#### INDEX OF SHEETS **DESCRIPTION** TITLE SHEET STREAM GEOMETRY SHEET STREAM PROFILE SHEET STREAM PROFILE SHEET STREAM GRADING PLAN STREAM DETAIL SHEET 1 STREAM DETAIL SHEET 2 BIORETENTION SITE 1 GRADING PLAN BIORETENTION SITE 1 GEOMETRY SHEET BIORETENTION SITE 1 PROFILES BIORETENTION SITE 2 GRADING PLAN AND PROFILES BIORETENTION SITE 2 GEOMETRY SHEET BIORETENTION DETAILS BIORETENTION NOTES DRAINAGE PLAN AND PROFILES DRAINAGE PLAN AND PROFILES DRAINAGE PROFILES **EROSION & SEDIMENT CONTROL PLAN** EROSION & SEDIMENT CONTROL PLAN **EROSION & SEDIMENT CONTROL PLAN EROSION & SEDIMENT CONTROL PLAN** EROSION & SEDIMENT CONTROL NOTES AND DETAILS EROSION & SEDIMENT CONTROL NOTES AND DETAILS **EROSION & SEDIMENT CONTROL NOTES** STREAM LANDSCAPE PLAN BIORETENTION SITE 1 LANDSCAPE PLAN BIORETENTION SITE 2 LANDSCAPE PLAN LANDSCAPE NOTES AND DETAILS FOREST CONSERVATION PLAN FOREST CONSERVATION PLAN FOREST CONSERVATION PLAN FOREST CONSERVATION NOTES AND DETAILS LEGEND LIMIT OF DISTURBANCE \_\_\_\_\_ EXISTING MAJOR CONTOURS \_\_\_\_\_\_

#### PROPOSED CONTOURS \_\_\_\_\_\_ EXISTING 100 YEAR FLOODPLAIN \_\_\_\_\_ PROPOSED 100 YEAR FLOODPLAIN\_\_\_\_\_ EXISTING TREE TO BE SAVED \_\_\_\_\_\_ EDGE OF TREELINE WATERS OF THE US\_\_\_\_\_\_ PROPERTY LINE\_\_\_\_\_ EXISTING STORM DRAIN \_\_\_\_\_\_ EXISTING SEWER MANHOLE \_\_\_\_\_\_ EXISTING STORM DRAIN MANHOLE \_\_\_\_\_\_ STONE TOE PROTECTION\_\_\_\_\_ RIFFLE GRADE CONTROL \_\_\_\_\_ SANDBAG DAM \_\_\_\_\_\_ REMOVABLE PUMPING STATION \_\_\_\_\_\_ FILTER BAG \_\_\_\_\_\_ SILT FENCE \_\_\_\_\_ SF \_\_\_\_ SUPER SILT FENCE \_\_\_\_\_ ORANGE SAFETY FENCE/ORANGE CONSTRUCTION FENCE\_\_\_ PROPOSED STORM DRAIN\_\_\_\_\_\_ STABILIZED CONSTRUCTION ENTRANCE \_\_\_\_\_\_ EXISTING CHAIN LINK FENCE \_\_\_\_\_ PROPERTY LINE \_\_\_\_\_ EXISTING ROAD EDGE \_\_\_\_\_\_ EXISTING SEWER LINE \_\_\_\_\_ CLEARWATER DIVERSION FENCE \_\_\_\_\_CWDF\_\_\_ SOTE BOUNDARY AND MAD HALL SYMPOL

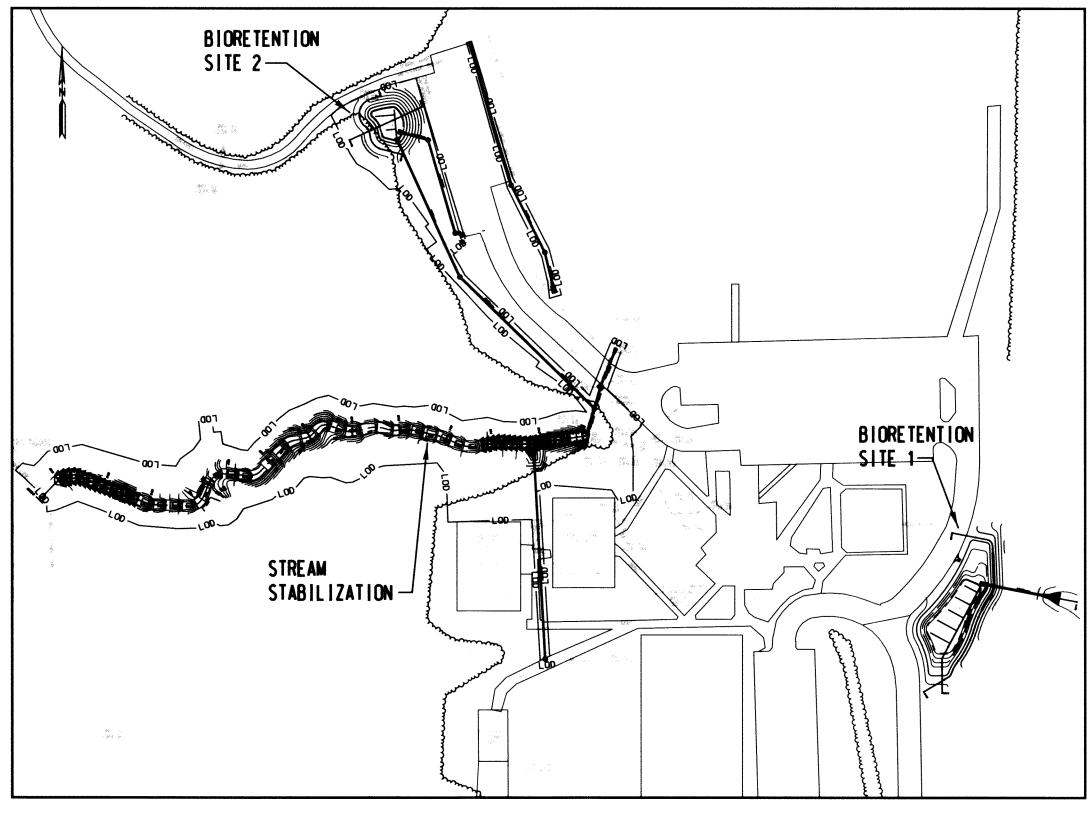
EXISTING MINOR CONTOURS \_\_\_\_\_

SUIL BUUNDHRT HIND MAP UNIT STMBUL	• •• •• •• •• ••	
ENGINEER	'S CERTIFICATE	
"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CO BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITION THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERV	ONS AND THAT IT WAS PREPARED	
MantenBond	P.E. • 25753	09/10/2010
ŠIGNĀTŪRE OF ENGINEER (PRINT NALE BELOW SIGNATURE)  MATTHEW R. SNYDER, PE		DATE
DEVELOPER	R'S CERTIFICATE	
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSON HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE CONTROL OF SEDIMENT AND EROSION BEFORE THE BEGI ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSER	NNEL INVOLVED IN THE CONSTRUCT THE ENVIRONMENT APPROVED TR NNING OF THE PROJECT. LALSO AU	TION PROJECT WILL AINING PROGRAM FOR
Hack S. Lichmann SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE)		<b>9/10/10</b> DATE

# SAVAGE PARK

CHANNEL STABILIZATION AND STORMWATER MANAGÉMENT HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS CAPITAL PROJECT S-6175 (DI124 08 - SAVAGE PARK STORM DRAIN)

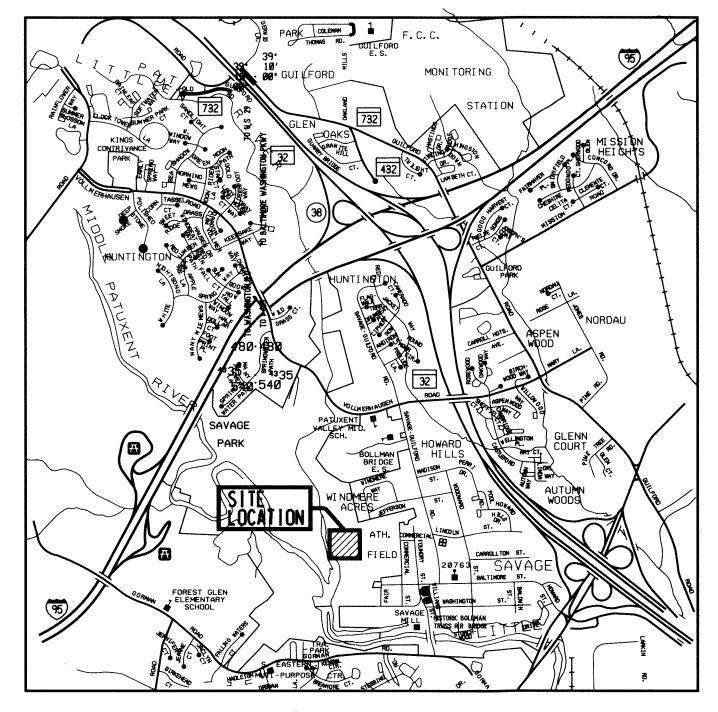


SITE SCHEMATIC SCALE: |" = 100'

#### SPECIAL CONTRACTOR NOTES

- 1. 100-YEAR FLOODPLAIN ELEVATION IS
- SHOWN ON THE PLANS. 2. NO STOCKPILE OF ANY MATERIAL IS
- ALLOWED IN THE 100-YEAR FLOODPLAIN 3. "USE I-P", PERSUANT TO WHICH THEY ARE
- PROTECTED FOR "WATER CONTACT RECREATION, PROTECTION OF NONTIDAL, WARMWATER, AQUATIC LIFE, AND PUBLIC WATER SUPPLY (COMAR 26.08.02.08). DUE TO THIS DESIGNATION, IN-STREAM WORK MAY NOT BE CONDUCTED DURING THE PERIOD OF MARCH 1ST TO JUNE 15TH, INCLUSIVE, DURING ANY YEAR (COMAR 26.08.02.11).
- 4. CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
- 5. THE CONTRACTOR SHALL EXERCISE CARE IN ACTIVITIES INVOLVING EITHER CUT AND FILL OR GRADING IN THE VICINITY OF TREES THAT ARE TO REMAIN AT THE CONSTRUCTION SITE. ALL EARTH CUTS AND ACTIVITIES IN THE VICINITY OF TREES TO REMAIN SHALL BE MADE IN A MANNER THAT DOES NOT DISTURB THE CRITICAL ROOT ZONE WITHIN THE DRIPLINE OF THE TREE. PROTECTIVE ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION. THE LOCATION OF THE PROTECTIVE ORANGE FENCING SHALL BE APPROVED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS PRIOR TO
- CONSTRUCTION. CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
- UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
- 9. ALL TREES TO BE REMOVED SHALL BE CUT AT THE BASE WITH A SAW AND NOT PUSHED OVER. TREE STUMPS MAY BE LEFT IN PLACE, UNLESS OTHERWISE DIRECTED ON THE PLANS.

AS-BUILT JUNE 6, 2011 NEW SHEETS 3A,5A,8A,10A, 11A,15A,16A,17A.





ADC MAP COORD. 20: A7 AND B3

H	OWARD COL	UNTY SURVEY	CONTROL	
DESIGNATION	PID	NORTHING	EASTING	ELEVATION
47FA	N/A	536345.2068	1361008.5091	258.799
<u> </u>				<b></b>

#### GENERAL INFORMATION

- 1. THE SUBJECT PROPERTIES ARE ZONED R-20 PER AUGUST 2007
- DISTRICT HAVE DETERMINED THAT THE DISTURBANCES WITHIN THE 100-YEAR FLOODPLAIN, WETLANDS, STREAM AND REQUIRED BUFFERS FOR THE PROPOSED STREAM RESTORATION PROJECT ARE CONSIDERED ESSENTIAL OR NECESSARY IN ACCORDANCE WITH SECTIONS 16.115(C) AND 16.116(C) OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS.
- 3. THIS PROJECT IS NOT A SUBDIVISION, AND THEREFORE THIS PLAN IS NOT REQUIRED TO MEET THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- 4. THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE. 5. THIS PLAN MEETS THE REQUIREMENTS OF THE FOREST CONSERVATION
- REGULATIONS. 6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY CONTAINED HEREIN PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- 7. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 24 HOURS IN ADVANCE OF ANY WORK BEING DONE.
- 8. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- 9. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NUMBER 47FA WAS USED FOR THIS SITE.
- 10. WATER IS PUBLIC.
- 11. SEWER IS PUBLIC.
- 12. EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD
- 13. THE FLOODPLAIN STUDY FOR THIS PROJECT WAS PREPARED BY KCI TECHNOLOGIES, INC. AND WAS APPROVED ON MAY 5, 2010.
- 14. THE WETLANDS DELINEATION FOR THIS PROJECT WAS PERFORMED BY KCI TECHNOLOGIES IN APRIL 2009.
- 15. THE EXISTING TOPOGRAPHY IS TAKEN FROM FIELD RUN SURVEY WITH ONE FOOT CONTOUR INTERVALS PREPARED BY AB CONSULTANTS, INC., IN APRIL 2009.
- 16. ALL WORK SHALL CONFORM TO THE MDE BEST MANAGEMENT PRACTICES FOR WETLANDS AND WATERWAYS AS LISTED IN THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT APPROVED MAY 10, 2010. (MDE TRACKING • 200963364/AI 129906).
- 17. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- 18. OBSTRUCTIONS SHOWN ON THIS DRAWING ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND KCI TECHNOLOGIES, INC. DOES NOT WARRANT OR GUARANTEE THE CORRECTNESS OR COMPLETENESS OF THE INFORMATION GIVEN. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY TO RESOLVE THE SITUATION. SHOULD THE CONTRACTOR MAKE FIELD CORRECTIONS OR ADJUSTMENTS WITHOUT NOTIFYING THE ENGINEER, THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THOSE CHANGES.
- 19. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO THE CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
- 20. A WAIVER PETITION (WP-10-069) FROM SECTION 16.1202, 16.103(J) AND 16.155(A)(I) WAS APPROVED ON JANUARY 8, 2010 THAT ALLOWS THE USE OF THE AREA INSIDE THE LIMIT OF DISTURBANCE AS THE NET TRACT AREA IN THE FOREST CONSERVATION CALCULATIONS AND NO SDP SUBMITTAL IS REQUIRED SUBJECT TO THE FOLLOWING CONDITIONS.
  - 1. APPROVAL OF ANY REQUIRED PERMITS FOR DISTURBANCE WITHIN THE FLOODPLAIN AND ITS BUFFERS.
  - 2. NO DISTURBANCE IS ALLOWED BEYOND THE LIMIT OF DISTURBANCE SHOWN ON THE WAIVER PETITION EXHIBIT.
  - 3. OFF SITE RETENTION MAY BE PROVIDED AT A 1:1 RATIO

AND 21152 () 316-7800 5-7818 SPARKS, IV...

TELEPHONE: (4]  $\tau_{\Lambda} \chi_{\Sigma} (410) \tilde{\Sigma}$ 



TITLE SHEET

NOT TO SCALE SEPTEMBER 2010

01-081795.20

CONSTRUCTION ISSUE:

D1124 08-SAVAGE PARK STORM DRAIN

SHEET NO.: 1 OF 32

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MD

DEPARTMENT OF RECREATION AND PARKS, HOWARD COUNTY, MD

DIRECTOR OF RECREATION AND PARKS

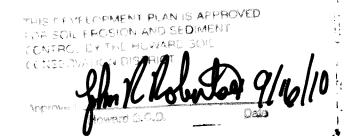
SAVAGE N/A AT OF LIF GRID . ZONING TAX MAP NO. ELECT. DISTR. CENSUS TRACT 10 R-20 47 6-01 606902 VATER CODE EWER CODE PUBL I C PUBL I C HOWARD COUNTY

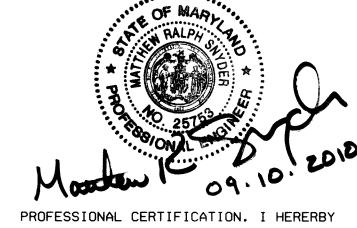
DEPARTMENT OF PARKS AND RECREATION

7120 OAKLAND MILLS ROAD

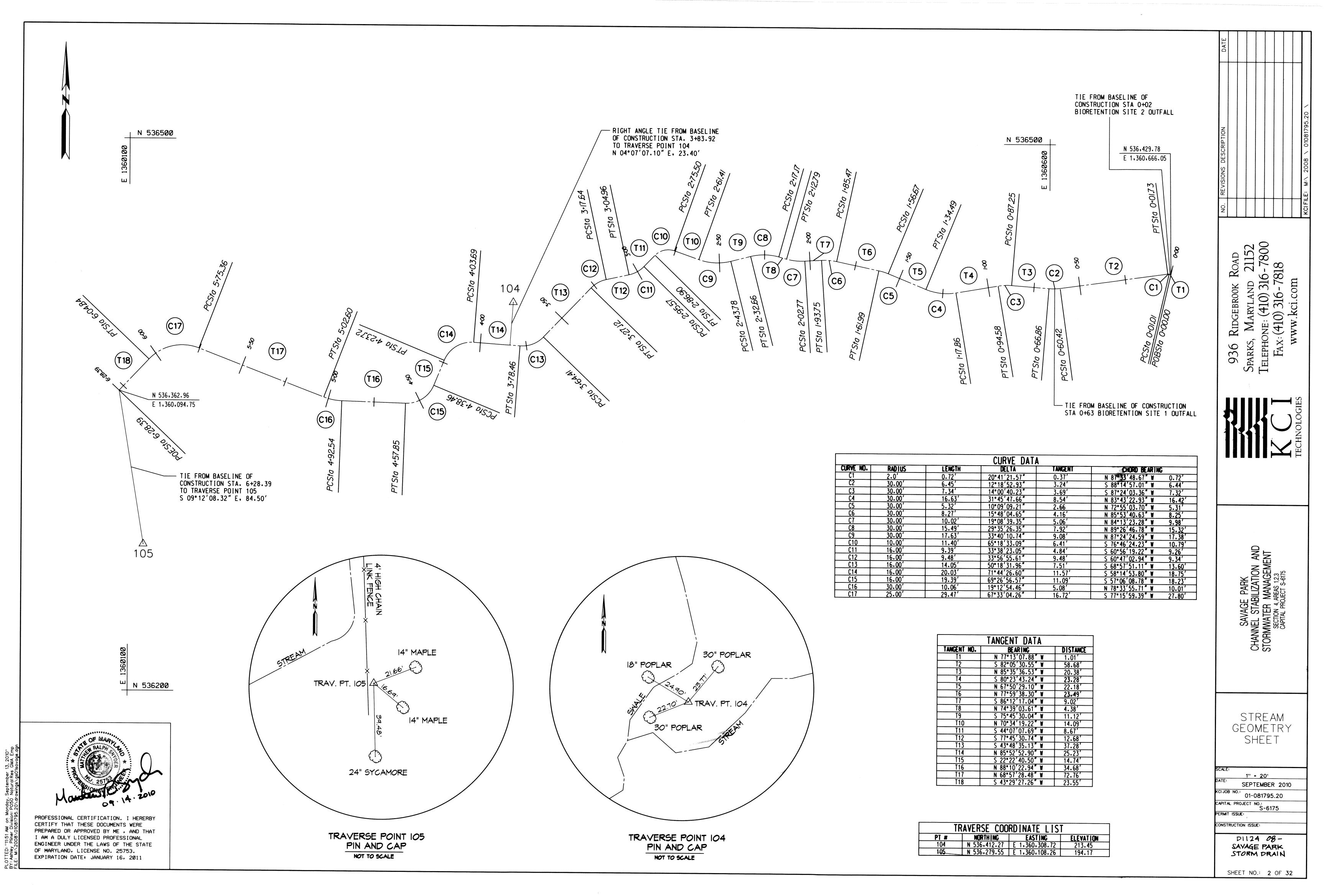
COLUMBIA, MD 21046 410-313-4700

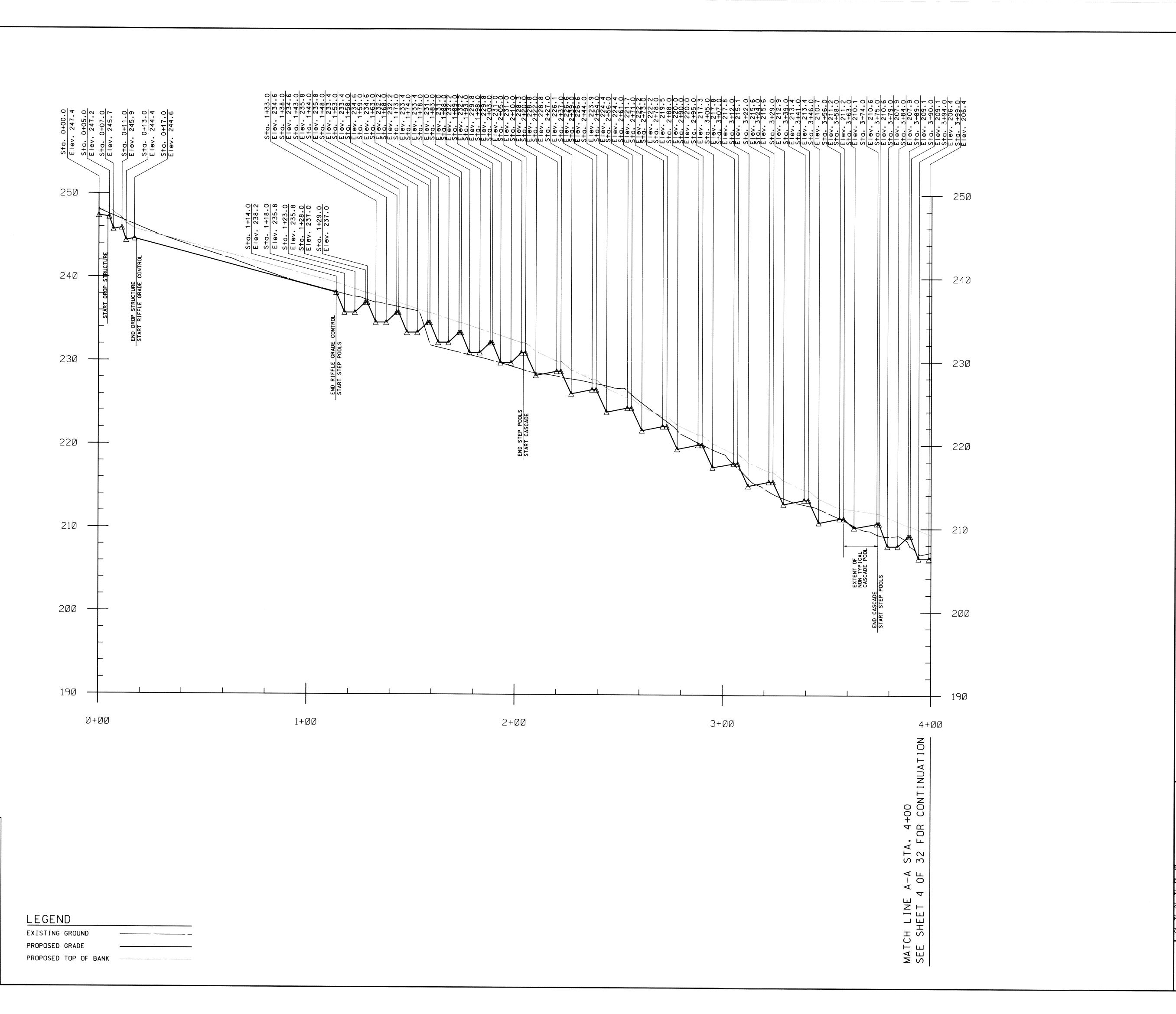
PERMIT INFORMATION CHART





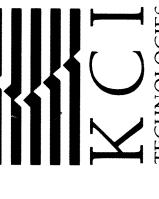
CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME , AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011





KCIFILE: M:\ 2008 \ 01081795.20 \

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

STREAM PROFILE

HOR. 1" - 20' VERT. 1" - 5'

SEPTEMBER 2010

KCI JOB NO.:
01-081795.20

CAPITAL PROJECT NO.: S-6175 PERMIT ISSUE:

CONSTRUCTION ISSUE:

DI124 08-SAVAGE PARK STORM DRAIN

SHEET NO.: 3 OF 32

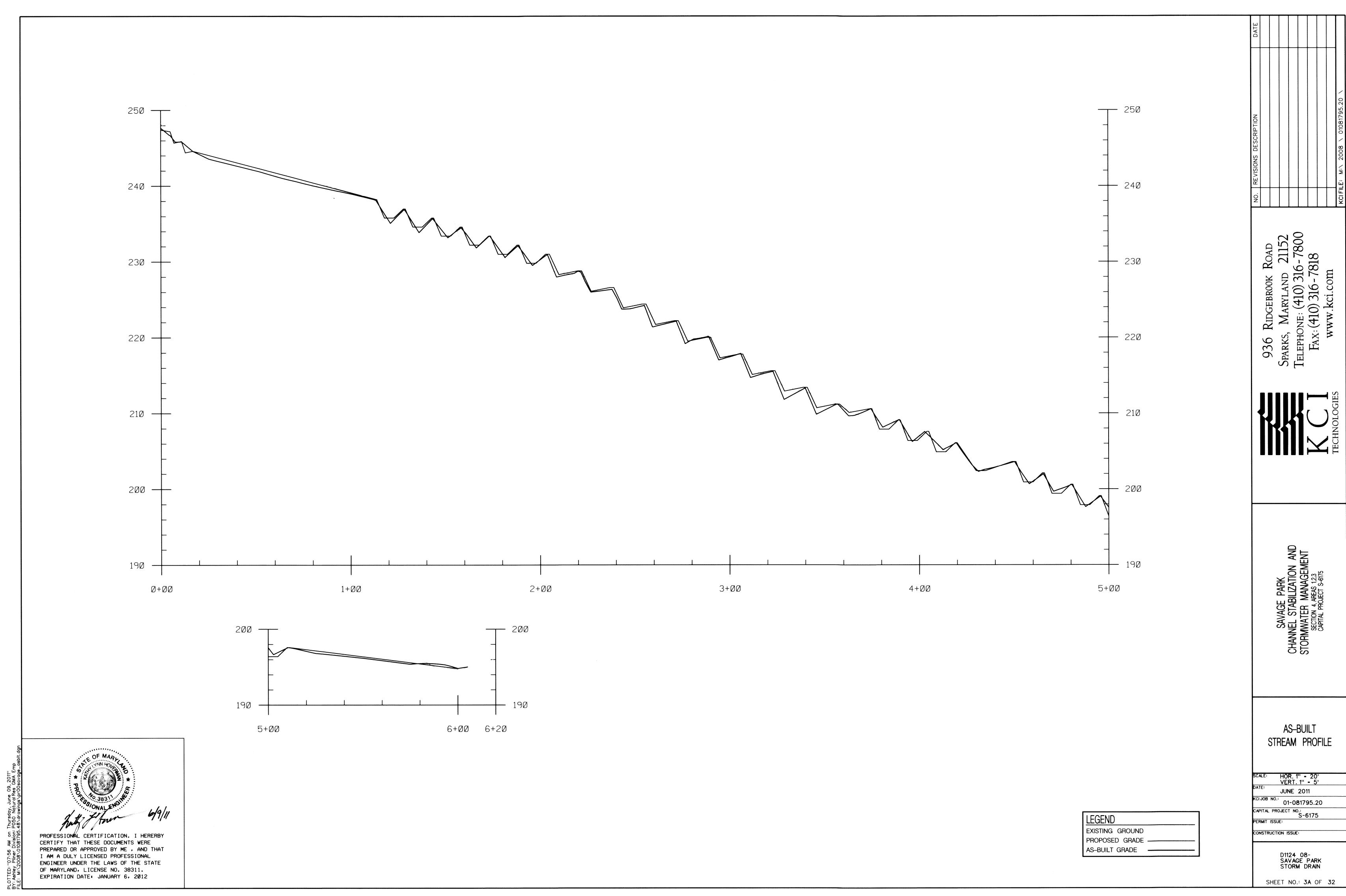
PROFESSIONAL CERTIFICATION. I HERERBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME , AND THAT

ENGINEER UNDER THE LAWS OF THE STATE

I AM A DULY LICENSED PROFESSIONAL

OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011

)TTED: "11:52 AM on Monday, September 13, 2010" Ashley Pliner Division: P050 Natural Res GMA Emp E: M:\2008\01081795.20\drawings\pr01savage.dgn



250 250 240 ----240 23Ø 230 220 220 210 210 200 200 190 4+00 5+00 6+00 7+00 1+00 CONTINUATI STA. 4-32 FOR , – А ОF , ω' MATCH LINE SEE SHEET

Montain Services of Many 18 of Ma

PROFESSIONAL CERTIFICATION. I HERERBY 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

) TTED: "11:52 AM on Monday, September 13, 2010" Ashley Pliner Division: P050 NaturalRes GMA Emp E: M:\2008\01081795.20\drawings\pr02savage.dgn

