Road Improvement Plan
for
Stephens Road
Emerson Section 2 – Phase 5C

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. All plan dimensions are to face of curb unless otherwise noted.

6. The existing topography is taken from aerial survey with 2' contour intervals prepared by Air Survey Corporation dated 1998.

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. 47E4 and 47G2 were used for this project.

8. Existing Water is public, contract no.257-W

9. Existing Sewer is public, contract no. 24-1781-D

10. Stormwater Management for this project will be addressed with the installation of one Stormwater Management Facility which will control the runoff per the latest approved Design Standards. The facility will be a wet, extended detention pond and will be owned by the Property Owners Association but maintained by Howard County.

11. Existing utilities are based on Construction Plans (contract no.W2-57 and field verified manholes.

12. The floodplain study for this project was prepared by Howard County dated ,1986.

13. The wetlands delineation study for this project was prepared by Daft-McCune-Walker, Inc., dated September 1998, and was approved by the U.S. Army Corps of Engineers on December 19, 2001 (Assigned tracking #'s 200280639|01-NT-0500 for pending impacts to jurisdictional resources).

14. The traffic study for this project was prepared by Wells and Associates, and was approved with the Comprehensive Sketch Plan (S-99-12).

15. Project background information:

Subdivision Name: "Emerson Section 2, Phase 5C"
Tax Map: 47
Lot.|Parcel: P10: P.837, P.165
Zoning: PEC-MXD-3 & R-SC-MXD-3
Election District: 6th
Total Tract Area: 3.57± acres
File Numbers: S-99-12, PB 339, ZB 979 M

16. 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 spacing of 20' shall be maintained between lights and any tree.

17. Sidewalk ramps shall meet current ADA requirements.

18. All sidewalks at intersections to have handicaps ramps,

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

20. Storm water management facility to be owned by the Property Owners Association (POA).

21. Maintenance Responsibility, routine and non-routine schedule are shown on sheet 10. Routine maintenance is the responsibility of the POA and non-routine maintenance is the responsibility of Howard County.

23. On March 12, 2003 WP-03-88 was approved. WP-03-88 was a waiver of submission of a Preliminary Plan for the Stephens Road improvements along the frontage of Emerson Section 2, Phase 5a.
The conditions of approval are as follows:
1. Compliance with the comments from DED, with the Final Plan submission.
2. The Final Plan for the right-of-way dedication and road improvements along Gorman Road and Stephens Road shall be submitted within 4 months of the date of this letter (by 7/12/03).
3. Compliance with comments from DLD, with the Final Plan submission.

24. Development of Emerson 2|5|C under the current Forest Conservation Act proposes the clearing of approximately 0.44 forested acres, and no forest retention. When evaluated cumulatively with previous phases of the project, no reforestation is required, and ~~5.74~~ 5.72 acres of reforestation is provided under this phase to offset future obligations for the cumulative Emerson projects. Cumulative forest clearing totals 47.59 acres, cumulative retention is 51.03 acres, and cumulative reforestation provided is ~~5.77~~ 5.72 acres.

25. Existing utility poles to be relocated prior to beginning any work.

0.69

Sheet Index

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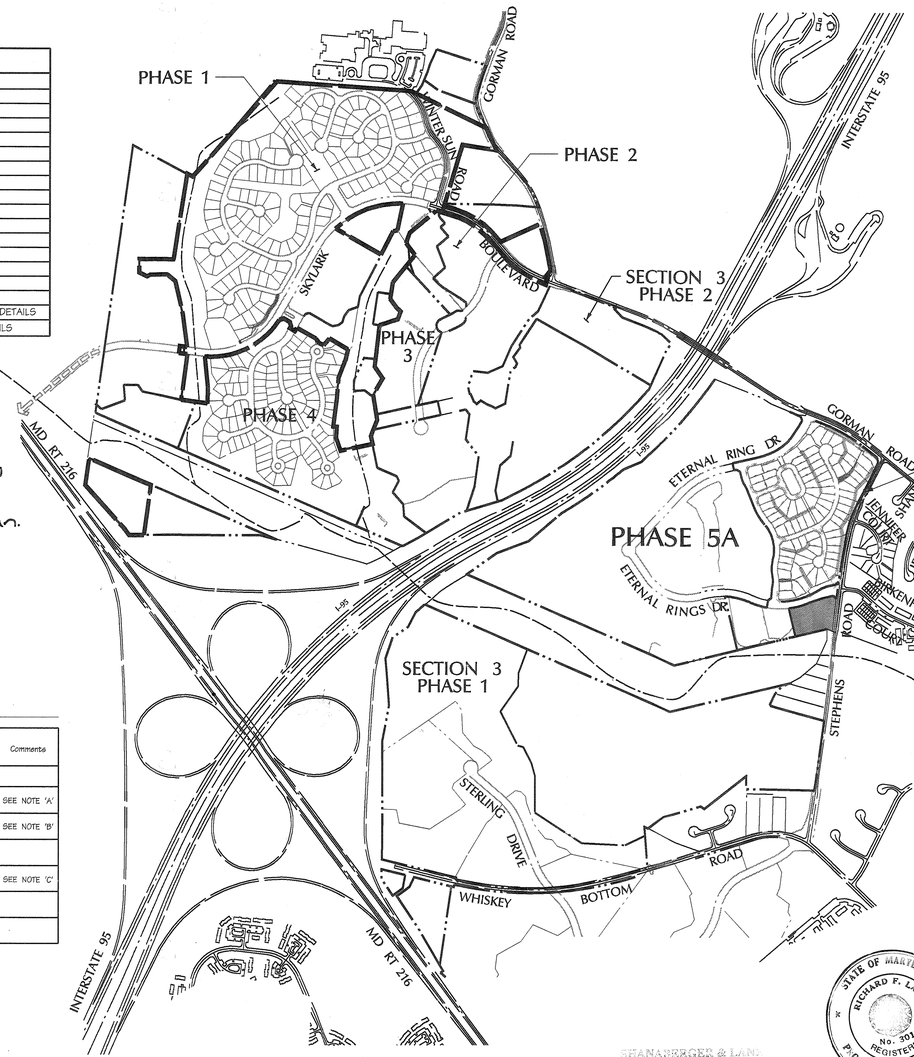
1	COVER SHEET
2	STEPHENS ROAD PLAN
3	STEPHENS ROAD PLAN
4	STEPHENS ROAD DETAILS
5	STORM DRAIN PROFILES
6	ROADWAY SIGNING AND STRIPING PLAN
7	DRAINAGE AREA MAP
8	SWM & GRADING PLAN
9	SWM DETAILS
10	SWM SPECIFICATIONS & SOIL BORING LOGS
11	SWM PROFILES
12	SEDIMENT AND EROSION PLAN
13	SEDIMENT AND EROSION CONTROL DETAILS
14	SEDIMENT AND EROSION CONTROL DETAILS
15	SEDIMENT AND EROSION CONTROL SPECIFICATIONS
16	FINAL LANDSCAPE PLAN
17	FINAL LANDSCAPE & WATER QUALITY NOTES AND DETAILS
18	FINAL FOREST CONSERVATION PLAN, NOTES, & DETAILS

FY2020 improvements to Stephens Rd. through Capital Proj. J-4202 betw Whiskey Bottom Rd. and Gorman Rd. cover this plan.

FOREST CONSERVATION TRACKING CHART

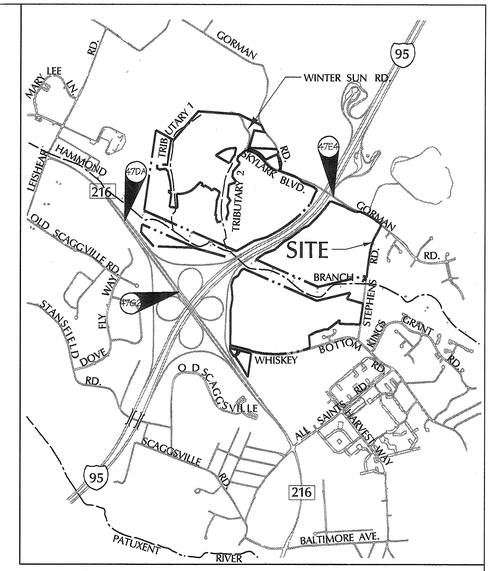
Section/ Phase Number	Gross Area	Floodplain/Ex. Sewer Easement	Net Tract Area	Ex. Forest Area	Forest Cleared	Forest Retained	Reforest./Affor. Required	Reforest./Affor. Provided	Excess Reforest./Affor.	Future Forest Clearing	Future Refor./Affor.	Comments
2.1	106.20	3.50	102.70	24.70	7.93	16.77	0.61	5.03	4.42	4.46	3.41	
2.2	118.90	3.50	115.40	24.80	8.03	16.77	2.95	5.03	2.08	3.28	3.41	SEE NOTE 'A'
2.3	137.35	4.00	133.35	34.40	12.53	21.87	1.27	5.03	3.76	2.18	3.91	SEE NOTE 'B'
3.1	206.85	21.19	185.66	85.30	39.47	45.83	0.00	5.03	5.03	2.18	3.91	
3.2	220.27	21.27	199.00	87.50	41.67	45.83	0.00	5.03	5.03	2.18	3.91	SEE NOTE 'C'
2.4	264.81	26.57	238.24	98.18	47.15	51.03	0.00	5.03	5.03	2.49	5.24	
2.5/c	267.84	27.40	240.44	98.62	47.59	51.03	0.00	~~5.77~~ 5.72	~~5.77~~ 5.72	2.49	5.24	

A. 1.20± ACRES OF FUTURE FOREST CLEARING SHOWN ON F-01-137 WAS CLEARED FOR SWM ON OPEN SPACE LOT 174.
B. 1.10± ACRES OF FUTURE FOREST CLEARING SHOWN ON F-01-137 WAS CLEARED FOR SWM ON OPEN SPACE LOT 176.
C. GROSS AREA INCLUDES 1.07± ACRES FOR SANITARY SEWER EXTENSION AND CONTAINS 0.08± ACRES OF FLOODPLAIN.



Overall Property Outline
Scale: 1" = 600'

NORTH



NORTH
Vicinity Map
SCALE: 1"=2000'

BENCHMARK
DESCRIPTION

COORDINATES IN MARYLAND NAD83(91) (HORIZONTAL) AND NGVD29 (VERTICAL) DATUMS.

47DA NORTHING: 163191.9104
EASTING: 4112865759
ELEVATION: 315905 ft.

47E4 NORTHING: 163326.2295
EASTING: 413136.2550
ELEVATION: 338.909ft.

47G2 NORTHING: 162440.1212
EASTING: 4118539279
ELEVATION: 364.210ft.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 2.4.04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK — DATE 2/24/04

STATE OF MARYLAND — RICHARD JOSEPH KOMIS — No. 19530 — PROFESSIONAL ENGINEER — 12/19/19

RK&K
100 EAST PRATT STREET
SUITE 500
BALTIMORE, MD 21202
PH: (410) 728-2900

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THESE DOCUMENTS WERE PREPARED AND APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 19530, EXPIRATION DATE: 12/15/2019.

NOTE: THE RK&K SEAL ON THIS SHEET ONLY APPLIES TO REDLINE REVISIONS SHOWN ON THE FOREST CONSERVATION PLAN (SHEET 18 OF 18).

Date	No.	Revision Description
	1	REDUCED FOREST CONSERVATION EASEMENT AREA

Emerson Section 2
Phase 5C

OWNER/DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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 #
EMERSON SECTION 2		PHASE 5 C		837
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
572/450	7,8,9,13	MXD	47	6 TH	-
WATER CODE	-	SEWER CODE	-		

TITLE
Cover Sheet

Drn By:	WDE	Scale:	1"=600'	Proj. No.	95054.G
Des By:	DFM	Date:	1/15/04		
Chk By:		Approved:			1 of 18

SHANABERGER & LANE
3726 TOWN & COUNTRY BLVD
SUITE 201
ELLICOTT CITY, MARYLAND 21043

STATE OF MARYLAND — RICHARD F. LANE — No. 301 — REGISTERED PROPERTY LINE SURVEYOR
9/28/07

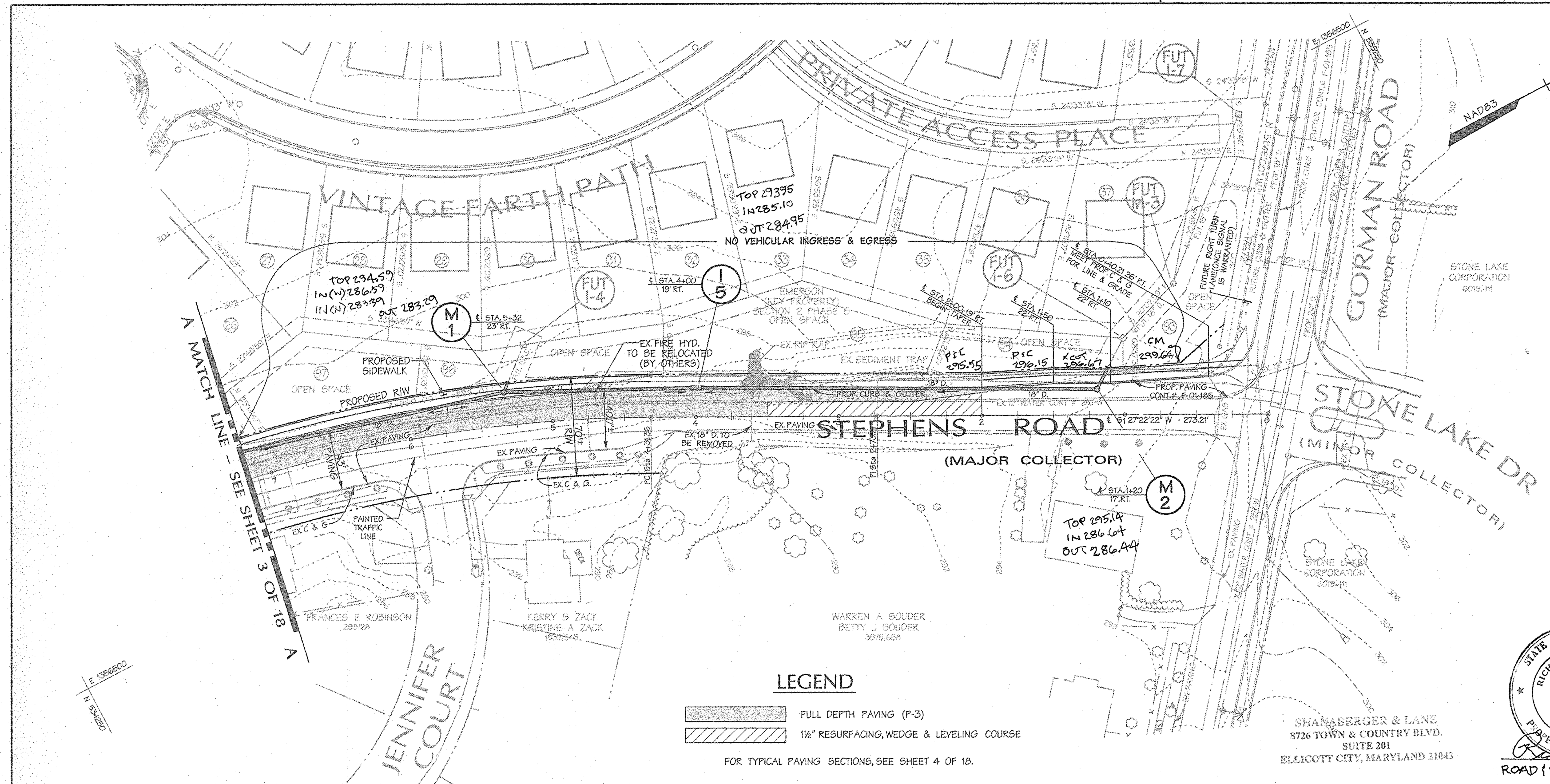
ROAD & STORM DRAIN AS-BUILT

11/14/04 Date

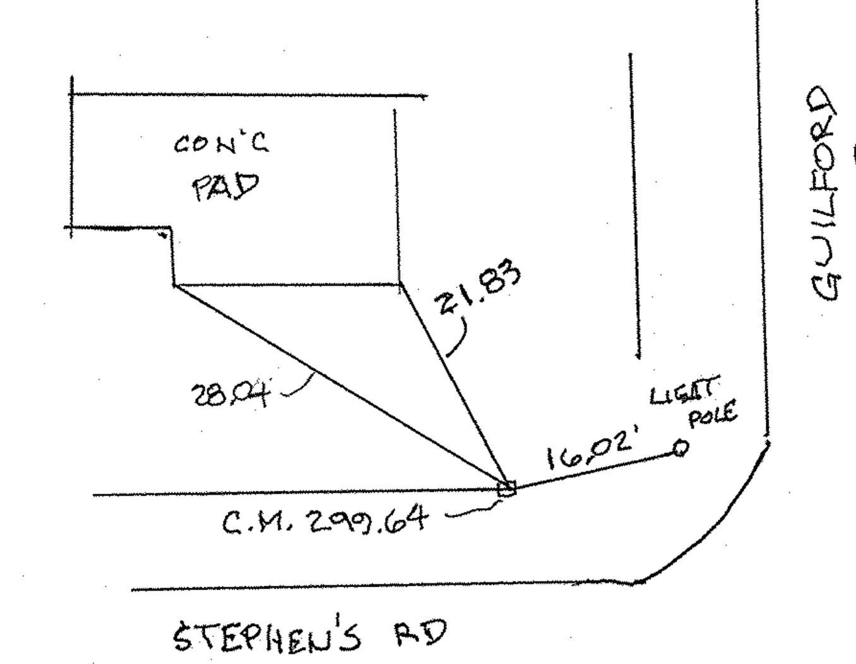
Professional Engr. No. 10531

Mon Jan 12 14:45:15 2004 n:\95054\95054g\95054g-r1

F-03-175



℄ CURVE DATA					
FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD
4+31.36 - 7+17.43	17'04'25"	960.00'	286.07'	144.10'	S 18°50'09" W 285.01'



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS HS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT HB — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MK — DATE 2/24/04

Date	No.	Revision Description

Emerson Section 2

Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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200 East Pennsylvania Avenue, Towson, Maryland 21286, 410 296 3333, Fax 296 4705

SUBDIVISION NAME	SECTION/ AREA	LOT/PARCEL #
EMERSON	PHASE 5C	837

PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
572/430	7,8,9,13	MXD	47	6 TH	-

WATER CODE	SEWER CODE
-	-

TITLE
STEPHENS ROAD WIDENING

Drn By:	WDE	Scale:	1"=50'	Proj. No.	95054.G
Des By:	DFM	Date:	1/15/04		
Chk By:		Approved:			2 of 18

1/14/04
Date

Professional Engr. No. 1055

F-03-175

℄ CURVE DATA					
FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD
7+17.43 - 14+06.08	3°40'39"	10,729.17'	688.65'	344.44'	S 8°27'37" W 688.53'

ETERNAL RINGS DRIVE ℄ CURVE DATA					
FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD
0+02.43 - 1+46.47	27°30'35"	300.00'	144.04'	73.44'	S 80°48'23" W 142.66'

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MK — DATE 2/24/04

Date	No.	Revision Description

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
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SUBDIVISION NAME		SECTION/ AREA		LOT/PARCEL #
EMERSON		PHASE 5C		837
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELEC. DISTRICT	CENSUS TRACT
5721/430	7,8,9,13	MXD	47	6 TH	-
WATER CODE		SEWER CODE		
-		-		

TITLE
STEPHENS ROAD WIDENING

Drn By: WDE	Scale: 1"=50'	Proj. No. 85054.G	
Des By: DFM	Date: 1/13/04		
Chk By:	Approved:	3 of 18	

Professional Engr. No. 16551

1/14/04
Date

STATE OF MARYLAND — RICHARD F. LANE — No. 701 — REGISTERED PROFESSIONAL SURVEYOR

STREET LIGHT LEGEND

250 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PENDANT (SAG) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM

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

STREET LIGHT TABLE

DWG. No.	STREET NAME	STATION	OFF-SET	FIXTURE / POLE TYPE	COMMENTS
	STEPHENS ROAD	10+74	24' RT.	✱	
	STEPHENS ROAD	12+51	23' RT.	✱	

STATE OF MARYLAND — RICHARD F. LANE — No. 701 — REGISTERED PROFESSIONAL SURVEYOR

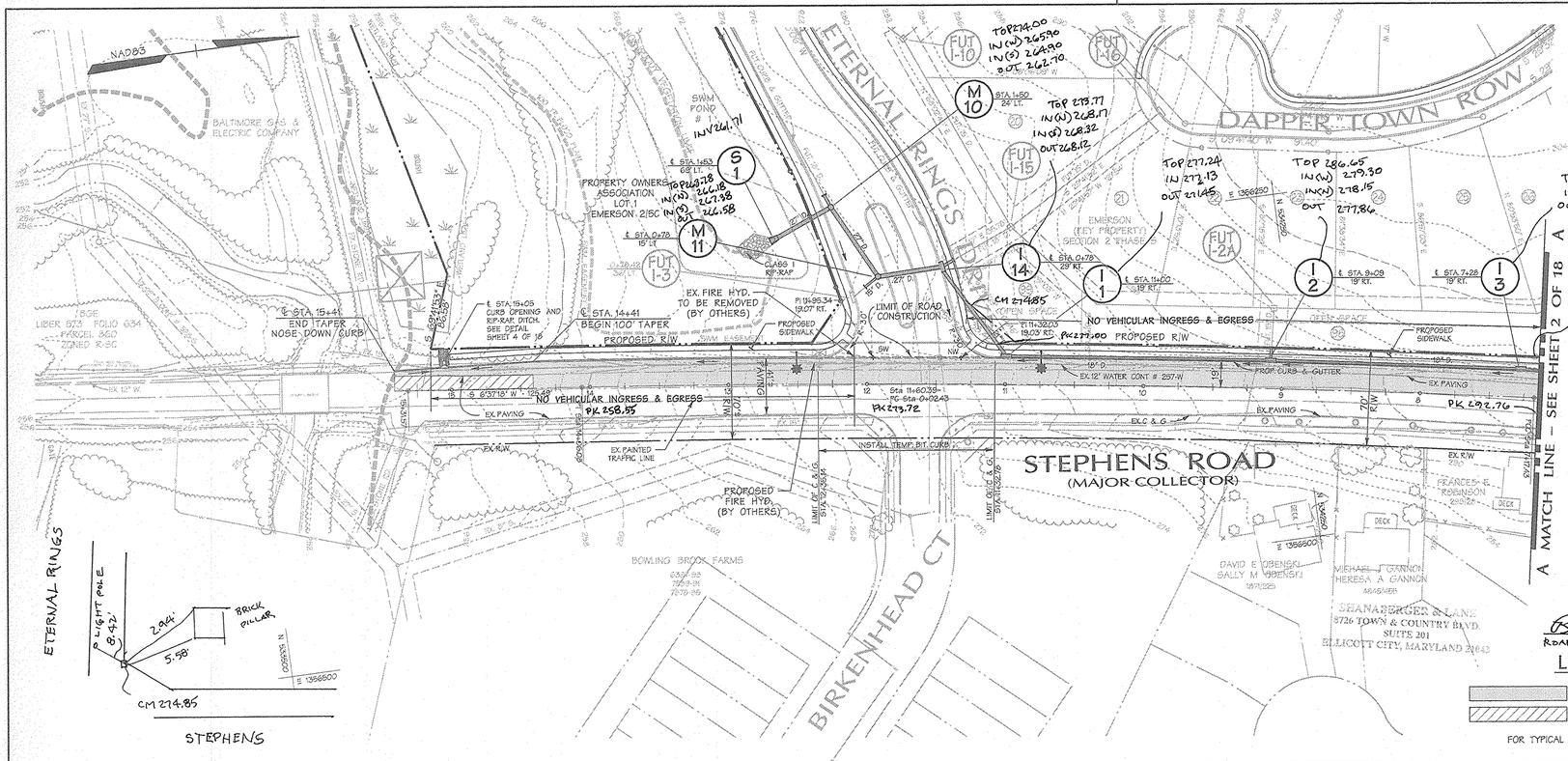
Richard F. Lane 7/28/07
ROAD / STORM DRAIN AS-BUILT

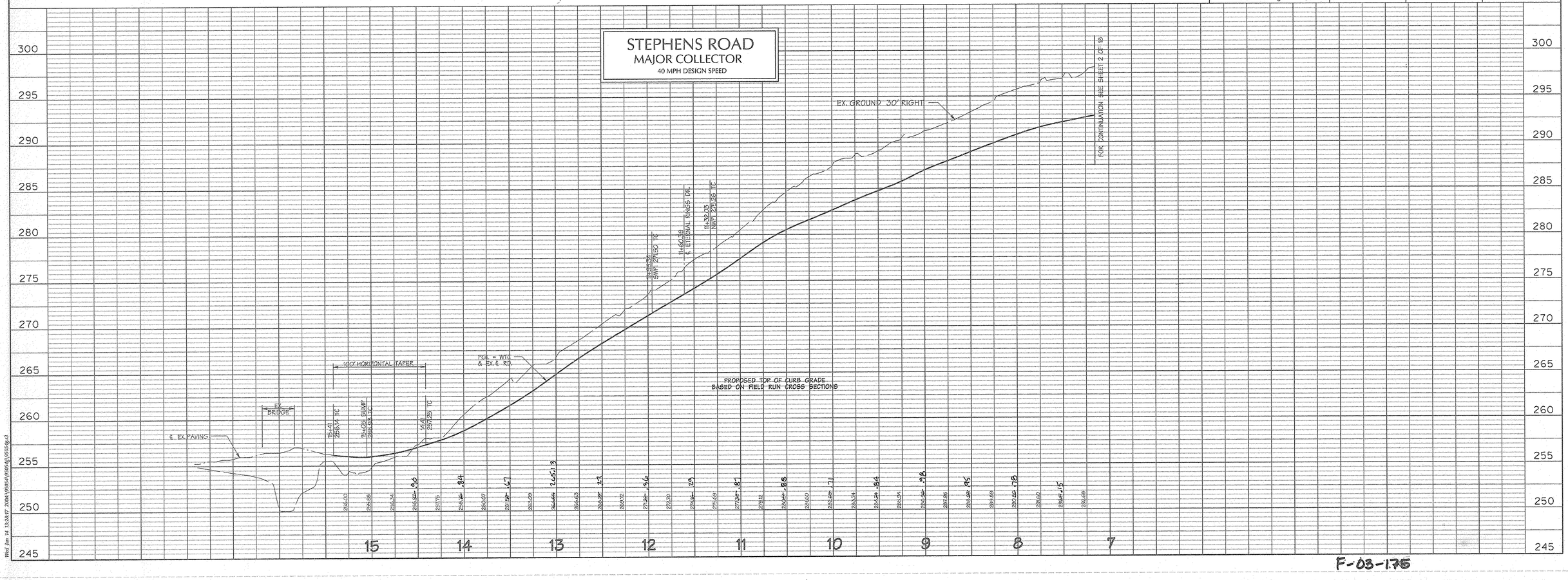
LEGEND

FULL DEPTH PAVING (P-3)

1½" RESURFACING, WEDGE & LEVELING COURSE

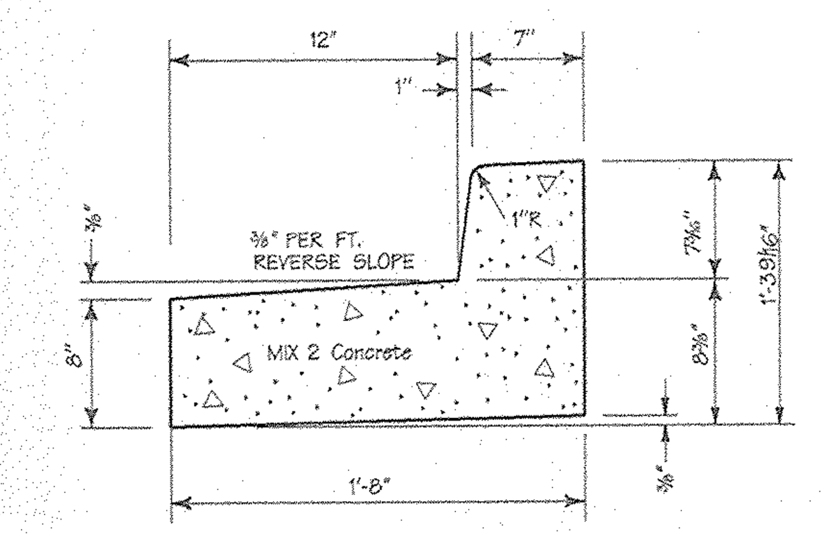
FOR TYPICAL PAVING SECTIONS, SEE SHEET 4 OF 18.



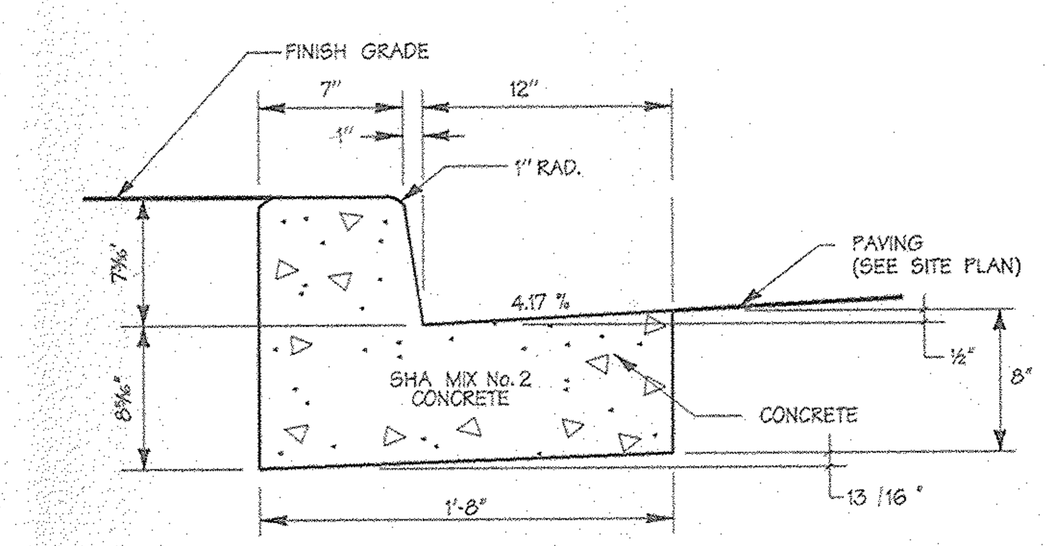


Wed Jan 14 13:26:17 2004 \\5054\5054sg\5054g03

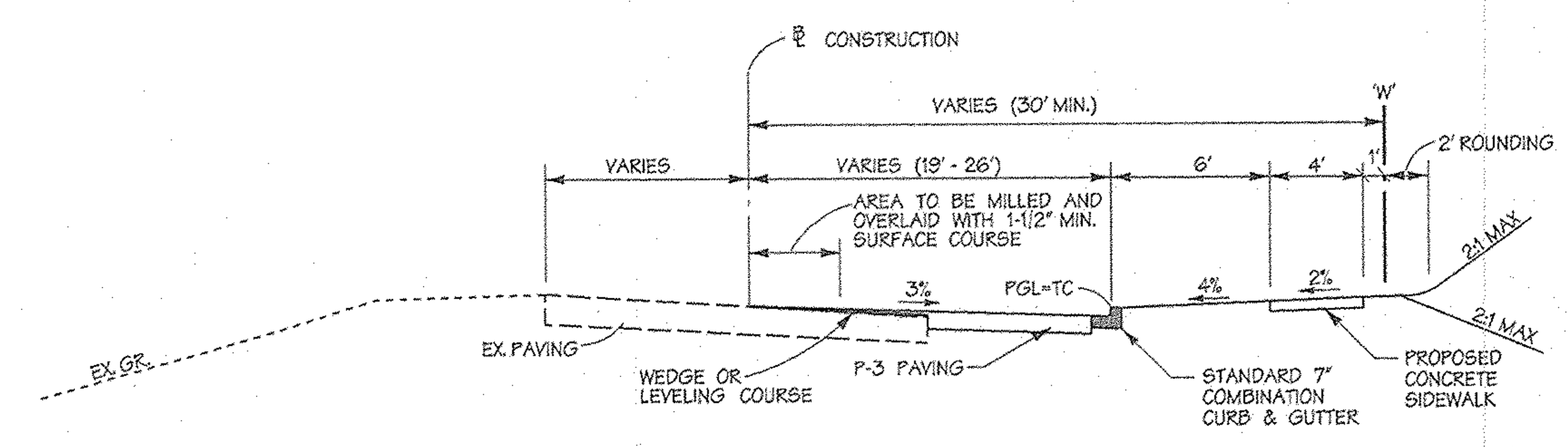
F-03-175



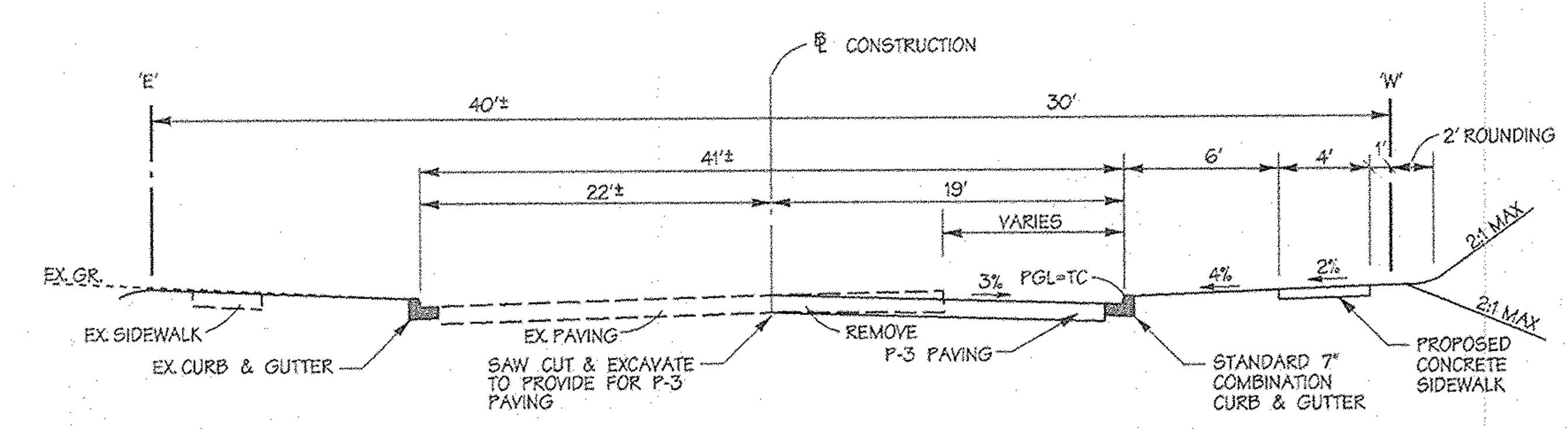
REVERSE 7" COMBINATION
CURB & GUTTER
NO SCALE



