FINAL ROAD CONSTRUCTION PLANS
MACBETH FARM
LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', AND 'F'
HOWARD COUNTY, MARYLAND

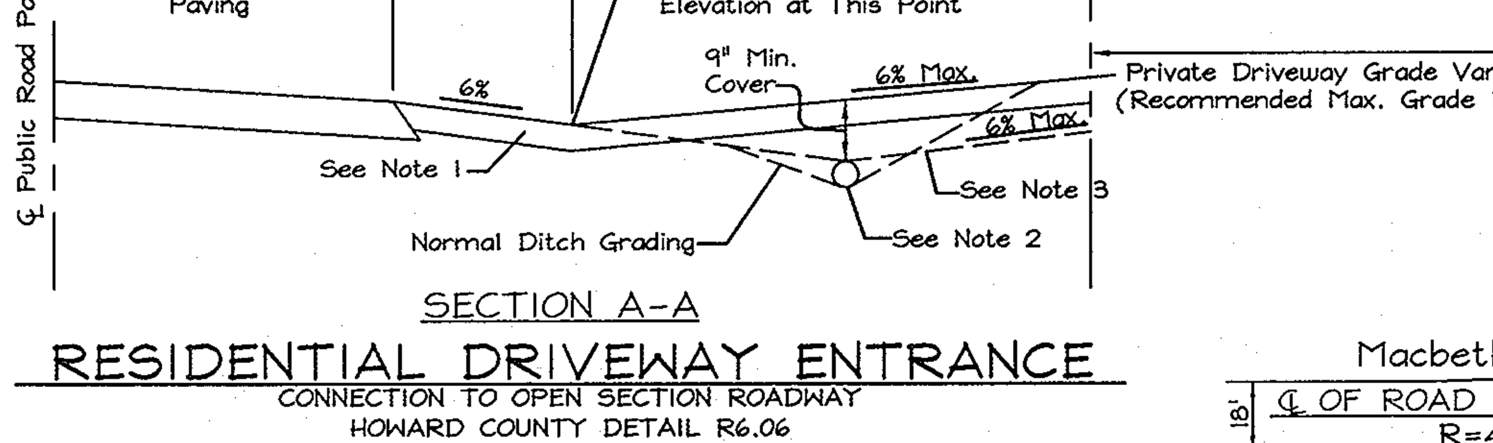
GENERAL NOTES

1. Subject property zoned RR-DEO per 02/02/04 Comprehensive Zoning Plan.
2. Private water and sewer will be used within this site.
3. Total area of property: 76.896ac.±
4. Area of proposed public R/W: 4.165ac.±
5. Number of proposed buildable lots: 35
   Area of proposed buildable lots: 36.936ac.±
6. Number of proposed buildable preservation parcels: 1
   Area of proposed buildable preservation parcels: 10.355ac.±
7. Number of proposed non-buildable preservation parcels: 5
   Area of proposed non-buildable preservation parcels: 25.440ac.±
8. Density calculations:
   a.) Total area of property = 76.896 Ac.±
   b.) Area of steep slopes = 0.480 Ac.±
   c.) Area of 100 yr floodplain = 4.350 Ac.±
   d.) Net Area of property = 72.066 Ac.±
   e.) Total number of Units based on own density: 76.896 Ac./4.25 Ac.per unit=18.093 units therefore 18 units.
   f.) Maximum number of units allowed utilizing the DEO option: 72.066 Ac. / 2 Acres per Unit = 36.03 Units therefore 36 units.
   g.) Number of DEO Units required = 36-18 = 18 DEO Units
9. The lots shown hereon comply with the minimum ownership, width and lot area as required by the Maryland State Department of the Environment.
10. ▨ This area designates a private sewage easement of at least 10,000 square feet (or 10,000 square feet per lot for shared drain fields associated with a shared sewage disposal facility) as required by the Maryland State Department of the Environment for individual sewage disposal (COMAR 26.04.03). Improvements of any nature in this area are restricted until public sewerage is available. These easements shall become null and void upon connection to a public sewerage system. The County Health Officer shall have the authority to grant adjustments to the private sewage easement.
11. All wells and septic fields within 100' of property's boundary have been shown.
12. The septic fields are located on soil types CgB2, CgC2, EkA, GnB2, GnC2, MgB2, MIB2, MID2, MID3, and MIE as per the soil survey of Howard County.
13. On-site topography based on a Field Run Topographic Survey prepared by FSH Associates dated January, 2004. Off-site and non-critical topography based on Howard County 1998 Aerial Topographic Surveys with five foot contours.
14. All wells to be drilled prior to submittal of final plat for signature. It is the developer's responsibility to schedule the well drilling prior to final plat submission. It will not be considered 'government delay' if the well drilling holds up the Health Department signature of the record plat.
15. Groundwater appropriations permit # H02004G008(1)
16. A.P.F.O. traffic study prepared by Traffic Concepts, Inc. and approved on October 14, 2004 under SP-04-13.
17. Wetlands Analysis prepared by Exploration Research Inc. and approved on October 27, 2004 under SP-04-13.
18. The project is not within the metropolitan district.
19. The project is in conformance with the latest Howard County Standards unless waivers have been approved.
20. The coordinates shown hereon are based upon the Howard County Geodetic Control which is based on the Maryland State Plane Coordinate system. Howard County monument numbers 341A and 341B were used for this project.
21. Storm Water Management for cpv and wqv is provided in a Micro Pool Extended Detention facility grass channels and sheet flow to buffer credit. Rev will be provided in grass swales. The facility will be privately owned with joint maintenance by the H.O.A. and Howard County.
22. No clearing, grading or construction is permitted within wetlands, streams or their required buffers and Forest Conservation or Natural Conservation Credit Easements.
23. The geotechnical report for this project was prepared by Hillis - Carns Engineering Associates, Inc. on May 10, 2004.
24. For flag or pipestem lots, refuse collection, snow removal and road maintenance are provided to the junction of the flag or pipestem and road right-of-way line.
25. Forest Conservation is met by planting 9.35 Acres of forest within Forest Conservation Easement # 1. Total (407,286 sf x $0.5 per sf) = $203,643.00 surety will be posted with the Developer's Agreement.
26. a. Buildable preservative parcel 'A' shall be privately owned and maintained, with H.O.A. and Howard County being Easement Holders.
    b. Environmental Non-buildable preservation parcels 'B', 'C', and 'D' shall be privately owned and maintained, with H.O.A. and Howard County being Easement Holders.
    c. Non-buildable preservation parcels 'E' shall be privately owned and maintained, with H.O.A. and Howard County being Easement Holders. Ownership of preservation parcel 'E' is intended to be conveyed to the adjacent property owner. The parcel is intended to be utilized for pasture.
    d. Non-buildable preservation parcels 'F' shall be H.O.A. owned and maintained, with Howard County being Easement Holder. This Parcel contains the storm water management facility.
27. Existing structures on site shall be removed prior to record plat signature and recordation.
28. All wells to be field located after being drilled by a licensed surveyor prior to building permit issuance.
29. The contractor shall notify the following utility companies or agencies at least five(5) working days before starting work shown on these plans:

State Highway Administration	410.531.5533
BGE(contractor services)	410.850.4620
BGE(underground damage control)	410.787.9068
Miss Utility	1.800.257.7777
Colonial Pipeline Company	410.795.1390
Howard County, Dept. of Public Works, Bureau of Utilities	410.313.4900
Howard County Health Department	410.313.2640

30. Financial surety for the required landscaping will be posted as part of the Developer's Agreement in the amount of $69,600 (197 shade trees @ $300.00 each, and 70 Evergreen Trees @ $150.00 each).
31. This plan is subject to the amended 5th Edition of the Subdivision Regulations (CB 45-2003) and the 2004 Zoning Regulations (CB 75-2003).
32. The property is listed on the historic sites inventory as "HO-467, the George Richardson Farm".
33. Previous Howard County file numbers: SP-04-13.
34. All sign posts used for traffic control signs installed in the county's right-of-way shall be mounted on a 2" galvanized steel, perforated, square tube post (14 gauge) inserted into a 2-1/2" galvanized steel perforated, square tube sleeve (12 gauge) 3' long. A galvanized steel pole cap shall be mounted on top of each post.
35. Traffic markings on Rt. 108 will be provided by Traffic Concepts, Inc.

General Notes Continued...



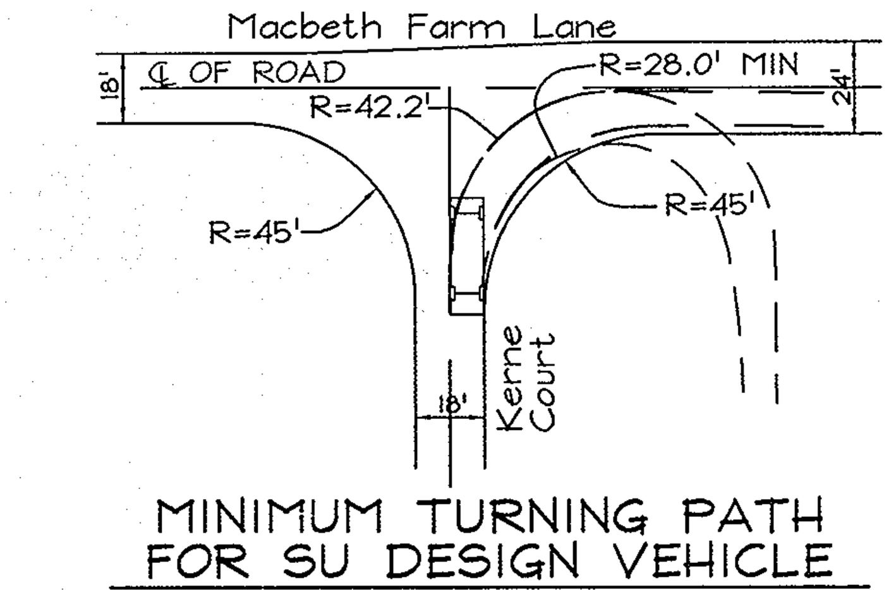
SECTION A-A

RESIDENTIAL DRIVEWAY ENTRANCE

CONNECTION TO OPEN SECTION ROADWAY
HOWARD COUNTY DETAIL R6.06
NOT TO SCALE

NOTES:

1. Driveway must be paved from edge of public road to right of way line using standard paving section P-1 as shown on St'd. No. or alternate section equal to or better than P-1, as approved by D.P.W.
2. Drainage culvert shall be sized for a 10 year frequency storm and the minimum size shall be 12" dia. round or 14" x 9" arch pipe if larger pipe is required, ditch invert shall be lowered to provide min. ditch gradient of 0.5% and clearance shown.
3. Swale flow may be provided over driveway located at or near the crest of vertical curves on the public road where quantity of flow is small, as approved by D.P.W.
4. Tie-in grade of private driveway shall not exceed 14%.
5. All private driveway culverts to be 12" CMP or equivalent.



MINIMUM TURNING PATH FOR SU DESIGN VEHICLE

SCALE 1"=50'

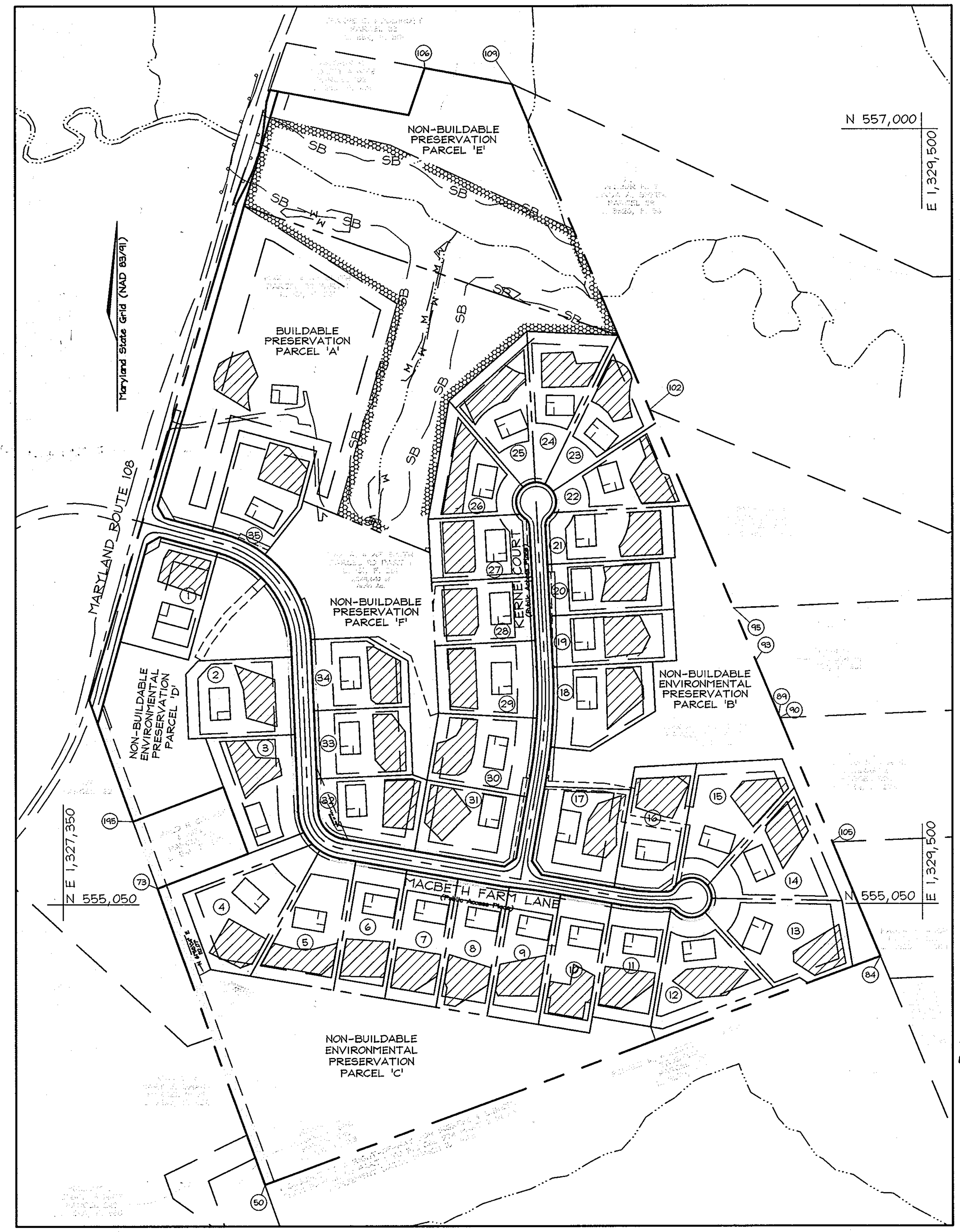
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

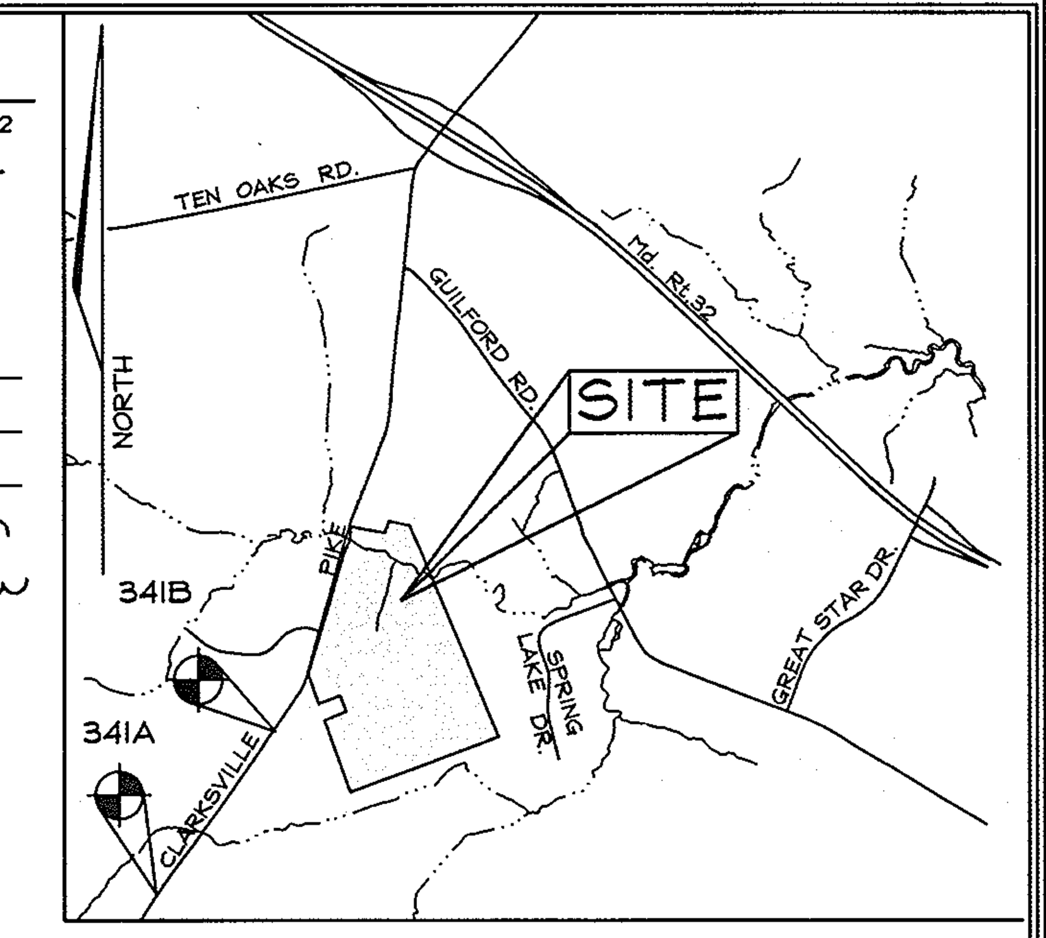
[illegible] 10-4-06
CHIEF, BUREAU OF HIGHWAYS DATE



LOCATION MAP
SCALE:1=200'

LEGEND

Existing Contour	------------382
Proposed Contour	—(444)—
Direction of Flow	←
Existing Spot Elevation	382.3
Proposed Spot Elevation	+82 53
Existing Stream Buffer	— SB — SB —
Existing Wetland Buffer	— WB — WB —
Existing Wetland	— W — W —
Existing Trees to Remain	
Proposed Septic Area	▨
Proposed Well Area	▩
Proposed House Site	▭
Denotes: Well Location	Ⓦ



VICINITY MAP
SCALE:1=2000'

BENCHMARKS

Sta.	341A	N 168,637.6155	E 404,116.4545	El.: 144.0654 (meters)
		N 553,271.910	E 1,325,838734	El.: 472.655 (feet)
Sta.	341B	N 169,156.2708	E 404,494.4156	El.: 135.1814 (meters)
		N 554,973.531	E 1,327,078.761	El.: 443.508 (feet)

SHEET INDEX

ROAD CLASSIFICATION

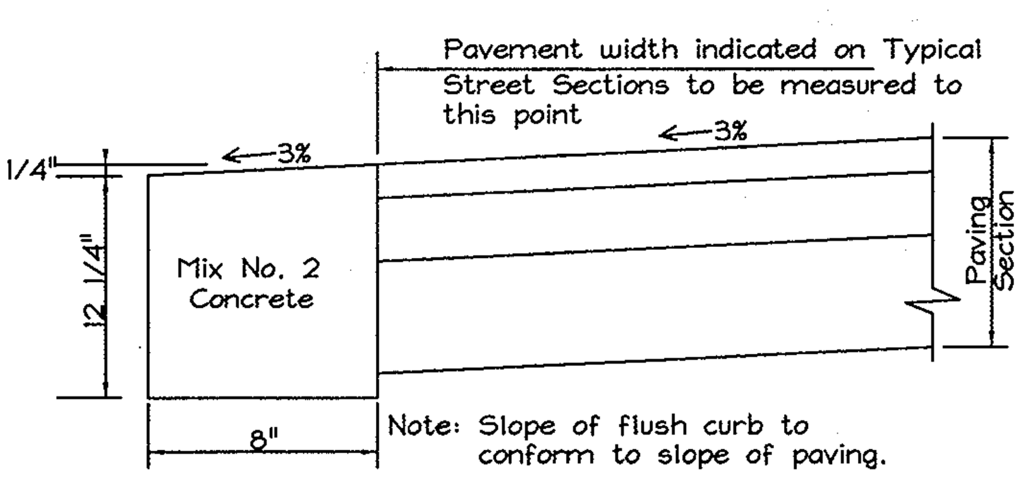
ROAD NAME	CLASSIFICATION	R/W
MacBeth Farm Lane (Sta. 0+00 - Sta. 16+13.22)	Public Access Street	50'
MacBeth Farm Lane (Sta. 16+13.22 - Sta. 19+87.33)	Public Access Place	40'
Kerne Court	Public Access Place	40'

CENTERLINE ROAD CURVE DATA

CURVE	ROAD NAME	CURVE STATIONING	DELTA	RADIUS	ARC LENGTH	CHORD BEARING	& LENGTH
C1	MacBeth Farm Lane	Sta. 2+26.67 - Sta. 5+74.52	72°28'27"	275.00'	347.85'	N38°34'42"W	325.12'
C2	MacBeth Farm Lane	Sta. 9+96.13 - Sta. 11+31.93	77°48'33"	100.00'	135.80'	N41°14'45"W	125.61'
C3	Kerne Court	Sta. 2+63.18 - Sta. 5+39.67	18°01'24"	550.00'	173.01'	N89°09'43"W	172.30'
C4	MacBeth Farm Lane	Sta. 18+46.84 - Sta. 20+19.85	12°49'01"	1236.00'	276.49'	N03°26'28"E	275.92'

Continue General Notes...

36. Using the density exchange option described in section 106 of the Zoning regulations, the development rights for 18 residential lots/parcels shown on the subdivision plan for Macbeth Farm, SP-04-13, have been transferred from: Property of Phillip Carroll and Camilla Carroll Liber 394 Folio 64 Tax Map 23 Parcel 71 Grid 10 (18 units). The creation of these lots is based on a maximum density of one residential unit for every two net acres.



FLUSH CURB DETAIL
NOT TO SCALE

AS-BUILTS

FOR ROADS, STORMDRAINS, EROSION & SEDIMENT CONTROLS

FOR STORMWATER MANAGEMENT & LANDSCAPING

STATE OF MARYLAND ★ CLYDE BROOKE MILLER ★ 135 PROPERTY LINE SURVEYOR

STATE OF MARYLAND ★ ZACHARIA YOSEF FISCH ★ 22418 PROFESSIONAL ENGINEER

[illegible] 1-15-2009 [illegible] 1/15/09

C.BROOKE MILLER DATE
PROP. L.S. #135

ZACHARIA Y. FISCH DATE
PE #22418

OWNER

THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER

CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

COVER SHEET

MACBETH FARM

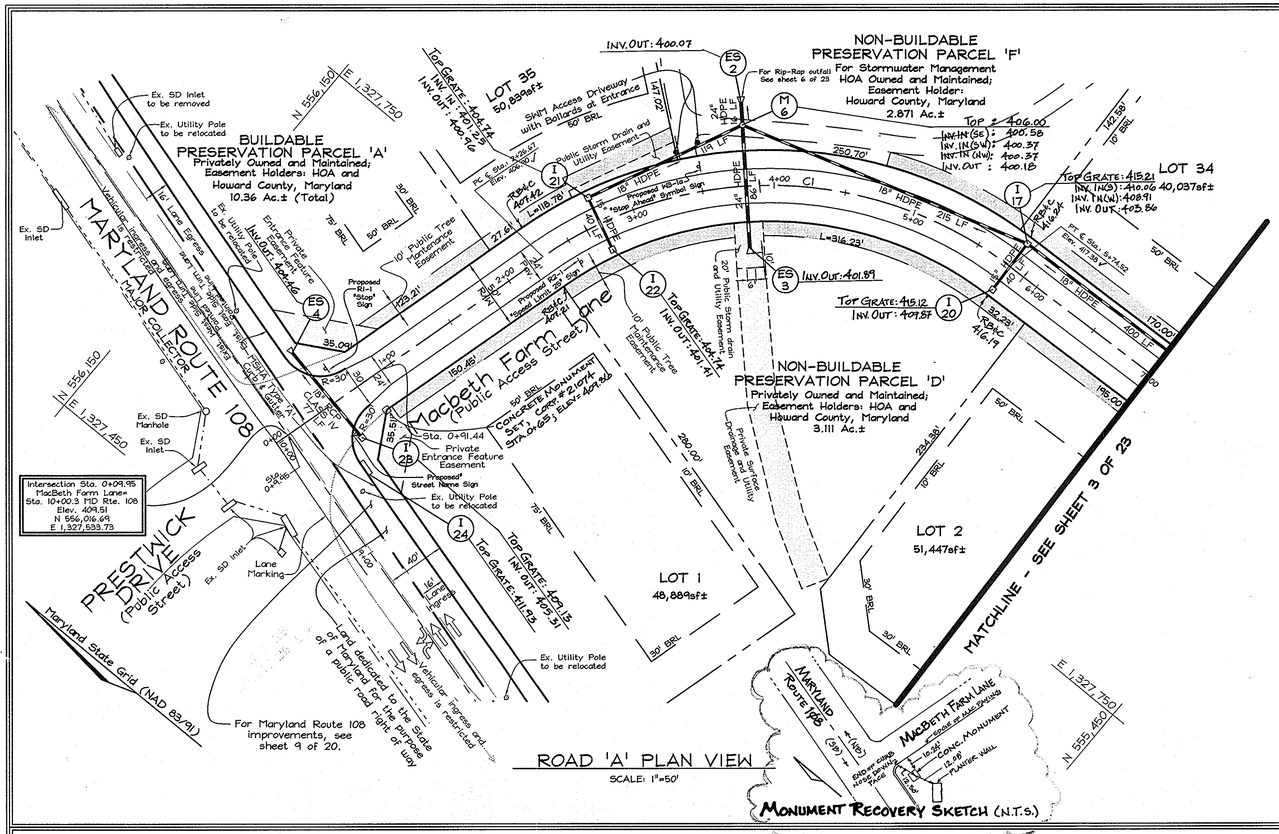
LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A',
NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

STATE OF MARYLAND ★ ZACHARIA YOSEF FISCH ★ 22418 PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 1 OF 23

F-06-101



APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS:

CHIEF, BUREAU OF HIGHWAYS — DATE: 10-4-06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 10/11/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 10/10/06

ROAD PROFILES
Macbeth Farm Lane
MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A',
NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 — Parcel 90
4th Election District — Howard County, Maryland

C. BROOKE MILLER, PROF. L.S. #135 — DATE: 1-15-2009

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 2 OF 23

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
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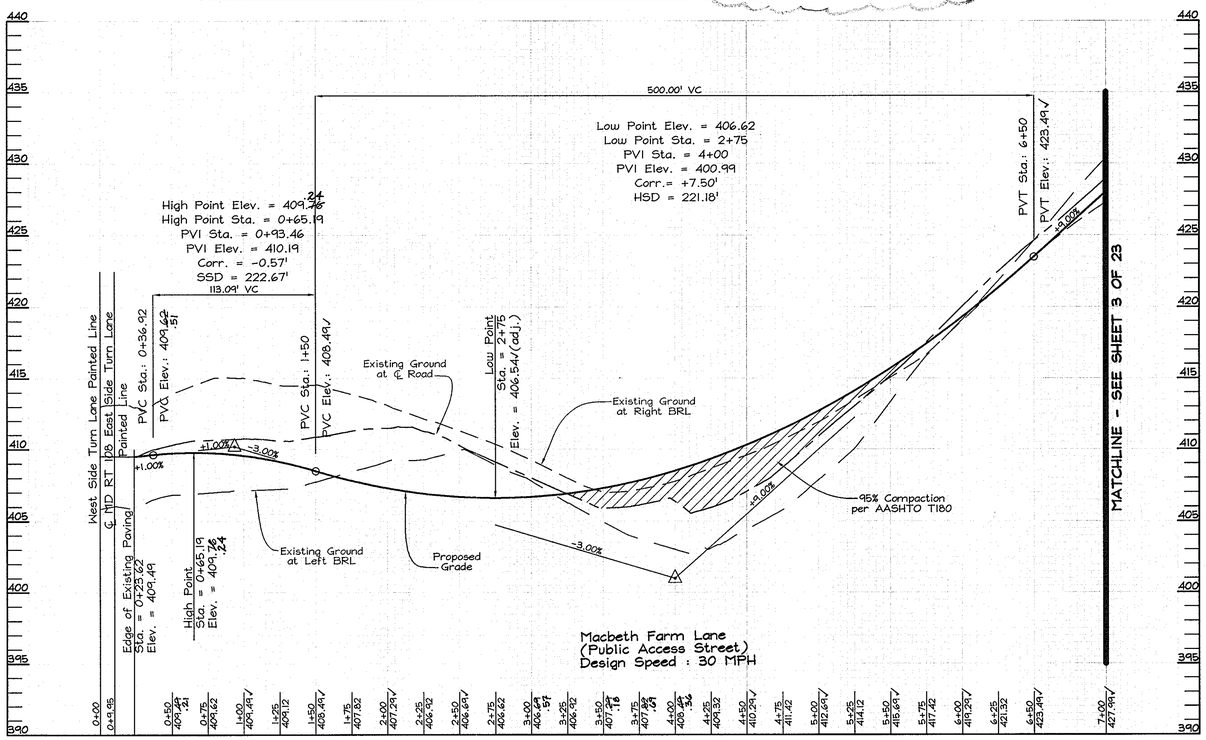
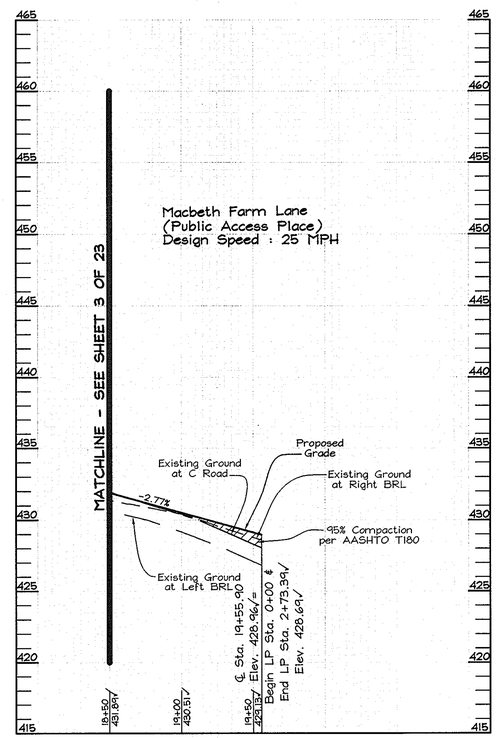
Ellicott City, Maryland 21042



