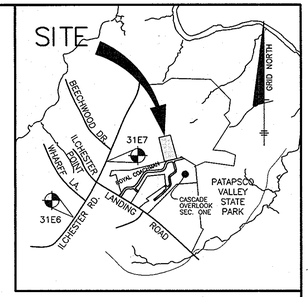
ROADS, STORM DRAINS AND STORMWATER MANAGEMENT

CASCADE OVERLOOK SECTION II

HOWARD COUNTY, MARYLAND



VICINITY MAP

SCALE: 1" = 2000'

BENCHMARKS – 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'

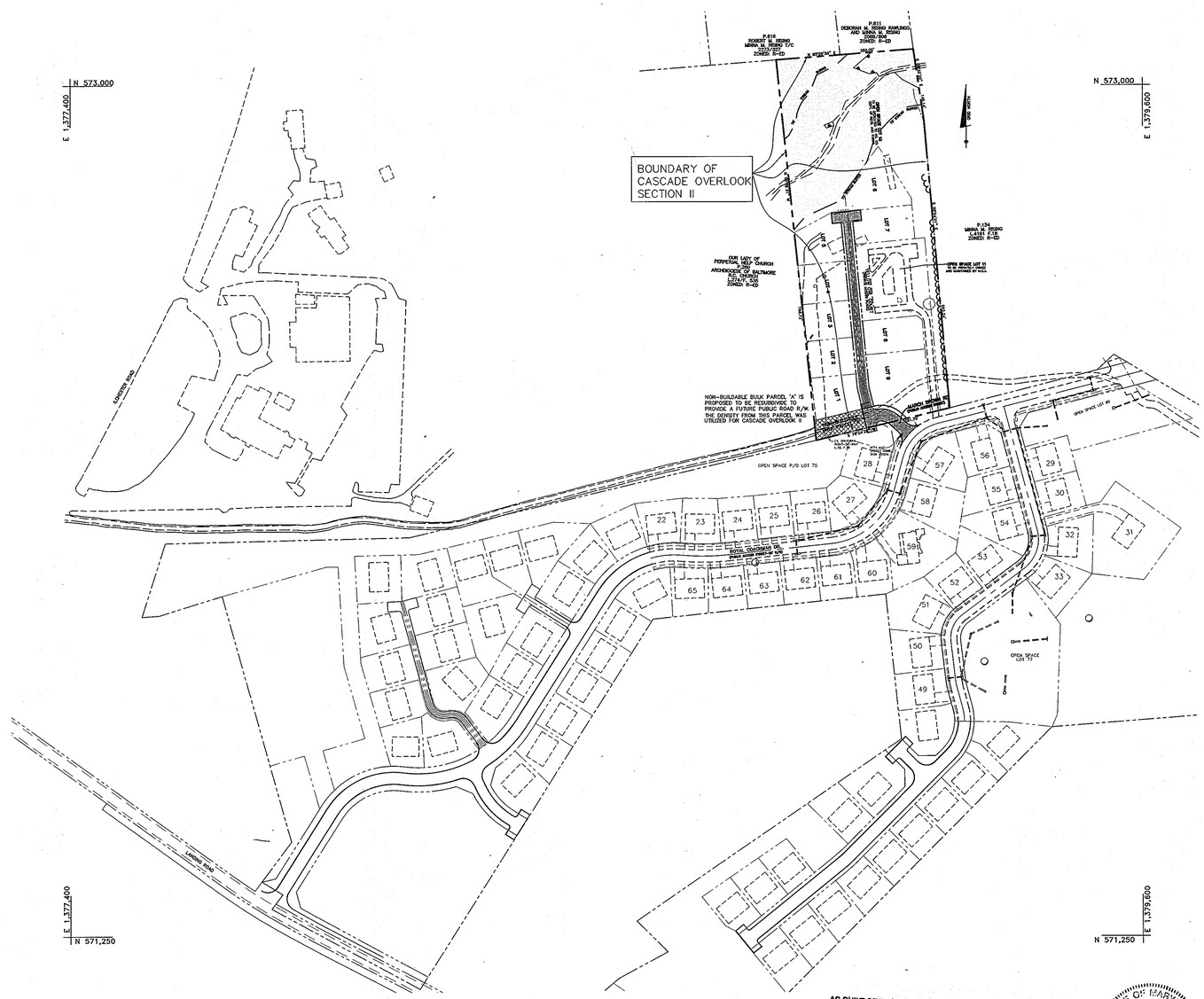
HO. CO. BM#2745004 ELEV. 364.78'
USED FOR VERTICAL CONTROL.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARD AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
2. 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.
3. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
4. 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.
5. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS (JUNE 1993)." A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
6. THE EXISTING TOPOGRAPY IS TAKEN FROM FIELD RUN SURVEY WITH CONTOUR INTERVALS PREPARED BY BENCHMARK ENGINEERING, INC ON OR ABOUT MAY, 2001.
7. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 31E6 AND 31E7 WERE USED FOR THIS PROJECT.
8. WATER IS PUBLIC. CONTRACT NO. 14-4080-D
9. SEWER IS PUBLIC. CONTRACT NO. 14-4080-D AND IS LOCATED WITHIN THE PATAPSCO DRAINAGE AREA.
10. STORMWATER MANAGEMENT FOR THIS PROJECT IS PROVIDED BY A MICRO-POOL EXTENDED DETENTION FACILITY AND IS PRIVATELY OWNED AND MAINTAINED.
11. EXISTING UTILITIES ARE BASED ON FIELD LOCATION AND CONTRACT DRAWINGS.
12. THERE IS NO FLOODPLAIN ON THIS SITE.
13. THE WETLANDS DELINEATION STUDY FOR THIS PROJECT WAS PREPARED BY ECO-SCIENCE PROFESSIONALS AND WAS APPROVED ON 08/15/2001
14. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
15. THIS PROPERTY IS WITHIN THE METROPOLITAN DISTRICT.
16. ALL LANDSCAPING REQUIREMENTS, AS SET FORTH IN THE LANDSCAPE MANUAL, SHALL BE FULFILLED. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $22,050.00
17. TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERY LOCATIONS ON-SITE.
18. SEDIMENT CONTROL SHALL BE PROVIDED FOR THIS PROJECT.
19. ALL ROAD FILLS SHALL BE COMPACTED TO 95% AS DETERMINED BY AASHTO T-180.
20. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING IN THE AREA OF ANY OVERHEAD POWERLINES.
21. THE FOREST CONSERVATION OBLIGATION FOR THIS SUBDIVISION WILL BE FULFILLED BY RETENTION OF 0.87 ACRES OF EXISTING FOREST IN A FOREST CONSERVATION EASEMENT. FINANCIAL SURETY FOR THE FOREST CONSERVATION RETENTION WILL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $7,579.40
22. THE CONTRACTOR SHALL MAINTAIN ACCESS TO DRIVEWAY LOCATED WITHIN THE L.30 F.36 RIGHT-OF-WAY AT ALL TIMES DURING CONSTRUCTION. ALSO, THE PURPOSE OF THE EXISTING 15-FOOT WIDE EASEMENT L.913F.106, LOCATED ON THE OUR LADY OF PERPETUAL HELP CHURCH IS TO MAINTAIN ACCESS TO THE EXISTING DRIVEWAY. THE EASEMENT RECORDED IN L.30 AT F. 36 IS FOR MAINTAINING INGRESS AND EGRESS TO PARCELS 134, 136, 569, AND 137. ACCESS SHALL BE MAINTAINED AT ALL TIMES ALONG THIS DRIVEWAY AND IT SHALL ONLY BE ABANDONED UPON OBTAINING APPROVAL FROM ALL OF THE PARTIES THAT HAVE A RIGHT TO USE THE DRIVE.
23. MARCH BROWN ROAD IS INTENDED TO BE EXTENDED ACROSS THE AREA OF BULK PARCEL 'A' AT A FUTURE DATE IN ORDER TO PROVIDED PUBLIC ROAD FRONTAGE TO THE PROPERTY OF OUR LADY OF PERPETUAL HELP. THIS ROAD WILL INCOMPASS THE EXISTING 15' WIDE RIGHT OF INGRESS AND ERGRESS RECORDED IN L.30, F.36. THE ROADWAY SHALL BE BUILT IN SUCH A MANNER TO ALLOW FOR CONTINUED ACCESS BY THE USERS OF THE EXISTING DRIVEWAY DURING CONSTRUCTION.

RIGHT OF WAY ELEVATION CHART NAD 83

R/W PT NO	DESCRIPTION	ELEVATION
1	MAG NAIL	421.98
2	MAG NAIL	422.87
3	REBAR & CAP	423.67
4	REBAR & CAP	424.68
5	REBAR & CAP	427.54



PLAN VIEW

SCALE: 1" = 200'

SHEET INDEX	
NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD PLAN
3	STORM DRAIN DRAINAGE AREA MAP AND PROFILE
4	STORMWATER MANAGEMENT DETAILS
5	GRADING, SEDIMENT AND EROSION CONTROL PLAN
6	SEDIMENT AND EROSION CONTROL DETAILS
7	STORMWATER MANAGEMENT NOTES
8	LANDSCAPE PLAN
9	FOREST CONSERVATION PLAN
10	FOREST CONSERVATION NOTES AND DETAILS

NO	DATE	REVISION

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT JK — DATE 1/23/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 1/21/04

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

~~NO AS-BUILT INFORMATION IS REQUIRED ON THIS SHEET~~

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

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
email: Benchmrk@cois.com

Donald Mason 12/23/03

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

PROJECT: **CASCADE OVERLOOK**
SECTION II
A SUBDIVISION OF PARCEL 259

LOCATION: TAX MAP 31, GRID 11, PARCEL 259
1st. ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

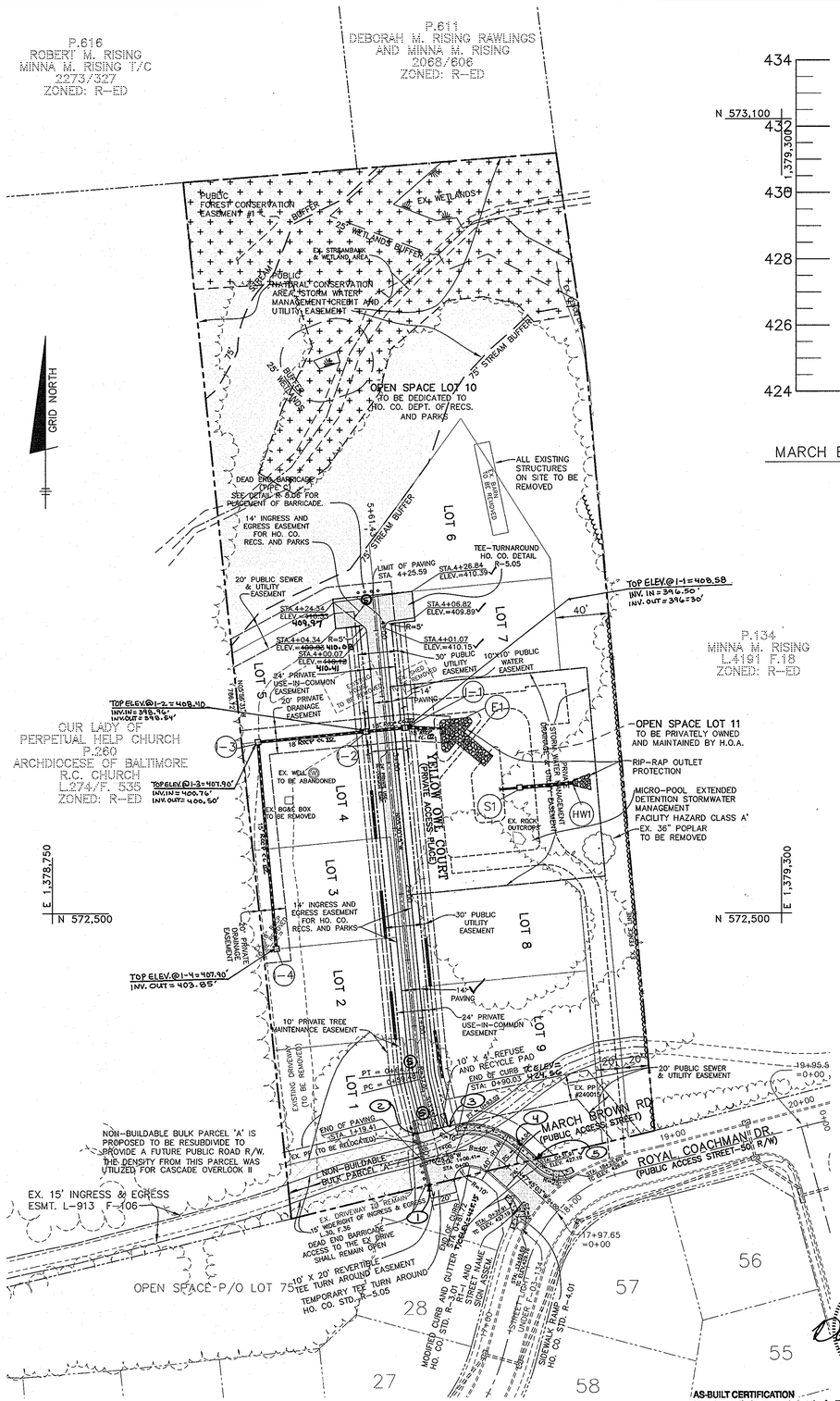
TITLE: *TITLE SHEET*

DATE: DECEMBER, 2003 PROJECT NO. 1480

DES: DAM DRN: RPS CHK: DAM SCALE: AS SHOWN DRAWING 1 OF 10

AS-BUILT

F-03-150



ROAD PLAN

HORIZ: 1"= 50'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/23/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/21/04

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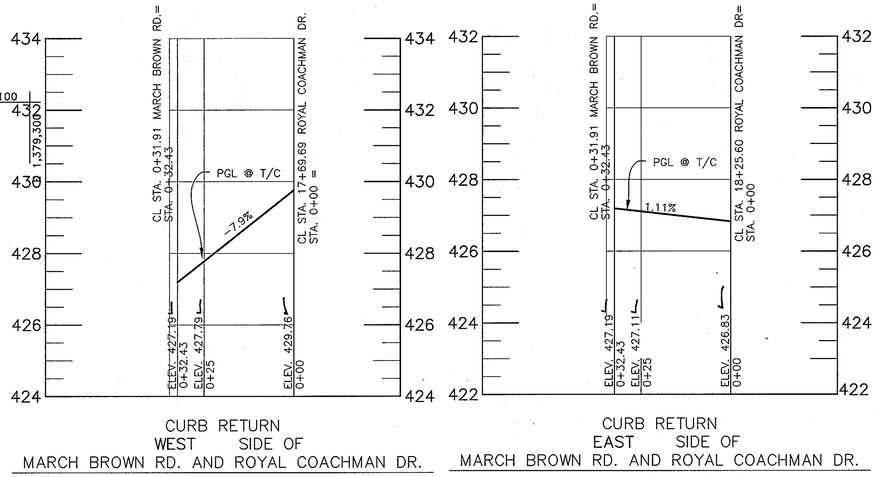
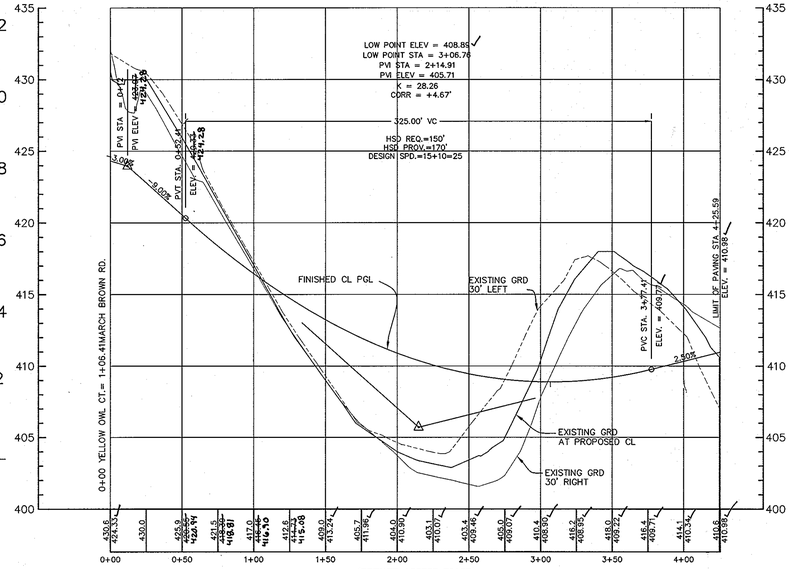
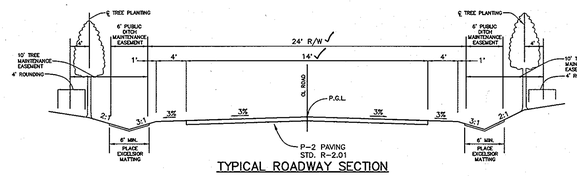




