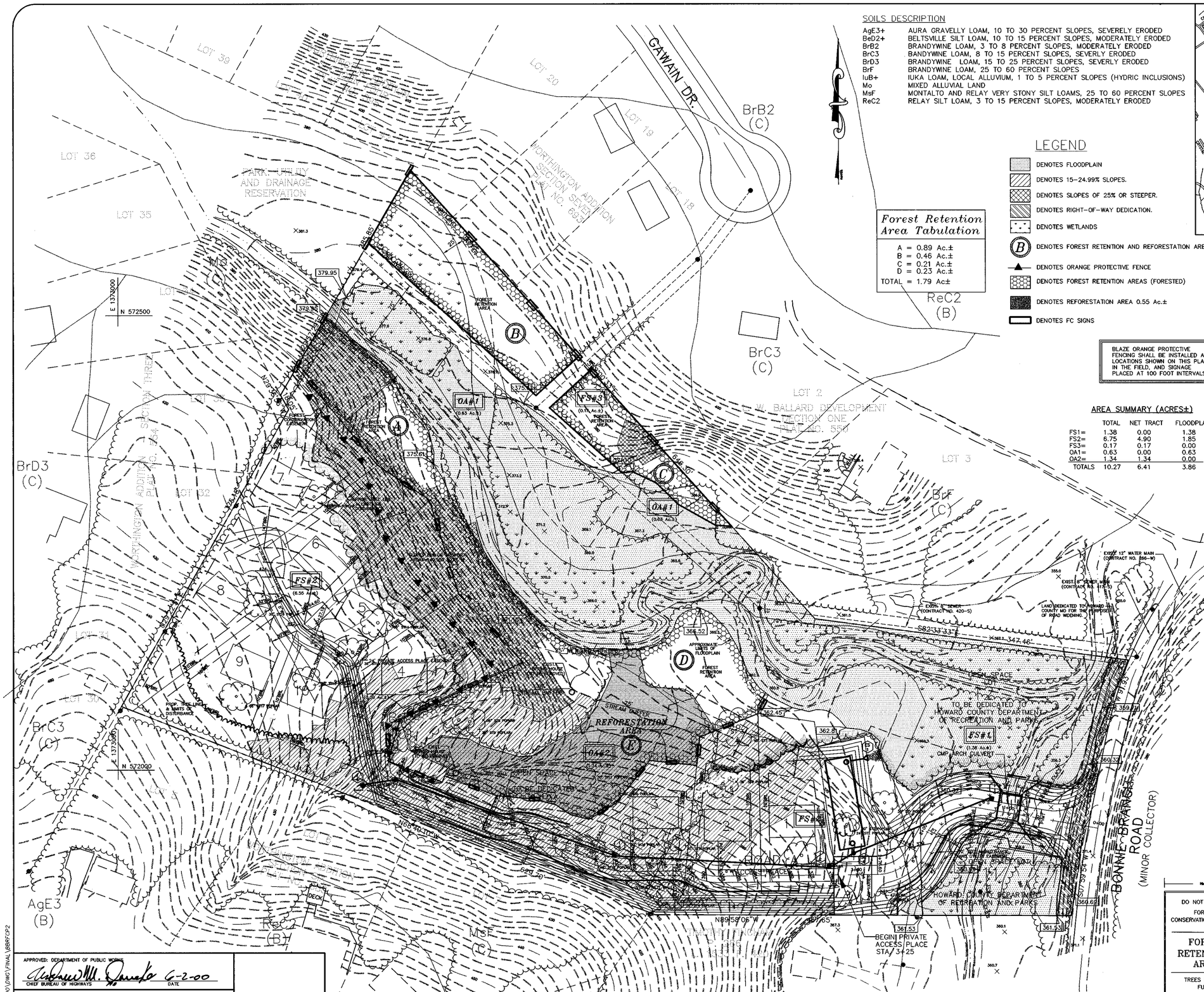
BONNIE BRANCH OVERLOOK

SECOND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

DRAINAGE AREA MAP

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95



SOILS DESCRIPTION

AgE3+	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED
BeD2+	BELTSVILLE SILT LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED
BrB2	BRANDYWINE LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
BrC3	BANDYWINE LOAM, 8 TO 15 PERCENT SLOPES, SEVERLY ERODED
BrD3	BRANDYWINE LOAM, 15 TO 25 PERCENT SLOPES, SEVERLY ERODED
BrF	BRANDYWINE LOAM, 25 TO 60 PERCENT SLOPES
IuB+	IUKA LOAM, LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES (HYDRIC INCLUSIONS)
Mo	MIXED ALLUVIAL LAND
MsF	MONTALTO AND RELAY VERY STONY SILT LOAMS, 25 TO 60 PERCENT SLOPES
ReC2	RELAY SILT LOAM, 3 TO 15 PERCENT SLOPES, MODERATELY ERODED

LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15-24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES FOREST RETENTION AND REFORESTATION AREAS
- DENOTES ORANGE PROTECTIVE FENCE
- DENOTES FOREST RETENTION AREAS (FORESTED)
- DENOTES REFORESTATION AREA 0.55 Ac.±
- DENOTES FC SIGNS

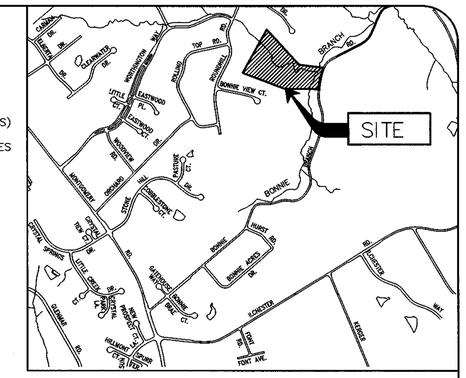
Forest Retention Area Tabulation

A =	0.89 Ac.±
B =	0.46 Ac.±
C =	0.21 Ac.±
D =	0.23 Ac.±
TOTAL =	1.79 Ac.±

BLAZE ORANGE PROTECTIVE FENCING SHALL BE INSTALLED AT LOCATIONS SHOWN ON THIS PLAN IN THE FIELD, AND SIGNAGE PLACED AT 100 FOOT INTERVALS.

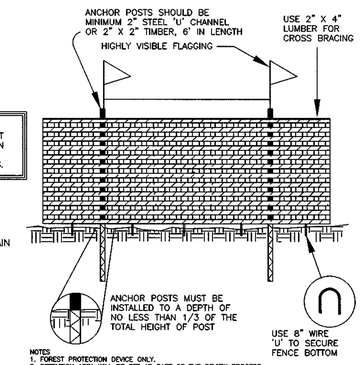
AREA SUMMARY (ACRES±)

	TOTAL	NET TRACT	FLOODPLAIN
FS1=	1.38	0.00	1.38
FS2=	6.75	4.90	1.85
FS3=	0.17	0.17	0.00
OA1=	0.63	0.00	0.63
OA2=	1.34	1.34	0.00
TOTALS	10.27	6.41	3.86



VICINITY MAP

SCALE: 1"=1000'



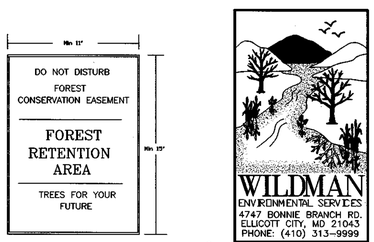
NOTES
1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT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

PROTECTIVE FENCE DETAIL
BLAZE ORANGE PLASTIC MESH

FOREST CONSERVATION WORKSHEET

I.	BASIC SITE DATA	
	GROSS TRACT AREA	10.27 Ac.±
	AREA WITHIN 100 YEAR FLOODPLAIN	3.40 Ac.±
	AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL	0.00 Ac.±
	NET TRACT AREA	6.87 Ac.±
	LAND USE CATEGORY OR ZONING	R-20
II.	INFORMATION FOR CALCULATIONS	
A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	AFFORESTATION THRESHOLD (15% x A)	N/A
D.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
E.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
F.	BREAK EVEN POINT (the amount of forest to be retained w/o mitigation)(. [(E x 0.2) + B]	2.11 Ac.±
G.	NET TRACT AREA FOREST TO BE RETAINED	1.79 Ac.±
III.	REFORESTATION CALCULATIONS	
A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
D.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
E.	FOREST AREAS TO BE CLEARED	3.28 Ac.±
F.	FOREST AREAS TO BE RETAINED (Net Tract Forest)	1.79 Ac.±
G.	FOREST AREAS CLEARED ABOVE FCT	3.28 Ac.±
H.	FOREST AREAS CLEARED BELOW FCT	0.00 Ac.±
I.	FOREST AREAS RETAINED ABOVE FCT	0.42 Ac.±
J.	OPEN AREA TO BE REFORESTED AND INCLUDED WITH "I" IN A FOREST CONSERVATION EASEMENT	0.55 Ac.±
K.	Clearing Above The Forest Conservation Threshold Only If Forest areas to be retained are at or above the FCT (if H equals or is more than B) the following applies:	
L.	TOTAL REFORESTATION FOR CLEARING ABOVE FCT (G x 1/4)	0.82 Ac.±
M.	CREDIT FOR FOREST RETAINED ABOVE FCT (K)	0.42 Ac.±
N.	TOTAL REFORESTATION REQUIRED	0.40 Ac.±
O.	TOTAL REFORESTATION TO BE PROVIDED ON-SITE WITHIN OA#2	0.55 Ac.±

NOTE: EXTRA REFORESTATION IN THE AMOUNT OF 0.15 ± Ac IS PROVIDED.



SIGNAGE DETAIL
NOT TO SCALE

Ronald R. Wildman 4/24/00
QUALIFIED PROFESSIONAL DATE:

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

THIS DRAWING IS TO BE USED FOR FOREST CONSERVATION PURPOSES ONLY

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/7/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

F:\96090\DWG\FINAL\BBRFCP2

project	date
96090	APR 2000
illustration	engineering
JEP	RBW
scale	approval
1"=50'	

no.	description	date
1	REVISED BRIDGE	10/25/01
	revisions	

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
FOREST CONSERVATION PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

ROAD CONSTRUCTION PLANS

BONNIE BRANCH OVERLOOK

LOTS 1 THRU 13

SECOND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SHEET INDEX	
COVER SHEET	1
ROAD PLAN AND PROFILES	2
GRADING, EROSION AND SEDIMENT CONTROL PLAN	3
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	4
SWM SPECIFICATIONS AND SOIL BORINGS	5
STROM DRAIN PROFILES AND DETAILS	6
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LANDSCAPE PLAN	10
FOREST CONSERVATION PLAN	11
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CONSPAN BRIDGE DETAILS	13 (C/S1)
CONSPAN BRIDGE DETAILS	14 (C/S2)
CONSPAN BRIDGE DETAILS	15 (C/S3)
CONSPAN BRIDGE DETAILS	16 (C/S4)
CONSPAN BRIDGE DETAILS	17 (C/S5)

OWNER

RONALD WILDMAN
4747 BONNIE BRANCH
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

BY THE DEVELOPER:

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

Ronald B. Wildman — 4/28/00
SIGNATURE OF DEVELOPER — DATE
Ronald B. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

4/28/00
SIGNATURE OF ENGINEER — DATE
B. JACOB HIKMAT
PRINTED NAME OF ENGINEER

STATE OF MARYLAND — B. JACOB HIKMAT — 17942 — PROFESSIONAL ENGINEER

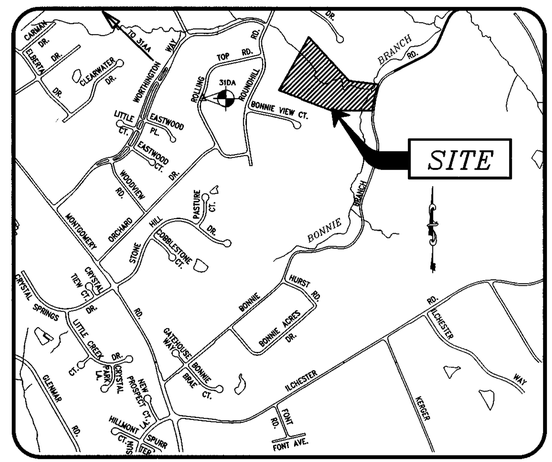
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS. — 5/24/00
Cheryl Simmons — 5/24/00
USDA - NATURAL RESOURCE CONSERVATION SERVICE — DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. — 5/24/00
John R Lamborn — 5/24/00
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
Andrew M. Darrah — 6/2/00
CHIEF BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
Cindy Hamilton — 6/19/00
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE
6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

96090/DWG/FINAL/COVER



VICINITY MAP

SCALE: 1"=1000'

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE (5) DAYS PRIOR TO ANY EXCAVATION WORK:

MISS UTILITY	1-800-257-7777
C&P TELEPHONE COMPANY	(410) 725-9976
HOWARD COUNTY BUREAU OF UTILITIES	(410) 313-4900
AT&T CABLE LOCATION DIVISION	(410) 393-3533
BALTIMORE GAS & ELECTRIC	(410) 685-0123
STATE HIGHWAY ADMINISTRATION	(410) 531-5533
HOWARD COUNTY DEPT. OF PUBLIC WORKS/ CONSTRUCTION INSPECTION DIVISION	(410) 313-1880

3. PROJECT BACKGROUND:

LOCATION: SECOND ELECTION DISTRICT – TAX MAP 31 – PARCEL 27	
ZONING: R-20	
DEED REFERENCE :	L. 3887 F. 579
TOTAL TRACT AREA :	10.27 ACRES ±
NUMBER OF PROPOSED LOTS:	13 (10 BUILDABLE)
ACREAGE OF PROPOSED BUILDABLE LOTS :	3.76 ACRES ±
OPEN SPACE REQUIRED :	3.08 ACRES ± (30%)
OPEN SPACE PROVIDED :	6.09 ACRES ±
AREA OF RIGHT OF WAY:	0.42 ACRES±
DPZ REFERENCE #: – SP-97-20, WP-98-75, P-99-03, BA 410-D	
WATER AND SEWER CONTRACT #	14-3823-D

4. TOPOGRAPHIC INFORMATION ARE BASED ON AERIAL TOPOGRAPHIC SURVEY BY WINGS AERIAL MAPPING CO., INC. ON MARCH 12, 1997.
5. HORIZONTAL AND VERTICAL DATUMS BASED ON (NAD'83) MARYLAND STATE COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS.

STA No. 31AA	N 573,998.5709 E 1,369,934.229	EL.= 500.157
STA No. 31DA	N 571,982.6701 E 1,372,145.075	EL.= 482.35

6. FLOODPLAIN DELINEATION IS BASED ON STUDY BY MILDENBERG BOENDER AND ASSOCIATES, INC. AND UPDATED JULY 1998. AND UPDATED DECEMBER 1999.
7. PUBLIC WATER AND SEWER WILL BE AVAILABLE UNDER CONTRACT #417-S AND #266-W.
8. STORMWATER MANAGEMENT IS PROVIDED VIA PRIVATE DETENTION FACILITY & STORMCEPTOR STORMWATER MANAGEMENT WILL BE PRIVATELY OWNED AND MAINTAINED. DRY WELLS WILL BE USED FOR LOTS 1-7.
9. TRAFFIC CONTROL DEVICES, MARKINGS, AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
10. COMPACTION IN FILL AREAS TO BE 95% AS DETERMINED PER AASHTO T-180.
11. CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES ON SITE PRIOR TO COMMENCING CONSTRUCTION.
12. FOREST CONSERVATION REQUIREMENTS HAVE BEEN SATISFIED ON SITE VIA RETENTION AND REFORESTATION.

FOREST CONSERVATION AREA =1.79 Ac	SURETY AMOUNT=	$7,797.20
REFORESTATION AREA =0.55 Ac	SURETY AMOUNT=	$7,187.40
	TOTAL SURETY REQUIRED =	$14,984.60

13. WETLANDS STUDY AND FOREST STAND DELINEATION IS WILDMAN ENVIRONMENTAL SERVICES, INC. DATED MARCH 1997.
14. PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
15. OPEN SPACE LOT 13 WILL BE OWNED BY THE HOME OWNER'S ASSOCIATION, LOTS 11 & 12 WILL BE OWNED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
16. SLOPES IN EXCESS OF 25% EXIST AND ARE IDENTIFIED WHERE THEY EXCEED 20,000 SQ. FT.
17. ALL EXISTING STRUCTURES TO BE REMOVED.
18. A MINIMUM OF TWO (2) PARKING SPACES ARE PROVIDED ON EACH LOT. NO OFF-STREET PARKING IS REQUIRED.
19. THE STREET LIGHT LOCATIONS AND TYPES OF LIGHTS ARE AS FOLLOWS :

STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE	NOTES
TWIN STREAM DRIVE (PUBLIC)	0+26	30' R	150-watt HPS VAPOR PENDANT FIXTURE (CUTOFF) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM.	ANGLE ARM AS SHOWN SHEET # 2
TWIN STREAM DRIVE (PUBLIC)	1+61	14' R	100 watt HPS VAPOR "TRADITIONAIRE" POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE	
TWIN STREAM DRIVE (PUBLIC)	3+17	15' L		

20. STREET LIGHTS WILL BE REQUIRED IN THIS DEVELOPMENT IN ACCORDANCE WITH THE DESIGN MANUAL STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SELECTED SHALL BE IN ACCORDANCE WITH THE LATEST HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)." THE JUNE 1993 POLICY INCLUDES GUIDELINES FOR LATERAL AND LONGITUDINAL PLACEMENT. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
21. BASED ON HOWARD COUNTY DATA, NO CEMETERIES OR HISTORIC STRUCTURES EXIST ON SITE.
22. PROJECT IS SUBJECT TO WAIVER PETITION WP-98-75. WAIVER IS TO SECTION 16.116(a)(2)(ii) OF THE SUBDIVISION REGULATIONS. WHICH RESTRICTS GRADING WITHIN STREAM BUFFERS. APPROVED MARCH 25, 1998 WITH THE FOLLOWING CONDITIONS: 1. THE HORIZONTAL ALIGNMENT OF THE PROPOSED PRIVATE ACCESS PLACE SHOULD FOLLOW THE OVERHEAD EASEMENT AS CLOSELY AS POSSIBLE. 2. INSURE THAT CREATED CUT SLOPES ARE NO STEEPER THAN 2:1 VERTICAL. OTHERWISE STRUCTURAL STABILIZATION WILL BE REQUIRED. 3. WAIVER APPROVAL APPLIES ONLY TO THE PROPOSED GRADING AND CLEARING FOR THE CUL-DE-SAC OF ROAD A, AND THE PRIVATE ACCESS PLACE EXTENDING FROM ITS TERMINUS.
23. ALL ROADS AND T-TURN AROUNDS ARE TO HAVE MOUNTABLE CURBS.
24. HOUSES NOT DRAINING TO SWM FACILITIES ARE TO HAVE DRY WELLS FOR WATER QUALITY.
25. EXISTING TREE LINE IS BASED ON AERIAL TOPOGRAPHY AND FOREST STAND DELINEATION.
26. JOINT PERMIT TRACKING NUMBER: 99-NT-0251/199964211.
27. FOR TRAFFIC CONTROL PLAN SEE SHEET 9 OF 12
28. BONNIE BRANCH ROAD IS A SCENIC ROAD.
29. THIS PROJECT IS SUBJECT TO BOARD OF APEALS CASE NO. BA 410-D
30. RETAINING WALLS ON BOTH SIDES OF THE PRIVATE ACCESS PLACE (TWIN STREAM DRIVE) ARE KEYSTONE RETAINING WALLS OR EQUIVALENT.
31. Landscape surety in the amount of $22,200.00 is part of the Developers Agreement.
32. CONCRETE TRASH PAD TO BE CONSTRUCTED AT STA: 2+79.85 AND STA: 3+08.85 (4'X10'X6").

project	date
96090	APR., 2000
illustration: MMP/SAA	engineering: MMP/SAA
scale: AS SHWN	approval: RJH

no.	description	date
1	ADD NOTE 32 & CHANGED STREET LIGHT LOCATION	11/20/00

revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
COVER SHEET

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

LEGEND

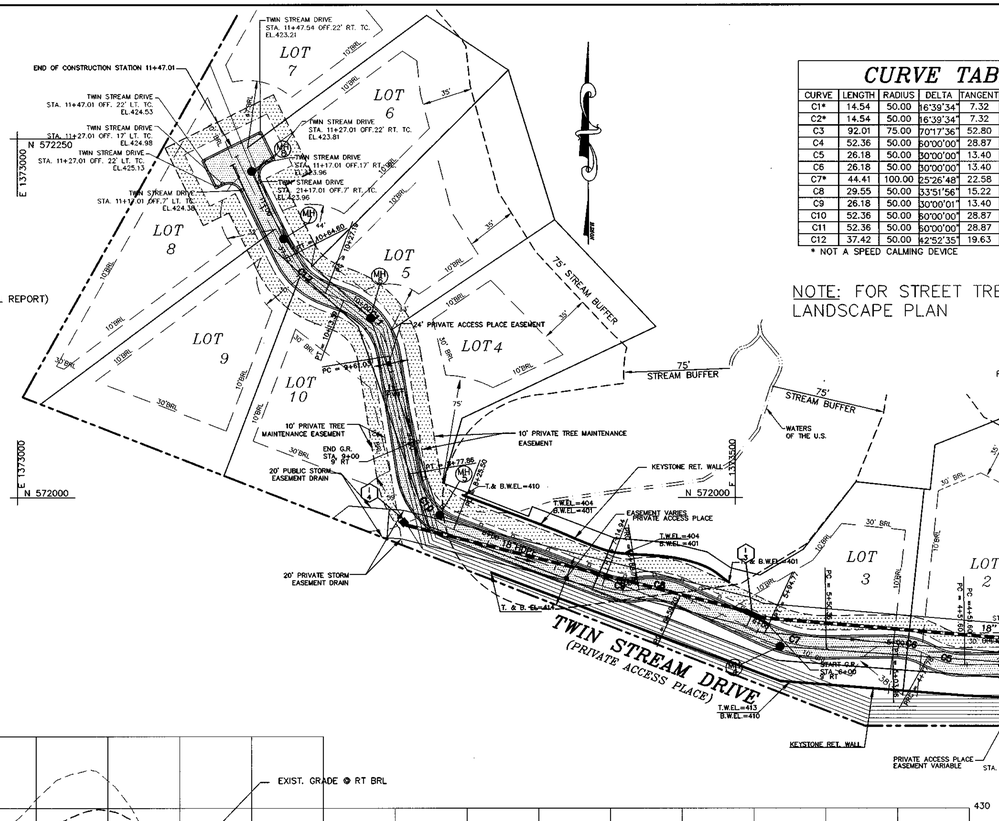
- DENOTES FLOOD PLAIN
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES PAVEMENT
- DENOTES CONCRETE PLATFORM
- DENOTES 95% BACKFILL
- DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

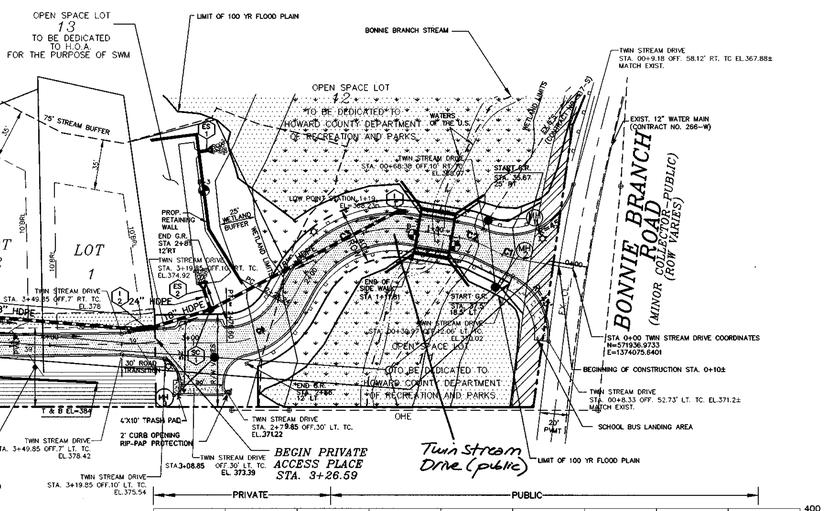
CURVE TABLE

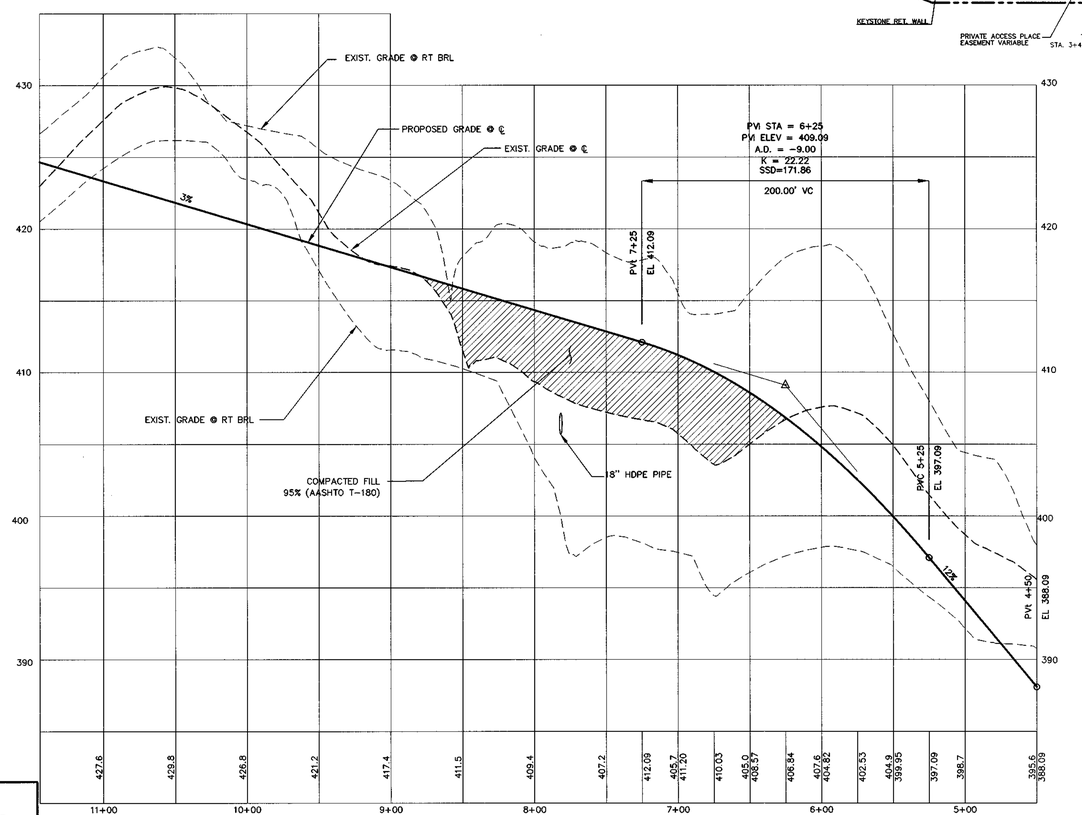
CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	BEARING
C1*	14.54	50.00	16°39'34"	7.32	14.49	S72°05'32"E
C2*	14.54	50.00	16°39'34"	7.32	14.49	N72°05'32"W
C3	92.01	75.00	70°17'36"	52.80	86.35	S64°25'52"W
C4	52.36	50.00	60°00'00"	28.87	50.00	N59°17'04"E
C5	26.18	50.00	30°00'00"	13.40	25.88	S75°42'56"E
C6	26.18	50.00	30°00'00"	13.40	25.88	N75°42'56"W
C7*	44.41	100.00	25°26'48"	22.58	44.05	S77°59'32"E
C8	29.55	50.00	33°51'56"	15.22	29.13	N82°12'06"W
C9	26.18	50.00	30°00'01"	13.40	25.88	S84°08'04"E
C10	52.36	50.00	60°00'00"	28.87	50.00	S39°08'04"E
C11	52.36	50.00	60°00'00"	28.87	50.00	N39°08'04"W
C12	37.42	50.00	42°52'35"	19.63	36.55	S47°41'46"E

* NOT A SPEED CALMING DEVICE

NOTE: FOR STREET TREES LOCATION SEE LANDSCAPE PLAN



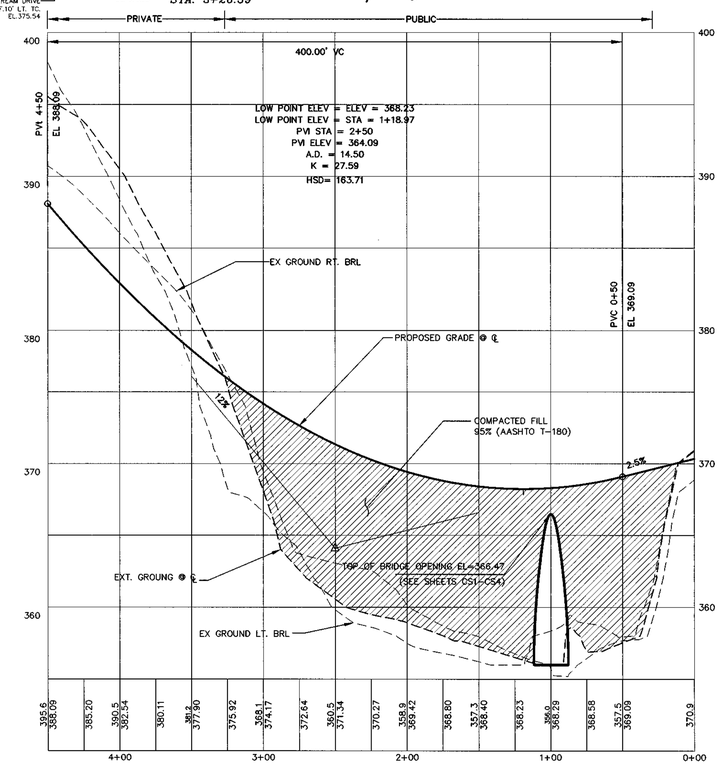




TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE(PRIVAE)
DESIGN SPEED: 25 MPH(VERTICAL)



TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE
DESIGN SPEED: 25 MPH(VERTICAL)

STATE OF MARYLAND — JACOB HOLLAT — 17946 — PROFESSIONAL ENGINEER

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/9/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/RD-PROF

no.	description	date
1	ADD TRASH PAD & CHANGED STREET LIGHT LOCATION	11/10/00

revisions

project 96090	date APR. 2000		
illustration	engineering		
SAA	MMP		
scale	approval		
1"=50'	RJH		

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
ROAD PLAN AND PROFILES

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

NOTE: THIS DRAWING IS TO BE USED FOR LANDSCAPE PLAN PURPOSES ONLY.

NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL
2. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $ 22,200.00 .

PUBLIC STREET TREE CALCULATIONS

BONNIE BRANCH ROAD - 250 LF OF CREDIT FOR EXISTING TREES
TWIN STREAM DRIVE - 580 / 40 = 14
TOTAL TREES REQUIRED = 14 TREES
TOTAL TREES PROVIDED = 14 TREES

PRIVATE STREET TREE CALCULATIONS

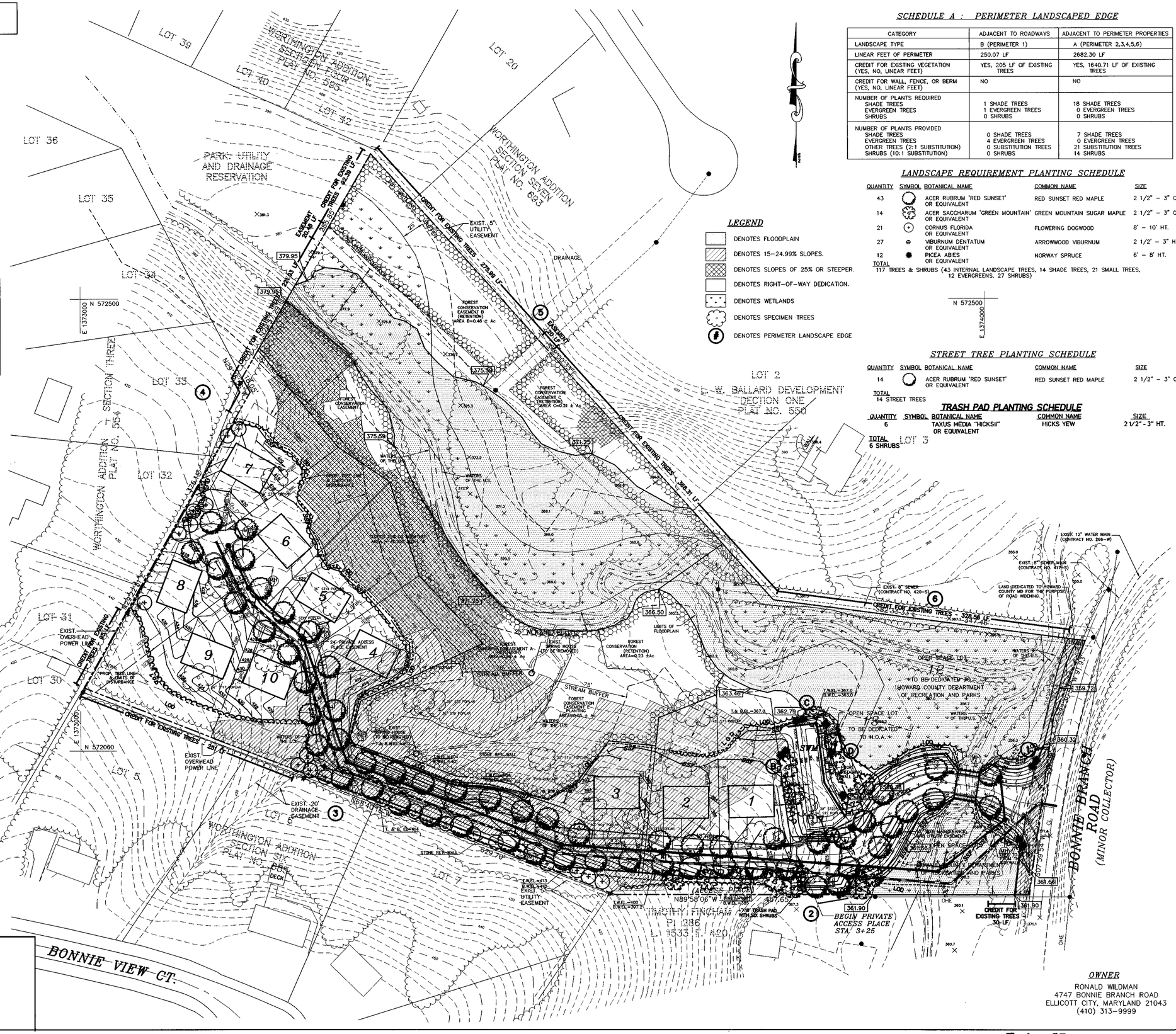
TWIN STREAM DRIVE - 1,694 / 40 = 43
TOTAL TREES REQUIRED = 43 TREES
TOTAL TREES PROVIDED = 43 TREES

SCHEDULE D : STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER	325 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	N/A
NUMBER OF TREES REQUIRED SHADE TREES EVERGREEN TREES	 7 SHADE TREES 9 EVERGREEN TREES
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES OTHER (10:1 SUBSTITUTION)	 7 SHADE TREES 8 EVERGREEN TREES 13 SHRUBS

PERIMETER	EDGE TYPE
PERIMETER 1	
ENTRANCE – 40 LF	N/A
SFD SIDE TO ROAD – 205 LF EXISTING TREES TO REMAIN	B
SFD SIDE TO ROAD TO ROAD – 45.07 LF 1 SHADE TREE / 50 LF 1 1 EVERGREEN / 40 LF 1	B
PERIMETER 2	
OPEN SPACE TO SFD – 30 LF EXISTING TREES TO REMAIN	A
OPEN SPACE TO SFD – 412.74 LF 1 SHADE TREE / 60 LF 7	A
PERIMETER 3	
SFD TO SFD – 251 LF EXISTING TREES TO REMAIN	A
SFD & OPEN SPACE TO SFD – 378.70 LF 1 SHADE TREE / 60 LF 7	A
PERIMETER 4	
EASEMENT – 20.48 LF	N/A
SFD & OPEN SPACE TO SFD – 408.42 LF EXISTING TREES TO REMAIN	A
SFD TO SFD – 250.15 LF 1 SHADE TREE / 60 LF 4	A
PERIMETER 5	
EASEMENTS – 41.57 LF	N/A
OPEN SPACE TO SFD – 622.73 LF EXISTING TREES TO REMAIN	A
PERIMETER 6	
OPEN SPACE TO SFD – 328.56 LF EXISTING TREES TO REMAIN	A
TOTAL PLANTING OBLIGATION	
SHADE TREES 19	
EVERGREEN TREES 1	
SHRUBS 0	

SWM PERIMETER	EDGE TYPE
SWM PERIMETER A – 50 LF 1 SHADE TREE / 50 LF 1 1 EVERGREEN / 40 LF 1	B
SWM PERIMETER B – 110 LF 1 SHADE TREE / 50 LF 2 1 EVERGREEN / 40 LF 3	B
SWM PERIMETER C – 55 LF 1 SHADE TREE / 50 LF 1 1 EVERGREEN / 40 LF 2	B
SWM PERIMETER D – 110 LF 1 SHADE TREE / 50 LF 3 1 EVERGREEN / 40 LF 3	B
TOTAL PLANTING OBLIGATION	
SHADE TREES 7	
EVERGREEN TREES 9	
SHRUBS 0	



SCHEDULE A : PERIMETER LANDSCAPED EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	B (PERIMETER 1)	A (PERIMETER 2,3,4,5,6)
LINEAR FEET OF PERIMETER	250.07 LF	2682.30 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	YES, 205 LF OF EXISTING TREES	YES, 1640.71 LF OF EXISTING TREES
CREDIT FOR WALL, FENCE, OR BERM (YES, NO, LINEAR FEET)	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	 1 SHADE TREES 1 EVERGREEN TREES 0 SHRUBS	 18 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) SHRUBS (10:1 SUBSTITUTION)	 0 SHADE TREES 4 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	 7 SHADE TREES 0 EVERGREEN TREES 21 SUBSTITUTION TREES 14 SHRUBS

LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15-24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES SPECIMEN TREES
- DENOTES PERIMETER LANDSCAPE EDGE

LANDSCAPE REQUIREMENT PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
43		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.
14		ACER SACCHARUM 'GREEN MOUNTAIN' OR EQUIVALENT	GREEN MOUNTAIN SUGAR MAPLE	2 1/2" – 3" CAL.
21		CORNUS FLORIDA OR EQUIVALENT	FLOWERING DOGWOOD	8' – 10' HT.
27		VIBURNUM DENTATUM OR EQUIVALENT	ARROWWOOD VIBURNUM	2 1/2' – 3" HT.
12		PICEA ABIES OR EQUIVALENT	NORWAY SPRUCE	6' – 8' HT.

TOTAL
117 TREES & SHRUBS (43 INTERNAL LANDSCAPE TREES, 14 SHADE TREES, 21 SMALL TREES, 12 EVERGREENS, 27 SHRUBS)

STREET TREE PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
14		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.

TOTAL
14 STREET TREES

TRASH PAD PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
6		TAXUS MEDIA "HICKSII" OR EQUIVALENT	HICKS YEW	2 1/2" - 3" HT.

TOTAL
6 SHRUBS

OWNER

RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00
APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/PLP

project	date
96090	APR 2000
illustration	engineering
MPP/SAA	SJD
scale	approval
1"=50'	MMP

no.	description	date
1	ADD TRASH PAD & TRASH PAD PLANTING SCHEDULE	11/16/00

revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
LANDSCAPE PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

LEGEND

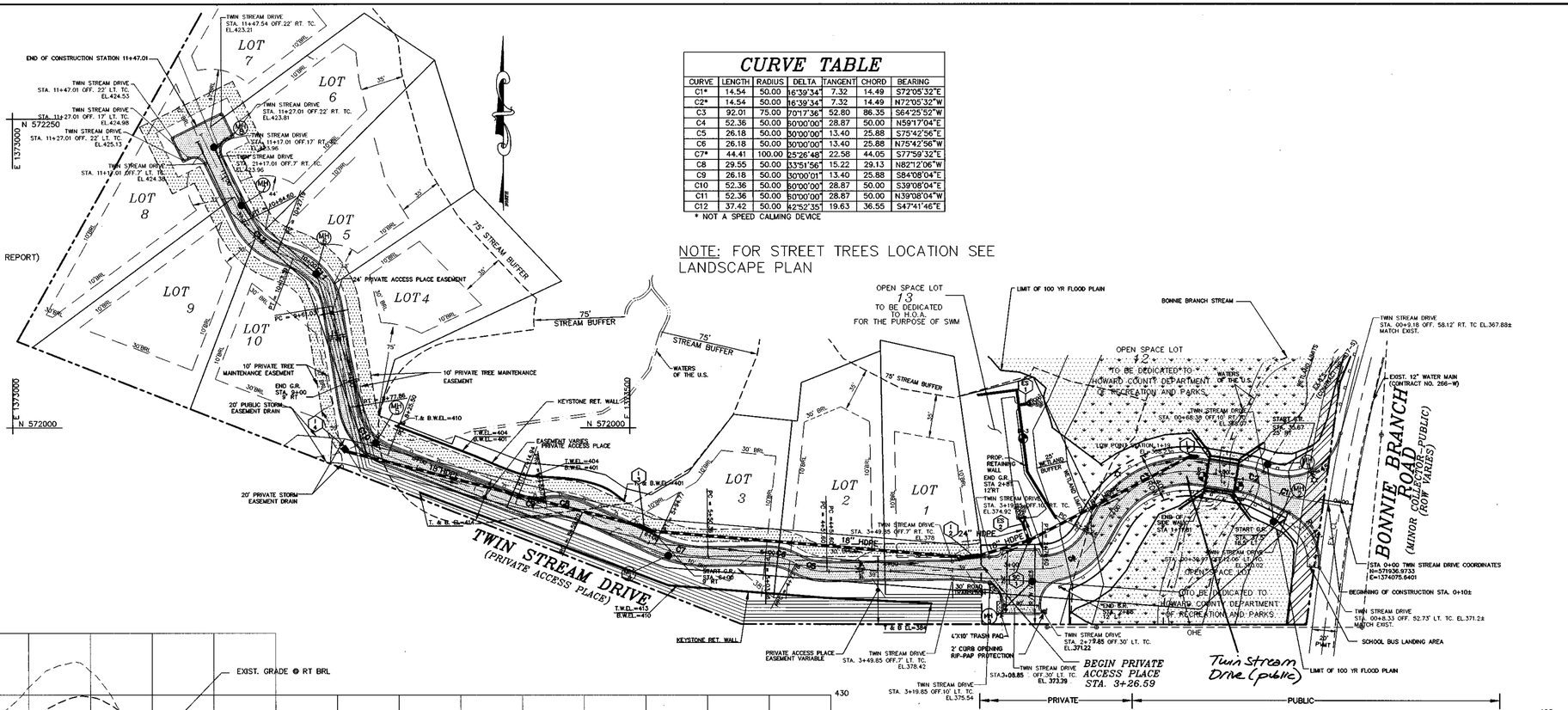
- DENOTES FLOOD PLAIN
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES PAVEMENT
- DENOTES CONCRETE PLATFORM
- DENOTES 95% BACKFILL
- DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

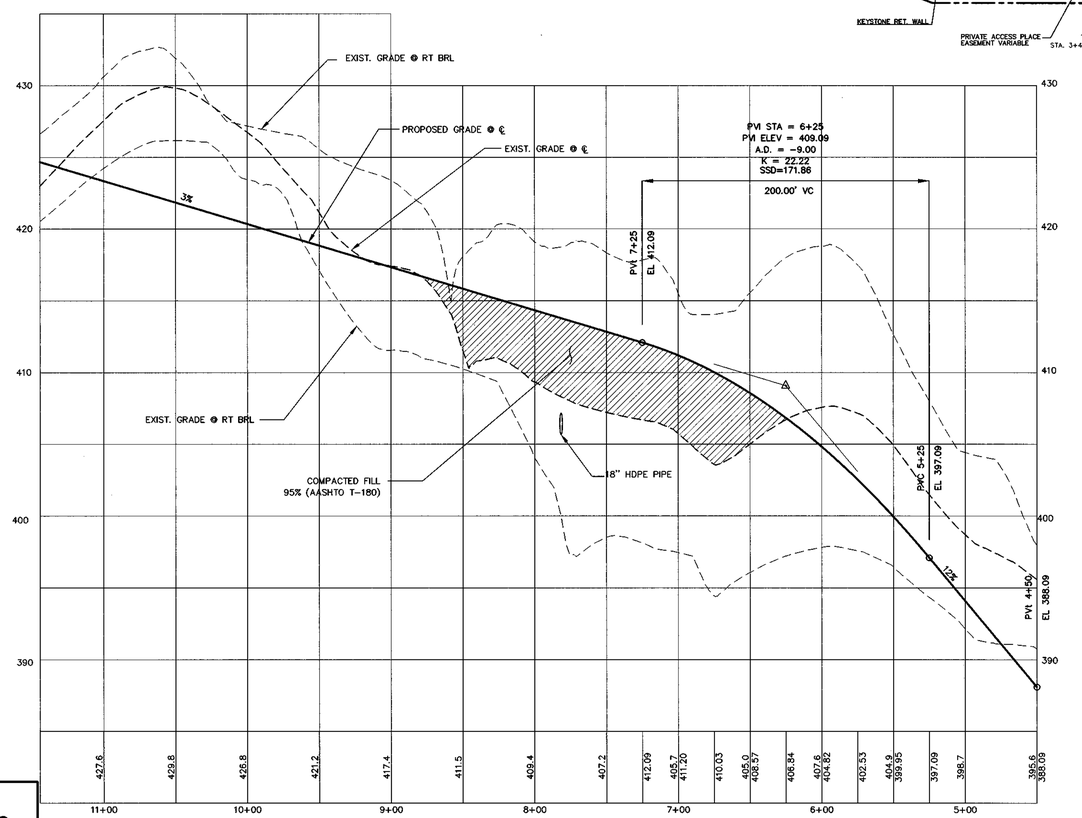
CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	BEARING
C1*	14.54	50.00	16°39'34"	7.32	14.49	S72°05'32"E
C2*	14.54	50.00	16°39'34"	7.32	14.49	N72°05'32"W
C3	92.01	75.00	70°17'36"	52.80	86.35	S64°25'52"W
C4	52.36	50.00	60°00'00"	28.87	50.00	N59°17'04"E
C5	26.18	50.00	30°00'00"	13.40	25.88	S75°42'56"E
C6	26.18	50.00	30°00'00"	13.40	25.88	N75°42'56"W
C7*	44.41	100.00	25°26'48"	22.58	44.05	S77°59'32"E
C8	29.55	50.00	33°51'56"	15.22	29.13	N82°12'06"W
C9	26.18	50.00	30°00'01"	13.40	25.88	S84°08'04"E
C10	52.36	50.00	60°00'00"	28.87	50.00	S39°08'04"E
C11	52.36	50.00	60°00'00"	28.87	50.00	N39°08'04"W
C12	37.42	50.00	42°52'35"	19.63	36.55	S47°41'46"E

* NOT A SPEED CALMING DEVICE

NOTE: FOR STREET TREES LOCATION SEE LANDSCAPE PLAN

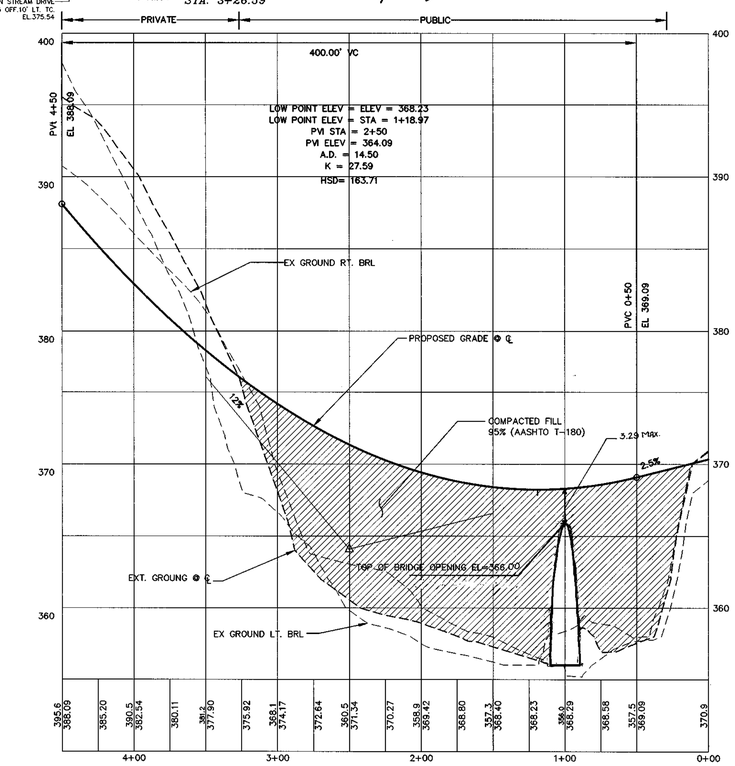




TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE(PRIVAE)
DESIGN SPEED: 25 MPH(VERTICAL)



TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE
DESIGN SPEED: 25 MPH(VERTICAL)

STATE OF MARYLAND — JACOB HERLAN — 17842 — PROFESSIONAL ENGINEER

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/12/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/RD-PROF

project	date
96090	APR. 2000
illustration	engineering
SAA	MMP
scale	approval
1"=50'	RJH

no.	revisions description	date
2	REVISED BRIDGE & PROFILE	10/25/01
1	ADD TRASH PAD & CHANGED STREET LIGHT LOCATION	11/10/00

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
ROAD PLAN AND PROFILES

MILDENBERG, BOENDER & ASSOC., INC.
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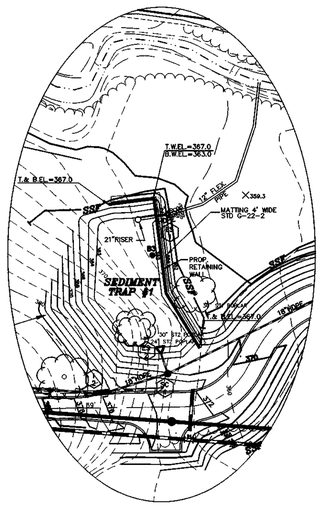
F-00-95

THIS DRAWING IS TO BE USED FOR GRADING PLAN PURPOSES ONLY



SEDIMENT TRAP DATA

TYPE:	ST-I PIPE OUTLET
DRAINAGE AREA:	3.22 ACRES
TOTAL VOLUME REQUIRED:	11,592 C.F.
TOTAL VOLUME PROVIDED:	15,855 C.F.
WET STORAGE REQUIRED:	5,796 C.F.
WET STORAGE PROVIDED:	6,995 C.F.
WET STORAGE EL:	364.5
DRY STORAGE REQUIRED:	5,796 C.F.
DRY STORAGE PROVIDED:	7,860 F.F.
DRY STORAGE EL:	366.0
RISER SIZE	21"
BARREL SIZE:	12"

BY THE DEVELOPER:

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

Ronald P. Wildman — 4/28/00
SIGNATURE OF DEVELOPER — DATE
Ronald P. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

4/28/00
SIGNATURE OF ENGINEER — DATE
R. JACOB WILKMAT
PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS

5/24/00
USDA - NATURAL RESOURCE CONSERVATION SERVICE — DATE

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

5/24/00
HOWARD SOIL CONSERVATION DISTRICT — DATE

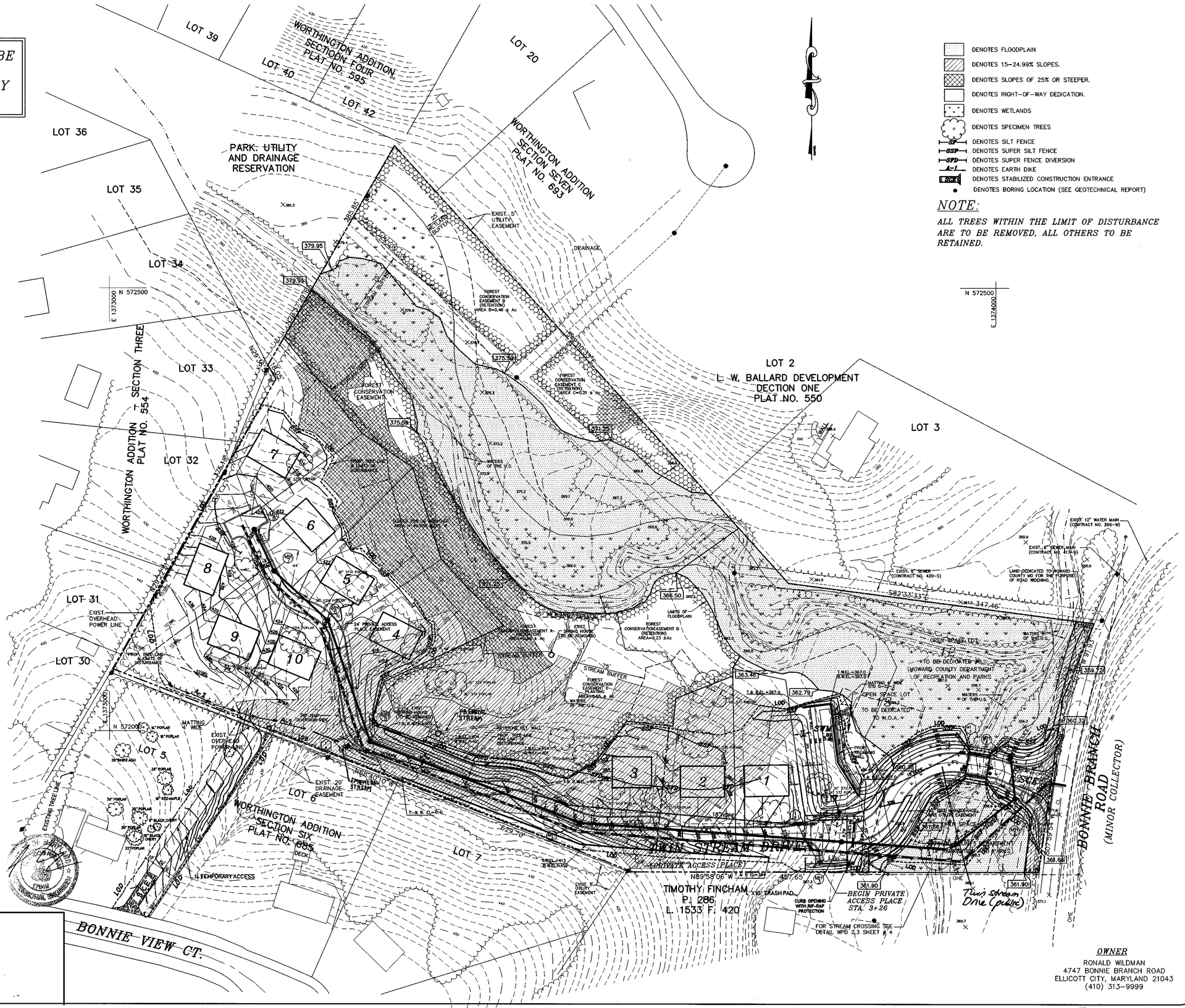
APPROVED: DEPARTMENT OF PUBLIC WORKS

6-2-00
CHIEF BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

6/19/00
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE



DENOTES FLOODPLAIN
DENOTES 15-24.99% SLOPES.
DENOTES SLOPES OF 25% OR STEEPER.
DENOTES RIGHT-OF-WAY DEDICATION.
DENOTES WETLANDS
DENOTES SPECIMEN TREES
SF — DENOTES SILT FENCE
SSF — DENOTES SUPER SILT FENCE
SFD — DENOTES SUPER FENCE DIVERSION
A-1 — DENOTES EARTH DIKE
S.S.A.E. — DENOTES STABILIZED CONSTRUCTION ENTRANCE
DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

NOTE:

ALL TREES WITHIN THE LIMIT OF DISTURBANCE ARE TO BE REMOVED, ALL OTHERS TO BE RETAINED.

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

project	date
96090	APR 2000
illustration	engineering
MPP/SAA	MMP/SAA
scale	approval
1"=50'	RJH

no.	description	date
3	REVISED BRIDGE	10/25/01
2	ADD TEMPORARY ACCESS FOR CONSTRUCTION	11/2/00
1	ADD TRASH PAD	10/26/00

revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
GRADING EROSION AND SEDIMENT CONTROL PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5531 Wash. (410) 997-0298 Fax.

3 OF 17

96090/DWG/FINAL/GRADE

F-00-95

NOTE: THIS DRAWING IS TO BE USED FOR LANDSCAPE PLAN PURPOSES ONLY.

NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL
2. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $ 22,200.00 .

