

BASIN C SWM FACILITIES AND LAYDOWN AREA SITE DEVELOPMENT PLAN 04-133

SWM DEVELOPMENT ACCOUNT

THIS SUBMISSION: DATE 21 APR. 2004 SDP # 04-133

DRAINAGE AREA (D.A.) TO BASIN	SOUTH BASIN	NORTH BASIN	WEST BASIN
MAXIMUM ALLOWABLE / DESIGN DRAINAGE AREA (ESTABLISHED 21 APR. 2004)	16.06 ACRES	10.90 ACRES	2.57 ACRES
EXISTING / CURRENT DRAINAGE AREA (AS OF DATE 21 APR. 2004)	7.51 ACRES	15.90 ACRES	0.00 ACRES
PROPOSED DRAINAGE AREA (CUMULATIVE) (THIS SUBMISSION)	9.26 ACRES	15.90 ACRES	0.00 ACRES
IS PROPOSED D.A. <= ALLOWABLE D.A.?	YES	YES	YES
IMPERVIOUS AREA (I.A.) DRAINING TO BASIN			
MAXIMUM ALLOWABLE / DESIGN IMPERVIOUS AREA (ESTABLISHED 21 APR. 2004)	13.65 ACRES	16.07 ACRES	0.97 ACRES
EXISTING / CURRENT IMPERVIOUS AREA (AS OF DATE 21 APR. 2004)	0.00 ACRES	0.43 ACRES	0.00 ACRES
PROPOSED IMPERVIOUS AREA (CUMULATIVE) (THIS SUBMISSION)	1.48 ACRES	0.43 ACRES	0.00 ACRES
IS PROPOSED I.A. <= ALLOWABLE I.A.?	YES	YES	YES

LIST OF SDP'S WITHIN BASIN C
DATE: 21 APR. 2004 SDP #: 04-133

SITE ANALYSIS DATA CHART

TOTAL PROJECT AREA: 361 Ac. +/-
AREA OF PLAN SUBMISSION: 12.2 Ac. +/-
LIMIT OF DISTURBANCE: 12.2 Ac. +/-
PRESENT ZONING: PEC
PROPOSED USE: SWM FACILITIES AND LAYDOWN AREA / RESEARCH FACILITY
MAXIMUM NUMBER OF EMPLOYEES (FOR PARKING COMPUTATIONS)
NO NEW EMPLOYEES
EXISTING MAXIMUM NUMBER OF JHU/APL EMPLOYEES: 3937
EXISTING MAXIMUM NUMBER OF PARKING SPACES REQUIRED
BY ZONING: 2450 (SDP 99-11)
EXISTING ONSITE PARKING SPACES: 4795 (SDP 04-76)
REQUIRED ADDITIONAL EMPLOYEE PARKING SPACES: N/A
PROPOSED ADDITIONAL EMPLOYEE PARKING SPACES: N/A

NOTE: PROPOSED ONSITE PARKING SPACES ARE FOR FLEET VEHICLES ONLY

EXISTING BUILDING COVERAGE = 21.1 ACRES
EXISTING GROSS FLOOR AREA COVERAGE = 44.8 AC,
12.4% OF TOTAL LOT AREA
PROPOSED BUILDING COVERAGE = 0.0 ACRES
GROSS FLOOR AREA COVERAGE = 0.0 ACRES
0% OF TOTAL LOT AREA
TOTAL GROSS FLOOR AREA COVERAGE = 44.8 ACRES
12.4% OF TOTAL LOT AREA
CASE NUMBERS APPLICABLE: IMPROVEMENTS
F 02-40 - SWM BASIN A, APFO,
F 04-188 - FOREST CONSERVATION
SDP 04-35 - SWM BASIN C
SDP 04-66 MAIN PARKING LOT
SDP 04-76 SERVICES AREA COMPLEX
WP 05-08 STEEP SLOPE WAIVER

SANITARY SEWER/WATER SERVICE - PRIVATE ONSITE SYSTEM,
PUBLIC CONNECTION

EXISTING OPEN SPACE AREA (LOT AREA MINUS PARKING & BUILDINGS)
= 287 ACRES, 79.5% OF TOTAL LOT AREA

PROPOSED OPEN SPACE AREA = 286 ACRES, 79.2% OF
TOTAL LOT AREA

GENERAL NOTES

- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AND JHU/APL PLANT FACILITIES OFFICE (443) 778-0167 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- ALL PLAN DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY WHITMAN, REQUARDT & ASSOCIATES, LLP DATED JANUARY 2004 AND JHU APPLIED PHYSICS LAB AERIAL TOPOGRAPHY AND UTILITY INFORMATION. SINCE NOT ALL INFORMATION SHOWN MAY REFLECT CURRENT CONDITIONS IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY CURRENT TOPOGRAPHIC AND UTILITY INFORMATION TO HIS OWN SATISFACTION.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM (NAD 83). JOHNS HOPKINS UNIVERSITY CONTROL STATIONS NOS. HOPKINS, 41EA, G12, G7 AND G8 WERE USED FOR THIS PROJECT.

STATION	NORTH	EAST
HOPKINS	544836.5300	1340825.3542
G12	550256.5002	1342325.2642
G7	548107.0328	1341025.0830
G8	549478.7005	1341170.4345
41 EA	544825.8093	1339217.4439
- WATER IS PUBLIC.
- SEWER IS PUBLIC.
- ALL SWM DEVICES ARE PRIVATELY OWNED AND MAINTAINED.
- EXISTING UTILITIES ARE BASED ON JHU/APL FACILITY RECORDS.
- THERE ARE NO WETLANDS OR FLOOD PLAINS WITHIN THE AREAS BEING DISTURBED BY THIS PROJECT.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- THE CONTRACTOR SHALL CONTACT MR. JAMES LOESCH (443) 778-5134 AT LEAST TEN DAYS BEFORE STARTING WORK OR DISRUPTION OF ANY UTILITIES.
- THE SUBJECT PROPERTY IS ZONED PEC PER THE 02/02/04 COMPREHENSIVE ZONING PLAN.
- NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE WETLANDS, STREAM(S) OR THEIR REQUIRED BUFFERS AND FOREST CONSERVATION EASEMENT AREAS.
- THE FOREST CONSERVATION OBLIGATION FOR THIS SITE WAS ADDRESSED UNDER F-04-188.
- STORM WATER MANAGEMENT PERIMETER LANDSCAPING IS NOT REQUIRED FOR THE STORM WATER MANAGEMENT FACILITIES DUE TO THE INTERNAL LOCATION OF THE BASINS WITHIN THE JHU APL CAMPUS.
- PARKING LOT INTERNAL LANDSCAPING IS NOT REQUIRED FOR THE LAYDOWN AREA DUE TO THE INTERNAL LOCATION OF THE PARKING LOT WITHIN THE JHU APL CAMPUS.

DRAWING LIST

SHEET NO.	DRAWING NO.	DRAWING TITLE
1	G-1	COVER SHEET
2	C-1	EXISTING CONDITIONS DRAINAGE AREA MAP
3	C-2	PROPOSED CONDITIONS DRAINAGE AREA MAP
4	C-3	SOIL BORING LOGS
5	C-4	SOUTH BASIN AND LAYDOWN AREA GRADING PLAN
6	C-5	SOUTH BASIN AND LAYDOWN AREA PROFILES, SECTIONS AND DETAILS
7	C-6	SOUTH BASIN AND LAYDOWN AREA PROFILES AND SECTIONS
8	C-7	SOUTH BASIN AND LAYDOWN AREA DRAINAGE AREA MAP
9	C-8	NORTH BASIN GRADING PLAN
10	C-9	NORTH BASIN PROFILES SECTIONS AND DETAILS
11	C-10	NORTH BASIN DRAINAGE AREA MAP
12	C-11	WEST BASIN GRADING PLAN
13	C-12	WEST BASIN EXTENDED DETENTION PROFILES, SECTIONS AND DETAILS
14	C-13	WEST BASIN BIORETENTION SITE DETAILS - 1
15	C-14	CONTRACTORS STAGING AND SPOIL AREA GRADING PLAN
16	C-15	CONTRACTORS STAGING AND SPOIL AREA SEDIMENT CONTROL PLAN
17	C-16	WEST BASIN BIORETENTION SITE DETAILS 4
18	C-17	WEST BASIN DRAINAGE AREA MAP
19	C-18	SOUTH BASIN AND LAYDOWN AREA EROSION AND SEDIMENT CONTROL PLAN
20	C-19	NORTH BASIN EROSION AND SEDIMENT CONTROL PLAN
21	C-20	WEST BASIN EROSION AND SEDIMENT CONTROL PLAN
22	C-21	EROSION AND SEDIMENT CONTROL NOTES 1
23	C-22	EROSION AND SEDIMENT CONTROL NOTES 2
24	C-23	EROSION AND SEDIMENT CONTROL DETAILS
25	C-24	STANDARD SPECIFICATION FOR STORM WATER MANAGEMENT CONSTRUCTION
26	L-1	SOUTH BASIN AND LAYDOWN AREA LANDSCAPE PLAN
27	L-2	NORTH BASIN LANDSCAPE PLAN
28	L-3	NORTH BASIN / SOUTH BASIN LANDSCAPE NOTES AND DETAILS 1
29	L-4	NORTH BASIN / SOUTH BASIN LANDSCAPE NOTES AND DETAILS 2
30	L-5	NORTH BASIN / SOUTH BASIN LANDSCAPE NOTES AND DETAILS 3

GENERAL NOTES CONTINUED

- WAIVER PETITION FILE NO. WP-05-08. REQUEST TO WAIVE SECTION 16.116, WHICH PROHIBITS DISTURBANCE TO STEEP SLOPES OVER 25% IN GRADE, AND MORE THAN 20,000 SQUARE FEET IN CONTIGUOUS AREA. APPROVED BY THE PLANNING DIRECTOR BY LETTER DATED AUGUST 31, 2004.

APPROVAL IS SUBJECT TO THE FOLLOWING CONDITION:
THE PETITIONER SHALL CONTINUE PROCESSING THE SITE PLAN (SDP-04-133) THROUGH THE REVIEW PROCESS TO SIGNATURE APPROVAL AND THEN APPLY FOR A GRADING PERMIT WITH THE DEPARTMENT OF INSPECTIONS LICENSES AND PERMITS.

GENERAL STRUCTURAL NOTES

CONCRETE NOTES

- REINFORCED CONCRETE SHALL BE DETAILED AND CONSTRUCTED IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE, (ACI 301) "SPECIFICATION FOR STRUCTURAL CONCRETE".
- ALL REINFORCEMENT SHALL CONFORM TO ASTM SPECIFICATION A615, DEFORMED, GRADE 60.
- ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
- THE CONTRACTOR SHALL SUBMIT SHOP DETAILS OF REINFORCING STEEL BEFORE PROCEEDING WITH FABRICATION.
- REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH ACI DETAILING MANUAL.
- MINIMUM COVER FOR ANY BAR SHALL BE 2" UNLESS OTHERWISE NOTED, WITH THE EXCEPTION OF BARS AT THE BOTTOM AND SIDES OF FOOTING, WHICH SHALL HAVE 3" MINIMUM COVER.
- CONCRETE SLAB AND WALLS SHALL BE POURED BETWEEN INDICATED JOINTS ALLOWING A MINIMUM PERIOD OF 3 DAYS TO ELAPSE BETWEEN ADJACENT POURS.
- CONSTRUCTION JOINTS SHALL BE AS DETAILED ON THE DRAWINGS AND NO ADDITIONAL JOINTS SHALL BE USED NOR ANY OMITTED EXCEPT BY WRITTEN AUTHORIZATION OF THE ENGINEER. ENGINEER APPROVED ADDITIONAL CONSTRUCTION JOINTS SHALL NOT RESULT IN ADDITIONAL EXPENSE TO THE OWNER.
- CONSTRUCT COLLAR IN TWO POURS.
- POUR ANTI-SEEP COLLAR WITH PIPE IN PLACE.
- PLACE AND COMPACT BACKFILL ON BOTH SIDES OF ANTI-SEEP COLLAR.
- LOCATE ANTI-SEEP COLLAR A MINIMUM OF 2 FEET FROM ANY PIPE JOINT.
- CONCRETE SHALL BE IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 420, AND SHALL BE 4000 PSI.
- PVC PIPE AND FITTINGS SHALL BE IN ACCORDANCE WITH MSHA STANDARD SPECIFICATIONS SECTION 905. ALL EXPOSED PVC PIPE SHALL BE GRAY IN COLOR.

CODES

- INTERNATIONAL CODE COUNCIL, "INTERNATIONAL BUILDING CODE".
- AMERICAN CONCRETE INSTITUTE, (ACI-318) "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".

DESIGN LOADS

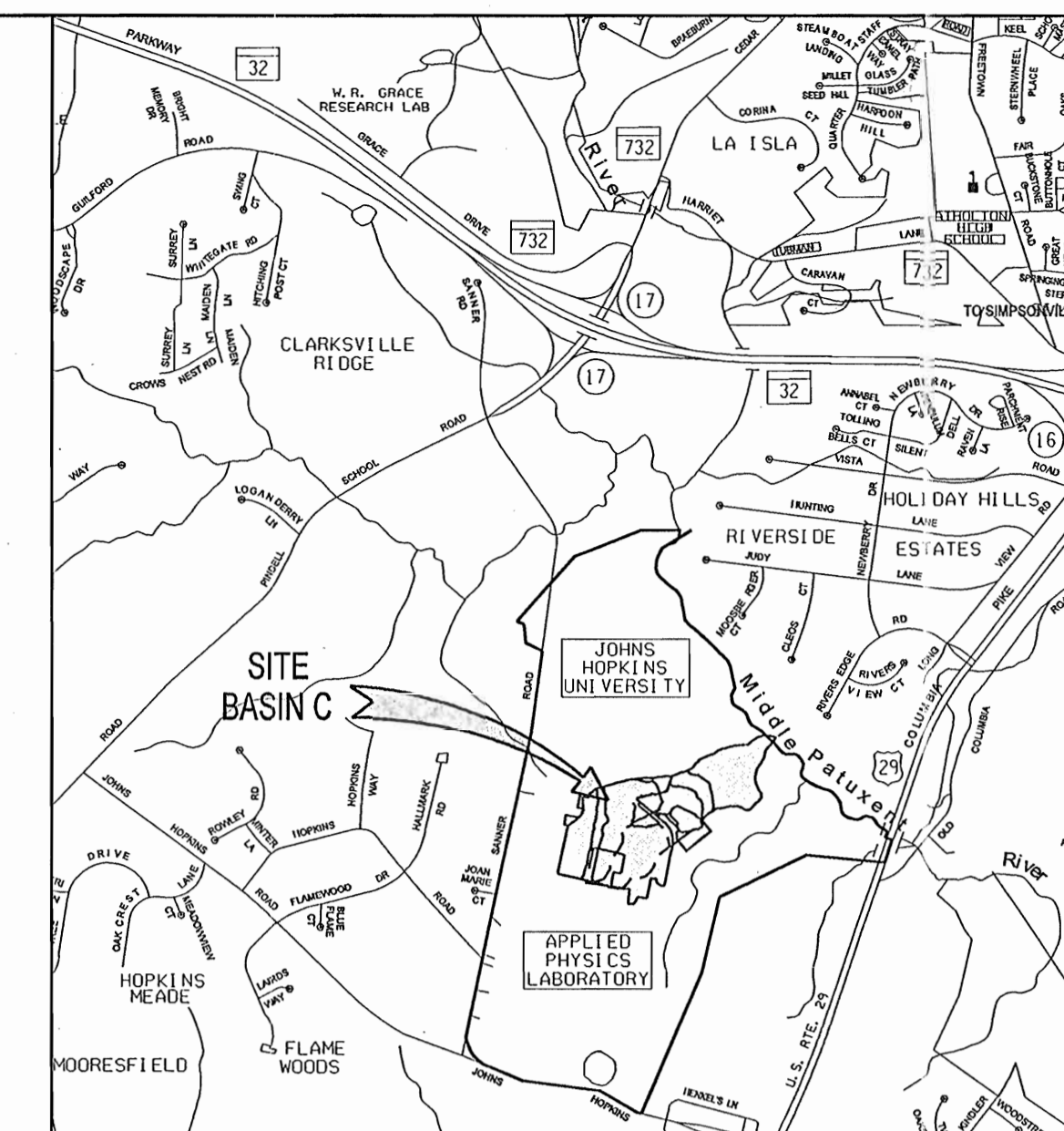
- DEAD LOADS - ACTUAL WEIGHT OF STRUCTURE.
WEIGHT OF SOIL - 100 P.C.F. TO RESIST UPLIFT.
120 P.C.F. DEAD LOAD
- LIVE LOADS - ROOF - 100 PSF
- ALL STRUCTURES DESIGNED TO RESIST UPLIFT WITH WATER LEVEL AT 100 YEAR ELEVATION, WITH FACTOR OF SAFETY OF 1.5.

FOUNDATION NOTES

- ALL EXCAVATION SHALL BE KEPT DRY. STANDING WATER SHALL NOT BE ALLOWED IN EXCAVATIONS.
- BEFORE PLACING ANY CONCRETE ON SUBGRADE, THE CONTRACTOR SHALL NOTIFY THE INSPECTOR.
- FOOTINGS SUBGRADE SHALL CONSIST OF UNDISTURBED SOIL UNLESS SOFT UNSUITABLE MATERIAL IS ENCOUNTERED.
- ALL SOFT AND UNSUITABLE SOIL BELOW FOOTINGS AND SLABS SHALL BE UNDERCUT AND REPLACED WITH CONTROLLED, COMPACTED FILL OF GRADED AGGREGATE BASE MATERIAL.
- FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY AASHTO T-99.

MISCELLANEOUS

- ALL RIPRAP AND GABIONS TO BE PLACED OVER CLASS C NON-WOVEN FILTER CLOTH.
- GABION INFLOW PROTECTION TO BE PVC COATED (GREY COLOR) 6" MINIMUM THICKNESS MATTRESS OVER FILTER CLOTH.



VICINITY MAP

SCALE: 1" = 2000'

JHU - APL BASIN C

EXISTING	PROPOSED	DESCRIPTION
260	260	MAJOR CONTOUR
12"SD	258	MINOR CONTOUR
8"W	30"SD	STORM DRAIN
6"SAN	12"S	WATER
UE		SANITARY SEWER
⊗		UNDERGROUND ELECTRIC
⊗		VALVE
⊗		FIRE HYDRANT
○	○	MANHOLE/INLET
⊕		STREET LIGHT
—x—x—	—x—x—	FENCE
○	○	TREES/WOODSLINE
—	—	STREAM
W	W	WETLAND
⊕	⊕	STORM WATER MANAGEMENT BORING LOCATION
MgB2		SOIL BOUNDARIES / SOIL TYPE
---	---	DRAINAGE AREA BOUNDARY
---	---	PAVING
---	---	CURB AND GUTTER
---	---	DRAINAGE AREA DESIGNATION AREA (SQ MI.) RCN TC
→	→	OVERLAND FLOW PATH
→	→	Tc PATH
▬	▬	STEEP SLOPES 25% OR GREATER
▬	▬	STEEP SLOPES 15% TO 25%
---	---	MAN MADE STEEP SLOPES
400 S.F.		AREA LABEL

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APPLIED PHYSICS LABORATORY
11100 JOHNS HOPKINS ROAD
LAUREL MARYLAND 20723

BASIN C
SWM FACILITIES
AND LAYDOWN AREA
SDP 04-133

JHU/APL INTERNAL USE

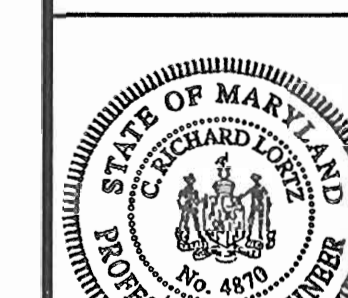
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GRAPHIC SCALES



WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

COVER SHEET



DRAWING NO.

G-1

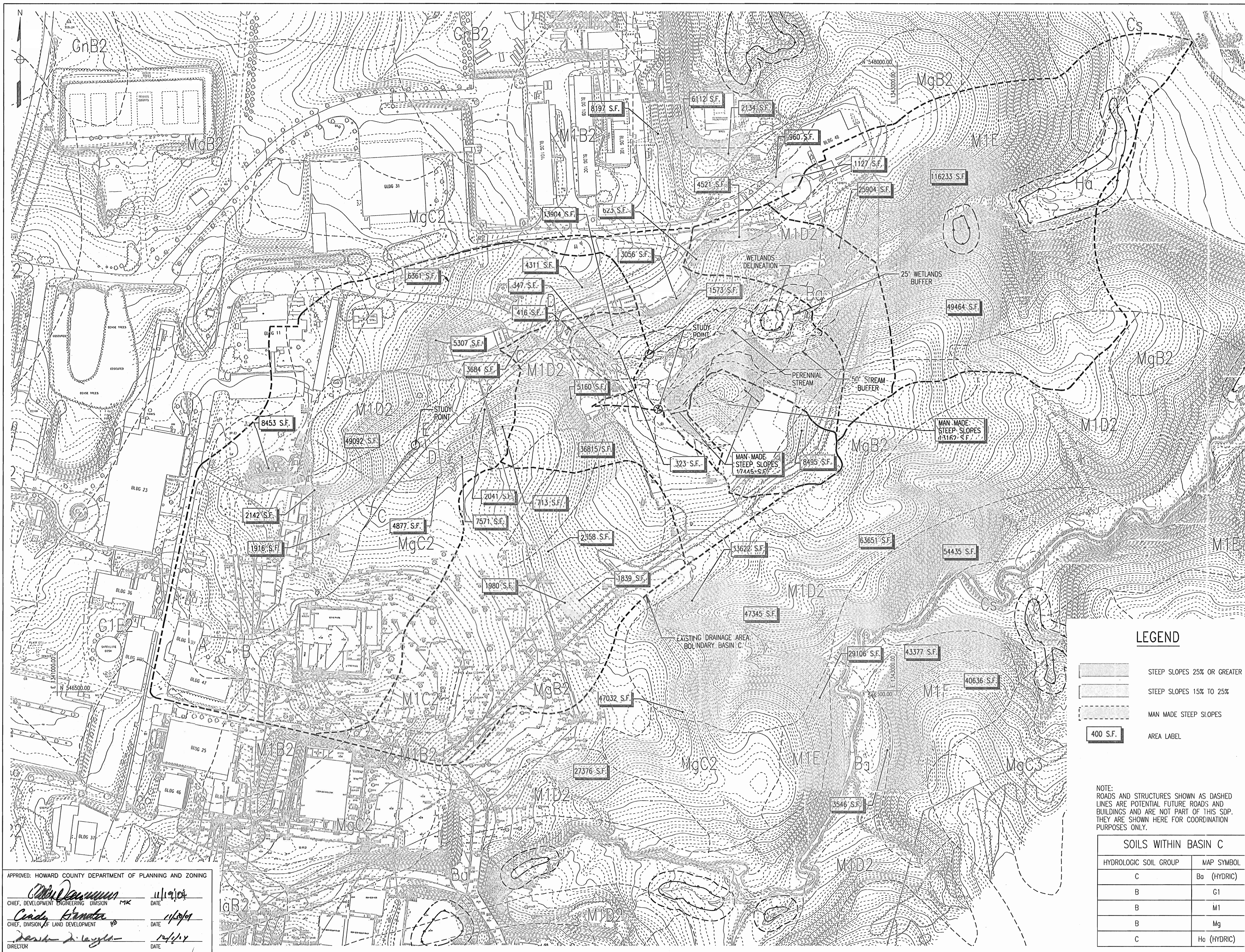
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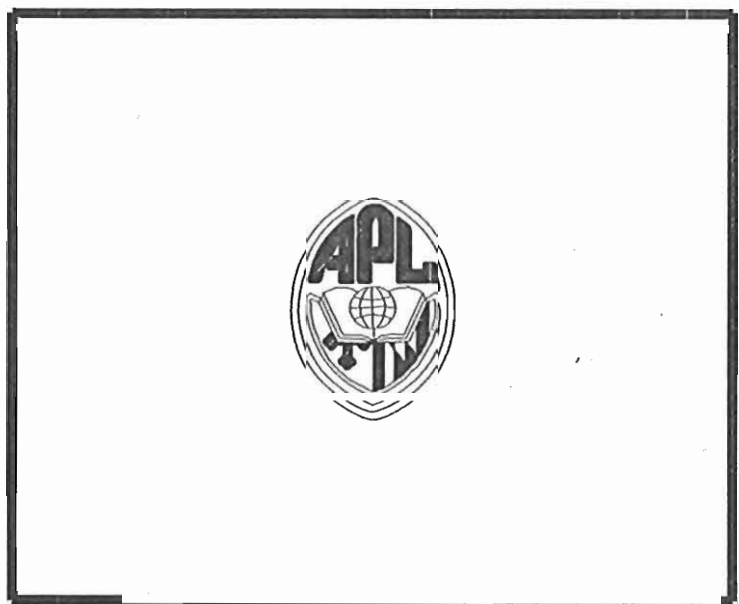
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Drawn By: EE, PB
Checked By: AUO
Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

James Loesch
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK
DATE: 10/20/04
James Loesch
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 10/20/04
James Loesch
DIRECTOR DATE: 10/20/04

PERMIT INFORMATION CHART							
OWNER: THE JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY 11100 JOHNS HOPKINS ROAD LAUREL MARYLAND 20723 ATTN: MR. JAMES LOESCH VOICE (443) 778-5134 FAX (443) 778-6122	WATER CODE: E-21	SEWER CODE: 6480000	BUILDING N/A	STREET ADDRESS 11100 JOHNS HOPKINS ROAD LAUREL, MARYLAND 20723	PARCEL SUBDIVISION NAME: JOHNS HOPKINS UNIVERSITY PROPERTY (APPLIED PHYSICS LABORATORY SITE)	SECTION/AREA N/A	PARCEL 1
PLAT 15429- 15433	FOREST CONS. PLAT F-04-188	ZONE PEC	TAX MAP BLOCK 41 11	ELEC. DIST. 51H	CENSUS TRACT 605102		





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BASIN C
 SWM FACILITIES
 AND LAYDOWN AREA
 SDP 04-133

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GRAPHIC SCALES

SCALE: 1" = 100'

LEGEND

	STEEP SLOPES 25% OR GREATER
	STEEP SLOPES 15% TO 25%
	MAN MADE STEEP SLOPES
	AREA LABEL

NOTE:
 ROADS AND STRUCTURES SHOWN AS DASHED LINES ARE POTENTIAL FUTURE ROADS AND BUILDINGS AND ARE NOT PART OF THIS SDP. THEY ARE SHOWN HERE FOR COORDINATION PURPOSES ONLY.

SOILS WITHIN BASIN C

HYDROLOGIC SOIL GROUP	MAP SYMBOL
C	Ba (HYDRIC)
B	G1
B	M1
B	Mg
C	Ho (HYDRIC)

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Michael J. ... 11/19/04
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MKK DATE

Cathy ... 11/19/04
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

David ... 11/19/04
 DIRECTOR DATE

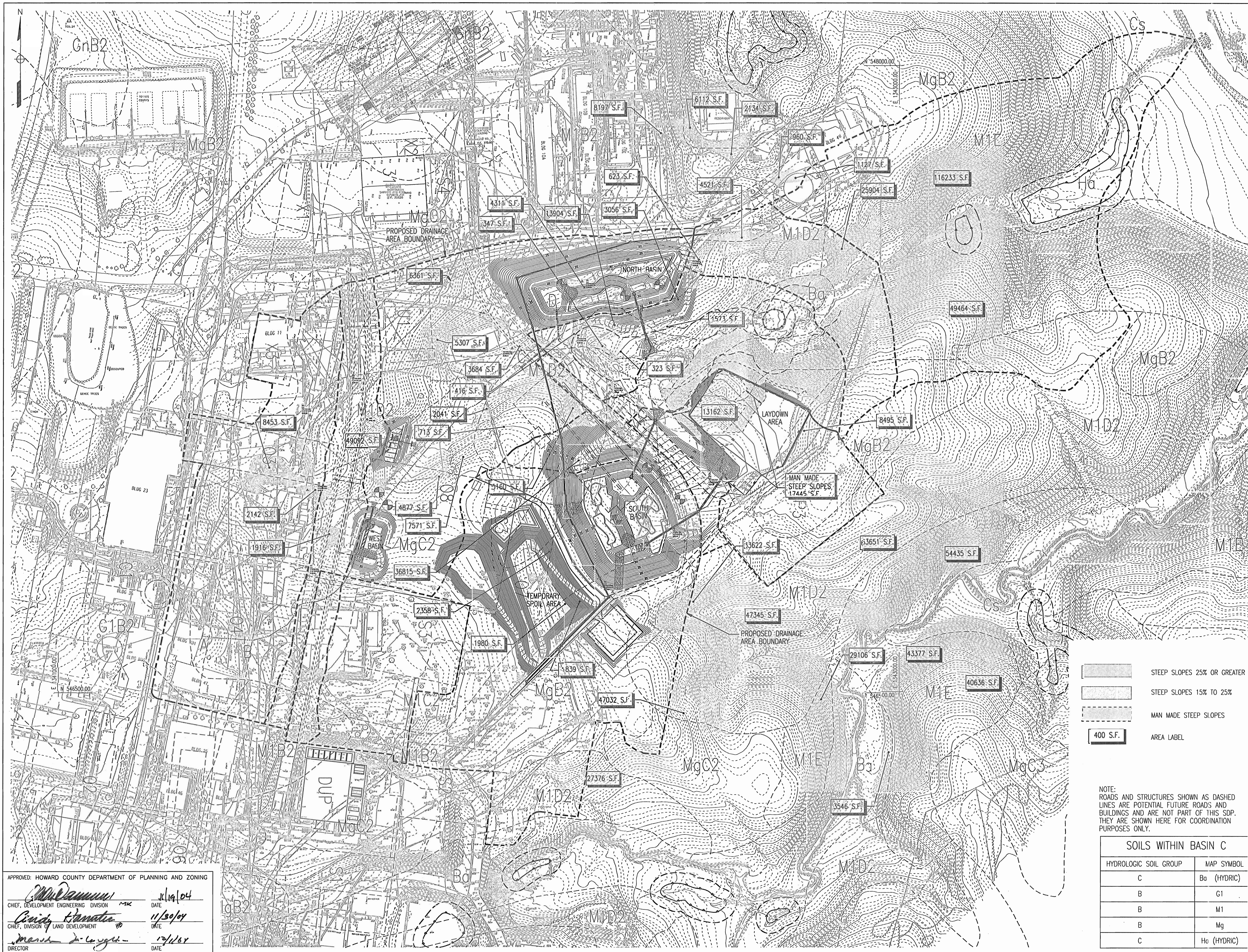
WR&A
 WHITMAN, REQUARDT AND ASSOCIATES, LLP
 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

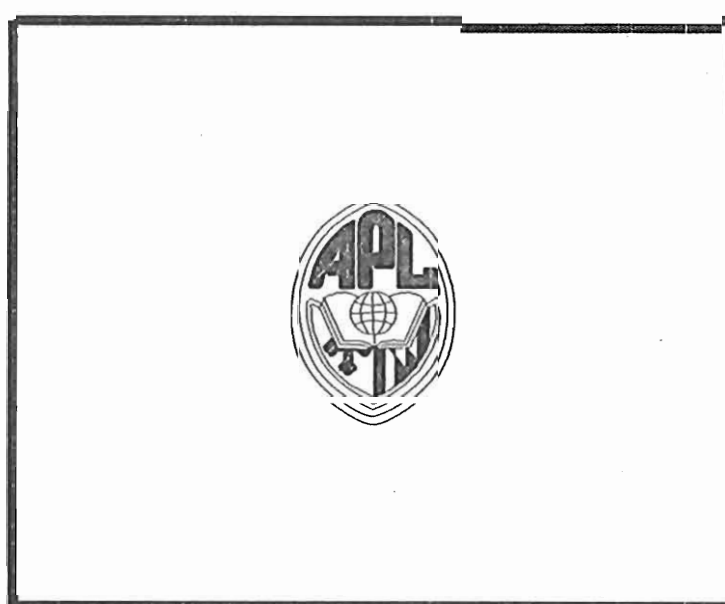
EXISTING CONDITIONS DRAINAGE AREA MAP

DRAWING NO. C-1

Sheet 2 of 30

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 Checked By: AUO Date: 10/20/04



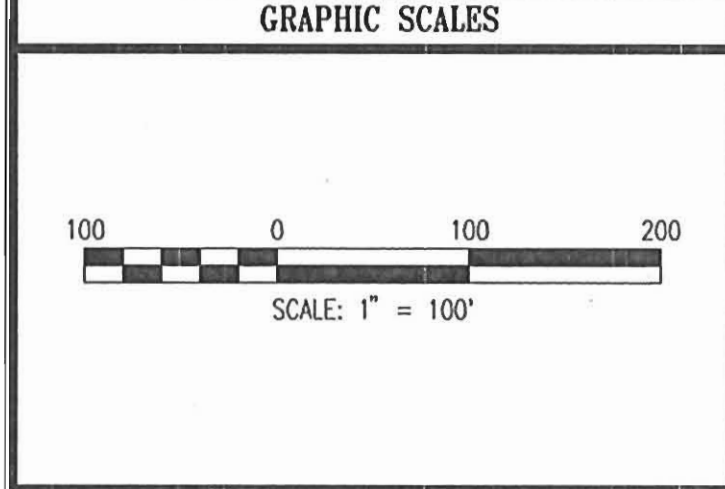


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- STEEP SLOPES 25% OR GREATER
- STEEP SLOPES 15% TO 25%
- MAN MADE STEEP SLOPES
- 400 S.F. AREA LABEL

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SOILS WITHIN BASIN C	
HYDROLOGIC SOIL GROUP	MAP SYMBOL
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WR&A

WHITMAN, REQUARDT AND ASSOCIATES, LLP
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 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

PROPOSED CONDITIONS DRAINAGE AREA MAP

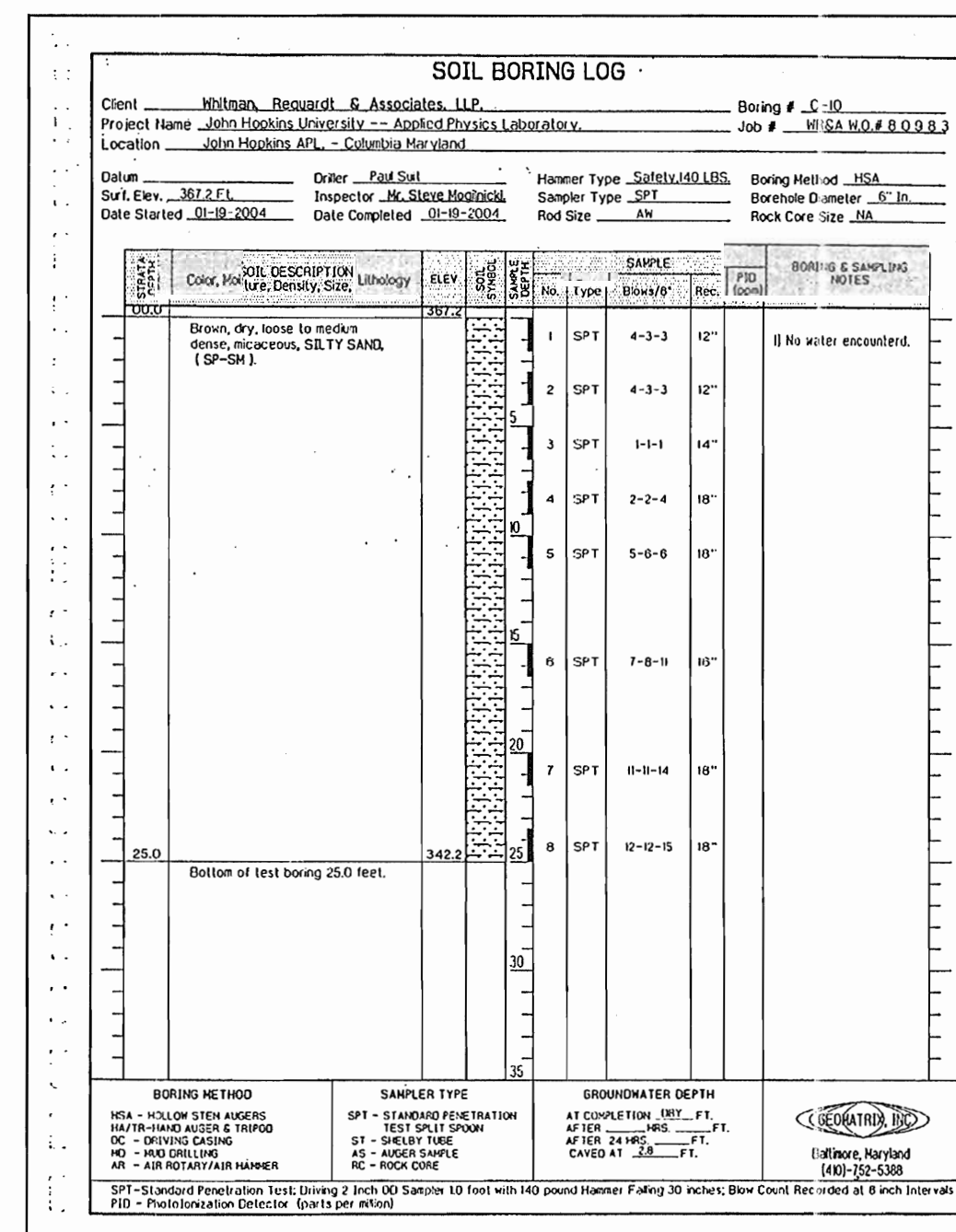
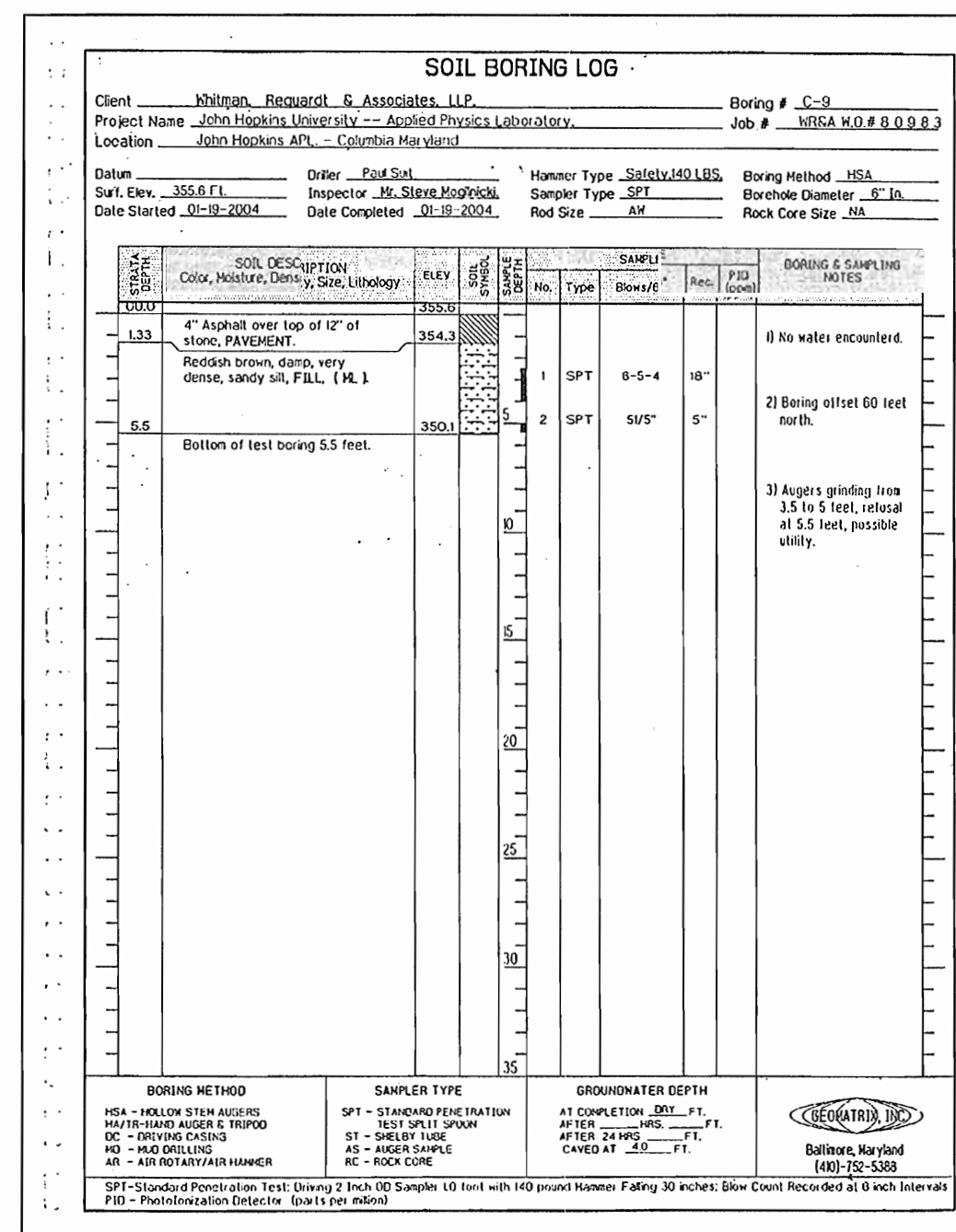
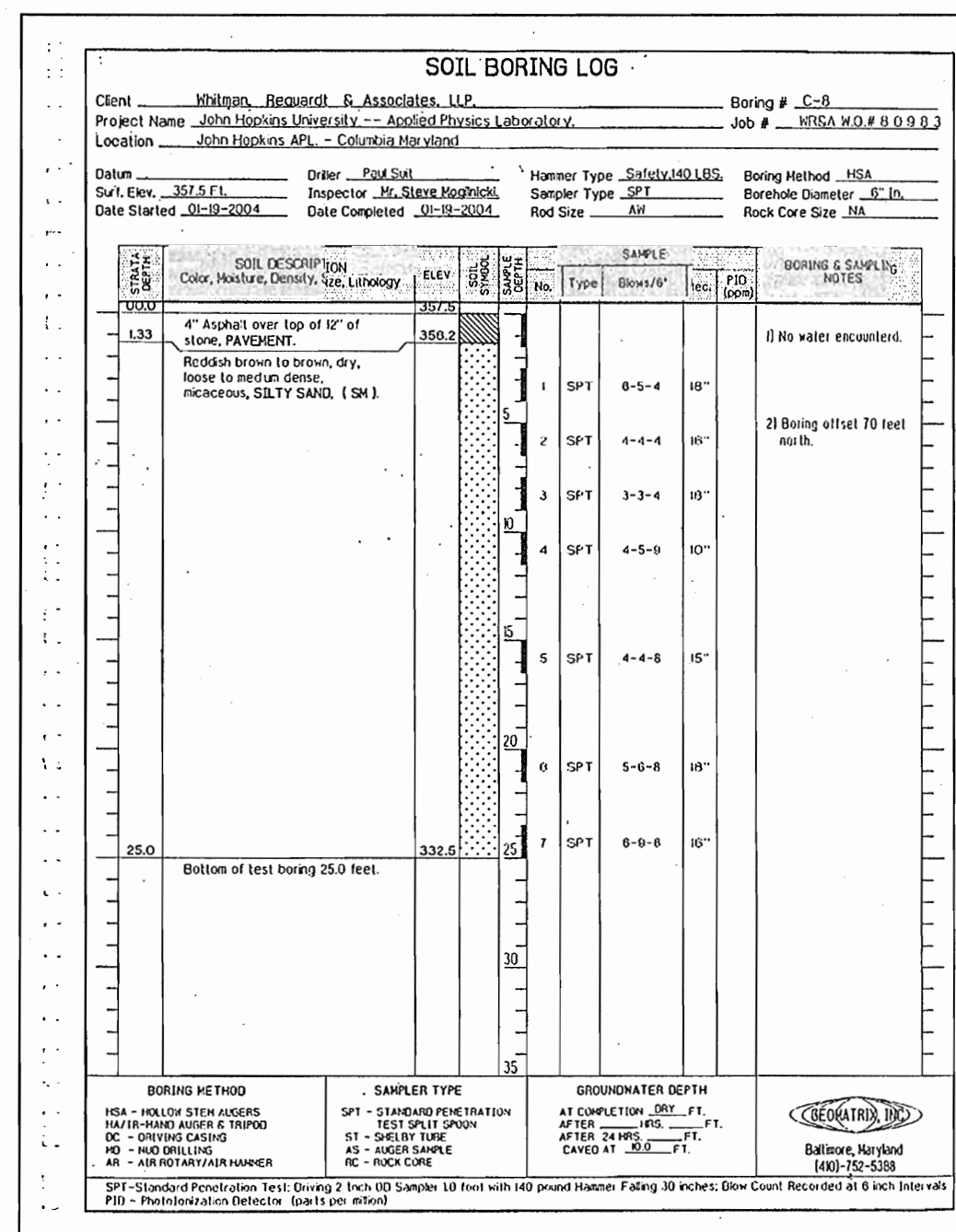
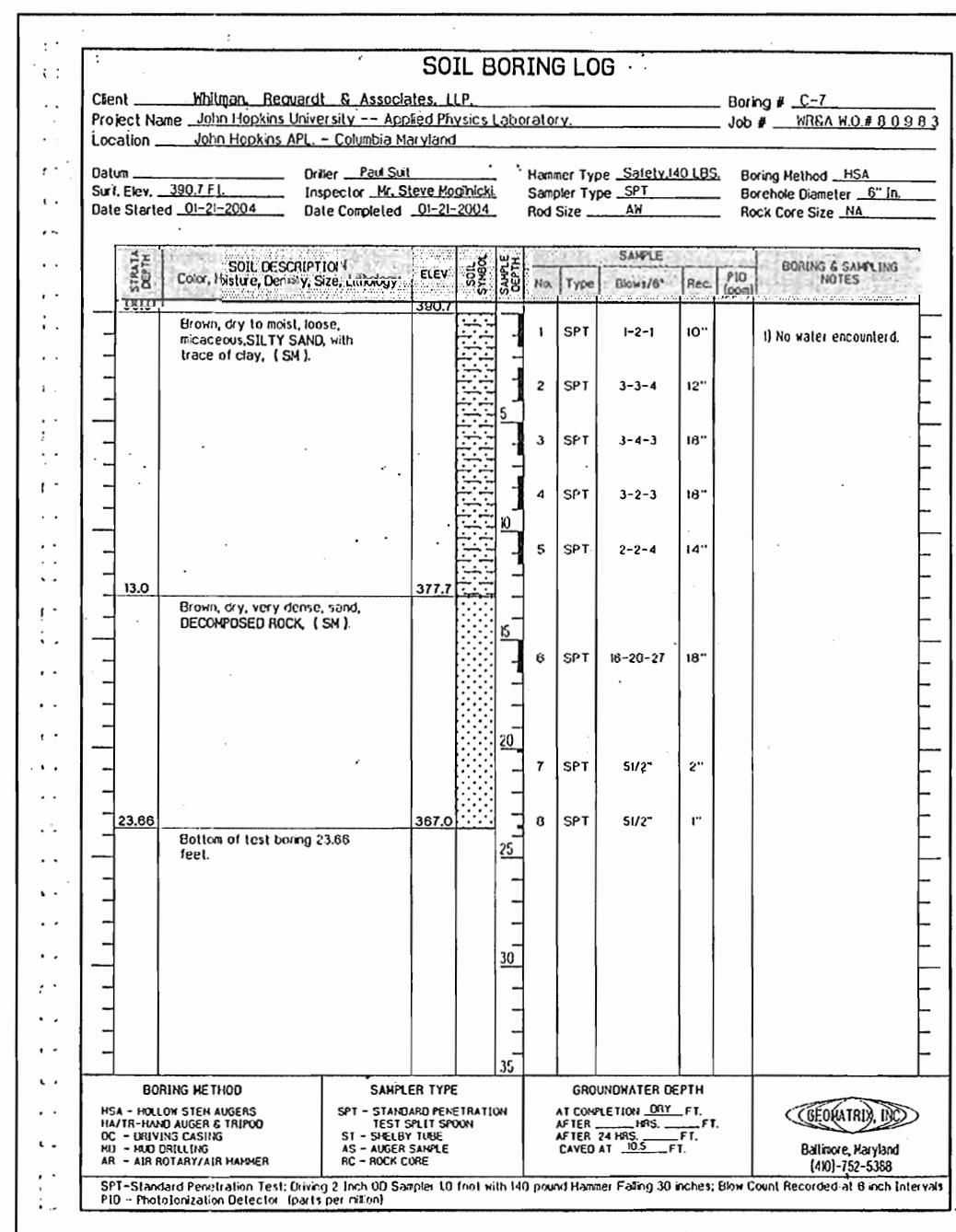
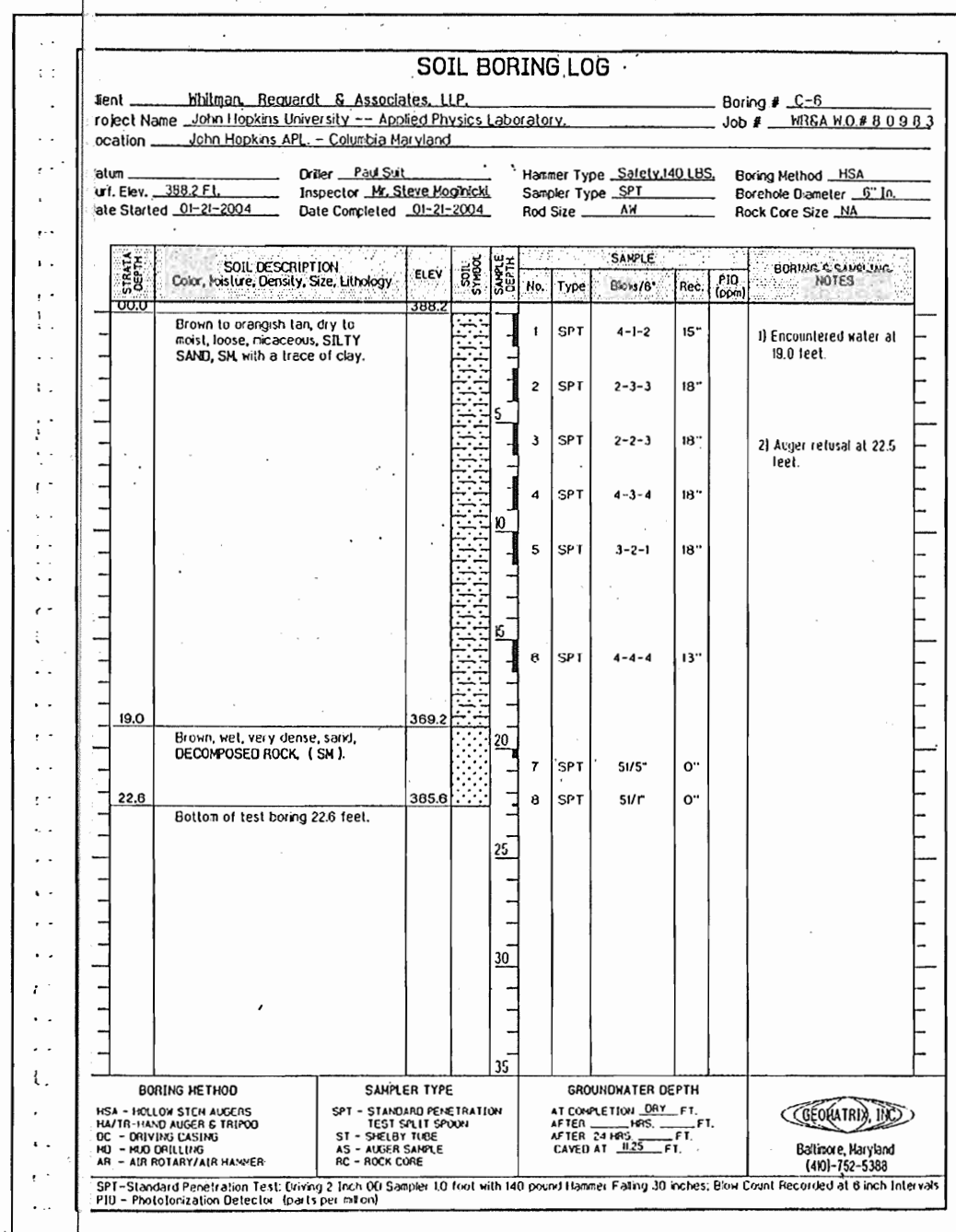
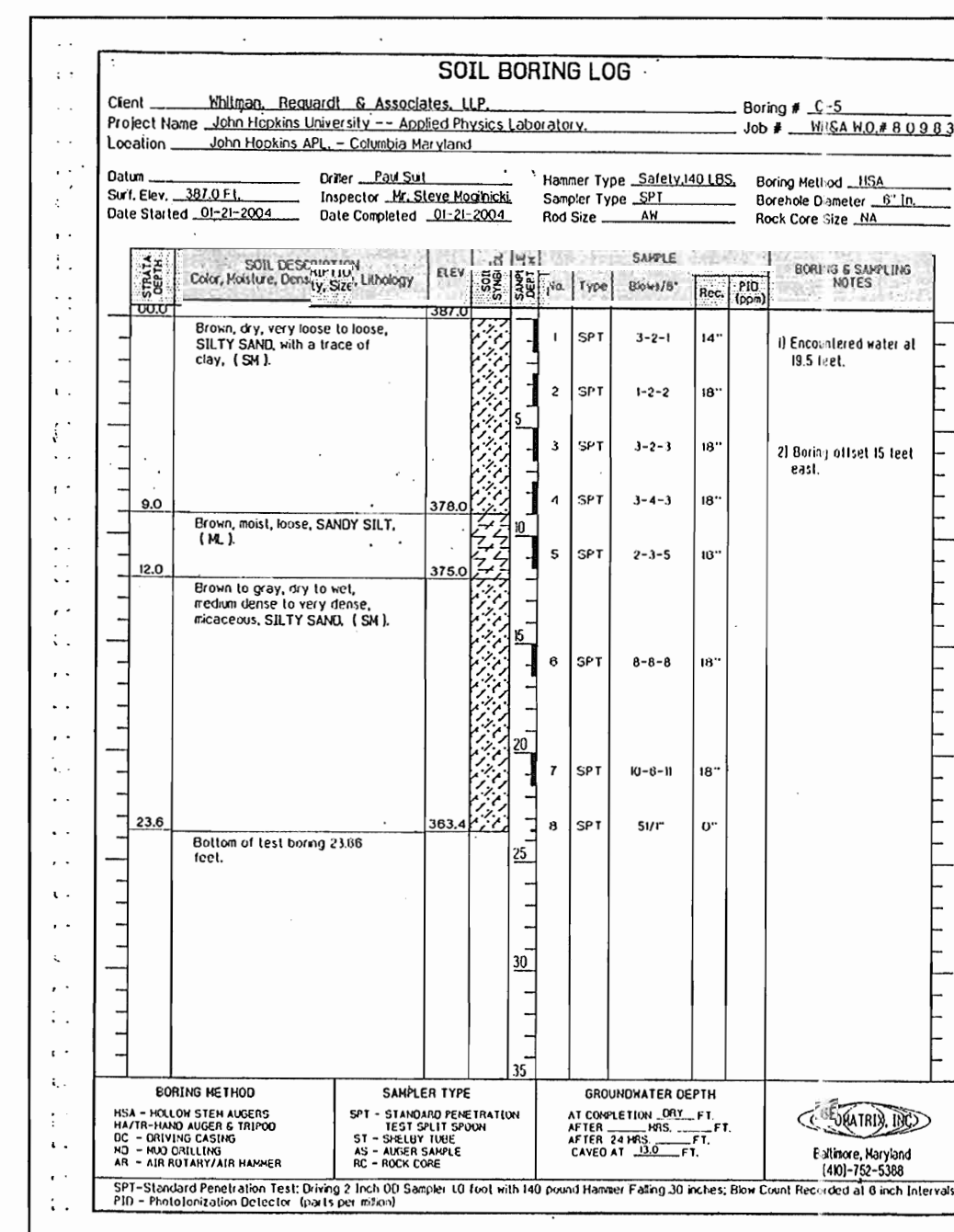
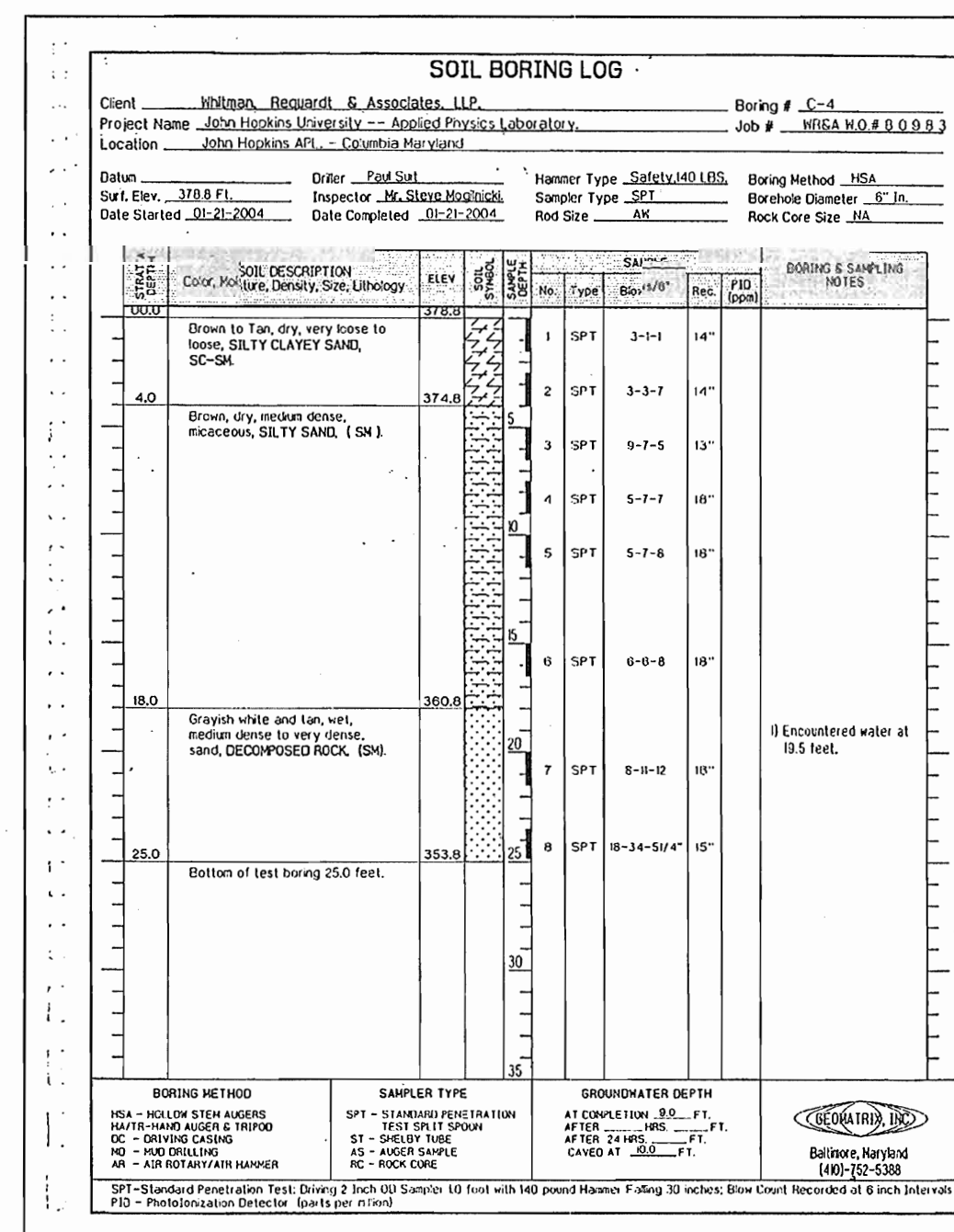
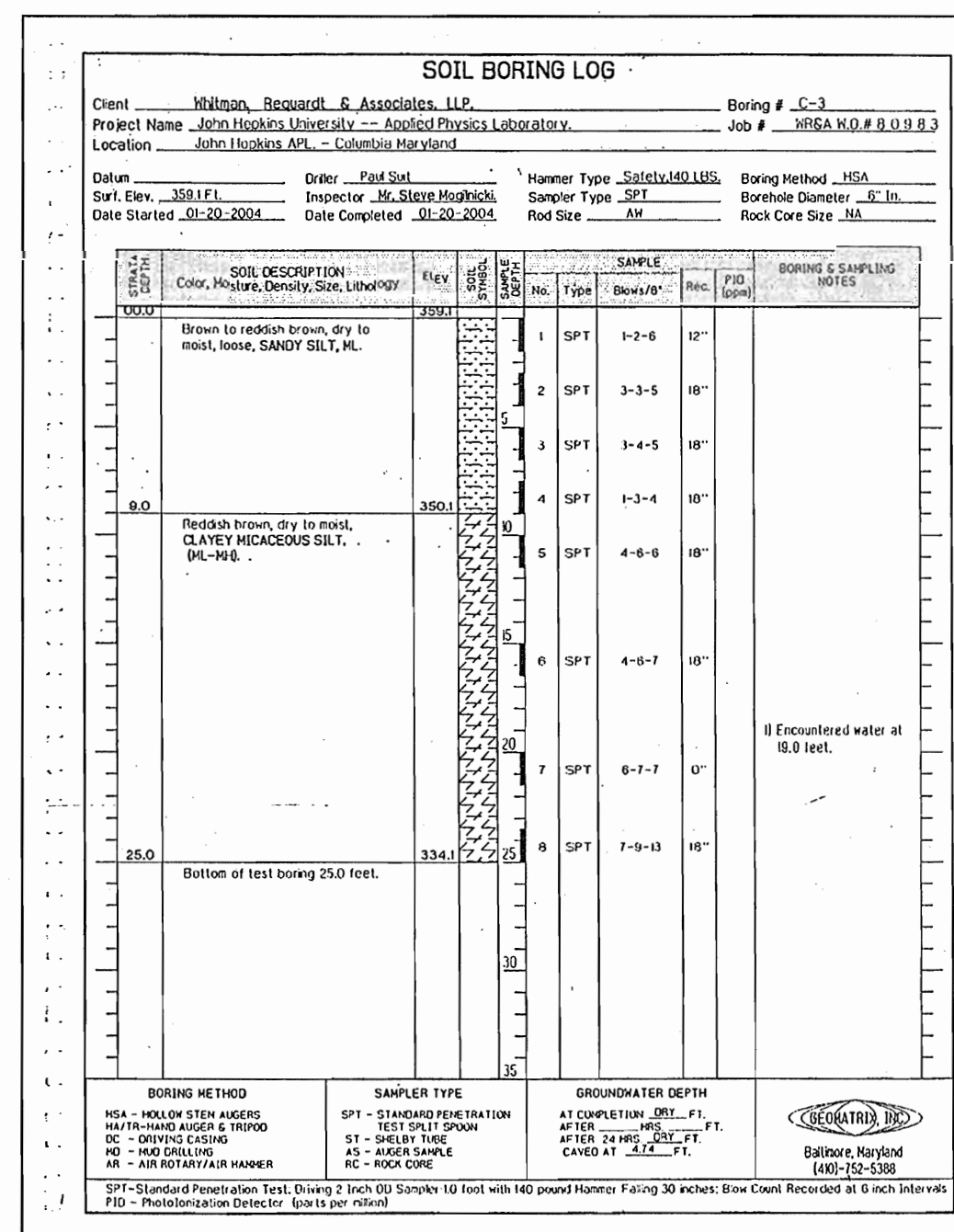
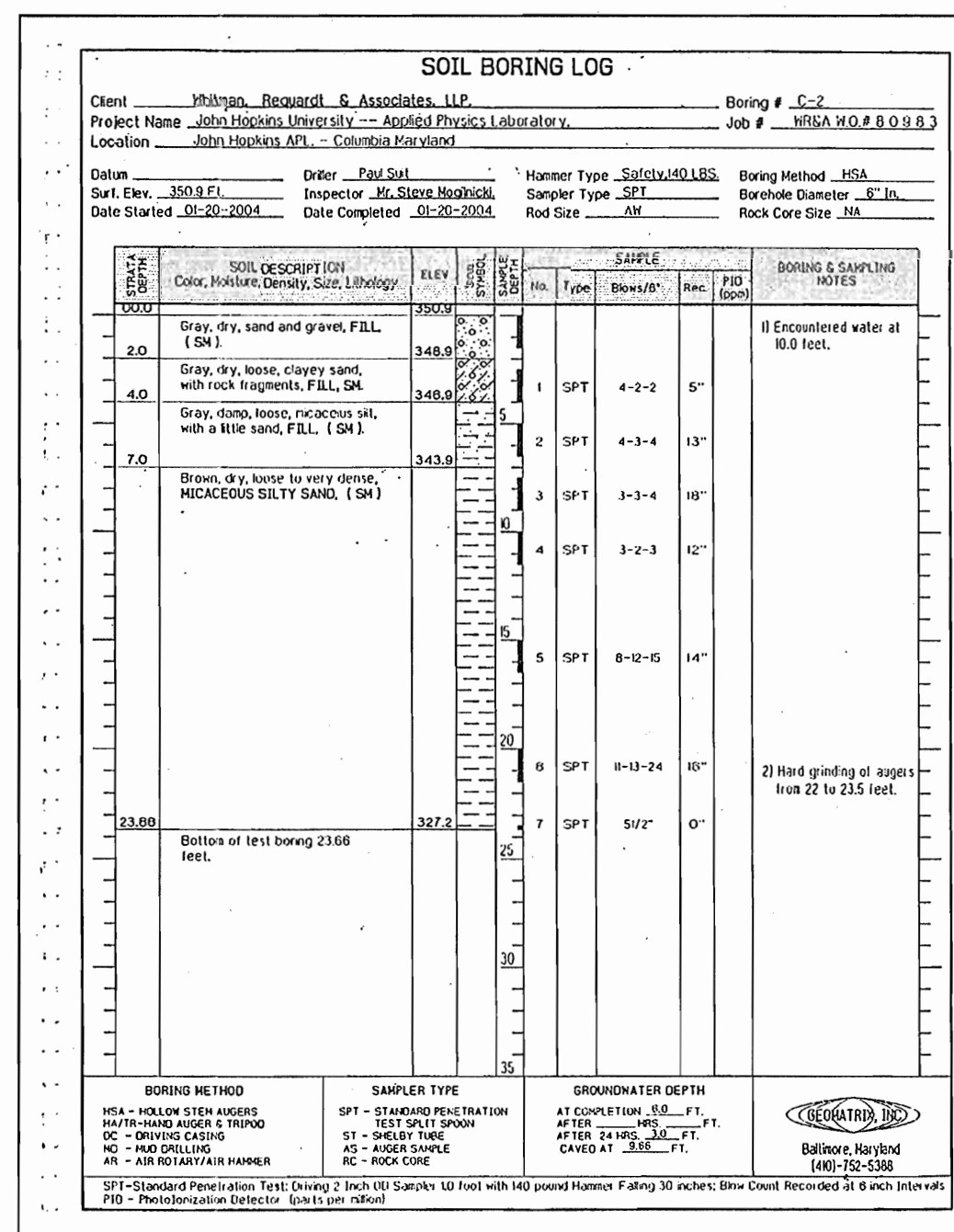
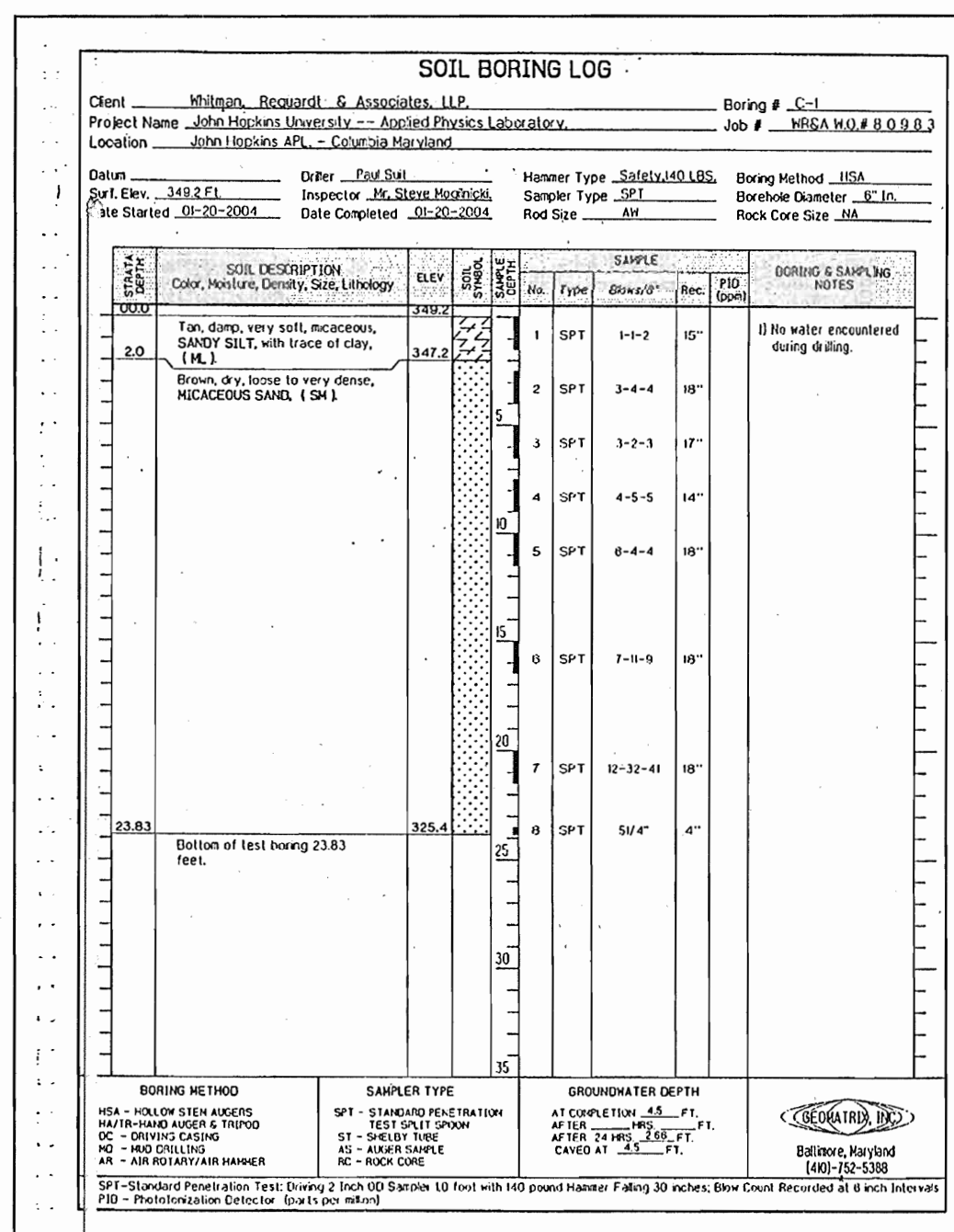
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Sheet 3 of 30	
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Checked By: AUO	Date: 10/20/04

