

STORMWATER MANAGEMENT RETROFIT AT ROCKBURN TOWNSHIP

INDEX OF DRAWINGS

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- POND SPECIFICATIONS
- LANDSCAPING PLAN
- LANDSCAPING DETAILS

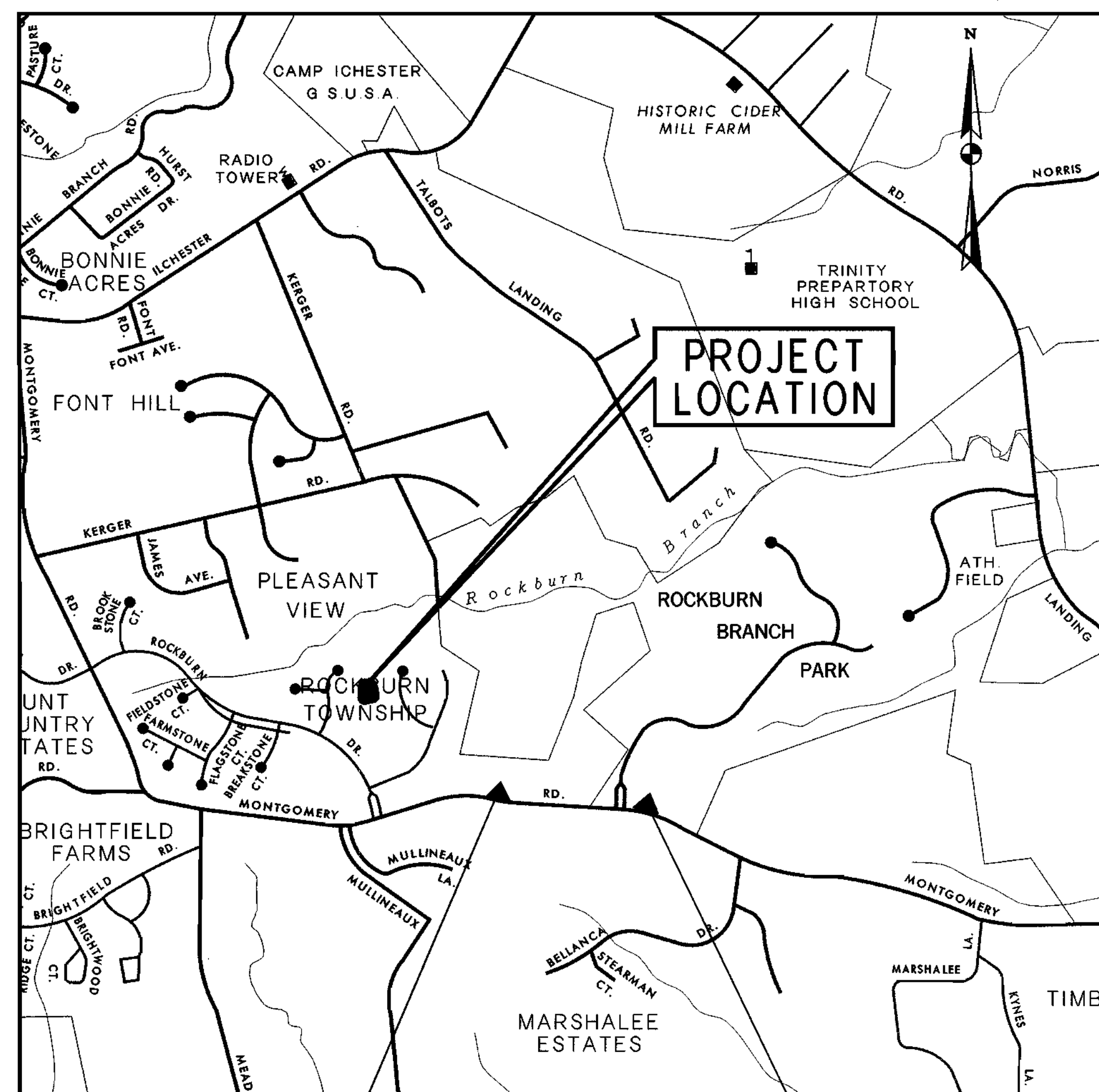
1ST ELECTION DISTRICT HOWARD COUNTY, MARYLAND CAPITAL PROJECT NO. D-1106

GENERAL NOTES

- THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING CONSTRUCTION INSPECTION DIVISION AT 410-313-1880 AND MISS UTILITY AT 1-800-257-7777 AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK.
- ALL ELEVATIONS SHOWN ARE BASED ON THE U.S.C. AND G.S. MEAN SEA LEVEL DATUM, 1929.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY.
- ALL WORK SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, ISSUED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT AND THE NATURAL RESOURCES CONSERVATION SERVICE.
- THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY URS CORPORATION DATE NOV. 2000.
- THE PROPERTY LINES AND EASEMENT LINES ARE APPROXIMATELY INDICATED AS SHOWN ON PLAT NO. 7394
- SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION, SHOULD THE
- CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHOD, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
- APPROXIMATE UTILITIES ARE SHOWN FROM AVAILABLE RECORDS. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- ALL PIPE ELEVATIONS SHOWN ARE INVERT ELEVATIONS.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- POND STRUCTURE HAZARD CLASSIFICATION = A. DUE TO NATURE OF PROXIMITY OF ROCKBURN BRANCH PARK.
- THIS PROJECT IS SUBJECT TO THE FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLAN COORDINATE SYSTEM, HOWARD COUNTY MONUMENT NOS. 17E AND 17EA WERE USED FOR THIS PROJECT.
- THERE IS NO FLOODPLAIN ON THIS SITE.
- THERE ARE NO WETLANDS ON THIS SITE.
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- THIS PROJECT IS EXEMPT FROM THE FOREST CONSERVATION REQUIREMENTS IN ACCORDANCE WITH APPENDIX 'O' - HOWARD COUNTY CAPITAL IMPROVEMENT PROJECTS OF THE FOREST CONSERVATION MANUAL AS A SINGLE LOT CLEARING LESS THAN 40,000 SQUARE FEET OF FOREST.

PERMIT INFORMATION BLOCK					
SUBDIVISION NAME		SECTION/AREA		LOT / PARCEL*	
ROCKBURN TOWNSHIP		1/2		O.S. LOT 200	
PLAT* OR L/F	BLOCK*	ZONE	TAX/ZONE MAP	ELEC. DIST	CENSUS TRACT
8633, 8635 8638	21/3	R-20	31/37	I	6011.01

ADDRESS CHART	
LOT NUMBER	STREET ADDRESS
O.S. LOT 200	7782 ROCKBURN DRIVE

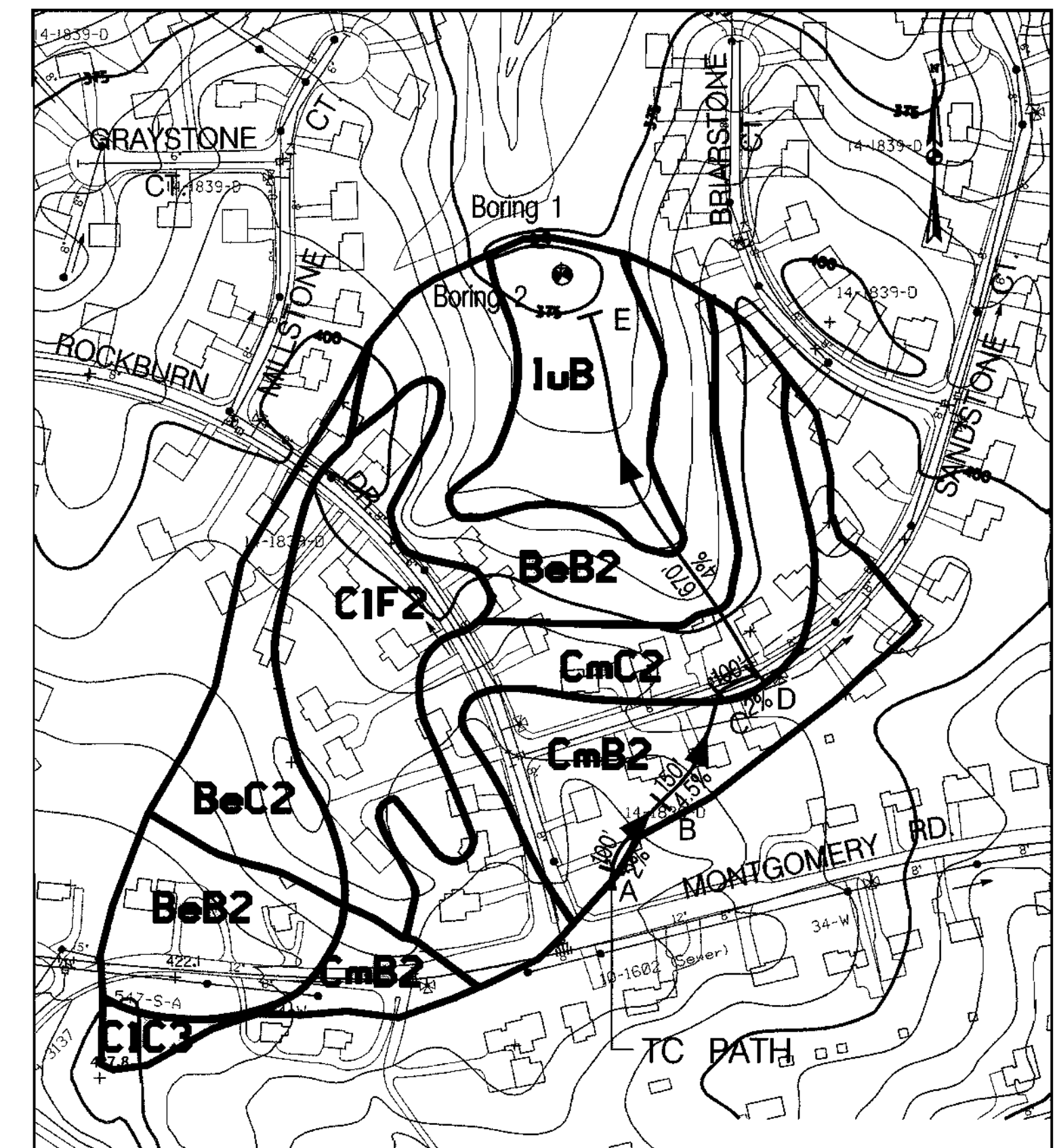


37BA
EL. 394.75
N 563785.62
E 1376343.17

LOCATION MAP
HOWARD COUNTY

37BB
EL. 373.81
N 563663.42
E 1378040.47

SCALE: 1" = 1000'



HYDROLOGIC SOIL:
TYPE 'B' = 16.06 AC.
TYPE 'C' = 5.08 AC.

DRAINAGE AREA =
21.14 AC.
Tc = 0.336 hr
PERCENT IMPERVIOUS = 34%

STORMWATER MANAGEMENT DRAINAGE AREA MAP - ROCKBURN TOWNSHIP

FIRST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND
SCALE 1" = 200' SEPT. 20, 1988

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.

PE NO. _____
DATE _____

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

SITE ANALYSIS DATA CHART	
a. TOTAL PROJECT AREA:	= 0.95 ACRES
b. AREA OF PLAN SUBMISSION:	= 0.95 ACRES
c. LIMIT OF DISTURBED AREA:	= 0.95 ACRES
d. PRESENT ZONING DESIGNATION:	= "R-20"
e. DPZ FILE REFERENCE:	= S-87-26, P-87-58, F-88-273

BMP DATA SUMMARY	
ADDRESS	ROCKBURN TOWNSHIP, HOWARD COUNTY, MD
MD COORDINATES (NAD83)	NORTH 564,705 EAST 1,375,317
ADC MAP/GRID	16/J6
STRUCTURE TYPE	EXTENDED DETENTION
MOP LAND USE	OPEN SPACE
STRUCTURE DRAINAGE AREA	21.14 ACRES
TOTAL SITE DRAINAGE AREA	21.14 ACRES
RCN - POST DEVELOPMENT	76
ON/OFF SITE SWM	ON SITE STORMWATER MANAGEMENT
OWNER	HOWARD COUNTY, MD

STORMWATER MANAGEMENT SUMMARY CHART						
STORM	(AS-BUILT) EXISTING POND INFLOW	(AS-BUILT) EXISTING POND DISCHARGE	(AS-BUILT) EXISTING POND ELEVATION	PROPOSED PEAK DISCHARGES	PROPOSED POND ELEVATIONS	PROPOSED STORAGE VOLUMES
	CFS	CFS	FT.	CFS	FT.	AC.-FT.
1 YR.	23.29	12.98	373.75	3.21	374.60	0.58
2 YR.	34.71	20.47	374.57	11.94	374.89	0.68
10 YR.	75.30	56.88	376.01	45.63	375.66	1.00
100 YR.	122.77	115.38	376.69	85.33	376.47	1.34

BY THE DEVELOPER:

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

Howard E. Saltzman 12/8/03
DEVELOPER DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division 12/24/03
Date

Chief, Division of Land Development 12/30/03
Date

Director 12/10/03
Date

APPROVED: DEPARTMENT OF RECREATION AND PARKS

Director 12-9-03
Date

Howard County
Owners: Department of Recreation and Parks
7120 Oakland Mills Rd.
Columbia, MD 21046-1677
Phone No. 410-313-4640

Howard County
Department of Public Works
6751 Columbia Gateway Drive, Fifth Floor
Columbia, MD 21046
Phone No. 410-313-2330

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

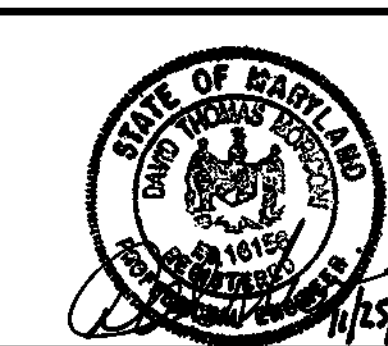
Director of Public Works 12/8/03
Date

Chief, Stormwater Management Division 12/10/03
Date

PREPARED BY
URS
4 NORTH PARK DRIVE
HUNT VALLEY, MARYLAND
TEL: (410) 785-1220

Chief, Bureau of Environmental Services 12/8/03
Date

Chief, Bureau of Highways 12-9-03
Date



DES: WLM			
DRN: SYC/EGB			
CHK: DTM			
DATE: 8-01-03	BY: NO.	REVISION	DATE

TITLE SHEET

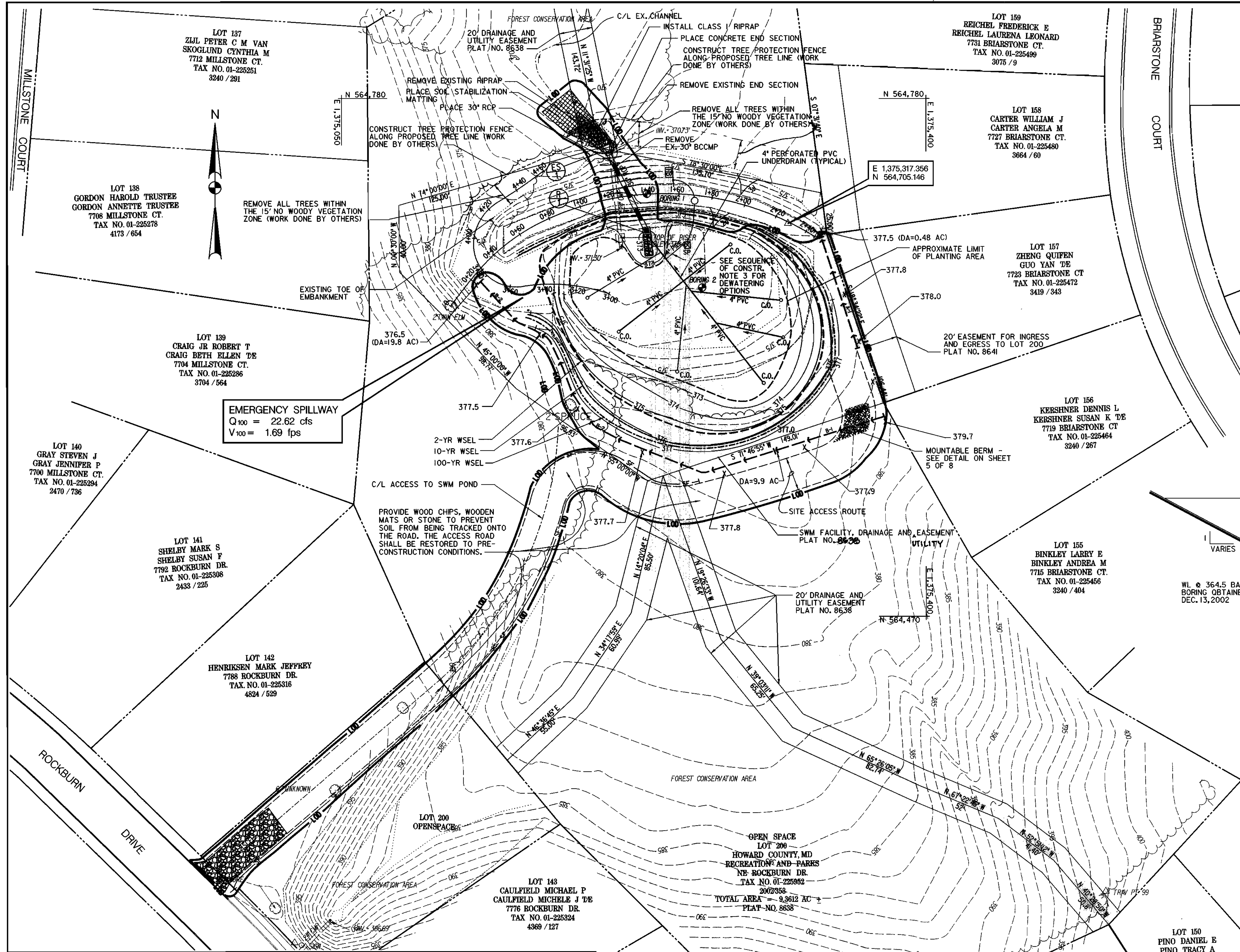
SCALE MAP NO. N/A BLOCK NO.

