GENERAL NOTES

1. EXISTING ZONING - R-20 PER APRIL 13, 2004 COMPREHESIVE ZONING
2. SITE AREA - GROSS = 13.1327 AC.+/-, NET = 11.86 AC.+/-
3. AREA OF PROPOSED LOTS - 11.9499 AC.+/- (INCLUDES OPEN SPACE LOTS)
4. AREA OF ROADS - 1.1828 AC.+/-
5. NUMBER OF PROPOSED LOTS - 19 SINGLE FAMILY LOTS, OPEN SPACE LOTS , LOT 20 OWNED BY HOWARD COUNTY LOT NO. 21, SWM POND OWNED BY HOA LOT NO. 22, RECREATION AREA OPEN SPACE OWNED BY HOA
6. CENSUS TRACT - #6027
7. RECORD PLAT REFERENCES - 12932, 14103
8. DEED REFERENCES - 4327 / 0328, 995 / 0194
9. MINIMUM LOT SIZE - 12,000 S.F.
10. THE SITE IS LOCATED WITHIN THE METROPOLITAN DISTRICT. THE SITE IS LOCATED WITHIN THE PLANNED SERVICE AREA AND THE PATAPSCO TREATMENT PLANT DRAINAGE AREA. THE SITE IS PROPOSED TO BE SERVICED WITH PUBLIC WATER AND SEWER.
11. OPEN SPACE - REQ. - 40 % OF GROSS SITE AREA
    13.1327 X .4 = 5.25 AC.+/-
    - PROV. - 251,219.20 S.F. = 5.7672 AC.+/- = 44.07 %
12. RECREATION AREA - REQ. - 200 S.F. PER LOT
    200 X 19 = 3,800 S.F. = 0.087 AC.+/-
    - PROV. - 3,894 S.F. = 0.0894 AC.+/-
13. THE TOPOGRAPHY SHOWN IS FROM FIELD RUN SURVEY WITH MAXIMUM 2' CONTOUR INTERVALS PREPARED BY G.W. STEPHENS DATED 09/05/03.
14. THE PROJECT IS IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
15. 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. 31AB & 31DA. WERE USED FOR THIS PROJECT.
16. EXISTING UTILITIES ARE BASED ON THE UTILITY DRAWINGS FOR CONTRACT NOS. 64 W FOR THE 6" WATER MAIN IN NOTTINGHAM WAY AND 417-S FOR THE 10" SANITARY SEWER IN BONNIE BRANCH RD.
17. THE STORMWATER MANAGEMENT SYSTEM SHOWN ON THIS PLAN IS DESIGNED TO FINAL ULTIMATE SIZE AND SHAPE FOR THE NUMBER OF UNITS SHOWN ON THIS DEVELOPMENT. POND TYPE DRY EXTENDED DETENTION. THE FACILITY INCLUDING THE SAND FILTER TO BE OWNED AND MAINTAINED BY HOA.
18. BUILDING FOOTPRINTS ARE FOR ILLUSTRATIVE PURPOSES ONLY.
19. STREET CLASSIFICATION NOTE:
    THE EXTENSION OF NOTTINGHAM WAY IS PROPOSED AS A PUBLIC ACCESS STREET. ATTENBOROUGH WAY IS PROPOSED AS A PUBLIC ACCESS PLACE.
20. THE SWM AREA LOT NO. 21, HOA OWNED. RECREATION AREA OPEN SPACE LOT 22, HOA OWNED.
21. OPEN SPACE LOT 20 WILL BE TRANSFERED TO HOWARD COUNTY FEE SIMPLE.
22. THIS PROJECT IS GRANDFATHERED TO THE 5TH EDITION SUBDIVISION AND LAND DEVELOPMENT REGULATIONS. THE SKETCH PLAN S02-18 WAS APPROVED PRIOR TO MAY 22, 2003. THIS PROJECT IS SUBJECT TO ZONING REGULATIONS COUNCIL BILL 5-2003, EFFECTIVE 10-02-03.
23. LANDSCAPING IS THE DEVELOPER'S RESPONSIBILITY AS PART OF THE DEVELOPERS AGREEMENT IN THE AMOUNT OF $18,600.00. STREET TREE SURETY AMOUNT OF $14,400.00.
24. FOR PUBLIC WATER AND SEWER SEE PUBLIC DRAWINGS CONTRACT NO. 14-4182-D.
25. FOR STORMDRAINS SEE SHEETS 4 AND 5.

RIGHT OF WAY ELEVATION CHART NAD. 83		
R/W PT. NO.	DECRIPTION	ELEVATION
7	REBAR & CAP	481.72'
8	REBAR & CAP	429.69'
9	REBAR & CAP	419.72'
10	REBAR & CAP	426.24'
11	REBAR & CAP	411.32'
12	REBAR & CAP	421.60'
13	CONC. MON.	421.47'
14	REBAR & CAP	409.28'
15	REBAR & CAP	408.86'
16	REBAR & CAP	408.30'
17	REBAR & CAP	408.35'
18	REBAR & CAP	411.32'
19	REBAR & CAP	414.76'
20	REBAR & CAP	419.48'
22	REBAR & CAP	421.53'
23	REBAR & CAP	421.59'

RIGHT OF WAY ELEVATION CHART NAD. 83		
R/W PT. NO.	DESCRIPTION	ELEVATION
24	REBAR & CAP	420.71'
25	REBAR & CAP	412.13'
28	REBAR & CAP	428.29'
29	REBAR & CAP	429.13'

Final Plans

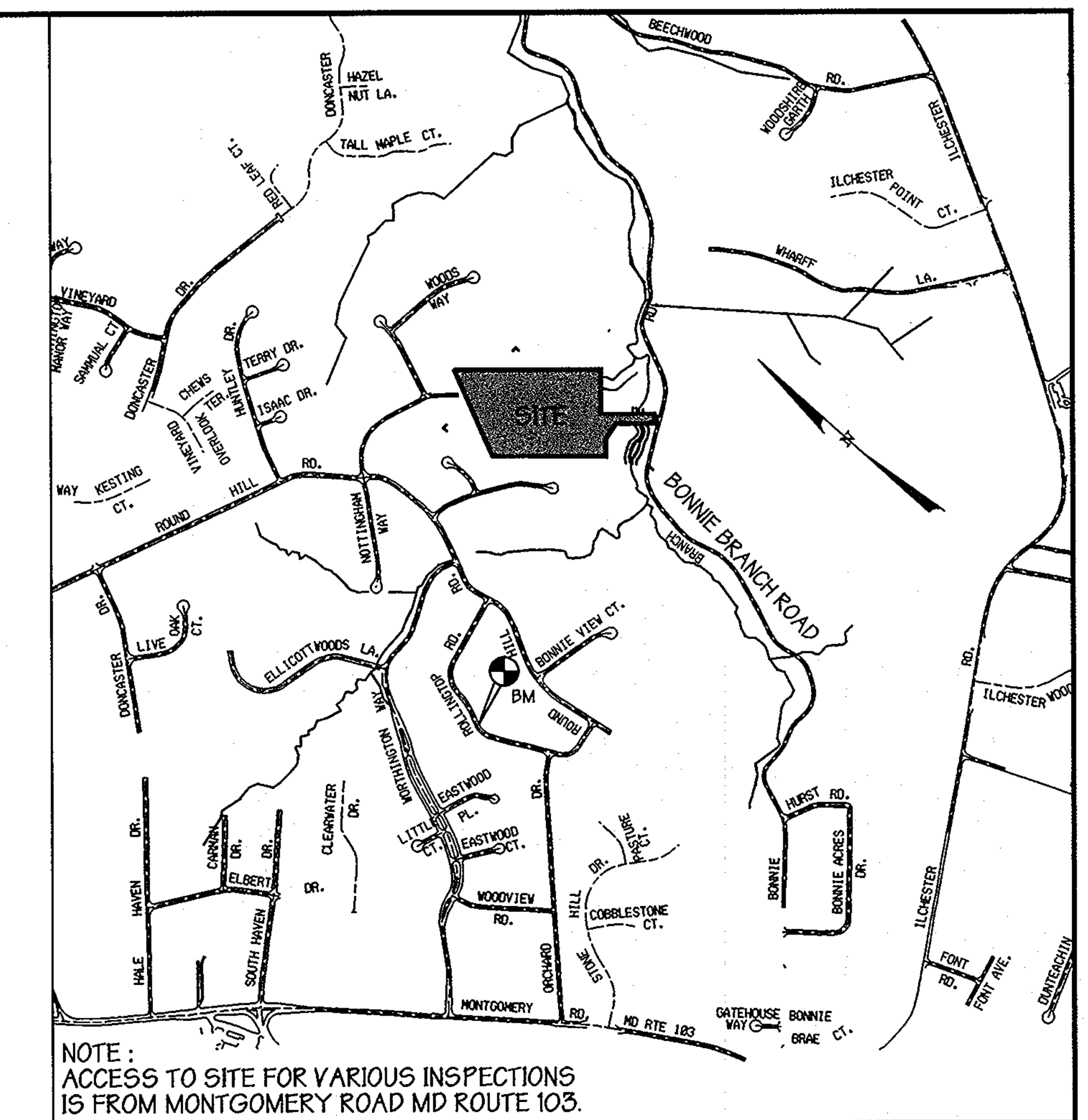
F 04 - 181

NOTTINGHAM WAY ACRES

LOTS 1 THRU 22

A RESUBDIVISION LOT 2 PLAT NO. 12932 AND LOT 4 PLAT NO. 14103

DATA SOURCES
EXISTING TOPO FIELD RUN SURVEY WITH MAXIMUM TWO FOOT CONTOURS BY G.W. STEPHENS DATED 09/05/03
BOUNDARY SHOWN PER BOUNDARY SURVEY DATED 2002 (BY GWS)
SOILS (IF SHOWN) TAKEN FROM H. CO. SOIL SURVEY, 1968
PORTIONS OF 100 YEAR FLOODPLAIN TAKEN FROM PLAT NO. 4063, FROM DEED OF EASEMENT 4166/149.



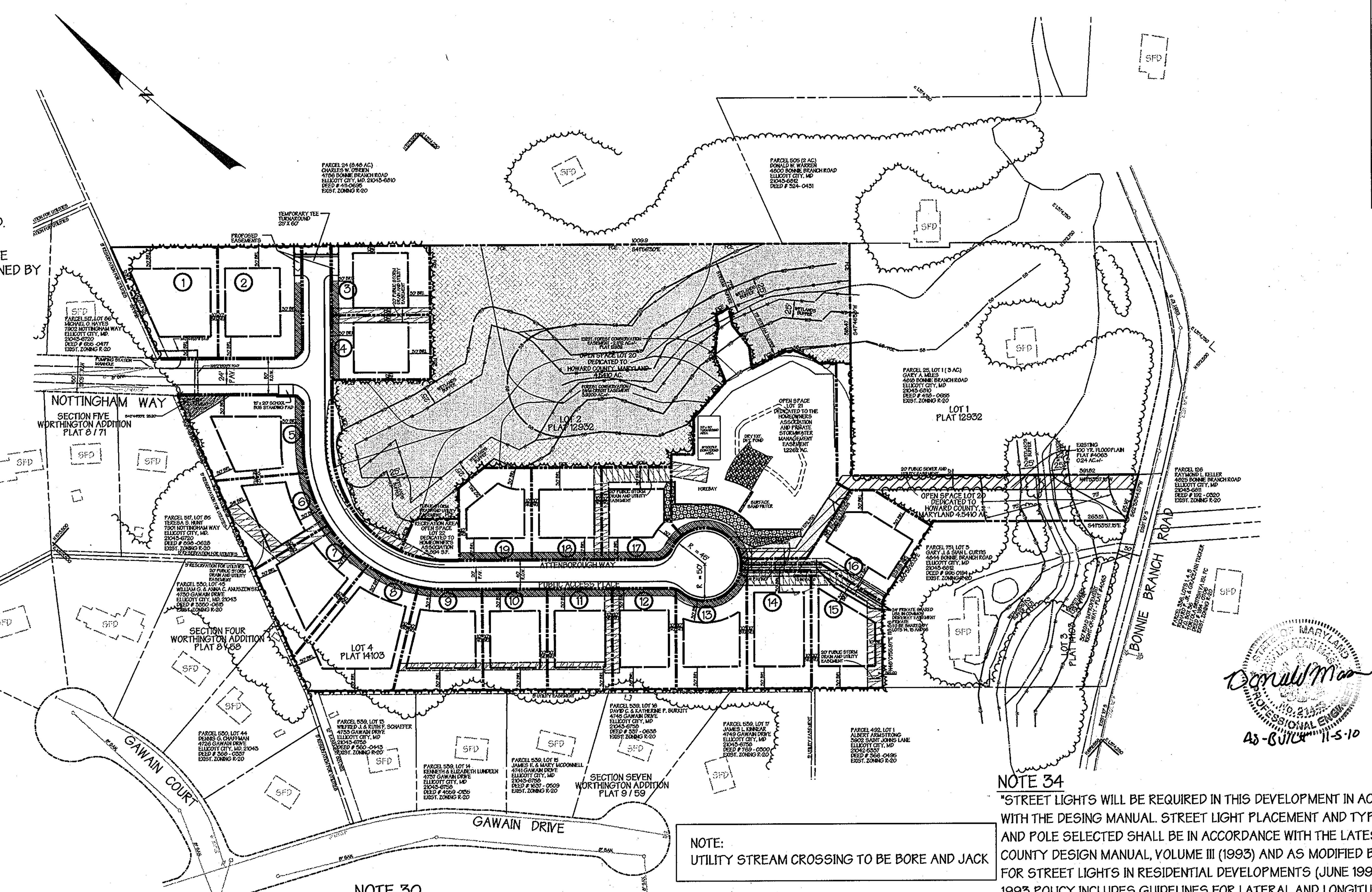
NOTE :
ACCESS TO SITE FOR VARIOUS INSPECTIONS IS FROM MONTGOMERY ROAD MD ROUTE 103.

VICINITY MAP

SCALE: 1" = 1000'

BENCH MARK: # 31DA - SET IN CONCRETE

N 571982.646
E 1372144.970
ELEV. 482.359
7' EAST FROM EAST EDGE OF PAVING OF ROLLING TOP ROAD 85.8' TO TRANSMISSION POWER LINES GATE AND 0.1 MILE FROM ORCHARD ROAD



SHEET INDEX

MINIMUM LOT SIZE CHART

LOT NO	GROSS AREA	PIPESTEM AREA	MINIMUM LOT SIZE
1	17182	—	17182
2	17595	—	17595
3	12802	—	12802
4	12015	—	12015
5	16561	—	16561
6	12017	—	12017
7	13570	—	13570
8	18738	—	18738
9	14548	—	14548
10	12282	—	12282
11	12282	—	12282
12	12002	—	12002
13	12722	—	12722
14	14328	82	14246
15	15170	826	14344
16	15322	802	14520
17	12168	—	12168
18	12033	—	12033
19	12085	—	12085

NOTE 26
PER SECTION 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS, AFTER CONSULTATION WITH THE SOIL CONSERVATION DISTRICT DPZ DETERMINED THAT THE INTRUSION INTO THE STREAM AND WETLAND BUFFERS IS ESSENTIAL FOR THE PURPOSE OF THE SWM OUTFALL AND RIP RAP STABILIZATION.

NOTE 27
THE EASEMENT / PIPESTEMS SERVING LOTS 14 TRU 16 WILL COMPLY WITH THE DESIGN MANUAL MINIMUMS: 14' PAVING WITHIN COMBINED PIPESTEM WIDTH OF 24'.

NOTE 28
BONNIE BRANCH ROAD IS A SCENIC ROAD AND THAT THE SCENIC ROAD STUDY WAS APPROVED UNDER S 02 - 18.

NOTE 29
PREVIOUS FILE NUMBERS S 02 - 18 AND P 04 - 06. EXISTING FOREST CONSERVATION EASEMENT WHICH IS PART OF LOT 20 WAS RECORDED UNDER F 97 - 164 (LIBER 4167 FOLIO 032).

NOTE 30
THIS PROJECT IS SUBJECT TO ZONING REGULATIONS EFFECTIVE 10-02-03 AS AMENDED BY CB 50-2001, COUNCIL BILL 50-2003 (S 02-18 WAS SUBMITTED 6-4-02) AND THE FIFTH EDITION SUBDIVISION REGULATIONS (S 02-18 WAS SUBMITTED BEFORE 5-22-03).

NOTE 31
AT THE SITE DEVELOPMENT PLAN STAGE, ALL LOTS WILL BE SUBJECT TO THE FRONT BRL'S IN THE 4-13-04 ZONING REGULATIONS, SECTION 108.D(4)(c) AND NOT TO THE FRONT BRL'S CURRENTLY SHOWN FOR THE PIPESTEM LOTS.

NOTE 32:
FOREST CONSERVATION EASEMENT IS A RETENTION AREA.
FOREST RETENSION SURETY AMOUNT OF 169,884 SQ. FT. X $ 0.20 Sq. Ft. = $ 33,976.80

NOTE 33:
FOREST CONSERVATION EASEMENT FEE - IN - LIEU AMOUNT OF $24,223.00 TO MEET THE REFORESTATION OBLIGATION FOR THIS PROJECT. THIS FEE INCLUDES $19,602.00 (39,204 SQ. FT. X $0.50 / SQ. FT.) TO MEET THE 0.9 ACRES REFORESTATION OBLIGATION AND ($3,129 SQ. FT. X $1.00 / SQ. FT.) TO ADDRESS THE ABANDONMENT OF 3,129 SQ. FT. OF EXISTING FOREST CONSERVATION EAEMENT.

NOTE 34
"STREET LIGHTS WILL BE REQUIRED IN THIS DEVELOPMENT IN ACCORDANCE WITH THE DESING MANUAL STREET LIGHT PLACEMENT AND TYPE OF FIXTURE AND POLE SELECTED SHALL BE IN ACCORDANCE WITH THE LATEST HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)" THE JUNE 1993 POLICY INCLUDES GUIDELINES FOR LATERAL AND LONGITUDINAL PLACEMENT. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREETLIGHT AND ANY TREE."

NOTE 35
COMPACTION SHALL BE 95% IN FILL AREAS PER AASHTO T-180 STANDARDS.

NOTE 36
ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.

LEGEND

PROPOSED RIGHT-OF-WAY LINE
PROPOSED LOT LINE
TRACT BOUNDARY
EXISTING LOT OR PARCEL LINE
EXISTING RIGHT-OF-WAY LINE
PROPOSED EASEMENT
EXISTING TREELINES
PROPOSED TREELINES
BUILDING SETBACK LINE
WETLAND LIMIT LINE — W —
100 YEAR FLOOD PLAIN — FP —
75' STREAM BUFFER — SB —
25' WETLANDS BUFFER — WB —
STREAM

Donald Mason
AS-BUILT 11-5-10

GWS
GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHOEMAKER — PROFESSIONAL ENGINEER — No. 25916

OWNERS
PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
William L. Malone Jr. 5-17-05
CHIEF, BUREAU OF HIGHWAYS DATE:

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
Cindy Hamilton 5/24/05
CHIEF, DIVISION OF LAND DEVELOPMENT DATE:
5/23/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE:

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

COVER SHEET
SCALE: AS SHOWN

NOTTINGHAM WAY ACRES
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04
PRIOR REFERENCE FILES S-02-18, P 04 - 06
SHEET 1 of 27
F 04 - 181
ZONED R-20
TAX MAP 31

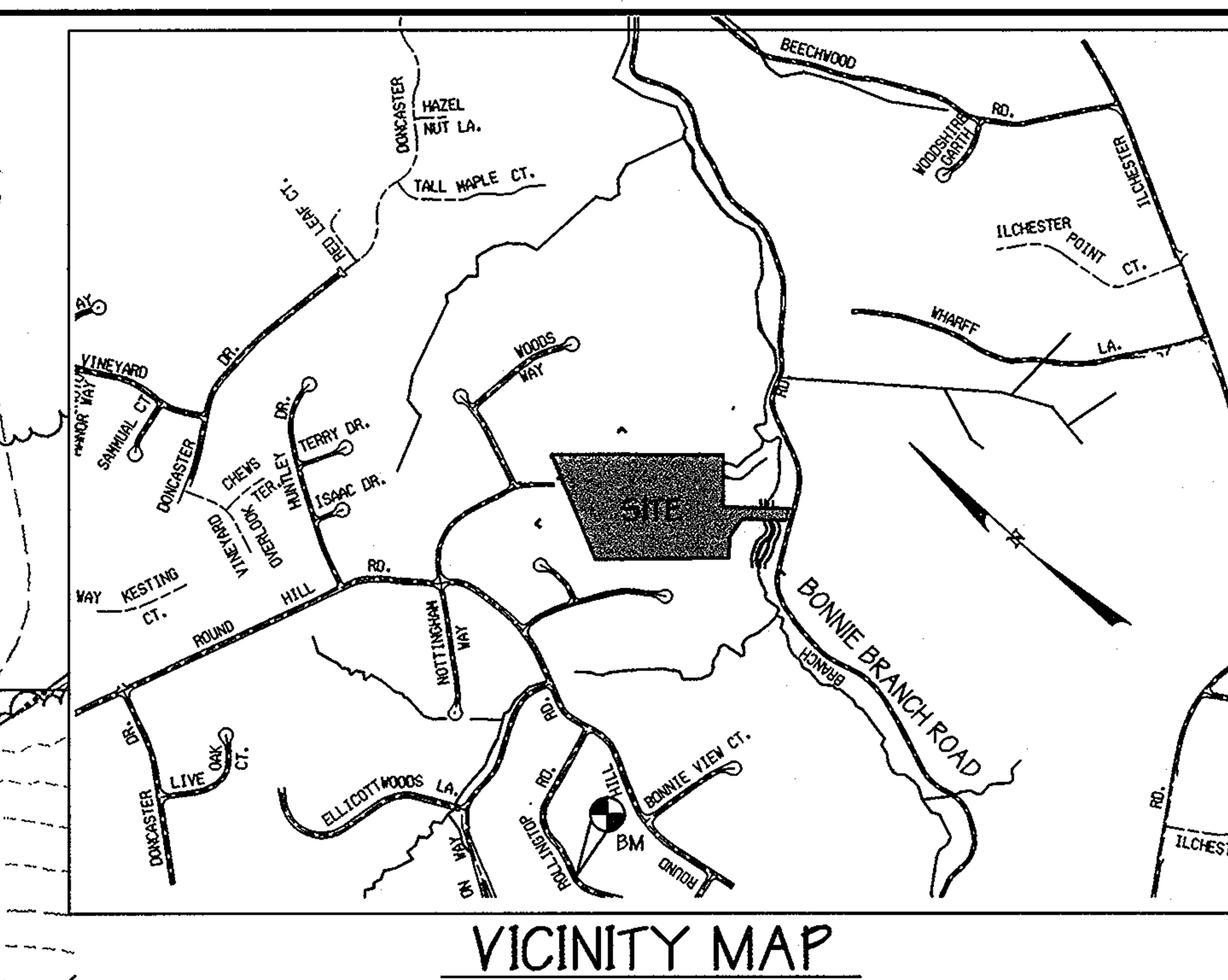
F-04-181

LEGEND

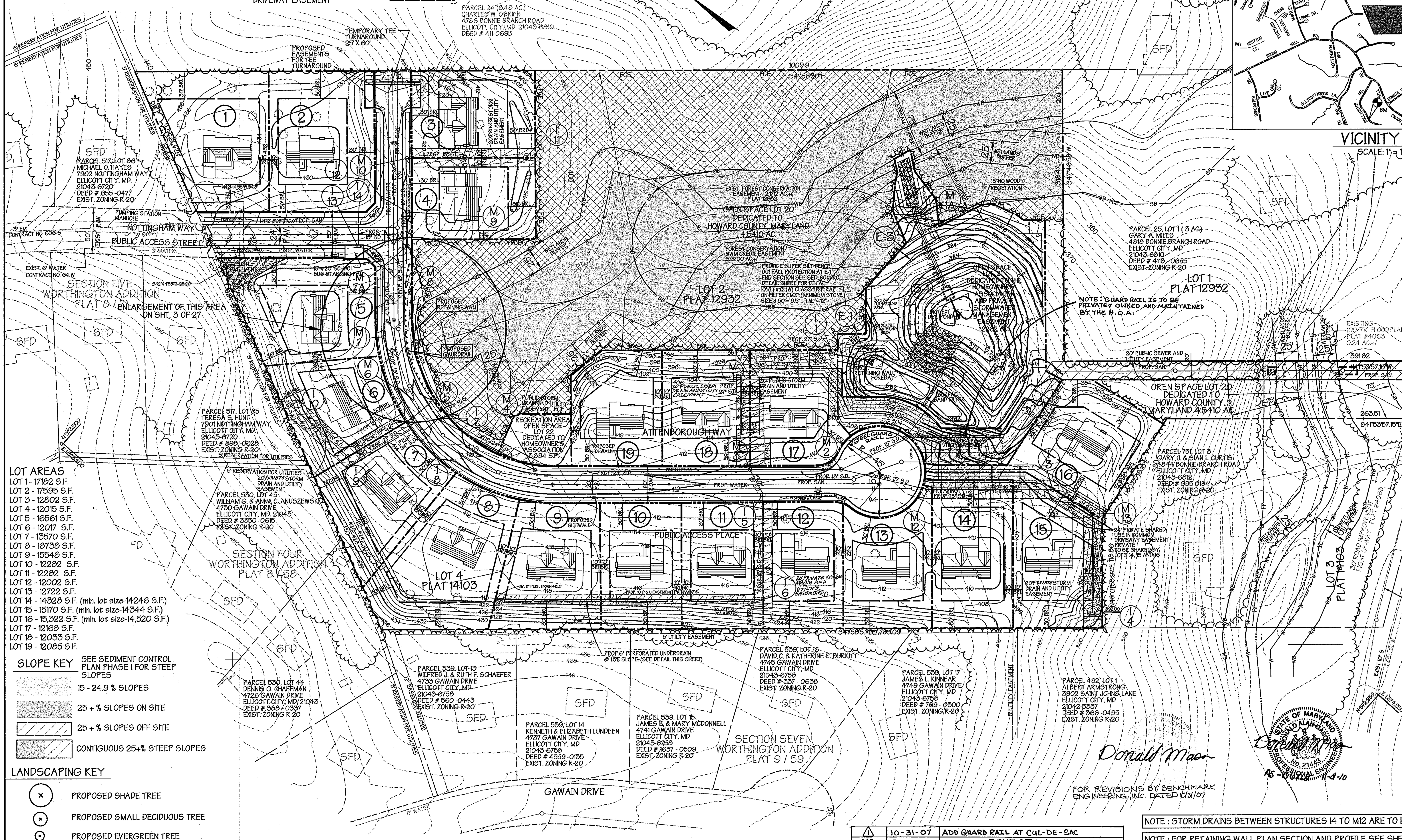
PROPOSED RIGHT-OF-WAY LINE	
PROPOSED LOT LINE	
TRACT BOUNDARY	
EXISTING LOT OR PARCEL LINE	
EXISTING RIGHT-OF-WAY LINE	
PROPOSED EASEMENT	
EXISTING TREELINES	
PROPOSED TREELINES	
BUILDING SETBACK LINE	
EXISTING SOIL CLASSIFICATIONS	
EXISTING 5' CONTOUR	305
EXISTING 25' CONTOUR	300
WETLAND LIMIT LINE	W
100 YEAR FLOOD PLAIN	FP
75' STREAM BUFFER	SB
25' WETLANDS BUFFER	WB
STREAM	
PROPOSED CONTOUR	300
SPECIMEN TREE	
24' PRIVATE SHARED USE IN COMMON DRIVEWAY EASEMENT	
20' PRIVATE INGRESS & EGRESS ACCESS EASEMENT	
20' PUBLIC SEWER AND UTILITY EASEMENT	
20' PRIVATE STORM DRAIN UTILITY EASEMENT	
EXISTING FOREST CONSERVATION EASEMENT	
FOREST CONSERVATION EASEMENT	

BENCH MARK: # 31DA - SET IN CONCRETE

N 571982.646, E 1372144.970 ELEV. 482.359
7' EAST FROM EAST EDGE OF PAVING OF ROLLING TOP ROAD
85.8' TO TRANSMISSION POWER LINES GATE AND 0.1 MILE
FROM ORCHARD ROAD



VICINITY MAP
SCALE: 1" = 1000'



LOT AREAS

- LOT 1 - 17182 S.F.
- LOT 2 - 17595 S.F.
- LOT 3 - 12802 S.F.
- LOT 4 - 12015 S.F.
- LOT 5 - 16561 S.F.
- LOT 6 - 12017 S.F.
- LOT 7 - 13570 S.F.
- LOT 8 - 18738 S.F.
- LOT 9 - 15548 S.F.
- LOT 10 - 12282 S.F.
- LOT 11 - 12282 S.F.
- LOT 12 - 12002 S.F.
- LOT 13 - 12722 S.F.
- LOT 14 - 14328 S.F. (min. lot size-14246 S.F.)
- LOT 15 - 15170 S.F. (min. lot size-14344 S.F.)
- LOT 16 - 15,322 S.F. (min. lot size-14,520 S.F.)
- LOT 17 - 12168 S.F.
- LOT 18 - 12033 S.F.
- LOT 19 - 12085 S.F.

SLOPE KEY

SEE SEDIMENT CONTROL PLAN PHASE I FOR STEEP SLOPES

- 15 - 24.9 % SLOPES
- 25 + % SLOPES ON SITE
- 25 + % SLOPES OFF SITE
- CONTIGUOUS 25+% STEEP SLOPES

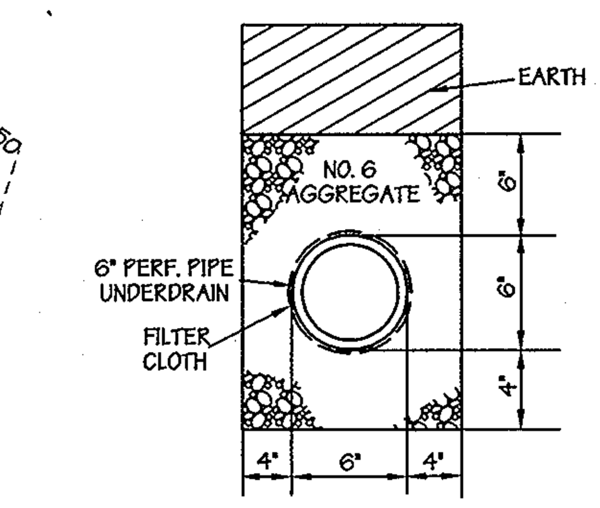
LANDSCAPING KEY

- PROPOSED SHADE TREE
- PROPOSED SMALL DECIDUOUS TREE
- PROPOSED EVERGREEN TREE

Donald Mason

FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 10/31/07

AS-BUILT 11-4-10



SUB-SURFACE UNDERDRAIN TRENCH
N.T.S.

NOTE : STORM DRAINS BETWEEN STRUCTURES 14 TO M12 ARE TO BE PRIVATELY OWNED AND MAINTAINED.

NOTE : FOR RETAINING WALL PLAN SECTION AND PROFILE SEE SHEETS 26 AND 27

NO.	DATE	REVISION
1	10-31-07	ADD GUARD RAIL AT CUL-DE-SAC

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHORTELL — No. 29218 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

SITE AND GRADING PLAN

SCALE: 1" = 50'

NOTTINGHAM WAY ACRES

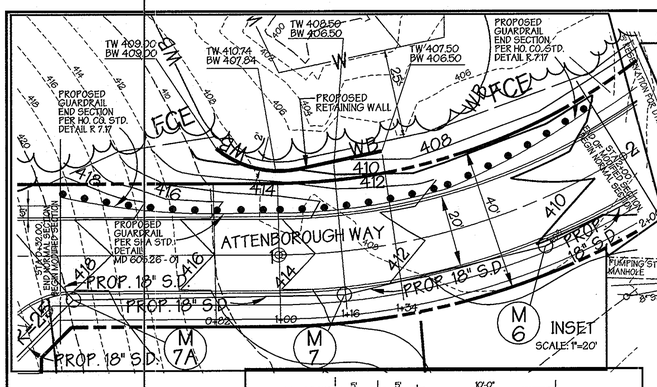
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

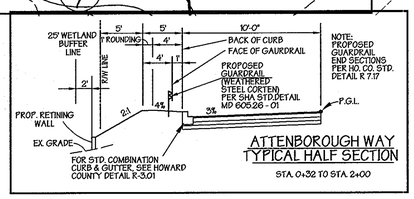
SHEET 2 of 27
F 04 - 181

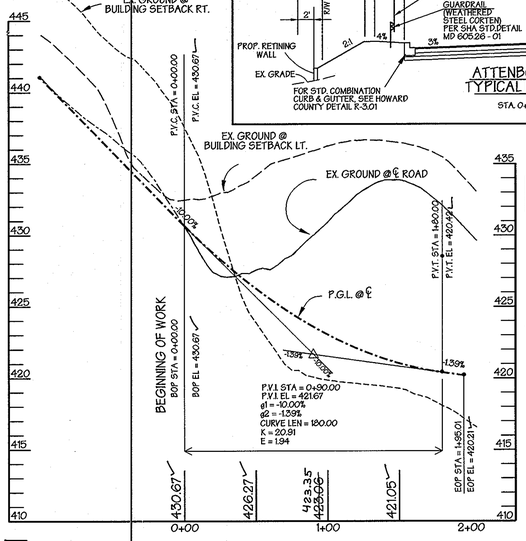
ZONED R-20 — TAX MAP 31

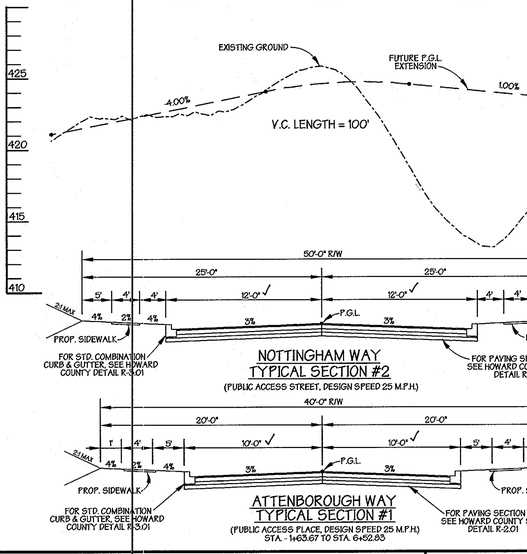
F-04-181

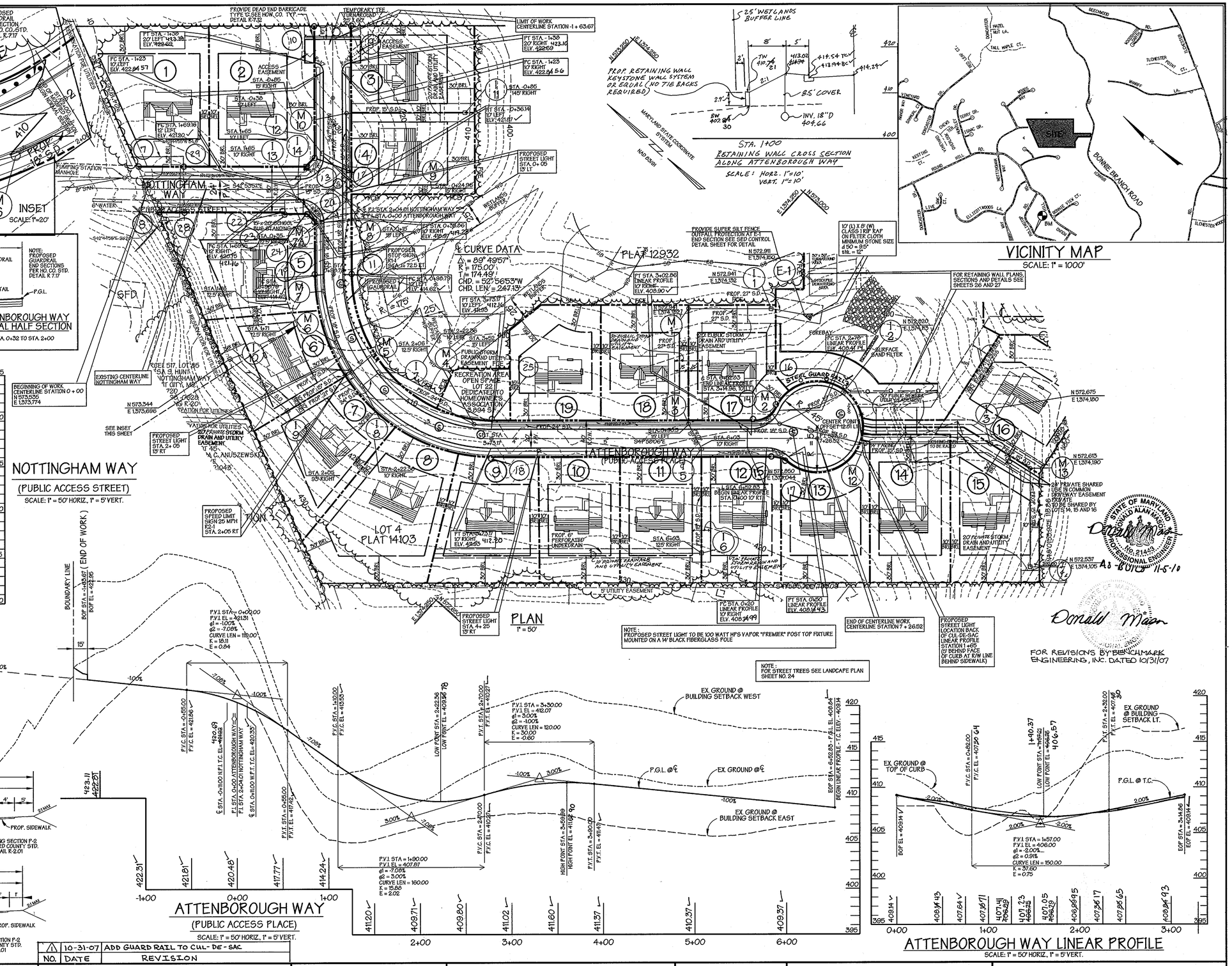
...\9282finalsiteplankp.s01 03/21/2005 10:30:48 AM Kengle SCALE











NO.	DATE	REVISION
1	10-31-07	ADD GUARD RAIL TO CUL-DE-SAC

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SWEITZER — No. 22218 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/16/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

ROAD PLAN ROAD PROFILES WITH ROAD SECTIONS

SCALE: AS NOTED

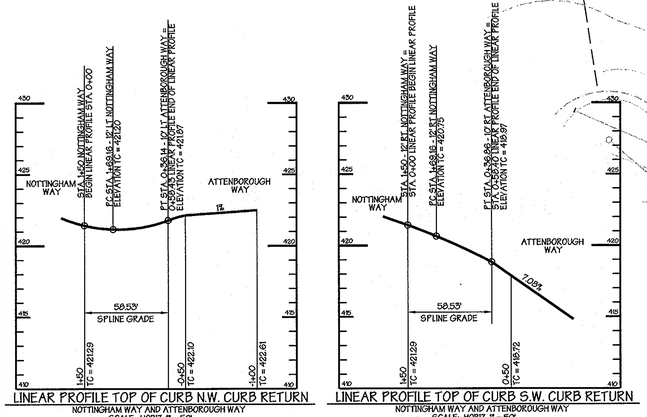
NOTTINGHAM WAY ACRES
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 3 of 27
F 04 - 181
ZONED R-20 — TAX MAP 31

