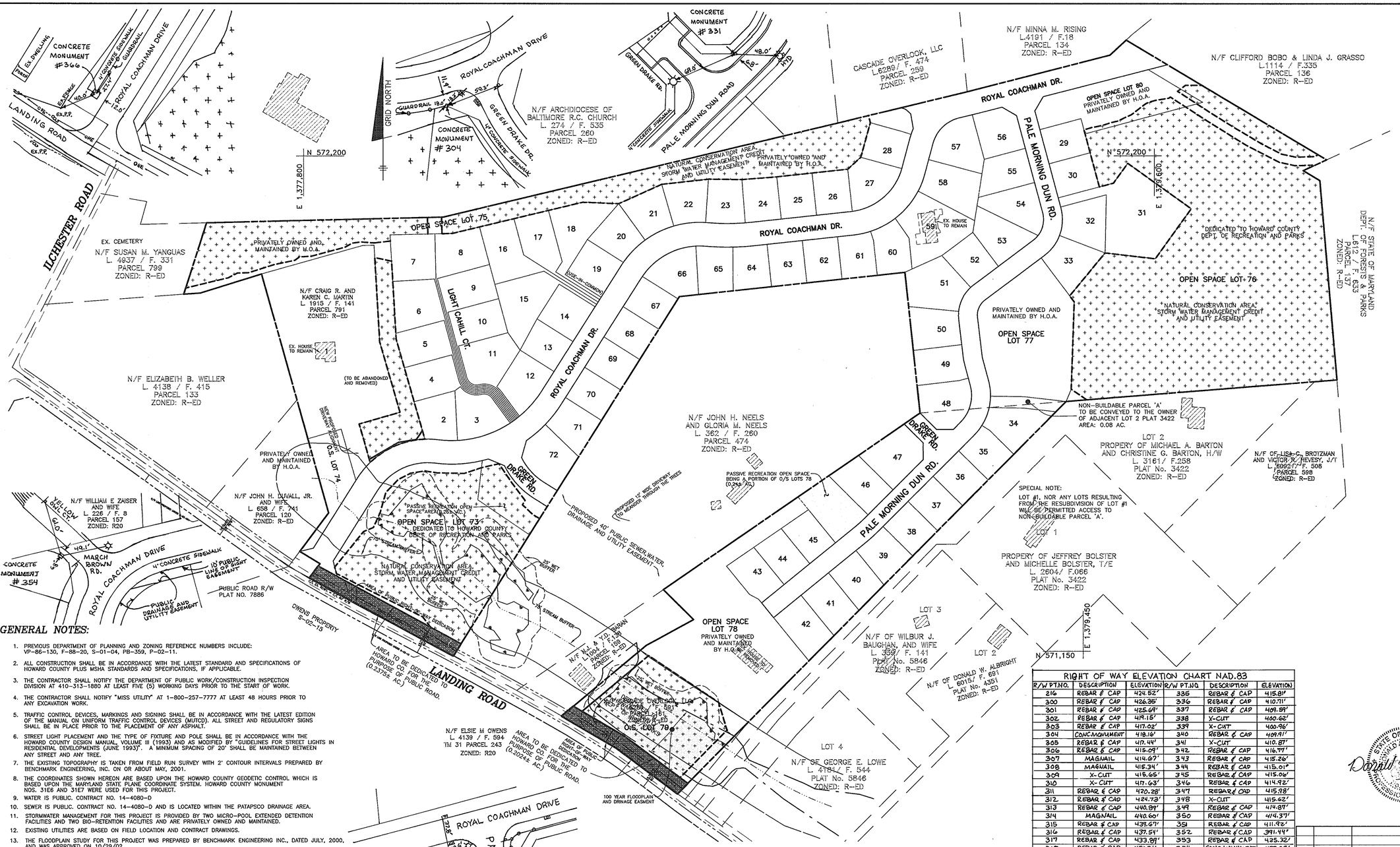


VICINITY MAP
SCALE: 1" = 2000'

BENCH MARKS NAD'83

HO. CO. #31E6
3/4" REBAR 0.5' BELOW SURFACE
5' SOUTHWEST OF ILCHESTER ROAD PAVING
500'± WEST OF WHARF LANE.
N 570852.3717' E 1376700.6467'

HO. CO. #31E7
3/4" REBAR 0.5' BELOW SURFACE
9' SOUTHEAST OF ILCHESTER ROAD PAVING
250'± WEST OF BEECHWOOD ROAD
N 572335.3503' E 1377504.0332'

HO. CO. BM#2745004 ELEV. 364.78'
USED FOR VERTICAL CONTROL.

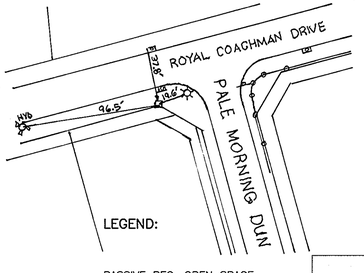
SHEET INDEX

NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD PLAN AND DETAILS
3	ROAD PLAN AND DETAILS
4	ROAD PLAN AND DETAILS
5	ROAD PROFILES AND DETAILS
6	ROAD PROFILES AND DETAILS
7	ROAD PROFILES AND DETAILS
8	ROAD PROFILES AND DETAILS
9	ROAD PROFILES AND DETAILS
10	ROAD PROFILES
11	ROAD PROFILES
12	STORM DRAINAGE AREA MAP AND DETAILS
13	STRUCTURE AND PIPE SCHEDULES
14	STORM DRAIN PROFILES
15	STORM DRAIN PROFILES
16	GRADING, EROSION AND SEDIMENT CONTROL PLAN
17	GRADING, EROSION AND SEDIMENT CONTROL PLAN
18	GRADING, EROSION AND SEDIMENT CONTROL PLAN
19	GRADING, EROSION AND SEDIMENT CONTROL DETAILS
20	TEMPORARY SWM POST #1
21	TEMPORARY SWM BASIN #3, PROFILES AND SEDIMENT CONTROL DETAILS
22	STORMWATER MANAGEMENT DETAILS POND #1
23	STORMWATER MANAGEMENT DETAILS POND #2
24	EROSION AND SEDIMENT CONTROL DETAILS & SWM NOTES
25	STORMWATER MANAGEMENT BORING REPORTS
26	LANDSCAPE PLAN
27	LANDSCAPE (BIO-RETENTION #1) PLAN
28	LANDSCAPE (BIO-RETENTION #2) PLAN
29	FOREST CONSERVATION PLAN
30	FOREST CONSERVATION NOTES AND DETAILS
31	ENTRANCE AND STRIPPING PLAN
32	LANDING ROAD CROSS-SECTIONS
33	SWM LANDSCAPING PLAN AND PLANTING DETAILS

GENERAL NOTES:

1. PREVIOUS DEPARTMENT OF PLANNING AND ZONING REFERENCE NUMBERS INCLUDE: VP-86-130, F-88-20, S-01-04, PB-359, P-02-11.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARD AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
3. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORK/CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
4. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
5. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
6. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)". A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET AND ANY TREE.
7. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH 2' CONTOUR INTERVALS PREPARED BY BENCHMARK ENGINEERING, INC. ON OR ABOUT MAY, 2001.
8. 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. 31E6 AND 3167 WERE USED FOR THIS PROJECT.
9. WATER IS PUBLIC. CONTRACT NO. 14-4080-D
10. SEWER IS PUBLIC. CONTRACT NO. 14-4080-D AND IS LOCATED WITHIN THE PATAPSCO DRAINAGE AREA.
11. STORMWATER MANAGEMENT FOR THIS PROJECT IS PROVIDED BY TWO MICRO-POOL EXTENDED DETENTION FACILITIES AND TWO BIO-RETENTION FACILITIES AND ARE PRIVATELY OWNED AND MAINTAINED.
12. EXISTING UTILITIES ARE BASED ON FIELD LOCATION AND CONTRACT DRAWINGS.
13. THE FLOODPLAIN STUDY FOR THIS PROJECT WAS PREPARED BY BENCHMARK ENGINEERING INC., DATED JULY, 2000, AND WAS APPROVED ON 10/29/02.
14. THE WETLANDS DELINEATION FOR THIS PROJECT WAS PREPARED BY ECO-SCIENCE PROFESSIONALS AND WAS APPROVED ON 10/29/02.
15. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
16. SITE HAS BEEN INCORPORATED INTO THE METROPOLITAN DISTRICT, ON FEBRUARY 3, 2003, DECISION NO. 4-2003.
17. ALL LANDSCAPING REQUIREMENTS, AS SET FORTH IN THE LANDSCAPE MANUAL, SHALL BE FULFILLED.
18. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON-SITE.
19. SEDIMENT CONTROL SHALL BE PROVIDED FOR THIS PROJECT.
20. ALL ROAD FILLS SHALL BE COMPACTED TO 95% AS DETERMINED BY AASHTO T-180.
21. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING IN THE AREA OF ANY OVERHEAD POWERLINES.
22. THE PROPOSED STREAM CROSSING FOR THE PURPOSE OF CONSTRUCTING THE ENTRANCE ROAD HAS BEEN DETERMINED TO BE ESSENTIAL, PER SECTION 16.116(c). THE DESIGN OF PROPOSED ENTRANCE ROAD MUST MINIMIZE ENVIRONMENTAL DISTURBANCE, PER SECTION 16.116(c)(10).
23. A WAIVER FROM SECTION 2.4.1 OF THE DESIGN MANUAL WAS APPROVED ON FEBRUARY 28, 2002. THE WAIVER PROVIDES RELIEF FROM THE TYPICAL ROAD SECTION ALONG A PORTION OF ROYAL COACHMAN DRIVE.
24. LANDING ROAD IS A SCENIC ROADWAY.
25. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $49,650.00.
26. FINANCIAL SURETY FOR THE FOREST CONSERVATION PLANTINGS WILL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT. RETENTION $0.20 X 10.6 ACRES = $92,347.20 AND REFORESTED $0.50 X 1.0 ACRES = 0.05 ACRES CREDIT FOR LANDSCAPING = $20,691.00; 10/01/03 $113,038.00.
27. PROJECT IS SUBJECT TO THE 4th EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
28. MARYLAND DEPARTMENT OF THE ENVIRONMENT, APPLICATION TRACKING NUMBER 03-NT-0297/200364843, FOR LETTER OF AUTHORIZATION FOR ROAD CROSSING AND UTILITY CROSSING OF EXISTING STREAM AND WETLANDS.

LOCATION PLAN
SCALE: 1" = 100'



LEGEND:
- PASSIVE REC. OPEN SPACE
- FOREST CONSERVATION EASEMENT
- 100 YEAR FLOOD PRONE LIMIT
- EXISTING STREAM

CENTERLINE CURVE DATA

ROAD	STATION	RADIUS	LENGTH	TANGENT	DELTA	CHORD
ROYAL COACHMAN DRIVE	2+35.27 TO 4+06.02	150.00'	170.74'	95.96'	65°13'06"	N64°42'16"E 161.67'
	4+06.02 TO 6+89.61	250.00'	283.59'	159.25'	64°59'38"	N64°49'01"E 268.63'
	10+03.94 TO 11+92.37	172.00'	188.42'	104.92'	62°46'00"	S55°51'14"E 48.56'
	11+92.37 TO 12+90.19	500.00'	97.82'	49.07'	11°12'35"	N89°28'54"E 97.67'
	15+01.72 TO 16+82.14	150.00'	180.42'	102.93'	68°54'55"	N49°25'09"E 169.74'
	17+50.03 TO 18+57.26	100.00'	107.24'	59.43'	61°26'31"	N45°40'57"E 102.17'
PALE MORNING DUN ROAD	2+63.08 TO 3+52.34	75.00'	89.26'	50.77'	68°11'29"	S19°03'26"W 84.09'
	5+09.88 TO 5+72.71	60.00'	62.83'	34.64'	60°00'00"	S23°09'10"W 60.00'
	6+52.32 TO 6+66.74	100.00'	14.42'	7.22'	08°15'46"	S10°58'43"E 14.41'
	7+11.92 TO 8+16.64	100.00'	104.72'	57.74'	60°00'00"	S14°53'24"W 100.00'
	11+04.97 TO 11+36.39	300.00'	31.42'	15.72'	06°00'00"	S47°53'24"W 31.40'
GREEN DRAKE ROAD	0+47.78 TO 1+32.04	150.00'	84.26'	43.27'	32°11'02"	S41°44'52"E 83.15'
FUTURE ALIGNMENT	2+82.00 TO 3+52.41	50.00'	70.41'	42.47'	80°41'06"	N81°49'04"E 64.74'
	7+47.79 TO 10+33.10	175.00'	285.32'	185.75'	93°24'53"	N88°10'57"E 254.75'
LIGHT CAHILL COURT	0+91.46 TO 1+29.86	32.00'	38.39'	21.89'	68°44'40"	N70°48'03"W 36.13'
	1+29.86 TO 1+77.05	30.00'	47.19'	30.07'	90°08'05"	N60°06'21"W 42.48'

RIGHT OF WAY ELEVATION CHART NAD.83

R/W PT.NO.	DESCRIPTION	ELEVATION	R/W PT.NO.	DESCRIPTION	ELEVATION
216	REBAR & CAP	424.62'	335	REBAR & CAP	415.81'
300	REBAR & CAP	426.35'	336	REBAR & CAP	410.71'
301	REBAR & CAP	425.69'	337	REBAR & CAP	409.59'
302	REBAR & CAP	419.15'	338	X-CUT	410.62'
303	REBAR & CAP	417.02'	339	X-CUT	410.96'
304	CONC.MONUMENT	418.16'	340	REBAR & CAP	409.91'
305	REBAR & CAP	417.44'	341	X-CUT	410.87'
306	REBAR & CAP	415.09'	342	REBAR & CAP	416.77'
307	MAGNAIL	414.67'	343	REBAR & CAP	415.26'
308	MAGNAIL	415.34'	344	REBAR & CAP	415.01'
309	X-CUT	418.65'	345	REBAR & CAP	415.04'
310	X-CUT	417.63'	346	REBAR & CAP	414.92'
311	REBAR & CAP	420.28'	347	REBAR & CAP	415.98'
312	REBAR & CAP	424.73'	348	X-CUT	415.62'
313	REBAR & CAP	440.89'	349	REBAR & CAP	414.87'
314	MAGNAIL	440.60'	350	REBAR & CAP	414.37'
315	REBAR & CAP	439.67'	351	REBAR & CAP	411.92'
316	REBAR & CAP	437.54'	352	REBAR & CAP	391.44'
317	REBAR & CAP	433.59'	353	REBAR & CAP	425.32'
318	REBAR & CAP	430.91'	354	CONC.MONUMENT	421.29'
319	REBAR & CAP	426.26'	355	REBAR & CAP	427.85'
321	CONC.MONUMENT	419.50'	356	REBAR & CAP	430.22'
322	REBAR & CAP	414.79'	357	REBAR & CAP	431.13'
323	MAGNAIL	415.32'	358	REBAR & CAP	433.82'
324	REBAR & CAP	416.15'	359	REBAR & CAP	437.50'
325	REBAR & CAP	416.22'	360	MAGNAIL	437.56'
326	REBAR & CAP	416.98'	361	REBAR & CAP	440.42'
327	REBAR & CAP	415.33'	362	REBAR & CAP	440.49'
328	REBAR & CAP	415.11'	363	REBAR & CAP	425.23'
329	REBAR & CAP	415.37'	364	REBAR & CAP	417.24'
330	REBAR & CAP	416.33'	365	REBAR & CAP	410.80'
331	CONC.MONUMENT	416.47'	366	CONC.MONUMENT	425.72'
332	REBAR & CAP	417.31'	210	REBAR & CAP	421.55'
333	REBAR & CAP	423.71'	225	SPIKE	406.49'
334	REBAR & CAP	417.35'	233	REBAR & CAP	399.36'

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/3/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/2/03

STATE OF MARYLAND — DONALD ALAN MASON — 21443 — PROFESSIONAL ENGINEER — 4-25-11

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 4-25-11

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

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

STATE OF MARYLAND — DONALD ALAN MASON — 21443 — PROFESSIONAL ENGINEER — 12/5/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 & 11, PARCELS 160,161, 788, & 791
1st ELECTION DISTRICT - HOWARD COUNTY, MARYLAND

TITLE: TITLE SHEET
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: DECEMBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 1 OF 33

AS-BUILT

F-03-134

\\tsalvol1\engineer\projects\1383 PFAU\dwg\7009S01R.dwg, Title Sheet, 12/5/2003 8:19:37 AM, Administrator

GRID NORTH

ILCHESTER ROAD

N 572,200

E 1,377,650

N/F ARCHDIACESE OF BALTIMORE R.C. CHURCH
L. 274 / F. 535
PARCEL 260
ZONED: R-ED

N 572,200

E 1,378,450

20' PUBLIC UTILITY ESMT.

NATURAL CONSERVATION AREA
STORM WATER MANAGEMENT CREDIT
AND UTILITY EASEMENT

FOREST CONSERVATION EASEMENT #2

MATCH LINE SHEET 3

EX. CEMETERY

N/F SUSAN M. YANGUAS
L. 4837 / F. 331
PARCEL 798
ZONED: R-ED

OPEN SPACE P/O LOT 75
N/F CLIFFORD T. BOSS
PRIVATELY OWNED AND MAINTAINED BY H.O.A.
L. 2073 / F. 464
PARCEL 788
ZONED: R-ED

FOREST CONSERVATION EASEMENT #2

EX. DRIVEWAY TO BE REMOVED

N/F CRAIG R. AND KAREN C. MARTIN
L. 1915 / F. 141
PARCEL 791
ZONED: R-ED

NOTE: EXISTING WELL TO BE ABANDONED AFTER WATER SYSTEM IS INSTALLED AND CONNECTED

EX. WELL

EX. HOUSE TO REMAIN

NOTE: EXISTING SEPTIC TO BE ABANDONED AFTER CONNECTION TO PROPOSED SANITARY SEWER SYSTEM

EX. SEPTIC

NOTE: NEW ALIGNMENT TO BE INSTALLED DURING INITIAL ROAD CONSTRUCTION OF ROYAL COACHMAN DRIVE.

N/F ELIZABETH B. WELLER
L. 4138 / F. 415
PARCEL 133
ZONED: R-ED

EXISTING PAVING

LANDING ROAD - 30' WIDE
(MINOR COLLECTOR 60' ULT. R/W)
(SCENIC ROAD)

N/F WILLIAM E ZAISER
AND WIFE
L. 226 / F. 8
PARCEL 157
ZONED: R20

R/W LINE PROPOSED UNDER S-03-004

EXISTING R/W PLAT NO. 7588

C/L EX. RDWY. = C/L 60' R/W

PROP. 10' DECEL LANE

EXISTING CENTERLINE

EXISTING 30' PERSCRIPTIVE RIGHT-OF-WAY

OWENS PROPERTY
S-02-15

N/F ELSIE M OWENS
L. 4139 / F. 584
TM 31 PARCEL 243
ZONED: R20

E 1,377,650
N 571,150

NOTE: SEE SHEET NO. 31 FOR LANDING ROAD IMPROVEMENTS

OPEN SPACE LOT 74
PRIVATELY OWNED AND MAINTAINED BY H.O.A.

END GUARDRAIL STA. 2+33 RIGHT PLACE END TREATMENT PER SHA MD 605-03

EX. DRAINAGE EASEMENT

N/F JOHN H. DUVALL, JR. AND WIFE
L. 650 / F. 741
PARCEL 120
ZONED: R-ED

EX. DWELLING TO BE REMOVED

LOCATION OF EXISTING UNDERGROUND ELECTRIC

BEGIN GUARDRAIL STA. 0+92 RIGHT PLACE END TREATMENT PER SHA MD 605-03

EXISTING UTILITY POLE TO BE RELOCATED BEHIND PROPOSED WALK

OPEN SPACE LOT
DEDICATED TO HOWARD COUNTY
DEPARTMENT OF RECREATION AND PARKS

FOREST CONSERVATION EASEMENT #1

NATURAL CONSERVATION AREA
STORM WATER MANAGEMENT CREDIT
AND UTILITY EASEMENT

AREA TO BE DEDICATED TO HOWARD CO. FOR THE PURPOSE OF PUBLIC ROAD, SEE S-02-15 FOR EXISTING AND PROPOSED R/W

CONCRETE SIDEWALK

LIGHT CAHILL CT.

GREEN DRAKE RD.

ROYAL COACHMAN DR.

TEE TURN-AROUND HO. CO. STD. R-5.60

TEE TURN-AROUND HO. CO. STD. R-5.05

TOP ELEV. = 438.77
INV OUT = 434.05

TOP ELEV. = 437.13
INV IN = 434.78
INV OUT 434.45

TOP ELEV. @ I-8 = 419.33
INV. IN = 416.41
INV. OUT = 416.29
INV. THROAT = 418.51

TOP ELEV. @ I-7 =
INV. IN = 415.70
INV. OUT = 415.78

TOP ELEV. @ I-9 = 419.31
INV. OUT = 416.73

TOP ELEV. @ I-5 = 416.82
INV. OUT = 413.81

TOP ELEV. @ I-4 = 416.78
INV. IN = 413.30
INV. OUT = 413.30

TOP ELEV. @ I-12 = 436.56'
INV. IN = 433.28'
INV. OUT = 433.17'

TOP ELEV. @ I-10 = 430.27'
INV. IN (NE) = 423.19'
INV. IN (SE) = 423.26'
INV. OUT = 423.00'

TOP ELEV. @ I-11 = 425.70'
INV. OUT = 424.15'

TOP ELEV. @ 6A = 425.00'
INV. IN = 421.35'
INV. OUT = 421.25'

TOP ELEV. @ I-6 = 422.27'
INV. IN (NE) = 416.15'
INV. IN (NW) = 415.42'
INV. OUT = 415.33'

TOP ELEV @ I-1 = 415.35
INV OUT = 411.62

10'x20' REVERTIBLE TEE TURN AROUND ESM'T.

TEMPORARY TEE TURN AROUND HO. CO. STD R-5.05

LIMIT OF SUBMISSION CL STATION 1+65.39

DEAD END BARRICADE (TYPE A OR HO. CO. STD R-7.10.) SEE DETAIL R 5.06 FOR PLACEMENT OF BARRICADE. SPECIAL NOTE: OMIT BARRICADE IN AREA OF PROPOSED DRIVEWAY.

TOP ELEV @ I-2 = 415.12
INV IN = 411.21 (FROM I-1)
INV OUT = 408.10 (MH-1)
INV IN = 408.26 (East)

TOP ELEV @ MH-1 = 415.65
INV IN = 408.26
INV OUT 408.00

MATCH LINE SHEET 4

MATCH LINE SHEET 4

NOTE: FOR CENTERLINE ROAD CURVE DATA SEE SHEET 1

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

1) NO EXCESS FILL CONSTRUCTION MATERIAL OR DEBRIS SHALL BE STOCKPILED OR STORED IN NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOOD PLAIN.

2) PLACE MATERIALS IN A LOCATION AND MANNER THAT DOES NOT ADVERSELY IMPACT SURFACE OR SUBSURFACE WATER FLOW INTO OR OUT OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOOD PLAIN.

3) DO NOT USE THE EXCAVATED MATERIAL AS BACKFILL IF IT CONTAINS WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE. IF ADDITIONAL BACKFILL IS REQUIRED, USE CLEAN MATERIAL FREE OF WASTE METAL PRODUCTS, UNSIGHTLY DEBRIS, TOXIC MATERIAL, OR ANY OTHER DELETERIOUS SUBSTANCE.

4) PLACE HEAVY EQUIPMENT ON MATS OR SUITABLY OPERATE THE EQUIPMENT TO PREVENT DAMAGE TO NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, WATERWAYS, OR THE 100-YEAR FLOODPLAIN.

5) REPAIR AND MAINTAIN ANY SERVICEABLE STRUCTURE OR FILL SO THERE IS NO PERMANENT LOSS OF NONTIDAL WETLANDS, NONTIDAL WETLAND BUFFERS, OR WATERWAYS OR PERMANENT MODIFICATION OF THE 100-YEAR FLOODPLAIN IN EXCESS OF THAT LOST UNDER THE ORIGINALLY AUTHORIZED STRUCTURE OR FILL.

6) RECTIFY ANY NONTIDAL WETLANDS, WETLAND BUFFERS, WATERWAYS, OR 100 YEAR FLOODPLAIN TEMPORARILY IMPACTED BY ANY CONSTRUCTION.

7) ALL STABILIZATION IN THE NONTIDAL WETLAND AND NONTIDAL WETLAND BUFFER SHALL CONSIST OF THE FOLLOWING SPECIES: ANNUAL RYE - GRASS (LOLIUM MULTIFLORUM), MILLET (SETARIA ITALICA), BARLEY (HORDEUM SP.), OATS (AVENA SP.), AND/OR RED FESCUE (FESTUCA RUBRA). THESE SPECIES WILL ALLOW FOR THE STABILIZATION OF THE SITE WHILE ALSO ALLOWING FOR THE VOLUNTARY REVEGETATION OF NATIVE WETLAND SPECIES. OTHER NON-PERSISTENT VEGETATION MAY BE ACCEPTABLE BUT MUST BE APPROVED BY THE NONTIDAL WETLANDS AND WATERWAYS DIVISION. KENTUCK 31 FESCUE SHALL NOT BE UTILIZED IN NETWORK OR CHESAPEAKE AREAS. THE AREA SHOULD BE SEEDED AND MULCHED TO REDUCE EROSION AFTER CONSTRUCTION ACTIVITIES HAVE BEEN COMPLETED.

8) AFTER INSTALLATION HAS BEEN COMPLETED, MAKE POST-CONSTRUCTION GRADES AND ELEVATIONS THE SAME AS THE ORIGINAL GRADES AND ELEVATIONS IN TEMPORARILY IMPACTED AREAS.

9) TO PROTECT AQUATIC SPECIES IN-STREAM WORK IS PROHIBITED AS DETERMINED BY THE CLASSIFICATION OF THE STREAM:

USE I WATERS: IN STREAM WORK SHALL NOT BE CONDUCTED DURING THE PERIOD MARCH 1 THROUGH JUNE 15, INCLUSIVE DURING ANY YEAR.

10) STORMWATER RUNOFF FROM IMPERVIOUS SURFACES SHALL BE CONTROLLED TO PREVENT THE WASHING OF DEBRIS INTO THE WATERWAYS.

11) CULVERTS SHALL BE CONSTRUCTED AND ANY RIPRAP PLACED SO AS NOT TO OBSTRUCT THE MOVEMENT OF AQUATIC SPECIES UNLESS THE PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER.

LEGEND:

- PROPOSED GUARDRAIL =
- PROPOSED CONC. SIDEWALK =
- PROPOSED STORM DRAIN PIPE =
- PROPOSED CATCH BASIN =
- EXISTING WETLANDS =
- PROPOSED ROAD SIGN =
- PROPOSED STREET LIGHT =
- FOREST CONSERVATION EASEMENT =
- NATURAL CONSERVATION AREA = STORM WATER MANAGEMENT CREDIT AND UTILITY EASEMENT
- PUBLIC DRAINAGE EASEMENT =
- LINE OF SIGHT EASEMENT =

NOTE: ALL ROADS ARE TO BE PUBLIC ROADS

STREET LIGHT SCHEDULE

SYMBOL	LOCATION		DESCRIPTION
☼	ROYAL COACHMAN DR.	CL STA. 0+28 OFFS. 30' RIGHT	150 WATT HPS PENDANT FIXTURE (CUTOFF) MOUNTED ON 25' GALVANIZED STEEL POLE USING A 6' ARM
☼	ROYAL COACHMAN DR.	CL STA. 3+15 OFFS. 16' LEFT	100 WATT HPS VAPOR TRADITIONAIRE POST TOP MOUNTED ON 14' BLACK FIBERGLASS POLE
		CL STA. 5+26 OFFS. 17.5' RIGHT	
		CL STA. 6+25 OFFS. 18' LEFT	
		CL STA. 9+46 OFFS. 16' LEFT	

PLAN VIEW
SCALE: 1" = 50'

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 3-25-11

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 4-25-11

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/12/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION M&J — DATE 12/24/03

NO	DATE	REVISION
2	5-25-04	REVISE HDPEP TO RCCP CL IV
1	2-5-04	ADD 18" HDPE CULVERT AND MANAGEMENT PRACTICES NOTES

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11, PARCELS 160, 161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: ROAD PLAN AND DETAILS
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

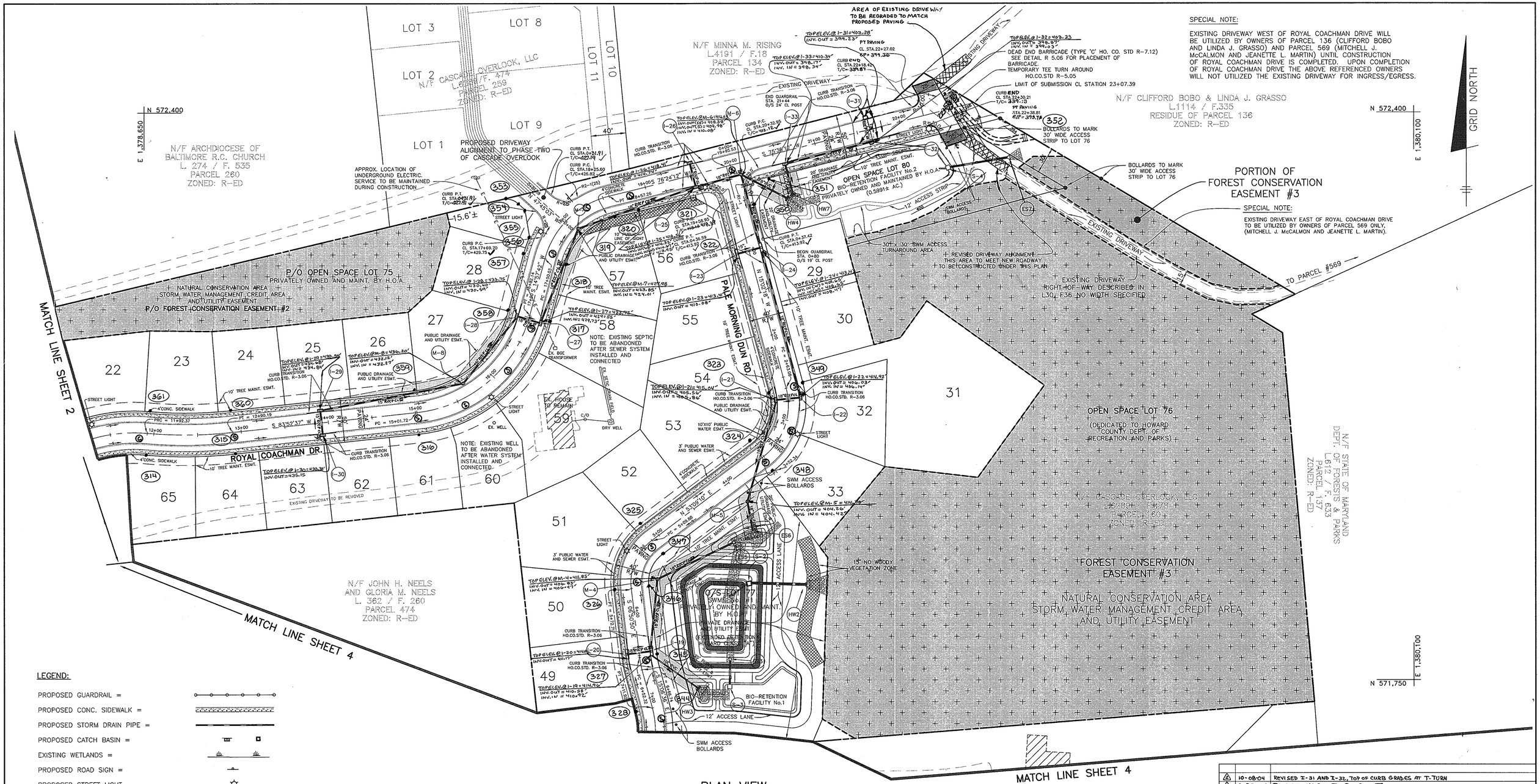
DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 2 OF 33

AS-BUILT

F-03-134

\\salvo\Engineer projects\1383 PFAU\dwg\7017502R.dwg, SHEET 2, 11/17/2003 9:54:56 AM



PLAN VIEW
SCALE: 1" = 50'

LEGEND:

- PROPOSED GUARDRAIL =
- PROPOSED CONC. SIDEWALK =
- PROPOSED STORM DRAIN PIPE =
- PROPOSED CATCH BASIN =
- EXISTING WETLANDS =
- PROPOSED ROAD SIGN =
- PROPOSED STREET LIGHT =
- FOREST CONSERVATION EASEMENT =
- NATURAL CONSERVATION AREA = STORM WATER MANAGEMENT CREDIT AND UTILITY EASEMENT
- PUBLIC DRAINAGE EASEMENT =
- LINE OF SIGHT EASEMENT =

NOTE: ALL ROADS ARE TO BE PUBLIC ROADS

STREET LIGHT SCHEDULE

SYMBOL	LOCATION		DESCRIPTION
☼	ROYAL COACHMAN DR.	CL STA. 11+33 OFFS. 16' LEFT	100 WATT HPS VAPOR TRADITIONAIRE POST TOP MOUNTED ON 14' BLACK FIBERGLASS POLE
		CL STA. 15+84 OFFS. 16' RIGHT	
		CL STA. 17+75 OFFS. 16' LEFT	
		CL STA. 19+66 OFFS. 17.5' RIGHT	
		CL STA. 22+30 OFFS. 16' RIGHT	
☼	PALE MORNING DUN RD.	CL STA. 3+10 OFFS. 16.5' RIGHT	100 WATT HPS VAPOR TRADITIONAIRE POST TOP MOUNTED ON 14' BLACK FIBERGLASS POLE
		CL STA. 5+35 OFFS. 14' RIGHT	

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

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Donald Mason, P.E. No. 21443 Date 4-25-11

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License No. 21443 Expiration Date: 12-21-12

NOTE: FOR CENTERLINE ROAD CURVE DATA SEE SHEET 1

NO	DATE	REVISION
2	10-08-04	REVISED I-31 AND I-32, TOP OF CURB GRADES AT T-TURN
1	5-25-04	REVISE NDPDEP TO RECP CLIV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
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8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

DONALD MASON — PROFESSIONAL ENGINEER
11/19/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/30/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
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(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *ROAD PLAN AND DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 3 OF 33

AS-BUILT

F-03-134

\\tsa\vol1\engineer projects\1383 PFAU\dwg\20175003.dwg, SHEET 3, 11/14/2003 7:04:25 AM

NOTE: ALL ROADS ARE TO BE PUBLIC ROADS

STREET LIGHT SCHEDULE

SYMBOL	LOCATION		DESCRIPTION
☼	PALE MORNING DUN RD.	CL STA. 7+45 O/S 16.5' LEFT	100 WATT HPS VAPOR TRADITIONAIRE POST TOP MOUNTED ON 14' BLACK FIBERGLASS POLE
		CL STA. 8+58 O/S 27.0' RIGHT	
		CL STA. 11+21 O/S 16'.5 LEFT	
		CL STA. 13+81 O/S 22.0' RIGHT	

GRID NORTH

MATCH LINE SHEET 2

MATCH LINE SHEET 3

N/F JOHN H. NEELS AND GLORIA M. NEELS L. 362 / F. 260 PARCEL 474 ZONED: R-ED

PASSIVE RECREATION OPEN SPACE BEING A PORTION OF LOT 78 (0.24± AC.)

NOTE: EXISTING WELL AND SEPTIC SYSTEM TO BE ABANDONED AFTER SANITARY AND WATER SYSTEMS ARE INSTALLED AND CONNECTED

APPROX. AREA OF EX. SEPTIC

DEAD END BARRICADE (TYPE A HO. CO. STD. R-7.10) SEE DETAIL R 5.06 FOR PLACEMENT OF BARRICADE.

TEMPORARY TEE TURN AROUND HO. CO. STD. R-5.05

NON-BUILDABLE PARCEL 'A' TO BE CONVEYED TO THE OWNER OF ADJACENT LOT 2 PLAT 3422 AREA: 0.08 AC. INTENT OF NON-BUILDABLE PARCEL 'A' IS FOR INGRESS AND EGRESS FOR LOT #2 ONLY.

PROPOSED 12' WIDE DRIVEWAY (TO BE CONSTRUCTED BY OTHERS)

NOTE: PROPOSED NEW DRIVEWAY TO BE INSTALLED BY THE OWNER OF ADJACENT LOT 2 PLAT 3422 AFTER COMPLETION OF PALE MORNING DUN RD.

N 571,550 / E 1,378,300

NOTE: PROPOSED NEW DRIVEWAY TO BE INSTALLED DURING ROAD CONSTRUCTION FOR ROYAL COACHMAN DRIVE AND GREEN DRAKE ROAD.

PROPOSED 12' WIDE DRIVEWAY TO MEANDER THROUGH THE TREES

EXISTING BUILDING

EXISTING OVERHEAD ELECTRIC LINE, SERVICE TO BE MAINTAINED DURING CONSTRUCTION

EXISTING BUILDING TO BE REMOVED

PROPOSED 40' PUBLIC SEWER, WATER, DRAINAGE AND UTILITY EASEMENT

30' PUBLIC SEWER, WATER, DRAINAGE AND UTILITY ESMT.

GREEN DRAKE RD

PALE MORNING DUN ROAD

O/S LOT 78

O/S LOT 78 (EXTENDED DETENTION HAZARD-CLASS 'A') PRIVATE DRAINAGE EASEMENT

SWMF No. 2

O/S LOT 79 TO BE DEDICATED TO HOWARD COUNTY PARKS DESIGNATED AS PASSIVE RECREATION AREA (1.135 AC.) 100 YEAR FLOODPLAIN PRIVATE DRAINAGE AND UTILITY EASEMENT

AREA TO BE DEDICATED TO HOWARD CO. FOR THE PURPOSE OF PUBLIC ROAD. (0.202± AC.)

LANDING ROAD – 30' WIDE (MINOR COLLECTOR 60' ULT. R/W) (SCENIC ROAD)

EXISTING 30' PERSCRIPTIVE RIGHT-OF-WAY

EXISTING CENTERLINE

EXISTING RIGHT-OF-WAY

EXISTING PERENIAL STREAM

EXISTING BUILDING TO BE REMOVED

NOTE: EXISTING SEPTIC SYSTEM TO BE ABANDONED AND REMOVED

NOTE: EXISTING WELL TO BE ABANDONED

20' PUBLIC SEWER AND UTILITY EASEMENT

15' NO WOODY VEGETATION ZONE

25' WETLAND BUFFER

75' STREAM BUFFER

EXISTING PERENIAL STREAM

N/F N.J. & Y.D. BARAN 1004 / F. 158 PARCEL 158 ZONED: R-ED

LOT 3 BAUGHAN PROPERTY PLAT No. 5846 ZONED: R-ED

LOT 2 BAUGHAN PROPERTY PLAT No. 4351 ZONED: R-ED

LOT 4 BAUGHAN PROPERTY PLAT No. 5846 ZONED: R-ED

LOT 2 N/F MICHAEL A. BARTON AND CHRISTINE G. BARTON L. 3161/ F. 258 PLAT No. 3422 ZONED: R-ED

N 571,550 / E 1,379,800

SPECIAL NOTE: LOT #1, NOR ANY LOTS RESULTING FROM THE RESUBDIVISION OF LOT #1 WILL BE PERMITTED ACCESS TO NON-BUILDABLE PARCEL 'A'.