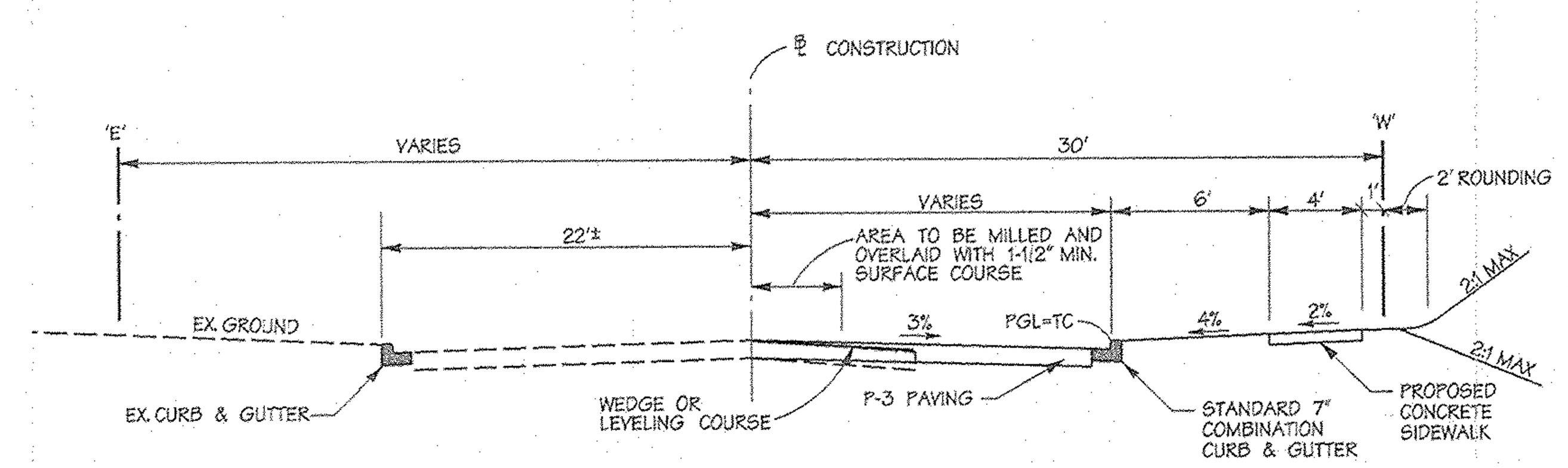
SECTION
TYPE "A" CURB AND GUTTER
NO SCALE



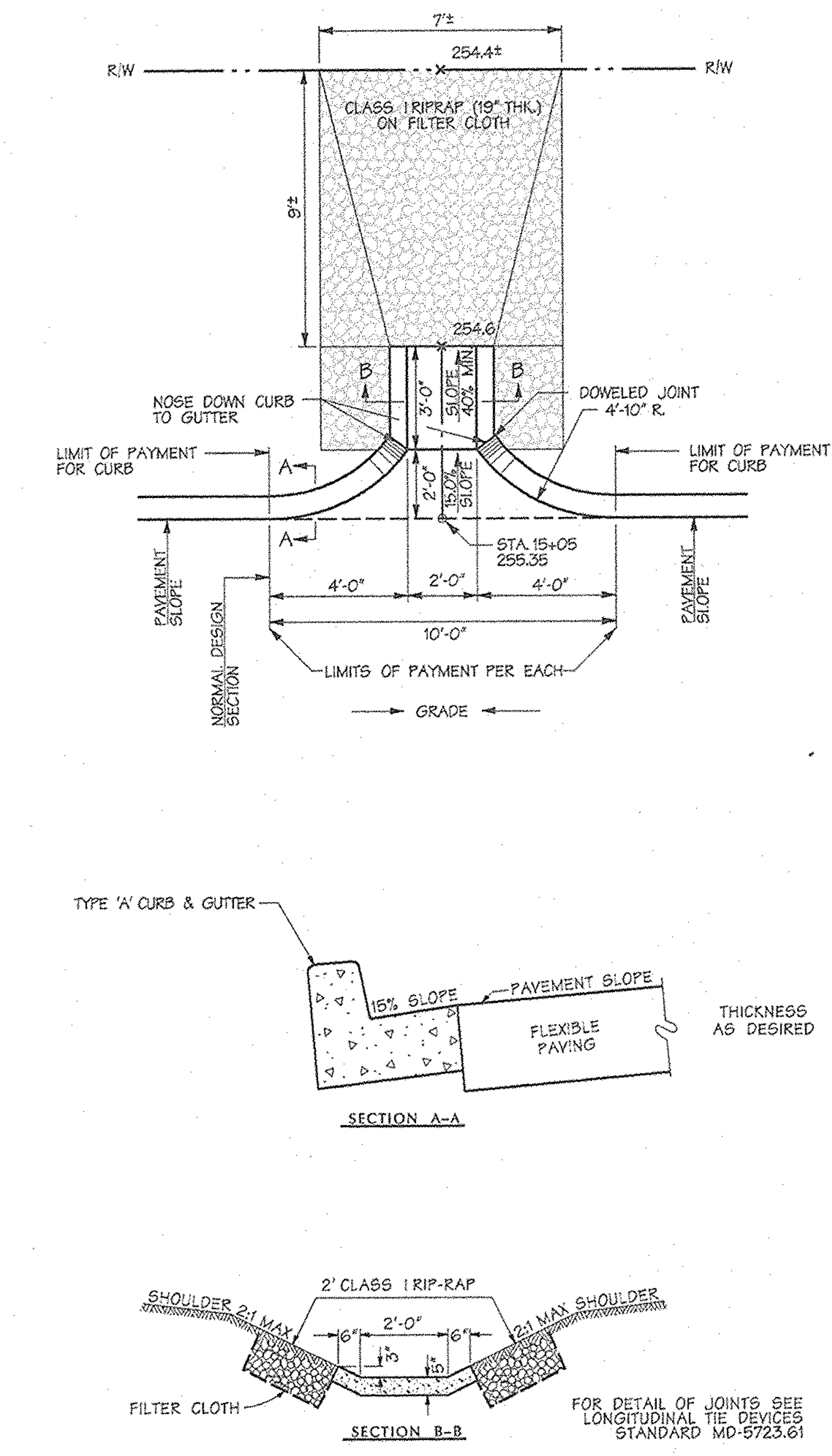
TYPICAL SECTION STEPHENS ROAD STA. 2+00 TO STA. 3+50
CLOSED SECTION VARIABLE R/W
40 MPH DESIGN SPEED
NO SCALE



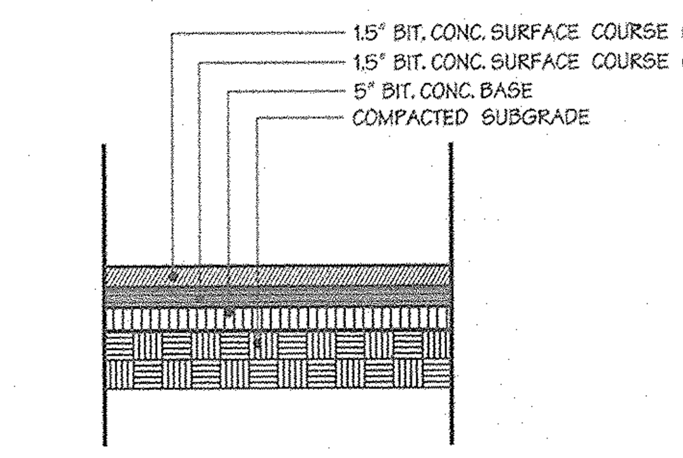
TYPICAL SECTION STEPHENS ROAD STA. 3+50 TO STA. 14+41
CLOSED SECTION 70' R/W ±
40 MPH DESIGN SPEED
NO SCALE



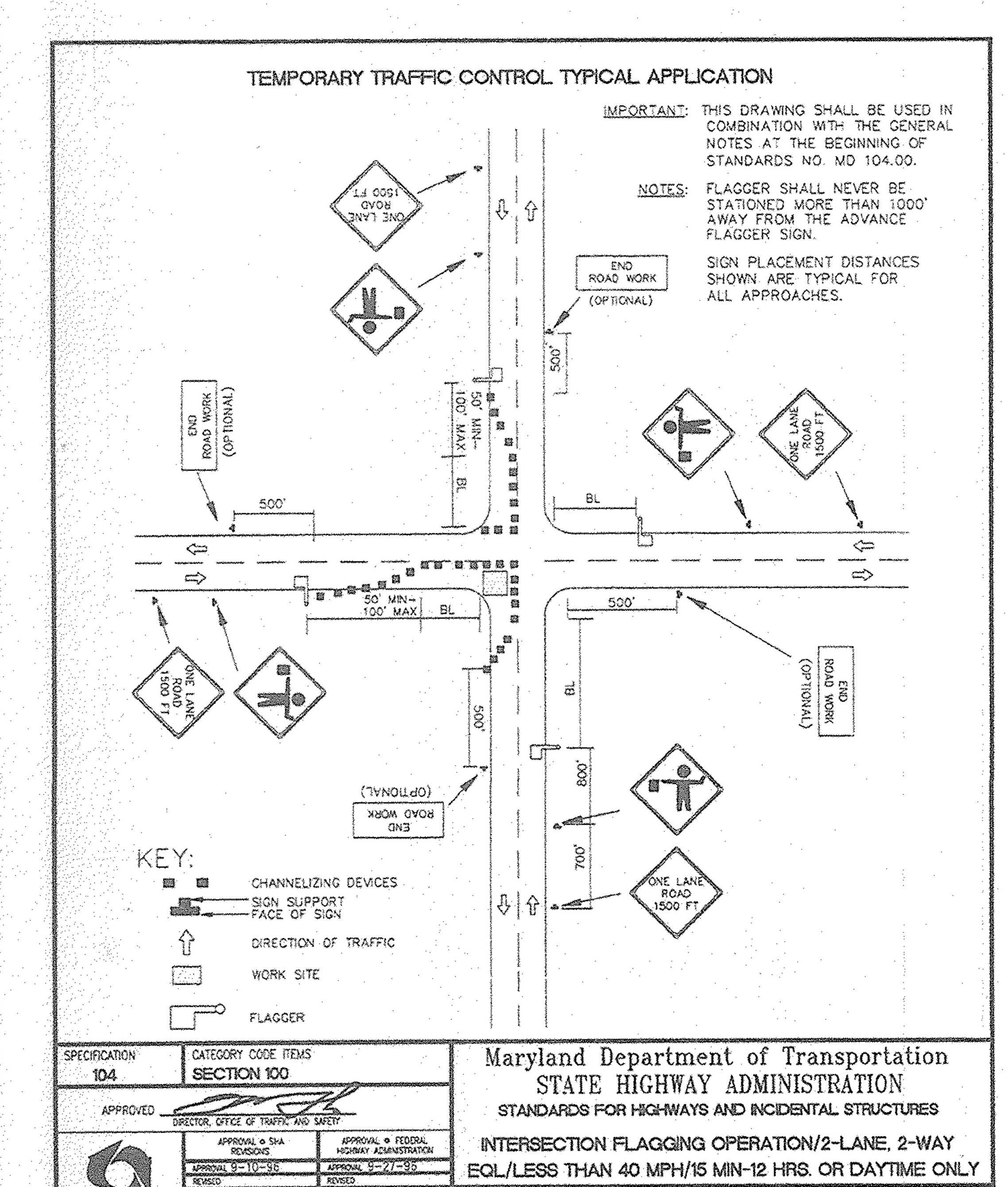
TYPICAL SECTION STEPHENS ROAD STA. 14+41 TO STA. 15+41
CLOSED SECTION 70' R/W ±
40 MPH DESIGN SPEED
NO SCALE

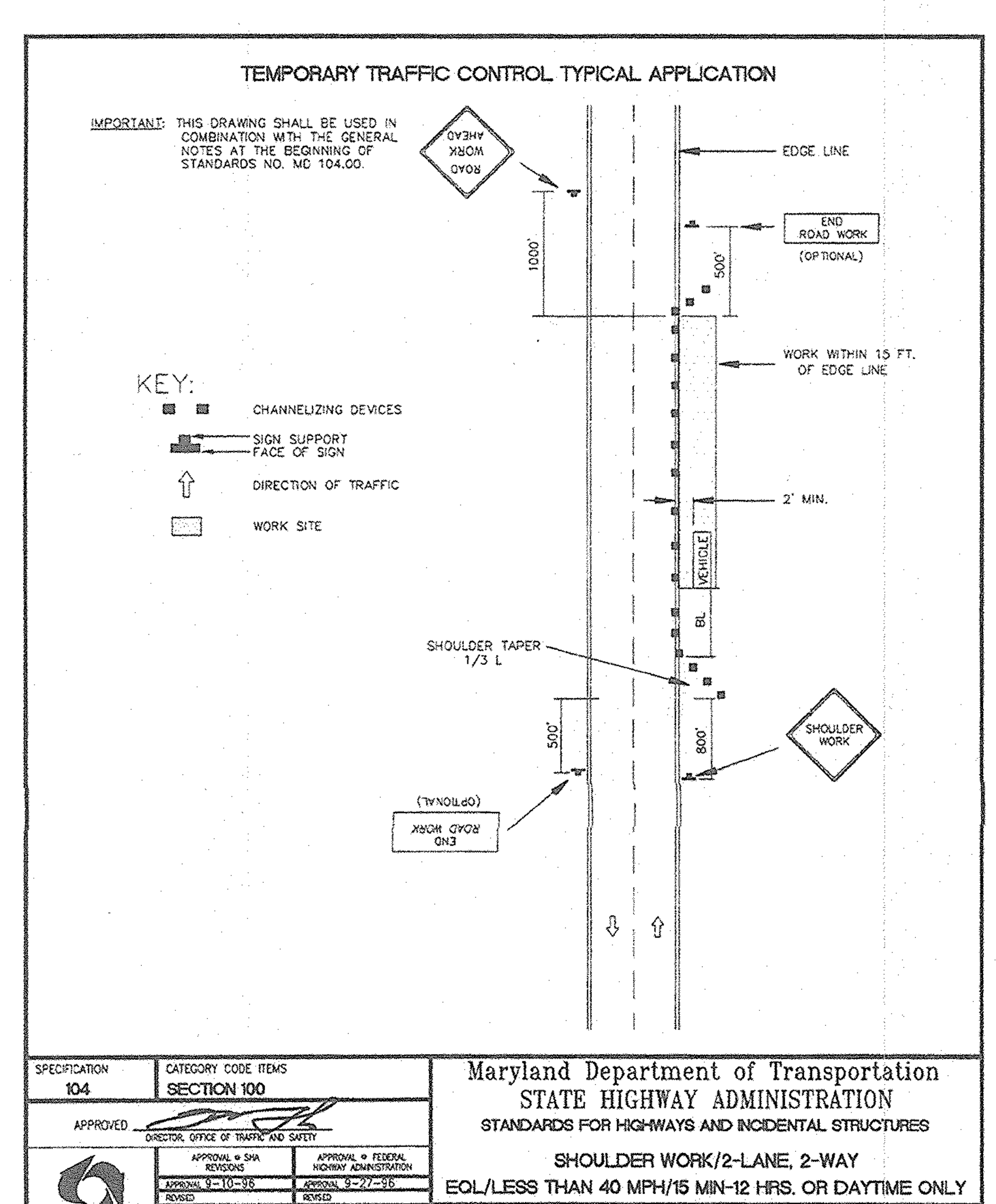


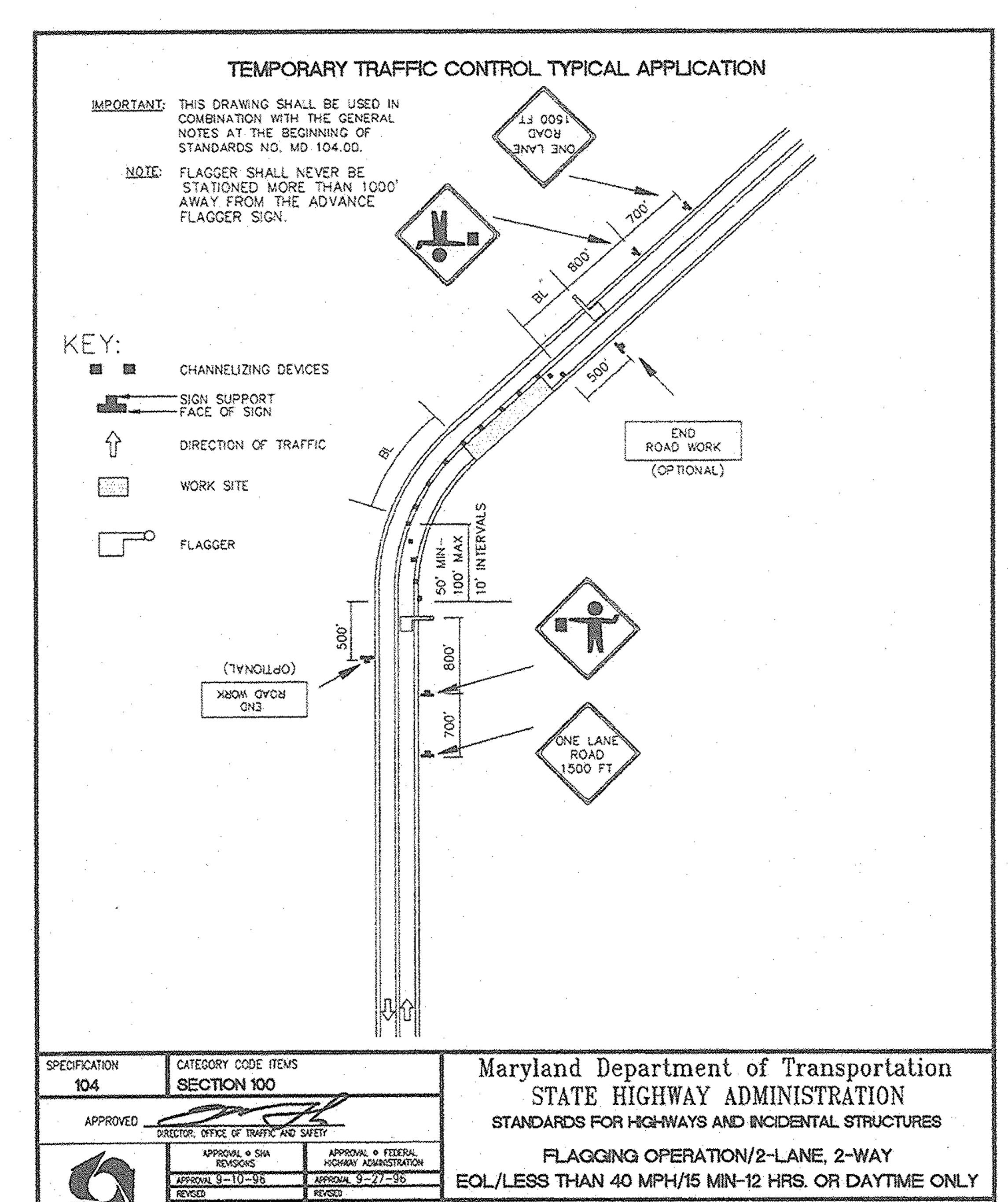
STANDARD CURB OPENING DETAIL
CURB & GUTTER SECTION
NO SCALE



P3 PAVING
NOT TO SCALE







APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2/24/04

Date	No.	Revision Description

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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200 East Pennsylvania Avenue
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410 296 3333
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SUBDIVISION NAME	SECTION AREA	LOT/PARCEL #
EMERSON	PHASE 5C	837

PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
572/430	7,8,9,13	MXD	47	6 TH	-

WATER CODE -- SEWER CODE

1/14/04
Date

Professional Engr. No. 10557

TITLE
STEPHENS ROAD DETAILS

Drn By:	KDE	Scale:	NONE	Proj. No.	95054.G
Des By:	DFM	Date:	1/15/04		
Chk By:		Approved:			4 of 18

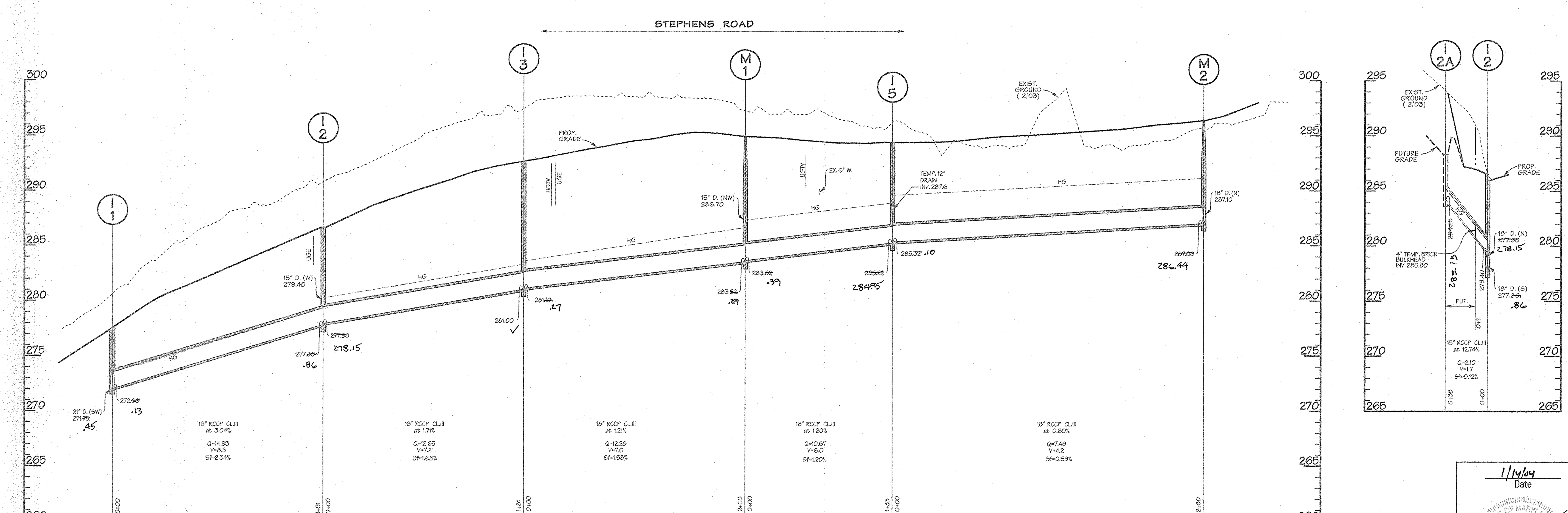
F-03-175

STRUCTURE SCHEDULE

NO.	TYPE	INV. IN	INV. OUT	TOP ELEV.	REMARKS	LOCATION
I-1	A-5 (W= 3'-0")	272.~~00~~13	271.~~75~~45	277.~~39~~24	HO.CO. DETAIL SD.4.01	℄ STA. 11+00 - 19' RT.
I-2	A-5 (W= 2'-6")	277.~~90~~86	27~~7~~8.~~80~~15	286.~~59~~25	HO.CO. DETAIL SD.4.01	℄ STA. 9+09 - 19' RT.
I-3	A-5 (W= 2'-6")	281.~~80~~	281.~~00~~57	292.~~62~~53	HO.CO. DETAIL SD.4.01	℄ STA. 7+28 - 19' RT.
I-5	A-10	28~~4~~.~~32~~95	285.~~22~~10	29~~4~~3.~~00~~95	HO.CO. DETAIL SD.4.02	℄ STA. 2+10 - 19' RT.
I-14	A-10 (W= 4'-0")	268.~~50~~12	268.~~25~~32	273.~~82~~72	HO.CO. DETAIL SD.4.02	℄ STA. 0+78 - 29' RT.
M-1	STANDARD MANHOLE	283.~~62~~89	283.~~52~~79	294.~~88~~91	HO.CO. DETAIL G 5.12	℄ STA. 5+32 - 23' RT.
M-2	STANDARD MANHOLE	28~~7.10~~6.44	28~~7~~2.0~~0~~4	295.~~85~~74	HO.CO. DETAIL G 5.12	℄ STA. 1+20 - 17' RT.
M-10	STANDARD MANHOLE	26~~5.75~~2.70	263.~~50~~90	274.~~11~~00	HO.CO. DETAIL G 5.13	℄ STA. 1+50 - 24' LT.
M-11	STANDARD MANHOLE	26~~5.00~~8	266.~~75~~15	273.~~30~~18	HO.CO. DETAIL G 5.13	℄ STA. 0+78 - 15' LT.
S-1	CONC. END SECTION (27")	262~~.18~~	26~~2~~1.~~00~~71	---	HO.CO. DETAIL SD 5.52	℄ STA. 1+53 - 69' LT.

PIPE SCHEDULE

SIZE	TYPE	LENGTH
15"	RCCP	30'
18"	RCCP	1023'
21"	RCCP	81'
24"	RCCP	46'
27"	RCCP	104'



PROFILES

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

1/14/04
Date

Professional Engr. No. 1055

SHANABERGER & LANE
8726 TOWN & COUNTRY BLVD.
SUITE 201
ELLICOTT CITY, MARYLAND 21043

STATE OF MARYLAND — RICHARD F. LANE — No. 301 REGISTERED — PROPERTY LINE SURVEYOR

Richard F. Lane 9/28/07
ROAD & STORM DRAIN AS-BUILT

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-11-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2/24/04

Date	No.	Revision Description

Emerson Section 2

Phase 5C

OWNER /DEVELOPER:

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Fax 296-4705

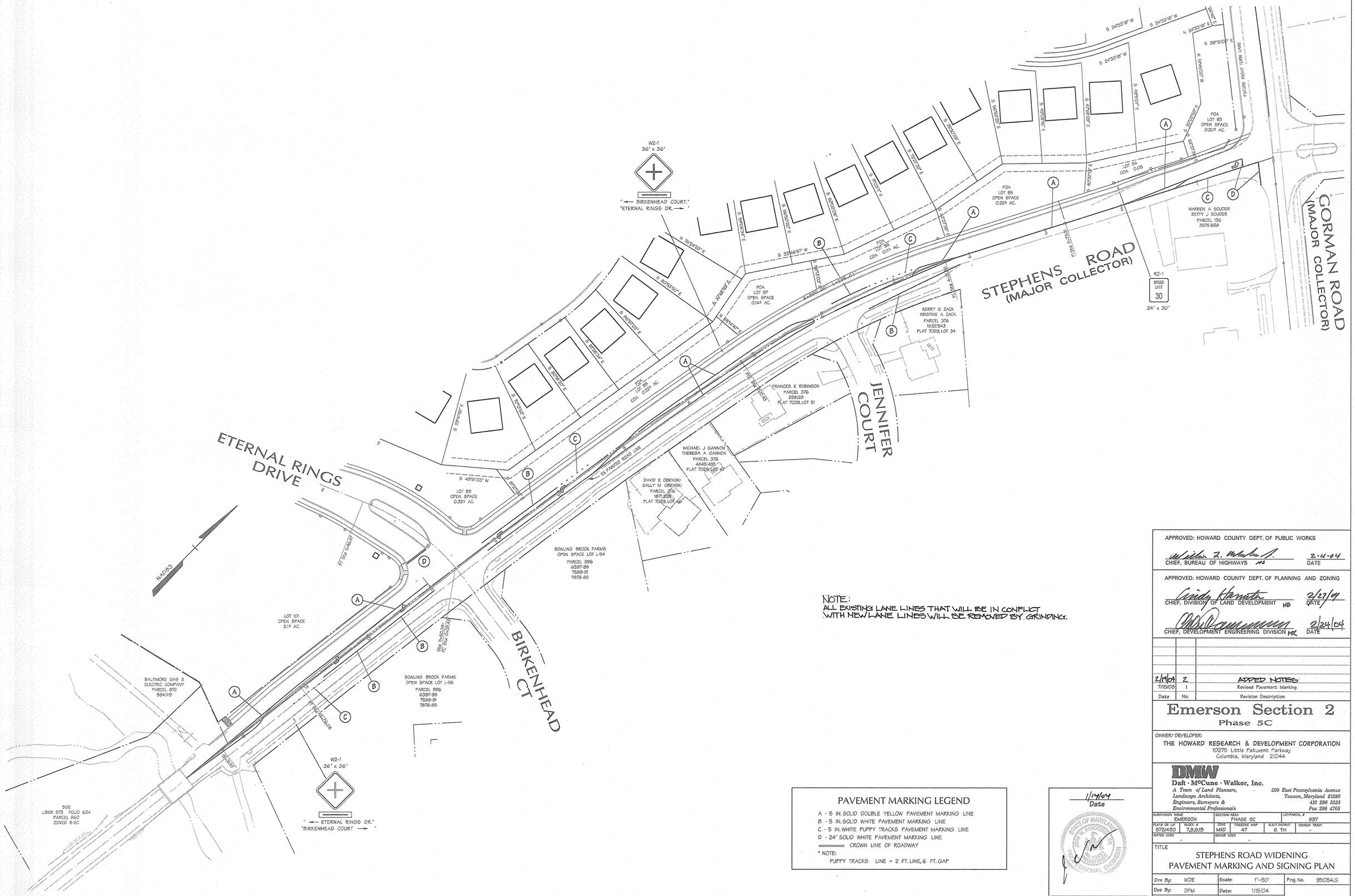
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA
EMERSON SECTION 2 PHASE 5
TAX MAP 47 PARCEL
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
STORM DRAIN PROFILES

Des By	DFM	Scale AS SHOWN	Proj. No. 95054.G
Drn By	KDE	Date 1/15/04	5 OF 18
Chk By		Approved	

F-03-175 2004n\95054\95054g\95054G.SDI



NOTE:
ALL EXISTING LANE LINES THAT WILL BE IN CONFLICT WITH NEW LANE LINES WILL BE REMOVED BY GRINDING.

PAVEMENT MARKING LEGEND

A - 5 IN. SOLID DOUBLE YELLOW PAVEMENT MARKING LINE
B - 5 IN. SOLID WHITE PAVEMENT MARKING LINE
C - 5 IN. WHITE PUPPY TRACKS PAVEMENT MARKING LINE
D - 24" SOLID WHITE PAVEMENT MARKING LINE
CROWN LINE OF ROADWAY
* NOTE:
PUPPY TRACKS LINE = 2 FT. LINE, 6 FT. GAP

1/14/04
Date

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT HB — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MK — DATE 2/24/04

Date	No.	Revision Description
2/19/04	2	ADDED NOTES
7/15/03	1	Revised Pavement Marking

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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 #
EMERSON	PHASE 5C	857

PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
5772/430	7,8,9,13	MXD	47	6 TH	-

WATER CODE	SEWER CODE
-	-

TITLE
STEPHENS ROAD WIDENING
PAVEMENT MARKING AND SIGNING PLAN

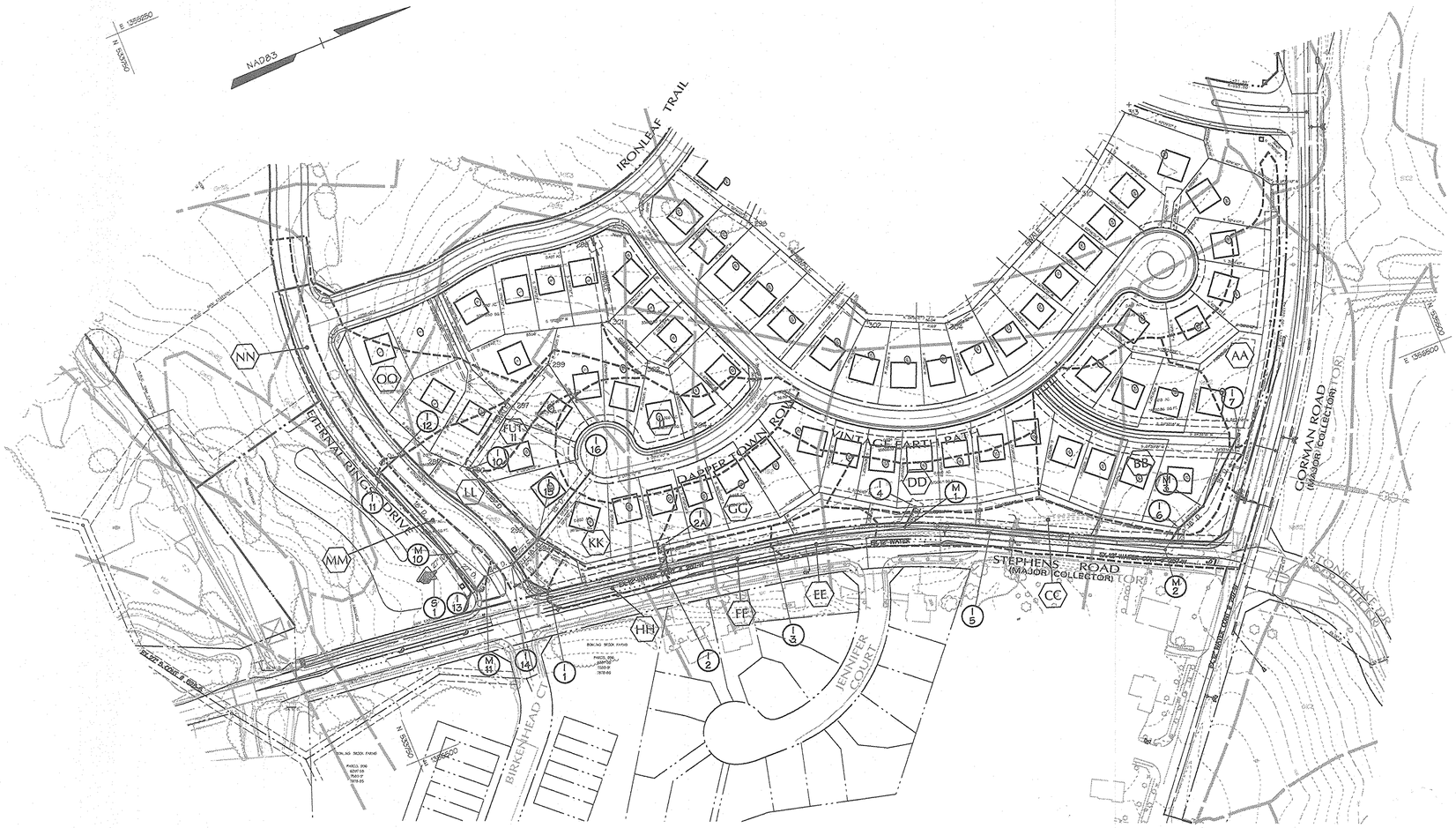
Drn By:	WDE	Scale:	1"=50'	Proj. No.	95054.G
Des By:	DFM	Date:	1/15/04		
Chk By:		Approved:			6 of 18

F-03-175

Mon Jan 12 15:26:36 2004 n:\95054\95054g\95054g.mt

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 STOCKED 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), STABILIZATION OF THE SITE WHILE ALSO ALLOWING THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTANT 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 FINAL CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS.
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 - 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.



