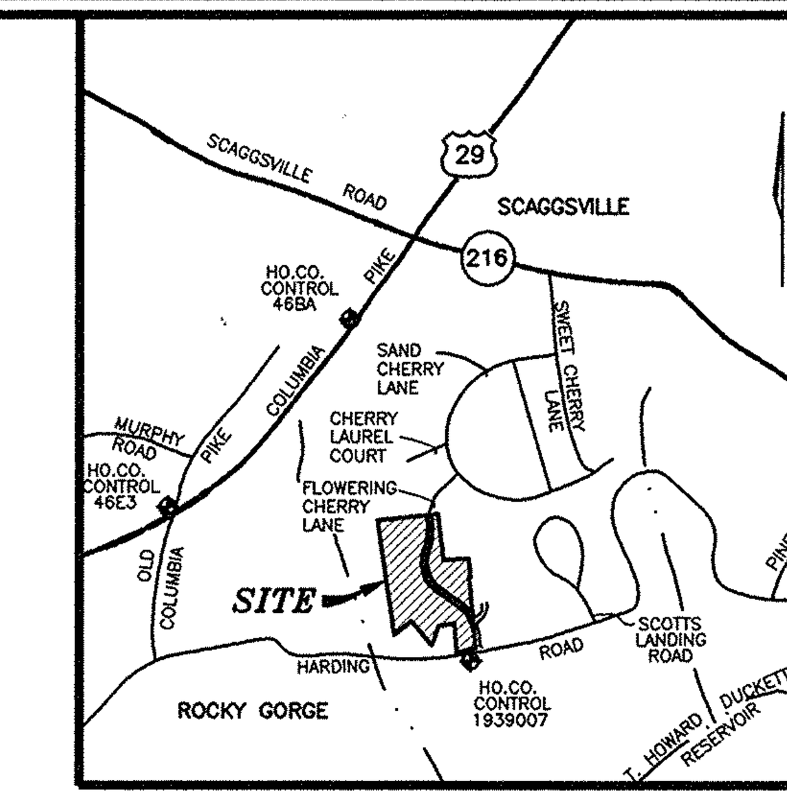
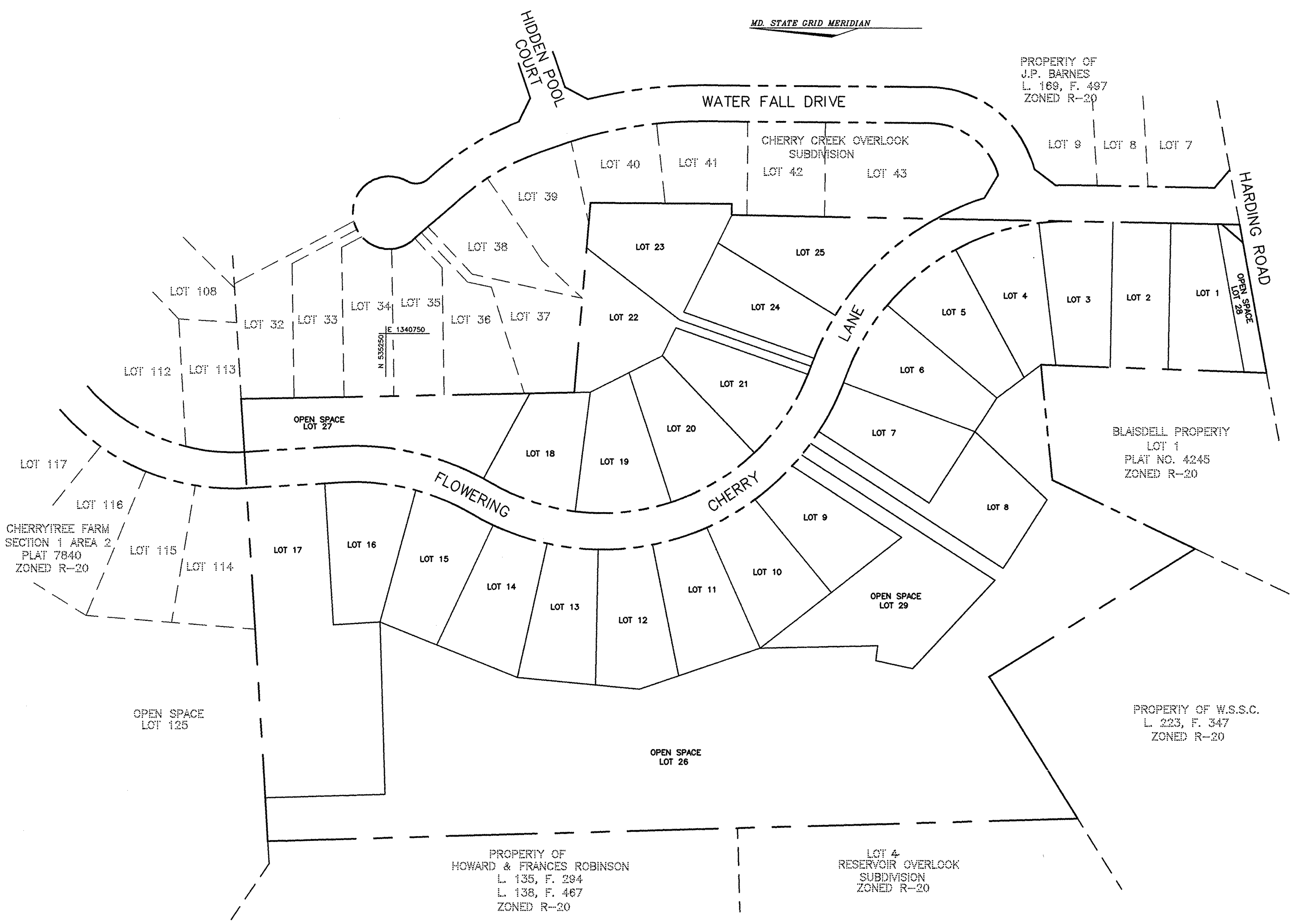
SHEET INDEX	
1	TITLE SHEET
2	ROAD CONSTRUCTION PLAN
3	ROAD CONSTRUCTION PROFILE
4	GRADING, SEDIMENT CONTROL PLAN AND LANDSCAPING PLAN
5	STORM DRAIN DRAINAGE AREA MAP & SOILS MAP
6	STORM DRAIN PROFILES AND STORMWATER MANAGEMENT DETAILS
7	STORMWATER MANAGEMENT AND SEDIMENT CONTROL NOTES AND DETAILS

HARDING WOODS
FINAL ROAD CONSTRUCTION PLANS
HOWARD COUNTY, MARYLAND



VICINITY MAP
SCALE: 1"=2000'



PLAN
SCALE:1"=100'

GENERAL NOTES

1. ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. PROJECT BACKGROUND:
   LOCATION: TAX MAP 46 BLOCK 16 PARCEL 65
   6 TH ELECTION DISTRICT
   ZONING: R-20
   TOTAL TRACT AREA: 20.51 AC.
   NUMBER OF PROPOSED LOTS: 25 SFD, 4 OPEN SPACE
   DATE SKETCH PLAN APPROVED: AUGUST 13, 1997
   APPLICABLE DPZ FILE NUMBERS: S-97-19, P-98-12
3. TRACT BOUNDARY ESTABLISHED BY A BOUNDARY SURVEY BY MARKS & VOGEL ASSOCIATES, INC. DATED APRIL, 1997.
4. TOPOGRAPHY BASED ON A FIELD RUN SURVEY PREPARED BY MARKS & VOGEL ASSOCIATED,INC. DATED APRIL, 1997. CONTOUR INTERVAL IS 2 FEET.
5. COORDINATES: HORIZONTAL DATUMS BASED ON NAD 83
   HO. CO. GEODETIC CONTROL STATIONS 46BA AND 46E3
   VERTICAL DATUMS BASED ON NAD 29
   HO. CO. GEODETIC CONTROL STATION 1939007
6. WATER AND SEWER FOR THIS PROJECT WILL BE PUBLIC: CONTR. NO. 24-1614-D & 24-3639-D
7. EXISTING UTILITIES WERE LOCATED PER COUNTY DRAWINGS AND FIELD RUN SURVEY.
8. STORMWATER MANAGEMENT METHOD: DETENTION OF 2 YR. AND 10 YR. STORMS AND WATER QUALITY PROVIDED BY EXTENDED DETENTION OF THE 1 YR. STORM. HAZARD CLASSIFICATION FOR THE STRUCTURE SHALL BE 'A'.
9. THE STORMWATER MANAGEMENT FACILITY IS TO BE PRIVATELY OWNED (H.O.A.) AND JOINTLY MAINTAINED (H.O.A. AND HOWARD COUNTY).
10. THERE ARE NO WETLANDS ON SITE.
11. FOREST STAND DELINEATION PLAN PREPARED BY MARKS & VOGEL ASSOCIATES, INC. DATED SEPTEMBER, 1997.
12. A TRAFFIC STUDY IS NOT REQUIRED.
13. THERE IS NO FLOODPLAIN ON SITE.
14. A NOISE STUDY IS NOT REQUIRED.
15. GEOTECHNICAL REPORT PROVIDED BY HERBST/BENSON & ASSCO. DATE OCTOBER 2, 1997.
16. ALL LANDSCAPING REQUIREMENTS AS SET FORTH IN THE LANDSCAPE MANUAL SHALL BE COMPLIED WITH.
17. STREET LIGHTING SHALL BE 100-WATT TRADITIONARE HPS VAPOR POST TOP FIXTURE ON A 14' BLACK FIBERGLASS POLE.
18. PROPOSED FORCE MAIN SEWER AND WATER CONNECTION TO RESERVOIR OVERLOOK TO BE CONSTRUCTED BY OTHERS.
19. THE EXISTING HOUSE ON LOT 24 WILL BE RELOCATED TO LOT 17.
20. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. CONTRACTOR TO INSTALL ALL REQUIRED LANDSCAPING IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
21. OPEN SPACE LOT 26 IS TO BE OWNED AND MAINTAINED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
22. OPEN SPACE LOTS 27, 28 & 29 ARE TO BE OWNED AND MAINTAINED BY THE HOME OWNERS ASSOCIATION.

NO.	REVISION	DATE

AS-BUILT CERTIFICATE

DATE

OWNER/DEVELOPER
BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

10-26-98
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

10/29/98
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

10/20/98
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

HARDING WOODS
LOTS 1 THRU 25 AND
OPEN SPACE LOTS 26 THRU 29

TITLE SHEET

TAX MAP #46 REFERENCE: S-97-19, P-98-12
PARCEL #65 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

VOGEL & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3691 PARK AVENUE, SUITE 101
ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828
FAX: (410) 465-3966

STATE OF MARYLAND ... 9/30/98
ROBERT H. VOGEL, P.E. # 16193

DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: AS SHOWN
W.O. NO.: 96-72

SHEET 1 OF 7

F-98-151

CURVE DATA CHART						
CURVE NO.	RADIUS	LENGTH	TANGENT	CHORD	BEARING	DELTA
CURVE 1	350.00'	304.12'	162.41'	294.64'	N45°43'15"W	49°47'04"
CURVE 2	330.00'	580.42'	398.72'	508.44'	N20°13'35"W	100°46'26"
CURVE 3	350.00'	205.98'	106.07'	203.02'	S13°18'04"W	33°43'08"

STREET LIGHT LOCATION CHART	
CENTERLINE STATION	CENTERLINE OFFSET
6+00	16', RT.
9+70	16', LT.
13+72	16', RT.

ALL STREET LIGHTS TO BE 100-WATT TRADITIONARE HPS VAPOR POST TOP FIXTURE ON A 14' BLACK FIBERGLASS POLE.

SCHEDULE A
PERIMETER LANDSCAPE EDGE

LANDSCAPE EDGE	(1)	(2)	(3)	(4)	(5)	(6)
LANDSCAPE TYPE	B	A	A	A	A	A
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	205	1255	1120	565	720	495
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	YES 100	YES 1255	YES 1120	YES 475	YES 535	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(BASED ON TOTAL PERIMETER) TYPE A / TYPE B						
SHADE TREES (1:60) (1:50)	4	20	18	9	12	8
EVERGREEN TREES 0 (1:40)	5	0	0	0	0	0
SHRUBS	0	0	0	0	0	0
NUMBER OF PLANTS PROVIDED(BASED ON TOTAL MINUS CREDIT) TYPE A / TYPE B	205 - 100 105LF	NONE	NONE	565 - 475 90LF	720 - 535 185LF	
SHADE TREES (1:60) (1:50)	2			2	3	8
EVERGREEN TREES 0 (1:40)	2			0	0	0
OTHER TREES (2:1 SUBSTITUTION)	0			0	0	0
SHRUBS (10:1 SUBSTITUTION)	0			0	0	0

SCHEDULE D
STORMWATER MANAGEMENT AREA LANDSCAPING

LANDSCAPE TYPE	B
TOTAL LINEAR FEET OF PERIMETER	460
NUMBER OF TREES REQUIRED SHADE TREES(1:50) EVERGREEN TREES(1:40)	9 11
CREDIT FOR EXISTING VEGETATION LINEAR FEET	YES* 270
CREDIT FOR OTHER LANDSCAPING	NO
NUMBER OF PLANTS PROVIDED (460-270=190LF) SHADE TREES(1:50) EVERGREEN TREES(1:40) SHRUBS(10:1 TREE SUBSTITUTION)	4 9 0

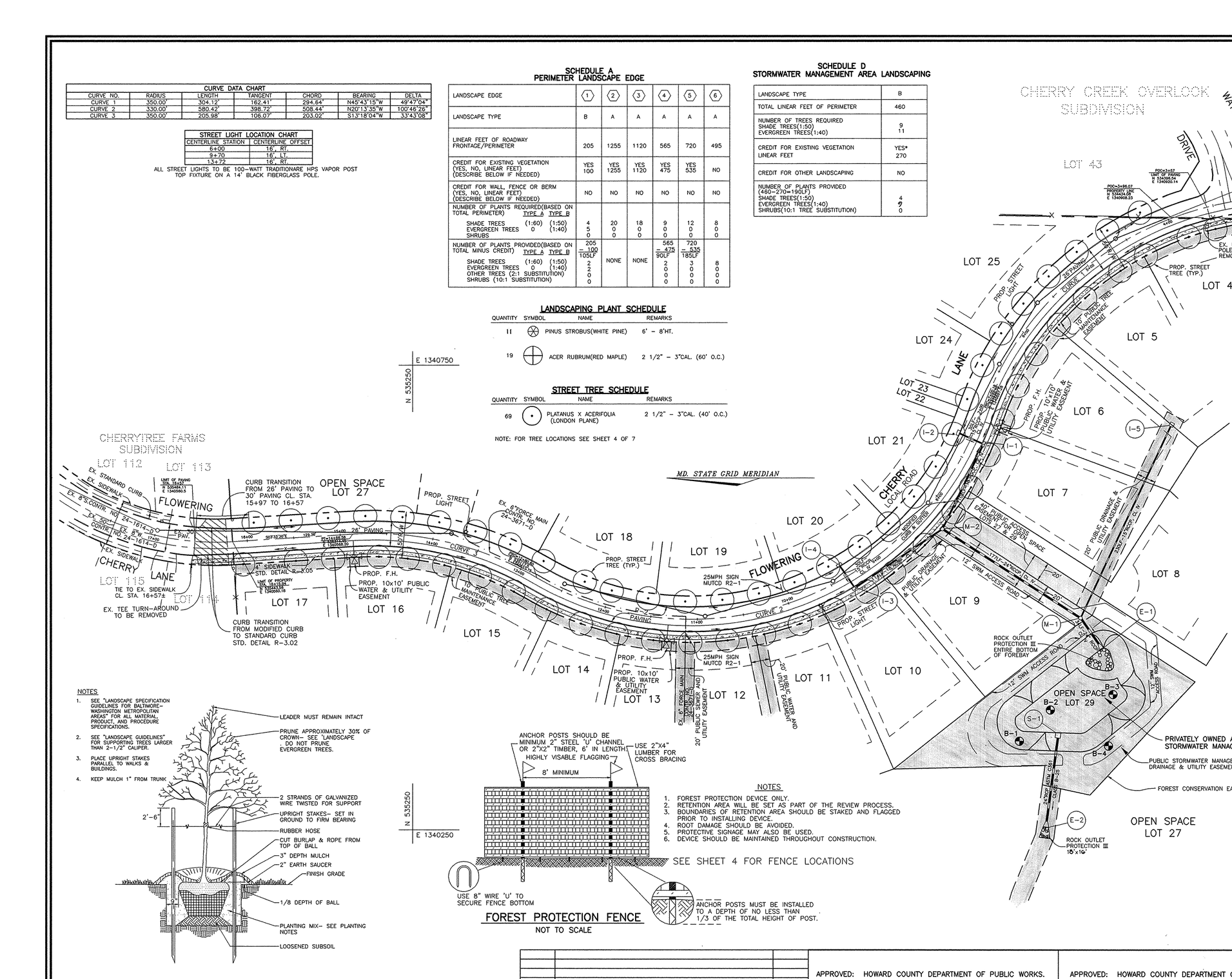
LANDSCAPING PLANT SCHEDULE

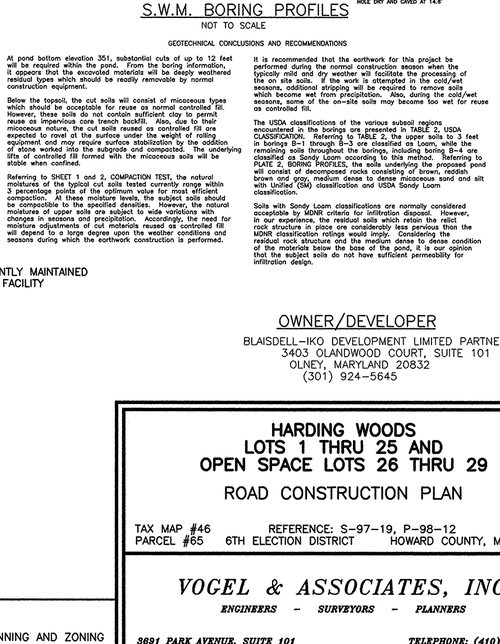
QUANTITY	SYMBOL	NAME	REMARKS
11	⊗	PINUS STROBUS(WHITE PINE)	6' - 8'HT.
19	⊕	ACER RUBRUM(RED MAPLE)	2 1/2" - 3"CAL. (60' O.C.)

STREET TREE SCHEDULE

QUANTITY	SYMBOL	NAME	REMARKS
69	•	PLATANUS X ACERIFOLIA (LONDON PLANE)	2 1/2" - 3"CAL. (40' O.C.)

NOTE: FOR TREE LOCATIONS SEE SHEET 4 OF 7





S.W.M. BORING PROFILES

NOT TO SCALE

GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

At pond bottom elevation 351, substantial cuts of up to 12 feet will be required within the pond. From the boring information, it appears that the excavated materials will be deeply weathered residual types which should be readily removable by normal construction equipment.

Below the topsoil, the cut soils will consist of micaceous types which should be acceptable for reuse as normal controlled fill. However, these soils do not contain sufficient clay to permit reuse as impervious core trench backfill. Also, due to their micaceous nature, the cut soils reused as controlled fill are expected to ravel at the surface under the weight of rolling equipment and may require surface stabilization by the addition of stone worked into the subgrade and compacted. The underlying lifts of controlled fill formed with the micaceous soils will be stable when confined.

Referring to SHEET 1 and 2, COMPACTION TEST, the natural moistures of the typical cut soils tested currently range within 3 percentage points of the optimum value for most efficient compaction. At these moisture levels, the subject soils should be compactible to the specified densities. However, the natural moistures of upper soils are subject to wide variations with changes in seasons and precipitation. Accordingly, the need for moisture adjustments of cut materials reused as controlled fill will depend to a large degree upon the weather conditions and seasons during which the earthwork construction is performed.