 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

STREAM PROFILE

HOR. 1" - 20' VERT. 1" - 5' SEPTEMBER 2010

O1-081795.20

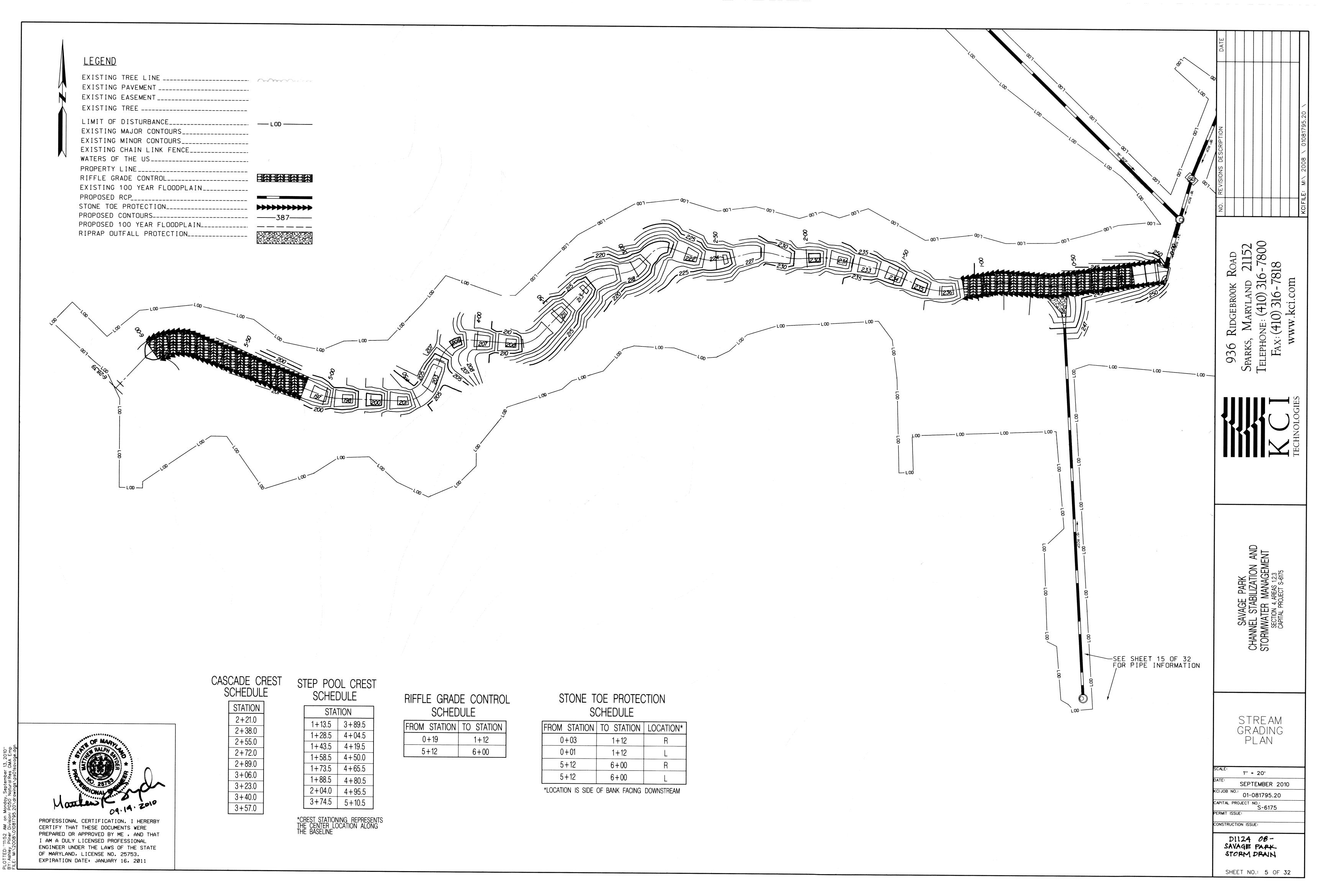
CAPITAL PROJECT NO.:

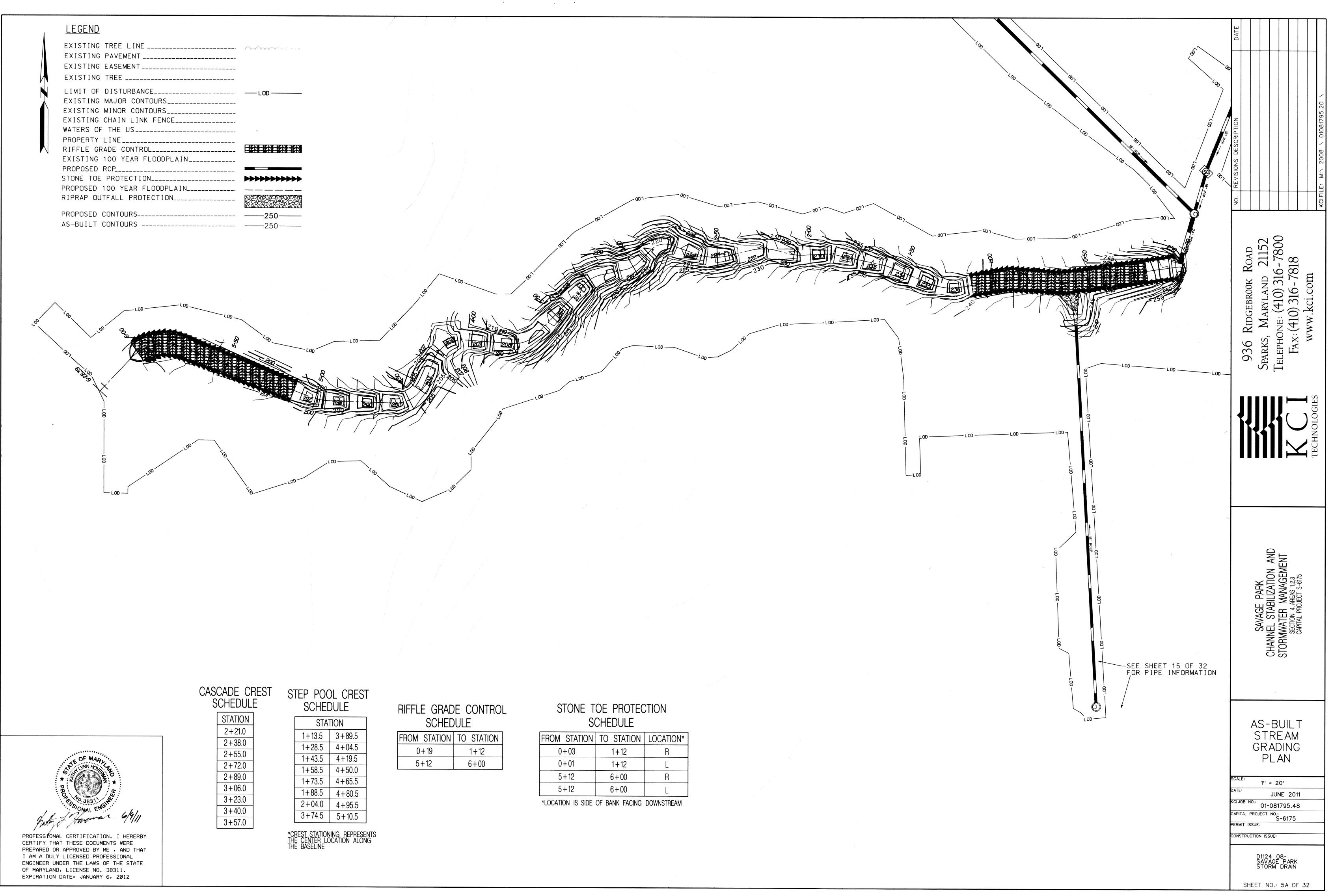
S-6175

CONSTRUCTION ISSUE:

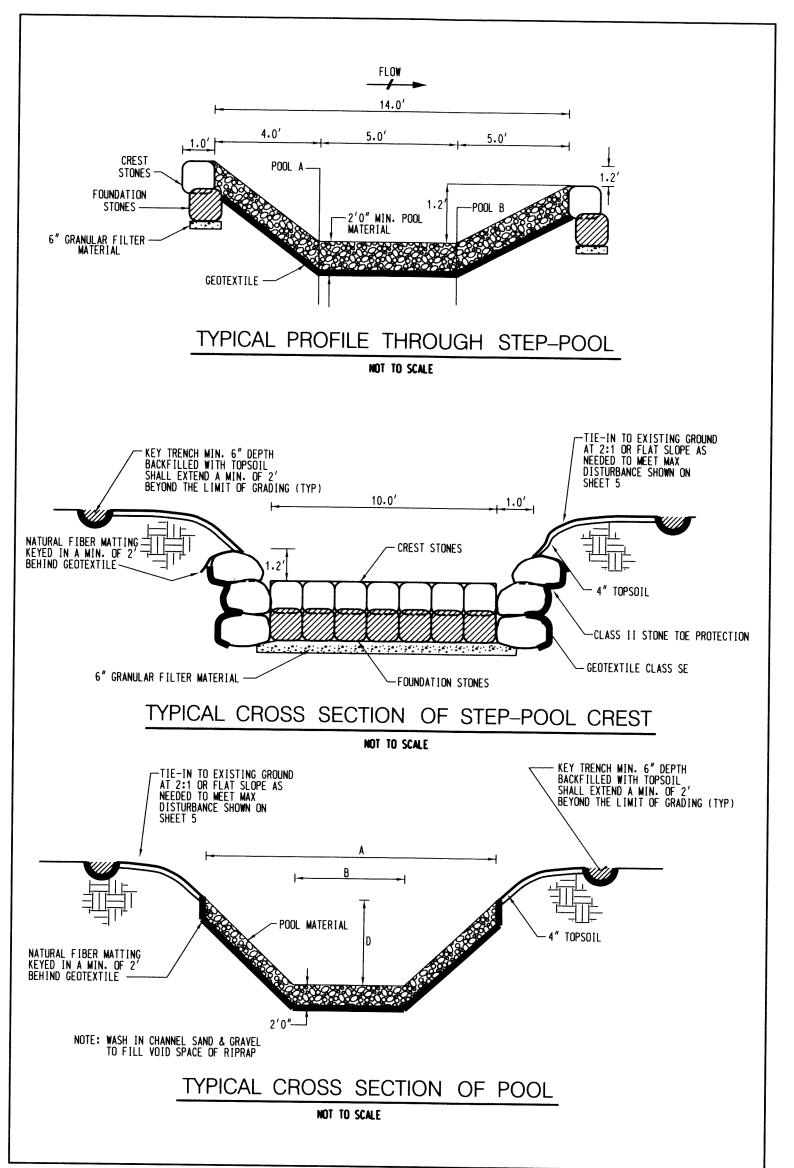
DIIZA 08-SAYAGE PARK STORM DRAIN

SHEET NO.: 4 OF 32





TTED: "07:47 AM on Thursday, June 09, 2011" Ashley Pliner Division: P050 NaturalRes GMA Emp :: M:\2008\01081795.48\drawings\ps01savage\_a



STEP POOL SYSTEM FROM STATION 1+14 TO 2+05, 3+75 TO 4+19, AND 4+51 TO 5+11

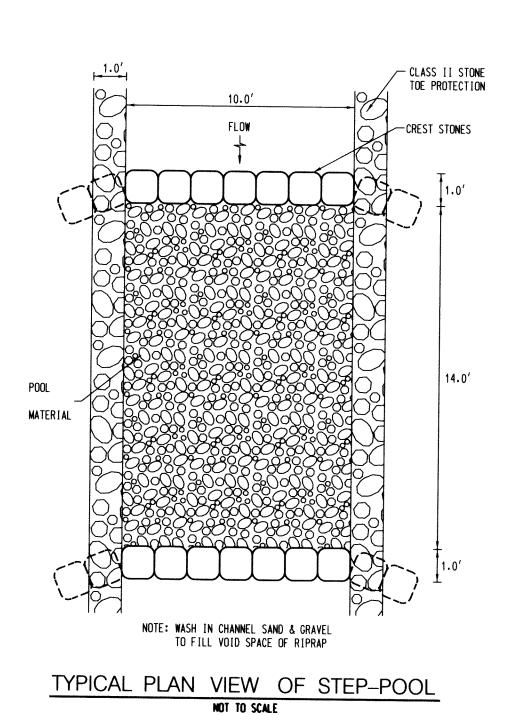
#### TYPICAL POOL SECTION SCHEDULE FROM 1+14 TO 2+05

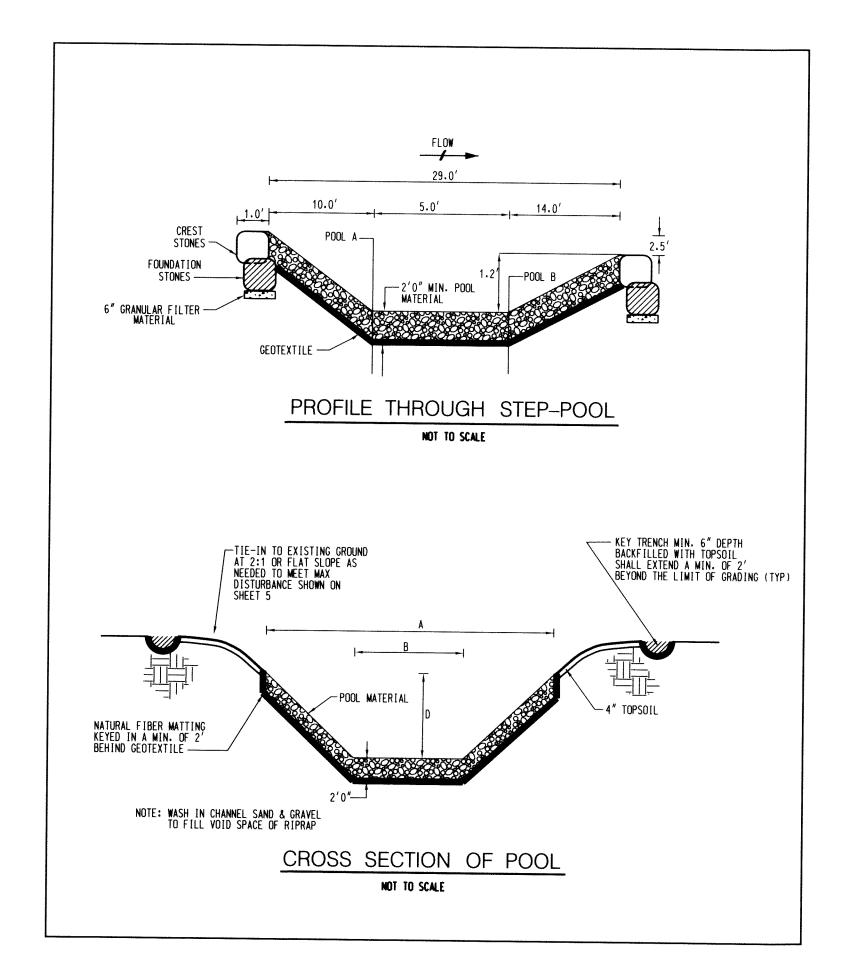
POOL LOCATION	Α	В	D
POOL A	15.0'	4.0′	3.25′
POOL B	15.0′	4.0′	2.82'

# TYPICAL POOL SECTION SCHEDULE FROM 3+75 TO 4+19 AND FROM 4+51 TO 5+11 POOL LOCATION A B D POOL A 15.0' 4.0' 3.47'

POOL B

15.0' 4.0' 2.94'

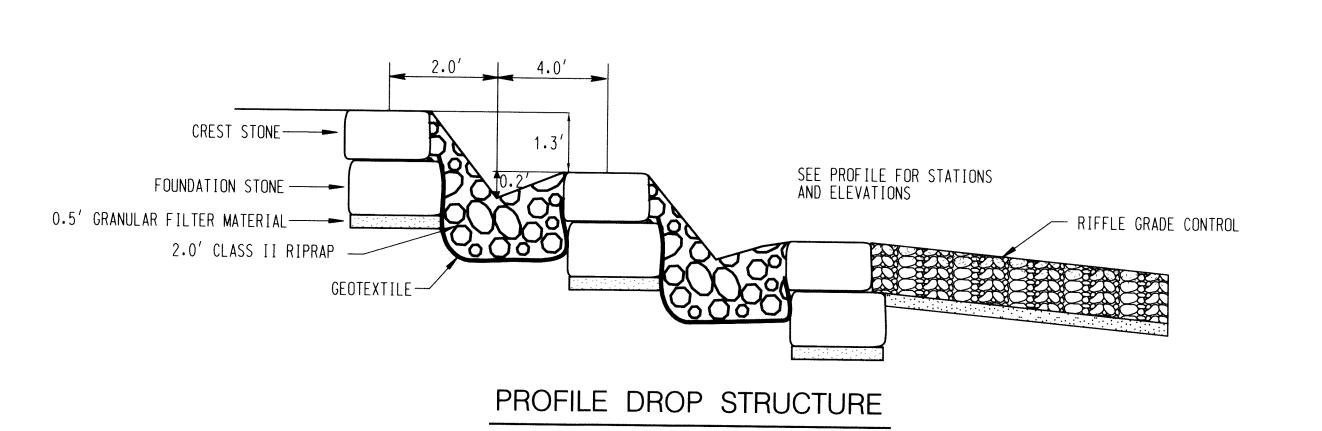




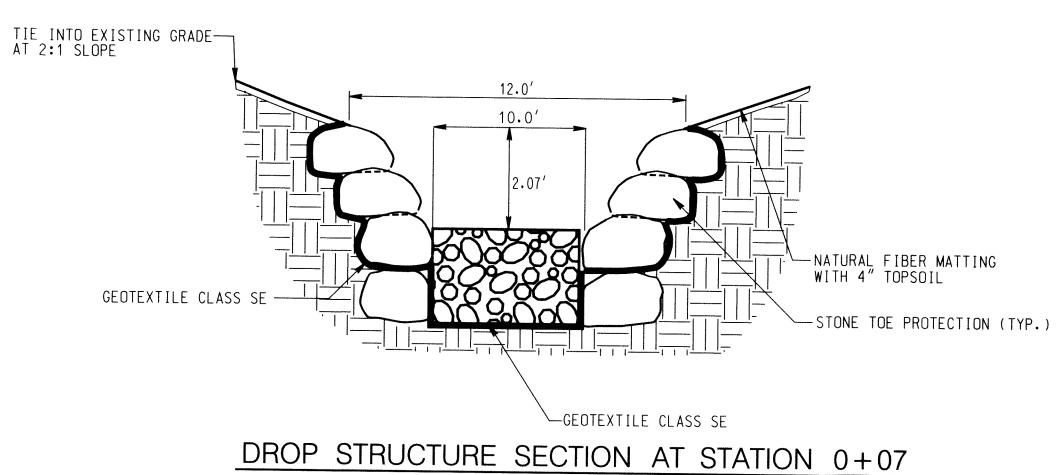
NON TYPICAL FROM STATION 4+19.5 TO 4+50.0

POOL SECTION SCHEDULE FROM 4+19.5 TO 4+50.0

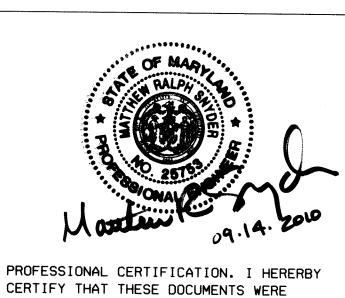
SECTION SCHEDULE FROM 4+19.5 TO 4+						
POOL LOCATION	Α	В	D			
POOL A	17.0′	4.0′	4.338′			
POOL B	17.0′	4.0′	3.907			



SCALE: NOT TO SCALE



NOT TO SCALE



PROFESSIONAL CERTIFICATION. I HERERBY 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

SAVAGE PARK
CHANNEL STORM DETAIL

SCALE:

DATE: SEPTEMBER 2010

KCI JOB NO:: 01-081795.20

CAPITAL PROJECT NO:: S-6175

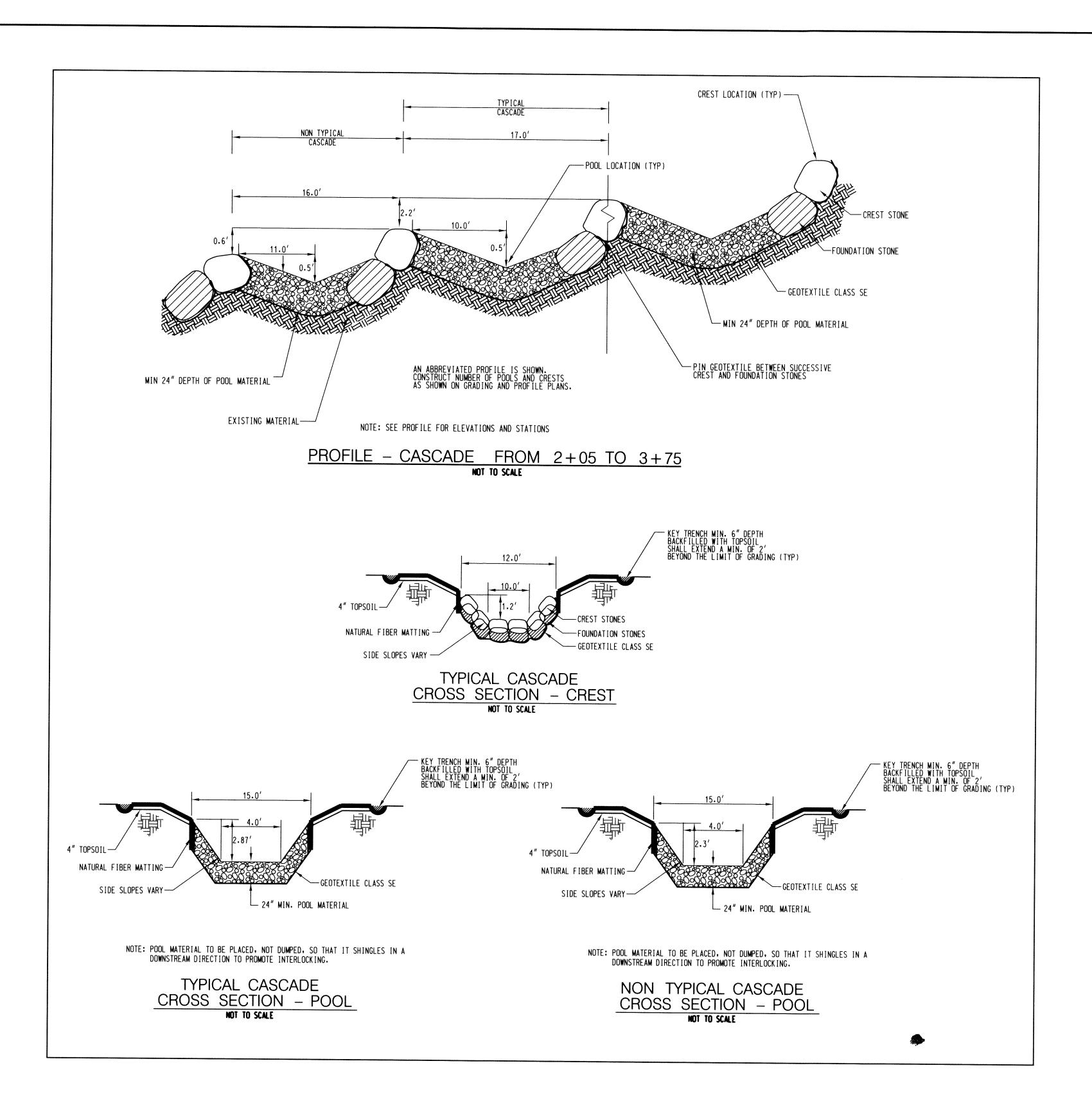
PERMIT ISSUE:

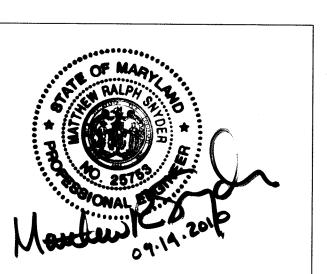
CONSTRUCTION ISSUE:

D1124 08
SAVAGE PARKSTORM DRAIN

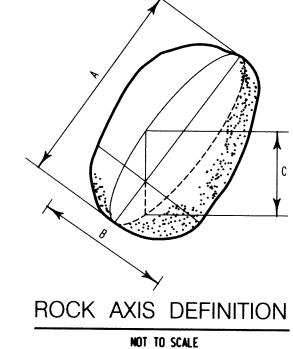
SHEET NO:: 6 OF 32

936





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



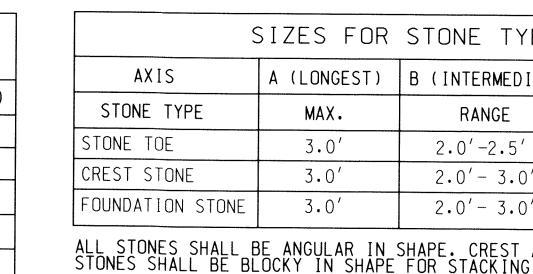
A = LONGEST AXIS (LENGTH)

B = INTERMEDIATE AXIS (WIDTH)

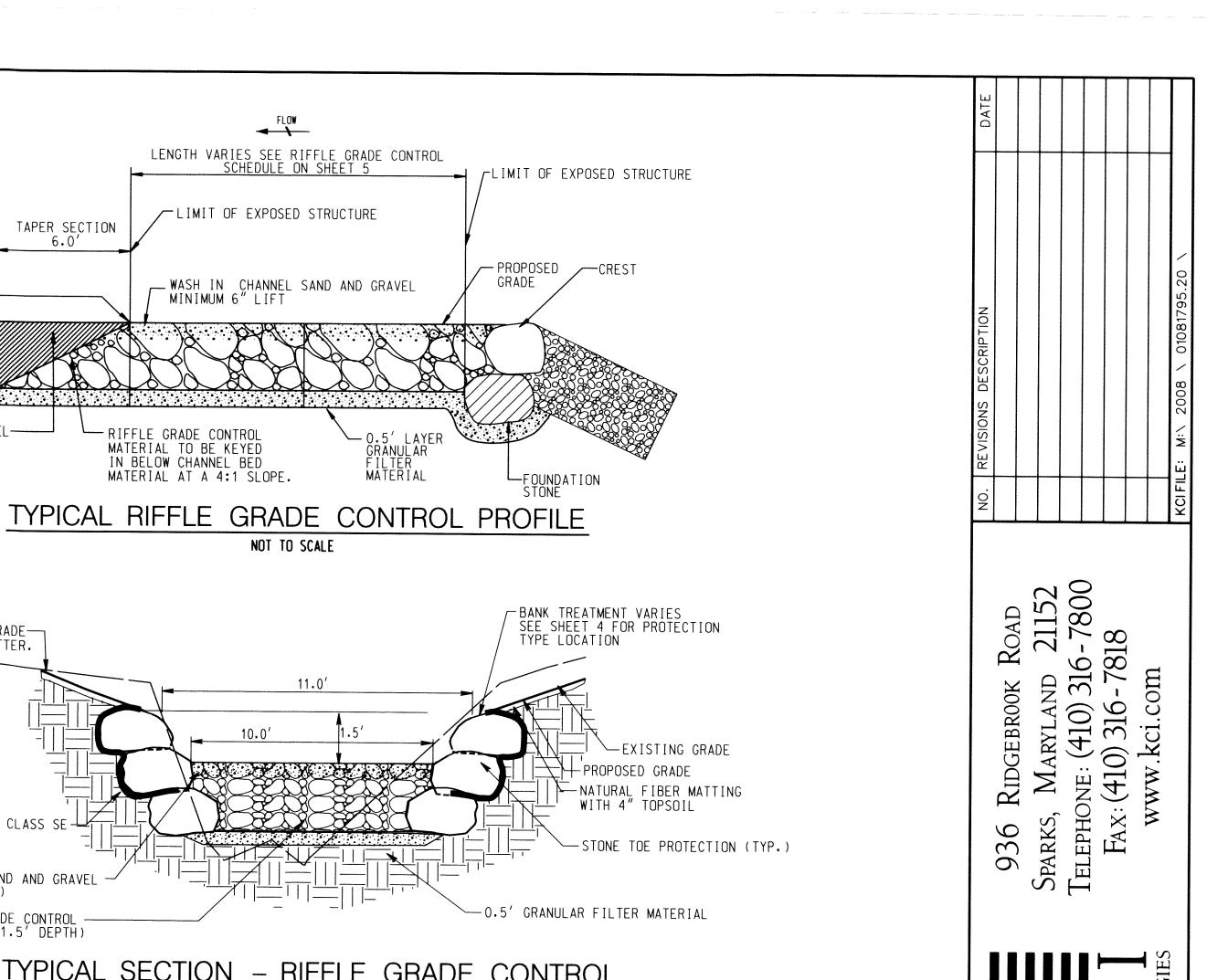
C = SHORTEST AXIS (THICKNESS)

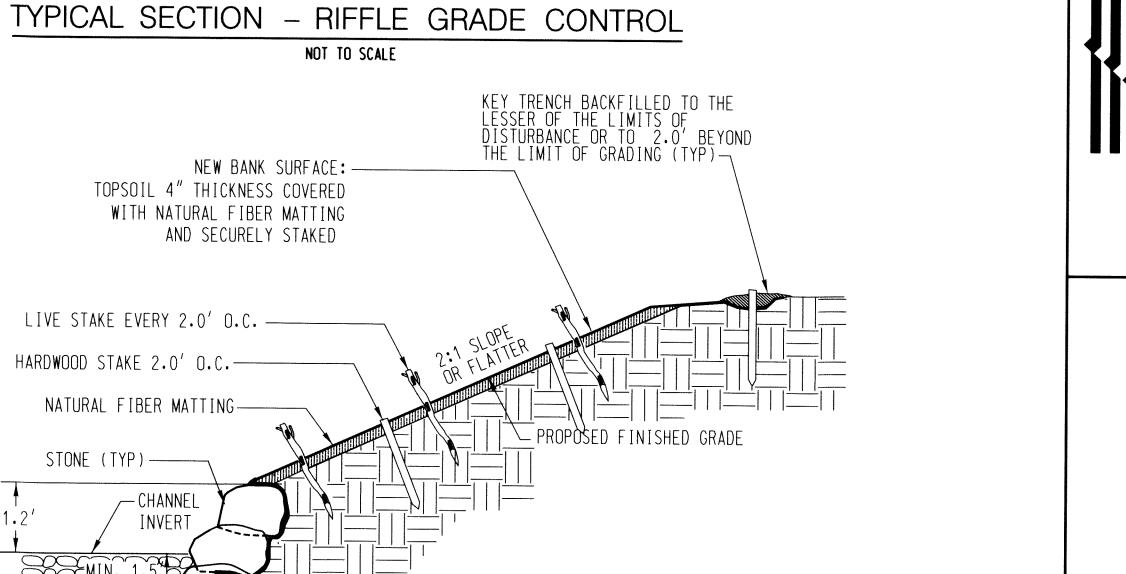
	****					
GRANULAR FILTER MATERIAL						
% LESS THAN	US STD SIEVE					
100	2.5 in					
85-100	1.0 in					
60-100	0.5 in					
35-70	No. 10					
20-50	No. 40					
3-20	No. 200					
	MATI % LESS THAN  100  85-100  60-100  35-70  20-50					

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



TOUNDATION STUNE	J. U	2.0 - 3.0	1.0
ALL STONES SHALL B	E ANGULAR IN	SHAPE, CREST AND	FOUNDATION





POOL MATERIAL

RIPRAP SIZES

CLASS II

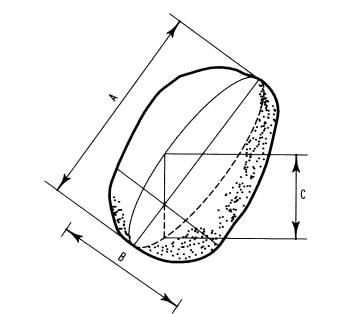
50% CLASS 0 50% CLASS I

STREAM DETAIL SHEET 2

SCALE:	
DATE:	SEPTEMBER 2010
KCIJOB NO.:	01-081795.20
CAPITAL PRO	S-6175
PERMIT ISSU	E:
CONSTRUCTION	ON ISSUE:

D1124 08-SAYAGE PARK STORM DRAIN

SHEET NO .: 7 OF 32



-RIFFLE GRADE CONTROL MATERIAL OR CREST STONES TYPICAL STONE TOE PROTECTION DETAIL NOT TO SCALE SIZES FOR STONE TYPES A (LONGEST) B (INTERMEDIATE) C (SHORTEST) RANGE MAX.

