





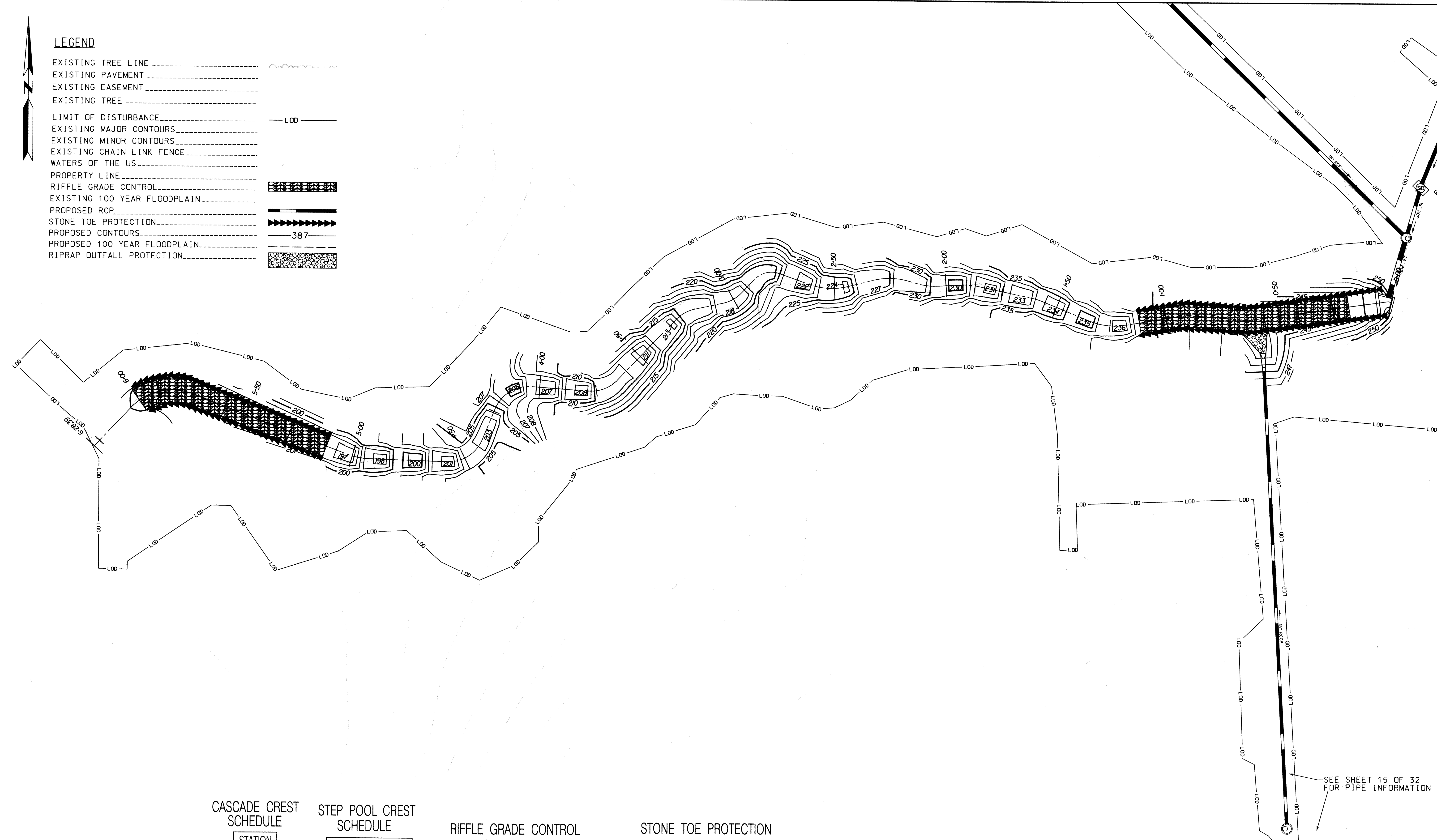






**LEGEND**

EXISTING TREE LINE	-----
EXISTING PAVEMENT	-----
EXISTING EASEMENT	-----
EXISTING TREE	-----
LIMIT OF DISTURBANCE	----- L00 -----
EXISTING MAJOR CONTOURS	-----
EXISTING MINOR CONTOURS	-----
EXISTING CHAIN LINK FENCE	-----
WATERS OF THE US	-----
PROPERTY LINE	-----
RIFFLE GRADE CONTROL	-----
EXISTING 100 YEAR FLOODPLAIN	-----
PROPOSED RCP	-----
STONE TOE PROTECTION	-----
PROPOSED CONTOURS	----- 387 -----
PROPOSED 100 YEAR FLOODPLAIN	-----
RIPRAP OUTFALL PROTECTION	-----



CASCADE CREST SCHEDULE

STATION
2+21.0
2+38.0
2+55.0
2+72.0
2+89.0
3+06.0
3+23.0
3+40.0
3+57.0

STEP POOL CREST SCHEDULE

STATION	STATION
1+13.5	3+89.5
1+28.5	4+04.5
1+43.5	4+19.5
1+58.5	4+50.0
1+73.5	4+65.5
1+88.5	4+80.5
2+04.0	4+95.5
3+74.5	5+10.5

\*CREST STATIONING REPRESENTS THE CENTER LOCATION ALONG THE BASELINE

RIFFLE GRADE CONTROL SCHEDULE

FROM STATION	TO STATION
0+19	1+12
5+12	6+00

STONE TOE PROTECTION SCHEDULE

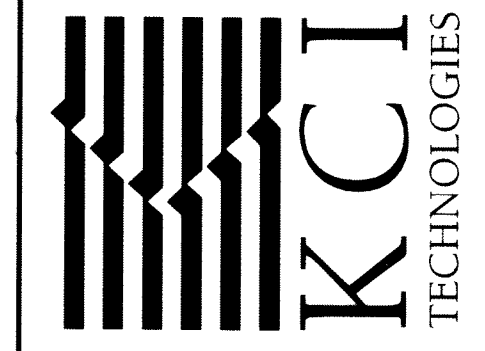
FROM STATION	TO STATION	LOCATION*
0+03	1+12	R
0+01	1+12	L
5+12	6+00	R
5+12	6+00	L

\*LOCATION IS SIDE OF BANK FACING DOWNSTREAM

SEE SHEET 15 OF 32 FOR PIPE INFORMATION

NO.	REVISIONS DESCRIPTION	DATE

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SAVAGE PARK  
 CHANNEL STABILIZATION AND  
 STORMWATER MANAGEMENT  
 SECTION 4 AREAS 1,2,3  
 CAPITAL PROJECT S-6175

STREAM GRADING PLAN

SCALE:	1" = 20'
DATE:	SEPTEMBER 2010
KCI JOB NO.:	01-081795.20
CAPITAL PROJECT NO.:	S-6175
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

D1124 08-  
 SAVAGE PARK  
 STORM DRAIN

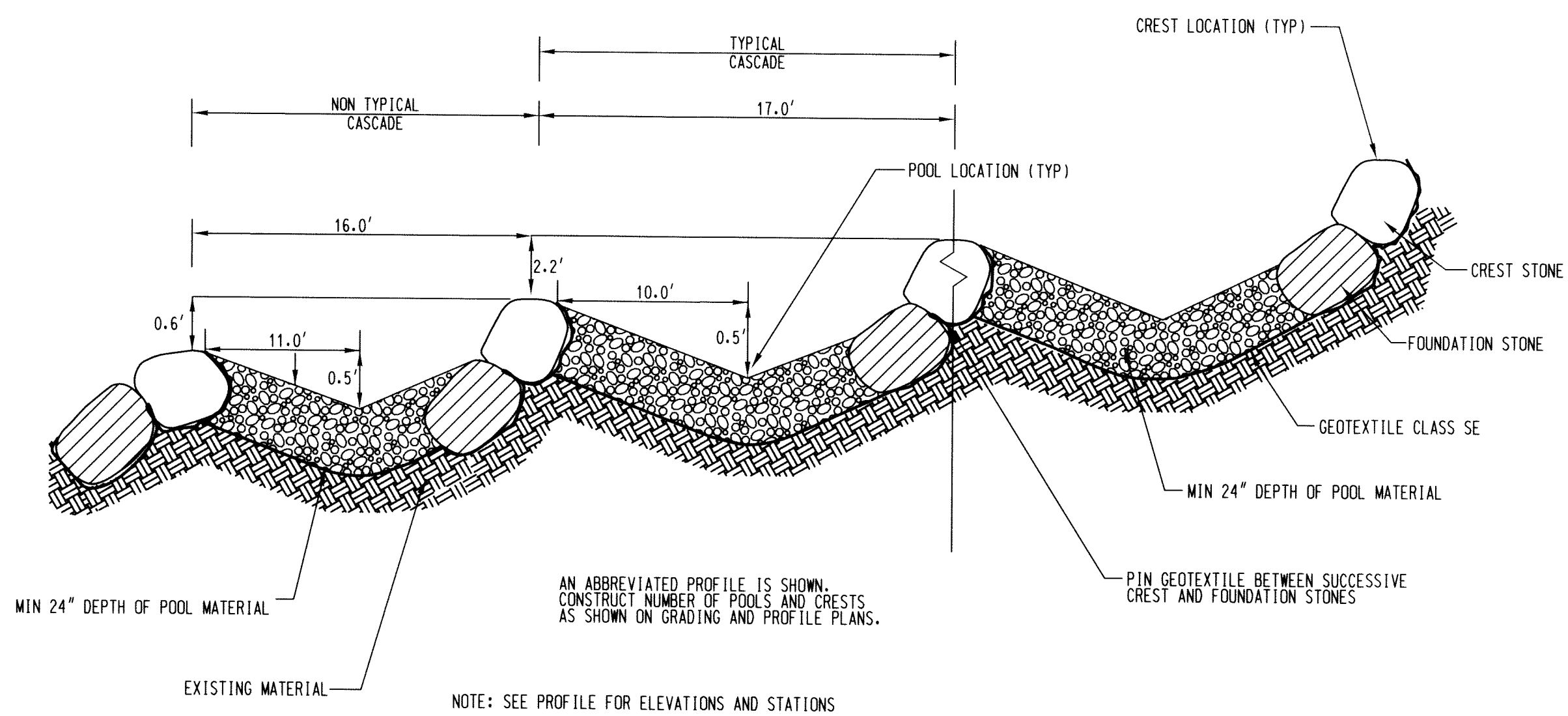
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011

PLOTTED: 11:52 AM on Monday, September 13, 2010  
 BY: Ashley, Pline, Division: P050, Nctur of Res, CMA, Emp  
 FILE: \\K0208\01081795.20\Drawings\3501\save.dgn