ROAD PROFILE
SCALE: Hor. 1"=50'
Vert. 1"=5'



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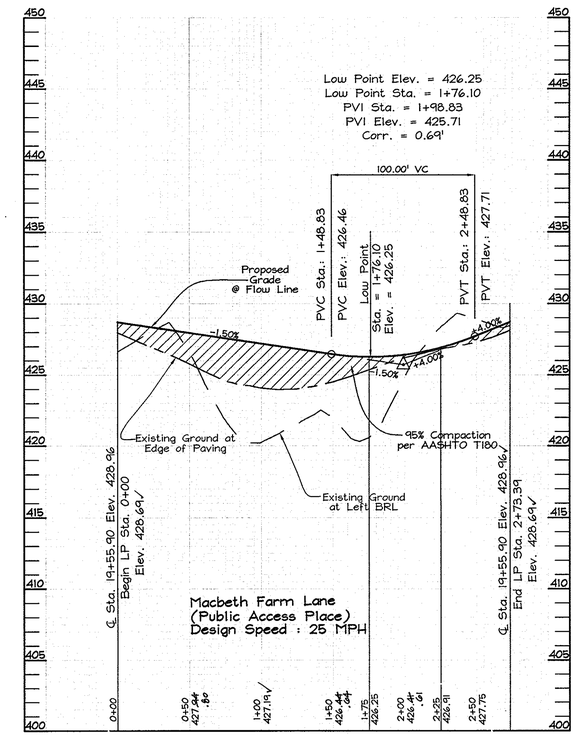
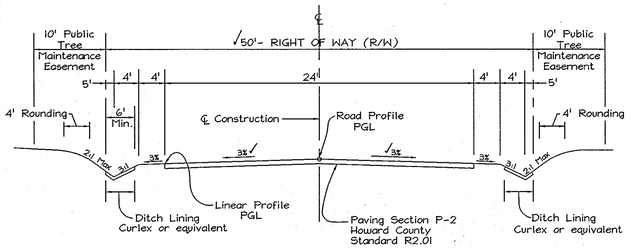


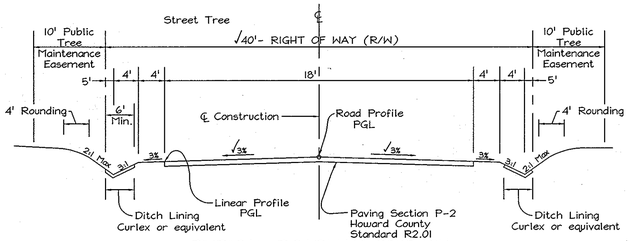
LINEAR PROFILE
SCALE: Hor. 1"=50'
Vert. 1"=5'

F-06-101



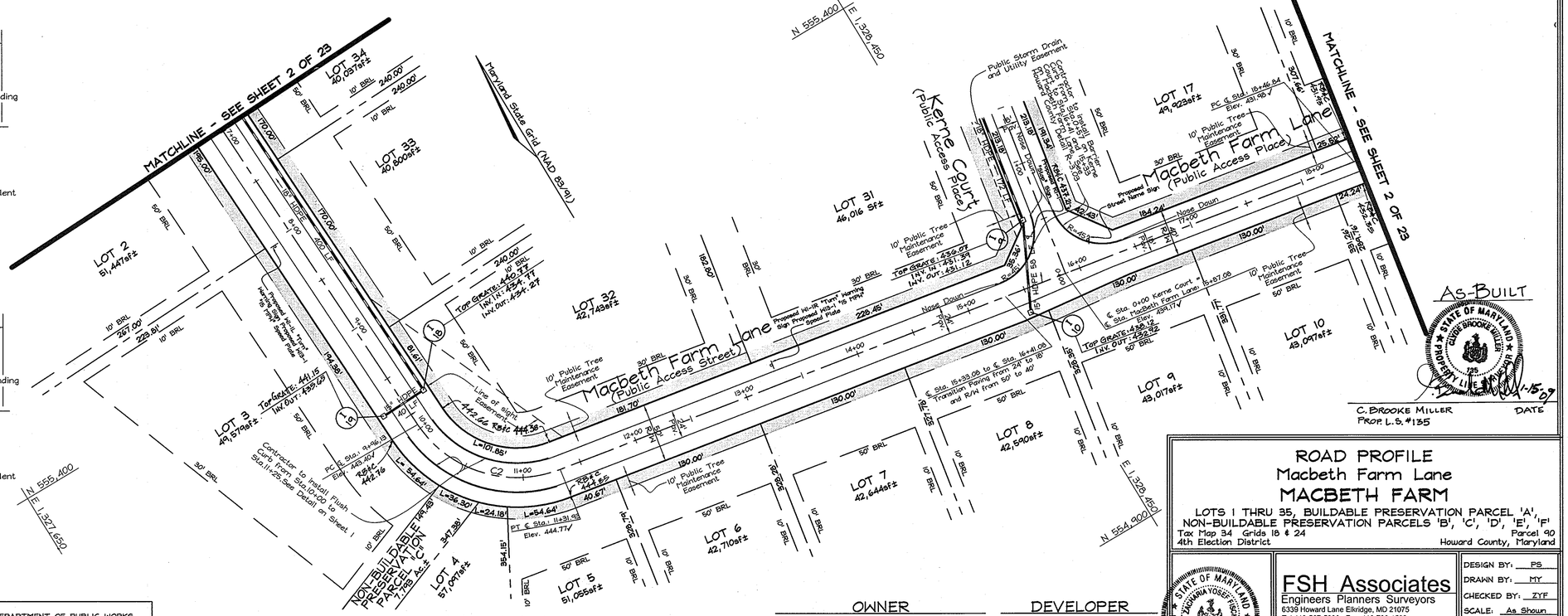
TYPICAL ROADWAY SECTION
CLASSIFICATION : PUBLIC ACCESS STREET

Macbeth Farm Lane* (Sta. 0+00 thru Sta. 15+33.08)
DESIGN SPEED: 30 MPH
*Note: MacBeth Farm Lane ℄ Sta. 15+33.08 thru 16+41.08 is a transition section from 50' R/W to 40' R/W and 24' paving to 18' paving.
NOT TO SCALE



TYPICAL ROADWAY SECTION
CLASSIFICATION : PUBLIC ACCESS PLACE

Macbeth Farm Lane* (Sta. 16+41.08 thru Sta. 19+55.90) & Kerne Court (Sta. 0+00 thru Sta. 8+95.01)
*Note: MacBeth Farm Lane ℄ Sta. 15+33.08 thru 16+41.08 is a transition section from 50' R/W to 40' R/W and 24' paving to 18' paving.
DESIGN SPEED: 25 MPH
NOT TO SCALE



ROAD 'A' PLAIN VIEW
SCALE: 1"=50'

As-Built
STATE OF MARYLAND
GEORGE BROOKE MILLER
725
PROPERTY LINE SURVEYOR
1-15-09
C. BROOKE MILLER
PROF. L.S. #135
DATE

ROAD PROFILE
Macbeth Farm Lane
MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/11/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/10/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 10-4-06

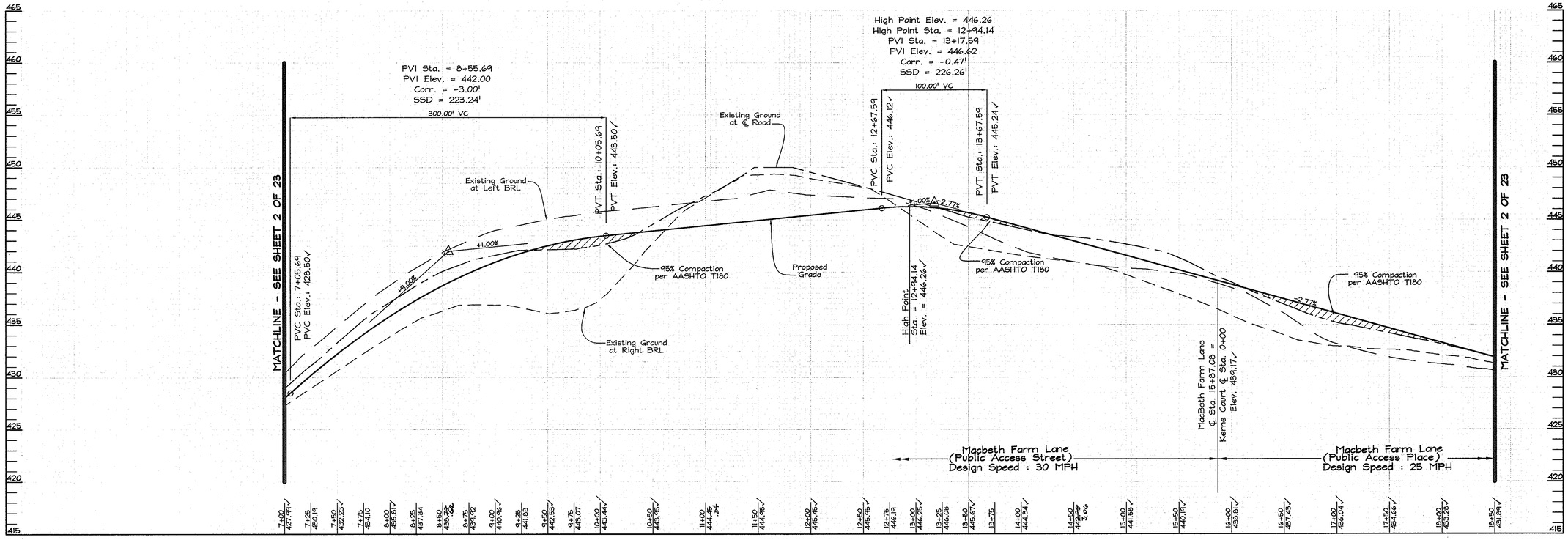
OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

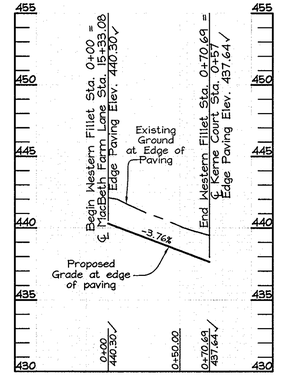
STATE OF MARYLAND
JOSHUA YOSEF FISCH
21418
PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 3 OF 23

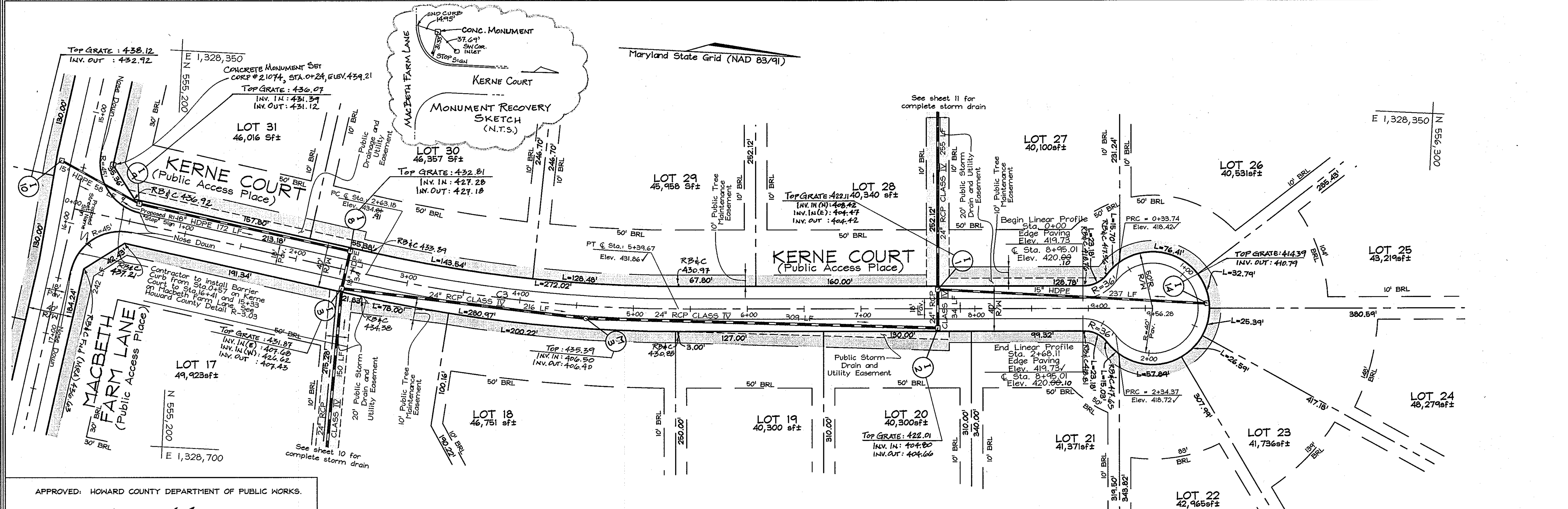


ROAD PROFILE
SCALE: Hor. 1"=50'
Vert. 1"=5'



Kerne Court
WESTERN FILLET PROFILE
SCALE- HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

F-06-101



KERNE COURT PLAN VIEW

SCALE: 1"=50'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

10-4-06
CHIEF, BUREAU OF HIGHWAYS — DATE

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10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

OWNER

THE ESTATE OF ELIZABETH SMITH
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10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER

CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

AS-BUILT

C. BROOKE MILLER
PROP. L.S. #135
1-15-2009
DATE

ROAD PROFILES
KERNE COURT
MACBETH FARM

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DESIGN BY:	PS
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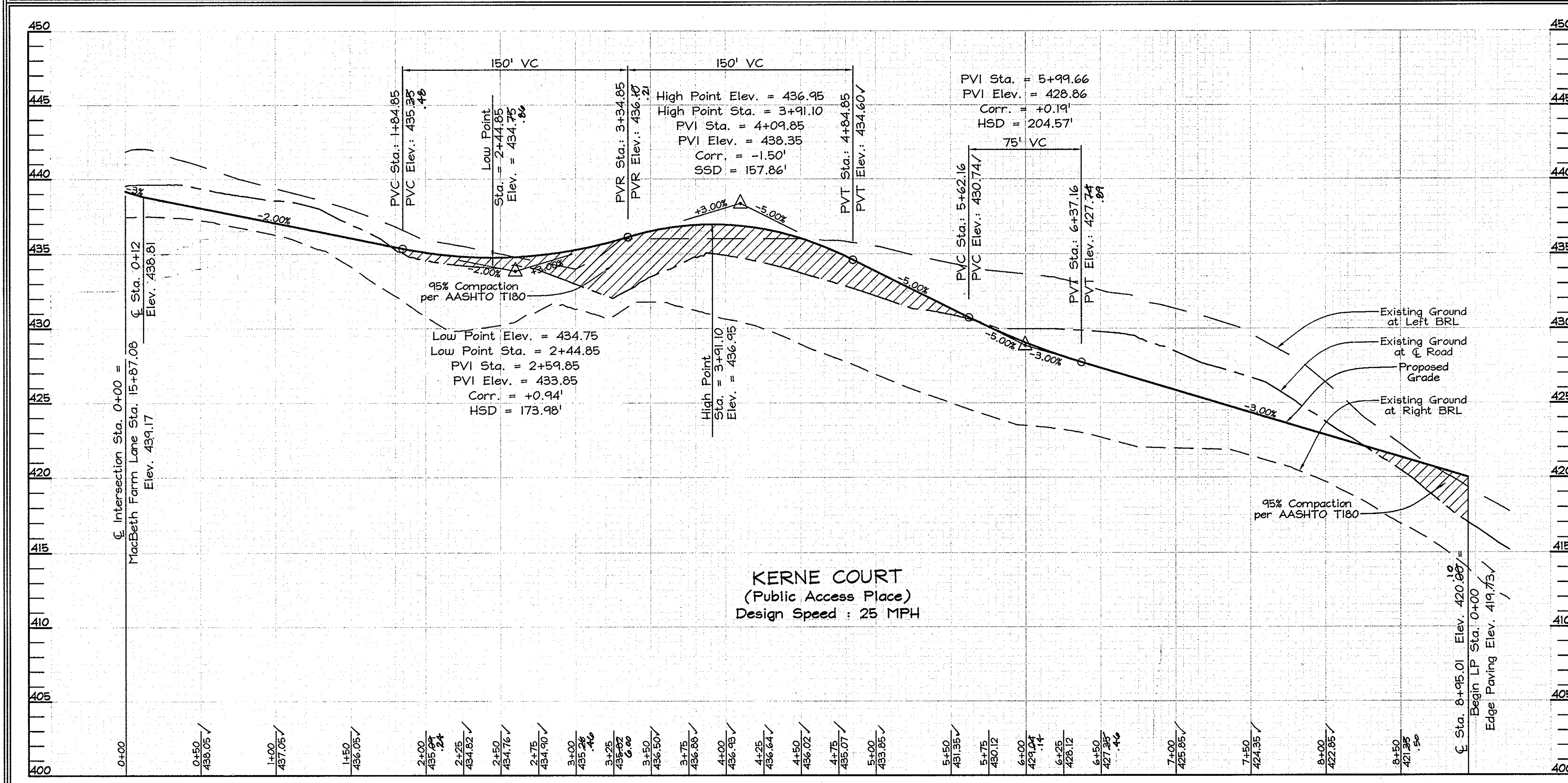
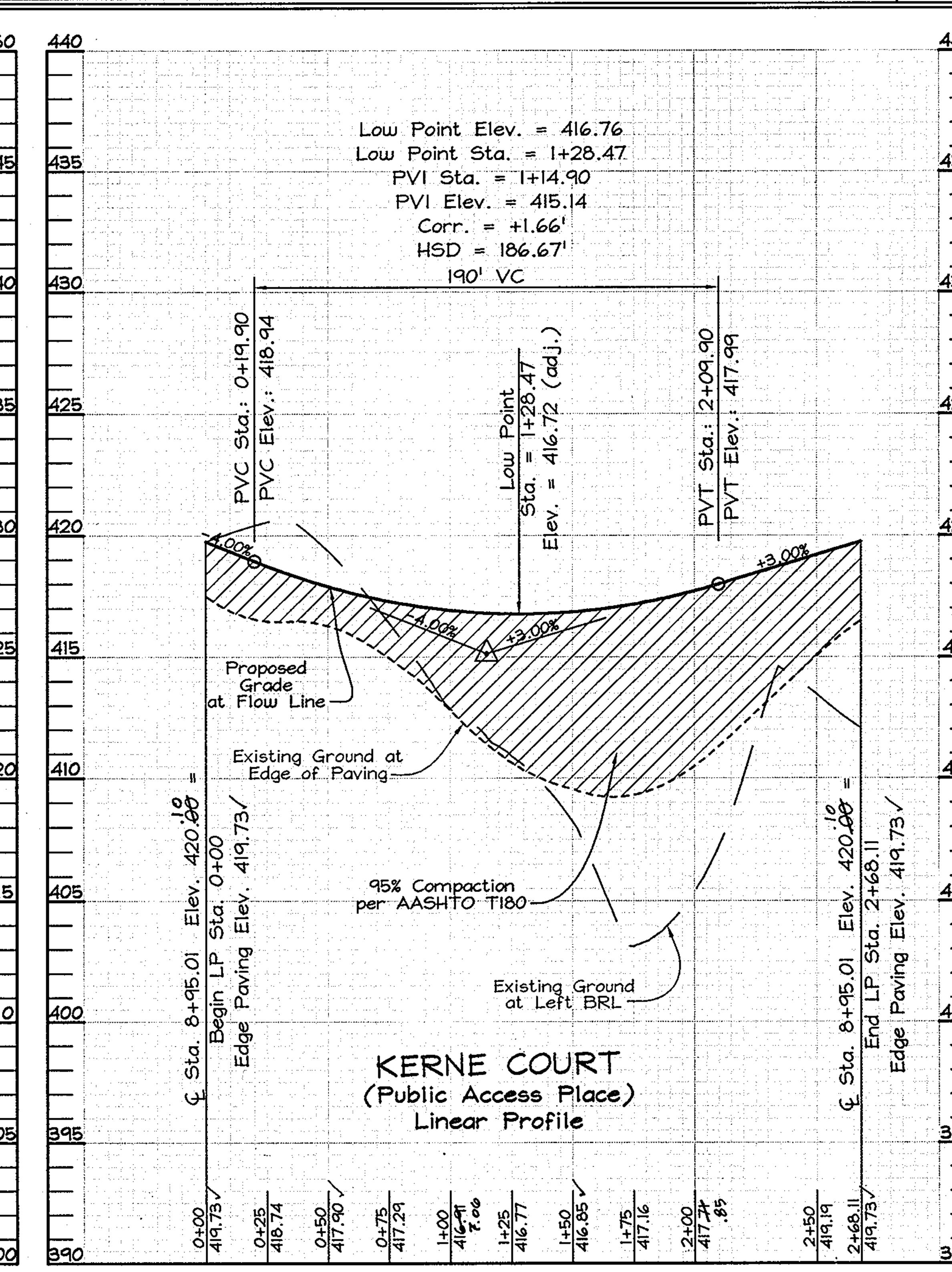


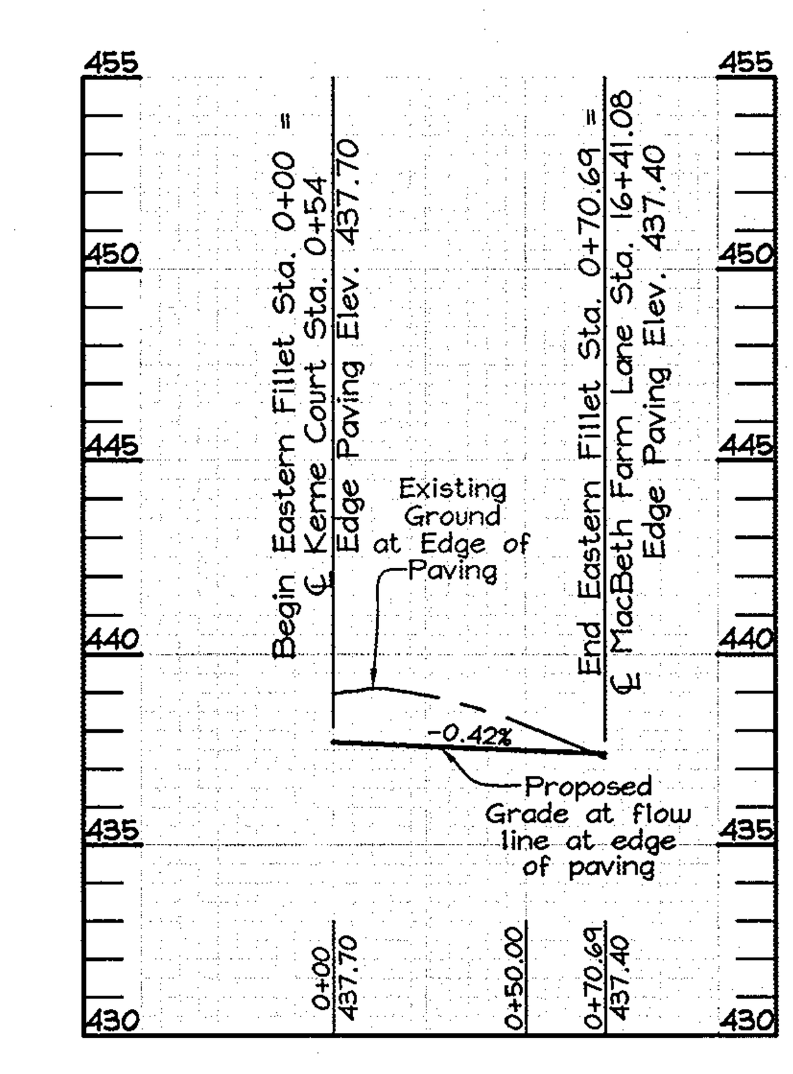
ROAD PROFILE

SCALE: Hor. 1"=50'
Vert. 1"=5'



LINEAR PROFILE

SCALE: Hor. 1"=50'
Vert. 1"=5'



KERNE COURT EASTERN FILLET PROFILE

SCALE- HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

F-06-101

LEGEND

Existing Contour	------------382
Proposed Contour	(82)
Spot Elevation	+82.53
Existing Trees to Remain	
Silt Fence	SF — SF
Super Silt Fence	SSF — SSF
Double Super Silt Fence	DSSF
Erosion Control Matting	ECM ECM
Limit of Disturbance	LOD
Rip-Rap Inflow Protection	RRP

Note:
Erosion control matting shall be placed in all road side ditches and grass swale. Level spreaders and grass swales with check dams to be constructed under SDP plan for lots.

DEVELOPER

CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

OWNER

THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[illegible] 10-4-06
CHIEF, BUREAU OF HIGHWAYS DATE

DEVELOPER'S CERTIFICATE

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

[illegible] 8/31/06
SIGNATURE OF DEVELOPER DATE

ENGINEERS CERTIFICATE

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

Zacharia Y Fisch 8/31/06
SIGNATURE OF ENGINEER DATE
ZACHARIA Y. FISCH

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

Jim Myers /es 9/29/06
USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

[illegible] 9/29/06
HOWARD SOIL CONSERVATION DISTRICT DATE

SEDIMENT AND EROSION CONTROL AND GRADING PLAN

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

STATE OF MARYLAND
ZACHARIA YOSEF FISCH
22418
PROFESSIONAL ENGINEER
Zacharia Y. Fisch

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	PS
DRAWN BY:	MY
CHECKED BY:	ZYF
SCALE:	1"=60'
DATE:	Aug. 31, 2006
W.O. No.:	3165
SHEET No.:	5 OF 23

F-06-101

NOTE:
All level spreaders and grass channels with check dams lots 22 and 23 to be constructed by builder under an approved SDP.

LEGEND

Existing Contour	- - - - - 382
Proposed Contour	—(82)—
Spot Elevation	+82.53
Direction of Flow	→
Tree Protection Fence	
Existing Trees to Remain	
Stabilized Construction Entrance	SCE
Silt Fence	SF
Super Silt Fence	SSF
Double Row Super Silt Fence	DSSF
Channel Silt Fence	CSF
Earth Dike	ED A-1
Limit of Disturbance	LOD
Temporary Swale	⇒ ⇒ ⇒
Erosion Control Matting	ECM
Rip-Rap Inflow Protection	RRP

Note:
Erosion control matting shall be placed in all road side ditches and grass swale.

NOTE:
1. Level spreaders to be constructed at building permit stage.
2. For sediment control Basin schedule see sheet 16.