(PRIVATE ACCESS PLACE)

YELLOW OWL COURT

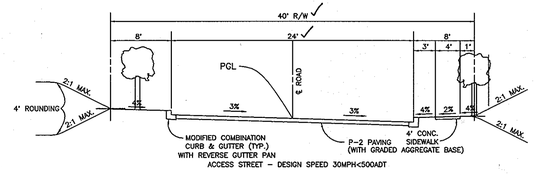
HORIZ.: 1" = 50'
VERT.: 1" = 5'



TYPICAL ROADWAY SECTION

YELLOW OWL COURT

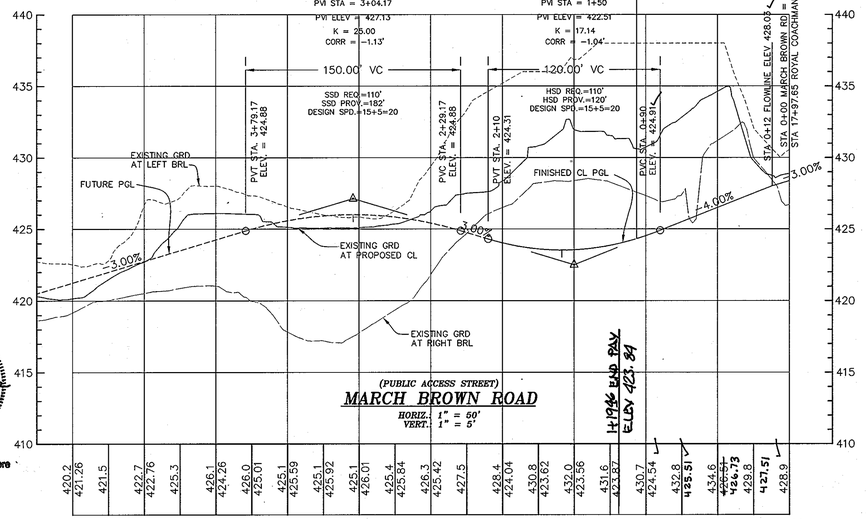
(PRIVATE ACCESS PLACE – 100 ADT)
DESIGN SPEED: 25 MPH
STA. 0+34.07 TO STA. 5+10.18 (T-TURN)
NOT TO SCALE



TYPICAL ROADWAY SECTION

MARCH BROWN ROAD

(PUBLIC ACCESS STREET – LESS THEN 500 ADT)
DESIGN SPEED: 15 MPH
STA. 0+32 TO STA. 0+81.72
NOT TO SCALE



(PUBLIC ACCESS STREET)

MARCH BROWN ROAD

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

CENTERLINE CURVE DATA						
ROAD	STATION	RADIUS	LENGTH	TANGENT	DELTA	CHORD
YELLOW OWL COURT	0+59.48 TO 0+64.71	37.00'	5.22'	2.62'	08°05'17"	N09°32'53"W 5.22'
MARCH BROWN RD	0+54.04 TO 0+93.02	40.00'	38.98'	21.20'	55°50'29"	N75°40'17"W 37.46'

NO	DATE	REVISION
1	5-25-04	REVISE HDPE TO RCCP CL IIC

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
email: Benchmrk@cois.com

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

Donald Mason 12/23/03

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

PROJECT: **CASCADE OVERLOOK**
SECTION II
A SUBDIVISION OF PARCEL 259

LOCATION: TAX MAP 31, GRID 11, PARCEL 259
1st. ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

TITLE: *ROAD PLAN*

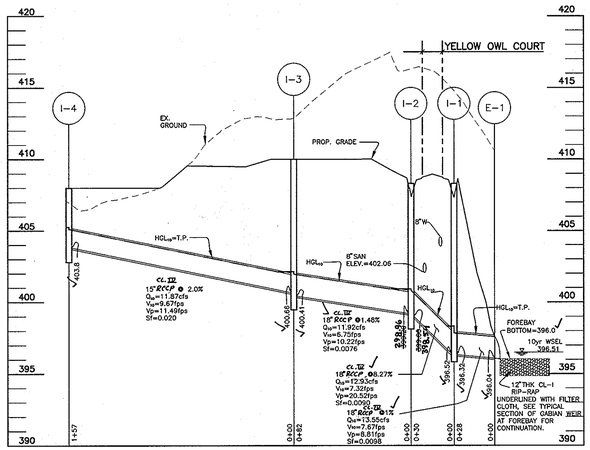
DATE: DECEMBER 22, 2003 — PROJECT NO. 1480

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 2 OF 10

AS-BUILT

F-03-150

\\bsalvol1\engineer\projects\1480 WOODS PROP\dwg\7017S01alt1.dwg, Road Plan and Profile, 12/23/2003 3:15:47 PM, Administrator



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

PIPE SCHEDULE		
SIZE	LENGTH	TYPE
18"	140'	RCCP CL IV
15"	157'	RCCP CL IV

STRUCTURE SCHEDULE

STORM INLETS

NO.	TYPE	LOCATION		INV. IN	INV. OUT	TOP ELEV.	HO. CO. STD.
I-1	D	N 572473.25	E 1378919.16	396.52✓	396.32✓	~~408.50~~ 408.30	SD - 4.11
I-2	D	N 572629.63	E 1378905.20	~~398.00~~ 398.20	~~398.00~~ 398.00	408.30✓	SD - 4.11
I-3	D	N 572637.46	E 1378986.45	400.66✓	400.41✓	410.00✓	SD - 4.11
I-4	D	N 572640.34	E 1379016.32	---	403.80✓	408.00✓	SD - 4.11
E-1	18"RCCP CL IV END SECTION	N 572639.15	E 1379044.56	396.04✓	396.0✓	---	SEE MFG. SPECS
S-1	RISER	N 572594.65	E 1379098.03	397.55✓	389.22✓	398.67✓	---
HW-1	42" HEADWALL	N 572598.64	E 1379143.16	389.00✓	389.00✓	---	SD - 5.11

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

PLAN
SCALE: 1" = 60'

LEGEND

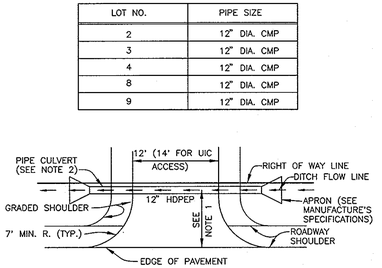
- SOILS CLASSIFICATION
- SOILS DELINEATION
- EXISTING CONTOURS 595 / 600
- PROPOSED CONTOURS 600
- LIMIT OF WETLANDS
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- DRAINAGE AREA
- NATURAL CONSERVATION CREDIT AREA

STORM DRAIN RUNOFF

STRUCTURE	DA (Ac.)	'C'	%IMP	ZONE
I-1	0.40	0.24	73	R-ED
I-2	0.62	0.28	70	R-ED
I-3	0.11	0.30	65	R-ED
I-4	6.20	0.29	18	R-ED
18" DIV. PIPE	6.20	0.29	18	R-ED

DRIVEWAY CULVERT SIZING

LOT NO.	PIPE SIZE
2	12" DIA. CMP
3	12" DIA. CMP
4	12" DIA. CMP
8	12" DIA. CMP
9	12" DIA. CMP



DRIVEWAY CULVERT
NOTES AND DETAIL
NOT TO SCALE

NOTES:

1. DRIVEWAY MUST BE PAVED FROM EDGE OF PUBLIC ROAD TO RIGHT-OF-WAY LINE USING STANDARD PAVING SECTION P-1 AS SHOWN ON ST'D NO. R-2.01 OR ALTERNATIVE SECTION EQUAL TO OR BETTER THAN P-1, AS APPROVED BY D.P.W.
2. DRAINAGE CULVERT SHALL BE SIZED FOR A 10 YEAR FREQUENCY STORM.
3. ALL DRIVEWAY CULVERT PIPES TO BE 12" HDPEP OR GREATER TO PREVENT BLOCKING. HDPE APRONS TO BE INSTALLED AT EACH END OF THE DRIVEWAY CULVERT AND SIZED PER MANUFACTURE'S SPECIFICATIONS. IF A LARGER PIPE IS REQUIRED, DITCH INVERT CAN BE LOWERED TO PROVIDE MIN. DITCH GRADIENT OF 0.5% AND CLEARANCE SHOWN.
4. SWALE FLOW MAY BE PROVIDED OVER DRIVEWAY IF LOCATED AT OR NEAR THE CREST OF A VERTICAL CURVE ON THE PUBLIC ROAD WHERE QUANTITY OF FLOW IS SMALL, AS APPROVED BY D.P.W.
5. TIE IN GRADE OF PRIVATE DRIVEWAY SHALL NOT EXCEED 14%.
6. SEE HOWARD COUNTY STANDARD DETAIL R-6.06 FOR ADDITIONAL INFORMATION.

NO.	DATE	REVISION
⚠	5-26-04	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
E-MAIL: benchmrk@cais.com

STATE OF MARYLAND DONALD ALAN MASON No. 21443 PROFESSIONAL ENGINEER
Donald Mason 12/9/03

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

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

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/23/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 1/21/04

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

PROJECT: CASCADE OVERLOOK
SECTION II
A SUBDIVISION OF PARCEL 259

LOCATION: TAX MAP 31- GRID 11, PARCEL 259
1st. ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

TITLE: *STORM DRAIN DRAINAGE AREA MAP AND PROFILE*

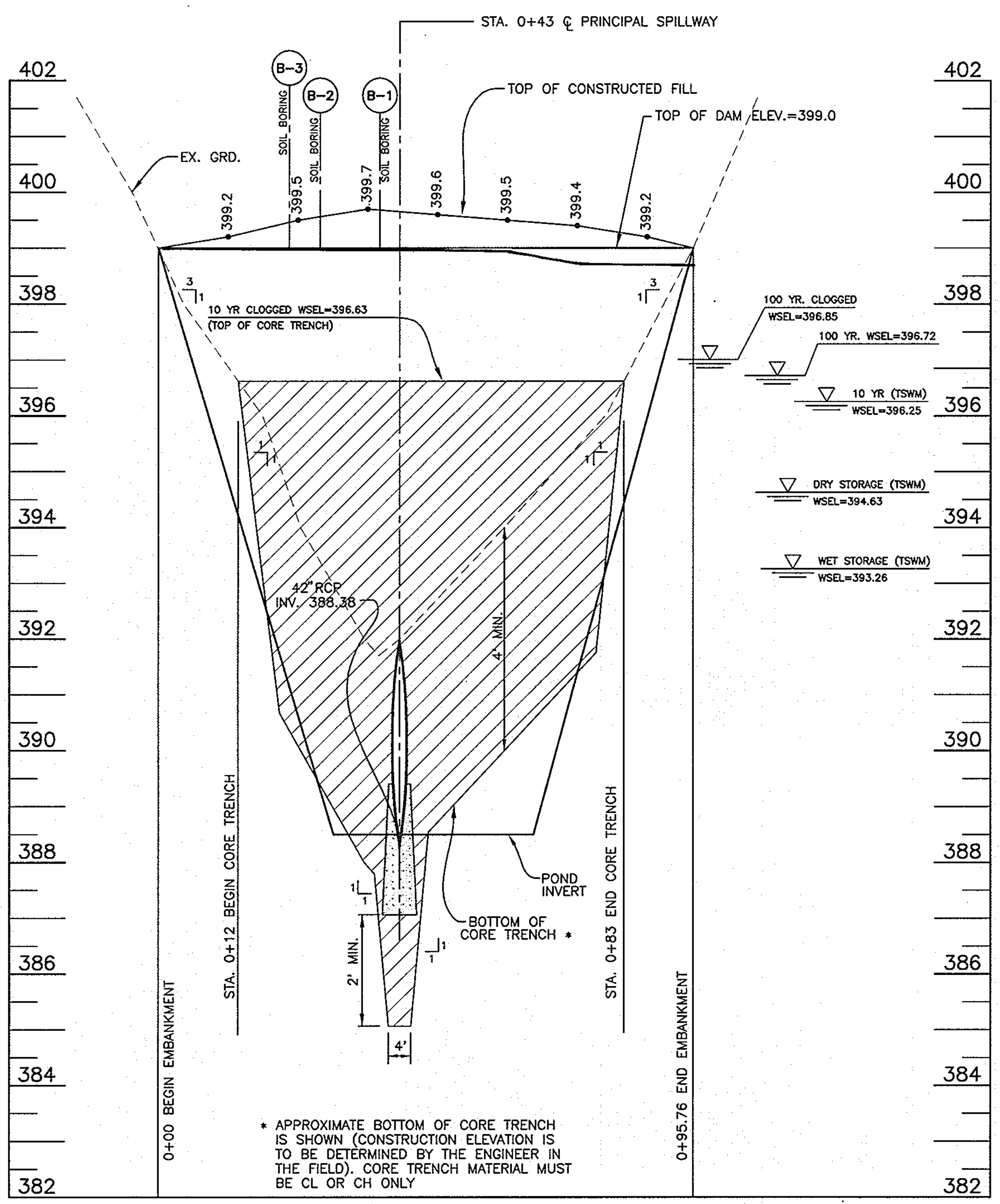
DATE: SEPTEMBER, 2003 PROJECT NO. 1480

Design: DAM Draft: RPS Check: DAM SCALE: AS SHOWN DRAWING 3 OF 10

AS-BUILT

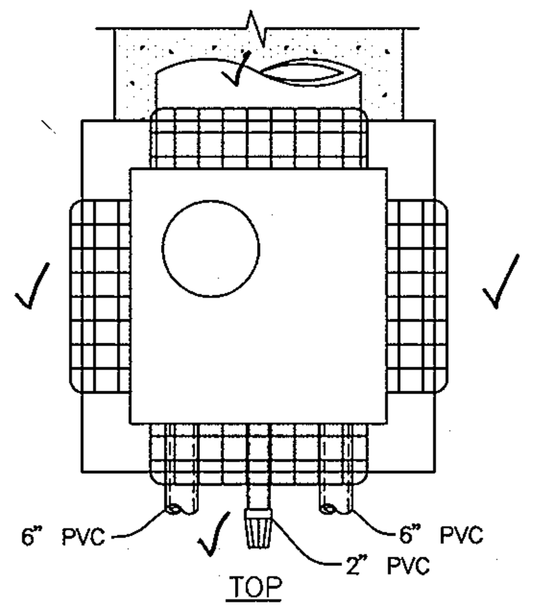
F-03-150

\\balvol1\engineer\projects\1480 WOODS PROP\dwg\7025S02ALT1.dwg, SWM PROFILE, 12/9/2003 11:50:14 AM, Administrator