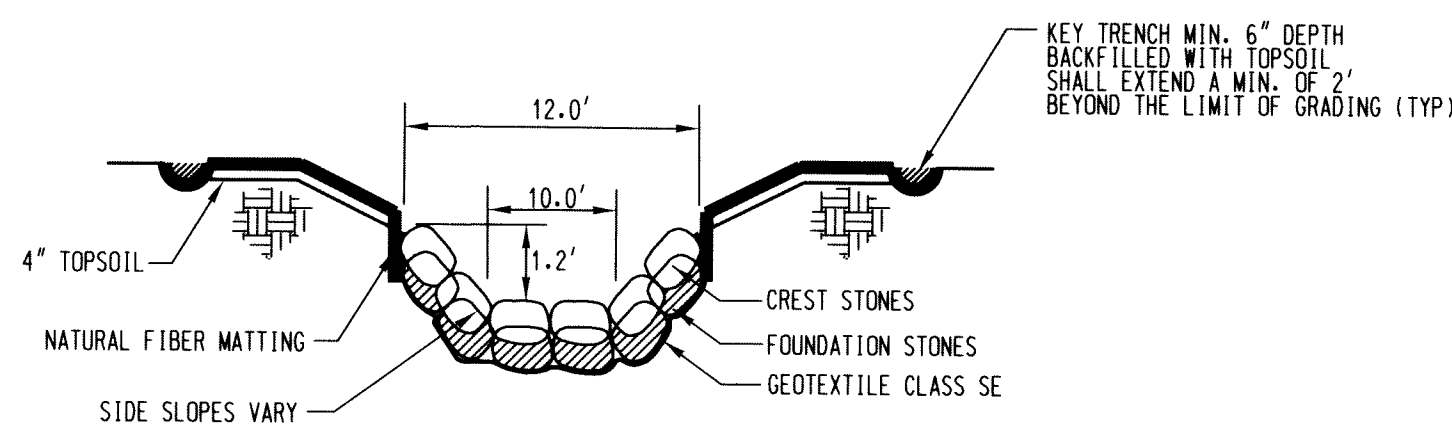




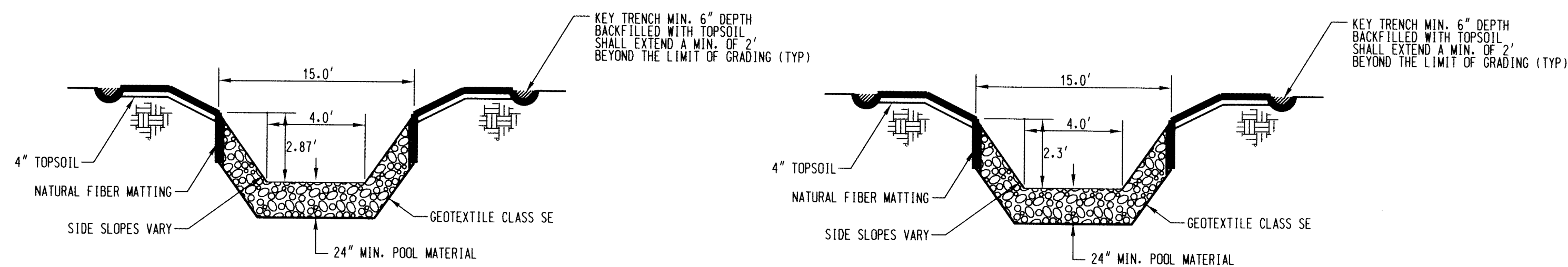




PROFILE - CASCADE FROM 2+05 TO 3+75  
NOT TO SCALE

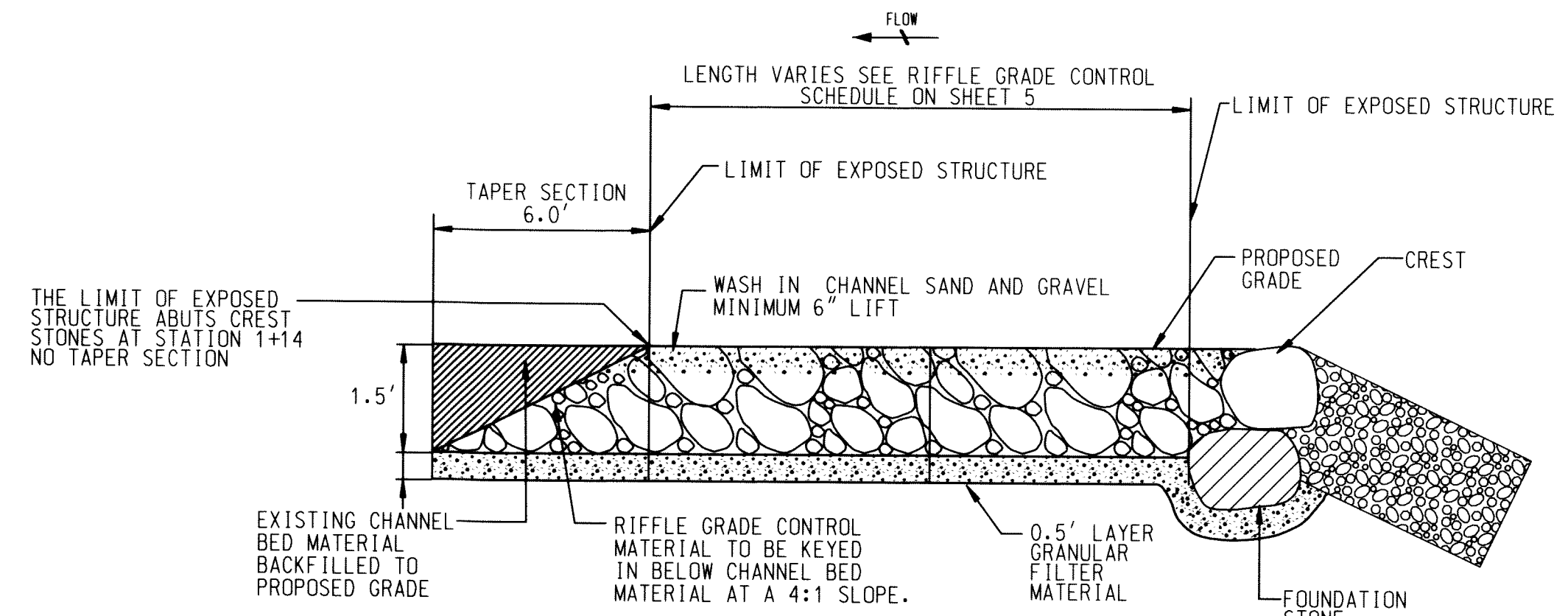


TYPICAL CASCADE CROSS SECTION - CREST  
NOT TO SCALE

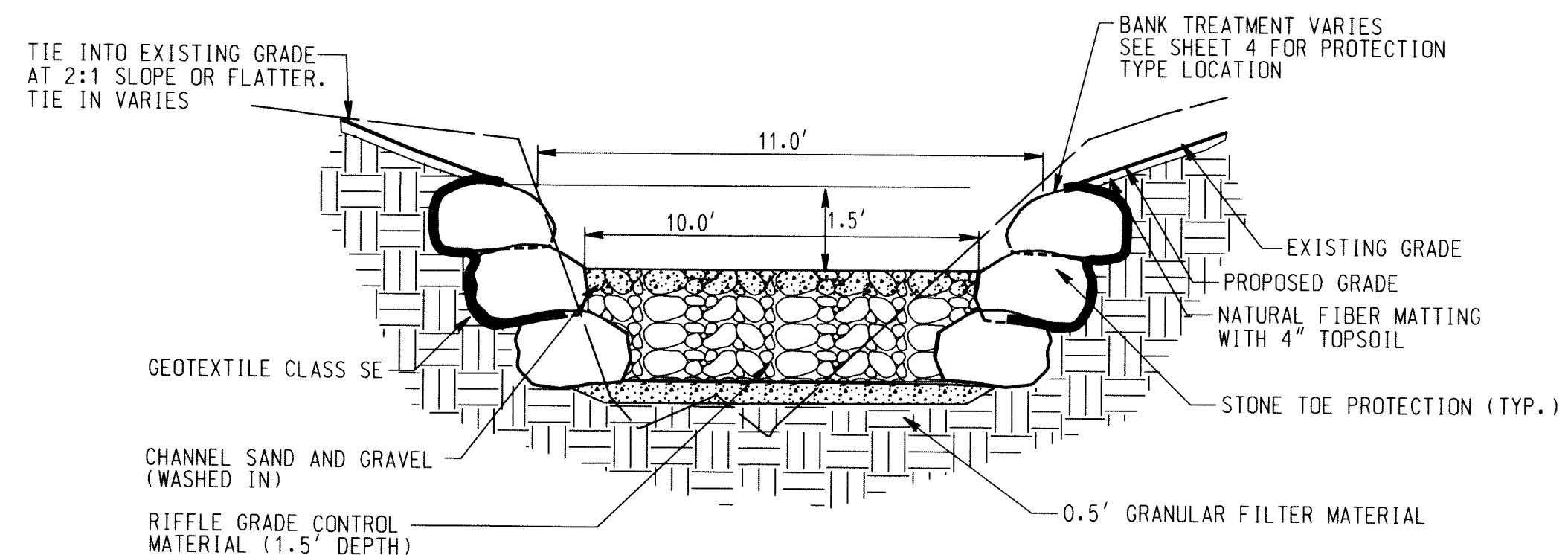


TYPICAL CASCADE CROSS SECTION - POOL  
NOT TO SCALE

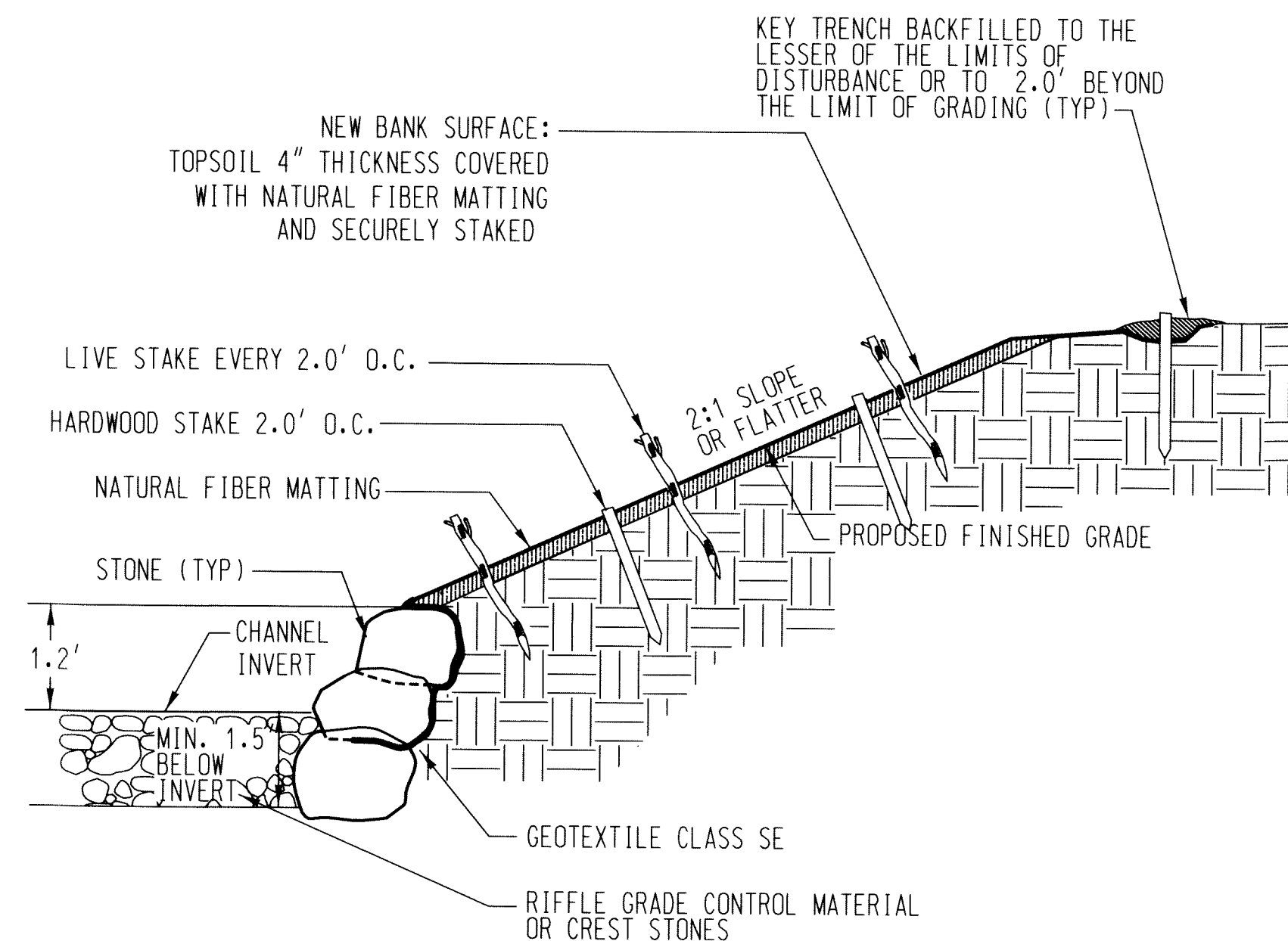
NON TYPICAL CASCADE CROSS SECTION - POOL  
NOT TO SCALE



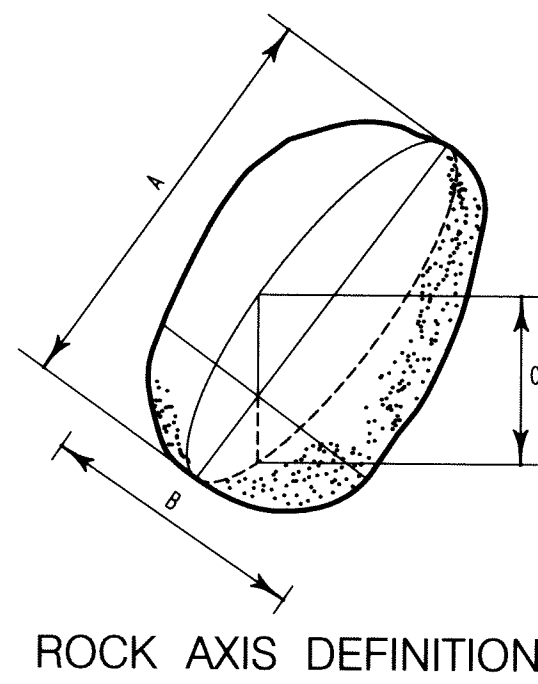
TYPICAL RIFFLE GRADE CONTROL PROFILE  
NOT TO SCALE



TYPICAL SECTION - RIFFLE GRADE CONTROL  
NOT TO SCALE



TYPICAL STONE TOE PROTECTION DETAIL  
NOT TO SCALE



ROCK AXIS DEFINITION  
NOT TO SCALE

GRANULAR FILTER MATERIAL	
% LESS THAN	US STD SIEVE
100	2.5 in
85-100	1.0 in
60-100	0.5 in
35-70	No. 10
20-50	No. 40
3-20	No. 200

RIFFLE GRADE CONTROL MATERIAL	
% LESS THAN	SIZE (INCHES)
10	1.7
30	5.5
50	8.2
60	9
84	12
100	16.4

AXIS	SIZES FOR STONE TYPES		
	A (LONGEST)	B (INTERMEDIATE)	C (SHORTEST)
STONE TYPE	MAX.	RANGE	MIN.
STONE TOE	3.0'	2.0' - 2.5'	1.5'
CREST STONE	3.0'	2.0' - 3.0'	1.0'
FOUNDATION STONE	3.0'	2.0' - 3.0'	1.0'

POOL MATERIAL RIPRAP SIZES	
CASCADES	CLASS II
STEP POOLS	50% CLASS 0 50% CLASS I

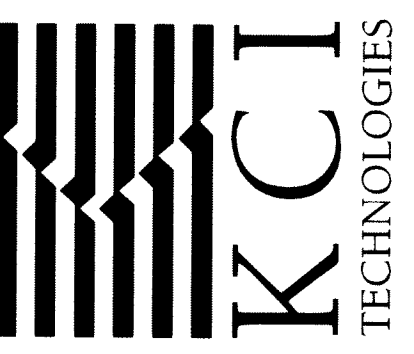
ALL STONES SHALL BE ANGULAR IN SHAPE. CREST AND FOUNDATION STONES SHALL BE BLOCKY IN SHAPE FOR STACKING



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SAVAGE PARK  
CHANNEL STABILIZATION AND  
STORMWATER MANAGEMENT  
SECTION 4 AREAS 133  
CAPITAL PROJECT S-6175

STREAM  
DETAIL  
SHEET 2

SCALE:  
DATE: SEPTEMBER 2010  
KCI JOB NO.: 01-081795.20  
CAPITAL PROJECT NO.: S-6175  
PERMIT ISSUE:  
CONSTRUCTION ISSUE:

D1124 08-  
SAVAGE PARK  
STORM DRAIN





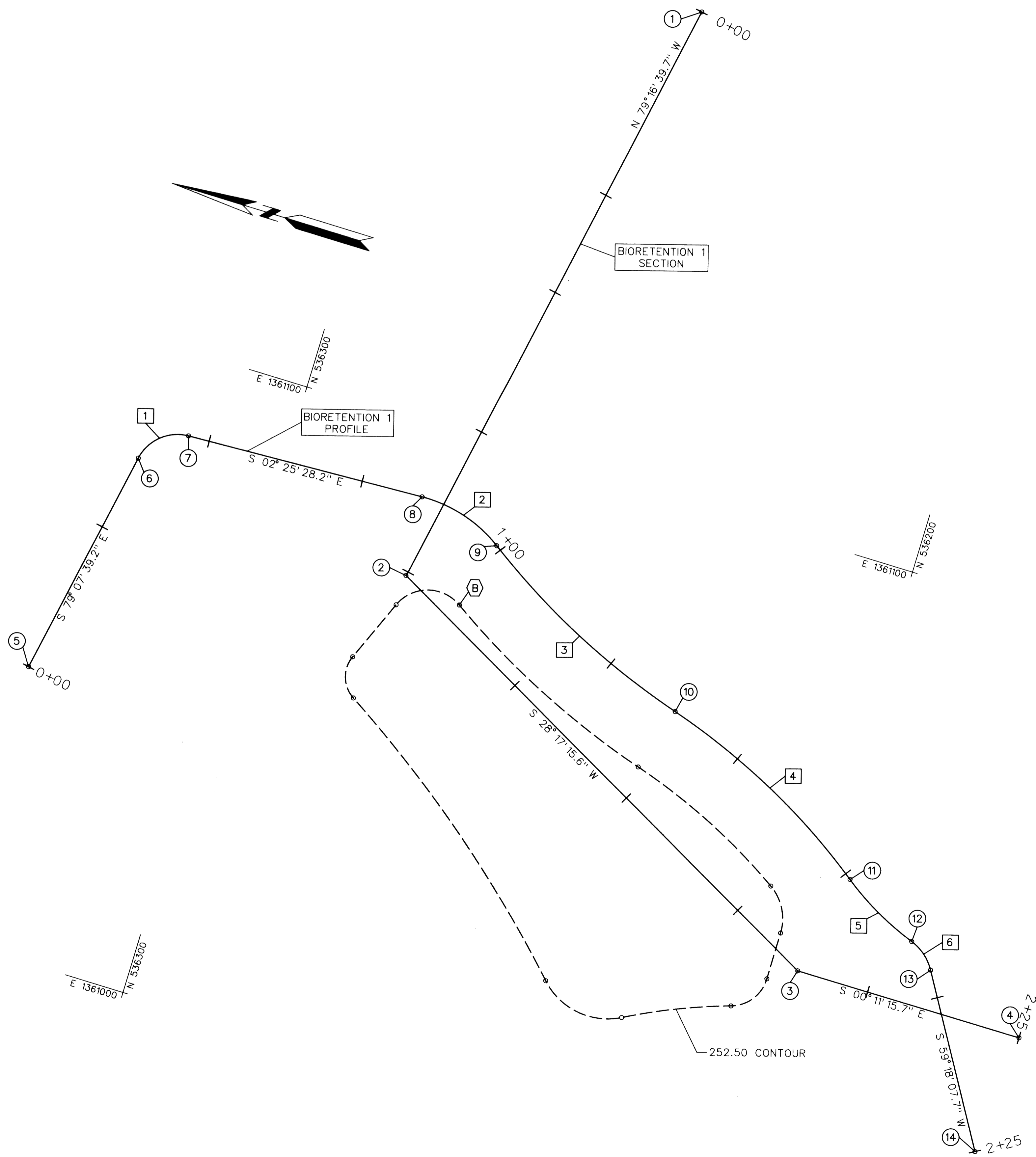
BASELINE CONTROL COORDINATES				
LOCATION	PT. NO.	STATION	NORTHING	EASTING
BIORETENTION 1 SECTION	1	0+00.00	536257.57	1361174.94
	2	1+00.64	536276.30	1361076.05
	3	1+88.40	536199.02	1361034.46
	4	2+25.00	536162.49	1361034.58
BIORETENTION 1 PROFILE	5	0+00.00	536329.25	1361044.85
	6	0+37.25	536322.22	1361081.44
	7	0+46.62	536315.64	1361087.11
	8	0+84.76	536277.53	1361088.72
	9	0+99.10	536264.01	1361084.79
	10	1+37.67	536229.47	1361067.99
	11	1+76.14	536195.32	1361050.70
	12	1+90.03	536183.13	1361044.15
	13	1+95.54	536178.96	1361040.70
	14	2+25.00	536163.92	1361015.37

CURVE DATA						
CURVE	DELTA	DEGREE	RADIUS	TANGENT	LENGTH	EXTERNAL
1	76° 42' 11.9"	818° 30' 40.1"	7.0'	5.54'	9.37'	1.93'
2	37° 20' 13.0"	260° 26' 7.3"	22.0'	7.43'	14.34'	1.22'
3	17° 57' 58.1"	46° 34' 55.0"	123.0'	19.44'	38.57'	1.53'
4	19° 48' 5.7"	51° 28' 43.3"	111.3'	19.43'	38.47'	1.68'
5	16° 55' 57.5"	121° 54' 21.3"	47.0'	7.00'	13.89'	0.52'
6	39° 29' 13.5"	716° 11' 50.1"	8.0'	2.87'	5.51'	0.50'

CONTOUR STAKEOUT INFORMATION			
LOCATION	STATION	NORTHING	EASTING
CONTOUR 252.50	0+00.00	536266.96	1361074.10
	0+38.16	536232.53	1361057.95
	0+66.43	536206.99	1361046.05
	0+74.36	536203.35	1361039.37
	0+81.88	536203.33	1361031.84
	0+89.48	536207.51	1361026.10
	1+06.89	536223.51	1361019.31
	1+21.21	536236.68	1361021.36
	1+75.25	536278.69	1361055.12
	1+82.36	536280.69	1361061.33
	1+93.07	536276.52	1361071.20

NOTE: CONTOUR STAKEOUT POINTS PROCEED IN A CLOCKWISE DIRECTION AROUND CONTOUR.

LEGEND	
1	CURVE NUMBER
①	POINT NUMBER
(B)	BEGINNING POINT OF CONTOUR STAKEOUT INFORMATION (STA. 0+00.00)



STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 RALPH J. HARRIS  
 LICENSE NO. 25753  
 EXPIRATION DATE: JANUARY 16, 2011  
 09/14/2010

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**KCI**  
 TECHNOLOGIES

SAVAGE PARK  
 CHANNEL STABILIZATION AND  
 STORMWATER MANAGEMENT  
 SECTION 4 AREAS 1, 2, 3  
 CAPITAL PROJECT S-6175

BIORETENTION SITE 1  
 GEOMETRY SHEET

SCALE: 1" = 10'  
 DATE: SEPTEMBER 2010  
 KCI JOB NO.: 01-081795.20  
 CAPITAL PROJECT NO.: S-6175  
 PERMIT ISSUE:  
 CONSTRUCTION ISSUE:

D1124 08-  
 SAVAGE PARK  
 STORM DRAIN

SHEET NO.: 9 OF 32



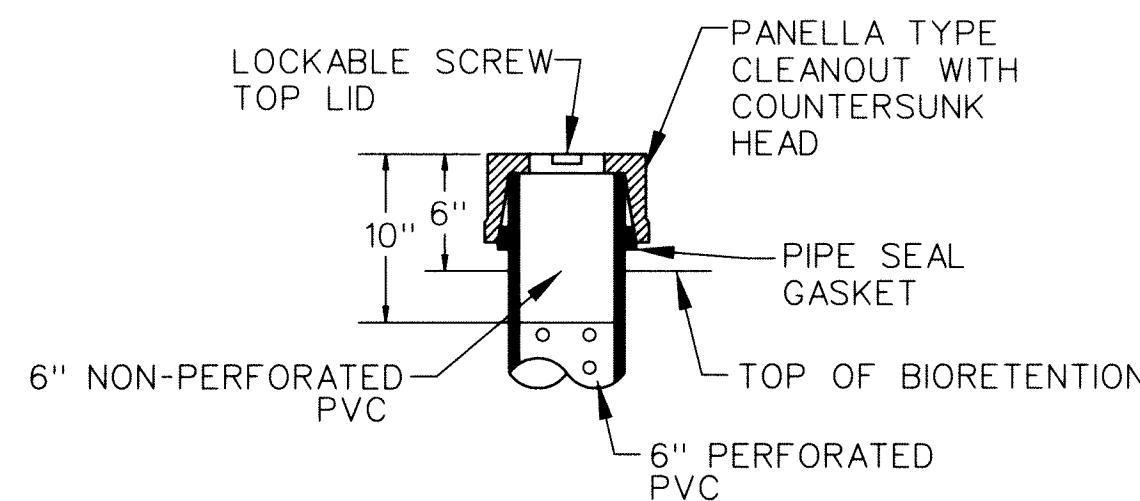




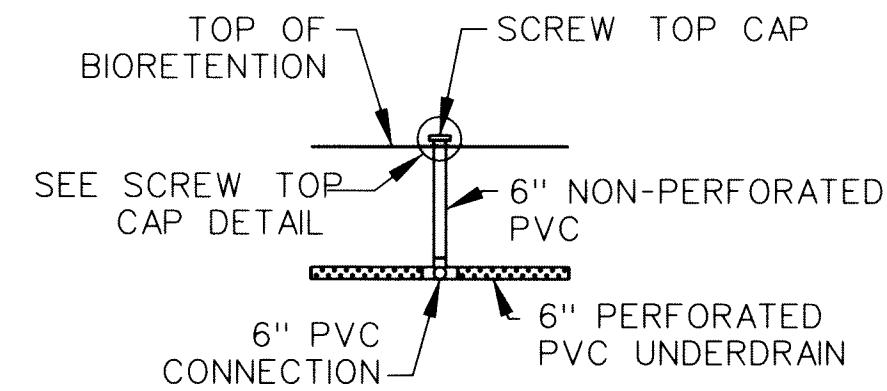




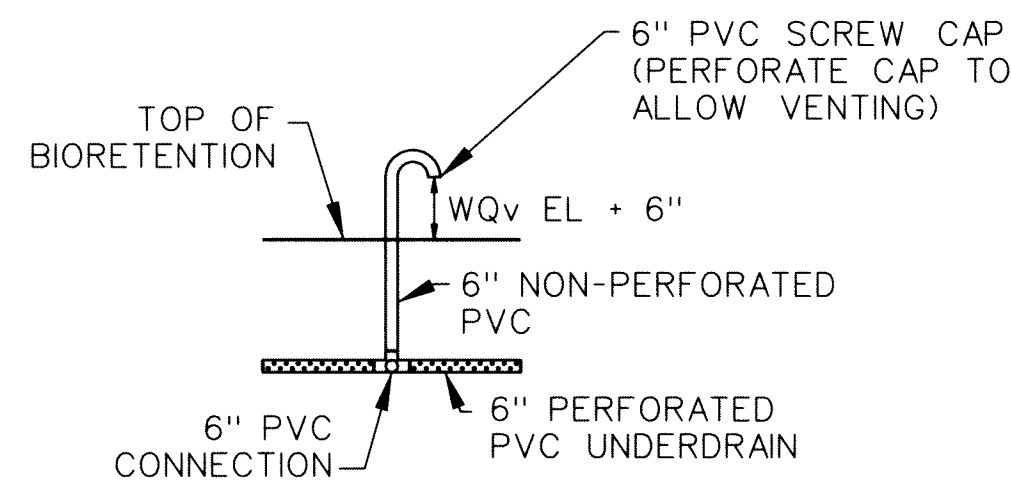




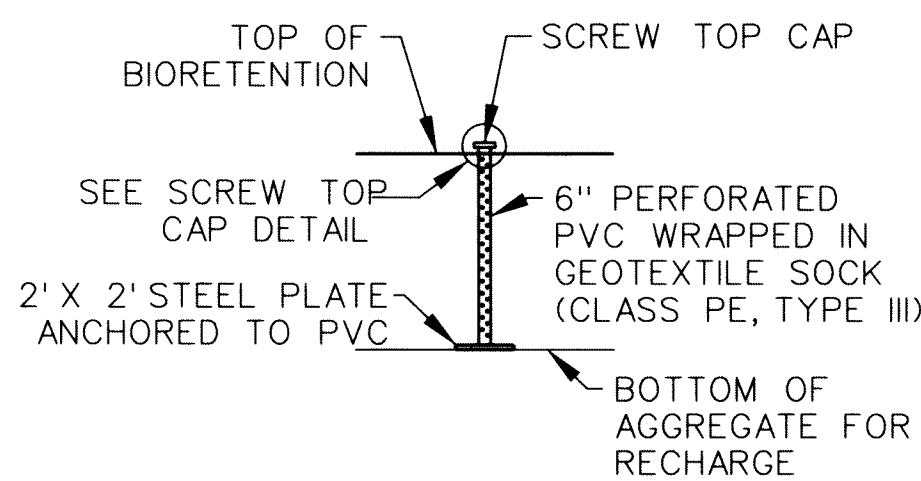
**SCREW TOP CAP**  
NOT TO SCALE



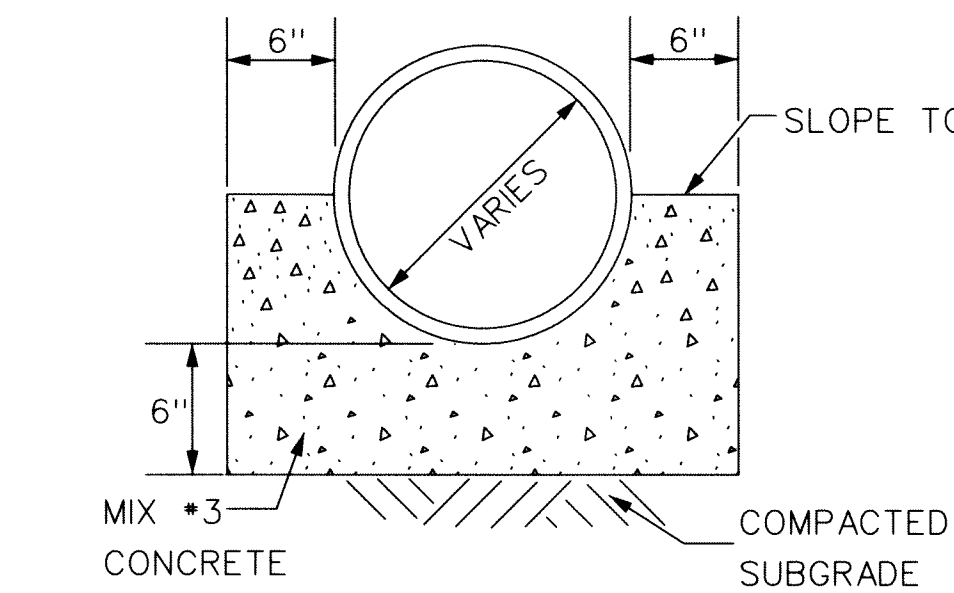
**CLEANOUT DETAIL**  
NOT TO SCALE



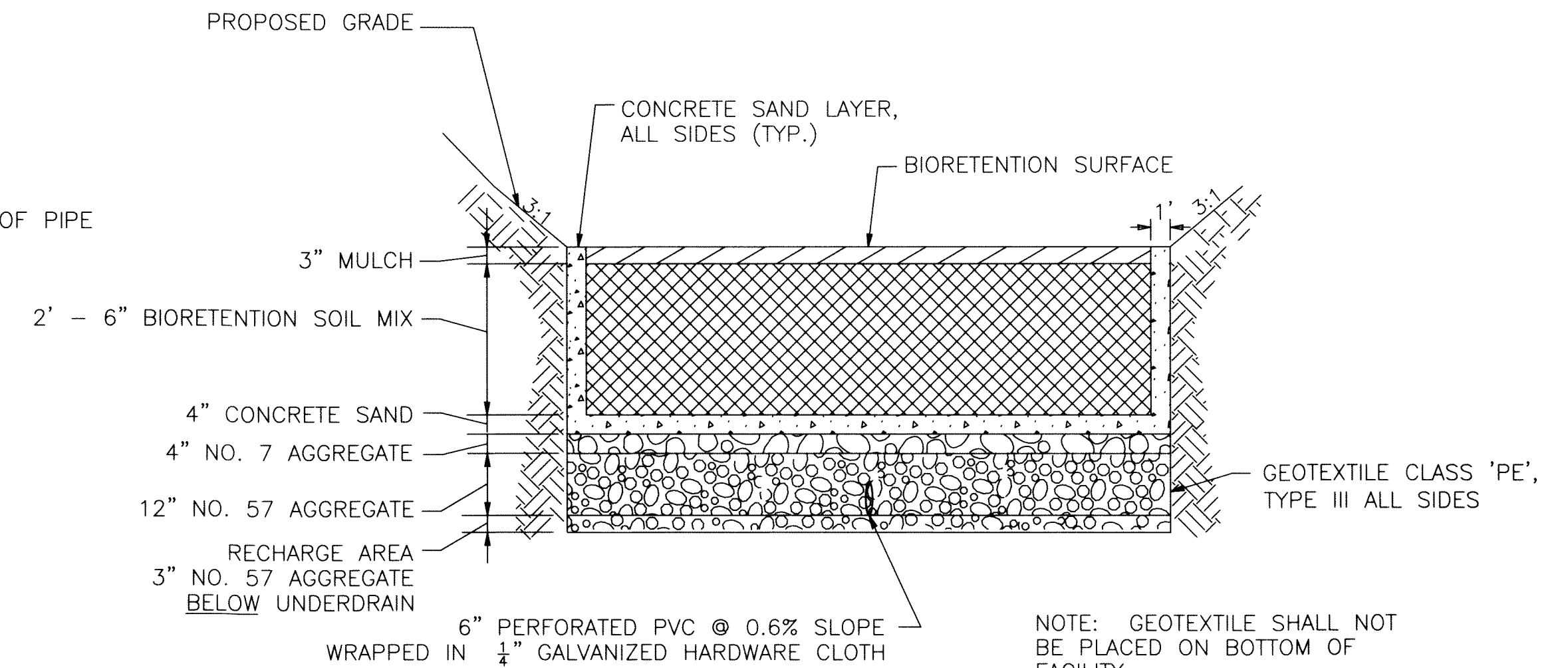
**J-VENT DETAIL**  
NOT TO SCALE



**OBSERVATION WELL DETAIL**  
NOT TO SCALE



**PIPE BEDDING CONCRETE CRADLE**  
NOT TO SCALE



**BIORETENTION AREA TYPICAL SECTION**  
SCALE: NOT TO SCALE

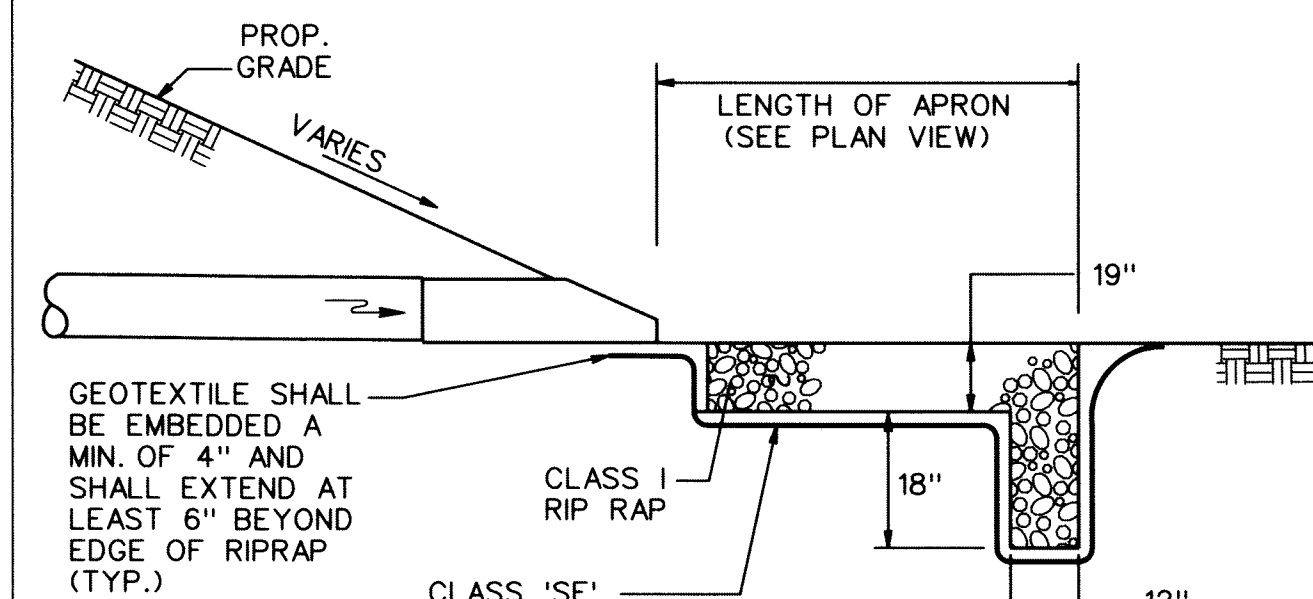
**NOTES:**

- FOR OBSERVATION WELL/CLEANOUT, PROVIDE A TUBE MADE OF NON-CORROSIVE MATERIAL, AT LEAST THREE FEET LONG WITH AN INSIDE DIAMETER OF AT LEAST 6 INCHES.
- THE TUBE SHALL HAVE A FACTORY ATTACHED CAST IRON OR HIGH IMPACT PLASTIC COLLAR WITH RIBS TO PREVENT ROTATION WHEN REMOVING SCREW TOP LID. THE SCREW TOP LID SHALL BE CAST IRON OR HIGH IMPACT PLASTIC THAT WILL WITHSTAND ULTRA-VIOLET RAYS.
- ALL VISIBLE PVC FEATURES ABOVE THE GROUND SURFACE SHALL BE BLACK IN COLOR.

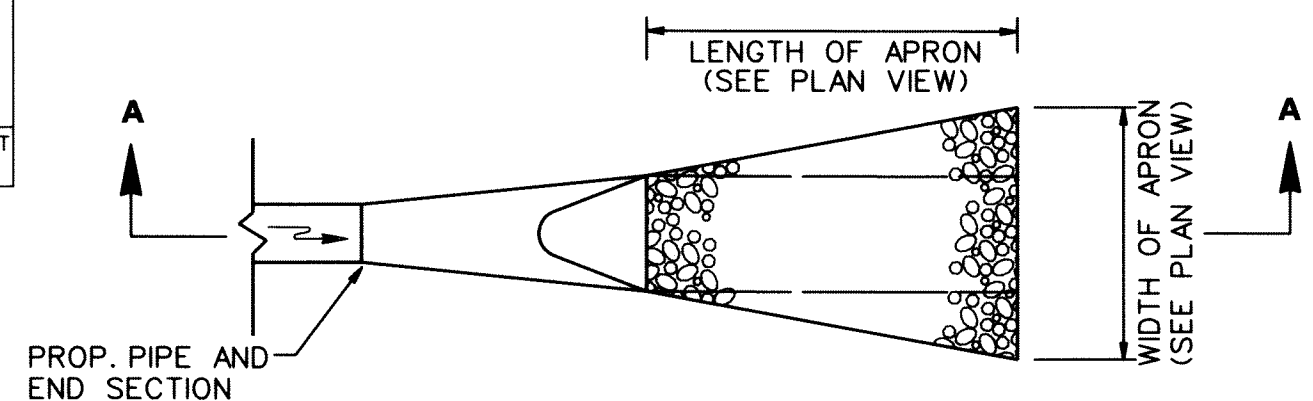
**ROCK OUTLET PROTECTION I**

**Construction Specifications**

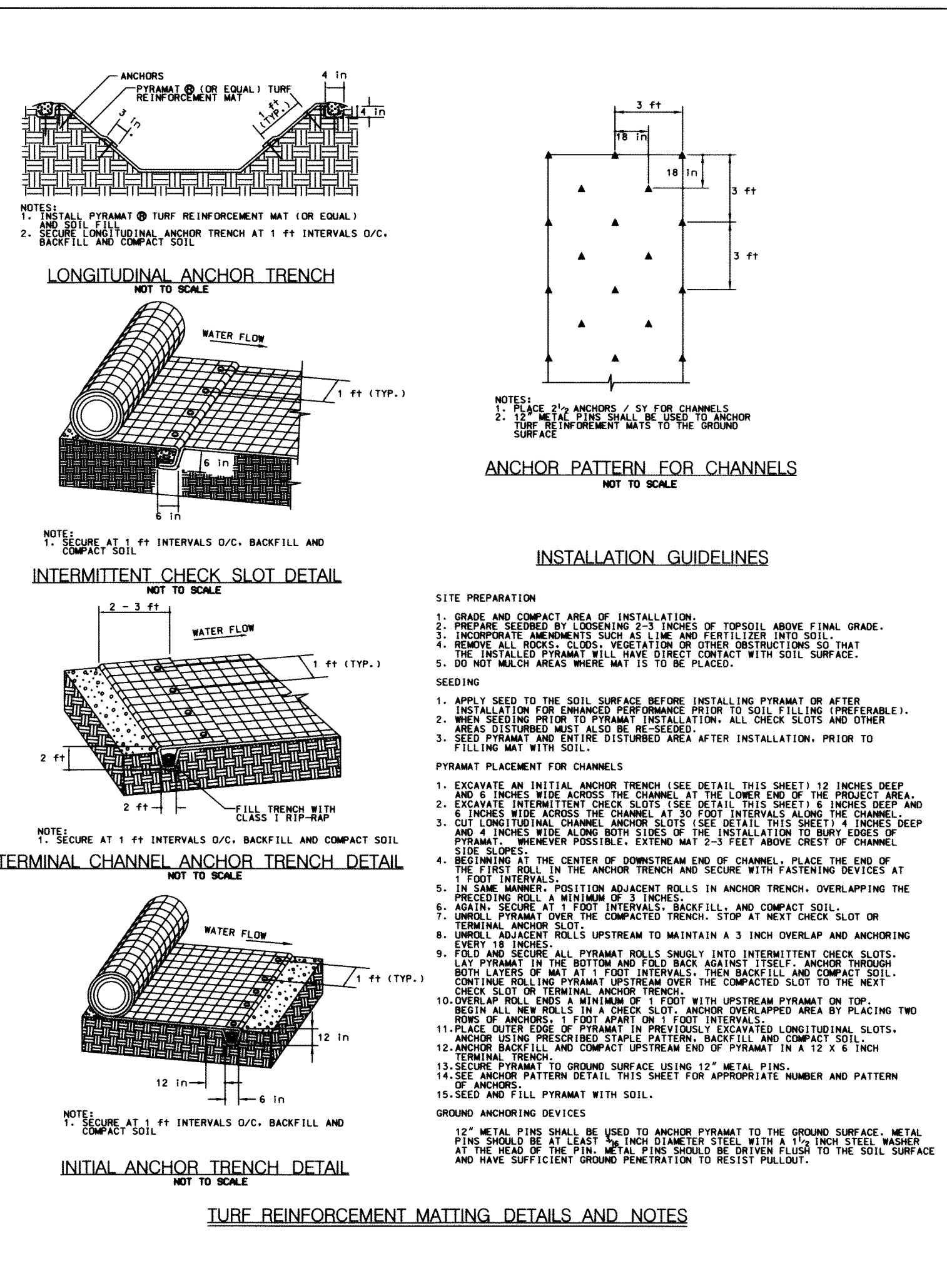
- The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
- The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.
- 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.
- 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.
- 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.



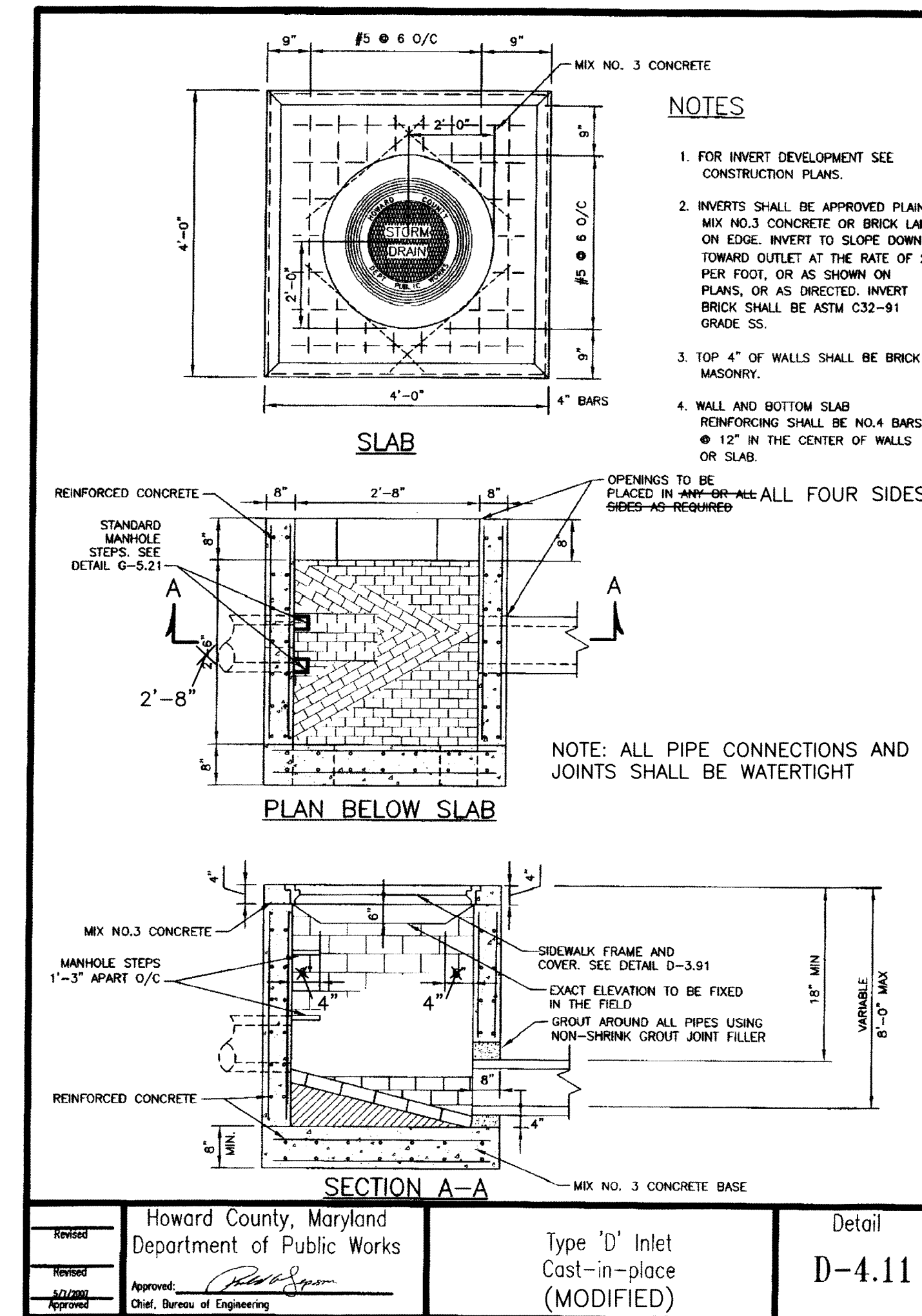
**SECTION A-A**  
NOT TO SCALE



**RIP RAP OUTLET PROTECTION DETAIL**  
NOT TO SCALE



**TURF REINFORCEMENT MATTING DETAILS AND NOTES**



**SECTION A-A**  
MIX NO. 3 CONCRETE BASE

Revised	Howard County, Maryland Department of Public Works	Detail
Revised		Type 'D' Inlet Cast-in-place (MODIFIED)
Approved	Approved: <i>[Signature]</i> Chief, Bureau of Engineering	D-4.11

NO.	REVISIONS DESCRIPTION	DATE

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SAVAGE PARK  
CHANNEL STABILIZATION AND  
STORMWATER MANAGEMENT  
SECTION 4 AREAS 1,2,3  
CAPITAL PROJECT S-6175

**BIORETENTION DETAILS**

SCALE:	N/A
DATE:	SEPTEMBER 2010
KCI JOB NO.:	01-081795.20
CAPITAL PROJECT NO.:	S-6175
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	
D1124 08- SAVAGE PARK STORM DRAIN	
SHEET NO.: 13 OF 32	



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PLOTTED: 11:52 AM on Monday, September 13, 2010  
 FILE: M:\2008\081795.20\Drawings\PSW\_2010\_savage.dgn

**SPECIFICATIONS FOR BIORETENTION FACILITY**

DESCRIPTION. THIS WORK SHALL CONSIST OF INSTALLING BIORETENTION FACILITIES, SMALL LANDSCAPED BASINS THAT PROVIDE WATER QUALITY MANAGEMENT BY FILTERING STORMWATER RUNOFF BEFORE IT IS RELEASED INTO STORMDRAIN SYSTEMS AND WATERWAYS, AS SPECIFIED IN THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER.

MATERIALS.  
 CONCRETE SAND 901.01  
 NO. 57 AGGREGATE 901.01  
 NO. 7 AGGREGATE 901.01  
 NO. 2 AGGREGATE M-43, NO. 2  
 WATER 920.08.01  
 GEOTEXTILE, CLASS PE, TYPE III 921  
 BIORETENTION SOIL MIXTURE (BSM) 900  
 MULCH, SHREDDED HARDWOOD BARK 920.05.03 AND 920.05.04  
 PLANT MATERIALS 700 AND 920.07

PIPE, POLYVINYL CHLORIDE PROFILE WALL PIPE (PPWP) AND FITTINGS. THE MATERIAL SHALL HAVE A DIAMETER OF 6 IN. AND INCLUDES PERFORATED AND NON-PERFORATED PIPE. PIPE MATERIALS AND FITTINGS SHALL CONFORM TO M-304. PERFORATIONS SHALL BE SLOTTED. PERFORATED PPWP USED FOR OBSERVATION WELLS SHALL INCLUDE AN APPROPRIATE GEOTEXTILE SOCK AS RECOMMENDED AND SUPPLIED BY THE MANUFACTURER.

BIORETENTION SOIL MIXTURE (BSM). BSM IS A BLENDED MIXTURE OF SAND, MULCH, AND PLANTING SOIL. THE BSM SHALL BE A HOMOGENEOUS MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN 2 IN. AND SHALL BE FREE FROM ANY PARTS OF BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, MUDWORT, NUTSEDGE, POISON IVY, CANADIAN THISTLE, TEARthumb, PHRAGMITES, OR OTHER NOXIOUS WEEDS AS SPECIFIED IN COMAR 15.08.01.05. THE BSM SHALL CONSIST OF THE FOLLOWING:

- (A) SAND. THE SAND SHALL COMPOSE 50 PERCENT BY VOLUME OF THE BSM. THE SAND SHALL BE FINE AGGREGATE, SECTION 901.
- (B) MULCH. THE MULCH SHALL COMPOSE 20 PERCENT BY VOLUME OF THE BSM. THE MULCH SHALL BE DOUBLE SHREDDED HARDWOOD BARK CONSISTING OF THE BARK FROM HARDWOOD TREES WHICH HAS BEEN MILLED AND SCREENED TO A MAXIMUM 2 IN. PARTICLE SIZE AND PROVIDE A UNIFORM TEXTURE FREE FROM SAWDUST, TOXIC SUBSTANCES, AND FOREIGN MATERIALS AND SHALL BE AGED AT LEAST 6 MONTHS.
- (C) PLANTING SOIL. THE PLANTING SOIL SHALL COMPOSE 30 PERCENT BY VOLUME OF THE BSM. THE PLANTING SOIL SHALL BE A NATURAL OR FURNISHED, FRIABLE SOIL, UNIFORM IN COLOR AND TEXTURE. THE GRADING ANALYSIS SHALL BE AS FOLLOWS:

ITEM	CRITERIA	TEST METHOD
SAND (2.0 - 0.050 MM)	50 - 85%	T88
SILT (0.050 - 0.002 MM)	0 - 50%	T88
CLAY (LESS THAN 0.002 MM)	5 - 10%	T88
ORGANIC MATTER	1.5 - 10%	T194

THE TEXTURAL ANALYSIS FOR THE PLANTING SOIL SHALL BE AS FOLLOWS:

SIEVE SIZE	MINIMUM PERCENTPASSING BY WEIGHT
2 IN.	100
NO. 4	90
NO. 10	80

MIXING THE SAND, MULCH, AND PLANTING SOIL SHALL BE HOMOGENOUSLY MIXED AND BLENDED TO CREATE THE BSM TO THE SATISFACTION OF THE ENGINEER. THE BSM SHALL NOT BE BLENDED UNTIL THE REQUIRED PLANTING SOIL HAS BEEN SAMPLED, TESTED, AND APPROVED.