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Howard County
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 11/19/04

Cindy Kramiec
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE: 11/30/04

Marisa DeLuca
 DIRECTOR DATE: 12/1/04



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Michael J. ... 11/19/04
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
Charles ... 11/19/04
 CHIEF, DIVISION OF LAND DEVELOPMENT
David ... 12/1/07
 DIRECTOR



THE JOHNS HOPKINS UNIVERSITY
 APPLIED PHYSICS LABORATORY
 1100 JOHNS HOPKINS ROAD
 LAUREL MARYLAND 20723

BASIN C
 SWM FACILITIES
 AND LAYDOWN AREA
 SDP 04-133

JHU/APL INTERNAL USE

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GRAPHIC SCALES

WR&A
 WHITMAN, REARDT AND ASSOCIATES, L.P.
 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

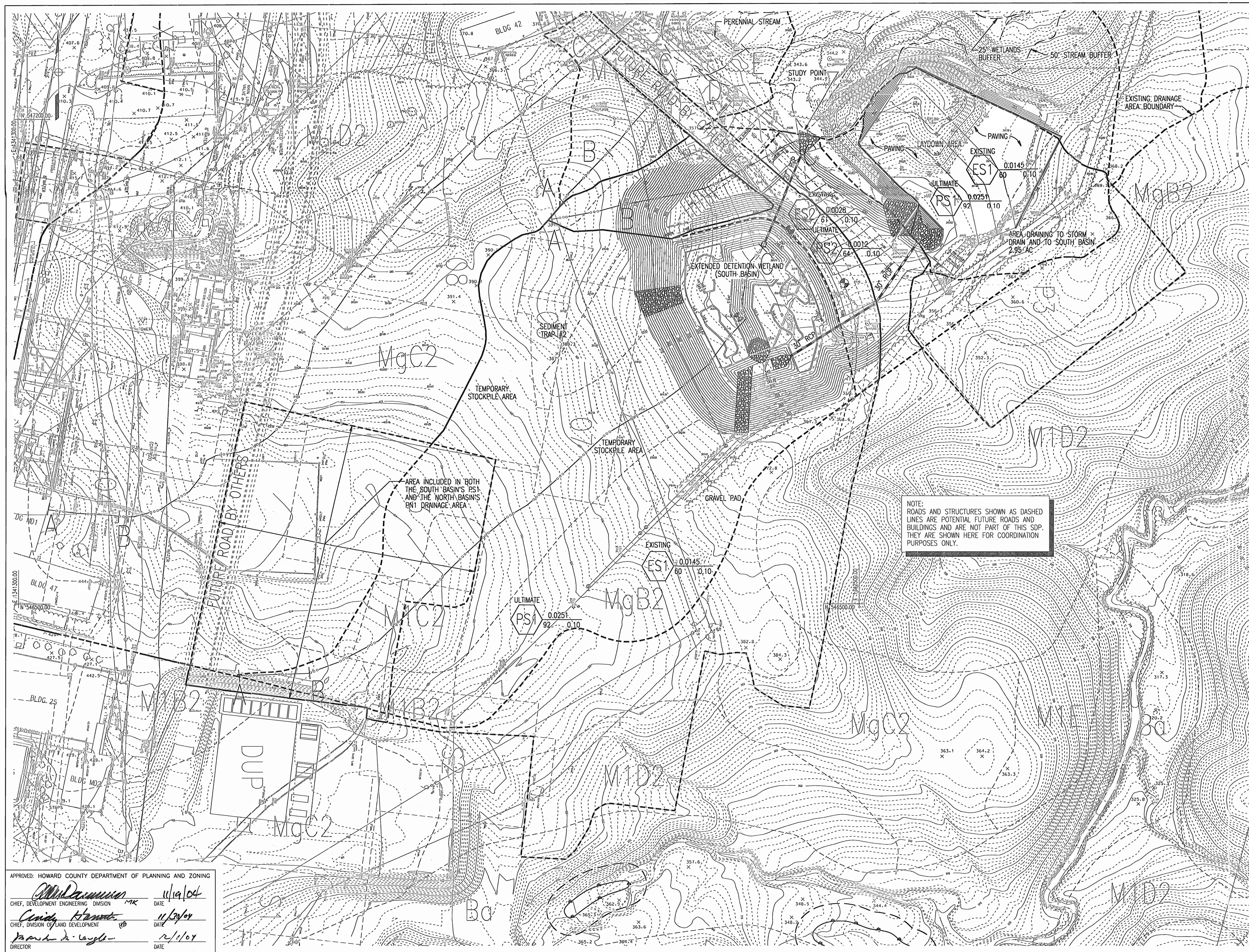
SOIL BORING LOGS

DRAWING NO. **C-3**

Sheet 4 of 30

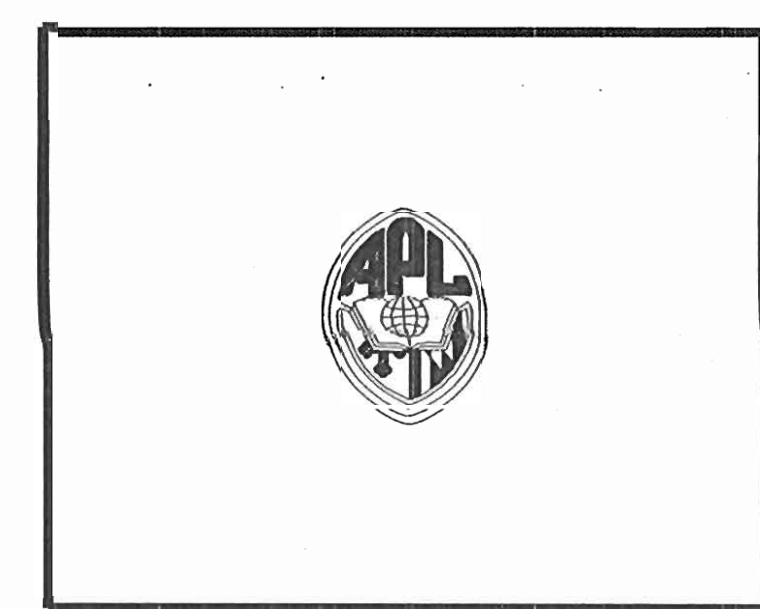
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 Checked By: AUO | Date: 10/20/04



NOTE:
ROADS AND STRUCTURES SHOWN AS DASHED
LINES ARE POTENTIAL FUTURE ROADS AND
BUILDINGS AND ARE NOT PART OF THIS SDP.
THEY ARE SHOWN HERE FOR COORDINATION
PURPOSES ONLY.

AREA INCLUDED IN BOTH
THE SOUTH BASIN'S PS1
AND THE NORTH BASIN'S
PS1 DRAINAGE AREA

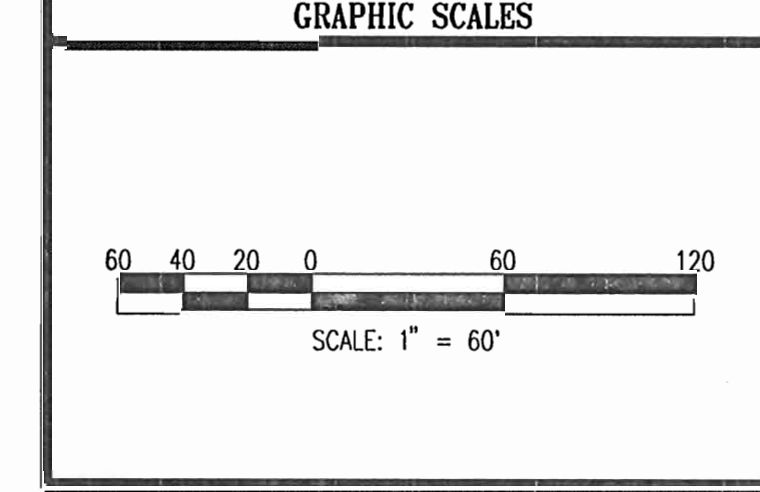


THE JOHNS HOPKINS UNIVERSITY
APPLIED PHYSICS LABORATORY
11100 JOHNS HOPKINS ROAD
LAUREL MARYLAND 20723

BASIN C
SWM FACILITIES
AND LAYDOWN AREA
SDP 04-133

JHU/APL INTERNAL USE

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WR&A

WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

SOUTH BASIN AND LAYDOWN
AREA DRAINAGE AREA MAP

	DRAWING NO.
	C-7
Sheet 8 of 30	
Scale:	
Designed By: MH, EE	Drawn By: EE, PB
Checked By: AUO	Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard County
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE: 11/19/04

Conrad
CHIEF, DIVISION OF LAND DEVELOPMENT
DATE: 11/20/04

Mark A. Leple
DIRECTOR
DATE: 12/1/04

Alignment Name: NORTH BASIN
Alignment Description: ACCESS ROAD

Point Type	Station	Northing (Y)	Easting (X)
LC=	51.4062	547574.2612	1342501.1939
RC=	142.8484		
CD=	20'37"08"		
DC=	4'06"34"		
LC=	7.6608	547524.4214	1342489.7835
RC=	5.0500		
CD=	85'55"06"		
DC=	113'34"42"		
LC=	0+59.07	547521.6695	1342483.4047
RC=	1.4832		
CD=	69'52"38" W		
DC=	113'34"42"		
LC=	28.1870	547522.1798	1342482.0121
RC=	-21.9608		
CD=	73'32"24"		
DC=	260'54"02"		
LC=	0+88.74	547514.6478	1342456.8224
RC=	34.7722		
CD=	36'34"07" W		
DC=	177'45"30"		
LC=	24.4069	547486.7257	1342436.0990
RC=	32.2324		
CD=	43'23"07"		
DC=	177'45"30"		
LC=	20.4079	547474.1958	1342415.8314
RC=	95.5477		
CD=	12'14"16"		
DC=	59'57"56"		

Alignment Name: NORTH BASIN
Alignment Description: EMBANKMENT

Point Type	Station	Northing (Y)	Easting (X)
LC=	0+00.00	547395.7200	1342253.0909
RC=	16.3104		
CD=	71'34"49" E		
DC=	16.8661	547400.8737	1342268.5657
LC=	18.5639	547406.2030	1342284.5677
RC=	40.0000		
CD=	26'35"27"		
DC=	143'14"22"		
LC=	0+51.74	547407.8460	1342302.8919
RC=	20.7794		
CD=	81'49"40" E		
DC=	143'14"22"		
LC=	16.6600	547405.8923	1342323.4603
RC=	-40.0000		
CD=	23'51"49"		
DC=	143'14"22"		
LC=	0+89.18	547405.9768	1342339.9645
RC=	116.5847		
CD=	48'14"17" E		
DC=	520'52"15"		
LC=	9.2610	547437.5078	1342452.2044
RC=	-11.0000		
CD=	48'14"17" E		
DC=	520'52"15"		
LC=	2+15.03	547443.2636	1342459.1101
RC=	22.1926		
CD=	26'04"13" E		
DC=	520'52"15"		
LC=	2+05.76	547463.1982	1342468.8632
RC=	38.9511		
CD=	26'04"13" E		
DC=	520'52"15"		
LC=	2+15.03	547499.7717	1342482.2637
RC=	24.7617		
CD=	26'04"13" E		
DC=	520'52"15"		

Alignment Name: NORTH BASIN
Alignment Description: ACCESS ROAD ALONG BUFFER

Point Type	Station	Northing (Y)	Easting (X)
LC=	0+00.00	547387.8167	1342276.7859
RC=	33.9441		
CD=	42'46"04"		
DC=	123'58"40"		
LC=	0+17.81	547391.9888	1342294.0968
RC=	45.4749		
CD=	42'46"04"		
DC=	123'58"40"		
LC=	0+33.94	547383.2970	1342309.6380
RC=	0+35.56		
CD=	60'46"58" E		
DC=	42'14"18"		
LC=	58.9757	547381.0446	1342313.6654
RC=	-80.0000		
CD=	42'14"18"		
DC=	71'37"11"		
LC=	0+69.46	547365.9616	1342340.6342
RC=	0+69.46		
CD=	76'58"45" E		
DC=	42'14"18"		
LC=	8.6832	547380.9867	1342405.6068
RC=	-80.0000		
CD=	61'33"08"		
DC=	71'37"11"		
LC=	1+37.67	547381.9658	1342409.8410
RC=	1+42.00		
CD=	70'45"37" E		
DC=	286'28"44"		
LC=	22.8948	547406.7097	1342480.7369
RC=	-20.0000		
CD=	65'35"19"		
DC=	286'28"44"		
LC=	2+25.64	547410.8560	1342492.9035
RC=	24.3564		
CD=	51'01"17" E		
DC=	227'41"15"		
LC=	19.5512	547423.7899	1342494.0651
RC=	50.0000		
CD=	227'41"15"		
DC=	114'35"30"		
LC=	3+09.58	547497.4302	1342500.7299
RC=	3+19.23		
CD=	547506.2074		
DC=	1342505.3138		

NORTH BASIN DESIGN SUMMARY

North Basin
Extended Detention Shallow Marsh (W-2) Hazard Class 'A'
Drainage Area : 18.9 Acres

DESIGN STORM	WATER SURFACE ELEVATION (feet)	STORAGE VOLUME (acre feet)	Qin (cfs)	Qout (cfs)
Invert	345.00	0.00	n/a	n/a
2-year	353.10		7.54	7.37
10-year	353.95		60.48	59.09
100-year	354.58		115.82	111.47
Forebay Sediment Volume	351.00	0.33	n/a	n/a
Recharge Volume (Rev)	352.00	1.28	n/a	n/a
Water Quality Volume (Wqv)	352.00	1.28	n/a	n/a
Channel Protection Volume (Cpv)	352.80	1.88	n/a	n/a
(1-year)				
Overbank Flood Protection (Op)	n/a	n/a	n/a	n/a
Extreme Flood Protection (Of)	n/a	n/a	n/a	n/a
Top of Dam Elevation	356	5.13	n/a	n/a

Note: Op and Of are not required for this project as determined by HDRS.

Riser: Reinforced Concrete Box
Principal Spillway: 30 inch RCP
Emergency Spillway: 30 feet wide vegetated earth
Maintenance: Private Responsibility of the Owner (JHU - APL)

OPERATION AND MAINTENANCE SCHEDULE

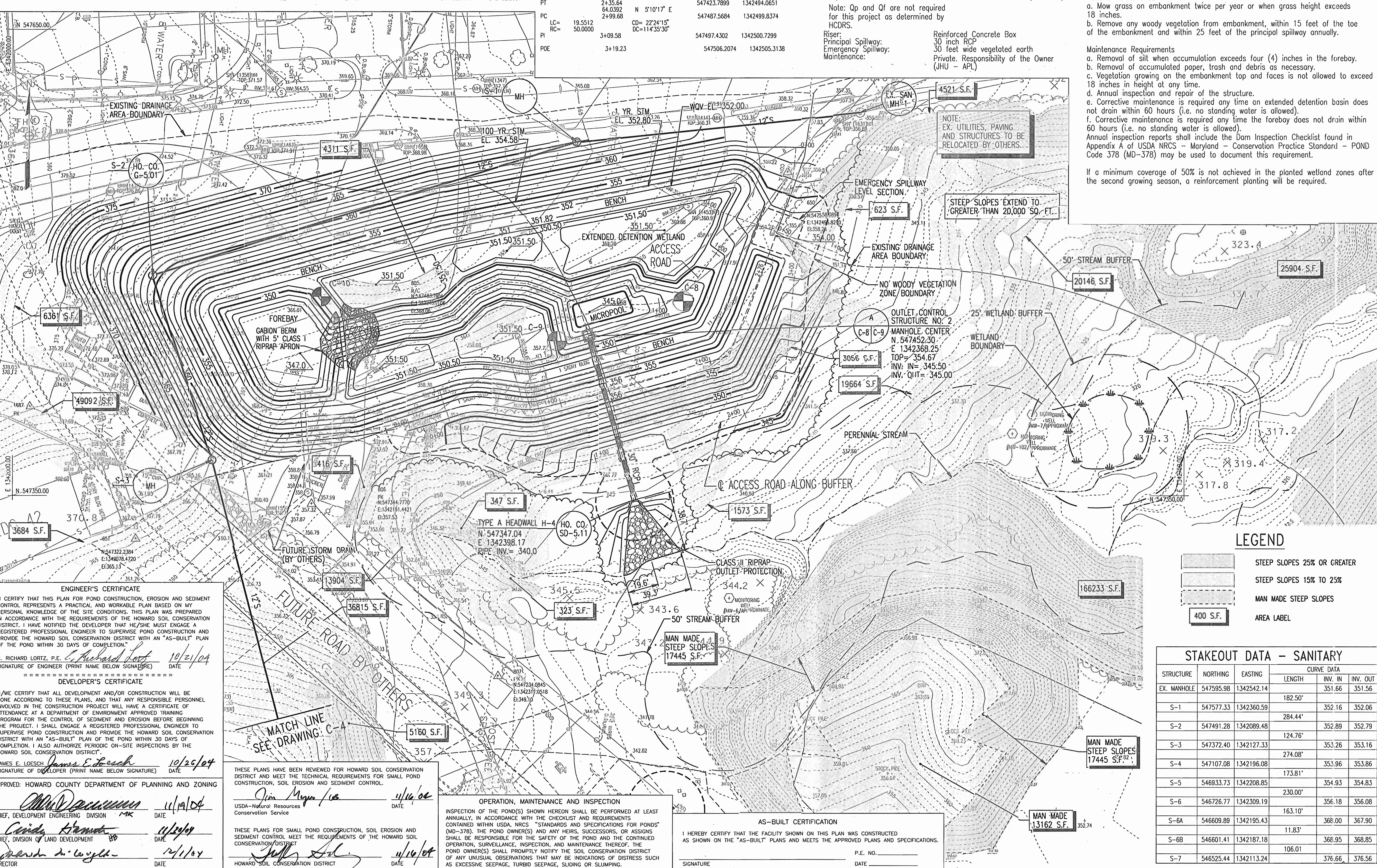
Maintenance is the responsibility of the Owner, JHU - APL. Inspections shall be performed by the Howard County Department of Public Works (DPW) during the first year of operation and at least once every three years thereafter. The Owner shall perform any maintenance or repairs required by DPW on a schedule to be determined when the maintenance or repair is required.

Inspection Schedule	Responsible Party
a. First year of operation	HCDPW
b. Triennial Inspection	HCDPW
c. Annual Inspection - Generate Annual Inspection Report	APL
d. At end of second growing season - Check for vegetation establishment	APL
e. Sixty hours after the end of each significant rainfall event (>2.6 inches of rainfall) Check for ponding water, sediment deposition in the forebay, erosion damage, trash and clogging of the spillway orifices.	APL

Routine Maintenance
a. Mow grass on embankment twice per year or when grass height exceeds 18 inches.
b. Remove any woody vegetation from embankment, within 15 feet of the toe of the embankment and within 25 feet of the principal spillway annually.

Maintenance Requirements
a. Removal of silt when accumulation exceeds four (4) inches in the forebay.
b. Removal of accumulated paper, trash and debris as necessary.
c. Vegetation growing on the embankment top and faces is not allowed to exceed 18 inches in height at any time.
d. Annual inspection and repair of the structure.
e. Corrective maintenance is required any time an extended detention basin does not drain within 60 hours (i.e. no standing water is allowed).
f. Corrective maintenance is required any time the forebay does not drain within 60 hours (i.e. no standing water is allowed).
Annual inspection reports shall include the Dam Inspection Checklist found in Appendix A of USDA NRCS - Maryland - Conservation Practice Standard - POND Code 378 (MD-378) may be used to document this requirement.

If a minimum coverage of 50% is not achieved in the planted wetland zones after the second growing season, a reinforcement planting will be required.



ENGINEER'S CERTIFICATE
I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.
C. RICHARD LORTZ, P.E. *C. Richard Lortz* 10/21/04
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

DEVELOPER'S CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.
JAMES E. LOESCH *James E. Loesch* 10/26/04
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

[Signature] 11/29/04
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 12/1/04
DIRECTOR 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.
[Signature] 11/16/04
USDA-Natural Resources Conservation Service DATE

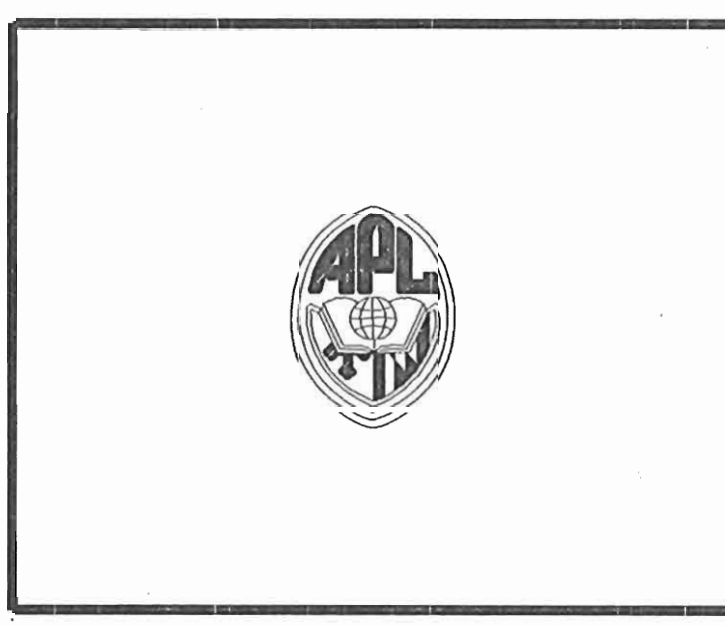
THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
[Signature] 11/16/04
HOWARD SOIL CONSERVATION DISTRICT DATE

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, NRCS "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 INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

AS-BUILT CERTIFICATION
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.
SIGNATURE _____ P.E. NO. _____
DATE _____

STAKEOUT DATA - SANITARY

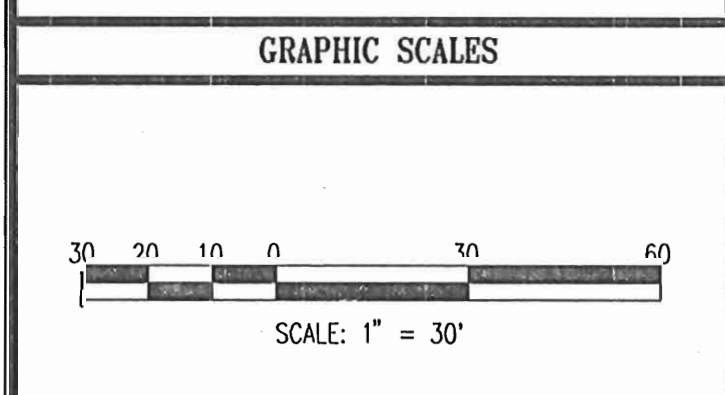
STRUCTURE	NORTHING	EASTING	CURVE DATA		
			LENGTH	INV. IN	INV. OUT
EX. MANHOLE	547595.98	1342542.14	182.50'	351.66	351.56
S-1	547577.33	1342360.59	284.44'	352.16	352.06
S-2	547491.28	1342089.48	124.76'	352.89	352.79
S-3	547372.40	1342127.33	274.08'	353.26	353.16
S-4	547107.08	1342196.08	173.81'	353.96	353.86
S-5	546933.73	1342208.85	230.00'	354.93	354.83
S-6	546726.77	1342309.19	163.10'	356.18	356.08
S-6A	546609.89	1342195.43	11.83'	368.00	367.90
S-6B	546601.41	1342187.18	106.01'	368.95	368.85
S-7	546525.44	1342113.24	376.66'	376.66	376.56



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SDP 04-133

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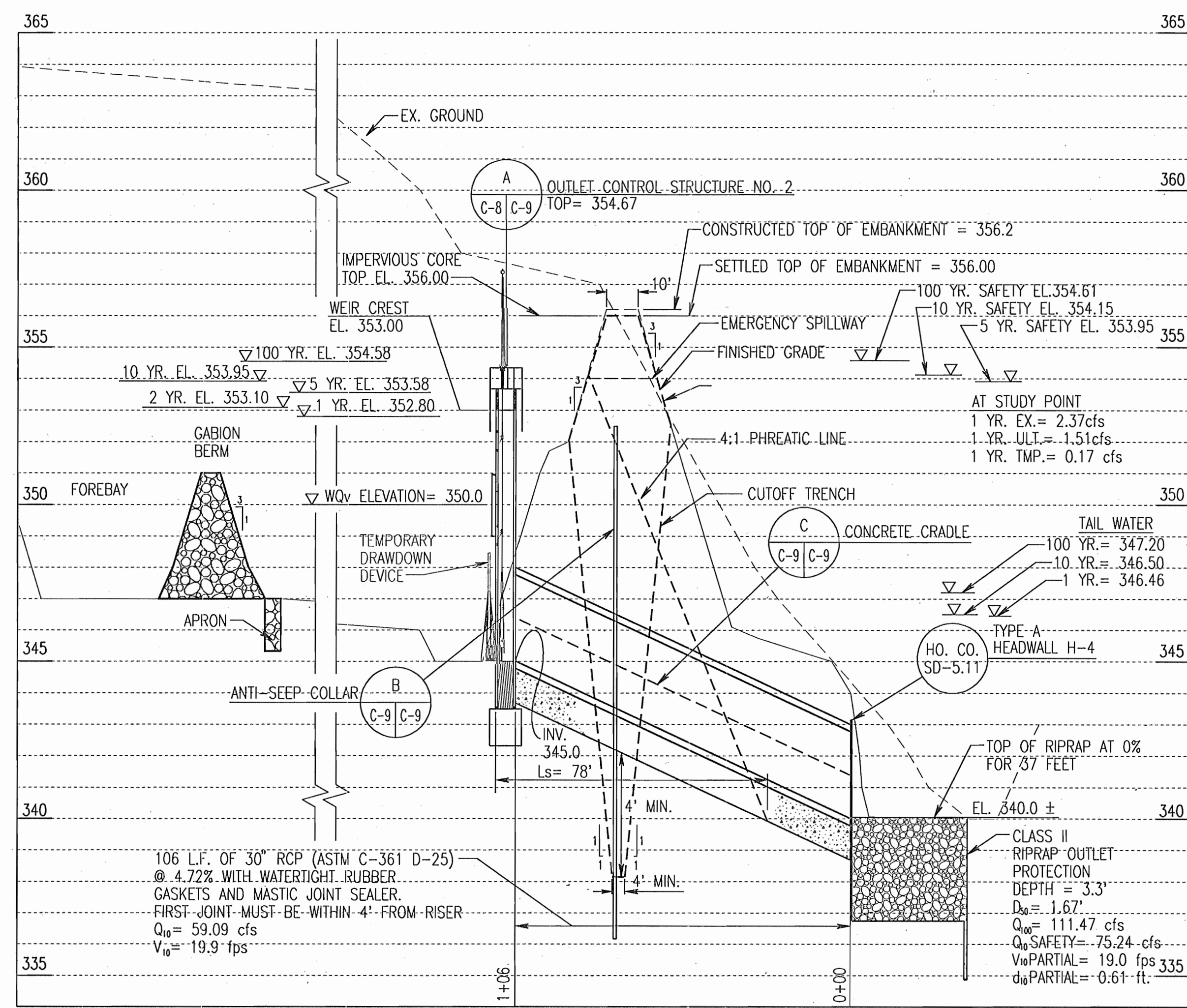
WR&A
WHITMAN, REQUARDT AND ASSOCIATES, L.L.P.
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

NORTH BASIN GRADING PLAN

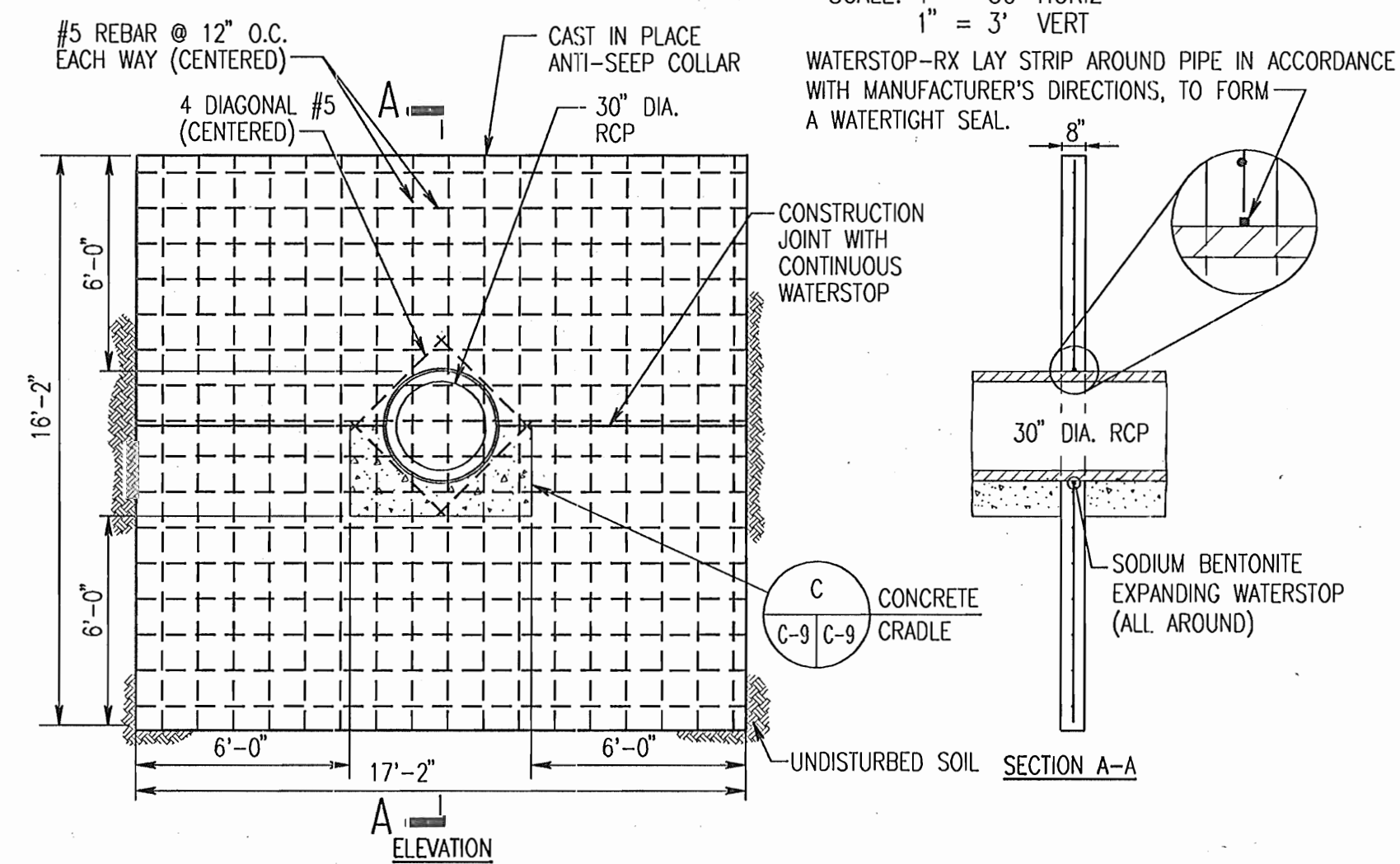
DRAWING NO. **C-8**

Sheet 9 of 30

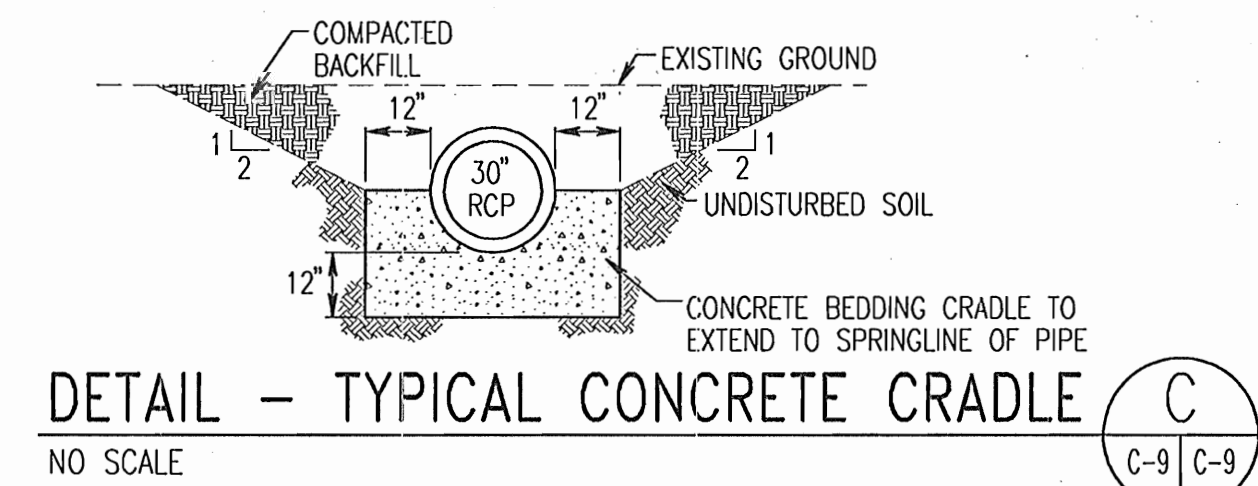
Scale: _____
Designed By: MH, EE Drawn By: EE, PB
Checked By: AUO Date: 10/20/04