It is recommended that the earthwork for this project be performed during the normal construction season when the typically mild and dry weather will facilitate the processing of the on site soils. If the work is attempted in the cold/wet seasons, additional stripping will be required to remove soils which become wet from precipitation. Also, during the cold/wet seasons, some of the on-site soils may become too wet for reuse as controlled fill.

The USDA classifications of the various subsoil regions encountered in the borings are presented in TABLE 2, USDA CLASSIFICATION. Referring to TABLE 2, the upper soils to 3 feet in borings B-1 through B-3 are classified as Loam, while the remaining soils throughout the borings, including boring B-4 are classified as Sandy Loam according to this method. Referring to PLATE 2, BORING PROFILES, the soils underlying the proposed pond will consist of decomposed rocks consisting of brown, reddish brown and gray, medium dense to dense micaceous sand and silt with Unified (SM) classification and USDA Sandy Loam classification.

Soils with Sandy Loam classifications are normally considered acceptable by MDNR criteria for filtration disposal. However, in our experience, the residual soils which retain the relict rock structure in place are considerably less pervious than the MDNR classification ratings would imply. Considering the residual rock structure and the medium dense to dense condition of the materials below the base of the pond, it is our opinion that the subject soils do not have sufficient permeability for infiltration design.

OWNER/DEVELOPER

BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

NOTES

1. SEE "LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREAS" FOR ALL MATERIAL, PRODUCT, AND PROCEDURE SPECIFICATIONS.
2. SEE "LANDSCAPE GUIDELINES" FOR SUPPORTING TREES LARGER THAN 2-1/2" CALIPER.
3. PLACE UPRIGHT STAKES PARALLEL TO WALKS & BUILDINGS.
4. KEEP MULCH 1" FROM TRUNK

TREE PLANTING AND STAKING

DECIDUOUS AN EVERGREEN TREES UP TO 2-1/2" CALIPER

NOTES

1. FOREST PROTECTION DEVICE ONLY.
2. RETENTION AREA WILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF RETENTION AREA SHOULD BE STAKED AND FLAGGED PRIOR TO INSTALLING DEVICE.
4. ROOT DAMAGE SHOULD BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHOULD BE MAINTAINED THROUGHOUT CONSTRUCTION.

SEE SHEET 4 FOR FENCE LOCATIONS

FOREST PROTECTION FENCE

NOT TO SCALE

NO.	REVISION	DATE

AS-BUILT CERTIFICATE

DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 10-26-98

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/27/98

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/28/98

HARDING WOODS
LOTS 1 THRU 25 AND
OPEN SPACE LOTS 26 THRU 29

ROAD CONSTRUCTION PLAN

TAX MAP #46 REFERENCE: S-97-19, P-98-12
PARCEL #65 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

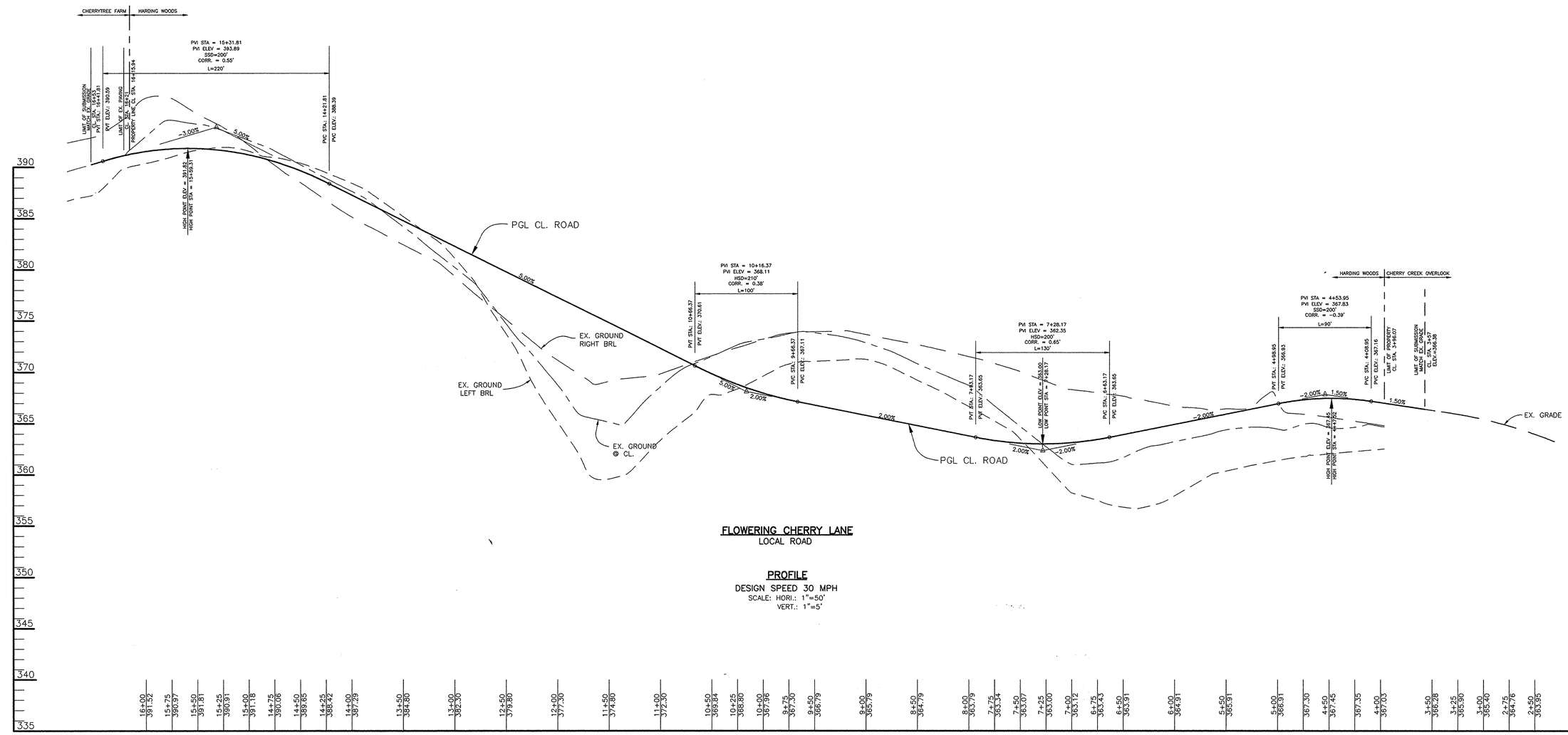
VOGEL & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3691 PARK AVENUE, SUITE 101
ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828
FAX: (410) 465-3966

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 6193 — PROFESSIONAL ENGINEER — 9/30/98
ROBERT H. VOGEL, P.E. # 16193

DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: 1"=50'
W.O. NO.: 96-72

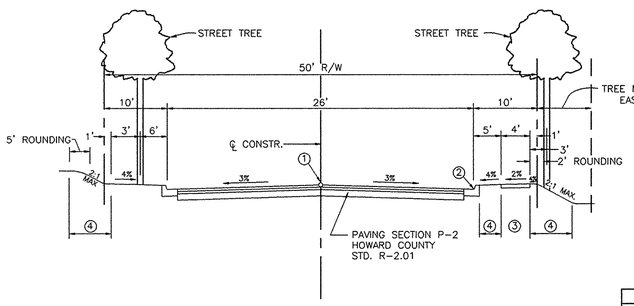
SHEET 2 OF 7

F-98-151



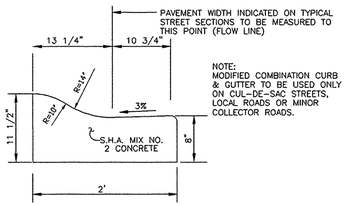
FLOWERING CHERRY LANE
LOCAL ROAD

PROFILE
DESIGN SPEED 30 MPH
SCALE: HORI.: 1"=50'
VERT.: 1"=5'



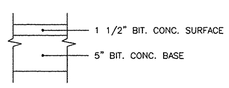
① PROFILE GRADE LINE (PGL). SEE DESIGN MANUAL.
② MOD. COMB. CURB & GUTTER
③ 4" CONCRETE SIDEWALK AS REQUIRED BY SUB-DIVISION REGULATIONS.(ONE SIDE)
④ INDICATES 2" TOPSOIL, SEED & MULCH.

FLOWERING CHERRY LANE
LOCAL ROAD
CL. STA. 3+57.00 TO CL. STA. 16+53.00
HOWARD COUNTY STANDARD 2.11
DESIGN SPEED 30 MPH
NOT TO SCALE

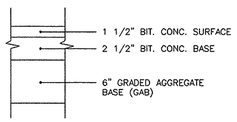


NOTE:
MODIFIED COMBINATION CURB & GUTTER TO BE USED ONLY ON CUL-DE-SAC STREETS, LOCAL ROADS OR MINOR COLLECTOR ROADS.

MODIFIED CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE



FULL DEPTH BIT. CONC. ALTERNATE



GRANULAR BASE ALTERNATES

P-2 PAVING SECTION
HOWARD COUNTY STANDARD R-2.01
NOT TO SCALE

NO.	REVISION	DATE

AS-BUILT CERTIFICATE

DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 10-26-98

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 10/29/98

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 10/29/98

OWNER/DEVELOPER
BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

HARDING WOODS
LOTS 1 THRU 25 AND OPEN SPACE LOTS 26 THRU 29
ROAD CONSTRUCTION PROFILE
FLOWERING CHERRY LANE
3+57.00 TO 16+53.00

TAX MAP #46 PARCEL #65 — REFERENCE: S-97-19, P-98-12 — 6TH ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

VOGEL & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3691 PARK AVENUE, SUITE 101
ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828
FAX: (410) 465-3966

STATE OF MARYLAND — ROBERT HARRIS VOGEL — REGISTERED PROFESSIONAL ENGINEER — 9/30/98
ROBERT H. VOGEL, P.E. # 16193

DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: AS SHOWN
W.O. NO.: 96-72

SHEET 3 OF 7

F-98-151

ENGINEERS CERTIFICATE

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

SIGNATURE OF ENGINEER 9/30/98 DATE
ROBERT H. VOGEL

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

USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

HOWARD SOIL CONSERVATION DISTRICT DATE

"AS-BUILT" CERTIFICATION

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

ROBERT H. VOGEL, P.E. NO. 16193 DATE

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE IN ACCORDANCE 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."

SIGNATURE OF DEVELOPER 9/24/98 DATE

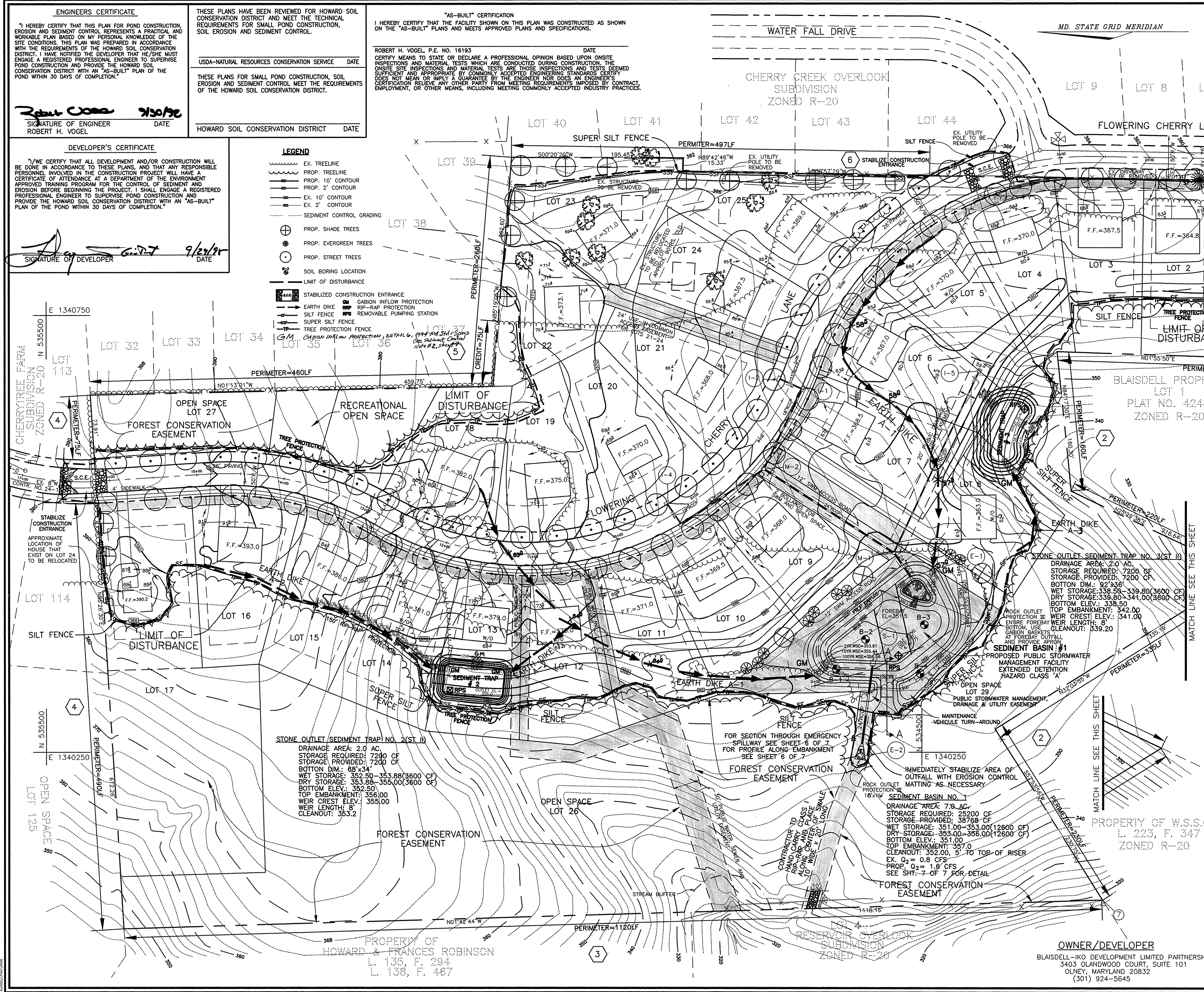
NOTES:

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED 26 LANDSCAPE TREES HAS BEEN POSTED AS PART OF THE DEVELOPER'S AGREEMENT IN THE AMOUNT OF $6,750.00.

FOR LANDSCAPE SCHEDULE & TREE PLANTINGS SEE SHEET 2 OF 7.

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP 9/24/98 DATE



LEGEND
EX. TREELINE
PROP. TREELINE
PROP. 10' CONTOUR
PROP. 2' CONTOUR
EX. 10' CONTOUR
EX. 2' CONTOUR
SEDIMENT CONTROL GRADING
PROP. SHADE TREES
PROP. EVERGREEN TREES
PROP. STREET TREES
SOIL BORING LOCATION
LIMIT OF DISTURBANCE
STABILIZED CONSTRUCTION ENTRANCE
GM GABION INFLOW PROTECTION
RRP RIP-RAP PROTECTION
RPS REMOVABLE PUMPING STATION
EARTH DIKE
SILT FENCE
SUPER SILT FENCE
TREE PROTECTION FENCE
WATER FALL DRIVE
MD. STATE GRID MERIDIAN
CHERRY CREEK OVERLOOK SUBDIVISION ZONED R-20
FLOWERING CHERRY LANE
HARDING ROAD
BLAISDELL PROPERTY LOT 1 PLAT NO. 4245 ZONED R-20
OPEN SPACE LOT 27
FOREST CONSERVATION EASEMENT
RECREATIONAL OPEN SPACE
LIMIT OF DISTURBANCE
OPEN SPACE LOT 26
OPEN SPACE LOT 28
OPEN SPACE LOT 29
STONE OUTLET SEDIMENT TRAP NO. 2(ST II)
DRAINAGE AREA: 2.0 AC.
STORAGE REQUIRED: 7200 CF
STORAGE PROVIDED: 7200 CF
BOTTOM DIM.: 68'x34'
WET STORAGE: 352.50-353.88(3600 CF)
DRY STORAGE: 353.88-355.00(3600 CF)
BOTTOM ELEV.: 352.50
TOP EMBANKMENT: 356.00
WEIR CREST ELEV.: 355.00
WEIR LENGTH: 8'
CLEANOUT: 353.2
STONE OUTLET SEDIMENT TRAP NO. 3(ST II)
DRAINAGE AREA: 2.0 AC.
STORAGE REQUIRED: 7200 CF
STORAGE PROVIDED: 7200 CF
BOTTOM DIM.: 92'x36'
WET STORAGE: 338.50-339.80(3600 CF)
DRY STORAGE: 339.80-341.00(3600 CF)
BOTTOM ELEV.: 338.50
TOP EMBANKMENT: 342.00
WEIR CREST ELEV.: 341.00
WEIR LENGTH: 8'
CLEANOUT: 339.20
SEDIMENT BASIN #1
PROPOSED PUBLIC STORMWATER MANAGEMENT FACILITY EXTENDED DETENTION HAZARD CLASS 'A'
SEDIMENT BASIN NO. 1
DRAINAGE AREA: 7.0 AC.
STORAGE REQUIRED: 25200 CF
STORAGE PROVIDED: 38768 CF
WET STORAGE: 351.00-353.00(12600 CF)
DRY STORAGE: 353.00-356.00(12600 CF)
BOTTOM ELEV.: 351.00
TOP EMBANKMENT: 357.0
CLEANOUT: 352.00, 5' TO TOP OF RISER
EX. Q2 = 0.8 CFS
PROP. Q2= 1.6 CFS
SEE SHT. 7 OF 7 FOR DETAIL
FOR SECTION THROUGH EMERGENCY SPILLWAY SEE SHEET 6 OF 7 FOR PROFILE ALONG EMBANKMENT SEE SHEET 6 OF 7
IMMEDIATELY STABILIZE AREA OF OUTFALL WITH EROSION CONTROL MATTING AS NECESSARY
PROPERTY OF W.S.S.C. L. 223, F. 347 ZONED R-20
PROPERTY OF HOWARD & FRANCES ROBINSON L. 135, F. 294 L. 138, F. 467
LOT 4 RESERVOIR OVERLOOK SUBDIVISION ZONED R-20
MATCH LINE SEE THIS SHEET
OWNER/DEVELOPER
BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

NO.	REVISION	DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS 10-26-98 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT 10/29/98 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 10/20/98 DATE

HARDING WOODS
LOTS 1 THRU 25 AND OPEN SPACE LOTS 26 THRU 29
GRADING, SEDIMENT CONTROL AND LANDSCAPE PLAN

TAX MAP #46 REFERENCE: S-97-19, P-98-12
PARCEL #65 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

VOGEL & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3691 PARK AVENUE, SUITE 101 ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828 FAX: (410) 465-3966

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — REGISTERED PROFESSIONAL ENGINEER — 9/30/98
ROBERT H. VOGEL, P.E. # 16193