F. 04-181

...\finalplans\9282finalroad.s01 03/21/2005 10:41:09 AM kengle SCALE

AREA	ACREAGE	'C'	% IMP.
⟨A⟩	1.21	0.43	
⟨B⟩	1.27	0.44	
⟨C⟩	0.70	0.38	
⟨D⟩	0.37	0.34	
⟨E⟩	1.24	0.34	
⟨F⟩	1.41	0.32	
⟨G⟩	1.13	0.42	
⟨H⟩	0.24	0.87	
⟨I⟩	1.00	0.32	
⟨J⟩	0.66	0.43	
⟨K⟩	0.95	0.32	
⟨L⟩	0.41	0.32	
⟨M⟩	0.86	0.57	
⟨N⟩	0.57	0.32	



PLAN
1" = 50'

LEGEND
—o—o—o— STEEL GUARD RAIL

Donald Mason
FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 10/31/07

NO.	DATE	REVISION
1	10-31-07	ADD GUARD RAIL TO CUL-DE-SAC

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK KELLER — No. 22214 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/25/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

STORM DRAINS DRAINAGE AREA MAP

SCALE: 1" = 50'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 4 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F-04-181

...\9282finaldrainmap.s01 03/18/2005 03:42:29 PM kengle SCALE

STRUCTURE SCHEDULE

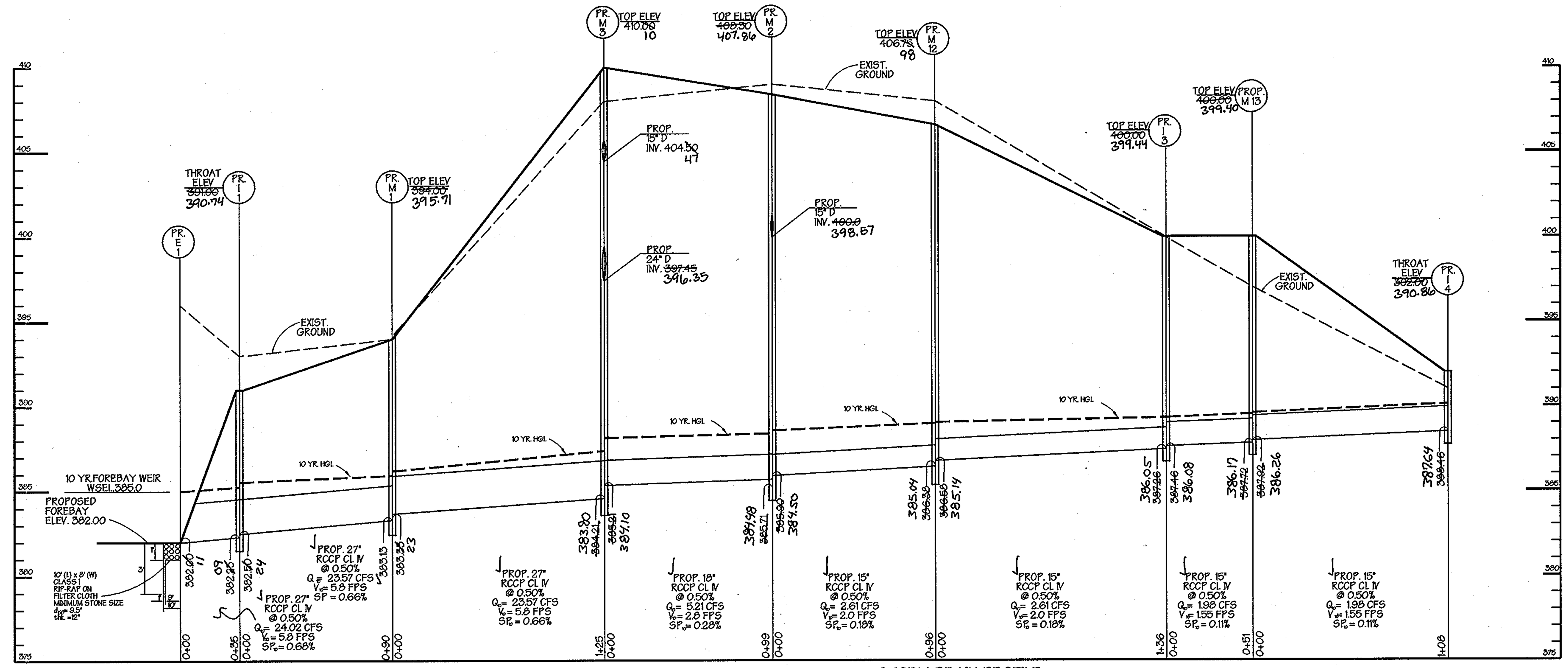
NO.	TYPE	TOP ELEV.	INV. IN	INV. OUT	HO. CO. DTL.
M-1	STD. PRECAST MANHOLE	~~394.00~~ 395.71	~~383.33~~ 383.23	383.13✓	G-5.13
M-2	STD. PRECAST MANHOLE *	~~408.30~~ 407.86	~~385.90~~ 384.50	~~385.71~~ 384.48	G-5.12
M-3	STD. PRECAST MANHOLE *	410.~~00~~ .10	~~385.21~~ 384.1	~~384.21~~ 383.80	G-5.13
M-4	STD. PRECAST MANHOLE	~~412.10~~ 412.13	400.~~03~~ 33	~~399.93~~ 400.13	G-5.12
M-5	STD. PRECAST MANHOLE *	410.~~00~~ .11	~~401.44~~ 402.11	~~401.19~~ 402.01	G-5.12
M-6	STD. PRECAST MANHOLE	410.~~60~~ 68	~~402.62~~ 401.98	~~402.52~~ 401.78	G-5.12
M-7	STD. PRECAST MANHOLE	413.~~60~~ 49	~~403.01~~ 402.64	402.~~91~~ .39	G-5.12
M-7A	STD. PRECAST MANHOLE	~~418.60~~ 419.09	403.~~49~~ .37	403.~~39~~ .29	G-5.12
M-8	STD. PRECAST MANHOLE *	420.~~10~~ .22	~~405.17~~ 404.97	403.~~67~~ .42	G-5.12
M-9	STD. PRECAST MANHOLE	~~420.80~~ 421.70	405.~~36~~ .00	405.~~36~~ .00	G-5.12
M-10	STD. PRECAST MANHOLE	422.~~00~~ 46	405.~~85~~ 46	405.~~60~~ 41	G-5.12
M-12	STD. PRECAST MANHOLE	406.~~75~~ .98	~~386.58~~ 385.14	~~386.38~~ 385.04	G-5.12
M-13	STD. PRECAST MANHOLE	~~400.00~~ 399.40	~~387.92~~ 386.26	~~387.72~~ 386.17	G-5.12
E-1	27" CONCRETE END SECTION	——	——	382.~~00~~ 11	SD-5.51

* ADD GRANITE BLOCK INVERT PROTECTION TO STRTUCTURE

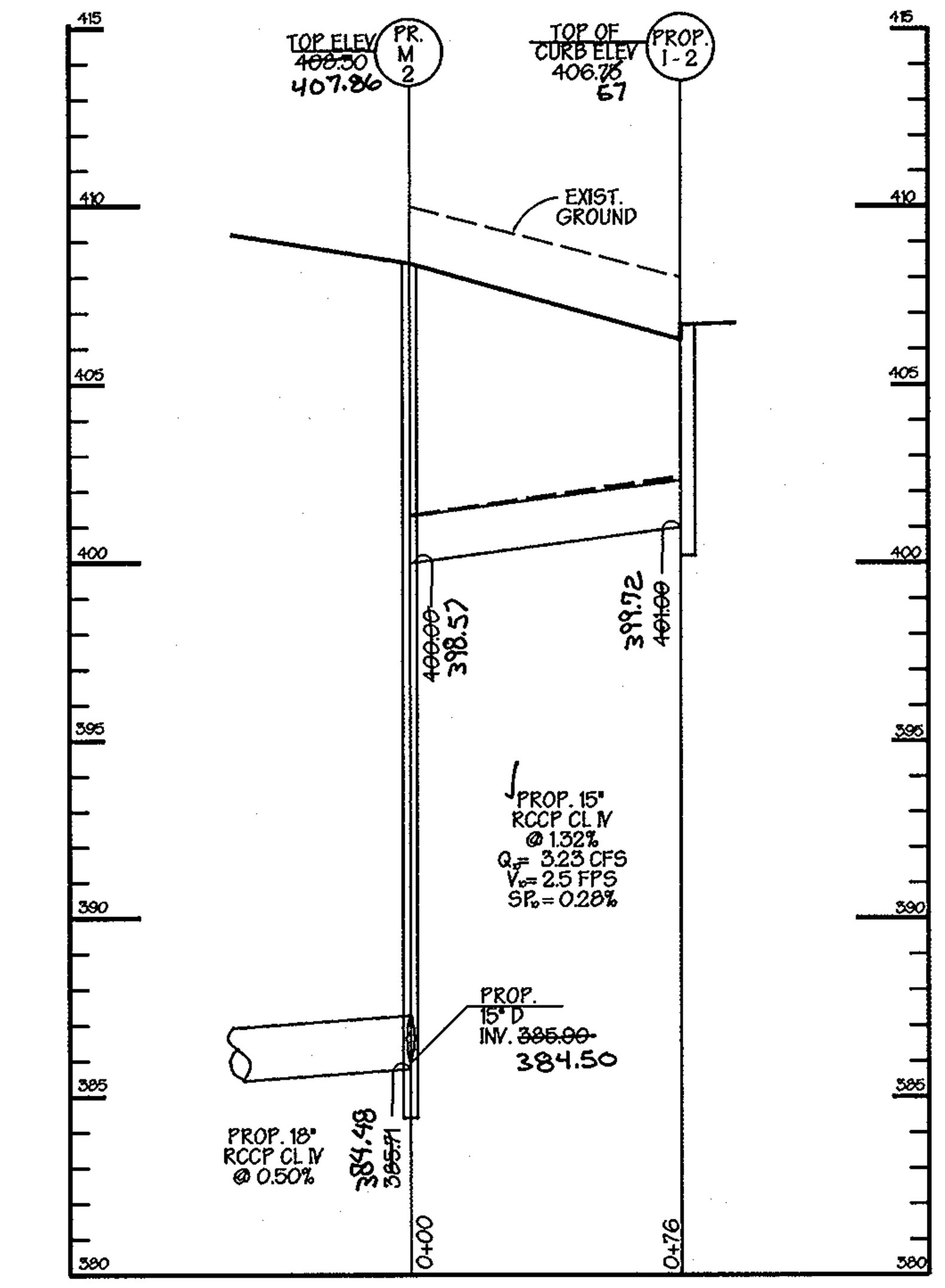
INLET SCHEDULE

NO.	TYPE	TOP ELEV.	INV. IN	INV. OUT	Qc.f.s.	HO. CO. DTL.
I-1	TYPE 'D' INLET GRATE	* ~~391.00~~ 390.74	382.2~~5~~ 4	382.~~35~~ .09	1.19	SD-4.11
I-2	A-10	** 406.~~75~~ .57	——	~~401.00~~ 399.72	3.23	SD-4.41
I-3	SINGLE WR INLET GRATE	*** 399.44 ~~400.00~~	~~387.46~~ 386.08	~~387.26~~ 386.05	0.86	SD-4.37
I-4	TYPE 'D' INLET GRATE	* ~~392.00~~ 390.86	——	~~388.46~~ 387.64	1.98	SD-4.11
I-5	A-5	** 409.~~64~~ .70	~~405.62~~ 406.45	~~405.52~~ 406.40	1.85	SD-4.40
I-6	TYPE 'D' INLET GRATE	* 413.~~00~~ .17 TOP	——	410.~~30~~ .47	2.11	SD-4.11
I-7	A-10	** ~~409.86~~ 410.06	~~400.72~~ 401.26	~~400.62~~ 401.16	1.39	SD-4.41
I-8	A-10	** ~~409.86~~ 410.06	401.~~09~~ .76	~~400.84~~ 401.46	3.10	SD-4.41
I-9	TYPE 'D' INLET GRATE	* ~~413.00~~ 412.91	~~403.85~~ 404.01	402.5~~0~~6	2.97	SD-4.11
I-10	TYPE 'D' INLET GRATE	* ~~423.00~~ 422.74	——	418.0~~0~~4	2.78	SD-4.11
I-11	TYPE 'D' INLET GRATE	* 409.~~00~~ .44	——	~~406.50~~ 407.39	0.86	SD-4.11
I-12	A-5	** 421.~~90~~ 68	——	~~410.00~~ 409.18	1.78	SD-4.40
I-13	A-10	** ~~420.80~~ 421.28	416.6~~0~~8	416.3~~5~~8	3.70	SD-4.41
I-14	A-10	** 421.~~18~~ 29	——	417.~~06~~ 54	3.43	SD-4.41

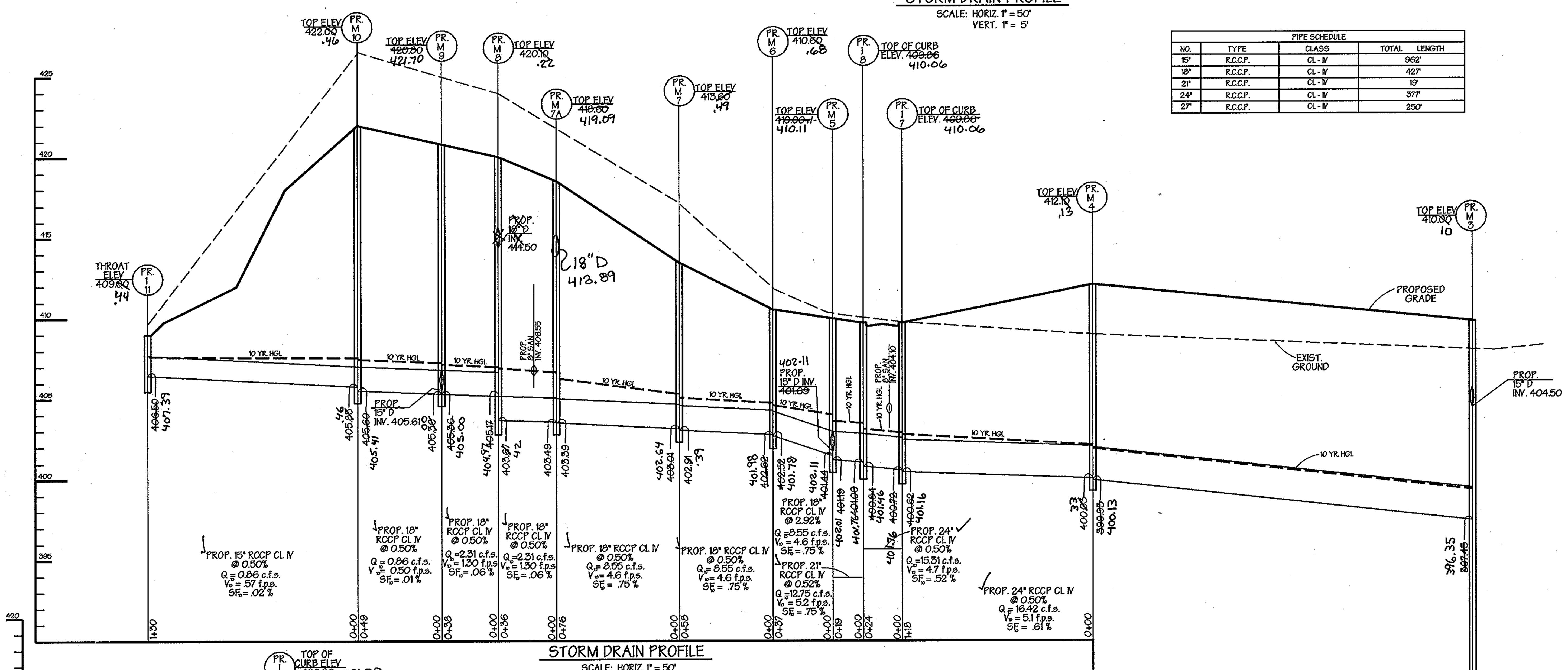
* THROAT ELEVATION
** TOP OF CURB ELEVATION
*** TOP GRATE ELEVATION



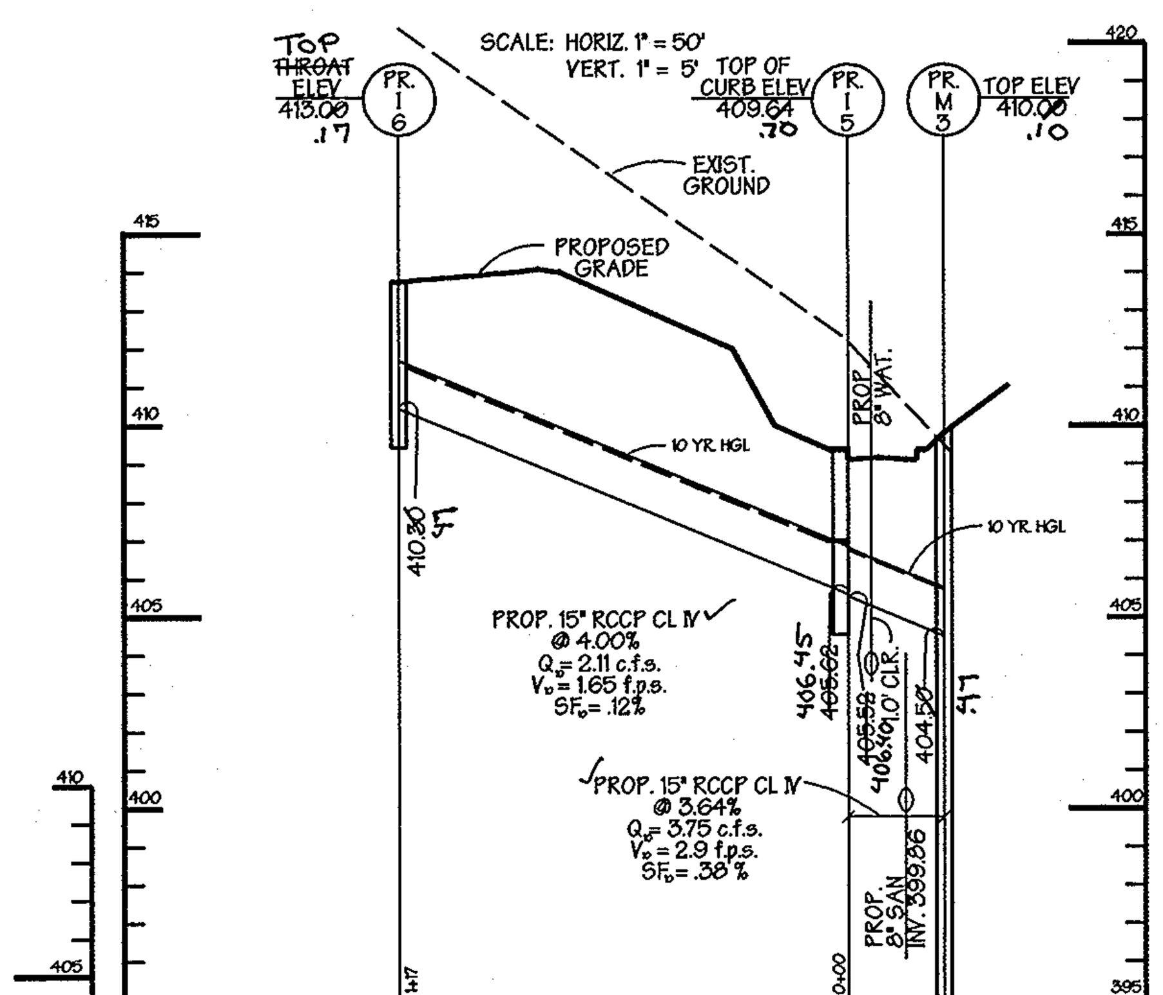
STORM DRAIN PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'



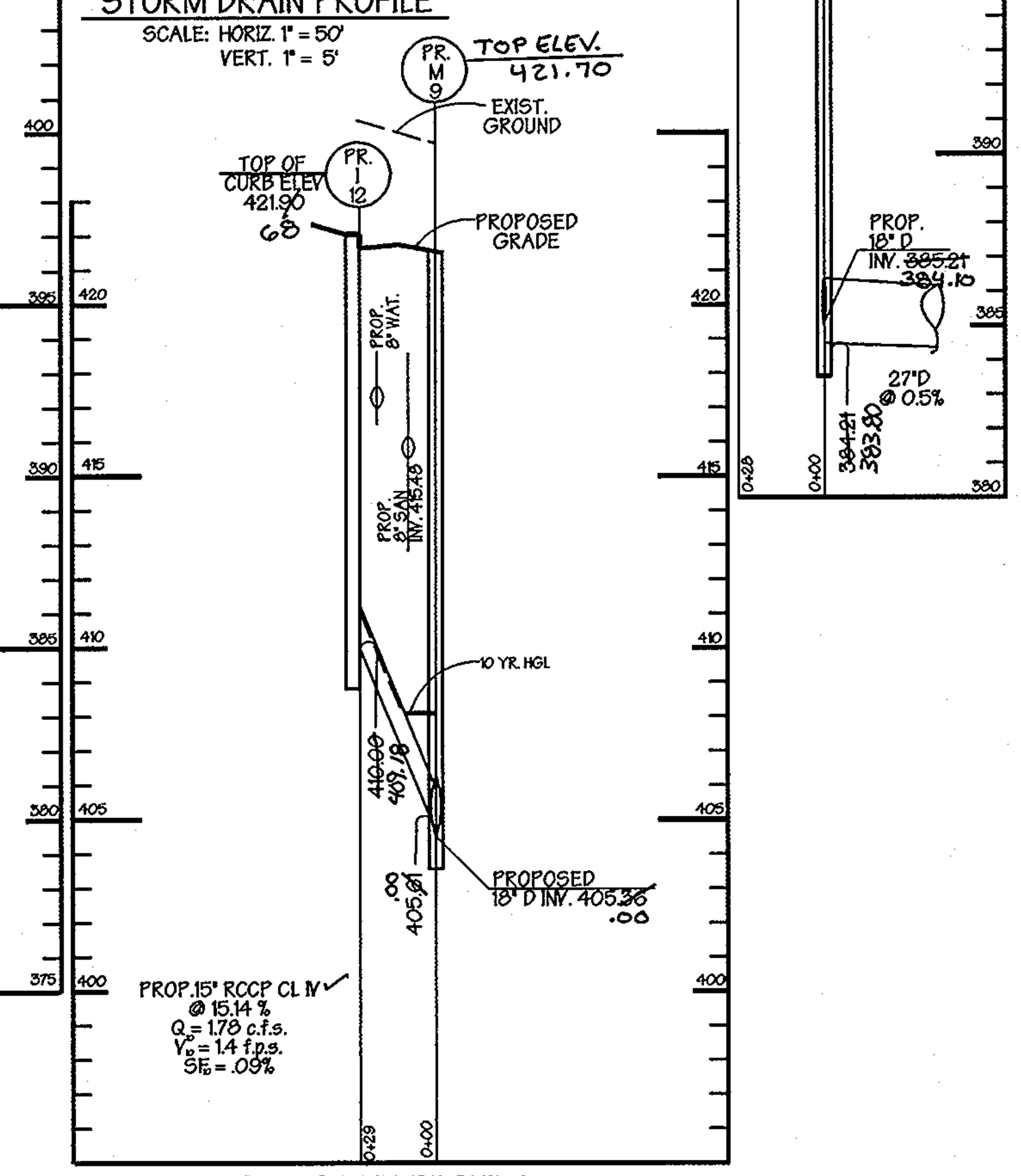
PIPE SCHEDULE			
NO.	TYPE	CLASS	TOTAL LENGTH
15"	R.C.C.P.	CL - IV	962'
18"	R.C.C.P.	CL - IV	427'
21"	R.C.C.P.	CL - IV	19'
24"	R.C.C.P.	CL - IV	377'
27"	R.C.C.P.	CL - IV	250'



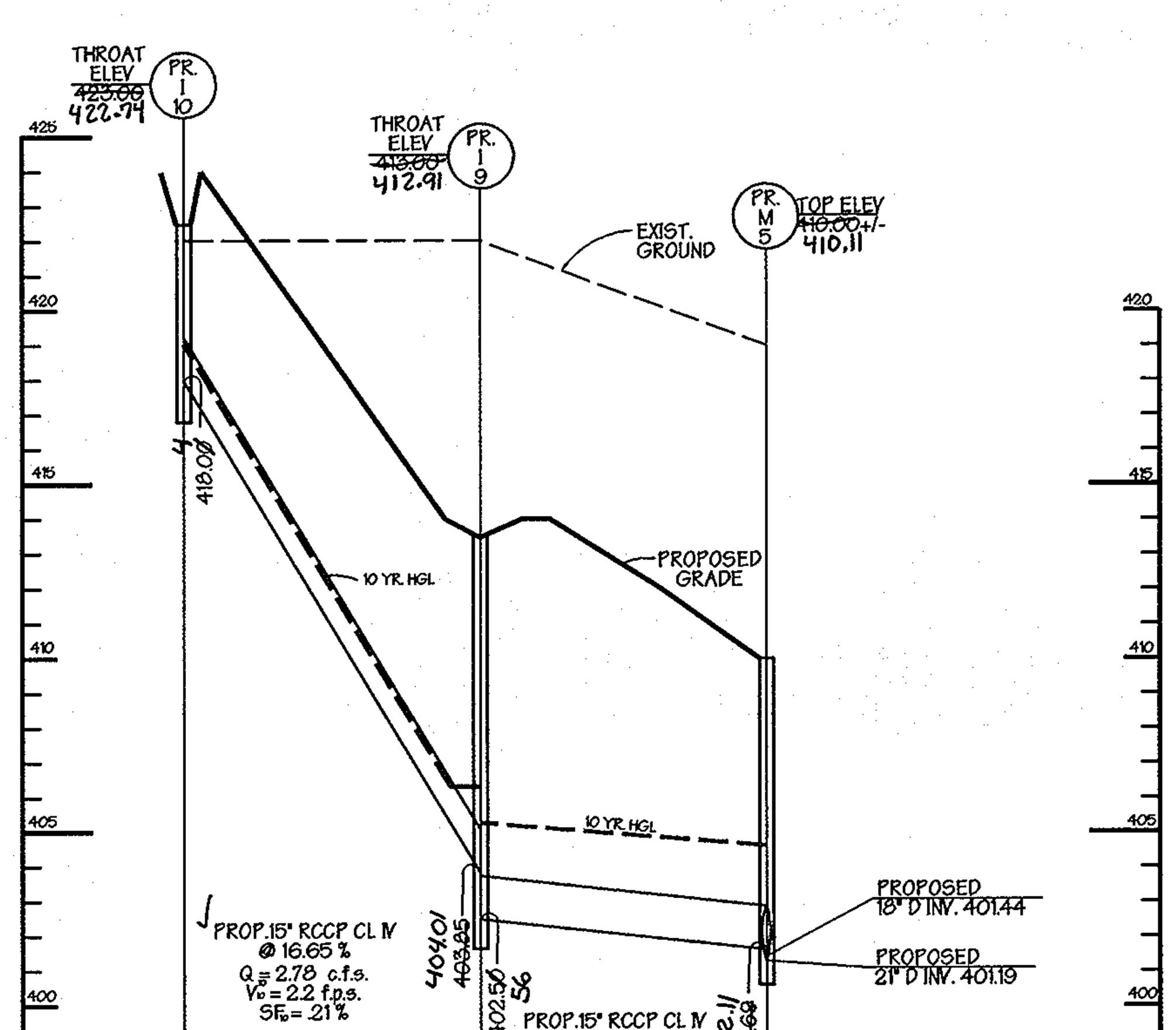
STORM DRAIN PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'



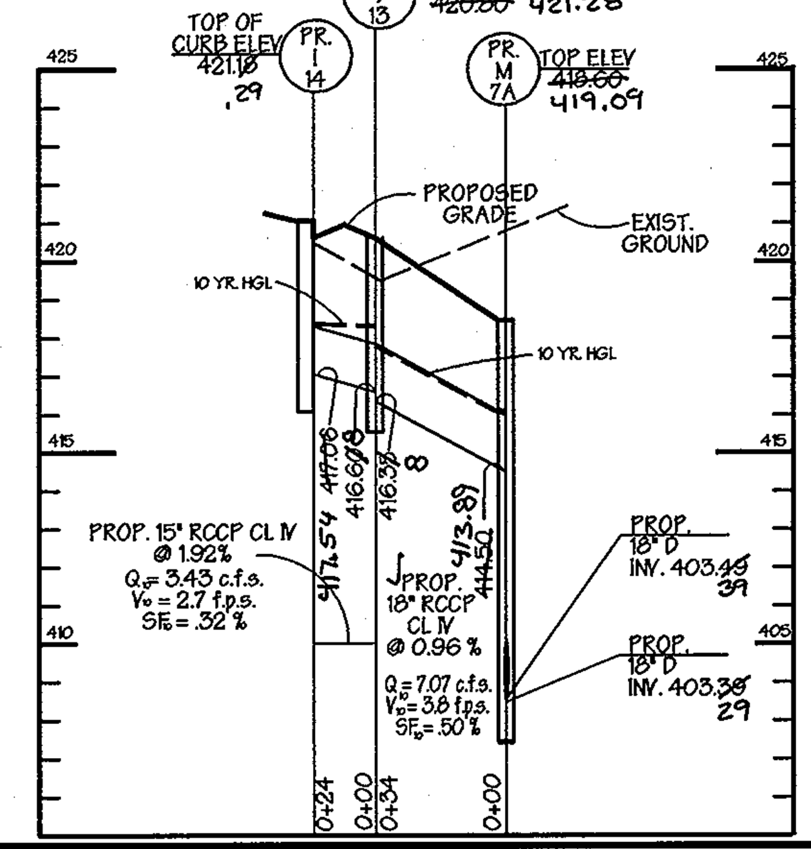
STORM DRAIN PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'

GWS

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

STORM DRAIN PROFILES

SCALE: 1" = 50'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

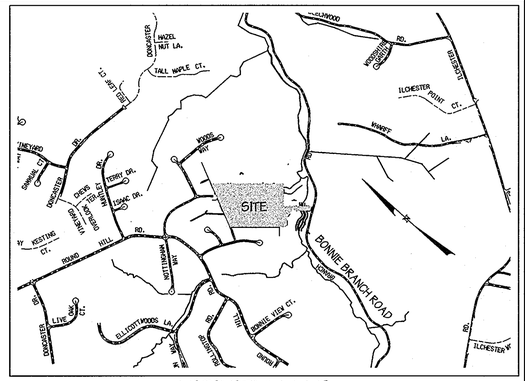
SHEET 5 of 27
F 04 - 181

ZONED R-20
TAX MAP 31

F.04.181

..\9282finaldrainprofilesrevke.sD 03/21/2005 10:03:41 AM kengle SCALE

DRAINAGE AREA	RCN	Tc (hrs.)	AREA (acres)	1-YR STORM (cfs)	10-YR STORM (cfs)	100-YR. STORM (cfs)
A	67	0.28	23.66	7.68	44.96	85.38
B	68	0.16	2.79	1.27	7.09	13.09



VICINITY MAP
SCALE: 1" = 1000'

SWM SUMMARY TABLE						
DRAINAGE AREA	RCN	Tc (hrs.)	AREA (Ac.)	1-yr. Q (cfs)	10-yr. Q (cfs)	100-yr. Q (cfs)
EX. DA A	67	0.28	23.66 +/-	7.68	44.96	85.38
EX. DA B	68	0.16	2.79 +/-	1.27	7.09	13.09
TOTAL EX.	----	----	----	8.46	51.05	97.09
PROP. ROUTED TO BMP	76	0.10	17.64 +/-	19.59	67.82	112.42
BMP DISCHARGE	----	----	----	0.54	32.18	115.46
BYPASS	68	0.10	8.81 +/-	3.21	17.51	32.82
TOTAL PROP.	----	----	----	3.69	49.12	146.88

SOIL	CLASS
BrF	C
BrD2	C
BrB2	C
GnB2	C
ReC2	B
LeB2	B
Mo	D
MrE	C
AdB2	C

LEGEND

- TRACT BOUNDARY
- EXISTING LOT OR PARCEL LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING TREELINES
- BUILDING SETBACK LINE
- EXISTING SOIL CLASSIFICATIONS
- EXISTING 5' CONTOUR
- EXISTING 25' CONTOUR
- WETLAND LIMIT LINE
- 100 YEAR FLOOD PLAIN
- 75' STREAM BUFFER
- 25' WETLANDS BUFFER
- STREAM
- DRAINAGE AREA
- Tc PATH

EXISTING DRAINAGE AREA A
RCN 67
Tc 0.28 HRS.
23.66 AC. +/-

EXISTING DRAINAGE AREA B
RCN 68
Tc 0.16 HRS.
2.79 AC. +/-

SEGMENT AB
100' SHEET
FLOW @ 9.0%

SEGMENT BC
200' SHALLOW
CONC. FLOW @ 17.5%

SEGMENT CD
1,160' CHANNEL FLOW @ 7.8%

SP-A

SP-B

NOTTINGHAM WAY

SHELLEY LANE

GAWAIN COURT

GAWAIN DRIVE

BONNIE BRANCH ROAD

NOTE: THE TOPOGRAPHY SHOWN IS FROM HOWARD CO. G.I.S. DATED 1998

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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE:

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

HOWARD SOIL CONSERVATION DISTRICT DATE:

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK KENGLE — No. 22218 — REGISTERED PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/19/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

EXISTING STORMWATER MANAGEMENT DRAINAGE AREA MAP

SCALE: 1" = 100'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 6 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

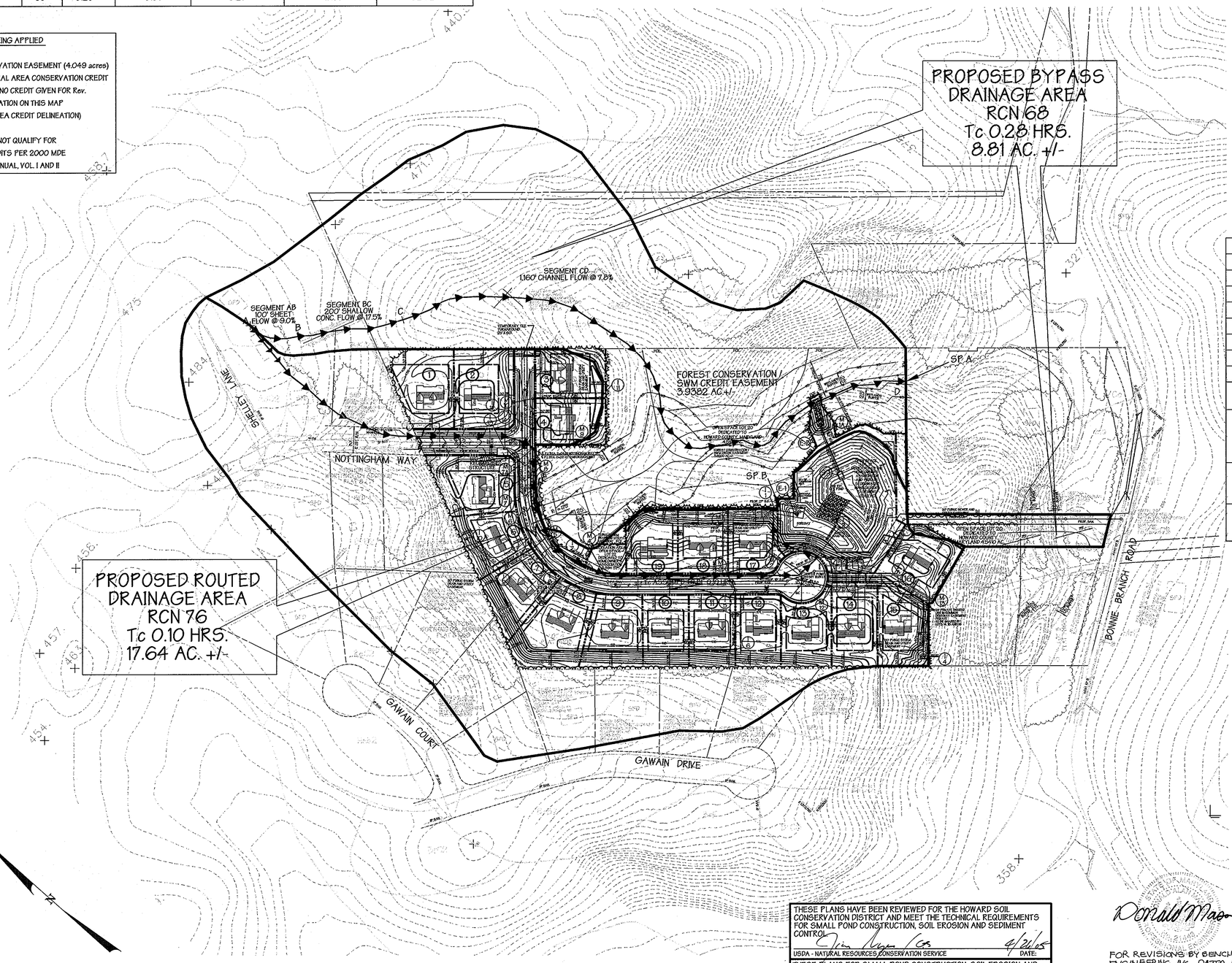
F.04.181

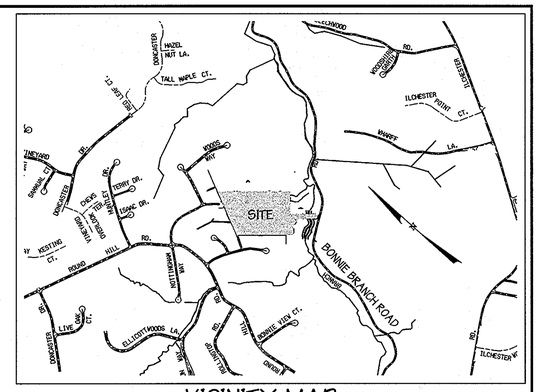
DRAINAGE AREA	RCN	Tc (hrs.)	AREA (acres)	1-YR STORM (cfs)	10-YR STORM (cfs)	100-YR. STORM (cfs)
ROUTED	76	0.10	17.64	19.59	67.82	112.42
BYPASS	68	0.28	8.81	3.21	17.51	32.82

SWM CREDITS BEING APPLIED

FOREST CONSERVATION EASEMENT (4.049 acres) USED FOR NATURAL AREA CONSERVATION CREDIT TO REDUCE WQv; NO CREDIT GIVEN FOR Rev. (SEE FCE DELINEATION ON THIS MAP FOR NATURAL AREA CREDIT DELINEATION)

THIS SITE DOES NOT QUALIFY FOR ADDITIONAL CREDITS PER 2000 MDE SWM DESIGN MANUAL, VOL. I AND II





VICINITY MAP
SCALE: 1" = 1000'

SWM SUMMARY TABLE

DRAINAGE AREA	RCN	Tc (hrs.)	AREA (Ac.)	1-yr. Q (cfs)	10-yr. Q (cfs)	100-yr. Q (cfs)
EX. DA A	67	0.28	23.66 +/-	7.68	44.96	85.38
EX. DA B	68	0.16	2.79 +/-	1.27	7.09	13.09
TOTAL EX.	-----	-----	-----	8.46	51.05	97.09
PROP. ROUTED TO BMP	76	0.10	17.64 +/-	19.59	67.82	112.42
BMP DISCHARGE	-----	-----	-----	0.54	32.18	115.46
BYPASS	68	0.10	8.81 +/-	3.21	17.51	32.82
TOTAL PROP.	-----	-----	-----	3.69	49.12	146.88

	ONSITE AREA WITHIN D.A. TO SWM BMP	13.08 AC. +/-
WQv	TOTAL % IMPERVIOUS AREA AREA OF FOREST CONSV. EASEMENT TOTAL AREA FOR WQv CALCULATION WQv TO BE TREATED IN SWM BMP	36.5 % 3.97 AC. +/- 9.11 AC. +/- 12,510 CU. FT. (0.287 AC.-FT.)
Rev	TOTAL AREA FOR Rev CALCULATION COMPOSITE "S" FACTOR FOR Rev TOTAL Rev TO BE PROVIDED	13.08 AC. +/- 0.1457 2,616 CU. FT. (0.06 AC.-FT.)
Qp10	EXISTING Q10 (cfs) @ DESIGN POINT PROPOSED Q10 (cfs) @ DESIGN POINT	51.05 cfs 49.12 cfs

SOIL	CLASS
BrF	C
BrD2	C
BrB2	C
GnB2	C
ReC2	B
LeB2	B
Mo	D
MrE	C
AdB2	C

LEGEND

PROPOSED RIGHT-OF-WAY LINE
PROPOSED LOT LINE
TRACT BOUNDARY
EXISTING LOT OR PARCEL LINE
EXISTING RIGHT-OF-WAY LINE
PROPOSED EASEMENT
EXISTING TREELINES
PROPOSED TREELINES
BUILDING SETBACK LINE
EXISTING SOIL CLASSIFICATIONS
EXISTING 5' CONTOUR
EXISTING 25' CONTOUR
WETLAND LIMIT LINE
100 YEAR FLOOD PLAIN
75' STREAM BUFFER
25' WETLANDS BUFFER
STREAM
DRAINAGE AREA
Tc PATH

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

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE: 4/26/05

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

HOWARD SOIL CONSERVATION DISTRICT — DATE: 4/26/05

Donald Mason
FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 10/31/07

NOTE: THE TOPOGRAPHY SHOWN IS FROM HOWARD CO. G.I.S. DATED 1998

NO.	DATE	REVISION
1	10-21-07	ADD GUARD RAIL AT CUL-DE-SAC

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK KENGLE — No. 22121 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-12-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/25/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

PROPOSED STORMWATER MANAGEMENT DRAINAGE AREA MAP

SCALE: 1" = 100'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 7 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F.04.181

AS-BUILT CERTIFICATION

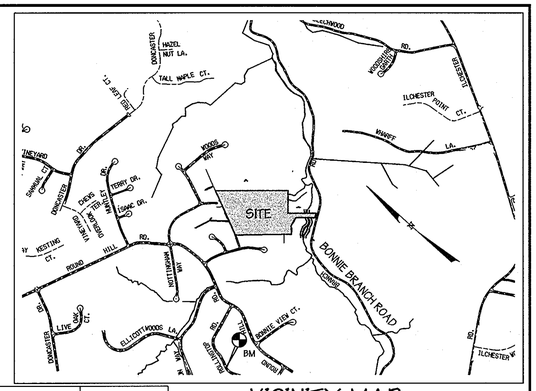
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEET THE APPROVED PLANS AND SPECIFICATIONS.