STORMWATER MANAGEMENT RETROFIT AT ROCKBURN TOWNSHIP - OPEN SPACE LOT 200 CAPITAL PROJECT NO. D-1106

1ST ELECTION DISTRICT - HOWARD COUNTY, MARYLAND
TAX MAP NO. 31/37, GRID NO. 21/3, PARCEL NO. 793

SCALE
AS SHOWN

SHEET
1 OF 8



OWNERSHIP AND MAINTENANCE RESPONSIBILITY OF THIS STORMWATER MANAGEMENT FACILITY (P-1) BELONGS TO HOWARD COUNTY

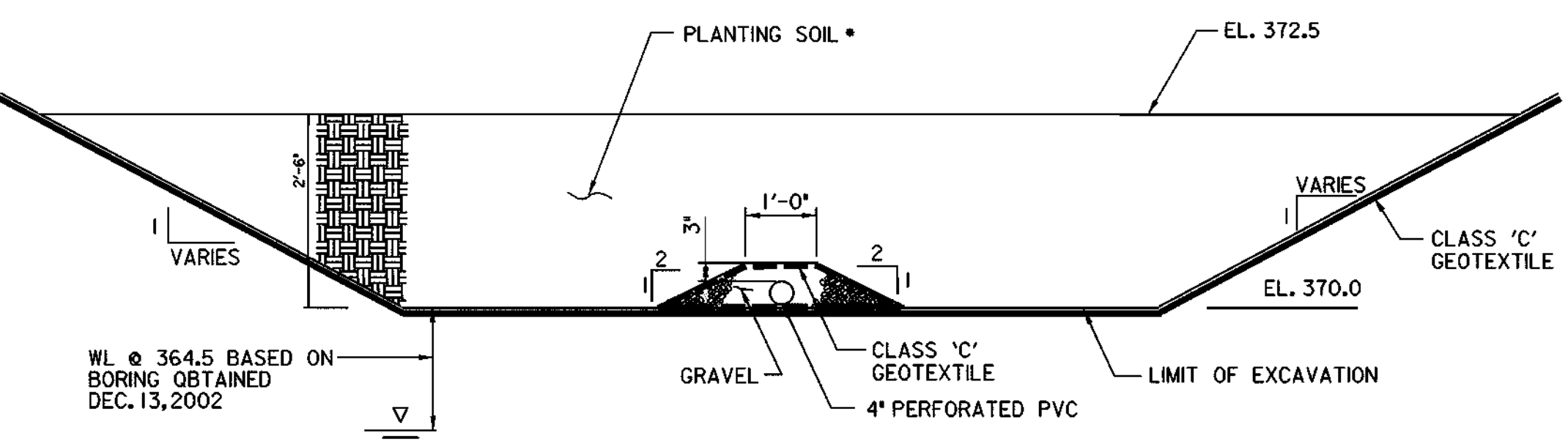
MATERIAL SPECIFICATIONS FOR PLANTING AREA

- PLANTING SOIL: SAND 35% - 60%
SILT 30% - 55%
CLAY 10% - 25%
- PROVIDE FOR TESTING OF EXISTING SOILS FOR COMPLIANCE WITH BIORETENTION SPECIFICATIONS.
- GEOTEXTILE: CLASS 'C'
- OPENING SIZE PER ASTM-D-4751
GRAB TENSILE STRENGTH PER ASTM-D-4632
PUNCTURE RESISTANCE PER ASTM-D-4833
- GRAVEL: AASHTO M-43 (0.25" TO 0.75")
- UNDERDRAIN PIPING: 4" RIGID SCHEDULE 40 PVC OR SDR 35
3/4" PERFORATIONS @ 6" O.C., 4 HOLES PER ROW, MIN. OF 3" OF GRAVEL OVER PIPE

NO STOCKPILES ARE PERMITTED ON SITE

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.



TYPICAL SECTION - PLANTING AREA

SCALE: NOT TO SCALE

AS-BUILT CERTIFICATION
I hereby certify that the facility shown on this plan was constructed as shown on the "as-built" plan and meets the approved plans and specifications.
Signature _____ PE NO. _____
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 all responsible personnel involved in that construction project will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspection by the Howard Soil Conservation District."
Howard E. Sully 12/10/03
DEVELOPER DATE

ENGINEER'S CERTIFICATE
"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it is 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."
David J. Moricani NOV 25, 2003
Signature of Engineer (Print name below signature) Date

These plans have been reviewed for the Howard Soil Conservation District and meet the technical requirements for small pond construction, soil erosion and sediment control.
John M. ... 12/23/03
USDA - Natural Resources Conservation Service Date

These plans for small pond construction, soil erosion and sediment control meet the requirements of the Howard Soil Conservation District.
Howard Soil Conservation District 12/23/03
Signature Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING
... 12/24/03
Chief, Development Engineering Division Date
... 12/30/03
Chief, Division of Land Development Date
... 12/24/03
Director Date

APPROVED: DEPARTMENT OF RECREATION AND PARKS
... 12/9/03
Director Date

LOT 144 NORDBY CRAIG J
NORDBY KRISTINA M DE
7772 ROCKBURN DR.
TAX NO. 01-225332
4047 / 112

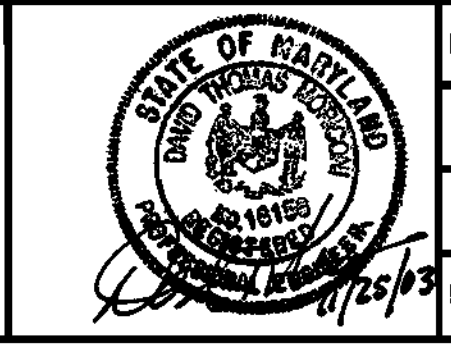
LOT 148 MCCLURKIN REGINALD ONEAL
MCCLURKIN MINNIE DENISE
7709 SANDSTONE CT.
TAX NO. 01-225375
2382 / 426

LOT 149 SCHANTZ DAVID LLOYD JR
SCHANTZ OONAGH MARY
7713 SANDSTONE CT.
TAX NO. 01-225383
2427 / 339

LOT 150 PINO DANIEL E
PINO TRACY A
7717 SANDSTONE CT.
TAX NO. 01-225339
2413 / 738

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
... 12/19/03
DIRECTOR OF PUBLIC WORKS DATE
Howard E. Sully 12/11/03
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

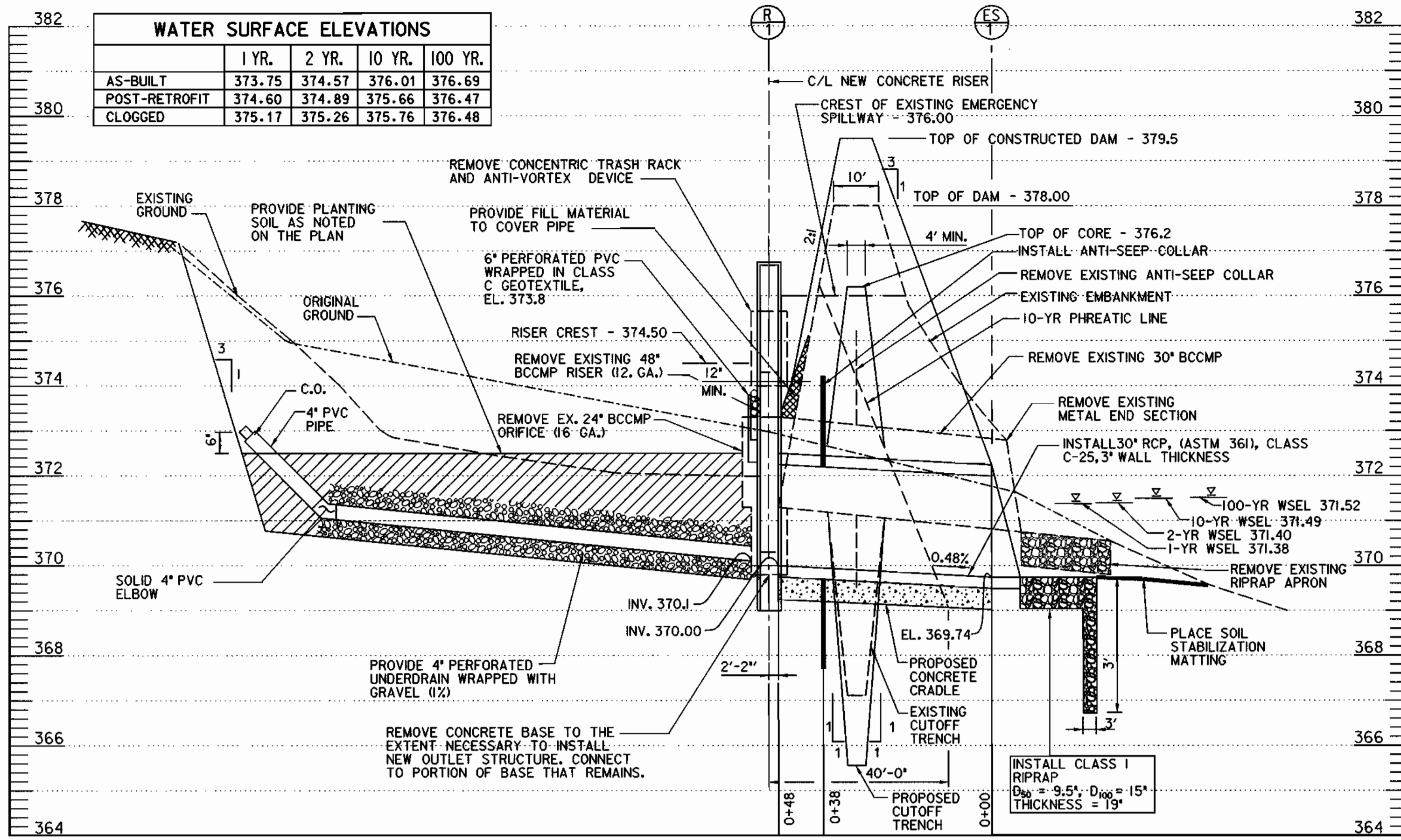
PREPARED BY
URS
4 NORTH PARK DRIVE
HUNT VALLEY, MARYLAND
TEL: (410) 785-7220



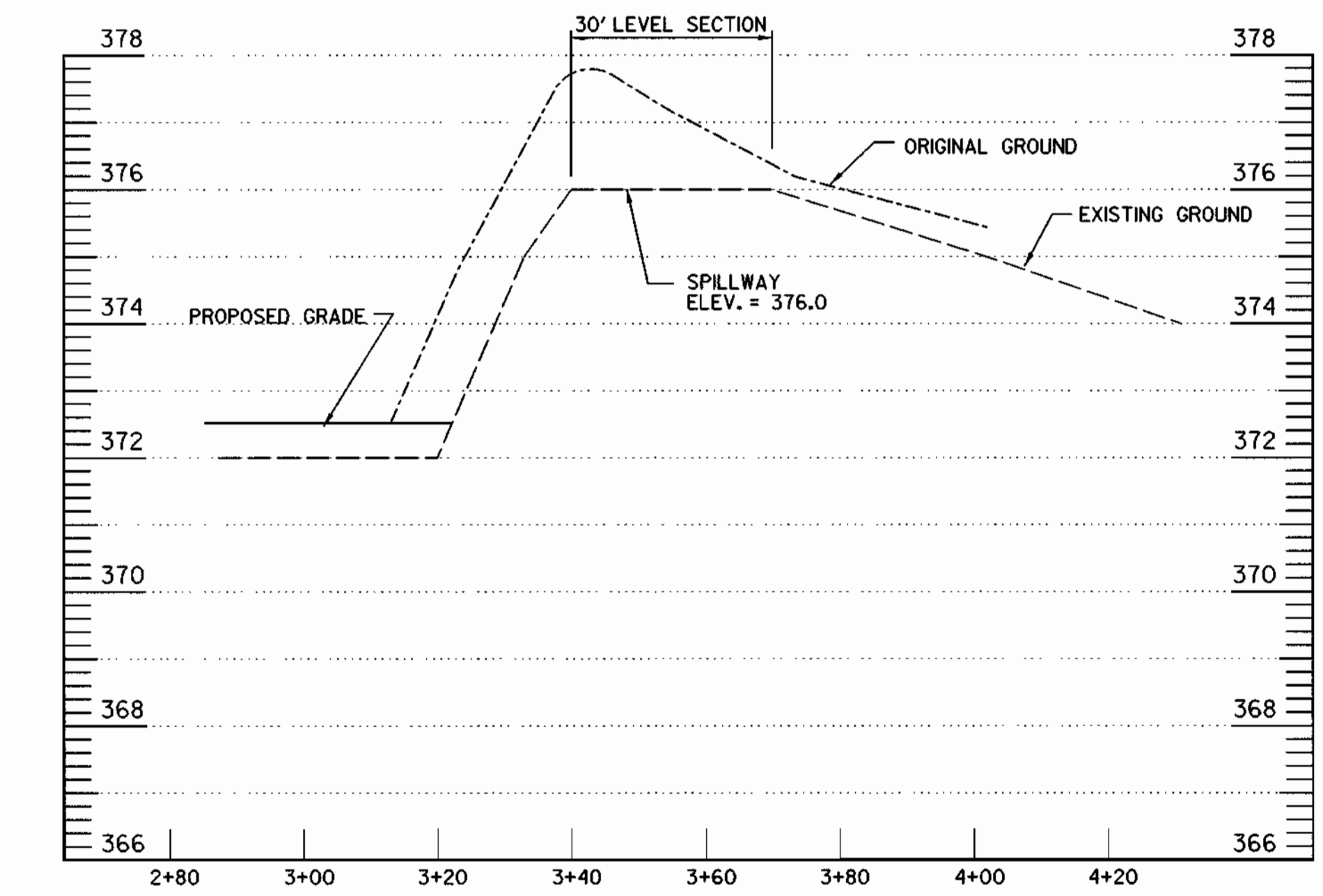
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GRADING AND EROSION CONTROL
SEDIMENT CONTROL PLAN
SCALE MAP NO. N/A BLOCK NO.

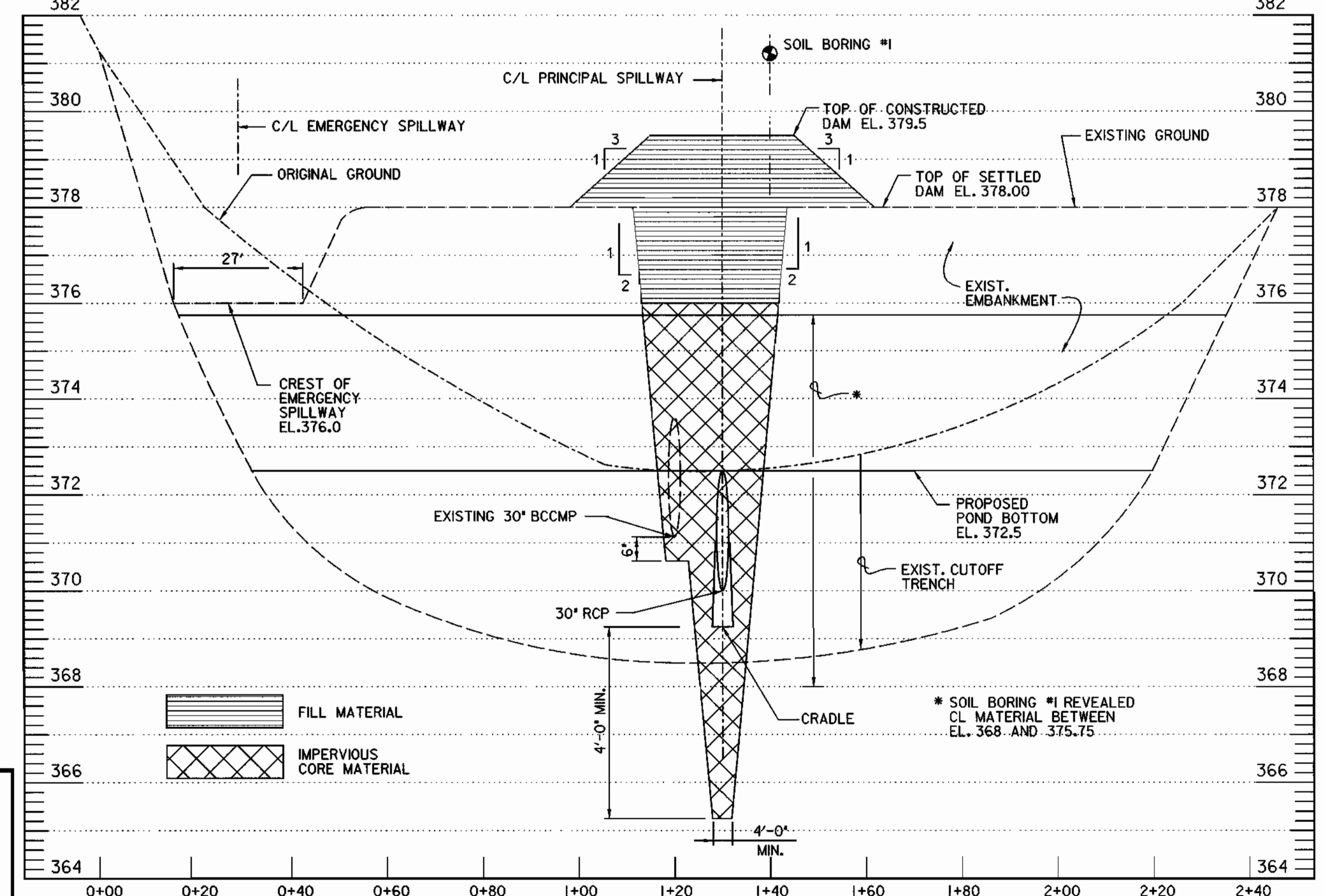
SCALE AS SHOWN
SHEET 2 OF 8
STORMWATER MANAGEMENT RETROFIT AT
ROCKBURN TOWNSHIP - OPEN SPACE LOT 200
CAPITAL PROJECT NO. D-1106
1ST ELECTION DISTRICT - HOWARD COUNTY, MARYLAND
TAX MAP NO. 31/37, GRID NO. 21/3, PARCEL NO. 793