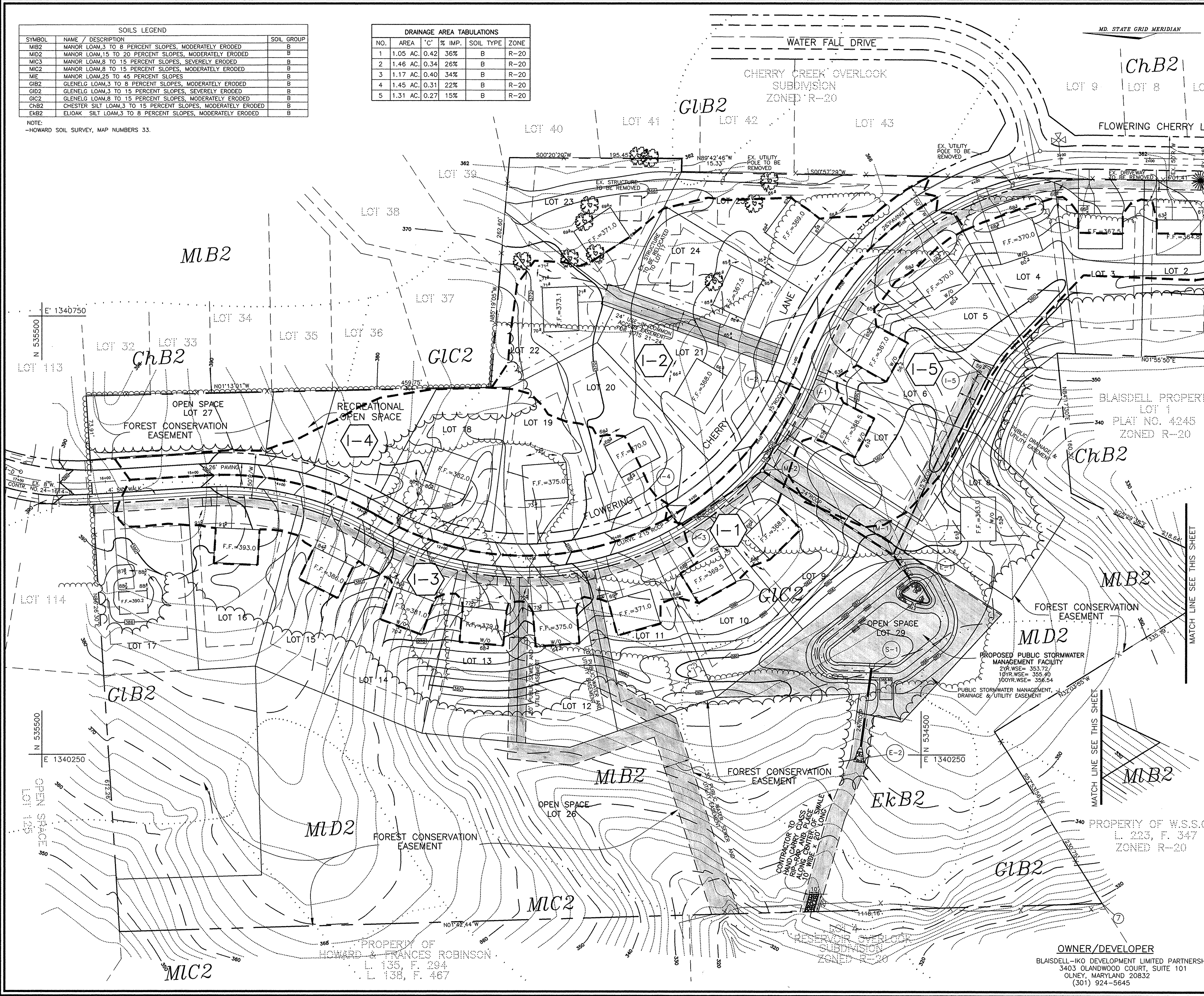
DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: 1"=50'
W.O. NO.: 96-72

F-98-151

SOILS LEGEND		
SYMBOL	NAME / DESCRIPTION	SOIL GROUP
MIB2	MANOR LOAM,3 TO 8 PERCENT SLOPES, MODERATELY ERODED	B
MID2	MANOR LOAM,15 TO 20 PERCENT SLOPES, MODERATELY ERODED	B
MIC3	MANOR LOAM,8 TO 15 PERCENT SLOPES, SEVERELY ERODED	B
MIC2	MANOR LOAM,8 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
MIE	MANOR LOAM,25 TO 45 PERCENT SLOPES	B
GIB2	GLENELG LOAM,3 TO 8 PERCENT SLOPES, MODERATELY ERODED	B
GID2	GLENELG LOAM,3 TO 15 PERCENT SLOPES, SEVERELY ERODED	B
GIC2	GLENELG LOAM,8 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
ChB2	CHESTER SILT LOAM,3 TO 15 PERCENT SLOPES, MODERATELY ERODED	B
EkB2	ELIOAK SILT LOAM,3 TO 8 PERCENT SLOPES, MODERATELY ERODED	B

NOTE:
-HOWARD SOIL SURVEY, MAP NUMBERS 33.

DRAINAGE AREA TABULATIONS					
NO.	AREA	'C'	% IMP.	SOIL TYPE	ZONE
1	1.05 AC.	0.42	36%	B	R-20
2	1.46 AC.	0.34	26%	B	R-20
3	1.17 AC.	0.40	34%	B	R-20
4	1.45 AC.	0.31	22%	B	R-20
5	1.31 AC.	0.27	15%	B	R-20



OWNER/DEVELOPER
BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

NO.	REVISION	DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS 10-26-98 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT 10/29/98 DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 10/28/98 DATE

HARDING WOODS
LOTS 1 THRU 25 AND OPEN SPACE LOTS 26 THRU 29
STORM DRAIN DRAINAGE AREA MAP & SOILS MAP

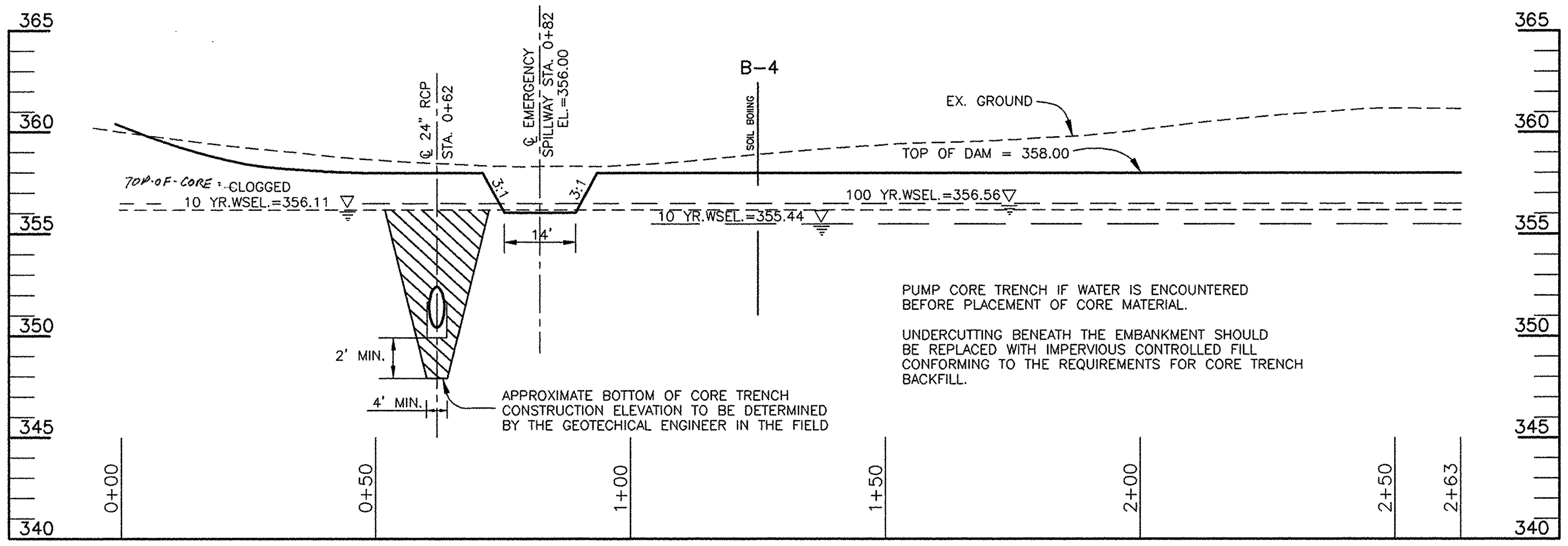
TAX MAP #46 REFERENCE: S-97-19, P-98-12
PARCEL #65 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

VOGEL & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3691 PARK AVENUE, SUITE 101
ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828
FAX: (410) 465-3966

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 REGISTERED PROFESSIONAL ENGINEER 9/30/98
ROBERT H. VOGEL, P.E. # 16193

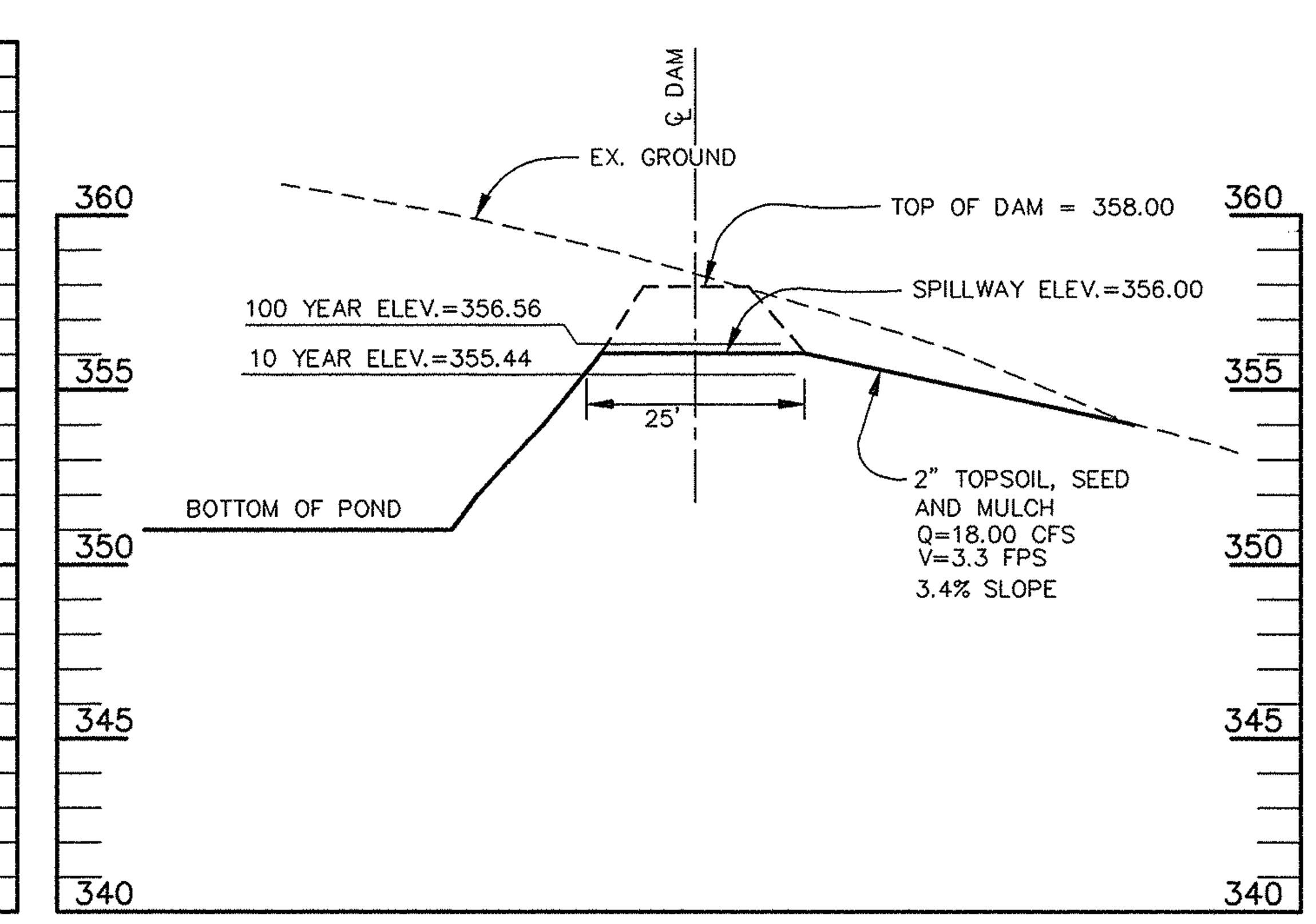
DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: 1"=50'
W.O. NO.: 96-72

F-98-151



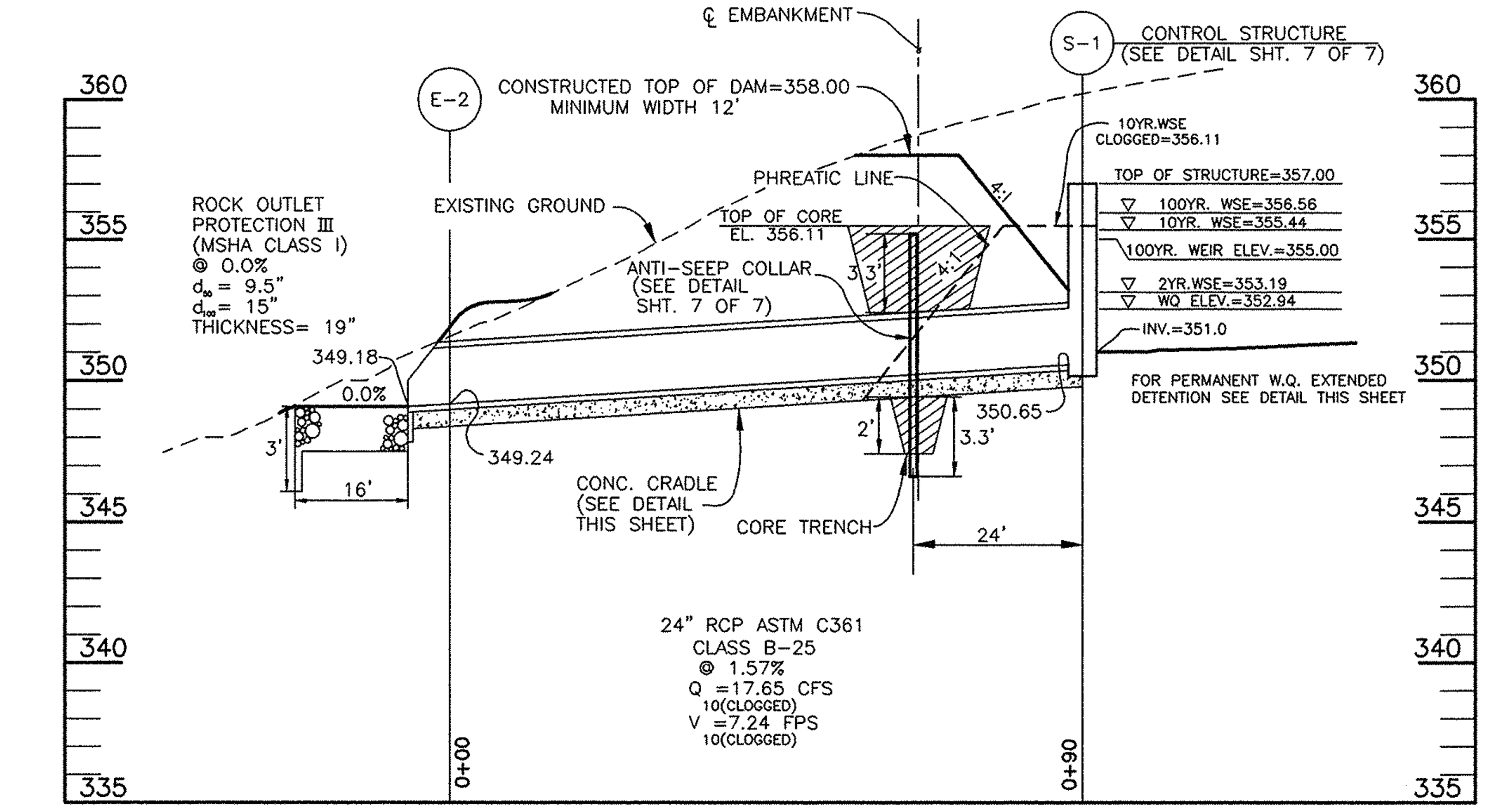
PROFILE ALONG ℄ OF EMBANKMENT

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



SECTION 'A-A'
EMERGENCY SPILLWAY PROFILE

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



CROSS SECTION THROUGH PRINCIPAL SPILLWAY

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

STORMWATER MANAGEMENT POND CONSTRUCTION SPECIFICATIONS

I. SITE PREPARATION

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES,VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1.

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 50 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.

II. EARTH FILL

MATERIAL

THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6", FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT AND CUT OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH, OR CL CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGN AND CONSTRUCTION ARE SUPERVISED BY A GEOTECHNICAL ENGINEER.

PLACEMENT

AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN 8-INCH MAXIMUM THICKNESS (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 THE 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 SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT.

WHERE A MINIMUM REQUIRED DENSITY IS SPECIFIED, IT 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.

CUTOFF TRENCH

THE CUTOFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE BOTTOM WIDTH OF THE TRENCH SHALL BE GOVERNED BY THE EQUIPMENT USED FOR EXCAVATION, WITH THE MINIMUM WIDTH BEING FOUR FEET. THE DEPTH SHALL BE AT LEAST FOUR FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1 TO 1 OR FLATTER. THE BACKFILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY.

III. STRUCTURAL 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 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.

IV. PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

A. CORRUGATED METAL PIPE-ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR CORRUGATED METAL PIPE:

1. MATERIALS - (STEEL PIPE) - THIS PIPE AND ITS APPURTENANCES SHALL BE GALVANIZED AND FULLY BITUMINOUS COATED AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-190 TYPE A WITH WATERTIGHT COUPLING BANDS. ANY BITUMINOUS COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND.
   STEEL PIPES WITH POLYMERIC COATING SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (10 MIL) ON BOTH SIDES OF THE PIPE. THE FOLLOWING COATINGS OR AN APPROVED EQUAL MAY BE USED: NEXON, PLASTI-COTE, BLAC-KLAD, AND BETH-CU-LOY. COATED CORRUGATED STEEL PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M-245 AND M-246.

   MATERIALS - (ALUMINUM COATED STEEL PIPE) - THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATION M-274 WITH WATERTIGHT COUPLING BANDS OR FLANGES. ANY ALUMINUM COATING DAMAGED OR OTHERWISE REMOVED SHALL BE REPLACED WITH COLD APPLIED BITUMINOUS COATING COMPOUND.

   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 SURFACES THAT ARE TO BE IN CONTACT WITH CONCRETE SHALL BE PAINTED WITH ONE COAT OF ZINC CHROMATE PRIMER. 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 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 CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BAND WIDTH. THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 48" IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE, A 12" WIDE STANDARD LAP TYE BAND WITH 12" WIDE BY 3/8" THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12" WIDE HUGGER TYPE BAND WITH O-RING GASKETS HAVING A MINIMUM DIAMETER OF 1/2" GREATER THAN THE CORRUGATION DEPTH. PIPES 48" IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24" LONG ANNULAR CORRUGATED BAND USING RODS AND LUGS. A 12" WIDE BY 3/8" THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED ON THE END OF EACH PIPE FOR A TOTAL OF 24".
   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 STRUCTURAL BACKFILL AS SHOWN ABOVE.
6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

V. 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 DESIGNATION C-361.
2. BEDDING - ALL REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN CONCRETE BEDDING FOR THEIR ENTIRE LENGTH. THIS BEDDING SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 10% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 3 INCHES, OR AS SHOWN ON THE DRAWINGS.
3. LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 2 FEET FROM THE RISER.
4. BACKFILLING SHALL CONFORM TO STRUCTURAL BACKFILL AS SHOWN ABOVE.
5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

VI. POLYVINYL CHLORIDE (PVC) PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR POLYVINYL CHLORIDE (PVC) PIPE:

1. MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241.
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 STRUCTURAL BACKFILL AS SHOWN ABOVE.
5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

VII. CONCRETE

CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 608, MIX NO. 3.

IX. CARE OF WATER DURING CONSTRUCTION

ALL WORK ON THE PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM THE VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION 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 OF REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER TO SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

VI. 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 MARYLAND SOIL CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MD-342) OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.

VII. EROSION AND SEDIMENT CONTROL

CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. CONSTRUCTION PLANS SHALL DETAIL EROSION AND SEDIMENT CONTROL MEASURES TO BE EMPLOYED DURING THE CONSTRUCTION PROCESS.

