

**General Notes**

- All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
- The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection Division at 410-313-1880 at least five (5) working days prior to the start of work.
- The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
- Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs be in place prior to the placement of any asphalt.
- All plan dimensions are to face of curb unless otherwise noted.
- The existing topography is taken from aerial survey with 2' contour intervals prepared by Air Survey Corporation dated 1998.
- 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.
- Water is public, contract no. 44-4161-D
- Sewer is public, contract no. 44-4161-D
- 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 (POA). Routine maintenance will be performed by the POA and non-routine maintenance will be performed by Howard County. See sheet 5 of 20 for specific maintenance requirements for each.
- Existing utilities are based on Construction Plans (contract no. and field verified manholes).
- The floodplain study for this project was prepared by Howard County, dated 1996.
- 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 2002E06391/01-NT-0500 for pending impacts to jurisdictional resources).
- The traffic study for this project was prepared by Wells and Associates, and was approved with the Comprehensive Sketch Plan (S-99-12)
- Project background information:  
 Subdivision Name: Emerson Section 2, Phase 5B and Section 3, Area 4  
 Tax Map: 47  
 Lot/Parcel P/O:  
 Zoning: MXD  
 Election District: 6th  
 Total Tract Area: 24,05 acres (23.85 Acres + 0.2 acres previously recorded)  
 Palace Hall Drive (K/W)  
 File Numbers: S-99-12, WP-03-154, PB-339,2B, 979M, F-01-145, P-03-16  
 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.
- Sidewalk ramps shall meet current ADA requirements.
- All sidewalks at intersections to have handicaps ramps.
- Street trees shall be planted at least 5' from any inlet structure.
- Storm water management facility to be owned by the Property Owners Association (POA).
- Maintenance Responsibility, routine and non-routine schedule are shown on sheet 5 of 20. Routine maintenance is responsibility of POA and non-routine maintenance is responsibility of Howard County.
- Development of Emerson 2, Section 5/B under the current Forest Conservation Act proposes approximately 15.68 acres of forest clearing, 1.32 acres of forest retention, and 2.90 acres of reforestation. When evaluated cumulatively with previous phases of the project, 63.31 acres of clearing, 52.35 acres of retention, and 11.64 acres of reforestation is proposed. The cumulative reforestation obligation is 8.51 acres
- WP-03-154, Emerson 2/5B approved on August 6, 2003. Section 16.121e(1) Waived requiring minimum 40' frontage onto a public road right of way for Open Space lots. Approval granted with the following conditions: The Preliminary Plan for Phase 5B (F-03-16) shall show a temporary 40' access easement to Open Space Lots 2-3, and that easement shall be maintained until Eternal Rings Drive is extended on a future plan for Emerson MXD.
- The Preliminary Plan (F-03-16) was approved on December 8, 2003.
- Related DPZ file numbers -S-99-12, WP-03-154, PB-339, 2B 979-M, F-01-145, WP-04-14, P-03-16.
- MDE/COE permit No. 01-NT-0222/200164079

# EMERSON (KEY PROPERTY)

## SECTION 2 PHASE 5B, PARCEL AA SECTION 3 AREA 4, PARCEL A

Howard County Maryland

**Sheet Index**

SHEET	DESCRIPTION
1	COVER SHEET
2	PALACE HALL ROAD AND STORM DRAIN PLAN
3	STORM DRAIN PLAN & PROFILES
4	STORM DRAIN DRAINAGE AREA MAP
5	SWM PLAN
6	SWM PROFILES
7	SWM DETAILS
8	SWM SPECIFICATIONS
9	SEDIMENT & EROSION CONTROL PLAN
10	SEDIMENT & EROSION CONTROL PLAN
11	SEDIMENT & EROSION CONTROL DETAILS
12	SEDIMENT & EROSION CONTROL DETAILS
13	SEDIMENT & EROSION CONTROL DETAILS & SPECIFICATIONS
14	FOREST CONSERVATION PLAN
15	FOREST CONSERVATION PLAN
16	FOREST CONSERVATION PLAN
17	FOREST CONSERVATION PLAN
18	LANDSCAPE PLAN
19	LANDSCAPE PLAN
20	LANDSCAPE DETAILS

27. THIS PROJECT COMPLIES WITH SECTION 16.124 OF THE HOWARD COUNTY CODE FOR LANDSCAPE REQUIREMENTS. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF \$10,200 (21 SHADE TREES, 26 EVERGREEN TREES).

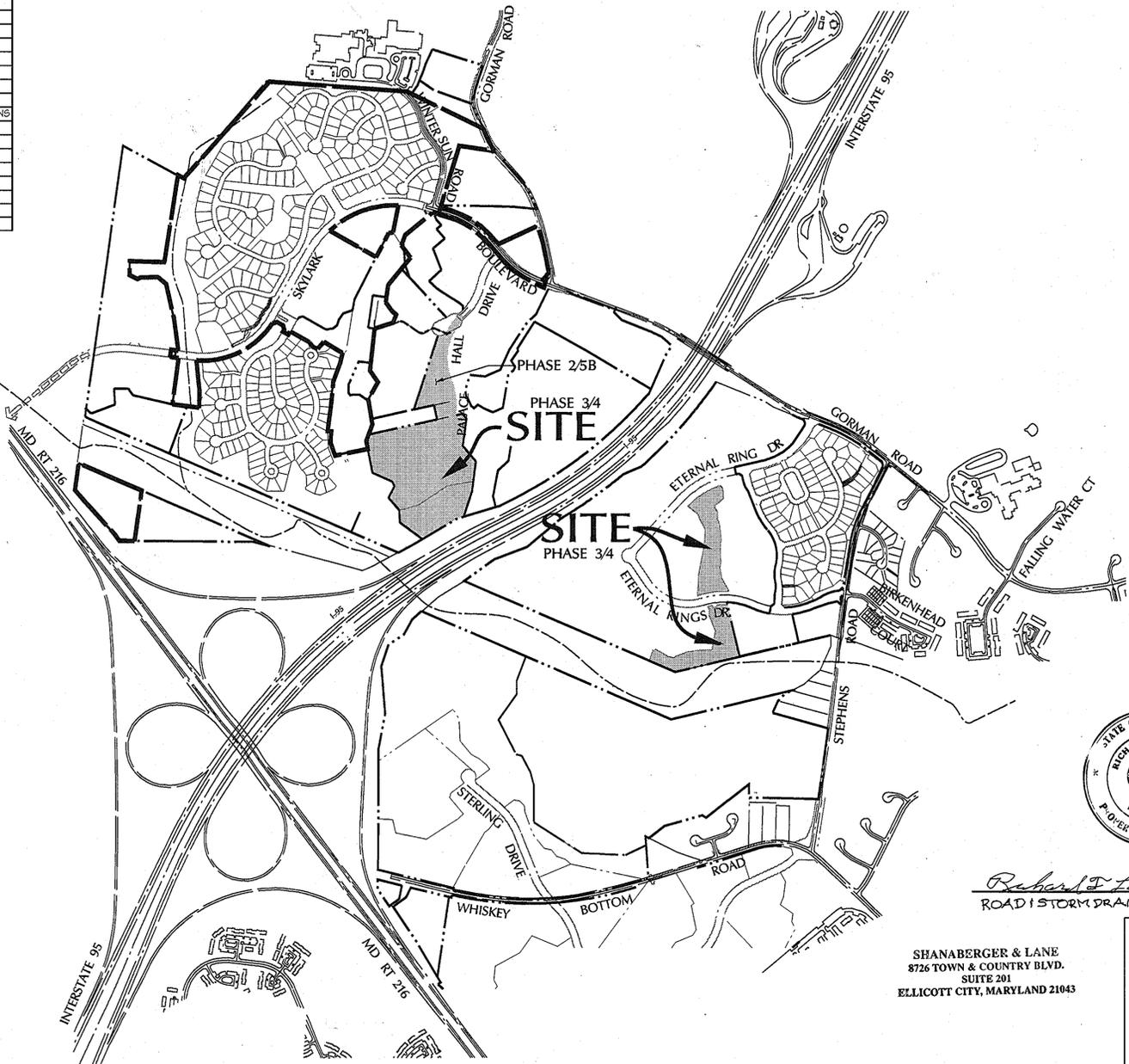
28. WP-04-14, Emerson 2/3, Bulk Parcel D-1 approved on September 10, 2003. Section 16.106(h)(2) establishes the milestone date by which as sketch plan/preliminary equivalent sketch plan (for fee-simple lots) or a site plan (for condominium development or non-residential development) must be submitted when a bulk parcel is recorded on a record plat; and Section 16.144(a), which provides that when a milestone date is not complied with, the plan shall be voided and all previous approvals and housing unit allocations rescinded.

Approval is subject to the following conditions:  
 1. The milestone date for submission of a sketch plan/preliminary equivalent sketch plan or site development plan for subdivision or development of Parcel D-1, shall be extended to coincide with the milestone date that will be established for Parcel AA as recorded on a plat in the Land Records of Howard County.

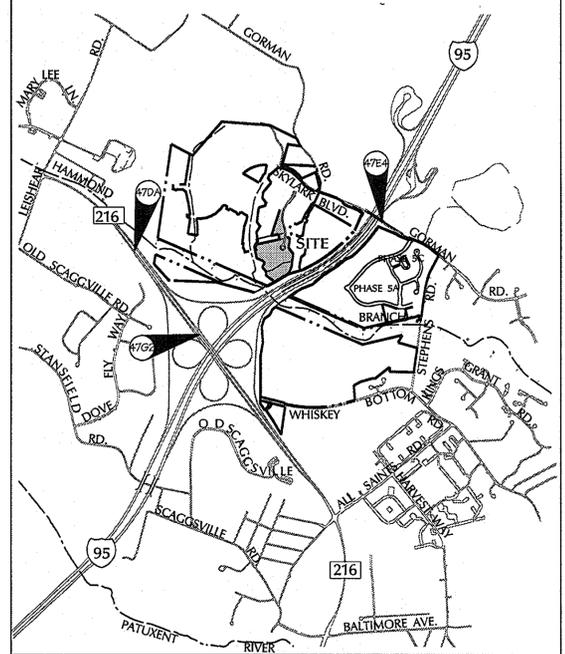
**FOREST CONSERVATION TRACKING CHART**

Section/Phase Number	Gross Area	Floodplain	Net Tract Area	Ex. Forest Area	Forest Retained	Forest Retained	Reforest./Affor. Required	Reforest./Affor. Provided	Excess Reforest./Affor.	Future Forest Clearing	Future Reforest./Affor.	Comments
2 1A/1B	106.20	3.50	102.70	24.70	7.93	16.77	0.61	5.03	4.42	4.48	3.41	
2/2	119.90	3.50	116.40	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	2.19	204.66	85.30	39.47	46.83	0.00	5.03	5.03	2.18	3.91	
3/2	220.27	2.127	218.14	87.50	41.67	46.83	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	
2/5C	267.84	27.40	240.44	98.62	47.59	51.03	0.00	5.77	5.77	2.49	5.24	
2/6A	277.75	27.40	250.35	98.62	47.59	51.03	0.00	5.77	5.77	2.49	5.24	See Note D
2/4	277.75	27.40	250.35	98.62	47.59	51.03	0.00	5.55	5.55	2.49	3.91	See Note E
2/5A	306.93	27.51	279.42	98.66	47.63	51.03	2.79	5.74	5.95	2.49	3.91	
2/5B	332.63	32.45	300.18	115.66	63.31	82.35	8.51	11.64	3.13	2.49	3.91	See Note F

A. 120+/- ACRES OF FUTURE FOREST CLEARING SHOWN ON F-01-137 WAS CLEARED FOR SWM ON OPEN SPACE LOT 17A.  
 B. 110+/- ACRES OF FUTURE FOREST CLEARING SHOWN ON F-01-137 WAS CLEARED FOR SWM ON OPEN SPACE LOT 17B.  
 C. GROSS AREA INCLUDES 107+/- ACRES FOR SANITARY SEWER EXTENSION AND CONTAINS 0.4+/- ACRES OF FLOODPLAIN.  
 D. GROSS AREA INCLUDES 0.38 ACRES FOR THE SANITARY SEWER SHOWN ON F-02-178. GROSS AREA ALSO INCLUDES 0.07 ACRES FOR AREA PREVIOUSLY ACCOUNTED FOR UNDER F-03-16.  
 E. THIS LINE ITEM ACCOUNTS FOR REFORESTATION PROVIDED RETROactively ON A PHASE THAT PREVIOUSLY ADDRESSED FOREST CONSERVATION. APPROXIMATELY 1.33 ACRES OF FUTURE REFORESTATION AREA WILL BE USED UNDER THIS REFORESTATION PLAN.  
 F. GROSS AREA EXCLUDES 0.824 ACRES FOR SANITARY SEWER SHOWN ON F-02-178. A GROSS AREA INCLUDES 2.37 ACRES FOR THE WETLAND MITIGATION SITE FLOODPLAIN INCLUDED 12 ACRES FOR THE MITIGATION AREA FLOODPLAIN.



**Overall Property Outline**  
Scale: 1" = 600'



**Vicinity Map**  
SCALE: 1" = 2000'

**BENCHMARK DESCRIPTION**

COORDINATES IN MARYLAND NAD83(91) (HORIZONTAL) AND NGVD29 (VERTICAL) DATUMS.  
 47DA NORTHING: 163191.9104  
 EASTING: 411265759  
 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  
*William F. ...* 12-6-04  
 CHIEF, BUREAU OF HIGHWAYS MS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Harold ...* 12/22/04  
 CHIEF, DIVISION OF LAND DEVELOPMENT HB DATE

*...* 12/22/04  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

5-11-12 (1) REVIEW FOR CLEARING STREAK CRISSING ON F. 11-036



*Richard F. Lane #301*  
 ROAD/STORM DRAIN AS-BUILT  
 Date 10/27/04

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



Professional Engr. No. 10551

Date No. Revision Description

**EMERSON (KEY PROPERTY)**  
 SECTION 2, PHASE 5B, PARCEL AA  
 SECTION 3 AREA 4, PARCEL A

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

**DMW**  
 Daft-McCune-Walker, Inc.  
 300 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 286-3233  
 Fax: 296-4705  
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SECTION NAME	EMERSON	SECTION AREA	DATE	NO.
PLAN OR LOT	7A&D	ZONE	FAVOR	47
WATER CODE		REVISION	6 TH	

TITLE: **Cover Sheet**

Drn By: KDE Scale: 1"=600' Proj. No. 95054.03  
 Des By: Date: 05/21/04  
 Chk By: Approved: 1 of 20

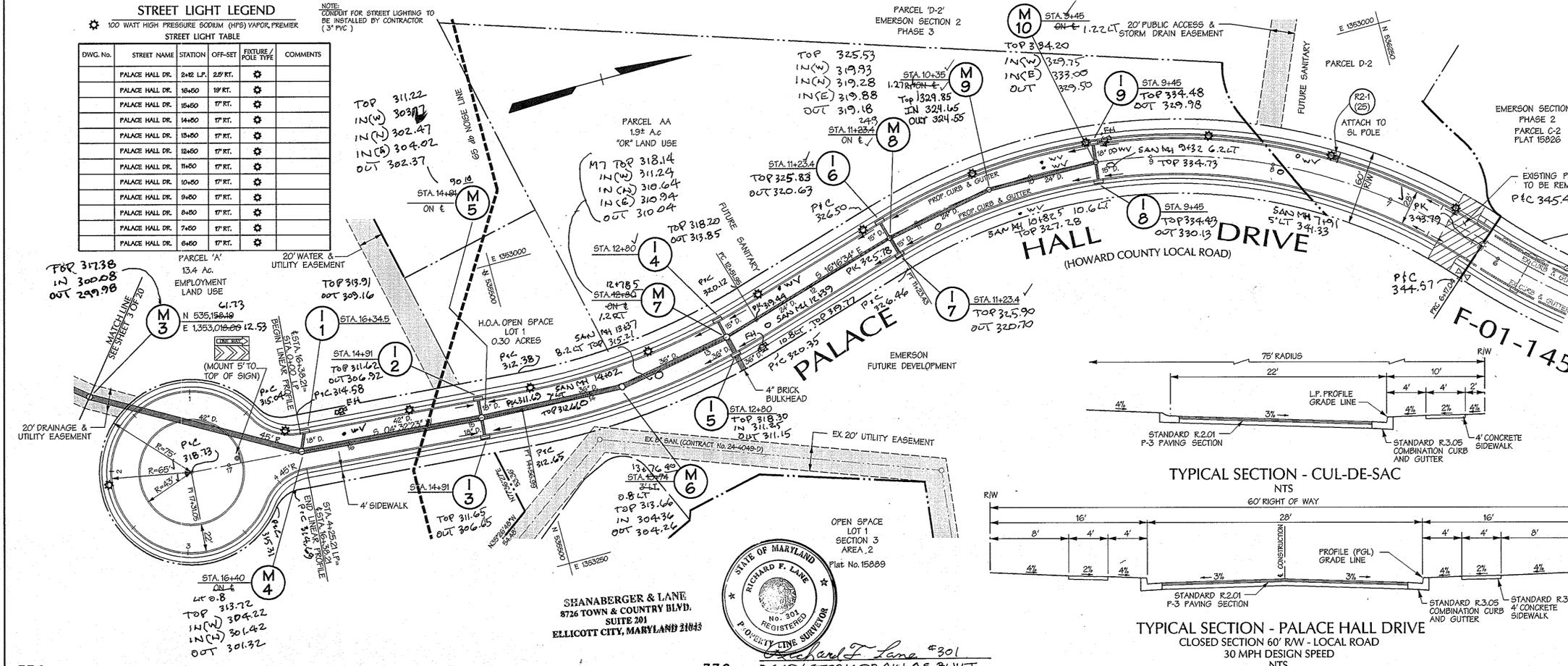
**STREET LIGHT LEGEND**

100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR, PREMIER STREET LIGHT TABLE

DWG. No.	STREET NAME	STATION	OFF-SET	FIXTURE / POLE TYPE	COMMENTS
	PALACE HALL DR.	2+42	17' RT.	10' RT.	
	PALACE HALL DR.	18+00	17' RT.	10' RT.	
	PALACE HALL DR.	15+00	17' RT.	10' RT.	
	PALACE HALL DR.	14+00	17' RT.	10' RT.	
	PALACE HALL DR.	13+00	17' RT.	10' RT.	
	PALACE HALL DR.	12+00	17' RT.	10' RT.	
	PALACE HALL DR.	11+00	17' RT.	10' RT.	
	PALACE HALL DR.	10+00	17' RT.	10' RT.	
	PALACE HALL DR.	9+00	17' RT.	10' RT.	
	PALACE HALL DR.	8+00	17' RT.	10' RT.	
	PALACE HALL DR.	7+00	17' RT.	10' RT.	
	PALACE HALL DR.	6+00	17' RT.	10' RT.	

