Final Plan
Myrtue Property
Lots 1–31, Buildable Preservation Parcel A, Non–Buildable Preservation Parcels B–D, F–K, Non–Buildable Parcel E, and Cemetery Lot 1
Howard County, Maryland

General Notes

1. All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.

2. The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection division at 410-313-1880 at least five (5) working days prior to the start of work.

3. The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.

4. Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs be in place prior to the placement of any asphalt.

5. Street light placement and the type of fixture and pole shall be in accordance with the Howard County Design Manual, Volume III (1993) and as modified by "Guidelines for Street Lights in Residential Developments (June 1993)." A minimum 20 feet spacing shall be between the light and any tree.

6. The existing on-site topography was flown by Virginia Resource Mapping,Inc. dated February 20,2003. Supplemental field survey by DMW, Inc. October, 2006

7. The coordinates shown hereon are based upon the Howard County Geodetic Control which is based upon the Maryland State Plane Coordinate System. Howard County Monument Nos. 31EA and 37DA were used for this project.

8. Project background information:
   Subdivision Name: Myrtue Property & Lot 1,Valley Anne Estates Section 2
   Total Area 151.7 Acres
   Tax Map: 10
   Lot/Parcel: P.225, Lot 1 Valley Anne Estates Section 2
   Zoning: RCDEO
   Election District: 6
   Preliminary Plan Approval Date : 4/15/05
   File Numbers: WP-04-100 Approved 6/25/04, SP-04-07
   WP-04-100 (approved 6/25/04) was approved allowing the following disturbances into the environmental buffer.

   a) Section 16.115(c)(2) to allow clearing, filling or impervious paving within a floodplain for the purpose of a road crossing (Impact 1) and for the purpose of a SWM outfall (Impact 8);
   b) Section 16.116(a)(1) to allow grading, removal of vegetative cover, and paving within 25 feet of a wetland for the purpose of a road crossing (Impacts 1,2&6) and for the purpose of SWM outfall (Impact 8);
   c) Section 16.116(a)(1) to allow grading, removal of vegetative cover and paving within 75 feet of a perennial stream for the purpose of a road crossing (Impacts 1 and 2);
   d) Section 16.116(b) to allow grading, removal of vegetative cover, and paving on steep slopes (25% and greater, over 10 vertical feet) for the purpose of a road crossing (Impacts 1A,7) and for a SWM storm drain (Impact 9).

   The approval is subject to the following conditions:
   1. All grading disturbances associated with the proposed road crossing and SWM elements located within floodplain, stream, wetlands, their required buffers, and steep slopes are subject to obtaining all necessary Water Quality Certificates and Non-Tidal Wetlands Permits from MDE and/or the U.S. Army Corps of Engineers, if applicable.
   2. All grading and construction activities located within the 100 year floodplain, stream, wetlands, their required buffers, and steep slopes shall be minimized and in compliance with approved Grading and Sediment Control Plans and Permits. Best Management practices shall be used by all contractors. Stabilization shall be initiated immediately upon completion of proposed activity.
   3. The developer is required to use the least damaging design Impacts #1 and #2 in accordance with the requirements of SCD (dated 3/31/2004) and Section 16.116(c)(3) of the Subdivision and Land Development Regulations.The developer shall replant any environmental areas disturbed where grading and removal of vegetative cover has taken place in accordance with Section 16.116(c)(3). The replanting plan shall be submitted as part of the final road construction drawings.
   4. Reduce disturbances to impacts #4,7, and 8.
   5. Per DED comments dated 5/28/2004, only the SWM outfall is allowed as an environmental disturbance, not the pond itself.
      Note: Intrusions #3 grading of steep slopes, #5 grading of steep slopes, & #10 grading of steep slopes, were shown in WP-04-100 and have been eliminated.

9. Street trees shall be planted at least 5' from any inlet structure.

10. This project complies with the requirements of Section 16.1200 of the Howard County Code for Forest Conservation by providing approximately 17.3 acres of afforestation and reforestation to offset the proposed clearing of 6.1 acres. Approximately 9.3 acres of existing forest will be retained.

11. STORMWATER MANAGEMENT FOR THIS PROJECT WILL BE ADDRESSED WITH ENVIRONMENTAL SITE DESIGN PRACTICES DESIGNED IN ACCORDANCE WITH THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES I & II, AS AMENDED BY THE STORMWATER MANAGEMENT ACT OF 2007. SELECTED PRACTICES INCLUDE GRASS SWALES(M8), MICRO-BIORETENTION(M6), NON-ROOFTOP DISCONNECTION (N2) SUBMERGED GRAVEL WETLANDS (M-12).
    SWM 2 MAINTENANCE: SGW-B, SGW-C, MB-D, SGW-E / MB-F ARE PRIVATELY OWENED AND MAINTAINED BY THE HOA..ON-LOT FACILITIES ARE PRIVATELY OWNED, AND MAINTAINED BY THE LOT OWNER.

13. There will be no Howard County services provided on the flag or pipestem lots.

14. Boundary and existing easements were taken from a Boundary survey prepared by Daft, McCune - Walker, Inc. dated August 14, 2003.

15. A noise study is not required for this project.

16. Financial surety for the required landscaping in the amount of $106,950.00 must be posted as part of the developer's agreement.

17. Financial surety for the Forest Conservation requirements in the amount of $465,637.60 must be posted as part of the developer's agreement.

18. The Maryland Department of the Environment Tracking Number is 200662349/06-NT-3068

19. 95% compaction in fill areas to be per AASHTO T-180 standards.

20. All sign posts used for traffic control signs installed in the County Right of Way shall be mounted on a 2" galvanized steel, perforated, square tube posts(14 gauge) inserted into 2½2" galvanized steel, perforated, square tube sleeve(12 gauge) 3' long. A galvanized steel pole cap shall be mounted on top of each post.

21. The septic reserve area designation shown in the legend designates a private sewerage easement of at least 10,000 SF as required by the Maryland department of the environment for individual sewerage disposal. 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 public sewerage easement. Recordation of a modified sewerage easement shall not be necessary.

22. 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 governmental delay" if the well drilling holds-up the Health Department signature of the record plat. If well success rate is accomplished at various locations within the site, the developer shall have the option to request relief from drilling the remaining wells prior to plat recordation.

23. There is a 100 year floodplain on this site. A Floodplain Study prepared by Daft,McCune and Walker has been submitted.

24. The Myrtue Property is listed in the Howard County Historic Sites Inventory as HO-190, "Good Fellowship." Existing structures on site will remain as shown on Preservation parcel 'A'.

25. A cemetery identified as #10-1 in the Howard County Cemetery & Gravesite Inventory exists on the property per resolution #47-1994 approved at the 10/27/04 planning board meeting.

26. A Design Manual Waiver Request was granted on 9/26/06 waiving the requirement a safety bench be placed between one foot and eighteen inches below the Channel Protection elevation and the 25' buffer from the toe of embankment or to the top of cut to a right of way, respectively regarding facility #4.

JUSTIFICATION OF THE SUBDIVISION DESIGN
AS RELATED TO THE PRESERVATION PARCELS
The Myrtue Property and Valley Anne Estates section 2, Lot 1 are a 151.7 acre site zoned RC-DEO on Woodstock Road in western Howard County. There is an existing farmhouse and outbuildings on the west end of the property; however, the site has not been farmed for several years. Several stream systems including the Davis Branch crisscrosse the site, and there are associated wetland areas. The northeast corner of the property is forested; grazing has left the forest with little to no understory. Several transmission main easements also cross the site. Woodstock Road, a county designated scenic road, provides public road frontage on the western boundary of the property. The property also has frontage on Browns Farm Road; however, that frontage is restricted from use by environmental constraints.

A cluster subdivision of 31 single family detached lots has been designed respecting, as feasible, the environmentally sensitive areas on site. Non-buildable Preservation Parcels are proposed, and all environmentally sensitive areas will be contained on Preservation Parcels.

The intended function and purpose of the Preservation Parcels will be:

1. Limited farming activities on 1 Preservation Parcel A & C.
2. Conservation areas, associated with the Davis Branch, other streams, floodplain, wetlands and associated buffers. The majority of the forest in the northeast corner of the site will be located on Preservation Parcel D.
3. Provision of forest conservation requirements: Parcels B & D will be utilized in part for reforestation and retention.
4. Creation of a forest conservation bank, utilizing the excess reforestation areas within the subdivision and assist in screening the adjacent property: Parcels F & G.
5. Sending density. The developer intends to transfer density rights at the subdivision (record plat) stage. The density will be sent after recordation of the plat which will create the 20-acre preservation parcel.

The road alignment and cluster lot design minimizes impacts to these functions by locating environmental areas and buffers within the Preservation Parcels, reforesting the floodplain, wetlands and stream buffers, and minimizing the extent of public road and number of residential lots within existing forest areas. Potential lots are severely constrained by unsuitable soils, environmental conditions, and underground pipeline easements.

'Good Fellowship' (HO 190), a historic residence on Preservation Parcel A, is currently occupied by the Myrtue family. Situated on a prominent knoll on the west end of the property, the structure, its surrounding outbuildings, trees and nearby cemetery will remain intact, with the exception of one storage building at the bottom of the hill, near the stream. As +-25 acres, the Preservation Parcel is of sufficient size to preserve the setting of this resource. Driveway access to the structure is obtained to the southwest, from Brown's Farm Road. The primary façade of the structure faces Woodstock Road, and existing vegetation between the new subdivision road and the building will screen the building from view. The closest proposed lots to the north are almost 700 feet distant, and will have homes with fronts facing the historic structure, although intervening distance and vegetation will mitigate any direct views.

STORMWATER MANAGEMENT PRACTICES

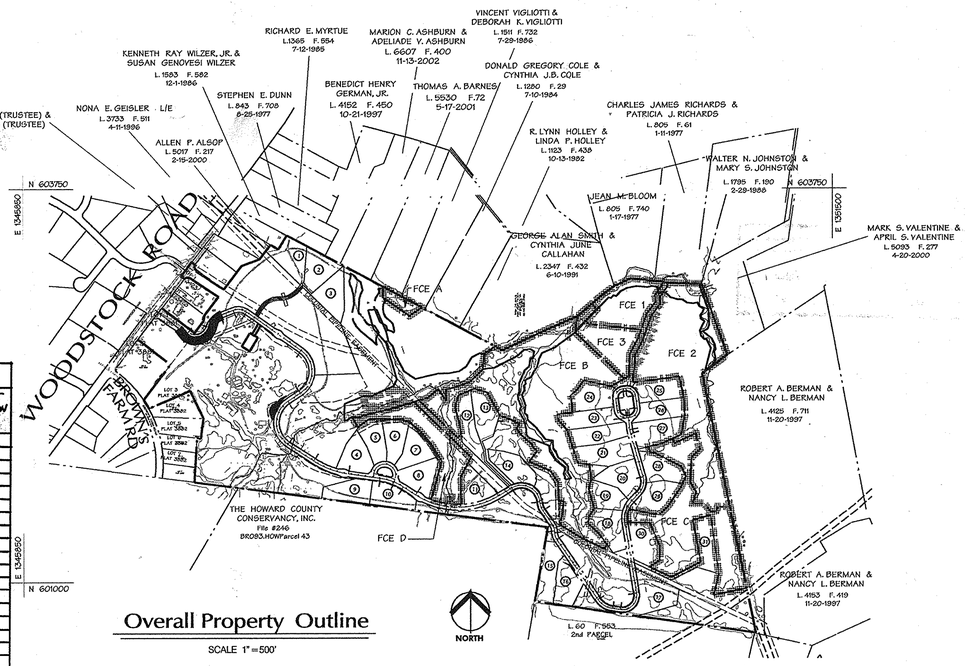
LOT NO.	ADDRESS	*N-2 NO.	MICRO-BIO RETENTION M6 (NO.)
LOT 1	1731 DAVIS BRANCH RD	1	1
LOT 2	1737 DAVIS BRANCH RD		1
LOT 3	1743 DAVIS BRANCH RD		1
LOT 4	1801 DAVIS BRANCH RD	1	1
LOT 5	1807 DAVIS BRANCH RD		1
LOT 6	1813 DAVIS BRANCH RD		1
LOT 7	1819 DAVIS BRANCH RD		1
LOT 8	1825 DAVIS BRANCH RD		1
LOT 11	1841 DAVIS BRANCH RD		1
LOT 12	1847 DAVIS BRANCH RD	1	1
LOT 13	1853 DAVIS BRANCH RD	1	1
LOT 14	1859 DAVIS BRANCH RD		1
LOT 17	1904 DAVIS BRANCH RD	1	1
LOT 18	1921 DAVIS BRANCH RD		1
LOT 19	1927 DAVIS BRANCH RD		1
LOT 20	1933 DAVIS BRANCH RD		1
LOT 21	1939 DAVIS BRANCH RD	1	1
LOT 22	1945 DAVIS BRANCH RD	1	1
LOT 23	1951 DAVIS BRANCH RD	1	1
LOT 24	1957 DAVIS BRANCH RD	1	1
LOT 25	1954 DAVIS BRANCH RD	1	1
LOT 26	1948 DAVIS BRANCH RD	1	1
LOT 27	1942 DAVIS BRANCH RD	1	1
LOT 28	1936 DAVIS BRANCH RD	1	1
LOT 29	1930 DAVIS BRANCH RD	1	1
LOT 30	1916 DAVIS BRANCH RD	1	1
LOT 31	1910 DAVIS BRANCH RD	1	1

*DISCONNECTION OF NON-ROOFTOP RUNOFF.

Preservation parcel owners
A) Preservation Parcel 'A' (Buildable) Owner: Mr. Myrtue easement holder #1: H.O.A.. easement holder #2: Ho. Co. Gov't.
B) Preservation Parcel 'B' (Non-Buildable) Owner: Mr. Myrtue easement holder #1: H.O.A.. easement holder #2: Ho. Co. Gov't.
C) Preservation Parcel 'C' (Non-Buildable) Owner: Mr. Myrtue easement holder #1: H.O.A.. easement holder #2: The Ho. Co. Gov't.
D) Preservation Parcel 'D' (Non-Buildable) Owner: H.O.A. easement holder #1: The Howard County Conservancy Inc easement holder #2: Ho. Co. Gov't.
* E) NonBuildable Parcel 'E' (Non-Buildable) Owner: H.O.A. Maintained by H.O.A.
F) Preservation Parcel 'F' (Non-Buildable) Owner: H.O.A. easement holder #1: The Howard County Conservancy Inc. easement holder #2: Ho. Co. Gov't.
G) Preservation Parcel 'G' (Non-Buildable) Owner: Owner of Lot 16. easement holder #1: H.O.A.. easement holder #2: Ho. Co. Gov't.

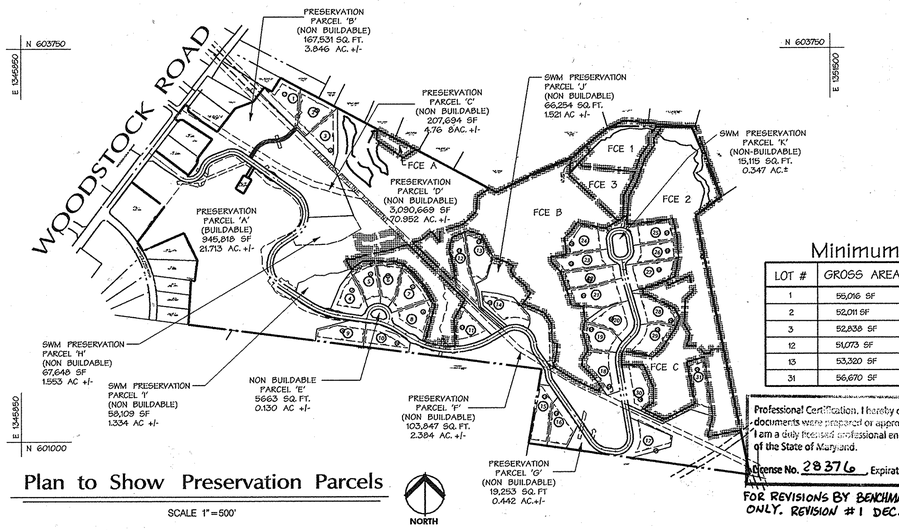
SWM parcel owners
H) SWM Preservation Non-Buildable Parcel 'H' Owner: H.O.A. easement holder #1: Ho. Co. Gov't.
I) Preservation Parcel 'I' (Non-Buildable) Owner: H.O.A. easement holder #1: Ho. Co. Gov't.
J) Preservation Parcel 'J' (Non-Buildable) Owner: H.O.A. easement holder #1: Ho. Co. Gov't.
K) Preservation Parcel 'K' (Non-Buildable) Owner: H.O.A. easement holder #1: Ho. Co. Gov't.

* NonBuildable Parcel 'E' is not a preservation parcel.



Overall Property Outline

SCALE 1"=500'



Plan to Show Preservation Parcels

SCALE 1"=500'

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4	ROAD PLAN - STA 23+50 TO 37+00
5	ROAD PLAN - STA 37+00 TO 47+50
6	ROAD PLAN - 47+50 TO 64+70.51
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37	RETAINING WALL # 1 ELEVATION VIEW
38	RETAINING WALL # 2 & CONSTRUCTION DETAILS
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Minimum Lot Size Chart

LOT #	GROSS AREA	PIPESTEM AREA	MIN. LOT AREA
1	55,016 SF	3,190 SF	51,826 SF
2	52,011 SF	3,277 SF	48,734 SF
3	52,838 SF	3,171 SF	49,667 SF
12	51,073 SF	2,912 SF	48,791 SF
13	53,320 SF	2,925 SF	50,395 SF
31	56,670 SF	9,620 SF	47,050 SF

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

STATE OF MARYLAND — JULIE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-15-15

9-24-07
Date

Professional Engr. No. 28376

BENCHMARK DESCRIPTION

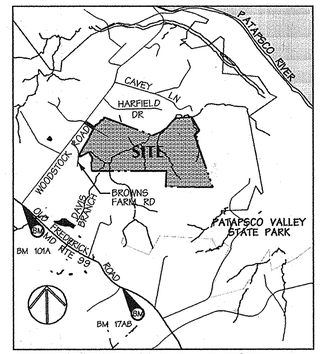
Coordinates and bearings shown on this plan are based upon the system of coordinates established in the Maryland Coordinate System - NAD 83 (1991) and are based upon the Howard County Department of Public Works Survey Geodetic Survey Control Stations:

DESIGNATION	NORTH (sFT)	EAST (sFT)
10IA	600995.107	1345340.34

Stamped disk on concrete column

DESIGNATION	NORTH (sFT)	EAST (sFT)
17AB	598435.240	1348615.248

Concrete Monument (Replaces 17AA)



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PERMITTED USE NO. 20129626

VICINITY MAP

SCALE: 1"=2000'

Site Analysis Data Chart

1. General Site Data
   a. Present Zoning: RCDEO
   b. Applicable DPZ File References: WP 04-100
   c. Proposed Use of Site or Structure(s): 32 Single Family Homes
      Proposed Water and Sewer Systems: Well and Septic
2. Area Tabulation
   a. Gross site area : 151.7 Acres
   b. Approximate Area of Steep Slopes (25% or Greater): 12.5 Acres ±
   c. Approximate Area of 100 Year Floodplain: 10.4 Acres ±
   d. Net Site Area: 128.8 Acres±
   e. Area of Proposed Buildable Preservation Parcels: 21.7 Acres ±
   f. Area of Proposed Non-Buildable Preservation Parcel: 81.3 Acres ±
   g. Area of Proposed SFD Lots: 35.7 Acres+/-
   h. Proposed Open Space Lots: N/A
   i. Area of Proposed Public Roads: 6.9 Acres
   j. Area of Proposed Private Roads: N/A
   k. Area of Proposed SWM Parcels: N/A
3. Residential Unit/Lot Tabulation
   a. Total Number of Residential Units/Lots Allowed for Overall Project: 35
   b. Total number of Lots allowed per DEO/CEO: 64
   c. Number of SFD Residential Units/Lots proposed: 31
   d. DEO/CEO units to be acquired: 0
   e. Number of Non Buildable Preservation Parcels proposed: 9
   f. Number of Buildable Preservation Parcels proposed: 1
   g. Number of SWM Parcels proposed: N/A
   h. Number of Open Space Lots proposed: N/A
   i. Total Number of Lots/Parcels proposed: 41
   j. Number of Cemetery Lots: 1 (Cemetery Lot 1)
   k. Number of Non-buildable Parcels: 1 (Non- Buildable Parcel E)

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE PLAN SET TO PROVIDE ESD SWM PRACTICES

FINAL PLAN
MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225

OWNER/DEVELOPER:
DAVIS BRANCH, LLC
c/o James Keelty and Co. Inc.
P.O. Box 528
61 E. Padonia Road.
Timonium, MD 21093

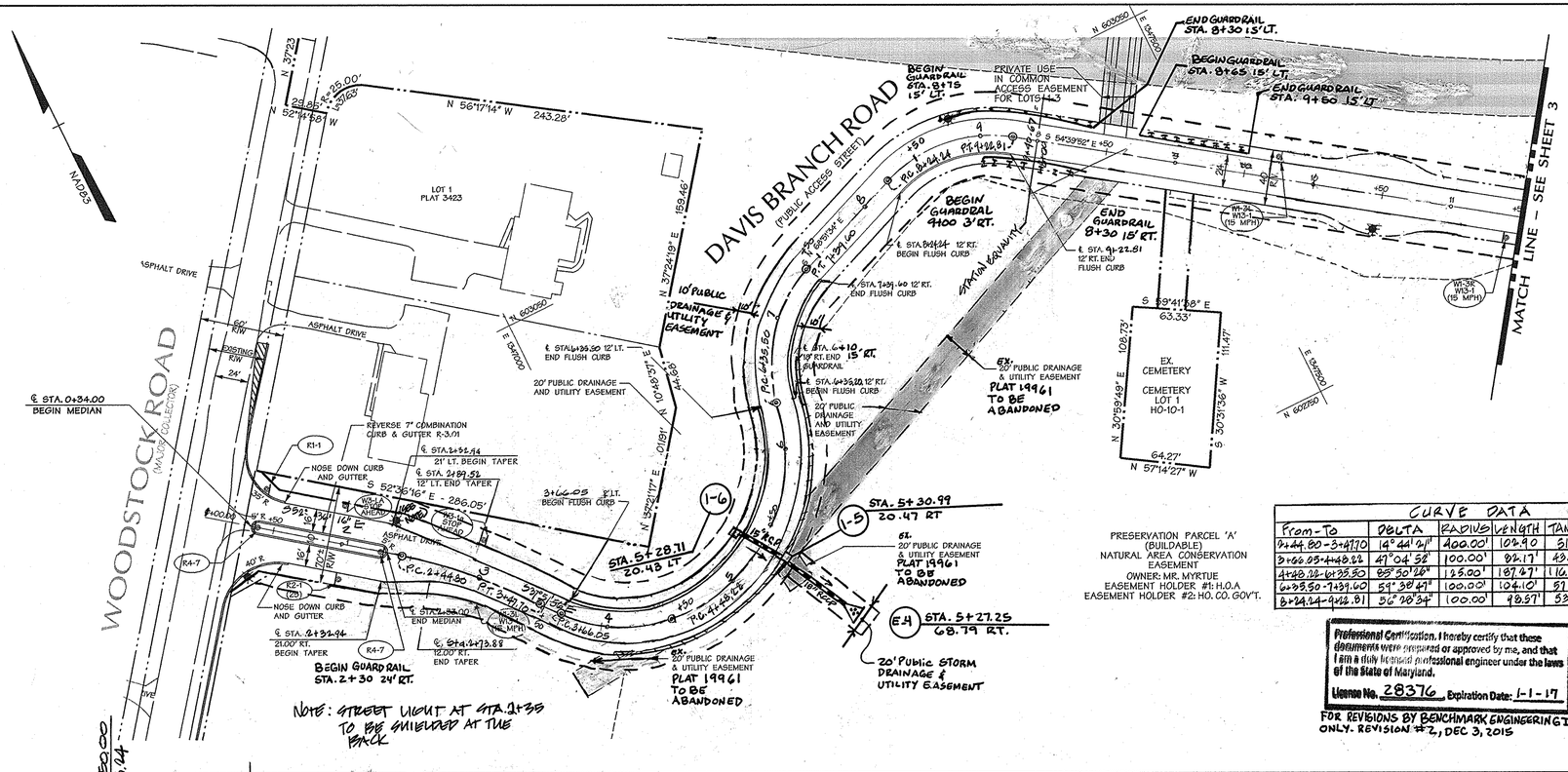
DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

TITLE
MYRTUE PROPERTY
FINAL PLAN
COVER SHEET

Des By		Scale AS SHOWN	Proj. No. 02033.D
Drn By	GMO	Date 2/14/07	Sheet 1 of 56
Chk By		Approved	

F-06-104

Mon Sep 17 15:44:37 2007 n:\02033\Final plans\02033.DVR



STREET LIGHT LEGEND

✱ 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PREMIER 14' BLACK FIBERGLASS POLE

NOTE: CONDUIT FOR STREET LIGHTING TO BE INSTALLED BY CONTRACTOR (3" PVC)

STREET LIGHT TABLE

STREET NAME	STATION	OFF-SET
DAVIS BRANCH ROAD	1+38	36'RT.
DAVIS BRANCH ROAD	2+35	24'LT.
DAVIS BRANCH ROAD	4+65	16'RT.
DAVIS BRANCH ROAD	6+95	16'LT.
DAVIS BRANCH ROAD	8+80	16'LT.
DAVIS BRANCH ROAD	10+47	16'RT.

CURVE DATA

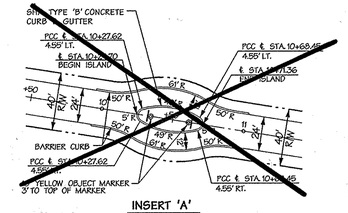
From-To	DELTA	RADIUS	LENGTH	TANGENT	CHORD
0+44.80-3+47.10	14° 44' 21"	400.00'	102.90	51.73'	S45° 14' 02" E 102.61'
3+66.05-4+46.22	49° 04' 52"	100.00'	85.17'	45.57'	S61° 24' 22" E 82.63'
4+88.22-6+35.50	85° 50' 16"	125.00'	187.47'	116.24'	N52° 08' 00" E 170.24'
6+35.50-7+39.60	59° 38' 47"	100.00'	104.10'	57.32'	N39° 02' 10" E 99.47'
8+24.24-9+42.81	56° 28' 34"	100.00'	98.57'	53.71'	S82° 54' 09" E 94.63'

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #2, DEC 3, 2015

STATE OF MARYLAND · ALAN K. MILLER · No. 28376 · PROFESSIONAL ENGINEER

12-14-15



INSERT 'A'

NOTE: SEE SHEET 8 FOR WOODSTOCK ROAD WIDENING PLAN

0-24-07
Date

Professional Engr. No. 20784

✱ REVISIONS INCLUDE STORM DRAIN, GRADING, EASEMENTS, REMOVAL OF 'SPEED CONTROLS'.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/10

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 4/7/10

Date	No.	Revision Description
12-3-15	2	REVISE SWM for ESD METHODS ✱
11/14/08	1	Railroad Rd. Alignment, Grade and Easements

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH LLC
JAMES KEELEY AND CO. INC.
P.O. BOX 6225
611 E. PATONIA ROAD,
TIMONIUM, MD 21093

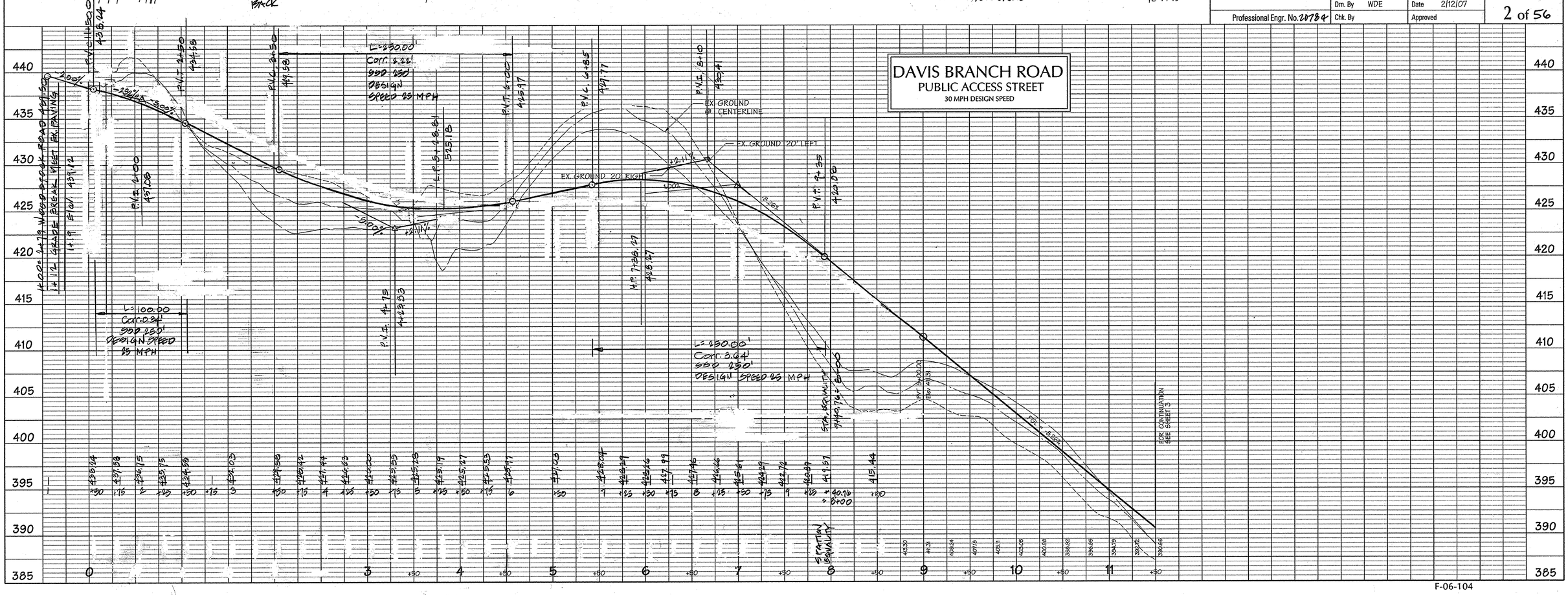
DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA
3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
FINAL ROAD PLAN AND PROFILE DAVIS BRANCH ROAD
STA 1+00 TO STA 11+50

Des. By KAD	Scale 1" = 50'	Proj. No. 02033.D	2 of 56
Dm. By WDE	Date 2/12/07		
Chk. By	Approved		



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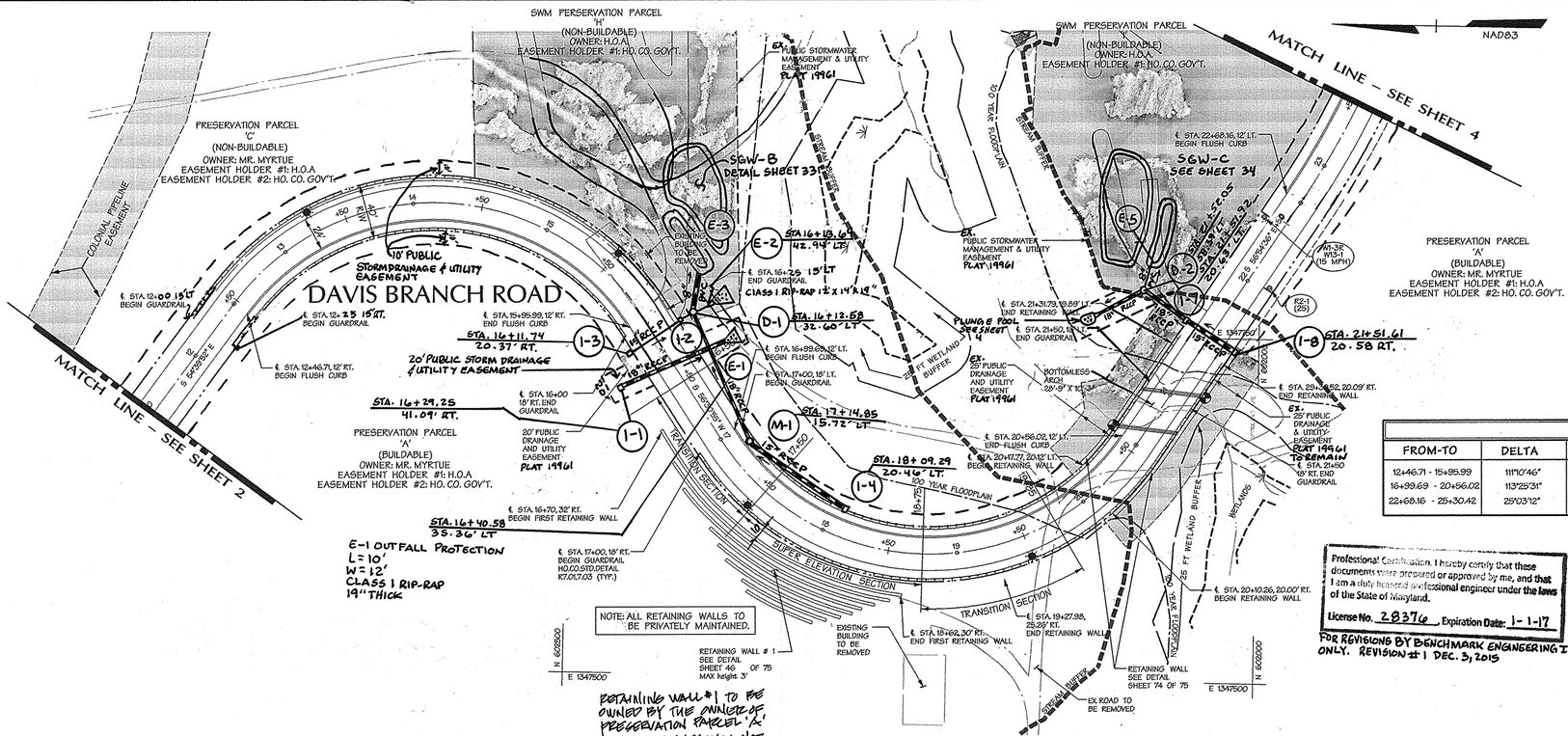


STREET LIGHT LEGEND

✱ 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PREMIER 14' BLACK FIBERGLASS POLE

NOTE: CONDUIT FOR STREET LIGHTING TO BE INSTALLED BY CONTRACTOR (3" PVC)

STREET LIGHT TABLE

STREET NAME	STATION	OFF-SET
DAVIS BRANCH ROAD	13+25	16' LT.
DAVIS BRANCH ROAD	15+50	16' LT.
DAVIS BRANCH ROAD	17+47	16' RT.
DAVIS BRANCH ROAD	19+50	16' RT.

CURVE DATA

FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD	
12+46.71 - 15+95.99	111°10'46"	180.00'	349.28'	262.78'	S 0°55'31" W	297.00'
16+99.69 - 20+56.02	113°25'31"	180.00'	356.34'	274.15'	S 0°11'51" E	300.93'
22+68.16 - 25+30.42	25°03'12"	600.00'	262.36'	133.31'	S 69°26'12" E	260.27'

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

STATE OF MARYLAND — ALICE A. WHITE — No. 28376 — REGISTERED PROFESSIONAL ENGINEER

12-15-15

9-24-07
Date

STATE OF MARYLAND — CHARLES A. KELLY — No. 20784 — PROFESSIONAL ENGINEER

Professional Engr. No. 20784

✱ REVISIONS INCLUDE STORMDRAIN, GRADING, EASEMENTS,

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE SWM FOREST METHODS ✱

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 522
61 E. PADONIA ROAD.
TIMONIUM, MD 21093

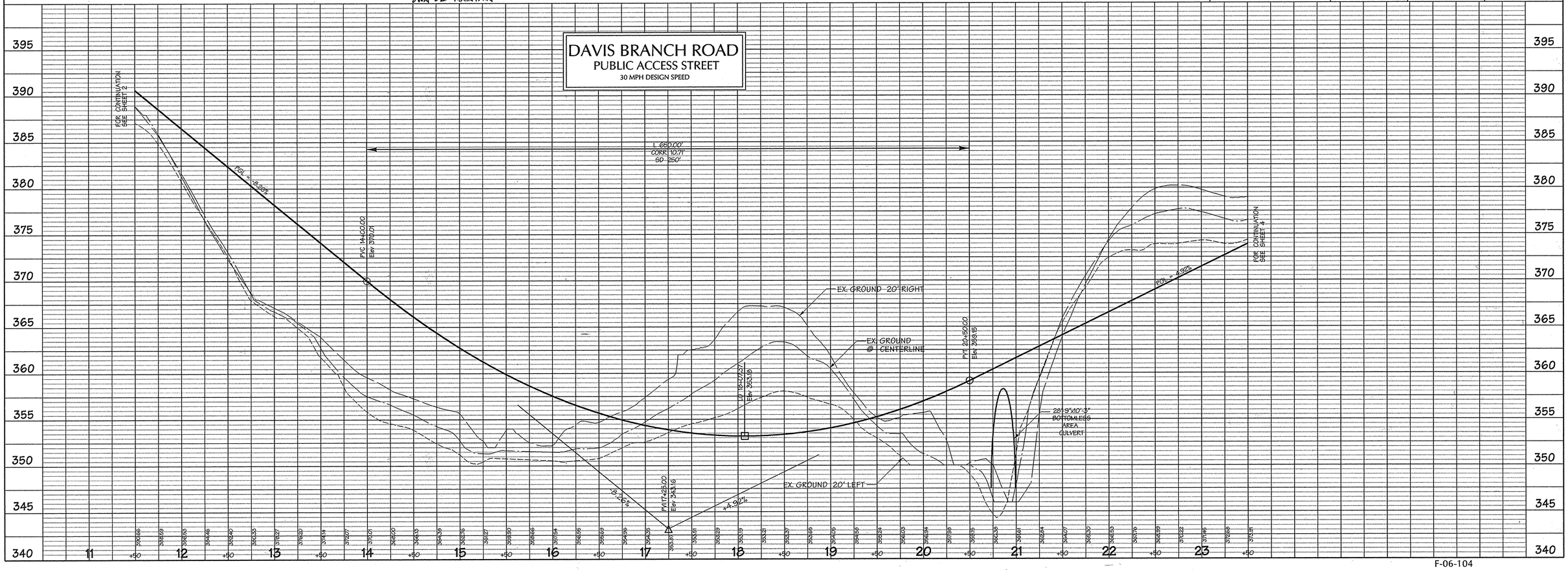
DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA
3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
FINAL ROAD PLAN AND PROFILE
STA 11+50 TO 23+50

Des. By	KAD	Scale	1" = 50'
Drn. By	WDE	Date	8/12/07
Chk. By		Approved	

Proj. No. 02033.D



F-06-104

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* REVISIONS INCLUDE STORM DRAINS, GRADING, EASEMENTS, REMOVAL OF "SFEED CONTROLS".

FOREST CONSERVATION EASEMENTS D

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE SWM FOR ESD PRACTICES *

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 929
611 E. PADONIA ROAD.
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9-24-07
Date

Professional Engr. No. 20704

AREA
3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
FINAL ROAD PLAN AND PROFILE
STA 23+50 TO 37+00

Des. By KAD	Scale 1" = 50'	Proj. No. 02033.D	4 of 56
Dm. By WDE	Date 11/17/06		
Chk. By	Approved		

MATCH LINE – SEE SHEET 3

MATCH LINE – SEE SHEET 5

DAVIS BRANCH ROAD

SWM PRESERVATION PARCEL 'F'
(NON-BUILDABLE)
OWNER: H.O.A.
EASEMENT HOLDER #1: HO. CO. GOVT.

PRESERVATION PARCEL 'A'
(BUILDABLE)
OWNER: MR. MYRTUE
EASEMENT HOLDER #1: H.O.A.
EASEMENT HOLDER #2: HO. CO. GOVT.

NONBUILDABLE PARCEL 'E'
(NON-BUILDABLE)
OWNER: H.O.A.
MAINTAINED BY: H.O.A.

PRESERVATION PARCEL 'P'
(NON-BUILDABLE)
OWNER: H.O.A.
EASEMENT HOLDER #1: THE HO. CO. CONSERVANCY INC.
EASEMENT HOLDER #2: HO. CO. GOVT.

N 82°38'05" W 2487.76'

CURVE DATA						
FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD	
22+68.16 - 25+30.32	25°03'12"	600.00'	262.36'	133.31'	S 69°26'12" E	260.27'
27+52.28 - 29+27.09	25°02'21"	400.00'	174.81'	88.82'	S 69°26'37" E	173.42'
30+29.24 - 36+39.17	64°07'17"	545.00'	609.93'	341.36'	S 88°59'06" E	578.59'
0+25.69 - 2+86.41	194°18'43"	76.88'	260.72'	-1.00'	S 74°48'26" E	152.56'

STREET LIGHT TABLE

STREET NAME	STATION	OFF-SET
DAVIS BRANCH ROAD	24+95	16' RT.
DAVIS BRANCH ROAD	27+30	19' LT.
DAVIS BRANCH ROAD	28+80	16' LT.
DAVIS BRANCH ROAD	30+50	16' RT.
DAVIS BRANCH ROAD	32+60	15' RT.

STREET LIGHT LEGEND

150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PREMIER 14' BLACK FIBERGLASS POLE

NOTE:
CONDUIT FOR STREET LIGHTING TO BE INSTALLED BY CONTRACTOR. (3" PVC) 18" TO 24" BELOW SURFACE

INSERT 'B'

INSERT 'C'

DAVIS BRANCH ROAD
PUBLIC ACCESS STREET
30 MPH DESIGN SPEED

SEE SHEET 3 FOR CONTINUATION

SEE SHEET 5 FOR CONTINUATION

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28316, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1, DEC 3, 2015

12-15-15

F-06-104

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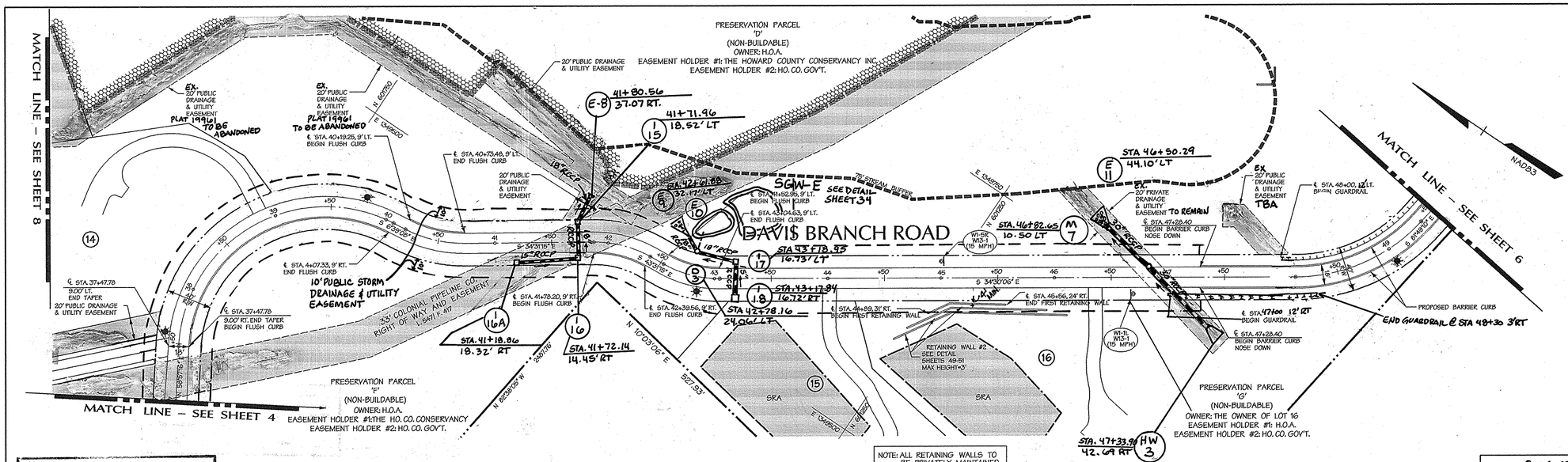
* REVISIONS INCLUDE STORM DRAIN, GRADING, EASEMENTS.



NOTE: ALL RETAINING WALLS TO BE PRIVATELY MAINTAINED.

RETAINING WALL #2 TO BE OWNED BY THE OWNER OF LOT 16. HOWARD COUNTY WILL NOT OWN OR MAINTAIN.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 23376, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1, DEC. 3, 2015

STATE OF MARYLAND — JULIE A. WILLEMS — No. 23376 — PROFESSIONAL ENGINEER — 12-15-15

STREET LIGHT LEGEND

150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PREMIER 14' BLACK FIBERGLASS POLE

NOTE: CONDUIT FOR STREET LIGHTING TO BE INSTALLED BY CONTRACTOR (3" PVC)

STREET LIGHT TABLE

STREET NAME	STATION	OFF-SET
DAVIS BRANCH ROAD	37+60	13' LT.
DAVIS BRANCH ROAD	39+77	13' LT.
DAVIS BRANCH ROAD	42+90	13' RT.
DAVIS BRANCH ROAD	49+00	13' RT.

CURVE DATA

FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD	
37+48.78 - 40+07.33	114°23'36"	130.00'	259.55'	201.69'	S 63°50'56" E	218.54'
40+19.25 - 40+73.48	27°52'06"	111.50'	54.23'	27.66'	S 20°35'11" E	53.70'
41+87.20 - 42+39.56	30°00'00"	100.00'	52.36'	26.79'	S 19°31'15" E	51.76'
42+52.96 - 43+05.28	29°58'52"	100.00'	52.33'	26.78'	S 19°30'40" E	51.73'
48+12.57 - 49+37.42	48°32'55"	150.00'	127.10'	67.65'	S 57°32'42" E	123.33'

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/2/07

Date	No.	Revision Description
12-3-15	1	REVISED SWM TO ESD PRACTICES *

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KELLY AND CO. INC.
P.O. BOX 6229
61 E. PADONIA ROAD.
TIMONIUM, MD 21095

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9-24-07
Date

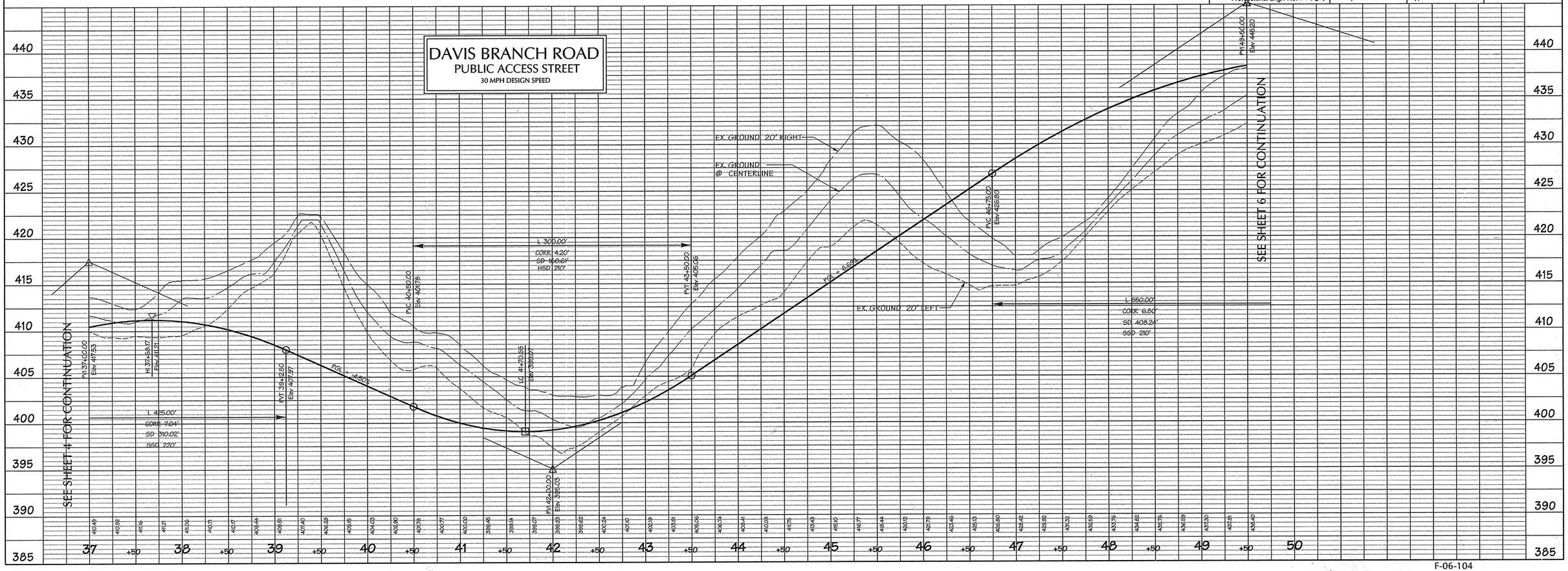
STATE OF MARYLAND — CHARLES W. DAFT — No. 20784 — PROFESSIONAL ENGINEER

Professional Engr. No. 20784

AREA
3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
FINAL ROAD PLAN AND PROFILE
STA 37+00 TO 47+50

Des. By KAD	Scale 1" = 50'	Proj. No. 02033.D	
Dm. By WDE	Date 8/12/07		5 of 56
Chk. By	Approved		



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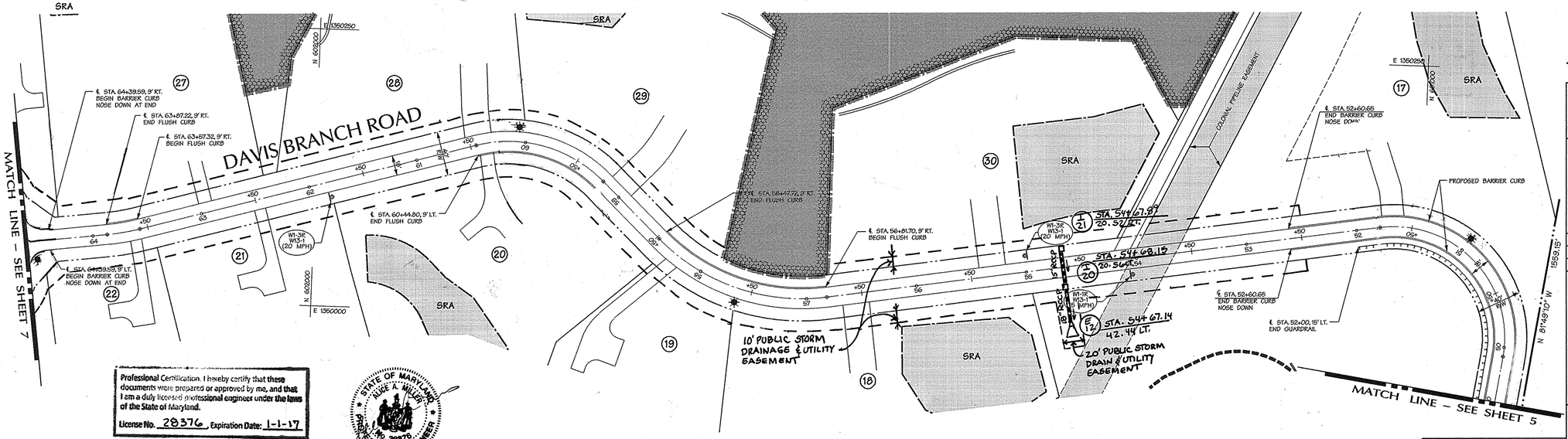


NAD83

* REVISIONS INCLUDE STORM DRAIN, GRADING, EASEMENTS.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 4/7/07

Date	No.	Revision Description
12-3-15	1	REVISED SWM FOR ESD PRACTICES *

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KELLY AND CO. INC.
P.O. BOX 6223
611 E. PADONIA ROAD.
TIMONIUM, MD 21093

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1, DEC. 3, 2015

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-15-15

FOREST CONSERVATION EASEMENTS C

STREET LIGHT LEGEND

150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PREMIER 14' BLACK FIBERGLASS POLE

NOTES:
CONDUIT FOR STREET LIGHTING TO BE INSTALLED BY CONTRACTOR (3" PVC)

STREET LIGHT TABLE

STREET NAME	STATION	OFF-SET
DAVIS BRANCH ROAD	51+00	13'RT
DAVIS BRANCH ROAD	57+63	13'LT
DAVIS BRANCH ROAD	60+05	13'RT

CURVE DATA

FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD	
49+91.54 - 51+78.81	107°17'47"	100.00'	187.27'	135.88'	N 44°31'57" E	161.08'
56+81.70 - 58+47.72	52°50'42"	180.00'	166.02'	89.44'	N 17°18'24" E	160.20'
59+19.92 - 60+44.80	59°37'25"	120.00'	124.88'	68.76'	N 13°56'03" E	119.32'
63+57.32 - 63+87.22	8°33'55"	200.00'	29.90'	14.98'	N 11°36'42" W	29.87'

0-24-07
Date

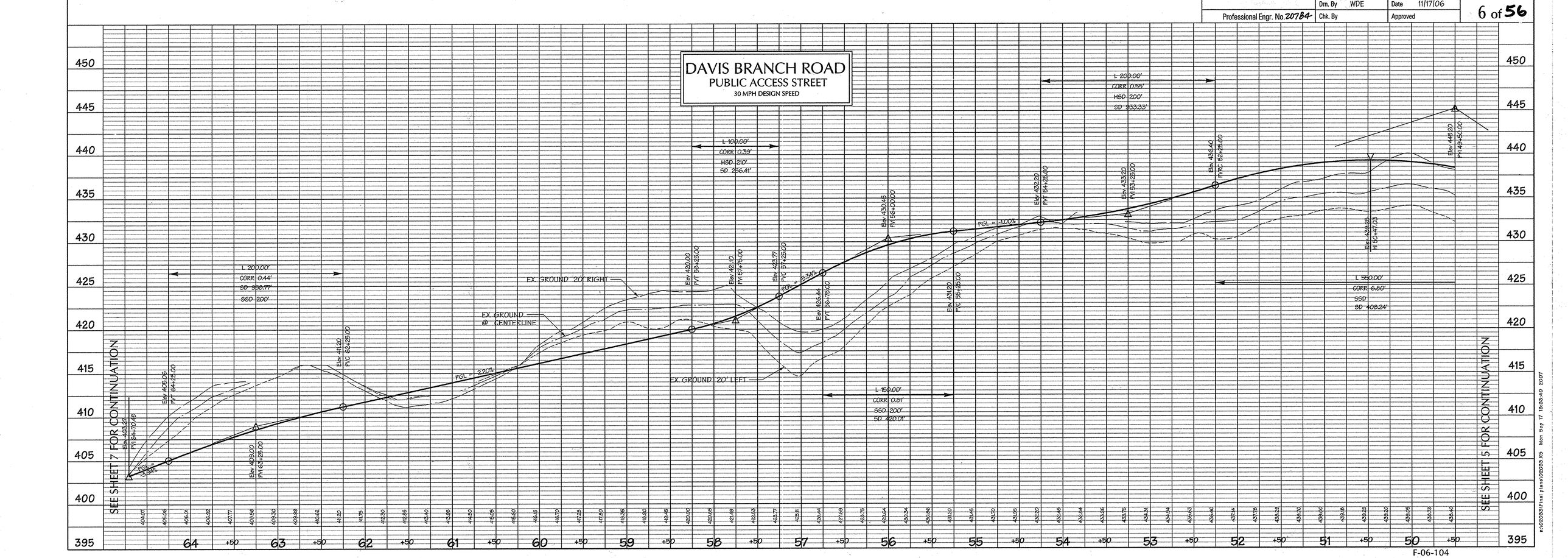
Professional Engr. No. 20784

AREA
3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
FINAL ROAD PLAN AND PROFILE
STA 47+50 TO 64+70.51