PROFILE - CENTERLINE 30" RCP - NORTH BASIN

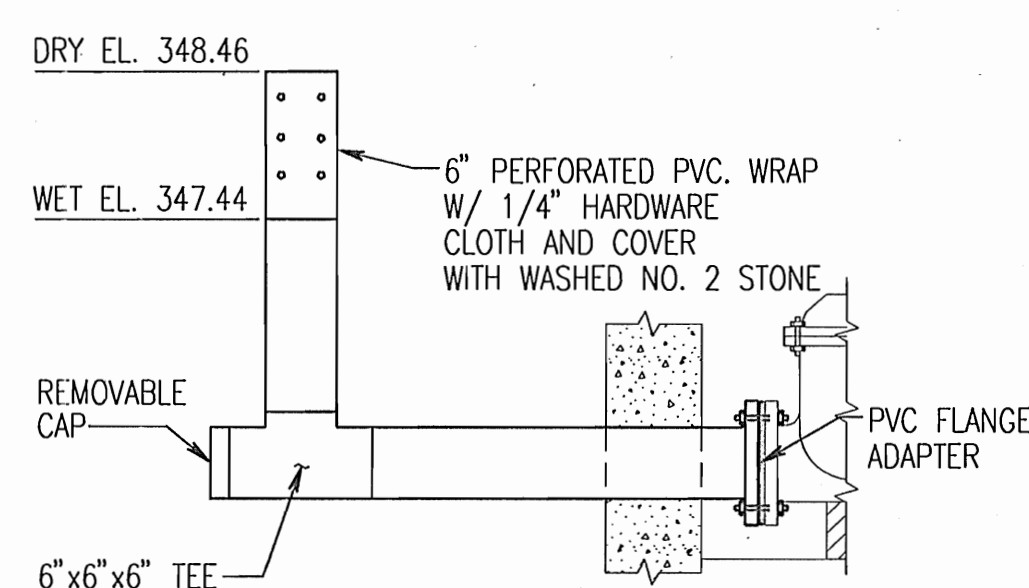


ANTI-SEEP COLLAR DETAIL

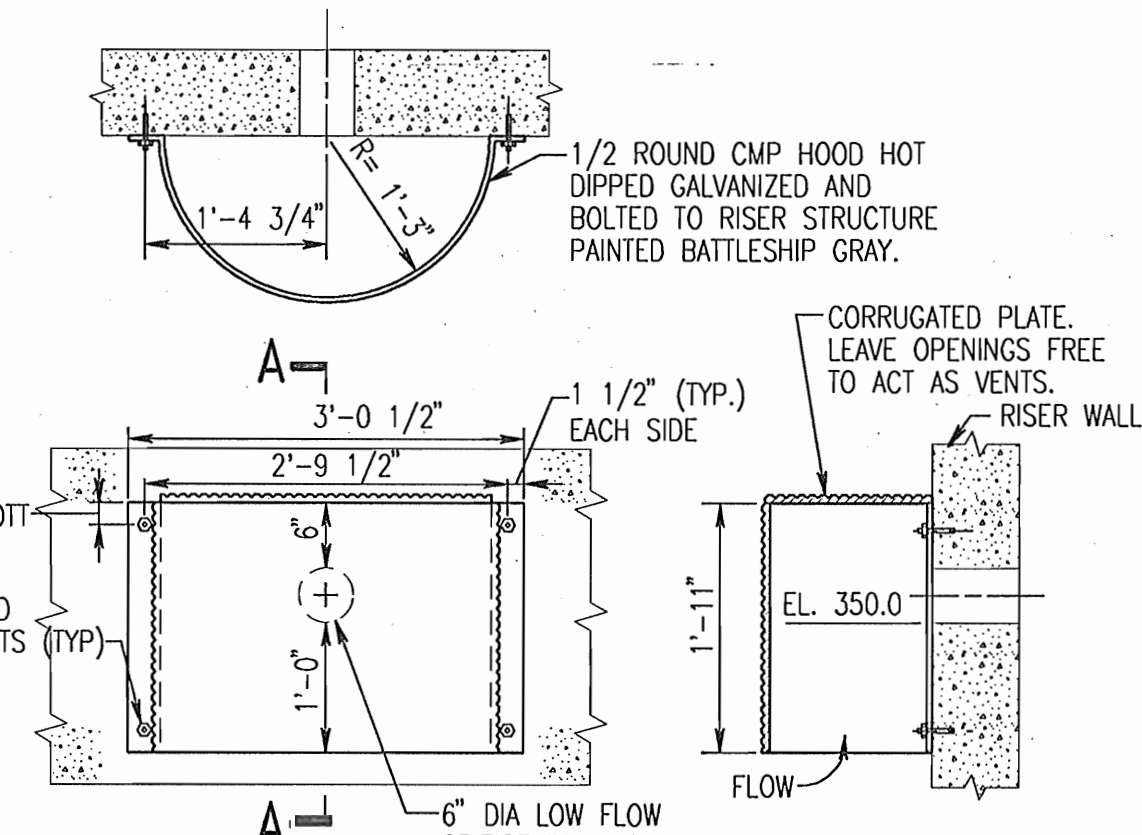


DETAIL - TYPICAL CONCRETE CRADLE

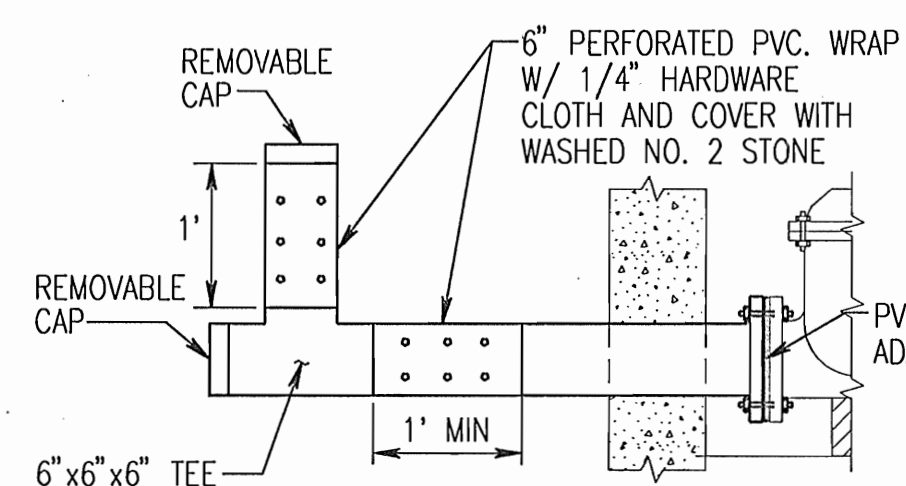
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 Chief, Division of Land Development
 Director



DETAIL - TEMPORARY DRAWDOWN DEVICE

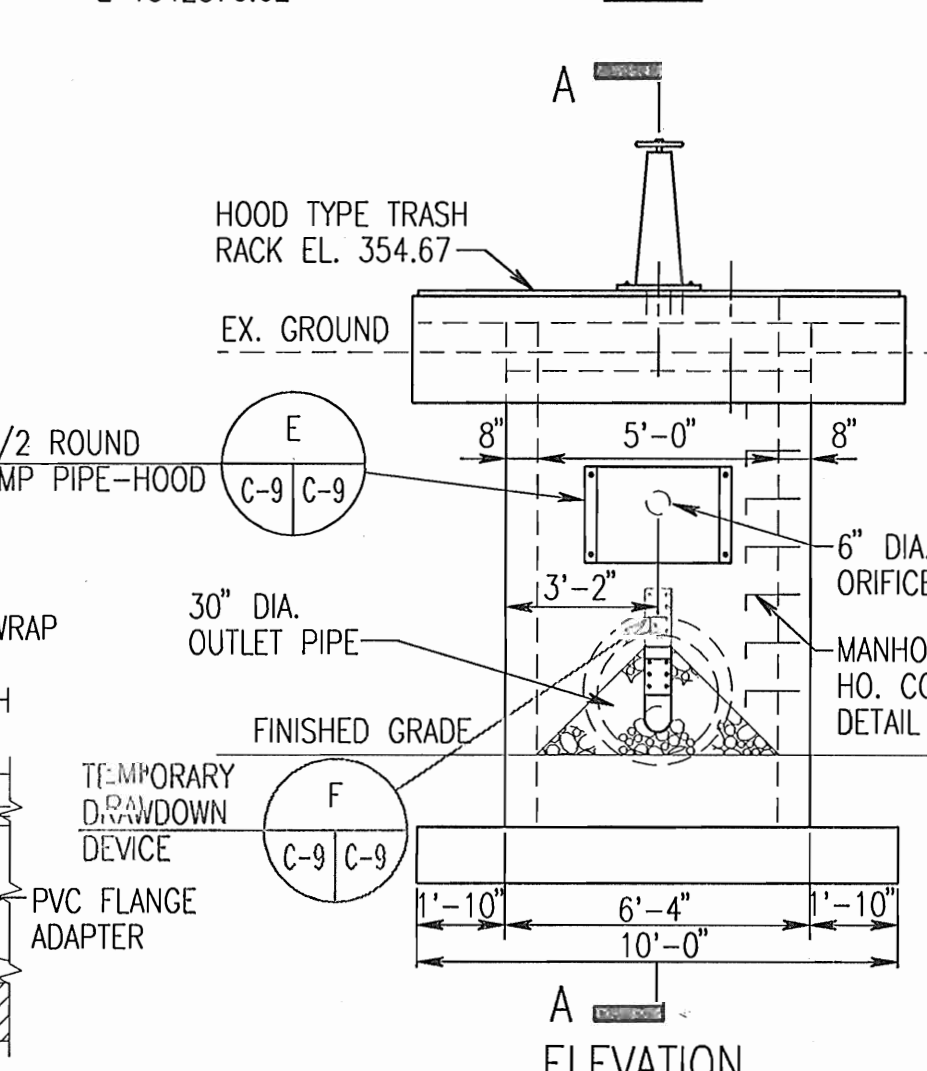
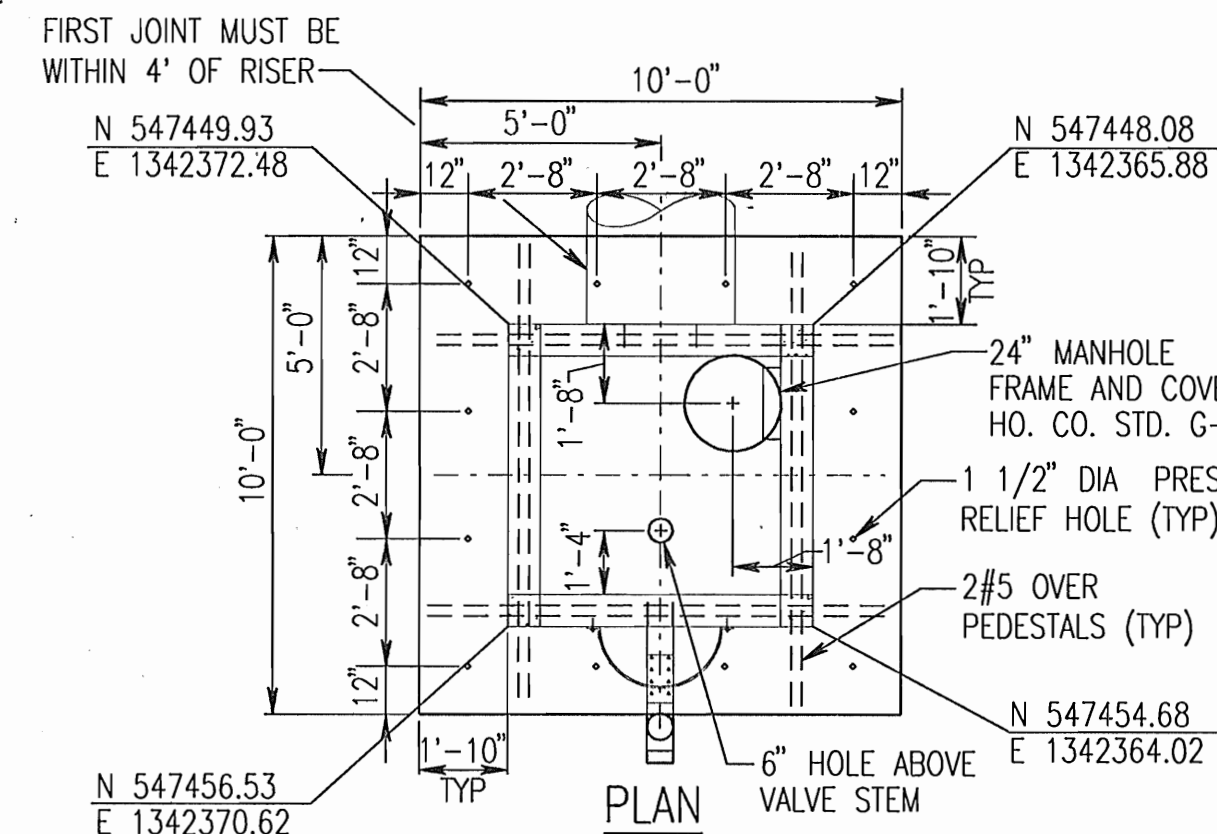
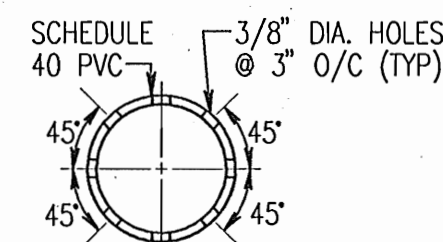


1/2 ROUND CMP PIPE-HOOD

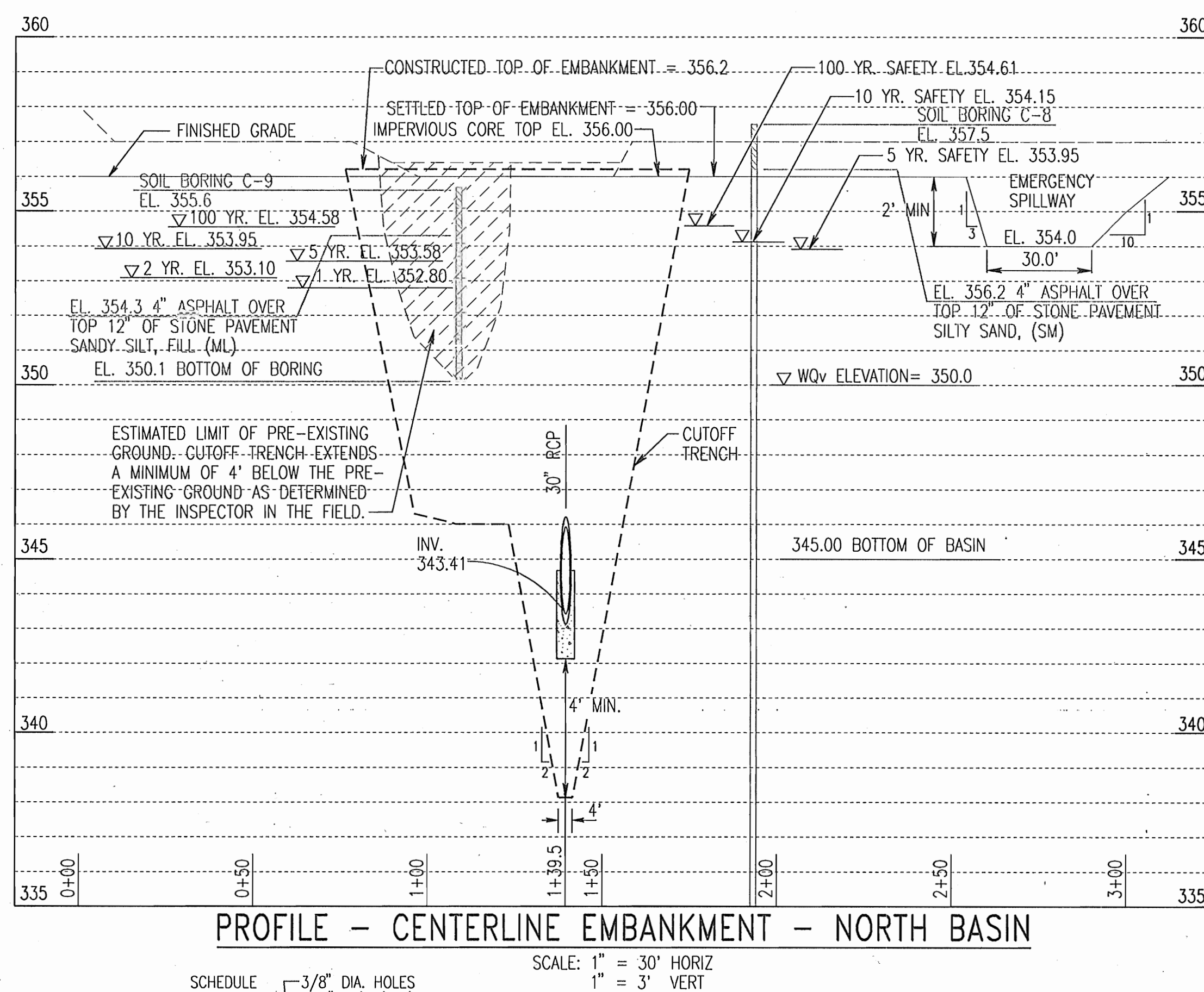


DETAIL - PERMANENT TRASH RACK ORIFICE

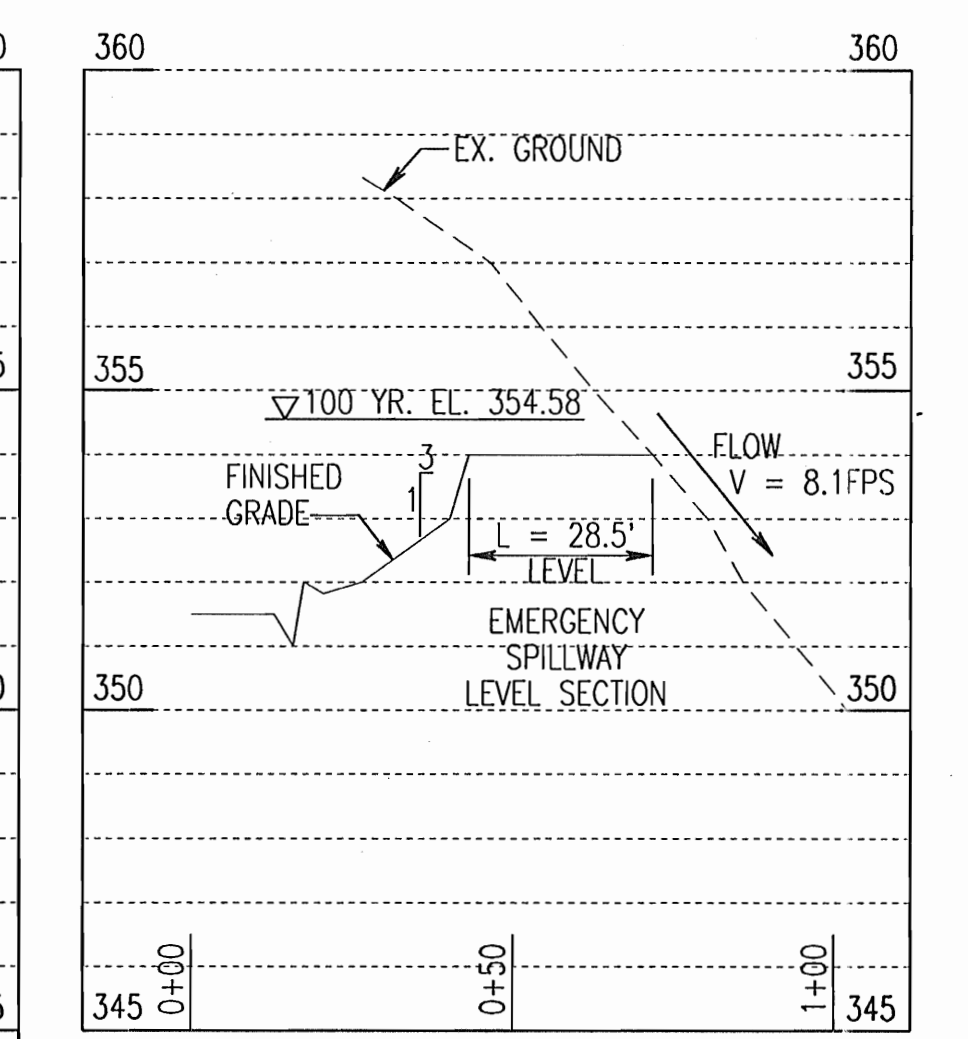
6" PERFORATED PVC



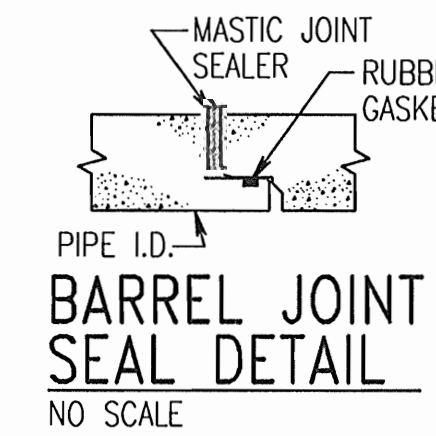
OUTLET CONTROL STRUCTURE NO. 2 AND PIPE SPILLWAY DETAILS



PROFILE - CENTERLINE EMBANKMENT - NORTH BASIN

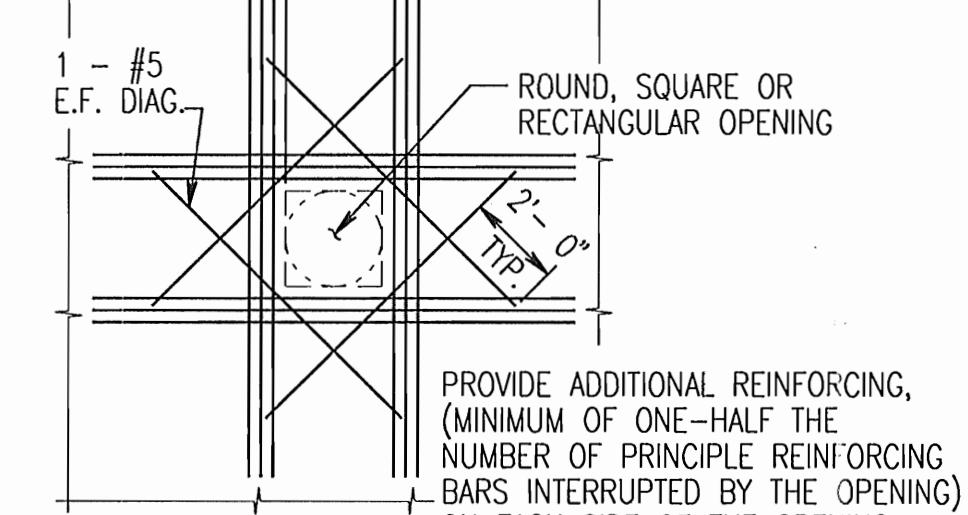


PROFILE - CENTERLINE EMERGENCY SPILLWAY - NORTH BASIN

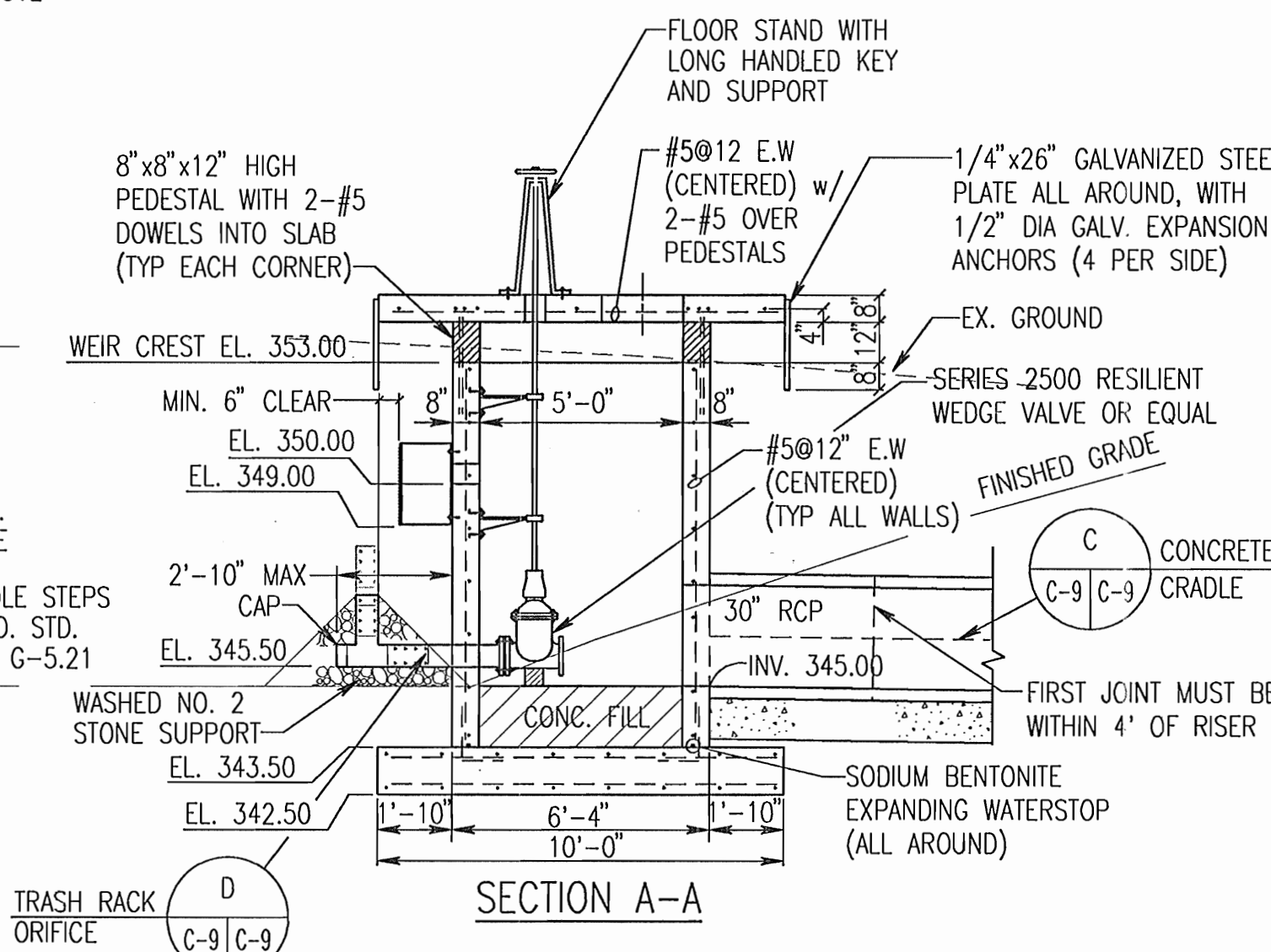


BARREL JOINT SEAL DETAIL

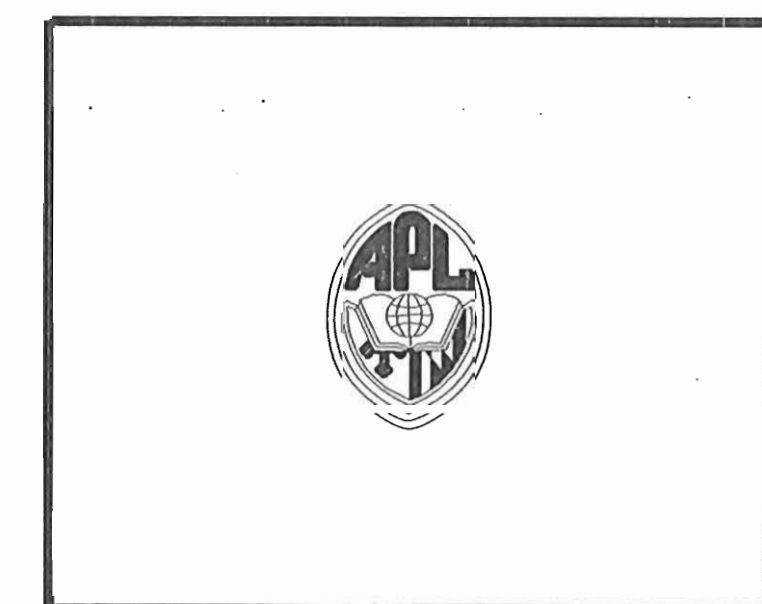
NOTE: FOR OPENINGS LESS THAN 12" DIA., NO ADDITIONAL REINFORCING IS REQUIRED PROVIDED NO REINFORCING IS INTERRUPTED BY THE OPENING



ADDITIONAL REINFORCING AROUND OPENINGS



SECTION A-A



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 1100 JOHNS HOPKINS ROAD
 LAUREL MARYLAND 20723

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 SDP 04-133

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GRAPHIC SCALES
 SCALE: 1" = 30'
 SCALE: 1" = 3'
 SCALE: 1/4" = 1'-0"
 SCALE: 3/8" = 1'-0"
 SCALE: 3/4" = 1'-0"

WR&A

WHITMAN, REQUARDT AND ASSOCIATES, LLP
 ENGINEERS, ARCHITECTS, PLANNERS
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 410 - 235 - 3450

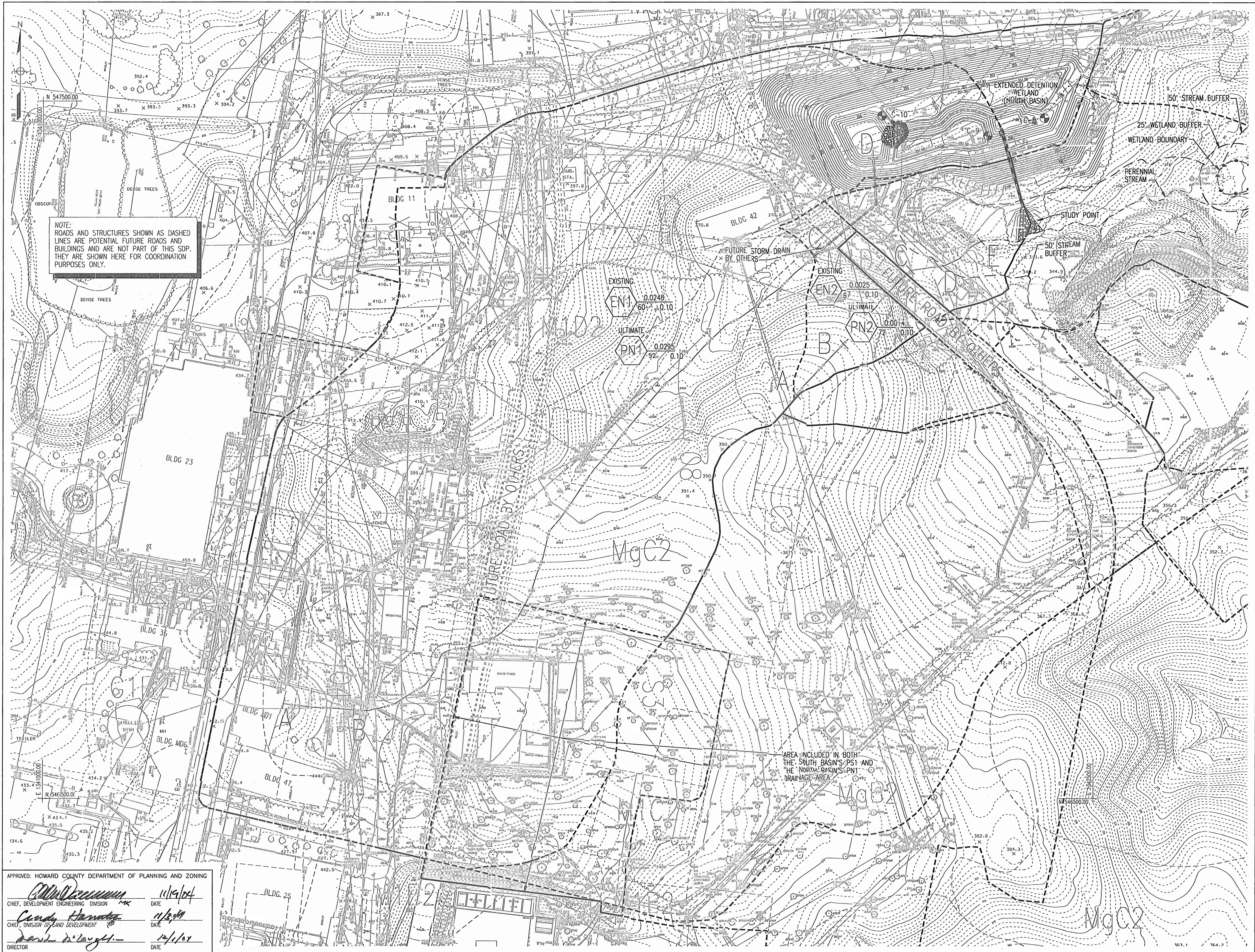
NORTH BASIN PROFILES, SECTIONS AND DETAILS

DRAWING NO. C-9

Sheet 10 of 30

Scale: 1" = 30' HORIZ, 1" = 3' VERT

Designed By: MH, EE Drawn By: EE, PB
 Checked By: AUO Date: 10/26/04



NOTE:
ROADS AND STRUCTURES SHOWN AS DASHED
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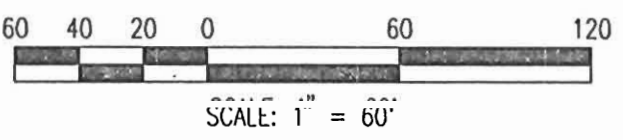
THE JOHNS HOPKINS UNIVERSITY
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HEREUNDER, WITHOUT THE EXPRESS WRITTEN CONSENT OF JHU/APL.

GRAPHIC SCALES



WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

NORTH BASIN
DRAINAGE AREA MAP



DRAWING NO.
C-10

Sheet 11 of 30

Scale:
Designed By: MH, EB Drawn By: EE, PB
Checked By: AUO Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
[Signature] 11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE
[Signature] 11/2/04
CHIEF, DIVISION OF LAND DEVELOPMENT DATE
[Signature] 12/1/04
DIRECTOR DATE



OPERATION AND MAINTENANCE SCHEDULE

Maintenance is the responsibility of the Owner, JHU - APL. Inspections shall be performed by the Howard County Department of Public Works (DPW) during the first year of operation and at least once every three years thereafter. The Owner shall perform any maintenance or repairs required by DPW on a schedule to be determined when the maintenance or repair is required.

Inspection Schedule	Responsible Party
a. First year of operation	HCDPW
b. Triennial Inspection	HCDPW
c. Annual Inspection - Generate Annual Inspection Report	APL
d. At end of second growing season - Check for vegetation establishment	APL
e. Sixty hours after the end of each significant rainfall event (>2.6 inches of rainfall) Check for ponding water, sediment deposition in the forebay, erosion damage, trash and clogging of the spillway orifices.	APL

Routine Maintenance

- Mow grass on embankment twice per year or when grass height exceeds 18 inches.
- Remove any woody vegetation from embankment, within 15 feet of the toe of the embankment and within 25 feet of the principal spillway annually.

Maintenance Requirements

- Removal of silt when accumulation exceeds four (4) inches in the forebay.
- Removal of accumulated paper, trash and debris as necessary.
- Vegetation growing on the embankment top and faces is not allowed to exceed 18 inches in height at any time.
- Annual inspection and repair of the structure.
- Corrective maintenance is required any time an extended detention basin does not drain within 60 hours (i.e. no standing water is allowed).
- Corrective maintenance is required any time the forebay does not drain within 60 hours (i.e. no standing water is allowed).

The Dam Inspection Checklist found in Appendix A of USDA NRCS - Maryland - Conservation Practice Standard - POND - Code 378 (MD-378) may be used to document this requirement.

Bioretention Facility
A drop of at least six inches shall be maintained at the inlet of the bioretention facility from the gravel trench level spreader (stone diaphragm). Dead or diseased plant material shall be replaced. Areas devoid of mulch shall be re-mulched on an annual basis.

WEST BASIN DESIGN SUMMARY

DESIGN STORM	WATER SURFACE ELEVATION (feet)	STORAGE VOLUME (acre feet)	Qin (cfs)	Qout (cfs)
Invert of Basin	390.00	0.0000	n/a	n/a
2-year	391.64	0.1055	3.62	0.58
10-year	391.90	0.1274	8.50	9.35
100-year	392.02	0.1390	14.39	13.95
Forebay Sediment Volume	392.50	0.0162	n/a	n/a
Recharge Volume (Rev)	n/a	0.0082	n/a	n/a
Water Quality Volume (WQv)	n/a	0.0830	n/a	n/a
Channel Protection Volume (Cpv)	391.52	0.1000	2.28	0.06
Overbank Flood Protection (Op)	n/a	n/a	n/a	n/a
Extreme Flood Protection (Of)	n/a	n/a	n/a	n/a
Top of Dam Elevation	394.10	0.3610	n/a	n/a

Note: Op and Of are not required for this project as determined by HCDRS.

Riser: Reinforced Concrete Box
Principal Spillway: 24 inch RCP
Emergency Spillway: None, Principal spillway only.
Maintenance: Private. Responsibility of the Owner (JHU - APL)

Alignment Name: WEST EMBANKMENT - EXTENDED DETENTION
Alignment Description: WEST BASIN EMBANKMENT

Point	Type	Station	Northing (Y)	Easting (X)
PC	LC= 36.1285 RC= 23.0000	0+55.91	546852.7777	1341714.9652
PI		0+78.91	546928.4434	1341721.4916
PT		0+92.04	546921.9168	1341743.5463
PC	LC= 36.1283 RC= 23.0000	1+23.04	546913.1204	1341737.2720
PI		1+46.04	546906.5941	1341795.3266
PT		1+59.17	546884.5394	1341788.8002
POE		1+94.50	546850.6613	1341778.7750

Alignment Name: WEST ACCESS - EXTENDED DETENTION
Alignment Description: WEST BASIN ACCESS ROAD

Point	Type	Station	Northing (Y)	Easting (X)
PC	LC= 22.9328 RC= -46.7023	0+00.00	546779.4917	1341728.0112
PCC	LC= 12.5893 RC= -34.8288	0+22.93	546783.6392	1341750.3322
PCC	LC= 11.8067 RC= -25.4321	0+35.52	546791.2448	1341760.2785
PCC	LC= 21.0285 RC= -64.4947	0+47.33	546801.0561	1341766.6542
PCC	LC= 10.8860 RC= -38.1288	0+68.36	546821.9650	1341767.7097
PCC	LC= 10.1944 RC= -26.5415	0+79.24	546832.2965	1341764.3988
POE		0+89.43	546839.9932	1341757.8099

Alignment Name: WEST BIORETENTION
Alignment Description: EMBANKMENT

Point	Type	Station	Northing (Y)	Easting (X)
PC	LC= 8.8645 RC= -35.0000	0+00.00 0+19.11	547037.2862	1341798.4631
PT		0+27.97	547062.0101	1341811.3937
PI		0+64.40	547097.1345	1341821.0631
PC	LC= 6.7826 RC= 29.0000	1+08.05	547139.2183	1341832.6483
PT		1+14.84	547145.4886	1341835.1933
POE		1+23.73	547153.2827	1341839.4768

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1100 JOHNS HOPKINS ROAD
LAUREL MARYLAND 20723**

**BASIN C
SWM FACILITIES
AND LAYDOWN AREA
SDP 04-133**

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GRAPHIC SCALES

WR&A

**WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450**

WEST BASIN GRADING PLAN

DRAWING NO.	C-11
Sheet 12 of 30	

Scale: _____
Designed By: MH, EE Drawn By: EE, PB
Checked By: AUO Date: 10/20/04

LEGEND

- STEEP SLOPES 25% OR GREATER
- STEEP SLOPES 15% TO 25%
- MAN MADE STEEP SLOPES
- AREA LABEL

ENGINEER'S CERTIFICATE

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

C. RICHARD LORTZ, P.E. *[Signature]* 10/21/04
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

=====

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

JAMES E. LOESCH *[Signature]* 10/20/04
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 11/20/04
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 12/1/04
DIRECTOR 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.

[Signature] 11/19/04
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] 11/16/04
HOWARD SOIL CONSERVATION DISTRICT DATE

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, NRCS "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.

AS-BUILT CERTIFICATION

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

SIGNATURE

DATE

NOTE: EX UTILITIES, PAVING AND STRUCTURES TO BE RELOCATED BY OTHERS.

NO WOODY VEGETATION ZONE BOUNDARY

BIORETENTION FACILITY

6" PVC UNDERDRAIN

HO. CO. TYPE C HEADWALL H-6
N 547092.67
E 1341839.46
INV. = 374.80
(USE STD. FOR 12" PIPE)

CLASS I RIPRAP OUTLET PROTECTION

7571 S.F.

4877 S.F.

HO. CO. TYPE C HEADWALL H-5
N 546942.73
E 1341748.44
PIPE INV. = 387.30

A
C-11-C-12
MANHOLE CENTER
N 546900.32 394.19
E 1341738.18
TOP = 393.13
INV. IN = 390.33
INV. OUT = 388.66

CONCRETE PILOT CHANNEL

HO. CO. SD-6-11
SD-6-21

CLASS I RIPRAP OUTLET PROTECTION

ACCESS ROAD

CLASS I RIPRAP OUTLET PROTECTION WITH 5' APRON

FOREBAY

NOTCHED GABION BERM CENTER NOTCH ON PILOT CHANNEL
6' LONG x 0.3' DEEP

EXTENDED DETENTION FACILITY

400 S.F.

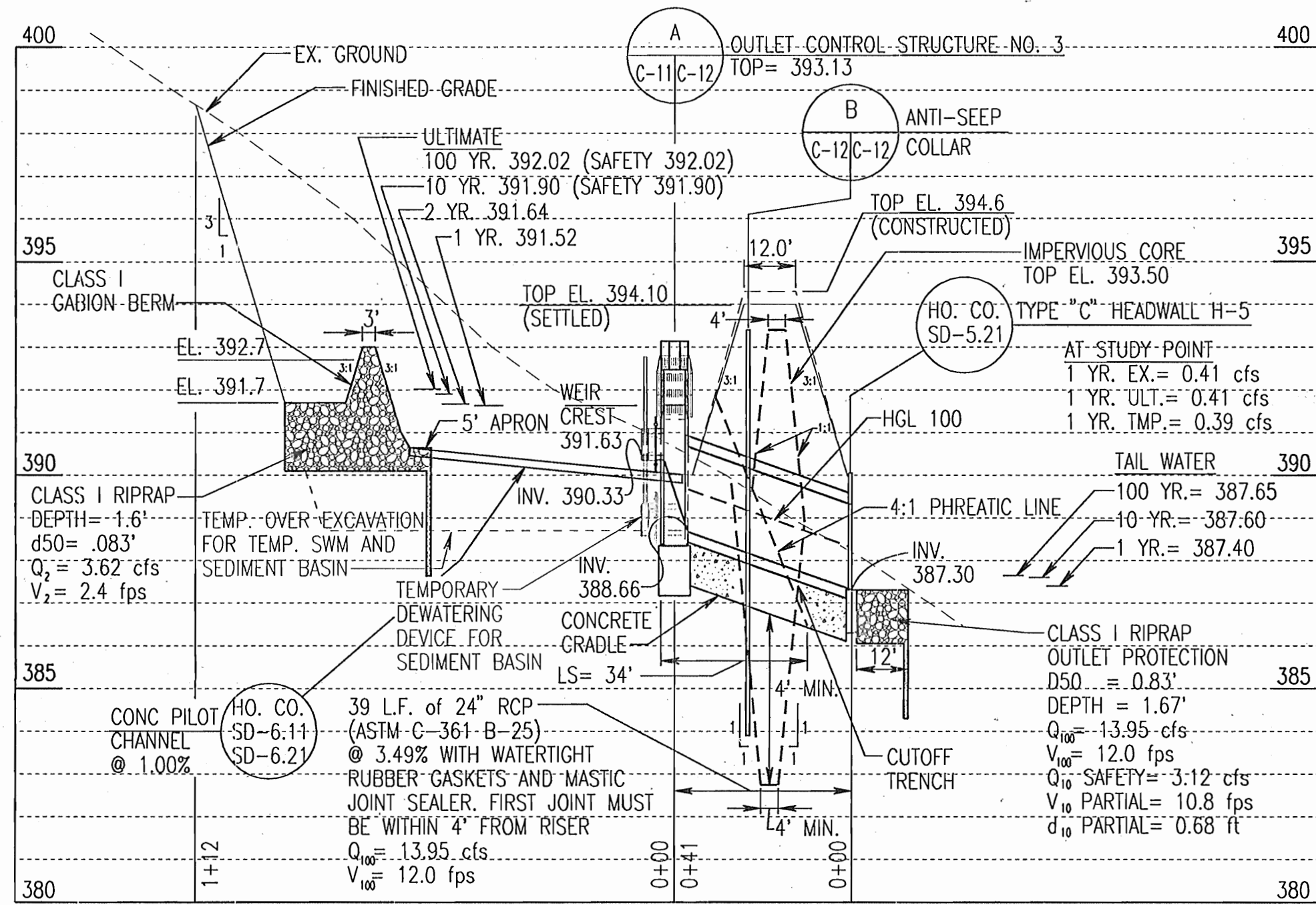
LEGEND

STEEP SLOPES 25% OR GREATER

STEEP SLOPES 15% TO 25%

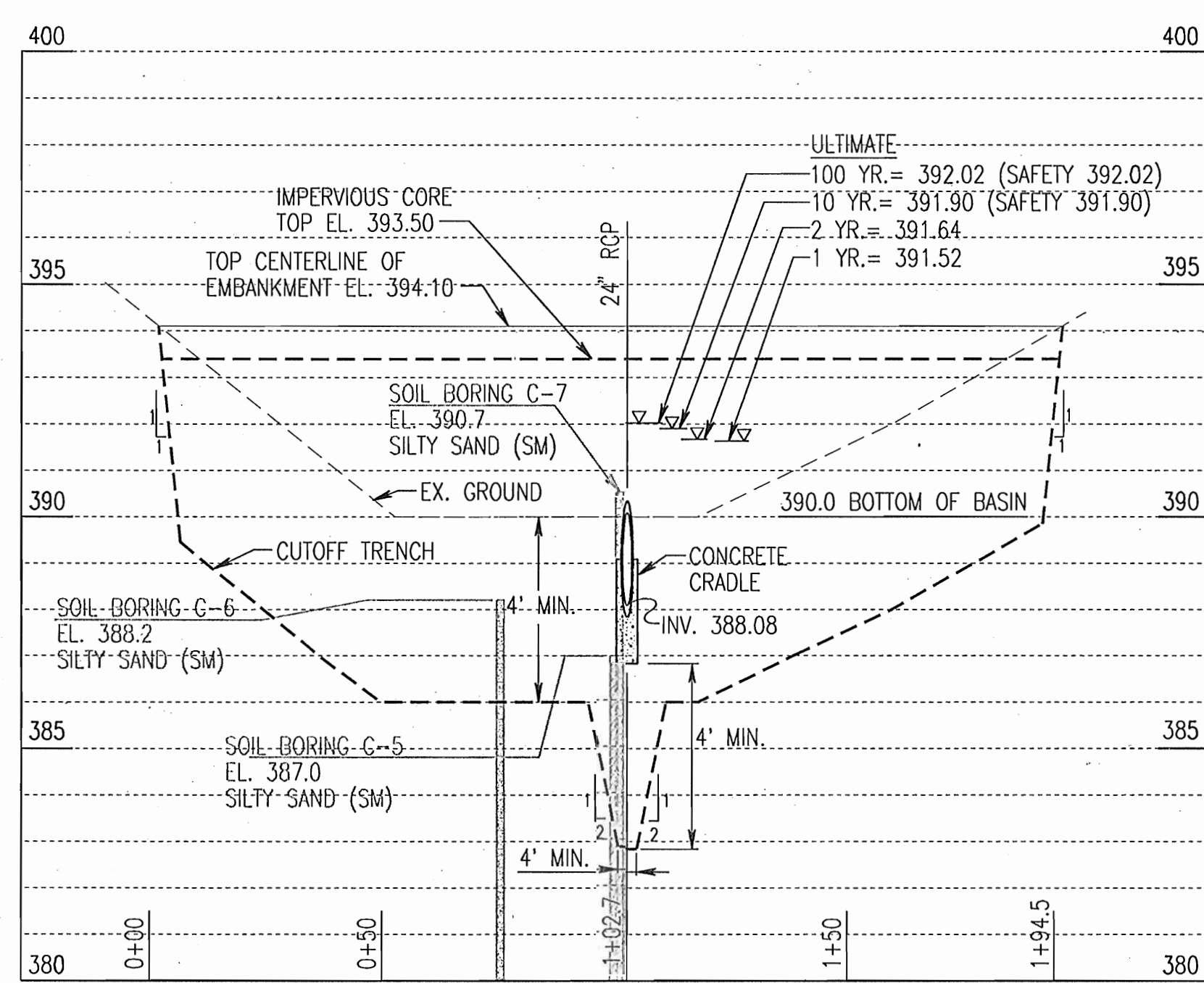
MAN MADE STEEP SLOPES

AREA LABEL



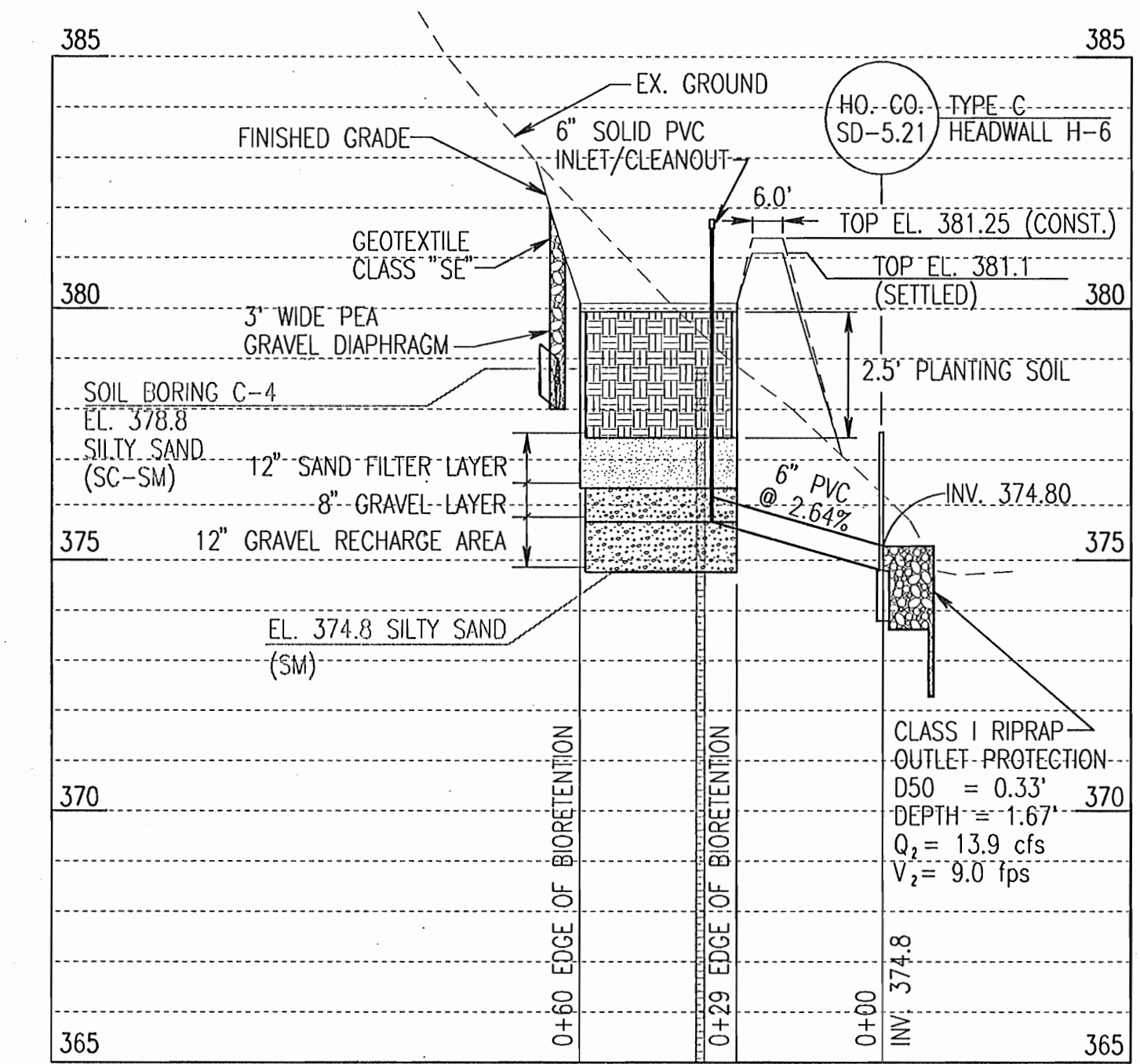
PROFILE - CENTERLINE 24" RCP - WEST BASIN