* FOR AS-BUILT POND ELEVATIONS SEE SHEET 20 OF 23

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

[signature] 9/22/06
USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE

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[signature] 9/29/06
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

DEVELOPER'S CERTIFICATE

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

[signature] 8/31/06
SIGNATURE OF DEVELOPER — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[signature] 10-4-06
CHIEF, BUREAU OF HIGHWAYS — DATE

ENGINEERS CERTIFICATE

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

Zacharia Y. Fisch 8/31/06
SIGNATURE OF ENGINEER — DATE
ZACHARIA Y. FISCH

STATE OF MARYLAND — ZACHARIA YOSEF FISCH — 22418 — PROFESSIONAL ENGINEER

[signature] 1/15/09
ZACHARIA Y. FISCH — DATE
PE# 22418

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

SEDIMENT AND EROSION CONTROL AND GRADING PLAN

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A',
NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 — Parcel 90
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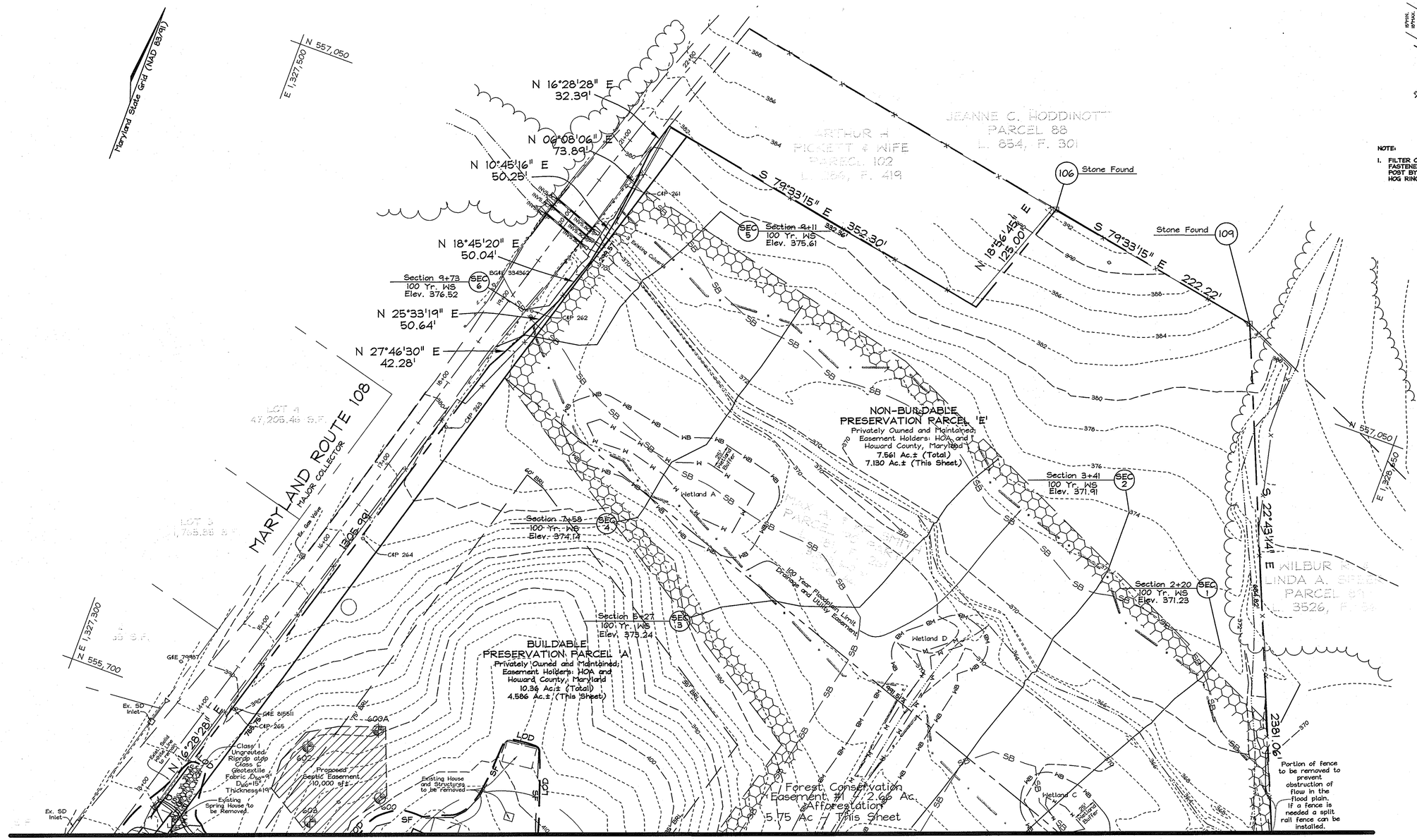
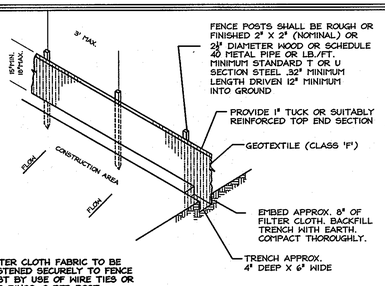
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	PS
DRAWN BY:	MY
CHECKED BY:	ZYF
SCALE:	1"=50'
DATE:	Aug. 31, 2006
W.O. No.:	3165
SHEET No.:	6 OF 23



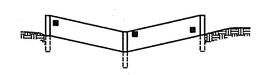
MATCHLINE - SEE SHEET 6 OF 23



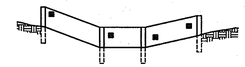
NOTE:

1. FILTER CLOTH FABRIC TO BE FASTENED SECURELY TO FENCE POST BY USE OF WIRE TIES OR HOG RINGS. 2 PER POST.

APPLICATIONS



SURFACE DRAIN OR MEDIAN DITCHES



SIDE DITCHES

PLAN VIEW SYMBOL

CSF CSF

CHANNEL SILT FENCE (C.S.F.)

LEGEND

- Existing Contour — 382
- Proposed Contour — 382
- Spot Elevation — +85.53
- Existing Trees to Remain
- Silt Fence — SF SF
- Super Silt Fence — SSF SSF
- Dual Super Silt Fence — DSSF DSSF
- Erosion Control Matting — ECM ECM
- Limit of Disturbance — LOD
- Channel Silt Fence — CSF CSF
- Rip-Rap Inflow Protection — RRP

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

USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE 9/29/06

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 9/29/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/11/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/10/06

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CHIEF, BUREAU OF HIGHWAYS — DATE 10-4-06

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SEDIMENT AND EROSION CONTROL AND GRADING PLAN

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
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W.O. No.: 3165
SHEET No.: 7 OF 23

F-06-101

21.0 STANDARDS AND SPECIFICATIONS FOR TOPSOIL

Definition

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

Purpose

To provide a suitable soil medium for vegetable growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:

a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.

b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.

c. The original soil to be vegetated contains material toxic to plant growth.

d. The soil is so acidic that treatment with limestone is not feasible.

II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.

II. Topsoil Specifications - Soil to be used as topsoil must meet the following:

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or a soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger that 1 and 1/2" in diameter.

ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

II. For sites having disturbed areas under 5 acres:

i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

iii. For sites having disturbed areas over 5 acres:

i. On soil meeting topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:

a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
b. Organic content of topsoil shall be not less than 1.5 percent by weight.
c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
d. No sod or seed shall be placed on soil soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

NOTE: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

ii. Place topsoil (if required) and apply soil ammendments specified in 20.0 Vegetative Stabilization-Section I-Vegetative Stabilization Methods and Materials.

V. Topsoil Application

I. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.

ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.

III. Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be place while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

SEQUENCE OF CONSTRUCTION

1. Obtain grading permit and contact Howard County Sediment Control Inspector(SCI) to arrange a pre-construction meeting. (1 day)
2. Install Stabilized Construction Entrance . (1 day)
3. Clear and grub as necessary for installation of silt fence, super silt fence, and sediment basin and install silt fence/ super silt fence, and install the stormwater management facility to be used as a sediment basin. (3 weeks)
4. With permission of SCI, install storm drain system. (3 weeks)
5. Upon completion of storm drain, and permission from the inspector, grade roads to subgrade. (3 weeks)
6. Fine grade roads and complete paving and final vegetative stabilization. Storm drains to remain open to convey runoff to Sediment/ Stormwater management basins. (1 week)
7. With permission of SCI remove all and sediment controls and apply permanent stabilization to those areas. (5 days)
8. Flush storm drains of sediment. Convert sediment/stormwater basin to permanent SWM by dewatering, removing accumulated sediment and blocking devices on orifices, restoring permanent weir, installing trash rack, grading bottom to permanent elevation shown and applying permanent seeding and mulching to disturbed areas. (1 week)
9. Contractor to remove all junk, trash, debris and any other unnatural materials from preservation parcels, floodplains, streams, wetlands and their buffers.

PERMANENT SEEDING NOTES

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

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

SOIL AMENDMENTS: In lieu of soil test recommendations, use the following schedule: Apply 2 tons per acre dolomitic limestone(92 lbs/1000 s.f.) And 900 lbs. / acre (20.7 lbs./1000s.f.) of 10-20-20 before seeding. Harrow or disc into upper 3 in. Of soil.
SEEDING: Apply a mixture of Turf Type Tall fescue(80%) and Hard Fescue (20%) in accordance with seeding dates and rates shown in the Permanent Seeding Summary shown on this sheet. For stabilization outside of the seeding dates, apply straw mulch at rates and methods specified below and apply permanent seeding when within proper seeding dates.
MULCHING: Immediately following seeding, apply a uniform 1- 2 in. Deep layer of un-rotted small grain straw at a rate of 2 tons/acre. (Apply 2.5 Tons/acre if a mulch anchoring tool is used).Straw may be anchored with wood cellulose fiber at a rate of 750 lbs. / acre mixed at a ratio of 50 lbs. Of wood fibre/ 100 gal. of water. Synthetic liquid binders such as Terra Tax II, Acrylic DLR (Agro- Tack), DCA-70, Petroset and other approved equals may be used at rates recommended by the manufacturers.

Permanent Seeding Summary

Seed Mixture (Hardiness Zone 7a and 6b) From Table 25					Fertilizer Rate (10-20-20)			Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths	N	P205	K20	
10	Tall Fescue (80%) Hard Fescue (20%)	120 30	3/1-5/15 8/15-11/15	0.5 in.	90lb/ac (2.0lb/ 1000sf)	175lb/ac (4lb/ 1000sf)	175lb/ac (4lb/ 1000sf)	2tons/ac (100lb/ 1000sf)

TEMPORARY SEEDING NOTES

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

SOIL AMENDMENTS: In lieu of soil test recommendations, use the following schedule: Apply 2 tons per acre dolomitic limestone(92 lbs/1000 s.f.) And 600 lbs. / acre (15 lbs./1000s.f.) of 10-10-10 before seeding. Harrow or disc into upper 3 in. Of soil.
SEEDING: Apply the Maryland State Highway approved seed mixture of Barley or Rye plus Foxtail Millet in accordance with seeding dates and rates shown in the Temporary Seeding Summary shown on this sheet. For stabilization outside of the seeding dates, apply straw mulch at rates and methods specified below.
MULCHING: Immediately following seeding, apply a uniform 1- 2 in. Deep layer of un-rotted small grain straw at a rate of 2 tons/acre. (Apply 2.5 Tons/acre if a mulch anchoring tool is used).Straw may be anchored with wood cellulose fiber at a rate of 750 lbs. / acre mixed at a ratio of 50 lbs. Of wood fibre/ 100 gal. of water. Synthetic liquid binders such as Terra Tax II, Acrylic DLR (Agro- Tack), DCA-70, Petroset and other approved equals may be used at rates recommended by the manufacturers.

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

Temporary Seeding Summary

Seed Mixture (Hardiness Zone 6a and 7a) From Table 26					Fertilizer Rate (10-10-10)	Lime Rate
No.	Species	Application Rate (lb/ac)	Seeding Dates	Seeding Depths		
2	Barley or Rye plus Foxtail Millet	150 lbs (3.5lbs/1000sqf)	2/1-11/30 (7a) 3/15-10/31 (6a)	1/4 in- 1/2 in	600 lb/ac (15lb/1000sf)	2 tons/ac (100lb/1000sf)

SEDIMENT CONTROL NOTES

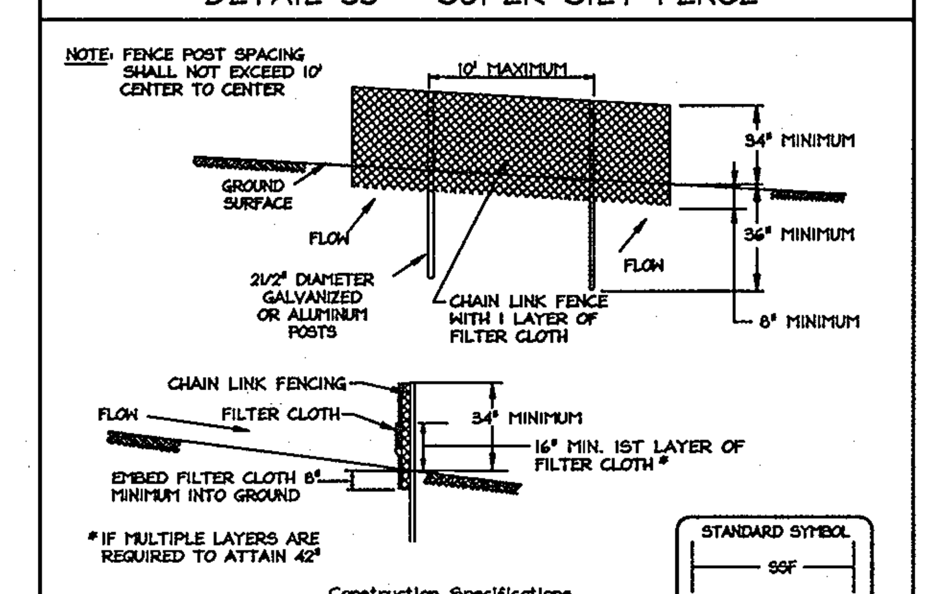
1. A minimum of 48 hours notice must be given to the Howard County Department of Inspection, License and Permits Sediment Control Division prior to the start of any construction (313-1855).
2. All vegetation and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. and revisions thereto.
3. Following initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within: (a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes, and all slopes greater than 3:1, (b) 14 days as to all other disturbed or graded areas on the project site.
4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol. I, Chapter 7, HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
5. All disturbed areas must be stabilized within the time period specified above and mulching (Sec. G). Temporary stabilization with mulch alone shall be done EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding, in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL 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	76.90 Acres
Area Disturbed	13.03 Acres
Area to be roofed or paved	2.01 Acres
Area to be vegetatively stabilized	11.02 Acres
Total Cut	5,000 CY
Total Fill	5,000 CY
Offsite waste/borrow area location	N/A

8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
9. Additional sediment controls must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized within one working day, whichever is shorter.

* Earthwork quantities are solely for the purpose of calculating fees. Contractor to verify all quantities prior to the start of construction.
** To be determined by contractor, with pre-approval of the Sediment Control Inspector with an approved and active grading permit

DETAIL 33 - SUPER SILT FENCE



Construction Specifications

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.

2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.

3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.

4. Filter cloth shall be embedded a minimum of 8" into the ground.

5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.

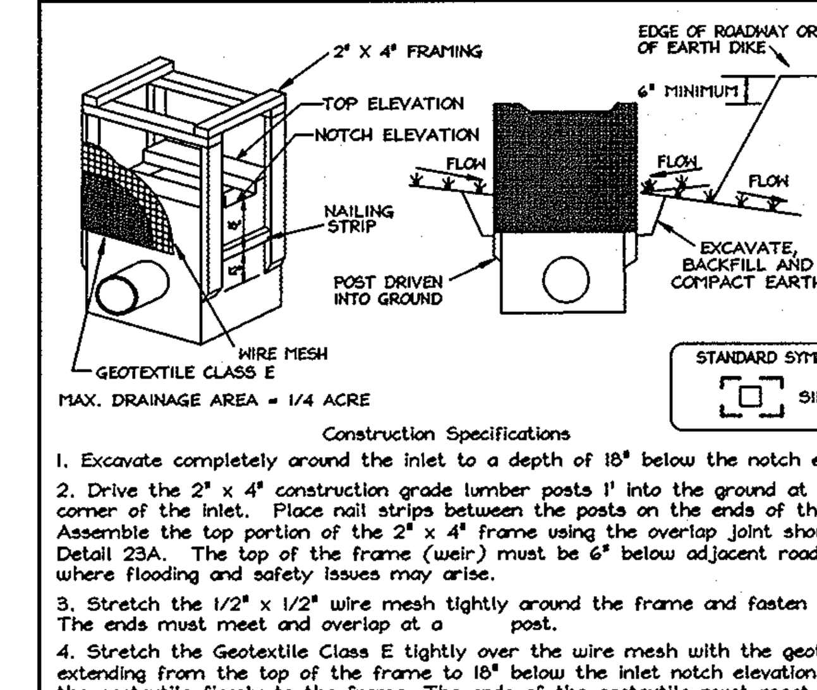
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height.

7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

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

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

DETAIL 23A - STANDARD INLET PROTECTION



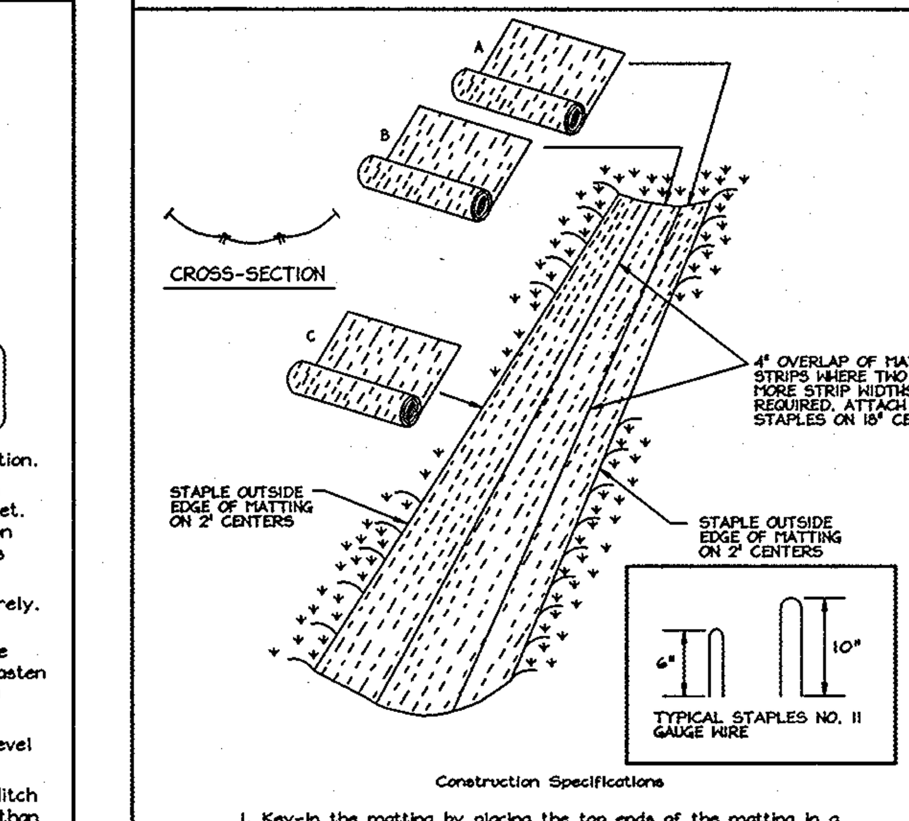
MAX. DRAINAGE AREA = 1/4 ACRE

Construction Specifications

1. Excavate completely around the inlet to a depth of 18" below the notch elevation.
2. Drive the 2" x 4" construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2" x 4" frame using the overlap joint shown on Detail 23A. The top of the frame (weir) must be 6" below adjacent roadways where flooding and safety issues may arise.
3. Stretch the 1/2" x 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.
4. Stretch the Geotextile Class E tightly over the wire mesh with the geotixtile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then fastened down.
5. Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.
6. If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.
7. The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 16 - 5	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 30 - EROSION CONTROL MATTING



Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".

2. Staple the 4" overlap in the channel center using an 18" spacing between staples.

3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.

4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.

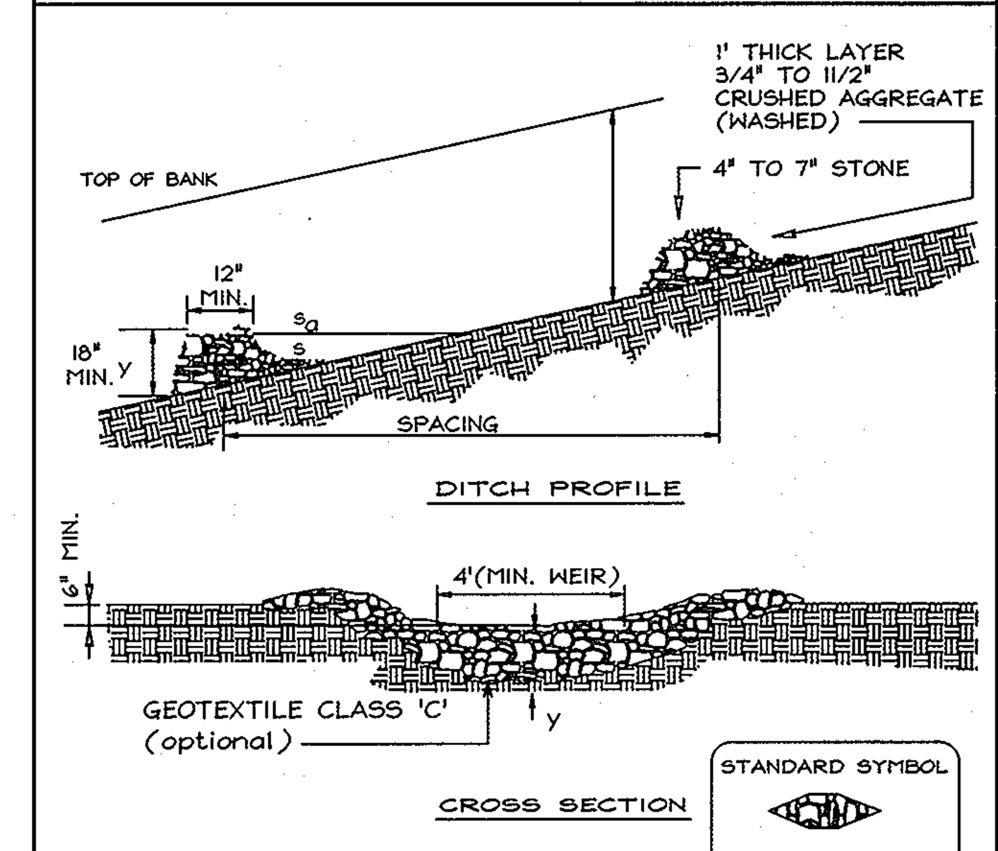
5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.

6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

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

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

DETAIL 7 - STONE CHECK DAM



STANDARD STONE CHECK DAM DESIGN

SLOPE	SPACING
2% or less	80'
2.1% to 4%	40'
4.1% to 7%	25'
7.1% to 10%	15'
over 10%	use lined waterway design

Construction Specifications

1. Swales and ditches shall be prepared in accordance with the construction specifications described in Section A-2, Standards and Specifications for Temporary Swale.

2. The check dam shall be constructed of 4"-7" stone. The stone shall be placed so that it completely covers the width of the channel and keyed into the channel banks.

3. The top of the check dam shall be constructed so the the center is approximately 6" lower than the outer edges, forming a weir that water can flow across.

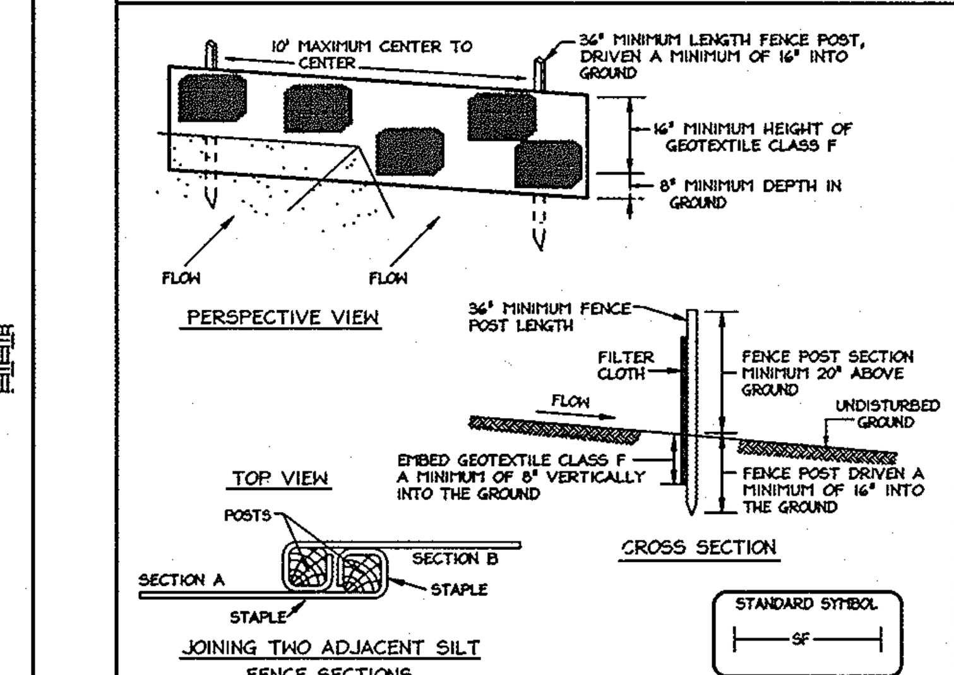
4. The maximum height of the check dam at the center shall not exced 2'.

5. The upstream sideof the check dam shall be lined with approximately 1' of 3/4" to 11/2" crushed aggregate.

6. Accumulated sediment shall be removed when it has built up to 1/2 of the original height of the weir crest.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B - 8 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 22 - SILT FENCE



Construction Specifications

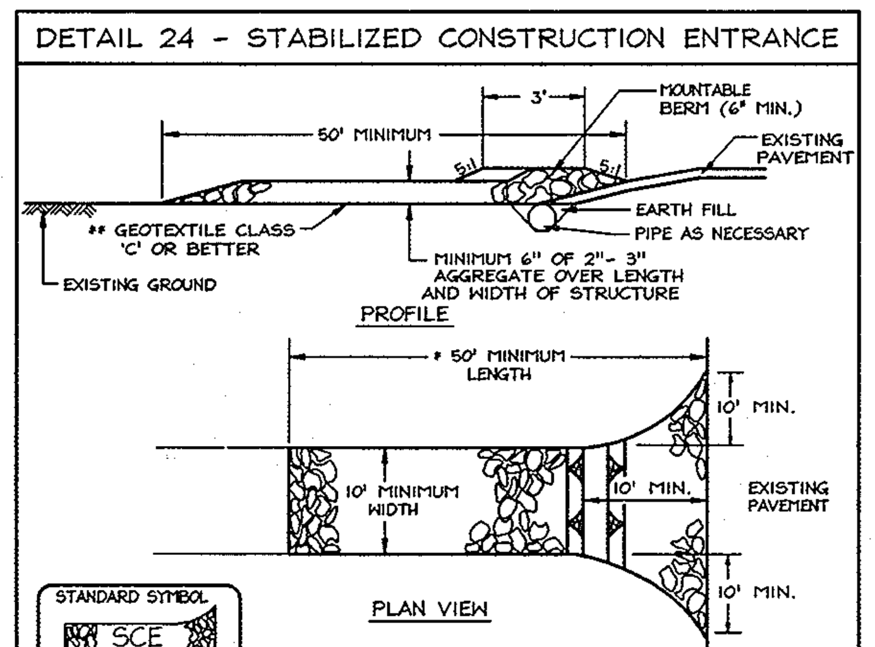
1. Fence posts shall be a minimum of 36" long, driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pound per linear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

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

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

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

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

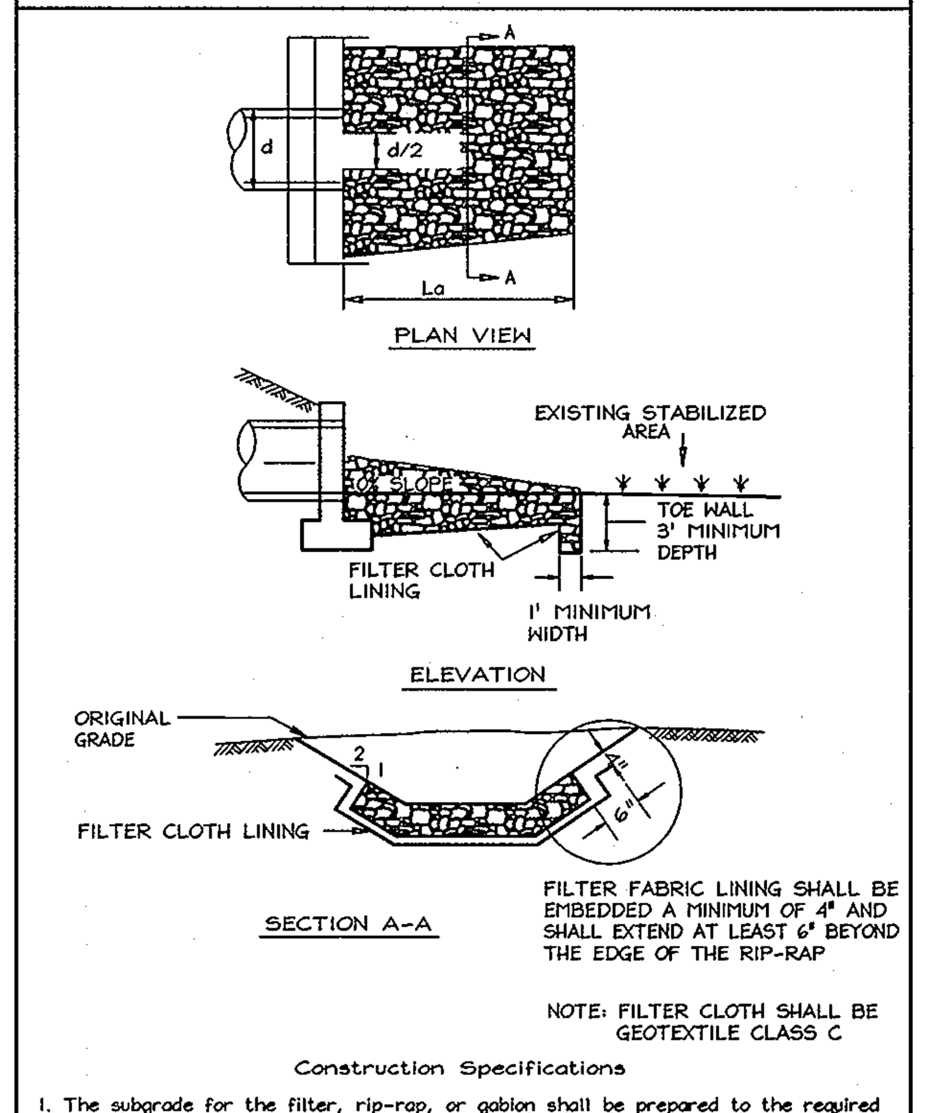


Construction Specification

1. Length - minimum of 50' (* 30' for a single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. ** The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey, a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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

DETAIL 27 - ROCK OUTLET PROTECTION III



NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

Construction Specifications

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

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

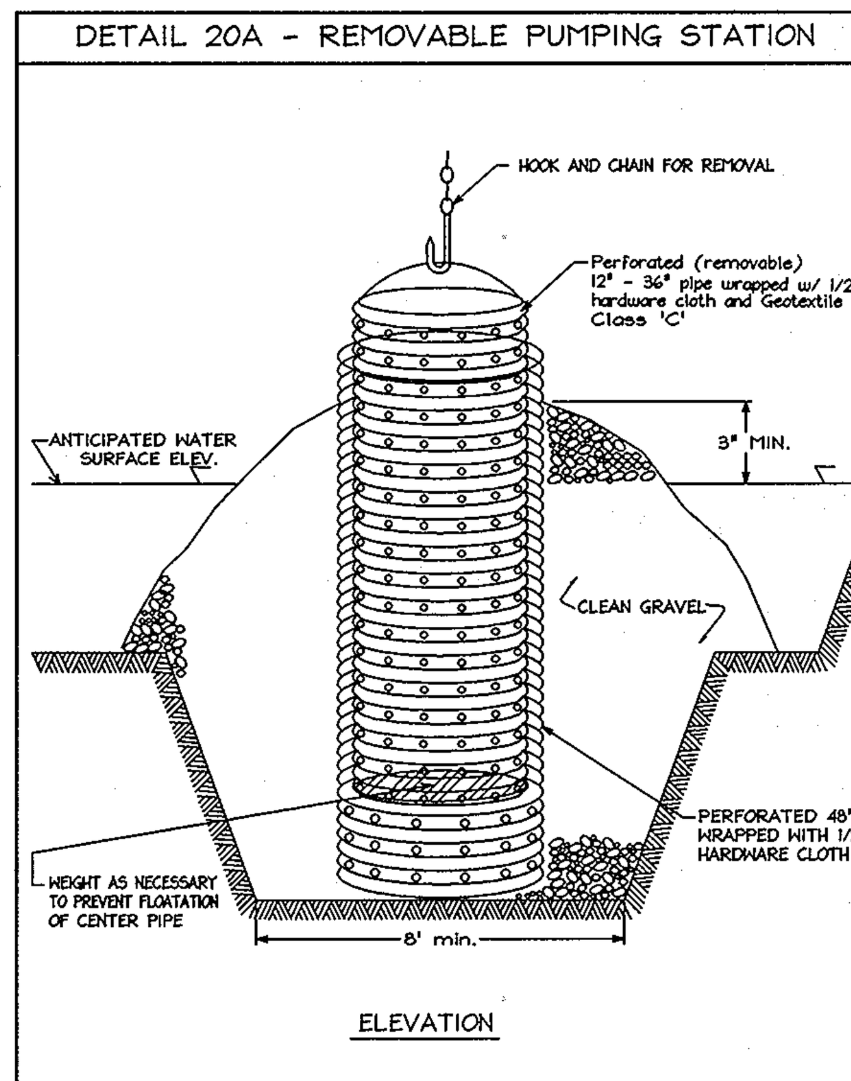
3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile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

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall 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 paced in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

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

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

DETAIL 20A - REMOVABLE PUMPING STATION



Construction Specifications

1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with 1/2" hardware cloth to prevent backfill material from entering the perforations.