THE BSM SHALL BE SAMPLED AND TESTED. SAMPLING WILL BE COMPLETED IN CONFORMANCE WITH MSMT 356 AND SHALL MEET THE FOLLOWING CRITERIA:

ITEM	CRITERIA	TEST METHOD
PH	5.5 - 7.5	D4972
MAGNESIUM	MINIMUM 35 PPM	*
PHOSPHORUS (PHOSPHATE- P <sub>3</sub> Q)	MINIMUM 75 PPM	*
POTASSIUM (K <sub>3</sub> O)	MINIMUM 85 PPM	*
SOLUBLE SALTS	NOT TO EXCEED 500 PPM	*

\* UNIVERSITY OF DELAWARE, COLLEGE OF AGRICULTURE AND NATURAL RESOURCES, SOIL TESTING PROGRAM TEST METHOD

AMENDMENTS. ANY BSM NOT MEETING THE ABOVE REQUIREMENTS SHALL BE AMENDED BY THE SUPPLIER. ALL AMENDMENTS SHALL BE MIXED UNIFORMLY INTO THE BSM AS FOLLOWS:

PH. THE PH SHALL BE ADJUSTED WITH DOLOMITIC LIMESTONE OR SULFUR (90%).  
 MAGNESIUM. MAGNESIUM DEFICIENCY SHALL BE AMENDED WITH DOLOMITIC LIMESTONE.  
 POTASSIUM. POTASSIUM DEFICIENCY SHALL BE AMENDED WITH 0-0-60 FERTILIZER.

AMENDED BSM SHALL BE SAMPLED AND TESTED TO ENSURE THE CRITERIA HAS BEEN MET.

ADDITIONAL REQUIREMENTS. AFTER A BSM STOCKPILE HAS BEEN FORMED FOR USE, THE BSM WILL BE SAMPLED AND TESTED AND SHALL MEET THE FOLLOWING GRADING ANALYSIS:

ITEM	CRITERIA	TEST METHOD
SAND (2.0 - 0.050 MM)	65 - 80%	T88
SILT (0.050 - 0.002 MM)	0 - 15%	T88
CLAY (LESS THAN 0.002 MM)	1 - 5%	T88
ORGANIC MATTER	15 - 25%	T194

CONSTRUCTION. BIORETENTION FACILITIES SHALL NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREAS ARE STABILIZED AS SHOWN ON THE CONTRACT PLANS AND TO THE SATISFACTION OF THE ENGINEER. BIORETENTION FACILITIES SHALL NOT BE USED AS SEDIMENT CONTROL FACILITIES NOR SHALL THEY BE CONSTRUCTED IN AREAS PREVIOUSLY USED FOR EROSION AND SEDIMENT CONTROL.

EXCAVATION. BIORETENTION FACILITIES SHALL BE EXCAVATED TO THE DIMENSIONS, SIDE SLOPES, AND ELEVATIONS AS SPECIFIED IN THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE ENGINEER. THE METHOD OF EXCAVATION SHALL MINIMIZE THE COMPACTION OF THE BOTTOM OF THE BIORETENTION FACILITIES. EXCAVATORS AND BACKHOES, OPERATING ON THE GROUND ADJACENT TO THE BIORETENTION FACILITIES, SHALL BE USED FOR EXCAVATION WHENEVER POSSIBLE. OTHERWISE, EXCAVATORS, BACKHOES AND OTHER EQUIPMENT SHALL BE WIDE-TRACK OR MARSH-TRACK FOR USE WITHIN THE BIORETENTION FACILITIES. THE USE OF LIGHT EQUIPMENT WITH TURF TIRES OPERATING WITHIN THE FACILITY IS ALSO ACCEPTABLE. THE USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH-PRESSURE TIRES IS PROHIBITED WITHIN THE PERIMETER OF BIORETENTION FACILITIES.

AFTER THE EXCAVATION IS COMPLETE AND PRIOR TO PLACING AGGREGATE AND PIPE, THE BOTTOM OF THE EXCAVATION SHALL BE ROTO-TILLED TO A MINIMUM DEPTH OF 6 IN. TO ALLEVIATE COMPACTION FROM EXCAVATION ACTIVITIES. ANY SUBSTITUTE METHOD FOR ROTO-TILLING MUST BE APPROVED BY THE ENGINEER PRIOR TO USE. ANY STANDING WATER SHALL BE REMOVED FROM THE BOTTOM OF THE EXCAVATION AND THE SOIL SHALL BE FRIABLE BEFORE ROTO-TILLING. THE EXCAVATION BOTTOM SHALL NOT BE ROTO-TILLED WHILE IN A MUDDY OR FROZEN CONDITION.

GEOTEXTILE. AFTER ROTO-TILLING THE EXCAVATION BOTTOM, GEOTEXTILE SHALL BE PLACED ON ALL SIDES OF BIORETENTION FACILITIES, EXCLUDING THE EXCAVATED BOTTOM, AS SPECIFIED IN THE CONTRACT DOCUMENTS. GEOTEXTILE SHALL BE PLACED TIGHTLY AGAINST THE EXCAVATION WALLS TO ELIMINATE VOIDS BENEATH THE GEOTEXTILE. WRINKLES AND FOLDS IN THE GEOTEXTILE SHALL BE AVOIDED. A MINIMUM 1 IN. OVERLAP AT THE GEOTEXTILE JOINT ENDS OR BREAKS SHALL BE MAINTAINED. GEOTEXTILE JOINTS AND OVERLAPS SHALL BE PINNED TO SECURELY HOLD THE GEOTEXTILE IN PLACE UNTIL PLACEMENT OF THE AGGREGATE, PIPE, AND BSM.

PERFORATED PIPE SYSTEM AND AGGREGATE. THE PERFORATED PIPE SYSTEM USING PPWP SHALL BE PLACED ON A 6 IN. (MINIMUM) BED OF NO. 2 AGGREGATE THAT COMPLETELY COVERS THE BOTTOM OF BIORETENTION FACILITIES. THE NO. 2 AGGREGATE BED AND PERFORATED PIPE SYSTEM SHALL BE COVERED WITH 12 IN. OF NO. 57 AGGREGATE.

ALL AGGREGATE SHALL BE CLEAN AND FREE OF ALL SOIL AND FINES. CARE SHALL BE TAKEN TO PREVENT SOIL, FINES, AND OTHER DEBRIS FROM INTERMIXING WITH THE AGGREGATE.

THE ENDS OF PIPES NOT TERMINATING IN A CLEANOUT, VENT, OR DRAINAGE STRUCTURE SHALL BE CAPPED UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS.

OBSERVATION WELLS. OBSERVATION WELLS USING PERFORATED AND NON-PERFORATED PPWP SHALL BE PLACED VERTICALLY IN BIORETENTION FACILITIES AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE WELLS SHALL TERMINATE AT THE MULCH LAYER TOP ELEVATION AND SHALL BE CAPPED WITH A SCREW CAP. THE PERFORATED PPWP PORTION OF THE WELL SHALL BE WRAPPED WITH AN APPROPRIATE GEOTEXTILE SOCK AS RECOMMENDED AND SUPPLIED BY THE MANUFACTURER.

VENTS. INVERTED J-VENTS USING NON-PERFORATED PPWP SHALL BE PLACED IN BIORETENTION FACILITIES AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE VENTS SHALL BE CONNECTED TO THE PERFORATED PIPE SYSTEM WITH THE APPROPRIATE MANUFACTURED CONNECTIONS AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE INVERTED J-VENTS SHALL EXTEND ABOVE THE WATER SURFACE ELEVATION OF BIORETENTION FACILITIES.

PLACEMENT AND COMPACTION OF THE BIORETENTION SOIL MIXTURE (BSM). THE BSM SHALL BE PLACED AND GRADED BY USING EXCAVATION HOES OPERATING ON THE GROUND ADJACENT TO BIORETENTION FACILITIES OR, IF THE CONFIGURATION OF THE BIORETENTION FACILITIES IS EXCEEDINGLY LARGE, WIDE-TRACK OR MARSH-TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES OPERATING WITHIN THE PERIMETER OF BIORETENTION FACILITIES MAY BE USED TO PLACE AND GRADE THE BSM. THE USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS OR HIGH-PRESSURE TIRES IS PROHIBITED WITHIN THE PERIMETER OF BIORETENTION FACILITIES.

THE BSM SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 12 IN.. AFTER EACH LIFT OF BSM IS PLACED, IT SHALL BE COMPACTED BY SATURATING WITH WATER UNTIL WATER FLOWS FROM THE PERFORATED PIPE SYSTEM. WATER FOR SATURATION SHALL BE APPLIED BY SPRAYING OR SPRINKLING. SATURATION OF EACH LIFT SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF THE ENGINEER. AN APPROPRIATE SEDIMENT CONTROL DEVICE SHALL BE USED TO TREAT ANY SEDIMENT-LADEN WATER DISCHARGED FROM THE PERFORATED PIPE SYSTEM.

FINAL GRADING OF THE BSM SHALL BE PERFORMED AFTER A 24-HOUR SETTLING PERIOD. FINAL ELEVATIONS SHALL BE WITHIN 2 IN. OF ELEVATIONS SPECIFIED IN THE CONTRACT DOCUMENTS.

PLANT INSTALLATION. PLANT MATERIAL SHALL BE INSTALLED IMMEDIATELY AFTER FINAL GRADING OF BIORETENTION FACILITIES AS SPECIFIED IN THE CONTRACT DOCUMENTS. MULCHING. BIORETENTION FACILITIES SHALL BE MULCHED IN ACCORDANCE WITH THE FOLLOWING, AS APPROPRIATE:

TYPICAL. IMMEDIATELY FOLLOWING PLANT INSTALLATION, OCCURRING IMMEDIATELY AFTER FINAL GRADING, BIORETENTION FACILITIES SHALL BE MULCHED TO A UNIFORM THICKNESS OF 3 IN., AND THE MULCH SHALL BE RAKED TO AN EVEN SURFACE.

TEMPORARY. FOR PLANT INSTALLATION THAT WILL COMMENCE WITHIN 30 CALENDAR DAYS OF FINAL GRADING, BIORETENTION FACILITIES SHALL BE MULCHED TO A MINIMUM THICKNESS OF 1 IN. IMMEDIATELY FOLLOWING FINAL GRADING. THE MULCH SHALL BE RAKED TO AN EVEN SURFACE. DURING PLANT INSTALLATION, CARE SHALL BE TAKEN TO PREVENT CONTAMINATION OF THE MULCH AND BSM. IMMEDIATELY AFTER PLANT INSTALLATION, BIORETENTION FACILITIES SHALL BE MULCHED TO A TOTAL UNIFORM THICKNESS OF 3 IN. AND RAKED TO AN EVEN SURFACE.

EXTENDED TEMPORARY. FOR PLANT INSTALLATION THAT WILL COMMENCE BEYOND 30 CALENDAR DAYS OF FINAL GRADING, BIORETENTION FACILITIES SHALL BE MULCHED TO A UNIFORM THICKNESS OF 3 IN., AND THE MULCH SHALL BE RAKED TO AN EVEN SURFACE. PRIOR TO PLANT INSTALLATION, THE EXTENDED TEMPORARY MULCHING LAYER SHALL BE REMOVED IN ITS ENTIRETY FROM BIORETENTION FACILITIES AND DISPOSED OF AS EXCESS OR UNSUITABLE MATERIAL. CARE SHALL BE TAKEN TO PREVENT THE REMOVAL OF BSM DURING THE MULCH REMOVAL. IMMEDIATELY AFTER PLANT INSTALLATION, BIORETENTION FACILITIES SHALL BE MULCHED TO A UNIFORM THICKNESS OF 3 IN. AND RAKED TO AN EVEN SURFACE.

**CONTRACTOR'S AS-BUILT NOTE**

AS-BUILT PLANS AND CERTIFICATION ARE REQUIRED FOR THESE STORM WATER MANAGEMENT FACILITIES. THESE MUST BE PREPARED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER. AFTER FINAL ACCEPTANCE OF THE FACILITY, HOWARD COUNTY WILL PREPARE THE AS-BUILT PLANS AND THE AS BUILT CERTIFICATION.

TO PREPARE THE REQUIRED AS-BUILT PLANS AND CERTIFICATION, THESE STORM WATER MANAGEMENT FACILITIES MUST BE INSPECTED BY THE ENGINEER AT SPECIFIC STAGES DURING THE CONSTRUCTION AS REQUIRED BY THE CURRENT HOWARD COUNTY STORM WATER MANAGEMENT POLICY AND DESIGN MANUAL. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST FIVE (5) WORKING DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE PLANS.

**CONSTRUCTION NOTE**

UNLESS OTHERWISE NOTED, ALL CONSTRUCTION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH:

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION.

MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION, JANUARY, 2001, STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIAL.

**GENERAL NOTES**

1. THE PROPOSED GRADING SHOWN ON THIS PLAN MEETS THE REQUIREMENTS SET FORTH BY THE HOWARD COUNTY, HOWEVER, DUE TO BUILDING TYPES AND LAYOUT, SOME FIELD ADJUSTMENTS MAY BE REQUIRED. ALL CHANGES MUST COMPLY WITH THE ABOVE MENTIONED REQUIREMENTS.
2. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION, OR DISTURBANCE OF VEGETATION IN ANY FOREST RETENTION AREAS, EXCEPT AS PERMITTED BY HOWARD COUNTY.
3. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. KCI TECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR THE COMPLETENESS OF THE INFORMATION GIVEN. THE CONTRACTOR MUST VERIFY ALL SUCH INFORMATION TO HIS OWN SATISFACTION.
4. CONTRACTOR WILL CALL "MISS UTILITY" (800-257-7777) AT LEAST 48 HOURS PRIOR TO STARTING WORK.
5. SHOULD THE CONTRACTOR DISCOVER DISCREPANCIES BETWEEN THE PLANS AND FIELD CONDITIONS, THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT WRITTEN PERMISSION OF THE ENGINEER, THEN THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.

**"AS-BUILT" CERTIFICATION - BIORETENTION SITE 1**

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.

*Matthew R Snyder* ASSOCIATE  
 SIGNATURE TITLE  
 MATTHEW R SNYDER 25753  
 PRINT NAME MD LICENSE NUMBER

**"AS-BUILT" CERTIFICATION - BIORETENTION SITE 2**

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.

*Matthew R Snyder* ASSOCIATE  
 SIGNATURE TITLE  
 MATTHEW R SNYDER 25753  
 PRINT NAME MD LICENSE NUMBER

**OPERATION AND MAINTENANCE SCHEDULE**

ROUTINE MAINTENANCE:

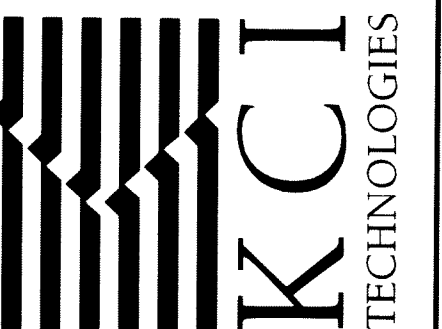
1. FACILITY SHALL BE INSPECTED ON A TRIENNIAL BASIS. INSPECTIONS SHALL BE PERFORMED FOLLOWING AT LEAST 72 HOURS OF DRY WEATHER.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED ONCE PER YEAR. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED. THE SURFACE OF THE BIORETENTION AREA SHALL NOT BE MOWED.
3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION AT THE INFLOW AREAS AS WELL AS THE OVERFLOW AND OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
5. PLANTINGS SHALL BE REPLACED AS NEEDED TO ENSURE A SIGNIFICANT NUMBER OF SHRUBS ARE PRESENT AND FULL HERBACEOUS COVERAGE EXISTS WITHIN THE FACILITY.

NON-ROUTINE MAINTENANCE:

1. STRUCTURAL COMPONENTS OF THE FACILITY SUCH AS THE EMBANKMENT, UNDERDRAIN SYSTEM, AND OVERFLOWS SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE.
2. SEDIMENT SHALL BE REMOVED FROM THE FACILITY IF 25% OR MORE OF THE SURFACE AREA IS COVERED.
3. THE MONITORING WELLS SHALL BE OPENED DURING TRIENNIAL INSPECTIONS. IF MORE THAN SIX INCHES OF WATER IS PRESENT WITHIN THE WELL, THE UNDERDRAIN SYSTEM SHALL BE FLUSHED AND/OR REPAIRED TO ENSURE THE SYSTEM IS WORKING PROPERLY.

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD  
 SPARKS, MARYLAND 21152  
 TELEPHONE: (410) 316-7800  
 Fax: (410) 316-7818  
 www.kci.com



SAVAGE PARK  
 CHANNEL STABILIZATION AND  
 STORMWATER MANAGEMENT  
 SECTION 4 AREAS 1,2,3  
 CAPITAL PROJECT 5-615

**BIORETENTION NOTES**

SCALE:	N/A
DATE:	SEPTEMBER 2010
KCI JOB NO.:	01-081795.20
CAPITAL PROJECT NO.:	S-6175
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

D1124 08-  
 SAVAGE PARK  
 STORM DRAIN

PLOTTED: 11:52 AM on Monday, September 13, 2010  
 BY: Ashley, Piner - Division: PDSO - NaturalRes - QMA\_Emp  
 FILE: M:\2008\01081795.20\Drawings\5-615\_savage.dgn