A=0.78 AC. IMP.= 22% AA C=.037
A=1.73 AC. IMP.= 31% BB C=0.43
A=0.92 AC. IMP.=45% CC C=0.54
A=0.63 AC. IMP.= 27% DD C=0.40
A=0.23 AC. IMP.= 37% EE C=0.46
A=0.20 AC. IMP.= 48% FF C=0.56
A=0.70 AC. IMP.= 34% GG C=0.46
A=0.24 AC. IMP.= 40% HH C=0.50
A=0.36 AC. IMP.= 20% II C=0.35
A=1.24 AC. IMP.= 45% JJ C=0.45
A=0.77 AC. IMP.= 49% KK C=0.57
A=0.62 AC. IMP.= 31% LL C=0.43
A=0.21 AC. IMP.= 67% MM C=0.70
A=0.23 AC. IMP.= 73% NN C=0.74
A=0.94 AC. IMP.= 47% OO C=0.55

Legend

EX. CURB & GUTTER		DRAINAGE AREA LIMIT	
EX. MAJOR CONTOURS	400	DRAINAGE AREA DEFINITION	AA
EX. MINOR CONTOURS	402	PROPERTY LINE	
EX. STORM DRAIN	EX 21" RCP	ROADWAY RIGHT-OF-WAY	
EX. SEWER	EX 8" S	PROPOSED LOT LINE	
EX. WATER	EX 8" W	PROPOSED EASEMENT	
EXISTING TREE LINE		PROPOSED CURB & GUTTER	
EXISTING WETLAND LIMIT		PROPOSED SIDEWALK	
PROP. STORM DRAIN	15" RCCP CL. IV		

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

William J. Mackey Jr. — CHIEF, BUREAU OF HIGHWAYS WJM — 2-4-04 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

Cindy Hamilton — CHIEF, DIVISION OF LAND DEVELOPMENT HB — 2/27/04 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION MK — 2/24/04 DATE

Date	No.	Revision Description
2/19/04	2	WETLAND NOTES

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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 #
EMERSON		PHASE 5C		937
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
5721/430	7,8,9,13	MXD	47	6 TH	-
WATER CODE		SEWER CODE			
-		-			

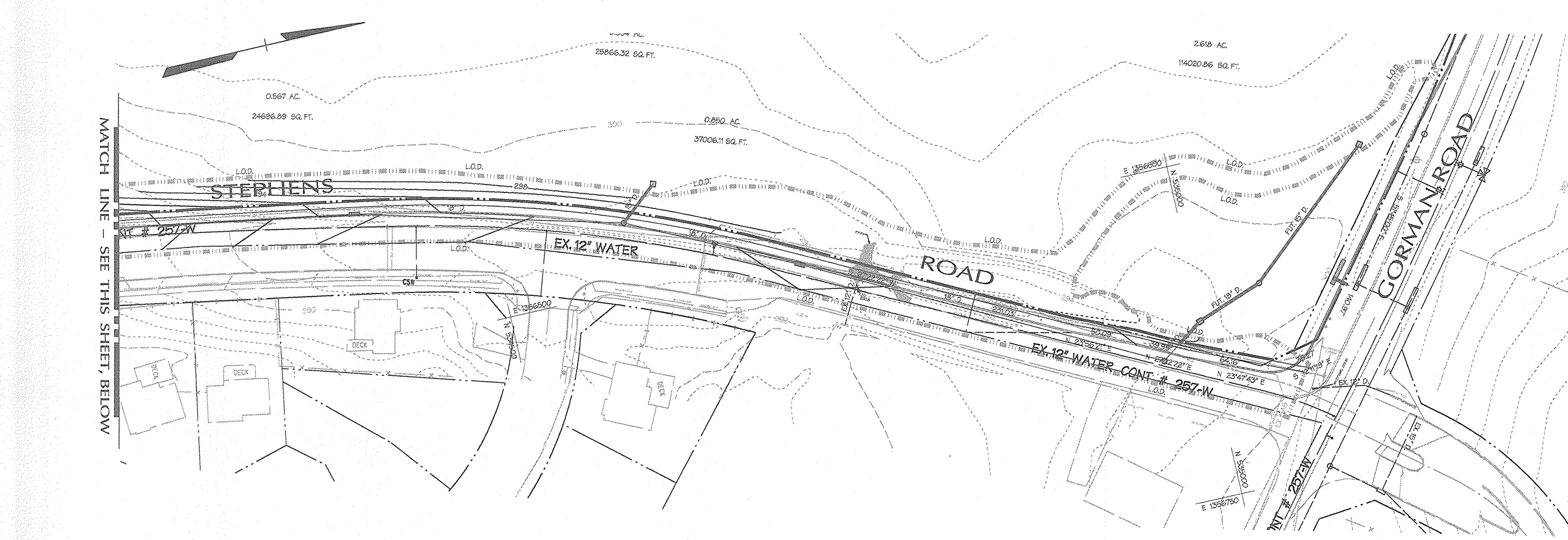
TITLE
STORM DRAINS
DRAINAGE AREA MAP

Drn By: WPE/ KDE	Scale: 1"=100'	Proj. No. 95054.G	
Des By: DFM	Date: 1/15/04		7 of 18
Chk By:	Approved:		

1-20-04
Date

Professional Engr. No. 10551

F-03-175



POND 1

DESIGN FLOW SUMMARY PROPOSED CONDITIONS *

Structure Type	RETENTION
Water Quality Type	WET POND
Structure Classification	A
Watershed Area to Facility (SWM) (Ac.)	11.05
Level of Management Required	1-Yr
Level of Management Provided	1-Yr
Top Width Provided (ft)	12.0
Maximum Height of Fill (ft)	6.0
Freeboard Required (ft)	1.0
Freeboard Provided (ft)	1.47
Water Quality Vol. WQ_v Required (Ac-ft)	0.255
Water Quality Vol. WQ_v Provided (Ac-ft) *	0.664
Recharge Required Rev (Ac-ft)	0.060
Recharge Provided Rev (Ac-ft)**	0.060
Channel Protection Vol. Cp_v Required (Ac-ft)	0.455
Channel Protection Vol. Cp_v Provided (Ac-ft) *	0.455
WQ_v Water Surface Elev. = Normal Pool	265.20
Cp_v Water Surface Elev.	266.06
Riser Crest Elev.	266.00
100 Yr. Clogged Water Surface Elev.	267.53
Pond Volume Below 100 Yr. Clogged WSE (Ac-ft)	1.59
Emergency Spillway Elevation	267.00

* WQv IS PROVIDED IN THE WET PORTION OF THE POND. Cpv IS PROVIDED IN THE POND ABOVE THE WQv STORAGE VOLUME AND CONSISTS OF THE 1-YEAR STORM ROUTING (SEE TR-20).

** RECHARGE IS PROVIDED WITHIN THE DRAINAGE AREAS FOR POND 1 (EMERSON 2/5c) AND POND 2 (FUTURE EMERSON 2/5a) AND IS CONSIDERED ON A TOTAL-SITE BASIS. THE PERCENT-AREA METHOD IN CONJUNCTION WITH SWM CREDITS IS USED TO TREAT RECHARGE.

NOTES

1) THESE PONDS WILL BE DESIGNATED AS "POA" (PROPERTY OWNER'S ASSOCIATION) PROPERTY AND THUS WILL BE PRIVATELY OWNED AND JOINTLY MAINTAINED.

2) ACCESS TO THE SWM POND FACILITY'S MAINTENANCE ACCESS POINT OF ENTRY SHALL BE PROVIDED ACROSS THE ADJOINING DEVELOPMENT PARCEL BY GENERAL EASEMENT UNTIL DEFINED ACCESS AND EASEMENT IS DETERMINED AT SITE DEVELOPMENT STAGE. NO ACCESS WILL BE OBTAINED FROM RESTRICTED ACCESS ROADS OR ACROSS ENVIRONMENTALLY SENSITIVE AREAS.

THESE PONDS WILL HAVE DAM STRUCTURE HAZARD CLASSIFICATION OF 'A'

HAMMOND BRANCH IS IN THE MIDDLE PATUXENT RIVER WATERSHED AND HAS A STREAM USAGE CLASSIFICATION OF "I-P" (WATER CONTACT RECREATION, AQUATIC LIFE PROTECTION AND PUBLIC WATER SUPPLY.

ENGINEERS CERTIFICATE:

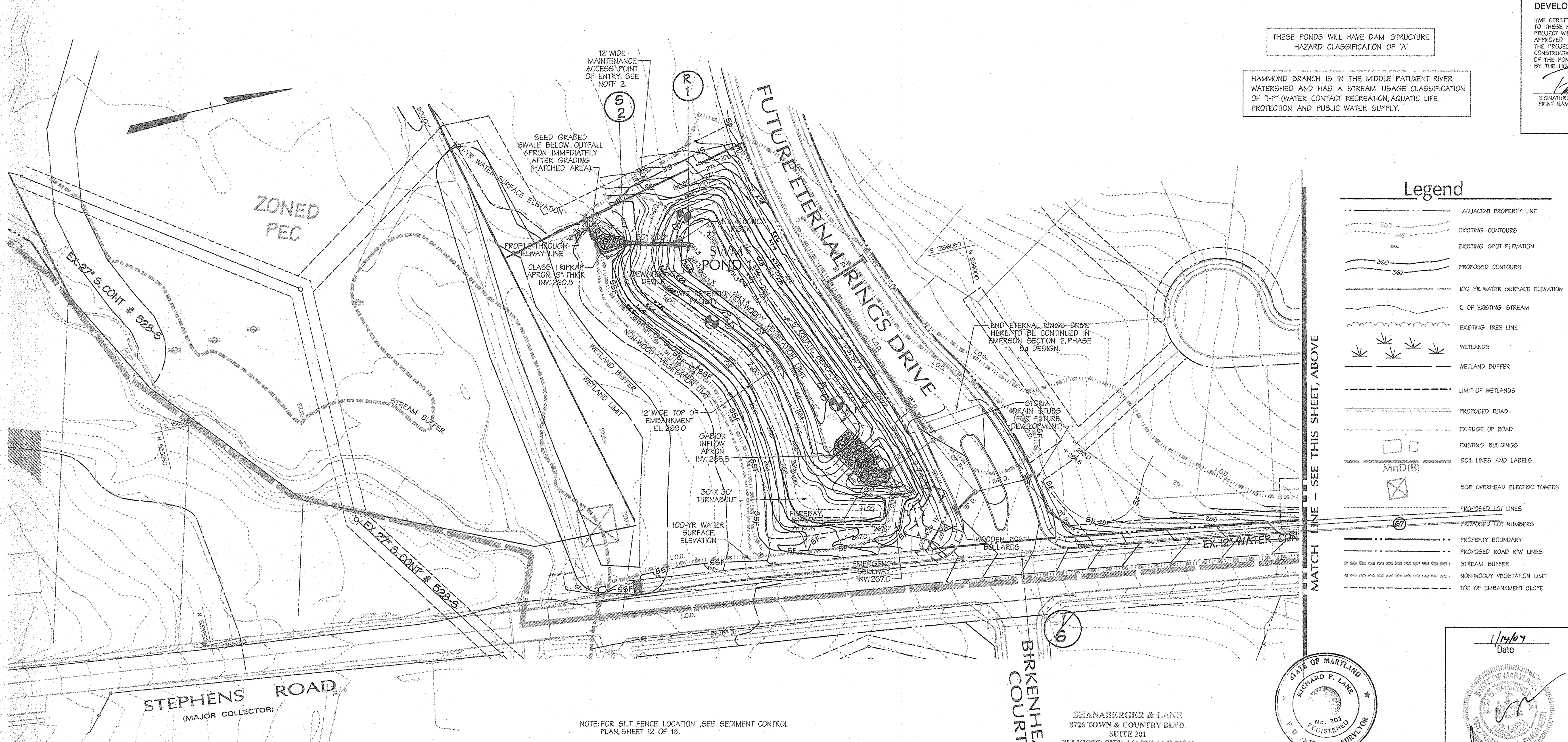
I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER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

[signature] 10551 1/14/04
SIGNATURE OF ENGINEER — REG. NO. — DATE
PRINT NAME BELOW SIGNATURE
John W. Ramsahai, Sr.

DEVELOPERS CERTIFICATE:

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

Paul G. Cavanaugh 1/14/04
SIGNATURE OF DEVELOPER — DATE
PRINT NAME BELOW SIGNATURE



NOTE: FOR SILT FENCE LOCATION, SEE SEDIMENT CONTROL PLAN, SHEET 12 OF 18.

SHANABERGER & LANE
8726 TOWN & COUNTRY BLVD.
SUITE 201
ELLICOTT CITY, MARYLAND 21043

Richard F. Lane 9/28/07
ROAD & STORM DRAIN AS-BUILT

STATE OF MARYLAND — RICHARD F. LANE — No. 301 REGISTERED — PROPERTY LINE SURVEYOR

1/14/04
Date

Professional Engr. No. 10551

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

[signature] 1/26/04
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE — DATE

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

APPROVED: [signature] 1/26/04
HOWARD SOIL CONSERVATION DISTRICT — DATE

PLAN NUMBER ____________

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

[signature] 2-4-04
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

[signature] 2/27/04
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] 2/24/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

Date	No.	Revision Description

Emerson Section 2

Phase 5C

OWNER /DEVELOPER:

THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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

TAX MAP 47 — PARCEL 837

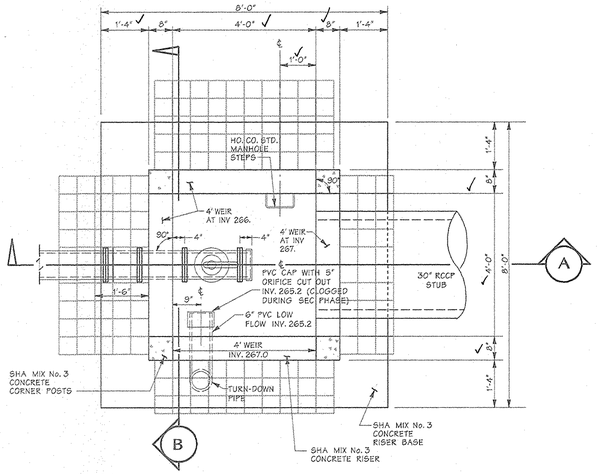
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE

STORMWATER MANAGEMENT POND GRADING PLANS

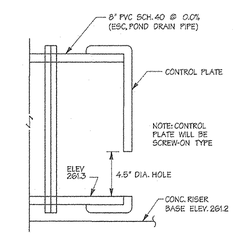
Des By MRT	Scale 1" = 50'	Proj. No. 95054.G2
Drn By KDE	Date 1/12/04	8 OF 18
Chk By	Approved	

F-03-175



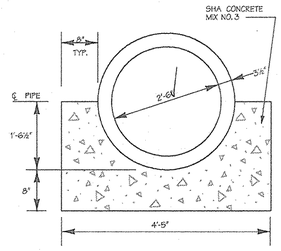
RISER PLAN (TOP SLAB REMOVED) - SWM POND 1

Scale: ½" = 1'-0"
CAST IN PLACE



ESC CONTROL PLATE DETAIL

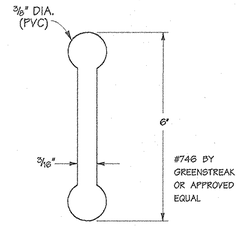
NTS



NOTE: CONCRETE CRADLE SHALL BE SCS TR-46 A-2

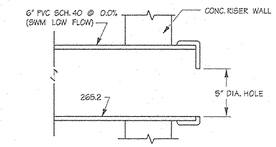
CONCRETE CRADLE DETAIL

NTS



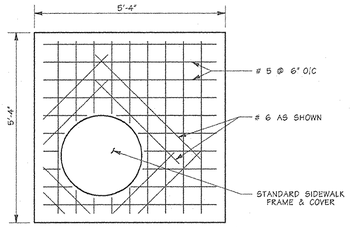
6" WATERSTOP

NOT TO SCALE



SWM LOW FLOW CONTROL PLATE DETAIL

NTS



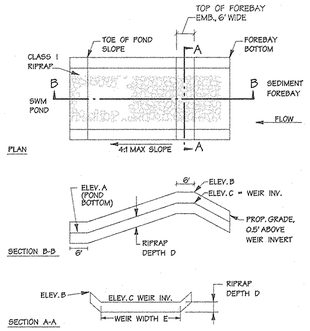
NOTES:

1. BOLT TOP SLAB TO RISER WITH (4) ½" x 6" LG. HEX. HEAD GALVANIZED BOLTS.
2. THE SIDE OF THE SLAB CLOSEST TO THE FRAME AND COVER WILL LINE UP WITH THE SIDE OF THE RISER WITH STANDARD MANHOLE STEPS.

TOP SLAB

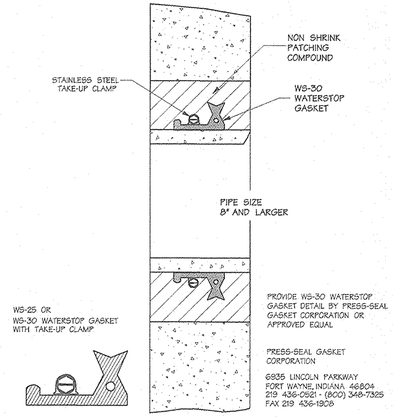
Scale: ½" = 1'-0"
CAST IN PLACE

DIMENSIONING TABLE	
VARIABLE	VALUE
A	262.0
B	266.0
C	265.5
D	19"
E	24"



SWM FOREBAY EMBANKMENT ARMORING DETAIL

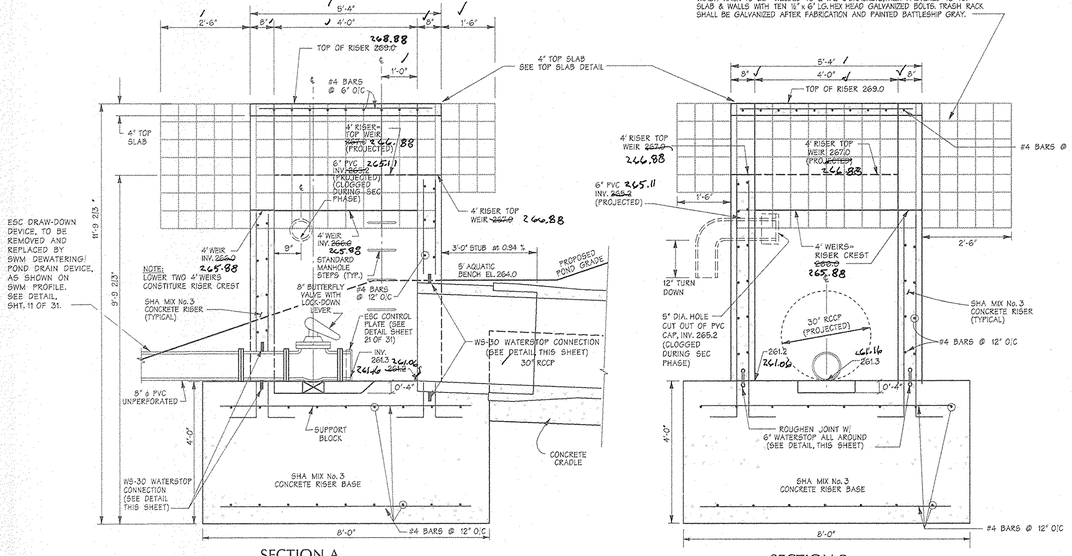
NOT TO SCALE



PIPE WATER STOP DETAIL

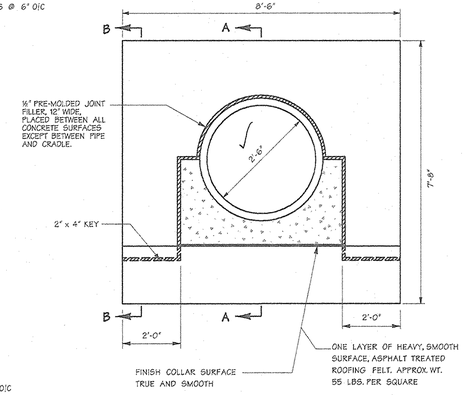
NOT TO SCALE

TRASH RACK DIMENSIONS:
1) MANHOLE STEPS AND 8" POND DRAIN SIDES = 3'-6" X 5'-0" X 2'-6" DEEP
2) BARREL AND 6" LOT FLOW SIDES = 2'-6" X 5'-0" X 1'-6" DEEP
CONSISTS OF #8 BENT BARS @ 6" O.C., TO BE MOUNTED ON RISER AS SHOWN. TRASH RACK TO BE WELDED TO 2" x 2" L-BRACKETS, THEN FASTENED TO TOP SLAB & WALLS WITH TEN ½" x 6" LG. HEX HEAD GALVANIZED BOLTS. TRASH RACK SHALL BE GALVANIZED AFTER FABRICATION AND PAINTED BATTLESHIP GRAY.



RISER DETAIL FOR SWM POND 1

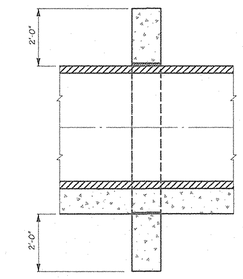
Scale: 1/2" = 1'-0"
CAST IN PLACE



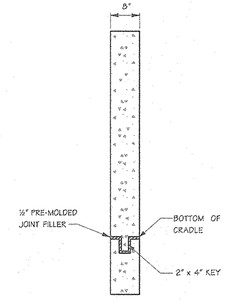
DETAIL SHOWN FOR EARTH FOUNDATION. FOR ROCK FOUNDATION, FOUND BOTTOM OF CRADLE ON ROCK LINE AND KEY COLLAR 6" INTO ROCK.

ANTI - SEEP COLLAR DETAIL - POND 2

CAST IN PLACE - NOT TO SCALE



SECTION A-A



SECTION B-B

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

U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE — 1/26/04 DATE

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

APPROVED: _____ HOWARD SOIL CONSERVATION DISTRICT — 1/26/04 DATE

PLAN NUMBER _____

DEVELOPERS CERTIFICATE:

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

SIGNATURE OF DEVELOPER — 1/14/04 DATE
PRINT NAME BELOW SIGNATURE

ENGINEERS CERTIFICATE:

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

SIGNATURE OF ENGINEER — 10551 REG. NO. — 1/14/04 DATE
PRINT NAME BELOW SIGNATURE
John W. Ranucchio, Sr.

SHANABERGER & LANE
8726 TOWN & COUNTRY BLVD.
SUITE 201
ELLICOTT CITY, MARYLAND 21043

STATE OF MARYLAND — RICHARD F. LANE — No. 701 — REGISTERED PROFESSIONAL ENGINEER

9/28/07

ROAD & STORM DRAIN AS-BUILT

1/14/04 Date

STATE OF MARYLAND — JOHN W. RANUCCHIO, SR. — No. 10551 — REGISTERED PROFESSIONAL ENGINEER

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — 2-4-04 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 2/27/04 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 2/24/04 DATE

Date	No.	Revision Description

Emerson Section 2

Phase 5C

OWNER /DEVELOPER:

THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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200 East Pennsylvania Avenue
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(410) 296-3333
Fax 296-4705

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

AREA

TAX MAP 47 — PARCEL 837
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE

STORMWATER MANAGEMENT DETAILS

Des By	MRT	Scale	AS SHOWN	Proj. No.	95054.G2
Drn By	KDE	Date	1/15/04		9 OF 18
Chk By		Approved			

F-03-175

STORMWATER MANAGEMENT POND
GENERAL CONSTRUCTION SPECIFICATIONS

1. GENERAL

All stormwater management facilities shall be constructed in accordance with Howard County's "Standard Specifications and Details for Construction", (1985) and the N.R.C.S. Maryland "Standards and Specifications for Ponds", (MD-378, 2000).

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

2. SITE PREPARATION

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

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

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

3. EARTH FILL

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

Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

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

COMPACTION - Control the movement of the hauling equipment over the fill so that the entire surface of each lift is compacted to 95% of AASHTO Specification T-99 (or equivalent ASTM Specifications). Fill material must contain enough moisture to yield the required degree of compaction with the equipment used.

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

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

EMBANKMENT CORE - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

4. STRUCTURE BACKFILL

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed 4 inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than 4 feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

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

5. REMOVAL AND REPLACEMENT OF DEFECTIVE FILL

Fill placed at densities lower than specified minimum density or at moisture contents outside the specified acceptable range of moisture content or otherwise not conforming to the requirements of the specifications shall be reworked to meet the requirements or removed and replaced by acceptable fill. The bottoms of such excavations shall be finished flat or gently curving and at the sides of such excavations the adjacent sound fill shall be trimmed to a slope not steeper than 3 feet horizontally to 1 foot vertically extending from the bottom of the excavation to the fill surface.

6. PIPE CONDUITS

All pipes shall be circular in cross section. All perforated pipes shall have a minimum of 3.31 square inches of opening per square foot of pipe surface (ex. 30 3/8-inch holes per square foot). Perforations are to be uniformly spaced around the full periphery of the pipe. Any holes blocked or partially blocked by bituminous coating shall be opened prior to installation.

REINFORCED CONCRETE PIPE - All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.
2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural purposes, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.
3. Laying Pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.
4. Backfilling shall conform to "Structure Backfill".
5. Connections - All connections (to anti-seep collars, riser, etc.) shall be watertight.
6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

PLASTIC PIPE - All of the following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated high density polyethylene (HDPE) pipe, couplings and fittings shall conform to following: 4" - 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.
2. Joints and connections to anti-seep collars shall be completely watertight.
3. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.
4. Backfilling shall conform to "Structure Backfill".
5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

7. CONCRETE

Concrete must meet minimum requirements set forth in Maryland State Highway Administration Standard Specifications for Construction and Materials, Section 918 (Portland Cement Concrete Mixtures), Mix Number 3. Reinforcing steel must be ASTM A615, Grade 60. Steel angles and anchor bars must be ASTM A36.

8. ROCK RIP-RAP

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

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

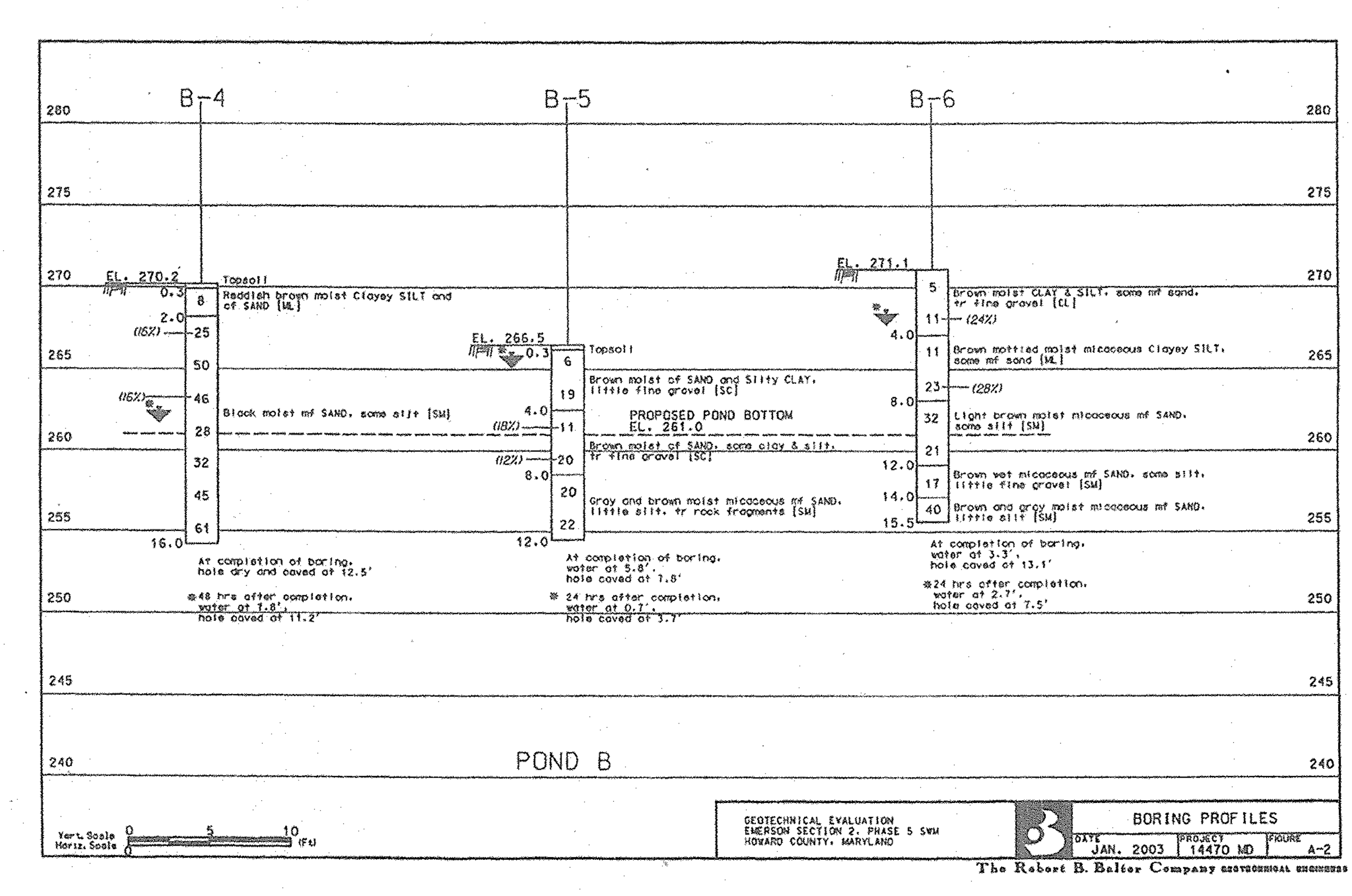
The rip-rap shall be placed to the required thickness in one operation. The rock shall be delivered and placed in a manner that will insure the rip-rap in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks filling the voids between the larger rocks.

9. CARE OF WATER DURING CONSTRUCTION

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

10. STABILIZATION

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



11. EROSION AND SEDIMENT CONTROL

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

All disturbed areas shall be controlled by an erosion and sediment control plan which has been approved by the Howard Soil Conservation District (Howard SCD).

12. SEEDING

Seeding, fertilizing and mulching shall be as follows:

Seed Mix: 50% Kenblue Kentucky Bluegrass
40% Pennlawn Creeping Red Fescue
10% Streaker Redtop
Applied at a rate of 150 pounds per acre.
(or)
Rebel II Tall Fescue (125 pounds per acre)
Pennfine Perennial Ryegrass (15 pounds per acre)
Kenblue Kentucky Bluegrass (10 pounds per acre)
(or)
Pennlawn Creeping Red Fescue (70 pounds per acre)
Aurora Hard Fescue (50 pounds per acre)
Common White Clover (6 pounds per acre)
Winter Rye (45 pounds per acre)

Lime: 2 tons per acre Dolomitic Limestone.

Fertilizer: 600 pounds per acre 10-10-10 fertilizer before seeding.
400 pounds per acre 30-0-0- Ureaform Fertilizer at time of seeding.

Mulch: Straw at 4,000 pounds per acre.

Anchoring: Mulching tool or wood cellulose fiber binder at a net dry binder rate of 750 pounds per acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water or at rates recommended by the manufacturer.

13. FILTER CLOTH

All filter cloth shall conform to the 1994 Maryland Standards and Specifications for soil erosion and sediment control, or the latest edition.

14. GABIONS

All gabions shall be PVC coated woven wire baskets. Stone size shall be 4 inches to 7 inches, (Class IV gabions)

15. FENCE

Split rail fencing:

Fencing shall be constructed in accordance with the details on these plans. The split rail fence shall be constructed of locust post and spruce rails, round side out, with post spaced 10 feet on center. The wire fabric shall be 4" x 2", 14 gauge, black vinyl coated welded wire mesh attached to the inside of the fence with stainless steel electrical staples 12 inches on center, each rail, and shall extend 6 inches below finished grade.

Chain link fencing:

Construct fencing in accordance with the State Highway Administration Standard details 690.01 and 690.02. Use specifications for a 6-foot fence, substituting 42" fabric and 6'-8" line posts. Construct the gate in accordance with SHA Standard Detail 692.01 with 42" fabric. The fabric used for the fence and gate must conform to AASHTO Designation M181-74.