LOT 1

N/F JEFFREY BOLSTER AND MICHELLE BOLSTER, T/E L. 2604/ F.066 PLAT No. 3422 ZONED: R-ED

N 571,100 / E 1,379,800

NOTE: FOR CENTERLINE ROAD CURVE DATA SEE SHEET 1

LEGEND:

PROPOSED GUARDRAIL =

PROPOSED CONC. SIDEWALK =

PROPOSED STORM DRAIN PIPE =

PROPOSED CATCH BASIN =

PROPOSED ROAD SIGN =

PROPOSED STREET LIGHT =

FOREST CONSERVATION EASEMENT =

NATURAL CONSERVATION AREA = STORMWATER MANAGEMENT CREDIT AND UTILITY EASEMENT

PUBLIC DRAINAGE EASEMENT =

PLAN VIEW
SCALE: 1" = 50'

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 5-25-11

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan was constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 5-25-11

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

NO	DATE	REVISION
1	5-25-04	REVISE HDPEP TO RCP CLIV

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 12/5/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/24/03

OWNER/DEVELOPER
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ELLICOTT CITY, MD 21041
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OWNER
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4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
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LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

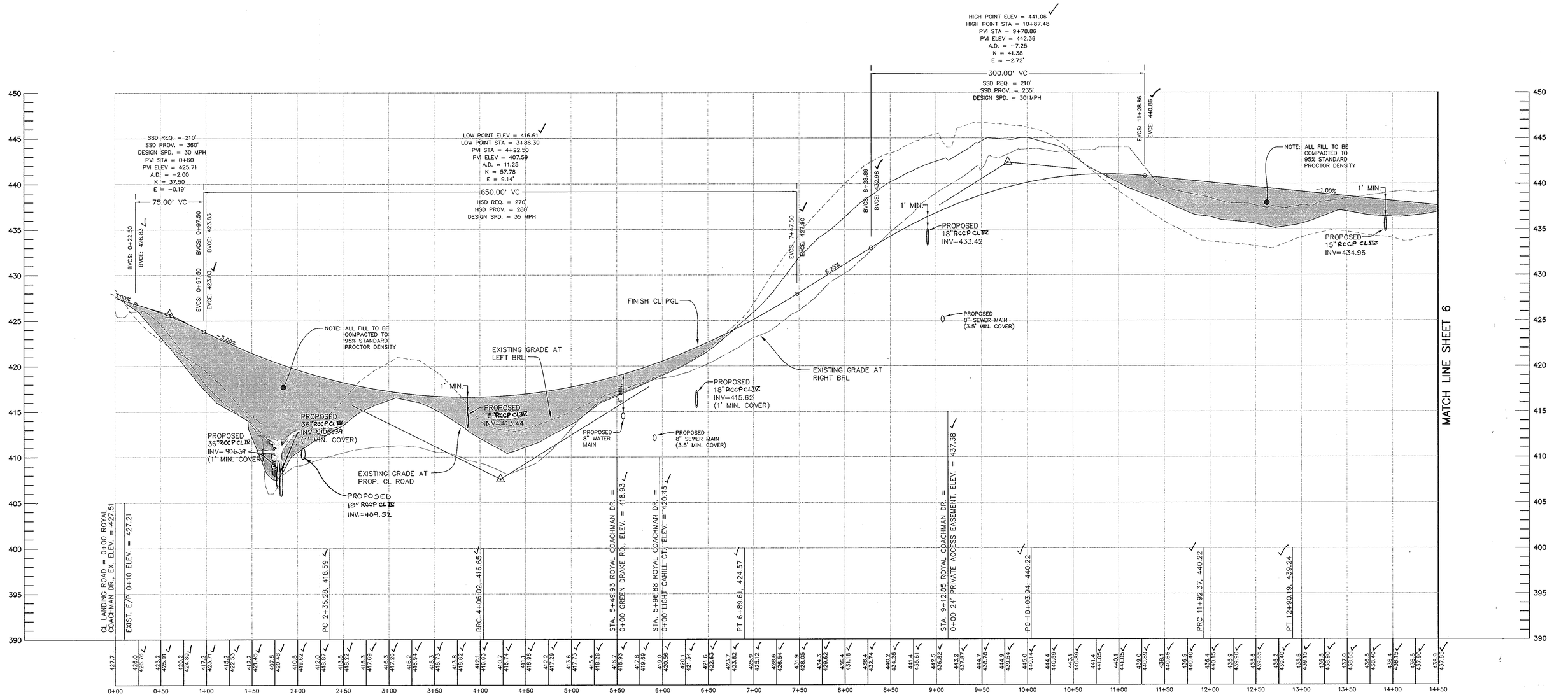
TITLE: ROAD PLAN
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 4 OF 33

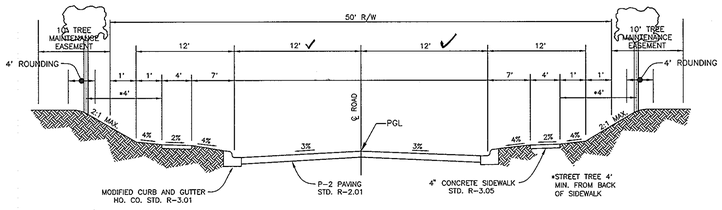
AS-BUILT

F-03-134



ROYAL COACHMAN DRIVE

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



TYPICAL ROADWAY SECTION

ROYAL COACHMAN DRIVE
(PUBLIC ACCESS STREET – LESS THEN 1000 ADT)
DESIGN SPEED: 30 MPH
STA. 0+35 TO STA. 17+79
NOT TO SCALE

NO	DATE	REVISION
2	5-25-04	REVISE HDPEP TO RCCP CL IV
1	2-5-04	ADD 18" HDPE AND REVISE (2) 36" HDPEP INVERTS

AS-BUILT CERTIFICATION
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Donald Mason, P.E. No. 21443 Date 4-25-11

STATE OF MARYLAND · DONALD ALAN MASON · No. 21443 · PROFESSIONAL ENGINEER

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8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/7/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/2/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/31/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'
LOCATION: TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE: *ROAD PROFILE AND DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11
DATE: OCTOBER, 2003 PROJECT NO. 1383
DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 5 OF 33

AS-BUILT

F-03-134

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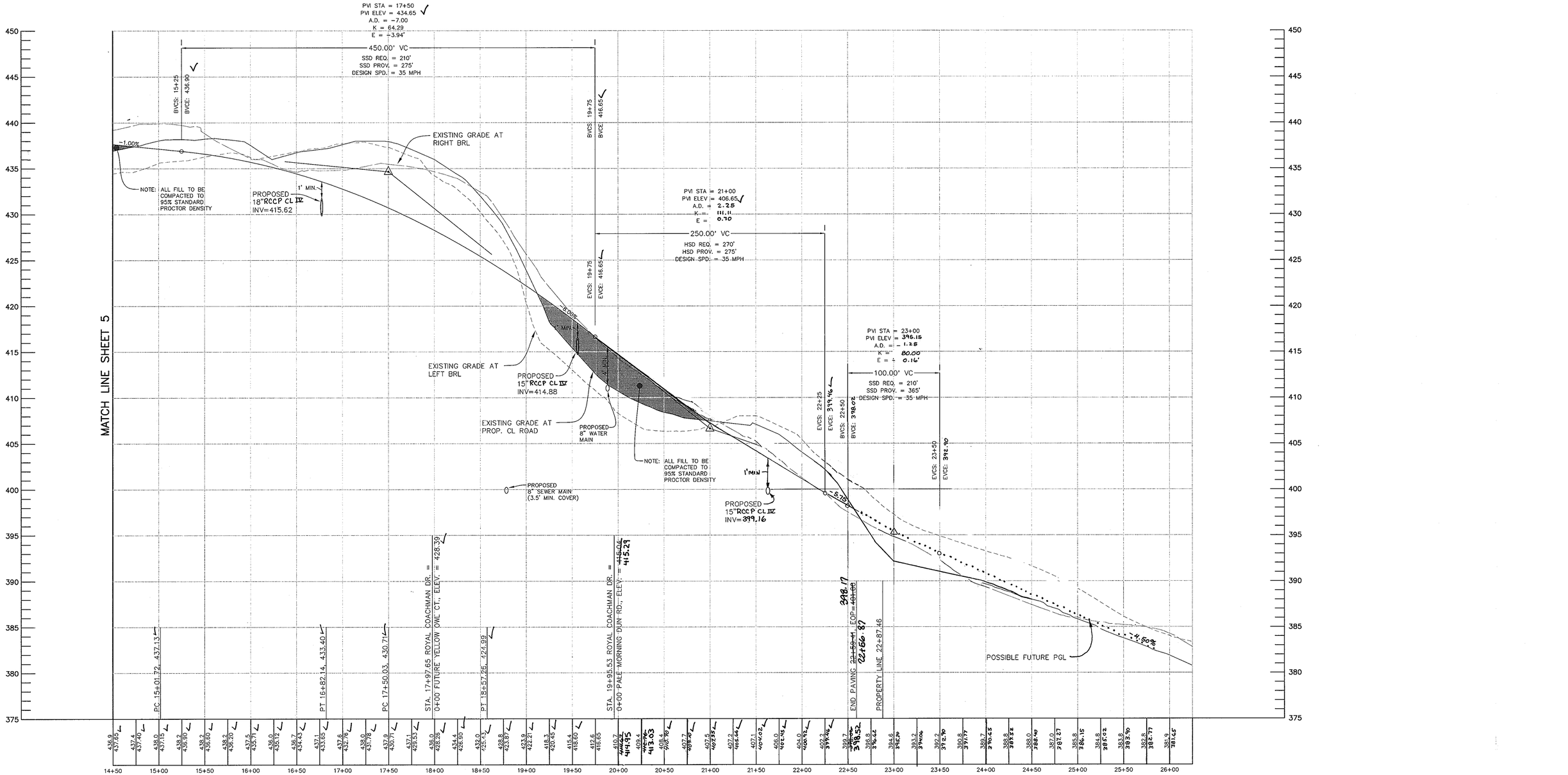
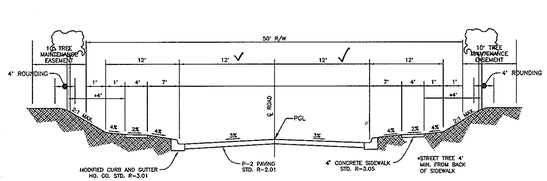


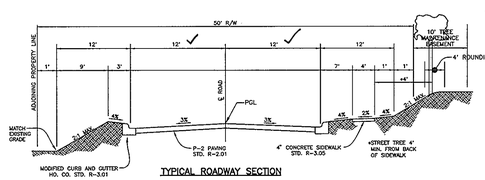
ROYAL COACHMAN DRIVE

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



TYPICAL ROADWAY SECTION

ROYAL COACHMAN DRIVE
(PUBLIC ACCESS STREET – LESS THEN 1000 ADT)
DESIGN SPEED: 30 MPH
STA. 0+25 TO STA. 18+13
NOT TO SCALE



TYPICAL ROADWAY SECTION

ROYAL COACHMAN DRIVE
(PUBLIC ACCESS STREET – LESS THEN 1000 ADT)
DESIGN SPEED: 30 MPH
STA. 18+13 TO STA. 22+53± (T-TURN)
NOT TO SCALE

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STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

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CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT JA — DATE 11/20/03
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/22/03

NO	DATE	REVISION
2	10-11-04	REVISED CENTERLINE ROYAL COACHMAN DRIVE 19+75 TO 26+24.48
1	5-25-04	REVISE HDPEP TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
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STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
Donald Mason 11/17/03

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1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *ROAD PROFILE AND DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383
DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 6 OF 33

AS-BUILT

F-03-134

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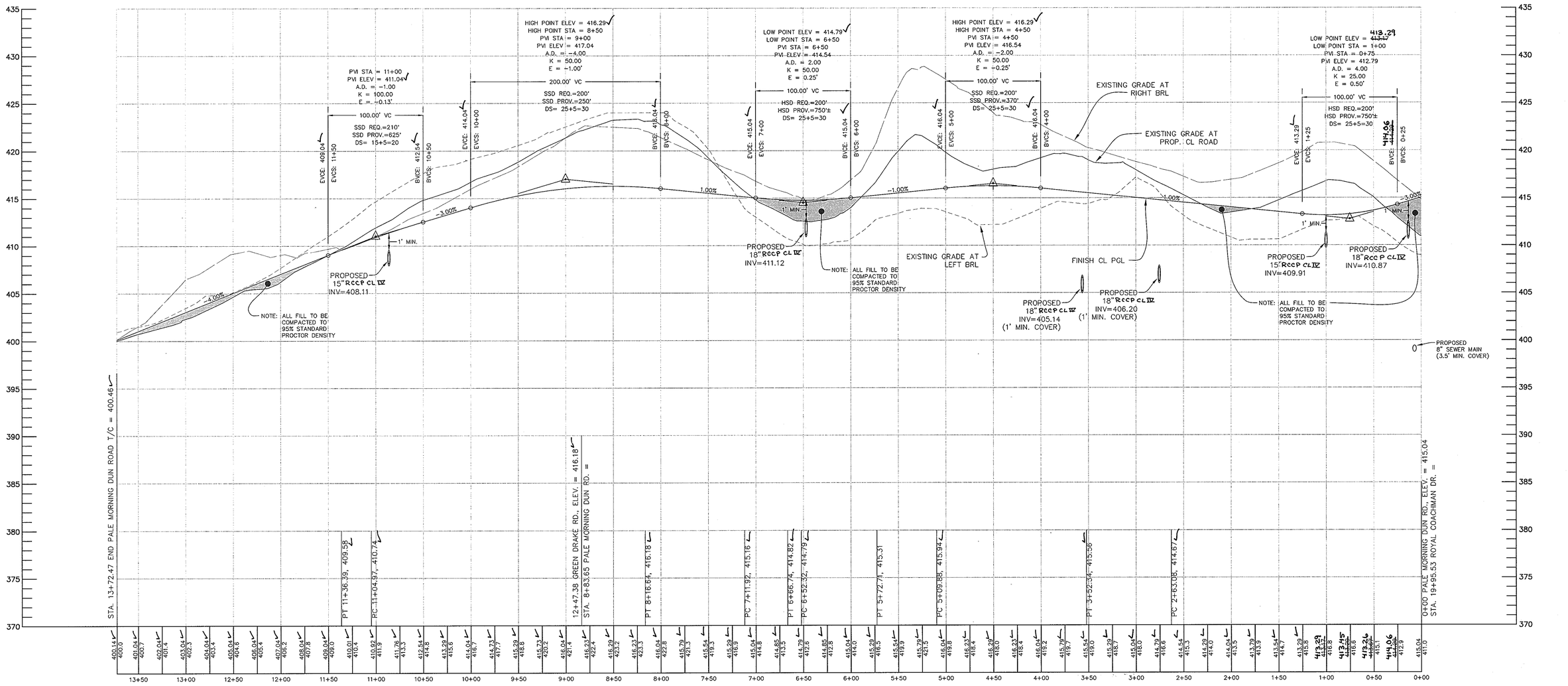
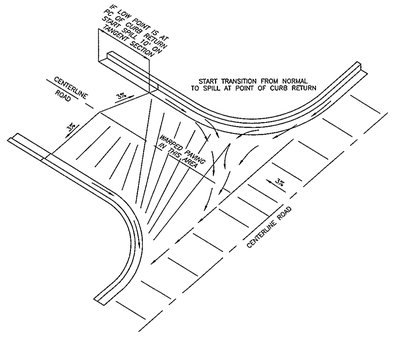
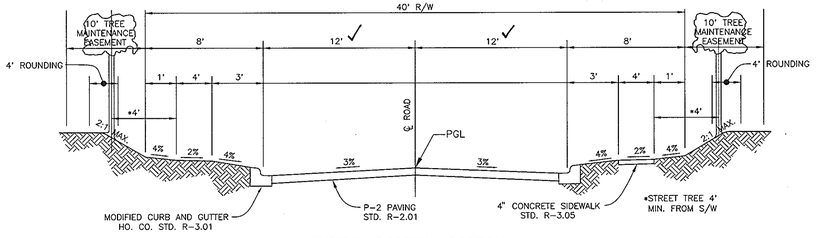


PALE MORNING DUN ROAD

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



INTERSECTION DRAINAGE DETAIL
SCALE: NOT TO SCALE



TYPICAL ROADWAY SECTION

PALE MORNING DUN ROAD
(PUBLIC ACCESS STREET – LESS THEN 500 ADT)
DESIGN SPEED: 30 MPH
STA. 0+35 TO STA. 13+88.57
NOT TO SCALE

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER

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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/3/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MRJ — DATE 12/20/03

NO	DATE	REVISION
1	5-25-04	REVISE HDPEP TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
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Donald Mason — 11/17/03

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1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

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VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

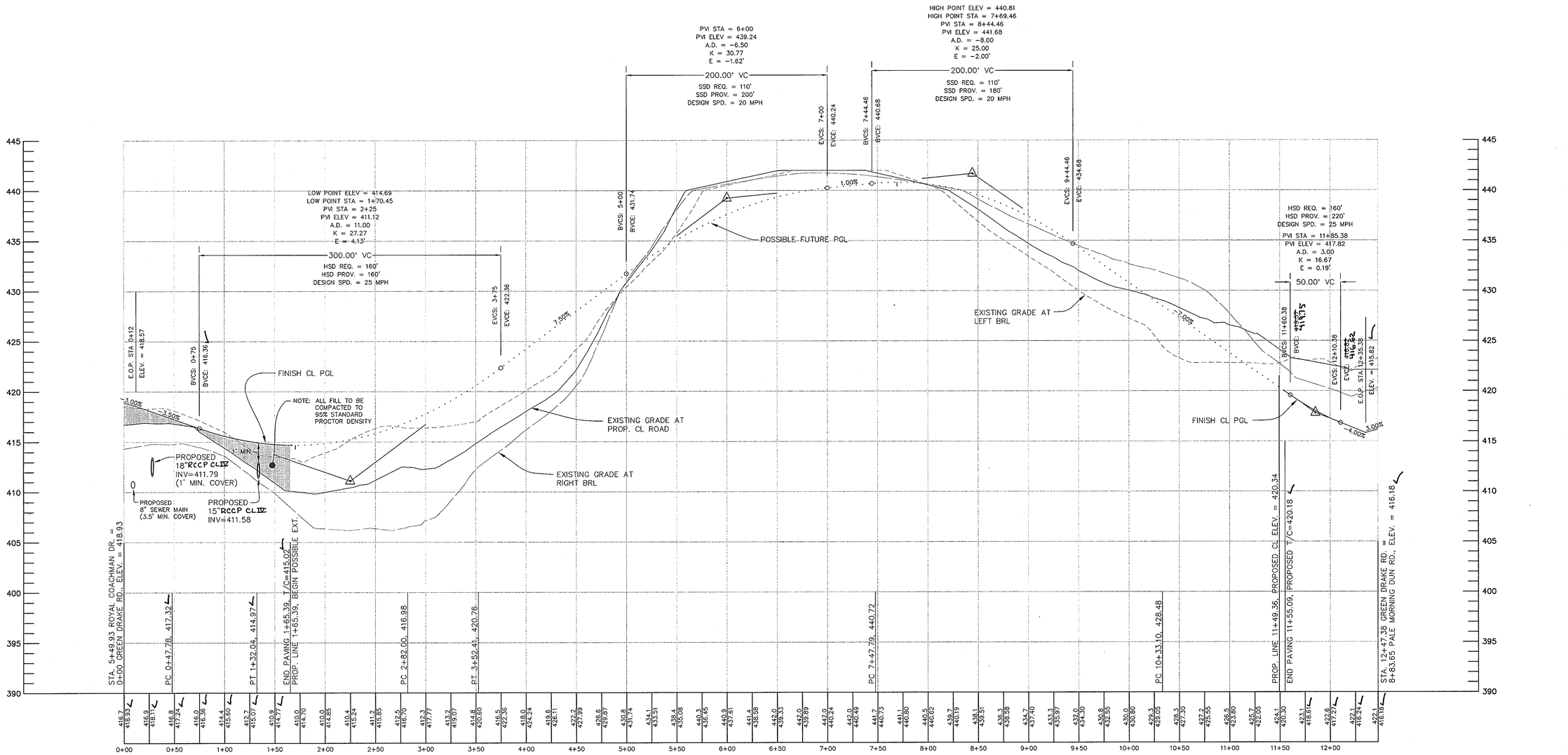
DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 7 OF 33

AS-BUILT

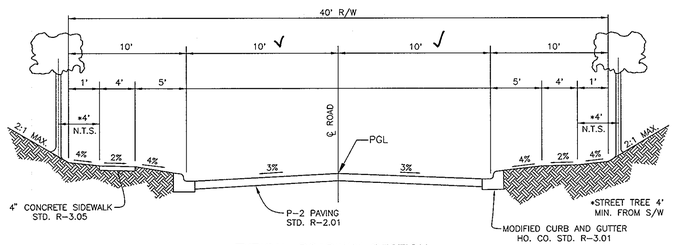
F-03-134

I:\taxwell\engineer projects\1383 PFAU\dwg\7017505.dwg, Sheet 7, 11/14/2003 9:01:35 AM



GREEN DRAKE ROAD WITH POSSIBLE FUTURE CONNECTION

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



TYPICAL ROADWAY SECTION

GREEN DRAKE ROAD
(PUBLIC ACCESS STREET – LESS THEN 200 ADT)
DESIGN SPEED: 20 MPH
STA. 0+35 TO STA. 1+38.50 (T-TURN)
STA. 11+28.20 TO 12+20.49 (T-TURN)
NOT TO SCALE

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
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License No. 21443 Expiration Date: 12-21-12

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/24/03

NO	DATE	REVISION
1	5-25-04	REVISE HDPEP TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *ROAD PROFILE AND DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 8 OF 33

AS-BUILT

F-03-134

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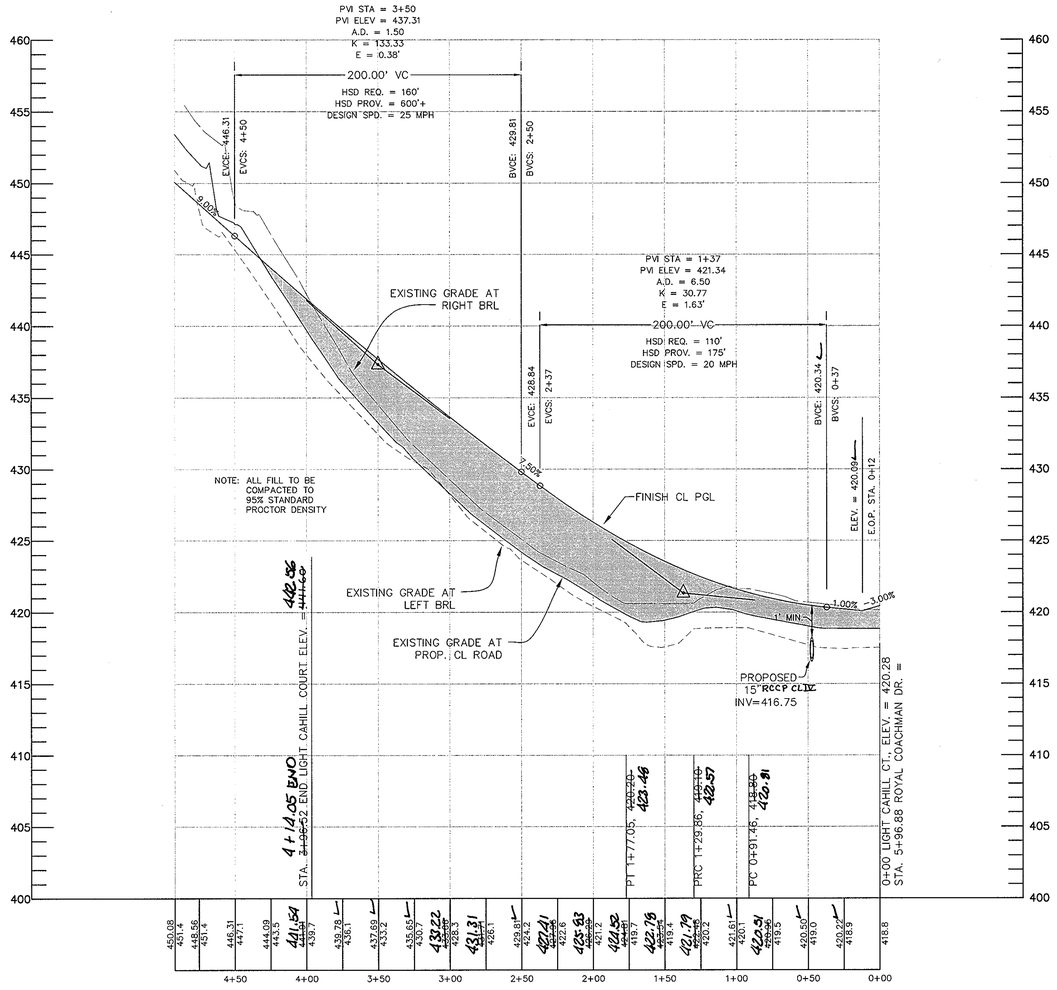
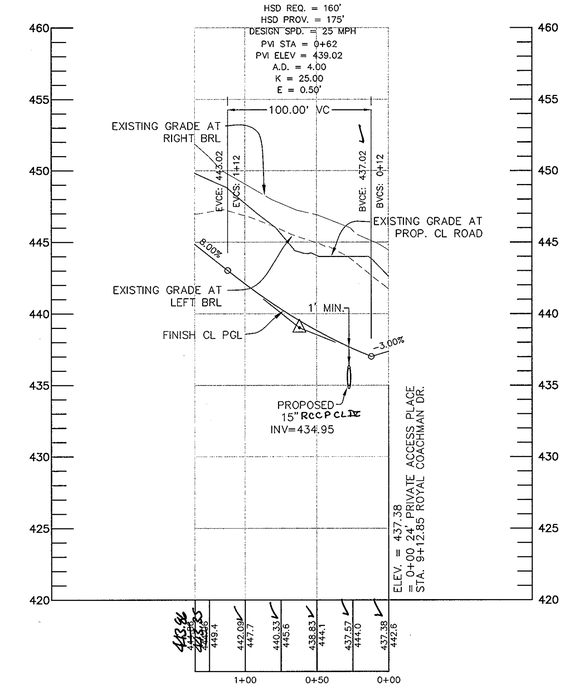


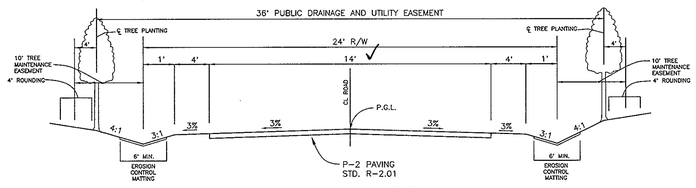
LIGHT CAHILL COURT

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



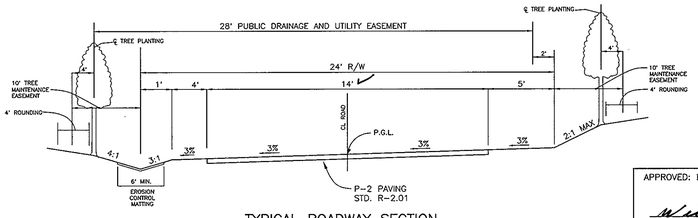
24' USE-IN-COMMON

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



TYPICAL ROADWAY SECTION

LIGHT CAHILL COURT
(PRIVATE ACCESS PLACE – LESS THEN 100 ADT)
DESIGN SPEED: 20 MPH
STA. 0+27 TO STA. 3+96.37 (T-TURN)
NOT TO SCALE



TYPICAL ROADWAY SECTION

24' USE-IN-COMMON
(PRIVATE ACCESS PLACE – LESS THEN 100 ADT)
DESIGN SPEED: 15 MPH
STA. 0+27 TO STA. 1+35 (T-TURN)
NOT TO SCALE

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. Williams — Date 12-15-11

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

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

No As-Built information required on this sheet

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/2/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MRJ — DATE 12/30/03

NO	DATE	REVISION
1	5-25-04	REVISE HDPEP TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason — 11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

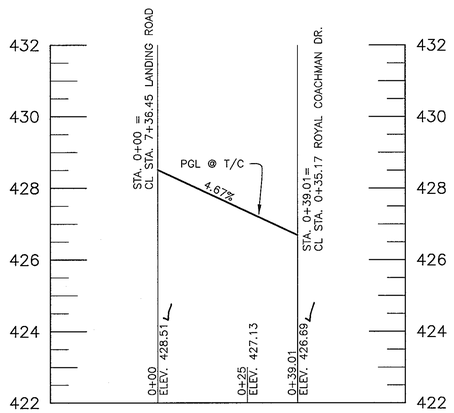
TITLE: *ROAD PROFILE AND DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 9 OF 33

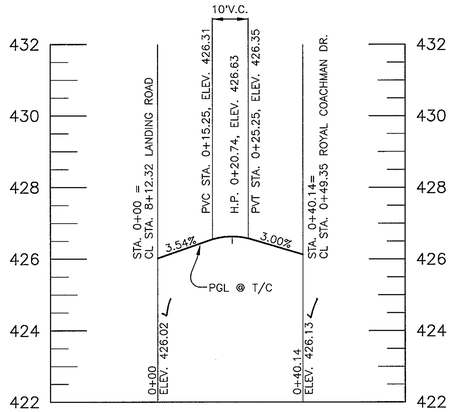
AS-BUILT F-03-134

\\tsclvol1\engineer\projects\1383 PFAU\dwg\70075505.dwg, Sheet 9, 11/14/2003 9:02:57 AM



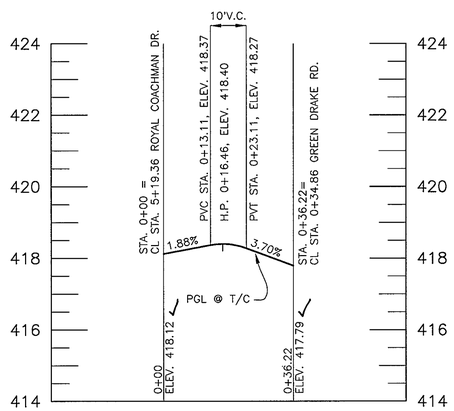
CURB RETURN
NORTHWEST SIDE OF
LANDING ROAD AND ROYAL COACHMAN DRIVE

SCALE: HORIZ: 1"=20' VERT: 1"=2'



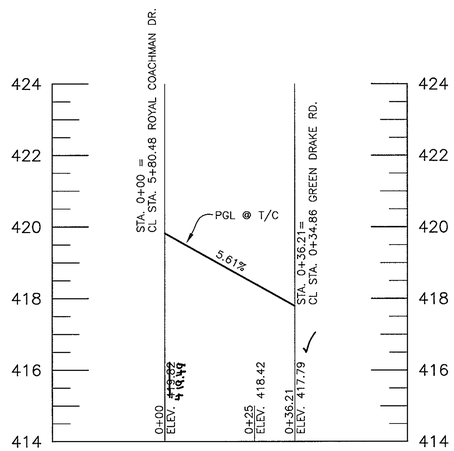
CURB RETURN
NORTHEAST SIDE OF
LANDING ROAD AND ROYAL COACHMAN DRIVE

SCALE: HORIZ: 1"=20' VERT: 1"=2'



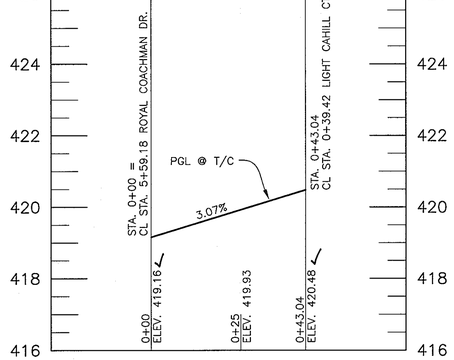
CURB RETURN
SOUTHWEST SIDE OF
ROYAL COACHMAN DR. AND GREEN DRAKE RD.

SCALE: HORIZ: 1"=20' VERT: 1"=2'



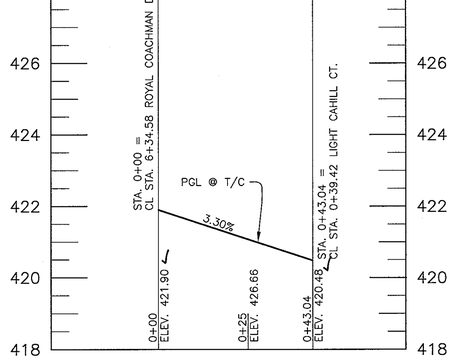
CURB RETURN
SOUTHEAST SIDE OF
ROYAL COACHMAN DR. AND GREEN DRAKE RD.

SCALE: HORIZ: 1"=20' VERT: 1"=2'



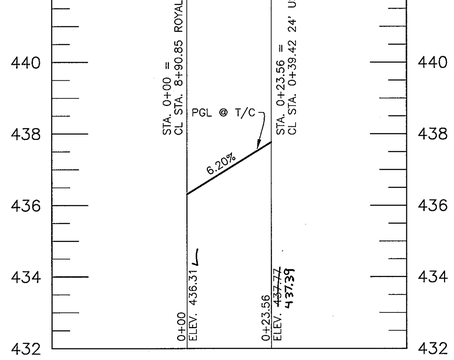
CURB RETURN
NORTHWEST SIDE OF
ROYAL COACHMAN DR. AND LIGHT CAHILL CT.

SCALE: HORIZ: 1"=20' VERT: 1"=2'



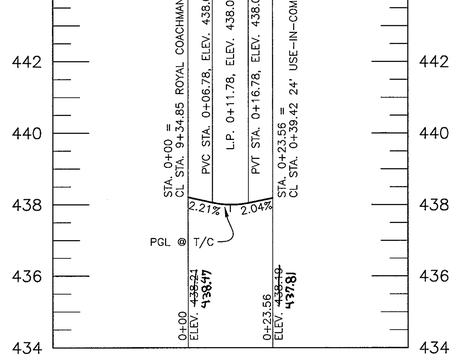
CURB RETURN
NORTHEAST SIDE OF
ROYAL COACHMAN DR. AND LIGHT CAHILL CT.

SCALE: HORIZ: 1"=20' VERT: 1"=2'



CURB RETURN
SOUTHWEST SIDE OF
ROYAL COACHMAN DR. AND 24' USE-IN-COMMON

SCALE: HORIZ: 1"=20' VERT: 1"=2'



CURB RETURN
NORTHWEST SIDE OF
ROYAL COACHMAN DR. AND 24' USE-IN-COMMON

SCALE: HORIZ: 1"=20' VERT: 1"=2'

GENERAL NOTES:

1. PGL GRADE SHOWN IS REPRESENTATIVE OF THE NORMAL TOP OF CURB.
2. MODIFICATIONS TO THE PGL GRADE SHOWN WILL BE NECESSARY FOR RETURNS WITH HANDICAP RAMPS PROPOSED.

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 4-25-11

STATE OF MARYLAND · DONALD ALAN MASON · No. 21443 · PROFESSIONAL ENGINEER

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

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason
PROFESSIONAL ENGINEER
11/12/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/30/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: ROAD PROFILE
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 10 OF 33

AS-BUILT

F-03-134

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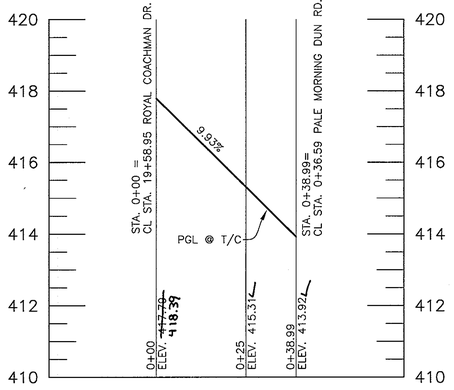
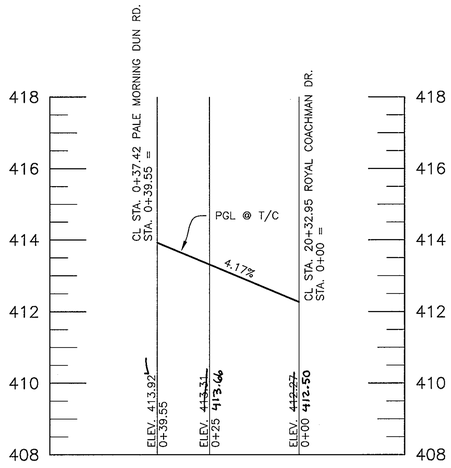


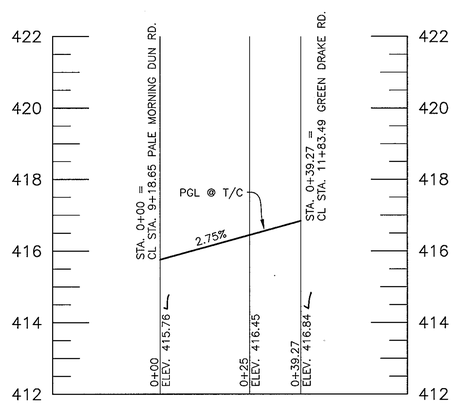
CURB RETURN
SOUTHWEST SIDE OF
ROYAL COACHMAN DR. AND PALE MORNING DUN RD.

SCALE: HORIZ: 1"=20' VERT: 1"-2'



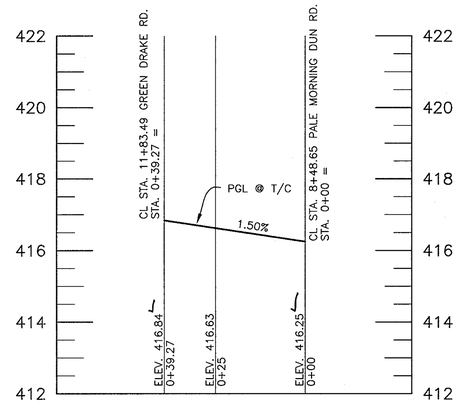
CURB RETURN
SOUTHEAST SIDE OF
ROYAL COACHMAN DR. AND PALE MORNING DUN RD.

SCALE: HORIZ: 1"=20' VERT: 1"-2'



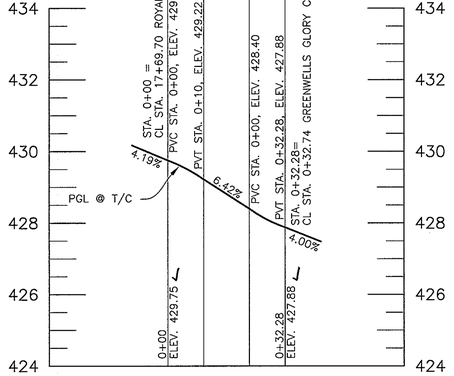
CURB RETURN
NORTHWEST SIDE OF
PALE MORNING DUN RD. AND GREEN DRAKE RD.

SCALE: HORIZ: 1"=20' VERT: 1"-2'



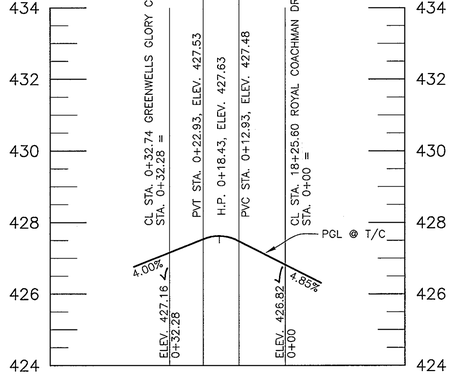
CURB RETURN
NORTHEAST SIDE OF
PALE MORNING DUN RD. AND GREEN DRAKE RD.

SCALE: HORIZ: 1"=20' VERT: 1"-2'



CURB RETURN
NORTHWEST SIDE OF MARCH BROWN RD.
ROYAL COACHMAN DR. AND ~~GREENWELLS GLORY CT.~~

SCALE: HORIZ: 1"=20' VERT: 1"-2'



CURB RETURN
NORTHEAST SIDE OF MARCH BROWN RD.
ROYAL COACHMAN DR. AND ~~GREENWELLS GLORY CT.~~

SCALE: HORIZ: 1"=20' VERT: 1"-2'

GENERAL NOTES:

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2. MODIFICATIONS TO THE PGL GRADE SHOWN WILL BE NECESSARY FOR RETURNS WITH HANDICAP RAMPS PROPOSED.

