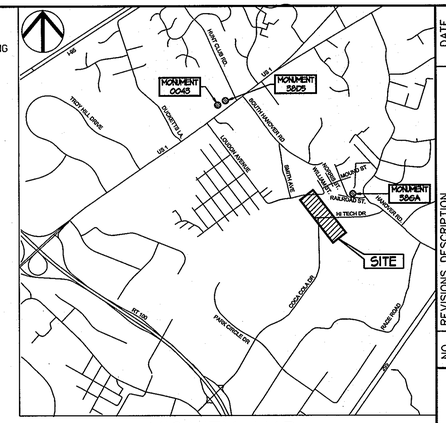
SITE DEVELOPMENT PLAN
HI TECH DRIVE
STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3 AREA 3
HOWARD COUNTY, MARYLAND
DEPARTMENT OF PUBLIC WORKS
CAPITAL PROJECT D - 1122

THE HORIZONTAL AND VERTICAL DATUM SHOWN HEREON ARE BASED ON GPS OBSERVATIONS FROM THE FOLLOWING N.G.S. TRAVERSE POINTS:
HORIZONTAL NAD 1983/91
VERTICAL NAVD 1988

HOWARD COUNTY CONTROL POINTS

	NORTH	EAST	ELEV
0043	558479.008	1386642.056	189.496
38D5	558378.539	1386524.284	193.024
38GA	555897.325	1390132.118	80.840



VICINITY MAP
Scale : 1" = 2000'
ADC MAP COORD. 4937 AND D10

INDEX OF SHEETS

LEGEND

- LIMIT OF DISTURBANCE ——— LOD ———
- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- PROPOSED CONTOURS ——— 360 ———
- EXISTING TREE
- EXISTING TREE TO BE SAVED
- EXISTING TREE TO BE REMOVED
- EDGE OF TREELINE
- EDGE OF WETLAND
- WETLAND BUFFER (25')
- WATERS OF THE UNITED STATES ——— WUS ———
- PROPERTY LINE
- EXISTING ROAD EDGE
- EXISTING SEWER LINE ——— S ——— S ———
- IMBRICATED WALL
- STONE TOE PROTECTION
- RIFFLE GRADE CONTROL
- BOULDER CLUSTER
- J VANE
- STABILIZED CONSTRUCTION ENTRANCE
- SANDBAG DAM
- SILT FENCE ——— SF ———
- PUMP (P)
- INTAKE HOSE AND DISCHARGE PIPE
- ORANGE SAFETY FENCE ——— OSF ———
- FILTER BAG
- EXISTING/PROPOSED 100-YR WSE*

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

SPECIAL CONTRACTOR NOTES

1. 100-YEAR FLOODPLAIN ELEVATION WILL BE SHOWN ON THE PLANS.
2. STOCKPILE OF MATERIAL IS ALLOWED IN 100-YEAR FLOODPLAIN IN DESIGNATED AREAS AS SHOWN ON PLANS NOT TO EXCEED A HEIGHT OF 3 FEET (COMAR 26.17.04.08).
3. IN-STREAM WORK IS PROHIBITED FROM MARCH 1ST TO JUNE 15TH, INCLUSIVE. STREAM CLASSIFICATION: USE I-P.
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.
6. CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
7. 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.
8. 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. ALL STUMPS TO REMAIN SHALL BE LEFT IN A SAFE CONDITION WITH NO PROTRUDING WOOD SPLINTERS OR SPIKES.

SITE ANALYSIS DATA CHART

1. TOTAL PROJECT AREA: 2.46 ACRES (107,076 SF).
2. DISTURBED AREA: 2.46 ACRES (107,076 SF).
3. PRESENT ZONING DESIGNATION: M-2
4. PROPOSED USE FOR THE SITE: STABILIZE EXISTING BANK/CHANNEL EROSION
5. OPEN SPACE ON SITE: 2.46 AC, 100% OF GROSS AREA
6. APPLICABLE DPZ FILE REFERENCES: F-07-144, F-06-230, F-08-138, F-08-186, F-09-080, SDP-05-153, WP-11-003

ADDRESS CHART

PARCEL/LOT #	STREET ADDRESS	PLAT #
PAR C-1/285	7050 HI TECH DRIVE	20001
PAR C-2/285	7030 HI TECH DRIVE	20001
PAR C-3/285	7010 HI TECH DRIVE	20001
PAR G-1/285	7450 COCA COLA DRIVE	20546
PAR G-2/285	7031 HI TECH DRIVE	20546
PAR G-3/285	7011 HI TECH DRIVE	20546
PAR I-1/285	7461 COCA COLA DRIVE	20446
PAR I-2/285	7481 COCA COLA DRIVE	20446
PAR I-3/285	7451 COCA COLA DRIVE	19985

ENGINEER'S CERTIFICATE

"I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) — DATE 1/7/11
Kathy L. Hoverman

DEVELOPER'S CERTIFICATE

"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE THE BEGINNING OF THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT"

SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) — DATE 1/13/11
Howard E. Saltzman

GENERAL NOTES

1. THE SUBJECT PROPERTIES ARE ZONED M-2.
2. THE DEPARTMENT OF PLANNING AND ZONING AND THE HOWARD SOIL CONSERVATION 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. NO PAVING OR NEW STRUCTURES SHALL BE PERMITTED WITHIN THE WETLANDS, STREAMS OR THEIR ASSOCIATED BUFFERS, FOREST CONSERVATION EASEMENTS, OR 100-YEAR FLOODPLAIN DEPICTED ON THESE PLANS.
4. THE DEPARTMENT OF PLANNING AND ZONING HAS DETERMINED THIS PLAN MEETS OR EXCEEDS STANDARD LANDSCAPING REQUIREMENTS AND THEREFORE SATISFIES LANDSCAPING OBLIGATIONS BY ALTERNATIVE COMPLIANCE IN ACCORDANCE WITH SUBSECTION 16.124(C) OF THE HOWARD COUNTY CODE.
5. THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE.
6. THIS PLAN MEETS THE REQUIREMENTS OF THE FOREST CONSERVATION ACT, WHICH INCLUDES 0 ACRES OF RETENTION AND 0.27 ACRES OF REFORESTATION. THESE REQUIREMENTS SHALL BE MET THROUGH FEE-IN-LIEU AT THE RATE OF $0.75/SF FOR A TOTAL OF $8820.40 PAID TO THE FOREST CONSERVATION FUND.
7. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
8. 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.
9. THE CONTRACTOR SHALL NOTIFY 'MISS UTILITY' AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
10. THE COORDINATES SHOWN HEREON ARE BASED ON HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NUMBER 0043, 38D5 AND 38GA WERE USED FOR THIS SITE.
11. WATER IS PUBLIC.
12. SEWER IS PUBLIC.
13. STORMWATER MANAGEMENT IS NOT REQUIRED FOR THIS PROJECT SINCE THE PROJECT WILL NOT ADD IMPERVIOUS AREA NOR WILL IT CHANGE THE EXISTING HYDROLOGY OF THE SITE.
14. EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
15. THE HYDROLOGIC AND HYDRAULIC FLOOD ANALYSES AND FLOOD DELINEATION SHOWN HERE ON WAS BASED ON A 100-YEAR, 24-HOUR RAINFALL AMOUNT OF 8.51 INCHES BASED ON NOAA ATLAS 14 RAINFALL DATA. SUCH A RAINFALL AMOUNT EXCEEDS THE HOWARD COUNTY REQUIREMENT OF 7.2-INCHES. DUE TO THIS, THE FLOODPLAIN ELEVATIONS AND LIMITS EXCEEDED THE HOWARD COUNTY REQUIREMENTS.
16. THE WETLANDS DELINEATION FOR THIS PROJECT WAS PERFORMED BY CHESAPEAKE ENVIRONMENTAL MANAGEMENT, INC. IN NOVEMBER 2007.
17. TOPOGRAPHIC SURVEY OF THE SITE WAS PERFORMED BY AB CONSULTANTS, INC. IN AUGUST 2007.
18. ALL WORK SHALL BE CONSTRUCTED ACCORDING TO THE REQUIREMENTS OF THE NONTIDAL WETLANDS AND WATERWAYS PERMIT DATED JULY 14, 2010. (TRACKING NO. 10-NT-0074 / 201060235).
19. NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
20. 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. THE CONTRACTOR MUST VERIFY SUCH INFORMATION TO HIS OWN SATISFACTION.
21. SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE PLANS AND THE FIELD CONDITIONS, 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.
22. 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.
23. A WAIVER PETITION (WP-11-003) FROM SECTION 16.1201 WAS APPROVED ON AUGUST 8, 2010 THAT ALLOWS THE USE OF THE AREA INSIDE THE LIMIT OF DISTURBANCE AS THE NET TRACT AREA IN THE FOREST CONSERVATION CALCULATIONS. THE FOREST CONSERVATION REQUIREMENTS SHALL BE MET THROUGH FEE-IN-LIEU WITH HOWARD COUNTY.
24. THIS PROJECT IS TO BE USED FOR WETLAND MITIGATION FOR CAPITAL PROJECT J-4148-B. REFER TO THE MARYLAND STATE PROGRAMMATIC GENERAL PERMIT-3 (MDSPGP-3) [CORPS PERMIT NUMBER 2003-61775] FOR MAINTENANCE CONDITIONS.
25. THIS PROJECT WAS APPROVED BY MARYLAND AVIATION ADMINISTRATION ON OCTOBER 14, 2010 BASED UPON PERMIT NUMBER 10-156.

THIS PROJECT PROVIDES 725 LINEAR FEET OF THE TOTAL 960 LINEAR FEET IN STREAM RESTORATION TO SATISFY THE REQUIREMENTS OF MDE PERMIT/ CERTIFICATION NUMBER: 200361775 / 03-NT-0017 AND CONDITION NO. 3 NOTED IN THE USACE APPLICATION: CENAB-OP-RMN (HO DPW / DORSEY RUN RD EXT / RD XING, CULVERT & BRIDGE) 52003 - 61775 FOR CAPITAL PROJECT J-4148-B.

STATE OF MARYLAND — KATHY LYNN HOVERMAN — No. 38311 — PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11
DIRECTOR — DATE 3/10/11

OWNER:
HOWARD COUNTY
DEPARTMENT OF PUBLIC WORKS
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MD 21046
410-313-3440

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 1/24/11
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES — DATE 1/20/11
CHIEF, STORMWATER MANAGEMENT DIVISION — DATE 1/18/11

PERMIT INFORMATION CHART

SUBDIVISION NAME		SECTION/AREA		LOT/PARCEL#	
PATAPSCO VALLEY BUSINESS CENTER		3/3		SEE ADDRESS CHART	
PLAT# or L/F SEE ADDRESS CHART	GRID #	ZONING	TAX MAP NO.	ELECT. DISTR.	CENSUS TRACT
	20	M-2	38	FIRST	6012.02
WATER CODE		SEWER CODE			
-		-			

AS-BUILT CERTIFICATION

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

Signature — P.E. No. — Date

Reviewed for HOWARD SCD and meets Technical Requirements.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — Date 2/24/11

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

NO.	REVISIONS	DESCRIPTION	DATE

KCIFILE: M:\ 2004 \ 01043223.26 \

HI TECH DRIVE
STREAM RESTORATION
PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
1ST ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

TITLE

SCALE: NOT TO SCALE
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SHEET NO.: 1 OF 25

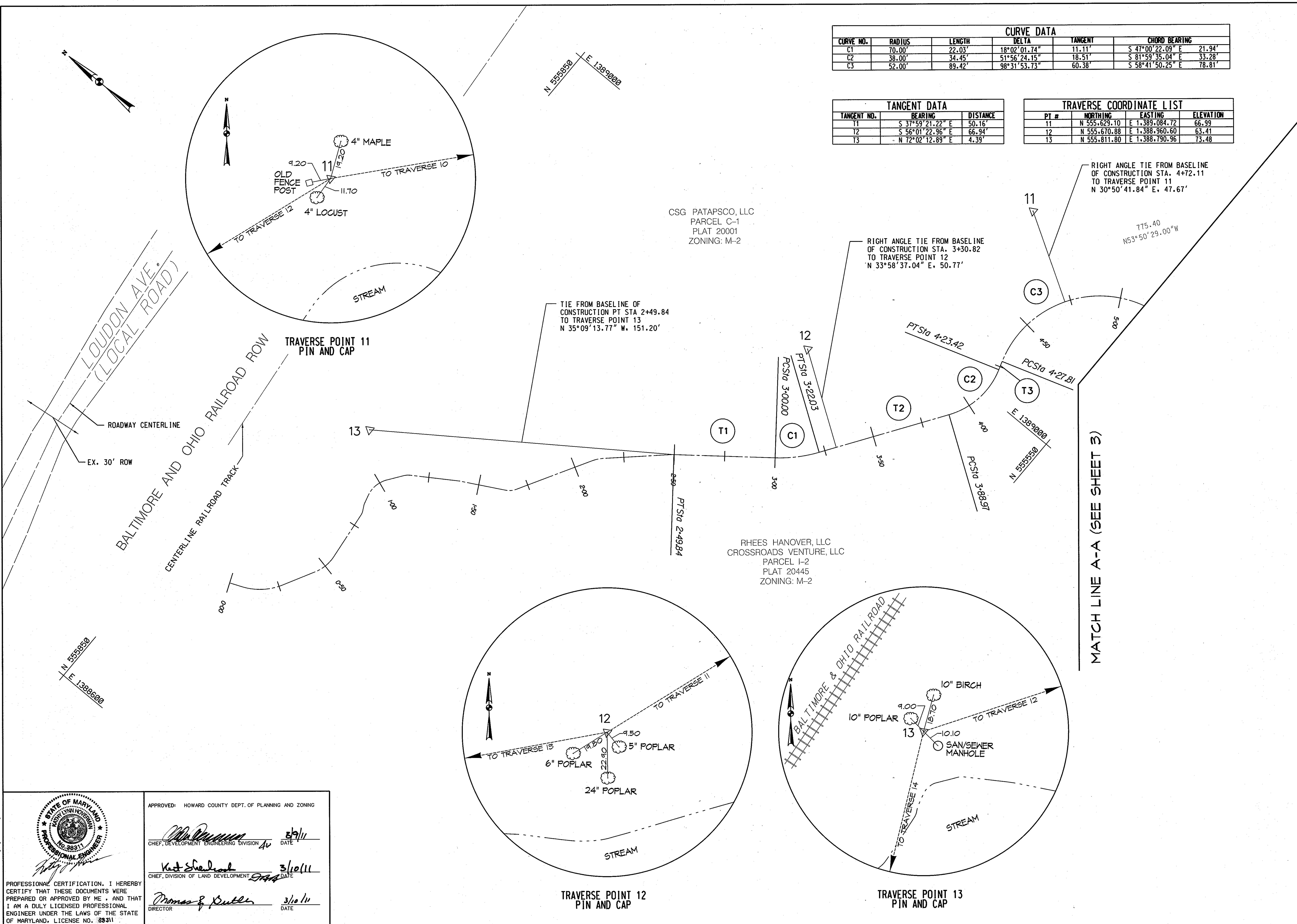
SDP-10-095

PLOTTED: "1102 AM on Monday, January 03, 2011"
BY: Harrow, Mark Division: P:\GIS Natural Res GMA Emp
File: P:\GIS\Mark Harrow\Projects\Patapsco Business\Sheet1.dgn