PROFILE ALONG PRINCIPAL SPILLWAY
 SCALE: HORIZONTAL 1" = 20'
 VERTICAL 1" = 2'

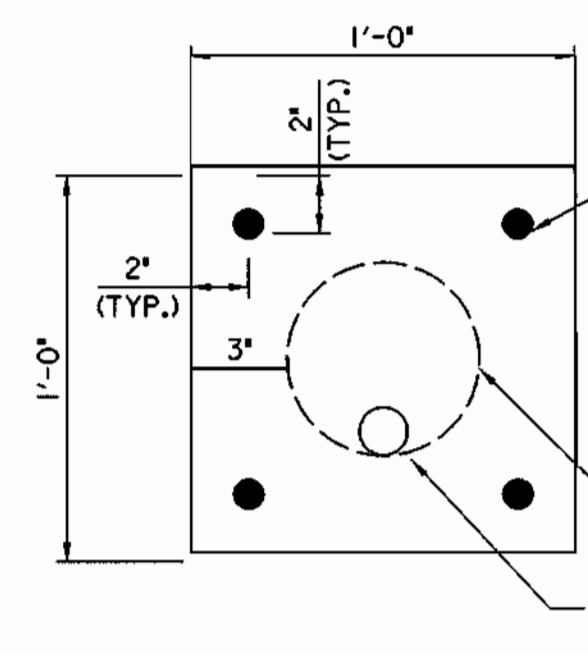


EMERGENCE SPILLWAY PROFILE
 SCALE: HORIZONTAL 1" = 20'
 VERTICAL 1" = 2'

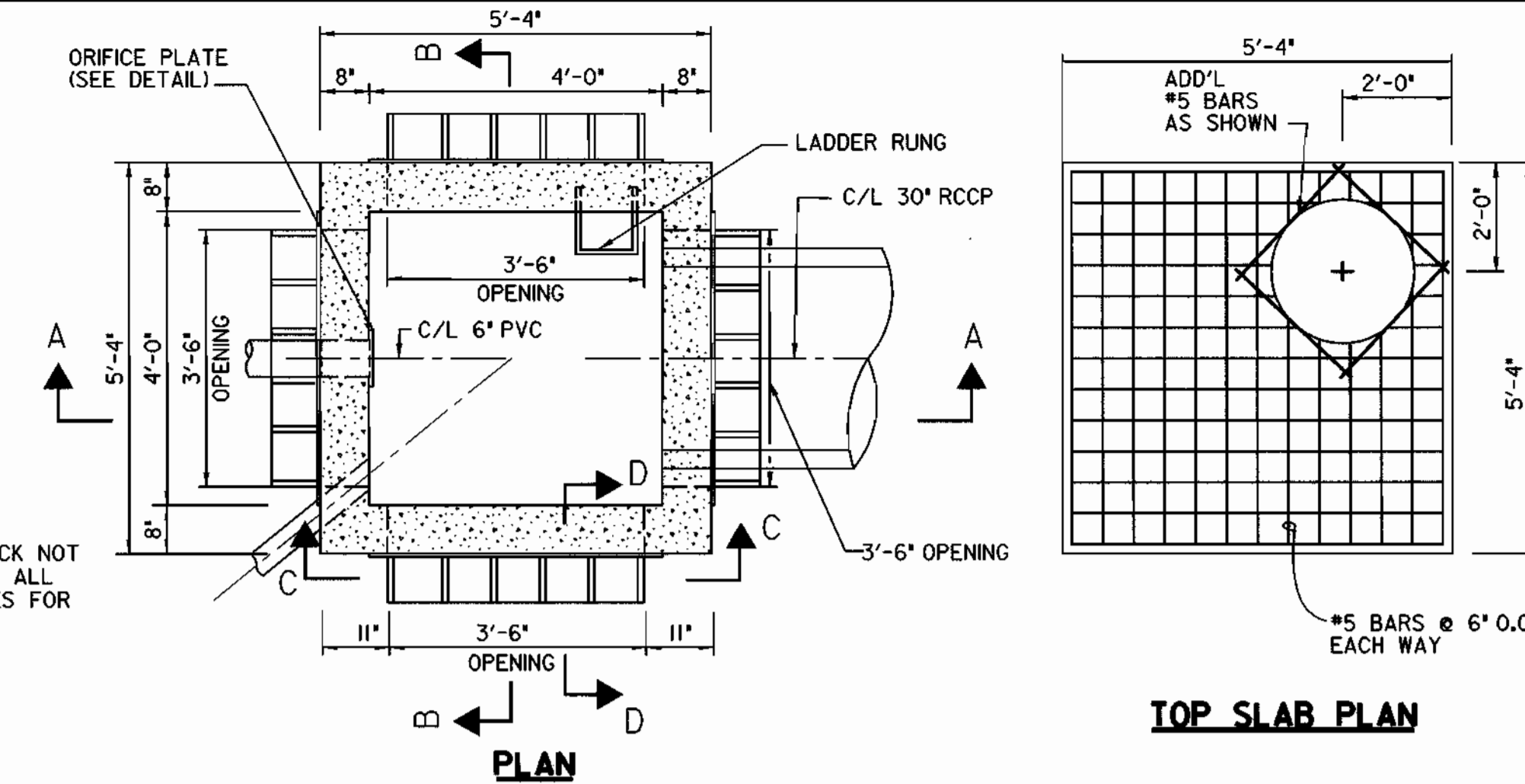


CROSS SECTION OF DAM ALONG CENTER LINE
 SCALE: HORIZONTAL 1" = 20'
 VERTICAL 1" = 2'

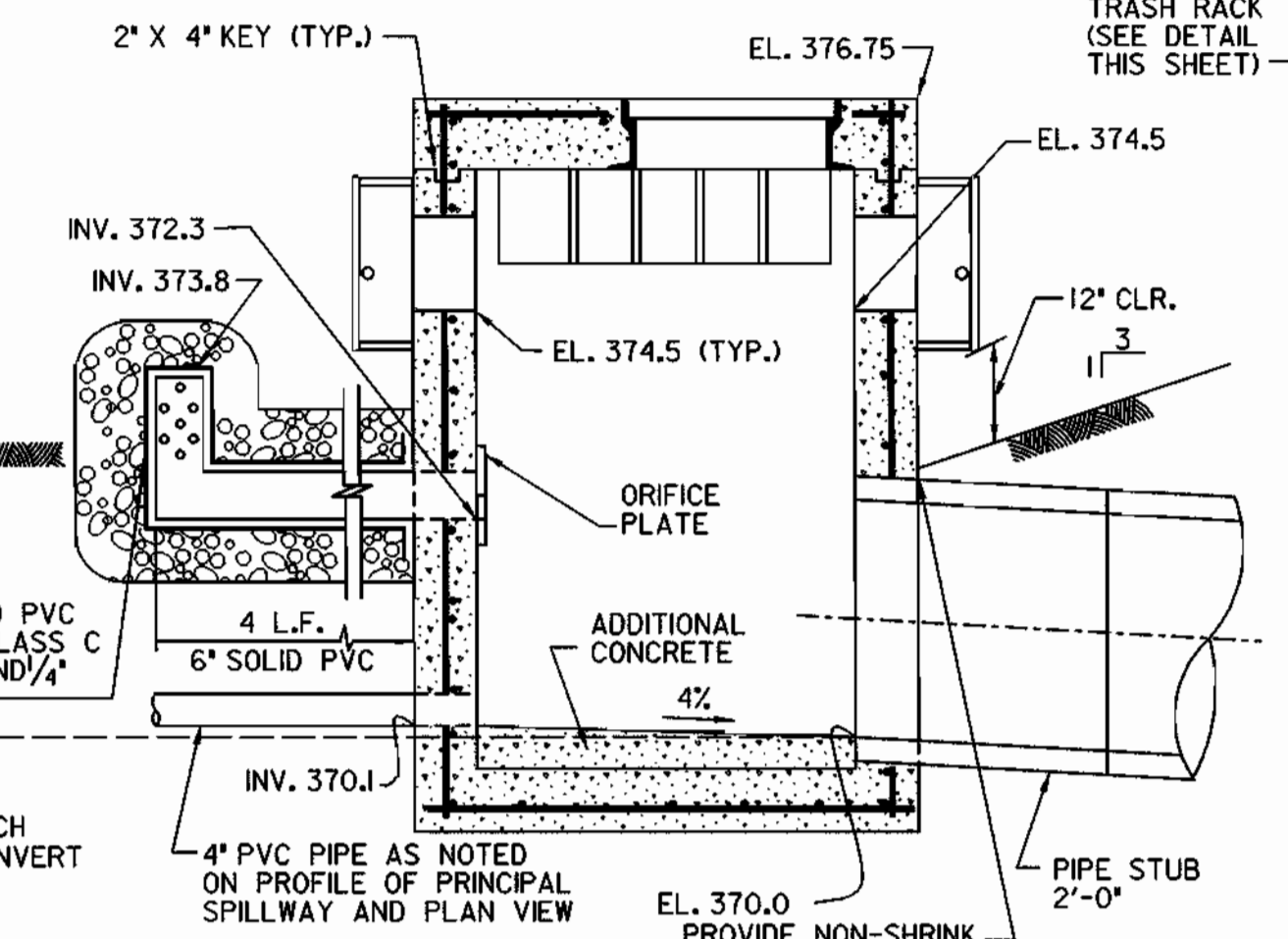
- GENERAL NOTES:**
- REFER TO STANDARD SD-3.91 FOR SIDEWALK FRAME AND COVER.
 - ALL REBAR TO HAVE 2" CONCRETE COVER MINIMUM.
 - CONCRETE SHALL BE MIX NO. 2 (3000 PSI) FOR CAST-IN-PLACE UNIT OR MIX NO. 6 (4500 PSI) FOR PRECAST UNIT.
 - REINFORCEMENT SHALL CONFORM TO ASTM A-615, GRADE 60, AND ALL EXPOSED REBAR SHALL BE GALVANIZED PER ASTM A 153 (AASHTO M 232).
 - ALL REINFORCING BARS ARE #5 @ 6" O.C. E. W. SHOWN UNLESS NOTED OTHERWISE.
 - LADDER RUNGS SHALL BE INSTALLED IN VERTICAL ALIGNMENT AT 1'-4" MAX. VERTICAL SPACING. RUNG TYPES SHALL BE IN ACCORDANCE WITH STANDARD MD 383.92 AND SHALL BE INCIDENTAL TO THE COST OF THE RISER STRUCTURE.
 - 6-INCH OF NO. 57 STONE UNDER THE OUTLET STRUCTURE SHALL BE PROVIDED.



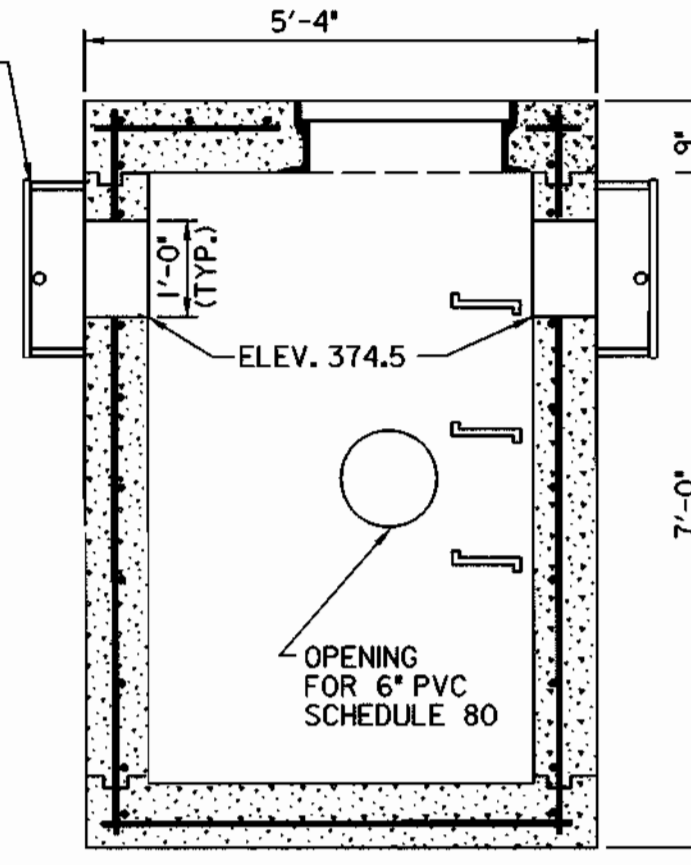
ORIFICE PLATE
 SCALE: 2" = 1'-0"



TOP SLAB PLAN

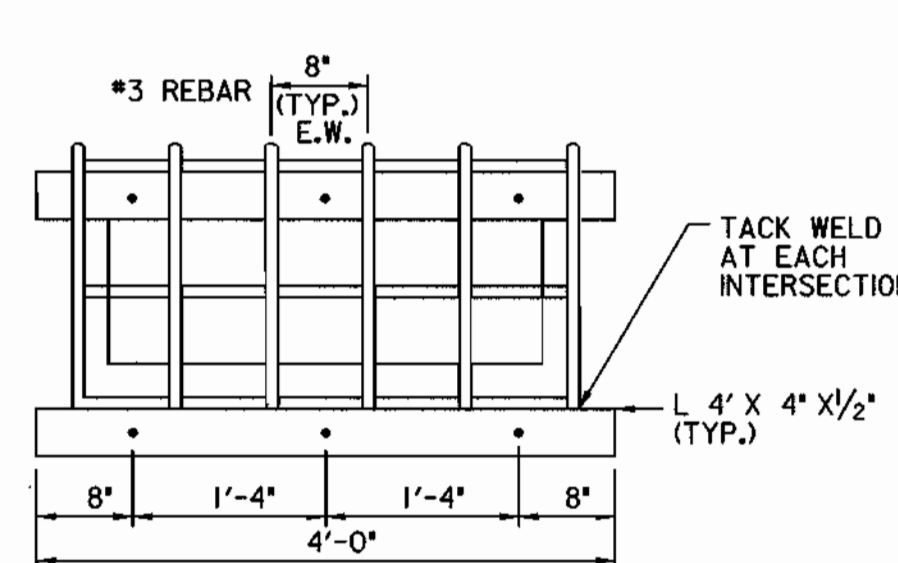


SECTION A-A

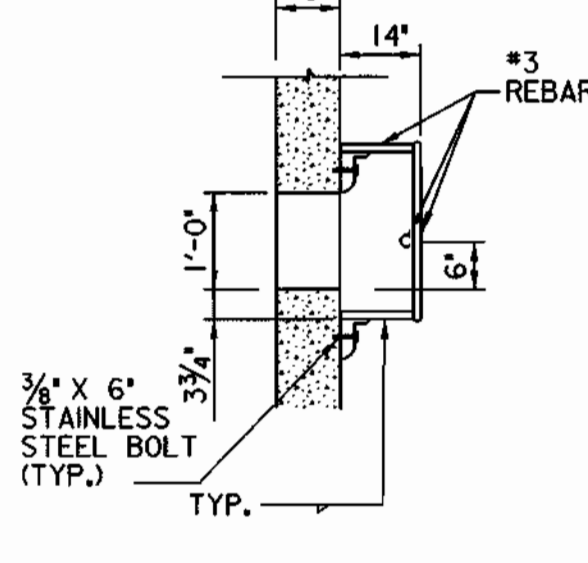


SECTION B-B

RISER STRUCTURE
 SCALE: 1/2" = 1'-0"



SECTION C-C
 NOT TO SCALE



SECTION D-D
 NOT TO SCALE

- NOTES:**
- CONTRACTOR SHALL FIELD MEASURE THE STRUCTURE DIMENSIONS FOR EXACT FITTING OF TRASH RACK.
 - ENTIRE RACK SHALL BE GALVANIZED AFTER FABRICATION.
 - STEPS SHALL BE INSTALLED IN ACCORDANCE WITH HOWARD COUNTY SPECIFICATION G-5-21.
 - PAINT TRASH RACK BATTLESHIP GREY.