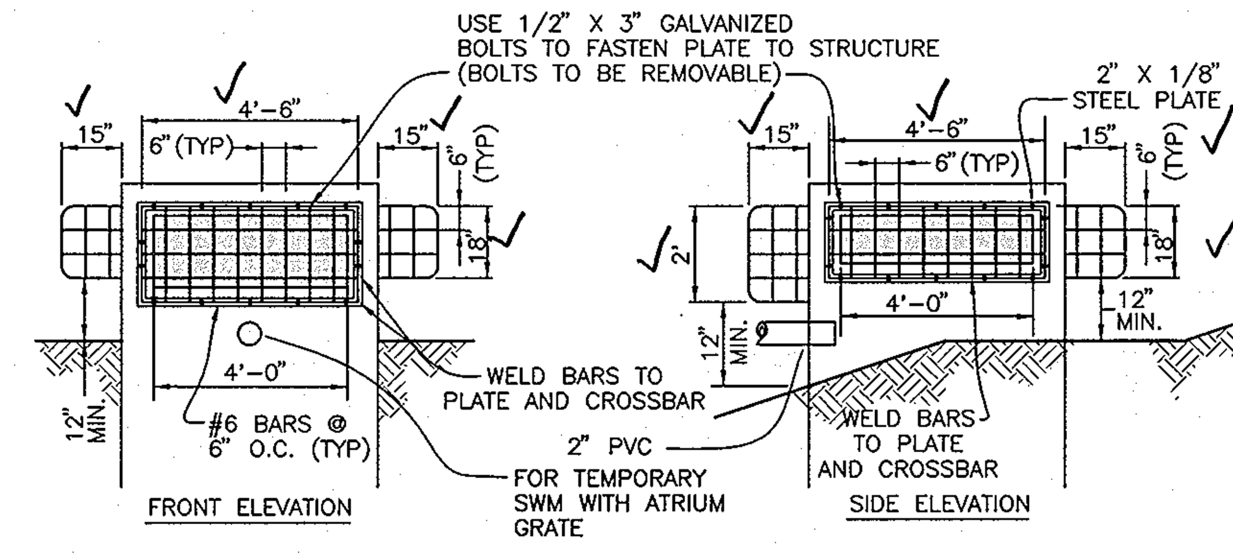
PROFILE ALONG CL OF EMBANKMENT

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



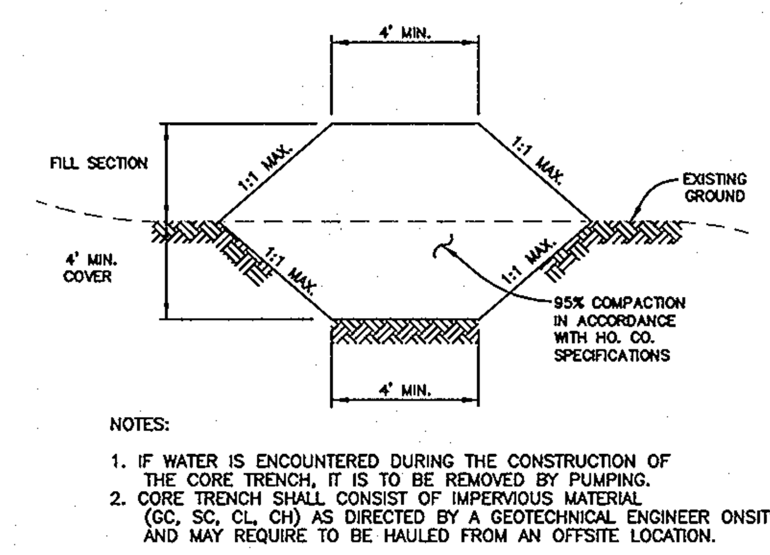
NOTES:

1. TRASH RACK SHALL BE GALVANIZED AFTER FABRICATION
2. TRASH RACK SHALL BE PAINTED BATTLESHIP GRAY.
3. SIDE ELEVATION TRASH RACK TO ALSO BE PLACED ON REAR OF RISER.



TRASH RACK DETAIL

SCALE: 1" = 4'

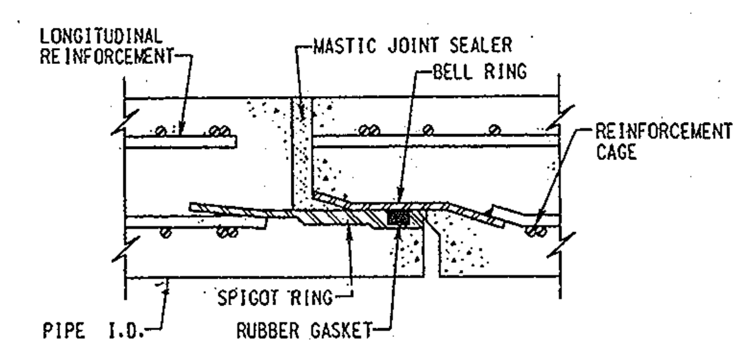


NOTES:

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.

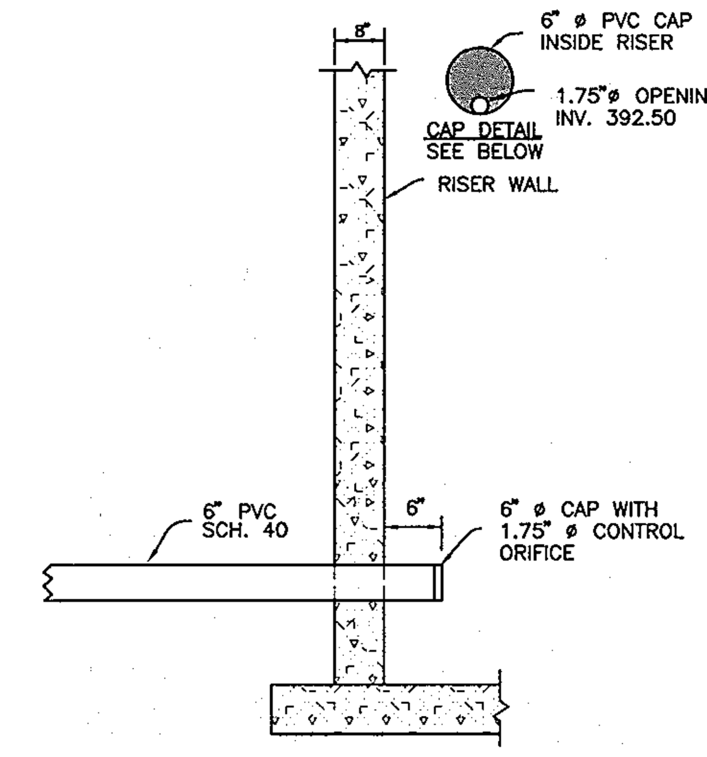
CORE TRENCH SECTION

NOT TO SCALE



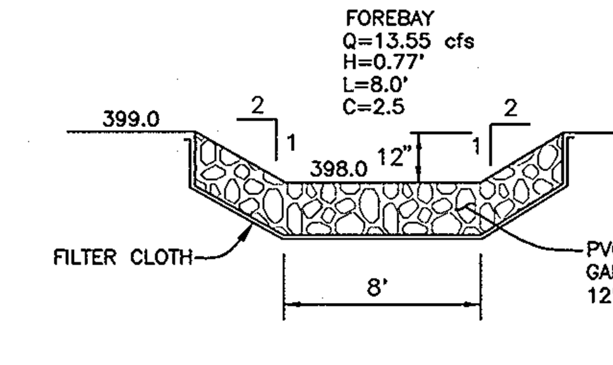
BARREL JOINT SEAL DETAIL

N.T.S.



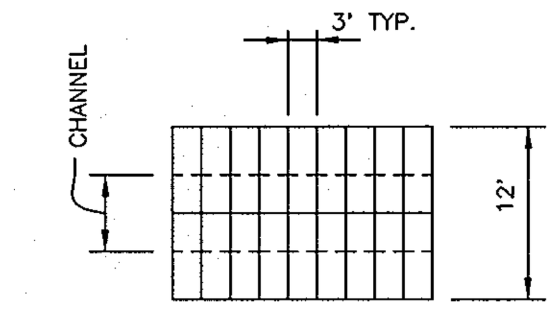
6" PIPE DETAIL AND PERMANENT EXTENDED DETENTION CONTROL ORIFICE

NOT TO SCALE



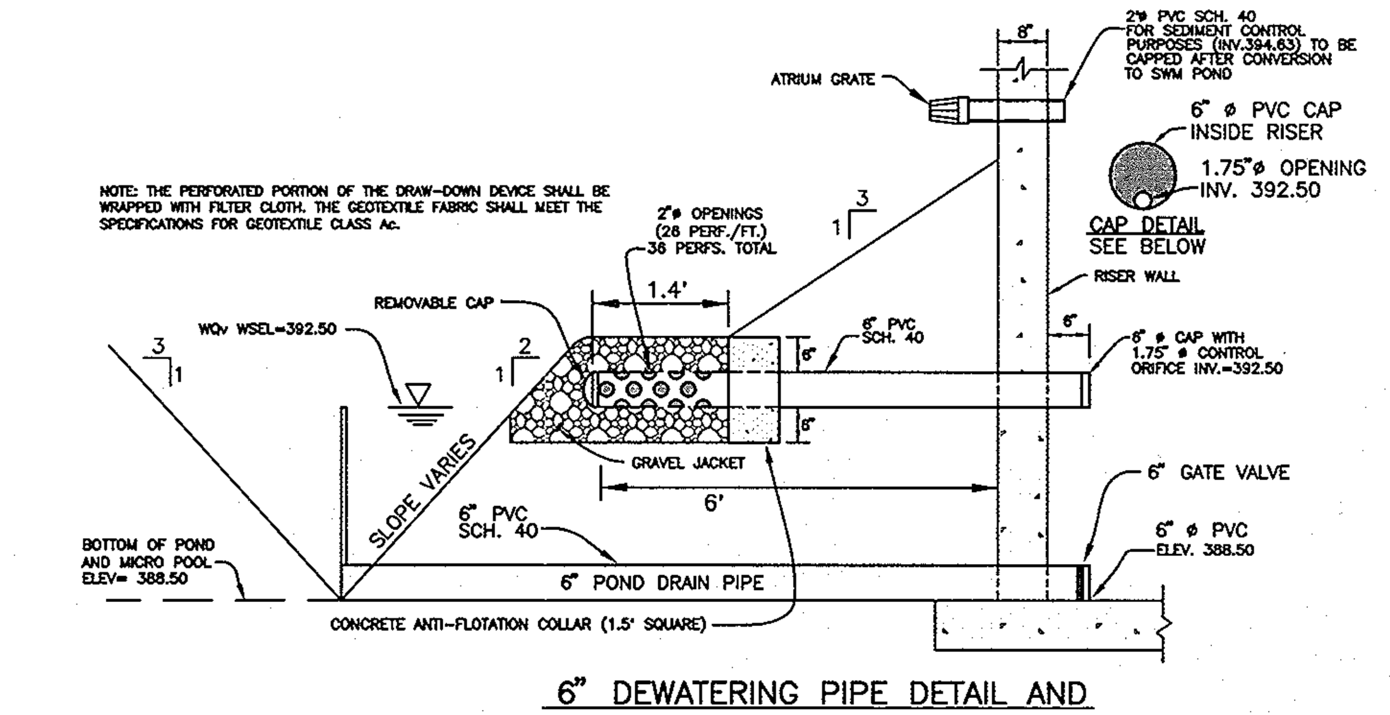
PROFILE THROUGH FOREBAY WEIR

NOT TO SCALE



GABION BASKET LAYOUT

NOT TO SCALE

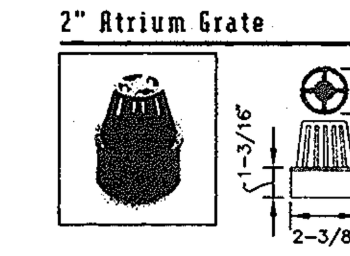


6" DEWATERING PIPE DETAIL AND PERMANENT EXTENDED DETENTION CONTROL ORIFICE

NOT TO SCALE

ATRIUM GRATES

2" Atrium Grate



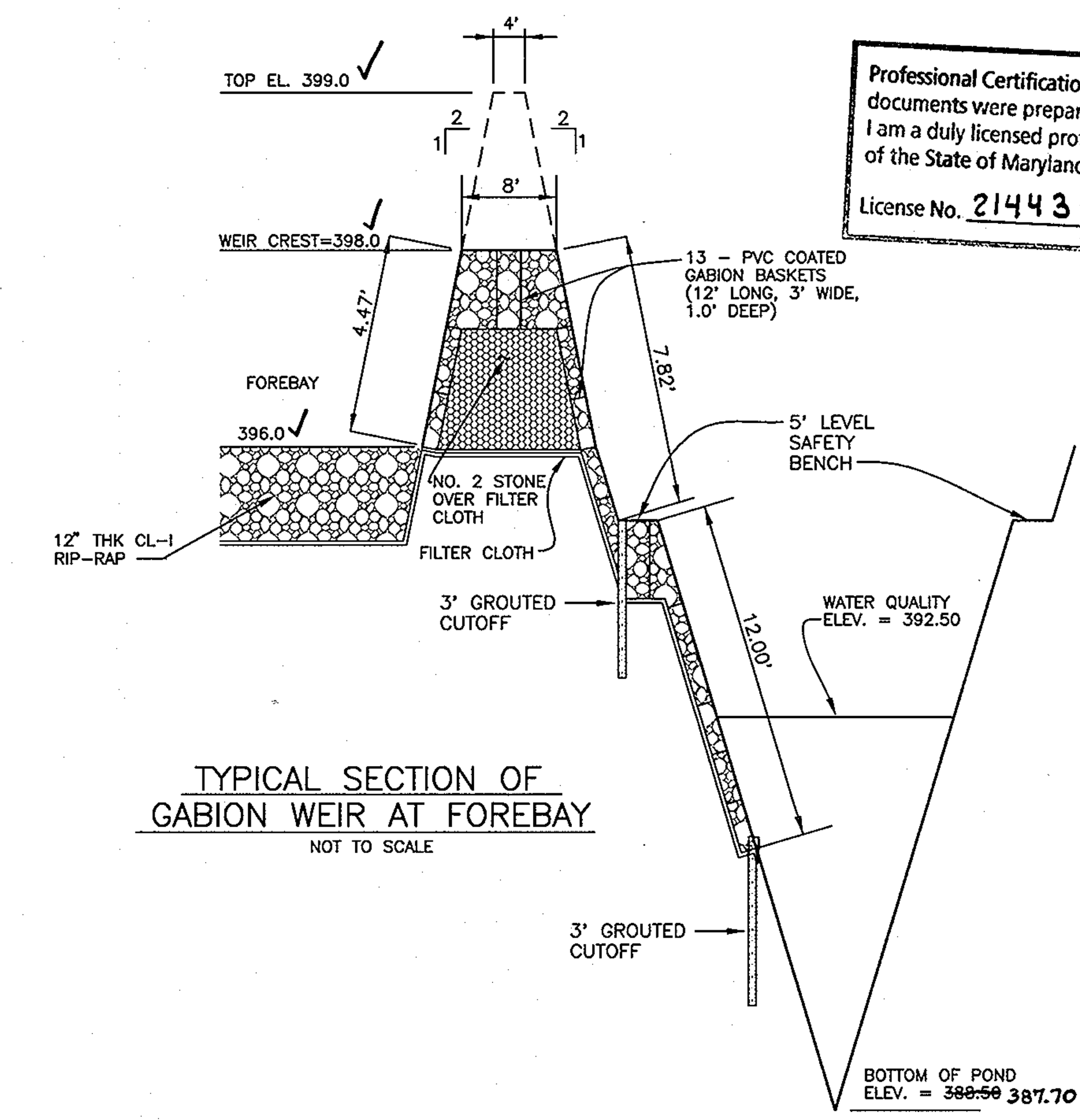
Description	Part No.	Pkg. Qty.	Color
2" Atrium Grate	270	20	Grey

Fits 2" Schedule 40 Fittings.