SCALE: 1" = 30' HORIZ
1" = 3' VERT



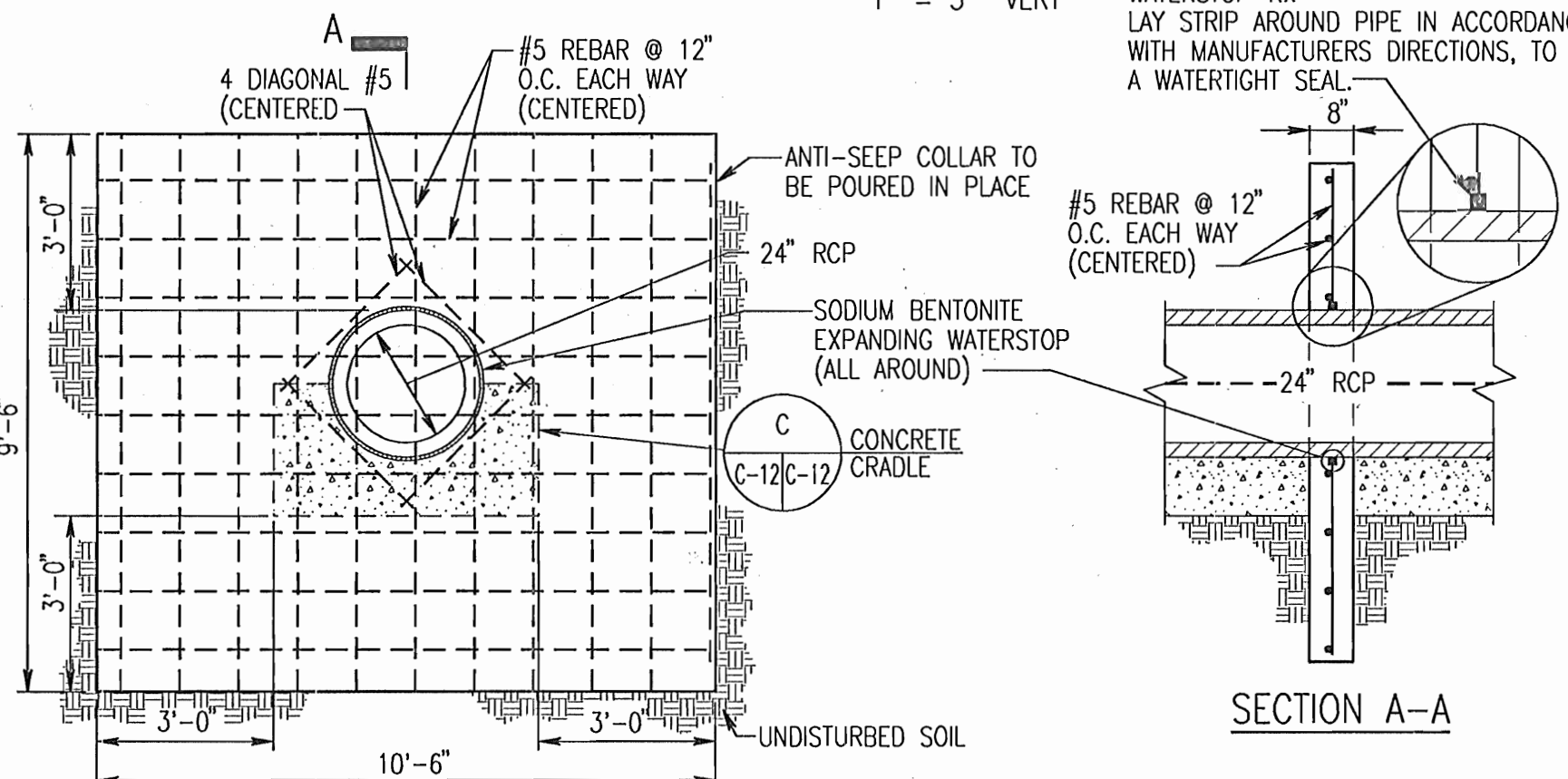
PROFILE - CENTERLINE OF EMBANKMENT EXTENDED DETENTION - WEST BASIN

SCALE: 1" = 30' HORIZ
1" = 3' VERT



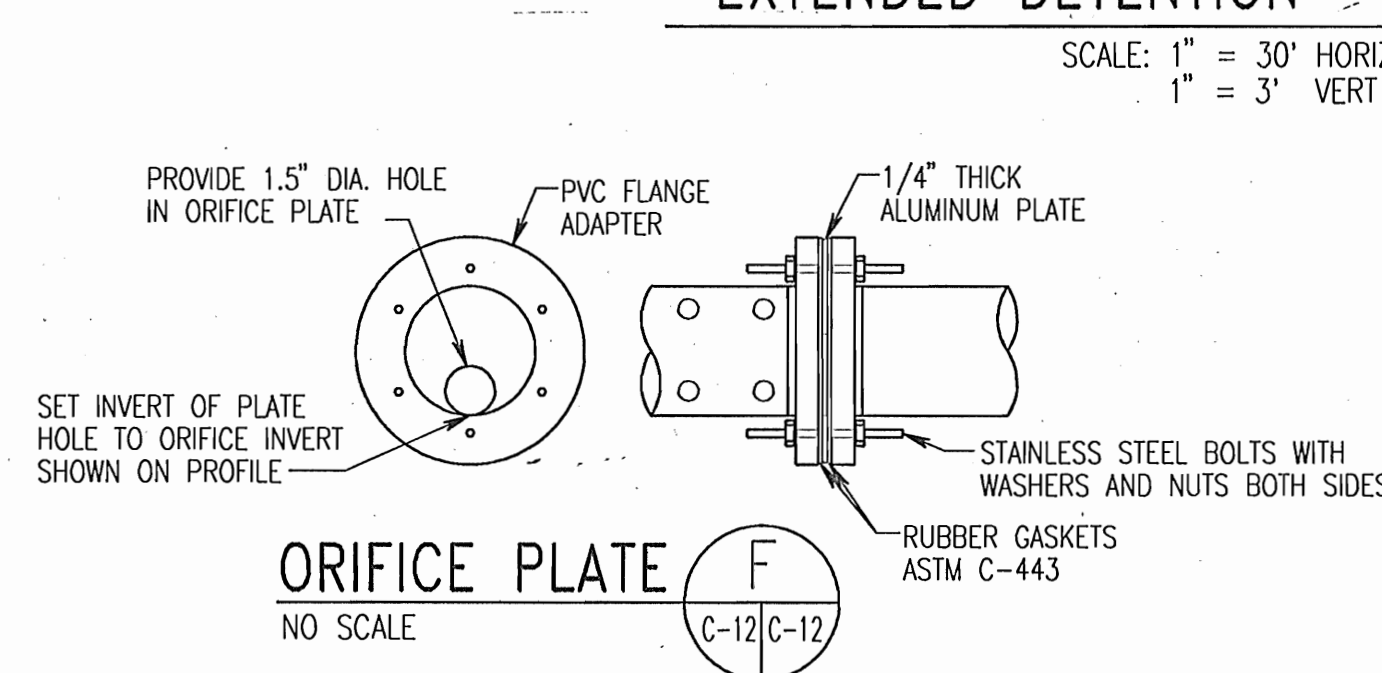
SECTION - BIORETENTION FACILITY

SCALE: 1" = 30' HORIZ
1" = 3' VERT



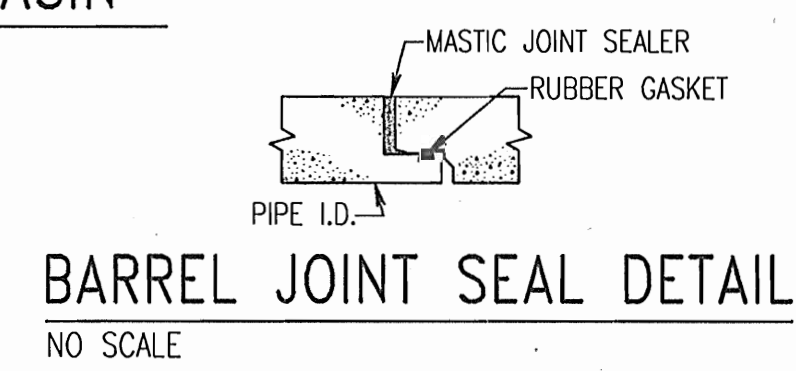
ANTI-SEEP COLLAR DETAIL

NO SCALE



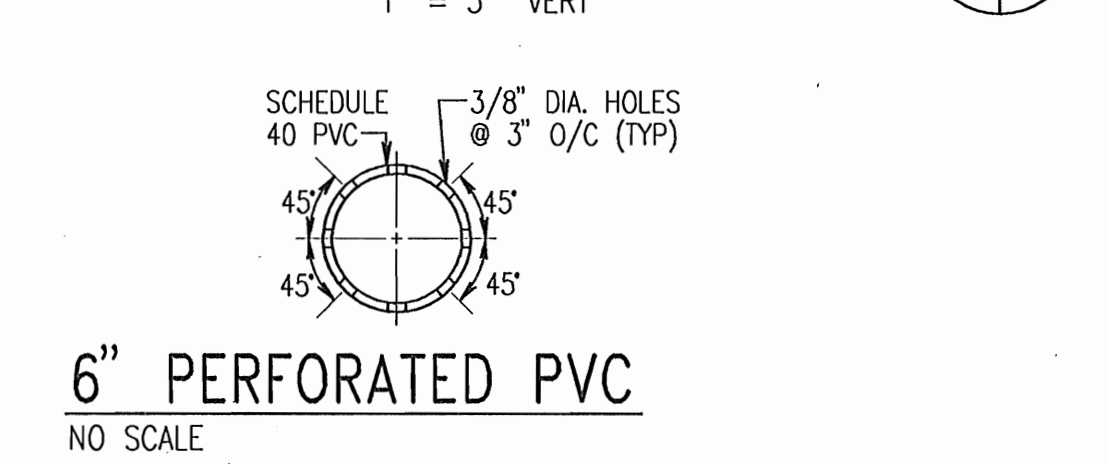
ORIFICE PLATE

NO SCALE



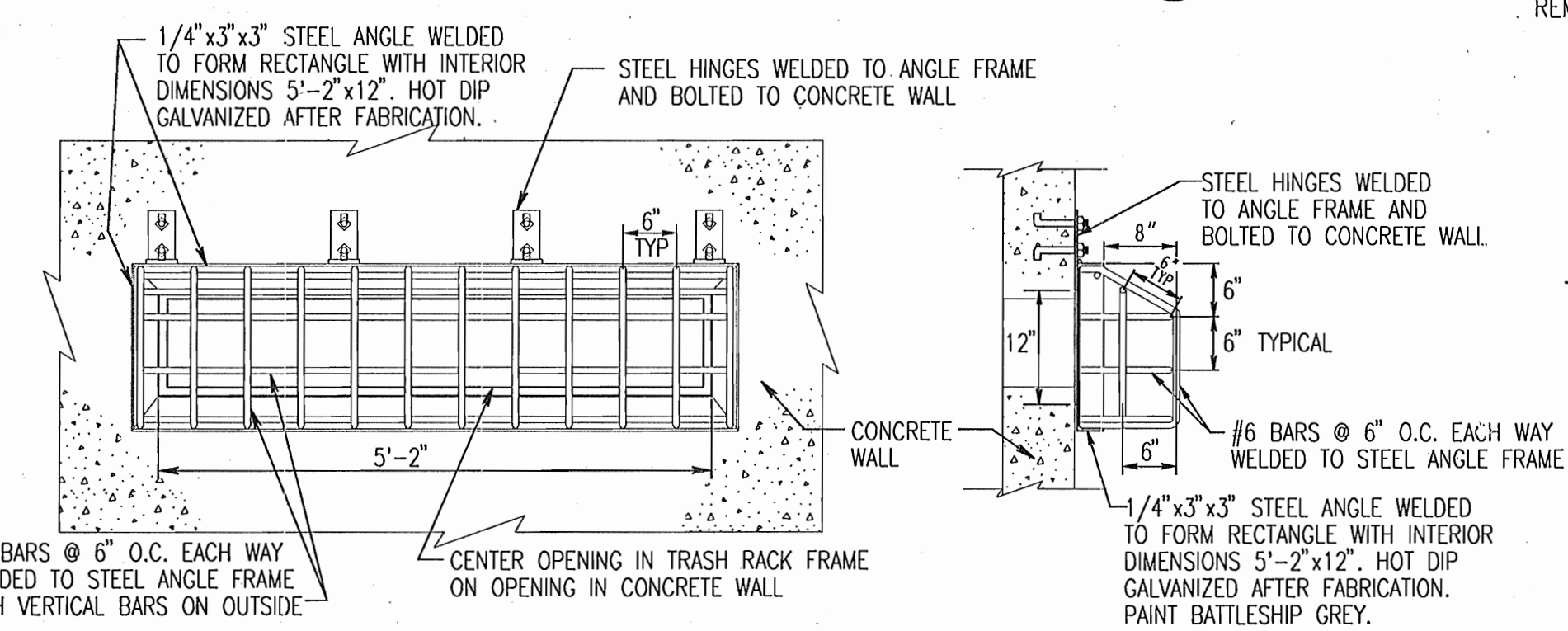
BARREL JOINT SEAL DETAIL

NO SCALE



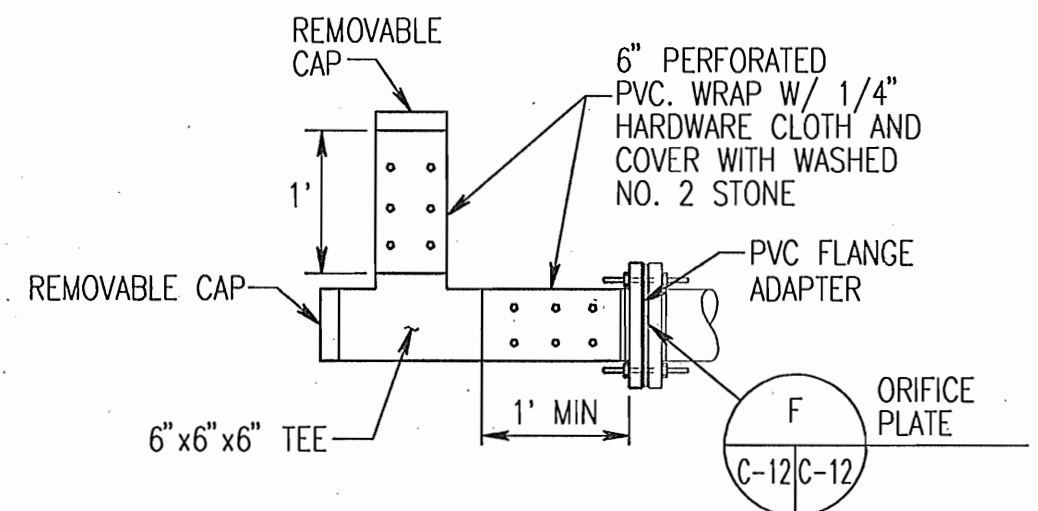
6" PERFORATED PVC

NO SCALE



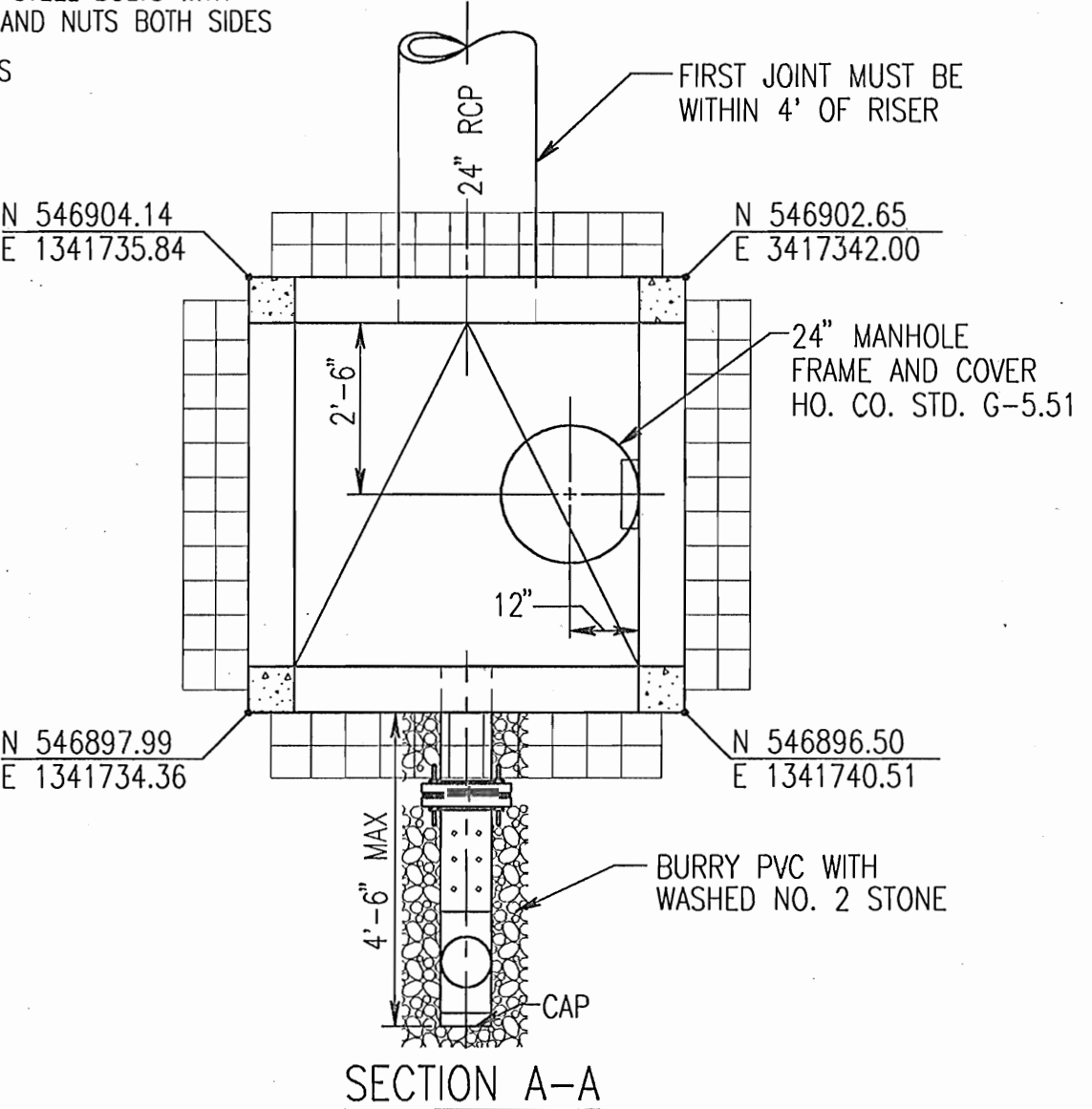
TYPICAL TRASH RACK DETAIL

NO SCALE

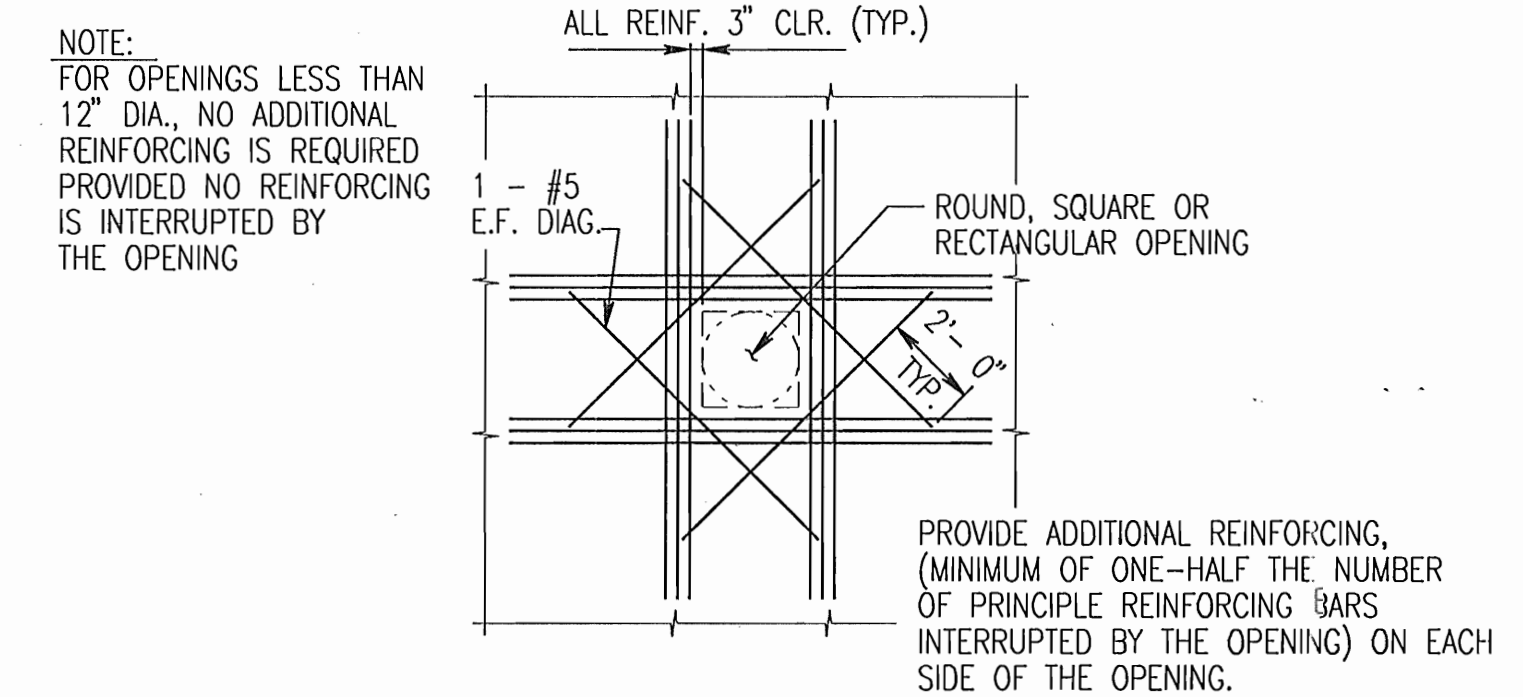


DETAIL - PERMANENT TRASH RACK ORIFICE

SCALE: 3/4" = 1'-0"

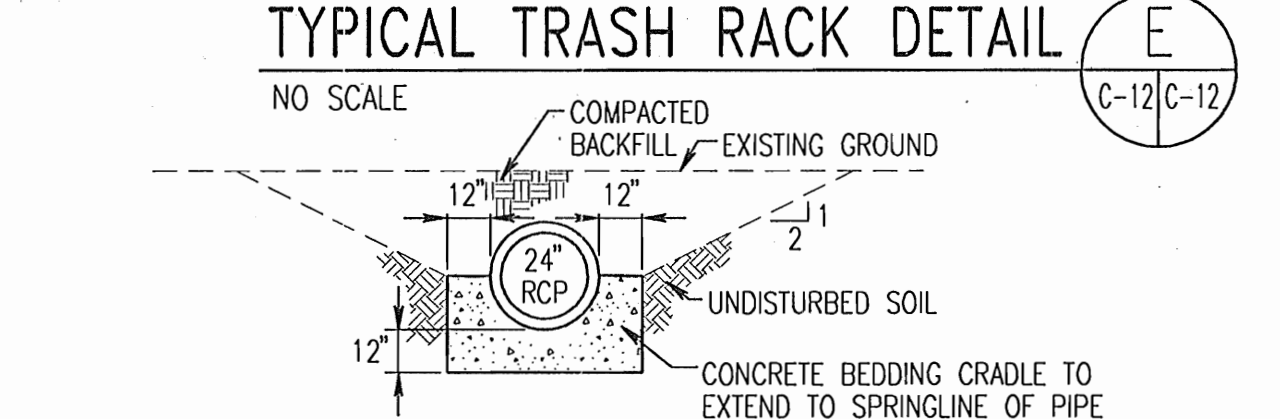


SECTION A-A



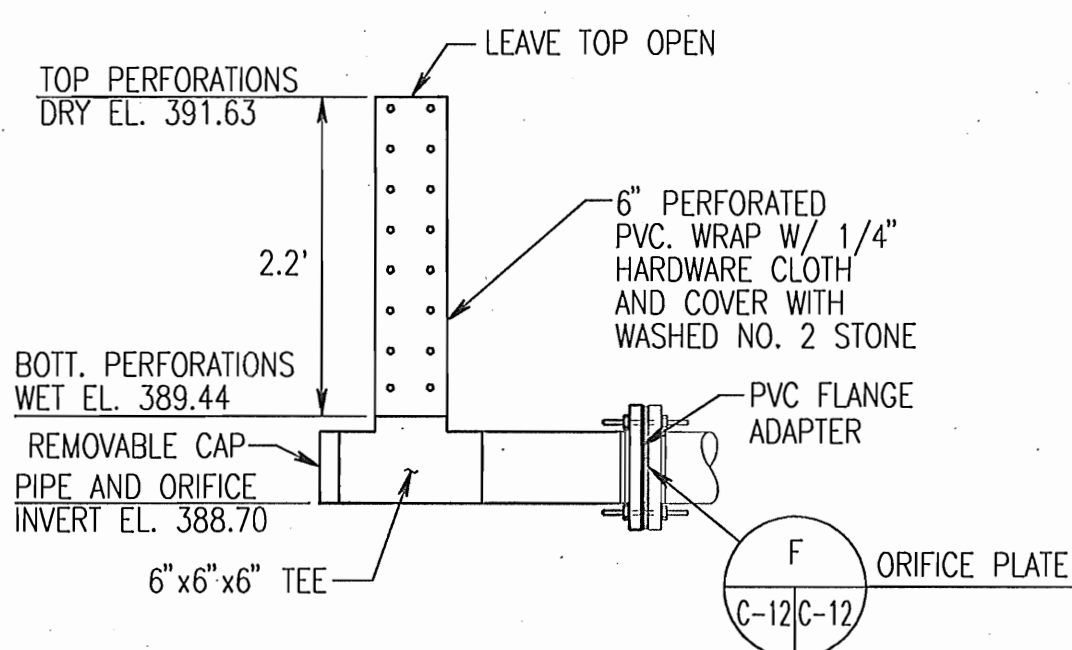
ADDITIONAL REINFORCING AROUND OPENINGS

NO SCALE



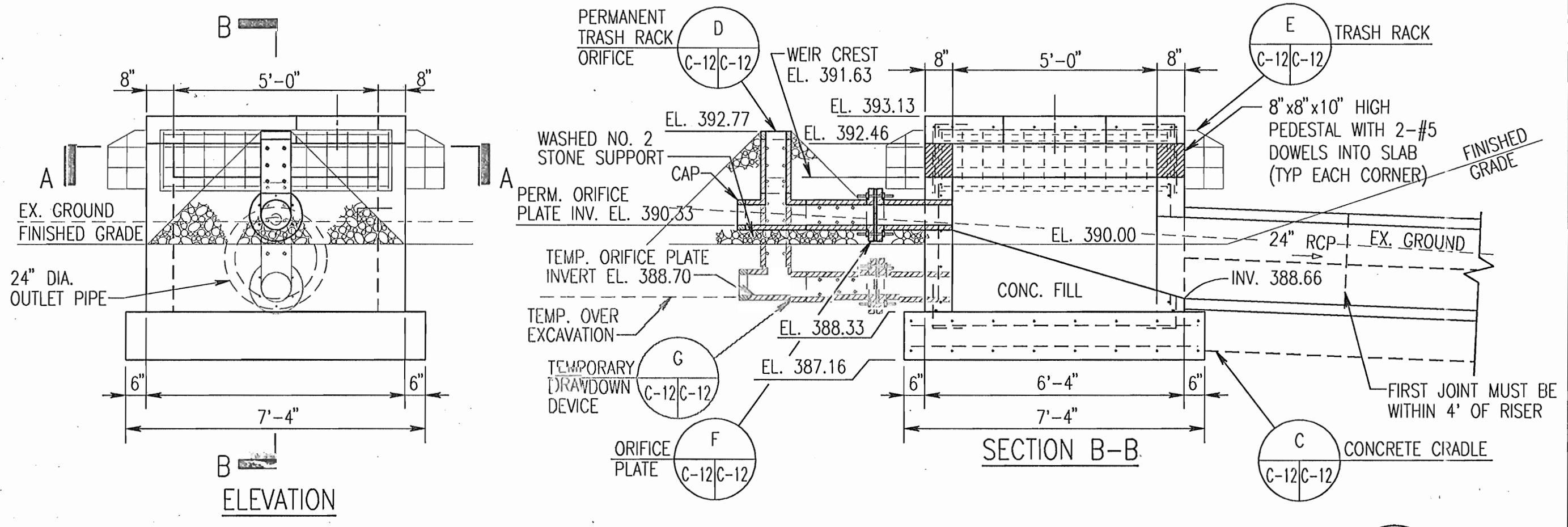
DETAIL - TYPICAL CONCRETE CRADLE

NO SCALE



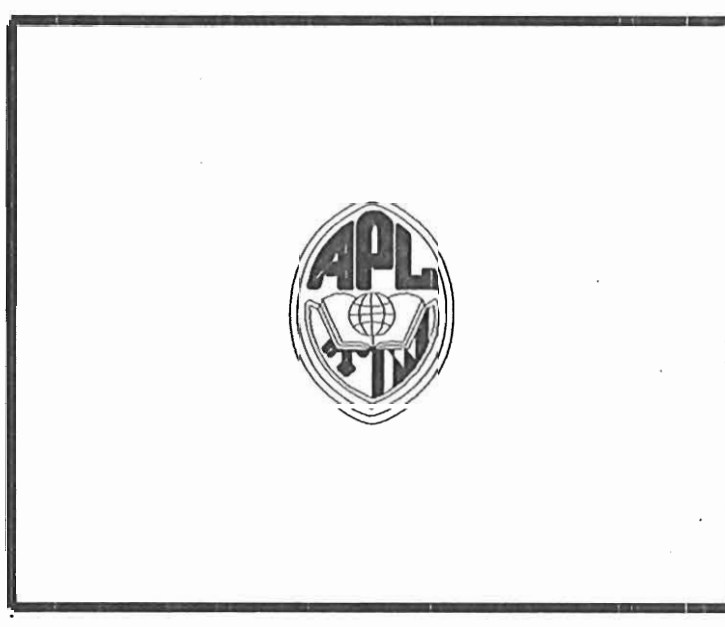
DETAIL - TEMPORARY DRAWDOWN DEVICE

SCALE: 3/4" = 1'-0"



OUTLET CONTROL STRUCTURE NO. 3 AND PIPE SPILLWAY DETAILS

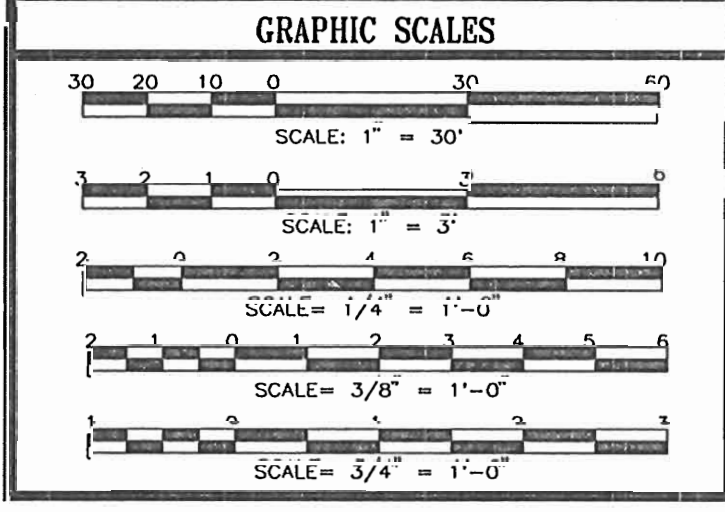
SCALE: 3/8" = 1'-0"



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ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
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WEST BASIN EXTENDED
DETENTION PROFILES,
SECTIONS AND DETAILS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

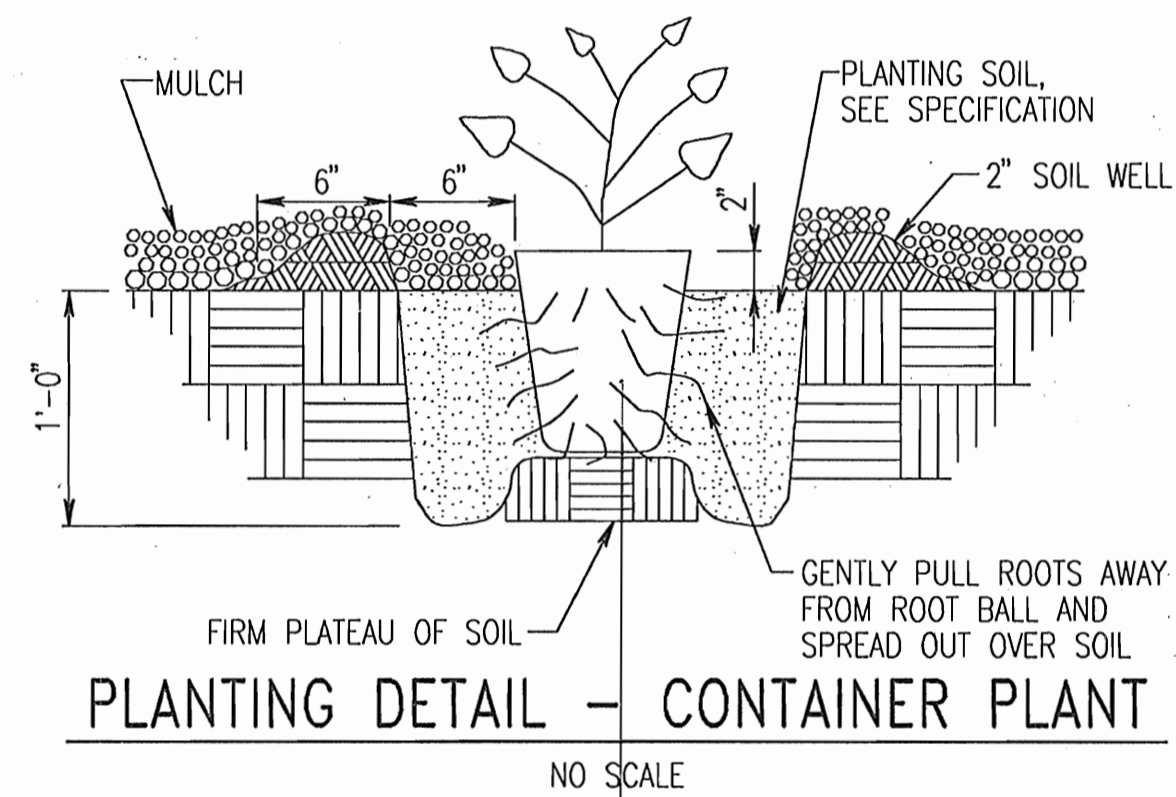
CHIEF, DEVELOPMENT ENGINEERING DIVISION

 CHIEF, DIVISION OF LAND DEVELOPMENT

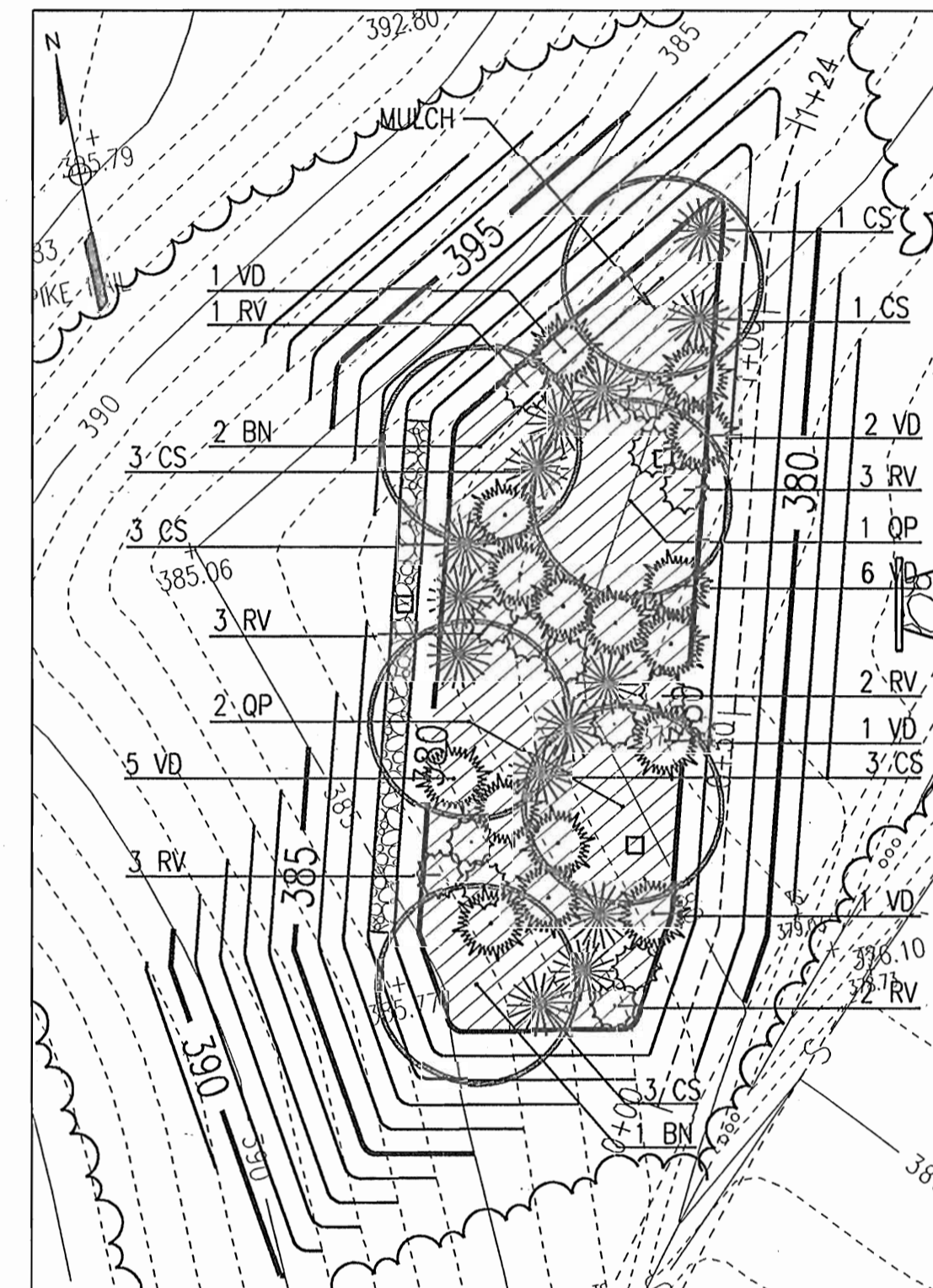
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DATE: 11/19/04
 DATE: 11/24/04
 DATE: 12/1/04

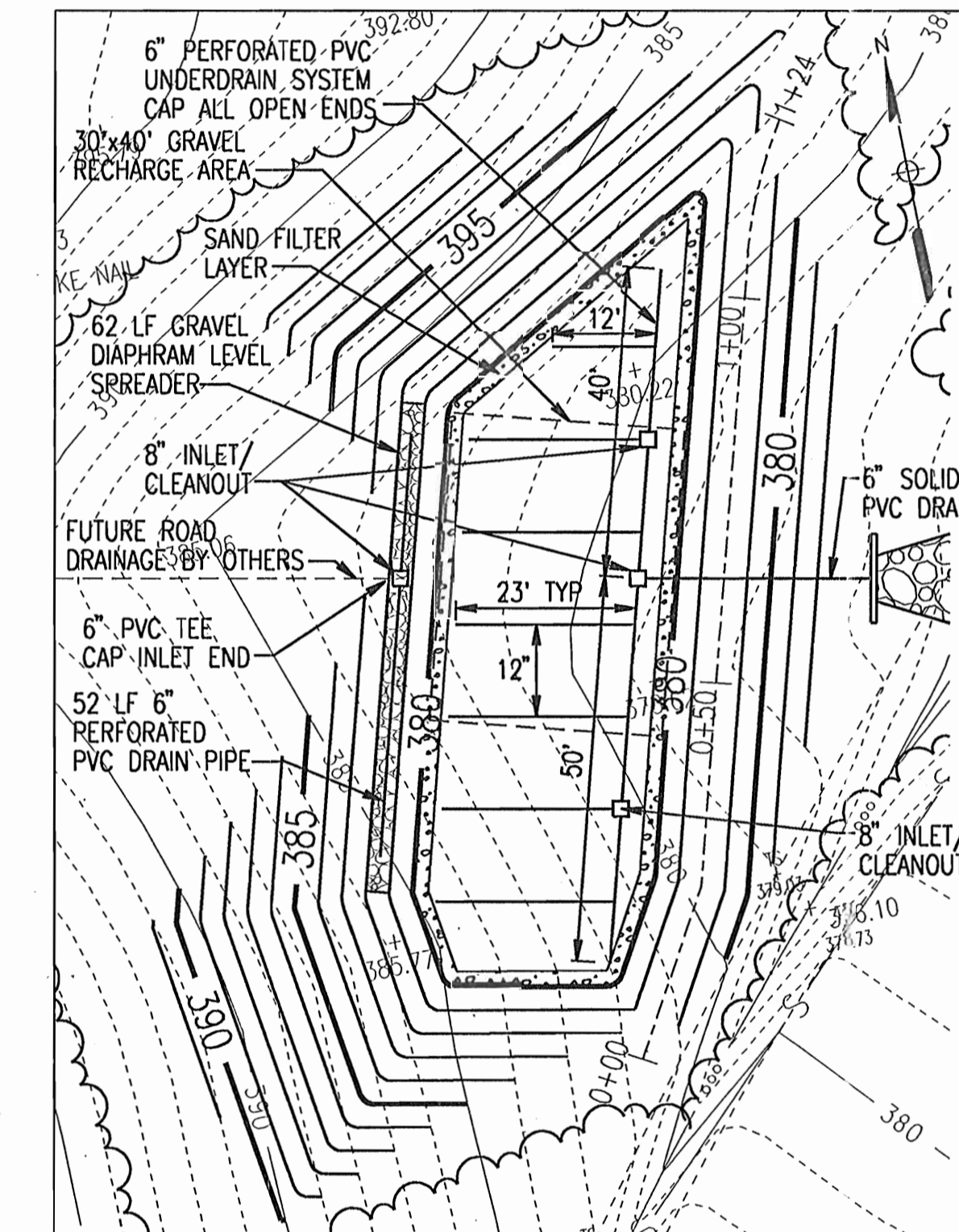
DRAWING NO. C-12
 Sheet 13 of 30
 Scale: _____
 Designed By: MH, EE
 Drawn By: EE, PB
 Checked By: AUO
 Date: 10/20/04



PLANTING DETAIL - CONTAINER PLANT
NO SCALE



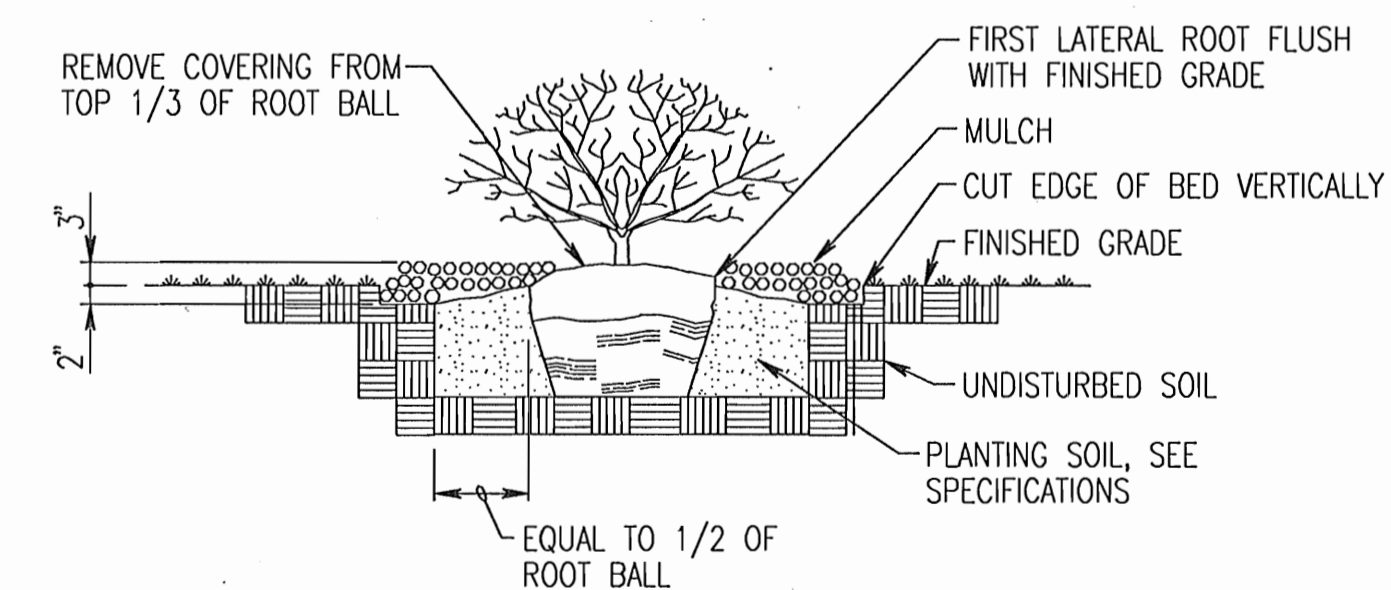
LANDSCAPE PLAN
BIORETENTION FACILITY
SCALE: 1" = 20'



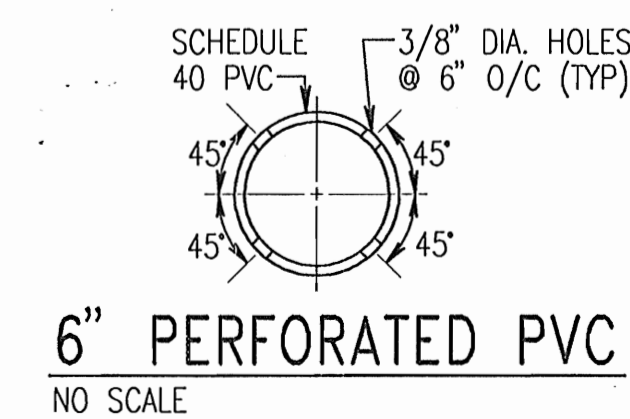
PLAN - BIORETENTION FACILITY
SCALE: 1" = 20'

LANDSCAPE PLANTING SCHEDULE							
KEY	SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	METHOD	COMMENTS
TREES							
BN		3	BETULA NIGRA	RIVER BIRCH	2 1/2" CAL.	B&B	PLANT 24" APART
OP		3	QUERCUS PHELLOS	WILLOW OAK	2 1/2" CAL.	B&B	PLANT 24" APART
SHRUBS							
CS		14	CORNUS STOLONIFERA	REDOSIER DOGWOOD	18"-24" HEIGHT	B&B/CONT.	PLANT 6'-8" APART
RV		14	RHODODENDRON VISCOSUM	SWAMP AZALEA	24"-36" HEIGHT	B&B/CONT.	PLANT 4'-6" APART
VD		16	VIBURNUM DENTATUM	ARROWWOOD VIBURNUM	36"-48" HEIGHT	B&B/CONT.	PLANT 6'-8" APART

MATERIAL	SPECIFICATION	SIZE	NOTES
PLANTING SOIL	SAND 35 - 60% SILT 30 - 55% CLAY 10 - 25%	N/A	PLANTINGS ARE SITE-SPECIFIC
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAGM AND CURTAIN DRAIN	PEA GRAVEL: ASTM-D-448 ORNAMENTAL STONE: WASHED COBBLES	PEA GRAVEL: NO. 6 STONE: 2" TO 5"	
UNDERDRAIN GRAVEL	AASHTO M-43	0.375" TO 0.75"	
GEOTEXTILE	CLASS C	N/A	FOR USE AS NECESSARY BENEATH GRAVEL ONLY
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO M-278	6" RIGID SCHEDULE 40 PVC OR SDR35	3/8" PERF. @ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES. INSTALL PIPE AT MINIMUM 0.5% SLOPE.
SAND	AASHTO-M-6 OR ASTM-C-33	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.



PLANTING DETAIL - SHRUB
NO SCALE



6" PERFORATED PVC
NO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

 CHIEF, DEVELOPMENT ENGINEERING DIVISION

 CHIEF, DIVISION OF LAND DEVELOPMENT

 DIRECTOR

DATE: 11/19/04
 DATE: 11/29/04
 DATE: 12/1/04

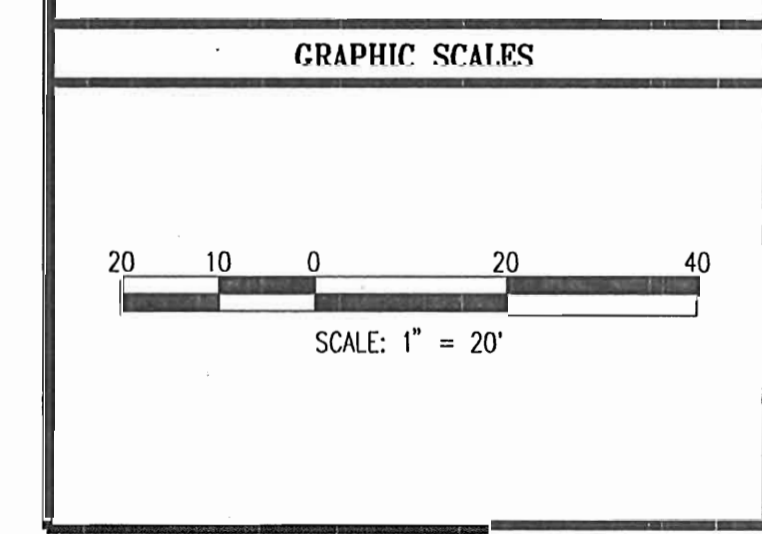


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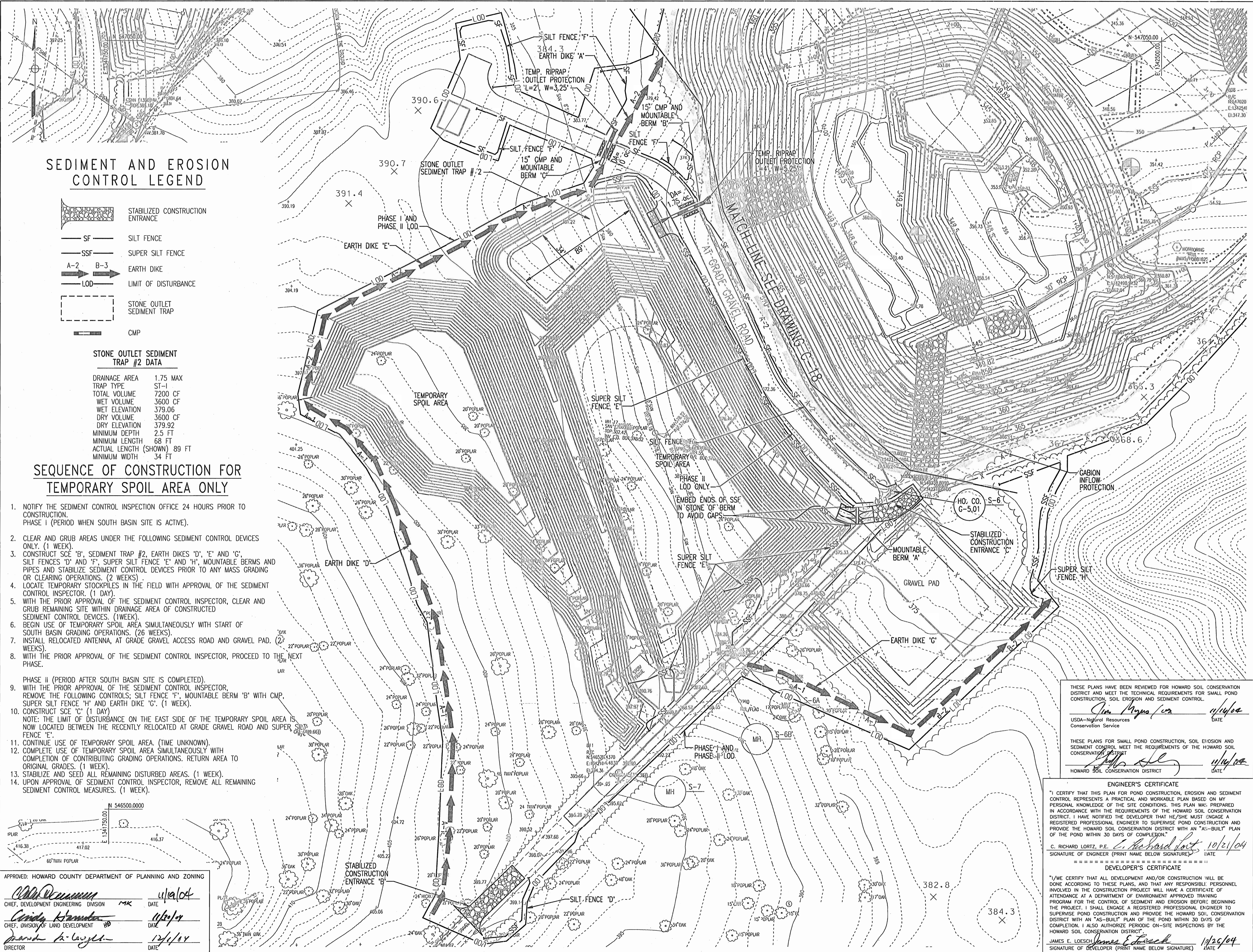
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 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
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WEST BASIN
 BIORETENTION
 SITE DETAILS-1

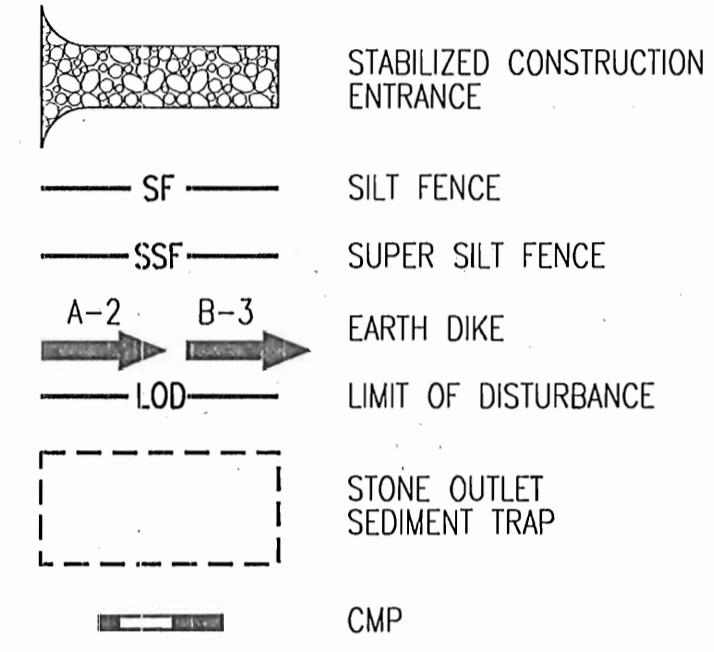
DRAWING NO.
C-13

Sheet 14 of 30

Scale:
 Designed By: MH, EE
 Drawn By: EE, PB
 Checked By: AUO
 Date: 10/20/04



SEDIMENT AND EROSION CONTROL LEGEND



STONE OUTLET SEDIMENT TRAP #2 DATA

DRAINAGE AREA	1.75 MAX
TRAP TYPE	ST-1
TOTAL VOLUME	7200 CF
WET VOLUME	3600 CF
WET ELEVATION	379.06
DRY VOLUME	3600 CF
DRY ELEVATION	379.92
MINIMUM DEPTH	2.5 FT
MINIMUM LENGTH	68 FT
ACTUAL LENGTH (SHOWN)	89 FT
MINIMUM WIDTH	34 FT

SEQUENCE OF CONSTRUCTION FOR TEMPORARY SPOIL AREA ONLY

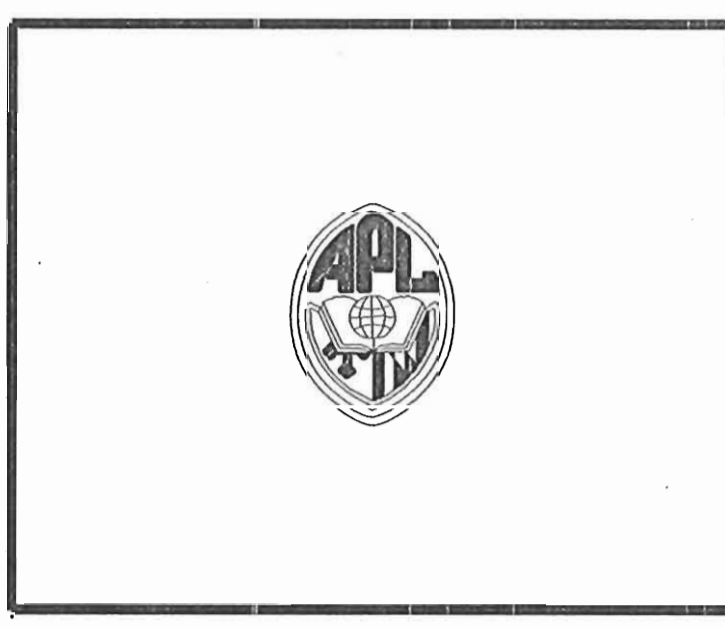
- NOTIFY THE SEDIMENT CONTROL INSPECTION OFFICE 24 HOURS PRIOR TO CONSTRUCTION. PHASE I (PERIOD WHEN SOUTH BASIN SITE IS ACTIVE).
 - CLEAR AND GRUB AREAS UNDER THE FOLLOWING SEDIMENT CONTROL DEVICES ONLY. (1 WEEK).
 - CONSTRUCT SCE 'B', SEDIMENT TRAP #2, EARTH DIKES 'D', 'E' AND 'G', SILT FENCES 'D' AND 'F', SUPER SILT FENCE 'E' AND 'H', MOUNTABLE BERMS AND PIPES AND STABILIZE SEDIMENT CONTROL DEVICES PRIOR TO ANY MASS GRADING OR CLEARING OPERATIONS. (2 WEEKS).
 - LOCATE TEMPORARY STOCKPILES IN THE FIELD WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR. (1 DAY).
 - WITH THE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB REMAINING SITE WITHIN DRAINAGE AREA OF CONSTRUCTED SEDIMENT CONTROL DEVICES. (1 WEEK).
 - BEGIN USE OF TEMPORARY SPOIL AREA SIMULTANEOUSLY WITH START OF SOUTH BASIN GRADING OPERATIONS. (26 WEEKS).
 - INSTALL RELOCATED ANTENNA, AT GRADE GRAVEL ACCESS ROAD AND GRAVEL PAD. (2 WEEKS).
 - WITH THE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, PROCEED TO THE NEXT PHASE.
- PHASE II (PERIOD AFTER SOUTH BASIN SITE IS COMPLETED).
- WITH THE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE THE FOLLOWING CONTROLS; SILT FENCE 'F', MOUNTABLE BERM 'B' WITH CMP, SUPER SILT FENCE 'H' AND EARTH DIKE 'G'. (1 WEEK).
 - CONSTRUCT SCE 'C'. (1 DAY)
NOTE: THE LIMIT OF DISTURBANCE ON THE EAST SIDE OF THE TEMPORARY SPOIL AREA IS NOW LOCATED BETWEEN THE RECENTLY RELOCATED AT GRADE GRAVEL ROAD AND SUPER SILT FENCE 'E'.
 - CONTINUE USE OF TEMPORARY SPOIL AREA. (TIME UNKNOWN).
 - COMPLETE USE OF TEMPORARY SPOIL AREA SIMULTANEOUSLY WITH COMPLETION OF CONTRIBUTING GRADING OPERATIONS. RETURN AREA TO ORIGINAL GRADES. (1 WEEK).
 - STABILIZE AND SEED ALL REMAINING DISTURBED AREAS. (1 WEEK).
 - UPON APPROVAL OF SEDIMENT CONTROL INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL MEASURES. (1 WEEK).