CURVE DATA					
CURVE NO.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING
C1	70.00'	22.03'	18°02'01.74"	11.11'	S 47°00'22.09" E 21.94'
C2	38.00'	34.45'	51°56'24.15"	18.51'	S 81°59'35.04" E 33.28'
C3	52.00'	89.42'	98°31'53.73"	60.38'	S 58°41'50.25" E 78.81'

TANGENT DATA		
TANGENT NO.	BEARING	DISTANCE
T1	S 37°59'21.22" E	50.16'
T2	S 56°01'22.96" E	66.94'
T3	N 72°02'12.89" E	4.39'

TRAVERSE COORDINATE LIST			
PT #	NORTHING	EASTING	ELEVATION
11	N 555,629.10	E 1,389,084.72	66.99
12	N 555,670.88	E 1,388,960.60	63.41
13	N 555,811.80	E 1,388,790.96	73.48



STATE OF MARYLAND
KATHLYNN HOWERMAN
NO. 38311
PROFESSIONAL ENGINEER

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APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 8/9/11
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 3/10/11
DIRECTOR	DATE 3/10/11

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NO. | REVISIONS DESCRIPTION | DATE

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PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
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GEOMETRY SHEET

SCALE: 1" = 20'
DATE: NOVEMBER 8, 2010
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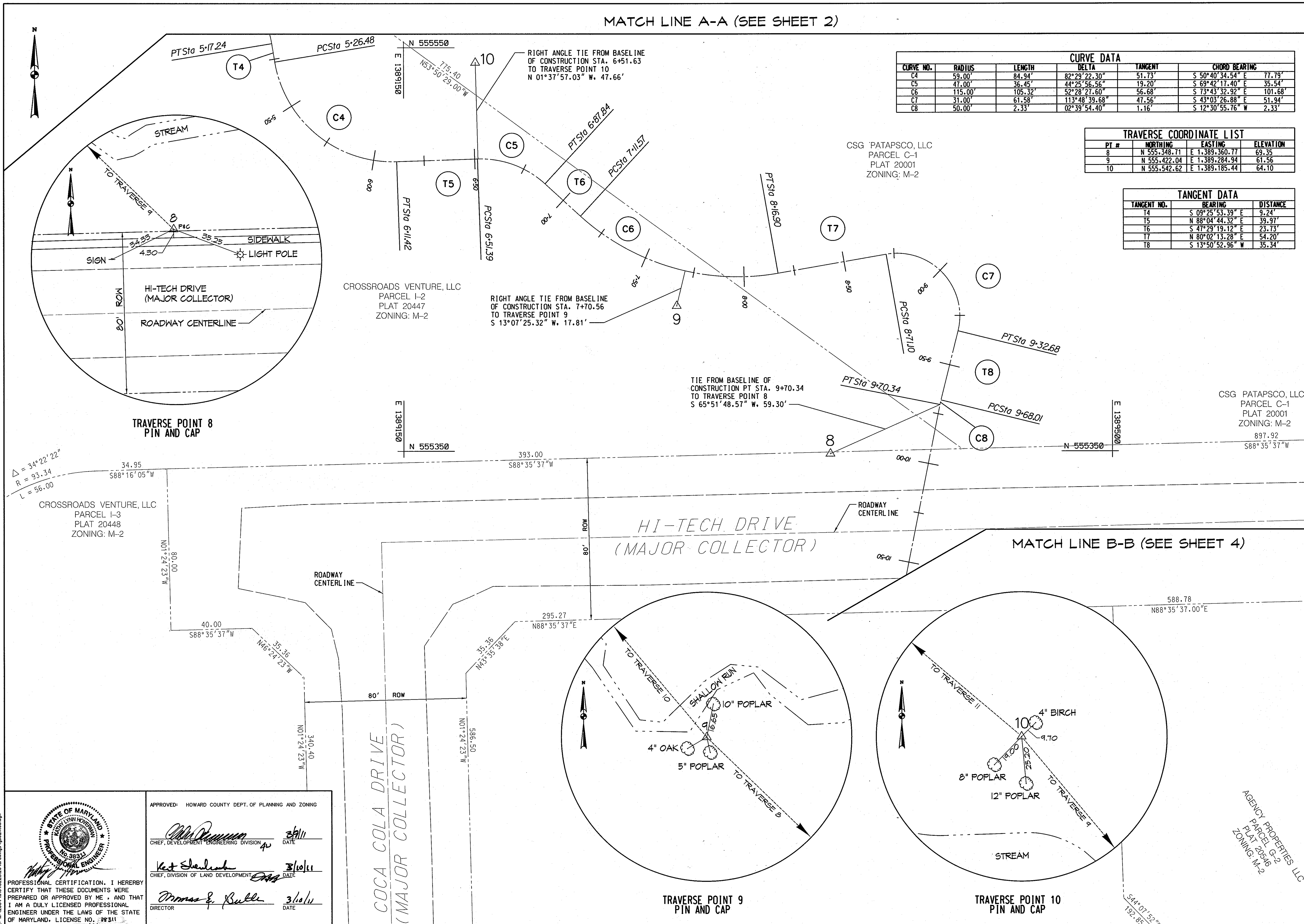
PERMIT ISSUE:
CONSTRUCTION ISSUE:



CURVE DATA					
CURVE NO.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING
C4	59.00'	84.94'	82°29'22.30"	51.73'	S 50°40'34.54" E 77.79'
C5	47.00'	36.45'	44°25'56.56"	19.20'	S 69°42'17.40" E 35.54'
C6	115.00'	105.32'	52°28'27.60"	56.68'	S 73°43'32.92" E 101.68'
C7	31.00'	61.58'	113°48'39.68"	47.56'	S 43°03'26.88" E 51.94'
C8	50.00'	2.33'	02°39'54.40"	1.16'	S 12°30'55.76" W 2.33'

TRAVERSE COORDINATE LIST			
PT #	NORTHING	EASTING	ELEVATION
8	N 555,348.71	E 1,389,360.77	69.35
9	N 555,422.04	E 1,389,284.94	61.56
10	N 555,542.62	E 1,389,185.44	64.10

TANGENT DATA		
TANGENT NO.	BEARING	DISTANCE
T4	S 09°25'53.39" E	9.24'
T5	N 88°04'44.32" E	39.97'
T6	S 47°29'19.12" E	23.73'
T7	N 80°02'13.28" E	54.20'
T8	S 13°50'52.96" W	35.34'

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KCI TECHNOLOGIES

HI TECH DRIVE STREAM RESTORATION

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SECTION 3, AREA 3

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GEOMETRY SHEET

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CONSTRUCTION ISSUE:

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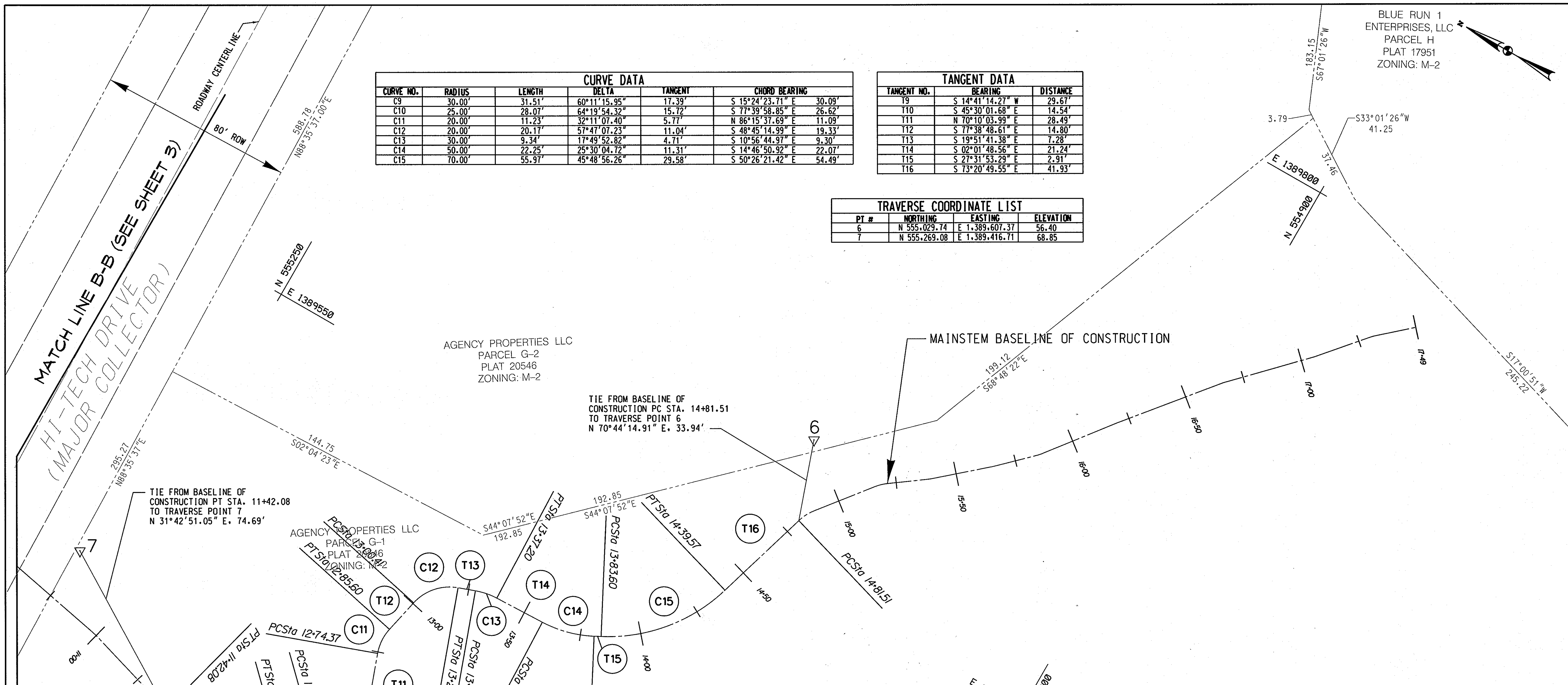
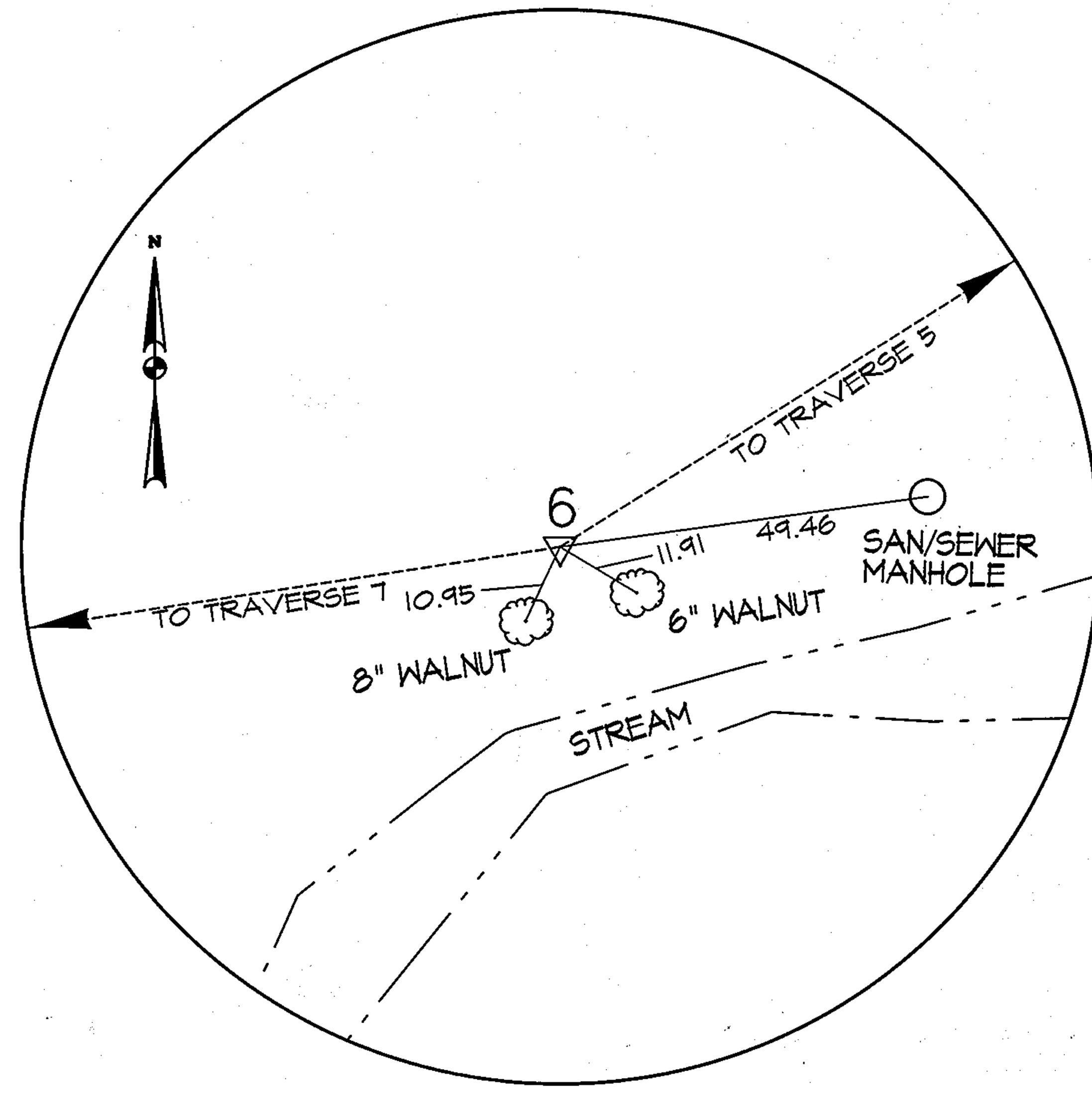
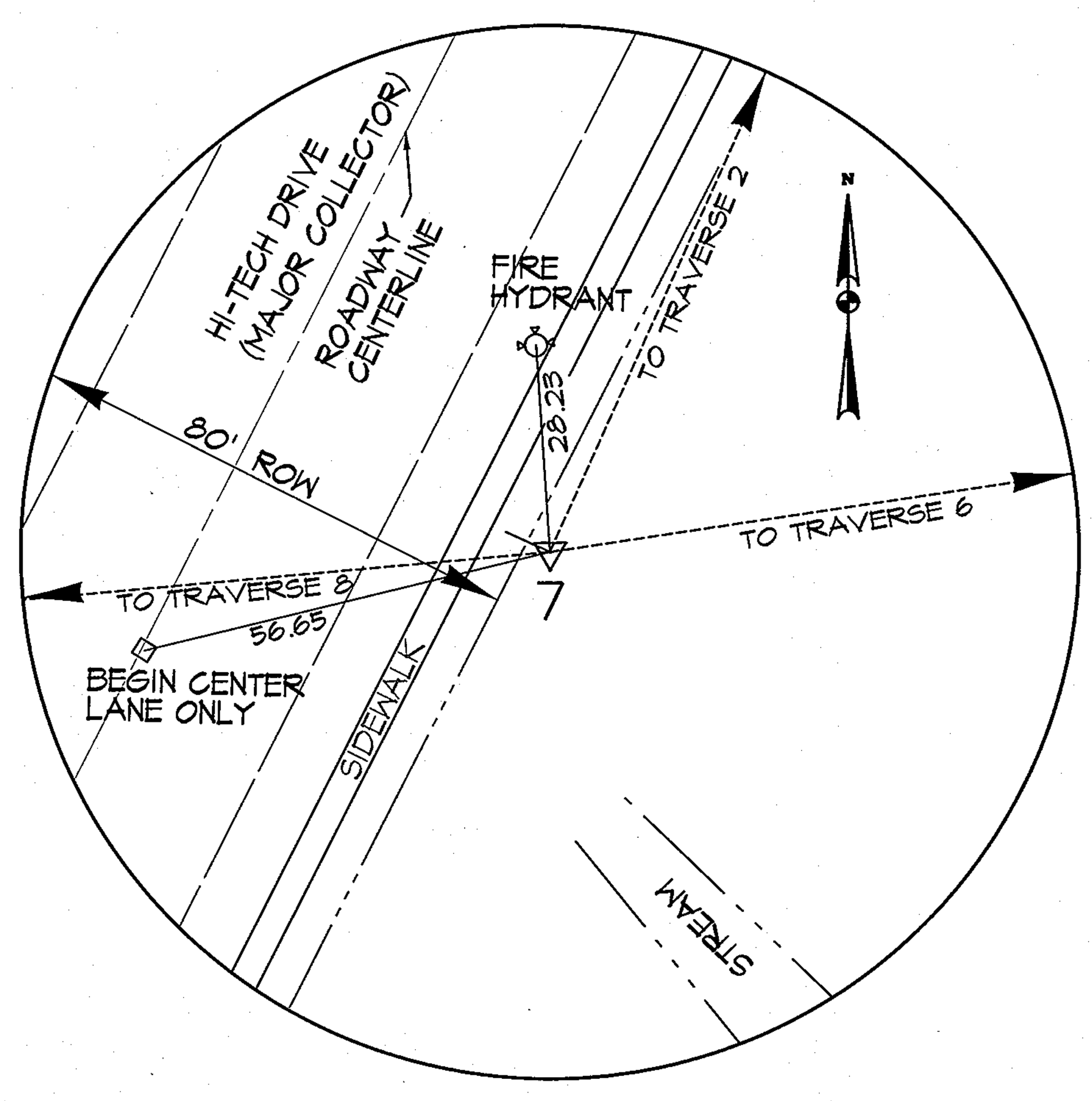