HARDWOOD STAKE 2.0' O.C.-

STONE (TYP) —

NATURAL FIBER MATTING-

FLOW

/ LIMIT OF EXPOSED STRUCTURE

-RIFFLE GRADE CONTROL MATERIAL TO BE KEYED IN BELOW CHANNEL BED MATERIAL AT A 4:1 SLOPE.

TAPER SECTION 6.0'

EXISTING CHANNEL—— BED MATERIAL BACKFILLED TO PROPOSED GRADE

TIE INTO EXISTING GRADE— AT 2:1 SLOPE OR FLATTER. TIE IN VARIES

GEOTEXTILE CLASS S

CHANNEL SAND AND GRAVE (WASHED IN)

LENGTH VARIES SEE RIFFLE GRADE CONTROL SCHEDULE ON SHEET 5

-- WASH IN CHANNEL SAND AND GRAVEL MINIMUM 6" LIFT

NOT TO SCALE

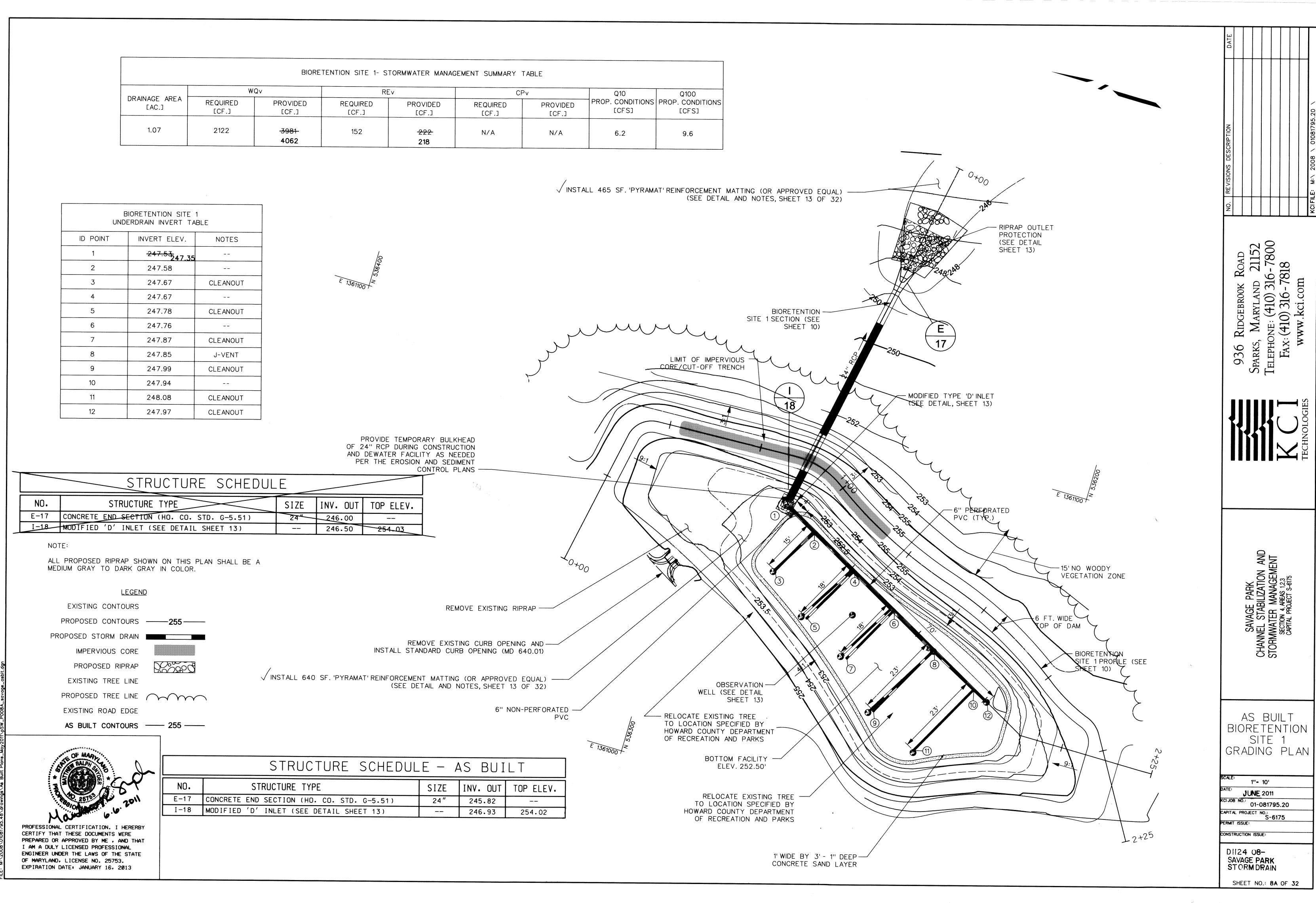
GRADE

CASCADES STEP POOLS 1.5′ 2.0'-2.5' 3.0' 2.0'-3.0' 1.0' 3 0' 2 0' - 3 0'

- GEOTEXTILE CLASS SE

														) TE
			RIORE	TENTION SITE 1- ST	ORMWATER MANAC	EMENT CHAMARY	TADI C							70
	DRAINAGE AREA	WQ REQUIRED		REQUIRED		Cf	PROVIDED	Q10 PROP. CONDITION	Q100 S PROP. CONDITIONS					
	1.07	[CF.]	[CF.] 3981	[CF.]	[CF.]	REQUIRED [CF.] N/A	[CF.]	[CFS] 6.2	[CFS] 9.6					TION
				102	4	;	IN/ A	0.2	9.0					DESCRIPTION OF NOTICE OF N
							INST	ALL 465 SF. 'PYRA	MAT' REINFORCEMENT M	ÁTTING (OR APPROVED EQUA	AL)			REVISIONS
	BIORETENTION SITE								(SEE DETAIL	AND NOTES, SHEET 13 OF 3	32)			NO. KCIFIL
ID POINT	INVERT ELEV.	ABLE NOTES										RIPRAP OUTLET PROTECTION (SEE DETAIL SHEET 13)		252
2	247.53 247.58			536400								248		ROAD 2115 16-78 18
4	247.67 247.67	CLEANOUT 		E 1361100 /2							250			BROOK YLAND Y10) 31 316 - 7 Ci.con
5 6	247.78 247.76	CLEANOUT 			·					BIORETENTION —— SITE 1 SECTION (SEE SHEET 10)	E			RIDGE MAR (410) : (410)
8	247.87 247.85	CLEANOUT J-VENT				14.			LIMIT OF IMPERV CORE/CUT-OFF TRE	ous 1	17 E			936 PARKS, ELEPHC FAX
10	247.99 247.94	CLEANOUT 						<b>A</b>	CORE/COT-OFF TRE	NCH	MODIFIED T	YPF 'D' INI ET		S
11 12	248.08 247.97	CLEANOUT								18	(SEE DETA	YPE 'D'INLET L, SHEET 13)		LOGIES
				PROVIDE OF 24" RCP	TEMPORARY BULK DURING CONSTRU	KHEAD CTION								ECHNO
	STRUCTUI	DE CCHER	)	PER THE	ER FACILITY AS NE EROSION AND SED CONTROL F	IMENT PLANS		2:1			3: 183	1	36200	
NO. STRU	JCTURE TYPE	AL SUMEL		INV. OUT TOP	ELEV.	MACADAM ROX	3.A				Fig.	-6" PEREORATED	= 1361100 / E	
E-17 CONCRETE END S I-18 MODIFIED 'D' I			24"	= 10100	03						A STATE OF THE STA	PVC (TYP.)		
NOTE: ALL PROPOSED RIPRAI MEDIUM GRAY TO DAF	P SHOWN ON THIS RK GRAY IN COLOF	PLAN SHALL BE /	A		₹5 <sub>6</sub>		Lo+0	00					-15'NO WOODY VEGETATION ZONE	ON AND EMENT
	<u>EGEND</u>	<b>.</b>									4		7	PARK ILIZATIOI MANAGEI REAS 1,2,3 REAS 1,2,3 RECT S-6175
EXISTING CONTO					RE	MOVE EXISTING RIF	PRAP			<b>E53.</b> F	<u>\$</u>	6 FT. TOP (	WIDE OF DAM	SAVAGE EL STAB WATER I
PROPOSED CONTO	RAIN			INST	REMOVE EXIS ALL STANDARD CU	TING CURB OPENIN RB OPENING (MD (	IG AND						BIORETENTION SITE 1 PROFILE (SEE SHEET 10)	S/ CHANNEL STORMW/
IMPERVIOUS C PROPOSED RIP	RAP DOOG		INSTALL 640	SF. 'PYRAMAT' REINF	ORCEMENT MATTIN (SEE DETAIL AND	G (OR APPROVED NOTES, SHEET 13	EQUAL) OF 32)		OBS	ERVATION	7 73/8		SHEET 10)	
PROPOSED TREE I							I-PERFORATED — PVC		RELOCATE EXISTIN	SHEET 13)	23/			
EXISTING ROAD E	DGE						The second secon	536300	TO LOCATION SPE HOWARD COUNTY OF RECREATION A	CIFIED BY DEPARTMENT	9)			BIORETENTION SITE 1 GRADING PLAN
OF MAG								E 1361000	BOTTO ELE	M FACILITY V. 252.50'			9:1	SCALE:
2510									RELOCA TO LOCA	TE EXISTING TREE				1"= 10'  DATE: SEPTEMBER 2010  KCI JOB NO.: 01-081795 20
PROFESSIONAL CERTIFICATION. I H									HOWARD CO	INTY DEPARTMENT CATION AND PARKS			1 25	CAPITAL PROJECT NO.: S-6175 PERMIT ISSUE: CONSTRUCTION ISSUE:
CERTIFY THAT THESE DOCUMENTS WE PREPARED OR APPROVED BY ME, AN I AM A DULY LICENSED PROFESSION ENGINEER UNDER THE LAWS OF THE OF MARYLAND, LICENSE NO. 25753.	ID THAT IAL STATE									1' WIDE BY 3' - 1 CONCRETE SAND	1" DEEP		12+25	DI124 08- SAVAGE PARK- STORM DRAIN
EXPIRATION DATE: JANUARY 16, 20	011									CONCRETE SAND	, LAIEK			SHEET NO.: 8 OF 32

PLOTTED: "11:52 AM on Monday, September 13, 2010" BY: Ashley Pliner Division: P050 Natural Res GMA Emp FILE: M:\2008\01081795.20\drawings\pSW\_P008\_savage.dgn



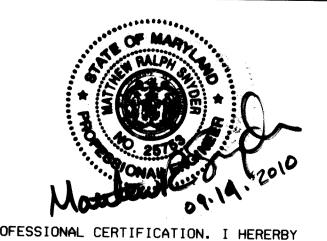
ED: "01:35 PM on Monday, June 06, 2011" on Burdette Division: P053 Water Resources GMA Emp

BASELINE CONTROL COORDINATES							
LOCATION	PT. NO.	STATION	NORTHING	EASTING			
BIORETENTION 1 SECTION	1	0+00.00	536257.57	1361174.94			
SECTION	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'			

CONTOL	JR STAKEOUT IN	NFORMATION	
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.

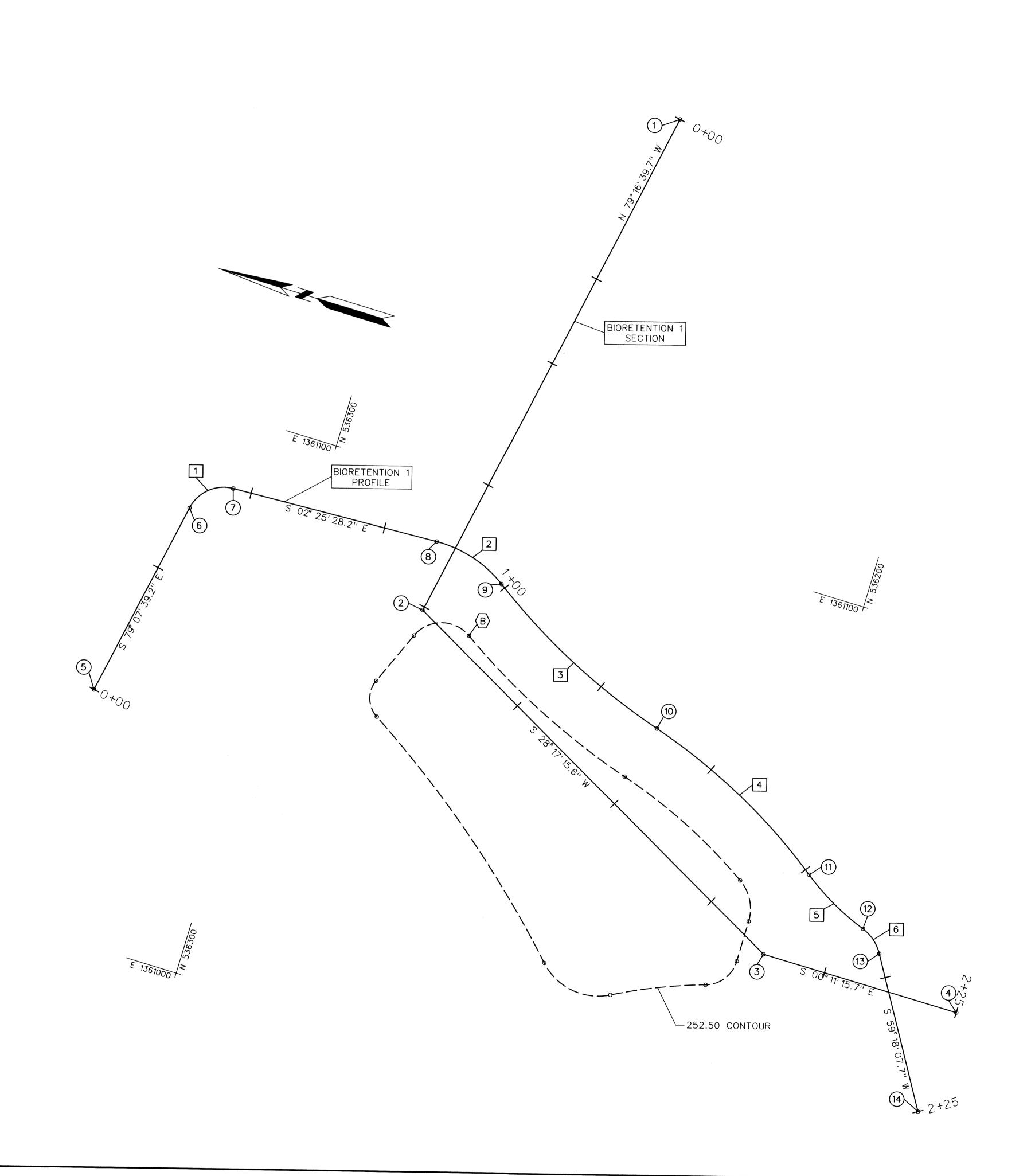


PROFESSIONAL CERTIFICATION. I HERERBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011

**LEGEND** 1 CURVE NUMBER

POINT NUMBER

BEGINNING POINT OF CONTOUR STAKEOUT INFORMATION (STA. 0+00.00)



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

BIORETENTION SITE 1

GEOMETRY

SHEET

SEPTEMBER 2010

1"- 10'

KCI JOB NO.: 01-081795.20

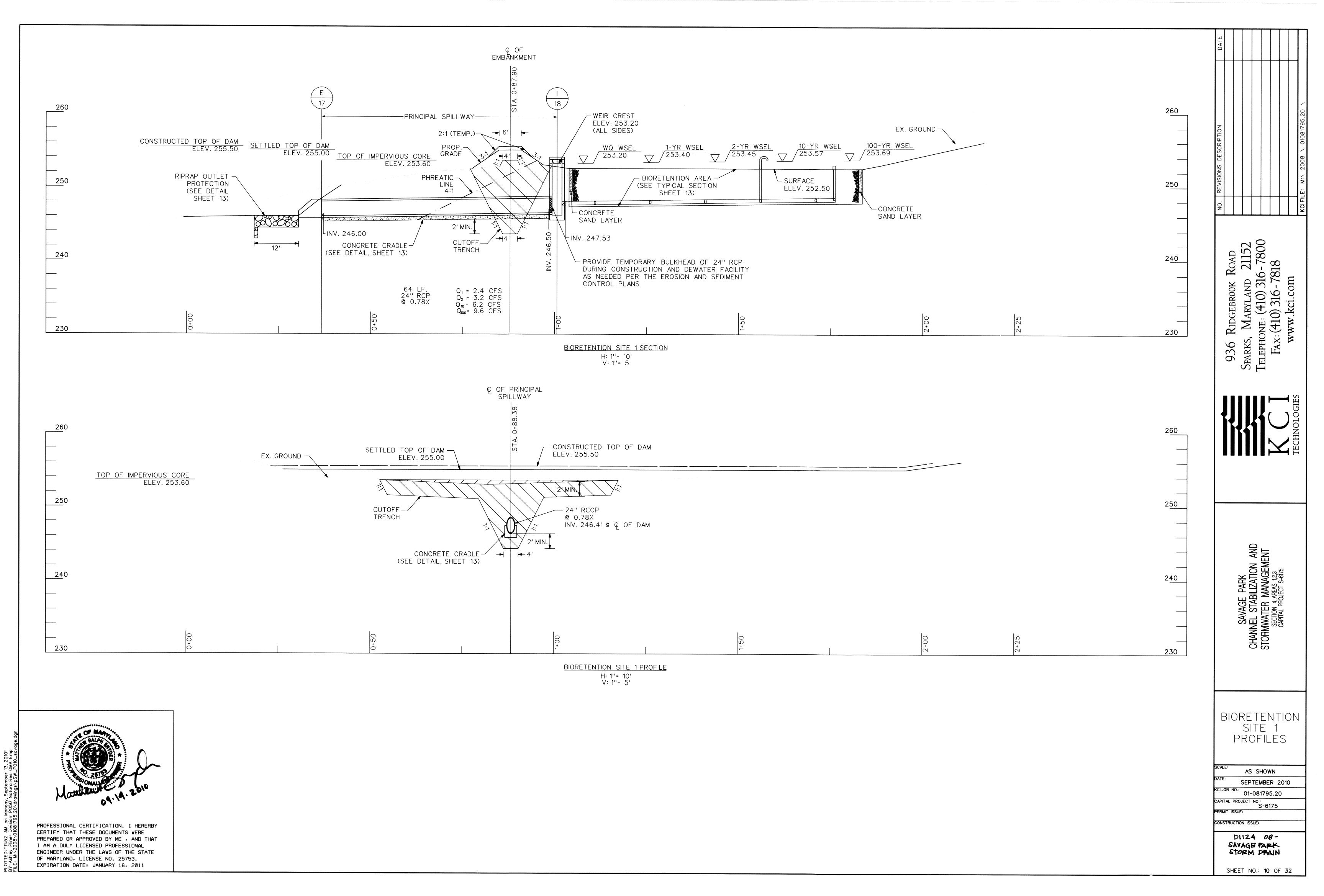
CAPITAL PROJECT NO.:
S-6175

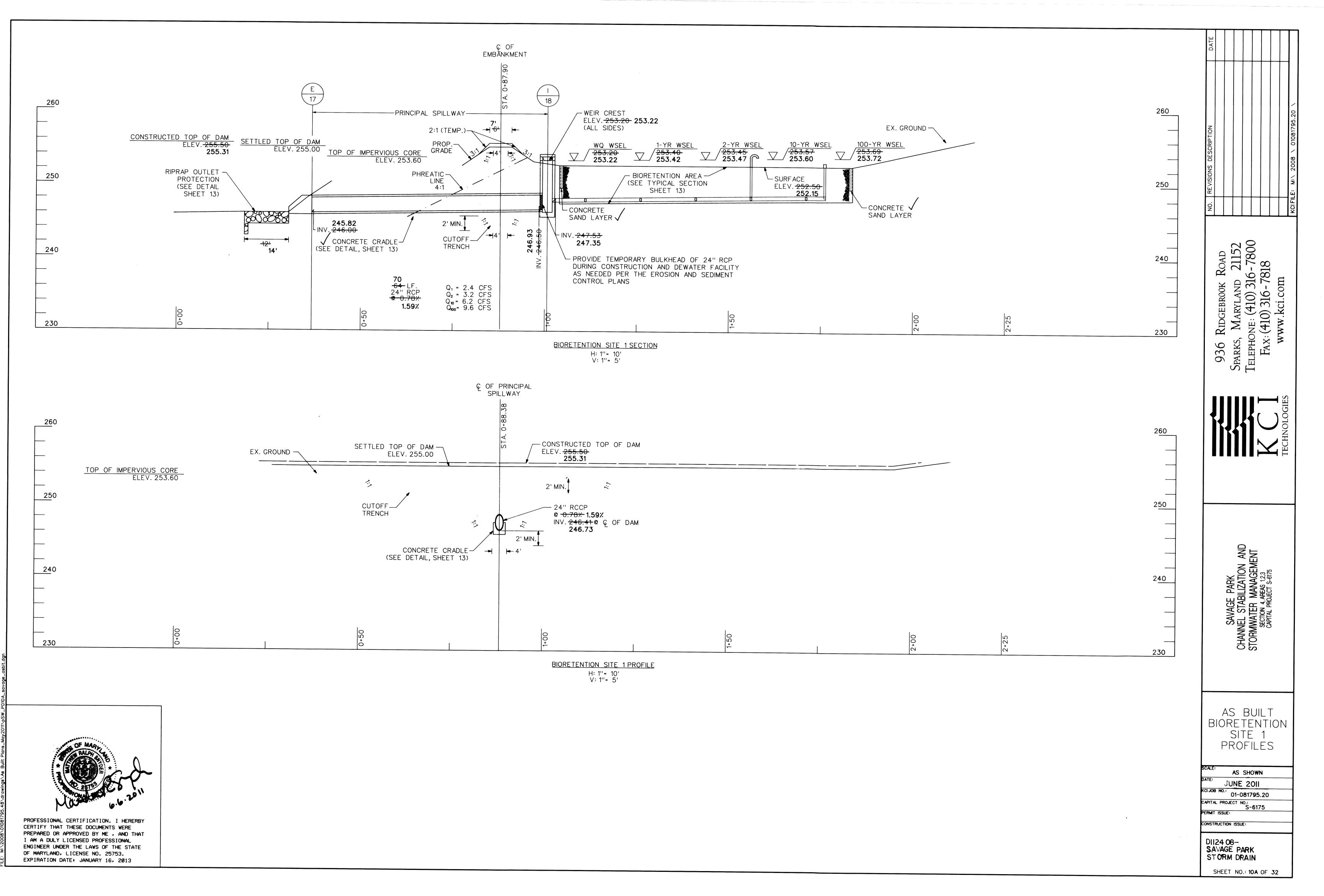
DIIZA 08-SAVAGE PARK STORM DRAIN

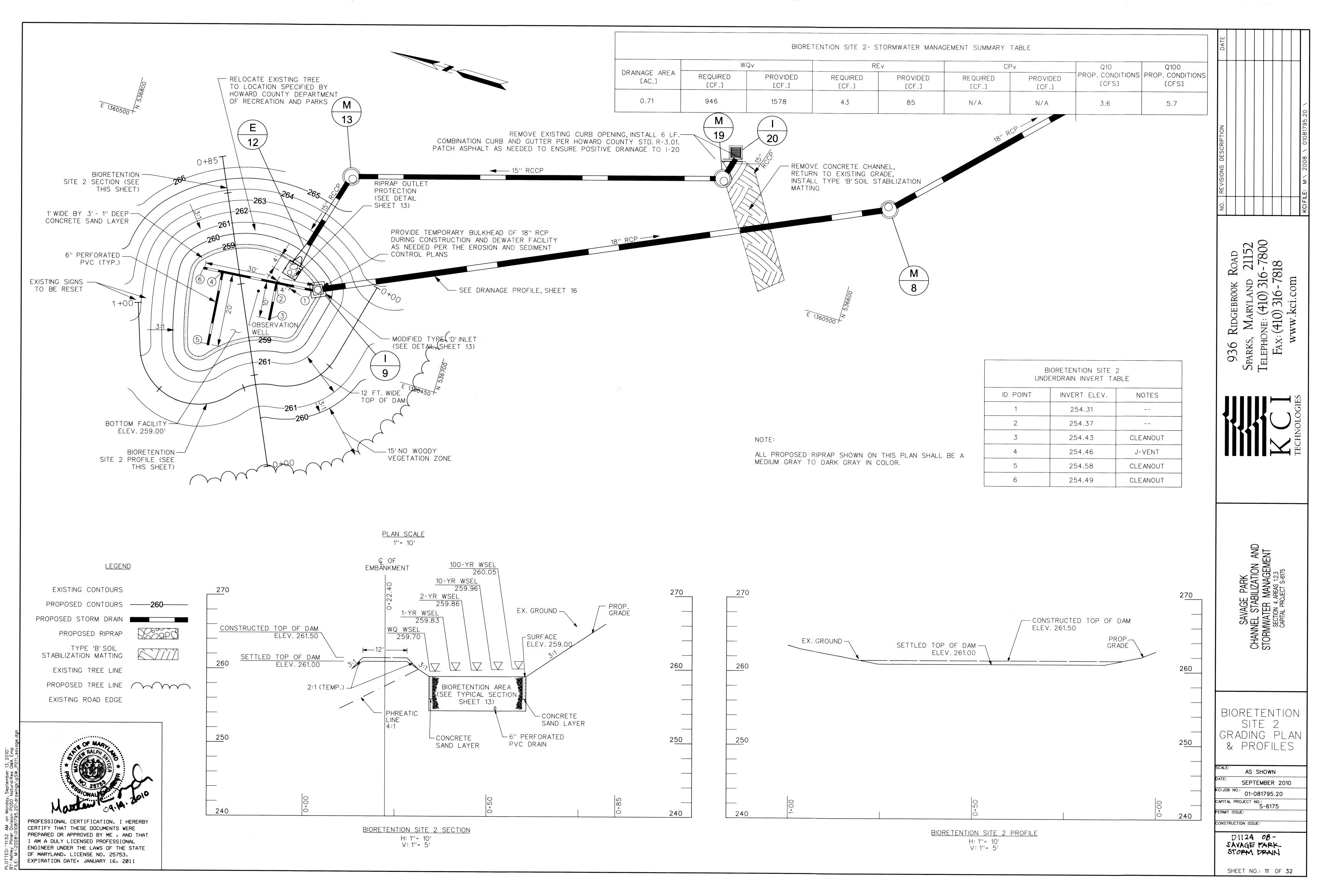
SHEET NO.: 9 OF 32

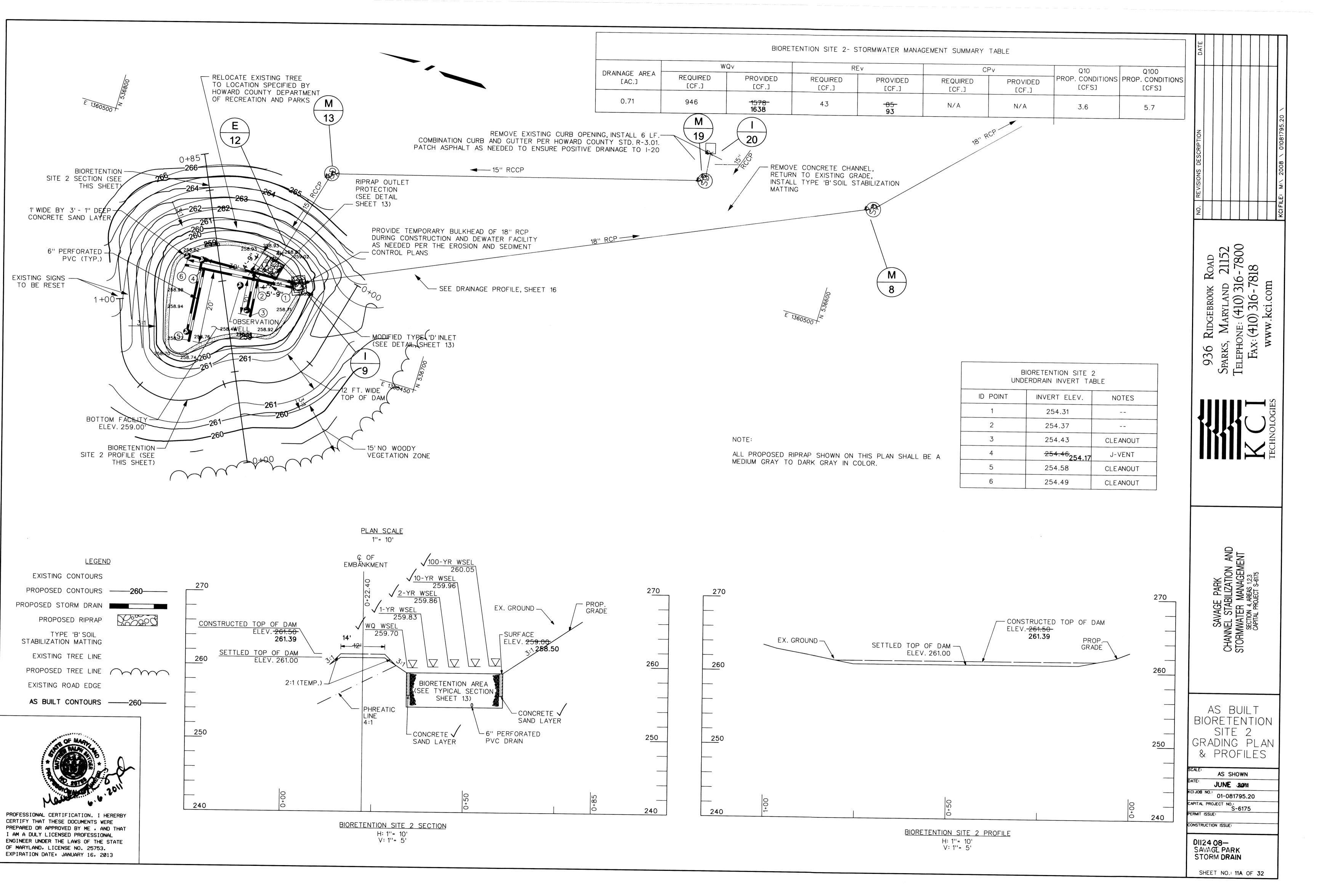
PERMIT ISSUE:

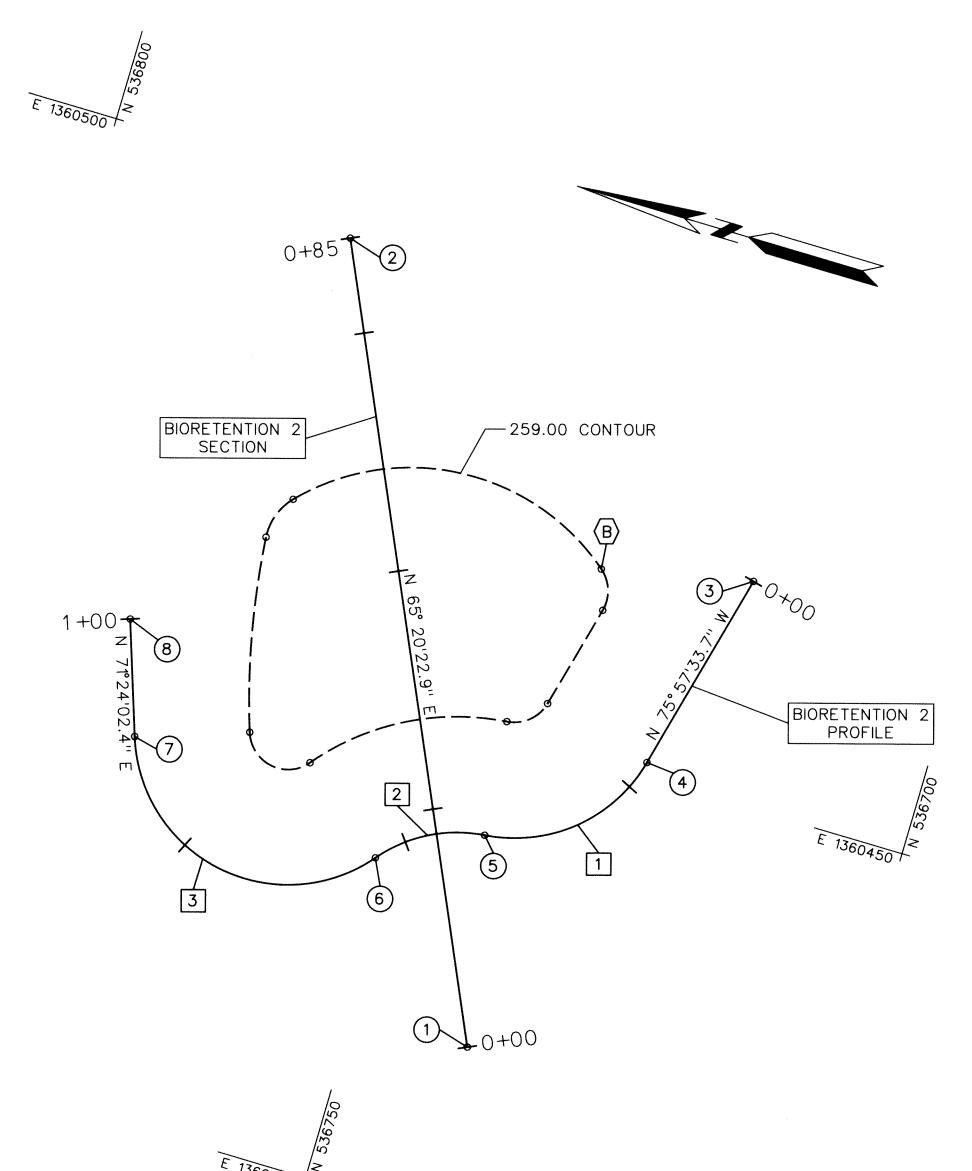
CONSTRUCTION ISSUE:









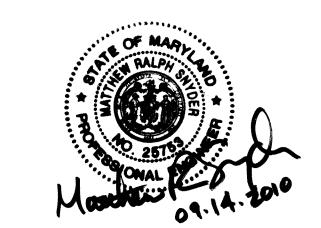


BASELINE CONTROL COORDINATES						
LOCATION	PT. NO.	STATION	NORTHING	EASTING		
BIORETENTION 2 SECTION	1	0+00.00	536737.66	1360417.82		
	2	0+85.00	536773.12	1360495.07		
BIORETENTION 2 PROFILE	3	0+00.00	536722.83	1360472.76		
	4	0+21.89	536728.14	1360451.52		
	5	0+41.60	536742.16	1360439.48		
	6	0+53.55	536752.41	1360433.98		
	7	0+87.74	536780.01	1360438.93		
	8	1+00.00	536783.92	1360450.55		

CURVE DATA								
CURVE	CURVE DELTA DEGREE RADIUS TANGENT LENGTH EXTERNAL							
1	70° 33'36.3''	358° 5'55.0"	16.0'	11.32'	19.70'	3.60'		
2	45° 38'22.2''	381° 58'18.7''	15.0'	6.31'	11.95'	1.27'		
3	122° 26'21.9''	358° 5'55.0"	16.0'	29.13'	34.19'	17.23'		

CONTOUR STAKEOUT INFORMATION						
LOCATION	STATION	NORTHING	EASTING			
CONTOUR 259.00	0+00.00	536738.38	1360469.47			
	0+04.51	536737.04	1360465.41			
	0+15.83	536739.78	1360454.44			
	0+20.75	536743.28	1360451.42			
	0+42.26	536761.74	1360441.52			
	0+50.81	536768.64	1360442.76			
	0+71.23	536772.75	1360462.71			
	0+76.22	536771.16	1360467.29			

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



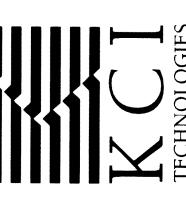
PROFESSIONAL CERTIFICATION. I HERERBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011 LEGEND

1 CURVE NUMBER

1) POINT NUMBER

BEGINNING POINT OF CONTOUR STAKEOUT INFORMATION (STA. 0+00.00)

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BIORETENTION SITE 2 GEOMETRY SHEET

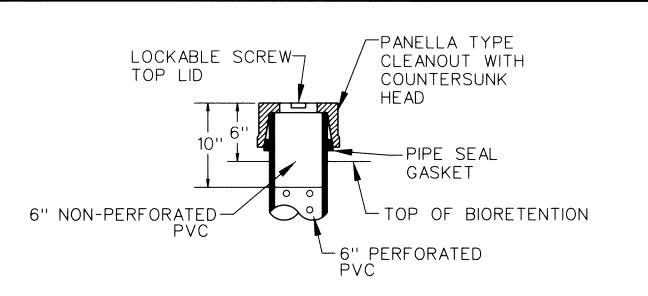
1''- 10' SEPTEMBER 2010 KCI JOB NO.: 01-081795.20

CAPITAL PROJECT NO.: S-6175

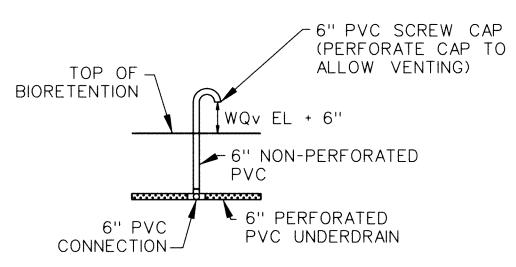
CONSTRUCTION ISSUE:

DII 24 08-SAVAGE PARK-STORM DRAIN

SHEET NO .: 12 OF 32



#### **SCREW TOP CAP** NOT TO SCALE

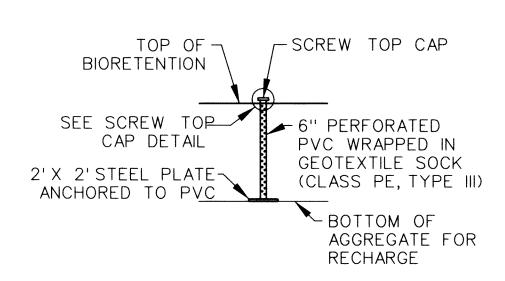


NOT TO SCALE

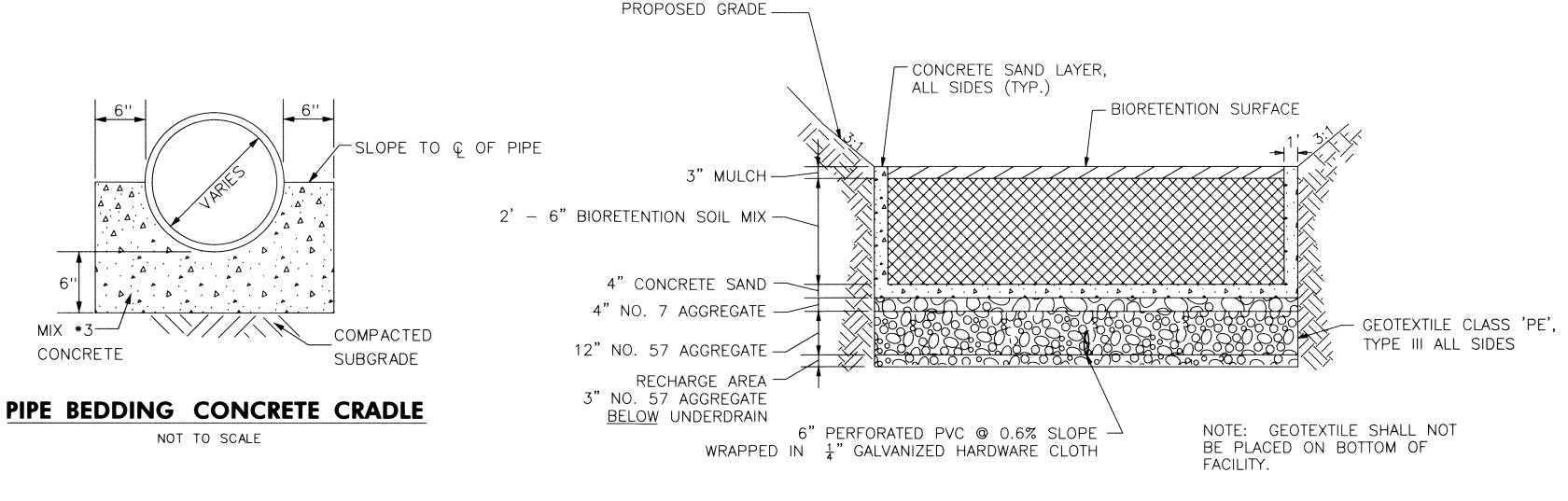
# J-VENT DETAIL

TOP OF -BIORETENTION -SCREW TOP CAP SEE SCREW TOP -6" NON-PERFORATED CAP DETAIL ► 6" PERFORATED PVC UNDERDRAIN CONNECTION -

#### **CLEANOUT DETAIL** NOT TO SCALE



#### **OBSERVATION WELL DETAIL** NOT TO SCALE

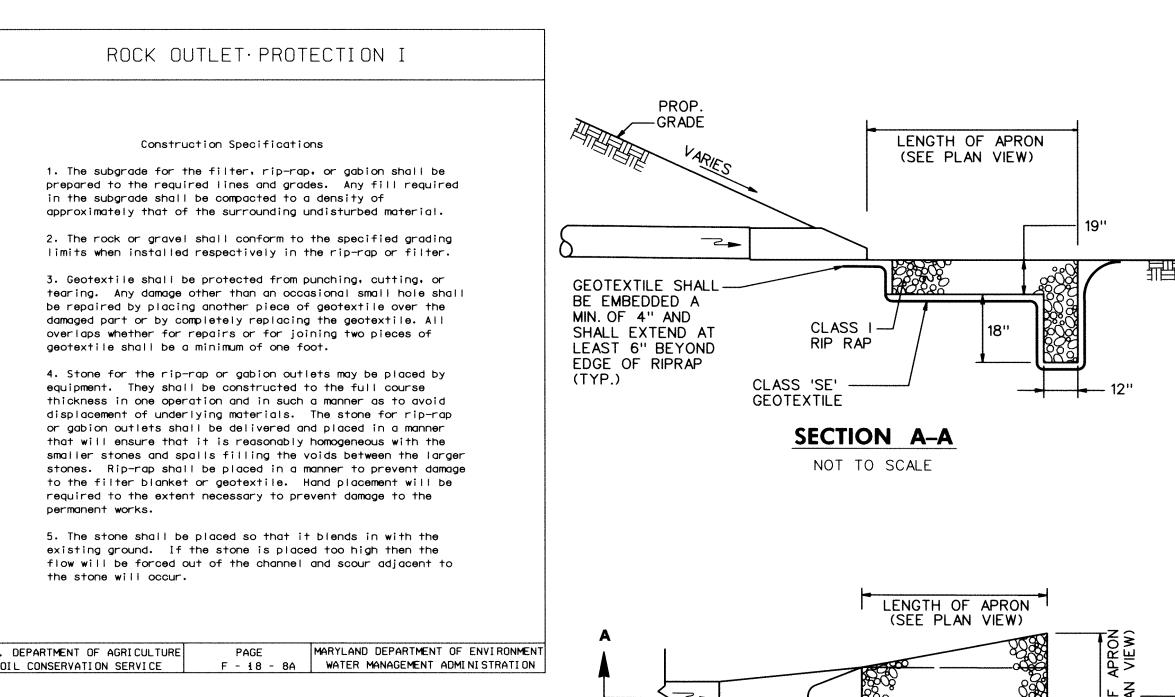


#### **BIORETENTION AREA TYPICAL SECTION**

SCALE: NOT TO SCALE

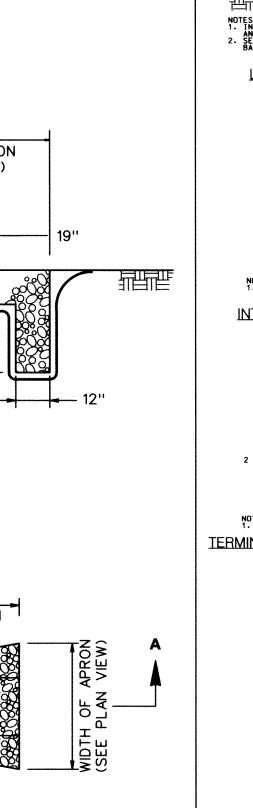
#### NOTES:

- 1. 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.
- 3. ALL VISIBLE PVC FEATURES ABOVE THE GROUND SURFACE SHALL BE BLACK IN COLOR.

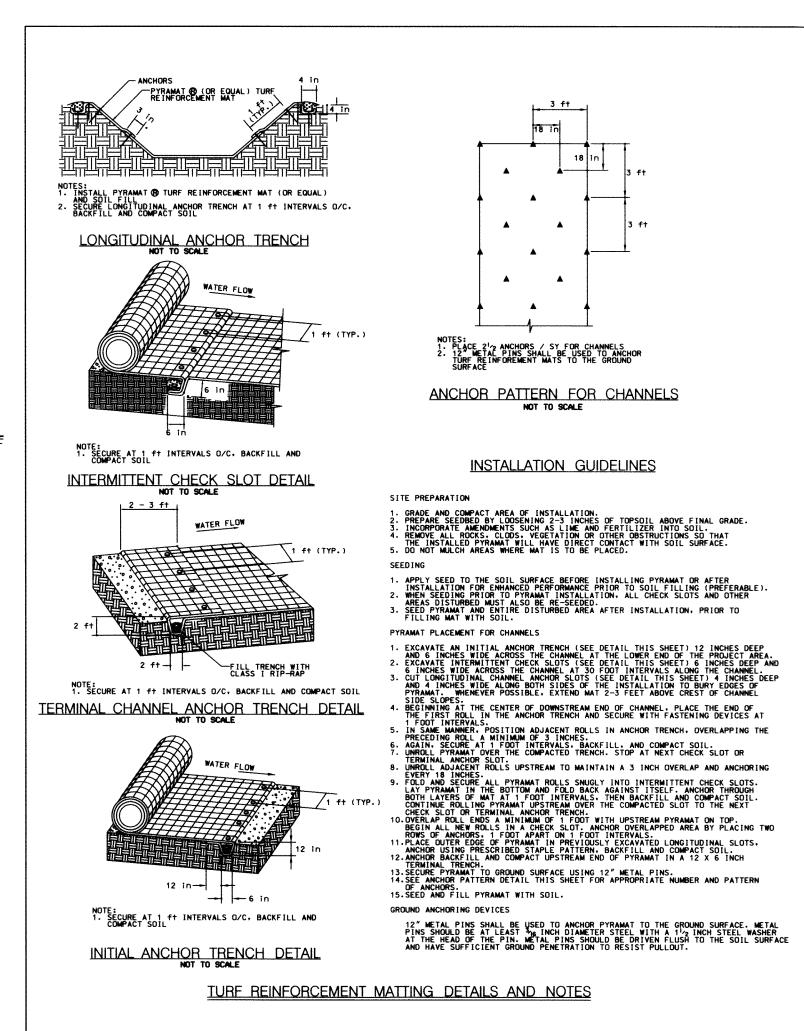


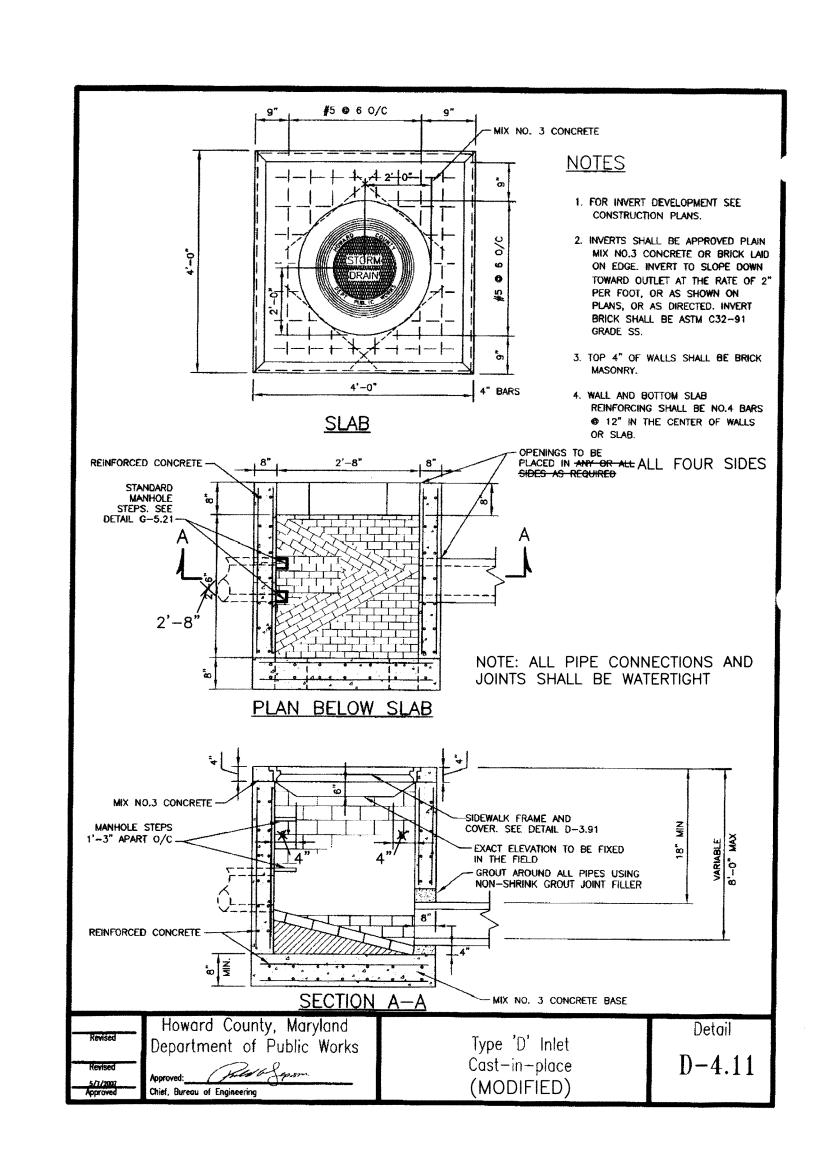
PROP. PIPE AND END SECTION

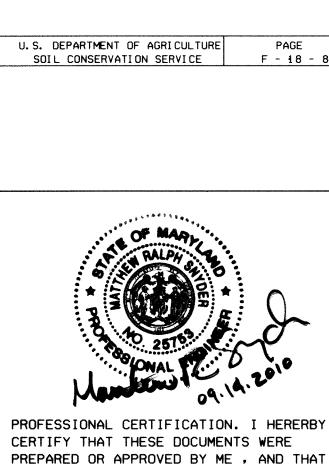












I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE

OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011

13, 2010" GMA Emp

N/A SEPTEMBER 2010 KCIJOB NO. 01-081795.20 CONSTRUCTION ISSUE: D1124 08-SAVAGE PARK

GEBROOK ROAD ARYLAND 21152 (410) 316-7800 0) 316-7818 RIDGEBROOK Telephone: (4Fax: (410)

Sparks,

936

BIORETENTION DETAILS

STORM DRAIN

SHEET NO.: 13 OF 32

#### SPECIFICATIONS FOR BIORETENTION FACILITY

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, MUGWORT, 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- P2 Q)	MINIMUM 75 PPM	ж	
POTASSIUM (K, O)	MINIMUM 85 PPM	*	
SOLUBLE SALTS	NOT TO EXCEED 500 PPM	*	

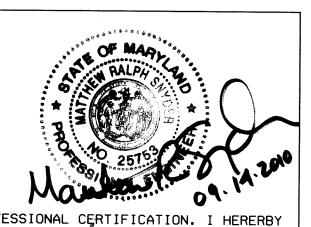
\* UNIVERSITY OF DELAWARE, COLLEGE OF AGRICULTURE AND NATURAL RESOURCES, SOIL TESTING PROGRAM TEST METHOD

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:



PALP PALP 257
Working od. L.
PROFESSIONAL CERTIFICATION. I HERERBY CERTIFY THAT THESE DOCUMENTS WERE
PREPARED OR APPROVED BY ME , AND THAT I AM A DULY LICENSED PROFESSIONAL

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	

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 6 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 FACILITIÈS. THÉ 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 TURE 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 IN 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 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

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

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

25753 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

MD LICENSE NUMBER

#### OPERATION AND MAINTENANCE SCHEDULE

1. FACILITY SHALL BE INSPECTED ON A TRIENNIAL BASIS. INSPECTIONS SHALL BE PERFORMED

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

3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS

4. VISIBLE SIGNS OF EROSION AT THE INFLOW AREAS AS WELL AS THE OVERFLOW AND OUTLET

5. PLANTINGS SHALL BE REPLACED AS NEEDED TO ENSURE A SIGNIFICANT NUMBER OF SHRUBS ARE PRESENT AND FULL HERBACEOUS COVERAGE EXISTS WITHIN THE FACILITY.

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.

ROUTINE MAINTENANCE:

FOLLOWING AT LEAST 72 HOURS OF DRY WEATHER.

BIORETENTION AREA SHALL NOT BE MOWED.

AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

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

ROAD 21152 6-7800 818 ND 2 )316-5-781{ 4RYLAN (410) (3) 316 SPARKS, MAN. ELEPHONE: (4) FAX: (410) 936

SAVAGE PORTION STORMWATER MARKED SECTION 4, ARE CAPITAL PROJECTION 4,

BIORETENTION

N/A SEPTEMBER 2010 01-081795.20 CAPITAL PROJECT NO.: S-6175

ERMIT ISSUE:

CONSTRUCTION ISSUE:

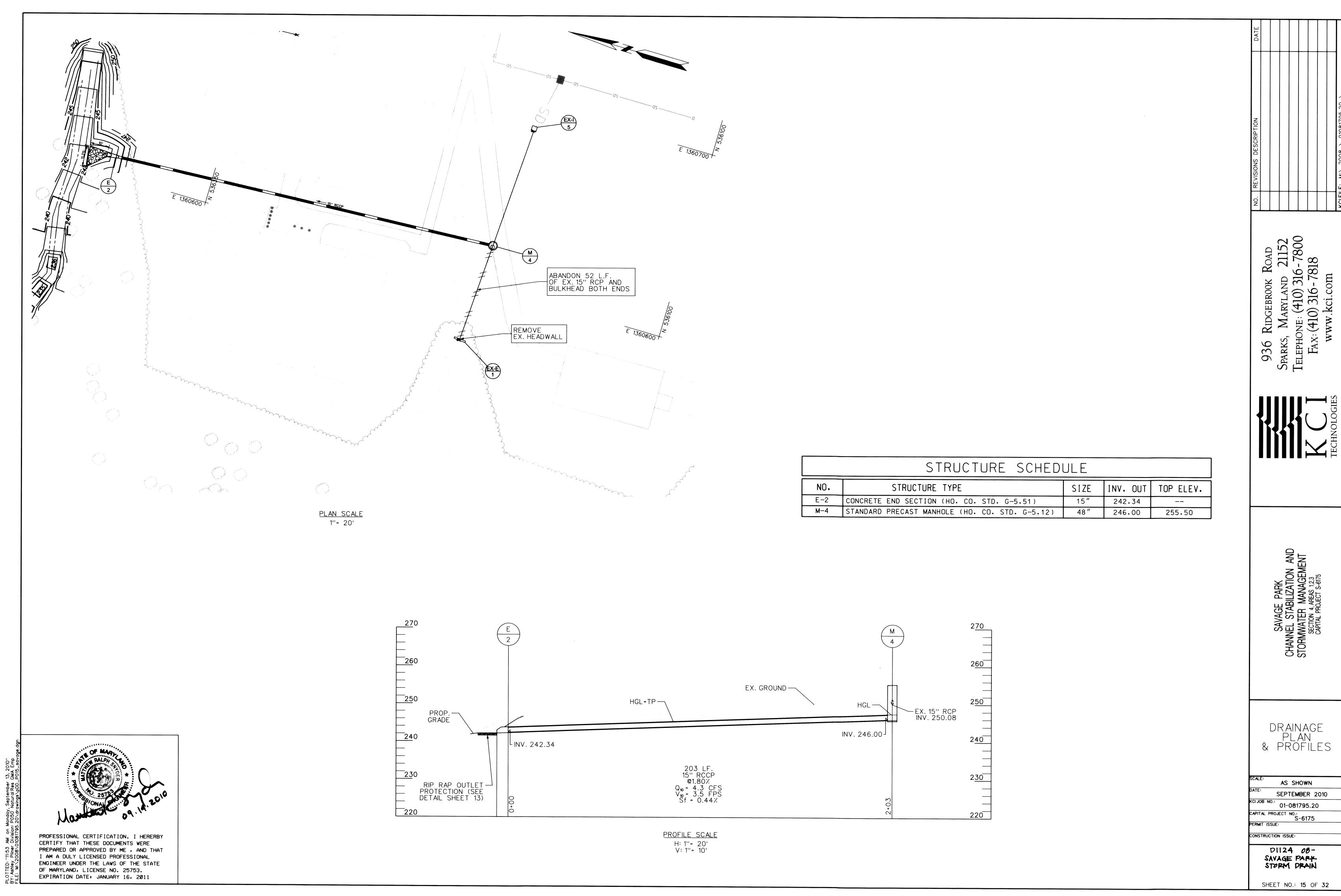
D1124 08-SAVAGE PARK STORM DRAIN

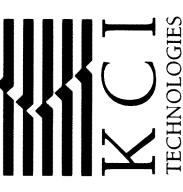
SHEET NO.: 14 OF 32

ENGINEER UNDER THE LAWS OF THE STATE

OF MARYLAND, LICENSE NO. 25753.