NOTE:
 ORIGINAL GROUND FROM 1992. AS-BUILT DRAWINGS. EXISTING GROUND FROM NOV. 2000 SURVEY BY URS CORPORATION

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 Date: 12/24/03

APPROVED: DEPARTMENT OF RECREATION AND PARKS
 Director
 Date: 12-9-03

DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 Chief, Bureau of Environmental Services
 Chief, Bureau of Highways

PREPARED BY
URS
 4 NORTH PARK DRIVE
 HUNT VALLEY, MARYLAND
 TEL: (410) 785-7220

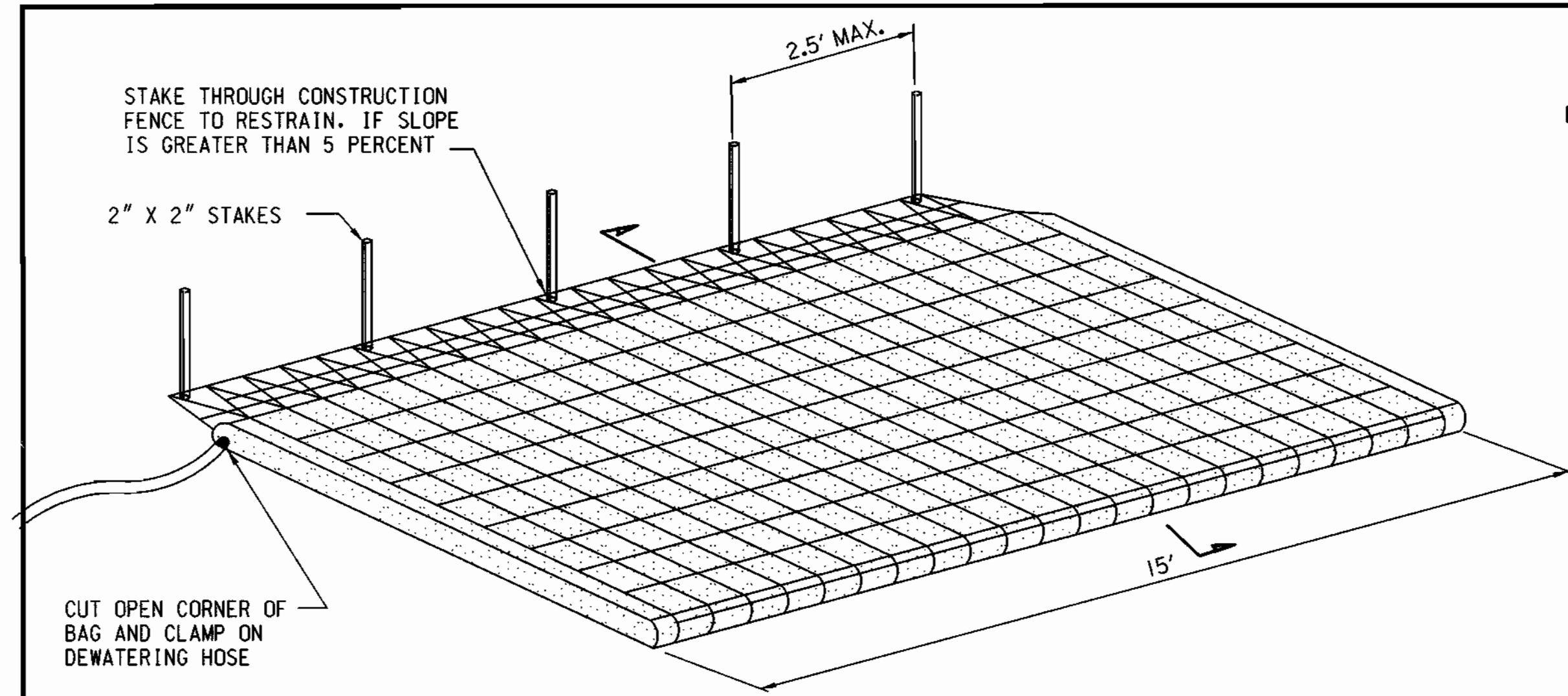


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DRN: SYC/EGB			
CHK: DTM			
DATE: 8-01-03	BY NO.	REVISION	DATE

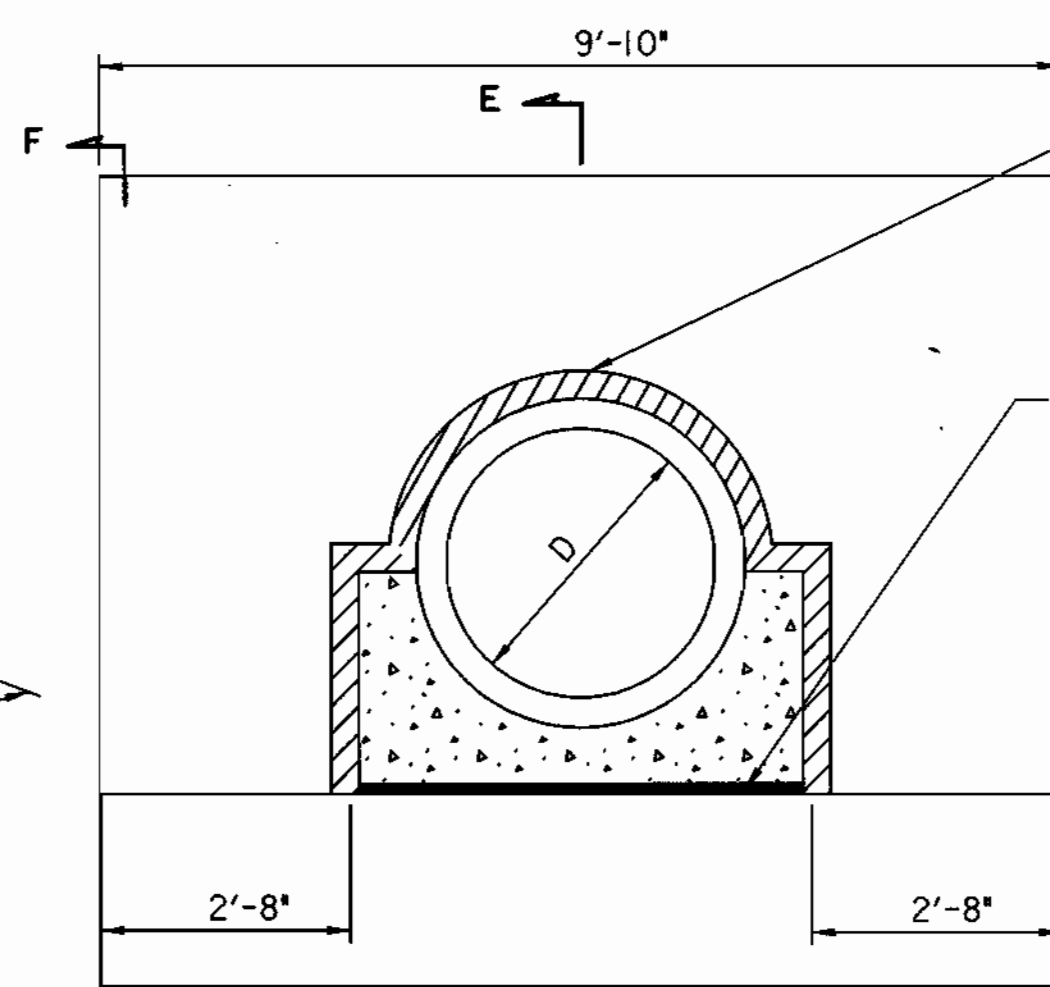
STORMWATER MANAGEMENT POND AND DETAILS

STORMWATER MANAGEMENT RETROFIT AT ROCKBURN TOWNSHIP - OPEN SPACE LOT 200 CAPITAL PROJECT NO. D-1106
 1ST ELECTION DISTRICT - HOWARD COUNTY, MARYLAND
 TAX MAP NO. 31/37, GRID NO. 21/3, PARCEL NO. 793

SCALE AS SHOWN
 SHEET 3 OF 8



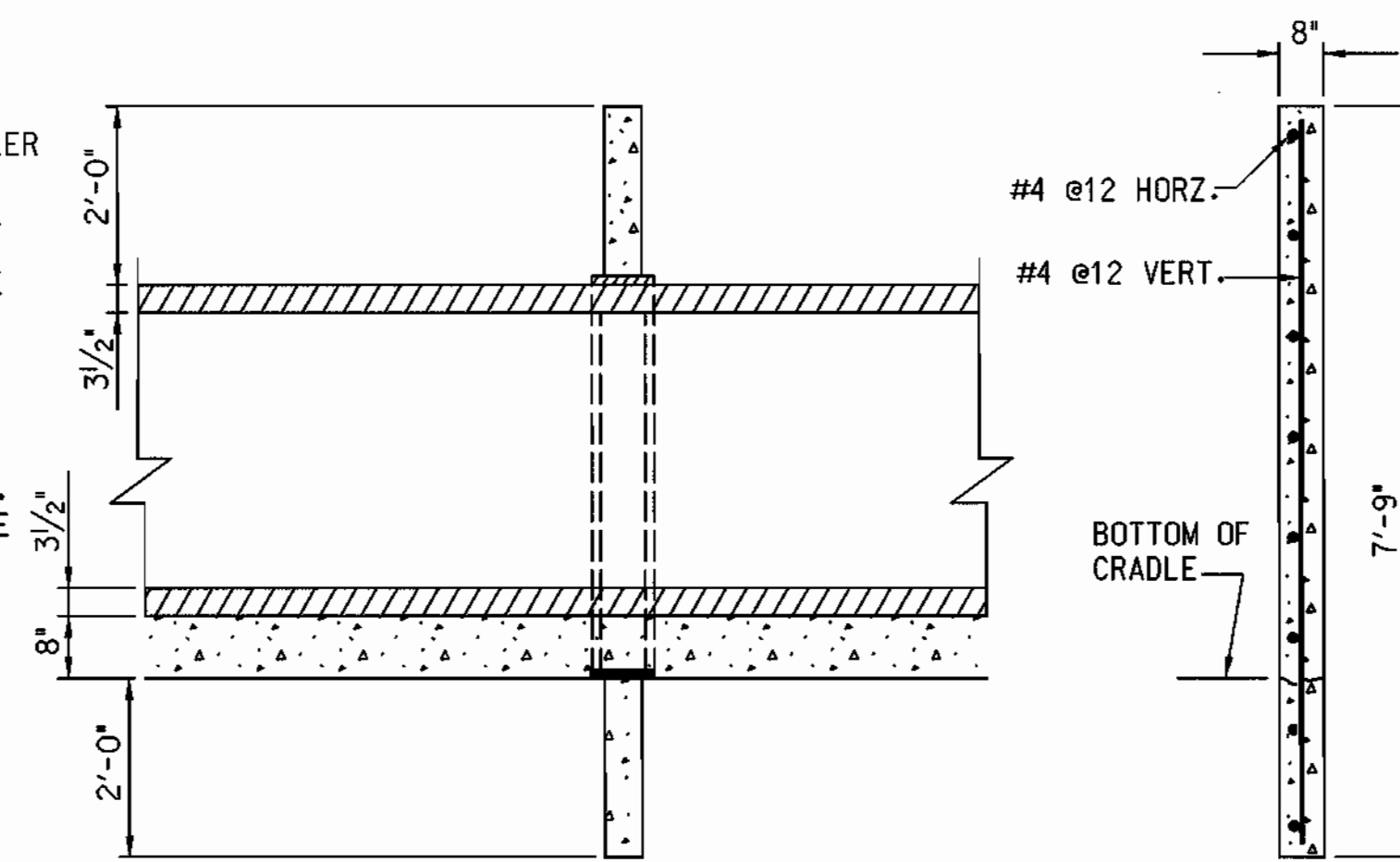
ISOMETRIC VIEW



PLAN VIEW

ASPHALT JOINT FILLER MATERIAL SHALL BE PLACED BETWEEN ALL CONCRETE SURFACES EXCEPT BETWEEN THE PIPE AND CRADLE

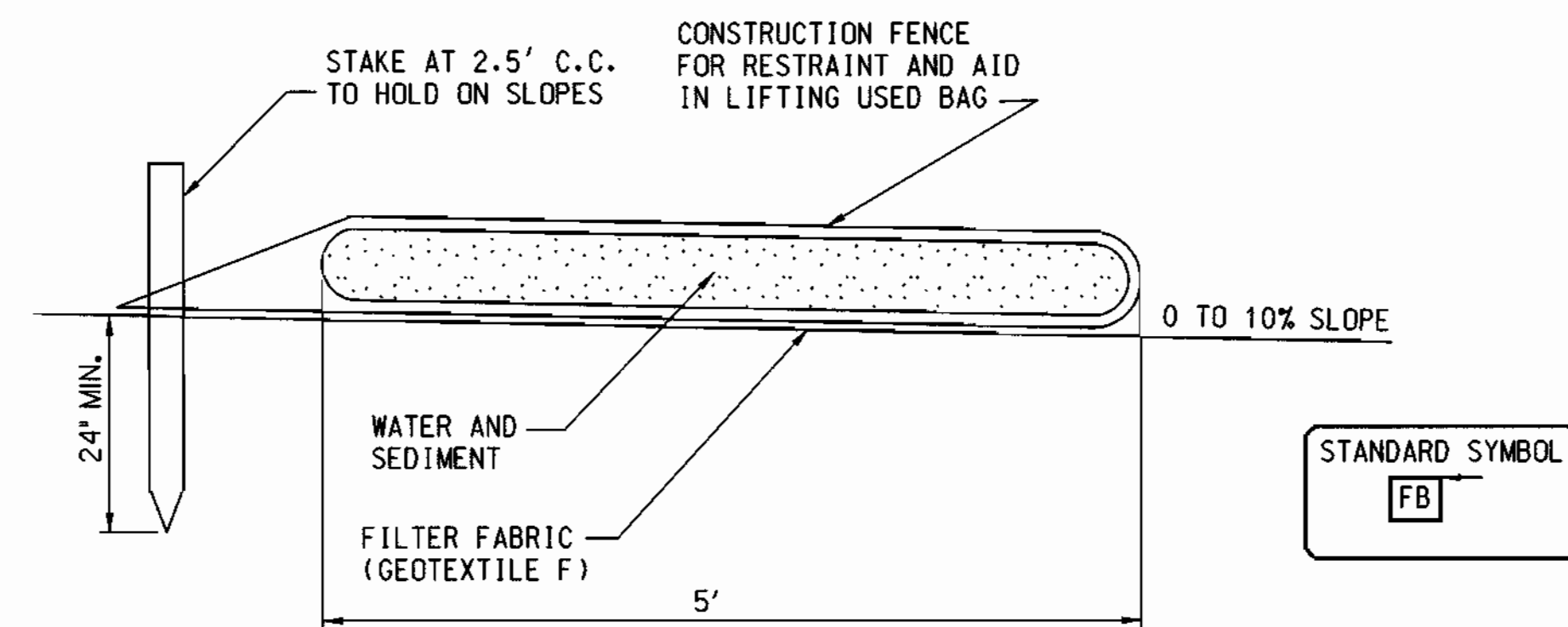
ONE LAYER OF HEAVY, SMOOTH SURFACE, ASPHALT TREATED, ROOFING FELT, APPROX. WT. 55 LBS. PER SQUARE FINISH COLLAR SURFACE TRUE AND SMOOTH, SEE A2 CONCRETE CRADLE DETAIL (SAME PAGE)



SECTION E-E

SECTION F-F (SHOWING STEEL)

SCS TR-46
A2 CONCRETE CRADLE DETAIL
NOT TO SCALE



SECTION

NOTES:

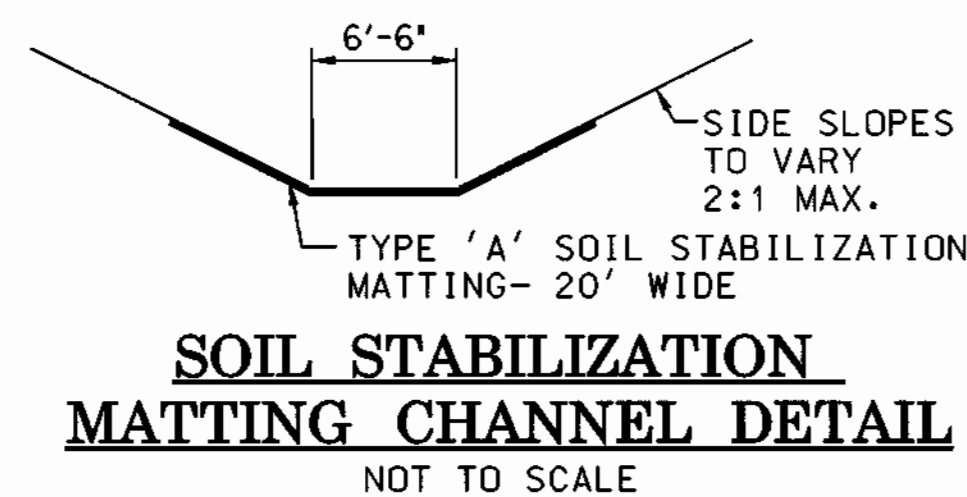
1. FILTER BAG SHALL BE PLACED ON A SLOPING OR LEVEL, WELL GRADED VEGETATED SITE SUCH THAT WATER WILL FLOW AWAY FROM DEVICE AND ANY WORK AREAS.
2. WIDTH AND LENGTH SHALL BE AS SHOWN.
3. THE FILTER BAG MUST BE STAKED IN PLACE AND SECURED TO THE PUMP DISCHARGE LINE.
4. FILTER BAG SHALL NOT BE USED FOR DISCHARGE FLOWS GREATER THAN 300 GPM.
5. DEVICE SHALL BE REMOVED AND DISPOSED OF AFTER BAG IS FILLED WITH SEDIMENT. SEDIMENT FROM BAG SHALL BE SPREAD IN AN UPLAND AREA.
6. FILTER FABRIC SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:

Tensile Strength	50 lb / in (min)	Test : MSMT 509
Tensile Modulus	20 lb / in (min)	Test : MSMT 509
Flow Rate	0.3 gal ft ² / minute (max.)	Test : MSMT 322
Filtering Efficiency	75% (min)	Test : MSMT 322