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

CURVE DATA					
FROM-TO	DELTA	RADIUS	LENGTH	TANGENT	CHORD
6+17.04 - 11+23.43	64°45'02"	448.10'	506.40'	284.10'	5 16'05"57" W 479.88'
12+51.95 - 14+56.99	20°48'57"	564.30'	205.04'	103.66'	5 05'52"05" E 203.92'



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. ...* 12-6-04  
 CHIEF, BUREAU OF HIGHWAYS #3 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Harold ...* 12/27/04  
 CHIEF, DIVISION OF LAND DEVELOPMENT #8 DATE

*Chris ...* 12/27/04  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION #K DATE

Date No. Revision Description

**EMERSON (KEY PROPERTY)**  
 SECTION 2 PHASE 5B, PARCEL AA  
 SECTION 3 AREA 4, PARCEL A  
 OWNER/DEVELOPER:  
 THE HOWARD RESEARCH & DEVELOPMENT CORPORATION  
 10275 Little Patuxent Parkway  
 Columbia, Maryland 21044

**DMW**  
 Duff-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4708

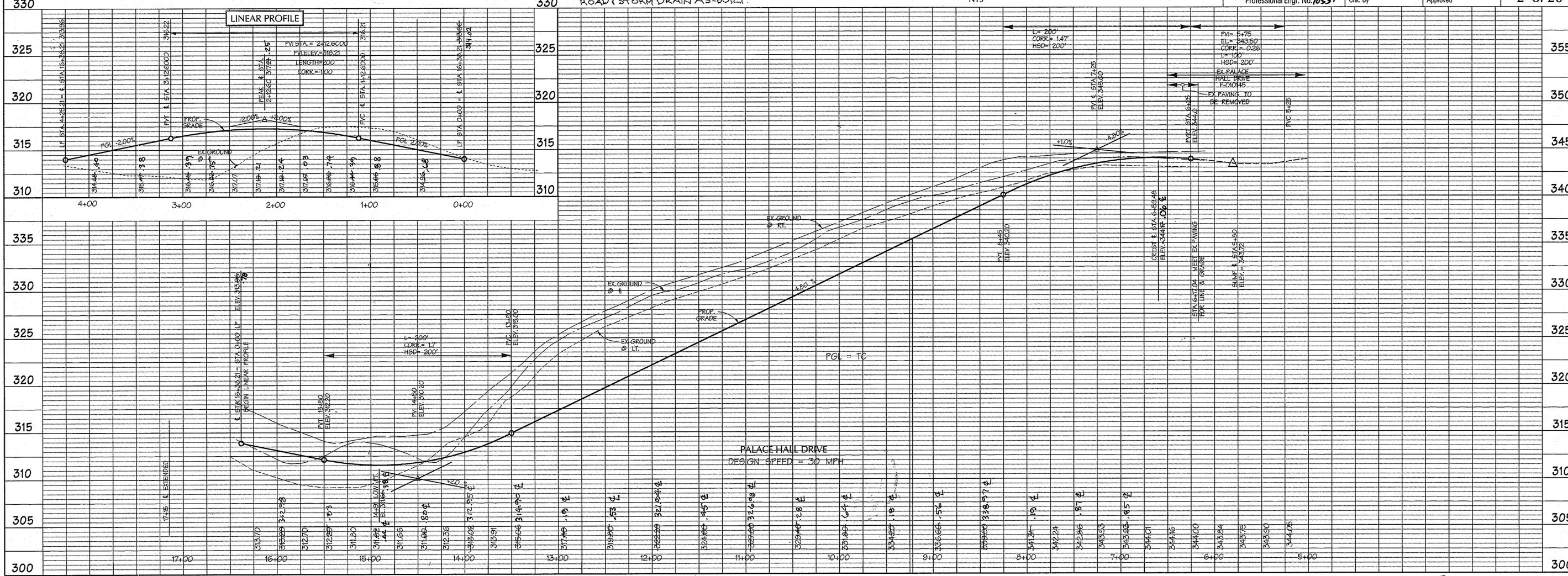
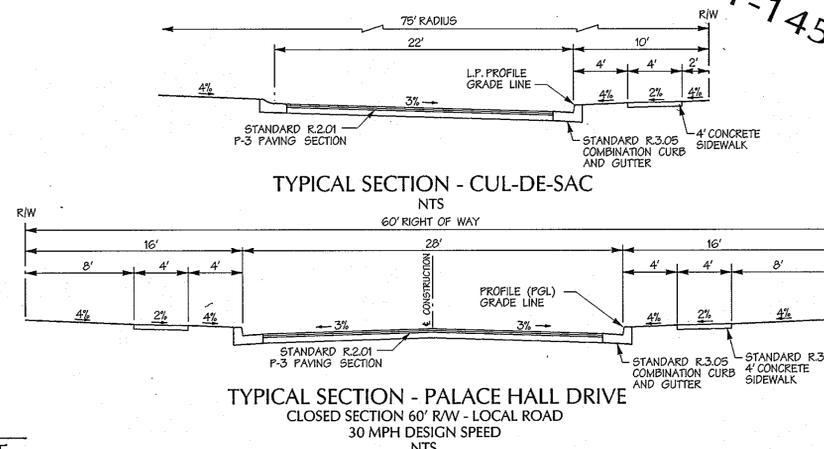
A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

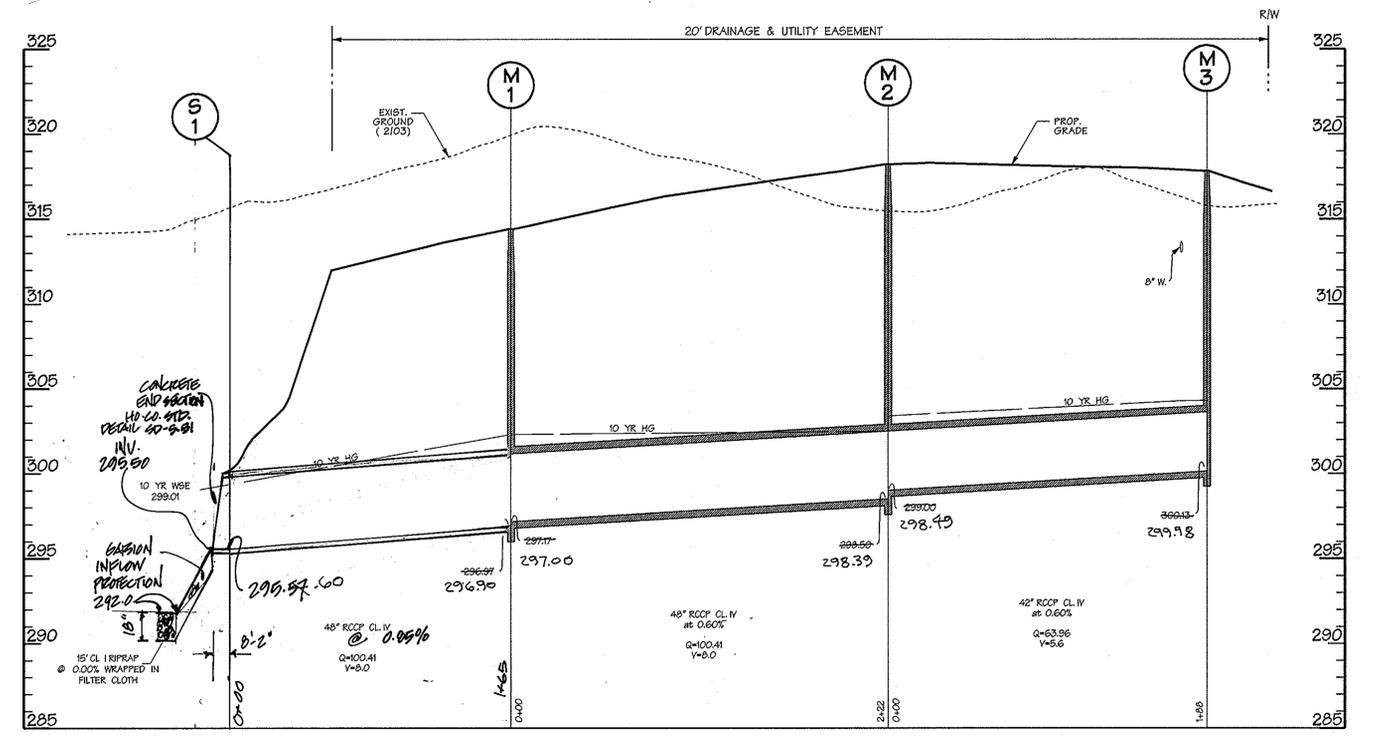
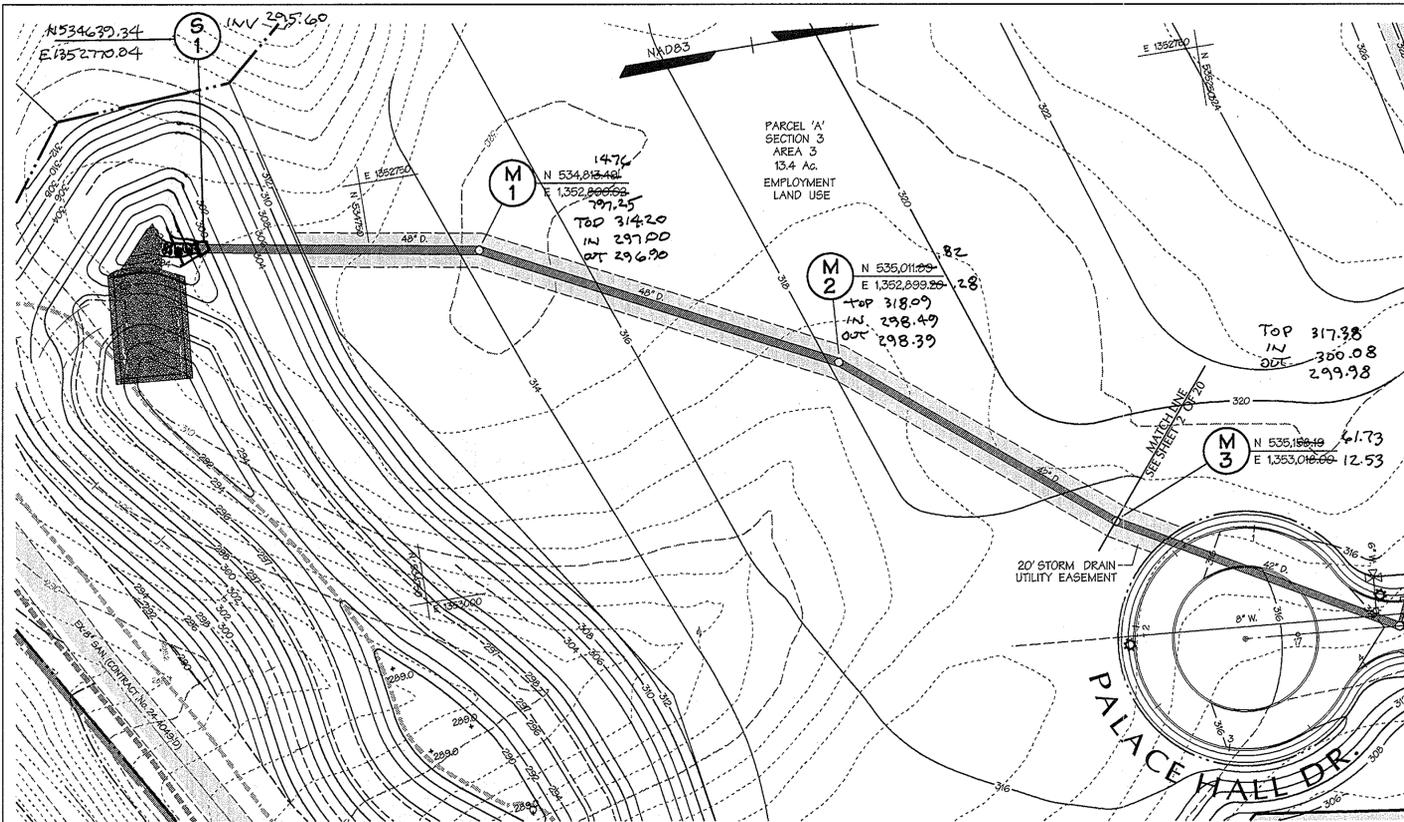
AREA TAX MAP PARCEL  
 6TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE **PLAN & PROFILE**  
**PALACE HALL DRIVE**

Des. By KAD Scale 1"=50' Proj. No. 95254.63  
 Dm. By KDE Date 07/28/04  
 Chk. By Approved 2 of 20

Professional Engr. No. 6557





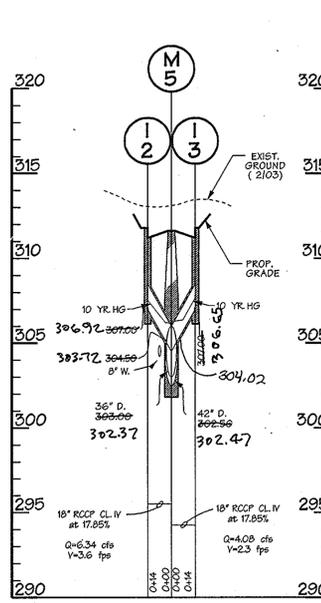
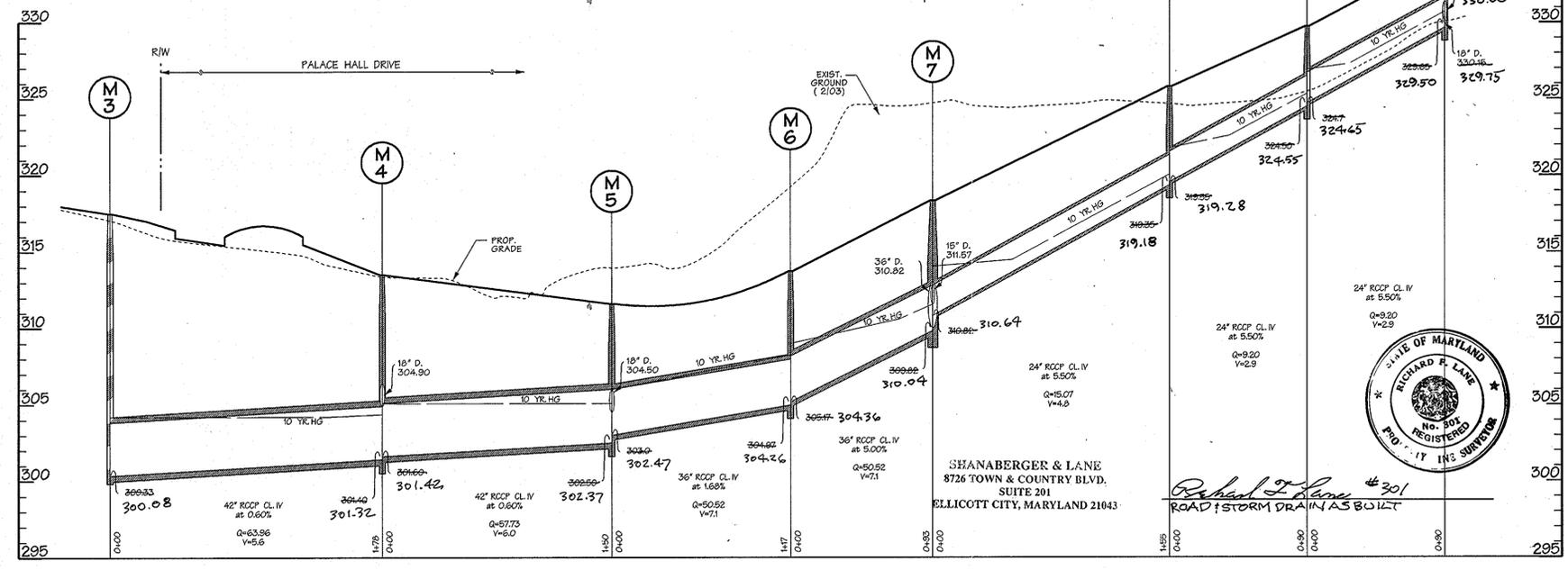
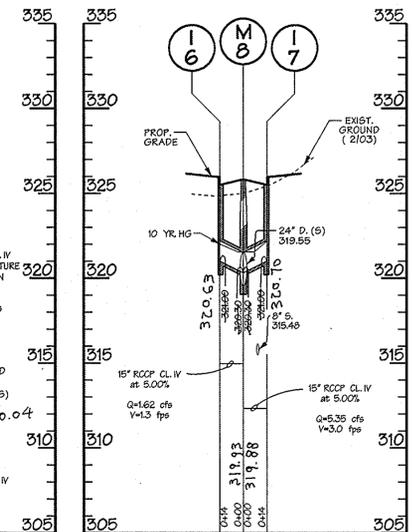
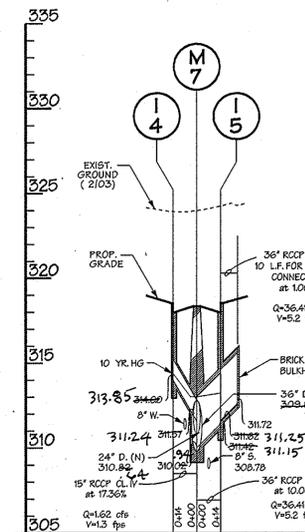
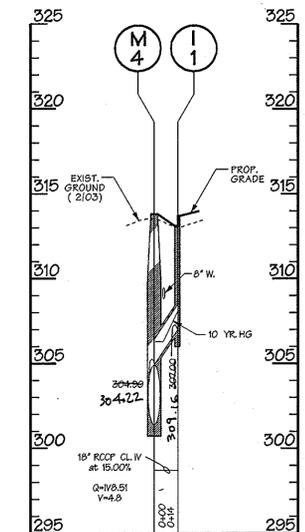
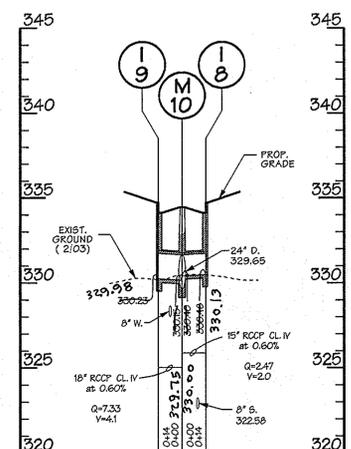
PLAN  
SCALE: 1" = 50'