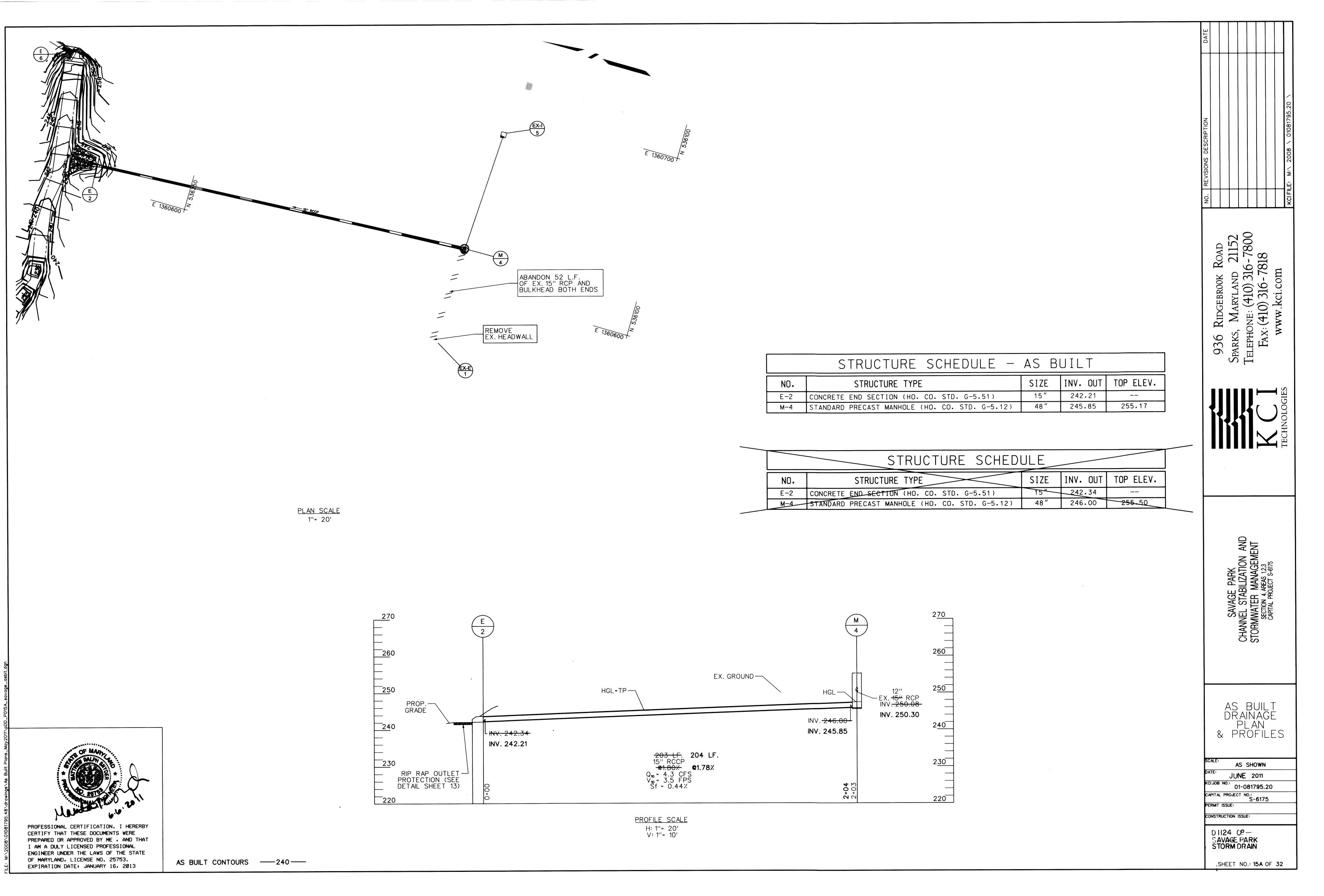
EXPIRATION DATE: JANUARY 16, 2011

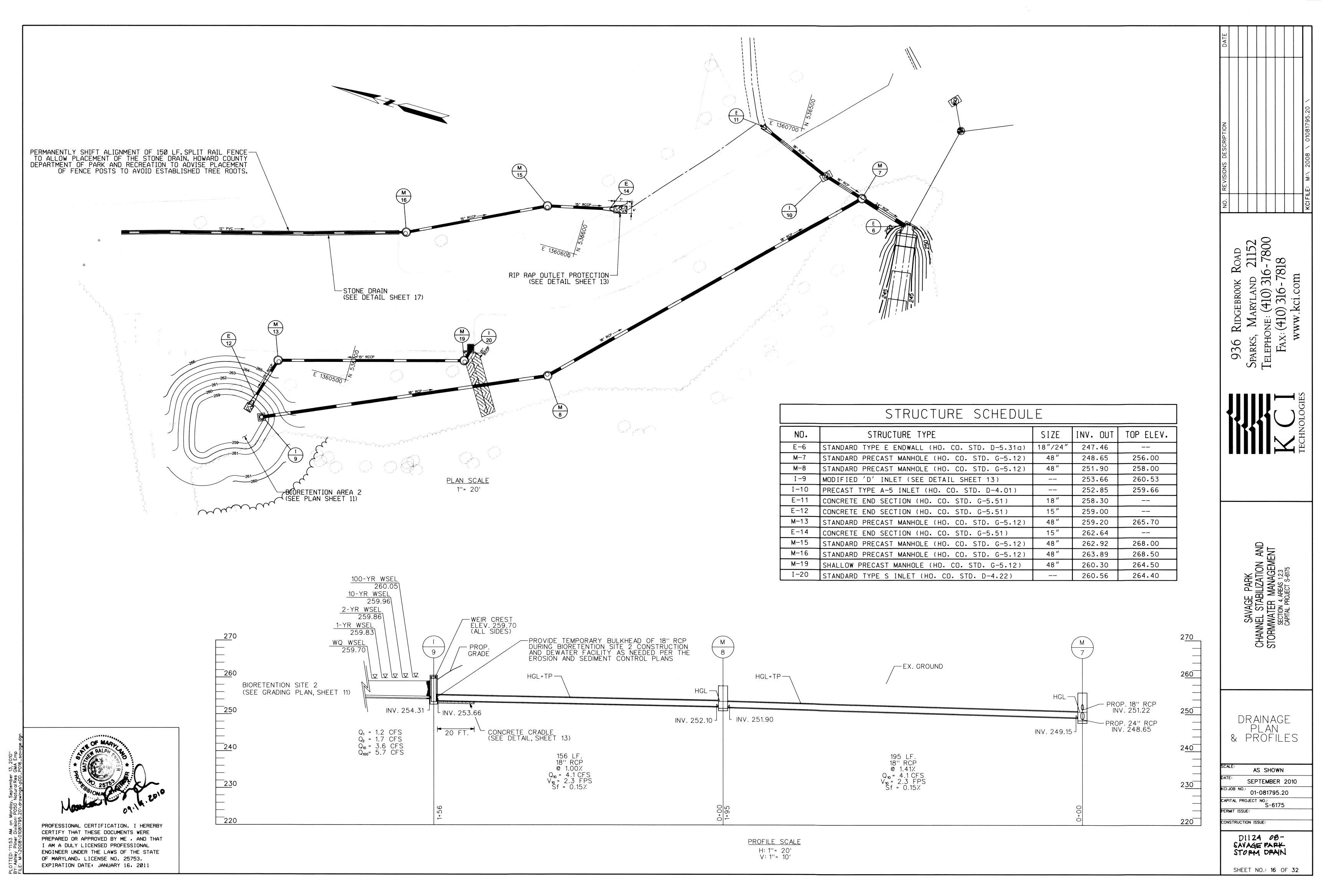


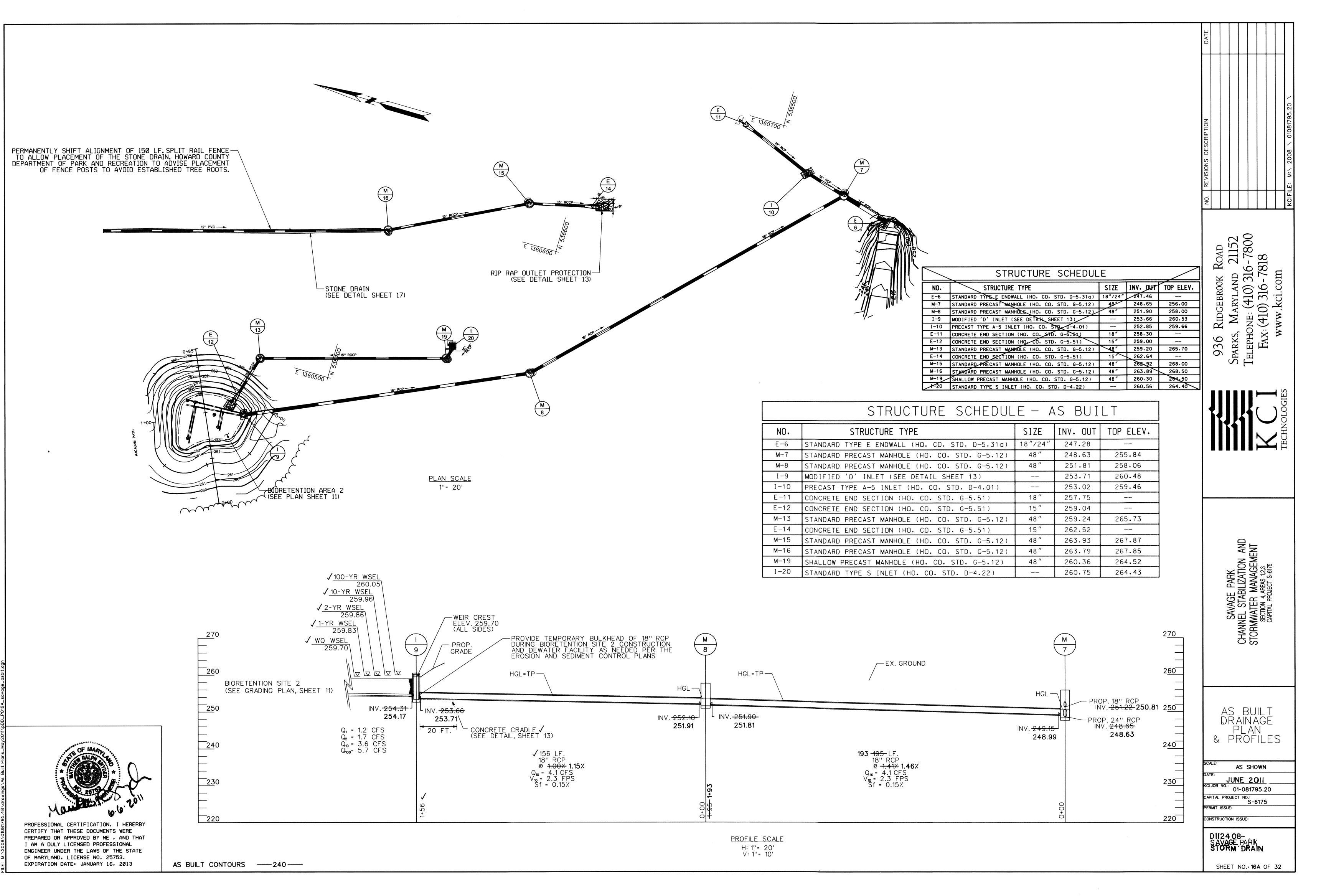


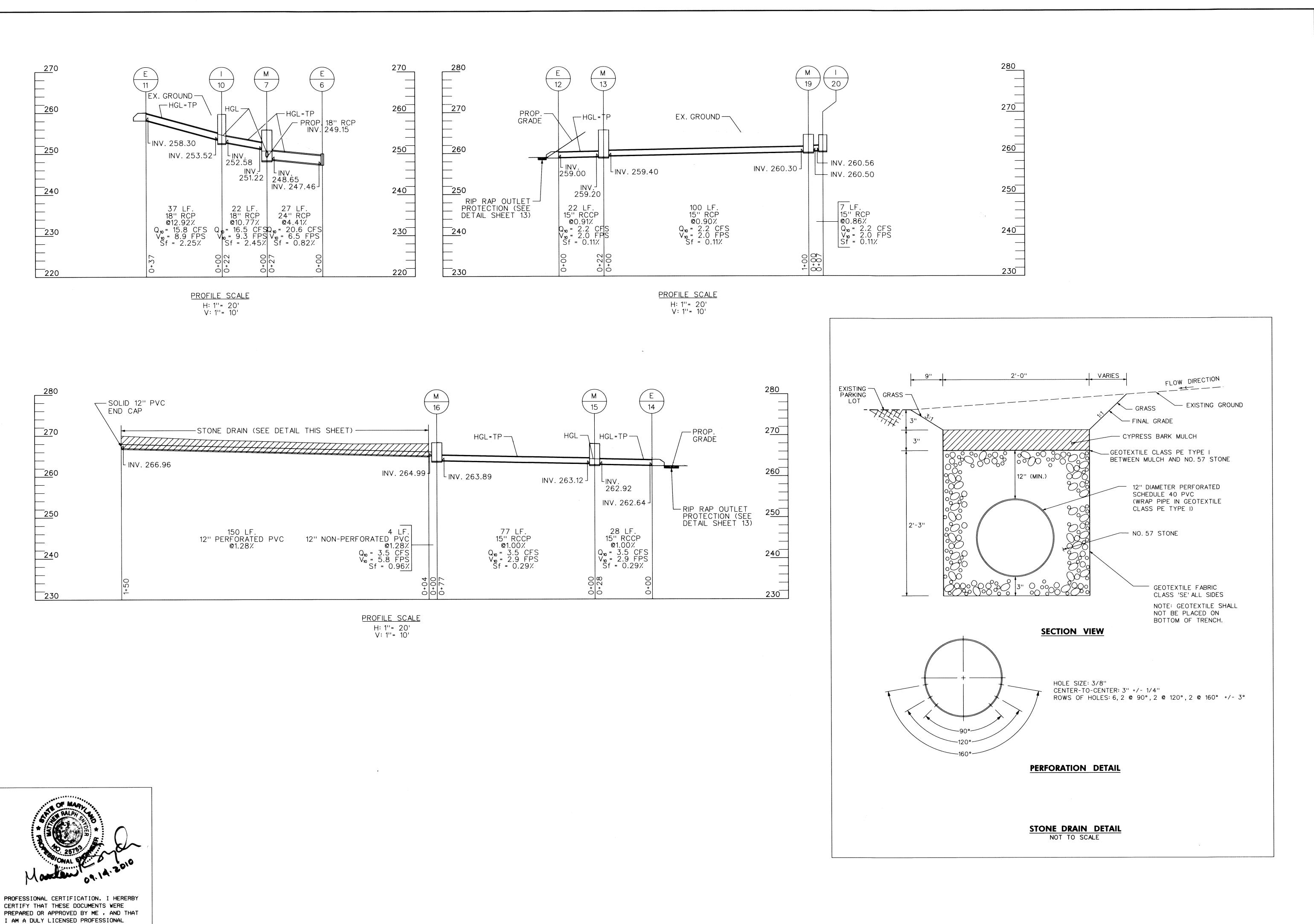
DRAINAGE PLAN & PROFILES

D1124 08-









AM on Monday, September 13, 2010'' Division: P050 Natural Res GMA Emp 1081795.20\drawings\pDD\_P017\_sav

ENGINEER UNDER THE LAWS OF THE STATE

OF MARYLAND, LICENSE NO. 25753. EXPIRATION DATE: JANUARY 16, 2011

SAVAGE PARK

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

> DRAINAGE PROFILES

SCALE: AS SHOWN
DATE: SERTEMBER C

SEPTEMBER 2010 KCI JOB NO.: 01-081795.20

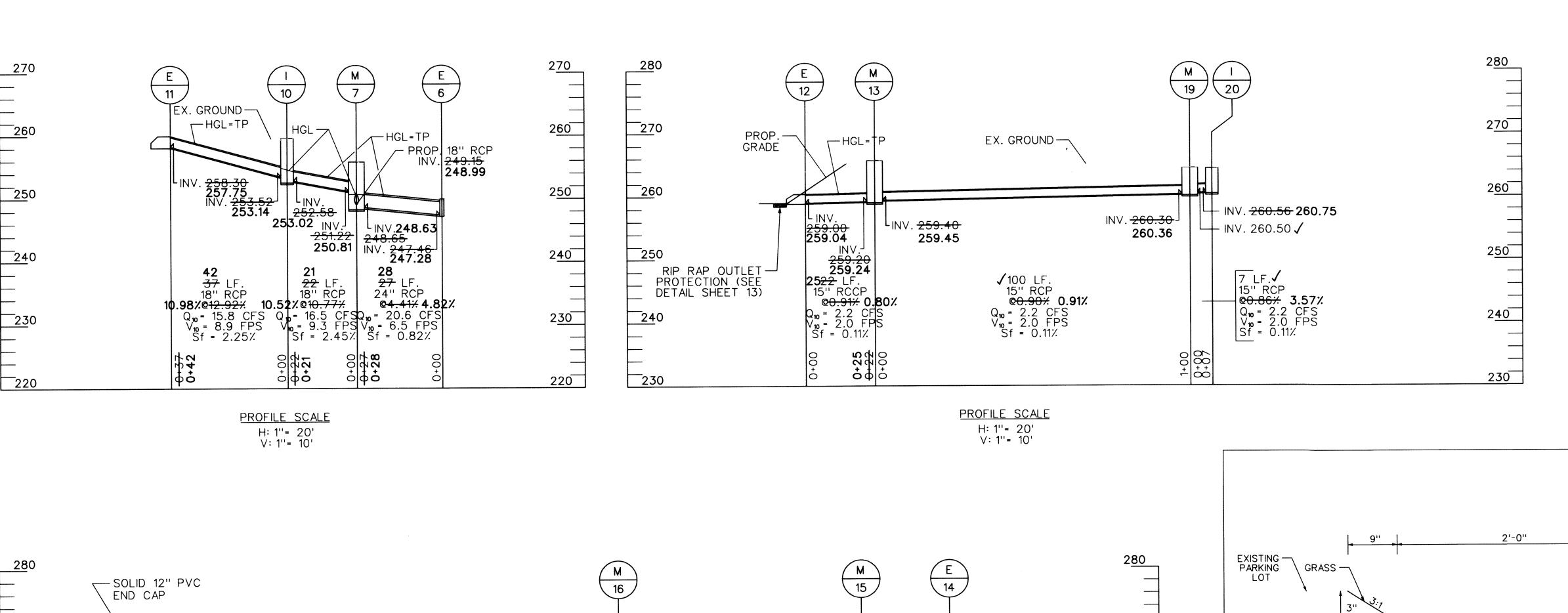
CAPITAL PROJECT NO.:
S-6175
PERMIT ISSUE:

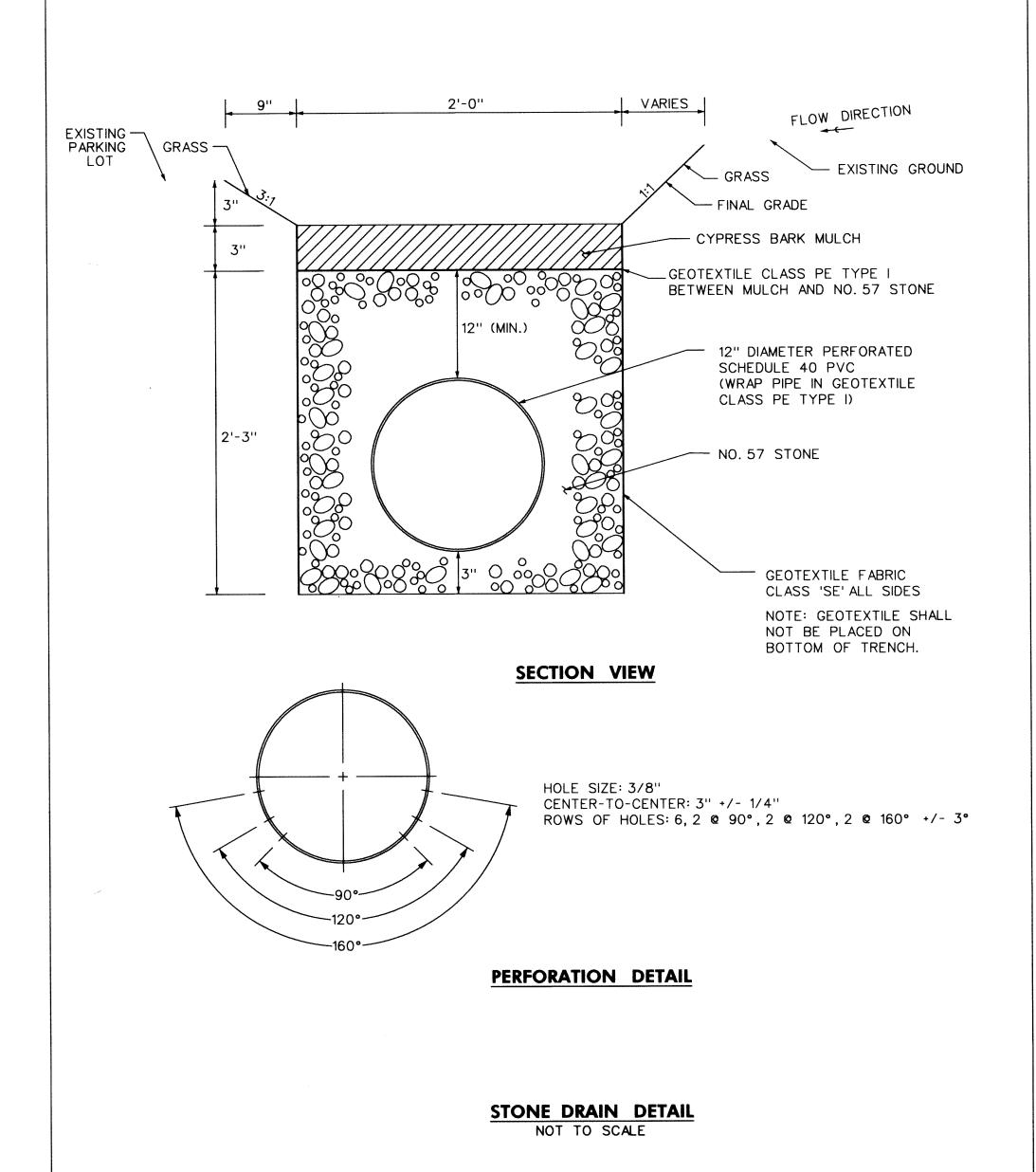
CONSTRUCTION ISSUE:

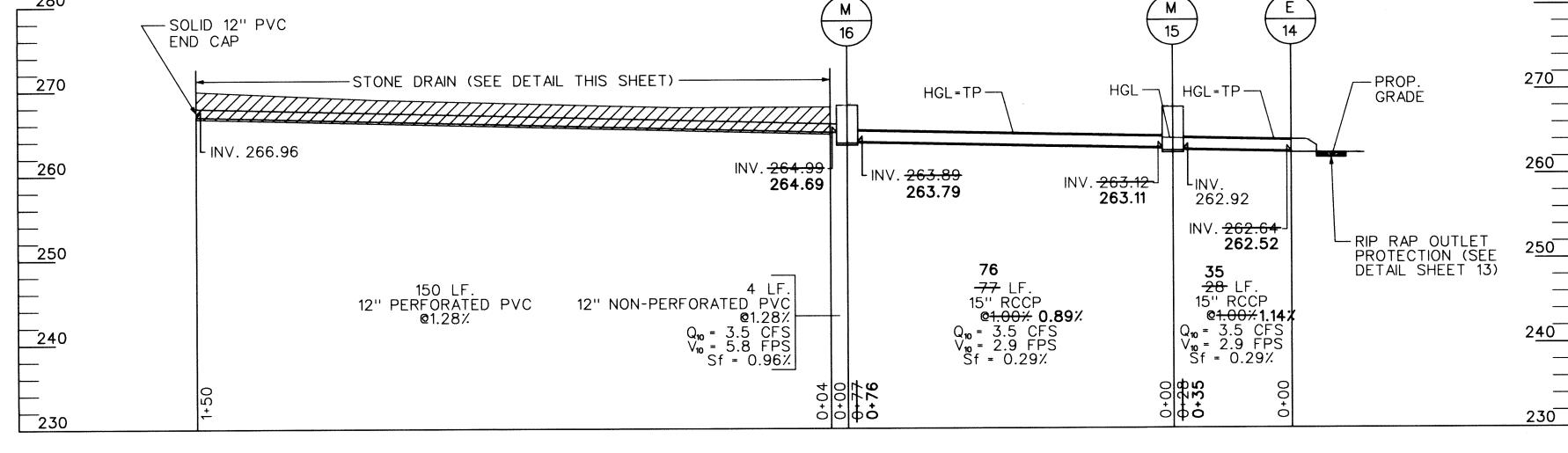
D1124 08SAVAGE PARK

STORM DRAIN

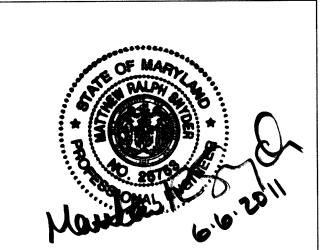
SHEET NO.: 17 OF 32







PROFILE SCALE
H: 1''= 20'
V: 1''= 10'



PROFESSIONAL CERTIFICATION. I HERERBY 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, 2013

STORM DRAIN

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

AS BUILT DRAINAGE PROFILES

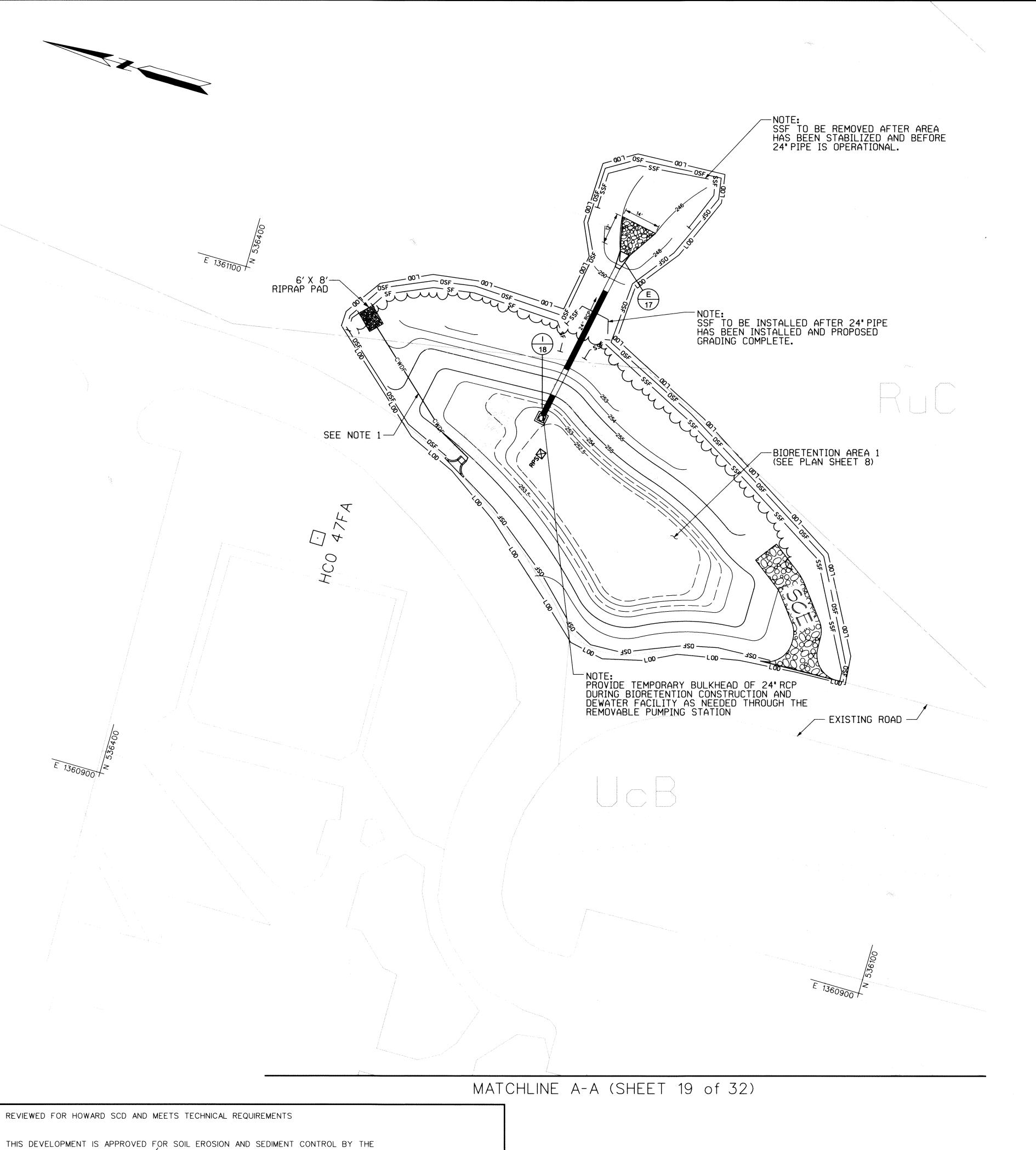
SCALE: AS SHOWN
DATE: JUNE 2011

CAPITAL PROJECT NO.:
S-6175

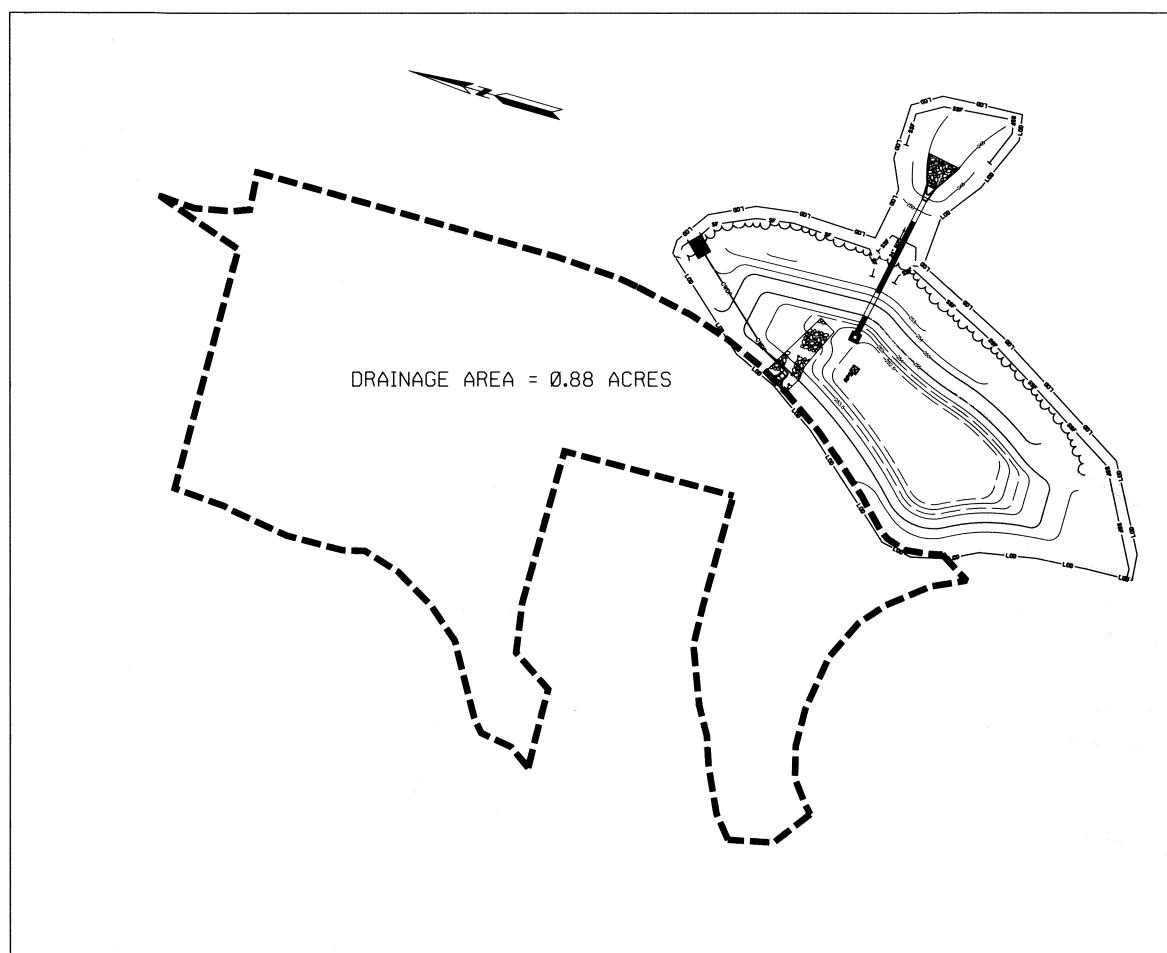
PERMIT ISSUE:

CONSTRUCTION ISSUE:

SHEET NO.: 17A OF 32



- 1. SHIFT CLEARWATER DIVERSION FENCE AS NECSSARY
- TO COMPLETE GRADING OF BIORETENTION AREA.
- 2. SEE SHEET 26 FOR LANDSCAPE PLAN. 3. SEE SHEET 24 FOR SEQUENCE OF CONSTRUCTION..
- 4. ALL CONTRUCTION AREAS SHALL BE DEMARKATED BY PLACING ORANGE CONSTRUCTION FENCING AT THE LOD BOUNDARY LINE AND/OR EDGE OF PAVEMENT.
- 5. PEDESTRIAN SAFETY IS THE HIGHEST PRIORITY. ALL CONSTRUCTION ACTIVITIES ARE LOCATED WITHIN PUBLIC PARK FACILITIES THAT MAY BE IN USE DURING CONSTRUCTION PERIODS. USE EXTREME CAUTION.