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 1-25-11

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT JA — DATE 11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 11/20/03

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
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PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *ROAD PROFILE AND DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 11 OF 33

AS-BUILT

F-03-134

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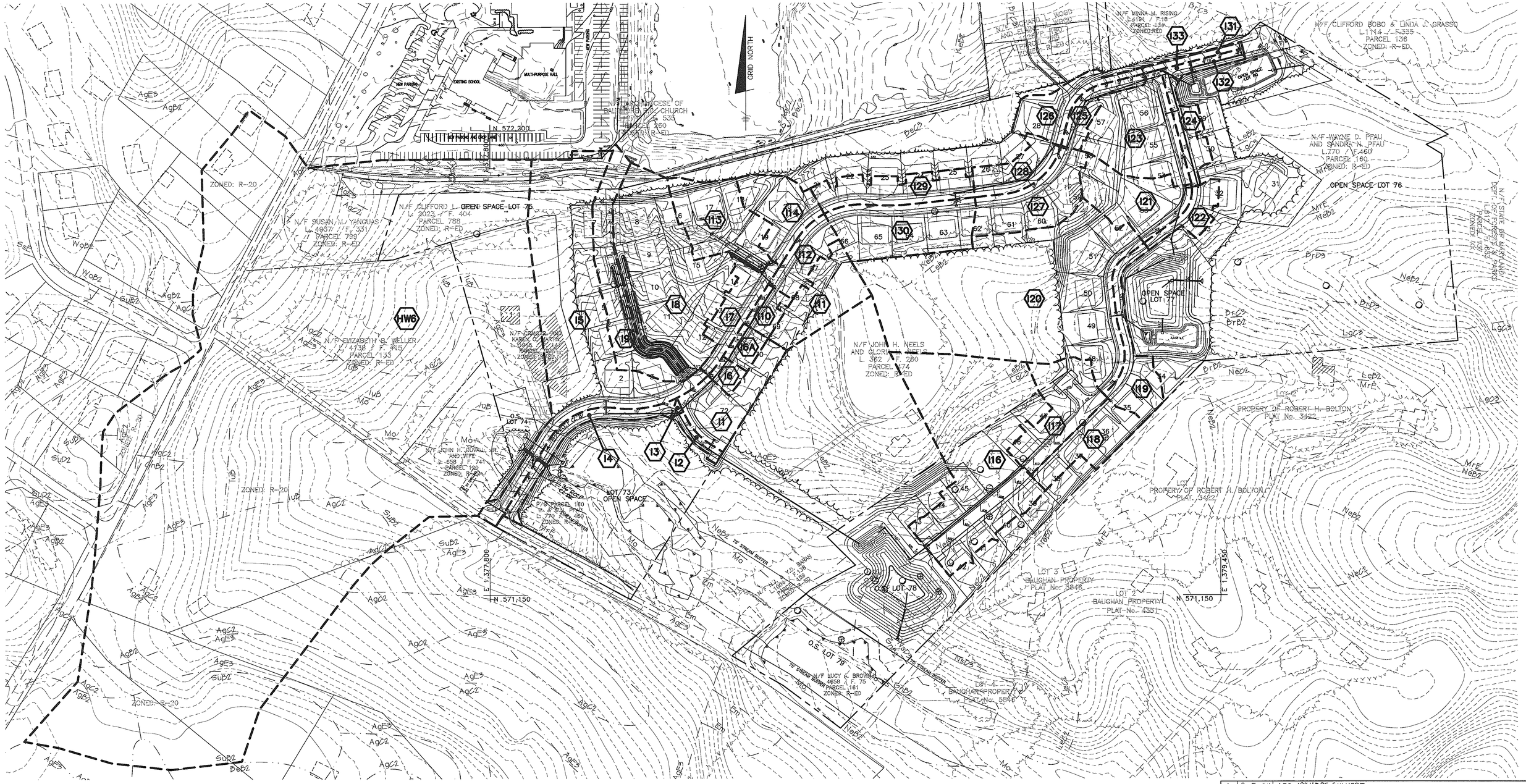

PLAN VIEW

SCALE: 1" = 100'

SOILS CLASSIFICATION

SYMBOL	DESCRIPTION	HYDROLOGIC GROUP
AdB2	ALDINO SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
AgB2	AURA GRAVELLY LOAM, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	C
AgC2	AURA GRAVELLY LOAM, 5 TO 10 PERCENT SLOPES, MODERATELY ERODED	C
AgE3	AURA GRAVELLY LOAM, 10 TO 30 PERCENT SLOPES, SEVERELY ERODED	C
BeC3	BELTSVILLE SILT LOAM, 5 TO 10 PERCENT SLOPES, SEVERELY ERODED	C
BrB2	BRANDYWINE LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	A
BrC3	BRANDYWINE LOAM, 8 TO 15 PERCENT SLOPES, SEVERELY ERODED	A
BrD3	BRANDYWINE LOAM, 15 TO 25 PERCENT SLOPES, SEVERELY ERODED	A
CnB2	CHILLUM-FAIRFAX LOAMS, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	C
DeB2	DELANCO SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
Em	ELKTON SILT LOAM	C/D
GnB2	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
IuB	IUKA LOAM,LOCAL ALLUVIUM, 1 TO 5 PERCENT SLOPES	C
KeB2	KELLY SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	D
LeB2	LEGORE SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	B
LeC2	LEGORE SILT LOAM, 8 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
LgC3	LEGORE SILT CLAY LOAM, 8 TO 15 PERCENT SLOPES, SEVERELY ERODED	B
Mo	MIXED ALLUVIAL LAND	B
MrE	MONTALTO AND RELAY SOILS, 15 TO 45 PERCENT SLOPES	B
NeB2	NESHAMINY SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	B
NeC2	NESHAMINY SILT LOAM, 8 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
NsD3	NESHAMINY SILT LOAM, 15 TO 25 PERCENT SLOPES, SEVERELY ERODED	B
ReC2	RELAY SILT LOAM, 3 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
SuB2	SUNNYSIDE FINE SANDY LOAM, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	B
SuD2	SUNNYSIDE FINE SANDY LOAM, 5 TO 15 PERCENT SLOPES, MODERATELY ERODED	B

STORM DRAIN RUNOFF

INLET	DA (Ac.)	C	%IMP	ZONE
I-1	0.53	.42	68	R-ED
I-2	0.08	.65	66	R-ED
I-3	0.01	.80	78	R-ED
I-4	0.30	.64	67	R-ED
I-5	2.98	.26	23	R-ED
I-6	0.09	.53	66	R-ED
I-6A	0.13	.54	66	R-ED
I-7	0.37	.49	67	R-ED
I-8	1.69	.26	34	R-ED
I-9	0.59	.29	54	R-ED
I-10	0.15	.44	50	R-ED
I-11	0.73	.29	39	R-ED
I-12	0.30	.43	50	R-ED
I-13	0.71	.29	38	R-ED
I-14	0.50	.40	66	R-ED
I-16	2.39	.35	60	R-ED
I-17	0.65	.46	69	R-ED

STORM DRAIN RUNOFF

INLET	DA (Ac.)	C	%IMP	ZONE
I-18	0.44	.41	66	R-ED
I-19	0.45	.43	49	R-ED
I-20	4.01	.42	66	R-ED
I-21	0.52	.36	67	R-ED
I-22	0.21	.42	50	R-ED
I-23	1.06	.38	68	R-ED
I-24	0.25	.43	62	R-ED
I-25	0.22	.55	68	R-ED
I-26	0.32	.42	46	R-ED
I-27	0.46	.37	46	R-ED
I-28	0.33	.45	51	R-ED
I-29	0.48	.48	67	R-ED
I-30	0.43	.43	66	R-ED
I-31	0.08	.78	85	R-ED
I-32	0.07	.74	68	R-ED
I-33	0.04	.76	70	R-ED
HW-6	24.41	.35	86	R-ED/R-20

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

No As-Built information is required on this sheet

NO	DATE	REVISION
1	2-5-04	ADD 18" HDPE CULVERT
2	5-25-04	REVISE HDPEP TO RCCP CL IV

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/3/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAT — DATE 12/30/03

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

11/17/03

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(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *STORM DRAINAGE AREA MAP*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 12 OF 33

AS-BUILT F-03-134

STRUCTURE SCHEDULE

STORM INLETS

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
I-1	A-5	CL STA. 1+33.79 O/S 10.43' LEFT GREEN DRAKE RD.	411.21 –	411.69✓	415.35 ~~415.21~~	SD – 4.01 OR 4.40
I-2	A-5	CL STA. 1+33.79 O/S 10.43' RIGHT GREEN DRAKE RD.	408.26 ~~411.41~~ (15"-NE) ~~408.46~~ (18"-NW)	408.26✓	415.21✓	SD – 4.01 OR 4.40
I-3	A-5	CL STA. 0+31.85 O/S 10.43' RIGHT GREEN DRAKE RD.	411.51 (18"-NW)✓ 412.96 (18"-NE)✓	411.26✓	418.16✓	SD – 4.01 OR 4.40
I-4	A-5	CL STA. 3+86.37 O/S 12.43' RIGHT ROYAL COACHMAN DR.	413.30✓	413.13✓	416.83✓	SD – 4.01 OR 4.40
I-5	A-5	CL STA. 3+86.37 O/S 12.43' LEFT ROYAL COACHMAN DR.	–	413.81 ~~413.58~~	416.83✓	SD – 4.01 OR 4.40
I-6	A-5	CL STA. 6+37.44 O/S 12.43' RIGHT ROYAL COACHMAN DR.	416.28 (18"-NE)✓ 415.48 (18"-NW)✓	415.28✓	422.29✓	SD – 4.01 OR 4.40
I-6A	A-5	CL STA. 6+95.11 O/S 12.43' RIGHT ROYAL COACHMAN DR.	421.35 ~~421.28~~	421.25 ~~421.08~~	425.08✓	SD – 4.01 OR 4.40
I-7	A-5	CL STA. 6+37.44 O/S 12.43' LEFT ROYAL COACHMAN DR.	415.78 ~~415.96~~	415.76✓	422.29✓	SD – 4.01 OR 4.40
I-8	TYPE 'D' INLET	CL STA. 0+47.42 O/S 14.33' RIGHT LIGHT CAHILL CT.	416.60✓	416.35✓	419.33 ~~419.64~~	SD – 4.11 OR 4.39
I-9	TYPE 'D' INLET	CL STA. 0+47.42 O/S 14.33' LEFT LIGHT CAHILL CT.	–	416.89✓	419.31 ~~419.64~~	SD – 4.11 OR 4.39
I-10	A-5	CL STA. 7+80.75 O/S 12.43' RIGHT ROYAL COACHMAN DR.	423.10 (18"-NE)✓ 423.10 (15"-SE)✓	422.90✓	430.20✓	SD – 4.01 OR 4.40
I-11	TYPE 'D' INLET	N 571709.01 E 1378463.16	–	424.04✓	425.79 ~~426.66~~	SD – 4.11 OR 4.39
I-12	A-5	CL STA. 8+87.85 O/S 12.43' RIGHT ROYAL COACHMAN DR.	433.20 ~~433.11~~	433.17 ~~432.91~~	436.47✓	SD – 4.01 OR 4.40
I-13	TYPE 'D' INLET	CL STA. 0+34.33 O/S 14.33' RIGHT 24' USE-IN-COMMON	434.79✓	434.45 ~~434.17~~	437.23✓	SD – 4.11 OR 4.39
I-14	A-5	CL STA. 9+37.85 O/S 12.43' LEFT ROYAL COACHMAN DR.	–	435.65 ~~435.26~~	438.77 ~~438.58~~	SD – 4.01 OR 4.40
I-16	A-5	CL STA. 13+72.90 O/S 17.00' RT PALE MORNING DUN RD.	396.77 ~~397.00~~	396.80✓	400.36✓	SD – 4.01 OR 4.40
I-17	A-10	CL STA. 10+86.05 O/S 12.43' RT PALE MORNING DUN RD.	407.71 ~~407.99~~	407.74✓	411.40 ~~411.61~~	SD – 4.02 OR 4.41
I-18	A-5	CL STA. 10+86.05 O/S 12.43' LF PALE MORNING DUN RD.	–	408.25✓	411.61✓	SD – 4.01 OR 4.40
I-19	A-5	CL STA. 6+46.82 O/S 12.43' LF PALE MORNING DUN RD.	410.92✓	410.72 (18"-N)✓ 408.31 (10"-S)✓	415.01✓	SD – 4.01 OR 4.40
I-20	A-10	CL STA. 6+46.82 O/S 12.43' RT PALE MORNING DUN RD.	–	411.31✓	415.01✓	SD – 4.02 OR 4.41
I-21	A-5	CL STA. 2+75.35 O/S 12.43' RT PALE MORNING DUN RD.	405.86 ~~406.06~~	405.56 ~~405.86~~	415.01✓	SD – 4.01 OR 4.40
I-22	A-5	CL STA. 2+75.35 O/S 12.43' LF PALE MORNING DUN RD.	406.14 ~~406.54~~	406.03 ~~406.34~~	415.01✓	SD – 4.01 OR 4.40
I-23	A-5	CL STA. 1+00.00 O/S 12.43' RT PALE MORNING DUN RD.	–	410.05✓	413.39✓	SD – 4.01 OR 4.40
I-24	A-5	CL STA. 1+00.00 O/S 12.43' LF PALE MORNING DUN RD.	408.65 ~~408.44~~ (15"-N) 409.77 (15"-W)✓	408.47 ~~408.19~~	413.39✓	SD – 4.01 OR 4.40
I-25	A-5	CL STA. 19+55.94 O/S 12.43' RT ROYAL COACHMAN DR.	414.74 (15"-N)✓ ~~415.00~~ (18"-W) 414.32	413.95 ~~413.76~~	418.56 ~~418.36~~	SD – 4.01 OR 4.40
I-26	A-5	CL STA. 19+55.94 O/S 12.43' LF ROYAL COACHMAN DR.	–	414.74 ~~415.00~~	418.36✓	SD – 4.01 OR 4.40
I-27	A-5	CL STA. 16+77.52 O/S 12.43' RT ROYAL COACHMAN DR.	429.83✓	429.63✓	433.78✓	SD – 4.01 OR 4.40
I-28	A-5	CL STA. 16+77.52 O/S 12.43' LF ROYAL COACHMAN DR.	430.42✓	430.22✓	433.78✓	SD – 4.01 OR 4.40
I-29	A-5	CL STA. 13+92.17 O/S 12.43' LF ROYAL COACHMAN DR.	434.82✓	434.54✓	438.44✓	SD – 4.01 OR 4.40
I-30	A-5	CL STA. 13+92.17 O/S 12.43' RT ROYAL COACHMAN DR.	–	435.10✓	438.44✓	SD – 4.01 OR 4.40
I-31	A-5	CL STA. 21+63.65 O/S 12.43' LF ROYAL COACHMAN DR.	–	399.23✓	403.38✓	SD – 4.01 OR 4.40
I-32	A-5	CL STA. 21+63.65 O/S 12.43' RT ROYAL COACHMAN DR.	399.09✓	398.89✓	403.38✓	SD – 4.01 OR 4.40
I-33	A-5	CL STA. 20+61.37 O/S 12.43' RT ROYAL COACHMAN DR.	398.38✓	398.18✓	410.29✓	SD – 4.01 OR 4.40

STORM MANHOLES

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
M-1	4'-0" MANHOLE	N 571500.32 E 1378261.62	409.26 ~~409.51~~	409.00 ~~409.31~~	415.8±✓	G – 5.12
M-2	4'-0" MANHOLE	N 571302.47 E 1378691.01	393.16 ~~392.92~~	393.06 ~~392.72~~	397.81 ~~398.00~~	G – 5.12
M-3	4'-0" MANHOLE	N 571231.19 E 1378748.96	394.96✓	394.76✓	398.00✓	G – 5.12
M-4	4'-0" MANHOLE	N 571865.93 E 1379235.95	406.99✓	406.79✓	412.0±✓	G – 5.12
M-5	4'-0" MANHOLE	N 571954.66 E 1379338.92	414.42 ~~404.64~~	404.26 ~~404.44~~	414.78 ~~415.00~~	G – 5.12
M-6	4'-0" MANHOLE	CL STA. 0+13.34 O/S 13.75' LF PALE MORNING DUN RD.	410.08 ~~409.87~~	408.38 ~~407.95~~ (8"-SE) 409.98 ~~409.67~~ (18"-S)	414.03 ~~414.23~~	G – 5.12
M-7	4'-0" MANHOLE	CL STA. 18+03.65 O/S 16.05' RT ROYAL COACHMAN DR.	423.93✓	423.73✓	428.15✓	G – 5.12
M-8	4'-0" MANHOLE	CL STA. 15+66.04 O/S 15.08' LF ROYAL COACHMAN DR.	432.27 ~~432.08~~	432.12 ~~431.88~~	436.20 ~~436.39~~	G – 5.12

END SECTIONS

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
ES-1	18" RCCP CL IV END SECTION	N 569443.35 E 1379749.09	392.11✓	392.00✓	–	SD – 5.52
ES-2	18" RCCP CL IV END SECTION	N 567715.80 E 1380757.70	392.11✓	392.00✓	–	SD – 5.52
ES-3	15" RCCP CL IV END SECTION	N 567726.38 E 1380744.93	402.56✓	402.50✓	–	SD – 5.52
ES-9	15" RCCP CL IV END SECTION	N 571458.74 E 1377956.56	409.32	409.29	–	SD- 5.52
ES-5	18" RCCP CL IV END SECTION	N 567493.17 E 1380327.01	404.08✓	404.00✓	–	SD – 5.52
ES-6	18" RCCP CL IV END SECTION	N 567367.22 E 1378836.10	404.03✓	404.00✓	–	SD – 5.52
ES-8	24" HDPE END SECTION	N 569227.78 E 1379532.71	394.23	394.20	–	SD – 5.52

HEADWALLS

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
HW1	TYPE 'A' HEADWALL	N 571053.01 E 1378719.91	384.62✓	–	388.62✓	SD – 5.11(30"PIPE)
HW2	TYPE 'A' HEADWALL	N 571860.35 E 1379404.67	398.00✓	–	402.00✓	SD – 5.11(30"PIPE)
HW3	TYPE 'C' ENDWALL	N 571747.38 E 1379274.67	405.00✓	–	406.75✓	SD – 5.21(12"PIPE)
HW4	TYPE 'C' ENDWALL	N 572306.53 E 1379375.53	398.00✓	– 404.19	400.00 ~~398.75~~	SD – 5.21(12"PIPE)
HW5	SEE DETAIL THIS SHEET	N 571441.69 E 1377931.66	– 405.19	~~405.50/404.50~~	418.29 ~~418.50~~	SEE DETAIL THIS SHEET
HW6	SEE DETAIL THIS SHEET	N 571482.95 E 1377875.32	407.10 ~~407.50/406.50~~	406.16 –	414.76 ~~415.00~~	SEE DETAIL THIS SHEET
HW7	TYPE 'C' ENDWALL	N 572308.59 E 1379390.67	398.00✓	–	400.25✓	SD – 5.21(18"PIPE)

OUTFALL STRUCTURES

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
S-1	SEE DETAIL	N 571121.25 E 1378735.73	385.00✓	385.00✓	~~397.00~~ 436.20	–
S-2	SEE DETAIL	N 571854.42 E 1379332.93	398.50✓	398.50✓	~~410.00~~ 436.20	–
S-3	SEE DETAIL	N 571744.02 E 1379313.36	403.58	403.58	408.83✓	–
S-4	SEE DETAIL	N 572335.75 E 1379568.82	394.98✓	394.98✓	401.83✓	–

1) STRUCTURE ELEVATION AND LOCATION FOR MANHOLES IS AT THE TOP AND CENTER OF RIM.
2) STRUCTURE ELEVATION AND LOCATION FOR CURB INLETS IS AT THE TOP OF CURB AT MIDPOINT OF THE INLET AT THE FACE.
3) STRUCTURE ELEVATION AND LOCATION FOR ENDSECTIONS IS AT THE CONNECTION OF PIPE AND END SECTION.
4) PRECAST STRUCTURES MEETING HS-20 LOADING MAY BE USED.
5) ALL STORM DRAINS SHALL BE RCCP CL IV UNLESS OTHERWISE NOTED.
6) TOP OF SLAB ELEVATION SHOWN FOR 'D' TYPE INLETS.
7) STRUCTURE ELEVATION AND LOCATION FOR TYPE 'D' INLETS IS AT THE TOP CENTER OF THE SLAB.
8) STRUCTURE ELEVATION AND LOCATION FOR HEADWALL IS AT THE TOP CENTER FACE OF WALL.

NO.	TYPE	LOCATION	INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
ES-10	18' RCCP CL IV END SECTION	N571506.56 E 1377880.32	409.80	409.77	—	SD-5.52

PIPE SCHEDULE

RUN	SIZE	LENGTH	SLOPE	TYPE & CLASS
HW-1 TO S-1	30"	75'	0.50%	RCCP IV
ES-1 TO I-2	18"	404'	4.03%	RCCP IV
I-2 TO M-1	18"	37'	2.30%	RCCP IV
M-1 TO I-3	18"	72'	2.42%	RCCP IV
I-3 TO I-4	18"	162'	1.00%	RCCP IV
I-4 TO I-5	15"	28'	1.00%	RCCP IV
I-2 TO I-1	15"	28'	1.00%	RCCP IV
I-3 TO I-6	18"	109'	2.14%	RCCP IV
I-6 TO I-6A	18"	61'	7.93%	RCCP IV
I-6A TO I-10	18"	86'	1.89%	RCCP IV
I-10 TO I-12	18"	107'	9.16%	RCCP IV
I-12 TO I-13	18"	50'	2.13%	RCCP IV
I-13 TO I-14	15"	47'	1.00%	RCCP IV
I-10 TO I-11	15"	94'	1.00%	RCCP IV
I-6 TO I-7	18"	28'	1.00%	RCCP IV
I-7 TO I-8	18"	39'	1.00%	RCCP IV
I-8 TO I-9	15"	29'	1.00%	RCCP IV
ES-2 TO M-2	18"	15'	4.00%	RCCP IV
M-2 TO M-3	18"	92'	2.00%	RCCP IV
M-3 TO I-16	18"	43'	4.28%	RCCP IV
I-16 TO I-17	18"	285'	3.77%	RCCP IV
I-17 TO I-18	15"	26'	1.00%	RCCP IV

PIPE SCHEDULE

RUN	SIZE	LENGTH	SLOPE	TYPE & CLASS
HW2 TO S-2	36"	64'	0.78%	RCCP IV
ES-3 TO S-3	15"	36'	3.03%	RCCP IV
HW3 TO I-19	10"	70'	4.70%	PVC SCH 40
ES-5 TO M-4	18"	96'	2.84%	RCCP IV
M-4 TO I-19	18"	83'	4.45%	RCCP IV
I-19 TO I-20	18"	28'	1.38%	RCCP IV
ES-6 TO M-5	18"	34'	1.20%	RCCP IV
M-5 TO I-21	18"	122'	1.00%	RCCP IV
I-21 TO I-22	18"	28'	1.00%	RCCP IV
I-22 TO I-24	18"	178'	0.93%	RCCP IV
I-24 TO M-6	18"	87'	1.42%	RCCP IV
M-6 TO I-25	18"	54'	7.27%	RCCP IV
I-25 TO M-7	18"	143'	6.13%	RCCP IV
M-7 TO I-27	18"	117'	4.89%	RCCP IV
I-27 TO I-28	18"	28'	1.38%	RCCP IV
I-28 TO M-8	18"	98'	1.48%	RCCP IV
M-8 TO I-29	18"	166'	1.48%	RCCP IV
I-29 TO I-30	15"	28'	1.00%	RCCP IV
I-24 TO I-23	15"	28'	1.00%	RCCP IV
I-25 TO I-26	15"	28'	0.90%	RCCP IV
HW4 TO M-6	8"	60'	12.47%	PVC SCH 40
ES-8 TO S-4	24"	69'	1.00%	HDPE
HW7 TO I-33	18"	37'	0.5%	RCCP IV
I-33 TO I-32	18"	102'	0.5%	RCCP IV
I-32 TO I-31	15"	28'	0.50%	RCCP IV
HW5 TO HW6	2-36"	70'	2.86%	RCCP IV
ES-9 TO ES-10	18"	90'	0.50%	RCCP IV

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

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

D	E	F	G	H	J	K	L	N
36"	10'-0"	21'-4"	6'-6"	8'-6"	5'-3"	9"	12"	14"

'HW6' MODIFIED TYPE 'A' HEADWALL

NOT TO SCALE

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

'HW5' MODIFIED TYPE 'A' HEADWALL

NOT TO SCALE

INLET #19

HO.CO. STD. A-5 INLET
SD – 4.40 (PRECAST)
NOT TO SCALE

MANHOLE #6

HO.CO. STD. G-5.13
(PRECAST)
NOT TO SCALE

Appendix D.8. Miscellaneous Details for Compliance with Performance Criteria

Detail 6 Isolation Diversion Structure

TYPICAL ISOLATION / DIVERSION MANHOLE

(Source: Bell, 1996)

DIVERSION STRUCTURE DETAILS

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on the AS-BUILT plan.
Donald Mason, P.E. Lic. 21443 Date 4/25/11

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

NO	DATE	REVISION
4	5-25-2011	REVISE PIPE RUN FROM ES8 TO S4 TO BE HDPE.
3	10-11-04	REV. I-31, I-32, I-33, PIPE RUNS HW7 TO I-33, I-33 TO I-32
2	5-25-04	REVISE HDPEP TO RCCP CL IV
1	2-5-04	ADD ES-10 AND REVISE HW5 AND HW6

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

11/17/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS HS — 12-24-03 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT JA — 1/13/04 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — 12/24/03 DATE

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O. BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *STRUCTURE AND PIPE SCHEDULE & STORMWATER MANAGEMENT DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 | PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 13 OF 33

AS-BUILT

F-03-134

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PROFILE ALONG CL EMBANKMENT BASIN #4

HORIZONTAL: 1"=20'
VERTICAL: 1"=2'

TEMP. SWM BASIN #4 EMBANKMENT SECTION THRU RISER

HORIZONTAL: 1"=20'
VERTICAL: 1"=2'

PLAN VIEW

SCALE: 1"=30'

CONSTRUCTION SPECIFICATIONS FOR SEDIMENT BASINS

1. *Site Preparation*: Perimeter sediment control devices must be installed prior to clearing and grubbing. Areas where the embankment is to be placed shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots or other objectionable material. The pool area shall not be cleared until completion of the dam embankment unless the pool area is to be used for borrow. In order to facilitate clean-out and restoration, the pool area (measured at the top of the pipe spillway) shall be cleared of all brush, trees, and other objectionable materials.

2. *Cut-off Trench*: A cut-off trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be four feet. The cut-off trench shall extend up both abutments to the flow elevation. The minimum bottom width shall be two feet, but wide enough to permit operation of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for the embankment. The trench shall be dewatered during the backfilling-compaction operation. Fore dewatering see Section D.

3. *Embankment*: The fill material shall be taken from approved areas shown on the plans. It shall be clean mineral soil free of roots, woody vegetation, oversized stones, rocks, or other objectionable material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW & SP) or organic materials (Unified Soil Classes OL and OH) shall not be placed in the embankment. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in six-inch to eight-inch thick continuous lifts over the entire length of the fill. Compaction shall be obtained by routing and hauling the construction equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel track of the equipment or by the use of a compactor. The embankment shall be constructed to an elevation 10 percent higher than the design height to allow for settlement.

4. *Principal Spillway*: Steel risers shall be securely attached to the barrel or barrel sub by welding the full circumference making a watertight connection. Concrete risers shall be poured with the principal spillway in place to prevent welds around the principal spillway filled with concrete or shrink proof grout for watertight connection. The barrel sub must be attached to the riser at the lowest point for watertight connection. The barrel sub must be attached to the riser at the base section (angle) of grade at the outlet conduit. The connection between the riser and the riser base shall be watertight. All connections between barrel sections must be achieved by approved watertight band assemblies. The barrel and riser shall be placed on a firm, smooth foundation of impervious soil as the embankment is constructed. Preceding the embankment to install the barrel pervious materials such as sand, gravel, or crushed stone shall not be used as backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be placed in four inch lifts and hand compacted under and around the pipe to at least the same density as adjacent embankment. A depth of 1.5 times the pipe diameter (min.) shall be backfilled over the principal spillway and hand compacted before crossing it with construction equipment.

5. *Emergency Spillway*: The emergency spillway shall be installed in undisturbed ground. The achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical to the successful operation of the emergency spillway and must be constructed within a tolerance of ± 0.2 feet.

6. *Vegetative Treatment*: Stability the embankment in accordance with the appropriate vegetative Standard and Specifications immediately following construction. In no case shall the embankment remain undistributed for more than seven (7) days. Once constructed, the top and outside face of the embankment shall be mulched with sod and mulch. The remainder of the interior slopes should be stabilized (see time) with seed and mulch. post-basin completion and monitored and maintained erosion free during the life of the basin.

7. *Safety*: Local requirements concerning fencing and signs shall be met, warning the public of hazards of soft sediment and floodwater.

8. *Maintenance*: Repair all damage caused by soil erosion and construction equipment at or before the end of each working day. Sediment shall be removed from this basin when it reaches the specified distance below the top of the riser as shown on the riser. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain. Disposal areas must be stabilized.

9. *Final Disposal*: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then basin material and trapped sediments must be removed and safely disposed of and the basin shall be backfilled with a structural fill. When the basin area is to remain open space, the pond may be pumped dry (using methods in Section D - Dewatering), graded, and back filled.

10. *Conversion to Stormwater Management Structure*: After permanent stabilization of all disturbed areas, temporary sediment basins may be converted to permanent stormwater management structures. To convert permanent standards, may be converted to permanent stormwater management structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with approved stormwater management design plans. Additional grading may also be necessary to provide the required storage volume in the basin. Conversion can only take place after all disturbed areas have been adequately stabilized to the satisfaction of the inspection authority and storm drains have been flushed.

DETAIL 16 – CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE (cont'd)

Riser Size, 'D'	Trash Rack Dimension Diam.	Trash Rack Dimension Height	Minimum Size Concrete Pad	Minimum Size Concrete Base	Minimum Size Concrete Cap
12	10	16	66 diam.	16 diam.	—
15	12	16	"	"	—
18	12	16	"	"	—
21	12	16	"	"	—
24	12	16	"	"	—
27	12	16	"	"	—
30	12	16	"	"	—
36	12	16	"	"	—
42	12	16	"	"	—
48	12	16	"	"	—
54	12	16	"	"	—
60	12	16	"	"	—
66	12	16	"	"	—
72	12	16	"	"	—
78	12	16	"	"	—
84	12	16	"	"	—

Note: The above trash rack and anti-vortex device information is only for corrugated metal pipe. Concrete risers must use the requirements of NO 378.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PACE C – 19 – 28	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION	PACE	U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
			C – 19 – 28A		

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. 21442 Expiration Date: 12-31-12

Not As-Built Information is required on this sheet

NO	DATE	REVISION
1	12-23-2011	REVISE PIPE FROM ECS TO 24 TO BE HDPE

BENCHMARK

ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS

ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

11/19/12

OWNER/DEVELOPER	PROJECT: CASCADE OVERLOOK SECTION ONE
CASCADE OVERLOOK, LLC. P.O.BOX 417 ELLICOTT CITY, MD 21041 (410) 465-4244	LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'
OWNER CRAIG R. AND KAREN C. MARTIN 4637 LANDING ROAD ELKRIDGE, MD 21075	LOCATION: TAX MAP 31, GRID 10 & 17,PARCELS 160,161, 788, & 791 1 st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
	TITLE: TEMPORARY SWM BASIN #4
	DATE: OCTOBER, 2003 PROJECT NO. 11383
DES: DAM DRN: RPS CHK: DAM	SCALE: AS SHOWN DRAWING 20 OF 22

F-03-134 Asbuilt

I. Site Preparation: Perimeter sediment control devices must be installed prior to clearing and grubbing. Areas where the embankment is to be placed shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots or other objectionable material. The pool area shall not be cleared until completion of the dam embankment unless the pool area is to be used for borrow. In order to facilitate clean-out and restoration, the pool area (measured at the top of the pipe spillway) shall be cleared of all brush, trees, and other objectionable materials.

2. Cut-off Trench: A cut-off trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be four feet. The cut-off trench shall extend up both abutments to the flow elevation. The minimum bottom width shall be two feet, but wide enough to permit operation of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for the embankment. The trench shall be dewatered during the backfilling-compaction operation. Fore dewatering see Section D.

3. Embankment: The fill material shall be taken from approved areas shown on the plans. It shall material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW & SP) or organic materials (Unified Soil Classes OL and OH) shall not be placed in the embankment. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in six-inch to eight-inch thick continuous lifts over the entire length of the fill. Compaction shall be obtained by routing and hauling the construction equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel track of the equipment or by the use of a compactor. The embankment shall be constructed to an elevation 10 percent higher than the design height to allow for settlement.

4. Principal Spillway: Steel risers shall be securely attached to the barrel or barrel sub by welding the full circumference making a watertight connection. Concrete risers shall be poured with the principal spillway in place to prevent welds around the principal spillway filled with concrete or shrink proof grout for watertight connection. The barrel sub must be attached to the riser at the lowest point for watertight connection. The barrel sub must be attached to the riser at the base section (angle) of grade at the outlet conduit. The connection between the riser and the riser base shall be watertight. All connections between barrel sections must be achieved by approved watertight band assemblies. The barrel and riser shall be placed on a firm, smooth foundation of impervious soil as the embankment is constructed. Preceding the embankment to install the barrel pervious materials such as sand, gravel, or crushed stone shall not be used as backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be placed in four inch lifts and hand compacted under and around the pipe to at least the same density as adjacent embankment. A depth of 1.5 times the pipe diameter (min.) shall be backfilled over the principal spillway and hand compacted before crossing it with construction equipment.

5. Emergency Spillway: The emergency spillway shall be installed in undisturbed ground. The achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical to the successful operation of the emergency spillway and must be constructed within a tolerance of ± 0.2 feet.

6. Vegetative Treatment: Stability the embankment in accordance with the appropriate vegetative Standard and Specifications immediately following construction. In no case shall the embankment remain undistributed for more than seven (7) days. Once constructed, the top and outside face of the embankment shall be mulched with sod and mulch. The remainder of the interior slopes should be stabilized (see time) with seed and mulch. post-basin completion and monitored and maintained erosion free during the life of the basin.

7. Safety: Local requirements concerning fencing and signs shall be met, warning the public of hazards of soft sediment and floodwater.

8. Maintenance: Repair all damage caused by soil erosion and construction equipment at or before the end of each working day. Sediment shall be removed from this basin when it reaches the specified distance below the top of the riser as shown on the riser. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain. Disposal areas must be stabilized.

9. Final Disposal: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then basin material and trapped sediments must be removed and safely disposed of and the basin shall be backfilled with a structural fill. When the basin area is to remain open space, the pond may be pumped dry (using methods in Section D - Dewatering), graded, and back filled.

10. Conversion to Stormwater Management Structure: After permanent stabilization of all disturbed areas, temporary sediment basins may be converted to permanent stormwater management structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with approved stormwater management design plans. Additional grading may also be necessary to provide the required storage volume in the basin. Conversion can only take place after all disturbed areas have been adequately stabilized to the satisfaction of the inspection authority and storm drains have been flushed.

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL DESIGNATE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE SITE OWNER OR DEVELOPER WITH THE NAME OF THE PERSON TO BE CONTACTED AT ANY HOUR OF THE DAY IN THE EVENT OF A POND EMERGENCY. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

CASCADE OVERLOOK LLC
BY: Craig R. Martin 11/20/12
DEVELOPER DATE

BY THE ENGINEER:

"I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST SECURE 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."

ENDRESS – DONALD V. MASON, P.E. # 21493 11/19/12
ENGINEER DATE

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.

NATURAL RESOURCES CONSERVATION SERVICE 12/19/12
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 12/19/12
DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS 12-24-12
DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT 12/20/12
DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 12/19/12
DATE

I:\asbuilt\engineer\projects\03-134\dwg\20031220-dwg, 11/14/2012 1:54:19 PM

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 4-25-11

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

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/31/03

NO	DATE	REVISION
2	10-08-04	REVISED PROFILE HW7 TO I-31
1	5-25-04	REVISE HDPEP TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 & 11, PARCELS 160,161, 788, & 791
1st ELECTION DISTRICT – HOWARD COUNTY, MARYLAND

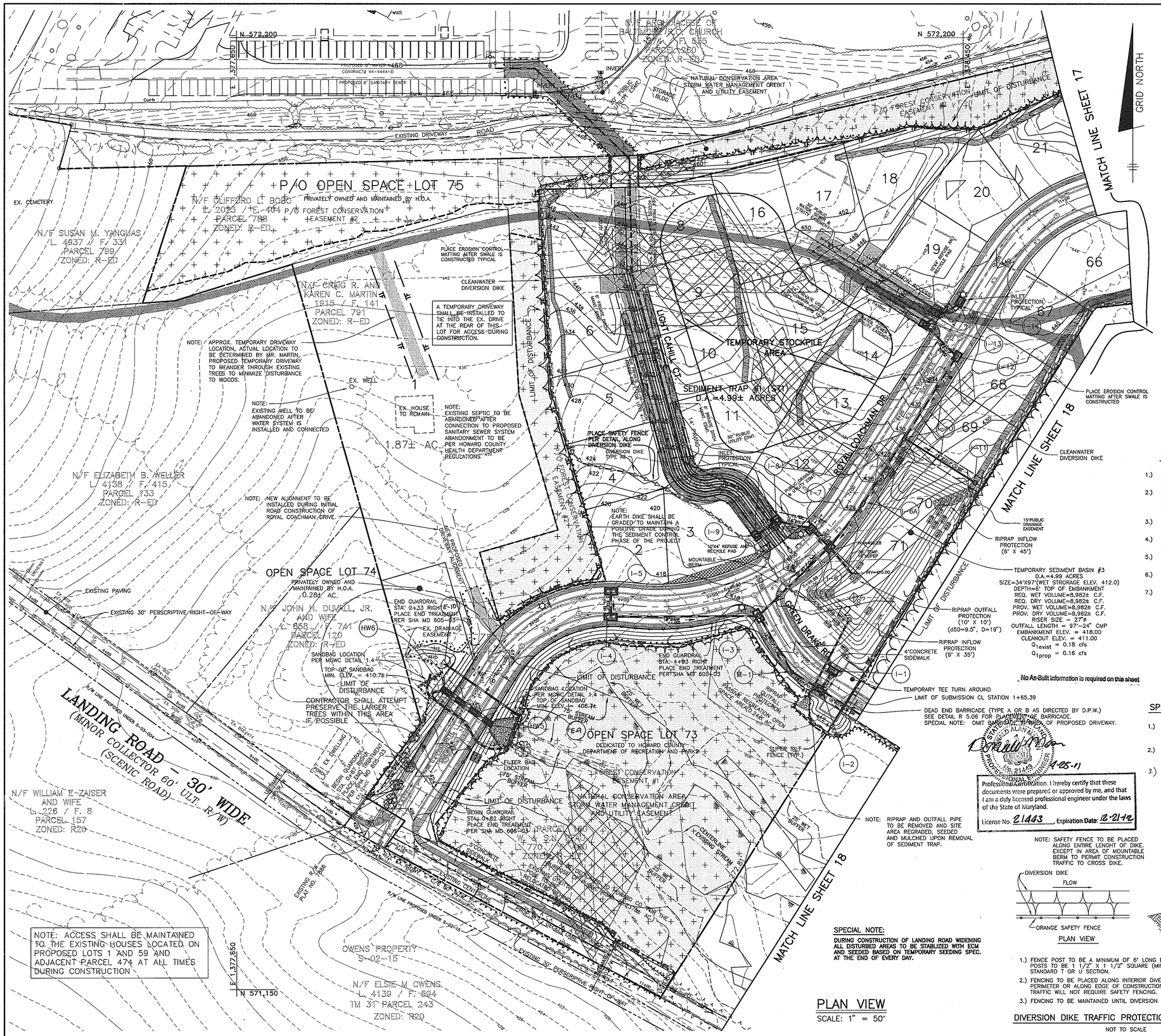
TITLE:
STORM DRAIN PROFILE
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 | PROJECT NO. 1383
DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 15 OF 33

AS-BUILT

F-03-134

\\tsa\vol1\engineer\projects\1383 PFAU\dwg\7044S14.dwg, Sheet 15, 11/14/2003 12:34:44 PM


N 572,200
N 571,150
E 1,377,650
E 1,378,450
PROPOSED 8" WATER CONTRACT# 44-4444-D
PROPOSED 8" SANITARY SEWER
EXISTING DRIVEWAY
ROAD
N/F ARCHDIOCESE OF BALTIMORE R.C. CHURCH L. 595 / F. 595 PARCEL 1360 ZONED: R-ED
NATURAL CONSERVATION AREA STORM WATER MANAGEMENT CREDIT AND UTILITY EASEMENT
P/O FOREST CONSERVATION EASEMENT #2
LIMIT OF DISTURBANCE
P/O OPEN SPACE LOT 75
PRIVATELY OWNED AND MAINTAINED BY H.O.A.
L. 2023 / F. 404 P/O FOREST CONSERVATION EASEMENT #2
EX. CEMETERY
N/F CLIFFORD L. BOSO PARCEL 788 ZONED: R-ED
N/F SUSAN M. YANGHAS L. 4837 / F. 331 PARCEL 789 ZONED: R-ED
N/F CRAIG R. AND KAREN C. MARTIN 1915 / F. 141 PARCEL 791 ZONED: R-ED
PLACE EROSION CONTROL MATTING AFTER SWALE IS CONSTRUCTED TYPICAL
CLEANWATER DIVERSION DIKE
A TEMPORARY DRIVEWAY SHALL BE INSTALLED TO TIE INTO THE EX. DRIVE AT THE REAR OF THIS LOT FOR ACCESS DURING CONSTRUCTION.
NOTE: APPROX. TEMPORARY DRIVEWAY LOCATION, ACTUAL LOCATION TO BE DETERMINED BY MR. MARTIN. PROPOSED TEMPORARY DRIVEWAY TO MEANDER THROUGH EXISTING TREES TO MINIMIZE DISTURBANCE TO WOODS.
EX. WELL
NOTE: EXISTING WELL TO BE ABANDONED AFTER WATER SYSTEM IS INSTALLED AND CONNECTED
EX. HOUSE TO REMAIN
NOTE: EXISTING SEPTIC TO BE ABANDONED AFTER CONNECTION TO PROPOSED SANITARY SEWER SYSTEM ABANDONMENT TO BE PER HOWARD COUNTY HEALTH DEPARTMENT REGULATIONS
1.87± AC.
N/F ELIZABETH B. WELLER L. 4138 / F. 415 PARCEL 733 ZONED: R-ED
NOTE: NEW ALIGNMENT TO BE INSTALLED DURING INITIAL ROAD CONSTRUCTION OF ROYAL COACHMAN DRIVE.
NEW PROPOSED DRIVEWAY ALIGNMENT
OPEN SPACE LOT 74
PRIVATELY OWNED AND MAINTAINED BY H.O.A. 0.28± AC.
N/F JOHN H. DUVALL, JR. AND WIFE L. 658 / F. 741 PARCEL 120 ZONED: R-ED
EXISTING PAVING
EXISTING 30' PERSCRIPTIVE RIGHT-OF-WAY
END GUARDRAIL STA. 2+33 RIGHT PLACE END TREATMENT PER SHA MD 605.03
EX. DRAINAGE EASEMENT
SANDBAG LOCATION PER MSWC DETAIL 1.4
TOP OF SANDBAG MIN. ELEV. = 410.7±
LIMIT OF DISTURBANCE
CONTRACTOR SHALL ATTEMPT TO PRESERVE THE LARGER TREES WITHIN THIS AREA IF POSSIBLE
LANDING ROAD - 30' WIDE (MINOR COLLECTOR 60' ULT. R/W) (SCENIC ROAD)
N/F WILLIAM E. ZAISER AND WIFE L. 226 / F. 8 PARCEL 157 ZONED: R20
EX. DWELLING
EX. GUARDRAIL TO BE REMOVED
BEGIN GUARDRAIL STA. 0+82 RIGHT PLACE END TREATMENT PER SHA MD 605.03
EX. CONCRETE SIDEWALK
EXISTING CENTERLINE
R/W LINE PROPOSED UNDER S-02-04
EXISTING R/W PLAT NO. 7888
NOTE: ACCESS SHALL BE MAINTAINED TO THE EXISTING HOUSES LOCATED ON PROPOSED LOTS 1 AND 59 AND ADJACENT PARCEL 474 AT ALL TIMES DURING CONSTRUCTION
OWENS PROPERTY S-02-15
N/F ELSIE M. OWENS L. 4139 / F. 584 TM 37 PARCEL 243 ZONED: R20
PLACE SAFETY FENCE PER DETAIL ALONG DIVERSION DIKE
DIVERSION DIKE TYPE 2B
NOTE: EARTH DIKE SHALL BE GRADED TO MAINTAIN A POSITIVE GRADE DURING THE SEDIMENT CONTROL PHASE OF THE PROJECT
10'X4' REFUSE AND RECYCLE PAD
MOUNTABLE BERM
SEDIMENT TRAP #1 (ST1) D.A.=4.99± ACRES
TEMPORARY STOCKPILE AREA
LIGHT CAHILL CT.
ROYAL COACHMAN DR.
INLET PROTECTION TYPICAL
PUBLIC DRAINAGE EASEMENT
15" PUBLIC DRAINAGE EASEMENT
30" PUBLIC UTILITY ESMT.
14" PAVING
RIPRAP INFLOW PROTECTION (6' X 45')
TEMPORARY SEDIMENT BASIN #3
SIZE=34'X97'(WET STRORAGE ELEV. 412.0)
DEPTH=6' TOP OF EMBANKMENT
REQ. WET VOLUME=8,982± C.F.
REQ. DRY VOLUME=8,982± C.F.
PROV. WET VOLUME=8,982± C.F.
PROV. DRY VOLUME=8,982± C.F.
RISER SIZE = 27"ø
OUTFALL LENGTH = 97'-24" CMP
EMBANKMENT ELEV. = 418.00
CLEANOUT ELEV. = 411.00
Q_{1exist} = 0.18 cfs
Q_{1prop} = 0.16 cfs
RIPRAP OUTFALL PROTECTION (10' X 10') (d50=9.5", D=19")
RIPRAP INFLOW PROTECTION (6' X 35')
4'CONCRETE SIDEWALK
GREEN DRAW RD.
TEMPORARY TEE TURN AROUND
LIMIT OF SUBMISSION CL STATION 1+65.39
DEAD END BARRICADE (TYPE A OR B AS DIRECTED BY D.P.W.) SEE DETAIL R 5.06 FOR PLACEMENT OF BARRICADE. SPECIAL NOTE: OMIT BARRICADE IN FRONT OF PROPOSED DRIVEWAY.
NOTE: RIPRAP AND OUTFALL PIPE TO BE REMOVED AND SITE AREA REGRADED, SEEDED AND MULCHED UPON REMOVAL OF SEDIMENT TRAP.
OPEN SPACE LOT 73 DEDICATED TO HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
FOREST CONSERVATION EASEMENT #1
NATURAL CONSERVATION AREA STORM WATER MANAGEMENT CREDIT AND UTILITY EASEMENT
PARCEL 800 W. & S.N. 1/2 LOT 770 ZONED: R-ED
FILTER BAG LOCATION
75' STREAM BUFFER
25' WET BUFFER
BEGIN GUARDRAIL STA. 4+83 RIGHT PLACE END TREATMENT PER SHA MD 605.03
SUPER SILT FENCE (TYP.)
RIPRAP OUTFALL PROTECTION OPEN SPACE AREA 2 (24')
EXISTING 30' PERSCRIPTIVE RIGHT-OF-WAY
PROPOSED 30' DRIVEWAY ENTRANCE
PROPOSED 30' DRIVEWAY ENTRANCE
PROPOSED 30' DRIVEWAY ENTRANCE

SPECIAL NOTES LOT 59:

PLACE 4' HIGH ORANGE SAFETY FENCE AROUND EXISTING WELL AND SEPTIC SYSTEM, TO ELIMINATE POSSIBLE LAND DISTURBANCE DURING CONSTRUCTION. AFTER PROPOSED WATER AND SEWER SYSTEMS ARE INSTALLED AND SERVICE PROVIDED TO EXISTING DWELLING SAFETY FENCE CAN BE REMOVED.