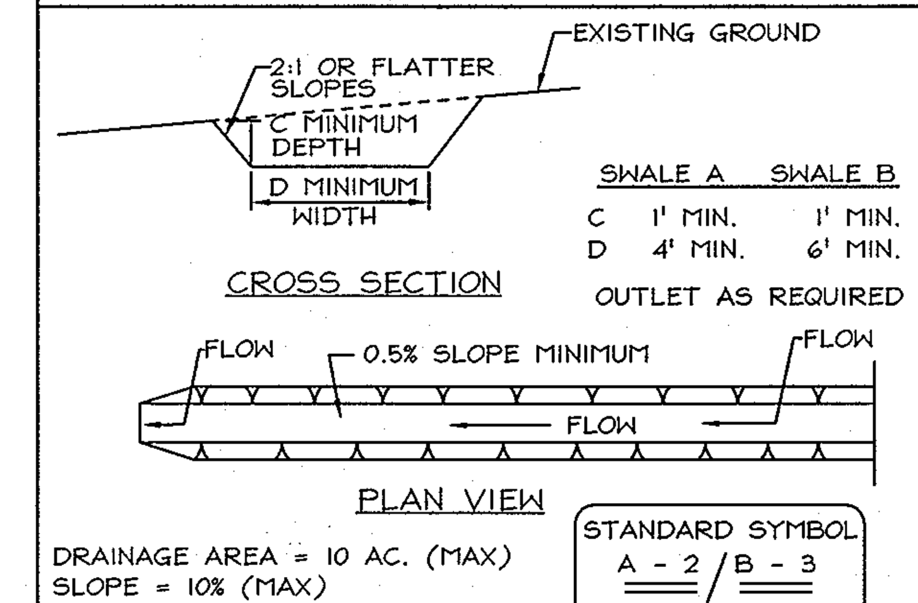
2. After installing the outer pipe, backfill around outer pipe with 2" aggregate or clean gravel.

3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be 1/2" X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with 1/2" hardware cloth first, then wrapped again with Geotextile Class C.

4. The center pipe should extend 12" to 18" above the anticipated water surface elevation or riser crest elevation when dewatering a basin.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE D - 12 - 4	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 2 - TEMPORARY SWALE



DRAINAGE AREA = 10 AC. (MAX)
SLOPE = 10% (MAX)

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

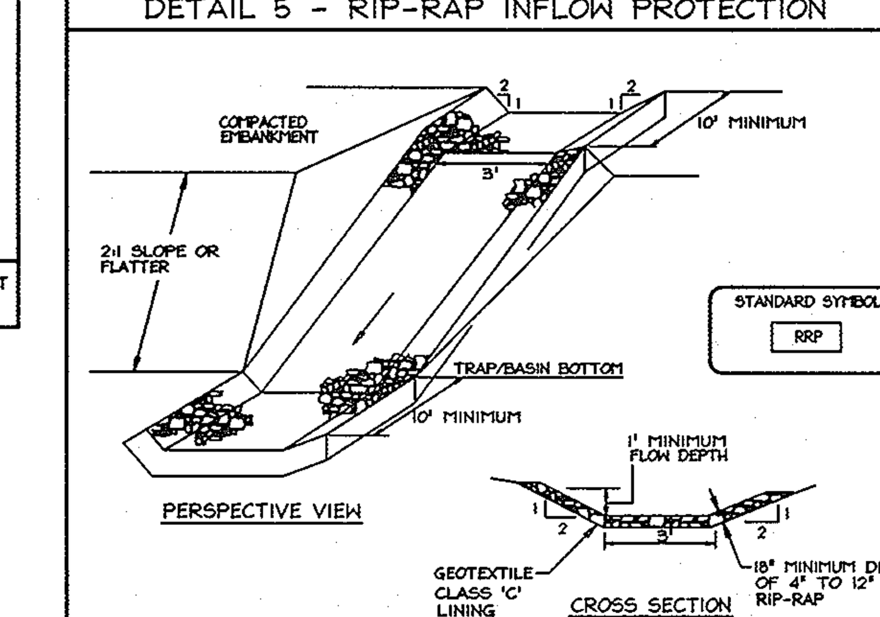
1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4"-7" stone or recycled concrete equivalent pressed into soil. in a minimum 7" layer.

Construction Specifications

1. All temporary swales 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 objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.
5. The swale shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill, if necessary, 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 swale.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A - 2 - 4	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

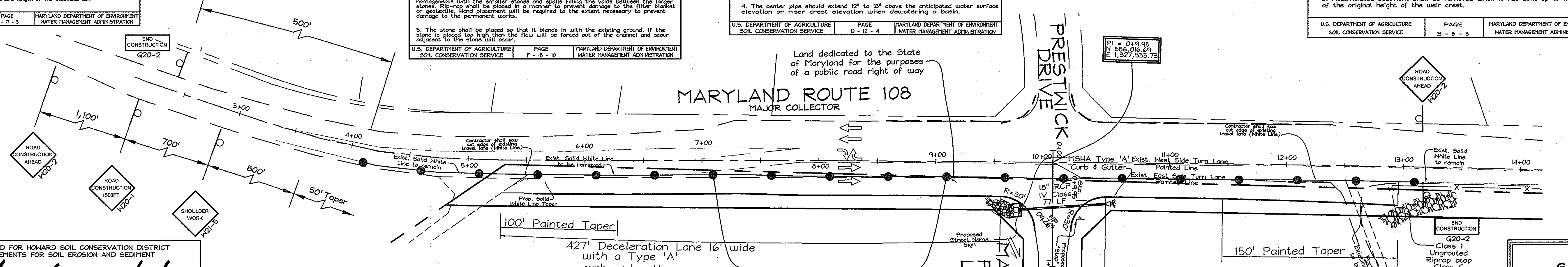
DETAIL 5 - RIP-RAP INFLOW PROTECTION



Construction Specifications

1. Rip-rap lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3' (min.) bottom width. The channel shall be lined with 4" to 12" rip- rap to a depth of 18".
2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.
3. Entrance and exit sections shall be installed as shown on the detail section.
4. Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.
5. Gabion Inflow Protection may be used in lieu of Rip-rap Inflow Protection.
6. Rip-rap should blend into existing ground.
7. Rip-rap Inflow Protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Swale lining criteria.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B - 6 - 2	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



TRAFFIC CONTROL PLAN
Scale: 1"=50'

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

[illegible] 9/29/06
USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE

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

[illegible] 9/29/06
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[illegible] 10-4-06
CHIEF, BUREAU OF HIGHWAYS — DATE

DEVELOPER'S CERTIFICATE

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

[illegible] 8/31/06
SIGNATURE OF DEVELOPER — DATE

ENGINEERS CERTIFICATE

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

Zacharia Y. Fisch 8/31/06
SIGNATURE OF ENGINEER — DATE
ZACHARIA Y. FISCH

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

TRAFFIC CONTROL PLAN, SEDIMENT & EROSION CONTROL AND MISCELLANEOUS NOTES & DETAILS
MACBETH FARM

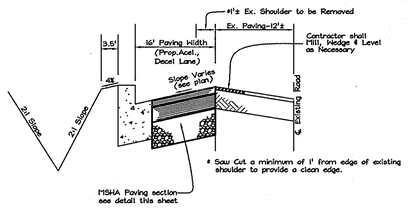
LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 — Parcel 90
4th Election District — Howard County, Maryland

STATE OF MARYLAND
ZACHARIA YOSEF FISCH
22418
PROFESSIONAL ENGINEER

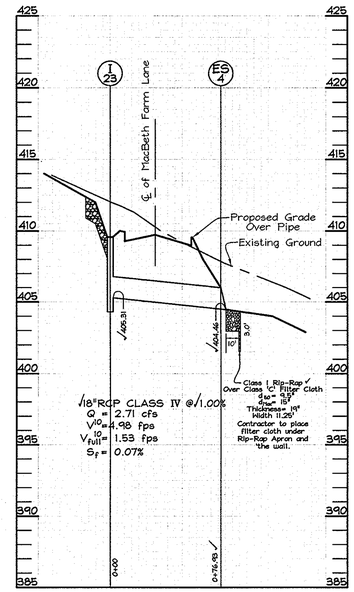
FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	PS
DRAWN BY:	MY
CHECKED BY:	ZYF
SCALE:	As Shown
DATE:	Aug. 31, 2006
W.O. No.:	3165
SHEET No.:	8 OF 23

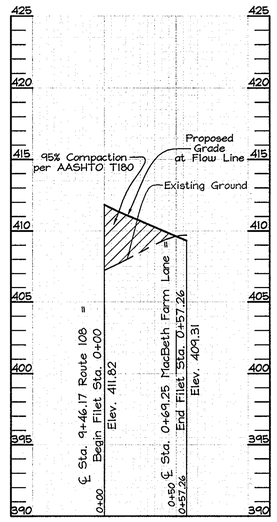
F-06-101



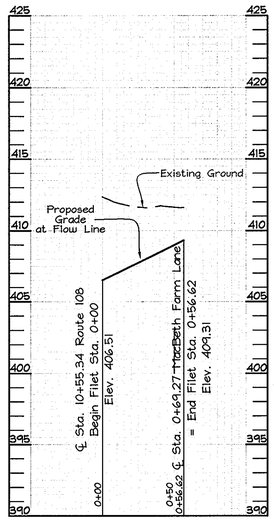
WIDENING DETAIL
MARYLAND ROUTE 108
NOT TO SCALE



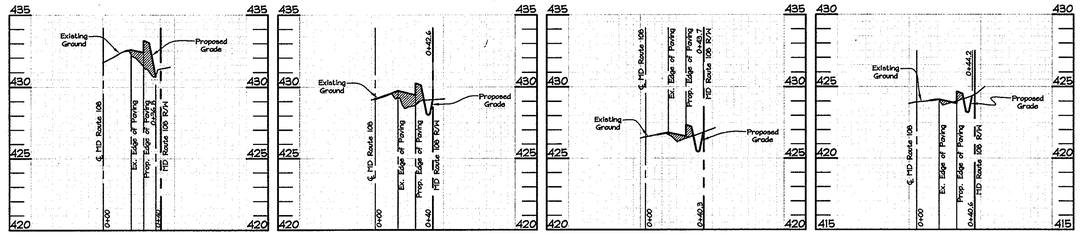
STORM DRAIN PROFILES
Scale: Horizontal- 1"=50'
Vertical-1"=5'



Macbeth Farm Lane
Southern Fillet
Scale: Hor.: 1"=50'
Vert.: 1"=5'



Macbeth Farm Lane
Northern Fillet
Scale: Hor.: 1"=50'
Vert.: 1"=5'

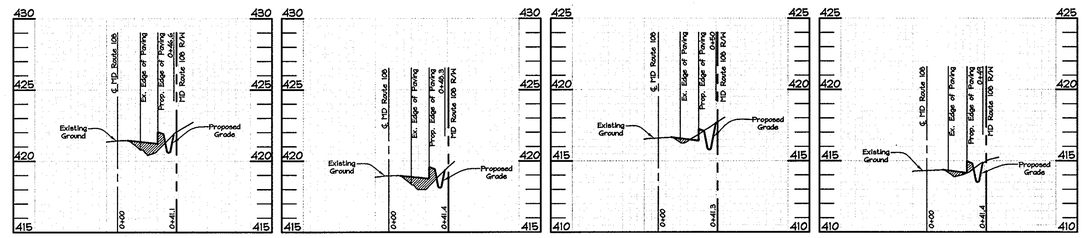


Section at Sta. 5+50
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 6+00
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 6+50
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 7+00
Scale: Hor.: 1"=50'
Vert.: 1"=5'

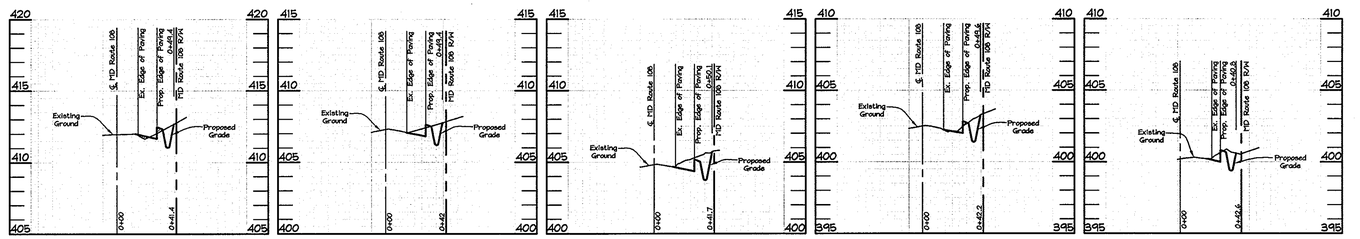


Section at Sta. 7+50
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 8+00
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 8+50
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 9+00
Scale: Hor.: 1"=50'
Vert.: 1"=5'



Section at Sta. 9+50
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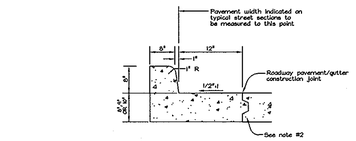
Vert.: 1"=5'

Section at Sta. 10+50
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 11+00
Scale: Hor.: 1"=50'
Vert.: 1"=5'

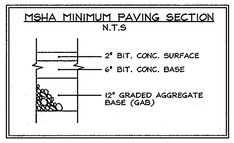
Section at Sta. 11+50
Scale: Hor.: 1"=50'
Vert.: 1"=5'

Section at Sta. 12+00
Scale: Hor.: 1"=50'
Vert.: 1"=5'

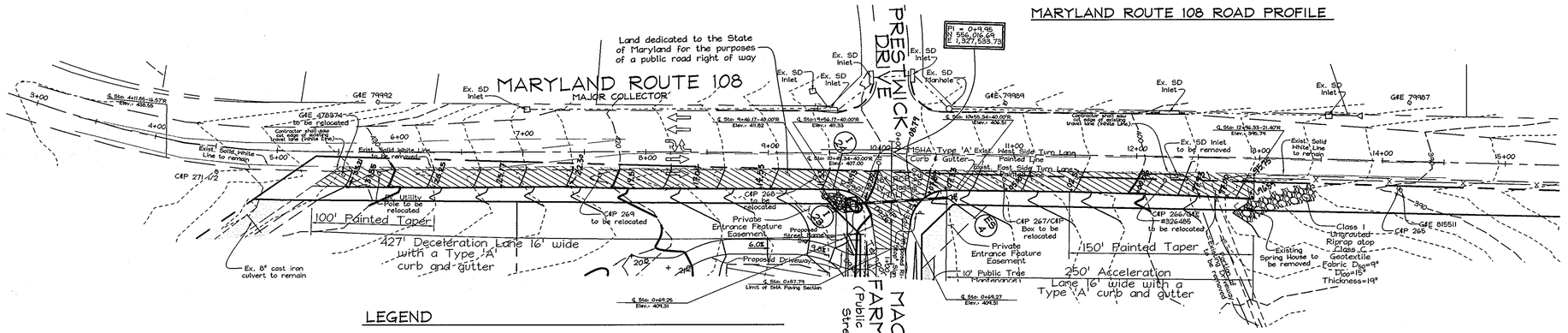


MSHA TYPE 'A' CONCRETE COMBINATION CURB AND GUTTER
MD. NO. 620.02
NOT TO SCALE

NOTES:
1. Slope gutter pan 1/2" per foot toward flow line on all roadways including superelevated sections. Except interchange ramps.
2. Provide Key and Longitudinal tie bar as required.
3. Maximum joint spacing for concrete curb and gutter is 10'.



Note:
1: test borings to be drilled along proposed acceleration & deceleration lanes to determine suitability of paving section.
2: All spot elevation along curb line are at flow line and not at top of curb.
3: I-24 is a precast or cast in place COG/COS Inlet Maryland State Highway Administration Standard No.374.68



MARYLAND ROUTE 108 ROAD PROFILE

LEGEND

Denotes SHA Paving Section

Denotes proposed rip-rap d_{50}=9.5", d_{max}=15", thickness 19".

Traffic Markings will be provided by Traffic Concepts, Inc.

ENTRANCE & WIDENING PLAN
Scale: 1"=50'

AS-BUILT

STATE OF MARYLAND · CLIVE BROOKE MILLER · 135 · PROFESSIONAL ENGINEER

C. Brooke Miller 1-15-2009
C. BROOKE MILLER PROF L.S.#135 DATE

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

USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hewitt 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

W. Mike Nicholas Jr. 10-4-06
CHIEF, BUREAU OF HIGHWAYS DATE

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

SIGNATURE OF DEVELOPER 8/31/06 DATE

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Zacharia Y. Fisch 8/31/06
SIGNATURE OF ENGINEER DATE
ZACHARIA Y. FISCH

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

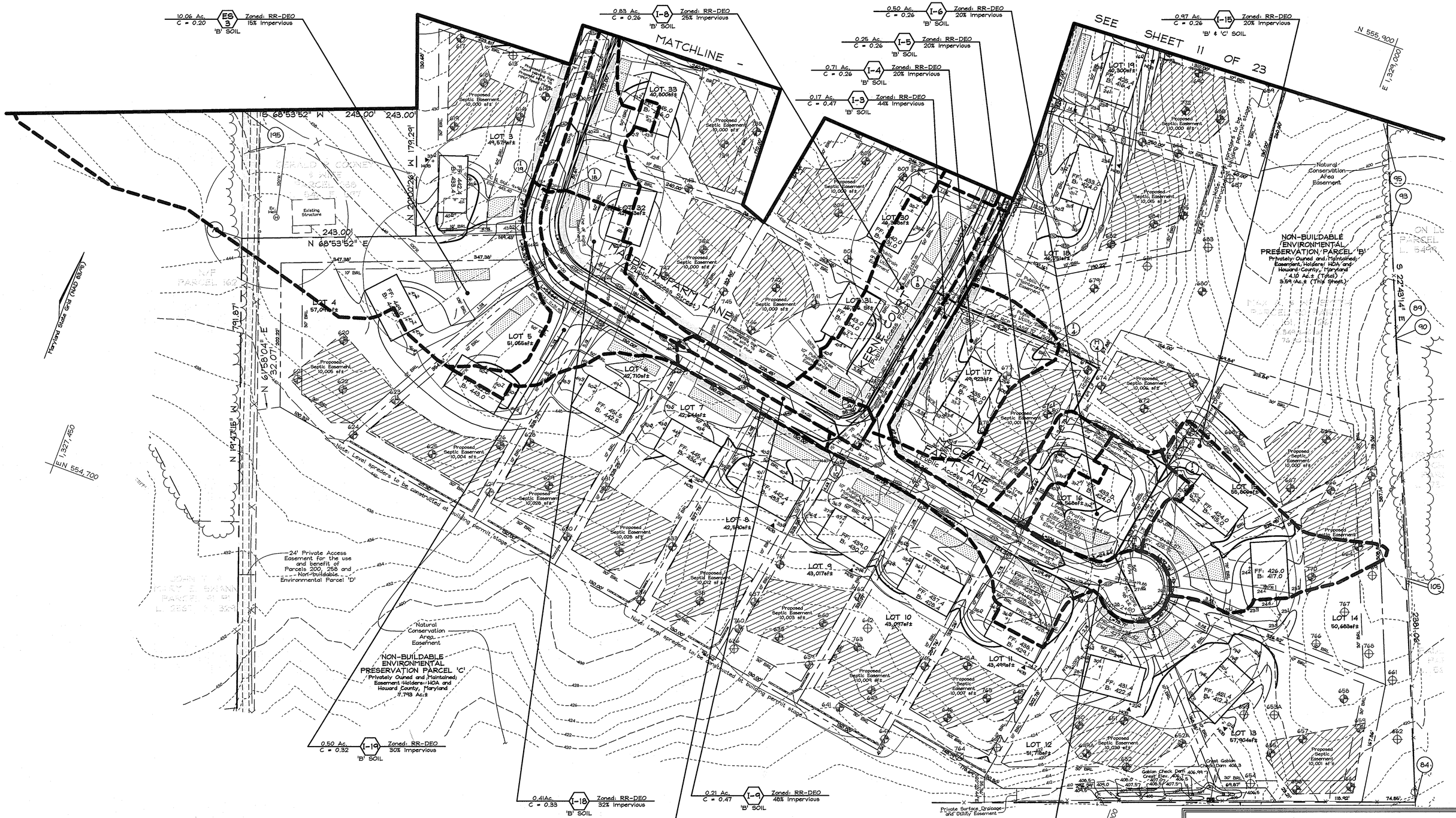
STATE OF MARYLAND · ZACHARIA YOSEF FISCH · 22418 · PROFESSIONAL ENGINEER

ENTRANCE PLAN AND DETAILS
MACBETH FARM
LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 9 OF 23

F-06-101



USE THIS SHEET FOR DRAINAGE AREAS ONLY

STORM DRAIN DRAINAGE AREA MAP

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'

Tax Map 34 Grids 18 & 24 Parcel 90

4th Election District Howard County, Maryland

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 10-4-06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/11/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/10/06

OWNER

THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER

CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

STATE OF MARYLAND — JOSHUA VOSSEN FISH — 22418 — PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	PS
DRAWN BY:	MY
CHECKED BY:	ZYF
SCALE:	1"=60'
DATE:	Aug. 31, 2006
W.O. No.:	3165
SHEET No.:	10 OF 23

F-06-101

USE THIS SHEET FOR DRAINAGE AREAS ONLY

OWNER

THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER

CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

STORM DRAIN DRAINAGE AREA MAP

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A',
NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

STATE OF MARYLAND ZACHARIA YOSEF FISCH 22418 PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
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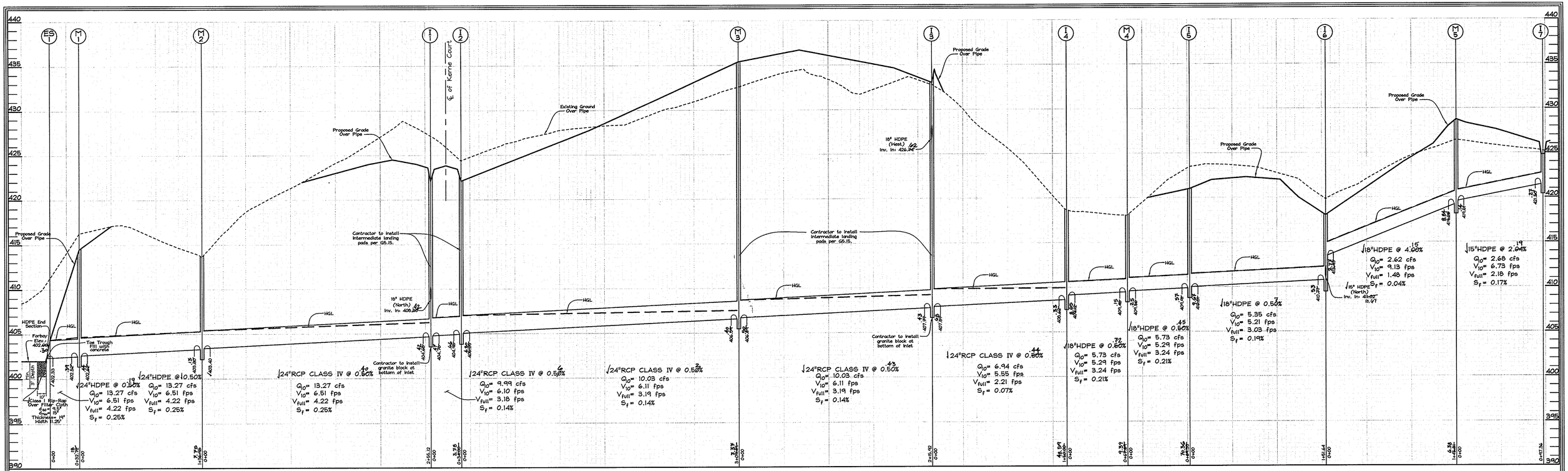
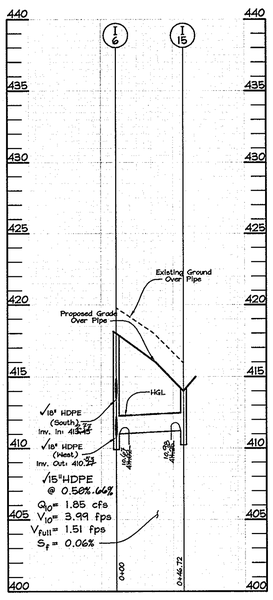
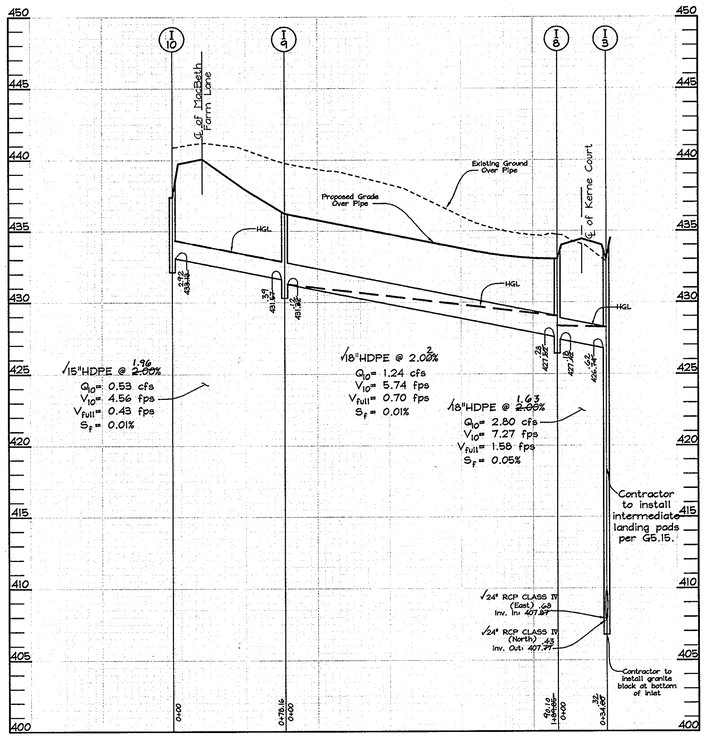
E-mail: info@fsheri.com