16. INSPECTION SCHEDULE

1. Prior notification shall be given to the engineer so that inspections may be made at the following stages:
   (1) Upon completion of excavation to subfoundation and where required, installation of structural supports or reinforcement for structures, including but not limited to:
      (I) Core trenches for structural embankments,
      (II) Inlet-outlet structures, anti-seep structures, watertight connectors on pipes and
      (III) trenches for enclosed storm drainage facilities.
   (2) During placement of structural fill, reinforcing and concrete, and installation of piping and catch basins,
   (3) During backfill of foundations and trenches,
   (4) During embankment construction, and
   (5) Upon completion of final grading and establishment of permanent stabilization.

   No work shall proceed until the engineer inspects and approves the work previousely completed.
2. Geotechnical compaction testing of the facility embankment is required. Certification must be provided to the designated engineer in charge of the as-built.
3. A copy of all material supply tickets must be given to the dedignated engineer in charge of the as-built.

17. MAINTENANCE SCHEDULE

ROUTINE MAINTENANCE: (BY POA)

1. THE FACILITY SHALL BE INSPECTED TWICE ANNUALLY, MARCH AND SEPTEMBER, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378).
2. VEGETATED COVER SHALL BE MAINTAINED AT ALL TIMES.
3. VEGETATION ON EMBANKMENT AND ACCESS BENCH SHALL NOT EXCEED 18" IN HEIGHT.
4. TOP AND OUTSIDE SIDE SLOPE OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER.

NON-ROUTINE MAINTENANCE: (BY HOWARD COUNTY)

1. THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.
2. RILLS ON THE SLOPES OF THE DAM AND WASHED IN THE EARTH SPILLWAY SHALL BE FILLED WITH SUITABLE MATERIAL AND THOROUGHLY COMPACTED. THESE AREAS SHALL BE RESEEDED OR RESODDED, LIMED, AND FERTILIZED AS NEEDED.
3. ALL APPURTENANCES SHALL BE KEPT FREE OF TRASH.
4. SEDIMENT SHALL BE REMOVED FROM FOREBAYS WHEN THE DEPTH EXCEEDS 1'.
5. TRASH AND DEBRIS SHALL BE REMOVED AS NECESSARY.
6. INSIDE SIDE SLOPE AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED, CARE SHOULD BE TAKEN NOT TO MOW ANY OF THE WETLAND PLANTINGS IN THE VICINITY OF THE SAFETY BENCH.

18. OPERATION, MAINTENANCE AND INSPECTION

Inspection of ponds shown hereon shall be performed at least twice annually in accordance with the checklist and requirements contained within the USDA, SCA "Standards and Specifications for Ponds" (MD-378). The pond owner(s) and any heirs, successors or assigns shall be responsible for the safety of the pond and the continued operation, surveillance, inspection and maintenance thereof. The pond owner(s) shall promptly notify the Howard SCD of any unusual observations that may be indicators of distress such as excessive seepage, turbid seepage, sliding or slumping.

19. UTILITIES

No utilities may be constructed within/along any MD-378 embankment.

During the geotechnical evaluation, a high water table was encountered in both of the proposed SWM facility locations. Also, at Pond A, the natural soils at the pond bottoms exhibited silt and clay contents of 55%, which is in excess of the maximum allowable (40%). Based on these conditions, the SWM pond bottoms will not meet the infiltration requirements outlined by MDE regulations. Infiltration is not planned at these ponds.

SCS criteria for embankment ponds requires installation of a cutoff trench of relatively impervious material at or upstream of the centerline of the embankment and the cutoff trench should extend into relatively impervious materials and consist of materials conforming to the Unified Soil Classification SC, CH, or CL. The required minimum depth and width of the cutoff trench is at least 4 feet, with side slopes not steeper than 1H: 1V. Based upon the subsurface data developed from the borings, these materials were encountered onsite in limited quantities in the top 4 to 8 feet of the borings, except B-4. Additional imported clay material will likely have to be used in the clay core because of the limited amount available on-site. Section 6.1 General Earthwork Requirements outlines the earthwork requirements for construction of the SWM pond.

5.2. *Drainage Structure Foundations*

Based upon the conditions indicated by the subsurface exploration program and our understanding of the proposed construction, it is our opinion that the natural soils are generally acceptable for support of typical spread footings. Based our data, and preparation of the soils surfaces as recommended later in this report, the design may proportioned for an allowable soil bearing pressure of 2,500 psf. It is noted that it is absolutely essential that the new footings bear on acceptable bearing strata. Newly excavated footings must be carefully cleaned of loosened or otherwise unsuitable materials, as verified by monitoring, testing and inspection in the field during construction.

Based on present information, groundwater will likely be encountered and impact foundation excavation and construction. However, it is important to prevent surface water or seepage from collecting in open excavations prior to concrete placement. If water does inadvertently collect in foundation excavations, it will be necessary to bail the water from the hole, remove the saturated soils, and re-test the adequacy of the bearing surface to support the design pressure prior to placing concrete.

The maximum dry density (AASHTO T-99) for the residual soil samples ranged from 107.8 to 113.5 pcf with optimum moisture contents ranging from 17.6% to 18.4%. The natural moisture content of the fill materials on site was generally above the optimum moisture content. Based on these conditions, significant drying of the soil by discing and aeration or other means of manipulation can be anticipated during the earthwork process. Furthermore, the micaceous component of the on-site soils makes it susceptible to loss of strength upon exposure to free water. Therefore, it would be prudent to schedule clearing and grubbing,

Table 2-Potential Excavation Problems

Boring	Existing Elevation	Proposed Bottom Elevation	Elevation to SPT resistances of:		
			50 blows/6 inches (1)	50 blows/3 to 6 inches (2)	50 blows/3 inches or less (3)
B-1	272.0	262	---	---	---
B-2	276.0	262	---	262.0	---
B-3	272.3	262	260.3	258.3	---
B-4	270.2	261	256.2	---	---
B-5	266.5	261	---	---	---
B-6	271.1	261	---	---	---

NOTES:
(1) Excavation of materials exhibiting this range of blow counts is typically accomplished through normal mass excavation techniques, i.e. excavation by loader, pan, backhoe, etc. Some limited ripping or jack hammering of materials may be required, especially in trenches.
(2) Excavation of materials exhibiting this range of blow counts will typically require ripping, jack hammering or hoe ramming for excavation, especially in trenches or other confined areas.
(3) Excavation of materials exhibiting this range of blow counts will typically require hard ripping or extensive jack hammering. Blasting or other hard excavation techniques may be required, especially in trenches or other confined areas.

The Robert B. Balter Company 5 14470_rep1

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2/24/04

Date	No.	Revision Description
2/19/04	2	ADDED NOTES

Emerson Section 2

Phase 5C

OWNER /DEVELOPER:

THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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
TAX MAP 47 PARCEL 837
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
STORMWATER MANAGEMENT SPECIFICATIONS & SOIL BORING LOGS

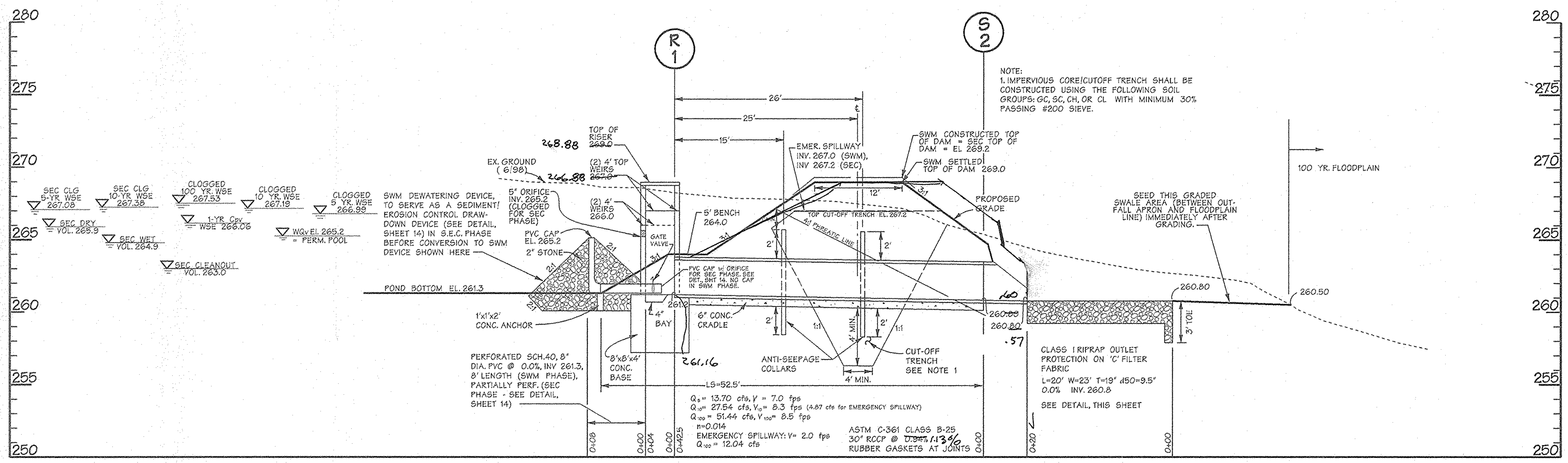
Date 1/14/04

Professional Engr. No. 10551

Des By MRT	Scale AS SHOWN	Proj. No. 95054.G2
Drn By KDE	Date 1/15/04	10 OF 18
Chk By	Approved	

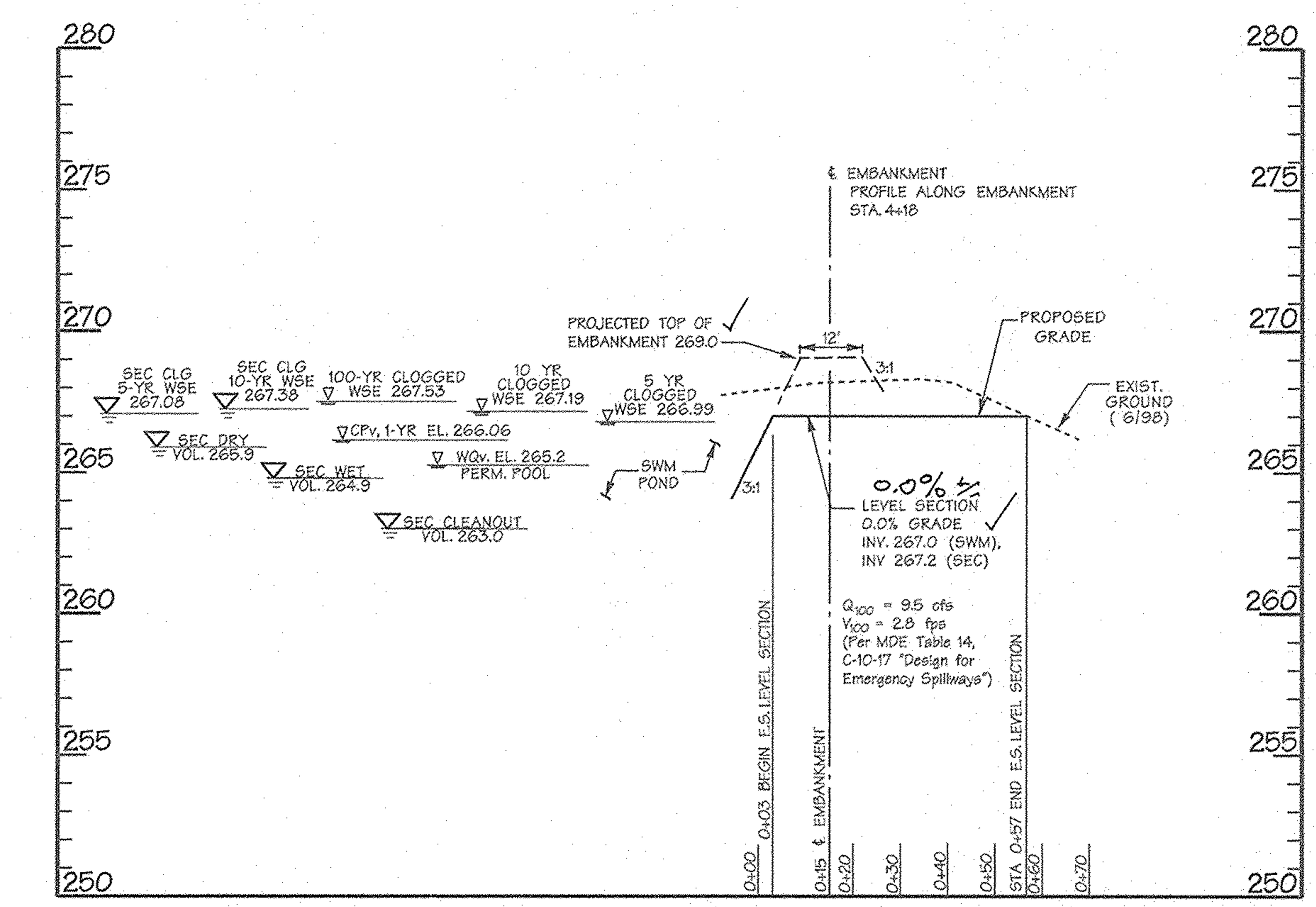
Wed Jan 14 13:26:07 2004 m:\95054\95054g\95054G.m4

F-03-175



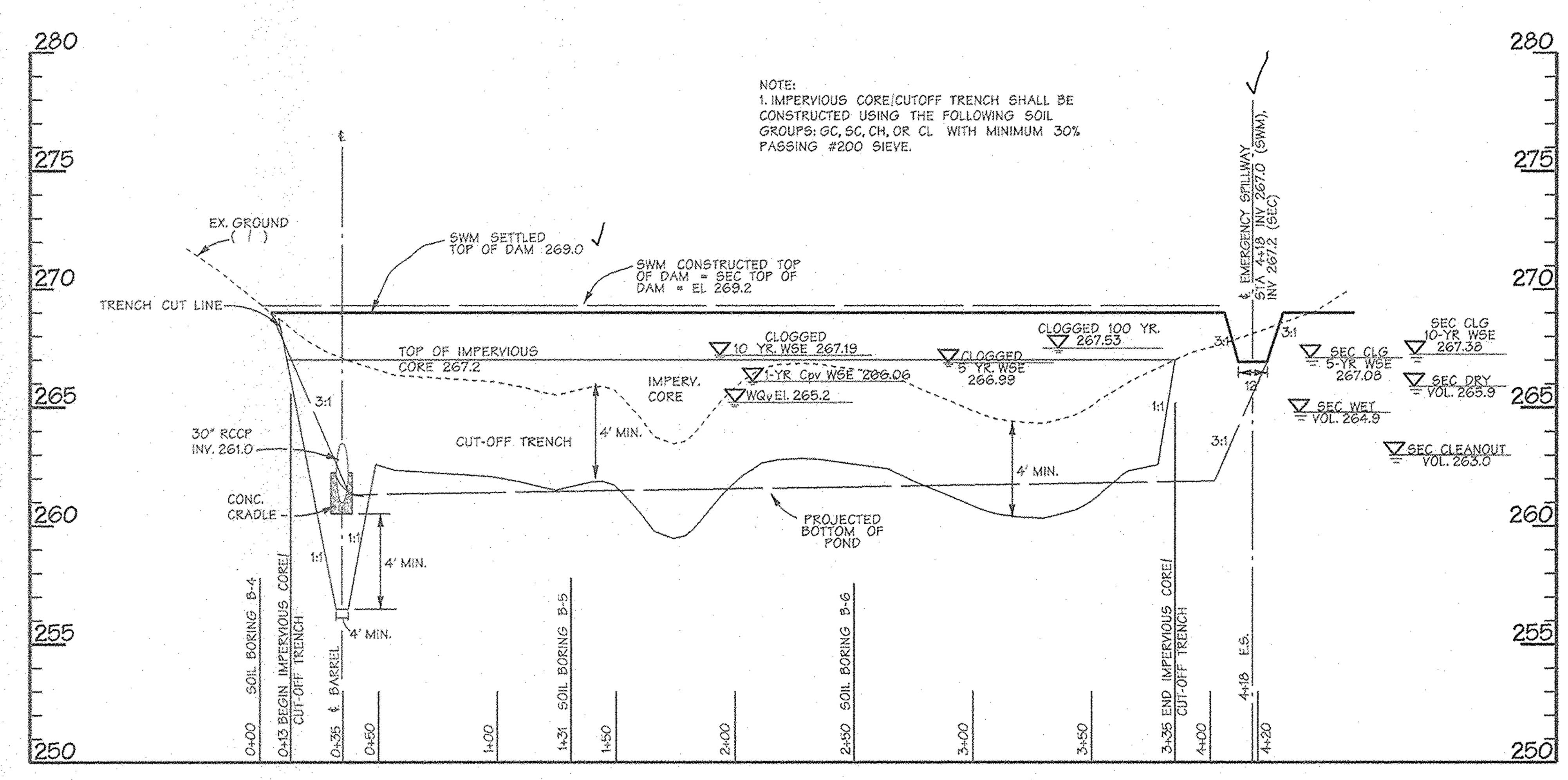
SWM BARRIER PROFILE FOR EMERSON 2, PHASE 5c, POND 1

SCALE: HORZ.: 1"=10'
VERT.: 1"=5'



SWM EMERGENCY SPILLWAY PROFILE FOR EMERSON 2, PHASE 5c, POND 1

SCALE: HORZ.: 1"=30'
VERT.: 1"=5'



PROFILE ALONG CENTERLINE OF EMBANKMENT

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

CONSTRUCTION SPECIFICATIONS

1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.

2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.

3. GEOTEXTILE CLASS C SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE SHALL BE A MINIMUM OF ONE FOOT.

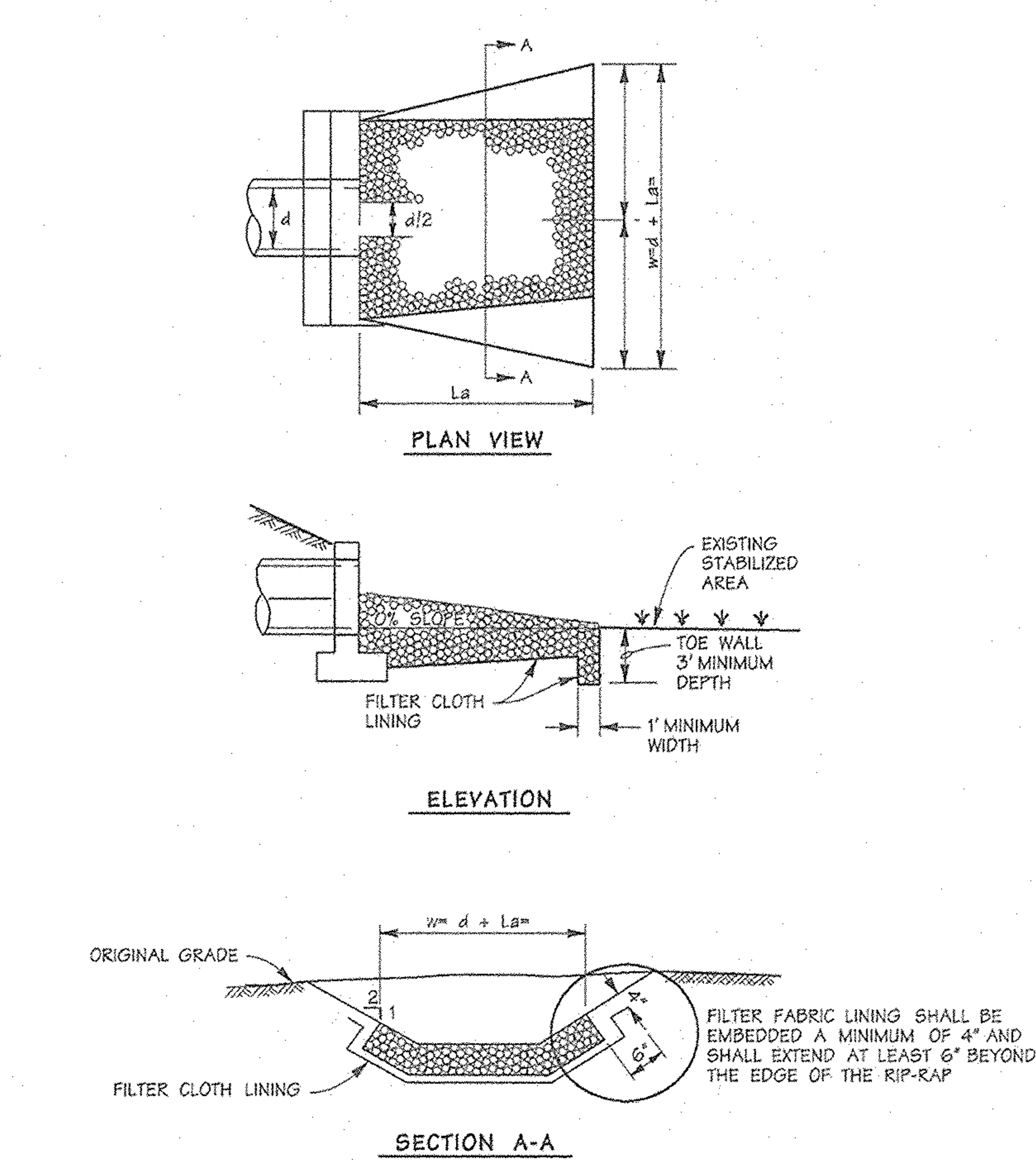
4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.

5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE — *MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION*

F-18-8A, 9A, 10A

ROCK OUTLET PROTECTION SPECIFICATIONS



NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE — *MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION*

F-18-10-A (END)

ROCK OUTLET PROTECTION III

NOT TO SCALE

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

Jim Myers /CB — 1/26/04
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE — DATE

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

APPROVED: [signature] — 1/26/04
HOWARD SOIL CONSERVATION DISTRICT — DATE

PLAN NUMBER ______

DEVELOPERS CERTIFICATE:

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

Paul G. Cavanaugh — 1/14/04
SIGNATURE OF DEVELOPER — DATE
PRINT NAME BELOW SIGNATURE

ENGINEERS CERTIFICATE:

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

[signature] — 10551 — 1/14/04
SIGNATURE OF ENGINEER — REG. NO. — DATE
PRINT NAME BELOW SIGNATURE
John W. Ranocchia, Jr.

SHANABERGER & LANE
8726 TOWN & COUNTRY BLVD.
SUITE 201
ELLICOTT CITY, MARYLAND 21043

STATE OF MARYLAND — RICHARD F. LANE — REGISTERED — PROPERTY LINE SURVEYOR

Richard F. Lane 9/28/07
ROAD & STORM DRAIN AS-BUILT

1/14/04
Date

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

[signature] — 2-4-04
CHIEF, BUREAU OF HIGHWAYS — DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

[signature] — 2/27/04
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

[signature] — 2/24/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

Date	No.	Revision Description

Emerson Section 2
Phase 5C

OWNER /DEVELOPER:

THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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(410) 296-3333
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A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA
TAX MAP 47 — PARCEL 837
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
STORMWATER MANAGEMENT AND SEDIMENT/EROSION CONTROL PROFILES

Des By	MRT	Scale	AS SHOWN	Proj. No.	95054.G2
Drn By	KDE	Date	1/15/04	11 OF 18	
Chk By		Approved			

F-03-175

BASIN TABLE

BASIN NUMBER		1
EXISTING DRAINAGE AREA: ACRES		12.14
INTERIM DRAINAGE AREA: ACRES		12.00
PROPOSED DRAINAGE AREA: ACRES		12.00
STORAGE REQUIRED: CUBIC FEET	WET	21852
	DRY	21852
	TOTAL	43704
STORAGE PROVIDED: CUBIC FEET	WET	25908
	DRY	24109
	TOTAL	50017
EXISTING GROUND ELEVATION		264
TOP EMBANKMENT ELEVATION		269.2
EMERGENCY SPILLWAY CREST ELEVATION		267.20
RISER CREST ELEVATION		266.0
WET STORAGE ELEVATION		264.4
CLEANOUT ELEVATION		263.00
BOTTOM ELEVATION		261.30
Q_{10} INTO BASIN (C.F.S.)		66.49
Q_{10} OUT BARREL (C.F.S.)		49.69
Q_{10} OUT EMERGENCY SPILLWAY		2.38
BASIN DEPTH	WET	3.10
	DRY	1.50
	TOTAL	4.60
DESIGN HIGHWATER		267.38
FREEBOARD PROVIDED		1.82
BARREL DIAMETER		30 In
RISER DIAMETER		4' X 4'
EMERGENCY SPILLWAY WIDTH		12 ft
WET STORAGE ZONE ELEVATION		261.30 - 264.4
DRY STORAGE ZONE ELEVATION		264.4 - 265.90
BOTTOM DIMENSIONS		356 X 132

Legend

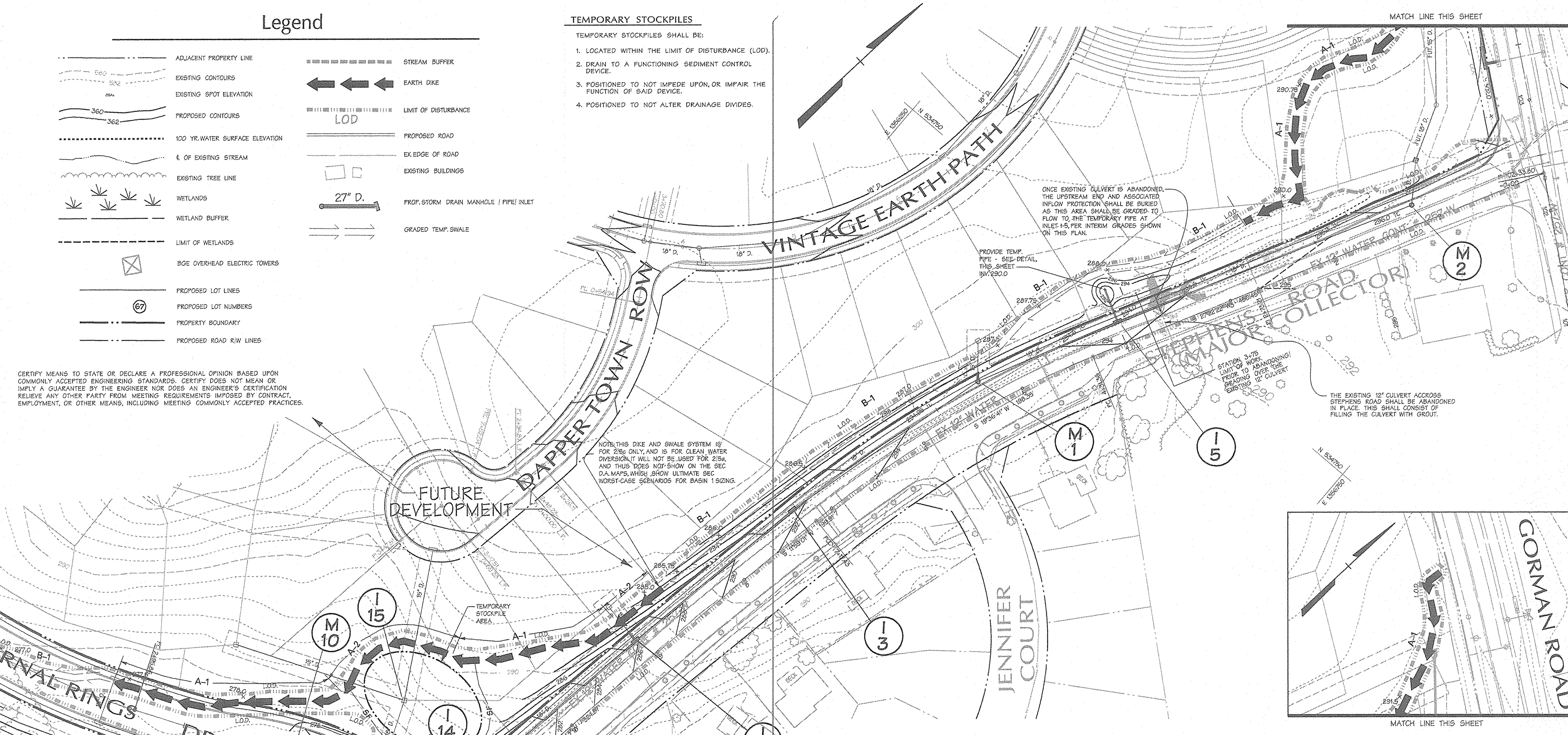
- ADJACENT PROPERTY LINE
- EXISTING CONTOURS
- EXISTING SPOT ELEVATION
- PROPOSED CONTOURS
- 100 YR. WATER SURFACE ELEVATION
- ℄ OF EXISTING STREAM
- EXISTING TREE LINE
- WETLANDS
- WETLAND BUFFER
- LIMIT OF WETLANDS
- BGE OVERHEAD ELECTRIC TOWERS
- PROPOSED LOT LINES
- (67) PROPOSED LOT NUMBERS
- PROPERTY BOUNDARY
- PROPOSED ROAD R/W LINES
- STREAM BUFFER
- EARTH DIKE
- LOD LIMIT OF DISTURBANCE
- PROPOSED ROAD
- EX. EDGE OF ROAD
- EXISTING BUILDINGS
- 27" D. PROP. STORM DRAIN MANHOLE / PIPE/ INLET
- GRADED TEMP. SWALE

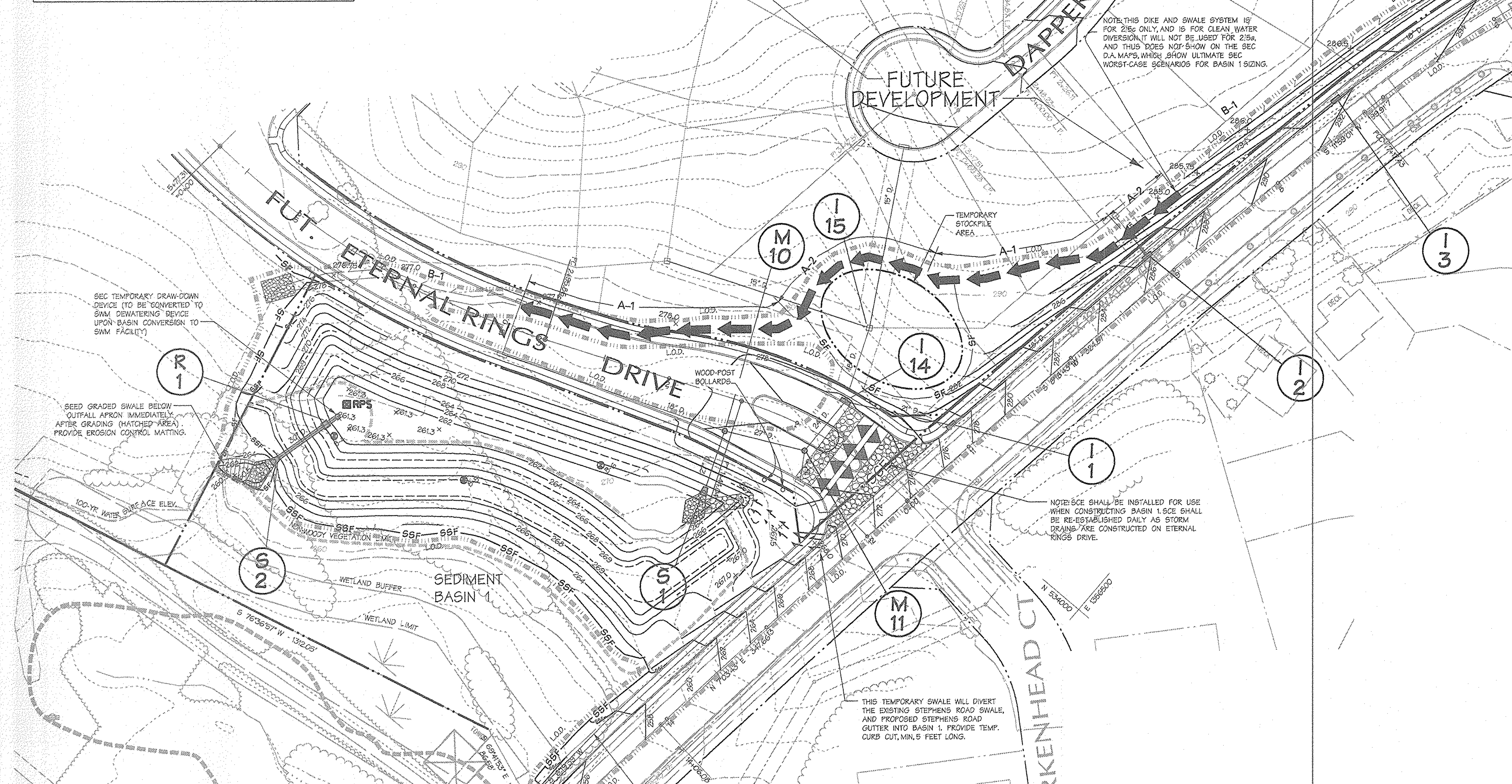
CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED PRACTICES.