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 11/16/04
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

[Signature] 11/16/04
 CHIEF, DIVISION OF LAND DEVELOPMENT WB DATE

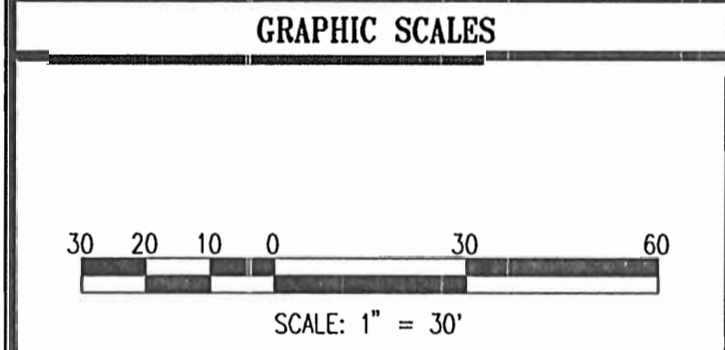
[Signature] 12/1/04
 DIRECTOR DATE



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 SDP 04-133**

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

[Signature] 11/16/04
 USA-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] 11/16/04
 HOWARD SOIL CONSERVATION DISTRICT DATE

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

C. RICHARD LORTZ, P.E. *[Signature]* 10/21/04
 SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

DEVELOPER'S CERTIFICATE
 "I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

JAMES E. LOESCH *[Signature]* 10/26/04
 SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

WR&A
 WHITMAN, REQUARDT AND ASSOCIATES, LLP
 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

CONTRACTORS STAGING AND SPOIL AREA SEDIMENT CONTROL PLAN

DRAWING NO. **C-15**

Sheet 16 of 30

Scale: **1" = 30'**

Designed By: MH, EE Drawn By: EE, PB
 Checked By: AUO Date: 10/20/04

1. MATERIAL SPECIFICATIONS

THE ALLOWABLE MATERIALS TO BE USED IN BIORETENTION AREA ARE DETAILED IN TABLE AS SHOWN ON THIS SHEET.

2. PLANTING SOIL

THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDERANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDAGRASS, QUACKGRASS, JOHNSONGRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:

- PH RANGE 5.2 - 7.0
- ORGANIC MATTER 1.5 - 4% (BY WEIGHT)
- MAGNESIUM 35 LB./AC
- PHOSPHORUS (PHOSPHATE - P205) 75 LB./AC
- POTASSIUM (POTASH - K2O) 85 LB./AC
- SOLUBLE SALTS NOT TO EXCEED 500 PPM

ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, PHOSPHORUS, AND POTASSIUM AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOP SOIL WAS EXCAVATED. SINCE DIFFERENT LABS CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY. SHOULD THE PH FALL OUT OF THE ACCEPTABLE RANGE, IT MAY BE MODIFIED (HIGHER) WITH LIME OR (LOWER) WITH IRON SULFATE PLUS SULFUR.

3. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE REQUIRED SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE. WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 12" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

4. PLANT MATERIAL

ALL PLANT MATERIAL SHALL BE GUARANTEED FOR ONE FULL YEAR TO BE IN A HEALTHY GROWING CONDITION. PLANT MATERIALS WHICH DO NOT FULFILL THIS GUARANTEE SHALL BE REPLACED AT NO COST TO THE OWNER THROUGHOUT THE ORIGINAL GUARANTEE PERIOD.

5. PLANT INSTALLATION

MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.

TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.

6. UNDERDRAINS

UNDERDRAINS ARE TO BE PLACED ON A 3'-0" WIDE SECTION OF FILTER CLOTH. PIPE IS PLACED NEXT, FOLLOWED BY THE GRAVEL BEDDING. THE ENDS OF UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL SHALL BE CAPPED.

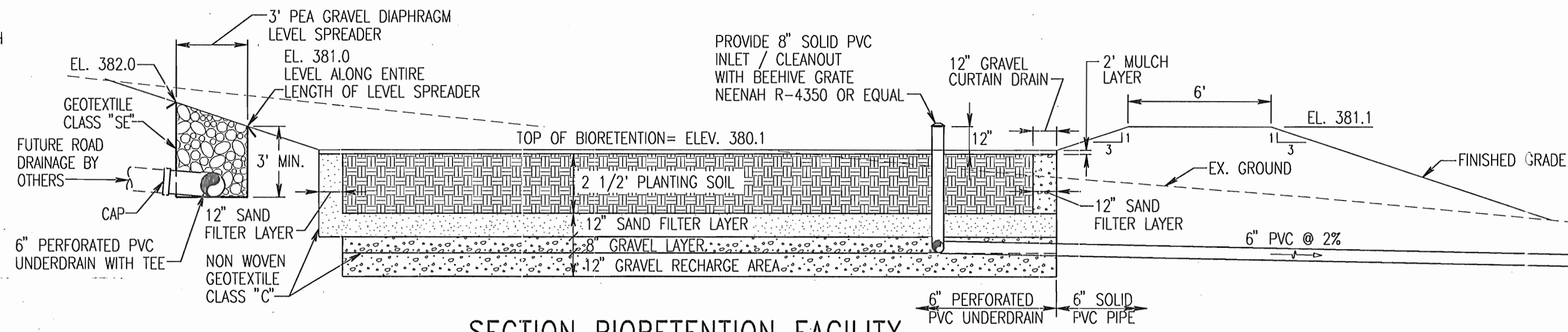
THE MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).

7. MISCELLANEOUS

THE BIORETENTION FACILITY MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED.

8. MAINTENANCE

THE BIORETENTION FACILITY SHALL BE INSPECTED ON AN ANNUAL BASIS. IF WATER POUNDS FOR MORE THAN 72 HOURS AFTER A RAINFALL EVENT, THE UNDERDRAIN SHALL BE CLEANED OUT AND THE TOP LAYERS OF PLANT MATERIAL SHALL BE REPLACED AS NECESSARY. DEAD OR DISEASED PLANT MATERIAL SHALL BE REPLACED. AREAS DEVOID OF MULCH SHALL BE RE-MULCHED.



SECTION BIORETENTION FACILITY

SCALE: 1/4" = 1'-0"



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BASIN C
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SDP 04-133

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GRAPHIC SCALES



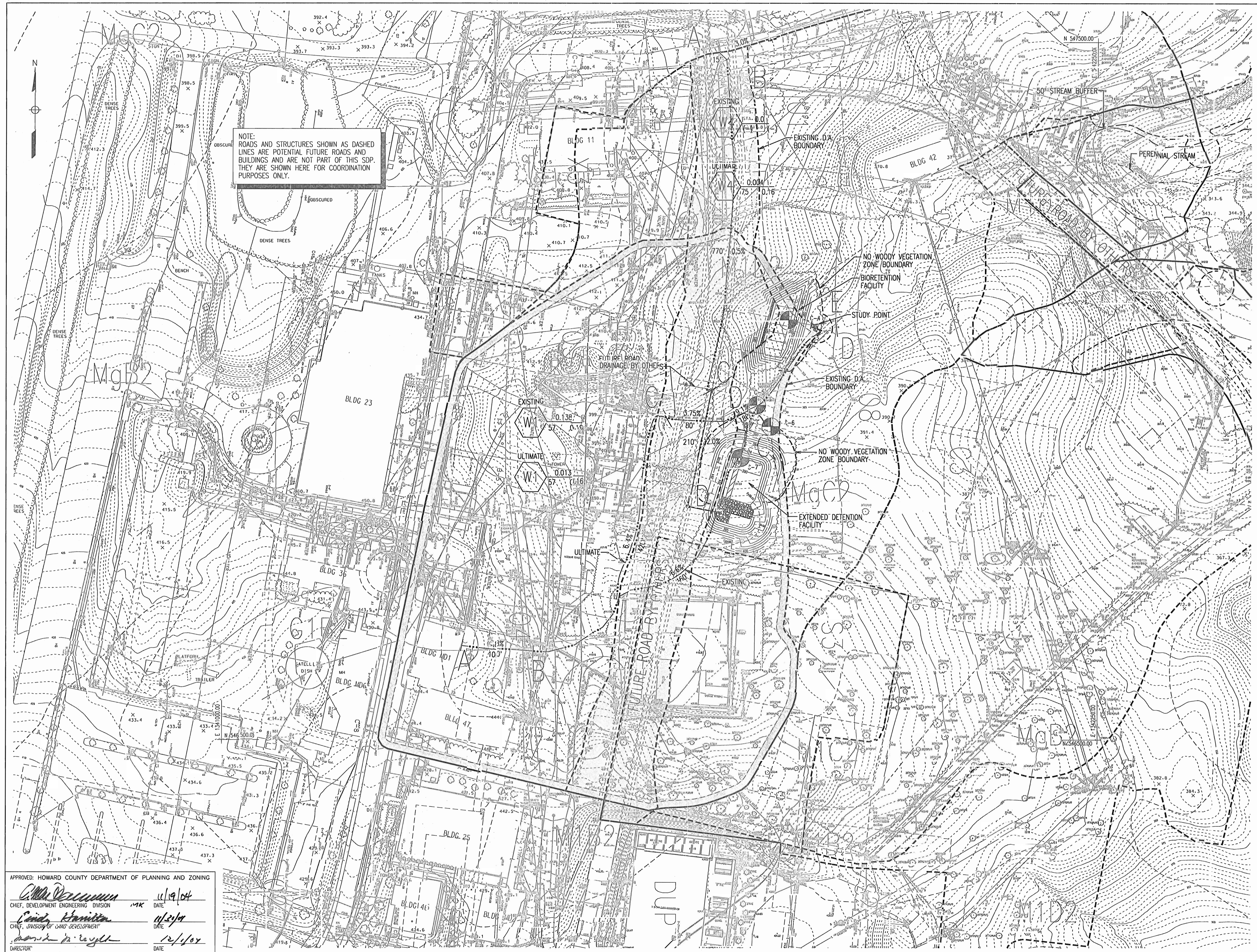
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WEST BASIN
BIORETENTION
SITE DETAILS-4

	DRAWING NO.
	C-16
Sheet 17 of 30	
Scale:	
Designed By: MH, EE	Drawn By: EE, PB
Checked By: AUO	Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

	11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION MK	DATE
	11/19/04
CHIEF, DIVISION OF LAND DEVELOPMENT WB	DATE
	12/1/04
DIRECTOR	DATE



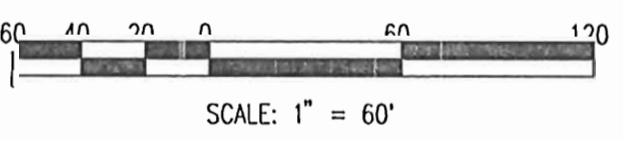


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**BASIN C
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 AND LAYDOWN AREA
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**WEST BASIN DRAINAGE
 AREA MAP**

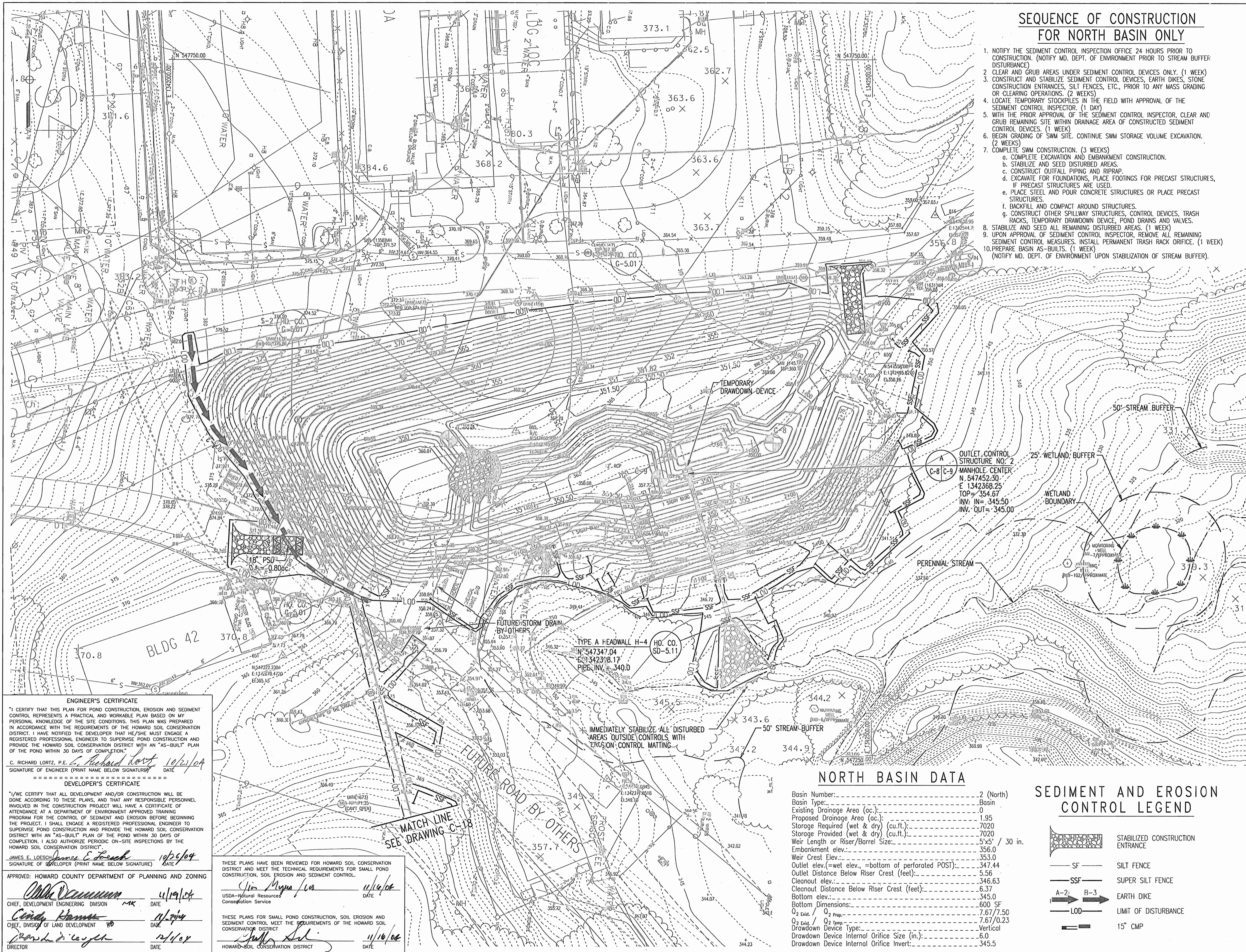
	DRAWING NO.
	C-17
Sheet 18 of 30	
Scale:	
Designed By: MH, EE	Drawn By: EE, PB
Checked By: AUO	Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Alma DeLuca
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 11/19/04

David Hamilton
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 11/24/04

David P. Gault
 DIRECTOR
 DATE: 12/1/04



SEQUENCE OF CONSTRUCTION FOR NORTH BASIN ONLY

1. NOTIFY THE SEDIMENT CONTROL INSPECTION OFFICE 24 HOURS PRIOR TO CONSTRUCTION. (NOTIFY MD. DEPT. OF ENVIRONMENT PRIOR TO STREAM BUFFER DISTURBANCE).
2. CLEAR AND GRUB AREAS UNDER SEDIMENT CONTROL DEVICES ONLY. (1 WEEK)
3. CONSTRUCT AND STABILIZE SEDIMENT CONTROL DEVICES, EARTH DIKES, STONE CONSTRUCTION ENTRANCES, SILT FENCES, ETC., PRIOR TO ANY MASS GRADING OR CLEARING OPERATIONS. (2 WEEKS)
4. LOCATE TEMPORARY STOCKPILES IN THE FIELD WITH APPROVAL OF THE SEDIMENT CONTROL INSPECTOR. (1 DAY)
5. WITH THE PRIOR APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB REMAINING SITE WITHIN DRAINAGE AREA OF CONSTRUCTED SEDIMENT CONTROL DEVICES. (1 WEEK)
6. BEGIN GRADING OF SWM SITE. CONTINUE SWM STORAGE VOLUME EXCAVATION. (2 WEEKS)
7. COMPLETE SWM CONSTRUCTION. (3 WEEKS)
 - a. COMPLETE EXCAVATION AND EMBANKMENT CONSTRUCTION.
 - b. STABILIZE AND SEED DISTURBED AREAS.
 - c. CONSTRUCT OUTFALL PIPING AND RIPRAP.
 - d. EXCAVATE FOR FOUNDATIONS, PLACE FOOTINGS FOR PRECAST STRUCTURES, IF PRECAST STRUCTURES ARE USED.
 - e. PLACE STEEL AND FOUR CONCRETE STRUCTURES OR PLACE PRECAST STRUCTURES.
 - f. BACKFILL AND COMPACT AROUND STRUCTURES.
 - g. CONSTRUCT OTHER SPILLWAY STRUCTURES, CONTROL DEVICES, TRASH RACKS, TEMPORARY DRAWDOWN DEVICE, POND DRAINS AND VALVES.
8. STABILIZE AND SEED ALL REMAINING DISTURBED AREAS. (1 WEEK)
9. UPON APPROVAL OF SEDIMENT CONTROL INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL MEASURES. INSTALL PERMANENT TRASH RACK ORIFICE. (1 WEEK)
10. PREPARE BASIN AS-BUILTS. (1 WEEK) (NOTIFY MD. DEPT. OF ENVIRONMENT UPON STABILIZATION OF STREAM BUFFER).



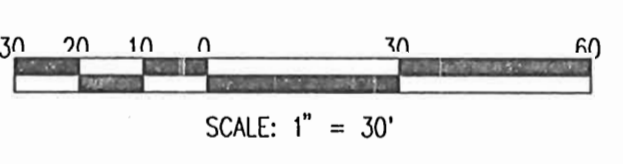
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SDP 04-133**

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NORTH BASIN EROSION AND SEDIMENT CONTROL PLAN

DRAWING NO. **C-19**
Sheet 20 of 30
Scale:
Designed By: MH, EE Drawn By: EE, PB
Checked By: ATIO Date: 10/20/04

NORTH BASIN DATA

Basin Number:	2 (North)
Basin Type:	Basin
Existing Drainage Area (ac.):	0
Proposed Drainage Area (ac.):	1.95
Storage Required (wet & dry) (cu.ft.):	7020
Storage Provided (wet & dry) (cu.ft.):	7020
Weir Length or Riser/Barrel Size:	5'x5' / 30 in.
Embankment elev.:	356.0
Weir Crest Elev.:	353.0
Outlet elev. (=wet elev. =bottom of perforated POST):	347.44
Outlet Distance Below Riser Crest (feet):	5.56
Cleanout elev.:	346.63
Cleanout Distance Below Riser Crest (feet):	6.37
Bottom elev.:	345.0
Bottom Dimensions:	600 SF
Q ₂ Exist. / Q ₂ Prop.:	7.67/7.50
Q ₂ Exist. / Q ₂ Temp.:	7.67/0.23
Drawdown Device Type:	Vertical
Drawdown Device Internal Orifice Size (in.):	6.0
Drawdown Device Internal Orifice Invert:	345.5

SEDIMENT AND EROSION CONTROL LEGEND

- STABILIZED CONSTRUCTION ENTRANCE
- SILT FENCE
- SUPER SILT FENCE
- EARTH DIKE
- LIMIT OF DISTURBANCE
- 15' CMP

ENGINEER'S CERTIFICATE

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

C. RICHARD LORTZ, P.E. *C. Richard Lortz* 10/21/04
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

JAMES E. LOESCH *James E. Loesch* 10/25/04
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chad Drayman 4/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION
Andy Kramer 11/2/04
CHIEF, DIVISION OF LAND DEVELOPMENT
Frank D. Cooper 12/1/04
DIRECTOR

THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.
Ellen Myra Lee 11/14/04
USDA-Natural Resources Conservation Service

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT
Julia Sid 11/16/04
HOWARD SOIL CONSERVATION DISTRICT

MATCH LINE
SEE DRAWING C-18

IMMEDIATELY STABILIZE ALL DISTURBED AREAS OUTSIDE CONTROLS WITH EROSION CONTROL MATTING

TYPE A HEADWALL H-4
N=547347.04
E=1342378.17
PIPE INV.= 340.0
HO. CO. SD-5.11

OUTLET CONTROL STRUCTURE NO. 2
MANHOLE CENTER
N=547452.30
E=1342368.25
TOP= 354.67
INV. IN= 345.50
INV. OUT= 345.00

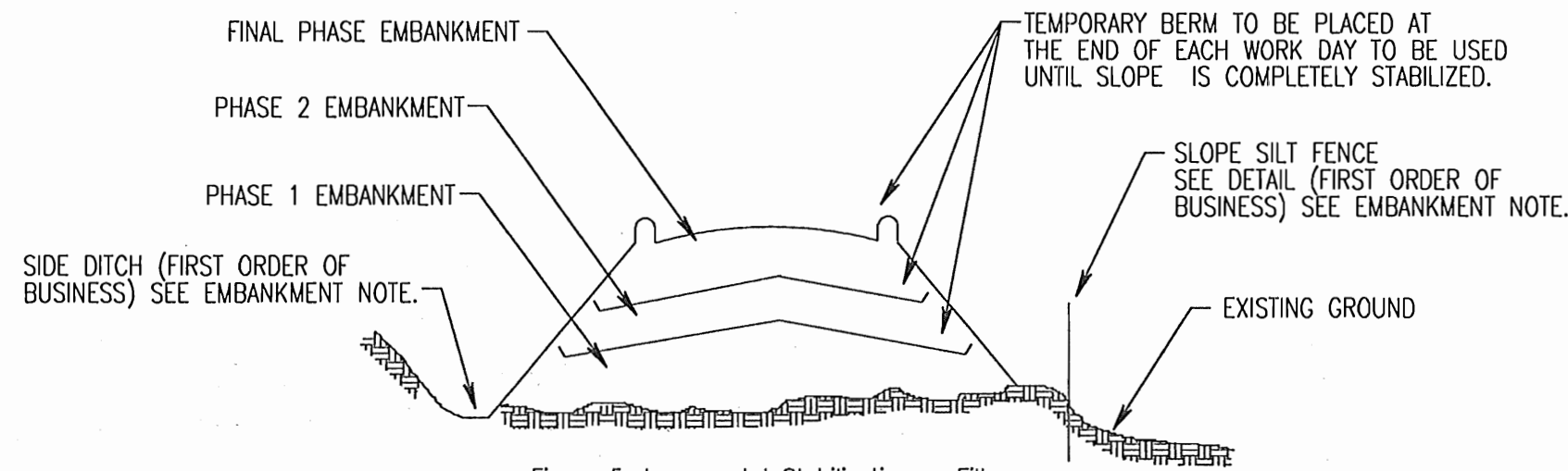


Figure 5. Incremental Stabilization - Fill

Section II - Temporary Seeding

Vegetation - annual grass or grain used to provide cover on disturbed areas for up to 12 months. For longer duration of vegetative cover, Permanent Seeding is required.

A. Seed Mixtures - Temporary Seeding

- Select one or more of the species or mixtures listed in Table 26 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Temporary Seeding Summary below, along with application rates, seeding dates and seeding depths. If this Summary is not put on the plans and completed, then Table 26 must be put on the plans.
- For sites having soil tests performed, the rates shown on this table shall be deleted and the rates recommended by the testing agency shall be written in. Soil tests are not required for Temporary Seeding.

TEMPORARY SEEDING SUMMARY

SEED MIXTURE (HARDINESS ZONE 6B) FROM TABLE 26				FERTILIZER RATE (10-10-10)	LIME RATE
SPECIES	APPLICATION RATE (lb/oc)	SEEDING DATES	SEEDING DEPTHS		
ANNUAL RYEGRASS	50	3/1 - 4/30 8/15 - 11/15	1/4" - 1/2"	600 LB/AC (15 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)
WEEPING LOVEGRASS	4	5/1 - 8/14	1/4" - 1/2"		

Section III: Permanent Seeding

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

A. Seed Mixtures - Permanent Seeding

- Select one or more of the species or mixtures listed in Table 25 for the appropriate Plant Hardiness Zone (from Figure 5) and enter them in the Permanent Seeding Summary below, along with application rates and seeding dates. Seeding depths can be estimated using Table 26. If this summary is not put on the construction plans and completed, then Table 25 must be put on the plans. Additional planting specifications for exceptional sites such as shorelines, streambanks, or dunes or for special purposes such as wildlife or aesthetic treatment may be found in USDA-SCS Technical Field Office Guide, Section 342 - Critical Area Planting. For special lawn maintenance areas, see Section IV Sod and V Turfgrass.
- For sites having disturbed area over 5 acres, the rates shown on this table shall be deleted and the rates recommended by the soil testing agency shall be written in.
- For areas receiving low maintenance, apply ureaform fertilizer (46-0-0) at 3 1/2 lbs/1000 sq. ft. (150 lbs/ac), in addition to the above soil amendments shown in the table below, to be performed at the time of seeding.

PERMANENT SEEDING SUMMARY

Seed Mixture (For Hardiness Zone 6B) (From Table 25)					Fertilizer Rate (10-20-20)			Lime Rate
NO.	Species	Application Rate (lb/oc)	Seeding Dates	Seeding Depths	N	P205	K20	
3	TALL FESCUE 85%	125	3/15 - 5/15 8/15 - 10/15	1/2"	90 lb/oc (2.0 lb/1000 sf)	175 lb/oc (4 lb/1000 sf)	175 lb/oc (100 lb/1000 sf)	2 tons/oc (100 lb/1000 sf)
	PERENNIAL RYEGRASS 10%	15						
	KENTUCKY BLUEGRASS 5%	10						
7	TALL FESCUE 83%	110	3/1 - 5/15 5/16 - 8/14 8/15 - 10/15	1/2"				
	WEEPING LOVEGRASS 2% PLUS	3						
	SERECIA LESPEDEZA 15%	20						

TABLE 24 MAINTENANCE FERTILIZATION FOR PERMANENT SEEDINGS

Use Soil Test Results or Rates Shown Below

Seeding Mixture	Type	lb/oc	lb/1000 sf	Time	Mowing
Tall fescue makes up 70% or more of cover	10-10-10 or 30-10-10	500	11.5	Yearly or as needed. Fall	Not closer than 3" if occasional mowing is desired.
Crownvetch Sericea Lespedeza Birdsfoot Trefoil	0-20-0	400	9.2	Spring, the year following establishment and every 4-5 years thereafter	Do not mow crownvetch
Fairly uniform stand of tall fescue and sericea lespedeza, or birdsfoot trefoil	5-10-10	500	11.5	Fall the year following establishment and every 4-5 years thereafter	Not required, no closer than 4" in fall after seed has matured.
Weeping lovegrass & sericea lespedeza fairly uniform plant distribution.	5-10-10	500	11.5	Spring, the year following establishment and every 3-4 years thereafter	Not required, not closer than 4" in fall after seed has matured.
Red & chewing fescue, Kentucky bluegrass, hard fescue mixtures	20-10-10	250	5.8	September, 30 days later, December, May 20, June 30, if needed	Mow no closer than 2" for red fescue and K. bluegrass 3" for fescue.
		100	2.3		

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

A. General Specifications

- Class of turfgrass sod shall be Maryland or Virginia State Certified or Approved. Sod labels shall be made available to the job foreman and inspector.
- Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/4", at the time of cutting. Measurement for thickness shall exclude top growth and that individual pieces of sod shall be cut to the suppliers width and length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pieces and torn or uneven ends will not be acceptable.
- Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be approved by an agronomist or soil scientist prior to its installation.

B. Sod Installation

- During periods of excessively high temperature or in areas having dry subsoil, the subsoil shall be lightly irrigated immediately prior to laying the sod.
- The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.
- Wherever possible, sod shall be laid with the long edges parallel to the contour and with staggering joints. Sod shall be rolled on, tamped, pegged or otherwise secured to prevent slippage on slopes and to ensure solid contact between sod roots and the underlying soil surface.
- Sod shall be watered immediately following rolling or tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. The operations of laying, tamping and irrigating for any piece of sod shall be completed within eight hours.

C. Sod Maintenance

- In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4". Watering should be done during the heat of the day to prevent wilting.
- After the first week, sod watering is required as necessary to maintain adequate moisture content.
- The first mowing of sod should not be attempted until the sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2" and 3" unless otherwise specified.

SECTION IV - TURFGRASS ESTABLISHMENT

Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance. Areas to receive seed shall be tilled by disking or other approved methods to a depth of 2 to 4 inches, leveled and raked to prepare a proper seedbed. Stones and debris over 1 1/2 inches in diameter shall be removed. The resulting seedbed shall be in such condition that future mowing of grasses will pose no difficulty.

NOTE: Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.

A. Turfgrass Mixtures

- Kentucky Bluegrass - Full sun mixture - For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and eastern shore. Recommended Certified Kentucky Bluegrass Cultivars Seeding Rate: 1.5 to 2.0 pounds/1000 square feet. A minimum of three bluegrass cultivars should be chosen ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.
- Kentucky Bluegrass/Perennial Rye - Full sun mixture - For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Rye/Certified Kentucky Bluegrass Seeding rate: 2 pounds mixture/1000 square feet. A minimum of 3 Kentucky Bluegrass Cultivars must be chosen, with each cultivar ranging from 10% to 35% of the mixture by weight.
- Tall Fescue/Kentucky Bluegrass - Full sun mixture - For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixtures includes: certified Tall Fescue Cultivars 95 - 100%, certified Kentucky Bluegrass Cultivars 0 - 5%. Seeding rate: 5 to 8 lb/1000 sf. One or more cultivars may be blended.
- Kentucky Bluegrass/Fine Fescue - Shade Mixture - For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes; certified Kentucky Bluegrass Cultivars 30-40% and certified Fine Fescue and 60-70%. Seeding rate: 1 1/2 - 3 lbs/1000 square feet. A minimum of 3 Kentucky bluegrass cultivars must be chosen, with each cultivar ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

NOTE: Turfgrass varieties should be selected from those listed in the most current University of Maryland Publication, Agronomy Mimeo #77, "Turfgrass Cultivar Recommendations for Maryland".

B. Ideal times of seeding

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

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

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

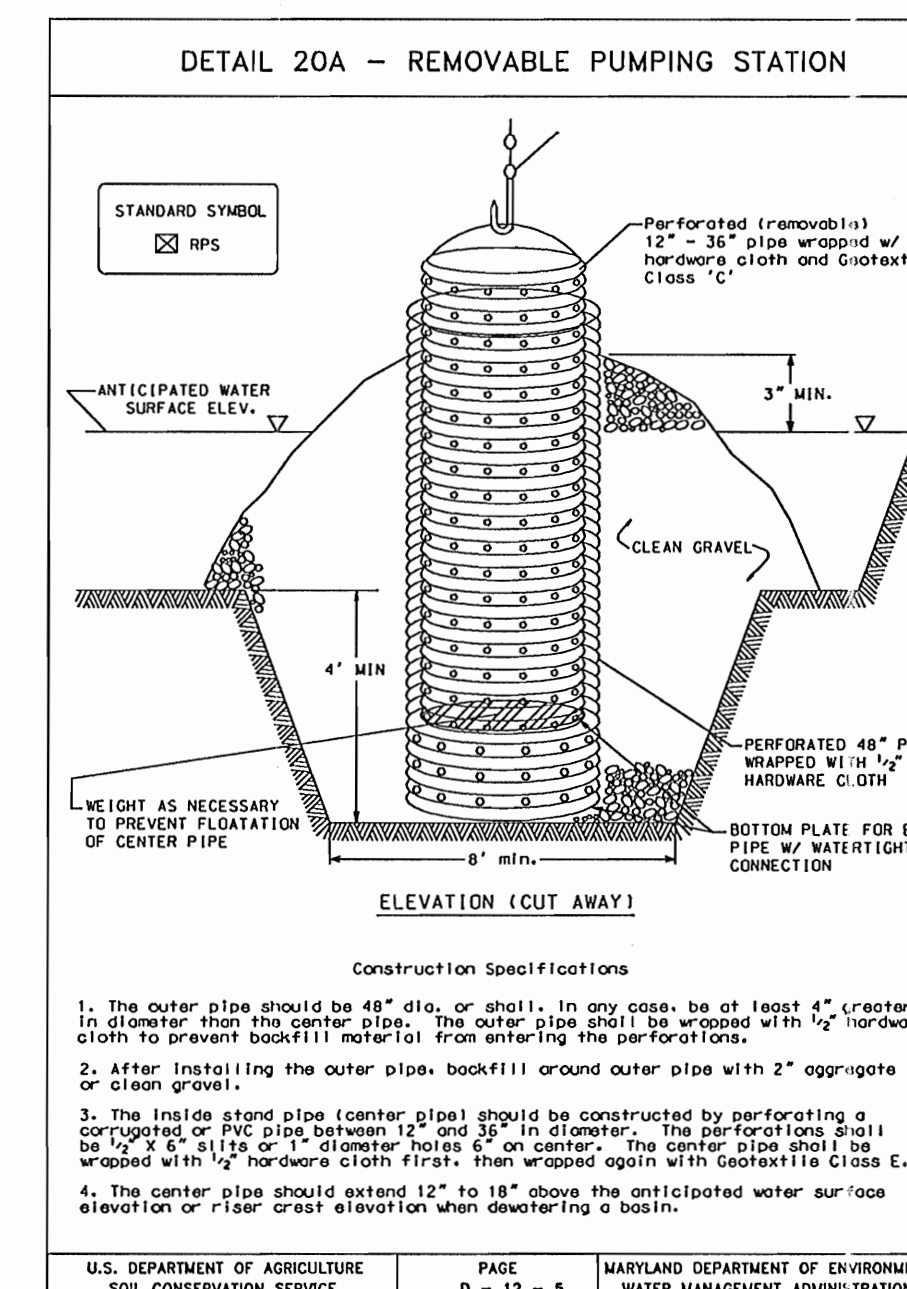
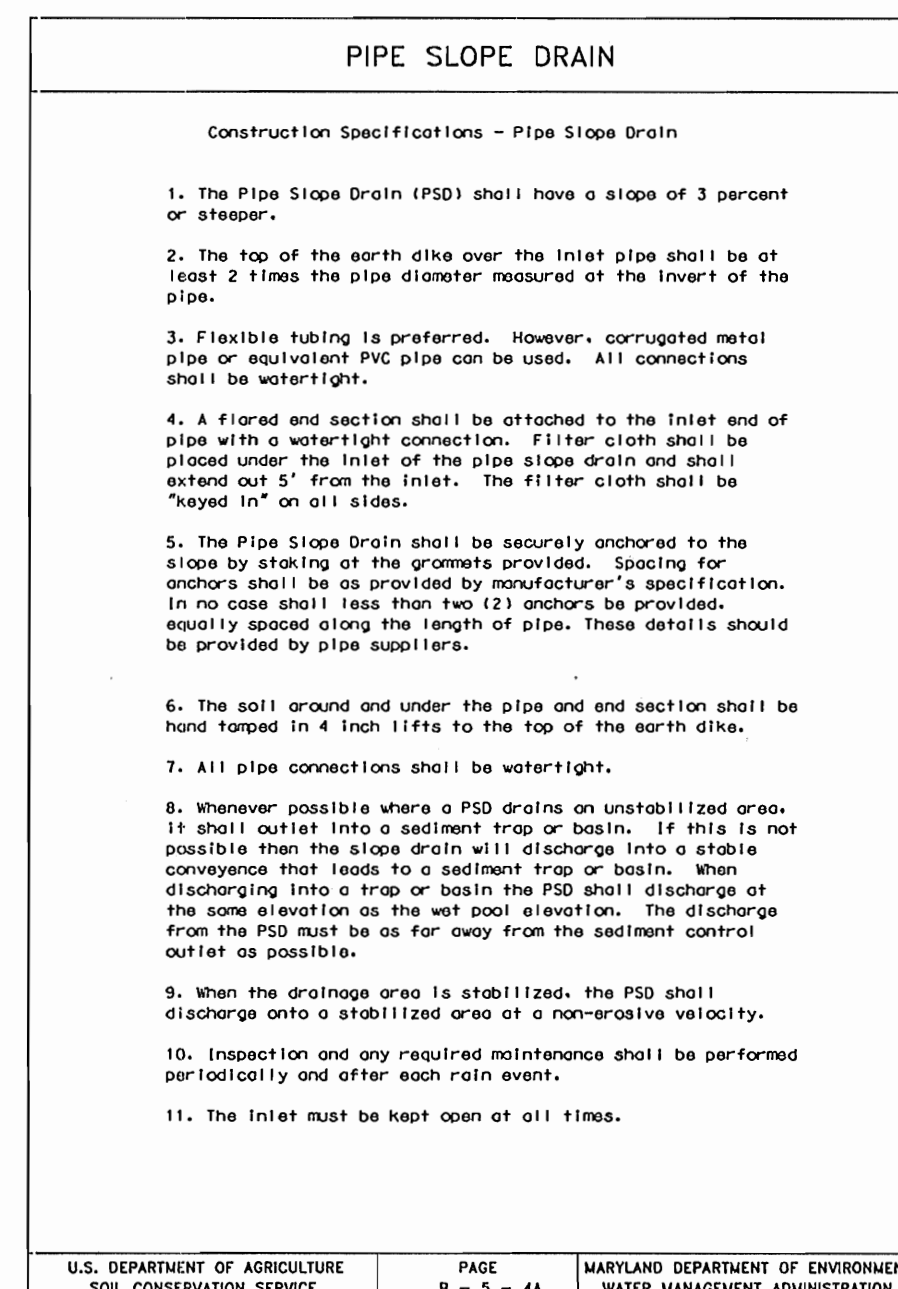
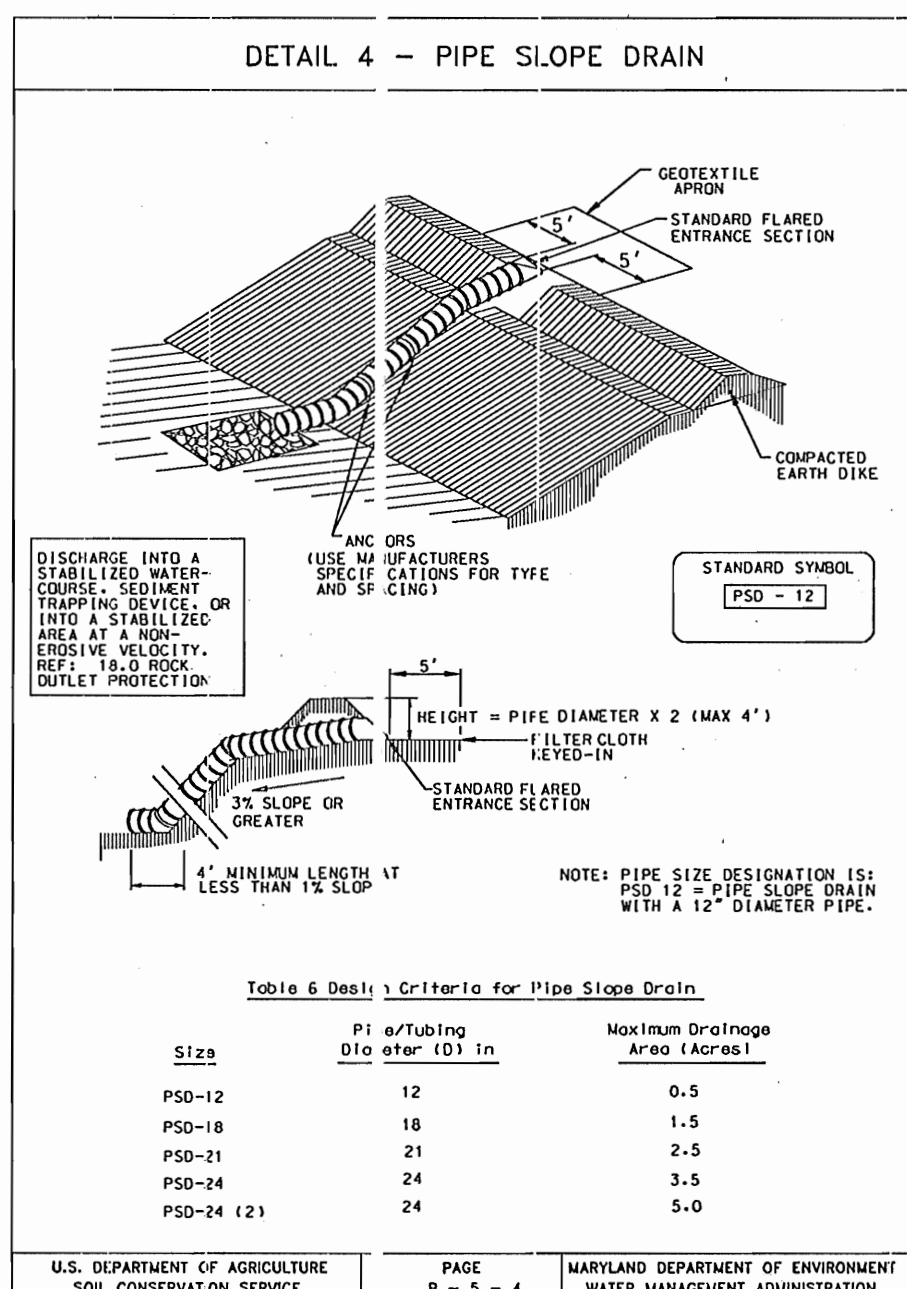
C. Irrigation

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

D. Repair and Maintenance

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

- Once the vegetation is established, the site shall have 95% groundcover to be considered adequately stabilized.
- If the stand provides less than 40% ground coverage, reestablish following original time, fertilizer, seedbed preparation and seeding recommendations.
- If the stand provides between 40% and 94% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
- Maintenance fertilizer rates for permanent seedings are shown in Table 24. For lawns and other medium to high maintenance turfgrass areas, refer to the University of Maryland publication "Lawn Care in Maryland" Bulletin No.171.