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011













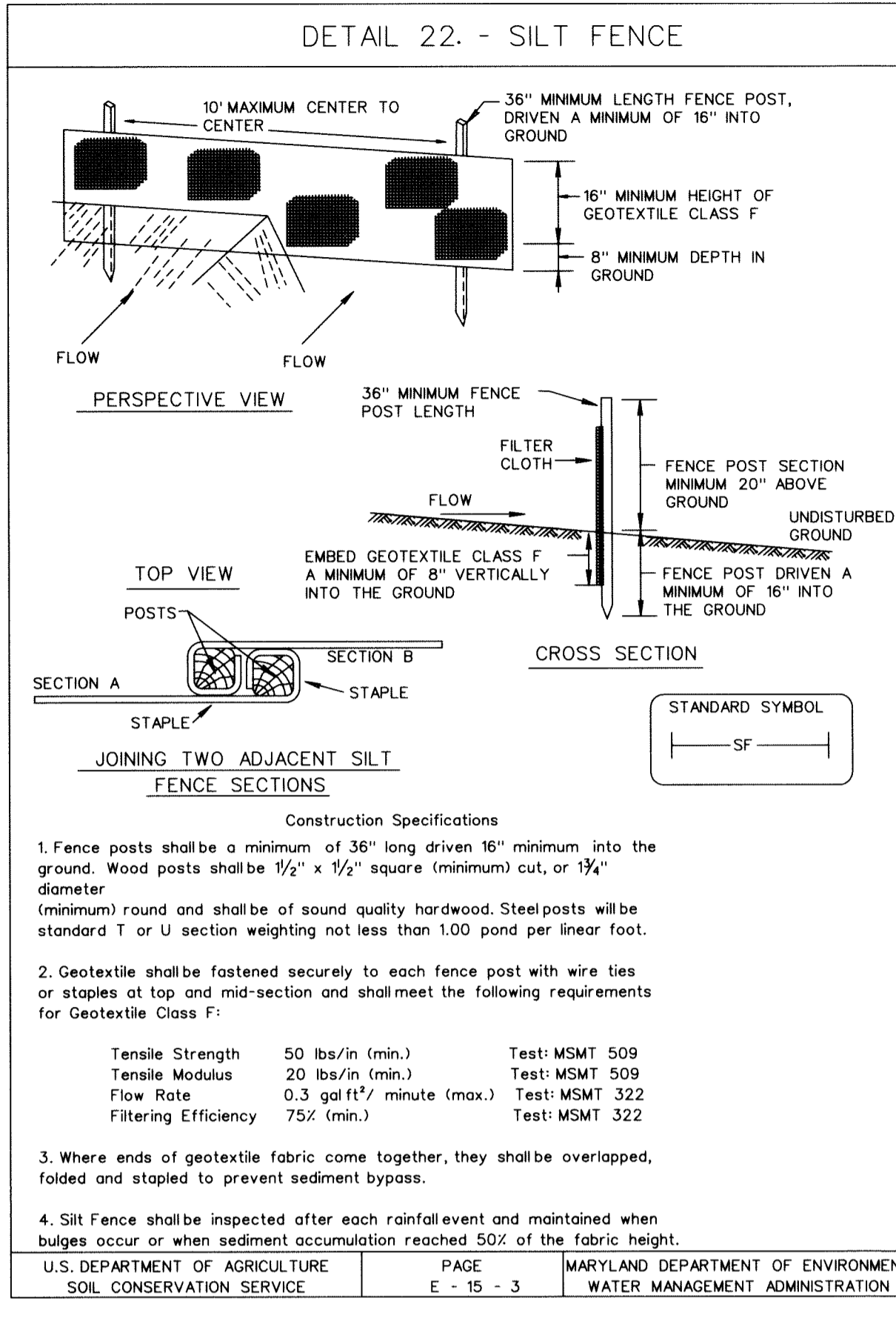












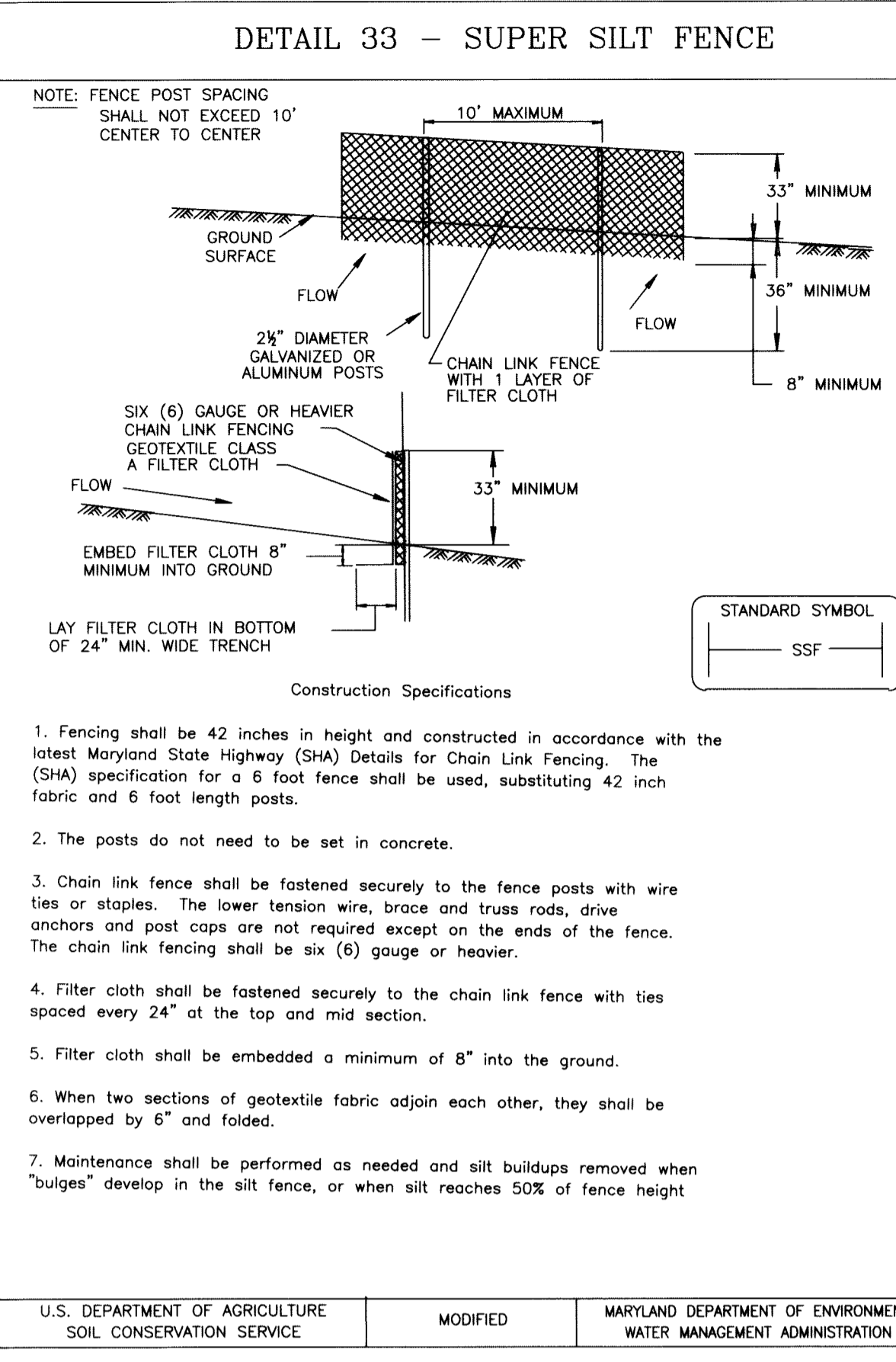
### SILT FENCE

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 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

Note: In areas of less than 2:1 slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE E - 45 - 3A | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

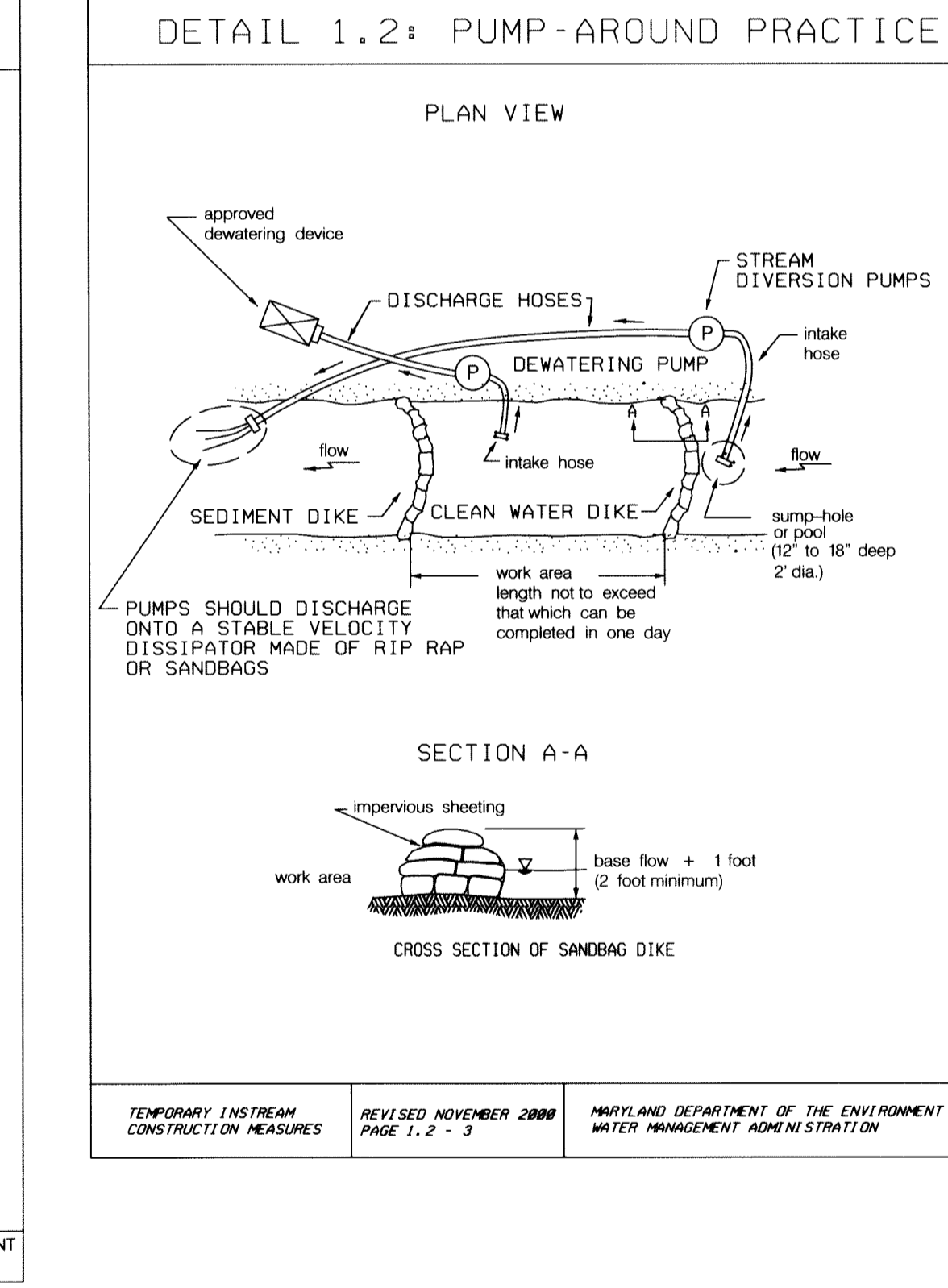
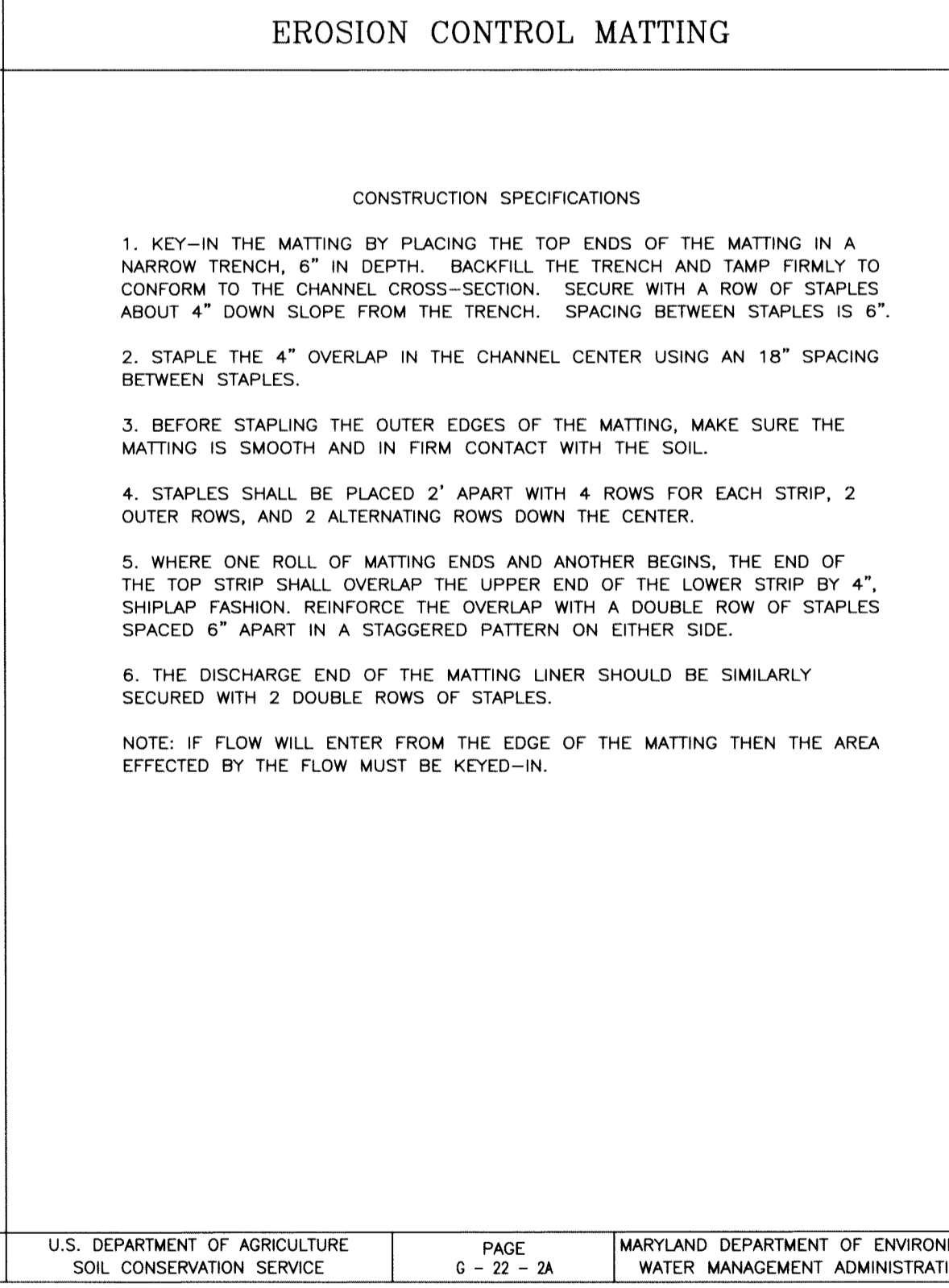
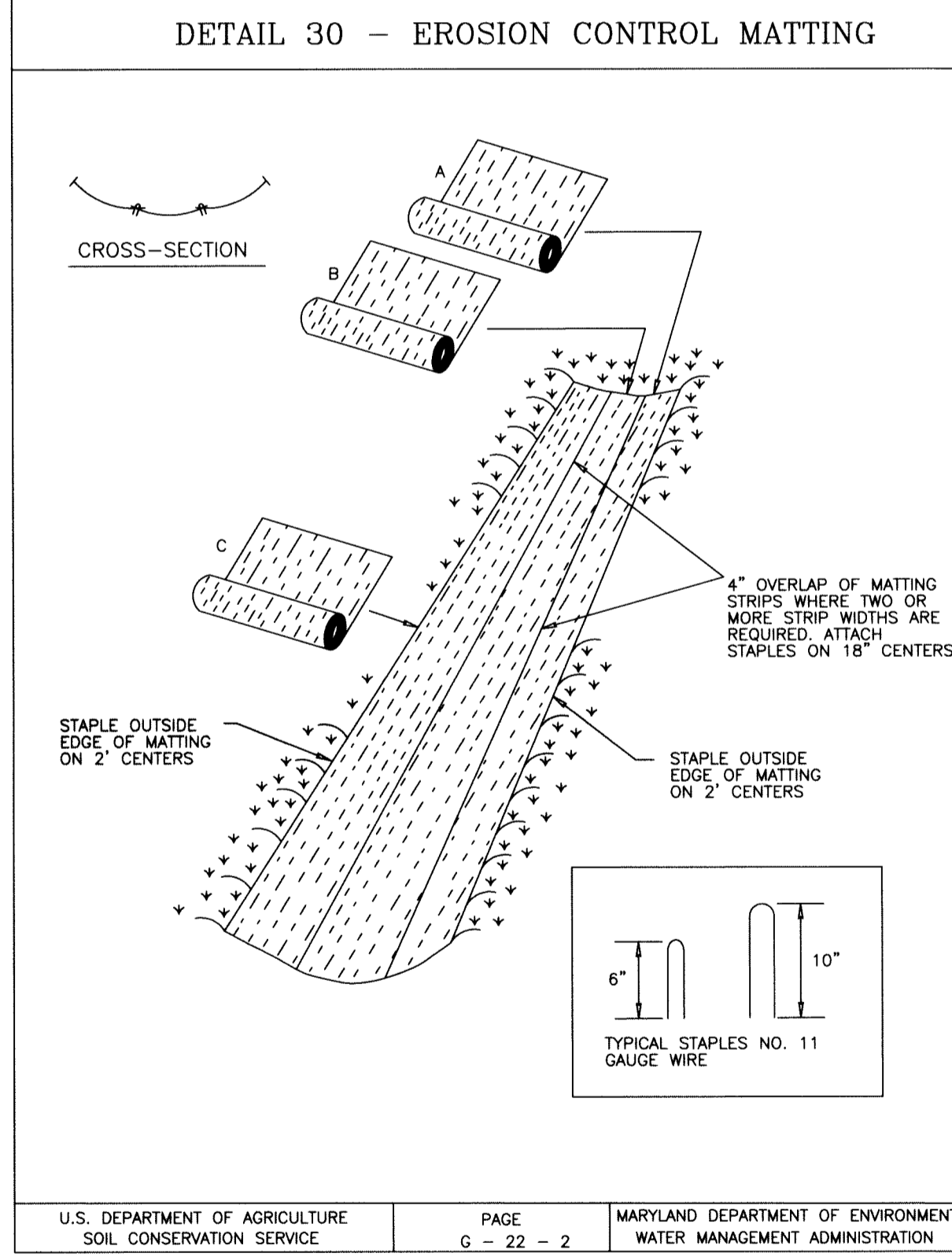
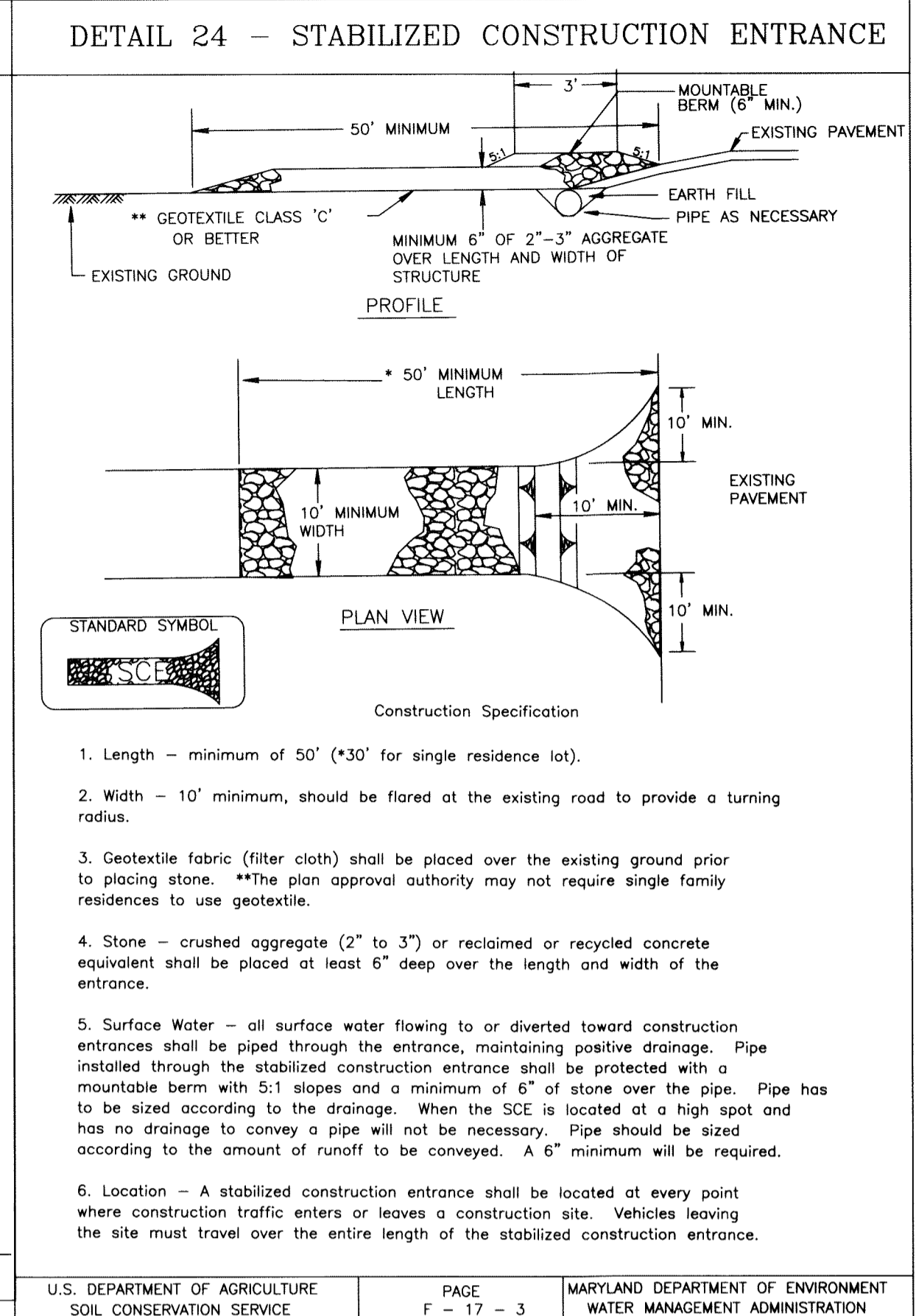


### SUPER SILT FENCE

Design Criteria

Slope	Slope Steepness	Slope Length (maximum)	Silt Fence Length (maximum)
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 5:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

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



MARYLAND DEPARTMENT OF THE ENVIRONMENT WATERWAY CONSTRUCTION GUIDELINES REVISED NOVEMBER 2000  
TEMPORARY INSTREAM CONSTRUCTION MEASURES PAGE 1.2 - 1

MCWC 1.2: PUMP-AROUND PRACTICE  
The work should consist of installing a temporary pump around and supporting measures to divert flow around instream construction sites.