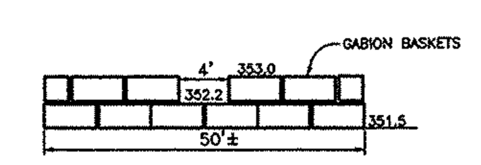
VIII. ROCK RIPRAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, AND MATERIALS, SECTION 608, MIX NO. 3

BULK SPECIFIC GRAVITY AND ABSORPTION SHALL BE DETERMINED ACCORDING TO ASTM C 127. THE TEST FOR SOUNDNESS SHALL BE PERFORMED ACCORDING TO ASTM C 88.
THE RIPRAP SHALL BE PLACED TO THE REQUIRED THICKNESS IN ONE OPERATION. THE ROCK SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THE RIPRAP IN PLACE SHALL BE HOMOGENEOUS WITH THE LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT ONE TO ANOTHER WITH THE SMALLER ROCKS FILLING THE VOIDS BETWEEN THE LARGER ROCKS. FILTER CLOTH 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 919.12.

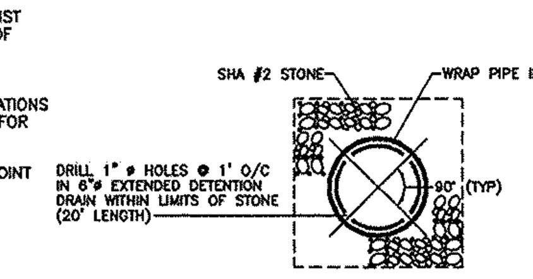
PIPE SCHEDULE

SIZE	TYPE/CLASS	LENGTH
15"	RCCP/CLASS IV	260 LF
18"	RCCP/CLASS IV	216
24"	RCCP/CLASS IV	34 LF
24"	RCCP ASTM C361/ CLASS B-25	90 LF



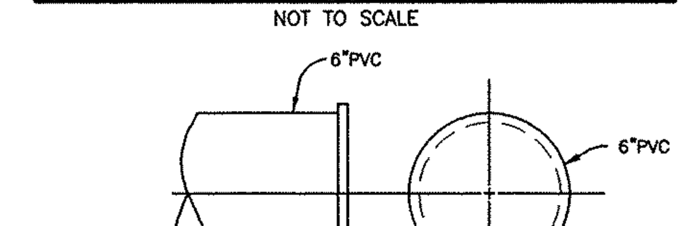
SECTION ALONG FOREBAY

NOT TO SCALE



6" PERFORATED PIPE SECTION

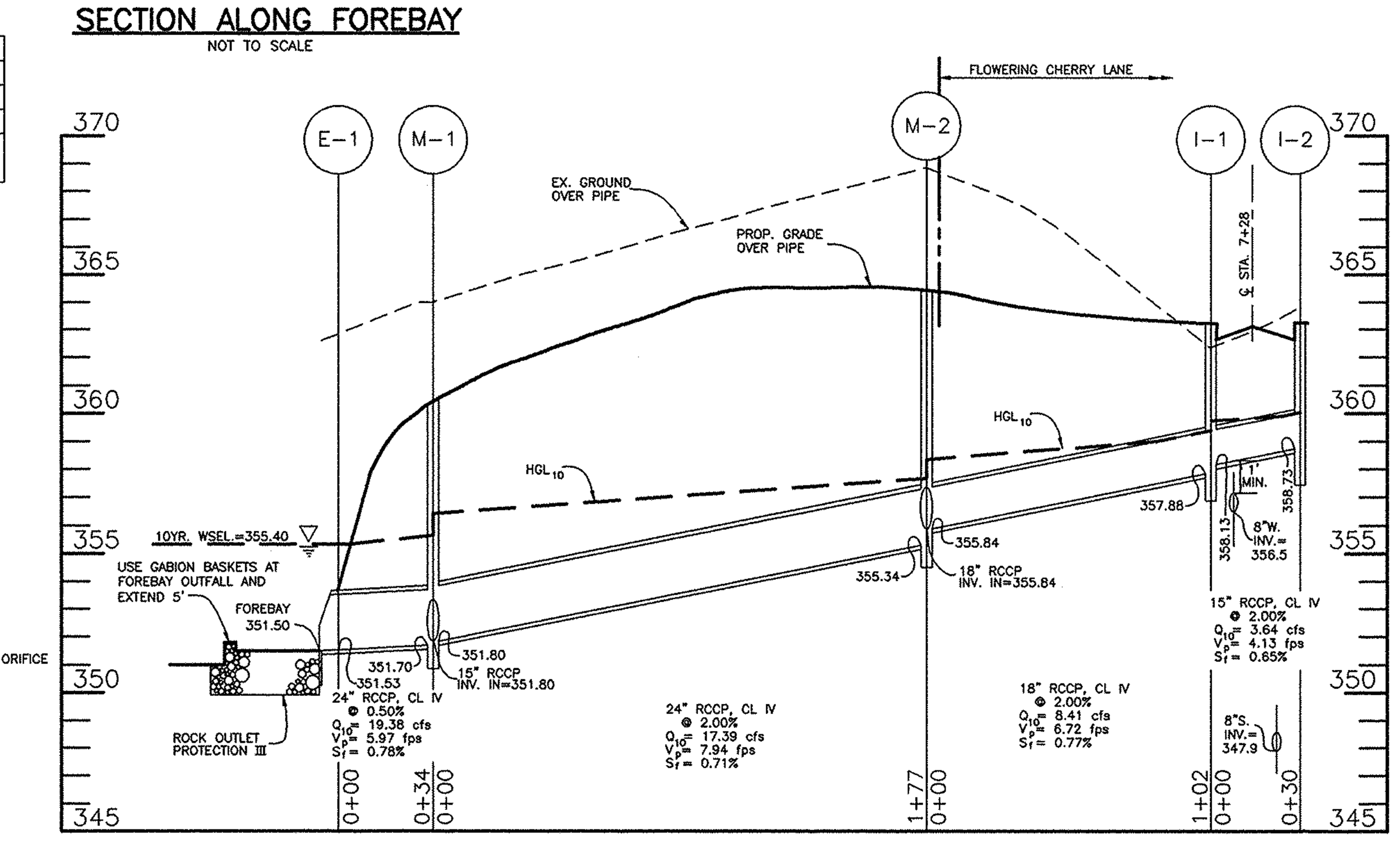
NOT TO SCALE



NOTES:
1. DO NOT INSTALL CAP WITH 3"ø ORIFICE ON INSIDE OF RISER UNTIL CONVERSION TO FINAL S.W.M. FACILITY.
2. CONVERT 6" PVC INSTALLED FOR DEWATERING DEVICE TO PERMANENT EXTENDED DETENTION PIPE(SEE DETAIL THIS SHEET).

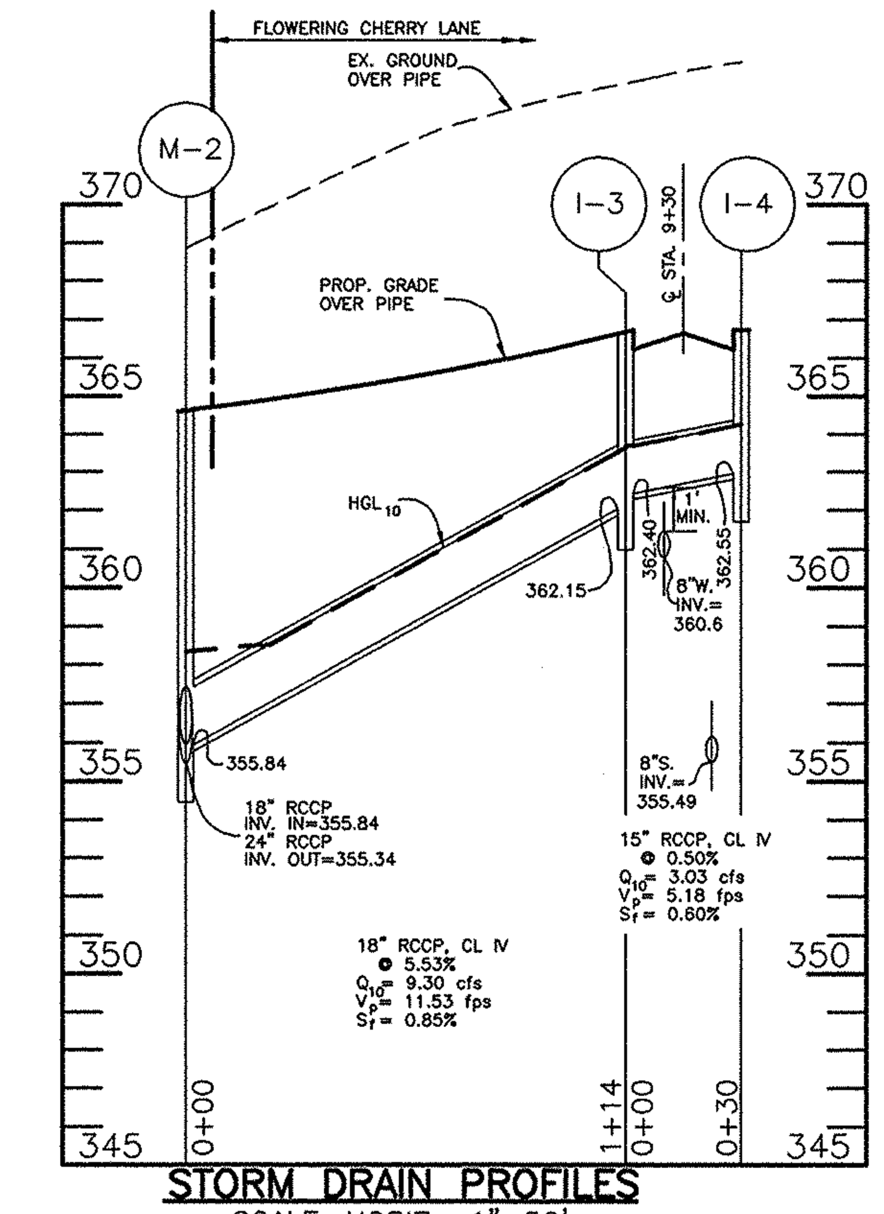
PVC OFIFICE STRUCTURE

NOT TO SCALE



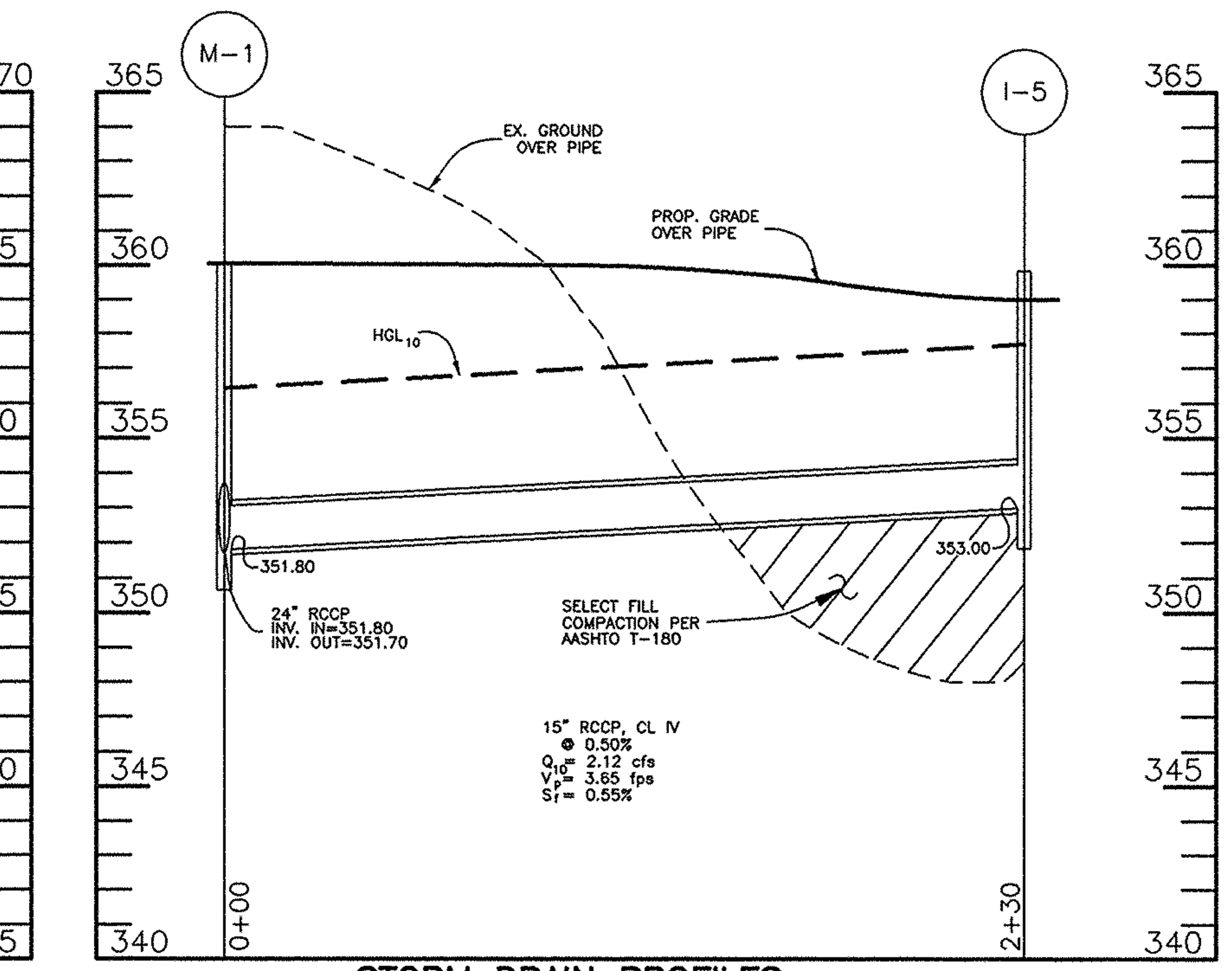
STORM DRAIN PROFILES

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



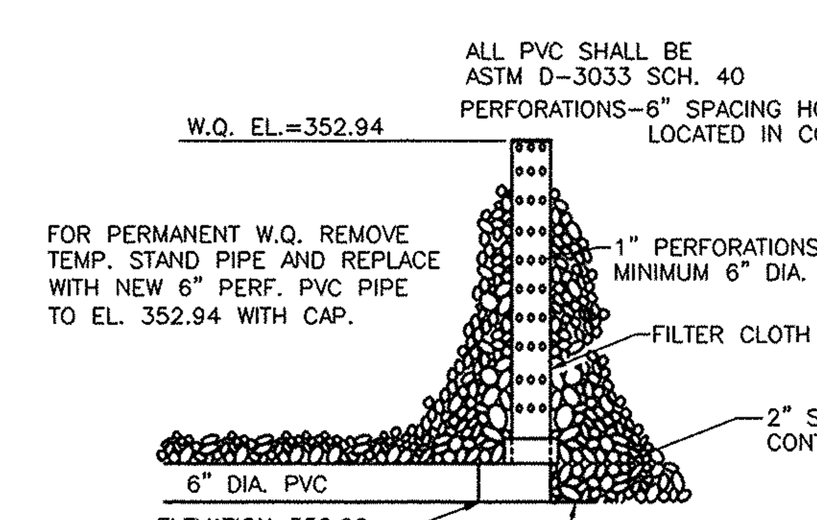
STORM DRAIN PROFILES

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



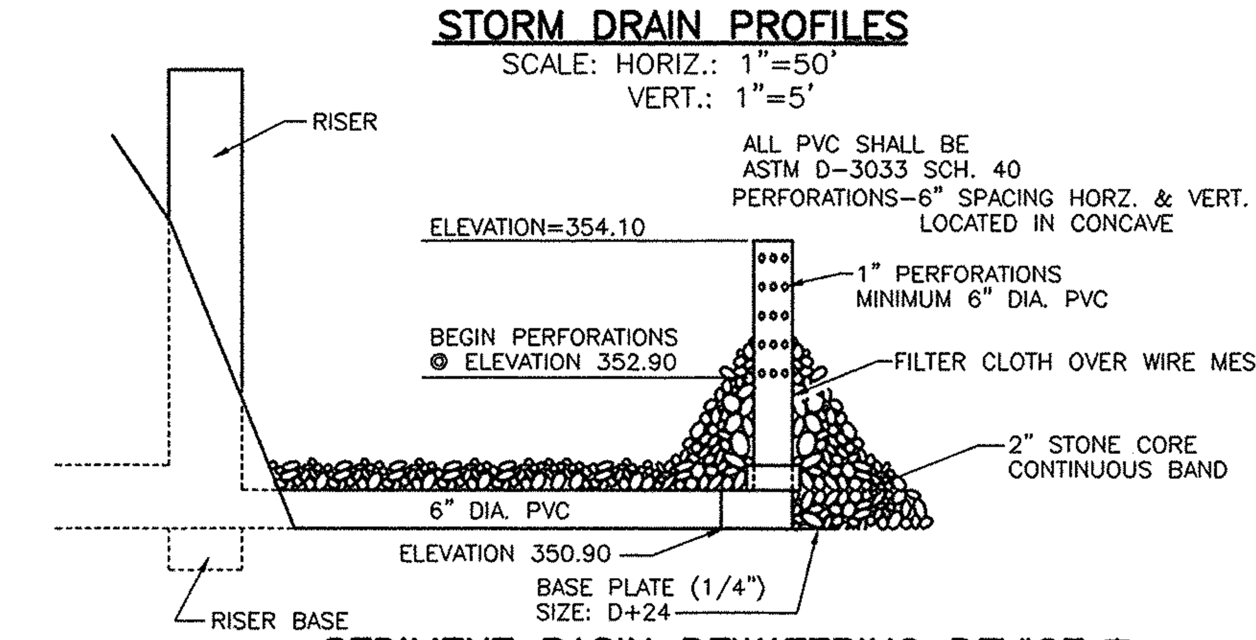
STORM DRAIN PROFILES

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



PERMANENT W.Q. EXTENDED DETENTION PIPE DETAIL

NOT TO SCALE



SEDIMENT BASIN DEWATERING DEVICE I WITH 6" PERFORATED RISER

NOT TO SCALE

"AS-BUILT" CERTIFICATION

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

ROBERT H. VOGEL, P.E. NO. 16193 DATE

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

OWNER/DEVELOPER

BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

OPERATION AND MAINTENANCE SCHEDULE FOR STORMWATER MANAGEMENT DETENTION FACILITY

STORMWATER MANAGEMENT FACILITY

ROUTINE MAINTENANCE

1. FACILITY WILL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
3. DEBRIS AND LITTER NEXT TO THE OUTLET STRUCTURE SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREAS 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 DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, INTERFERE WITH THE FUNCTION OF THE RISER, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

POND SUMMARY

	2 YEAR	10 YEAR	100 YEAR
FLOW INTO POND	9.8 c.f.s.	24.4 c.f.s.	42.4 c.f.s.
FLOW OUT OF POND	0.6 c.f.s.	4.5 c.f.s.	36.8 c.f.s.
W.S. ELEVATION	353.81	355.44	356.56
STORAGE VOLUME	0.42 AC FT	0.86 AC FT	1.52 AC FT

OPERATION, MAINTENANCE AND INSPECTION

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 MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATIONS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	INV IN	INV OUT	REMARKS
I-1	A-5 INLET(L 6.33' x W 3.83')	CL. STA. 7+28, 13' LT.	362.61TG	15"358.13	18"358.88	SD-4.40
I-2	A-5 INLET(L 6.33' x W 3.83')	CL. STA. 7+28, 13' RT.	362.61TG	-	15"358.73	SD-4.40
I-3	A-5 INLET(L 6.33' x W 3.83')	CL. STA. 9+30, 13' LT.	366.00TG	15"362.40	18"362.15	SD-4.40
I-4	A-5 INLET(L 6.33' x W 3.83')	CL. STA. 9+30, 13' RT.	366.00TG	-	15"362.55	SD-4.40
I-5	TYPE 'D' INLET	N.534434.4 E.1340686.4	359.00*	-	15"353.00	SD-4.11
M-1	MANHOLE	N.534532.2 E.1340478.2	360.50TR	15"351.80 24"351.80	24"351.70	G-5.12
M-2	MANHOLE	N.534680.7 E.1340573.7	364.50TR	18"355.84 18"355.84	24"355.34	G-5.12
E-1	CONCRETE END SECTION	N.534512.7 E.1340450.3	353.50TP	-	24"351.50	SD-5.51
E-2	CONCRETE END SECTION	N.534568.6 E.1340259.6	350.85TP	-	24"349.24	SD-5.51
S-1	MODIFIED TYPE 'D' INLET	N.534556.4 E.1340350.7	357.00	-	24"350.65	SD-4.39

NOTE: ALL STORM DRAIN PIPE TO BE RCCP CLASS IV UNLESS OTHERWISE NOTED.
TG = TOP OF GRATE
TP = TOP OF PIPE
TR = TOP OF RIM
* ELEV. AT OPENING

ENGINEERS CERTIFICATE

"I HEREBY 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."