NDS, INC. 1-800-726-1994

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



TYPICAL SECTION OF GABION WEIR AT FOREBAY

NOT TO SCALE

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 A. MASON   PE NO. 21443   DATE 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."

CASCADE OVERLOOK LLC

By: [signature] MEMBER   12-9-03

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   12/9/03

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]   1/14/04

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]   1/14/04

HOWARD SOIL CONSERVATION DISTRICT   DATE

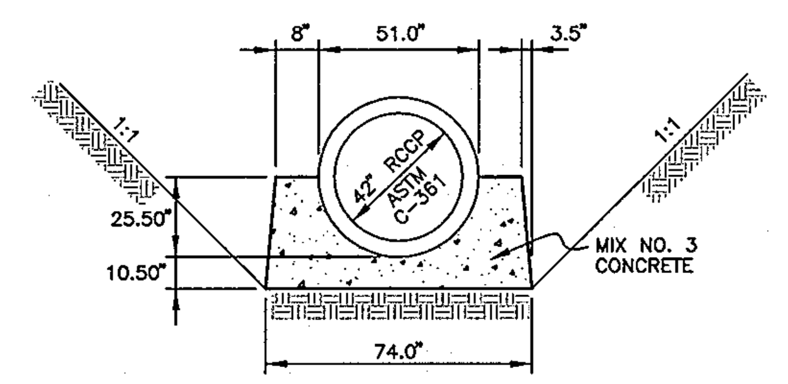
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature]   1/23/04

CHIEF, DIVISION OF LAND DEVELOPMENT JA   DATE

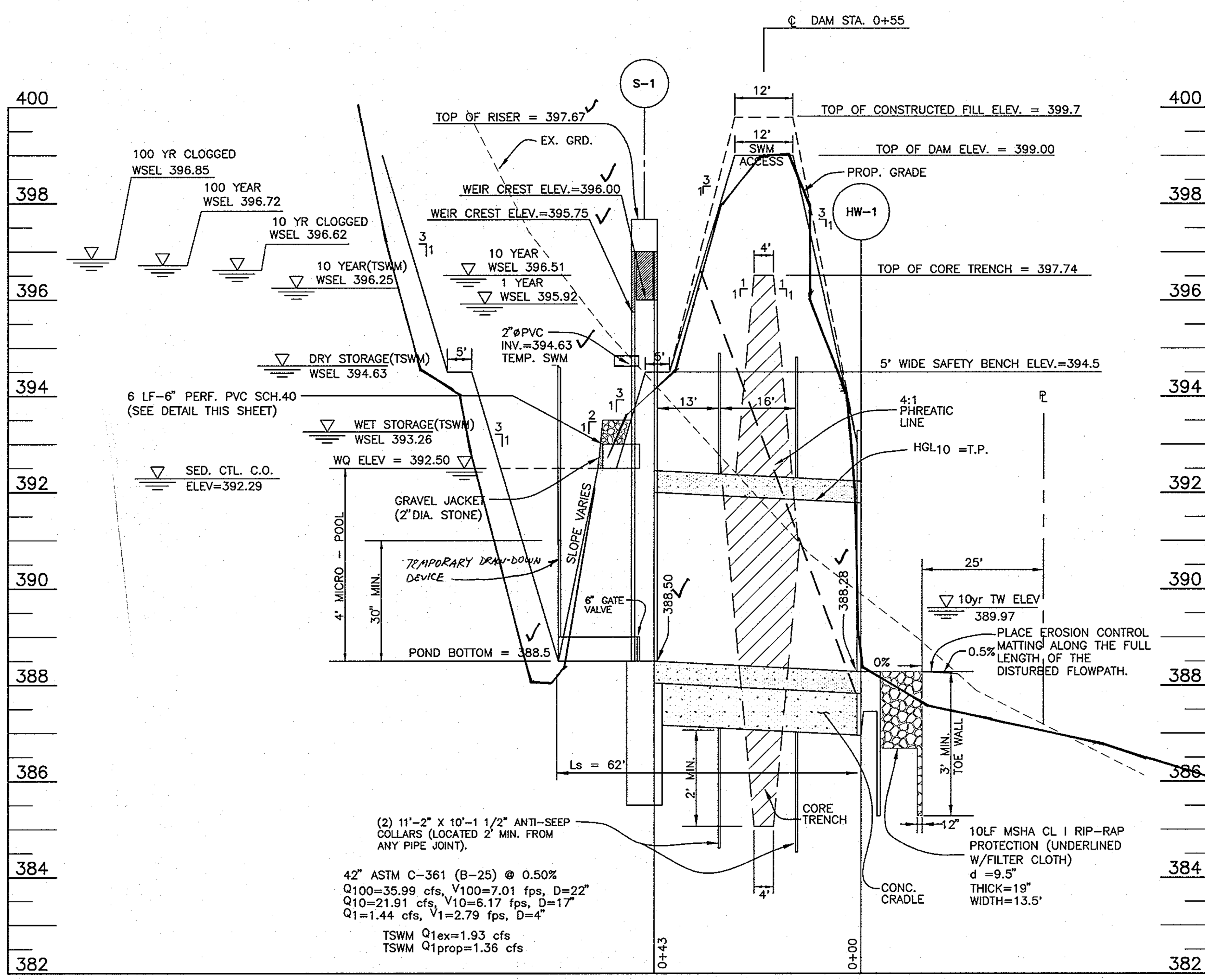
[signature]   1/26/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ   DATE



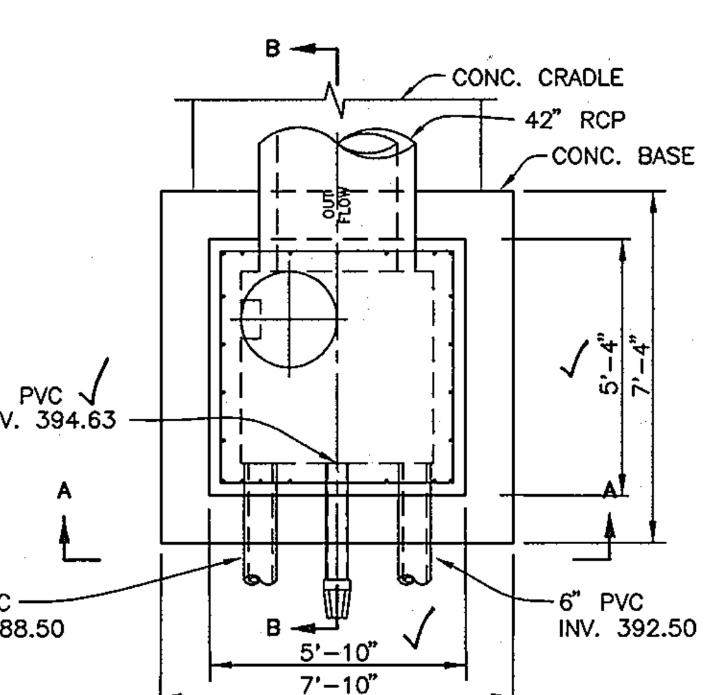
TYPE A-2 CONCRETE CRADLE

NOT TO SCALE

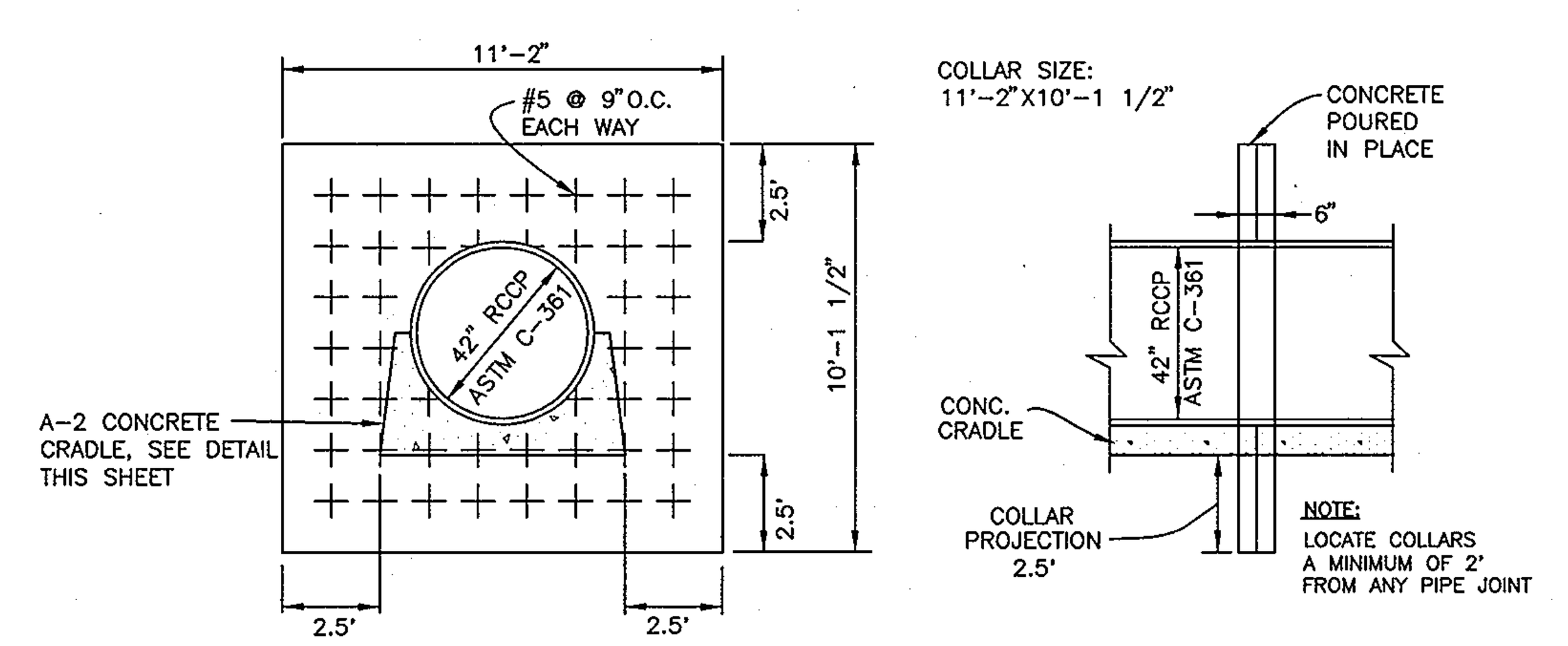


SECTION THRU PRINCIPAL SPILLWAY

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



PLAN



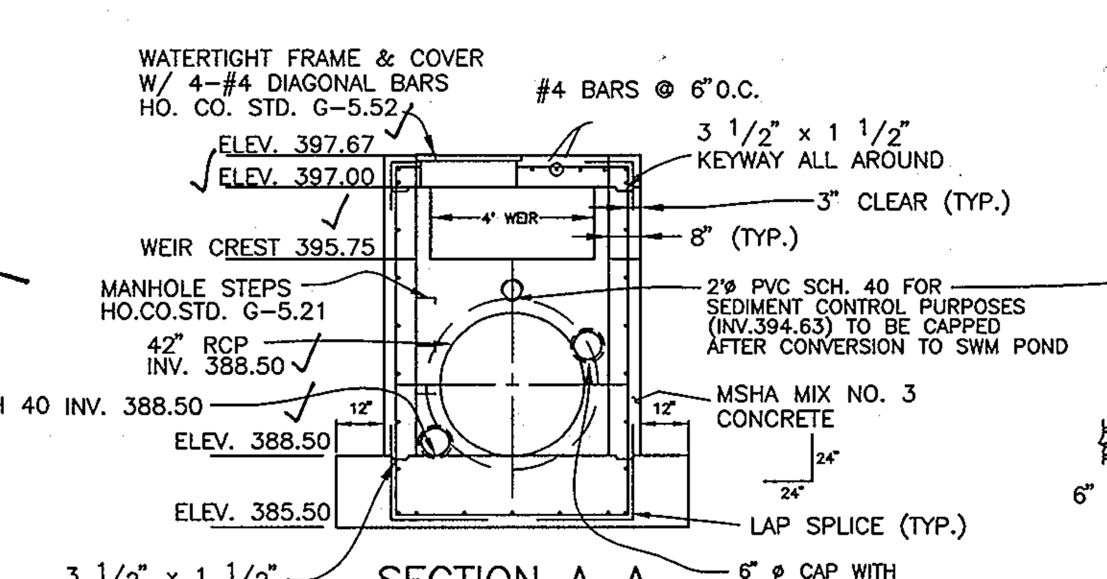
ANTI-SEEP COLLAR

NOT TO SCALE

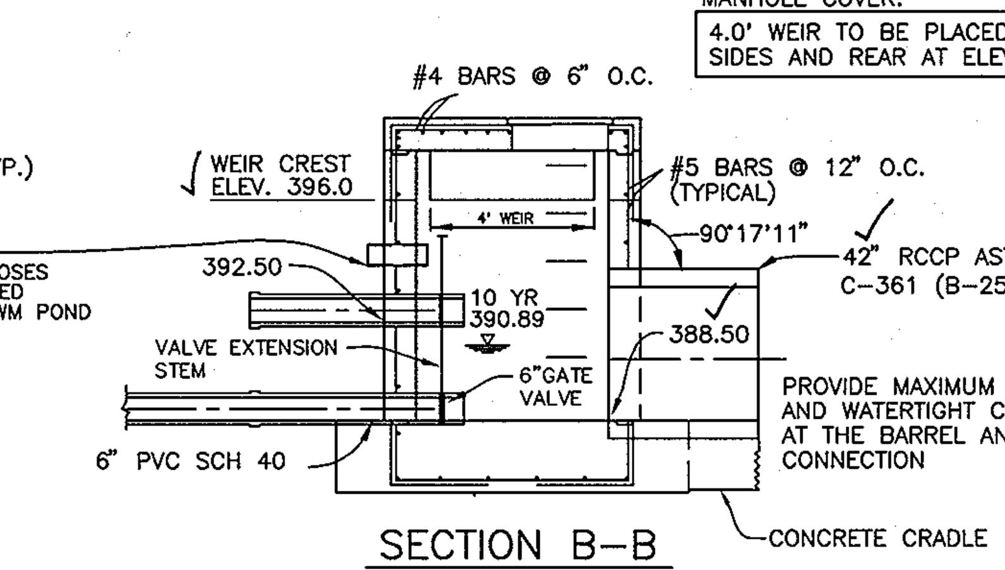
NOTE:

TOP MANHOLE STEP SHALL BE A MAXIMUM OF 2'-0" BELOW THE TOP OF THE MANHOLE COVER.