DONALD KLAN MASON — No. 21443 — PROFESSIONAL ENGINEER

ENGINEER: Donald Mason — NO. 21443 — DATE 11-5-10

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER'S CERTIFICATION. ENGINEER'S CERTIFICATION DOES NOT RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

BENCH MARK: # 31DA - SET IN CONCRETE
N 571982.646
E 1372144.970
ELEV. 482.359
7' EAST FROM EAST EDGE OF PAVING OF ROLLING TOP ROAD
85.8' TO TRANSMISSION POWER LINES GATE AND 0.1 MILE FROM ORCHARD ROAD



VICINITY MAP
SCALE: 1" = 1000'

LEGEND

PROPOSED RIGHT-OF-WAY LINE	
PROPOSED LOT LINE	
TRACT BOUNDARY	
EXISTING LOT OR PARCEL LINE	
EXISTING RIGHT-OF-WAY LINE	
PROPOSED EASEMENT	
EXISTING TREELINES	
PROPOSED TREELINES	
BUILDING SETBACK LINE	
EXISTING SOIL CLASSIFICATIONS	
EXISTING 5' CONTOUR	
EXISTING 25' CONTOUR	
WETLAND LIMIT LINE	W W W
100 YEAR FLOOD PLAIN	FP FP FP
75' STREAM BUFFER	SB SB
25' WETLANDS BUFFER	WB WB
STREAM	

SOIL	CLASS
BrF	C
BrD2	C
BrB2	C
GnB2	C
ReC2	B
LeB2	B
Mo	D
MrE	C

NOTE:
PLEASE REFER TO SHEET 24 FOR LANDSCAPING PLAN FOR THIS FACILITY.

	TOTAL EXISTING (cfs)	PROPOSED POND INFLOW (cfs)	PROPOSED POND DISCHARGE (cfs)	POND WATER SURFACE ELEVATION (feet)	PROPOSED BYPASS (cfs)	TOTAL PROPOSED (cfs)
1-YR.	8.46	19.59	0.54	378.46	3.21	3.69
10-YR.	51.05	67.82	32.18	381.36	17.51	49.12
100-YR.	97.09	112.42	115.46	382.04	32.82	146.88

DESCRIPTION	DATA
POND TYPE	MD-378 DETENTION (DRY)
HAZARD CLASSIFICATION	HAZARD CLASS "A"
TOP OF EMBANKMENT	384.04
FREEBOARD REQUIRED (100-YR. STORM)	2.0 FT.
FREEBOARD PROVIDED (100-YR. STORM)	2.0 FT.

	Proposed Routed	Proposed Bypass	BMP Used
Area (acres)	17.64 ac..	8.81 ac..	
Rev (Required / Provided)	0.04 ac-ft / 0.04 ac-ft	N/A	Stone Storage beneath Surface Sand Filter
WQv (Required / Provided)*	0.135 ac-ft / 0.14 ac-ft	N/A	Surface Sand Filter
Cpv (Required / Provided)	0.67 ac-ft / 0.67 ac-ft	N/A	Detention Pond **
Qp10 (Required / Provided)	1.05 ac-ft / 1.42 ac-ft	N/A	Detention Pond **
Qp100 (Required / Provided)	N/A	N/A	N/A

*Prior to Sand Filter Media (75% of Total WQv) ** MD-378 Detention Pond, Hazard Class "a"

NOTE:
REFER TO SHEETS 26 AND 27 FOR RETAINING WALL PLANS, SECTIONS AND DETAILS

NOTE: THE STORMWATER MANAGEMENT SYSTEM SHOWN ON THIS PLAN IS TO BE OWNED AND MAINTAINED BY THE HOMEOWNERS' ASSOCIATION.

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personal involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

Signature of Developer: John N. Bowers Jr. Date 3/18/05
Print Name: John N. Bowers Jr.

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer: Kevin Patrick Shorter Date 21 MAR 2005
Print Name: Kevin Patrick Shorter PE # 29218

CONSULTANTS HAZARD CLASS CERTIFICATION:
I certify that this pond meets all requirements for hazard class (A) B or C. (requirements as stated in the soil conservation service - maryland standards and specifications for pond, code 378, november 1992). All necessary investigations and computations have been performed to verify this finding. A copy of said information has been supplied to howard county soil conservation district.

Engineer: Kevin Patrick Shorter Date: 21 MAR 2005
Name: Kevin Patrick Shorter

AS-BUILT CERTIFICATION:
I hereby certify that the facility shown on this plan was constructed as shown on the "as-built" plans and meet the approved plans and specifications.

Signature P.E. # Date:

Certify means to state or declare a professional opinion based upon on-site inspections and material tests which are conducted during construction. The on-site inspections and material tests are those inspections and tests deemed sufficient and appropriate by commonly accepted engineering standards. Certify does not mean or imply a guarantee by the engineer nor does an engineer's certification relieve any other party from meeting requirements imposed by contract, employment, or other means, including meeting commonly accepted industry practices.

NO.	DATE	REVISION
1	10-31-07	ADD GUARD RAIL AT CUL-DE-SAC

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.
USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE: 4/26/05

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SOIL CONSERVATION DISTRICT — DATE: 4/26/05

FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 10/31/07

OPEN SPACE LOT 20 DEDICATED TO WARD COUNTY, MARYLAND 4.5410 AC.

EXIST. FOREST CONSERVATION EASEMENT - 2.1712 AC.+/- PLAT 12952

FOREST CONSERVATION / SWM CREDIT EASEMENT 3.9200 AC.+/-

PROP. SWM EASEMENT

OPEN SPACE LOT 21 DEDICATED TO THE HOMEOWNERS ASSOCIATION AND PRIVATE STORMWATER MANAGEMENT EASEMENT 1.2262 AC.

75' STREAM BUFFER — 25' WETLANDS BUFFER — 75' STREAM BUFFER — 25' WETLANDS BUFFER

NO WOODY VEGETATION AREA (15' FROM TOE OR CUT SLOPE, 25' FROM RISER STRUCTURE)

318.47' S47°46'58"W

PARCEL 25, LOT 1
GARY A. MILES
4818 BONNIE BRAE
ELLICOTT CITY, MD
21043-6810
DEED # 4118 / 065
EXIST. ZONING R-2

PROPOSED 27" S.D.

20' PUBLIC STORM DRAIN AND UTILITY EASEMENT

PROPOSED RETAINING WALL

FOREBAY #4

SURFACE SAND FILTER #6

DRY EXT. DET. POND #5

#1 #2 #3 #7 #8 #9

30' x 30' TURNAROUND AREA

STOCKPILE DEWATERING AREA

30' PUBLIC STORM DRAIN & UTILITY EASEMENT

20' PRIVATE INGRESS & EGRESS ACCESS EASEMENT

STEEL GUARD RAIL — BOLLARDS MARKING — SWM BMP ACCESS

PROP. 15" S.D. — PROP. 18" S.D. — PROP. SAN. — PROP. 15" S.D.

EXISTING BARN TO BE RAZED

14' PAVING

GROUTED GABION INFLOW PROTECTION

CONCRETE FLOW CHANNEL (SEE DETAIL SHEET 10)

ACCESS RAMP

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHORTER — No. 29218 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

STORMWATER MANAGEMENT PLAN

SCALE: 1" = 20'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 8 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F-04-181

...\92821finalswmplan.sh1 03/21/2005 11:04:27 AM kengle SCALE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 21443, Expiration Date: 12-21-12

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE ENGINEERING SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" DRAWING AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.

DONALD ALAN MASON — STATE OF MARYLAND — PROFESSIONAL ENGINEER

-ENGINEER- LICENSE NO. 21443

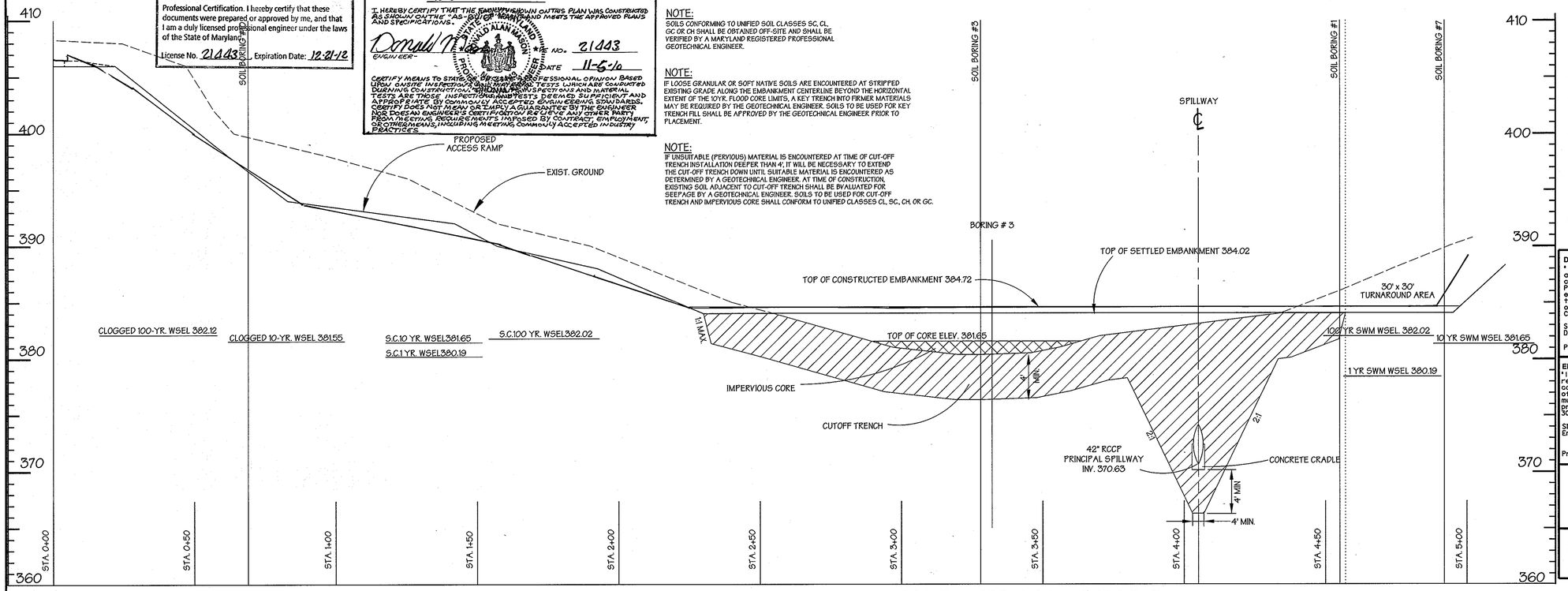
DATE 11-5-10

I CERTIFY MEANS TO STATE MY PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND/OR TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. SUCH ONSITE INSPECTIONS AND TESTS OF SOIL AND MATERIAL TYPES ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN GUARANTEE OR INSURANCE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY OF OBLIGATIONS, RESPONSIBILITY IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHERWISE, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

NOTE:
SOILS CONFORMING TO UNIFIED SOIL CLASSES SC, CL, GC OR CH SHALL BE OBTAINED OFF-SITE AND SHALL BE VERIFIED BY A MARYLAND REGISTERED PROFESSIONAL GEOTECHNICAL ENGINEER.

NOTE:
IF LOOSE GRANULAR OR SOFT NATIVE SOILS ARE ENCOUNTERED AT STRIPPED EXISTING GRADE ALONG THE EMBANKMENT CENTERLINE BEYOND THE HORIZONTAL EXTENT OF THE 10YR. FLOOD CORE LIMITS, A KEY TRENCH INTO FIRMER MATERIALS MAY BE REQUIRED BY THE GEOTECHNICAL ENGINEER. SOILS TO BE USED FOR KEY TRENCH FILL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.

NOTE:
IF UNSUITABLE (PERVIOUS) MATERIAL IS ENCOUNTERED AT TIME OF CUT-OFF TRENCH INSTALLATION DEEPER THAN 4', IT WILL BE NECESSARY TO EXTEND THE CUT-OFF TRENCH DOWN UNTIL SUITABLE MATERIAL IS ENCOUNTERED AS DETERMINED BY A GEOTECHNICAL ENGINEER. AT TIME OF CONSTRUCTION, EXISTING SOIL ADJACENT TO CUT-OFF TRENCH SHALL BE EVALUATED FOR SEEPAGE BY A GEOTECHNICAL ENGINEER. SOILS TO BE USED FOR CUT-OFF TRENCH AND IMPERVIOUS CORE SHALL CONFORM TO UNIFIED CLASSES CL, SC, CH, OR GC.



CROSS SECTION OF DAM ALONG CENTERLINE

SCALE: HORZ. 1"=20' VERT. 1"=5'

RELEASE STRUCTURE NOTES

1. UNLESS OTHERWISE NOTED CAST-IN-PLACE STRUCTURE SHALL BE BUILT IN ACCORDANCE TO HOWARD CO. STD. DETAILS.
2. STRUCTURE TO BE CAST-IN-PLACE REINFORCED CONCRETE WITH 3,500 P.S.I.(MIN.) COMPRESSIVE STRENGTH @ 28 DAYS. DESIGN OF PRECAST CONC. STRUCTURE SHALL BE PROVIDED BY MANUFACTURER.
3. ALL REINFORCING TO BE CONTINUOUS THROUGHOUT STRUCTURE.
4. ALL REINFORCING TO HAVE 1 6" MIN. OVERLAPS.
5. TWO (2) INCH COVER MINIMUM FOR ALL REBARS IN WALLS AND THREE (3) INCHES FOR THE BASE.
6. PROVIDE ADDITIONAL # 4 REBARS ALONG THE PERIMETER OF ALL OPENINGS WITH THE AREA OF STEEL EQUAL TO OR GREATER THAN THE AREA OF STEEL "REMOVED" DUE TO OPENING.
7. SHOP DRAWINGS FOR PRECAST CONCRETE RISERS WITH SUPPORTING STRUCTURAL COMPUTATIONS (SIGNED AND SEALED BY A MD. REGISTERED ENGINEER) MEETING A.S.T.M. REQUIREMENTS FOR PRECAST STRUCTURES MUST BE SUBMITTED TO THE ENGINEER, AND THE APPROVING AGENCY FOR APPROVAL PRIOR TO FABRICATION. IF ANY STRUCTURE DIMENSIONS VARY FROM WHAT WAS ORIGINALLY REVIEWED / APPROVED, THEN THE HYDRAULICS, FLOTATION AND STRUCTURAL INTEGRITY OF THE STRUCTURE WILL HAVE TO BERE-ANALYZED.
8. ALL EXPOSED CORNERS OF CONCRETE SHALL BE CHAMFERED WITH 3/4" X 3/4" MILLED CHAMFER STRIPS.

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personel involved in the construction project will have a certificate of attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard soil Conservation District."

Signature of Developer _____ Date 4/8/05
Print Name John N. Bowers Jr.

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

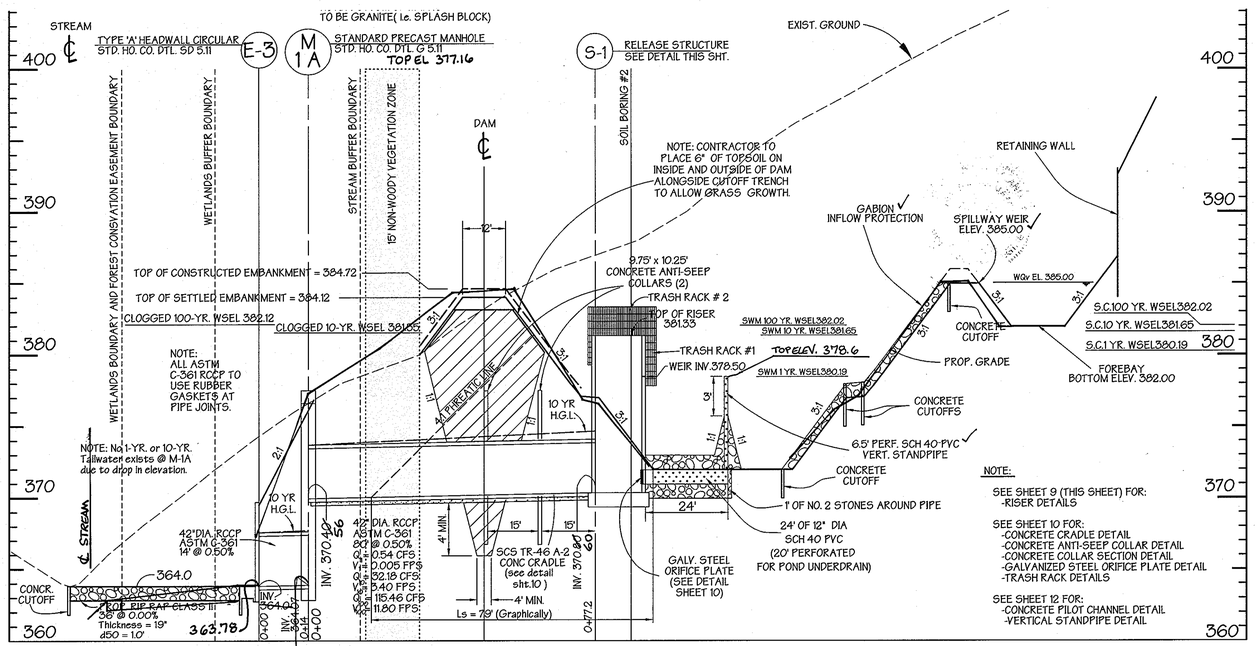
Signature of Engineer _____ Date 08 APR 2005
Print Name Kevin Patrick Shortell PE # 29218

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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE: 4/26/05

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

HOWARD SOIL CONSERVATION DISTRICT — DATE: 4/26/05

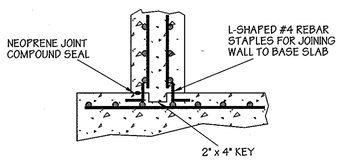


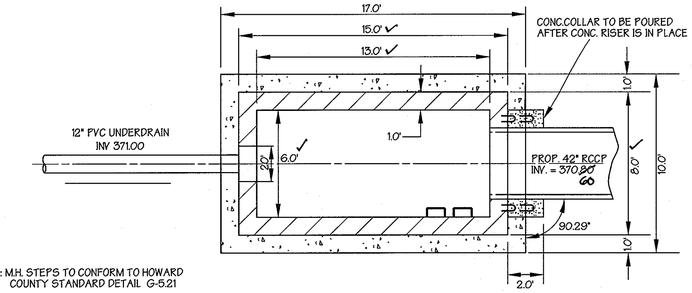
PROFILE THRU PRINCIPAL SPILLWAY

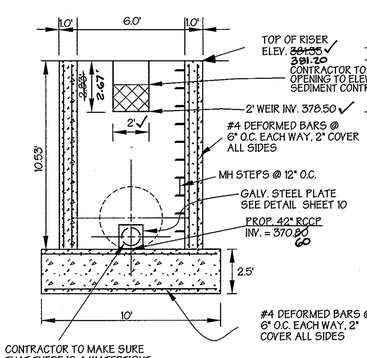
SCALE: HORZ. 1"=20' VERT. 1"=5'

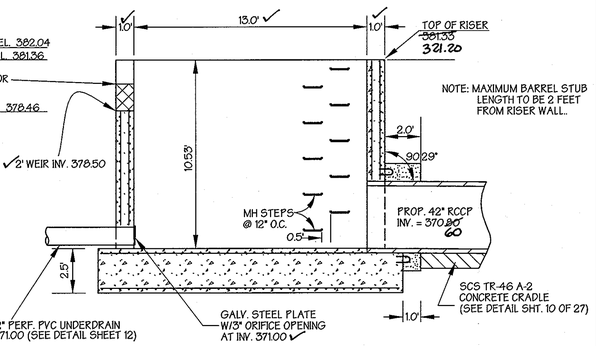
KEYED JOINT DETAIL FOR WALL CONNECTION TO BASE SLAB

NOT TO SCALE









RELEASE STRUCTURE DETAIL

SCALE: 1" = 4'

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
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APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-23-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

STORMWATER MANAGEMENT DETAILS

SCALE: AS SHOWN

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 9 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F-04-181

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CONSTRUCTION SPECIFICATIONS

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

SITE PREPARATION

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be cleared and grubbed within 15 feet of the toe of the embankment.

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

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

EARTH FILL

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

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

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

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

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

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

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

STRUCTURE BACKFILL

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

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

PIPE CONDUITS

All pipes shall be circular in cross section.

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

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

Materials - (Aluminum Coated Steel Pipe) ⊕ This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

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

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

All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, pre-punched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gaskets; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of ¼ inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of ¾ (four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable.

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

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

5. Backfilling shall conform to "Structure Backfill".

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

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

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

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

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

4. Backfilling shall conform to "Structure Backfill".

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

Plastic Pipe - 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 the following: 4"-10" pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

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

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

4. Backfilling shall conform to "Structure Backfill".

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

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

CONCRETE

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

ROCK RIPRAP

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

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

CARE OF WATER DURING CONSTRUCTION

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect 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 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 or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

STABILIZATION

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

EROSION AND SEDIMENT CONTROL

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

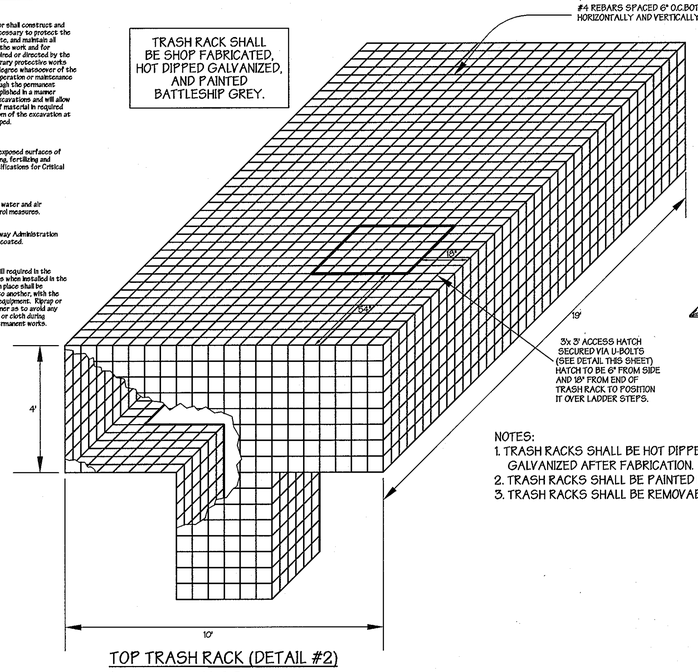
GABIONS

Gabions shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 312 and must be CL IV, PVC coated.

OUTFALL PROTECTION

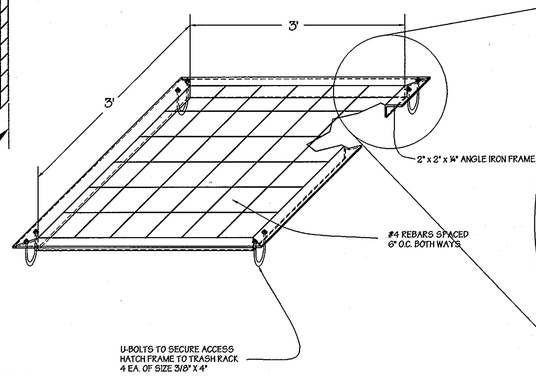
Subgrade for riprap or gabion outfalls shall be prepared to the required line and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the specified grading limits when installed in the riprap or gabion. All stone shall be delivered and placed in a manner that will insure the stone 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. Stone for outfalls may be placed by equipment. Riprap or gabion outlets shall be constructed to full course thickness in one operation and in such a manner as to avoid any displacement of underlying materials. The contractor shall avoid damage to the filter blanket or cloth during placement of riprap. Hand placement shall be required as needed to prevent damage to the permanent works. Filter cloth shall be placed under all riprap and gabions.

TRASH RACK SHALL BE SHOP FABRICATED, HOT DIPPED GALVANIZED, AND PAINTED BATTLESHIP GREY.

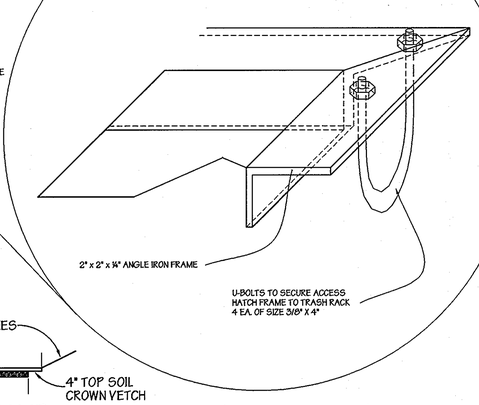


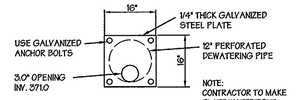
TOP TRASH RACK (DETAIL #2)
N.T.S.

NOTES:
1. TRASH RACKS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
2. TRASH RACKS SHALL BE PAINTED BATTLESHIP GREY.
3. TRASH RACKS SHALL BE REMOVABLE.

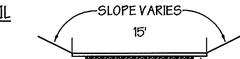


TRASH RACK ACCESS HATCH DETAIL
N.T.S.



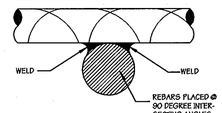


GALVANIZED STEEL PLATE FOR Cp, RELEASE
NOT TO SCALE

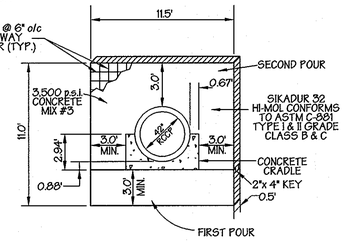


ACCESS RAMP
NOT TO SCALE

NOTE:
NO RUST SHALL BE PERMITTED ON REBAR SURFACES TO BE WELDED. GALVANIZE RACK AFTER FABRICATION.



TRASH RACK WELDING DETAIL
NOT TO SCALE



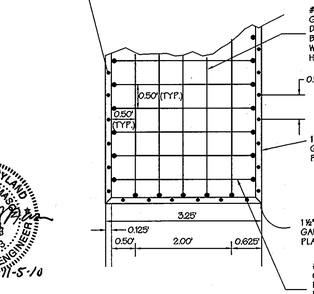
CONCRETE ANTI-SEEP COLLAR
NOT TO SCALE

NOTE:
1. LOCATE ANTI-SEEP COLLARS OF 2' MIN. FROM ALL PIPE JOINTS, SPACING BETWEEN COLLARS TO BE 15' MINIMUM.
2. THE SEAL BETWEEN THE PIPE AND COLLAR SHALL BE WATER TIGHT.
3. COLLAR SHALL PROJECT A MIN. OF 3' FROM THE EXTERIOR OF THE CONCRETE CRADLE AND THE PIPE ON ALL FOUR SIDES.
4. COLLAR SHALL BE CAST-IN-PLACE REINFORCED CONCRETE WITH 3,500 PSI (MIN) STRENGTH @ 28 DAYS CONCRETE.
5. ALL REINFORCING TO BE CONTINUOUS THROUGHOUT COLLAR.
6. ALL REINFORCING TO HAVE 1'-6" MIN. OVERLAPS.
7. PROVIDE ADDITIONAL #4 REBARS ALONG THE PERIMETER OF ALL OPENINGS WITH THE AREA OF STEEL EQUAL TO OR GREATER THAN AREA OF STEEL 'REMOVED' DUE TO OPENINGS.
8. TWO (2) INCH COVER MINIMUM FOR ALL REBARS.
9. UNLESS OTHERWISE NOTED COLLAR SHALL BE BUILT IN ACCORDANCE WITH HOWARD COUNTY CONSTRUCTION MATERIAL SPECIFICATIONS. COLLAR SHALL NOT BE BRICK.
10. WATER TIGHT SEAL TO BE SIKADUR 32, HI-MOL, CONFORMING TO ASTM C-881; TYPE I & II; GRADE 2; CLASS B & C. EPOXY BONDING/GROUTING ADHESIVE.

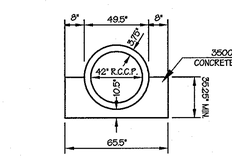
SIDE VIEW (TYPICAL)
N.T.S.

SIDE VIEW (@ 2' WEIR ONLY)
N.T.S.

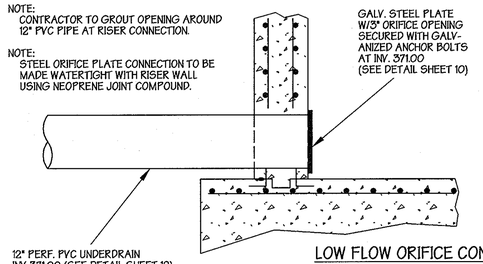
TRASH RACKS SHALL BE SHOP FABRICATED, HOT DIPPED GALVANIZED, AND PAINTED BATTLESHIP GREY.



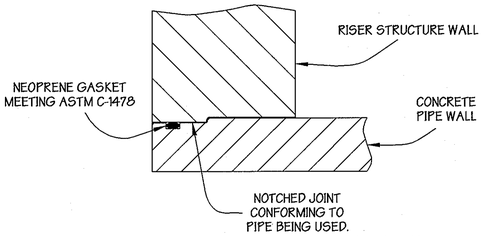
FRONT VIEW @ 2' WEIR SHOWING FLANGE MOUNTING (TYPICAL)
N.T.S.



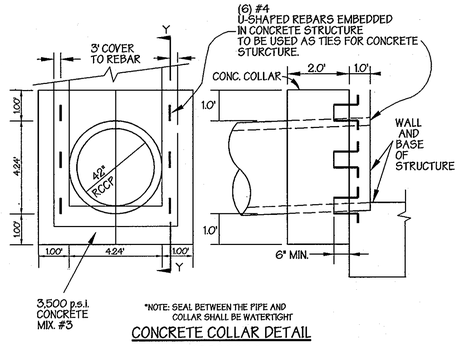
SCS TR-46 A-2
CONCRETE CRADLE DETAIL
NOT TO SCALE



LOW FLOW ORIFICE CONNECTION DETAIL
NOT TO SCALE



TYPICAL CONFINED GASKET JOINT DETAIL FOR PIPE CONNECTIONS AT RISER
NOT TO SCALE



*NOTE: SEAL BETWEEN THE PIPE AND COLLAR SHALL BE WATERTIGHT

CONCRETE COLLAR DETAIL
NOT TO SCALE

DEVELOPER CERTIFICATION:

"I certify that all development and/or construction will be done according to these plans, and that any responsible personal involved in the construction project will have a certificate of attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

Signature of Developer _____ Date 3/21/05

Print Name JOHN BOWERS JR

ENGINEER CERTIFICATION:

"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer _____ Date 21 MAR 2005

Print Name Kevin Patrick Sheridan PE # 29218

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.

_____ 4/22/05

USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE:

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

_____ 4/22/05

HOWARD SOIL CONSERVATION DISTRICT DATE:

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND KEVIN PATRICK SHERIDAN No. 29218 PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/4/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/06

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

STORMWATER MANAGEMENT NOTES

SCALE: AS SHOWN

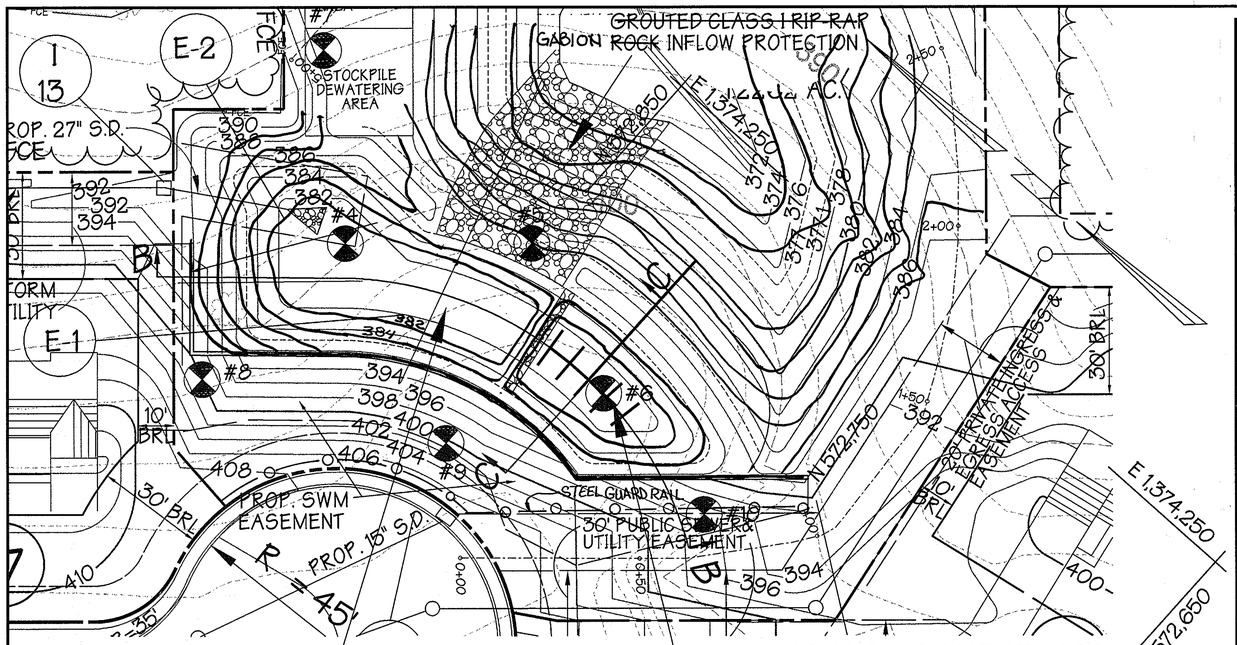
NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 10 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

F. 04. 181

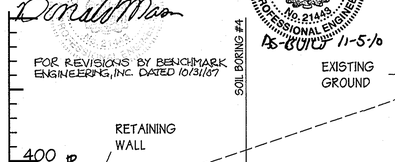


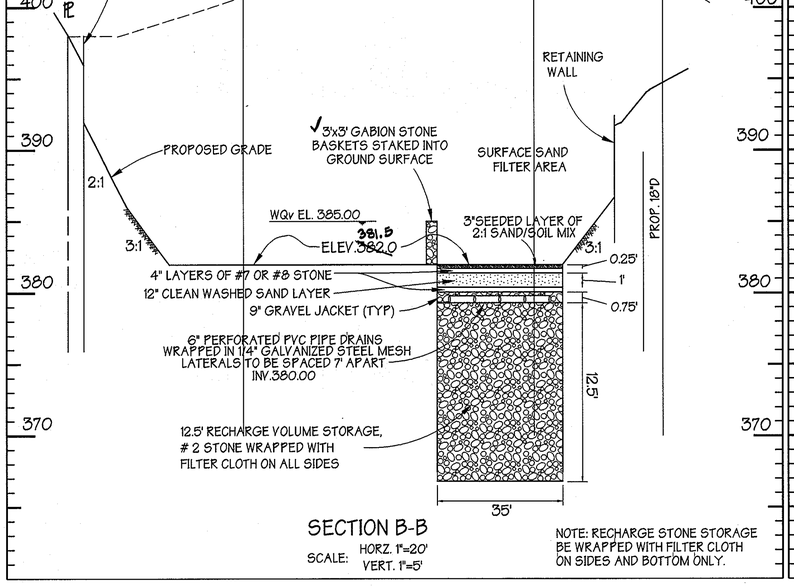
FOREBAY

PLAN VIEW

SCALE:1"=20'

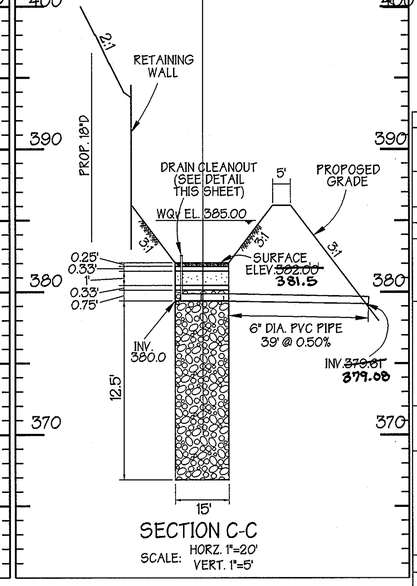
NOTE : REFER TO SHEETS 26 AND 27 FOR RETAINING WALL PLANS, SECTIONS AND DETAILS





SECTION B-B

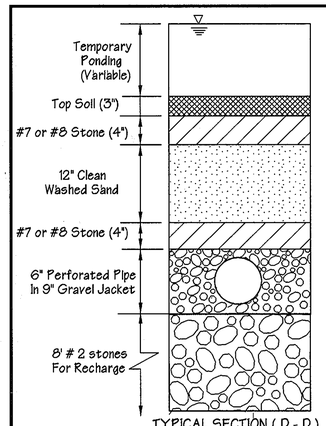
SCALE: HORZ. 1"=20' VERT. 1"=5'



SECTION C-C

SCALE: HORZ. 1"=20' VERT. 1"=5'

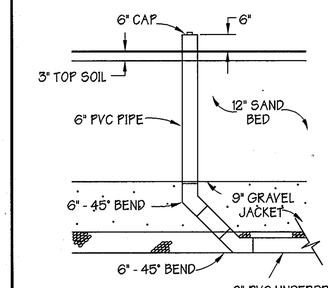
NOTE: RECHARGE STONE STORAGE BE WRAPPED WITH FILTER CLOTH ON SIDES AND BOTTOM ONLY.