STRUCTURE SCHEDULE

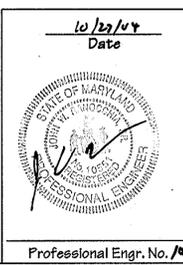
NO.	TYPE	INV. IN	INV. OUT	TOP ELEV.	REMARKS	LOCATION
M-1	SHA STD. 72" M	297.00	296.90	314.20	MD 384.05	N 534,813.49, E 1,352,800.02 ✓
M-2	SHA STD. 72" M	8.49	298.00	298.90	MD 384.05	N 535,011.89, E 1,352,899.20 ✓
M-3	SHA STD. 72" M	.08	300.35	300.35	MD 384.05	N 535,158.19, E 1,353,018.00 ✓
M-4	SHA STD. 72" M	.42	301.82	301.82	MD 384.05	STA. 16+40 ✓
M-5	STANDARD MANHOLE (60")	4	303.97	302.90	HO. CO. STD. G.5.03	STA. 14+91 ✓
M-6	STANDARD MANHOLE (60")	4.36	306.47	304.90	HO. CO. STD. G.5.13	STA. 13+74 ✓
M-7	STANDARD MANHOLE (60")	.64	310.32	310.32	HO. CO. STD. G.5.13	STA. 12+80 ✓
M-8	STANDARD MANHOLE (48")	.23	319.52	319.52	HO. CO. STD. G.5.12	STA. 11+25 ✓
M-9	STANDARD MANHOLE (48")	.65	324.72	324.58	HO. CO. STD. G.5.12	STA. 10+35 ✓
M-10	STANDARD MANHOLE (48")		329.05	334.84	HO. CO. STD. G.5.12	STA. 9+45 ✓
I-1	A-10 (SD 4.02)		309.00	313.45	HO. CO. STD. SD.4.02	STA. 16+34.5 ✓
I-2	A-10 (SD 4.02)		308.92	311.90	HO. CO. STD. SD.4.02	STA. 14+91 ✓
I-3	A-10 (SD 4.02)		308.05	311.20	HO. CO. STD. SD.4.02	STA. 14+91 ✓
I-4	A-10 (SD 4.02)		318.85	318.85	HO. CO. STD. SD.4.02	STA. 12+80 ✓
I-5	A-10 (SD 4.02)		311.22	318.85	HO. CO. STD. SD.4.02	STA. 12+80 ✓
I-6	A-10 (SD 4.02)		324.00	325.36	HO. CO. STD. SD.4.02	STA. 11+25 ✓
I-7	A-10 (SD 4.02)		328.00	325.36	HO. CO. STD. SD.4.02	STA. 11+25 ✓
I-8	A-10 (SD 4.02)		330.23	334.78	HO. CO. STD. SD.4.02	STA. 9+45 ✓
I-9	A-10 (SD 4.02)		330.23	334.78	HO. CO. STD. SD.4.02	STA. 9+45 ✓
S-1	CONC. END SECTION SD 5.52	295.60	295.60		HO. CO. STD. SD.5.51	

PIPE SCHEDULE

LF	SIZE
596	42" RCCP
236	36" RCCP
335	24" RCCP
42	18" RCCP
42	18" RCCP
408	48" RCCP



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 12-6-14  
 CHIEF, BUREAU OF HIGHWAYS  
 APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
 12/23/14  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 APPROVED: 12/23/14  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION



Revision Description

EMERSON (KEY PROPERTY)  
 SECTION 2 PHASE 5B, PARCEL AA,  
 SECTION 3 AREA 4, PARCEL A

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

**DMW**  
 Dan M. 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

DATE: 10/23/14

TITLE: STORM DRAIN PLAN AND PROFILES  
 PALACE HALL DRIVE

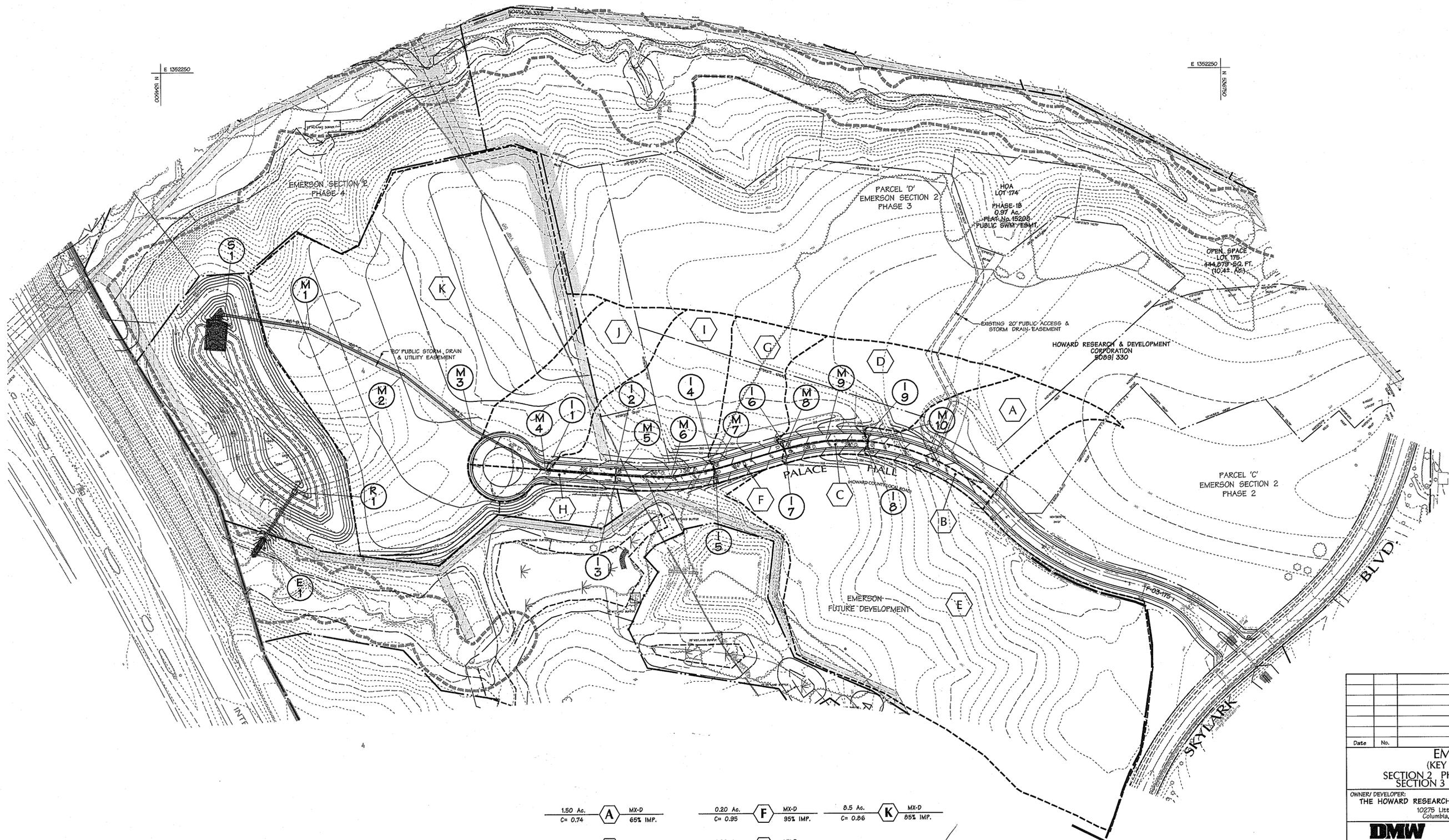
Proj. No. 95054G3  
 3 of 20

NAD83

E 1392250

E 1392250

E 1384000



1.50 Ac. <b>A</b> MX-D C= 0.74 65% IMP.	0.20 Ac. <b>F</b> MX-D C= 0.95 95% IMP.	0.5 Ac. <b>K</b> MX-D C= 0.86 85% IMP.
0.30 Ac. <b>B</b> MX-D C= 0.95 95% IMP.	1.00 Ac. <b>G</b> MX-D C= 0.74 65% IMP.	
0.20 Ac. <b>C</b> MX-D C= 0.95 95% IMP.	0.50 Ac. <b>H</b> MX-D C= 0.95 95% IMP.	
1.10 Ac. <b>D</b> MX-D C= 0.74 65% IMP.	1.30 Ac. <b>I</b> MX-D C= 0.74 65% IMP.	
8.77 Ac. <b>E</b> MX-D C= 0.74 65% IMP.	1.50 Ac. <b>J</b> MX-D C= 0.86 85% IMP.	

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. Malin*  
 CHIEF, DIVISION OF HIGHWAYS 12/11/04 DATE

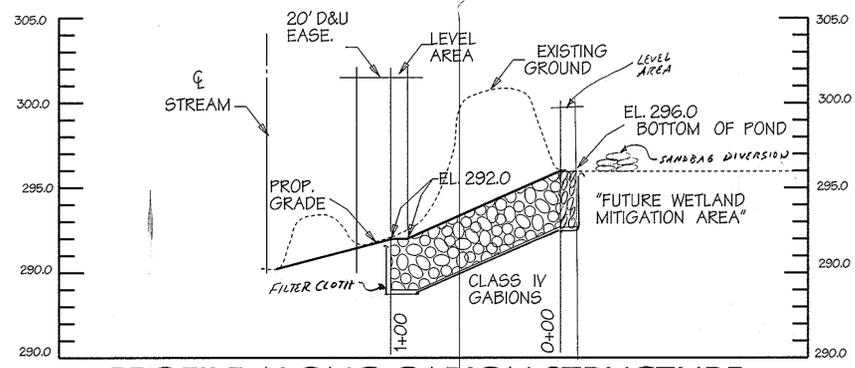
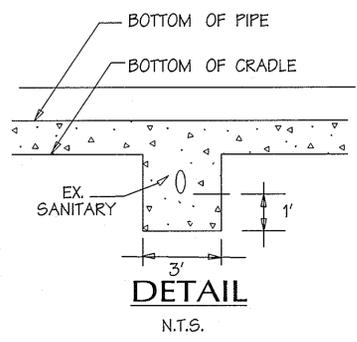
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Harold B. ...*  
 CHIEF, DIVISION OF LAND DEVELOPMENT 12/11/04 DATE

*Chris ...*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 12/11/04 DATE

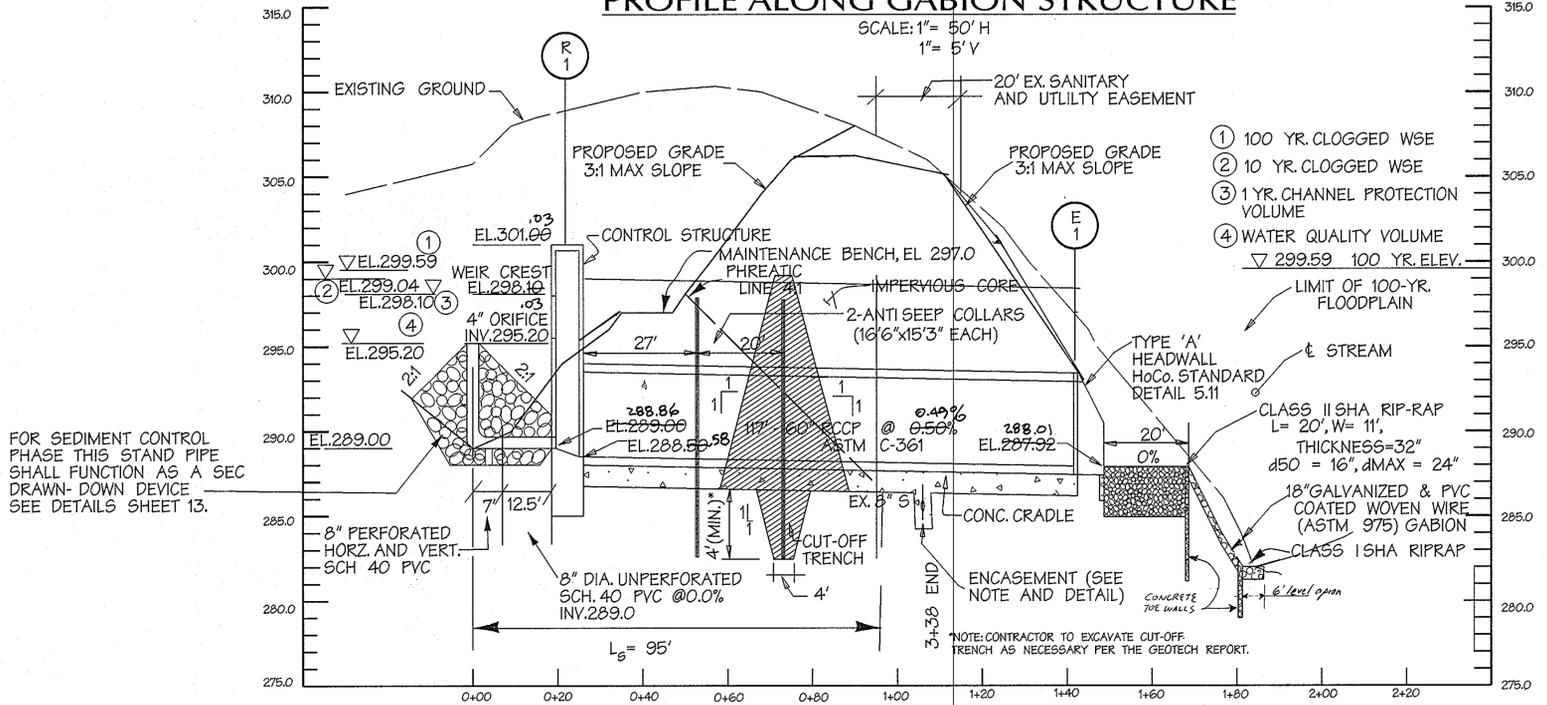


Date	No.	Revision Description
<b>EMERSON</b> (KEY PROPERTY) SECTION 2 PHASE 5B, PARCEL AA, SECTION 3 AREA 4, PARCEL A		
OWNER/ DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORPORATION 10275 Little Patuxent Parkway Columbia, Maryland 21044		
<b>DMW</b> Daft · McCune · Walker, Inc. A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals 200 East Pennsylvania Avenue Towson, Maryland 21286 410 296 3333 Fax: 296 4705		
EMERSON	SECTION AREA	LOT/FACED
EMERSON	PHASE 5B	
PLAT OR LOT	BLOCK #	TAXING MAP
		47
WATER CODE	SEWER CODE	ELECT. DISTRICT
		@ T14
<b>TITLE</b> <b>STORM DRAIN DRAINAGE AREA MAP</b> 8TH ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND		
Drn By:	Scale: 1"=100'	Proj. No. 95054.G3
Des By: KDE	Date: 05/21/04	
Chk By:	Approved:	4 of 20

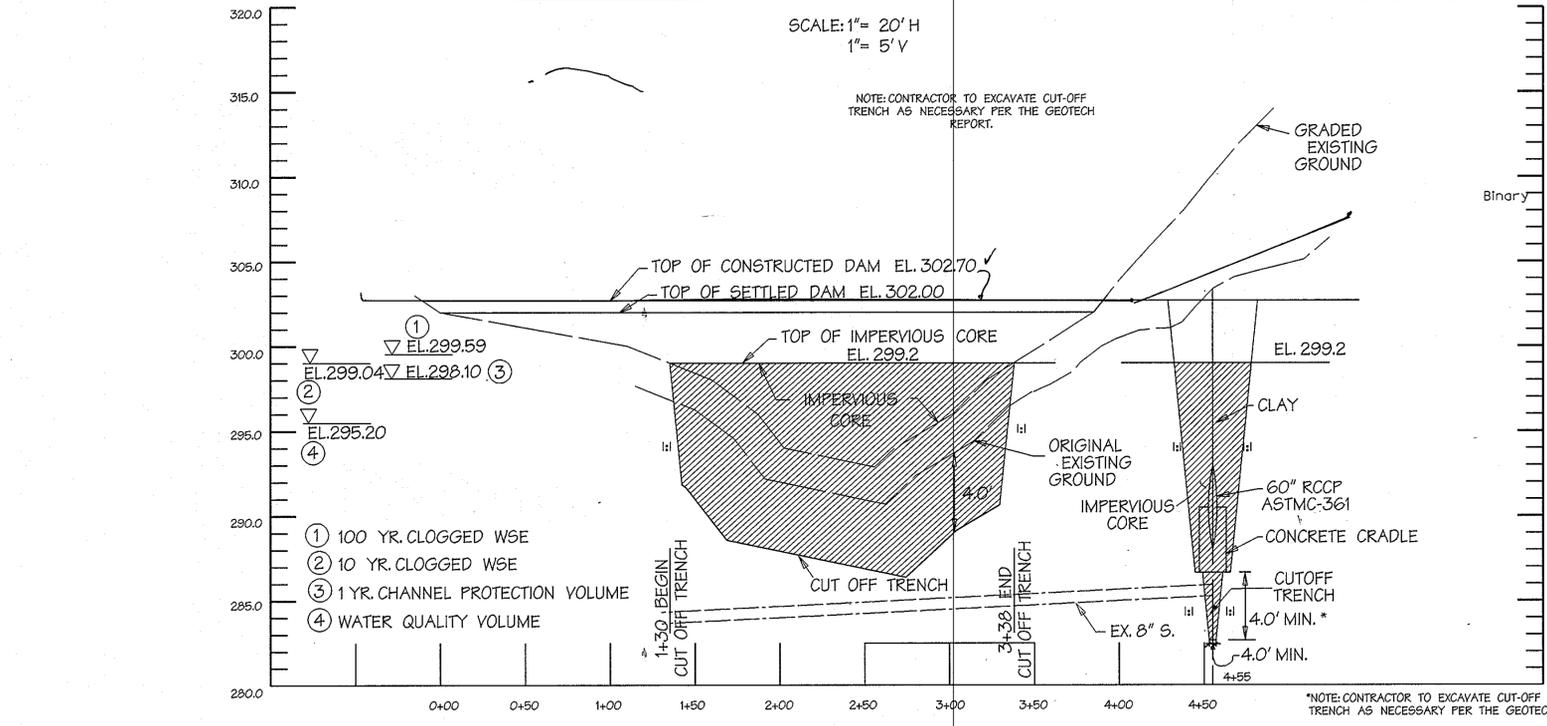




PROFILE ALONG GABION STRUCTURE  
SCALE: 1" = 50' H  
1" = 5' V



PROFILE THROUGH PRINCIPAL SPILLWAY  
SCALE: 1" = 20' H  
1" = 5' V



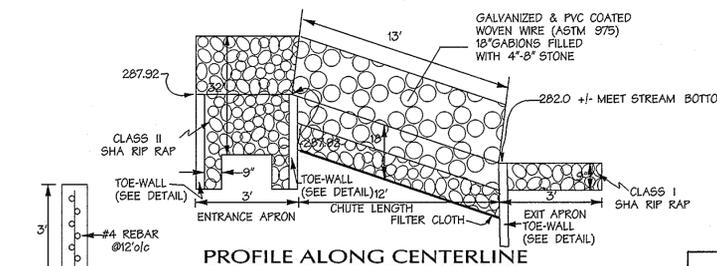
PROFILE ALONG CENTERLINE OF DAM  
SCALE: 1" = 50' H  
1" = 5' V

FOR SEDIMENT CONTROL PHASE THIS STAND PIPE SHALL FUNCTION AS A SEC DRAWN-DOWN DEVICE SEE DETAILS SHEET 13.