4.0' WEIR TO BE PLACED ON BOTH SIDES AND REAR AT ELEV. 396.00



SECTION A–A FRONT VIEW



SECTION B–B SIDE VIEW

CONTROL STRUCTURE

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

12/9/03

OWNER/DEVELOPER:

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

PROJECT: CASCADE OVERLOOK

LOCATION: SECTION II A SUBDIVISION OF PARCEL 259, HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT DETAILS

DATE: DECEMBER, 2003   PROJECT NO. 1480

DES: MLV	DRN: RPS	CHK: DAM	SCALE: AS SHOWN	DRAWING 4 OF 10

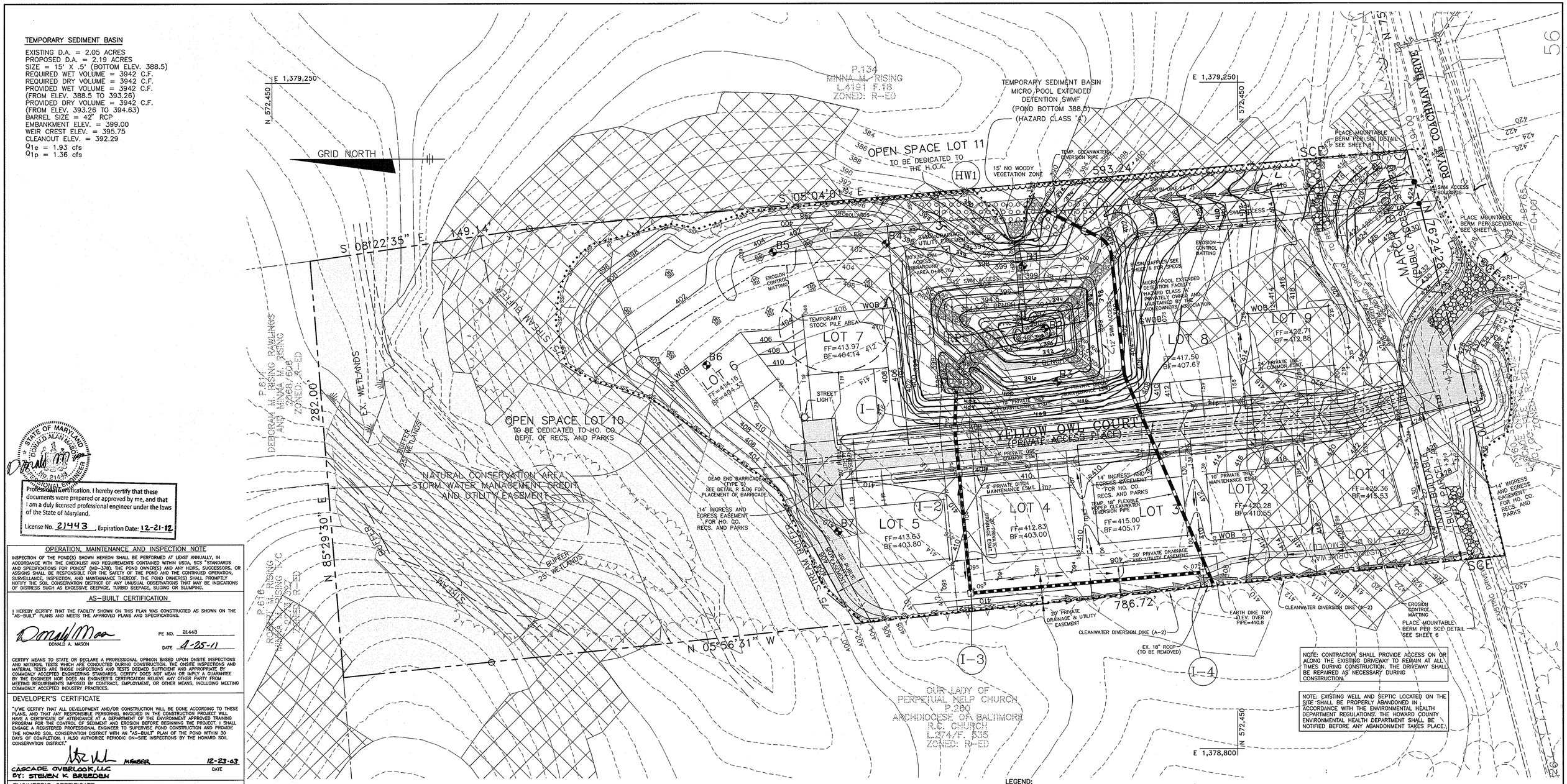
AS-BUILT

F-03-150

\\saivol1\engineer\projects\1480 WOODS PROP\dwg\7024S1.dwg, SWM Detail, 12/9/2003 11:47:10 AM, Administrator

TEMPORARY SEDIMENT BASIN

EXISTING D.A. = 2.05 ACRES
PROPOSED D.A. = 2.19 ACRES
SIZE = 15' X 5' (BOTTOM ELEV. 388.5)
REQUIRED WET VOLUME = 3942 C.F.
REQUIRED DRY VOLUME = 3942 C.F.
PROVIDED WET VOLUME = 3942 C.F.
(FROM ELEV. 388.5 TO 393.26)
PROVIDED DRY VOLUME = 3942 C.F.
(FROM ELEV. 393.26 TO 394.63)
BARREL SIZE = 42" RCP
EMBANKMENT ELEV. = 399.00
WEIR CREST ELEV. = 395.75
CLEANOUT ELEV. = 392.29
Q_{1e} = 1.93 cfs
Q_{1p} = 1.36 cfs



PLAN VIEW
SCALE: 1" = 30'

LEGEND:

EXISTING CONTOUR	430 / 428	SOIL BORING	B5
PROPOSED CONTOUR	440	PROPOSED ROAD SIGN	
LIMIT OF DRAINAGE AREA		PROPOSED STREET LIGHT	
EARTH DIKE		PROPOSED STORM DRAIN	
EXISTING WETLANDS		RIPRAP PROTECTION	
EXISTING TREELINE		15' NO WOODY VEGETATION ZONE	
PROPOSED TREELINE		AREA OF 15% TO 24.99% SLOPES	
LIMIT OF DISTURBANCE *		AREA OF 25% OR GREATER SLOPES	
TREE PROTECTION FENCE	TF	NATURAL CONSERVATION AREA STORM WATER MANAGEMENT CREDIT AND UTILITY EASEMENT	
DRAINAGE FLOW ARROW		TEMP. CLEANWATER DIVERSION PIPE	
SILT FENCE	SF	REMOVABLE PUMP STATION	RPS
SUPER SILT FENCE	SSF		
HOUSE BOX (NTS)			
SOIL STABILIZATION MATTING			

* NOTE: AREAS OF DISTURBANCE THAT ARE NOT TREATED BY SEDIMENT CONTROL ARE TO RECEIVE IMMEDIATE STABLIZATION WITH SOD OR ECM/SEED BY THE END OF EVERY DAY.

STORMWATER MANAGEMENT SUMMARY TABLE (D.A. 1A)

STORM FREQUENCY (yr)	EXISTING RUNOFF (cfs)	SWMF INFLOW (cfs)	SWMF DISCHARGE (cfs)	WSEL (feet)	STORAGE (ac-ft)
1	4.75	6.61	3.77	396.92	0.2994
10	20.65	23.29	21.89	397.65	0.3613
100	36.29	38.80	38.02	397.92	0.3842

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

OPERATION, MAINTENANCE AND INSPECTION NOTE

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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.

DEVELOPER'S CERTIFICATE

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MEMBER — 12-23-03 DATE

CASCADE OVERLOOK, LLC
BY: STEVEN K BREEDEN

ENGINEER'S CERTIFICATE

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

12-23-03 DATE

ENGINEER – DONALD A. MASON, P.E. # 21443

APPROVED:

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 — 1/12/04 DATE

APPROVED:

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

HOWARD SOIL CONSERVATION DISTRICT — 1/12/04 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT JA — 1/29/04 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — 1/21/04 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
email: Benchmrk@cols.com

STATE OF MARYLAND — DONALD ALAN MASON — No. 21443 — PROFESSIONAL ENGINEER — 12/23/03

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

PROJECT: **CASCADE OVERLOOK**
SECTION II
A SUBDIVISION OF PARCEL 259

LOCATION: TAX MAP 31, GRID 11, PARCEL 259
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: **GRADING, SEDIMENT AND EROSION CONTROL PLAN**

DATE: DECEMBER, 2003 PROJECT NO. 1480

DES: DAM/MLV | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 5 OF 10

AS-BUILT

F-03-150

\\Bsahost1\engineer\projects\1480 WOODS PROP\dwg\7026s03ALT1.dwg, GRADING, 12/23/2003 3:46:30 PM, Administrator

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.

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.

BY THE DEVELOPER:

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CASCADE OVERLOOK LLC

By: [signature] 12-9-03

DEVELOPER STEVEN K BREEDEN DATE

BY THE ENGINEER:

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[signature: Donald Mason] 12/9/03

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] 1/14/04

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] 1/14/04

HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 1/28/04

CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[signature] 1/21/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ DATE

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	5.00	ACRES
AREA DISTURBED	3.60	ACRES
IMPERVIOUS AREA	1.50	ACRES
AREA TO BE VEGETATIVELY STABILIZED	2.10	ACRES
TOTAL CUT	10716	CY
TOTAL FILL	5793	CY
OFFSITE WASTE/BORROW AREA LOCATION	4923	CY

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.

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.

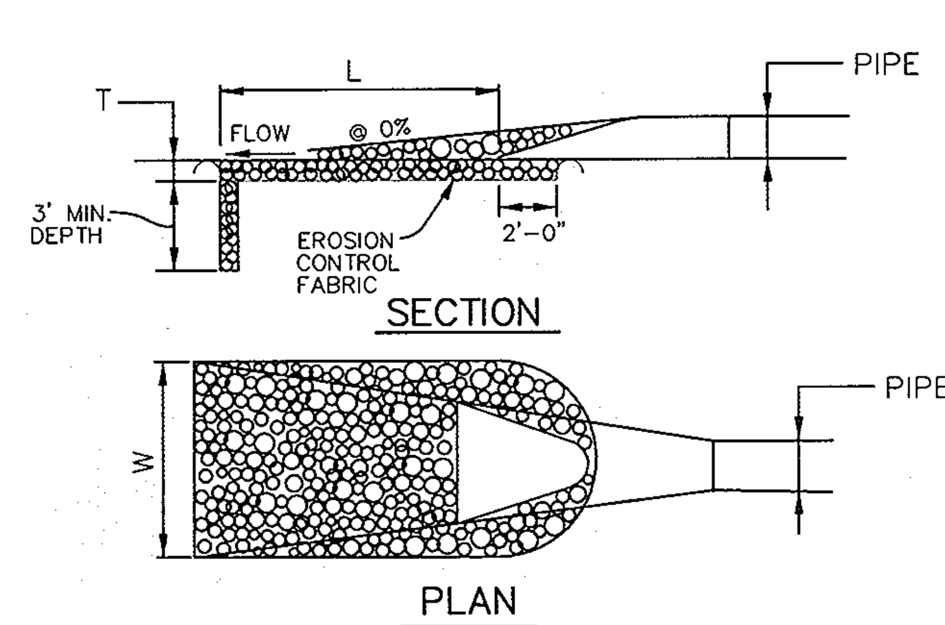
MULCHING: APPLY 1–1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPES 8 FEET OR HIGHER, 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.
DAY 2–7	INSTALL STABILIZED CONSTRUCTION ENTRANCES, SILT FENCES, SUPER SILT FENCE, TEMPORARY DIVERSION PIPE AND TEMPORARY CLEANWATER DIVERSION DIKES.
DAY 8–40	WITH PERMISSION OF HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, INSTALL SEDIMENT BASIN.
DAY 41–50	INSTALL ANY REMAINING SEDIMENT CONTROL DEVICES.
DAY 51–58	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, BRING ROAD BEDS TO SUBGRADE AND THEN MASS GRADE LOTS AND STABILIZE IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES.
DAY 59–122	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, INSTALL STORM DRAINS, WATER, SEWER AND UTILITY LINES.
DAY 123–145	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, INSTALL CURB AND GUTTER AND COMPLETE GRADING OF SITE. STABILIZE IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES.
DAY 146–153	INSTALL PAVING.
DAY 154–161	UPON APPROVAL OF THE HOWARD COUNTY SEDMENT CONTROL INSPECTOR, REMOVE SEDIMENT BASIN AND REMAINING SEDIMENT CONTROL DEVICES AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES.
DAY 162–180	UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, CONVERT SEDIMENT BASIN TO STORMWATER MANAGEMENT FACILITY. SHAPE FACILITIY PER FINAL GRADES SHOWN ON THE PLANS AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. REMOVE THE TEMPORARY CLEANWATER DIVERSION PIPE. DEVELOPER MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" OF THE POND WITHIN 30 DAYS OF COMPLETION.



STRUCTURE	D–50	LENGTH (L)	WIDTH (W)	THICKNESS (T)	SHA CLASS
HW–1	9.5"	10'	13.5'	19"	I
DIVERSION PIPE	9.5"	10'	10'	19"	I

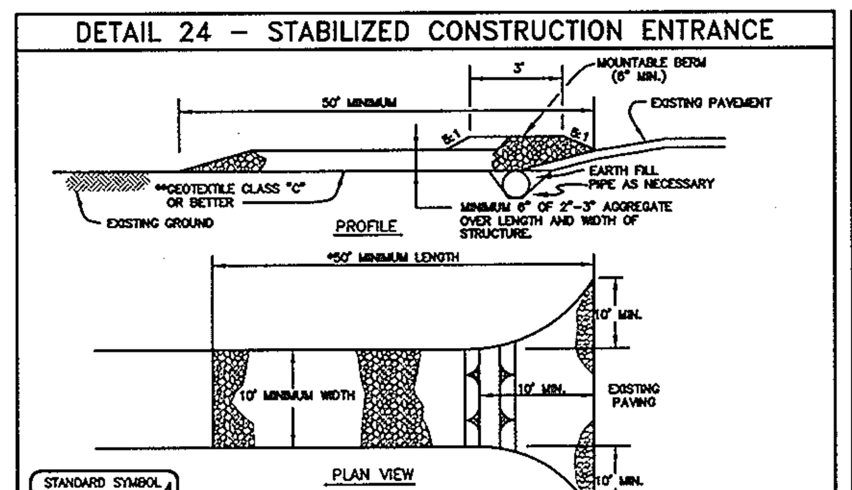
OUTLET PROTECTION DETAIL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. THE SUBGRADE FOR THE FILTER, RIP–RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADE. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP–RAP OR FILTER.
3. GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
4. STONE FOR THE RIP–RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR RIP–RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP–RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORK.
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 OCUR.

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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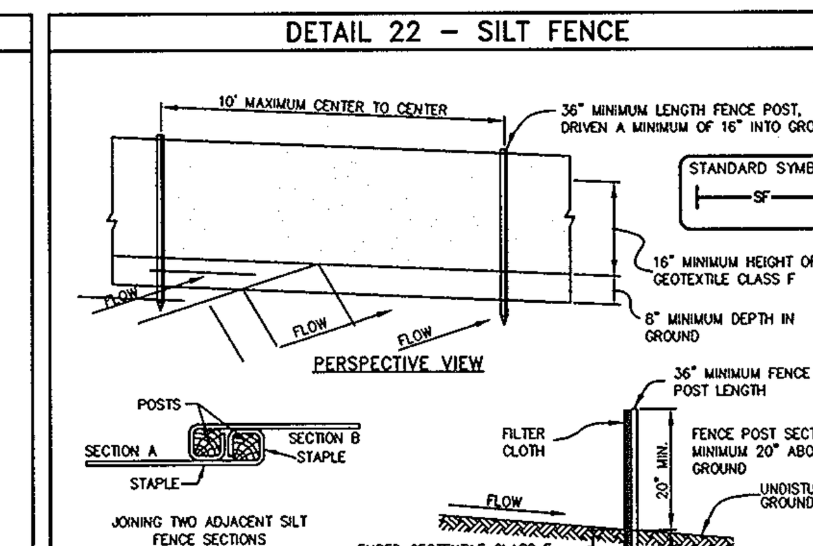
DETAIL 22 – SILT FENCE



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 11/2" x 11/2" square (minimum) cut, or 13/4" 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.