TYPICAL SECTION (D - D)

ABOVE GROUND SAND FILTER

NOT TO SCALE



6" CLEANOUT DETAIL

NOT TO SCALE

OPERATION AND MAINTENANCE SCHEDULE OF PRIVATELY OWNED AND MAINTAINED STORMWATER POND

ROUTINE MAINTENANCE

1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS THE RIP-RAP OR GABION OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON-ROUTINE MAINTENANCE

1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE EMAL THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHALL BE REMOVED FROM THE POND AND FOREBAY NO LATER THAN WHEN THE CAPACITY OF THE POND OR FOREBAY IS HALF-FULL OF SEDIMENT OR WHEN DEEMED NECESSARY FOR AESTHETIC REASONS UPON APPROVAL FROM THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

OPERATION AND MAINTENANCE SCHEDULE OF PRIVATELY OWNED AND MAINTAINED SURFACE SAND FILTER

ROUTINE MAINTENANCE

1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE SURFACE SAND FILTER ARE FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
3. DEBRIS AND LITTER NEXT TO THE OUTLET PIPES SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE SURFACE SAND FILTER AS WELL AS RIP-RAP OUTLET SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON-ROUTINE MAINTENANCE

1. STRUCTURAL COMPONENTS OF THE SURFACE SAND FILTER SUCH AS THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHALL BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

3.4.6 Filtering Maintenance Criteria

The sediment chamber outlet devices shall be cleaned/repaired when drawdown times within the chamber exceed 36 hours. Trash and debris shall be removed as necessary.

Sediment should be cleaned out of the sedimentation chamber when it accumulates to a depth of more than six inches. Vegetation within the sedimentation chamber should be limited to a height of 18 inches.

When the filtering capacity of the filter diminishes substantially (e.g., when water ponds on the surface of the filter bed for more than 72 hours), the top few inches of discolored material shall be removed and shall be replaced with fresh material. The removed sediments should be disposed in an acceptable

manner (e.g. landfill). Silt/sediment should be removed from the filter bed when the accumulation exceeds one inch.

Organic filters (F-4) or surface sand filters (F-5) that have a grass cover should be mowed a minimum of 3 times per growing season to maintain maximum grass heights less than 12 inches.

A drop of at least six inches shall be provided at the inlet of bioretention facilities (F-6) (stone diaphragm). Dead or diseased plan material shall be replaced. Areas devoid of mulch should be re-mulched on an area basis.

Direct maintenance access shall be provided to the pretreatment area and the filter bed.

Construction of sand filters and bioretention areas shall conform to the specifications outlined in Appendix

B.3.

B.3.A Sand Filter Specifications

1. Material Specifications for Sand Filters

The allowable materials for sand filter construction are detailed in Table B.3.1.

2. Sand Filter Testing Specifications

Underground sand filters, facilities within sensitive groundwater aquifers, and filters designed to serve

urban hot spots are to be tested for water tightness prior to placement of filter media. Entrances and exits should be plugged and the system completely filled with water to demonstrate water tightness. Water tightness means no leakage for a period of 8 hours.

All overflow weirs, multiple orifices and flow distribution slots are to be field-tested to verify adequate distribution of flows.

3. Sand Filter Construction Specifications

Provide sufficient maintenance access (i.e., 12-foot-wide road with legally recorded easement). Vegetated access slopes are to be a maximum of 10%; gravel slopes to 15%; paved slopes to 20%.

Absolutely no runoff is to enter the filter until all contributing drainage areas have been stabilized.

Surface or filter bed is to be level.

All underground sand filters should be clearly delineated with signs so that they may be located when maintenance is due.

Surface sand filters may be planted with appropriate grasses; see Appendix A.

"Pocket" sand filters (and residential bioretention facilities treating areas larger than an acre) shall be sized with a stone "window" that covers approximately 10% of the filter area. This "window" shall be filled pea gravel (3/4 inch stone).

Material Specifications

The allowable materials to be used in bioretention area are detailed in Table B.3.2.

Planting Soil

The soil shall be a uniform mix, free of stones, stumps, roots or other similar objects larger than two inches. No other materials or substances shall be mixed or dumped within the bioretention area that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil shall be free of Bermuda grass, Quackgrass,

Johnson grass, Mugwort, Nutsedge, Poison Ivy, Canadian Thistle, Tearthumb, or other, noxious weeds.

The planting soil shall be tested and shall meet the following criteria:

pH range	5.2 - 7.0
organic matter	1.5 - 4%
magnesium	35 lb/ac.
phosphorus P2O5	75 lb/ac.
potassium K2O	85 lb/ac.
soluble salts	not to exceed 500 ppm

All bioretention areas shall have a minimum of one test. Each test shall consist of both the standard soil test for pH, Phosphorus, And potassium and additional tests of organic

matter, and soluble salts. A textural analysis is required from the site stockpiled topsoil. If topsoil is imported, then a texture analysis shall be performed for each location where the top soil was excavated.

Since different labs calibrate their testing equipment differently, all testing results shall

come from the same testing facility.

Should the pH fall out of the acceptable range, it may be modified (higher) with lime or (lower) with iron sulfate plus sulfur.

Compaction

It is very important to minimize compaction of both the base of the bioretention area and the required backfill. When possible, use excavation hoes to remove original soil. If bioretention areas are excavated using a loader, the contractor should use wide track or

marsh track equipment, or light equipment with turf type tires. Use of equipment with narrow tracks or narrow tires, rubber tires with large lugs, or high pressure tires will cause excessive compaction resulting in reduced infiltration rates and storage volumes and is not acceptable. Compaction will significantly contribute to design failure.

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

effects of compaction from heavy equipment.

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

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

When back filling the bioretention facility, place soil in lifts 12" or greater. Do not use

heavy equipment within the bioretention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade Bioretention material with light equipment such as a compact loader or a dozerloader with marsh tracks.

Plant Material

Plant material should conform to the American Standard Nursery Stock, published by the American Association of Nurserymen, and should be selected from certified, reputable nurseries.

Plant Installation

Shredded hardwood mulch is the only accepted mulch. Pine mulch and wood chips will float and move to the perimeter of the bioretention area during a storm event and are not acceptable.

Shredded mulch must be well aged (6 to 12 months) for acceptance.

The plant root ball should be planted no 1/8th of the ball is above the final grade surface. Root stock of the plant material shall be kept moist during transport and on-site storage. Planting pits shall follow LCA planting guidelines. The diameter of the planting pit shall

be at least six inches larger than the diameter of the planting ball. Set and maintain the plant straight during the entire planting process. Thoroughly water ground bed cover after installation.

Trees shall be braced using 2" by 2" stakes only as necessary and for the first growing

season only. Stakes are to be equally spaced on the outside of the tree ball.

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

The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bioretention structure is to improve water quality. Adding fertilizers defeats, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch is used to amend the soil. Rototill area fertilizer at a rate of 0 pounds per 1000 square feet.

Underdrains

Underdrains to be placed on a 3'-0" wide section of filter cloth. Pipe is placed next, followed by the gravel bedding. The ends of underdrain pipes not terminating in an observation well shall be capped.

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

Filter Strips

Construct pea gravel diaphragms 12" wide, minimum, and 24" deep minimum.

Perimeter berms to be a sand/gravel mix. See bioretention planting media specifications; add 10% gravel, reduce clay components accordingly. Berms to have overflow weirs with 6 inch minimum head.

Slope range to be 2% minimum to 6% maximum.

Miscellaneous

The bioretention facility facility may not be constructed until all contributing drainage area has been stabilized.

Materials Specifications for Sand Filters

PARAMETER	SPECIFICATION	SIZE	NOTES
Sand	AASHTO M-6 or ASTM C-33 33 concrete sand	0.02" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
Peat			The material must be reed-sedge hemic peat, shredded, uncompacted, uniform, and clean.
Leaf Compost		n/a	
Underdrain Gravel	AASHTO M-43	0.35" TO 0.75"	
Geotextile Fabric (if required)	ASTM-D-4833 (puncture strength - 125 lbs ASTM-D-4632 (tensile strength - 300 lbs	0.08" thick equivlant opening size of #80 sieve	Must maintain 125 gpm per sq. ft. flow rate. Note: a 4" pea gravel layer may be substituted for geotextiles meant to "separate" sand filter layers.
Impermeable liner (if required)	ASTM-D-4833 (puncture ASTM-D-4122 (tensile strength 1,100 lbs., elongation 200%) ASTM-D-624 (Tear resistance 150 lbs./in) ASTM-D-471 (water adsorption: +5 to -2 % mass)		
underdrain piping	F 758, Type PS 28 or ASSSHTO-M-278	4" - 6" rigid schedule 40 PVC or SDR35	3/8" perf. @ 6" on center, 4 holes per row; minimum of 3" of gravel over pipes; not necessary underneath pipes
concrete (cast in place)	MHSA Standard and Spec, Section 902 - Mix No. 3; f'c = 3500 psi., normal weight, air-entrained; re-enforcing to meet ASTM 615-60	n/a	on-site testing of poured-in-place concrete required: 28 day strength and slump test; all concrete design (cast-in-place or pre-cast) not using previously approved State or local standards requires design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland - design to include meeting ACI Code 350.R/89; vertical loading [H-10 or H-20]; allowable horizontal loading (based on soil pressures); and analysis of potential cracking
concrete (pre-cast)	per pre-cast manufacturer	n/a	SEE ABOVE NOTE
non-rebar steel	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM -A 123

NO.	DATE	REVISION
1	10-31-07	ADD GUARD RAIL AT CUL-DE-SAC

DEVELOPER CERTIFICATION:

"I certify that all development and/or construction will be done according to these plans, and that any responsible personel involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

Signature of Developer: John N. Bowers Jr. Date: 3/2/05

Print Name: John N. Bowers Jr.

ENGINEER CERTIFICATION:

"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer: Kevin Patrick Shortell Date: 21 MAR 2005

Print Name: Kevin Patrick Shortell PE # 29218

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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE: 4/26/05

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

HOWARD SOIL CONSERVATION DISTRICT — DATE: 4/26/05

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
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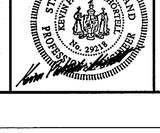
(410) 825-8120



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PARCEL 751, LOT 4
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DEVELOPER

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410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/27/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

SCALE: 1" = 20'

FOREBAY/SURFACE SAND FILTER PROFILES AND DETAILS

NOTTINGHAM WAY ACRES

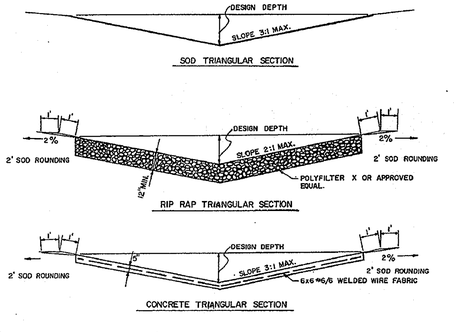
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 11 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F-04-181

K&E BALTIMORE MD 1233 HERCULENE MC 2176*



NOTE:
1. ALL SOD TO BE STAKED WITH 3/8" x 1" x 12" WOOD STAKES ON 24" CENTERS BOTH WAYS.
2. CONC. SHALL BE S.H.A. MIX NO. 2.

REV. MAR. 1986

HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS	TRIANGULAR OPEN CHANNELS	DRAWN BY R.M.B.
Approved [signature] 3-8-88		CHECKED BY J.L.F.
Chief - Bureau of Engineering		SCALE NONE
		SD-6.11

The Robert B. Balter Company
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BORING LOG — BORING B-4 — PAGE 1 OF 1

CLIENT Nottingham — PROJECT NAME Nottingham Way Acres
PROJECT LOCATION Howard County, MD — PROJECT NUMBER 14669
RIG ATV R-Tired CME 750 — METHOD Hollow Stem Auger — SAMPLER: 2-in OD SS — HAMMER: 140# — FALL: 30" — AUTO? No
DATE STARTED 8/23/04 — COMPLETED 8/23/04
DRILLER PJ Parks — HELPER Dan Brodosky
SITE DELAYS
LOCATION As Staked — BULK SAMPLES 0-5

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (FT)	HOLE DEPTH (FT)	WATER DEPTH (FT)	WATER ELEV (FT)
8/23/04		0 @ 24		22.0	dry	
8/23/04				21.9	dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC/MIN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	ATTERBERGS PL	LL	PI	REMARKS
				0.4 / 399.6				SURFACE EL = 400.2 Topsoil						
	S1	2-2-3-4	5	2.0 / 398.2		SC		Brown moist Clayey SAND		9				
5	S2	6-8-5-11	16					Brown and black moist micaceous Silty SAND		18				
	S3	5-7-9-14	16											
	S4	20-20-21-22	41			SM				12				
10	S5	10-13-23-30	36											
15	S6	31-42-50/4"	50/4"@	14.0 / 386.2				Brown moist Silty SAND (Decomposed Rock)		11				(1)
20	S7	31-50/5"	50/5"											
	S8	50/4"	50/4"	24.0 / 376.2 24.3 / 375.9				Brown moist Silty SAND (highly weathered rock) Terminated at 24.3 feet.						

REMARKS: (1) Pond bottom elev 382

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BORING LOG — BORING B-5 — PAGE 1 OF 1

CLIENT Nottingham — PROJECT NAME Nottingham Way Acres
PROJECT LOCATION Howard County, MD — PROJECT NUMBER 14669
RIG ATV R-Tired CME 750 — METHOD Hollow Stem Auger — SAMPLER: 2-in OD SS — HAMMER: 140# — FALL: 30" — AUTO? No
DATE STARTED 8/20/04 — COMPLETED 8/20/04
DRILLER PJ Parks — HELPER Dan Brodosky
SITE DELAYS
LOCATION As Staked — BULK SAMPLES 0-5

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (FT)	HOLE DEPTH (FT)	WATER DEPTH (FT)	WATER ELEV (FT)
8/20/04		0 @ 72		17.7	dry	
8/23/04				17.1	dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC/MIN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	ATTERBERGS PL	LL	PI	REMARKS
				0.5 / 402.3				SURFACE EL = 402.8 Topsoil						
	S1	1-2-2-3	5	2.0 / 400.8		SC		Brown moist Clayey SAND		11				
5	S2	6-6-7-9	13					Brown & gray moist Silty SAND						
	S3	6-7-13-16	20											
	S4	14-15-20-19	35			SM				16				
10	S5	14-17-18-25	35							14				
15	S6	17-24-30	54	14.0 / 388.8				Brown & gray moist Silty SAND (Decomposed rock)			NP	NP	NP	(1) (2)
	S7	50/1"	50/1"	18.0 / 384.8 19.5 / 383.3				Tan dry Silty SAND and ROCK FRAGMENTS (Highly weathered rock) Terminated at 19.5 feet.						

REMARKS: (1) Auger Resual at 19.5' (2) Pond bottom elev 382

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BORING LOG — BORING B-6 — PAGE 1 OF 1

CLIENT Nottingham — PROJECT NAME Nottingham Way Acres
PROJECT LOCATION Howard County, MD — PROJECT NUMBER 14669
RIG ATV R-Tired CME 750 — METHOD Hollow Stem Auger — SAMPLER: 2-in OD SS — HAMMER: 140# — FALL: 30" — AUTO? No
DATE STARTED 8/20/04 — COMPLETED 8/20/04
DRILLER PJ Parks — HELPER Dan Brodosky
SITE DELAYS
LOCATION As Staked — BULK SAMPLES 5-10

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (FT)	HOLE DEPTH (FT)	WATER DEPTH (FT)	WATER ELEV (FT)
8/20/04		0 @ 72		27.0	dry	
8/23/04				27.0	dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC/MIN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	ATTERBERGS PL	LL	PI	REMARKS
				0.5 / 406.5				SURFACE EL = 406.5 Topsoil						
	S1	3-3-7-7	10	2.0 / 404.5		CL		Brown moist Sandy CLAY, tr roots						
	S2	11-11-12-14	23	4.0 / 402.5		SM		Brown moist micaceous Silty SAND		17				
5	S3	6-7-10-13	17	6.0 / 400.5		SM		Tan moist Silty SAND						
	S4	15-25-33-48	57					Tan moist Silty SAND (decomposed rock)		11				
10	S5	20-31-50/5"	50/5"											
15	S6	42-50/5"	50/5"							7				
	S7	50/5"	50/5"							7				
20	S8	50/2"	50/2"	24.5 / 382.0				Tan moist Silty SAND with rock fragments (Highly weathered rock)			NP	NP	NP	(1)
	S9	50/0"	50/0"	29.2 / 377.3				Terminated at 29.2 feet.						

REMARKS: (1) Pond bottom elev 382

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BORING LOG — BORING B-7 — PAGE 1 OF 1

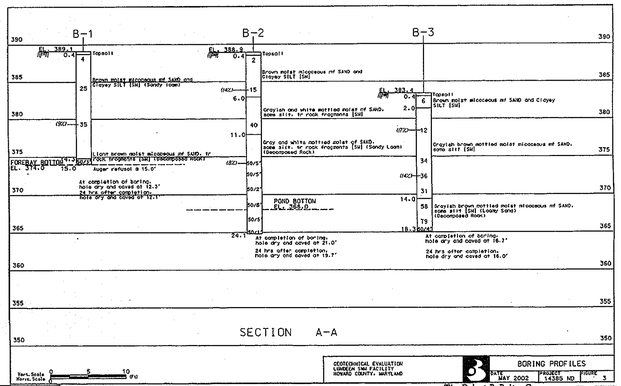
CLIENT Nottingham — PROJECT NAME Nottingham Way Acres
PROJECT LOCATION Howard County, MD — PROJECT NUMBER 14669
RIG ATV R-Tired CME 750 — METHOD Hollow Stem Auger — SAMPLER: 2-in OD SS — HAMMER: 140# — FALL: 30" — AUTO? No
DATE STARTED 8/23/04 — COMPLETED 8/23/04
DRILLER PJ Parks — HELPER Dan Brodosky
SITE DELAYS
LOCATION As Staked — BULK SAMPLES 0-5

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (FT)	HOLE DEPTH (FT)	WATER DEPTH (FT)	WATER ELEV (FT)
8/20/04		0 @ 24		8.7	dry	
8/23/04				64.0	dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC/MIN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	ATTERBERGS PL	LL	PI	REMARKS
				0.5 / 390.5				SURFACE EL = 391.0 Topsoil						
	S1	1-3-4-10	7	2.0 / 389.0		ML		Brown moist Sandy SILT, tr roots						
	S2	5-6-8-9	12					Brown moist micaceous Silty SAND		22				
5	S3	7-11-11-13	22	6.0 / 385.0		SM				18	NP	NP	NP	
	S4	50/4"	50/4"					Light brown moist Silty SAND with rock fragments (decomposed rock)		8				
	S5	50/4"	50/4"			SM		8.5 to 11.0 Rock Layers						
10				11.0 / 380.0				Terminated at 11.0 feet.						(1)

REMARKS: (1) Auger refusal at 11.0



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BORING LOG — BORING B-8 — PAGE 1 OF 1

CLIENT Nottingham — PROJECT NAME Nottingham Way Acres
PROJECT LOCATION Howard County, MD — PROJECT NUMBER 14669
RIG ATV R-Tired CME 750 — METHOD Hollow Stem Auger — SAMPLER: 2-in OD SS — HAMMER: 140# — FALL: 30" — AUTO? No
DATE STARTED 8/20/04 — COMPLETED 8/20/04
DRILLER PJ Parks — HELPER Dan Brodosky
SITE DELAYS
LOCATION As Staked — BULK SAMPLES 0-5

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (FT)	HOLE DEPTH (FT)	WATER DEPTH (FT)	WATER ELEV (FT)
8/20/04		0 @ 72		10.2	dry	
8/23/04				17.1	dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC/MIN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	ATTERBERGS PL	LL	PI	REMARKS
				0.5 / 401.1				SURFACE EL = 401.6 Topsoil						
	S1	1-4-6-8	10	2.0 / 399.6		SC		Tan moist Clayey SAND		23	18	31	13	
	S2	6-7-11-12	18	4.0 / 397.6		SM		Brown moist Silty SAND		19				
5	S3	5-12-22-20	34	6.0 / 395.6		SM		Tan moist Silty coarse SAND						
	S4	24-22-21-26	43	8.0 / 393.6		ML		Brown moist Sandy SILT		17				
	S5	14-30-50/5"	50/5"	8.0 / 393.6		SM		Tan & brown moist Silty SAND (decomposed rock)						
10														
15	S6	44-50/4"	50/4"							7				
	S7	50/1"	50/1"	18.0 / 383.6 19.3 / 382.3				Terminated at 19.3 feet.						

REMARKS:

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BORING LOG — BORING B-9 — PAGE 1 OF 1

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PROJECT LOCATION Howard County, MD — PROJECT NUMBER 14669
RIG ATV R-Tired CME 750 — METHOD Hollow Stem Auger — SAMPLER: 2-in OD SS — HAMMER: 140# — FALL: 30" — AUTO? No
DATE STARTED 8/23/04 — COMPLETED 8/20/04
DRILLER PJ Parks — HELPER Dan Brodosky
SITE DELAYS
LOCATION As Staked — BULK SAMPLES 0-5

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (FT)	HOLE DEPTH (FT)	WATER DEPTH (FT)	WATER ELEV (FT)
8/20/04		0 @ 72		21.8	dry	
8/23/04				21.4	dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC/MIN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	ATTERBERGS PL	LL	PI	REMARKS
				0.5 / 406.6				SURFACE EL = 407.1 Topsoil						
	S1	2-3-4-5	7	2.0 / 405.1		SC		Brown moist Clayey SAND, tr mica						
	S2	6-7-8-9	16					Brown, tan & gray moist Silty SAND		21				
5	S3	4-5-6-7	11			SM				19	NP	NP	NP	
	S4	7-10-12-12	22	8.0 / 399.1						14				
	S5	5-5-8-12	14					Black moist Silty fine SAND						
10				14.0 / 393.1		SM								
15	S6	20-24-30	54					Black moist Silty fine SAND (decomposed rock)		11				
	S7	50/2"	50/2"	19.0 / 388.1				Tan moist Silty fine SAND (Highly weathered rock) Rock layers 19 to 21.5'						
20	S8	50/2"	50/2"	24.4 / 382.7				Terminated at 24.4 feet.						

REMARKS:

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BORING LOG — BORING B-10 — PAGE 1 OF 1

CLIENT Nottingham — PROJECT NAME Nottingham Way Acres
PROJECT LOCATION Howard County, MD — PROJECT NUMBER 14669
RIG ATV R-Tired CME 750 — METHOD Hollow Stem Auger — SAMPLER: 2-in OD SS — HAMMER: 140# — FALL: 30" — AUTO? No
DATE STARTED 8/23/04 — COMPLETED 8/23/04
DRILLER PJ Parks — HELPER Dan Brodosky
SITE DELAYS
LOCATION As Staked — BULK SAMPLES 0-5

WATER LEVELS

DATE	TIME	ELAPSED HOURS	CASING DEPTH (FT)	HOLE DEPTH (FT)	WATER DEPTH (FT)	WATER ELEV (FT)
8/20/04		0 @ 24		9.2	dry	
8/23/04				8.8	dry	

DEPTH (ft)	SAMPLE TYPE AND NUMBER	SPT BLOWS/6" OR REC/MIN %	N VALUE OR CORE RQD	STRATUM CHANGE DEPTH/ELEV (ft)	GRAPHIC LOG	USCS	WATER LEVEL	MATERIAL DESCRIPTION	PP (tsf)	NMC %	ATTERBERGS PL	LL	PI	REMARKS
				0.5 / 403.1				SURFACE EL = 403.6 Topsoil						
	S1	2-3-4-5	7	2.0 / 401.6		SC		Brown moist Clayey SAND with gravel		21	19	30	20	
	S2	10-11-9-9	20	4.0 / 399.6				Light brown moist Silty SAND (decomposed rock)						
5	S3	14-30-50/2"	50/2"			SM								
	S4	50/4"	50/4"	7.8 / 395.8				Tan dry Rock Fragments (auger shavings) (Highly weathered rock)						
	S5	50/1"	50/1"											
10				10.5 / 393.1				Terminated at 10.5 feet.						(1)

REMARKS: (1) Auger refusal at 10.5'

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personal involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

Signature of Developer [signature] Date 3/21/05
Print Name John N. Bauers JR

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer [signature] Date 21 MAR 2005
Print Name Kevin Patrick Shortall PE # 29218

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] 4/26/05
USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE:

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
[signature] 4/26/05
HOWARD SOIL CONSERVATION DISTRICT DATE:

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHORTALL — No. 29218 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
[signature] 5-17-05
CHIEF, BUREAU OF HIGHWAYS DATE:

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
[signature] 5/24/05
CHIEF, DIVISION OF LAND DEVELOPMENT DATE:
[signature] 5/27/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE:

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

DETAILS AND BORINGS

SCALE: AS SHOWN

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 12 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

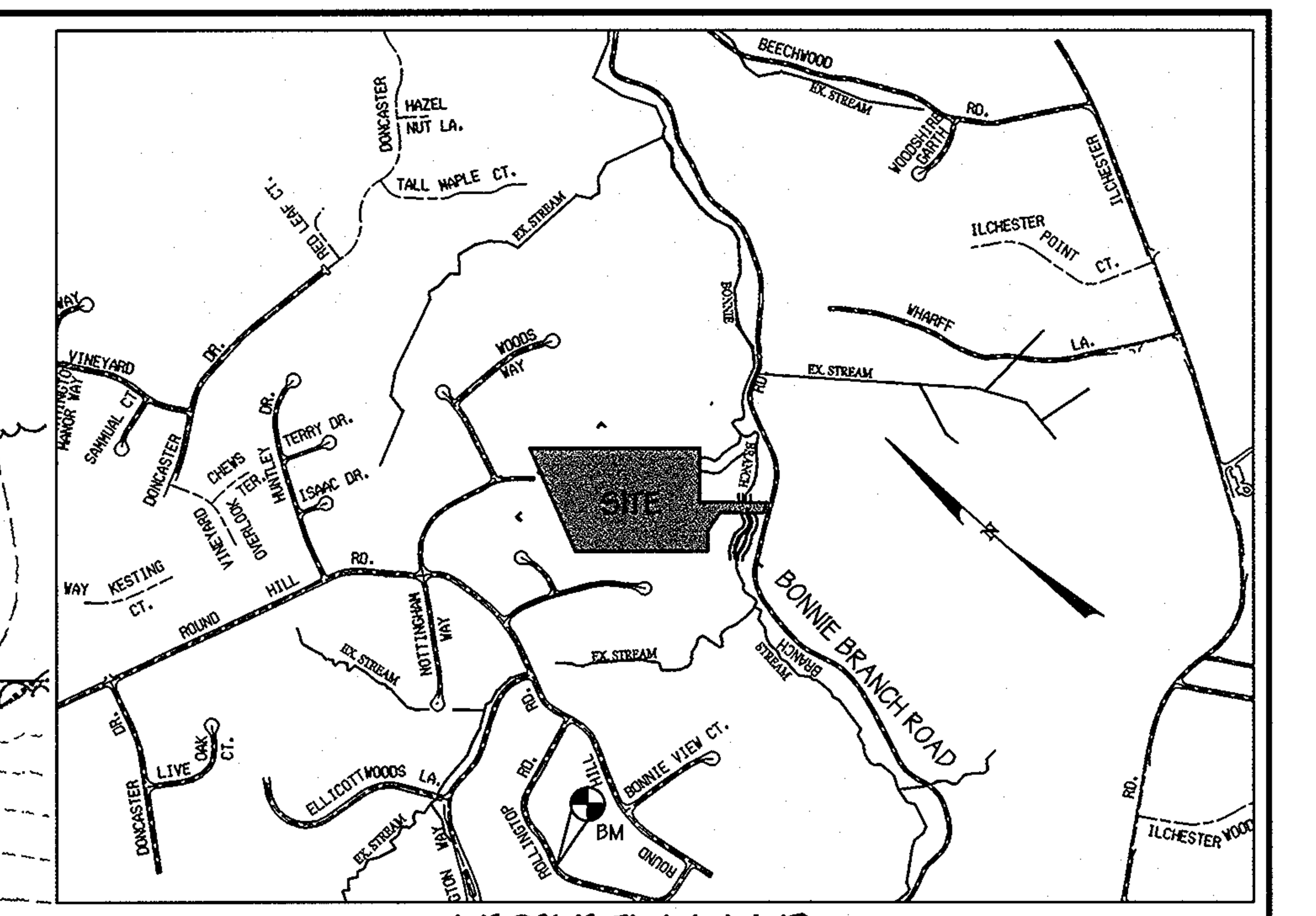
F.04.181

UTILITY CONSTRUCTION OUTSIDE ROADWAY

1. EXCAVATED TRENCH MATERIALSHALL BE PLACED ON UPSTREAM SIDE OF TRENCH
2. IMMEDIATELY FOLLOWING PIPE INSTALLATION, THE TRENCH SHALL BE BACKFILLED, COMPACTED AND IMMEDIATELY STABILIZED (MULCHED, SEEDED AND/OR SODDED MECHANICAL STABILIZATION) AT THE END OF EACH WORK DAY.
3. SILT FENCE SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED LONGER THAN ONE (1) WORKING DAY (SILT FENCE AS PER SEC STANDARD , STD. DRAWING - E-15-3)
4. THE CONTRACTOR SHALL DISTURBED AND OPEN TRENCH THE MINIMUM PRACTICAL AREA REQUIRED TO ACCOMPLISH THE WORK DESIGNATED FOR EACH DAY
5. ALL SEDIMENT AND EROSION CONTROL PRACTICES AND VEGETATIVE STABILIZATION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL IN DEVELOPING AREAS, ANY EROSION AND SEDIMENT CONTROL PRACTICES DAMAGED BY UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY .

BENCH MARK: # 31DA - SET IN CONCRETE

N 571982.646, E 1372144.970 ELEV. 482.359
7' EAST FROM EAST EDGE OF PAVING OF ROLLING TOP ROAD 85.8' TO TRANSMISSION POWER LINES GATE AND 0.1 MILE FROM ORCHARD ROAD



VICINITY MAP
SCALE: 1" = 1000'

SEDIMENT BASIN

EX. DRAINAGE AREA - 10.37 AC.
INTERIM DRAINAGE AREA - 10.37 AC. ±
STORAGE REQUIRED - 37,332 CU. FT.
STORAGE PROVIDED - 101,571 CU. FT.
SLOPE INSIDE EMBANKMENT - 3:1
SLOPE OUTSIDE EMBANKMENT - 3:1
WET STORAGE ZONE - 375.14 TO 379.14
DRY STORAGE ZONE - 372.00 TO 375.14
WET STORAGE REQUIRED - 9,333 CU. FT.
WET STORAGE PROVIDED - 9,333 CU. FT.
DRY STORAGE REQUIRED - 18,666 CU. FT.
DRY STORAGE PROVIDED - 18,666 CU. FT.
TOP OF EMBANKMENT ELEVATION - 384.03
TOP OF EMBANKMENT WIDTH - 12'
BOTTOM OF TRAP ELEVATION - 372.00
BOTTOM OF TRAP DIMENSIONS - 43' x 71'

SLOPE KEY

- 15 - 24.9 % SLOPES
- 25 + % SLOPES ON SITE
- 25 + % SLOPES OFF SITE
- CONTIGUOUS 25+% STEEP SLOPES

SEDIMENT & EROSION CONTROL LEGEND

- LIMIT OF DISTURBANCE — LOD
- SILT FENCE — SF
- SUPER SILT FENCE — SSF
- STABILIZE CONSTRUCTION ENTRANCE W/ MOUNTABLE BERM
- RIP RAP INFLOW PROTECTION — RRP
- GABION INFLOW PROTECTION — GM
- REMOVABLE PUMPING STATION
- SUPER FENCE DIVERSION — SFD
- INLET PROTECTION — IP
- EROSION CONTROL MATTING

LEGEND

- TRACT BOUNDARY
- EXISTING RIGHT-OF-WAY LINE
- PROPOSED EASEMENT
- EXISTING TREELINES
- PROPOSED TREELINES
- BUILDING SETBACK LINE
- EXISTING SOIL CLASSIFICATIONS
- EXISTING 5' CONTOUR — 305
- EXISTING 25' CONTOUR — 300
- WETLAND LIMIT LINE — W
- 100 YEAR FLOOD PLAIN — FP
- 75' STREAM BUFFER — SB
- 25' WETLANDS BUFFER — WB
- STREAM
- PROPOSED CONTOUR — 300
- SPECIMEN TREE

MARYLAND DEPARTMENT OF ENVIRONMENTAL TRACKING NO. 200560233

LIMIT OF DISTURBANCE : 378,972 SQ. FT. 8.70 AC. +/-

Sequence of Operation Phase I

1. OBTAIN GRADING PERMIT. (1 DAY)
2. NOTIFY THE HOWARD COUNTY DEPARTMENT OF PERMITS AND LICENSES 48 HOURS BEFORE BEGINNING WORK. (1 DAY)
3. WITH PERMISSION FROM SEDIMENT CONTROL INSPECTION, INSTALL STABILIZED CONSTRUCTION ENTRANCE. (2 DAYS)
4. WITH PERMISSION FROM SEDIMENT CONTROL INSPECTOR CLEAR AND GRUB AND INSTALL SILT FENCE, SUPER SILT FENCE . (4 DAYS)
5. INSTALL STORM DRAINS FROM I-10 TO E-2 (SEE PLAN) PROVIDE INLET PROTECTION FOR I-7, I-8 & I-9. GRADE AND STABILIZE SWALE AT I-10 IMMEDIATELY WITH EROSION CONTROL MATTING, INSTALL SUPER FENCE DIVERSION TO I-10. (3 DAYS).
6. WITH PERMISSION FROM SEDIMENT CONTROL INSPECTOR INSTALL SEDIMENT BASIN. (15 DAYS)
7. INSTALL STORM DRAINS FROM I-4 TO E-1 (SEE PLAN). 4 DAYS
8. INSTALL SFD TO SEDIMENT BASIN. (2 DAYS)
9. WITH PERMISSION FROM SEDIMENT CONTROL INSPECTOR PROCEED TO PHASE 2. (1 DAY)

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personel involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard soil Conservation District."

Signature of Developer: [signature] Date 3/21/05
Print Name: John N. Bowers Jr.

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personel knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer: [signature] Date 21 MAR 2005
Print Name: Kevin Patrick Shortall PE # 29218

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] 4/26/05
USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE:

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT
[signature] 4/26/05
HOWARD SOIL CONSERVATION DISTRICT — DATE:

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHORTALL — No. 29218 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
[signature] 5-17-05
CHIEF, BUREAU OF HIGHWAYS — DATE:

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
[signature] 5/24/05
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE:
[signature] 5/23/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE:

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

EROSION AND SEDIMENT CONTROL PLAN PHASE 1

SCALE: 1" = 50'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 13 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F-04-181

...\9282sedcompl phl.s01 03/21/2005 10:42:23 AM kengle SCALE

UTILITY CONSTRUCTION OUTSIDE ROADWAY

1. EXCAVATED TRENCH MATERIALSHALL BE PLACED ON UPSTREAM SIDE OF TRENCH

2. IMMEDIATELY FOLLOWING PIPE INSTALLATION, THE TRENCH SHALL BE BACKFILLED, COMPACTED AND IMMEDIATELY STABILIZED (MULCHED, SEEDED AND/OR SODDED MECHANICAL STABILIZATION) AT THE END OF EACH WORK DAY.