PUBLIC STREET TREE CALCULATIONS

BONNIE BRANCH ROAD - 250 LF OF CREDIT FOR EXISTING TREES
TWIN STREAM DRIVE - 580 / 40 = 14
TOTAL TREES REQUIRED = 14 TREES
TOTAL TREES PROVIDED = 14 TREES

PRIVATE STREET TREE CALCULATIONS

TWIN STREAM DRIVE - 1,694 / 40 = 43
TOTAL TREES REQUIRED = 43 TREES
TOTAL TREES PROVIDED = 43 TREES

SCHEDULE D : STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER	325 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	N/A
NUMBER OF TREES REQUIRED SHADE TREES EVERGREEN TREES	 7 SHADE TREES 9 EVERGREEN TREES
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES OTHER (10:1 SUBSTITUTION)	 7 SHADE TREES 8 EVERGREEN TREES 13 SHRUBS

PERIMETER		EDGE TYPE
PERIMETER 1		
ENTRANCE – 40 LF		N/A
SFD SIDE TO ROAD – 205 LF EXISTING TREES TO REMAIN		B
SFD SIDE TO ROAD TO ROAD – 45.07 LF		B
1 SHADE TREE / 50 LF	1	
1 EVERGREEN / 40 LF	1	
PERIMETER 2		
OPEN SPACE TO SFD – 30 LF EXISTING TREES TO REMAIN		A
OPEN SPACE TO SFD – 412.74 LF		A
1 SHADE TREE / 60 LF	7	
PERIMETER 3		
SFD TO SFD – 251 LF EXISTING TREES TO REMAIN		A
SFD & OPEN SPACE TO SFD – 378.70 LF		A
1 SHADE TREE / 60 LF	7	
PERIMETER 4		
EASEMENT – 20.48 LF		N/A
SFD & OPEN SPACE TO SFD – 408.42 LF EXISTING TREES TO REMAIN		A
SFD TO SFD – 250.15 LF		A
1 SHADE TREE / 60 LF	4	
PERIMETER 5		
EASEMENTS – 41.57 LF		N/A
OPEN SPACE TO SFD – 622.73 LF EXISTING TREES TO REMAIN		A
PERIMETER 6		
OPEN SPACE TO SFD – 328.56 LF EXISTING TREES TO REMAIN		A
TOTAL PLANTING OBLIGATION		
SHADE TREES	19	
EVERGREEN TREES	1	
SHRUBS	0	

SWM PERIMETER		EDGE TYPE
SWM PERIMETER A – 50 LF		B
1 SHADE TREE / 50 LF	1	
1 EVERGREEN / 40 LF	1	
SWM PERIMETER B – 110 LF		B
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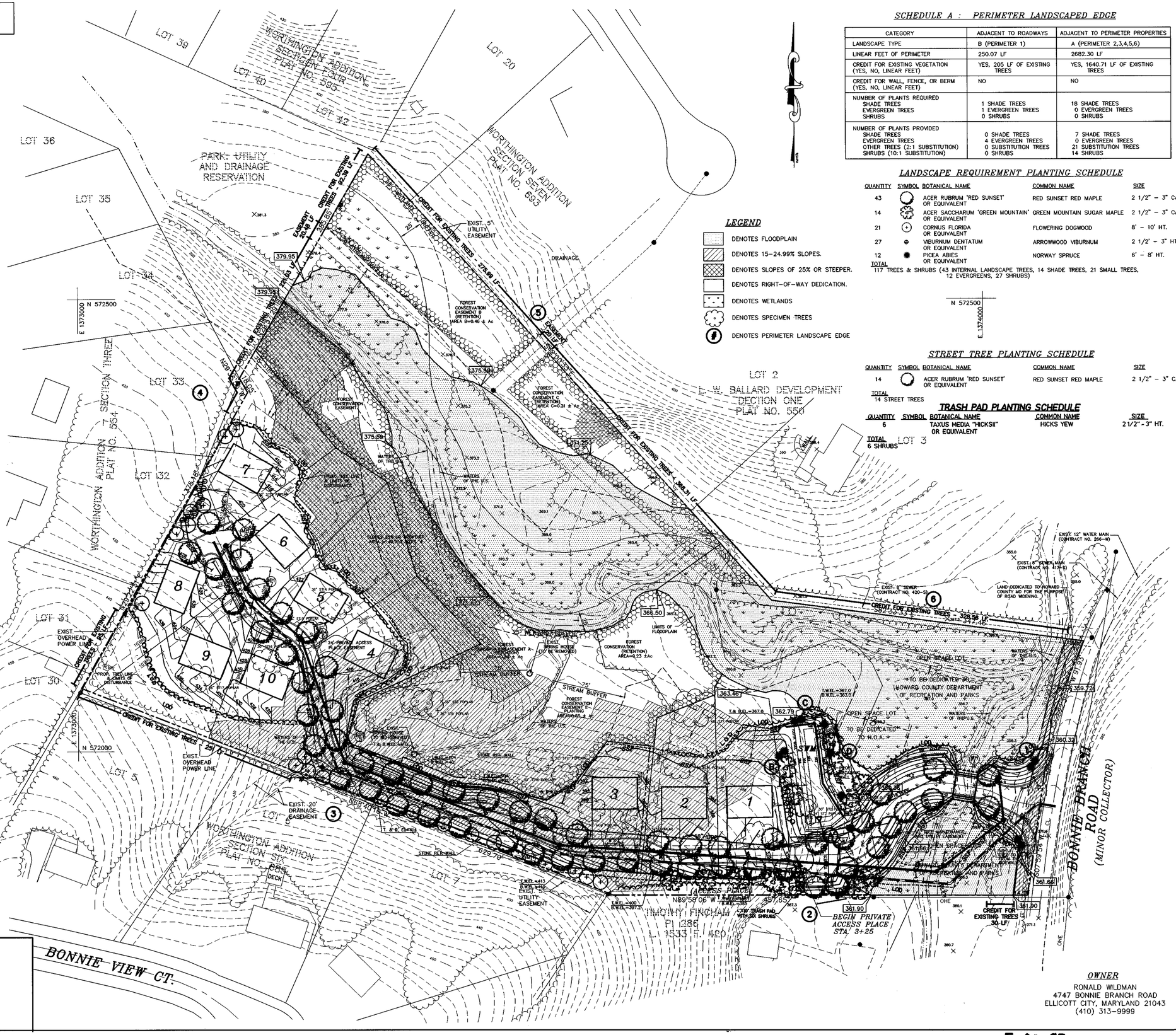
1 EVERGREEN / 40 LF	3	
SWM PERIMETER C – 55 LF		B
1 SHADE TREE / 50 LF	1	
1 EVERGREEN / 40 LF	2	
SWM PERIMETER D – 110 LF		B
1 SHADE TREE / 50 LF	3	
1 EVERGREEN / 40 LF	3	
TOTAL PLANTING OBLIGATION		
SHADE TREES	7	
EVERGREEN TREES	9	
SHRUBS	0	



LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15-24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES SPECIMEN TREES
- DENOTES PERIMETER LANDSCAPE EDGE

SCHEDULE A : PERIMETER LANDSCAPED EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	B (PERIMETER 1)	A (PERIMETER 2,3,4,5,6)
LINEAR FEET OF PERIMETER	250.07 LF	2682.30 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	YES, 205 LF OF EXISTING TREES	YES, 1640.71 LF OF EXISTING TREES
CREDIT FOR WALL, FENCE, OR BERM (YES, NO, LINEAR FEET)	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	 1 SHADE TREES 1 EVERGREEN TREES 0 SHRUBS	 18 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) SHRUBS (10:1 SUBSTITUTION)	 0 SHADE TREES 4 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	 7 SHADE TREES 0 EVERGREEN TREES 21 SUBSTITUTION TREES 14 SHRUBS

LANDSCAPE REQUIREMENT PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
43		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.
14		ACER SACCHARUM 'GREEN MOUNTAIN' OR EQUIVALENT	GREEN MOUNTAIN SUGAR MAPLE	2 1/2" – 3" CAL.
21		CORNUS FLORIDA OR EQUIVALENT	FLOWERING DOGWOOD	8' – 10' HT.
27		VIBURNUM DENTATUM OR EQUIVALENT	ARROWWOOD VIBURNUM	2 1/2' – 3" HT.
12		PICEA ABIES OR EQUIVALENT	NORWAY SPRUCE	6' – 8' HT.

TOTAL
117 TREES & SHRUBS (43 INTERNAL LANDSCAPE TREES, 14 SHADE TREES, 21 SMALL TREES, 12 EVERGREENS, 27 SHRUBS)

STREET TREE PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
14		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.

TOTAL
14 STREET TREES

TRASH PAD PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
6		TAXUS MEDIA "HICKSII" OR EQUIVALENT	HICKS YEW	2 1/2" - 3" HT.

TOTAL
6 SHRUBS

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00
APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/PLP

no.	description	date
2	REVISED BRIDGE	10/23/01
1	ADD TRASH PAD & TRASH PAD PLANTING SCHEDULE	11/8/00

revisions

project	date
96090	APR 2000
illustration	engineering
MPP/SAA	SJD
scale	approval
1"=50'	MMP

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
LANDSCAPE PLAN

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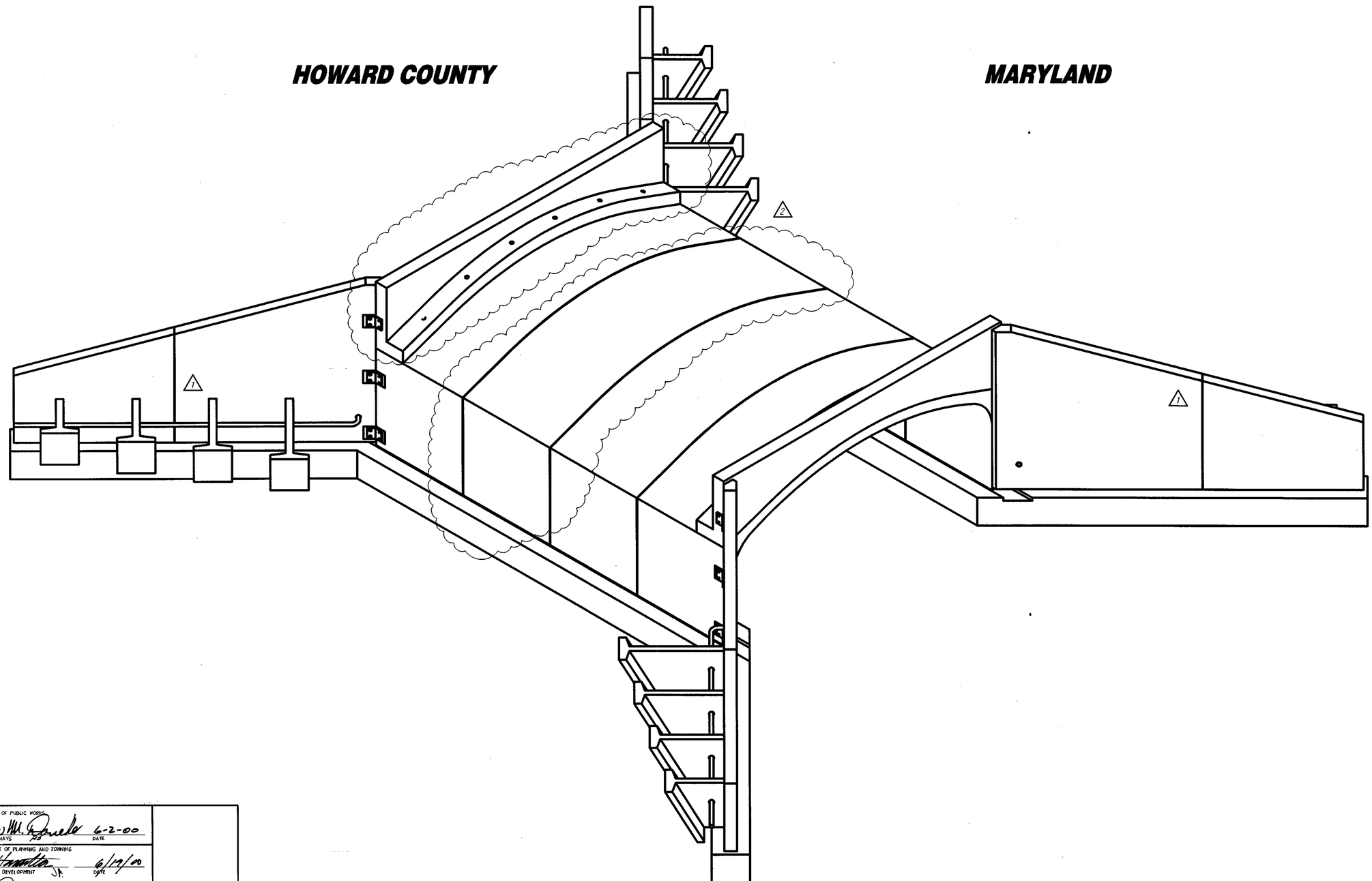
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

BONNIE BRANCH OVERLOOK



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CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

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CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

Stamp

No.	Date	Description	By
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6			
5			
4			
3			
2	2/3/00	REV. HDW PER JR/LENGTHEN STRCT. PER OWNER	JVP
1	1/24/00	REV. WW TO BE TWO PIECE PER JEFF RICKARD	JVP

REVISIONS

Consultant

Consultant Project No.

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HOWARD COUNTY MARYLAND

BONNIE BRANCH OVERLOOK

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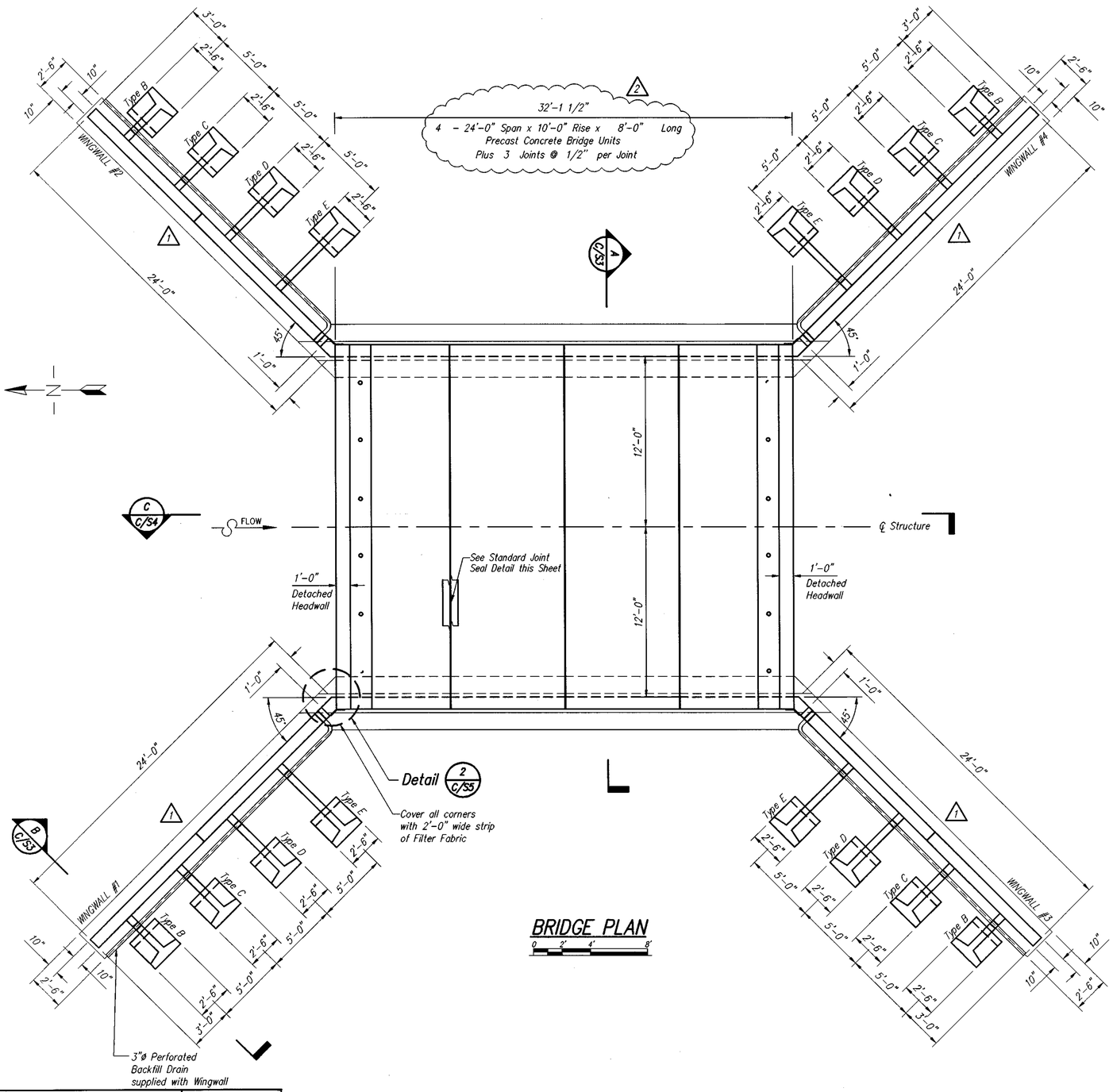
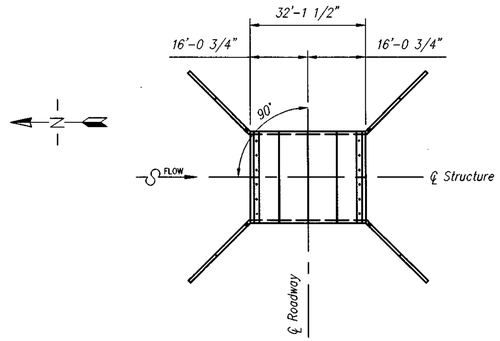
Drawn	RPU		
Checked	JVP	Sheet No.	13 C/S1
Date	12/15/99		

F-00-95



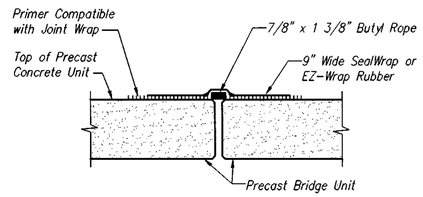
BRIDGE PLAN

0 2' 4' 8'



LOCATION PLAN

0 20' 40'



STANDARD JOINT SEAL DETAIL

0 1' 2'

NOTES

GENERAL NOTES:

1. This bridge has been designed for general site conditions. The project engineer shall be responsible for the structure's suitability to the existing site conditions and for the hydraulic evaluation -- including scour and confirmation of soil conditions.
2. Prior to construction, contractor must verify all elevations shown through the engineer.

DESIGN DATA

Design Loading: HS27-44
Design Fill Height: 2'-0" max. from top of crown to top of pavement.
Design Method: Load factor per AASHTO Specification
Assumed Allowable Soil Bearing: 4000 PSF (Verify)

MATERIALS

Precast units shall be constructed and installed in accordance with CON/SPAN Specifications.
Concrete for Footings and Wingwalls shall have a minimum compressive strength of 4000 psi.
Reinforcing steel for Footings and Wingwalls shall conform to ASTM A615, A616 or A617-Grade 60.

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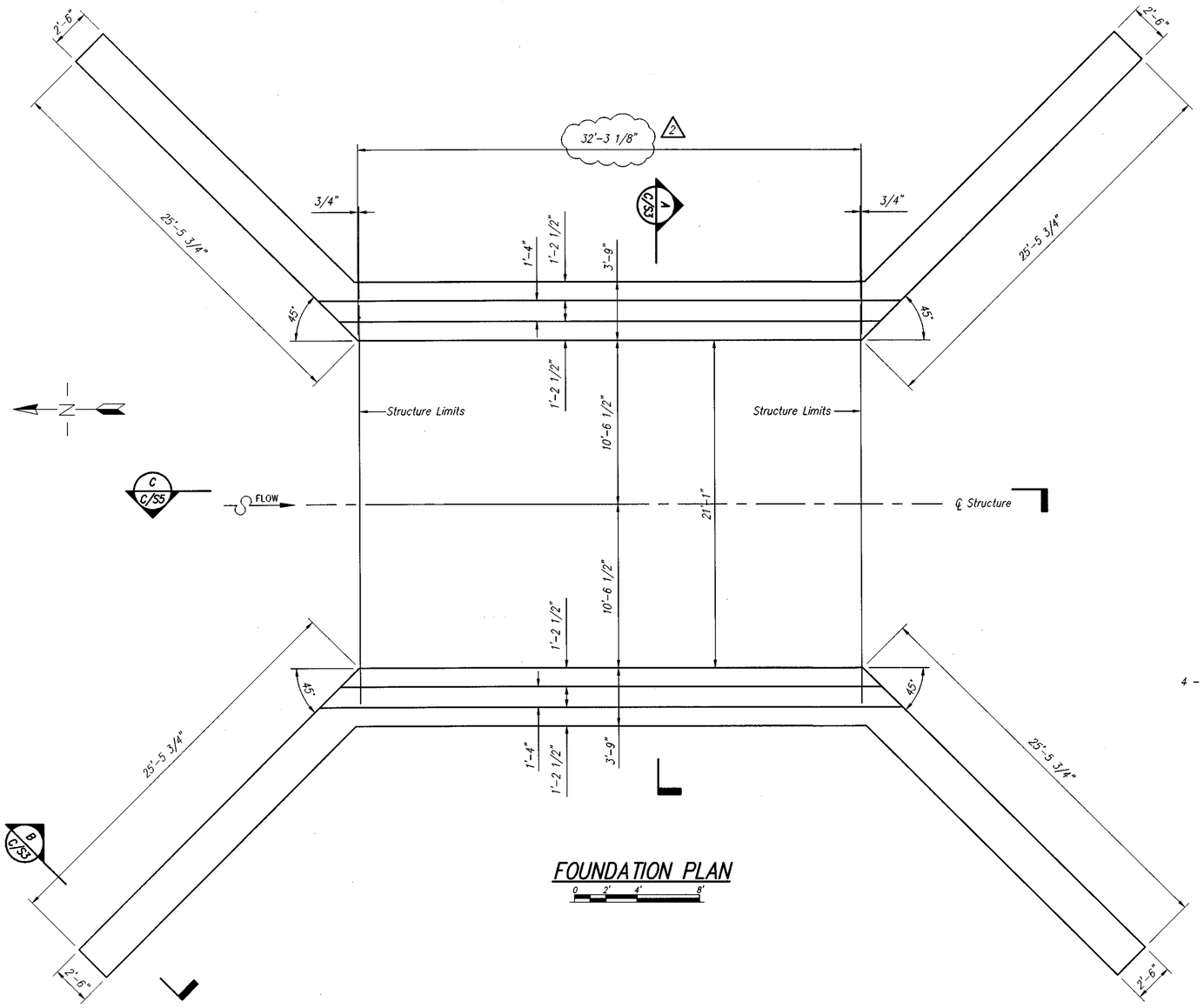
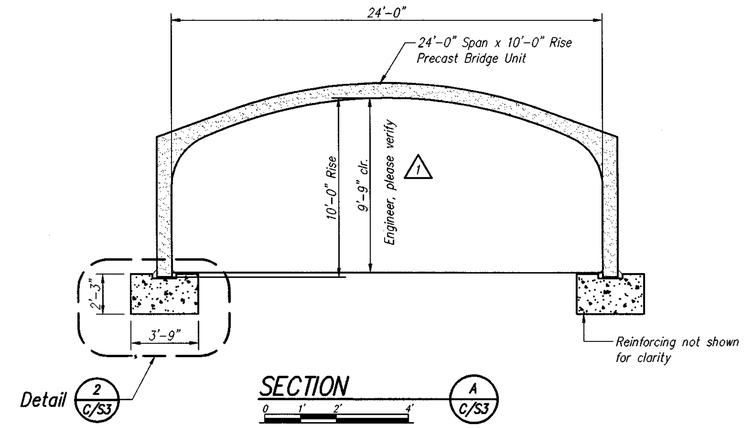


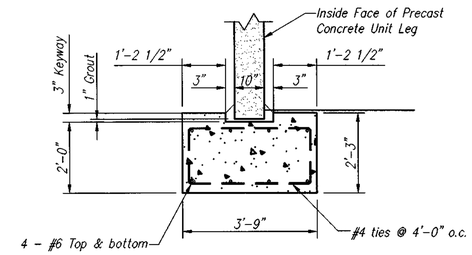
FOUNDATION PLAN

0 2' 4' 8'



SECTION

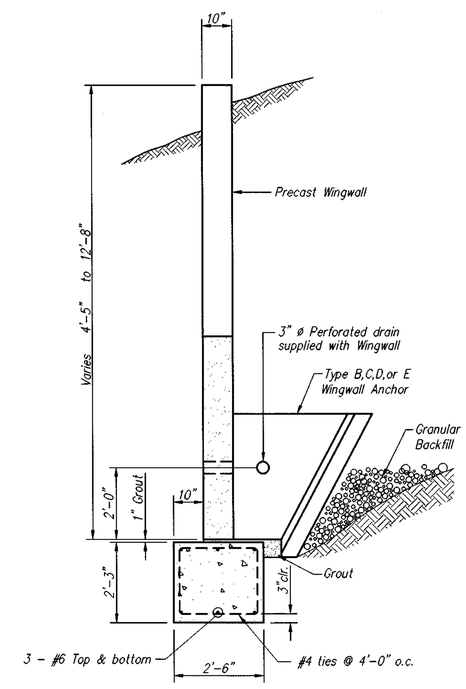
0 1' 2' 4'



DETAIL

0 1' 2'

2 C/S3



SECTION

0 1' 2' 4'

B C/S2

Note:
Lap (3'-0") #6 Longitudinal Bars in Wingwall and Bridge Footings to make continuous.

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CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/14/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/2/00

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN BRIDGE SYSTEMS

1. DESCRIPTION

This work shall consist of constructing a Con/Span culvert in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the Engineer.

2. TYPES

Precast reinforced concrete Con/Span culverts manufactured in accordance with this specification shall be designated by span and rise.

3. MATERIALS – CONCRETE

The concrete for the culverts shall be air-entrained when installed in areas subject to freeze-thaw conditions, composed of Portland cement, fine and coarse aggregates, admixtures and water. Concrete shall contain 6 ± 2 percent air. The air entraining admixture shall conform to AASHTO M154.

3.1 Portland Cement – Shall conform to the requirements of ASTM Specifications C150-Type I, Type II, or Type III cement.

3.2 Coarse Aggregate – Shall consist of stone having a maximum size of 1 inch. Aggregate shall meet requirements for ASTM C33.

3.3 Water Reducing Admixture – The manufacturer may submit for approval by the Engineer, a water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.

3.4 Calcium Chloride – The addition to the mix of calcium chloride or admixtures containing calcium chloride will not be permitted.

4. MATERIALS – STEEL REINFORCEMENT AND HARDWARE

All reinforcing steel for the culverts shall be fabricated and placed in accordance with the detailed shop drawings submitted by the manufacturer.

4.1 Steel Reinforcement – Reinforcement shall consist of welded wire fabric conforming to ASTM Specification A 185 or A 497, or deformed billet steel bars conforming to ASTM Specification A 615, Grade 60. Longitudinal distribution reinforcement may consists of welded wire fabric or deformed billet-steel bars.

5. MANUFACTURE

5.1 Mixture – The aggregates, cement and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements of this specification. The proportion of Portland cement in the mixture shall not be less than 564 pounds (6 sacks) per cubic yard of concrete.

5.2 Curing – The precast concrete culvert units shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used:

5.2.1. Steam Curing – The culverts may be low pressure, steam cured by a system that will maintain a moist atmosphere.

5.2.2. Water Curing – The culverts may be water cured by any method that will keep the sections moist.

5.2.3. Membrane Curing – A sealing membrane conforming to the requirements of ASTM Specification C 309 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of application shall be within + 10 degrees F of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the compounds and shall be damp when the compound is applied.

5.3 Forms – the forms used in manufacture shall be sufficiently rigid and accurate to maintain the culvert dimensions within the permissible variations given in Section 7. All casting surfaces shall be of a smooth material.

5.4 Handling – Handling devices or holes shall be permitted in each culvert for the purpose of handling and setting.

5.5 Storage – The culverts shall be stored in such a manner to prevent cracking or damage. The units shall not be stored in an upright position until the compressive strength is a minimum of 4,000 psi.

6. DESIGN

6.1 The culvert dimension and reinforcement details shall be as prescribed in the plan and the shop drawings provided by the manufacturer subject to the provisions of Section 7. The minimum concrete compressive strength shall be 4,000 psi. The minimum steel yield strength shall be 60,000 psi.

The culverts are designed in accordance with the "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1996. A minimum of one foot of cover above the crown of the culvert is required in the installed condition. (Unless noted otherwise and designed accordingly.)

6.2 Placement of Reinforcement – The cover of concrete over the outside circumferential reinforcement shall be 2 inches minimum. The cover of concrete over the inside circumferential reinforcement shall be 1 1/2 inches minimum. The clear distance of the end circumferential wires shall not be less than one inch nor more than two inches from the ends of the culvert. Reinforcement shall be assembled utilizing single or multiple layers of welded wire fabric, or utilizing a single layer of deformed billet-steel bars. The welded wire fabric shall be composed of circumferential and longitudinal wires meeting the spacing requirements of 6.4 and shall contain sufficient longitudinal wires extending through the culvert to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 6.4. The ends of the longitudinal distribution reinforcement shall be not more than 3 inches from the ends of the culvert.

6.3 Bending of Reinforcement – The outside and inside circumferential reinforcing steel for the corners of the culvert shall be bent to such an angle that is approximately equal to the configuration of the culvert's outside corner.

6.4 Laps, Welds, and Spacing – Tension splices in the circumferential reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of ACI 12.8 and 12.19. For deformed welded wire fabric, the overlap shall meet the requirements of ACI 12.7 and 12.18. For deformed billet-steel bars, the overlap shall meet the requirements of ACI 12.2. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be not less than 2 inches nor more than 4 inches. For the wire fabric, the spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.

7. PERMISSIBLE VARIATIONS

7.1 Internal Dimensions – The internal dimension shall vary not more than 1% from the design dimensions nor more than 1-1/2 inches whichever is less. The haunch dimensions shall vary not more than 3/4 inch from the design dimension.

7.2 Slab and Wall Thickness – The slab and wall thickness shall not be less than that shown in the design by more than 1/4 inch. A thickness more than that required in the design shall not be cause for rejection.

7.3 Length of Opposite Surfaces – Variations in laying lengths of two opposite surfaces of the culvert shall not be more than 5/8 inch in any culvert section, except where beveled ends for laying of curves are specified by the purchaser.

7.4 Length of Section – The underrun in length of a section shall not be more than 1/2 inch in any culvert.

7.5 Position of Reinforcement – The maximum variation in position of the reinforcement shall be + 1/2 inch. In no case shall the cover over the reinforcement be less than 1 inches for the outside circumferential steel or be less than 1 inch for the inside circumferential steel as measured to the external or internal surface of the culvert. These tolerances or cover requirements do not apply to mating surfaces of the joints.

7.6 Area of Reinforcement – The areas of steel reinforcement shall be the design steel areas as shown in the manufacturer's shop drawings. Steel areas greater than those required shall not be cause for rejection. The permissible variation in diameter of any reinforcement shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcement.

8. TESTING AND INSPECTION

8.1 Type of Test Specimen – Concrete compressive strength shall be determined from compression tests made on cylinders or cores. For cylinder testing a minimum of 4 cylinders shall be taken during each production run. For core testing, one core shall be cut from a culvert section selected at random from each group of 15 culverts or less of a particular size and production run. For each continuous production run, each group of 15 culverts of a single size or fraction thereof shall be considered separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 consecutive days.

8.2 Compression Testing – Cylinders shall be made and tested as prescribed by the ASTM C 39 Specification. Cores shall be obtained and tested for compressive strength in accordance with the provisions of the ASTM C 497 Specification.

8.3 Acceptability of Cylinder Tests – Failure of any of the 28 day test cylinders to meet 90 percent of the minimum compressive strength requirement can be cause for rejection.

8.4 Acceptability of Core Tests – The compressive strength of the concrete in each group of culverts as defined in 8.1 is acceptable when the core test strength is equal to or greater than the design concrete strength. When the compressive strength of the core tested is less than the design concrete strength, the culvert from which that core was taken may be recored. When the compressive strength of the recore is equal to or greater than the design concrete strength, the compressive strength of the concrete in that group of culverts is acceptable.