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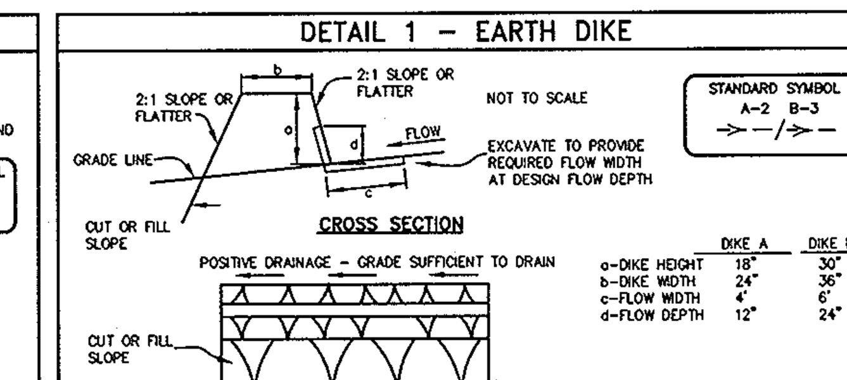
DETAIL 1 – EARTH DIKE



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, stabilized area at a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

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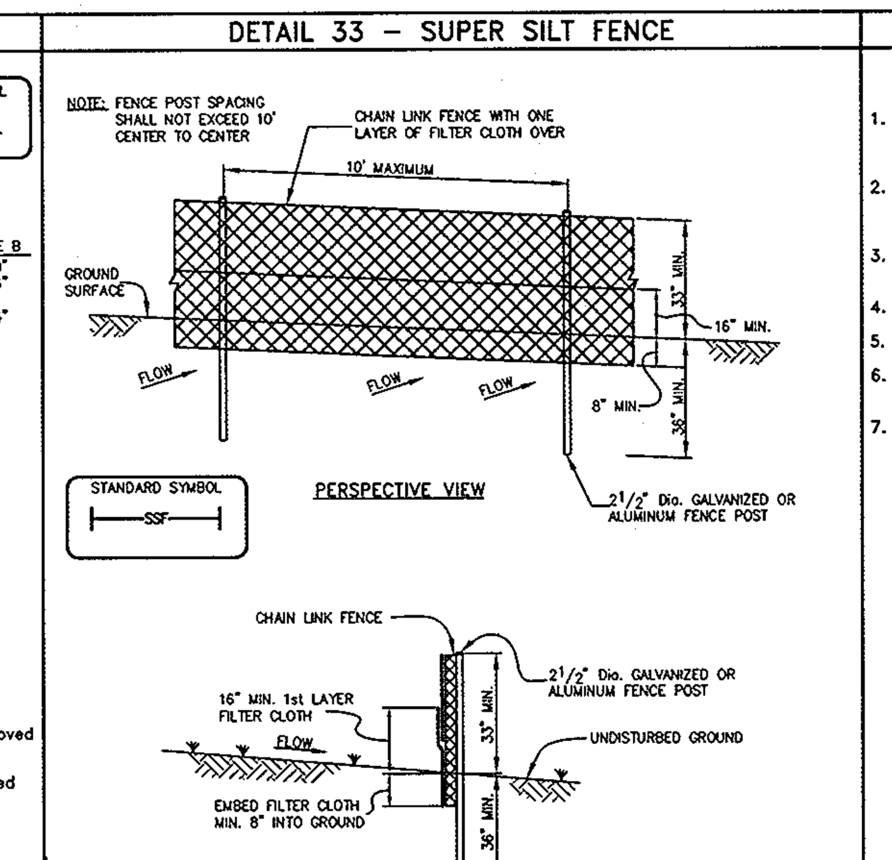
DETAIL 33 – SUPER SILT FENCE



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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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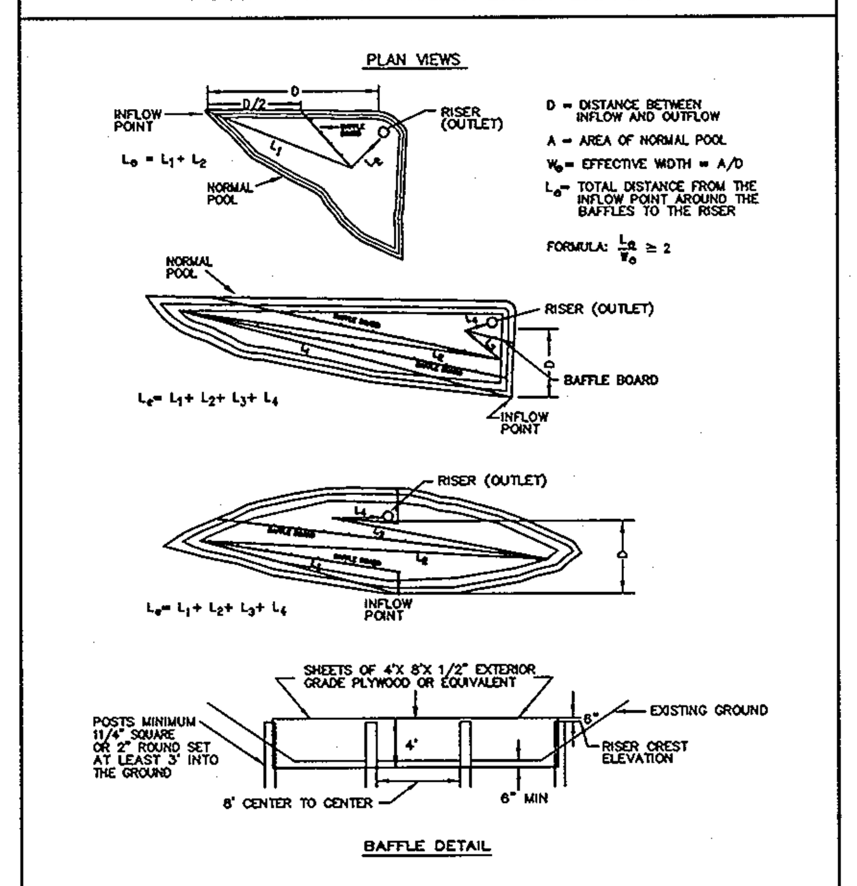
DETAIL 18 – SEDIMENT BASIN BAFFLES



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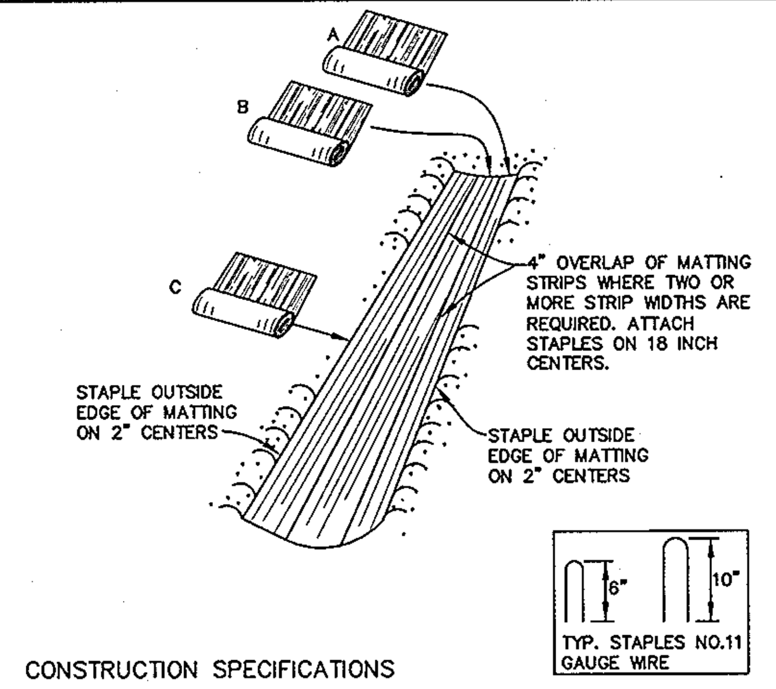


CONSTRUCTION SPECIFICATIONS

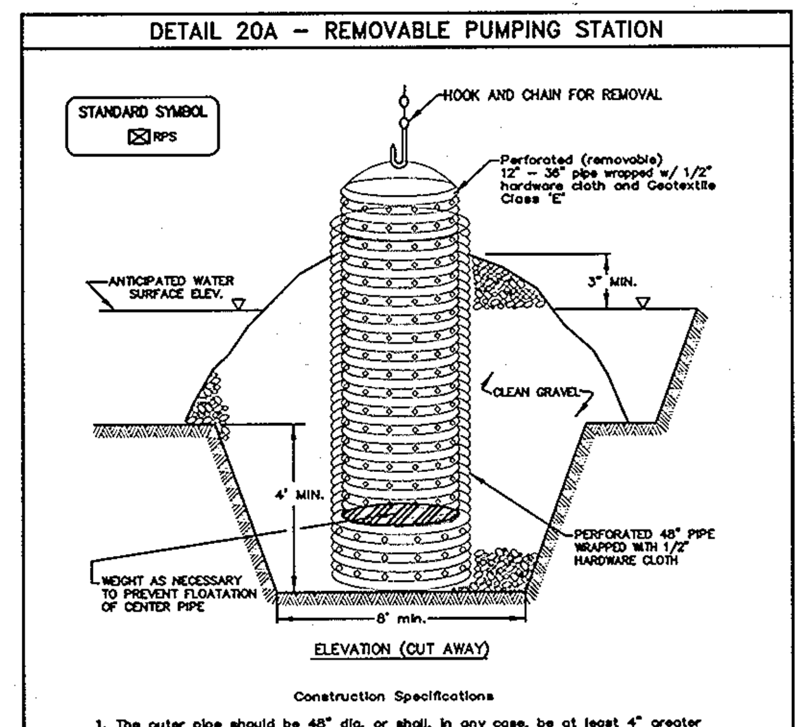
1. KEY-IN THE MATTING BY PLACING THE TOP ENDS OF THE MATTING IN A NARROW TRENCH, 6" IN DEPTH. BACKFILL THE TRENCH AND TAMP FIRMLY TO CONFORM TO THE CHANNEL CROSS-SECTION. SECURE WITH A ROW OF STAPLES ABOUT 4" DOWN SLOPE FROM THE TRENCH. SPACING BETWEEN STAPLES IS 6".
2. STAPLE THE 4" OVERLAP IN THE CHANNEL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

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

SOIL STABILIZATION MATTING

NOT TO SCALE

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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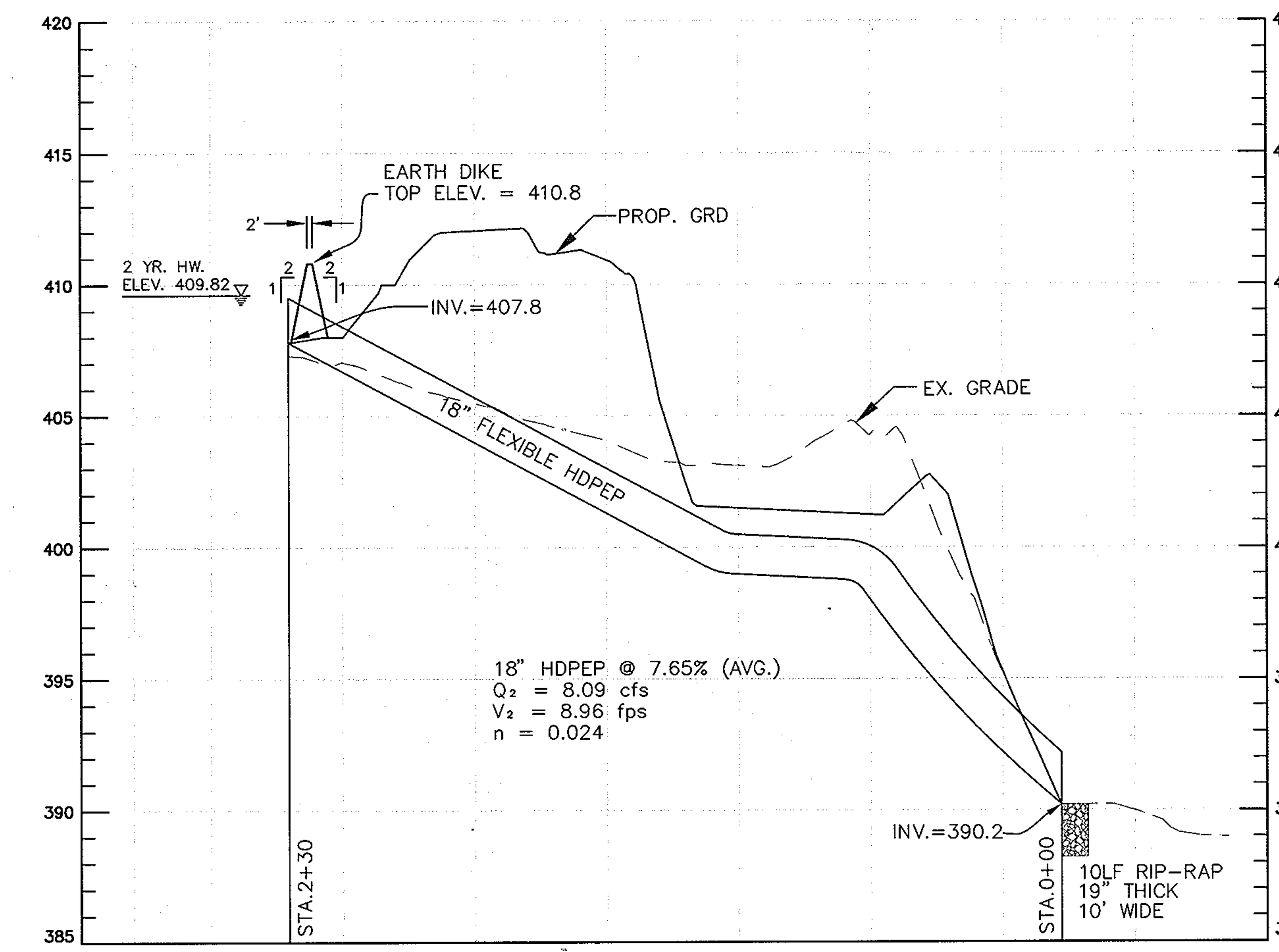
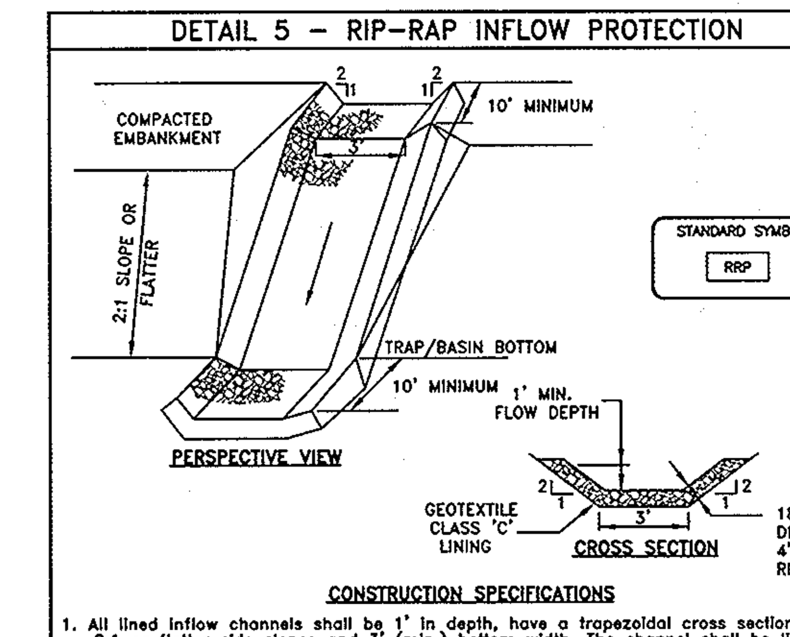


DIVERSION PIPE PROFILE

SCALE: HORIZONTAL: 1"=50'
VERTICAL: 1"=5'

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.