ENGINEER'S CERTIFICATE
"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."
C. RICHARD LORTZ, P.E. *C. Richard Lortz* 10/21/04
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

DEVELOPER'S CERTIFICATE
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."
JAMES E. LOESCH *James E. Loesch* 10/26/04
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

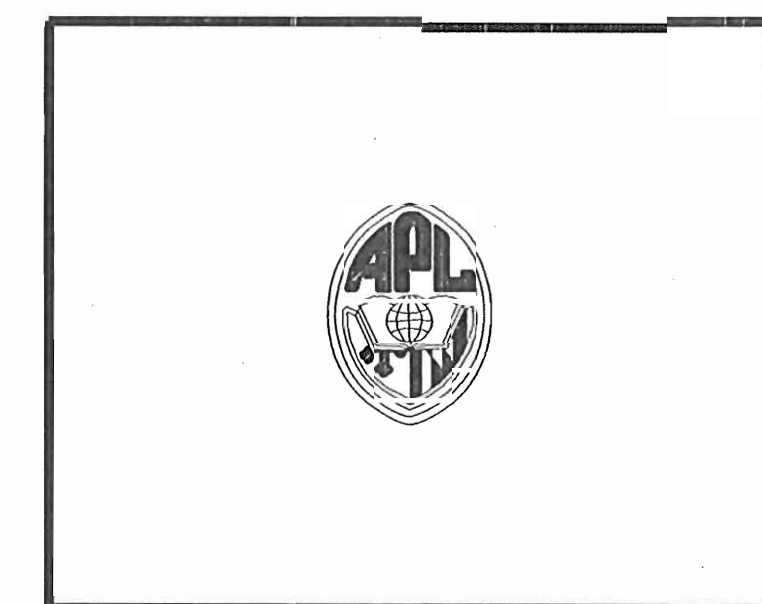
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Chris Deacon 11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Chris Hamilton 11/24/04
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Mark de la Cruz 12/1/04
DIRECTOR DATE

REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.
in Meyer 11/16/04
USDA-Natural Resources Conservation Service DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
Guthrie 11/16/04
HOWARD S.C.D. DATE



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APPLIED PHYSICS LABORATORY
11100 JOHNS HOPKINS ROAD
LAUREL MARYLAND 20723

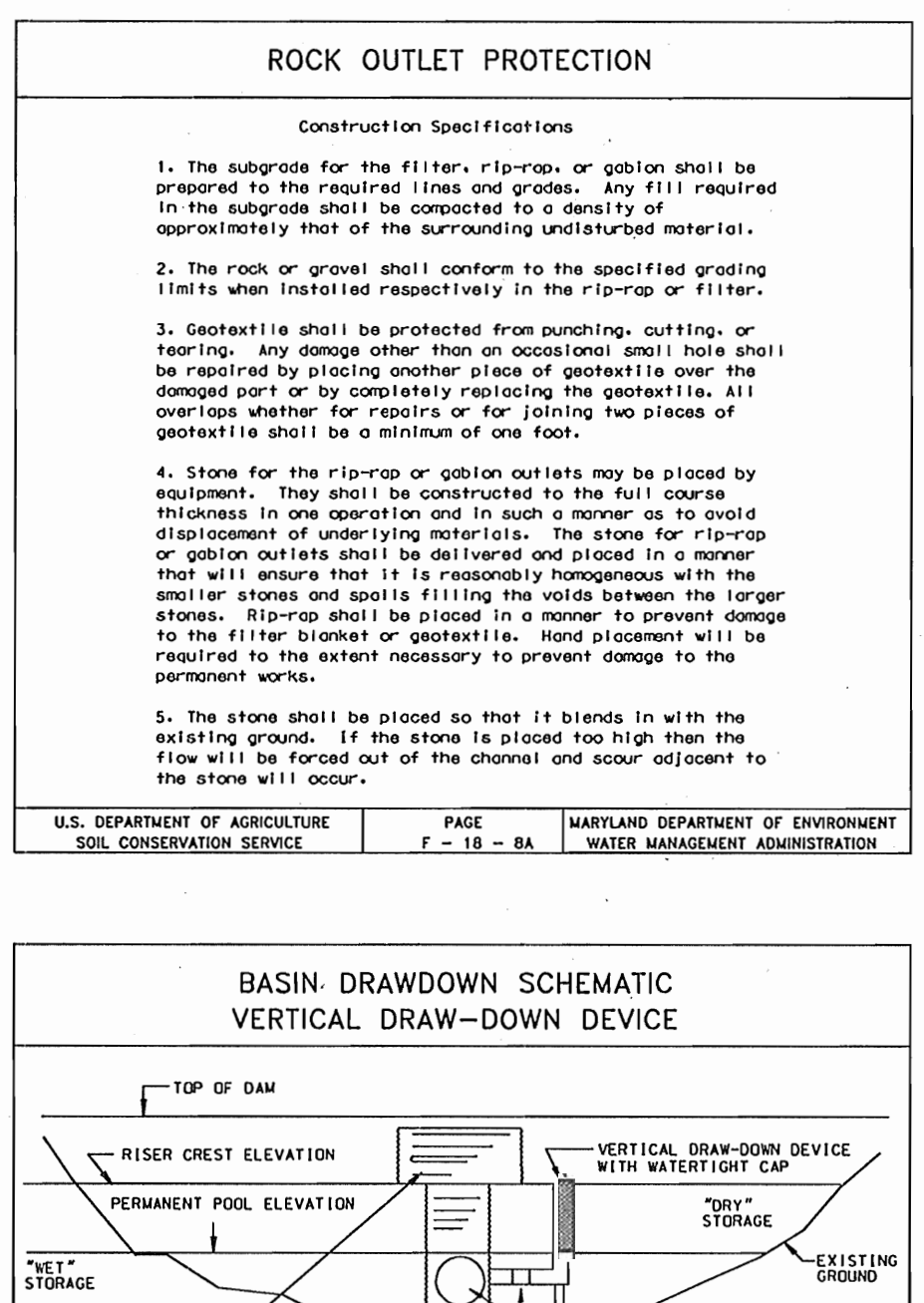
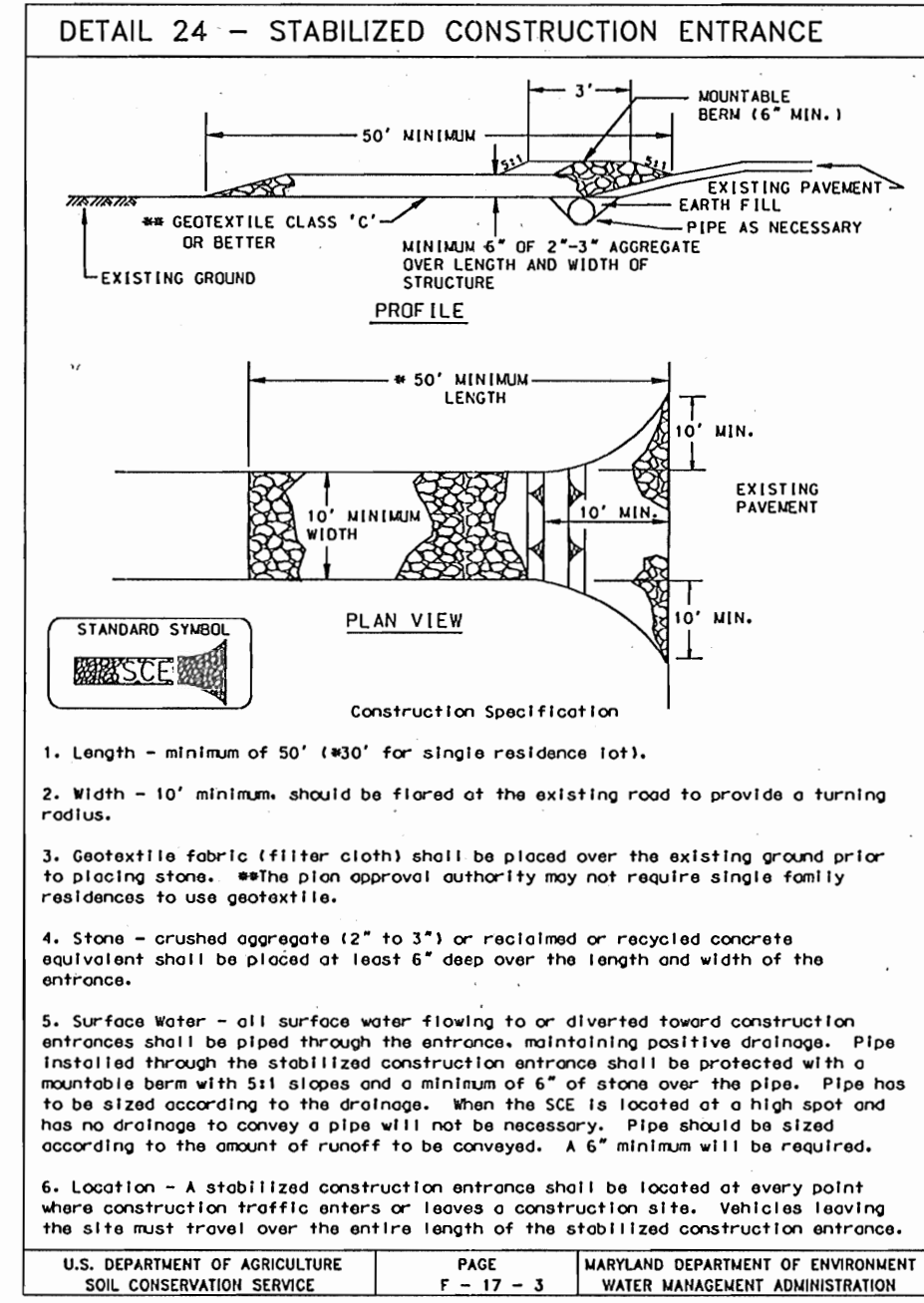
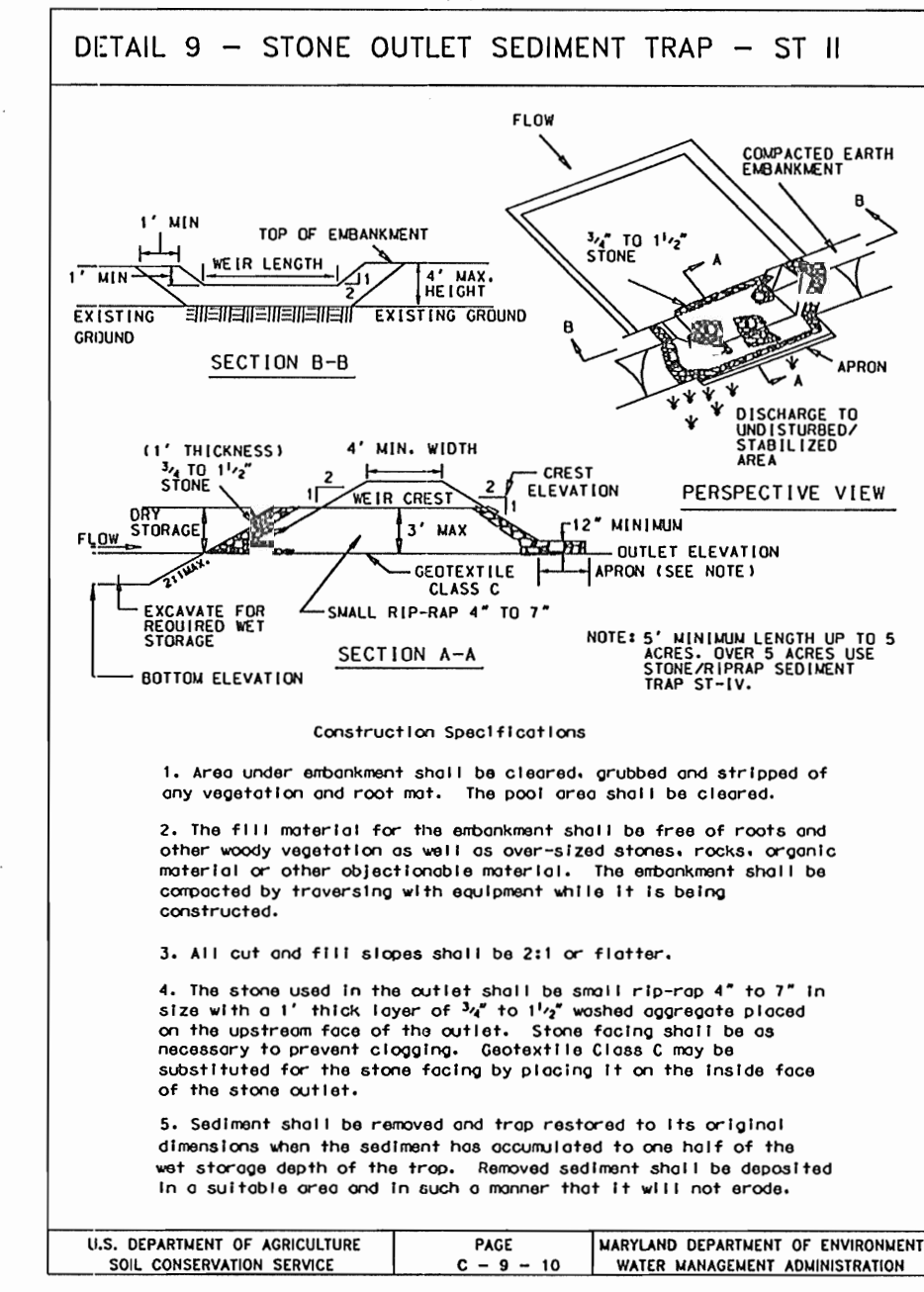
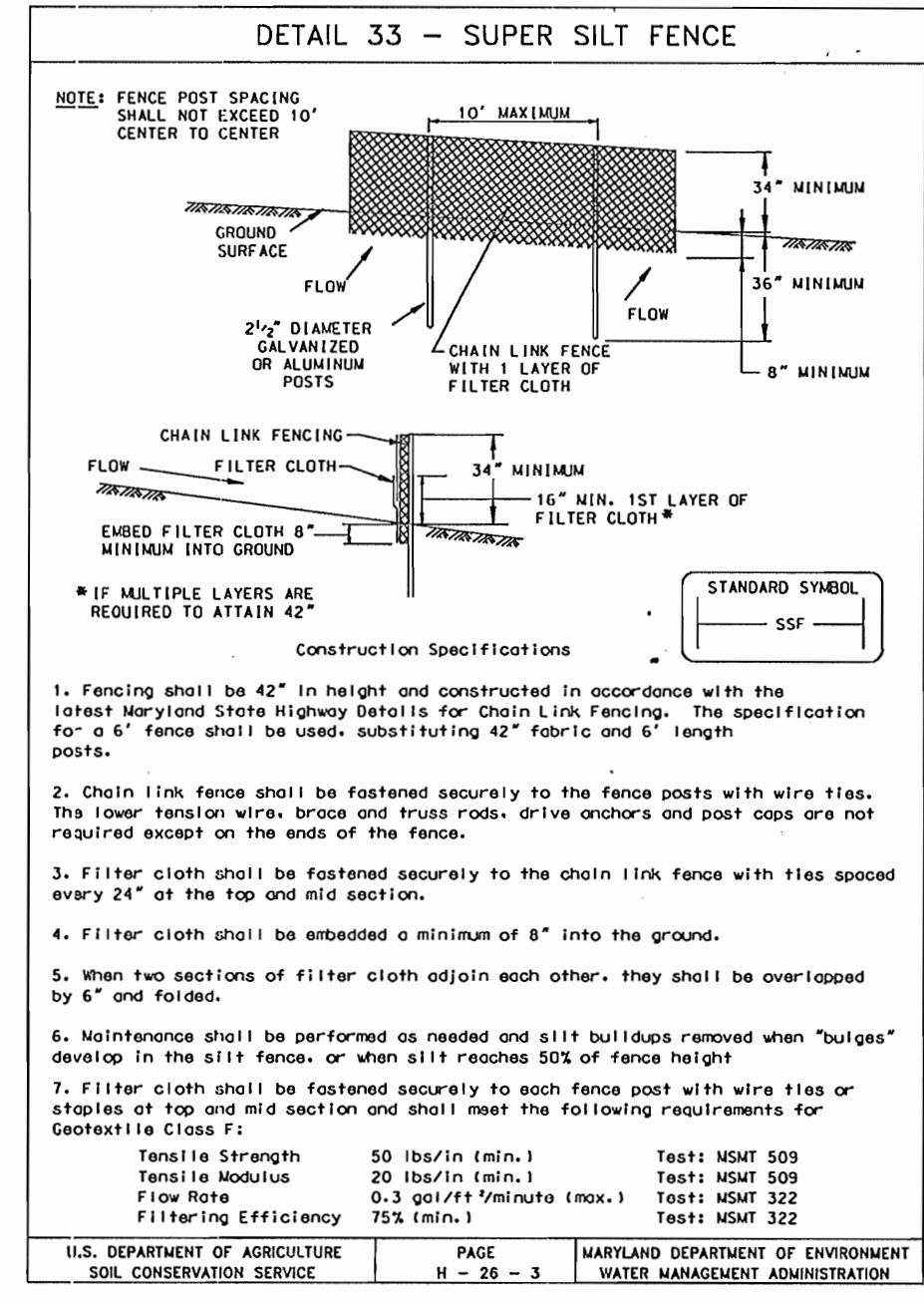
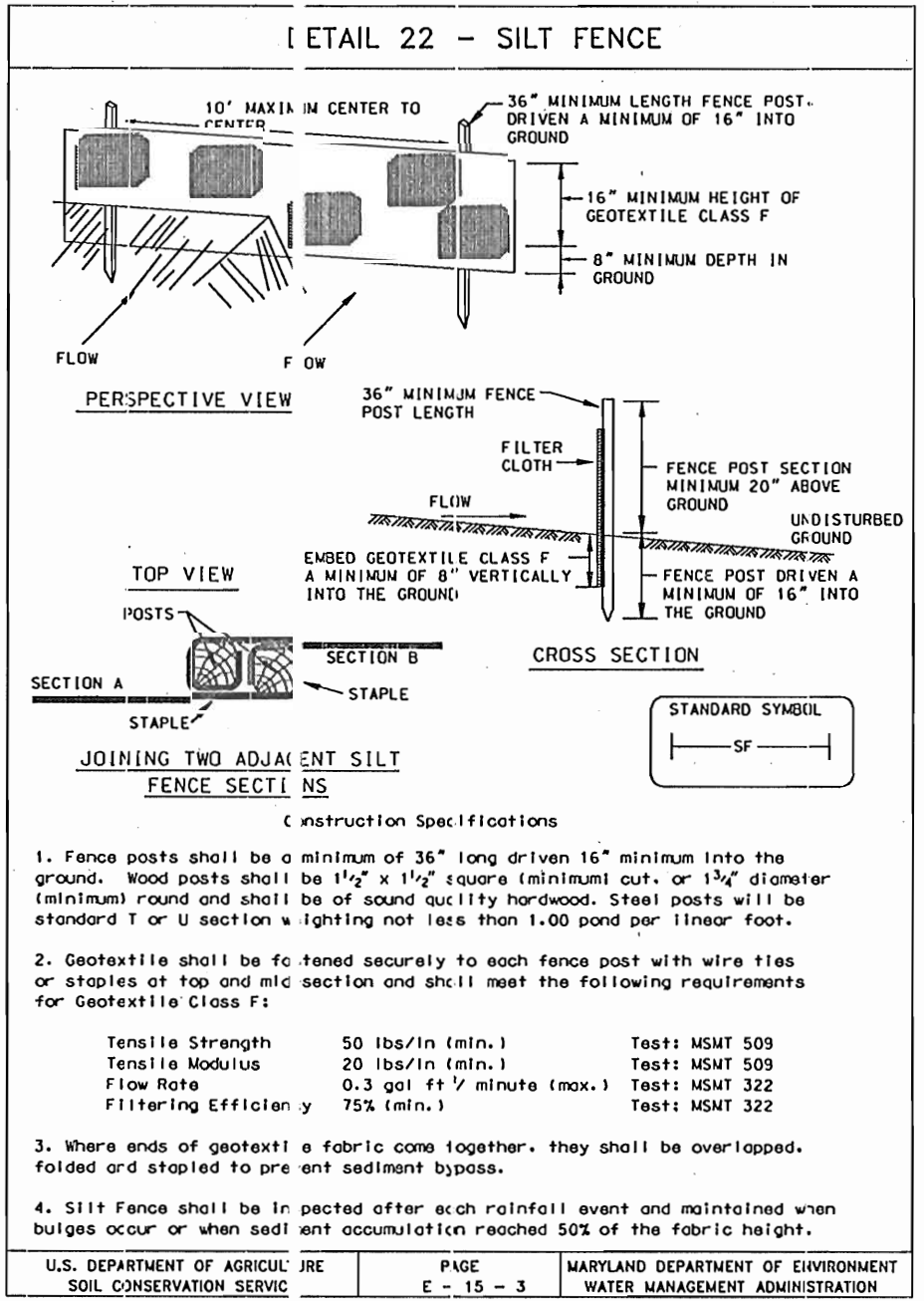
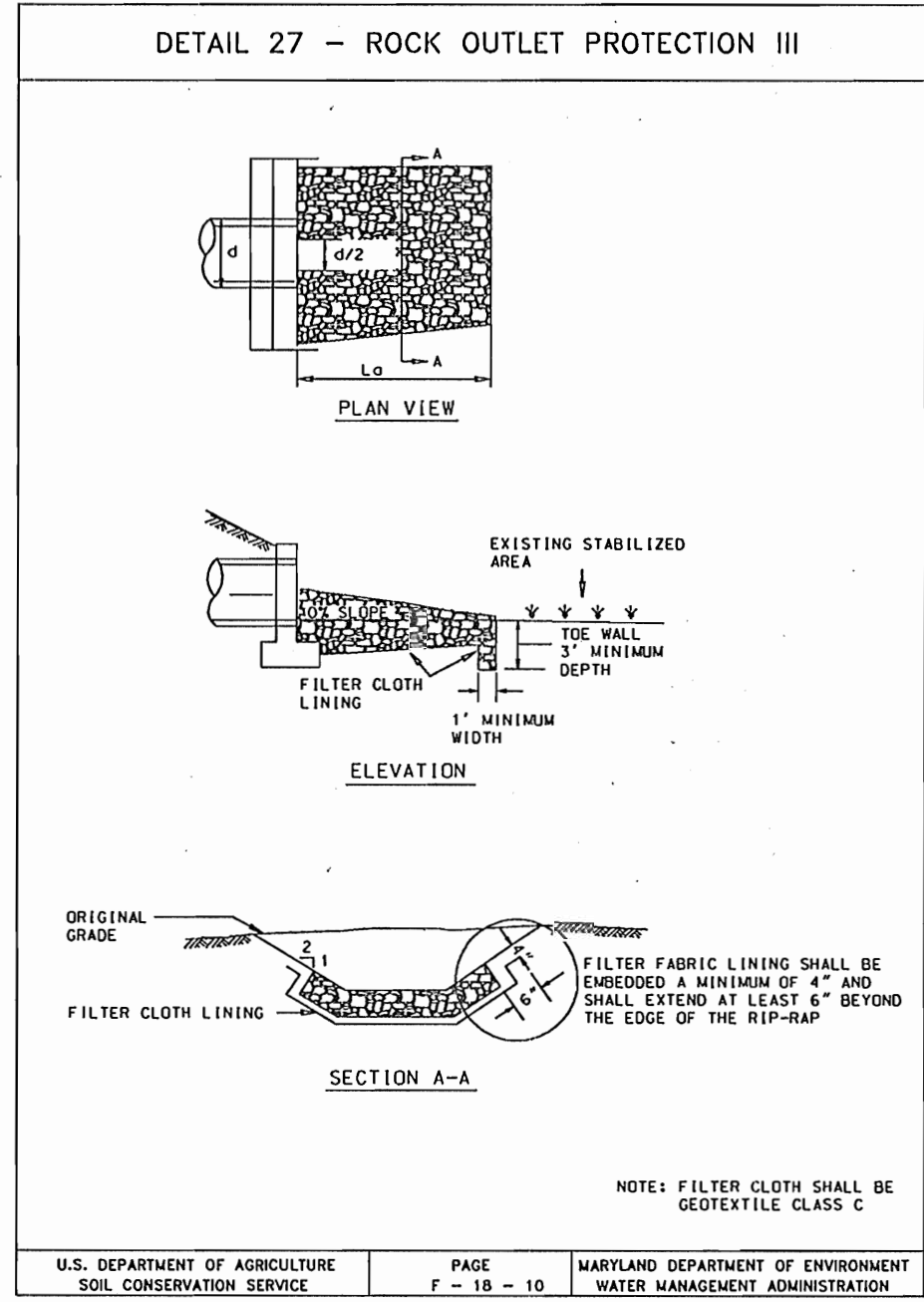
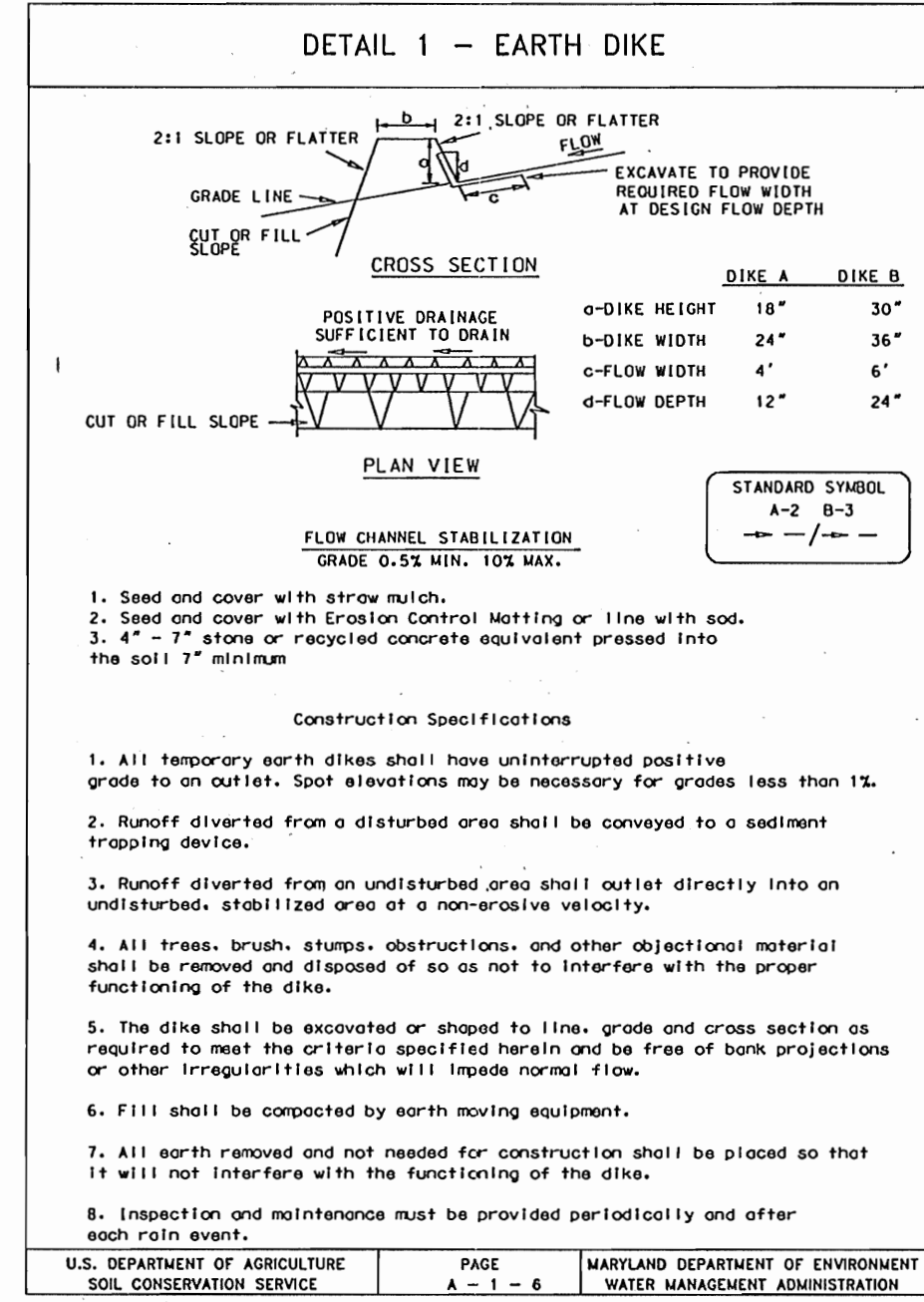
BASIN C
SWM FACILITIES
AND LAYDOWN AREA
SDP 04-133

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GRAPHIC SCALES

WR&A
WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

EROSION AND SEDIMENT CONTROL NOTES 2
DRAWING NO. C-22
Sheet 23 of 30
Scale:
Designed By: MH, EE Drawn By: EE, PB
Checked By: AUO Date: 10/20/04



SILT FENCE

Silt Fence Design Criteria

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

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

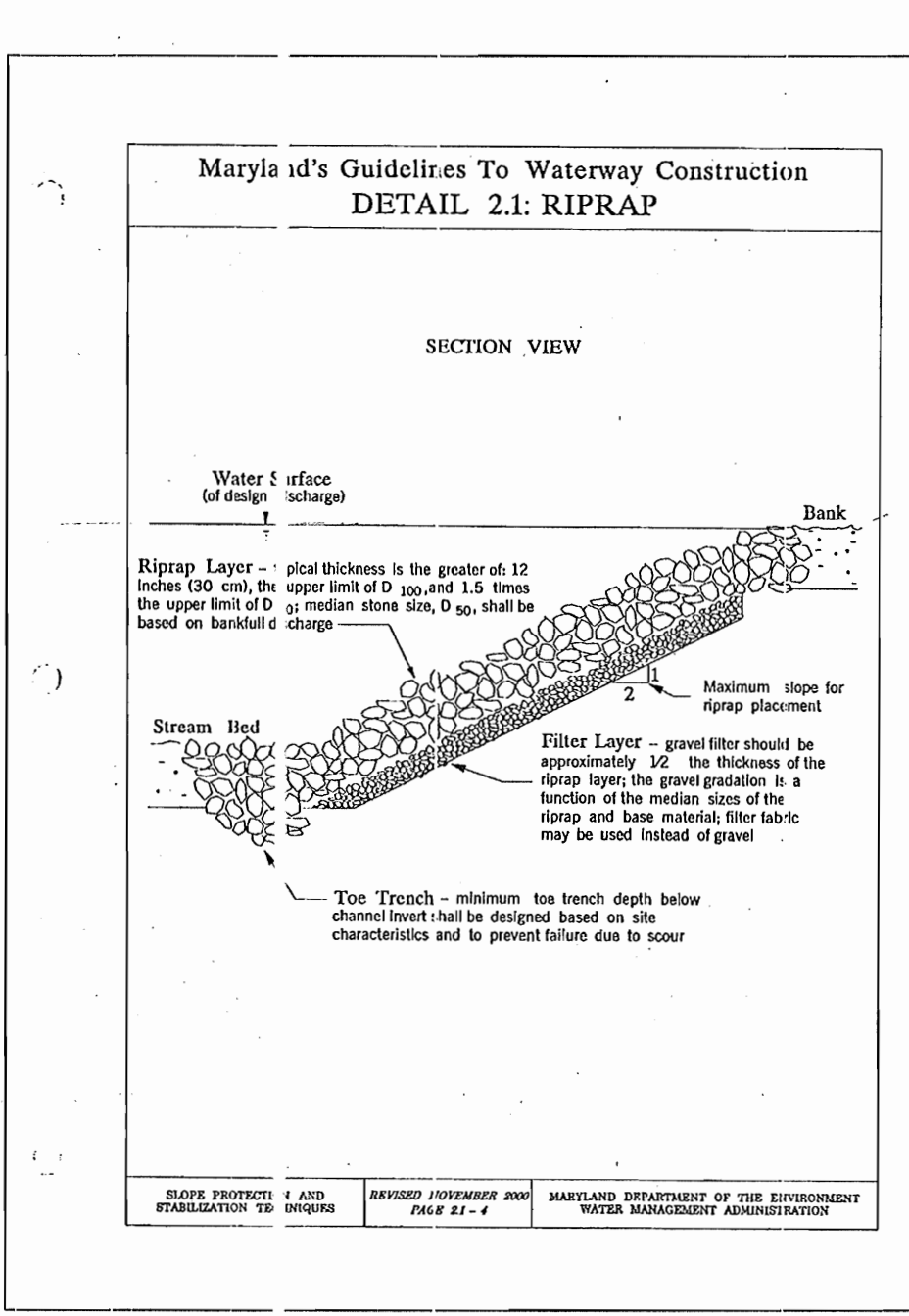
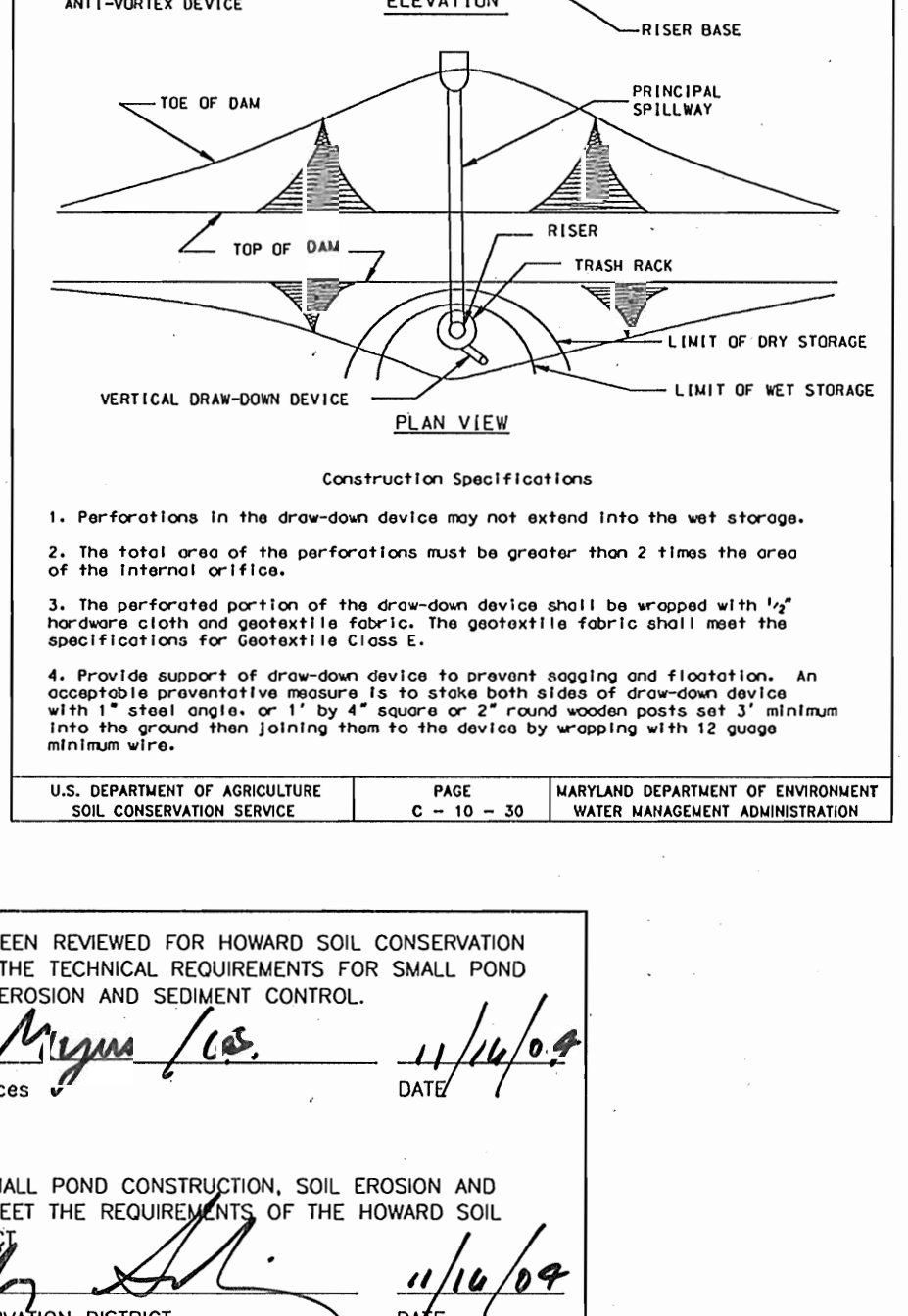
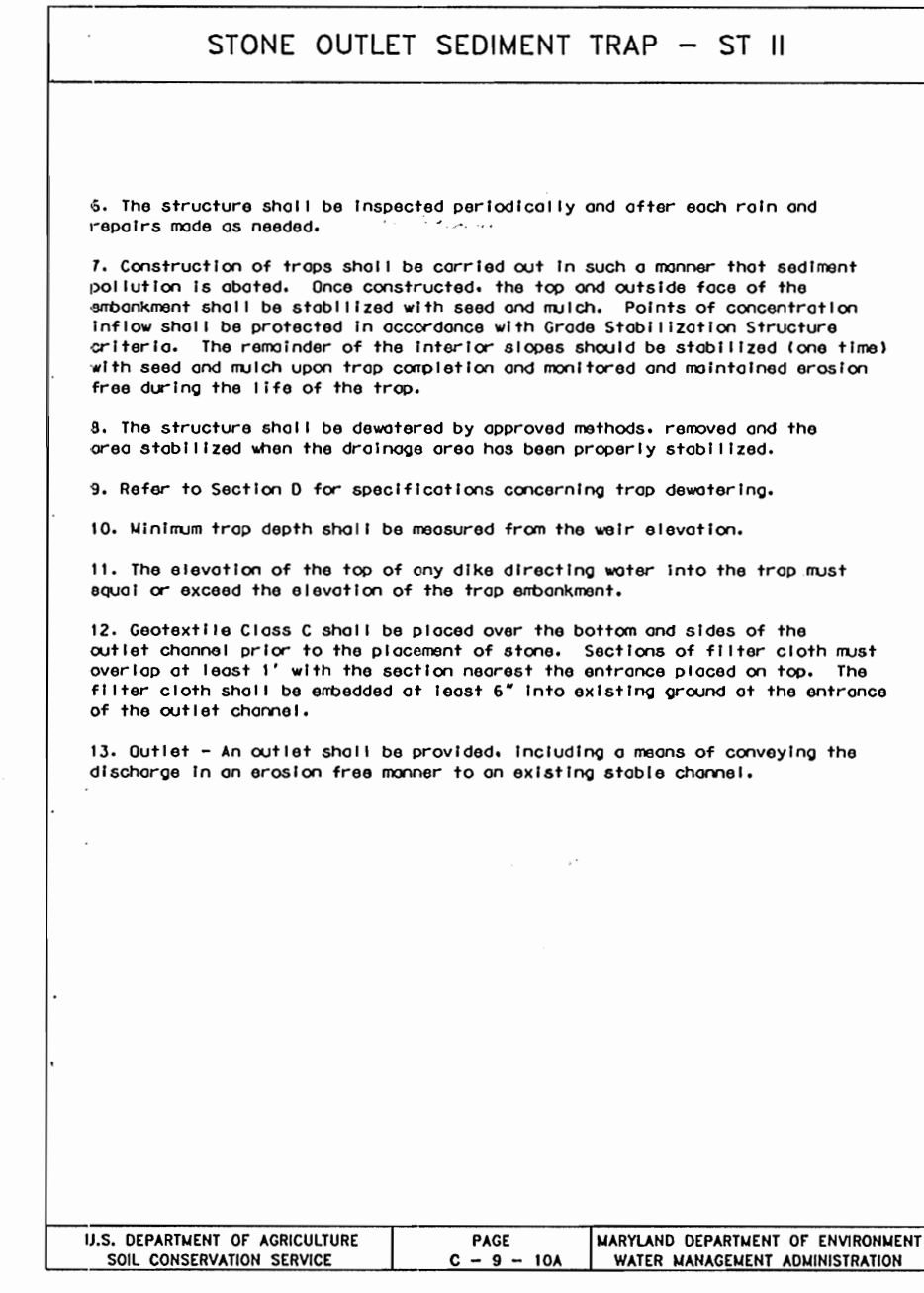
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE 18 - 13 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SUPER SILT FENCE

Design Criteria

Slope Steepness	Slope Length (Minimum)	Silt Fence Length (Maximum)
0 - 10%	0 - 10:1	Unlimited
10 - 20%	10:1 - 5:1	1,500 feet
20 - 33%	5:1 - 3:1	1,000 feet
33 - 50%	3:1 - 2:1	500 feet
50% +	2:1 +	250 feet

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE 18 - 26 - 3A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



MGW2.1: RIPRAP

Table 2.1. Riprap Gradations for Riprap Stone Classes

Class	Size	% Total Weight Coarser Than
I	150 (37.5)	100
II	75 (18.75)	100
III	37.5 (9.375)	100

Uniform grade riprap should incorporate regular rock to promote interlocking.

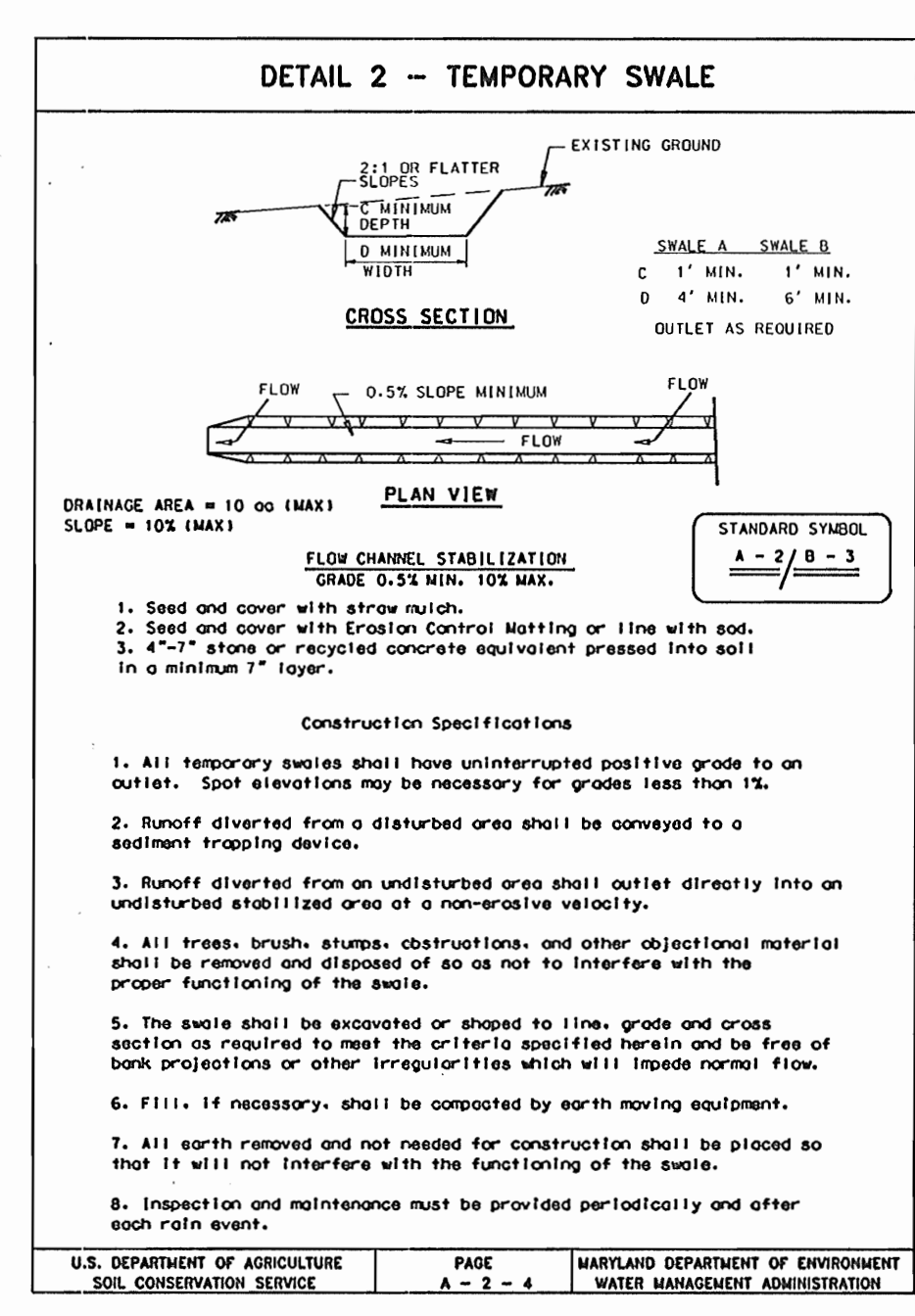
Approximate Cost (\$199): \$18 per linear ft

INSTALLATION GUIDELINES

- All erosion and sediment control devices, including the existing basin, should be implemented as the first order of protection in a plan approved by the WMA or local authority. Once a final installation project is initiated, the contractor shall follow the approved plan and shall be responsible for maintaining the structure until approved by the WMA or local authority.
- The contractor should install all erosion control devices as the first order of protection.
- Discretion should be made to reasonably conform with the existing stream slope and bed.
- All fill in the subgrade should be compacted to a density approximating that of the surrounding undisturbed material.
- Provisions must be made to anchor the riprap in the stream bed and to provide protection against undermining. If this cannot be accomplished by creating a toe trench, an alternative method of protection must receive prior written approval from the WMA or local authority.
- The filter layer or blanket should be placed immediately after stone placement.
- The stone for the riprap should be spread in a uniform layer to the specified depth. Where stone sizes vary, the larger stones should be placed in the upper layers and the smaller stones in the lower layers. The riprap should be placed with the riprap layer on top and the filter layer on the bottom. The riprap should be placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spoils filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
- Any excavation voids existing along the edges of the completed slope and channel protection should be backfilled and compacted.
- All disturbed areas should be permanently stabilized in accordance with an approved sediment and erosion control plan.

Note: The use of rock vases (MGWC 1.1 Rock Vases) should be considered to reduce high velocity flows on the slope protection and prevent future toe scour.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE 21 - 2 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



ENGINEER'S CERTIFICATE

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

C. RICHARD LOITZ, P.E. *C. Richard Loitz* 10/21/04
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

JAMES E. LOESCH *James E. Loesch* 10/26/04
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Chris Dawson 11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Cathy Hamilton 11/24/04
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

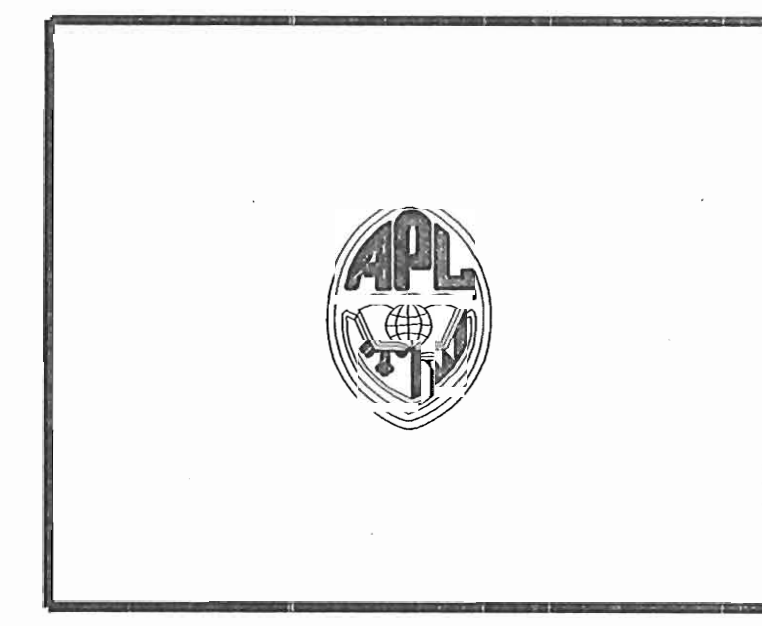
Mark J. Leight 12/1/04
DIRECTOR DATE

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

Jian Nguyen 11/16/04
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.

John Smith 11/16/04
HOWARD SOIL CONSERVATION DISTRICT DATE

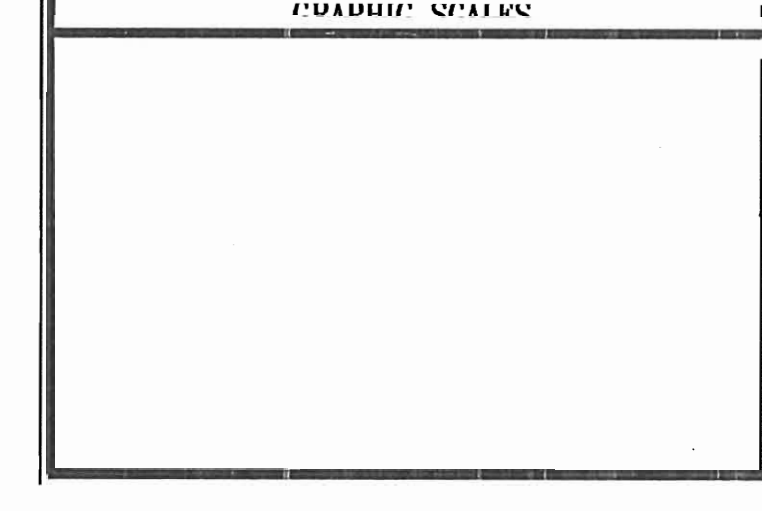


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SWM FACILITIES
AND LAYDOWN AREA
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WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

EROSION AND SEDIMENT CONTROL DETAILS

DRAWING NO. C-23

Sheet 24 of 30

Scale: _____

Designed By: MH, EE Drawn By: EE, PB
Checked By: AHQ Date: 10/20/04

STORMWATER MANAGEMENT POND CONSTRUCTION SPECIFICATIONS

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

A. Site Preparation

Areas designed 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 no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.

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

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

B. Earth Fill

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

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

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

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

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.

Embankment Core -

The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of 4 feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

C. 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 other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

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

D. PIPE CONDUITS

All pipes shall be circular in cross section.

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

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

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

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

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

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. 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 bandwidth. The following type connections are acceptable for pipes less than 24" in diameter: flanges on both ends of the pipe with a circular 3/8" inch closed cell neoprene gasket, pre-punched to the flange bolt circle, sandwiched between adjacent flanges; a 12-inch wide standard lap type band with 12" wide by 3/8-inch 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 24" in diameter and larger shall be connected by a 24" long annular corrugated band using a minimum of 4 (four) rods and lugs, 2 on each connecting pipe end. A 24" wide by 3/8" thick closed cell gasket will be installed with 12-inches on the end of each pipe. Flanged joints with 3/8" closed cell gaskets the full width of the flange is also acceptable.

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

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

5. Backfilling shall conform to "Structural Backfill."

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

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

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

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

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

4. Backfilling shall conform to "Structural Backfill."

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

Plastic Pipe - The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipes, couplings and fittings shall conform to the following: 4" - 10" pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" shall meet the requirements of AASHTO M294 Type S.

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

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

4. Backfilling shall conform to "Structure Backfill."

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

E. Drainage Diaphragms

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

F. Concrete

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

G. Rock Riprap

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

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

H. Core of Water During Construction

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect the areas to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required or 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.

I. Stabilization

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

J. 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.

GEOTECHNICAL RECOMMENDATIONS

NRCS approval of the ponds is required because the embankments are all greater than 4 feet in height.

The pond construction should meet the requirements of the U.S.D.A. Natural Resources Conservation Service for ponds, (i.e., Code 378). For fill, the density should not be less than 95% of the maximum dry density, with a moisture content within +/- 2% of the optimum. The compaction should be tested by the Geotechnical Engineer. Compaction should be determined by AASHTO method T-99 (Standard Proctor).

All embankment subgrades should be proofrolled and densified. All existing fill should be removed from the embankment footprint, and it should be refilled with compacted fill. The cutoff trenches should be excavated into low permeability material of undisturbed earth. The minimum depth of the trenches should be 4 feet, but they will be deeper if needed to fully cutoff pervious materials. The side slopes of the cutoff trenches should be 1:1. The proposed embankments should be designed as homogeneous earth dams. The most clayey soils should be placed in the cutoff trenches, and in the upstream slopes of the embankments. The side slopes of the embankments should be 3:1 (horizontal:vertical). At the top of each embankment, the minimum width should be 6 to 10 feet. Additional height should be added to each embankment in case of settlement. The emergency spillways should be cut into original ground.

In this report, the embankment height is measured from the bottom of the concrete cradle, along the centerline of the embankment, to the top of the emergency spillway. The heights of the proposed embankments are as follows: the south pond, 12.7 feet; the north pond, 11.6 feet; and the west pond, 6.8 feet.

MD 378 distinguishes between embankment ponds and excavated ponds. The APL ponds will be constructed by both methods. In general, excavation will be needed in the pond centers 6 to 10 feet below the existing land surface. According to the MD 378 definition, a pond constructed by both the embankment method and the excavation method is considered an embankment pond, if the depth of the impounded water at the spillway storm design high water elevation is greater than or equal to 3 feet (measured from the low point on the upstream toe to the design high water). Therefore, these three ponds are all embankment ponds.

A paved laydown area, similar to a parking lot has been proposed. The laydown area is on top of an old landfill. For pavement, APL has requested Howard County Standard P3. The subsurface investigation for this project has intentionally avoided disturbance of the old landfill. APL has stated that the landfill has been successfully closed.

Unless the old landfill materials are improved, it is expected that differential settlement of the laydown area pavement will occur. During the preparation of this Geotechnical Report, WR&A discussed with APL the options for minimizing such differential settlement. The result of this discussion was that soil treatment (for example, dynamic compaction) was not desired by APL, due to its relatively high cost, and the potential for disturbance of the old landfill. Therefore, APL decided to accept that differential settlement in the laydown area might occur.



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SDP 04-133

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GRAPHIC SCALES

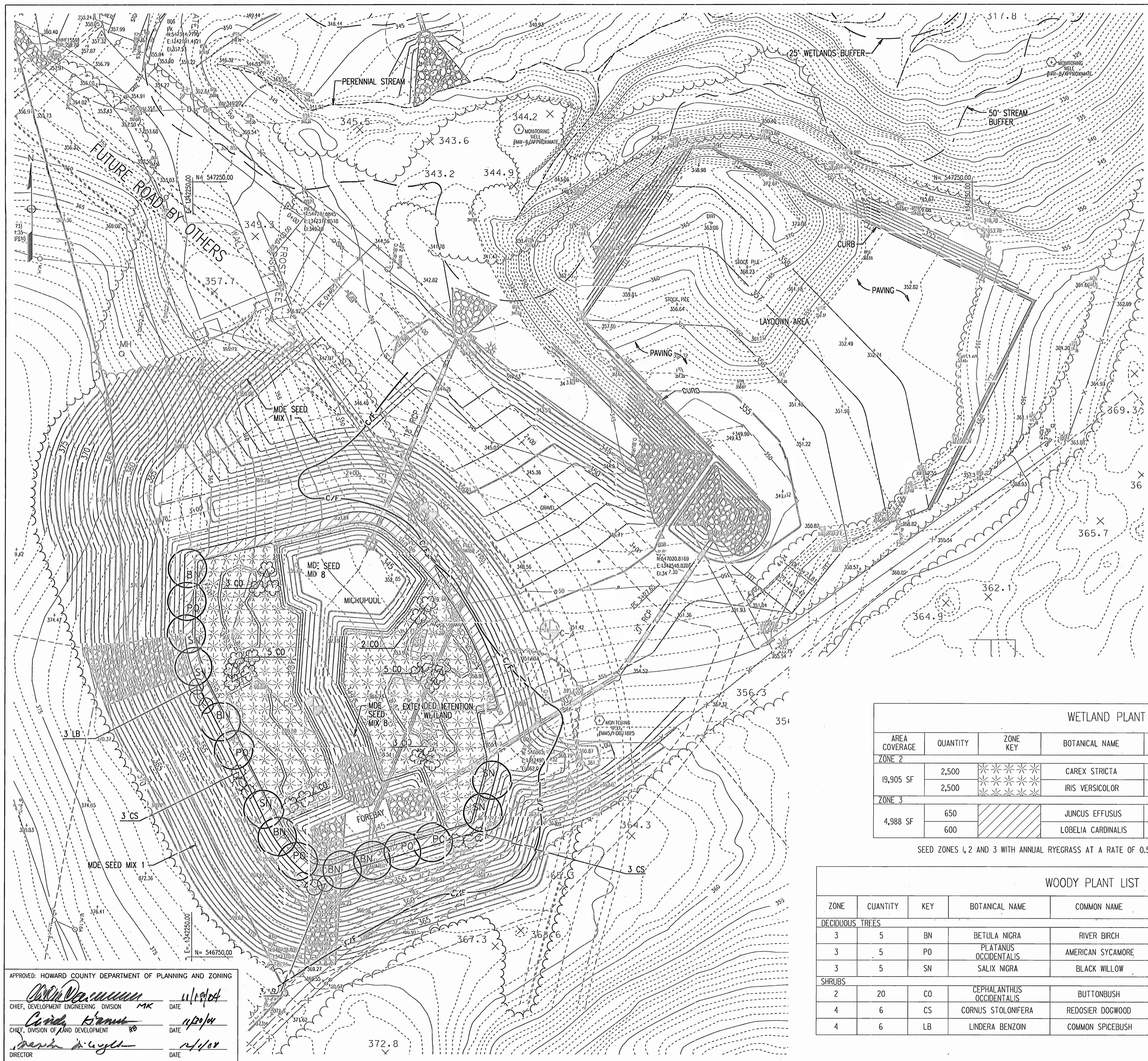


WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

STANDARD SPECIFICATION FOR STORMWATER MANAGEMENT CONSTRUCTION

	DRAWING NO.
	C-24
Sheet 25 of 30	
Scale:	
Designed By: MH, EE	Drawn By: EE, PB
Checked By: AUO	Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING	
	11/19/04
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
	11/20/04
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
	11/1/04
DIRECTOR	DATE



LEGEND

- 350 -- EXISTING CONTOUR
- 350 — PROPOSED CONTOUR
- LOD -- LIMITS OF DISTURBANCE
- C/F - CUT/FILL LINE
- XX PROPOSED SHADE TREES
- ☼ ☼ ☼ PROPOSED SHRUBS
- ⊖ EXISTING TREELINE
- ⊖ PROPOSED TREELINE
- MG THOUSAND GALLONS

SOUTH BASIN DESIGN SUMMARY

South Basin
 Extended Detention Shallow Wetland (W-2)
 Drainage Area : 16.06 Acres

DESIGN STORM	WATER SURFACE ELEVATION (feet)
Invert	345.00
2-year	352.59
10-year	353.44
100-year	354.28
Forebay Sediment Volume	
Recharge Volume (Rev)	352.00
Water Quality Volume (WqV)	350.00
Channel Protection Volume (CpV)	351.96
(1-year)	
Overbank Flood Protection (Op)	n/a
Extreme Flood Protection (Qf)	n/a
Top of Dam Elevation	356

Note: Qp and Qf are not required for this project as determined by HCDRS.