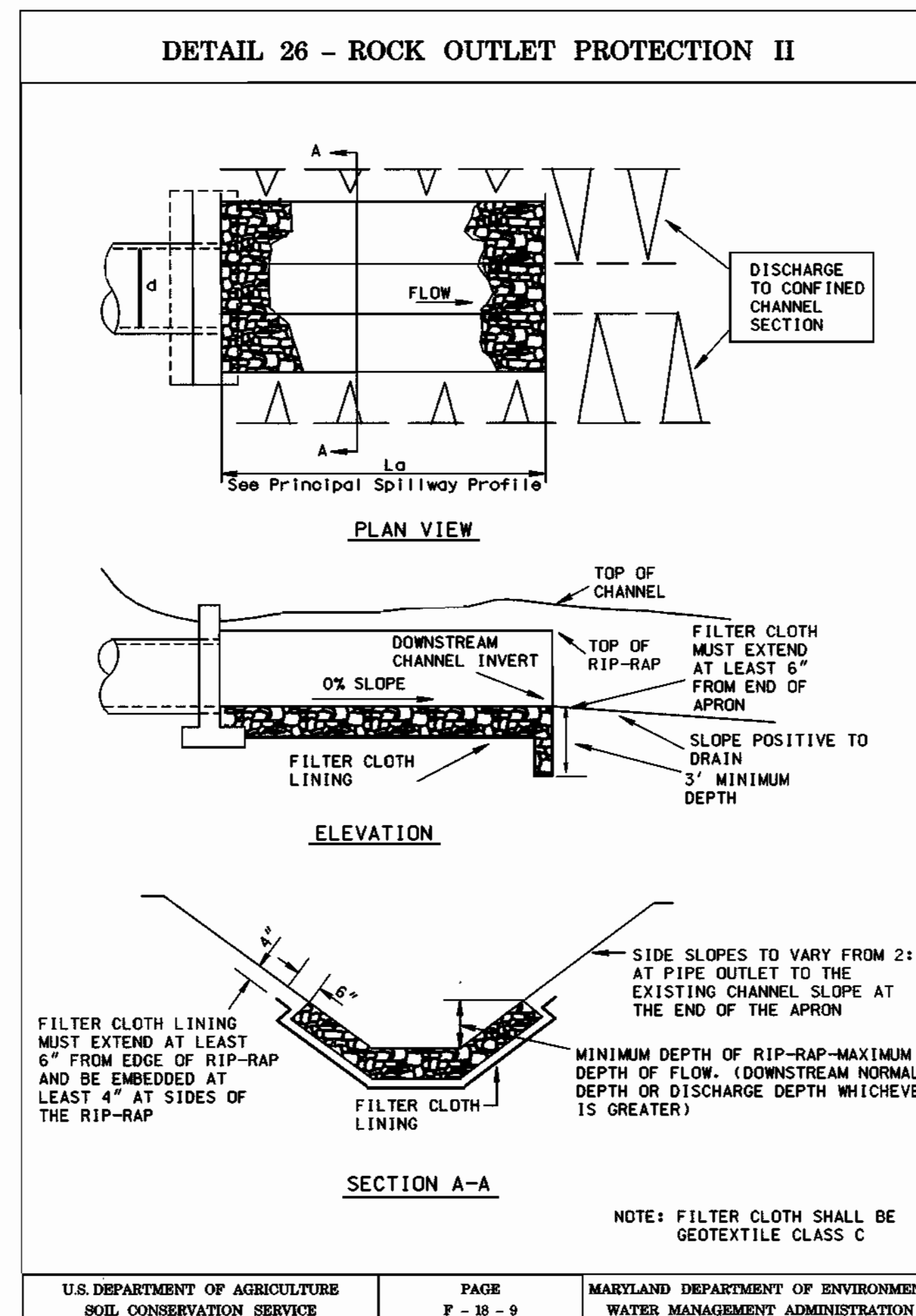
FILTER BAG



(TEMPORARY EROSION CONTROL MEASURE)
NOT TO SCALE



SOIL STABILIZATION
MATTING CHANNEL DETAIL
NOT TO SCALE



DETAIL 26 - ROCK OUTLET PROTECTION II

PLAN VIEW

ELEVATION

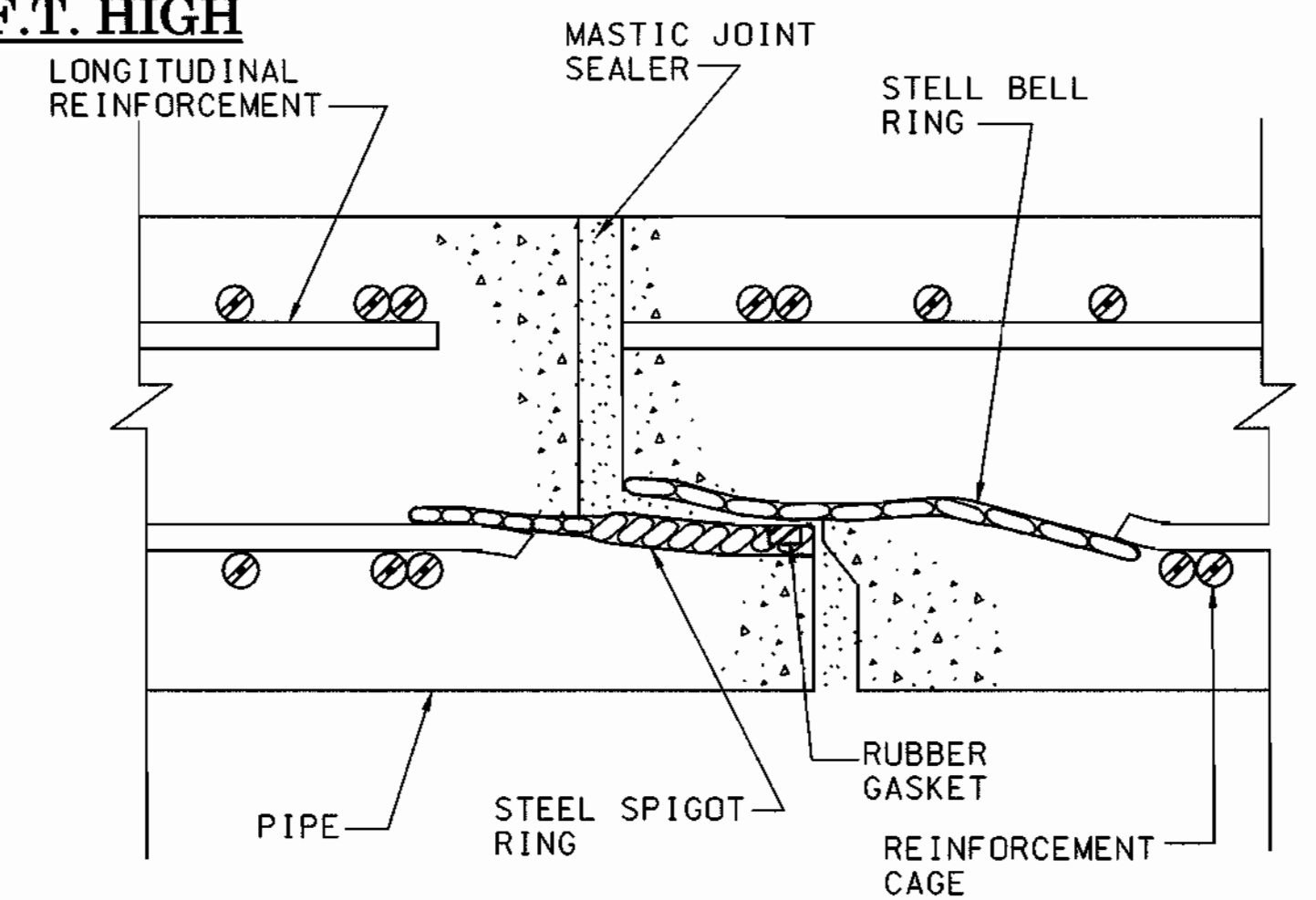
SECTION A-A

ROCK OUTLET PROTECTION II
NOT TO SCALE

Construction Specifications

1. The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
2. The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.
3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.
4. Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 9A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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ASTM DESIGNATION C361
(Diameters 12 thru 168 inch
pressures to 125 feet of head)
NOT TO SCALE

APPROVED: DEPARTMENT OF PLANNING AND ZONING <i>[Signature]</i> Chief, Development Engineering Division Date: 12/24/03	APPROVED: DEPARTMENT OF RECREATION AND PARKS <i>[Signature]</i> Date: 12/30/03
APPROVED: DEPARTMENT OF PUBLIC WORKS <i>[Signature]</i> Chief, Division of Land Development Date: 12/21/03	APPROVED: DEPARTMENT OF PUBLIC WORKS <i>[Signature]</i> Chief, Stormwater Management Division Date: 12/21/03

AS-BUILT CERTIFICATION

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

Signature: _____ PE NO. _____
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 all responsible personnel involved in that construction project will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 days of completion. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

[Signature] 12/18/03
DEVELOPER DATE

ENGINEER'S CERTIFICATE

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

[Signature] DATE: 12/23/03
Signature of Engineer (Print name below signature) DATE

These plans have been reviewed for the Howard Soil Conservation District and meet the technical requirements for small pond construction, soil erosion and sediment control.

[Signature] 12/23/03
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] 12/23/03
Howard Soil Conservation District DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

12/16/03
DIRECTOR OF PUBLIC WORKS DATE

12/18/03
[Signature] DATE

CHIEF, STORMWATER MANAGEMENT DIVISION

PREPARED BY
URS
4 NORTH PARK DRIVE
HUNT VALLEY, MARYLAND
TEL: (410) 785-7220

12/16/03
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

12-9-03
[Signature] DATE

CHIEF, BUREAU OF HIGHWAYS

STATE OF MARYLAND
DEPARTMENT OF ENVIRONMENT
WATER MANAGEMENT ADMINISTRATION

DES: WLM	DRN: SYC/EGB	CHK: DTM	DATE: 8-01-03	BY NO.	REVISION	DATE
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STORMWATER MANAGEMENT
NOTES AND DETAILS

SCALE MAP NO. N/A BLOCK NO.

STORMWATER MANAGEMENT RETROFIT AT
ROCKBURN TOWNSHIP - OPEN SPACE LOT 200
CAPITAL PROJECT NO. D-1106

1ST ELECTION DISTRICT - HOWARD COUNTY, MARYLAND
TAX MAP NO. 31/37, GRID NO. 21/3, PARCEL NO. 793

SCALE AS SHOWN
SHEET 4 OF 8

PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER 3 INCHES OF SOIL BY RAKING, DISCING, OR OTHER ACCEPTABLE MEANS BEFORE SEEDING. IF NOT PREVIOUSLY LOOSENED.

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

- 1) PREFERRED - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS. PER 1,000 SQUARE FEET) AND 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS. PER 1,000 SQUARE FEET) BEFORE SEEDING. HARROW OR DISC INTO UPPER 3 INCHES OF SOIL AT TIME OF SEEDING. APPLY 400 LBS. PER ACRE 30-0-0 UREAFORM FERTILIZER (9 LBS. PER 1,000 SQUARE FEET).
- 2) ACCEPTABLE - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS. PER 1,000 SQUARE FEET) AND 1,000 LBS. PER ACRE 10-10-10 FERTILIZER (23 LBS. PER 1,000 SQUARE FEET) BEFORE SEEDING. HARROW OR DISC INTO UPPER 3 INCHES OF SOIL.

SEEDING: FOR THE PERIOD MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 1 THROUGH OCTOBER 15, SEED WITH 60 LBS. PER ACRE (1/4 LBS. PER 1,000 SQUARE FEET) OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 THROUGH JULY 31, SEED WITH 60 LBS. PER ACRE (1/4 LBS. PER 1,000 SQUARE FEET) OF KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS. PER ACRE (10.05 LBS. PER 1,000 SQUARE FEET) OF WEEPING LOVEGRASS. DURING THE PERIOD OCTOBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY ONE OF THE FOLLOWING OPTIONS:

- 1) 2 TONS PER ACRE OF WELL-ANCHORED MULCH STRAW AND SEED AS SOON AS POSSIBLE IN THE SPRING.
- 2) USE SOD.
- 3) SEED WITH 60 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS PER ACRE WELL-ANCHORED STRAW.

MULCHING: APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 90 LBS. PER 1,000 SQUARE FEET) OF UNROTATED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 28 GALLONS PER ACRE (5 GALLONS PER 1,000 SQUARE FEET) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES, 8 FEET OR HIGHER, USE 347 GALLONS PER ACRE (8 GALLONS PER 1,000 SQUARE FEET) FOR ANCHORING.

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

TEMPORARY SEEDING NOTES

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

SEEDBED PREPARATION: LOOSEN UPPER 3 INCHES OF SOIL BY RAKING, DISCING, OR OTHER ACCEPTABLE MEANS BEFORE SEEDING.

SOIL AMENDMENTS: APPLY 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS. PER 1,000 SQUARE FEET).

SEEDING: FOR PERIODS MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2 1/2 BUSHELS PER ACRE OF ANNUAL RYE (32 LBS. PER 1,000 SQUARE FEET). FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS. PER ACRE OF WEEPING LOVEGRASS (10.05 LBS. PER 1,000 SQUARE FEET). FOR THE PERIOD NOVEMBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELL-ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING OR USE SOD.

MULCHING: APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 90 LBS. PER 1,000 SQUARE FEET) OF UNROTATED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 28 GALLONS PER ACRE (5 GALLONS PER 1,000 SQUARE FEET) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES, 8 FEET OR HIGHER, USE 347 GALLONS PER ACRE (8 GALLONS PER 1,000 SQUARE FEET) FOR ANCHORING. REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

SEQUENCE OF CONSTRUCTION

1. OBTAIN THE NECESSARY PERMITS PRIOR TO CONSTRUCTION. (1 DAY)
2. INSTALL TREE PROTECTION FENCE (1 DAY)
3. INSTALL THE PERIMETER SEDIMENT CONTROL MEASURES INCLUDING SILT FENCE, SUPER SILT FENCE, EARTH DIKE, SUMP PIT, FILTER BAG AND STABILIZED CONSTRUCTION ENTRANCE AS SHOWN ON GRADING PLAN. INSTALL TEMP 4" PIPE FROM THE SUMP PIT TO THE NEW UNDERDRAIN SYSTEM TO ALLOW FOR A GRAVITY DEWATERING OF THE BASIN AREA DURING NON-WORKING HOURS. (5 DAYS)
4. UPON THE HOWARD COUNTY INSPECTOR'S APPROVAL, CLEAR AND GRUB THE SITE AS NEEDED. ANY WATER ENCOUNTERED DURING CONSTRUCTION WITHIN THE POND SHALL BE PUMPED THROUGH THE FILTER BAG. (2 DAYS)
5. UPON VERIFICATION OF A 5-DAY CLEAR (NO PRECIPITATION) WEATHER FORECAST FROM THE NATIONAL WEATHER SERVICE, BEGIN ROUGH GRADING AND REMOVAL OF THE EXISTING OUTLET STRUCTURE. INSTALL SUMP PIT STABILIZE AREAS OUTSIDE OF ANY SPECIFIC EROSION CONTROL DEVICE IMMEDIATELY. (5 DAYS)
6. INSTALL NEW OUTLET STRUCTURE, LOW FLOW DEVICE AND UNDERDRAIN SYSTEM. PLACE GRAVEL AS REQUIRED PER PLAN OR AS DIRECTED BY THE ENGINEER. (1 WEEK)
7. PLACE PLANTING SOIL WITHIN THE DESIGNATED BIORETENTION AREA. PLACE CONTAINER AND B & B LANDSCAPING MULCH ENTIRE POND AREA, EXCEPT FOR ACCESS ROAD AND AREA OF EARTH DIKE. (3 DAYS)
8. REMOVE THE EARTH DIKE AND IMMEDIATELY STABILIZE WITH 4" TOPSOIL, SEED AND MULCH. (2 DAYS)
9. STABILIZE THE DISTURBED AREAS WITH TOPSOIL, PERMANENT SEEDING AND MULCHING AS NEEDED. (1 WEEK)
10. UPON THE HOWARD CO. INSPECTOR'S APPROVAL, REMOVE ALL SEDIMENT EROSION CONTROL DEVICES AND STABILIZE THE REMAINING AREAS WITH PERMANENT SEEDING. (1 WEEK)

NOTE: THE TIME LINE EXCLUDES WEATHER RELATED DELAYS.

STANDARD SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (410-313-1855).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
 - A) 7 CALENDAR DAYS FOR ALL PERMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERMETER SLOPES, AND ALL SLOPES STEEPER THAN 3%.
 - B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THE PERIMETER IN ACCORDANCE WITH VOLUME 1, CHAPTER 7, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING, SOD, TEMPORARY SEEDING, AND MULCHING (SECTION G). TEMPORARY STABILIZATION WITH MULCH ALONE SHALL ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:
 - TOTAL SITE AREA - 0.97 ACRES
 - AREA DISTURBED - 0.97 ACRES
 - AREAS TO BE ROOFED OR PAVED - 0 ACRES
 - AREA TO BE VEGETATIVELY STABILIZED - 0.97 ACRES
 - TOTAL CUT - 1,200 C.Y.
 - TOTAL FILL - N/A
 - OFF-SITE WASTE SITE - HOWARD COUNTY LANDFILL
 - OFF-SITE BORROW SITE - APPROVED SITE WITH ACTIVE GRADING PERMIT
8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING, OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACKFILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.
12. SITE GRADING WILL BEGIN ONLY AFTER ALL PERIMETER SEDIMENT CONTROL MEASURES HAVE BEEN INSTALLED AND ARE IN A FUNCTIONING CONDITION.
13. SEDIMENT WILL BE REMOVED FROM TRAPS WHEN ITS DEPTH REACHES CLEAN OUT ELEVATION SHOWN ON THE PLANS.
14. CUT AND FILL QUANTITIES PROVIDED UNDER SITE ANALYSIS DO NOT REPRESENT BID QUANTITIES. THESE QUANTITIES DO NOT DISTINGUISH BETWEEN TOPSOIL, STRUCTURAL FILL OR EMBANKMENT MATERIAL, NOR DO THEY REFLECT CONSIDERATION OF UNDERCUTTING OR REMOVAL OF UNSUITABLE MATERIAL. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH SITE CONDITIONS WHICH MAY AFFECT THE WORK.
15. CONSTRUCTION WITHIN, ALONG OR ACROSS STREAM CHANNELS SHALL, AS A MINIMUM, CONFORM TO CRITERIA DESCRIBED UNDER "MARYLAND'S GUIDELINES TO WATERWAY CONSTRUCTION".