Des. By	KAD	Scale	1" = 50'	Proj. No.	02033.D
Drn. By	WDE	Date	11/17/06		
Chk. By		Approved			6 of 56

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals



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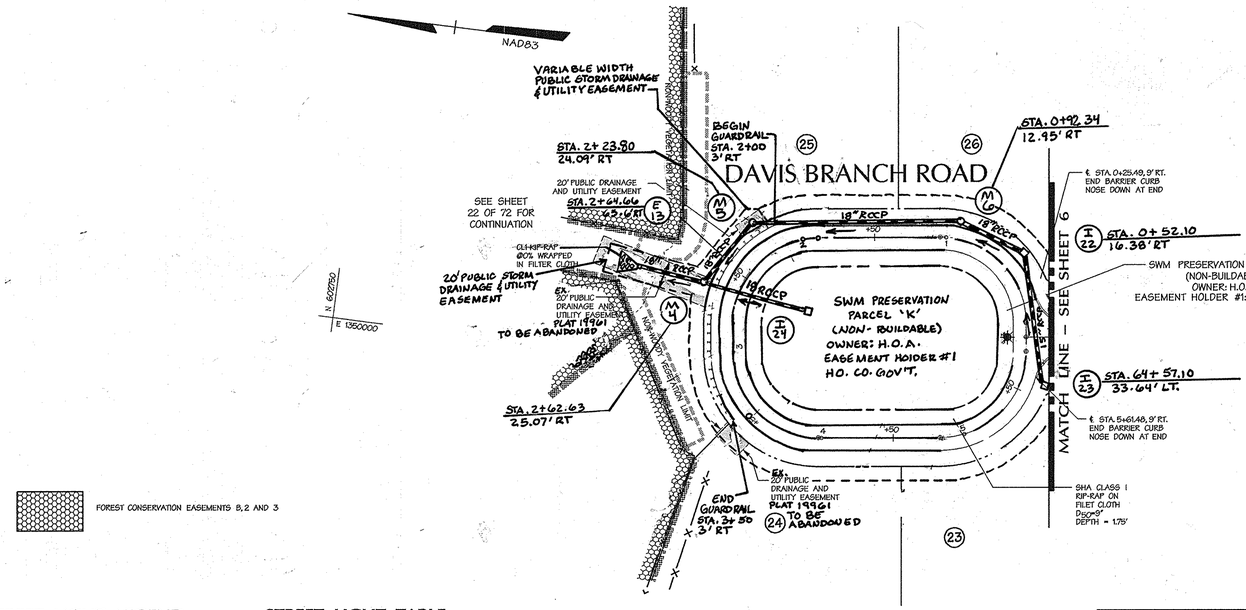


FOREST CONSERVATION EASEMENTS B,2 AND 3

STREET LIGHT LEGEND

✱ 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PREMIER 14' BLACK FIBERGLASS POLE
NOTE:
CONDUIT FOR STREET LIGHTING TO BE INSTALLED BY CONTRACTOR (3" PVC)

STREET LIGHT TABLE

STREET NAME	STATION	OFF-SET
DAVIS BRANCH ROAD	0+00	13'LT

CURVE DATA

FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD	
0+10.00 - 1+04.25	90°00'00"	60.00'	94.25'	60.00'	N 37°40'15" E	84.85'
1+89.25 - 2+83.50	90°00'00"	60.00'	94.25'	60.00'	N 52°19'45" W	84.85'
3+03.50 - 3+97.74	90°00'00"	60.00'	94.25'	60.00'	S 37°40'15" W	84.85'
4+82.74 - 5+76.99	90°00'00"	60.00'	94.25'	60.00'	S 52°19'45" E	84.85'

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INT. ONLY. REVISION # 1, DEC. 8, 2015

STATE OF MARYLAND — ALICE A. MILLER — 28376 — PROFESSIONAL ENGINEER
12-15-15

✱ REVISIONS INCLUDE STORM DRAINS, GRADING, EASEMENTS.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE SWM TO ESD PRACTICES ✱

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 6828
69 E. PADONIA ROAD,
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9-24-07
Date

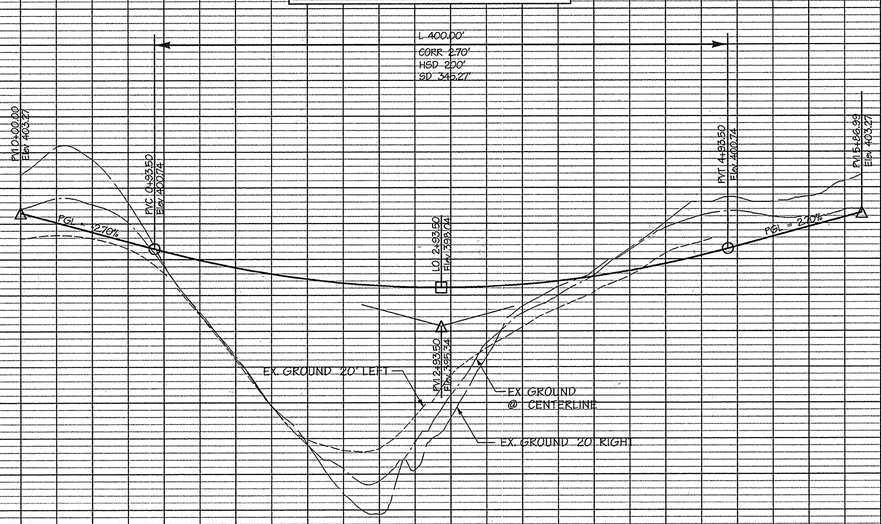
Professional Engr. No. 20784

AREA
3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
FINAL ROAD PLAN AND PROFILE
CUL-DE-SAC

Des. By KAD	Scale 1" = 50'	Proj. No. 02033.D	
Drn. By WDE	Date 2/14/07	7 of 56	
Chk. By	Approved		

DAVIS BRANCH ROAD
PUBLIC ACCESS STREET
30 MPH DESIGN SPEED



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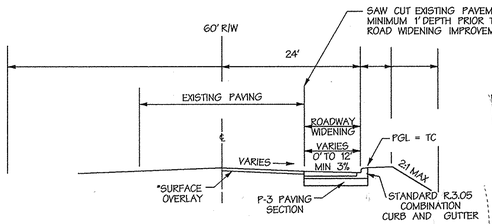
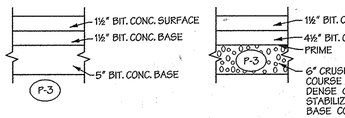


*SURFACE OVERLAY TO BE EQUAL TO SURFACE COURSE OF TYPICAL PAVING SECTION OF SUBDIVISION

TYPICAL WOODSTOCK ROAD WIDENING SECTION

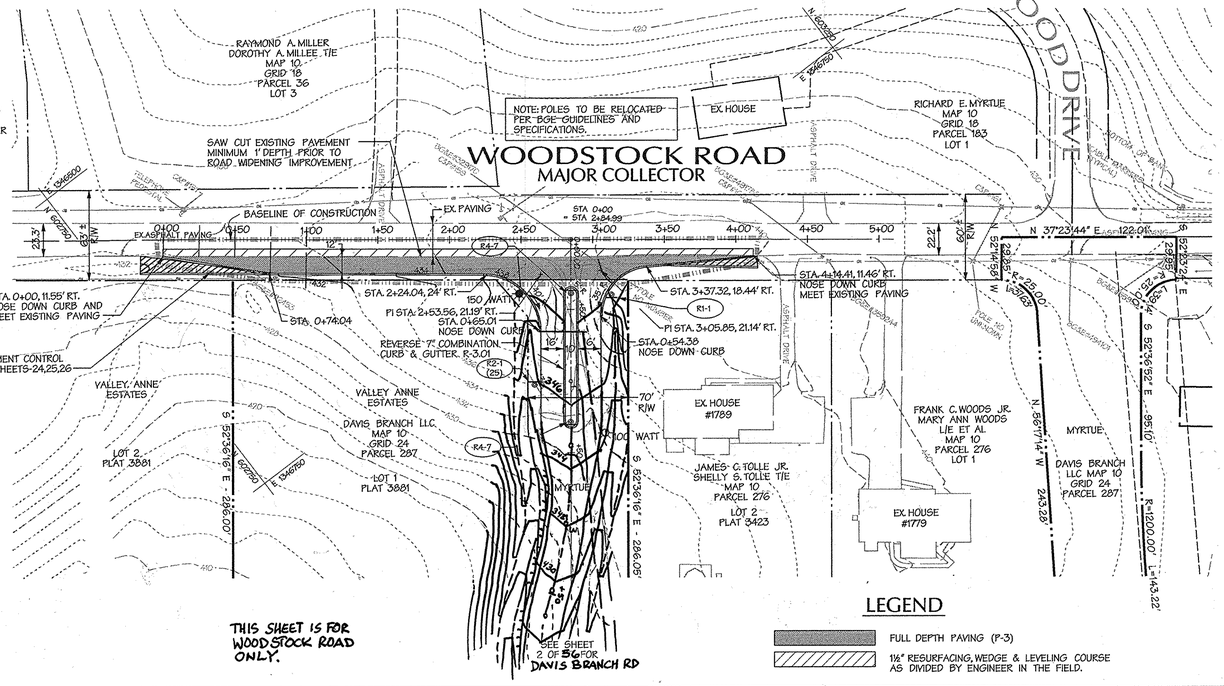
NOT TO SCALE



PAVING SECTION P-3

NOT TO SCALE

NOTE: ANY DISTURBANCE FOR THE WIDENING OF WOODSTOCK ROAD WILL BE IMMEDIATELY STABILIZED BY THE END OF EACH WORK DAY



LEGEND

- FULL DEPTH PAVING (P-3)
- 1½" RESURFACING, WEDGE & LEVELING COURSE AS DIVIDED BY ENGINEER IN THE FIELD.

NAD83

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

STATE OF MARYLAND — NILES A. MILLER — No. 28376 — PROFESSIONAL ENGINEER

12-15-15

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE TO REFLECT REVISIONS TO DAVIS BRANCH RD.

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON- BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 622
61 E. PADONIA ROAD
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

12-24-07
Date

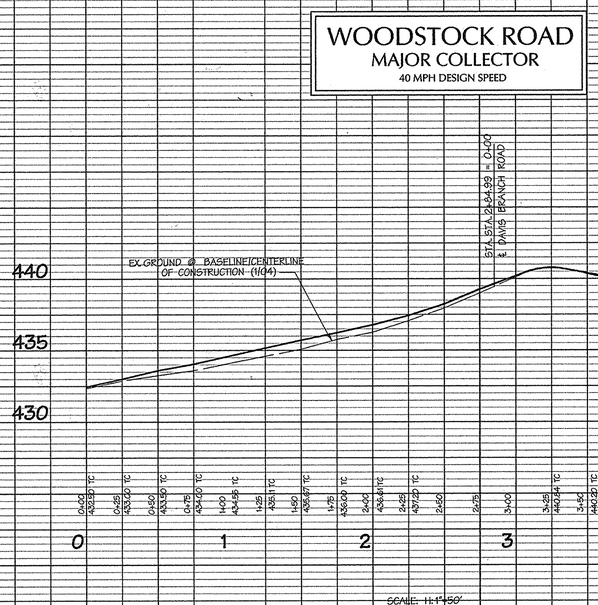
Professional Engr. No. 20784

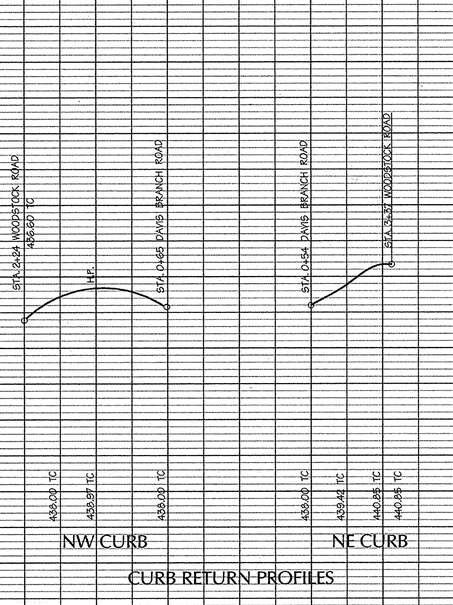
AREA

3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
ROAD WIDENING AND SEDIMENT CONTROL PLAN
WOODSTOCK ROAD

Des. By KAD	Scale 1" = 50'	Proj. No. 02033.D	
Drn. By GMO	Date 2/14/07		8 of 56
Chk. By	Approved		





CURB RETURN PROFILES

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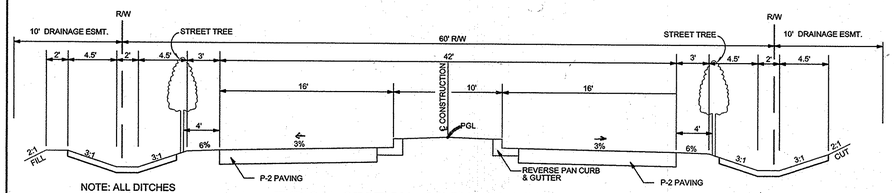
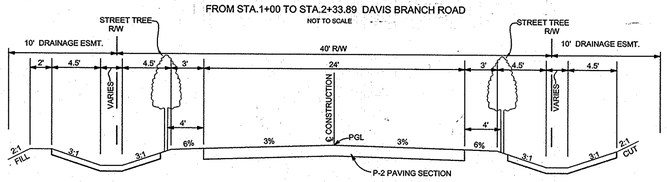


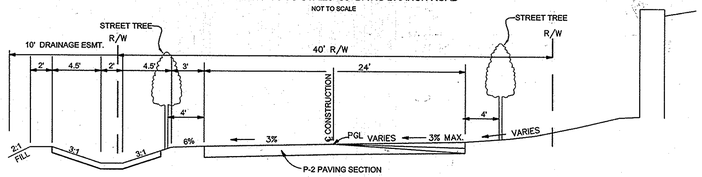
NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

TYPICAL SECTION - 24' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA.1+00 TO STA.2+33.89 DAVIS BRANCH ROAD
NOT TO SCALE



NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

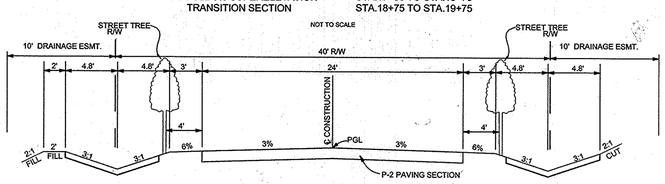
TYPICAL SECTION - 24' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA.2+33.89 TO STA.16+50 DAVIS BRANCH ROAD
AND STA.19+75 TO STA.25+50 DAVIS BRANCH ROAD
NOT TO SCALE



NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

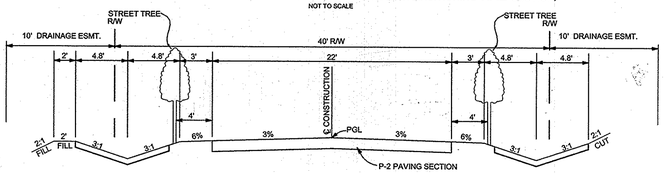
WARP SECTION - 24' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)

TRANSITION SECTION STA.16+50 TO STA.17+50
FULL 3% SUPERELEVATION STA.17+50 TO STA.18+75
TRANSITION SECTION STA.18+75 TO STA.19+75
NOT TO SCALE



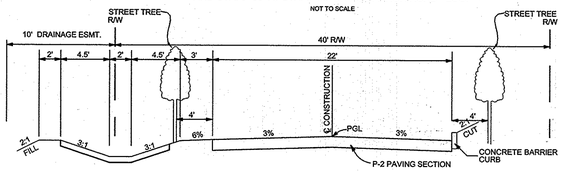
NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

TYPICAL SECTION - 24' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA. 25+50 TO STA.27+00 DAVIS BRANCH ROAD (TRANSITIONING TO 22' SECTION)
NOT TO SCALE



NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

TYPICAL SECTION - 22' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA. 27+00 TO STA. 28+50 DAVIS BRANCH ROAD
AND STA. 0+00 TO STA. 3+06 DAVIS BRANCH ROAD - LOOP
NOT TO SCALE

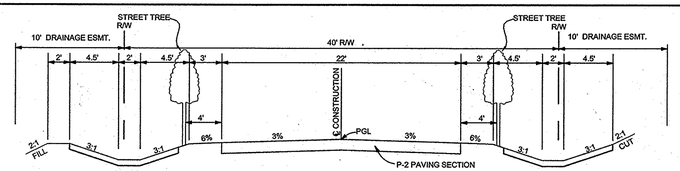


NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

TYPICAL SECTION - 22' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA. 28+50 TO STA. 30+00 DAVIS BRANCH ROAD
NOT TO SCALE

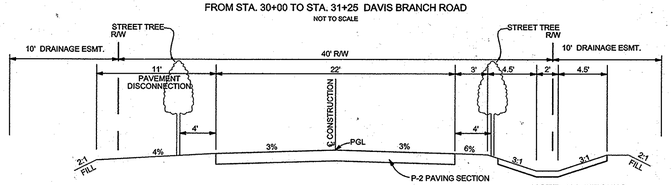
GUARD RAIL LOCATION NOTE:

GUARD RAILS SHALL BE PLACED WITH FACE OF BEAM 3' OFF EDGE OF PAVEMENT, BETWEEN BEGINNING AND ENDING STATIONS SPECIFIED ON SHEETS 2–7.



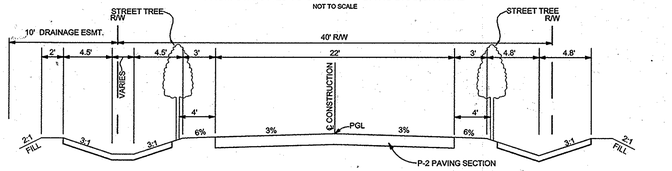
NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

TYPICAL SECTION - 22' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA. 30+00 TO STA. 31+25 DAVIS BRANCH ROAD
NOT TO SCALE



NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

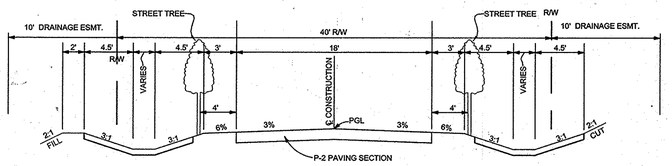
TYPICAL SECTION - 22' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA. 31+25 TO STA. 33+50 DAVIS BRANCH ROAD
NOT TO SCALE



NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

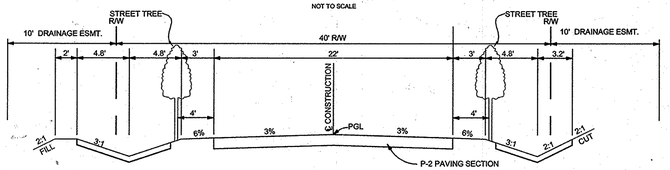
TYPICAL SECTION - 22' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA. 33+50 TO STA. 35+50 DAVIS BRANCH ROAD*
NOT TO SCALE

*STA 36+50 TO 37+50 TRANSITIONS BETWEEN 22' SECTION AND 18' SECTION



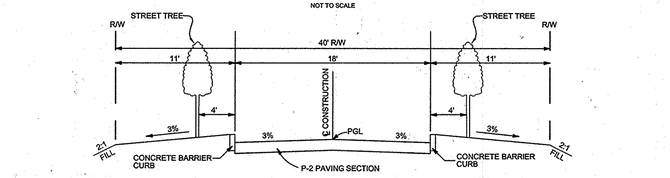
NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

TYPICAL SECTION - 18' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA.37+50 TO 43+00 DAVIS BRANCH ROAD*
AND STA. 52+60 TO 64+70.41 DAVIS BRANCH ROAD
NOT TO SCALE

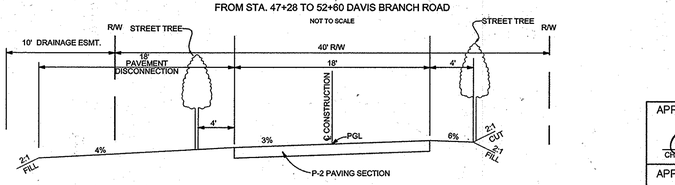


NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

TYPICAL SECTION - 22' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM STA. 42+75 TO STA. 47+28 DAVIS BRANCH ROAD
NOT TO SCALE

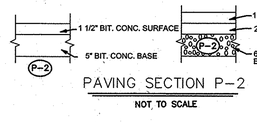


TYPICAL SECTION - 18' PUBLIC ACCESS STREET- CLOSED SECTION
(30 MPH DESIGN SPEED)
FROM STA. 47+28 TO 52+60 DAVIS BRANCH ROAD
NOT TO SCALE

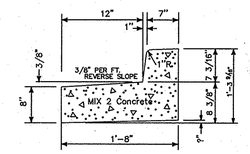


NOTE: ALL DITCHES TO BE STABILIZED WITH 10' ECM

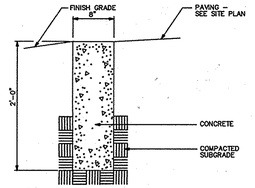
TYPICAL SECTION - 18' PUBLIC ACCESS STREET
(30 MPH DESIGN SPEED)
FROM 0+00 TO 5+86.99 CUL-DE-SAC OF DAVIS BRANCH ROAD
NOT TO SCALE



PAVING SECTION P-2
NOT TO SCALE

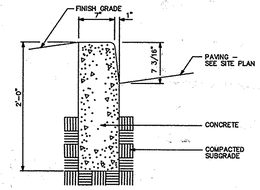


REVERSE 7" COMBINATION CURB & GUTTER R-3.01
NOT TO SCALE



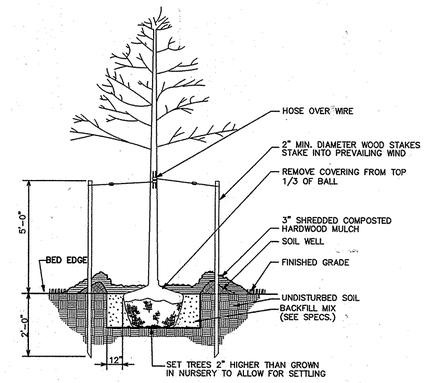
SECTION

CONCRETE FLUSH CURB
NOT TO SCALE

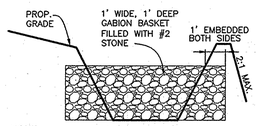


SECTION

CONCRETE BARRIER CURB
NOT TO SCALE



SWALE WIDTH TABLE		
LOCATION	OFFSET	WIDTH
STA 2+00 TO STA 7+30	RT & LT	6'
STA 28+50 TO STA 31+10	LT	5'
STA 30+00 TO STA 32+50	RT	5'
STA 33+60 TO STA 37+25	LT	5'
STA 38+00 TO STA 41+20	RT	4'
STA 38+00 TO STA 42+90	LT	4'
STA 52+75 TO STA 54+75	RT & LT	8'
STA 54+75 TO STA 64+65	RT & LT	3'



NOTE:
GABION BASKET LENGTHS TABULATED THIS SHEET.

GABION CHECK DAM
NOT TO SCALE

GABION CHECK DAMS			
SWALE NAME	STATION	OFFSET	LENGTH
GS-5A	3+03	22.6' RT	14'
GS-6A	3+21	22.9' LT	14'
GS-6A	3+84	22.6' LT	14'
GS-5A	3+84	22.5' RT	14'
GS-13	34+95	22.4' LT	13'
GS-13	35+39	22.4' LT	13'
GS-13	35+84	22.4' LT	13'
GS-16A	39+59	17.3' RT	12'
GS-16A	40+48	17.3' RT	12'
GS-15A	40+48	17.9' LT	12'
GS-22	56+77	17.7' RT	11'
GS-23	57+66	17.5' LT	11'
GS-22	57+88	18.5' RT	11'

STONE CHECK DAMS SHALL BE PLACED EVERY 15' IN THE VEE SWALES ON BOTH SIDES, FROM STA 43+35 TO 47+10. THE CHECK DAMS ARE FOR VELOCITY CONTROL PURPOSES, AND SHALL BE 1.1' HIGH. SEE SHEET 20 FOR DETAIL.

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 6, 2007 DMW PLAN SHEET.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/19/16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — BLAKE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-18-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT:
MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

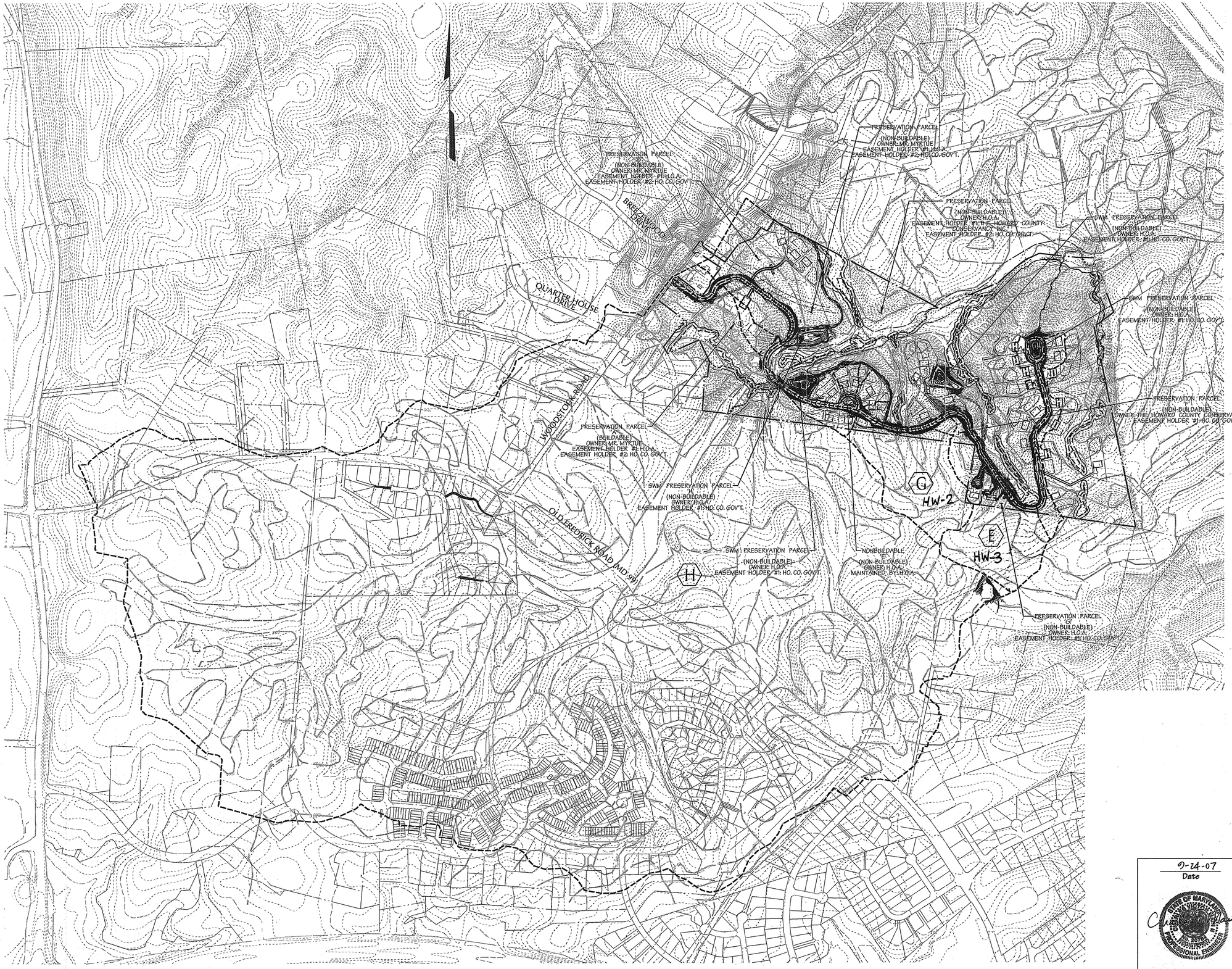
TITLE:
ROAD DETAILS

DES: AAM | DRAFT: AAM | CHECK: CAM

DATE: JUNE, 2015 / DECEMBER, 2015
PROJECT NO. 2099
SCALE: AS SHOWN
DRAWING 9 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7017.dwg, TYP SECT, 12/14/2015 9:58:16 AM, bdodson



11.9 AC± C=0.28 (E) ZONING RC DEO 10% IMP.

15.3 AC± C=0.28 (G) ZONING 10% IMP.

656 AC± (H) AREA H - "Q" 100-YR SEE FLOODPLAIN SYUDY

FOR OFFSITE DRAINAGE MAP ONLY
ON-SITE CONTOURS DO NOT REFLECT CURRENT DESIGN.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. _____, Expiration Date: _____

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

STATE OF MARYLAND ALICE A. MILLER No. 20879 PROFESSIONAL ENGINEER

LEGEND

- DRAINAGE AREA BOUNDARY LINE
- PROPERTY BOUNDARY LINE
- EX. STREAM
- SOIL TYPE AND BOUNDARIES

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE DRAINAGE TO HW-3; ADD STRUCTURE DESIGNATIONS

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 528
61 E. PADONIA ROAD,
TIMONIUM, MD 21093

DMW
Daft · McCune · Walker, Inc.
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals
200 East Pennsylvania Avenue
Towson, Maryland 21286
410 296 3333
Fax 296 4705

SUBDIVISION NAME		SECTION/AREA		LOT/PARCEL
MYRTUE PROPERTY		N/A		P. 225/287
PLAT# OR L/F	BLOCK #	ZONE REQUIRED	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
281/269	24		10	3	6067.04
WATER CODE		SEWER CODE			
-		-			

9-24-07
Date

STATE OF MARYLAND COUNTY OF HOWARD CHARLES W. WALKER No. 20784 REGISTERED PROFESSIONAL ENGINEER

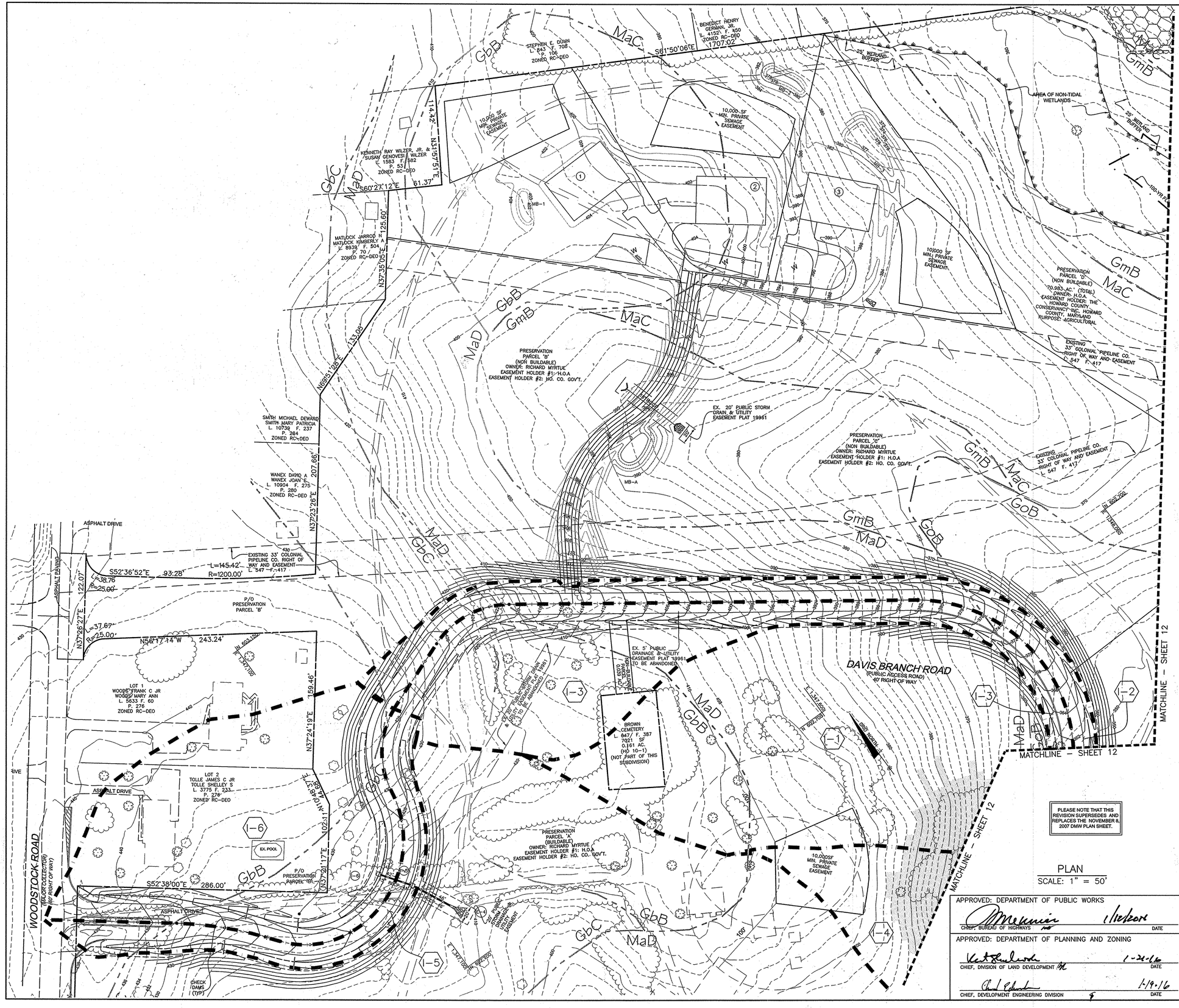
Professional Engr. No. 20784

TITLE
OFFSITE
STORM DRAIN DRAINAGE AREA MAP
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

Drn By:	GMO	Scale:	1"=400'	Proj. No.	02033.D
Des By:		Date:	11/17/06		
Chk By:		Approved:			

F-06-104

Mon Sep 17 14:10:24 2007 n:\02033\Final plans\02033.DA1



LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W — PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS
- EXISTING TREELINE
- MaC — SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- STORM DRAIN DRAINAGE AREA DIVIDE
- I-22 — STORM DRAIN DRAINAGE AREA DESIGNATION

PLAN
SCALE: 1" = 50'

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/18/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/19/16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — JUDGE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT:
MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
STORM DRAIN DRAINAGE AREA MAP

DATE: JUNE, 2015 / DECEMBER, 2015
PROJECT NO. 2099
SCALE: AS SHOWN
DRAWING 11 OF 56

DES: AAM | DRAFT: AAM | CHECK: CAM

F-06-104

J:\2099 Myrtue Property\dwg\7025.dwg, SDDA-11, 12/14/2015 10:13:37 AM, bdodson

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W — PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS
- EXISTING TREELINE
- MaC — SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- STORM DRAIN DRAINAGE AREA DIVIDE
- I-22 — STORM DRAIN DRAINAGE AREA DESIGNATION

PLAN
SCALE: 1" = 50'

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-14-15
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24, PARCEL 225, 6th ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

TITLE: STORM DRAIN DRAINAGE AREA MAP

DATE: JUNE, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

DES: AAM | DRAFT: AAM | CHECK: CAM | SCALE: AS SHOWN | DRAWING 12 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7025.dwg, SDDA-12, 12/14/2015 10:12:30 AM, bdodson

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

AREA AND "C" FACTOR TABULATION

PROJECT: Myrtue Property DATE: 09/17/15 AAM

INLET #	ZONING (Z)	SUBAREA (B)	AREA (Ac) (A)	"C" FACTOR (C)	% IMPERVIOUS (P) CALCULATED
I-1	RC-DEO		2.66	0.22	0
I-2	RC-DEO		0.68	0.49	42
I-3	RC-DEO		1.44	0.34	19
I-4	RC-DEO		2.66	0.34	19
I-5	RC-DEO		0.43	0.52	48
I-6	RC-DEO		1.94	0.34	21
I-7	RC-DEO		0.79	0.64	67
I-8	RC-DEO		2.15	0.28	10
I-9	RC-DEO		0.30	0.43	33
I-10	RC-DEO		0.28	0.42	33
I-11	RC-DEO		0.64	0.33	17
I-12	RC-DEO		0.10	0.47	39
I-13	RC-DEO		0.19	0.45	37
I-14	RC-DEO		0.96	0.29	12
I-15	RC-DEO		0.39	0.41	30
I-16	RC-DEO		2.97	0.28	10
I-17	RC-DEO		0.30	0.53	49
I-18	RC-DEO		2.20	0.28	10
HW-3	RC-DEO		11.89	0.28	10
I-20	RC-DEO		0.16	0.56	54
I-21	RC-DEO		0.17	0.57	56
I-22	RC-DEO		0.77	0.38	27
I-23	RC-DEO		0.88	0.42	23
I-24	RC-DEO		0.79	0.42	33
HW-2	RC-DEO		15.31	0.27	10

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
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STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-14-15
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.19.16

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24, PARCEL 225, 6th ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

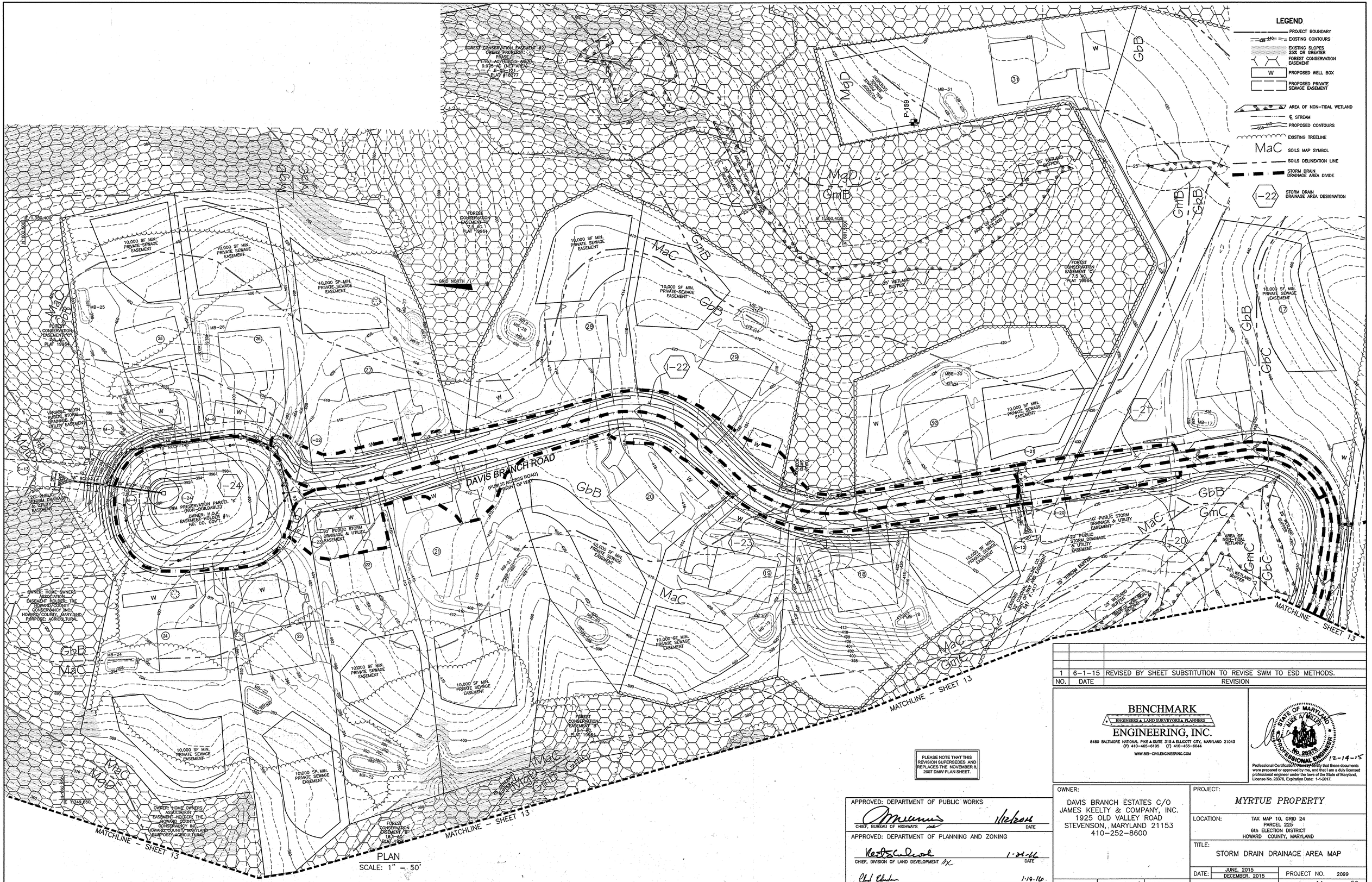
TITLE: STORM DRAIN DRAINAGE AREA MAP

DATE: JUNE, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

DES: AAM | DRAFT: AAM | CHECK: CAM | SCALE: AS SHOWN | DRAWING 13 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7025.dwg, SDDA-13, 12/14/2015 9:42:24 AM, bdodson



PLAN
SCALE: 1" = 50'

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W — PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS
- EXISTING TREELINE
- MaC — SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- STORM DRAIN DRAINAGE AREA DIVIDE
- I-22 — STORM DRAIN DRAINAGE AREA DESIGNATION

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 11/16/2015

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

BENCHMARK
ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — BLAKE A. MILLER — No. 28576 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28576, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, , MARYLAND 21153
410-252-8600

PROJECT:
MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
STORM DRAIN DRAINAGE AREA MAP

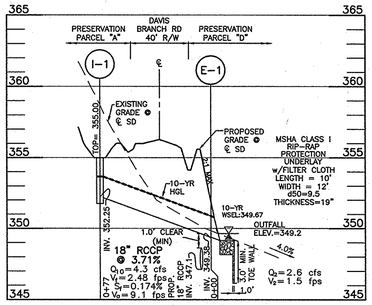
DATE: JUNE, 2015 / DECEMBER, 2015
PROJECT NO. 2099

DES: AAM | DRAFT: AAM | CHECK: CAM

SCALE: AS SHOWN
DRAWING 14 OF 56

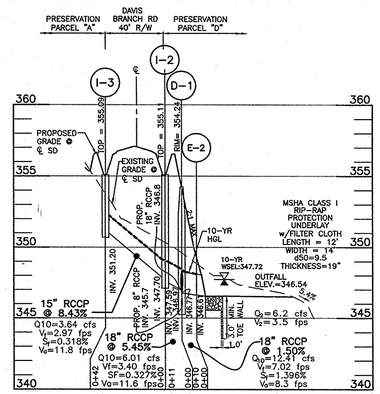
F-06-104

J:\2099 Myrtue Property\dwg\7025.dwg, SDDA-14, 12/11/2015 9:41:35 AM, bdodson



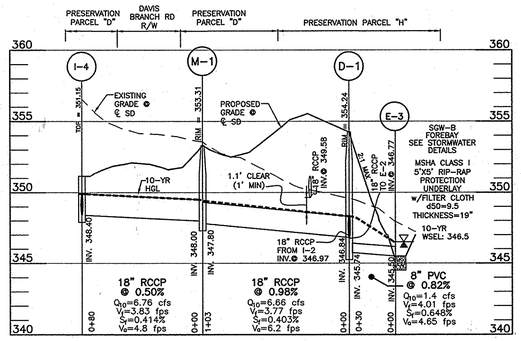
E1 TO I1

SCALE: 1"=50' HORIZ., 1"=5' VERT.



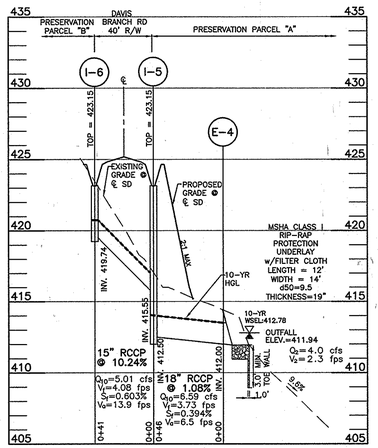
E2 TO I3

SCALE: 1"=50' HORIZ., 1"=5' VERT.



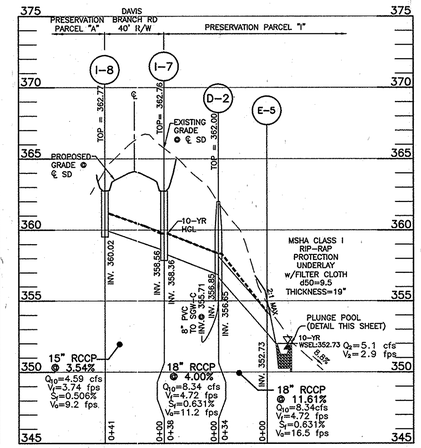
E3 TO I4

SCALE: 1"=50' HORIZ., 1"=5' VERT.



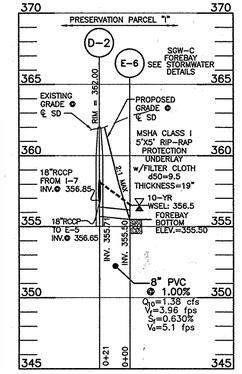
E4 TO I6

SCALE: 1"=50' HORIZ., 1"=5' VERT.



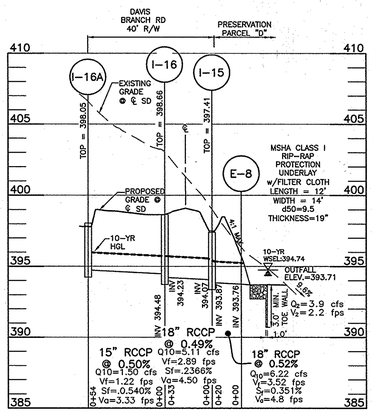
E5 TO I8

SCALE: 1"=50' HORIZ., 1"=5' VERT.



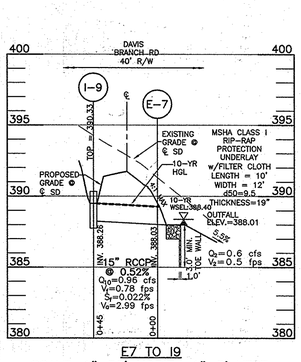
E6 TO D2

SCALE: 1"=50' HORIZ., 1"=5' VERT.



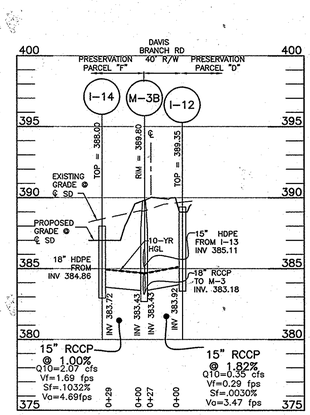
E8 TO I16

SCALE: 1"=50' HORIZ., 1"=5' VERT.



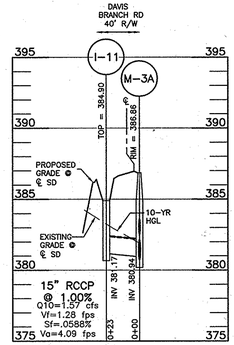
E7 TO I9

SCALE: 1"=50' HORIZ., 1"=5' VERT.



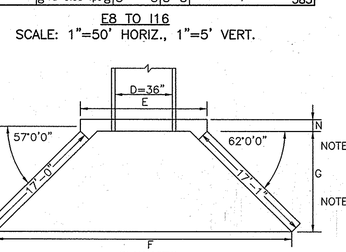
I-12 TO I14

SCALE: 1"=50' HORIZ., 1"=5' VERT.



M3A TO I11

SCALE: 1"=50' HORIZ., 1"=5' VERT.



D	E	F	G	H	J	K	L	N
36"	5'-1"	20'-8"	14'-8"	11'-6"	4'-0"	9"	12"	14"

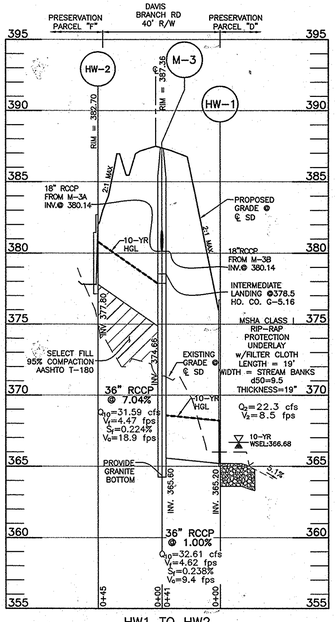
NOTE: CONTRACTOR SHALL PROVIDE 3"-45° BEVEL AROUND PIPE OPENINGS ON UP-STREAM HEADWALLS

NOTE: SEE HO. CO. STD SD-5.11 FOR SPECIFICATIONS ON REINFORCING STEEL.

NOTE: DETAIL IS FOR OVERALL DIMENSIONS ONLY, CONTRACTOR SHALL VERIFY STRUCTURAL DESIGN BEFORE CONSTRUCTION

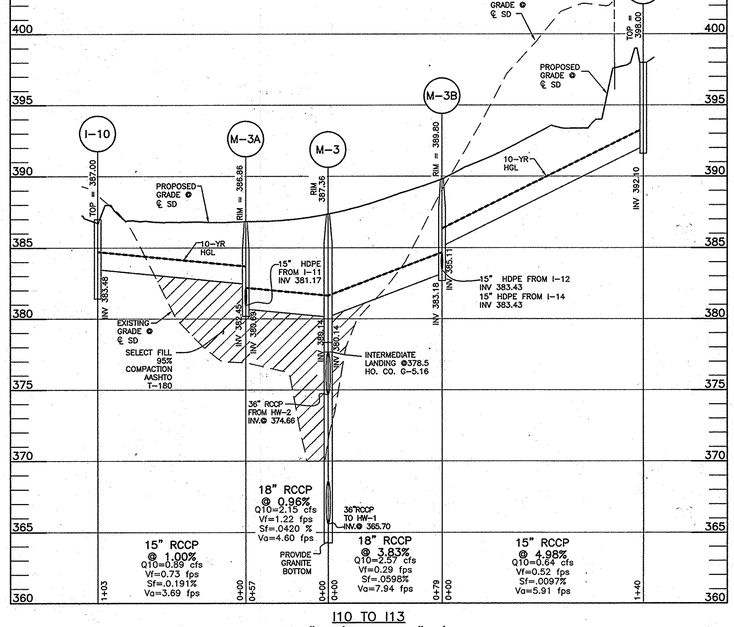
H-1 (DOWNSTREAM) MODIFIED TYPE 'A' HEADWALL

NOT TO SCALE



HW1 TO HW2

SCALE: 1"=50' HORIZ., 1"=5' VERT.



I10 TO I13

SCALE: 1"=50' HORIZ., 1"=5' VERT.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

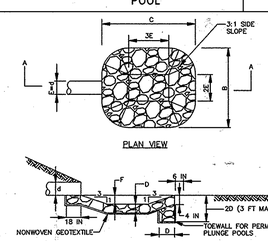
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

PLUNGE POOL GEOMETRY

OUTFALL	B	C	D	E	F	RIP-RAP SHA CLASS
E-5*	7.50'	9.00'	19"	1.5'	0.75'	0

*A 6' X 3' X 1 GABION WALL SHALL BE PROVIDED AT THE END OF PLUNGE POOL AT E-5 FOR ENERGY DISSIPATION. THE GABION SHALL BE EMBEDDED ALONG ITS LENGTH TO A DEPTH OF 2' OF ITS WIDTH, WITH AN EXPOSED DIMENSION OF 1'X1'X6'.

DETAIL D-4-2 PLUNGE POOL — STANDARD SYMBOL PP



CONSTRUCTION SPECIFICATIONS

1. USE SPECIFIED CLASS OF RIPRAP.
2. USE NONWOVEN GEOTEXTILE AS SPECIFIED IN SECTION M-1 MATERIALS, AND PROTECT FROM PUNCHING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE.
3. PREPARE THE SUBGRADE FOR THE PLUNGE POOL TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EMBED THE GEOTEXTILE A MINIMUM OF 4 INCHES AND EXTEND THE GEOTEXTILE A MINIMUM OF 6 INCHES BEYOND THE EDGE OF THE SCOUR HOLE.
5. STONE FOR THE PLUNGE POOL MAY BE PLACED BY EQUIPMENT. CONSTRUCT TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. DELIVER AND PLACE THE STONE FOR THE PLUNGE POOL IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE STONE FOR THE PLUNGE POOL IN A MANNER TO PREVENT DAMAGE TO THE GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. AT THE PLUNGE POOL OUTLET, PLACE THE STONE SO THAT IT MEETS THE EXISTING GRADE.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL		
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

*NOTE:
SEE SHEET 15 FOR STRUCTURE SCHEDULES

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
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STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

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JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

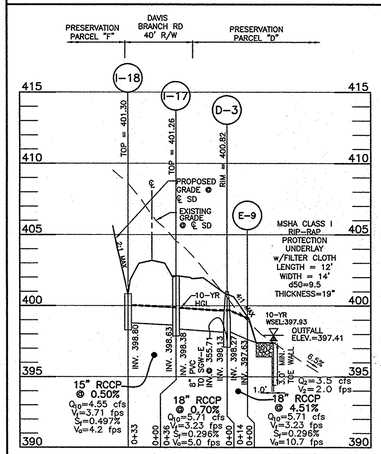
LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: STORMDRAIN PROFILES

DATE: JUNE, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

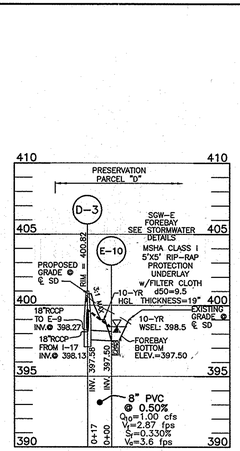
DES: AAM — DRAFT: AAM — CHECK: CAM — SCALE: AS SHOWN — DRAWING 15 OF 56

F-06-104



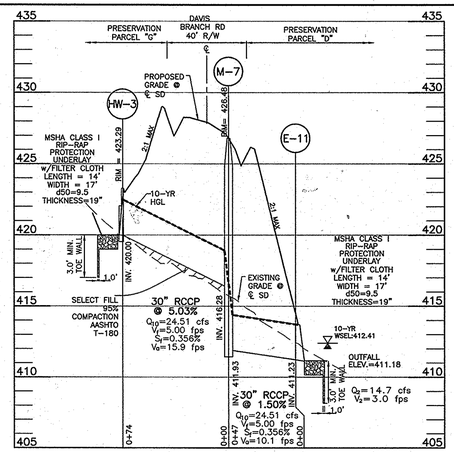
E9 to I18

SCALE: 1"=50' HORIZ., 1"=5' VERT.



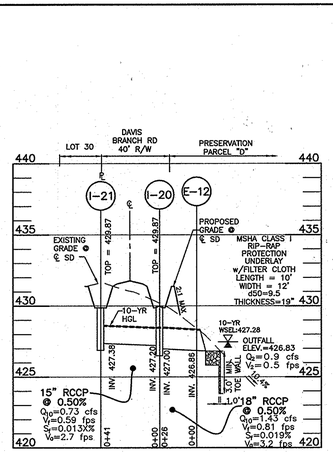
E10 TO D3

SCALE: 1"=50' HORIZ., 1"=5' VERT.