DRAINAGE AREA TO CLEARWATER DIVERSION FENCE SCALE: 1"= 40"

# LEGEND

LIMIT OF DISTURBANCE	
ORANGE SAFETY FENCE/ORANGE CONSTRUCTION FENCE	OSF
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	
EXISTING 100 YEAR FLOODPLAIN	
PROPOSED 100 YEAR FLOODPLAIN	
EXISTING TREE TO BE SAVED	
EDGE OF TREELINE	`T\$
WATERS OF THE US	
PROPERTY LINE	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	. \$
EXISTING STORM DRAIN	- 50
RIFFLE GRADE CONTROL	and the second s
SANDBAG DAM	
PUMP	<b>P</b>
FILTER BAG	F8
SILT FENCE	SF
SUPER SILT FENCE	SSF
STABILIZED CONSTRUCTION ENTRANCE	
	OSCEDO
PROPOSED STORM DRAIN	
REMOVABLE PUMPING STATION	<b>⊠</b> RPS
CLEARWATER DIVERSION FENCE	CWDF
SOILS BOUNDARY AND MAP UNIT SYMBOLS	

936 RIDG SPARKS, MA TELEPHONE: (

1"- 20' SEPTEMBER 2010 01-081795.20

ONSTRUCTION ISSUE:

DI124 08 SAVAGE PARK STORM DRAIN

SHEET NO .: 18 OF 32



CERTIFY THAT THESE DOCUMENTS WERE I AM A DULY LICENSED PROFESSIONAL OF MARYLAND, LICENSE NO. 25753.

EXPIRATION DATE: JANUARY 16, 2011

PROFESSIONAL CERTIFICATION. I HERERBY PREPARED OR APPROVED BY ME , AND THAT ENGINEER UNDER THE LAWS OF THE STATE

EROSION & SEDIMENT CONTROL PLAN

1''= 20' SEPTEMBER 2010

01-081795.20 CAPITAL PROJECT NO.:
S-6175

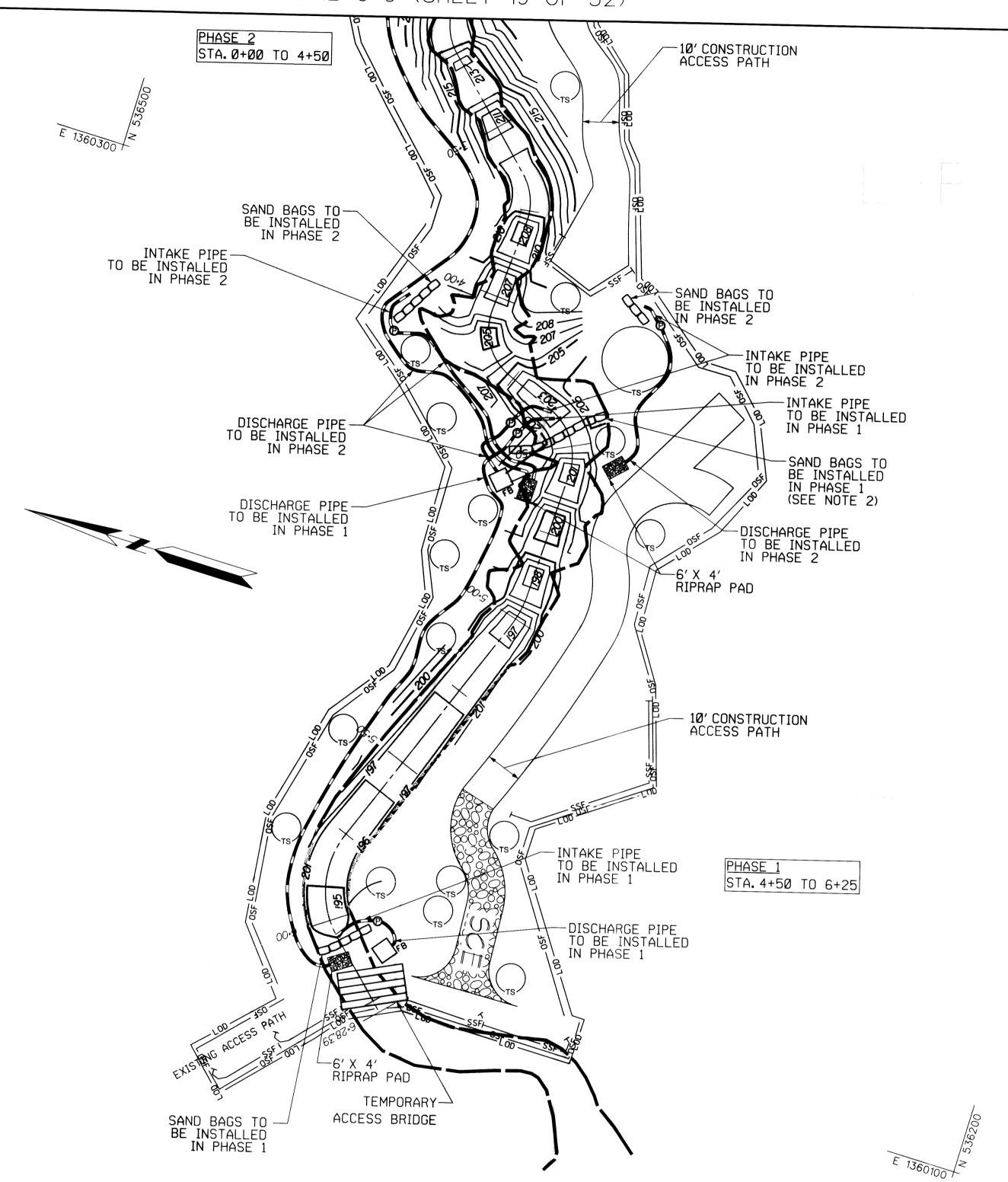
ONSTRUCTION ISSUE:

DI124 06-SAVAGE PARK STORM DRAIN

SHEET NO.: 19 OF 32

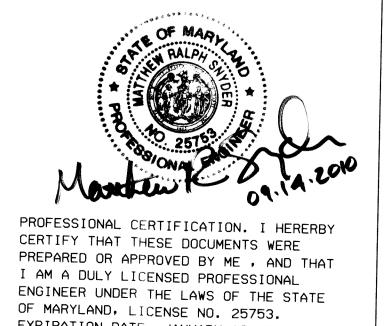
THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE

STREAM CLOSURE FOR UNNAMED TRIBUTARY: MARCH 1 TO JUNE 15



LITTLE PATUXENT RIVER

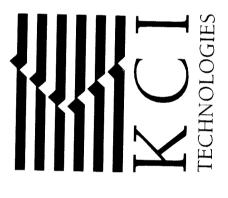
REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE



NOTES:

- 1. RELOCATE SAND BAGS AS NECESSARY TO FACILITATE GRADING WHERE PHASES OF CONSTRUCTION TIE TOGETHER.
- 2. FLEXIBLE INTAKE AND DISCHARGE PIPES MAY BE SHIFTED WITHIN THE LOD AS NEEDED TO ALLOW CONSTRUCTION ACCESS TO CHANNEL.
- 3. SEE SHEET 24 FOR SEQUENCE OF CONSTRUCTION.
- 4. ALL CONTRUCTION AREAS SHALL BE DEMARKATED BY PLACING ORANGE CONSTRUCTION FENCING AT THE LOD BOUNDARY LINE AND/OR EDGE OF PAVEMENT.
- 5. PEDESTRIAN SAFETY IS THE HIGHEST PRIORITY. ALL CONSTRUCTION ACTIVITIES ARE LOCATED WITHIN PUBLIC PARK FACILITIES THAT MAY BE IN USE DURING CONSTRUCTION PERIODS. USE EXTREME CAUTION.

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STREAM CLOSURE FOR UNNAMED TRIBUTARY: MARCH 1 TO JUNE 15

# LEGEND

LIMIT OF DISTURBANCE	
ONANGE SHEET FENCE/URANGE CONSTRUCTION FENCE	LOD OSF
EXISTING MAJOR CONTOURS	USF
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	200-
EXISTING IDD YEAR FLOODPLAIN	
PRUPUSED 100 YEAR FLOODPLAIN	
EXISTING TREE TO BE SAVED	
EDGE OF TREELINE	TS
WHIERS OF THE US	
PROPERTY LINE	
EVIZITING KNAN FNGE	
EXISTING SEWER LINE	
EXISTING STORM DRAIN	
RIFFLE GRADE CONTROL	
SANDBAG DAM	
PUMP	
FILTER BAG	Ø
SILT FENCE	FB
SUPER SILT FENCE	SF
STABILIZED CONSTRUCTION ENTRANCE	SSF
	SOSCE OF
PROPOSED STORM DRAIN	
REMOVABLE PUMPING STATION	Mana
CLEARWATER DIVERSION FENCE	⊠RPS
	CWDF
SOILS BOUNDARY AND MAP UNIT SYMBOLS_	

15 TO 25% SLOPES\_\_\_\_\_

25% + SLOPES\_\_\_\_\_

EROSION & SEDIMENT CONTROL PLAN

SCALE:	1''= 20'
DATE:	SEPTEMBER 201
KCIJOB NO	01-081795.20
CAPITAL PE	ROJECT NO.:

PERMIT ISSUE: ONSTRUCTION ISSUE:

D1124 08-SAVAGE PARK STORM DRAIN

SHEET NO .: 20 OF 32

EXPIRATION DATE: JANUARY 16, 2011

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

NOTES:

- 1. BIORETENTION AREA 2 SHALL BE CONSTRUCTED ONLY AFTER DRAINAGE SYSTEM FROM EX-E-6 TO I-9 IS INSTALLED AND DRAINAGE SYSTEM FROM E-14 TO M-16, INCLUDING STONE DRAIN, IS INSTALLED.
- 2. DRAINAGE SYSTEM FROM E-12 TO M-13, INCLUDING STONE DRAIN, SHALL BE INSTALLED ONLY AFTER BIORETENTION AREA 2 HAS BEEN CONSTRUCTED AND STABILIZED WITH MULCH.
- 3. SEE SHEETS 15 17 FOR DRAINAGE PLANS AND PROFILES.
- 4. SEE SHEET 27 FOR LANDSCAPE PLAN.
- 5. REFER TO "EROSION AND SEDIMENT CONTROL FOR PROPOSED STORM DRAIN INSTALLATION" DETAIL SHEET 22 WHEN INSTALLING DRAINAGE SYSTEM FROM E-14 TO M-16, INCLUDING STONE DRAIN.
- 6. SEE SHEET 24 FOR SEQUENCE OF CONSTRUCTION.
- 7. ALL CONTRUCTION AREAS SHALL BE DEMARKATED BY PLACING ORANGE CONSTRUCTION FENCING AT THE LOD BOUNDARY LINE AND/OR EDGE OF PAVEMENT
- 8. PEDESTRIAN SAFETY IS THE HIGHEST PRIORITY. ALL CONSTRUCTION ACTIVITIES ARE LOCATED WITHIN PUBLIC PARK FACILITIES THAT MAY BE IN USE DURING CONSTRUCTION PERIODS. USE EXTREME CAUTION.

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ND 21152
316-7800
5-7818 Fax: (410) SPARKS, 936



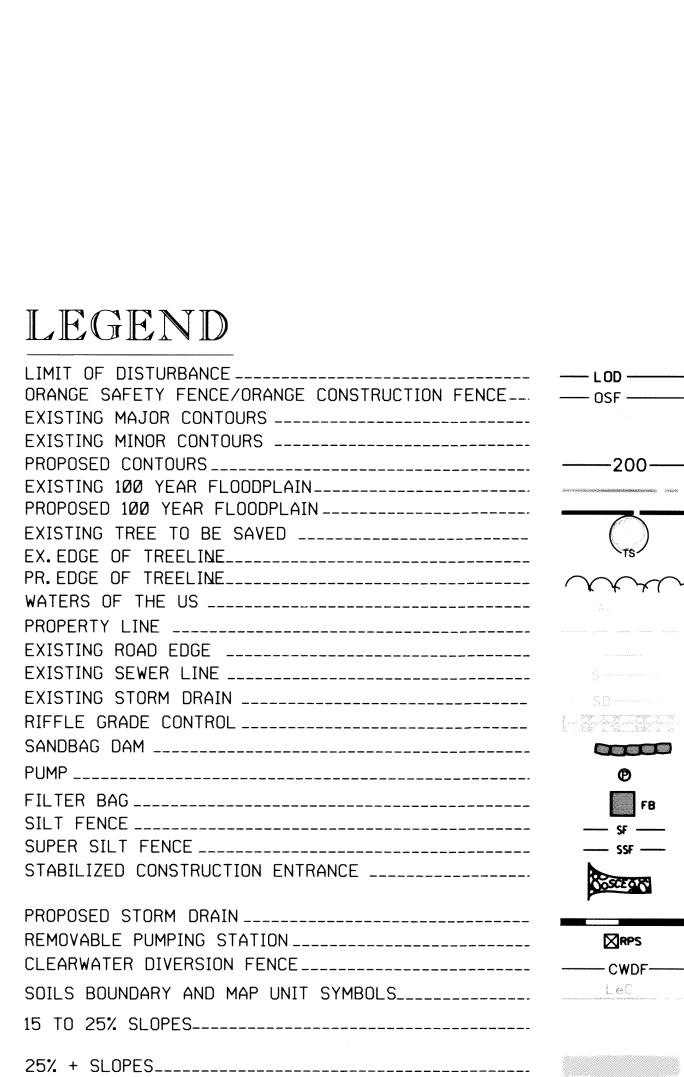
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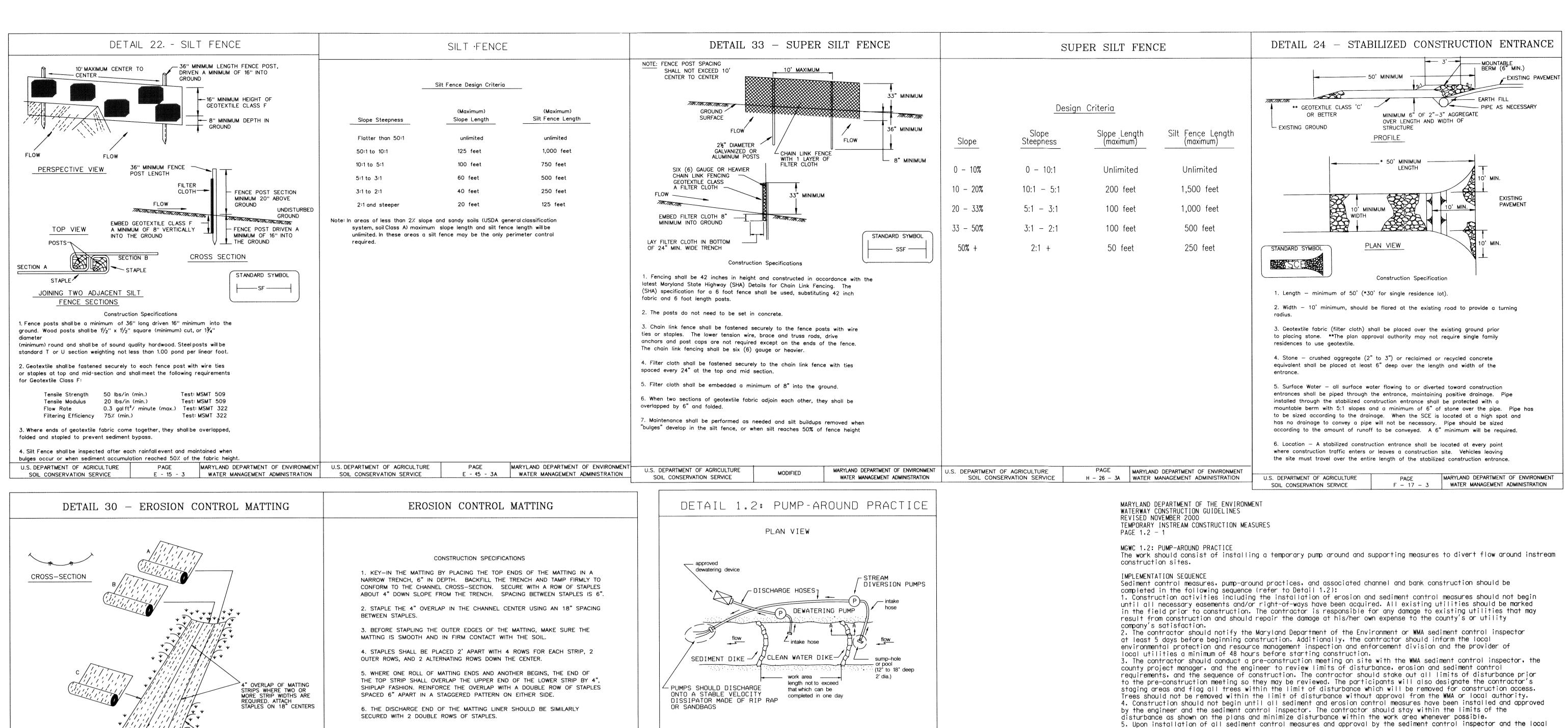
1"= 20" SEPTEMBER 2010

APITAL PROJECT NO.: S-6175 CONSTRUCTION ISSUE:

> D1124 08-SAVAGE PARK STORM DRAIN

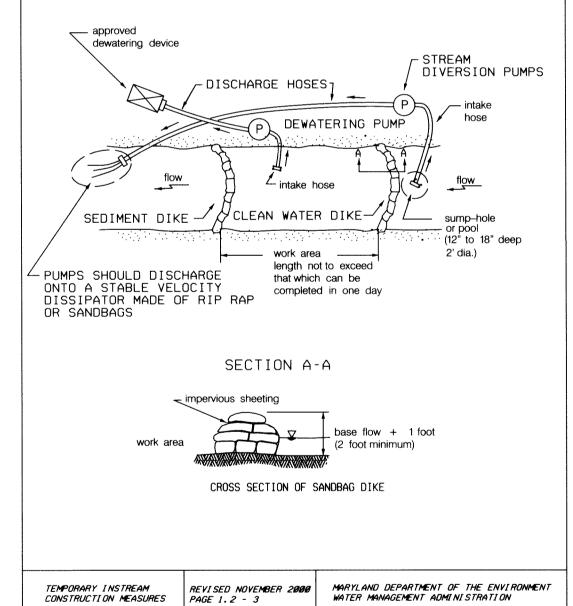
SHEET NO.: 21 OF 32





EFFECTED BY THE FLOW MUST BE KEYED-IN. U.S. DEPARTMENT OF AGRICULTURE MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION -PROPOSED STORM DRAIN

NOTE: IF FLOW WILL ENTER FROM THE EDGE OF THE MATTING THEN THE AREA

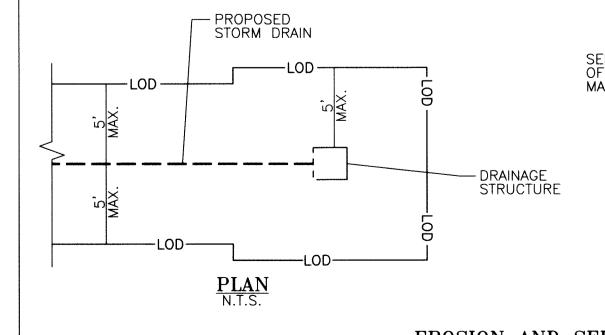


CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK - DRAINAGE

TRENCHES FOR UTILITY INSTALLATIONS SHALL BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH WORKING DAY. WHEN THIS IS NOT POSSIBLE, THE AREA SHALL CONFORM

TEMPORARY SILT FENCES SHALL BE PLACED IMMEDIATELY DOWNSTREAM OF ANY DISTURBED AREA INTENDED TO REMAIN DISTURBED FOR MORE THAN ONE DAY.

EROSION AND SEDIMENT CONTROL FOR PROPOSED STORM DRAIN INSTALLATION



PROFESSIONAL CERTIFICATION. I HERERBY 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

EXPIRATION DATE: JANUARY 16, 2011

dissipater made of riprap or sandbags.

Waterway Construction).

work area in the main stem.

the channel below the downstream sandbag dike.

seed and mulch or seed and matting as specified on the plans.

velocity dissipater used for the main stem pump around.

until the sediment control inspector approves their removal.

environmental protection and resource management inspection and enforcement division, the contractor should

construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor should only begin work in an area which can be completed by the end of the day including grading adjacent to the channel. At the end of each work day, the work area must be stabilized and the pump around removed from the channel. Work should not be conducted in the channel during rain events. 6. Sandbag dikes should be situated at the upstream and downstream ends of the work area as shown on the plans,

begin work at the upstream section and proceed downstream beginning with the establishment of stabilized

and stream flow should be pumped around the work area. The pump should discharge onto a stable velocity

7. Water from the work area should be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure should be located such that the water drains back into

and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to

flush, a new clean water dike should be established upstream from the old sediment dike. Finally, upon

establishment of a new sediment dike below the old one, the old sediment dike should be removed.

3. Traversing a channel reach with equipment within the work area where no work is proposed should be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures should

be used to minimize disturbance to the channel. Temporary stream crossings should be used only when necessary

9. All stream restoration measures should be installed as indicated by the plans and all banks graded in accordance with the grading plans and typical cross- sections. All grading must be stabilized at the end of each day with

11. A pump around must be installed on any tributary or storm drain outfall which contributes baseflow to the work

12. If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, should follow

13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices

the same sequence as for the main stem of the river or stream. When construction on the tributary is completed,

10. After an area is completed and stabilized, the clean water dike should be removed. After the first sediment

area. This should be accomplished by locating a sandbag dike at the downstream end of the tributary or storm

drain outfall and pumping the stream flow around the work area. This water should discharge onto the same

work on the main stem should resume. Water from the tributary should continue to be pumped around the

14. After construction, all disturbed areas should be regraded and revegetated as per the planting plan.

construction entrances. In some cases, work may begin downstream if appropriate. The sequence of

OOK ROAD AND 21152 () 316-7800 6-7818 RIDGEBROOK (410) (410) (410) (410) PARKS, MAn. ELEPHONE: (4) FAX: (410) 36 9

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EROSION & SEDIMENT CONTROL NOTES & DETAILS

SEPTEMBER 2010 01-081795.20 APITAL PROJECT NO. ERMIT ISSUE ONSTRUCTION ISSUE:

> D1124 08-SAVAGE PARK STORM DRAIN

SHEET NO.: 22 OF 32

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

TYPICAL STAPLES NO. 11

MARYLAND DEPARTMENT OF ENVIRONMENT

WATER MANAGEMENT ADMINISTRATION

GAUGE WIRE

STAPLE OUTSIDE EDGE OF MATTING ON 2' CENTERS

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

13, 2010" GMA Emp

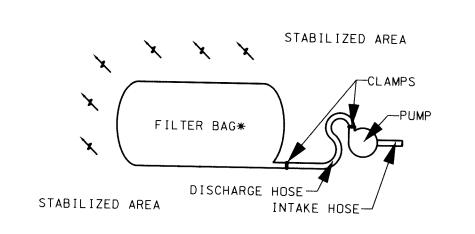
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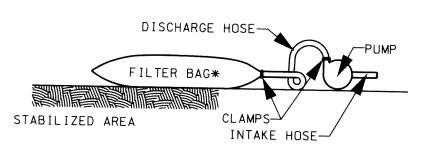
SOIL CONSERVATION SERVICE

SEDIMENT CONTROL FOR UTILITY CONSTRUCTION IN AREAS OUTSIDE OF DESIGNED CONTROLS SHALL FOLLOW THESE ADDITIONAL BEST MANAGEMENT PRACTICES:

EXCAVATED MATERIAL SHALL BE PLACED ON THE HIGH SIDE OF THE

OF MARYLAND, LICENSE NO. 25753.





\* NON-WOVEN GEOTEXTILE FILTER BAG WHICH RETAINS ALL SEDIMENT PARTICLES LARGER THAN 150 MICRONS.

#### FILTER BAG DEWATERING DEVICE FOR PUMPED WATER NOT TO SCALE

- NOTES: 1. PLACE FILTER BAGS ON STABLE OR WELL VEGETATED AREAS WHICH ARE FLATTER THAN 5% AND WILL NOT ERODE WHEN SUBJECTED TO BAG DISCHARGES.
  - 2. CLAMP PUMP DISCHARGE HOSES SECURELY INTO FILTER BAGS. 3.LIMIT PUMPING RATE TO 1/2 THE MANUFACTURER'S MAXIMUM
  - 4. WHEN SEDIMENTS FILL 1/2 THE VOLUME OF A FILTER BAG, IMMEDIATELY REMOVE THAT BAG FROM SERVICE. PROPERLY DISPOSE OF SPENT BAGS WITH THEIR SEDIMENTS.

NOTE: ALL WATER COLLECTED WITHIN THE LIMIT OF DISTURBANCE (WITH THE EXCEPTION OF WATER DIVERTED AROUND THE WORK AREA) SHALL BE PUMPED THROUGH THE FILTER BAG.