SOIL STABILIZATION MATTING

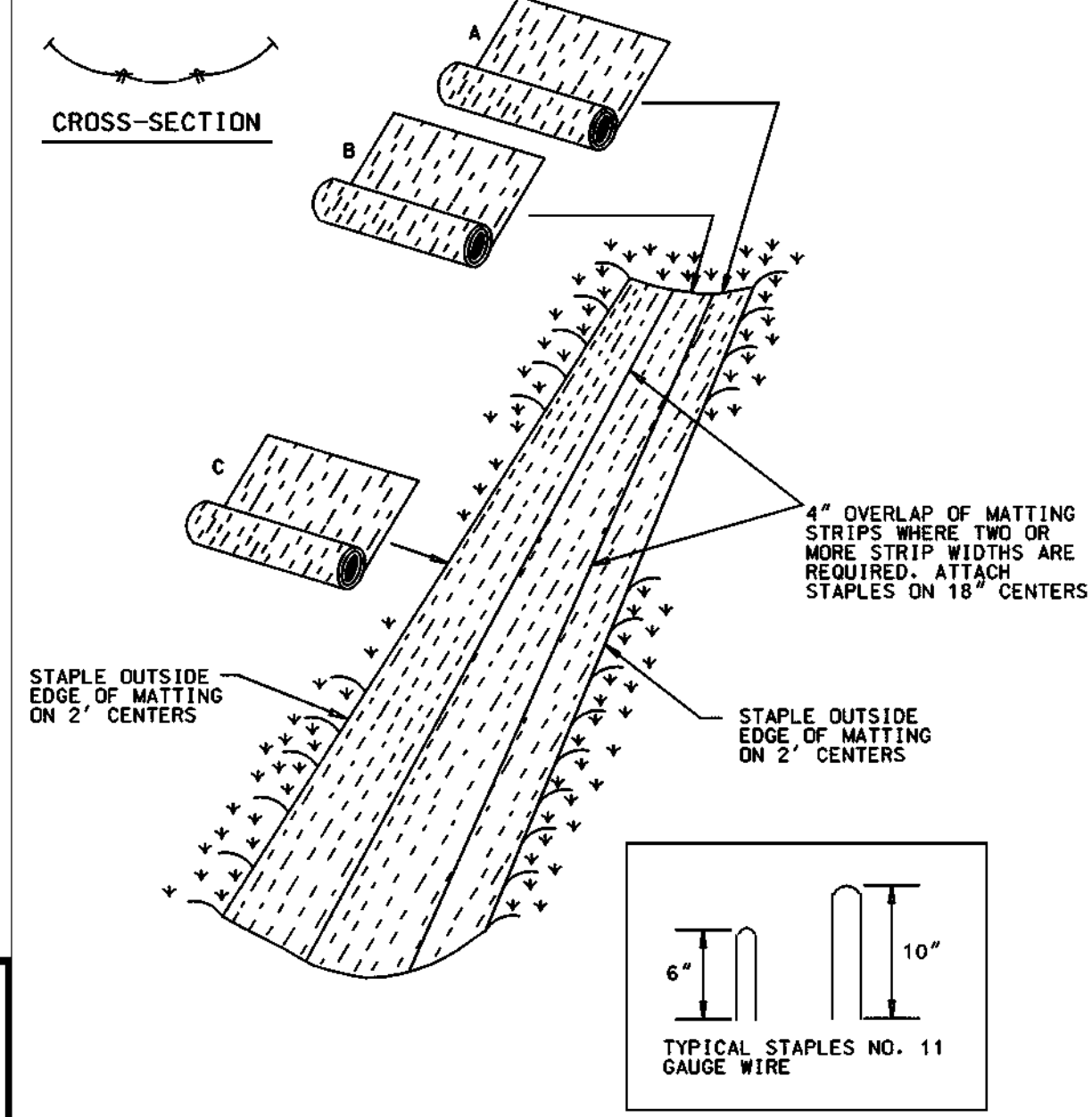
Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".
2. Staple the 4" overlap in the channel center using an 18" spacing between staples.
3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.
4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.
6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

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

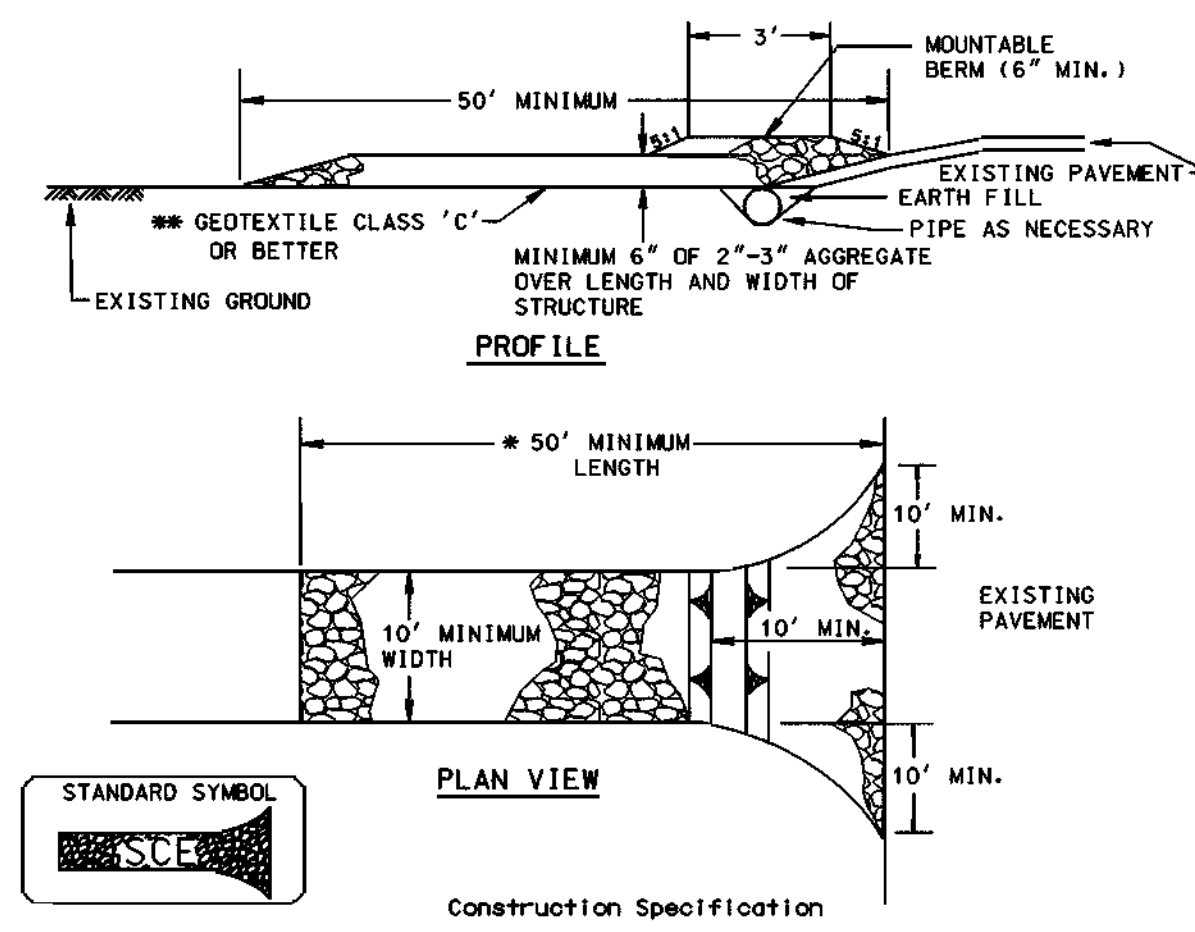
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE G - 22 - 2A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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DETAIL 30 - SOIL STABILIZATION MATTING



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DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

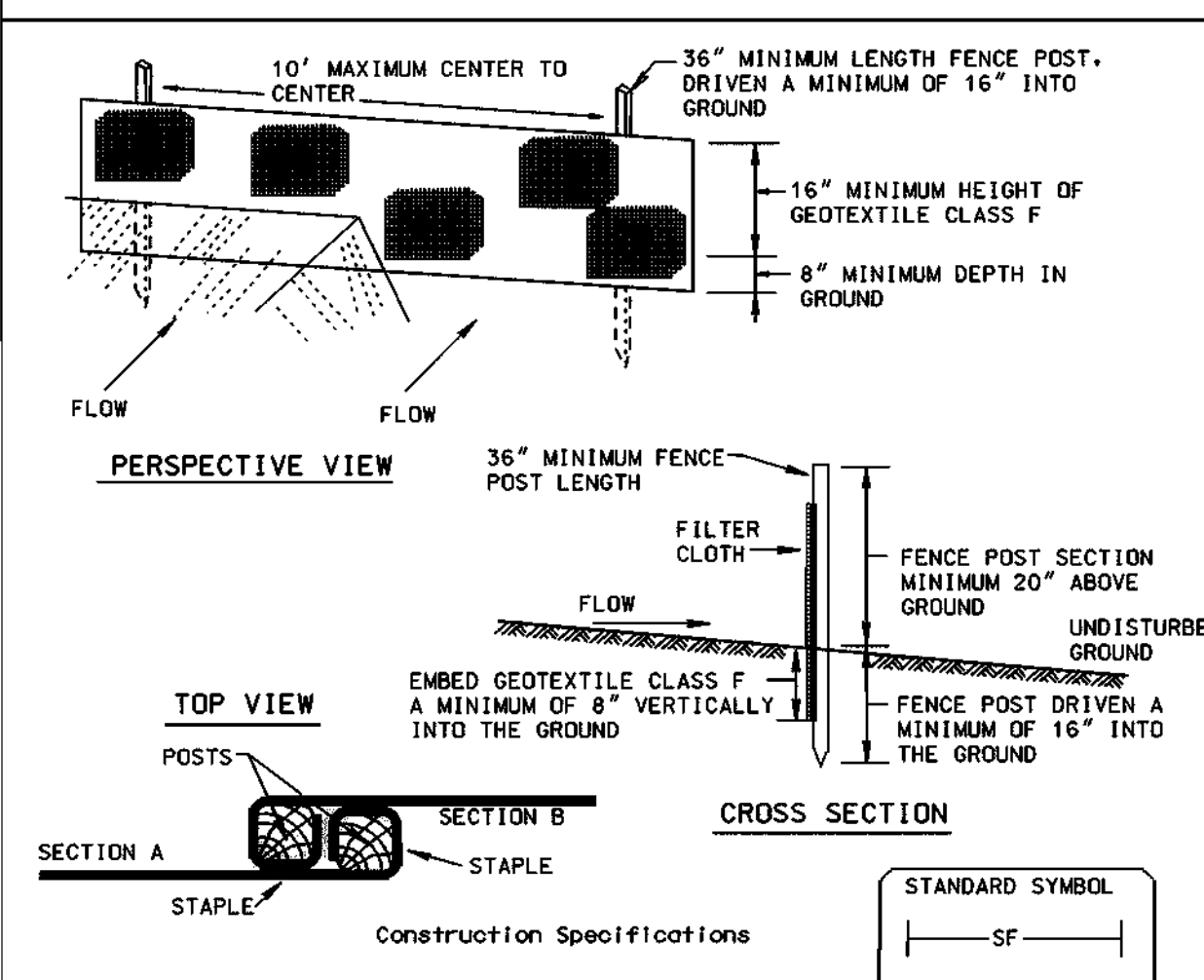


Construction Specifications

1. Length - minimum of 50' (#30' for single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mounded berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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DETAIL 22 - SILT FENCE



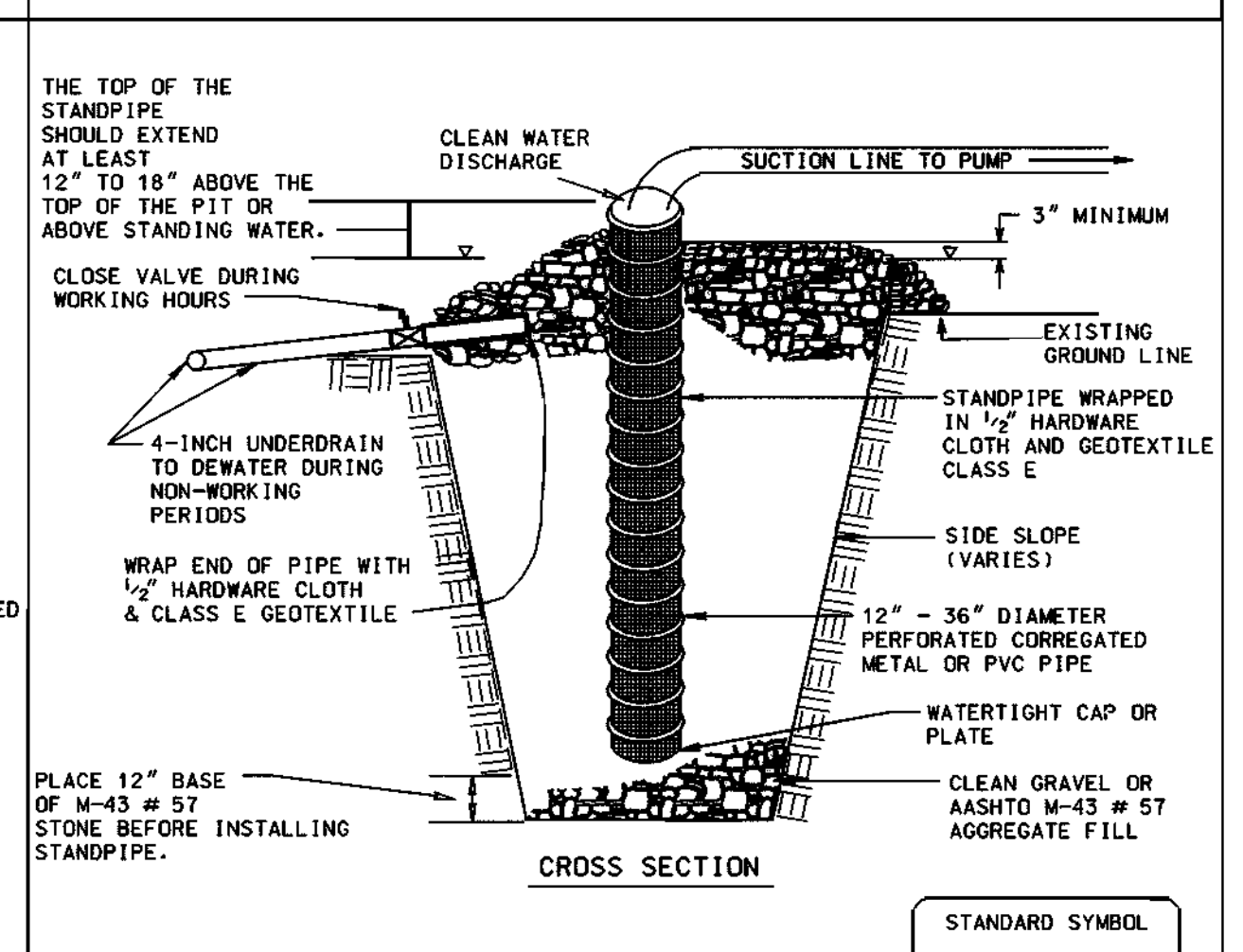
Construction Specifications

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

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal +/- minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322
 3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
 4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of the fabric height.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION
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DETAIL 20B - SUMP PIT

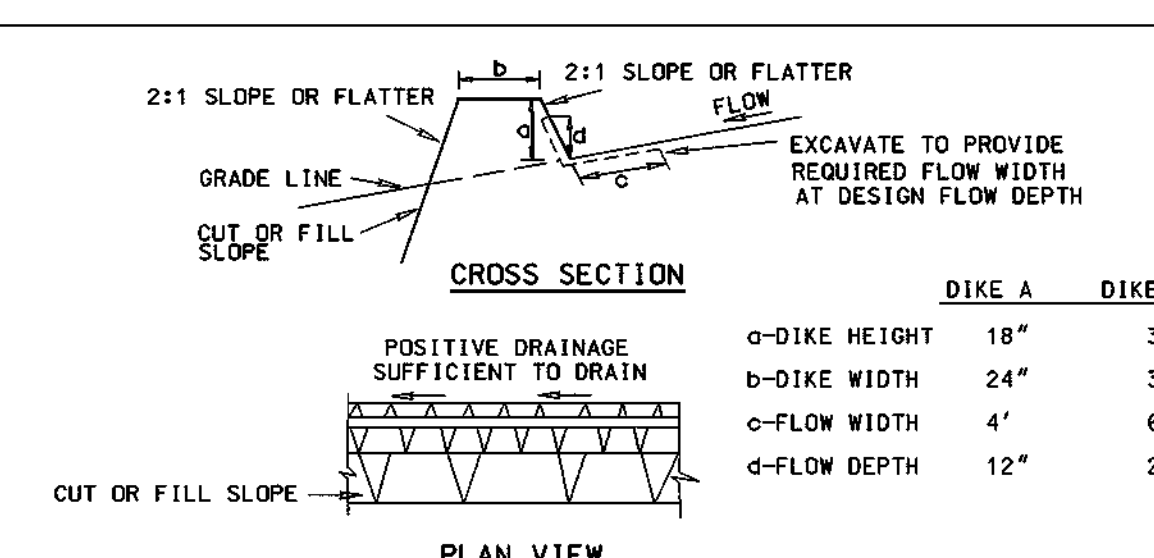


Construction Specifications

1. Pit dimensions are variable, with the minimum diameter being 2 times the standpipe diameter.
2. The standpipe should be constructed by perforating a 12" to 24" diameter corrugated or PVC pipe. Then wrapping with 1/2" hardware cloth and Geotextile Class E. The perforations shall be 1/2" x 6" slits or 1" diameter holes.
3. A base of filter material consisting of clean gravel or #57 stone should be placed in the pit to a depth of 12". After installing the standpipe, the pit surrounding the standpipe should then be backfilled with the same filter material.
4. The standpipe should extend 12" to 18" above the lip of the pit or the riser crest elevation (basin dewatering only) and the filter material should extend 3" minimum above the anticipated standing water elevation.