Robert Vogel 9/30/98
SIGNATURE OF ENGINEER DATE
ROBERT H. VOGEL

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE IN ACCORDANCE 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."

9/29/98
SIGNATURE OF DEVELOPER DATE

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

/GS 10/9/98
USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

10/9/98
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

10-26-98
CHIEF, BUREAU OF HIGHWAYS HS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/29/98
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

HARDING WOODS
LOTS 1 THRU 25 AND OPEN SPACE LOTS 26 THRU 29
STORM DRAIN PROFILES AND STORMWATER MANAGEMENT DETAILS

TAX MAP #46 REFERENCE: S-97-19, P-98-12
PARCEL #65 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

VOGEL & ASSOCIATES, INC.
ENGINEERS - SURVEYORS - PLANNERS
3691 PARK AVENUE, SUITE 101
ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828
FAX: (410) 465-3966

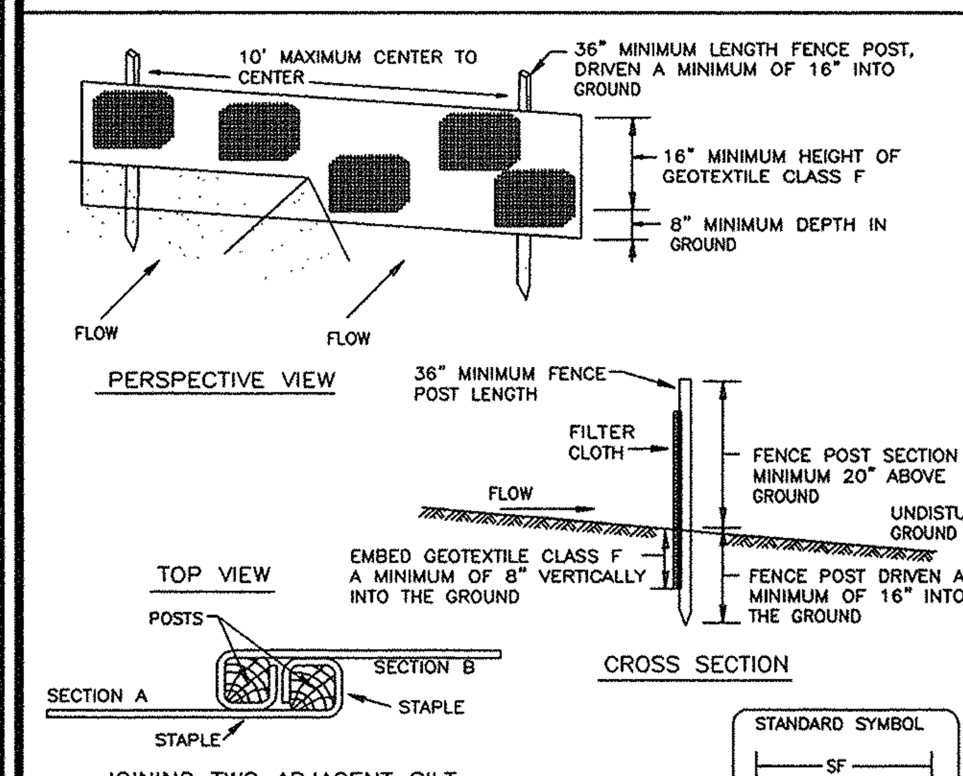
STATE OF MARYLAND ROBERT HARRIS VOGEL NO. 16193 REGISTERED PROFESSIONAL ENGINEER 9/30/98
ROBERT H. VOGEL, P.E. # 16193

DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: AS SHOWN
W.O. NO.: 96-72

SHEET 6 OF 7

F-98-151

DETAIL 22 – SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 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 weighting 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:

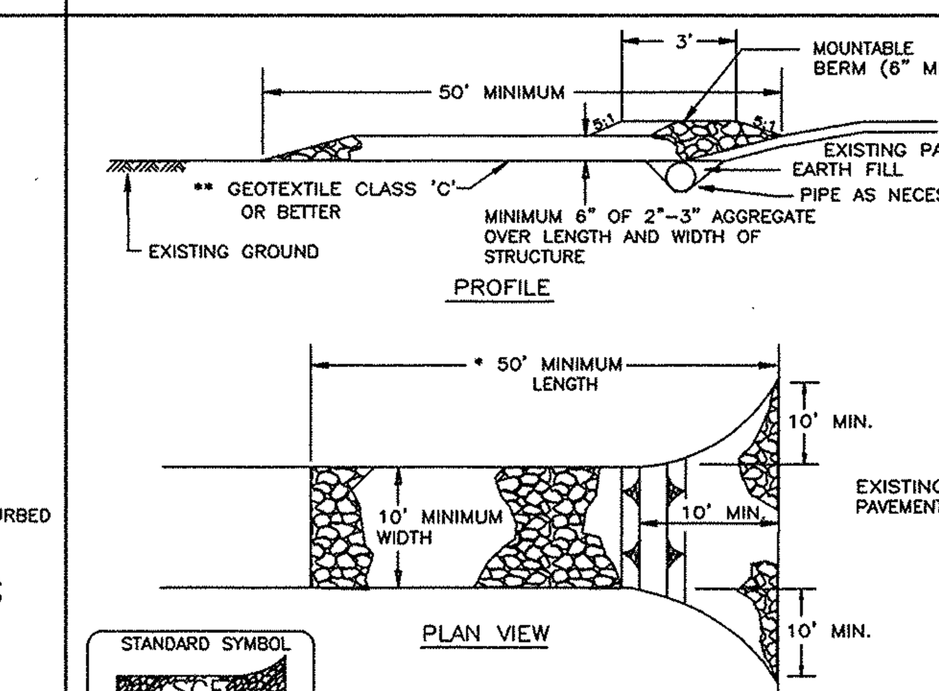
Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft² / minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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

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

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

DETAIL 24 – STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

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

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

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

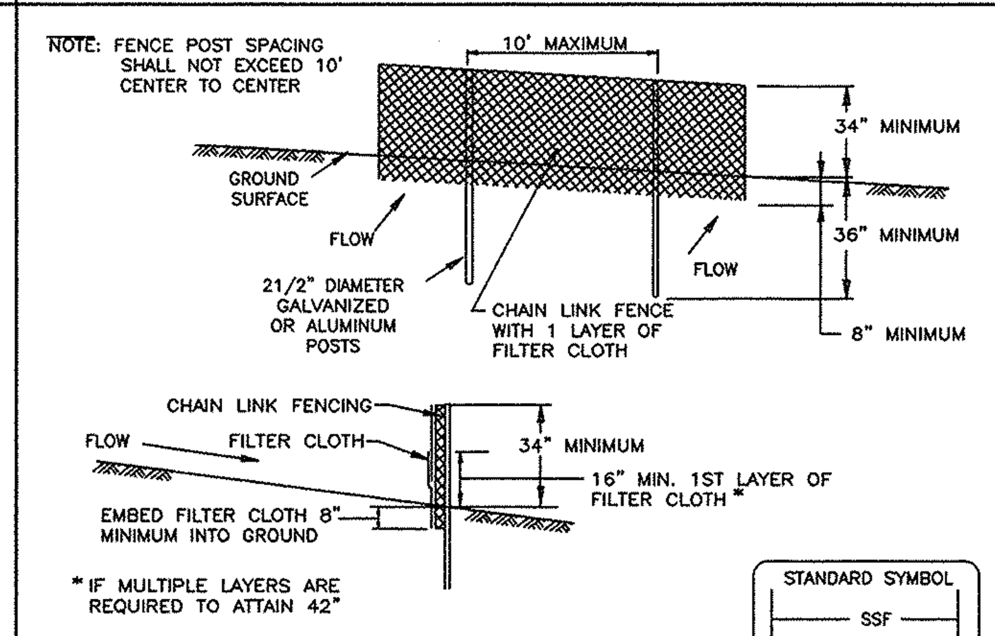
4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

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

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

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

DETAIL 33 – 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.

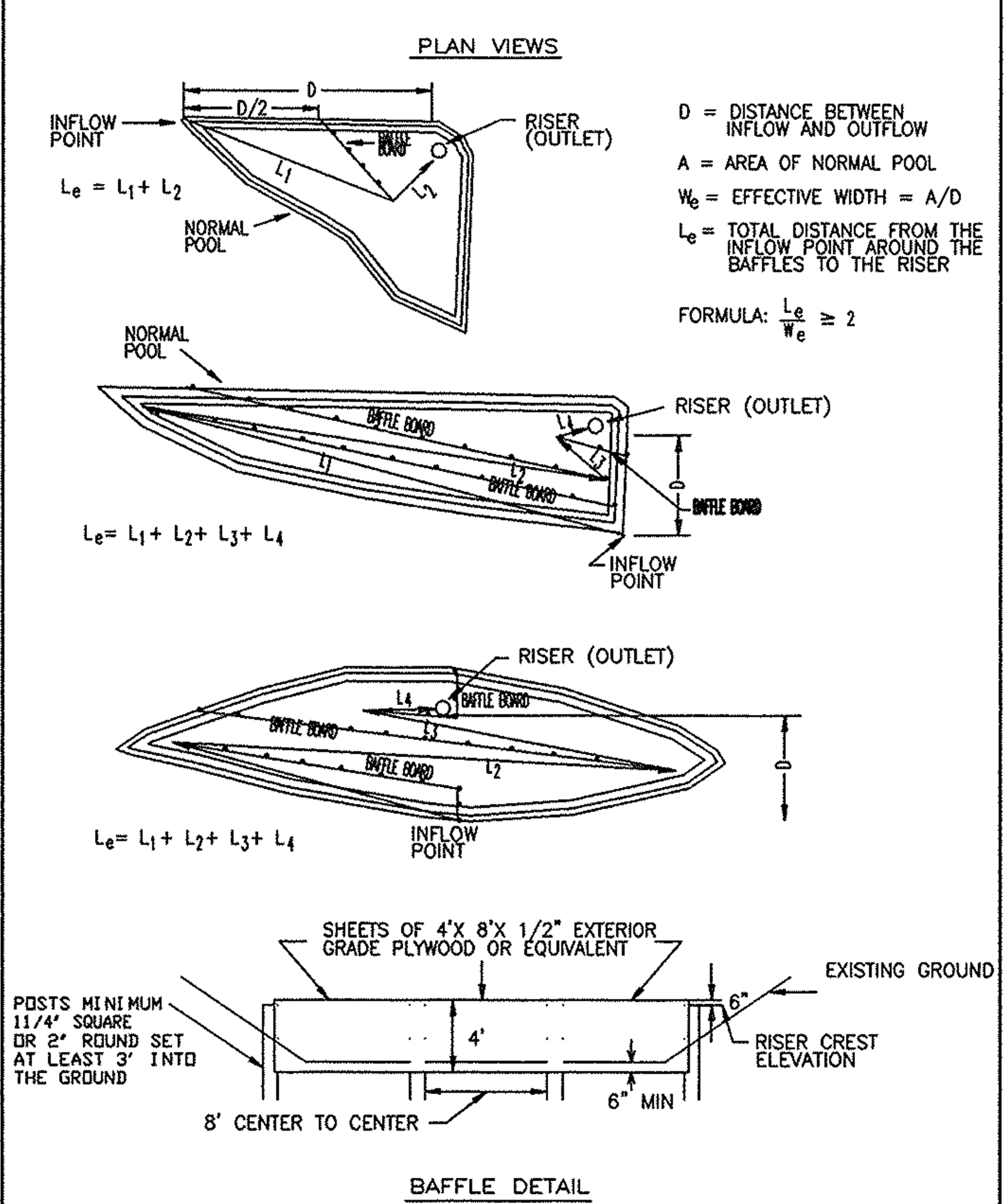
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

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:

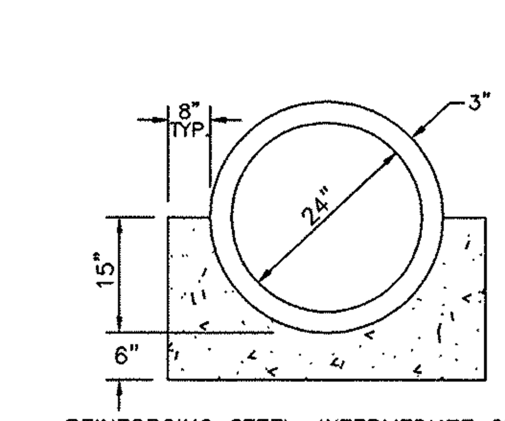
Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft²/minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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

DETAIL 18 – SEDIMENT BASIN BAFFLES



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 10 - 28	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



REINFORCING STEEL: INTERMEDIATE GRADE

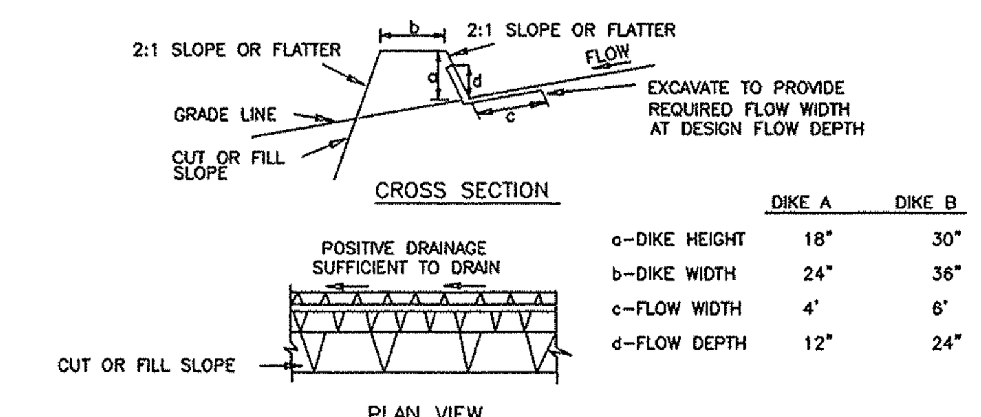
CONCRETE: CLASS B
fc'=4,000 P.S.I.
fc=1,600 P.S.I.

(REF. TR-46)

A2 PIPE CRADLE DETAIL

NOT TO SCALE

DETAIL 1 – EARTH DIKE



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

STANDARD SYMBOL
A-2 B-3

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

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

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.

5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

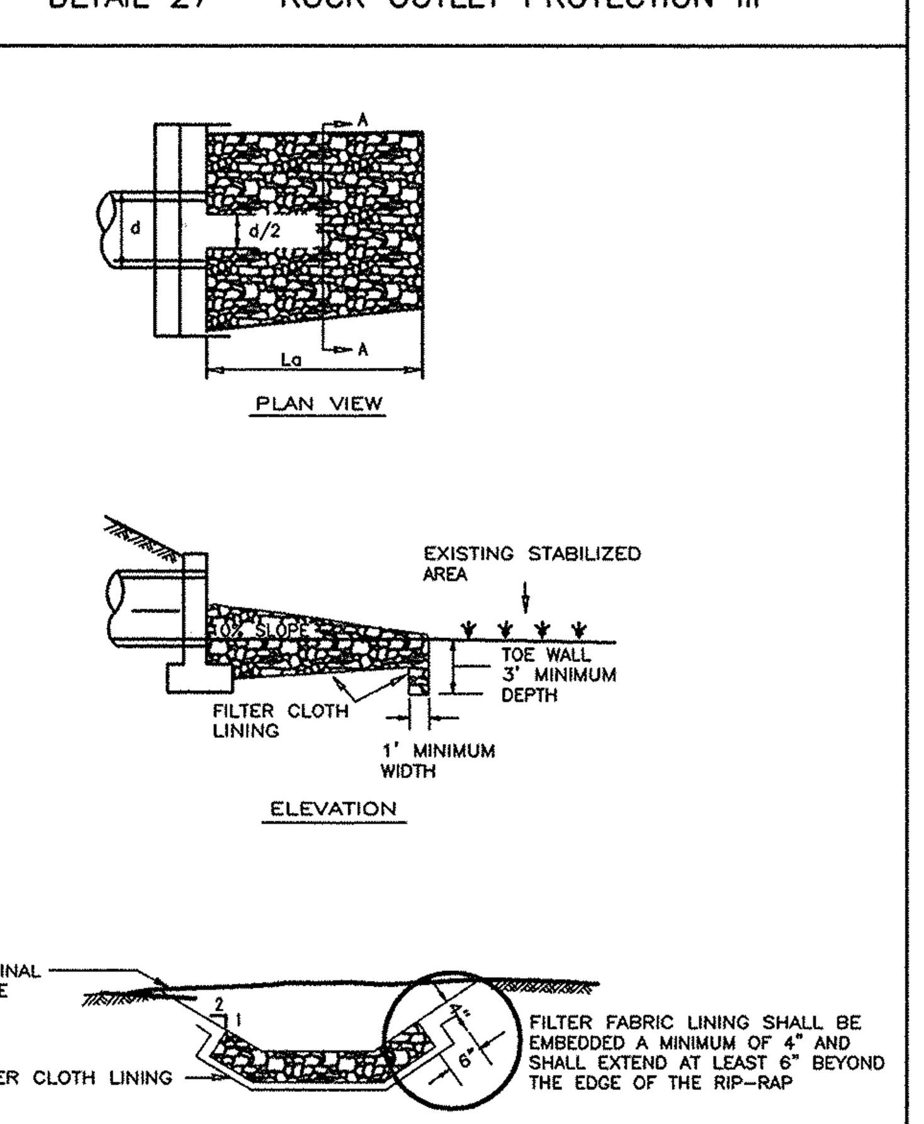
6. Fill shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.