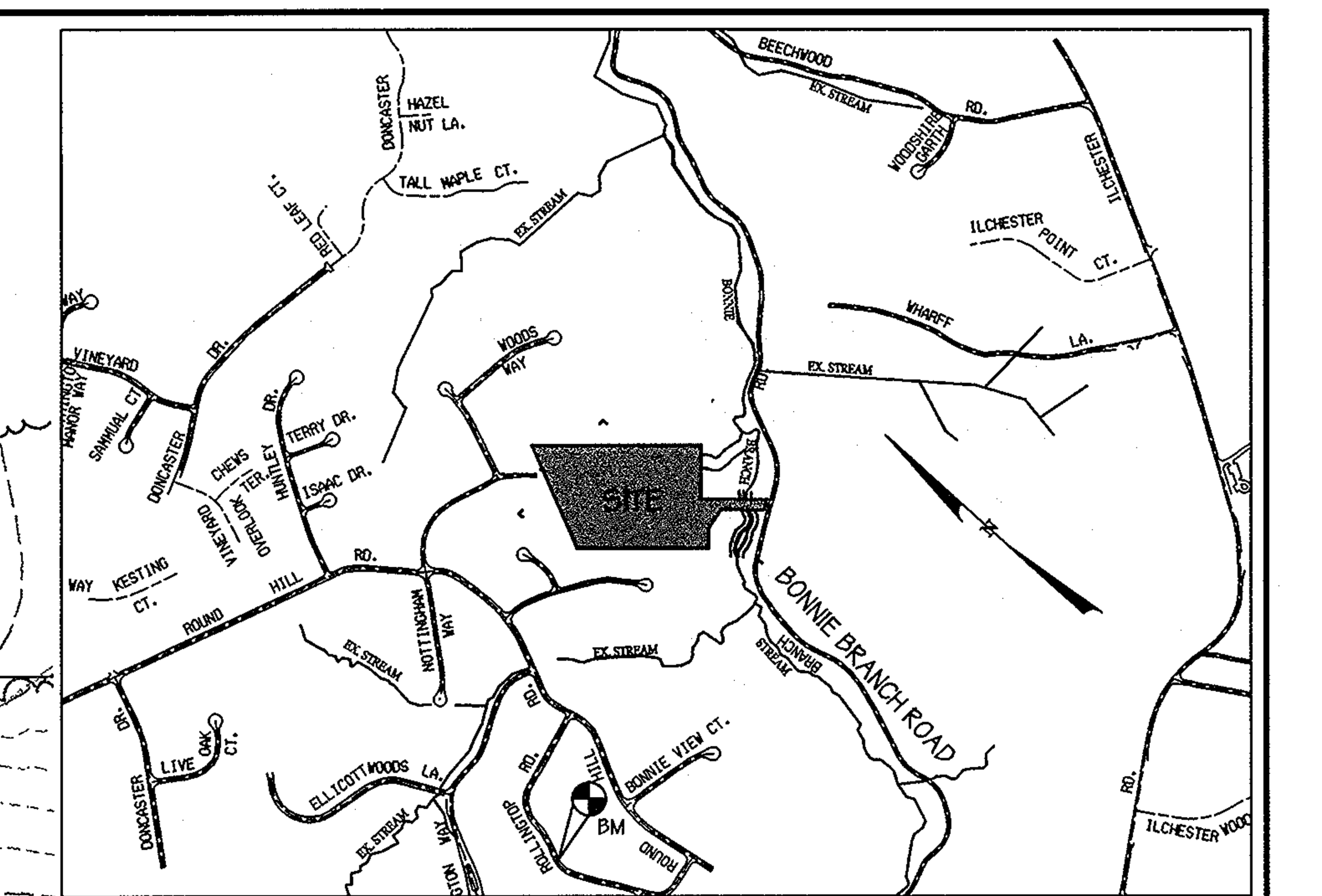
3. SILT FENCE SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED LONGER THAN ONE (1) WORKING DAY (SILT FENCE AS PER SEC STANDARD , STD. DRAWING - E-15-3)

4. THE CONTRACTOR SHALL DISTURBED AND OPEN TRENCH THE MINIMUM PRACTICAL AREA REQUIRED TO ACCOMPLISH THE WORK DESIGNATED FOR EACH DAY

5. ALL SEDIMENT AND EROSION CONTROL PRACTICES AND VEGETATIVE STABILIZATION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL IN DEVELOPING AREAS, ANY EROSION AND SEDIMENT CONTROL PRACTICES DAMAGED BY UTILITY CONSTRUCTION ARE TO BE REPAIRED IMMEDIATELY .

BENCH MARK: # 31DA - SET IN CONCRETE

N 571982.646, E 1372144.970 ELEV. 482.359
7' EAST FROM EAST EDGE OF PAVING OF ROLLING TOP ROAD
85.8' TO TRANSMISSION POWER LINES GATE AND 0.1 MILE
FROM ORCHARD ROAD



VICINITY MAP
SCALE: 1" = 1000'

SLOPE KEY

- 15 - 24.9 % SLOPES
- 25 + % SLOPES ON SITE
- 25 + % SLOPES OFF SITE
- CONTIGUOUS 25+% STEEP SLOPES

SEDIMENT & EROSION CONTROL LEGEND

LIMIT OF DISTURBANCE	——LOD——
LIMIT OF DISTURBANCE / TREE PROTECTION FENCE	LOD X —— X —— LOD X
SILT FENCE	—SF— —SF—
SUPER SILT FENCE	—SSF— —SSF—
STABILIZE CONSTRUCTION ENTRANCE W/ MOUNTABLE BERM	
RIP RAP INFLOW PROTECTION	RRP
GABION INFLOW PROTECTION	GM
REMOVABLE PUMPING STATION	⊠
SUPER FENCE DIVERSION	—SFD— —SFD—
INLET PROTECTION	[ ]IP
EROSION CONTROL MATTING	

MARYLAND DEPARTMENT OF ENVIRONMENTAL TRACKING NO. 200560233

LIMIT OF DISTURBANCE : 378,972 SQ. FT. 8.70 AC. +/-

NO.	DATE	REVISION
1	10-31-07	ADD GUARD RAIL AT CUL-DE-SAC

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction willbe done according to these plans, and that any responsible personel involved in the construction project willhave a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an 'as-built' plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard soil Conservation District."

Signature of Developer [signature] Date 3/21/05
Print Name John N Bowes, Jr.

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personel knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an 'as-built' plan of the pond within 30 days of completion."

Signature of Engineer [signature] Date 21 MAR 2005
Print Name Kevin Patrick Shotell PE # 29218

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] 4/26/05
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THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
[signature] 4/26/05
HOWARD SOIL CONSERVATION DISTRICT DATE:

Sequence of Operation Phase 2

10. WITH PERMISSION FROM THE SEDIMENT CONTROL INSPECTOR CLEAR AND GRUB REMAINDER OF SITE AND BEGIN GRADING OPERATION. (10 DAYS)
11. INSTALL UTILITIES - REMAINDER OF STORM DRAINS, WATER, SEWER. (15 DAYS)
12. PROVIDE INLET PROITECTION FOR INLETS. (3 DAYS)
13. PROCEED WITH FINAL PAVING OF ROAD ONLY. (5 DAYS)
14. WITH PERMISSION FROM SEDIMENT CONTROL INSPECTOR BEGIN CONSTRUCTION OF HOMES. (15 DAYS)
15. PROCEED WITH LANDSCAPING AND STABILIZATION OPERATION. (7 DAYS)
16. REMOVE TEMPORARY OUTFALL PIPE FROM M4 TO E2 (SEE PHASE I). FLUSH STORM DRAIN SYSTEM (4 DAYS)
17. ONCE HOUSE CONSTRUCTION, LANDSCAPING AND PERNAMENT STABILIZATION IS COMPLETE, WITH PERMISSION FROM SEDIMENT CONTROL INSPECTOR REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES AND DEVICES. (12 DAYS)
18. WITH PERMISSION FROM SEDIMENT CONTROL INSPECTOR CONVERT SEDIMENT BASIN TO STORMWATER MANAGEMENT POND. (6 DAYS)

LEGEND

PROPOSED RIGHT-OF-WAY LINE	
PROPOSED LOT LINE	
TRACT BOUNDARY	
EXISTING LOT OR PARCEL LINE	
EXISTING RIGHT-OF-WAY LINE	
PROPOSED EASEMENT	
EXISTING TREELINES	
PROPOSED TREELINES	
BUILDING SETBACK LINE	
EXISTING SOIL CLASSIFICATIONS	
EXISTING 5' CONTOUR	— 305 —
EXISTING 25' CONTOUR	— 300 —
WETLAND LIMIT LINE	—W—
100 YEAR FLOOD PLAIN	—FP—
75' STREAM BUFFER	—SB—
25' WETLANDS BUFFER	—WB—
STREAM	
PROPOSED CONTOUR	— 300 —
SPECIMEN TREE	
SHARED USE IN COMMON DRIVEWAY EASEMENT	
20' INGRESS & EGRESS EASMT.	

GWS
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DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

EROSION AND SEDIMENT CONTROL PLAN PHASE 2

SCALE: 1" = 50'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 14 of 27
F 04 - 181
ZONED R-20
TAX MAP 31

F.04.181

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Stabilization Specifications

Section I - Vegetative Stabilization Methods and Materials

A. Site Preparation

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

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

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

B. Soil Amendments (Fertilizer and Lime Specifications)

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

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

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

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

v. Soil Amendments : Use only one of the following schedules

i. Preferred - Apply 2 tons per acre dolomitic limestone (92 lbs. / 100 s.f.) and 600 lbs. per acre 10-10-10 fertilizer (14 lbs. / 100 s.f.). Before seeding, harrow or disc into upper three inches of soil. At time of seeding, apply 400 lbs. per acre 30-0-0 auriform fertilizer (9.1 lbs / 100 s.f.).

ii. Acceptable - Apply 2 tons per acre dolomitic limestone (92lbs. / 1000 s.f.) and 1000 lbs. per acre 10-10-10 fertilizer (23 lbs. / 1000 s.f.) before seeding, harrow or disc upper three inches of soil.

C. Seedbed Preparation

i. Temporary Seeding

a. Seedbed preparation shall consist of loosening soil to a depth 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 not be tracked leaving the surface in an irregular condition with ridges running parallel to the contour of the slope.

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

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

ii. Permanent Seeding

a. Minimum soil conditions required for permanent vegetative establishment:

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

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

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

d. Mix soil amendments into the top 3 - 5" 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" of soil should be loose and friable. Seedbed loosening may not be necessary on newly disturbed areas.

D. Seed Specifications

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

ii. Inoculant - The inoculant for treating legume seed in the seed mixture 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 degrees F. can weaken bacteria and make inoculant less effective.

NOTE: SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY TYPE AND RATE OF SEED USED.

E. Methods of Seeding

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

a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen; maximum of 100 lbs. per acre total soluble nitrogen; P205 (phosphorus): 200 lbs./ac.; K20 (potassium): 200 lbs./ac.

b. Lime - use only ground agricultural limestone, (Up to 3 tons per acre may be applied by hydroseeding). Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.

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

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

a. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the Temporary or Permanent Seeding Summaries or Tables 25 or 26. The seeded area shall then be rolled with a weighted roller to provide good seed to soil contact.

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

iii. Drill or Cultipacker Seeding: Mechanized seeders that apply and cover seed with soil.

a. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering. Seedbed must be firm after planting.

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

F. Mulch Specifications (In order of preference)

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

ii. Wood Cellulose Fiber Mulch (WCFM)

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

b. WCFM shall be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.

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

d. WCFM materials shall be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seed in contact with the soil without inhibiting the growth of the grass seedlings.

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

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

NOTE: ONLY STERILE STRAW MULCH SHOULD BE USED IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.

G. Mulching Seeded Areas - Mulch shall be applied to all seeded areas immediately after seeding.

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

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

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

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

i. A mulch anchoring tool is a tractor drawn implement designed to punch and anchor mulch into the soil surface a minimum of two (2) inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should be used on the contour if possible.

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

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

iv. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3000 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.

A. Seed Mixtures - Permanent Seeding

i. select one or more off the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from figure 5) and enter them in Permanent Seeding Summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this Summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, dunes or for special purposes such as wildlife or asthetic treatment may be found in USDA-SCS Technical Field Office Guide, Section 342 - Critical Area Planting. For special lawn maintainance areas, see Sections IV Sod and V Turfgrass.

ii. For sites having disturbed areas over 5 acres, the rates shownon this table shall be deleted and the rates recommended by the testing agency shall be written in.

iii. For areas recieving low maintenance, apply ureaform fertilizer (46-0-0) at 3-1/2 lbs/1000 sq. ft. (150 lbs/ac), in addition to the above soil ammendments shown in the table below, to be performed at the time of seeding

Section III - Permanent Seeding

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

A. Seed Mixtures - Permanent Seeding

i. select one or more off the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from figure 5) and enter them in Permanent Seeding Summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this Summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, dunes or for special purposes such as wildlife or asthetic treatment may be found in USDA-SCS Technical Field Office Guide, Section 342 - Critical Area Planting. For special lawn maintainance areas, see Sections IV Sod and V Turfgrass.

ii. For sites having disturbed areas over 5 acres, the rates shownon this table shall be deleted and the rates recommended by the testing agency shall be written in.

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Section IV - Sod: To provide quick cover on disturbed areas (2:1 grade or steeper).

A. General specifications

i. Class of turfgrass sod shall be Maryland or Virginia State Certified or Approval. Sod labels shall be made available to the job foreman and inspector.

ii. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/4", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the suppliers width and length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pads and torn or uneven ends will not be acceptable.

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

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

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

vi. Site Preparation : Fertilizer and Lime application rates will be determined by soil test. Under unusual circumstances where there is insufficent time for a complete soil test, fertilizer and lime may be applied in amounts shown under vi-b, below.

a. Prior to sodding, the surface will be cleared of all trash, debris, and of all roots,brush, wire, grade stakes and other objects that would interfere with planting, fertilizing, or maintenance operations.

b. Where soil is acid or composted of heavy clays, ground limestone will be spread at the rate of 2 tons per acre(100 lbs. / 1000 s.f.). In all soils 1000 lbs. per acre (25 lbs. / 1000 s.f.) of 10-10-10 fertilizer or equivalent will be uniformly applied and mixed into the top thre inches of soil with the required lime.

c. All areas recieving sod will be uniformly fine graded. Hard packed earth will be scarified prior to placement of sod.

B. Sod Installation

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

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

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

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

C. Sod Maintenance

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

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

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

Section IV - Turfgrass Establishment

Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to 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 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

i. Kentucky Bluegrass - Full sun mixture - For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and eastern shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds/1000 square feet. A minimum of three bluegrass cultivars should be chosen ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

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

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

iv. Kentucky Bluegrass/Fine Fescue - Shade Mixture - For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; certified Kentucky Bluegrass Cultivars 30 - 40% and certified Fine Fescue and 60 - 70%. Seeding rate: 1 1/2 - 3 lbs./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 #77, "Turfgrass Cultivar Recommendations for Maryland".

B. Ideal times of seeding

Western MD: March 15-June 1, August 1-October 1 (Hardiness Zones - 5b, 6a)

Central MD: March 1-May 15, August 15-October 15 (Hardiness Zones - 6b)

Southern MD, Eastern Shore: March 1-May 15, August 15-October 15 (Hardiness Zones - 7a, 7b)

C. Irrigation

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

D. Repairs and Maintenance

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

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

ii. If the stand provides less than 40% ground coverage, reestablish following original lime, fertilizer, seedbed preparation and seeding recommendations.

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

iv. Maintenance fertilizer rates for permanent seedings are shown in Table 24. For lawns and other medium to high maintenance turfgrass areas, refer to the University of Maryland publication "Lawn Care in Maryland" Bulletin No. 171.

Sediment Control Notes

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (313-1855).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" AND REVISIONS THERETO
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
   A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1,
   B) 14 DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR PERMANENT SEEDING, SOD, TEMPORARY SEEDING AND MULCHING (SEC G). TEMPORARY STABILIZATION WITH MULCH ALONE SHALL ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:
   TOTAL AREA OF SITE 13.1327 ACRES
   AREA DISTURBED 8.70 ACRES
   AREA TO BE ROOFED OR PAVED 1.80 ACRES
   AREA TO BE VEGETATIVELY STABILIZED 6.9 ACRES
   TOTAL CUT 35,300 C.Y.
   TOTAL FILL 28,000 C.Y. (INCLUDES 15% COMPACTION)
   OFFSITE WASTE/BORROW AREA LOCATION : EXCESS CUT SHALL BE TAKEN TO A SITE WITH AN OPEN GRADING PERMIT.
8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

Table 26 - Temporary Seeding Rates, Depths, and Dates

SPECIES	MINIMUM SEEDING RATES PER ACRE	LBS/1000 SQ. FT.	PLANTING DEPTH INCHES	7a and 7b 2/1-4/30	7a and 7b 5/1-8/14	7a and 7b 8/15-11/30	6b 3/1-4/30	6b 5/1-8/14	6b 8/15-11/15	6a and 5b 3/15-5/31	6a and 5b 6/1-7/31	6a and 5b 8/1-10/31
CHOOSE ONE: BARLEY OATS RYE	2.5 B.U. (122 lbs.) 3 B.U. (96 lbs.) 2.5 B.U. (140 lbs.)	2.80 2.21 3.22	1-2 1-2 1-2	X X X	- - -	BY 10/15 - X	X X X	- - -	BY 10/15 - X	X X X	- - -	BY 10/1 - X
BARLEY OR RYE PLUS FOXTAIL MILLET	150 lbs.	3.45	1	X X	X X	10/15 X	X X	X X	10/15 X	X X	X X	10/1 X
WEEPING LOVEGRASS	4 lbs.	.09	1/4 - 1/2	-	X	-	-	X	-	-	X	-
ANNUAL RYEGRASS	50 lbs.	1.15	1/4 - 1/2	X	-	11/1	X	-	11/1	X	-	8/15
MILLET	50 lbs.	1.15	1/2	-	X	-	-	X	-	-	X	-

Table 25 - Permanent Seeding for Low Maintenance Areas

HARDINESS ZONE

MIX	SEED MIX (USE CERTIFIED MATERIAL IF AVAILABLE)	PLANTING RATE LBS/AC.	PLANTING RATE LBS/1000 SQ. FT.	SITE CONDITIONS	USDA HARDINESS ZONES	5/1-5/15	3/15-6/1	5/16-8/14	6/2-7/31	8/1-10/1	8/15-10/15	8/15-11/15	NOTES
1	TALL FESCUE (75%) CANADA BLUEGRASS (10%) KENTUCKY BLUEGRASS (10%) REDTOP (5%)	150	3.4	MOIST TO DRY	5b		X			X			A
					6a		X			X			
					6b	X					X		
					7a	X						X	
					7b	X						X	
2	KENTUCK BLUEGRASS (50%) CREEPING RED FESCUE OR A HARD FESCUE (40%) REDTOP (10%)	150	3.4	MOIST TO MODERATELY DRY TO DRY	5b		X			X			B
					6a		X			X			
					6b	X					X		
3	TALL FESCUE (85%) PERENNIAL RYEGRASS (10%) KENTUCKY BLUEGRASS (5%)	125 15 10	2.9 .34 .23	MOIST TO DRY	5B		X			X			C
					6A		X			X			
					6B	X					X		
					7A	X						X	
					7B	X						X	
4	RED FESCUE OR CHEWINGS FESCUE (80%) PERENNIAL RYEGRASS (20%)	60 60 15	.92 .92 .34	MOIST TO DRY	5b		X			X			D
					6a		X			X			
					6b	X					X		
5	TALL FESCUE (85%) OR PERENNIAL RYEGRASS (50%) PLUS CROWNVETCH OR FLATPEA	110 20 20 20	2.5 .46 .46 .46	MOIST TO DRY	5b		X			X			E
					6a		X			X			
					6b	X					X		
					7a	X						X	
					7b	X						X	
6	WEEPING LOVEGRASS (17%) SERECIA LESPEDEZA (83%)	4 20	.09 .46	DRY TO VERY DRY	6a	X		X					F
					7a	X		X					
					7b	X		X					
7	TALL FESCUE (83%) WEEPING LOVEGRASS (2%) PLUS SERECIA LESPEDEZA (15%)	110 3 20	2.5 .07 .46	DRY TO VERY DRY	5b		X		X	X			G
					6a		X		X	X			
					6b	X		X			X		
					7a	X		X				X	
					7b	X		X				X	
8	REED CANARYGRASS (75%) REDTOP (6%) PLUS BIRDSFOOT TREEFOIL (19%)	40 3 10	.92 .07 .23	WET TO MODERATELY DRY	5b		X			X			H
					6a		X			X			
					6b	X					X		
					7a	X						X	
					7b	X						X	
9	TALL FESCUE (86%) POA TRIVIALIS (7%) BIRDSFOOT TREEFOIL (7%)	125 10 10	2.9 .23 .23	WET TO MODERATELY DRY	5b		X			X			I
					6a		X			X			
					6b	X					X		
10	TALL FESCUE (80%) HARD FESCUE (20%)	120 30	3.4 .69	WET TO DRY	5b		X			X			J
					6a		X			X			
					6b	X					X		
					7a	X						X	
					7b	X						X	
11	HARD FESCUE (100%)	75	1.7	MOIST TO DRY	5b		X			X			K
					6a		X			X			
					6b	X					X		
					7a	X						X	

24.0 MATERIALS SPECIFICATIONS

Table 27 Geotextile Fabrics

CLASS	APPARENT OPENING SIZE MM. MAX.	GRAB TENSILE STRENGTH LB. MIN.	BURST STRENGTH PSI. MIN.
A	0.30 **	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F (SILT FENCE)	0.40-0.80*	90	190

* US Std. Sieve CW-02215 ** 0.50 MM. MAX. FOR SUPER SILT FENCE

The properties shall be determined in accordance with the following procedures:

- Apparent opening size — MSMT 323
- Grab tensile strength — ASTM D 1682: 4 x 8" specimen, 1x2" clamps, 12" /min. strain rate in both principal directions of geotextile fabric.
- Burst strength — ASTM D 3786

The fabric shall be inert to commonly encountered chemicals and hydrocarbons, and will be rot and mildew resistant. It shall be manufactured from fibers consisting of long chain synthetic polymers, and composed of a minimum of 85% by weight of polyolephins, polyesters, or polymides. The geotextile fabric shall resist deterioration from ultraviolet exposure.

In addition, Classes A through E shall have a 0.01 cm./sec. minimum permeability when tested in accordance with MSMT 507, and an apparent minimum elongation of 20 percent (20%) when tested in accordance with the grab tensile strength requirements listed above.

Silt Fence
Class F geotextile fabrics for silt fence have a 50 lb./in. minimum tensile strength and a 20 lb./in. minimum tensile modules when tested in accordance with MSMT 509. The material shall also have a 0.3 gal/ft. /min. flow rate and seventy-five percent (75%) minimum filtering efficiency when tested in accordance with MSMT 322.

Geotextile fabrics used in the construction of silt fence shall resist deterioration from ultraviolet exposure. The fabric shall contain sufficient amounts of ultraviolet ray inhibitors and stabilizers to provide a minimum of 12 months of expected usable construction life at a temperature range of 0 to 120 degrees F.

NOTES:
A. USED BY SHA ON SLOPED AREAS. ADD A LEGUME FOR SLOPES > THAN 3:1.
B. USED IN MEDIAN AREAS BY SHA. SHADE TOLERANT.
C. POPULAR MIX - PRODUCES PERMANENT GROUNDCOVER QUICKLY. BLUEGRASS THICKENS STAND.
D. BEST USE ON SHADY SLOPES NOT ON POORLY DRAINED CLAYS.
E. USE ON LOW MAINTENANCE, STEEP SLOPES. USE TALL FESCUE IN DRAUGHTY CONDITIONS. CROWN VETCH BEST FOR 5b, 6a, 6b
F. SUITABLE FOR SEEDING IN MID-SUMMER.
G. WEEPING LOVEGRASS MAY BE SEEDED WITH TALL FESCUE IN MID-SUMMER. SERECIA LESPEDEZA IS BEST SUITED FOR ZONES 7a AND 7b.
H. USE ON POORLY DRAINED SOILS - DITCHES OR WATERWAYS. BIRDSFOOT TREEFOILS BEST FOR ZONES 5b, 6a, ABOVE 2,000 FEET.
I. USE IN AREAS OF MOIST SHADE. POA TRIVIALIS THRIVES IN WET SHADY AREAS.
J. TALL FESCUE MAY BE SEEDED ALONE. THE HARD FESCUE PROVIDES BETTER SHADE TOLERANCE AND PRODUCES A BETTER STAND.
K. LOW FERTILITY GRASS. REQUIRES INFREQUENT MOWING. GOOD COMPANION FOR WILDFLOWERS.

PERMANENT SEEDING RATES

FERTILIZER RATE (10-20-20) N	P205	K20	LIME RATE
90LB/AC (2.0 LB/1000 S.F.)	175 LB/AC (4.0 LB/1000 S.F.)	175 LB/AC (4.0 LB/1000 S.F.)	2 TONS/AC (100 LB/1000 S.F.)

NOTE:
FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES THE RATES SHOWN ABOVE FOR PERMANENT SEEDING SHALL BE DELETED AND THE RATES RECOMMENDED BY THE SOIL TESTING AGENCY SHALL BE USED. SOIL TESTING SHALL BE PERFORMED AT THE TIME OF FINE GRADING AND THE RESULTS SHALL BE FURNISHED TO THE SEDIMENT CONTROL INSPECTOR.

Fertilizer Rates

Temporary Seeding

Fertilizer Rate (10-10-10)	Lime Rate
600 lb/ac (15lb/1000 s.f.)	2 Tons/ac (100lb/1000 s.f.)

Permanent Seeding

Fertilizer Rate (10-20-20) N	P205	K20	Lime Rate
90 lb/ac (2.0lb/1000 s.f.)	175 lb/ac (4.0lb/1000 s.f.)	175 lb/ac (4.0lb/1000 s.f.)	2 tons/ac (100 lb/1000 s.f.)

21.0 STANDARD AND SPECIFICATIONS

FOR

TOPSOIL

Definition

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

Purpose

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

Conditions Where Practice Applies

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

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

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

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

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

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

Construction and Material Specifications

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

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

I. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger that 1 ½" in diameter.

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

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

II For sites having disturbed areas under 5 acres:

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

III For sites having disturbed areas over 5 acres:

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

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

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

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

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

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

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

V. Topsoil Application

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

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

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

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

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

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

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

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

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

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

References: Guideline Specifications, Soil Preparation and Sodding. MD-VA, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institutes. Revised 1973.

G-21-1-3
1994

18.0 STANDARDS AND SPECIFICATIONS

FOR

ROCK OUTLET PROTECTION

Definition

Rock placed at the outfall of channels or culverts.

Purpose

To reduce the velocity of flow in the receiving channel to non-erosive rates.

Conditions Where Practice Applies

This practice applies where discharge velocities and energies at the outlets of culverts are sufficient to erode the next downstream reach. This applies to outlets of all types such as sediment basins, storm water management ponds and road culverts.

Design Criteria

The design method presented here applies to sizing rock rip-rap and gabions to protect a downstream area. It does not apply to rock lining of channels or streams. The design of rock outlet protection depends entirely on the location. Pipe outlets at the top of cuts or on slopes steeper than 10 percent can not be protected by rock aprons or rip-rap sections due to reconcentration of flows and high velocities encountered after the flow leaves the apron.

Be aware that many county and state agencies have regulations and design procedures established for dimensions, type and size of materials and locations where outlet protection is required.

1. Tailwater Depth

The depth of tailwater immediately below the pipe outlet must be determined for the design capacity of the pipe. If the tailwater depth is less than half the diameter of the pipe and the receiving stream is wide enough to accept divergence of the flow, it shall be classified as a Minimum Tailwater Condition. If the tailwater depth is greater than half the pipe diameter and the receiving stream will continue to confine the flow, it shall be classified as a Maximum Tailwater Condition. Pipes which outlet onto flat areas with no defined channel may be assumed to have a Minimum Tailwater Condition.

2. Apron Size

The apron length and width shall be determined from the curves according to the tailwater condition:

Minimum Tailwater — Use Table 19
Maximum Tailwater — Use Table 20

If the pipe discharges directly into a well-defined channel, the apron shall extend across the channel bottom and up the channel banks to an elevation one-foot above the maximum tailwater depth or to the top of the bank, whichever is less. The upstream end of the apron adjacent to the pipe shall have a width two times the diameter of the outlet pipe or conform to pipe end section if used.

3. Bottom Grade

The outlet protection apron shall be constructed with no slope along its length. There shall be no obstruction at the end of the apron. The elevation of the downstream end of the apron shall be equal to the elevation of the receiving channel or adjacent ground.

4. Alignment

The outlet protection apron shall be located so that there are no bends in the horizontal alignment.

5. Materials

The outlet protection may be done using rock rip-rap or gabions. Rip-rap shall be composed of a well-graded mixture of stone sized so that fifty (50) percent of the pieces, by weight, shall be larger than the size determined by using the charts. The minimum d50 size to be used shall be nine (9) inches. A well-graded mixture as used herein is defined as a mixture composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone in such a mixture shall be 2.0 times the size selected on the chart located in the following paragraph.

6. Thickness

For SHA rip-rap specifications the following values are used:

Table 18
Rip-rap Sizes and Thicknesses (SHA Specifications)

	D50	D100	Thickness
Class I	9.5"	15"	19"
Class II	16"	24"	32"
Class III	23"	34"	46"

7. Stone Quality

Stone for rip-rap shall consist of field stone or rough and hewn quarry stone. The stone shall be hard and angular and of a quality that will not disintegrate on exposure to water or weathering. The specific gravity of the individual stones shall be at least 2.5. Recycled concrete equivalent may be used provided it has a density of at least 150 pound per cubic foot and does not have any exposed steel or reinforcing bars.

8. Filter

A filter is a layer of material placed between the rip-rap and the underlaying soil surface to prevent soil movement into and through the rip-rap to prevent piping, reduce uplift pressure and collect water. Rip-rap shall have a filter placed under it in all cases. A filter can be of two general forms: a grave layer or a Geotextile Class C27.

9. Gabions

Gabion baskets may be used as rock outlet protection, provided they are made of hexagonal triple twist mesh with heavily galvanized steel wire. The maximum lined dimension of the mesh opening shall not exceed 4 ½ inches. The area of the mesh opening shall not exceed ten (10) square inches. Gabions shall be fabricated in such a manner that the sides, ends and lid can be assembled at the construction site into a rectangular basket of the specified sizes. Gabions shall be of single unit construction and shall be installed according to the manufacturer's specifications. The area on which the gabion is to be installed shall be graded as shown on the drawings. Foundation conditions shall be the same as for placing rock rip-rap. Geotextile Class C shall be placed under all gabions. Gabions must be keyed into prevent undermining of the main gabion structure. Refer to Table 28 for Gabion stone sizes.

Maintenance

Once a rip-rap outlet has been installed, the maintenance needs are very low. It should be inspected after high flows to see if scour beneath the rip-rap has occurred or if any stones have been dislodged. Repairs should be made immediately.

Construction Specifications

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

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

3. Geotextile Class C28 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-footl.

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in 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.

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

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] 4/26/05
USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE:

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

[signature] 4/26/05
HOWARD SOIL CONSERVATION DISTRICT — DATE:

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personel involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard soil Conservation District."

Signature of Developer [signature] Date 3/21/05
Print Name John N. Bowers, Jr.

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personel knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer [signature] Date 21 MAR 2005
Print Name Kevin Patrick Shortell PE # 29218

GWS

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHORTELL — No. 29218 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
[signature] 5-17-05
CHIEF, BUREAU OF HIGHWAYS — DATE:

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
[signature] 5/24/05
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE:
[signature] 5/23/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE:

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

EROSION AND SEDIMENT CONTROL NOTES

SCALE: AS NOTED

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

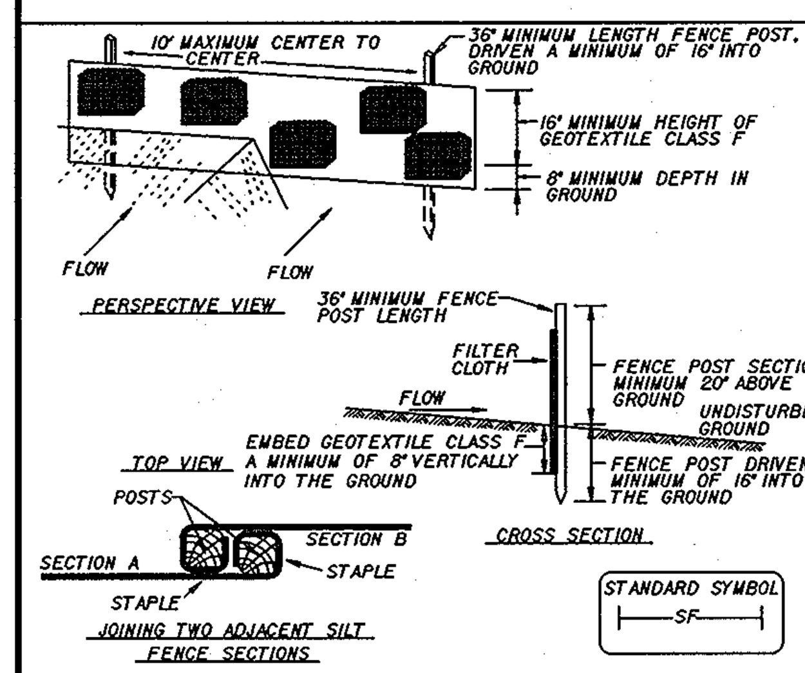
SHEET 15 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F.04.181

...\9282sedconnotdet.s01 03/21/2005 10:44:20 AM kengle SCALE

DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1½" x 1½" square (minimum) cut, or 1¾" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound per linear foot.

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

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft²/ minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

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SILT FENCE

Silt Fence Design Criteria

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

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

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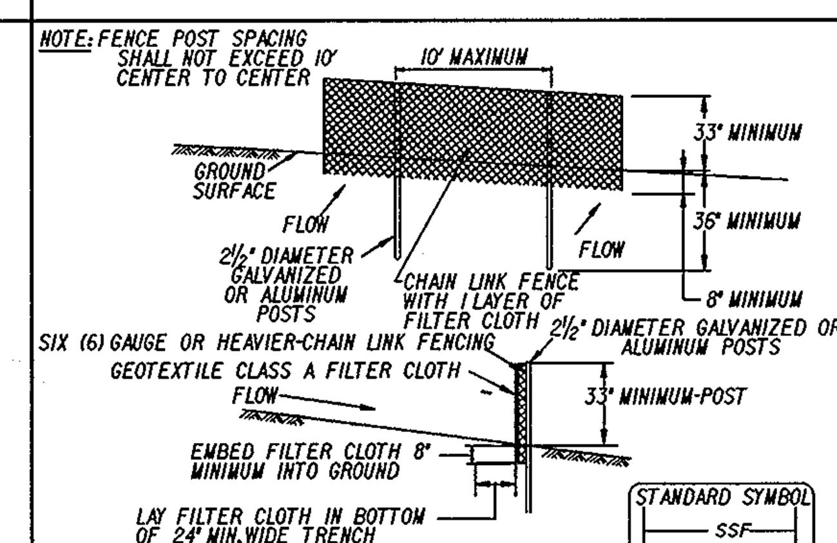
DETAIL 33 - SUPER SILT FENCE



Construction Specifications

1. Fencing shall be 42" high and constructed in accordance with the latest Maryland State Highway (SHA) Details for Chain Link Fencing. The SHA specifications for a 6 foot fence shall be used, substituting 42 inch fabric and 6 foot length posts.

2. The posts do not need to be set in concrete.

3. Chain link fence shall be fastened securely to the fence posts with wire ties or staples. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence. The chain link fence shall be six (6) gauge or heavier.

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

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

6. When two sections of geotextile fabric adjoin each other, they shall be overlapped by 6" and folded.

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

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | MODIFIED

SUPER SILT FENCE

Design Criteria

Slope	Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
0 - 10%	0 - 10:1	unlimited	unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

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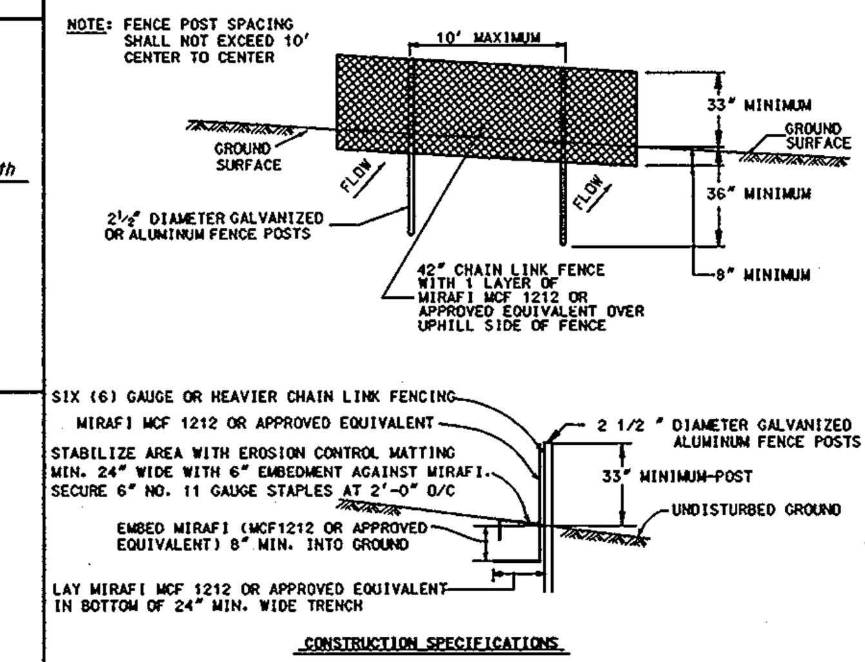


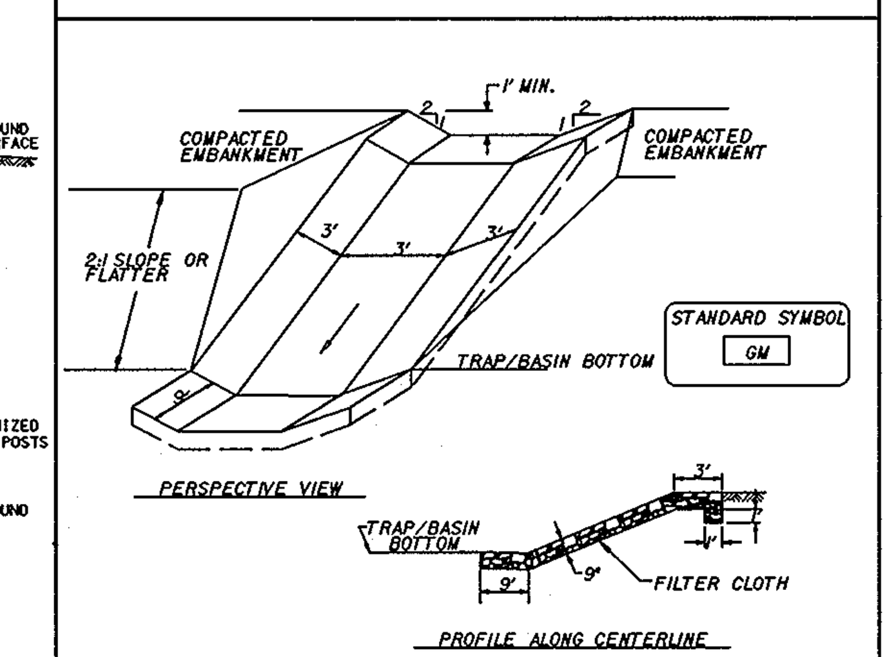
CONSTRUCTION SPECIFICATIONS

1. Fencing shall be 42 inches in height and constructed in accordance with the latest Maryland State Highway (SHA) Details for chain link fencing. The specification for a 6-ft fence shall be used substituting 42" fabric and 6-ft length posts.
2. The posts do not need to be set in concrete.
3. Chain link fence shall be fastened securely to the fence post with wire ties or staples. The lower tension wire, brace, or 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) guage or heavier.
4. MIRAFI MCF 1212 or approved equivalent shall be fastened securely to the chain link fence with ties spaces every 24-inches at the top and mid section.
5. MIRAFI MCF 1212 or approved equivalent shall be embedded a minimum of 8-inches into the ground.
6. When two sections of MIRAFI MCF 1212 or approved equivalent ajoin each other, they shall be overlopped by 6-inches and folded.
7. Maintenace shall be performed as needed.
8. Maximum flow slope 10.0%
9. Maximum drainage area 5 acres.

STANDARD SYMBOL
SFD

SUPER FENCE DIVERSION

DETAIL 6 - GABION INFLOW PROTECTION



Construction Specifications

1. Gabion inflow protection shall be constructed of 9' x 3' x 9" gabion baskets forming a trapezoidal cross section 1' deep, with 2:1 side slopes, and a 3' bottom width.