E11 TO HW3

SCALE: 1"=50' HORIZ., 1"=5' VERT.



E12 TO I21

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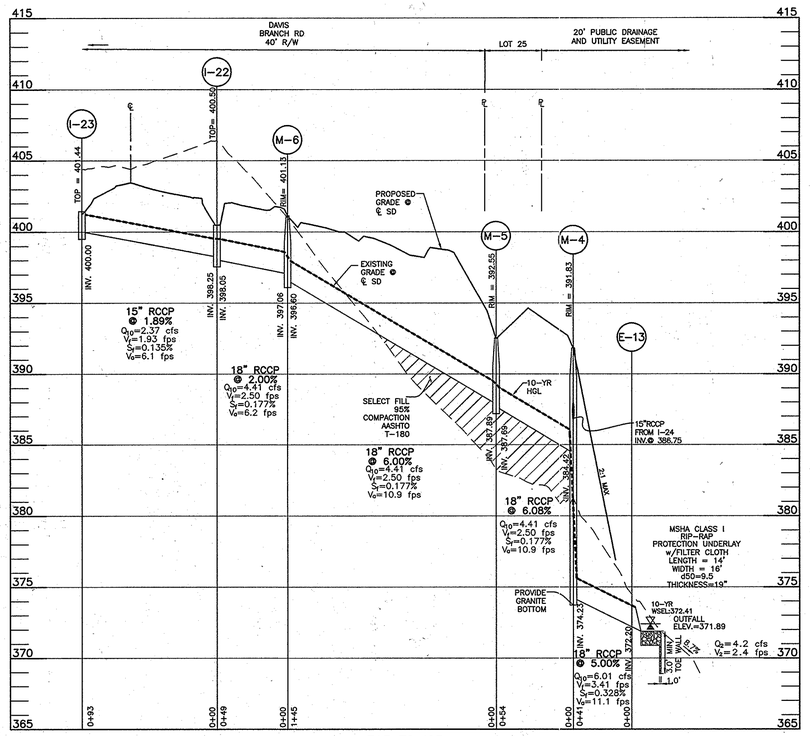
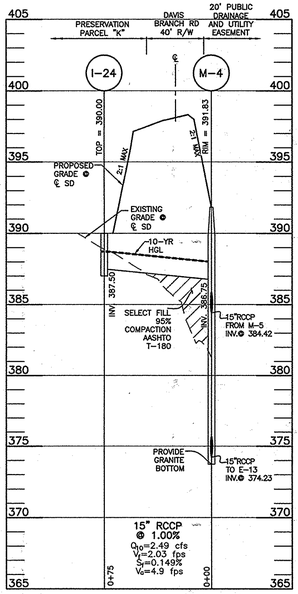


E13 TO I23

SCALE: 1"=50' HORIZ., 1"=5' VERT.



M4 TO I24

SCALE: 1"=50' HORIZ., 1"=5' VERT.

STRUCTURE TABLE

INLETS*

NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	STD. DETAIL		REMARKS
I-1	TYPE 'K'	CL STA. 16+29.25 Davis Branch Road, OFFSET 41.09' RIGHT		352.25(18")	355.00	HO.CO. STD G-5.12	PUBLIC	
I-2	TYPE 'K'	CL STA. 16+12.36 Davis Branch Road, OFFSET 21.17' LEFT	347.70(15")	347.59(18")	355.11	HO.CO. STD G-5.12	PUBLIC	
I-3	TYPE 'K'	CL STA. 16+11.74 Davis Branch Road, OFFSET 20.37' RIGHT		351.20(15")	355.09	HO.CO. STD G-5.12	PUBLIC	
I-4	TYPE 'K'	CL STA. 18+09.29 Davis Branch Road, OFFSET 20.46' LEFT		348.40(18")	351.15	HO.CO. STD G-5.12	PUBLIC	
I-5	TYPE 'K'	CL STA. 5+30.99 Davis Branch Road, OFFSET 20.47' RIGHT	415.55(15")	412.50(18")	423.15	HO.CO. STD G-5.12	PUBLIC	
I-6	TYPE 'K'	CL STA. 05+28.71 Davis Branch Road, OFFSET 20.43' LEFT		419.74(15")	423.15	HO.CO. STD G-5.12	PUBLIC	
I-7	TYPE 'K'	CL STA. 21+51.92 Davis Branch Road, OFFSET 20.63' LEFT		358.36(18")	362.76	HO.CO. STD G-5.12	PUBLIC	
I-8	TYPE 'K'	CL STA. 21+51.61 Davis Branch Road, OFFSET 20.58' RIGHT		360.02(15")	362.77	HO.CO. STD G-5.12	PUBLIC	
I-9	TYPE 'D'	CL STA. 27+27.39 Davis Branch Road, OFFSET 25.62' LEFT		388.26(15")	390.33	HO.CO. STD D-4.10	PUBLIC	WEIR ELEVATION=390.33, 4-SIDES
I-10	TYPE 'K'	CL STA. 31+09.10 Davis Branch Road, OFFSET 19.56' LEFT		383.48(15")	387.00	HO.CO. STD G-5.12	PUBLIC	
I-11	TYPE 'K'	CL STA. 32+13.51 Davis Branch Road, OFFSET 19.32' RIGHT		381.17(15")	384.90	HO.CO. STD G-5.12	PUBLIC	
I-12	TYPE 'K'	CL STA. 33+60.45 Davis Branch Road, OFFSET 20.05' LEFT		383.92(15")	388.81	HO.CO. STD G-5.12	PUBLIC	
I-13	TYPE 'K'	CL STA. 34+90.96 Davis Branch Road, OFFSET 21.66' LEFT		392.10(15")	398.00	HO.CO. STD G-5.12	PUBLIC	
I-14	TYPE 'D'	CL STA. 33+46.66 Davis Branch Road, OFFSET 33.76' RIGHT		383.72(15")	388.00	HO.CO. STD D-4.10	PUBLIC	WEIR ELEVATION=390.33, 4-SIDES
I-15	TYPE 'K'	CL STA. 41+71.96 Davis Branch Road, OFFSET 18.52' LEFT	394.07(18")	393.87(18")	397.21	HO.CO. STD G-5.12	PUBLIC	
I-16	TYPE 'K'	CL STA. 41+72.14 Davis Branch Road, OFFSET 14.45' RIGHT	394.48(15")	394.23(18")	398.66	HO.CO. STD G-5.12	PUBLIC	
I-16A	TYPE 'K'	CL STA. 41+18.86 Davis Branch Road, OFFSET 18.32' RIGHT		394.74(15")	398.10	HO.CO. STD G-5.12	PUBLIC	
I-17	TYPE 'K'	CL STA. 43+18.95 Davis Branch Road, OFFSET 16.73' LEFT	398.63(15")	398.38(18")	401.26	HO.CO. STD G-5.12	PUBLIC	
I-18	TYPE 'K'	CL STA. 43+17.84 Davis Branch Road, OFFSET 16.72' RIGHT		398.80(15")	401.30	HO.CO. STD G-5.12	PUBLIC	
I-20	TYPE 'K'	CL STA. 54+67.97 Davis Branch Road, OFFSET 20.56' LEFT	427.20(15")	427.00(18")	429.99	HO.CO. STD G-5.12	PUBLIC	
I-21	TYPE 'K'	CL STA. 54+67.59 Davis Branch Road, OFFSET 20.52' RIGHT		427.38(15")	429.87	HO.CO. STD G-5.12	PUBLIC	
I-22	TYPE 'K'	CL STA. 0+52.10 Davis Branch Loop, OFFSET 16.38' RIGHT	398.25(15")	398.05(18")	400.48	HO.CO. STD G-5.12	PUBLIC	
I-23	TYPE 'K'	CL STA. 64+57.10 Davis Branch Road, OFFSET 33.64' LEFT		400.00(15")	401.44	HO.CO. STD G-5.12	PUBLIC	
I-24	TYPE 'K'	CL STA. 02+31.05 Davis Branch Loop, OFFSET 48.13' LEFT		387.50(15")	390.00	HO.CO. STD G-5.12	PUBLIC	
F-1	FLOW-THRU	CL STA. 29+98.05 Davis Branch Loop, OFFSET 11.00' LEFT		---	393.44	MD-474.68	PUBLIC	

1) STRUCTURE ELEVATION AND LOCATION FOR TYPE 'K' AND TYPE 'D' INLETS IS AT THE TOP OF GRATE OR COVER AT THE MIDPOINT OF THE INLET.
2) FLOW THROUGH CURB INLETS INLETS SHALL 4' LONG, WITH A 3" OPENING, AND 2' WIDE FROM FACE OF CURB TO REAR INLET LIP, IN GENERAL COMPLIANCE WITH MD 374.68.
3) FLOW THROUGH CURB INLETS (F) SHALL BE EROSION PROTECTION SHALL CONSIST OF CLASS I RIPRAP, 19" THICK FROM BACK OF INLET TO BOTTOM OF SWALE.

STRUCTURE TABLE

MANHOLES*

NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	STD. DETAIL	OWNER	REMARKS
M-1	48" MH	CL STA. 17+14.85 Davis Branch Road, OFFSET 15.72' LEFT	348.00(18")	347.80(18")	353.31	HO.CO. STD G-5.12	PUBLIC	
M-3	60" MH	CL STA. 32+71.49 Davis Branch Road, OFFSET 4.25' LEFT	374.66(36") 381.68(18") 380.14(18")	365.60(36")	387.36	HO.CO. STD G-5.13	PUBLIC	
M-3A	48" MH	CL STA. 32+13.66 Davis Branch Loop, OFFSET 3.85' LEFT	380.94(15") 382.45(15")	380.69(18")	386.86	HO.CO. STD G-5.12	PUBLIC	
M-3B	48" MH	CL STA. 33+50.50 Davis Branch Road, OFFSET 4.77' RIGHT	383.43(15") 383.43(15") 385.11(15")	384.86(18")	389.80	HO.CO. STD G-5.12	PUBLIC	
M-4	48" MH	CL STA. 02+62.63 Davis Branch Loop, OFFSET 25.07' RIGHT	384.42(18") 386.76(15")	374.23(18")	391.83	HO.CO. STD G-5.12	PUBLIC	
M-5	48" MH	CL STA. 02+23.80 Davis Branch Loop, OFFSET 24.09' RIGHT	387.89(18")	387.69(18")	392.55	HO.CO. STD G-5.12	PUBLIC	
M-6	48" MH	CL STA. 0+92.34 Davis Branch Loop, OFFSET 12.95' RIGHT	397.06(18")	396.60(18")	401.13	HO.CO. STD G-5.12	PUBLIC	
M-7	60" MH	CL STA. 46+82.65 Davis Branch Road, OFFSET 10.50' LEFT	416.28(30")	411.93(30")	426.48	HO.CO. STD G-5.13	PUBLIC	

M-2 HAS BEEN PURPOSELY REMOVED FROM THIS PLAN.

PIPE SCHEDULE

SIZE	LENGTH	TYPE & CLASS	OWNER
8"	69'	CLASS IV RCP	PRIVATE
15"	795'	CLASS IV RCP	PUBLIC
18"	958'	CLASS IV RCP	PUBLIC
30"	121'	CLASS IV RCP	PUBLIC
36"	85'	CLASS IV RCP	PUBLIC

STRUCTURE TABLE

DIVERSION MANHOLES*

NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	STD. DETAIL	OWNER	REMARKS
D-1	48" MH	CL STA. 16+12.58 DAVIS BRANCH ROAD, OFFSET 32.60' LEFT	346.84(18") 346.97(18")	345.74(8") 346.77(18")	354.24	HO.CO. STD G-5.12	PUBLIC	
D-2	48" MH	CL STA. 21+52.05 DAVIS BRANCH ROAD, OFFSET 58.39' LEFT	356.85(18")	356.71(8") 356.65(18")	362.00	HO.CO. STD G-5.12	PUBLIC	
D-3	48" MH	CL STA. 42+78.16 DAVIS BRANCH ROAD, OFFSET 24.06' LEFT	398.13(18")	398.27(18") 397.38(8")	400.82	HO.CO. STD G-5.12	PUBLIC	

STRUCTURE TABLE

HEADWALL STRUCTURES*

NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	STD. DETAIL	OWNER	REMARKS
HW-1	MODIFIED TYPE "A"	CL STA. 32+74.39 DAVIS BRANCH ROAD, OFFSET 44.77' LEFT	365.20(36")		376.00		PUBLIC	SEE SHEET 15 FOR OVERALL DIMENSIONS
HW-2	TYPE "A" 36" RCCP	CL STA. 32+71.40 DAVIS BRANCH ROAD, OFFSET 40.26' RIGHT	377.80(36")		382.70	HO.CO. STD D-5.11	PUBLIC	
HW-3	TYPE "A" 30" RCCP	CL STA. 47+33.90 DAVIS BRANCH ROAD, OFFSET 42.69' RIGHT		420.00(30")	423.29	HO.CO. STD D-5.11	PUBLIC	

STRUCTURE TABLE

END SECTIONS*

NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.	STD. DETAIL	OWNER	REMARKS
E-1	18" CONCRETE END SECTION	CL STA. 16+40.58 Davis Branch Road, OFFSET 35.36' LEFT	349.38(18")		351.17	HO.CO. STD G-5.51	PUBLIC	
E-2	18" CONCRETE END SECTION	CL STA. 16+13.64 Davis Branch Road, OFFSET 42.94' LEFT	346.61(18")		348.41	HO.CO. STD G-5.51	PUBLIC	
** E-3	8" PVC; NO END SECTION	N=602,404.5068 E=1,347,793.2890	N/A		N/A		PUBLIC	
E-4	18" CONCRETE END SECTION	CL STA. 05+27.25 Davis Branch Road, OFFSET 68.79' RIGHT	412.00(18")		413.89	HO.CO. STD G-5.51	PUBLIC	
E-5	18" CONCRETE END SECTION	CL STA. 21+22.06 Davis Branch Road, OFFSET 74.01' LEFT	352.73(18")		354.52	HO.CO. STD G-5.51	PUBLIC	
** E-6	8" PVC; NO END SECTION	N=602,077.6798 E=1,347,804.7303	N/A		N/A		PUBLIC	
E-7	18" CONCRETE END SECTION	CL STA. 26+82.98 Davis Branch Road, OFFSET 21.69' LEFT	388.03(15")		389.55	HO.CO. STD G-5.51	PUBLIC	
E-8	18" CONCRETE END SECTION	CL STA. 41+80.56 Davis Branch Road, OFFSET 37.03' LEFT	393.76(18")		395.26	HO.CO. STD G-5.51	PUBLIC	
E-9	18" CONCRETE END SECTION	CL STA. 42+61.88 Davis Branch Road, OFFSET 32.17' LEFT	397.63(18")		399.42	HO.CO. STD G-5.51	PUBLIC	
** E-10	8" PVC; NO END SECTION	CL STA. 21+72.62 Davis Branch Road, OFFSET 64.07' LEFT	N/A		N/A		PUBLIC	
E-11	24" CONCRETE END SECTION	CL STA. 46+50.29 Davis Branch Road, OFFSET 44.10' LEFT	411.23(30")		414.11	HO.CO. STD G-5.51	PUBLIC	
E-12	18" CONCRETE END SECTION	CL STA. 54+67.14 Davis Branch Road, OFFSET 46.54' LEFT	426.86(18")		428.69	HO.CO. STD G-5.51	PUBLIC	
E-13	18" CONCRETE END SECTION	CL STA. 02+64.66 Davis Branch Loop, OFFSET 65.59' RIGHT	372.20(18")		373.99	HO.CO. STD G-5.51	PUBLIC	

**NOTE: THERE IS NO END SECTION FOR B-3, B-6, B-10. 8" PVC SHALL OUTFALL TO 5'x5' CLASS I RIP-RAP. LOCATION REFERS TO ENDPOINT QUADRANT OF 8" PIPE.

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 6, 2007 DMW PLAN SHEET.

*NOTE:
STRUCTURE LOCATION FOR MANHOLES IS AT THE CENTER OF THE RIM.
STRUCTURE LOCATION FOR INLETS IS AT THE CENTER OF THE INLET.
STRUCTURE LOCATION FOR THE END-SECTIONS IS AT THE PIPE INVERT OF THE STRUCTURE.
PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/19/16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MICHEL — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT:
MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
STORMDRAIN PROFILES

DES: AAM | DRAFT: AAM | CHECK: CAM

DATE: JUNE, 2015 / DECEMBER, 2015 | PROJECT NO. 2099

SCALE: AS SHOWN | DRAWING 16 OF 56

F-06-104

PLAN
SCALE: 1" = 150'

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

FOR SEDIMENT CONTROL ONLY

ENGINEER'S CERTIFICATE

"I HEREBY 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."

ENGINEER – Alice A. Miller P.E. 12-14-15 DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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."

DEVELOPER 12/16/15 DATE

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

HOWARD SCD 1/7/16 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS 1/12/2016 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT 1-21-16 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 1-18-16 DATE

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24, PARCEL 225, 6th ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

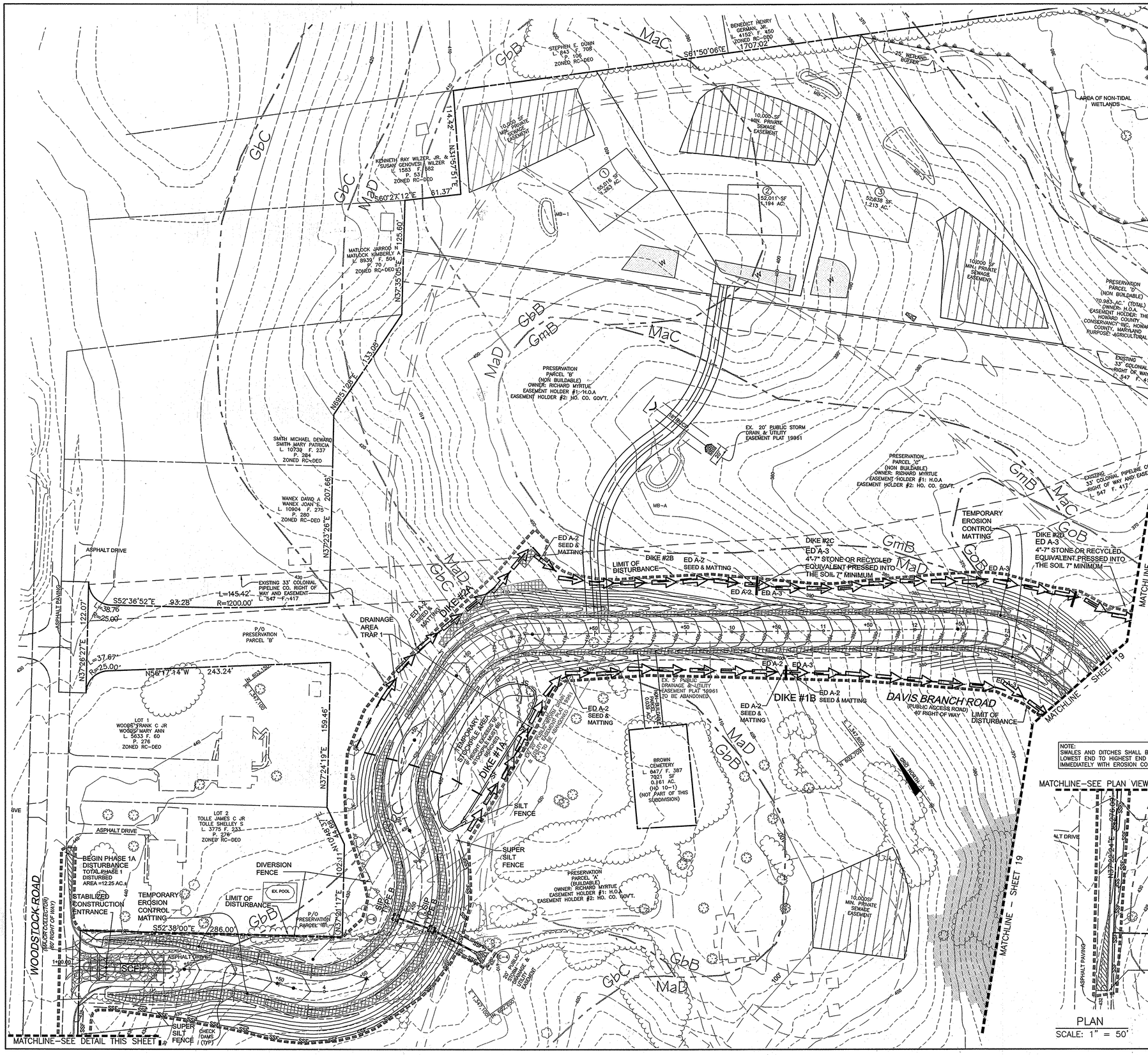
TITLE: COMPOSITE EROSION AND SEDIMENT CONTROL PLAN

DATE: JUNE, 2015 / DECEMBER, 2015 | PROJECT NO. 2099

DES: AAM | DRAFT: AAM | CHECK: CAM | SCALE: AS SHOWN | DRAWING 17 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7023-Overall.dwg, SEC-OVERALL, 12/14/2015 9:37:09 AM, bdodson



Baffle Board Design (See Detail G-2-4)

1. A = surface area at wet storage elevation = _____ ft.
2. Effective width, $W_e = (A/2)/L$ = _____ ft.
3. Flow length from inflow point to outlet = _____ ft.
4. If line 3 is less than $W_e \times 2$, provide baffle boards to lengthen flow path.
5. Effective flow length, $L_e = L1 + L2 + L3$ = _____ ft (must be $\geq We \times 2$ = _____ ft)

Trap 1:
A= 9597 SF
W_e= 69.3'

Inflow length @ Dike 2 = 48' Needs Baffle)
Use 56' baffle. L_1 = 45'; L_2 = 24'; L_e = 69'

Inflow length @ Dike 3 = 152' (OK)

Trap 2:
A= 8540 SF
W_e= 57.6'

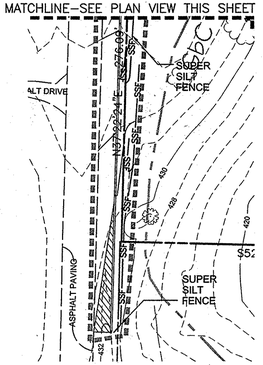
Inflow length @ Dike 5 = 128' (OK)

Inflow length @ Dike 6 = 64' (OK)

PLEASE NOTE: THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 6, 2007 DMW PLAN SHEET.

NOTE:
SWALES AND DITCHES SHALL BE CONSTRUCTED FROM LOWEST END TO HIGHEST END AND STABILIZED IMMEDIATELY WITH EROSION CONTROL MATTING

MATCHLINE-SEE PLAN VIEW THIS SHEET



PLAN
SCALE: 1" = 50'

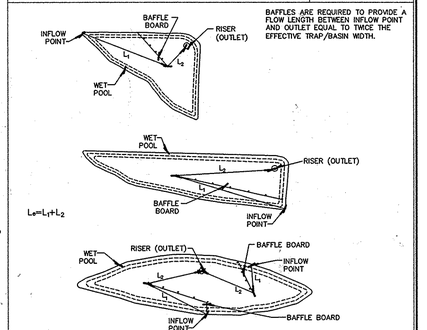
LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS (435 / 440)
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- LIMIT OF DISTURBANCE
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS (440 / 435)
- EXISTING TREELINE
- MaC SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- SF SILT FENCE
- SUPER SILT FENCE
- EROSION CONTROL MATTING
- EARTH DIKE
- DIVERSION FENCE
- SIP STANDARD INLET PROTECTION
- MOUNTABLE BERM
- SPB SUBMERSIBLE PUMP

DETAIL G-2-4 BAFFLE BOARDS

STANDARD SYMBOL: BB

BAFFLES ARE REQUIRED TO PROVIDE A FLOW LENGTH BETWEEN INFLOW POINT AND OUTLET EQUAL TO TWICE THE EFFECTIVE TRAP/BASIN WIDTH.



MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SOILS LEGEND

SYMBOL	TYPE	K* FACTOR	NAME
GbB	B	.28	GLADSTONE LOAM – 3 TO 8 PERCENT SLOPES
GbC	B	.28	GLADSTONE LOAM – 8 TO 15 PERCENT SLOPES
GmB	C	.43	GLENVILLE SILT LOAM – 8 TO 15 PERCENT SLOPES
GmC	C	.43	GLENVILLE SILT LOAM – 8 TO 15 PERCENT SLOPES
GoB	C	.43	GLENVILLE–CORDORUS SILT LOAMS – 0 TO 8 PERCENT SLOPES
MaC	B	.32	MANOR LOAM – 8 TO 15 PERCENT SLOPES
MaD	B	.32	MANOR LOAM – 15 TO 25 PERCENT SLOPES
MgD	B	.32	MANOR–BANNERTOWN SANDY LOAMS, 15 TO 20 PERCENT SLOPES, ROCKY

SOILS TAKEN FROM NRCS WEB SOIL SURVEY, MARCH 17, 2014. REF. SOIL SURVEY MAPS 5 & 6.
*WHOLE SOIL K FACTOR

ENGINEER'S CERTIFICATE

"I HEREBY 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."

ENGINEER – Alice A. Miller, P.E — DATE 12-14-15

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCROING TO THIS PLAN OF DEVELOPMENT 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."

DEVELOPER — DATE 12/16/15

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

HOWARD SCD — DATE 1/3/16

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.19.16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND ALICE A. MILLER No. 28376 PROFESSIONAL ENGINEER

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017. — 12-14-15

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24 PARCEL 225 6th ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: GRADING & SEDIMENT AND EROSION CONTROL PLAN

DATE: JUNE, 2015 DECEMBER, 2015 — PROJECT NO. 2099

DES: AAM | DRAFT: AAM/NAF | CHECK: CAM | SCALE: AS SHOWN | DRAWING 18 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7023.dwg, SEC-18, 12/14/2015 9:35:24 AM, bdodson

STONE/RIPRAP OUTLET SEDIMENT TRAP ST–II, TRAP NO. 1		
DRAINAGE AREA – INITIAL	3.36	ACRES
DRAINAGE AREA – INTERIM	3.36	ACRES
DRAINAGE AREA – FINAL	3.36	ACRES
TOTAL STORAGE REQUIRED	12,096	CF
TOTAL STORAGE PROVIDED	29,589	CF
WET STORAGE REQUIRED	6,048	CF
WET STORAGE PROVIDED	6,064	CF
DRY STORAGE REQUIRED	6,048	CF
DRY STORAGE PROVIDED	23,525	CF
EXISTING GROUND ELEVATION AT OUTLET (WET STORAGE ELEVATION)	344.0	FT
TRAP BOTTOM ELEVATION	343.0	FT
TRAP BOTTOM DIMENSIONS	32 x 180	FT x FT
WEIR LENGTH	14	FT
WEIR CREST (DRY STORAGE) ELEVATION	347.0	FT
CLEANOUT ELEVATION	343.50	FT
TOP OF EMBANKMENT ELEVATION	348.0	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	4	FT
OUTLET PROTECTION – LENGTH	15	FT
OUTLET PROTECTION – DEPTH	19	IN

Trap 1 - 2 year volume
SCS Method

Given Input Data:
Description .... Trap 1
Drainage area 0.0052 mi2
Runoff curve number, CN 91
Time of concentration, Tc .... 0.0100 hrs
Dimensionless Hydrograph .... scsdim
Rainfall .... 3.2000 in
Distribution Curve .... tr20t2: Type 2, 24 hrs
Duration .... 24.0000 hrs
Antecendent Moisture Condition .... Type II
Time Increment, Tp .... 0.1000 hrs

Computed Results:
Peak discharge, qp .... 11.3850 cfs
Peak Time, Tp .... 11.9543 hrs
Peak rate factor 484
Constant, K 0.7500
Runoff Volume .... 2.2714 in
.... 7.6227 cfs-hrs
.... 0.6299 ac-ft
.... 27,438 cf

Temporary stormwater management is addressed by retaining the 2-year storm volume.

* ENVIRONMENTAL DISTURBANCE LABELS REFLECT THE ORIGINAL AREAS WAIVED.

PLAN
SCALE: 1" = 50'

NOTE:
SWALES AND DITCHES SHALL BE CONSTRUCTED FROM LOWEST END TO HIGHEST END AND STABILIZED IMMEDIATELY WITH EROSION CONTROL MATTING

NOTE:
SEE SHEET 18 FOR LEGEND

STONE/RIPRAP OUTLET SEDIMENT TRAP ST–II, TRAP NO. 2		
DRAINAGE AREA – INITIAL	2.79	ACRES
DRAINAGE AREA – INTERIM	2.79	ACRES
DRAINAGE AREA – FINAL	2.79	ACRES
TOTAL STORAGE REQUIRED	10,044	CF
TOTAL STORAGE PROVIDED	23,450	CF
WET STORAGE REQUIRED	10,890	CF
WET STORAGE PROVIDED	10,993	CF
DRY STORAGE REQUIRED	10,890	CF
DRY STORAGE PROVIDED	33,242	CF
EXISTING GROUND ELEVATION AT OUTLET (WET STORAGE ELEVATION)	360.0	FT
TRAP BOTTOM ELEVATION	358.75	FT
TRAP BOTTOM DIMENSIONS	27 x 130	FT x FT
WEIR LENGTH	12	FT
WEIR CREST (DRY STORAGE) ELEVATION	363.0	FT
CLEANOUT ELEVATION	359.35	FT
TOP OF EMBANKMENT ELEVATION	364.0	FT
SIDE SLOPE	2:1	H:V RATIO
EMBANKMENT TOP WIDTH	4	FT
OUTLET PROTECTION – LENGTH	12	FT
OUTLET PROTECTION – DEPTH	19	IN

DETAIL G-1-2 — STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II — STANDARD SYMBOL ST–II

1 OF 3

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL G-1-2 — STONE/RIPRAP OUTLET SEDIMENT TRAP ST-II — STANDARD SYMBOL ST–II

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TRAP IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE AVOIDED.
2. CLEAR, GRUB, AND STRIP ANY VEGETATION AND ROOT MAT FROM THE AREA UNDER THE EMBANKMENT AND TRAP BOTTOM.
3. USE FILL MATERIAL FREE OF ROOTS, WOODY VEGETATION, OVERSIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL FOR THE EMBANKMENT.
4. CONSTRUCT TOP OF EMBANKMENT 1 FOOT MINIMUM ABOVE WEIR CREST. COMPACT THE EMBANKMENT BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
5. MAKE ALL CUT AND FILL SLOPES 2:1 OR FLATTER.
6. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H–1 MATERIALS, OVER THE BOTTOM AND SIDES OF OUTLET AND APRON PRIOR TO PLACEMENT OF RIPRAP. OVERLAP SECTIONS OF GEOTEXTILE AT LEAST 1 FOOT WITH THE SECTION NEARER TO THE TRAP PLACED ON TOP. EMBED GEOTEXTILE AT LEAST 6 INCHES INTO EXISTING GROUND AT ENTRANCE OF OUTLET CHANNEL.
7. USE CLEAN 4 TO 7 INCH RIPRAP TO CONSTRUCT THE WEIR. USE CLASS I RIPRAP FOR THE APRON. USE OF RECYCLED CONCRETE EQUIVALENT IS ACCEPTABLE.
8. PLACE 1 FOOT OF CLEAN ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE ON THE UPSTREAM FACE OF THE WEIR.
9. CONSTRUCT AND MAINTAIN THE OUTLET ACCORDING TO APPROVED PLAN, AND IN SUCH A MANNER THAT EROSION AT OR BELOW THE OUTLET DOES NOT OCCUR.
10. STABILIZE THE EMBANKMENT AND INTERIOR SLOPES WITH SEED AND MULCH. STABILIZE POINTS OF CONCENTRATED INFLOW AS SHOWN ON APPROVED PLAN.
11. REMOVE SEDIMENT AND RESTORE TRAP TO ORIGINAL DIMENSIONS WHEN SEDIMENT HAS ACCUMULATED TO CLEANOUT ELEVATION (50% OF WET STORAGE DEPTH). DEPOSIT REMOVED SEDIMENT IN AN APPROVED AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE. KEEP POINTS OF INFLOW AND OUTFLOW AS WELL AS INTERIOR OF THE TRAP FREE FROM EROSION, AND REMOVE ACCUMULATED DEBRIS. MAINTAIN EMBANKMENTS TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B–4 VEGETATIVE STABILIZATION. REMOVE ANY TREES, BRUSH, OR OTHER WOODY VEGETATION GROWING ON EMBANKMENT OR NEAR PRINCIPAL SPILLWAY. MAINTAIN LINE, GRADE, AND CROSS SECTION.
12. WHEN DEWATERING TRAP, PASS REMOVED WATER THROUGH AN APPROVED SEDIMENT CONTROL PRACTICE.
13. UPON REMOVAL, GRADE AND STABILIZE THE AREA OCCUPIED BY TRAP.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL
U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE | 2011 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Trap 2 - 2 year volume
SCS Method

Given Input Data:
Description .... Trap 2 - 2 year
Drainage area 0.0044 mi2
Runoff curve number, CN 91
Time of concentration, Tc .... 0.0100 hrs
Dimensionless Hydrograph .... scsdim
Rainfall .... 3.2000 in
Distribution Curve .... tr20t2: Type 2, 24 hrs
Duration .... 24.0000 hrs
Antecendent Moisture Condition .... Type II
Time Increment, Tp .... 0.1000 hrs

Computed Results:
Peak discharge, qp .... 9.6335 cfs
Peak Time, Tp .... 11.9543 hrs
Peak rate factor 484
Constant, K 0.7500
Runoff Volume .... 2.2713 in
.... 6.4497 cfs-hrs
.... 0.5330 acft
.... 23,217 cf

Temporary stormwater management is addressed by retaining the 2-year storm volume.

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- LIMIT OF DISTURBANCE
- AREA OF NON–TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS
- EXISTING TREELINE
- MaC SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- SF SILT FENCE
- SSF SUPER SILT FENCE
- EROSION CONTROL MATTING
- EARTH DIKE
- DF DIVERSION FENCE
- SIP STANDARD INLET PROTECTION
- MOUNTABLE BERM
- SP SUBMERSIBLE PUMP

ENGINEER'S CERTIFICATE

"I HEREBY 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."

ENGINEER – Alice A. Miller, P.E — DATE 12-14-15

DEVELOPER'S CERTIFICATE

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DEVELOPER — DATE 12/16/15

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

HOWARD SCD — DATE 1/7/16

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

NO.	DATE	REVISION
1	6–1–15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410–465–6105 (F) 410–465–6644
WWW.BEI–CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

SOILS LEGEND			
SYMBOL	TYPE	K* FACTOR	NAME
GbB	B	.28	GLADSTONE LOAM – 3 TO 8 PERCENT SLOPES
GbC	B	.28	GLADSTONE LOAM – 8 TO 15 PERCENT SLOPES
GmB	C	.43	GLENVILLE SILT LOAM – 8 TO 15 PERCENT SLOPES
GmC	C	.43	GLENVILLE SILT LOAM – 8 TO 15 PERCENT SLOPES
GoB	C	.43	GLENVILLE–CORDORUS SILT LOAMS – 0 TO 8 PERCENT SLOPES
MaC	B	.32	MANOR LOAM – 8 TO 15 PERCENT SLOPES
MaD	B	.32	MANOR LOAM – 15 TO 25 PERCENT SLOPES
MgD	B	.32	MANOR–BANNERTOWN SANDY LOAMS, 15 TO 20 PERCENT SLOPES, ROCKY

SOILS TAKEN FROM NRCS WEB SOIL SURVEY, MARCH 17, 2014. REF. SOIL SURVEY MAPS 5 & 6.
*WHOLE SOIL K FACTOR

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410–252–8600

PROJECT: MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: GRADING & SEDIMENT AND EROSION CONTROL PLAN

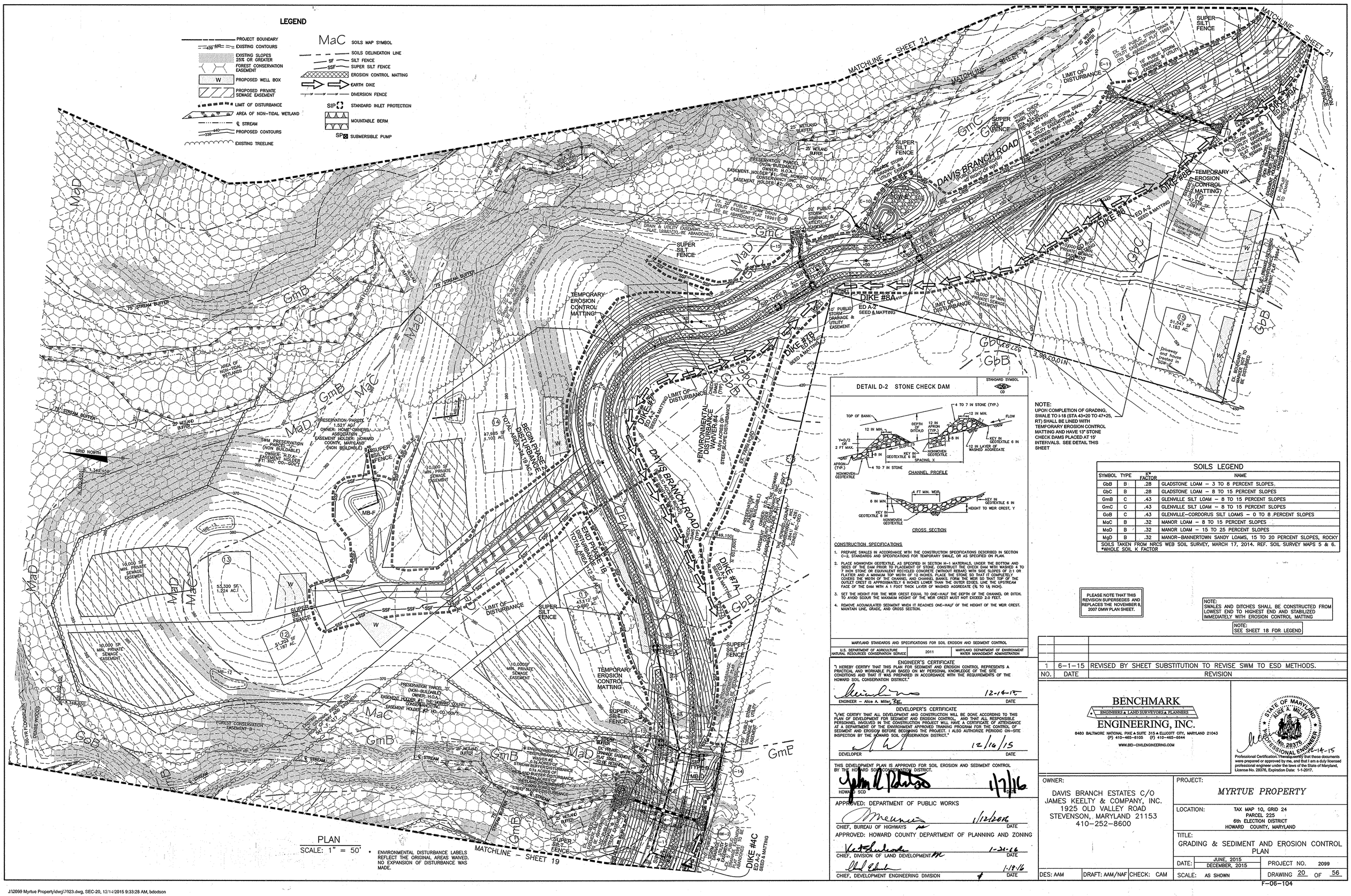
DATE: JUNE, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

DES: AAM | DRAFT: AAM/NAF | CHECK: CAM | SCALE: AS SHOWN | DRAWING 19 OF 56

F–06–104

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS (430 / 440)
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W — PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- LIMIT OF DISTURBANCE
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS (440 / 338)
- EXISTING TREELINE
- MaC — SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- EROSION CONTROL MATTING
- EARTH DIKE
- DIVERSION FENCE
- SIP — STANDARD INLET PROTECTION
- MOUNTABLE BERM
- SP — SUBMERSIBLE PUMP


MATCHLINE SHEET 21
MATCHLINE SHEET 19
DAVIS BRANCH ROAD
GRID NORTH
N 1,340,150
N 1,348,650
E 349,150
E 350,000
SUPER SILT FENCE
TEMPORARY EROSION CONTROL MATTING
DIKE #8A
DIKE #8B
DIKE #7A
DIKE #7B
DIKE #4C
SEED & MATTING
LIMIT OF DISTURBANCE
BEGIN PHASE 1B DISTURBANCE
TOTAL AREA 12.29 AC±
BEGIN PHASE 2 DISTURBANCE
TOTAL AREA 14.19 AC±
*ENVIRONMENTAL DISTURBANCE #4
*ENVIRONMENTAL DISTURBANCE #5
SWM PRESERVATION PARCEL 'A' (NON BUILDABLE)
OWNER: H.O.A.
EASEMENT HOLDER #1: THE HOWARD COUNTY CONSERVANCY INC.
EASEMENT HOLDER #2: HO. CO. GOV'T.
PRESERVATION PARCEL 'C' (NON-BUILDABLE)
PRESERVATION PARCEL 'D' (NON-BUILDABLE)
FOREST CONSERVATION EASEMENT #1
FOREST CONSERVATION EASEMENT #2
EX. 20' PUBLIC STORM DRAIN & UTILITY EASEMENT PLAT 19981 TO BE ABANDONED
EX. 10' PUBLIC STORM DRAIN & UTILITY EASEMENT PLAT 19981 TO BE ABANDONED
EX. 20' PRIVATE STORM DRAIN & UTILITY EASEMENT H.O.A. CONVEYED TO HOWARD COUNTY BY PLAT 19981 TO REMAIN
EX. 10' PRIVATE STORM DRAIN & UTILITY EASEMENT PLAT 19981 TO REMAIN
EX. 10' PUBLIC STORM DRAIN & UTILITY EASEMENT PLAT 19981 TO REMAIN
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EX. 10' PUBLIC STORM DRAIN & UTILITY EASEMENT
10,000 SF MIN. PRIVATE SEWAGE EASEMENT
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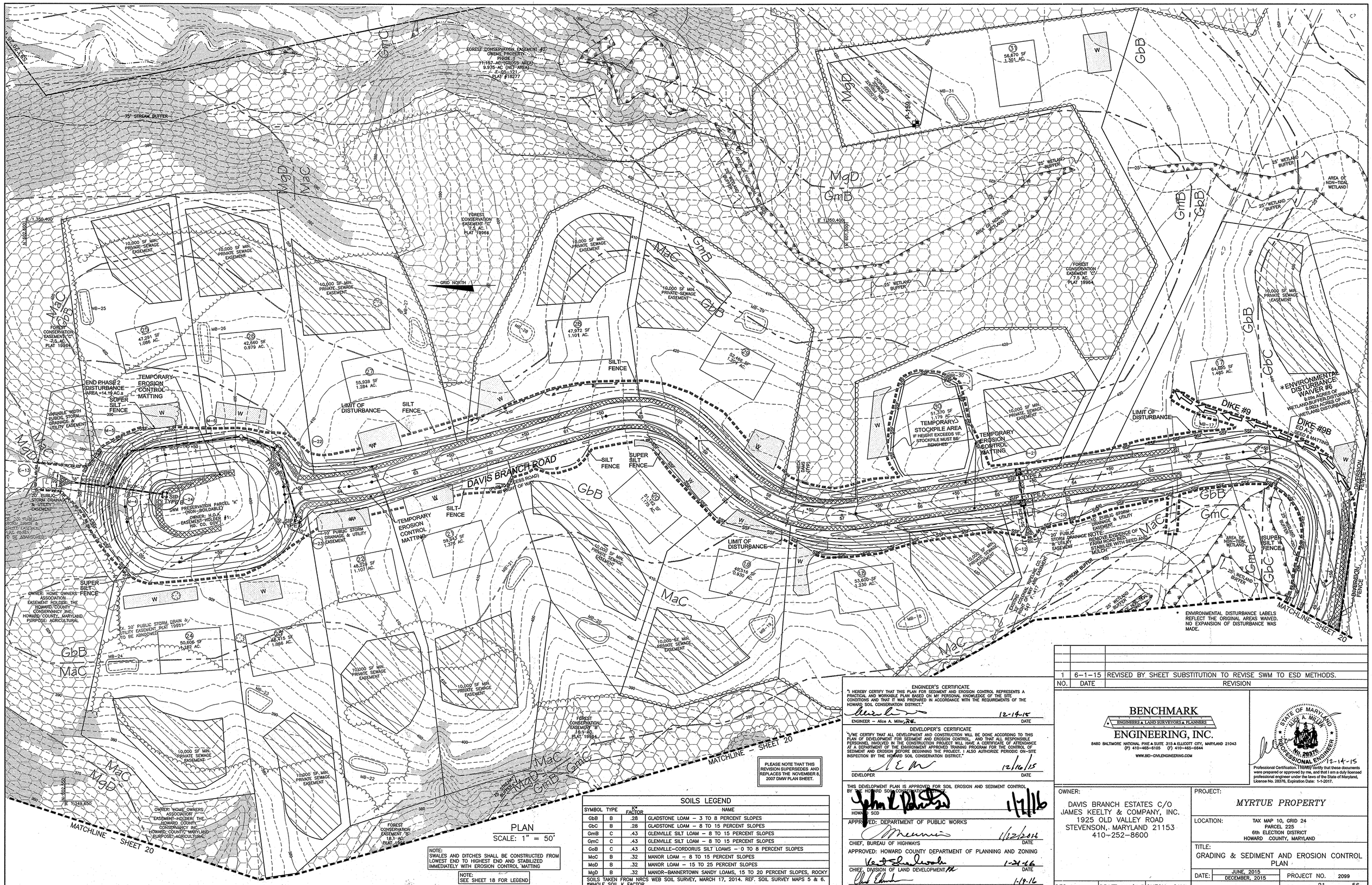
10,000 SF MIN. PRIVATE SEWAGE EASEMENT
EX. 10' PRIVATE SEWAGE EASEMENT PLAT 19981 TO REMAIN
EX. 10' PRIVATE SEWAGE EASEMENT PLAT 19981 TO BE ABANDONED



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ENGINEER – Alice A. Miller, P.E. — DATE 12-14-15

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DEVELOPER — DATE 12/10/15

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HOWARD SCD — DATE 1/7/16

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/22/2016

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

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STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

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SCALE: AS SHOWN — DRAWING 21 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7023.dwg, SEC-21, 12/14/2015 9:32:43 AM, bdodson

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

A. Soil Preparation

1. Temporary Stabilization
   a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be tracked with ridges running parallel to the contour of the slope.
   b. Apply fertilizer and lime as prescribed on the plans.
   c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
   a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
   i. Soil pH between 6.0 and 7.0.
   ii. Soluble salts less than 500 parts per million (ppm).
   iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: if lovegrass will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
   iv. Soil contains 1.5 percent minimum organic matter by weight.
   v. Soil contains sufficient pore space to permit adequate root penetration.
   b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
   c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
   d. Apply soil amendments as specified on the approved plan or as indicated by the results of a soil test.
   e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake lawn areas to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where site conditions will not permit normal seedbed preparation. Track slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seedbed loosening may be unnecessary on newly disturbed areas.

B. Topsoiling

1. Topsoil is placed over prepared subsoil prior to establishment of permanent vegetation. The purpose is to provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.
2. Topsoil salvaged from an existing site may be used provided it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-NRCS.
3. Topsoiling 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.
4. Areas having slopes steeper than 2:1 require special consideration and design.
5. Topsoil Specifications: Soil to be used as topsoil must meet the following criteria:
   a. Topsoil must be a loam, sandy loam, clay loam, silt loam, sandy clay loam, or loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Topsoil must not be a mixture of contrasting textured subsoils and must contain less than 5 percent by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1½ inches in diameter.
   b. Topsoil must be free of noxious plants or plant parts such as Bermuda grass, quack grass, Johnson grass, nut sedge, poison ivy, thistle, or others as specified.
   c. 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.
6. Topsoil Application
   a. Erosion and sediment control practices must be maintained when applying topsoil.
   b. Uniformly distribute topsoil in a 5 to 8 inch layer and lightly compact to a minimum thickness of 4 inches. Spreading is to 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 must be corrected in order to prevent the formation of depressions or water pockets.
   c. Topsoil must not be placed if 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.

C. Soil Amendments (Fertilizer and Lime Specifications)

1. Soil tests must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas of 5 acres or more. Soil analysis may be performed by a recognized private or commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analyses.
2. Fertilizers must be uniform in composition, free flowing and suitable for accurate application by appropriate equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers must all be delivered to the site fully labeled according to the applicable laws and must bear the name, trade name or trademark and warranty of the producer.
3. Lime materials must be ground limestone (hydrated or burnt lime may be substituted except when hydroseeding) which contains at least 50 percent total oxides (calcium oxide plus magnesium oxide). Limestone must be ground to such fineness that at least 50 percent will pass through a #100 mesh sieve and 98 to 100 percent will pass through a #20 mesh sieve.
4. Lime and fertilizer are to be evenly distributed and incorporated into the top 3 to 5 inches of soil by disking or other suitable means.
5. Where the subsoil is either highly acidic or composed of heavy clays, spread ground limestone at the rate of 4 to 8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil.

H-5 STANDARDS AND SPECIFICATIONS
FOR DUST CONTROL

Definition: Controlling the suspension of dust particles from construction activities.
Purpose: To prevent blowing and movement of dust from exposed soil surfaces to reduce on and off-site damage including health and traffic hazards.

Conditions Where Practice Applies

Areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications

1. Mulches: See Section B-4-2 Soil Preparation, Topsoiling, and Soil Amendments, Section B-4-3 Seeding and Mulching, and Section B-4-4 Temporary Stabilization. Mulch must be anchored to prevent blowing.
2. Vegetative Cover: See Section B-4-4 Temporary Stabilization.
3. Tillage: Till to roughen surface and bring clods to the surface. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment that may produce the desired effect.
4. Irrigation: Sprinkle site with water until the surface is moist. Repeat as needed. The site must not be irrigated to the point that runoff occurs.
5. Barriers: Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing.
6. Chemical Treatment: Use of chemical treatment requires approval by the appropriate plan review authority.

B-4-8 STANDARDS AND SPECIFICATIONS
FOR STOCKPILE AREA

Definition: A mound or pile of soil protected by appropriately designed erosion and sediment control measures.
Purpose: To provide a designated location for the temporary storage of soil that controls the potential for erosion, sedimentation, and changes to drainage patterns.

Conditions Where Practice Applies

Stockpile areas are utilized when it is necessary to salvage and store soil for later use.

Criteria

1. The stockpile location and all related sediment control practices must be clearly indicated on the erosion and sediment control plan.
2. The footprint of the stockpile must be sized to accommodate the anticipated volume of material and based on a side slope ratio no steeper than 2:1. Benching must be provided in accordance with Section B-3 Land Grading.
3. Runoff from the stockpile area must drain to a suitable sediment control practice.
4. Access the stockpile area from the upgrade side.
5. Clear water runoff into the stockpile area must be minimized by use of a diversion device such as an earth dike, temporary swale or diversion fence. Provisions must be made for discharging concentrated flow in a non-erosive manner.
6. Where runoff concentrates along the toe of the stockpile fill, an appropriate erosion/sediment control practice must be used to intercept the discharge.
7. Stockpiles must be stabilized in accordance with the 3/7 day stabilization requirement as well as Standard B-4-1 Incremental Stabilization and Standard B-4-4 Temporary Stabilization.
8. If the stockpile is located on an impervious surface, a liner should be provided below the stockpile to facilitate cleanup. Stockpiles containing contaminated material must be covered with impermeable sheeting.

Maintenance

The stockpile area must continuously meet the requirements for Adequate Vegetative Establishment in accordance with Section B-4 Vegetative Stabilization. Side slopes must be maintained at no steeper than a 2:1 ratio. The stockpile area must be kept free of erosion. If the vertical height of a stockpile exceeds 20 feet for 2:1 slopes, 30 feet for 3:1 slopes, or 40 feet for 4:1 slopes, benching must be provided in accordance with Section B-3 Land Grading.

B-4-3 STANDARDS AND SPECIFICATIONS FOR SEEDING AND MULCHING

A. Seeding

1. Specifications
   a. All seed must meet the requirements of the Maryland State Seed Law. All seed must be subject to re-testing by a recognized seed laboratory. All seed used must have been tested within the 6 months immediately preceding the date of sowing such material on any project. Refer to Table B.4 regarding the quality of seed. Seed tags must be available upon request to the inspector to verify type of seed and seeding rate.
   b. Mulch alone may be applied between the fall and spring seeding dates only if the ground is frozen. The appropriate seeding mixture must be applied when the ground thaws.
   c. Inoculants: The inoculant for treating legume seed in the seed mixtures must be a pure culture of nitrogen fixing bacteria prepared specifically for the species. Inoculants must not be used later than the date indicated on the container. Add fresh inoculants as directed on the package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75 to 80 degrees Fahrenheit can weaken bacteria and make the inoculant less effective.
   d. Sod or seed must not be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.
2. Application
   a. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
   i. Incorporate seed into the subsoil at the rates prescribed on Temporary Seeding Table B.1, Permanent Seeding Table B.3, or site-specific seeding summaries.
   ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction. Roll the seeded area with a weighted roller to provide good seed to soil contact.
   b. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.
   i. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.
   ii. Apply seed in two directions, perpendicular to each other. Apply half the seeding rate in each direction.
   c. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer).
   i. If fertilizer is being applied at the time of seeding, the application rates should not exceed the following: nitrogen, 100 pounds per acre total of soluble nitrogen; P2O5 (phosphorous), 200 pounds per acre; K2O (potassium), 200 pounds per acre.
   ii. Lime: Use only ground agricultural limestone (up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
   iii. Mix seed and fertilizer on site and seed immediately and without interruption.
   iv. When hydroseeding do not incorporate seed into the soil.

B. Mulching

1. Mulch Materials (in order of preference)
   a. Straw consisting of thoroughly threshed wheat, rye, oat, or barley and reasonably bright in color. Straw is to be free of noxious weed seeds as specified in the Maryland Seed Law and not musty, moldy, caked, decayed, or excessively dusty. Note: Use only sterile straw mulch in areas where one species of grass is desired.
   b. Wood Cellulose Fiber Mulch (WCFM) consisting of specially prepared wood cellulose processed into a uniform fibrous physical state.
   i. WCFM is to be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
   ii. WCFM, including dye, must contain no germination or growth inhibiting factors.
   iii. WCFM materials are to be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material must form a blotter-like ground cover, on application, having moisture absorption and percolation properties and must cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.
   iv. WCFM material must not contain elements or compounds at concentration levels that will be phyto-toxic.
   v. WCFM must conform to the following physical requirements: fiber length of approximately 10 millimeters, diameter approximately 1 millimeter, pH range of 4.0 to 8.5, ash content of 1.6 percent maximum and water holding capacity of 90 percent minimum.
2. Application
   a. Apply mulch to all seeded areas immediately after seeding.
   b. When straw mulch is used, spread it over all seeded areas at the rate of 2 tons per acre to a uniform loose depth of 1 to 2 inches. Apply mulch to achieve a uniform distribution and depth so that the soil surface is not exposed. When using a mulch anchoring tool, increase the application rate to 2.5 tons per acre.
   c. Wood cellulose fiber used as mulch must be applied at a net dry weight of 1500 pounds per acre. Mix the wood cellulose fiber with water to attain a mixture with a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
3. Anchoring
   a. Perform mulch anchoring immediately following application of mulch to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon the size of the area and erosion hazard:
   i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of 2 inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
   ii. Wood cellulose fiber may be used for anchoring straw. Apply the fiber binder at a net dry weight of 750 pounds per acre. Mix the wood cellulose fiber with water at a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water. iii. Synthetic binders such as Acrylic DLR (Agro-Tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used. Follow application rates as specified by the manufacturer. Application of liquid binders needs to be heavier at the edges where wind catches mulch, such as in valleys and on crests of banks. Use of asphalt binders is strictly prohibited.
   iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer recommendations. Netting is usually available in rolls 4 to 15 feet wide and 300 to 3,000 feet long.