TRAVERSE POINT 6
PIN AND CAP



TRAVERSE POINT 7
PIN AND CAP

CURVE DATA					
CURVE NO.	RADIUS	LENGTH	DELTA	TANGENT	CHORD BEARING
C9	30.00'	31.51'	60°11'15.95"	17.39'	S 15°24'23.71" E 30.09'
C10	25.00'	28.07'	64°19'54.32"	15.72'	S 77°39'58.85" E 26.62'
C11	20.00'	11.23'	32°11'07.40"	5.77'	N 86°15'37.69" E 11.09'
C12	20.00'	20.17'	57°47'07.23"	11.04'	S 48°45'14.99" E 19.33'
C13	30.00'	9.34'	17°49'52.82"	4.71'	S 10°56'44.97" E 9.30'
C14	50.00'	22.25'	25°30'04.72"	11.31'	S 14°46'50.92" E 22.07'
C15	70.00'	55.97'	45°48'56.26"	29.58'	S 50°26'21.42" E 54.49'

TANGENT DATA		
TANGENT NO.	BEARING	DISTANCE
T9	S 14°41'14.27" W	29.67'
T10	S 45°30'01.68" E	14.54'
T11	N 70°10'03.99" E	28.49'
T12	S 77°38'48.61" E	14.80'
T13	S 19°51'41.38" E	7.28'
T14	S 02°01'48.56" E	21.24'
T15	S 27°31'53.29" E	2.91'
T16	S 73°20'49.55" E	41.93'

TRAVERSE COORDINATE LIST			
PT #	NORTHING	EASTING	ELEVATION
6	N 555,029.74	E 1,389,607.37	56.40
7	N 555,269.08	E 1,389,416.71	68.85

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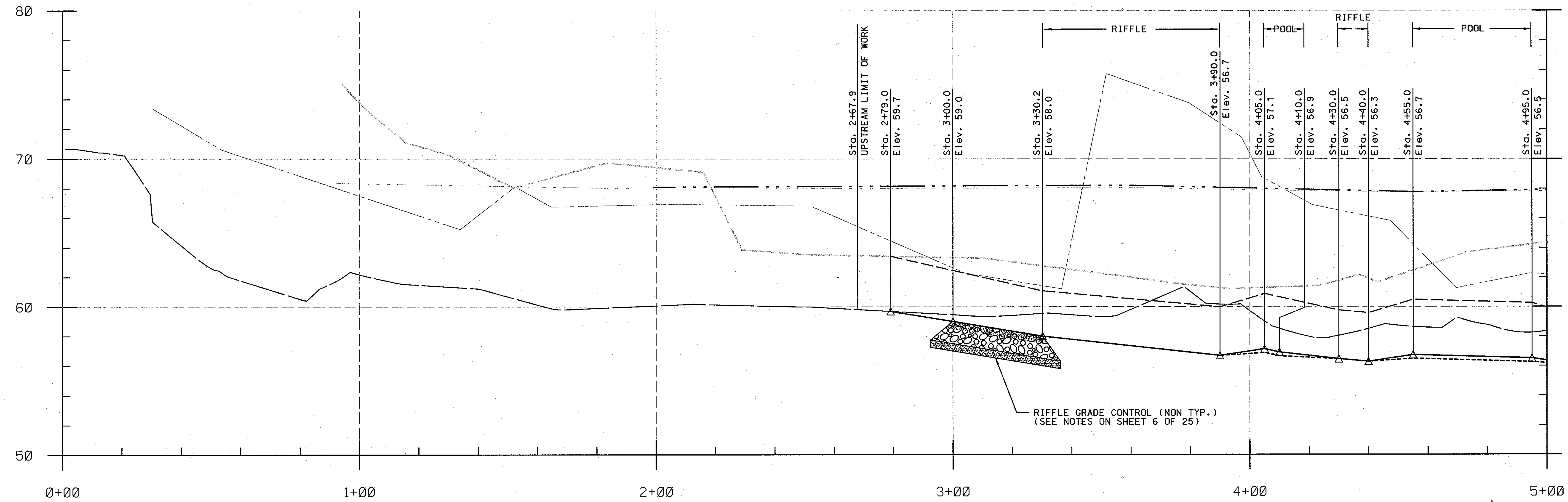
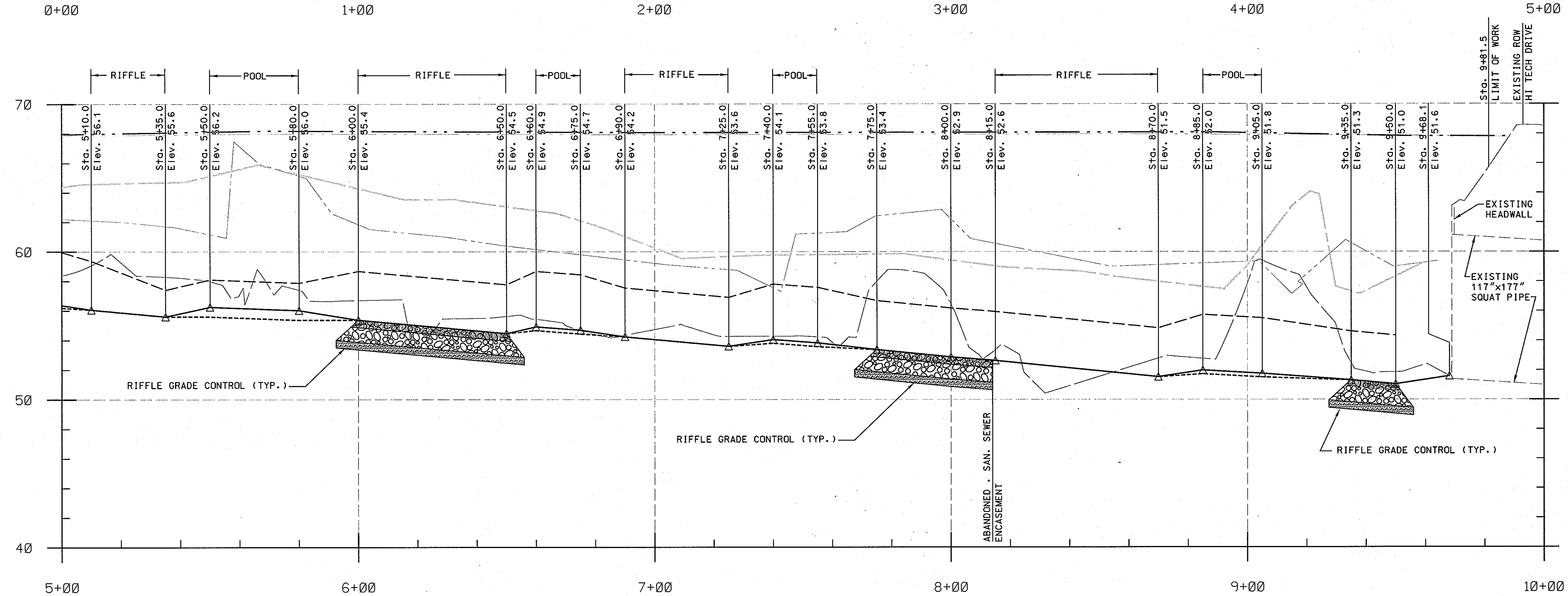
CONSTRUCTION ISSUE:





PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 39311 EXPIRATION DATE: JANUARY 06, 2012

STATE OF MARYLAND · KATHY LYNN HOVERMAN · No. 39311 · PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

LEGEND

- EXISTING GROUND
- PROPOSED GROUND
- PROPOSED THALWEG
- PROPOSED TOP OF BANK
- EXISTING TOP OF BANK RIGHT
- EXISTING TOP OF BANK LEFT
- 100-YR PROPOSED WATER SURFACE ELEVATION
- 100-YR EXISTING WATER SURFACE ELEVATION

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2004 \ 01043223.26 \

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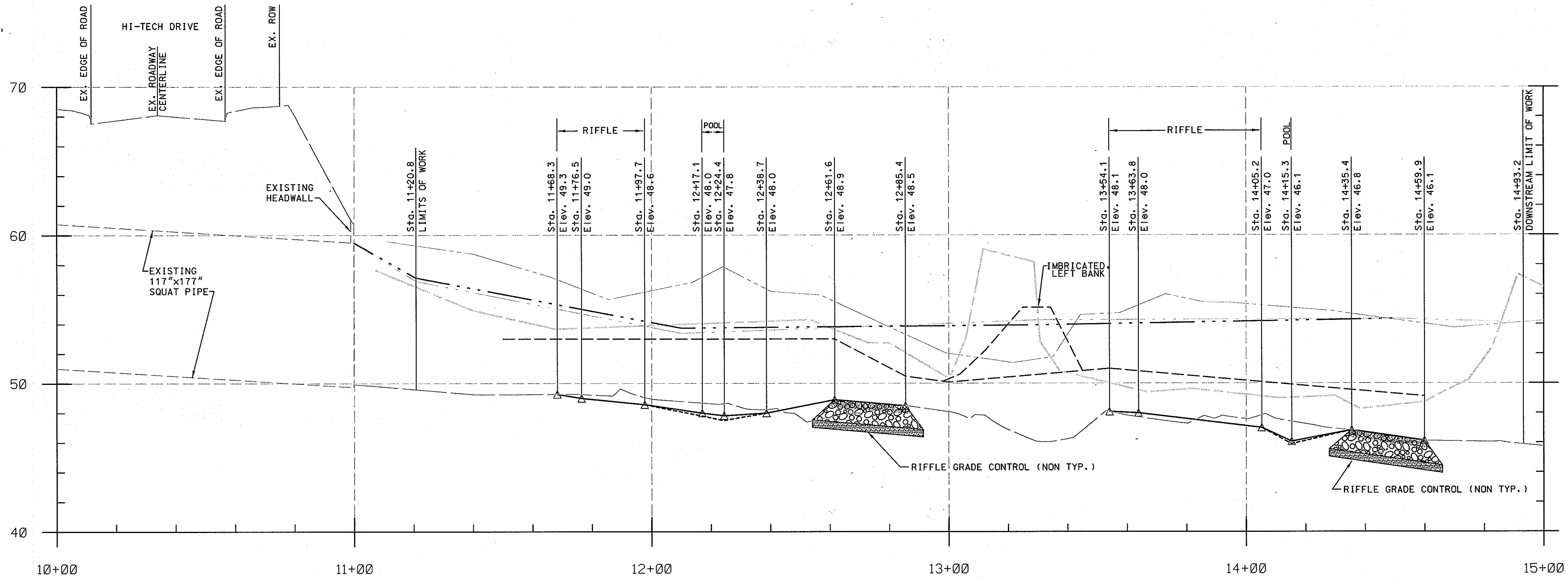
HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

PROFILE

SCALE: HOR. 1"=20', VERT. 1"=4'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SDP-10-095



NOTE:

1. NON TYPICAL RIFFLE GRADE CONTROLS ARE TO BE BUILT WITH THE SAME MATERIAL AND MANNER AS TYPICAL RIFFLE GRADE CONTROLS EXCEPT THEIR CROSS SECTION SHAPE IS TO MATCH THE GRADING CONTOURS SHOWN ON SHEET 9.
2. ALL GRADING ON THIS SHEET IS NON TYPICAL AND IS TO TIE-IN TO EXISTING BANK AND BED IN VARIOUS WAYS. ALL PROPOSED GRADING SHALL BE DONE TO REFLECT THE CONTOURS NOTED ON SHEET 9.
3. POOLS AND RIFFLES CALLED OUT ON THIS SHEET ONLY ARE NON TYPICAL. MATERIAL USED FOR THE BED SHOULD BE CHANNEL BED MATERIAL HOWEVER THE CROSS SECTIONAL SHAPE SHALL BE DETERMINED FROM THE CONTOURS DISPLAYED ON SHEET 9.