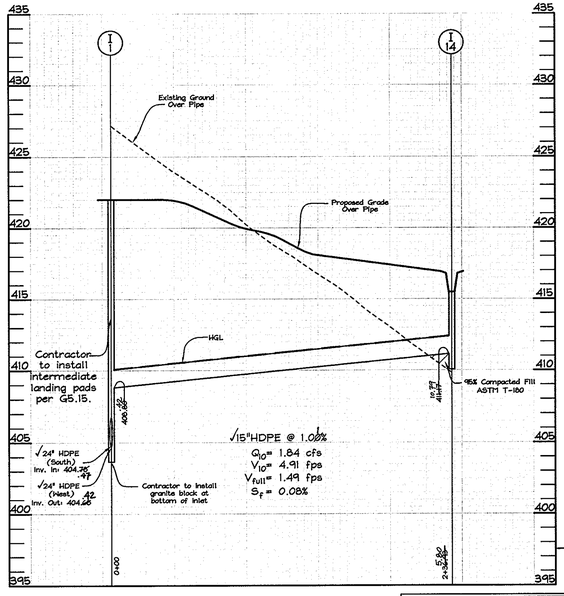
DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: 1"=60'
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 11 OF 23

F-06-101









AS-BUILT

STATE OF MARYLAND — CLYDE BROOKE MILLER — 135 — PROPERTY LINE SURVEYOR

1-15-2009

C. BROOKE MILLER — DATE

PROFLS#135

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/4/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/10/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 10-4-06

STORM DRAIN PROFILES

Scale: Horizontal- 1"=50'
Vertical-1"=5'

OWNER

THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER

CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

STORM DRAIN PROFILES

MACBETH FARM

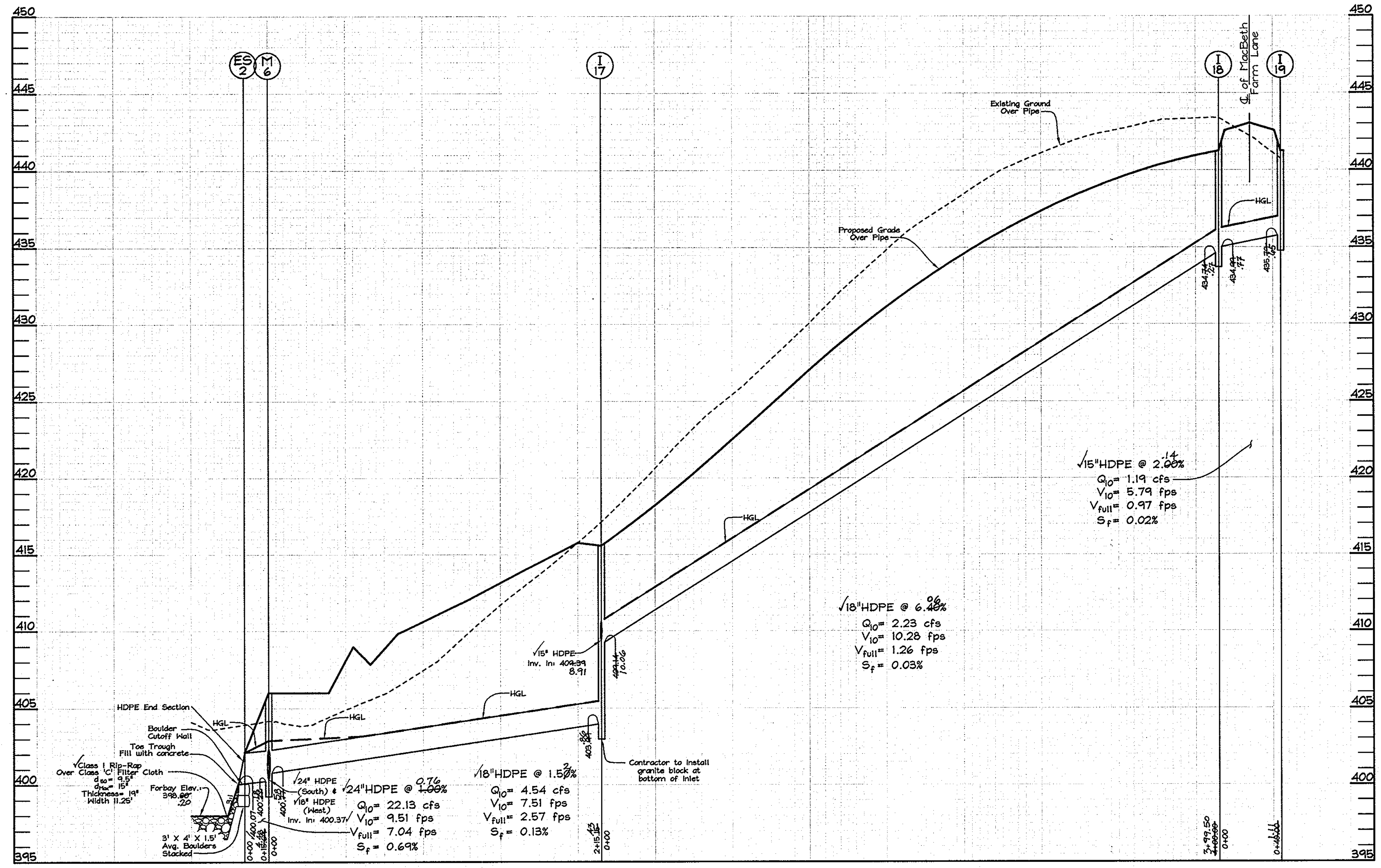
LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 — Parcel 90
4th Election District — Howard County, Maryland

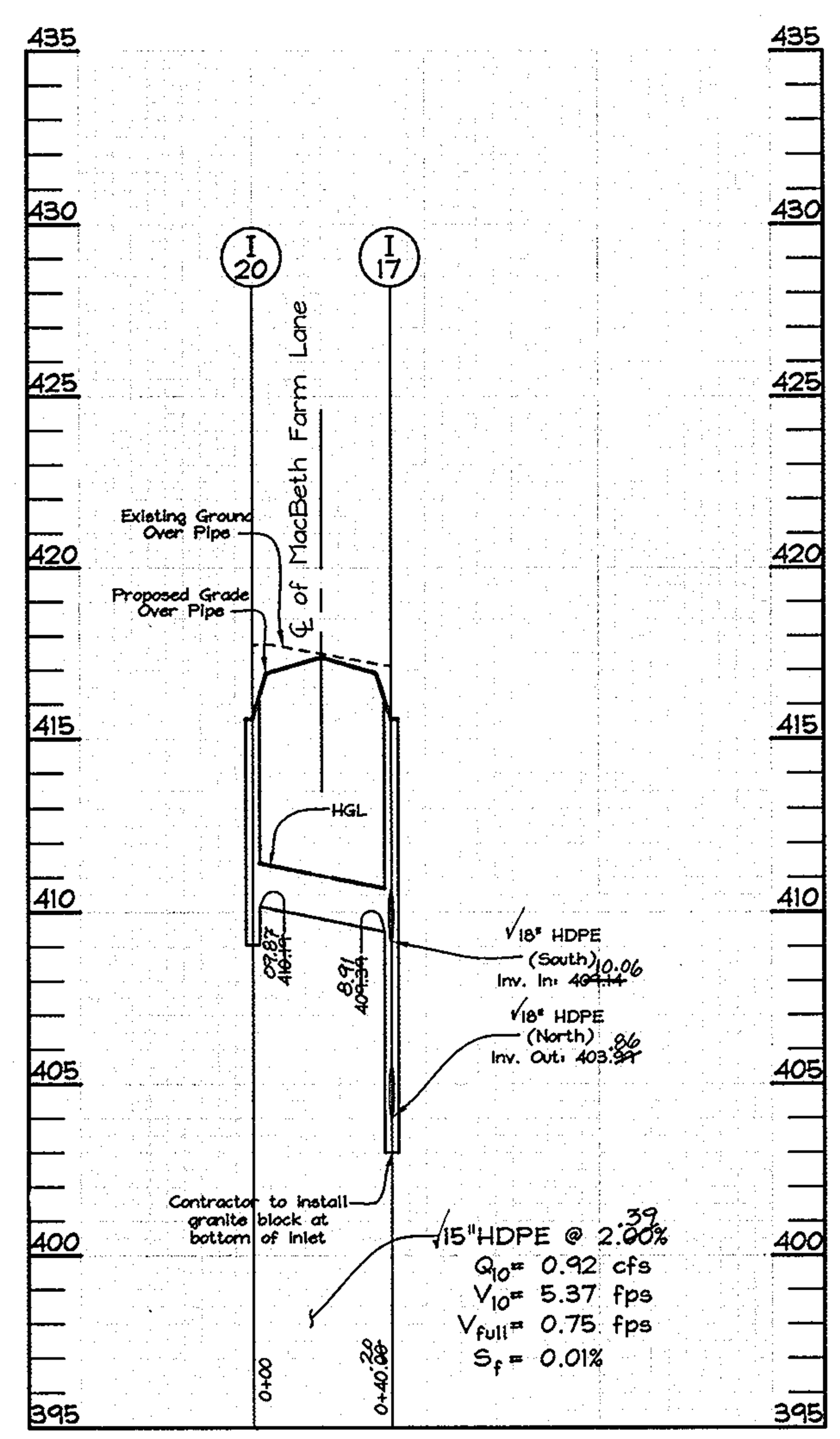
STATE OF MARYLAND — ZACHARIA YOSEF FISH — 22418 — PROFESSIONAL ENGINEER

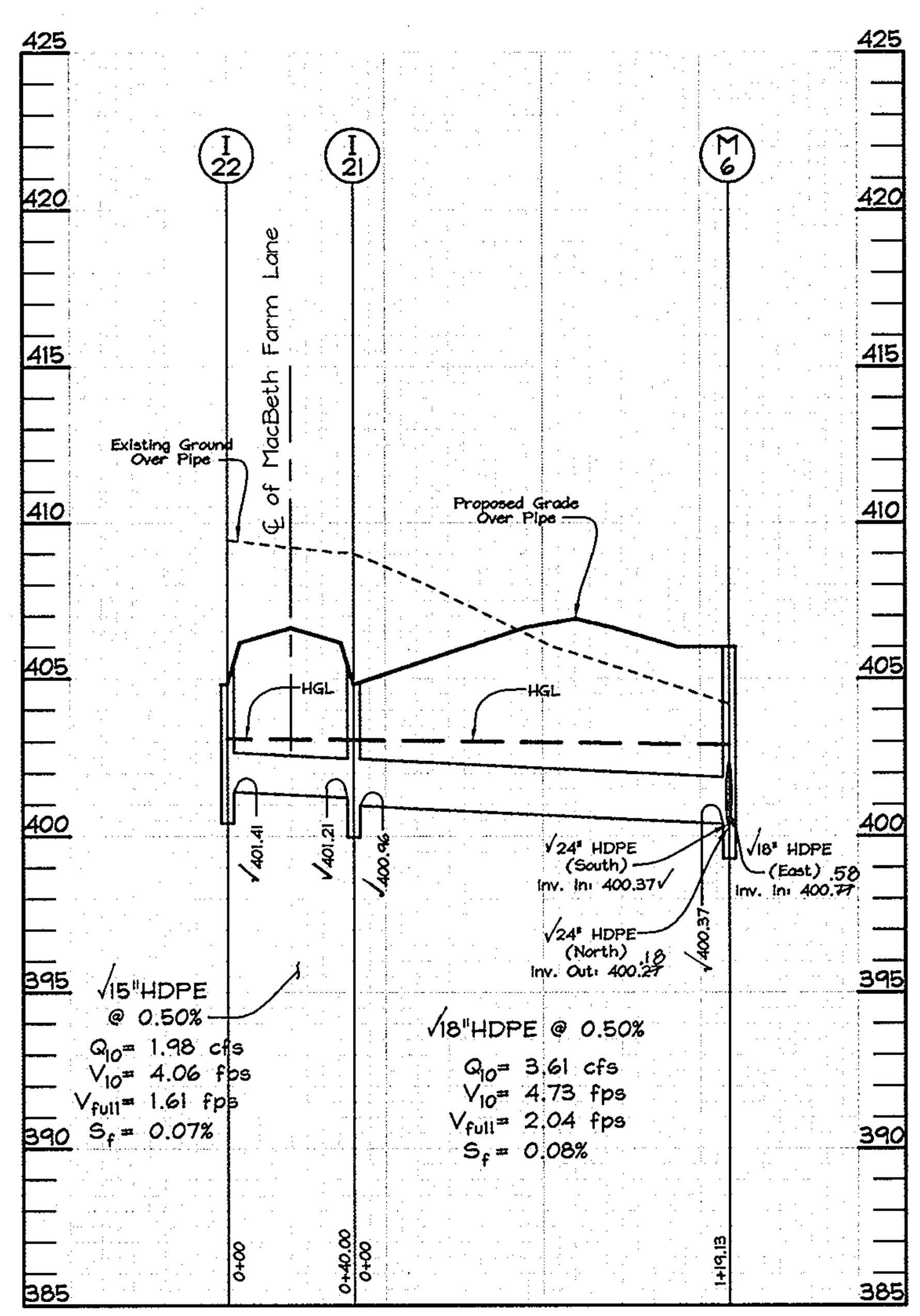
FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

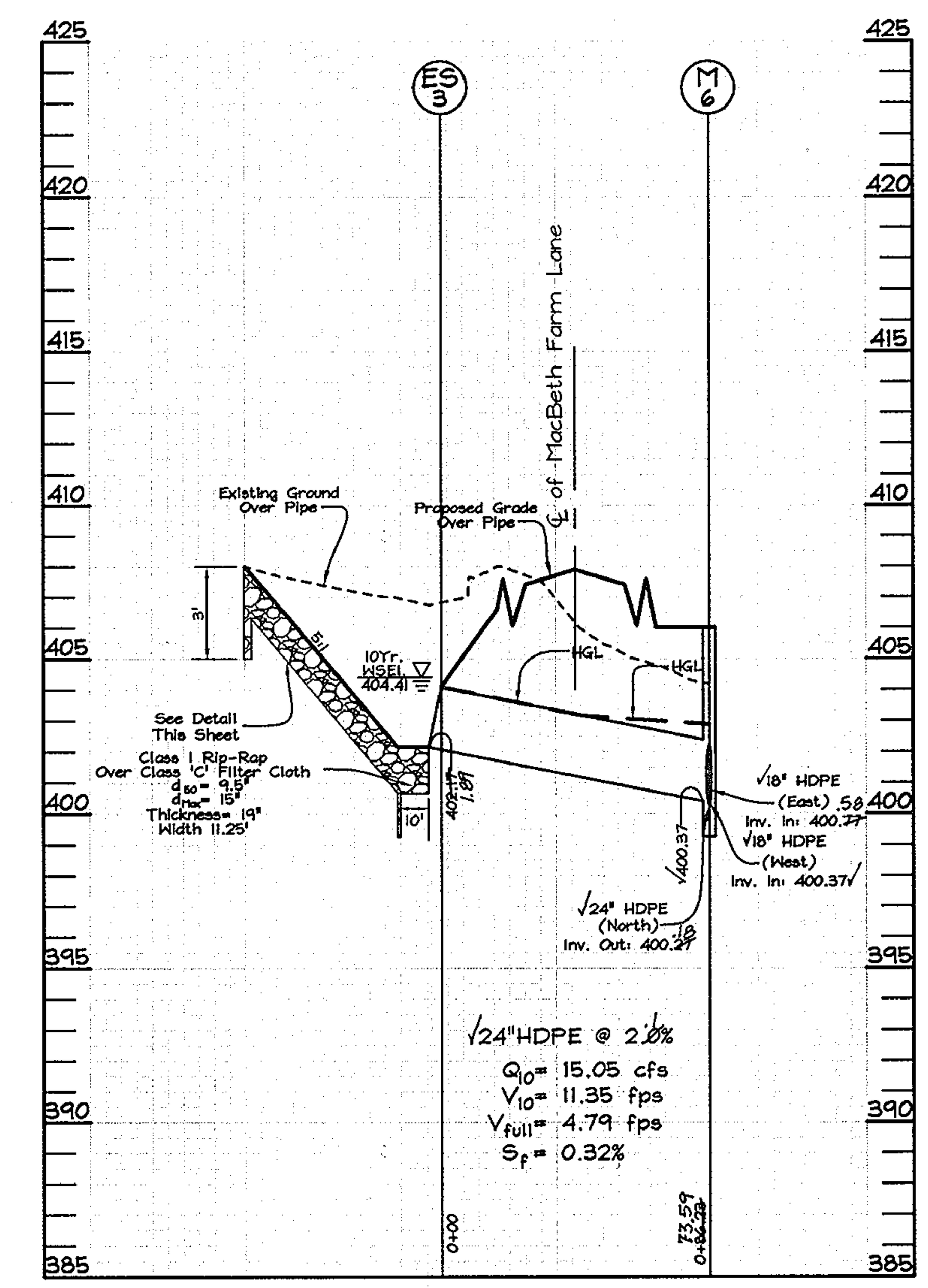
DESIGN BY:	PS
DRAWN BY:	MY
CHECKED BY:	ZYF
SCALE:	As Shown
DATE:	Aug. 31, 2006
W.O. No.:	3165
SHEET No.:	12 OF 23

F-06-101







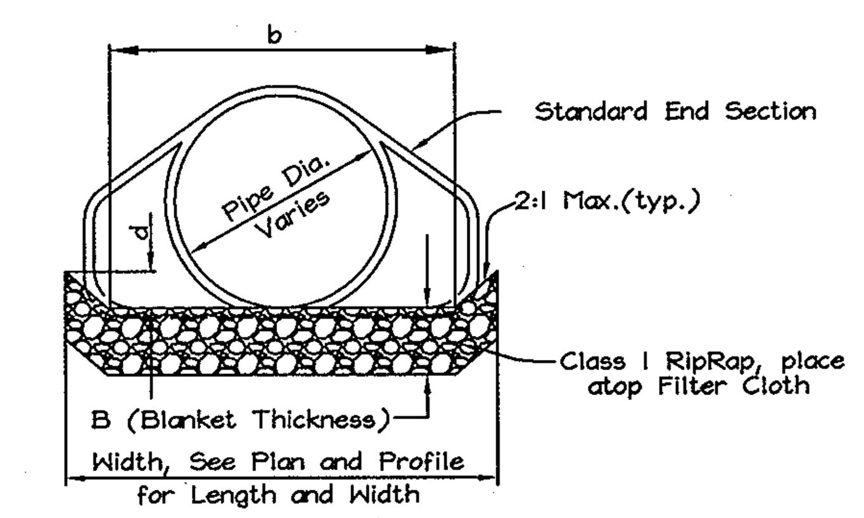


STORM DRAIN PROFILES

Scale: Horizontal- 1"=50'
Vertical-1"=5'

PIPE SCHEDULE

SIZE	TYPE	LENGTH
15"	HDPE	579 LF
18"	HDPE	1394 LF
24"	HDPE	272 LF
18"	RCP CLASS IV	77 LF
24"	RCP CLASS IV	965 LF



TYP. OUTFALL DETAIL

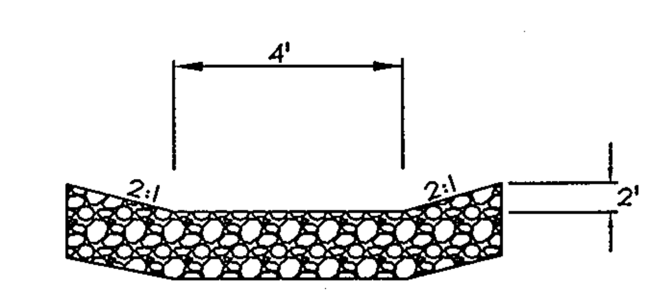
Not to Scale

Structure	Q(c.f.s.)	S	n	b	d	$d_{max.}$	d_{50}	B (Blanket Thickness)
ES-1	13.27 cfs	0.5%	0.06	5.6	1.06'	15"	9.5"	19"
ES-2	22.13 cfs	0.5%	0.06	5.6	1.4'	15"	9.5"	19"
ES-3	15.05 cfs	0.5%	0.06	5.6	1.12'	15"	9.5"	19"
ES-4	2.71 cfs	0.5%	0.06	4.0	0.56'	15"	9.5"	19"

AS-BUILT

STATE OF MARYLAND
CLYDE BROOKE MILLER
135
PROPERTY LINE SURVEYOR

[illegible] 1-15-2009
C. BROOKE MILLER DATE
PROP. L.S.#135



CLASS I RIP RAP OVER GEOTEXTILE CLASS 'C' 19" THICK
d_{cp} = 9.5" Q_{10}= 15.05 cfs DEPTH OF FLOW = 7"
d_{max} =19" V_{10}= 4.9 fps

ES- 3 RIP RAP IN FLOW PROTECTION DETAIL

Not to Scale

STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	REMARKS
I-1	Precast Open End Grate	℄ Kerne Court Sta. 7+67.50-17' left	✓422.11	15" 408.~~88~~ .42 24" 404.~~78~~ .47	404.~~68~~ .42	SD 4.36
I-2	Precast Open End Grate	℄ Kerne Court Sta. 7+67.50-17' right	422.~~11~~ .91	40~~5.05~~ 4.80	404.~~95~~ .66	SD 4.36
I-3	Precast Open End Grate	℄ Kerne Court Sta. 2+44.85-17' right	4~~03.04~~ 31.87	18" 426.~~74~~ .62 24" 407.~~87~~ .68	407.~~77~~ .43	SD 4.36
I-4	Precast Open End Grate	N 555,344.36 E 1,328,702.60	41~~8.60~~ 3.95	40~~9.12~~ 8.65	408.~~62~~ .33	SD 4.36
I-5	Precast Open End Grate	N 555,264.64 E 1,328,757.70	42~~1.00~~ 0.47	4~~10.01~~ 09.67	409.~~31~~ .57	SD 4.36
I-6	Precast Open End Grate	N 555,238.71 E 1,328,907.10	41~~8.00~~ 7.70	18" 413.53 15" 411.02 10.67	410.~~77~~ .53	SD 4.36
I-7	Precast Open End Grate	MacBeth Farm Lane L.P. Sta. 1+76.10-8' outside edge of pav.	424.~~81~~ .57	–	421.~~50~~ .27	SD 4.36
I-8	Precast Open End Grate	℄ Kerne Court Sta. 2+44.85-17' left	43~~3.04~~ 2.81	427.~~52~~ .28	427.~~42~~ .18	SD 4.36
I-9	Precast Open End Grate	℄ Kerne Court Sta. 0+55.00-17' left	436.~~24~~ .27	431.~~57~~ .39	431.~~32~~ .12	SD 4.36
I-10	Precast Open End Grate	℄ MacBeth Farm Lane Sta. 15+48.08-20' right	438.~~46~~ .12	–	43~~3.13~~ 2.92	SD 4.36
I-14	Precast Open End Grate	Kerne Court L.P. Sta. 1+28.47-8' outside edge of pav.	41~~5.28~~ 4.39	–	41~~1.17~~ 0.79	SD 4.36
I-15	Precast Open End Grate	N 555,284.73 E 1,328,915.09	✓414.00	–	41~~1.25~~ 0.98	SD 4.36
I-17	Precast Open End Grate	℄ MacBeth Farm Lane Sta. 5+74.52-20' left	415.~~57~~ .21	15" 40~~9.39~~ 8.91 18" 40~~9.14~~ 10.06	403.~~49~~ .86	SD 4.36
I-18	Precast Open End Grate	℄ MacBeth Farm Lane Sta. 9+74.52-20' left	44~~1.25~~ 0.77	434.~~99~~ .77	434.~~74~~ .27	SD 4.36
I-19	Precast Open End Grate	℄ MacBeth Farm Lane Sta. 9+74.52-20' right	441.~~25~~ .15	–	435.~~79~~ .65	SD 4.36
I-20	Precast Open End Grate	℄ MacBeth Farm Lane Sta. 5+74.52-20' right	415.~~57~~ .12	–	4~~10.19~~ 09.87	SD 4.36
I-21	Precast Open End Grate	℄ MacBeth Farm Lane Sta. 2+72.83-20' left	✓404.74	✓401.21	✓400.96	SD 4.36
I-22	Precast Open End Grate	℄ MacBeth Farm Lane Sta. 2+72.83-20' right	✓404.74	–	✓401.41	SD 4.36
I-23	Precast Open End Grate	N 555,975.77 E 1,327,565.26	409.~~23~~ .13	–	✓405.31	SD 4.36
I-24	10'-Wide-Throat Through Inlet	℄ MD RT. 108 Sta. 9+50.40-29.36' right	41~~2.19~~ 1.93*	**	**	MD 374.68
M-1	Standard Precast Manhole (4')	N 555,724.19 E 1,328,257.49	41~~5.00~~ 4.84	402.~~62~~ .44	402.~~52~~ .39	G 5.12
M-2	Standard Precast Manhole (4')	N 555,860.33 E 1,328,272.12	✓414.00	✓403.40	403.~~30~~ .13	G 5.12
M-3	Standard Precast Manhole (4')	℄ Kerne Court Sta. 4+58.79-11' right	✓435.39	406.~~69~~ .50	406.~~59~~ .40	G 5.12
M-4	Standard Precast Manhole (4')	N 555,333.01 E 1,328,769.33	✓418.02	409.~~58~~ .25	409.~~48~~ .15	G 5.12
M-5	Standard Precast Manhole (4')	MacBeth Farm Lane L.P. Sta. 0+39.49 @ R/W	427.~~70~~ .44	15" 419.~~51~~ .14	41~~9.26~~ 8.84	G 5.12
M-6	Standard Precast Manhole (4')	N 555,912.34 E 1,327,902.74	✓406.00 18	18" 400.37✓ 24" 400.37✓ 24" 400.~~77~~ .58	✓400.~~27~~ .18	G 5.12
ES-1	24" HDPE End Section	N 555,727.69 E 1,328,224.96	✓404.35	402.35	402.33	Hancor or equivalent
ES-2	24" HDPE End Section	N 555,923.08 E 1,327,914.18	✓402.11	✓400.10	✓400.07	Hancor or equivalent
ES-3	24" HDPE End Section	N 555,853.31 E 1,327,839.89	40~~2.11~~ 3.89	40~~2.17~~ 1.95	40~~2.11~~ 1.89	Hancor or equivalent
ES-4	18" Concrete End Section	N 556,051.27 E 1,327,580.06	✓405.99	✓404.49	✓404.46	5.52

NOTES:
1. Top elevations are to the top of concrete inlet for all inlets, and center top of manhole cover for precast manholes.
2. Top elevations for Type 'S' Inlet along curb and gutters are to the center, edge of grate at the flow line. Top elevations for Type 'S' Inlets in grass areas are to the center top of grate.
3. Top slope of structures to conform to slope of paving
4. The wall thickness design of inlets I-1, I-2, I-3, I-17 and M-3 shall be designed in conjunction with SHA MD-383.11 Design Detail and Howard County SD-4.36 and G 5.12.
5. For intets I-1, I-2, I-3, and M-3 provide landing pads per detail G5.15.
6. * Top elevation for I-24 is top of concrete at top of curb line.
**See MD 374.68 for Details
Use Slab Type II,
10' Trough Opening, 3.5' Wide.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[illegible] 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[illegible] 10-4-06
CHIEF, BUREAU OF HIGHWAYS DATE