PERMANENT SEED MIXTURE

HARDINESS ZONE: 6b TABLE B.3 SEED MIXTURE: 11					FERTILIZER RATE (10-20-20)			LIME RATE
NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATES	SEEDING DEPTHS (IN)	N	P205	5K20	
9	FESCUE, TALL	60	3/1 to 5/15 & 8/1 to 10/15	1/4-1/2 IN	45 LB PER ACRE (1.0 LB/ 1000 SF)	90 LB PER ACRE (2.0 LB/ 1000 SF)	90 LB PER ACRE (2.0 LB/ 1000 SF)	2 TONS PER ACRE (90 LB/ 1000 SF)
	KENTUCKY BLUEGRASS	40	3/1 to 5/15 & 8/1 to 10/15	1/4-1/2 IN				

Table B.1: Temporary Seeding for Site Stabilization

Plant Species	Seeding Rate 1/ lb/ac	Seeding Rate 1/ lb/1000 ft2	Seeding Depth 2/ (inches)	Recommended Seeding Dates by Plant Hardiness Zone 3/: 5b and 6a	6b	7a and 7b
Cool-Season Grasses						
Annual Ryegrass (Lolium perenne ssp. Multiflorum	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 31	Feb 15 to Apr 30; Aug 15 to Nov 30
Barley (Hordeum vulgare)	96	2.2	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 31	Feb 15 to Apr 30; Aug 15 to Nov 30
Oats (Avena sativa)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 31	Feb 15 to Apr 30; Aug 15 to Nov 30
Wheat (Triticum aestivum)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30	Mar 1 to May 15; Aug 1 to Oct 31	Feb 15 to Apr 30; Aug 15 to Nov 30
Cereal Rye (Secale cereale)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31	Mar 1 to May 15; Aug 1 to Nov 15	Feb 15 to Apr 30; Aug 15 to Dec 15
Warm-Season Grasses						
Foxtail Millet (Serataria italica)	30	0.7	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14
Pearl Millet (Pennisetum glaucum	20	0.5	0.5	Jun 1 to Jul 31	May 16 to Jul 31	May 1 to Aug 14

Notes:

1/ Seeding rates for the warm season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.

Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seeding rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% (by weight) of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.

Oats are the recommended nurse crop for warm-season grasses.

2/ For sandy soils, plant seeds at twice the depth listed above.

3/ The planting dates listed are averages for each Zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.

DETAIL E-3 SUPER SILT FENCE

STANDARD SYMBOL: SSF

CONSTRUCTION SPECIFICATIONS

1. INSTALL 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. DRIVE THE POSTS A MINIMUM OF 36 INCHES INTO THE GROUND.
2. FASTEN 9 GAUGE OR HEAVIER GALVANIZED CHAIN LINK FENCE (2⅜ INCH MAXIMUM OPENING) 42 INCHES IN HEIGHT SECURELY TO THE FENCE POSTS WITH WIRE TIES OR HUG RINGS.
3. FASTEN WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS, SECURELY TO THE UPSLOPE SIDE OF CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 8 INCHES INTO THE GROUND.
4. WHERE ENDS OF THE GEOTEXTILE COME TOGETHER, THE ENDS SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED TO PREVENT SEDIMENT BY PASS.
5. EXTEND BOTH ENDS OF THE SUPER SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SUPER SILT FENCE.
6. PROVIDE MANUFACTURER CERTIFICATION TO THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
7. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL CHAIN LINK FENCING AND GEOTEXTILE.

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DETAIL C-1 EARTH DIKE

STANDARD SYMBOL: A-1 (PLACE DESIGNATION (e.g. A-1) ON FLOW CHANNEL SIDE OF DIKE.)

	DIKE TYPE A	DIKE TYPE B
a - DIKE HEIGHT	18 IN MIN.	30 IN MIN.
b - DIKE WIDTH	24 IN MIN.	36 IN MIN.
c - FLOW WIDTH	4 FT MIN.	6 FT MIN.
d - FLOW DEPTH	12 IN MIN.	24 IN MIN.

FLOW CHANNEL STABILIZATION

A-1 SEED WITH STRAW MULCH AND TACK. (NOT ALLOWED FOR CLEAR WATER DIVERSION.)
A-2/B-2 SEED WITH SOIL STABILIZATION MATTING OR LINE WITH SOD.
A-3/B-3 4 TO 7 INCH STONE OR EQUIVALENT RECYCLED CONCRETE PRESSED INTO SOIL A MINIMUM OF 7 INCHES AND FLUSH WITH GROUND.

CONSTRUCTION SPECIFICATIONS

1. REMOVE AND DISPOSE OF ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SO AS NOT TO INTERFERE WITH PROPER FUNCTION OF EARTHDIKE.
2. EXCAVATE OR SHAPE EARTH DIKE TO LINE, GRADE, AND CROSS SECTION AS SPECIFIED. BANK PROJECTIONS OR OTHER IRREGULARITIES ARE NOT ALLOWED.
3. COMPACT FILL.
4. CONSTRUCT FLOW CHANNEL ON AN UNINTERRUPTED, CONTINUOUS GRADE, ADJUSTING THE LOCATION DUE TO FIELD CONDITIONS AS NECESSARY TO MAINTAIN POSITIVE DRAINAGE.
5. PROVIDE OUTLET PROTECTION AS REQUIRED ON APPROVED PLAN.
6. STABILIZE EARTH DIKE WITHIN THREE DAYS OF INSTALLATION. STABILIZE FLOW CHANNEL FOR CLEAR WATER DIVERSION WITHIN 24 HOURS OF INSTALLATION.
7. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS, AND MAINTAIN POSITIVE DRAINAGE. KEEP EARTH DIKE AND POINT OF DISCHARGE FREE OF EROSION, AND CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
8. UPON REMOVAL OF EARTH DIKE, GRADE AREA FLUSH WITH EXISTING GROUND. WITHIN 24 HOURS OF REMOVAL STABILIZE DISTURBED AREA WITH TOPSOIL, SEED, AND MULCH, OR AS SPECIFIED ON APPROVED PLAN.

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DETAIL D-4-1-C ROCK OUTLET PROTECTION III

STANDARD SYMBOL: ROPIII

DISCHARGE TO AN UNCONFINED CHANNEL OR FLAT AREA

RIPRAP CLASS	THICKNESS (T)
I	19 IN
II	32 IN
III	46 IN

CONSTRUCTION SPECIFICATIONS

1. RIPRAP AND STONE MUST CONFORM TO THE SPECIFIED CLASS.
2. USE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, AND PROTECT FROM PUNCTURING, CUTTING, OR TEARING. REPAIR ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. PROVIDE A MINIMUM OF ONE FOOT OVERLAP FOR ALL REPAIRS AND FOR JOINING TWO PIECES OF GEOTEXTILE TOGETHER.
3. PREPARE THE SUBGRADE FOR GEOTEXTILE OR STONE FILTER (⅜ TO 1½ INCH MINIMUM STONE FOR 6 INCH MINIMUM DEPTH) AND RIPRAP TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
4. EXTEND GEOTEXTILE AT LEAST 6 INCHES BEYOND EDGES OF RIPRAP AND EMBED AT LEAST 4 INCHES AT SIDES OF RIPRAP.
5. CONSTRUCT RIPRAP OUTLET TO FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. PLACE STONE FOR RIPRAP OUTLET IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. PLACE RIPRAP IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE. HAND PLACE TO THE EXTENT NECESSARY.
6. WHERE NO ENDWALL IS USED, CONSTRUCT THE UPSTREAM END OF THE APRON SO THAT THE WIDTH IS TWO TIMES THE DIAMETER OF THE OUTLET PIPE, AND EXTEND THE STONE UNDER THE OUTLET BY A MINIMUM OF 18 INCHES.
7. CONSTRUCT APRON WITH 0% SLOPE ALONG ITS LENGTH AND WITHOUT OBSTRUCTIONS. PLACE STONE SO THAT IT BLENDS IN WITH EXISTING GROUND.
8. MAINTAIN LINE, GRADE, AND CROSS SECTION. KEEP OUTLET FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. AFTER HIGH FLOWS INSPECT FOR SCOUR AND RIPRAP DISLODGED RIPRAP. MAKE NECESSARY REPAIRS IMMEDIATELY.

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DETAIL C-8 MOUNTABLE BERM

STANDARD SYMBOL: MB

CONSTRUCTION SPECIFICATIONS

1. USE MINIMUM WIDTH OF 10 FEET TO ALLOW FOR VEHICULAR PASSAGE.
2. PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE EARTH MOUND PRIOR TO PLACING STONE.
3. PLACE 2 TO 3 INCH STONE OR EQUIVALENT RECYCLED CONCRETE AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE MOUNTABLE BERM.
4. MAINTAIN LINE, GRADE, AND CROSS SECTION. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN SPECIFIED DIMENSIONS. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE.

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DETAIL B-4-6-C PERMANENT SOIL STABILIZATION MATTING CHANNEL APPLICATION

STANDARD SYMBOL: PSSMC – * lb/ft² (* INCLUDE SHEAR STRESS)

CONSTRUCTION SPECIFICATIONS

1. USE MATTING THAT HAS A DESIGN VALUE FOR SHEAR STRESS EQUAL TO OR HIGHER THAN THE SHEAR STRESS DESIGNATED ON APPROVED PLANS.
2. USE PERMANENT SOIL STABILIZATION MATTING MADE OF OPEN WEAVE SYNTHETIC, NON-DEGRADABLE FIBERS OR ELEMENTS OF UNIFORM THICKNESS AND DISTRIBUTION THROUGHOUT. CHEMICALS USED IN THE MAT MUST BE NON-LEACHING AND NON-TOXIC TO VEGETATION AND SEED GERMINATION AND NON-INJURIOUS TO THE SKIN. IF PRESENT, NETTING MUST BE EXTRUDED PLASTIC WITH A MAXIMUM MESH OPENING OF 2x2 INCHES AND SUFFICIENTLY BONDED OR SEWN ON 2 INCH CENTERS ALONG LONGITUDINAL AXIS OF THE MATERIAL TO PREVENT SEPARATION OF THE NET FROM THE PARENT MATERIAL.
3. SECURE MATTING USING STEEL STAPLES OR WOOD STAKES. STAPLES MUST BE "U" OR "T" SHAPED STEEL WIRE HAVING A MINIMUM GAUGE OF NO. 11 AND NO. 8 RESPECTIVELY. "U" SHAPED STAPLES MUST AVERAGE 1 TO 1 ½ INCHES WIDE AND BE A MINIMUM OF 6 INCHES LONG. "T" SHAPED STAPLES MUST HAVE A MINIMUM 8 INCH MAIN LEG, A MINIMUM 1 INCH SECONDARY LEG, AND MINIMUM 4 INCH HEAD. WOOD STAKES MUST BE ROUGH-SAWN HARDWOOD, 12 TO 24 INCHES IN LENGTH, 1x3 INCH IN CROSS SECTION, AND WEDGE SHAPE AT THE BOTTOM.
4. PERFORM FINAL GRADING, TOPSOIL APPLICATION, SEEDBED PREPARATION, AND PERMANENT SEEDING IN ACCORDANCE WITH SPECIFICATIONS. PLACE MATTING WITHIN 48 HOURS OF COMPLETING SEEDING OPERATIONS, UNLESS END OF WORKDAY STABILIZATION IS SPECIFIED ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
5. UNROLL MATTING IN DIRECTION OF WATER FLOW, CENTERING THE FIRST ROLL ON THE CHANNEL CENTER LINE. WORK FROM CENTER OF CHANNEL OUTWARD WHEN PLACING ROLLS. LAY MATTING SMOOTHLY AND FIRMLY UPON THE SEEDED SURFACE. AVOID STRETCHING THE MATTING.
6. OVERLAP OR ABUT EDGES OF MATTING ROLLS PER MANUFACTURER RECOMMENDATIONS. OVERLAP ROLL ENDS BY 6 INCHES (MINIMUM), WITH THE UPSTREAM MAT OVERLAPPING ON TOP OF THE NEXT DOWNSTREAM MAT.
7. KEY IN THE TOP OF SLOPE END OF MAT 6 INCHES (MINIMUM) BY DIGGING A TRENCH, PLACING THE MATTING ROLL END IN THE TRENCH, STAPLING THE MAT IN PLACE, REPLACING THE EXCAVATED MATERIAL, AND TAMPING TO SECURE THE MAT END IN THE KEY.
8. STAPLE/STAKE MAT IN A STAGGERED PATTERN ON 4 FOOT (MAXIMUM) CENTERS THROUGHOUT AND 2 FOOT (MAXIMUM) CENTERS ALONG SEAMS, JOINTS, AND ROLL ENDS.
9. IF SPECIFIED BY THE DESIGNER OR MANUFACTURER AND DEPENDING ON THE TYPE OF MAT BEING INSTALLED, ONCE THE MATTING IS KEYED AND STAPLED IN PLACE, FILL THE MAT VOIDS WITH TOP SOIL OR GRANULAR MATERIAL AND LIGHTLY COMPACT OR ROLL TO MAXIMIZE SOIL/MAT CONTACT WITHOUT CRUSHING MAT.
10. ESTABLISH AND MAINTAIN VEGETATION SO THAT REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT ARE CONTINUOUSLY MET IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.

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DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

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DETAIL E-1 SILT FENCE

STANDARD SYMBOL: SF

CONSTRUCTION SPECIFICATIONS

1. USE WOOD POSTS 1¾ X 1¾ ± ⅛ INCH (MINIMUM) SQUARE CUT OF SOUND QUALITY HARDWOOD. AS AN ALTERNATIVE TO WOODEN POST USE STANDARD "T" OR "U" SECTION STEEL POSTS WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
2. USE 36 INCH MINIMUM POSTS DRIVEN 16 INCH MINIMUM INTO GROUND NO MORE THAN 6 FEET APART.
3. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS AND FASTEN GEOTEXTILE SECURELY TO UPSLOPE SIDE OF FENCE POSTS WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION.
4. PROVIDE MANUFACTURER CERTIFICATION TO THE AUTHORIZED REPRESENTATIVE OF THE INSPECTION/ENFORCEMENT AUTHORITY SHOWING THAT THE GEOTEXTILE USED MEETS THE REQUIREMENTS IN SECTION H-1 MATERIALS.
5. EMBED GEOTEXTILE A MINIMUM OF 8 INCHES VERTICALLY INTO THE GROUND. BACKFILL AND COMPACT THE SOIL ON BOTH SIDES OF FABRIC.
6. WHERE TWO SECTIONS OF GEOTEXTILE ADJOIN: OVERLAP, TWIST, AND STAPLE TO POST IN ACCORDANCE WITH THIS DETAIL.
7. EXTEND BOTH ENDS OF THE SILT FENCE A MINIMUM OF FIVE HORIZONTAL FEET UPSLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT TO PREVENT RUNOFF FROM GOING AROUND THE ENDS OF THE SILT FENCE.
8. REMOVE ACCUMULATED SEDIMENT AND DEBRIS WHEN BULGES DEVELOP IN SILT FENCE OR WHEN SEDIMENT REACHES 25% OF FENCE HEIGHT. REPLACE GEOTEXTILE IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

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PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS

1) NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
2) PLACE MATERIALS IN A LOCATION AND MANNER WHICH DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
3) DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.
4) PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
5) REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS, OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.
6) RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
7) ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), OATS (UNIOLA SP.), AND/OR RYE (SECALE CEREALE). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 FESCUE SHALL NOT BE UTILIZED IN THE WETLAND OR BUFFER AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.
8) AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
9) TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM: USE I WATERS: IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
10) STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
11) CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES, UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.TEMPORARY MATS WILL BE USED DURING CULVERT CONSTRUCTION.

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (410-313-1855).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 3 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 7 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC. B-4-5), TEMPORARY SEEDING (SEC. B-4-4) AND MULCHING (SEC.B-4-3). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
5. 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.
6. SITE ANALYSIS:

TOTAL AREA OF SITE	151.3 AC	ACRES
AREA DISTURBED	21.0 AC	ACRES
AREA TO BE ROOFED OR PAVED	3.1 AC	ACRES
AREA TO BE VEGETATIVELY STABILIZED	17.9 AC	ACRES
TOTAL CUT	77,970 CY	CU. YDS.*
TOTAL FILL	53,590 CY	CU. YDS.*
OFFSITE WASTE/BORROW AREA LOCATION	SITE WITH ACTIVE GRADING PERMIT	

** CUT/FILL QUANTITIES ARE FOR SEDIMENT CONTROL PURPOSES ONLY. CONTRACTOR SHALL PERFORM THEIR OWN EARTHWORK CALCULATIONS FOR SITE BALANCING.

7. ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
8. ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
9. 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.
10. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED BY THE END OF EACH WORKDAY, WHICHEVER IS SHORTER.
11. ANY CHANGES OR REVISIONS TO THE SEQUENCE OF CONSTRUCTION MUST BE REVIEWED AND APPROVED BY THE PLAN APPROVAL AUTHORITY PRIOR TO PROCEEDING WITH CONSTRUCTION.
12. A PROJECT IS TO BE SEQUENCED SO THAT GRADING ACTIVITIES BEGIN ON ONE GRADING UNIT (MAXIMUM ACREAGE OF 20 AC. PER GRADING UNIT) AT A TIME. WORK MAY PROCEED TO A SUBSEQUENT GRADING UNIT WHEN AT LEAST 50 PERCENT OF THE DISTURBED AREA IN THE PRECEDING GRADING UNIT HAS BE STABILIZED AND APPROVED BY THE ENFORCEMENT AUTHORITY. UNLESS OTHERWISE SPECIFIED AND APPROVED BY THE APPROVAL AUTHORITY, NO MORE THAN 30 ACRES CUMULATIVELY MAY BE DISTURBED AT A GIVEN TIME.

Sequence of Construction

Duration	Step
1 Day	1. Obtain Grading Permit. The MDE tracking for this project is #200662349.
1 Day	2. Notify MDE Department of Environmental Protection Non-Tidal Wetlands and Waterways Inspection and Compliance Section (410-537-3510) at least 5 days in advance of beginning any work in streams or 100- year floodplain.
1 Day	3. Request a preconstruction meeting with HCDPW Sediment Control Division (410-313-1855) at least 48 hours prior to the start of any work.
7 Days	4. Phase 1A (LOD 6.81 ac.): Clear and grub only that area necessary for the installation of SCE, SFD, and Cleanwater diversion Dike (Dike #1) around Trap #1 and SSF below Trap #1 area.
1 Day	5. Install Bypass Storm Drain I-1 to E-1.
5 Days	6. Begin installation of Trap #1. Construct trap to grades on plan and construct remaining ED (Dike #2) to Trap #1.
45 Days	7. With permission from sediment control inspector, road may be brought to grade within area draining to Trap #1 (approximately Sta. 0+00 to Sta 16+00). Storm drains shall be installed as grades allow, with inlet protection as shown. Maintain positive flows to Trap #1 as grading progresses.
5 Days	8. After the drainage area to Stormwater facility SGW-B is fully stabilized, the facility shall be constructed.With permission from the sediment control inspector, earth dikes and Trap #1 may be removed and the disturbed area stabilized. This removal may be before or after the stormwater facility is constructed. The facility shall be protected from inflow by blocking E-3 until all upstream disturbance is stabilized, at which point the block on E-3 may be removed and flows may be enter the facility.
2 Days	9. Obtain permission from MDE inspector to begin construction of arch culvert. Install temporary access bridge at location of existing ford. Contractor shall only cross stream at temporary access. In stream work shall not be conducted in compliance with the MDE permit, and during the period March 1 through June 15, inclusive during any year.Culvert construction may begin before road construction is completed.
60 Days	11. Install super silt fence below proposed road construction area from Trap #1 to arch culvert area, and along stream banks at culvert construction area per plan construct culvert.
1 Day	11. Phase 1B (LOD 5.54 ac, 12.35 ac total disturbance): Using existing farm road for access, and with permission from MDE and Sediment Control Inspectors, begin construction of HW-1(~Sta. 32+70). Work should take place within anticipated dry weather. excessive disturbance of the existing farm road may necessitate placement of stone stabilization, as instructed by the sediment control inspector.
14 Days	12. Place riprap protection on downstream faces of streambank, and SSF below embankment area from Sta 31+50 to 34+50 before beginning headwall construction. Manhole M-3 base must be placed before backfill behind HW-1, and the sections must be added as fill is placed. When sufficient fill is place to construct pipe from M-3 to HW-2, HW-2 shall be placed and upstream riprap stabilization shall be installed.
4 Days	13. Construct cleanwater diversion Dike #4 from arch culvert to HW-2.
7 days	14. Install super silt fence below Trap #2 and begin Trap construction. At the completion of Trap #2, install Dikes #5 and #6 and all remaining sediment controls to Sta 37+00, end of Phase IB.
45 days	15. With approval from sediment control inspector, roadway may be brought to grade to Sta 37+00. Storm drains shall be installed as grades allow, with inlet protection as shown. Cut and fill slopes shall be stabilized as they are brought to grade. Maintain positive flows to Trap #2 as grading progresses.
7 days	16. After the drainage area to Stormwater facility SGW-C is fully stabilized, the facility shall be constructed.With permission from the sediment control inspector, earth dikes and Trap #2 may be removed and the disturbed area stabilized. This removal may be before or after the stormwater facility is constructed. The facility shall be protected from inflow by blocking E-6 until all upstream disturbance is stabilized, at which point the block on E-6 may be removed and flows may be enter the facility.
1 Day	18. Phase 2 (LOD 8.65 ac, 14.19 acres total active disturbance): Upon completion of arch culvert, and stabilization of roadway to the end of Phase 1B, and with approval from the sediment control inspector, Phase 2 work may commence.
6 days	19. Place downhill super silt fence from 45+50 to 48+50. Place sufficient fill to provide cover, and construct bypass storm drain E-11 to HW-3.
4 days	20. Construct clean water diversion Dikes #7, #8 and #9.
4 days	21. Install remaining sediment controls throughout project as indicated on the plans.
60 days	22. With the permission of the sediment control inspector, road may be brought to grade through the end of the project. Cut and fill slopes shall be stabilized as they are brought to grade.
7 days	23. Stormwater facilities MB-D and SGW-E shall be constructed after their respective drainage areas are fully stabilized. The facilities may receive inflow when upstream are stabilized.
4 days	24. With approval from the sediment control inspector, remove earth dikes and sediment controls and permanently stabilize disturbances.

Notes:

Construct swales from lowest end to highest end and stabilize immediately with permanent erosion control matting or sod.

All LOD within buffers is to receive erosion control matting over seed, or sod.

On-lot construction (houses, driveways, culverts, stormwater facilities) will take place under individual permit plans.

NOTE:
* ANY SEDIMENT CONTROL PRACTICE THAT IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
* TEMPORARY OR PERMANENT STABILIZATION IS BE BE PERFORMED AS DIRECTED BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR OR AT THE TIME FRAMES REQUIRED BY THE 2001 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL WHICHEVER IS MORE RESTRICTIVE.

ENGINEER'S CERTIFICATE

"I HEREBY 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."

ENGINEER – Alice A. Miller, P.E. 12-14-15 DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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."

DEVELOPER 12/16/15 DATE

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

HOWARD SCD 1/4/16 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS 1/12/2016 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT 1-21-16 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 1.19.16 DATE

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6844
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND · ALICE A. MILLER · No. 28376 · PROFESSIONAL ENGINEER
12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: GRADING & SEDIMENT AND EROSION CONTROL DETAILS

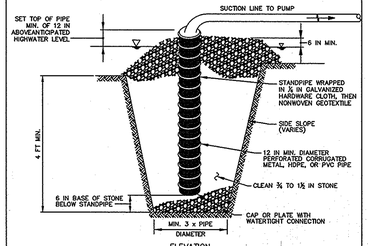
DATE: JUNE, 2015 / DECEMBER, 2015	PROJECT NO. 2099
DES: AAM | DRAFT: AAM | CHECK: CAM | SCALE: AS SHOWN	DRAWING 22 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7023.dwg, SEC-NOTES AND DETAILS-22, 12/14/2015 9:31:52 AM, bdodson

DETAIL F-2 SUMP PIT

STANDARD SYMBOL: SP



CONSTRUCTION SPECIFICATIONS

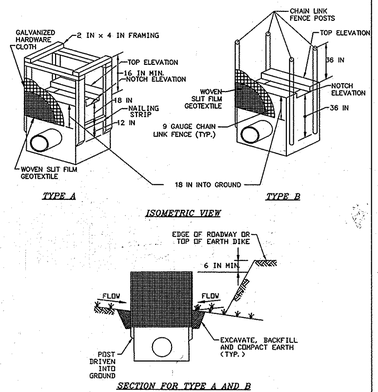
1. USE 12 INCH OR LARGER DIAMETER CORRUGATED METAL, HDPE, OR PVC PIPE WITH 1 INCH DIAMETER PERFORATIONS, 6 INCHES ON CENTER. BOTTOM OF PIPE MUST BE CAPPED WITH WATERTIGHT SEAL.
2. WRAP PIPE WITH ¾ INCH GALVANIZED HARDWARE CLOTH AND WRAP NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, OVER THE HARDWARE CLOTH.
3. EXCAVATE PIT TO THREE TIMES THE PIPE DIAMETER AND FOUR FEET IN DEPTH. PLACE ¾ TO 1½ INCH STONE OR EQUIVALENT RECYCLED CONCRETE, 6 INCHES IN DEPTH PRIOR TO PIPE PLACEMENT.
4. SET TOP OF PIPE MINIMUM 12 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
5. BACKFILL PIT AROUND THE PIPE WITH ¾ TO 1½ INCH CLEAN STONE OR EQUIVALENT RECYCLED CONCRETE AND EXTEND STONE A MINIMUM OF 6 INCHES ABOVE ANTICIPATED WATER SURFACE ELEVATION.
6. DISCHARGE TO A STABLE AREA AT A NONEROSIVE RATE.
7. A SUMP PIT REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, REMOVE PERFORATED PIPE AND REPLACE GEOTEXTILE AND STONE. KEEP POINT OF DISCHARGE FREE OF EROSION.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP



1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL E-9-1 STANDARD INLET PROTECTION

STANDARD SYMBOL: SIP

CONSTRUCTION SPECIFICATIONS:

1. USE WOVEN SLIT FILM GEOTEXTILE AS SPECIFIED IN SECTION H-1 MATERIALS.
2. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18 INCHES BELOW THE NOTCH ELEVATION.
3. FOR TYPE A, USE NOMINAL 2 INCH X 4 INCH CONSTRUCTION GRADE LUMBER POSTS, DRIVEN 1 FOOT 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 2X4 FRAME AS SHOWN. STRETCH ¾ INCH GALVANIZED HARDWARE CLOTH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. FASTEN GEOTEXTILE SECURELY TO THE HARDWARE CLOTH WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND HARDWARE CLOTH A MINIMUM OF 18 INCHES BELOW THE WEIR CREST. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED TO THE POST.

   FOR TYPE B, USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND 6 FOOT LENGTH, DRIVEN A MINIMUM OF 8 INCHES BELOW THE WEIR CREST AT EACH CORNER OF THE STRUCTURE. FASTEN 9 GAUGE OR HEAVIER CHAIN LINK FENCE, 42 INCHES IN HEIGHT, SECURELY TO THE FENCE POSTS WITH WIRE TIES. FASTEN GEOTEXTILE SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP AND MID SECTION. EMBED GEOTEXTILE AND CHAIN LINK FENCE A MINIMUM OF 18 INCHES BELOW THE WEIR CREST.
4. BACKFILL AROUND THE INLET IN LOOSE 4 INCH LIFTS AND COMPACT UNTIL SOIL IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
5. STORM DRAIN INLET PROTECTION REQUIRES FREQUENT MAINTENANCE. REMOVE ACCUMULATED SEDIMENT AFTER EACH RAIN EVENT TO MAINTAIN FUNCTION AND AVOID PREMATURE CLOGGING. IF INLET PROTECTION DOES NOT COMPLETELY DRAIN WITHIN 24 HOURS AFTER A STORM EVENT, IT IS CLOGGED. WHEN THIS OCCURS, REMOVE ACCUMULATED SEDIMENT AND CLEAN, OR REPLACE GEOTEXTILE AND STONE.

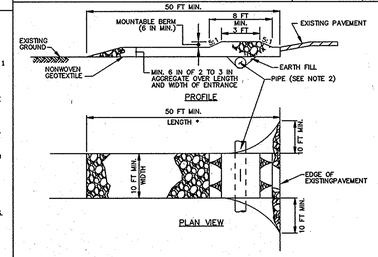
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL B-1 STABILIZED CONSTRUCTION ENTRANCE

STANDARD SYMBOL: SCE



CONSTRUCTION SPECIFICATIONS

1. PLACE STABILIZED CONSTRUCTION ENTRANCE IN ACCORDANCE WITH THE APPROVED PLAN. VEHICLES MUST TRAVEL OVER THE ENTIRE LENGTH OF THE SCE. USE MINIMUM LENGTH OF 50 FEET (*50 FEET FOR SINGLE RESIDENCE LOT). USE MINIMUM WIDTH OF 10 FEET. FLARE SCE 10 FEET MINIMUM AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
2. PIPE ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD THE SCE UNDER THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PROTECT PIPE INSTALLED THROUGH THE SCE WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 12 INCHES OF STONE OVER THE PIPE. PROVIDE PIPE AS SPECIFIED ON APPROVED PLAN. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY, A PIPE IS NOT NECESSARY. A MOUNTABLE BERM IS REQUIRED WHEN SCE IS NOT LOCATED AT A HIGH SPOT.
3. PREPARE SUBGRADE AND PLACE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS.
4. PLACE CRUSHED AGGREGATE (2 TO 3 INCHES IN SIZE) OR EQUIVALENT RECYCLED CONCRETE (WITHOUT REBAR) AT LEAST 6 INCHES DEEP OVER THE LENGTH AND WIDTH OF THE SCE.
5. MAINTAIN ENTRANCE IN A CONDITION THAT MINIMIZES TRACKING OF SEDIMENT. ADD STONE OR MAKE OTHER REPAIRS AS CONDITIONS DEMAND TO MAINTAIN CLEAN SURFACE, MOUNTABLE BERM, AND SPECIFIED DIMENSIONS. IMMEDIATELY REMOVE STONE AND/OR SEDIMENT SPILLED, DROPPED, OR TRACKED ONTO ADJACENT ROADWAY BY VACUUMING, SCRAPING, AND/OR SWEEPING. WASHING ROADWAY TO REMOVE MUD TRACKED ONTO PAVEMENT IS NOT ACCEPTABLE UNLESS WASH WATER IS DIRECTED TO AN APPROVED SEDIMENT CONTROL PRACTICE.

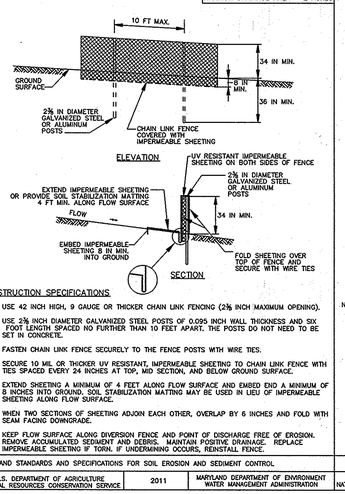
MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL C-9 DIVERSION FENCE

STANDARD SYMBOL: DF

MAXIMUM DRAINAGE AREA = 2 ACRES



CONSTRUCTION SPECIFICATIONS

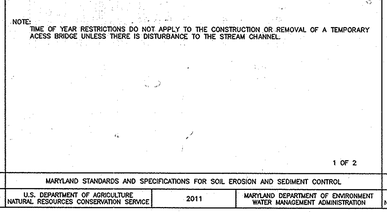
1. USE 42 INCH HIGH, 9 GAUGE OR THICKER CHAIN LINK FENCING (2⅜ INCH MAXIMUM OPENING).
2. USE 2⅜ INCH DIAMETER GALVANIZED STEEL POSTS OF 0.095 INCH WALL THICKNESS AND SIX FOOT LENGTH SPACED NO FURTHER THAN 10 FEET APART. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. FASTEN CHAIN LINK FENCE SECURELY TO THE FENCE POSTS WITH WIRE TIES.
4. SECURE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING TO CHAIN LINK FENCE WITH TIES SPACED EVERY 24 INCHES AT TOP, MID SECTION, AND BELOW GROUND SURFACE.
5. EXTEND SHEETING A MINIMUM OF 4 FEET ALONG FLOW SURFACE AND EMBED END A MINIMUM OF 8 INCHES INTO GROUND. SOIL STABILIZATION MATTING MAY BE USED IN LIEU OF IMPERMEABLE SHEETING ALONG FLOW SURFACE.
6. WHEN TWO SECTIONS OF SHEETING ADJOIN EACH OTHER, OVERLAP BY 6 INCHES AND FOLD WITH SEAM FACING DOWNGRADE.
7. KEEP FLOW SURFACE ALONG DIVERSION FENCE AND POINT OF DISCHARGE FREE OF EROSION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. MAINTAIN POSITIVE DRAINAGE. REPLACE IMPERMEABLE SHEETING IF TORN. IF UNDERMINING OCCURS, REINSTALL FENCE.

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB



NOTE:
TIME OF YEAR RESTRICTIONS DO NOT APPLY TO THE CONSTRUCTION OR REMOVAL OF A TEMPORARY ACCESS BRIDGE UNLESS THERE IS DISTURBANCE TO THE STREAM CHANNEL.

1 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL H-4-1 TEMPORARY ACCESS BRIDGE

STANDARD SYMBOL: TB

CONSTRUCTION SPECIFICATIONS

1. CONSTRUCT TEMPORARY BRIDGE STRUCTURE AT OR ABOVE THE BANK ELEVATION TO PREVENT IMPACTS FROM FLOATING MATERIALS AND DEBRIS.
2. PLACE ABUTMENTS PARALLEL TO, AND ON, STABLE BANKS.
3. CONSTRUCT BRIDGE TO SPAN ENTIRE CHANNEL UNLESS OTHERWISE INDICATED ON APPROVED PLAN.
4. USE STRINGERS CONSISTING OF LOGS, SAWN TIMBER, PRESTRESSED CONCRETE BEAMS, METAL BEAMS, OR OTHER APPROVED MATERIALS.
5. SELECT DECKING MATERIALS TO PROVIDE SUFFICIENT STRENGTH TO SUPPORT THE ANTICIPATED LOAD. PLACE ALL DECKING MEMBERS PERPENDICULAR TO THE STRINGERS, BUTT TIGHTLY, AND SECURELY FASTEN. DECKING MATERIALS MUST BE BUTTED TIGHTLY TO PREVENT ANY SOIL MATERIAL TRACKED ONTO THE BRIDGE FROM FALLING INTO THE WATERWAY BELOW.
6. SECURELY FASTEN OPTIONAL RUN PLANKING FOR THE LENGTH OF THE SPAN. PROVIDE A RUN PLANK FOR EACH TRACK OF THE EQUIPMENT WHEELS. ALTHOUGH RUN PLANKS ARE OPTIONAL, THEY MAY BE NECESSARY TO PROPERLY DISTRIBUTE LOADS.
7. INSTALL CURBS THE ENTIRE LENGTH OF THE OUTER SIDES OF THE DECK TO PREVENT SEDIMENT FROM ENTERING THE STREAM CHANNEL.
8. ANCHOR BRIDGE SECURELY AT ONLY ONE END USING STEEL CABLE OR CHAIN. ANCHORING AT ONLY ONE END WILL PREVENT CHANNEL OBSTRUCTION IN THE EVENT THAT FLOODWATERS FLOAT THE BRIDGE. ACCEPTABLE ANCHORS ARE LARGE TREES, LARGE BOULDERS, OR BURIED STEEL POSTS. ANCHOR MUST BE SUFFICIENT TO PREVENT THE BRIDGE FROM FLOATING DOWNSTREAM.
9. AREAS DISTURBED DURING BRIDGE INSTALLATION AND/OR REMOVAL MUST NOT BE LEFT UNSTABILIZED OVERNIGHT UNLESS THE RUNOFF IS DIRECTED TO AN APPROVED SEDIMENT CONTROL DEVICE.
10. STABILIZE APPROACH TO BRIDGE AND KEEP FREE OF EROSION. CLEAN SEDIMENT FROM DECKING AND CURBS DAILY BY SCRAPING, SWEEPING, AND/OR VACUUMING. ENSURE THAT DECKING AND CURBS REMAIN TIGHTLY BUTTED WITHOUT GAPS. REMOVE DEBRIS TRAPPED BY BRIDGE. MAINTAIN AREAS ADJACENT TO CROSSING TO CONTINUOUSLY MEET REQUIREMENTS FOR ADEQUATE VEGETATIVE ESTABLISHMENT IN ACCORDANCE WITH SECTION B-4 VEGETATIVE STABILIZATION.
11. AFTER THE TEMPORARY CROSSING IS NO LONGER NEEDED, REMOVE IT WITHIN 14 CALENDAR DAYS. IF SUBJECT TO THE USE DESIGNATION CLOSURE, REMOVE AT THE END OF CLOSURE PERIOD. PROTECT STREAM BANKS DURING BRIDGE REMOVAL AND STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MATTING. ACCOMPLISH REMOVAL OF THE BRIDGE AND CLEAN UP OF THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL. STORE ALL REMOVED MATERIALS IN AN APPROVED STAGING AREA.

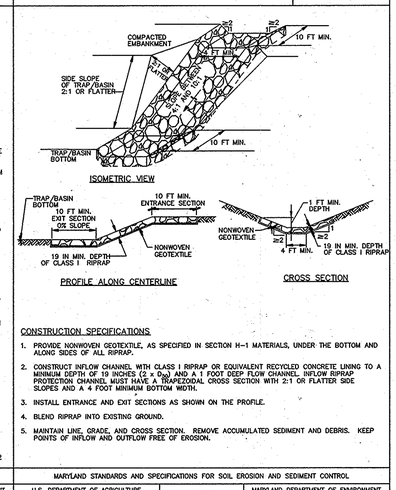
2 OF 2

MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE	2011	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL D-3-1 RIPRAP INFLOW PROTECTION

STANDARD SYMBOL: RIP



CONSTRUCTION SPECIFICATIONS

1. PROVIDE NONWOVEN GEOTEXTILE, AS SPECIFIED IN SECTION H-1 MATERIALS, UNDER THE BOTTOM AND ALONG SIDES OF ALL RIPRAP.
2. CONSTRUCT INFLOW CHANNEL WITH CLASS I RIPRAP OR EQUIVALENT RECYCLED CONCRETE LINING TO A MINIMUM DEPTH OF 19 INCHES ($2 \times D_{50}$) AND A 1 FOOT DEEP FLOW CHANNEL. INFLOW RIPRAP PROTECTION CHANNEL MUST HAVE A TRAPEZOIDAL CROSS SECTION WITH 2:1 OR FLATTER SIDE SLOPES AND A 4 FOOT MINIMUM BOTTOM WIDTH.
3. INSTALL ENTRANCE AND EXIT SECTIONS AS SHOWN ON THE PROFILE.
4. BLEND RIPRAP INTO EXISTING GROUND.
5. MAINTAIN LINE, GRADE, AND CROSS SECTION. REMOVE ACCUMULATED SEDIMENT AND DEBRIS. KEEP POINTS OF INFLOW AND OUTFLOW FREE OF EROSION.

ENGINEER'S CERTIFICATE

"I HEREBY 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."

ENGINEER – Alice A. Miller, P.E. — DATE 12-14-15

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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."

DEVELOPER — DATE 12/16/15

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

HOWARD SCD — DATE 1/7/16

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.19.16

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: GRADING & SEDIMENT AND EROSION CONTROL DETAILS

DATE: JUNE, 2015 / DECEMBER, 2015

PROJECT NO. 2099

DES: AAM DRAFT: AAM CHECK: CAM

SCALE: AS SHOWN

DRAWING 23 OF 56

F-06-104

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PRIVATELY OWNED
ON-LOT BIORETENTION DIMENSIONS

FACILITY	A	B	C	D	E	F	G	H	LENGTH	WIDTH	FILTER (Af)	PLANTINGS			LINER
MB-1	403.00	402.00	401.75	399.75	399.42	398.92	398.75	398.00	36	11	353	16	12	12	LINED
MB-2	379.00	378.00	377.75	375.75	375.42	374.92	374.75	373.50	46	8	362	16	12	12	UNLINED
MB-3	378.00	377.00	376.75	374.75	374.42	373.92	373.75	371.00	50	12	460	20	15	15	UNLINED

ON-LOT BIORETENTION FACILITIES

FACILITY	Drainage Area	Impervious	I (%)	Rv	Specific Pe	ESDv (cf)	75% ESDv (cf)	Volume Stored	Volume treated (V/0.75)	Pe Treated	Required Pretreatment (cf)
MB-1	9601	4400	46%	0.462	1.8	666	500	518 cf	690 cf	1.85	
MB-2	14159	4400	31%	0.330	1.8	700	525	530 cf	707 cf	1.82	
MB-3	17845	8342	47%	0.471	1.8	1260	945	1043 cf	1391 cf	1.99	

FACILITY	Drainage Area	Impervious	Swale Length	Swale Width	I (%)	Rv	Specific Pe	ESDv (cf)	Volume Treated	Pe Treated
GS-5A	14307	6164	391	6	43%	0.438	1.60	939	912 cf	1.75
GS-5B	6003	2950	203	6	49%	0.492	1.80	443	474 cf	1.92
GS-6A	16363	6222	340	6	38%	0.392	1.80	963	793 cf	1.48
GS-6B	25411	2474	207	6	10%	0.138	1.00	291	463 cf	1.66

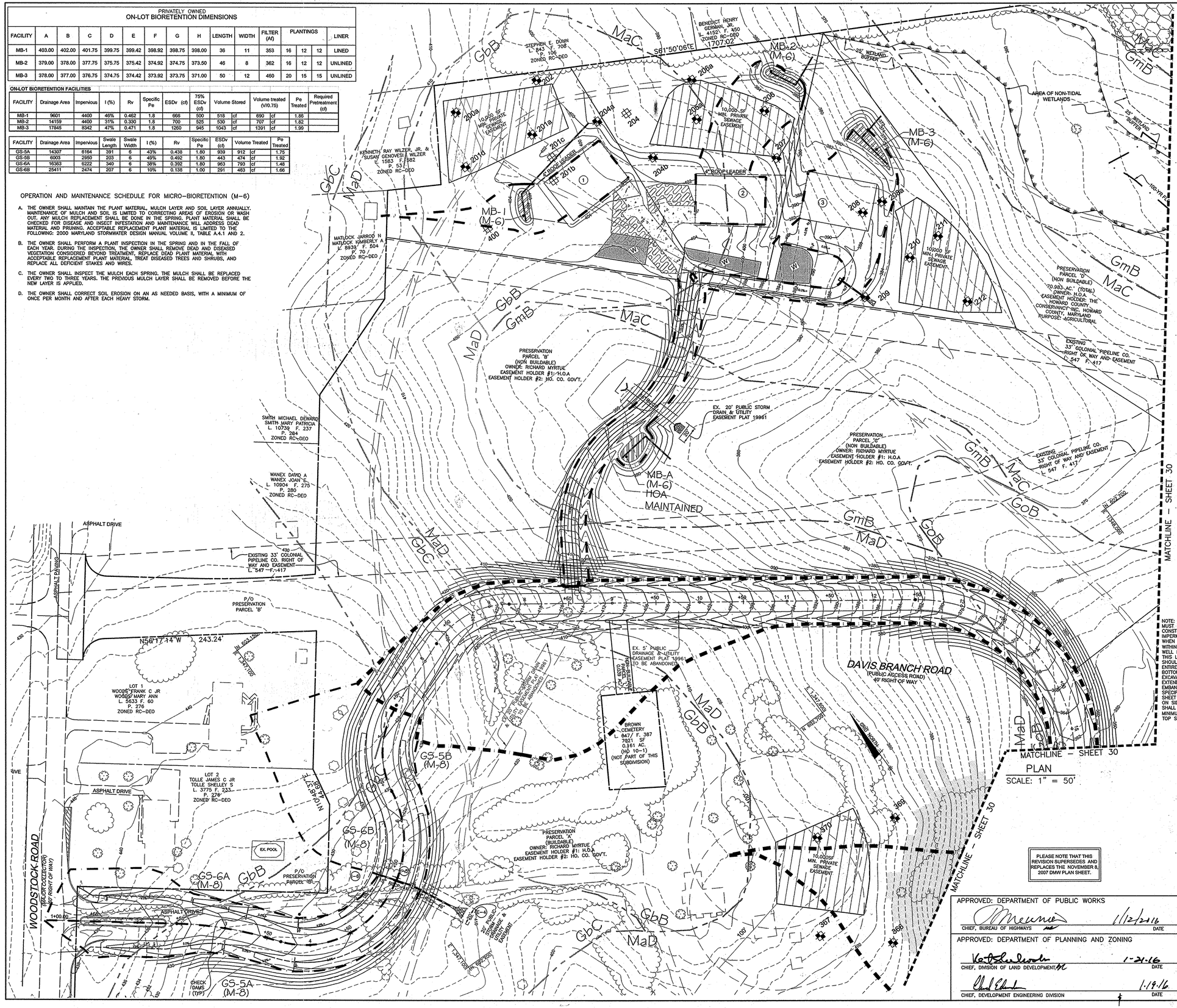
OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

A. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.

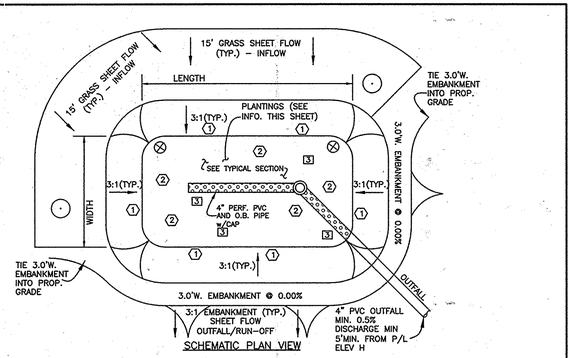
B. THE OWNER SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

C. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

D. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.



PLAN
SCALE: 1" = 50'



SCHEMATIC PLAN VIEW

LEGEND

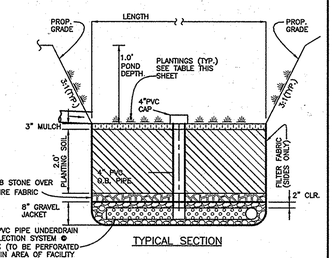
- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W — PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS
- EXISTING TREELINE
- MaC — SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- MICRO-BIORETENTION FACILITY
- SUBMERGED GRAVEL WETLANDS
- I-14 — STORMDRAIN STRUCTURE
- DISCONNECTED PAVEMENT
- DISCONNECTION RECEIVING AREA

MICROBIORETENTION PLANTING SCHEDULE
(SEE SPREADSHEET ABOVE FOR SPECIFIC NUMBER OF PLANTINGS)

1. IRIS VERSICOLOR (IRIS)
2. LOBELIA CARDINALIS CARDINAL FLOWER
3. RUDBECKIA SUBTOMENTOSA – SWEET CONEFLOWER
- CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)
- SWAMP CHESTNUT OAK (QUERCUS MICHAUXII) (2 PER FACILITY)

MICROBIORETENTION PLANTING DATA

1. PLANTINGS WITHIN THE PONDING AREA OF THE MICRO-BIORETENTION FACILITY ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE
2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE MICRO-BIORETENTION FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE
3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO-BIORETENTION FACILITY NEAR O.B. PIPE AND UNDERDRAIN.



TYPICAL SECTION

TYPICAL PROFILE

MICRO-BIORETENTION DETAILS
NOT TO SCALE

NOTE: FACILITIES MUST BE CONSTRUCTED WITH IMPERMEABLE LINER WHEN INSTALLED WITHIN THE 100' WELL RADIUS. THIS LINING SHOULD INCLUDE ENTIRE SIDES AND BOTTOM OF THE EXCAVATION AND EXTEND TO TOP OF EMBANKMENT. SEE SPECIFICATION ON SHEET 35. LINING ON SIDE SLOPES SHALL BE BELOW A MINIMUM OF 6" OF TOP SOIL.

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.19.16

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — JESSE L. HILLEN — No. 28376 — PROFESSIONAL ENGINEER

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT:
MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
STORMWATER MANAGEMENT PLAN

DATE: JUNE, 2015 / DECEMBER, 2015
PROJECT NO. 2099
DRAWING 24 OF 56
SCALE: AS SHOWN

DES: AAM | DRAFT: AAM | CHECK: CAM

F-06-014

J:\2099 Myrtue Property\dwg\7024.dwg, SWM Sheet 24, 12/14/2015 9:29:05 AM, bdodson

LEGEND

- PROJECT BOUNDARY
- 440 EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- 340 PROPOSED CONTOURS
- EXISTING TREELINE
- MaC SOILS MAP SYMBOL
- SOILS DELINEATION LINE
- MICRO-BIORETENTION FACILITY
- SUBMERGED GRAVEL WETLANDS
- I-14 STORMDRAIN STRUCTURE
- DISCONNECTED PAVEMENT
- DISCONNECTION RECEIVING AREA

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6)

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B. THE OWNER SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

C. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

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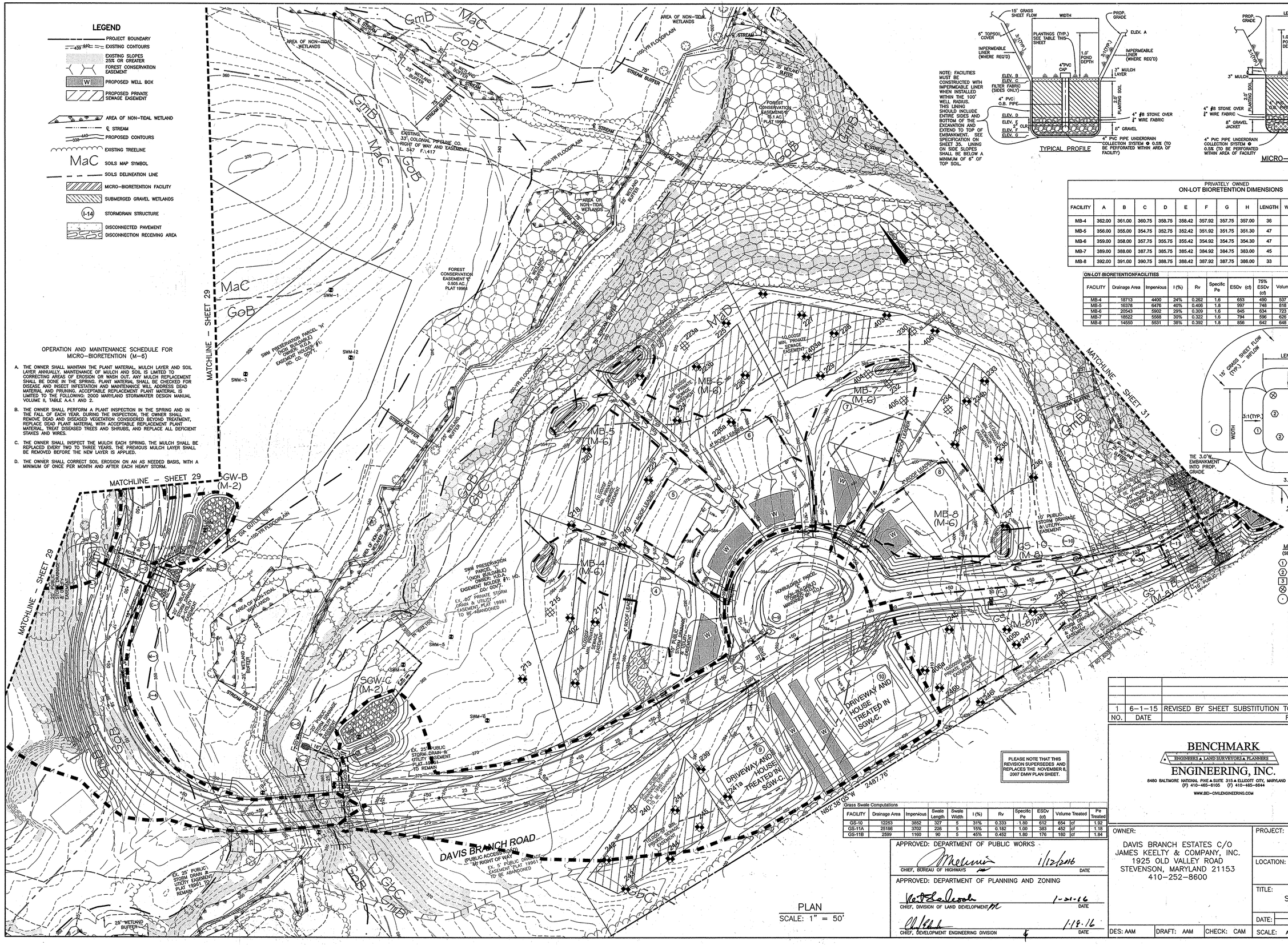
MATCHLINE – SHEET 29
MATCHLINE – SHEET 31
MATCHLINE – SHEET 29
DAVIS BRANCH ROAD
(PUBLIC ACCESS ROAD)
50' RIGHT OF WAY
EX. 5' PUBLIC DRAINAGE EASEMENT PLAT 19961 TO BE ABANDONED
N82°56'05"W 2487.76'
MB-4 (M-6)
MB-5 (M-6)
MB-6 (M-6)
MB-7 (M-6)
MB-8 (M-6)
MB-14 (M-6)
SGW-A (M-2)
SGW-B (M-2)
SGW-C (M-2)
GS-10 (M-8)
GS-11A (M-8)
GS-11B (M-8)
SWM-1
SWM-2
SWM-3
SWM-5
SWM-6
AREA OF NON-TIDAL WETLANDS
℄ STREAM
100-YR FLOODPLAIN
75' STREAM BUFFER
25' WETLAND BUFFER
FOREST CONSERVATION EASEMENT 'E' 0.505 AC. PLAT 19961
FOREST CONSERVATION EASEMENT 'F' 15.1 AC. PLAT 19961
EXISTING 33' COLONIAL PIPELINE CO. RIGHT OF WAY AND EASEMENT L. 547 F.\417
SWM PRESERVATION PARCEL 'A' (NON BUILDABLE) OWNER: H.O.A. EASEMENT HOLDER #1: HO. CO. 50'R/W
SWM PRESERVATION PARCEL 'B' (NON BUILDABLE) OWNER: H.O.A. EASEMENT HOLDER #1: HO. CO. 50'R/W
10,000SF MIN. PRIVATE SEWAGE EASEMENT
10,000SF MIN. PRIVATE SEWAGE EASEMENT (WORK WITHIN EASEMENT TO BE PERFORMED BY HOMEOWNER)
HOMEOWNER PIPED UNDERDRAIN MARKED BY ⊙
DRIVEWAY AND HOUSE TREATED IN SGW-C.
DRIVEWAY AND HOUSE TREATED IN SGW-C.
20' PUBLIC STORM DRAINAGE & UTILITY EASEMENT
EX. 25' PUBLIC STORM DRAIN & UTILITY EASEMENT PLAT 19961 TO REMAIN
EX. 20' PRIVATE STORM DRAIN & UTILITY EASEMENT PLAT 19961 TO BE ABANDONED
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EX. 20

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- PROJECT BOUNDARY
- 440 EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W PROPOSED WELL BOX
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MICRO-BIORETENTION DETAILS

NOT TO SCALE

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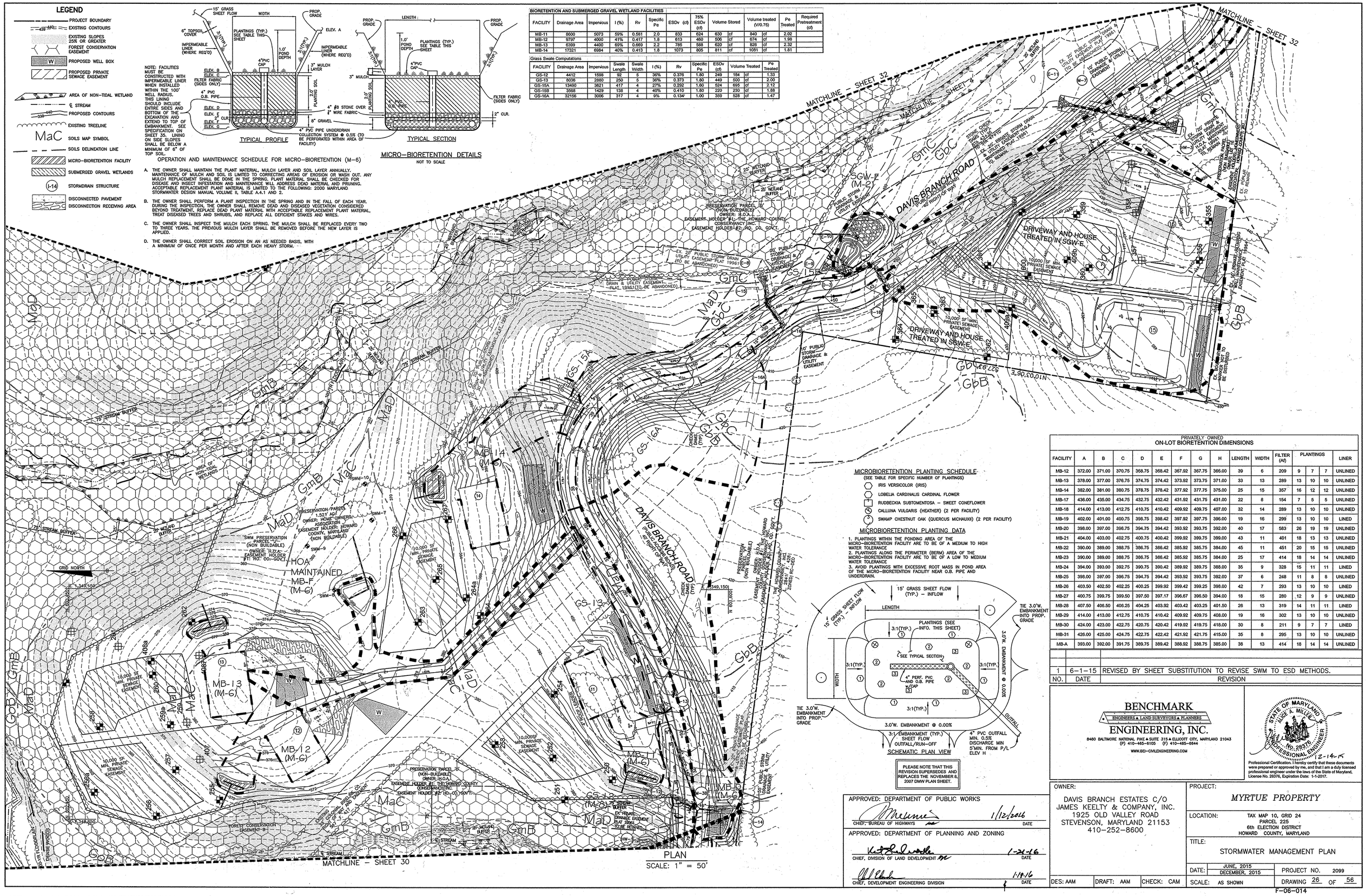
BIORETENTION AND SUBMERGED GRAVEL WETLAND FACILITIES

FACILITY	Drainage Area	Impervious	I (%)	Rv	Specific Pe	ESDv (cf)	75% ESDv (cf)	Volume Stored		Volume treated (V/0.75)		Pe Treated	Required Pretreatment (cf)
MB-11	8600	5073	59%	0.581	2.0	833	624	630	cf	840	cf	2.02	
MB-12	9797	4000	41%	0.417	1.8	613	460	506	cf	674	cf	1.98	
MB-13	6399	4400	69%	0.669	2.2	785	588	620	cf	826	cf	2.32	
MB-14	17321	6984	40%	0.413	1.8	1073	805	811	cf	1081	cf	1.81	

Grass Swale Computations

FACILITY	Drainage Area	Impervious	Swale Length	Swale Width	I (%)	Rv	Specific Pe	ESDv (cf)	Volume Treated		Pe Treated
GS-12	4412	1598	92	5	36%	0.376	1.80	249	184	cf	1.33
GS-13	8038	2880	250	5	36%	0.373	1.80	449	500	cf	2.00
GS-15A	13480	3621	417	4	27%	0.292	1.60	524	695	cf	2.12
GS-15B	3568	1429	138	4	40%	0.410	1.80	220	230	cf	1.68
GS-16A	32156	3006	317	4	9%	0.134	1.00	369	528	cf	1.47



PLAN

MICROBIORETENTION PLANTING SCHEDULE

(SEE TABLE FOR SPECIFIC NUMBER OF PLANTINGS)

- IRIS VERSICOLOR (IRIS)
- LOBELIA CARDINALIS CARDINAL FLOWER
- RUDBECKIA SUBTOMENTOSA – SWEET CONEFLOWER
- CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)
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MICROBIORETENTION PLANTING DATA

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3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO-BIORETENTION FACILITY NEAR O.B. PIPE AND UNDERDRAIN.