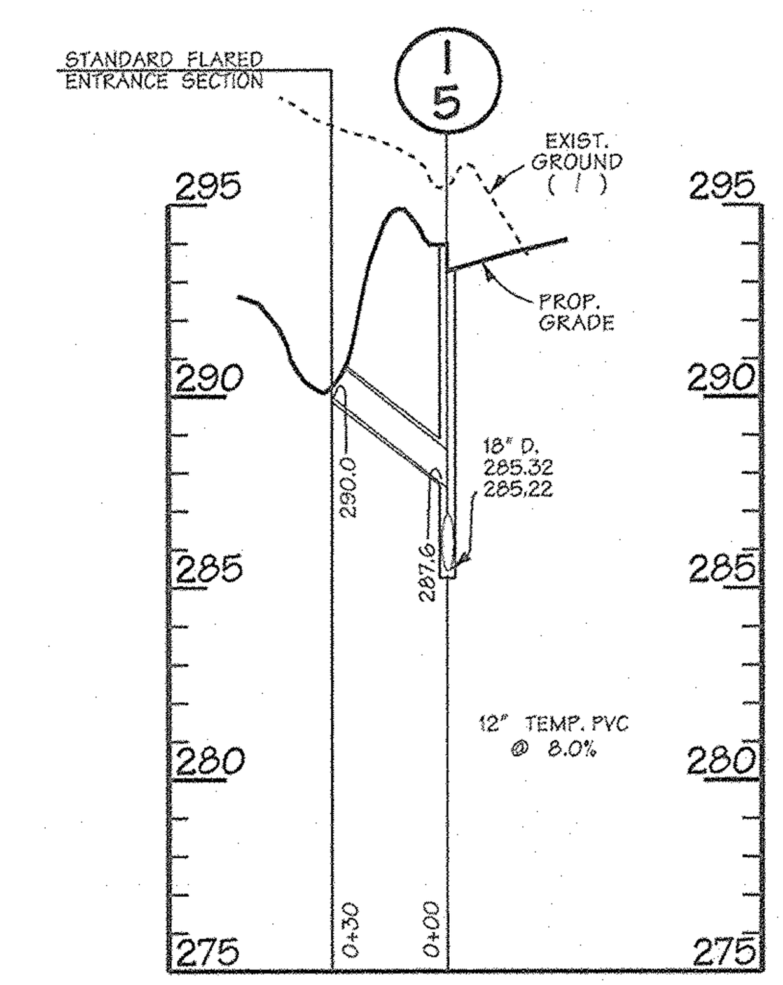
TEMPORARY STOCKPILES

TEMPORARY STOCKPILES SHALL BE:

1. LOCATED WITHIN THE LIMIT OF DISTURBANCE (LOD).
2. DRAIN TO A FUNCTIONING SEDIMENT CONTROL DEVICE.
3. POSITIONED TO NOT IMPEDE UPON, OR IMPAIR THE FUNCTION OF SAID DEVICE.
4. POSITIONED TO NOT ALTER DRAINAGE DIVIDES.







TEMPORARY DIVERSION PIPE AT I-5

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

THIS PLAN HAS BEEN REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.

U.S. NATURAL RESOURCE CONSERVATION SERVICE — DATE 1/26/04

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

HOWARD S.C.D. — DATE 1/26/04

DEVELOPER'S CERTIFICATION:

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

Paul G. Cavanaugh — DATE 1/14/04
SIGNATURE OF DEVELOPER
PRINT NAME BELOW SIGNATURE

ENGINEER'S CERTIFICATION:

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

SIGNATURE OF ENGINEER — 1/14/04
PRINT NAME BELOW SIGNATURE
John H. Ranocchia, Sr.

1/14/04
Date

Professional Engr. No. 10561

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2/24/04

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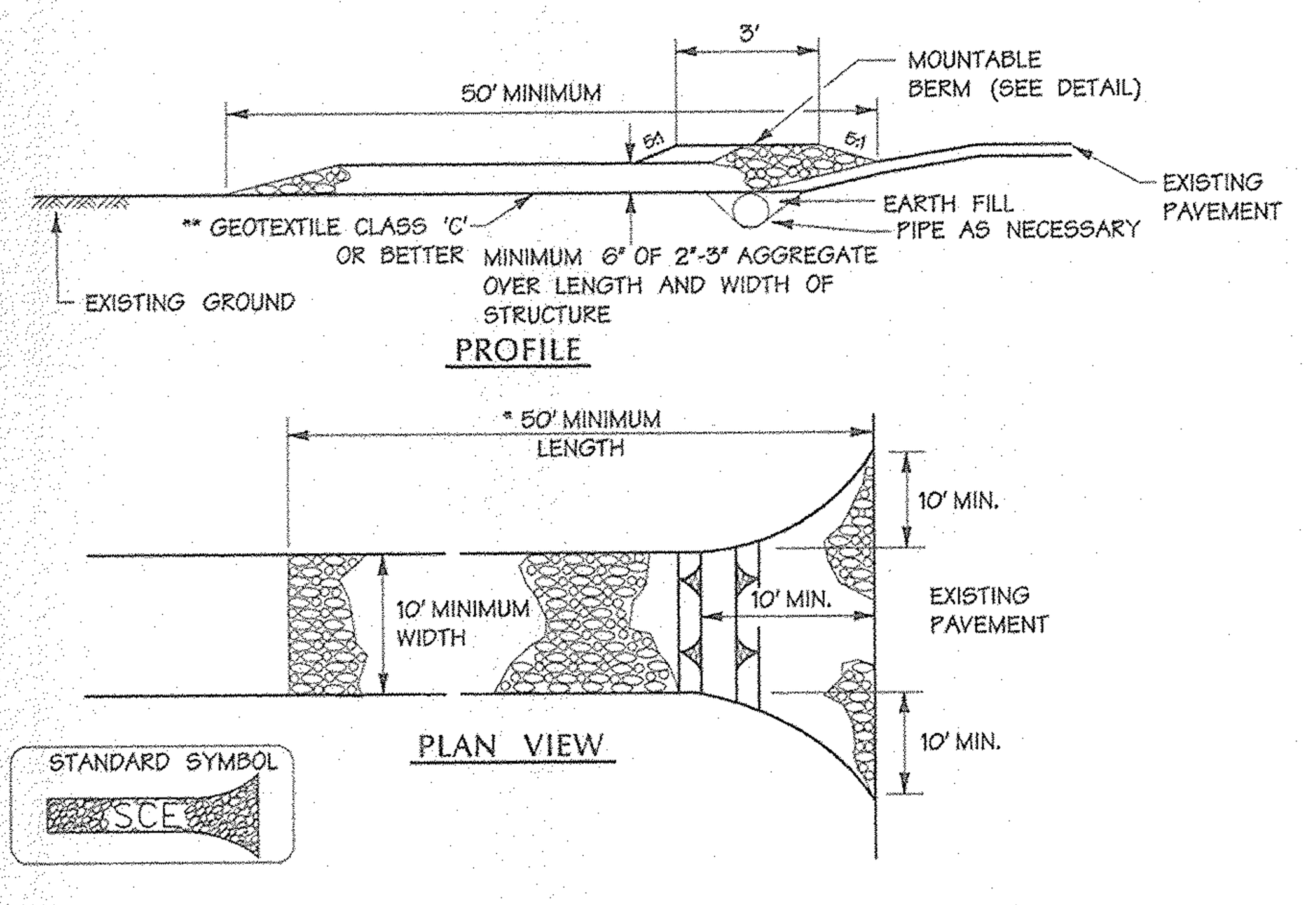
AREA
TAX MAP 47 — PARCEL 837
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
SEDIMENT & EROSION CONTROL PLAN

Des By MRT	Scale 1" = 50'	Proj. No. 95054.G2
Drn By	Date 1/12/04	12 OF 18
Chk By	Approved	

F-03-175



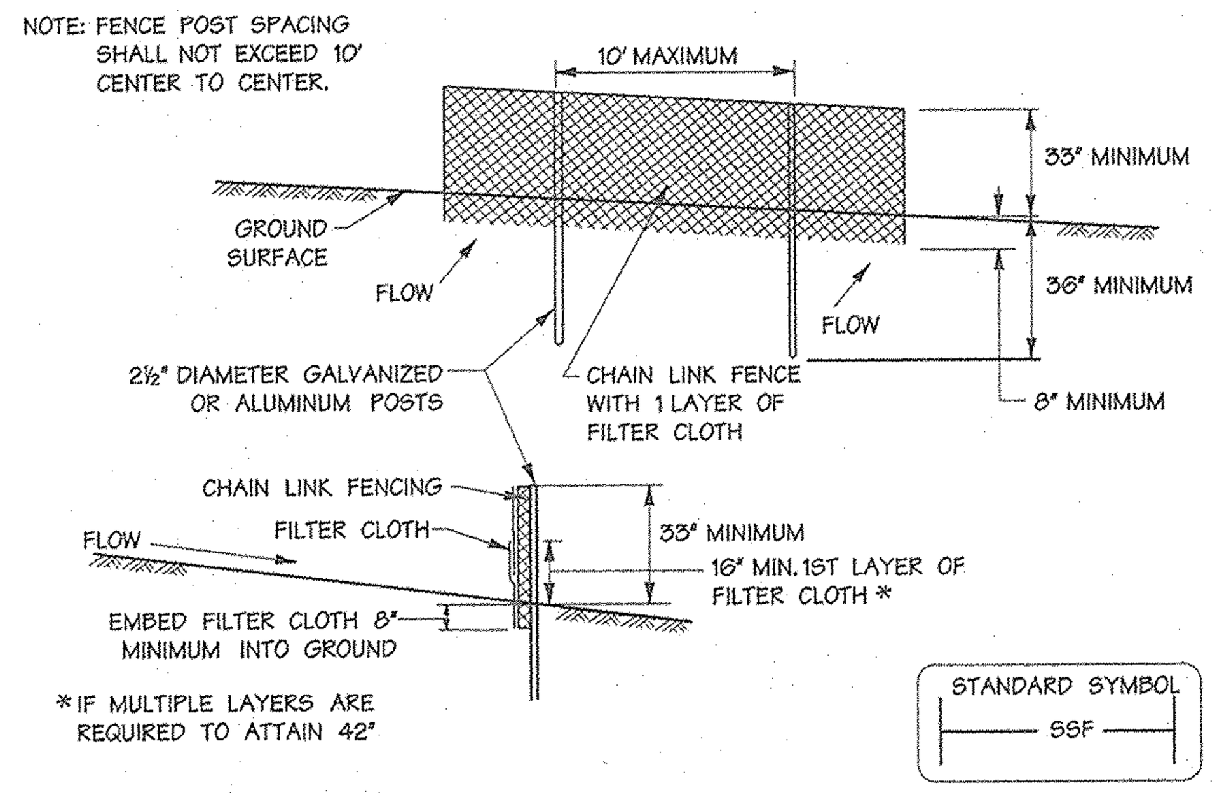
CONSTRUCTION SPECIFICATIONS

1. LENGTH - MINIMUM OF 50' (*30' FOR SINGLE RESIDENCE LOT).
2. WIDTH - 10' MINIMUM, SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
3. GEOTEXTILE FABRIC CLASS C (FILTER CLOTH) SHALL BE PLACED OVER THE EXISTING GROUND PRIOR TO PLACING STONE. **THE PLAN APPROVAL AUTHORITY MAY NOT REQUIRE SINGLE FAMILY RESIDENCES TO USE GEOTEXTILE.
4. STONE - CRUSHED AGGREGATE (2" TO 3") OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT SHALL BE PLACED AT LEAST 6" DEEP OVER THE LENGTH AND WIDTH OF THE ENTRANCE.
5. SURFACE WATER - ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. PIPE HAS TO BE SIZED ACCORDING TO THE DRAINAGE. WHEN THE SCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM WILL BE REQUIRED.
6. LOCATION - A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.

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

Stabilized Construction Entrance

Not To Scale



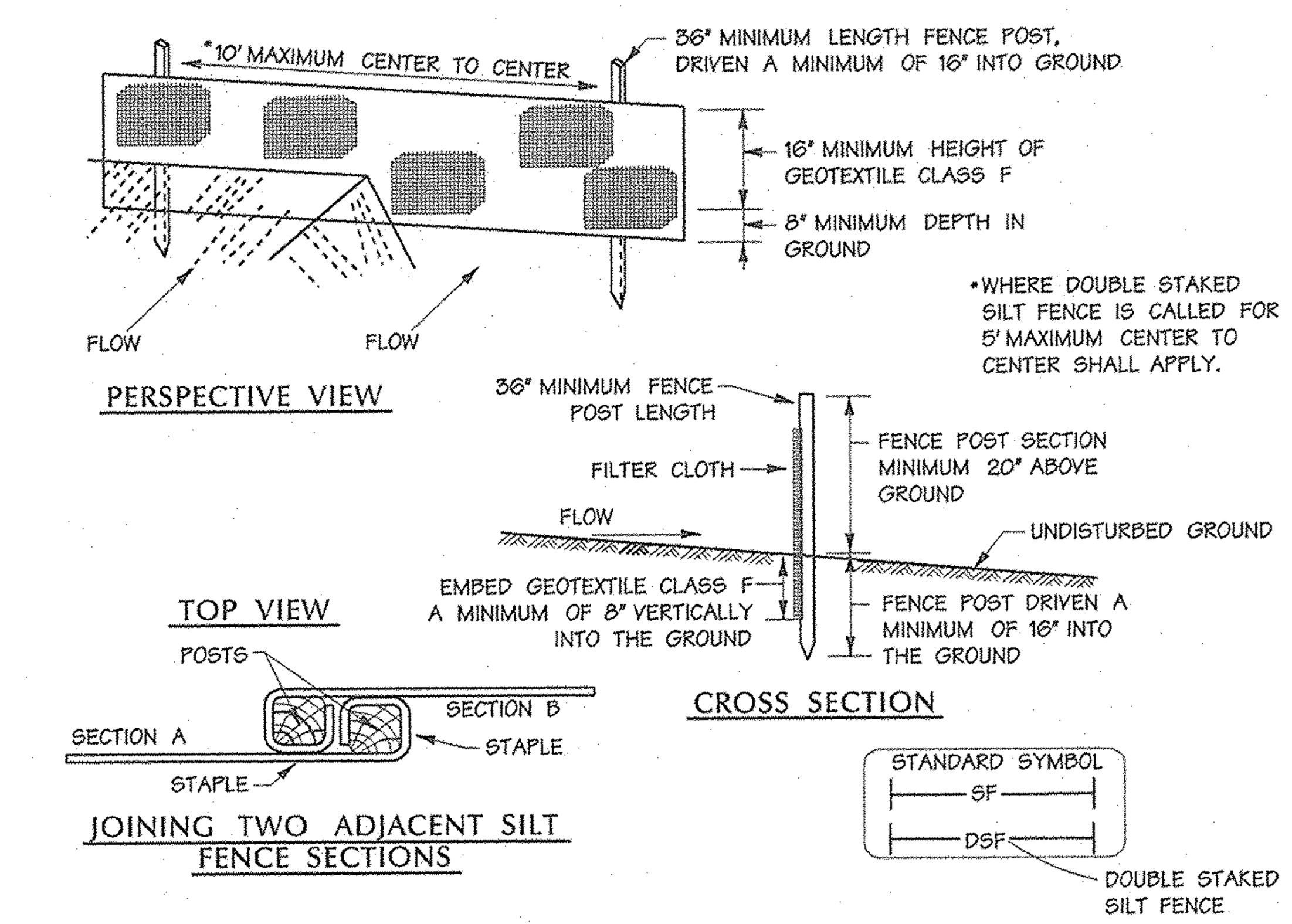
CONSTRUCTION SPECIFICATIONS

1. FENCING SHALL BE 42 INCHES IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY (SHA) DETAILS FOR CHAIN LINK FENCING. THE SPECIFICATION FOR A 6' FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6' LENGTH POSTS.
2. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
3. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES. THE LOWER TENSION WIRE, BRACE AND TRUSS RODS, DRIVE ANCHORS AND POST CAPS ARE NOT REQUIRED EXCEPT ON THE ENDS OF THE FENCE. THE CHAIN LINK FENCING SHALL BE SIX (6) GAUGE OR HEAVIER.
4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
5. FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
6. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
7. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF FENCE HEIGHT.

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

Super Silt Fence

Not To Scale



CONSTRUCTION SPECIFICATIONS

1. FENCE POSTS SHALL BE A MINIMUM OF 36" LONG DRIVEN 16" MINIMUM INTO THE GROUND. WOOD POSTS SHALL BE 1½" x 1½" SQUARE (MINIMUM) CUT, OR 1¾" DIAMETER (MINIMUM) ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHTING NOT LESS THAN 1.00 POUND PER LINEAR FOOT.
2. GEOTEXTILE SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:

TENSILE STRENGTH	50 LBS/IN (MIN.)	TEST: MSMT 509
TENSILE MODULUS	20 LBS/IN (MIN.)	TEST: MSMT 509
FLOW RATE	0.3 GAL FT/MIN (MAX)	TEST: MSMT 322
FILTERING EFFICIENCY	75% (MIN.)	TEST: MSMT 322

3. WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
4. SILT FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHED 50% OF THE FABRIC HEIGHT.

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

Silt Fence

Not To Scale

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
   A. SEVEN CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1.
   B. FOURTEEN DAYS AS TO ALL OTHER DISTURBED OF GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE "HOWARD COUNTY DESIGN MANUAL", STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR PERMANENT SEEDINGS (SEC. 51), SODS (SEC. 54), TEMPORARY SEEDING (SEC. 50), AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE (INCL. EMERSON 2/5a, 2/5c)	32.80 ACRES
AREA DISTURBED (2/5c ONLY)	4.06 ACRES
AREA TO BE ROOFED OR PAVED	1.08 ACRES
AREA TO BE VEGETATIVELY STABILIZED	2.98 ACRES
TOTAL CUT	10,000 CUBIC YARDS*
TOTAL FILL	10,000 CUBIC YARDS*

   *EXCESS EXCAVATED MATERIAL RESULTING FROM EXCAVATION ON THE SITE SHALL BE PLACED IN THE STOCKPILE AREA INDICATED ON THE SEDIMENT/EROSION CONTROL PLAN. ONLY AS NECESSARY, AND AS APPROVED BY THE SEDIMENT CONTROL INSPECTOR, EXCESS FILL SHALL BE DISPOSED IN AN APPROVED DISPOSAL FACILITY WITH OPEN GRADING PERMIT.
8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

Howard Co. Sed. Control General Notes

SILT FENCE DESIGN CRITERIA

SLOPE STEEPNESS	(MAXIMUM) SLOPE LENGTH	(MAXIMUM) SILT FENCE LENGTH
FLATTER THAN 50:1 (2%)	UNLIMITED	UNLIMITED
50:1 TO 10:1 (2-10%)	125 FEET	1,000 FEET
10:1 TO 5:1 (10-20%)	100 FEET	750 FEET
5:1 TO 3:1 (20-33%)	60 FEET	500 FEET
3:1 TO 2:1 (33-50%)	40 FEET	250 FEET
2:1 AND STEEPER (* 50%)	20 FEET	125 FEET

NOTE: IN AREAS OF LESS THAN 2% SLOPE AND SANDY SOILS (USDA GENERAL CLASSIFICATION SYSTEM, SOIL CLASS A) MAXIMUM SLOPE LENGTH AND SILT FENCE LENGTH WILL BE UNLIMITED. IN THESE AREAS A SILT FENCE MAY BE THE ONLY PERIMETER CONTROL REQUIRED

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

Silt Fence

Not To Scale

1. OBTAIN GRADING PERMIT, NOTIFY MARYLAND DEPARTMENT OF ENVIRONMENT (MDE) NONTIDAL WETLANDS AND WATERWAYS INSPECTIONS AND COMPLIANCE SECTIONS AT 410 631 3510 AT LEAST FIVE DAYS IN ADVANCE OF BEGINNING ANY WORK IN STREAMS, 100-YEAR FLOOD PLAIN, NONTIDAL WETLANDS AND WETLANDS BUFFERS. MDE TRACKING NUMBER IS 200164079.
2. NOTIFY HCD DEPARTMENT OF INSPECTIONS 410 313 1855 AT LEAST 48 HOURS PRIOR TO BEGINNING WORK.
3. IF APPLICABLE, ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMIT OF DISTURBANCE, WHERE THE LIMIT IS WITHIN 50 FEET OF THE FOREST CONSERVATION EASEMENT, 100-YEAR FLOOD PLAIN, WETLANDS, WETLANDS BUFFER OR STREAM BUFFER. THIS SHALL BE COMPLETED BY AND INSPECTED AT THE PRE-CONSTRUCTION MEETING.
4. WITH PERMISSION, FROM THE SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB FOR AND INSTALL STABILIZED CONSTRUCTION ENTRANCE. INSTALL SUPER SILT FENCE (SSF) AROUND SEDIMENT BASIN AS SHOWN ON PLANS.
5. CLEAR AND GRUB FOR, INSTALL BASIN, DIKES AND SWALE. STABILIZE IMMEDIATELY.
6. INSTALL REMAINDER OF SEDIMENT AND EROSION CONTROL (SEC) MEASURES.
7. NOTIFY HCD DEPARTMENT OF INSPECTION, UPON COMPLETION OF SAID INSTALLATION.
8. WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR CLEAR AND GRUB REMAINDER OF SITE SOUTH OF STEPHENS ROAD STA. 3+75. EXECUTE/ MAINTAIN DUST CONTROL PER DUST CONTROL SPECIFICATIONS.
9. INSTALL STORM DRAINS AND CURB AND GUTTER FOR ROAD WIDENING UP TO STA. 3+75. AT THE TIME I-5 IS CONSTRUCTED INSTALL TEMPORARY 12" PIPE AND SUMP (SEE DETAIL, SHEET 12 OF 18). ABANDON THE EXISTING 12" CULVERT (THAT CROSSES STEPHENS ROAD) IN PLACE BY FILLING WITH GROUT. FILL SUMP AT UPSTREAM END OF ABANDONED CULVERT AS NECESSARY SO THAT RUNOFF WILL DRAIN TO TEMPORARY SUMP. GRADE THIS AREA SO THAT POSITIVE DRAINAGE BETWEEN THE EXISTING DEPRESSION (WEST SIDE OF STEPHENS ROAD, NORTH OF STA. 3+50) AND THE TEMPORARY 12" PIPE (AT INLET I-5) IS OBTAINED. STABILIZE IMMEDIATELY.
10. WITH THE APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB REMAINDER OF SITE NORTH OF STA. 3+75. CONSTRUCT REMAINING STORM DRAINS & CURB & GUTTER.
11. PAVE ROAD.
12. UPON STABILIZATION OF SITE WITH ESTABLISHED VEGETATION AND WITH PERMISSION OF THE SEDIMENT CONTROL INSPECTOR, FLUSH STORM DRAIN SYSTEM.
13. WITH THE EXCEPTION OF BASIN1, SF/SSF DOWNSTREAM OF BASIN 1 AND TEMPORARY SWALE (FROM STEPHENS ROAD TO BASIN 1), REMOVE SEDIMENT CONTROL MEASURES AND STABILIZE. BASIN 1 AND TEMPORARY SWALE SHALL BE USED IN THE EMERSON 2/5a PHASE.

Sequence of Operations

Earthwork Operations

THE NATURAL MOISTURE CONTENT OF THE FILL MATERIALS ON SITE WAS GENERALLY ABOVE THE OPTIMUM MOISTURE CONTENT. BASED ON THESE CONDITIONS, SIGNIFICANT DRYING OF THE SOIL BY DISCING AND AERATION OR OTHER MEANS OF MANIPULATION CAN BE ANTICIPATED DURING THE EARTHWORK PROCESS. THE MICACEOUS COMPONENT OF THE ON-SITE SOILS MAKES IT SUSCEPTIBLE TO LOSS OF STRENGTH UPON EXPOSURE TO FREE WATER, THEREFORE, IT WOULD BE PRUDENT TO SCHEDULE CLEARING AND GRUBBING, STRIPPING, AND EARTHWORK OPERATIONS FOR THE WARMER, DRYER PERIODS OF THE YEAR IF POSSIBLE SO THAT CONSTRUCTION SCHEDULES WILL NOT BE DELAYED DUE TO INCLEMENT WEATHER.

ALL FILL PLACED FOR THE EMBANKMENT, UTILITY BACKFILL, OR ANY OTHER LOCATION REQUIRING STABLE SUPPORT OR MINIMAL SETTLEMENT SHALL BE CONSTRUCTED AS CONTROLLED COMPACTED FILL. CONTROLLED COMPACTED FILL AND FOUNDATION EXCAVATIONS SHALL MEET THE FOLLOWING REQUIREMENTS:

A) WITHIN THE DESCRIBED CONSTRUCTION AREAS, STRIP THE VEGETATION, TOPSOIL, AND ANY ORGANIC, CONTAMINATED, OR OTHERWISE UNSUITABLE MATERIALS TO EXPOSE CLEAN SOILS. THE SUBJECT AREA SHALL ENCOMPASS THE SWM POND AND EXTEND OUTWARD FROM THE EDGES A MINIMUM OF 5 FEET PLUS 1 ADDITIONAL FOOT HORIZONTALLY FOR EVERY FOOT OF NEW FILL TO BE PLACED, OR CUT TO BE EXCAVATED.

B) PROOFROLL THE STRIPPED SOIL SURFACE WITH A FULLY LOADED, TANDEM-AXLE DUMP TRUCK, OR OTHER APPROVED EQUIPMENT, UNDER THE OBSERVATION OF A GEOTECHNICAL ENGINEER OR HIGHLY QUALIFIED SENIOR LEVEL SOILS TECHNICIAN, TO VERIFY AND ESTABLISH A UNIFORM, DENSE AND STABLE CONDITION. ANY SOFT, YIELDING, ORGANIC, CONTAMINATED, OR OTHERWISE UNACCEPTABLE SPOTS DETECTED SHALL BE OVEREXCAVATED AND REPLACED WITH CONTROLLED COMPACTED FILL.

C) ANY MATERIAL USED FOR CONTROLLED FILL SHALL BE INSPECTED AND APPROVED FOR USE BY A GEOTECHNICAL ENGINEER OR QUALIFIED SOILS TECHNICIAN PRIOR TO USE ON THE SITE. ALL FILL SHALL BE FREE FROM TOPSOIL, BOULDERS, COBBLES, ROOTS, ORGANIC MATTER, AND DEBRIS. PRELIMINARY APPROVAL OF THE BORROW MATERIAL SHALL NOT CONSTITUTE GENERAL ACCEPTANCE OF ALL MATERIALS IN THE DEPOSIT OR SOURCE OF SUPPLY, AND THE ACCEPTANCE SHALL BE SUBJECT TO FIELD TESTS TAKEN AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER OR QUALIFIED SOILS TECHNICIAN.

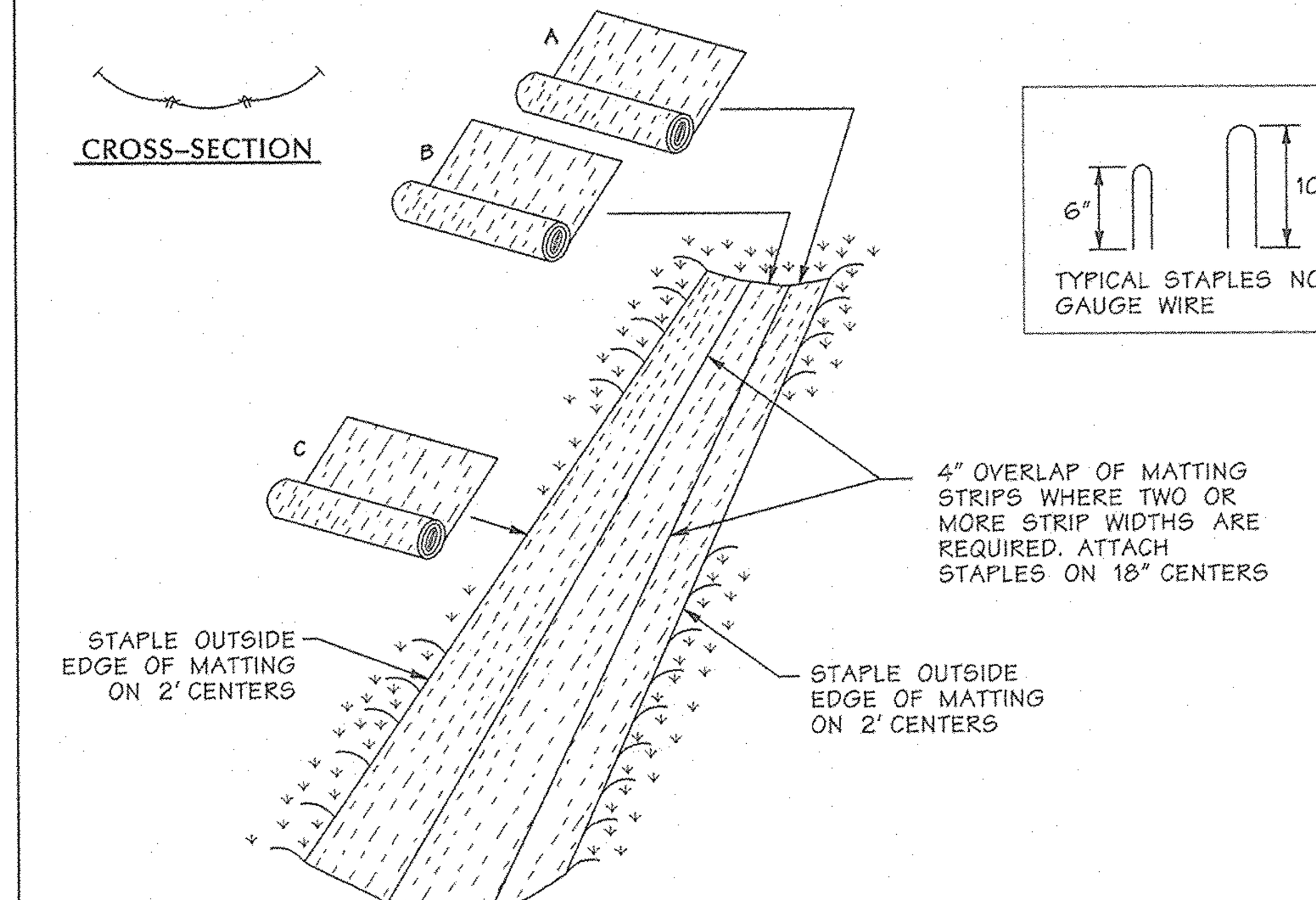
D) COMPACTED FILL SHOULD BE PLACED IN HORIZONTAL, SUCCESSIVE, UNIFORM LAYERS HAVING A MAXIMUM UNCOMPACTED LIFT THICKNESS OF 8 INCHES. EACH LIFT SHOULD BE COMPACTED UNIFORMLY TO A MINIMUM OF 95 PERCENT OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T-99 (ASTM D-698). THE MOISTURE CONTENT OF THE MATERIALS SHALL BE MAINTAINED WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT IN ORDER TO ATTAIN THE REQUIRED DEGREE OF COMPACTION. EACH LIFT SHOULD BE UNIFORMLY AND EVENLY BLADE MIXED DURING SPREADING TO ENSURE UNIFORMITY OF THE MATERIAL IN EACH LAYER. IF THE WORK DETERIORATES PRIOR TO PLACEMENT OF THE NEXT LIFT, THE LAYER SHALL BE RECOMPACTED AND RESHAPED ACCORDINGLY.

E) SUCCESSIVE LIFTS OF COMPACTED FILL SHALL NOT BE PLACED UNTIL THE LAYER UNDER CONSTRUCTION HAS BEEN COMPACTED TO THE REQUIRED DENSITY AS MEASURED BY A GEOTECHNICAL ENGINEER OR QUALIFIED SOILS TECHNICIAN. SUCCESSIVE RUNS OF EQUIPMENT SHALL BE STAGGERED OVER THE WIDTH OF EACH LAYER.

F) WHERE FILLS ARE TO BE PLACED ON SLOPES, THE ORIGINAL GROUND SHOULD BE DEEPLY SCARIFIED OR WHERE SLOPES ARE STEEPER THAN 5:1 THE SLOPE SHOULD BE BENCHED, WHEN CONSIDERED NECESSARY BY THE ENGINEER, IN ORDER THAT THE PLACEMENT OF FILL MAY BE ACCOMPLISHED IN HORIZONTAL LIFTS.

IT IS NOTED THAT THIS METHODOLOGY IS RECOMMENDED BOTH AS PREPARATION FOR AREAS TO RECEIVE NEW FILL, AS WELL AS, LOCATIONS WHERE CUT IS REQUIRED TO ESTABLISH THE PROPOSED GRADES SUCH AS FOUNDATION EXCAVATIONS. IN CUT AREAS, THE PROOFROLLING AND SELECTIVE UNDERCUTTING SHALL BE ACCOMPLISHED AFTER EXCAVATION DOWN TO THE PROPOSED GRADES HAS BEEN COMPLETED.

Geotechnical Recommendations



CONSTRUCTION SPECIFICATIONS

1. KEY-IN THE MATTING BY PLACING THE TOP ENDS OF THE MATTING IN A NARROW TRENCH, 6" IN DEPTH. BACKFILL THE TRENCH AND TAMP FIRMLY TO CONFORM TO THE CHANNEL CROSS-SECTION. SECURE WITH A ROW OF STAPLES ABOUT 4" DOWN SLOPE FROM THE TRENCH. SPACING BETWEEN STAPLES IN 6".
2. STAPLE THE 4" OVERLAP IN THE CHANNEL CENTER USING AN 18" SPACING BETWEEN STAPLES.
3. BEFORE STAPLING THE OUTER EDGES OF THE MATTING, MAKE SURE THE MATTING IS SMOOTH AND IN FIRM CONTACT WITH THE SOIL.
4. STAPLES SHALL BE PLACED 2' APART WITH 4 ROWS FOR EACH STRIP, 2 OUTER ROWS, AND 2 ALTERNATING ROWS DOWN THE CENTER.
5. WHERE ONE ROLL OF MATTING ENDS AND ANOTHER BEGINS, THE END OF THE TOP STRIP SHALL OVERLAP THE UPPER END OF THE LOWER STRIP BY 4", SHIPLAP FASHION. REINFORCE THE OVERLAP WITH A DOUBLE ROW OF STAPLES SPACED 6" APART IN A STAGGERED PATTERN ON EITHER SIDE.
6. THE DISCHARGE END OF THE MATTING LINER SHOULD BE SIMILARLY SECURED WITH 2 DOUBLE ROWS OF STAPLES.

NOTE: IF FLOW WILL ENTER FROM THE EDGE OF THE MATTING THEN THE AREA EFFECTED BY THE FLOW MUST BE KEYED-IN.