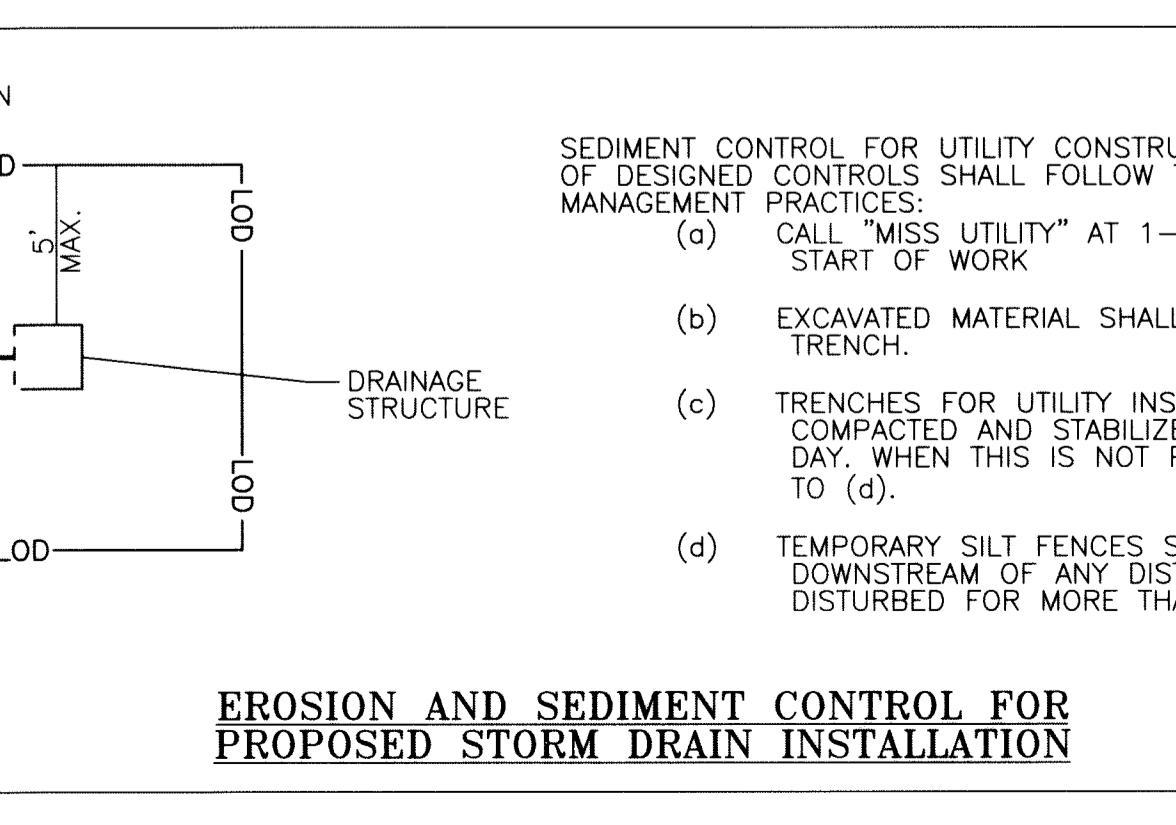
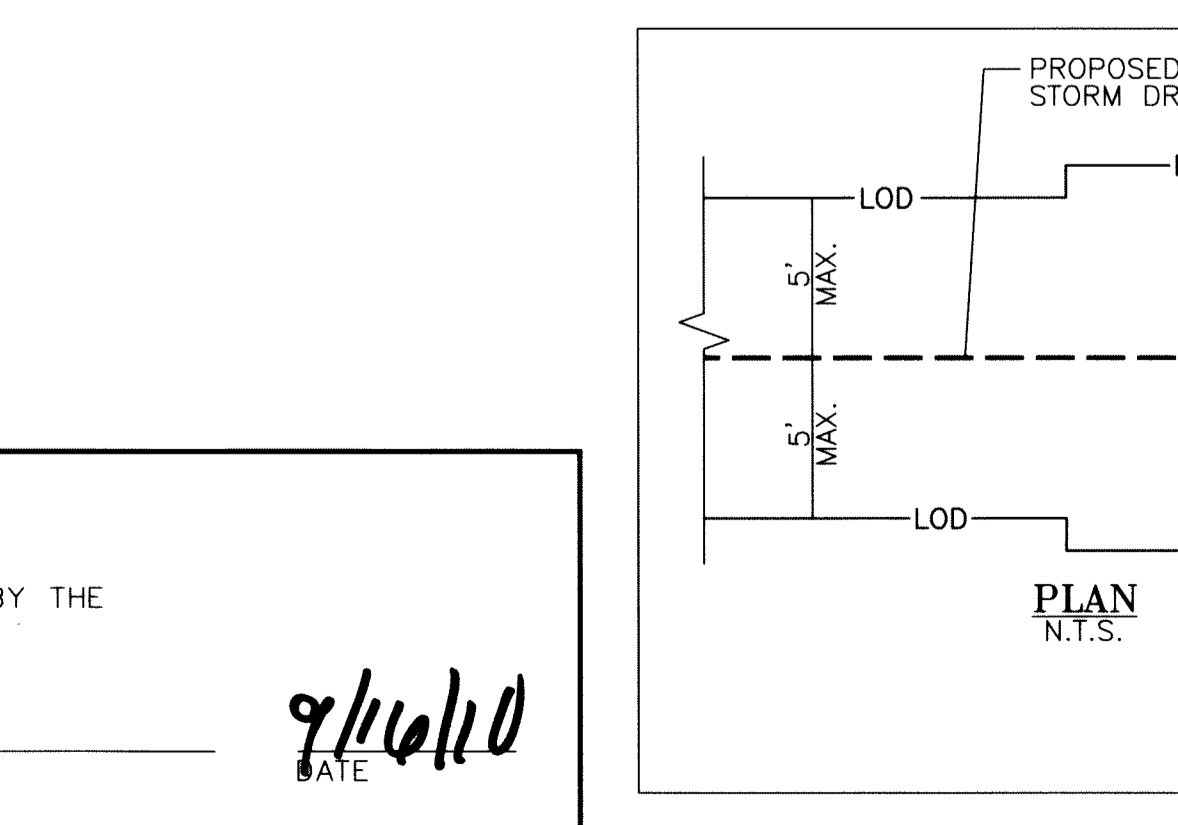
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE | PAGE H - 26 - 3A | MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT

*[Signature]*  
HOWARD SCD

9/16/10  
DATE



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011

*[Signature]*  
9-14-2010

SAVAGE PARK CHANNEL STABILIZATION AND STORMWATER MANAGEMENT SECTION 4 AREAS 12.3 CAPITAL PROJECT S-6175

EROSION & SEDIMENT CONTROL NOTES & DETAILS

SCALE: N/A  
DATE: SEPTEMBER 2010  
JOB NO.: 01-081795.20  
CAPITAL PROJECT NO.: S-6175  
PERMIT ISSUE:  
CONSTRUCTION ISSUE:

DI124 08-SAVAGE PARK STORM DRAIN  
SHEET NO.: 22 OF 32

NO. REVISIONS DESCRIPTION

DATE

936 RIDGEBROOK ROAD  
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KCI TECHNOLOGIES

SAVAGE PARK CHANNEL STABILIZATION AND STORMWATER MANAGEMENT SECTION 4 AREAS 12.3 CAPITAL PROJECT S-6175

EROSION & SEDIMENT CONTROL NOTES & DETAILS

SCALE: N/A  
DATE: SEPTEMBER 2010  
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CONSTRUCTION ISSUE:

DI124 08-SAVAGE PARK STORM DRAIN  
SHEET NO.: 22 OF 32

FILE: M:\2008\081795.20\Drawings\SES\_P022.dwg



21.0 STANDARD AND SPECIFICATIONS

FOR

TOPSOIL

Definition

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

Purpose

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

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:

- a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
- b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
- c. The original soil to be vegetated contains material toxic to plant growth.
- d. The soil is so acidic that treatment with limestone is not feasible.

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

Construction and Material Specifications

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

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

- i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2" in diameter.
- ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, johnsongrass, nutsedge, poison ivy, thistle, or others as specified.
- iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

III. For sites having disturbed areas under 5 acres:

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

IV. For sites having disturbed areas over 5 acres:

- i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil to compliance with the following:
  - a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
  - b. Organic content of topsoil shall be not less than 1.5 percent by weight.
  - c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
  - d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time as elapsed (14 days min.) to permit dissipation of phytotoxic materials.

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

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

V. Topsoil Application

- i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.
- ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.
- iii. Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
- iv. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

HOWARD COUNTY CONSERVATION DISTRICT  
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 (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 most current MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.
4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol 1, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
6. All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
7. Site Analysis:
  - Total Area of Site 67.30 Acres
  - Area Disturbed 2.08 Acres
  - Area to be roofed or paved 0.05 Acres
  - Area to be vegetatively stabilized 1.96 Acres
  - Total Cut 2,325 Cu. Yds.
  - Total Fill 235 Cu. Yds.
  - Offsite waste/borrow area location and permit To Be Determined

8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
9. Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each work day, whichever is shorter. Offsite waste/borrow site shall have an approved sediment control plan and permit.

HOWARD SOIL CONSERVATION DISTRICT

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 three inches of soil by raking, disking 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/acre dolomitic limestone (92 lbs/1000 sq. ft.) and 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil. At time of seeding, apply 400 lbs/acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq. ft.)
2. **Acceptable** -- Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq. ft.) and 1000 lbs/acre 10-10-10 fertilizer (23 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil.

**Seeding** - For the periods March 1 - April 30, and August 1 - October 15, seed with 60 lbs/acre (1.4 lbs/1000 sq. ft.) of Kentucky 31 Tall Fescue. For the period May 1 - July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs/acre (.05 lbs/100sq. ft.) of weeping lovegrass. During the period of October 16 - February 28, protect site by: **Option 1** - Two tons per acre of well anchored straw mulch and seed as soon as possible in the spring. **Option 2** - Use sod. **Option 3** - Seed with 60 lbs/acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.

**Mulching** - Apply 1-1/2 to 2 tons per acre (70 to 90 lbs/1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool. No asphalt emulsion shall be used for anchoring. Only a non-toxic, latex tacking material is allowed.

**Maintenance** - Inspect all seeding areas and make needed repairs, replacements and reseedings.

\*\* Contractor shall perform a soil test at the site as a first order of business. The results shall be reviewed by Department of Recreation and Parks to determine appropriate soil amendments and fertilization needs for this project. No fertilizer or soil amendments shall be added without approval of Department of Recreation and Parks.

FILL MATERIAL AND COMPACTION REQUIREMENTS:

In general, existing on-site soils free from environmental contamination, building debris, frozen, organic or wet materials and with a Unified Soils Classification of CL-MU, or more granular, with a plasticity index less than 12 can be reused as compacted fill. On-site soils with a Unified Soils Classification of CL, CH, or MH or with liquid limits greater than 40 and plastic indices greater than or equal to 12 are not suitable as structural fill. If imported materials are required it shall have a Unified Soils Classification of SM or more granular and less plastic and a maximum dry density of at least 105-pcf in accordance with the modified proctor test method (ASTM D-1557) or as approved by the Engineer.

Fill shall be placed in horizontal, eight-inch maximum loose lifts and compacted to at least 92 percent of the Modified Proctor maximum dry density (ASTM D-1557), or alternately the Contractor shall compact each lift a minimum of 3 to 4 passes as approved by the Engineer. The moisture content of the fill shall be properly controlled during placement and shall be within 3 percentage points of the optimum moisture. Filling placed on hillsides shall be benched to prevent a sliding failure plane.

As directed by the Engineer, in-place density tests shall be performed by an engineering technician on a full-time basis under the supervision of a geotechnical engineer licensed in the State of Maryland to verify that the proper degree of compaction is being obtained.

GENERAL CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777, HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION (410)-313-1880 AND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION (410)-537-3510 AT LEAST SEVEN (7) DAYS PRIOR TO BEGINNING ANY WORK.
2. THE CONTRACTOR SHALL OBTAIN GRADING AND ALL NECESSARY PERMITS FOR CONSTRUCTION (INCLUDING MDE PERMIT FOR STORMWATER ASSOCIATED WITH CONSTRUCTION ACTIVITY) FROM THE COUNTY AT THE PRE-CONSTRUCTION MEETING.
3. CONTRACTOR SHALL COORDINATE AN ON-SITE PRE-CONSTRUCTION MEETING THAT SHALL INCLUDE COUNTY PROJECT MANAGER, A REPRESENTATIVE FROM MARYLAND DEPARTMENT OF ENVIRONMENT, HOWARD COUNTY CONSTRUCTION INSPECTION, BUREAU OF UTILITY, AND HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
4. CONTRACTOR SHALL STAKE OUT LOD AND TREE SAVES PRIOR TO PRE-CONSTRUCTION MEETING.
5. CONTRACTOR SHALL TAKE EXTRA PRECAUTION FOR TRANSPORTING MATERIALS FROM THE STOCKPILE AREA TO THE CONSTRUCTION SITE.
6. CONTRACTOR SHALL MINIMIZE THE IMPACT ON EXISTING TREES, WETLANDS, U.S. WATERS, EXISTING UTILITY AND OTHER EXISTING FEATURES.
7. CONTRACTOR SHALL CAUTION THE TRUCK DRIVERS TO TAKE EXTRA PRECAUTION WHILE DRIVING ON THE TEMPORARY ACCESS PATHWAY SO THAT IT CAN MINIMIZE THE IMPACTS ON STREAMBED, SIDE SLOPES, EXISTING TREES, U.S. WATERS, AND ANY EXISTING FEATURES.
8. ALL IN STREAM WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE PUMP AROUND CRITERIA.



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011

SEQUENCE OF CONSTRUCTION

DURATION

CHANNEL STABILIZATION PHASE

1. INSTALL TEMPORARY ACCESS BRIDGE, SCE, SILT FENCE, SUPER SILT FENCE, AND ORANGE SAFETY FENCE USING THE ACCESS PATHS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR. THE ACCESS PATHS SHALL BE STABILIZED WITH STONE OR PROTECTED WITH SILT FENCE AT THE INSPECTOR'S DISCRETION. WITH PERMISSION FROM INSPECTOR, CONTRACTOR SHALL PROCEED WITH PHASE 1.

PHASE 1: (STA. 4+50 TO STA. 6+25)

2. INSTALL PUMP-AROUND PRACTICE AS SHOWN ON THE PLANS FROM STA. 4+50 TO STA. 6+25. WITH APPROVAL OF INSPECTOR COMMENCE IN STREAM WORK.
3. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON MAIN CHANNEL, WORKING DOWNSTREAM TO UPSTREAM, FROM STA. 6+25 TO STA. 4+50 AND STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA THAT CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY THE END OF EACH DAY.
4. PERMANENTLY STABILIZE WORK AREA WITHIN PHASE 1 AND WITH PERMISSION FROM INSPECTOR, CONTRACTOR SHALL PROCEED WITH PHASE 2.

PHASE 2: (STA. 0+00 TO STA. 4+50)

5. INSTALL PUMP-AROUND PRACTICES AS SHOWN ON THE PLANS FROM STA. 0+00 TO STA. 4+50. WITH APPROVAL OF INSPECTOR COMMENCE IN STREAM WORK.
6. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON MAIN CHANNEL, WORKING DOWNSTREAM TO UPSTREAM, FROM STA. 4+50 TO STA. 0+00 AND STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA THAT CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY THE END OF EACH DAY.
7. WITH PERMISSION FROM INSPECTOR, REMOVE THE PUMP AROUND SYSTEM AND PERMANENTLY STABILIZE THE WORK AREA WITHIN PHASE 2. WITH PERMISSION FROM INSPECTOR, CONTRACTOR SHALL PROCEED WITH THE DRAINAGE PHASE.

DRAINAGE PHASE

NOTE: DRAINAGE CONSTRUCTION SHALL OCCUR AFTER THE CHANNEL STABILIZATION WORK HAS BEEN COMPLETED.

8. INSTALL SILT FENCE AND SUPER SILT FENCE DOWNSTREAM OF PIPE TRENCH LOCATIONS AND AT PIPE OUTFALLS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.
9. CONSTRUCT DRAINAGE SYSTEM FROM E-2 TO M-4, INCLUDING RIPRAP AT OUTFALL, AS SHOWN ON THE PLANS. REPAIR ASPHALT PATHS DISTURBED BY PIPE TRENCH AS NEEDED. CONSTRUCT ONLY THAT LENGTH OF PIPE EACH DAY THAT CAN BE STABILIZED TO EXISTING GRADE BY THE END OF EACH WORK DAY.
10. CONSTRUCT DRAINAGE SYSTEM FROM E-6 TO E-11 AND M-7 TO I-9 AS SHOWN ON THE PLANS. REPAIR ROAD TO EXISTING CONDITION AFTER CONSTRUCTION OF I-10 TO E-11. CONSTRUCT ONLY THAT LENGTH OF PIPE EACH DAY THAT CAN BE STABILIZED TO EXISTING GRADE BY THE END OF EACH WORK DAY, UNLESS AREA DRAINS TO SILT FENCE/SUPER SILT FENCE CONSTRUCTED IN STEP 2.
11. CONSTRUCT DRAINAGE SYSTEM FROM E-14 TO M-16, INCLUDING STONE DRAIN, AS SHOWN ON THE PLANS. CONSTRUCT ONLY THAT LENGTH OF PIPE EACH DAY THAT CAN BE STABILIZED TO EXISTING GRADE BY THE END OF EACH WORK DAY.
12. PERMANENTLY STABILIZE ALL AREAS WITHIN THE DRAINAGE PHASE WORK AREA. AND WITH PERMISSION FROM THE INSPECTOR, PROCEED WITH THE NEXT PHASE.

BIORETENTION AREA 1 PHASE

NOTE: BIORETENTION AREA 1 CAN BE CONSTRUCTED AT ANY POINT AFTER STEP 7 OF THE GENERAL CONSTRUCTION NOTES.

13. INSTALL SCE, SILT FENCE, SUPER SILT FENCE, AND CLEARWATER DIVERSION FENCE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.
14. CONSTRUCT DRAINAGE SYSTEM FROM E-17 TO I-18, INCLUDING RIPRAP AT OUTFALL, AS SHOWN ON THE PLANS.
15. CONSTRUCT BIORETENTION FACILITY, INCLUDING EMBANKMENT, AS SHOWN ON THE PLAN. ALL SEDIMENT LADEN WATER WITHIN THE LOD SHALL BE PUMPED THROUGH A REMOVABLE PUMPING STATION.
16. DURING A DRY WEATHER FORECAST, REMOVE CLEARWATER DIVERSION FENCE AND PERFORM FINAL GRADING OF FACILITY. INSTALL RIPRAP DOWNSTREAM OF CURB OPENING.
17. LANDSCAPE BIORETENTION PER THE LANDSCAPE PLANS AND PERMANENTLY STABILIZE THE AREA. WITH THE PERMISSION OF THE INSPECTOR, REMOVE THE TEMPORARY BULKHEAD FROM THE 24" RCP.

BIORETENTION AREA 2 PHASE

NOTE: BIORETENTION AREA 2 CAN BE CONSTRUCTED AFTER THE DRAINAGE WORK (STEPS 10 - 14) HAVE BEEN COMPLETED.

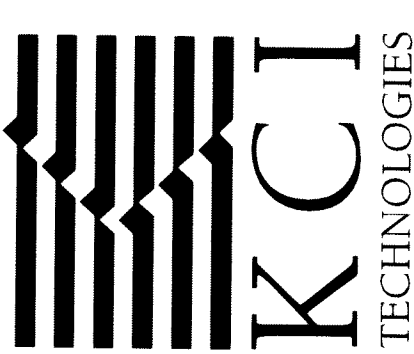
18. INSTALL SCE AND SILT FENCE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.
19. RELOCATE EXISTING TREE AS SPECIFIED ON THE PLANS TO THE LOCATION DETERMINED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
20. CONSTRUCT BIORETENTION FACILITY, INCLUDING EMBANKMENT, AS SHOWN ON THE PLAN. ALL SEDIMENT LADEN WATER WITHIN THE LOD SHALL BE PUMPED THROUGH A REMOVABLE PUMPING STATION.
21. AFTER BIORETENTION AREA HAS BEEN STABILIZED, DURING A DRY WEATHER FORECAST, REMOVE EXISTING CONCRETE CHANNEL AT CURB OPENING AND STABILIZE AREA TO EXISTING GRADE AND CONSTRUCT DRAINAGE SYSTEM FROM E-12 TO I-20 AS SHOWN ON THE PLANS.
22. REMOVE CONCRETE CURB AND GUTTER AS SHOWN ON THE PLANS.
23. LANDSCAPE BIORETENTION PER THE LANDSCAPE PLANS AND PERMANENTLY STABILIZE THE AREA. WITH THE PERMISSION OF THE INSPECTOR, REMOVE THE TEMPORARY BULKHEAD FROM THE 18" RCP AND PROCEED WITH THE FINAL STABILIZATION PHASE.

FINAL STABILIZATION PHASE

24. WITH PERMISSION FROM THE INSPECTOR, REMOVE ALL SEDIMENT CONTROL DEVICES AND PERMANENTLY STABILIZE THE REMAINING DISTURBED AREA.
25. REMOVE ALL STOCKPILE AREAS AND STABILIZE THE AREA TO ITS EXISTING CONDITION.