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

STORM DRAIN PROFILES

MACBETH FARM

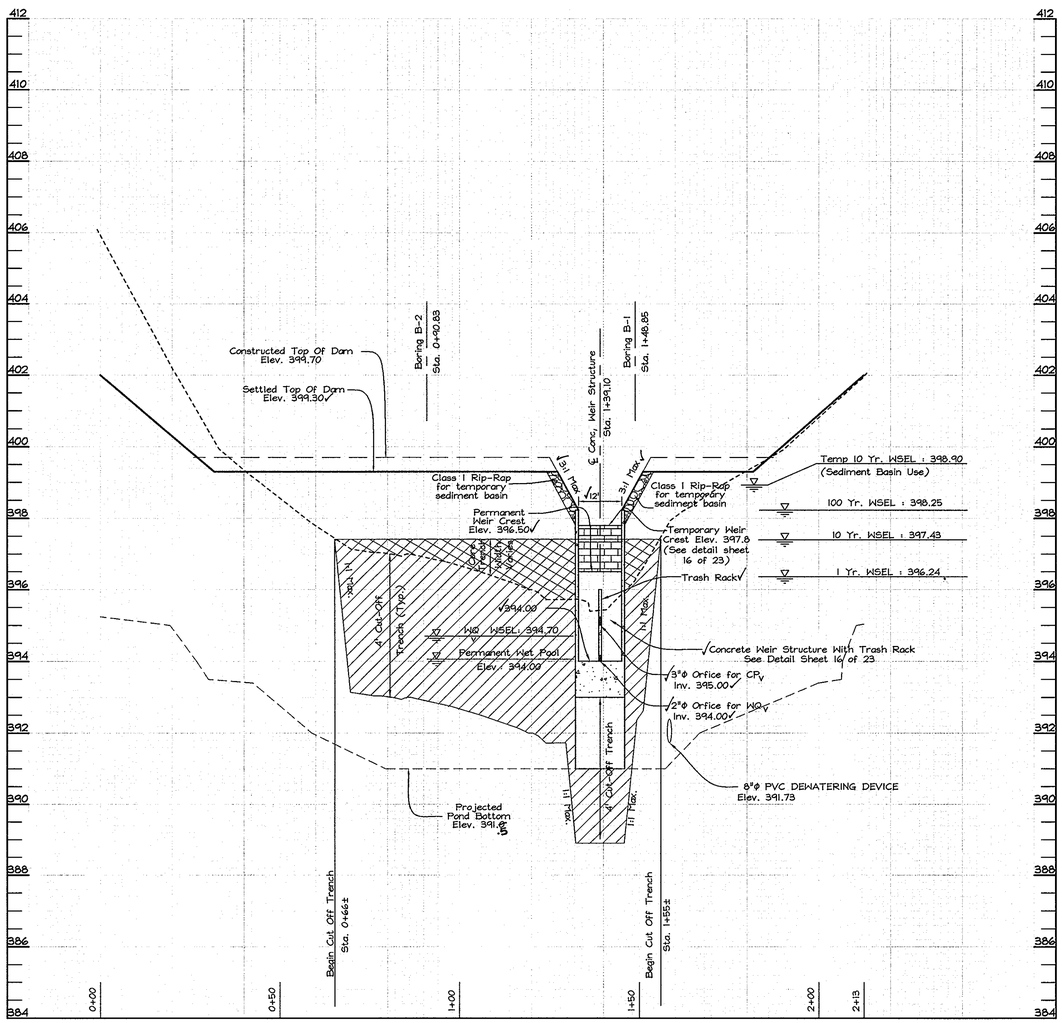
LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A',
NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

STATE OF MARYLAND
ZACHARIA YOSEF FISCH
22418
PROFESSIONAL ENGINEER
[illegible]

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

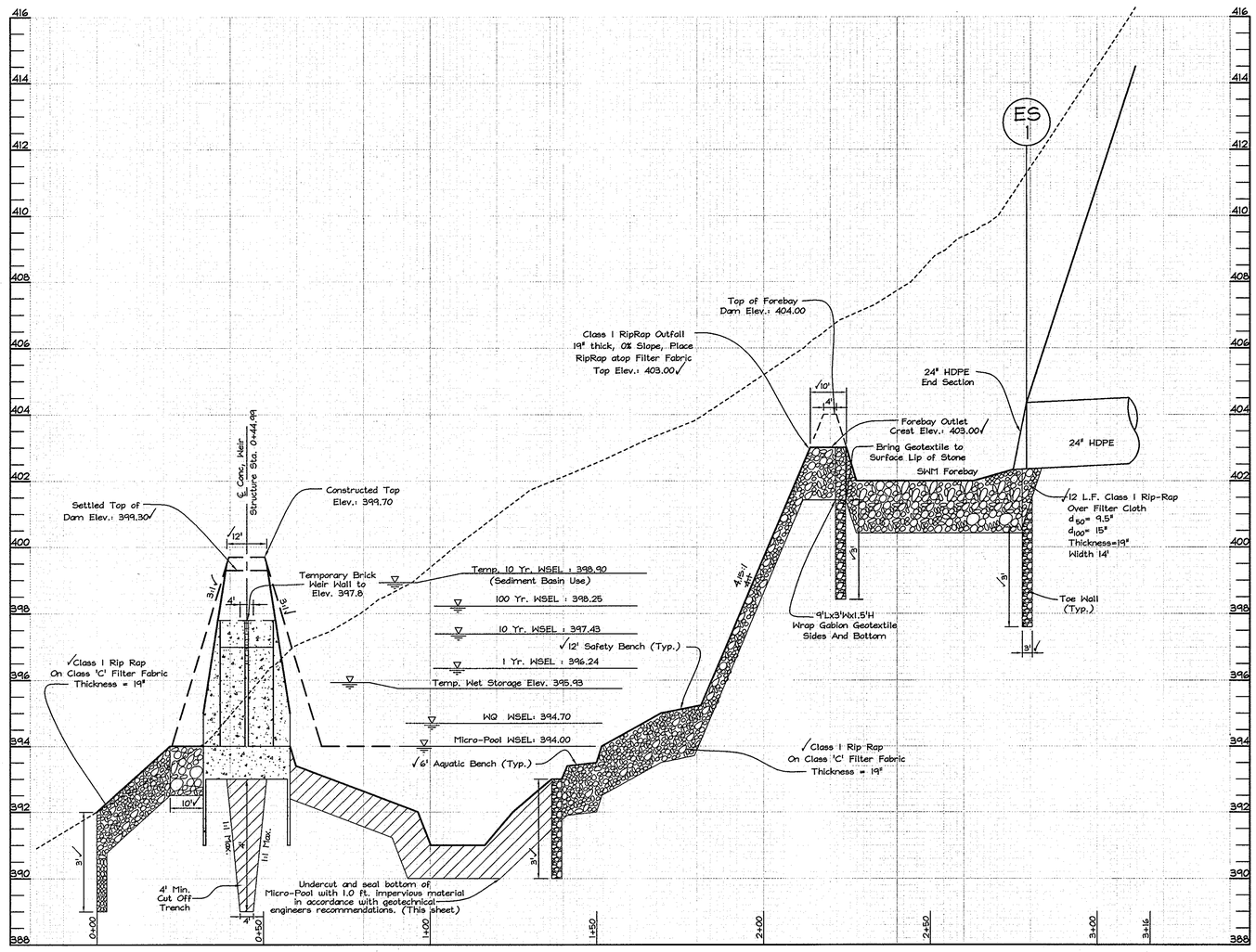
DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 13 OF 23

F-06-101



SWM POND
SECTION 'A'-'A' CL EMBANKMENT

Scale: Horizontal- 1"=20'
Vertical-1"=2'



SWM POND
SECTION 'B'-'B' CONCRET WEIR & FOREBAY 1

Scale: Horizontal- 1"=20'
Vertical-1"=2'

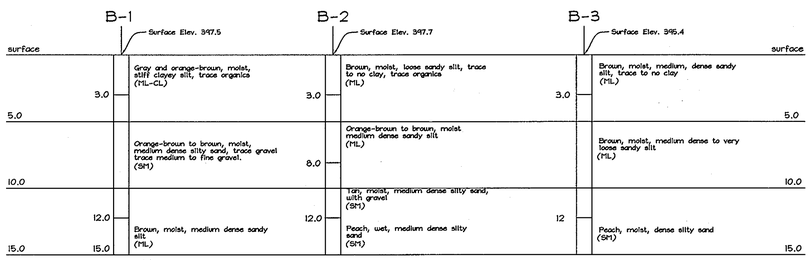
GEOTECHNICAL RECOMMENDATIONS

The area of the SWM pond facility should be stripped of topsoil and any other unsuitable materials from the embankment or structure areas in accordance with Soil Conservation Guidelines. After stripping operations have been completed, the exposed subgrade materials should be proofrolled with a loaded dump truck or similar equipment in the presence of a geotechincal engineer or his representative. For areas that are not accessible to a dump truck, the materials should be observed and tested by a geotechnical engineer or his representative utilizing a Dynamic Cone Penetrometer. Any excessively soft or loose materials identified by proofrolling or penetrometer test should be excavated to suitable firm soil, and then grades re-established by backfilling with suitable soil.

A representative of the Geotechnical Engineer should be present to monitor placement and compaction of fill for the embankment and cut- off trench. In accordance with NRCS-MD Code No. 378 Pond Standards/specifications, soils considered suitable for the center of embankment and cut-off trench shall conform to Unified Soil Classification GC, SC, CH, OR CL and must have at least 30% passing the #200 sieve.

It is our professional opinion that in addition to the soil materials described above a fine-grained soil, including Silt (ML) with a plasticity index of 10 or more can be utilized for the center of the embankment and core trench. All fill materials must be placed and compacted in accordance with NRCS-MD Code No.378 specifications.

If it is desired to maintain a water level within the micropool, then it may be desirable to provide a lining in the pond bottom. The liner should be a minimum of one foot thick, should extend up the sides of the pond to the elevation where the level is to be maintained and should be comprised of materials similar to those outlined above for cut-off trenches in accordance with NRCS-MD Code No.378 specifications



S.W.M. BORING PROFILES
NOT TO SCALE

AS-BUILT

STATE OF MARYLAND * ZACHARIA YOSSEF FISCH * 22418 * PROFESSIONAL ENGINEER

Zacharia Y. Fisch 1/15/09
ZACHARIA Y. FISCH PE#22418 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/11/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/10/06

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STORMWATER MANAGEMENT NOTES AND DETAILS

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

STATE OF MARYLAND * ZACHARIA YOSSEF FISCH * 22418 * PROFESSIONAL ENGINEER

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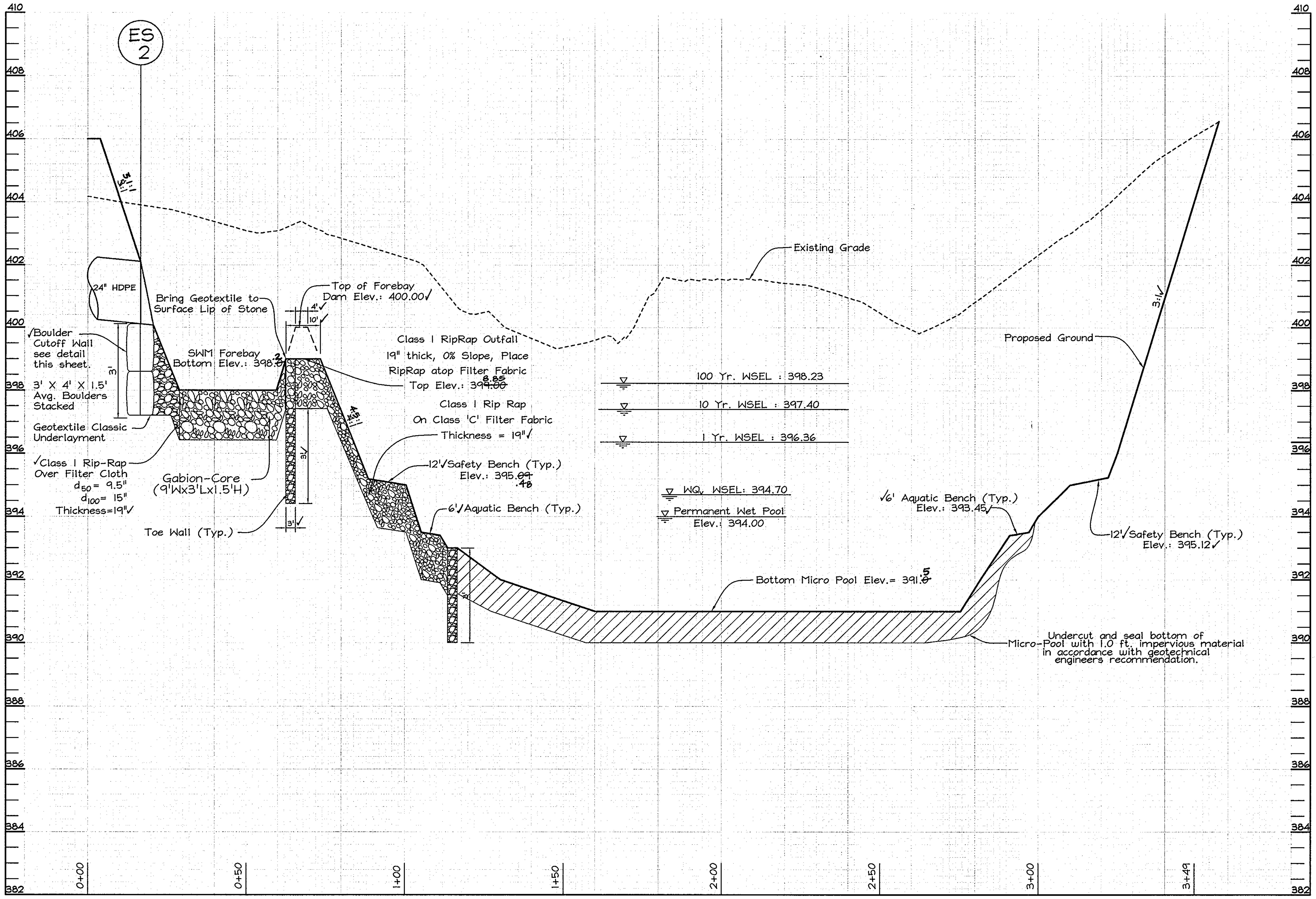
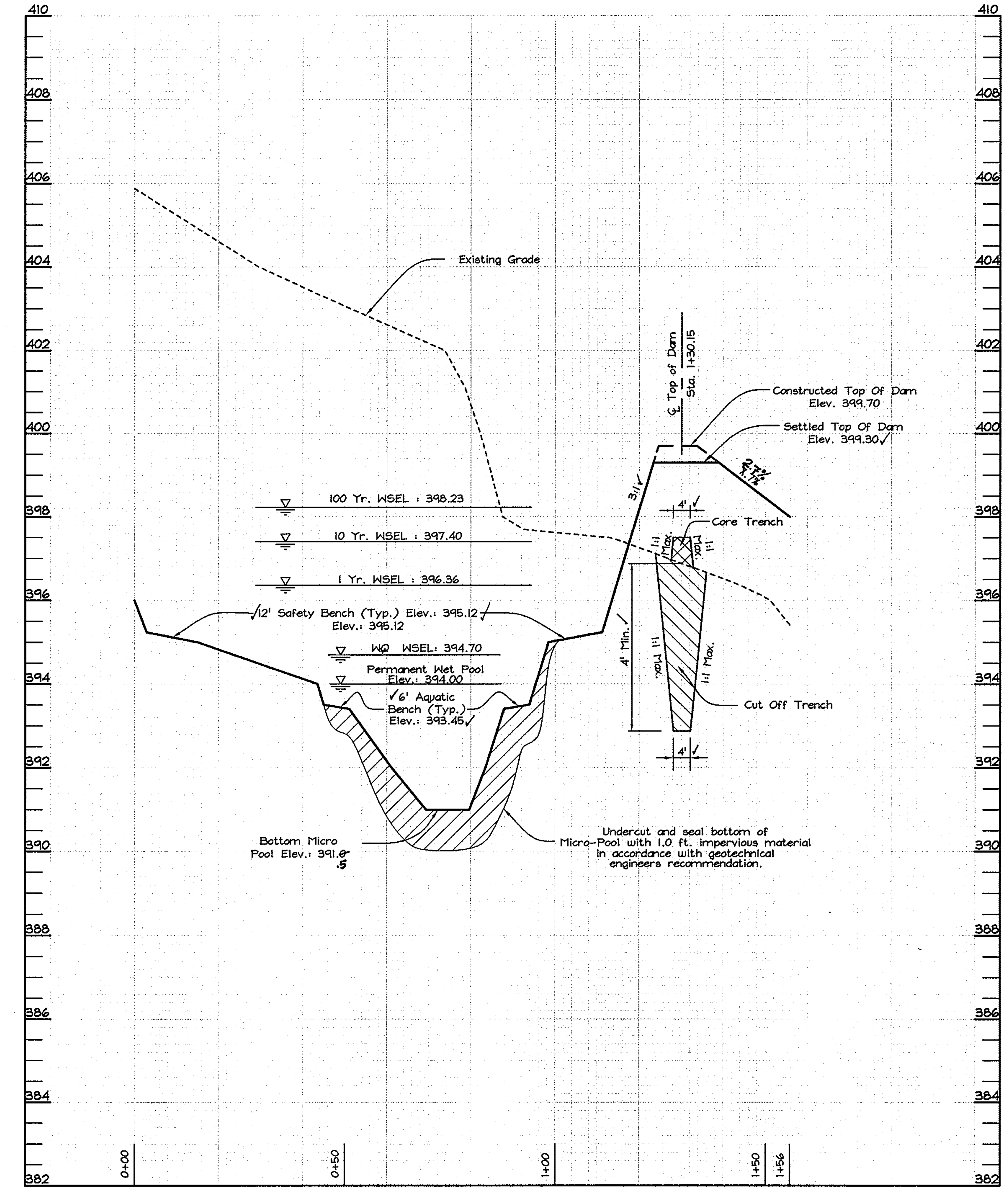
SHEET No.: 14 OF 23

F-06-101



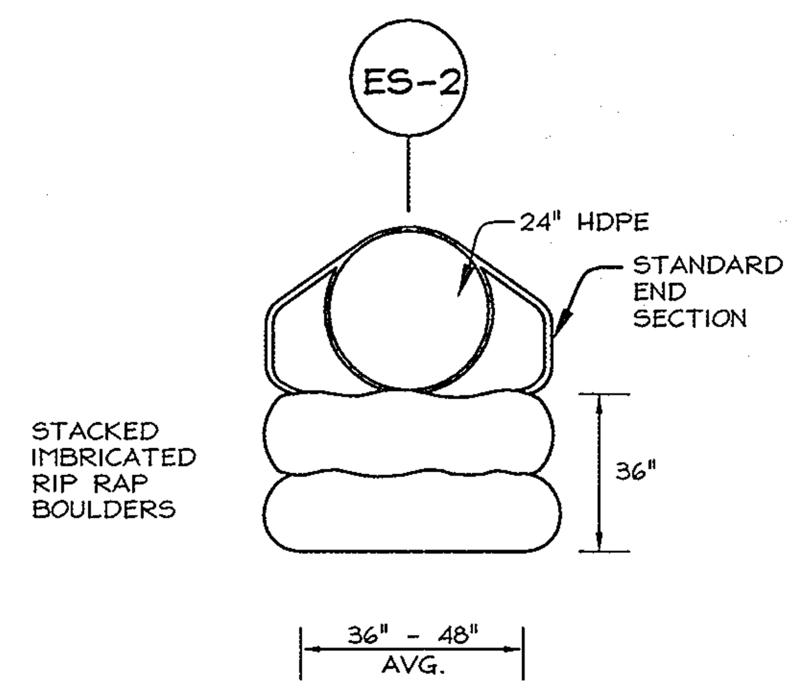
SWM POND
SECTION 'C'-'C' FOREBAY 2

Scale: Horizontal- 1"=20'
Vertical-1"=2'



SWM POND
SECTION 'D'-'D' EMBANKMENT CROSS SECTION

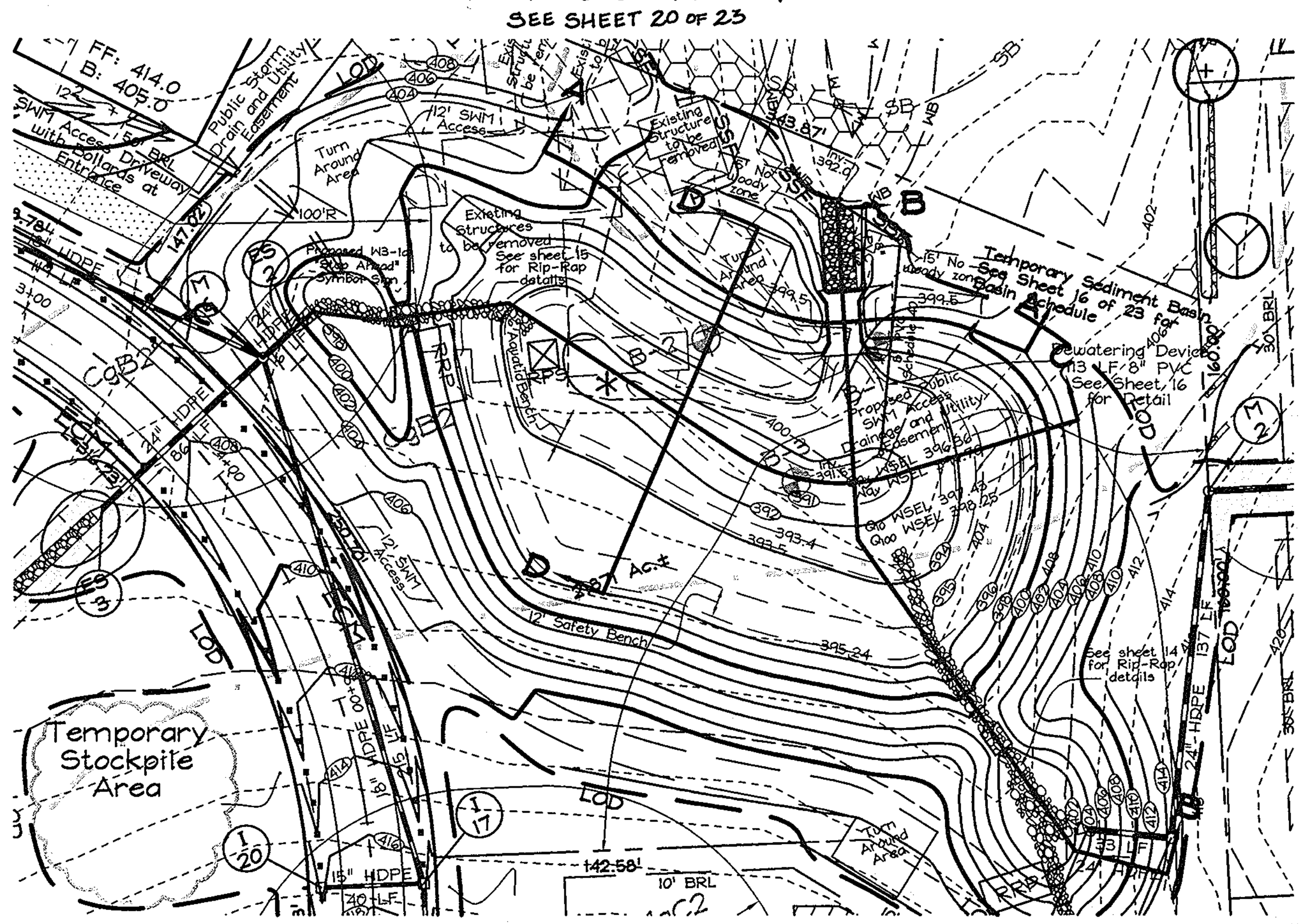
Scale: Horizontal- 1"=20'
Vertical-1"=2'



BOULDER FOUNDATION AND CUTOFF WALL

T.Y.P
NOT TO SCALE

AS-BUILT
POND ELEVATIONS *
SEE SHEET 20 OF 23



Scale: 1"=50'

AS-BUILT

ZACHARIA Y. FISCH 1/15/09
PE# 22418 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT JA — 10/11/06 DATE

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STORMWATER MANAGEMENT NOTES AND DETAILS

MACBETH FARM

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F-06-101

MARYLAND 378
STORMWATER MANAGEMENT FACILITY CONSTRUCTION SPECIFICATIONS
CONSTRUCTION SPECIFICATIONS (FOR SWM DETENTION FACILITY CS-1)

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

Site Preparation

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

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

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

Earth Fill

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

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

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

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

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

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

Structure Backfill

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

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

Pipe Conduits

All pipes shall be circular in cross section.

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

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

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

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

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

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

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

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

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

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

Reinforced Concrete PipeAll of the following criteria shall apply for reinforced concrete pipe:

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

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

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

4. Backfilling shall conform to "Structure Backfill".

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

Plastic PipeThe following criteria shall apply for plastic pipe:

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

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

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

4. Backfilling shall conform to "Structure Backfill".

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

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

Concrete

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

Rock Riprap

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

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

Care of Water during Construction

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

Stabilization

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

Erosion and Sediment Control

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

OPERATION AND MAINTENANCE SCHEDULE FOR STORMWATER MANAGEMENT DETENTION FACILITY

STORMWATER MANAGEMENT FACILITY
ROUTINE MAINTENANCE BY H.O.A.
1. FACILITY WILL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF IT IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
3. DEBRIS AND LITTER NEXT TO THE OUTLET STRUCTURE SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON-ROUTINE MAINTENANCE BY HOWARD COUNTY
1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, INTERFERE WITH THE FUNCTION OF THE RISER, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

Recharge Obligation (Total Site)
Rev Req'd: N/A*
Rea Req'd: 0.27 Ac
Rea Prov'd.: 0.27 Ac

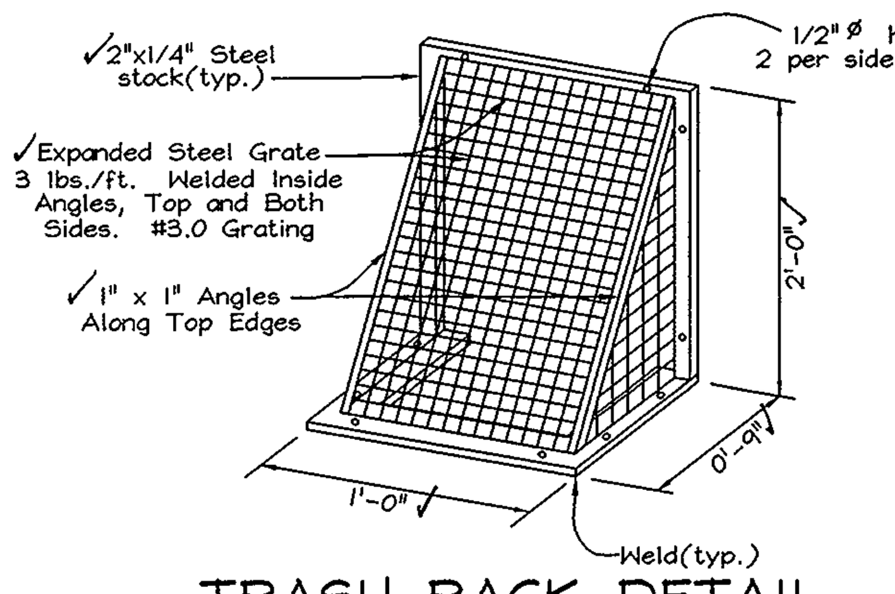
POND SUMMARY	1YEAR(CPv)	10 YEAR**	100 YEAR
Flow Into Pond	6.06 cfs	55.83 cfs	103.69 cfs
Flow Out of Pond	0.22 cfs	42.32 cfs	79.58 cfs
WS Elevation	396.24	397.43	398.25
Storage Volume	0.57 ac.ft		

WATER QUALITY FOR AREA TO POND**
WQv Req'd: 0.456 ac.ft
WQv Prov'd: 0.39 ac.ft(wet pool) 0.23 ac.ft(extended detention)
Total Provided: 0.62 ac.ft

* Recharge is met through the Percent Area Method.
** Assumes clogged Low Flow Orifices.