LEGEND

EXISTING GROUND
PROPOSED GROUND
PROPOSED THALWEG
PROPOSED TOP OF BANK
EXISTING TOP OF BANK RIGHT
EXISTING TOP OF BANK LEFT
100-YR PROPOSED WATER SURFACE ELEVATION
100-YR EXISTING WATER SURFACE ELEVATION

STATE OF MARYLAND · PROFESSIONAL ENGINEER · No. 38311

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APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

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CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/16/11

NO.	REVISIONS DESCRIPTION	DATE

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PROFILE

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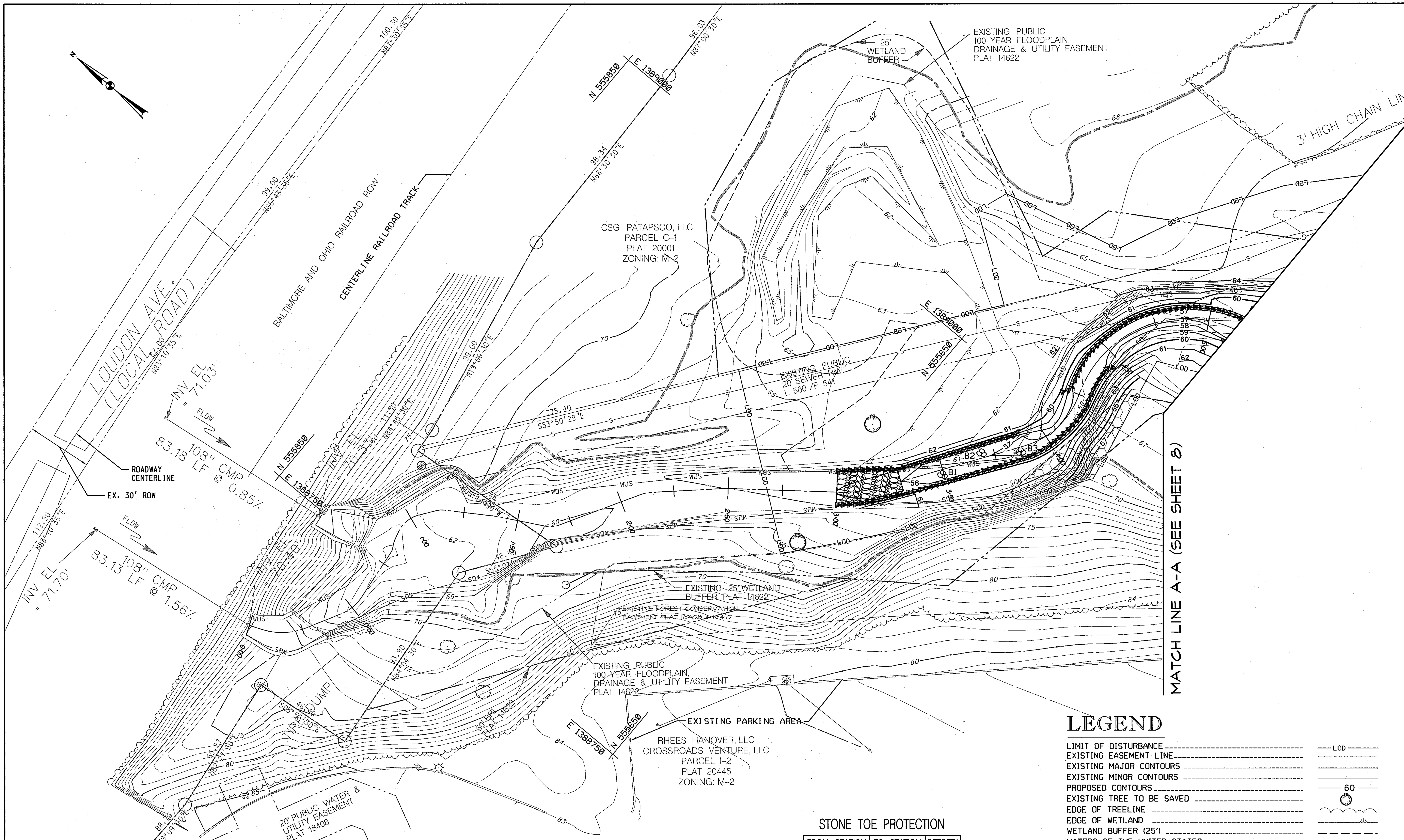

RIFFLE GRADE CONTROL

FROM STATION	TO STATION
3+00	3+30

BOULDER CLUSTER

NAME	STATION	OFFSET*
B1	3+49	R
B2	3+70	L
B3	3+85	R

*FACING DOWNSTREAM, STATION FROM BASELINE OF CONSTRUCTION

STONE TOE PROTECTION

FROM STATION	TO STATION	OFFSET*
3+00	3+90	L
3+00	4+46	R
4+22	5+37	L
5+10	6+51	R

*FACING DOWNSTREAM, MEASURED FROM BASELINE OF CONSTRUCTION

NOTE: THE HYDROLOGIC AND HYDRAULIC FLOOD ANALYSES AND FLOOD DELINEATION SHOWN HERE ON WAS BASED ON A 100-YEAR, 24-HOUR RAINFALL AMOUNT OF 8.51 INCHES BASED ON NOAA ATLAS 14 RAINFALL DATA. SUCH A RAINFALL AMOUNT EXCEEDS THE HOWARD COUNTY REQUIREMENT OF 7.2-INCHES. DUE TO THIS, THE FLOODPLAIN ELEVATIONS AND LIMITS EXCEEDED THE HOWARD COUNTY REQUIREMENTS.

LEGEND

- LIMIT OF DISTURBANCE — LOD
- EXISTING EASEMENT LINE
- EXISTING MAJOR CONTOURS
- EXISTING MINOR CONTOURS
- PROPOSED CONTOURS — 60
- EXISTING TREE TO BE SAVED
- EDGE OF TREELINE
- EDGE OF WETLAND
- WETLAND BUFFER (25')
- WATERS OF THE UNITED STATES — WUS
- PROPERTY LINE
- EXISTING ROAD EDGE
- EXISTING SEWER LINE — S
- STONE TOE PROTECTION
- BOULDER CLUSTER
- RIFFLE GRADE CONTROL
- EXISTING TREE
- EXISTING/PROPOSED 100-YR WSE*
- IMPACTS TO EXISTING FCE

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

STATE OF MARYLAND KATHY LYNN HOVERMAN No. 38311 PROFESSIONAL ENGINEER

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CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

PLOTTED: "11:07 AM on Monday, January 03, 2011"
BY: Harmony Miller Division: P050 NaturalRes GMA Emp
FILE: M:\2004\01043223.26\drawings\ps03htec.dgn

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HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3

HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
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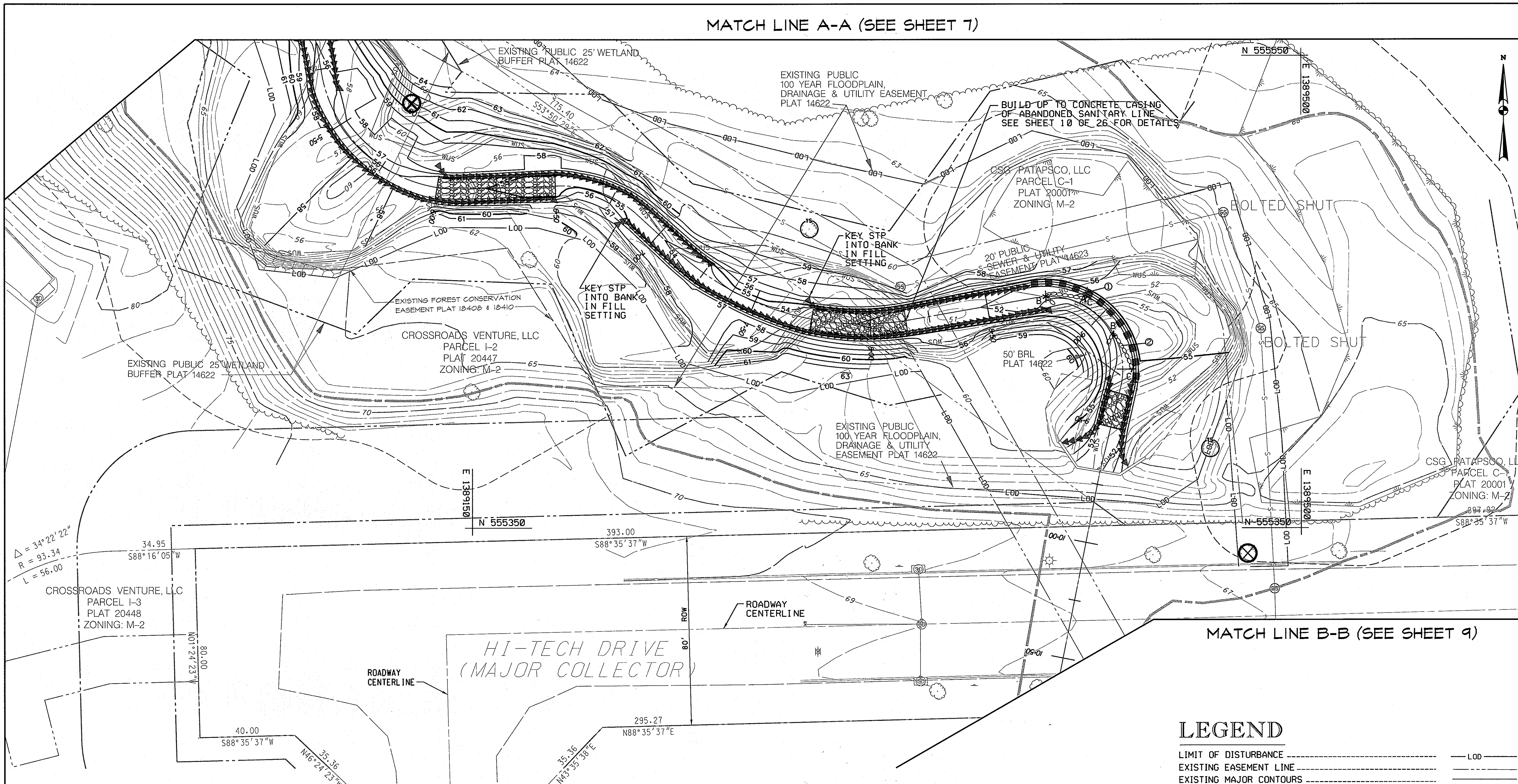
COLUMBIA, MARYLAND 21046

PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

GRADING PLAN

SCALE: 1" = 20'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

MATCH LINE A-A (SEE SHEET 7)



MATCH LINE B-B (SEE SHEET 9)

RIFFLE GRADE CONTROL

FROM STATION	TO STATION
6+00	6+50
7+75	8+15
9+35	9+50

IMBRICATED WALL

FROM STATION	TO STATION	OFFSET*
8+70	9+30	L

*FACING DOWNSTREAM, MEASURED FROM BASELINE OF CONSTRUCTION

J VANE

VANE NO.	POINT C	POINT B	OFFSET*
1	8+90	8+75	L
2	9+25	9+09	L

*FACING DOWNSTREAM, MEASURED FROM BASELINE OF CONSTRUCTION

STONE TOE PROTECTION SCHEDULE

FROM STATION	TO STATION	OFFSET*
4+20	5+37	L
5+10	6+51	R
5+98	7+26	L
6+83	8+78	R
7+72	8+70	L
9+30	9+61	R
9+30	9+65	L

*FACING DOWNSTREAM, MEASURED FROM BASELINE OF CONSTRUCTION

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LEGEND

LIMIT OF DISTURBANCE	LOD
EXISTING EASEMENT LINE	
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	387
EXISTING TREE TO BE SAVED	
EXISTING TREE TO BE REMOVED	
EDGE OF TREELINE	
EDGE OF WETLAND	
WETLAND BUFFER (25')	
WATERS OF THE UNITED STATES	WUS
PROPERTY LINE	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	S
IMBRICATED WALL	
STONE TOE PROTECTION	
RIFFLE GRADE CONTROL	
J VANE	
J VANE NUMBER	①
EXISTING TREE	
EXISTING/PROPOSED 100-YR WSE*	
IMPACTS TO EXISTING FCE	

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

STATE OF MARYLAND KATHY LYNN HOVERMAN No. 38311 PROFESSIONAL ENGINEER

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CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

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NO. | REVISIONS DESCRIPTION | DATE