8. Inspection and maintenance must be provided periodically and after each rain event.

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

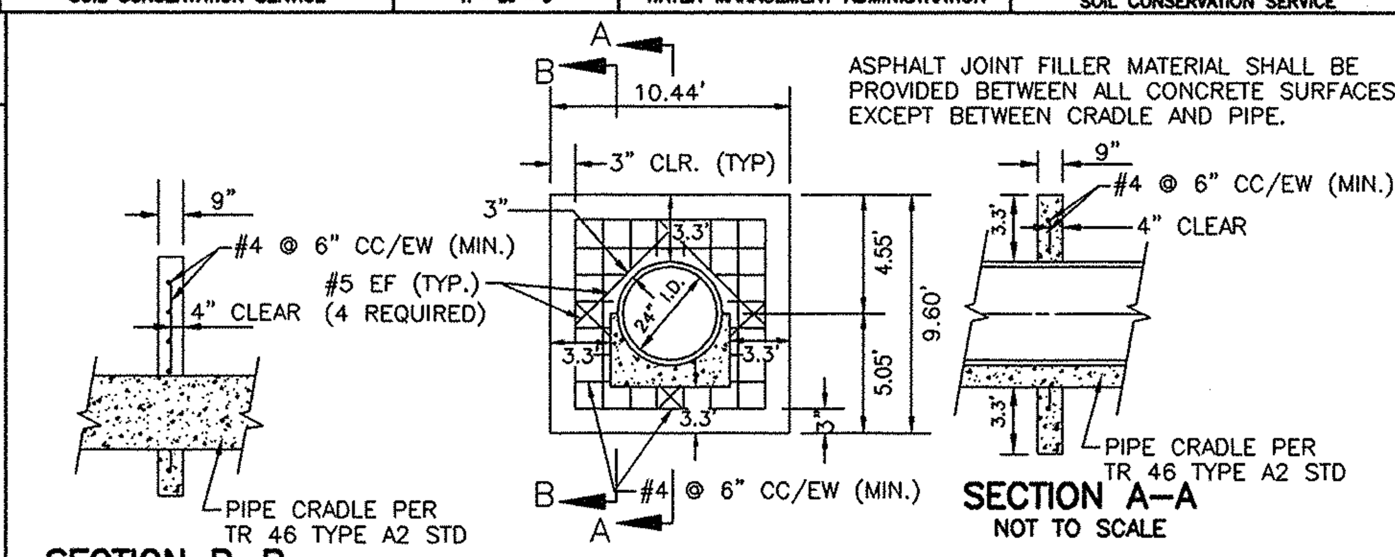
DETAIL 27 – ROCK OUTLET PROTECTION III



NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

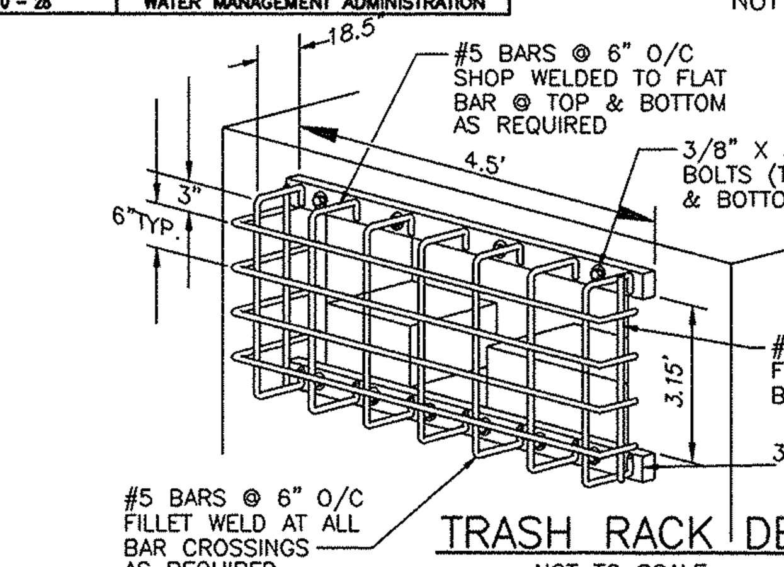
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 10	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

CONCRETE ANTI-SEEP COLLAR DETAIL



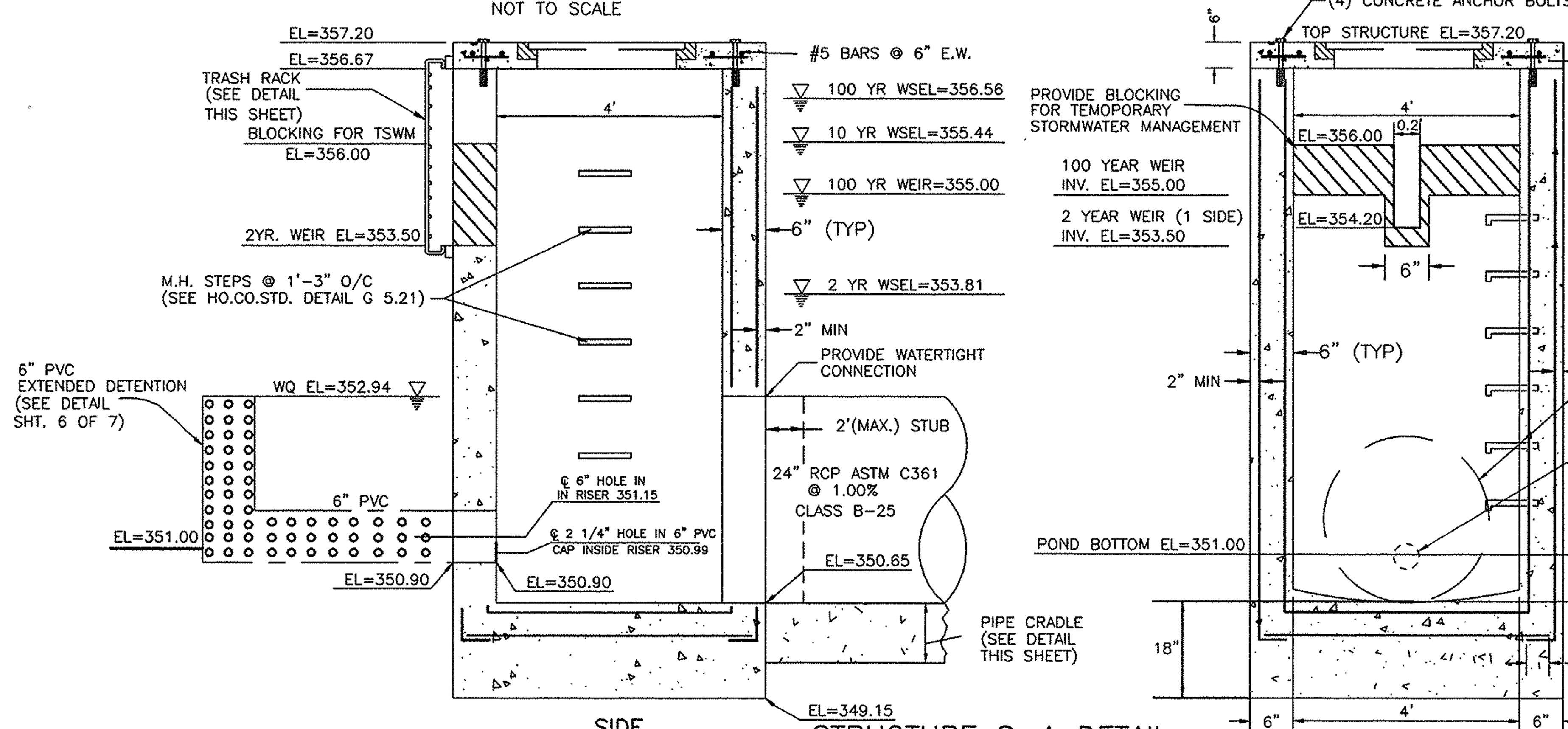
NOT TO SCALE

TRASH RACK DETAIL



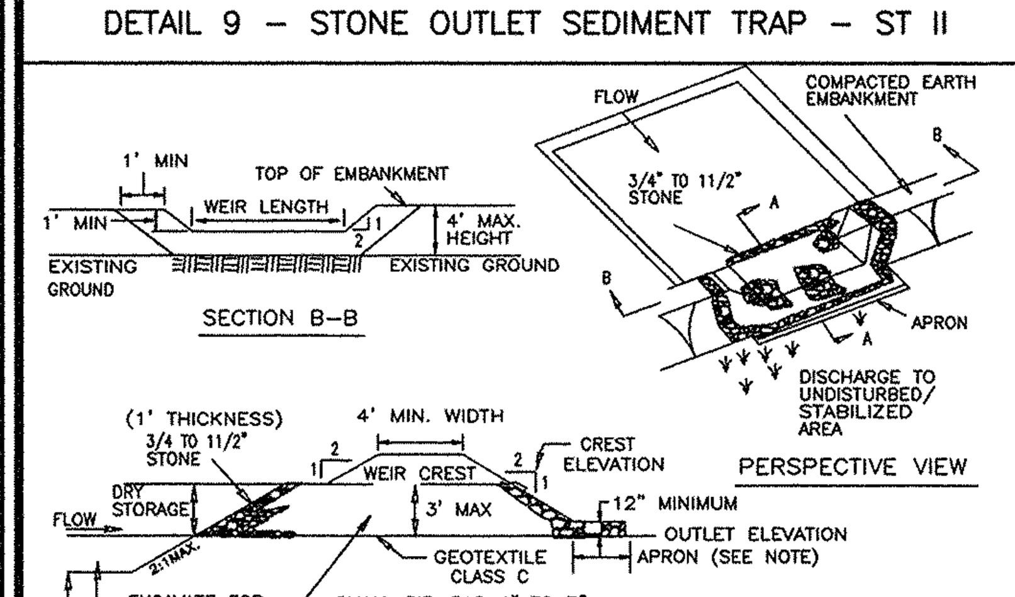
NOT TO SCALE

STRUCTURE S-1 DETAIL
MODIFIED TYPE 'D' INLET



NOT TO SCALE

DETAIL 9 – STONE OUTLET SEDIMENT TRAP – ST II



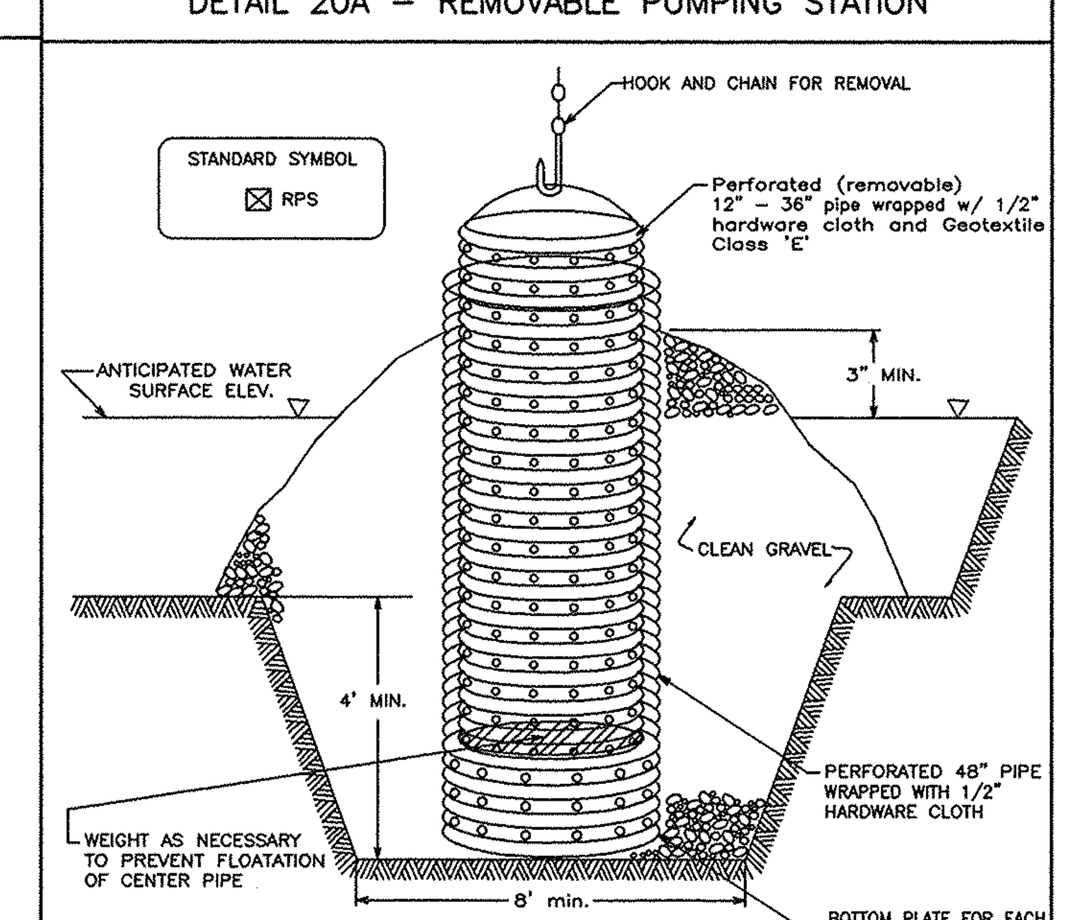
NOTE: 5' MINIMUM LENGTH UP TO 5 ACRES. OVER 5 ACRES USE STONE/RIPRAP SEDIMENT TRAP ST-IV.

Construction Specifications

1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots and other woody vegetation as well as over-sized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. All cut and fill slopes shall be 2:1 or flatter.
4. The stone used in the outlet shall be small rip-rap 4" to 7" in size with a 1' thick layer of 3/4" to 11/2" washed aggregate placed on the upstream face of the outlet. Stone facing shall be as necessary to prevent clogging. Geotextile Class C may be substituted for the stone facing by placing it on the inside face of the stone outlet.
5. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to one half of the wet storage depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
6. the structure shall be inspected periodically after each rain and repairs made as needed.
7. Construction of traps shall carried out in such a manner that sediment pollution is abated. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. Points of concentration inflow shall be protected in accordance with Grade Stabilization Structure criteria. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap.
8. The structure shall be dewatered by approved methods, removed and the area stabilized when the drainage area has been properly stabilized.
9. Refer to section D for specifications concerning trap dewatering.
10. Minimum trap depth shall be measured from weir elevation.
11. The elevation of the top of any dike directing water into the trap must equal or exceed the elevation of the trap embankment.
12. Geotextile Class C shall be placed over the bottom and sides of the outlet channel prior to the placement of stone. Sections of filter cloth must overlap at least 1' with the section nearest the entrance placed on top. The filter cloth shall be embedded at least 6" into existing ground at the entrance of the outlet channel.
13. Outlet–An outlet shall be provided, including a means of conveying the discharge in an erosion free manner to an existing stable channel.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 9 - 10	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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 E.

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

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

BLAISDELL\FINAL\DETAIL6

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

DEFINITION

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

PURPOSE

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

CONDITION WHERE PRACTICE APPLIES

I. This practice is limited to areas having 2:1 or flatter slopes where:
   a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. The original soil to be vegetated contains material toxic to plant growth.
   d. The soil is so acidic that treatment with limestone is not feasible.

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

CONSTRUCTION AND MATERIAL SPECIFICATIONS

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agriculture 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 textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2 " in diameter.
   ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.
   iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

II. For sites having disturbed areas under 5 acres:
   i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I – Vegetative Stabilization Methods and Material.

III. For sites having disturbed areas over 5 acres:
   i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
      a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be perscribed to raise the pH to 6.5 or higher.
      b. Organic content of topsoil shall not be 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 a 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 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.

SEQUENCE OF CONSTRUCTION

1. Obtain grading permit. Installation and inspection of tree protection fence to be done prior to commencement of grading.
2. Notify Howard County Bureau Of Inspections and Permits (410-313-1880) at least 24 hours before starting any work.
3. Construct Stabilized Construction Entrances....................1 day
4. Clear and grub site....................3 days
5. Install sediment control devices(silt fence, super silt fence, earth dikes, sediment traps and construct TSWM facility with temp. blocking and dewatering device....................5 days
6. Rough grade for road construction and areas east of proposed road(lots 18-25)....................1 week
7. Stabilize area of lots(18-25) and install storm drain, water and sewer systems....................3 weeks
8. Begin constructing curb and gutter, sidewalk and road paving...2 weeks
9. Rough grade remaining areas within LOD. Remove sediment trap no. 3 and utilize storm drain system to divert sediment to TSWM facility ....4 days
10. Stabilize remaining disturbed areas of the site....................1 week
11. With site stabilized, flush stormdrain system and convert sediment basin to final stormwater management facility by replacing dewatering device with extended detention pipe. Install 6" cap with 2 1/4" hole at inv. 350.90 inside riser. Remove temp. blocking and grade top of dam to el. 358.00.......4 days
12. As stormwater management pond is stabilized, install pond landscaping as shown in Schedule 'D' and perimeter landscaping as shown in Schedule 'A'. See sheet 4 for Schedule tables.................... 2 days
13. During grading and after each rainfall, the contractor shall inspect and provide the necessary maintenance on the sediment and erosion control measures shown hereon.
14. Following initial soil disturbance or redisturbance permanent or temporary stabilization shall be complied with: A. 7 calendar days for all perimeter sediment control structures, dikes, swales, ditch perimeter slopes slopes and all slopes greater than 3:1.
    B. 14 calendar days for all other disturbed areas.
15. Upon stabilization of all disturbed areas and with the approval of the sediment control inspector, remove all sediment control devices.

TEMPORARY SEEDING

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 periods March 1 thru April 30 and from August 15 thru November 15, seed with 2 1/2 bushel per acre of annual rye (3.2 lbs./1000 sq. ft.). For the period May 1 thru August 14, seed with 3 lbs. per acre of weeping lovegrass (.07 lbs./1000 sq. ft.). For the period November 16 thru 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 gal. per acre (5 gal./1000 sq. ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gal. per acre (8 gal./1000 sq. ft.) for anchoring.

Refer to the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for rate and methods not covered.

PERMANENT SEEDING NOTES

Apply to graded or cleared areas not subject to immediate further disturbance where a permanent, long-lived vegetative cover is needed.

Seedbed Preparation: Loosen upper 3 inches of soil by raking, discing, or other acceptable means before seeding, if not previously loosened.

Soil Amendments: Use one 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 3 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./1000sq. 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 thru April 30 and August 1 thru October 15, seed with 60lbs. per acre (1.4 lbs./1000 sq. ft.) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs. 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 thru 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 Kentucky 31 Tall Fescue, and mulch with 2 tons per acre well anchored straw.

Mulching: Apply 1 1/2 to 2 tons per acre (70-90 lbs./1000 sq. ft.) of un-rotted 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 emulcified 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.

SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspection, License and Permits Sediment Control Division prior to the start of any construction (313-1855).

2. All vegetation and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. and revisions thereto.

3. Following initial soil disturbance or 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 7, HOWARD COUNTY DESIGN MANUAL, Storm Drainage.

5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding, and mulching (Sec. G). Temporary stabilization with mulch alone shall 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	20.51 acres
Area Disturbed	11.55 acres
Area to be roofed or paved	0.89 acres
Area to be vegetatively stabilized	10.66 acres
Total Cut	27423 cu. yds.
Total Fill	27294 cu. yds.
Offsite waste/borrow area location	(To be determined by contractor, with pre-approval of the Sediment Control Inspector with an approved and active grading permit)

8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.

9. Additional sediment controls must be provided, if deemed necessary by the Howard County Sediment Control Inspector.

10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.

11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized within one working day, whichever is shorter.

OWNER/DEVELOPER

BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

ENGINEERS CERTIFICATE

"I HEREBY 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."

Robert Vogel 9/30/98
SIGNATURE OF ENGINEER DATE
ROBERT H. VOGEL

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE IN ACCORDANCE 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."