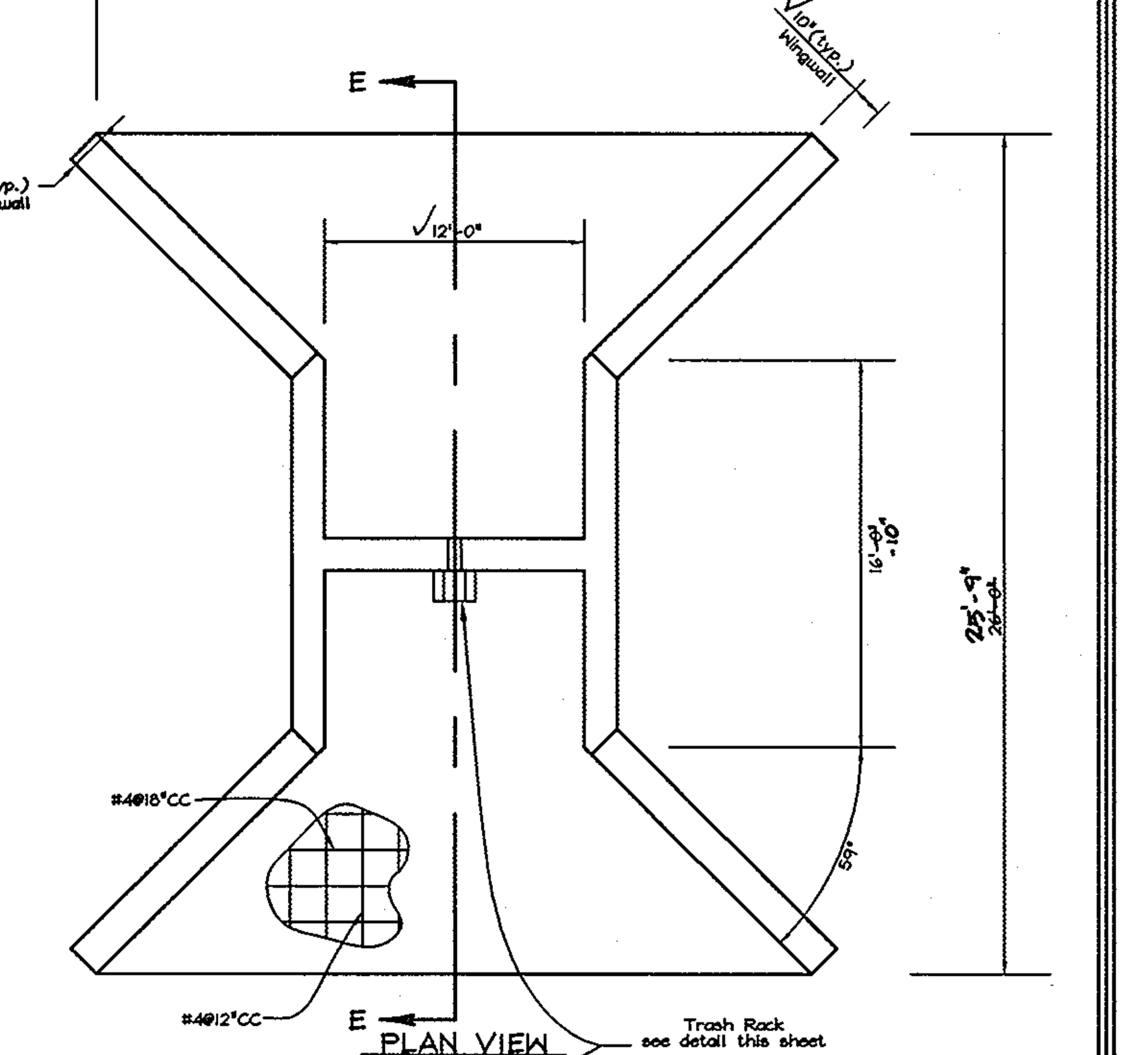
TEMPORARY SEDIMENT BASIN SCHEDULE

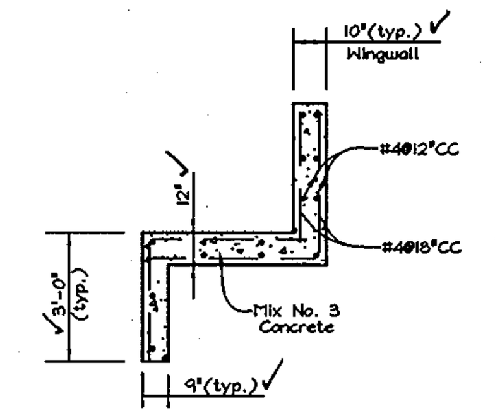
DRAINAGE AREA:27.81 OFC
WET STORAGE REQUIRED: 50,058 CU.FT.
WET STORAGE ELEVATION: 395.9 (SEDIMENT BASIN POOL)
DRY STORAGE REQUIRED: 50,058 CU.FT.
DRY STORAGE ELEVATION: 397.8
TEMP WEIR CREST ELEVATION: 397.8
10YR DESIGN HIGH WATER ELEVATION: 398.90
BOTTOM BASIN ELEVATION: 391.0
CLEANOUT ELEVATION: 394.5

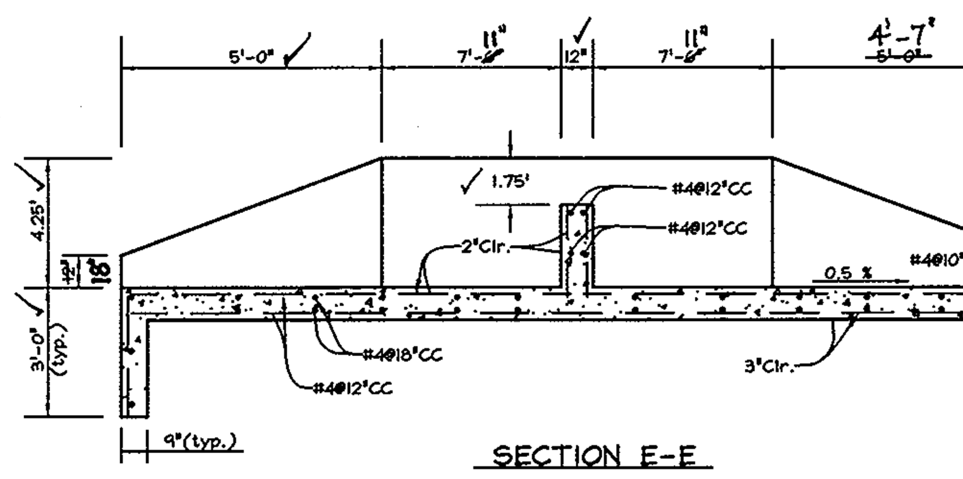


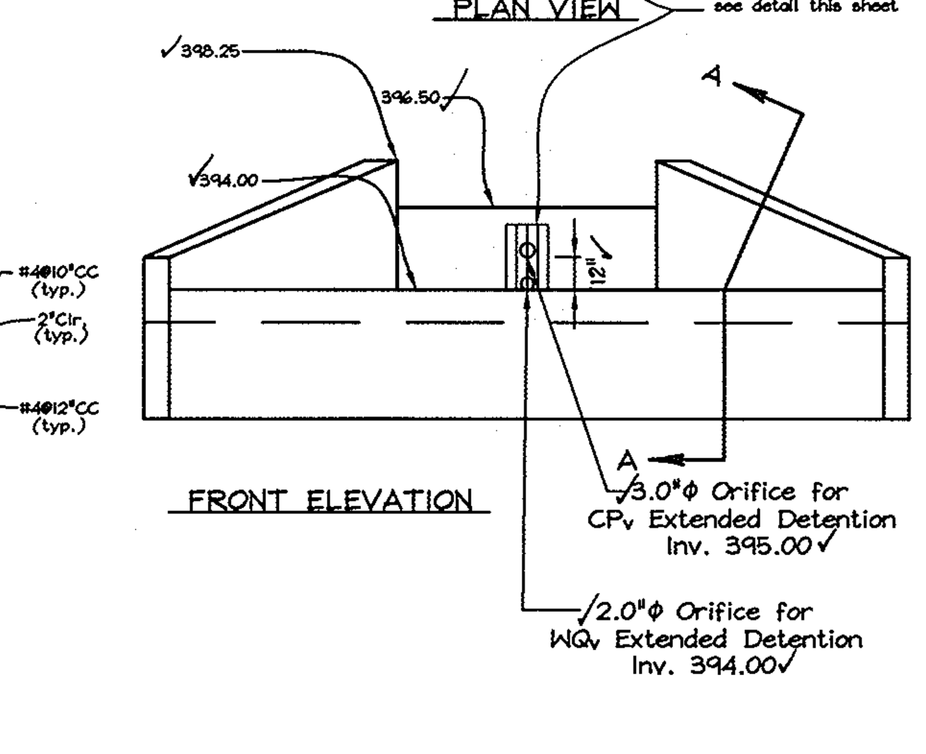
TRASH RACK DETAIL
NOT TO SCALE

NOTES:
1. Steel to conform to ASTM A-36.
2. All surfaces to be coated with ZRC cold galvanizing compound after welding.
3. Trash rack to be fastened to the concrete with 1/2" masonry anchors. Trash rack to be removeable.
4. Paint trash rack with Battleship Grey.









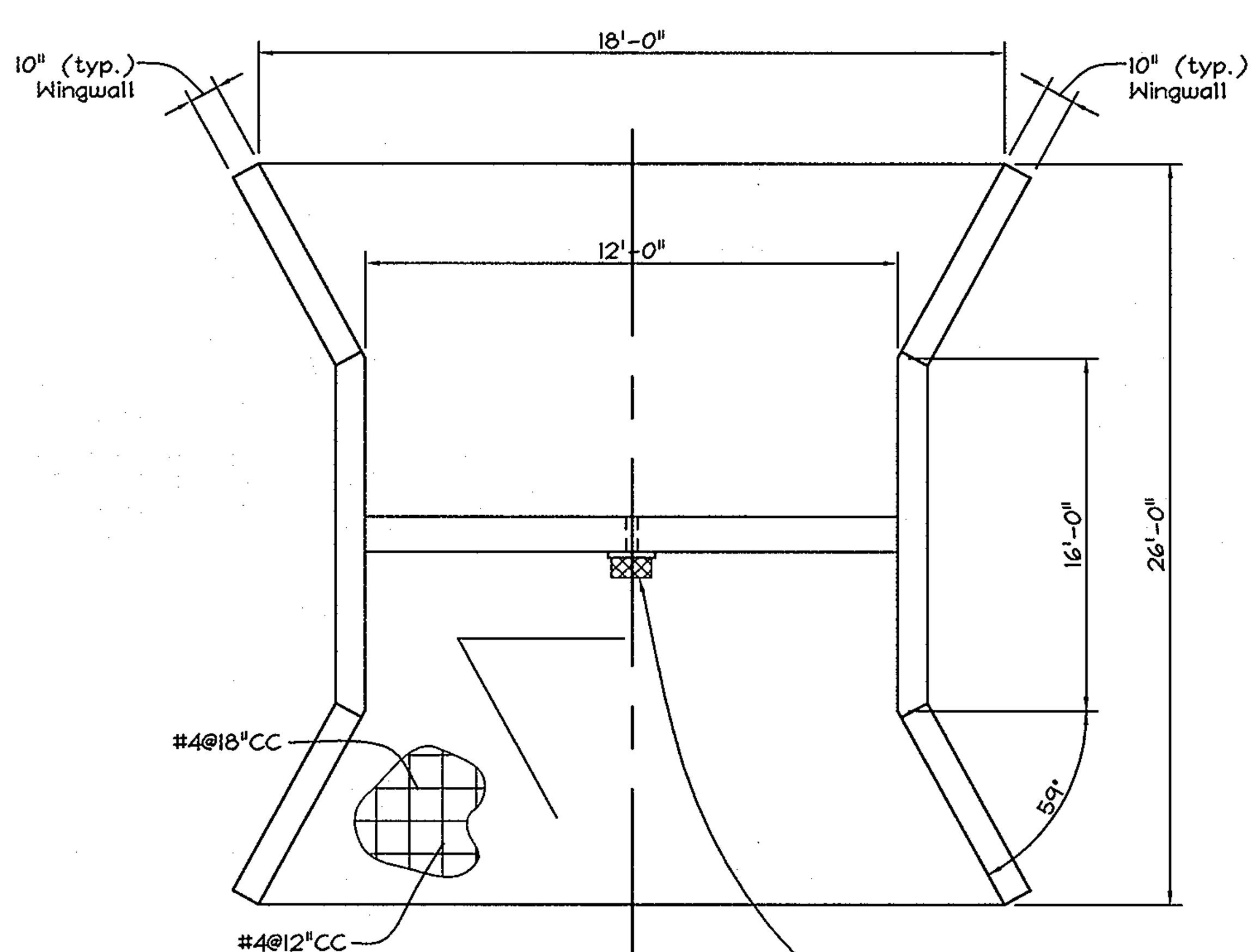
NOTES:
1. All exposed edges to have a 3/4"x3/4" chamfer or as directed.
2. Concrete shall be SHA mix #3(fc=3500 psi @ 28 days)
3. Reinforcing steel shall be ASTM A-615 grade 60.
4. See section thru weir structure details sheet 10 of 13 for all inverts and elevations of structures

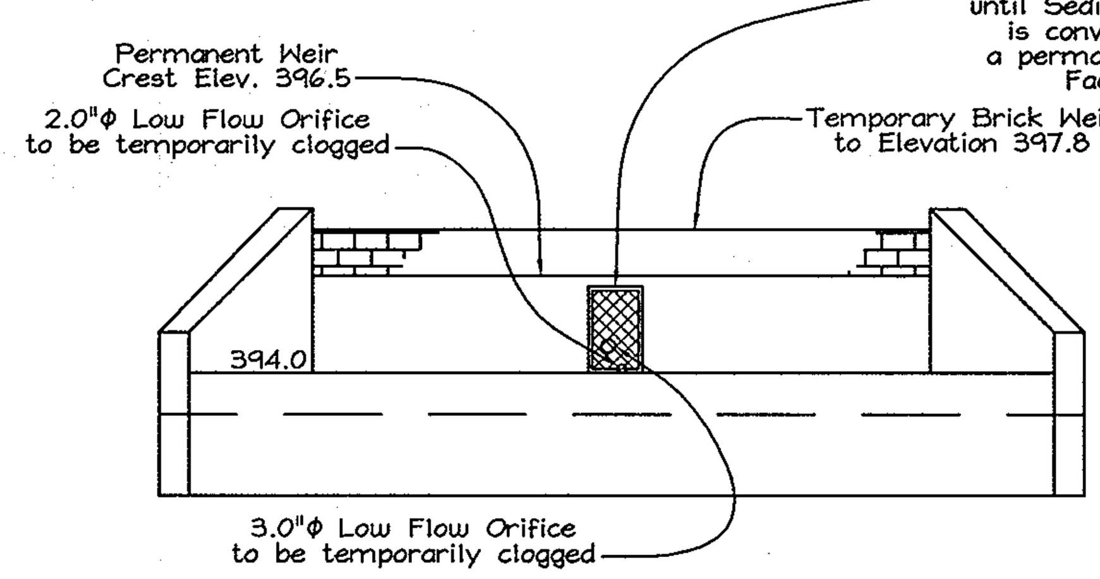
CS-1 CONCRETE WEIR CONTROL STRUCTURE
NOT TO SCALE

AS-BUILT

STATE OF MARYLAND ZACHARIA YOSEF FISCH 22418 PROFESSIONAL ENGINEER

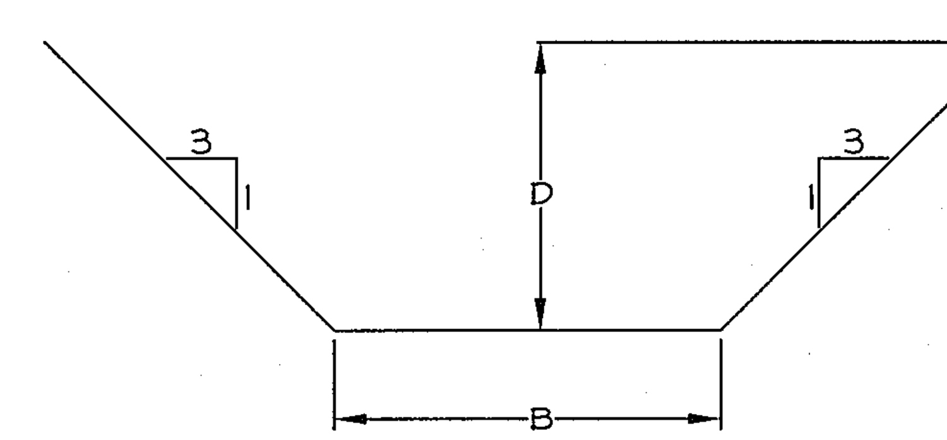
[illegible] 1/15/09
ZACHARIA Y. FISCH DATE
PE#22418





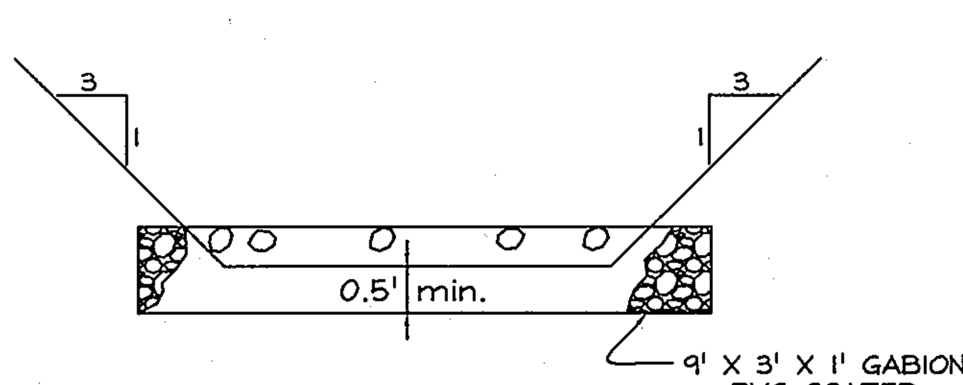
CS-1 CONCRETE WEIR CONTROL STRUCTURE MODIFICATIONS FOR SEDIMENT CONTROL
NOT TO SCALE

NOTE:
Contractor shall extend weir wall to elevation 397.8 with brick and mortor. Once site is stabilized, basin conversion will include removal of brick and mortor and restoration of permanent weir crest (396.5).



GRASS CHANNEL SECTION TYPICAL
Not to Scale

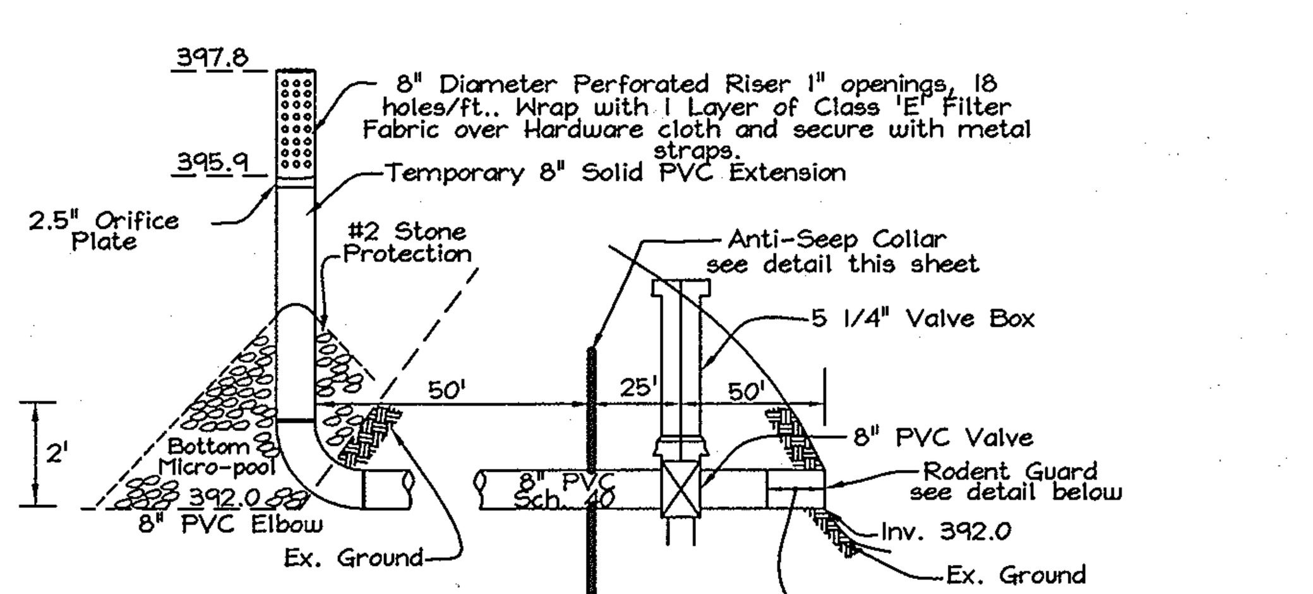
Location	B	D	Q_{10}	V_{10}	$V_{(WQ)}$	S
Lots 12, 13	4.0 ft	1.0 ft	8.4 cfs	2.6 fps	0.97 fps	1.5%
Lots 22, 23	4.0 ft	1.0 ft	2.7 cfs	2.0 fps	0.98 fps	2.0%



GABION CHECK DAM FOR GRASS CHANNELS TYPICAL
Not to Scale

1. Gabion baskets to be placed in channels where specified on drawings.
2. Set gabion basket 6 in. min. into bottom of grass channel.
3. Gabion baskets to be filled with dark grey colored gabion stone only.
4. All grass channels to be constructed by builder during house construction.

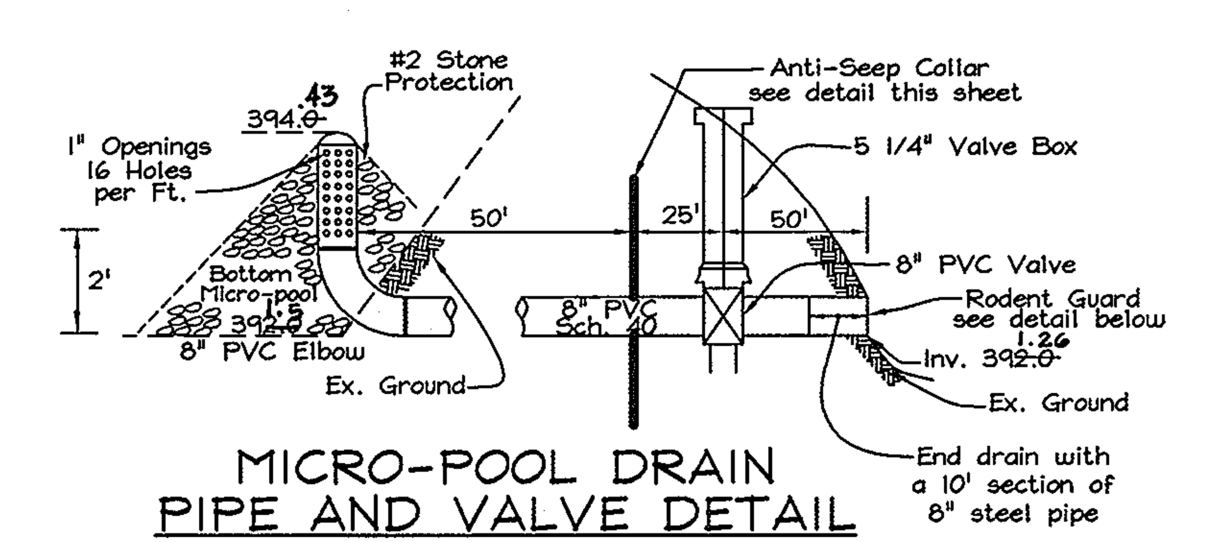
WATER QUALITY (WQv) GRASS CHANNELS



MICRO-POOL DRAIN PIPE AND VALVE DETAIL
MODIFICATION FOR SEDIMENT CONTROL
NOT TO SCALE

RODENT GUARD
4" Steel Pipe
1/2"Galvanized Bolt (10" Long) and Nut

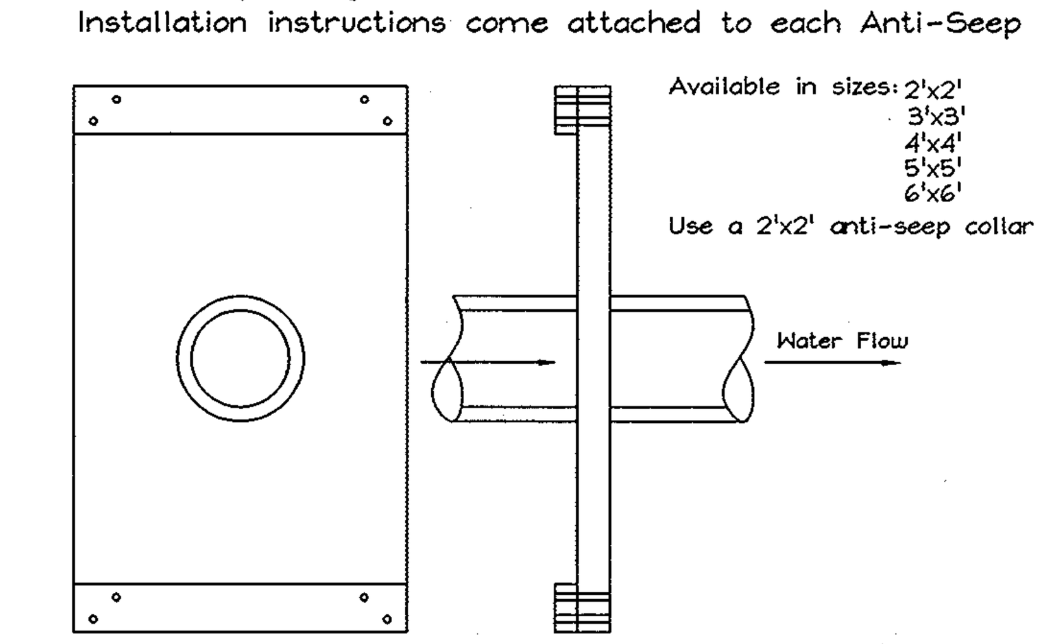
NOTE:
Once site is stabilized, contractor to remove temporary 8" solid PVC extension and install permanent device per detail this sheet.



MICRO-POOL DRAIN PIPE AND VALVE DETAIL
NOT TO SCALE

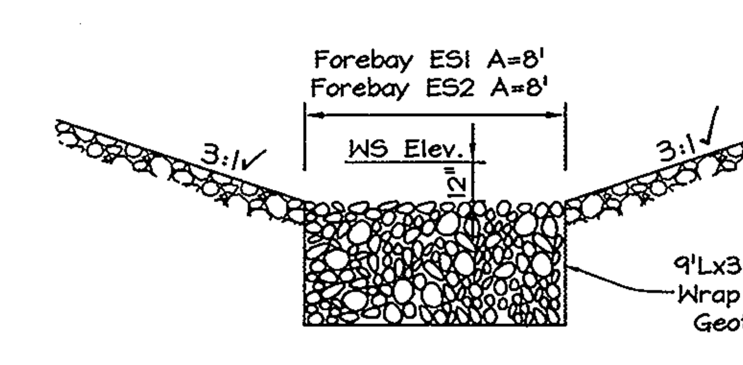
RODENT GUARD
8" Steel Pipe
1/2"Galvanized Bolt (10" Long) and Nut

Anti- Seep Flanges- 1/16" Gum Rubber With Wood Frame
Installation instructions come attached to each Anti-Seep



Directions for Using The Anti-Seep Collar
1. Unroll the Anti-Seep and attach the boards to the edges to form a square. (Use the boards and nails provided.) (4'x4' & Larger)
2. Cut a round hole in the center of the rubber that is smaller than the pipe size (approx. 33% smaller). This will allow the rubber to stretch over the pipe. This should provide a nearly waterproof seal between the pipe and the Anti-Seep.
3. Slip the pipe through the Anti-Seep, inspect the seal between the pipe and the Anti-Seep, carefully backfill and compact with suitable soil.