DETAIL 35 - TEMPORARY ACCESS BRIDGE

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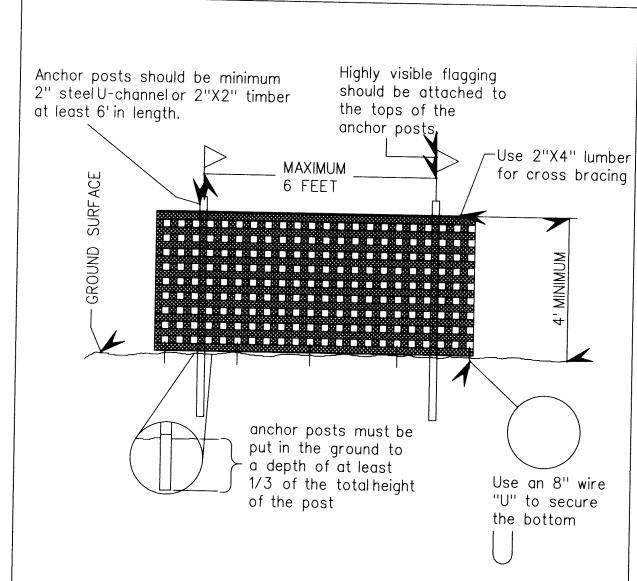
U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

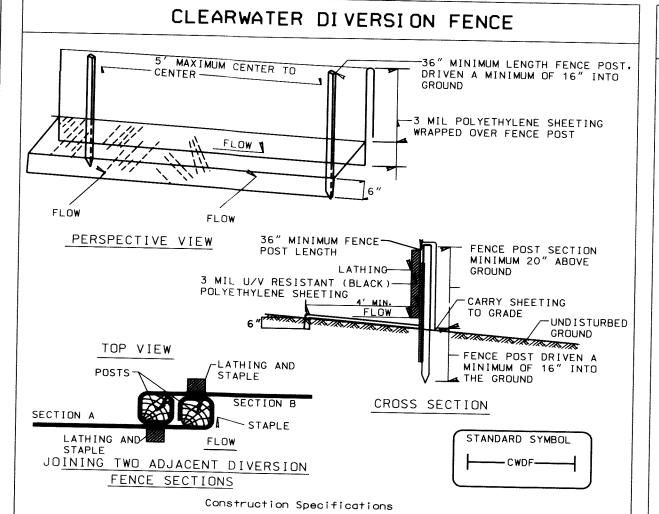
#### FILTER BAG SPECIFICATIONS

- 1. FILTER BAG SHALL BE MADE OF NON-WOVEN GEOTEXTILE WITH A MINIMUM SURFACE AREA OF 225 SQUARE FEET PER SIDE.
- 2. ALL STRUCTURAL SEAMS SHALL BE SEWN WITH A DOUBLE STITCH USING A DOUBLE NEEDLE MACHINE WITH HIGH STRENGTH THREAD.
  SEAM STRENGTH SHALL WITHSTAND 100 LB/IN USING ASTM D-4884
- 3. FILTER BAG SHALL HAVE A NOZZLE LARGE ENOUGH TO ACCOMMODATE A FOUR(4) INCH DIAMETER PUMP DISCHARGE HOSE.
- 4. NOZZLE SHALL BE SEALED TIGHTLY AROUND THE PUMP DISCHARGE HOSE WITH A STRAP OR SIMILAR DEVICE TO PREVENT UNFILTERED WATER FROM ESCAPING.
- 5. FILTER BAG SHALL BE PLACED ON A LEVEL OR GENTLY SLOPING (5% MAXIMUM) AREA.
- 6. FILTER BAG SHALL BE PLACED UPON A BASE OF STRAW BALES OR THREE (3) INCHES OF CLEAN STONE TO PROMOTE DEWATERING THROUGH BOTTOM SURFACE OF THE FILTER BAG.
- 7. PUMPING RATES SHALL BE CONTROLLED TO PREVENT EXCESSIVE PRESSURE WITHIN THE FILTER BAG. AS THE BAG BECOMES FILLED WITH SEDIMENT THE PUMPING RATE SHALL BE REDUCED.
- 8. THE FILTER BAG SHALL BE DEWATERED, REMOVED AND DISPOSED OF UPON COMPLETION OF PUMPING OPERATIONS OR AFTER IT HAS REACHED CAPACITY, WHICHEVER OCCURS FIRST. THE DEWATERED SEDIMENT FROM THE BAG SHALL BE SPREAD IN AN UPLAND AREA AND STABILIZED WITHIN 24 HOURS.
- 9. THE GEOTEXTILE FABRIC SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS WITH PROPERTIES DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:

THE THOUSENING	<b>J</b> .	
WEIGHT GRAB TENSILE PUNCTURE FLOW RATE PERMITIVITY (SEC) UV RESISTANCE APPARENT OPENING SIZE (AOS)	10 OZ/YD 210 LBS. 150 LBS. 70 GAL/MIN/FT2 1.3 70% 40-80	ASTM D-3776 ASTM D-4632 ASTM D-4833 ASTM D-4491 ASTM D-4991 ASTM D-4355 ASTM D-4751



DETAIL FOR BLAZE ORANGE PLASTIC MESH SAFETY FENCE NOT TO SCALE



- 1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Posts shall be 2 " x 2 " square (minimum) cut. and shall be of sound quality hardwood. Maximum post spacing shall be 5 feet center to center
- 2. 3 mil polyethylene sheeting shall be fastened securely to each fence post with lathing and staples at top and mid-section:
- 3. Ends of polyethylene sheeting shall come together only at posts. Ends shall be overlapped, folded and stapled to prevent runoff bypass. The upgrade section shall overlap the downgrade section.
- 4. Diversion fence shall have an uninterupted positive grade to a stable outlet. 5. The contributing drainage area measured to the outlet shall not exceed 2

NUMBER 57\*

NUMBER 1

RIP-RAP\*

CLASS I

CLASS II

CLASS III

CLASS

С

F (SILT FENCE)

\* US STD. SIEVE CW-02215

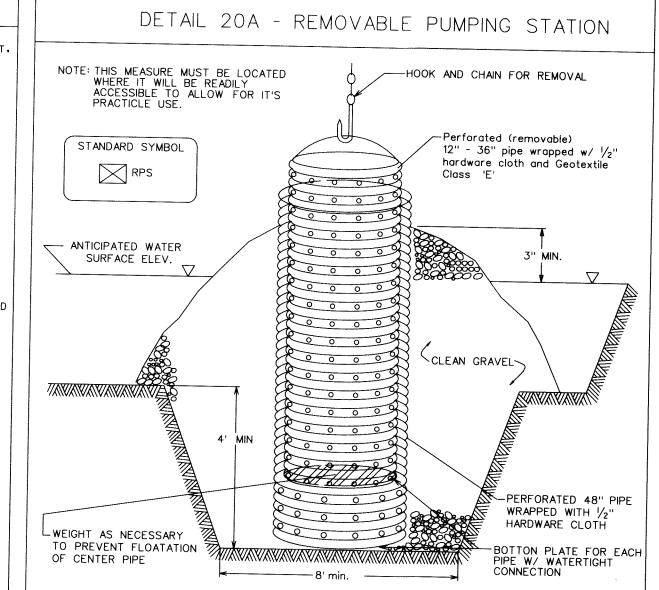
-BURST STRENGTH

- APPARENT OPENING SIZE MSMT 323

DETERIORATION FROM ULTRAVIOLET EXPOSURE.

THE GRAB TENSILE STRENGTH REQUIREMENTS LISTED ABOVE.

6. Diversion Fence shall be inspected after each rainfall event and maintained when necessary.



ELEVATION Construction Specifications

1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with ½" hardware cloth to prevent backfill material from entering the perforations.

2. After installing the outer pipe, backfill around outer pipe with 2" aggregate

HEIGHT

N/A

N/A

N/A

GRAB TENSILE

STRENGTH

LB. MIN.

250

200

200

90

90

\*\* .50 MM. MAX. FOR SUPER SILT FENCE

BURST STRENGTH

PSI MIN.

500

320

320

145

145

190

, 150 LB. MAX.

N/A 700 LB. MAX.

N/A 2000 LB. MAX

M-43

M-43

N/A

N/A

24.0 MATERIALS AND SPECIFICATIONS TABLE 27 GEOTEXTILE FABRICS

TABLE 28 STONE SIZE

3/8"-1 1/2"

2"-3"

4"-7"

N/A

SIZE RANGE | D 50 | D 100 | AASHTO

\* THIS CLASSIFICATION IS TO BE USED ON THE INSIDE FACE OF STONE OUTLETS

\*\* THIS CLASSIFICATION IS TO BE USED WHENEVER SMALL RIP-RAP IS REQUIRED THE STATE HIGHWAY ADMINISTRATION DESIGNATION FOR THIS STONE IS STONE FOR GABIONS ( 905.01.04).

APPARENT

OPENING SIZE

0.30\*\*

MM. MAX.

0.30

0.60

0.40 - 0.80 \*

THE PROPERTIES SHALL BE DETERMINED IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:

ASTM D 3786

-GRAB TENSILE STRENGTH ASTM D 1682 4"x8" SPECIMEN 1"x2" CLAMPS, 12"/ MIM. STRAIN RATE

IN BOTH PRINCIPAL DIRECTIONS OF GEOTEXTILEFABRIC.

THE FABRIC SHALL BE INERT TO COMMONLY ENCOUNTERED CHEMICALS AND HYDRCARBONS, AND WILL BE ROT AND MILDEW

IN ADDITION CLASSES A THROUGH E SHALL HAVE A 0.01 CM/SEC. MINIMUM PERMEABILITY WHEN TESTED IN ACCORDANCE

CLASS F GEATEXTILE FABRICS FOR ALL SILT FENCE SHALL HAVE A 50LB./IN. MINIMUM TENSILE STRENGTH AND A 20 LB/IN

GEOTEXTILE FABRICS USED IN THE CONSTRUCTION OF THE SILT FENCE SHALL RESIST DETERIORATION FROM ULTRAVIOLET EXPOSURE. THE FABRIC SHALL CONTAIN SUFFICIENT AMOUNTS OF ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A

MINIMUM OF 12 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 TO 120 DEGREES F.

MATERIALS SPECIFICATIONS

GAL./FT.SQUARED/MIN. FLOW RATE AND SEVENTY-FIVE PERCENT (75%) MINIMUM FILTERING EFFICIENCY WHEN TESTED IN ACCORDANCE

WITH MSMT 507, AND AN APPARENT MINIMUM ELONGATION OF 20 PERCENT (20%) WHEN TESTED IN ACCORDANCE WITH

MINIMUM TENSILE MODULES WHEN TESTED IN ACCORDANCE WITH MSMT 509. MATERIAL SHALL ALSO HAVE A 0.3

RESISTANT. IT SHALL BE MANUFACTURED FROM FIBERS CONSISTING OF LONG CHAIN SYNTHETIC POLYMERS, AND COMPOSED OF A MINIMUM OF 85% BY WEIGHT OF POLYOLEPHINS, POLYESTERS, OR POLYAMIDES. THE GEOTEXTILE FABRIC SHALL RESIST

15"

3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be \( \frac{1}{2}\)" X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with \( \frac{1}{2}\)" hardware cloth first, then wrapped again with Geotextile Class E.

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

U.S. DEPARTMENT OF AGRICULTURE MARYLAND DEPARTMENT OF ENVIRONMENT SOIL CONSERVATION SERVICE WATER MANAGEMENT ADMINISTRATION

ROAD 21152 16-7800 7818

MARYLAN NE: (410) (410) (410)

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LEPHONE: (410) FAX: (410) 310 www.kci.

SPARKS, Telepho

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

EROSION & SEDIMENT CONTROL NOTES & DETAILS

N/A SEPTEMBER 2010 01-081795.20 APITAL PROJECT NO.: S-6175

D1124 08-SAVAGE PARK STOPM DRAIN

SHEET NO.: 23 OF 32

PERMIT ISSUE:

CONSTRUCTION ISSUE:

TEMPORARY ACCESS BRIDGE

9. Bridge Anchors — Bridges shall be securely anchored at only one end using steel cable or chain. Anchoring at only one end will prevent channel obstruction in the event that floodwaters float the bridge. Acceptable anchors are large trees, large boulders, or driven steel anchors. Anchoring shall be sufficient to prevent the bridge from floating downstream and possibly causing an obstruction to the flow.

10. Stabilization – All areas disturbed during installation shall be stabilized within 14 calendar days of the disturbance in accordance with the Standard for "Critical Area

TEMPORARY ACCESS BRIDGE

#### Construction Specifications

1. Restriction - Construction, use, or removal of a temporary access bridge will not normally have any time of year restrictions since construction, use, or removal should not affect the stream or its banks, unless the bridge is built with a pier(s) in the water.

2. Bridge Placement - A temporary bridge structure shall be constructed at or above the bank elevation to prevent the entrapment of floating materials and debris.

3. Abutments — Abutments shall be placed parallel to, and on, stable banks.

4. Bridge Span - Bridges shall be constructed to span the entire channel. If the channel width exceeds 8', (as measured from top-of-bank to top-of-bank), then a footing, pier, or bridge support may be constructed within the waterway. One additional footing, pier, or bridge support will be permitted for each additional 8' width of the channel. However, no footing, pier, or bridge support will be permitted within the channel for waterways less than 8'

5. Stringers - Stringers shall either be logs, sawn timber, prestressed concrete beams, metal beams, or other approved

6. Deck Material — Decking materials shall be of sufficient strength to support the anticipated load. All decking members shall be placed perpendicular to the stringers, butted tightly, and securely fastened to the stringers. Decking materials must be butted tightly to prevent any soil material tracked onto the bridge from falling into the waterway below.

7. Run Planks (optional) — Run planking shall be securely fastened to the length of the span. One run plank shall be provided for each track of the equipment wheels. Although run planks are optional, they may be necessary to properly

8. Curbs or fenders – Curbs or fenders may be installed along the outer sides of the deck. Curbs or fenders are an option which will provide additional safety.

MARYLAND DEPARTMENT OF ENVIRONMENT SOIL CONSERVATION SERVICE WATER MANAGEMENT ADMINISTRATION

Apply to graded or cleared areas likely to be re-disturbed where a short-term vegetative cover is needed.

Seedbed preparation: -- Loosen upper three inches of soil by raking, disking or other acceptable means before seeding, if not previously

Soil Amendments: -- Apply 600 lbs/acre 10-10-10 fertilizer (14 lbs/1000 sq. ft.).

(3.2 lbs/1000 sq. ft.). For the period May 1 - August 14, seed with 3 lbs/acre of weeping lovegrass (.07 lbs/1000 ft.). For the period November 16 - February 28, protect site by applying 2 tons/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/acre (70 to 90 lbs/1000 sq. ft.) of unrotted weed-free, 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 backing material is allowed.

Refer to the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR not covered.

HOWARD SOIL CONSERVATION DISTRICT TEMPORARY SEEDING NOTES \*\*

Seeding: -- For periods March 1 - April 30 and from August 15 - October 15, seed with 2-1/2 bushelper acre of annual rye

SOIL EROSION AND SEDIMENT CONTROL for additional rates and methods

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

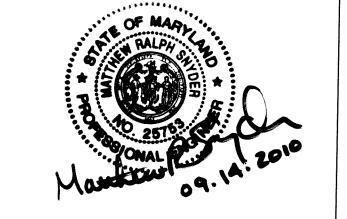
THIS DEVELOPMENT IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE

MARYLAND DEPARTMENT OF ENVIRONMENT

WATER MANAGEMENT ADMINISTRATION

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE



MARYLAND DEPARTMENT OF ENVIRONMENT

H - 29 - 9B WATER MANAGEMENT ADMINISTRATION

PROFESSIONAL CERTIFICATION. I HERERBY 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

#### 21.0 STANDARD AND SPECIFICATIONS

FOR

TOPSOIL Definition

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

#### urpose

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 materialis 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 mixutre 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 11/2" 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 disturbed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following proceures.
- 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:
  - On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
    - a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
  - b. Organic content of topsoil shall be not less than 1.5 percent by weight.
  - 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 phyto-toxic materials.
- Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
  - ii. Place topsoil(if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization Section \* 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 minmum 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 my otherwise be detrimental to proper grading and seedbed preparation.

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

\_\_\_\_\_\_9/10/1

### 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
- 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 aermination and establishment of arasses.

other disturbed or graded areas on the project site.

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

Area Disturbed

Area to be roofed or paved

Area to be vegetatively stabilized

Total Cut

Total Fill

Offsite waste/borrow area location and permit

67.30 Acres
2.08 Acres
1.96 Acres
2,325 Cu. Yds.
235 Cu. Yds.
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 PERMANANT 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.

<u>Soil Amendments:</u> 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.

<u>Maintenance</u> - 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-ML, 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. Fill being 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.

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.

• 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.

## DURATION

3 DAYS

1 DAY

1 DAY

1 DAY

3 DAYS

3 DAYS

3 DAYS

1 DAY

1 DAY

2 DAYS

5 DAYS

2 DAYS

2 DAYS

1 DAY

1 DAY

5 DAYS

2 DAYS

1 DAY

1 DAY

2 DAYS

1 DAY

2 DAYS

# SEQUENCE OF CONSTRUCTION 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 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.

3. WITH APPROVAL OF INSPECTOR COMMENCE IN STREAM WORK.

4. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON MAIN CHANNEL, WORKING

3. DAYS

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.

5. 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)

6. INSTALL PUMP-AROUND PRACTICES AS SHOWN ON THE PLANS FROM STA. 0+00 TO STA. 4+50.

7. WITH APPROVAL OF INSPECTOR COMMENCE IN STREAM WORK.

8. 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.

9. 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. 10. 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

INSPECTUR.

11. 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.

12. 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.

13. 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.

14. 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.

15. INSTALL SCE, SILT FENCE, SUPER SILT FENCE, AND CLEARWATER DIVERSION FENCE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.

16. CONSTRUCT DRAINAGE SYSTEM FROM E-17 TO I-18, INCLUDING RIPRAP AT OUTFALL, AS

SHOWN ON THE PLANS.

17. 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.

18. DURING A DRY WEATHER FORECAST, REMOVE CLEARWATER DIVERSION FENCE AND PERFORM FINAL GRADING OF FACILITY. INSTALL RIPRAP DOWNSTREAM OF CURB OPENING.

19. 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

HAVE BEEN COMPLETED.

20. INSTALL SCE AND SILT FENCE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR.

21. RELOCATE EXISTING TREE AS SPECIFIED ON THE PLANS TO THE LOCATION DETERMINED BY HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.

22. CONSTRUCT BIORETENTION FACILITY, INCLUDING EMBANKMENT, AS SHOWN ON THE PLAN. ALL SEDIMENT LADEN WATER WITHIN THE LOD SHALL BE PUMPED THROUGH A REMOVABLE

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

PUMPING STATION.

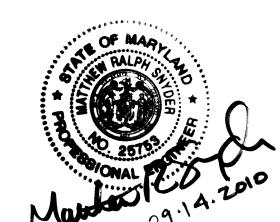
23. AFTER BIORETENTION AREA HAS BEEN STABILIZED, DURING A DRY WEATHER FORECAST, REMOVE EXISTING CONCRETE CHANNEL AT CURB OPENING AND STABILIZE AREA TO EXISTING GRADE AND CONSTRUCT DRAINAGE SYSTEM FROM E-12 TO I-20 AS SHOWN ON THE PLANS.

24. REMOVE CONCRETE CURB AND GUTTER AS SHOWN ON THE PLANS.

25. 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

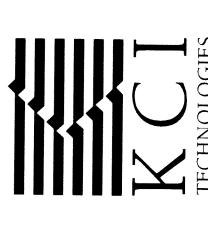
27. WITH PERMISSION FROM THE INSPECTOR, REMOVE ALL SEDIMENT CONTROL DEVICES AND PERMANENTLY STABILIZE THE REMAINING DISTURBED AREA.
28. REMOVE ALL STOCKPILE AREAS AND STABILIZE THE AREA TO ITS EXISTING CONDITION.



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KOAD 21152 16-7800 7818

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

N/A

PATE: SEPTEMBER 2010

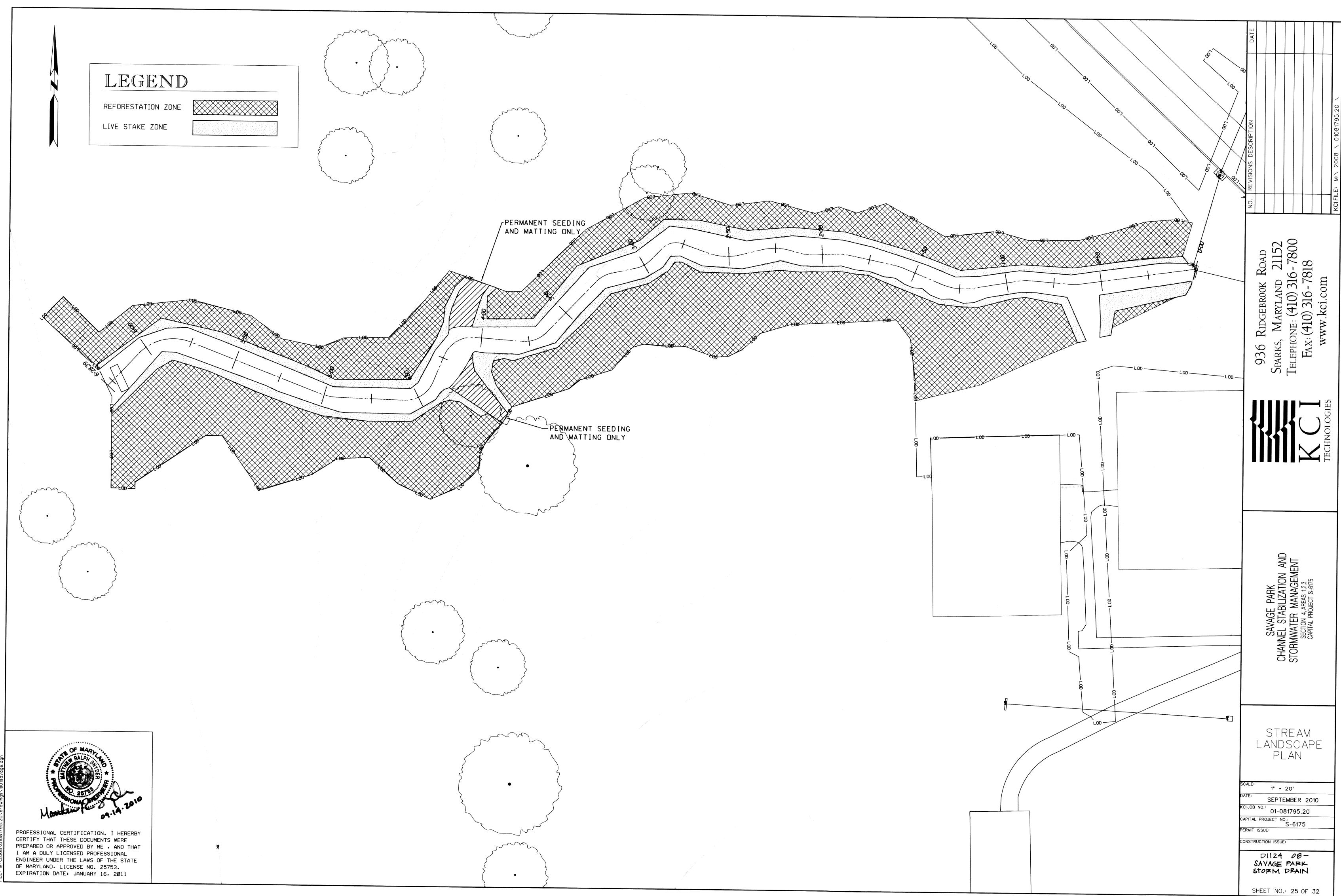
CI JOB NO.: 01-081795.20

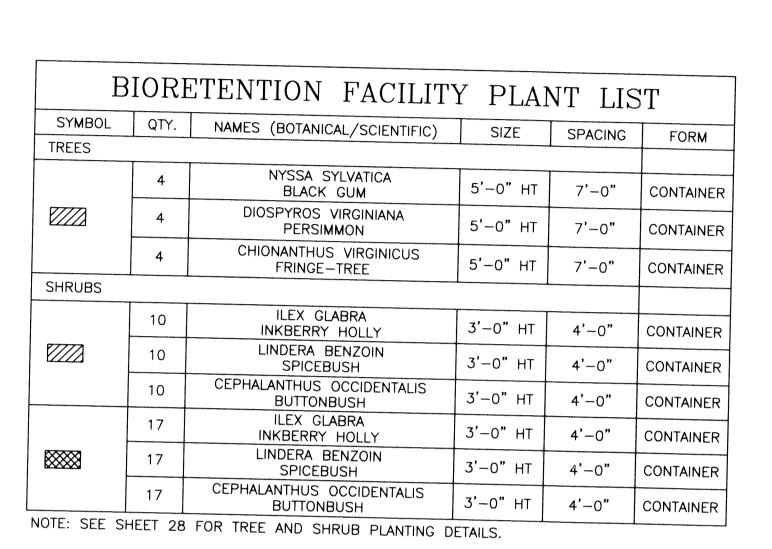
PAPITAL PROJECT NO.: S-6175

ERMIT ISSUE: ONSTRUCTION ISSUE:

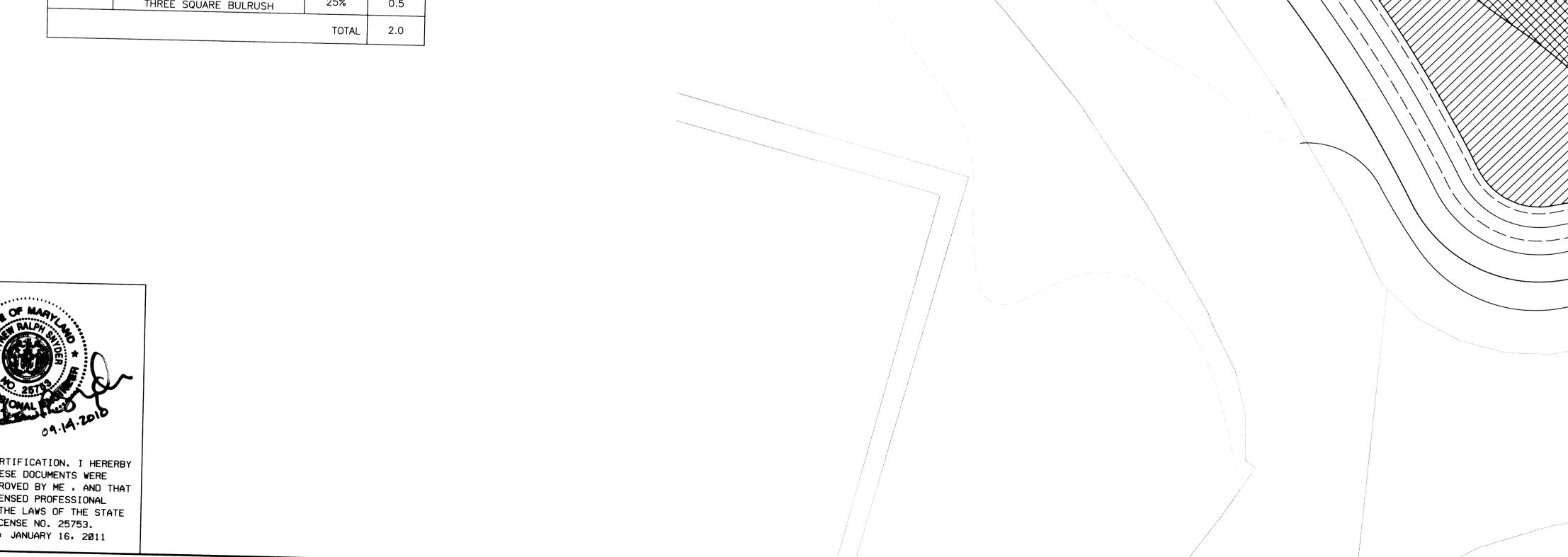
D1124 08-SAVAGE PARK STORM DRAIN

SHEET NO.: 24 OF 32





SYMBOL	NAMES (BOTANICAL/SCIENTIFIC)	PERCENT OF MIX	QUANTITY (LBS.)
HERBACEOU	JS SEED MIX		(
2021 SF /	0.05 AC		
<b>∞</b> ∞∞	ELMYUS VIRGINICUS VIRGINIA WILDRYE	25%	0.5
	CAREX VULPINOIDEA FOX SEDGE	25%	0.5
	AGROSTIS ALBA REDTOP	25%	0.5
	SCIRPUS PUNGENS THREE SQUARE BULRUSH	25%	0.5
		TOTAL	2.0



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-15'NO WOODY VEGETATION ZONE

BIORETENTION SITE 1 LANDSCAPE PLAN

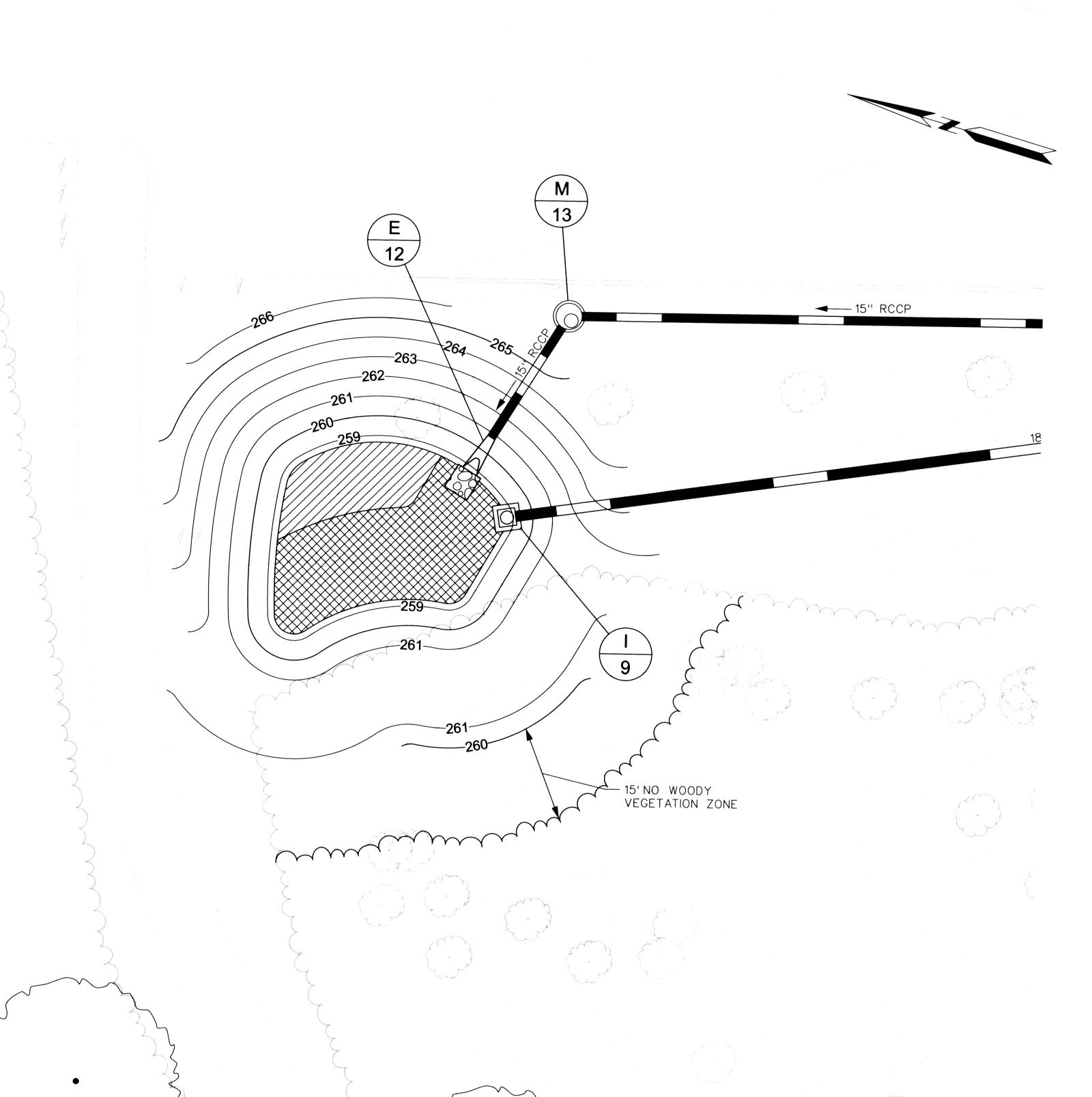
1''= 10' SEPTEMBER 2010 .CI JOB NO.: 01-081795.20

CONSTRUCTION ISSUE:

DII24 08-SAVAGE PARK STORM DRAIN

SHEET NO .: 26 OF 32

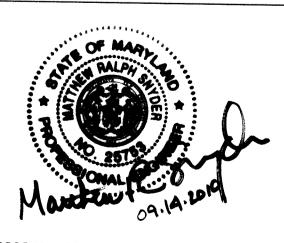
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В	IORE	ETENTION FACILITY	Y PLAI	NT LIS	ST
SYMBOL	QTY.	NAMES (BOTANICAL/SCIENTIFIC)	SIZE	SPACING	FORM
TREES					
	2	NYSSA SYLVATICA BLACK GUM	5'-0" HT	7'-0"	CONTAINE
	2	DIOSPYROS VIRGINIANA PERSIMMON	5'-0" HT	7'-0"	CONTAINE
	2	CHIONANTHUS VIRGINICUS FRINGE—TREE	5'-0" HT	7'-0"	CONTAINE
SHRUBS					
	1	ILEX GLABRA INKBERRY HOLLY	3'-0" HT	4'-0"	CONTAINE
	1	LINDERA BENZOIN SPICEBUSH	3'-0" HT	4'-0"	CONTAINE
anni anni	1	CEPHALANTHUS OCCIDENTALIS BUTTONBUSH	3'-0" HT	4'-0"	CONTAINE
	9	ILEX GLABRA INKBERRY HOLLY	3'-0" HT	4'-0"	CONTAINE
$\bowtie$	9	LINDERA BENZOIN SPICEBUSH	3'-0" HT	4'-0"	CONTAINE
	9	CEPHALANTHUS OCCIDENTALIS BUTTONBUSH	3'-0" HT	4'-0"	CONTAINE

NOTE: SEE SHEET 28 FOR TREE AND SHRUB PLANTING DETAILS.