EXISTING WELL TO BE ABANDONED ONLY AFTER THE PROPOSED WATER SYSTEM IS IN AND SERVICE PROVIDED TO THE EXISTING DWELLING.

EXISTING SEPTIC SYSTEM TO BE ABANDONED ONLY AFTER PROPOSED SANITARY SEWER SYSTEM IS INSTALLED AND CONNECTED TO EXISTING DWELLING. AT THAT TIME THE EXISTING SEPTIC SYSTEM TO BE ABANDONED PER HOWARD COUNTY HEALTH DEPARTMENT REGULATIONS.

LEGEND:

EXISTING CONTOUR 442
PROPOSED CONTOUR 440
LIMIT OF DRAINAGE AREA
EARTH DIKE
EXISTING WETLANDS
EXISTING TREELINE
PROPOSED TREELINE
LIMIT OF DISTURBANCE
TREE PROTECTION FENCE TF
DRAINAGE FLOW ARROW
SILT FENCE SF
SUPER SILT FENCE SSF
SLOPES BETWEEN 15% AND 24.9%
RIPRAP PROTECTION
NATURAL CONSERVATION AREA STORM WATER MANAGEMENT CREDIT AND UTILITY EASEMENT
15' NO WOODY VEGETATION ZONE
INLET PROTECTION
GUARDRAIL
REMOVEABLE PUMPING STA. RPS
EROSION CONTROL MATTING

OPERATION, MAINTENANCE AND INSPECTION NOTE

INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA SCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378). THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTANANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE FACILITY SHOWN HEREON WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED DESIGN SPECIFICATIONS.

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

Donald Mason 21443
DONALD A. MASON 4/26-11

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 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.

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

DEVELOPER CASCADE OVERLOOK, LLC. STEVEN BERGER DATE 12-5-03

BY THE ENGINEER:

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

ENGINEER – DONALD A. MASON, P.E. # 21443 — 12/5/03 DATE

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.

NATURAL RESOURCES CONSERVATION SERVICE — 12/16/03 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 — 12/16/03 DATE

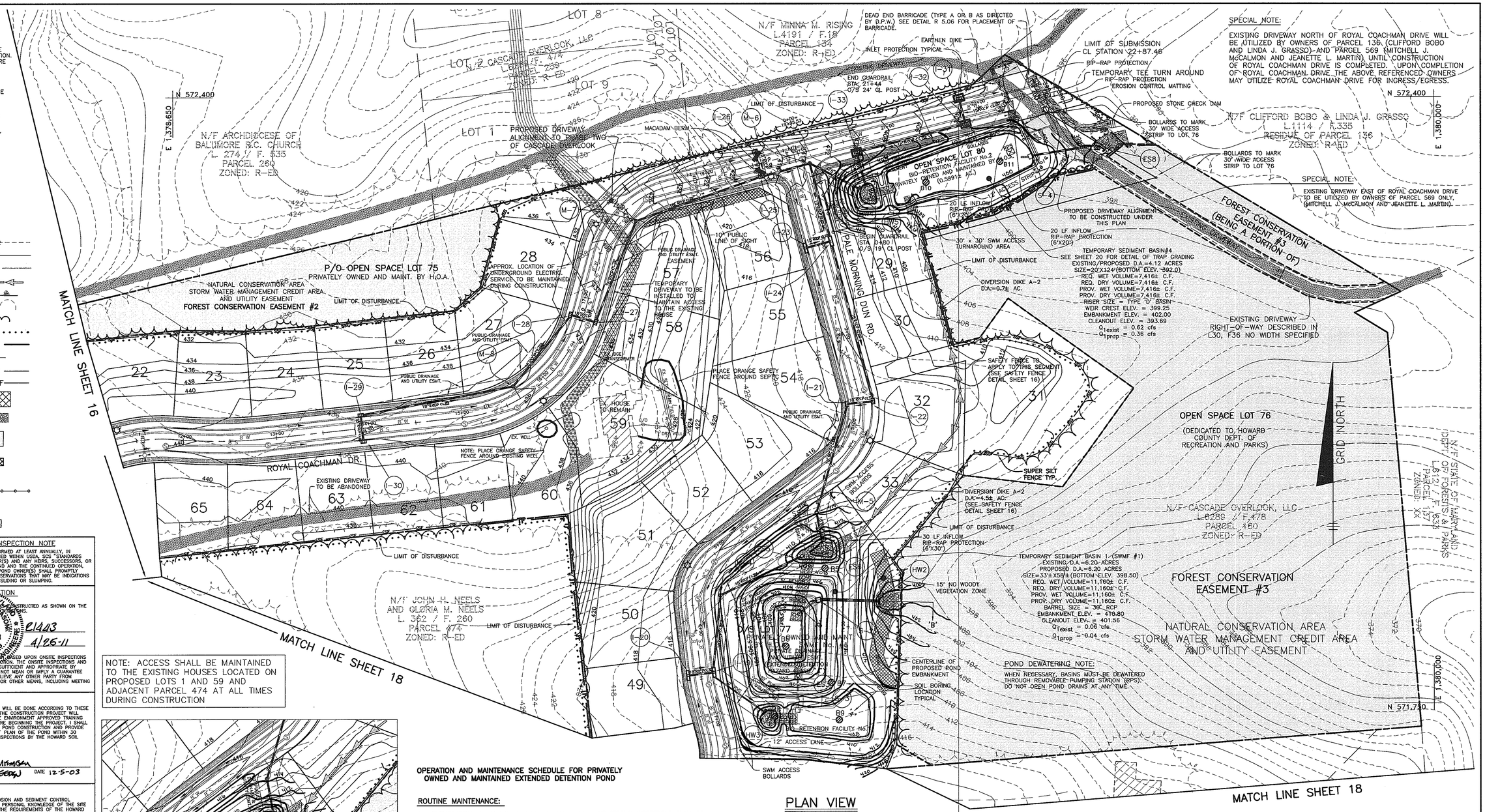
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — 12-24-03 DATE

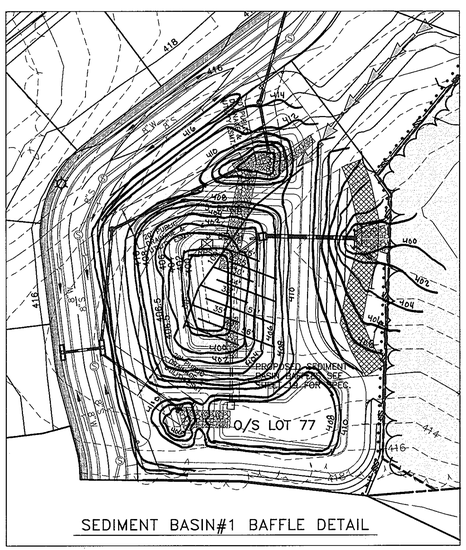
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 1/13/04 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 12/24/03 DATE



NOTE: ACCESS SHALL BE MAINTAINED TO THE EXISTING HOUSES LOCATED ON PROPOSED LOTS 1 AND 59 AND ADJACENT PARCEL 474 AT ALL TIMES DURING CONSTRUCTION



SEDIMENT BASIN#1 BAFFLE DETAIL

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED EXTENDED DETENTION POND

ROUTINE MAINTENANCE:

1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES PER YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL 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:

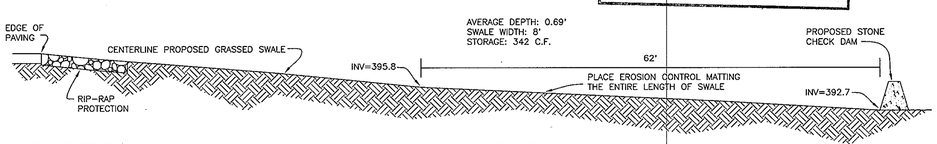
1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENTS SHALL BE REMOVED FROM THE POND, AND FOREBAY, NO LATER THAN WHEN THE CAPACITY OF THE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

PLAN VIEW
SCALE: 1" = 50'

SWMF #1 STORM DATA	
STORM EVENT	ELEVATION
Wpv	402.40
Cpv	407.65
Qp10	408.45
Qp100	408.80

STATE OF MARYLAND — DONALD ALAN MASON — No. 21449 — PROFESSIONAL ENGINEER — 4/26-11

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. 21449, Expiration Date: 12-21-12



GRASSED SWALE PROFILE DETAIL
N.T.S.

SPECIAL NOTE:
CURL ENDS OF SILT FENCE AND SUPER SILT FENCE UPHILL A MINIMUM OF 2 FEET IN ELEVATION.

NO	DATE	REVISION
1	5-28-04	REVISE HDPED TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
Donald Mason 12/5/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *GRADING, SEDIMENT AND EROSION CONTROL PLAN*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: DECEMBER, 2003 — PROJECT NO. 1383
DES: DAM — DRN: RPS — CHK: DAM — SCALE: AS SHOWN — DRAWING 17 OF 33

AS-BUILT

F-03-134

\\tsa\vol1\engineer\projects\1383 PFAU\dwg\7026S17.dwg, SHEET 17, 12/4/2003 6:19:04 PM, Administrator

OPERATION, MAINTENANCE AND INSPECTION NOTE

INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378). THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTAINANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

AS-BUILT CERTIFICATION

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

Donald Mason — DONALD A. MASON   PE NO. 21443   DATE 4/25/11

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 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.

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

DEVELOPER CASCADE OVERLOOK, LLC — MEMBER STEVEN K BREEDEN — DATE 12-5-03

BY THE ENGINEER:

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

ENGINEER – DONALD A. MASON, P.E. # 21443 — DATE 12/5/03

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.

NATURAL RESOURCES CONSERVATION SERVICE — DATE 12/16/03

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 12/16/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/24/03

SWMF #2 STORM DATA	
STORM EVENT	ELEVATION
Wpv	389.10
Cpv	394.46
Qp10	395.65
Qp100	396.20

NOTE: ACCESS SHALL BE MAINTAINED TO THE EXISTING HOUSES LOCATED ON PROPOSED LOTS 1 AND 59 AND ADJACENT PARCEL 474 AT ALL TIMES DURING CONSTRUCTION

SPECIAL NOTE:

CURL ENDS OF SILT FENCE AND SUPER SILT FENCE UPHILL A MINIMUM OF 2 FEET IN ELEVATION.

LEGEND:

EXISTING CONTOUR	- - - 442 - - -
PROPOSED CONTOUR	440
LIMIT OF DRAINAGE AREA	
EARTH DIKE	
EXISTING WETLANDS	
EXISTING TREELINE	
PROPOSED TREELINE	
LIMIT OF DISTURBANCE	
TREE PROTECTION FENCE	TF
EROSION CONTROL MATTING =	
DRAINAGE FLOW ARROW =	
SILT FENCE	SF
SUPER SILT FENCE	SSF
SLOPES BETWEEN 15% AND 24.9%	
RIPRAP PROTECTION	
NATURAL CONSERVATION AREA STORM WATER MANAGEMENT CREDIT AND UTILITY EASEMENT	
15' NO WOODY VEGETATION ZONE	
REMOVEABLE PUMPING STA.	RPS

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED EXTENDED DETENTION POND

ROUTINE MAINTENANCE:

1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES PER YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED.
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1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
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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

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 4/25/11

NO	DATE	REVISION
1	5-25-04	REVISE HDPEP TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 12/5/03

OWNER/DEVELOPER

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P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER

CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK* *SECTION ONE*
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791; 1 st. ELECTION DISTRICT; HOWARD COUNTY, MARYLAND

TITLE: ***GRADING, SEDIMENT AND EROSION CONTROL PLAN***
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: DECEMBER, 2003 — PROJECT NO. 1383

DES: DAM — DRN: RPS — CHK: DAM — SCALE: AS SHOWN — DRAWING 18 OF 33

AS-BUILT — F-03-134

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SEDIMENT CONTROL NOTES

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, (313-1850).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL", REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 51) SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE	36.78	ACRES
AREA DISTURBED	21.74	ACRES
AREA TO BE ROOFED OR PAVED	11.51	ACRES
AREA TO BE VEGETATIVELY STABILIZED	10.23	ACRES
TOTAL CUT	71003	CY
TOTAL FILL	30388	CY
OFFSITE WASTE/BORROW AREA LOCATION	SEE NOTE #12	

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 CONTROL 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 CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.
12. WASTE WILL BE HAULED TO AN APPROVED WASTE DISPOSAL SITE, WITH A ACTIVE GRADING PERMIT.

TEMPORARY SEEDBED PREPARATIONS

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT).

SEEDING: FOR PERIOD MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2-1/2 BUSHELS PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT). FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (.07 LBS/1000 SQ FT). FOR THE PERIOD NOVEMBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES, 8 FT. OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

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

PERMANENT SEEDBED PREPARATIONS

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ON OF THE FOLLOWING SCHEDULES:

1. PREFERRED – APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0- UREAFORM FERTILIZER (9 LBS/1000 SQ FT).
2. ACCEPTABLE – APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ FT) BEFORE SEEDING. HARROW OR DISC INTO UPPER THREE INCHES OF SOIL.

SEEDING: FOR THE PERIODS MARCH 1 THROUGH APRIL 30 AND AUGUST 1 THROUGH OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SQ FT) OF KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (.05 LBS/1000 SQ FT) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) USE SOD. OPTION (3) SEED WITH 60 LBS PER ACRE OF KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS PER ACRE OF WELL ANCHORED STRAW.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

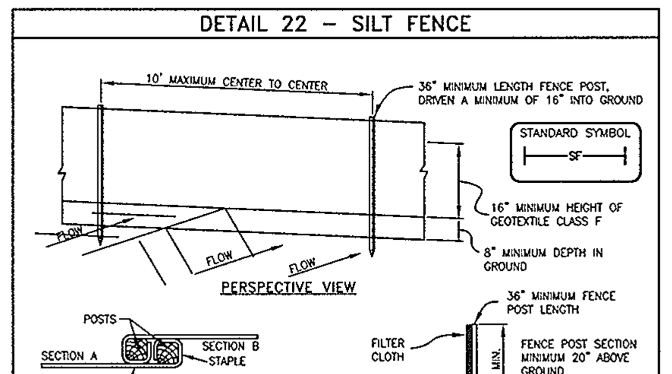
MAINTENANCE: INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

SEQUENCE OF CONSTRUCTION

NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION

DAY 1	OBTAIN GRADING PERMIT and A LETTER OF AUTHORIZATION FROM MDE. APPLICATION TRACKING NO. 03-NT-0297/200364843 MUST BE OBTAINED PRIOR TO DISTURBANCE OF THE STREAM OR WETLANDS FOR THE ROAD AND/OR UTILITY CROSSING.
DAY 2-7	INSTALL STABILIZED CONSTRUCTION ENTRANCES, TREE PROTECTION FENCES, SILT FENCES, SUPER SILT FENCES, TEMPORARY DIVERSION PIPES AND TEMPORARY CLEANWATER DIVERSION DIKES.
DAY 8-40	INSTALL SEDIMENT TRAPS AND BASINS.
DAY 41-50	INSTALL EARTH DIKES AND ANY REMAINING SEDIMENT CONTROL DEVICES.
DAY 51-58	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, BRING ROAD BEDS ONLY TO SUBGRADE AND STABILIZE SLOPES IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES.
DAY 59-89	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, MASS GRADE LOTS AND STABILIZE IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES.
DAY 90-149	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, INSTALL STORM DRAINS, WATER, SEWER AND UTILITY LINES. INLET I-5 TO BE TEMPORARILY BLOCKED.
DAY 150-170	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, INSTALL CURB AND GUTTER AND INSTALL PAVING.
DAY 171-180	COMPLETE GRADING OF SITE AND STABLIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES.
DAY 181-190	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT TRAPS AND REMAINING SEDIMENT CONTROL DEVICES, AND STABILIZED DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES.
DAY 191-200	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, CONVERT SEDIMENT BASINS TO STORMWATER MANAGEMENT FACILITIES/ BIO-RETENTION FACILITIES. SHAPE FACILITIES PER FINAL GRADES SHOWN ON THE PLANS AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES.

DETAIL 22 – SILT FENCE



CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

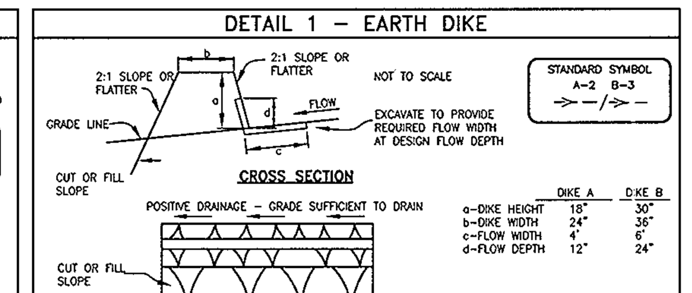
1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 3/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 1.00 pond per linear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

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

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

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

DETAIL 1 – EARTH DIKE



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

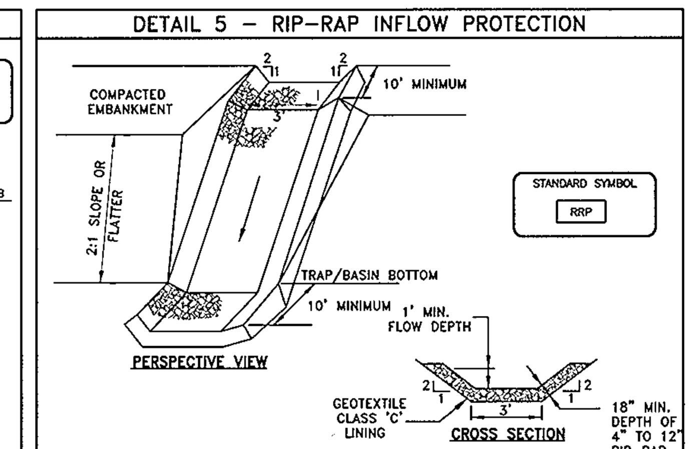
1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" – 7" stone or recycled concrete equivalent pressed into the soil 7" minimum.

CONSTRUCTION SPECIFICATIONS

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stablized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

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

DETAIL 5 – RIP-RAP INFLOW PROTECTION

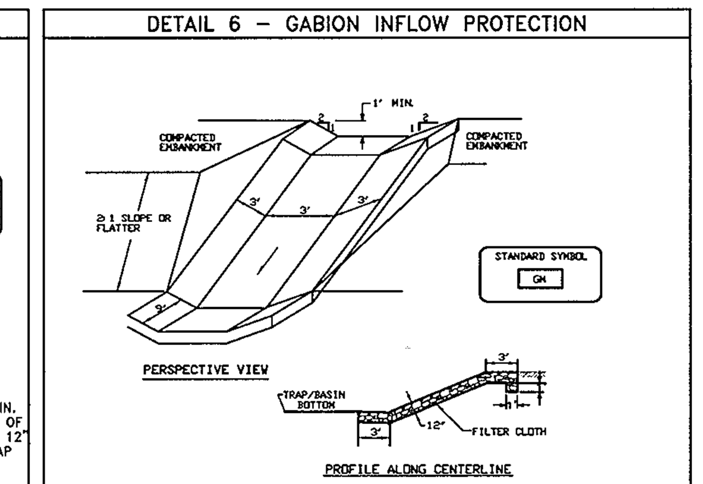


CONSTRUCTION SPECIFICATIONS

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

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

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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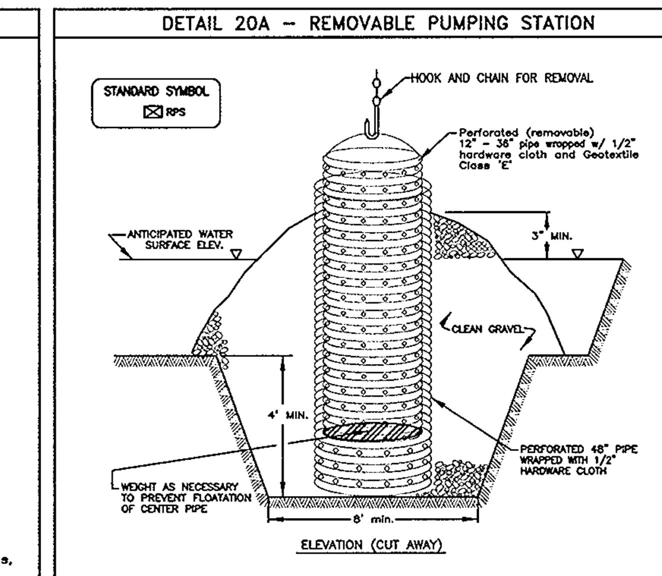
DETAIL 20A – REMOVABLE PUMPING STATION



Construction Specifications

1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with 1/2" hardware cloth to prevent backfill material from entering the perforations.
2. After installing the outer pipe, backfill around outer pipe with 2" aggregate or clean gravel.
3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be 1/2" X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with 1/2" hardware cloth first, then wrapped again with Geotextile Class C.
4. The center pipe should extend 12" to 18" above the anticipated water surface elevation or riser crest elevation when dewatering a basin.

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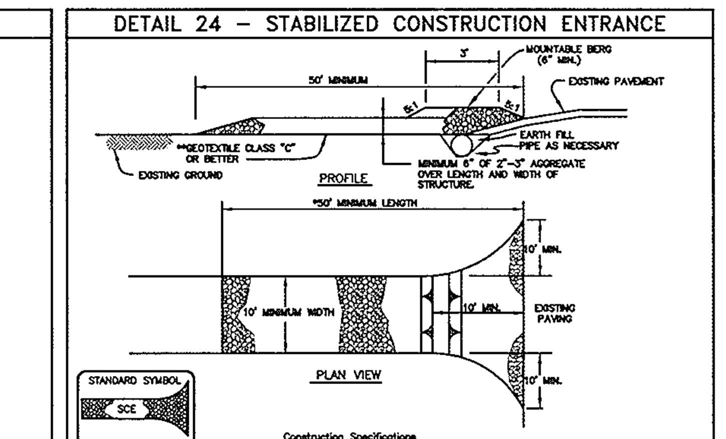
DETAIL 24 – STABILIZED CONSTRUCTION ENTRANCE



Construction Specifications

1. Length – minimum of 50' (*30' for single residence lot).
2. Width– 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residence 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 mounted berg 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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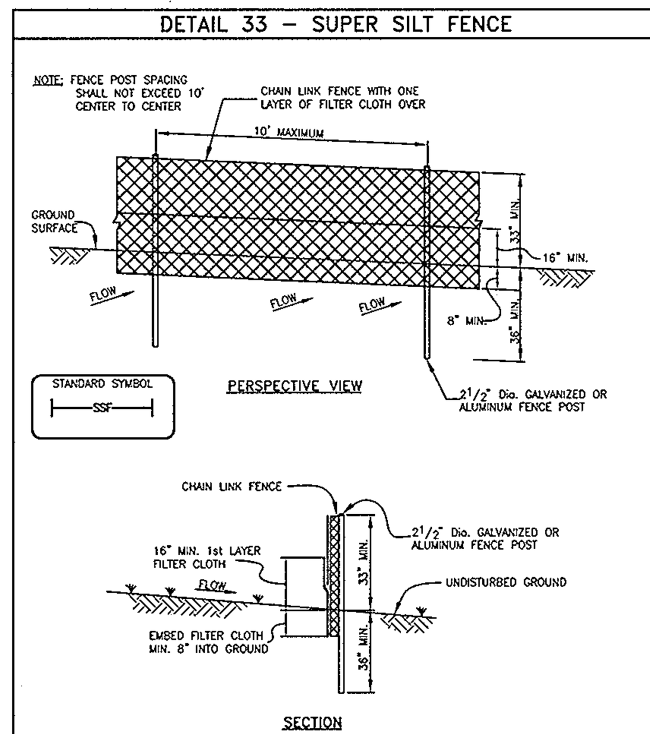
DETAIL 33 – SUPER SILT FENCE



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SUPER SILT FENCE

CONSTRUCTION SPECIFICATIONS

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and truss rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:

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

SUPER SILT FENCE DESIGN CRITERIA

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
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	1,000 feet
33 – 50%	3:1 – 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

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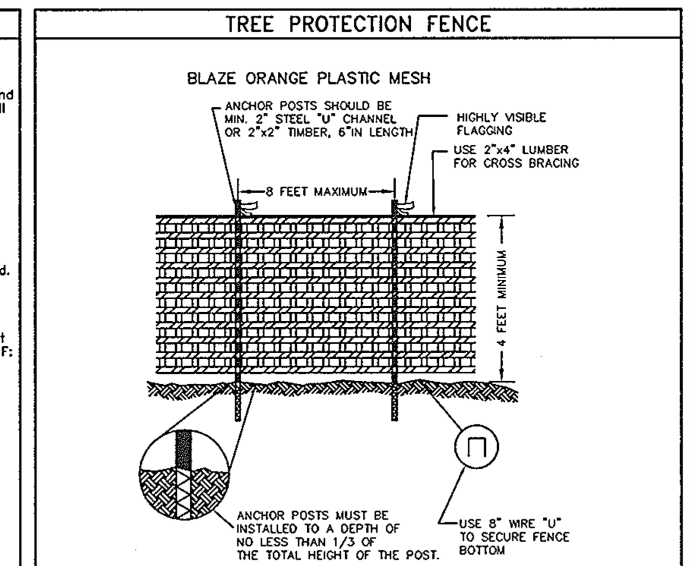
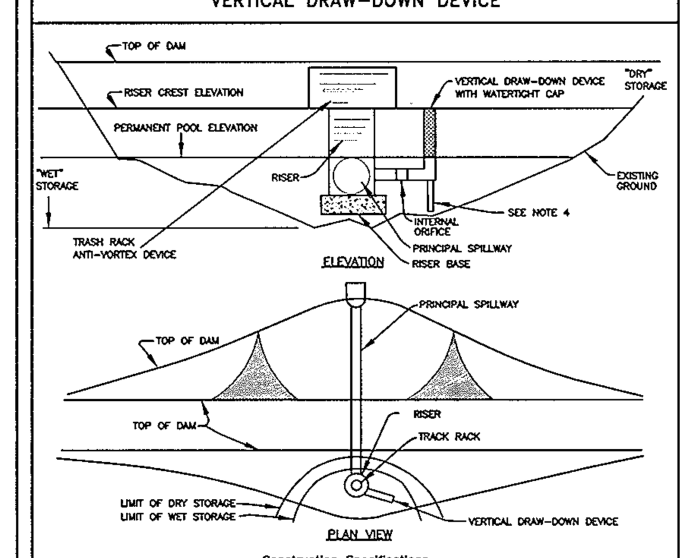
TREE PROTECTION FENCE



NOTES:

1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICES.
4. AVOID ROOT DAMAGE WHEN PLACING ANCHOR POSTS.
5. DEVICE SHOULD BE PROPERLY MAINTAINED DURING CONSTRUCTION
6. PROTECTIVE SIGNAGE IS ALSO REQUIRED.

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 2 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 1" by 4" square or 2" round wooden posts set 3' minimum into the ground then joining them to the device by wrapping with 12 gauge minimum wire.

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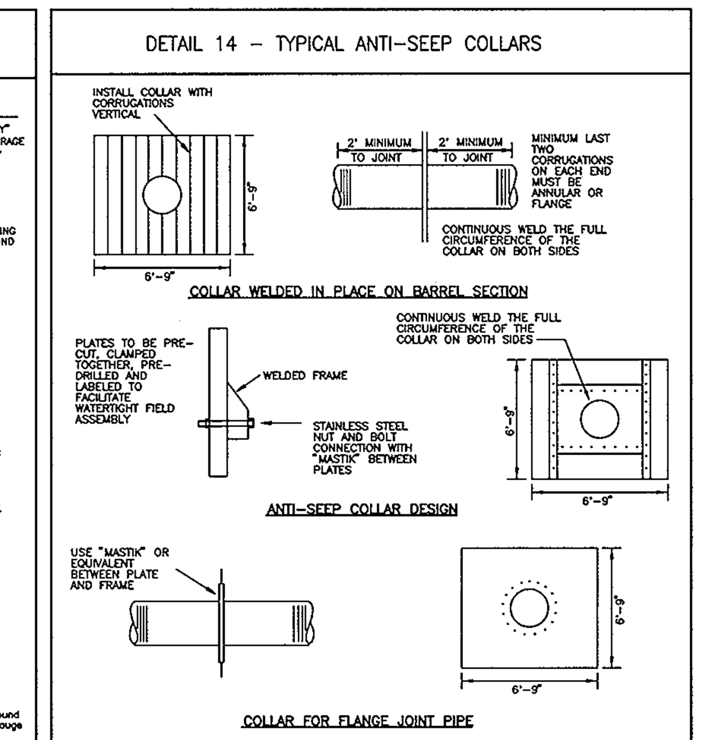
DETAIL 14 – TYPICAL ANTI-SEEP COLLARS



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TOPSOIL SPECIFICATIONS

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

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

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

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

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

III. 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.

IV. 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 or topsoil shall be not less than 1.5 percent by weight.

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

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

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

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

V. Topsoil Application

i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, earth dikes, slope silt fence and sediment traps and basins.

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

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

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

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

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

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

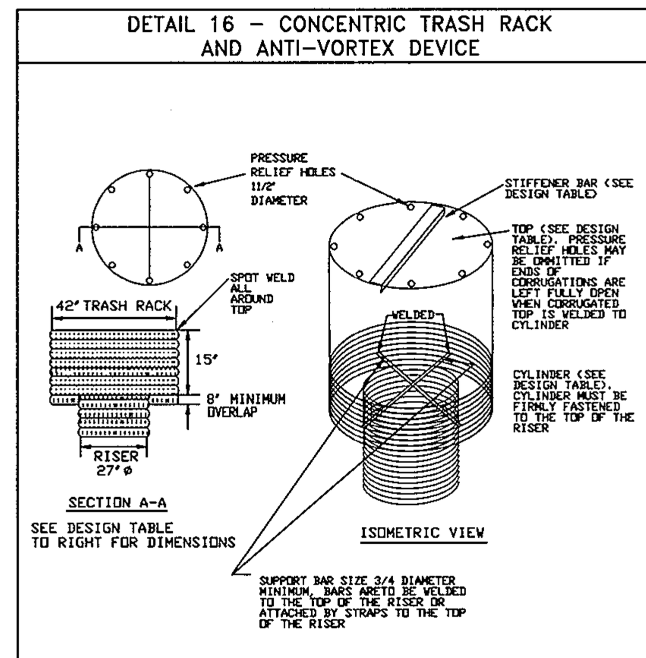
b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.

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

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

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

DETAIL 16 – CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE



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DETAIL 16 – CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE (cont'd)

Riser Diam., in.	Trash Rack Cylinder Diam. in.	Thick., gage	H, in.	Minimum Size Support Bar	Minimum Top Thickness	Stiffener
12	18	16	6	#6 Rebar	16 ga.	--
15	21	16	7	"	"	--
18	27	16	8	"	"	--
21	30	16	11	#6 Rebar	16 ga.	--
24	36	16	13	"	14 ga.	--
27	42	16	15	#6 Rebar	14 ga.	--
36	54	14	17	#8 Rebar	12 ga.	--
42	60	14	19	"	"	--
48	72	12	21	1-1/4" pipe or 1-1/4 x 1-1/4 x1/4 angle	10 ga.	--
54	78	12	25	"	"	--
60	90	12	29	1-1/2" pipe or 1-1/2 x 1-1/2 x1/4 angle	8 ga.	--
66	96	10	33	2" pipe or 2x2x3/16 angle	8 ga., w/stiffener	2x2x1/4 angle
72	102	10	36	"	"	2-1/2x2-1/2x1/4 angle
78	114	10	39	2-1/2" pipe or 2x2x1/4 angle	"	"
84	120	10	42	2-1/2" pipe or 2-1/2x2-1/2x1/4 angle	"	2-1/2 x2-1/2x 5/16 angle

Note: The above trash rack and anti-vortex device information is only for corrugated metal pipe. Concrete risers must meet the requirements of MD 378.

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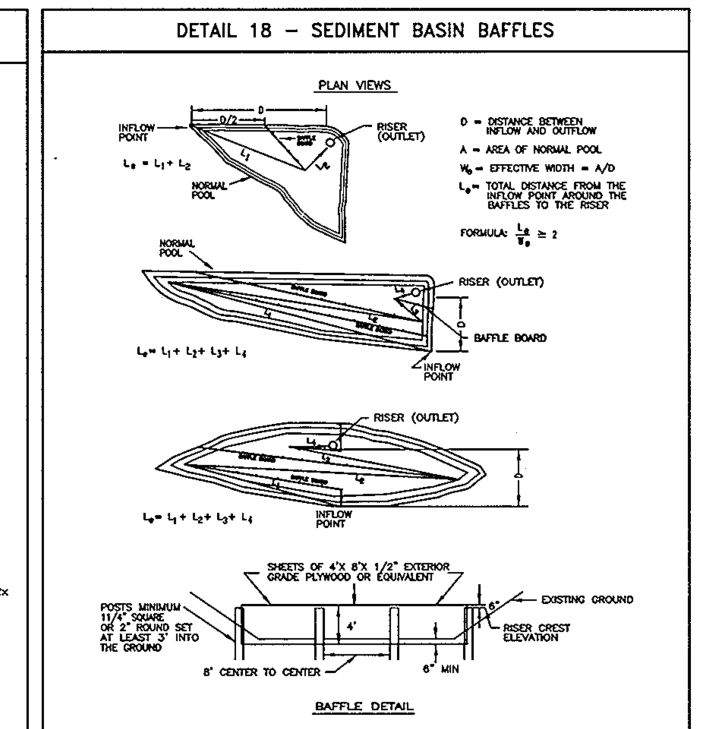
DETAIL 18 – SEDIMENT BASIN BAFFLES



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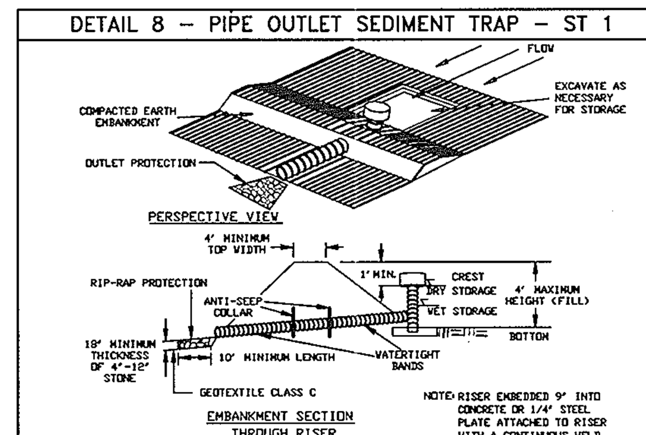
DETAIL 8 – PIPE OUTLET SEDIMENT TRAP – ST 1



Construction Specifications

1. The area under the embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. The total trap volume as measured from the bottom to riser crest elevation shall be 3600 cubic feet per acre of drainage area (see Table 9). The top of embankment must be ≥ 1' above the riser crest elevation.
4. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to one half of the wet storage depth of the trap (900cf/ac). The sediment shall be deposited in a suitable area and in such a manner that it will not erode.
5. The structure shall be inspected periodically and after each rain and repairs made as necessary.

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PIPE OUTLET SEDIMENT TRAP – ST 1 (cont'd)

6. Construction operations shall be carried out in such a manner that erosion and water pollution are abated. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. Points of concentrated inflow shall be protected in accordance with Grade Stabilization Structure criteria. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap.
7. The structure shall be removed and area stabilized when the drainage area has been properly stabilized.
8. All cut and fill slopes shall be 2:1 or flatter.
9. All pipe connections shall be watertight.
10. Above the wet storage elevation, the riser shall be perforated with 1/2" wide by 6" long slits or 1" diameter holes spaced 6" vertically and horizontally. No perforations will be allowed within 6" of the horizontal barrel.
11. The riser shall be wrapped with 1/2" hardware cloth (wire) then wrapped with Geotextile Class E. The filter cloth shall extend 6" above the highest slit and 6" below the lowest slit. Where ends of filter cloth come together, they shall be overlapped, folded and fastened to prevent bypass. Filter cloth shall be replaced as necessary to prevent clogging.
12. Straps or connecting bands shall be used to hold the filter cloth and wire fabric in place. They shall be placed at the top and bottom of the cloth.
13. Fill material around the pipe spillway shall be hand compacted in 4" layers. A minimum of 2' of hand-compacted backfill shall be placed over the pipe spillway before crossing it with construction equipment.
14. The riser shall be anchored with either a concrete base or steel plate base to prevent flotation. Concrete bases shall be at least twice the riser diameter and 12" deep with the riser embedded 9". Steel plate bases shall be at least twice the riser diameter, 1/4" minimum thickness and attached to the bottom of the riser by a continuous weld to form a watertight connection. Then place 2' of stone, gravel or tamped earth on the plate.
15. Anti seep collars shall be constructed in accordance with plans (ref. table 16 and Details 13 and 14).
16. Concentric trash rack and anti-vortex device design details are on Detail 16.
17. Refer to Section D for dewatering requirements of sediment traps.
18. Outlet – An outlet shall be provided, which includes a means of conveying the discharge in an erosion free manner to an existing stable channel.
19. Where discharge occurs at the property line, local ordinances and drainage easement requirements shall be met.

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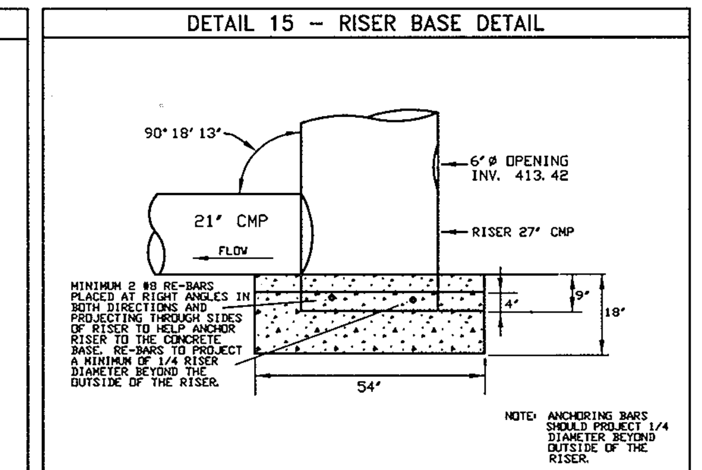
DETAIL 15 – RISER BASE DETAIL



Construction Specifications

The riser shall have a base attached with a watertight connection and shall have sufficient weight to prevent flotation of the riser. Two approved bases for risers 10' or less in height are:

1. A concrete base 18" thick with the riser embedded 9" in the base.
2. A 1/4" minimum thickness steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2' of stone, gravel, or compacted earth placed on it to prevent flotation. In either case, each side of the square base shall be twice the riser diameter.

Note: For risers greater than ten feet high computations shall be made to design a base which will prevent floatation. The minimum factor of safety shall be 1.20 (downward forces = 1.20 x upward forces).