ANTI- SEEP COLLAR
NOT TO SCALE



TYPICAL SECTION THROUGH FORBAY SPILLWAY
SCALE: NOT TO SCALE

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[illegible] 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JK DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[illegible] 10-4-06
CHIEF, BUREAU OF HIGHWAYS DATE

STORMWATER MANAGEMENT PLAN

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A',
NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

STATE OF MARYLAND ZACHARIA YOSEF FISCH 22418 PROFESSIONAL ENGINEER
[illegible]

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 16 OF 23

F-06-101

LANDSCAPE PLAN, NOTES AND DETAILS

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'

Tax Map 34 Grids 18 & 24 — Parcel 90

4th Election District — Howard County, Maryland

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[illegible] 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[illegible] 10-4-06
CHIEF, BUREAU OF HIGHWAYS — DATE

DEVELOPER'S BUILDER'S CERTIFICATE

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

[illegible] 8/31/06
SIGNATURE OF DEVELOPER — DATE

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

STATE OF MARYLAND
ZACHARIA YOSEF FISCH
22418
PROFESSIONAL ENGINEER
[illegible]

FSH Associates
Engineers Planners Surveyors
6339 Howard Lane Elkridge, MD 21075
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY:	PS
DRAWN BY:	MY
CHECKED BY:	ZYF
SCALE:	1"=60'
DATE:	Aug. 31, 2006
W.O. No.:	3165
SHEET No.:	17 OF 23

F-06-101

LEGEND

- Existing Contour
- Proposed Contour
- Existing Spot Elevation
- Proposed Spot Elevation
- Existing Trees to Remain
- Light Poles
- Landscape Perimeter — PERIMETER ONE
- Red Maple
- London Planetree
- Willow Oak
- Red Oak
- American Linden
- Eastern Arborvitae
- Loblolly Pine

AS-BUILT

* FOR POND ELEVATIONS SEE SHEET 20 OF 23

DEVELOPER'S BUILDER'S CERTIFICATE

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[signature] 8/31/06
SIGNATURE OF DEVELOPER — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[signature] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[signature] 10-4-06
CHIEF, BUREAU OF HIGHWAYS — DATE

STATE OF MARYLAND — ZACHARIA YOSEF FISCH — 22418 — PROFESSIONAL ENGINEER

[signature] 1/15/09
ZACHARIA Y. FISCH
P.E. #22418 — DATE

OWNER
THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER
CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

LANDSCAPE PLAN, NOTES AND DETAILS

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 — Parcel 90
4th Election District — Howard County, Maryland

STATE OF MARYLAND — ZACHARIA YOSEF FISCH — 22418 — PROFESSIONAL ENGINEER

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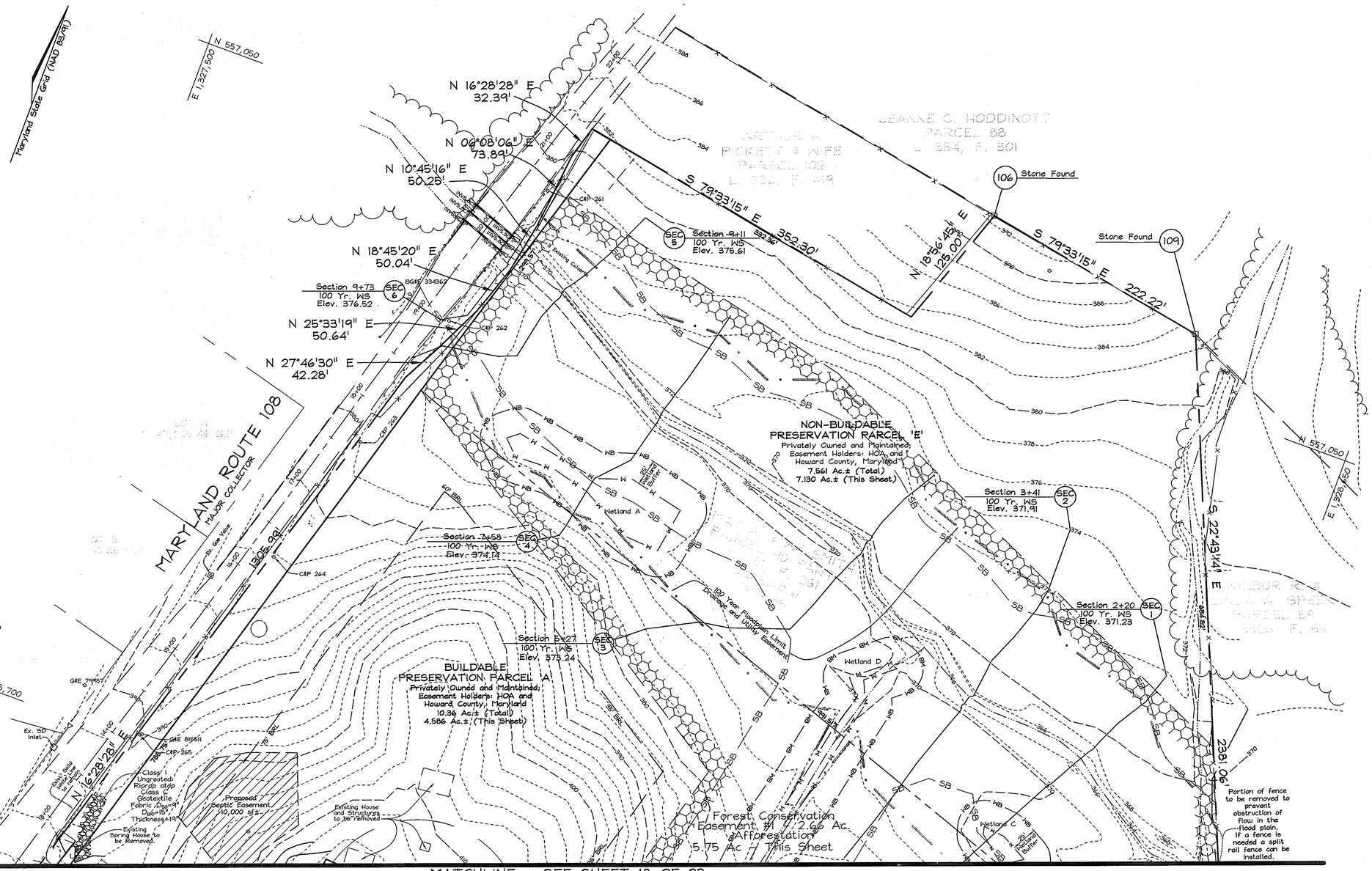
DESIGN BY:	PS
DRAWN BY:	MY
CHECKED BY:	ZYF
SCALE:	1"=50'
DATE:	Aug. 31, 2006
W.O. No.:	3165
SHEET No.:	18 OF 23



LEGEND

- Existing Contour — 382
- Proposed Contour — 382
- Existing Spot Elevation — 382.5
- Proposed Spot Elevation — +82.53
- Existing Trees to Remain
- Light Poles
- Landscape Perimeter — PERIMETER ONE
- Red Maple
- London Planetree
- Willow Oak
- Red Oak
- American Linden
- Eastern Arborvitae
- Loblolly Pine

STREET TREE SCHEDULE

STREET NAME	LF REQUIRED	TREES REQUIRED	PROVIDED
ROAD 'A'	4,014'	101	101
ROAD 'B'	2,008'	50	50

STREET TREE LANDSCAPE SCHEDULE

QUAN.	BOTANICAL NAME	SIZE	NOTE
91	Acer rubrum, Shade Trees 'October Glory Red Maple'	2 1/2"-3" Cal.	B & B
39	Platanus x acerifolia, Shade Trees 'Bloodgood' 'London Plane'	2 1/2"-3" Cal.	B & B
64	Quercus phellos Willow Oak	2 1/2"-3" Cal.	B & B
81	Quercus rubra Red Oak	2 1/2"-3" Cal.	B & B
73	Tilia americana 'Redmond' 'Redmond' American Linden	2 1/2"-3" Cal.	B & B
24	Pinus taeda Loblolly Pine	6'-8'	B & B
46	Thuja occidentalis 'Techny' 'Techny' Eastern Arborvitae	6'-8'	B & B

See legend for plant symbology

SCHEDULE D : STORMWATER MANAGEMENT AREA LANDSCAPING

Linear Feet of Perimeter	1,919LF
Credit for Existing Vegetation (No, Yes and Linear Feet)	No
Credit for other Landscaping (No, Yes and %)	No
Number of Trees Required Shade Trees (1:50) Evergreen Trees (1:40)	 38 Shade Trees 48 Evergreen Trees
Number of Plants Provided Shade Trees Evergreen Trees Other Trees (2:1 Substitution)	 38 Shade Trees 48 Evergreen Trees

MATCHLINE - SEE SHEET 18 OF 23

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS			ADJACENT TO PERIMETER PROPERTIES								
	1 B	11 B	12 B	2 A	3 A	4 A	5 A	6 A	7 A	8 A	9 A	10 A
Perimeter/Frontage Designation												
Landscape Type												
Linear Feet of Roadway Frontage/Perimeter	225'	422'	184'	456'	957'	2132'	100'	1198'	845'	465'	2071'	759'
Credit for Existing Vegetation (Yes, No, Linear Feet)	No	No	No	No	No	No	No	No	No	No	Yes 530' (Pond)* 1541'	Yes 167' (Pond)* 592'
Remaining Perimeter Length												
Credit for Wall, Fence or Berm (Yes, No, Linear Feet)	No	No	No	No	No	No	No	No	No	No	No	No
Remaining Perimeter Length												
Number of Plants Required												
Shade Trees	1:50 5	1:50 9	1:50 4	1:60 8	1:60 16	1:60 36	1:60 2	1:60 20	1:60 15	1:60 8	1:60 26	1:60 10
Evergreen Trees	1:40 6	1:40 11	1:40 5	-	-	-	-	-	-	-	-	-
Shrubs	-	-	-	-	-	-	-	-	-	-	-	-
Number of Plants Provided												
Shade Trees	5	9	4	8	16	36	2	20	15	8	26	10
Evergreen Trees	6	11	5	-	-	-	-	-	-	-	-	-
Other Trees (2:1 Substitution)	-	-	-	-	-	-	-	-	-	-	-	-
Shrubs (10:1 Substitution)	-	-	-	-	-	-	-	-	-	-	-	-
(Describe Plant Substitution Credits Below if needed)												

* Credit taken form Stormwater Management Pond Planting.

LANDSCAPE NOTES

1. At the time of installment, all shrubs and other plantings herewith listed and approved for this site, shall be of the proper height requirements in accordance with the Howard County Landscaping Manual. In addition, no substitutions or relocation of required plantings may be made without prior review and approval from the Department of Planning and Zoning. Any deviation from this approved Landscape Plan may result in denial or delay in the release of landscape surety until such time as all required materials are planted and/or revisions are made to applicable plans and certificates.
2. The owner, tenant, and/or their agents shall be responsible for maintenance of the required landscaping, including both plant materials and berms, fences and walls. All plant materials shall be maintained in good growing condition, and when necessary, replaced with new materials to ensure continued compliance with applicable regulations. All other required landscaping shall be permanently maintained in good condition, and when necessary, repaired or replaced.
3. Financial surety for the required landscaping will be posted as part of the Developer's Agreement in the amount of $69,600 (197 shade trees @ $300.00 each, and 70 Evergreen Trees @ $150.00 each).

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/11/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/10/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 10-4-06

DEVELOPER'S BUILDER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE 8/31/06

OWNER

THE ESTATE OF ELIZABETH SMITH
c/o Charles Slade, Personal Representative
10450 Shaker Drive, Suite 112
Columbia, Maryland 21046

DEVELOPER

CLARKSVILLE OVERLOOK, LLC
5300 Dorsey Hall Drive
Suite 200A
Ellicott City, Maryland 21042

LANDSCAPE PLAN, NOTES AND DETAILS

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 — Parcel 90
4th Election District — Howard County, Maryland

STATE OF MARYLAND * VICTORIA YOSEF FISCH * 22418 * PROFESSIONAL ENGINEER

FSH Associates
Engineers Planners Surveyors
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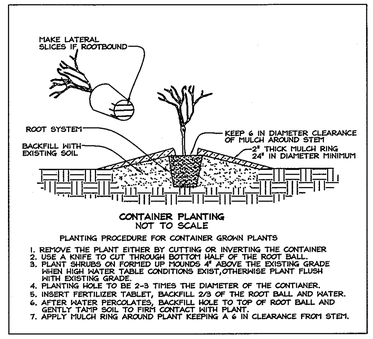
Tel:410-567-5200 Fax: 410-796-1562
E-mail: info@fsheri.com

DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: 1"=50'
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 19 OF 23

F-06-101

SWM POND PLANTING PLAN

SCALE: Hor.: 1"=30'



CONTAINER PLANTING
NOT TO SCALE

PLANTING PROCEDURE FOR CONTAINER GROWN PLANTS

1. REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER
2. USE A KNIFE TO CUT THROUGH BOTTOM HALF OF THE ROOT BALL.
3. PLANT SHRUBS ON FORMED UP MOUNDS 4" ABOVE THE EXISTING GRADE WHEN HIGH WATER TABLE CONDITIONS EXIST, OTHERWISE PLANT FLUSH WITH EXISTING GRADE
4. PLANTING HOLE TO BE 2-3 TIMES THE DIAMETER OF THE CONTAINER.
5. INSERT FERTILIZER TABLET, BACKFILL 2/3 OF THE ROOT BALL AND WATER.
6. AFTER WATER PERCOLATES, BACKFILL HOLE TO TOP OF ROOT BALL AND GENTLY TAMP SOIL TO FIRM CONTACT WITH PLANT.
7. APPLY MULCH RING AROUND PLANT KEEPING A 6 IN CLEARANCE FROM STEM.

EMERGENT PLANTING
(1200 S.F.) (100 PLANTINGS, 24" O.C. WITHIN 4 - 6'± 20-40'± PLOTS)

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR	PLANTING STOCK	QUANTITY
Swamp Milkweed	Asclepias incarnata	OBL	Bare root	25
Marsh Hibiscus	Hibiscus moscheutos	OBL	Bare root	25
Cardinal Flower	Lobelia cardinalis	FACW+	Bare root	25
Lizard Tail	Saururus cernuus	OBL	Bare root	25

EMERGENT PLANTING NARRATIVE
Vegetation establishment is expected though natural plant propagation and will be enhanced by supplemental planting around the pond area. Supplemental planting in 6' wide plots of varying length (20'-40', see plan).
Plant installation may be delayed one year after grading to allow the graded area to settle and hydrology to stabilize.

SWM Planting Notes

Within Facility - elev. 394.0 to edge of driveway and as shown - 50,025.4 s.f. To be planted with Red Top (Agrostis alba) at 5 lbs / 1000 s.f. to the edge of the access drive.

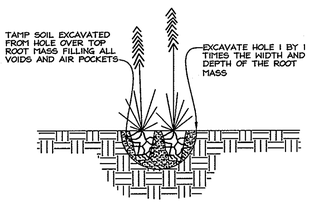
Emergent Planting Area

SWM POND WOODY PLANT SCHEDULE

KEY	SYMBOL	QUAN.	BOTANICAL NAME	SIZE	NOTE
CA		12	Clethra alnifolia Sweet Pepperbush	3'-4' Ht.	Cont.
CO		12	Cornus ammomum Silky Dogwood	3'-4' Ht.	Cont.
IG		12	Ilex glabra Inkberry	3'-4' Ht.	Cont.
VP		12	Viburnum prunifolium Blackhaw	3'-4' Ht.	Cont.

Remaining area around the stormwater management facility will be stabilized as per the permanent seeding notes, Sheet 8 of 23, and vegetated as per the landscape buffer requirements; see sheets 17-19 of 23.

Entire area to be prepared as per the permanent seeding notes.



EMERGENT PLANTING
NOT TO SCALE

EMERGENT PLANTING SPECIFICATIONS

1) Rooted herbaceous plants may be locally harvested and planted immediately following harvest.
2) If not planted immediately after delivery to the job site, plants must be protected from direct exposure to the sun and roots must be kept moist at all times.
3) All plants shall contain new roots, white in color.
4) All plants must appear healthy, with no leaf spots, damage, wilting or evidence of insects or disease.
5) Planting operations must be followed immediately by installation of wire barriers.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/11/06

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/10/06

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 10-4-06

AS-BUILT

STATE OF MARYLAND · ZACHARIA YOSEF FISCH · 22418 · PROFESSIONAL ENGINEER

Zacharia Y. Fisch 1/15/09

ZACHARIA Y FISCH — DATE

PE#22418

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STORMWATER MANAGEMENT NOTES AND DETAILS

MACBETH FARM

LOTS 1 THRU 35, BUILDABLE PRESERVATION PARCEL 'A', NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
Tax Map 34 Grids 18 & 24 Parcel 90
4th Election District Howard County, Maryland

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DESIGN BY: PS
DRAWN BY: MY
CHECKED BY: ZYF
SCALE: As Shown
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 20 OF 23

F-06-101

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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8318 FORREST STREET
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EMAIL: EXPLORATIONRES@CS.COM

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STATE OF MARYLAND STEPHEN L. HUBER No. 363 REGISTERED PROFESSIONAL FORESTER

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FOREST CONSERVATION PLAN

MACBETH FARM

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NON-BUILDABLE PRESERVATION PARCELS 'B', 'C', 'D', 'E', 'F'
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SCALE: 1"=60'
DATE: Aug. 31, 2006
W.O. No.: 3165
SHEET No.: 21 OF 23

F-06-101

MATCHLINE - SEE SHEET 23 OF 23

FOR AsBUILT * POND ELEVATIONS SEE SHEET 20 OF 23

LEGEND

Existing Contour	382
Proposed Contour	82
Spot Elevation	+82.53
Direction of Flow	
Tree Protection Fence	
Existing Trees to Remain	
Limit of Disturbance	LOD
Forest Conservation Easement	
Forest Conservation Signage	△

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Zacharia Y Fisch 1/15/09
ZACHARIA Y. FISCH DATE
PE # 22418

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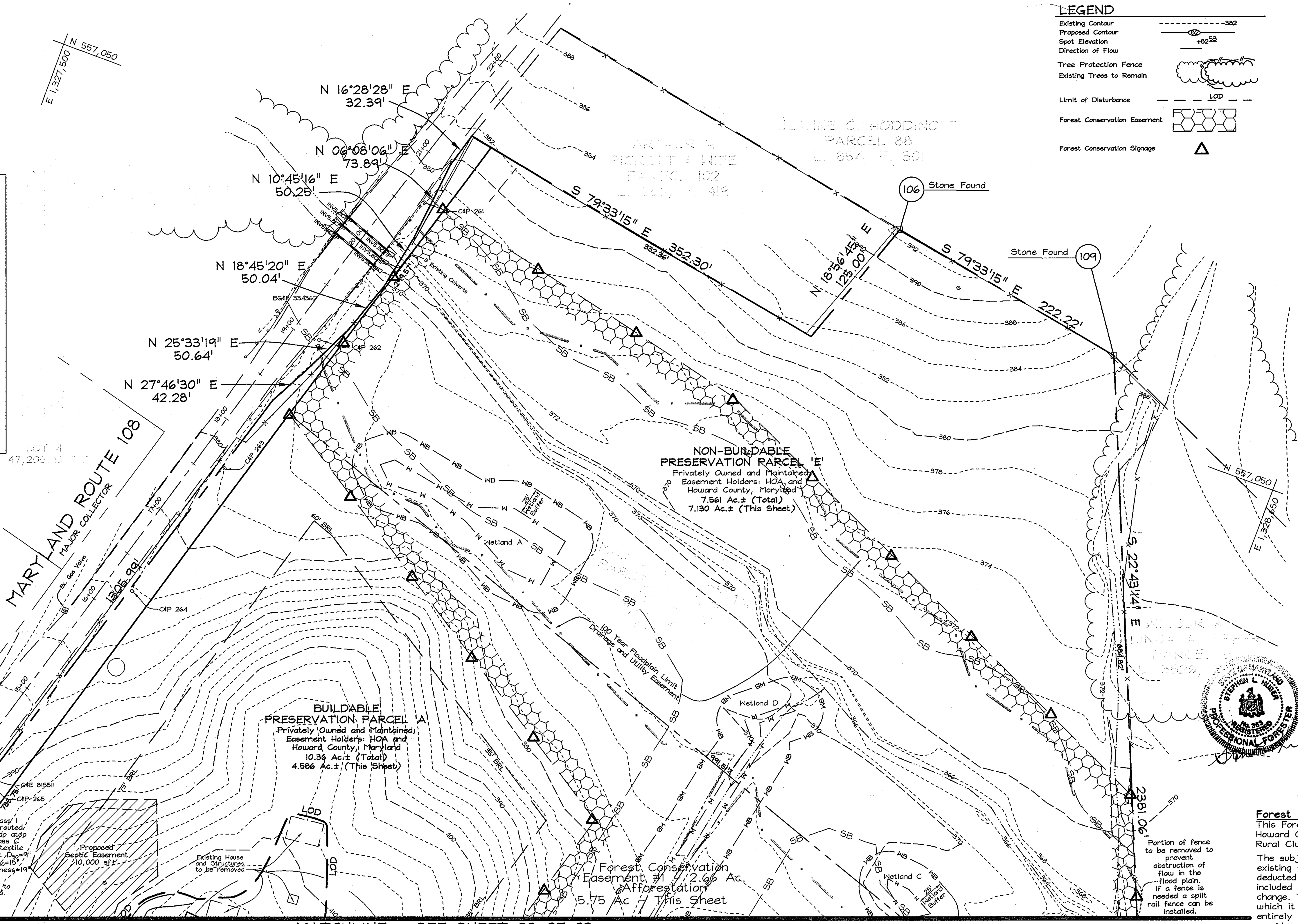
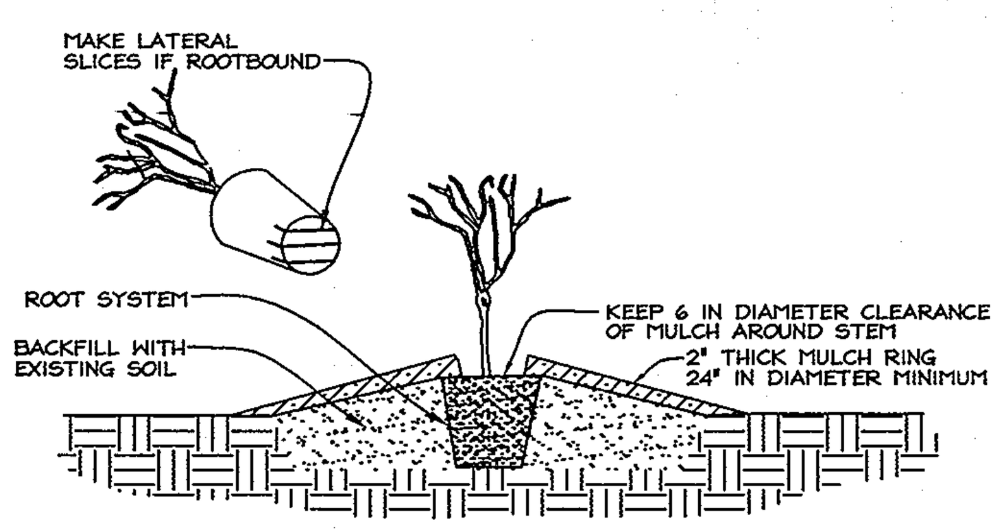


MATCHLINE - SEE SHEET 22 OF 23



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NOT TO SCALE

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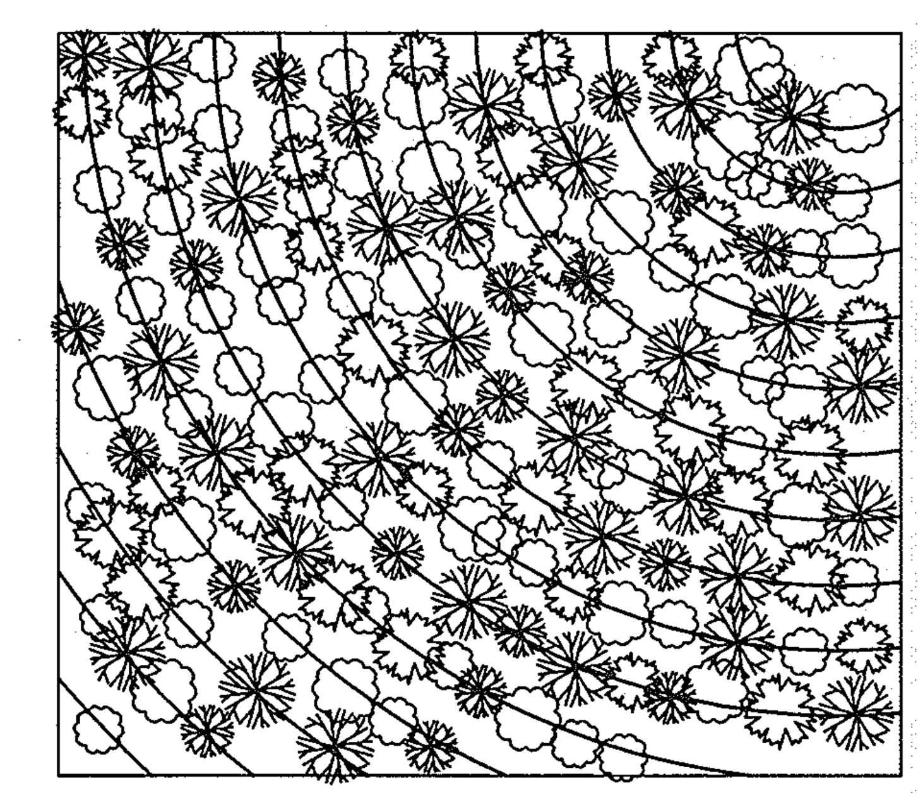
4. PLANTING HOLE TO BE 2-3 TIMES THE DIAMETER OF THE CONTAINER.
5. INSERT FERTILIZER TABLET, BACKFILL 2/3 OF THE ROOT BALL AND WATER.
6. AFTER WATER PERCOLATES, BACKFILL HOLE TO TOP OF ROOT BALL AND GENTLY TAMP SOIL TO FIRM CONTACT WITH PLANT.
7. APPLY MULCH RING AROUND PLANT KEEPING A 6 IN CLEARANCE FROM STEM.

FOREST CONSERVATION WORKSHEET

Net Tract Area	Acres
A. Total Tract Area	79.60
B. Area Within 100 Year Floodplain	*
C. Other deductions	32.86
D. Net Tract Area	46.74
Zoning Use Category: RESIDENTIAL-SUBURBAN	
Land Use Category	
E. Afforestation Minimum (20 % x D)	9.35
F. Conservation Threshold (25 % x D)	11.69
Existing Forest Cover	
G. Existing Forest on Net Tract Area	0
H. Forest Area Above Conservation Threshold	0
Breakeven Point	
I. Forest Retention Above Threshold with no Mitigation	N/A
J. Clearing Permitted without Mitigation	N/A
Proposed Forest Clearing	
K. Forest Areas to be Cleared	0
L. Forest Areas to be Retained	0
Planting Requirements	
M. Reforestation for Clearing Above Threshold	0
N. Reforestation for Clearing Below the Threshold	0
P. Credit for Retention Above Conservation Threshold	0
Q. Total Reforestation Required	0
R. Total Afforestation Required	9.35
S. Total Reforestation and Afforestation Requirement	9.35

* 4.35 Ac of Floodplain was deducted as part of the exclusion of Preservation Parcels A and E per Rural Cluster rules. The entirety of the floodplain is within these two parcels.

CURVEILINEAR RANDOMIZED PLANTING
PLANT LOCATIONS WILL BE DETERMINED BY AN ECOLOGIST AT EXPLORATION RESEARCH, INC. UTILIZING THE FOLLOWING METHODOLOGY



PLANT PLACEMENT DETAIL
NOT TO SCALE

1. MIX TREE AND SHRUB SPECIES IN THE STAGING AREA.
2. THE PROJECT MANAGER WILL SET THE GUIDE CURVILINEAR LINE. AS CLOSE TO CONTOUR AS POSSIBLE

STATE OF MARYLAND STEPHEN L. HUBER No. 363 REGISTERED PROFESSIONAL FORESTER

Forest Conservation Narrative

This Forest Conservation Plan was prepared in accordance with the Howard County Forest Conservation Manual and utilizes the guidelines for Rural Cluster Subdivisions.

The subject property has a gross tract area of 79.60± Ac. There is no existing forest on site. There are several Preservation Parcels which are deducted to arrive at a net tract of 46.74 Ac. Only Preservation Parcel F is included for being less than 3.0 Ac. No other parcels are undergoing landuse change. The 100 Year Floodplain was deducted along with Parcels A and E in which it is found, in its entirety. Afforestation requirements will be met entirely on-site in one easement. The easement will enhance wildlife habitat corridors and add forest in priority areas (floodplain, wetlands, streams and their buffers).

The planting areas will be planted with container grown stock at 350 trees/acre with tree shelters.

The total forest conservation obligation met on this site is 9.35 acres, with a total forest conservation surety amount of $203,643.00 (afforestation planting of 407,286 s.f. X $ 0.50/s.f.).

Planting Area Monitoring Notes

1. Monthly visits during the first growing season are to assess the success of the plantings and to determine if supplemental watering, pest control, invasive plant control, mowing, deer protection or other actions are necessary. Early spring visits will document winter kill and autumn visits will document summer kill.
2. The minimum survival rate shall be 75% of the total number of trees planted per acre at the end of the two year maintenance period. Wild tree seedlings from natural regeneration on the planting site may be counted up to 50% toward the total survival number if they are healthy native species at least 12 inches tall.
3. Survival will be determined by a stratified random sampling of the plantings.
4. Effective monitoring will assess plant survivability during the first growing season and make recommendations for reinforcement plantings if required at that time.
5. A final inspection and certification by the ERI qualified professional is required after the second growing season.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/11/06
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[illegible] 10/10/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Afforestation Area Planting Notes

1. Afforestation areas may be planted as soon as reasonable to do so. Late winter- early spring plantings are preferred. Earliest planting dates will vary from year to year but planting may generally begin as soon as the ground is no longer frozen. Alternate planting dates may be considered as conditions warrants.
2. Soil amendments and fertilization recommendations will be made based upon the results of soil analysis for nitrogen, phosphorus, potassium, organic matter content and pH. If required, fertilizer will be provided using a slow release, soluble 16-8-16 analysis designed to last 5-8 years contained in polyethylene perforated bags such as manufactured by ADCO Works, P.O. Box 310 Hollins, N.Y. 11423 or approved equal.
3. Plant materials shall be planted in accordance with the planting diagram, planting details and planting schedule.
4. Plant stock must be protected from desiccation at all times prior to planting. Materials held for planting shall be moistened and placed in cool shaded areas until ready for placement.
5. Planting materials shall be nursery grown and inspected prior to planting. Plants not conforming to the American Standards for Nursery Stock specifications for size, form, vigor, or roots, or due to trunk wounds, breakage, desiccation, insect or disease must be replaced.
6. Newly planted trees may require watering at least once per week during the first growing season depending on rainfall in order to get established. The initial planting operation should allow for watering during installation to completely soak backfill materials.
7. Mulch shall be applied in accordance with the diagram provided and shall consist of woodchips or shredded hardwood bark mulch, free of wood alcohol.
8. Planting holes should be excavated to a minimum diameter of 2.5 to 3 times the diameter of the root ball or container. Mechanical angering is preferred with scarification of the sides of each hole.
9. Site preparation for planting shall include moving of entire planting area, then banded tilling of 4 ft. wide bands spaced 11'o.c. and laid out in curvilinear rows. Stabilize disturbed areas with perennial rye after planting.

Reforestation and Afforestation Area Protection Signage

Min. 11"

Forest Conservation Area

REFORESTATION PROJECT

Trees for Your Future

Min 15"

SIGN DETAIL: PERMANENT SIGN

SIGNAGE NOTE: ALL TREE PROTECTION SIGNS SHALL BE PLACED ON METAL 'T' POSTS OR PRESSURE TREATED WOOD POLES. NO ATTACHMENT OF SIGNS TO TREES IS PERMITTED.

Easement 1: PLANTING AREA: 9.35 Ac. - 3273 trees @ 350/Ac

Qty	Botanical Name	Common Name	Min. Size	Spacing	Notes
330	Acer rubrum	Red Maple	WHIP 2-3'	11' o.c.	1-3 Gallon Container Grown or Bare Root with 5' tree shelters
327	Quercus alba	White Oak	WHIP 2-3'	11' o.c.	
327	Quercus rubra	Red oak	WHIP 2-3'	11' o.c.	
327	Amelanchier canadensis	Service berry	WHIP 2-3'	11' o.c.	
327	Prunus serrotina	Black Cherry	WHIP 2-3'	11' o.c.	
327	Juniperus virginiana	Redcedar	WHIP 2-3'	11' o.c.	
327	Platanus occidentalis	Sycamore	WHIP 2-3'	11' o.c.	
327	Pinus taeda	Loblolly Pine	WHIP 2-3'	11' o.c.	
327	Carpinus caroliniana	Ironwood	WHIP 2-3'	11' o.c.	
327	Liquidambar styraciflua	Sweetgum	WHIP 2-3'	11' o.c.	

FOREST CONSERVATION EASEMENT TABLE

EASEMENT	TYPE	AREA (ACRES)
1	AFFORESTATION PLANTING	9.35
TOTAL		9.35

EXPLORATION RESEARCH, INC.
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