9/29/98
SIGNATURE OF DEVELOPER DATE

"AS-BUILT" CERTIFICATION

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

ROBERT H. VOGEL, P.E. NO. 16193 DATE

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

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

Cheryl Simmons /cs. 10/9/98
USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

10/9/98
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

10-26-98
CHIEF, BUREAU OF HIGHWAYS HS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/29/98
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

10/28/98
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	REVISION	DATE

HARDING WOODS
LOTS 1 THRU 25 AND OPEN SPACE LOTS 26 THRU 29
STORMWATER MANAGEMENT AND SEDIMENT CONTROL NOTES AND DETAILS

TAX MAP #46 REFERENCE: S-97-19, P-98-12
PARCEL #65 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

VOGEL & ASSOCIATES, INC.
ENGINEERS – SURVEYORS – PLANNERS
3691 PARK AVENUE, SUITE 101 ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828 FAX: (410) 465-3966

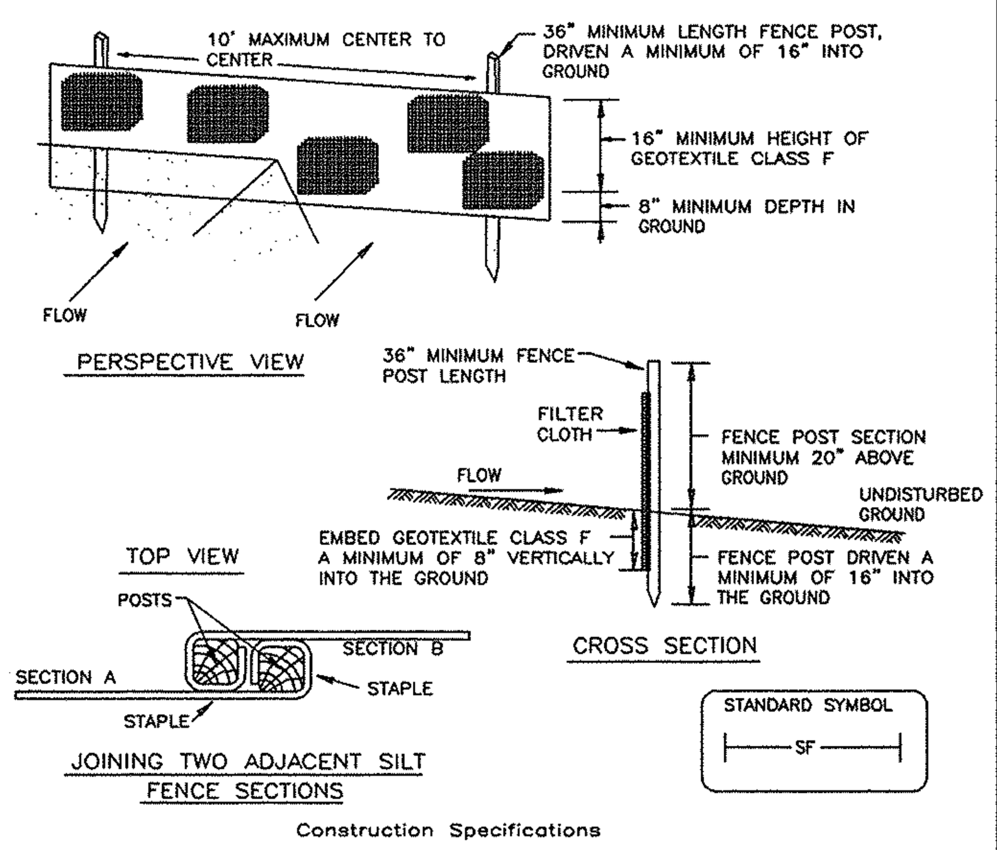
STATE OF MARYLAND – ROBERT HARRIS VOGEL – No. 16193 – REGISTERED PROFESSIONAL ENGINEER – 9/30/98
ROBERT H. VOGEL, P.E. # 16193

DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: AS SHOWN
W.O. NO.: 96-82

SHEET 7 OF 7

F-98-151

DETAIL 22 – SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 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 weighting 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:

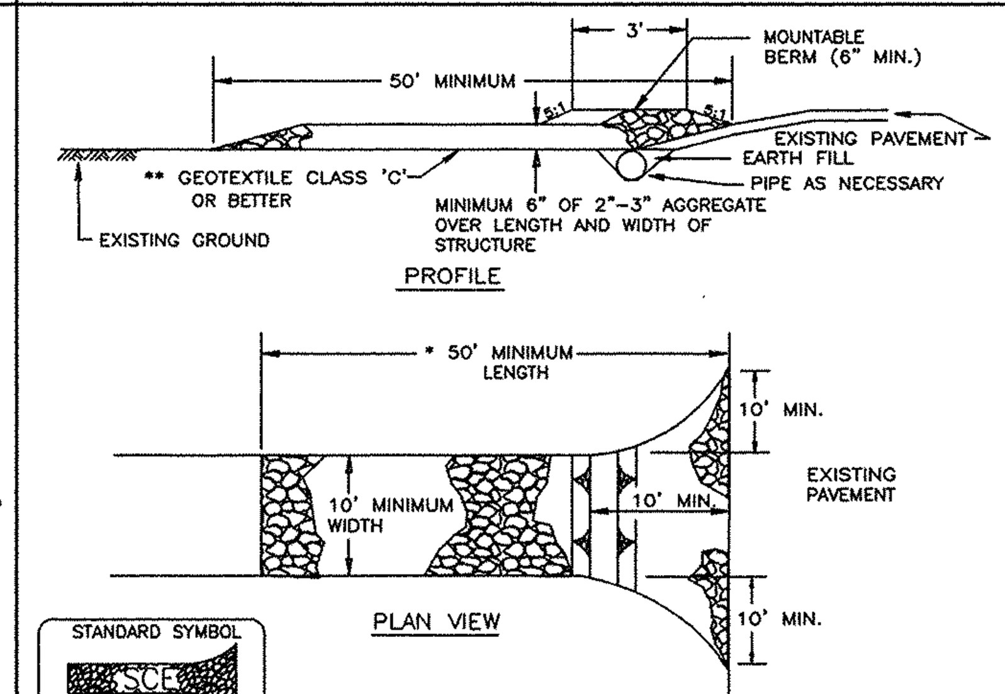
Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft² / minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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

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

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

DETAIL 24 – STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

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

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

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

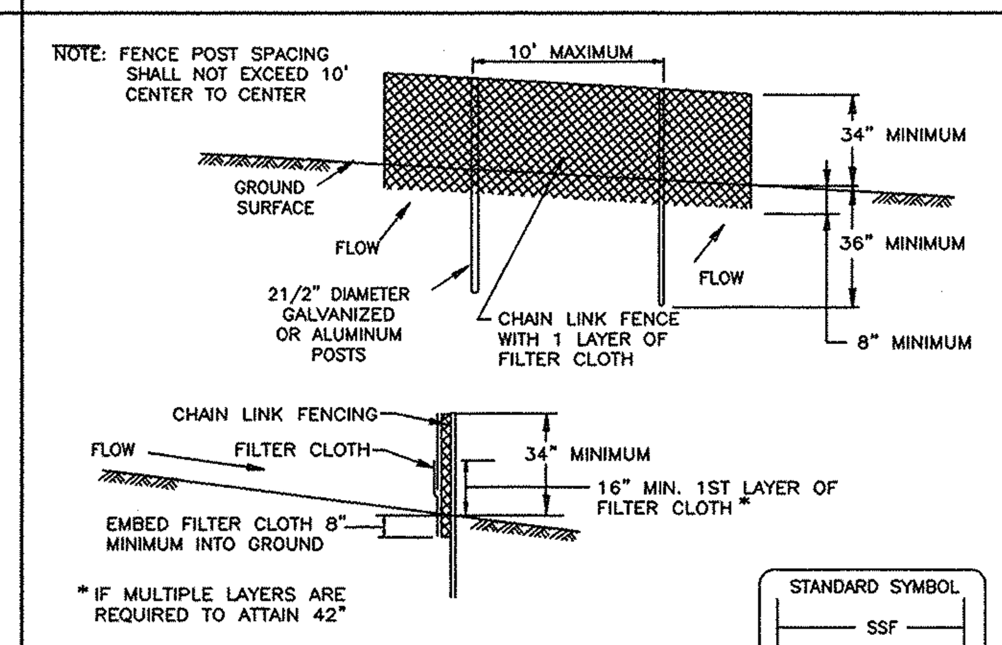
4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

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

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

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

DETAIL 33 – 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.

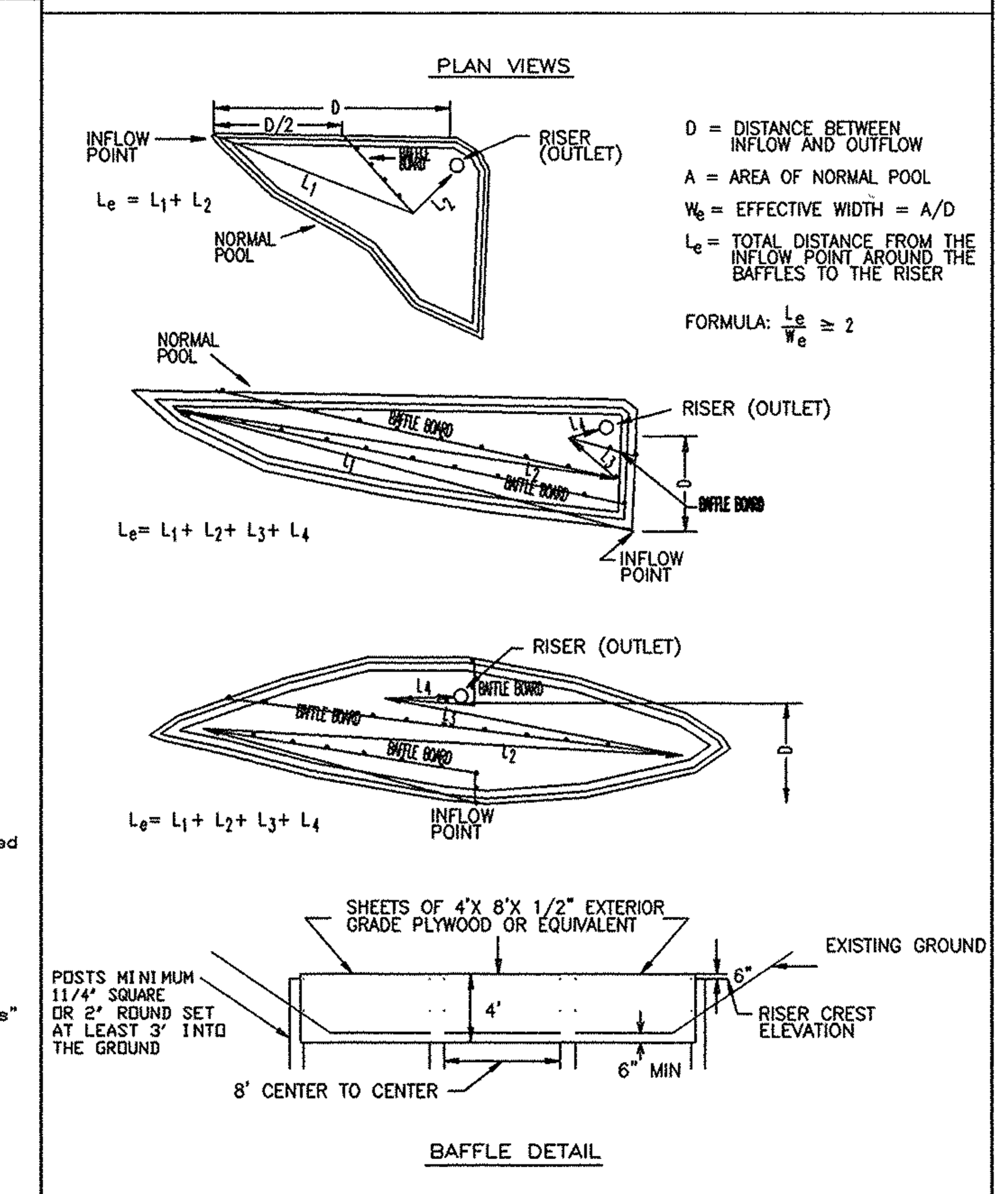
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height

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:

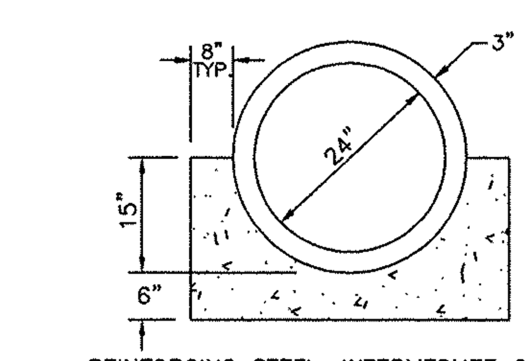
Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft²/minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 28 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 18 – SEDIMENT BASIN BAFFLES



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 10 - 28	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



REINFORCING STEEL: INTERMEDIATE GRADE

CONCRETE: CLASS B
fc'=4,000 P.S.I.
fc=1,600 P.S.I.

(REF. TR-46)

A2 PIPE CRADLE DETAIL

NOT TO SCALE

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

DEFINITION

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

PURPOSE

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

CONDITION WHERE PRACTICE APPLIES

I. This practice is limited to areas having 2:1 or flatter slopes where:
   a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
   b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
   c. The original soil to be vegetated contains material toxic to plant growth.
   d. The soil is so acidic that treatment with limestone is not feasible.

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

CONSTRUCTION AND MATERIAL SPECIFICATIONS

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agriculture 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 textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2" in diameter.
   ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.
   iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

II. For sites having disturbed areas under 5 acres:
   i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization – Section I – Vegetative Stabilization Methods and Material.

III. For sites having disturbed areas over 5 acres:
   i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
      a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be perscribed to raise the pH to 6.5 or higher.
      b. Organic content of topsoil shall not be 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 a 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 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.

TEMPORARY SEEDING

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 periods March 1 thru April 30 and from August 15 thru November 15, seed with 2 1/2 bushel per acre of annual rye (3.2 lbs./1000 sq. ft.). For the period May 1 thru August 14, seed with 3 lbs. per acre of weeping lovegrass (.07 lbs./1000 sq. ft.). For the period November 16 thru 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 gal. per acre (5 gal./1000 sq. ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gal. per acre (8 gal./1000 sq. ft.) for anchoring.

Refer to the 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for rate and methods not covered.

PERMANENT SEEDING NOTES

Apply to graded or cleared areas not subject to immediate further disturbance where a permanent, long-lived vegetative cover is needed.

Seedbed Preparation: Loosen upper 3 inches of soil by raking, discing, or other acceptable means before seeding, if not previously loosened.

Soil Amendments: Use one 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 3 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./1000sq. 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 thru April 30 and August 1 thru October 15, seed with 60lbs. per acre (1.4 lbs./1000 sq. ft.) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs. 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 thru 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 Kentucky 31 Tall Fescue, and mulch with 2 tons per acre well anchored straw.

Mulching: Apply 1 1/2 to 2 tons per acre (70-90 lbs./1000 sq. ft.) of un-rotted 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 emulcified 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.

SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspection, License and Permits Sediment Control Division prior to the start of any construction (313-1855).

2. All vegetation and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. and revisions thereto.

3. Following initial soil disturbance or 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 7, HOWARD COUNTY DESIGN MANUAL, Storm Drainage.

5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding, and mulching (Sec. G). Temporary stabilization with mulch alone shall 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	20.51	acres
Area Disturbed	11.55	acres
Area to be roofed or paved	0.89	acres
Area to be vegetatively stabilized	10.66	acres
Total Cut	27423	cu. yds.
Total Fill	27294	cu. yds.
Offsite waste/borrow area location	(To be determined by contractor, with pre-approval of the Sediment Control Inspector with an approved and active grading permit)	

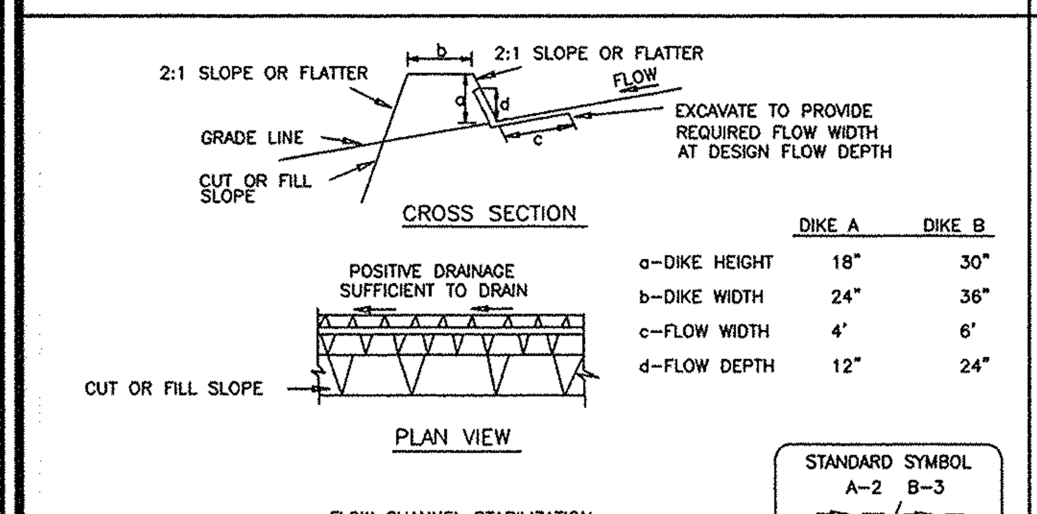
8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.

9. Additional sediment controls must be provided, if deemed necessary by the Howard County Sediment Control Inspector.

10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.

11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized within one working day, whichever is shorter.

DETAIL 1 – EARTH DIKE



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

STANDARD SYMBOL
A-2 B-3

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

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

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non-erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.

5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

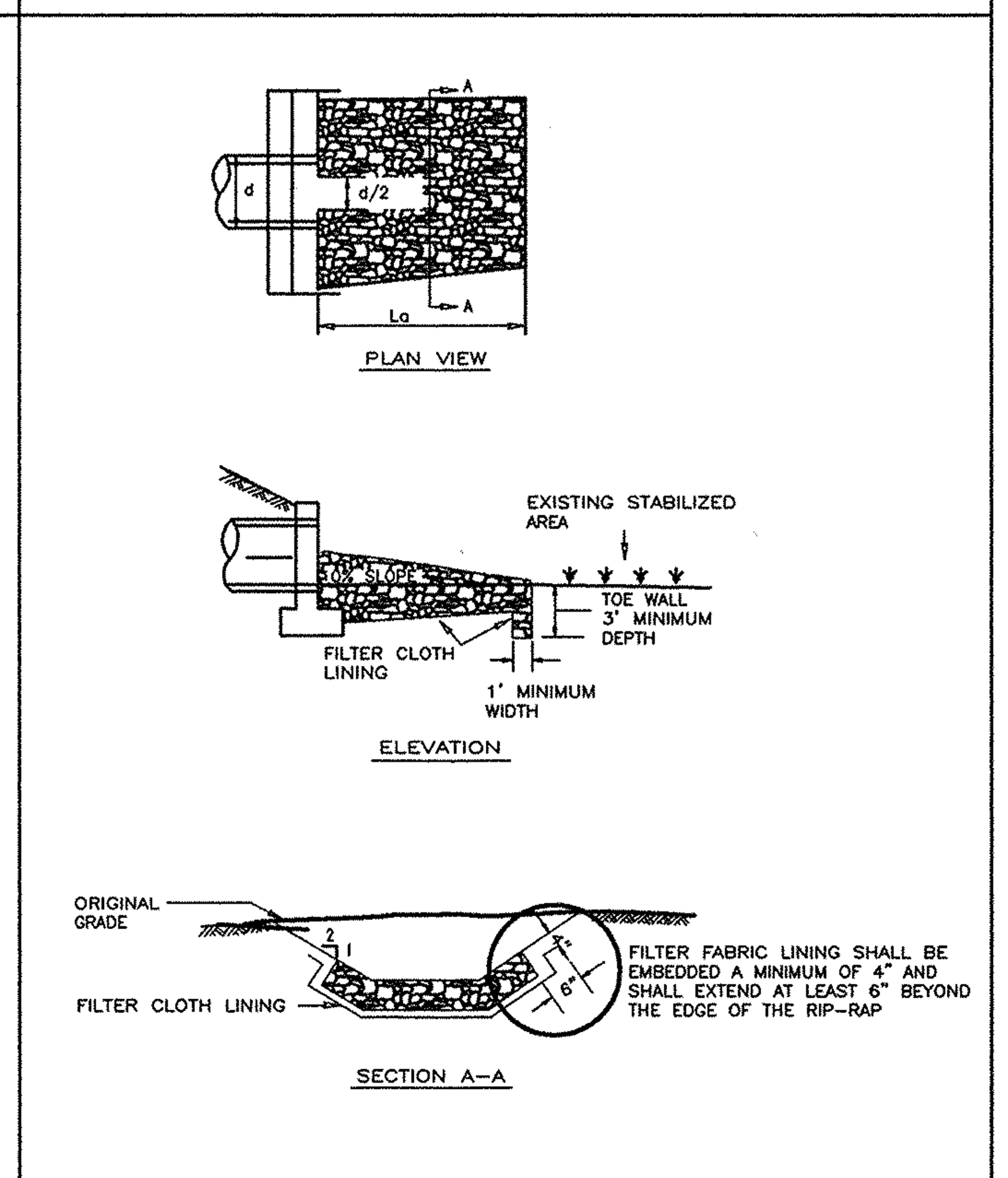
6. Fill shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.