8.4.1 When the compressive strength of any recore is less than the design concrete strength, the culvert from which that core was taken shall be rejected. Two culverts from the remainder of the group shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group of culverts is acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the group of culverts shall be rejected or, at the option of the manufacturer, each culvert of the remainder of the group shall be cored and accepted individually, and any of these culverts that have cores with less than the design concrete strength shall be rejected.

8.4.2 Plugging Core Holes – The core holes shall be plugged and sealed by the manufacturer in a manner such that the culvert will meet all of the test requirements of this specification. Culverts so sealed shall be considered satisfactory for use.

8.4.3 Test Equipment – Every manufacturer furnishing culverts under this specification shall furnish all facilities and personnel necessary to carryout the test required.

9. JOINTS

The culverts shall be produced with flat butt ends. The ends of the culvert shall be such that when the sections are laid together they will make a continuous line of culverts with a smooth interior free of appreciable irregularities, all compatible with the permissible variations – in Section 7. The joint width shall not exceed 3/4 inches.

10. WORKMANSHIP AND FINISH

The culverts shall be substantially free of fractures. The ends of the culverts shall be normal to the walls and centerline of the culvert section, within the limits of the variations given in section 7, except where beveled ends are specified. The surface of the culverts shall be a smooth steel form or troweled surface. Trapped air pockets causing surface defects shall be considered as part of a smooth steel form finish.

11. REPAIRS

Culverts may be repaired, if necessary, because of imperfections in manufacture or handling damage and will be acceptable if, in the opinion of the purchaser, the repairs are sound, properly finished and cured, and the repaired section conforms to the requirements of this specification.

12. INSPECTION

The quality of materials, the process of manufacture, and the finished culverts shall be subject to inspection by the purchaser.

13. REJECTION

Culverts shall be subject to rejection on account of any of the specification requirements. Individual culverts may be rejected because of any of the following:

13.1 Fractures or cracks passing through the wall, except for a single end crack that does not exceed one half the thickness of the wall.

13.2 Defects that indicate proportioning, mixing, and molding not in compliance with Section 5.

13.3 Honeycombed or open texture.

13.4 Damaged ends, where such damage would prevent making a satisfactory joint.

14. MARKING

Each culvert shall be clearly marked by waterproof paint. The following shall be shown on the inside of the vertical leg of the culvert section:

Culvert Section Span X Culvert Rise

Date of Manufacture

Name or trademark of the manufacturer

15. CONSTRUCTION REQUIREMENTS

15.1 Footings – the culverts shall be installed on either precast or cast-in-place concrete footings. The design size and elevation of the footings shall be as determined by the Engineer. A three inch deep keyway shall be formed in the top surface of the footing three inches clear of the inside and outside faces of the culvert, unless specified otherwise on the plans. The footings shall be given a smooth float finish and shall reach a compressive strength of 2,000 psi before placement of the culvert sections. The completed footing surface shall be constructed in accordance with grades shown on the plans. When tested with a 10 foot straight edge, the surface shall not vary more than 1/4 inch in 10 feet. If a precast concrete footing is used, the contractor shall prepare a 4 inch thick layer of compacted granular material the full width of the footing prior to placing the precast footing.

15.2 Placement of the Culverts – The culverts shall be placed as shown on the Engineer's plan drawings. Special care shall be taken in setting the culverts to the true line and grade. The culverts shall be set on 6" X 6" masonite or steel shims. A minimum of 1/2 inch gap shall be provided between the footing and the bottom of the culverts vertical legs. The gap shall be filled with cement grout (Portland cement and water or cement mortar composed of one part Portland cement and three parts of sand, by volume, and water.)

15.2-a Provide MSHA Mix number 3 non-reinfoced concretefrom bedrock to bottom of footing, non-reinforced concrete shall extend 6" on either side of the footing.

15.3 External Protection of Joints – The butt joint made by two adjoining culverts shall be covered with a 7/8" x 1 3/8" (1 1/4" round equivalent) piece of butyl rope and a minimum of a 9 inch wide joint wrap. The surface shall be free of dirt before applying the joint material. A primer compatible with the joint wrap to be used shall be applied for a minimum width of nine inches on each side of the joint. The external wrap shall be either EZ-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION, SEAL WRAP by MAR MAC MANUFACTURING CO. INC. or approved equal. The joint shall be covered continuously from the bottom of one culvert section leg, across the top of the arch and to the opposite culvert section leg. Any laps that result in the joint wrap shall be a minimum of six inches long with the overlap running downhill.

In addition to the joints between units, the joint between the end unit and the headwall shall also be sealed. If using precast wingwalls, the joint between the end bridge unit and the wingwall shall be sealed with this type of wrap or at the discretion of the Engineer, filter fabric shall be substituted.

During the backfilling operation, care shall be taken to keep the joint wrap in its proper location over the joint.

15.4 Backfill – Backfill shall be considered as all replaced excavation and new embankment adjacent to the Con/Span bridge units and wingwalls. The project construction and material specifications which include the specifications for excavation for structures and roadway excavation and embankment construction shall apply except as modified in this section.

No backfill shall be placed against any structural elements until they have been approved by the Engineer.

Backfill against a waterproofed surface shall be placed carefully to avoid damage to the waterproofing material.

Mechanical tampers or approved compacting equipment shall be used to compact all backfill and embankment immediately adjacent to each side of the culvert and over the top of the culvert until it is covered to a minimum depth of one foot. The backfill within four feet of each side of the culvert shall be placed in lifts of eight inches or less (loose depth). Heavy compaction equipment shall not be operated in this area or over the culvert until it is covered to a depth of one foot.

Lightweight dozers and graders may be operated over culverts having one foot of compacted cover, but heavy earth moving equipment (larger than a D-4 Dozer weighing in excess of 12 tons and having track pressures of eight psi or greater) shall require two feet of cover unless the design cover is less than two feet. In no case shall equipment operating in excess of the design load (HS20 or HS25) be permitted over the culvert unless approved by Con/Span.

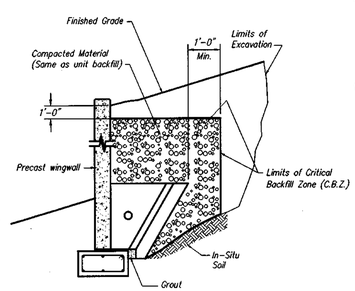
Any additional fill and subsequent excavation required to provide this minimum cover shall be made at no additional cost to the project.

As a precaution against introducing unbalanced stresses in the culvert, when placing backfill at no time shall the difference between the heights of fill on opposite sides of the culvert exceed 24".

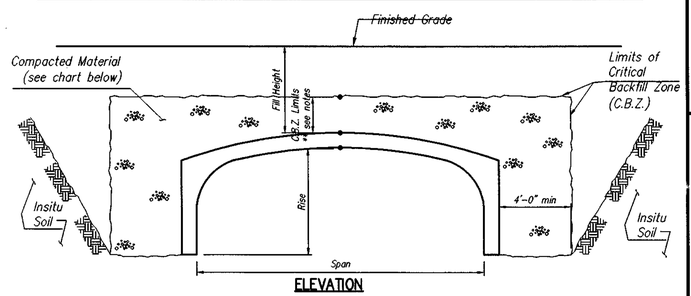
Backfill in front of wingwalls shall be carried to ground lines shown in the plans.

BACKFILL DESCRIPTION

Group Classification	A-1		A-3	A-2				A-4
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7	
Sieve Analysis, Percent Passing								
No. 10	50 max.							
No. 40	30 max.	50 max.	51 max.					
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.	35 max.	36 min.
Characteristics of Fraction Passing No. 40								
Liquid Limit				40 max.	41 min.	40 max.	41 min.	40 max.
Plasticity Index	6 max.		N.P.	10 max.	10 max.	11 min.	11 min.	10 max.
Usual Types of Significant Constituent Materials	Stone Fragments, Gravel & Sand		Fine Sand	Silty or Clayey Gravel and Sand				Silty Soils
General Rating as Subgrade			Excellent to Good					Fair to Poor



WINGWALL BACKFILL REQUIREMENTS



ELEVATION

NOTES
1. SEE CON/SPAN SPECIFICATIONS SECTION 15.4 FOR BACKFILL SPECIFICATIONS.
* 2. FOR FILL HEIGHTS LESS THAN 2'-0", THE FINISHED GRADE SHALL BE THE BOUNDARY LINE FOR THE C.B.Z.
3. BACKFILLING OPERATIONS WITHIN THE C.B.Z. SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH).
4. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS.
5. BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY.

SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE C.B.Z.	ACCEPTABLE MATERIAL OUTSIDE C.B.Z.
≤ 24'-0"	> 12'-0"	A1, A3	**
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4	**
> 24'-0"	**	A1, A3	**

** EMBANKMENT MATERIAL PER PROJECT SPECIFICATIONS

BACKFILL REQUIREMENTS

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CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

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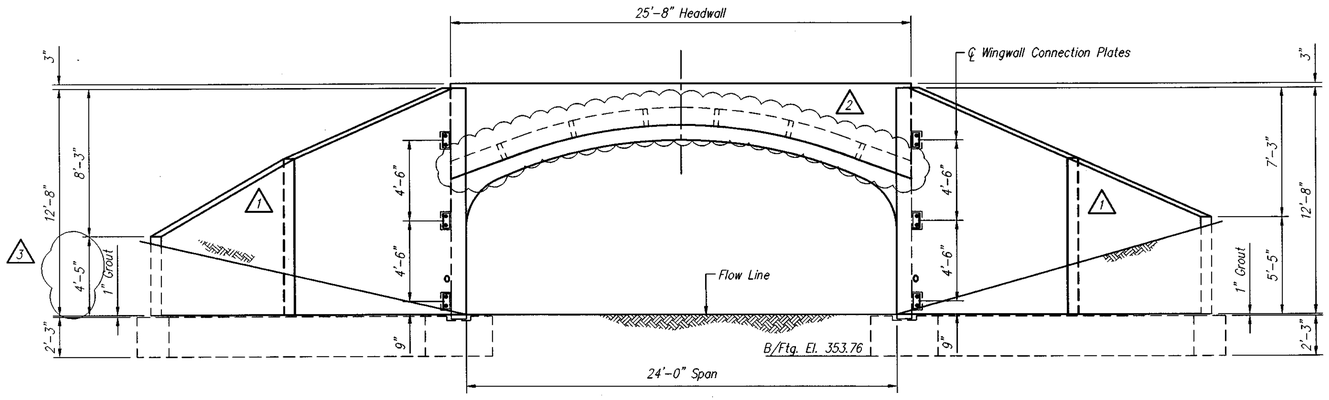
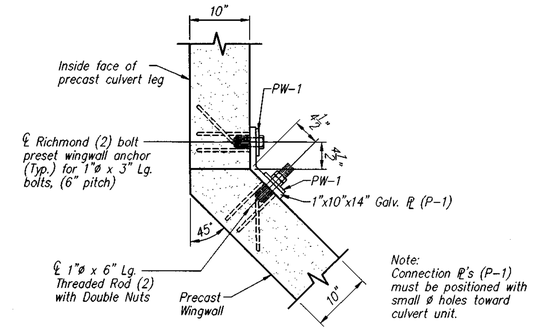


TYPICAL END ELEVATION

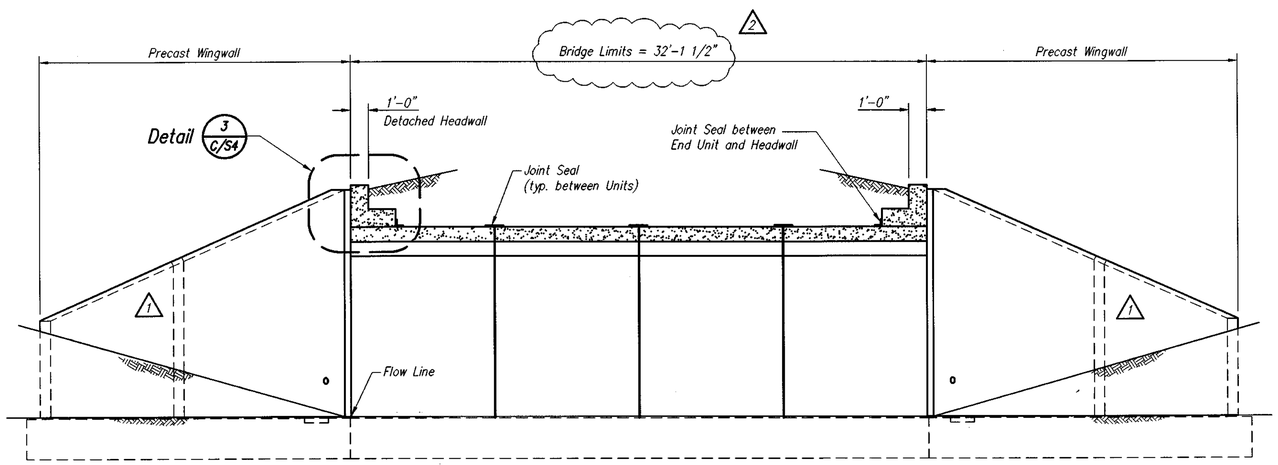
0 2' 4' 8'



Note:
Connection ℙ's (P-1) must be positioned with small ø holes toward culvert unit.

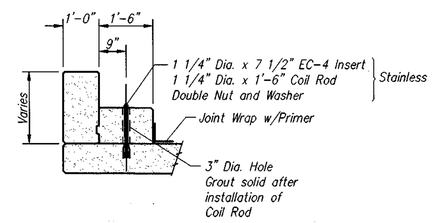
DETAIL 1 C/S2

0 1' 2'



SECTION C C/S2

0 2' 4' 8'



DETAIL 3 C/S4

0 1' 2' 4'

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

Stamp

No.	Date	Description	By
7			
6			
5			
4			
3	2/21/00	Wingwall Drop	JVP
2	2/3/00	REV. HDW PER JR/LENGTHEN STRCT. PER OWNER	JVP
1	1/24/00	REV. WW TO BE TWO PIECE PER JEFF RICKARD	JVP

REVISIONS

Consultant

Consultant Project No.

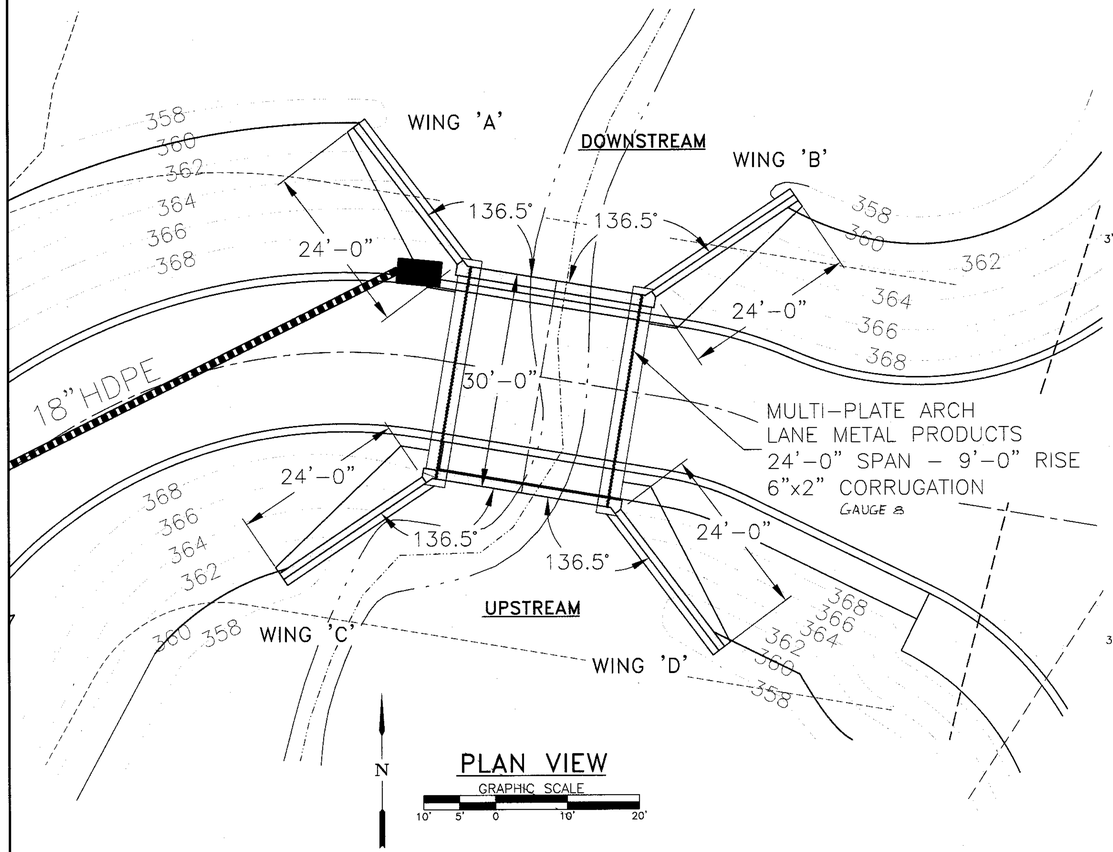
CONSPAN® BRIDGE SYSTEMS
3100 Research Blvd.
P.O. Box 20266
Dayton, Ohio 45420-0266
(937) 254-2233
(800) 526-3999
Fax (937) 254-8365
Email: INFO@CON-SPAN.COM

HOWARD COUNTY MARYLAND

BONNIE BRANCH OVERLOOK

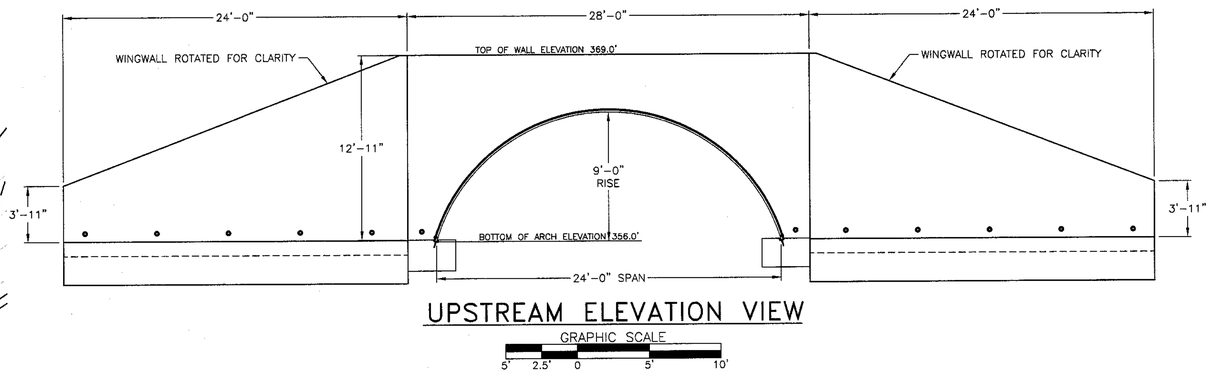
Designed JVP	C/S Project No. 7439
Drawn RPU	
Checked JVP	Sheet No. C/S4 16
Date 12/15/99	

F-00-95



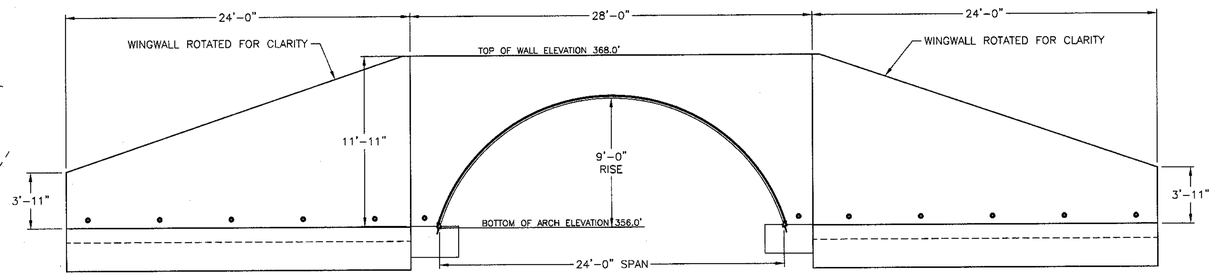
PLAN VIEW

GRAPHIC SCALE
10' 5' 0 10' 20'



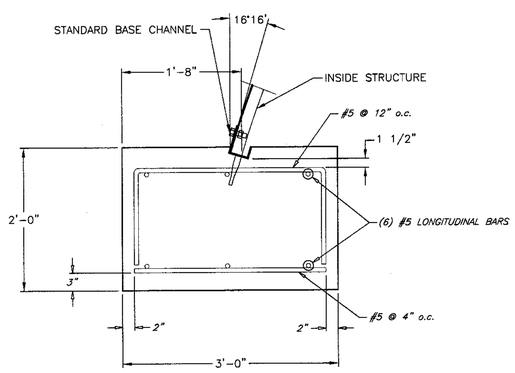
UPSTREAM ELEVATION VIEW

GRAPHIC SCALE
5' 2.5' 0 5' 10'



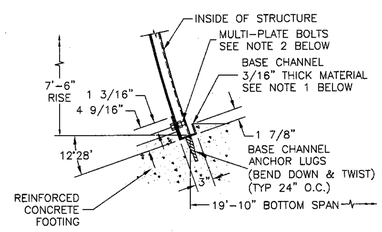
DOWNSTREAM ELEVATION VIEW

GRAPHIC SCALE
5' 2.5' 0 5' 10'



TYPICAL FOOTING DESIGN

GRAPHIC SCALE
1' .5' 0 1' 2'

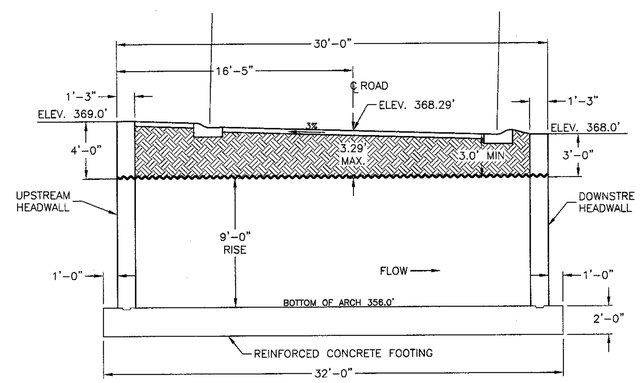


BASE CHANNEL DETAIL

NOT TO SCALE

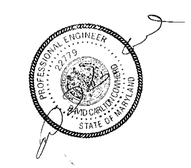
NOTES FOR BASE CHANNEL

1.) REFERENCE CONTECH DWG. No. 1008964 FOR BASE CHANNEL DETAILS.
2.) SHORT BOLT CONNECTION TO BASE CHANNEL SHOWN. OPPOSITE SIDE OF STRUCTURE REQUIRES 3" LONG BOLTS. REFERENCE CONTECH DWG. No. 103690 "MULTI-PLATE BASE CHANNEL INSTALLATION DETAILS."



PROFILE VIEW

GRAPHIC SCALE
5' 2.5' 0 5' 10'



NOTES FOR FOOTING:

1.) CONCRETE SHALL BE f'c = 3500 psi.
2.) REINFORCEMENT SHALL BE ASTM A-615 GRADE 60.

THE PURPOSE OF THIS SHEET IS TO REPLACE SHEET 13 OF BONNIE BRANCH OVERLOOK F-00-95.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-6-02
APPROVED: DEPARTMENT OS PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5/29/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/29/02

02/25/02	RMW	RAISED UPSTREAM HEADWALL (CBC-3335)

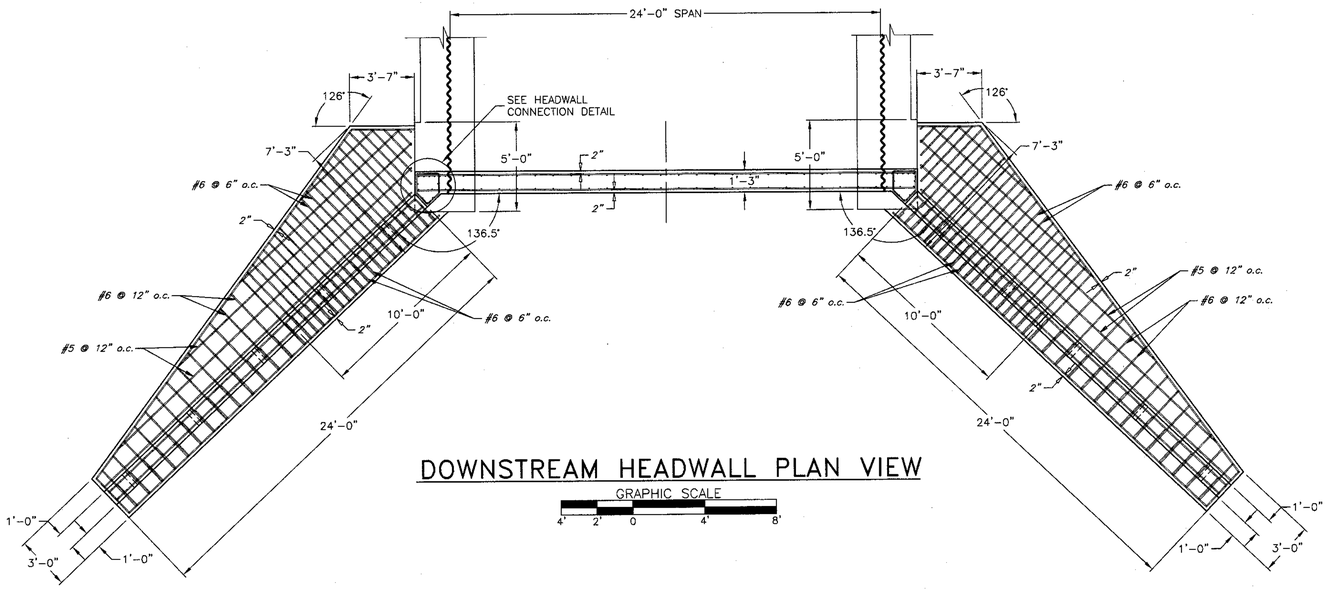
CBC ENGINEERS
DAYTON, OHIO

REVISED PLAN, PROFILE & DETAILS

Drawn By	Date	WILDMAN ENVIRONMENTAL SERVICES DESIGN OF MULTI-PLATE ARCH BONNIE BRANCH OVERLOOK HOWARD COUNTY, MARYLAND
DWR	07/31/01	
Approved By	Date	

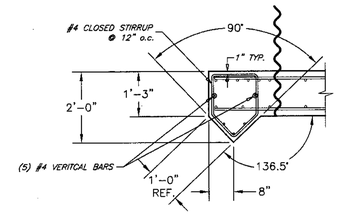
Scale	Project No.	Rev.	Sheet
GRAPHIC	CBC-3237	1	13 OF 18

F-00-95



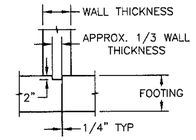
DOWNSTREAM HEADWALL PLAN VIEW

GRAPHIC SCALE 4' 2' 0 4' 8'



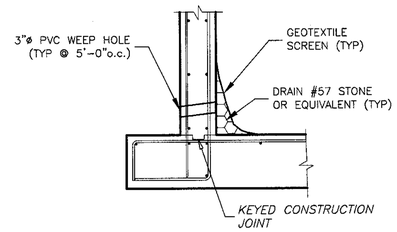
HEADWALL CONNECTION DETAIL

GRAPHIC SCALE 2' 1' 0 2' 4'



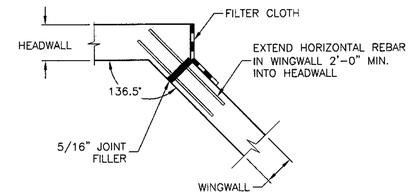
KEYED CONSTRUCTION JOINT DETAIL

NOT TO SCALE



WEEP HOLE DETAIL

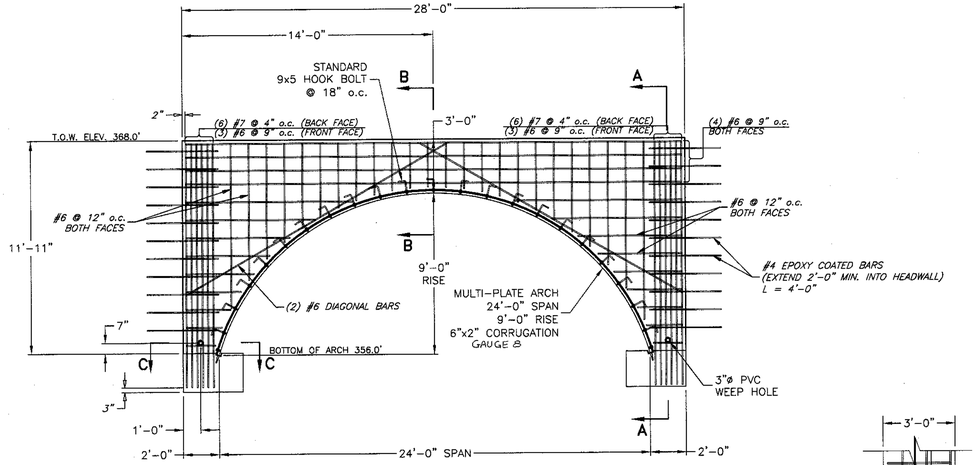
NOT TO SCALE



EXPANSION JOINT DETAIL

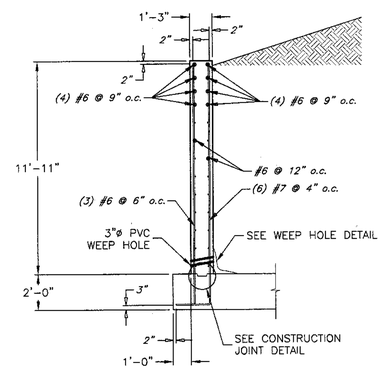
NOT TO SCALE

NOTES FOR EXPANSION JOINT:
A FILTER CLOTH THREE FOOT IN WIDTH AND DOUBLE THICKNESS SHALL BE APPLIED TO ALL TRANSVERSE JOINTS IN THE FOOTING AND WALLS. THE MATERIAL SHALL BE CENTERED ON THE JOINT AND THE EDGES SEALED WITH A MASTIC OR WITH TWO SIDED TAPE. THE FILTER CLOTH SHALL BE A GEOTEXTILE MEETING THE APPROVAL OF THE ENGINEER.
JOINT FILLER SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH No. 10 GAGE COPPER WIRE OR No. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.