SCHEMATIC PLAN VIEW

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

PRIVATELY OWNED ON-LOT BIORETENTION DIMENSIONS

FACILITY	A	B	C	D	E	F	G	H	LENGTH	WIDTH	FILTER (Af)	PLANTINGS			LINER
MB-12	372.00	371.00	370.75	368.75	368.42	367.92	367.75	366.00	39	6	209	9	7	7	UNLINED
MB-13	378.00	377.00	376.75	374.75	374.42	373.92	373.75	371.00	33	13	289	13	10	10	UNLINED
MB-14	382.00	381.00	380.75	378.75	378.42	377.92	377.75	375.00	25	15	357	16	12	12	UNLINED
MB-17	436.00	435.00	434.75	432.75	432.42	431.92	431.75	431.00	22	8	154	7	5	5	UNLINED
MB-18	414.00	413.00	412.75	410.75	410.42	409.92	409.75	407.00	32	14	289	13	10	10	UNLINED
MB-19	402.00	401.00	400.75	398.75	398.42	397.92	397.75	396.00	19	16	299	13	10	10	LINED
MB-20	398.00	397.00	396.75	394.75	394.42	393.92	393.75	392.00	40	17	583	26	19	19	UNLINED
MB-21	404.00	403.00	402.75	400.75	400.42	399.92	399.75	399.00	43	11	401	18	13	13	UNLINED
MB-22	390.00	389.00	388.75	386.75	386.42	385.92	385.75	384.00	45	11	451	20	15	15	UNLINED
MB-23	390.00	389.00	388.75	386.75	386.42	385.92	385.75	384.00	25	17	414	18	14	14	UNLINED
MB-24	394.00	393.00	392.75	390.75	390.42	389.92	389.75	388.00	35	9	328	15	11	11	LINED
MB-25	398.00	397.00	396.75	394.75	394.42	393.92	393.75	392.00	37	6	248	11	8	8	UNLINED
MB-26	403.50	402.50	402.25	400.25	399.92	399.42	399.25	398.00	42	7	293	13	10	10	LINED
MB-27	400.75	399.75	399.50	397.50	397.17	396.67	396.50	394.00	18	15	280	12	9	9	UNLINED
MB-28	407.50	406.50	406.25	404.25	403.92	403.42	403.25	401.50	26	13	319	14	11	11	LINED
MB-29	414.00	413.00	412.75	410.75	410.42	409.92	409.75	408.00	19	16	302	13	10	10	UNLINED
MB-30	424.00	423.00	422.75	420.75	420.42	419.92	419.75	418.00	30	8	211	9	7	7	LINED
MB-31	426.00	425.00	424.75	422.75	422.42	421.92	421.75	415.00	35	8	295	13	10	10	UNLINED
MB-A	393.00	392.00	391.75	389.75	389.42	388.92	388.75	385.00	38	13	414	18	14	14	UNLINED

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — JUDGE A. MILLER — No. 29376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 29376, Expiration Date: 1-1-2017.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT:
MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE:
STORMWATER MANAGEMENT PLAN

DATE: JUNE, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

DES: AAM — DRAFT: AAM — CHECK: CAM — SCALE: AS SHOWN — DRAWING 26 OF 56

F-06-014

J:\2099 Myrtue Property\dwg\7024.dwg, SWM Sheet 26, 12/14/2015 9:15:36 AM, bdodson

ONLOT BIORETENTION WETLAND FACILITIES

FACILITY	Drainage Area	Impervious	I (%)	Rv	Specific Pe	ESDv (cf)	75% ESDv (cf)	Volume Stored	Volume treated (V/0.75)	Pe Treated	Required Pretreatment (cf)
MB-17	5815	4000	69%	0.669	2.2	713	535	550 cf	733 cf	2.26	
MB-18	11462	5518	48%	0.483	1.8	831	623	629 cf	838 cf	1.82	
MB-19	12271	6512	53%	0.528	1.8	971	728	732 cf	975 cf	1.81	
MB-20	26506	5509	21%	0.237	1.6	838	628	744 cf	991 cf	1.89	
MB-21	18856	4400	23%	0.260	1.6	654	490	561 cf	748 cf	1.83	
MB-22	22028	4400	20%	0.230	1.2	506	380	617 cf	823 cf	1.95	
MB-23	20434	4400	22%	0.244	1.6	664	498	553 cf	737 cf	1.77	
MB-24	12310	4400	36%	0.372	1.8	686	515	558 cf	743 cf	1.95	
MB-25	12226	4400	36%	0.374	1.8	686	514	523 cf	697 cf	1.83	
MB-26	10471	4400	42%	0.428	1.8	673	504	505 cf	673 cf	1.80	
MB-27	9355	4400	47%	0.473	1.8	664	498	507 cf	675 cf	1.83	
MB-28	5535	4400	79%	0.765	2.2	777	583	583 cf	777 cf	2.20	
MB-29	7338	4400	60%	0.590	2.0	721	541	570 cf	760 cf	2.11	
MB-30	6378	4400	69%	0.671	2.2	784	588	590 cf	787 cf	2.21	
MB-31	8932	4400	49%	0.493	1.8	661	496	504 cf	672 cf	1.83	

Grass Swale Computations

FACILITY	Drainage Area	Impervious	Swale Length	Swale Width	I (%)	Rv	Specific Pe	ESDv (cf)	Volume Treated	Pe Treated
GS-20	7162	3674	202	8	51%	0.512	1.80	550	606 cf	1.98
GS-21	7512	3924	202	8	52%	0.520	1.80	586	606 cf	1.86
GS-22	36306	8725	1021	3	24%	0.266	1.60	1289	1361 cf	1.69
GS-23	38236	8765	993	3	23%	0.256	1.60	1307	1324 cf	1.62

PLAN
SCALE: 1" = 50'

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
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- FOREST CONSERVATION EASEMENT
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NOTE: SEE SHEET 31 FOR DETAILS, DIMENSIONS, PLANTING SCHEDULES AND OPERATIONS AND MAINTENANCE SCHEDULE

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 6, 2007 DMW PLAN SHEET.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.19.16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — KEISE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT PLAN

DATE: JUNE, 2015 / DECEMBER, 2015
PROJECT NO. 2099
DES: AAM DRAFT: AAM CHECK: CAM
SCALE: AS SHOWN
DRAWING 27 OF 56
F-06-014

J:\2099 Myrtue Property\dwg\7024.dwg, SWM Sheet 27, 12/14/2015 9:13:18 AM, bdodson

PLAN – SUBMERGED GRAVEL WETLANDS – B   PRIVATELY OWNED AND MAINTAINED BY HOMEOWNERS ASSOCIATION

SCALE: 1" = 50'

FOREBAY
Q = 1.4 cfs
H = 0.27'
L = 4.0'
C = 2.5

Q = C(L)H^1.5
OR
H = (Q/CL)^0.666
WHERE C=2.5

(M–2) SUBMERGED GRAVEL WETLAND B
FOREBAY SPILLWAY DETAIL

SCALE: 1"=30' HORZ., 1"=3' VERT.

SGW–B SECTION A–A
SCALE: 1"=30' HORIZ., 1"=3' VERT.

SGW-B: Submerged		
Gravel Wetland (M-2)	3.90	Ac.
Total Drainage Area:	169719	s.f.
Impervious Area:	.35598	s.f.
Impervious:	21%	
Rv =	0.239	
ESDV =	5403.2	c.f
75% Req'd Storage:	4052	
Depth of Stone	3	ft.
Stone Porosity:	0.40	

Storage Computation:

Elevation (ft)	Area (sf)	Average Area (sf)	Contour Interval (ft)	Incremental Volume (ft^3)	Total Volume (ft^3)
345.00	1769				0
		2060.0	1.00	2060.0	
346.00	2351				2060

Stone Storage: 2122.8
Total ESDv Stored: 4183

Forebay Storage Computation:

Elevation (ft)	Area (sf)	Average Area (sf)	Contour Interval (ft)	Incremental Volume (ft^3)	Total Volume (ft^3)
345.50	269				0
		430.0	1.00	430.0	
346.50	591				430

PLANTING LEGEND	
SYMBOL	NAME
①	41 POND BUTTERCUP RANUNCULUS SUBRIGIDUS
②	29 MEADOW PHLOX PHLOX MACULATA
□	47 CARDINAL FLOWER LOBELIA CARDINALIS
△	18 SILKY WILLOW SALIX SERICEA
◎	25 VIBURNUM, POSSUM–HAW VIBURNUM NUDUM

PLANTING DETAIL FOR SGW–B
(M–2) SUBMERGED GRAVEL WETLANDS
NOT TO SCALE

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

OPERATION AND MAINTENANCE SCHEDULE FOR SUBMERGED GRAVEL WETLANDS (M-2)

1. During the first year of operation, inspections should be conducted after every major storm and poorly established areas revegetated.
2. Sediment accumulation in the pretreatment areas should be removed as necessary.
3. Signs of uneven flow within the wetland may mean that the gravel or underdrain is clogged. The gravel or underdrain may need to be removed, cleaned and replaced.
4. A dense stand of wetland vegetation should be maintained through the life of the facility with plantings replaced as needed.
5. Inlets and outlets to each gravel wetland cell should be free from debris.
6. Erosion at inflow points should be repaired. Flow splitters should be functional to prevent bypassing of the facility.

MATERIALS & SPECIFICATIONS FOR MICRO–BIORETENTION			
MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS	SEE APPENDIX A; TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND 60–65% COMPOST 35–40% OR SANDY LOAM 30% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT ASTM D 2974		
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS "C")		N/A	PE TYPE 1 NONWOVEN
GEOTEXTILE (1/4" WIRE MESH)		1/4" WIRE MESH	1/4" WIRE MESH
UNDERDRAIN GRAVEL	AASHTO M–43	NO. 57 OR NO. 6 0.375" TO 0.750"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M–278	4" TO 6" RIGID SCH.40 PVC, SDR35 OR HDPE	3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 2" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES.
IMPERVIOUS LINER	ASTM–D–4833 (THICKNESS) ASTM–D–412 (TENSILE STRENGTH 1,100 LB., ELONGATION 200%) ASTM–D–624 (TEAR RESISTANCE – 150 LB./IN) ASTM–D–471 (WATER ADSORPTION: +8 TO –2% MASS)	30 MIL. THICK	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
GEOTEXTILE (BELOW IMPERV. LINER)	ASTM–D–4833 (PUNCTURE STRENGTH 125LB) ASTM–D–4632 (TENSILE STRENGTH 300 LB.)		

NO.	DATE	REVISION
1	6–1–15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

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STATE OF MARYLAND ALICE A. MILLER No. 28376 PROFESSIONAL ENGINEER 12-14-15

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410–252–8600

PROJECT: MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER FACILITIES DETAILS

DATE: JUNE, 2015 / DECEMBER, 2015
PROJECT NO. 2099

DES: AAM | DRAFT: AAM | CHECK: CAM | SCALE: AS SHOWN | DRAWING 28 OF 56

F–06–014

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SGW-C: Submerged Gravel Wetland (M-2)	3.15	Ac.
Total Drainage Area:	137096	s.f.
Impervious Area:	33760	s.f.
Impervious:	25%	
Rv =	0.272	
ESDV =	4965.2	c.f
75% Req'd Storage:	3724	
Depth of Stone	2	ft.
Stone Porosity:	0.40	

Storage Computation:

Elevation (ft)	Area (sf)	Average Area (sf)	Contour Interval (ft)	Incremental Volume (ft^3)	Total Volume (ft^3)
357.00	2035				0
		2336.5	1.00	2336.5	
358.00	2638				2337

Stone Storage:	1628
Total ESDv Stored:	3965

Forebay Storage Computation:

Elevation (ft)	Area (sf)	Average Area (sf)	Contour Interval (ft)	Incremental Volume (ft^3)	Total Volume (ft^3)
355.50	250				0
		411.0	1.00	411.0	
356.50	572				411

SGW-C SECTION B-B
SCALE: 1"=30' HORIZ., 1"=3' VERT.

(M-2) SUBMERGED GRAVEL WETLAND C
FOREBAY SPILLWAY DETAIL
SCALE: 1"=30' HORZ., 1"=3' VERT.

SYMBOL	PLANTING LEGEND NAME
①	48 POND BUTTERCUP RANUNCULUS SUBRIGIDUS
②	34 MEADOW PHLOX PHLOX MACULATA
□	54 CARDINAL FLOWER LOBELIA CARDINALIS
△	20 SILKY WILLOW SALIX SERICEA
◎	30 VIBURNUM, POSSUM-HAW VIBURNUM NUDUM

PLANTING DETAIL FOR SGW-C
(M-2) SUBMERGED GRAVEL WETLANDS
NOT TO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SUBMERGED GRAVEL WETLANDS (M-2)

1. During the first year of operation, inspections should be conducted after every major storm and poorly established areas revegetated.
2. Sediment accumulation in the pretreatment areas should be removed as necessary.
3. Signs of uneven flow within the wetland may mean that the gravel or underdrain is clogged. The gravel or underdrain may need to be removed, cleaned and replaced.
4. A dense stand of wetland vegetation should be maintained through the life of the facility with plantings replaced as needed.
5. Inlets and outlets to each gravel wetland cell should be free from debris.
6. Erosion at inflow points should be repaired. Flow splitters should be functional to prevent bypassing of the facility.

PLAN – SUBMERGED GRAVEL WETLANDS – C
SCALE: 1" = 50'
PRIVATELY OWNED AND MAINTAINED BY HOMEOWNERS ASSOCIATION

PLAN – SUBMERGED GRAVEL WETLANDS – E
SCALE: 1" = 50'

PRIVATELY OWNED AND MAINTAINED BY HOMEOWNERS ASSOCIATION

SGW-E SECTION C-C
SCALE: 1"=30' HORIZ., 1"=3' VERT.

(M-2) SUBMERGED GRAVEL WETLAND C
FOREBAY SPILLWAY DETAIL
SCALE: 1"=30' HORZ., 1"=3' VERT.

SGW-E: Submerged Gravel Wetland (M-2)	2.57	Ac.
Total Drainage Area:	111909	s.f.
Impervious Area:	25596	s.f.
Impervious:	23%	
Rv =	0.256	
ESDV =	3817.6	c.f
75% Req'd Storage:	2863	
Depth of Stone	4	ft.
Stone Porosity:	0.40	

Storage Computation:

Elevation (ft)	Area (sf)	Average Area (sf)	Contour Interval (ft)	Incremental Volume (ft^3)	Total Volume (ft^3)
397.00	1137				0
		1350.5	1.00	1350.5	
398.00	1564				1351

Stone Storage:	1591.8
Total ESDv Stored:	2942

Forebay Storage Computation:

Elevation (ft)	Area (sf)	Average Area (sf)	Contour Interval (ft)	Incremental Volume (ft^3)	Total Volume (ft^3)
397.50	157				0
		264.0	1.00	264.0	
398.50	371				264

SYMBOL	PLANTING LEGEND NAME
①	27 POND BUTTERCUP RANUNCULUS SUBRIGIDUS
②	19 MEADOW PHLOX PHLOX MACULATA
□	30 CARDINAL FLOWER LOBELIA CARDINALIS
△	11 SILKY WILLOW SALIX SERICEA
◎	16 VIBURNUM, POSSUM-HAW VIBURNUM NUDUM

PLANTING DETAIL FOR SWG-E
(M-2) SUBMERGED GRAVEL WETLANDS
NOT TO SCALE

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

MATERIALS & SPECIFICATIONS FOR STORMWATER FACILITIES

MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS	SEE APPENDIX A; TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND 60–65% COMPOST 35–40% OR SANDY LOAM 30% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT ASTM D 2974		
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS "C")		N/A	PE TYPE 1 NONWOVEN
GEOTEXTILE (1/4" WIRE MESH)		1/4" WIRE MESH	1/4" WIRE MESH
UNDERDRAIN GRAVEL	AASHTO M-43	NO. 57 OR NO. 6 0.375" TO 0.750"	
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STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER

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JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24; PARCEL 225; 6th ELECTION DISTRICT; HOWARD COUNTY, MARYLAND

TITLE: STORMWATER FACILITIES DETAILS

DATE: JUNE, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

DES: AAM | DRAFT: AAM | CHECK: CAM | SCALE: AS SHOWN | DRAWING 29 OF 56

F-06-014

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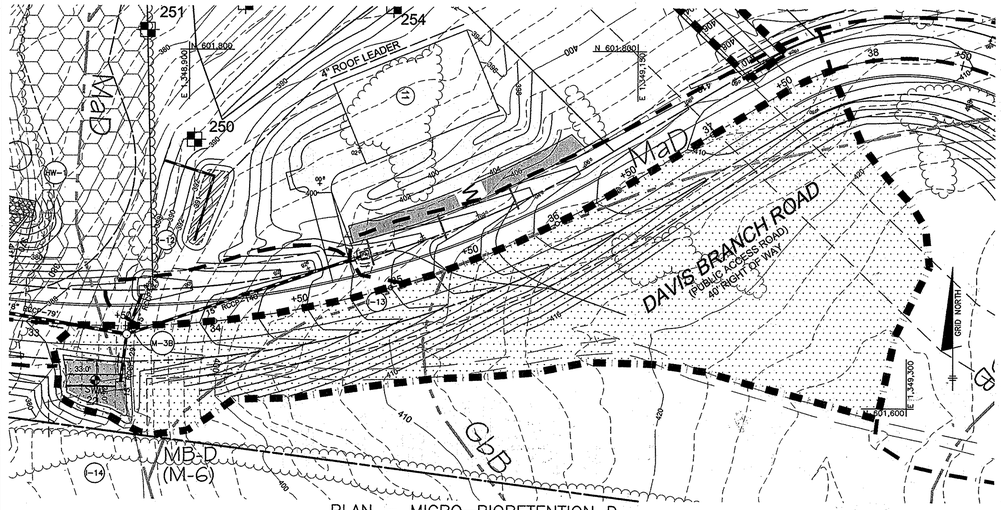


PLAN – MICRO–BIORETENTION D

SCALE: 1" = 40'

PRIVATELY OWNED AND MAINTAINED BY HOMEOWNERS ASSOCIATION

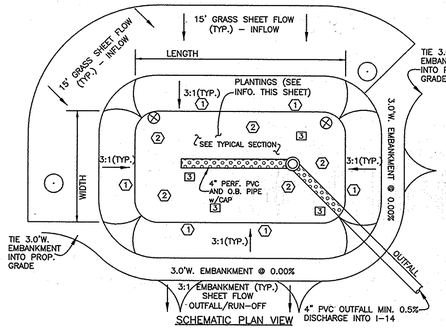
OPERATION AND MAINTENANCE SCHEDULE FOR MICRO–BIORETENTION (M–6)

A. THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUME II, TABLE A.4.1 AND 2.

B. THE OWNER SHALL PERFORM A PLANT INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL, TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.

C. THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.

D. THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.



SCHEMATIC PLAN VIEW

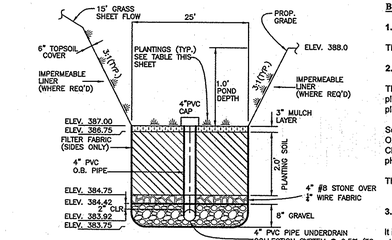
MB-D: Micro-Bioretention (M-6)			Storage Computation:					
			Elevation	Area	Average Area	Contour Interval	Incremental Volume	Total Volume
Total Drainage Area:	41944 s.f.		(ft)	(sf)	(sf)	(ft)	(ft^3)	(ft^3)
Impervious Area:	5115 s.f.		387.00	755				0
Impervious:	12%				971.0	0.60	776.8	
Rv =	0.160		388.00	1157				777
ESDV =	558.4 c.f		Min. Area of Filter @ 2% DA):				838.88	NO
75% Req'd Storage:	419							

MICROBIORETENTION PLANTING SCHEDULE

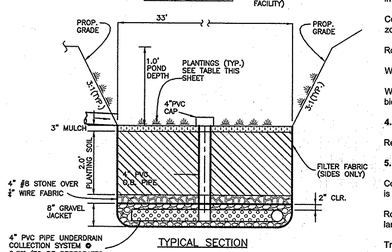
1. IRIS VERSICOLOR (IRIS) (21)
2. LOBELIA CARDINALIS CARDINAL FLOWER (34)
3. RUDBECKIA SUBTOMENTOSA – SWEET CONEFLOWER (29)
- CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)
- SWAMP CHESTNUT OAK (QUERCUS MICHAUXII) (2 PER FACILITY)

MICROBIORETENTION PLANTING DATA

1. PLANTINGS WITHIN THE PONDING AREA OF THE MICRO–BIORETENTION FACILITY ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE
2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE MICRO–BIORETENTION FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE
3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO–BIORETENTION FACILITY NEAR O.B. PIPE AND UNDERDRAIN.



TYPICAL PROFILE



TYPICAL SECTION

MICRO–BIORETENTION DETAILS

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

B.4.C Specifications for Micro-Bioretention, Rain Gardens, Landscape Infiltration & Infiltration Berms

1. Material Specifications:

The allowable materials to be used in these practices are detailed in Table B.4.1.

2. Filtering Media or Planting Soil:

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the micro-bioretention practice that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.08.01.05. The planting soil shall be tested and shall meet the following criteria:

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

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

3. Compaction:

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

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

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

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

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

4. Plant Material:

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

5. Plant Installation:

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

Rootstock of the plant material shall be kept moist during transport and on-site storage. The plant root ball should be planted so 1/8th of the ball is above final grade surface. The diameter of the planting pit shall be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

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

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

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

6. Underdrains:

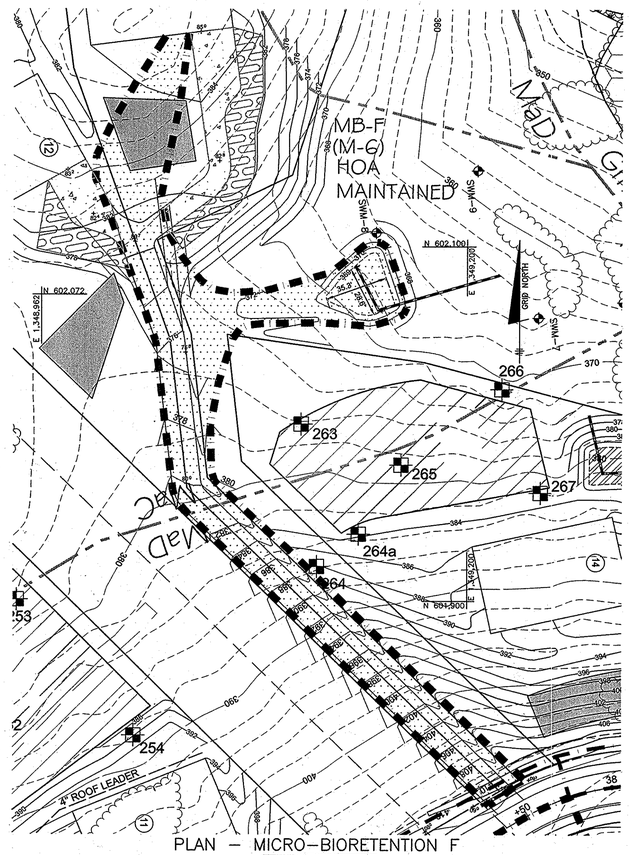
Underdrains should meet the following criteria:

- Pipe- Should be 4" to 6" diameter, slotted or perforated rigid plastic pipe (ASTMF 758, Type PS 28, or AASHTO-M-278) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
- Perforations - If perforated pipe is used, perforations should be ⅜" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a ¼" (No. 4 or 4x4) galvanized hardware cloth.
- Gravel - The gravel layer (No. 57 stone preferred) shall be at least 3" thick above and below the underdrain
- The main collector pipe shall be at a minimum 0.5% slope.
- A rigid, non-perforated observation well must be provided (one per every 1,0000 square feet) to provide a clean-out port and monitor performance of the filter.
- A 4" layer of pea gravel (⅛" to ⅜" stone) shall be located between the filter media and underdrain to prevent migration of fines into the underdrain. This layer may be considered part of the filter bed when bed thickness exceeds 24".

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

7. Miscellaneous:

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

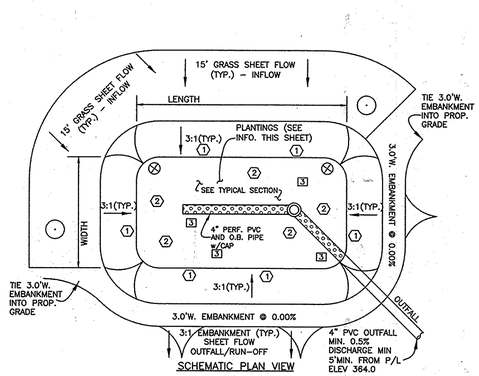


PLAN – MICRO–BIORETENTION F

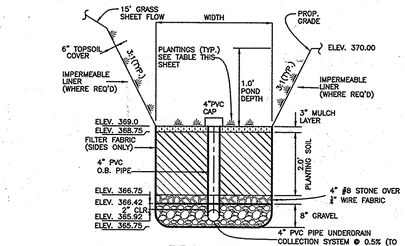
SCALE: 1" = 40'

PRIVATELY OWNED AND MAINTAINED BY HOMEOWNERS ASSOCIATION

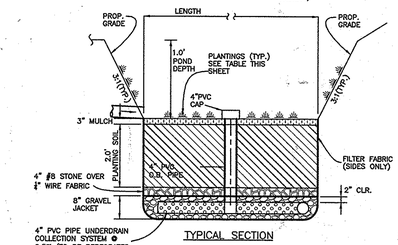
MB-F: Micro-Bioretention (M-6)			Storage Computation:					
			Elevation	Area	Average Area	Contour Interval	Incremental Volume	Total Volume
Total Drainage Area:	16955 s.f.		(ft)	(sf)	(sf)	(ft)	(ft^3)	(ft^3)
Impervious Area:	6711 s.f.		387.00	815				0
Impervious:	40%				1005.0	0.80	804.0	
Rv =	0.406		388.00	1195				804
ESDV =	1033.1 c.f		Min. Area of Filter @ 2% DA):				339.1	OK
75% Req'd Storage:	775							



SCHEMATIC PLAN VIEW



TYPICAL PROFILE



TYPICAL SECTION

MICRO–BIORETENTION DETAILS

NOT TO SCALE

MICROBIORETENTION PLANTING SCHEDULE

1. IRIS VERSICOLOR (IRIS) (21)
2. LOBELIA CARDINALIS CARDINAL FLOWER (33)
3. RUDBECKIA SUBTOMENTOSA – SWEET CONEFLOWER (29)
- CALLUNA VULGARIS (HEATHER) (2 PER FACILITY)
- SWAMP CHESTNUT OAK (QUERCUS MICHAUXII) (2 PER FACILITY)

MICROBIORETENTION PLANTING DATA

1. PLANTINGS WITHIN THE PONDING AREA OF THE MICRO–BIORETENTION FACILITY ARE TO BE OF A MEDIUM TO HIGH WATER TOLERANCE
2. PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE MICRO–BIORETENTION FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE
3. AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO–BIORETENTION FACILITY NEAR O.B. PIPE AND UNDERDRAIN.

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 6, 2007 DMW PLAN SHEET.

MATERIALS & SPECIFICATIONS FOR MICRO–BIORETENTION

MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS	SEE APPENDIX A; TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.0' TO 4.0' DEEP)	LOAMY SAND 60–65% COMPOST 35–40% OR SANDY LOAM 30% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT ASTM D 2974		
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS "C")		N/A	PE TYPE 1 NONWOVEN
GEOTEXTILE (1/4" WIRE MESH)		1/4" WIRE MESH	1/4" WIRE MESH
UNDERDRAIN GRAVEL	AASHTO M–43	NO. 57 OR NO. 6 0.375" TO 0.750"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M–278	4" TO 6" RIGID SCH.40 PVC, SDR35 OR HDPE	3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 2" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES.
IMPERVIOUS LINER	ASTM–D–4833 (THICKNESS) ASTM–D–412 (TENSILE STRENGTH 1,100 LB., ELONGATION 200%) ASTM–D–624 (TEAR RESISTANCE – 150 LB./IN) ASTM–D–471 (WATER ADSORPTION: +8 TO –2% MASS)	30 MIL. THICK	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
GEOTEXTILE (BELOW IMPERV. LINER)	ASTM–D–4833 (PUNCTURE STRENGTH 125LB) ASTM–D–4632 (TENSILE STRENGTH 300 LB.)		

NO.	DATE	REVISION
1	6–1–15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.19.16

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410–465–6105 (F) 410–465–6644
WWW.BEI–CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — NO. 28376 — PROFESSIONAL ENGINEER

12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410–252–8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER FACILITIES DETAILS

DATE: JUNE, 2015 / DECEMBER, 2015

PROJECT NO. 2099

DES: AAM | DRAFT: AAM | CHECK: CAM

SCALE: AS SHOWN

DRAWING 30 OF 56

F–06–014

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-1
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Surf. Elev. ___ Ft. — Hammer Drop 30 in. — Rock Core Diameter ___ — Inspector ___
Date Started 8/12/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/12/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Brown, moist, very loose, silty sand, trace organics, trace clay (SM-ML)	8" of Topsoil	18"		1-2-2-2	4
Light brown, moist, medium dense to dense, silty sand, trace mica (SM)		18"		5-12-13-18	25
		17"		5-12-13-18	25
		15"		5-12-19-38	31
Light brown, moist, very dense, silty sand and gravel (Decomposed Rock to Rock)	Groundwater encountered @ 13.0' while drilling	13"		19-39-51/5	100+
		9"		41-51/5	100+
Bottom of Test Boring @ 13.9'					

Ground Water: At Completion dry ft.; After 24 hrs. 7.0' ft. — Cave In Depth: 7.0' ft.; 6.0' ft.

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

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-2
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Hammer Drop 30 in. — Date Started 8/12/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/12/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Grey, moist, medium stiff to stiff, silty clay, trace organics, trace sand (CL-ML)	10" Topsoil	16"		2-3-3-2	6
		17"		3-6-6-8	12
Grey, moist, stiff clay, some sand (CL)		18"		3-5-6-6	11
Grey to brown, moist, stiff sandy silt, trace mica (ML-SM)	Groundwater encountered @ 9.5' while drilling	15"		5-7-7-11	14
		16"		6-7-12-15	19
		12"		6-11-7-8	18
Bottom of Test Boring @ 15.0'					

Ground Water: At Completion 8.0' ft.; After 24 hrs. 6.0' ft. — Cave In Depth: 6.0' ft.; 8.0' ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-3
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Hammer Drop 30 in. — Date Started 8/12/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/12/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Dark brown, moist, loose silty sand, trace organics, trace clay (SM)	10" Topsoil	15"		2-2-3-3	5
Dark grey, moist, stiff clay, some sand (CL)		18"		8-11-13-12	24
Grey, moist, stiff micaceous silt, trace clay, trace gravel (ML)	Groundwater encountered @ 7.0' while drilling	18"		6-7-4-10	11
Whitish grey to grey, moist, medium dense, silty sand, trace mica, trace clay (SM)		15"		4-6-8-9	14
		13"		5-8-12-16	20
Dark grey, moist, hard sandy silt, trace gravel, trace mica (ML-SM)		15"		16-15-18-22	33
Bottom of test boring @ 15.0'					

Ground Water: At Completion dry ft.; After 24 hrs. 7.5' ft. — Cave In Depth: 6.0' ft.; 7.5' ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-4
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Hammer Drop 30 in. — Date Started 8/12/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/12/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Brown, moist, soft to medium stiff, silty clay, trace organics, trace mica, trace sand (CL-ML)	10" Topsoil	15"		2-2-3-4	5
		20"		3-4-4-7	8
	No groundwater encountered while drilling	15"		4-5-5-8	10
Grey, moist, medium stiff to stiff, sandy silt, trace gravel (ML-SM)		13"		9-8-6-9	12
		16"		8-11-10-9	21
		12"		8-9-11-15	20
Bottom of test boring @ 15.0'					

Ground Water: At Completion dry ft.; After 24 hrs. dry ft. — Cave In Depth: 6.5' ft.; 6.5' ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-5
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Hammer Drop 30 in. — Date Started 8/12/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/12/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Brown, moist, soft silty clay, trace organics, trace mica, trace sand (CL-ML)	10" Topsoil	16"		2-2-2-3	4
Brown, moist, medium stiff clay, trace mica, trace sand (CL)		16"		4-5-5-6	10
	No groundwater encountered while drilling	16"		3-4-5-10	9
Dark brown, moist, dense silty sand, trace gravel (SM)		16"		9-15-20-19	35
Grey, moist, stiff to hard, sandy silt, trace mica (ML-SM)		18"		10-15-14-15	29
		18"		16-20-30-35	50
Bottom of test boring @ 15.0'					

Ground Water: At Completion dry ft.; After 24 hrs. dry ft. — Cave In Depth: 12.5 ft.; 12.5 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-6
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Hammer Drop 30 in. — Date Started 8/12/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/12/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Brown, moist, soft silt, trace organics, trace mica, trace clay (ML)	10" Topsoil	18"		1-2-2-3	4
Light brown, moist, stiff sandy silt, trace rock fragments (ML-SM)		15"		5-8-10-9	18
Brown, moist, loose to medium dense, silty sand, trace clay, trace mica (SM-ML)	No groundwater encountered while drilling	18"		5-6-8-11	14
		18"		5-6-4-4	10
Dark grey, moist, medium stiff to stiff silt, trace sand (ML)		15"		3-4-6-7	10
		15"		5-6-4-8	12
Grey to dark grey, moist, dense silty sand and silt, trace mica (Possible Decomposed Rock)		12"		10-23-25-51/5	48
Bottom of test boring @ 20.0'					

Ground Water: At Completion dry ft.; After 24 hrs. dry ft. — Cave In Depth: 5.5' ft.; 5.5' ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-7
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Hammer Drop 30 in. — Date Started 8/13/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/13/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Light brown, moist, medium stiff clay, trace organics, trace mica, trace gravel (CL)	12" of Topsoil	12"		2-3-3-4	6
Light brown, moist, medium stiff micaceous silt (ML)		20"		4-4-4-8	8
Grey to brown, moist, loose to medium dense, silty sand, trace mica (SM)		20"		3-4-5-5	9
		12"		3-4-5-8	9
	No groundwater encountered while drilling	15"		2-3-4-5	7
		15"		3-6-8-9	14
Bottom of Test Boring @ 15.0'					

Ground Water: At Completion dry ft.; After 24 hrs. dry ft. — Cave In Depth: 4.0 ft.; 4.0 ft.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No. SWM-8
Location: Howard County, MD — Job # 02219A

SAMPLER: Hammer Wt. 140 lbs. — Hole Diameter 6" — Foreman L. Smith
Hammer Drop 30 in. — Date Started 8/13/04 — Pipe Size 2.0 in. — Boring Method HSA — Date Completed 8/13/04

Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
Brown, moist, medium stiff silty clay, trace organics, trace mica, trace sand (CL-ML)	10" Topsoil	18"		2-3-3-5	6
Brown, moist, stiff micaceous sandy silt, trace clay (ML)		20"		5-5-6-10	11
Brown, moist, stiff clay, trace mica (CL)	No groundwater encountered while drilling	20"		4-5-7-8	12
Grey to whitish grey, moist, medium dense, silty sand (SM-ML)		17"		5-6-8-9	14
		15"		4-8-8-9	16
		17"		6-8-10-12	18
Bottom of test boring @ 15.0'					

Ground Water: At Completion dry ft.; After 24 hrs. dry ft. — Cave In Depth: 4.0 ft.; 3.5 ft.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1, DEC. 3, 2015

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-15-15

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07
~~DIRECTOR~~ — ~~DATE~~

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 528
61 E. PADONIA ROAD,
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

T. E. SCOTT & ASSOCIATES, INC.
128 COCKEYSVILLE ROAD, SUITE 300
HUNT VALLEY, MARYLAND 21030
tes@MdSWM.com
Phone: 410.458.2651
Fax: 443.269.0216
www.MdSWM.com

9-24-07
STATE OF MARYLAND — CHARLES VICTOR MANN III — No. 20784 — REGISTERED PROFESSIONAL ENGINEER
Professional Engr. No 20784

SUBDIVISION NAME	SECTION/AREA	LOT PARCEL #
MYRTUE PROPERTY	N/A	P. 225

PLAT# OR LF	BLOCK#	ZONE	TAX ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
647/987	24	RCDEO	10	6	6067.04

WATER CODE — SEWER CODE

TITLE: STORMWATER MANAGEMENT BORING LOGS

Des. By	tes	Scale	As Shown	Proj. No.	02033
Drn. By	TSA	Date	3-[illegible]-06		
Chk. By		Approved			

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-9
Location: Howard County, MD — Job #: 02219A

SAMPLER
Datum: — Hammer Wt.: 140 lbs. — Hole Diameter: 6" — Foreman: L. Smith
Surf. Elev.: Ft. — Hammer Drop: 30 in. — Rock Core Diameter: — Inspector:
Date Started: 8/13/04 — Pipe Size: 2.0 in. — Boring Method: HSA — Date Completed: 8/13/04

Elevation/Depth	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
0	Brown, moist, soft silty clay, trace organics, trace mica, trace sand (CL-ML)	10" Topsoil	13"		2-2-3-3	5
	Light brown to brown, moist, medium stiff to stiff, micaceous sandy silt, trace clay (ML)		18"		3-4-5-7	9
5		No groundwater encountered while drilling	10"		5-7-8-11	15
			10"		8-11-12-13	23
10	Light brown, moist, medium dense silty sand, trace gravel, trace clay (SM)		14"		7-7-8-11	15
	Light brown, moist, stiff sandy silt (ML-SM)		13"		7-8-10-11	18
15	Bottom of test boring @ 15.0'					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER / CAVE IN DEPTH: AT COMPLETION dry ft. 6.5 ft.; AFTER 24 HRS. dry ft. 6.5 ft.; AFTER ___ HRS. ___ ft. ___ ft.
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-10
Location: Howard County, MD — Job #: 02219A

SAMPLER
Datum: — Hammer Wt.: 140 lbs. — Hole Diameter: 6" — Foreman: L. Smith
Surf. Elev.: Ft. — Hammer Drop: 30 in. — Rock Core Diameter: — Inspector:
Date Started: 8/16/04 — Pipe Size: 2.0 in. — Boring Method: HSA — Date Completed: 8/16/04

Elevation/Depth	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
0	Dark grey, moist, medium stiff silt, trace organics, trace gravel, trace mica, trace clay (ML)	10" Topsoil	10"		2-3-3-4	6
	Light brown, moist, medium stiff to stiff, silty clay, trace mica (CL-ML)		13"		3-4-5-8	9
5		No groundwater encountered while drilling	20"		5-8-11-11	19
	Brown, moist, loose to medium dense, silty sand, trace mica (SM)		18"		4-4-6-5	10
10			15"		[illegible]	14
	Dark grey, moist, dense silty sand, trace mica (SM-ML)		15"		[illegible]-25-[illegible]-27	48
15	Bottom of test boring @ 15.0'					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER / CAVE IN DEPTH: AT COMPLETION dry ft. 6.0 ft.; AFTER 24 HRS. dry ft. 6.0 ft.; AFTER ___ HRS. ___ ft. ___ ft.
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-11
Location: Howard County, MD — Job #: 02219A

SAMPLER
Datum: — Hammer Wt.: 140 lbs. — Hole Diameter: 6" — Foreman: L. Smith
Surf. Elev.: Ft. — Hammer Drop: 30 in. — Rock Core Diameter: — Inspector:
Date Started: 8/16/04 — Pipe Size: 2.0 in. — Boring Method: HSA — Date Completed: 8/16/04

Elevation/Depth	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
0	Brown, moist, loose silty sand, trace gravel, trace clay (SM)	6" Topsoil	12"		2-3-3-5	6
	Brown, moist, medium dense, silty sand, trace gravel, trace mica (SM-ML)		16"		8-10-13-10	23
5		No groundwater encountered while drilling	18"		10-11-13-11	24
	Grey, moist, hard sandy silt, trace mica (ML)		15"		6-10-20-22	30
10	Grey to brown, moist, very dense silt and silty sand (Decomposed Rock)		12"		28-32-51/6	100+
15			18"		18-18-38-51/6	66
	Bottom of test boring @ 18.5'		4"		51/6	100+

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER / CAVE IN DEPTH: AT COMPLETION dry ft. 5.5 ft.; AFTER 24 HRS. dry ft. 5.0 ft.; AFTER ___ HRS. ___ ft. ___ ft.
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-12
Location: Howard County, MD — Job #: 02219A

SAMPLER
Datum: — Hammer Wt.: 140 lbs. — Hole Diameter: 6" — Foreman: L. Smith
Surf. Elev.: Ft. — Hammer Drop: 30 in. — Rock Core Diameter: — Inspector:
Date Started: 8/16/04 — Pipe Size: 2.0 in. — Boring Method: HSA — Date Completed: 8/16/04

Elevation/Depth	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
0	Brown, moist, very soft micaceous silt, trace organics (ML)	10" Topsoil	10"		1-1-2-2	3
	Grey to brown, moist, loose to medium loose, silt and silty sand, trace mica (SM-ML)		15"		3-3-3-6	6
5		No groundwater encountered while drilling	18"		3-5-5-6	11
			18"		3-5-6-8	11
10			18"		6-8-10-16	18
15			15"		25-38-51/5	100+
	Dark grey, moist, very dense silt and silty sand, trace gravel (Decomposed Rock to Rock)		11"		37-51/5	100+
	Bottom of test boring @ 18.9'					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER / CAVE IN DEPTH: AT COMPLETION dry ft. 5.9 ft.; AFTER 24 HRS. dry ft. 5.0 ft.; AFTER ___ HRS. ___ ft. ___ ft.
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1, DEC 3, 2015

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-15-15

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-13
Location: Howard County, MD — Job #: 02219A

SAMPLER
Datum: — Hammer Wt.: 140 lbs. — Hole Diameter: 6" — Foreman: L. Smith
Surf. Elev.: Ft. — Hammer Drop: 30 in. — Rock Core Diameter: — Inspector:
Date Started: 8/16/04 — Pipe Size: 2.0 in. — Boring Method: HSA — Date Completed: 8/16/04

Elevation/Depth	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
0	Brown, moist, medium stiff, silty clay, trace mica, trace organics (CL-ML)	10" Topsoil	12"		2-3-4-7	7
	Grey to brown, moist, medium stiff to stiff, sandy silt, trace organics in S-2 (ML-SM)		24"		3-5-[illegible]	12
5		No groundwater encountered while drilling	20"		3-4-4-6	8
			13"		5-7-8-9	15
10			17"		5-8-9-9	17
15			18"		23-35-51/6	100+
	Dark grey, moist, very dense silt and silty sand (Decomposed Rock)		13"		25-38-40-44	78
20	Bottom of test boring @ 20.0'					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER / CAVE IN DEPTH: AT COMPLETION dry ft. 5.5 ft.; AFTER 24 HRS. dry ft. 5.5 ft.; AFTER ___ HRS. ___ ft. ___ ft.
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property Culvert — Boring No.: B-1
Location: Howard County, MD — Job #: 02219A

SAMPLER
Datum: — Hammer Wt.: 140 lbs. — Hole Diameter: 6" — Foreman: Lamont Smith
Surf. Elev.: 348.0 Ft. — Hammer Drop: 30 in. — Rock Core Diameter: — Inspector:
Date Started: 10/17/05 — Pipe Size: 2 in. — Boring Method: HSA — Date Completed: 10/17/05

Elevation/Depth	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
0	Brown, moist, very soft, micaceous sandy silt, trace organics (ML)	Topsoil-5"; No groundwater encountered while drilling.	14"		1-1-2	3
	Light brown to tan, moist, medium dense to very dense, micaceous silty sand (SM)		16"		6-9-14	23
4			10"		15-51/4"	100+
8			9"		12-51/3"	100+
			12"		19-16-18	34
12	Gray, moist, very dense, micaceous silty sand (SM; Decomposed ROCK)		9"		41-51/3"	100+
20	Bottom of boring @ 20.8'	Boring was offset 20.0' to avoid slope.	10"		25-51/4"	100+

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER / CAVE IN DEPTH: AT COMPLETION Dry ft. 15.5 ft.; AFTER 24 HRS. ___ ft. ___ ft.; AFTER ___ HRS. ___ ft. ___ ft.
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

HILLIS - CARNES ENGINEERING ASSOCIATES, INC.
RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property Culvert — Boring No.: B-2
Location: Howard County, MD — Job #: 02219A

SAMPLER
Datum: — Hammer Wt.: 140 lbs. — Hole Diameter: 6" — Foreman: Lamont Smith
Surf. Elev.: 348.0 Ft. — Hammer Drop: 30 in. — Rock Core Diameter: — Inspector:
Date Started: 10/17/05 — Pipe Size: 2 in. — Boring Method: HSA — Date Completed: 10/17/05

Elevation/Depth	Description	Boring and Sampling Notes	Rec.	NM	SPT Blows	N
0	Brown to tan, moist, very loose, silty sand, trace rock fragments and organics (SM)	Topsoil-4"; No groundwater encountered while drilling.	10"		1-1-2	3
	Tan, moist, very dense, silty sand, trace rock fragments (SM; Decomposed ROCK)		15"		9-20-46	66
4	Auger refusal @ 5.5'; Bottom of boring @ 5.6'	B-2a offset boring 5.0' [illegible] auger refusal @ 2.0'.	6" / 0"		51/6" / 51/0"	100+ / 100+

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE; PT - PRESSED SHELBY TUBE; CA - CONTINUOUS FLIGHT AUGER; RC - ROCK CORE
SAMPLE CONDITIONS: D - DISINTEGRATED; I - INTACT; U - UNDISTURBED; L - LOST
GROUND WATER / CAVE IN DEPTH: AT COMPLETION Dry ft. ___ ft.; AFTER 24 HRS. ___ ft. ___ ft.; AFTER ___ HRS. ___ ft. ___ ft.
BORING METHOD: HSA - HOLLOW STEM AUGERS; CFA - CONTINUOUS FLIGHT AUGERS; DC - DRIVING CASING; MD - MUD DRILLING
STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30"; COUNT MADE AT 6" INTERVALS.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07
~~DIRECTOR~~ — ~~DATE~~

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 528
61 E. PADONIA ROAD,
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4706
A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME	SECTION/AREA	LOT PARCEL #
MYRTUE PROPERTY	N/A	P. 2[illegible]

PLAT# OR LF	BLOCK#	ZONE	TAX ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
647/987	24	RC-DEO	10	6	6061.04

WATER CODE — SEWER CODE

TITLE: STORMWATER MANAGEMENT BORING LOGS

T. E. SCOTT & ASSOCIATES, INC.
128 COCKEYSVILLE ROAD, SUITE 300
HUNT VALLEY, MARYLAND 21030
tes@MdSWM.com
Phone: 410.458.2651
Fax: 443.269.0216
www.MdSWM.com

9-24-07
STATE OF MARYLAND — CHARLES VICTOR ... — No. 20784 — REGISTERED PROFESSIONAL ENGINEER
Professional Engr. No. 20784

Des. By	tes	Scale	As Shown	Proj. No.	02033
Drn. By	TSA	Date	3-13-06		
Chk. By		Approved			

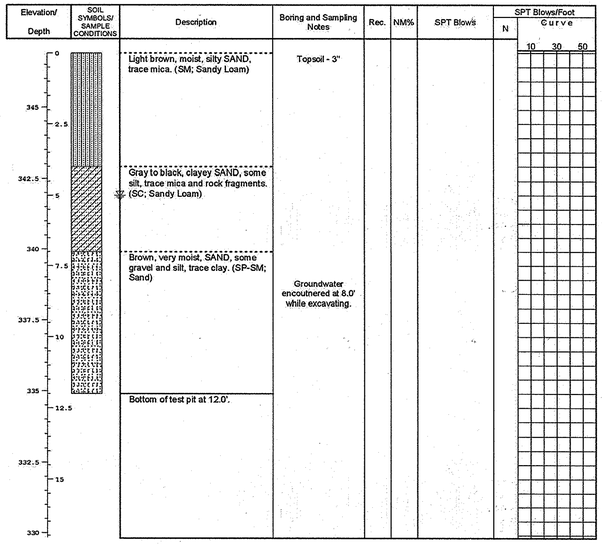
HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-20
Location: Howard County, Maryland — Job #: 15175A

SAMPLER

Datum: ____ Hammer Wt.: ____ lbs. Hole Diameter: ____ Foreman: D. Stone
Surf. Elev.: 346.904 ft Hammer Drop: ____ in. Rock Core Diameter: ____ Inspector: C. Hillis
Date Started: 05/11/2015 Pipe Size: ____ in. Boring Method: Test Pit Date Completed: 05/11/2015



SAMPLER TYPE
DRIVEN SPLIT SPOON UNLESS OTHERWISE
PT - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

SAMPLE CONDITIONS
D - DISINTEGRATED
I - INTACT
U - UNDISTURBED
L - LOST

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	5.0 ft.	12.0 ft.
AFTER 24 HRS.	____ ft.	____ ft.
AFTER ____ HRS.	____ ft.	____ ft.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30". COUNT MADE AT 6" INTERVALS.