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STATE OF MARYLAND – DONALD ALAN MASON – No. 21443 – PROFESSIONAL ENGINEER
4/26/11

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

No As-Built information is required on this sheet

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

CASCADE OVERLOOK LLC
BY: [signature] MEMBER 11/20/03
DEVELOPER STEVEN K BREEDEN DATE

BY THE ENGINEER:

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

Donald Mason 11/17/03
ENGINEER – DONALD A. MASON, P.E. # 21443 DATE

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] 12/16/03
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] 12/16/03
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

[signature] 12-24-03
CHIEF, BUREAU OF HIGHWAYS HS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 1/13/04
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[signature] 12/30/03
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ DATE

NO	DATE	REVISION

BENCHMARK ENGINEERING, INC.
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

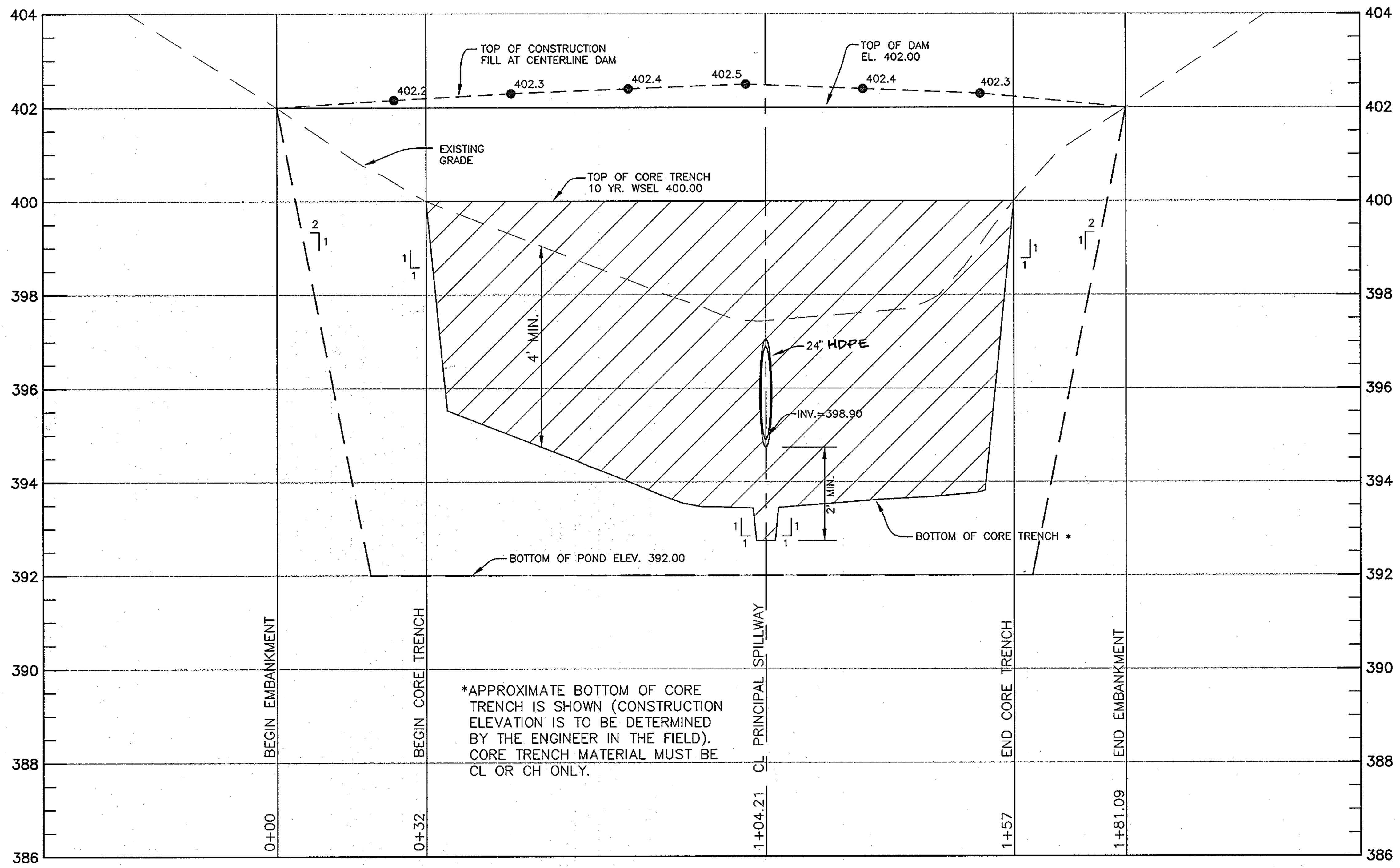
LOCATION:
TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *GRADING, SEDIMENT AND EROSION CONTROL DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 | PROJECT NO. 1383

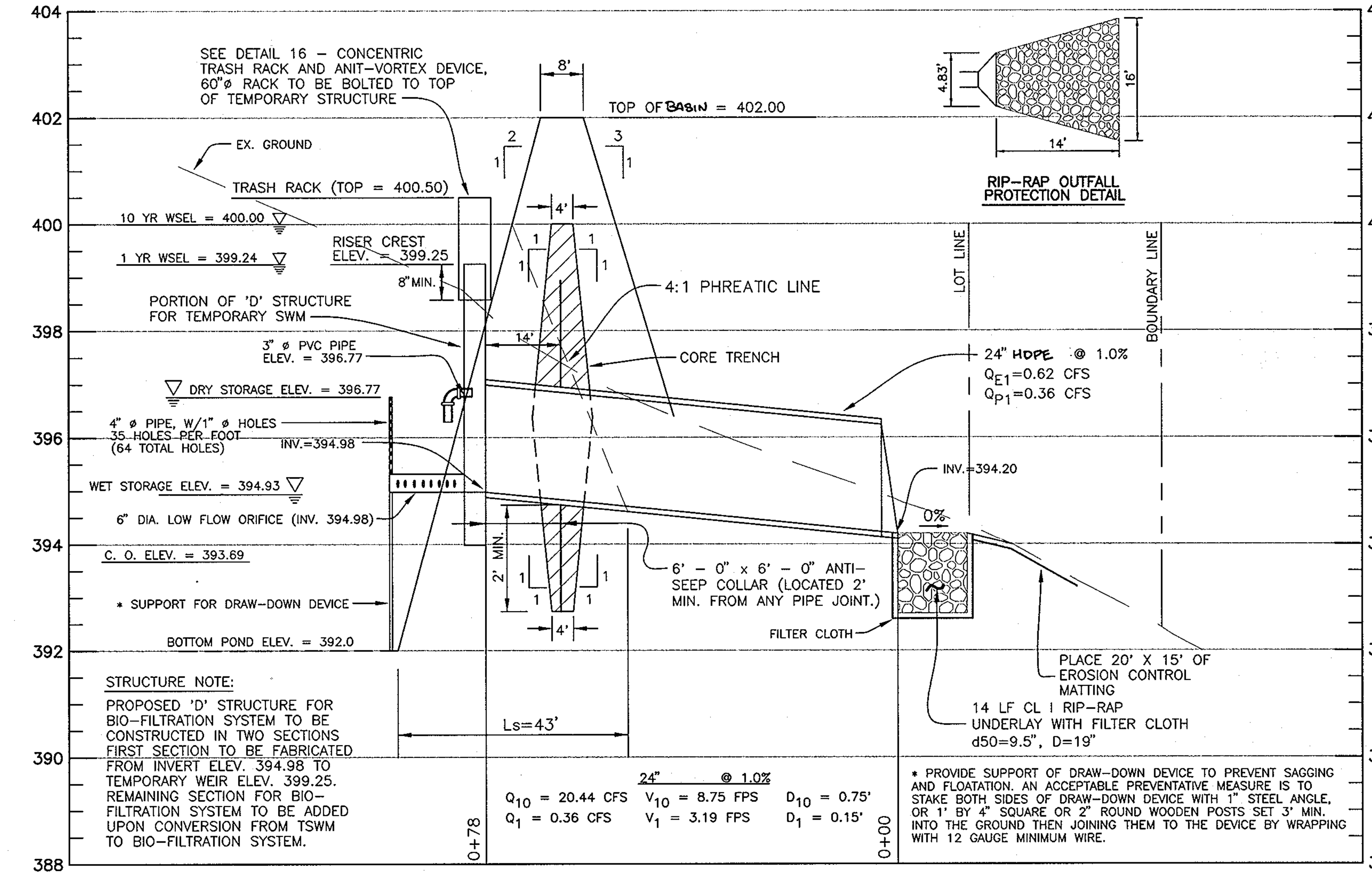
DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 19 OF 33

AS-BUILT F-03-134



PROFILE ALONG CL EMBANKMENT BASIN #4

HORIZONTAL: 1"=20'
VERTICAL: 1"=2'



STRUCTURE NOTE:
PROPOSED 'D' STRUCTURE FOR BIO-FILTRATION SYSTEM TO BE CONSTRUCTED IN TWO SECTIONS FIRST SECTION TO BE FABRICATED FROM INVERT ELEV. 394.98 TO TEMPORARY WEIR ELEV. 399.25. REMAINING SECTION FOR BIO-FILTRATION SYSTEM TO BE ADDED UPON CONVERSION FROM TSWM TO BIO-FILTRATION SYSTEM.

0+78

24" @ 1.0%
Q_{10} = 20.44 CFS V_{10} = 8.75 FPS D_{10} = 0.75'
Q_1 = 0.36 CFS V_1 = 3.19 FPS D_1 = 0.15'

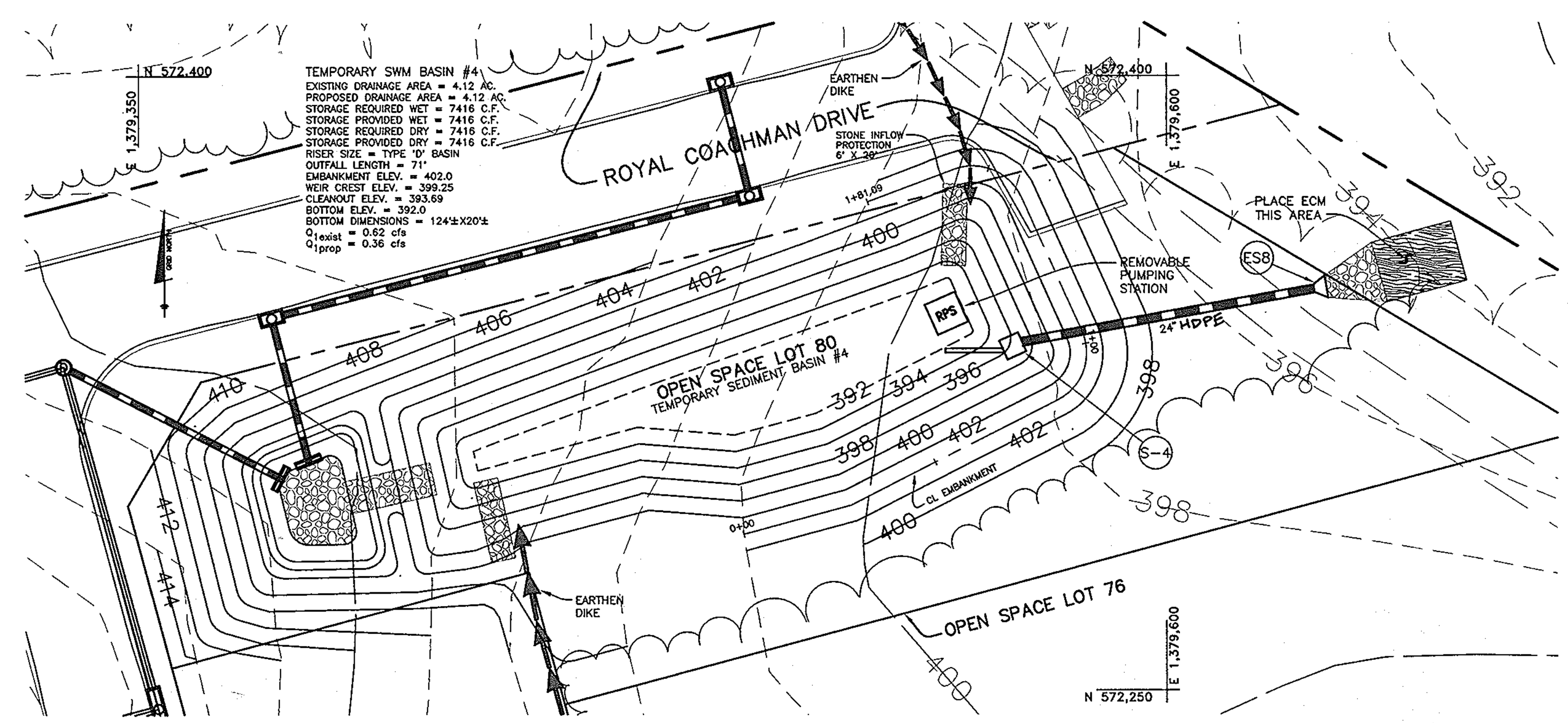
0+00

* 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 1' BY 4" SQUARE OR 2" ROUND WOODEN POSTS SET 3' MIN. INTO THE GROUND THEN JOINING THEM TO THE DEVICE BY WRAPPING WITH 12 GAUGE MINIMUM WIRE.

NOTE: 3"ø PVC PIPE FOR TEMPORARY SWM TO BE CUT OFF AND CAPPED AFTER CONVERSION TO BIO-FILTRATION FACILITY.

TEMP. SWM BASIN #4 EMBANKMENT SECTION THRU RISER

HORIZONTAL: 1"=20'
VERTICAL: 1"=2'



PLAN VIEW

SCALE: 1"=30'

CONSTRUCTION SPECIFICATIONS FOR SEDIMENT BASINS

1. Site Preparation: Perimeter sediment control devices must be installed prior to clearing and grubbing. Areas where the embankment is to be placed shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots or other objectionable material. The pool area shall not be cleared until completion of the dam embankment unless the pool area is to be used for borrow. In order to facilitate clean-out and restoration, the pool area (measured at the top of the pipe spillway) shall be cleared of all brush, trees, and other objectionable materials.

2. Cut-off Trench: A cut-off trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be four feet. The cut-off trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be two feet, but wide enough to permit operation of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for the embankment. The trench shall be dewatered during the backfilling-compaction operations. For dewatering see Section D.

3. Embankment: The fill material shall be taken from approved areas shown on the plans. It shall be clean mineral soil free of roots, woody vegetation, oversized stones, rocks, or other objectionable material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW & SP) or organic materials (Unified Soil Classes OL and OH) shall not be placed in the embankment. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in six-inch to eight-inch thick continuous lifts over the entire length of the fill. Compaction shall be obtained by routing and hauling the construction equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel or tread track of the equipment or by the use of a compactor. **The embankment shall be constructed to an elevation 10 percent higher than the design height to allow for settlement.**

4. Principal Spillway: Steel risers shall be securely attached to the barrel or barrel stub by welding the full circumference making a watertight structural connection. Concrete risers shall be poured with the principal spillway in place or precast with voids around the principal spillway filled with concrete or shrink proof grout for watertight connection. The barrel stub must be attached to the riser at the same percent (angle) of grade as the outlet conduit. The connection between the riser and the riser base shall be watertight. All connections between barrel sections must be achieved by approved watertight band assemblies. The barrel and riser shall be placed on a firm, smooth foundation of impervious soil as the embankment is constructed. **Breaching the embankment to install the barrel is unacceptable.** Pervious materials such as sand, gravel, or crushed stone shall not be used as backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be placed in four inch lifts and hand compacted under and around the pipe to at least the same density as the adjacent embankment. A depth of 1.5 times the pipe diameter (min.) shall be backfilled over the principal spillway and hand compacted before crossing it with construction equipment.

5. Emergency Spillway: **The emergency spillway shall be installed in undisturbed ground.** The achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical to the successful operation of the emergency spillway and must be constructed within a tolerance of ± 0.2 feet.

6. Vegetative Treatment: Stabilize the embankment in accordance with the appropriate vegetative Standard and Specifications immediately following construction. In no case shall the embankment remain unstabilized for more than seven (7) days. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon basin completion and monitored and maintained erosion free during the life of the basin.

7. Safety: **Local requirements concerning fencing and signs shall be met, warning the public of hazards of soft sediment and floodwater.**

8. Maintenance: Repair all damage caused by soil erosion and construction equipment at or before the end of each working day. Sediment shall be removed from the basin when it reaches the specified distance below the top of the riser as shown on the riser. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain. Disposal areas must be stabilized.

9. Final Disposal: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then the basin material and trapped sediments must be removed and safely disposed of and the basin shall be backfilled with a structural fill. When the basin area is to remain open space, the pond may be pumped dry (using methods in Section D - Dewatering), graded, and back filled.

10. Conversion to Stormwater Management Structure: After permanent stabilization of all disturbed contributory drainage areas, temporary sediment basins, if initially built and certified to meet permanent standards, may be converted to permanent stormwater management structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with approved stormwater management design plans. Additional grading may also be necessary to provide the required storage volume in the basin. **Conversion can only take place after all disturbed areas have been permanently stabilized to the satisfaction of the inspection authority and storm drains have been flushed.**

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

CASCADE OVERLOOK LLC
By: [signature] MEMBER 11/20/03
DEVELOPER — STEVEN K BREEDEN — DATE

BY THE ENGINEER:

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

Donald Mason 11/17/03
ENGINEER – DONALD A. MASON, P.E. # 21443 — DATE

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

Jim Myers / CS 12/16/03
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] 12/16/03
HOWARD SOIL CONSERVATION DISTRICT — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

[signature] 12-24-03
CHIEF, BUREAU OF HIGHWAYS HS — DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 1/13/04
CHIEF, DIVISION OF LAND DEVELOPMENT JA — DATE

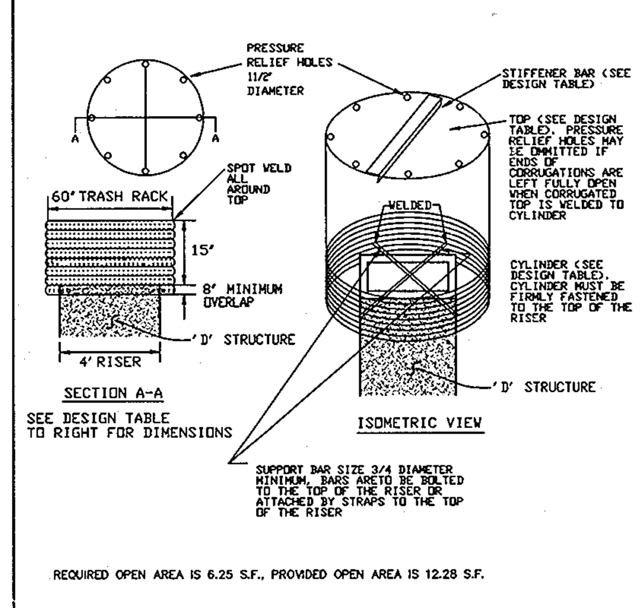
[signature] 12/30/03
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
8-26-11

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

No As-Built Information is required on this sheet

DETAIL 16 – CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE



REQUIRED OPEN AREA IS 6.25 S.F., PROVIDED OPEN AREA IS 12.28 S.F.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE C – 10 – 26 | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 16 – CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE (cont'd)

Riser Diam., in.	Trash Rack Cylinder Diam. in.	Thick. gage	H, in.	Minimum Size Support Bar	Minimum Top Thickness	Stiffener
12	18	16	6	#6 Rebar	16 ga.	--
15	21	16	7	"	"	--
18	27	16	8	"	"	--
21	30	16	11	#6 Rebar	16 ga.	--
24	36	16	13	"	14 ga.	--
27	42	16	15	#6 Rebar	14 ga.	--
36	54	14	17	#8 Rebar	12 ga.	--
42	60	14	19	"	"	--
48	72	12	21	1-1/4" pipe or 1-1/4 x 1-1/4 x1/4 angle	10 ga.	--
54	78	12	25	"	"	--
60	90	12	29	1-1/2" pipe or 1-1/2 x 1-1/2 x1/4 angle	8 ga.	--
66	96	10	33	2" pipe or 2x2x3/16 angle	8 ga., w/stiffener	2x2x1/4 angle
72	102	10	36	"	"	2-1/2x2-1/2x1/4 angle
78	114	10	39	2-1/2" pipe or 2x2x1/4 angle	"	"
84	120	10	42	2-1/2" pipe or 2-1/2x2-1/2x1/4 angle	"	2-1/2 x2-1/2x 5/16 angle

Note: The above trash rack and anti-vortex device information is only for corrugated metal pipe. Concrete risers must meet the requirements of MD 378.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE C – 10 – 26A | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

NO	DATE	REVISION
2	5-25-2011	REVISE PIPE FROM ES8 TO S4 TO BE HDPE
1	5-25-04	REVISE HDPEP TO RCCP CL. IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

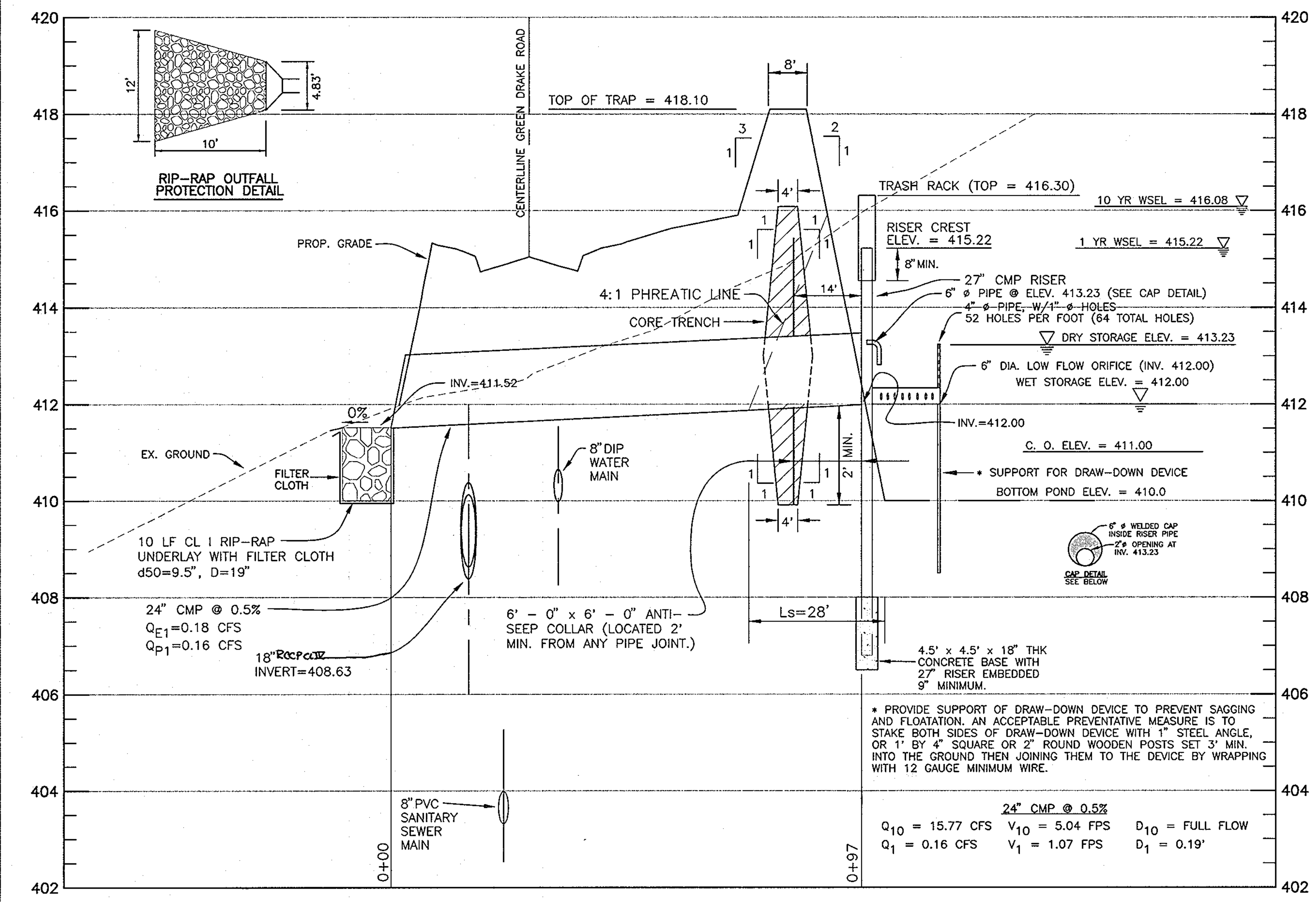
TITLE:
TEMPORARY SWM BASIN #4
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 | PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 20 OF 33

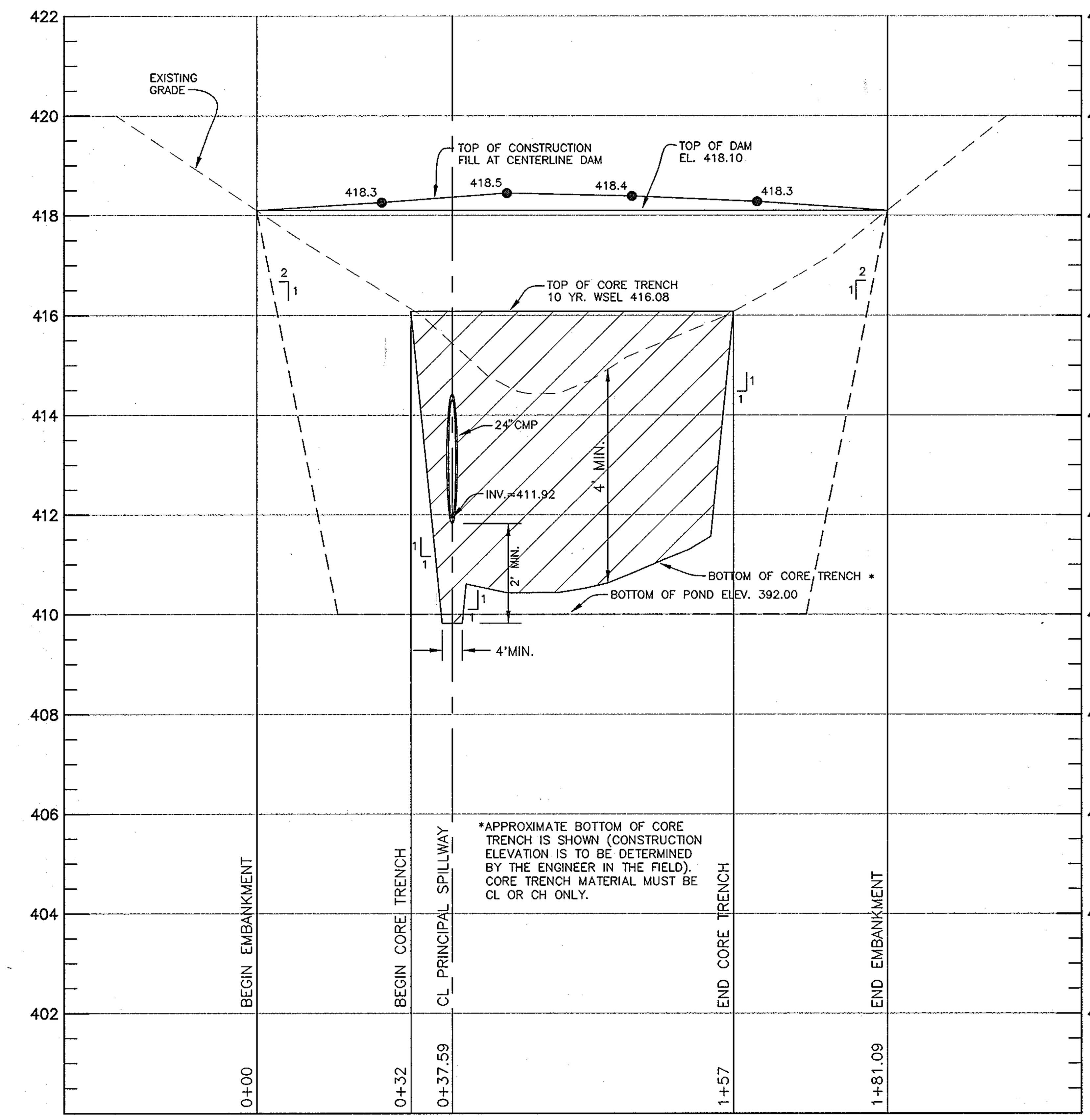
ASBUILT F-03-134

\\tsa\wolf\engineer\projects\1383 PFAU\dwg\7023S20.dwg, SHEET 20, 11/14/2003 1:34:19 PM



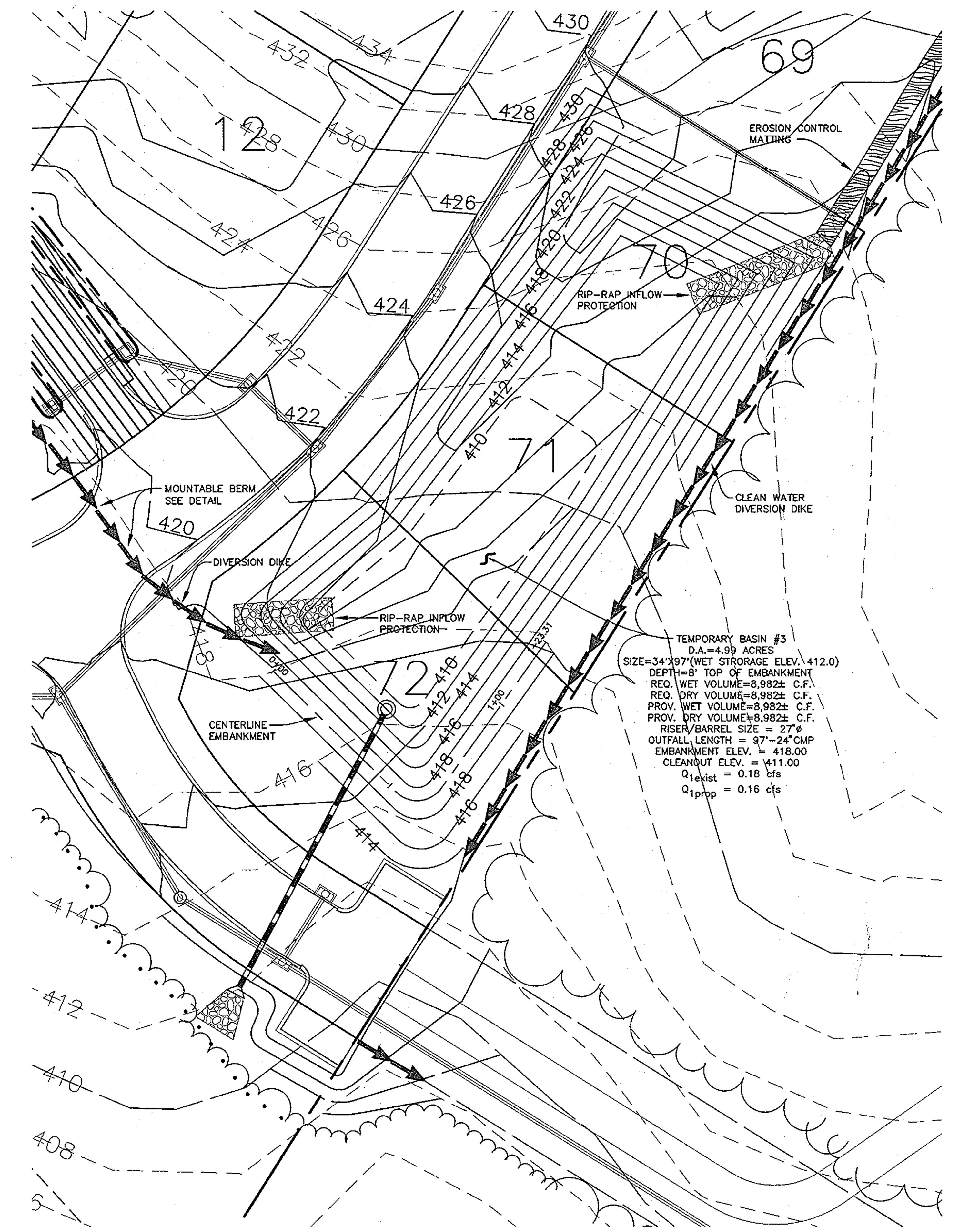
TEMP. SWM BASIN #3 EMBANKMENT SECTION THRU RISER

HORIZONTAL: 1"=20'
VERTICAL: 1"=2'



PROFILE ALONG CL EMBANKMENT TSWM BASIN #3

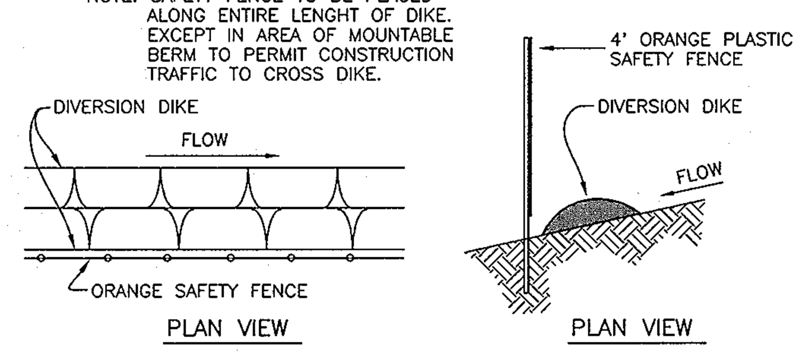
HORIZONTAL: 1"=20'
VERTICAL: 1"=2'



PLAN VIEW

SCALE: 1"=30'

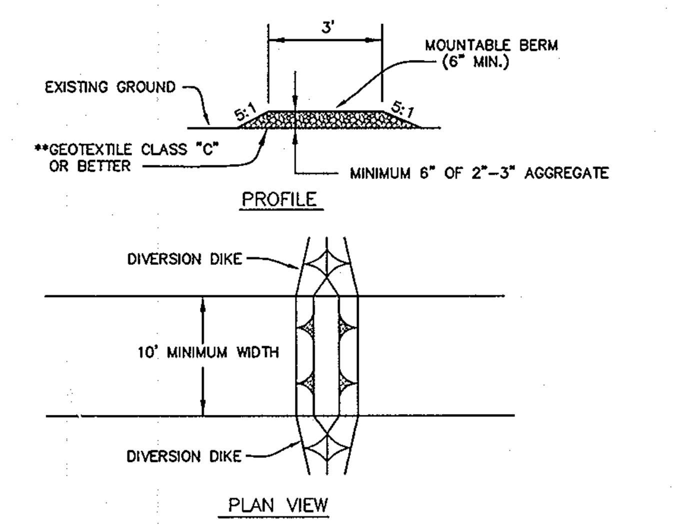
NOTE: SAFETY FENCE TO BE PLACED ALONG ENTIRE LENGHT OF DIKE. EXCEPT IN AREA OF MOUNTABLE BERM TO PERMIT CONSTRUCTION TRAFFIC TO CROSS DIKE.



1.) FENCE POST TO BE A MINIMUM OF 6' LONG DRIVEN 16" INTO THE GROUND. POSTS TO BE 1 1/2" X 1 1/2" SQUARE (MINIMUM). STEEL POSTS WILL BE STANDARD T OR U SECTION.
2.) FENCING TO BE PLACED ALONG INTERIOR DIVERSION DIKES. DIKES ALONG PERIMETER OR ALONG EDGE OF CONSTRUCTION AREA AWAY FROM DIRECT TRAFFIC WILL NOT REQUIRE SAFETY FENCING.
3.) FENCING TO BE MAINTAINED UNTIL DIVERSION DIKES ARE REMOVED.

DIVERSION DIKE TRAFFIC PROTECTION FENCING DETAIL

NOT TO SCALE



Construction Specifications

1. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residence to use geotextile.
2. 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 construction vehicle access.
3. Surface Water – all surface water flowing to or diverted toward temporary trap shall maintain positive drainage. Diversion dike shall be protected with a mountable berm with 5:1 slopes and minimum of 6" of stone, with a minimum top width of 3'.
4. Location – A mountable berm shall be located at every point of access along diversion dike, where construction traffic crosses dike.

MOUNTABLE BERM DETAIL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS FOR SEDIMENT BASINS

1. Site Preparation: Perimeter sediment control devices must be installed prior to clearing and grubbing. Areas where the embankment is to be placed shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots or other objectionable material. The pool area shall not be cleared until completion of the dam embankment unless the pool area is to be used for borrow. In order to facilitate clean-out and restoration, the pool area (measured at the top of the pipe spillway) shall be cleared of all brush, trees, and other objectionable materials.

2. Cut-off Trench: A cut-off trench shall be excavated along the centerline of earth fill embankments. The minimum depth shall be four feet. The cut-off trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be two feet, but wide enough to permit operation of excavation and compaction equipment. The side slopes shall be no steeper than 1:1. Compaction requirements shall be the same as those for the embankment. The trench shall be dewatered during the backfilling-compaction operations. For dewatering see Section D.

3. Embankment: The fill material shall be taken from approved areas shown on the plans. It shall be clean mineral soil free of roots, woody vegetation, oversized stones, rocks, or other objectionable material. Relatively pervious materials such as sand or gravel (Unified Soil Classes GW, GP, SW & SP) or organic materials (Unified Soil Classes OL and OH) shall not be placed in the embankment. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material shall contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material shall be placed in six-inch to eight-inch thick continuous lifts over the entire length of the fill. Compaction shall be obtained by routing and hauling the construction equipment over the fill so that the entire surface of each layer of the fill is traversed by at least one wheel or tread track of the equipment or by the use of a compactor. The embankment shall be constructed to an elevation 10 percent higher than the design height to allow for settlement.

4. Principal Spillway: Steel risers shall be securely attached to the barrel or barrel stub by welding the full circumference making a watertight structural connection. Concrete risers shall be poured with the principal spillway in place or precast with voids around the principal spillway filled with concrete or shrink proof grout for watertight connection. The barrel stub must be attached to the riser at the same percent (angle) of grade as the outlet conduit. The connection between the riser and the riser base shall be watertight. All connections between barrel sections must be achieved by approved watertight band assemblies. The barrel and riser shall be placed on a firm, smooth foundation of impervious soil as the embankment is constructed. Breaching the embankment to install the barrel is unacceptable. Pervious materials such as sand, gravel, or crushed stone shall not be used as backfill around the pipe or anti-seep collars. The fill material around the pipe spillway shall be placed in four inch lifts and hand compacted under and around the pipe to at least the same density as the adjacent embankment. A depth of 1.5 times the pipe diameter (min.) shall be backfilled over the principal spillway and hand compacted before crossing it with construction equipment.

5. Emergency Spillway: The emergency spillway shall be installed in undisturbed ground. The achievement of planned elevations, grades, design width, entrance and exit channel slopes are critical to the successful operation of the emergency spillway and must be constructed within a tolerance of ± 0.2 feet.

6. Vegetative Treatment: Stabilize the embankment in accordance with the appropriate vegetative Standard and Specifications immediately following construction. In no case shall the embankment remain unstabilized for more than seven (7) days. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon basin completion and monitored and maintained erosion free during the life of the basin.

7. Safety: Local requirements concerning fencing and signs shall be met, warning the public of hazards of soft sediment and floodwater.

8. Maintenance: Repair all damage caused by soil erosion and construction equipment at or before the end of each working day. Sediment shall be removed from the basin when it reaches the specified distance below the top of the riser as shown on the riser. This sediment shall be placed in such a manner that it will not erode from the site. The sediment shall not be deposited downstream from the embankment, adjacent to a stream or floodplain. Disposal areas must be stabilized.

9. Final Disposal: When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved sediment control plan. The proposed use of a sediment basin site will often dictate final disposition of the basin and any sediment contained therein. If the site is scheduled for future construction, then the basin material and trapped sediments must be removed and safely disposed of and the basin shall be backfilled with a structural fill. When the basin area is to remain open space, the pond may be pumped dry (using methods in Section D - Dewatering), graded, and back filled.

10. Conversion to Stormwater Management Structure: After permanent stabilization of all disturbed contributory drainage areas, temporary sediment basins, if initially built and certified to meet permanent standards, may be converted to permanent stormwater management structures. To convert the basin from temporary to permanent use, the outlet structure must be modified in accordance with approved stormwater management design plans. Additional grading may also be necessary to provide the required storage volume in the basin. Conversion can only take place after all disturbed areas have been permanently stabilized to the satisfaction of the inspection authority and storm drains have been flushed.

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

CASCADE OVERLOOK LLC
BY: [signature] MEMBER 11/20/03
DEVELOPER STEVEN K BREEDEN DATE

BY THE ENGINEER:

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

Donald Mason 11/17/03
ENGINEER – DONALD A. MASON, P.E. # 21443 DATE

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] 12/16/03
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] 12/16/03
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

[signature] 12-24-03
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 1/12/04
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[signature] 12/31/03
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ DATE

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER 4-25-11

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

No As-Built information is required on this sheet

NO	DATE	REVISION
△	5-25-04	REVISE HDPEP TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *TEMPORARY SWM BASIN #3, PROFILES AND SEDIMENT CONTROL DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 | PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 21 OF 33

AS-BUILT

F-03-134

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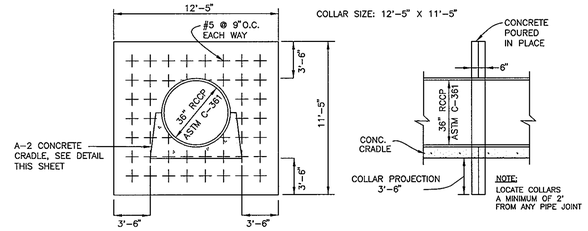
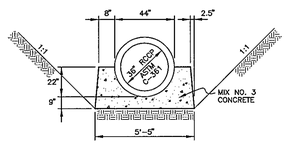


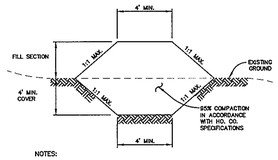
ANTI-SEEP COLLAR – POND #1

NOT TO SCALE



POND #1 TYPE A-2 CONCRETE CRADLE

NOT TO SCALE

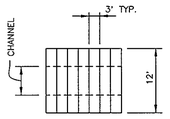


NOTES:

1. IF WATER IS ENCOUNTERED DURING THE CONSTRUCTION OF THIS CORE TRENCH, IT IS TO BE REMOVED BY PUMPING.
2. CORE TRENCH SHALL CONSIST OF IMPERVIOUS MATERIAL (GC, SC, CL, CH) AS DIRECTED BY A GEOTECHNICAL ENGINEER ONSITE AND MAY REQUIRE TO BE HAULED FROM AN OFFSITE LOCATION.

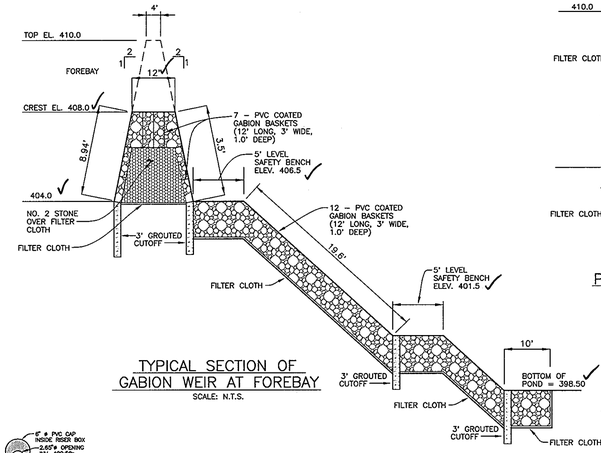
CORE TRENCH SECTION

NOT TO SCALE



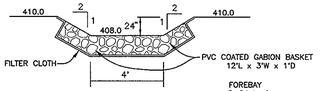
GABION BASKET LAYOUT

SCALE: 1"=20'



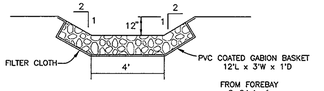
TYPICAL SECTION OF GABION WEIR AT FOREBAY

SCALE: N.T.S.