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

Erosion Control Matting

Not To Scale

DEVELOPER'S CERTIFICATION:

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

SIGNATURE OF DEVELOPER — DATE 1/14/04
PRINT NAME BELOW SIGNATURE

ENGINEER'S CERTIFICATION:

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

SIGNATURE OF ENGINEER — 1/14/04
PRINT NAME BELOW SIGNATURE
John W. Ranucchia Sa

THIS PLAN HAS BEEN REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.

U.S. NATURAL RESOURCE CONSERVATION SERVICE — DATE 1/26/04

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

HOWARD S.C.D. — DATE 1/26/04

1/14/04
Date

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2/24/04

Date	No.	Revision Description

Emerson Section 2

Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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

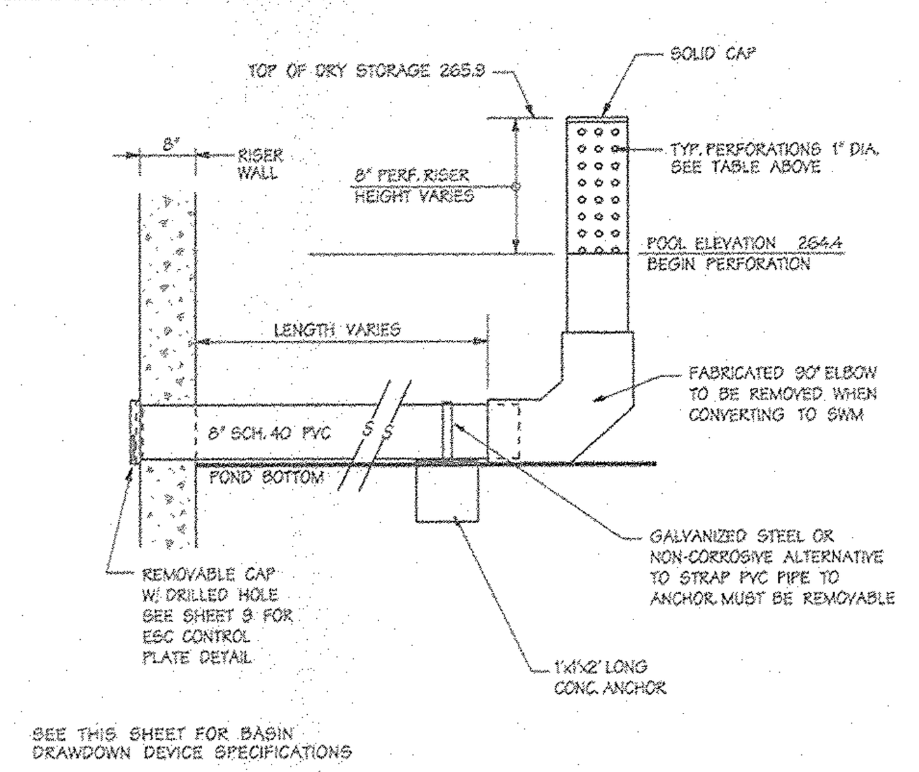
AREA: TAX MAP 47 — PARCEL 837
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE: SEDIMENT & EROSION CONTROL DETAILS

Drn By: WDE	Scale: N/A	Proj. No. 95054.G2	
Des By: MRT	Date: 1/15/04	13 of 18	
Chk By:	Approved:		

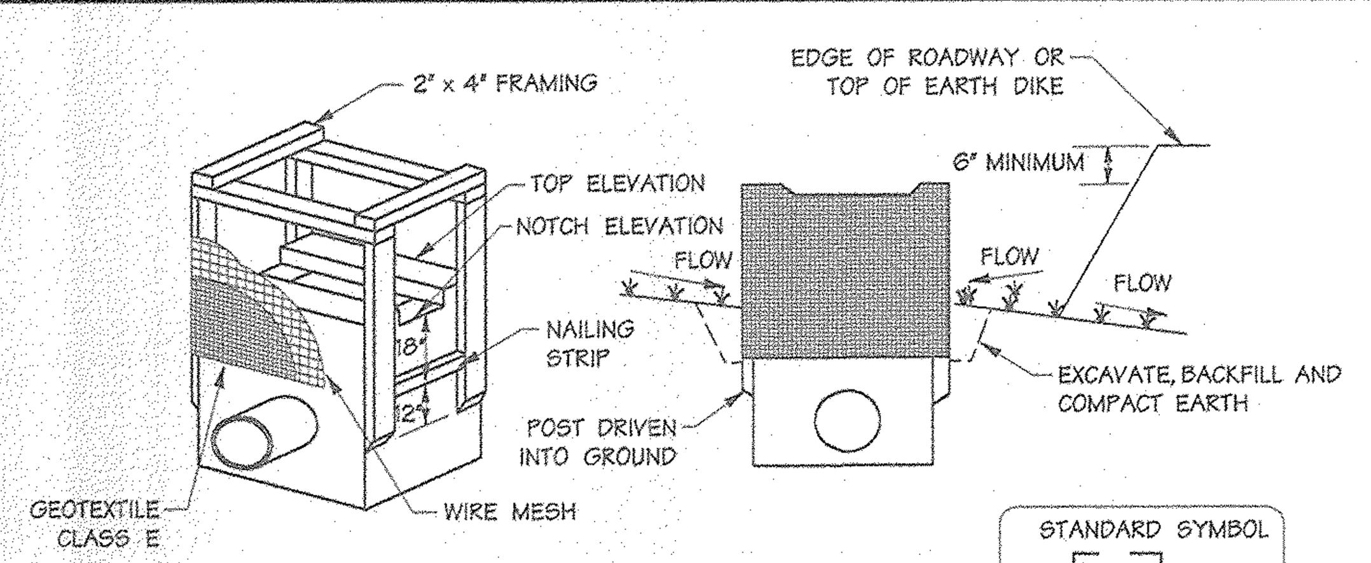
F-03-175

RISER #	LENGTH	WET POOL ELEV.	PERF. RISER HEIGHT	ORIFICE DRILLED HOLE SIZE	PERFORATION SPACING	PERFORATIONS PER VERT. FT.
BASIN 1	8'	264.4	1.5'	1.0"	2.0"	56



Not to Scale

Sediment Control Draw-Down



MAX. DRAINAGE AREA = 1/4 ACRE

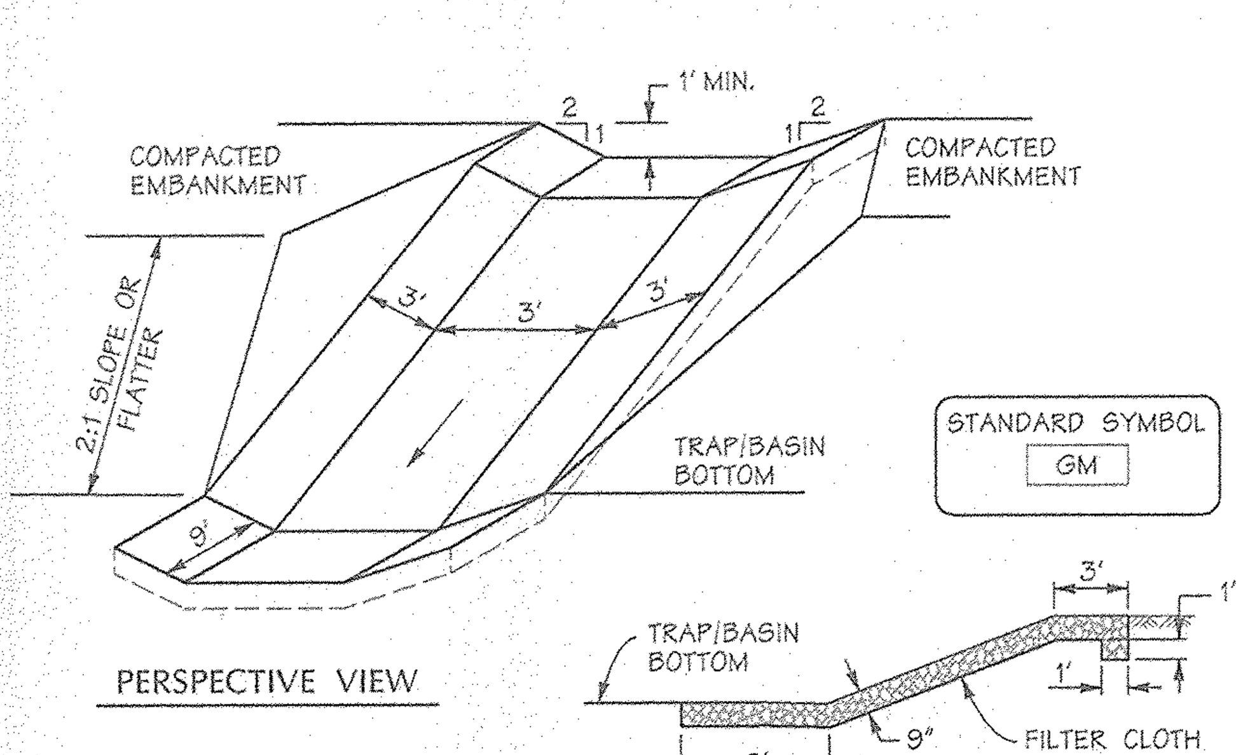
CONSTRUCTION SPECIFICATIONS

1. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18" BELOW THE NOTCH ELEVATION.
2. DRIVE THE 2" x 4" CONSTRUCTION GRADE LUMBER POSTS 1' INTO THE GROUND AT EACH CORNER OF THE INLET. PLACE NAIL STRIPS BETWEEN THE POSTS ON THE ENDS OF THE INLET. ASSEMBLE THE TOP PORTION OF THE 2" x 4" FRAME USING THE OVERLAP JOINT SHOWN ON DETAIL. THE TOP OF THE FRAME (WEIR) MUST BE 6" BELOW ADJACENT ROADWAYS WHERE FLOODING AND SAFETY ISSUES MAY ARISE.
3. STRETCH THE ½" x ½" WIRE MESH TIGHTLY AROUND THE FRAME AND FASTEN SECURELY. THE ENDS MUST MEET AND OVERLAP AT A POST.
4. STRETCH THE GEOTEXTILE CLASS E TIGHTLY OVER THE WIRE MESH WITH THE GEOTEXTILE EXTENDING FROM THE TOP OF THE FRAME TO 18" BELOW THE INLET NOTCH ELEVATION. FASTEN THE GEOTEXTILE FIRMLY TO THE FRAME. THE ENDS OF THE GEOTEXTILE MUST MEET AT A POST, BE OVERLAPPED AND FOLDED, THEN FASTENED DOWN.
5. BACKFILL AROUND THE INLET IN COMPACTED 6" LAYERS UNTIL THE LAYER OF EARTH IS LEVEL WITH THE NOTCH ELEVATION ON THE ENDS AND TOP ELEVATION ON THE SIDES.
6. IF THE INLET IS NOT IN A SUMP, CONSTRUCT A COMPACTED EARTH DIKE ACROSS THE DITCH LINE DIRECTLY BELOW IT. THE TOP OF THE EARTH DIKE SHOULD BE AT LEAST 6" HIGHER THAN THE TOP OF THE FRAME.
7. THE STRUCTURE MUST BE INSPECTED PERIODICALLY AND AFTER EACH RAIN AND THE GEOTEXTILE REPLACED WHEN IT BECOMES CLOGGED.

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

Not To Scale

Standard Inlet Protection



PROFILE ALONG CENTERLINE

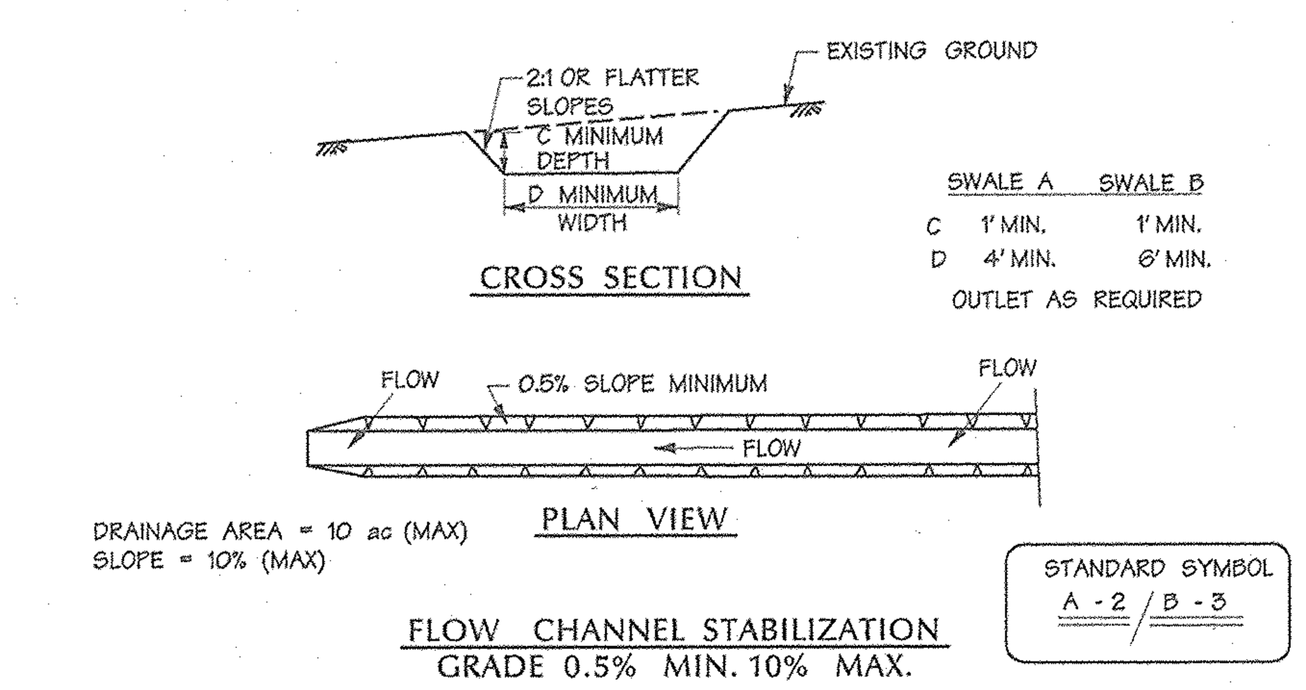
CONSTRUCTION SPECIFICATIONS

1. GABION INFLOW PROTECTION SHALL BE CONSTRUCTED OF 9' x 3' x 9" GABION BASKETS FORMING A TRAPEZOIDAL CROSS SECTION 1' DEEP, WITH 2:1 SIDE SLOPES, AND A 3' BOTTOM WIDTH.
2. GEOTEXTILE CLASS C SHALL BE INSTALLED UNDER ALL GABION BASKETS.
3. THE STONE USED TO FILL THE GABION BASKETS SHALL BE 4" - 7".
4. GABIONS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
5. GABION INFLOW PROTECTION SHALL BE USED WHERE CONCENTRATED FLOW IS PRESENT ON SLOPES STEEPER THAN 4:1.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
B - 7 - 2
MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

Gabion Inflow Protection

NOT TO SCALE



DRAINAGE AREA = 10 ac (MAX)
SLOPE = 10% (MAX)

PLAN VIEW

STANDARD SYMBOL A - 2 / B - 3

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

1. SEED AND COVER WITH STRAW MULCH.
2. SEED AND COVER WITH EROSION CONTROL MATTING OR LINE WITH SOD.
3. 4"-7" STONE OR RECYCLED CONCRETE EQUIVALENT PRESSED INTO SOIL IN A MINIMUM 7" LAYER.

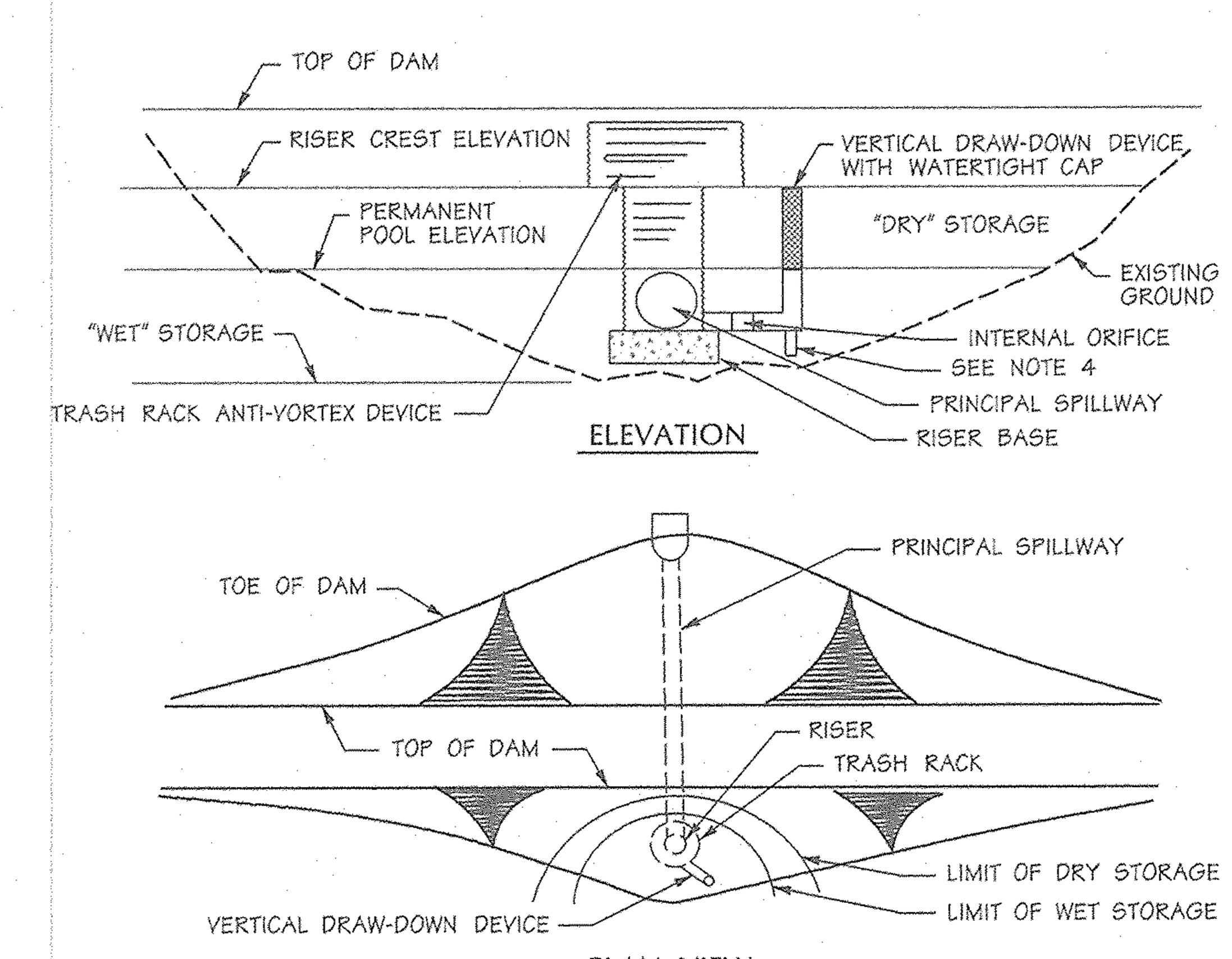
CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET. SPOT ELEVATIONS MAY BE NECESSARY FOR GRADES LESS THAN 1%
2. RUNOFF DIVERTED FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. RUNOFF DIVERTED FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT A NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONAL MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE SWALE.
5. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILL, IF NECESSARY, SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE SWALE.
8. INSPECTION AND MAINTENANCE MUST BE PROVIDED PERIODICALLY AND AFTER EACH RAIN EVENT.

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

Not To Scale

Temporary Swale



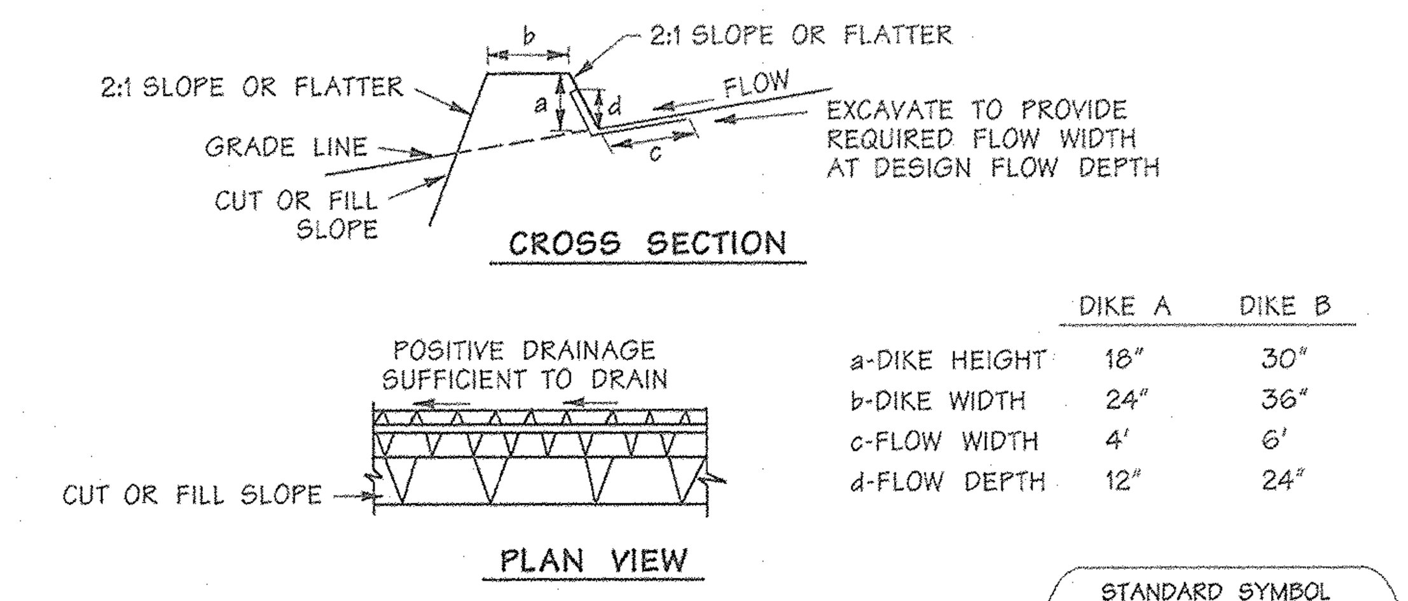
PLAN VIEW

CONSTRUCTION SPECIFICATIONS

1. PERFORATIONS IN THE DRAW-DOWN DEVICE MAY NOT EXTEND INTO THE WET STORAGE.
2. THE TOTAL AREA OF THE PERFORATIONS MUST BE GREATER THAN 4 TIMES THE AREA OF THE INTERNAL ORIFICE.
3. THE PERFORATED PORTION OF THE DRAW-DOWN DEVICE SHALL BE WRAPPED WITH ½" HARDWARE CLOTH AND GEOTEXTILE FABRIC. THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS FOR GEOTEXTILE CLASS E.
4. PROVIDE SUPPORT OF DRAW-DOWN DEVICE TO PREVENT SAGGING AND FLOTATION. AN ACCEPTABLE PREVENTATIVE MEASURE IS TO STAKE BOTH SIDES OF THE DRAW-DOWN DEVICE WITH 1" STEEL ANGLE, OR 2" BY 2" SQUARE OR 2" ROUND WOODEN POSTS SET 3' MINIMUM INTO THE GROUND THEN JOINING THEM TO THE DEVICE BY WRAPPING WITH 12 GAUGE MINIMUM WIRE.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
C - 10 - 30
MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

Basin Drawdown Schematic Ver. Drawdown Device



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

PLAN VIEW

STANDARD SYMBOL
E.D. A-2
E.D. B-3

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

1. SEED AND COVER WITH STRAW MULCH.
2. SEED AND COVER WITH EROSION CONTROL MATTING OR LINE WITH SOD.
3. 4" - 7" STONE OR RECYCLED CONCRETE EQUIVALENT PRESSED INTO THE SOIL 7" MINIMUM.

CONSTRUCTION SPECIFICATIONS

1. ALL TEMPORARY EARTH DIKES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET. SPOT ELEVATIONS MAY BE NECESSARY FOR GRADES LESS THAN 1%.
2. RUNOFF DIVERTED FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
3. RUNOFF DIVERTED FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED, STABILIZED AREA AT A NON-EROSIVE VELOCITY.
4. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONAL MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE DIKE.
5. THE DIKE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF BANK PROJECTIONS OR OTHER IRREGULARITIES WHICH WILL IMPEDE NORMAL FLOW.
6. FILL SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
7. ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIKE.
8. INSPECTION AND MAINTENANCE MUST BE PROVIDED PERIODICALLY AND AFTER EACH RAIN EVENT.

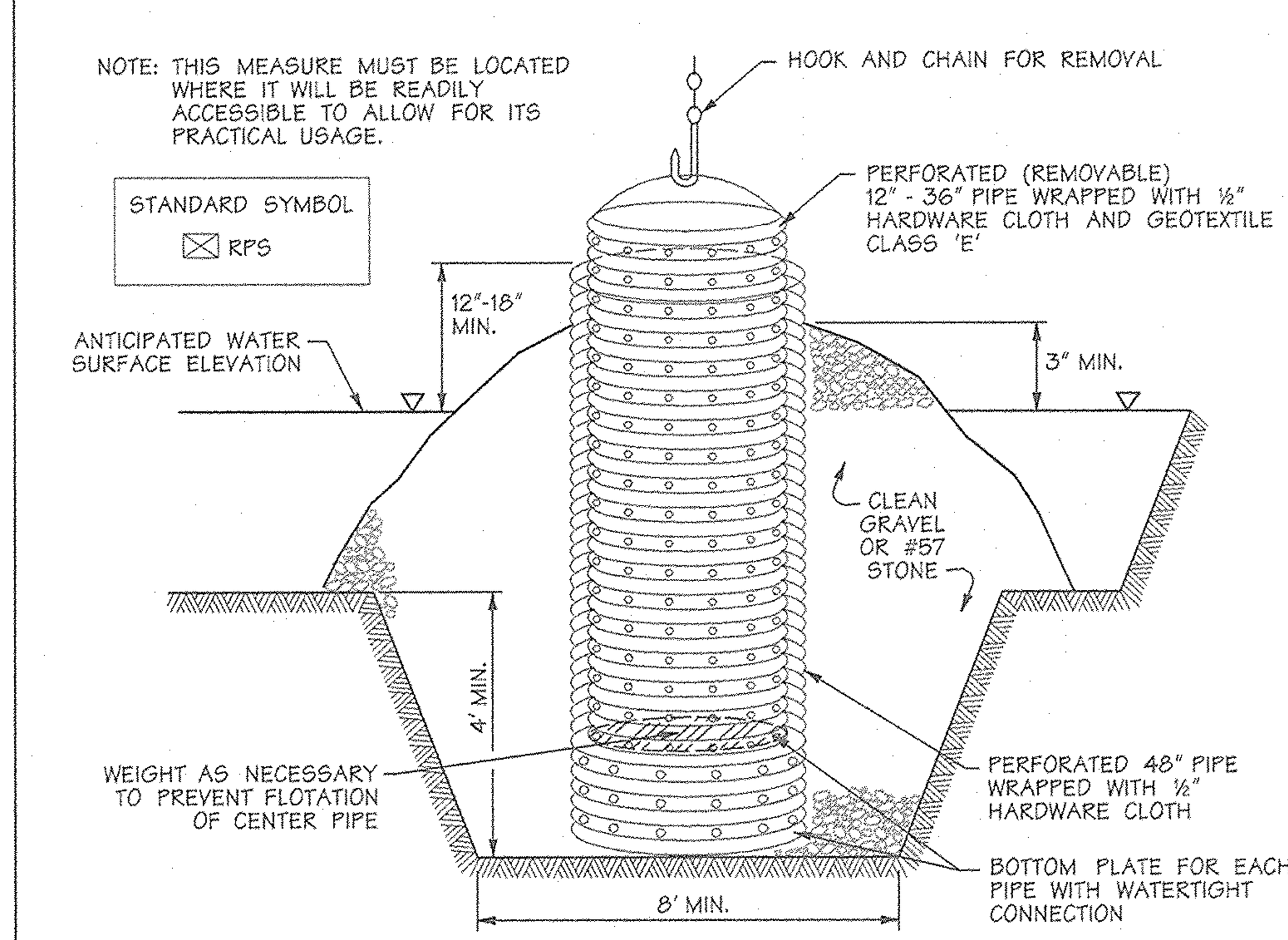
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
A - 1 - 6
MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

Not To Scale

Earth Dike

NOTE: THIS MEASURE MUST BE LOCATED WHERE IT WILL BE READILY ACCESSIBLE TO ALLOW FOR ITS PRACTICAL USAGE.

STANDARD SYMBOL
RPS



ELEVATION (CUT AWAY)

CONSTRUCTION SPECIFICATIONS

1. THE OUTER PIPE SHOULD BE 48" DIAMETER OR SHALL, IN ANY CASE, BE AT LEAST 4" GREATER IN DIAMETER THAN THE CENTER PIPE. THE OUTER PIPE SHALL BE WRAPPED WITH ½" HARDWARE CLOTH TO PREVENT BACKFILL MATERIAL FROM ENTERING THE PERFORATIONS.
2. AFTER INSTALLING THE OUTER PIPE, BACKFILL AROUND OUTER PIPE WITH 2" AGGREGATE OR CLEAN GRAVEL.
3. THE INSIDE STAND PIPE (CENTER PIPE) SHOULD BE CONSTRUCTED BY PERFORATING A CORRUGATED OR PVC PIPE BETWEEN 12" AND 36" IN DIAMETER. THE PERFORATIONS SHALL BE ½" x 6" SLITS OR 1" DIAMETER HOLES 6" ON CENTER. THE CENTER PIPE SHALL BE WRAPPED WITH ½" HARDWARE CLOTH FIRST, THEN WRAPPED AGAIN WITH GEOTEXTILE CLASS E.
4. THE CENTER PIPE SHOULD EXTEND 12" TO 18" ABOVE THE ANTICIPATED WATER SURFACE ELEVATION OR RISER CREST ELEVATION WHEN DEWATERING A BASIN.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
D - 12 - 5
MARYLAND DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

Removable Pumping Station

NOT TO SCALE

DEVELOPER'S CERTIFICATION:

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Paul G. Cavanaugh 1/14/04
SIGNATURE OF DEVELOPER / DATE
PRINT NAME BELOW SIGNATURE

ENGINEER'S CERTIFICATION:

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

[signature] 1/14/04
SIGNATURE OF ENGINEER
PRINT NAME BELOW SIGNATURE
John W. Ranocchia, Sr.

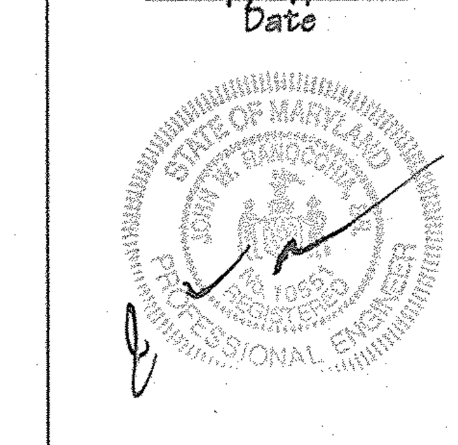
REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS

[signature] 1/26/04
U.S. NATURAL RESOURCE CONSERVATION SERVICE / DATE

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

[signature] 1/26/04
HOWARD S.C.D. / DATE

1/14/04
Date



Professional Engr. No. 10557

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

[signature] 2-4-04
CHIEF, BUREAU OF HIGHWAYS / DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

Cindy Hamilton 2/27/04
CHIEF, DIVISION OF LAND DEVELOPMENT / DATE

[signature] 2/24/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION / DATE

Date	No.	Revision Description

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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

AREA
TAX MAP 47 — PARCEL 837
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

SEDIMENT & EROSION CONTROL DETAILS

Des By:	RB/RT	Scale:	N/A	Proj. No.	95054.G2
Drn By:	WDE	Date:	1/15/04	14 of 18	
Chk By:		Approved:			

Wed Jan 14 13:06:50 2004:\95054\95054g\95054g.ec4

F-03-175

STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. SITE PREPARATION

I. Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms waterways, or sediment control basins.

II. Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding.

III. Schedule required soil test to determine soil amendment composition and application rates for sites having disturbed area over 5 acres.

B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

I. Soil test must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 5 acres. Soil analysis may be performed by the University of Maryland or a recognized commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analysis.

II. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers shall be delivered to the site fully labeled according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrantee of the producer.

III. Lime materials shall be ground limestone (hydrated or brunt lime may be substituted) which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50% will pass through a #100 mesh sieve and 98 - 100% will pass through a #20 mesh sieve.

IV. Incorporate lime and fertilizer into the top 3 - 5 inches of soil by disking or other suitable means.

C. SEEDBED PREPARATION

I. TEMPORARY SEEDING

A. Seedbed preparation shall consist of loosening soil to a depth of 3 inches to 5 inches by means of suitable agricultural or construction equipment, such a disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened it should not be rolled or dragged smooth but left in the roughened condition. Sloped areas (greater than 3:1) should be tracked leaving the surface in an irregular condition with ridges running parallel to the counter of the slope.

B. Apply fertilizer and lime as prescribed on the plans.

C. Incorporate lime and fertilizer into the top 3 - 5 inches of soil by disking or other suitable means.

II. PERMANENT SEEDING

A. Minimum soil conditions required for permanent vegetative establishment:

1. Soil ph shall be between 6.0 and 7.0.
2. Soluble salts shall be less than 500 parts per million (PPM).
3. The soil shall contain less than 40% clay but enough fine grained material (> 30% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if Lovegrass or Sericia Lespedeza is to be planted. Then a sandy soil (< 30% silt plus clay) would be acceptable.
4. Soil shall contain 1.5% minimum organic matter by weight.
5. Soil must contain sufficient pore space to permit adequate root penetration.
6. If these conditions cannot be met by the soils on site, adding topsoil is required in accordance with Section 21 - Standard and Specification for Topsoil.

B. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3 - 5 inches to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.

C. Apply soil amendments as per soil test or as included on the plans.

D. Mix soil amendments into the top 3 - 5 inches of topsoil by disking or other suitable means. Lawn areas should be raked to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Where site conditions will not permit normal seedbed preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 - 3 inches of soil should be loose and friable. Seedbed loosening may not be necessary on newly disturbed areas.

D. SEED SPECIFICATIONS

I. All seed must meet the requirements of the Maryland State Seed Law. All seed shall be subject to re-testing by a recognized seed laboratory. All seed used shall have been tested within the 6 months immediately preceding the date of sowing such material on this job.

Note: Seed tags shall be made available to the inspector to verify type and rate of seed used.

II. Inoculant - The inoculant for treating legume seed in the seed mixtures shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species. Inoculants shall not be used later than the date indicated on the container. Add fresh inoculant as directed on 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 75-80 F. can weaken bacteria and make the inoculant less effective.

E. METHODS OF SEEDING

I. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or cultipacker seeder.

A. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following:
Nitrogen; maximum of 100 pounds per acre total of soluble
Nitrogen; P205 (phosphorous); 200 pounds per acre; K20 (potassium): 200 pounds per acre.

B. 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.

C. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.

II. Dry Seeding: This includes use of conventional drop or broadcast spreaders.

A. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the temporary or permanent seeding summaries or tables 25 or 26. The seeded area shall then be rolled with a weighed roller to provide good seed soil contact.

B. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

III. Drill or cultipacker seeding: Mechanized seeders that apply and cover seed with soil.

A. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least ¼ inch of soil covering.

Seedbed must be firm after planting.

B. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

F. MULCH SPECIFICATIONS (IN ORDER OF PREFERENCE)

I. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonably bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weeds seeds as specified in the Maryland Seed Law.

II. Wood cellulose fiber mulch (WCFM)

A. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state.

B. WCFM shall 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.

C. WCFM, including dye shall contain no germination or growth inhibiting factors.

D. WCFM materials shall 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 shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.

E. WCFM material shall contain no elements or compounds at concentration levels that will be phyto-toxic.

F. WCFM must conform to the following physical requirements:
Fiber length to approximately 10 mm., diameter approximately 1mm., ph range of 4.0 to 8.5, ash content of 1.6% maximum and water holding capacity of 90% minimum.

Note: Only sterile straw mulch should be used in areas where one species of grass is desired.

G. MULCHING SEEDED AREAS - Mulch shall be applied to all seeded areas where one species of grass is desired.

I. If grading is completed outside of the seeding season, mulch alone shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications.

II. When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons per acre. Mulch shall be applied in a uniform loose depth of between 1inches and 2 inches. Mulch applied shall achieve a uniform distribution and depth so that the surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons per acre.

III. Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 pounds per acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

H. SECURING STRAW MULCH - Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area and erosion hazard:

I. A mulch anchoring tool is a tractor drawn implement design to punch and anchor mulch into the soil surface a minimum of two (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 be used on the contour if possible.

II. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 pounds per acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

III. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys or on crest of banks. The remainder of area should appear uniform after binder application. Synthetic binders - such as Acrylic DLR (agro-tack), DCA-70, Petroset, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.

IV. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3,000 feet long.

SECTION II - TEMPORARY SEEDING

VEGETATION - Annual grass or grain used to provide cover on disturbed areas for up to 12 months. For longer duration of vegetative cover, permanent seeding is required.

Seed Mixture (Hardiness Zone 6B)					Fertilizer Rate (10-10-10)	Lime Rate
No.	Species	Application Rate (Lb./Ac.)	Seeding Dates	Seeding Depths		
1	Annual Ryegrass	50	2/1 - 4/30 8/15 - 11/1	½"-½"	600 Lbs./Ac. (15 Lbs./1000 SF)	2 Tons/Ac. (100 Lbs./1000 SF)
2	Weeping Lovegrass	4	5/1 - 8/14	¼"-½"		

SECTION III - PERMANENT SEEDING

Seeding grass and legumes to establish ground cover for a minimum of one year on disturbed areas generally receiving low maintenance.

Seed Mixture No.3 (Hardiness Zone 6B)					Fertilizer Rate (10-20-20)			Lime Rate
%	Species	Application Rate (Lb./Ac.)	Seeding * Dates	Seeding Depths	N	P205	K20	
85	Rebel II Tall Fescue	125	3/1 - 5/15 8/15 - 11/15	¼"-½"	90 Lb./Ac. (2 Lb./ 1000 Sq.Ft.)	175 Lb./Ac. (4 Lb./ 1000 Sq.Ft.)	175 Lb./Ac. (4 Lb./ 1000 Sq.Ft.)	2 Tons/Ac. (100 Lb./ 1000 Sq.Ft.)
10	Pennfine Perennial Ryegrass	15						
5	Kenblue Kentucky Bluegrass	10						

* For 5-16 through 8-14 add two (2) pounds of Weeping Lovegrass per acre or ten (10) pounds of Millet per acre to seed mixture (i.e. Mix #3 shown).

G - 20 - 1A

Vegetative Stabilization

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SECTION IV - SOD

To provide quick cover on disturbed areas (2:1 grade or flatter)

A. GENERAL SPECIFICATIONS

I. Class of turfgrass sod shall be Maryland or Virginia State certified or approved. Sod labels shall be made available to the job foreman and inspector.

II. Sod shall be machine cut at a uniform soil thickness of¾", plus or minus¼", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the suppliers width length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pads and torn or uneven ends will not be acceptable.

III. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.

IV. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.

V. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be approved by an agronomist or soil scientist prior to its installation.

B. SOD INSTALLATION

I. During periods of excessively high temperature or in areas having dry subsoil, the subsoil shall be lightly irrigated immediately prior to laying the sod.

II. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which air drying of the roots.

III. Wherever possible, sod shall be laid with the long edges parallel to the contour and with staggering joints. Sod shall be rolled and tamped, pegged or otherwise secured to prevent slippage on slopes and to ensure solid contact between sod roots and the underlying soil surface.

IV. Sod shall be watered immediately following rolling or tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. the operations laying, tamping and irrigating for any piece of sod shall be completed within eight hours.

C. SOD MAINTENANCE

I. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4 inches. Watering should be done during the heat of the day to prevent wilting.

II. After the first week, sod watering is required as necessary to maintain adequate moisture content.

III. The first mowing of sod should not be attempted until the sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2 inches and 3 inches unless otherwise specified.

SECTION V - TURFGRASS ESTABLISHMENT

Areas where turfgrass may be desired may include lawns, parks, playgrounds, and commercial sires which will receive a medium high level of maintenance. Areas to receive seed shall be tilled by disking or other approved methods to a depth of 2 to 4 inches, leveled and raked to prepare a proper seedbed. Stones and debris over 1½inches in diameter shall be removed. The resulting seedbed shall be in such condition that future mowing of grasses will pose no difficulty.

Note: Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.

A. TURFGRASS MIXTURES

I. Kentucky Bluegrass - Full sun mixture - For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended certified Kentucky Bluegrass cultivars seeding rate: 1.5 to 2.0 pounds per 1000 square feet. A minimum of three Bluegrass cultivars should be chosen ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

II. Kentucky Bluegrass/Perennial Rye - Full sun mixture - For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass cultivars/certified Kentucky Bluegrass seeding rate: 2 pounds mixture per 1000 square feet. A minimum of 3 Kentucky Bluegrass cultivars must be chosen, with each cultivar ranging from 10% to 35% of the mixture by weight.

III. Tall Fescue/Kentucky Bluegrass - Full sun mixture - For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes; certified Tall Fescue cultivars 95-100%, certified Kentucky Bluegrass cultivars 0 - 5%, seeding rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.

IV. Kentucky Bluegrass/Fine Fescue - Shade mixture - For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; certified Kentucky Bluegrass cultivars 30-40% and certified Fine Fescue and 60-70%. Seeding rate: 1½- 3 pounds per 1000 square feet. A minimum of 3 Kentucky Bluegrass cultivars must be chosen. With each cultivar ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

Note: Turfgrass varieties should be selected form those listed in the most current University of Maryland publication, agronomy mimeo number 77, "Turfgrass Cultivar Recommendations for Maryland".

B. IDEAL TIMES OF SEEDING

Western Maryland: March 15 - June 1, August 1 - October 1 (hardiness zones - 5B, 6A).

Central Maryland: March 1 - May 15, August 15 - October 15 (hardiness zone - 6B).

Southern Maryland, Eastern Shore: March 1 - May 15, August 15 - October 15 (hardiness zones - 7A , 7B).

C. IRRIGATION

If soil moisture is different, supply new seedlings with adequate water for plant growth (1/2" - 1" every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

D. REPAIRS AND MAINTENANCE

Inspect all seeded areas for failures and make necessary repairs, replacements, and reseedings within the planting season.

I. Once the vegetation is established, the site shall have 95% groundcover to be considered adequately stabilized.

II. If the stand provides less than 40% ground coverage, re-establish following original lime, fertilizer, seedbed preparation and seeding recommendations.

III. If the stand provides between 40% and 94% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.

IV. Maintenance fertilizer rates for permanent seedings are shown in Table 24, for lawns and other medium high maintenance turfgrass areas, refer to the University of Maryland publication "Lawn Care in Maryland" bulletin number 171.

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

DEFINITION

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

PURPOSE

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

CONDITIONS WHERE PRACTICE APPLIES

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

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

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

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

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

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

CONSTRUCTION AND MATERIAL SPECIFICATIONS

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

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

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

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

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

II. For sites having disturbed areas under 5 acres:

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

a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.

b. Organic content of topsoil shall be not less than 1.5 percent by weight.

c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.

d. No sod or seed shall be placed on soil which has been treated with soil esterlants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

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

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

V. Topsoil Application

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

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

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

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

VI. Alternative for Permanent Seeding - Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:

i. Composted Sludge Material for use as a soil conditioner for sites having disturbed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:

a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.

b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a Ph of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.

c. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.

iv. Composted sludge shall be amended with a potassium fertilizer applied at a rate of 4 lb/1,000 square feet, and 1/3 the normal lime application rate.

References: Guidelines Specifications, Soil Preparation and Sodding. MD-VA, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institutes. Revised 1975.

1/14/04
Date

Professional Engr. No. 10557

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2/24/04

Date	No.	Revision Description

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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

AREA
TAX MAP 47 PARCEL 837
6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE
SEDIMENT & EROSION CONTROL SPECIFICATIONS

Des By: MRT	Scale: N/A	Proj. No.	95054.G2
Drn By: WDE	Date: 1/15/04		15 of 18
Chk By:	Approved:		

F-03-175

Wed Jan 14 13:08:20 2004 I:\95054\95054g\95054g.dwg

DEVELOPER'S CERTIFICATION:

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

SIGNATURE OF DEVELOPER — DATE 1/14/04
PRINT NAME BELOW SIGNATURE

ENGINEER'S CERTIFICATION:

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

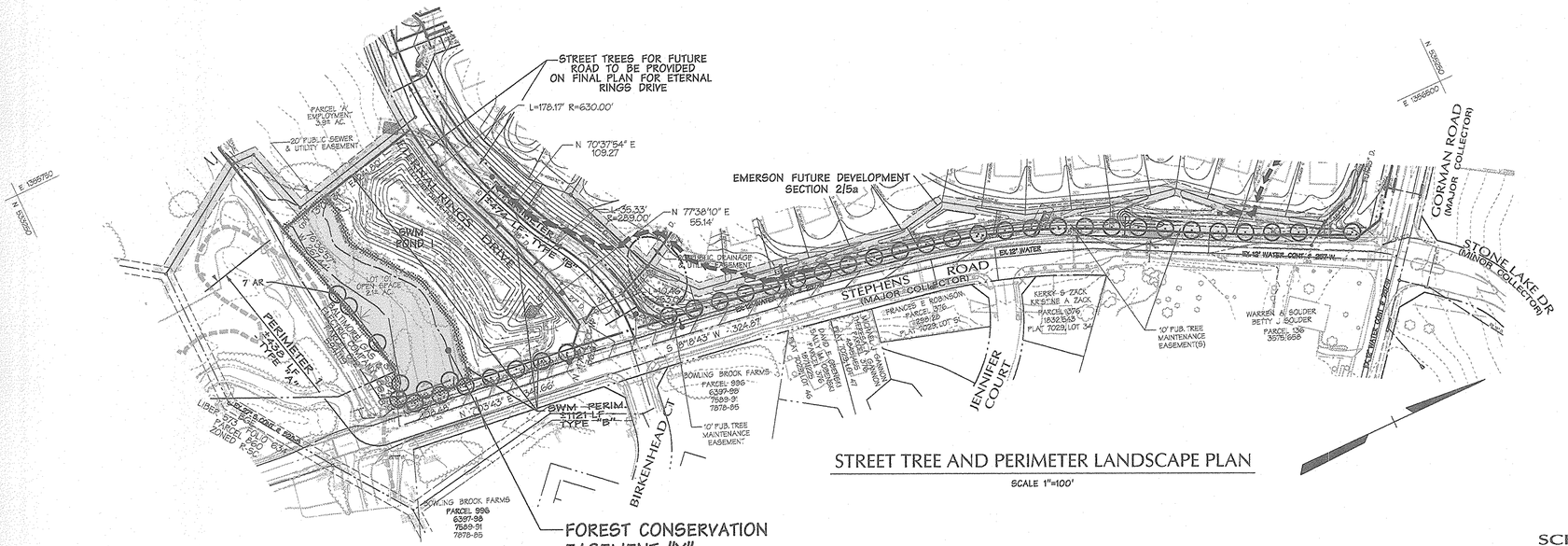
SIGNATURE OF ENGINEER — 1/14/04
PRINT NAME BELOW SIGNATURE
John W. Ranocchia, Sr.

REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS

U.S. NATURAL RESOURCE CONSERVATION SERVICE — DATE 1/26/04

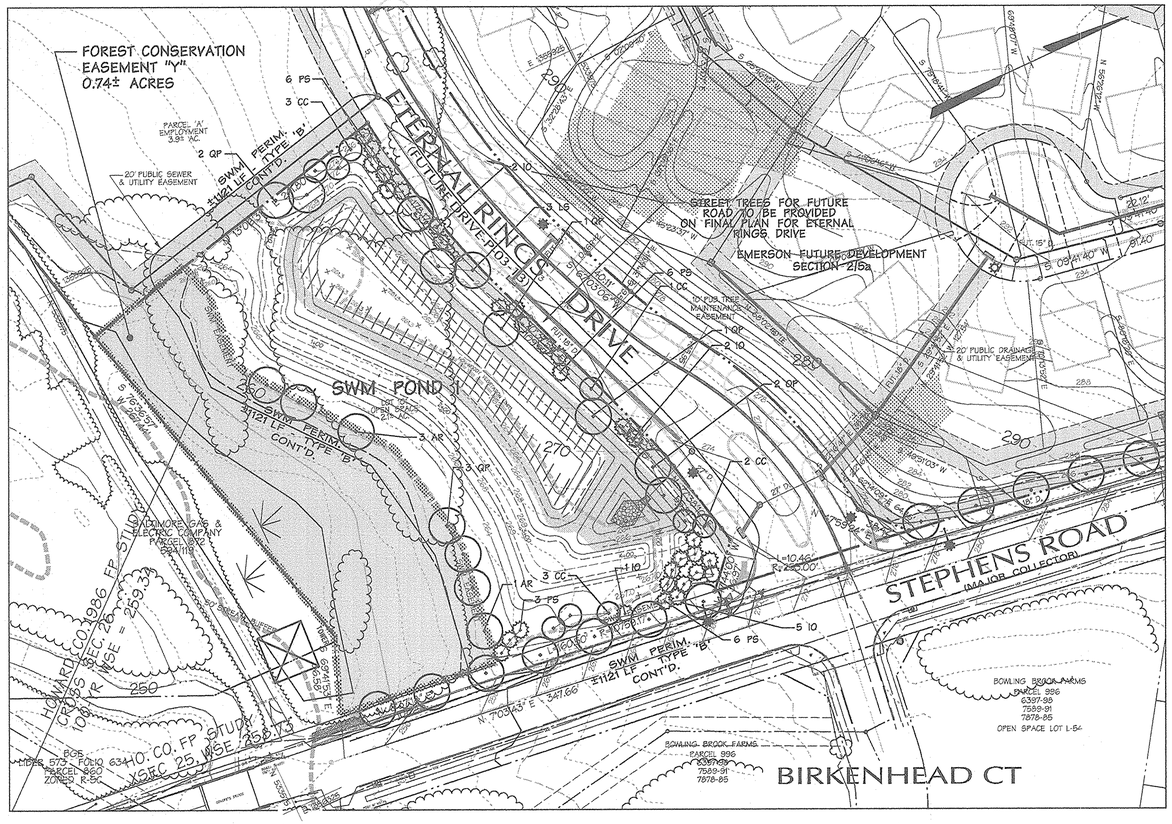
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD S.C.D. — DATE 1/26/04



STREET TREE AND PERIMETER LANDSCAPE PLAN

SCALE 1"=100'



STORMWATER MANAGEMENT POND 1 PERIMETER LANDSCAPING PLAN

SCALE 1"=50'

Legend

EX. CURB & GUTTER		PROP. STORM DRAIN	15" D.
EX. MAJOR CONTOURS	400	PROP. SEWER	8" S.
EX. MINOR CONTOURS	402	PROP. WATER	8" W.
EX. STORM DRAIN	15" RCP	PROPERTY LINE	
EX. SEWER	8" S.	ROADWAY RIGHT-OF-WAY	
EX. WATER	8" W.	PROPOSED LOT LINE	
EXISTING TREE LINE		PROPOSED EASEMENT	
EXISTING WETLAND LIMIT		PROPOSED CURB & GUTTER	
WETLAND BUFFER		PROPOSED SIDEWALK	
100 YR. FLOODPLAIN	100 YEAR WATER SURF. ELEV.	SLOPE 15% - 24.9%	
LIMIT OF DISTURBANCE	LOD	FOREST CONSERVATION EASEMENT	
SOIL(S) LINE (NOT SHOWN)	CmB2 CmC2	PROPOSED MINOR CONTOUR	
75' STREAM BUFFER		PROPOSED MAJOR CONTOUR	
PROPOSED STREET TREE (PRESENT) PROPOSED STREET TREE (FUTURE)		PROPOSED STREET LIGHTS	
ZONE 'A' WATER QUALITY PLANTING		ZONE 'B' WATER QUALITY PLANTING	

Plant List (Perimeter & Stormwater Perimeter Landscaping)

QTY	SYM	BOTANICAL NAME/ COMMON NAME	SIZE	REMARKS
SHADE TREES				
11	AR	ACER RUBRUM 'RED SUNSET' RED SUNSET RED MAPLE	2 1/2" - 3" CAL. 12'-14' HT	B & B FULL HEAD
3	LS	LIQUIDAMBAR STYRACIFLUA SWEET GUM	2 1/2" - 3" CAL. 12'-14' HT	B & B
9	QP	QUERCUS PALUSTRIS PIN OAK	2 1/2" - 3" CAL. 12'-14' HT	B & B
EVERGREEN TREES				
10	IO	ILEX OPACA AMERICAN HOLLY	6'-8' HT.	B & B
21	PS	PINUS STROBUS WHITE PINE	6'-8' HT.	B & B HEAVY / UNSHEARED
FLOWERING TREES				
9	CC	CERCIS CANADENSIS REDBUD	8'-10' HT.	B & B

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT to PERIMETER PROP.
LANDSCAPE TYPE "A"	P 1
LINEAR FEET OF PERIMETER	438 LF.
LANDSCAPE TYPE "B"	
LINEAR FEET OF PERIMETER	
LANDSCAPE TYPE "C"	
LINEAR FEET OF PERIMETER	
CREDIT FOR EXISTING VEGETATION (DESCRIBE BELOW IF NEEDED)	N/A
CREDIT FOR BERM (DESCRIBE BELOW IF NEEDED)	N/A
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES SHRUBS	7 -- --
NUMBER OF PLANTS PROVIDED* SHADE TREES EVERGREEN TREES OTHER TREES (2 :1 SUBSTITUTION) SHRUBS (10 :1 SUBSTITUTION) (DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	7 -- --

NOTE: STREET TREES WILL BE PROVIDED @ 1/40 LF. 33 STREET TREES SHOWN ON THIS SHEET. STREET TREE LOCATIONS SHALL COMPLY WITH SECTION IX OF THE DEVELOPMENT CRITERIA.

NOTE: THE DEVELOPER WILL PROVIDE ALL PERIMETER LANDSCAPE OBLIGATIONS

WATER QUALITY PLANTING PLAN**

FACILITY #1

ZONE "A" (18172 +/- s.f.)

Species	Size	Spacing	Quantity	Remarks
Scirpus tabernaemontanii	quart container*	36"	466	OBL
Iris pseudacoris	quart container*	36"	466	OBL
Lobelia cardinalis	quart container	36"	466	FACW
Iris versicolor	quart container*	36"	466	OBL
Panicum virgatum	quart container	36"	466	FAC
Saururus cernuus	quart container*	36"	466	OBL
TOTALS			2330	

ZONE "B" (16203 +/- s.f.)

Species	Size	Spacing	Quantity	Remarks
Sagittaria latifolia	quart container*	36"	1040	OBL
Peltandra virginica	quart container*	36"	1040	OBL
TOTALS			2080	

* Dormant rhizomes of *Scirpus*, *Iris* and *Saururus*, dormant tubers of *Sagittaria*, and 1st year bulbs of *Peltandra* may be substituted if plantings are to be installed during dormant season.

** Alternate species and install in random pattern, distributing each species across the hydrologic gradient of each planting zone. Single species massings to be avoided.

1-14-04
Date

STATE OF MARYLAND MELANIE MOSS LANDSCAPE ARCHITECT

Landscape Architect No. 551

SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING

POND #	1
LINEAR FT OF PERIMETER (TYPE "B")	1121 LF
NUMBER OF TREES REQUIRED SHADE TREES @ 1/50 L.F. EVERGREEN TREES @ 1/40 L.F.	22 28
CREDIT FOR EXISTING VEGETATION	NA
CREDIT FOR OTHER LANDSCAPING	NA
NUMBER OF TREES PROVIDED* SHADE TREES EVERGREEN TREES FLOWERING TREES	16 31 9

NOTE: THE DEVELOPER WILL PROVIDE ALL SWM LANDSCAPE OBLIGATIONS

* 9 FLOWERING TREES AND 3 EVERGREEN TREES HAVE BEEN SUBSTITUTED FOR 6 SHADE TREES.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/2/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 2/24/04

Date	No.	Revision Description

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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 #
EMERSON		PHASE 5C		527
PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
5721/430	7,23,13	MXD	47	6 TH	-
WATER CODE		SEWER CODE		
-		-		

TITLE

FINAL LANDSCAPE PLAN

Drn By:	ajs	Scale: AS SHOWN	Proj. No. 95054.G
Des By:	ajs	Date: 1/15/04	
Chk By:	mm	Approved:	16 of 18

F-03-175

Mon Jan 12 14:47:44 2004 n:\95054\95054g\95054g.r5

Landscape Notes

1. The contractor shall review architectural/engineering plans to become thoroughly familiar with grading and surface utilities.

2. All equipment and tools shall be placed so as not to interfere or hinder the pedestrian and vehicular traffic flow. See Seasonal Plant List for planting times of bulbs and seasonal plants.

3. The contractor shall coordinate with lighting and irrigation contractors regarding timing of installation of plant material.

4. The contractor shall insure that his work does not interrupt established or projected drainage patterns.

5. During planting operations, excess waste materials shall be promptly and frequently removed from the site.

6. The contractor is advised of the existence of underground utilities on the site. Their exact location shall be verified in the field with the owner or general contractor prior to the commencement of any digging operations. In the event they are uncovered, the contractor shall be held responsible for all damage to utilities and such damage shall not result in any additional expenses to the owner.

7. If utility lines are encountered in excavation of tree pits, other locations for trees shall be made by the contractor without additional compensation. No changes of location shall be made without approval of the landscape architect.

8. Maintain positive drainage out of planting beds at a minimum 2% slope. All grades, dimensions, and existing conditions shall be verified by the contractor on site before construction begins. Any discrepancies shall be brought to the attention of the landscape architect or owner.

9. Every possible safeguard shall be taken to protect building surfaces, equipment, and furnishing. The contractor shall be responsible for any damage or injury to person or property which may occur as a result of his negligence in the execution of the work.

10. In the event of variation between quantities shown on the plant list and the plans, the plans shall control. The contractor is responsible for verifying all plant quantities prior to the commencement of work. Sod quantity take-offs are the responsibility of the contractor. All discrepancies shall be reported to the landscape architect for clarification prior to bidding. The contractor shall furnish plant material in sizes as specified in plant list.

11. The contractor shall stake all material located on the site for review and/or adjustment by the landscape architect prior to planting. All locations are to be approved by the landscape architect before excavation.

12. Plants shall conform to current "American Standards for Nursery Stock" by American Association of Nurserymen (AAN), particularly with regard to size, growth, size of ball, and density of branch structure. Plant material shall be tagged at the source by the landscape architect unless this requirement is specifically waived.

13. All plants (B&B or container) shall be properly identified by weather-proof labels securely attached thereto before delivery to project site. Labels shall identify plants by name, species, and size. Labels shall not be removed until the final inspection by the landscape architect or agent in charge.

14. Any material and/or work may be rejected by the landscape architect if it does not meet the requirements of the specifications. All rejected materials shall be removed from the site by the contractor.

15. No substitutions shall be made without written consent of the owner or landscape architect.

16. The landscape architect or owner shall have the right, at any stage of the operations, to reject any and all work and material which, in his opinion, does not meet the requirements of these plans and specifications.

17. The contractor shall be wholly responsible for stability and conditions of all trees and shrubs and shall be legally liable for any damage caused by instability of any plant materials.

18. All proposed trees to be installed either entirely in or entirely out of planting beds. Planting bed lines are not to be obstructed. All shrubs and ground cover areas shall be planted in continuous prepared bed and top dressed with 3-inch shredded hardwood mulch. Mulch shall have been shredded within the last six months.

19. All planting beds adjacent to lawn, sod, or seeded areas shall be spade edged.

20. Maintenance shall begin after each plant has been installed and shall continue until 90 days after final acceptance by the architect or owner representative. Maintenance includes mowing of turf, watering, pruning, weeding, fertilizing, mulching, replacement of sick or dead plants, and any other care necessary for the proper growth of the plant material. The contractor must be able to provide continued maintenance if requested by the owner.

21. Upon completion of all landscaping, an acceptance of the work shall be held. The contractor shall notify the landscape architect or owner for scheduling the inspection at least seven (7) days prior to the anticipated inspection date.

22. All trees shall be guaranteed for 12 months from the date of acceptance. All shrubs and ground covers shall be guaranteed for 12 months from the date of acceptance.

23. The contractor is responsible for testing project soils. The contractor is to provide a certified soils report to the owner. The contractor shall verify that the soils on site are acceptable for the proper growth of the proposed plant material. Should the contractor find poor soil conditions, the contractor shall be required to provide soil amendments as necessary. These amendments shall include, but not be limited to, fertilizers, lime, and topsoil. Proper planting soils must be verified prior to planting of materials.

24. 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)

c. For bed planting, shrubs and groundcover spaces 24 inches or closer, incorporate the following ingredients per 20 sf and incorporate into top 8 inches of existing soils by rototilling or similar method of incorporation.
.2 cy sharp sand
.3 cy organic material
4.5 lbs treble superphosphate
5 lbs dolomite limestone (eliminate for acid loving plants)

25. The contractor shall dispose of stumps and major roots of all plants to be removed. Any depressions caused by removal operations shall be refilled with fertile, friable soil placed and compacted so as to reestablish proper grade for new planting and/or lawn areas.

26. The contractor shall insure adequate vertical drainage in all plant beds and planters.

27. All disturbed areas on the site not planted with shrubs or ground cover shall be fine graded and seeded or sodded as noted on landscape plan.

28. All sod shall be obtained from areas having growing conditions familiar to areas to be covered. Areas to be sodded shall be raked of stones and debris. Debris and stones over 1 inch in diameter shall be removed from the site. All damaged sod will be rejected. All sod must be placed with staggered joints, tightly butted, with no inequalities in grade. Place all sod in rows at right angles to slopes (where applicable).

29. All planting procedures shall conform to Daft McCune Walker Inc. specifications.

30. Some field located plants are not graphically shown on this plan but are within the limit of construction line. All plants (field located plants and graphically shown plants) are noted on the plant list.

Water Quality Planting Specifications

PART 1 GENERAL

1.01 DESCRIPTION: Work consists of all labor, materials, equipment and services necessary for and incidental to the execution and completion of WETLAND PLANTS as indicated on the Drawings and specified herein.

A. Include:

1. Furnishing of all plant material.

2. Soil preparation, planting operations.

3. Maintenance and guarantee.

1.02 QUALITY ASSURANCE

A. American Association of Nurserymen (A.A.N.): "American Standard for Nursery Stock", (A.N.S.I. Z60.1) as expanded herein.

B. Nomenclature: In accordance with HORTUS III by L. H. Bailey.

C. United States Department of Agriculture: Textural Classification Diagram for Soils.

1.03 STANDARD OF COMPARISON

A. When the Drawings indicate a total quantity of five (5) or more of an individual plant (other than bulbs or perennials) the Contractor shall obtain approval of a standard of comparison prior to delivery on site. Assemble samples of all plants to be evaluated as "standards" at the principal business location of the Contractor. Notify Owner to schedule an inspection for approval of "standards" and to obtain record photographs. Photographs of each "standard" shall be used for comparison of all material subsequently installed on the site.

1.04 SUBMITTALS

A. Source: Notify the Owner, in writing, of source of all material before delivery.

1.05 DELIVERY, STORAGE AND HANDLING

A. Root stock of the plant material shall be kept moist during transport from the source to the job site and until planted.

B. Transport and handle plants so that foliage, roots, or balls are protected from breakage, sun and winds. Tops or roots of plants allowed to dry out or which have been damaged or disturbed root balls will be cause for rejection.

1.06 DRAWINGS

A. The Contractor shall use quantities of wetland plants noted on the plant list.

1.07 PROJECT CONDITIONS

A. Planting shall commence following approval of the as-built certification of the subject water quality facility.

B. All emergent wetland plantings shall be installed between April 15 and June 30 or as directed by the Landscape Architect. Do not plant when ground is frozen. Do not use frozen planting soil at any time.

1.08 DEFINITIONS

A. Start of Planting: Installation of plant material into excavated pits or beds.

B. Payment Release Inspection: Conducted monthly by the Owner or designated representative to verify quantity only for partial payment to the Contractor. Payment release inspection does not waive any requirements of the standard of comparison or initial acceptance clause.

C. Initial Inspection: Conducted at the request of the Contractor and the Owner when 90% or more of all planting and related tasks are complete.

D. Initial Acceptance: Occurs when all plant material is in place in accordance with the specifications and approved by the Owner.

E. Maintenance Period: From start of planting to final acceptance.

F. Guarantee Period: From initial acceptance and continuing for 90 days thereafter, excluding the period from November 1 to April 15.

G. Final Acceptance: Occurs after Contractor has completed all outstanding items, as determined by the Owner, at the end of the maintenance and guarantee period.

1.09 GUARANTEE AND REPLACEMENT

A. All plants in an impaired, dead or dying condition prior to initial acceptance and prior to final acceptance shall be removed and replaced. Replacement materials shall be the same size as other unreplaced material considering growth that has occurred since original installation. Methods of installation shall be identical to the original. The contractor shall guarantee 85% survivorship at the end of the guarantee period.

B. Replacements shall be made between April 15 and June 30, the season following the initial planting, and shall conform to the planting specifications listed above.

C. The contractor shall notify the Landscape Architect to arrange a site meeting to determine the replacement requirements, at the end of the guarantee period.

PART 2 PRODUCTS

2.01 PLANTS

A. Sound, healthy, vigorous, free from plant diseases, insect pests or their eggs.

B. Plants cut back from larger sizes or pruned prior to delivery will not be accepted.

C. It is anticipated that these plants will need to be obtained from a nursery source. These plant species are normally unavailable from standard landscape nursery sources.

D. Shape and Form: Plant materials shall be symmetrical and typical for the variety and species.

E. Container: The soil/root masses shall be thoroughly moist upon delivery to the job site. Any dry and light weight plants shall be rejected. If not planted immediately after being delivered to the job site, the plants shall be stored out of direct exposure to the sun and wind and their root masses maintained moist, through periodic watering, until the time of planting.

Until the removal of the plants from the containers, the soil/root masses shall be the size of the specified

soil exists on the bottom of the containers, the plants will be rejected since they have not been grown sufficiently long in the containers to root into the soils contained therein.

The plants shall appear healthy with no leaf spots, leaf damage, leaf discolorations, leaf wilting, or evidence of insects on the leaves.

The container size shall be at least as large as indicated in the specifications or shown in the plant tables/lists. Plants shall not be rejected if supplied in containers larger than specified.

F. Fiber or Peat Pot: If not planted immediately after being delivered to the job site, the plants shall be stored out of direct exposure to the sun and wind and their pots and associated root masses maintained moist, through periodic watering, until the time of planting.

The plants shall be well-rooted through the sides and bottoms of the pots and firmly contained therein.

Should the plants be removed from the pots by holding them from their tops and gently pulling on the pots, the plants shall be rejected.

If growing, the plants shall appear healthy with no foliar spots, discolorations, wilting, or other evidence of the presence of disease or insects.

Plants shall not be rejected if supplied in pots larger than specified.

The number of plants, stems, or culms per pot as specified or shown in the plant tables/lists at least shall be present, on the average, or the plants shall be rejected.

G. Dormant Propagule (Herbaceous): If not planted immediately after being delivered to the job site, the dormant propagules shall be stored out of the direct exposure to the sun and wind, and they shall be protected by covering with straw, peat moss, compost, or other suitable materials and shall be maintained moist, through periodic watering, until the time of planting.