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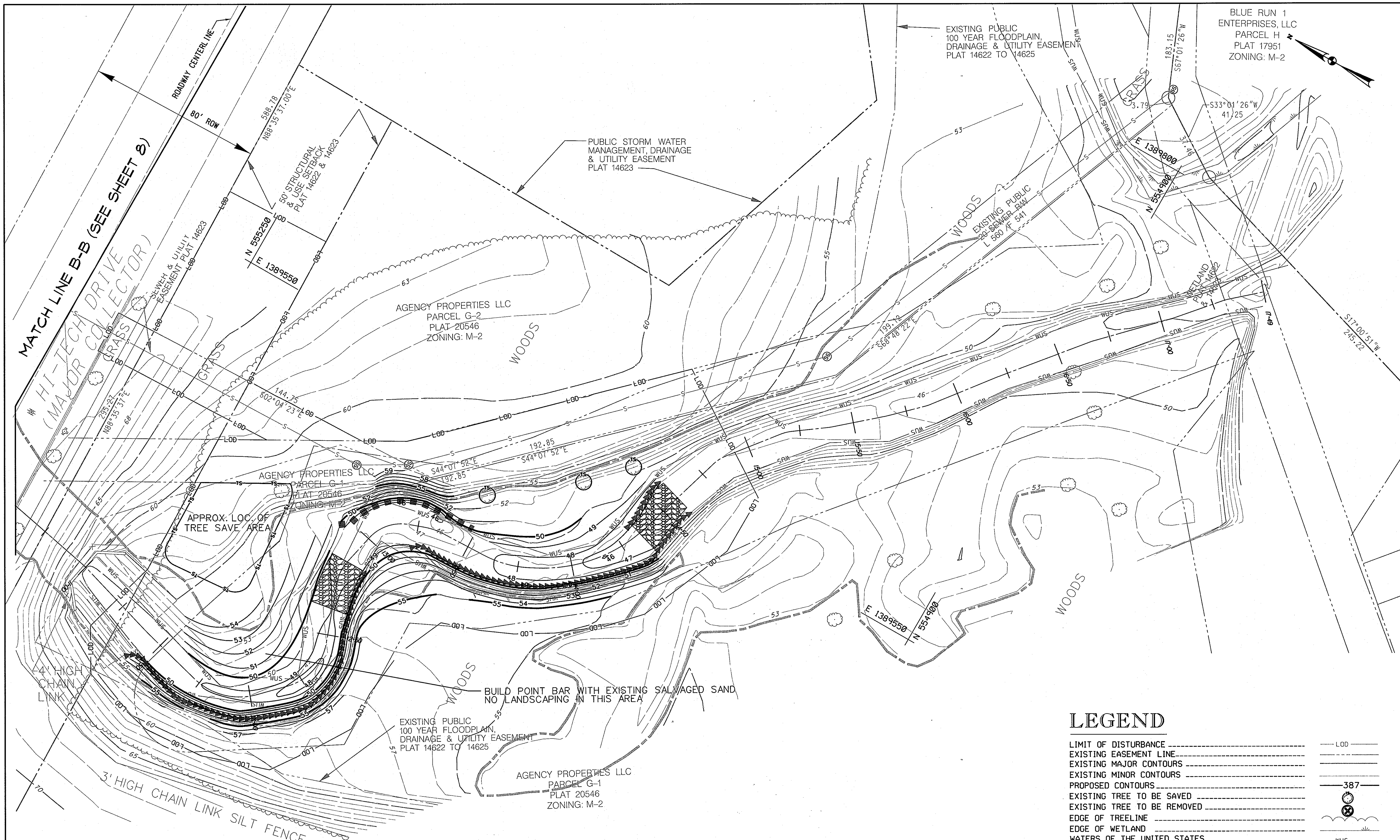
HI TECH DRIVE STREAM RESTORATION
PATAPSCO VALLEY BUSINESS CENTER SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

GRADING PLAN

SCALE: 1" = 20'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:



LEGEND

LIMIT OF DISTURBANCE	LOD
EXISTING EASEMENT LINE	
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	387
EXISTING TREE TO BE SAVED	
EXISTING TREE TO BE REMOVED	
EDGE OF TREELINE	
EDGE OF WETLAND	
WATERS OF THE UNITED STATES	WUS
PROPERTY LINE	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	S
IMBRICATED WALL	
STONE TOE PROTECTION	
RIFFLE GRADE CONTROL	
TREE SAVE AREA	TS
EXISTING TREE	
EXISTING/PROPOSED 100-YR WSE*	

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

STONE TOE PROTECTION

FROM STATION	TO STATION	OFFSET*
11+41	12+89	R
13+23	14+60	R
14+30	14+60	L

*FACING DOWNSTREAM, MEASURED FROM BASELINE OF CONSTRUCTION

IMBRICATED WALL

FROM STATION	TO STATION	OFFSET*
12+98	13+47	L

*FACING DOWNSTREAM, MEASURED FROM BASELINE OF CONSTRUCTION

RIFFLE GRADE CONTROL

FROM STATION	TO STATION
12+62	12+85
14+35	14+59

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APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

STATE OF MARYLAND — KATHRYN HOVERMAN — No. 38311 — PROFESSIONAL ENGINEER

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ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

GRADING PLAN

SCALE: 0 0.25 0.5 1.0 INCHES
1" = 20'

DATE: NOVEMBER 8, 2010

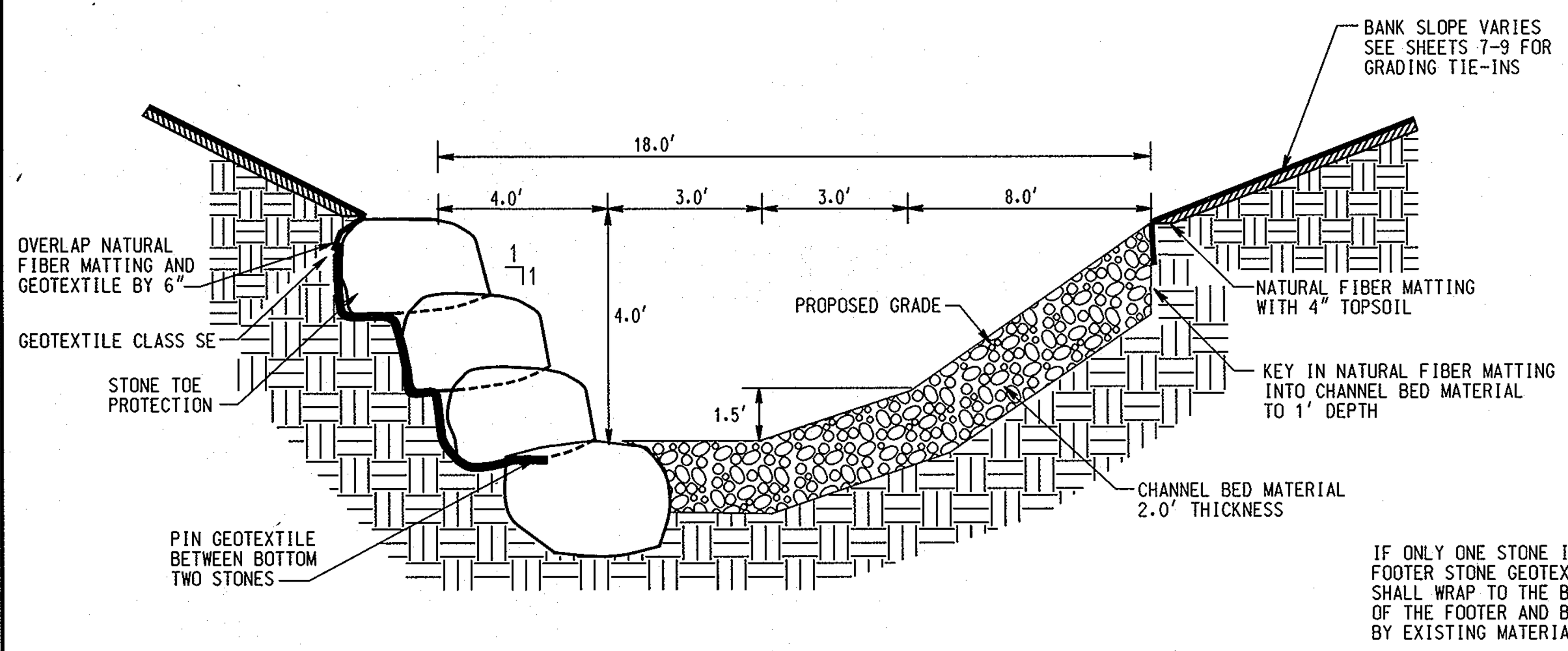
KCI JOB NO.: 01-043223.26

CAPITAL PROJECT NO.: D - 1122

PERMIT ISSUE:

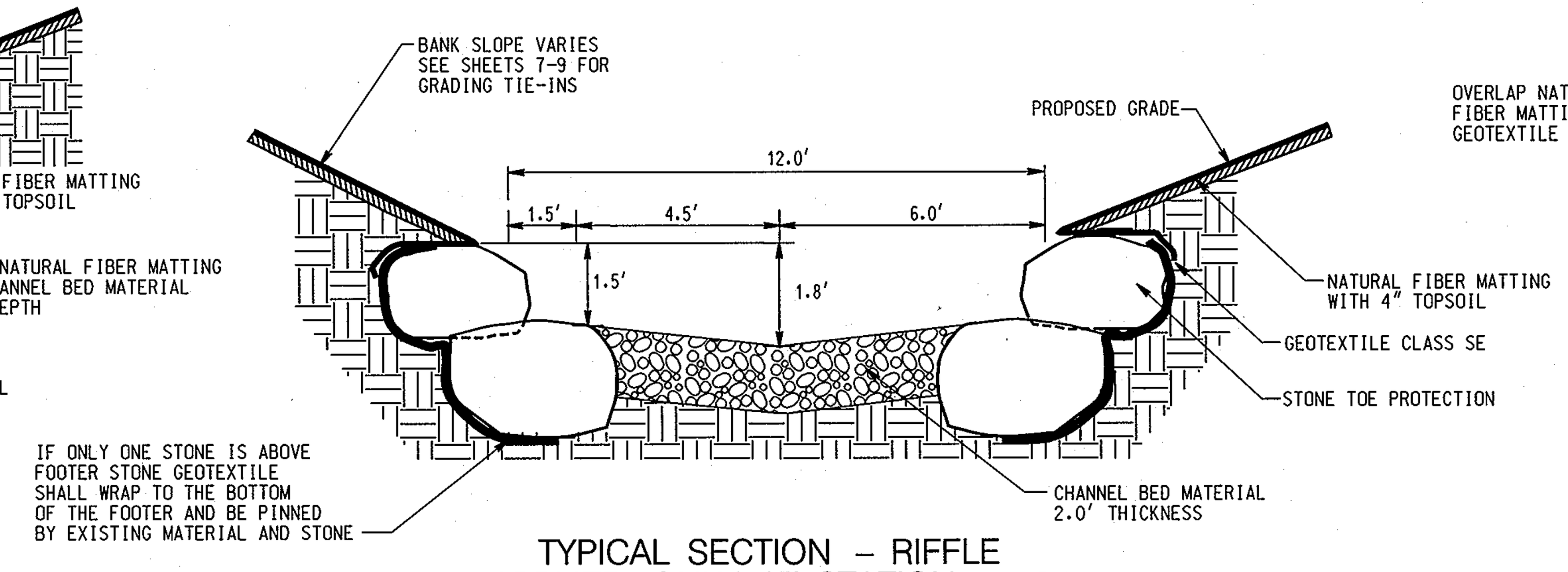
CONSTRUCTION ISSUE:

SDP-10-095



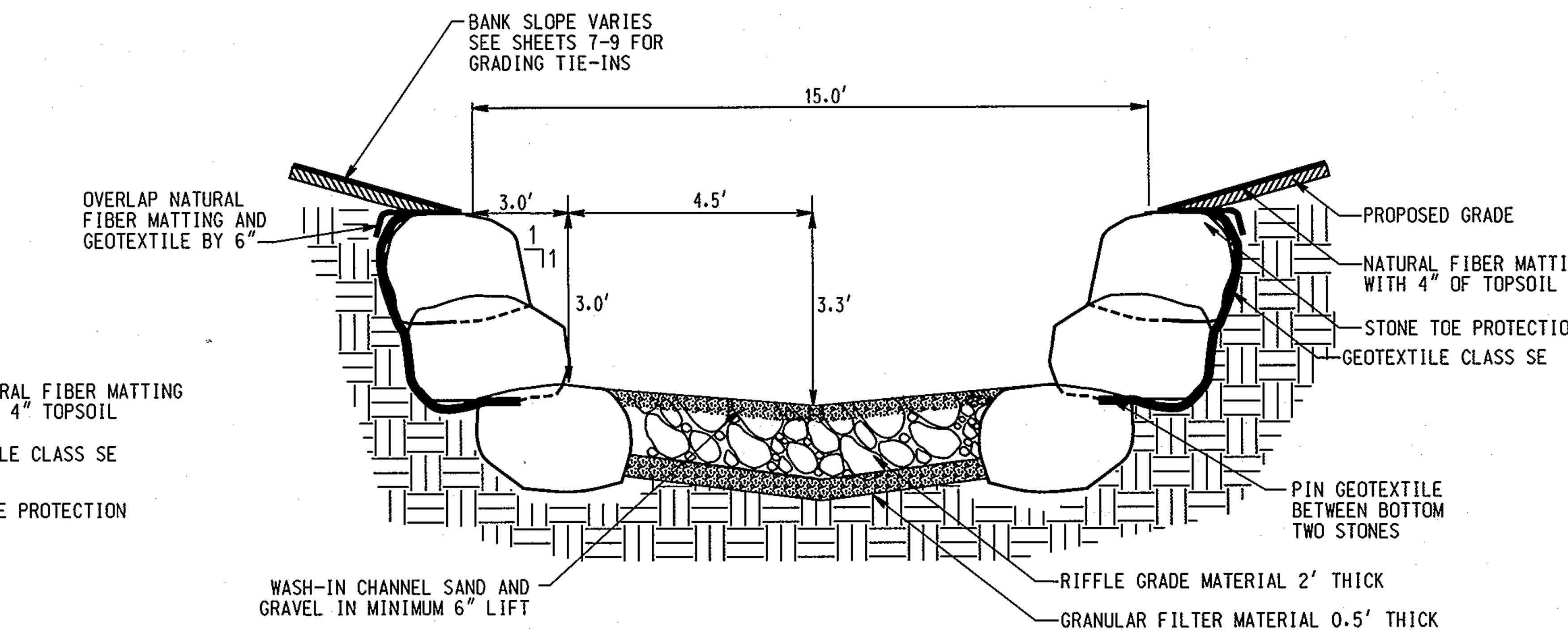
TYPICAL SECTION - POOL

NOT TO SCALE



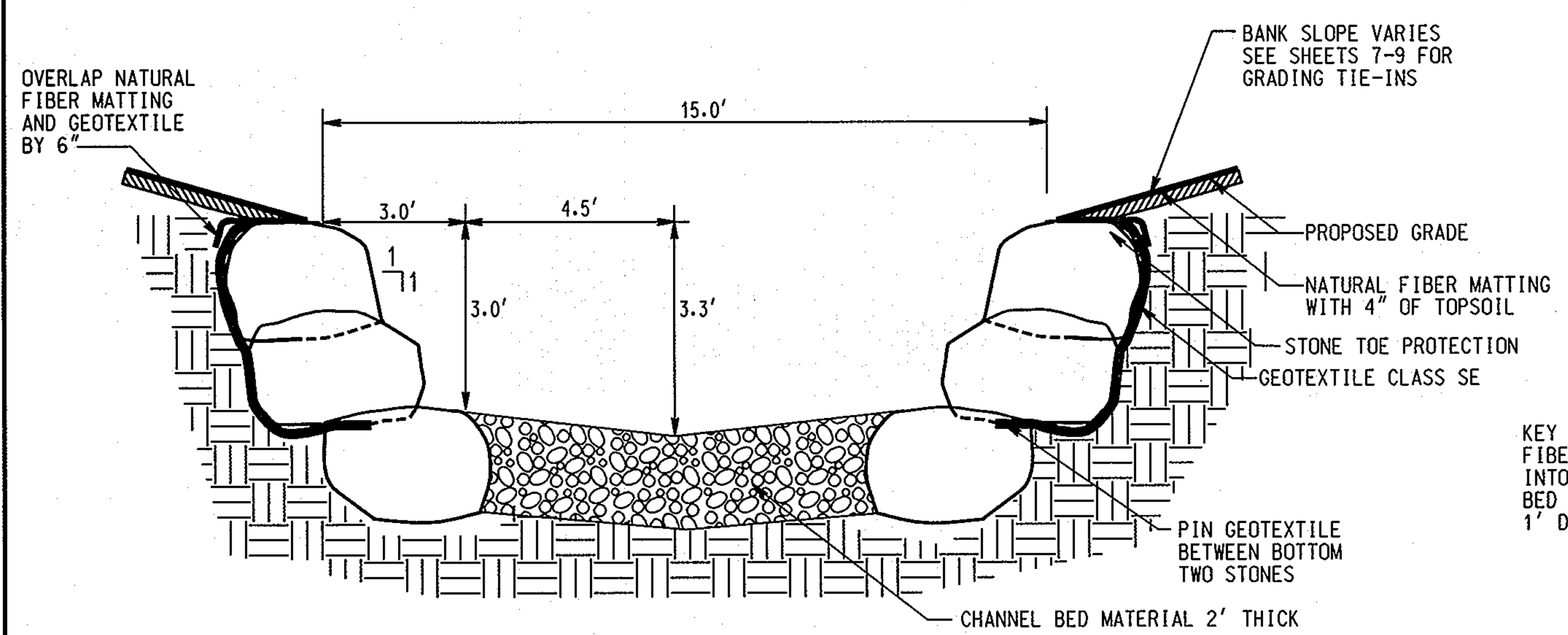
TYPICAL SECTION - RIFFLE
APPLIED ONLY AT STATION 5+35

NOT TO SCALE



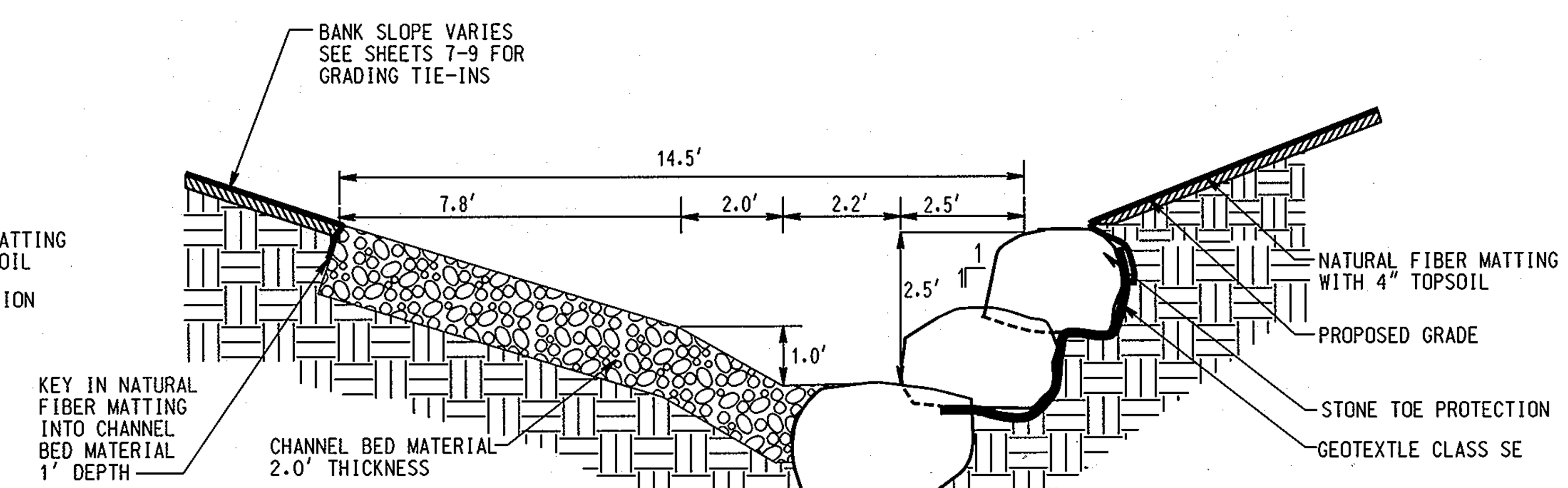
TYPICAL SECTION - RIFFLE GRADE CONTROL

NOT TO SCALE



TYPICAL SECTION - RIFFLE

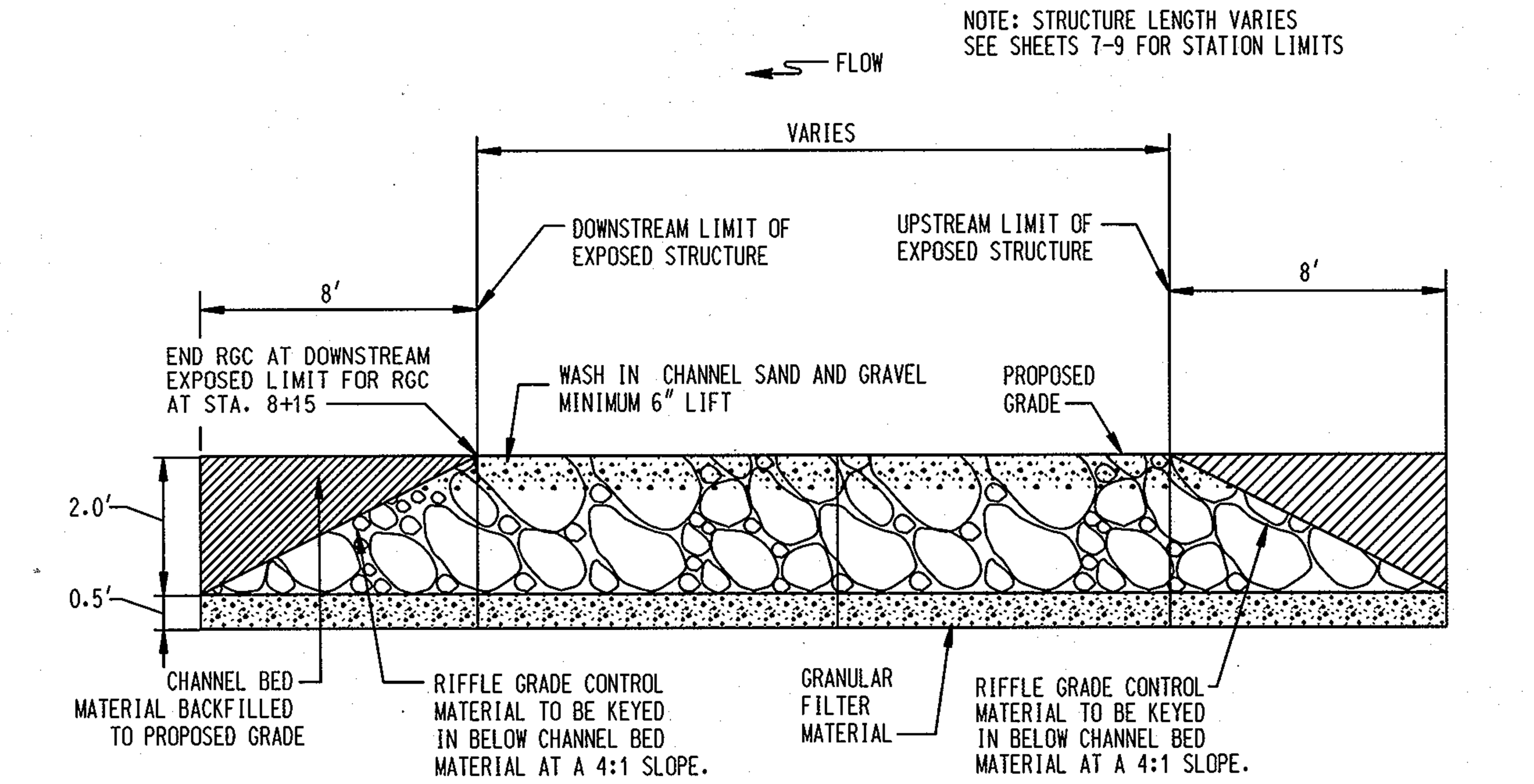
NOT TO SCALE



TYPICAL SECTION - POOL
APPLIED ONLY FROM STATION 5+35 TO 5+80

NOT TO SCALE

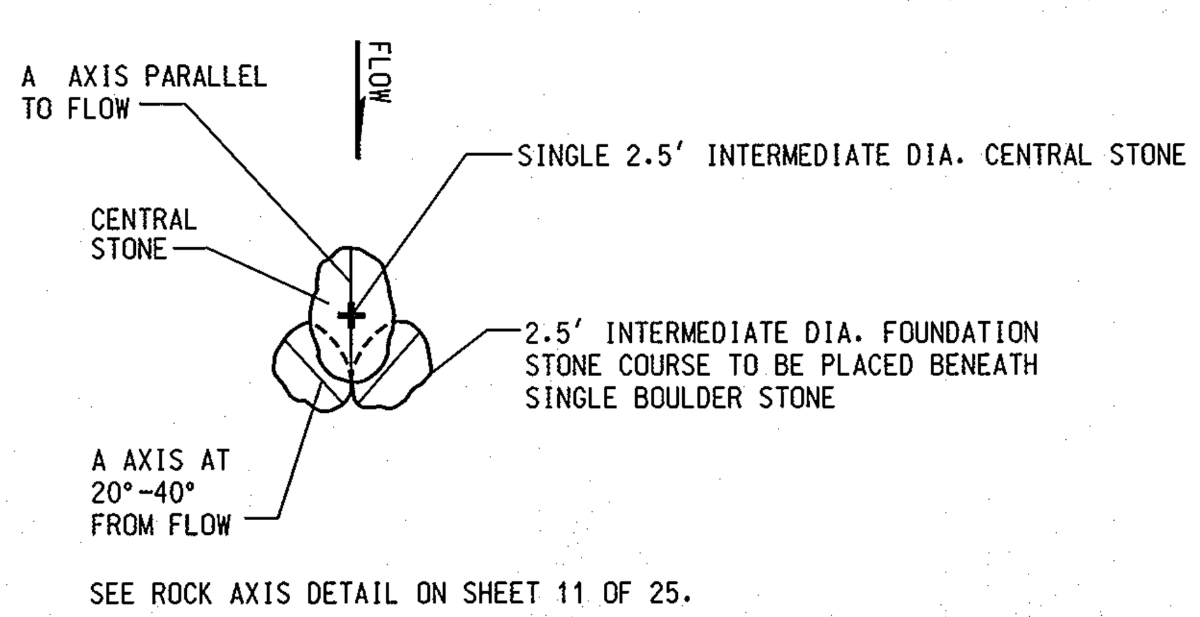
NOTE: STRUCTURE LENGTH VARIES SEE SHEETS 7-9 FOR STATION LIMITS



TYPICAL RIFFLE GRADE CONTROL PROFILE

NOT TO SCALE

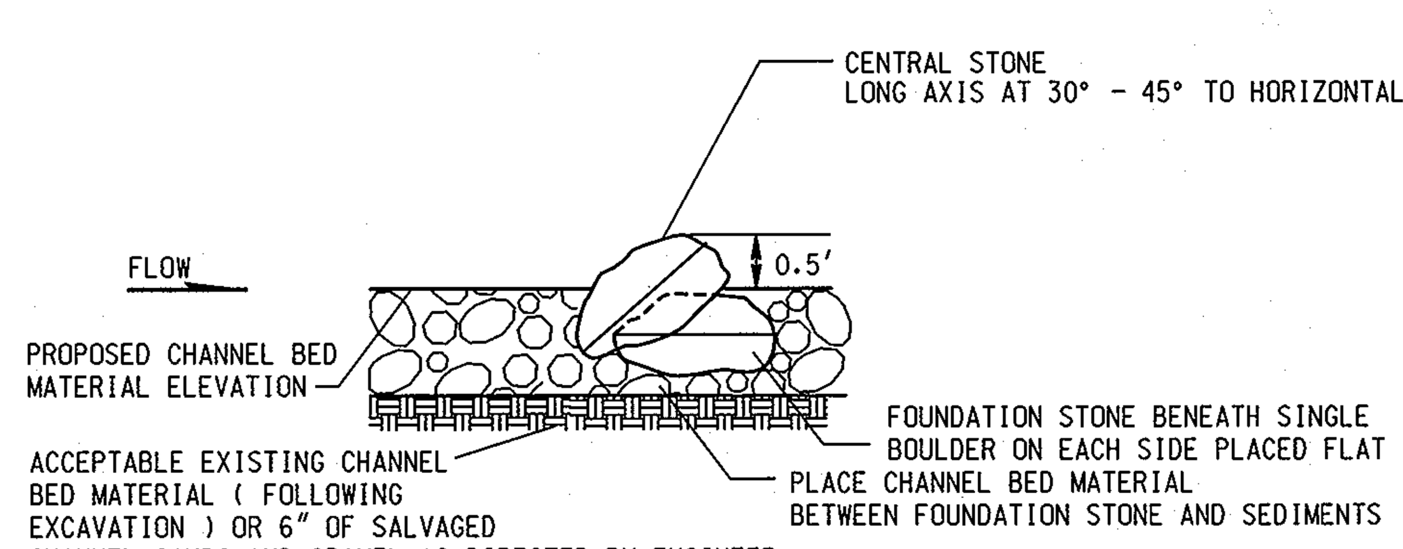
NOTES: 1. ALL RIFFLE GRADE CONTROL STRUCTURES SHALL BE CONSTRUCTED FROM DOWNSTREAM TO UPSTREAM
2. THE RIFFLE GRADE CONTROL MATERIAL SHALL BE PLACED TO ITS FULL DEPTH MOVING FROM ONE BANK TO THE OPPOSING BANK.