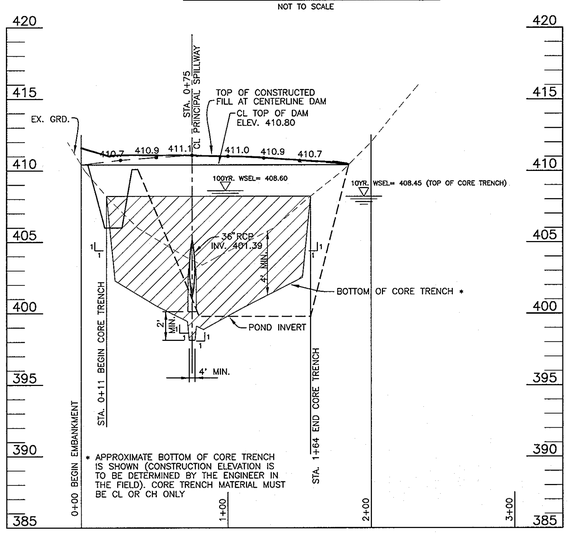
PROFILE THROUGH FOREBAY WEIR

NOT TO SCALE



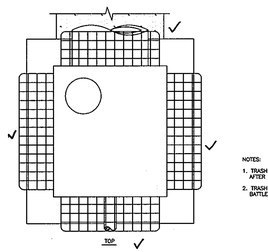
GABION INFLOW PROTECTION CHANNEL

NOT TO SCALE



PROFILE ALONG CL OF EMBANKMENT
SECTION A–A POND #1

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

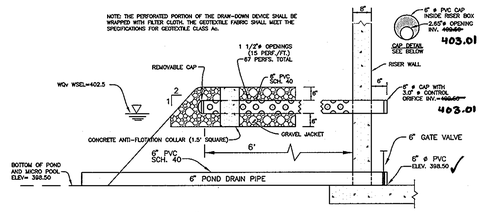


NOTES:

1. TRASH RACK SHALL BE GALVANIZED AFTER FABRICATION
2. TRASH RACK SHALL BE PAINTED BATTLESHIP GRAY.

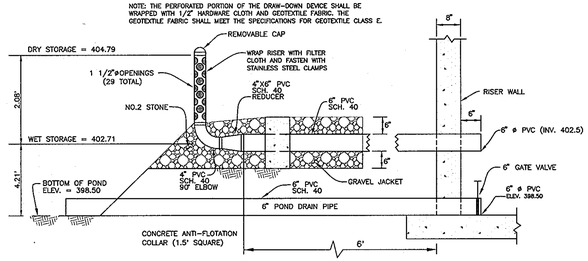
TRASH RACK DETAIL – POND #1

SCALE: N.T.S.



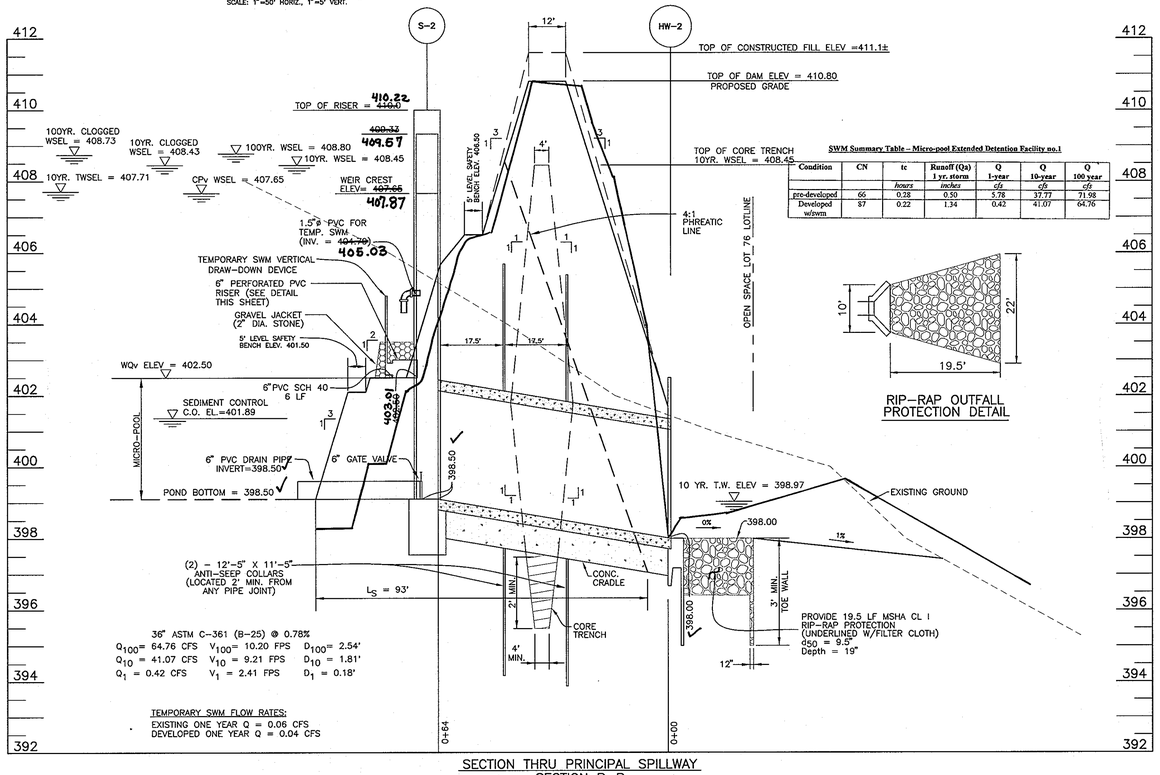
6" DEWATERING PIPE DETAIL AND PERMANENT EXTENDED DETENTION CONTROL ORIFICE

NOT TO SCALE



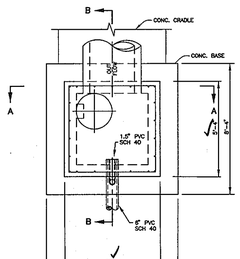
POND #1 6" TEMPORARY SWM VERTICAL DRAW-DOWN DEVICE

NOT TO SCALE



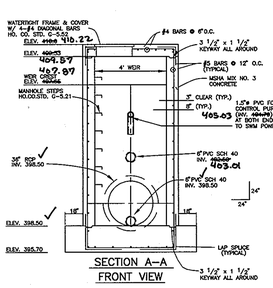
SWM Summary Table – Micro-pool Extended Detention Facility no.1

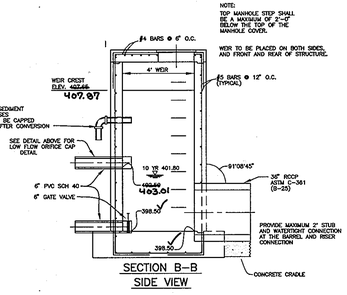
Condition	CN	tc	Runoff (Qa) 1 yr. storm	Q 1-year	Q 10-year	Q 100 year
		hours	inches	cfs	cfs	cfs
pre-developed	66	0.28	0.50	5.78	37.77	71.98
Developed w/swm	87	0.22	1.34	0.42	41.07	64.76



RIP-RAP OUTFALL PROTECTION DETAIL

PLAN





CONTROL STRUCTURE – POND #1

SCALE: 1" = 4'

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.

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER 4-25-11

AS–BUILT CERTIFICATION

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

Donald Mason — DONALD A. MASON — PE NO. 21443 — DATE 4-25-11

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 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.

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

CASCADE OVERLOOK LLC
BY: STEVEN K. BREEDEN, MEMBER — DEVELOPER — 11/20/03 DATE

BY THE ENGINEER:

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

Donald Mason — ENGINEER – DONALD A. MASON, P.E. # 21443 — 11/17/03 DATE

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.

NATURAL RESOURCES CONSERVATION SERVICE — 12/16/03 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 — 12/16/03 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — 12-24-03 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 1/13/04 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 12/24/03 DATE

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410–465–6105 FAX: 410–465–6644

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER 11/17/03

OWNER/DEVELOPER

CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465–4244

OWNER

CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK* SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON–BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *STORMWATER MANAGEMENT DETAILS POND #1*
VP–86–130, F–88–20, S–01–04, PB–359, P–02–11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 22 OF 33

AS-BUILT

F–03–134

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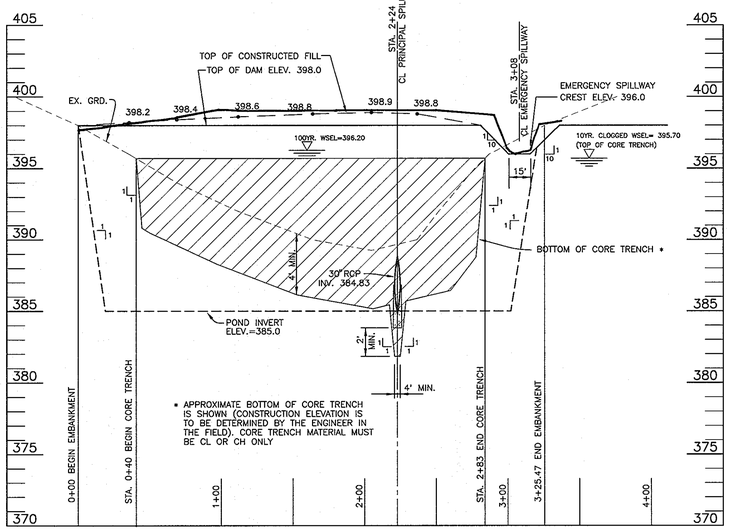
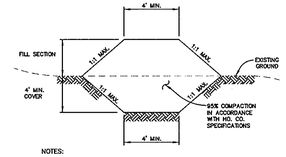
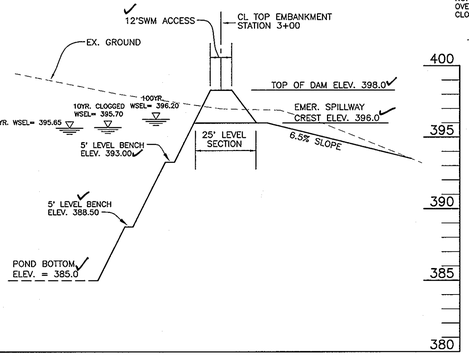


PROFILE ALONG CL OF EMBANKMENT
SECTION A–A POND #2
SCALE: 1"=50' HORIZ., 1"=5' VERT.

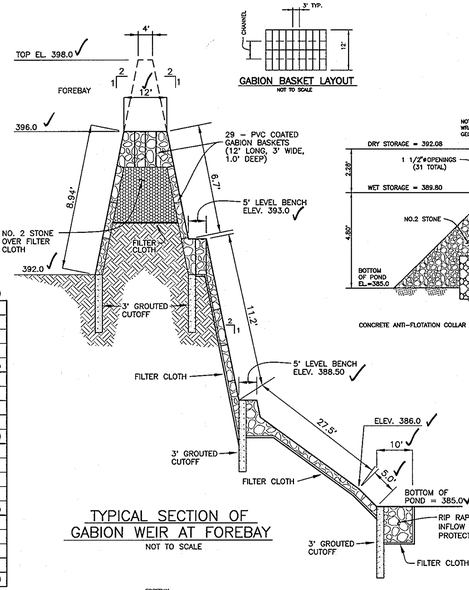


NOTES:
1. IF WATER IS ENCOUNTERED DURING THE CONSTRUCTION OF THE CORE TRENCH, IT IS TO BE REMOVED BY PUMPING.
2. CORE TRENCH SHALL CONSIST OF IMPERVIOUS MATERIAL (GC, SC, CL, CH) AS DIRECTED BY A GEOTECHNICAL ENGINEER ONSITE AND MAY REQUIRE TO BE HAULED FROM AN OFFSITE LOCATION.

CORE TRENCH SECTION
NOT TO SCALE

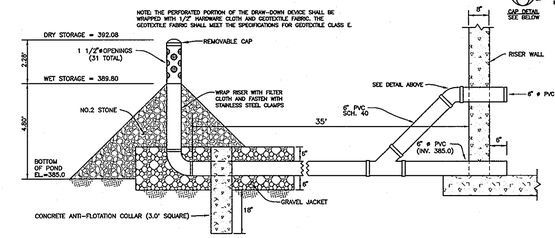


EMERGENCY SPILLWAY PROFILE
SECTION C–C POND #2

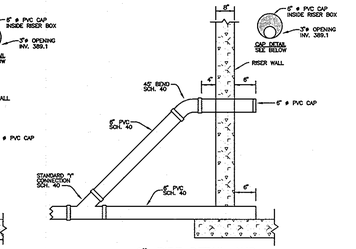


TYPICAL SECTION OF
GABION WEIR AT FOREBAY
NOT TO SCALE

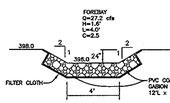
GABION BASKET LAYOUT
NOT TO SCALE



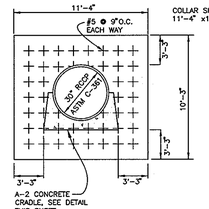
POND #2 6" TEMPORARY SWM
VERTICAL DRAW-DOWN DEVICE
NOT TO SCALE

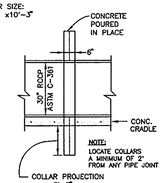


6" PIPE DETAIL AND
PERMANENT EXTENDED DETENTION CONTROL ORIFICE
NOT TO SCALE

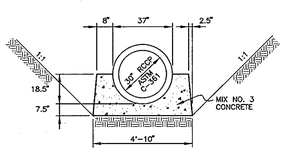


PROFILE THROUGH
FOREBAY WEIR
NOT TO SCALE

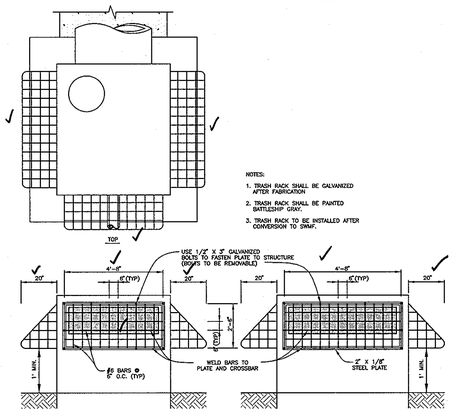




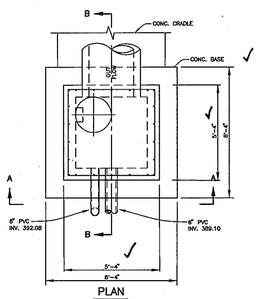
ANTI-SEEP COLLAR – POND #2
NOT TO SCALE



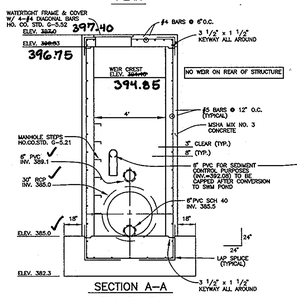
POND #2 TYPE A–2
CONCRETE CRADLE
NOT TO SCALE



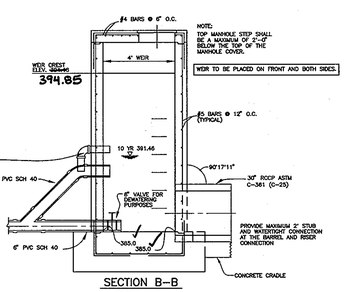
TRASH RACK DETAIL – POND #2
SCALE: N.T.S.



PLAN

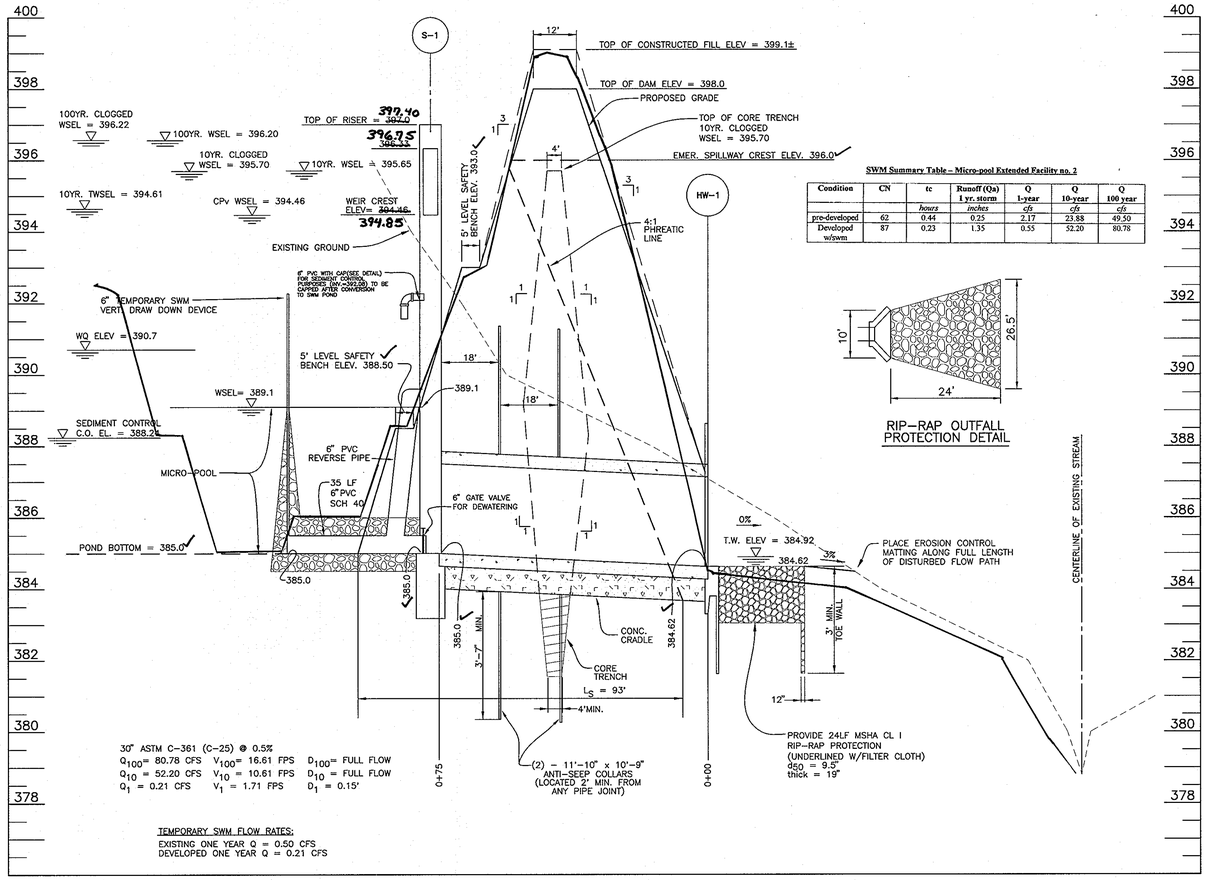


SECTION A–A
FRONT VIEW



SECTION B–B
SIDE VIEW

CONTROL STRUCTURE – POND #2
SCALE: 1" = 4'



SECTION THRU PRINCIPAL SPILLWAY
SECTION B–B
POND #2
SCALE: 1"=20' HORIZ., 1"=2' VERT.

SWM Summary Table – Micro-pool Extended Facility no. 2

Condition	CN	tc	Runoff (Qa) 1 yr. storm	Q 1-year	Q 10-year	Q 100 year
		hours	inches	cfs	cfs	cfs
pre-developed	62	0.44	0.25	2.17	23.88	49.50
Developed w/swm	87	0.23	1.35	0.55	52.20	80.78

RIP–RAP OUTFALL
PROTECTION DETAIL

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER

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

License No. 21443 Expiration Date: 12-21-12

AS–BUILT CERTIFICATION

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

Donald Mason — PE NO. 21443
DONALD A. MASON — DATE 4-21-11

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 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.

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

CASCADE OVERLOOK LLC
BY: MEMBER 11/20/03
STEVEN K BREEDEN
DEVELOPER — DATE

BY THE ENGINEER:

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

Donald Mason 11/17/03
ENGINEER – DONALD A. MASON, P.E. # 21443 — DATE

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.

NATURAL RESOURCES CONSERVATION SERVICE — 12/16/03 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 — 12/16/03 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS MG — 12-24-03 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — 1/2/04 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION MRJ — 12/24/03 DATE

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410–465–6105 FAX: 410–465–5644

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER
11/17/03

OWNER/DEVELOPER:
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465–4244

OWNER:
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON–BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *STORMWATER MANAGEMENT DETAILS POND #2*
VP–88–130, F–88–20, S–01–04, PB–359, P–02–11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM	DRN: RPS	CHK: DAM

SCALE: AS SHOWN DRAWING 23 OF 33

AS-BUILT

F–03–134

\\tsa\vol1\engineer\projects\1383 PEA\Dwg\3024PZS23.dwg, Sheet 23, 11/17/2003 5:21:05 AM

MGWC 1.4: Diversion Pipe

Temporary measure for dewatering in–channel construction sites

Description

The work should consist of installing flow diversion pipes in combination with sandbag or stone diversions when construction activities occur within the stream channel.

Effective Uses & Limitations

Diversion pipes with an insufficient flow capacity can cause the channel diversion to fail thereby resulting in severe erosion of the disturbed channel section under construction. Therefore, in–channel construction activities should occur only during periods of low flow.

Material Specifications

Materials for stream diversions shoulld meet the following requirements:

* Riprap: Stone should be washed and have a minimum diameter of 6 inches (15 centimeters).
* Sandbags: Sandbags should consist of materials which are resistant to ultra–violet radiation, tearing, and puncture and should be woven tightly enough to prevent leakage of fill material (i.e., sand, fine gravel, etc.).
* Sheeting: Sheeting should consist of polyethylene or other material which is imprevious and resistant to puncture and tearing.

Installation Guidelines

All erosion and sediment control devices including mandatory filter bags should be installed as the first order of business according to a plan approved by the WMA or local authority. Installation should proceed from upstream to downstream during low flow conditions. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.

Diversion pipes with sandbag or stone barriers should be completed as follows (refer to detail 1.4):

1. Sandbag/stone barriers should be sized and installed as detailed in MGWC 1.5: Sandbag/Stone Diversion. The materials should be sized to withstand baseflow velocities.
2. All excavated material should be deposited and stabilized in an approved area outside the 100–year floodplain unless otherwise authorized by the WMA.
3. Sediment–laden water from the construction area should be pumped to a filter bag.
4. The diversion pipe should have a minimum capacity sufficient to convey the 2–year flow for projects with a duration of two weeks or greater. For projects of shorter duration, the capacity of the pipe can be reduced accordingly.
5. If necessary, silt fence or straw bales should be installed around the perimeter of the work area.
6. Sediment control devices are to remain in place until all disturbed areas are stabilized and the inspecting authority approves their removal.

Maryland's Guidelines To Waterway Construction
DETAIL 1.4: DIVERSION PIPE

TEMPORARY INSTREAM CONSTRUCTION MEASURES	*REVISED NOVEMBER 2000 PAGE 1.4 - 2*	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

FILTER BAG DETAIL

NOTES:

1. FILTER BAG SHALL BE PLACED ON A SLOPING OR LEVEL, WELL GRADED VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM DEVICE AND ANY WORK AREAS.
2. THE FILTER BAG MUST BE STACKED IN PLACE AND SECURED TO THE PUMP DISCHARGE LINE
3. FILTER BAG SHALL NOT BE USED FOR DISCHARGE FLOWS GREATER THAN 300 GPM.
4. DEVICE SHALL BE REMOVED AND DISPOSED OF AFTER BAG IS FILLED WITH SEDIMENT. SEDIMENT FROM BAG SHALL BE SPREAD IN AN UPLAND AREA.

MGWC 4.2: Utility Crossing

Temporary in–stream construction

Description

The work should consist of installing erosion control devices in and adjacent to the construction of utility crossings.

Installation Guidelines

All erosion and sediment control devices, including filter bags should be implemented as the first order of business according to a plan approved by the WMA or local authority. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.) The proposed construction sequence is as follows (refer to Detail 4.2):

1. The contractor should insure that a continuous perimeter control barrier is in place to minimize the amount of pollutants entering the flow. A diversion pipe as shown in MGWC 1.4: Diversion Pipe or other measure should be installed and sandbag or stone barriers as shown in MGWC
2. 1.5: Sandbag/Stone Diversion should be constructed according to specifications to divert the stream flow.
3. All construction should take place during stream low flows. The length of construction time should be limited to a maximum of 5 consecutive days for each crossing.
4. All utility crossings should be placed a minimum of 3 feet (1 meter) beneath the stream bed unless an alternative section is specifically approved by the WMA. For instances where a 3–foot cover is not viable, two alternate stabilization options are given in the Detail 4.2. A low flow channel shall be constructed through all riprap placements across the stream bed.
5. The stream should be diverted by an approved temporary stream diversion, the construction area should be dewatered, and any disturbed banks should be stabilized. The contractor may elect to construct the utility crossing in two stages. In this case, a WMA approved flow barrier may be constructed to keep the construction area dry.
6. Once the crossing is completed, the diversion should be removed from upstream to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal.
7. Construction vehicles to cross existing stream by utilizing existing driveway west of utility crossing. By utilizing this existing driveway, eliminates the need to construct temporary vehicle crossing to install utility and minimize impact to stream and wetlands.

Maryland's Guidelines To Waterway Construction
DETAIL 4.2(a): UTILITY CROSSING

STREAM CROSSINGS	*PAGE 4.2 - 2*	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

Maryland's Guidelines To Waterway Construction
DETAIL 4.2(b): UTILITY CROSSING

STREAM CROSSINGS	*REVISED NOVEMBER 2000 PAGE 4.2 - 3*	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

HILLIS–CARNES ENGINEERING ASSOCIATES, INC. RECOMMENDATIONS

Embankment and Cut–off trench Construction

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

A representative of the geotechnical Engineer should be present to monitor placement and compaction of fill for each embankment and cut–off trench. In accordance with Maryland Soil Conservation Specification 378, soils considered suitable for the center of embankment and cut–off trench shall conform to Unified Soil Classification GC, SC, CH, or CL. Per SCS 378, consideration may be given to the use of other materials in the embankment if design and construction are supervised by a geotechnical engineer.

It is our professional opinion that in addition to the soil materials described above a fine grained soil, including Silt (ML) with a plasticity index of 10 or more can be utilized for the center of the embankment and core trench. Based on the results of the test pits, it appears that surficial materials in the areas of test pits TP–1 through TP–6, TP–10 and TP–11 include silty clay and clayey silt. These materials should be suitable for core and cut–off trench material. However, exploration with test pits and additional laboratory testing should be conducted prior to construction to identify and quantify potential borrow areas. All fill materials must be placed and compacted in accordance with MD SCS 378 specifications.

Additionally, the following procedures should be utilized to construct the proposed embankments:

1. Slope construction should commence at the toes of the proposed slopes and continue upwards as additional fill is placed. The engineered fill placed for slope construction should be benched into the natural slopes in the abutment areas to provide good contact and to prevent the presence of weak zones.
2. Typically during slope construction, compaction equipment has difficulty compacting soils along the shoulder. It is therefore important that the bank be overfilled during slope construction and then cut back to the required geometry.
3. After construction, the slopes should be promptly vegetated to prevent erosion. Also, to prevent erosion from occurring prior to sprouting of the vegetation, the slopes should be protected with straw or an erosion control geotextile.
4. The embankment construction should be done under the supervision of an experienced soil inspector or the Geotechnical Engineer. Sufficient testing during fill placement should be done to verify adequate compaction.

It is recommended that test pits be performed with an excavator to determine if rock within the basin areas will require blasting to establish proposed grades. Should it be determined that the rock within the basin areas will require blasting, it is recommended that the blasting within 75 ft. of the riser and principal spillway structures be performed prior to construction of the principal spillways and riser structures.

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

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

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

Earth Fill

Material – The fill material shall be taken from approved designated borrow areas. If shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable material. 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 teh 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 a 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 cores 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 resistively 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 sided 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 criteria shall apply for corrugated metal pipe:

1. Materials – (Polymer Coated steel pipe) – Steel pipes with polymeric coatings shall bave 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.

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

Materials – (Aluminum Pipe) – This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M–196 or M–211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M–190 Type A. Aluminum surfaces that are to be contact with concrete sholl 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. Dimple bands are not considered to be watertight.

All connection 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, prepunched 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 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24–inch wide by 3/8–inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8 inch closed cell gaskets the full width of the flange is also acceptable.

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

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

5. Backfilling shall conform to "Structure Backfill".

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

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

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

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

3. Laying pipe – Bell and spigot pipe shall be places 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 form the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to "Structure Backfill".

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

Plastic 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" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

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

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

4. Backfilling shall conform to "Structure Backfill".

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

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

Concrete

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

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction 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 evacuations, 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 location being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

Stabilization

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

Erosion and Sediment Control

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

BY THE DEVELOPER:

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."

CASCADE OVERLOOK LLC
By: [signature] MEMBER 11/20/03
DEVELOPER STEVEN K BREEDEN DATE

BY THE ENGINEER:

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

Donald Mason 11/17/03
ENGINEER – DONALD A. MASON, P.E. # 21443 DATE

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

Jim Myers / CS 12/16/03
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] 12/16/03
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

William F. Malone Jr. 12-24-03
CHIEF, BUREAU OF HIGHWAYS HS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 1/13/04
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[signature] 12/30/03
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ DATE

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DETAIL 26 – ROCK OUTLET PROTECTION II

NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

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DETAIL 26 – 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 EQUIPMEMT. 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 SPOILS 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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DETAIL 27 – ROCK OUTLET PROTECTION III

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DETAIL 27 – ROCK OUTLET PROTECTION III

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 EQUIPMEMT. 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 SPOILS 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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STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
Donald Mason 9-25-11

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

No As-Built information is required on this sheet

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410–465–6105 FAX: 410–465–6644

Donald Mason 11/17/03

OWNER/DEVELOPER:
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465–4244

OWNER:
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON–BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *EROISION AND SEDIMENT CONTROL DETAILS & STORMWATER MANAGEMENT NOTES*
VP–86–130, F–88–20, S–01–04, PB–359, P–02–11

DATE: OCTOBER, 2003 | PROJECT NO. 1383

DES: DAM	DRN: RPS	CHK: DAM	SCALE: AS SHOWN	DRAWING 24 OF 33

AS-BUILT

F–03–134

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook — Boring Number: B-1
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 6" — Foreman Lamont Smith
Surf. Elev.: — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 10-19-01 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 10-19-01

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, loose, silty SAND (SM)	2.5		I	2-3-4-5	1	15"	2" Topsoil
	Brown, moist, medium stiff, clayey SILT (ML-CL)	5.0	5.0	I/D	4-4-5-5	2	16"	Groundwater encountered at 15.0' while drilling
	Gray, moist, medium dense, silty SAND trace gravel (SM)	7.5		I	3-4-7-7	3	20"	Caved in at 10.5' at Completion
	Brown, moist, loose, sandy SILT, trace mica (ML)	10.0	10.0	I	3-4-5-8	4	24"	Caved in at 10.0' after 24 hours
	Dark brown - orange-brown, moist, medium stiff, clayey SILT - silty CLAY (ML-CL)	15.0	15.0	I/D	3-3-4-5	5	24"	
	Gray, brown, moist, very loose, fine sandy SILT (ML)	17.0		D	1-2-2-3	6	13"	Backfilled after 24 hours
	Bottom of Hole at 17.0'		20.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook — Boring Number: B-2
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 6" — Foreman Lamont Smith
Surf. Elev.: — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 10-19-01 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 10-19-01

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, medium dense, silty SAND with mica (SM) FILL	2.5		D	3-10-13-11	1	12"	2" Gravel
	Orange-brown, moist, medium dense, fine sandy SILT (ML)	5.0	5.0	I	6-8-10-15	2	14"	Groundwater encountered at 14.5' while drilling
	Brown, moist, medium dense, fine sandy SILT (ML)			D	6-10-18-21	3	20"	Caved in at 13.0' at Completion
		10.0	10.0	I	4-4-4-5	4	15"	Caved in at 11.5' after 24 hours
	Gray-brown, moist to wet, soft, clayey SILT, trace to little fine sand (ML)	15.0	15.0	I	2-2-3-4	5	13"	Backfilled after 24 hours
	Orange-brown, wet, very loose, sandy SILT (ML)	17.0		D	2-2-3-5	6	24"	
	Bottom of Hole at 17.0'		20.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION 12.0 FT. AFTER 24 hrs 9.0 FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook — Boring Number: B-3
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 6" — Foreman Lamont Smith
Surf. Elev.: — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 10-19-01 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 10-19-01

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, very loose to loose, fine sandy SILT, with gravel in S-2 (ML)			D	1-2-3-5	1	18"	6" Topsoil
		5.0	5.0	D	2-4-6-11	2	18"	No groundwater encountered while drilling
	Brown, gray, moist, stiff, clayey SILT (ML-CL)	7.5		I/D	5-6-6-9	3	24"	Caved in at 4.5' at Completion
	Bottom of Hole at 7.5' Refusal at 7.5'			L	51/0"	4	N/R	Caved in at 4.0' after 24 hours
			10.0					
			15.0					
			20.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER 24 hrs Dry FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook — Boring Number: B-4
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 6" — Foreman Lamont Smith
Surf. Elev.: — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 10-19-01 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 10-19-01

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Orange-brown, moist, medium dense, SILT, trace to no clay (ML) Possible FILL			D/I	2-4-7-7	1	11"	3" Topsoil
		5.0	5.0	I	5-7-9-8	2	12"	No groundwater encountered while drilling
	Brown, moist, medium dense to loose, sandy SILT (ML)			I/D	3-4-8-8	3	18"	Caved in at 7.0' at Completion
		10.0	10.0	I/D	3-6-6-7	4	24"	Caved in at 6.5' after 24 hours
	Orange-brown and gray, wet, medium stiff, SILT, trace to little clay (ML-CL)	12.0		I	3-4-4-6	5		
	Bottom of Hole at 12.0'		15.0					
			20.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER 24 hrs Dry FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook — Boring Number: B-5
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 6" — Foreman Lamont Smith
Surf. Elev.: — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 10-23-01 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 10-23-01

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, loose, silty sand, trace clay (SM)	2.5		I	2-3-4-4	1	13"	3" Topsoil
	Orange-brown, moist to wet, medium stiff, SILT, trace to little clay (ML-CL)	5.0	5.0	D	3-4-5-5	2	16"	No groundwater encountered while drilling
	Orange-brown, moist, medium dense, SILT, trace mica (ML)			D	4-6-8-7	3	20"	Caved in at 10.0' at Completion
		10.0	10.0	D	7-10-13-16	4	20"	
	Yellow-brown, moist, medium dense silty SAND, with gravel-sized rock fragments (SM)	14.0		D	3-8-11-16	5	18"	
	Brown, moist, very dense, silty SAND with rock fragments (SM) Decomposed Rock	17.0	15.0	I	8-27-34-51/6"	6	16"	
	Bottom of Hole at 17.0'		20.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook — Boring Number: B-6
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 6" — Foreman Lamont Smith
Surf. Elev.: — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 10-23-01 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 10-23-01

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, loose to medium dense, sandy SILT, trace gravel, trace to no clay (ML)			D	2-2-4-5	1	14"	3" Topsoil
				I/D	5-7-7-6	2	12"	No groundwater encountered while drilling
		8.0	5.0	D	8-12-14-14	3	18"	Caved in at 7.0' at Completion
	Brown black, moist, medium dense, silty SAND with rock fragments (SM)	10.0	10.0	D	8-10-14-16	4	16"	
	Bottom of Hole at 10.0'		15.0					
			20.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook — Boring Number: B-7
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 6" — Foreman Lamont Smith
Surf. Elev.: — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 10-23-01 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 10-23-01

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					
	Brown, moist, loose, silty SAND (SM-ML)	2.5		D	2-2-3-5	1	12"	3" Topsoil
	Brown, moist, medium dense, sandy SILT, trace to little gravel (ML)			D	6-10-15-10	2	20"	No groundwater encountered while drilling
		8.0	5.0	I	4-8-11-10	3	18"	Caved in at 5.5' at Completion
	Brown, moist, medium dense, silty SAND (SM)	10.0	10.0	D	9-9-13-14	4	16"	
	Bottom of Hole at 10.0'		15.0					
			20.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook Section 1 SWM — Boring Number: B-8
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 7" — Foreman Harry Hines
Surf. Elev. 414.38 — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 07-25-02 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 07-25-02

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					3" Topsoil
	Light brown and white, moist, loose to dense silty sand, with decomposed rock fragments (SM)			D	1-3-5	1	10"	
			5.0	D	5-8-8	2	12"	No groundwater encountered while drilling
				D	6-5-6	3	14"	
			10.0	D	12-16-24	4	13"	
		12.0						Caved in at 12.0' at Completion
	Light brown to orange brown, moist, medium dense sandy silt (ML)		15.0	D	6-11-13	5	16"	
	Bottom of Test Hole at 20.0'	20.0	20.0	D	5-7-10	6	18"	

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook Section 1 SWM — Boring Number: B-9
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 7" — Foreman Harry Hines
Surf. Elev. 412.11 — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 07-25-02 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 07-25-02

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					3" Topsoil
	Brown, tan and white, moist, loose to medium dense sandy silt-silty sand (SM-ML)			D	1-3-4	1	16"	
								No groundwqater encountered while drilling
		4.5	5.0	D	10-9-8	2	14"	
	Light brown to white, dry medium dense to dense silty sand, with decomposed rock fragments (SM)			D	4-6-7	3	13"	
			10.0	D	14-18-25	4	10"	
		12.0						Caved in at 12.5' at Completion
	Dark brown to brown, moist, dense sandy silt (ML)		15.0	D	19-22-25	5	14"	
	Bottom of Test Hole at 20.0'	20.0	20.0	D	20-25-25	6	16"	

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook Section 1 SWM — Boring Number: B-10
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 7" — Foreman Harry Hines
Surf. Elev. 405.84 — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 07-25-02 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 07-25-02

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					3" Topsoil
	Dark brown, moist, medium dense sandy silt, trace roots (ML) Possible Fill	2.5			3-5-7	1	13"	
	Brown, moist, medium dense sandy silt, some to trace gravel (ML)		5.0		3-5-7	2	13"	No groundwater encountered while drilling
		7.5			-3-5-7	3	8"	
	Brown, moist, loose, micaceous sandy silt (ML)		10.0		3-4-5	4	12"	
		11.5						
	Light brown and white, dry, very dense silty sand (SM) Decomposed Rock		15.0		15-50/5"	5	9"	
			20.0		30-50/2"	6	7"	

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook Section 1 SWM — Boring Number: B-10
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 7" — Foreman Harry Hines
Surf. Elev. 405.84 — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 07-25-02 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 07-25-02

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
			20.0					
	Light brown and white, dry, very dense silty sand (SM) Decomposed Rock	25.0	25.0		50/5"	7	6"	
	Bottom of Test Hole at 25.0'		30.0					
			35.0					
			40.0					

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

HILLIS - CARNES
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RECORD OF SOIL EXPLORATION

Project Name: Cascade Overlook Section 1 SWM — Boring Number: B-11
Location: Howard County, Maryland — Job #: 01472A

SAMPLER
Datum: — Hammer Wt. 140 Lbs. — Hole Diameter 7" — Foreman Harry Hines
Surf. Elev. 399.35 — Hammer Drop 30 Inches — Rock Core Dia. - — Inspector
Date Started 07-25-02 — Pipe Size 2.0 Inches OD — Boring Method HSA — Completed 07-25-02

ELEV.	SOIL DESCRIPTION Color,Moisture,Density,Size,Proportion	STRA. DEPTH	DEPTH SCALE	CON	SAMPLE BLOWS 6"	NO.	REC.	BORING & SAMPLING NOTES
	SURFACE		0.0					3" Topsoil
	Brown, dry, very loose to medium dense sandy silt (ML)			D	2-3-2	1	13"	
		5.0	5.0	D	7-6-11	2	14"	No groundwater encountered while drilling
	Brown, moist, medium dense silty sand - sandy silt (SM-ML)	7.5		D	4-7-5	3	14"	
	Brown, tan and white, dry to moist, medium dense to very dense, silty sand with decomposed rock fragments and gravel (SM)		10.0	D	2-12-11	4	14"	
								Caved in at 12.0' at Completion
			15.0	D	21-24-34	5	12"	
	Bottom of Test Hole at 20.0'	20.0	20.0	D	6-7-10	6	16"	

SAMPLER TYPE: DRIVEN SPLIT SPOON UNLESS OTHERWISE NOTED. PT-PRESSED SHELBY TUBE, CA-CONTINUOUS FLIGHT AUGER, RC-ROCK CORE
SAMPLE CONDITIONS: D-DISINTEGRATED, I-INTACT, U-UNDISTURBED, L-LOST
GROUND WATER DEPTH: AT COMPLETION Dry FT. AFTER ___ FT. AFTER ___ FT.
BORING METHOD: HSA-HOLLOW STEM AUGERS, CFA-CONT. FLIGHT AUGERS, DC-DRIVING CASING, MD-MUD DRILLING

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

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.
License No. 21443, Expiration Date: 12-21-12
Donald Mason 11/28/11

No As-Built information is required on this sheet

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — 12-24-03 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — 1/13/04 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION — 12/30/03 DATE

OWNER/DEVELOPER:
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER:
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

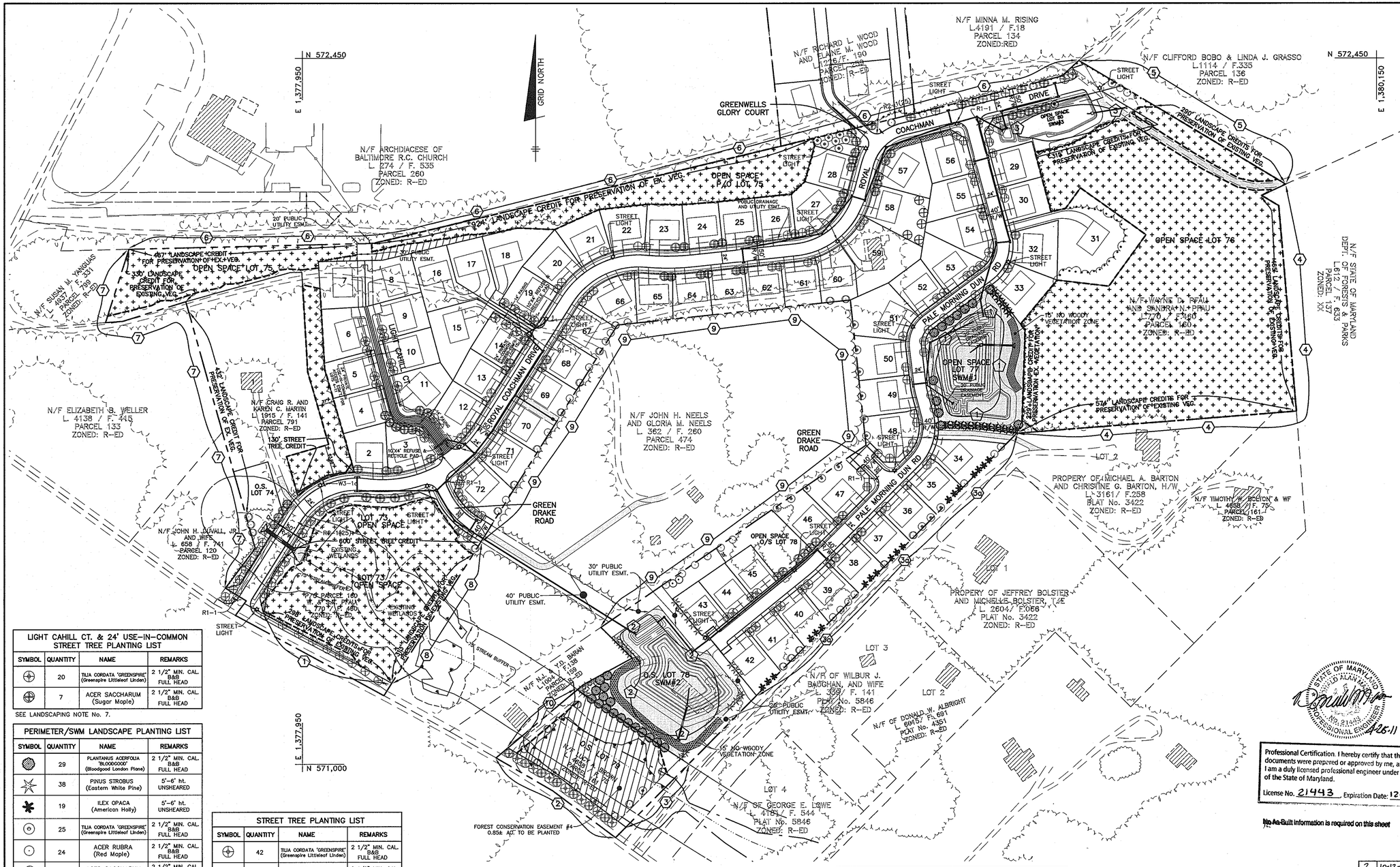
LOCATION: TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT BORING REPORTS
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: SEPTEMBER, 2003 — PROJECT NO. 1383
DES: DAM — DRN: RPS — CHK: DAM — SCALE: AS SHOWN — DRAWING 25 OF 33

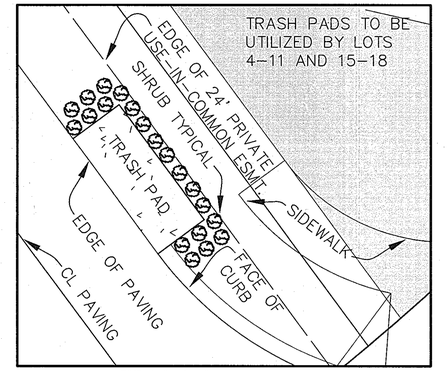
AS-BUILT — F-03-134

\\tsa\vol1\engineer\projects\1383 PFAU\dwg\7024S25.dwg, Sheet 25, 11/17/2003 5:24:13 AM



PLAN VIEW

SCALE: 1" = 100'



TRASH PAD SHRUB PLANTING DETAIL

N.T.S.