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD  
SPARKS, MARYLAND 21152  
TELEPHONE: (410) 316-7800  
FAX: (410) 316-7818  
www.kci.com



SAVAGE PARK  
CHANNEL STABILIZATION AND  
STORMWATER MANAGEMENT  
SECTION 4 AREAS 1,2,3  
CAPITAL PROJECT S-6175

EROSION &  
SEDIMENT  
CONTROL  
NOTES

SCALE:	N/A
DATE:	SEPTEMBER 2010
KCI JOB NO.:	01-081795-20
CAPITAL PROJECT NO.:	S-6175
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

D1124 08-  
SAVAGE PARK  
STORM DRAIN

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

*John R. Roberts*  
HOWARD SCD

*ghalo*  
DATE

PLOTTED: 11:54 AM on Monday, September 13, 2010  
 By: Ashley Pliner Division: PDSO Natural Resources QMA Eng  
 FILE: M:\2008\081795-20\drawings\SES-D024-sswpage.dgn

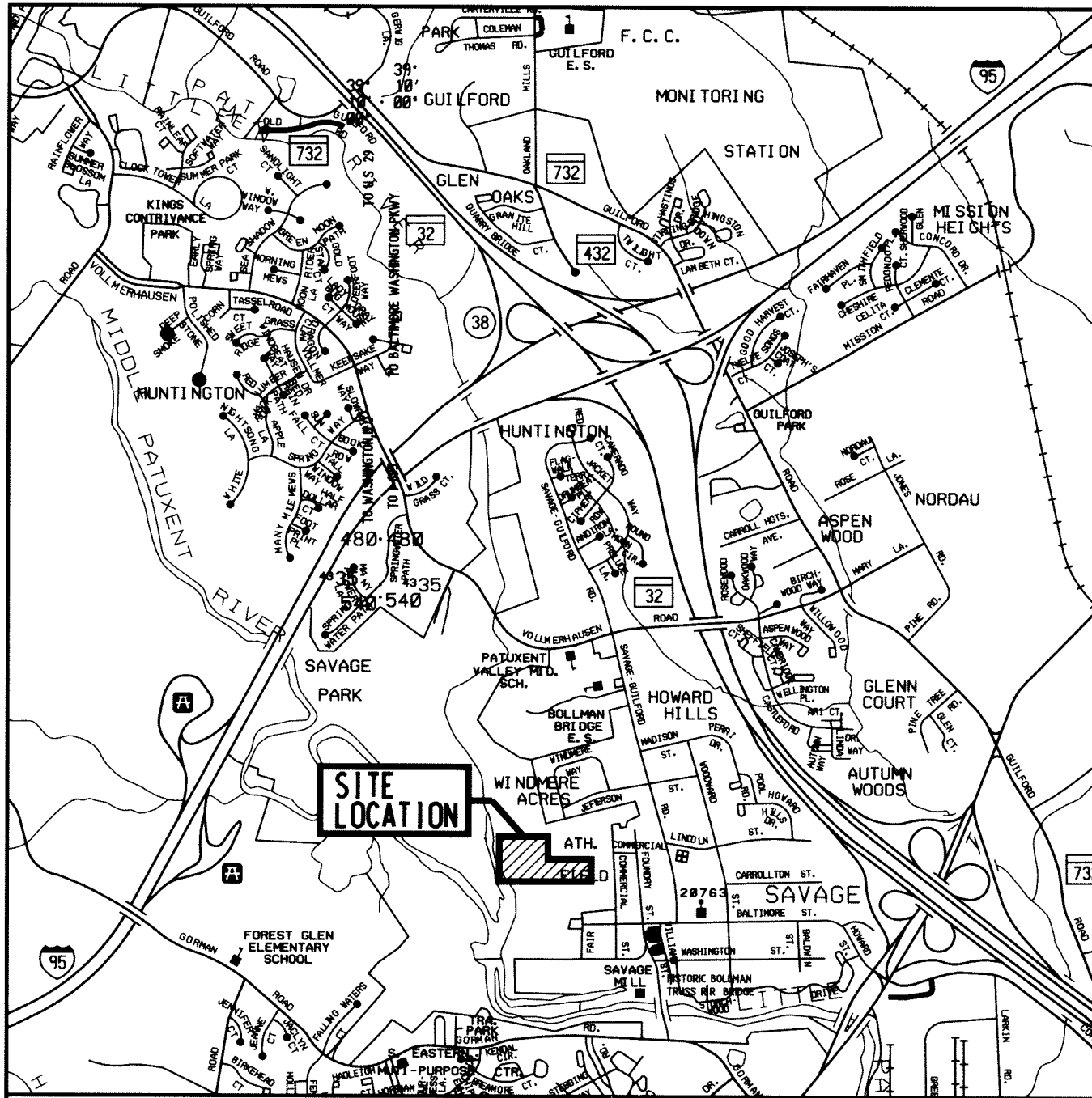




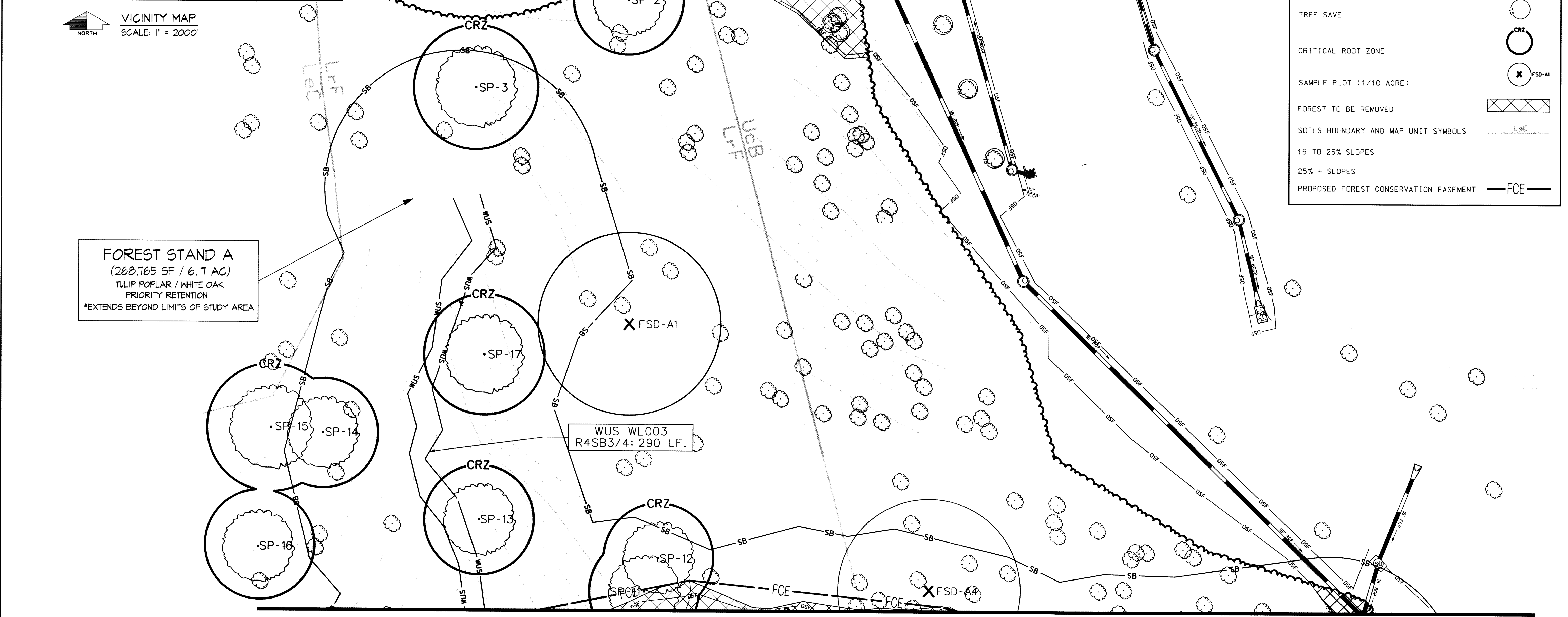








VICINITY MAP  
SCALE: 1" = 2000'

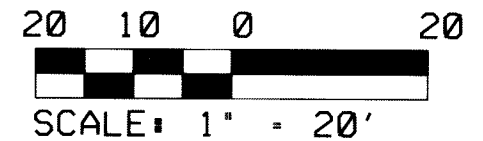


**FOREST STAND A**  
(262,765 SF / 6.17 AC)  
TULIP POPLAR / WHITE OAK  
PRIORITY RETENTION  
\*EXTENDS BEYOND LIMITS OF STUDY AREA

WUS WL003  
R4SB3/4; 290 LF.

LEGEND	
LIMIT OF DISTURBANCE	— L00 —
WATERS OF THE US (WUS)	— WUS —
EPHEMERAL CHANNEL	— SB —
50' WATERS OF THE US BUFFER	— SB —
EXISTING 100-YEAR FLOODPLAIN	— 275 —
EXISTING MAJOR CONTOUR	— 275 —
EXISTING MINOR CONTOUR	— 275 —
PROPOSED MAJOR CONTOUR	— 275 —
PROPOSED MINOR CONTOUR	— 275 —
PROPOSED DRAINAGE PIPE	— OSF —
ORANGE SAFETY FENCE/ TREE PROTECTION FENCING	— OSF —
EXISTING PAVEMENT	— OSF —
EXISTING EASEMENT	— OSF —
EXISTING TREELINE	— OSF —
EXISTING TREE	○
SPECIMEN TREE	○
TREE SAVE	○
CRITICAL ROOT ZONE	○
SAMPLE PLOT (1/10 ACRE)	○
FOREST TO BE REMOVED	⊗
SOILS BOUNDARY AND MAP UNIT SYMBOLS	— LRF —
15 TO 25% SLOPES	— LRF —
25% + SLOPES	— LRF —
PROPOSED FOREST CONSERVATION EASEMENT	— FCE —

MATCH LINE SEE SHEET 30 OF 32 AND 31 OF 32



THIS PLAN WAS PREPARED BY  
HARMONY MILLER  
KCI TECHNOLOGIES  
MDNR QUALIFIED PROFESSIONAL STATUS  
(2272008)

*Harmony Miller*  
SIGNATURE

15 SEPT 2010  
DATE

NO.	REVISIONS DESCRIPTION	DATE

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SPARKS, MARYLAND 21152  
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FAX: (410) 316-7818  
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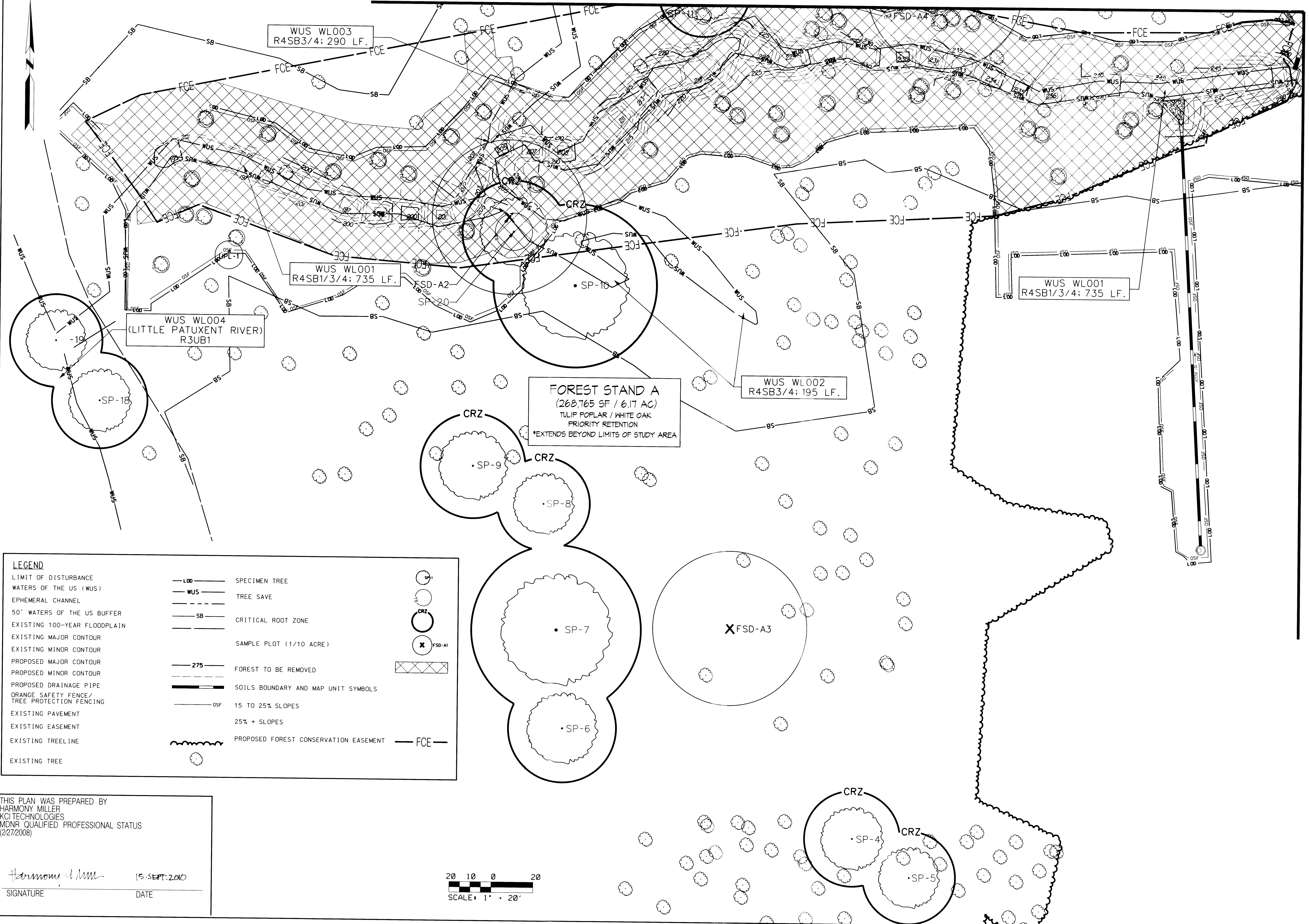
SAVAGE PARK  
CHANNEL STABILIZATION AND  
STORMWATER MANAGEMENT  
SECTION 4 AREAS 1,2,3  
CAPITAL PROJECT S-6175

FOREST  
CONSERVATION  
PLAN

SCALE: 1" = 20'  
DATE: SEPTEMBER 2010  
KCI JOB NO.: 01-081795.20  
CAPITAL PROJECT NO.: S-6175  
PERMIT ISSUE:  
CONSTRUCTION ISSUE:

D1124 08-  
SAVAGE PARK  
STORM DRAIN

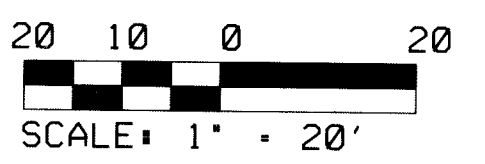
SHEET NO.: 29 OF 32



LEGEND	
LIMIT OF DISTURBANCE	— L00 —
WATERS OF THE US (WUS)	— WUS —
EPHEMERAL CHANNEL	— SB —
50' WATERS OF THE US BUFFER	— FCE —
EXISTING 100-YEAR FLOODPLAIN	— 275 —
EXISTING MAJOR CONTOUR	— OSF —
EXISTING MINOR CONTOUR	— OSF —
PROPOSED MAJOR CONTOUR	— OSF —
PROPOSED MINOR CONTOUR	— OSF —
PROPOSED DRAINAGE PIPE	— OSF —
ORANGE SAFETY FENCE / TREE PROTECTION FENCING	— OSF —
EXISTING PAVEMENT	— OSF —
EXISTING EASEMENT	— OSF —
EXISTING TREELINE	— OSF —
EXISTING TREE	— OSF —
SPECIMEN TREE	○
TREE SAVE	○
CRITICAL ROOT ZONE	○
SAMPLE PLOT (1/10 ACRE)	○
FOREST TO BE REMOVED	○
SOILS BOUNDARY AND MAP UNIT SYMBOLS	○
15 TO 25% SLOPES	○
25% + SLOPES	○
PROPOSED FOREST CONSERVATION EASEMENT	— FCE —

THIS PLAN WAS PREPARED BY  
 HARMONY MILLER  
 KCI TECHNOLOGIES  
 MDNR QUALIFIED PROFESSIONAL STATUS  
 (2/27/2008)

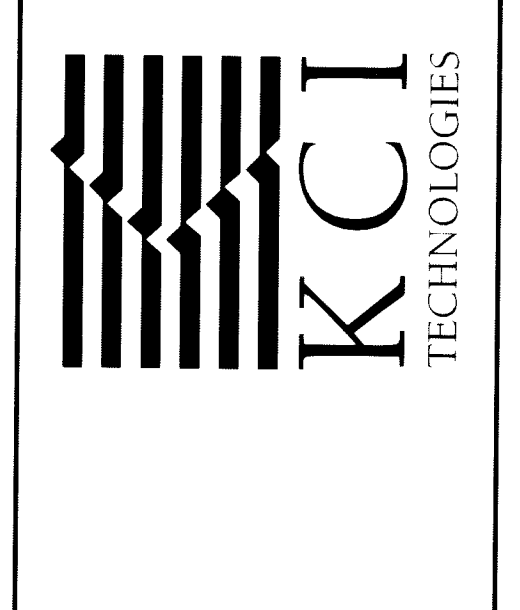
*Harmony Miller* 15-SEPT-2010  
 SIGNATURE DATE



MATCH LINE SEE SHEET 31 OF 32

NO.	REVISIONS DESCRIPTION	DATE

936 RIDGEBROOK ROAD  
 SPARKS, MARYLAND 21152  
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 FAX: (410) 316-7818  
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SAVAGE PARK  
 CHANNEL STABILIZATION AND  
 STORMWATER MANAGEMENT  
 SECTION 4 AREAS 12.3  
 CAPITAL PROJECT S-6175

FOREST  
 CONSERVATION  
 PLAN

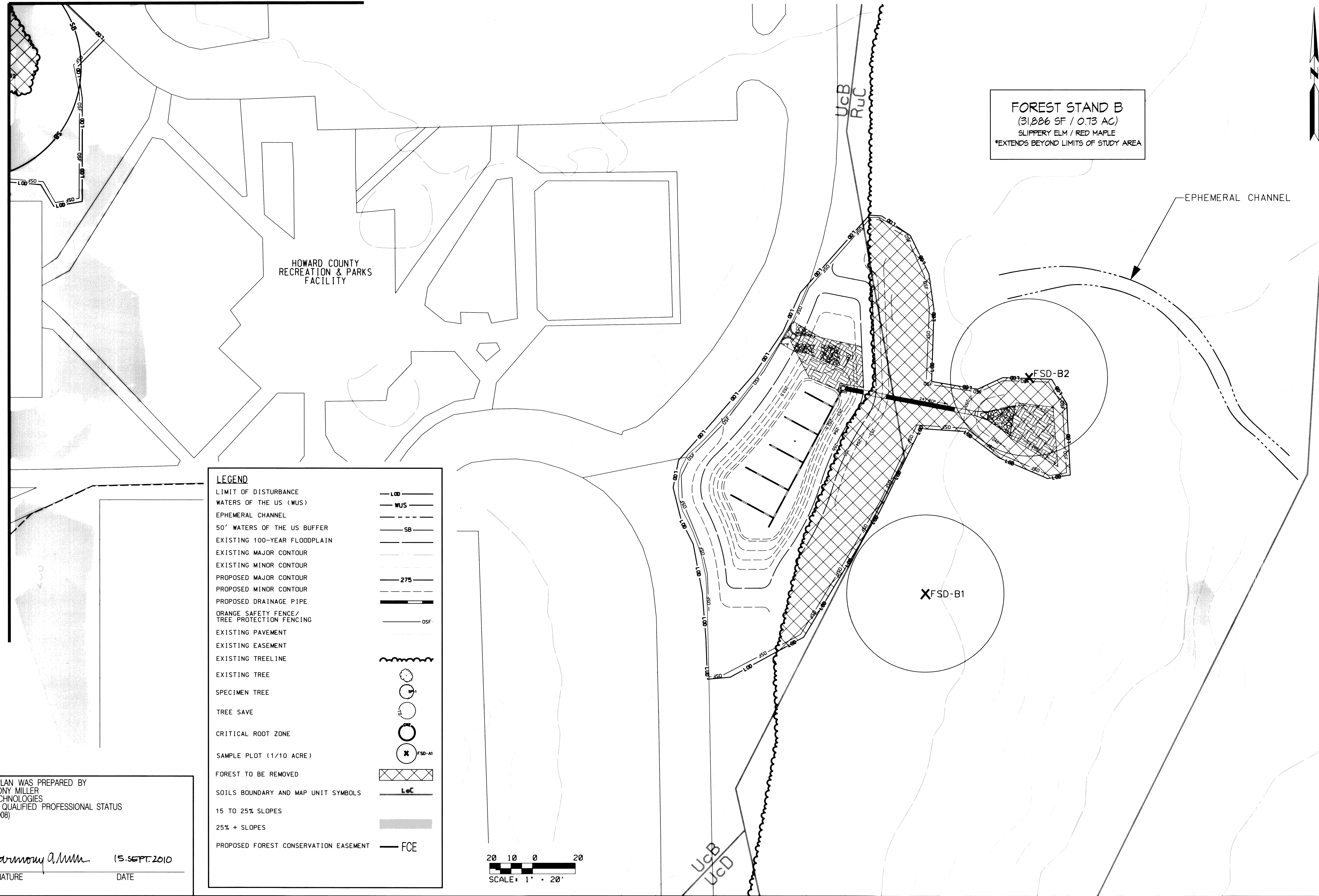
SCALE: 1" = 20'  
 DATE: SEPTEMBER 2010  
 KCI JOB NO.: 01-081795.20  
 CAPITAL PROJECT NO.: S-6175  
 PERMIT ISSUE:  
 CONSTRUCTION ISSUE:

21124 08-  
 SAVAGE PARK  
 STORM DRAIN

SHEET NO.: 30 OF 32

MATCH LINE SEE SHEET 29 OF 32

MATCH LINE SEE SHEET 30 OF 32



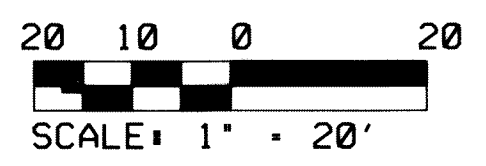
**FOREST STAND B**  
 (31,886 SF / 0.73 AC)  
 SLIPPERY ELM / RED MAPLE  
 \*EXTENDS BEYOND LIMITS OF STUDY AREA

HOWARD COUNTY  
 RECREATION & PARKS  
 FACILITY

EPHEMERAL CHANNEL

**LEGEND**

- LIMIT OF DISTURBANCE — L.O.D.
- WATERS OF THE US (WUS) — WUS
- EPHEMERAL CHANNEL — [dashed line]
- 50' WATERS OF THE US BUFFER — SB
- EXISTING 100-YEAR FLOODPLAIN — [dotted line]
- EXISTING MAJOR CONTOUR — [solid line]
- EXISTING MINOR CONTOUR — [dashed line]
- PROPOSED MAJOR CONTOUR — [solid line]
- PROPOSED MINOR CONTOUR — [dashed line]
- PROPOSED DRAINAGE PIPE — [thick solid line]
- ORANGE SAFETY FENCE/TREE PROTECTION FENCING — OSF
- EXISTING PAVEMENT — [dotted line]
- EXISTING EASEMENT — [dashed line]
- EXISTING TREELINE — [wavy line]
- EXISTING TREE — [circle with cross]
- SPECIMEN TREE — [circle with 'S']
- TREE SAVE — [circle with 'S']
- CRITICAL ROOT ZONE — [circle with 'X']
- SAMPLE PLOT (1/10 ACRE) — [circle with 'X'] FSD-A1
- FOREST TO BE REMOVED — [cross-hatched]
- SOILS BOUNDARY AND MAP UNIT SYMBOLS — L.O.C.
- 15 TO 25% SLOPES — [stippled]
- 25% + SLOPES — [solid grey]
- PROPOSED FOREST CONSERVATION EASEMENT — F.C.E.