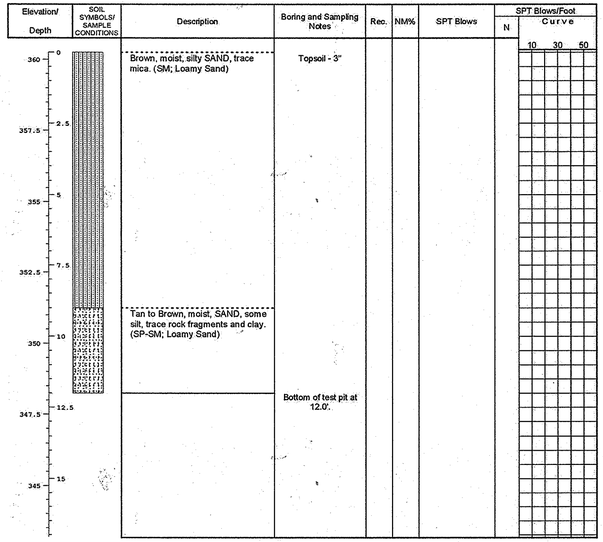
HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-21
Location: Howard County, Maryland — Job #: 15175A

SAMPLER

Datum: ____ Hammer Wt.: ____ lbs. Hole Diameter: ____ Foreman: D. Stone
Surf. Elev.: 360.25 ft Hammer Drop: ____ in. Rock Core Diameter: ____ Inspector: C. Hillis
Date Started: 05/11/2015 Pipe Size: ____ in. Boring Method: Test Pit Date Completed: 05/11/2015



SAMPLER TYPE
DRIVEN SPLIT SPOON UNLESS OTHERWISE
PT - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

SAMPLE CONDITIONS
D - DISINTEGRATED
I - INTACT
U - UNDISTURBED
L - LOST

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	12.0 ft.
AFTER 24 HRS.	____ ft.	____ ft.
AFTER ____ HRS.	____ ft.	____ ft.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30". COUNT MADE AT 6" INTERVALS.

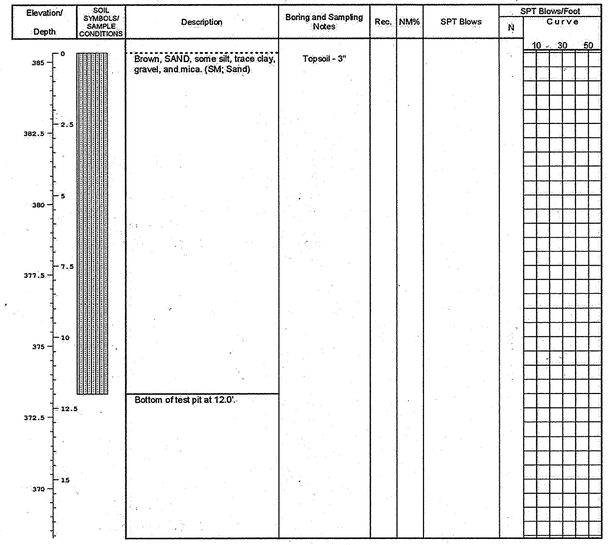
HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-22
Location: Howard County, Maryland — Job #: 15175A

SAMPLER

Datum: ____ Hammer Wt.: ____ lbs. Hole Diameter: ____ Foreman: D. Stone
Surf. Elev.: 385.32 ft Hammer Drop: ____ in. Rock Core Diameter: ____ Inspector: C. Hillis
Date Started: 05/11/2015 Pipe Size: ____ in. Boring Method: Test Pit Date Completed: 05/11/2015



SAMPLER TYPE
DRIVEN SPLIT SPOON UNLESS OTHERWISE
PT - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

SAMPLE CONDITIONS
D - DISINTEGRATED
I - INTACT
U - UNDISTURBED
L - LOST

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	12.0 ft.
AFTER 24 HRS.	____ ft.	____ ft.
AFTER ____ HRS.	____ ft.	____ ft.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30". COUNT MADE AT 6" INTERVALS.

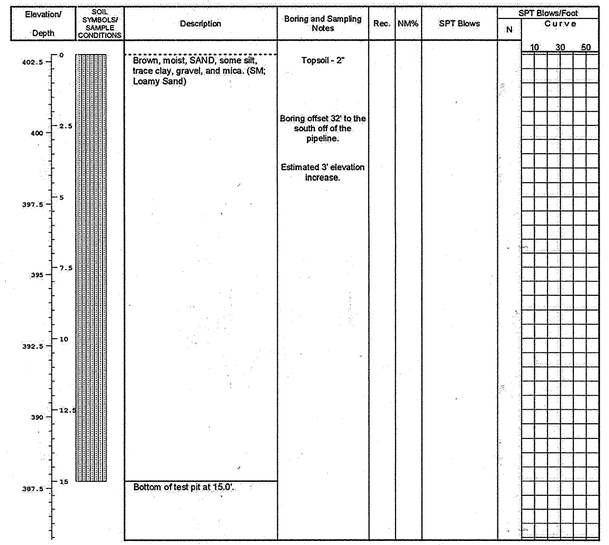
HILLIS - CARNES ENGINEERING ASSOCIATES, INC.

RECORD OF SOIL EXPLORATION

Project Name: Myrtue Property — Boring No.: SWM-23
Location: Howard County, Maryland — Job #: 15175A

SAMPLER

Datum: ____ Hammer Wt.: ____ lbs. Hole Diameter: ____ Foreman: D. Stone
Surf. Elev.: 402.75 ft Hammer Drop: ____ in. Rock Core Diameter: ____ Inspector: C. Hillis
Date Started: 05/11/2015 Pipe Size: ____ in. Boring Method: Test Pit Date Completed: 05/11/2015



SAMPLER TYPE
DRIVEN SPLIT SPOON UNLESS OTHERWISE
PT - PRESSED SHELBY TUBE
CA - CONTINUOUS FLIGHT AUGER
RC - ROCK CORE

SAMPLE CONDITIONS
D - DISINTEGRATED
I - INTACT
U - UNDISTURBED
L - LOST

	GROUND WATER	CAVE IN DEPTH
AT COMPLETION	Dry ft.	12.0 ft.
AFTER 24 HRS.	____ ft.	____ ft.
AFTER ____ HRS.	____ ft.	____ ft.

BORING METHOD
HSA - HOLLOW STEM AUGERS
CFA - CONTINUOUS FLIGHT AUGERS
DC - DRIVING CASING
MD - MUD DRILLING

STANDARD PENETRATION TEST-DRIVING 2" O.D. SAMPLER 1' WITH 140# HAMMER FALLING 30". COUNT MADE AT 6" INTERVALS.

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 6, 2007 DMW PLAN SHEET.

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

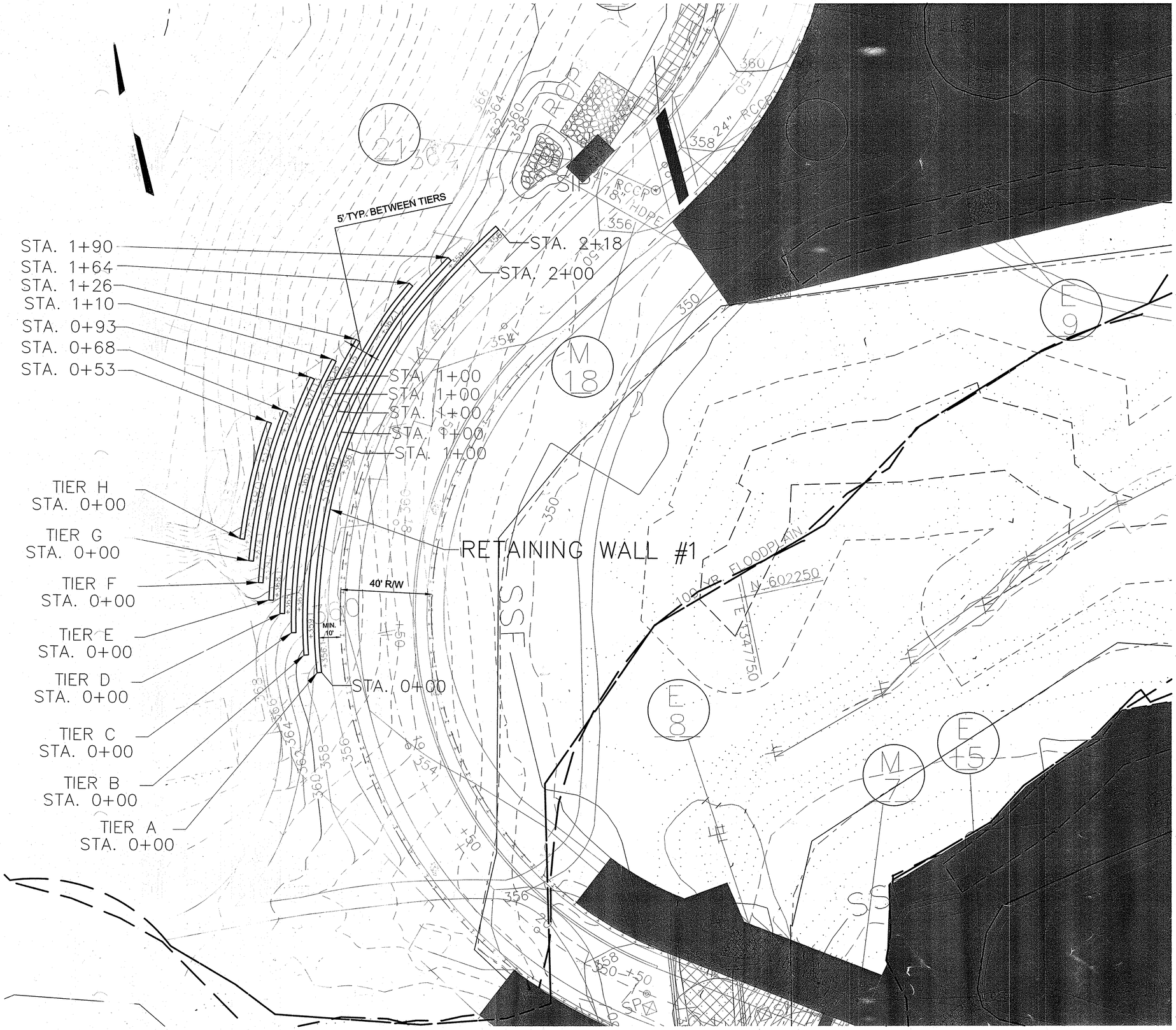
TITLE: STORMWATER BORINGS

DATE: DECEMBER, 2015 — PROJECT NO. 2099
SCALE: AS SHOWN — DRAWING 33 OF 56

DES: AAM | DRAFT: AAM | CHECK: CAM

F-06-014

J:\2099 Myrtue Property\dwg\7024.dwg, SWM Borings 33, 12/14/2015 9:09:12 AM, bdodson



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1, DEC. 3, 2015

STATE OF MARYLAND ALICE A. WALLER No. 28376 PROFESSIONAL ENGINEER 12-15-15

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

~~DIRECTOR~~ ~~DATE~~

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

OWNER/DEVELOPER:

OWNER	DEVELOPER
MYRTUE RICHARD E & WF 3504 MYRTLE ST EDISTO SC 29438-3723	JAMES KEELTY AND CO. INC. P.O. BOX 528 61 E. PADONIA ROAD. TIMONIUM, MD 21093

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A — Annapolis Junction, MD
(410) 880-4788 — Fax: (410)880-4098

DMW
Daft McCune Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME		SECTION / AREA		LOT/PARCEL #
MYRTUE PROPERTY		N/A		225
PLAT OR L/F	BLOCK # ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
647/387	24	17	6th	6067.04
WATER CODE		SEWER CODE		

TITLE

RETAINING WALL #1
LOCATION PLAN

Des. By	HM	Scale	1" = 20'	Proj. No.	03053-G
Drn. By	HM	Date	9/25/07		
Chk. By	RWS	Approved	RWS	34 of 56	

9/25/07
Date

STATE OF MARYLAND RICHARD W. STUDENY No. 14434 PROFESSIONAL ENGINEER

14434
Professional Engr. No.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1 DEC. 3, 2015

STATE OF MARYLAND
ALICE A. MILLER
No. 28376
PROFESSIONAL ENGINEER
12-15-15

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/5/07

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07

~~DIRECTOR~~ — ~~DATE~~

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

OWNER/DEVELOPER:

OWNER	DEVELOPER
MYRTUE RICHARD E & WF 3504 MYRTLE ST EDISTO SC 29438-3723	JAMES KEELTY AND CO. INC. P.O. BOX 528 61 E. PADONIA ROAD. TIMONIUM, MD 21093

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A — Annapolis Junction, MD
(410) 880-4788 — Fax: (410)880-4098

DMW
Daft McCune Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME		SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY		N/A		225
PLAT OR L.F.	BLOCK # ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
647/387	24	10	6th	6067.04
WATER CODE		SEWER CODE		

TITLE

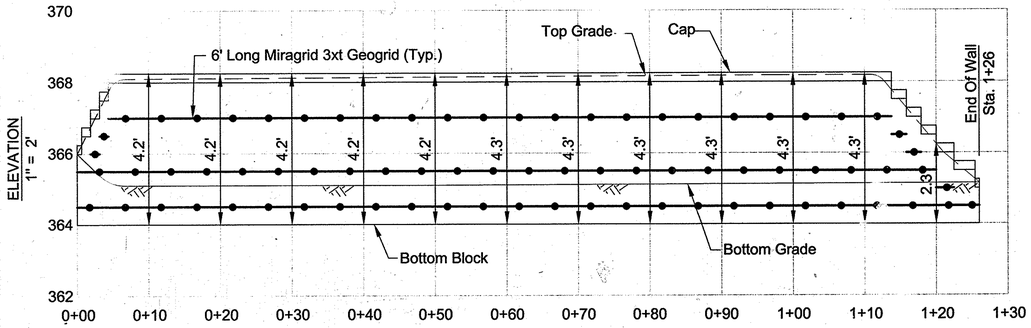
RETAINING WALL #2
LOCATION PLAN

Des. By	HM	Scale	1" = 20"	Proj. No. 03053-G
Drn. By	HM	Date	9/25/07	35 of 56
Chk. By	RWS	Approved	RWS	

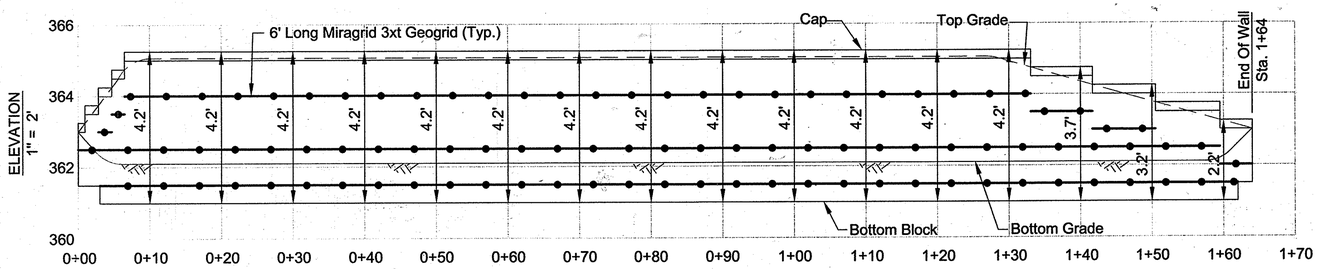
9/25/07
Date

STATE OF MARYLAND
RICHARD W. STURTEVANT
No. 14434
PROFESSIONAL ENGINEER

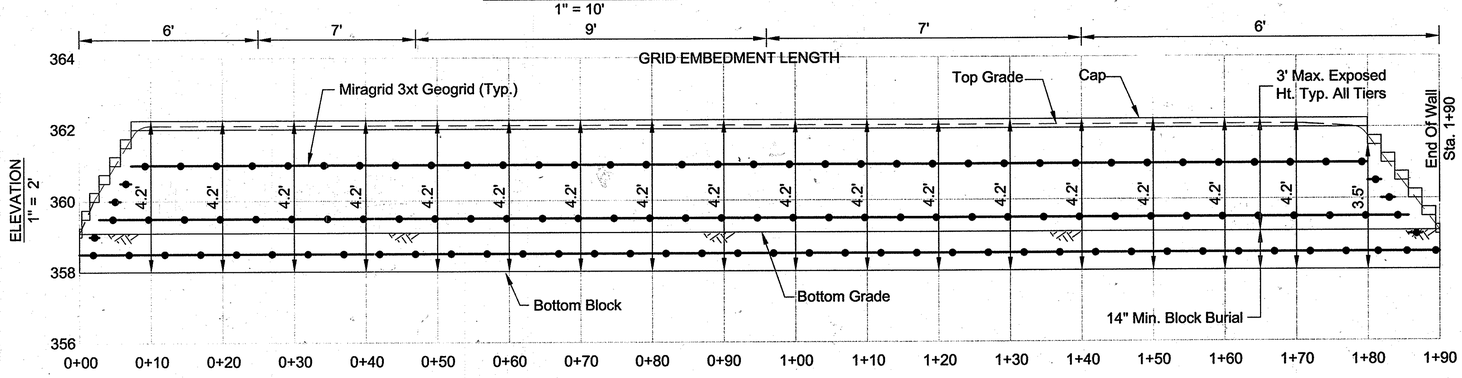
14434
Professional Engr. No.



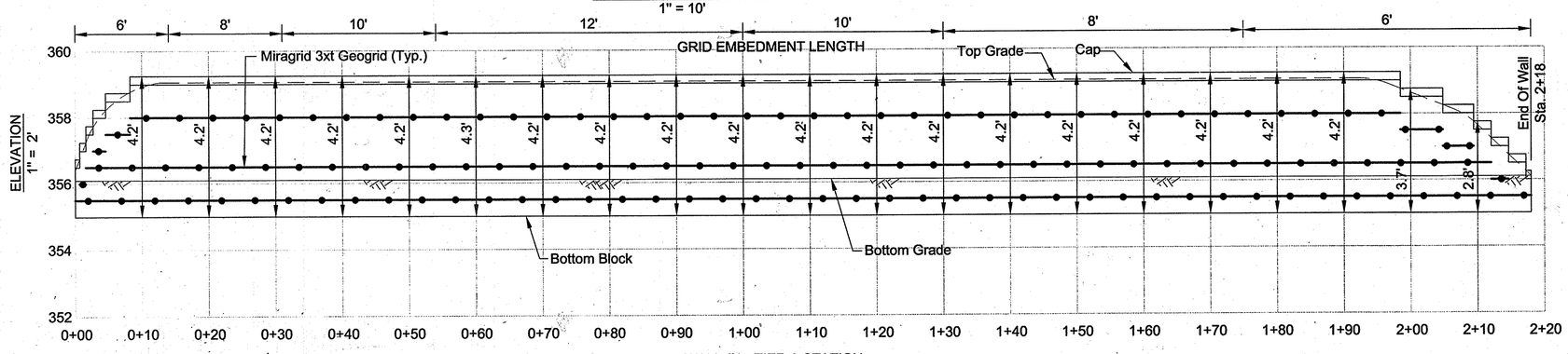
WALL #1 - TIER D STATION
1" = 10'



WALL #1 - TIER C STATION
1" = 10'



WALL #1 - TIER B STATION
1" = 10'



WALL #1 - TIER A STATION
1" = 10'

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

STATE OF MARYLAND ALICE A. MILLER No. 28376 PROFESSIONAL ENGINEER
12-15-15

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

~~DIRECTOR~~ ~~DATE~~

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

OWNER/DEVELOPER:

OWNER
MYRTUE RICHARD E & WF
3504 MYRTLE ST
EDISTO SC 29438-3723

DEVELOPER
JAMES KEELTY AND CO. INC.
P.O. BOX 528
61 E. PADONIA ROAD.
TIMONIUM, MD 21093

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A
(410) 880-4788
Annapolis Junction, MD
Fax: (410)880-4098

DMW
Daft -McCune -Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME	SECTION/AREA	LOT/PARCEL #
MYRTUE PROPERTY	/A	22F
PLAT# OR L.F. 647/387	BLOCK # 24	ZONE
TAX/ZONE MAP 10	ELECT. DISTRICT 5th	CENSUS TRACT 6067.04
WATER CODE	SEWER CODE	

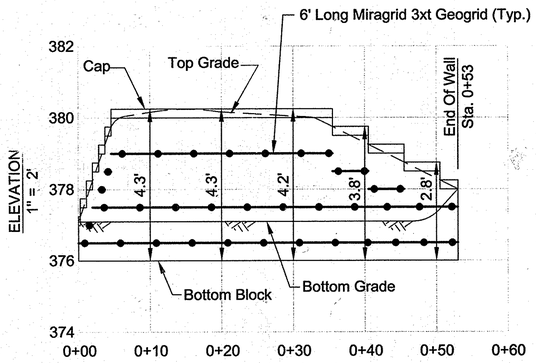
TITLE
RETAINING WALL #1
ELEVATION VIEW

Des. By	HM	Scale	AS SHOWN	Proj. No. 03053-G
Drn. By	HM	Date	9/25/07	36 of 56
Chk. By	RWS	Approved	RWS	

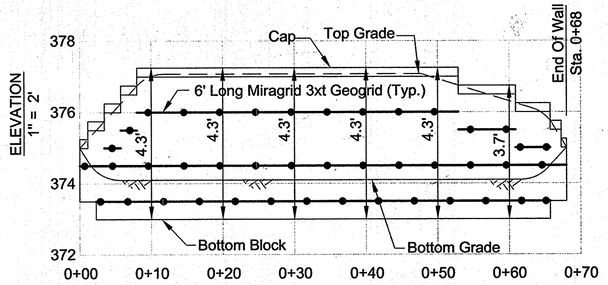
9/25/07
Date

STATE OF MARYLAND RICHARD W. STUDENT No. 14434 PROFESSIONAL ENGINEER

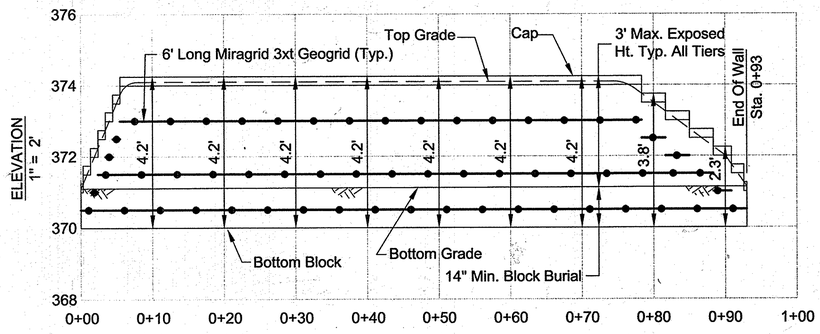
14434
Professional Engr. No.



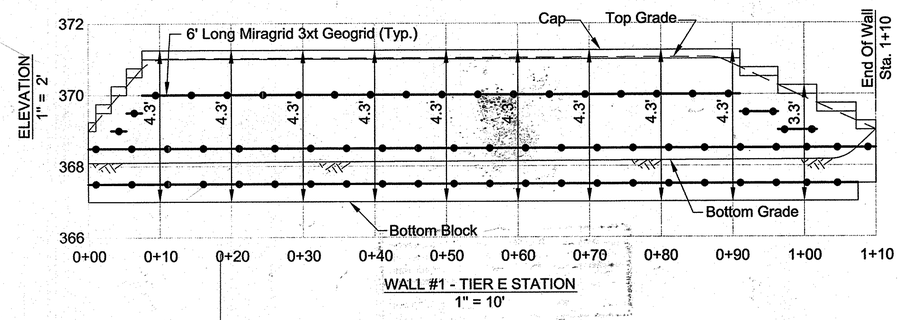
WALL #1 - TIER H STATION
1" = 10'



WALL #1 - TIER G STATION
1" = 10'



WALL #1 - TIER F STATION
1" = 10'



WALL #1 - TIER E STATION
1" = 10'

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1 DEC. 3, 2015

STATE OF MARYLAND · JESSE A. MILLER · No. 28376 · PROFESSIONAL ENGINEER
12-15-15

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/5/07
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07

~~DIRECTOR~~ — ~~DATE~~

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

OWNER/DEVELOPER:

OWNER	DEVELOPER
MYRTUE RICHARD E & WF 3504 MYRTLE ST. EDISTO SC 29438-3723	JAMES KEELTY AND CO. INC. P.O. BOX 528 61 E. PADONIA ROAD. TIMONIUM, MD 21093

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A — Annapolis Junction, MD
(410) 880-4788 — Fax: (410)880-4098

DMW
Daft · McCune Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME		SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY		N/A		225
PLAT# OR L/F	BLOCK # ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
647/387	24	10	6th	6067.04
WATER CODE		SEWER CODE		

9/25/07 Date

STATE OF MARYLAND · RICHARD W. STRONG · No. 14434 · PROFESSIONAL ENGINEER

14434 Professional Engr. No.

TITLE
RETAINING WALL #1 (CON'T)
ELEVATION VIEW

Des. By	HM	Scale	AS SHOWN	Proj. No.	03053-G
Drn. By	HM	Date	9/25/07		37 of 56
Chk. By	RWS	Approved	RWS		

WALL #2 - TIER C
STATION 1" = 10'

WALL #2 - TIER B
STATION 1" = 10'

WALL #2 - TIER A STATION
1" = 10'

NOTES:

1. No trees shall be planted within 10 feet of the top of the retaining wall.
2. Retaining walls shall only be constructed under the observation of a registered professional engineer and a (NICET, WACEL, or equiv.) certified soils technician.
3. One soil boring shall be required every one hundred feet along the entire length of the wall. Copies of all boring reports shall be provided to the Howard County Inspector Prior to the start of construction.
4. The required bearing pressure beneath the wall system shall be verified in the field by a certified soils technician. Testing documentation must be provided to the Howard County Inspector prior to start of construction. The required bearing test shall be the Dynamic Cone Penetrometer test ASTM STP-399.
5. The suitability of fill material shall be confirmed by the on-site soils technician. Each 8" lift must be compacted to a minimum 95% standard proctor density and the testing report shall be made available to the Howard County Inspector upon completion of construction.
6. Walls shall not be constructed on uncertified fill materials.
7. Walls shall not be constructed within a Howard Co. right-of-way or easement.

STATE OF MARYLAND · ALICE A. MILLER · PROFESSIONAL ENGINEER

12-15-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

SPECIFICATIONS

KEYSTONE MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 Description

A. Work shall consist of furnishing and construction of a KEYSTONE Retaining Wall System in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.
C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

1.02 Delivery, Storage and Handling

A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.
B. Contractor shall protect all materials from damage due to job site conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Modular Concrete Retaining Wall Units

A. Modular concrete units shall conform to the architectural requirements.
B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.
C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:
Compressive strength = 3000 psi minimum;
Absorption = 8 % maximum
Dimensional tolerances = ± 1/8" from nominal unit dimensions.
D. Maximum gap between erected units shall be -½ inch

2.02 Shear Connectors

A. Shear connectors shall be 1/2 inch diameter thermoset isopthalic polyester resin-protruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to + 100 degrees F.
B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.03 Base Leveling Pad Material

A. Material shall consist of a compacted #57 crushed stone base as shown on the construction drawings.

2.04 Unit Drainage Fill

A. Unit drainage fill shall consist of #57crushed stone

2.05 Reinforced Backfill

A. Reinforced backfill shall type SM, be free of debris and meet the following gradation tested in accordance with ASTM D-422 and meet other properties shown on the plan:

Sieve Size	Percent Passing
2 inch	100-75
3/4 inch	100-75
No. 40	0-60
No. 200	0-45

Plasticity Index (PI) <10 and Liquid Limit <40 per ASTM D-4318.
B. Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the reinforced soil mass.

2.06 Geogrid Soil Reinforcement

A. Geosynthetic reinforcement shall consist of geogrid manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn, or HDPE material.

2.07 Drainage Pipe

A. The drainage pipe shall be perforated corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

PART 3: EXECUTION

3.01 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Owner's representative shall be responsible for inspecting and approving the excavation prior to placement of leveling material or fill soils.

3.02 Base Leveling Pad

A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6" in front and behind the modular wall unit.
B. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Excavation

A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.
B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.
C. Install shear/connecting devices per manufacturer's recommendations.
D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill.
E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed manufacturers recommendations.

3.04 Structural Geogrid Installation

A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.
C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.
D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

3.05 Reinforced Backfill Placement

A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.
C. Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be + 3% to - 3% of optimum.
D. Only lightweight hand-operated equipment shall be allowed within 3 feet from the tail of the modular concrete unit.
E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.
G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3.06 Cap Installation

A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.07 Field Quality Control

A. The Owner shall engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction.
B. As a minimum, quality assurance testing should include foundation soil inspection, soil bearing and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications.

TYPICAL WALL SECTION
N.T.S.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07

~~DIRECTOR~~ ~~DATE~~

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

OWNER/DEVELOPER:

OWNER	DEVELOPER
MYRTUE RICHARD E & WF 3504 MYRTLE ST EDISTO SC 29438-3723	JAMES KEELTY AND CO. INC. P.O. BOX 528 61 E. PADONIA ROAD. TIMONIUM, MD 21093

HILLIS-CARNES
ENGINEERING ASSOCIATES
10975 Guilford Road, Suite A, Annapolis Junction, MD
(410) 880-4788 Fax: (410)880-4098

DMW
Daft · McCune · Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9/25/07
Date

STATE OF MARYLAND · RICHARD W. STURTEVANT · No. 14434 · PROFESSIONAL ENGINEER

14434
Professional Engr. No.

SUBDIVISION NAME	SECTION/AREA	LOT/PARCEL #
MYRTUE PROPERTY	N/A	225

PLAT# OR/L F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
647/387	24		10	6th	6067.04

WATER CODE · SEWER CODE

TITLE
RETAINING WALL #2 ELEVATION AND CONSTRUCTION DETAILS

Des. By HM	Scale	AS SHOWN	Proj. No.	03053-G
Drn. By HM	Date	9/25/07		
Chk. By RWS	Approved	RWS	38 of 56	

MATCH LINE – SEE SHEET 40

MATCH LINE – SEE SHEET 41

WOODSTOCK ROAD
(SEMI-RURAL MAJOR COLLECTOR HOWARD COUNTY)

BROWNS FARM ROAD
(HOWARD COUNTY LOCAL ROAD)

DAVIS BRANCH ROAD

LOT 1
PLAT 3881

LOT 2
PLAT 3881

LOT 3
PLAT 3882

LOT 4
PLAT 3882

LOT 5
PLAT 3882

LOT 6
PLAT 3882

LOT 7
PLAT 3882

25.6 ACRES
TO REMAIN IN PRESERVATION PARCELS A AND B
(NETTED OUT OF CALCULATIONS)

EX. CEMETERY (NOT FOREST)

EX. RESIDENCE AND FARM BUILDINGS TO REMAIN

PRESERVATION PARCEL 'C'
(NON-BUILDABLE)
OWNER: MR. MYRTUE
EASEMENT HOLDER #1: H.O.A.
EASEMENT HOLDER #2: HO. CO. GOV'T.

SWM PRESERVATION PARCEL 'H'
(NON-BUILDABLE)
OWNER: H.O.A.
EASEMENT HOLDER #1: HO. CO. GOV'T.

P-1 MICROPOOL EXTENDED DETENTION

F-1 MICROPOOL EXTENDED DETENTION

PRESERVATION PARCEL 'A'
(BUILDABLE)
OWNER: MR. MYRTUE
EASEMENT HOLDER #1: H.O.A.
EASEMENT HOLDER #2: HO. CO. GOV'T.

SWM PRESERVATION PARCEL
(NON-BUILDABLE)
OWNER: H.O.A.
EASEMENT HOLDER #1: HO. CO. GOV'T.

25' WETLAND BUFFER

100 YEAR FLOODPLAIN

NON WOODY VEGETATION ZONE

THE HOWARD COUNTY CONSERVANCY, INC.
L. 2841 F. 428
4-22-1993

N 602750
E 1343795.00
S 52°36'16" E 1305.00'
N 37°19'17" E 309.40'
S 66°37'03" W 316.76'
N 25°36'00" W 186.66'
L=270.33'
R=769.00'
N 602000
N 07°21'10" E 241.01'
S 89°39'50" E 26.98'
N 00°20'10" E 369.24'
N 82°38'05" W 2487.76'
N 602750
E 1343700
S 30°51'36" W 114.97'
N 87°41'27" W 41.27'

LEGEND

- HEAD OF STREAM
- WETLAND
- STREAM CENTER LINE
- 25' WETLAND BUFFER
- WETLAND SYMBOL
- STREAM BUFFER
- EX. TREELINE
- 100 YEAR FLOOD PLAIN
- SCRUB SHRUB
- SPECIMEN TREES (LOCATION APPROX) W/ CRITICAL ROOT ZONE
- 400 EX. MAJOR CONTOUR
- 402 EX. MINOR CONTOUR
- SLOPES BETWEEN 15% AND 25%
- SLOPES GREATER THAN 25%
- LIMIT OF DISTURBANCE
- PROPOSED HOUSES
- FOREST CONSERVATION EASEMENT
- FOREST CLEARING
- NON WOODY VEGETATION ZONE
- REFORESTATION
- TEMPORARY TREE PROTECTION FENCE
- PERMANENT FOREST PROTECTION SIGNS

NOTE:
HATCHING INDICATES EXISTING FORESTS THAT WILL NOT BE RETAINED IN EASEMENT PER SECTION 16.120 (b) (4) (iii) (b) OF THE HOWARD COUNTY CODE; THEREFORE, THESE AREAS ARE COUNTED AS "CLEARED" FOR FOREST CALCULATION PURPOSES. THE ACTUAL LIMITS OF TREE REMOVAL WILL DEPEND ON INDIVIDUAL LOT DEVELOPMENT. WOODED PORTIONS OF SLOPES GREATER THAN 25% AND THEIR ADJACENT SLOPES GREATER THAN 15% SHALL REMAIN UNDISTURBED.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY: REVISION #1 DEC. 3, 2015

STATE OF MARYLAND
ALICE A. MILLER
No. 28376
PROFESSIONAL ENGINEER
12-15-15

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/6/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NOs. PLAN & TITLE BLOCK

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KELLY AND CO. INC.
P.O. BOX 528
61 E. PADONIA ROAD.
TIMONIUM, MD 21095

DMW
Dall-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9/24/07
Date

3397
Landscape Architect No.

SUBDIVISION NAME		SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY		N/A		225/287
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
24/1289	24		10	3rd	6067.04
WATER CODE			SEWER CODE		

TITLE
FOREST CONSERVATION PLAN

Des. By	Scale	1"=50'	Proj. No. 02033.D
Dm. By WDE/MSS	Date	2/14/07	39 of 56
Chk. By	Approved		

F-06-104

n:\02033\Final plans\02033-F02 Tue Sep 18 08:40:57 2007

RICHARD E. MYRTUE
1365/554
7-12-1985

STEPHEN E. DUNN
843/708
8-25-1977

KENNETH RAY WILZER, JR. & SUSAN GENOVESI WILZER
1583/582
12-1-1986

ALLEN F. ALSOP
5017/217
2-15-2000

BENEDICT HENRY GERMAN, JR.
4152/450
10-21-1997

MARION C. ASHBURN & ADELIADE Y. ASHBURN
6607/400
11-13-2002

THOMAS E. BARNES
5530/72
5-17-2001

VINCENT VIGLIOTTI & DEBORAH K. VIGLIOTTI
15111/732
7-29-1986

GEISLER (CHILDREN)
3733/511
4-11-1996

DAVID A. WANEX & JOAN E. WANEX
4328/510
5-27-1998

N 603600 E 347250

N 603500 E 349550

FOREST CONSERVATION EASEMENT A
0.5± ACRES TOTAL
0.4± ACRES RETENTION
0.1± ACRES REFORESTATION
0.0± ACRES FLOODPLAIN

S 60°27'12" E 61.37'

N 37°27'28" E 135.05'

N 37°27'28" E 207.66'

N 37°24'19" E 159.46'

E=1200.001' L=143.22'

S 64°50'26" E 1707.02'

PRESERVATION PARCEL 'B'
(NON-BUILDABLE)
OWNER: MR. MYRTUE
EASEMENT HOLDER #1: H.O.A.
EASEMENT HOLDER #2: HO. CO. GOV'T.

PRESERVATION PARCEL 'A'
(BUILDABLE)
OWNER: MR. MYRTUE
EASEMENT HOLDER #1: H.O.A.
EASEMENT HOLDER #2: HO. CO. GOV'T.

PRESERVATION PARCEL 'C'
(NON-BUILDABLE)
OWNER: MR. MYRTUE
EASEMENT HOLDER #1: H.O.A.
EASEMENT HOLDER #2: HO. CO. GOV'T.

PRESERVATION PARCEL 'D'
(NON-BUILDABLE)
OWNER: H.O.A.
EASEMENT HOLDER #1: THE HOWARD COUNTY CONSERVANCY INC.
EASEMENT HOLDER #2: HO. CO. GOV'T.

PRESERVATION PARCEL 'C'
(NON-BUILDABLE)
OWNER: MR. MYRTUE
EASEMENT HOLDER #1: H.O.A.
EASEMENT HOLDER #2: HO. CO. GOV'T.

25.0± ACRES TO REMAIN IN PRESERVATION PARCEL A (NETTED OUT OF CALCULATIONS)

S 69°39'31" E 17.85'

S 69°39'31" E 85.24'

S 59°39'31" W 63.33'

S 69°39'31" E 25.51'

N 31°07'54" E 109.72'

DAVIS BRANCH ROAD

COLONIAL PIPELINE EASEMENT

25 FT WETLAND BUFFER

P-1 MICROPOOL EXTENDED DETENTION

NON WOODY VEGETATION ZONE

DAVIS BRANCH

100 YEAR FLOODPLAIN

MATCH LINE – SEE SHEET 39

MATCH LINE – SEE SHEET 44

NAD83

LEGEND

WETLAND
HEAD OF STREAM
STREAM CENTER LINE
25' WETLAND BUFFER
WETLAND SYMBOL
STREAM BUFFER
EX. TREELINE
100 YEAR FLOOD PLAIN

SCRUB SHRUB

SPECIMEN TREES (LOCATION APPROX) W/ CRITICAL ROOT ZONE

460 EX. MAJOR CONTOUR
462 EX. MINOR CONTOUR

SLOPES BETWEEN 15% AND 25%
SLOPES GREATER THAN 25%
LIMIT OF DISTURBANCE
PROPOSED HOUSES
FOREST CONSERVATION EASEMENT
FOREST CLEARING
REFORESTATION
TEMPORARY TREE PROTECTION FENCE
PERMANENT FOREST PROTECTION SIGNS
NON WOODY VEGETATION ZONE

STATE OF MARYLAND
JUDE A. MILLER
No. 19878
PROFESSIONAL ENGINEER

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

9/24/07
Date

STATE OF MARYLAND
3397
Landscape Architect No.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE SHEET NOS. PLAN & TITLE BLOCK

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 5228
611 E. PADONIA ROAD,
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME: MYRTUE PROPERTY		SECTION/AREA: N/A	LOT/PARCEL #: 228-287
PLAT# OR L/F: 28128/9	BLOCK #: 24	ZONE:	TAX/ZONE MAP: 10
ELECT. DISTRICT: 3rd	CENSUS TRACT: 6067.04	WATER CODE:	SEWER CODE:

TITLE: FOREST CONSERVATION PLAN

Des. By	Scale 1"=50'	Proj. No. 02033.D	
Dm. By WDE/MSS	Date 2/14/07	40 of 56	
Chk. By	Approved		

F-06-104

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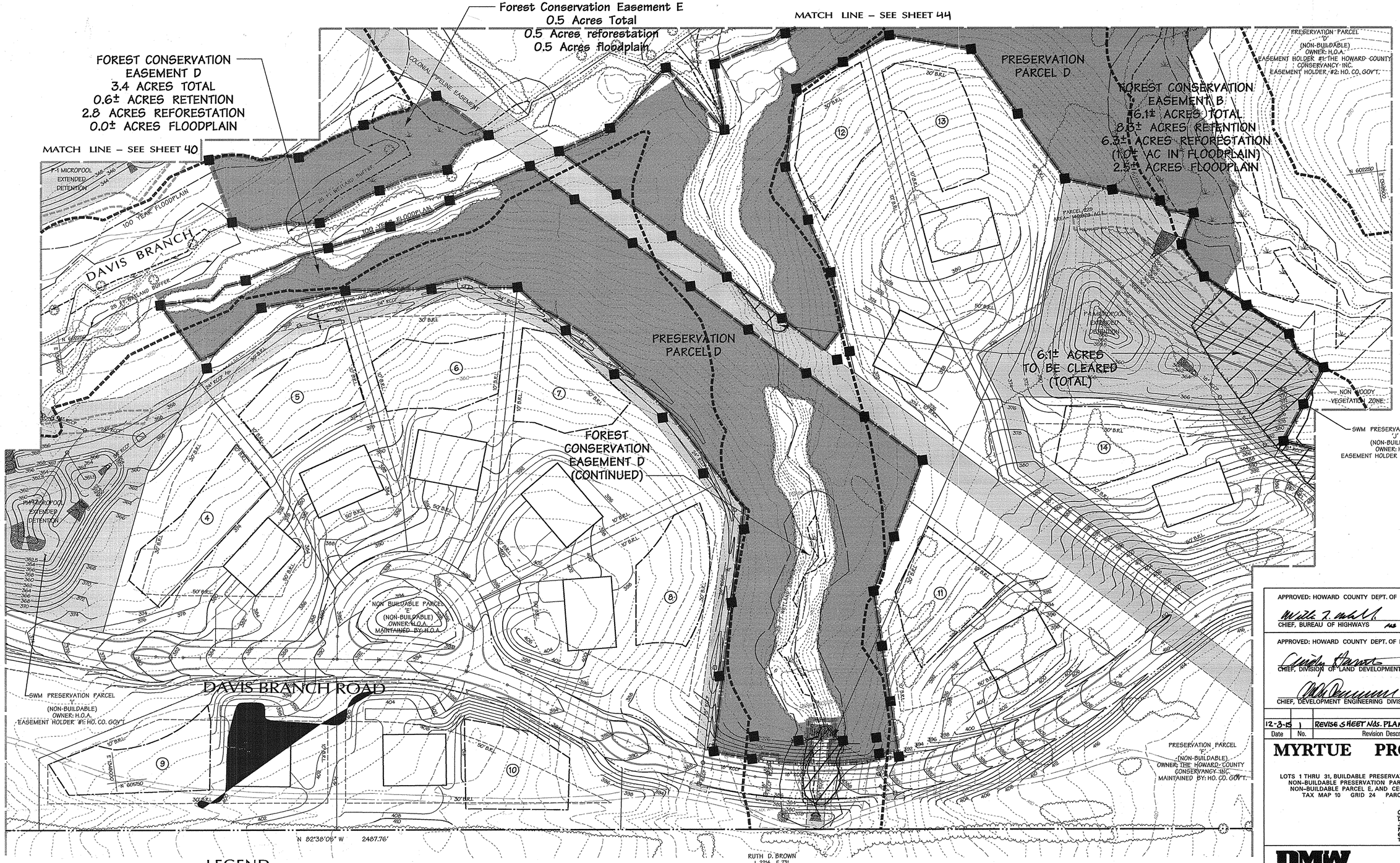

LEGEND

HEAD OF STREAM
WETLAND
STREAM CENTER LINE
25' WETLAND BUFFER
WETLAND SYMBOL
STREAM BUFFER
EX. TREELINE
100 YEAR FLOOD PLAIN
SCRUB SHRUB

SPECIMEN TREES (LOCATION APPROX) W/ CRITICAL ROOT ZONE
EX. MAJOR CONTOUR
EX. MINOR CONTOUR
SLOPES BETWEEN 15% AND 25%
SLOPES GREATER THAN 25%
LIMIT OF DISTURBANCE

PROPOSED HOUSES
FOREST CONSERVATION EASEMENT
FOREST CLEARING
REFORESTATION
TEMPORARY TREE PROTECTION FENCE
PERMANENT FOREST PROTECTION SIGNS
NON WOODY VEGETATION ZONE

STATE OF MARYLAND ALICE A. MINGES No. 29376 PROFESSIONAL ENGINEER 11-15-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 29376, Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

9/24/07
Date

3391
Landscape Architect No.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — Date 10-27-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/7/07
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISE SHEET NOS. PLAN & TITLE BLOCK

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KERLEY AND CO. INC.
P.O. BOX 628
61 E. PATAPSCO ROAD.
TIMONIUM, MD 21093

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Fax 296-4705
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SUBDIVISION NAME			SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY			NA.		225/287
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
2261/299	24		10	3rd	6067.04
WATER CODE			SEWER CODE		

TITLE
FOREST CONSERVATION PLAN

Des. By	Scale	1"=50'	Proj. No. 02033.D
Dm. By WDE/MSS	Date	2/14/07	41 of 56
Chk. By	Approved		

F-06-104

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MATCH LINE – SEE SHEET 43

MATCH LINE – SEE SHEET 41

NAD83

6.1± ACRES TO BE CLEARED (TOTAL)

FCE C CONTINUED

EXISTING FOREST CONSERVATION EASEMENT 2 11.2± AC. TOTAL 10.0 AC. RETENTION (OUTSIDE FLOODPLAIN) F-05-121 (OWENS PROPERTY)

ROBERT ZUBERMAN & NANCY K. BERMAN L. 2216 F. 731

SWM PRESERVATION PARCEL (NON-BUILDABLE) OWNER: H.O.A. EASEMENT HOLDER #1: HO. CO. GOVT.

100 YEAR FLOODPLAIN

PRESERVATION PARCEL 'D' (NON-BUILDABLE) OWNER: H.O.A. EASEMENT HOLDER #1: THE HOWARD COUNTY CONSERVANCY INC. EASEMENT HOLDER #2: HO. CO. GOVT.

FOREST CONSERVATION EASEMENT B 16.1± AC. TOTAL 8.3± AC. RETENTION 2.5± AC. REFORESTATION (1.0 +\- AC. IN FLOODPLAIN) 2.5 ± AC. FLOODPLAIN

FOREST CONSERVATION EASEMENT C 7.5± AC. TOTAL 0.0± AC. RETENTION 7.5± AC. REFORESTATION 0.0± AC. FLOODPLAIN

FCE C CONTINUED

PRESERVATION PARCEL (NON-BUILDABLE) OWNER: H.O.A. EASEMENT HOLDER #1: THE HOWARD COUNTY CONSERVANCY INC. EASEMENT HOLDER #2: HO. CO. GOVT.

N 82°38'05" W 2487.76'

RUTH D. BROWN L. 2216 F. 731
SAMUEL BROWN, RUTH D. BROWN & FRANCES LOUISE BROWN L. 394 F. 553 L. 60 F. 36
1st PARCEL

N 10°03'06" E 322.33'

DAVIS BRANCH ROAD

75' STREAM BUFFER

25' WETLAND BUFFER

MATCH LINE – SEE INSET ON SHEET 44

LEGEND

- WETLAND
- HEAD OF STREAM
- STREAM CENTER LINE
- 25' WETLAND BUFFER
- WETLAND SYMBOL
- STREAM BUFFER
- EX. TREELINE
- 100 YEAR FLOOD PLAIN
- SCRUB SHRUB
- SPECIMEN TREES (LOCATION APPROX) W/ CRITICAL ROOT ZONE
- 420 EX. MAJOR CONTOUR
- 402 EX. MINOR CONTOUR
- SLOPES BETWEEN 15% AND 25%
- SLOPES GREATER THAN 25%
- LIMIT OF DISTURBANCE
- PROPOSED HOUSES
- FOREST CONSERVATION EASEMENT
- FOREST CLEARING
- REFORESTATION
- TEMPORARY TREE PROTECTION FENCE
- PERMANENT FOREST PROTECTION SIGNS
- STREAM BUFFER

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1 DEC. 3, 2015

STATE OF MARYLAND · JUDE A. MILLER · No. 28376 · PROFESSIONAL ENGINEER · 12-15-15

NOTE:
HATCHING INDICATES EXISTING FORESTS THAT WILL NOT BE RETAINED IN EASEMENT PER SECTION 16.120 (b) (4) (iii) (b) OF THE HOWARD COUNTY CODE; THEREFORE, THESE AREAS ARE COUNTED AS "CLEARED" FOR FOREST CALCULATION PURPOSES. THE ACTUAL LIMITS OF TREE REMOVAL WILL DEPEND ON INDIVIDUAL LOT DEVELOPMENT. WOODED PORTIONS OF SLOPES GREATER THAN 25% AND THEIR ADJACENT SLOPES GREATER THAN 15% SHALL REMAIN UNDISTURBED.

9/24/07 Date

STATE OF MARYLAND · 3397 · REGISTERED LANDSCAPE ARCHITECT

3397 Landscape Architect No.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/5/07

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NOS. PLAN & TITLE BLOCK

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KELLY AND CO. INC.
P.O. BOX 623
61 E. PADONIA ROAD.
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME			SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY			N/A		225/287
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
25112299	24		10	3rd	6067.04
WATER CODE			SEWER CODE		

TITLE
FOREST CONSERVATION PLAN

Des. By		Scale 1"=50'	Proj. No. 02033.D
Drn. By	WDE/MGS	Date 2/14/07	42 of 56
Chk. By		Approved	

F-06-104

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0.5± AC. FLOODPLAIN IN EXISTING FCE 1

GEORGE ALAN SMITH & CYNTHIA JUNE CALLAHAN L. 2347 F. 432

NAD83

JEAN M. BLOOM L. 805 F. 740

S 83°35'16" E 329.71'

CHARLES JAMES RICHARDS & PATRICIA J. RICHARDS L. F.

100 YEAR FLOODPLAIN

1.2± AC. FLOODPLAIN IN EXISTING FCE 2

MARK S. VALENTINE & APRIL S. VALENTINE L. 5093 F. 277

N 603000

E 1350750

EXISTING FOREST CONSERVATION EASEMENT 1
2.7± AC. TOTAL
2.2 AC. RETENTION (OUTSIDE FLOODPLAIN) FOR F- 05 -121 (OWENS PROPERTY)

FOREST CONSERVATION EASEMENT

FUTURE FOREST CONSERVATION EASEMENT 3
2.3± AC. TOTAL
2.1± AC. RETENTION (OUTSIDE FLOODPLAIN) FOR F-06-116 (ZAISER PROPERTY)

EXISTING FOREST CONSERVATION EASEMENT 2
11.2± AC. TOTAL
10.0± AC. RETENTION (OUTSIDE FLOODPLAIN) FOR F- 05-121 (OWENS PROPERTY)

#2 41" TULIP POPULAR (FAIR CONDITION)

#3 32" TULIP POPLAR (POOR CONDITION)

#1 30" WHITE OAK (FAIR CONDITION)

#4 34" RED MAPLE (FAIR CONDITION)

#5 37" TULIP POPLAR (GOOD CONDITION)

NON WOODY VEGETATION ZONE

SWM PRESERVATION PARCEL 'K' (NON-BUILDABLE) OWNER: H.O.A. EASEMENT HOLDER: HO. CO. GOV'T.

6.1± ACRES TO BE CLEARED (TOTAL)

FCE B CONTINUED

FCE C CONTINUED

ROBERT A. BERMAN & NANCY L. BERMAN L. 1478 F. 177

DAVIS BRANCH ROAD

MATCH LINE – SEE SHEET 44

MATCH LINE – SEE SHEET 42

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISION BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

STATE OF MARYLAND · HUGH A. MILLER · No. 28376 · PROFESSIONAL ENGINEER

12-15-15

TREE	DESCRIPTION	CONDITION	STATUS
1	30" WHITE OAK	FAIR	TO BE SAVED *
2	41" TULIP POPLAR	FAIR	TO BE SAVED *
3	32" TULIP POPLAR	POOR	TO BE REMOVED
4	34" RED MAPLE	FAIR	TO BE REMOVED
5	37" TULIP POPLAR	GOOD	TO BE SAVED *

* SPECIMEN TREES 1, 2 AND 5 SHALL REMAIN UNDISTURBED TO THE EXTENT FEASIBLE DURING CONSTRUCTION.

NOTE:
HATCHING INDICATES EXISTING FORESTS THAT WILL NOT BE RETAINED IN EASEMENT PER SECTION 16.120 (b) (4) (iii) (b) OF THE HOWARD COUNTY CODE; THEREFORE, THESE AREAS ARE COUNTED AS "CLEARED" FOR FOREST CALCULATION PURPOSES. THE ACTUAL LIMITS OF TREE REMOVAL WILL DEPEND ON INDIVIDUAL LOT DEVELOPMENT. WOODED PORTIONS OF SLOPES GREATER THAN 25% AND THEIR ADJACENT SLOPES GREATER THAN 15% SHALL REMAIN UNDISTURBED.

LEGEND

- HEAD OF STREAM
- STREAM CENTER LINE
- WETLAND
- 25' WETLAND BUFFER
- WETLAND SYMBOL
- STREAM BUFFER
- EX. TREELINE
- 100 YEAR FLOOD PLAIN
- SCRUB SHRUB
- SPECIMEN TREES (LOCATION APPROX) W/ CRITICAL ROOT ZONE
- 400 EX. MAJOR CONTOUR
- 402 EX. MINOR CONTOUR
- SLOPES BETWEEN 15% AND 25%
- SLOPES GREATER THAN 25%
- LIMIT OF DISTURBANCE
- PROPOSED HOUSES
- FOREST CONSERVATION EASEMENT
- FOREST CLEARING
- NON WOODY VEGETATION ZONE
- REFORESTATION
- TEMPORARY TREE PROTECTION FENCE
- PERMANENT FOREST PROTECTION SIGNS
- TEMPORARY SPECIMAN TREE PROTECTION SIGN

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-27-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/5/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/5/07

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NOS. PLAN & TITLE BLOCK

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 628
91 E. PADONIA ROAD,
TIMONIUM, MD 21093

DMW
Dall-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9/24/07 Date

33397 Landscape Architect No.

SUBDIVISION NAME			SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY			N/A		225/287
PLAT # OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
29/229	24		10	3rd	6067.04
WATER CODE			SEWER CODE		

TITLE: FOREST CONSERVATION PLAN

Des. By	Scale	1"=50'	Proj. No. 02033.D
Dm. By WDE/MSS	Date	2/14/07	43 of 56
Chk. By	Approved		

F-06-104

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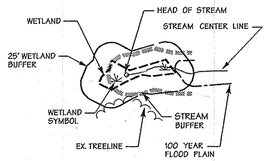
LEGEND



SCRUB SHRUB

SPECIMEN TREES (LOCATION APPROX) W/ CRITICAL ROOT ZONE

400 EX. MAJOR CONTOUR

402 EX. MINOR CONTOUR

SLOPES BETWEEN 15% AND 25%

SLOPES GREATER THAN 25%

LIMIT OF DISTURBANCE

PROPOSED HOUSES

FOREST CONSERVATION EASEMENT

FOREST CLEARING

REFORESTATION

TEMPORARY TREE PROTECTION FENCE

PERMANENT FOREST PROTECTION SIGNS

NAD83

MATCH LINE – SEE SHEET 59 OF 40

VINCENT VIGLIOTTI & DEBORAH K. VIGLIOTTI
15111/732
7-29-1986

N 603250
E 1349750

DONALD GREGORY COLE & CYNTHIA J. B. COLE
12801/23
7-10-1984

S 61°50'06" E 1707.02'

R. LYNN HOLLEY & LINDA P. HOLLEY
1123/438
10-13-1982

PRESERVATION PARCEL 'D'
(NON-BUILDABLE)
OWNER: H.O.A.
EASEMENT HOLDER #1: THE HOWARD COUNTY CONSERVANCY, INC.
EASEMENT HOLDER #2: HO. CO. GOV'T.