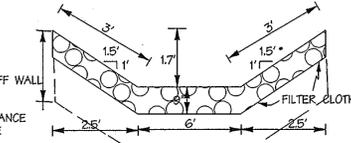
- ① 100 YR. CLOGGED WSE
- ② 10 YR. CLOGGED WSE
- ③ 1 YR. CHANNEL PROTECTION VOLUME
- ④ WATER QUALITY VOLUME

### RENO MATTRESS DROP STRUCTURE

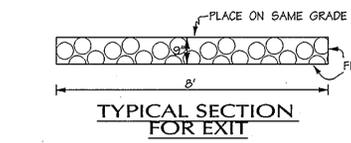
N.T.S.



PROFILE ALONG CENTERLINE



TYPICAL SECTION FOR ENTRANCE & CHUTE



TYPICAL SECTION FOR EXIT

- CONSTRUCTION NOTES
- Reno mattress shall be 3 cell 9'x6'x9" nominal size, cut and tied to meet plan design.
  - Mattress, Entrance apron, toe-wall & exit apron shall be filled with 4-6 inch stone.
  - Filter fabric shall be used under and on sides of mattress and loose stone.
  - Excavate as necessary for toe-wall and mattress installation.
  - Backfill shall be tamped by reasonable methods to insure satisfactory degree of compaction to minimize settlement.
  - All disturbed areas shall be seeded according to specifications.
  - Chute lengths may vary for 1, 2 or 3 mattresses but slope should not exceed 2:1.

**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 HEIGHTS 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: *John W. Ramonick, Sr.*  
REG. NO. 10551 DATE 10/27/04

**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/WE 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/WE ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

Signature: *Paul G. Caravaggio*  
DATE 10/27/04

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.

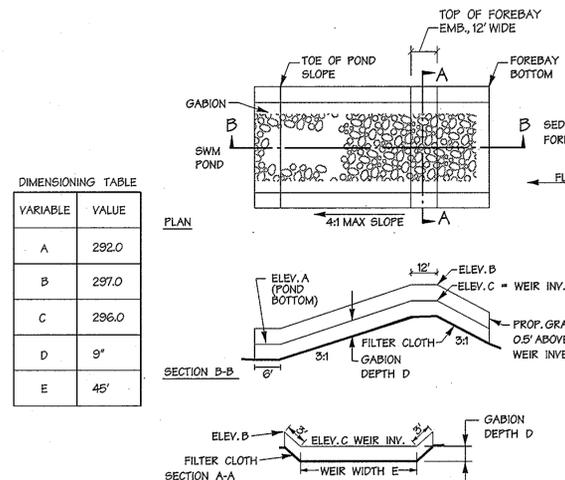
Signature: *Jim Meyer, P.E.*  
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE DATE 11/22/04

APPROVED: *William J. ...*  
HOWARD SOIL CONSERVATION DISTRICT DATE 11/22/04

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
Signature: *William J. ...*  
CHIEF, BUREAU OF HIGHWAYS DATE 12-11-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
Signature: *Harold ...*  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE 12/22/04

Signature: *...*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 12/23/04

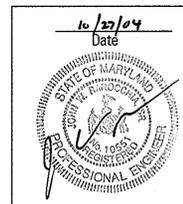


SWM FOREBAY EMBANKMENT ARMORING DETAIL  
NOT TO SCALE

DIMENSIONING TABLE

VARIABLE	VALUE
A	292.0
B	297.0
C	296.0
D	9'
E	45'

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



**EMERSON**  
(KEY PROPERTY)  
SECTION 2 PHASE 5B, PARCEL AA  
SECTION 3 AREA 4, PARCEL A

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

**DMW**  
DRAFT 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 PROFILES		
Des By JP	Scale 1" = 50'	Proj. No. 95054.G3
Dn By JP	Date 07/28/04	6 OF 20
Chk By	Approved	



**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 materials 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 have construction supervised by a geotechnical engineer.

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

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

**COMPACTION** - 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 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 phi 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-301.
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.
7. Mastic grout of barrel joints shall be used.

**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 B, 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 soils 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 Mixture), 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 slightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the 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 posts 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" x 6" line posts. Construct the gate in accordance with SHA Standard Detail 622.01 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:
  - (i) 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-outlets 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.
2. No work shall proceed until the engineer inspects and approves the work previously completed.
3. Geotechnical compaction testing of the facility embankment is required. Certification must be provided to the designated engineer in charge of the as-built.
4. A copy of all material supply tickets must be given to the designated engineer in charge of the as-built.

**17. MAINTENANCE SCHEDULE**

**ROUTINE MAINTENANCE:**

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. SEDIMENT SHALL BE REMOVED FROM FOREBAYS WHEN THE DEPTH EXCEEDS 1'.
4. VEGETATION ON EMBANKMENT AND ACCESS BENCH SHALL NOT EXCEED 18" IN HEIGHT.
5. 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:**

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 INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.
2. LIGHT AND DARK SPOTS OF THE DAM AND WASHED IN THE EARTH SPILLWAY SHALL BE FILLED WITH SUITABLE MATERIAL AND THOROUGHLY COMPACTED. THESE AREAS SHALL BE RESEDED OR RESEEDDED LIMED, AND FERTILIZED AS NEEDED.
3. ALL AFFURTELVANCES SHALL BE KEPT FREE OF TRASH AND DEBRIS.
4. TRASH AND DEBRIS SHALL BE REMOVED AS NECESSARY.
5. INSIDE SIDE SLOPE AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED. CARE SHALL BE TAKEN NOT TO MOW ANY OF THE WETLAND PLANTINGS IN THE VICINITY OF THE 5' 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, SCS "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.

**5. EVALUATIONS AND RECOMMENDATIONS**

**5.1. Stormwater Management Pond**

Based upon our review of the available project plans, we understand that the proposed SWM facility will be constructed by excavation of the pond and construction of the embankment. The stormwater management facilities may require cuts and fills, up to 10 ft. Infiltration practices are not expected at these pond locations, so no final infiltration tests were performed.

We have assumed that the embankment construction will include a cutoff trench and impermeable core. Since the depth of water impounded against the embankment at the principal spillway will be 3 feet or more, we presume the proposed facilities will be designed and constructed in accordance with the current specifications established by Maryland Soil Conservation Society (SCS) Standards and Specifications 378 for embankment ponds.

According to the "Maryland Stormwater Design Manual, Volume 1 & 2" (2000), established by the Maryland Department of Environment (MDE), it is our understanding that infiltration practices are not recommended to be utilized where the groundwater table or bedrock is within 4.0 feet of the invert level of an infiltration facility, or in materials that exhibit infiltration rates less than 0.52 inches per hour (based on field testing). Additionally, infiltration practices are not allowed on slopes greater than 15%, in fill materials or in materials with a clay content above 20% or silt and clay content above 40%.

During the geotechnical evaluation, a high water table was encountered at borings B-2 and B-3. Based on these conditions, the SWM pond bottom would not meet the infiltration requirements outlined by MDE regulations. As previously stated, infiltration is not planned at these ponds.

SCS criteria require combined inside and outside embankment side slopes of no less than 5H:1V. Although detailed seepage and stability analyses have not been performed, in our experience the critical stability condition is typically at the inside slope for the condition of rapid drawdown. For the typical residual soils (silty sands or SM) that may be used for the side slopes, adequate inside slope stability require inside slopes not steeper than 2.5H:1V or 3H:1V.

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 not encountered at this pond site, however limited clay materials were encountered in other sections of the Emerson development. Imported clay material will likely have to be used in the clay core. Section 6.1 General Earthwork Requirements outlines the earthwork requirements for construction of the SWM pond.

It should be noted that underlying impervious soils were generally not encountered in the borings. Therefore, the cut-off trench will require much deeper penetration (to an unknown depth). As an alternative a compacted clay blanket can be placed over the entire pond bottom. This should be 12 inches thick and placed in three lifts, with each compacted to 90% of the Standard Proctor maximum dry density. The blanket should be covered by 12 inches of compacted general site soils. Another option would be to construct an internal chimney filter drain, inside the embankment.

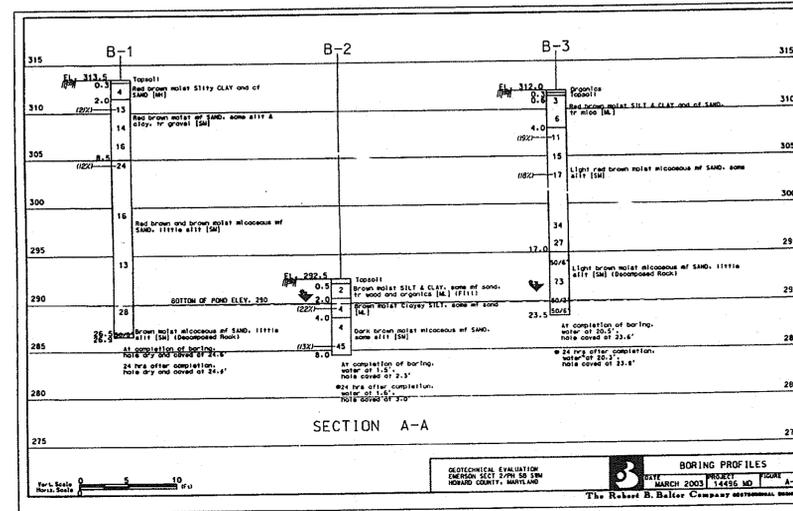
All foundations shall be constructed in accordance with the recommendations in Section 5.2 Foundations. All procedures regarding the installation of the discharge structures should be approved by SCS and Howard County.

**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 be proportioned for an allowable soil bearing pressure of 2,500 psf, for soils with N-values greater than 10. 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.

Foundations which will be subject to the effects of freezing weather both during and following construction must bear a minimum of 30 inches below the surrounding grades to mitigate the possibility of detrimental frost action. Also, any minimum footing widths, sizes, and reinforcing required by applicable codes must be maintained. It is noted that proper construction procedures must be employed to prevent the loss of supporting capacity of the soil bearing surface once footings have been excavated. Such measures include exercising care while setting reinforcing steel, placing concrete as soon as possible after excavation, and providing protection from the weather. During cold weather, the exposed bearing surface must be protected from freezing, and in no case may concrete be placed over materials which are frozen or have been degraded by freezing.

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.



14496-a.dgn 03/24/2003 01:48:16 PM

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

*William R. ...* 12-21-04  
CHIEF, BUREAU OF HIGHWAYS MS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*Harold ...* 12/22/04  
CHIEF, DIVISION OF LAND DEVELOPMENT MS DATE

*Michael ...* 12/22/04  
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

Date	No.	Revision Description

**EMERSON  
(KEY PROPERTY)  
SECTION 2 PHASE 5B, PARCEL AA  
SECTION 3 AREA 4, PARCEL A**

OWNER / DEVELOPER:

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

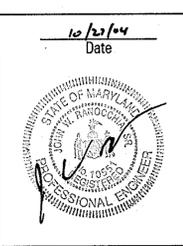
**DMW**  
Duff McCreary-Walker, Inc.  
200 West Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3388  
Fax 296-4706

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

Des By	MRT	Scale	AS SHOWN	Proj. No.	95054.G3
Dm By	WDE	Date	10/29/04		
Chk By		Approved		8	OF 20

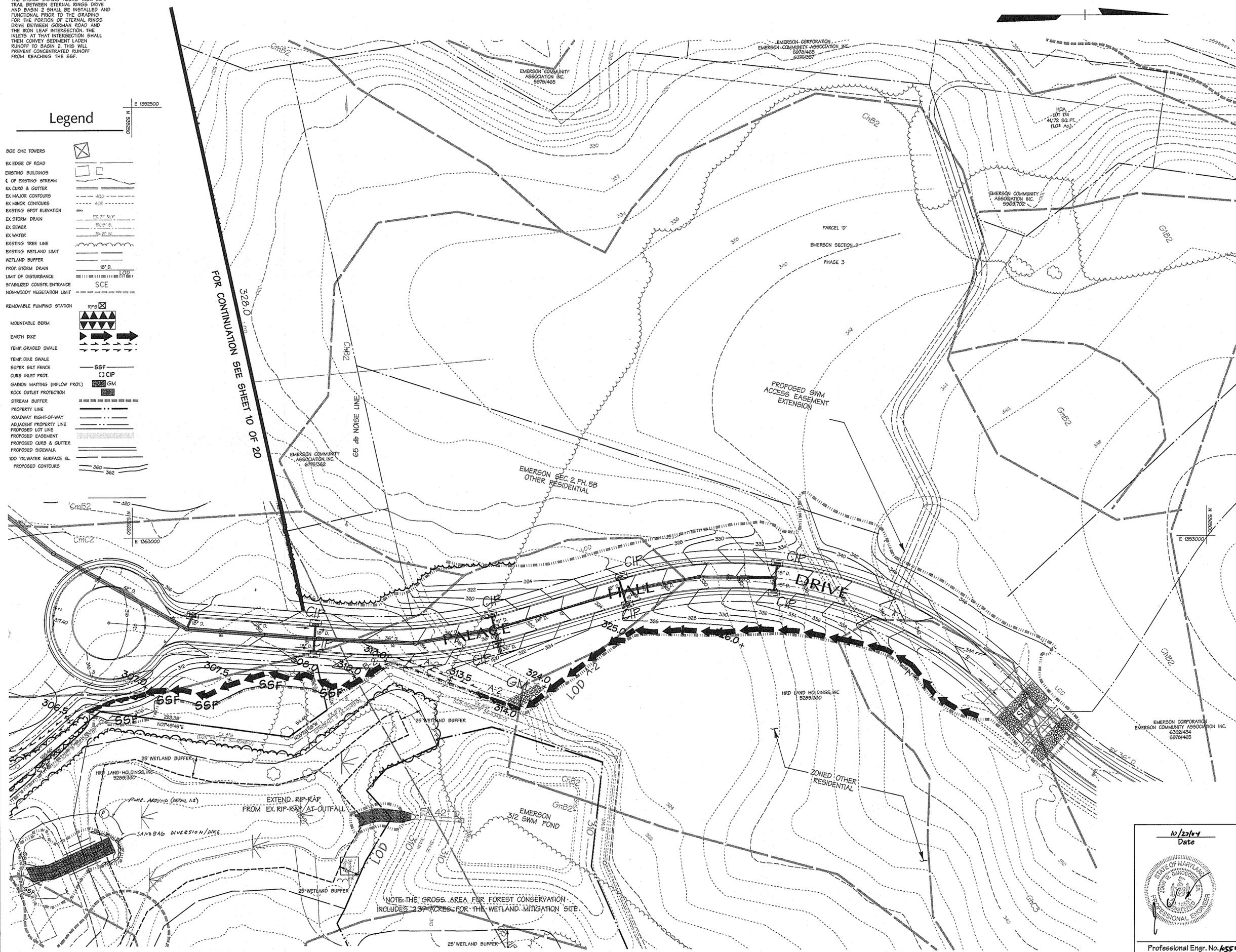


**SEQUENCING NOTE:**

THE STORM DRAINS ALONG IRON LEAF TRAIL BETWEEN ETERNAL RINGS DRIVE AND BASIN 2 SHALL BE INSTALLED AND FUNCTIONAL PRIOR TO THE GRADING FOR THE PORTION OF ETERNAL RINGS DRIVE BETWEEN GORMAN ROAD AND THE IRON LEAF INTERSECTION. THE INLETS AT THAT INTERSECTION SHALL THEN CONVEY SEDIMENT TO THE RUNOFF TO BASIN 2. THIS WILL PREVENT CONCENTRATED RUNOFF FROM REACHING THE S6F.

**Legend**

- BOE ONE TOWERS
- EX EDGE OF ROAD
- EXISTING BUILDINGS
- EX EXISTING STREAM
- EX CURB & GUTTER
- EX MAJOR CONTOURS
- EX MINOR CONTOURS
- EXISTING SPOT ELEVATION
- EX STORM DRAIN
- EX SEWER
- EX WATER
- EXISTING TREE LINE
- EXISTING WETLAND LIMIT
- WETLAND BUFFER
- PROP. STORM DRAIN
- LIMIT OF DISTURBANCE
- STABILIZED CONSTR. ENTRANCE
- NON-WOODY VEGETATION LIMIT
- REMOVABLE PUMPING STATION
- MOUNTABLE BERM
- EARTH DIKE
- TEMP. GRADED SWALE
- TEMP. DIKE SWALE
- SUPER SALT FENCE
- CURB INLET PROT.
- GABION MATTING (INFLOW PROT.)
- ROCK OUTLET PROTECTION
- STREAM BUFFER
- PROPERTY LINE
- ROADWAY RIGHT-OF-WAY
- ADJACENT PROPERTY LINE
- PROPOSED LOT LINE
- PROPOSED EASEMENT
- PROPOSED CURB & GUTTER
- PROPOSED SIDEWALK
- 100 YR. WATER SURFACE EL.
- PROPOSED CONTOURS



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 'F' (WATER CONTACT RECREATION, AQUATIC LIFE PROTECTION AND PUBLIC WATER SUPPLY).