Riser:	Reinforced Concrete Box
Principal Spillway:	27 inch RCP
Emergency Spillway:	28 feet wide vegetated earth
Maintenance:	Responsibility of the Owner (JHU - APL)

HYDROLOGIC ZONES

PERMANENT POOL ELEVATION 350.00

ZONE 1 UP TO EL. 348.50
 ZONE 2 (LOW MARSH) EL. 348.50 TO EL. 349.50
 ZONE 3 (HIGH MARSH) EL. 349.50 TO EL. 350.00
 ZONE 4 EL. 350.00 TO EL. 352.59
 ZONE 5 EL. 352.59 TO EL. 354.28
 ZONE 6 EL. 354.28 AND ABOVE

NOTE

FOR LANDSCAPE NOTES AND DETAILS, SEE THE NORTH BASIN/SOUTH BASIN LANDSCAPE NOTES AND DETAILS SHEET.

WETLAND PLANT LIST

AREA COVERAGE	QUANTITY	ZONE KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	SPACING
19,905 SF	2,500	***	CAREX STRICTA	TUSsock SEDGE	2' PLUG	TUBER OR ROOT MASS	24" O.C.
	2,500	***	IRIS VERSICOLOR	BLUE FLAG	2' PLUG	TUBER OR ROOT MASS	24" O.C.
4,988 SF	650	///	JUNCUS EFFUSUS	SOFT RUSH	2' PLUG	TUBER OR ROOT MASS	24" O.C.
	600	///	LOBELIA CARDINALIS	CARDINAL FLOWER LOBELIA	2' PLUG	TUBER OR ROOT MASS	24" O.C.

SEED ZONES 1, 2 AND 3 WITH ANNUAL RYEGRASS AT A RATE OF 0.5 LBS/1000 SF FOR EROSION AND WEED CONTROL.

WOODY PLANT LIST

ZONE	QUANTITY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	SPACING	MULCH	WATER
DECIDUOUS TREES									
3	5	BN	BETULA NIGRA	RIVER BIRCH	5' HT.	#3 CONT.	26' O.C.	-	0.625 MG
3	5	PO	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	5' HT.	#3 CONT.	26' O.C.	-	0.625 MG
3	5	SN	SALIX NIGRA	BLACK WILLOW	4' HT.	#3 CONT.	26' O.C.	-	0.625 MG
SHRUBS									
2	20	CO	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	2' HT.	CONT.	8' O.C.	-	0.250 MG
4	6	CS	CORNUS STOLONIFERA	REDOSIER DOGWOOD	2' HT.	CONT.	8' O.C.	4.7 S.Y.	0.075 MG
4	6	LB	LINDERA BENZOIN	COMMON SPICEBUSH	2' HT.	CONT.	8' O.C.	4.7 S.Y.	0.075 MG

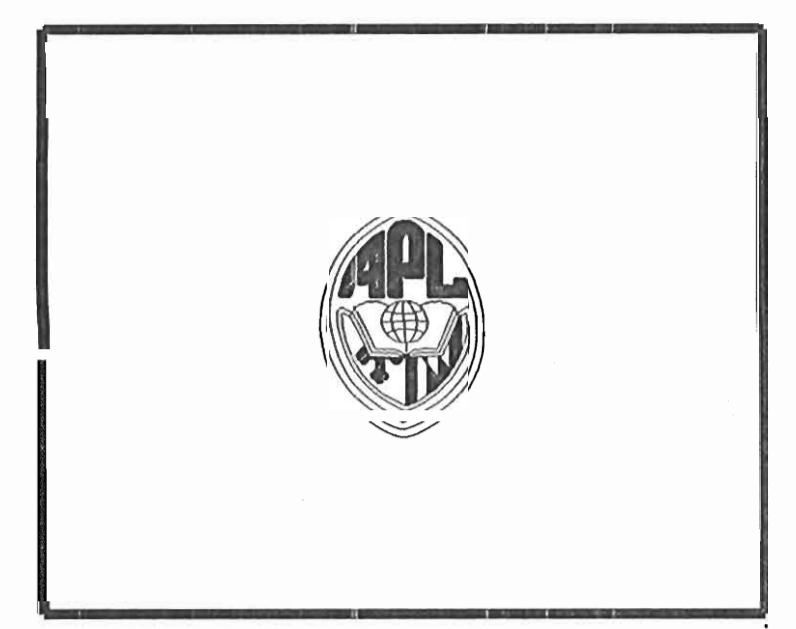
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard County Seal

CHIEF, DEVELOPMENT ENGINEERING DIVISION *MK* DATE *11/19/04*

CHIEF, DIVISION OF PLANNING AND DEVELOPMENT *RO* DATE *11/20/04*

DIRECTOR *David J. Light* DATE *11/10/04*

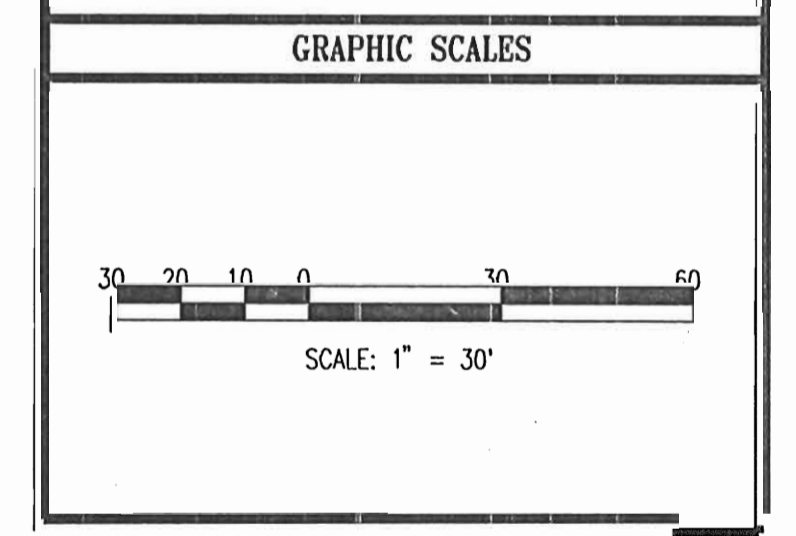


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WR&A

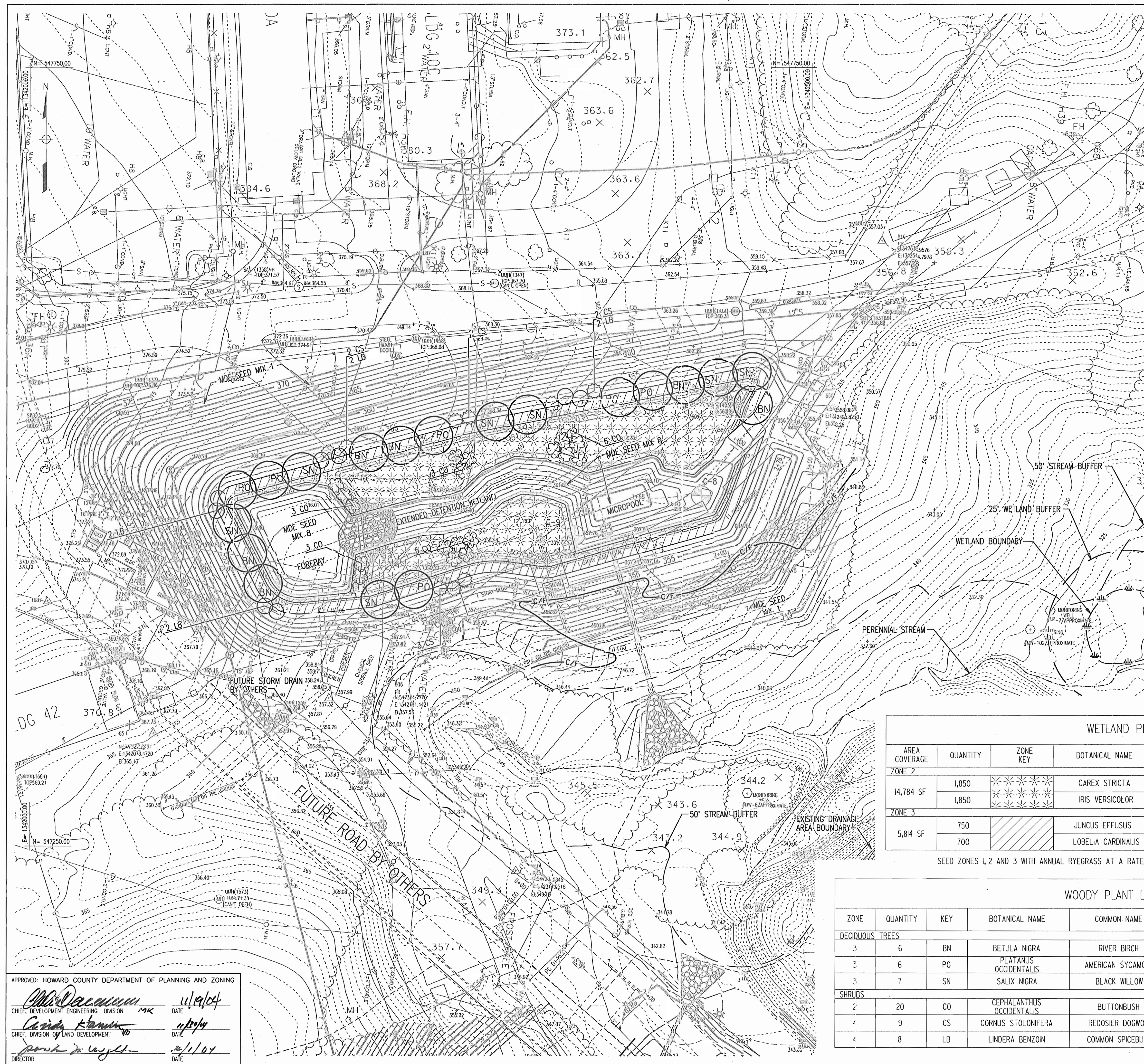
WHITMAN, REQUARDT AND ASSOCIATES, LLP
 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

SOUTH BASIN AND LAYDOWN AREA LANDSCAPE PLAN

DRAWING NO.
1-1

Sheet 26 of 30

Scale:
 Designed By: *HWP* Drawn By: *SAZ*
 Checked By: *AT10* Date: *10/20/04*



- LEGEND**
- 350 -- EXISTING CONTOUR
 - 350 — PROPOSED CONTOUR
 - LOD -- LIMITS OF DISTURBANCE
 - C/F — CUT/FILL LINE
 - XX PROPOSED SHADE TREES
 - ☼ PROPOSED SHRUBS
 - ~ EXISTING TREELINE
 - ~ PROPOSED TREELINE
 - MG THOUSAND GALLONS

NORTH BASIN DESIGN SUMMARY

North Basin
Extended Detention Shallow Marsh (W-2)
Drainage Area : 18.9 Acres

DESIGN STORM	WATER SURFACE ELEVATION (feet)
Invert	345.00
2-year	353.10
10-year	353.95
100-year	354.58
Forebay Sediment Volume	351.00
Recharge Volume (Rev)	352.00
Water Quality Volume (WQv)	352.00
Channel Protection Volume (Cpv)	352.80
(1-year)	
Overbank Flood Protection (Op)	n/a
Extreme Flood Protection (Of)	n/a
Top of Dam Elevation	356.00

Note: Op and Of are not required for this project as determined by HCDRS.

Riser:	Reinforced Concrete Box
Principal Spillway:	30 inch RCP
Emergency Spillway:	30 feet wide vegetated earth
Maintenance:	Responsibility of the Owner (JHU - APL)

HYDROLOGIC ZONES

- PERMANENT POOL ELEVATION 352.00
- ZONE 1 UP TO EL. 350.50
 - ZONE 2 LOW MARSH EL. 350.50 TO EL. 351.50
 - ZONE 3 HIGH MARSH EL. 351.50 TO EL. 352.00
 - ZONE 4 EL. 352.00 TO EL. 353.10
 - ZONE 5 EL. 353.10 TO EL. 354.58
 - ZONE 6 EL. 354.58 AND ABOVE

NOTE
FOR LANDSCAPE NOTES AND DETAILS, SEE THE NORTH BASIN/SOUTH BASIN LANDSCAPE NOTES AND DETAILS SHEET.

WETLAND PLANT LIST

AREA COVERAGE	QUANTITY	ZONE KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	SPACING
14,784 SF	1,850	***	CAREX STRICTA	TUSsock SEDGE	2" PLUG	TUBER OR ROOT MASS	24" O.C.
	1,850	***	IRIS VERSICOLOR	BLUE FLAG	2" PLUG	TUBER OR ROOT MASS	24" O.C.
5,814 SF	750	///	JUNCUS EFFUSUS	SOFT RUSH	2" PLUG	TUBER OR ROOT MASS	24" O.C.
	700	///	LOBELIA CARDINALIS	CARDINAL FLOWER	2" PLUG	TUBER OR ROOT MASS	24" O.C.

SEED ZONES 1, 2 AND 3 WITH ANNUAL RYEGRASS AT A RATE OF 0.5 LBS/1000 SF FOR EROSION AND WEED CONTROL.

WOODY PLANT LIST

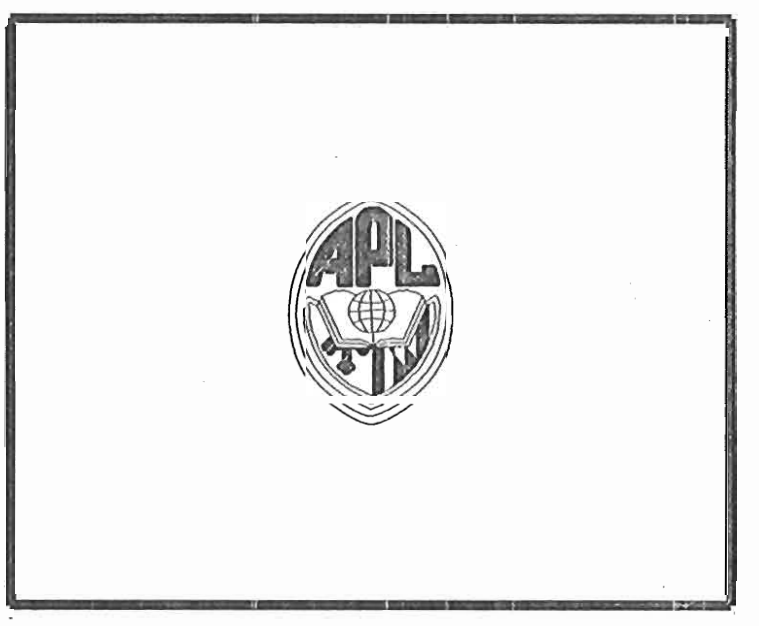
ZONE	QUANTITY	KEY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	SPACING	MULCH	WATER
DECIDUOUS TREES									
3	6	BN	BETULA NIGRA	RIVER BIRCH	5' HT.	#3 CONT.	26" O.C.	-	0.750 MG
3	6	PO	PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	5' HT.	#3 CONT.	26" O.C.	-	0.750 MG
3	7	SN	SALIX NIGRA	BLACK WILLOW	4' HT.	#3 CONT.	26" O.C.	-	0.875 MG
SHRUBS									
2	20	CO	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	2' HT.	CONT.	8" O.C.	-	0.250 MG
4	9	CS	CORNUS STOLONIFERA	REDOSIER DOGWOOD	2' HT.	CONT.	8" O.C.	7.1 S.Y.	0.12 MG
4	8	LB	LINDERA BENZOIN	COMMON SPICEBUSH	2' HT.	CONT.	8" O.C.	6.3 S.Y.	0.100 MG

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Howard County 11/19/04
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK DATE

Carole Kram 11/19/04
 CHIEF, DIVISION OF LAND DEVELOPMENT WB DATE

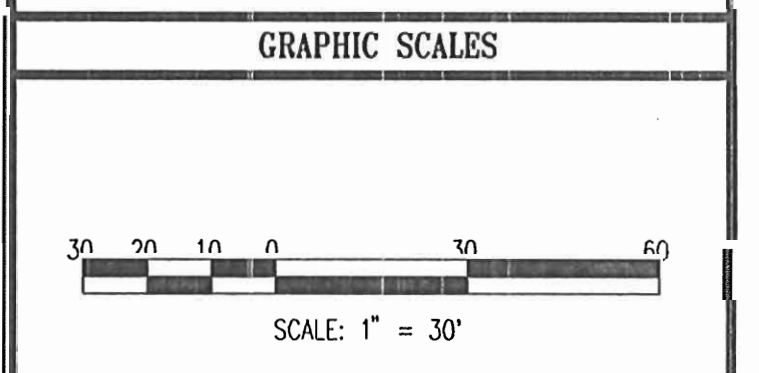
Howard County 11/19/04
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 WHITMAN, REARDT AND ASSOCIATES, LLP
 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

**NORTH BASIN
 LANDSCAPE PLAN**

DRAWING NO.
L-2

Sheet 27 of 30

Scale:
 Designed By: HWP Drawn By: SAZ
 Checked By: AIO Date: 10/20/04

WETLAND NOTES

- ALL WETLAND CONSTRUCTION ACTIVITIES WILL BE UNDER THE DIRECTION OF A PROFESSIONAL LANDSCAPER FAMILIAR WITH WETLAND CONSTRUCTION TECHNIQUES.
- IDENTIFY WETLAND CONSTRUCTION AREA BY SURVEY AND FIELD MARK WITH FLAGGING.
- TEMPORARILY DIVERT DRAINAGE AWAY FROM PROPOSED CONSTRUCTION AREAS WHERE POSSIBLE TO PREVENT WORKING IN SATURATED OR INUNDATED CONDITIONS.
- INSTALL SILT FENCING WHERE NECESSARY BETWEEN EXCAVATION AREAS AND WETLANDS AND/OR DRAINAGE. USE BEST MANAGEMENT PRACTICES (BMP) IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN.
- REMOVE WOODY VEGETATION AND TRANSPORT AWAY FROM WORK AREA. DISPOSE OF WOODY MATERIAL AND DEBRIS AS PER APPROPRIATE FEDERAL, STATE AND LOCAL CODES.
- GRADE SITE TO DESIRED SUBGRADE ELEVATION(S) (1 FOOT BELOW FINAL GRADE), SHAPE AND SIZE. REMOVE SURPLUS MATERIAL FROM WORK AREAS USING BMP'S FOR EROSION & SEDIMENT CONTROL.
- PLACE A SIX-INCH LIFT OF SUBSOIL AND A SIX-INCH LIFT OF TOPSOIL ON THE SURFACE IN THE CONSTRUCTION AREA TO BRING THE AREA UP TO FINAL GRADE. UNEVEN, IRREGULAR SURFACES WILL ADD DIVERSITY TO THE SITE.
- DELINEATE AND IDENTIFY PLANTING LOCATIONS IN THE FIELD.
- PLANT PROPOSED TREES, SHRUBS, NURSERY PLANTS, STOCK AND/OR SEED ACCORDING TO MDSA SPECIFICATIONS AND CONSTRUCTION DRAWINGS.
- REMOVE WATER FLOW AND DRAINAGE DIVERSIONS AND ALLOW FLOODING/SATURATION TO OCCUR.
- WATER PLANTINGS AS NEEDED ACCORDING TO PLANT SPECIFICATIONS DURING DRY PERIODS.
- OPTIMUM SEASON TO UNDERTAKE THIS WORK IS SPRING FOR ESTABLISHMENT OF PLANTS.
- ZONE 1, IN BOTH THE NORTH BASIN AND THE SOUTH BASIN, SHALL BE SEEDED WITH MDE SEED MIX 8.

WETLAND PLANTING

THE PROFESSIONAL LANDSCAPER WILL INSPECT PLANTS FOR INJURY, INFESTATION, AND IMPROPER PRUNING. THE CONTRACTOR WILL NOT BEGIN PLANTING UNTIL THE INSPECTION IS COMPLETED AND DEFICIENCIES ARE CORRECTED OR PLANTS REPLACED AND REVIEWED BY THE PROFESSIONAL LANDSCAPER.

POTTED PLANTS AND RHIZOMES WILL BE PLANTED (APPROXIMATELY THREE (3) INCHES DEEP OR AS APPROPRIATE FOR EACH POT) BY HAND IN MOIST TO WET SOILS LEAVING GROWING STEMS ABOVE GROUND.

TUBERS AND ROOTSTOCK ROOTS WILL BE PUSHED ONE (1) TO THREE (3) INCHES INTO MOIST TO SATURATED SOILS BY HAND, ENOUGH TO COVER THE ROOTS. FIRM SOIL AROUND ROOT BY HAND. WHEN PLANTING IN WATER, SUFFICIENT WEIGHT TO HOLD THE PLANT IN PLACE WILL BE USED. UTILIZE WEIGHTS SUCH AS #8 PENNY NAILS HELD WITH RUBBER BANDS OR PLACE ROOTS IN A MESH BAG WITH ROCKS. SPACING FOR PLANTS IS SPECIFIED ON THE TYPICAL HERBACEOUS PLANTINGS DETAIL.

BARE ROOT PLANTS (BR) WILL BE CUT OFF CLEAN. ALL BROKEN OR FRAYED ROOTS WILL BE TREATED WITH A PLANT HORMONE SUCH AS "TRANSPLANTONE" OR "ROOTONE" OR AN APPROVED EQUAL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.

EXCAVATE THE PLANTING PITS TO SUFFICIENT SIZE TO EXCEED THE ROOT BALL DIAMETER OR BARE ROOT SPREAD AS APPROVED BY THE PROFESSIONAL LANDSCAPER. SPREAD ROOTS OUT IN THE PIT AND CAREFULLY WORK SOIL IN AND AMONG THE ROOTS OF THE SEEDLINGS, TUBERS, AND ROOTSTOCK AS DIRECTED BY THE PROFESSIONAL LANDSCAPER.

PLANT VARIETIES WILL BE PLANTED ON TWO (2) FOOT CENTERS, UNIFORMLY MIXED THROUGHOUT THE CONSTRUCTION AREA.

WHEN SPECIFIED PLANT SIZES OR TYPES ARE NOT AVAILABLE, SUBSTITUTIONS MAY BE MADE BY THE CONTRACTOR AFTER REVIEW BY THE PROFESSIONAL LANDSCAPER PROVIDED SUBSTITUTIONS PROVIDE EQUAL OR GREATER WETLAND FUNCTION AND VALUE SUCH AS HABITAT VALUE AND EROSION AND SEDIMENT CONTROL AND PROVIDED THE SPECIES HAVE SIMILAR WETLAND INDICATOR STATUS AND CAN THRIVE UNDER ANTICIPATED SITE CONDITIONS. STANDARD REFERENCES AS TO SPECIFIC SPECIES VALUE MUST BE UTILIZED FOR COMPARISON AND DETERMINATION OF SUBSTITUTED SPECIES SUITABILITY. INCREASED COSTS WHICH MAY BE ASSOCIATED WITH SUBSTITUTIONS WILL BE BORNE BY THE CONTRACTOR.

PLANT AND ROOTSTOCK WILL BE TRUE TO TYPE AND NAME IN ACCORDANCE WITH THE CURRENT EDITION OF STANDARDIZED PLANT NAMES, AMERICAN JOINT COMMITTEE OF HORTICULTURE NOMENCLATURE. BAGGED OR BUNDLED STOCK WILL BE LABELED WITH COMMON PLANT NAME AND TYPICAL OF THE SPECIES OF VARIETY INDICATED. ALL PLANTS AND ROOTSTOCK WILL BE FREE FROM DISEASE AND INJURIOUS INSECTS IN ACCORDANCE WITH STATE AND FEDERAL LAWS. PLANTS AND ROOTSTOCK WILL BE FREE OF MECHANICAL INJURIES, CUT BACK LEADER, DECAY, ROT, MOLD OR OTHER DEFECTS. NURSERY GROWN PLANTS OR ROOTSTOCK WILL BE ACCUMATED TO SITE SOIL AND CLIMATIC CONDITIONS. ROOTSTOCK MUST BE FIBROUS AND HAVE WELL-BRANCHED ROOT SYSTEMS CHARACTERISTIC OF THE SPECIES.

CARE OF PLANTINGS AFTER CONSTRUCTION

IF SOILS ARE NOT WET, THE AREA WILL BE WATERED IMMEDIATELY AFTER PLANTING. THE SOIL SUBSTRATE MUST BE KEPT SATURATED DURING PLANTING AND CONTINUED ACCORDING TO CLIMATIC CONDITIONS AND UNTIL PLANTINGS BECOME FULLY ESTABLISHED AS DETERMINED BY THE PROFESSIONAL LANDSCAPER.

PREPARATION OF THE WETLAND SUBSTRATE

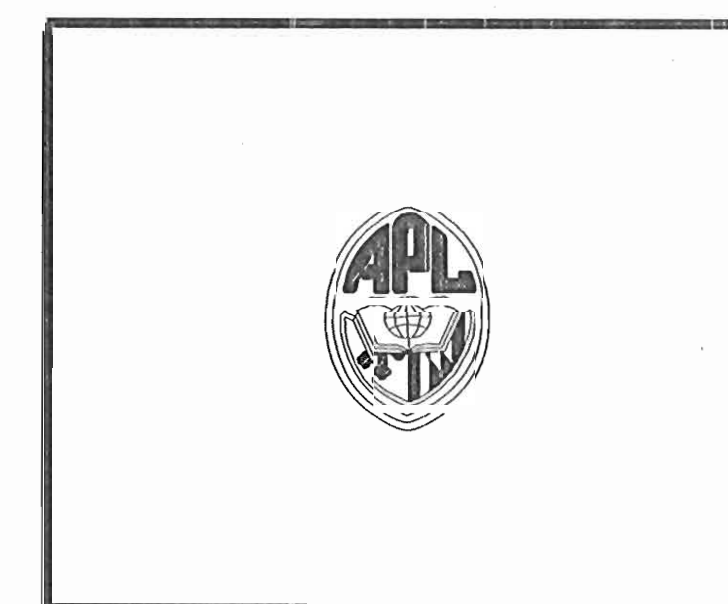
THE WETLAND SUBSTRATE WILL BE DEVELOPED BY FIRST PLACING ONE (1) SIX-INCH LIFT OF SUBSOIL AND ONE (1) SIX-INCH LIFT OF TOPSOIL ON THE SUB-GRADE OF THE CONSTRUCTION AREA. THE PLANTING BED WILL NOT BE COMPACTED EXCEPT IN MINIMAL AMOUNTS NECESSARY FOR PLACEMENT OF THE MATERIAL. ONLY LIGHT BEARING EQUIPMENT WILL BE USED FOR PLACEMENT.

TO FACILITATE PLANTING, THE TOP FOUR (4) INCHES OF TOPSOIL WILL BE ROTOTILLED TO LOOSEN AND MIX SOIL MATERIALS, WHICH MAY HAVE BEEN COMPACTED DURING PLACEMENT.

THE CONTRACTOR WILL REMOVE ROCKS AND OTHER DEBRIS TWO (2) INCHES OR LARGER IN DIAMETER THAT MAY BE HARMFUL TO PLANT GROWTH OR AS DIRECTED BY THE ENGINEER.

GENERAL LANDSCAPE NOTES

- THE LANDSCAPE PLAN IS FOR LANDSCAPE PURPOSES ONLY. AS-BUILT SITE CONDITIONS MAY VARY. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND UTILITY LOCATIONS SHOWN WITHIN THE PROJECT LIMITS AND SHALL INFORM THE ENGINEER OF ANY DISCREPANCIES OR POTENTIAL PROBLEMS PRIOR TO COMMENCING WORK.
- ALL PLANTING AND MULCHING SHALL BE DONE IN ACCORDANCE WITH THE MDSA BOOK OF STANDARDS, HIGHWAY & INCIDENTAL STRUCTURES, CATEGORY 7, LANDSCAPING AND THE 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUMES 1 AND 2.
- DO NOT BLOCK THE MAINTENANCE ACCESS ROADS WITH TREES OR SHRUB PLANTINGS.
- DO NOT PLANT TREES OR SHRUBS WITHIN 5'-0" OF THE CENTERLINE OF ALL UNDERGROUND UTILITY LINES. DO NOT PLANT TREES WITHIN 10'-0" OF THE CENTERLINE OF ALL OVERHEAD UTILITY LINES. "MISS UTILITY" 1-800-257-7777 MUST BE CONTACTED A MINIMUM OF 72 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION FOR PLANT MATERIAL INSTALLATION.
- ALL DECIDUOUS TREES GREATER THAN OR EQUAL TO 6'-0" HEIGHT MUST BE STAKED PER MDSA SPECIFICATION SECTION 710-03.03(B).
- ALL PLANTS SHALL BE WATERED OVER A ONE YEAR PERIOD IN ACCORDANCE WITH MDSA SPECIFICATIONS. THE CONTRACTOR SHALL PROVIDE SUFFICIENT MANPOWER AND EQUIPMENT TO COMPLETE EACH WATERING WITHIN FIVE DAYS OF THE DAY ON WHICH WATERING WAS DESIGNATED TO BEGIN. SEE CHART BELOW.
- ALL TREES SHALL BE PLANTED ONLY DURING THE SPRING PLANTING SEASON.
- MULCH IS NOT TO BE USED AROUND TREES OR OTHER PLANT MATERIAL IN ZONES 1 THROUGH 3.
- ALL TREES AND SHRUBS IN ZONES 4 THROUGH 6 SHALL BE SPREAD WITH 3 INCH DEEP SHREDDED HARDWOOD BARK MULCH. SHRUBS IN ZONE 4 SHALL HAVE A MULCH BED 3 FEET IN DIAMETER (0.8 S.Y. PER SHRUB).
- TREES, SHRUBS AND/OR ANY TYPE OF WOODY VEGETATION ARE NOT TO BE PLANTED ON ANY EMBANKMENT COMPRISED OF FILL MATERIAL.
- TREES AND SHRUBS ARE NOT TO BE PLANTED WITHIN 15 FEET OF THE TOE OF SLOPE OR WITHIN 25 FEET OF ANY DRAINAGE STRUCTURES OR PIPES.
- LANDSCAPE AREAS FOR WETLAND PLANT MATERIAL IN THE BMP FACILITIES (ZONES 2 AND 3) WILL BE SPREAD WITH A MINIMUM 6" OF SUBSOIL AND 6" OF TOPSOIL. ALL OTHER AREAS OF THE BMP FACILITIES WILL BE SPREAD WITH 4" OF TOPSOIL. ALL SUBSOIL AND TOPSOIL SHALL CONFORM TO MDSA SPECIFICATION SECTION 701 AND SECTION 920.



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11100 JOHNS HOPKINS ROAD
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BASIN C
SWM FACILITIES
AND LAYDOWN AREA
SDP 04-133

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GRAPHIC SCALES



WHITMAN, REQUARDT AND ASSOCIATES, LLP
ENGINEERS, ARCHITECTS, PLANNERS
801 S. CAROLINE STREET
BALTIMORE, MARYLAND 21231
410 - 235 - 3450

NORTH BASIN/
SOUTH BASIN LANDSCAPE
NOTES AND DETAILS-2

DRAWING NO.	L-4
Sheet	29 of 30
Scale:	
Designed By: HWP	Drawn By: SAZ
Checked By: AUO	Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

<i>Mark D. ...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	11/19/04 DATE
<i>...</i> CHIEF, DIVISION OF LAND DEVELOPMENT	11/20/04 DATE
<i>...</i> DIRECTOR	12/1/04 DATE



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**NORTH BASIN/
 SOUTH BASIN LANDSCAPE
 NOTES AND DETAILS-3**

DRAWING NO.

L-5

Sheet 30 of 30

Scale:

Designed By: HWP

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Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

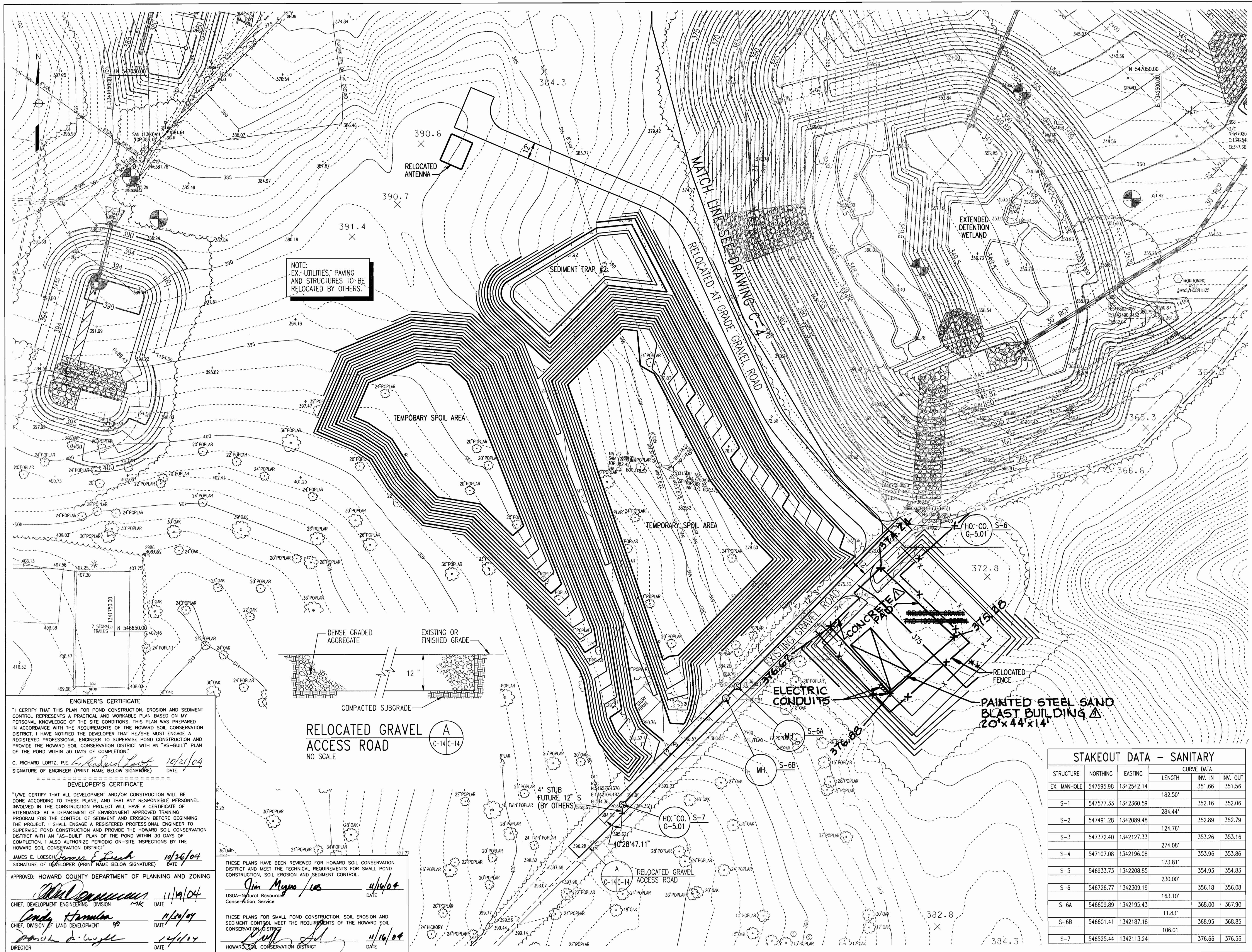
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 11/19/04

 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 11/19/04

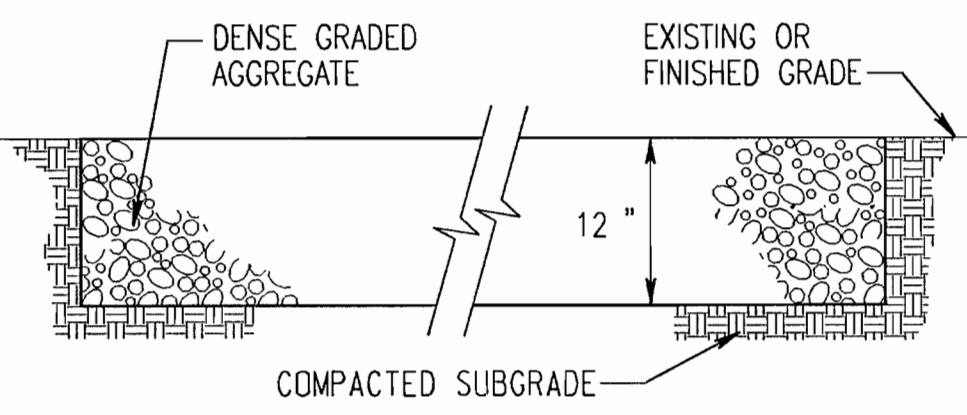
 DIRECTOR
 DATE: 12/1/04

MATERIAL	SPECIFICATION	SIZE	NOTES
PLANTING SOIL	SAND 35 - 60% SILT 30 - 55% CLAY 10 - 25%	N/A	PLANTINGS ARE SITE-SPECIFIC
MULCH	SHREDDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM
WATER	A MINIMUM OF 5 ADDITIONAL WATERINGS	N/A	USE 25 GALLONS PER TREE PER WATERING USE 2.5 GALLONS PER SHRUB PER WATERING

SDP-04-133



NOTE:
EX- UTILITIES; PAVING
AND STRUCTURES TO BE
RELOCATED BY OTHERS.



RELOCATED GRAVEL ACCESS ROAD
NO SCALE

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

C. RICHARD LORTZ, P.E. *C. Richard Lortz* 10/21/04
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

DEVELOPER'S CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

JAMES E. LOESCH *James E. Loesch* 10/26/04
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
CHIEF, DEVELOPMENT ENGINEERING DIVISION *[Signature]* 11/19/04
CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 11/29/04
DIRECTOR *[Signature]* 12/1/04

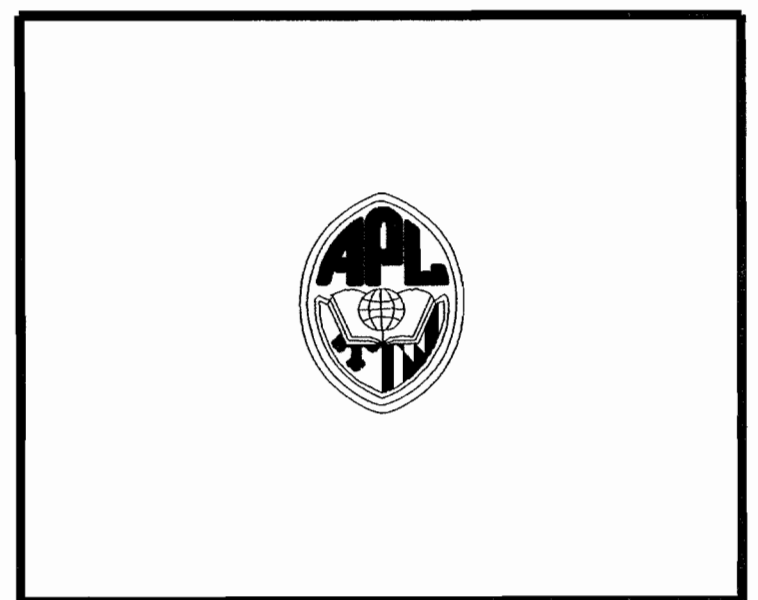
THESE PLANS HAVE BEEN REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Jim Myers / us 11/16/04
USDA-Natural Resources Conservation Service
THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT
HOWARD SOIL CONSERVATION DISTRICT 11/16/04

STAKEOUT DATA - SANITARY

STRUCTURE	NORTHING	EASTING	CURVE DATA		
			LENGTH	INV. IN	INV. OUT
EX. MANHOLE	547595.98	1342542.14	182.50'	351.66	351.56
S-1	547577.33	1342360.59	284.44'	352.89	352.66
S-2	547491.28	1342089.48	124.76'	353.26	353.16
S-3	547372.40	1342127.33	274.08'	353.96	353.86
S-4	547107.08	1342196.08	173.81'	354.93	354.83
S-5	546933.73	1342208.85	230.00'	356.18	356.08
S-6	546726.77	1342309.19	163.10'	368.00	367.90
S-6A	546609.89	1342195.43	11.83'	368.95	368.85
S-6B	546601.41	1342187.18	106.01'	376.66	376.56
S-7	546525.44	1342113.24			

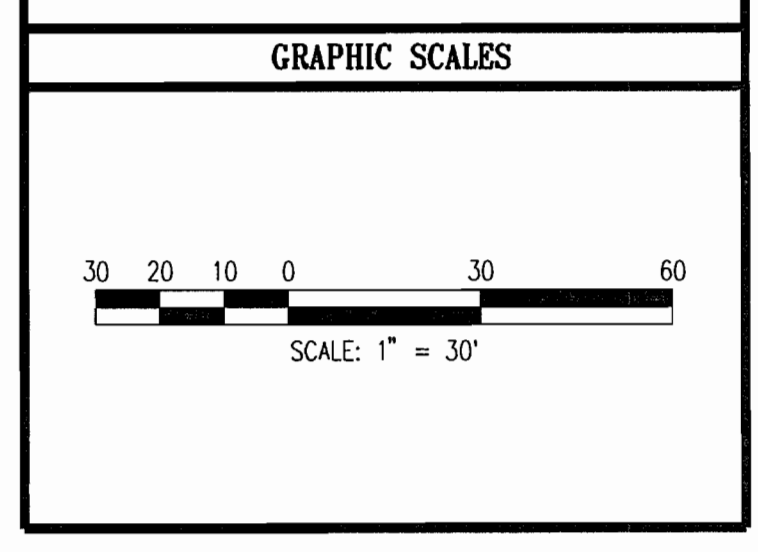
ADD SAND BLAST PAD BUILDING 11/2/06



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SDP 04-133**

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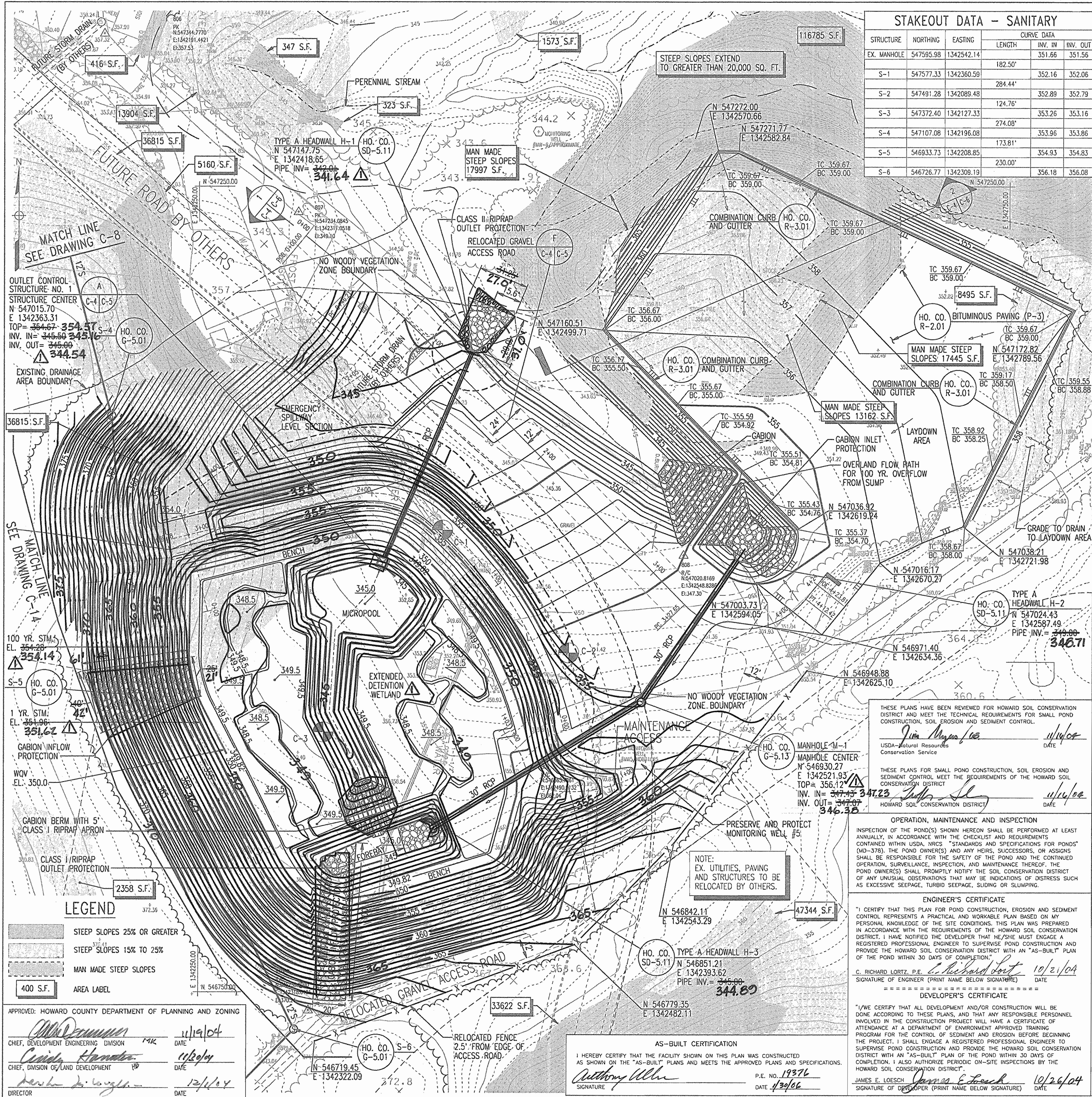
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BALTIMORE, MARYLAND 21231
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CONTRACTORS STAGING AND SPOIL AREA GRADING PLAN

DRAWING NO. **C-14**

Sheet 15 of 30

Scale:
Designed By: MH, EE, Drawn By: EE, PB
Checked By: AUO Date: 10/20/04



STAKEOUT DATA - SANITARY

STRUCTURE	NORTHING	EASTING	CURVE DATA		
			LENGTH	INV. IN	INV. OUT
EX. MANHOLE	547595.98	1342542.14	182.50'	351.66	351.56
S-1	547577.33	1342360.59	284.44'	352.16	352.06
S-2	547491.28	1342089.48	124.76'	352.89	352.79
S-3	547372.40	1342127.33	274.08'	353.26	353.16
S-4	547107.08	1342196.08	173.81'	353.96	353.86
S-5	546933.73	1342208.85	230.00'	354.93	354.83
S-6	546726.77	1342309.19		356.18	356.08

OPERATION AND MAINTENANCE SCHEDULE

Maintenance is the responsibility of the Owner, JHU - APL. Inspections shall be performed by the Howard County Department of Public Works (DPW) during the first year of operation and at least once every three years thereafter. The Owner shall perform any maintenance or repairs required by DPW on a schedule to be determined when the maintenance or repair is required.

Inspection Schedule
 a. First year of operation
 b. Triennial Inspection
 c. Annual Inspection - Generate Annual Inspection Report
 d. At end of second growing season - Check for vegetation establishment
 e. Sixty hours after the end of each significant rainfall event (>2.6 inches of rainfall) Check for ponding water, sediment deposition in the forebay, erosion damage, trash and clogging of the spillway orifices.

Routine Maintenance
 a. Mow grass on embankment twice per year or when grass height exceeds 18 inches.
 b. Remove any woody vegetation from embankment, within 15 feet of the toe of the embankment and within 25 feet of the principal spillway annually.

Maintenance Requirements
 a. Removal of silt when accumulation exceeds four (4) inches in the forebay.
 b. Removal of accumulated paper, trash and debris as necessary.
 c. Vegetation growing on the embankment top and faces is not allowed to exceed 18 inches in height at any time.
 d. Annual inspection and repair of the structure.
 e. Corrective maintenance is required any time an extended detention basin does not drain within 60 hours (i.e. no standing water is allowed).
 f. Corrective maintenance is required any time the forebay does not drain within 60 hours (i.e. no standing water is allowed).
 The Dam Inspection Checklist found in Appendix A of USDA NRCS - Maryland - Conservation Practice Standard - POND - Code 378 (MD-378) may be used to document this requirement.

If a minimum coverage of 50% is not achieved in the planted wetland zones after the second growing season, a reinforcement planting will be required.

SOUTH BASIN DESIGN SUMMARY

SOUTH BASIN
 Extended Detention Shallow Marsh (W-2) Hazard Class 'A'
 Drainage Area = 16.06 Acres

DESIGN STORM	WATER SURFACE ELEVATION (feet)	STORAGE VOLUME (acre feet)	Qin (cfs)	Qout (cfs)
Invert	345.00	0.00	n/a	n/a
2-year	352.19	1.72	1.72	1.41
10-year	353.21	13.45	13.45	13.11
100-year	354.14	59.62	59.62	56.36
Forebay Sediment Volume	350.00	+0.88	1.45	n/a
Recharge Volume (Rev)	350.00	+0.88	1.45	n/a
Channel Protection Volume (Cpv)	351.96	+0.88	1.78	n/a
Overbank Flood Protection (Op)	n/a	n/a	n/a	n/a
Extreme Flood Protection (Of)	n/a	n/a	n/a	n/a
Top of Dam Elevation	356	501.632	n/a	n/a

Note: Op and Of are not required for this project as determined by HCDRS.

Riser: Reinforced Concrete Box
 Principal Spillway: 27 inch RCP
 Emergency Spillway: 78 feet wide vegetated earth
 Maintenance: Private. Responsibility of the Owner (JHU - APL)

ALIGNMENT NAME: MAINTENANCE ACCESS ROAD

Alignment Description: ACCESS ROAD TO BASIN

Point Type	Station	CD	Northing (Y)	Easting (X)
LC	48.0528	30°48'33"	546883.5468	1342519.4752
RC	89.3639	DC= 64°06'54"		
PCC	0+48.05	DC= 229°10'59"	546874.1167	1342472.9453
LC	29.1486	DC= 66°48'13"		
RC	25.0000	DC= 229°10'59"	546890.8157	1342451.0640
PT	0+77.20	N 19°14'55" W	546894.0949	1342449.9190
PC	LC= 10.2361	DC= 232°7'34"		
RC	-25.0000	DC= 229°10'59"	546802.8098	1342444.6870
PT	0+90.91	N 42°42'29" W	546905.3733	1342442.3208
PC	LC= 6.4977	DC= 14°53'30"		
RC	25.0000	DC= 229°10'59"	546910.6638	1342438.5801
PT	1+00.90	N 27°49'00" W	546912.4313	1342437.6476
POE	1+02.90			

ALIGNMENT NAME: SOUTH EMBANKMENT

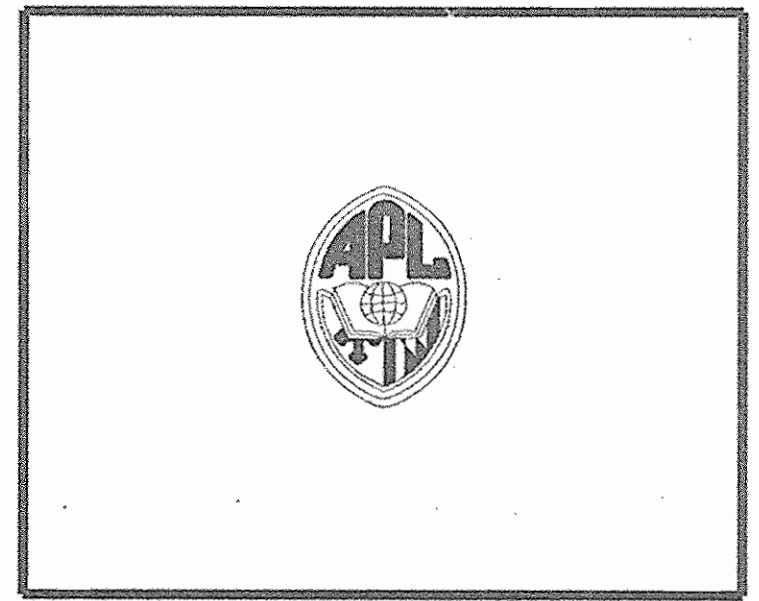
Alignment Description:

Point Type	Station	CD	Northing (Y)	Easting (X)
LC	157.6585	37°14'41"	546911.8760	1342475.2338
RC	-242.5364	DC= 23°37'25"		
PCC	1+57.66	DC= 54°19'36"	547044.6203	1342395.4080
LC	57.8389	DC= 93°55'39"		
RC	-61.0000	S 76°01'50" W	547057.3327	1342341.1817
PT	2+15.50		547027.3290	1342220.5704
POE	124.2872			
POE	3+39.78			

ALIGNMENT NAME: RELOCATED GRAVEL ROAD

Point Type	Station	CD	Northing (Y)	Easting (X)
LC	0+00.00		547219.1135	1342315.6370
PC	46.2055	S 50°35'23" E	547189.7791	1342351.3364
LC	56.4746	DC= 6°28'17"		
RC	500.0000	DC= 11°27'33"	547151.5399	1342392.8544
PT	1+02.68	S 44°07'06" E	546990.0367	1342549.4622
PC	224.9650	DC= 97°08'39"		
LC	84.7742	DC= 11°43'30"	546993.5561	1342624.3583
RC	-50.0000	N 38°44'15" E	547002.4376	1342631.4833
PT	4+12.42			
POE	11.3862			
POE	4+23.81			

AS-BUILT 11/4/05

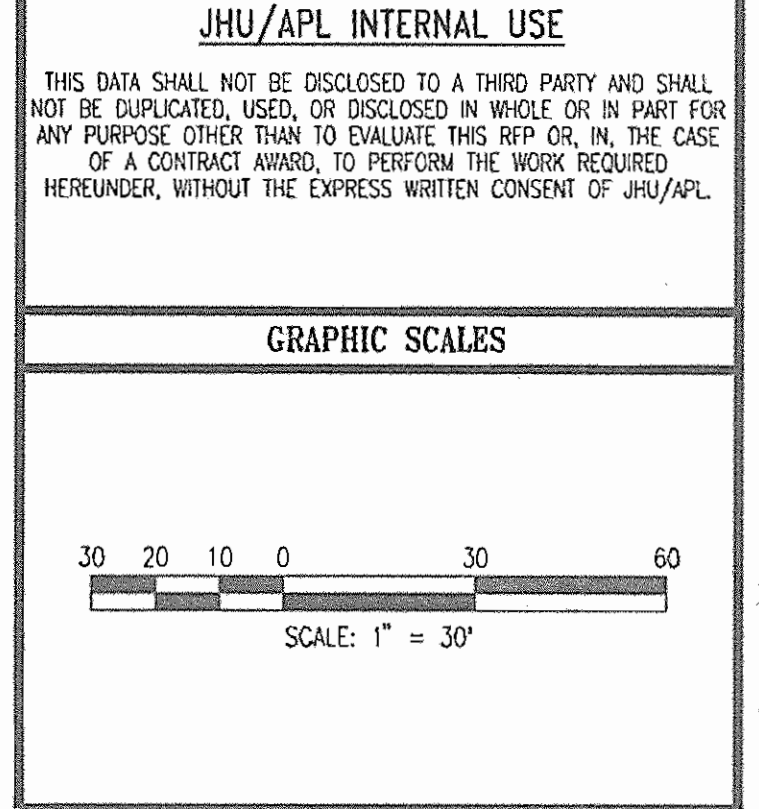


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SOUTH BASIN AND LAYDOWN AREA GRADING PLAN

DRAWING NO. C-4
 Sheet 5 of 30

Scale:
 Designed By: MH, EE
 Drawn By: EE, PB
 Checked By: AUC
 Date: 10/20/04

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Michael J. ... 11/19/04
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

... 11/20/04
 CHIEF, DIVISION OF LAND DEVELOPMENT

... 12/1/04
 DIRECTOR

HO. CO. S-6
 G-5.01
 N-546719.45
 E-1342322.09

AS-BUILT CERTIFICATION

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

Anthony ... P.E. NO. 19376
 SIGNATURE DATE 1/31/06

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

Jim ... 11/14/04
 USA-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.