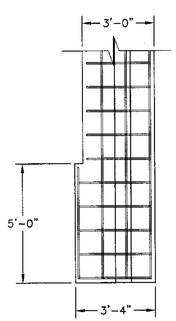
DOWNSTREAM HEADWALL ELEVATION VIEW

GRAPHIC SCALE 4' 2' 0 4' 8'



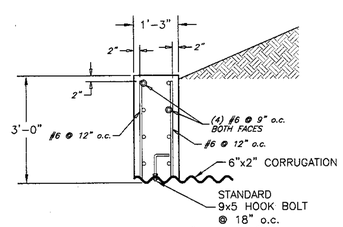
SECTION 'A-A'

GRAPHIC SCALE 4' 2' 0 4' 8'



SECTION 'C-C'

GRAPHIC SCALE 3' 1.5' 0 3' 6'



SECTION 'B-B'

GRAPHIC SCALE 2' 1' 0 2' 4'

NOTES FOR FOOTING:
1.) CONCRETE SHALL BE f'c = 3500 psi.
2.) REINFORCEMENT SHALL BE ASTM A-615 GRADE 60.

THE PURPOSE OF THIS SHEET IS TO REPLACE SHEET 14 OF BONNIE BRANCH OVERLOOK F-00-95.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 6-6-02

APPROVED: DEPARTMENT OS PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5/29/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/29/02

02/25/02	RMW	RAISED UPSTREAM HEADWALL (CBC-3335)

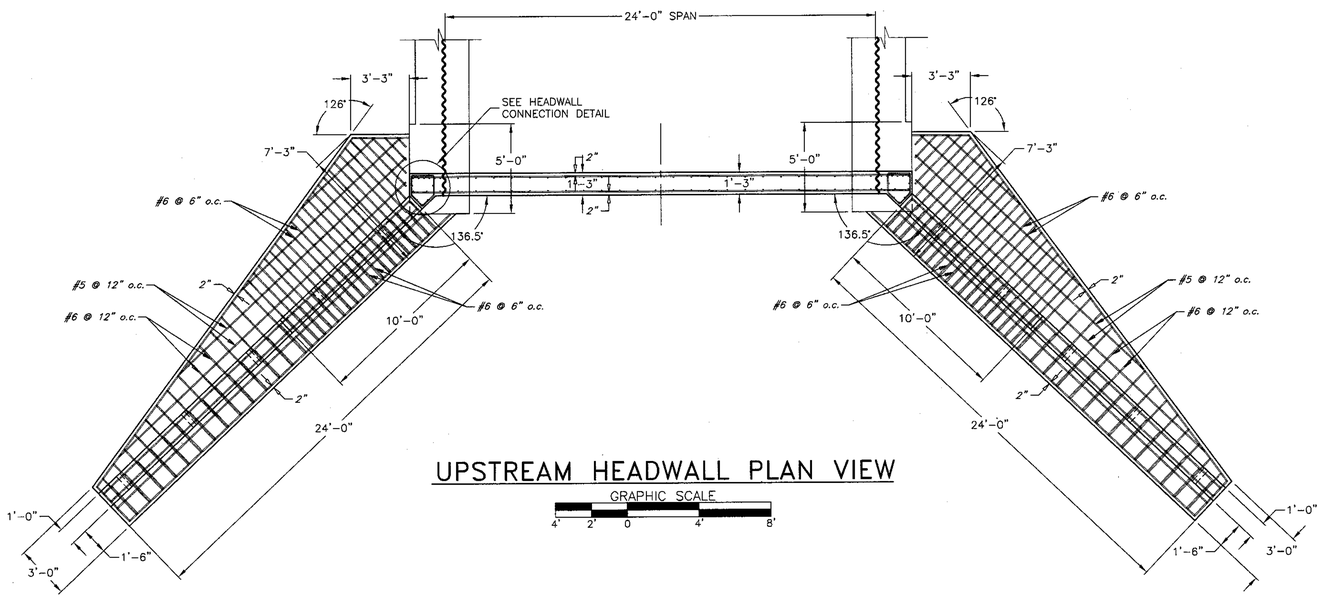
CBC ENGINEERS
DAYTON, OHIO

REVISED DOWNSTREAM HEADWALL DETAILS

Drawn By	Date	WILDMAN ENVIRONMENTAL SERVICES DESIGN OF MULTI-PLATE ARCH BONNIE BRANCH OVERLOOK HOWARD COUNTY, MARYLAND
DWR	07/31/01	
Approved By	Date	

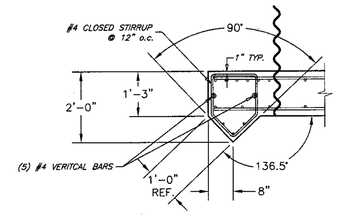
Scale	Project No.	Rev.	Sheet
GRAPHIC	CBC-3237	1	14 OF 18

F-00-95



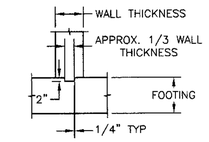
UPSTREAM HEADWALL PLAN VIEW

GRAPHIC SCALE
4' 2' 0 4' 8'



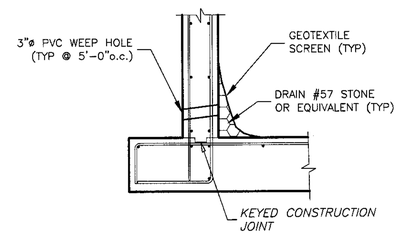
HEADWALL CONNECTION DETAIL

GRAPHIC SCALE
2' 1' 0 2' 4'



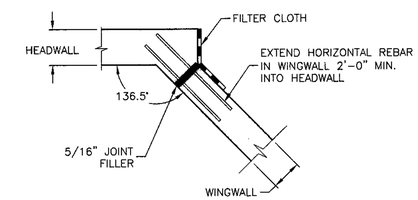
KEYED CONSTRUCTION JOINT DETAIL

NOT TO SCALE



WEEP HOLE DETAIL

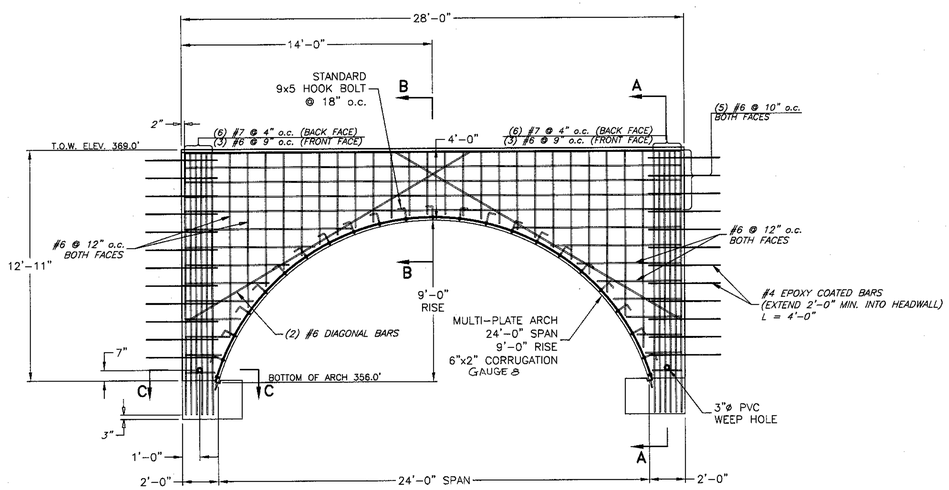
NOT TO SCALE



EXPANSION JOINT DETAIL

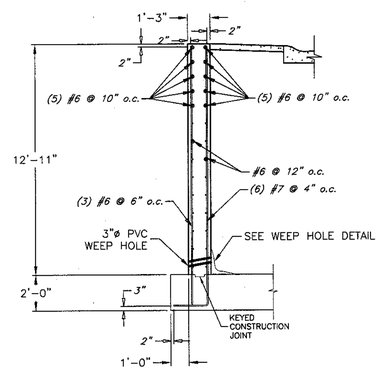
NOT TO SCALE

NOTES FOR EXPANSION JOINT:
A FILTER CLOTH THREE FOOT IN WIDTH AND DOUBLE THICKNESS SHALL BE APPLIED TO ALL TRANSVERSE JOINTS IN THE FOOTING AND WALLS. THE MATERIAL SHALL BE CENTERED ON THE JOINT AND THE EDGES SEALED WITH A MASTIC OR WITH TWO SIDED TAPE. THE FILTER CLOTH SHALL BE A GEOTEXTILE MEETING THE APPROVAL OF THE ENGINEER.
JOINT FILLER SHALL BE SECURELY STITCHED TO ONE FACE OF THE CONCRETE WITH No. 10 GAGE COPPER WIRE OR No. 12 GAGE SOFT DRAWN GALVANIZED STEEL WIRE.



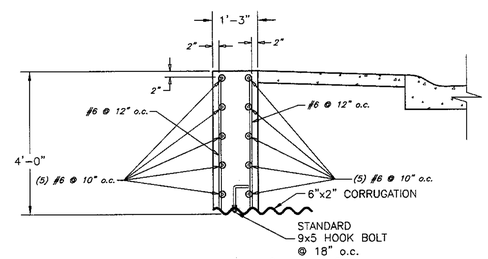
UPSTREAM HEADWALL ELEVATION VIEW

GRAPHIC SCALE
4' 2' 0 4' 8'



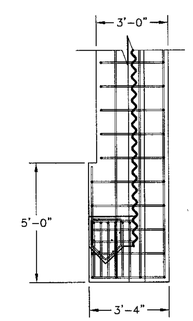
SECTION 'A-A'

GRAPHIC SCALE
4' 2' 0 4' 8'



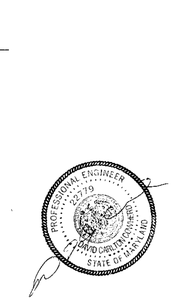
SECTION 'B-B'

GRAPHIC SCALE
2' 1' 0 2' 4'



SECTION 'C-C'

GRAPHIC SCALE
3' 1.5' 0 3' 6'



NOTES FOR FOOTING:
1.) CONCRETE SHALL BE f'c = 3500 psi.
2.) REINFORCEMENT SHALL BE ASTM A-615 GRADE 60.

02/25/02	RMW	RAISED UPSTREAM HEADWALL (CBC-3335)

THE PURPOSE OF THIS SHEET IS TO REPLACE SHEET 15 OF BONNIE BRANCH OVERLOOK F-00-95.

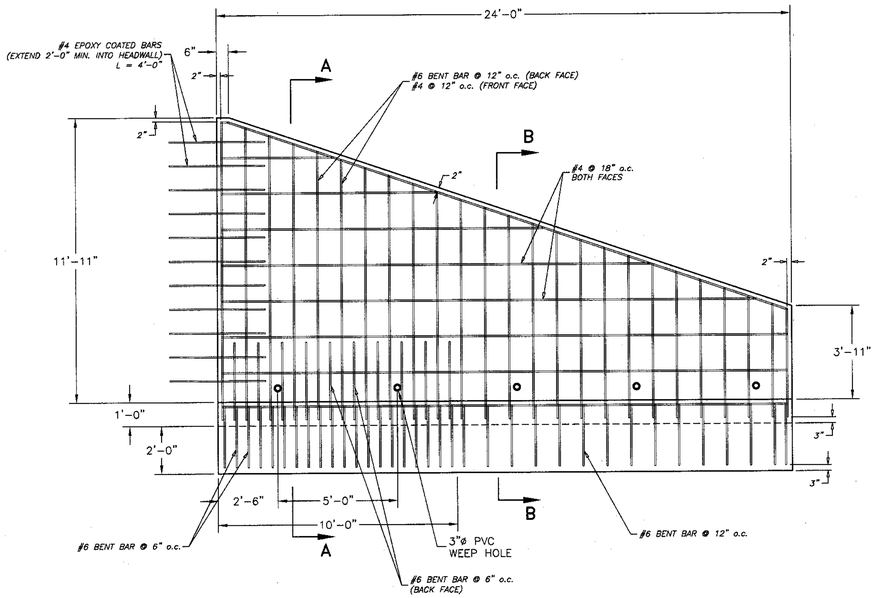
APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-6-02
APPROVED: DEPARTMENT OS PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5/29/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/29/02

CBC ENGINEERS
DAYTON, OHIO

REVISED UPSTREAM HEADWALL DETAILS

Drawn By DWR	Date 07/31/01	WILDMAN ENVIRONMENTAL SERVICES DESIGN OF MULTI-PLATE ARCH BONNIE BRANCH OVERLOOK HOWARD COUNTY, MARYLAND
Approved By	Date	
Scale GRAPHIC	Project No. CBC-3237	Rev. 1 — Sheet 15 OF 18

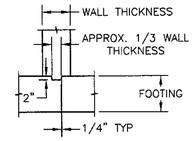
F-00-95



DOWNSTREAM WINGWALL ELEVATION VIEW

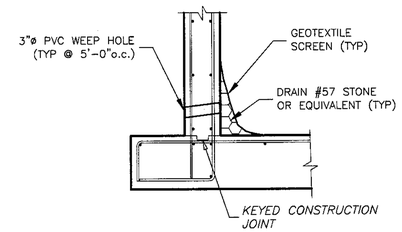
GRAPHIC SCALE

3' 1.5' 0 3' 6'



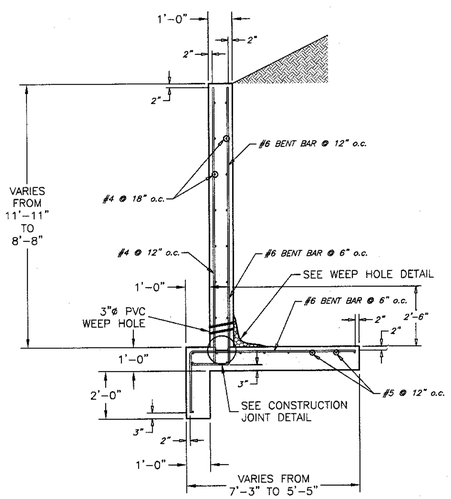
KEYED CONSTRUCTION JOINT DETAIL

NOT TO SCALE



WEEP HOLE DETAIL

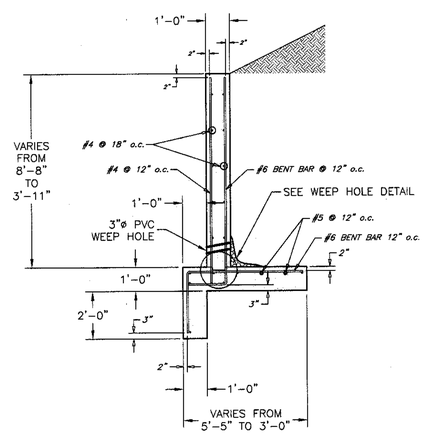
NOT TO SCALE



SECTION 'A-A'

GRAPHIC SCALE

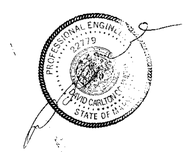
3' 1.5' 0 3' 6'



SECTION 'B-B'

GRAPHIC SCALE

3' 1.5' 0 3' 6'



NOTES FOR FOOTING:
1.) CONCRETE SHALL BE f'c = 3500 psi.
2.) REINFORCEMENT SHALL BE ASTM A-615 GRADE 60.

THE PURPOSE OF THIS SHEET IS TO REPLACE SHEET 16 OF BONNIE BRANCH OVERLOOK F-00-95.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-6-02
APPROVED: DEPARTMENT OS PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5/29/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/29/02

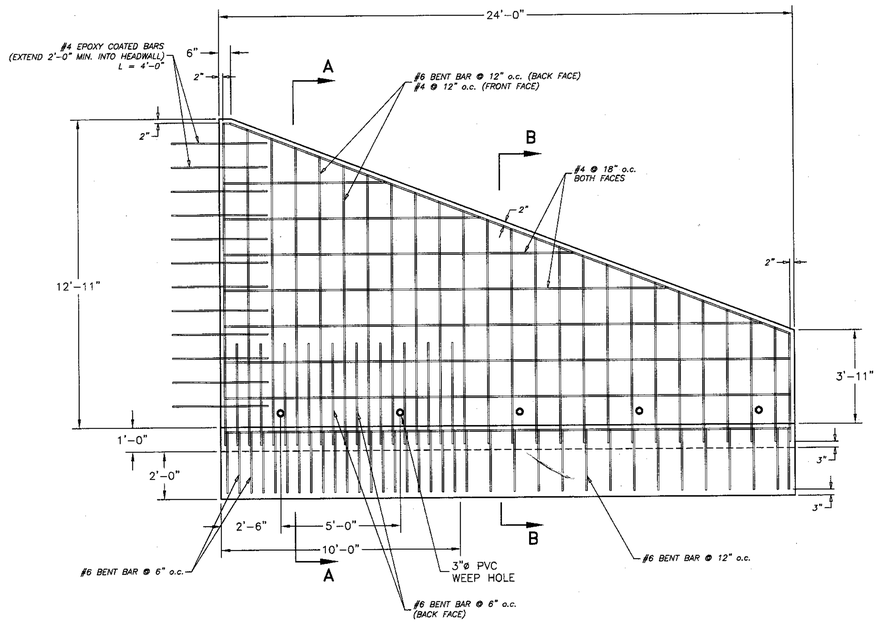
02/25/02	RMW	RAISED UPSTREAM HEADWALL (CBC-3335)

CBC ENGINEERS
DAYTON, OHIO

REVISED DOWNSTREAM WINGWALL DETAILS

Drawn By DWR	Date 07/31/01	WILDMAN ENVIRONMENTAL SERVICES DESIGN OF MULTI-PLATE ARCH BONNIE BRANCH OVERLOOK HOWARD COUNTY, MARYLAND
Approved By	Date	
Scale GRAPHIC	Project No. CBC-3237	Rev. 1 / Sheet 16 OF 18

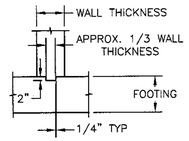
F-00-95



UPSTREAM WINGWALL ELEVATION VIEW

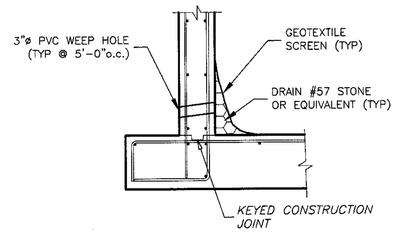
GRAPHIC SCALE

3' 1.5' 0 3' 6'



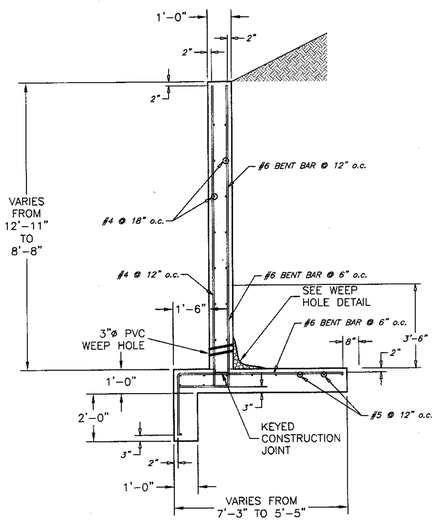
KEYED CONSTRUCTION JOINT DETAIL

NOT TO SCALE



WEEP HOLE DETAIL

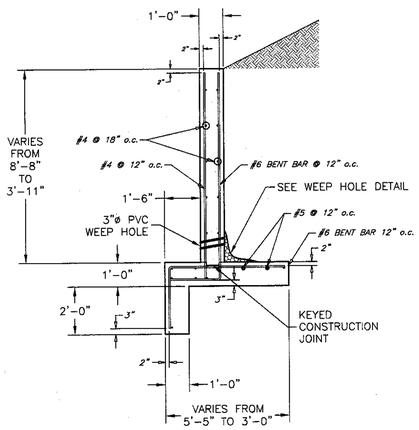
NOT TO SCALE



SECTION 'A-A'

GRAPHIC SCALE

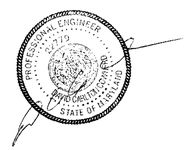
3' 1.5' 0 3' 6'



SECTION 'B-B'

GRAPHIC SCALE

3' 1.5' 0 3' 6'



NOTES FOR FOOTING:
1.) CONCRETE SHALL BE f'c = 3500 psi.
2.) REINFORCEMENT SHALL BE ASTM A-615 GRADE 60.

THE PURPOSE OF THIS SHEET IS TO REPLACE SHEET 17 OF BONNIE BRANCH OVERLOOK F-00-95.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-6-02
APPROVED: DEPARTMENT OS PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5/29/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/29/02

02/25/02	RMW	RAISED UPSTREAM HEADWALL (CBC-3335)

CBC ENGINEERS
DAYTON, OHIO

REVISED UPSTREAM WINGWALL DETAILS

Drawn By DWR	Date 07/31/01	WILDMAN ENVIRONMENTAL SERVICES DESIGN OF MULTI-PLATE ARCH BONNIE BRANCH OVERLOOK HOWARD COUNTY, MARYLAND
Approved By	Date	

Scale	Project No.	Rev.	Sheet
GRAPHIC	CBC-3237	1	17 OF 18

F-00-95

I - GENERAL

1.0 STANDARDS AND DEFINITIONS

1.1 STANDARDS - All standards refer to latest edition unless otherwise noted.

1.1.1 ASTM D-698-70 (Method C) "Standard Test Methods for Moisture. Density Relations of Soils and Soil Aggregate Mixtures Using 5.5-lb (2.5 kg.) Rammer and 12" (305-mm) Drop".

1.1.2 ASTM D-1557 "Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 [2,700 kN m/m^3]).

1.1.3 ASTM D-2922 "Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear Methods (Shallow Depth)".

1.1.4 ASTM D-1556 "Standard Test Method for Density of Soil in Place by the Sand-Cone Method".

1.1.5 All construction and materials shall be in accordance with the current AASHTO Specifications.

1.2 DEFINITIONS

1.2.1 Owner - In these specifications the word "Owner" shall mean Bonnie Branch Subdivision.

1.2.2 Engineer - In these specifications the word "Engineer" shall mean the Owner designated engineer.

1.2.3 Design Engineer - In these specifications the words "Design Engineer" shall mean CBC Engineers and Associates, Ltd.

1.2.4 Contractor - In these specifications the word "Contractor" shall mean the firm or corporation undertaking the execution of any work under the terms of these specifications.

1.2.5 Approved - In these specifications the word "approved" shall refer to the approval of the Engineer or his designated representative.

1.2.6 As Directed - In these specifications the words "as directed" shall refer to the directions to the Contractor from the Owner or his designated representative.

2.0 GENERAL CONDITIONS

2.1 The Contractor shall furnish all labor, material and equipment and perform all work and services except those set out and furnished by the Owner, necessary to complete in a satisfactory manner the site preparation, excavation, footings, culvert installation, head walls, wing walls, filling, compaction, and grading as shown on the plans and as described therein.

This work is to be accomplished under the observation of the Owner or his designated representative.

2.2 The Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including, without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site; and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work.

If conditions other than those indicated are discovered by the Contractor, the Owner should be notified immediately. The material which the Contractor believes to be a changed condition should not be disturbed so that the owner can investigate the condition.

2.3 The construction shall be performed under the direction of an experienced engineer who is familiar with the multi-plate structures.

II - FOUNDATION PREPARATION

1.0 UNDERCUTS

1.1 The soil beneath the bottom of the footings should be undercut to rock for all foundations, including the structure, headwalls, and wingwalls.

1.2 The excavations should be cleaned of all debris and loose material and all water should be pumped out before placement of the backfill.

1.3 In areas where rock is not present at normal footing depth, the area beneath the footing shall be undercut to rock.

1.4 Any excavation beneath the footing bottoms, if required, should be filled with lean concrete (1000 psi).

2.0 DEWATERING

2.1 There may be a need to dewater before excavating. All foundation excavations shall be pumped free of water and all soft and loose material shall be removed before pour concrete.

3.0 INSPECTION

3.1 All foundation excavations should be examined by a geotechnical engineer or his representative to determine that they are bearing on proper materials.

III - WINGWALLS AND ENDWALLS

1.0 END TREATMENTS

1.1 The endwalls and wingwalls shall consist of reinforced concrete conforming to Division II, Section 8, Class A of the AASHTO Standard Specifications for highway bridges having a minimum compression strength of 3500 psi.

1.2 Reinforcing steel shall conform to ASTM A-615, Grade 60, having a minimum yield strength of 60,000 psi.

1.3 The foundations for the wingwalls and endwalls shall be prepared as outlined in Section II of these specifications.

1.4 The endwalls shall be anchored to the MULTI-PLATE arch in the manner shown on the plans and shall be formed and poured in accordance with the plan dimensions.

1.5 Round weep holes spaced not over 5 feet on center shall be placed in the wingwalls as shown on the construction drawings. A granular envelope, consisting of #57 stone or equivalent, shall be placed behind each weep hole for a distance of approximately 1 foot from all edges of the weep hole. A free-draining geotextile screen shall be placed between the weep hole and the stone to prevent erosion of the stone.

IV - CONCRETE

1.0 CODES AND STANDARDS

1.1 Reinforced concrete shall conform to the requirements of AASHTO Standard Specifications for Highway Bridges, Division II – Construction, Section 8, "Concrete Structures" having a minimum compressive strength of 3,500 psi.

2.0 STANDARDS FOR MATERIALS

2.1 Portland Cement - Conforming to ASTM Specification C-150, Type I or II.

2.2 Water - The water shall be drinkable, clean free from injurious amounts of oils, acids, alkalis, organic materials, or deleterious substances.

2.3 Aggregates - Fine and coarse aggregates shall conform to current ASTM Specification C-33 "Specification for Concrete Aggregates" except that local aggregates which have been shown by tests and by actual service to produce satisfactory qualities may be used when approved by the Engineer.

2.4 Submittals - Test data and/or certifications to the Owner shall be furnished upon request.

3.0 PROPORTIONING OF CONCRETE

3.1 COMPOSITION

3.1.1 The concrete shall be composed of cement, fine aggregate, coarse aggregate and water.

3.1.2 The concrete shall be homogeneous, readily placeable and uniformly workable and shall be proportioned in accordance with ACI-211.1.

3.1.3 Proportions shall be established on the basis of field experience with the materials to be employed.

3.1.4 An air-entraining admixture, conforming to the requirements of ASTM C260, shall be used in all concrete furnished under this Contract. The quantity of admixture shall be such as to produce an air content in the freshly mixed concrete of 6 percent plus or minus 1 percent as determined in accordance with ASTM C231 or C173, unless otherwise noted on the Drawings.

3.2 Qualities Required - As indicated in the table below:

TABLE IV-1
QUALITIES REQUIRED

ITEM	QUALITY REQUIRED
Class	A
Type of Cement	I or II
Compressive Strength f'$_c$ (psi) @ 28 days	3,500 psi
Slump, inches	2 – 4 in.

3.3 Maximum Size of Coarse Aggregates - Maximum size of coarse aggregates shall not be larger than 38 mm (1.5").

3.4 Rate of Hardening of Concrete - Concrete mix shall be adjusted to produce the required rate of hardening for varied climatic conditions:

Under 40°F Ambient Temperature - Accelerate calcium chloride at 2% is acceptable when used within the recommendations of ACI-306R "Cold Weather Concreting." Admixtures containing chloride ion in excess of 1% by weight of admixture shall not be used in reinforced concrete.

4.0 MIXING AND PLACING

4.1 Equipment - Ready Mix Concrete shall be used and shall conform to the "Specifications for Ready-Mix Concrete," ASTM C-94. Approval is required prior to using job mixed concrete.

4.2 Preparation - All work shall be in accordance with ACI-304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete." All construction debris and extraneous matter shall be removed from within the forms. Concrete shall be placed on clean surfaces, free from water. Concrete that has to be dropped four (4) feet or more shall be placed through a tremie.

4.3 All concrete shall be consolidated by internal mechanical vibration immediately after placement. Vibrators shall be of a size appropriate for the work, capable of transmitting vibration to concrete at frequencies of not less than 4,500 impulses per minute.

5.0 FORM WORK

5.1 Forms shall be of wood, steel or other approved material and shall be set and held true to the dimensions, lines and grades of the structure (elements) prior to and during the placement of concrete.

5.2 Forms shall not be removed until the concrete has sufficient strength to prevent concrete drainage.

6.0 CURING

Fresh concrete shall be protected from rains, flowing water and mechanical injury for a period of four (4) days.

7.0 REINFORCING STEEL

7.1 MATERIAL

7.1.1 All reinforcing bars shall be deformed bars (ASTM-A615) Grade 60.

7.2 BENDING AND SPLICING

7.2.1 Bar reinforcement shall be cut and bent to the shapes shown on the plans. Fabrication tolerances shall be in accordance with ACI 315. All bars shall be bent cold, unless otherwise permitted.

7.2.2 All reinforcement shall be furnished in the full lengths indicated on the plans unless otherwise permitted. Except for splices shown on the plans and splices for No. 5 or smaller bars, splicing of bars will not be permitted without written approval. Splices shall be staggered as far as possible.