**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]* 10/29/04  
SIGNATURE OF ENGINEER DATE  
PRINT NAME BELOW SIGNATURE **John W. Renczek, Sr.**

**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]* 10/27/04  
SIGNATURE OF DEVELOPER DATE  
PRINT NAME BELOW SIGNATURE **Paul G. Covatta**

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

*[Signature]* 11/22/04  
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE DATE

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

*[Signature]* 11/22/04  
HOWARD S.C.D. DATE

**APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS**

*[Signature]* 12-21-04  
CHIEF, BUREAU OF HIGHWAYS DATE

**APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING**

*[Signature]* 12/27/04  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 12/28/04  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Date	No.	Revision Description

**EMERSON PROPERTY SECTION 2 PHASE 5B, PARCEL AA SECTION 3 AREA 4, PARCEL A**

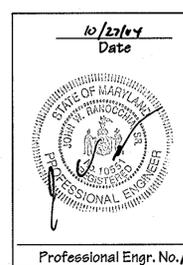
OWNER/DEVELOPER:  
**THE HOWARD RESEARCH & DEVELOPMENT CORPORATION**  
10275 Little Patuxent Parkway  
Columbia, Maryland 21044

**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

PROVISION NAME	EMERSON	SECTION AREA	PHASE 5B	LOT/PARCEL #	037
PLAT OR L.P. NO.	572/430	ZONE	7.8, 9.13	PHASE MAP	47
WATER CODE		ELECT. DISTRICT	6 TH	CENSUS TRACT	

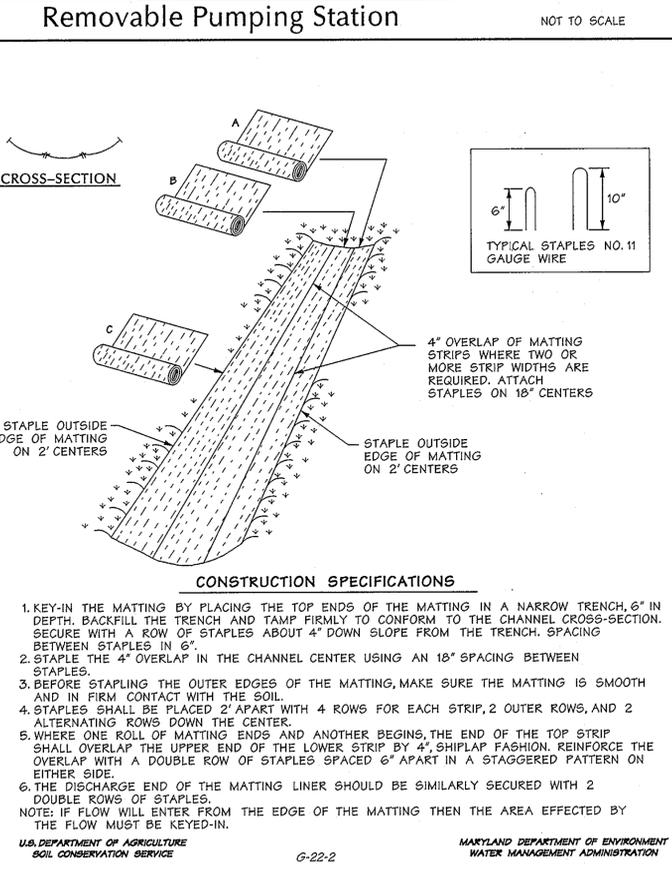
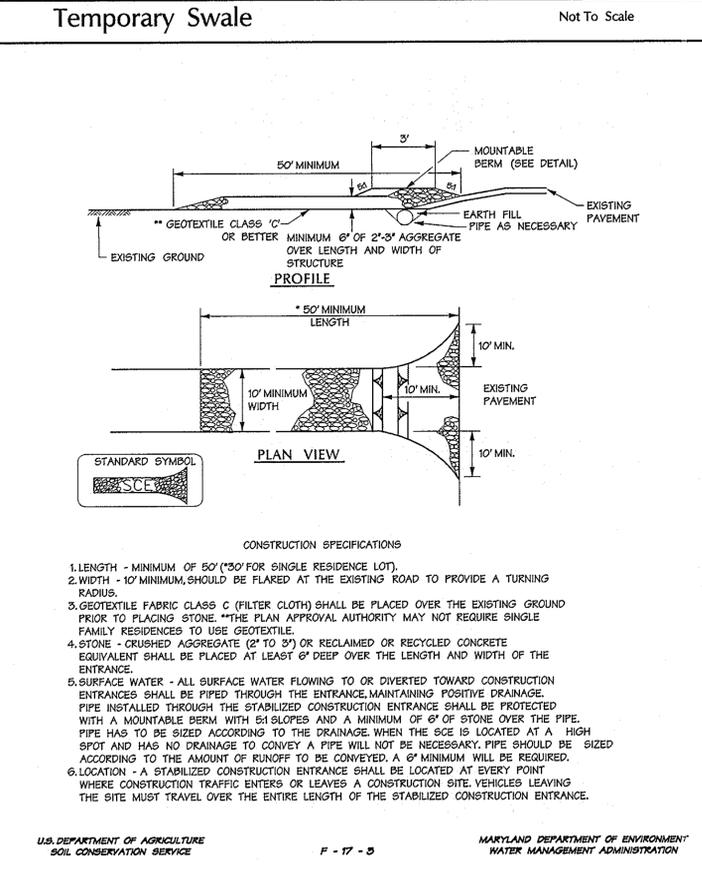
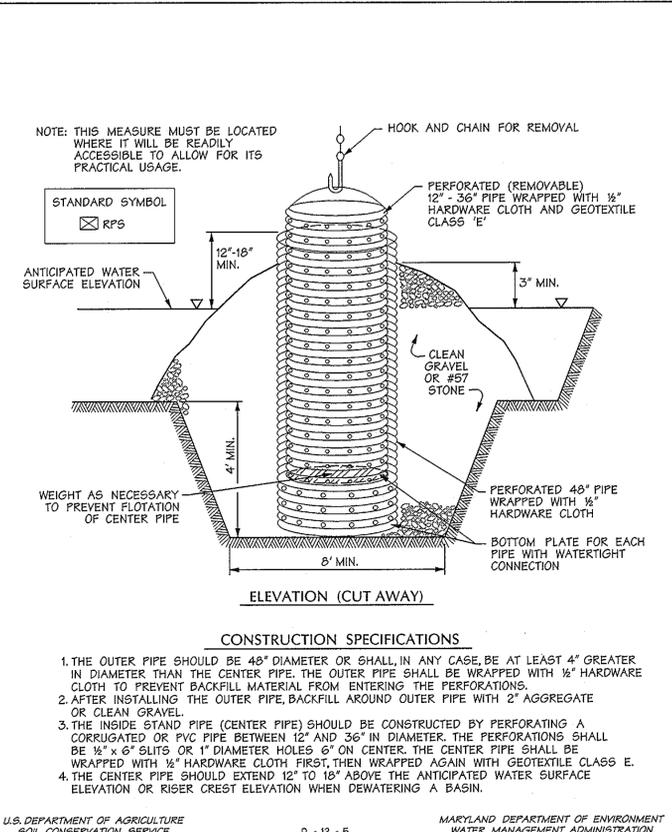
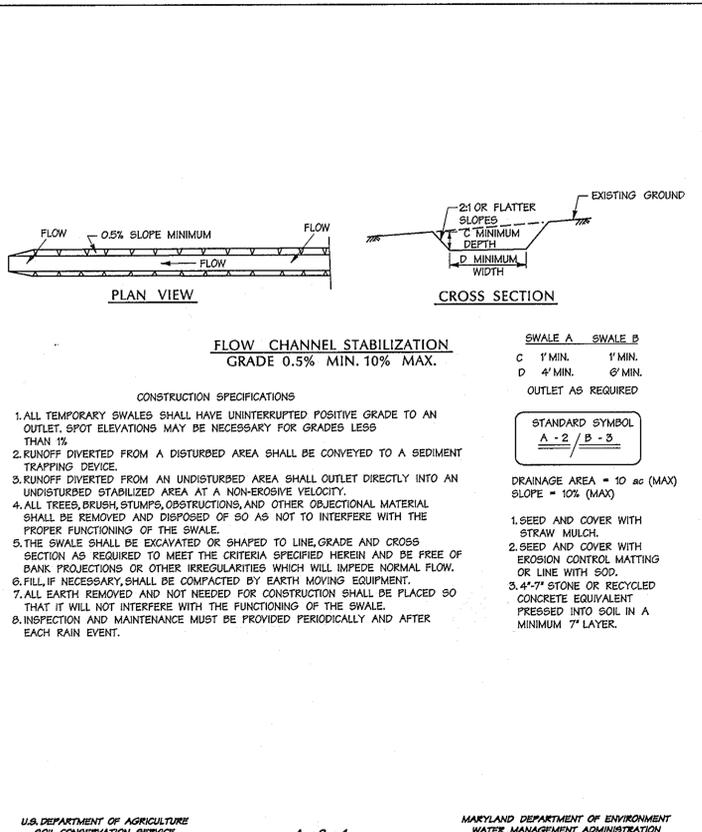
**TITLE**  
FINAL PLAN  
SEDIMENT AND EROSION CONTROL PLAN

Drn By:	PS	Scale:	1"=50'	Proj. No.:	95054.G3
Des By:	JP	Date:	10/29/04		
Chk By:		Approved:			9 OF 20



Professional Engr. No. 10523





**Stabilized Construction Entrance** Not To Scale

**DEVELOPER'S CERTIFICATION:**  
 I HEREBY 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. ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.

**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 COUNTY SOIL CONSERVATION DISTRICT.

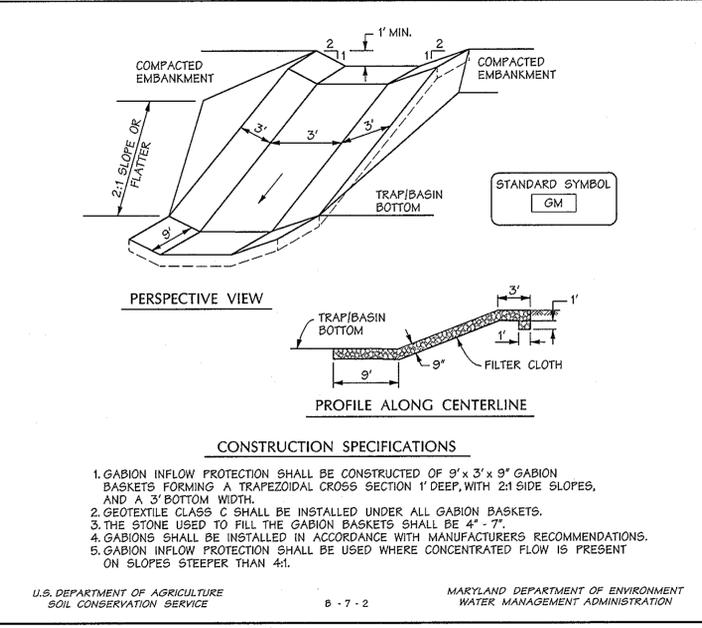
Signature: *John W. Rauschies*  
 Date: 11/27/04

**Erosion Control Matting** Not To Scale

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

Signature: *Jim Mays*  
 Date: 11/27/04

Signature: *John W. Rauschies*  
 Date: 11/27/04



**Gabion Inflow Protection** 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 (303-1955).

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 THEREOF.

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 OR GRADED AREAS ON THE PROJECT SITE.

4. A SEDIMENT TRAPPING BASIN 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. 50), 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 (THESE NUMBERS REFLECT PHASES 5a AND 5c COMBINED):  
 TOTAL AREA OF SITE 23.85 ACRES\*\*  
 AREA TO BE ROOFED OR PAVED 17.35 ACRES  
 AREA TO BE VEGETATIVELY STABILIZED 15.75 ACRES  
 TOTAL CUT 25,662 CUBIC YARDS\*\*\*  
 TOTAL FILL 25,662 CUBIC YARDS\*\*\*

\*\*CUT AND FILL WILL BE BALANCED ON THIS SITE IF AN OFF-SITE WASTE/BORROW AREA IS REQUIRED, IT SHALL CONSIST OF A FACILITY APPROVED BY THE HOWARD CO. SCD AND THAT HAS A MARYLAND 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 OBTAINED.

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.

**Sediment Control General Notes** Sedctrl.cdl / HOGENN

**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 DISING 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) PROFOUR 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 UNIFORM FIRMNESS 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-1557). 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 MOISTURE 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 PROFOURING AND SELECTIVE UNDERCUTTING SHALL BE ACCOMPLISHED AFTER EXCAVATION DOWN TO THE PROPOSED GRADES HAS BEEN COMPLETED.

- BEST MANAGEMENT PRACTICES FOR WORKING IN NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, AND 100-YEAR FLOODPLAINS
- NO EXCESS FILL, CONSTRUCTION MATERIAL, OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.
  - 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.
  - 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.
  - 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.
  - 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.
  - RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.
  - ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYEGRASS (*Lolium multiflorum*), MILLET (*Echinochloa crusgalli*), OATS (*Avena sativa*), AND/OR RYE (*Secale cereale*). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING THE VOLUNTARY REVEGETATION OF NATURAL WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE, BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCKY 31 BEECH 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.
  - AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.
  - TO PROTECT AQUATIC SPECIES, IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:  
 USE INWATERS-IN-STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE, DURING ANY YEAR.
  - STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAY.
  - OUTLETS 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.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 Signature: *William J. ...*  
 CHIEF, BUREAU OF HIGHWAYS  
 DATE: 12-01-04

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
 Signature: *Charles ...*  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 12/27/04

Signature: *Mark ...*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 12/27/04

Revelon Description  
**EMERSON**  
 (KEY PROPERTY)  
 SECTION 2 PAHSE 5B, PARCEL AA  
 SECTION 3 AREA 4, PARCEL A

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

**DMW**  
 Dan M. Curie - Walker, Inc.  
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 410 286 3833  
 Fax 286 4705

SUBDIVISION NAME: EMERSON SECTION AREA: PHASE 5B LOT/FACEL # 837  
 PLAT OR LOT: 572/430 BLOCK # 7,8,9,10 ZONE: MXD TAXING MAP: 47 ELEC. DISTRICT: 6 TH CENSUS TRACT:  
 WATER CODE: BENE CODE:

TITLE  
**SEDIMENT & EROSION CONTROL DETAILS**

Drn By: PS Scale: N/A Proj. No. 95054.G3  
 Des By: JP Date: 10/29/04  
 Ck By: Approved: 11 of 20

Professional Engr. No. 10551  
 Date: 10/29/04

F-04-127

**CROSS SECTION**

**PLAN VIEW**

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

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

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

**CONSTRUCTION SPECIFICATIONS**

- ALL TEMPORARY EARTH DIKES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET. SPOT ELEVATIONS MAY BE NECESSARY FOR GRADES LESS THAN 1%.
- RUNOFF DIVERTED FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.
- RUNOFF DIVERTED FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED, STABILIZED AREA AT A NON-EROSIVE VELOCITY.
- 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.
- 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 IMPERE NORMAL FLOW.
- FILL SHALL BE COMPACTED BY EARTH MOVING EQUIPMENT.
- ALL EARTH REMOVED AND NOT NEEDED FOR CONSTRUCTION SHALL BE PLACED SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIKE.
- 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

**CROSS SECTION**

**PLAN VIEW**

**CONSTRUCTION SPECIFICATIONS**

- 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.
- THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
- 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.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
- FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDSUP 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

**ELEVATION**

**PLAN VIEW**

**CONSTRUCTION SPECIFICATIONS**

- PERFORATIONS IN THE DRAW-DOWN DEVICE MAY NOT EXTEND INTO THE WET STORAGE.
- THE TOTAL AREA OF THE PERFORATIONS MUST BE GREATER THAN 4 TIMES THE AREA OF THE INTERNAL ORIFICE.
- THE PERFORATED PORTION OF THE DRAW-DOWN DEVICE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH AND GEOTEXTILE FABRIC. THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS FOR GEOTEXTILE CLASS E.
- 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

**Temporary methods:**

- Mulches - see standards for vegetative stabilization with mulches only. Mulch should be crimped or tacked to prevent blowing.
- Vegetative cover - see standards for temporary vegetative cover.
- Tillage - to roughen surface and bring clods to the surface. This is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect.
- Irrigation - this is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. repeat as needed. At no time should the site be irrigated to the point the runoff begins to flow.
- Barriers - solid board fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling soil blowing.
- Calcium chloride - apply at a rate that will keep surface moist. May need retreatment.

**Permanent methods:**

- Permanent vegetation - see standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place.
- Topsolling - covering with less erosive soil materials. See standards for topsolling.
- Stone - cover surface with crushed stone or coarse gravel.

**Earth Dike** Not To Scale

**Super Silt Fence** Not To Scale

**Basin Drawdown Schematic Ver. Drawdown Device**

**Dust Control Specifications**

**PERSPECTIVE VIEW**

**TOP VIEW**

**CROSS SECTION**

**JOINING TWO ADJACENT SILT FENCE SECTIONS**

**CONSTRUCTION SPECIFICATIONS**

- FENCE POSTS SHALL BE A MINIMUM OF 36" LONG DRIVEN 16" MINIMUM INTO THE GROUND. WOOD POSTS SHALL BE 1 1/2" X 1 1/2" SQUARE (MINIMUM) CUT OR 1 1/2" DIAMETER (MINIMUM) ROUND AND SHALL BE OF SOUND QUALITY HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHING NOT LESS THAN 100 POUND PER LINEAR FOOT.
- 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
- WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS.
- SILT FENCE SHALL BE INSPECTED AFTER EACH RAINFALL EVENT AND MAINTAINED WHEN BULGES OCCUR OR WHEN SEDIMENT ACCUMULATION REACHED 50% OF THE FABRIC HEIGHT.

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**PLAN VIEW**

**ELEVATION**

**SECTION A-A**

**CONSTRUCTION SPECIFICATIONS**

- 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.
- THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
- 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.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
- FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDSUP REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF FENCE HEIGHT.

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**CONSTRUCTION SPECIFICATIONS**

- 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.
- THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
- GEOTEXTILE CLASS C<sup>3</sup> OR BETTER 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 FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
- 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 FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
- THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

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**Mountable Berm Detail** NOT TO SCALE

BERM No.	HEIGHT
A	18"
B	30"

FILTER CLOTH SHALL BE GEOTEXTILE CLASS 'C', OR BETTER

SoilCon.org / F175

**Rock Outlet Protection III**

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

- No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain.
- 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.
- 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.
- 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.
- Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
- Rectify any nontidal wetlands, wetland buffers, waterways, or the 100-year floodplain temporarily impacted by any construction.
- All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (*Lolium multiflorum*), Millet (*Setaria italica*), Oats (*Avena sp.*), and/or Rye (*Secale cereale*). These species will allow for the stabilization of the site while also allowing the voluntary revegetation of nontidal wetland species. Other non-persistent vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division. Kentucky 31 fence 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.
- After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
- To protect aquatic species, in-stream work is prohibited as determined the classification of the stream:  
Use 1 Waters: in-stream work shall not be conducted during the period March 1 through June 15, inclusive, during any year.
- Stormwater runoff from impervious surfaces shall be controlled to prevent the washing of debris into the waterway.
- 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.