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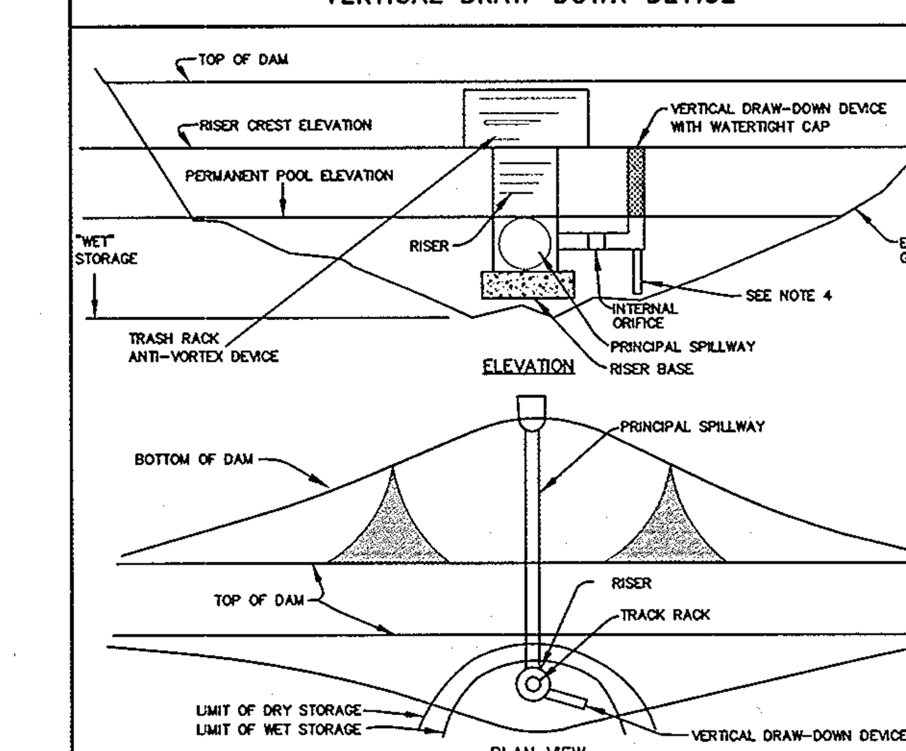
BASIN DRAWDOWN SCHEMATIC
VERTICAL DRAW–DOWN DEVICE



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 4 – PIPE SLOPE DRAIN

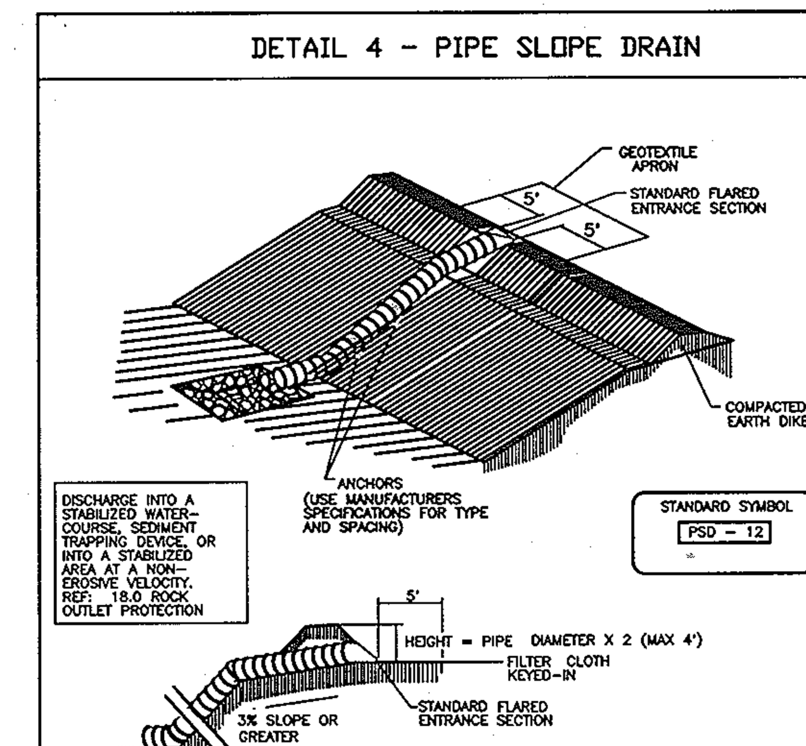

Table 6 Design Criteria for Pipe Slope Drain

Size	Pipe/Tubing Diameter (D) In	Maximum Drainage Area (Acres)
PSD–12	12	0.5
PSD–18	18	1.5
PSD–21	21	2.5
PSD–24	24	3.5
PSD–24 (2)	24	5.0

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PIPE SLOPE DRAIN

Construction Specifications – Pipe Slope Drain

1. The Pipe Slope Drain (PSD) shall have a slope of 3 percent or steeper.
2. The top of the earth dike over the inlet pipe shall be at least 2 times the pipe diameter measured at the invert of the pipe.
3. Flexible tubing is preferred. However, corrugated metal pipe or equivalent PVC pipe can be used. All connections shall be watertight. pipe.
4. A flared end section shall be attached to the inlet end of pipe with a watertight connection. Filter cloth shall be placed under the inlet of the pipe slope drain and shall extend out 5' from the inlet. The filter cloth shall be "keyed in" on all sides. pipe.
5. The Pipe Slope Drain shall be securely anchored to the slope by staking at the grommets provided. Spacing for anchors shall be as provided by manufacturer's specification. In no case shall less than two (2) anchors be provided, equally spaced along the length of pipe. These details should be provided by pipe suppliers. pipe.
6. The soil around and under the pipe and end section shall be hand tamped in 4 inch lifts to the top of the earth dike.
7. All pipe connections shall be watertight.
8. Whenever possible where a PSD drains an unstabilized area, it shall outlet into a sediment trap or basin. If this is not possible then the slope drain will discharge into a stable conveyance that leads to a sediment trap or basin. When discharging into a trap or basin the PSD shall discharge at the same elevation as the wet pool elevation. The discharge from the PSD must be as far away from the sediment control outlet as possible.
9. When the drainage area is stabilized, the PSD shall discharge onto a stabilized area at a non-erosive velocity.
10. Inspection and any required maintenance shall be performed periodically and after each rain event.
11. The inlet must be kept open at all times.

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[Seal: STATE OF MARYLAND, DONALD ALAN MASON, No. 21443, PROFESSIONAL ENGINEER] 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

[signature: Donald Mason] 12/9/03

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

PROJECT: **CASCADE OVERLOOK**
SECTION II
A SUBDIVISION OF PARCEL 259

LOCATION: TAX MAP 31, GRID 11, PARCEL 259
1st. ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

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

DATE: SEPTEMBER, 2003 | PROJECT NO. 1480

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 6 OF 10

AS-BUILT

F–03–150

P:\PROJECTS\1480 WOODS PROP\dwg\7023S14.dwg, SED. CONTROL DETAILS, 12/9/2003 1:33:11 PM, Administrator

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 shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

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

3. Connections – All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti–seep collars shall be connected to the pipe in such a manner as to be completely watertight. 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.

BORING	DEPTH OF TEST (ft)	MEASURED IN–SITU RATE (in/hr)
B–2	2	0.000
B–3	2	0.000
B–4	6.5	3.875
B–5	6.5	0.188
B–6	6.5	0.438
B–7	6.5	0.000

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.

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] 12-9-03
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."

[signature] 12/9/03
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] 1/14/04
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] 1/14/04
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 1/23/04
CHIEF, DIVISION OF LAND DEVELOPMENT JA DATE

[signature] 1/21/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ 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

[seal and signature] 12/9/03

[seal: 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

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

PROJECT: **CASCADE OVERLOOK**
SECTION II
A SUBDIVISION OF PARCEL 259

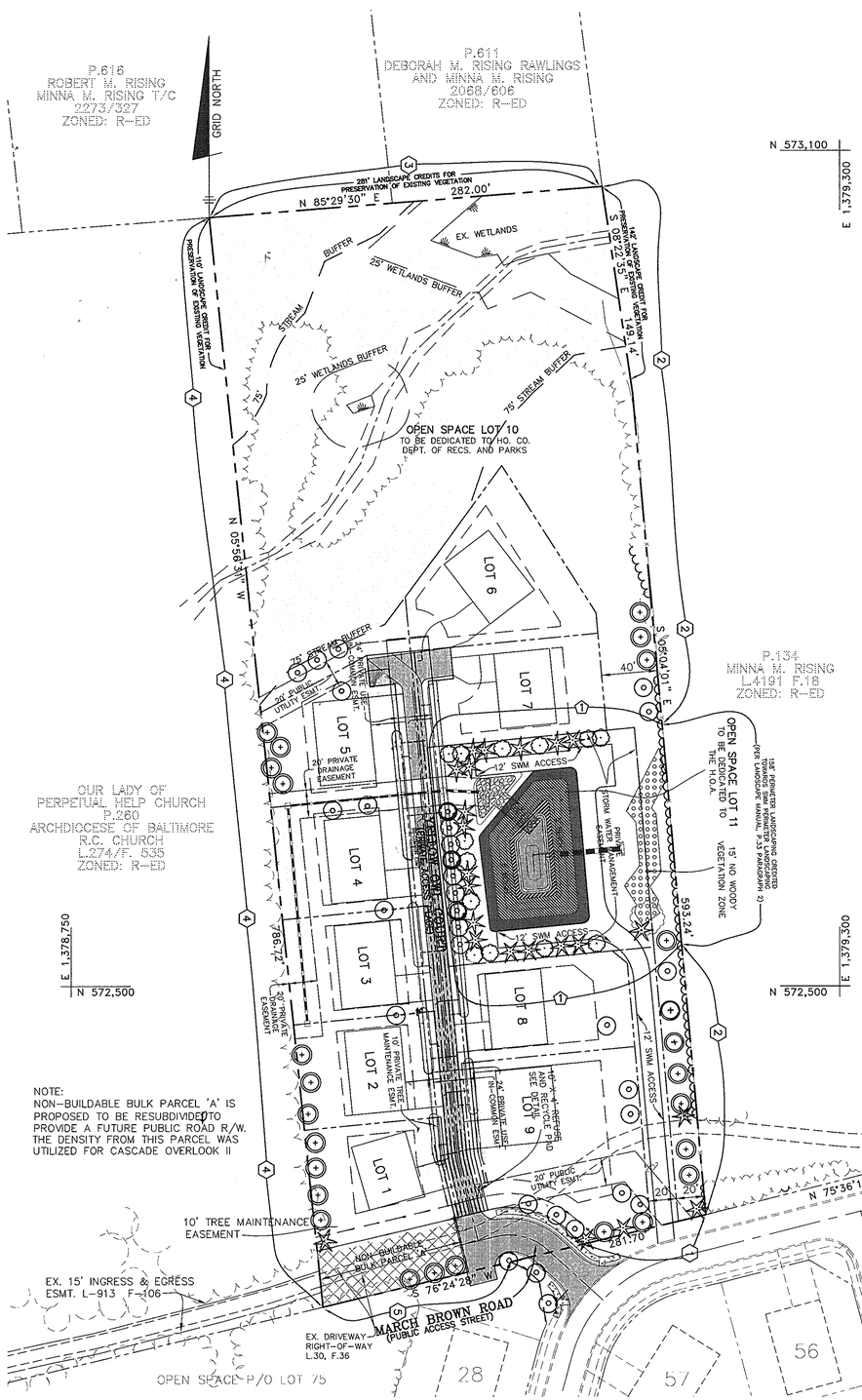
LOCATION:
TAX MAP 31, GRID 11, PARCEL 259
1st. ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

TITLE:
STORMWATER MANAGEMENT NOTES
VP–86–130, F–88–20, S–01–04, PB–359, P–02–11

DATE: SEPTEMBER, 2003 | PROJECT NO. 1480
DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 7 OF 10

AS-BUILT F–03–150

\\tsa\vol1\engineer\projects\1480 WOODS PROP\dwg\7023S2.dwg, SED. CONTROL DETAILS, 12/9/2003 12:47:37 PM, Administrator



PLAN VIEW
SCALE: 1" = 50'

NOTE:
NON-BUILDABLE BULK PARCEL 'A' IS PROPOSED TO BE RESUBDIVIDED TO PROVIDE A FUTURE PUBLIC ROAD R/W. THE DENSITY FROM THIS PARCEL WAS UTILIZED FOR CASCADE OVERLOOK II

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 1/23/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 1/21/04

PLANTING SCHEDULE
SWMF MICROPOOL E.D.

ZONE	AREA	PLANT MIX	ELEVATION
1	4104 SF	100% WATER LILLY	388.50 – 391.50
2	2438 SF	50% BROAD WATER WEED	391.50 – 392.50
		25% DUCK POTATO	
		25% ARROW ARUM	
3	1050 SF	50% CUTGRASS, RICE	392.50 – 393.50
		50% SWITCHGRASS	
4	5751 SF	50% LOVEGRASS–MEADOW	393.50 – 396.50
		25% VIOLETS, COMMON BLUE	
		25% CONEFLOWER,CUT–LEAF	
5	0 SF	75% WITCHGRASS, NEEDLE–LEAF	396.50 – 399.00
		25% CONEFLOWER, SWEET	
6	0 SF	N/A	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 WITHIN 15' OF THE TOE OF THE SLOPE OR 25' OF THE SPILLWAY.

LEGEND:
ZONE 1
ZONE 2
ZONE 3
ZONE 4
ZONE 5
RIP–RAP

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.

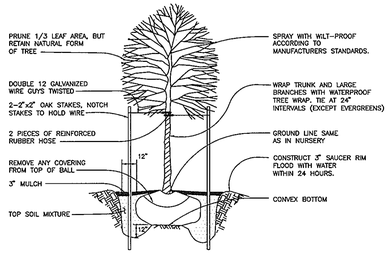
3.) TREES MUST BE A MINIMUM OF FOUR(4) FEET FROM THE CURB OR SIDEWALK AND MUST BE A MINIMUM OF FIVE(5) FEET FROM ANY STORM DRAIN.

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

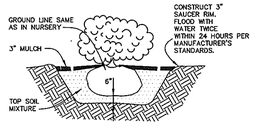
5.) THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SEC.–16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.

6.) FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF $22,050.00

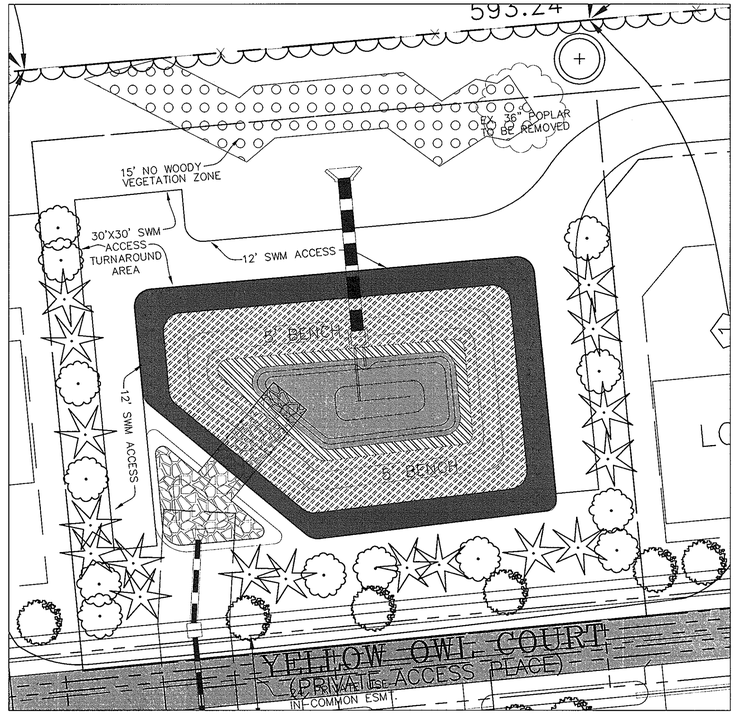
7.) TWENTY–TWO STREET TREES ALONG YELLOW OWL COURT A PRIVATE ACCESS PLACE ARE COUNTED AS LANDSCAPE TREES FOR PURPOSE OF SURETY.