N 602150
E 1349750

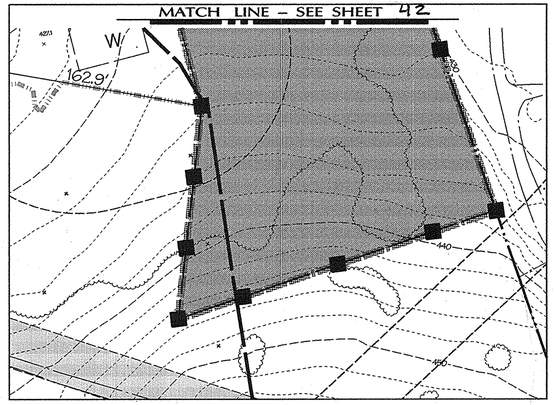
100 YEAR FLOODPLAIN

DAVIS BRANCH

FOREST CONSERVATION EASEMENT B
16.1± ACRES TOTAL
8.3± ACRES RETENTION
6.3± ACRES REFORESTATION
(1.0± ACRES IN FLOODPLAIN)
2.5± ACRES FLOODPLAIN

MATCH LINE – SEE SHEET 41

MATCH LINE – SEE SHEET 42



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

STATE OF MARYLAND
ALICE A. MILLER
No. 28376
PROFESSIONAL ENGINEER

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

12-15-15

N 603250
E 1349750

GEORGE ALAN SMITH & CYNTHIA JUNE CALLAHAN
L. 2347 F. 432

100 YEAR FLOODPLAIN

N 65°08'08" E 151.85'

N 52°38'08" E 132.00'

N 48°50'39" E 197.70'

N 66°50'58" E 247.50'

0.2 ± AC. FLOODPLAIN IN FUTURE FOREST CONSERVATION EASEMENT 3

FOREST CONSERVATION EASEMENT 3
2.3± AC. TOTAL
2.1± AC. RETENTION (OUTSIDE FLOODPLAIN)
FOR F-06-116
(ZAISER PROPERTY)

EXISTING FOREST CONSERVATION EASEMENT 1
2.7± AC. TOTAL
2.2± ACRES RETENTION (OUTSIDE FLOODPLAIN)
FOR F-05-121
(OWENS PROPERTY)
PLAT #18277

MATCH LINE – SEE SHEET 43

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-8-15	1	REVISED SHEET NOS. PLAN & TITLE BLOCK

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
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JAMES KEELTY AND CO. INC.
P.O. BOX 628
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TIMONIUM, MD 21093

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(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9/24/07 Date

3997 Landscape Architect No.

SUBDIVISION NAME: MYRTUE PROPERTY		SECTION/AREA: N/A	LOT/PARCEL #: 225/287
PLAT OR L/F: 28172/89	BLOCK #: 24	ZONE:	TAX/ZONE MAP: 10
ELECT. DISTRICT: 3rd	CENSUS TRACT: 6067.04		
WATER CODE:	SEWER CODE:		

TITLE: **FOREST CONSERVATION PLAN**

Des. By	Scale 1"=50'	Proj. No. 02033.D	
Dm. By WDE/MSS/MDT	Date 11/17/06	**44 of 56**	
Chk. By	Approved		

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F-06-104

STANDARDS AND SPECIFICATIONS FOR PLANTING

1. PLANT MATERIAL SELECTION

A. Nursery grown plant materials greater than 1" caliper should meet or exceed the requirements of the American Nurserymen Specifications, i.e. should be typical of the species and variety, have a normal habit of growth, be first quality, sound, vigorous, well-branched, have healthy, well furnished root systems, and be free of disease, insect pests and mechanical injuries.

B. Planting stock less than 1" caliper should meet the following standards:

Seedling/whips:

Hardwoods – 1/4" to 1/2" caliper with roots not less than 8" long
Shrubs – 1/8" or larger caliper with 8" root system.

2. PLANTING SITE PREPARATION

Soils shall not be disturbed outside the area necessary for planting individual specimens and the removal of exotic invasive plant material. These areas should be stabilized as shown on the temporary seeding notes. At least two weeks prior to the proposed planting date, the contractor shall spot spray with Round-up, Ally or other approved herbicide to remove multiflora rose and other undesirable vegetation.

3.PLANTING PERIOD

All material shall be planted between September 15 and May 31. Material shall not be installed when ground is frozen.

4.PLANT MATERIAL STORAGE

Plants should be planted within 24 hours of delivery if possible. Plant material which are left unplanted for more than 24 hours shall be protected from direct sun and weather and kept moist. Nursery stock should not be left unplanted for more than two weeks.

5.ON-SITE INSPECTION

Prior to planting, planting stock shall be inspected by the landscape architect or other qualified professional familiar with this plan. Plant material not conforming to standard nurseryman specifications for size, form, vigor, roots, trunk wounds, insects and disease should be replaced.

6.TOPSOIL FOR PLANTING SOIL

A. On-site material or imported from same source as topsoil used on site for finish grading.

1. Uniform composition, free of subsoil, clay lumps, stones, stumps, roots or similar objects larger than 1 inch.

2. Topsoil must be free of plants or plant parts of bermudagrass, quackgrass, Johnsongrass, nutsedge, poison ivy, Canada thistle, or others as specified.

3. All topsoil shall be tested by a recognized laboratory for pH and soluble salts. A pH of 4.5 to 7.5 is required. Soluble salts shall not be higher than 500 parts per million.

7. ADDITIVE FOR BACKFILL MIX

A. Wood Residuals:

1. Source shall be well composted, not chemically treated.

2. Physical properties – grading:

U.S. Sieve	Dry Weight Percent Passing
3/8"	100
1/4"	90 – 100
No. 8	70 – 100
No. 35	0 – 30

3. Organic content by ash analysis: 90 – 100 percent dry weight

4. Chemistry:

Range.

a. Saturation Extract Conductivity (EC) ——— Nil – 3.5
b. Reaction (pH) ——— 3.0 – 5.5

5. Salinity: Maximum saturation extract conductivity 1.0 millimhos per cm at 25 degrees centigrade.

B. Sand

1. Physical Properties – Grading:

U.S. Sieve	Dry Weight Percent Passing
No. 4	100
No. 10	95 – 100
No. 18	90 – 100
No. 35	65 – 100
No. 60	0 – 50
No. 140	0 – 20
No. 270	0 – 7

2. Chemistry:

Saturation Extract Conductivity (EC) ——— Nil – 3.0
Sodium Absorption Ratio (SAR) ——— Nil – 6.0
Boron – ppm in saturation extract solution ——— Nil – 1.0
Reaction (pH) ——— 6.0 – 7.5
Available calcium – sodium acetate extractable – ppm —— Nil – 2000 dry weight

C. Treble Superphosphate: Commercial product containing 19 to 20 percent available phosphoric acid.

8. MULCH

A. Shredded long fiber hardwood.

B. Mulch shall have been shredded within the last six (6) months.

9. PLANTING MIX

A. Planting mix shall be prepared at approved on-site staging area using approved on-site existing soil. Mix minimum quantities of 20 cubic yards or sufficient mix for entire job if less than 20 cubic yards is required.

B. Thoroughly mixed in the following proportions for tree and shrub planting mix:

.5 cy Existing soil
.2 cy Sharp sand
.3 cy Wood residuals
4.5 lbs. Treble superphosphate
5 lbs. Dolomite limestone (eliminate for acid loving plants)

10. LAYOUT AND EXCAVATION OF PLANTING AREAS

A. Plants shall be placed in each zone at random locations shown at spacing as indicated on the plan.

B. The Landscape Architect or qualified professional will check location of plants in the field and shall adjust to exact position before planting begins.

C. Subsoil shall not be worked when moisture content is so great that excessive compaction will occur, nor when it is so dry that clods will not readily break. Water shall be applied, if necessary, to bring soil to an optimum moisture content before tilling and planting.

D. Tree pits shall not be excavated more than 24 hours in advance of planting operation. Tree pits shall be excavated to the following dimensions:

Excavation for	Width	Depth
Canned Trees	Can + 12 in.	Can + 4 in.
B&B Trees	Ball + 12 in.	Ball + 4 in.

E. Excavate shrub pits to the following depths:

Excavation for	Width	Depth
Shrubs	Ball or Can + 8 in.	Can + 4 in., not less than 12 in.

11. PREPARING PLANT MATERIALS FOR PLANTING

A. Container stock shall be removed carefully after cans have been cut on two sides with approved cutter. Do not use spade to cut cans. Do not lift or handle container plants by tops, stems or trunks at any time.

B. Do not bind or handle any plant with wire or rope at any time so as to damage bark or break branches. Lift and handle plants only from bottom of ball.

C. Balled and burlapped (B&B) plants shall have firm balls of earth. Plants moved with a ball will not be accepted if the ball is cracked or broken before or during planting operations. B&B material shall be dug only when dormant. Pre-dug stored B&B material shall be inspected and approved at the storage site.

D. Do not force roots for bare rooted trees into excavated pits – custom dig pits to receive roots without deformation.

12. MIXING

A. Mix soil base, amendments and chemical additives by mechanical means.

B. Soil and sand bases shall be completely pulverized and free of lumps or aggregated material. Moisture content of base materials shall not be such that chemical granular or pelletized additives become dissolved during the mixing process.

C. Mix media in quantities of not less than 20 cubic yards or mix total quantity required if less than 50 cubic yards. The Contractor shall be responsible for continuity between batches.

D. Contaminating backfill mix with unmixed soil in backfill mixing lots shall be avoided.

13. INSTALLATION OF CONTAINERIZED PLANT MATERIAL

A. Scarify the walls and bottom of all plant pits immediately prior to the placement of plant and backfill mix. The Contractor shall remove all glazing of soil caused by an auger or mechanical hole digger.

B. Wells around trees and shrubs: after planting is complete, form a soil well 3 inches high around each plant, extending to the outer limit of the plant pit in accordance with planting details shown on the Drawings.

C. Smooth planted areas to conform to specified grades after full settlement as occurred. Contractor shall bear final responsibility for proper surface drainage of planted areas. Any discrepancy in the drawings or specifications, obstructions on the site, or prior work done by another party, which Contractor feels precludes establishing proper drainage, shall be brought to the attention of the Landscape Architect in writing.

D. Water all plants immediately again after planting.

E. Spread mulch in required areas to the compacted depth of 2 inches.

14. Maintenance by the Contractor

A. A 2-year Contractor's Maintenance and Monitoring Period shall be at mobilization. Seventy-five percent survivorship must be guaranteed for this period. The Site Shall be inspected at the end of the two year period to ascertain survivorship and provide for replacement if necessary.

B. The Contractor's maintenance of new planting shall consist of watering, cultivating, weeding (and spot spraying with an approved herbicide as needed to control multiflora rose), mulching, and removing invasive vegetation as necessary to insure survival. The Contractor shall maintain and protect plantings from herbivory using Ropel or other approved herbivore deterrent as necessary to ensure survival.

C. Protect planting area and plants at all times against damage of all kinds for duration of maintenance period. Maintenance includes temporary protection barriers and signs as required for protection. If any plants become damaged or injured, because sufficient protection was not provided, treat or replace as directed by Landscape Architect at no additional cost to Owner.

GUARANTEE: A MINIMUM SURVIVAL RATE OF 75% IS TO BE GUARANTEED BY THE CONTRACTOR AT THE END OF THE TWO YEAR MAINTENANCE PERIOD.

PRECONSTRUCTION MEETING/CONSTRUCTION PERIOD PRACTICES

Before construction begins, a required preconstruction meeting shall be held. The principle contractors, engineer, Howard County Inspectors and a qualified forest professional familiar with the plan shall be present. All items pertaining to forest retention, tree preservation, and construction period practices shall be discussed.

Any changes to the plan due to on-site conditions must be approved by the Howard County Department of Planning and Zoning.

POST CONSTRUCTION MANAGEMENT/MAINTENANCE BY CONTRACTOR

All dead trees or tree limbs which pose an immediate safety hazard will be felled. Trees dropped within the forest retention area will not be removed.

All temporary forest protection structures will be removed after construction and permanent signage will be placed where indicated on the plan.

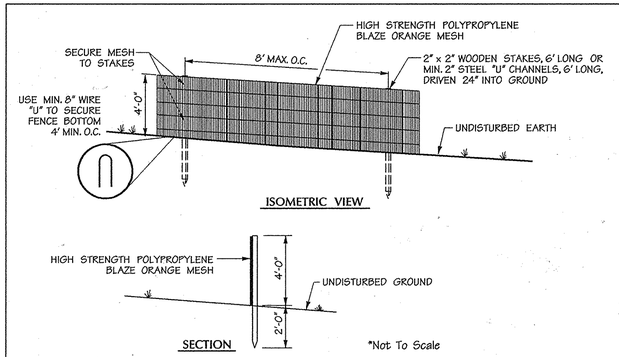
A 2-year Contractor's Maintenance and Monitoring Period shall begin at mobilization. Seventy five percent survivorship must be guaranteed for this period. The site shall be inspected at the end of the two year period to ascertain survivorship and provide for replacement if necessary.

The Contractor's maintenance of new planting shall consist of watering, cultivating, weeding, and mulching as necessary to insure survival.

Contractor shall protect planting areas and plants at all times against damage of all kinds for duration of maintenance period. Maintenance includes temporary protection barriers and signs as required for protection. If any plants become damaged or injured, because sufficient protection was not provided, treat or replace as directed by Landscape Architect at no additional cost to Owner.

REFORESTATION AREAS SHOWN ON THIS PLAN TO BE PLACED IN FOREST CONSERVATION EASEMENT WITH PERMANENT FOREST PROTECTION SIGNS PLACED AT 50' TO 100' INTERVALS AROUND EASEMENTS.

FCE	REFORESTATION	TREE QUANTITY
A	0.1 ac	35
B	6.3 ac	2,205
C	7.5 ac	2,625
D	2.8 ac	980
E	0.5 ac	175
TOTAL	17.2 ac	6,020



NOTES:
1. THIS DETAIL IS FOR FOREST PROTECTION DEVICE ONLY.
2. FOREST RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF FOREST RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING THE DEVICE.
4. ROOT DAMAGE SHALL BE AVOIDED.
5. PROTECTION SIGNAGE MAY ALSO BE USED.
6. FOREST PROTECTION FENCE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.
7. INSTALLATION OF FOREST PROTECTION FENCE MUST BE APPROVED BY BALTIMORE COUNTY EIR (410-887-3980) PRIOR TO ISSUANCE OF BUILDING OR GRADING PERMITS.

Forest Protection Fence

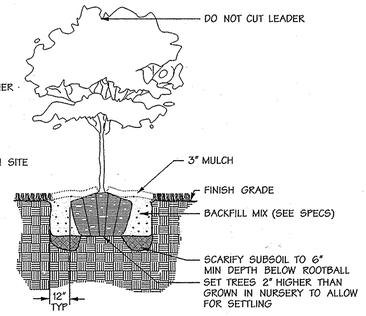
PLANTING PROCEDURES FOR ALL CONTAINER GROWN TREES AND SHRUBS:

1. REMOVE THE PLANT EITHER BY CUTTING OR INVERTING THE CONTAINER

2. GENTLY LOOSEN ROOTS FROM SOILS. ROOTS MAY NOT BE CUT OR TRIMMED ON SITE

3. PLANT SHRUB OR TREE 1 TO 2 INCHES ABOVE THE EXISTING GRADE

4. APPLY 2 TO 3 INCH THICK LAYER OF SHREDDED HARDWOOD MULCH



Typical Tree Planting (For container grown)

Not To Scale

PLANT LIST

Zone 1 - Wetland - Plants required - 245 (350 whips/acre x 0.7 acres)

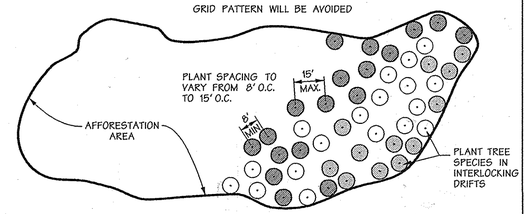
Species name	Common name	Size	Spacing	Quantity	Tolerance	Indicator status
Quercus bicolor	swamp white oak	18"-24" height/cont. grown	11' x 11'	49	full sun to part shade	FACW
Salix nigra	black willow	18"-24" height/cont. grown	11' x 11'	49	full sun to part shade	FACW
Taxodium distichum	bald cypress	18"-24" height/cont. grown	11' x 11'	49	full sun to part shade	OBL
Betula nigra	river birch	18"-24" height/cont. grown	11' x 11'	49	full sun	FACW
Cornus amomum	silky dogwood	18"-24" height/cont. grown	11' x 11'	49	full sun to part shade	FACW
TOTALS				245		

Zone 2 - Wetland Buffers and Floodplain - Plants required - 525 (350 whips/acre 1.5 acres)

Species name	Common name	Size	Spacing	Quantity	Tolerance	Indicator status
Acer rubrum	red maple	18" - 24" height/cont. grown	11' x 11'	120	full sun to part shade	FAC
Betula nigra	river birch	18" - 24" height/cont. grown	11' x 11'	95	full sun	FACW
Liquidambar styraciflua	sweetgum	18" - 24" height/cont. grown	11' x 11'	100	full sun	FAC
Platanus occidentalis	sycamore	18" - 24" height/cont. grown	11' x 11'	130	full sun to part shade	FACW
Fraxinus pensylvanica	green ash	18" - 24" height/cont. grown	11' x 11'	80	full sun to part shade	FACW
TOTALS				525		

Zone 3 - Uplands - Plants required - 5,250 (350 whips/acre x 15.0 acres)

Species name	Common name	Size	Spacing	Quantity	Tolerance	Indicator status
Acer rubrum	red maple	18" - 24" height/cont. grown	11' x 11'	850	full sun to part shade	FAC
Amelanchier canadensis	serviceberry	18" - 24" height/cont. grown	11' x 11'	275	full sun to part shade	FACU
Cercis canadensis	Eastern redbud	18" - 24" height/cont. grown	11' x 11'	300	full sun to part shade	FACU
Liriodendron tulipifera	tulip poplar	18" - 24" height/cont. grown	11' x 11'	865	full sun	FACU
Liquidambar styraciflua	sweetgum	18" - 24" height/cont. grown	11' x 11'	850	full sun	FAC
Prunus serotina	black cherry	18" - 24" height/cont. grown	11' x 11'	725	full sun	FACU
Quercus alba	white oak	18" - 24" height/cont. grown	11' x 11'	700	full sun to part shade	FACU
Quercus rubra	Northern red oak	18" - 24" height/cont. grown	11' x 11'	685	full sun to part shade	FACU
TOTALS				5,250		

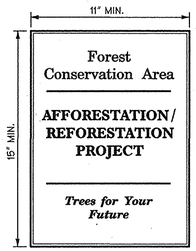


Planting Design Schematic

Not To Scale

*Not To Scale

Specimen Tree Protection Signage



SIGNS TO BE PLACED ON METAL POSTS 5'± ABOVE FINISH GRADE PRIOR TO PLANTING. PLACE SIGNS EVERY 100' AROUND PERIMETER OF FOREST CONSERVATION AREA.

*Not To Scale

Permanent Signage

Note to Contractor:
Zone I species shall be planted within wetlands. Zone II species shall be planted within wetland buffers and floodplains. Zone III species shall be planted on all remaining uplands. Each planting area shall have a minimum of five different species. Maintenance is required to remove and control exotic, inavasive herbaceous and shrub species throughout the planting areas. Tree shelters shall be used.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1 DEC 3, 2015

12-12-15

9/24/07
Date

#3397
Landscape Architect No.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO. IN TITLE BLOCK.

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 509
611 E. PADONIA ROAD.
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME		SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY		N/A		225/287
PLAT # OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
281/289	24		10	3rd	6067.04
WATER CODE			SEWER CODE		

TITLE

FOREST CONSERVATION PLAN

SPECIFICATIONS and DETAILS

Des. By		Scale	As Shown
Drn. By	MSS	Date	11/17/06
Chk. By		Approved	

Proj. No. 02033.D

45 of 56

F-06-104

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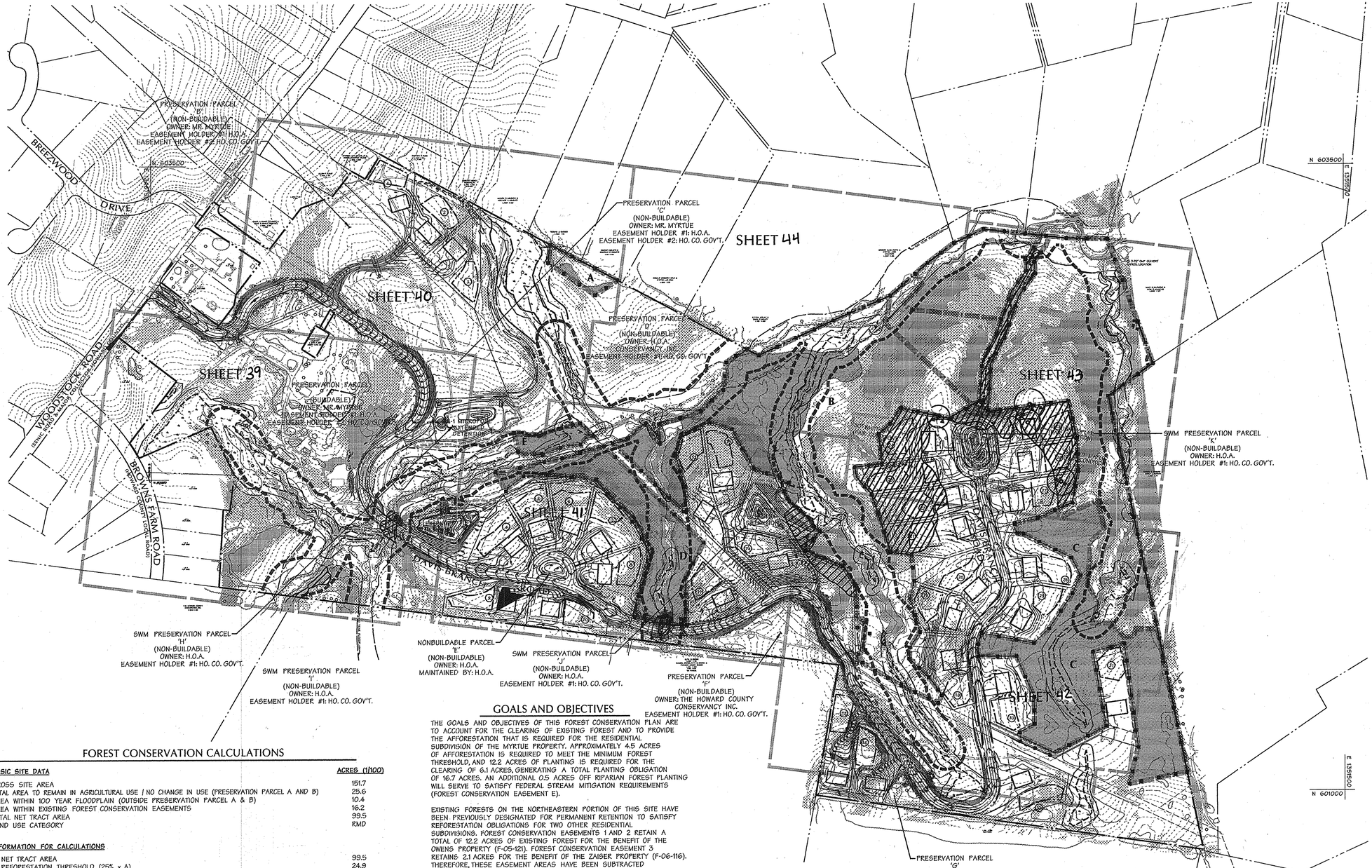
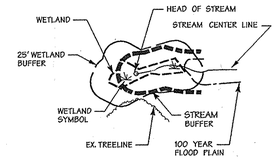


LEGEND



- SCRUB SHRUB
- SPECIMEN TREES (LOCATION APPROX) W/ CRITICAL ROOT ZONE
- 100 EX. MAJOR CONTOUR
- 102 EX. MINOR CONTOUR
- SLOPES BETWEEN 15% AND 25%
- SLOPES GREATER THAN 25%
- LIMIT OF DISTURBANCE
- PROPOSED HOUSES
- FOREST CONSERVATION EASEMENT
- FOREST CLEARING
- REFORESTATION
- TEMPORARY TREE PROTECTION FENCE
- PERMANENT FOREST PROTECTION SIGNS
- NON WOODY VEGETATION ZONE

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER

12-12-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

FOREST CONSERVATION CALCULATIONS

BASIC SITE DATA	ACRES (1/100)
GROSS SITE AREA	151.7
TOTAL AREA TO REMAIN IN AGRICULTURAL USE / NO CHANGE IN USE (PRESERVATION PARCEL A AND B)	25.6
AREA WITHIN 100 YEAR FLOODPLAIN (OUTSIDE PRESERVATION PARCEL A & B)	10.4
AREA WITHIN EXISTING FOREST CONSERVATION EASEMENTS	16.2
TOTAL NET TRACT AREA	99.5
LAND USE CATEGORY	RMD

INFORMATION FOR CALCULATIONS	
A. NET TRACT AREA	99.5
B. REFORESTATION THRESHOLD (25% x A)	24.9
C. AFFORESTATION MINIMUM (20% x A)	19.9
D. EXISTING FOREST ON NET TRACT AREA (OUTSIDE PRESERVATION PARCELS AND EX.FCE's AND FLOODPLAIN)	15.4
E. FOREST AREAS TO BE CLEARED	6.1
F. FOREST AREAS TO BE RETAINED	9.3

AFORESTATION CALCULATIONS	
A. NET TRACT AREA	99.5
B. AFFORESTATION THRESHOLD (20% x A)	19.9
C. EXISTING FOREST ON NET TRACT AREA	15.4
D. FOREST AREAS TO BE CLEARED	6.1
E. FOREST AREAS TO BE RETAINED	9.3

CLEARING BELOW THE MINIMUM	
IF EXISTING FORESTS ARE LESS THAN THE AFFORESTATION MINIMUM (IF C IS LESS THAN B), AND CLEARING IS PROPOSED, THE FOLLOWING CALCULATIONS APPLY:	
AFFORESTATION FOR UNFORESTED AREAS BELOW THE MINIMUM B-C	4.5
REFORESTATION FOR CLEARING BELOW THRESHOLD Dx2	12.2
TOTAL AFFORESTATION AND REFORESTATION REQUIRED (B-C) + (Dx2)	16.7
AFFORESTATION AND REFORESTATION PROVIDED	16.7 ACRES
REFORESTATION TO SATISFY STREAM MITIGATION	0.5 ACRES
TOTAL REFORESTATION PROVIDED	17.2 ACRES

GOALS AND OBJECTIVES

THE GOALS AND OBJECTIVES OF THIS FOREST CONSERVATION PLAN ARE TO ACCOUNT FOR THE CLEARING OF EXISTING FOREST AND TO PROVIDE THE AFFORESTATION THAT IS REQUIRED FOR THE RESIDENTIAL SUBDIVISION OF THE MYRTUE PROPERTY. APPROXIMATELY 4.5 ACRES OF AFFORESTATION IS REQUIRED TO MEET THE MINIMUM FOREST THRESHOLD, AND 12.2 ACRES OF PLANTING IS REQUIRED FOR THE CLEARING OF 6.1 ACRES, GENERATING A TOTAL PLANTING OBLIGATION OF 16.7 ACRES. AN ADDITIONAL 0.5 ACRES OFF RIPARIAN FOREST PLANTING WILL SERVE TO SATISFY FEDERAL STREAM MITIGATION REQUIREMENTS (FOREST CONSERVATION EASEMENT E).

EXISTING FORESTS ON THE NORTHEASTERN PORTION OF THIS SITE HAVE BEEN PREVIOUSLY DESIGNATED FOR PERMANENT RETENTION TO SATISFY REFORESTATION OBLIGATIONS FOR TWO OTHER RESIDENTIAL SUBDIVISIONS. FOREST CONSERVATION EASEMENTS 1 AND 2 RETAIN A TOTAL OF 12.2 ACRES OF EXISTING FOREST FOR THE BENEFIT OF THE OWENS PROPERTY (F-05-121). FOREST CONSERVATION EASEMENT 3 RETAINS 2.1 ACRES FOR THE BENEFIT OF THE ZAISER PROPERTY (F-06-116). THEREFORE, THESE EASEMENT AREAS HAVE BEEN SUBTRACTED FROM THE GROSS AND EXISTING FOREST ON-SITE NUMBERS IN THE MYRTUE PROPERTY CALCULATIONS. PRESERVATION PARCELS A AND B TO REMAIN IN THE MYRTUE FAMILY POSSESSION (25.6 ACRES) HAS BEEN SUBTRACTED FROM THE GROSS TRACT AREA, AND LOT 13 OF VALLEY ANNE ESTATES (1.81 ACRES) HAS BEEN INCLUDED.

PLANTING AREAS ARE LOCATED WITHIN AND ADJACENT TO WATER RESOURCES, AND CONTIGUOUS WITH EXISTING WOODED AREAS; SPECIES WERE CHOSEN TO REFLECT AND ENHANCE THOSE FOUND IN THE EXISTING FOREST COMMUNITIES. THREE PLANTING ZONES HAVE BEEN SPECIFIED ACCORDING TO ANTICIPATED MOISTURE REGIME.

EXISTING CONDITIONS AT THE SITE MAKE PLANTING IN WETLANDS AND ALONG STREAMS DIFFICULT OR INAPPROPRIATE. LARGE-SCALE PLANTING IN THE LARGE WETLAND AREA SOUTH OF FCE A WOULD REQUIRE A TEMPORARY STREAM CROSSING, AND SO IS NOT APPROPRIATE GIVEN THE SUITABILITY OF PLANTING AREAS ELSEWHERE ON-SITE. THE MAJORITY OF THE LAND IMMEDIATELY ADJACENT TO DAVIS BRANCH IS CURRENTLY VEGETATED WITH YOUNG TREES AND SAPLINGS. PLANTING THE WETLANDS ON SHEET 60 WOULD OFFER ONLY SMALL EASEMENTS, AND SINCE THESE AREAS WILL ULTIMATELY REVERT TO FOREST WHEN LEFT UNDISTURBED, OTHER PLANTING AREAS WERE CHOSEN. ENHANCEMENT PLANTINGS ALONG THE NARROW CONFIGURATION OF WETLANDS ON THE SOUTHEASTERN PART OF THE SITE ARE APPROPRIATE. OVERALL THE PROPOSED AFFORESTATION/REFORESTATION PLANTINGS FOLLOW DRAINAGE COURSES AND ENHANCE EXISTING RESOURCES TO PROVIDE LARGE BLOCKS OF CONTIGUOUS, RIPARIAN FOREST, WHICH IS CONSISTENT WITH THE PRIORITIES OUTLINED IN THE MANUAL.

FINANCIAL SECURITY IN THE AMOUNT OF $374,616 (17.2 ACRES @ $0.50/S.F.) IS REQUIRED FOR PLANTINGS. A SECURITY IN THE AMOUNT OF $81,021.60 (9.3 ACRES @ $0.20/S.F.) IS REQUIRED FOR FOREST RETENTION. THE TOTAL FOREST CONSERVATION SECURITY IS $455,637.60.

FOREST CONSERVATION EASEMENT SUMMARY CHART

FCE	RETENTION	AFFORESTATION/ REFORESTATION	FLOODPLAIN	TOTAL
A	0.4 AC.	0.1 AC.	0.0 AC.	0.5 AC.
B	8.3 AC.	6.3 AC. (1.0 AC OF THIS IS IN FLOODPLAIN)	2.5 AC.	16.1 AC.
C	0.0 AC.	7.5 AC.	0.0 AC.	7.5 AC.
D	0.6 AC.	2.8 AC.	0.0 AC.	3.4 AC.
E	0.0	0.5 AC.	0.5 AC.	0.5 AC.
TOTAL	9.3 AC.	17.2 AC.	3.0 AC.	27.5 AC.

9/24/07
Date

3397
Landscape Architect No.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-27-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	)	REVISE SHEET NOS. PLAN & TITLE BLOCK

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

OWNER/DEVELOPER
DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 629
611 E. PADONIA ROAD.
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705

A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME			SECTION/AREA		LOT/PARCEL #
MYRTUE PROPERTY			N/A		225/287
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELEC. DISTRICT	CENSUS TRACT
2811289	24		10	3rd	6067.04
WATER CODE			SEWER CODE		

TITLE

FOREST CONSERVATION PLAN
INDEX SHEET

Des. By	Scale	1"=200'	Proj. No. 02033.D
Drn. By WDE/MSS/MDT	Date	11/17/06	46 of 56
Chk. By	Approved		

F-06-104

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SCHEDULE A
PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT to ROADWAYS	ADJACENT to PERIMETER PROP. / PRES. PARCELS										
LANDSCAPE TYPE "A"		P 3	P 4	P 5*	P 6	P 7	P 8	P 9	P 10	P 11	P 12	P 13
LINEAR FEET OF PERIMETER		2593 LF	1235 LF	1067 LF	604 LF	1400 LF	2050 LF	1077 LF	940 LF	2473 LF	800 LF	965 LF
LANDSCAPE TYPE "B"	P 1											
LINEAR FEET OF PERIMETER	290 LF											
LANDSCAPE TYPE "C"												
LINEAR FEET OF PERIMETER												
LANDSCAPE TYPE "D"												
LINEAR FEET OF PERIMETER												
CREDIT FOR EXISTING VEGETATION (DESCRIBE BELOW IF NEEDED)	N/A	N/A	N/A	N/A	N/A	N/A	1,046 LF	750 LF	N/A	N/A	N/A	N/A
CREDIT FOR BERM (DESCRIBE BELOW IF NEEDED)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	 6 7 –	 43 – –	 21 – –	 18 – –	 10 – –	 23 – –	 17 – –	 5 – –	 16 – –	 41 – –	 13 – –	 16 – –
NUMBER OF PLANTS PROVIDED* SHADE TREES EVERGREEN TREES OTHER TREES (2 : 1 SUBSTITUTION) SHRUBS (10 : 1 SUBSTITUTION) (DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	 3 7 6	 43 – –	 20 – 6	 16 67 5	 8 – 4	 19 – 8	 15 – 4	 4 – 2	 14 – 4	 36 – 10	 11 – 4	 14 – 4

NOTES:
1. STREET TREES WILL BE PROVIDED @ 1/40 LF. THE BONDING FOR THE STREET TREES IS SEPARATE FROM THE LANDSCAPE EDGE PLANTING.
2. THE DEVELOPER WILL PROVIDE ALL PERIMETER LANDSCAPE OBLIGATIONS.
3. DEVELOPER WILL PROVIDE 657' OF TYPE 'D' BUFFER ON THE REAR OF LOTS 9 & 10 IN LIEU OF THE REQUIRED 657' OF TYPE 'A' BUFFER. THE LANDSCAPE SURETY WILL BE BASED ON ALL PLANTS PROVIDED IN SCHEDULE "A".
4. ADDITIONAL LANDSCAPING ADJACENT TO TOLLE PROPERTY 1789 WOODSTOCK RD. AND TO THE REAR OF 1789 AND 1779 WOODSTOCK RD. TO BE PROVIDED BY THE DEVELOPER. SEE CHART SHEET 48.

STREET TREE SCHEDULE

ROAD NAME	LENGTH OF ROAD (BOTH SIDES)	# OF TREES REQUIRED (1 PER 40 L.F.)	# OF TREES PROVIDED
WOODSTOCK ROAD	350'	9	9
DAVIS BRANCH ROAD	14,556'	364	364
TOTAL	14,906'	373	373

NOTES:
1. LOCATION OF TREES MAY VARY BASED ON EASEMENTS.
2. THE BONDING OF THE STREET TREES WILL BE INCLUDED IN THE COST ESTIMATE FOR THE ROAD.

GENERAL PLANTING NOTES
1. ALL PLANT MATERIAL TO MEET A.A.N. STANDARDS.
2. LANDSCAPE CONTRACTOR TO FOLLOW LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE WASHINGTON METRO AREA APPROVED BY LCAMW.
3. NO SUBSTITUTIONS TO BE MADE WITHOUT CONSENT OF LANDSCAPE ARCHITECT OR OWNER.
4. ALL BEDS TO BE TOPPED WITH THREE INCHES OF HARDWOOD MULCH.
5. LANDSCAPE CONTRACTOR TO VERIFY LOCATION OF UTILITIES WITH OWNER BEFORE PLANTING.
6. LANDSCAPE ARCHITECT/OWNER SHALL SELECT, VERIFY AND/OR APPROVE ALL PLANT MATERIAL. AT OWNER'S DISCRETION, SPECIMEN AND OTHER PLANT MATERIAL WILL BE SELECTED.
7. LANDSCAPE CONTRACTOR SHALL COORDINATE PLANT BED FILLING OPERATIONS AND PLANT MATERIAL INSTALLATION WITH GENERAL CONTRACTOR AND UTILITIES CONTRACTOR. AT THE TIME OF FINAL INSPECTION WITH ACCEPTANCE, ALL ELECTRIC, WATER, DRAINAGE, AND FOUNTAIN UTILITIES, AS WELL AS ALL PLANT MATERIALS, SHALL REMAIN UNDAMAGED. LIKEWISE, LANDSCAPE CONTRACTOR AND UTILITIES CONTRACTOR SHALL COORDINATE EFFORTS TO ENSURE THAT SURFACE UTILITIES ARE AT THE PROPER ELEVATION RELATIVE TO FINAL GRADES.
8. CONTRACTOR SHALL NOTIFY MISS UTILITY 72 HOURS PRIOR TO CONSTRUCTION.
9. 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.
10. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HO. CO. CODE. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING IN THE AMOUNT OF $106,950.00 MUST BE POSTED AS PART OF THE DEVELOPER'S AGREEMENT. (252 SHADE, 130 EVERGREENS, AND 79 ORNAMENTAL TREES).
11. 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 CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE-YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

PLAN
SCALE: 1" = 50'

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

DEVELOPER'S/BUILDER'S CERTIFICATE

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

DAVIS BRANCH ESTATES — 12/16/15 DATE

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — 1/12/2016 DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — 1-21-16 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION — 1.19.16 DATE

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-14-15
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24, PARCEL 225, 6th ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

TITLE: FINAL LANDSCAPE PLAN

DATE: SEPTEMBER, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

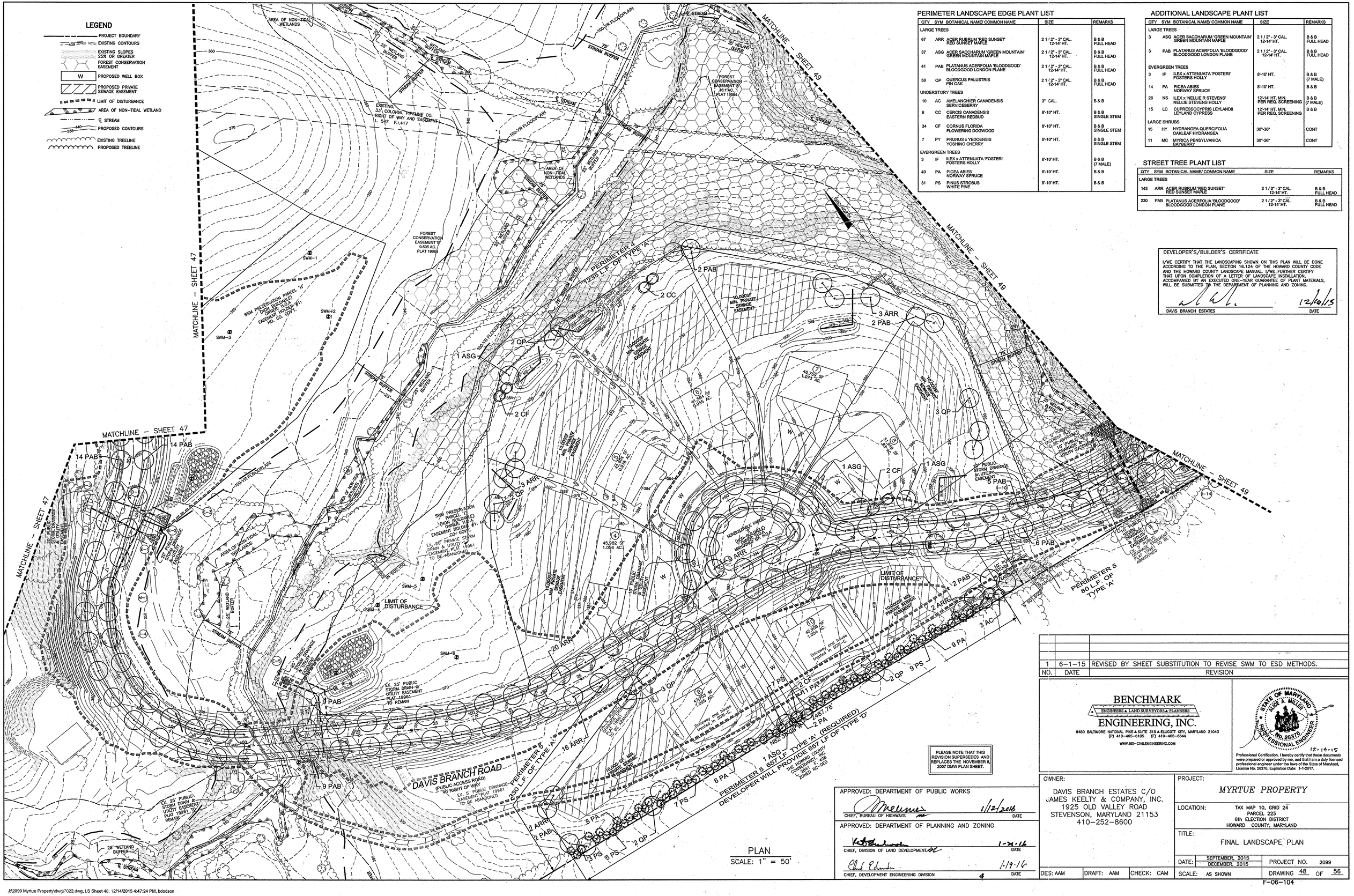
DES: AAM — DRAFT: AAM — CHECK: CAM — SCALE: AS SHOWN — DRAWING 47 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7022.dwg, LS Sheet 47, 12/14/2015 4:47:57 PM, bdodson

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W — PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- LIMIT OF DISTURBANCE
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS
- EXISTING TREELINE
- PROPOSED TREELINE



PLAN
SCALE: 1" = 50'

PERIMETER LANDSCAPE EDGE PLANT LIST

QTY	SYM	BOTANICAL NAME/ COMMON NAME	SIZE	REMARKS
LARGE TREES				
67	ARR	ACER RUBRUM 'RED SUNSET' RED SUNSET MAPLE	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD
37	ASG	ACER SACCHARUM 'GREEN MOUNTAIN' GREEN MOUNTAIN MAPLE	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD
41	PAB	PLATANUS ACERFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD
58	QP	QUERCUS PALUSTRIS PIN OAK	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD
UNDERSTORY TREES				
10	AC	AMELANCHIER CANADENSIS SERVICEBERRY	3" CAL.	B & B
6	CC	CERCIS CANADENSIS EASTERN REDBUD	8'-10' HT.	B & B SINGLE STEM
34	CF	CORNUS FLORIDA FLOWERING DOGWOOD	8'-10' HT.	B & B SINGLE STEM
7	PY	PRUNUS x 'YEDOENSIS YOSHINO CHERRY	8'-10' HT.	B & B SINGLE STEM
EVERGREEN TREES				
3	IF	ILEX x ATTENUATA 'FOSTERI' FOSTERS HOLLY	8'-10' HT.	B & B (7 MALE)
40	PA	PICEA ABIES NORWAY SPRUCE	8'-10' HT.	B & B
31	PS	PINUS STROBUS WHITE PINE	8'-10' HT.	B & B

ADDITIONAL LANDSCAPE PLANT LIST

QTY	SYM	BOTANICAL NAME/ COMMON NAME	SIZE	REMARKS
LARGE TREES				
3	ASG	ACER SACCHARUM 'GREEN MOUNTAIN' GREEN MOUNTAIN MAPLE	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD
3	PAB	PLATANUS ACERFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD
EVERGREEN TREES				
3	IF	ILEX x ATTENUATA 'FOSTERI' FOSTERS HOLLY	8'-10' HT.	B & B (7 MALE)
14	PA	PICEA ABIES NORWAY SPRUCE	8'-10' HT.	B & B
26	NS	ILEX x 'NELLIE R STEVENS' NELLIE STEVENS HOLLY	12'-14' HT. MIN. PER REQ. SCREENING	B & B (7 MALE)
15	LC	CUPRESSOCYPRIS LEYLANDII LEYLAND CYPRESS	12'-14' HT. MIN. PER REQ. SCREENING	B & B
LARGE SHRUBS				
15	HY	HYDRANGEA QUERCIFOLIA OAKLEAF HYDRANGEA	30"-36"	CONT
11	MC	MYRICA PENSYLVANICA BAYBERRY	30"-36"	CONT

STREET TREE PLANT LIST

QTY	SYM	BOTANICAL NAME/ COMMON NAME	SIZE	REMARKS
LARGE TREES				
143	ARR	ACER RUBRUM 'RED SUNSET' RED SUNSET MAPLE	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD
230	PAB	PLATANUS ACERFOLIA 'BLOODGOOD' BLOODGOOD LONDON PLANE	2 1/2" - 3" CAL. 12-14' HT.	B & B FULL HEAD

DEVELOPER'S/BUILDER'S CERTIFICATE

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

DAVIS BRANCH ESTATES — DATE 12/16/15

APPROVED: DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-14-16
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — RUDGE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: FINAL LANDSCAPE PLAN

DATE: SEPTEMBER, 2015 / DECEMBER, 2015
PROJECT NO. 2099
SCALE: AS SHOWN
DRAWING 48 OF 56

DES: AAM | DRAFT: AAM | CHECK: CAM

F-06-104

J:\2099 Myrtue Property\dwg\7022.dwg, LS Sheet 48, 12/14/2015 4:47:24 PM, bdodson

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

DEVELOPER'S/BUILDER'S CERTIFICATE

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DAVIS BRANCH ESTATES — DATE 12/16/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1.19.16

NO.	DATE	REVISION
1	6-1-15	REVISED BY SHEET SUBSTITUTION TO REVISE SWM TO ESD METHODS.

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 315 ▲ ELLICOTT CITY, MARYLAND 21043
(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-14-15

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OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: *MYRTUE PROPERTY*

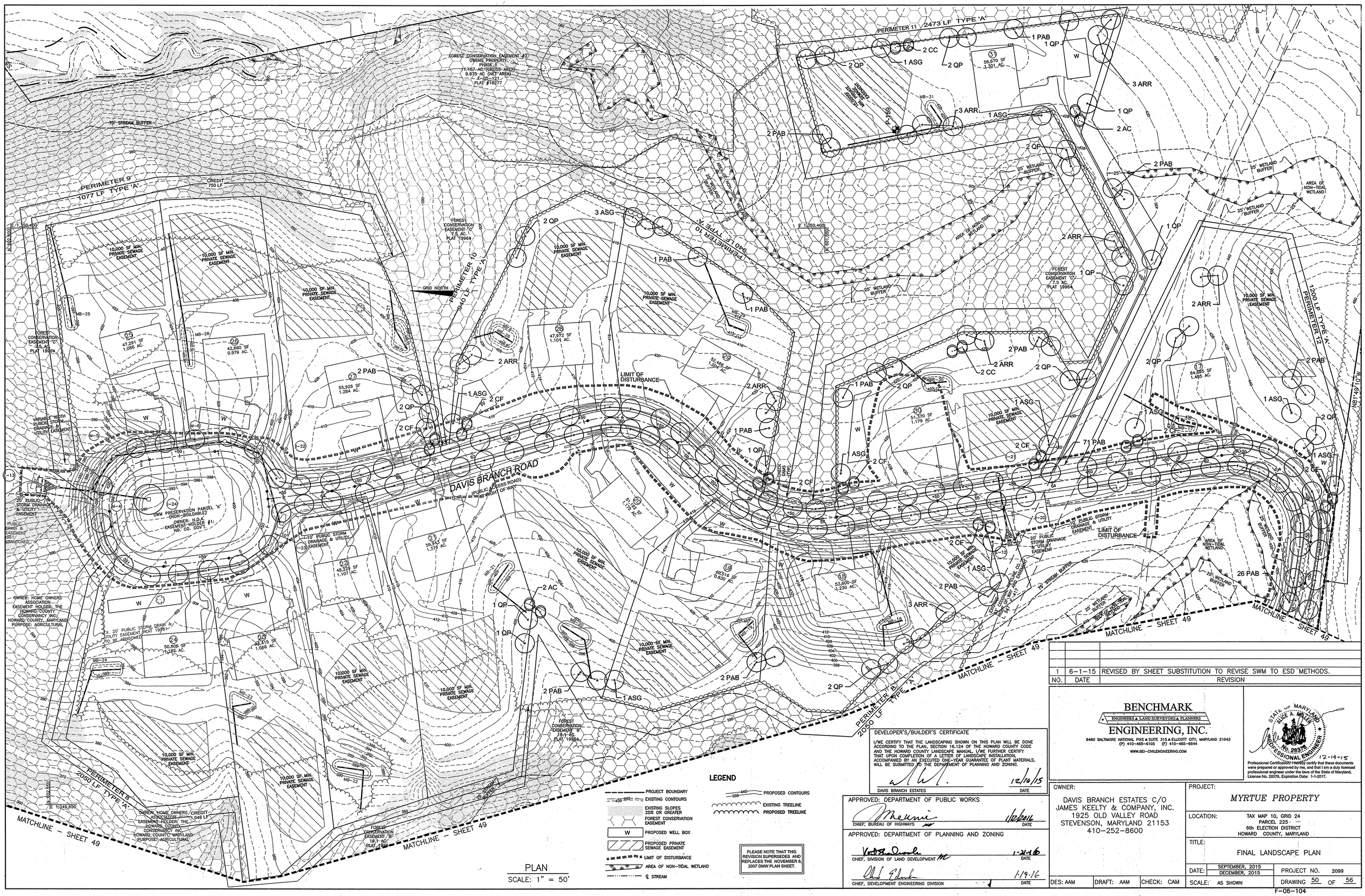
LOCATION: TAX MAP 10, GRID 24
PARCEL 225
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE: FINAL LANDSCAPE PLAN

DATE: SEPTEMBER, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

DES: AAM — DRAFT: AAM — CHECK: CAM — SCALE: AS SHOWN — DRAWING 49 OF 56

F-06-104



PLAN
SCALE: 1" = 50'

LEGEND

- PROJECT BOUNDARY
- EXISTING CONTOURS
- EXISTING SLOPES 25% OR GREATER
- FOREST CONSERVATION EASEMENT
- W PROPOSED WELL BOX
- PROPOSED PRIVATE SEWAGE EASEMENT
- LIMIT OF DISTURBANCE
- AREA OF NON-TIDAL WETLAND
- ℄ STREAM
- PROPOSED CONTOURS
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- PROPOSED TREELINE

PLEASE NOTE THAT THIS REVISION SUPERSEDES AND REPLACES THE NOVEMBER 8, 2007 DMW PLAN SHEET.

NO.	DATE	REVISION
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DAVIS BRANCH ESTATES — DATE 12/16/15

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 1/12/2016

APPROVED: DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1-21-16

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1-19-16

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
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(P) 410-465-6105 (F) 410-465-6644
WWW.BEI-CIVILENGINEERING.COM

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER — 12-14-15

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28376, Expiration Date: 1-1-2017.

OWNER:
DAVIS BRANCH ESTATES C/O
JAMES KEELTY & COMPANY, INC.
1925 OLD VALLEY ROAD
STEVENSON, MARYLAND 21153
410-252-8600

PROJECT: MYRTUE PROPERTY

LOCATION: TAX MAP 10, GRID 24, PARCEL 225, 6th ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

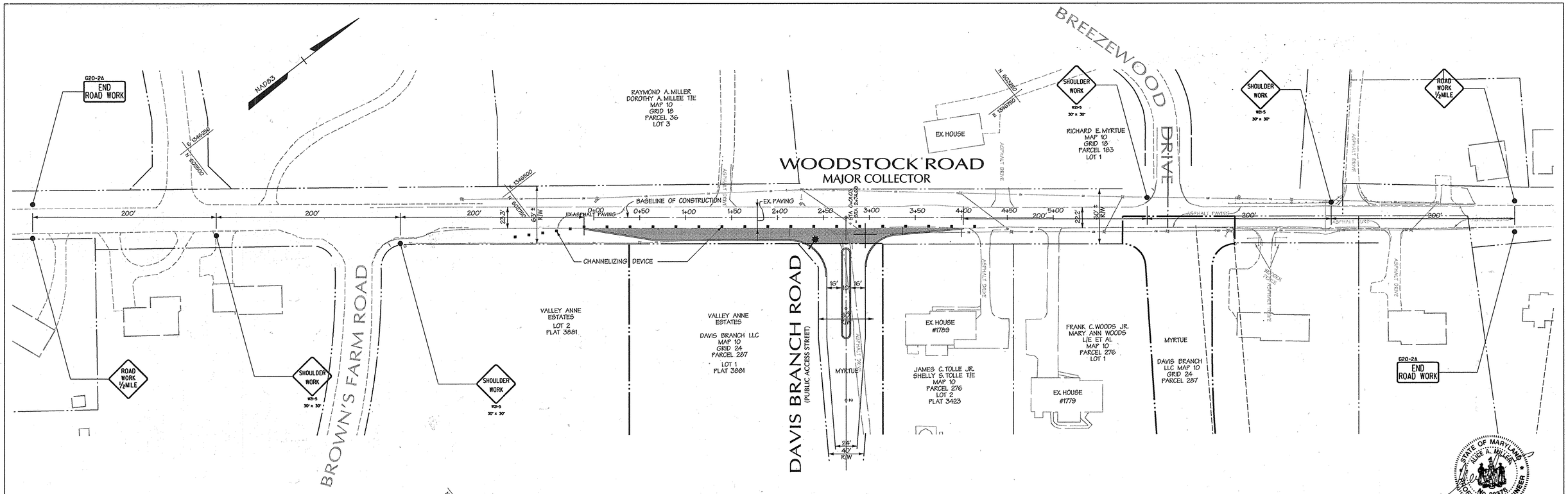
TITLE: FINAL LANDSCAPE PLAN

DATE: SEPTEMBER, 2015 / DECEMBER, 2015 — PROJECT NO. 2099

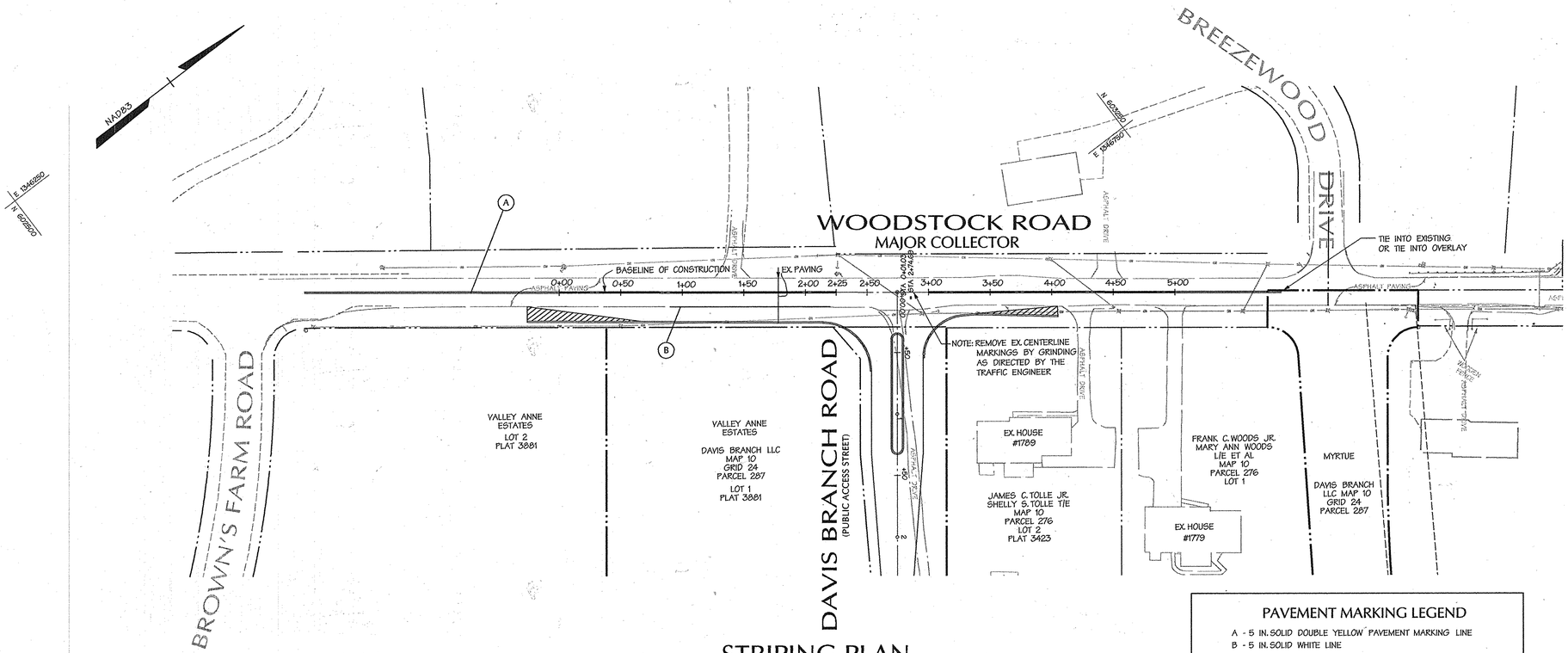
DES: AAM — DRAFT: AAM — CHECK: CAM — SCALE: AS SHOWN — DRAWING 50 OF 56

F-06-104

J:\2099 Myrtue Property\dwg\7022.dwg, LS Sheet 50, 12/14/2015 4:45:57 PM, bdodson



MAINTENANCE OF TRAFFIC PLAN



STRIPING PLAN

PAVEMENT MARKING LEGEND

A - 5 IN. SOLID DOUBLE YELLOW PAVEMENT MARKING LINE
B - 5 IN. SOLID WHITE LINE

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

STATE OF MARYLAND — JESSE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

Date	No.	Revision Description
12-3-15	1	REVISED SHEET NO.