**Silt Fence** Not To Scale

**DEVELOPER'S CERTIFICATION:**

"I HEREBY 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: *Paul G. Carver* Date: 10/27/04

**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: *John W. Renneking* Date: 10/27/04

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

**Rock Outlet Protection III** Not To Scale

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

Signature: *Jim Mays* Date: 11/22/04

Signature: *Shelley* Date: 11/22/04

U.S. NATURAL RESOURCE CONSERVATION SERVICE DATE

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

HOWARD S.C.D. DATE

**EMERSON (KEY PROPERTY) SECTION 2 PHASE 5B, PARCEL AA SECTION 3 AREA 4, PARCEL A**

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

**DMW**  
Daf + 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

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
Signature: *William J. ...* Date: 12-21-04  
CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
Signature: *Harold ...* Date: 12/22/04  
CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: *...* Date: 12/23/04  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

DATE: 10/27/04

Professional Engr. No. 10551

**SEDIMENT & EROSION CONTROL DETAILS**

DRN BY:	PS	SCALE:	N/A	PROJ. NO.:	95054.03
DES BY:	JP	DATE:	10/29/04		
CHK BY:	Approved:				12 of 20

Professional Engr. No. 10551

STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS

- A. SITE PREPARATION**
- Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms, waterways, or sediment control basins.
  - Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding.
  - Schedule required soil tests to determine soil amendment composition and application rates for sites having disturbed areas over 5 acres.
- B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)**
- 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.
  - 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 warranty of the producer.
  - Lime materials shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50% calcium oxide (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.
  - Incorporate lime and fertilizer into the top 3 - 5 inches of soil by disking or other suitable means.
- C. SEEDBED PREPARATION**
- TEMPORARY SEEDING**
    - 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 as 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 contour of the slope.
    - Apply fertilizer and lime as prescribed on the plans.
    - Incorporate lime and fertilizer into the top 3 - 5 inches of soil by disking or other suitable means.
  - PERMANENT SEEDING**
    - Minimum soil conditions required for permanent vegetative establishment:
      - Soil pH shall be between 6.0 and 7.0.
      - Soluble salts shall be less than 500 parts per million (PPM).
      - 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 Sorrelia Lespedeza is to be planted. Then a sandy soil (< 30% silt plus clay) would be acceptable.
      - Soil shall contain 1.5% minimum organic matter by weight.
      - Soil must contain sufficient pore space to permit adequate root penetration.
      - 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.
    - 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 close to prevent topsoil from sliding down a slope.
    - Apply soil amendments as per soil test or as included on the plans.
    - 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**
- 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.
  - 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**
- Hydroseeding:** Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or cultipacker seeder.
    - 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; P2O5 (phosphorous): 200 pounds per acre; K2O (potassium): 200 pounds per acre.
    - 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.
  - Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.
  - Drop Seeding: This includes use of conventional drop or broadcast spreaders.
    - 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 weighted roller to provide good seed soil contact.
    - Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

- Drill or cultipacker seeder: Mechanized seeders that apply and cover seed with soil.
    - Cultipacker seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering.
      - Seedbed must be firm after planting.
    - Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.
  - MULCH SPECIFICATIONS (IN ORDER OF PREFERENCE)**
    - 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 weed seeds as specified in the Maryland Seed Law.
    - Wood cellulose fiber mulch (WCFM)
      - WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state.
      - 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.
      - WCFM, including dye shall contain no germination or growth inhibiting factors.
      - 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.
      - WCFM material shall contain no elements or compounds at concentration levels that will be phytotoxic.
      - 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 SEEDING AREAS** - Mulch shall be applied to all seeded areas where one species of grass is desired.
- 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.
  - 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 1 1/2 inches 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.
  - Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1500 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:
- A mulch anchoring tool is a tractor drawn implement design to practice 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.
  - 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.
  - 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, Petrosert, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.
  - 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 Depth		
1	Annual Ryegrass	50	2/1 - 4/30 8/15 - 1/11	1/4" - 1/2"	600 Lbs./Ac. (15 Lbs./1000 SF)	2 Tons/Ac. (100 Lbs./1000 SF)
2	Weeping Lovegrass	4	5/1 - 8/14	1/4" - 1/2"		

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	N	P2O5	K2O	
85	Rebel II Tall Fescue	125	3/1 - 5/15 8/15 - 1/15	30 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	Perennial Ryegrass	15		1000 Sq.Ft.	1000 Sq.Ft.	1000 Sq.Ft.	
5	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).

SECTION IV - SOD

- To provide quick cover on disturbed areas (2:1 grade or flatter)
- A. GENERAL SPECIFICATIONS**
- 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.
  - Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/8", at the time of cutting. Measurements 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.
  - 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.
  - Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
  - 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**
- During periods of excessively high temperature or in areas having dry subsoil, the sod shall be lightly irrigated immediately prior to laying the sod.
  - 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.
  - 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.
  - 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**
- 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.
  - After the first week, sod watering is required as necessary to maintain adequate moisture content.
  - 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 sites 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 1/2 inches 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**
- 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.
  - 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.
  - 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 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.
  - 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: 1 1/2 - 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 from 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 seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

- D. REPAIRS AND MAINTENANCE**
- Once the vegetation is established, the site shall have 95% groundcover to be considered adequately stabilized.
  - If the stand provides less than 40% ground cover, re-establish following original lime, fertilizer, seedbed preparation and seeding recommendations.
  - If the stand provides between 40% and 94% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
  - 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**
- This practice is limited to areas having 2:1 or flatter slopes where:
    - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
    - The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish containing supplies of moisture and plant nutrients.
    - The original soil to be vegetated contains material toxic to plant growth.
    - The soil is so acidic that treatment with limestone is not feasible.
  - 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

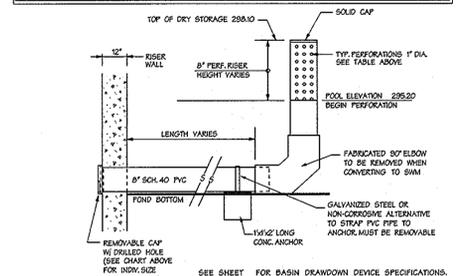
- Topsoil salvages from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experiment Station.
- Topsoil Specifications - Soil to be used as topsoil must meet the following:
  - 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 chert, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1-1/2" in diameter.
  - Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutgrass, poison ivy, thistle, or others as specified.
  - 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 1000 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.
- For sites having disturbed areas under 5 acres:
  - On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
    - 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.
    - Organic content of topsoil shall be not less than 1.5 percent by weight.
    - Topsoil having soluble salt content greater than 500 parts per million shall not be used.
  - No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used to weed control until sufficient time has elapsed (14 days min) to permit dissipation of phytotoxic materials.

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

- Place topsoil (if required) and apply soil amendments as specified in 21.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.
- Topsoil Application
  - When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Erosion Fence and Sediment Traps and Basins.
  - Grades on the areas to be topsoiled, which have been previously established, shall be maintained, about 4% - 8% higher in elevation. 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.
  - 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.
- Alternative for Permanent Seeding - Instead of applying the full amount of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:
  - 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:
    - 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.
    - 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.
    - Composted sludge shall be applied at a rate of 1 ton/1000 square feet.
  - Composted sludge shall be amended with a potassium fertilizer applied at a rate of 4 lb./1000 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 Institute, Revised 1975.

RISER #	LENGTH	WET POOL ELEV.	PERF. RISER HEIGHT	ORIFICE DRILLED HOLE SIZE	PERFORATION SPACING	PERFORATIONS PER VERT. FT.
BASIN 1	19.9'	295.20'	2.90'	1.0"	2.25"	40



Sediment Control Draw-Down

Sequence of Operations

- Obtain Grading permit, Notify Maryland Department of Environmental and Natural Resources Inspections and Compliance sections at (410)-631-3510 at least five days in advance of beginning any work in streams, 100-year floodplain, nonflood wetlands and wetland buffers.
  - Notify HCD Department of Inspections 410-313-1055 at least 48 hours prior to beginning any work. Department of Inspections (410)313-1055 at least 48 hours prior to beginning work.
  - Orange high visibility fence shall be manually installed along the limit of disturbance.
  - Where the limit is within 50 feet of forest conservation easement, 100-year floodplain, wetlands buffer or stream buffer. This shall be completed by and inspected at the pre-construction meeting.
  - With permission from the Sediment Control Inspector, clear and grub for and install the Stabilized Construction Entrance, Install Sump Site Fence (SSF) around the sediment basin as shown on plans.
  - Clear and grub, install basin, Notify HCD Inspector to gain permission to proceed.
  - Install remainder of Sediment and Erosion Control (SEC) measures, including dikes and swales.
  - Notify HCD Department of Inspection, upon completion of said installation.
  - With the approval of the sediment control inspector, clear and grub the remainder of the site.
  - Install utilities and curb and gutter.
  - Final Road.
  - Upon stabilization of site with established vegetation and with the permission of the Sediment Control Inspector, flush the storm drain system.
  - With the permission of the Sediment Control Inspector, remove sediment control measures and stabilize any areas disturbed by their removal. Convert basin to SWM pond.
- \*Use Waters: In-stream work shall not be conducted during the period March 1, through June 15 inclusive during any year.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. ...*  
 CHIEF, BUREAU OF HIGHWAYS *MS* 12-21-04  
 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Charles B. ...*  
 CHIEF, DIVISION OF LAND DEVELOPMENT *MS* 12/21/04  
 DATE

*David ...*  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION *MS* 12/21/04  
 DATE

Date	No.	Revision Description

**EMERSON**  
 (KEY PROPERTY)  
 SECTION 2 PHASE 5B, PARCEL AA  
 SECTION 3 AREA 4, PARCEL A

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

**DMW**  
 Dan McCreary - 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



**DEVELOPER'S CERTIFICATION:**

"I HEREBY 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. ...*  
 SIGNATURE OF DEVELOPER  
 DATE 11/22/04

**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."

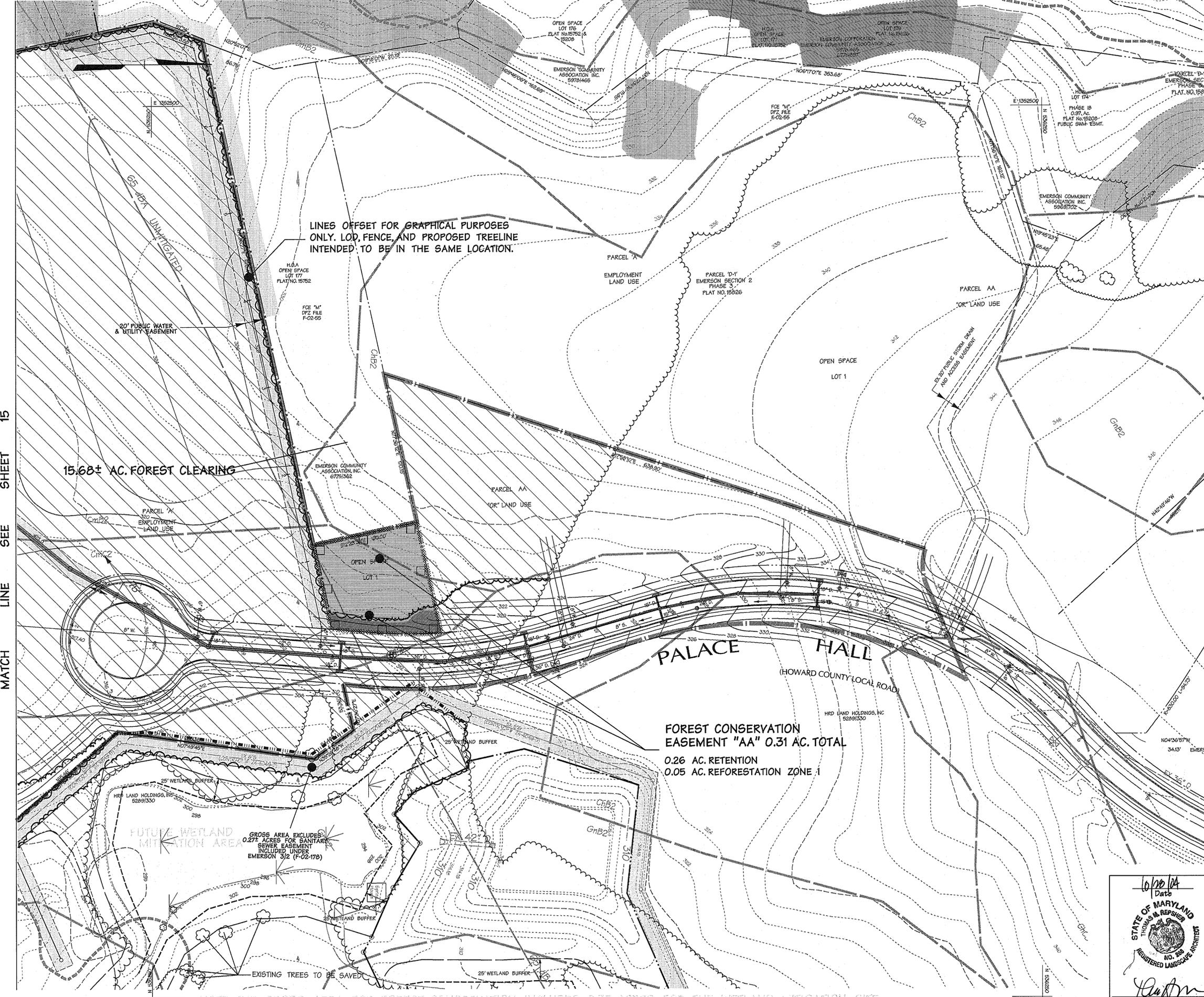
*John W. ...*  
 SIGNATURE OF ENGINEER  
 DATE 11/22/04

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

*Jim ...*  
 U.S. NATURAL RESOURCE CONSERVATION SERVICE  
 DATE 11/22/04

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

*John ...*  
 HOWARD S.C.D.  
 DATE 11/22/04



**GOALS AND OBJECTIVES**  
 THE GOALS AND OBJECTIVES OF THIS FOREST CONSERVATION PLAN ARE TO IDENTIFY FOREST AREAS TO BE CLEARED UNDER EMERSON 2 PHASE 5B AND TO PROVIDE LONG TERM PROTECTION FOR RETENTION AND REFORESTATION AREAS PROPOSED UNDER THIS PHASE. APPROXIMATELY 15.68 ACRES OF FOREST CLEARING AND 1.32 ACRES OF FOREST RETENTION IS PROPOSED UNDER THIS PHASE, AND APPROXIMATELY 2.77 ACRES OF REFORESTATION IS PROPOSED WITHIN THE FLOODPLAIN AND STREAM BUFFERS ON THE SOUTHERN PORTION OF THE PROJECT, AND ADJACENT TO THE RIGHT-OF-WAY ON THE NORTHERN PORTION OF THE PROJECT. WHEN EVALUATED CUMULATIVELY WITH PREVIOUS PHASES OF THIS PROJECT, 9.53 ACRES OF REFORESTATION IS REQUIRED, AND 11.51 ACRES OF REFORESTATION IS PROVIDED. PLANT SPECIES HAVE BEEN CHOSEN TO TOLERATE FLOODPLAIN AND UPLAND MOISTURE CONDITIONS WITHIN THE REFORESTATION AREAS.

**LEGEND**

EX CURB & GUTTER	---
EX MAJOR CONTOURS	--- 40' ---
EX MINOR CONTOURS	--- 2' ---
EX STORM DRAIN	EX 21" S.D.
EX SEWER	EX 21" S.
EX WATER	EX 21" W.
EXISTING TREE LINE	---
EXISTING WETLAND LIMIT	---
WETLAND BUFFER	---
EX 100 YEAR FLOODPLAIN	EX 100 YEAR WATER SURF. ELEV.
PROP. 100 YR FLOODPLAIN	PROP. 100 YEAR WATER SURF. ELEV.
LIMIT OF DISTURBANCE	L.D.
SOL(S) LINE (NOT SHOWN)	---
STREAM BUFFER	---
PROPOSED STREET TREE	○ 15" D.
PROP. STORM DRAIN	8" S.
PROP. SEWER	8" S.
PROP. WATER	8" W.
PROPERTY LINE	---
ROADWAY RIGHT-OF-WAY	---
PROPOSED LOT LINE	---
PROPOSED EASEMENT	---
PROPOSED CURB & GUTTER	---
PROPOSED SIDEWALK	---
SLOPE 15% - 24.9%	---
SLOPE 25% +	---
FOREST RETENTION AREA	---
FOREST CONSERVATION EASEMENT	---
FOREST CLEARING	---
PROPOSED MINOR CONTOUR	---
PROPOSED MAJOR CONTOUR	---
PROPOSED PHASE LINE	---
REFORESTATION ZONE I	---
REFORESTATION ZONE II	---
REFORESTATION ZONE III	---
PERMANENT FOREST PROTECTION SIGNS	---
TEMPORARY FOREST PROTECTION FENCE	---

**DATA SOURCES:**  
 TOPOGRAPHICAL INFORMATION ON EMERSON SECTION 2 WAS OBTAINED THROUGH AERIAL PHOTOGRAPHY DURING THE SUMMER OF 1999.  
 BOUNDARY SHOWN IS SURVEY BY DMW JUNE 1999.  
 WETLAND LIMITS WERE FIELD LOCATED IN SEPTEMBER 1999 AND JANUARY 2000 BY DMW.  
 FLOODPLAIN ELEVATION SHOWN AT EXISTING POND WAS INTERPOLATED FROM HAMMOND BRANCH FLOODPLAIN STUDY BY HOWARD COUNTY.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. ...* 12-21-04  
 CHIEF, BUREAU OF HIGHWAYS MS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Harold ...* 12/23/04  
 CHIEF, DIVISION OF LAND DEVELOPMENT MS DATE

*Chris ...* 12/23/04  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

Date	No.	Revision Description

**Emerson Section 2**  
 Phase 5B  
 Section 3 - Area 4

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

**DMW**  
 Dan McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-0332  
 Fax 296-4705

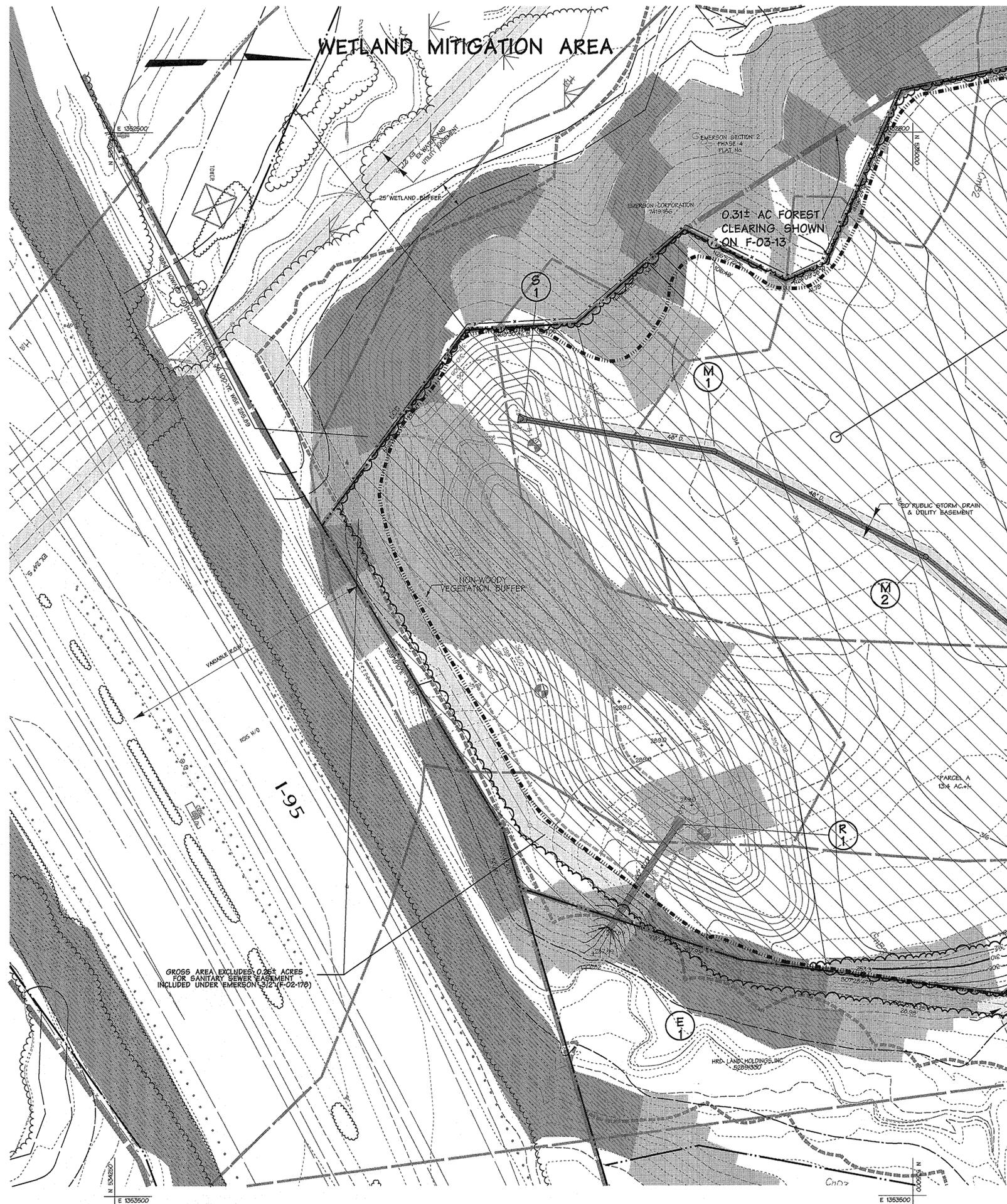
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

10/20/04 Date

STATE OF MARYLAND  
 THOMAS W. REPSHES  
 REGISTERED LANDSCAPE ARCHITECT

SUBDIVISION NAME	EMERSON	SECTION AREA	PHASE 5B	LOT/PARCEL #
PLAT OR LA	MDX	ZONE	TRAVERSE MAX	ELECT. OFFSET
			47	6 TH
WATER CODE		SEWER CODE		
TITLE				
Forest Conservation Plan				
Drn By: CRH	Scale: 1"=50'	Proj. No. 95054.G3		
Des By: SH	Date: 05/21/04			
Chk By: MM	Approved:	14 of 20		

NOTE: THE GROSS AREA FOR FOREST CONSERVATION INCLUDES 2.37 ACRES FOR THE WETLAND MITIGATION SITE.