TREE PLANTING DETAIL
NOT TO SCALE



SHRUB PLANTING DETAIL
NOT TO SCALE



STORMWATER MANAGEMENT FACILITY
PLANTING DETAIL
SCALE: 1"=20'

PERIMETER/SWM LANDSCAPE PLANTING LIST (1)			
SYMBOL	QUANTITY	NAME	REMARKS
	13	PLANTANUS ACERFOLIA "BLOODGOOD" (Bloodgood London Plane)	2 1/2" MIN. CAL. B&B FULL HEAD
	23	PINUS STROBUS (Eastern White Pine)	5'–6' ht. UNSHEARED
	26	ACER RUBRA (Red Maple)	2 1/2" MIN. CAL. B&B FULL HEAD

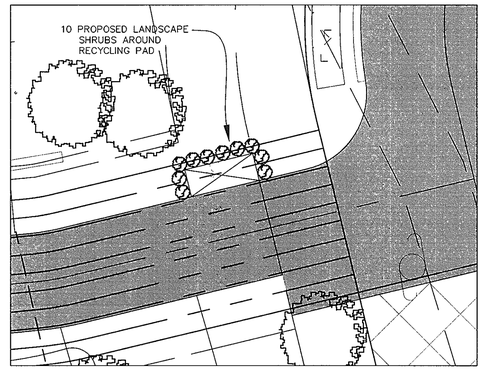
STREET AND PRIVATE ACCESS PLACE TREE PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	31	TILIA CORDATA "GREENSPIRE" (Greenspire Littleleaf Linden)	2 1/2" MIN. CAL. B&B FULL HEAD

REFUSE PAD SHRUB PLANTING LIST			
SYMBOL	QUANTITY	NAME	REMARKS
	10	JUNIPERUS CHINENSIS (Pfitzerlana Compacta) (Compact Pfitzer Juniper)	2–2 1/2' Height

PRIVATE ACCESS PLACE TREE CALCULATIONS
TREES REQUIRED FOR 851 LF OF PRIVATE ACCESS PLACE, 851 / 40 = 22 TREES REQUIRED
22 TREES PROVIDED

LANDSCAPE LEGEND	
SYMBOL	DESCRIPTION
	STREET TREES OR PRIVATE ACCESS PLACE TREES TO BE PROVIDED BY THE DEVELOPER
	SHADE TREES ALONG STORMWATER MANAGEMENT AREA AND PERIMETER TO BE PROVIDED BY THE DEVELOPER
	EVERGREEN TREES ALONG STORMWATER MANAGEMENT AREA AND PERIMETER TO BE PROVIDED BY THE DEVELOPER
	EVERGREEN SHRUBS PLANTED ALONGSIDE TRASH PAD LOCATIONS TO BE PROVIDED BY THE DEVELOPER

SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING	
LINEAR FEET OF PERIMETER LINEAR FEET OF PERIMETER	(1) 650' TYPE 'B'
NUMBER OF TREES REQUIRED SHADE TREES (1:50) EVERGREEN TREES (1:40)	 13 17
CREDIT FOR EXISTING VEGETATION (NO, YES AND %)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND LINEAR FEET)	NO
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES	 13 17



SHRUB PLANTING DETAIL
FOR REFUSE PAD

SCHEDULE A PERIMETER LANDSCAPE EDGE						
CATEGORY	ADJACENT TO PERIMETER PROPERTIES					ADJACENT TO TRASH PAD
LANDSCAPE BUFFER TYPE	(1) B	(2) A	(3) A	(4) A	(5) A	B
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	92'	584'	281'	787'	136'	28'
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	*YES 142'	*YES 281'	*YES 110'	NO	NO
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO
NUMBER OF PLANTS REQUIRED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS (10:1 SUBSTITUTE)	 2 3 – –	 8 – – –	 0 0 – –	 11 – – –	 3 – – –	 – – – 10
NUMBER OF PLANTS PROVIDED SHADE TREES EVERGREEN TREES OTHER TREES (2:1 SUBSTITUTE) SHRUBS (10:1 SUBSTITUTE)	 2 3 – –	 8 – – –	 0 0 – –	 11 – – –	 3 – – –	 – – – 10

* EXISTING VEGETATION TO REMAIN

STATE OF MARYLAND
DONALD A. MANN
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
1	10-12-2011	REVISE STREET AND PERIMETER TREE PLANTING LOCATIONS.

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
email: Benchmrk@aols.com

Donald Mann
12/23/03

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

PROJECT: **CASCADE OVERLOOK**
SECTION II
A SUBDIVISION OF PARCEL 259

LOCATION:
TAX MAP 31, GRID 11, PARCEL 259
1st. ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

TITLE: *LANDSCAPE PLAN*

DATE: DECEMBER, 2003 | PROJECT NO. 1480

DES: RPS | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 8 OF 10

AS-BUILT

F-03-150

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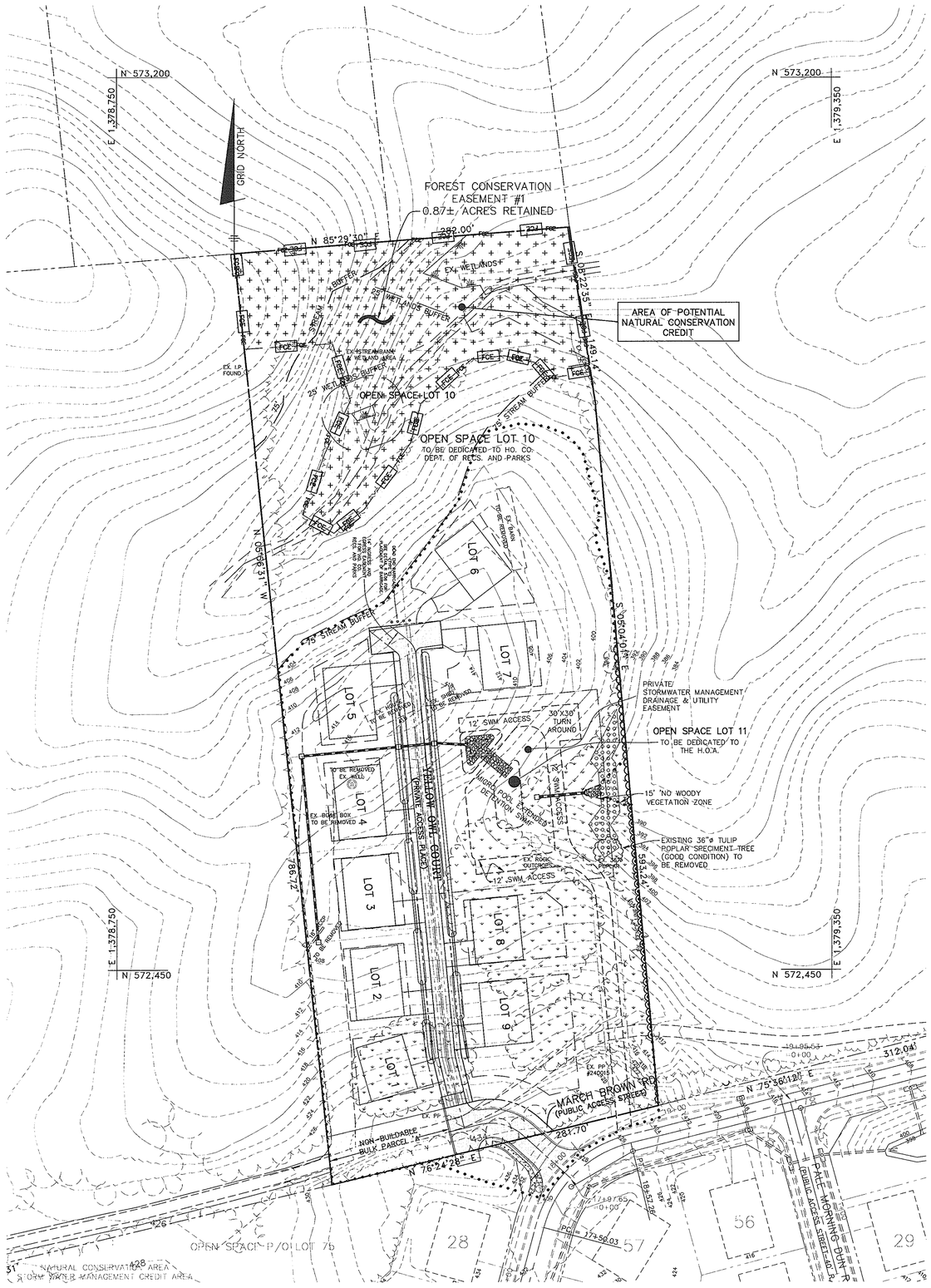

PLAN VIEW
SCALE: 1" = 50'

APPENDIX G
FOREST CONSERVATION WORKSHEET

	ACRES (1/100 acre)
I. BASIC SITE DATA	
GROSS SITE AREA	5.00
AREA WITHIN 100 YEAR FLOODPLAIN	0.00
AREA WITHIN AGRICULTURAL USE OR PRESERVATION PARCEL (IF APPLICABLE)	N/A
NET TRACT AREA	5.00
LAND USE CATEGORY (R-RLD, R-RMD, R-S, C/I/O, I)	R-ED
II. INFORMATION FOR CALCULATIONS	
A. NET TRACT AREA	5.00
B. REFORESTATION THRESHOLD (20% x A)	1.00
C. AFFORESTATION MINIMUM (15% x A)	0.75
D. EXISTING FOREST ON NET TRACT AREA	0.87
E. FOREST AREAS TO BE CLEARED	0.00
F. FOREST AREAS TO BE RETAINED	0.87
G. BREAK EVEN POINT	____

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	5.00
B. REFORESTATION THRESHOLD (25% x A)	1.25
D. EXISTING FOREST ON NET TRACT AREA	0.87
E. FOREST AREAS TO BE CLEARED	0.00
F. FOREST AREAS TO BE RETAINED	0.87
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)	____
H. FOREST AREAS CLEARED BELOW REFORESTATION THRESHOLD (B-F, if applicable)	____
I. FOREST AREAS RETAINED ABOVE REFORESTATION THRESHOLD (F-B, Retention Credit, if applicable)	____

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 _____

CREDIT FOR FOREST AREAS RETAINED ABOVE THRESHOLD
I = Retention Credit _____

TOTAL REFORESTATION REQUIRED
(G x 1/4) - I _____

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

SITE DATA	ACRES
GROSS AREA:	5.00
EX. LOTS/UNFORESTED PRESERVATION PARCEL/FLOODPLAIN:	0.00
NET TRACT AREA (NTA):	5.00
EXISTING FOREST ON NTA:	0.87
REFORESTATION THRESHOLD:	1.00
FOREST TO BE CLEARED:	0.00
FOREST TO BE RETAINED (NTA):	0.87
REFORESTATION REQUIRED:	____
REFORESTATION PROPOSED:	____

SURETY AMOUNT:
RETENTION $0.20 X 37,897 S.F. = $7,579.40

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/23/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ — DATE 1/26/04

See FCP Sheet 10 of 10 for FCP notes, details and specifications

LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- LIMIT OF WETLANDS
- 100 YEAR FLOODPLAIN
- FOREST TO BE RETAINED
- EXISTING SPECIMEN TREE
- LIMIT OF DISTURBANCE
- —FCE— LIMITS OF FOREST CONSERVATION EASEMENT
- —X—X—X— TEMPORARY PROTECTIVE FENCING
- FCE PERMANENT PROTECTIVE SIGNAGE
- FOREST CONSERVATION EASEMENT RETENTION
- TREED PASTURE

STATE OF MARYLAND — DONALD ALAN MOON — 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

SIGN BY JOHN CANOLES
Eco-Science Professionals, Inc.
CONSULTING ECOLOGISTS
P.O. Box 5096 Glen Arm, MD 21057 (410) 592-6752

MD DNR Qualified Professional
USACOE Wetland Delineator
Certification # WDCP3MD0610044G2
John P. Canoles 12/6/03

NO	DATE	REVISION

BENCHMARK
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8480 BALTIMORE NATIONAL PIKE ▲ SUITE 418
ELLICOTT CITY, MARYLAND 21043
phone: 410-465-6105 ▲ fax: 410-465-6644
email: BenchmrkE@cols.com

STATE OF MARYLAND — DONALD ALAN MOON — No. 21443 — PROFESSIONAL ENGINEER
12/9/03

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

PROJECT: CASCADE OVERLOOK
SECTION II
A SUBDIVISION OF PARCEL 259

LOCATION: TAX MAP 31, GRID 11, PARCEL 259
1 st. ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TITLE: FOREST CONSERVATION PLAN

DATE: SEPTEMBER, 2003 PROJECT NO. 1480

DES: DAM | DRN: RPS | CHK: DAM | SCALE: AS SHOWN | DRAWING 9 OF 10

AS-BUILT

F-03-150

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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.

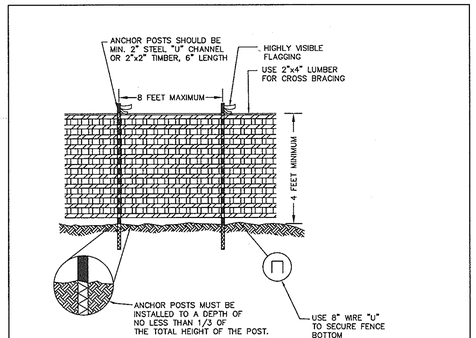
   h) A County official shall inspect the entire site.

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.

FCP NOTES

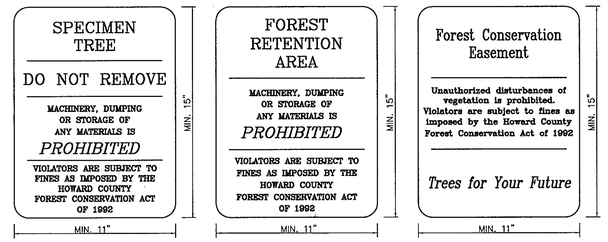
1. ANY FOREST CONSERVATION EASEMENT (FCE) AREA SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF HOWARD COUNTY WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.
2. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 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.



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



SIGN BY JOHN CANOLES
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MD DNR Qualified Professional
USACOE Wetland Delineator
Certification #WDCP93MD0610044152
12/9/02
John P. Canoles

STATE OF MARYLAND DONALD ALAN MOAN No. 21443 PROFESSIONAL ENGINEER
12-20-11

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 PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 1/23/04

CHIEF, DEVELOPMENT ENGINEERING DIVISION MRJ — DATE 1/21/04

NO	DATE	REVISION

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DATE: SEPTEMBER, 2003 PROJECT NO. 1480

DES: MLV DRN: THE CHK: DAM SCALE: AS SHOWN DRAWING 10 OF 10

AS-BUILT

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