7.2.3 In lapped splices, the bars shall be placed and wired in such a manner as to maintain the minimum distance to the surface of the concrete shown on the plans.

7.2.4 Substitution of different size bars will be permitted only when authorized by the engineer. The substituted bars shall have an area equivalent to the design area, or larger.

7.3 PLACING AND FASTENING

7.3.1 Steel reinforcement shall be accurately placed as shown on the plans and firmly held in position during the placing and setting of concrete. Bars shall be tied at all intersections around the perimeter of each mat and at not less than 2 foot centers or at every intersection, whichever is greater, elsewhere. Welding of cross bars (tack welding) will not be permitted for assembly of reinforcement.

7.3.2 Reinforcing steel shall be supported in its proper position by use of mortar blocks, wire bar supports, supplementary bars or other approved devices. Such devices shall be of such height and placed at sufficiently frequent intervals so as to maintain the distance between the reinforcing and the formed surface or the top surface within 1/4 inch of that indicated on the plans.

V - FILTER FABRIC (GEOTEXTILE SCREEN)

1.1 A minimum 18 inches of geotextile (filter fabric) shall be placed over all weepholes from all edges of the weepholes. The filter fabric shall be placed between weepholes and the granular material. Filter fabric shall be placed at all locations shown on the construction drawings.

1.2 Filter fabric cloth shall meet the following ASTM tests:

1.2.1 ASTM D4751 - Apparent opening size equal to #70 U.S. Standard Sieve Size.

1.2.2 ASTM D4632 (Grab Tensile Test) - Minimum Strength = 160 pounds.

1.2.3 ASTM D4632 (Grab Elongation) - 30-70%.

1.2.4 ASTM D4533 (Trapezoidal Tear) - Minimum Strength = 60 pounds.

1.2.5 ASTM D4355 (Stabilized for Heat and Ultra-Violet Degradation) - 70% strength retained.

1.3 The minimum fabric coefficient of permeability (ASTM D4491) shall be 0.24 cm/sec.

1.4 The fabric shall be non-woven with a minimum thickness (ASTM D5199) of 60 mils.

1.5 Fabric shall not be placed over sharp or angular rocks that could tear or puncture it.

1.6 Care should be exercised to prevent any puncturing or rupture of the filter fabric. Should such rupture occur the damaged area should be covered with a patch of filter fabric using an overlap minimum of one (1) foot.

THE PURPOSE OF THIS SHEET IS TO REPLACE SHEET 18 OF BONNIE BRANCH OVERLOOK F-00-95.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-6-02
APPROVED: DEPARTMENT OS PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5/29/02
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 5/29/02

02/25/02	RMW	RAISED UPSTREAM HEADWALL (CBC-3335)

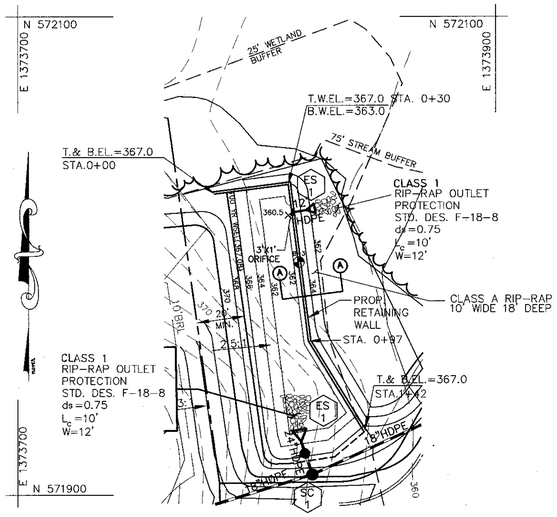
CBC ENGINEERS
DAYTON, OHIO

REVISED SPECIFICATIONS

Drawn By DWR	Date 7/31/01	WILDMAN ENVIRONMENTAL SERVICES DESIGN OF MULTI-PLATE ARCH BONNIE BRANCH OVERLOOK HOWARD COUNTY, MARYLAND
Approved By	Date	

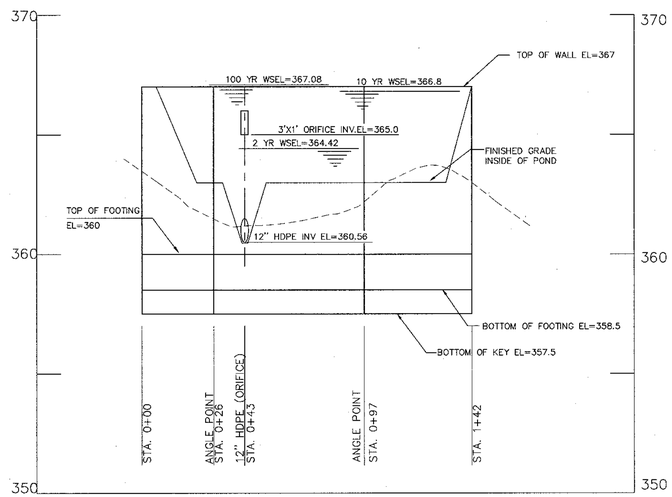
Scale	Project No.	Rev.	Sheet
GRAPHIC	CBC-3237	1	18 OF 18

F-00-95



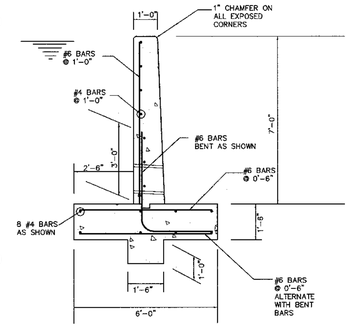
SWM PLAN

SCALE: 1"=30'

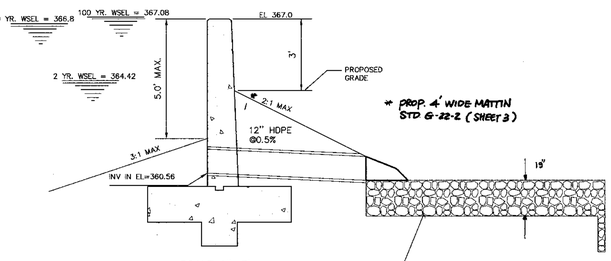


PROPOSED RETAINING WALL PROFILE

SCALE: HOR. 1"=30'
VER. 1"=3'



SCALE 1"=3'



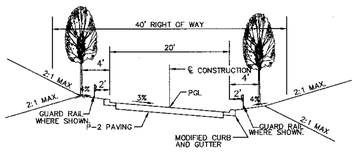
SCALE 1"=3'

SECTION A–A

CLASS 1
RIP-RAP OUTLET
PROTECTION
STD. DET. F-18-8
d =0.75
L =10'
W=12'

GENERAL NOTES:

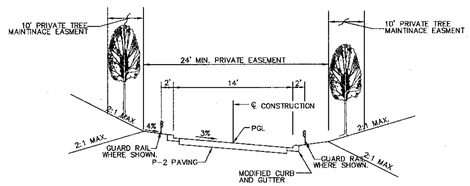
1. ALL CONCRETE AND REINFORCING STEEL SHALL CONFORM TO HOWARD COUNTY STANDARD SPECIFICATIONS.
2. F'c= 2,000 PSI; Fy = 60,000 PSI
3. SOIL BACKFILL UNIT WEIGHT NOT TO EXCEED 110 PCF
4. ALLOWABLE BEARING PRESSURE GREATER THAN OR EQUAL TO 3,750 PSF (BEARING CAPACITY TO BE TESTED IN THE FIELD PRIOR TO CONSTRUCTION.
5. DURING CONSTRUCTION, WALL MUST BE BACKFILLED EQUALLY ON BOTH SIDES.
6. PROVIDE MSHA MIX NUMBER 3, NON-REINFORCED CONCRETE FROM BEDROCK TO BOTTOM OF FOOTING, NON-REINFORCED CONCRETE SHALL EXTEND 6" ON EITHER SIDE OF THE FOOTING.
7. ALL CONCRETE SHALL BE MSHA MIX NO. 3



TYPICAL ROADWAY SECTION

N.T.S.

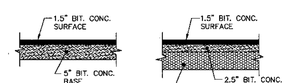
CLASSIFICATION: ACCESS PLACE (PUBLIC)
DESIGN SPEED: 15 MPH
FROM STA. 0+00 TO STA. 3+26.00



TYPICAL ROADWAY SECTION

N.T.S.

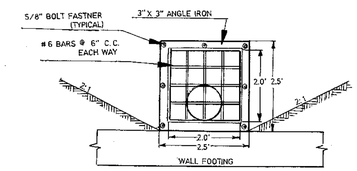
CLASSIFICATION: ACCESS PLACE (PRIVATE)
DESIGN SPEED: 15 MPH
FROM STA. 3+25.00 TO STA. 11+39.88



ALTERNATE "A" *ALTERNATE "B"*

PAVING SECTION – P2

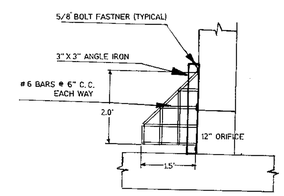
N.T.S.



TRASH RACK DETAIL

SCALE 1" = 2'

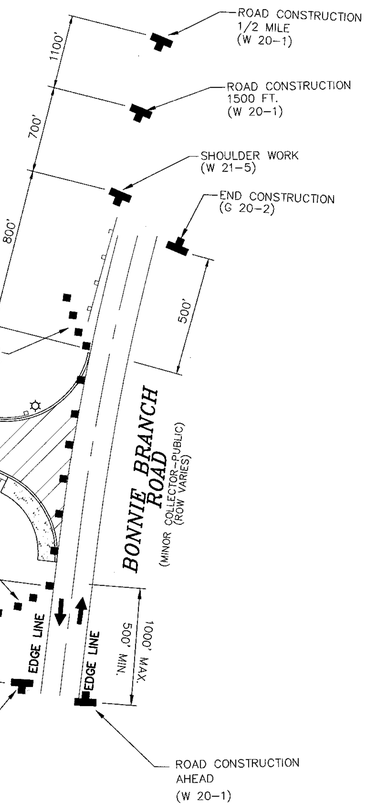
*NOTE**
TRASH RACK TO BE GALVENIZED AFTER FABRICATION AND PAINTED WITH TWO COATS OF BATTLESHIP GRAY PAINT



TRASH RACK DETAIL

SCALE 1" = 2'

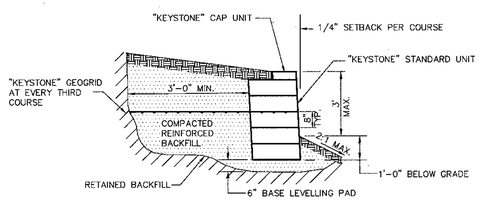
*NOTE**
TRASH RACK TO BE GALVENIZED AFTER FABRICATION AND PAINTED WITH TWO COATS OF BATTLESHIP GRAY PAINT



TRAFFIC CONTROL PLAN

N.T.S.

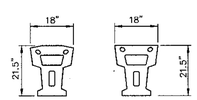
NOTE: 1. TRAFICE CONTROL PLAN IS TO BE IN COMPLIANCE WITH HOWARD COUNTY STANDARD DETAIL TE – 11.
2. THIS TRAFFIC CONTROL PLAN IS TO BE USED IN COMBINATION WITH THE GENERAL NOTES AT THE BEGIINING OF STANDARDS No. MD 104.00 OF BOOK OF STANDARDS, HIGHWAY & INCIDENAL STRUCTURES ISSUED BY STATE OF MARYLAND, DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION.



RETAINING WALL DETAIL

N.T.S.

NOTE: 1. ALL FOOTING AND DESIGN SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. COMPACTED REINFORCED BACKFILL SHALL CONSISIT OF GRAVEL OR CRUSHED STONE (1/2" TO 3/4") AT 95% STANDARD PROCTOR COMPACTION.



"KEYSTONE" STANDARD UNIT

N.T.S.

LEGEND

SIGN SUPPORT — FACE OF SIGN: TRAFFIC CONTROL SIGNAGE

CHANNELIZING DEVICE

DIRECTION OF TRAFFIC FLOW

LIMIT OF S.H.A. PAVING SECTION

ROAD CONSTRUCTION AHEAD — W 20-1

SHOULDER WORK — W 21-5

END CONSTRUCTION — G 20-2

TRAFFIC CONTROL SIGNAGE

N.T.S.

BY THE DEVELOPER:

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

Ronald B. Wildman — 4/27/00
SIGNATURE OF DEVELOPER, DATE
Ronald B. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

4/27/00
SIGNATURE OF ENGINEER, DATE
R. Jacob Hikmat
PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

5/24/00
USDA – NATURAL RESOURCE CONSERVATION SERVICE, DATE

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

5/24/00
HOWARD SOIL CONSERVATION DISTRICT, DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

6-2-00
CHIEF, BUREAU OF HIGHWAYS, DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

6/9/00
CHIEF, DIVISION OF LAND DEVELOPMENT, DATE

6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION, DATE

STATE OF MARYLAND — R. JACOB HIKMAT — 17948 — PROFESSIONAL ENGINEER

96090/DWG/FINAL/SECDET1

project	date
96090	APR. 2000
illustration	engineering
scale	approval
AS SHOWN	

no.	description	date
1	ADD M-1 AND REVISE LOCATION OF SC-1	05/03/2002

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
TYPICAL SECTIONS AND DETAILS

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

NOTE: THIS DRAWING IS TO BE USED FOR LANDSCAPE PLAN PURPOSES ONLY.

NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL
2. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $ 22,200.00 .

PUBLIC STREET TREE CALCULATIONS

BONNIE BRANCH ROAD - 250 LF OF CREDIT FOR EXISTING TREES
TWIN STREAM DRIVE - 580 / 40 = 14
TOTAL TREES REQUIRED = 14 TREES
TOTAL TREES PROVIDED = 14 TREES

PRIVATE STREET TREE CALCULATIONS

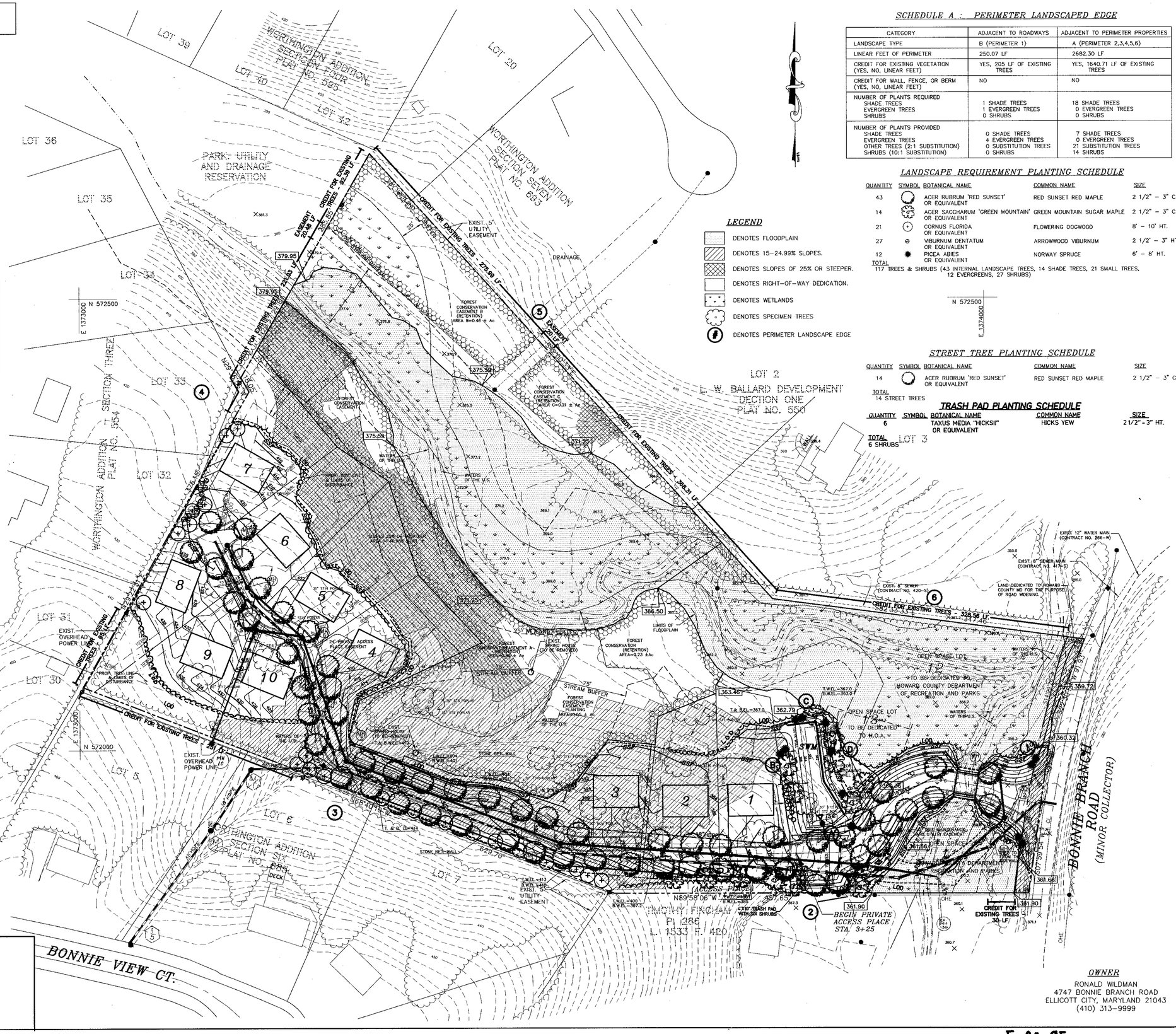
TWIN STREAM DRIVE - 1,694 / 40 = 43
TOTAL TREES REQUIRED = 43 TREES
TOTAL TREES PROVIDED = 43 TREES

SCHEDULE D : STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER	325 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	N/A
NUMBER OF TREES REQUIRED SHADE TREES EVERGREEN TREES	 7 SHADE TREES 9 EVERGREEN TREES
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES OTHER (10:1 SUBSTITUTION)	 7 SHADE TREES 8 EVERGREEN TREES 13 SHRUBS

PERIMETER		EDGE TYPE
PERIMETER 1		
ENTRANCE – 40 LF		N/A
SFD SIDE TO ROAD – 205 LF EXISTING TREES TO REMAIN		B
SFD SIDE TO ROAD TO ROAD – 45.07 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 1 1	B
PERIMETER 2		
OPEN SPACE TO SFD – 30 LF EXISTING TREES TO REMAIN		A
OPEN SPACE TO SFD – 412.74 LF 1 SHADE TREE / 60 LF	 7	A
PERIMETER 3		
SFD TO SFD – 251 LF EXISTING TREES TO REMAIN		A
SFD & OPEN SPACE TO SFD – 378.70 LF 1 SHADE TREE / 60 LF	 7	A
PERIMETER 4		
EASEMENT – 20.48 LF		N/A
SFD & OPEN SPACE TO SFD – 408.42 LF EXISTING TREES TO REMAIN		A
SFD TO SFD – 250.15 LF 1 SHADE TREE / 60 LF	 4	A
PERIMETER 5		
EASEMENTS – 41.57 LF		N/A
OPEN SPACE TO SFD – 622.73 LF EXISTING TREES TO REMAIN		A
PERIMETER 6		
OPEN SPACE TO SFD – 328.56 LF EXISTING TREES TO REMAIN		A
TOTAL PLANTING OBLIGATION		
SHADE TREES	19	
EVERGREEN TREES	1	
SHRUBS	0	

SWM PERIMETER		EDGE TYPE
SWM PERIMETER A – 50 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 1 1	B
SWM PERIMETER B – 110 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 2 3	B
SWM PERIMETER C – 55 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 1 2	B
SWM PERIMETER D – 110 LF 1 SHADE TREE / 50 LF 1 EVERGREEN / 40 LF	 3 3	B
TOTAL PLANTING OBLIGATION		
SHADE TREES	7	
EVERGREEN TREES	9	
SHRUBS	0	



LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15-24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES SPECIMEN TREES
- DENOTES PERIMETER LANDSCAPE EDGE

SCHEDULE A : PERIMETER LANDSCAPED EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	B (PERIMETER 1)	A (PERIMETER 2,3,4,5,6)
LINEAR FEET OF PERIMETER	250.07 LF	2682.30 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	YES, 205 LF OF EXISTING TREES	YES, 1640.71 LF OF EXISTING TREES
CREDIT FOR WALL, FENCE, OR BERM (YES, NO, LINEAR FEET)	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	 1 SHADE TREES 1 EVERGREEN TREES 0 SHRUBS	 18 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) SHRUBS (10:1 SUBSTITUTION)	 0 SHADE TREES 4 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	 7 SHADE TREES 0 EVERGREEN TREES 21 SUBSTITUTION TREES 14 SHRUBS

LANDSCAPE REQUIREMENT PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
43		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.
14		ACER SACCHARUM 'GREEN MOUNTAIN' OR EQUIVALENT	GREEN MOUNTAIN SUGAR MAPLE	2 1/2" – 3" CAL.
21		CORNUS FLORIDA OR EQUIVALENT	FLOWERING DOGWOOD	8' – 10' HT.
27		VIBURNUM DENTATUM OR EQUIVALENT	ARROWWOOD VIBURNUM	2 1/2' – 3" HT.
12		PICEA ABIES OR EQUIVALENT	NORWAY SPRUCE	6' – 8' HT.

TOTAL
117 TREES & SHRUBS (43 INTERNAL LANDSCAPE TREES, 14 SHADE TREES, 21 SMALL TREES, 12 EVERGREENS, 27 SHRUBS)

STREET TREE PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
14		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.

TOTAL
14 STREET TREES

TRASH PAD PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
6		TAXUS MEDIA "HICKSII" OR EQUIVALENT	HICKS YEW	2 1/2" - 3" HT.

TOTAL
6 SHRUBS

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00
APPROVED: DEPARTMENT OF PLANNING AND ZONNING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

no.	description	date
3	ADD STORM DRAIN - 5 TO 1-H, ADD SHM 6 TO SHM 10, AND REVISE LOCATION OF STREET TREES PER PIPE RELOCATIONS AND PIPES SHOWN	10/25/01
2	REVISED BRIDGE	11/16/00
1	ADD TRASH PAD & TRASH PAD PLANTING SCHEDULE	

revisions

project 96090	date APR 2000	engineering	approval
Illustration MPP/SAA	SJD	scale 1"=50'	MMP

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
LANDSCAPE PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

96090/DWG/FINAL/PLP

ROAD CONSTRUCTION PLANS

BONNIE BRANCH OVERLOOK

LOTS 1 THRU 13

SECOND ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SHEET INDEX

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ROAD PLAN AND PROFILES	2
GRADING, EROSION AND SEDIMENT CONTROL PLAN	3
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS	4
SWM SPECIFICATIONS AND SOIL BORINGS	5
STROM DRAIN PROFILES AND DETAILS	6
DRAINAGE AREA AND SOILS MAP	7
FILLET PROFILES	8
TYPICAL SECTIONS AND DETAILS	9
LANDSCAPE PLAN	10
FOREST CONSERVATION PLAN	11
FOREST CONSERVATION PLAN	12
BRIDGE DETAILS	13
BRIDGE DETAILS	14
BRIDGE DETAILS	15
BRIDGE DETAILS	16
BRIDGE DETAILS	17
BRIDGE DETAILS	18

OWNER

RONALD WILDMAN
4747 BONNIE BRANCH
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

BY THE DEVELOPER:

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

Ronald B. Wildman — SIGNATURE OF DEVELOPER — DATE 4/28/00
Ronald B. Wildman — PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF ENGINEER — DATE 4/28/00
R. JACOB HIKMAT — PRINTED NAME OF ENGINEER

STATE OF MARYLAND — R. JACOB HIKMAT — 17942 — PROFESSIONAL ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

Cheryl Simmons — USDA – NATURAL RESOURCE CONSERVATION SERVICE — DATE 5/24/00

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

John R Lamborn — HOWARD SOIL CONSERVATION DISTRICT — DATE 5/24/00

APPROVED: DEPARTMENT OF PUBLIC WORKS

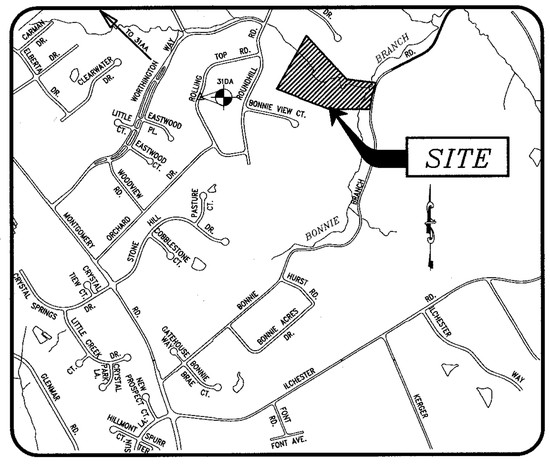
Eric Lee M. Pavelec — CHIEF BUREAU OF HIGHWAYS — DATE 6/2/00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

Cindy Stramble — CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/COVER



VICINITY MAP

SCALE: 1'=1000'

23. ALL ROADS AND T-TURN AROUNDS ARE TO HAVE MOUNTABLE CURBS.
24. HOUSES NOT DRAINING TO SWM FACILITIES ARE TO HAVE DRY WELLS FOR WATER QUALITY.
25. EXISTING TREE LINE IS BASED ON AERIAL TOPOGRAPHY AND FOREST STAND DELINEATION.
26. JOINT PERMIT TRACKING NUMBER: 99-NT-0251/199964211.
27. FOR TRAFFIC CONTROL PLAN SEE SHEET 9 OF 12
28. BONNIE BRANCH ROAD IS A SCENIC ROAD.
29. THIS PROJECT IS SUBJECT TO BOARD OF APEALS CASE NO. BA 410-D
30. RETAINING WALLS ON BOTH SIDES OF THE PRIVATE ACCESS PLACE (TWIN STREAM DRIVE) ARE KEYSTONE RETAINING WALLS OR EQUIVALENT.
31. Landscape surety in the amount of $22,200.00 is part of the Developers Agreement.
32. CONCRETE TRASH PAD TO BE CONSTRUCTED AT STA: 2+79.85 AND STA: 3+08.85 (4'X10'X6").

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE (5) DAYS PRIOR TO ANY EXCAVATION WORK:

MISS UTILITY	1-800-257-7777
C&P TELEPHONE COMPANY	(410) 725-9976
HOWARD COUNTY BUREAU OF UTILITIES	(410) 313-4900
AT&T CABLE LOCATION DIVISION	(410) 393-3533
BALTIMORE GAS & ELECTRIC	(410) 685-0123
STATE HIGHWAY ADMINISTRATION	(410) 531-5533
HOWARD COUNTY DEPT. OF PUBLIC WORKS/ CONSTRUCTION INSPECTION DIVISION	(410) 313-1880

3. PROJECT BACKGROUND:

LOCATION: SECOND ELECTION DISTRICT – TAX MAP 31 – PARCEL 27	
ZONING: R-20	
DEED REFERENCE :	L. 3887 F. 579
TOTAL TRACT AREA :	10.27 ACRES ±
NUMBER OF PROPOSED LOTS:	13 (10 BUILDABLE)
ACREAGE OF PROPOSED BUILDABLE LOTS :	3.76 ACRES ±
OPEN SPACE REQUIRED :	3.08 ACRES ± (30%)
OPEN SPACE PROVIDED :	6.09 ACRES ±
AREA OF RIGHT OF WAY:	0.42 ACRES±
DPZ REFERENCE #: – SP-97-20, WP-98-75, P-99-03, BA 410-D	
WATER AND SEWER CONTRACT #	14-3823-D

4. TOPOGRAPHIC INFORMATION ARE BASED ON AERIAL TOPOGRAPHIC SURVEY BY WINGS AERIAL MAPPING CO., INC. ON MARCH 12, 1997.
5. HORIZONTAL AND VERTICAL DATUMS BASED ON (NAD'83) MARYLAND STATE COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS.

STA No. 31AA	N 573,998.5709 E 1,369,934.229	EL.= 500.157
STA No. 31DA	N 571,982.6701 E 1,372,145.075	EL.= 482.35

6. FLOODPLAIN DELINEATION IS BASED ON STUDY BY MILDENBERG BOENDER AND ASSOCIATES, INC. AND UPDATED JULY 1998. AND UPDATED DECEMBER 1999.
7. PUBLIC WATER AND SEWER WILL BE AVAILABLE UNDER CONTRACT #417-S AND #266-W.
8. STORMWATER MANAGEMENT IS PROVIDED VIA PRIVATE DETENTION FACILITY & STORMCEPTOR STORMWATER MANAGEMENT WILL BE PRIVATELY OWNED AND MAINTAINED. DRY WELLS WILL BE USED FOR LOTS 1-7.
9. TRAFFIC CONTROL DEVICES, MARKINGS, AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
10. COMPACTION IN FILL AREAS TO BE 95% AS DETERMINED PER AASHTO T-180.
11. CONTRACTOR TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES ON SITE PRIOR TO COMMENCING CONSTRUCTION.
12. FOREST CONSERVATION REQUIREMENTS HAVE BEEN SATISFIED ON SITE VIA RETENTION AND REFORESTATION.