**LEGEND**

EX CURB & GUTTER	---
EX MAJOR CONTOURS	--- 400 ---
EX MINOR CONTOURS	--- 402 ---
EX STORM DRAIN	--- 15' D ---
EX SEWER	--- 8" S ---
EX WATER	--- 8" W ---
EXISTING TREE LINE	~ ~ ~ ~ ~
EXISTING WETLAND LIMIT	~ ~ ~ ~ ~
WETLAND BUFFER	~ ~ ~ ~ ~
EX 100 YR FLOODPLAIN	--- 100 YR WATER SURF ELEV. ---
PROP. 100 YR FLOODPLAIN	--- 100 YR WATER SURF ELEV. ---
LIMIT OF DISTURBANCE	--- LOD ---
SOIL(S) LINE (NOT SHOWN)	--- Cmt 1 ---
STREAM BUFFER	--- Cmt 2 ---
PROPOSED STREET TREE	○
PROP. STORM DRAIN	--- 15' D ---
PROP. SEWER	--- 8" S ---
PROP. WATER	--- 8" W ---
PROPERTY LINE	---
ROADWAY RIGHT-OF-WAY	---
PROPOSED LOT LINE	---
PROPOSED EASEMENT	---
PROPOSED CURB & GUTTER	---
PROPOSED SIDEWALK	---
SLOPE 15% - 24.9%	---
SLOPE 25% +	---
FOREST RETENTION AREA	---
FOREST CONSERVATION EASEMENT	---
FOREST CLEARING	---
PROPOSED MINOR CONTOUR	---
PROPOSED MAJOR CONTOUR	---
PROPOSED PHASE LINE	---
REFORESTATION ZONE I	---
REFORESTATION ZONE II	---
REFORESTATION ZONE III	---
PERMANENT FOREST PROTECTION SIGNS	---
TEMPORARY FOREST PROTECTION FENCE	---

15.68± AC. FOREST CLEARING (CONT.)

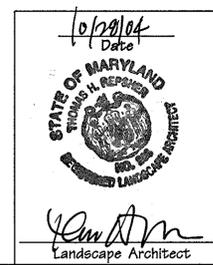
MATCH LINE SEE SHEET 14

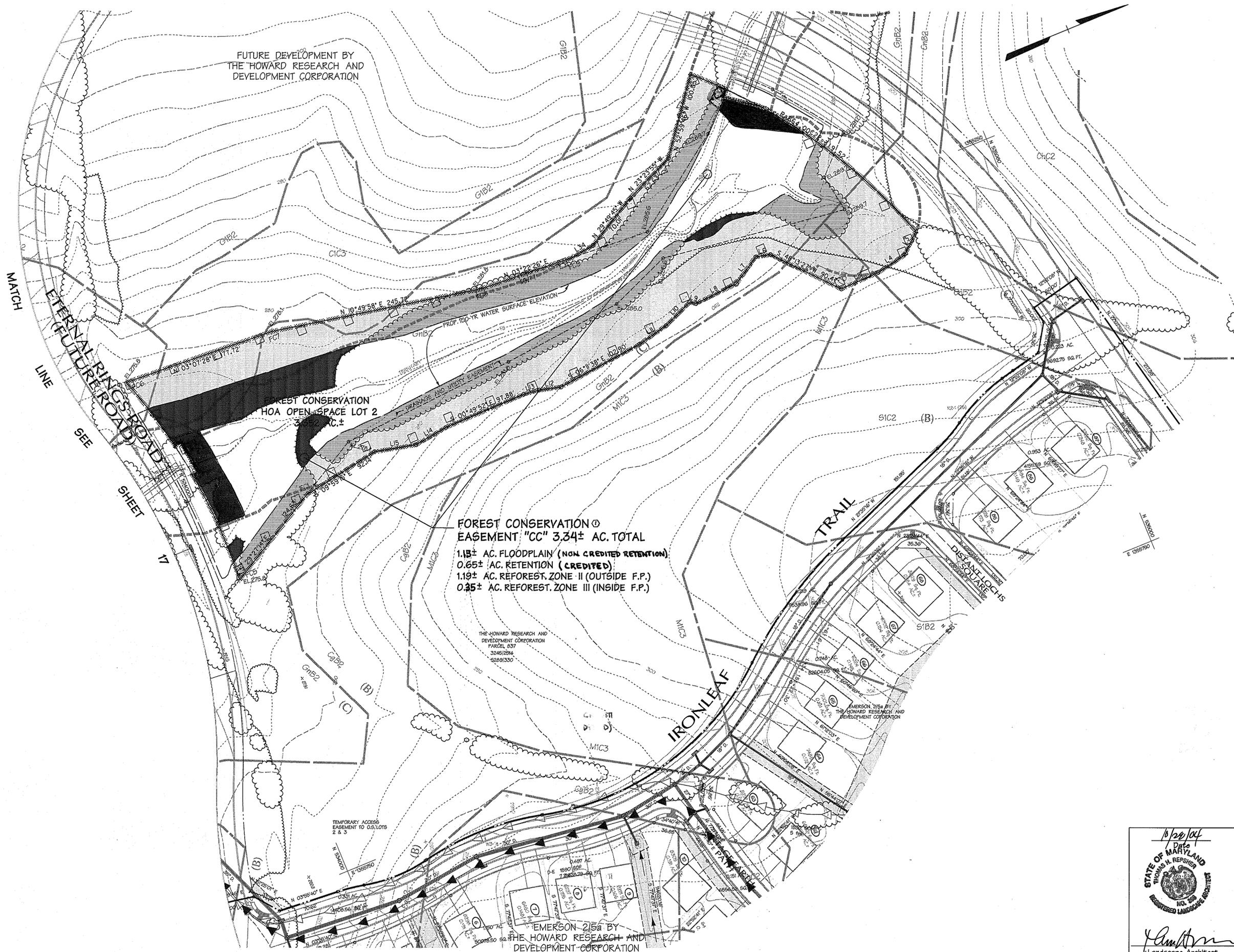
**DATA SOURCES:**  
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 BOUNDARY SHOWN IS SURVEY BY DMW JUNE, 1999.  
 WETLAND LIMITS WERE FIELD LOCATED IN SEPTEMBER, 1998 AND JANUARY, 2000 BY DMW.  
 FLOODPLAIN ELEVATION SHOWN AT EXISTING POND WAS INTERPOLATED FROM HAMMOND BRANCH FLOODPLAIN STUDY BY HOWARD COUNTY.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

<i>William J. ...</i> CHIEF, BUREAU OF HIGHWAYS	12-11-04 DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING	
<i>Harold ...</i> CHIEF, DIVISION OF LAND DEVELOPMENT	12/27/04 DATE
<i>Mark ...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	12/28/04 DATE

Date	No.	Revision Description
<b>Emerson Section 2</b> Phase 5B Section 3 - Area 4		
OWNER/DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORPORATION 10275 Little Patuxent Parkway Columbia, Maryland 21044		
<b>DMW</b> Duff-McCune-Walker, Inc. 200 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-5333 Fax 296-4705		
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals		
SECTION NAME EMERSON	SECTION AREA PHASE 5B	LOT/PANEL #
PLAT OR L.P. MXD	ZONE 47	ELECT. POINT @ TH
WATER CODE	SEWER CODE	
<b>Title</b> Forest Conservation Plan		
Drn By: CRH	Scale: 1"=50'	Proj. No. 95054.G3
Des By: SH	Date: 05/21/04	<b>15 of 20</b>
Chk By: MM	Approved:	





FUTURE DEVELOPMENT BY THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

FOREST CONSERVATION HOA OPEN SPACE LOT 2

**FOREST CONSERVATION EASEMENT "CC" 3.34± AC. TOTAL**  
 1.13± AC. FLOODPLAIN (NON CREDITED RETENTION)  
 0.65± AC. RETENTION (CREDITED)  
 1.19± AC. REFOREST. ZONE II (OUTSIDE F.P.)  
 0.35± AC. REFOREST. ZONE III (INSIDE F.P.)

THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION  
 PARCEL 037  
 3246/2294  
 3249/330

EMERSON 25a BY THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION

**LEGEND**

EX CURB & GUTTER	---
EX MAJOR CONTOURS	--- 400 ---
EX MINOR CONTOURS	--- 420 ---
EX STORM DRAIN	--- 6" x 12" ---
EX SEWER	--- 6" x 8" ---
EX WATER	--- 3" x 6" ---
EXISTING TREE LINE	--- (Symbol) ---
EXISTING WETLAND LIMIT	--- (Symbol) ---
WETLAND BUFFER	--- (Symbol) ---
EX 100 YR FLOODPLAIN	--- (Symbol) ---
PROP 100 YR FLOODPLAIN	--- (Symbol) ---
LIMIT OF DISTURBANCE	--- (Symbol) ---
SOIL(S) LINE (NOT SHOWN)	--- (Symbol) ---
STREAM BUFFER	--- (Symbol) ---
PROPOSED STREET TREE	--- (Symbol) ---
PROP. STORM DRAIN	--- 15" D ---
PROP. SEWER	--- 8" S ---
PROP. WATER	--- 8" W ---
PROPERTY LINE	--- (Symbol) ---
ROADWAY RIGHT-OF-WAY	--- (Symbol) ---
PROPOSED LOT LINE	--- (Symbol) ---
PROPOSED EASEMENT	--- (Symbol) ---
PROPOSED CURB & GUTTER	--- (Symbol) ---
PROPOSED SIDEWALK	--- (Symbol) ---
SLOPE 15% - 24.9%	--- (Symbol) ---
SLOPE 25% +	--- (Symbol) ---
FOREST RETENTION AREA	--- (Symbol) ---
FOREST CONSERVATION EASEMENT	--- (Symbol) ---
FOREST CLEARING	--- (Symbol) ---
PROPOSED MINOR CONTOUR	--- (Symbol) ---
PROPOSED MAJOR CONTOUR	--- (Symbol) ---
REFORESTATION PHASE LINE	--- (Symbol) ---
REFORESTATION ZONE I	--- (Symbol) ---
REFORESTATION ZONE II	--- (Symbol) ---
REFORESTATION ZONE III	--- (Symbol) ---
PERMANENT FOREST PROTECTION SIGNS	--- (Symbol) ---
TEMPORARY FOREST PROTECTION FENCE	--- (Symbol) ---

**DATA SOURCES:**  
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 FLOODPLAIN ELEVATION SHOWN AT EXISTING POND WAS INTERPOLATED FROM HAMMOND BRANCH FLOODPLAIN STUDY BY HOWARD COUNTY.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William Z. White* 12-4-04  
 CHIEF, BUREAU OF HIGHWAYS MS DATE

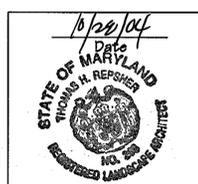
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Harold Bernadichowski* 12/27/04  
 CHIEF, DIVISION OF LAND DEVELOPMENT MS DATE

*Mark Dawson* 12/28/04  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

5-11-12	①	REVISED FOR CLEARING STREAM CROSSINGS ON F-11-032
Date	No.	Revision Description

**Emerson Section 2**  
 Phase 5B  
 Section 3 - Area 4

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



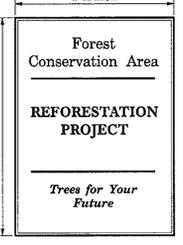
**DMW**  
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 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 286-3333  
 Fax 286-4705

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

SUBDIVISION NAME	EMERSON	SECTION AREA	PHASE 5B	LOT/PARCEL #
PLAT OR UP T	BOOK #	ZONE	TAXING MAP	SEWER TRACT
WATER CODE		SEWER CODE	47	6 TH
TITLE <b>Forest Conservation Plan</b>				
Drn By:	CRH	Scale:	1"=50'	Proj. No.
Des By:	SH	Date:	10/29/04	95054.03
Chk By:	MM	Approved:		16 of 20

FUTURE DEVELOPMENT BY  
THE HOWARD RESEARCH AND  
DEVELOPMENT CORPORATION

PERMANENT  
1" MINIMUM



SIGNS TO BE PLACED ON METAL POSTS 9" T ABOVE FINISH GRADE PRIOR TO PLANTING. PLACE SIGNS EVERY 100' AROUND PERIMETER OF FOREST CONSERVATION AREA.

Reforestation Area Protection Signage Not To Scale

Reforestation Area Planting Plan

Species	Common name	Size	Spacing	Quantity	Stage	Structure	Indicator
Acer rubrum	red maple	1" - 1 1/2" caliper	15' x 15'	10	all	tree	FAC
TOTALS				10			

Species	Common name	Size	Spacing	Quantity	Stage	Structure	Indicator
Acer rubrum	red maple	18" - 24" tall, cont. grow	11' x 11'	125	all	tree	FAC
Diospyros virginiana	persimmon	18" - 24" tall, cont. grow	11' x 11'	75	mid-late	tree	FAC
Juglans nigra	black walnut	18" - 24" tall, cont. grow	11' x 11'	100	early	tree	FAU
Liriodendron tulipifera	tulip poplar	18" - 24" tall, cont. grow	11' x 11'	125	early	tree	FAU
Pinus strobus	white pine	18" - 24" tall, cont. grow	11' x 11'	50	early	tree	FAU
Platanus occidentalis	sycamore	18" - 24" tall, cont. grow	11' x 11'	69	planter	tree	FAU
Quercus rubra	Northern red oak	18" - 24" tall, cont. grow	11' x 11'	100	mid	tree	FAU
TOTALS				644			

Species	Common name	Size	Spacing	Quantity	Stage	Structure	Indicator
Acer rubrum	red maple	18" - 24" tall, cont. grow	11' x 11'	75	all	tree	FAC
Acer dasycarpum	silver maple	18" - 24" tall, cont. grow	11' x 11'	65	mid	tree	FAU
Nyssa sylvatica	black gum	18" - 24" tall, cont. grow	11' x 11'	38	mid-late	tree	FAC
Platanus occidentalis	sycamore	18" - 24" tall, cont. grow	11' x 11'	100	mid	tree	FAU
Quercus pauciflora	pin oak	18" - 24" tall, cont. grow	11' x 11'	76	planter	tree	FAU
TOTALS				354			

① FOREST CONSERVATION EASEMENT "BB" 3.237± AC. TOTAL  
1.57± AC. FLOODPLAIN (NON CREDITED RETENTION)  
0.41± AC. RETENTION  
0.64± AC. REFOREST. ZONE II (OUTSIDE F.P.)  
0.67± AC. REFOREST. ZONE III (INSIDE F.P.)

FOREST CONSERVATION CALCULATIONS

BASIC SITE DATA	ACRES (1/100)
GROSS SITE AREA	332.63
AREA WITHIN 100 YEAR FLOODPLAIN	32.43
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (IF APPLICABLE)	N/A
NET TRACT AREA	300.20
LAND USE CATEGORY	CA
<b>INFORMATION FOR CALCULATIONS</b>	
A. NET TRACT AREA	300.20
B. REFORESTATION THRESHOLD (15% x A)	45.03
C. EXISTING FOREST ON NET TRACT AREA	45.03
D. EXISTING FOREST ON NET TRACT AREA	115.66
E. FOREST AREAS TO BE CLEARED	63.31
F. FOREST AREAS TO BE RETAINED	52.35
<b>REFORESTATION CALCULATIONS</b>	
A. NET TRACT AREA	300.20
B. REFORESTATION THRESHOLD (15% x A)	45.03
C. EXISTING FOREST ON NET TRACT AREA	115.66
D. FOREST AREAS TO BE CLEARED	63.31
E. FOREST AREAS TO BE RETAINED	52.35
F. FOREST AREAS CLEARED ABOVE REFORESTATION THRESHOLD	63.31
G. FOREST AREAS CLEARED BELOW REFORESTATION THRESHOLD	0.00
H. FOREST AREAS RETAINED ABOVE REFORESTATION THRESHOLD	7.32
<b>CLEARING ABOVE THE THRESHOLD</b>	
IF FOREST AREAS TO BE RETAINED ARE LESS THAN THE REFORESTATION THRESHOLD (IF F IS GREATER THAN B), THE FOLLOWING CALCULATIONS APPLY:	
REFORESTATION FOR CLEARING ABOVE THRESHOLD	15.83
REFORESTATION FOR CLEARING BELOW THRESHOLD	0.00
TOTAL REFORESTATION REQUIRED	15.83
(F x 14) + (G x 2)	
<b>CREDIT FOR RETENTION ABOVE CONSERVATION THRESHOLD</b>	
REFORESTATION REQUIRED	7.32
REFORESTATION PROVIDED	8.51 ACRES
	11.51 ACRES

A SURETY IN THE AMOUNT OF \$11,489.84 (1.32 ACRES AT \$8,205/F.A.) SHALL BE POSTED FOR FOREST RETENTION. A SURETY IN THE AMOUNT OF \$603,300.00 (2.77 ACRES AT \$218,015/F.A.) SHALL BE POSTED FOR REFORESTATION. THE TOTAL FOREST CONSERVATION SURETY AMOUNT IS \$718,350.44.