... 11/16/04
 HOWARD SOIL CONSERVATION DISTRICT DATE

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, NRCS "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 INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.

ENGINEER'S CERTIFICATE

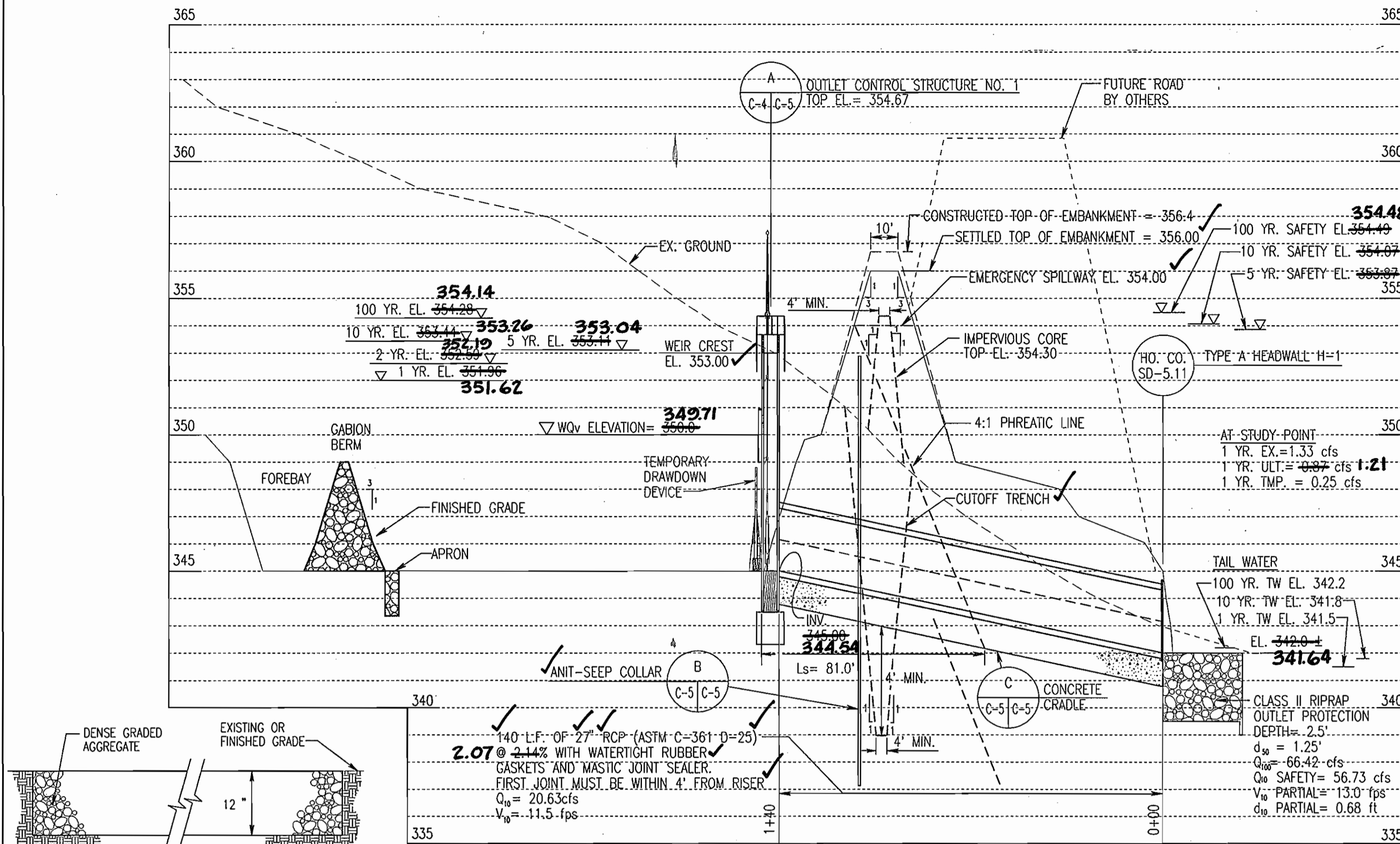
"I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER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

C. RICHARD LORTZ, P.E. *C. Richard Lortz* 10/21/04
 SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

DEVELOPER'S CERTIFICATE

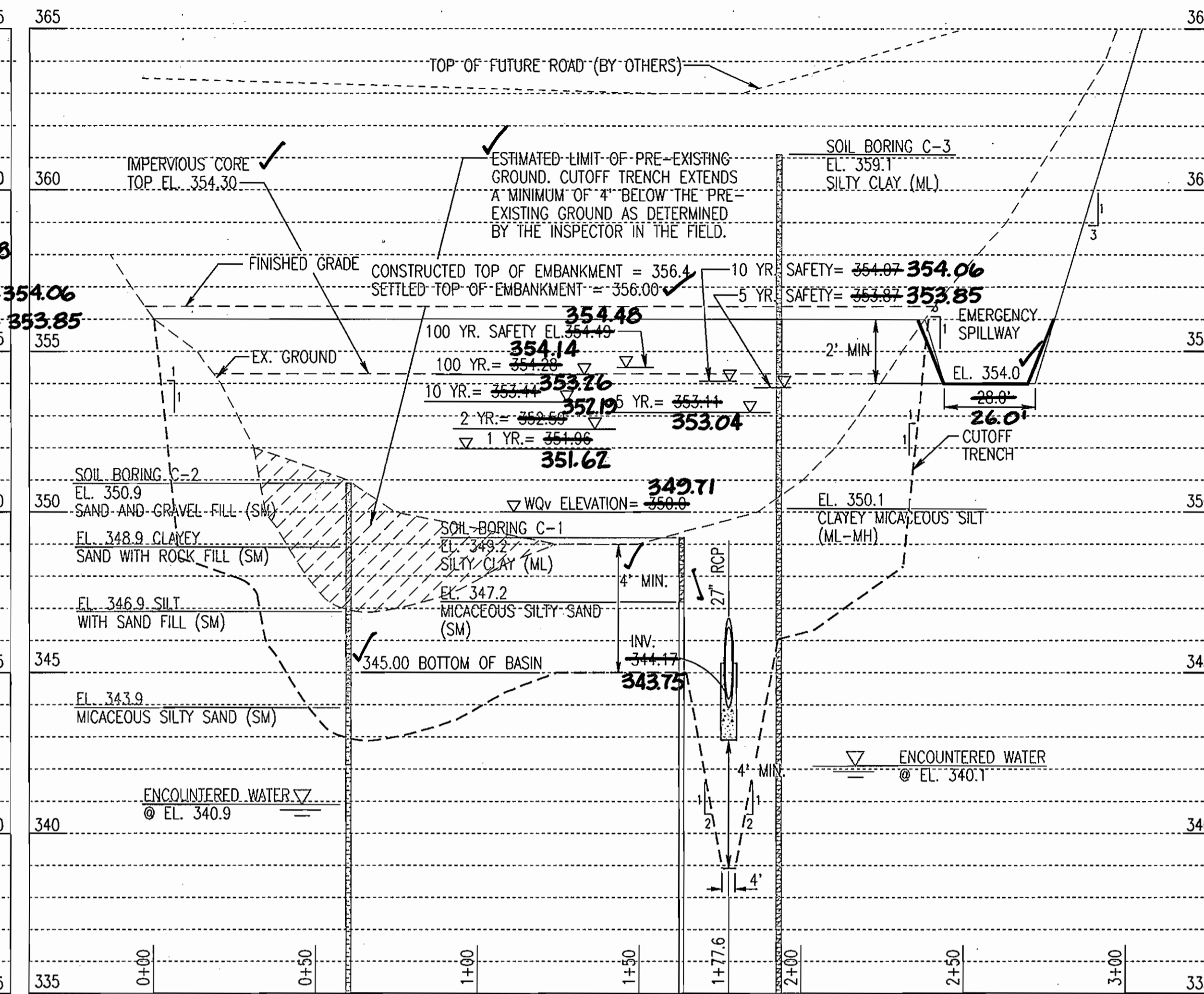
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JAMES E. LOESCH *James E. Loesch* 10/26/04
 SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE



△PROFILE - CENTERLINE 27" RCP - SOUTH BASIN

SCALE: 1" = 30' HORIZ
1" = 3' VERT

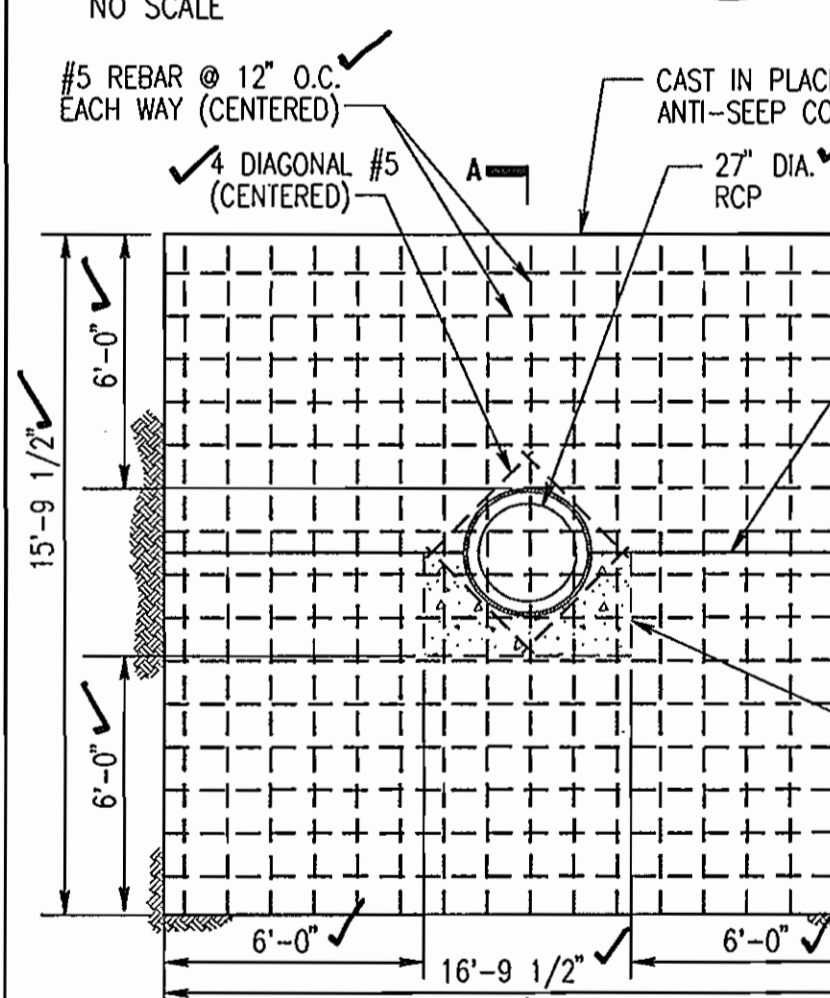


△PROFILE - CENTERLINE EMBANKMENT - SOUTH BASIN

SCALE: 1" = 30' HORIZ
1" = 3' VERT

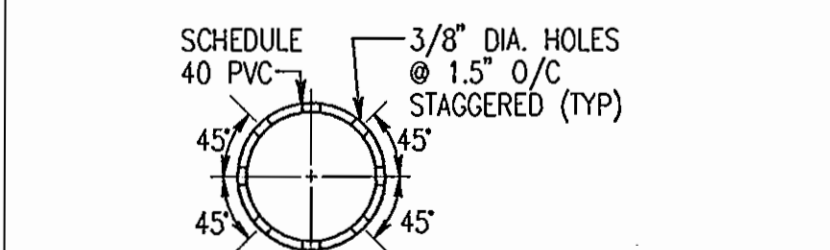
RELOCATED GRAVEL ACCESS ROAD

NO SCALE



ANTI-SEEP COLLAR DETAIL

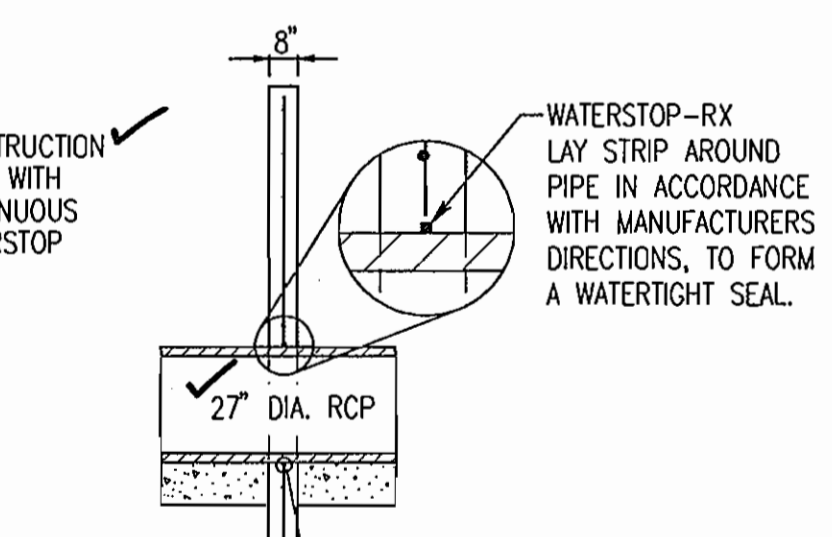
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6" PERFORATED PVC

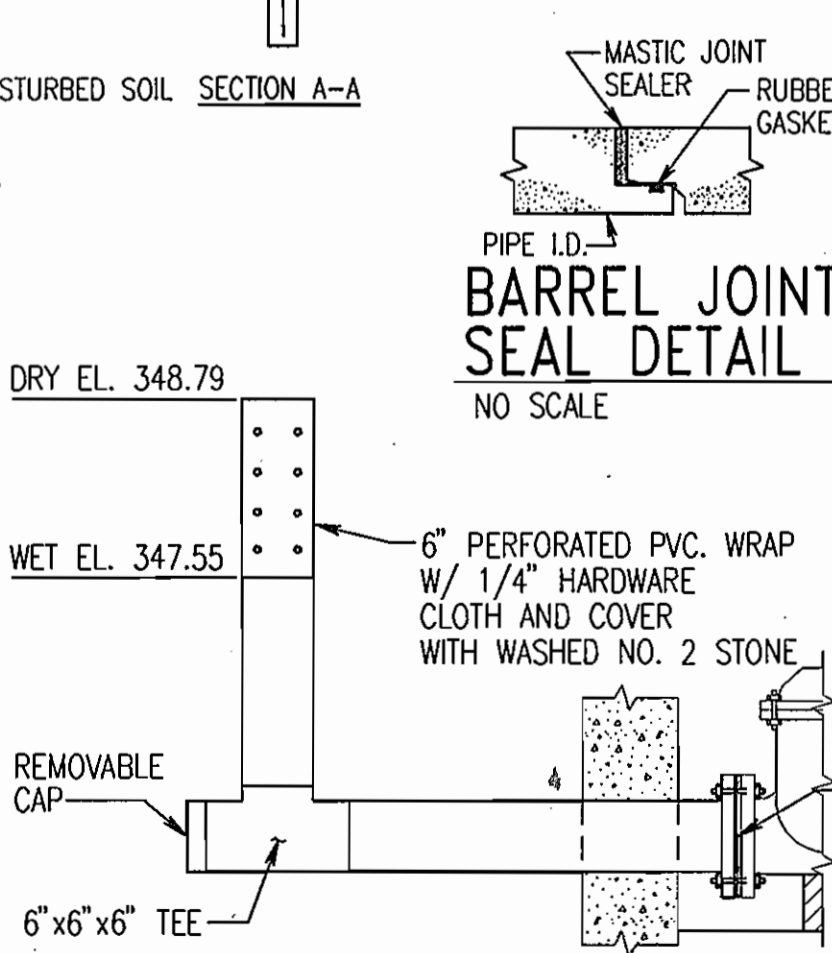
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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION MK 11/19/04
 CONYER HAMMILL 11/20/04
 CHIEF, DIVISION OF LAND DEVELOPMENT RB
 MARK D. LAUGH 12/1/04
 DIRECTOR



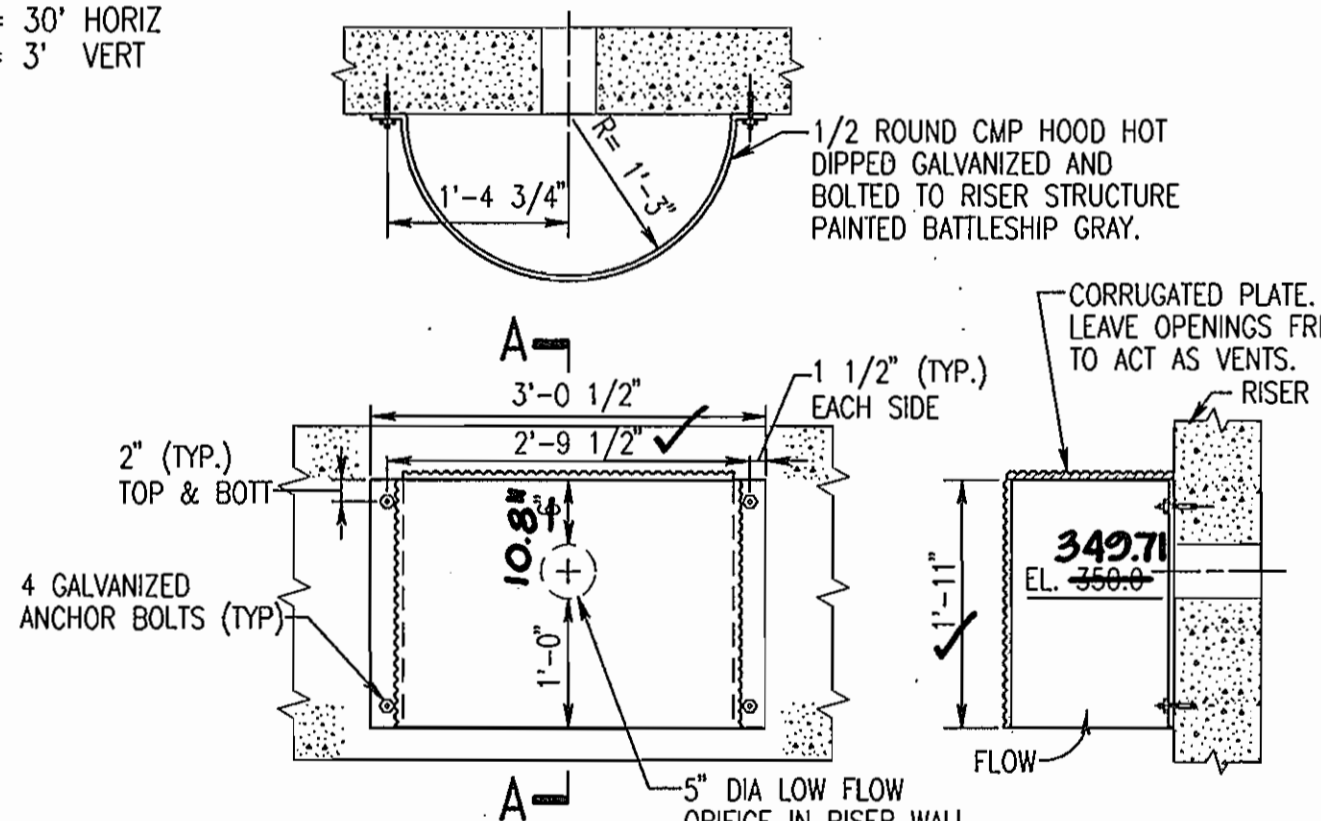
BARREL JOINT SEAL DETAIL

NO SCALE



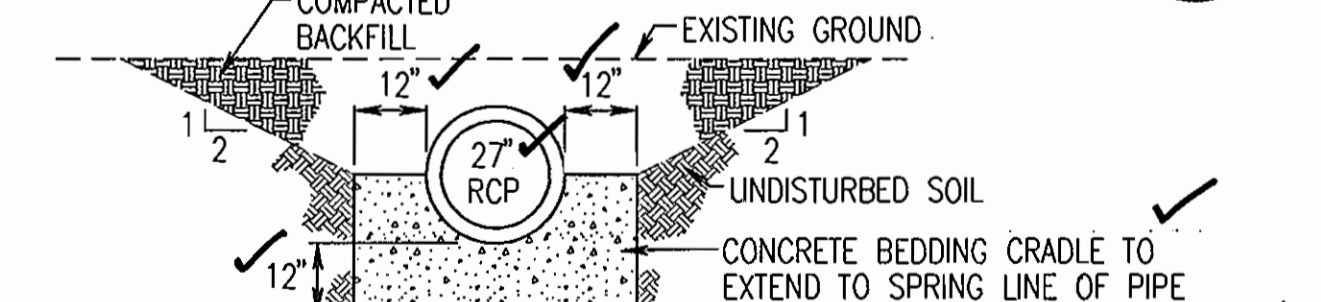
DETAIL - TEMPORARY DRAWDOWN DEVICE

SCALE: 3/4" = 1'-0"



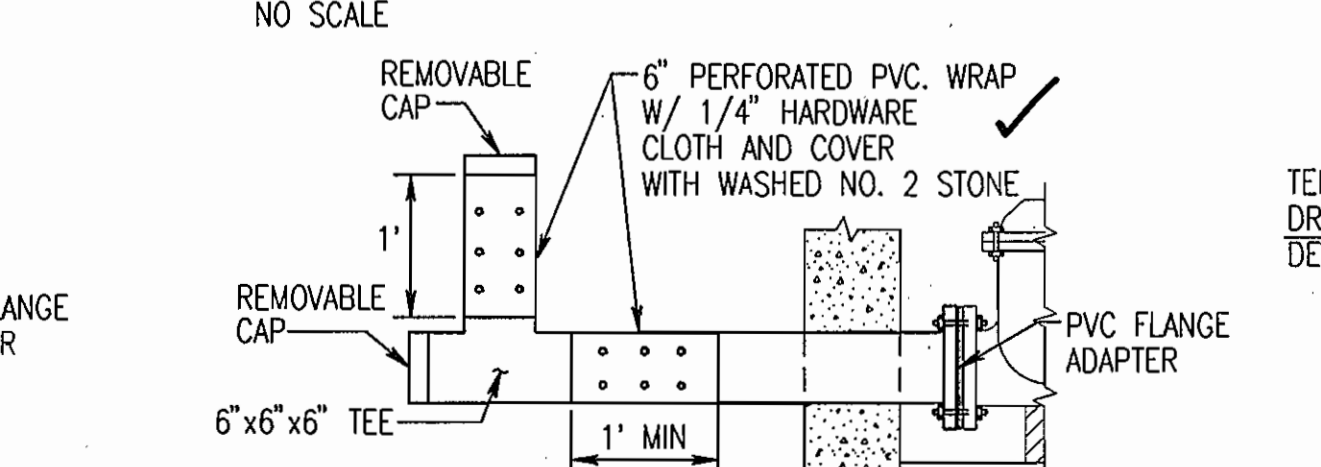
1/2 ROUND CMP PIPE-HOOD

NO SCALE



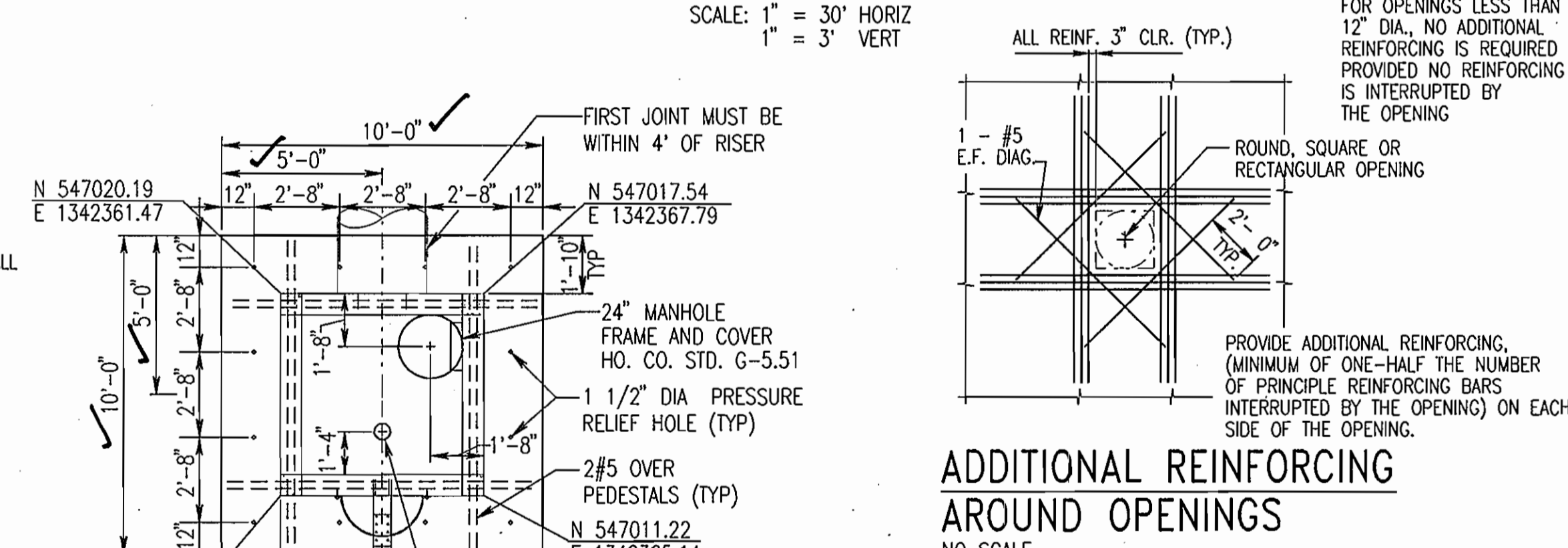
DETAIL - TYPICAL CONCRETE CRADLE

NO SCALE



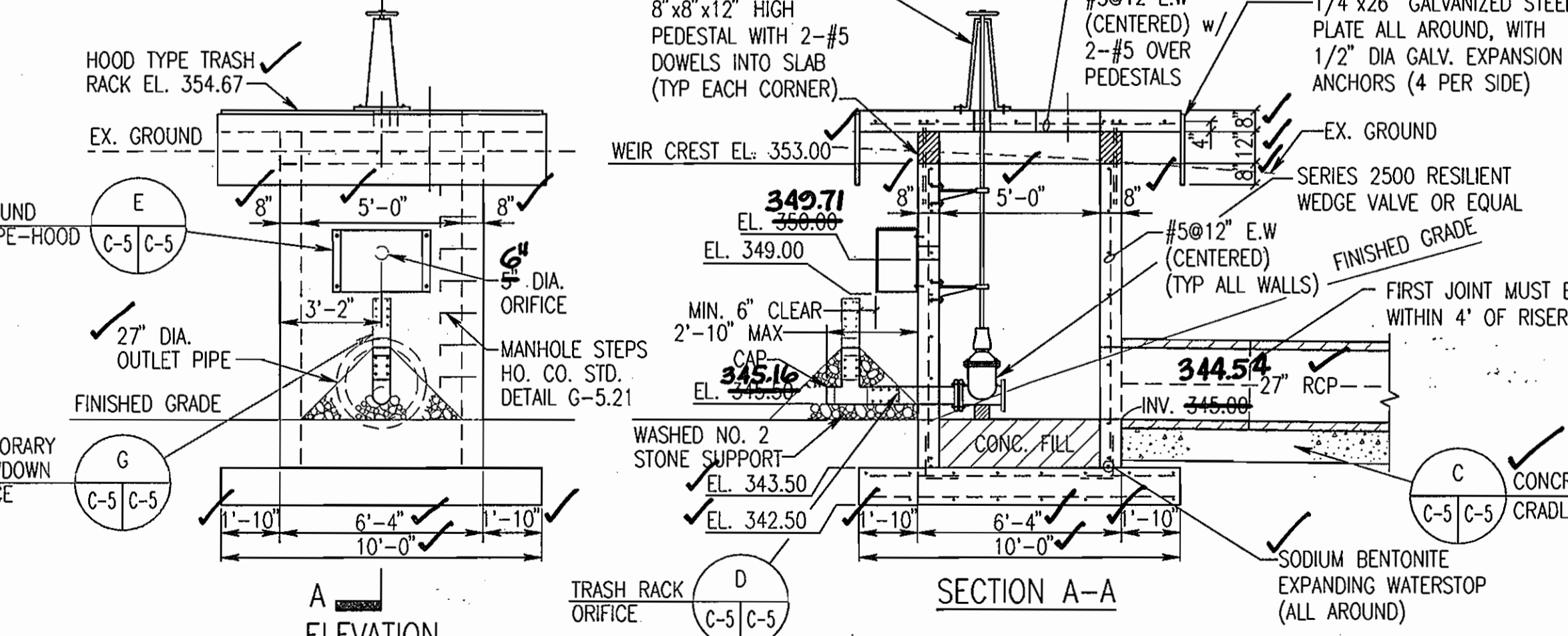
DETAIL - PERMANENT TRASH RACK ORIFICE DETAIL

SCALE: 3/4" = 1'-0"



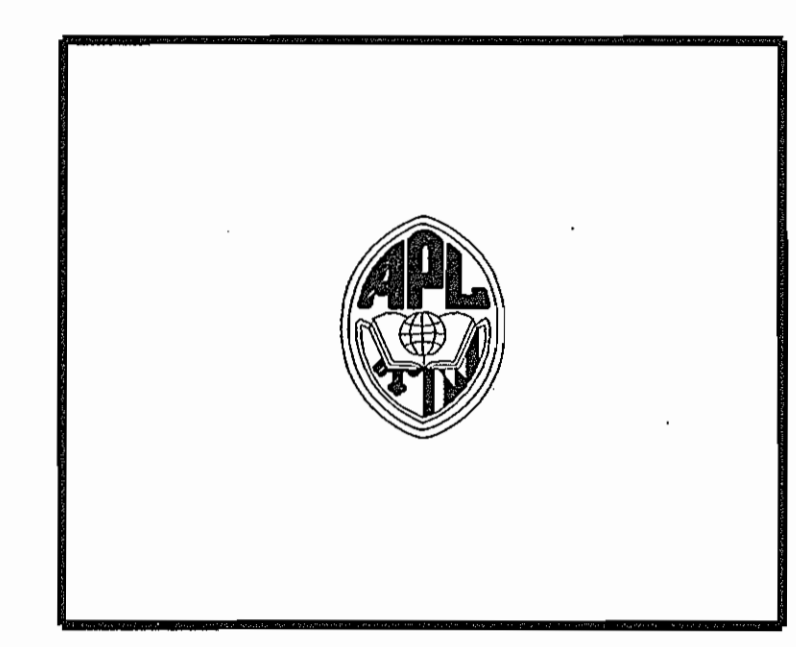
ADDITIONAL REINFORCING AROUND OPENINGS

NO SCALE



OUTLET CONTROL STRUCTURE NO. 1 AND PIPE SPILLWAY DETAILS

SCALE: 1/4" = 1'-0"

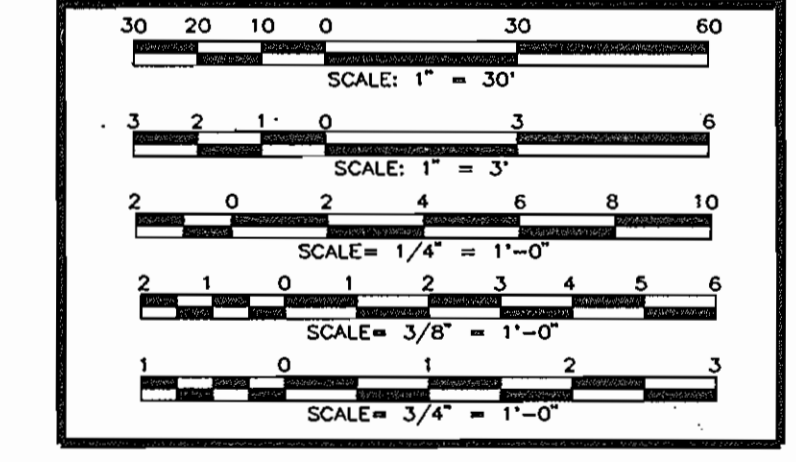


THE JOHNS HOPKINS UNIVERSITY
 APPLIED PHYSICS LABORATORY
 1100 JOHNS HOPKINS ROAD
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BASIN C
 SWM FACILITIES
 AND LAYDOWN AREA
 SDP 04-133

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 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

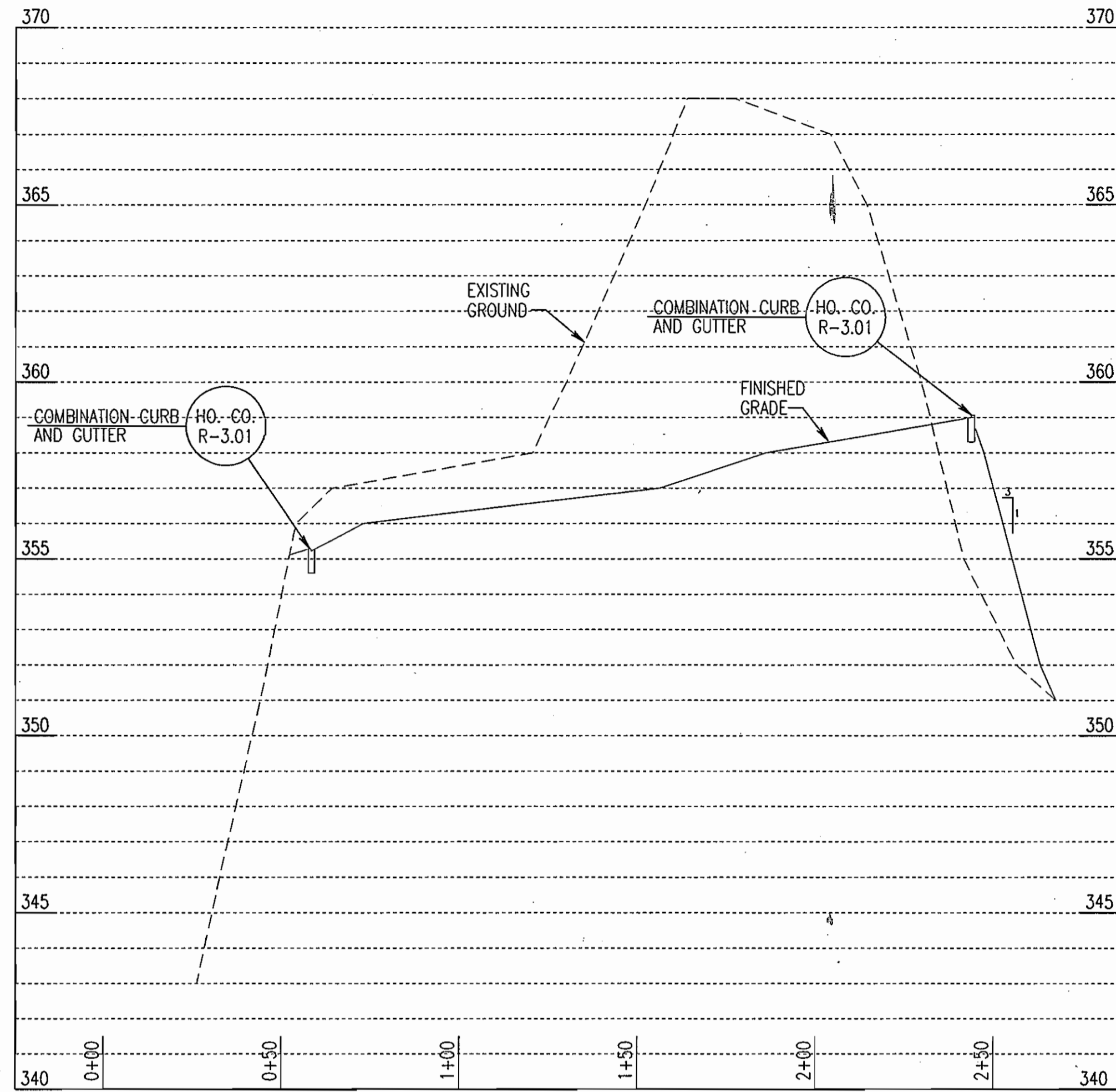
SOUTH BASIN AND LAYDOWN AREA PROFILES, SECTIONS AND DETAILS

DRAWING NO. C-5

Sheet 6 of 30

Scale: 1" = 30'

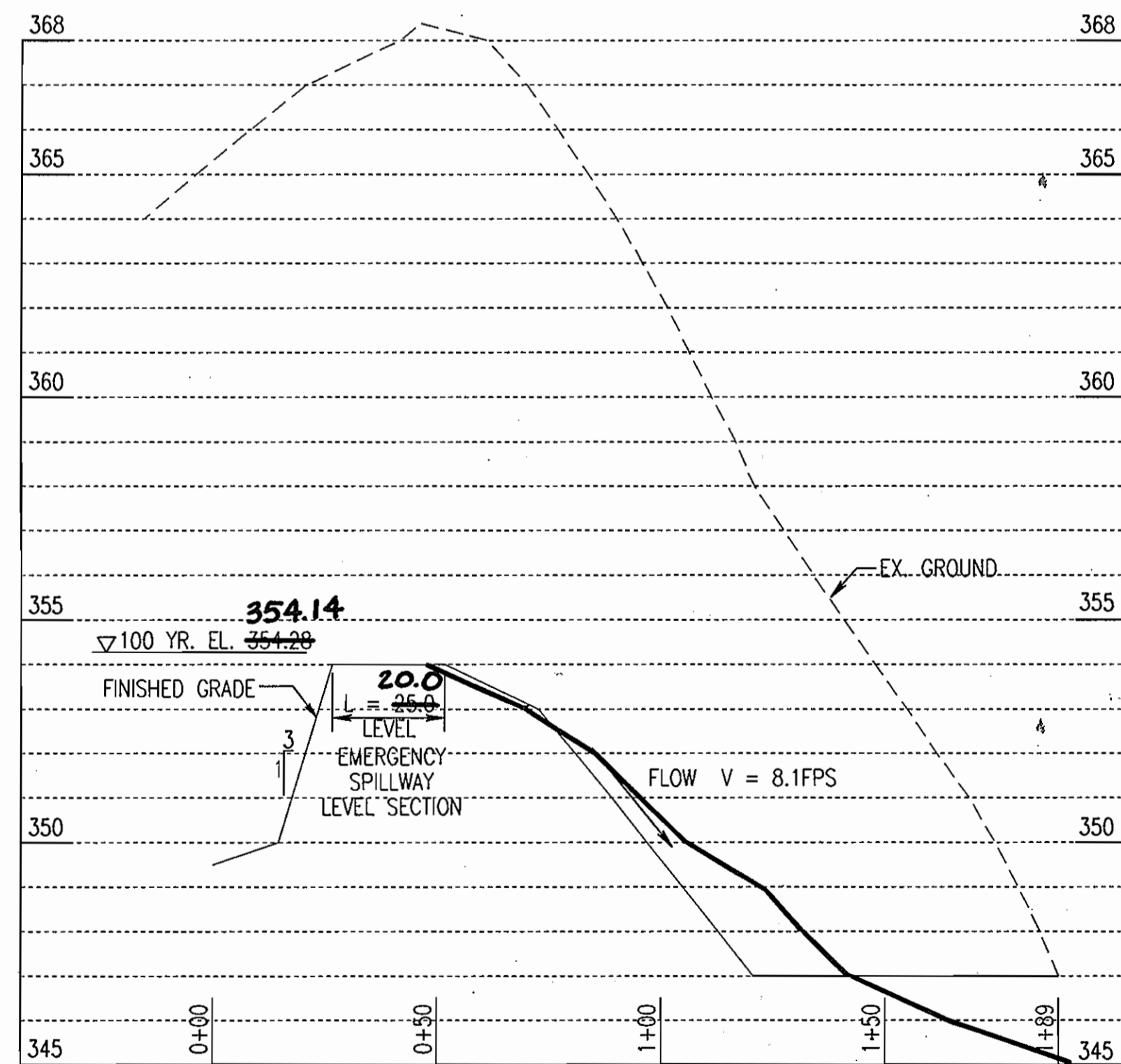
Designed By: MH, EE Drawn By: EE, PB
 Checked By: AUO Date: 10/20/04



SECTION - LAYDOWN AREA

SCALE: 1" = 30' HORIZ
1" = 3' VERT

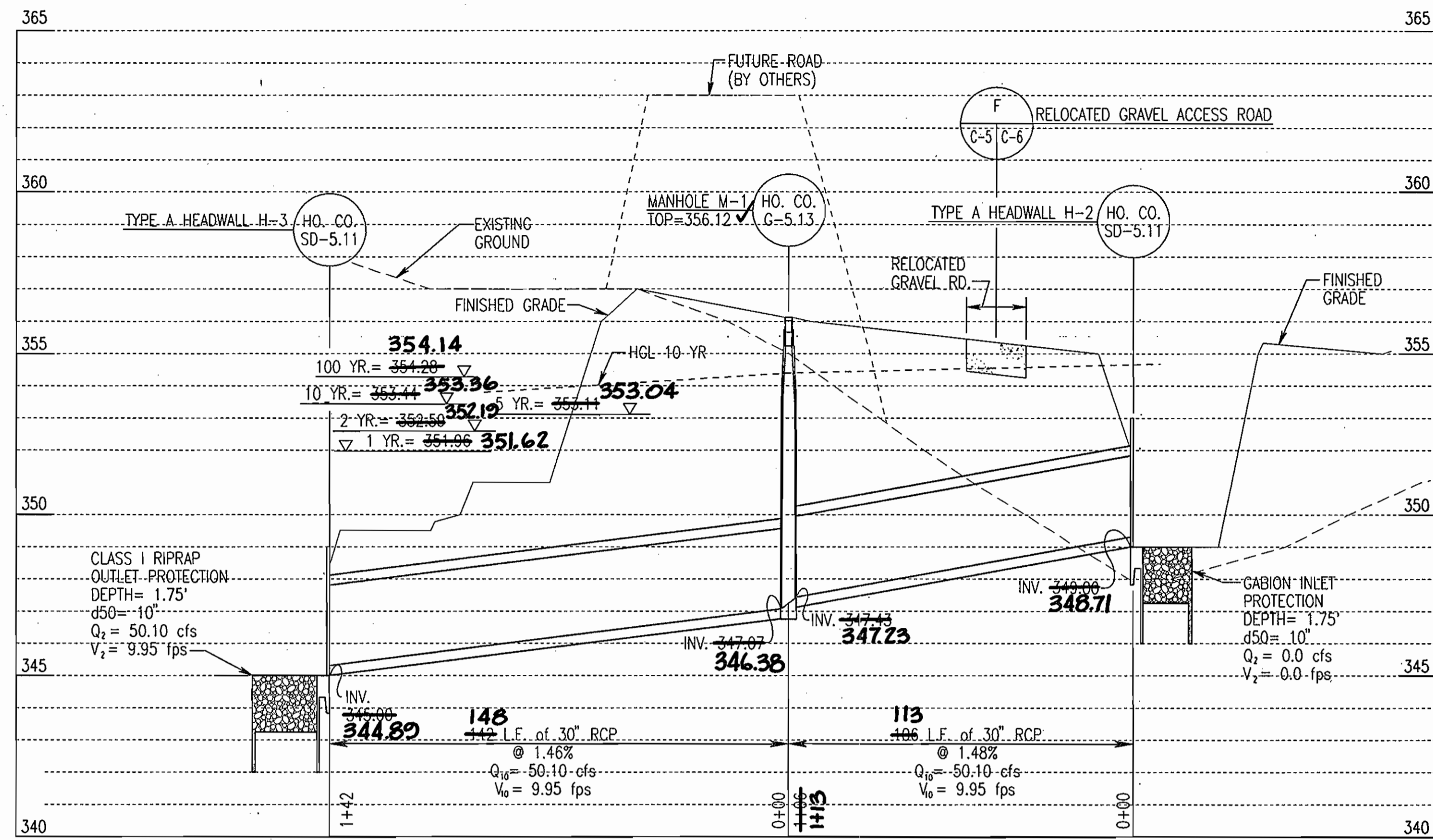
2
C-4 C-6



PROFILE - CENTERLINE EMERGENCY SPILLWAY - SOUTH BASIN

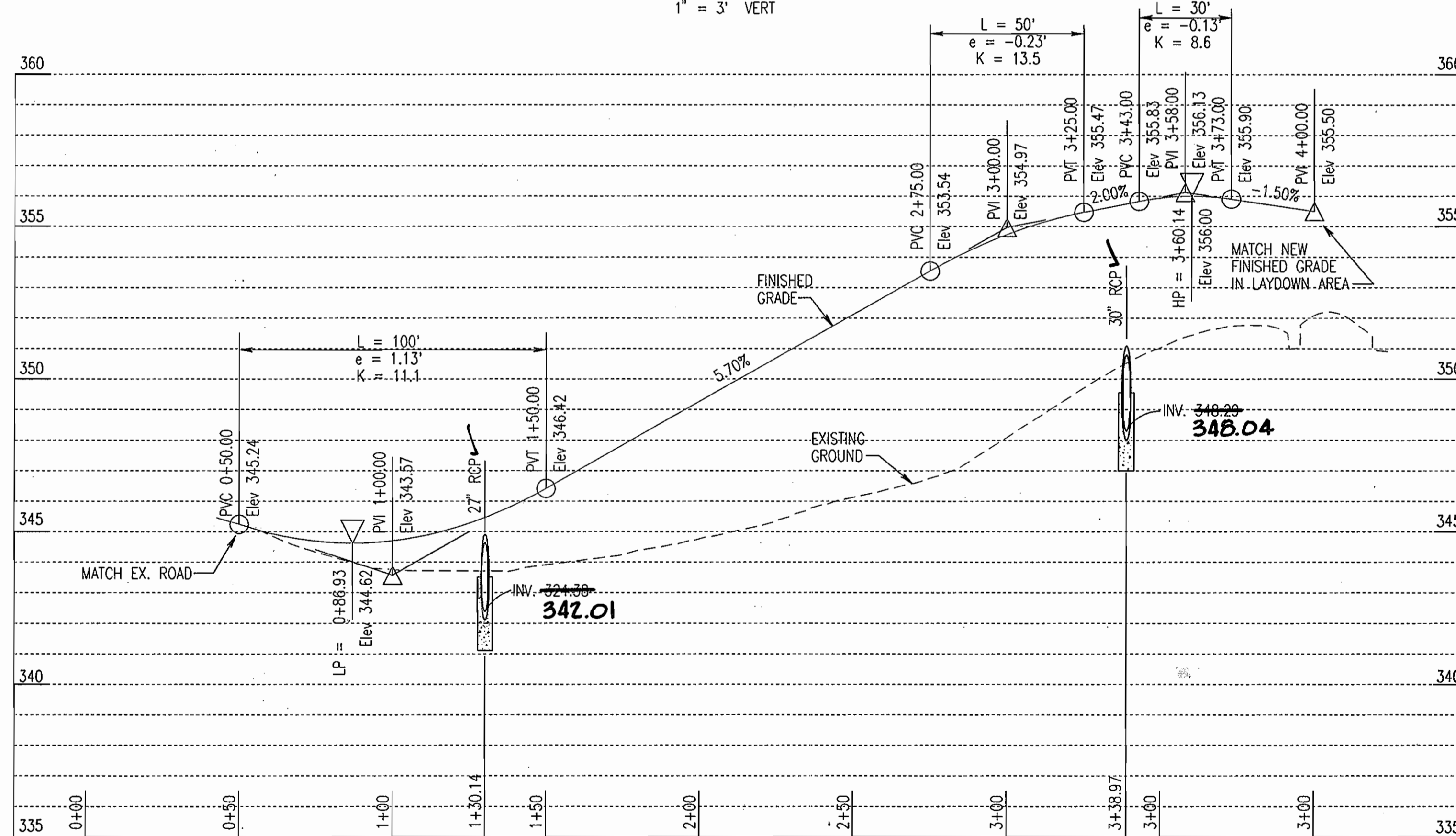
SCALE: 1" = 30' HORIZ
1" = 3' VERT

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division: *Howard Hamilton* MK 11/14/04
 Chief, Division of Land Development: *Candy Hamilton* 11/30/04
 Director: *Monica L. Cagle* 12/1/04



PROFILE - 30" RCP - LAYDOWN AREA TO SOUTH BASIN

SCALE: 1" = 30' HORIZ
1" = 3' VERT



PROFILE - CENTERLINE RELOCATED GRAVEL ROAD

SCALE: 1" = 30' HORIZ
1" = 3' VERT

STORM DRAIN STRUCTURE SCHEDULE

STRUCTURE I.D.	TYPE	STANDARD	SIZE	INV. IN	INV. OUT	TOP EL.
H-2	TYPE A HEADWALL	HO. CO. SD-5.11	30"	✓ 347.23	348.71	-
M-1	MANHOLE	HO. CO. G-5.13	30"	✓ 347.43	347.67	356.12
H-3	TYPE A HEADWALL	HO. CO. SD-5.11	30"	✓ 346.00	346.38	-

STORM DRAIN PIPE SCHEDULE

FROM STRUCTURE NO.	TO STRUCTURE NO.	SIZE (INCHES)	LENGTH (FEET)	CLASS	MATERIAL
H-2	MH-1	30"	113	IV	RCP
MH-1	H-3	30"	148	IV	RCP

AS-BUILT 11/04/05



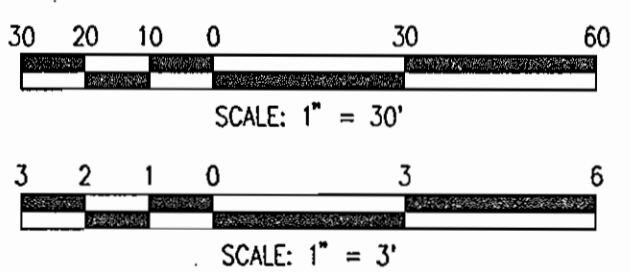
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 APPLIED PHYSICS LABORATORY
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GRAPHIC SCALES



WHITMAN, REQUARDT AND ASSOCIATES, LLP
 ENGINEERS, ARCHITECTS, PLANNERS
 801 S. CAROLINE STREET
 BALTIMORE, MARYLAND 21231
 410 - 235 - 3450

SOUTH BASIN AND
 LAYDOWN AREA PROFILES,
 AND SECTIONS

DRAWING NO. C-6
 Sheet 7 of 30
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