FOREST CONSERVATION AREA =1.79 Ac	SURETY AMOUNT=	$7,797.20
REFORESTATION AREA =0.55 Ac	SURETY AMOUNT=	$7,187.40
	TOTAL SURETY REQUIRED =	$14,984.60

13. WETLANDS STUDY AND FOREST STAND DELINEATION IS WILDMAN ENVIRONMENTAL SERVICES, INC. DATED MARCH 1997.
14. PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT.
15. OPEN SPACE LOT 13 WILL BE OWNED BY THE HOME OWNER'S ASSOCIATION, LOTS 11 & 12 WILL BE OWNED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
16. SLOPES IN EXCESS OF 25% EXIST AND ARE IDENTIFIED WHERE THEY EXCEED 20,000 SQ. FT.
17. ALL EXISTING STRUCTURES TO BE REMOVED.
18. A MINIMUM OF TWO (2) PARKING SPACES ARE PROVIDED ON EACH LOT. NO OFF-STREET PARKING IS REQUIRED.
19. THE STREET LIGHT LOCATIONS AND TYPES OF LIGHTS ARE AS FOLLOWS :

STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE	NOTES
TWIN STREAM DRIVE (PUBLIC)	0+26	30' R	150-watt HPS VAPOR PENDANT FIXTURE (CUTOFF) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM.	ANGLE ARM AS SHOWN SHEET # 2
TWIN STREAM DRIVE (PUBLIC)	1+61	14' R	100 watt HPS VAPOR "TRADITIONAIRE" POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE	
TWIN STREAM DRIVE (PUBLIC)	3+17	15' L		

20. STREET LIGHTS WILL BE REQUIRED IN THIS DEVELOPMENT IN ACCORDANCE WITH THE DESIGN MANUAL STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SELECTED SHALL BE IN ACCORDANCE WITH THE LATEST HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)." THE JUNE 1993 POLICY INCLUDES GUIDELINES FOR LATERAL AND LONGITUDINAL PLACEMENT. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
21. BASED ON HOWARD COUNTY DATA, NO CEMETERIES OR HISTORIC STRUCTURES EXIST ON SITE.
22. PROJECT IS SUBJECT TO WAIVER PETITION WP-98-75. WAIVER IS TO SECTION 16.116(a)(2)(ii) OF THE SUBDIVISION REGULATIONS. WHICH RESTRICTS GRADING WITHIN STREAM BUFFERS. APPROVES MARCH 25, 1998 WITH THE FOLLOWING CONDITIONS: 1. THE HORIZONTAL ALIGNMENT OF THE PROPOSED PRIVATE ACCESS PLACE SHOULD FOLLOW THE OVERHEAD EASEMENT AS CLOSELY AS POSSIBLE. 2. INSURE THAT CREATED CUT SLOPES ARE NO STEEPER THAN 2:1 VERTICAL. OTHERWISE STRUCTURAL STABILIZATION WILL BE REQUIRED. 3. WAIVER APPROVAL APPLIES ONLY TO THE PROPOSED GRADING AND CLEARING FOR THE CUL-DE-SAC OF ROAD A, AND THE PRIVATE ACCESS PLACE EXTENDING FROM ITS TERMINUS.

project	date
96090	APR. 2000
illustration	engineering
MMP/SAA	MMP/SAA
scale	approval
AS SHWN	RJH

no.	description	date
2	REVISE THE SHEET INDEX	5/21/02
1	ADD NOTE 32 & CHANGED STREET LIGHT LOCATION	11/30/00

revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
COVER SHEET

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Bal. (301) 621-5321 Wash. (410) 997-0298 Fax.

F-00-95

LEGEND

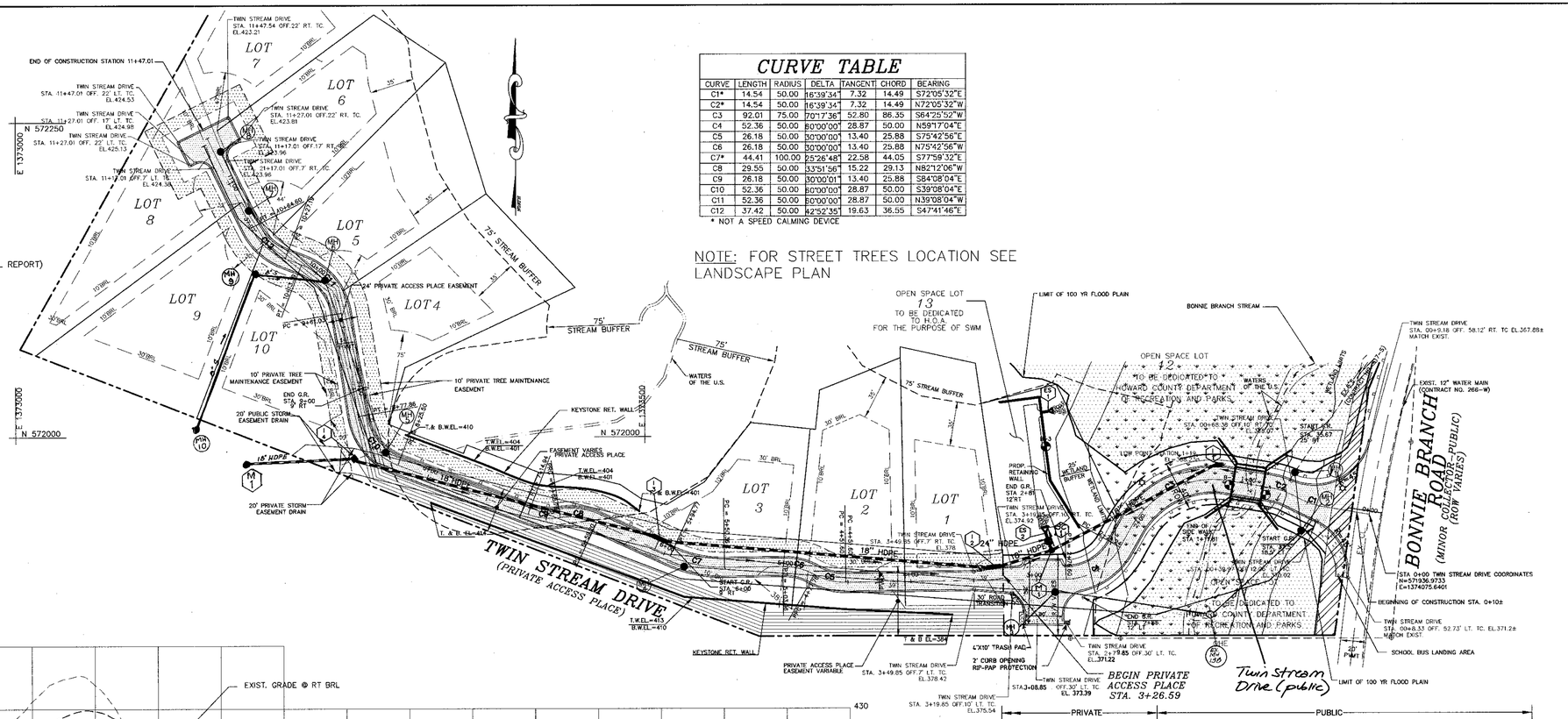
- DENOTES FLOOD PLAIN
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES PAVEMENT
- DENOTES CONCRETE PLATFORM
- DENOTES 95% BACKFILL
- DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

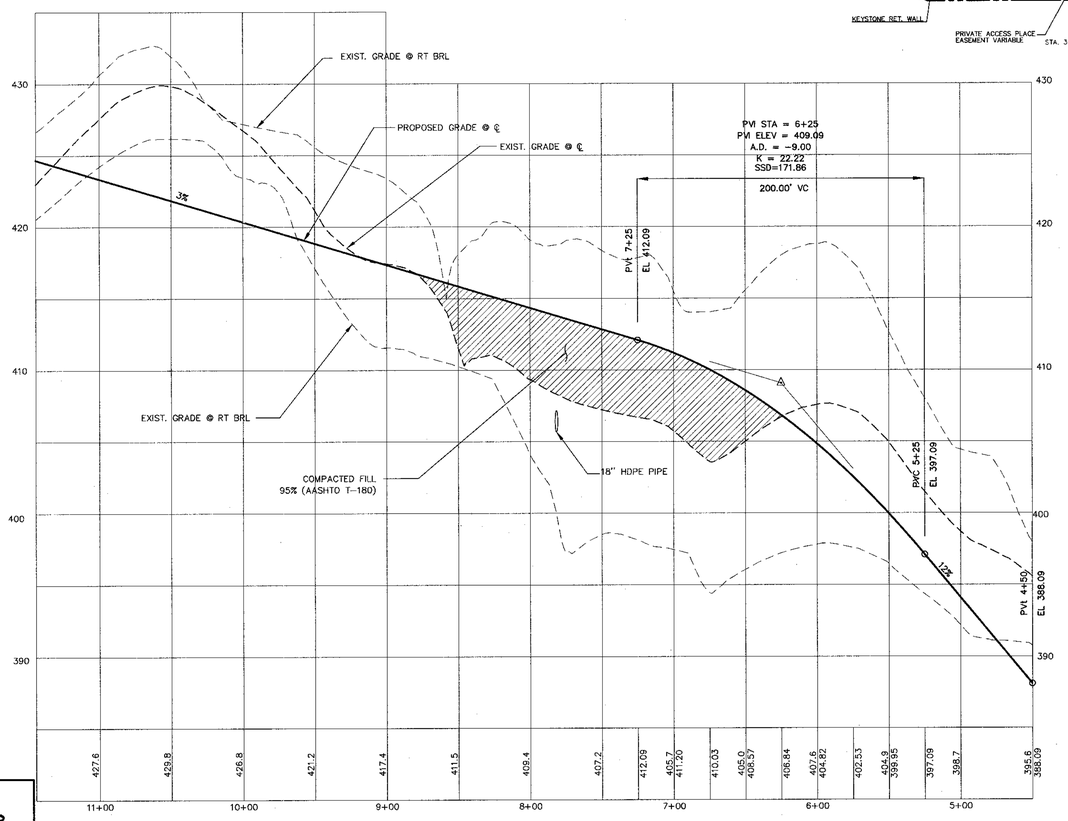
CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	BEARING
C1*	14.54	50.00	16°39'34"	7.32	14.49	S72°05'32"E
C2*	14.54	50.00	16°39'34"	7.32	14.49	N72°05'32"W
C3	92.01	75.00	70°17'36"	52.80	86.35	S64°25'52"W
C4	52.36	50.00	80°00'00"	28.87	50.00	N59°17'04"E
C5	26.18	50.00	30°00'00"	13.40	25.88	S75°42'56"E
C6	26.18	50.00	30°00'00"	13.40	25.88	N75°42'56"W
C7*	44.41	100.00	25°26'48"	22.58	44.05	S77°59'32"E
C8	29.55	50.00	33°51'56"	15.22	29.13	N82°12'06"W
C9	26.18	50.00	30°00'01"	13.40	25.88	S84°08'04"E
C10	52.36	50.00	80°00'00"	28.87	50.00	S39°08'04"E
C11	52.36	50.00	80°00'00"	28.87	50.00	N39°08'04"W
C12	37.42	50.00	42°52'35"	19.63	36.55	S47°41'46"E

* NOT A SPEED CALMING DEVICE

NOTE: FOR STREET TREES LOCATION SEE LANDSCAPE PLAN

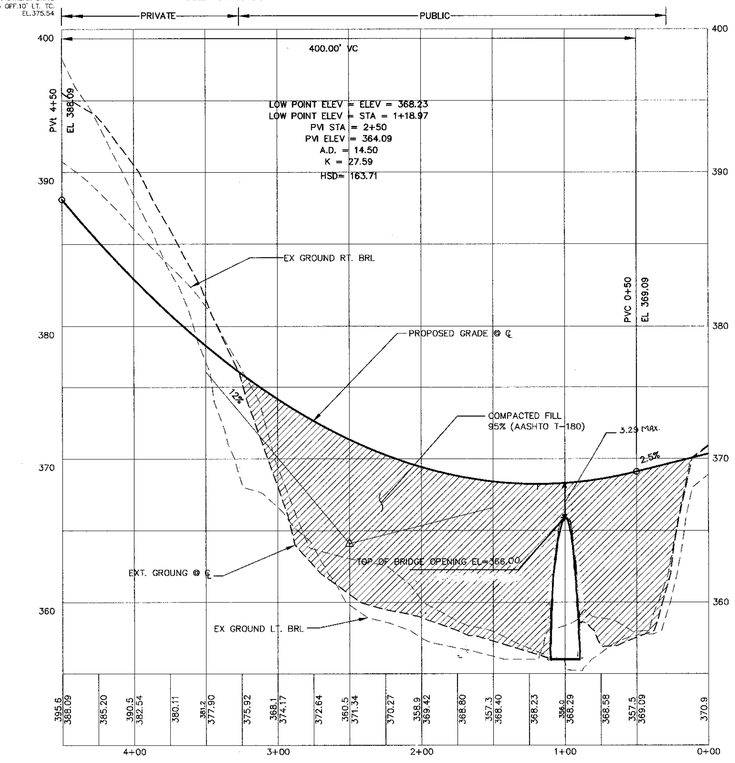




TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE(PRIVAE)
DESIGN SPEED: 25 MPH(VERTICAL)



TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE
DESIGN SPEED: 25 MPH(VERTICAL)

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/9/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

STATE OF MARLAND — R. JACOB HEMMAT — 17942 — PROFESSIONAL ENGINEER

96090/DWG/FINAL/RD-PROF

project	date
96090	APR. 2000
illustration	engineering
SAA	MMP
scale	approval
1"=50'	RJH

no.	description	date
3	ADD STORM DRAIN 1-5 TO 1-4, ADD SEWER: MH-6 TO MH-10	05/02/2002
2	REVISED BRIDGE & PROFILE	10/25/01
1	ADD TRASH PAD & CHANGED STREET LIGHT LOCATION	11/10/00

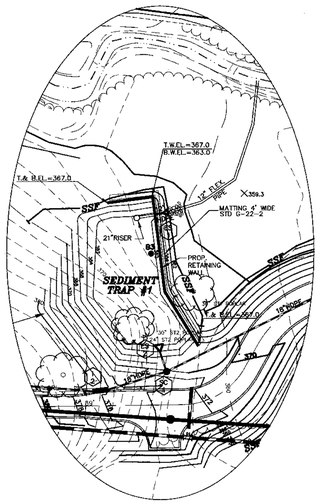
revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
ROAD PLAN AND PROFILES

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

THIS DRAWING IS TO BE USED FOR GRADING PLAN PURPOSES ONLY



SEDIMENT TRAP DATA

TYPE:	ST-I PIPE OUTLET
DRAINAGE AREA:	3.22 ACRES
TOTAL VOLUME REQUIRED:	11,592 C.F.
TOTAL VOLUME PROVIDED:	15,855 C.F.
WET STORAGE REQUIRED:	5,796 C.F.
WET STORAGE PROVIDED:	6,995 C.F.
WET STORAGE EL:	364.5
DRY STORAGE REQUIRED:	5,796 C.F.
DRY STORAGE PROVIDED:	7,860 F.F.
DRY STORAGE EL:	366.0
RISER SIZE:	21"
BARREL SIZE:	12"

BY THE DEVELOPER:

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

Ronald B. Wildman — 4/28/00
SIGNATURE OF DEVELOPER — DATE
Ronald B. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."

4/28/00
SIGNATURE OF ENGINEER — DATE
R. TRACY HIKMAT
PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS

5/24/00
USDA – NATURAL RESOURCE CONSERVATION SERVICE — DATE

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

5/24/00
HOWARD SOIL CONSERVATION DISTRICT — DATE

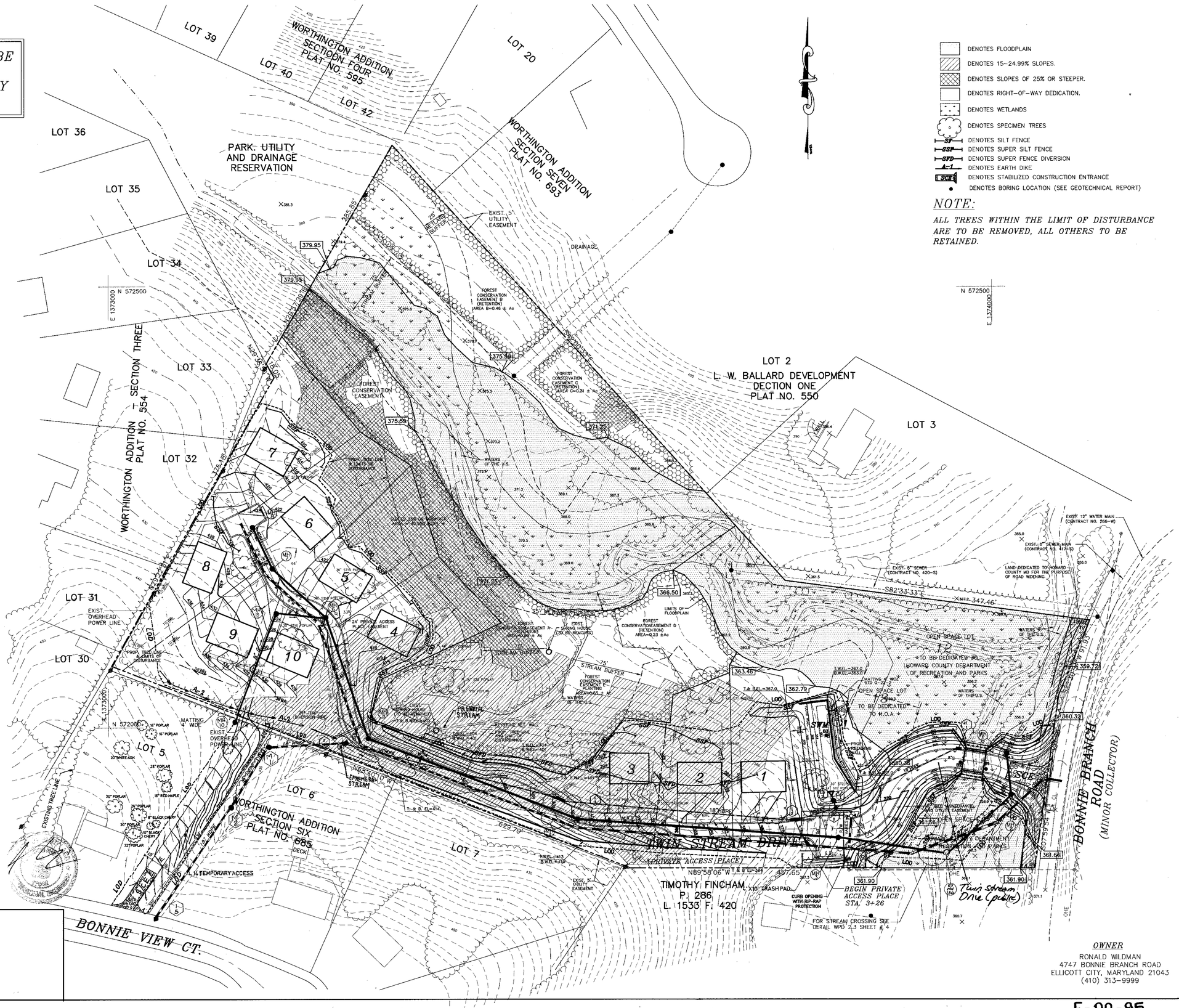
APPROVED: DEPARTMENT OF PUBLIC WORKS

6-2-00
CHIEF BUREAU OF HIGHWAYS — DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

6/19/00
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

6/12/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE



DENOTES FLOODPLAIN
DENOTES 15-24.99% SLOPES.
DENOTES SLOPES OF 25% OR STEEPER.
DENOTES RIGHT-OF-WAY DEDICATION.
DENOTES WETLANDS
DENOTES SPECIMEN TREES
SF — DENOTES SILT FENCE
SSF — DENOTES SUPER SILT FENCE
SFD — DENOTES SUPER FENCE DIVERSION
A-1 — DENOTES EARTH DIKE
S.C.E. — DENOTES STABILIZED CONSTRUCTION ENTRANCE
DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

NOTE:

ALL TREES WITHIN THE LIMIT OF DISTURBANCE ARE TO BE REMOVED, ALL OTHERS TO BE RETAINED.

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

project	date
96090	APR. 2000
illustration	engineering
MPP/SAA	MMP/SAA
scale	approval
1"=50'	RJH

no.	description	date
4	ADD STORM DRAIN 1-3 TO 1-4, ADD SEWER W4-5 TO W4-10	05/02/2002
3	REVISED BRIDGE	10/25/01
2	ADD TEMPORARY ACCESS FOR CONSTRUCTION	12/20/01
1	ADD TRASH PAD	10/26/00

revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
GRADING EROSION AND SEDIMENT CONTROL PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
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(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0299 Fax.

F-00-95

96090/DWG/FINAL/GRADE

NOTE: THIS DRAWING IS TO BE USED FOR LANDSCAPE PLAN PURPOSES ONLY.

NOTES:

1. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL
2. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $ 22,200.00 .

PUBLIC STREET TREE CALCULATIONS

BONNIE BRANCH ROAD - 250 LF OF CREDIT FOR EXISTING TREES
TWIN STREAM DRIVE - 580 / 40 = 14
TOTAL TREES REQUIRED = 14 TREES
TOTAL TREES PROVIDED = 14 TREES

PRIVATE STREET TREE CALCULATIONS

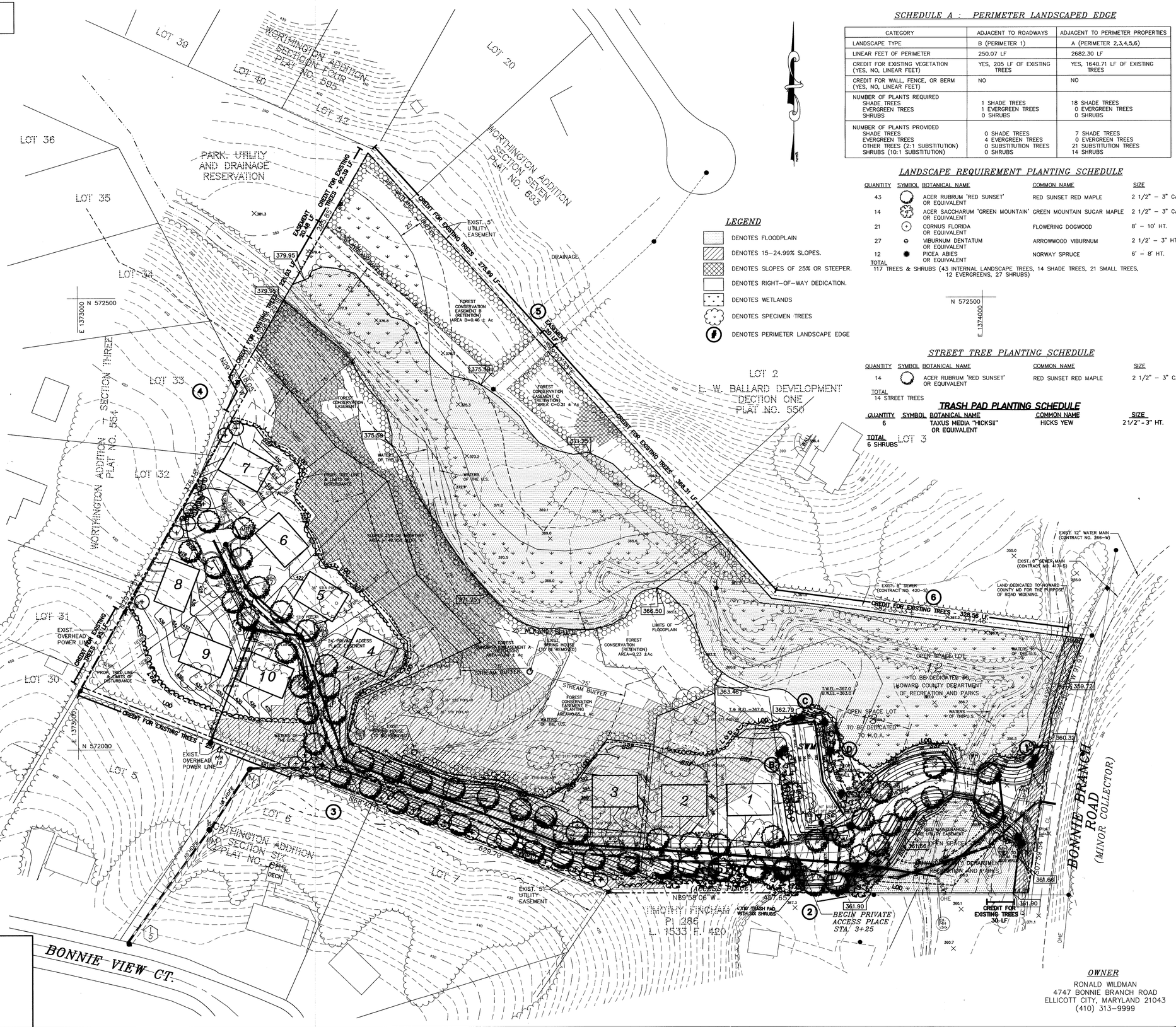
TWIN STREAM DRIVE - 1,694 / 40 = 43
TOTAL TREES REQUIRED = 43 TREES
TOTAL TREES PROVIDED = 43 TREES

SCHEDULE D : STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER	325 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	N/A
NUMBER OF TREES REQUIRED SHADE TREES EVERGREEN TREES	 7 SHADE TREES 9 EVERGREEN TREES
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES OTHER (10:1 SUBSTITUTION)	 7 SHADE TREES 8 EVERGREEN TREES 13 SHRUBS

PERIMETER	EDGE TYPE
PERIMETER 1	
ENTRANCE – 40 LF	N/A
SFD SIDE TO ROAD – 205 LF EXISTING TREES TO REMAIN	B
SFD SIDE TO ROAD TO ROAD – 45.07 LF 1 SHADE TREE / 50 LF 1 1 EVERGREEN / 40 LF 1	B
PERIMETER 2	
OPEN SPACE TO SFD – 30 LF EXISTING TREES TO REMAIN	A
OPEN SPACE TO SFD – 412.74 LF 1 SHADE TREE / 60 LF 7	A
PERIMETER 3	
SFD TO SFD – 251 LF EXISTING TREES TO REMAIN	A
SFD & OPEN SPACE TO SFD – 378.70 LF 1 SHADE TREE / 60 LF 7	A
PERIMETER 4	
EASEMENT – 20.48 LF	N/A
SFD & OPEN SPACE TO SFD – 408.42 LF EXISTING TREES TO REMAIN	A
SFD TO SFD – 250.15 LF 1 SHADE TREE / 60 LF 4	A
PERIMETER 5	
EASEMENTS – 41.57 LF	N/A
OPEN SPACE TO SFD – 622.73 LF EXISTING TREES TO REMAIN	A
PERIMETER 6	
OPEN SPACE TO SFD – 328.56 LF EXISTING TREES TO REMAIN	A
TOTAL PLANTING OBLIGATION	
SHADE TREES 19	
EVERGREEN TREES 1	
SHRUBS 0	

SWM PERIMETER	EDGE TYPE
SWM PERIMETER A – 50 LF 1 SHADE TREE / 50 LF 1 1 EVERGREEN / 40 LF 1	B
SWM PERIMETER B – 110 LF 1 SHADE TREE / 50 LF 2 1 EVERGREEN / 40 LF 3	B
SWM PERIMETER C – 55 LF 1 SHADE TREE / 50 LF 1 1 EVERGREEN / 40 LF 2	B
SWM PERIMETER D – 110 LF 1 SHADE TREE / 50 LF 3 1 EVERGREEN / 40 LF 3	B
TOTAL PLANTING OBLIGATION	
SHADE TREES 7	
EVERGREEN TREES 9	
SHRUBS 0	



LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15–24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT–OF–WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES SPECIMEN TREES
- DENOTES PERIMETER LANDSCAPE EDGE

SCHEDULE A : PERIMETER LANDSCAPED EDGE

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES
LANDSCAPE TYPE	B (PERIMETER 1)	A (PERIMETER 2,3,4,5,6)
LINEAR FEET OF PERIMETER	250.07 LF	2682.30 LF
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	YES, 205 LF OF EXISTING TREES	YES, 1640.71 LF OF EXISTING TREES
CREDIT FOR WALL, FENCE, OR BERM (YES, NO, LINEAR FEET)	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	 1 SHADE TREES 1 EVERGREEN TREES 0 SHRUBS	 18 SHADE TREES 0 EVERGREEN TREES 0 SHRUBS
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTION) SHRUBS (10:1 SUBSTITUTION)	 0 SHADE TREES 4 EVERGREEN TREES 0 SUBSTITUTION TREES 0 SHRUBS	 7 SHADE TREES 0 EVERGREEN TREES 21 SUBSTITUTION TREES 14 SHRUBS

LANDSCAPE REQUIREMENT PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
43		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.
14		ACER SACCHARUM 'GREEN MOUNTAIN' OR EQUIVALENT	GREEN MOUNTAIN SUGAR MAPLE	2 1/2" – 3" CAL.
21		CORNUS FLORIDA OR EQUIVALENT	FLOWERING DOGWOOD	8' – 10' HT.
27		VIBURNUM DENTATUM OR EQUIVALENT	ARROWWOOD VIBURNUM	2 1/2' – 3" HT.
12		PICEA ABIES OR EQUIVALENT	NORWAY SPRUCE	6' – 8' HT.

TOTAL
117 TREES & SHRUBS (43 INTERNAL LANDSCAPE TREES, 14 SHADE TREES, 21 SMALL TREES, 12 EVERGREENS, 27 SHRUBS)

STREET TREE PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
14		ACER RUBRUM 'RED SUNSET' OR EQUIVALENT	RED SUNSET RED MAPLE	2 1/2" – 3" CAL.

TOTAL
14 STREET TREES

TRASH PAD PLANTING SCHEDULE

QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
6		TAXUS MEDIA "HICKSII" OR EQUIVALENT	HICKS YEW	2 1/2" - 3" HT.