SEE ROCK AXIS DETAIL ON SHEET 11 OF 25.

BOULDER CLUSTER: MAIN CHANNEL

NOT TO SCALE



BOULDER CLUSTER PROFILE

NOT TO SCALE

BOULDER CLUSTER PLACEMENT		
BOULDER NUMBER	CENTRAL STONE STATION	CENTERLINE OFFSET*
1	3+49	R 3.0'
2	3+70	L 3.0'
3	3+85	R 3.0'

* FACING DOWNSTREAM

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

CHANNEL BED MIX MATERIAL*	
% LESS THAN	SIZE (IN)
10	1.2
30	3.9
50	5.9
60	6.3
84	10.0
100	11.8

RIFFLE GRADE CONTROL MIX*	
% LESS THAN	SIZE (IN)
10	1.4
30	4.7
50	7.1
60	7.6
84	12.0
100	14.2

* USE EXISTING CHANNEL MATERIAL BEFORE IMPORTING CHANNEL BED OR RIFFLE GRADE CONTROL MATERIAL

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

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STATE OF MARYLAND — PROFESSIONAL ENGINEER — NO. 38311

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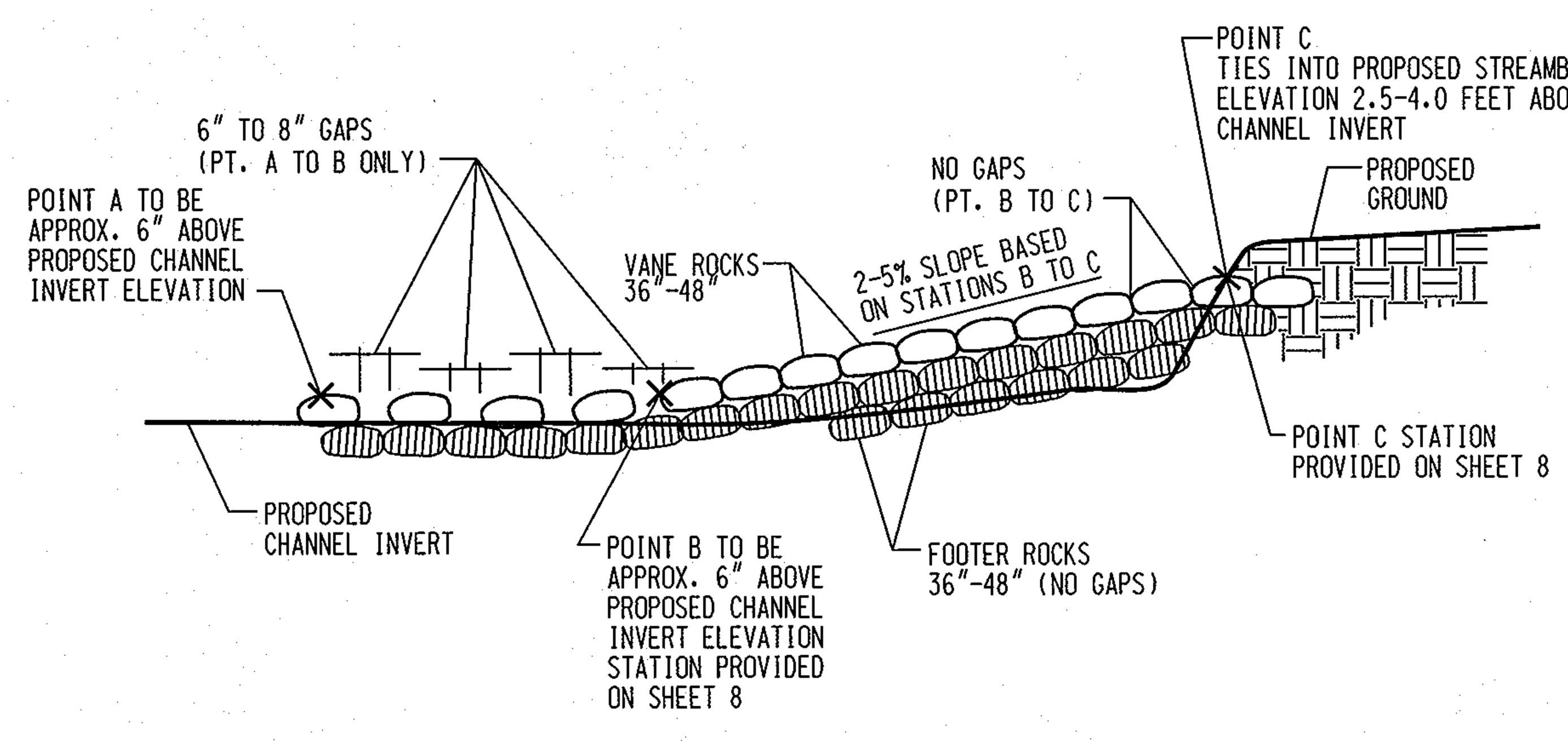
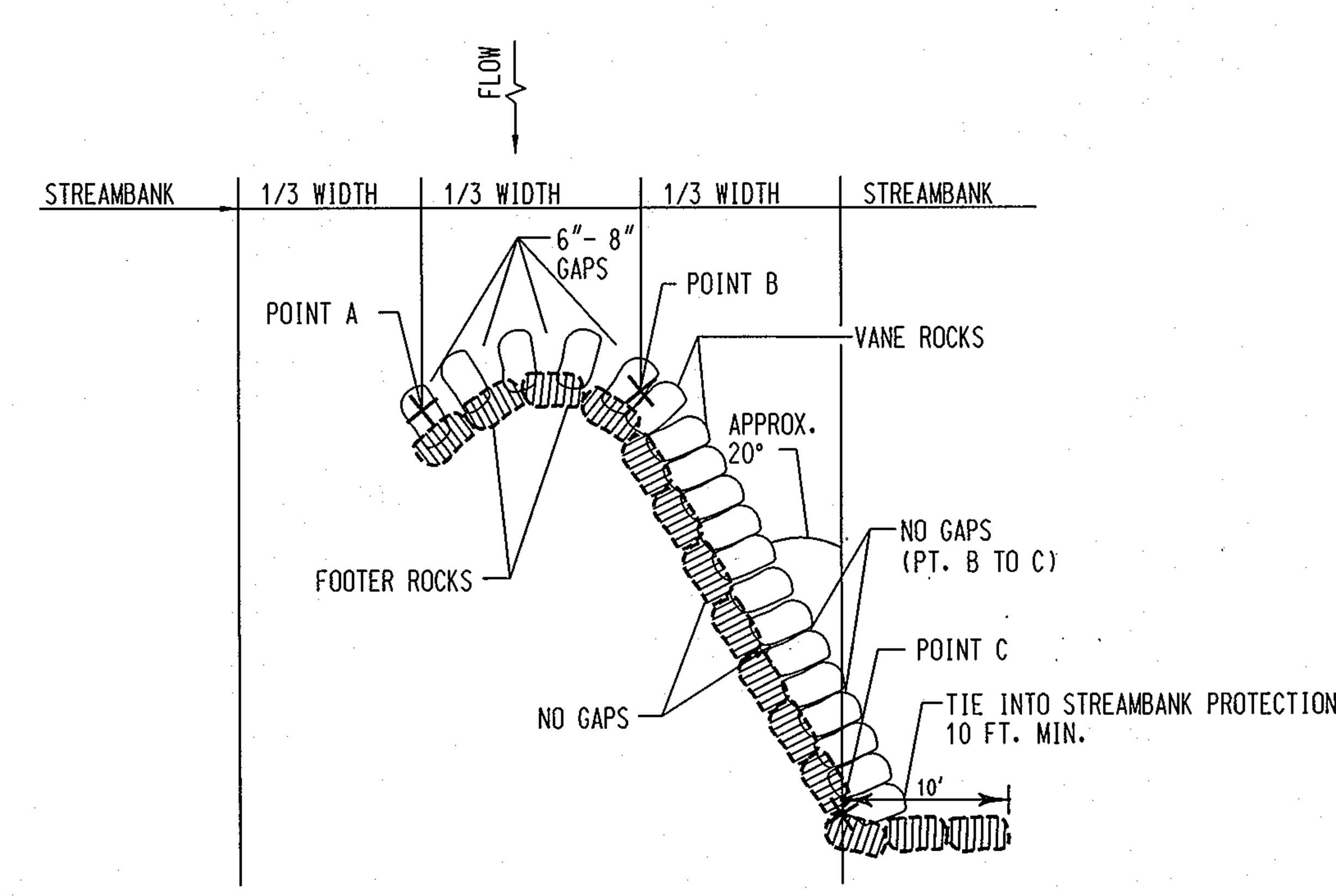
DETAILS

SCALE: NOT TO SCALE
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:



CROSS-SECTION VIEW

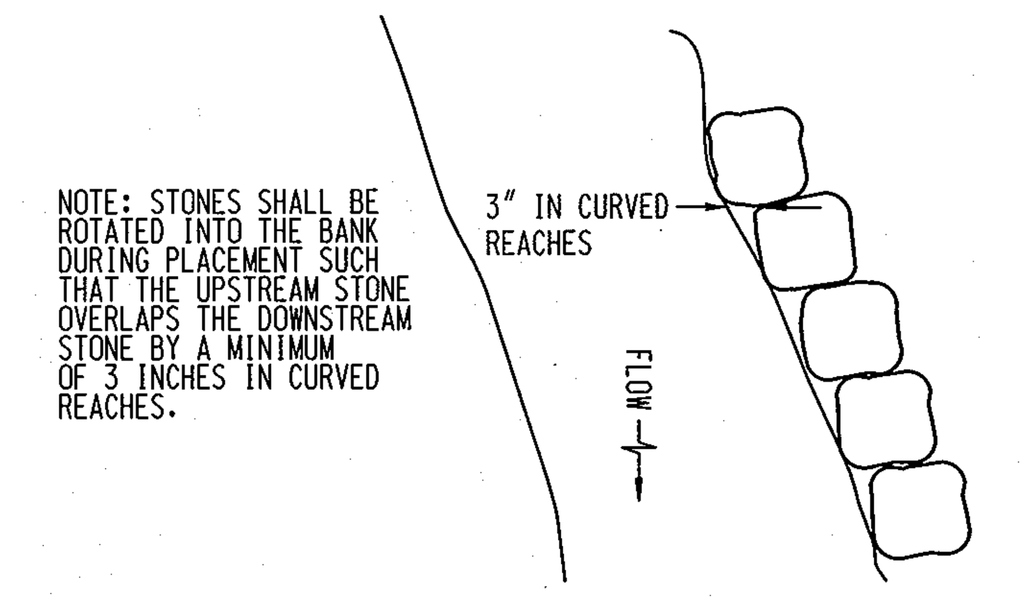


PLAN VIEW

J-HOOK VANE

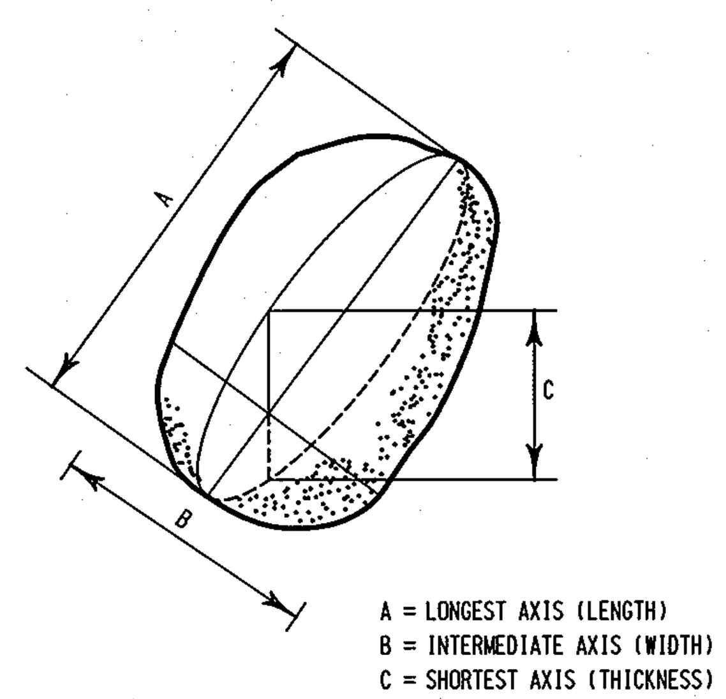
NOT TO SCALE

NOTE:
SET J-VANE PRIOR TO STONE TOE PROTECTION, BUILD STONE TOE ADJACENT AND ABUTTING FOOTER AND VANE STONES AS NECESSARY BASED ON HEIGHT OF STONE TOE.