SYMBOL	NAMES (BOTANICAL/SCIENTIFIC)	PERCENT OF MIX	QUANTITY (LBS.)
HERBACEO	JS SEED MIX	<u></u>	
731 SF /	0.02 AC		
	ELMYUS VIRGINICUS VIRGINIA WILDRYE	25%	0.25
	CAREX VULPINOIDEA FOX SEDGE	25%	0.25
	AGROSTIS ALBA REDTOP	25%	0.25
	SCIRPUS PUNGENS THREE SQUARE BULRUSH	25%	0.25
		TOTAL	1.0



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BIORETENTION SITE 2 LANDSCAPE

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1''= 10' SEPTEMBER 2010

KCI JOB NO.: 01-081795.20 CAPITAL PROJECT NO.:
S-6175

PERMIT ISSUE: CONSTRUCTION ISSUE:

DII24 08-SAVAGE PARK STORM DRAIN

SHEET NO .: 27 OF 32

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15' NO WOODY VEGETATION ZONE		
2011		
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	general de la constitución de la c	

## STREAM PLANT SCHEDULE

### LIVE STAKES (SHEET 25 OF 28)

(5284 SQ FT /0.12 AC)

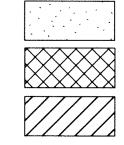
Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
330	Cornus racemosa	Gray dogwood	3' Length 1''-1.5" dia.	Dormant stems	2' O.C.
330	Cornus amomum	Silky dogwood	3' Length 1''-1.5'' dia.	Dormant stems	2' O.C.
330	Salix sericea	Silky willow	3' Length 1''-1.5'' dia.	Dormant stems	2' O.C.
330	Salix nigra	Black willow	3' Length 1''-1.5'' dia.	Dormant stems	2' O.C.

#### REFORESTATION ZONE (SHEET 25 OF 28) (27,003 SQ FT /0.62 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
SHRUBS					
56	Amelanchier canadensis	Canadian serviceberry	3' Height	Container	6'-8' O.C.
56	Lindera benzoin	Northern spicebush	3' Height	Container	6'-8' O.C.
56	Viburnum dentatum	Southern arrowwood	3' Height	Container	6'-8' O.C.
TDEEC					
TREES 27	Acer rubrum	Red maple	5' Height	Container	11' O.C.
	Acer rubrum Liquidambar styraciflua	Red maple Sweet gum	5' Height 5' Height	Container Container	11' O.C. 11' O.C.
27					11' O.C. 11' O.C. 11' O.C.
27 27	Liquidambar styraciflua	Sweet gum	5' Height	Container	11' O.C.

# PERMANENT SEEDING FOR LIVE STAKES AND REFORESTATION ZONES AND AS CALLED OUT ON THE LANDSCAPE PLAN (SHEET 25 OF 28)

(32,974 SQ FT /0.76 AC)



Botanical Name	Common Name	Application Rate (lbs/ac)	% of Mix	Quantity (lbs)	Remarks
Panicum virgatum	Switchgrass	18.0	25%	14.3	_
Poa palustris	Fowl bluegrass	30.0	40%	22.8	
Panicum clandestinum	Deertongue grass	18.0	25%	14.3	
Bromus ciliatus	Fringed brome	9.0	10%	5.7	_
	TOTALS	75.0	100%	57.1	-

Application Rate of 75 lbs / ac

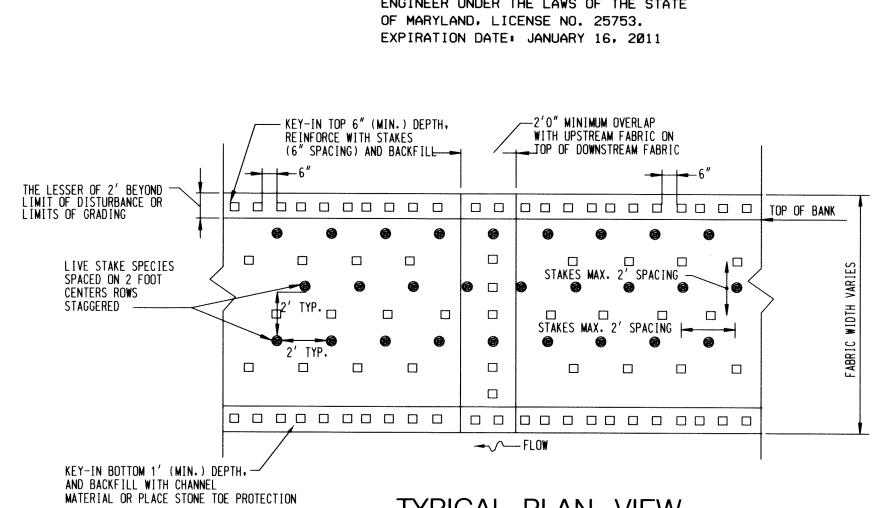
### TURF GRASS ZONE

(72,803 SQ FT /1.67 AC)

Qty(lbs)	Botanical Name
334	SHA Special Purpose Seed Mix 920.06.07 (b)

Application Rate of 200 lbs / ac

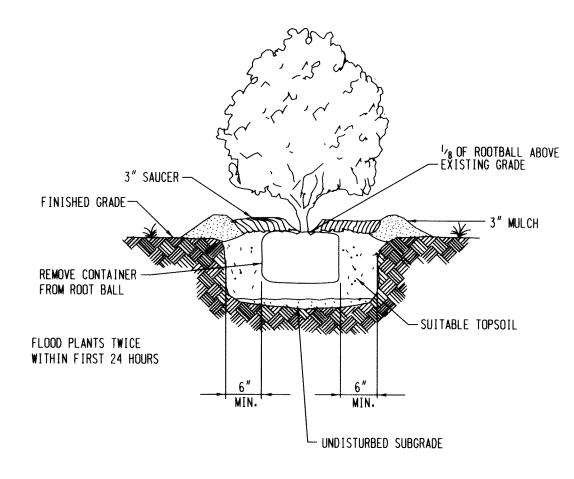
NOTE: TURF GRASS SEED IS TO BE PLACED IN ALL DISTURBED AREAS NOT SEEDED WITH PERMANANT SEEDING SHOWN ABOVE OR AREAS OF IMPERVIOUS SURFACES



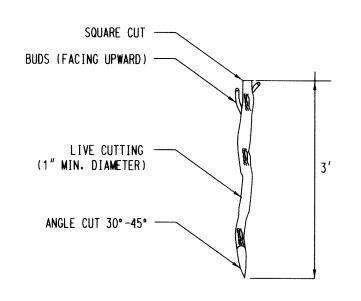
TYPICAL PLAN VIEW NATURAL FIBER MATTING WITH LIVE STAKES

NOT TO SCALE

NATURAL FIBER MATTING TO BE ROLLED LENGTHWISE ALONG STREAMBANK EXTENDING TO THE BOTTOM OF TOE PROTECTION AND A MINIMUM OF ONE FOOT PAST TOP OF BANK. IF MORE THAN ONE ROLL IS REQUIRED, MID-BANK OVERLAP SHOULD BE A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAKES. (SEE SPECIFICATIONS FOR MATERIALS)

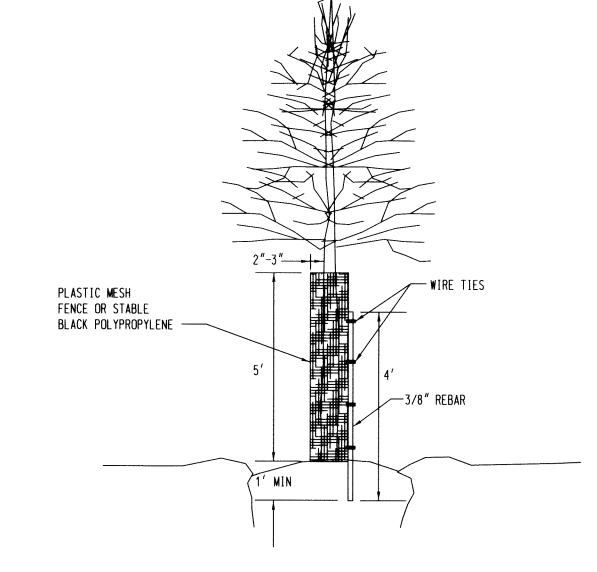


SHRUB PLANTING DETAIL NOT TO SCALE



LIVE STAKE DETAIL NOT TO SCALE

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TREE PLANTING DETAIL

NOT TO SCALE

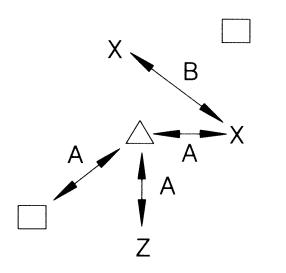
NOTE: TREE SHELTERS TO BE ADDED TO ALL TREES PLANTED

SUITABLE TOPSOIL

- REMOVE CONTAINER

FLOOD PLANTS TWICE WITHIN FIRST 24 HOURS

TREE SHELTER DETAIL NOT TO SCALE



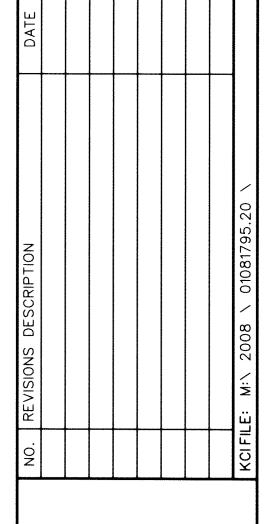
X , Z SHRUB SPECIES

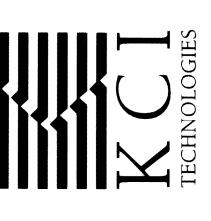
A: MINIMUM SPACING PER SCHEDULE

B: DUPLICATE SPECIES SPACING MINIMUM 2 TIMES MINIMUM SPACING

TREE AND SHRUB RANDOM SPACING

NOT TO SCALE





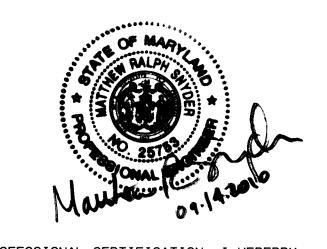
LANDSCAPE NOTES AND DETAILS

SEPTEMBER 2010 KCIJOB NO.: 01-081795.20 CAPITAL PROJECT NO.: S-6175

PERMIT ISSUE: CONSTRUCTION ISSUE:

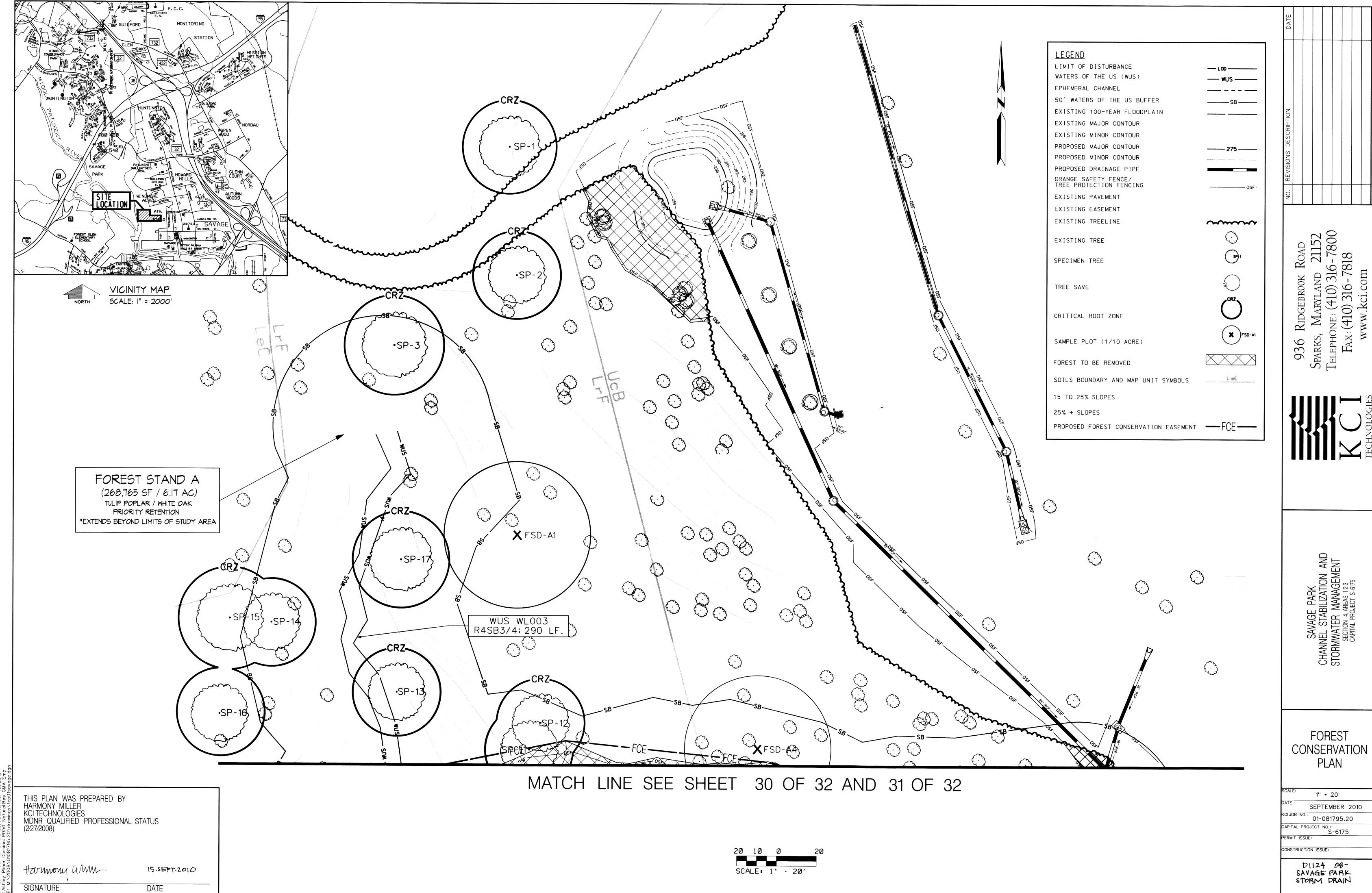
> D1124 08-SAVAGE PARK STORM DRAIN

SHEET NO.: 28 OF 32

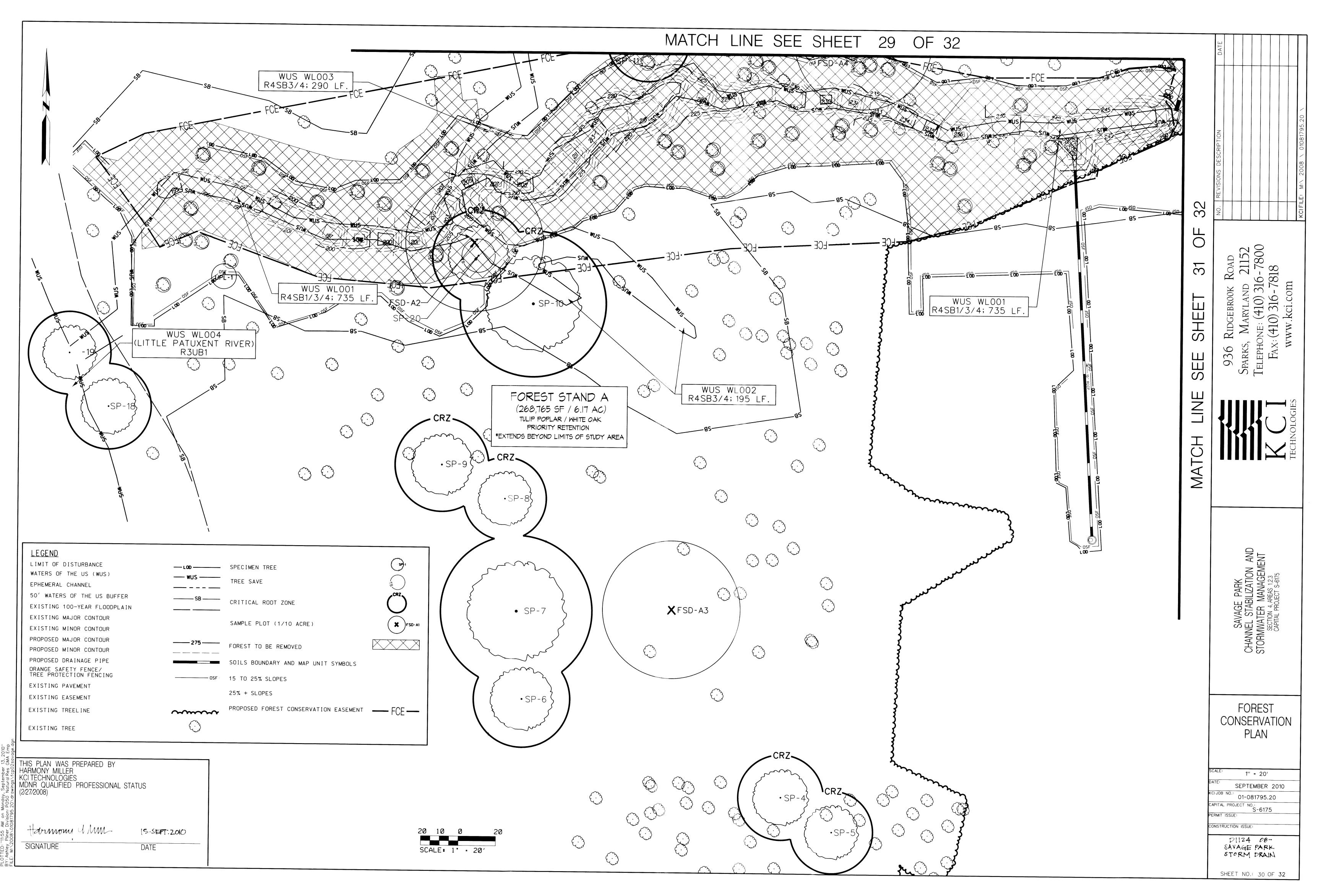


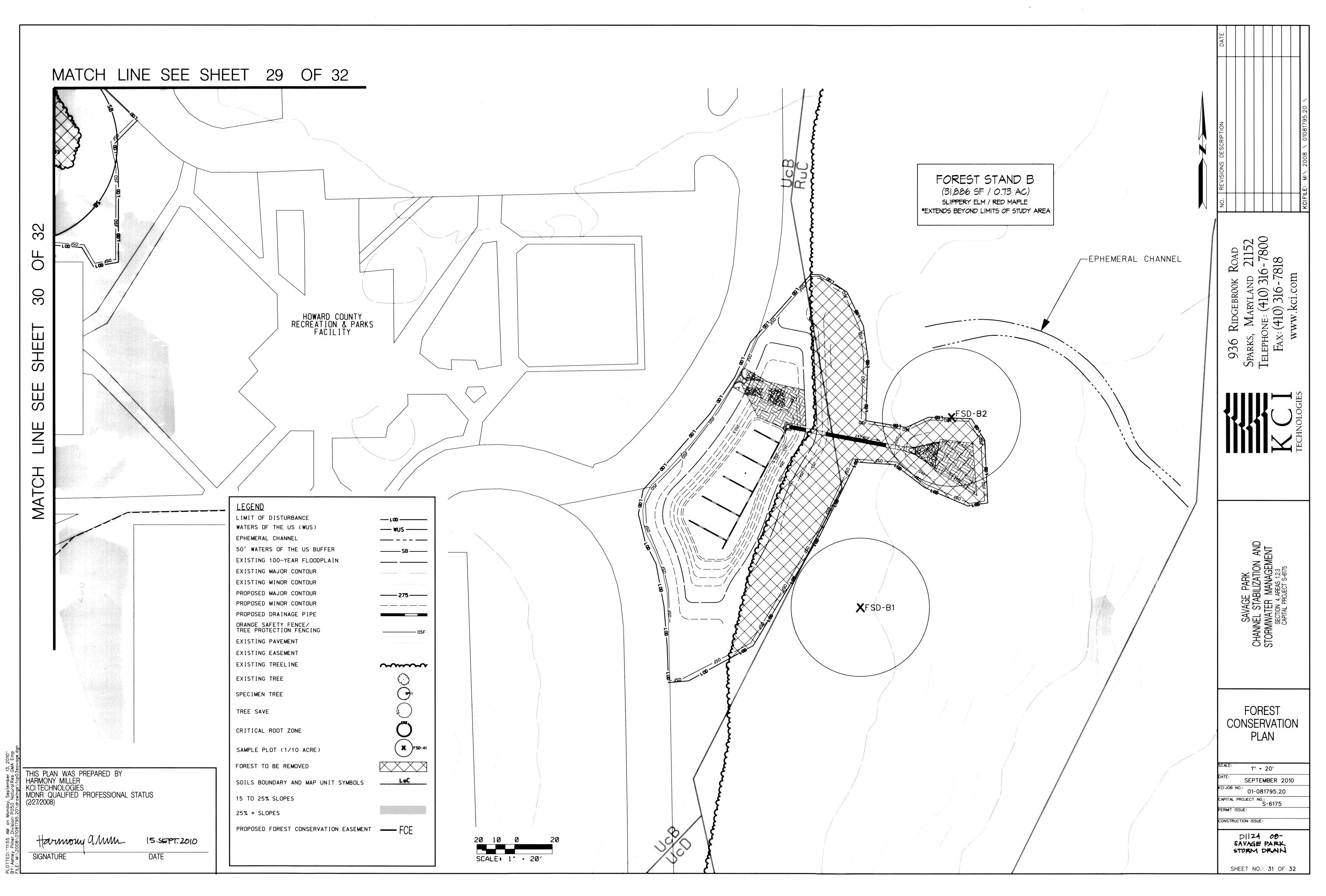
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AM on Monday, September 13, 2010" Division: P050 Natural Res GMA Emp 1081795.20\drawings\ld01savage.dgn



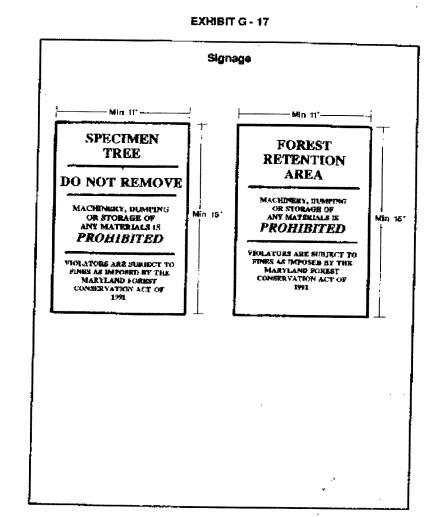
SHEET NO.: 29 OF **32** 



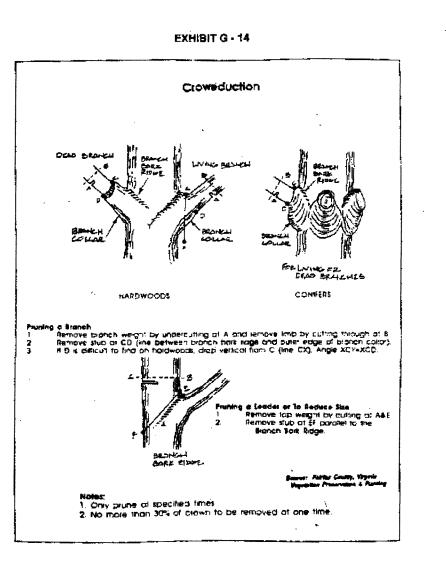


Specimen Trees					
ID	Size (inches DBH)	Condition	Species		
SP-1	32	Excellent	Black oak (Quercus velutina)		
SP-2	30	Good	American beech (Fagus grandifolia)		
SP-3	34	Good	White oak (Quercus alba)		
SP-4	31	Excellent	Tulip poplar (Liriodendron tulipifera)		
SP-5	30	Excellent	Tulip poplar (L. tulipifera)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

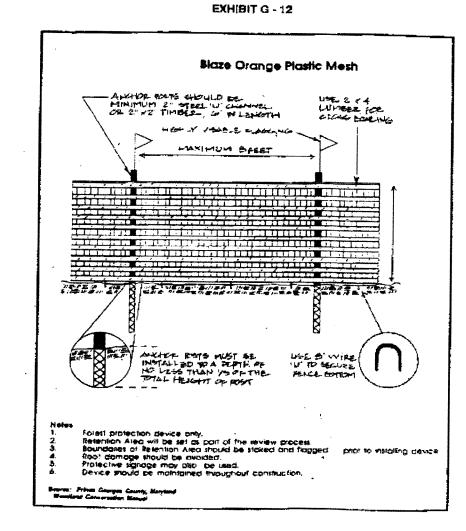
Soils				
Soil series	Hydric (Y/N)	K value		
Codorus and Hatboro silt loam, 0-3% slopes (Co)	Υ	0.28-0.43		
Legore silt loam, 8-15% slopes, stony (LeC)	N	0.02-0.43		
Legore-Relay gravelly loam, 25-65% slopes, very stony (LrF)	N	0.02-0.49		
Urban land-Chillum-Beltsville complex, 0-5% slopes (UcB)	N	0.10-0.49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



FOREST CONSERVATION SIGNAGE NOT TO SCALE

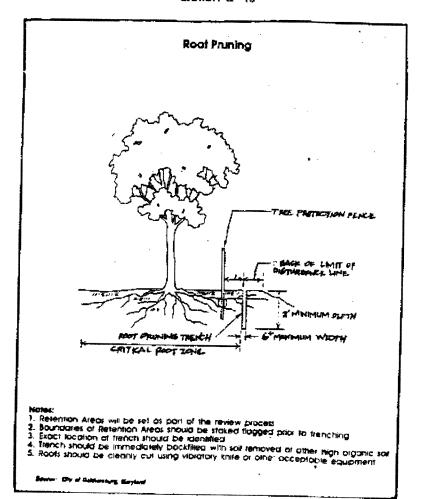


CROWN REDUCTION NOT TO SCALE



TREE PROTECTION FENCING/ ORANGE SAFETY FENCE NOT TO SCALE

#### EXHIBIT G - 15



ROOT PRUNING NOT TO SCALE

#### **Forest Conservation Worksheet** SAVAGE PARK WATER QUALITY IMPROVEMENT PROJECT **Net Tract Area**

Α.	Total Tract Area		A= 1.99
B.	Area within 100-year Floodpla	ain	B= 0.00
B1.	Area within existing Forest Co	onservation Easement *	B1= 0.00
C.	Area to Remain In Agricultural Production		$C = \frac{0.00}{0.00}$
D.	Net Tract Area (D=(A-B-B1-C		D= 1.99
Land	Use Category : Institut	tional Development Areas	
E.	Afforestation Threshold	(D x 15%)	E= 0.30
F.	Conservation Threshold	(D x 20%)	$F = \frac{0.40}{0.40}$
Exist	ing Forest Cover		
G.	Existing Forest Cover (exclud	ing floodplain)	G= <u>1.16</u> a
H.	Area of Forest Above Afforest		H= 0.86 a
1.	Area of Forest Above Conservation Threshold		I= 0.76 a
Breal	k Even Point		
J.	Forest Retention Above Thres	shold with no Mitigation	J= 0.55 a
	(1) If I>0 then J=(		
	(2) If I=0, J=0, go		
K.	Clearing Permitted Without M	itigation (K=G-J)	K= <u>0.61</u>
Prop	osed Forest Clearing		
L.	Total Area of Forest to be Cle	ared	L=1.16 a
M.	Total Area of Forest to be Retained (M=G-L)		$M = \frac{0.00 \text{ s}}{0.00 \text{ s}}$
Plant	ing Requirements		
N.	-	ove the Conservation Threshold	N= 0.19 a
P.	Reforestation for Clearing Bel	ow the Conservation Threshold	P= 0.80 a
Q.	Credit for Retention Above the	Conservation Threshold	Q = 0.00 a
R	Credit for Retention Above the Conservation Threshold		0.00 8

#### FOREST CONSERVATION NOTES

Total Reforestation Required Total Afforestation Required

1. 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.

2. See sheet 25 of 32 for landscape plans and sheet 28 of 32 for landscape notes and details.

Total Reforestation and Afforestation Requirement T=(R+S)

#### NOTES:

1. Project area is on one property owned by Howard County.

2. Existing Zoning: Institutional

3. Existing land use: Forest land deeded to Howard County. 4. The area within the limits of disturbance was used as the total tract area.

5. 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. 6. There are no wetlands within the project area.

7. Total surface area of perennial and intermittent streams: 6,338 sf.

8. Total linear feet of perennial and intermittent streams: 698 lf.

9. Total forested area within limits of disturbance:

1.16 acres. 10. 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.

11. 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.

12. 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.

13. Base data provided by KCI Technologies Inc. Ridgebrook Road, Sparks, Maryland 21152.

MARYLAND 21152

NE: (410) 316-7818

WW.kri SPARKS, MARYLAINL
TELEPHONE: (410) 316
FAX: (410) 316-78
www.kci.com RIDGEBROOK 936

R= 0.99 ac.

S= 0.00 ac.

T= 0.99 ac.



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

**FOREST** CONSERVATION NOTES AND DETAILS

NTS SEPTEMBER 2010 KCIJOB NO.: 01-081795.20 CAPITAL PROJECT NO.: S-6175 PERMIT ISSUE:

CONSTRUCTION ISSUE:

D1124 08-SAVAGE PARK STORM DRAIN

SHEET NO .: 32 OF 32

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Harmony a MML

SIGNATURE

5.SEPT. 2010 DATE