TOTAL
6 SHRUBS

OWNER

RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313–9999

STATE OF MARYLAND REGISTERED PROFESSIONAL ENGINEER

APPROVED: DEPARTMENT OF PUBLIC WORKS CHIEF BUREAU OF HIGHWAYS	DATE	6-2-00
APPROVED: DEPARTMENT OF PLANNING AND ZONNING CHIEF, DIVISION OF LAND DEVELOPMENT	DATE	6/19/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE	6/12/00

96090/DWG/FINAL/PLP

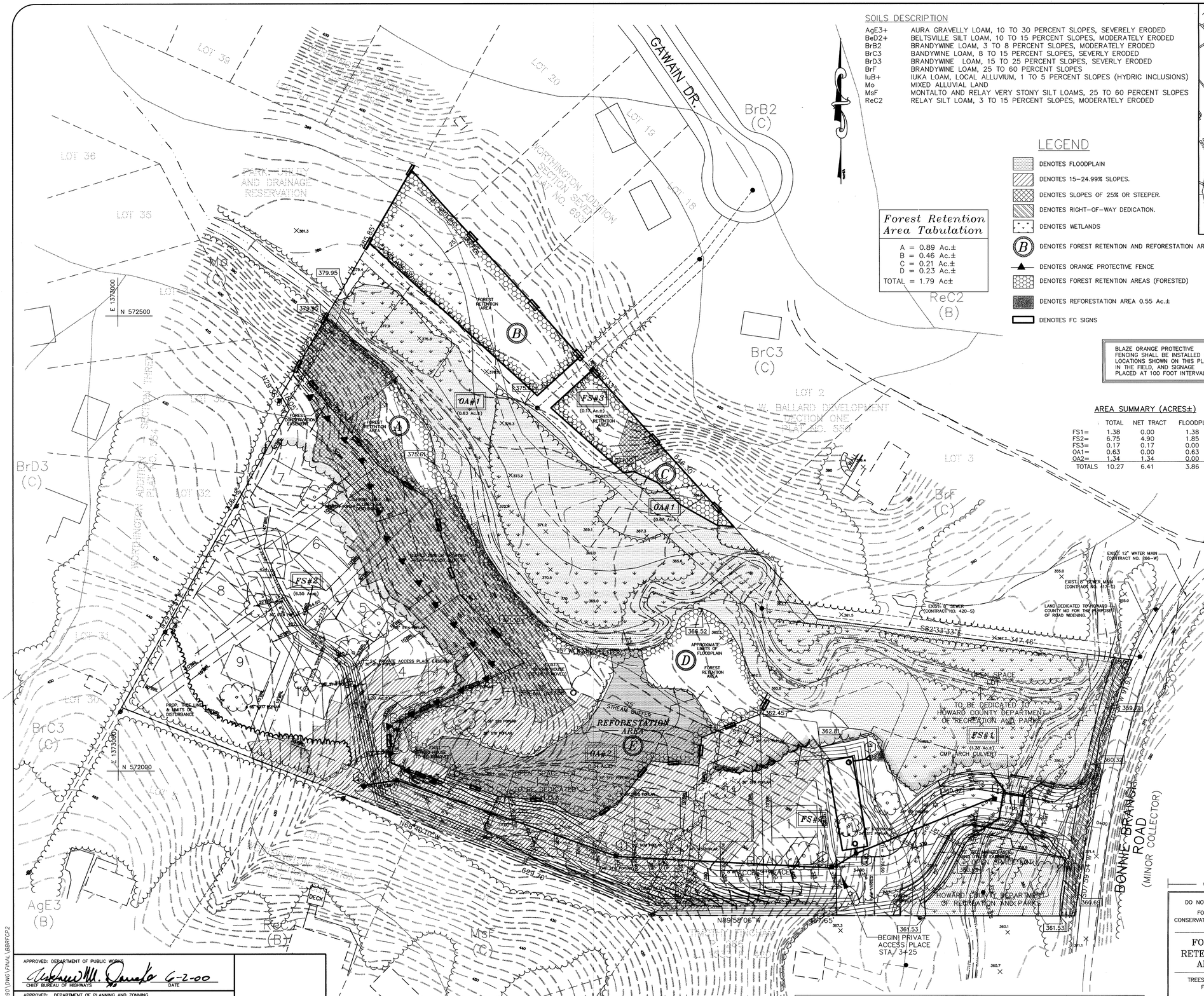
no.	description	date
4	REVISED GRADING, REMOVED RET-WALLS TO REFLECT AS-BUILT CONDITION ADD STORM DRAINS, REVISED SWM 10, AND REVISE 5/10/2002 ADD SWM DIRECT TREES PER PIPE RELOCATIONS AND PIPES SHOWN	04/19/06
3		
2	REVISED BRIDGE	10/25/01
1	ADD TRASH PAD & TRASH PAD PLANTING SCHEDULE	11/16/00

project 96090	date APR 2000		
illustration MPP/SAA	engineering SJD		
scale 1"=50'	approval MMP		

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
LANDSCAPE PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 203, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95



SOILS DESCRIPTION

AgE3+	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED
BeD2+	BELTSVILLE SILT LOAM, 10 TO 15 PERCENT SLOPES, MODERATELY ERODED
BrB2	BRANDYWINE LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
BrC3	BANDYWINE LOAM, 8 TO 15 PERCENT SLOPES, SEVERLY ERODED
BrD3	BRANDYWINE LOAM, 15 TO 25 PERCENT SLOPES, SEVERLY ERODED
BrF	BRANDYWINE LOAM, 25 TO 60 PERCENT SLOPES
IuB+	IUKA LOAM, LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES (HYDRIC INCLUSIONS)
Mo	MIXED ALLUVIAL LAND
MsF	MONTALTO AND RELAY VERY STONY SILT LOAMS, 25 TO 60 PERCENT SLOPES
ReC2	RELAY SILT LOAM, 3 TO 15 PERCENT SLOPES, MODERATELY ERODED

LEGEND

- DENOTES FLOODPLAIN
- DENOTES 15–24.99% SLOPES.
- DENOTES SLOPES OF 25% OR STEEPER.
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES FOREST RETENTION AND REFORESTATION AREAS
- DENOTES ORANGE PROTECTIVE FENCE
- DENOTES FOREST RETENTION AREAS (FORESTED)
- DENOTES REFORESTATION AREA 0.55 Ac.±
- DENOTES FC SIGNS

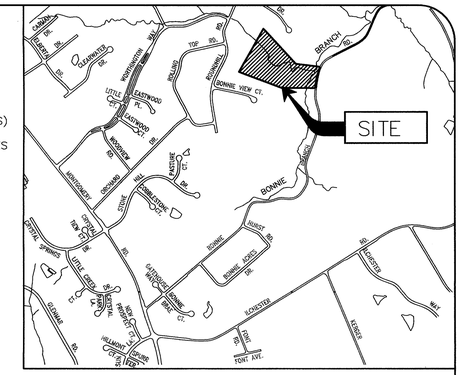
Forest Retention Area Tabulation

A = 0.89 Ac.±
B = 0.46 Ac.±
C = 0.21 Ac.±
D = 0.23 Ac.±
TOTAL = 1.79 Ac±

BLAZE ORANGE PROTECTIVE FENCING SHALL BE INSTALLED AT LOCATIONS SHOWN ON THIS PLAN IN THE FIELD, AND SIGNAGE PLACED AT 100 FOOT INTERVALS.

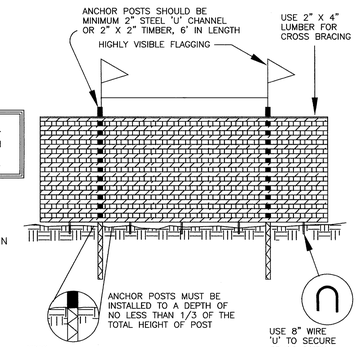
AREA SUMMARY (ACRES±)

	TOTAL	NET TRACT	FLOODPLAIN
FS1=	1.38	0.00	1.38
FS2=	6.75	4.90	1.85
FS3=	0.17	0.17	0.00
OA1=	0.63	0.00	0.63
OA2=	1.34	1.34	0.00
TOTALS	10.27	6.41	3.86



VICINITY MAP

SCALE: 1"=1000'



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

PROTECTIVE FENCE DETAIL
BLAZE ORANGE PLASTIC MESH

FOREST CONSERVATION WORKSHEET

I. BASIC SITE DATA

GROSS TRACT AREA	10.27 Ac.±
AREA WITHIN 100 YEAR FLOODPLAIN	3.40 Ac.±
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL	0.00 Ac.±
NET TRACT AREA	6.87 Ac.±
LAND USE CATEGORY OR ZONING	R-20

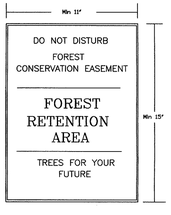
II. INFORMATION FOR CALCULATIONS

A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	AFFORESTATION THRESHOLD (15% x A)	N/A
D.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
E.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
F.	BREAK EVEN POINT (the amount of forest to be retained w/o mitigation)([(E x 0.2) + B]	2.11 Ac.±
G.	NET TRACT AREA FOREST TO BE RETAINED	1.79 Ac.±

III. REFORESTATION CALCULATIONS

A.	NET TRACT AREA	6.87 Ac.±
B.	FOREST CONSERVATION THRESHOLD (FCT) (20% x A)	1.37 Ac.±
C.	EXISTING FOREST ON NET TRACT AREA	5.07 Ac.±
D.	EXISTING FOREST ABOVE FCT	3.70 Ac.±
E.	FOREST AREAS TO BE CLEARED	3.28 Ac.±
F.	FOREST AREAS TO BE RETAINED (Net Tract Forest)	1.79 Ac.±
G.	FOREST AREAS CLEARED ABOVE FCT	3.28 Ac.±
H.	FOREST AREAS CLEARED BELOW FCT	0.00 Ac.±
I.	FOREST AREAS RETAINED ABOVE FCT	0.42 Ac.±
J.	OPEN AREA TO BE REFORESTED AND INCLUDED WITH "I" IN A FOREST CONSERVATION EASEMENT	0.55 Ac.±
K.	Clearing Above The Forest Conservation Threshold Only If Forest areas to be retained are at or above the FCT (if H equals or is more than B) the following applies:	
L.	TOTAL REFORESTATION FOR CLEARING ABOVE FCT (G x 1/4)	0.82 Ac.±
M.	CREDIT FOR FOREST RETAINED ABOVE FCT (K)	0.42 Ac.±
N.	TOTAL REFORESTATION REQUIRED	0.40 Ac.±
O.	TOTAL REFORESTATION TO BE PROVIDED ON-SITE WITHIN OA#2	0.55 Ac.±

NOTE: EXTRA REFORESTATION IN THE AMOUNT OF 0.15 ± Ac IS PROVIDED.



SIGNAGE DETAIL
NOT TO SCALE

WILDMAN ENVIRONMENTAL SERVICES
4747 BONNIE BRANCH RD.
ELLICOTT CITY, MD 21043
PHONE: (410) 313-9999

Ronald A. Wildman 4/20/00
QUALIFIED PROFESSIONAL DATE:

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

THIS DRAWING IS TO BE USED FOR FOREST CONSERVATION PURPOSES ONLY

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/7/00
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

F:\96090\DWG\FINAL\BRFCP2

project	date
96090	APR 2000
illustration	engineering
JEP	RBW
scale	approval
1"=50'	

no.	description	date
2.	REVISED GRAD. ING. REMOVED REF. w ALLS to REFLECT CASE "BUILT CONDITION	06/15/00
1.	REVISED BRIDGE	10/25/01

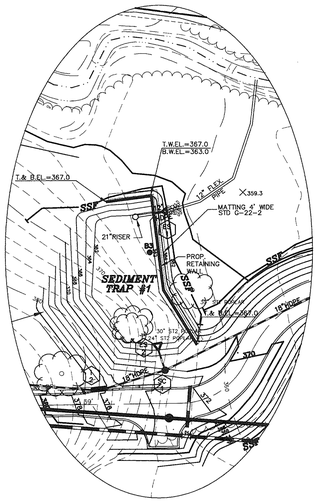
revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
FOREST CONSERVATION PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax.

F-00-95

THIS DRAWING IS TO BE USED FOR GRADING PLAN PURPOSES ONLY



SEDIMENT TRAP DATA

TYPE:	ST-I PIPE OUTLET
DRAINAGE AREA:	3.22 ACRES
TOTAL VOLUME REQUIRED:	11,592 C.F.
TOTAL VOLUME PROVIDED:	15,855 C.F.
WET STORAGE REQUIRED:	5,796 C.F.
WET STORAGE PROVIDED:	6,995 C.F.
WET STORAGE EL:	364.5
DRY STORAGE REQUIRED:	5,796 C.F.
DRY STORAGE PROVIDED:	7,860 F.F.
DRY STORAGE EL:	366.0
RISER SIZE	21"
BARREL SIZE:	12"

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER — DATE 4/28/00

Ronald B. Wildman
PRINTED NAME OF DEVELOPER

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. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

SIGNATURE OF ENGINEER — DATE 4/28/00

R. TRACY WILKMAN
PRINTED NAME OF ENGINEER

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

USDA - NATURAL RESOURCE CONSERVATION SERVICE — DATE 5/24/00

THIS DEVELOPMENT PLAN IS APPROVED FOR EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT — DATE 5/24/00

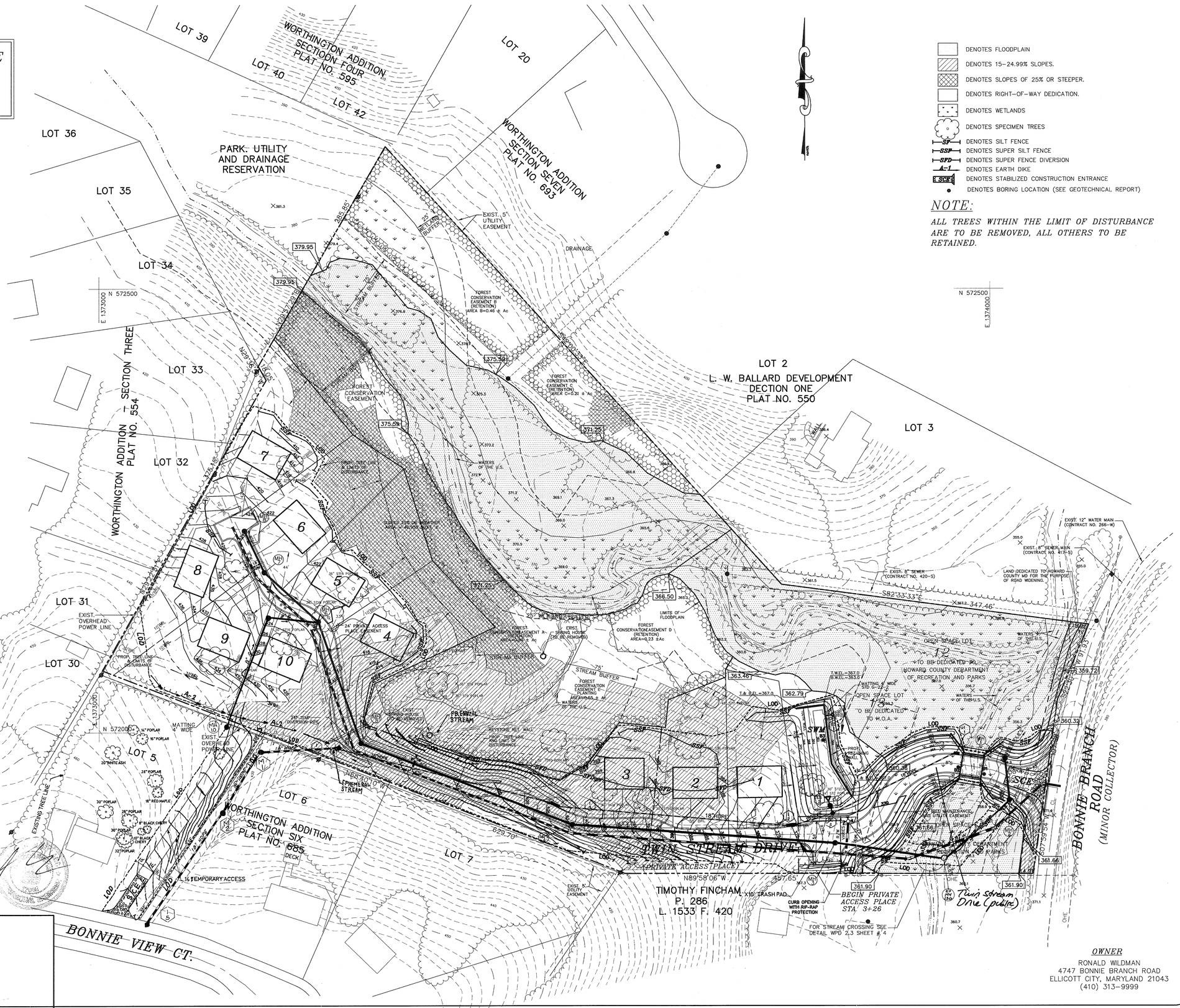
APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/19/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00



DENOTES FLOODPLAIN
DENOTES 15-24.99% SLOPES.
DENOTES SLOPES OF 25% OR STEEPER.
DENOTES RIGHT-OF-WAY DEDICATION.
DENOTES WETLANDS
DENOTES SPECIMEN TREES
SF — DENOTES SILT FENCE
SSF — DENOTES SUPER SILT FENCE
SFD — DENOTES SUPER FENCE DIVERSION
A-1 — DENOTES EARTH DIKE
S.S.C.E. — DENOTES STABILIZED CONSTRUCTION ENTRANCE
● DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

NOTE:

ALL TREES WITHIN THE LIMIT OF DISTURBANCE ARE TO BE REMOVED, ALL OTHERS TO BE RETAINED.

OWNER
RONALD WILDMAN
4747 BONNIE BRANCH ROAD
ELLICOTT CITY, MARYLAND 21043
(410) 313-9999

project	date
96090	APR. 2000
illustration	engineering
MFP/SAA	MFP/SAA
scale	approval
1"=50'	RJH

no.	description	date
5.	REVISE GRADING, REMOVE RETAINING WALLS TO REDUCE DRAIN 1-3-01, ADD SEWER MAIN TO MH-10	05/02/2002
4	REVISED BRIDGE	10/25/01
3	ADD TEMPORARY ACCESS FOR CONSTRUCTION	1/25/01
2	ADD TRASH PAD	06/30/00

revisions

TAX MAP 31, BLOCK 9, PARCEL 27

BONNIE BRANCH OVERLOOK

HOWARD COUNTY, MARYLAND

SECOND ELECTION DISTRICT

GRADING EROSION AND SEDIMENT CONTROL PLAN

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5321 Wash. (410) 997-0298 Fax

F-00-95

96090/DWG/FINAL/GRADE

LEGEND

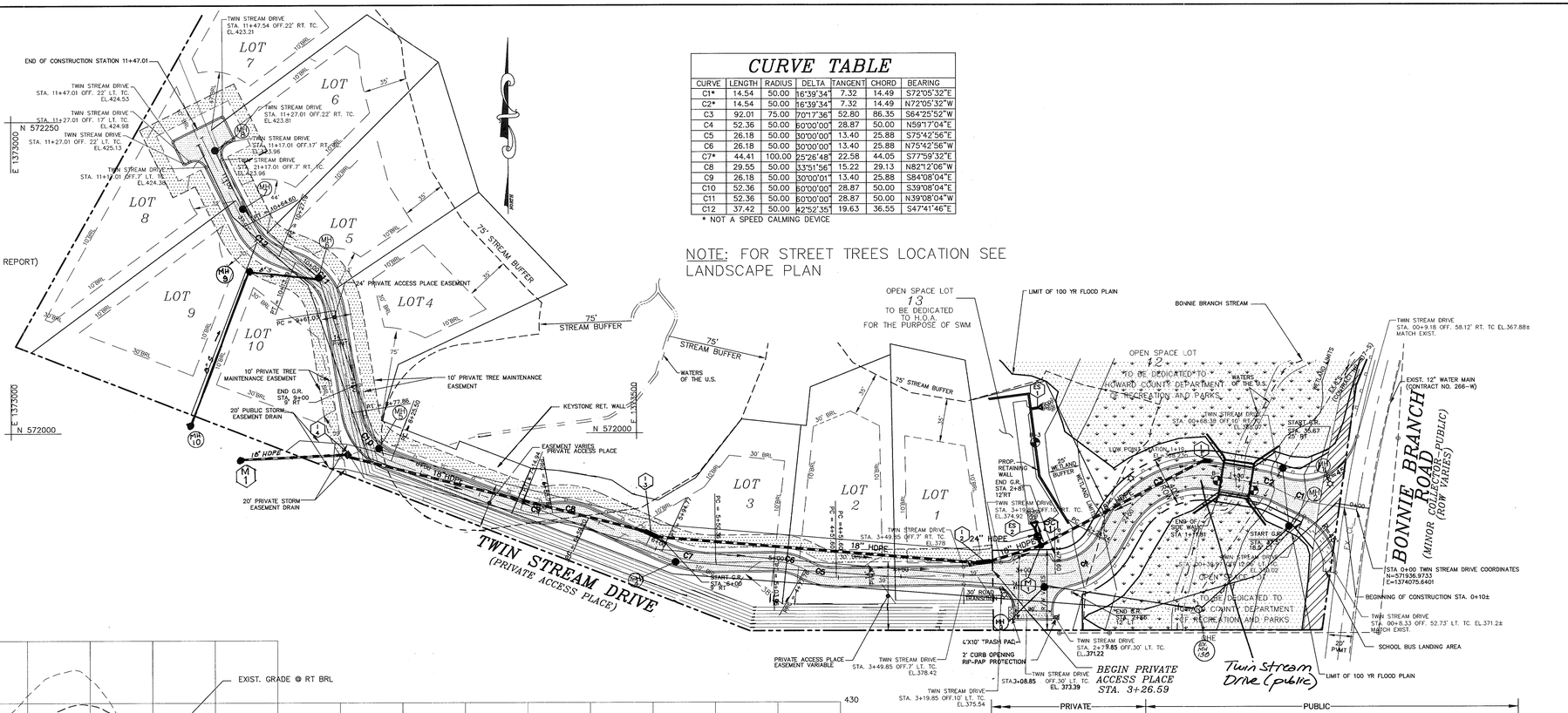
- DENOTES FLOOD PLAIN
- DENOTES RIGHT-OF-WAY DEDICATION.
- DENOTES WETLANDS
- DENOTES PAVEMENT
- DENOTES CONCRETE PLATFORM
- DENOTES 95% BACKFILL
- DENOTES BORING LOCATION (SEE GEOTECHNICAL REPORT)

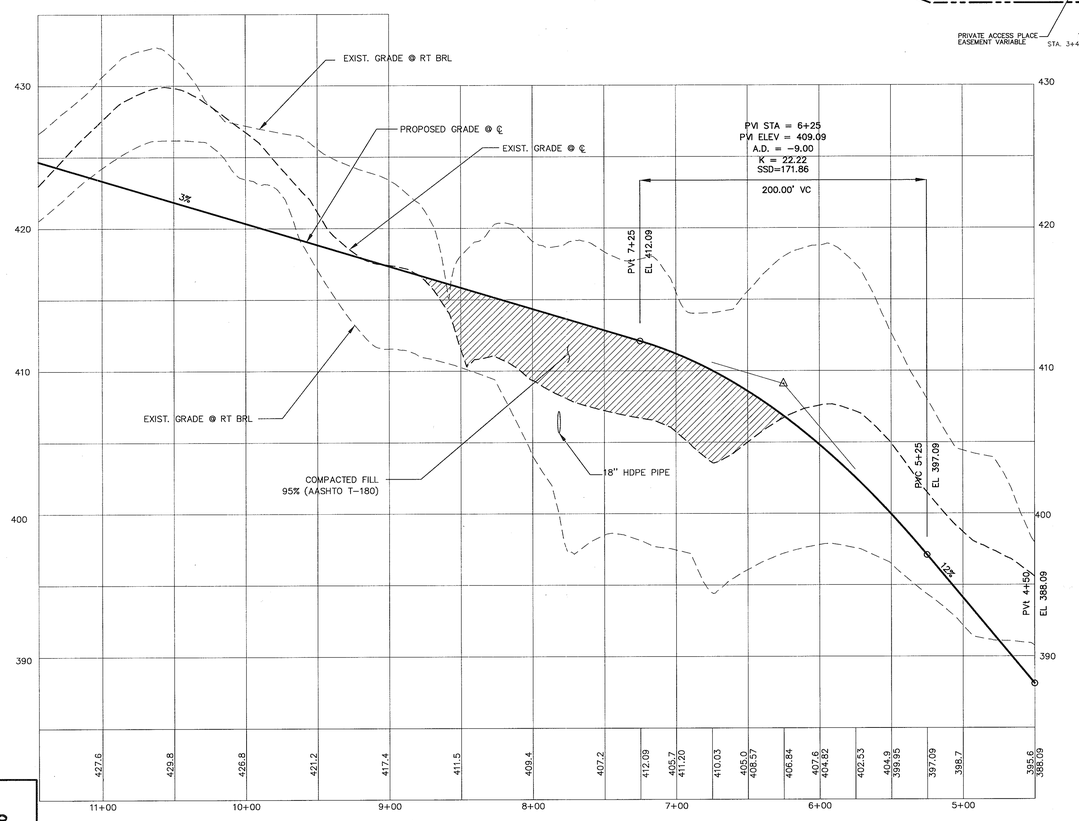
CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	TANGENT	CHORD	BEARING
C1*	14.54	50.00	16°39'34"	7.32	14.49	S72°05'32"E
C2*	14.54	50.00	16°39'34"	7.32	14.49	N72°05'32"W
C3	92.01	75.00	70°17'36"	52.80	86.35	S64°25'52"W
C4	52.36	50.00	60°00'00"	28.87	50.00	N59°17'04"E
C5	26.18	50.00	30°00'00"	13.40	25.88	S75°42'56"E
C6	26.18	50.00	30°00'00"	13.40	25.88	N75°42'56"W
C7*	44.41	100.00	25°26'48"	22.58	44.05	S77°59'32"E
C8	29.55	50.00	33°51'56"	15.22	29.13	N82°12'06"W
C9	26.18	50.00	30°00'01"	13.40	25.88	S84°08'04"E
C10	52.36	50.00	60°00'00"	28.87	50.00	S39°08'04"E
C11	52.36	50.00	60°00'00"	28.87	50.00	N39°08'04"W
C12	37.42	50.00	42°52'35"	19.63	36.55	S47°41'46"E

* NOT A SPEED CALMING DEVICE

NOTE: FOR STREET TREES LOCATION SEE LANDSCAPE PLAN

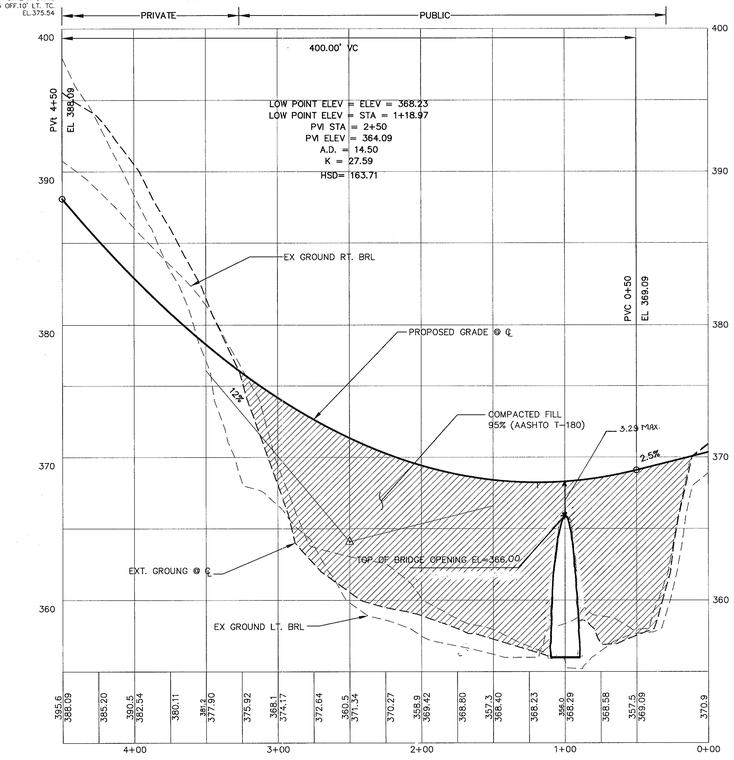




TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE(PRIVAE)
DESIGN SPEED: 25 MPH(VERTICAL)



TWIN STREAM DRIVE PROFILE

SCALE: HOR. 1"=50'
VER. 1"=5'

CLASSIFICATION: ACCESS PLACE
DESIGN SPEED: 25 MPH(VERTICAL)

STATE OF MARYLAND — RICHARD H. DOBBIN JR. — 1946 — PROFESSIONAL ENGINEER

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 6-2-00

APPROVED: DEPARTMENT OF PLANNING AND ZONNING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/9/00

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 6/12/00

96090/DWG/FINAL/RD-PROF

project	date
96090	APR. 2000
illustration	engineering
SAA	MMP
scale	approval
1"=50'	RJH

no.	description	date
4	REMOVED RET. WALL TO REFLECT AS-BUILT CONDITION	6/12/02
3	ADD STORM DRAIN; I-9 TO I-8, ADD SEWER; MH-8 TO MH-10	10/12/00
2	ADD STEPS, RAILING & SEWER	11/10/00
1	ADD TRASH PAD & CHANGED STREET LIGHT LOCATION	

revisions

TAX MAP 31, BLOCK 9, PARCEL 27
BONNIE BRANCH OVERLOOK
HOWARD COUNTY, MARYLAND
SECOND ELECTION DISTRICT
ROAD PLAN AND PROFILES

MILDENBERG, BOENDER & ASSOC., INC.
Engineers Planners Surveyors
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042
(410) 997-0296 Balt. (301) 621-5521 Wash. (410) 997-0298 Fax

F-00-95