DATA SOURCES:

TOPOGRAPHICAL INFORMATION ON EMERSON SECTION 2 WAS OBTAINED THROUGH AERIAL PHOTOGRAPHY DURING THE SUMMER OF 1999.  
BOUNDARY SHOWN IS SURVEY BY DMW JUNE, 1999.  
WETLAND LIMITS WERE FIELD LOCATED IN SEPTEMBER, 1998 AND JANUARY, 2000 BY DMW.  
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FLOODPLAIN ELEVATION SHOWN AT EXISTING POND WAS INTERPOLATED FROM HANMIND BRANCH FLOODPLAIN STUDY BY HOWARD COUNTY.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

*William Z. Mula* 12-6-04  
CHIEF, BUREAU OF HIGHWAYS MS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*Harold Bernard Johnson* 12/2/04  
CHIEF, DIVISION OF LAND DEVELOPMENT HB DATE

*David Dammann* 12/28/04  
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

5-11-12 ① REVISED FOR CLEARING STREAM CROSSING ON F-01-036

**Emerson Section 2**  
Phase 5B  
Section 3 - Area 4

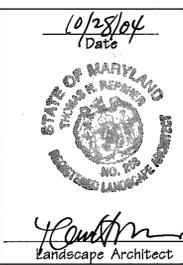
OWNER/DEVELOPER:  
THE HOWARD RESEARCH & DEVELOPMENT CORPORATION  
10275 Little Patuxent Parkway  
Columbia, Maryland 21044

**DMW**  
Duff-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME	EMERSON	SECTION AREA	PHASE 5B	LOT/PARCEL #
PLAT OR LP	MD	ZONE	MD	BLK/DISTRICT
WATER CODE		SEWER CODE		GENUS TRACT

**Forest Conservation Plan**

Drn By: CRH Scale: 1"=50' Proj. No. 95054.03  
Des By: SH Date: 10/29/04  
Chk By: MM Approved: 17 of 20



**LEGEND**

EX CURB & GUTTER	-----
EX MAJOR CONTOURS	-----
EX MINOR CONTOURS	-----
EX STORM DRAIN	-----
EX SEWER	-----
EX WATER	-----
EXISTING TREE LINE	-----
EXISTING WETLAND LIMIT	-----
WETLAND BUFFER	-----
EX 100 YR FLOODPLAIN	-----
PROP. 100 YR FLOODPLAIN	-----
LIMIT OF DISTURBANCE	-----
SOLS LINE (NOT SHOWN)	-----
STREAM BUFFER	-----
PROPOSED STREET TREE	-----
PROP. STORM DRAIN	-----
PROP. SEWER	-----
PROP. WATER	-----
PROPERTY LINE	-----
ROADWAY RIGHT-OF-WAY	-----
PROPOSED LOT LINE	-----
PROPOSED EASEMENT	-----
PROPOSED CURB & GUTTER	-----
PROPOSED SIDEWALK	-----
SLOPE 15% - 24.9%	-----
SLOPE 25% +	-----
FOREST RETENTION AREA	-----
FOREST CONSERVATION EASEMENT	-----
FOREST CLEARING	-----
PROPOSED MINOR CONTOUR	-----
PROPOSED MAJOR CONTOUR	-----
PROPOSED PHASE LINE	-----
REFORESTATION ZONE I	-----
REFORESTATION ZONE II	-----
REFORESTATION ZONE III	-----
PERMANENT FOREST PROTECTION SIGNS	-----
TEMPORARY FOREST PROTECTION FENCE	-----

BGE  
LIBER 447 FOLIO 783  
MAP 47 GRID 9  
ZONED PEC

ZONED  
PEC

FOREST CONSERVATION  
HOA OPEN SPACE LOT 3  
3.274 AC±

THE HOWARD RESEARCH AND  
DEVELOPMENT CORPORATION  
3246/2514  
5289/5230

PARCEL 037  
3246/2514  
5289/5230

MATCH LINE SEE SHEET 19



**LEGEND**

EX CURB & GUTTER	---
EX MAJOR CONTOURS	--- 400 ---
EX MINOR CONTOURS	--- 402 ---
EX STORM DRAIN	--- EX 21" RCP ---
EX SEWER	--- EX 8" S ---
EX WATER	--- EX 8" W ---
EXISTING TREE LINE	~~~~~
EXISTING WETLAND LIMIT	-----
WETLAND BUFFER	-----
EX 100 YR FLOODPLAIN	-----
PROP 100 YR FLOODPLAIN	-----
LIMIT OF DISTURBANCE	-----
SOIL(S) LINE (NOT SHOWN)	-----
STREAM BUFFER	-----
PROPOSED STREET TREE	○
REFORESTATION AREA	▨
FOREST CLEARING	▩
PROP. STORM DRAIN	--- 16" D ---
PROP. SEWER	--- 8" S ---
PROP. WATER	--- 8" W ---
PROPERTY LINE	---
ROADWAY RIGHT-OF-WAY	---
PROPOSED LOT LINE	---
PROPOSED EASEMENT	---
PROPOSED CURB & GUTTER	---
PROPOSED SIDEWALK	---
SLOPE 15% - 24.9%	▨
SLOPE 25% +	▩
FOREST RETENTION AREA	▨
FOREST CONSERVATION EASEMENT	▨
PROPOSED MINOR CONTOUR	---
PROPOSED MAJOR CONTOUR	---
PROPOSED PHASE LINE	---

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APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William Z. Walker* 12-6-04  
 CHIEF, BUREAU OF HIGHWAYS HS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING  
*Harold Bernard Liberman* 12/7/04  
 CHIEF, DIVISION OF LAND DEVELOPMENT HS DATE

*Michael M. M...* 12/23/04  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

Date	No.	Revision Description

**Emerson Section 2**  
 Phase 5B  
 Section 3 - Area 4

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

**DMW**  
 Dan McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3533  
 Fax 296-4705

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

Date: 10/29/04

SUBDIVISION NAME	EMERSON	SECTION AREA	PHASE 5B	LOT/PARCEL #
PLAT OR LOT #		ZONE	TWOZ04 MIX	47
WATER CODE		SEWER CODE		

TITLE: **Landscape Plan**

Drn By: CRH	Scale: 1"=50'	Proj. No. 96054.G3
Des By: CRH	Date: 10/29/04	
Chk By: MM	Approved:	18 of 20



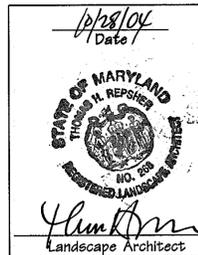
**LEGEND**

EX CURB & GUTTER	---
EX MAJOR CONTOURS	--- 40' ---
EX MINOR CONTOURS	--- 40' ---
EX STORM DRAIN	---
EX SEWER	---
EX WATER	---
EXISTING TREE LINE	---
EXISTING WETLAND LIMIT	---
WETLAND BUFFER	---
EX 100 YR FLOODPLAIN	---
PROP. 100 YR FLOODPLAIN	---
LIMIT OF DISTURBANCE	---
SOIL(S) LINE (NOT SHOWN)	---
STREAM BUFFER	---
PROPOSED STREET TREE	○
REFORESTATION AREA	▨
FOREST CLEARING	▨
PROP. STORM DRAIN	---
PROP. SEWER	---
PROP. WATER	---
PROPERTY LINE	---
ROADWAY RIGHT-OF-WAY	---
PROPOSED LOT LINE	---
PROPOSED EASEMENT	---
PROPOSED CURB & GUTTER	---
PROPOSED SIDEWALK	---
SLOPE 15% - 24.9%	---
SLOPE 25% +	---
FOREST RETENTION AREA	---
FOREST CONSERVATION EASEMENT	---
PROPOSED MINOR CONTOUR	---
PROPOSED MAJOR CONTOUR	---
PROPOSED PHASE LINE	---

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 APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

MATCH LINE SEE SHEET 18

<i>William F. Gubala</i>		12-6-04
CHIEF, BUREAU OF HIGHWAYS		DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING		
<i>Harold Bernard Jankowski</i>		12/22/04
CHIEF, DIVISION OF LAND DEVELOPMENT		DATE
<i>Mark M. Munn</i>		12/28/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION		DATE
Date	No.	Revision Description
<b>Emerson Section 2</b>		
Phase 5B		
Section 3 - Area 4		
OWNER/DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORPORATION 10275 Little Patuxent Parkway Columbia, Maryland 21044		
<b>DMW</b> Duff, McCune & Walker, Inc. 300 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-3353 Fax: 296-4705		
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals		
SECTION NAME EMERSON	SECTION AREA PHASE 5B	SECTION #
PLATE OR L.P. BLOCK #	ZONE TAXING MAP NO. 47	ELECT. DISTRICT 6 TH
WATER CODE	SEWER CODE	GEN. TRACT
TITLE <b>Landscape Plan</b>		
Des. By: CRH	Scale: 1"=50'	Proj. No. 98054.63
Chk. By: MM	Date: 10/29/04	19 of 20



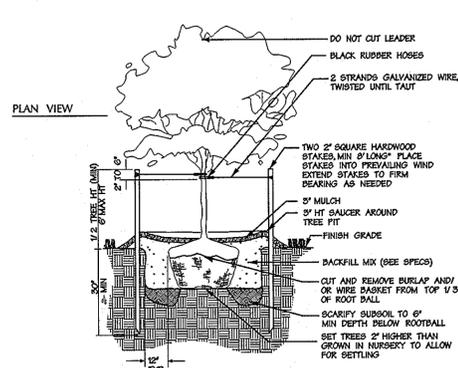
**Landscape Notes**

- The contractor shall review architectural/engineering plans to become thoroughly familiar with grading and surface utilities.
- All equipment and tools shall be placed so as not to interfere or hinder the pedestrian and vehicular traffic flow. Use seasonal plant lists for planting times of bare and seasonal plants.
- The contractor shall coordinate with lighting and irrigation contractors regarding timing of installation of plant material.
- The contractor shall insure that his work does not interrupt established or projected drainage patterns.
- During planting operations, excess waste materials shall be promptly and frequently removed from the site.
- 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 expense to the owner.
- 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.
- Minimum 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.
- Every possible safeguard shall be taken to protect building surfaces, equipment, and furnishings. 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.
- 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. 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.
- 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.
- Plants shall conform to current "American Standards for Nursery Stock" by American Association of Nurserymen (AAS) or the Howard County Landscape manual which ever is greater, particularly with regard to size (plants shall not be smaller in caliper, 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.
- 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, size. Labels shall not be removed until the final inspection by the landscape architect or agent in charge.
- 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.
- No substitutions shall be made without written consent of the owner or landscape architect.
- 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.
- 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.
- All proposed trees to be installed either entirely in or entirely out of planting beds. Planting bed lines are not to be obstructed. Mulch shall have been shredded within the last six months.
- All planting beds adjacent to lawn, eod, or seeded areas shall be spade edged.
- 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 moving 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.
- 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.
- All trees shall be guaranteed for 12 months from the date of acceptance.
- The contractor is responsible for testing project soils. The contractor is to provide a certified soil 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.
- 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 into:  
1. 5 cy existing soil  
2. 1 cy sharp sand  
3. 1 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' of and incorporate into top 6 inches of existing soils by rototilling or similar method of incorporation.  
1. 2 cy sharp sand  
2. 1 cy organic material  
4.5 lbs treble superphosphate  
5 lbs dolomite limestone (eliminate for acid loving plants)  
d. 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.
- The contractor shall insure adequate vertical drainage in all plant beds and planters.
- The Residential Internal Landscaping, and Landscaping for Lots with side yards adjacent to a street, will be addressed at the site plan stage.
- FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF \$10,200 (21 SHADE TREES, 26 EVERGREEN TREES).
- THE OWNER, TENANT, AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, INCLUDING BOTH PLANT MATERIALS AND BERRMS, 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.

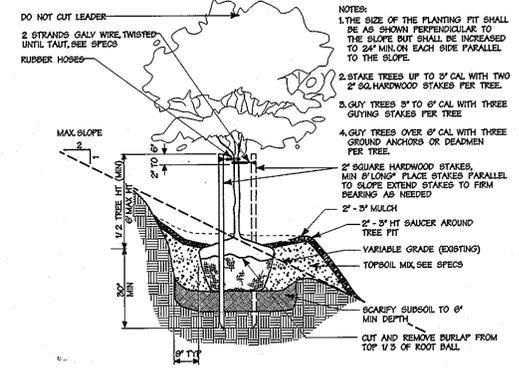
**DEVELOPER'S BUILDER'S CERTIFICATE**

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE APPROVED DEVELOPMENT CRITERIA 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.

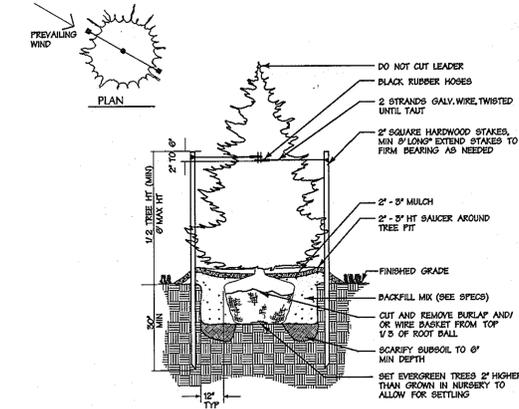
NAME: Paul G. Conner DATE: 12/7/04



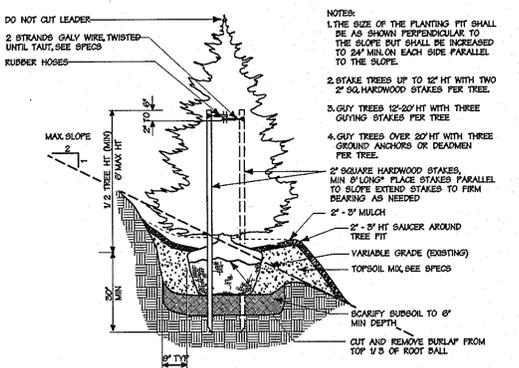
**C Less Than 3" Cal. Tree Planting**  
Not To Scale



**E Tree Planting on Slope**  
Not To Scale



**A Evergreen Tree Planting**  
Not To Scale



**F Evergreen Tree Planting on Slope**  
Not To Scale

**SCHEDULE D  
STORMWATER MANAGEMENT  
AREA LANDSCAPING**

POND #	1
LINEAR FT OF PERIMETER (TYPE "B")	1687 LF
NUMBER OF TREES REQUIRED	
SHADE TREES @ 1/50 L.F.	21
EVERGREEN TREES @ 1/40 L.F.	26
CREDIT FOR EXISTING VEGETATION	632 LF
CREDIT FOR OTHER LANDSCAPING	NA
NUMBER OF TREES PROVIDED*	
SHADE TREES	11
EVERGREEN TREES	25
ORNAMENTAL TREES	21

\* 20 ORNAMENTALS HAVE BEEN SUBSTITUTED FOR 10 SHADE TREES AND 1 ORNAMENTAL HAS BEEN SUBSTITUTED FOR 1 EVERGREEN TREE.

**NOTES:**

- THE DEVELOPER WILL PROVIDE ALL SWM LANDSCAPE OBLIGATIONS.
- STREET TREES SHOWN ON THIS PLAN.
- NO PERIMETER REQUIREMENTS HAVE BEEN SHOWN BECAUSE LIMITS OF CURRENT PHASE ARE BORDERED ON ALL SIDES BY OTHER EMERSON HOLDINGS LANDSCAPE PERIMETER(S) ADJACENT TO I-95 ARE INCLUDED IN SWM POND PERIM. CALCULATIONS.

**Plant List**

QTY	SYM	BOTANICAL NAME   COMMON NAME	SIZE
<b>SHADE TREES</b>			
34	AR	ACER RUBRUM 'RED SUNSET'   RED SUNSET MAPLE	2 1/2" - 3" CAL. 12'-14" HT. B & B FULL HEAD
8	AS	ACER SACCHARUM 'LEGACY'   LEGACY SUGAR MAPLE	2 1/2" - 3" CAL. 12'-14" HT. B & B FULL HEAD
3	NS	NYSSA SYLVATICA   BLACK GUM	2 1/2" - 3" CAL. B & B FULL HEAD
33	QR	QUERCUS RUBRA   RED OAK	2 1/2" - 3" CAL. B & B FULL HEAD
<b>FLOWERING TREES</b>			
9	AC	AMELANCHIER CANADENSIS   CANADIAN SERVICEBERRY	8'-10' HT. B & B FULL HEAD
12	CK	CORNUS KOUSA   JAPANESE DOGWOOD	8'-10' HT. B & B FULL HEAD
<b>EVERGREEN TREES</b>			
19	FA	PICEA ABIES   NORWAY SPRUCE	6'-8' HT. B & B
6	PS	PINUS STROBUS   WHITE PINE	6'-8' HT. B & B HEAVY   UNSHEARED

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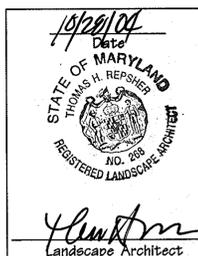
APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

APPROVED: William T. Mahala 12-6-04  
CHIEF, BUREAU OF HIGHWAYS  
APPROVED: David Bernadsky 12/2/04  
CHIEF, DIVISION OF LAND DEVELOPMENT  
APPROVED: David Daneman 12/23/04  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

**Emerson Section 2  
Phase 5B  
Section 3 - Area 4**

OWNER/DEVELOPER:  
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10275 Little Patuxent Parkway  
Columbia, Maryland 21044

**DMW**  
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(410) 286-3333  
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SUBDIVISION NAME	EMERSON	SECTION AREA	PHASE 5B	LOT/PARCEL #	
PLAT OR LOT #		ZONE	TRIGGER MAP	ELECT. DISTRICT	CENSUS TRACT
WATER CODE		REVENUE CODE			
<b>Title</b>					
<b>Landscape Details</b>					
Drn By:	CRH	Scale:	NTS	Proj. No.	95054-G3
Des By:	CRH	Date:	10/29/04	<b>20 of 20</b>	
Chk By:	MM	Approved:			