The bodies and shoots associated with the propagules shall have turgor or be rigid to the touch. If the bodies and/or shoots associated with the propagules are soft or mushy or appear rotten or decomposed, the plant materials shall be rejected.

Rhizome (stolon) sections shall provide a minimum of two shoots per section or Rhizome (stolon) sections containing at least a terminal shoot shall be a minimum of four inches in length (in order to ensure sufficient stored energy to support the new growth). Rhizome sections containing shoots that are soft or mushy or otherwise appear rotten shall not be accepted.

Suckers shall contain a terminal shoot and be a minimum of four inches in length (in order to ensure sufficient stored energy to support the new growth).

Growing Bare Root Plant (Herbaceous): The plants shall contain new roots that are clean and white in coloration.

If not planted immediately after delivery to the job site, the plants shall be stored out of direct exposure to the sun and wind and the new roots shall be protected by the use of straw, peat moss, compost, or other suitable materials and shall be maintained moist, through periodic watering, until the time of planting.

The plants shall appear healthy with no foliar spots, discolorations, wilting, or other evidence of the presence of disease or of insects.

2.02 FERTILIZER

A. Plant Fertilizer: Slow release fertilizer such as Osmocote 19-6-12 analysis (3-4 month release) or equal approved by the Landscape Architect.

B. Slow release fertilizer shall be applied at the time of planting and at the following rate:

All emergent plant material - planting pit application of 1 oz. per container or bare root plant.

C. Pesticides, herbicides and fungicides will not be used unless judged necessary by the wetland landscaper. If applied, quantities recommended by the Department of Agriculture shall not be exceeded.

D. Fertilizer shall be delivered to the site in the original unopened containers with formulas attached.

3.01 PREPARATION

A. Plant Locations: As shown on the Drawings, to dimensions if shown, to scale if not dimensioned. Locations subject to review by the Landscape Architect before starting excavation.

B. No plant material shall be installed until the Landscape Architect has approved the finish grade of the planted areas.

3.02 PLANTING PROCEDURES

A. Set plants straight and plumb.

B. Plant material shall be planted in existing soil with each planting pit excavated to size sufficient to contain the entire root stock or root mass without cramping.

C. Where water is not available on-site, the Contractor shall furnish sufficient quantities to complete the Work at no additional cost to the Owner.

3.04 CLEAN-UP

A. During planting operations, excess and waste materials shall be removed from the site on a daily basis.

B. Repair turf areas and other existing conditions damaged during planting operations, including regrading, seed, mulch and fertilization to the satisfaction of the Owner.

3.05 MAINTENANCE

A. Watering of plant material shall take place at the end of each for fourteen (14) consecutive days after planting has been completed. The watering shall completely saturate the soil and partially immerse the plant material.

B. During maintenance period, on approximately the 1st and 15th of each month, the Contractor shall provide sufficient supervision, equipment, materials and manpower to:

1. Keep all plants in a healthy growing condition by watering, when necessary, removing dead or dying branches, controlling insect infestations, removing sprouts, weeding.

2. Remove and replace dead or damaged plant material. Where replacement is not possible due to season, remove dead material, etc. and level pit until planting is possible.

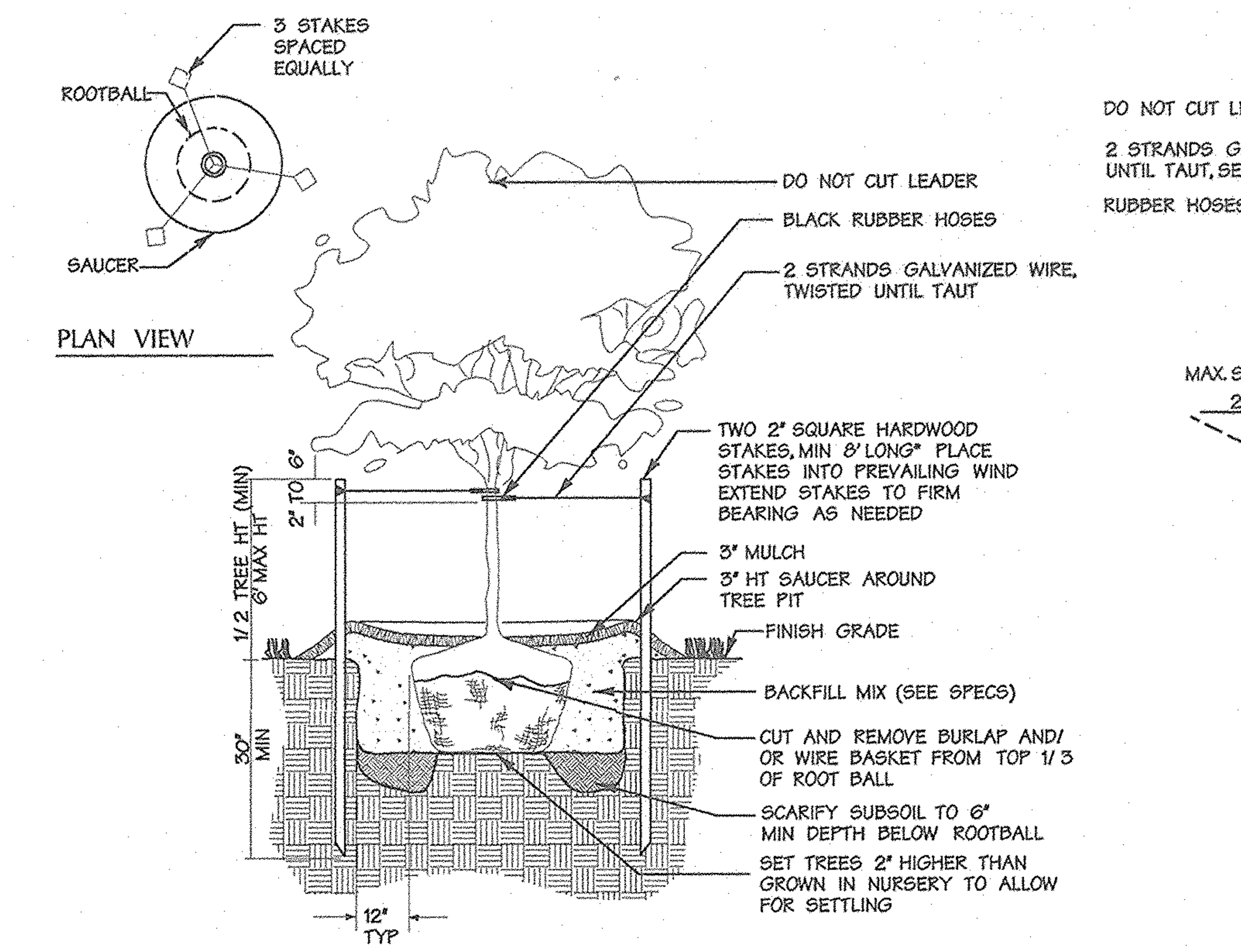
B. Notify Owner for review of activities prior to initiating maintenance operations each month.

General Planting Notes

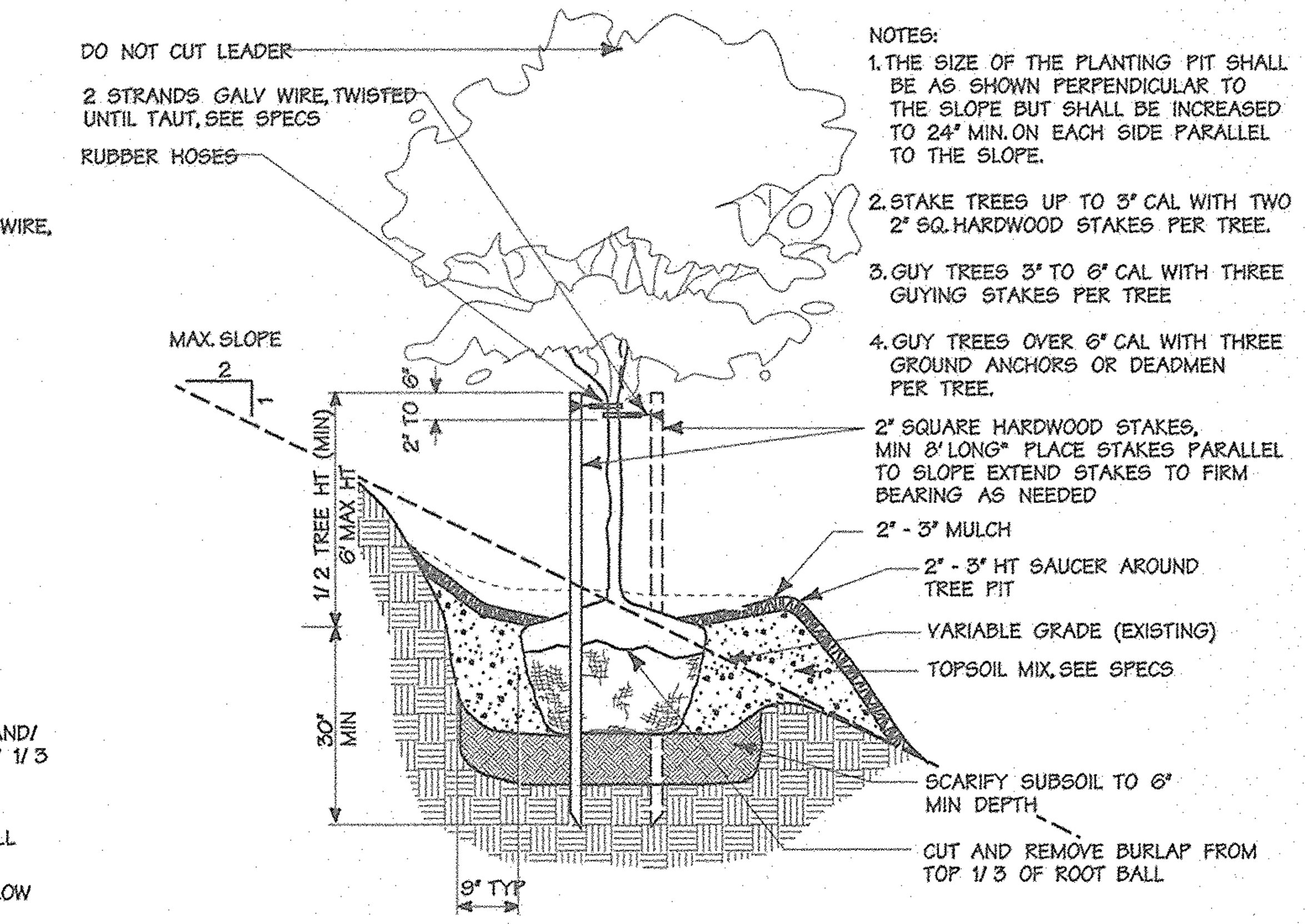
1. All plant material to meet A.A.N. Standards.
2. Landscape Contractor to follow landscape specification guidelines for Baltimore Washington Metro area approved by LCAMW.
3. No substitutions to be made without consent of Landscape Architect or Owner.
4. All beds to be topped with three inches of hardwood 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 $11,850.00 must be posted as part of the developer's agreement. (27 shade, 25 evergreens).
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.

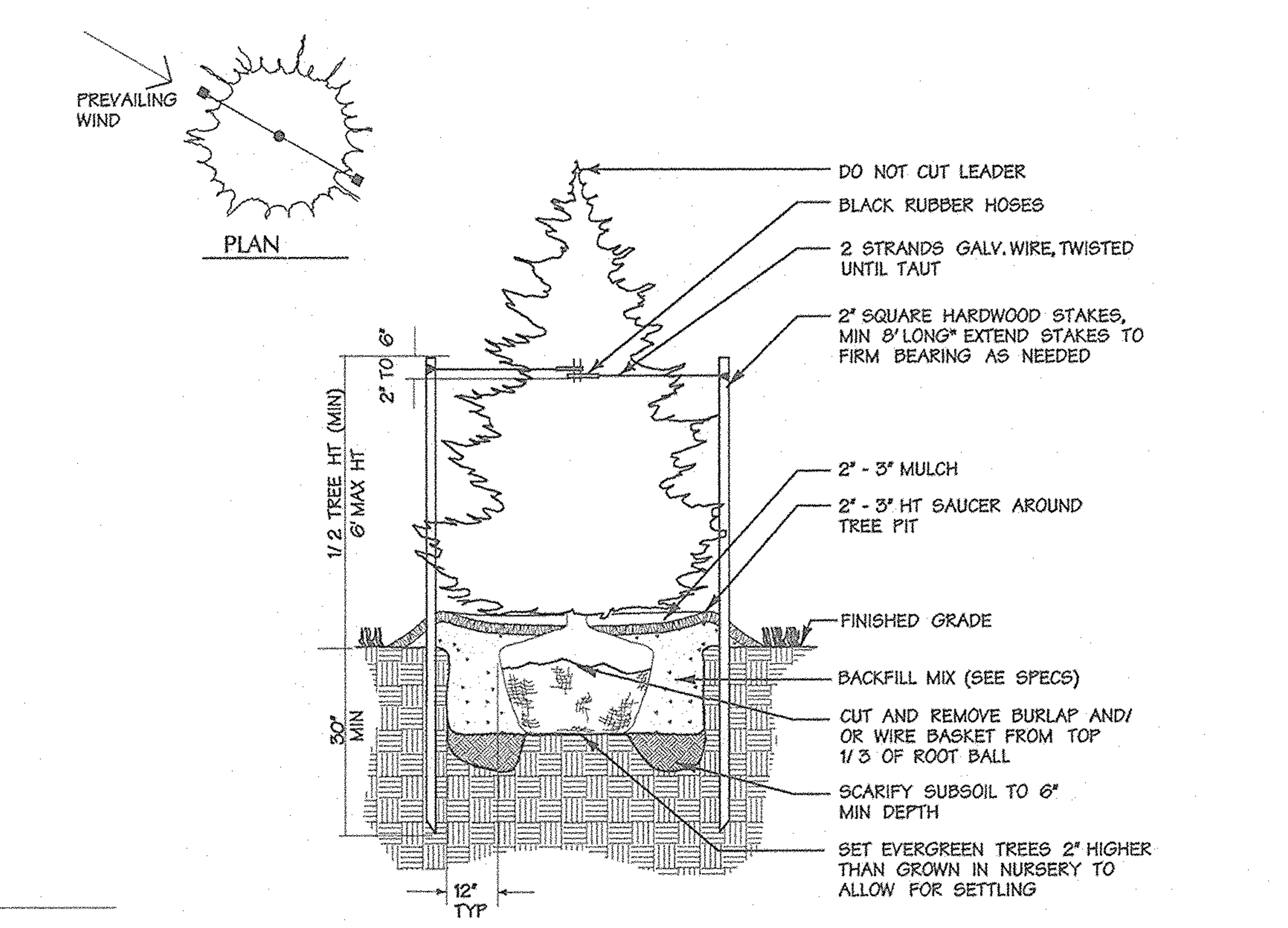
NAME: DATE



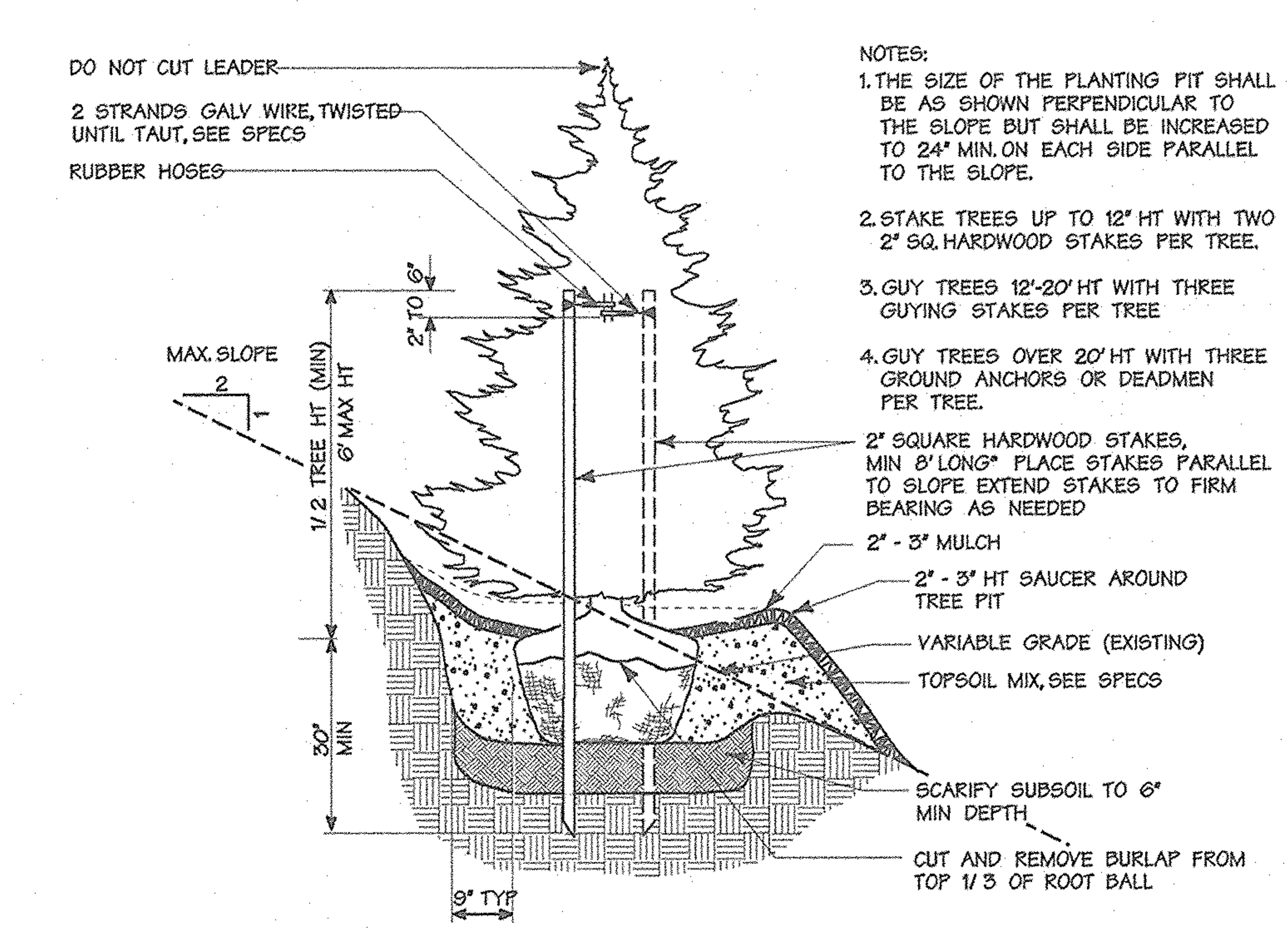
Less Than 3" Cal. Tree Planting
Not To Scale



Tree Planting on Slope
Not To Scale



Evergreen Tree Planting
Not To Scale



Evergreen Tree Planting on Slope
Not To Scale

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

[signature] 2-4-04
CHIEF, BUREAU OF HIGHWAYS HS — DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

[signature] 2/27/04
CHIEF, DIVISION OF LAND DEVELOPMENT HB — DATE

[signature] 2/24/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK — DATE

Date	No.	Revision Description

1/14/04
Date

STATE OF MARYLAND — MELANIE MOSER — LANDSCAPE ARCHITECT — 551

Landscape Architect No. 551

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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

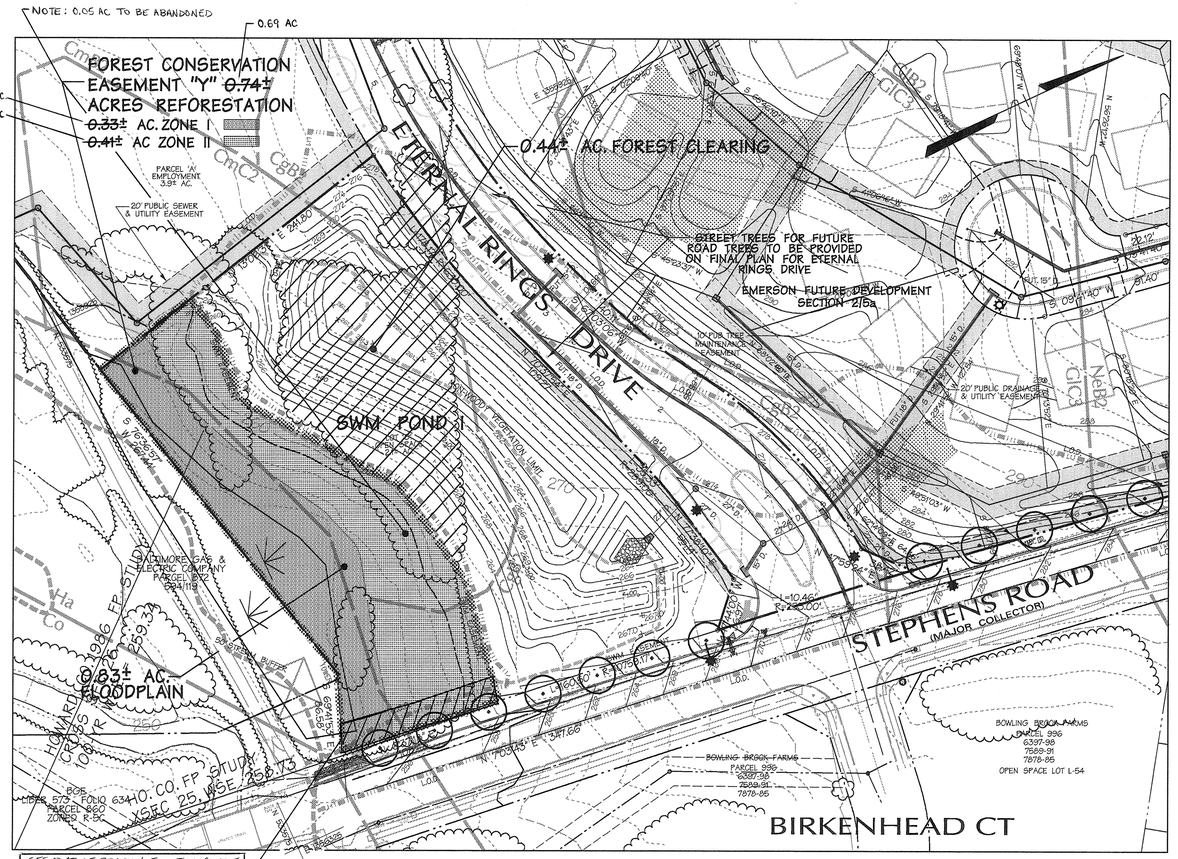
SUBDIVISION NAME		SECTION/ AREA		LOT/PARCEL #	
EMERSON		PHASE 5C		837	
PLATS OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
572/430	7,8,9,13	MXD	47	6 TH	-
WATER CODE		SEWER CODE			
-		-			

TITLE
FINAL LANDSCAPE AND WATER QUALITY NOTES AND DETAILS

Drn By:	ajs	Scale:	AS SHOWN	Proj. No.	95054.G
Des By:	ajs	Date:	1/15/04		
Chk By:	mm	Approved:			17 of 18

F-03-175

Mon Jan 12 14:47:02 2004 n:\95054\95054g\95054g.r7



SEE PLAT OF REVISION FOR FEE SIMPLE ACQUISITION FROM EXISTING FOREST CONSERVATION EASEMENT. TOTAL AREA ACQUIRED 2129 SF (0.05 AC.)

FOREST CONSERVATION EASEMENT "Y"

SCALE 1"=50'

NOTES

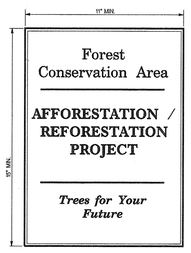
SEE SHEET 1 FOR FOREST CONSERVATION TRACKING CHART.

A SURETY IN THE AMOUNT OF $16,117.20 WILL BE REQUIRED FOR AFFORESTATION PLANTING (0.74 ACRES AT $0.50/S.F.).

A TOTAL OF 0.05 ACRES OF REFORESTATION WAS ABANDONED FROM FOREST CONSERVATION EASEMENT Y BY A PLAT REVISION, F-18- AND RECORDED ON

Legend

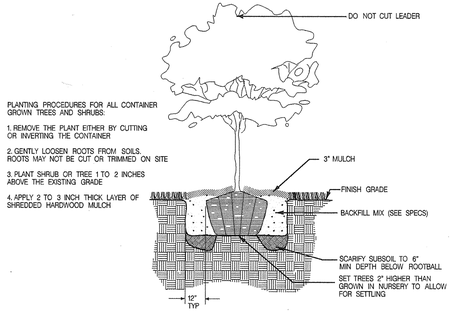
EX. CURB & GUTTER		PROP. STORM DRAIN	15" D.
EX. MAJOR CONTOURS	400	PROP. SEWER	8" S.
EX. MINOR CONTOURS	402	PROP. WATER	8" W.
EX. STORM DRAIN	EX. 21" RCP	PROPERTY LINE	
EX. SEWER	EX. 8" S.	ROADWAY RIGHT-OF-WAY	
EX. WATER	EX. 8" W.	PROPOSED LOT LINE	
EXISTING TREE LINE		PROPOSED EASEMENT	
EXISTING WETLAND LIMIT		PROPOSED CURB & GUTTER	
WETLAND BUFFER		PROPOSED SIDEWALK	
100 YR FLOODPLAIN	100 YEAR WATER SURF. ELEV.	SLOPE 15% - 24.9%	
LIMIT OF DISTURBANCE	LOD	FOREST CONSERVATION EASEMENT	
SOIL(S) LINE (NOT SHOWN)	CmB2 CmC2	PROPOSED MINOR CONTOUR	
75' STREAM BUFFER		PROPOSED MAJOR CONTOUR	
PROPOSED STREET TREE (PRESENT)		PROPOSED STREET LIGHTS	
PROPOSED STREET TREE (FUTURE)		PROPOSED FOREST CLEARING	



SIGNS TO BE PLACED ON METAL POSTS 3'-4½' ABOVE FINISH GRADE PRIOR TO PLANTING. PLACE SIGNS EVERY 100' AROUND PERIMETER OF FOREST CONSERVATION AREA.

Permanent Signage

Not To Scale

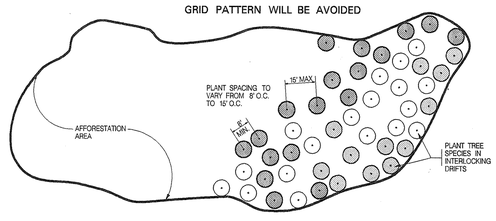


PLANTING PROCEDURES FOR ALL CONTAINER GROWN TREES AND SHRUBS:

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



Planting Design Schematic

Not To Scale

GOALS AND OBJECTIVES

The goals and objectives of this Forest Conservation Plan are to identify forests areas to be cleared under Emerson 2/5C, and to provide long term protection for reforestation areas to be planted under this phase. Approximately 0.44 acres of forest clearing and no retention is proposed under this phase, and approximately ~~0.74~~ 0.69 acres of reforestation is proposed within the floodplain on the southern portion of the project to offset future obligations for the cumulative Emerson project. When evaluated cumulatively with previous phases of this project, no reforestation is required, and ~~5.77~~ 5.7z acres (5.03 acres under previous phases, and ~~0.74~~ 0.69 acres currently) of reforestation is provided. Plant species have been chosen to tolerate wetland/mesic and upland floodplain moisture regimes, which have been differentiated by Zone I and Zone II designations, respectively.

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 PERMANANT FOREST PROTECTION SIGNS PLACED AT 50' TO 100' INTERVALS AROUND EASEMENTS.

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:

Seedlings/whips:

Hardwoods - 1/4" to 1/2" caliper with roots not less than 8" long
Shrubs - 1/6" 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 on sheet 8.

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
.3 cy Sharp sand
.2 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 occured. Contractor shall bear final responsibility for proper surface drainage of planted areas. Any discrepancy in the drawings or specifications, construction 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.

GUARANTEE:

A MINIMUM SURVIVAL RATE OF 75% IS TO BE GUARANTEED BY THE DEVELOPER AT THE END OF THE TWO YEAR MAINTENANCE PERIOD.

REFORESTATION AREA PLANTING PLAN

0.31

ZONE I (WETLAND/MESIC) - ~~0.33~~ 0.38 TOTAL
PLANTS REQUIRED - 98 (350 WHIPS/ACRE X 0.28 ACRES) *0.05 ACRES OF CREDIT DERIVED FROM LANDSCAPE PLANTINGS WITHIN FCE*

SPECIES	COMMON NAME	SIZE	SPACING	QUANTITY	STAGE	INDICATOR
ACER RUBRUM	RED MAPLE	24" CONTAINER GROWN WHIP	11' X 11'	20	ALL	FAC
BETULA NIGRA	RIVER BIRCH	24" CONTAINER GROWN WHIP	11' X 11'	15	EARLY	FACW
CORNUS AMOMUM	SILKY DOGWOOD	24" CONTAINER GROWN WHIP	11' X 11'	15	MID	FACW
FRAXINUS PENNSYLVANICA	GREEN ASH	24" CONTAINER GROWN WHIP	11' X 11'	20	EARLY	FACW
LIQUIDAMBAR STYRACIFLUA	SWEET GUM	24" CONTAINER GROWN WHIP	11' X 11'	18	EARLY	FAC
SALIX NIGRA	BLACK WILLOW	24" CONTAINER GROWN WHIP	11' X 11'	10	PIONEER	FACW
TOTALS				98		

0.38

ZONE II (FLOODPLAIN) - ~~0.41~~ 0.44 ACRES TOTAL
PLANTS REQUIRED - 116 (350 WHIPS/ACRE X 0.33 ACRES) *0.08 ACRES OF CREDIT DERIVED FROM LANDSCAPE PLANTINGS WITHIN FCE*

SPECIES	COMMON NAME	SIZE	SPACING	QUANTITY	STAGE	REMARKS
ACER RUBRUM	RED MAPLE	24" CONTAINER GROWN WHIP	11' X 11'	25	ALL	FAC
LIQUIDAMBAR STYRACIFLUA	SWEET GUM	24" CONTAINER GROWN WHIP	11' X 11'	21	EARLY	FAC
N'YSSA SYLVATICA	BLACK GUM	24" CONTAINER GROWN WHIP	11' X 11'	15	LATE	FAC
PLATANUS OCCIDENTALIS	SYCAMORE	24" CONTAINER GROWN WHIP	11' X 11'	10	MID	FACW
QUERCUS ALBA	WHITE OAK	24" CONTAINER GROWN WHIP	11' X 11'	20	MID	FACU
QUERCUS PALUSTRIS	PIN OAK	24" CONTAINER GROWN WHIP	11' X 11'	25	EARLY	FACW
TOTALS				116		

FOREST CONSERVATION CALCULATIONS

BASIC SITE DATA	ACRES (+/-)
GROSS SITE AREA	267.84
AREA WITHIN 100 YEAR FLOODPLAIN	27.40
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (IF APPLICABLE)	0.0
NET TRACT AREA	240.44
LAND USE CATEGORY	COMMERCIAL/INDUSTRIAL/OFFICE

INFORMATION FOR CALCULATIONS	
A. NET TRACT AREA	240.44
B. REFORESTATION THRESHOLD (15% x A)	36.07
C. AFFORESTATION MINIMUM (15% x A)	36.07
D. EXISTING FOREST ON NET TRACT AREA	98.62
E. FOREST AREAS TO BE CLEARED	47.59
F. FOREST AREAS TO BE RETAINED	51.03

REFORESTATION CALCULATIONS	
A. NET TRACT AREA	240.44
B. REFORESTATION THRESHOLD (15% x A)	36.07
C. EXISTING FOREST ON NET TRACT AREA	98.62
D. FOREST AREAS TO BE RETAINED	51.03
E. FOREST AREAS TO BE CLEARED ABOVE REFORESTATION THRESHOLD	47.59
F. FOREST AREAS CLEARED BELOW REFORESTATION THRESHOLD	0.00
G. FOREST AREAS RETAINED ABOVE REFORESTATION THRESHOLD	14.96

CLEARING ABOVE THE THRESHOLD ONLY

IF FOREST AREAS TO BE RETAINED ARE GREATER THAN THE REFORESTATION THRESHOLD (IF E IS GREATER THAN B), THE FOLLOWING CALCULATIONS APPLY:

REFORESTATION FOR CLEARING ABOVE THRESHOLD F*4*4	11.90
REFORESTATION FOR CLEARING BELOW THRESHOLD G*2	0.00
TOTAL REFORESTATION REQUIRED (F*1/4) + (G*2)	11.90
CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD	14.96
REFORESTATION REQUIRED	0.00 ACRES
REFORESTATION PROVIDED	5.77 ACRES
TOTAL	5.77 ACRES

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 2-4-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 2/27/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MK — DATE 2/24/04

Date	No.	Revision Description
	1	REDUCED FOREST CONSERVATION EASEMENT AREA

Emerson Section 2
Phase 5C

OWNER/ DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION
10275 Little Patuxent Parkway
Columbia, Maryland 21044

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 #
EMERSON	PHASE 5C	857

PLAT# OR L/F	BLOCK #	ZONE	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
5721430	7,8,9,13	MXD	47	6 TH	-

WATER CODE	SEWER CODE
-	-

TITLE
FINAL FOREST CONSERVATION PLAN, NOTES, & DETAILS

Drn By:	ajb	Scale:	AS SHOWN	Proj. No.	95054.G
Des By:	snh	Date:	1/15/04		
Chk By:	mm	Approved:			18 of 18

RK&K
700 EAST PRATT STREET
SUITE 500
BALTIMORE, MD 21202
PH: (410) 728-2900

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THESE DOCUMENTS WERE PREPARED AND APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 18530, EXPIRATION DATE: 12/15/2019

NOTE: THE RK&K SEAL ON THIS SHEET ONLY APPLIES TO REDLINE REVISIONS SHOWN ON THE FOREST CONSERVATION PLAN (SHEET 18 OF 18).

1/14/04
Date

Landscape Architect No. 551

F-03-175