LANDSCAPING NOTES

1.) PERIMETER LANDSCAPING SHALL BE PROVIDED BY THE EXISTING VEGETATION TO REMAIN AND BY THE PLANTINGS AS SHOWN ON THESE PLANS.

2.) THE DEVELOPER SHALL BE RESPONSIBLE FOR THE INTERNAL STREET PARKING PLANTINGS, THE PRESERVATION OF THE PERIMETER VEGETATION AND FOR THE PERIMETER PLANTINGS AS SHOWN ON THESE PLANS. BONDING FOR PLANTINGS IS THE OBLIGATION OF THE DEVELOPER AS PART OF THE DEVELOPERS AGREEMENT.

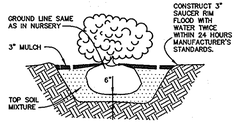
3.) TREES MUST BE A MINIMUM OF FOUR(4) FEET FROM THE CURB OR SIDEWALK AND MUST BE A MINIMUM OF FIVE(5) FEET FROM ANY STORM DRAIN.

4.) A MINIMUM DISTANCE OF TWENTY(20) FEET MUST BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND FROM ANY STREET LIGHTS.

5.) THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SEC.-16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.

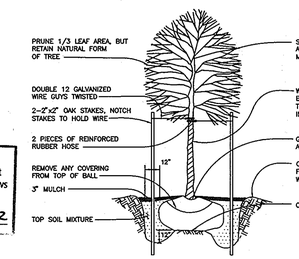
6.) FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $49,650.00

7.) TWENTY-SEVEN STREET TREES ALONG LIGHT CAHILL COURT AND THE 24' USE-IN-COMMON DRIVEWAY (BETWEEN LOTS 14 AND 19) ARE TO COUNTED AS LANDSCAPE TREES FOR PURPOSE OF SURETY.



SHRUB PLANTING DETAIL

NOT TO SCALE



TREE PLANTING DETAIL

NOT TO SCALE

LIGHT CAHILL CT. & 24' USE-IN-COMMON STREET TREE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
⊕	20	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2 1/2" MIN. CAL. B&B FULL HEAD
⊕	7	ACER SACCHARUM (Sugar Maple)	2 1/2" MIN. CAL. B&B FULL HEAD

SEE LANDSCAPING NOTE No. 7.

PERIMETER/SWM LANDSCAPE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
▨	29	PLANTANUS ACERFOLIA 'BLOODGOOD' (Bloodgood London Plane)	2 1/2" MIN. CAL. B&B FULL HEAD
✳	38	PINUS STROBUS (Eastern White Pine)	5'-6' ht. UNSHEARED
✱	19	ILEX OPACA (American Holly)	5'-6' ht. UNSHEARED
⊙	25	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2 1/2" MIN. CAL. B&B FULL HEAD
⊙	24	ACER RUBRA (Red Maple)	2 1/2" MIN. CAL. B&B FULL HEAD
⊙	28	ACER SACCHARUM (Sugar Maple)	2 1/2" MIN. CAL. B&B FULL HEAD
⊛	40	TAXUS MEDIA 'DENSIFORMIS' (Densiformis Yew)	2' - 2.5' HT. 15" - 18" WIDTH 24" SPACING

STREET TREE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
⊕	42	TILIA CORDATA 'GREENSPIRE' (Greenspire Littleleaf Linden)	2 1/2" MIN. CAL. B&B FULL HEAD
⊕	86	ACER RUBRA (Red Maple)	2 1/2" MIN. CAL. B&B FULL HEAD
⊕	78	ACER SACCHARUM (Sugar Maple)	2 1/2" MIN. CAL. B&B FULL HEAD

SCHEDULE A PERIMETER LANDSCAPE EDGE													
CATEGORY	ADJACENT TO ROADWAYS		ADJACENT TO PERIMETER PROPERTIES										ADJACENT TO TRASH PAD
LANDSCAPE BUFFER TYPE	①B	②A	③A	③B	④A	⑤A	⑥A	⑦A	⑧A	⑨A	⑩A		B
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	298'	292'	183'	773'	1094'	494'	2000'	957'	343'	1965'	186'		28'(EA.)
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	*YES 298'	NO	NO	NO	*YES 1039'	*YES 290'	*YES 1391'	*YES 762'	*YES 313'	NO	NO		NO
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO		NO
NUMBER OF PLANTS REQUIRED													
SHADE TREES	–	5	3	15	1	3	10	3	1	33	3		–
EVERGREEN TREES	–	–	–	19	–	–	–	–	–	–	–		–
SHRUBS (10:1 SUBSTITUTION)	–	–	–	–	–	–	–	–	–	–	–		20 (EA. PAD)
NUMBER OF PLANTS PROVIDED													
SHADE TREES	–	5	3	15	1	3	10	3	1	33	3		–
EVERGREEN TREES	–	–	–	19	–	–	–	–	–	–	–		–
SHRUBS (10:1 SUBSTITUTION)	–	–	–	–	–	–	–	–	–	–	–		20 (EA. PAD)

* EXISTING VEGETATION TO REMAIN

** PROPOSED FOREST CONSERVATION PLANTINGS WILL TAKE THE PLACE OF BUFFER

SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING			
LINEAR FEET OF PERIMETER	① 850' TYPE 'B'	② 1115' TYPE 'B'	③ 820' TYPE 'B'
NUMBER OF TREES REQUIRED			
SHADE TREES (1:50)	17	22	16
EVERGREEN TREES (1:40)	21	28	21
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	*YES 228'	NO	*YES 315'
CREDIT FOR OTHER LANDSCAPING (NO, YES AND LINEAR FEET)	NO	**YES 254'	YES ① 505'
NUMBER OF TREES REQUIRED AFTER CREDITS			
SHADE TREES (1:50)	12	17	–
EVERGREEN TREES (1:40)	16	22	–
OTHER TREES (2:1 SUBSTITUTION)	–	–	–

* EXISTING VEGETATION TO REMAIN

** PROPOSED FOREST CONSERVATION PLANTINGS WILL TAKE THE PLACE OF BUFFER

① BIO-RETENTION PLANTINGS WILL TAKE THE PLACE OF BUFFER

LANDSCAPE LEGEND	
SYMBOL	DESCRIPTION
⊕ ⊙	STREET TREES AND PERIMETER TREES TO BE PROVIDED BY THE DEVELOPER
▨	SHADE TREES ALONG STORMWATER MANAGEMENT TO BE PROVIDED BY THE DEVELOPER
✳	EVERGREEN TREES ALONG STORMWATER MANAGEMENT AREA TO BE PROVIDED BY THE DEVELOPER
✱	HOLLY TREES ALONG PERIMETER TO BE PROVIDED BY THE DEVELOPER
⊛	TAXUS MEDIA 'DENSIFORMIS' / DENSIFORMIS YEW EVERGREEN SHRUBS TO BE PLANTED ALONGSIDE TRASH PAD LOCATIONS TO BE PROVIDED BY THE DEVELOPER.
▨	15' NO WOODY VEGETATION ZONE
⁘	FOREST CONSERVATION EASEMENT
▨	FOREST CONSERVATION EASEMENT REFORESTATION AREA

STREET TREE CALCULATIONS
STREET TREES REQUIRED FOR 10,034 LF OF RIGHT-OF-WAY WITH 730 LF OF CREDIT FOR PRESERVING EXISTING VEGETATION (10,034 – 730) / 40 = 233 TREES REQUIRED
233 TREES PROVIDED

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

STATE OF MARYLAND — DONALD ALAN MAAN — No. 21443 — PROFESSIONAL ENGINEER — 4-26-11

No As-Built information is required on this sheet

NO	DATE	REVISION
2	10-12-2011	ADD 2 RED MAPLES ON LOT 43, 5 ON LOT 58, AND 1 ON OPEN SPACE LOT 80
1	2-5-04	ADD 18" HDPE CULVERT

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

STATE OF MARYLAND — DONALD MAAN — No. 21443 — PROFESSIONAL ENGINEER — 12/5/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 1/13/04

OWNER/DEVELOPER

CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER

CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: LANDSCAPE PLAN

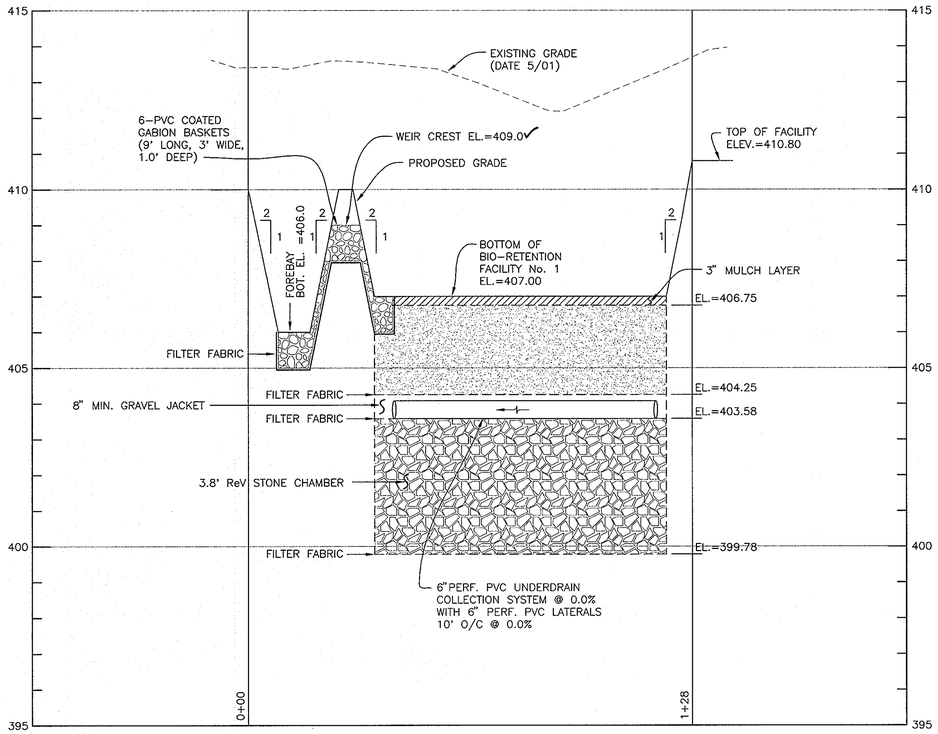
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: DECEMBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: SCALE: AS SHOWN DRAWING 26 OF 33

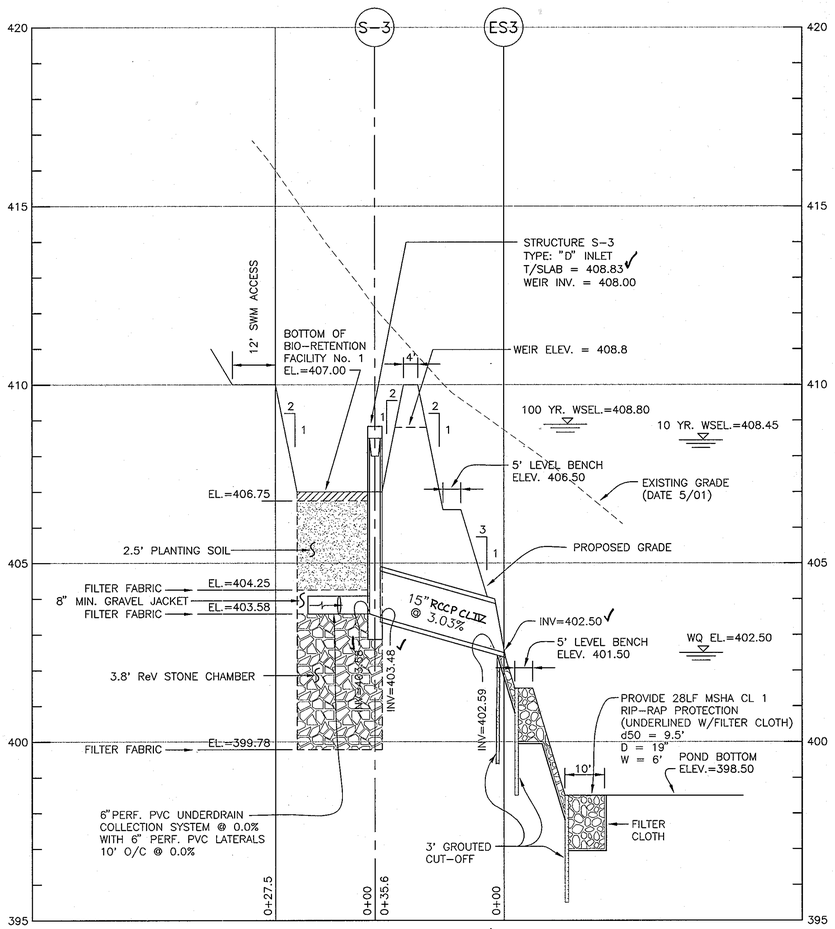
AS-BUILT

F-03-134



BIO-RETENTION FACILITY #1
SECTION A-A

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



BIO-RETENTION FACILITY #1
SECTION B-B

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'

TABLE B.3.2 MATERIALS AND SPECIFICATIONS FOR BIO-RETENTION			
MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS (IF REQUIRED)	SEE APPENDIX A; TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.5' TO 4.0' DEEP)	SAND: 35-60% SILT: 30-55% CLAY: 10-25%	N/A	USDA SOIL TYPES: LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAGM AND CURTAIN DRAIN	PEA GRAVEL: ASTM D-448 ORNAMENTAL STONE: WASHED COBBLES	PEA GRAVEL: NO.6 STONE: 2" TO 5"	
GEOTEXTILE (CLASS "C")	APPARENT OPENING SIZE: (ASTM D-4751) GRAB TENSILE STRENGTH: (ASTM D-4632) PUNCTURE RESISTANCE: (ASTM D-4833)	N/A	FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY
UNDERDRAIN GRAVEL	AASHTO M-43	0.375" TO 0.750"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR AASHTO M-278	4" TO 6" PVC SCH.40 PVC OR SDR35	3/8" PERF. @ 6" O/C, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES
POURED-IN-PLACE CONC. (IF REQUIRED)	MSHA MIX NO.3; f'c=3500psi @ 28 DAYS, NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM 615-60	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED; 28 DAY STRENGTH TEST AND SLUMP TEST; ALL CONC. 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/05: VERTICAL LOADING (H-10 or H-20) ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING

OPERATION & MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH-OUT. ANY REPLACEMENT OF MULCH SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE & INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL & PRUNING.

2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN THE SPRING AND FALL. THIS INSPECTION WILL INCLUDE; REMOVAL OF DEAD & DISEASED VEGETATION CONSIDERED BEYOND TREATMENT; TREATMENT OF ALL DISEASED TREES & SHRUBS; AND REPLACEMENT OF ALL DEFICIENT STAKES & WIRES.

3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE THE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.

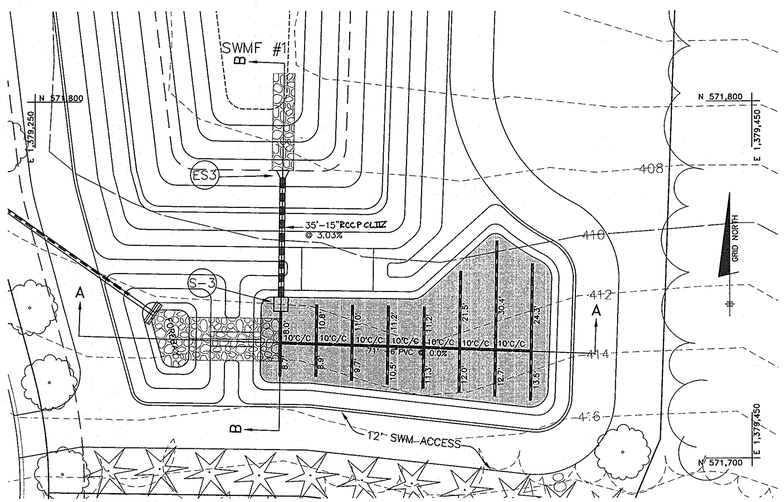
4. SOIL EROSION TO BE ADDRESSED ON AN AS-NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

SWMF - LANDSCAPE DATA

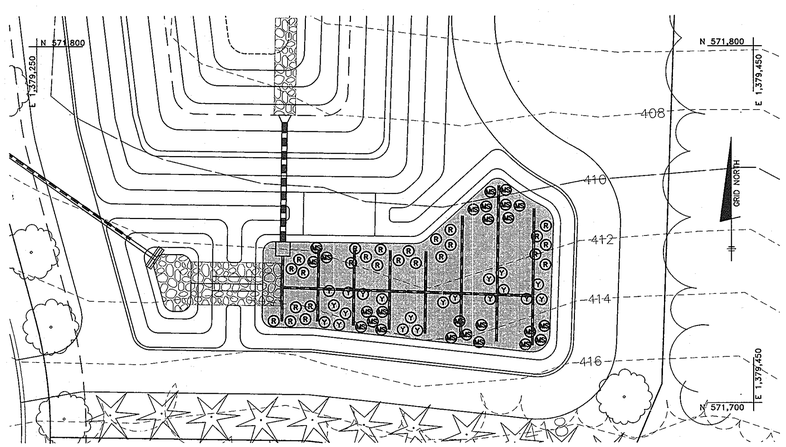
HYDROLOGIC ZONE 3 - REGULARLY INUNDATED
SHORELINE FRINGE
(HIGH MARSH)
HYDROLOGIC CONDITION - 0" TO 1'-0" DEEP
HARDINESS - TEMPERATE ZONE 6b (-5° TO 0°)
SEE SHEET 4 FOR SEQUENCE OF CONSTRUCTION

NOTE: REFER TO MDE 2000 MD STORMWATER DESIGN MANUAL VOLUMES 1 & 2 FOR LANDSCAPE CONTRACTOR RESPONSIBILITIES, PRACTICES AND MAINTENANCE DUTIES

SWMF PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
(R)	25	RHODODENDRON MAXIMUM "RHODODENDRON, ROSEBAY"	1.0' - 1.5' HT. 15" -18" WIDTH 18" -24" SPACE MIN.
(Y)	20	ILEX VOMITORIA "YAUPON HOLLY"	5.0' - 6.0' HT. UNSHEARED
(MS)	25	SPIRAEA ALBA MEADOW-SWEET, NARROW LEAF	1.5' - 2.5' HT. 15" -18" WIDTH 18" -24" SPACE MIN.



PLAN VIEW
SCALE: 1" = 20'



PLANTING PLAN VIEW
SCALE: 1" = 20'

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER
4-25-11

AS-BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.
Donald Mason, P.E. No. 21443 Date 4-25-11

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-20-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 11/18/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAT — DATE 11/30/03

NO	DATE	REVISION
1	5-26-04	REVISE HDPEP TO RCCP CL IIIZ

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
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STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER
11/17/03

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(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: BIO-RETENTION PLANTING DETAILS
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 27 OF 33

AS-BUILT

F-03-134

I:\cad\civil\engineer\projects\1383 PFAU\dwg\07022527.dwg, Sheet 27, 11/17/2003 6:37:56 AM

TABLE B.3.2 MATERIALS AND SPECIFICATIONS FOR BIO–RETENTION			
MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS (IF REQUIRED)	SEE APPENDIX A; TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
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MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM
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POURED–IN–PLACE CONC. (IF REQUIRED)	MSHA MIX NO.3; F'c=3500psi @ 28 DAYS, NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM 615–60	N/A	ON–SITE TESTING OF POURED–IN–PLACE CONC. REQUIRED; 28 DAY STRENGTH TEST AND SLUMP TEST; ALL CONC. DESIGN (CAST–IN–PLACE & 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

OPERATION & MAINTENANCE SCHEDULE FOR BIO–RETENTION AREAS

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SWMF – LANDSCAPE DATA

HYDROLOGIC ZONE 3 – REGULARLY INUNDATED SHORELINE FRINGE (HIGH MARSH)
HYDROLOGIC CONDITION – 0" TO 1'–0" DEEP
HARDINESS – TEMPERATE ZONE 6b (–5° TO 0°)
SEE SHEET 4 FOR SEQUENCE OF CONSTRUCTION

NOTE: REFER TO MDE 2000 MD STORMWATER DESIGN MANUAL VOLUMES 1 & 2 FOR LANDSCAPE CONTRACTOR RESPONSIBILITIES, PRACTICES AND MAINTENANCE DUTIES

SWMF PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
(R)	50	RHODODENDRON MAXIMUM "RHODODENDRON, ROSEBAY"	1.0' – 1.5' HT. 15" –18" WIDTH 18" –24" SPACE MIN.
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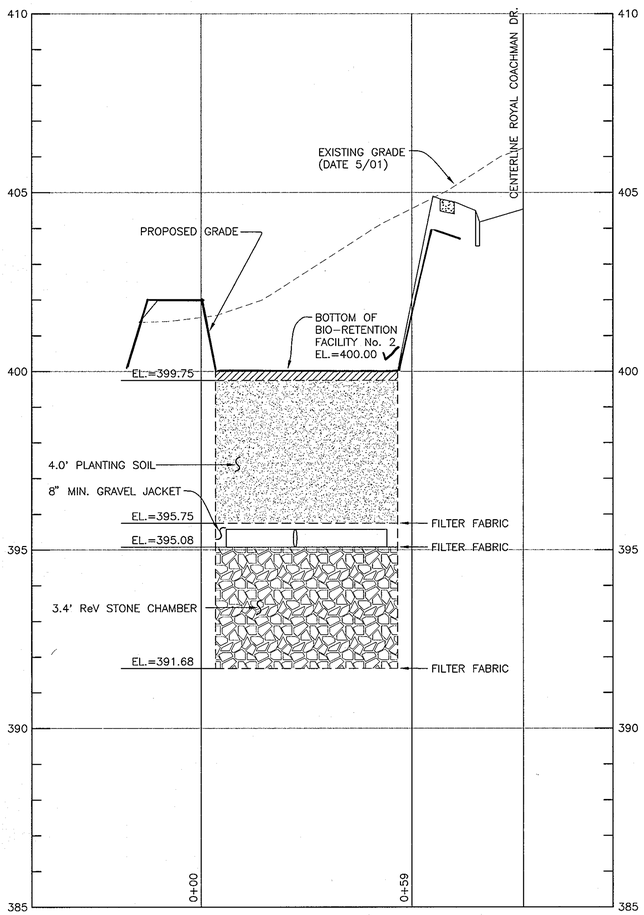
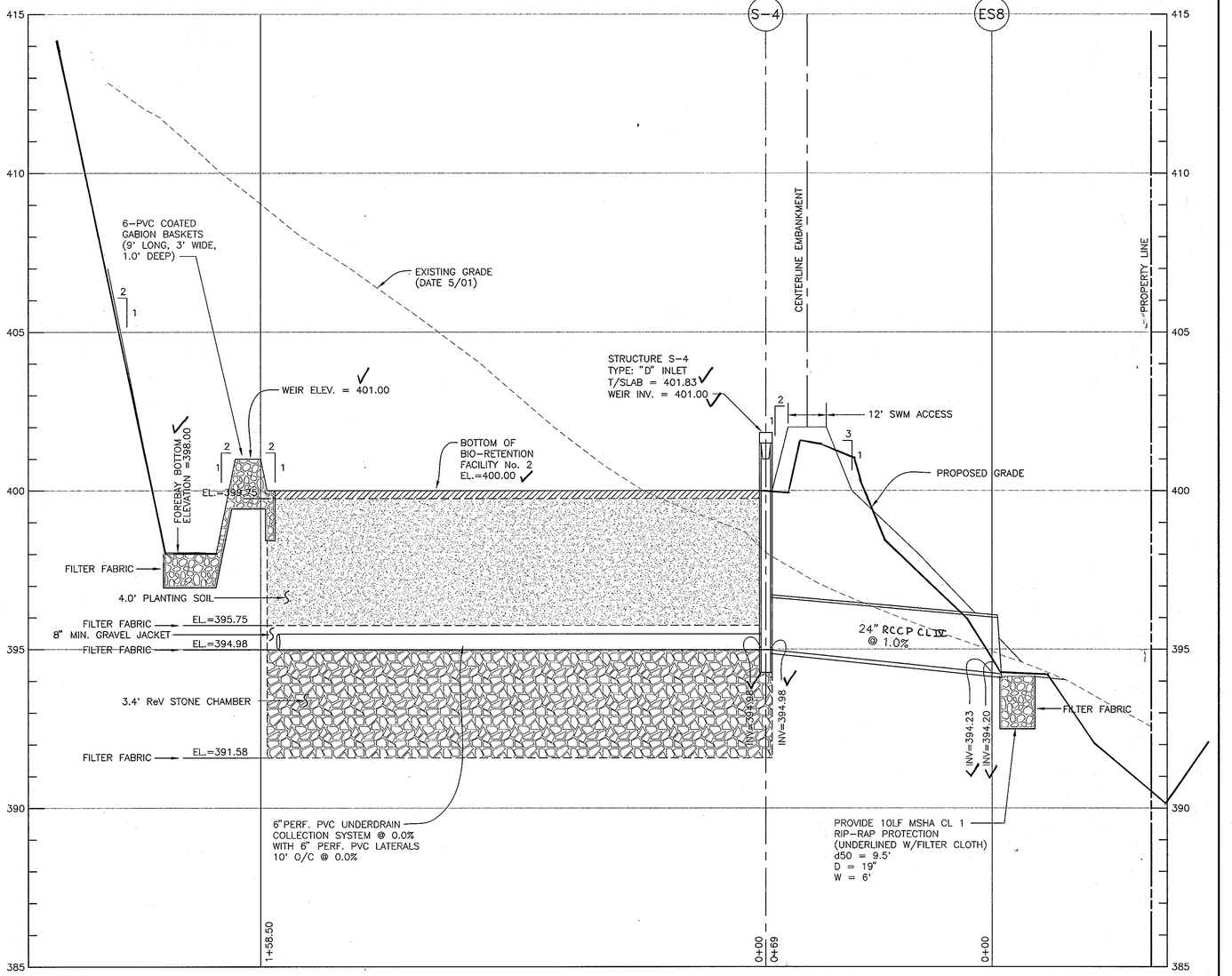
(MS)	50	SPIRAEA ALBA MEADOW–SWEET, NARROW LEAF	1.5' – 2.5' HT. 15" –18" WIDTH 18" –24" SPACE MIN.



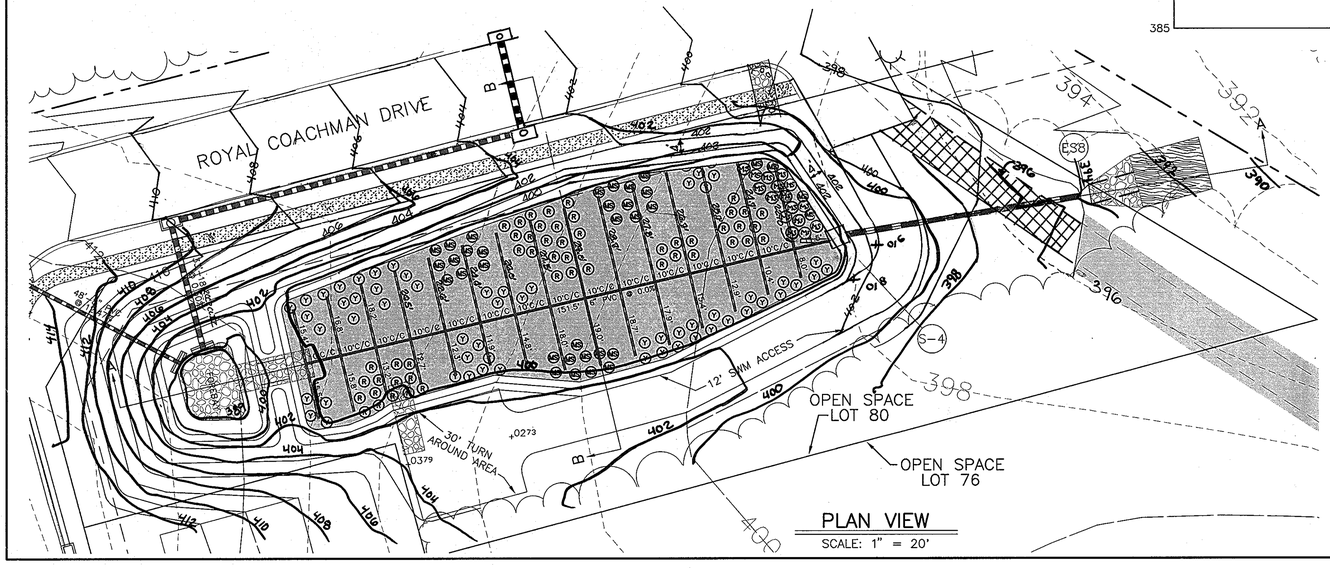
BIO–RETENTION FACILITY #2 SECTION B–B

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



BIO–RETENTION FACILITY #2 SECTION A–A

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 2'



PLAN VIEW

SCALE: 1" = 20'

AS–BUILT CERTIFICATION
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS–BUILT plan.
Donald Mason, P.E. No. 21443 Date 4-26-11

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

NO	DATE	REVISION
3	10-11-04	REVISED BIO–RETENTION FACILITY #2
2	5-25-04	REVISE HDPE TO RCCP CL IV

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410–465–6105 FAX: 410–465–6644

11/1/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 12/31/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
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PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON–BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: BIO–RETENTION PLANTING DETAILS
VP–86–130, F–88–20, S–01–04, PB–359, P–02–11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 28 OF 33

AS–BUILT

F–03–134

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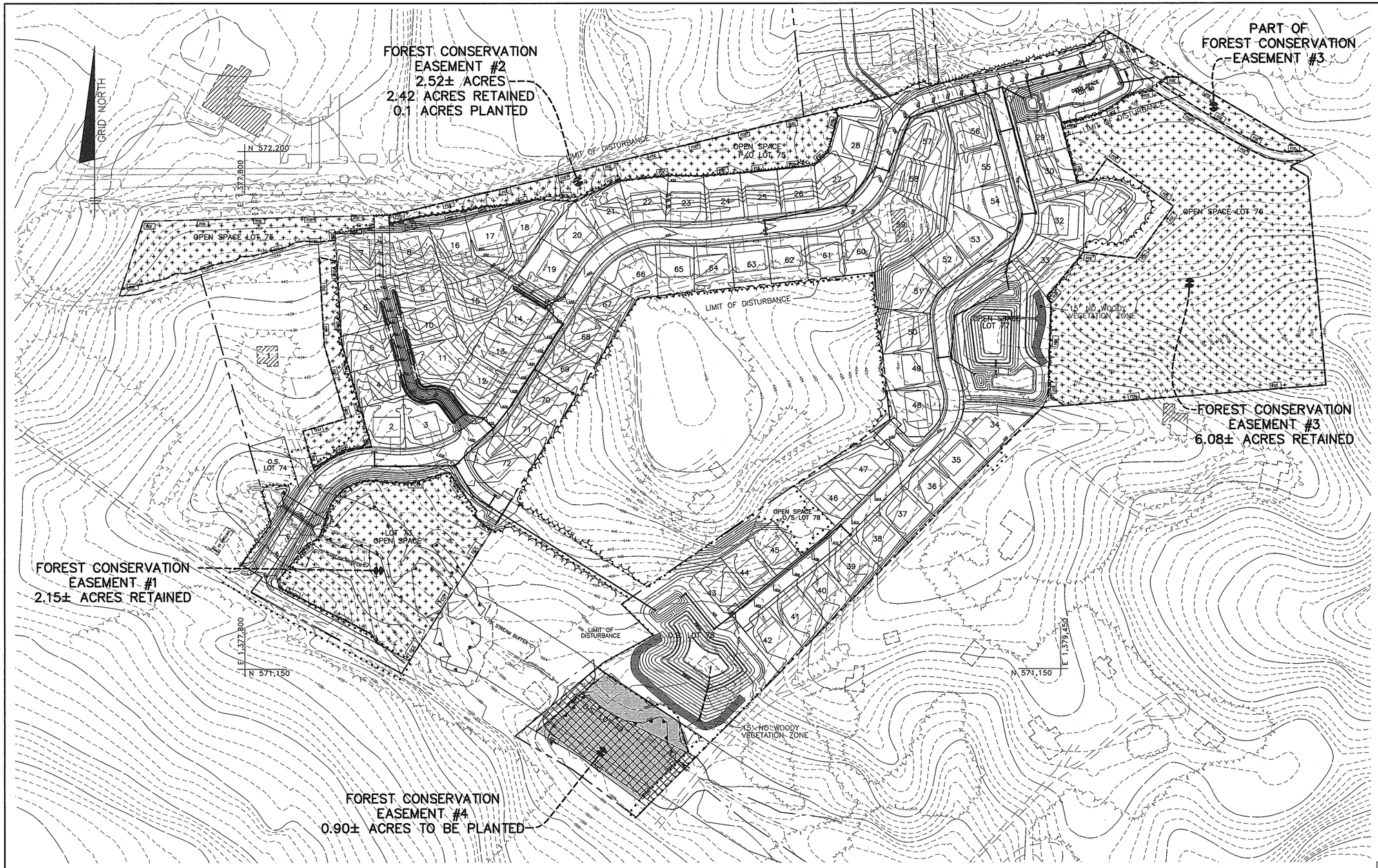

PLAN VIEW
SCALE: 1" = 100'

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- LIMIT OF WETLANDS
- 100 YEAR FLOODPLAIN
- FOREST TO BE RETAINED
- EXISTING SPECIMEN TREE
- LIMITS OF FOREST CONSERVATION EASEMENT
- TEMPORARY PROTECTIVE FENCING
- FCE — PERMANENT PROTECTIVE SIGNAGE
- FOREST CONSERVATION EASEMENT RETENTION
- FOREST CONSERVATION EASEMENT PLANTED
- 100 YEAR FLOODPLAIN, DRAINAGE AND UTILITY ESMT.
- 15' "NO WOODY VEGETATION ZONE"

SITE DATA	ACRES
GROSS AREA:	36.8
EX. LOTS/UNFORESTED PRESERVATION PARCEL/FLOODPLAIN:	0.7
NET TRACT AREA (NTA):	36.1
EXISTING FOREST ON NTA:	27.6
REFORESTATION THRESHOLD:	7.2
FOREST TO BE CLEARED:	17.0
FOREST TO BE RETAINED (NTA):	10.6
REFORESTATION REQUIRED:	0.9
REFORESTATION PROPOSED:	1.0
CREDIT FOR LANDSCAPING:	0.05

SURETY AMOUNT:
RETENTION $0.20 PER S.F. X 10.6 ACRES = $92,347.20
REFORESTED $0.50 PER S.F. X 1.0 ACRES – 0.05 ACRES CREDIT = $20,691.00

SPECIMEN TREE
DO NOT REMOVE
MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS *PROHIBITED*
VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE HOWARD COUNTY FOREST CONSERVATION ACT OF 1992
MIN. 15" × MIN. 11"

FOREST RETENTION AREA
MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS *PROHIBITED*
VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE HOWARD COUNTY FOREST CONSERVATION ACT OF 1992
MIN. 15" × MIN. 11"

Forest Conservation Easement
Unauthorized disturbances of vegetation is prohibited. Violators are subject to fines as imposed by the Howard County Forest Conservation Act of 1992
Trees for Your Future
MIN. 15" × MIN. 11"

See FCP Sheet 2 for FCP notes, details and specifications

APPENDIX G
FOREST CONSERVATION WORKSHEET

	ACRES (1/10 acre)
I. BASIC SITE DATA	
GROSS SITE AREA	36.8
AREA WITHIN 100 YEAR FLOODPLAIN	0.7
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (IF APPLICABLE)	N/A
NET TRACT AREA	36.1
LAND USE CATEGORY (R–RLD, R–RMD, R–S, C/I/O, I)	R–ED
II. INFORMATION FOR CALCULATIONS	
A. NET TRACT AREA	36.1
B. REFORESTATION THRESHOLD (20% x A)	7.2
C. AFFORESTATION MINIMUM (15% x A)	5.4
D. EXISTING FOREST ON NET TRACT AREA	27.6
E. FOREST AREAS TO BE CLEARED	17.0
F. FOREST AREAS TO BE RETAINED	10.6
G. BREAK EVEN POINT	11.3

III. DETERMINING REQUIREMENTS: AFFORESTATION OR REFORESTATION

1. Reforestation

If existing forest areas equal or exceed the afforestation minimum (if D equals or is more than C), and clearing of forest areas is proposed, reforestation requirements may apply.

GO TO SECTION IV

If existing forest areas equal or exceed the afforestation minimum (if D equals or is more than C), and no clearing of existing forest resources is proposed, no reforestation is required. No further calculations are needed.

2. Afforestation

If existing forest areas are less than the afforestation minimum (if D is less than C), afforestation requirements apply.

GO TO SECTION V

	ACRES (1/10 acre)
IV. REFORESTATION CALCULATIONS	
A. NET TRACT AREA	36.1
B. REFORESTATION THRESHOLD (20% x A)	7.2
D. EXISTING FOREST ON NET TRACT AREA	27.6
E. FOREST AREAS TO BE CLEARED	17.0
F. FOREST AREAS TO BE RETAINED	10.6
G. FOREST AREAS CLEARED ABOVE REFORESTATION THRESHOLD (D–F, If F equals or is greater than B, Alternate 1) (D–B, If F is less than B, Alternate 2)	17.0
H. FOREST AREAS CLEARED BELOW REFORESTATION THRESHOLD (B–F, If applicable)	N/A
I. FOREST AREAS RETAINED ABOVE REFORESTATION THRESHOLD (F–B, Retention Credit, if applicable)	3.4

SELECT THE ALTERNATE THAT APPLIES:

1. Clearing above the threshold only

If forest areas to be retained equal or are greater than the reforestation threshold (if F equals or is greater than B), the following calculations apply:

REFORESTATION FOR CLEARING ABOVE THRESHOLD G x 1/4	4.3
CREDIT FOR FOREST AREAS RETAINED ABOVE THRESHOLD I = Retention Credit	3.4
TOTAL REFORESTATION REQUIRED (G x 1/4) – I	0.9

If the total reforestation requirement is equal to or less than 0, no reforestation is required.