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DETAIL 1 - EARTH DIKE



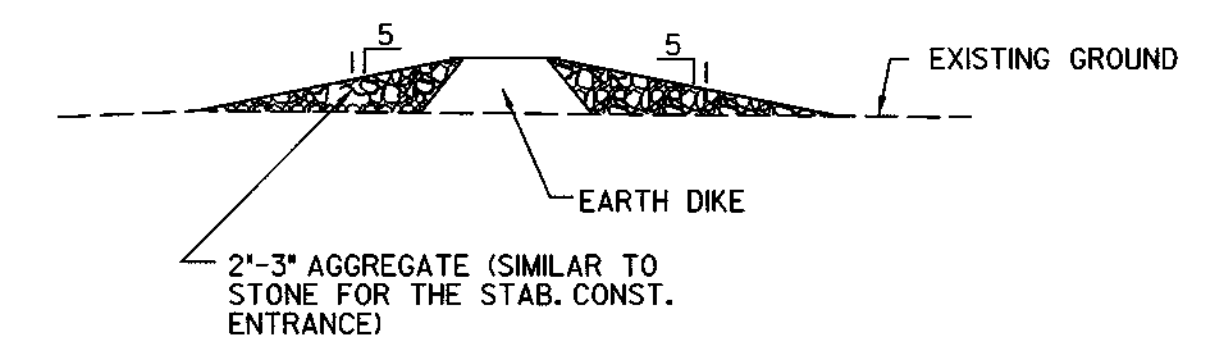
Construction Specifications

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

Construction Specifications

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

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

Construction Specifications

Construction Specifications

AS-BUILT CERTIFICATION

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

Signature _____ PE NO. _____
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 all responsible personnel involved in that construction project will have a Certificate of Attendance at a Department of the Environment Approved Training Program for the Control of Sediment and Erosion before beginning the project. I shall engage a registered professional engineer to supervise pond construction and provide the Howard Soil Conservation District with an "as-built" plan of the pond within 30 day of completion. I also authorize periodic on-site inspection by the Howard Soil Conservation District"

Howard E. Salyman 12/10/03
DEVELOPER DATE

ENGINEER'S CERTIFICATE

"I certify that this plan for sediment and erosion control represents a practical and workable plan based on my personal knowledge of the site conditions and that it as 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."

David T. Morlani N.P. 25, 2003
Signature of Engineer (Print name below signature) Date

These plans have been reviewed for the Howard Soil Conservation District and meet the technical requirements for small pond construction, soil erosion and sediment control.

Jim Meyer 12/23/03
USDA - Natural Resources Conservation Service Date

These plans for small pond construction, soil erosion and sediment control meet the requirements of the Howard Soil Conservation District.

Howard Soil Conservation District 12/23/03
Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING

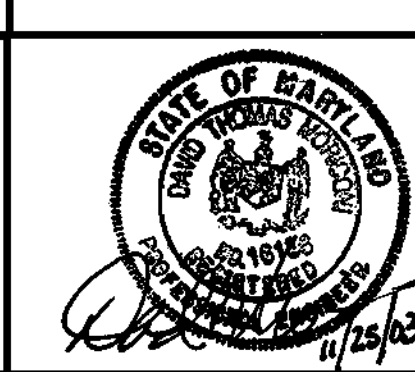
John J. ... 12/24/03
Chief, Development Engineering Division Date
Kathleen ... 12/20/03
Chief, Division of Land Development Date
Mark ... 12/21/03
Director Date

APPROVED: DEPARTMENT OF RECREATION AND PARKS

Lawrence ... 12-9-03
Director Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
John ... 12/19/03
DIRECTOR OF PUBLIC WORKS DATE
Howard E. Salyman 12/10/03
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

PREPARED BY
URS
4 NORTH PARK DRIVE
HUNT VALLEY, MARYLAND
TEL (410) 785-7220
John ... 12/19/03
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE
John ... 12-9-03
CHIEF, BUREAU OF HIGHWAYS DATE



DES: WLM	DRN: SYC/EGB	CHK: DTM	DATE: 8-01-03	BY NO.	REVISION	DATE
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EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

SCALE MAP NO. N/A BLOCK NO.

STORMWATER MANAGEMENT RETROFIT AT ROCKBURN TOWNSHIP - OPEN SPACE LOT 200 CAPITAL PROJECT NO. D-1106

1ST ELECTION DISTRICT - HOWARD COUNTY, MARYLAND
TAX MAP NO. 31/37, GRID NO. 21/3, PARCEL NO. 793

SCALE N.T.S.
SHEET 5 OF 8

CONSTRUCTION SPECIFICATIONS

THESE SPECIFICATIONS ARE APPROPRIATE TO ALL PONDS WITHIN THE SCOPE OF THE STANDARD FOR PRACTICE MD-378. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT VERSION.

SITE PREPARATION

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHARP BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 15 FEET OF THE TOE OF THE EMBANKMENT.

AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. TREES, BRUSH, AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE. FOR DRY STORMWATER MANAGEMENT PONDS, A MINIMUM OF A 25-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED.

ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE. WHEN SPECIFIED, A SUFFICIENT QUANTITY OF TOPSOIL WILL BE STOCKPILED IN A SUITABLE LOCATION FOR USE ON THE EMBANKMENT AND OTHER DESIGNATED AREAS.

EARTH FILL

MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6 INCHES, FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT, AND CUT OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION (C, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGNS MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER.

MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.

PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

COMPACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF HEAVY EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TIRED OR VIBRATORY ROLLER. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT.

WHEN REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 95% OF MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITH A MOISTURE CONTENT WITHIN ± 2% OF THE OPTIMUM. EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY, AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PROCTOR).

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

EMBANKMENT CORE - THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

STRUCTURE BACKFILL

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE, UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER 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 P.S.I. 28 DAY UN-CONFINED COMPRESSIVE STRENGTH. THE FLOWABLE FILL SHALL HAVE A MINIMUM PH OF 4.0 AND A MINIMUM RESISTIVITY OF 2,000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7" TO ASSURE FLOWABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING THE PIPE. WHEN USING FLOWABLE FILL, ALL METAL PIPE SHALL BE BITUMINOUS COATED. ANY ADJOINING SOIL FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHALL COMPLETELY FILL ALL VOIDS ADJACENT TO THE FLOWABLE FILL ZONE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE, UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURAL BACKFILL (FLOWABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE EMBANKMENT OR OTHER EMBANKMENT MATERIALS.

PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

CORRUGATED METAL PIPE -

ALL OF THE FOLLOWING 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 & 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.

POND MD-378-14 SPECIFICATIONS

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. DIPLE BANDS ARE NOT CONSIDERED TO BE WATERTIGHT.

ALL CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BANDWIDTH. THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 24 INCHES IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR 3/8 INCH CLOSED CELL NEOPRENE GASKET, PRE-PUNCHED TO THE FLANGE BOLT CIRCLE, SANDWICHED BETWEEN ADJACENT FLANGES; A 12 INCH WIDE STANDARD LAP TYPE BAND WITH 12 INCH WIDE BY 3/8 INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12 INCH WIDE HUGGER TYPE BAND WITH O-RING GASKETS HAVING A MINIMUM DIAMETER OF 1/2 INCH GREATER THAN THE CORRUGATION DEPTH. PIPES 24 INCHES IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24 INCH LONG ANNULAR CORRUGATED BAND USING A MINIMUM OF 4 (FOUR) RODS AND LUGS, 2 ON EACH CONNECTING PIPE END. A 24 INCH WIDE BY 3/8 INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET WILL BE INSTALLED WITH 12 INCHES ON THE END OF EACH PIPE. FLANGED JOINTS WITH 3/8 INCH THICK 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 UNSUITABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

5. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

REINFORCED CONCRETE PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361.

2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING / CRADLE FOR THEIR ENTIRE LENGTH. THIS BEDDING / CRADLE SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 50% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE A CONCRETE CRADLE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOWABLE FILL MAY BE USED 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 SPACES UNDER THE PIPE ARE FULLY COVERED. CARE SHALL BE TAKEN TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

PLASTIC PIPE - THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:

1. MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241. CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE, COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING: 4" - 10" INCH PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M252 TYPE S, AND 12" THROUGH 24" INCH SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE S.

2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATERTIGHT.

3. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSUITABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

DRAINAGE DIAPHRAGMS - WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

CONCRETE

CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

ROCK RIPRAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311. GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 921.09, CLASS C.

CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO ANY INLET 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 REQUIREMENTS. EXCAVATIONS WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTING OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED BELOW THE BOTTOM OF THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

STABILIZATION

ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A 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 NATURAL RESOURCE CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MD-342) OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.

EROSION AND SEDIMENT CONTROL

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

OPERATION AND MAINTENANCE SCHEDULE FOR STORMWATER PONDS (P-1 THROUGH P-5)

ROUTINE MAINTENANCE:

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

NON-ROUTINE MAINTENANCE:

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

TOPSOIL SPECIFICATIONS

SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:

1. TOPSOIL SHALL BE LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND, OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND SHALL CONTAIN LESS THAN 5 PERCENT BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1-1/2 INCHES IN DIAMETER.
2. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS AS BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
3. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 4-8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.
4. FOR SITES HAVE DISTURBED AREAS UNDER 5 ACRES, PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION - SECTION 1 VEGETATIVE STABILIZATION METHODS AND MATERIALS OF THE 1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

TOPSOIL APPLICATION:

- A. WHEN TOPSOILING, MAINTAIN NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE, AND SEDIMENT TRAPS AND BASINS.
- B. GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBEIT 4" - 8" HIGHER IN ELEVATION.
- C. TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN A 4" - 8" AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
- D. TOPSOIL SHALL NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDING PREPARATION.

RECORD OF SUBSURFACE EXPLORATION						
Project: Rockburn Township		Boring Number: B-2				
Location: Howard County, MD		Drilling Company: EBA Engineering, Inc.				
Job Number: 280220038		Driller: D. Addison				
Inspector: NA		Data drilled: 12/24/03				
Boring Method: Hollow Stem Auger		Surface Elevation: 578.2 feet				
Hole Diameter: 8 inches		Hammer Weight/Drop: 140lbs./30 in				
Water Level at Completion: NA		Water Level After 24 hrs.: 7.5' sand @ 14.5'				
Elevation	Description	Depth (ft)	Sample Number	Type	Blows / 6 in	Remarks
378.2		0				5 inches top soil
377	Orangeish brown, moist medium dense silty F-M SAND (fill)	1	S-1	SS	7-8-8	Location: Northing 564722 Easting 1375232
376		2				
375		3				
374	Orangeish brown, moist, very stiff, sandy CLAY trace gravel (fill)	4	S-2	SS	7-9-9	
373		5				
372	Orangeish brown, moist, stiff, sandy CLAY trace gravel (fill)	6	S-3	SS	6-7-8	
371		7				
370		8				
369	Orangeish brown, moist, very stiff, sandy CLAY trace plant roots (fill)	9	S-4	SS	5-7-9	
368		10				
367		11				
366	Orangeish brown, wet, dense, silty SAND with gravel, trace silt and clay	12	S-5	SS	10-18-20	
365		13				
364		14				
363	Bottom of boring @ 15.0 feet	15				
362		16				
361		17				
360		18				
359		19				
358		20				

EBA Engineering, Inc.
4813 Seton Drive
Baltimore, Maryland 21215

SS = Split Spoon
PT = Pushed Shelby Tube
RC = Rock Core

Sheet: 1 of 1

RECORD OF SUBSURFACE EXPLORATION						
Project: Rockburn Township		Boring Number: B-2				
Location: Howard County, MD		Drilling Company: EBA Engineering, Inc.				
Job Number: 280220038		Driller: D. Addison				
Inspector: NA		Data drilled: 12/24/03				
Boring Method: Hollow Stem Auger		Surface Elevation: 572.0 feet				
Hole Diameter: 8 inches		Hammer Weight/Drop: 140lbs./30 in				
Water Level at Completion: NA		Water Level After 24 hrs.: 7.5' sand @ 12.8'				
Elevation	Description	Depth (ft)	Sample Number	Type	Blows / 6 in	Remarks
372		0				5 inches top soil
371	Brown, moist, medium dense, silty fine to medium SAND (fill)	1	S-1	SS	7-7-9	Location: Northing 564696 Easting 1375255
370		2				
369		3				
368	Brown, moist, very stiff, silty CLAY with gravel (fill)	4	S-2	SS	9-10-10	
367		5				
366	light brown, moist to wet, medium dense, clayey fine SAND, trace gravel	6	S-3	SS	8-9-13	
365		7				
364		8				
363	Orangeish brown, wet, medium dense, silty SAND with gravel, trace silt and clay	9	S-4	SS	6-8-5	
362		10				
361		11				
360	light brown, wet, medium dense, fine to medium SAND, trace silt	12	S-5	SS	4-6-9	
359		13				
358		14				
357	Bottom of boring @ 15.0 feet	15				
356		16				
355		17				
354		18				
353		19				
352		20				

EBA Engineering, Inc.
4813 Seton Drive
Baltimore, Maryland 21215

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Sheet: 1 of 1

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature]
Chief, Development Engineering Division
Date: 12/24/03

[Signature]
Chief, Division of Land Development
Date: 12/30/03

[Signature]
Director
Date: 12/31/03

APPROVED: DEPARTMENT OF RECREATION AND PARKS

[Signature]
Director
Date: 12-7-03

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[Signature] 12/16/03
DIRECTOR OF PUBLIC WORKS DATE

[Signature] 12/10/03
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

[Signature] 12-9-03
CHIEF,

WET AREA SEED MIX (WAM)					
SEED VARIETY	PERCENTAGE OF SEED	MINIMUM PURITY	GERMINATION RATE	MAXIMUM % WEED	RATE LBS/1,000 SF
AGROSTIS ALBA - RED TOP	20%	98%	90%	.15%	2.0
AGROSTIS STOLONIFERA - CREEPING BENT GRASS	20%	98%	90%	.15%	2.0
POA PALUSTRIS - FOWL BLUEGRASS	20%	98%	90%	.15%	2.0
ELYMUS RIPARIUS - RIVERBANK WILD RYE	20%	98%	90%	.15%	2.0
PUCCINELLIA DISTANS - ALKALIGRASS	20%	98%	90%	.15%	2.0
TOTAL					10.0 LBS

NATIVE GRASS SEED MIX (NGM)					
SEED VARIETY	PERCENTAGE OF SEED	MINIMUM PURITY	GERMINATION RATE	MAXIMUM % WEED	RATE LBS/1,000 SF
TRIPSACUM DACTYLOIDES - EASTERN GAMMAGRASS	20%	98%	90%	.15%	2.2
ELYMUS CANDENSIS - CANADA WILD RYE	12%	98%	90%	.15%	1.1
ANDROPOGON GERARDII - BIG BLUESTEM	10%	98%	90%	.15%	1.1
ANDROPOGON SCOPARIUS - LITTLE BLUESTEM	10%	98%	90%	.15%	1.1
CHAMAECRISTA FASCICULATA - PARTRIDGE PEA	10%	98%	90%	.15%	1.1
PANICUM VIRGATUM - SWITCHGRASS	10%	98%	90%	.15%	1.1
POA PALUSTRIS - FOWL BLUEGRASS	10%	98%	90%	.15%	1.1
SORGHASTRUM NUTANS - INDIANGRASS	10%	98%	90%	.15%	1.1
COREOPSIS TINCTORIA - COREOPSIS	8%	98%	90%	.15%	0.9
TOTAL					10.8 LBS

MASTER PLANT SCHEDULE							
KEY	QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT	SPACING	REMARKS
AR	9	ALNUS RUGOSA	SPECKLED ALDER	6' HT.	B&B	10' O.C.	
BN	6	BETULA NIGRA	RIVER BIRCH	8' HT.	B&B	14' O.C.	
BB	29	CEPHALANTHUS OCCIDENTALIS	BUTTONBUSH	36" HT.	CONT.	9' O.C.	
CA	16	CLETHRA ALNIFOLIA	CLETHRA	24" HT.	CONT.	9' O.C.	
MV	3	MAGNOLIA VIRGINIANA	SWEETBAY	6' HT.	B&B		
PS	12	PINUS STROBUS	WHITE PINE	6' HT.	B&B	RANDOM	20' TO 35' O.C.
OP	5	QUERCUS PHELLOS	WILLOW OAK	2-1/2" CAL.	B&B	40' O.C.	
WAM	10,242 SF	WET AREA SEED MIX					
NGM	19,870 SF	NATIVE GRASS SEED MIX					

CAL. INDICATES CALIPER IN INCHES FOR SHADE TREES.
 HT. INDICATES HEIGHT IN FEET.
 B&B INDICATES PLANT MATERIAL SUPPLIED BALLED AND BURLAPPED.
 O.C. INDICATES ON CENTER SPACING

SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING	
Linear Feet of Perimeter (LF)	776
Linear Feet of Existing Vegetation (LF)	302
Net Linear Feet of Perimeter (LF)	474
Number of Trees Required	
Shade Trees (1 per 50 LF)	10
Evergreen Trees (1 per 40 LF)	12
Credit for Existing Vegetation (No, Yes and %)	Yes 39%
Credit for Existing Landscaping (No, Yes and %)	No
Number of Trees Provided	
Shade Trees (1 per 50 LF)	5
Evergreen Trees (1 per 40 LF)	12
Other Trees (2:1 substitution)	18 (= 9 Shade Trees)
Shrubs (10:1 substitution)	45 (= 4.5 Shade Trees)