MYRTUE PROPERTY

LOTS 1 THRU 31, BUILDABLE PRESERVATION PACERLS A, NON-BUILDABLE PRESERVATION PARCELS B-D, F-K, NON-BUILDABLE PARCEL E, AND CEMETERY LOT 1
TAX MAP 10 GRID 24 PARCEL 225/287

DAVIS BRANCH, LLC
JAMES KEELTY AND CO. INC.
P.O. BOX 1529
611 E. PADONIA ROAD.
TIMONIUM, MD 21093

DMW
Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

9-24-07
Date

Professional Engr. No. 20784

AREA

3rd ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE

ROAD WIDENING
MAINTENANCE OF TRAFFIC AND PAVEMENT MARKING PLAN

Des. By KAD	Scale 1" = 50'	Proj. No. 02033.D	
Dm. By WDE	Date 11/17/06		51 of 56
Chk. By	Approved		

F-06-104

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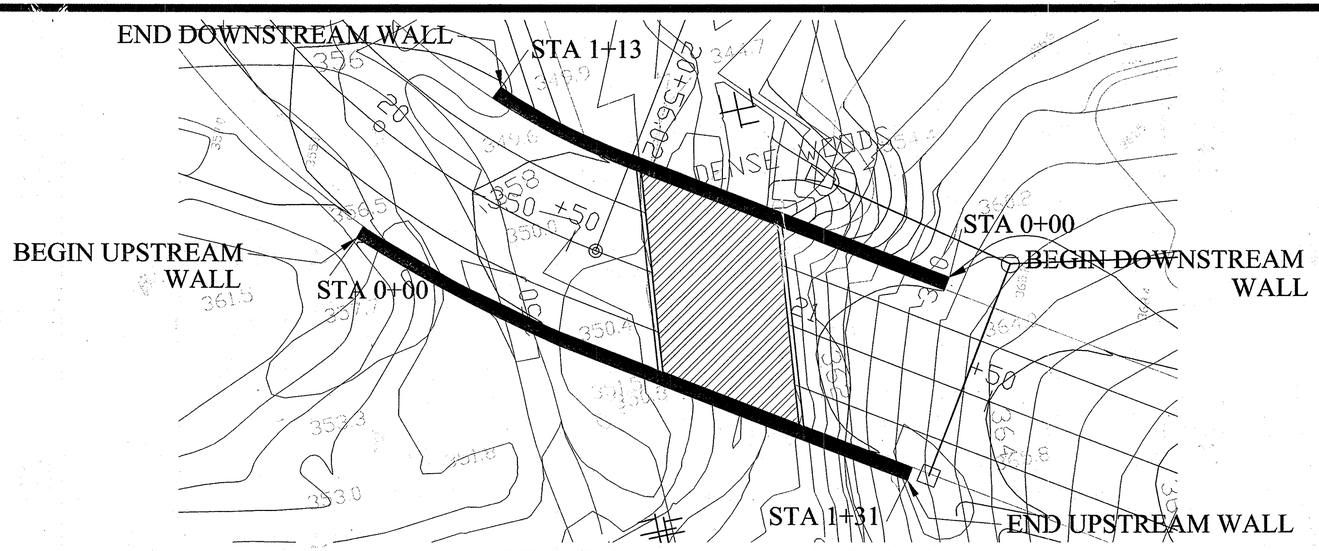


PLAN VIEW (LOW PROFILE ARCH LA3308)
SCALE: 1/16" = 1'

APPROVED: DEPARTMENT OF PLANNING & ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07
~~DIRECTOR~~ — ~~DATE~~

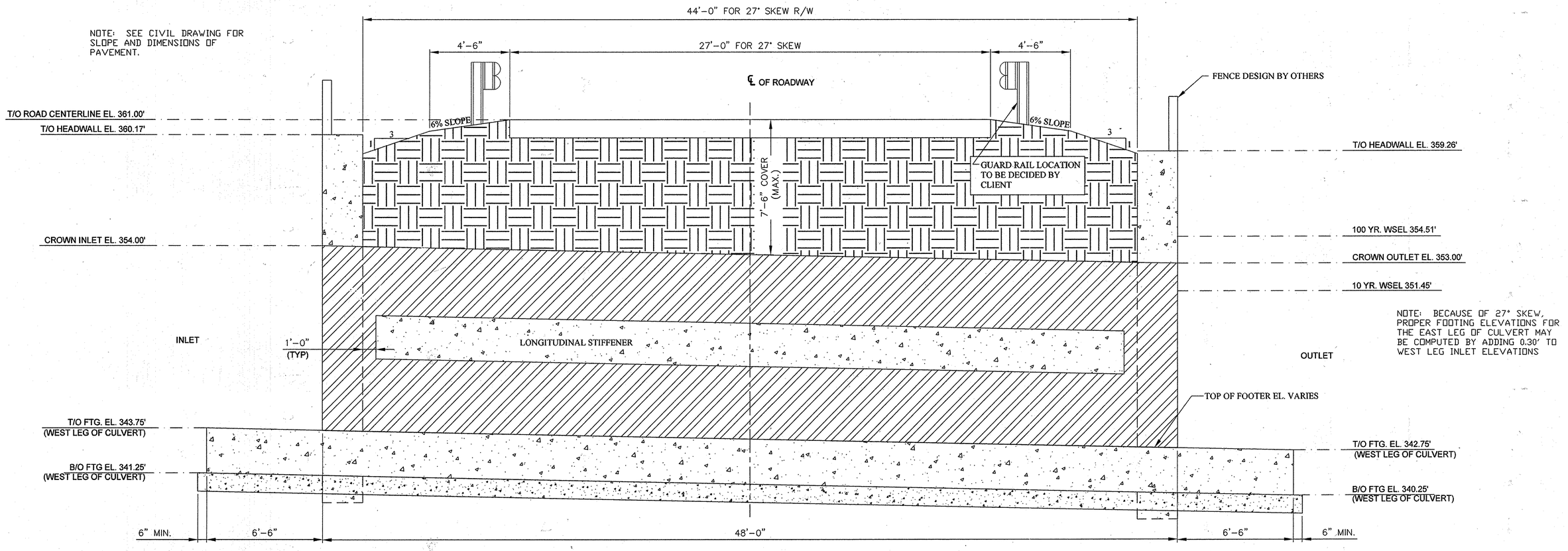
APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1 DEC 3, 2015

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER
12-15-15

NOTE: SEE CIVIL DRAWING FOR SLOPE AND DIMENSIONS OF PAVEMENT.



NOTE: BECAUSE OF 27° SKEW, PROPER FOOTING ELEVATIONS FOR THE EAST LEG OF CULVERT MAY BE COMPUTED BY ADDING 0.30' TO WEST LEG INLET ELEVATIONS

CULVERT CENTERLINE PROFILE (LOW PROFILE ARCH NO. LA3308)
SCALE: 3/8" = 1'

REVISIONS

No.	DATE	BY	DESCRIPTION
1.	05/21/06	MH	PER COMMENTS FROM CIVIL ENGINEER
2	12-3-15	BEF	REVISED SHEET NO

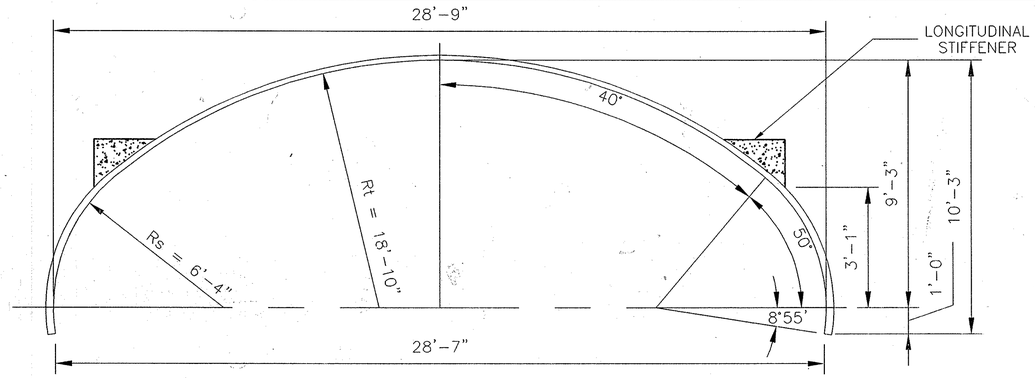
DRAWN BY: MH
DESIGN BY: MH
CHECKED BY: MS
DATE: 03/12/06
DO NOT SCALE THIS DRAWING; DIMENSIONS AND NOTES HAVE PRECEDENCE OVER DRAWING

CLIENT: LONG SPAN BRIDGE & CULVERT, LLC
OWNER: DAVIS BRANCH, LLC
JOB No: 1101-05-08

Ryan & Associates
A Division of WKR Consulting Inc.
Consulting & Design Engineers
Structural - Geotechnical - Civil
Email: info@ryanandassociates.net
922 North East St. Frederick, Md. 21701
Tel (301) 360-9534
Fax (301) 360-9574

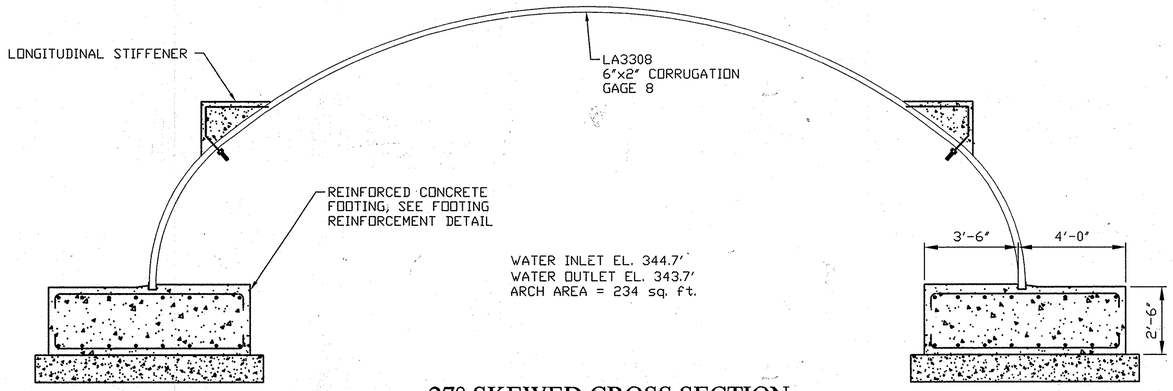
PLAN AND PROFILE
LONG SPAN LOW PROFILE ARCH LA3308
MYRTUE PROPERTY CULVERT
HOWARD COUNTY, MD

STATE OF MARYLAND — No. 00283 — PROFESSIONAL ENGINEER — 08/24/07
ENGINEER SEAL



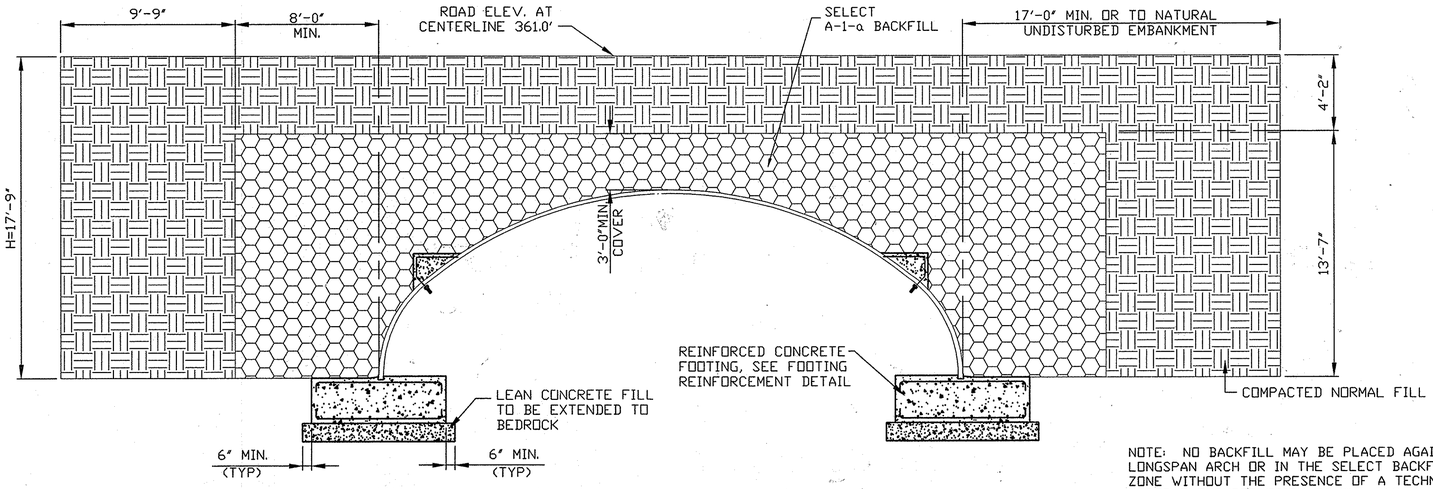
LOW PROFILE ARCH NO. LA3308 GAGE 8

SCALE: 3/8" = 1'



27° SKEWED CROSS SECTION

SCALE: 3/8" = 1'



TYPICAL SELECT BACKFILL SECTION AT CENTERLINE OF ROAD

SCALE: 1/4" = 1'

NOTE: NO BACKFILL MAY BE PLACED AGAINST THE LONGSPAN ARCH OR IN THE SELECT BACKFILL ZONE WITHOUT THE PRESENCE OF A TECHNICIAN UNDER THE SUPERVISION OF THE DESIGN ENGINEER.

APPROVED: DEPARTMENT OF PLANNING & ZONING

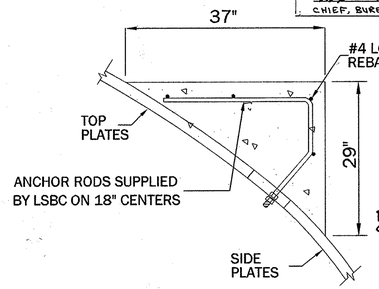
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

~~DIRECTOR~~ — ~~DATE~~

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376, Expiration Date: 1-1-17

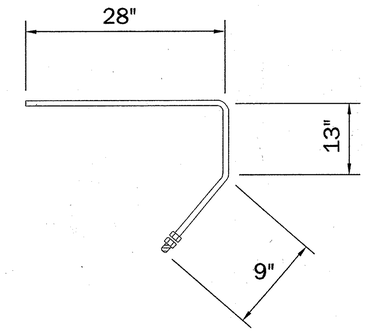
FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION # 1 DEC. 3, 2015

STATE OF MARYLAND · JUDE A. HILER · No. 28376 · PROFESSIONAL ENGINEER

12-15-15

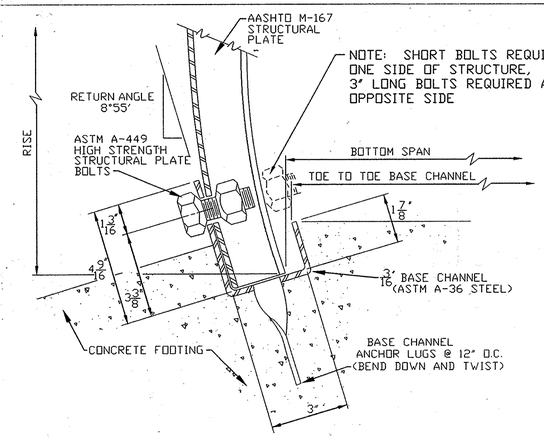
LONGITUDINAL STIFFENER DETAIL

NOT TO SCALE



BENT ROD DETAIL

NOT TO SCALE



BASE CHANNEL DETAIL

NOT TO SCALE

REVISIONS			
No.	DATE	BY	DESCRIPTION
1.	05/25/06	MH	PER COMMENTS FROM CIVIL ENGINEER
2.	12/3//5	BEE	REVISE SHEET NO.

DRAWN BY: MH
DESIGN BY: MH
CHECKED BY: MS
DATE: 03/12/06

DO NOT SCALE THIS DRAWING; DIMENSIONS AND NOTES HAVE PRECEDENCE OVER DRAWING

CLIENT: LONG SPAN BRIDGE & CULVERT, LLC

OWNER: DAVIS BRANCH, LLC

JOB No: 1101-05-08

Ryan & Associates
A Division of WKR Consulting Inc.
Consulting & Design Engineers
Structural - Geotechnical - Civil
Email: info@ryanandassociates.net
922 North East St. Tel (301) 360-9534
Frederick, Md. 21701 Fax (301) 360-9574

SECTIONS & DETAILS
LONG SPAN LOW PROFILE ARCH LA3308
MYRTUE PROPERTY CULVERT
HOWARD COUNTY, MD

ENGINEER SEAL

SHEET
53 OF 56

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

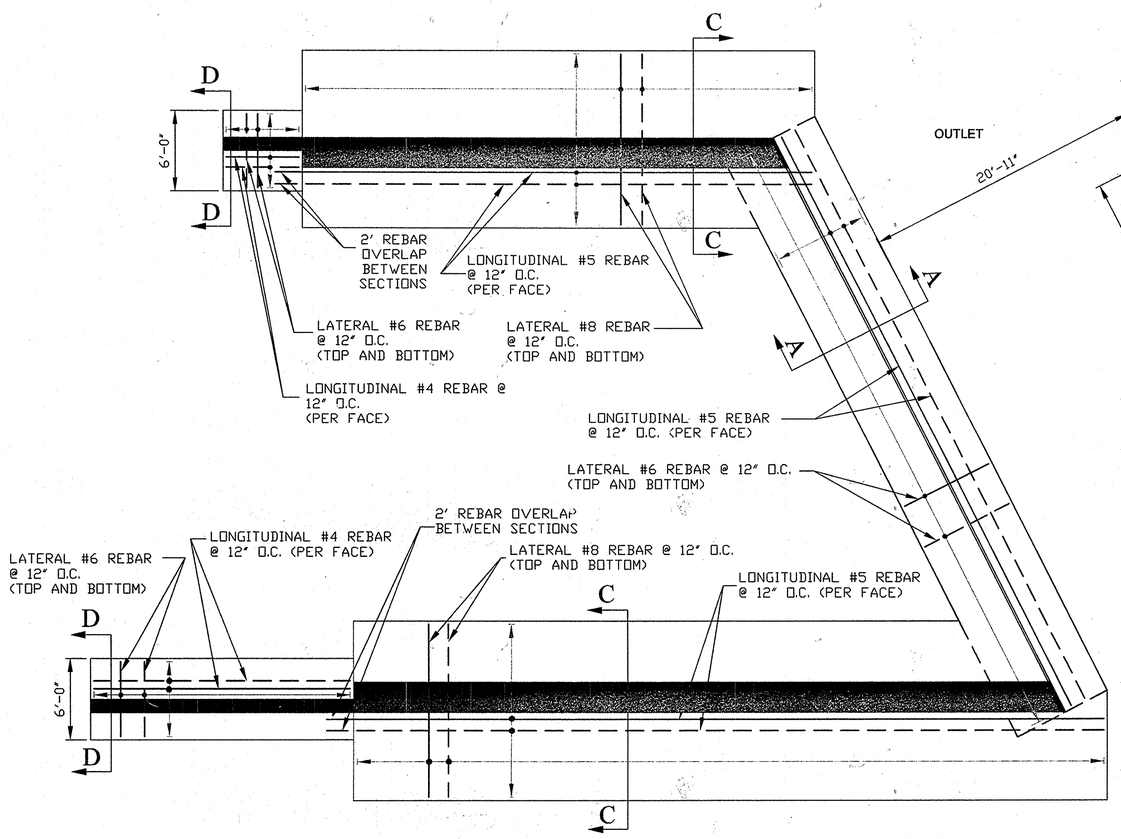
CHIEF, BUREAU OF HIGHWAYS — DATE 10-23-07

APPROVED: DEPARTMENT OF PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 11/7/07

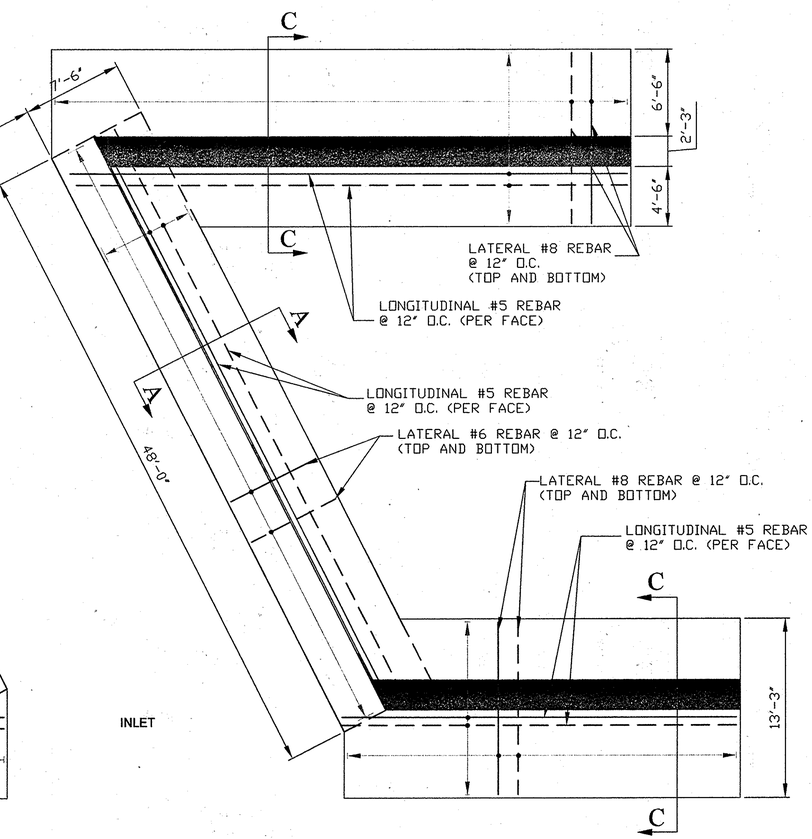
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/8/07

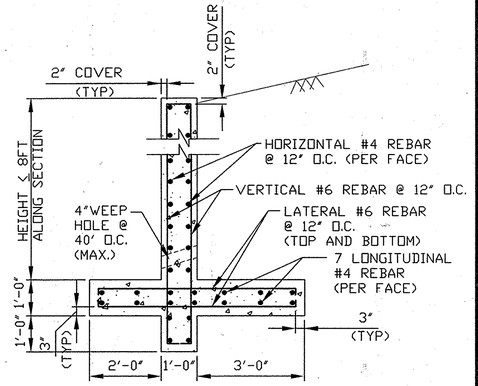
~~DIRECTOR~~ — ~~DATE~~



CULVERT & HEAD WALL FOOTING PLAN

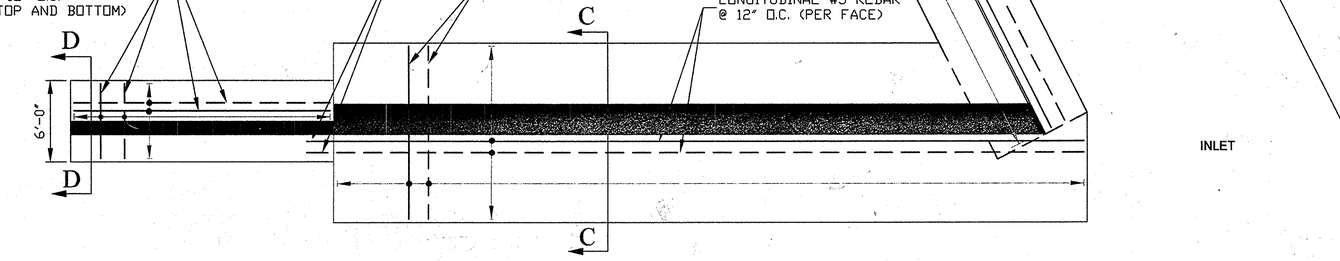
SCALE: 3/16"=1'

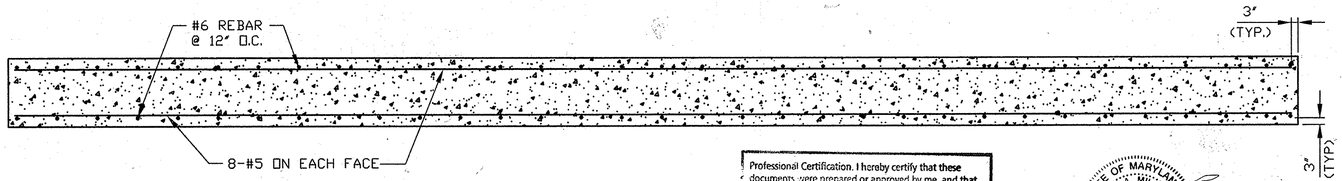




CULVERT HEADWALL SECTION D - D

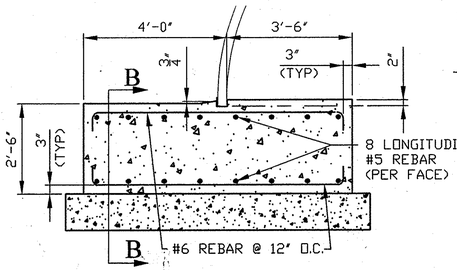
SCALE: 1/2" = 1'





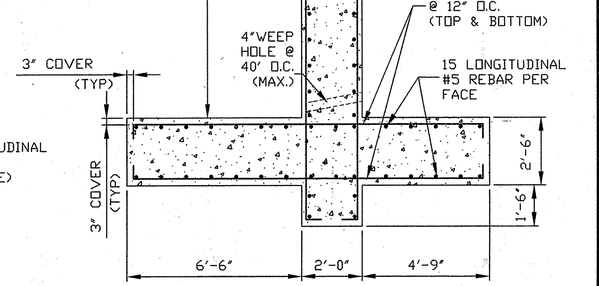
SECTION B-B

SCALE: 3/8"=1'



SECTION A-A

SCALE: 1/2"=1'



CULVERT HEADWALL SECTION C - C

SCALE: 3/8"= 1'

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 28376, Expiration Date: 1-1-17

STATE OF MARYLAND — ALICE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC 31 2015

12-12-15

REVISIONS

No.	DATE	BY	DESCRIPTION
1.	05/25/06	MH	PER COMMENTS FROM CIVIL ENGINEER
2.	12/3/15	BEI	REVISE SHEET NO.

DRAWN BY: MH
DESIGN BY: MH
CHECKED BY: MS
DATE: 09/18/06

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CLIENT: LONG SPAN BRIDGE & CULVERT, LLC
OWNER: DAVIS BRANCH, LLC
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FOOTING & HEAD WALL DETAILS

LONG SPAN LOW PROFILE ARCH LA3308

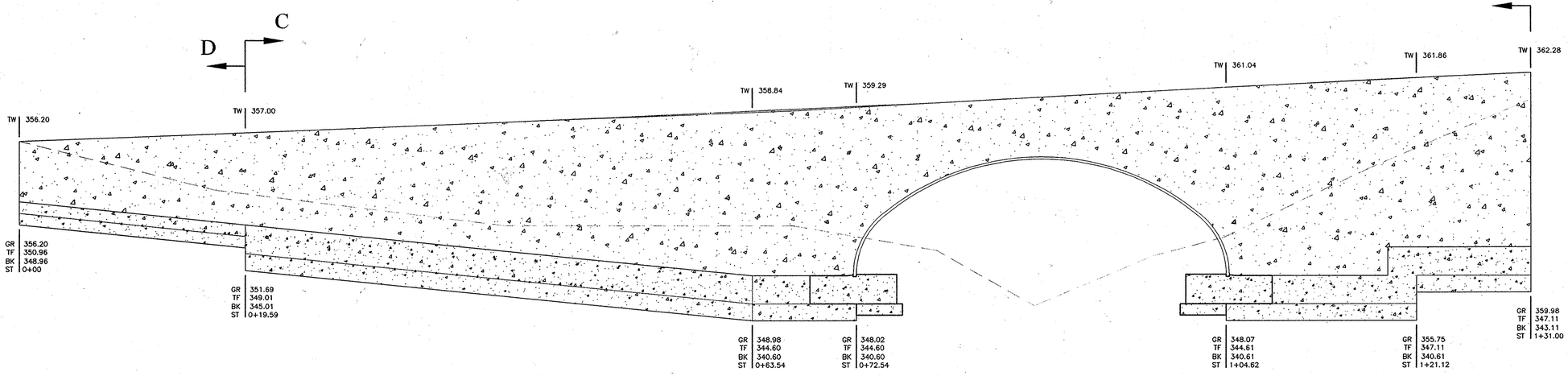
MYRTUE PROPERTY CULVERT

HOWARD COUNTY, MD

STATE OF MARYLAND — WILLIAM H. CARR — 09129/07 — PROFESSIONAL ENGINEER

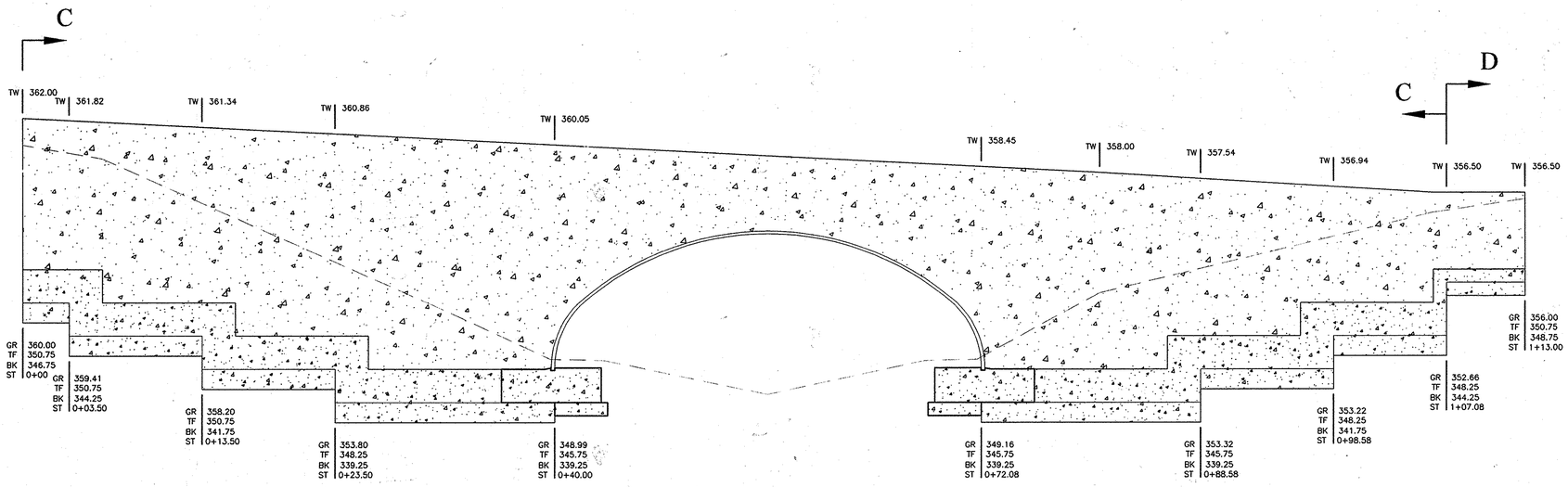
ENGINEER SEAL

SHEET 54 OF 56



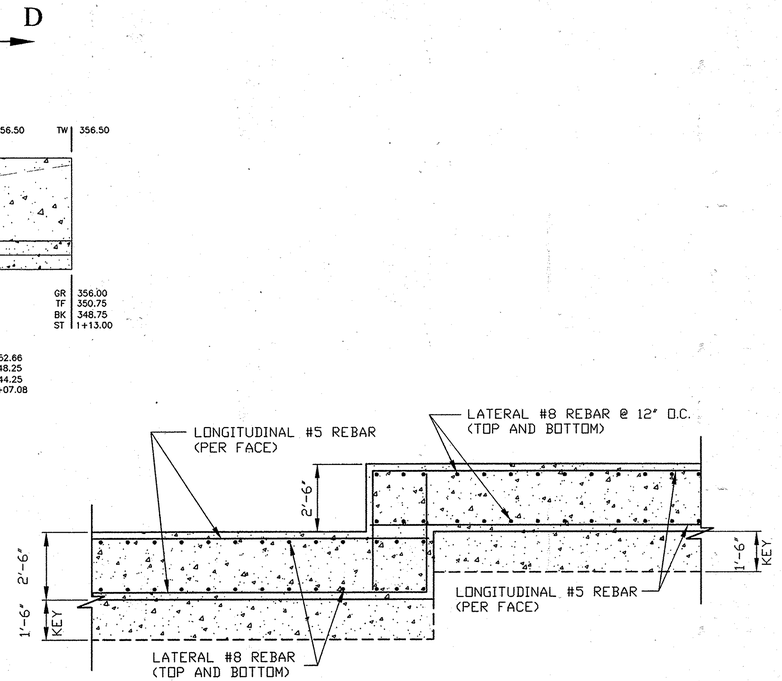
UPSTREAM CULVERT HEADWALL PROFILE

SCALE: 1/4"=1'



DOWNSTREAM CULVERT HEADWALL PROFILE

SCALE: 1/4"=1'



HEADWALL FOOTING STEP DETAIL

SCALE: 3/8" = 1'

APPROVED: DEPARTMENT OF PLANNING & ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 11/7/07 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT — 11/8/07 DATE

~~DIRECTOR~~ — ~~DATE~~

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — 10-23-07 DATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 28376 Expiration Date: 1-1-17

STATE OF MARYLAND — JULIE A. MILLER — No. 28376 — PROFESSIONAL ENGINEER

12-12-15

FOR REVISIONS BY BENCHMARK ENGINEERING INC. ONLY. REVISION #1 DEC. 3, 2015

REVISIONS

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2	12/5/15	BEE	REVISE SHEET NO.

DRAWN BY: MH
DESIGN BY: MH
CHECKED BY: MS
DATE: 03/12/06

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HEADWALL PROFILES
LONG SPAN LOW PROFILE ARCH LA3308
MYRTUE PROPERTY CULVERT
HOWARD COUNTY, MD

08/24/07
ENGINEER SEAL

SHEET
55 OF 56

NOTES & SPECIFICATIONS

1: DEFINITIONS

1.01 Owner: Davis Branch, LLC. Timonium, MD 21093

1.02 Contractor: xxx

1.03 Design Engineer: Ryan & Associates, Frederick, MD 21701

1.04 Site Civil Engineer: Daft, McCune, Walker, Inc. Towson, MD 21286

1.05 Site Geotechnical Engineer: Hillis-Carnes Engineering Associates, Inc. MD

If any of the above responsibilities change it is the owner's responsibility to notify LSBC prior to the start of the work. It is the owner's responsibility to make sure all parties listed above are aware of their roles, requirements, responsibilities and final submittals.

2: GENERAL

2.01 Contractor shall notify site engineer of any discrepancies, omissions, or conflicts between the various elements of the working drawings and/or specifications before proceeding with any work involved. In all cases, unless otherwise directed, the most stringent requirements shall govern and be performed.

2.02 Contractor shall verify all conditions, dimensions and elevations, etc., at the site and shall coordinate work performed by all trades. Do not scale drawings.

2.03 Shop drawings shall be reviewed and approved by the civil engineer prior to fabrication.

2.04 Sizes, locations, loads, and anchorage of equipment shall be verified in the field with equipment manufacturers (suppliers) prior to fabrication or installation of supporting structures.

2.05 Temporary bracing shall be provided wherever necessary to take care of all loads to which the structure may be subjected, including wind. Such bracing shall be left in place as long as may be required for safety or until all the structure elements are complete.

2.06 During and after construction the contractor and/or owner shall keep loads on the structure within the limits of the design load.

2.07 Contractor shall be responsible for safety and protection within and adjacent to the job site.

2.08 Civil engineer is responsible for erosion and sediment control design.

2.09 Road pavement design and its appurtenance structure are civil engineer's responsibility. Refer all pavement and roadway drainage system to civil drawing(s).

3: CONCRETE

3.01 All foundation concrete (footings, walls etc.) shall be normal weight concrete with a compressive strength equal to at least 4,000 psi within 28 days after casting. The water/cement ratio shall be no greater than 0.50 and slump shall be 2-4 inches.

3.02 All concrete work shall be placed, cured, stripped and protected as directed by these specifications and ACI standards and practices.

3.03 Contractor is responsible for all shoring and formwork.

3.04 Concrete design and detailing shall conform to the requirements of ACI 318-02. Contractor shall submit mix designs to the site engineer accompanied by appropriate graphs and background data for approval. Mix design shall indicate 7 and 28-day strengths, cement content, air content, water-cement ratio, amount of fine and coarse aggregates and admixtures.

a. Minimum ultimate compressive strength of concrete at 28 days shall be as follows, unless noted otherwise:
Footings and other concrete: 4000 PSI
Unreinforced concrete: 2000 PSI

3.05 All exterior concrete and concrete exposed to weather shall be air-entrained.

3.06 Use of additives shall not be permitted unless specifically approved by the site engineer.

3.07 The concrete subcontractor shall not reproduce any portion of the structural contract drawings for utilization as shop drawings.

3.08 Concrete shall be consolidated by means of mechanical vibration. Vibrators shall be inserted and removed vertically at regular intervals not to exceed 18" to ensure uniform consolidation. In no case shall vibrators be used to transport the concrete inside the forms.

3.09 Formwork shall follow ACI 347. "Recommended practice for concrete form work". Forms shall conform to the working drawing to shape, line and dimensions members and shall be substantially free from surface defects and sufficiently tight to prevent leakage. They shall be properly braced and tied to maintain position and shape.

3.10 Fresh concrete will be protected from rain, flowing water and mechanical injury, sun, drying winds and freezing for a period of 7 days. The temperature of the concrete must be kept above 50 degrees F for at least 7 days.

3.11 Ground water and surface water within the subgrade excavation area must be maintained below the bottoms of the footer elevation and the bottoms of the excavation during preparation of the subgrade.

4: GEOTECHNICAL NOTES

4.01 Geotechnical site information provided by others.

4.02 All structural fill soils will have a minimum dry density of 105PCF. Fill shall be compacted to at least 95% of the maximum dry density as determined by the standard proctor ASTM D698 (AASHTO T-99) with the exception of the top foot, which will be 100% of the maximum dry density.

4.03 All structural fill material will be placed in layers, which, before compaction, will not exceed eight inches. Each layer shall be spread to ensure conformity of materials in each layer.

4.04 Virgin/undisturbed soils are defined as soils with a minimum SPT "N" value of 12.

5: FOOTINGS

5.01 All footings are based on an allowable soil bearing pressure of 6,000 PSF. Any soil condition encountered during excavation that is contrary to those used for design of footings as outlined in these drawings shall be brought to the attention of the site Geotechnical Engineer for direction before proceeding.

5.02 Bottom of footings shall be a minimum of 3'-0" below finished grade, unless a lower elevation is noted. Footing elevations noted are estimated based on available geotechnical and grading information. All footings adjacent to existing footings shall be lowered to match existing footing elevation.

5.03 All foundation subgrades shall be inspected and approved under the supervision of the registered professional site Geotechnical Engineer or their representative prior to pouring concrete. Footings may be lowered to achieve the minimum footing subgrade bearing capacity of 6,000 PSF.

6: REINFORCING STEEL

6.01 Reinforcing bars shall be deformed billet steel conforming to ASTM A615, grade 60. All welded wire fabric shall conform to ASTM A185. Bars shall be branded by the manufacture with bar size and grade of steel and certified mill reports shall be submitted to Site Engineer for record. Reinforcing steel shall be detailed in accordance with the ACI "manual of standard practice for detailing reinforced concrete structures", latest edition. Provide corner bars at junctions of concrete walls and wall footings and lap 48 x bar diameters.

6.02 With wall reinforcing as shown in typical details, size and spacing of corner bars to be same as horizontal wall reinforcing, unless shown otherwise. Where continuous bars are called for, they shall run continuously around corners and lapped as necessary min. 48 x bar diameters. Provide standard hooks at discontinuous ends. Tension and compression lap splices shall not be less than the splice lengths as given in ACI 318. Generally lap top bars at mid span and bottom bars at supports. Provide placing accessories in accordance with ACI recommendations.

6.03 Provide the following minimum concrete cover for reinforcement:

a. Concrete cast against and permanently exposed to earth ...3"
b. Concrete exposed to earth or weather:
No. 6 through No. 18 bars ...2"
No. 5 bar, W31 or D31 wire, and smaller ... 1 ½"
c. Concrete slabs, walls and joists not exposed to the earth or weather:
No. 14 and No. 18 bars ... 1 ½"
No. 11 bar and smaller ...¾"
d. Beams, columns:
Primary reinforcement, ties, stirrups and spirals ... 1 ½"

7: EARTHWORK SPECIFICATIONS

7.01 The contractor shall furnish all labor, material and equipment for the earthwork. The contractor shall perform all work and services except those set out and furnished by Long Span Bridge & Culvert, LLC. (LSBC)

7.02 This work shall consist of all clearing and grading, preparation of the land to be filled, filling of the land, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the project lines, grades, slopes and specifications.

7.03 This work is to be accomplished under the observation of the Site Engineer or their representative. Placement of the backfill material will not be permitted unless the Engineer or their representative is on site.

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

7.05 The professional Site Geotechnical Engineer or their representative in the field shall verify the subgrade soil condition, gravel, and the rock quality. All stone subgrade shall be compacted with a vibratory plate compactor in no more than 8" lifts and verified by the professional Site Geotechnical Engineer or their representative.

7.06 If conditions other than those indicated by the confirmatory subsurface boring program are encountered by the contractor, Long Span Bridge & Culvert, LLC (LSBC) should be notified immediately. The material, which the contractor believes to be a changed condition, should not be disturbed so that LSBC and/or their designated representative can investigate the condition.

7.07 The work for clearing and grubbing includes furnishing all labor, materials, transportation, supervision, tools and construction machinery, which may be necessary to accomplish the clearing and grubbing for this project area.

7.08 All trees, bushes, etc., shall be removed from the limits of the proposed areas to receive fill or other engineered structures. The areas may be extended outside the actual lines of construction only to the distance required to provide the contractor with sufficient space to perform the work.

7.09 All stumps, vegetation, brush, debris or deleterious materials shall be removed from the limits of the fill or other engineered structures.

7.10 The work for stripping includes furnishing all labor, materials, transportation, supervision,tools and construction machinery, which may be necessary to be provided by the contractor.

7.11 When the construction/operation sequence requires, the area of fill or other engineered structures shall be properly stripped. This stripping shall include topsoil and other deleterious materials. Topsoil shall be removed to its full depth and stockpiled for use in the final cover. Any rubbish, organic and objectionable soils and other deleterious material shall be properly disposed of at a site approved by owner or LSBC.

7.12 The lines and grades shall be established by using control benchmarks provided by licensed surveyors.

7.13 Soft or spongy cohesive or silty materials encountered at the base of the excavation shall be removed at the direction of the Site Geotechnical Engineer or their representative. The excavation for the footing wall foundations shall be observed and subgrade-bearing capacity certified by the Site Geotechnical Engineer upon completion of this task. At the direction of the Site Geotechnical Engineer or their representative, soft material will be removed to a depth directed by the Site Geotechnical Engineer or their representative, and replaced with granular backfill compacted at least 100% of the maximum dry unit weight density at a moisture content within 2% of optimum as determined by AASHTO T-99 method / ASTM D698.

7.14 If a shape control technician is supplied by LSBC, no select granular backfill may be placed, without being observed by LSBC's shape control technician.

7.15 Ground water and surface water within the subgrade excavation area must be maintained at least 3 feet below the footer elevation during preparation of the subgrade if additional excavation is required to remove unsuitable materials, the water must be maintained 3 feet below the deepest excavation elevation.

7.16 The subgrade shall be compacted with a soil vibratory compactor or equivalent with a dynamic force of 50,000 pounds (min.). The top 1 foot of the subgrade soil shall be compacted to at least 100% of the maximum dry unit weight at a moisture content within 2% of optimum as determined by AASHTO T-99 method (standard proctor). All compaction and subgrade bearing capacity to be verified by the site geotechnical engineer or representative.

7.17 All select granular backfill material around the culvert and above the footing shall consist of AASHTO M 145 A-1-a. Recycled concrete material shall not be allowed. The select backfill material shall have fines (pass no. 200 sieve material) maximum 15% by weight. See typical select backfill chart this sheet.

7.18 The select granular backfill material and site soil backfill for the adjoining embankment material shall be tested in the laboratory for grain size distribution (AASHTO T-27 for granular material; AASHTO T-88 for soil material) and moisture-density relationship (AASHTO T-99). The testing described above is for purposes of verification of site soil backfill parameters and is in addition to the general project specifications for the embankment backfill, but does not supersede project specifications that may be more stringent.

7.19 All backfill operations shall place the material evenly on both sides of the plate arch and each lift shall extend for the entire length of the plate arch prior to placement of the next sequential lift. Fill placement shall begin in the middle of the plate arch length and extend equally on both sides in the upstream and downstream directions.

7.20 The select granular backfill shall be placed in horizontal layers not to exceed 8" loose depth. The lift thickness may be reduced by the Site Geotechnical Engineer or their representative to obtain the required compaction, fill all the voids, achieve the proper seating of the backfill material and achieve the stability of the backfill material and the plate arch. The granular backfill shall be compacted to 95% of the maximum dry unit weight as determined by the standard proctor test (AASHTO T-99). Field nuclear density tests shall be performed at a minimum frequency of two tests per lift and every 25' on each side of the structure. Greater emphasis shall be given to a uniform degree of compaction throughout each lift than to achieving a degree of compaction greater than the minimum specified criteria. Site Geotechnical Engineer shall do testing of select granular backfill.

7.21 All granular material shall be compacted using mechanical devices, vibrating plates or other equipment approved by the Site Geotechnical Engineer. Compaction equipment weighing more than 24,000 pounds shall not be used within 2.5' of the corrugated metal structure. The compaction equipment shall be capable of compacting the material under the haunch of the plate arch (I.E.; below the spring line of the plate arch).

7.22 The soil backfill (compacted normal backfill) within 17'-9" or to natural undisturbed embankment backfill on each side shall be placed in layers not of the selected granular to exceed 8" loose depth. The lift thickness may be reduced by the Site Geotechnical Engineer to obtain the required compaction. The soil backfill shall be compacted to a minimum of 95% of the maximum dry unit weight as determined by the standard proctor test (AASHTO T-99) and to a moisture content within 2% of the optimum moisture content as determined by the same test. Field nuclear density test shall be performed at a minimum frequency of four tests per every other lift and every 25' on the soil backfill on each side of the structure. The testing described above is in addition to the general project specifications for the embankment backfill, but does not supersede project specifications that may be more stringent than those requirements. The Site Geotechnical Engineer is responsible for testing and recording measurements of the soil backfill.

7.23 If at any time longitudinal cracks develop in the backfill surrounding the pipe to a distance of 30' from the spring line of the plate arch, these features must be brought to the immediate attention of the field QA/QC personnel and the Site Geotechnical Engineer.

7.24 While compacting granular backfill material with a vibrator compactor and adjacent to the plate arch, the opposite side of the plate arch should be observed to note if vibrations are loosening the granular material on that side. This may be more prevalent at higher elevations of the backfill with respect to the plate arch. If this condition occurs, the field QA/QC technician and Site Geotechnical Engineer should be notified prior to placement of a sequential lift on either side.

7.25 The structure should not be crossed with equipment heavier than a D4 dozer. No other equipment or highway (HS20) loading shall be allowed to cross the structure until the asphalt pavement is placed unless there is a minimum of 12" of soil cover or span/8 inches of soil cover whichever is greater, covering the plate arch. Top filling should begin at the middle of the structure (lengthwise) with the backfill being pushed up and over the structure with a D4 or preferably smaller type dozer. The fill should be pushed over the structure in a manner 45 to 90 degrees to the axis of the structure. Field nuclear density test shall be performed at a minimum frequency of four tests per every lift on the soil backfill on each side of the structure. The testing described above is in addition to the general project specifications for the embankment backfill, but does not supersede project specifications that may be more stringent than those requirements. The contractor shall submit to the owner samples of all proposed soil backfill material for laboratory testing to verify moisture and density relationships (AASHTO T-99/ASTM D698) and grain size relationships (AASHTO T-27/ASTM C136).

7.26 All construction to be certified at the end of the job by a Professional Engineer (Civil Engineer or Site Geotechnical Engineer) that all work performed by contractor meets these design requirements and specifications. Certification to be submitted to LSBC and the local jurisdiction for record file.

8: REQUIRED SUBMITTALS

8.01 The contractor must submit the following items to the Site Civil Engineer for approval in writing at least 2 weeks prior to use:
a. Manufacture certification for yield strength of reinforcing steel.
b. Manufacture certification for concrete design.
c. Shop drawings of all concrete work.

9: CONSTRUCTION OVERSIGHT CERTIFICATIONS

9.01 The plate arch construction requires engineering oversight and inspection. The Site, Civil and Geotechnical Engineers must provide LSBC certification reports of all footings and retaining wall/headwalls reinforcing placement and the following items:

a. Subgrade bearing capacity and backfill (select granular and compacted normal backfill) compaction testing, field reports, testing results, testing locations, and registered professional engineer's certification.

b. Field reports of concrete placement review, laboratory test results of concrete cylinder breaks at 7 and 28 days and certified by a Registered Professional Engineer.

c. Final report of construction certification that the construction was performed in accordance with the design and the material testing and inspection verifying the same, stamped by a Registered Professional Engineer.

10: ENVIRONMENTAL PERMITTING

10.01 These plans do not address environmental permitting requirements, which must be addressed and applied for with the state and Army Corp of Engineers, if the plate arch culvert lies within the stream buffer.

11: SAFETY

11.01 All contractors (and owners), their representatives and their crew must be qualified/certified to perform all works within their scope. They must adhere to OSHA's health and safety laws. The contractor is solely responsible for all site safety.

12: RA'S RESPONSIBILITY

12.01 RA's scope of works for this project are design of footing, headwall and plate arch culvert, and RA is responsible for that only. Acceptance of the plan drawings by our client & the owner means they agree to our scope and responsibilities.

13: LONG SPAN BRIDGE & CULVERT, LLC SCOPE OF WORK

13.01 Long Span Bridge & Culvert, LLC (LSBC) will deliver, furnish and assemble the Long Span low profile arch on footings designed by Ryan & Associates and prepared by Site Contractor. The base channel will be furnished by LSBC and installed in the concrete foundations by the Site Contractor in accordance with the plans.

13.02 LSBC will conduct a pre-construction meeting prior to foundation preparation and arch assembly. Attendance at the pre-construction meeting is mandatory for the owner or the owner's representative (e.g. Site Civil Engineer, Site Contractor and Concrete Contractor) and Site Geotechnical Engineer. It is the owner's responsibility to have each party in attendance. If a party is not in attendance it is the owner's responsibility to inform that entity of its responsibilities and duties prior to the start of work.

13.03 LSBC will provide a shape control technician to monitor structure's shape and observe the proper placement and compaction of the select fill material.

13.04 LSBC will require the Site Contractor to unload the structure plates and base channel. LSBC will require the Site Contractor to provide access to the structure for a rubber-tired crane. Parallel access roads shall be within 30' of the centerline of the structure on each side.

BACKFILL CHART

AASHTO M 145- TABLE 2 (MODIFIED*)

GROUP CLASSIFICATION	A-1		A-2 (MODIFIED)	
SIEVE ANALYSIS, PERCENT PASSING	A-1-a	A-1-b	A-2-4	A-2-5
NO. 10 (2.00 mm)	50 max	----	----	----
NO. 40 (.425 mm)	30 max	50 max	----	----
NO. 100 (.150 mm)	----	----	50 max	50 max
NO. 200 (.075 mm)	15 max	25 max	20 max	20 max
Characteristics of fraction passing No. 40 (0.425 mm)				
Liquid Limit	----	----	40 max	41 max
Plasticity Index	*6 max	6 max	10 max	10 max
Usual Material Types	Stone Fragments Gravel and Sand		Silty or Clayey Gravel and Sand	

*Modified to be more select than M-145

STATE OF MARYLAND ALICE A. MILLER No. 28376 PROFESSIONAL ENGINEER

12-15-15

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 28376 Expiration Date: 1-1-17

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Structural - Geotechnical - Civil
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NOTES AND SPECIFICATIONS
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