2. Geotextile Class C shall be installed under all gabion baskets.

3. The stone used to fill the gabion baskets shall be 4" - 7".

4. Gabions shall be installed in accordance with manufacturers recommendations.

5. Gabion Inflow Protection shall be used where concentrated flow is present on slopes steeper than 4:1.

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7.0 STANDARDS AND SPECIFICATIONS FOR GABION INFLOW PROTECTION

Definition

A temporary or permanent, lined drainageway installed to convey concentrated runoff into sediment traps and basins or down steep slopes as applicable. Gabion Inflow Protection consists of the installation of wire baskets (Gabions) filled with rock or recycled concrete equivalent in a flow channel for stabilization.

Purpose

The purpose of Gabion Inflow Protection is to provide stable conveyance of concentrated runoff down steep slopes, (i.e. into temporary sediment traps and basins) thereby preventing erosion of the flow channel.

Conditions Where Practice Applies

Gabion Inflow Protection is required where the slope of a drainage way contributing to a sediment trap or basin, or other steep area as applicable, exceeds 4:1 (25%). Surface runoff may be directed to the inflow device by means of dikes or swales.

Design Criteria

Gabion Inflow Protection shall be 4"- 7" stone[6] (min.) placed within manufactured wire baskets, underlain with Geotextile Class C[7] and placed from the ditch overfall elevation to the bottom of the trap or basin when the inflow slope is between 2:1 and 4:1. Slopes flatter than 10:1 shall be stabilized in accordance with Temporary Swale or Earth Dike criteria as applicable. For slopes between 4:1 and 10:1, see Rip-rap Inflow Protection.

Construction Specifications

1. Gabion Inflow Protection shall be constructed by arranging 9'x 3'x 9" gabion baskets forming a trapezoidal cross section 1' deep with 2:1 side slopes and 3' bottom width.
2. Geotextile Class C shall be installed under all gabion baskets.
3. The stone used to fill the gabion baskets shall be 4" - 7".
4. Gabion shall be installed in accordance with manufacturer's recommendations.
5. Gabion Inflow Protection shall be used where concentrated flow is present on slopes steeper than 4:1.

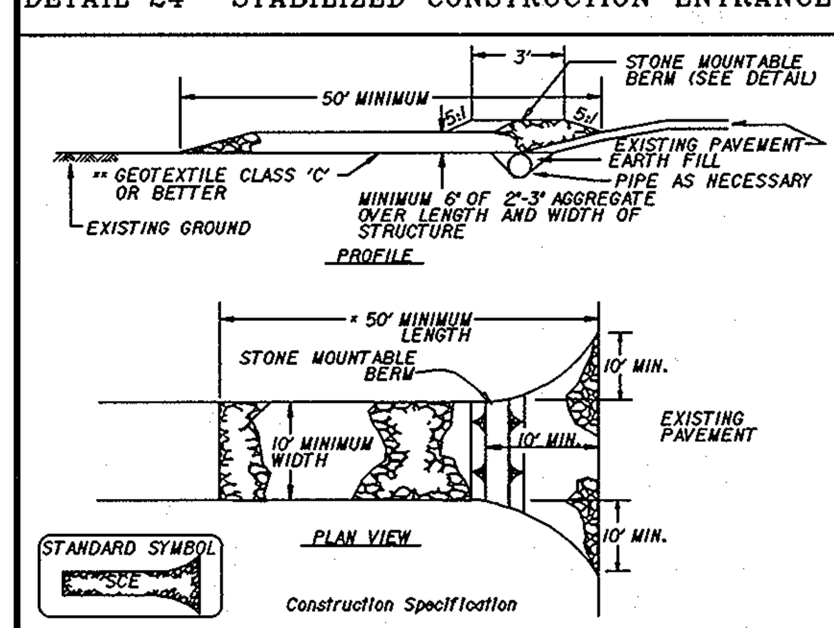
B-7-1

[6] See Table 28

[7] Refer to Table 27

1994

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).

2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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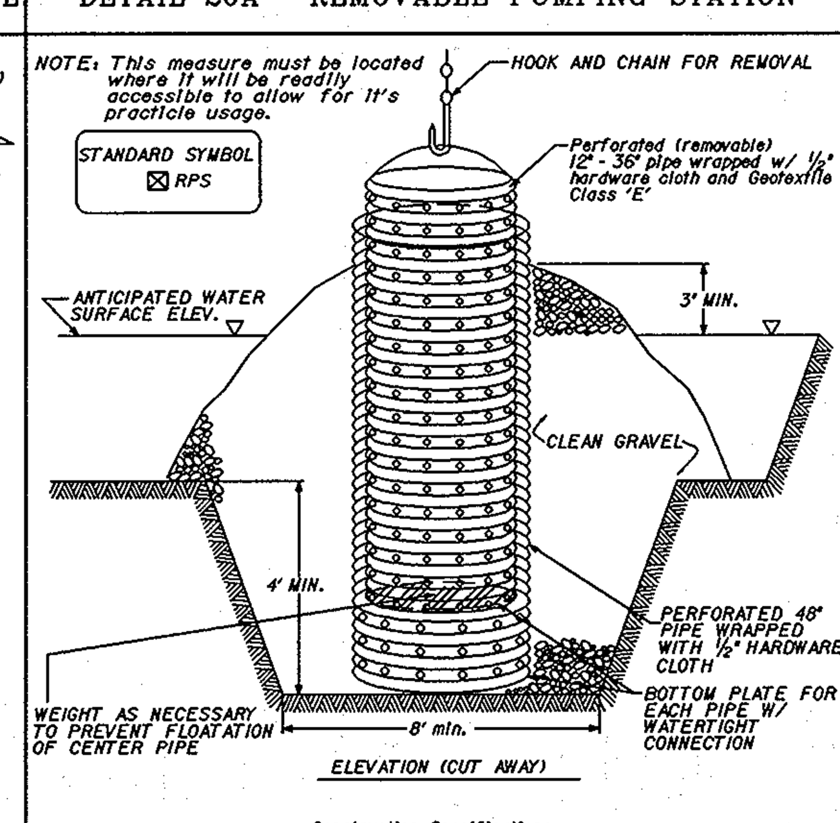
DETAIL 20A - REMOVABLE PUMPING STATION



Construction Specifications

1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with ½" hardware cloth to prevent backfill material from entering the perforations.

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

3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be ½" X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with ½" hardware cloth first, then wrapped again with Geotextile Class E.

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

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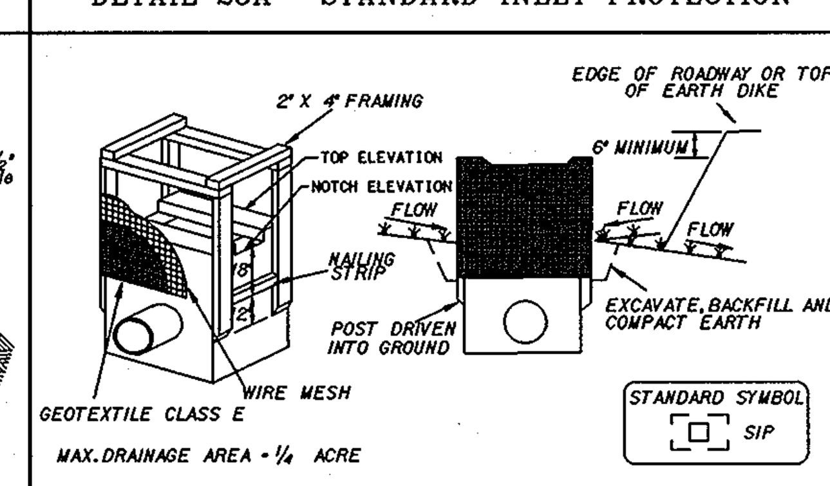
DETAIL 23A - STANDARD INLET PROTECTION



MAX. DRAINAGE AREA = ¼ ACRE

Construction Specifications

1. Excavate completely around the inlet to a depth of 18" below the notch elevation.

2. Drive the 2" x 4" construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2" x 4" frame using the overlap joint shown on Detail 23A. The top of the frame (weir) must be 6" below adjacent roadways where flooding and safety issues may arise.

3. Stretch the 1/2" x 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.

4. Stretch the Geotextile Class E tightly over the wire mesh with the geotixtile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then fastened down.

5. Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.

6. If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.

7. The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

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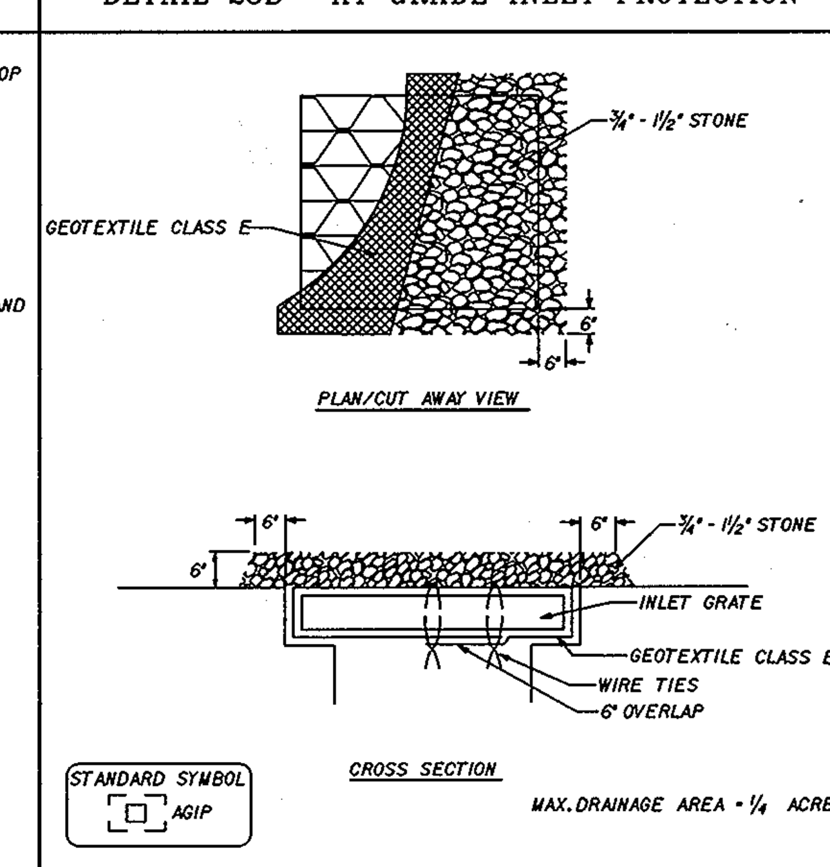
DETAIL 23B - AT GRADE INLET PROTECTION



MAX. DRAINAGE AREA = ¼ ACRE

Construction Specifications

1. Lift grate and wrap with Geotextile Class E to completely cover all openings, then set grate back in place.

2. Place ¾" to 1½" stone, 4"-6" thick on the grate to secure the fabric and provide additional filtration.

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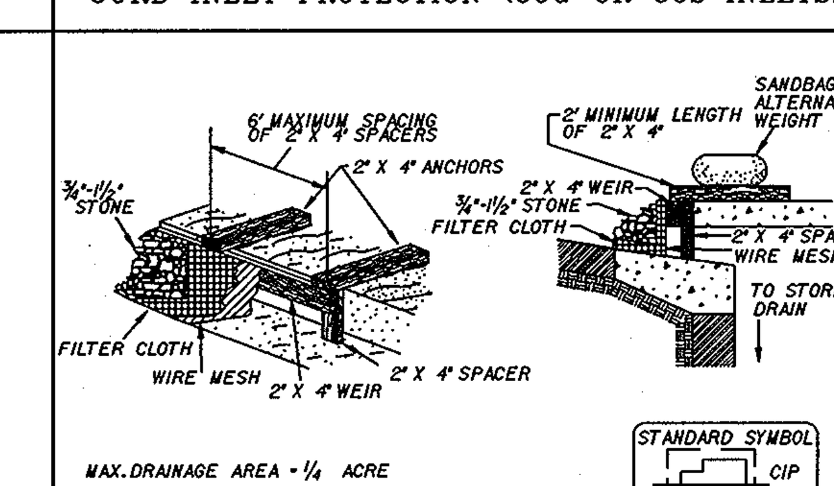
CURB INLET PROTECTION (COG OR COS INLETS)



MAX. DRAINAGE AREA = ¼ ACRE

Construction Specifications

1. Attach a continuous piece of wire mesh (30" minimum width by throat length plus 4') to the 2" x 4" weir (measuring throat length plus 2') as shown on the standard drawing.

2. Place a continuous piece of Geotextile Class E the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2" x 4" weir.

3. Securely nail the 2" x 4" weir to a 9" long vertical spacer to be located between the weir and the inlet face (max. 4' apart).

4. Place the assembly against the inlet throat and nail (minimum 2' lengths of 2" x 4" to the top of the weir at spacer locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.

5. The assembly shall be placed so that the end spacers are a minimum 1' beyond both ends of the throat opening.

6. Form the ½" x ½" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean ¾" x 1½" stone over the wire mesh and geotextile in such a manner to prevent water from entering the inlet under or around the geotextile.

7. This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment.

8. Assure that storm flow does not bypass the inlet by installing a temporary earth or asphalt dike to direct the flow to the inlet.

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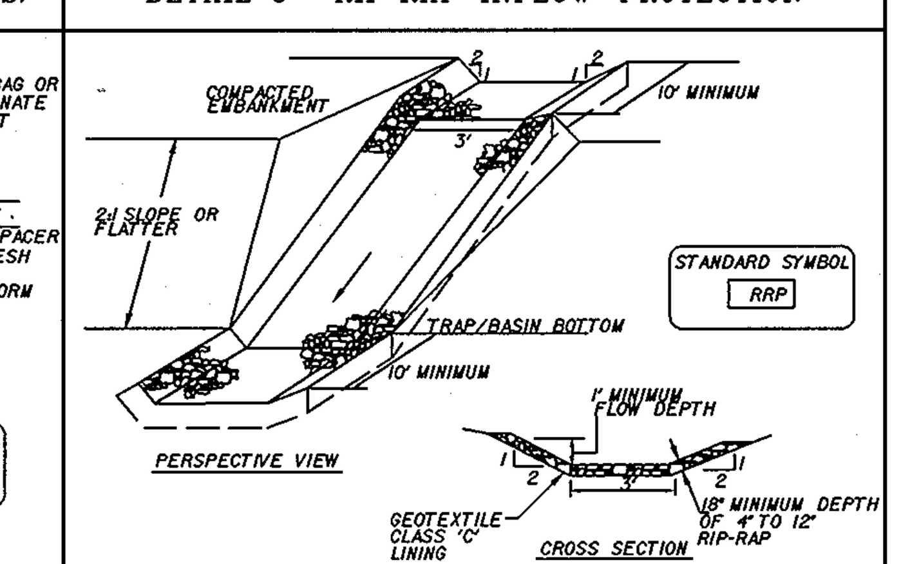
DETAIL 5 - RIP-RAP INFLOW PROTECTION



Construction Specifications

1. Rip-rap lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3' (min.) bottom width. The channel shall be lined with 4" to 12" rip-rap to a depth of 18".

2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.

3. Entrance and exit sections shall be installed as shown on the detail section.

4. Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.

5. Gabion Inflow Protection may be used in lieu of Rip-rap Inflow Protection.

6. Rip-rap should blend into existing ground.

7. Rip-rap Inflow Protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Swale lining criteria.

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6.0 STANDARDS AND SPECIFICATIONS FOR RIP-RAP INFLOW PROTECTION

Definition

A temporary or permanent, lined drainageway installed to convey concentrated runoff into sediment traps and basins or down steep slopes as applicable. Rip-rap Inflow Protection consists of the installation of rock or recycled concrete equivalent in a flow channel for stabilization.

Purpose

The purpose of Rip-rap Inflow Protection is to provide stable conveyance of concentrated runoff down steep slopes, (i.e. into temporary sediment traps and basins) thereby preventing erosion of the flow channel.

Conditions Where Practice Applies

Rip-rap Inflow Protection is required where the slope of a drainage way contributing to a sediment trap or basin exceeds 10:1 but is less than 4:1. Runoff may be directed to the inflow device by means of dikes or swales.

Design Criteria

Rip-rap Inflow protection shall be 4"- 12" rip-rap (min.), underlain with Geotextile Class C[4] and placed from the ditch overfall elevation to the bottom of the trap or basin when the inflow slope is between 4:1 and 10:1. Slopes flatter than 10:1 shall be stabilized in accordance with Temporary Swale or Earth Dike criteria as applicable. For slopes steeper than 4:1, see Gabion Inflow Protection.

Construction Specifications

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

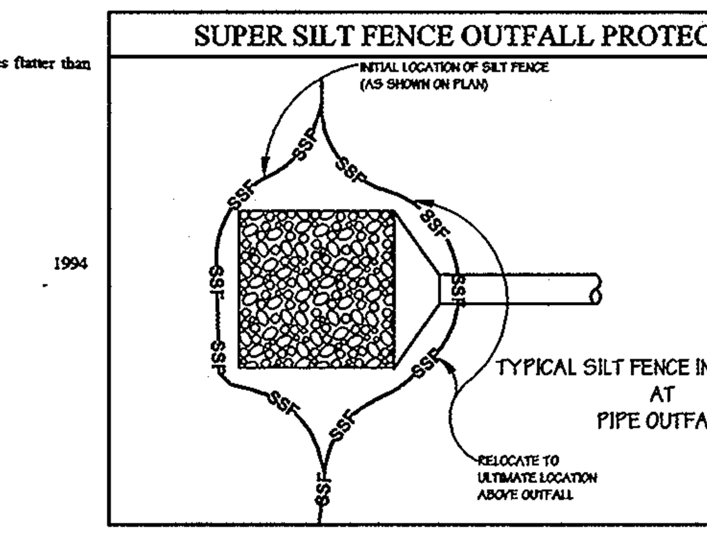
B-6-1

[4] Refer to Table 27

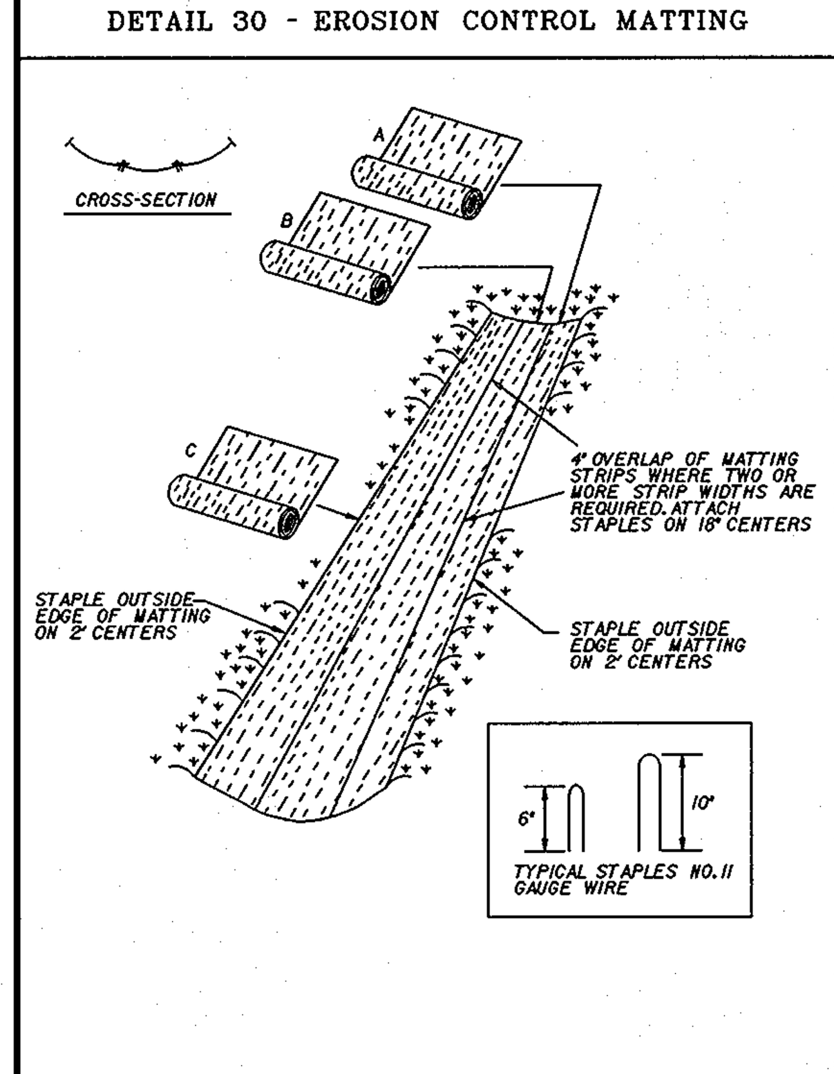
[5] See Table 28

1994

SUPER SILT FENCE OUTFALL PROTECTION



DETAIL 30 - EROSION CONTROL MATTING



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DETAIL 30 - EROSION CONTROL MATTING

Construction Specifications

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

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

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

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

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

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

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

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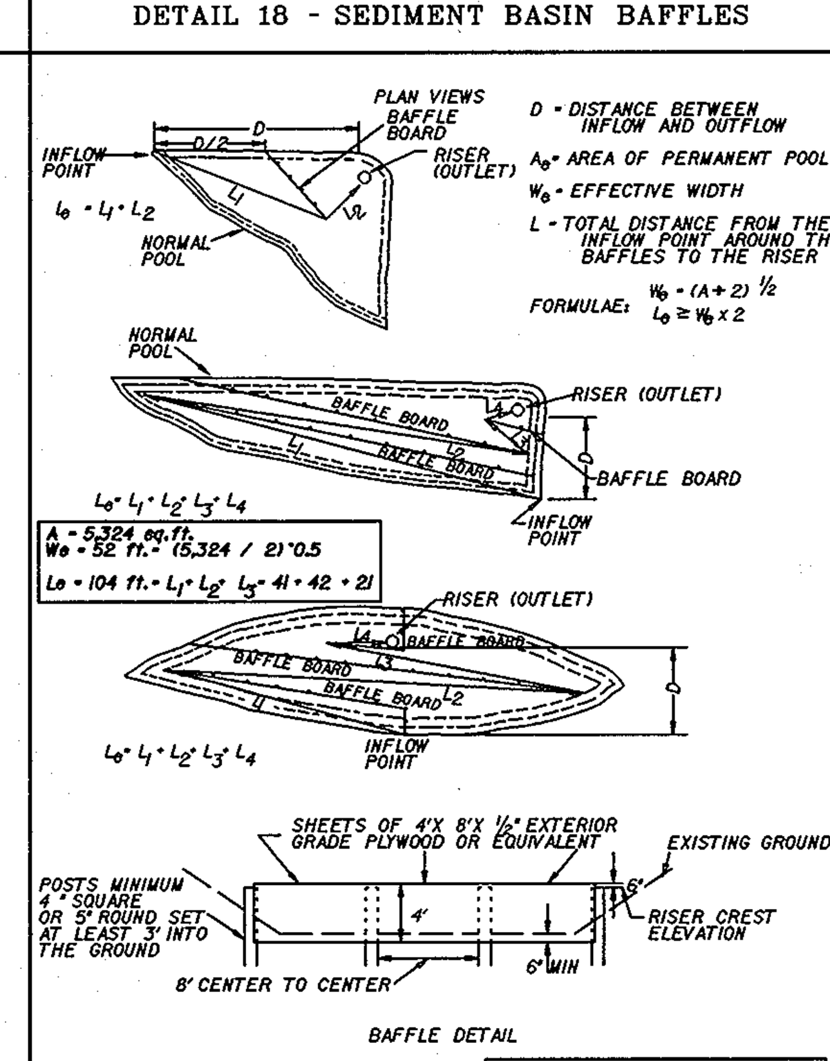
DETAIL 18 - SEDIMENT BASIN BAFFLES



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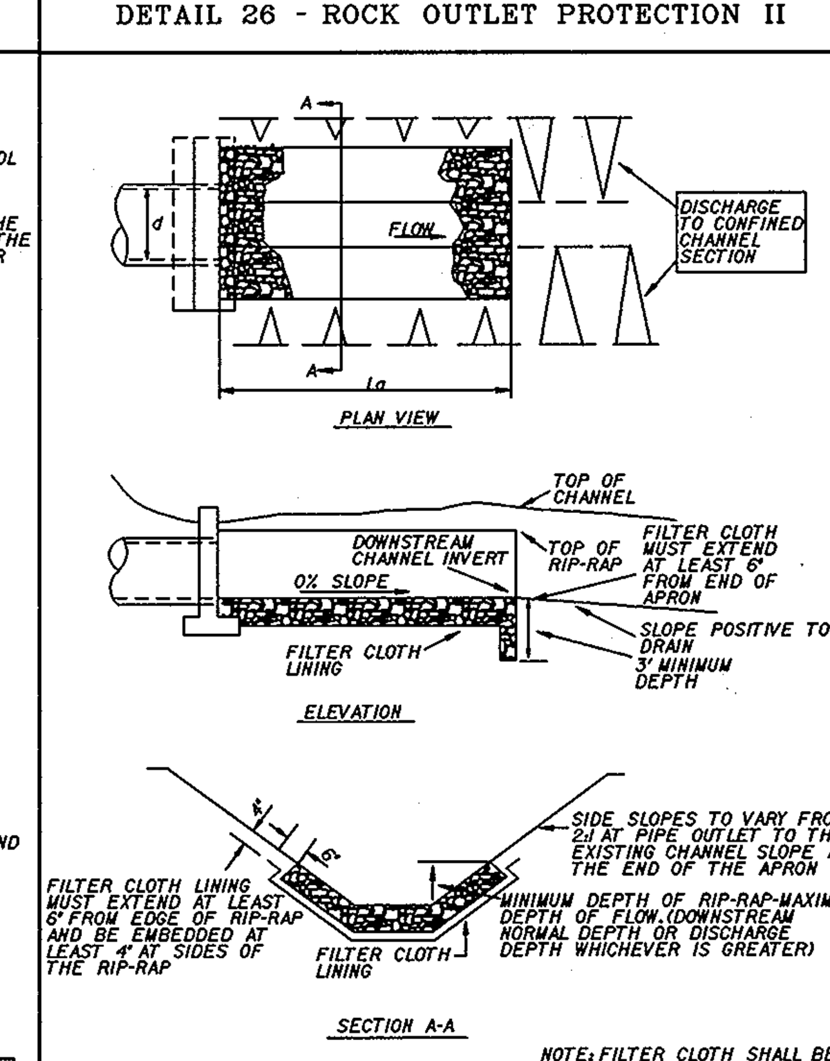
DETAIL 26 - ROCK OUTLET PROTECTION II



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ROCK OUTLET PROTECTION II

Construction Specifications

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

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

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

4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.

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

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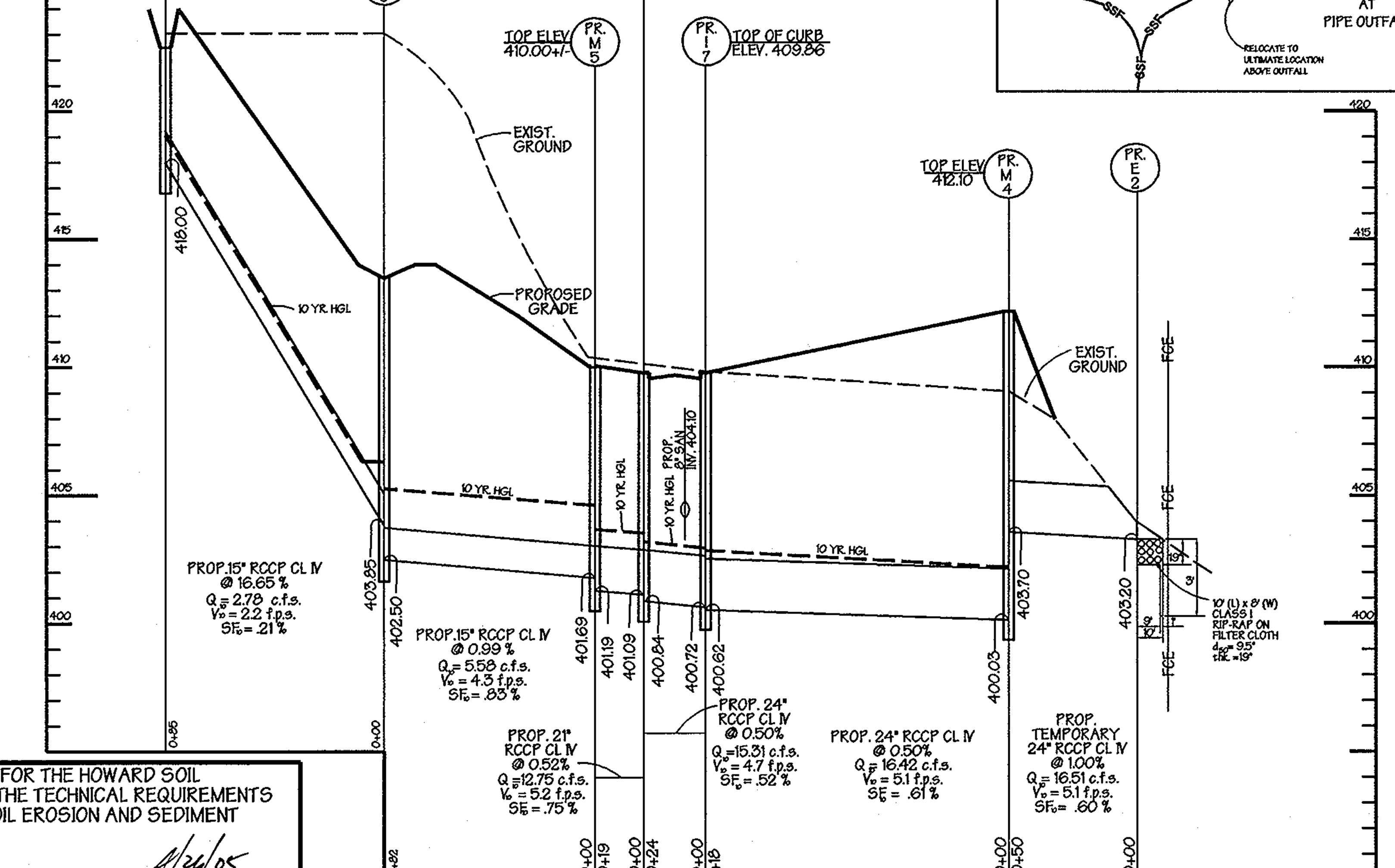
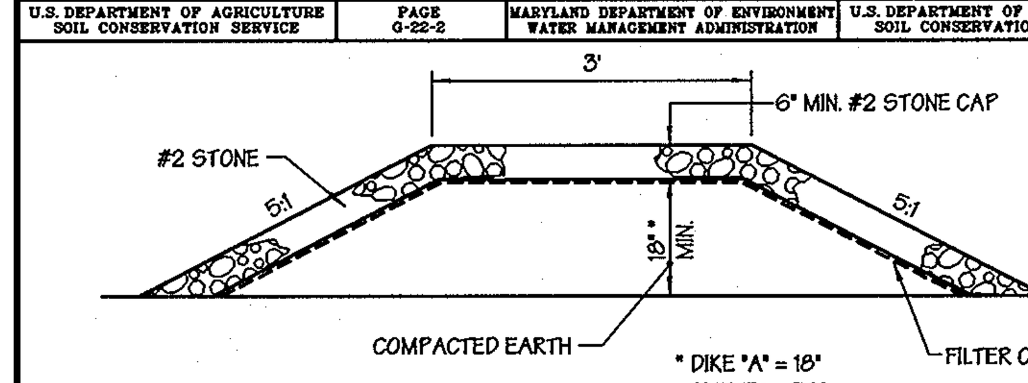
STORM DRAIN PROFILE



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



Stone Mountable Berm

SCALE: NTS.

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personel involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard soil Conservation District."

Signature of Developer [signature] Date 3/21/05

Print Name John N. Bowers, Jr

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personel knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer [signature] Date 21 MAR 2005

Print Name Kevin Patrick Shortall PE # 29218

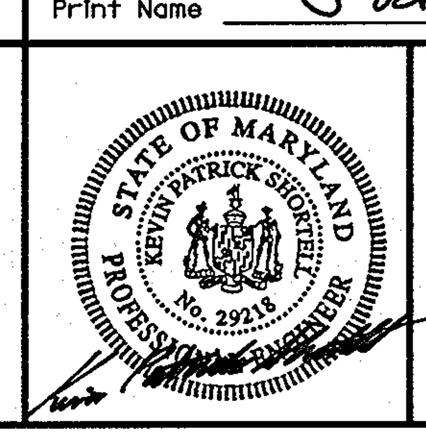
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL. [signature] 4/26/05

USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE:

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT [signature] 4/26/05

HOWARD SOIL CONSERVATION DISTRICT DATE:

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120



OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
[signature] 5-17-05
CHIEF, BUREAU OF HIGHWAYS DATE:

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
[signature] 5/24/05
CHIEF, DIVISION OF LAND DEVELOPMENT DATE:
[signature] 5/23/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE:

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

EROSION AND SEDIMENT CONTROL DETAILS

SCALE: AS NOTED

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

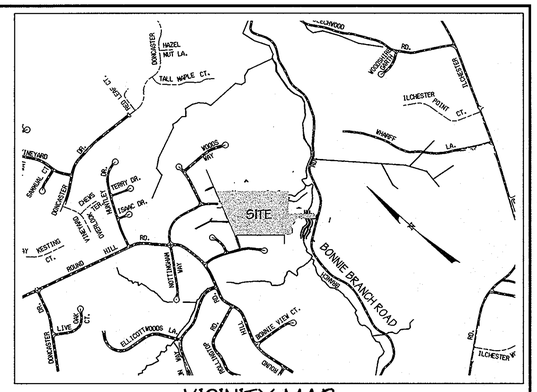
SHEET 16 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

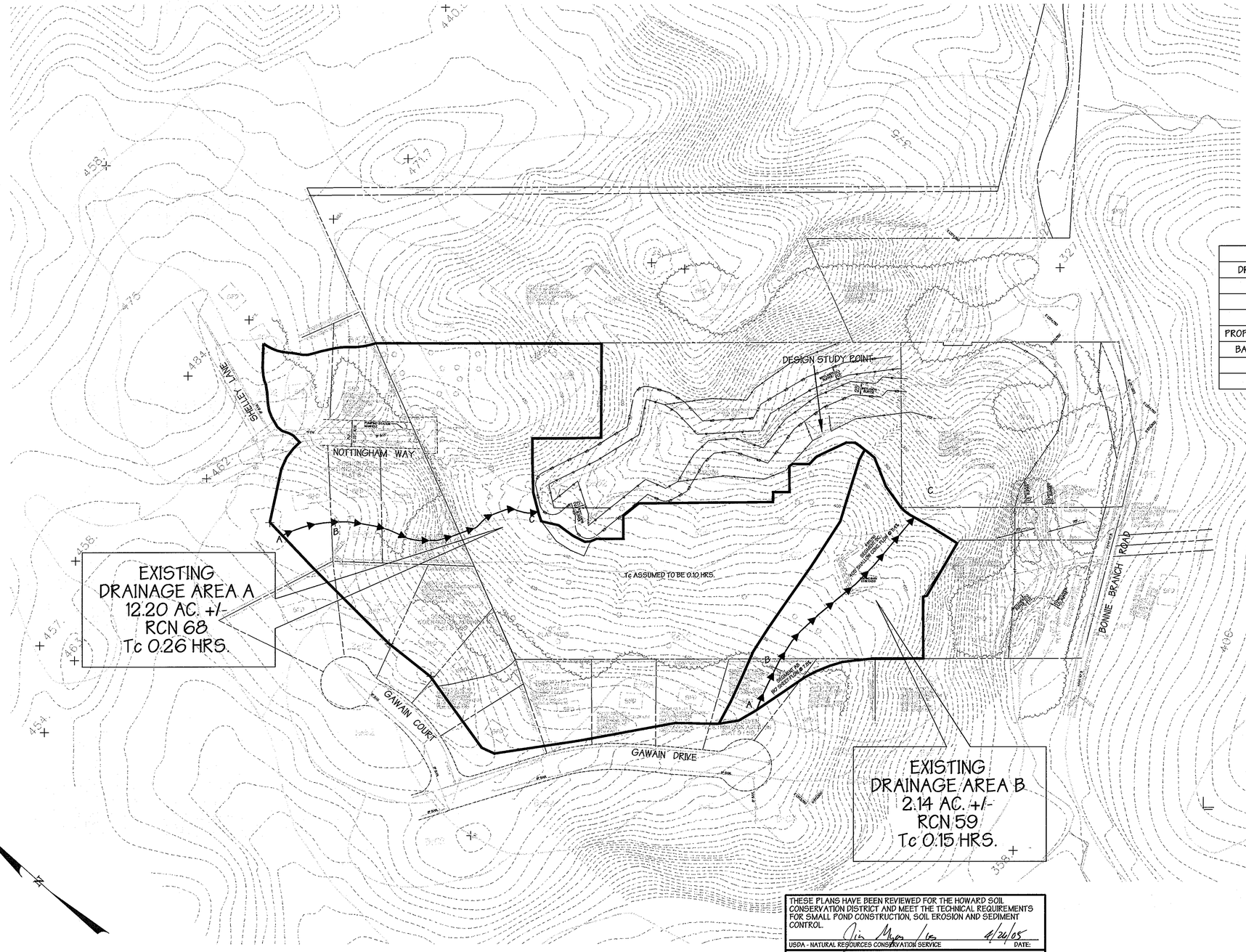
F-04-181

...\9282sedconnotdet1.s01 03/21/2005 10:45:08 AM kengle SCALE

DRAINAGE AREA	RCN	Tc (hrs.)	AREA (acres)	1-YR STORM (cfs)	10-YR STORM (cfs)	100-YR. STORM (cfs)
A	68	0.26	12.20	4.50	25.25	47.38
B	59	0.15	2.14	0.15	3.45	7.45



VICINITY MAP
SCALE: 1" = 1000'



SEDIMENT CONTROL / TEMP 10-YR. SWM SUMMARY TABLE						
DRAINAGE AREA	RCN	Tc (hrs.)	AREA (Ac.)	1-yr. Q (cfs)	10-yr. Q (cfs)	100-yr. Q (cfs)
EX. DA A	68	0.26	12.20 +/-	4.50	25.25	47.38
EX. DA B	59	0.15	2.14 +/-	0.15	3.45	7.45
TOTAL EX.	----	----	----	4.64	28.45	54.37
PROP. ROUTED TO BASIN	87	0.10	10.37 +/-	21.16	52.82	79.46
BASIN DISCHARGE	----	----	----	1.43	37.27	83.05
BYPASS	78	0.25	3.97 +/-	3.57	12.32	20.41
TOTAL PROP.	----	----	----	4.14	49.56	103.01

SOIL	CLASS
BrF	C
BrD2	C
BrB2	C
GnB2	C
ReC2	B
LeB2	B
Mo	D
MrE	C
AdB2	C

LEGEND

- TRACT BOUNDARY
- EXISTING LOT OR PARCEL LINE
- EXISTING RIGHT-OF-WAY LINE
- EXISTING TREELINES
- BUILDING SETBACK LINE
- EXISTING SOIL CLASSIFICATIONS
- EXISTING 5' CONTOUR
- EXISTING 25' CONTOUR
- WETLAND LIMIT LINE
- 100 YEAR FLOOD PLAIN
- 75' STREAM BUFFER
- 25' WETLANDS BUFFER
- STREAM
- DRAINAGE AREA
- Tc PATH