2. Clearing below the threshold

If forest areas to be retained are less than the reforestation threshold (if F is less than B), the following calculations apply:

REFORESTATION FOR CLEARING ABOVE THRESHOLD G x 1/4	____
REFORESTATION FOR CLEARING BELOW THRESHOLD H x 2	____
TOTAL REFORESTATION REQUIRED (G x 1/4) + (H x 2)	____

Since clearing occurs below the threshold, no forest retention credit is possible

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WDCP93MD0610044122
John P. Canoles

NO	DATE	REVISION
1	2-5-04	ADD 18" HDPE CULVERT

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 12-21-11

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
No As-Built information is required on this sheet

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 1/20/12

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER
11/17/03

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465–4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON–BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *FOREST CONSERVATION PLAN*
VP–86–130, F–88–20, S–01–04, PB–359, P–02–11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: SCALE: 1" = 100' DRAWING 29 OF 33

AS-BUILT

F–03–134

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FOREST PROTECTION PROCEDURES – Preconstruction Phase

1) The edge of the woods to be protected will be marked (staked or flagged) in the field per the limits of forest conservation easement shown in the approved site development plan prior to the start of construction activity. All areas within protective easement are to be considered "off limits" to any construction activities. The optional protective fencing shall be installed at the outside edge of forested areas and should be combined with sediment control devices when possible. The limit of the critical root zone and therefore the location of the protective devices is to be determined as follows:

Edge of Forested Area – 1 foot of protective radius/inch of DBH or an eight foot protective radius, whichever is greater.

Critical Root Zone for the forest on this site is an average of 12 feet from the trunk of the tree. Critical root zones for Specimen Tree #1 and #2 are 34' and 30'.

2) Construction activities expressly prohibited within the preservation areas are:

Placing or stockpiling backfill or top soil in protected areas
Felling trees into protected areas
Driving construction equipment into or through protected areas
Burning in or in close proximity to protected areas
Stacking or storing supplies of nay kind
Concrete wash–off areas.
Conducting trenching operations
Grading beyond the limits of disturbance
Parking vehicles or construction equipment
Removal of root mat or topsoil
Siting and construction of: Utility lines
Access roads
Impervious surfaces
Stormwater management devices
Staging areas

3) Protective fencing (see Figure "Protective Fencing") shall be the responsibility of the general contractor. The general contractor shall affix signs to the fencing at 25' minimum intervals indicating that these areas are "Forest Retention Area" (see Figure "Signage"). The general contractor shall take great care to assure the restricted areas are not violated and theat root systems are protected from smothering, flooding, excessive wetting from dewatering operations, off–site runoff, spillage, and drainage or solutions containing materials hazardous to tree roots.

4) The general contractor shall be responsible for any tree damaged or destroyed within the preservation areas whether caused by the contractor, his agents, employees, subcontractors, or licensees.

5) Foot traffic shall be kept to a minimum in the protective areas.

6) All trees which are not to be preserved within fifty feet of any tree preservation areas are to be removed in a manner that will not damage those trees that are designated for preservation. It is highly recommended that tree stumps within this fifty foot area be ground out with a stump grinding machine to minimize damage.

7) The general contractor shall designate a "wash out" area onsite for concrete trucks which will not drain toward a protected area.

8) A pre–construction meeting shall be held with local authorities before any disturbance has taken place on site.

FOREST PROTECTION PROCEDURES – Construction Phase

Forest and tree conditions should be monitored during construction and corrective measures taken when appropriate.

The following shall be monitored:

a) Soil compaction
b) Root injury – prune and monitor; consider crown reduction
c) Limb injury – prune and monitor
d) Flooded conditions – drain and monitor; correct problem
e) Drought conditions – water and monitor; correct problem
f) Other stress signs – determine reason, correct, and monitor

FOREST PROTECTION PROCEDURES – Post Construction Phase

The following measures shall be taken:

1) Corrective measures if damages were incurred due to negligence:

a) Stress reduction

b) Removal of dead or dying trees. This may be done only if trees pose an immediate safety hazard.

2) Removal of temporary structures:

a) No burial of discarded materials will occur onsite within the conservation area.

b) No open burning within 100 feet of a wooded area.

c) All temporary forest protection structures will be removed after construction.

d) Remove temporary roads by removing stone or broadcasting mulch; pre–construction elevation should be maintained.

e) Aerate compacted soil.

f) Replant disturbed sites with trees, shrubs and/or herbaceous plants.

g) Retain signs for retention areas or specimen trees.

h) A County official shall inspect the entire site.

3) Future protection measures:

a) Howard County and the developer shall arrange for the dedication of an appropriate forest conservation easement at a later date.

FOREST PROTECTION PROCEDURES – Preconstruction Phase

Stress Reduction and Protection of Specimen Trees
Isolated from Forest Retention Areas and
General Forest Retention Areas
(as they may apply)

Isolated specimen trees that are to be preserved will be examined to determine if stress reduction techniques are needed. Protective measures and their evaluation criteria are provided on this plan only if they are employed herein.

Root Pruning

Evaluation Criteria

Will the critical root zone be affected by construction activities such as grade changes, digging for foundations and roads or utility installation?

Design Considerations

a) Prune prior to construction as shown on the plan (see Figure "Root Pruning Detail.")
b) Prune root with a clean cut using proper pruning equipment such as a vibratory knife.
c) Exact location of pruning trench should be identified, and immediately backfilled to cover exposed roots after pruning with soil removed other topsoil, peat moss, or other suitable material or with other high organic soil.
d) For trees over 15" in diameter, root pruning may be done up to one year in advance of construction.
e) Tree(s) will be monitored for signs of stress.

Crown Reduction or Pruning

Evaluation Criteria

Has the root system been significantly reduced (>30%) or are there dead, damaged, or diseased limbs?

Design Considerations

a) Reduce only at specified times of the year:
Flowering trees – only after flowering and before bud set
Non–Flowering trees – in late winter, early spring or mid summer
b) No more than 1/3 of the crown should be removed at one time using acceptable pruning methods (see Figure "Crown Reduction Detail")
c) Monitor for signs of stress

Watering

Evaluation Criteria

Will construction activities alter the hydrology of the site? Has or will root pruning occur?

Design Considerations

a) Water only as necessary
b) Monitor for signs of stress (see Figure "Tree Planting and Maintenance Calendar")

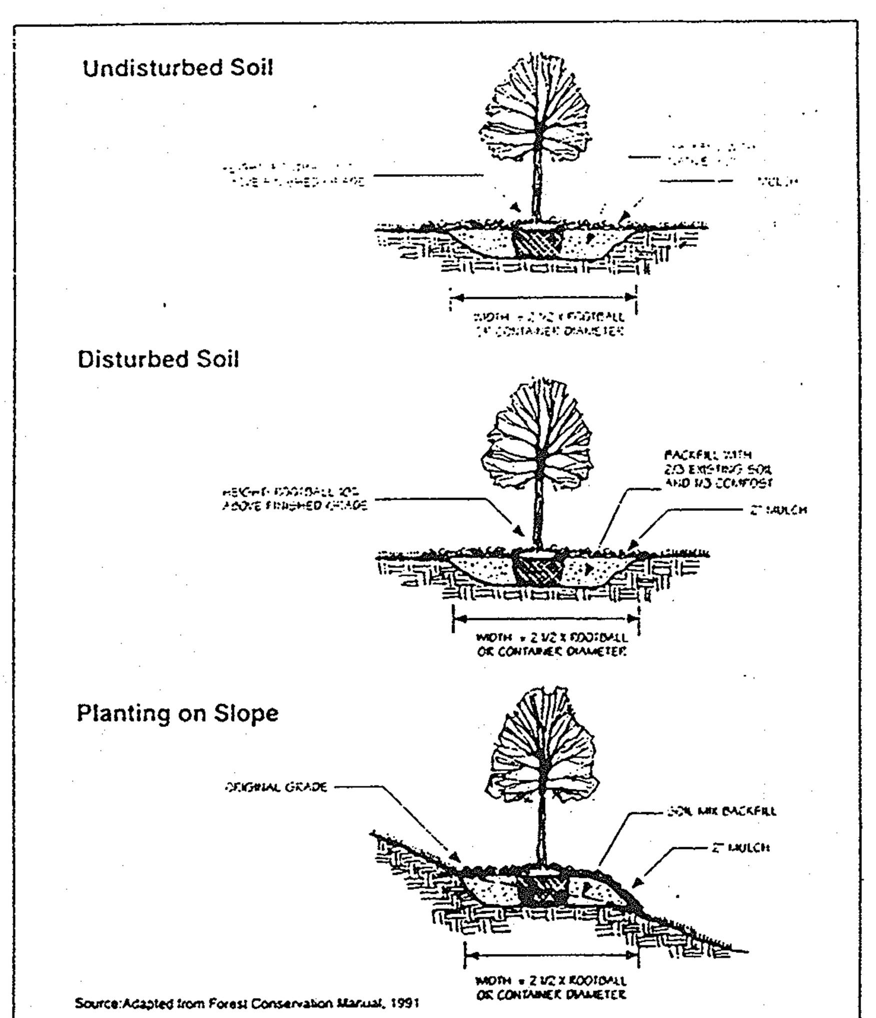
Fertilizing

Evaluation Criteria

Is or will be tree(s) be under stressful conditions? Has or will root pruning occur?

Design Considerations

a) Use low nitrogen and slow release fertilizers.
b) Apply in late fall or early spring (see Figure "Tree Planting and Maintenance and Calendar")
c) For small trees (<3" in diameter), use punch hole method or pressurized injection method (see Figure "Application of Fertilizers by Injection.")
d) For larger trees (>3" diameter), use punch hole method or pressurized injuction method (see Figure "Application of Fertilizers by Injection.")
e) Do not apply fertilizer any closer than 3' from tree trunk for pressurized injection method.
f) Monitor for signs of stress.



Container Grown and B&B Planting Techniques — Figure C-16

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 WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.

2. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENTS; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.

3. FORESTED AREAS OCCURRING OUTSIDE OF THE FCE SHALL NOT BE CONSIDERED PART OF THE FCE AND SHALL NOT BE SUBJECT TO PROTECTIVE LAND COVENANTS.

4. LIMITS OF DISTURBANCE SHALL BE RESTRICTED TO AREAS OUTSIDE THE LIMIT OF TEMPORARY FENCING OR THE FCE BOUNDARY, WHICHEVER IS GREATER.

5. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST CONSERVATION EASEMENT, EXCEPT AS PERMITTED BY HOWARD COUNTY DPZ.

6. NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREAS, ETC. SHALL OCCUR WITHIN AREAS DESIGNATED AS FOREST CONSERVATION EASEMENTS.

7. TEMPORARY FENCING SHALL BE USED TO PROTECT FOREST RESOURCES DURING CONSTRUCTION. THE FENCING SHALL BE PLACED ALONG ALL FCE BOUNDARIES WHICH OCCUR WITHIN 15 FEET OF THE PROPOSED LIMITS OF DISTURBANCE.

8. PERMANENT SIGNAGE SHALL BE PLACED 50–100' APART ALONG THE BOUNDARIES OF ALL AREA INCLUDED IN FOREST CONSERVATION EASEMENTS.

9. THE FOREST CONSERVATION OBLIGATIONS INCURRED BY THIS SITE DEVELOPMENT PLAN HAVE BEEN MET THROUGH THE RETENTION, IN AN EASEMENT, OF 10.6 ACRES OF EXISTING RETAINED FOREST AND 1.0 ACRES – 0.05 ACRES OF CREDIT FOR REFORESTATION. FOR A TOTAL OF 11.55 ACRES OF FOREST CONSERVATION EASEMENTS WILL BE CREATED FOR THIS PROJECT.

PLANTING SPECIFICATIONS

Planting/Soil Specifications

1. Planting of nursery stock shall take place between March 15th and April 30th. Container stock may be planted September 1-October 30.
2. A twelve (12) inch layer of topsoil shall be spread over all afforestation areas impacted by site grading to assure a suitable planting area. Disturbed areas shall be seeded and stabilized as per general construction plan for project. Planting areas not impacted by site grading shall have no additional topsoil installed.
3. All bareroot planting stock shall have their root systems dipped into an anti-desiccant gel prior to planting.
4. Plants shall be installed so that the top of root mass is level with the top of existing grade. Backfill in the planting pits shall consist of 3 parts existing soil to 1 part pine fines or equivalent.
5. Fertilizer shall consist of Agriform 22-8-2, or equivalent, applied as per manufacturer's specifications.
6. A two (2) inch layer of hardwood mulch shall be placed over the root area of all plantings.
7. Plant material shall be transported to the site in a tarped or covered truck. Plants shall be kept moist prior to planting.
8. All non-organic debris associated with the planting operation shall be removed from the site by the contractor.

Sequence of Construction

1. Plants shall be installed as per Plant Schedule and the Planting/Soil Specifications for the project.
2. Upon completion of the planting, signage shall be installed as per the Forest Retention Area Protection Devices shown on Sheet 2 of the Forest Conservation Plan.
3. Plantings shall be maintained and guaranteed in accordance with the Maintenance and Guarantee requirements for project.

Maintenance of Plantings

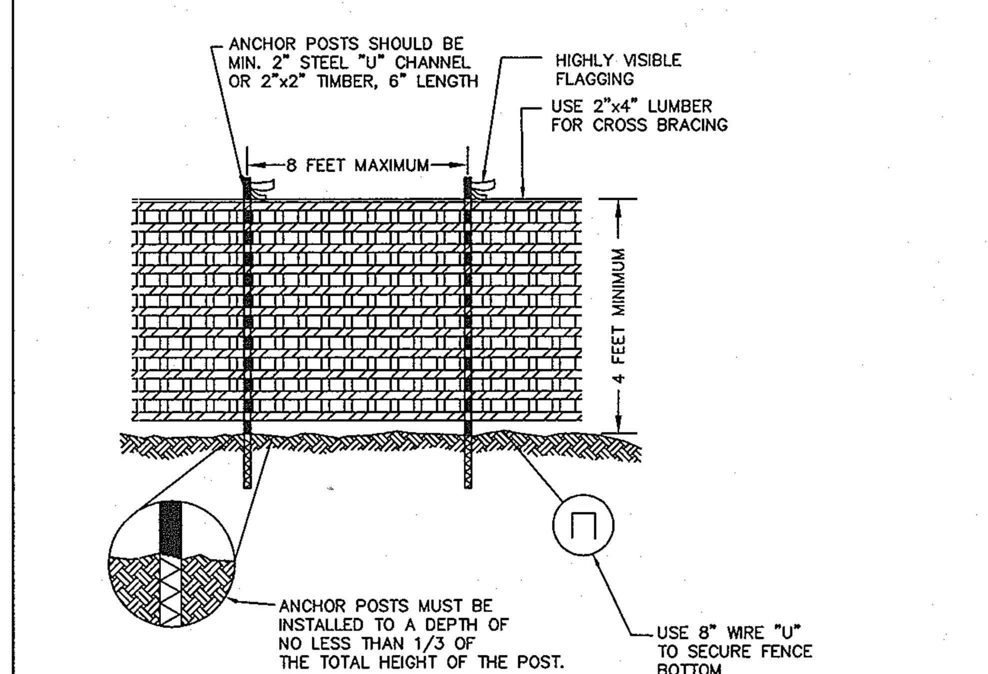
1. Maintenance of plantings shall last for a period of 24 months.
2. All plant material shall be watered twice a month during the 1st growing season. Watering may be more or less frequent depending on weather conditions. Watering during second growing season, to be once a month during May-September, if needed.
3. Invasive exotics and noxious weeds will be removed from reforestation areas. Old field successional species will be retained.
4. Plants will be examined a minimum two times during the growing season for serious plant pests and diseases. Serious problems will be treated with the appropriate agent.
5. Dead branches will be pruned from plantings.

Guarantee Requirements

1. After one growing season, plant material shall be maintained at 90% survival threshold. A 75 percent survival rate of forestation plantings will be required at the end of the 24 month maintenance period. All plant material below the 75 percent threshold will be replaced at the beginning of the next growing season.
2. The contractor will not be liable for plant loss due to theft or vandalism.

Surety for Retention and Reforestation

1. The developer shall post a surety (bond, letter of credit) to ensure that reforestation plantings are completed. Upon acceptance of the plantings by the County, the bond shall be released. Financial surety for the Forest Conservation plantings will be posted as part of the DPW developer's agreement. Retention $0.20 x 10.6 acres = $92,347.20, and reforested $0.50 x 1.0 acres – 0.05 acres credit for landscaping = $20,691.00; total = $113,038.00



NOTES:
1. BLAZE ORANGE OF BLUE PLASTIC MESH FENCE FOR FOREST PROTECTION DEVICE ONLY.
2. BOUNDARIES OF RETENTION AREA WILL BE ESTABLISHED AS PART OF THE FOREST CONSERVATION PLAN REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. AVOID DAMAGE TO CRITICAL ROOT ZONE. DO NOT DAMAGE OF SEVER LARGE ROOTS WHEN INSTALLING POSTS.
5. PROTECTIVE SIGNS ARE REQUIRED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

ADAPTED FROM PRINCE GEORGE'S COUNTY, MARYLAND. WOODLAND CONSERVATION MANUAL AND FOREST CONSERVATION MANUAL, 1991.

PLASTIC MESH TREE PROTECTION FENCE

Planting Schedule

FCE Planting Area 2 (0.10 acres)

Qty.	Species	Size	Spacing
3	Acer rubrum - Red maple	2 1/2" - 3" dia.	*
3	Fraxinus pennsylvanica - Green ash	2 1/2" – 3" dia.	*
6	Quercus alba - White oak	2 1/2" – 3" dia.	*

FCE Planting Area 4 (0.9 acres)

Qty.	Species	Size	Spacing
50	Acer rubrum - Red maple	2-3 whip	**
50	Betula nigra - River birch	2-3' whip	**
70	Fraxinus pennsylvanica - Green ash	2-3' whip	**
45	Nyssa sylvatica - Black gum	2-3' whip	**
40	Quercus palustris - Pin oak	2-3' whip	**
60	Salix nigra - Black willow	2-3' whip	**

Key:

* - landscape sized trees shall be installed on 20 foot centers in a random pattern throughout the easement. The trees should not be placed in a grid.

** Plantings to be spaced on 11 foot centers, plantings should be installed in rows to facilitate future maintenance. Where possible rows should be made along contour. Shelters required per County regulations.

Planting Notes:

1. No motorized vehicles permitted within wetlands.

2. Plants should be flagged to aid on location during maintenance, 2-3' whip plantings should also be planted in grid pattern to facilitate maintenance and removal of invasive and exotic species.

Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. Box 5006 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WDCP93MD0610044B2
John P. Canoles

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER — Donald Mason 2-25-11

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

No As-Built information is required on this sheet

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

Donald Mason 11/17/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — 12-24-03 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — 1/13/04 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — 12/30/03 DATE

~OWNER/DEVELOPER'
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465–4244

~OWNER'
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON–BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: FORREST CONSERVATION NOTES AND DETAILS
VP–86–130, F–88–20, S–01–04, PB–359, P–02–11

DATE: OCTOBER, 2003 | PROJECT NO. 1383
DES: DAM | DRN: RPS | CHK: | SCALE: AS SHOWN | DRAWING 30 OF 33

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F–03–134

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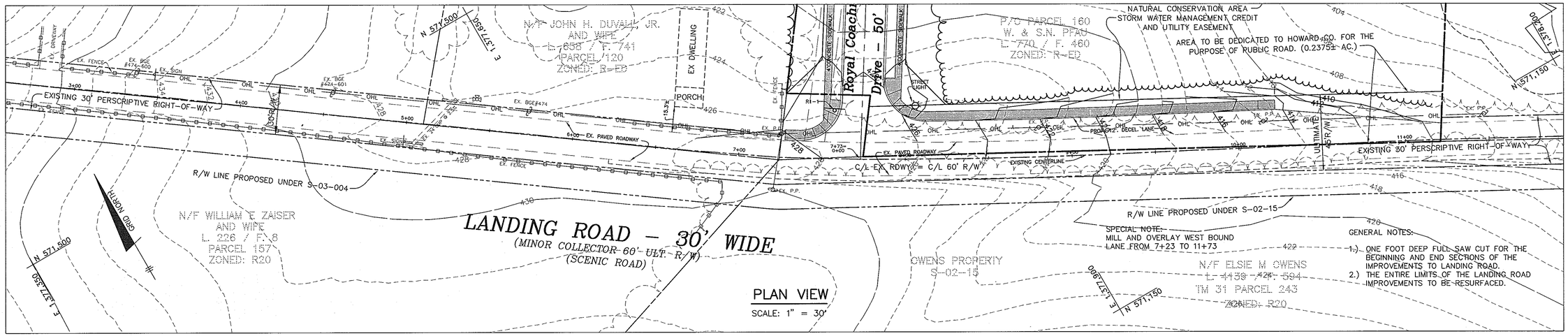

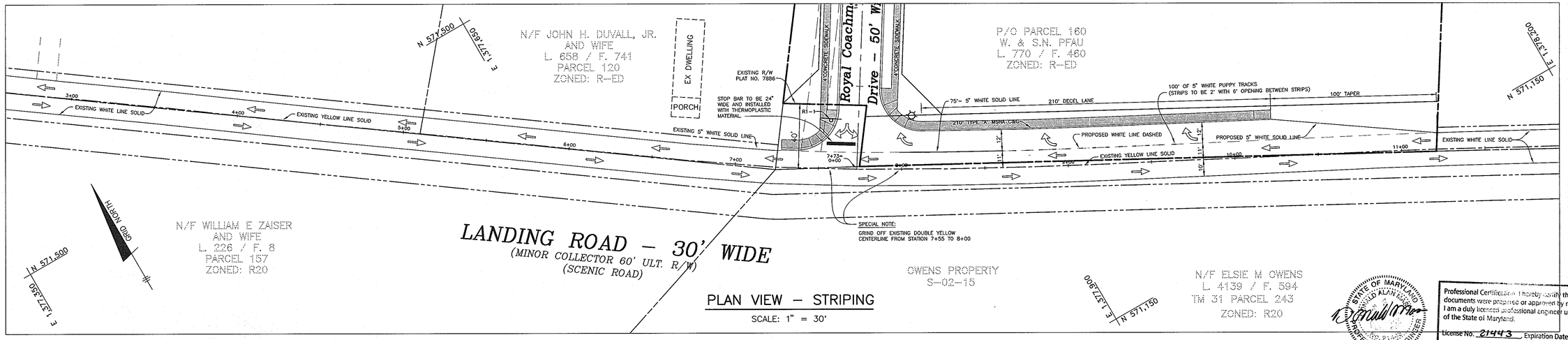

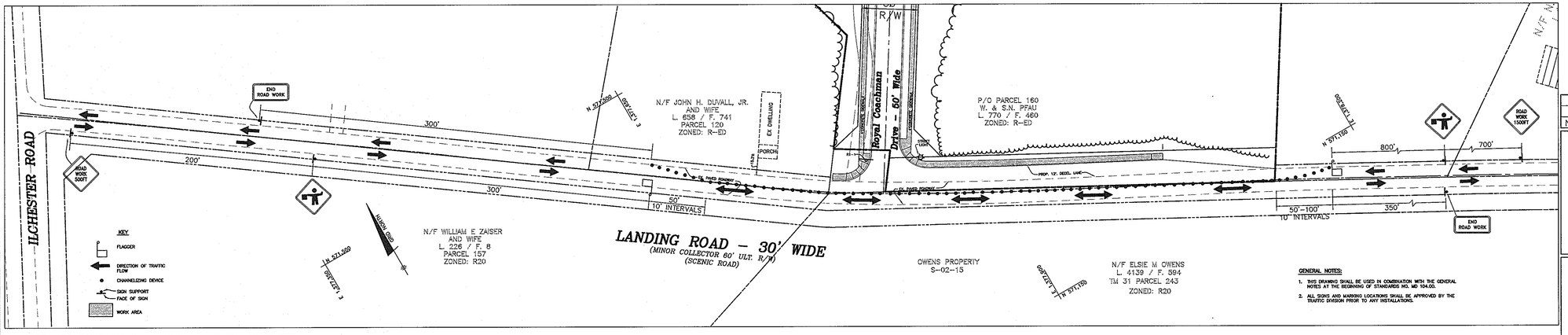

NOTE: CONTRACTOR SHALL SCHEDULE TO COMPLETE A MINIMUM OF A STONE BASE BY THE END OF EACH DAY AND THE ROAD SHALL BE RETURNED TO TWO LANE TRAFFIC WHEN NOT ATTENDED BY FLAGGERS.

PLAN VIEW - TRAFFIC CONTROL
SCALE: 1" = 50'

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 Information is reflected on this sheet

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 12/24/03

NO	DATE	REVISION

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11/17/03

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PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *ENTRANCE, STRIPING AND TRAFFIC CONTROL PLAN*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

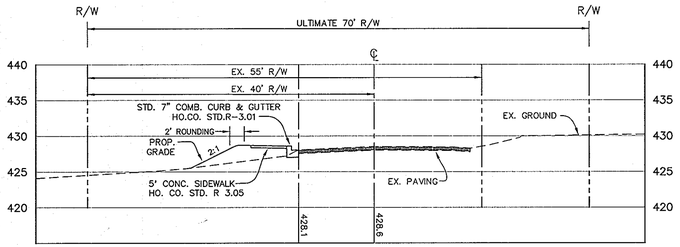
DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 31 OF 33

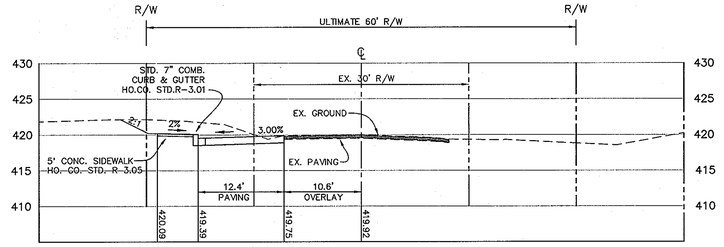
AS-BUILT

F-03-134

\\cadvol1\engineer\projects\1383 PFAU\dwg\7043S31MOD.dwg, Sheet 31 Entrance, 11/17/2003 7:04:20 AM



EX. LANDING ROAD – STA.7+27.66



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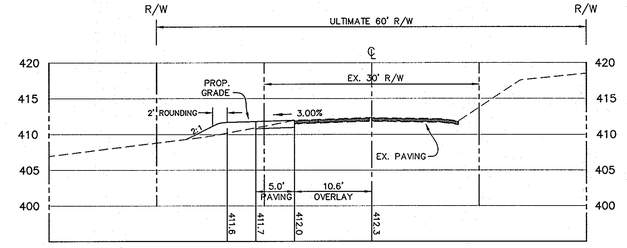
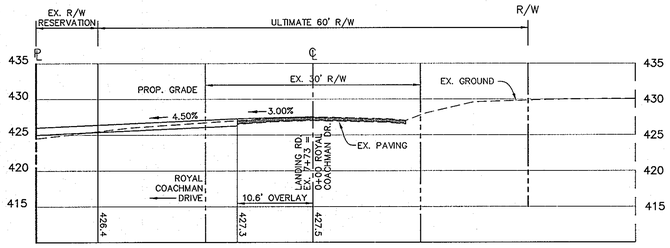
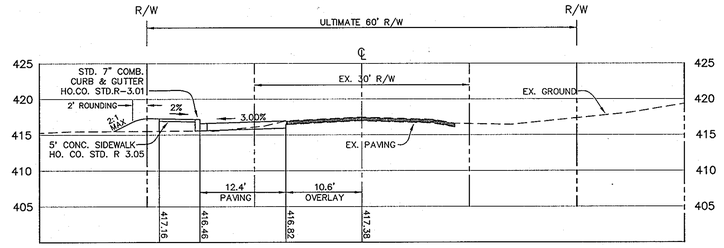


EX. LANDING ROAD – STA.10+75



EX. LANDING ROAD STA.7+73 @ PROP. ROYAL COACHMAN DR. STA.0+00



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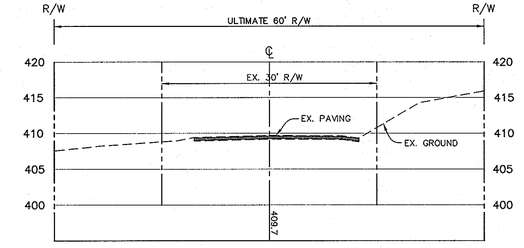
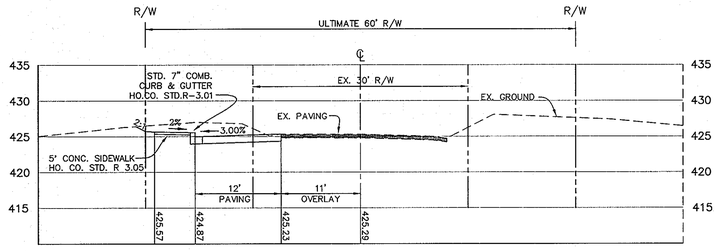
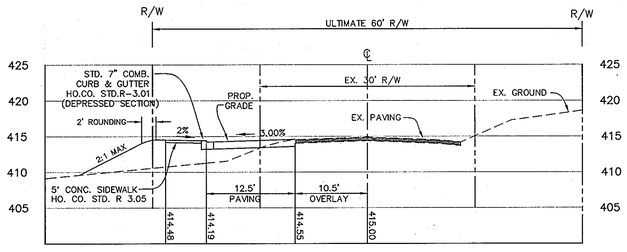


EX. LANDING ROAD – STA.11+22



EX. LANDING ROAD – STA.8+25



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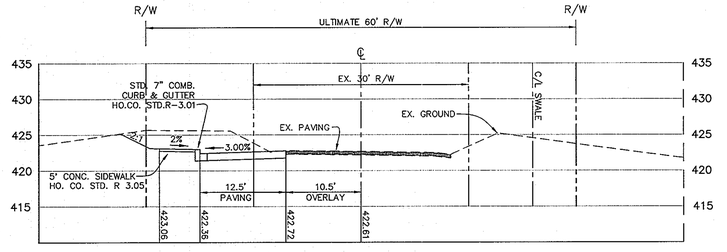

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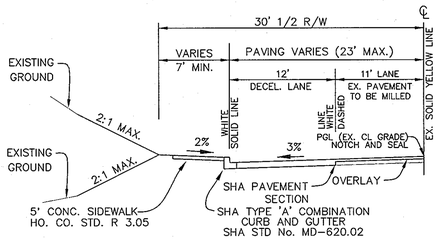
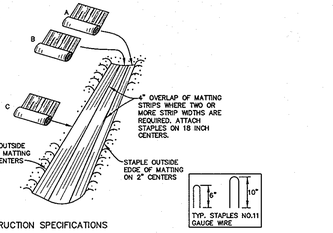


TYPICAL WIDENING SECTION
LANDING ROAD – CURB AND GUTTER
NOT TO SCALE

SHA TYPE 'A' COMBINATION CURB AND GUTTER
SHA STD No. MD-620.02



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 WITH 2 DOUBLE ROWS OF STAPLES.

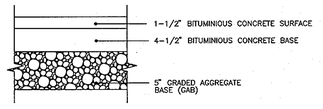
NOTE: IF FLOW WILL ENTER FROM THE EDGE OF THE MATTING THEN THE AREA EFFECTED BY THE FLOW MUST BE KEYED-IN.

SOIL STABILIZATION MATTING
NOT TO SCALE

STATE OF MARYLAND
DONALD ALAN MASON
No. 21443
PROFESSIONAL ENGINEER
12-25-11

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

No As-Built information is required on this sheet



P-3 PAVING SECTION
NOT TO SCALE

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER
11/17/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 1/9/04

OWNER/DEVELOPER
CASCADE OVERLOOK, L.L.C.
P.O.BOX 417
ELLICOTT CITY, MD 21041
(410) 465-4244

OWNER
CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: CASCADE OVERLOOK
SECTION ONE
LOTS 1 – 72 AND OPEN SPACE LOTS 73 – 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION:
TAX MAP 31, GRID 10 &11, PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: ROADWAY CROSS-SECTIONS EX LANDING ROAD
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: OCTOBER, 2003 PROJECT NO. 1383

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 32 OF 33

AS-BUILT F-03-134

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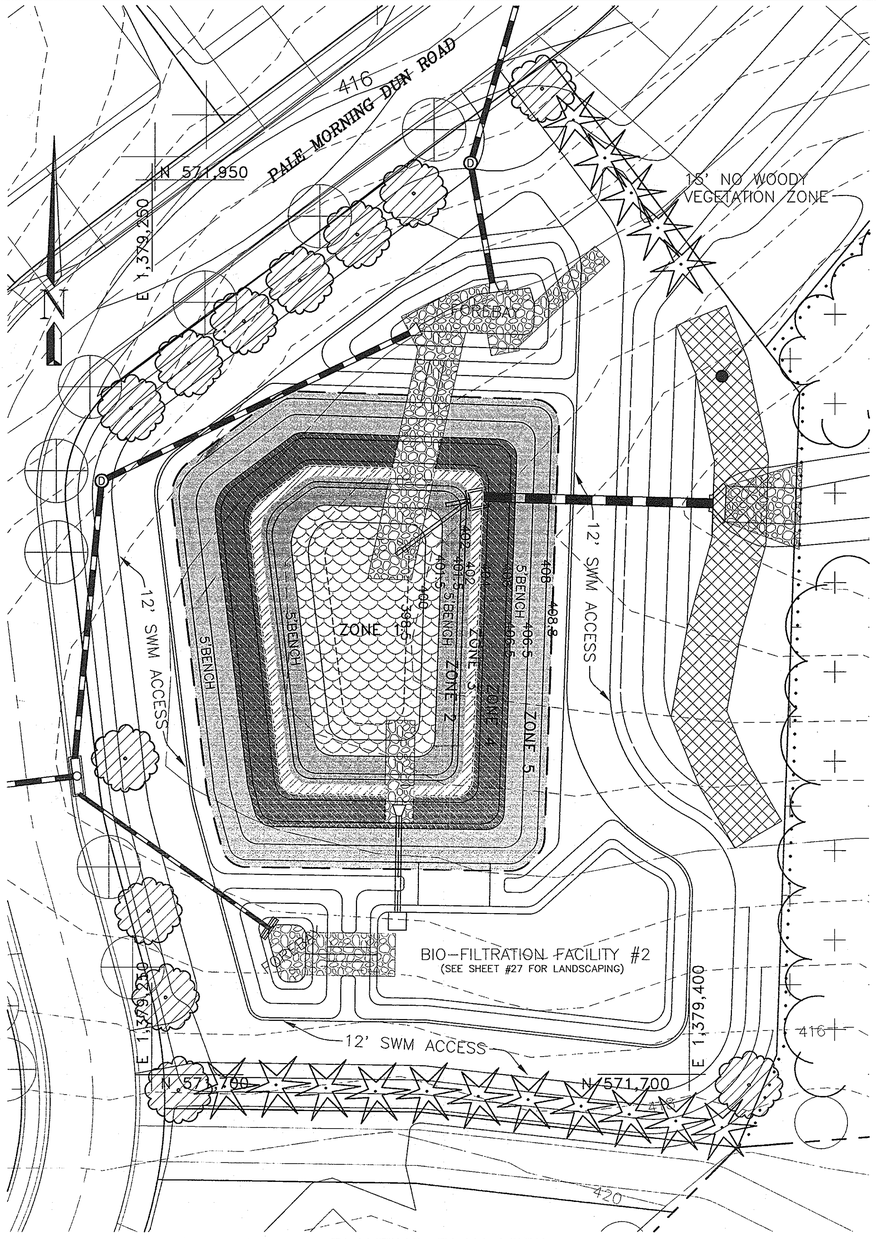
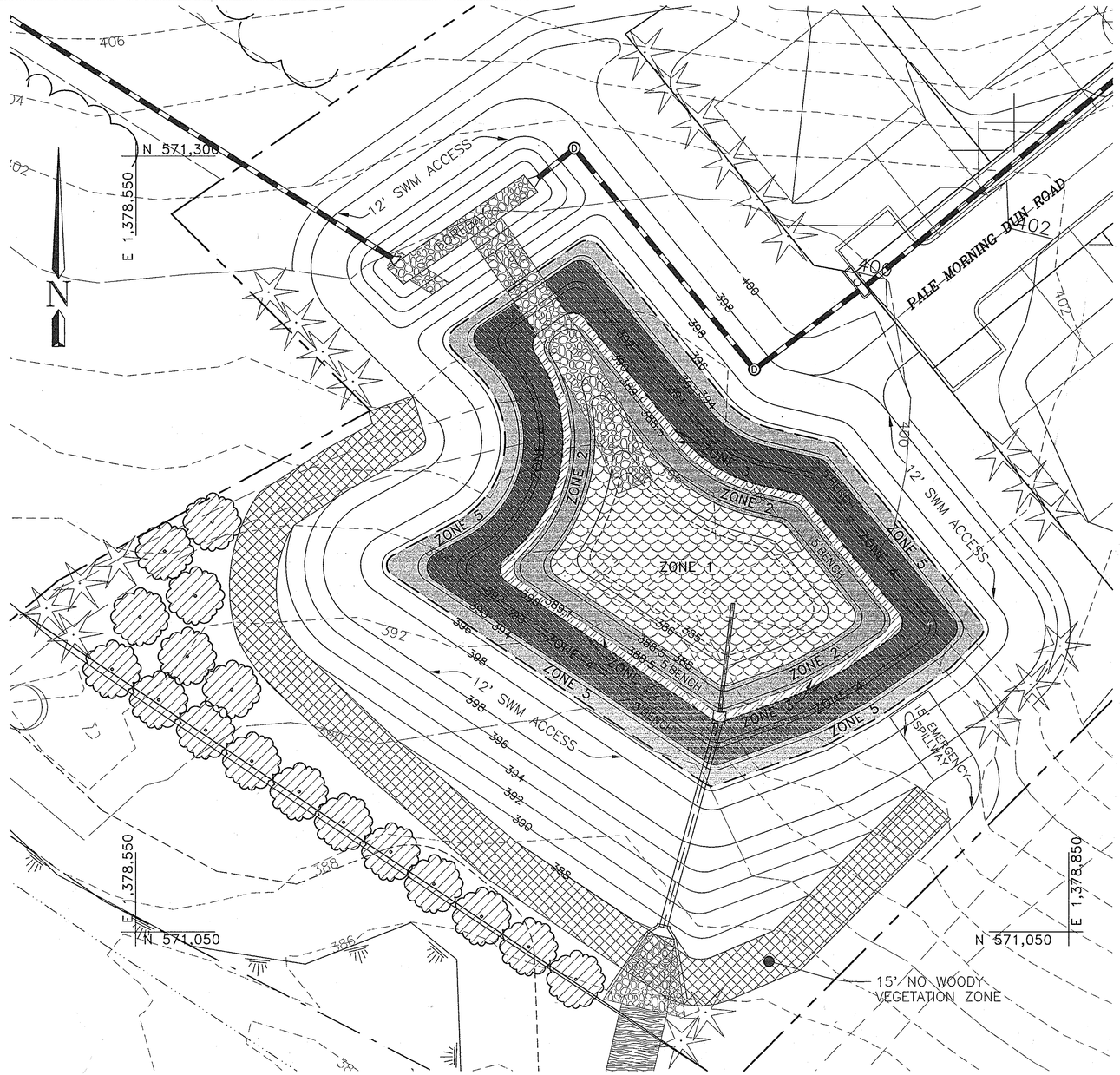


PLANTING PLAN VIEW

SCALE: 1" = 20'



PLANTING PLAN VIEW

SCALE: 1" = 20'

LEGEND:

- ZONE 1
- ZONE 2
- ZONE 3
- ZONE 4
- ZONE 5
- RIP-RAP
- EROSION CONTROL MATTING

PLANTING SCHEDULE
SWMF #1 MICROPOOL E.D.

ZONE	AREA	PLANT MIX
1	2299 SF	25% WATER LILLY
		75% SAGO POND PLANT
2	1762 SF	50% BROAD WATER WEED
		25% DUCK POTATO
		25% ARROW ARUM
3	801 SF	50% RICE CUTGRASS
		50% SWITCHGRASS
4	2781 SF	50% LOVEGRASS
		25% VIOLETS
		25% CONEFLOWER
5	1400 SF	100% FESCUES
6	0 SF	N/A

NOTES:

1. LOOSEN SOIL IN PLANTING ZONES TO A DEPTH OF THREE TO FIVE INCHES BEFORE PLANTING.
2. PLANTING HOLES TO HAVE A DIAMETER 6" GREATER THAN THE ROOT BALL BEING PLANTED IN THEM.
3. NO WOODY VEGETATION IS PERMITTED WITH 15' OF THE TOE OF THE SLOPE OR 25' OF THE SPILLWAY.

PLANTING SCHEDULE
SWMF #2 MICROPOOL E.D.

ZONE	AREA	PLANT MIX
1	4104 SF	25% WATER LILLY
		75% SAGO POND PLANT
2	2438 SF	50% BROAD WATER WEED
		25% DUCK POTATO
		25% ARROW ARUM
3	1050 SF	50% RICE CUTGRASS
		50% SWITCHGRASS
4	5751 SF	50% LOVEGRASS
		25% VOLETS
		25% CONEFLOWER
5	3200 SF	100% FESCUES
6	0 SF	N/A

NOTES:

1. LOOSEN SOIL IN PLANTING ZONES TO A DEPTH OF THREE TO FIVE INCHES BEFORE PLANTING.
2. PLANTING HOLES TO HAVE A DIAMETER 6" GREATER THAN THE ROOT BALL BEING PLANTED IN THEM.
3. NO WOODY VEGETATION IS PERMITTED WITH 15' OF THE TOE OF THE SLOPE OR 25' OF THE SPILLWAY.

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

12-20-03

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

No As-Built information is required on this sheet

NO	DATE	REVISION

BENCHMARK
ENGINEERS ▲ LAND SURVEYORS ▲ PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6644

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER

12/5/03

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 12-24-03

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/13/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAT — DATE 12/24/03

OWNER/DEVELOPER

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OWNER

CRAIG R. AND KAREN C. MARTIN
4937 LANDING ROAD
ELKRIDGE, MD 21075

PROJECT: *CASCADE OVERLOOK*
SECTION ONE
LOTS 1 - 72 AND OPEN SPACE LOTS 73 - 80 AND NON-BUILDABLE PARCEL 'A'

LOCATION: TAX MAP 31, GRID 10 &11,PARCELS 160,161, 788, & 791
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: *SWM LANDSCAPING PLAN AND PLANTING DETAILS*
VP-86-130, F-88-20, S-01-04, PB-359, P-02-11

DATE: DECEMBER, 2003 PROJECT NO. 1383

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 33 OF 33

AS-BUILT

F-03-134

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Administrator