8. Inspection and maintenance must be provided periodically and after each rain event.

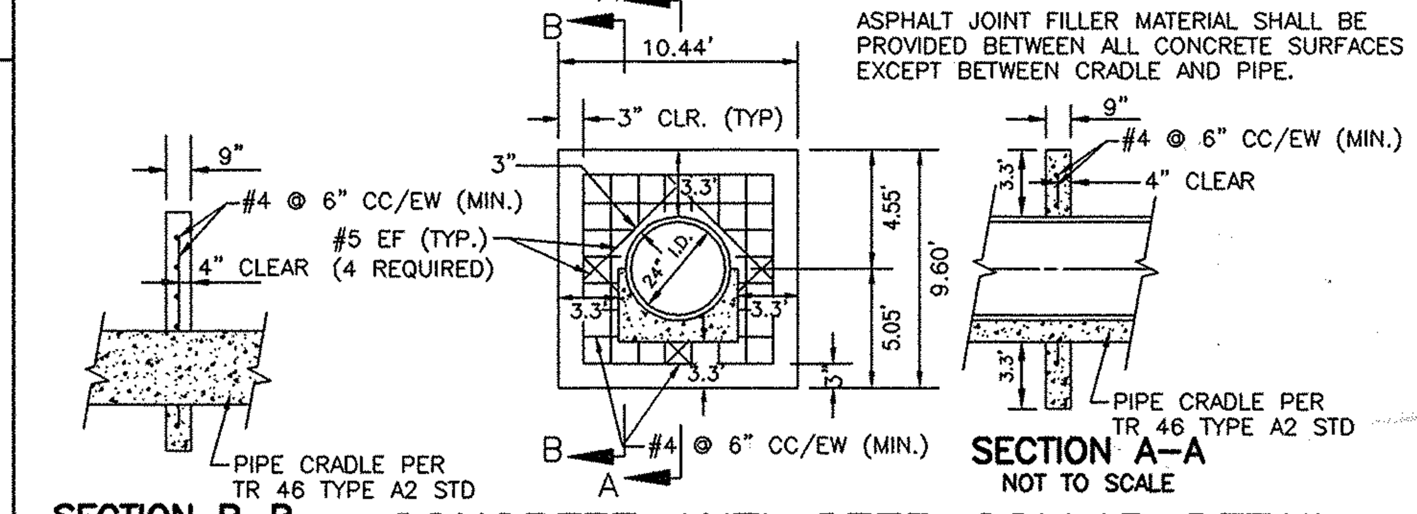
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE A - 1 - 6	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 27 – ROCK OUTLET PROTECTION III



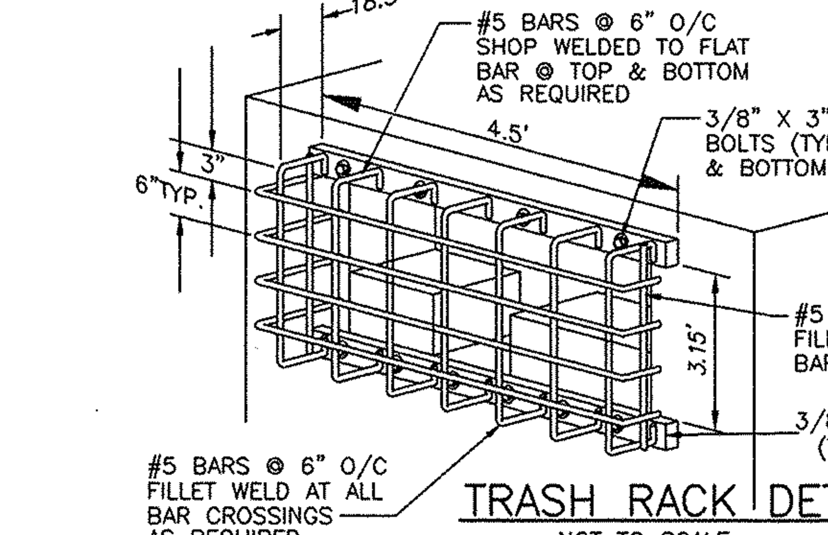
NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 10	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



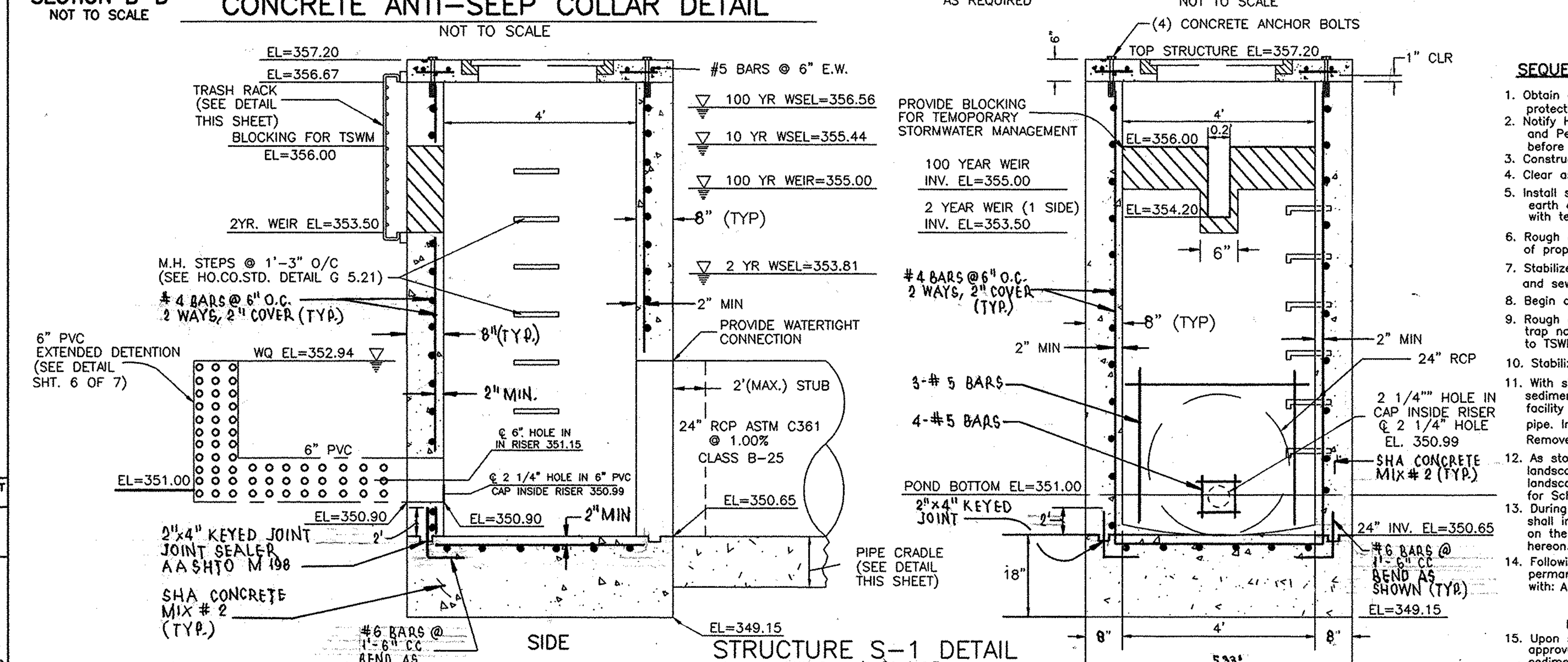
CONCRETE ANTI-SEEP COLLAR DETAIL

NOT TO SCALE



TRASH RACK DETAIL

NOT TO SCALE



STRUCTURE S-1 DETAIL
CAST IN PLACE

NOT TO SCALE

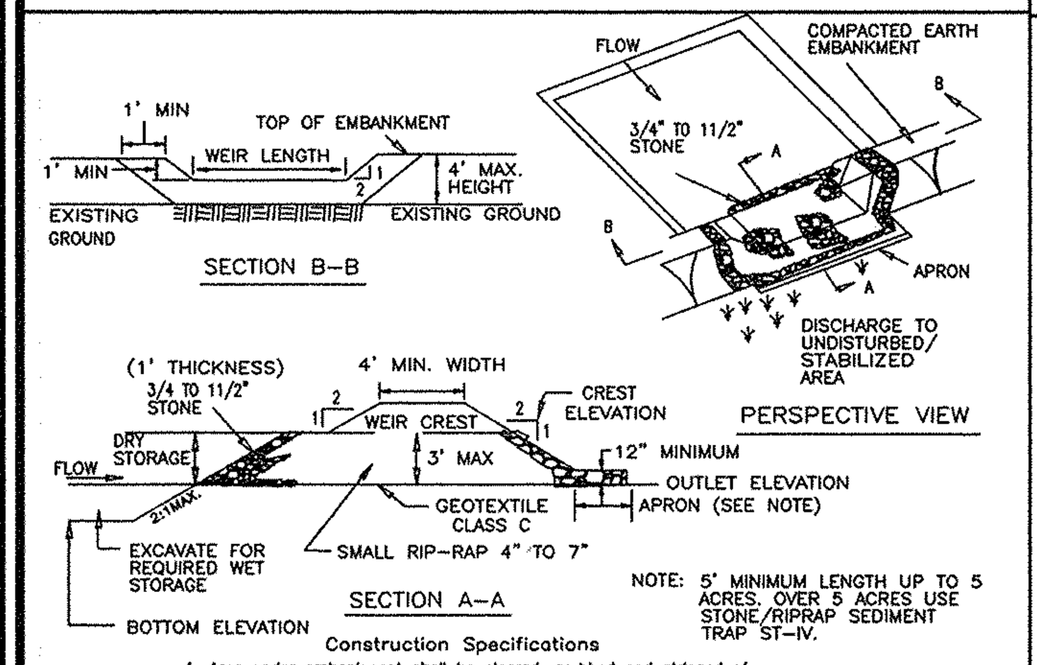
SEQUENCE OF CONSTRUCTION

1. Obtain grading permit. Installation and inspection of tree protection fence to be done prior to commencement of grading.
2. Notify Howard County Bureau Of Inspections and Permits (410-313-1880) at least 24 hours before starting any work.
3. Construct Stabilized Construction Entrances....................1 day
4. Clear and grub site....................3 days
5. Install sediment control devices(silt fence, super silt fence, earth dikes, sediment traps and construct TSWM facility with temp. blocking and dewatering device....................5 days
6. Rough grade for road construction and areas east of proposed road(lots 18-25)....................1 week
7. Stabilize area of lots(18-25) and install storm drain, water and sewer systems....................3 weeks
8. Begin constructing curb and gutter, sidewalk and road paving...2 weeks
9. Rough grade remaining areas within LOD. Remove sediment trap no. 3 and utilize storm drain system to divert sediment to TSWM facility....................4 days
10. Stabilize remaining disturbed areas of the site....................1 week
11. With site stabilized, flush stormdrain system and convert sediment basin to final stormwater management facility by replacing dewatering device with extended detention pipe. Install 6" cap with 2 1/4" hole at inv. 350.90 inside riser. Remove temp. blocking and grade top of dam to el. 358.00.......4 days
12. As stormwater management pond is stabilized, install pond landscaping as shown in Schedule 'D' and perimeter landscaping as shown in Schedule 'A'. See sheet 4 for Schedule tables....................2 days
13. During grading and after each rainfall, the contractor shall inspect and provide the necessary maintenance on the sediment and erosion control measures shown hereon.
14. Following initial soil disturbance or redisturbance permanent or temporary stabilization shall be complied with: A. 7 calendar days for all perimeter sediment control structures, dikes, swales, ditch perimeter slopes slopes and all slopes greater than 3:1.
    B. 14 calendar days for all other disturbed areas.
15. Upon stabilization of all disturbed areas and with the approval of the sediment control inspector, remove all sediment control devices.

OWNER/DEVELOPER

BLAISDELL-IKO DEVELOPMENT LIMITED PARTNERSHIP
3403 OLANDWOOD COURT, SUITE 101
OLNEY, MARYLAND 20832
(301) 924-5645

DETAIL 9 – STONE OUTLET SEDIMENT TRAP – ST II



NOTE: 5' MINIMUM LENGTH UP TO 5 ACRES. OVER 5 ACRES USE STONE/RIPRAP SEDIMENT TRAP ST-IV.

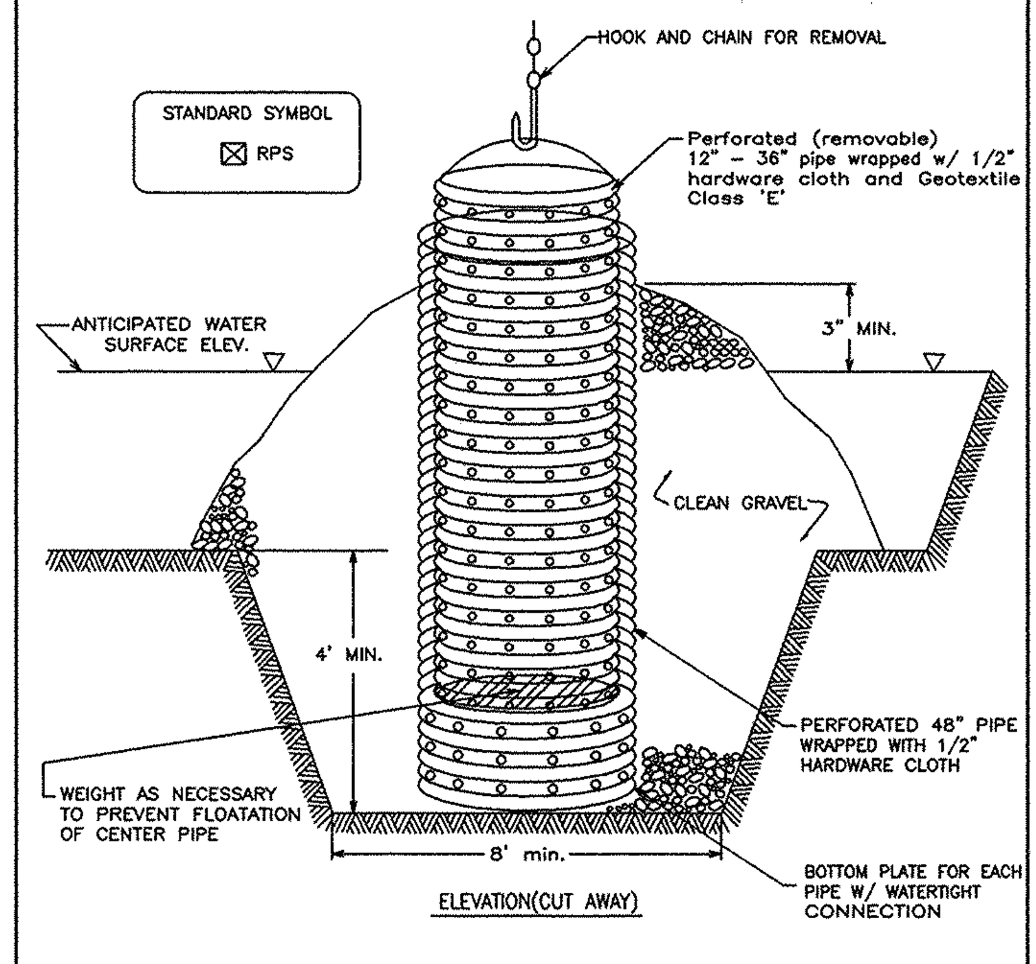
Construction Specifications

1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots and other woody vegetation as well as over-sized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. All cut and fill slopes shall be 2:1 or flatter.
4. The stone used in the outlet shall be small rip-rap 4" to 7" in size with a 1' thick layer of 3/4" to 11/2" washed aggregate placed on the upstream face of the outlet. Stone facing shall be as necessary to prevent clogging. Geotextile Class C may be substituted for the stone facing by placing it on the inside face of the stone outlet.
5. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to one half of the wet storage depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
6. the structure shall be inspected periodically after each rain and repairs made as needed.
7. Construction of traps shall carried out in such a manner that sediment pollution is abated. Once constructed, the top and outside face of the embankment shall be stabilized with seed and mulch. Points of concentration inflow shall be protected in accordance with Grade Stabilization Structure criteria. The remainder of the interior slopes should be stabilized (one time) with seed and mulch upon trap completion and monitored and maintained erosion free during the life of the trap.
8. The structure shall be dewatered by approved methods, removed and the area stabilized when the drainage area has been properly stabilized.
9. Refer to section D for specifications concerning trap dewatering.
10. Minimum trap depth shall be measured from weir elevation.
11. The elevation of the top of any dike directing water into the trap must equal or exceed the elevation of the trap embankment.
12. Geotextile Class C shall be placed over the bottom and sides of the outlet channel prior to the placement of stone. Sections of filter cloth must overlap at least 1' with the section nearest the entrance placed on top. The filter cloth shall be embedded at least 6" into existing ground at the entrance of the outlet channel.
13. Outlet-An outlet shall be provided, including a means of conveying the discharge in an erosion free manner to an existing stable channel.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 9 - 10	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

BLAISDELL\FINAL\DETAILS

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 E.

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

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

ENGINEERS CERTIFICATE

"I HEREBY 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."

Robert Vogel 9/30/98
SIGNATURE OF ENGINEER DATE
ROBERT H. VOGEL

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE IN ACCORDANCE 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."

[signature] 9/29/98
SIGNATURE OF DEVELOPER DATE

"AS-BUILT" CERTIFICATION

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

ROBERT H. VOGEL, P.E. NO. 16193 DATE

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ONSITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ONSITE SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE BY COMMONLY ACCEPTED ENGINEERING STANDARDS CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

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

Cheryl Simmons /cs. 10/9/98
USDA-NATURAL RESOURCES CONSERVATION SERVICE DATE

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

[signature] 10/9/98
HOWARD SOIL CONSERVATION DISTRICT DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[signature] HS 10-26-98
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 10/29/98
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[signature] 10/29/98
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

NO.	REVISION	DATE
1	REVISE CONTROL STRUCTURE TO CAST IN PLACE	1-6-99

HARDING WOODS
LOTS 1 THRU 25 AND
OPEN SPACE LOTS 26 THRU 29
STORMWATER MANAGEMENT AND SEDIMENT CONTROL NOTES AND DETAILS

TAX MAP #46 REFERENCE: S-97-19, P-98-12
PARCEL #65 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

VOGEL & ASSOCIATES, INC.
ENGINEERS – SURVEYORS – PLANNERS
3691 PARK AVENUE, SUITE 101
ELLICOTT CITY, MARYLAND 21043
TELEPHONE: (410) 461-5828
FAX: (410) 465-3966

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 REGISTERED PROFESSIONAL ENGINEER — 9/30/98
ROBERT H. VOGEL, P.E. # 16193

DESIGN BY: J.C.O.
DRAWN BY: J.C.O.
CHECKED BY: R.H.V.
DATE: MAY, 1998
SCALE: AS SHOWN
W.O. NO.: 96-82

SHEET 7 OF 7

F-98-151