NOTE: THE TOPOGRAPHY SHOWN IS FROM HOWARD CO. G.I.S. DATED 1998

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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE: 4/26/05

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

HOWARD SOIL CONSERVATION DISTRICT — DATE: 4/26/05

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/19/05

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHORTELL — No. 22021 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

EXISTING CONDITIONS SEDIMENT BASIN DRAINAGE AREA MAP

SCALE: 1" = 100'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 17 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F. 04-181

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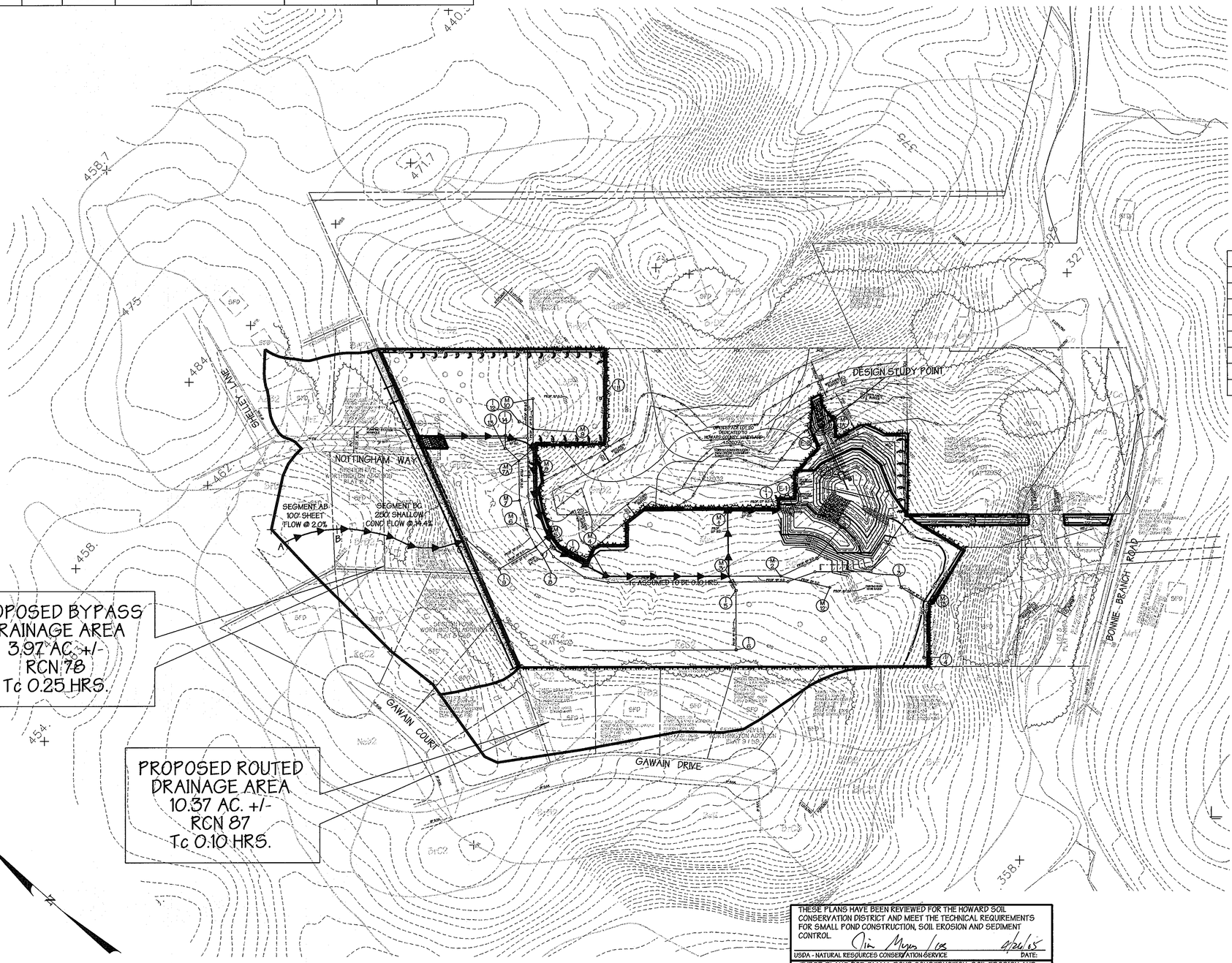
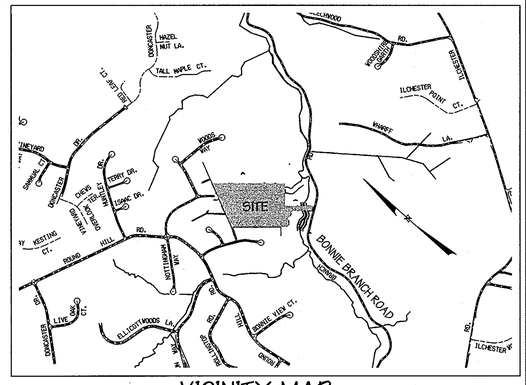
DRAINAGE AREA	RCN	Tc (hrs.)	AREA (acres)	1-YR STORM (cfs)	10-YR STORM (cfs)	100-YR. STORM (cfs)
ROUTED	87	0.10	10.37	21.16	52.82	79.46
BYPASS	78	0.25	3.97	3.57	12.32	20.41





VICINITY MAP

SCALE: 1" = 1000'

SEDIMENT CONTROL / TEMP 10-YR. SWM SUMMARY TABLE						
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TOTAL PROP.	----	----	----	4.14	49.56	103.01

SOIL	CLASS
BrF	C
BrD2	C
BrB2	C
GnB2	C
ReC2	B
LeB2	B
Mo	D
MrE	C
AdB2	C

LEGEND

- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED LOT LINE
- TRACT BOUNDARY
- EXISTING LOT OR PARCEL LINE
- EXISTING RIGHT-OF-WAY LINE
- PROPOSED EASEMENT
- EXISTING TREELINES
- PROPOSED TREELINES
- BUILDING SETBACK LINE
- EXISTING SOIL CLASSIFICATIONS
- EXISTING 5' CONTOUR (305)
- EXISTING 25' CONTOUR (300)
- WETLAND LIMIT LINE (W)
- 100 YEAR FLOOD PLAIN (FP)
- 75' STREAM BUFFER (SB)
- 25' WETLANDS BUFFER (WB)
- STREAM
- DRAINAGE AREA
- Tc PATH

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.

USDA - NATURAL RESOURCES CONSERVATION SERVICE — DATE: 4/26/05

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

HOWARD SOIL CONSERVATION DISTRICT — DATE: 4/26/05

NOTE: THE TOPOGRAPHY SHOWN IS FROM HOWARD CO. G.I.S. DATED 1998

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — No. 22218 — REGISTERED PROFESSIONAL ENGINEER

OWNERS

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MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
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TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
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TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/21/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/20/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

PROPOSED CONDITIONS SEDIMENT BASIN DRAINAGE AREA MAP

SCALE: 1" = 100'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 18 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F.04.181

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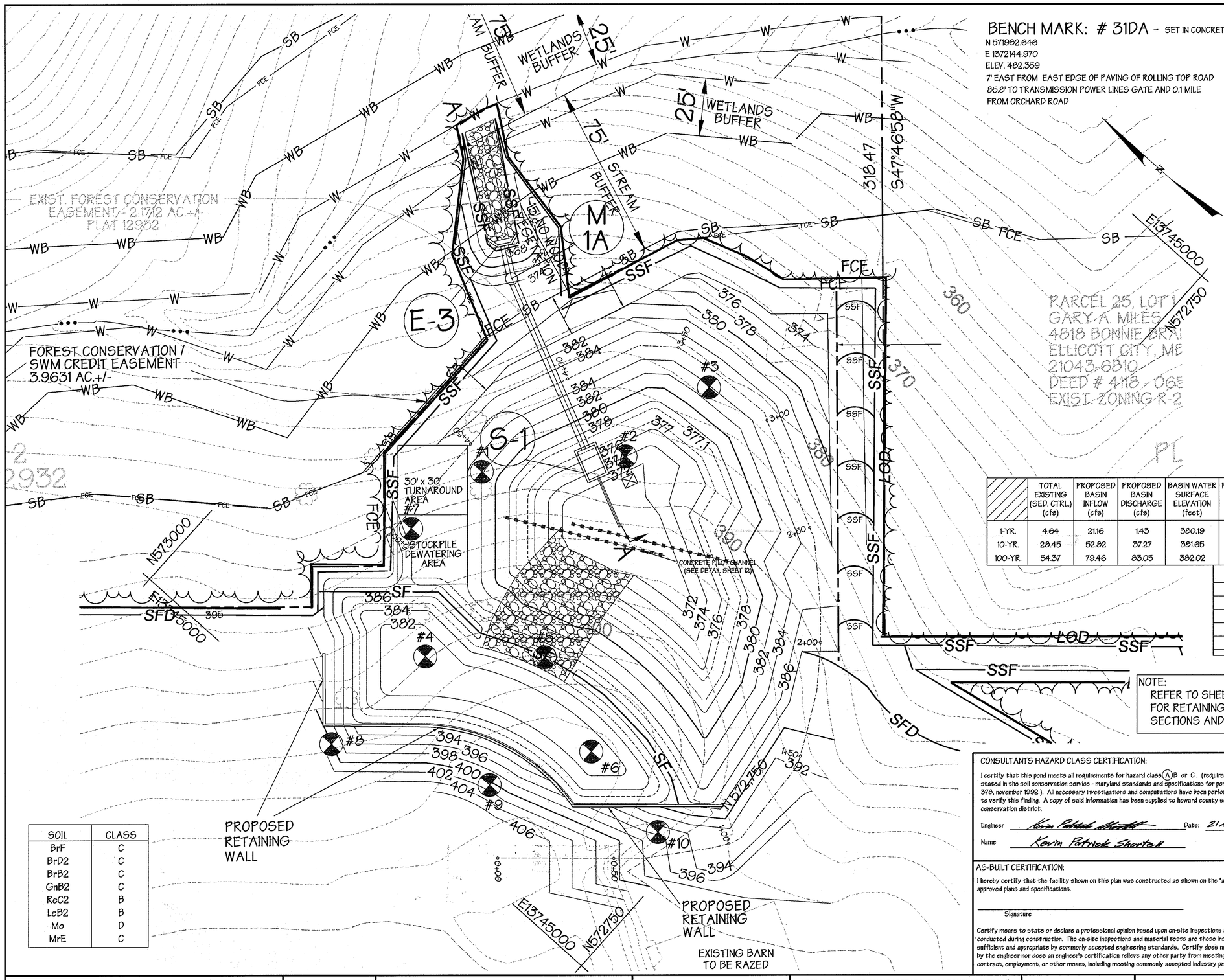

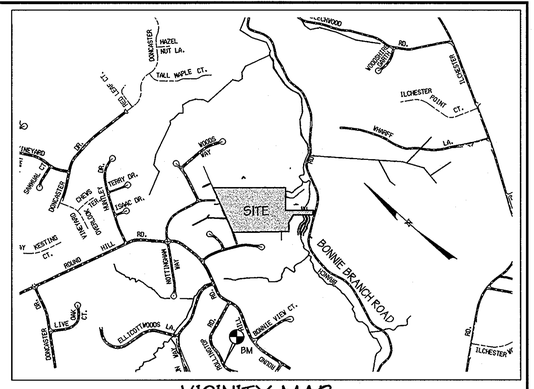

VICINITY MAP
SCALE: 1" = 1000'

LEGEND

- PROPOSED RIGHT-OF-WAY LINE
- PROPOSED LOT LINE
- TRACT BOUNDARY
- EXISTING LOT OR PARCEL LINE
- EXISTING RIGHT-OF-WAY LINE
- PROPOSED EASEMENT
- EXISTING TREELINES
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- WETLAND LIMIT LINE
- 100 YEAR FLOOD PLAIN
- 75' STREAM BUFFER
- 25' WETLANDS BUFFER
- STREAM

	TOTAL EXISTING (SED. CTRL.) (cfs)	PROPOSED BASIN INFLOW (cfs)	PROPOSED BASIN DISCHARGE (cfs)	BASIN WATER SURFACE ELEVATION (feet)	PROPOSED BASIN BYPASS (cfs)	TOTAL PROPOSED (SED. CTRL.) (cfs)	TOTAL EXISTING (SWM) (cfs)	PROPOSED SWM POND INFLOW (cfs)	PROPOSED SWM POND DISCHARGE (cfs)	POND WATER SURFACE ELEVATION (feet)	PROPOSED SWM POND BYPASS (cfs)	TOTAL PROPOSED (SWM) (cfs)
1-YR.	4.64	21.16	1.43	380.19	3.57	4.14	8.46	19.59	0.54	378.46	3.21	3.69
10-YR.	28.45	52.82	37.27	381.65	12.32	49.56	51.05	67.82	32.18	381.36	17.51	49.12
100-YR.	54.37	79.46	83.05	382.02	20.41	103.01	97.09	112.42	115.46	382.04	32.82	146.88

DESCRIPTION	DATA
POND TYPE	MD-378 DETENTION (DRY)
HAZARD CLASSIFICATION	HAZARD CLASS "A"
TOP OF EMBANKMENT	384.04
SED. CTRL. FREEBOARD REQUIRED (100-YR. STORM)	2.00 FT.
SED. CTRL. FREEBOARD PROVIDED (100-YR. STORM)	2.02 FT.

Area (acres) Draining to Basin	10.37 acres
Basin Volume (Required / Provided)	37,332 cu. ft. / 101,571 cu. ft.
Volume @ Dewatering Elev.	18,666 cu. ft.
Volume @ Cleanout Elev.	9,333 cu. ft.
Calculated Riser Crest Elev.	379.14
Calculated Permanent Pool Elev.	377.08
Calculated Basin Cleanout Elev.	375.14
Min. Basin Surface Area	5,663 sq. ft.
Q10 (cfs) Spillway Design Discharge	37.27 cfs
Design High Water Elev. (100-yr.)	382.02
MD-378 Detention Pond, Hazard Class "a"	

SOIL	CLASS
BrF	C
BrD2	C
BrB2	C
GnB2	C
ReC2	B
LeB2	B
Mo	D
MrE	C

NOTE:
REFER TO SHEETS 26 AND 27 FOR RETAINING WALL PLANS, SECTIONS AND DETAILS

CONSULTANTS HAZARD CLASS CERTIFICATION:

I certify that this pond meets all requirements for hazard class (A) B or C. (requirements as stated in the soil conservation service - maryland standards and specifications for pond, code 378, november 1992). All necessary investigations and computations have been performed to verify this finding. A copy of said information has been supplied to howard county soil conservation district.

Engineer Kevin Patrick Shorter Date: 21 MAR 2005

Name Kevin Patrick Shorter

AS-BUILT CERTIFICATION:

I hereby certify that the facility shown on this plan was constructed as shown on the "as-built" plans and meet the approved plans and specifications.

Signature P.E. # Date:

Certify means to state or declare a professional opinion based upon on-site inspections and material tests which are conducted during construction. The on-site inspections and material tests are those inspections and tests deemed sufficient and appropriate by commonly accepted engineering standards. Certify does not mean or imply a guarantee by the engineer nor does an engineer's certification relieve any other party from meeting requirements imposed by contract, employment, or other means, including meeting commonly accepted industry practices.

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personnel involved in the construction project will have a certificate of attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard Soil Conservation District."

Signature of Developer John W. Brown Date 3/2/05
Print Name John W. Brown, Jr.

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personal knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer Kevin Patrick Shorter Date 21 MAR 2005
Print Name Kevin Patrick Shorter PE # 29218

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND KEVIN PATRICK SHORTER No. 29218 PROFESSIONAL ENGINEER

OWNERS

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BALTIMORE, MD 21220-4304

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100 WEST PENNSYLVANIA AVE.
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DEVELOPER

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TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT DATE: 5/18/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 5/20/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

SEDIMENT BASIN PLAN

SCALE: 1" = 20'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 19 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

F-04-181

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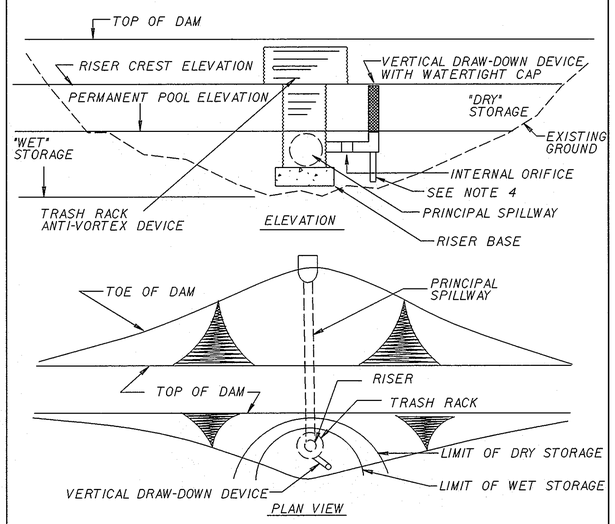
NOTE:
SEE SHEET 12 FOR BORING PROFILES.

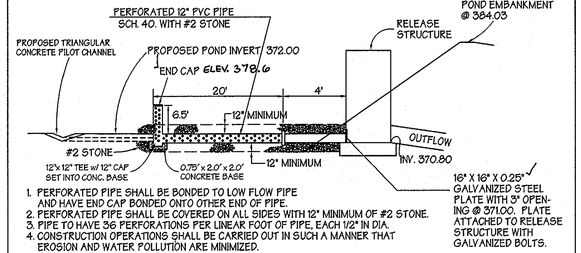
BASIN DRAWDOWN SCHEMATIC
VERTICAL DRAW-DOWN DEVICE



Construction Specifications

1. Perforations in the draw-down device may not extend into the wet storage.
2. The total area of the perforations must be greater than 4 times the area of the internal orifice.
3. The perforated portion of the draw-down device shall be wrapped with 1/2" hardware cloth and geotextile fabric. The geotextile fabric shall meet the specifications for Geotextile Class E.
4. Provide support of draw-down device to prevent sagging and floatation. An acceptable preventative measure is to stake both sides of 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 guage minimum wire.

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



1. PERFORATED PIPE SHALL BE BONDED TO LOW FLOW PIPE AND HAVE END CAP BONDED ONTO OTHER END OF PIPE.
2. PERFORATED PIPE SHALL BE COVERED ON ALL SIDES WITH 12" MINIMUM OF #2 STONE.
3. PIPE TO HAVE 36 PERFORATIONS PER LINEAR FOOT OF PIPE, EACH 1/2" IN DIA.
4. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE MINIMIZED.

SWM POND DEWATERING DEVICE
NOT TO SCALE

STATE OF MARYLAND
DONALD ALAN WELLS
No. 21443
PROFESSIONAL ENGINEER
AS-BUILT 3-2-11

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-12

6. CONSTRUCTION CONSIDERATIONS

6.1. *General Earthwork Requirements*

Controlled compacted fill will be required around the SWM pond. The fill for these areas was assumed to be obtained from the SWM pond area as well as other nearby regions. The maximum dry density (AASHTO T-99) for the residual soil samples ranged from 110.6 to 113.0 pcf with optimum moisture contents of 17%. The natural moisture content of the fill materials on site was generally above the optimum moisture content. Based on these conditions, significant drying of the soil by discing and aeration or other means of manipulation can be anticipated during the earthwork process. Furthermore, the micaceous component of the on-site soils makes it susceptible to loss of strength upon exposure to free water. Therefore, it would be prudent to schedule clearing and grubbing, 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 foundations 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 ponds and extend outward from the edges a minimum of 5 feet plus 1 additional foot horizontally for every foot of new fill to be placed, or cut to be excavated.

b) Proofroll the stripped soil surface with a fully loaded, tandem-axle dump truck, or other approved equipment, under the observation of a geotechnical engineer or highly qualified senior level soils technician, to verify and establish a uniform, dense and stable condition. Any soft, yielding, organic, contaminated, or otherwise unacceptable spots detected shall be overexcavated and replaced with controlled compacted fill.

c) Any material used for controlled fill should be inspected and approved for use by a geotechnical engineer or qualified soils technician prior to use on the site. All fill shall be free from topsoil, boulders, cobbles, roots, organic matter, and debris. Preliminary approval of the borrow material shall not constitute general acceptance of all materials in the deposit or source of supply, and the acceptance shall be subject to field tests taken at the discretion of the geotechnical engineer or qualified soils technician.

d) Compacted fill should be placed in horizontal, successive, uniform layers having a maximum uncompacted lift thickness of 8 inches. Each lift should be compacted uniformly to a minimum of 95 percent of the Standard Proctor maximum dry density as determined by AASHTO T-99 (ASTM

D-698). The moisture content of the materials shall be maintained within ± 3% of the optimum moisture content in order to attain the required degree of compaction. Each lift shall be uniformly and evenly blade mixed during spreading to ensure uniformity of the material in each layer. If the work deteriorates prior to placement of the next lift, the layer shall be recompacted and reshaped accordingly.

e) Successive lifts of compacted fill shall not be placed until the layer under construction has been compacted to the required density as measured by a geotechnical engineer or qualified soils technician. Successive runs of equipment shall be staggered over the width of each layer.

f) Where fills are to be placed on slopes, the original ground shall be deeply scarified or where slopes are steeper than 5 horizontal to 1 vertical the slope shall be stepped or benched, when considered necessary by the Engineer, in order that the placement of fill may be accomplished in horizontal lifts.

It is noted that this methodology is recommended both as preparation for areas to receive new fill, as well as locations where cut is required to establish the proposed grades such as foundation excavations. In cut areas, the proofrolling and selective undercutting shall be accomplished after excavation down to the proposed grades has been completed.

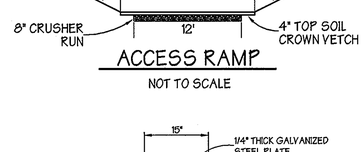
6.2. *Excavation Issues*

Conventional excavation methods should likely prove feasible for most of the excavations. However, it must be anticipated that dense to very dense decomposed rock or bedrock may be encountered during earthwork, possibly requiring the use of specialized excavation equipment and methods for difficult excavation.

It is our experience that the degree of difficulty in excavation can, in a general sense, be correlated to the N-values, the physical characteristics of the materials and the material's resistance to our drilling equipment. Typically, mass excavation of strata exhibiting N-values of less than 50 blows per 6 inches could generally be accomplished using conventional earthwork techniques. However, limited ripping or jack hammering of harder materials may be required in confined excavations or trenches. Materials with N-values of 50 blows per 3 inches to 6 inches, or which required very hard augering to penetrate with our drilling equipment, usually require ripping, jack hammering, or hoe ramming for removal, especially in confined areas or trenches. Any excavations below the depths of auger refusal, or in materials with N-values of 50 blows per 3 inches or less, will most likely require hard ripping, extensive jack hammering or blasting. Blasting may be required, especially in trenches or other confined areas.

It must be noted that the physical characteristics of the rock materials (e.g., jointing, fracturing, and foliation), along with the type of equipment used and the degree of access (confined or not), will greatly affect difficulty of excavation. It should also be noted that the data presented on the profiles represent the general subsurface conditions at the respective

boring locations. Deviations in the excavation characteristics due to differing degrees of weathering, as well as the physical characteristics of the subject materials, must be anticipated. Also, the excavation conditions, and the SPT values used to differentiate them, tend to vary and overlap. Accordingly, strata with similar SPT results may differ in excavation difficulty, and materials with similar excavation characteristics may have different SPT results.



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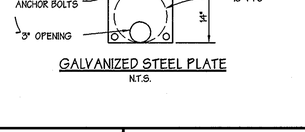

GALVANIZED STEEL PLATE
N.T.S.

DEVELOPER CERTIFICATION:

"I/ We certify that all development and/or construction will be done according to this plan for sediment and erosion control, and that all responsible personnel involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I also authorize periodic on-site inspections by the Howard soil Conservation District."

Signature of Developer: John N. Bowers Jr. Date 3/24/05
Print Name: John N Bowers Jr

ENGINEER CERTIFICATION:

"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it was prepared in accordance with the requirements of the Howard Soil Conservation District.

Signature of Engineer: Kevin Patrick Shortell Date 21 MAR 2005
Print Name: Kevin Patrick Shortell PE # 29218

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
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410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

SEDIMENT BASIN DETAILS

SCALE: AS SHOWN

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 20 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

F-04-181

CONSTRUCTION SPECIFICATIONS

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

SITE PREPARATION

Areas designated for borrow areas, embankments, 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 cleared and grubbed within 10 feet of the toe of the embankment.

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

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

EARTH FILL

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

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

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

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

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

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

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

STRUCTURE BACKFILL

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

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi 28-day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (haunching), 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 embankments or other embankment materials.

PIPE CONDUITS

All pipes shall be circular in cross section.

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

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

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

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

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

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

All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches in diameter: flanges on both ends of the pipe with a circular 3/8 inch closed cell neoprene gasket, pre-punched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12-inch wide by 3/8-inch thick closed cell circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of ⅛ inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable.

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

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

5. Backfilling shall conform to "Structure Backfill".

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

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

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

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

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

4. Backfilling shall conform to "Structure Backfill".

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

Plastic Pipe - 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 the following: 4"-10" pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

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

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

4. Backfilling shall conform to "Structure Backfill".

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

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

CONCRETE

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

ROCK RIPRAP

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

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

CARE OF WATER DURING CONSTRUCTION

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect 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 various parts of the work and for maintaining the excavation, 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 or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation as such locations which may require draining the water sumps from which the water shall be pumped.

STABILIZATION

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

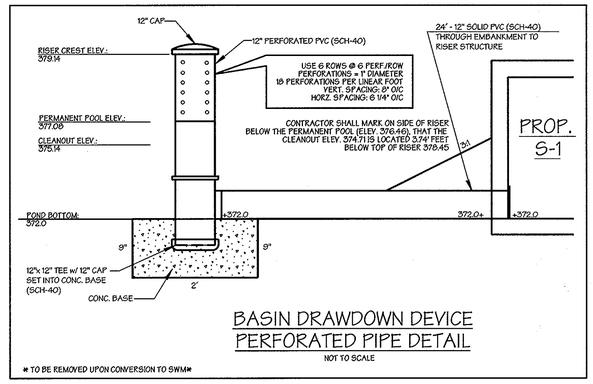
EROSION AND SEDIMENT CONTROL

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

Gabions shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 312 and must be CLTF, PVC coated.

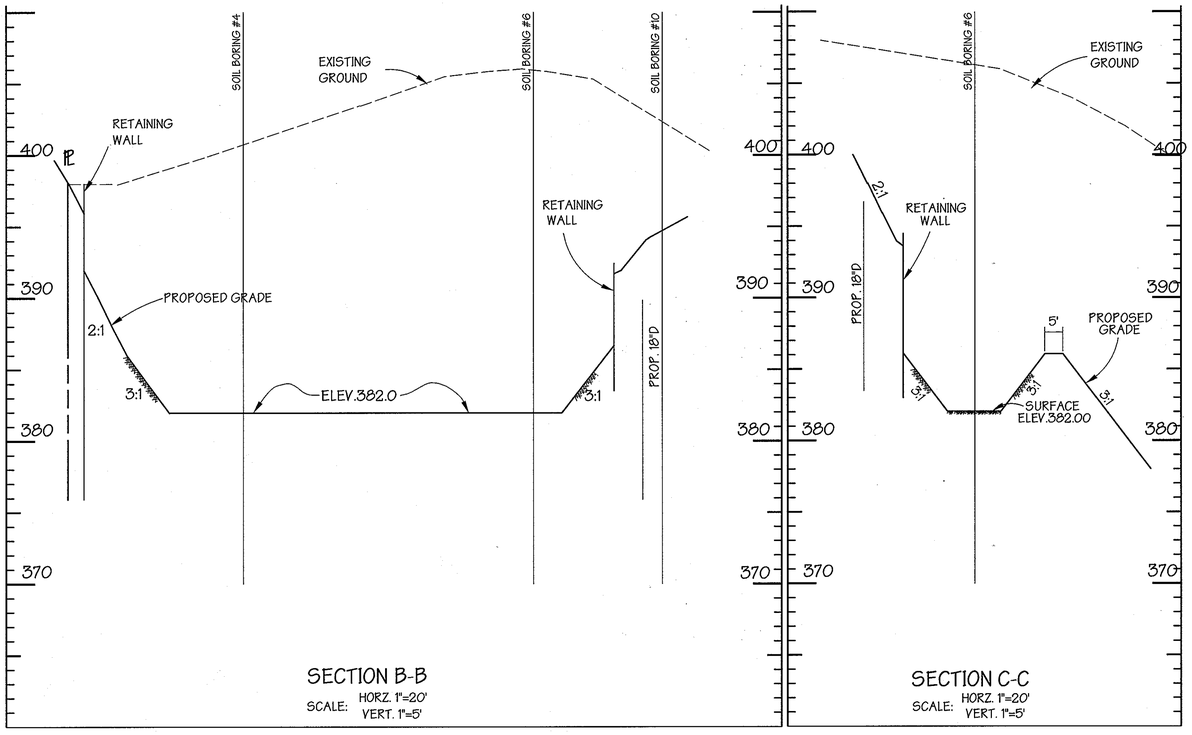
OUTFALL PROTECTION

Subgrade for riprap or gabion outfalls shall be prepared to the required line and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the specified grading limits when installed in the riprap or gabion. All stone shall be delivered and placed in a manner that will ensure the stone in place shall be reasonably homogenous with the larger rocks uniformly distributed and firmly in contact one to another, with the smaller rocks filling the voids between the larger rocks. Stone for outfalls may be placed by equipment. Riprap or gabion outlets shall be constructed to full course thickness in one operation and in such a manner as to avoid any displacement of underlying materials. The contractor shall avoid damage to the filter blankets or cloth during placement of riprap. Hand placement shall be required as needed to prevent damage to the permanent works. Filter cloth shall be placed under all riprap and gabions.



BASIN DRAWDOWN DEVICE
PERFORATED PIPE DETAIL
NOT TO SCALE

* TO BE REMOVED UPON CONVERSION TO SWM*



SECTION B-B
SCALE: HORZ. 1"=20'
VERT. 1"=5'

SECTION C-C
SCALE: HORZ. 1"=20'
VERT. 1"=5'

NOTE:

SEE SHEET 20 FOR:
-RISER DETAILS
-GALVANIZED STEEL ORIFICE PLATE DETAIL

SEE SHEET 10 FOR:
-CONCRETE CRADLE DETAIL
-CONCRETE ANTI-SEEP COLLAR DETAIL
-CONCRETE COLLAR SECTION DETAIL
-TRASH RACK DETAILS

SEE SHEET 12 FOR:
-CONCRETE PILOT CHANNEL DETAIL

SEE SHEET 21 (THIS SHEET) FOR:
-VERTICAL STANDPIPE DETAIL

DEVELOPER CERTIFICATION:
"I certify that all development and/or construction will be done according to these plans, and that any responsible personel involved in the construction project will have a certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspections by the Howard soil Conservation District."

Signature of Developer _____ Date 4/8/05
Print Name John N Bowers JR.

ENGINEER CERTIFICATION:
"I certify that this plan for pond construction, erosion and sediment control represents a practical and workable plan based on my personel knowledge of the site conditions. This plan was prepared in accordance with the requirements of the Howard Soil Conservation District. I have notified the developer that he/she must engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion."

Signature of Engineer _____ Date 8 APR 2005
Print Name Kevin Patrick Shortell PE # 29218

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND — KEVIN PATRICK SHORTELL — No. 29218 — PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS _____ DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT _____ DATE: 5/20/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION _____ DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

SEDIMENT BASIN NOTES

SCALE: AS SHOWN

NOTTINGHAM WAY ACRES
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 21 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

F.04.181

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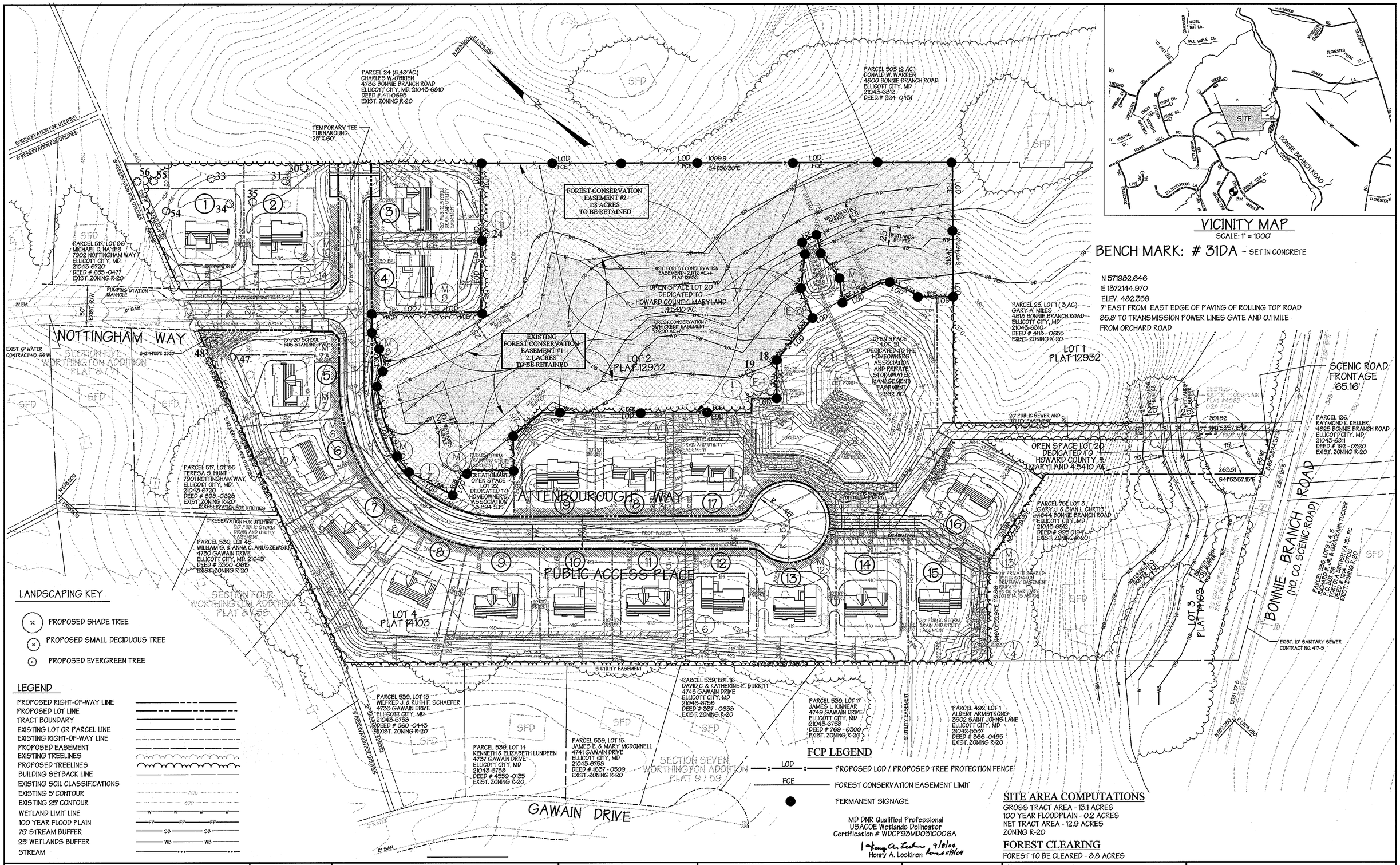


VICINITY MAP
SCALE: 1" = 1000'

BENCH MARK: # 31DA – SET IN CONCRETE

N 571982.646
E 1372144.970
ELEV. 482.359
7' EAST FROM EAST EDGE OF PAVING OF ROLLING TOP ROAD
85.8' TO TRANSMISSION POWER LINES GATE AND 0.1 MILE FROM ORCHARD ROAD

SITE AREA COMPUTATIONS

GROSS TRACT AREA - 13.1 ACRES
100 YEAR FLOODPLAIN - 0.2 ACRES
NET TRACT AREA - 12.9 ACRES
ZONING R-20

FOREST CLEARING

FOREST TO BE CLEARED - 8.8 ACRES

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-12-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

FOREST CONSERVATION PLAN

SCALE: 1" = 50'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04
2nd Revision: November 9, 2004
SHEET 22 of 27
F 04 - 181
ZONED R-20
TAX MAP 31

F-04-181

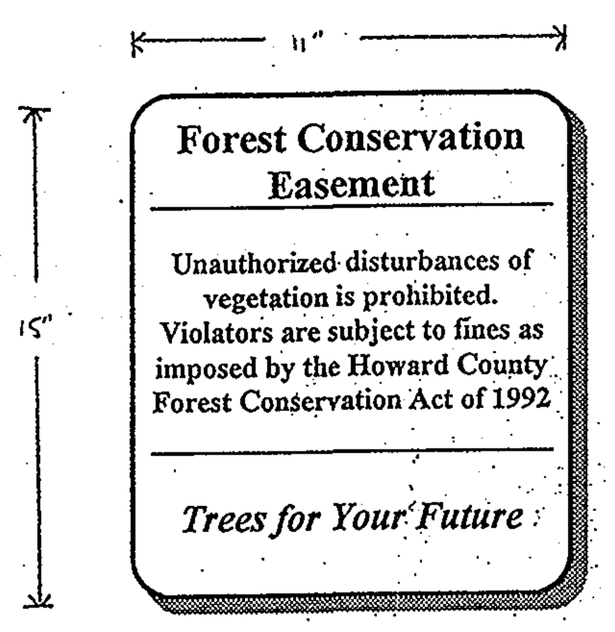
...\9282finalforestplan.s01 03/21/2005 09:59:24 AM kengle SCALE

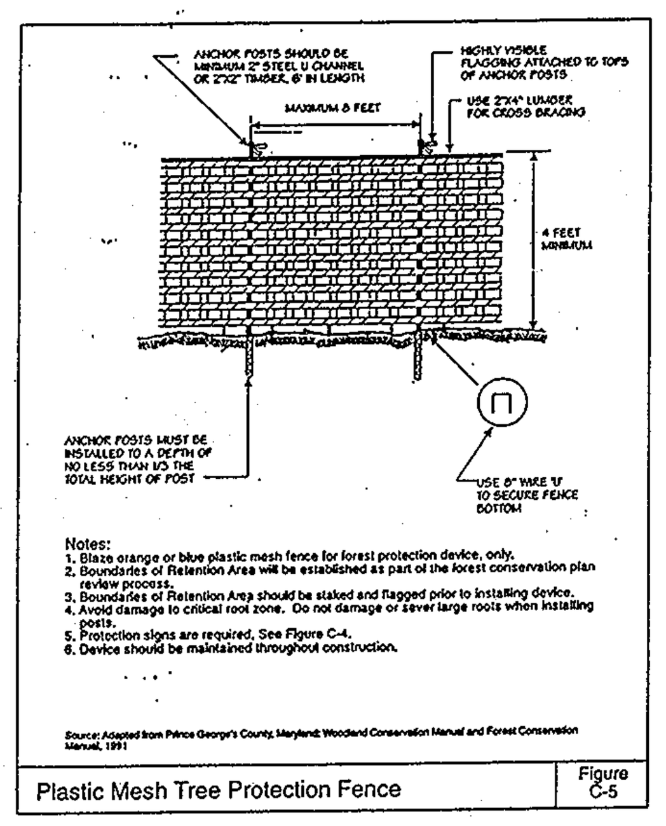
Specimen Trees

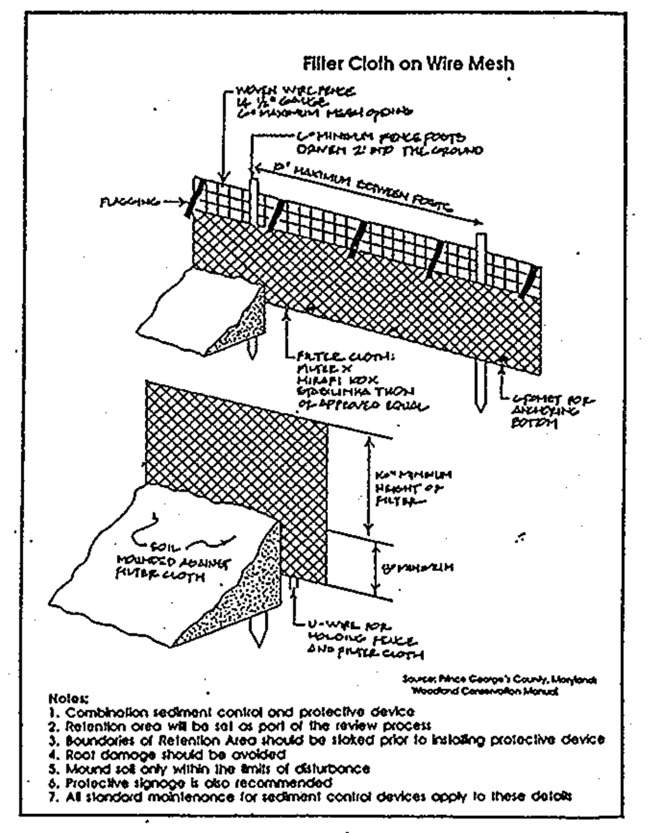
Key	Species Name	Size	Cond.
1	Tulip poplar	31"	Good
2	Tulip poplar	31"	Good
3	**Tulip poplar**	**32"**	**Good**
4	Tulip poplar	40"	Good
5	Tulip poplar	34"	Good
6	Tulip poplar	34"	Good
7	Tulip poplar	30"	Good
8	Tulip poplar	30"	Good
9	Tulip poplar	30"	Good
10	Tulip poplar	34"	Good
11	Tulip poplar	42"	Good
12	Tulip poplar	32"	Good
13	Tulip poplar	36"	Good
14	White ash	31"	Good
15	Tulip poplar	30"	Good
16	Tulip poplar	34"	Good
17	Tulip poplar	30"	Good
18	**Tulip poplar**	**39"**	**Good**
19	**Tulip poplar**	**38"**	**Good**
20	Tulip poplar	37"	Good
21	Tulip poplar	30"	Good
22	Tulip poplar	33"	Good
23	Tulip poplar	30"	Good
24	**Tulip poplar**	**32"**	**Good**
25	Tulip poplar	31"	Fair
26	Tulip poplar	34"	Good
27	Tulip poplar	30"	Good
28	Tulip poplar	35"	Good
29	Tulip poplar	35"	Good
30	**Tulip poplar**	**32"**	**Good**
31	**Tulip poplar**	**36"**	**Good**
32	Tulip poplar	32"	Good
33	**Tulip poplar**	**35"**	**Good**
34	*Tulip poplar*	*33"*	*Good*
35	*Tulip poplar*	*36"*	*Good*
36	Tulip poplar	34"	Good
37	Tulip poplar	39"	Good
38	Tulip poplar	36"	Good
39	Tulip poplar	39"	Good
40	Tulip poplar	41"	Good
41	Tulip poplar	31"	Good
42	Tulip poplar	36"	Good
43	Tulip poplar	32"	Good
44	Tulip poplar	30"	Good
45	Tulip poplar	40"	Good
46	Tulip poplar	37"	Good
47	*Tulip poplar*	*32"*	*Good*
48	*Tulip poplar*	*32"*	*Good*
49	Tulip poplar	31"	Good
50	Tulip poplar	33"	Good
51	Tulip poplar	39"	Good
52	Tulip poplar	34"	Good
53	Tulip poplar	32"	Good
54	*Tulip poplar*	*31"*	*Good*
55	**Tulip poplar**	**32"**	**Good**
56	**Tulip poplar**	**33"**	**Good**

Trees in **BOLD** text are proposed for retention
Trees in *ITALICIZED* may be possible to save. Individual decisions to be made during construction
All other specimen trees are proposed for removal

Signage and Fencing Details







SEDIMENT CONTROL NOTE

Sediment control shall be installed in accordance with the grading plan prepared for the site.