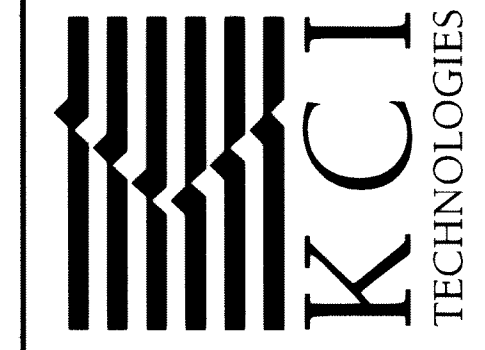


THIS PLAN WAS PREPARED BY  
 HARMONY MILLER  
 KCI TECHNOLOGIES  
 MDNR QUALIFIED PROFESSIONAL STATUS  
 (2/27/2008)

*Harmony Miller* 15 SEPT. 2010  
 SIGNATURE DATE

NO.	REVISIONS DESCRIPTION	DATE

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 SPARKS, MARYLAND 21152  
 TELEPHONE: (410) 316-7800  
 FAX: (410) 316-7818  
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SAVAGE PARK  
 CHANNEL STABILIZATION AND  
 STORMWATER MANAGEMENT  
 SECTION 4 AREAS 1,2,3  
 CAPITAL PROJECT S-6175

**FOREST CONSERVATION PLAN**

SCALE: 1" = 20'  
 DATE: SEPTEMBER 2010  
 KCI JOB NO.: 01-081795.20  
 CAPITAL PROJECT NO.: S-6175  
 PERMIT ISSUE:  
 CONSTRUCTION ISSUE:

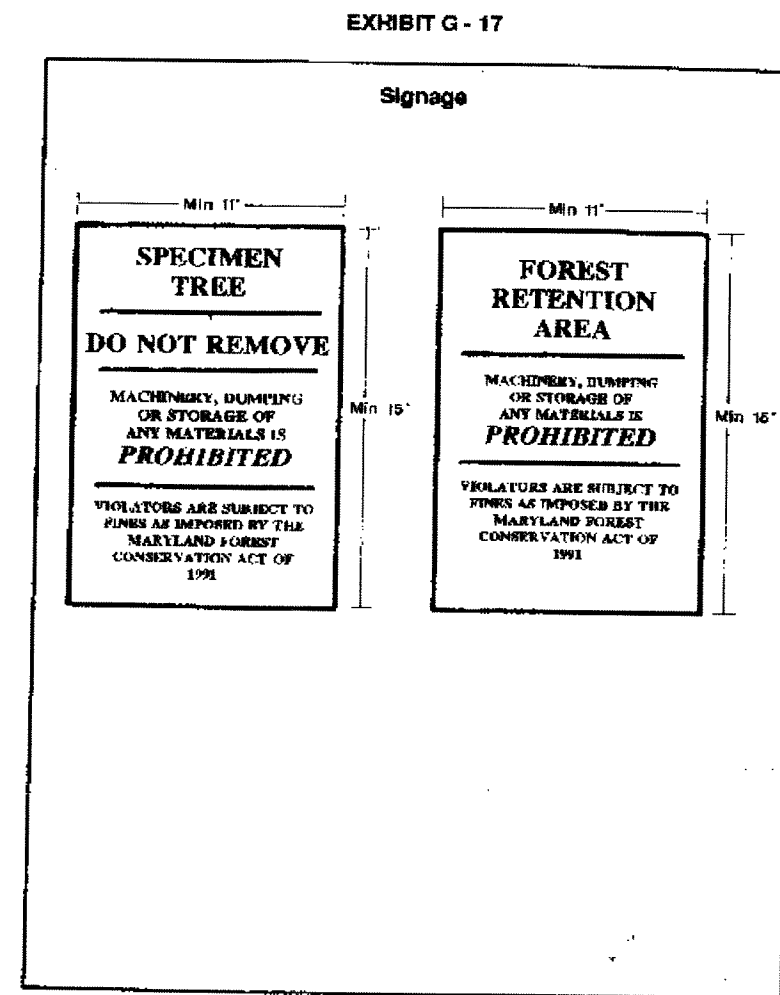
D1124 00-  
 SAVAGE PARK  
 STORM DRAIN

SHEET NO.: 31 OF 32

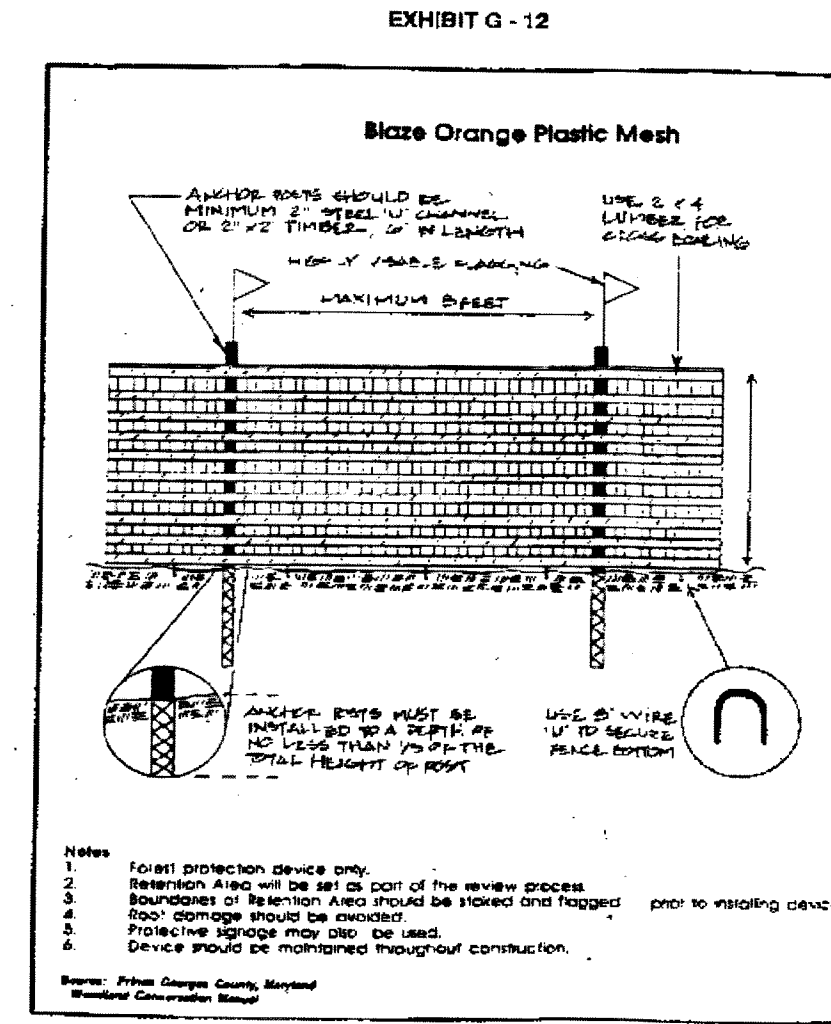
PLOTTED: 11:55 AM on Monday, September 13, 2010  
 By: Ashley Pliner, Division: PDSO, Natural Resources, CMA, Erip  
 FILE: M:\2008\01081795.20\Drawings\Twp03\_Savage.dgn

Specimen Trees			
ID	Size (inches DBH)	Condition	Species
SP-1	32	Excellent	Black oak ( <i>Quercus velutina</i> )
SP-2	30	Good	American beech ( <i>Fagus grandifolia</i> )
SP-3	34	Good	White oak ( <i>Quercus alba</i> )
SP-4	31	Excellent	Tulip poplar ( <i>Liriodendron tulipifera</i> )
SP-5	30	Excellent	Tulip poplar ( <i>L. tulipifera</i> )
SP-6	35	Excellent	Tulip poplar ( <i>L. tulipifera</i> )
SP-7	55	Good	Tulip poplar ( <i>L. tulipifera</i> )
SP-8	30	Good	White oak ( <i>Q. alba</i> )
SP-9	34	Excellent	White oak ( <i>Q. alba</i> )
SP-10	53	Fair	White oak ( <i>Q. alba</i> )
SP-11	30	Very Good	White oak ( <i>Q. alba</i> )
SP-12	30	Good	Tulip poplar ( <i>L. tulipifera</i> )
SP-13	30	Excellent	White oak ( <i>Q. alba</i> )
SP-14	30	Excellent	White oak ( <i>Q. alba</i> )
SP-15	35	Very Good	White oak ( <i>Q. alba</i> )
SP-16	30	Excellent	White oak ( <i>Q. alba</i> )
SP-17	33	Fair	White oak ( <i>Q. alba</i> )
SP-18	31	Excellent	Tulip poplar ( <i>L. tulipifera</i> )
SP-19	30	Good	American sycamore ( <i>Platanus occidentalis</i> )
SP-20	34	Excellent	Black oak ( <i>Q. velutina</i> )

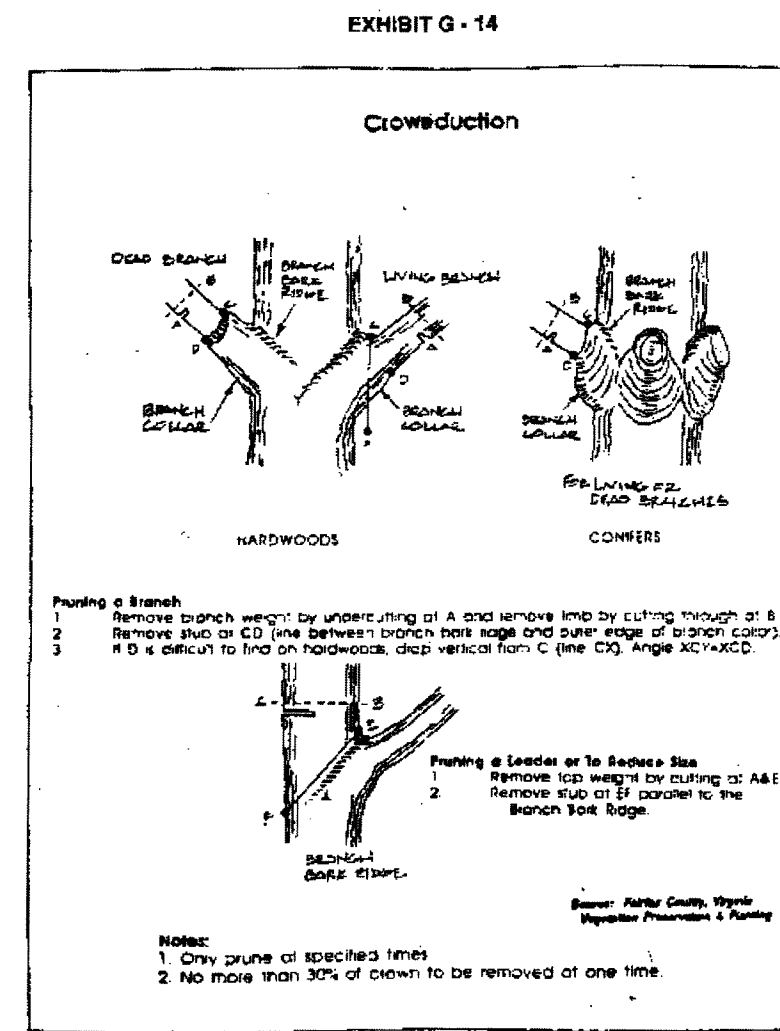
Soils		
Soil series	Hydric (Y/N)	K value
Codorus and Halboro silt loam, 0-3% slopes (Co)	Y	0.28-0.43
Lagore silt loam, 8-15% slopes, stony (LeC)	N	0.02-0.43
Lagore-Relay gravelly loam, 25-65% slopes, very stony (LrF)	N	0.02-0.49
Urban land-Chillum-Beltville complex, 0-5% slopes (UcB)	N	0.10-0.49
Russett and Beltville soils, 5-10% slopes (RuC)	N	0.15-0.49



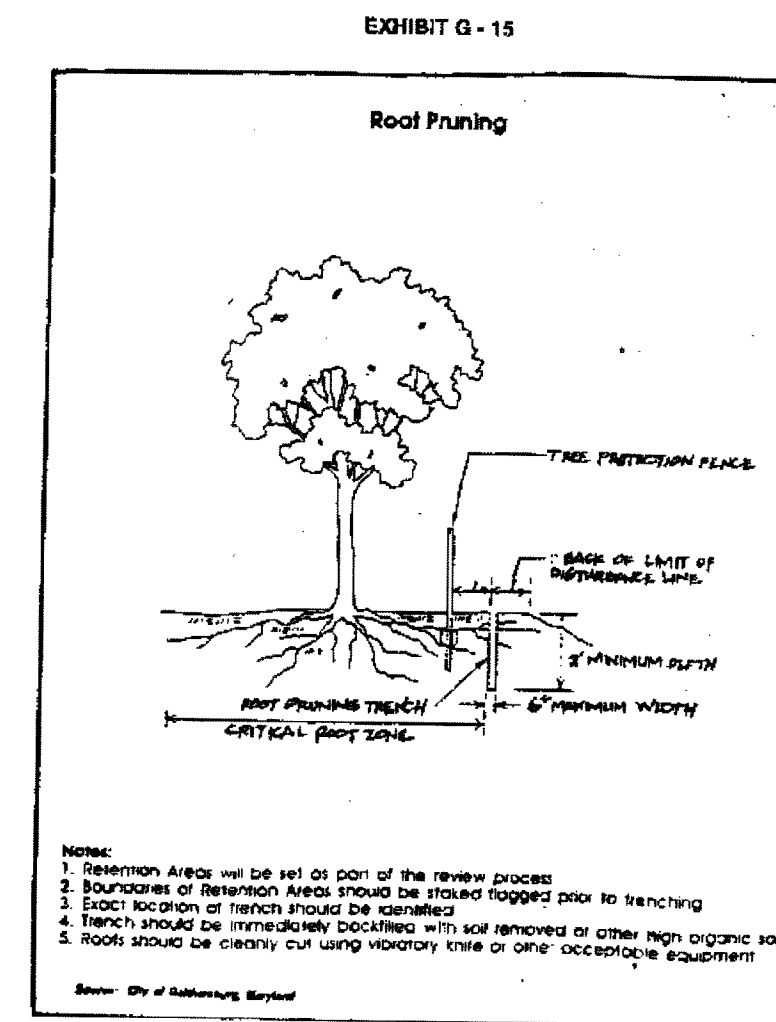
FOREST CONSERVATION SIGNAGE  
NOT TO SCALE



TREE PROTECTION FENCING/  
ORANGE SAFETY FENCE  
NOT TO SCALE



CROWN REDUCTION  
NOT TO SCALE



ROOT PRUNING  
NOT TO SCALE

**Forest Conservation Worksheet**  
SAVAGE PARK WATER QUALITY IMPROVEMENT PROJECT

**Net Tract Area**

A. Total Tract Area	A= 1.99 ac.
B. Area within 100-year Floodplain	B= 0.00 ac.
B1. Area within existing Forest Conservation Easement *	B1= 0.00 ac.
C. Area to Remain In Agricultural Production	C= 0.00 ac.
D. Net Tract Area (D=(A-B-B1-C))	D= 1.99 ac.

**Land Use Category :** Institutional Development Areas

E. Afforestation Threshold (D x 15%)	E= 0.30 ac.
F. Conservation Threshold (D x 20%)	F= 0.40 ac.

**Existing Forest Cover**

G. Existing Forest Cover (excluding floodplain)	G= 1.16 ac.
H. Area of Forest Above Afforestation Threshold	H= 0.86 ac.
I. Area of Forest Above Conservation Threshold	I= 0.76 ac.

**Break Even Point**

J. Forest Retention Above Threshold with no Mitigation	J= 0.55 ac.
(1) If I>0 then J=(0.2 x I)+F, go to K	
(2) If I=0, J=0, go to L	
K. Clearing Permitted Without Mitigation (K=G-J)	K= 0.61 ac.

**Proposed Forest Clearing**

L. Total Area of Forest to be Cleared	L= 1.16 ac.
M. Total Area of Forest to be Retained (M=G-L)	M= 0.00 ac.

**Planting Requirements**

N. Reforestation for Clearing Above the Conservation Threshold	N= 0.19 ac.
P. Reforestation for Clearing Below the Conservation Threshold	P= 0.80 ac.
Q. Credit for Retention Above the Conservation Threshold	Q= 0.00 ac.
R. Total Reforestation Required	R= 0.99 ac.
S. Total Afforestation Required	S= 0.00 ac.
T. Total Reforestation and Afforestation Requirement T=(R+S)	T= 0.99 ac.

**FOREST CONSERVATION NOTES**

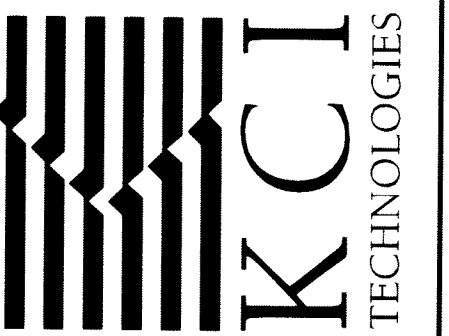
- Planting Requirement shall be met through 0.68 acre of replanting and stabilization within the limits of disturbance (LOD) and a 0.31 acre expansion of the forest conservation easement (FCE). The 0.31 acre expansion of the FCE will be contiguous to the LOD.
- See sheet 25 of 32 for landscape plans and sheet 28 of 32 for landscape notes and details.

**NOTES:**

- Project area is on one property owned by Howard County.
- Existing Zoning: Institutional
- Existing land use: Forest land deeded to Howard County.
- The area within the limits of disturbance was used as the total tract area.
- Waters of the U.S. were delineated by KCI Technologies, Inc. on April 7, 2009. Waters of the U.S. shown represent the unverified USACE water resource boundaries.
- There are no wetlands within the project area.
- Total surface area of perennial and intermittent streams: 6,338 sf.
- Total linear feet of perennial and intermittent streams: 698 lf.
- Total forested area within limits of disturbance: 1.16 acres.
- There are no Critical Habitat Areas within the project area. No rare, threatened or endangered species were encountered during the field investigations. In addition, correspondence with the Maryland Historic Trust, the U.S. Fish and Wildlife Service, and the Maryland Department of Natural Resources indicate there are no records of historic resources or sensitive natural resources within the affected area.
- Specimen tree #SP-20 is to be saved. This tree is located on the edge of a steep stream bank and therefore measures to protect this tree will be discussed at the pre-construction meeting.
- Tree Save is shown on trees within the LOD because an attempt will be made to save these trees. Trees will only be removed if necessary for grading or access.
- Base data provided by KCI Technologies Inc., Ridgebrook Road, Sparks, Maryland 21152.

NO.	REVISIONS DESCRIPTION	DATE

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SAVAGE PARK  
CHANNEL STABILIZATION AND  
STORMWATER MANAGEMENT  
SECTION 4 AREAS 12.3  
CAPITAL PROJECT S-6175

FOREST  
CONSERVATION  
NOTES AND  
DETAILS

SCALE:	NTS
DATE:	SEPTEMBER 2010
KCI JOB NO.:	01-081795.20
CAPITAL PROJECT NO.:	S-6175
PERMIT ISSUE:	
CONSTRUCTION ISSUE:	

D1124 08-  
SAVAGE PARK  
STORM DRAIN

THIS PLAN WAS PREPARED BY:  
HARMONY MILLER  
KCI TECHNOLOGIES  
MDNR QUALIFIED PROFESSIONAL STATUS  
(02.27.2008)

Signature: *Harmony Miller* DATE: 15 SEPT. 2010