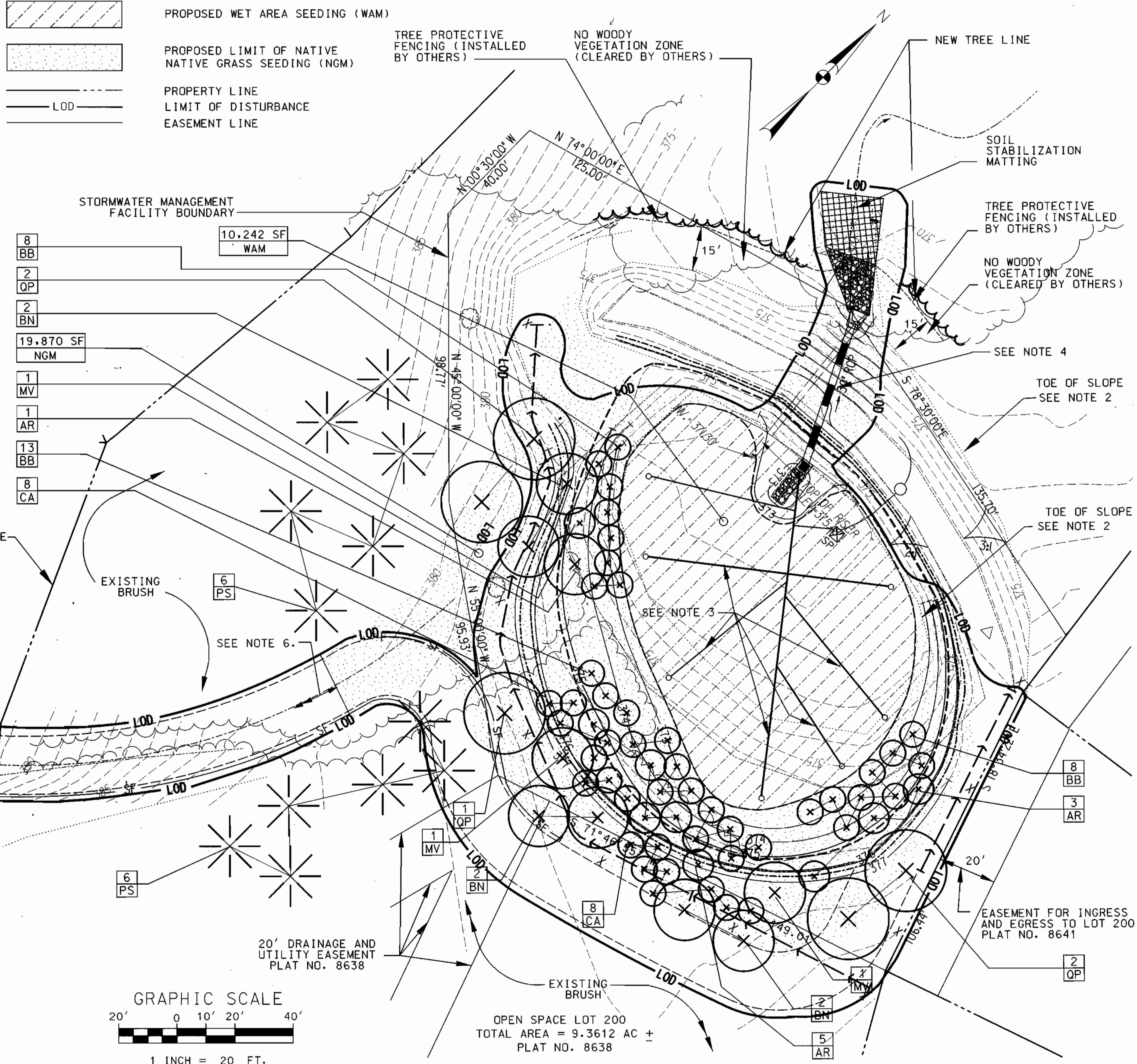
FINAL PLANTINGS OUTSIDE THE LIMIT OF DISTURBANCE SHALL BE PERFORMED AT THE COUNTY'S DISCRETION. PLANTINGS SHALL BE COORDINATED WITH THE DEPARTMENT OF RECREATION AND PARKS

LEGEND

- 371 --- EXIST. CONTOUR
- 370 --- EXIST. TREE LINE/ BRUSH LINE
- x ○ PROPOSED SHRUB/TREE
- 370 --- PROPOSED CONTOUR
- ▨ PROPOSED WET AREA SEEDING (WAM)
- ▩ PROPOSED LIMIT OF NATIVE NATIVE GRASS SEEDING (NGM)
- LOD --- PROPERTY LINE
- LOD --- LIMIT OF DISTURBANCE
- LOD --- EASEMENT LINE

PLANTING NOTES

1. PLAN FOR LANDSCAPING PURPOSES ONLY.
2. PLANT TREES AND SHRUBS 15 FEET AWAY FROM THE TOE OF SLOPE OF A DAM.
3. PLANT TREES AND SHRUBS 25 FEET AWAY FROM 4" PERFORATED PVC PIPES.
4. PLANT TREES AND SHRUBS 25 FEET AWAY FROM PRINCIPAL SPILLWAY STRUCTURES.
5. NO FERTILIZER SHALL BE ADDED TO SEEDING AND SHRUB PLANTING AREAS.
6. AREAS DISTURBED BEYOND LIMITS OF DISTURBANCE OR SEEDING AREAS SHOWN SHALL BE SEEDDED WITH KENTUCKY 31 TALL FESCUE - SEE EROSION AND SEDIMENT CONTROL NOTES AND DETAILS.
7. PLANT MATERIAL SHALL BE WARRANTED FOR ONE YEAR AFTER DATE OF ACCEPTANCE.



I/We certify that the landscaping shown on this plan will be done according to the approved plan, Section 16.124 of the Howard County Code and the Landscape Manual. I/We further certify that upon completion a letter of installation, accompanied by an executed one year guarantee of plant materials, will be submitted to the Department of Planning and Zoning.

Howard E. Saltzman 12/18/03
 Developer's Name Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division 4 12/24/03
 Chief, Division of Land Development 12/30/03
 DIRECTOR 12/31/03

APPROVED: DEPARTMENT OF RECREATION AND PARKS
 12-7-03
 DIRECTOR Date



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
 DIRECTOR OF PUBLIC WORKS 12/18/03
 12/18/03
 CHIEF, STORMWATER MANAGEMENT DIVISION

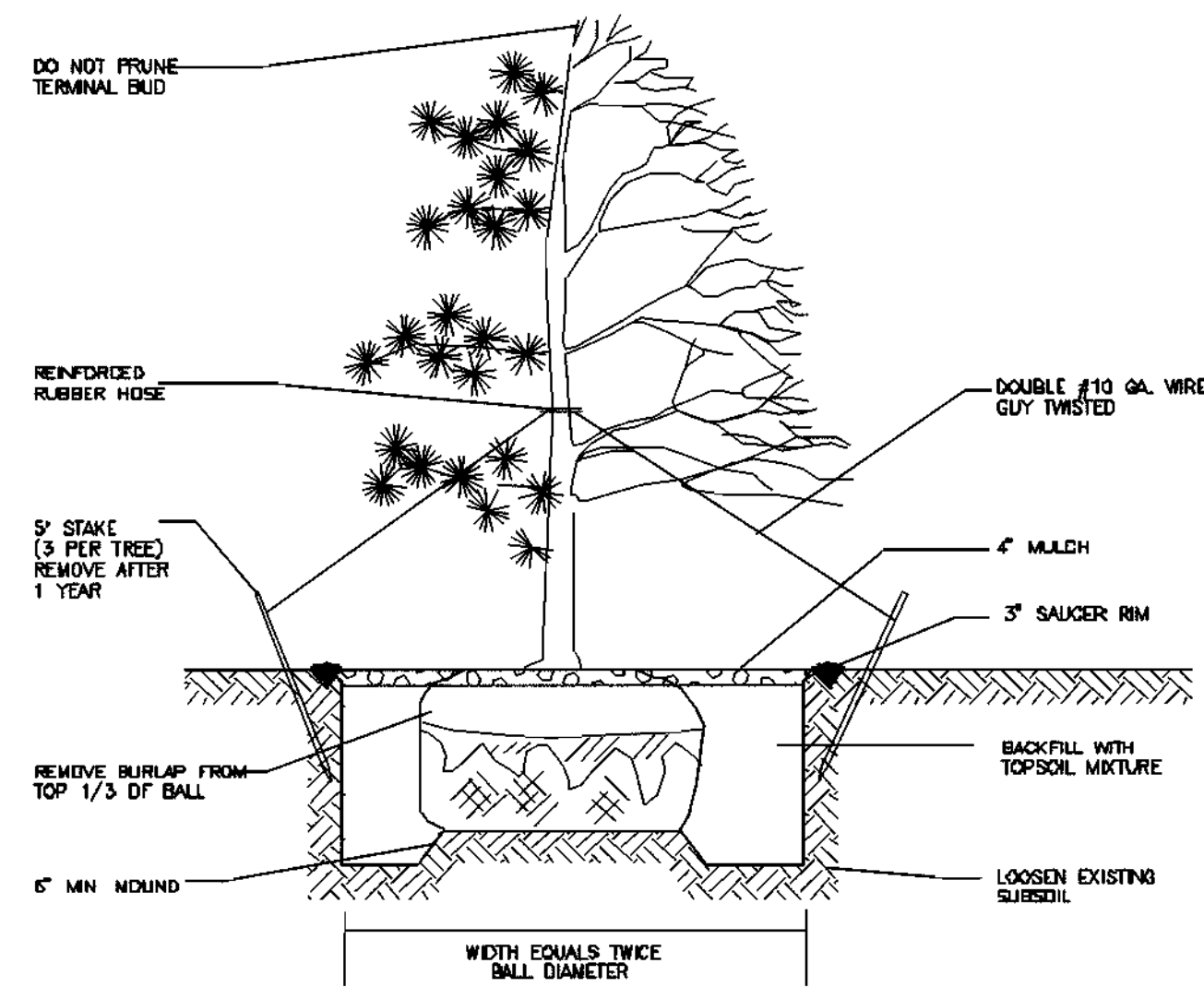
PREPARED BY
 URS
 4 NORTH PARK DRIVE
 HUNT VALLEY, MARYLAND
 TEL: (410) 785-7220
 12/15/03



DES: WHS			
DRN: WHS			
CHK: RKK			
DATE: 8-01-03	BY NO.	REVISION	DATE

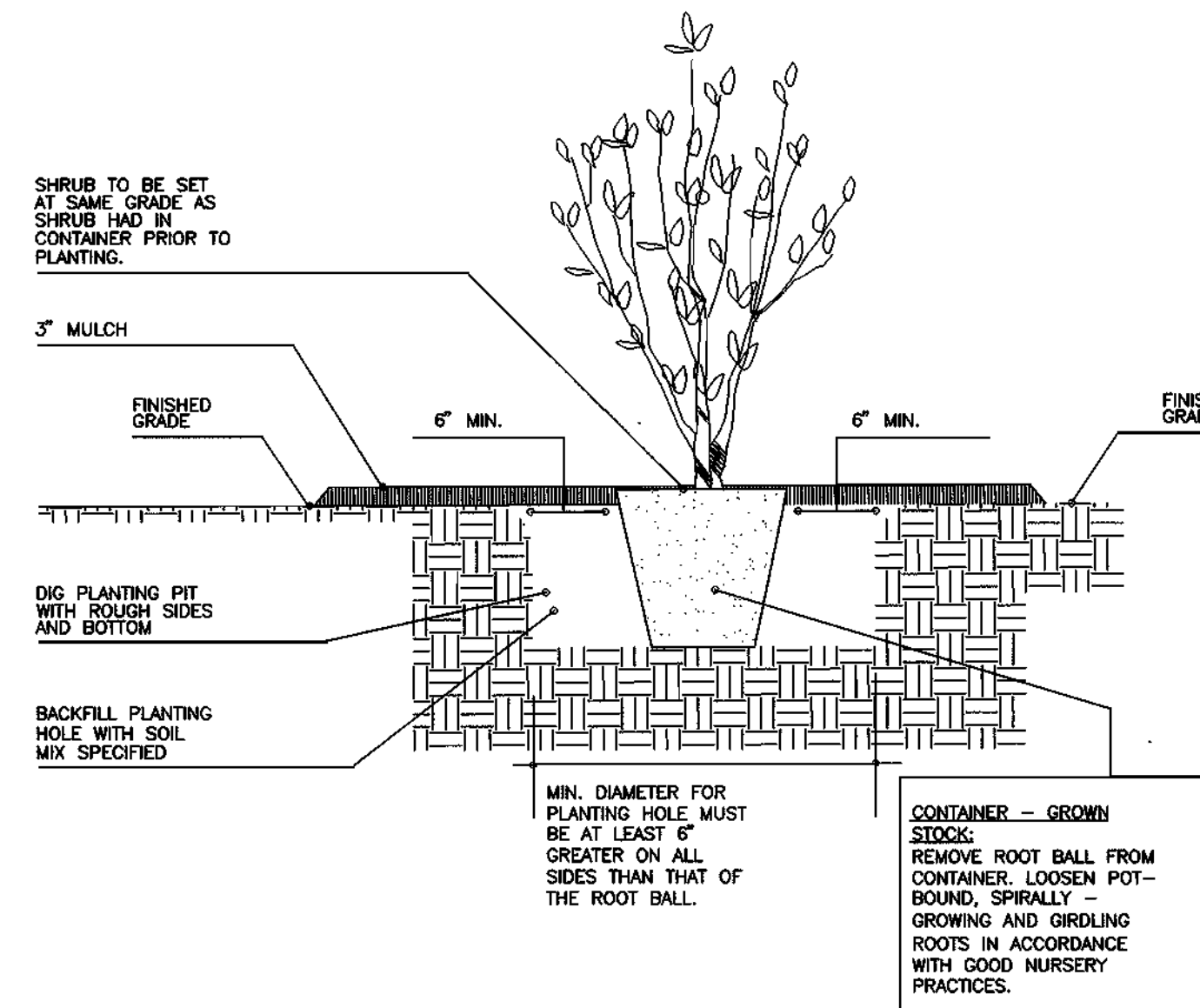
LANDSCAPE PLAN
 SCALE MAP NO. N/A BLOCK NO.

STORMWATER MANAGEMENT RETROFIT AT
 ROCKBURN TOWNSHIP - OPEN SPACE LOT 200
 CAPITAL PROJECT NO. D-1106
 1ST ELECTION DISTRICT - HOWARD COUNTY, MARYLAND
 TAX MAP NO. 31/37, GRID NO. 21/3, PARCEL NO. 793
 SCALE 1"=20'
 SHEET 7 OF 8



EVERGREEN/DECIDUOUS TREE PLANTING DETAIL
NOT TO SCALE

- NOTES
1. STAKES TO BE DRIVEN INTO UNDISTURBED SOIL
 2. PRUNE ALL BROKEN OR DAMAGED BRANCHES
 3. GROUND LINE TO BE THE SAME AS EXISTED AT NURSERY
 4. FOLLOW DETAIL ABOVE FOR SHRUB PLANTING NO STAKING NECESSARY
 5. MATERIALS WITH A FALL PLANTING HAZARD SHALL BE HANDLED ACCORDINGLY
 6. ALL PLANT MATERIAL SHALL CONFORM TO THE AMER. ASSOC. OF NURSERMEN'S STANDARDS.



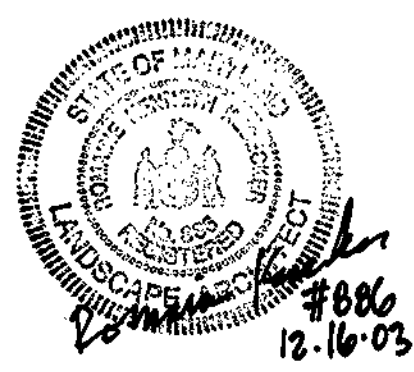
SHRUB PLANTING DETAIL
NOT TO SCALE

I/We certify that the landscaping shown on this plan will be done according to the approved plan, Section 16.124 of the Howard County Code and the Landscape Manual. I/We further certify that upon completion a letter of installation, accompanied by an executed one year guarantee of plant materials, will be submitted to the Department of Planning and Zoning.

Howard E. Salltyman 12/8/03
Developer's Name Date

APPROVED: DEPARTMENT OF PLANNING AND ZONING
[Signature] 12/24/03
 Chief, Development Engineering Division Date
[Signature] 12/20/03
 Chief, Division of Land Development Date
[Signature] 12/11/03
 Director Date

APPROVED: DEPARTMENT OF RECREATION AND PARKS
[Signature] 12-9-03
 Director Date



DEPARTMENT OF PUBLIC WORKS
 HOWARD COUNTY, MARYLAND
[Signature] 12/8/03
 DIRECTOR OF PUBLIC WORKS DATE
[Signature] 12/18/03
 CHIEF, STORMWATER MANAGEMENT DIVISION DATE

PREPARED BY
URS
 4 NORTH PARK DRIVE
 HUNT VALLEY, MARYLAND
 TEL: (410) 785-7220



DES:	WHS				
DRN:	WHS				
CHK:	RKK				
DATE:	8-01-03	BY	NO.	REVISION	DATE

LANDSCAPE DETAILS
 SCALE MAP NO. N/A BLOCK NO.

STORMWATER MANAGEMENT RETROFIT AT ROCKBURN TOWNSHIP - OPEN SPACE LOT 200 CAPITAL PROJECT NO. D-1106
 1ST ELECTION DISTRICT - HOWARD COUNTY, MARYLAND
 TAX MAP NO. 31/37, GRID NO. 21/3, PARCEL NO. 793

SCALE AS SHOWN
 SHEET 8 OF 8