Forest Conservation Worksheet

PROJECT NAME: Lundeen Property DATE: 9/8/04

BASIC SITE DATA	ACRES
Gross Site Area:	13.1
Area within 100 year floodplain:	0.2
Area within agricultural use or preservation parcel:	-
Area within overhead transmission lines:	-
Net Tract Area (NTA):	12.9
Land Use Category: R-20	
INFORMATION FOR CALCULATIONS	
Net Tract Area (NTA):	12.9
Forest conservation threshold (20 % x NTA):	2.6
Afforestation threshold (15 % x NTA):	1.9
Existing forest on NTA:	12.8
Existing forest above conservation threshold:	10.2
Break even point (if applicable):	4.6
Forest to be cleared:	8.9
Forest to be retained:	3.9
AFFORESTATION CALCULATIONS	
No forest clearing: Afforestation Threshold - Existing Forest	
Forest clearing: (Aff. thresh. - ex. forest) + (forest to be cleared x 2)	
REFORESTATION CALCULATIONS	
Clearing above threshold	
a. Forest cleared above threshold 8.9 x 1/4: 2.2 acres	
b. Forest retained above threshold: 1.3 acres	
Reforestation Required (a-b):	0.9

REFORESTATION NOTE:

1. **The developer proposes to pay a fee-in-lieu into the Howard County Forest Conservation Fund in the amount of $24,223.00 to meet the reforestation obligation for the project. This fee includes $19,602.00 (39,204 sq.ft. x $0.50/sq.ft.) to meet the 0.9 acre reforestation obligation and $3129.00 (3129 sq.ft. x $1.00/sq.ft.) to address the abandonment of 3,129.00 sq.ft. of existing forest conservation easement**

2. **The developer will have met the forest conservation obligation for the property upon payment of the fee to Howard County and retention of remaining 3.9 acres of onsite forest in a forest conservation easement.** SURETY AMOUNT OF 169,884 sq.ft. x $0.20 sq.ft. = $33,976.80

FCP NOTES

1. **Any Forest Conservation Easement (FCE) area shown hereon is subject to protective covenants which may be found in the Land Records of Howard County and which restrict the disturbance and use of these areas.**
2. **There shall be no clearing, grading, construction or disturbance of vegetation in the Forest Conservation Easement except as permitted by Howard County.**
3. **No stockpiles, parking areas, equipment cleaning areas, etc. shall occur within areas designated as Forest Conservation Easements.**
4. **Permanent signage shall be placed 100' apart along the boundaries of all areas included in Forest Conservation Easements.**

Sequence of Construction

1. **Pre-construction meeting shall be held between developer, contractor, and County inspector.**
2. **Sediment control shall be installed in accordance with general construction plan for site. Temporary protective fencing and forest conservation signage shall be installed as per forest conservation plan.**
3. **Site shall be graded, infrastructure installed, and houses constructed. Disturbed areas shall be stabilized. Permanent signage in poor condition shall be replaced**
4. **Post construction meeting shall be held with County inspector to ensure compliance with development plan. Sediment control and temporary protective fencing shall be removed upon stabilization of site and completion of construction activities.**
5. **Certification of forest retention paperwork shall be submitted to the County.**

MD DNR Qualified Professional
USACOE Wetlands Delineator
Certification # WDCP93MD0310006A
Henry A. Leskinen 9/8/04 Revised 11/9/04

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
[signature] 5-17-05
CHIEF, BUREAU OF HIGHWAYS DATE:

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
[signature] 5/24/05
CHIEF, DIVISION OF LAND DEVELOPMENT DATE:
[signature] 5/23/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE:

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

FOREST CONSERVATION PLAN NOTES AND DETAILS

SCALE: AS SHOWN

NOTTINGHAM WAY ACRES
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04
2nd Revision: November 9, 2004
SHEET 23of 27
F 04 - 181
ZONED R-20 TAX MAP 31

F.04.181

..\9282finalforestplannotes.s01 09/07/2004 05:23:10 PM kengle SCALE

PERIMETER 5
565 l.f.
TYPE "A" BUFFER
(1:60)

PERIMETER 4
745 l.f.
EX. VEGETATION
TO REMAIN
IS 745 l.f.

PERIMETER 3
150 l.f.
TYPE "B" BUFFER

PERIMETER 2
727 l.f.
EXISTING VEGETATION
TO REMAIN IS 507 l.f.

PERIMETER 6
443 l.f.
TYPE "A" BUFFER
(1:60)

PERIMETER 1
1029 l.f.
TYPE "A" BUFFER
(1:60)

SCHEDULE "D"
SWM AREA
665 l.f.
TYPE "B" BUFFER

STREET TREE
EXISTING TREE CREDIT
290 LF

SCHEDULE "D"
EX. VEGETATION
CREDIT = 301 l.f.

155 LANDSCAPE
TYPE "A"

SCENIC ROAD
FRONTAGE
65.16'

LEGEND

PROPOSED RIGHT-OF-WAY LINE	
PROPOSED LOT LINE	
TRACT BOUNDARY	
EXISTING LOT OR PARCEL LINE	
EXISTING RIGHT-OF-WAY LINE	
PROPOSED EASEMENT	
EXISTING TREELINES	
PROPOSED TREELINES	
BUILDING SETBACK LINE	
EXISTING 5' CONTOUR	
WETLAND LIMIT LINE	
100 YEAR FLOOD PLAIN	
75' STREAM BUFFER	
25' WETLANDS BUFFER	
STREAM	
PROPOSED SHADE TREE	
PROPOSED ORNAMENTAL TREE	
PROPOSED EVERGREEN TREE	
PROPOSED STREET TREE	

VICINITY MAP
SCALE: 1" = 1000'

SCHEDULE A
PERIMETER LANDSCAPE EDGE

	ROADWAYS	PERIMETER PROPERTIES	PLANTS REQUIRED		PLANTS PROVIDED	
Landscape Type	B	A				
Perimeter Edge 1	0	1029'	Shade	17	Shade Evergreen Ornamental	12 10 4
Perimeter Edge 2	0	*727'	Shade	4	Shade Evergreen Ornamental	4 0 0
Perimeter Edge 3	150	0	Shade Evergreen	3 4	Shade Evergreen Ornamental	0 0 0
Perimeter Edge 4	0	**745'	Shade	0	Shade Evergreen Ornamental	0 0 0
Perimeter Edge 5	0	565'	Shade	10	Shade Evergreen Ornamental	4 12 0
Perimeter Edge 6	0	443'	Shade	7	Shade Evergreen Ornamental	5 4 0
Lot 5 Buffer	0	***117'	Shade Evergreen	0 0	Shade Evergreen Ornamental	0 0 0
Credits for existing Vegetation, (Yes, No Linear Feet)	NO	1472'				
Credits for Wall, Fence, or Berm (Yes, No, Linear Feet)	NO	NO				

Comments: Perimeter 5 Receives a Type "B" Buffer Treatment because it Parallels the SWM Area. One shade tree and 1 evergreen tree to be installed along other perimeter locations.
*507 Lf existing vegetation credit.
**745 Lf. existing vegetation credit.
***117 Lf. LOT 5 buffer is deferred until the SDP for this project.

SCHEDULE D
STORMWATER MANAGEMENT AREA LANDSCAPING

Linear Feet of Perimeter	665'
Number of Trees Required Shade Trees Evergreen Trees	Landscape Type "B" 7 9
Credits for Existing Vegetation (No, Yes and %)	30%
Credits for Other Landscaping (No, Yes and %)	NO
Number of Trees Provided*** Shade Trees Evergreen Trees Other Trees (2:1 substitution) Shrubs (10:1 substitution)	5 9 4 0

STREET TREE LANDSCAPING REQUIREMENT

Linear Feet of Roadway	1094'
Number of Trees Required Shade Trees Ornamental Trees	48 0
Credits for Existing Vegetation (No, Yes and %)	29%
Number of Trees Provided Shade Trees Ornamental Trees (2:1 substitution)	46 4

STREET TREE
21 Quercus palustris
25 Acer rubrum

STREET TREE
4 Prunus serrulata 'Kwanzan'

PLANT LIST - FOR SCHEDULES A & D

KEY	QUANT.	BOTANICAL NAME / COMMON NAME	SIZE / COND.	SPACING	REMARKS
SHADE TREES					
QP	5	Quercus palustris / Pin Oak	2 1/2 - 3" B&B	As Shown	Full Crown
LS	16	Liquidambar styraciflua / Sweet Gum	2 1/2 - 3" B&B	As Shown	Full Crown
AR	1	Acer rubrum 'Red Sunset' / Red Sunset Maple	2 1/2 - 3" B&B	As Shown	Full Crown
QR	5	Quercus rubra / Red Oak	2 1/2 - 3" B&B	As Shown	Full Crown
QW	7	Quercus phellos / Willow Oak	2 1/2 - 3" B&B	As Shown	Full Crown
MINOR TREES / EVERGREENS					
PS	23	Pinus strobus / White Pine	6 - 8' B&B	As Shown	Heavy
PA	24	Picea abies / Norway Spruce	6 - 8' B&B	As Shown	Heavy
INS	4	Ilex x 'Nellie R. Stevens' / 'Nellie R. Stevens' Holly	6 - 8' B&B	Multi-Stem	Full
CC	9	Cercis canadensis / Eastern Redbud	8 - 10' B&B	Multi-Stem	Full

PLANT LIST - FOR STREET TREES

KEY	QUANT.	BOTANICAL NAME / COMMON NAME	SIZE / COND.	SPACING	REMARKS
SHADE TREES					
QP	21	Quercus palustris / Pin Oak	2 1/2 - 3" B&B	As Shown	Full Crown
AR	25	Acer rubrum 'Red Sunset' / Red Sunset Maple	2 1/2 - 3" B&B	As Shown	Full Crown
MINOR TREES / EVERGREENS					
PK	4	Prunus serrulata 'Kwanzan' / 'Kwanzan' Cherry	1 3/4 - 2" B&B	As Shown	Full Crown

NOTE: TYPE 'B' BUFFER ON LOT 5 (HOUSE HAS SIDETO ROAD) IS DEFERRED UNTIL THE SDP STAGE FOR THIS PROJECT.

BENCH MARK: # 31DA - SET IN CONCRETE
N 571982.646
E 1372144.970
ELEV. 482.359

NOTE: AS PART OF THE DEVELOPER'S AGREEMENT, THE DEVELOPER IS RESPONSIBLE FOR ALL BUFFER LANDSCAPING AS SHOWN ON THIS PLAN. $18,600.00 surety

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

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APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/27/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

LANDSCAPE PLAN

SCALE: 1" = 50'

NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 24 of 27
F 04 - 181

ZONED R-20 TAX MAP 31

F.04.181

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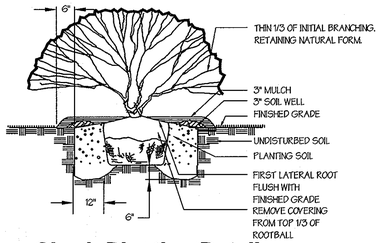
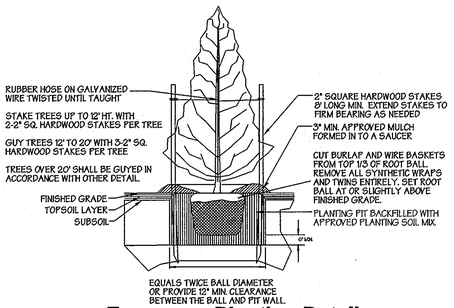


Shrub Planting Detail

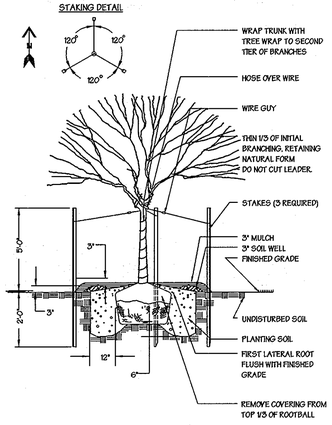
NOT TO SCALE



Evergreen Planting Detail

NOT TO SCALE

STAKING DETAIL



Tree Planting Detail

NOT TO SCALE

PLANTING NOTES

PLANT LOCATIONS SHALL BE FIELD ADJUSTED TO AVOID UTILITIES. CONTRACTOR IS RESPONSIBLE FOR LOCATING UTILITIES PRIOR TO START OF WORK. ALL TREES AND SHRUBS SHALL BE MULCHED TO A MINIMUM OF 18" BEYOND THE EDGE OF THE ROOT BALL. SHRUBS MASSES SHALL BE PLANTED IN CONTINUOUS MULCH BEDS. ALL WIRE, PLASTIC AND TWINE TIES SHALL BE REMOVED FROM TOP OF THE ROOT BALL.

PLANT STANDARDS

ALL NURSERY STOCK SHALL BE TOP QUALITY AND IN ACCORDANCE WITH THE AMERICAN ASSOCIATION OF NURSERYMEN, INC., "AMERICAN STANDARDS FOR NURSERY STOCK", LATEST EDITION. INFERIOR NURSERY STOCK WILL BE SUBJECT TO REJECTION BY THE LANDSCAPE ARCHITECT. BARE-ROOT SHALL NOT BE ALLOWED FOR ANY TREE DEFINED AS MAJOR DECIDUOUS, MINOR DECIDUOUS OR EVERGREEN

CHANGES MAY IMPACT REQUIRED CERTIFICATION

PLANT TYPES (DECIDUOUS TREES, EVERGREEN, ETC.), QUANTITIES, SPACING, LOCATION, AND SPECIES SHOWN ON THE APPROVED LANDSCAPE PLAN ARE BASED ON REQUIREMENTS STATED IN THE LATEST HOWARD COUNTY LANDSCAPE MANUAL ANY CHANGE IN THESE ITEMS MAY AFFECT THE REQUIRED APPROVAL AND CERTIFICATION OF THE INSTALLED PLANTING. OWNER IS REQUIRED TO ARRANGE AND PAY FOR CERTIFICATION BY LANDSCAPE ARCHITECT.

LANDSCAPE SPECIFICATIONS

LANDSCAPE SPECIFICATION SHALL CONFORM TO LCA LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREA, INCLUDING PLANTING PROCEDURES AND SOIL PREPARATION FOR SHRUBS AND PERENNIAL BEDS. A ONE-YEAR WARRANTY PERIOD SHALL BE REQUIRED. MAINTENANCE REQUIRED TO HONOR THE ONE YEAR WARRANTY SHALL BE PERFORMED AS PART OF THIS CONTRACT.

SPECIAL PROVISIONS TO LCA STANDARD SPECIFICATIONS

CONTRACTOR IS ENCOURAGED TO PERFORM SOIL TESTING. TEST RESULTS SHALL BE SUBMITTED 30 DAYS BEFORE PLANTING. FAILURE TO PERFORM TESTING WILL NOT VOID GUARANTEE PROVISIONS.

CONTRACTOR SHALL REVIEW AND TEST SUBSOIL DRAINAGE CHARACTERISTICS 30 DAYS PRIOR TO PLANTING AND NOTIFY OWNER UNACCEPTABLE CONDITIONS.

NO EXCEPTIONS TO THE GUARANTEE PROVISIONS ARE ALLOWED UNLESS AGREED TO IN WRITING PRIOR TO PLANTING.

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPE IN THE AMOUNT OF $18,600.00 IS A PART OF THE DEVELOPER'S AGREEMENT.

PLANTS REQUIRED CALCULATIONS

SHADE TREES	34 @ 300.00 =	10,200.00
EVERGREEN TREES	43 @ 150.00 =	6,450.00
MINOR TREES	13 @ 150.00 =	1,950.00
SHRUBS	0 @ 30.00 =	0
	TOTAL =	$18,600.00

STREET TREE SURETY

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED STREET TREE LANDSCAPE IN THE AMOUNT OF $14,400.00 IS A PART OF THE DEVELOPER'S AGREEMENT.

STREET TREES REQUIRED CALCULATIONS

SHADE TREES	46 @ 300.00 =	13,800.00
EVERGREEN TREES	0 @ 150.00 =	0
MINOR TREES	4 @ 150.00 =	600.00
SHRUBS	0 @ 30.00 =	0
	TOTAL =	$14,400.00

PLANT LIST - FOR SCHEDULES A & D

KEY	QUANT.	BOTANICAL NAME / COMMON NAME	SIZE / COND.	SPACING	REMARKS
SHADE TREES					
QP	5	Quercus palustris / Pin Oak	2 1/2 - 3" B&B	As Shown	Full Crown
LS	16	Liquidambar styraciflua / Sweet Gum	2 1/2 - 3" B&B	As Shown	Full Crown
AR	1	Acer rubrum 'Red Sunset / Red Sunset Maple	2 1/2 - 3" B&B	As Shown	Full Crown
QR	5	Quercus rubra / Red Oak	2 1/2 - 3" B&B	As Shown	Full Crown
QW	7	Quercus phellos / Willow Oak	2 1/2 - 3" B&B	As Shown	Full Crown
MINOR TREES / EVERGREENS					
PS	23	Pinus strobus / White Pine	6 - 8' B&B	As Shown	Heavy
PA	24	Picea abies / Norway Spruce	6 - 8' B&B	As Shown	Heavy
INS	4	Ilex x 'Nellie R. Stevens' / 'Nellie R. Stevens' Holly	6 - 8' B&B	Multi-Stem	Full
CC	9	Cercis canadensis / Eastern Redbud	8 - 10' B&B	Multi-Stem	Full

PLANT LIST - FOR STREET TREES

KEY	QUANT.	BOTANICAL NAME / COMMON NAME	SIZE / COND.	SPACING	REMARKS
SHADE TREES					
QP	21	Quercus palustris / Pin Oak	2 1/2 - 3" B&B	As Shown	Full Crown
AR	25	Acer rubrum 'Red Sunset / Red Sunset Maple	2 1/2 - 3" B&B	As Shown	Full Crown
MINOR TREES / EVERGREENS					
PK	4	Prunus serrulata 'Kwanzan' / 'Kwanzan' Cherry	1 3/4 - 2" B&B	As Shown	Full Crown

DEVELOPER'S / BUILDER'S CERTIFICATION

I / WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I / WE FURTHER CERTIFY THAT UPON COMPLETION A CERTIFICATION OF LANDSCAPE INSATALLATION, ACCOMPAINED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTEDTO THE DEPARTMENT OF PLANNING AND ZONING.

John W. Bowers — NAME — 3/21/05 — DATE

JOHN N. BOWERS, JR — PRINT NAME

NOTE:
THE OWNER, TENANT, AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

BOARD OF EXAMINERS OF LANDSCAPE ARCHITECTS — 1001 — LICENSED LANDSCAPE ARCHITECT — STATE OF MARYLAND

OWNERS

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410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/05
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/20/05

DESIGNED: G.D.T., K.E., P.C.
DRAWN: K.E.
CHECKED: P.C.

LANDSCAPE NOTES, DETAILS CERTIFICATION

SCALE: AS SHOWN

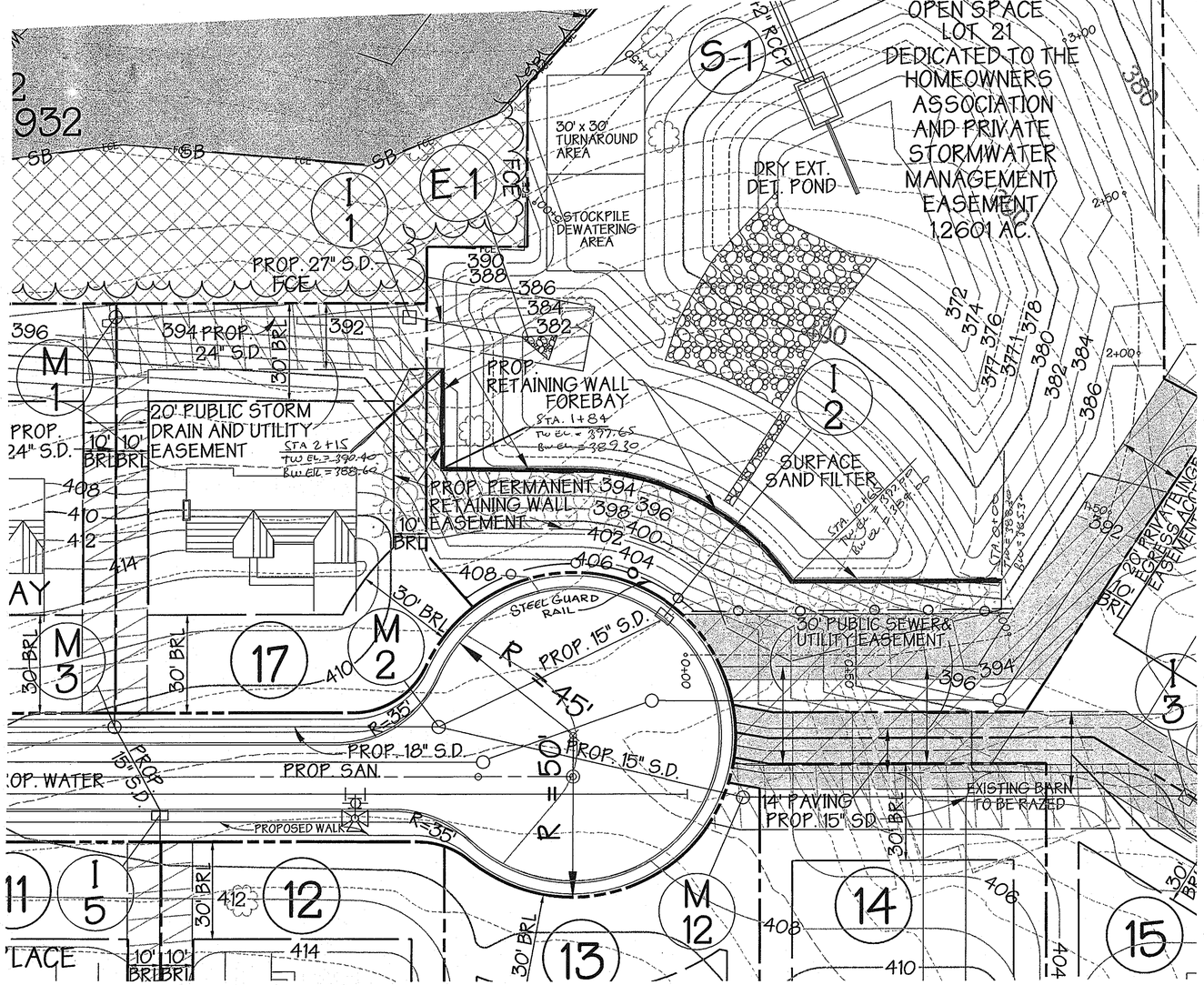
NOTTINGHAM WAY ACRES

HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04

SHEET 25 of 27
F 04 - 181

ZONED R-20 — TAX MAP 31

F. 04.181



WALL LOCATION PLAN

SCALE: 1" = 20'

NOTES:

1.) No trees shall be planted within 10 feet of the top of the retaining wall.
2.) Retaining walls shall only be constructed under the observation of a registered professional engineer and a (NICET, WACEL, or equiv.) certified soils technician.
3.) The required bearing pressure beneath the wall system shall be verified in the field by a certified soils technician. Testing documentation must be provided to the Howard County Inspector prior to start of construction. The required bearing test shall be the Dynamic Cone Penetrometer test ASTM STP-399.
4.) The suitability of fill material shall be confirmed by the on-site soils technician. Each 8" lift must be compacted to a minimum 95 % standard proctor density and the testing report shall be made available to the Howard County Inspector upon completion of construction.
5.) One soil boring is required every one hundred feet along the length of the wall. Copies of the boring reports shall be provided to the Howard County Inspector prior to the start of the construction.

SPECIFICATIONS

KEYSTONE MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 Description

A. Work shall consist of furnishing and construction of a KEYSTONE Retaining Wall System in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.
B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.
C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

1.02 Delivery, Storage and Handling

A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.
B. Contractor shall protect all materials from damage due to job site conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

PART 2: PRODUCTS

2.01 Modular Concrete Retaining Wall Units

A. Modular concrete units shall conform to the following architectural requirements:
face color - concrete grey - standard manufacturers' color may be specified by the Owner.
face finish - sculptured rock face in angular tri-planer configuration. Other face finishes will not be allowed without written approval of Owner.
bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 10 feet under diffused lighting.
B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.
C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:
compressive strength = 3000 psi minimum;
absorption = 8 % maximum (6 % in northern states) for standard weight aggregates;
dimensional tolerances = ± 1/8" from nominal unit dimensions not including rough split face, ±1/16" unit height - top and bottom planes;
unit size - 8" (H) x 18" (W) x 12" (D) minimum;
unit weight - 75 lbs/unit minimum for standard weight aggregates;
inter-unit shear strength - 1000 plf minimum at 2 psi normal pressure;
geogrid/unit peak connection strength - 1000 plf minimum at 2 psi normal force.
D. Modular concrete units shall conform to the following constructability requirements:
vertical setback = 1/8"± per course (near vertical) or 1"+ per course per the design;
alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;
maximum horizontal gap between erected units shall be - 1/2 inch.

2.02 Shear Connectors

A. Shear connectors shall be 1/2 inch diameter thermoset isophthalic polyester resin-protruded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to + 100 degrees F.
B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

2.03 Base Leveling Pad Material

A. Material shall consist of a compacted #57 crushed stone base as shown on the construction drawings.

2.04 Unit Drainage Fill

A. Unit drainage fill shall consist of #57crushed stone
B. One cubic foot, minimum, of drainage fill shall be used for each square foot of wall face. Drainage fill shall be placed within cores of, between, and behind units to meet this requirement.

2.05 Reinforced Backfill

A. Reinforced backfill shall type SM, be free of debris and meet the following gradation tested in accordance with ASTM D-422 and meet other properties shown on the plan:

Sieve Size	Percent Passing
2 inch	100-75
3/4 inch	100-75
No. 40	0-60
No. 200	0-50

Plasticity Index (PI) <15 and Liquid Limit <40 per ASTM D-4318.
B. Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the reinforced soil mass.

2.06 Geogrid Soil Reinforcement

A. Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn.

2.07 Drainage Pipe

A. The drainage pipe shall be perforated corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

PART 3 EXECUTION

3.01 Excavation

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Owner's representative shall be responsible for inspecting and approving the excavation prior to placement of leveling material or fill soils.

3.02 Base Leveling Pad

A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6" in front and behind the modular wall unit.
B. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.03 Modular Unit Installation

A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.
B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.
C. Install shearconnecting devices per manufacturer's recommendations.
D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.
E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed three courses.

3.04 Structural Geogrid Installation

A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.
B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.
C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to backfill placement on the geogrid.
D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

3.05 Reinforced Backfill Placement

A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 - 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.
C. Reinforced backfill shall be compacted to 95 % of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be + 3% to - 3% of optimum.
D. Only lightweight hand-operated equipment shall be allowed within 3 feet from the tail of the modular concrete unit.
E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.
G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3.06 Cap Installation

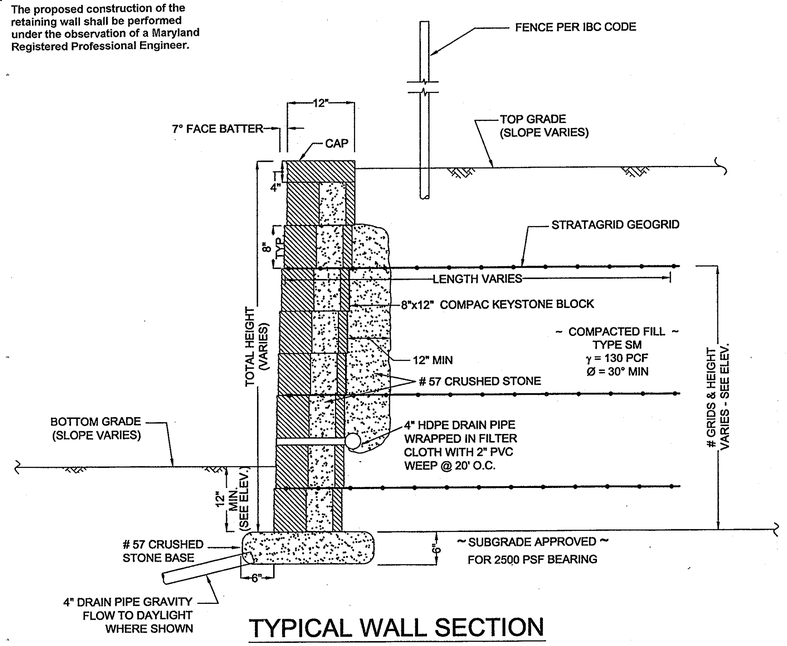
A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

3.07 Field Quality Control

A. The Owner shall engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction.
B. As a minimum, quality assurance testing should include foundation soil inspection, soil and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications.

Note:
Foundation soils must be examined by the soils engineer to assure the actual foundation soil strength meets or exceeds assumed design strengths.

Note:
The proposed construction of the retaining wall shall be performed under the observation of a Maryland Registered Professional Engineer.



TYPICAL WALL SECTION

N.T.S.

STATE OF MARYLAND DAVID ALAN MASON No. 21449 PROFESSIONAL ENGINEER

FOR REVISIONS BY BENCHMARK ENGINEERING, INC. DATED 10/31/07

No.	DATE	REVISION
1	10-31-07	ADD GUARD RAIL AT CUL-DE-SAC

HILLIS-CARNES
ENGINEERING ASSOCIATES, INC.
12011 Guilford Road Suite 106, Annapolis Junction, Maryland 20701
Balto. (410) 880-4788 D.C. (301) 470-4239, Fax (410) 880-4098

HCEA JOB # 04513-A

GEORGE W. STEPHENS, JR. AND ASSOCIATES, INC.
Civil Engineers and land Surveyors
1020 Cromwell Bridge Road
Towson, Maryland 21204
(410) 825-8120

STATE OF MARYLAND DONALD WARREN STUDENMENT No. 21414 PROFESSIONAL ENGINEER

OWNERS

PARCEL 25, LOT 2
MICHAEL L. WASHINGTON
916 FROG MORTAR ROAD
BALTIMORE, MD 21220-4304

PARCEL 751, LOT 4
NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204

DEVELOPER

NOTTINGHAM WAY ACRES, LLC
100 WEST PENNSYLVANIA AVE.
TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-08

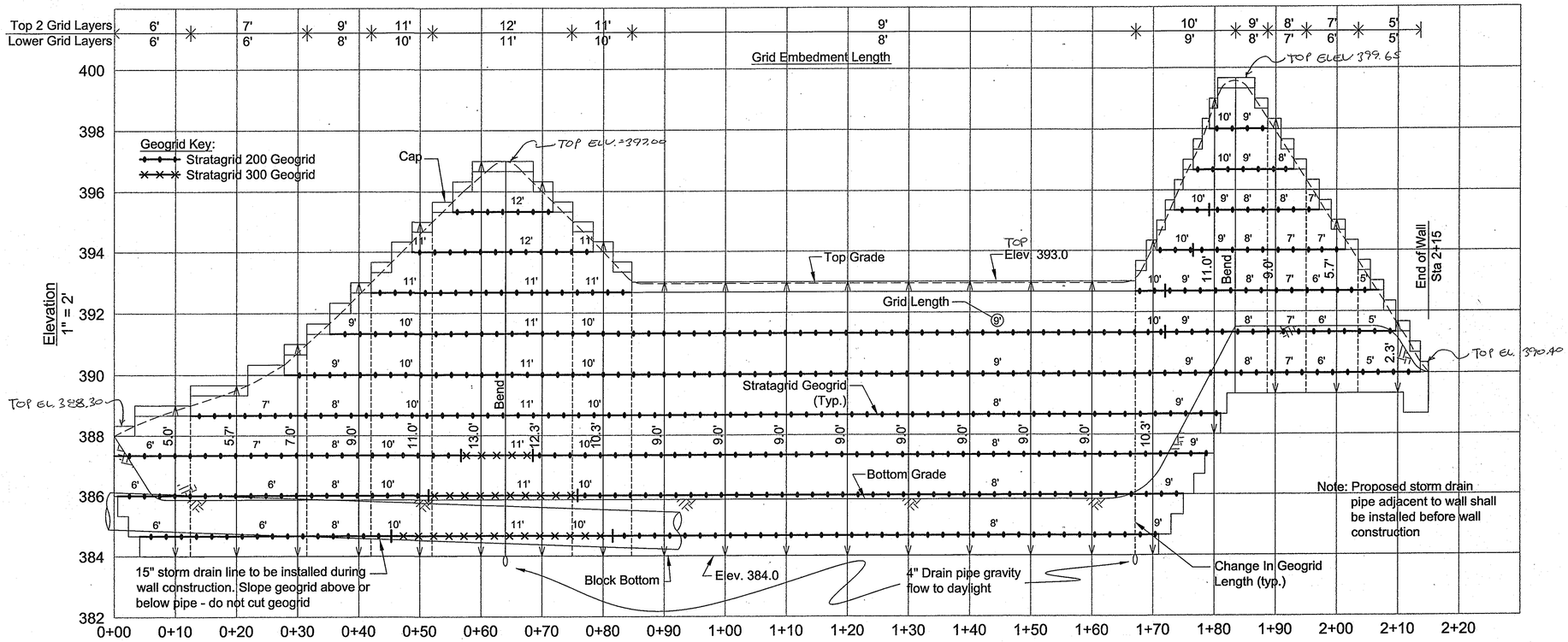
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/24/06
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/25/06

DESIGNED:	HM
DRAWN:	AM
CHECKED:	RWS

SWM POND RETAINING WALL CONSTRUCTION DETAILS
SCALE: AS SHOWN

NOTTINGHAM WAY ACRES
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 05/19/04
SHEET 26 of 27
F 04 - 181
ZONED R-20 TAX MAP 31

F-04-181



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TOWSON, MD 21204
410-825-0545

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE: 5-17-05

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE: 5/20/15
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE: 5/23/05

DESIGNED: HM
DRAWN: AM
CHECKED: RWS

SWM POND RETAINING WALL ELEVATIONS
SCALE: AS SHOWN

NOTTINGHAM WAY ACRES
HOWARD COUNTY, MARYLAND
ELECTION DISTRICT # 2
DATE - 11/12/04
SHEET 27 of 27
F 04 - 181
ZONED R-20 TAX MAP 31

F.04.181