TYPICAL PLAN VIEW
IMBRICATED BANK PROTECTION

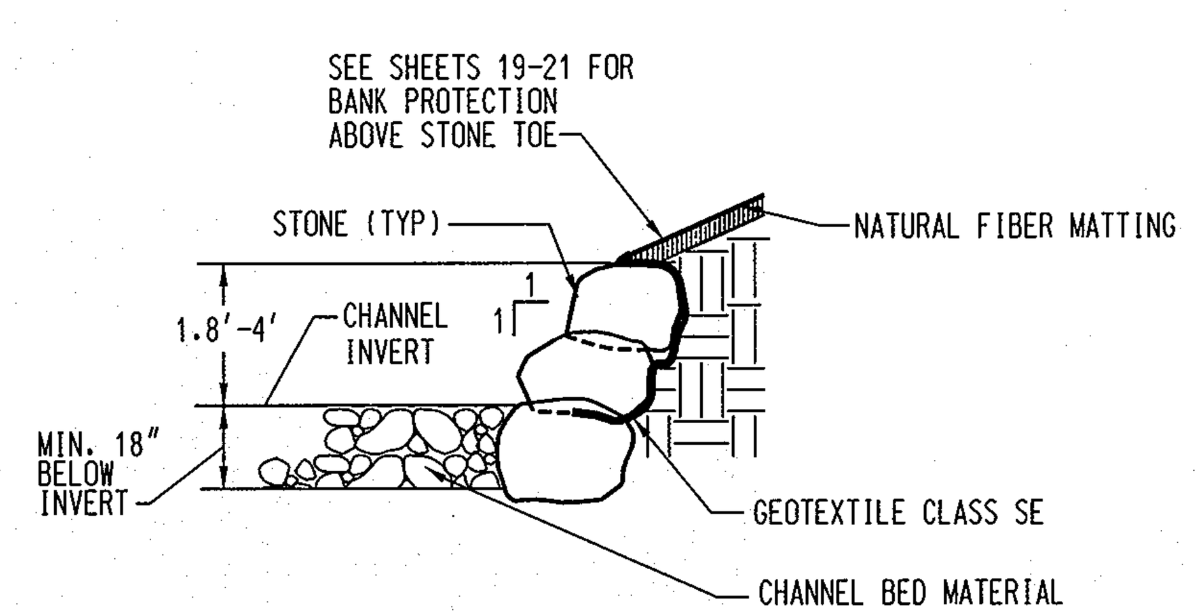
NOT TO SCALE



ROCK AXIS DEFINITION

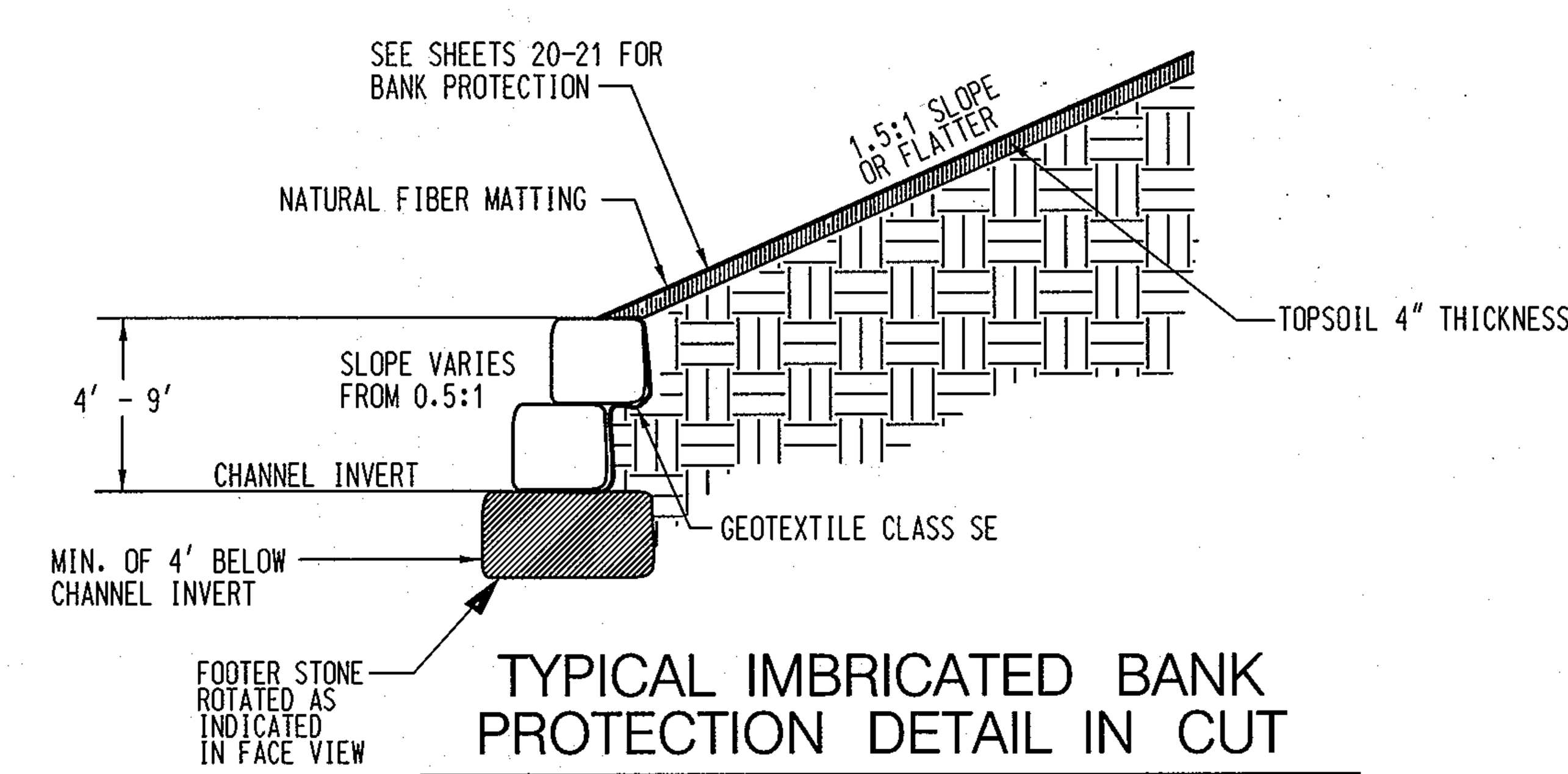
NOT TO SCALE

SIZES FOR STONE TYPES			
AXIS	A (LONGEST)	B (INTERMEDIATE)	C (SHORTEST)
STONE TYPE	MAX.	RANGE	MIN.
STONE TOE	3.0'	2.3'- 2.8'	1.8'
BOULDER STONE	3.0'	2.3'- 3.0'	2.0'
IMBRICATED STONE	3.5'	2.3'- 3.0'	2.0'
VANE ROCKS AND FOOTER	3.5'	2.3'- 3.0'	2.0'



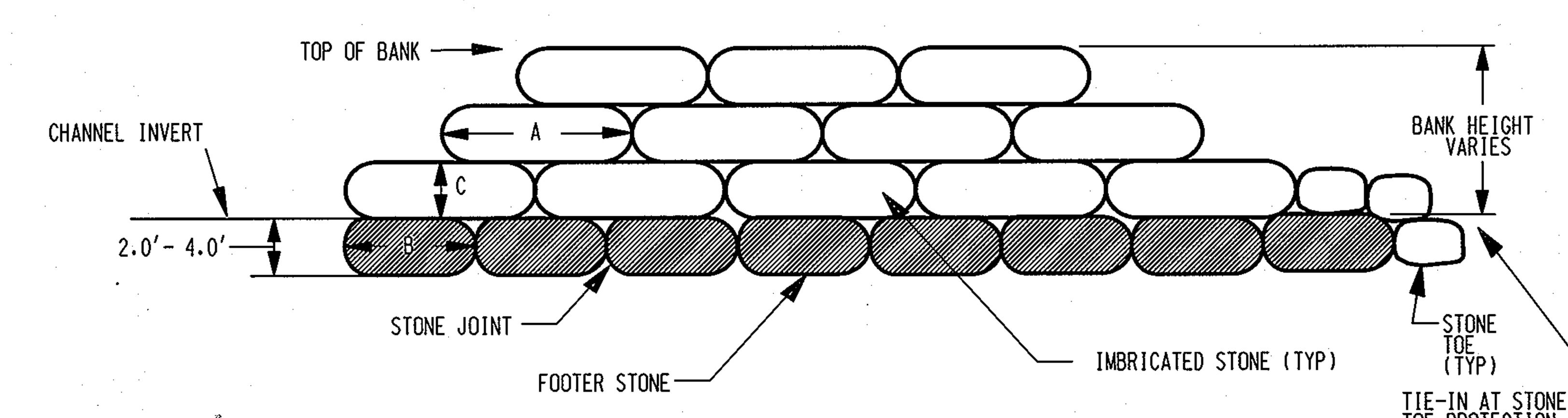
TYPICAL STONE TOE PROTECTION DETAIL

NOT TO SCALE



TYPICAL IMBRICATED BANK
PROTECTION DETAIL IN CUT

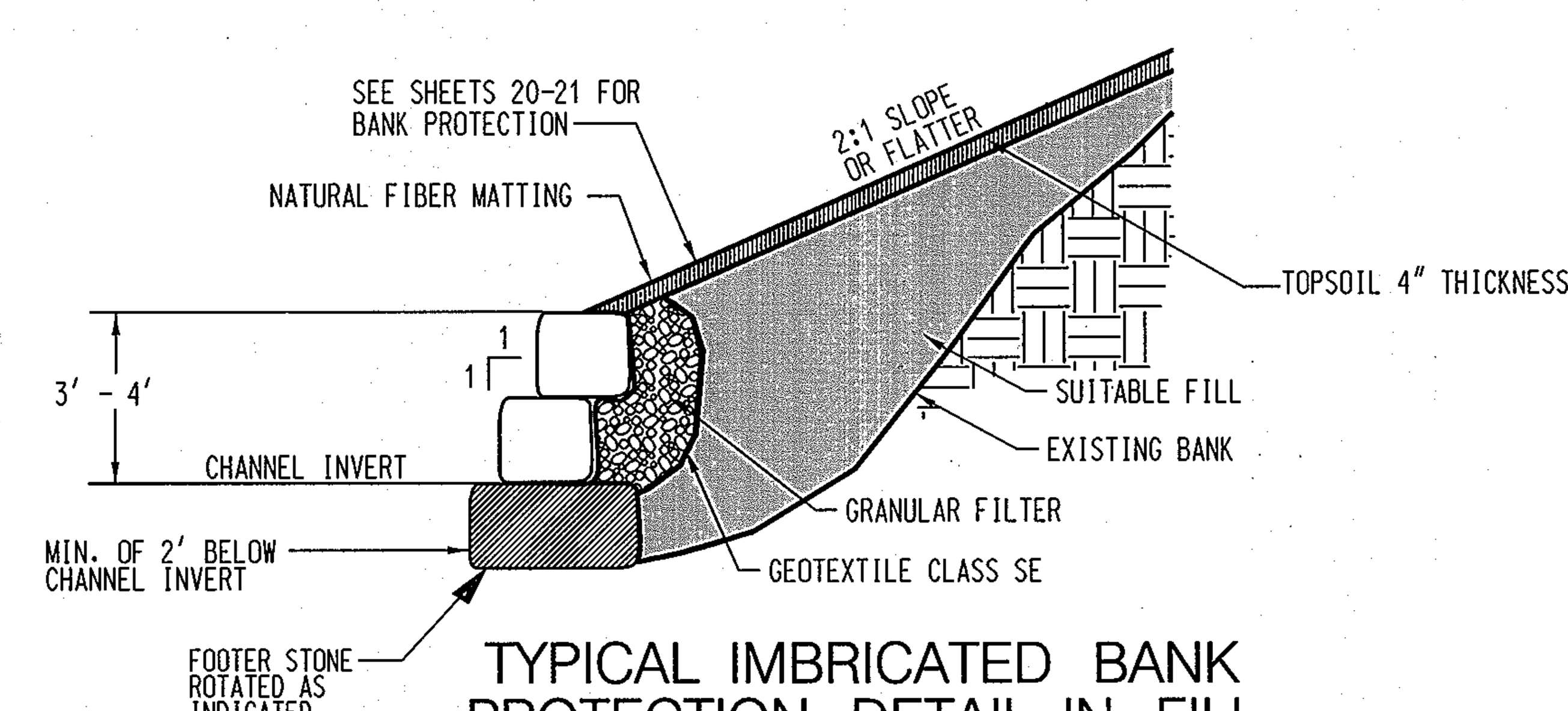
NOT TO SCALE



NOTES:
1. SEE STONE DIMENSION TABLE FOR SPECIFICS.
2. ALL STONE LAYERS SHALL BE NEATLY STACKED WITH STAGGERED JOINTS SO THAT EACH STONE RESTS FIRMLY ON TWO STONES IN THE LAYER BELOW.
3. CHINK ALL VOIDS WITH SMALLER STONE.
4. FOOTER STONES SHALL BE SET ON SUITABLE MATERIAL A MINIMUM OF 2' BELOW THE CHANNEL INVERT.
5. WHEN TIEING INTO STONE TOE PROTECTION, TAPER WALL HEIGHT DOWN TO HEIGHT OF STONE TOE PROTECTION.

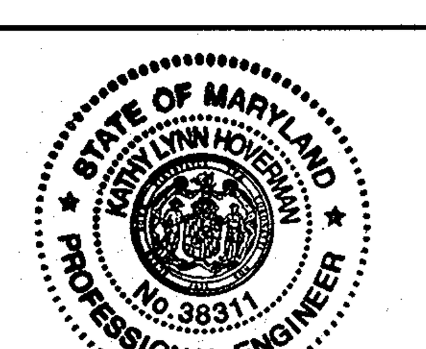
FACE VIEW - IMBRICATED STONE WALL

NOT TO SCALE



TYPICAL IMBRICATED BANK
PROTECTION DETAIL IN FILL

NOT TO SCALE



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311 EXPIRATION DATE: JANUARY 06, 2013

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 8/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2004 \ 01043223.26 \

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

HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

DETAILS

SCALE: NOT TO SCALE
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SDP-10-095

LEGEND

LIMIT OF DISTURBANCE	LOD LOD
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	387
EDGE OF TREELINE	
EDGE OF WETLAND	
WATERS OF THE UNITED STATES	WUS WUS
PROPERTY LINE	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	S S
STONE TOE PROTECTION	
IMBRICATED WALL	
BOULDER CLUSTER	
RIFFLE GRADE CONTROL	
SLOPES 15%-25%	
SLOPES >25%	

STATE OF MARYLAND
KEVIN LYNN HOVERMAN
No. 38311
PROFESSIONAL ENGINEER

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APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/5/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

PLOTTED: "11:09 AM on Monday, January 03, 2011"
BY: Harmony Miller, Division: P050 Natural Res GIA, Emp
File: N:\2004\00043223.26\engr\plot\steep.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\2004\00043223.26\

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HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3

HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046

PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 6
HOWARD COUNTY, MARYLAND

STEEP SLOPES

SCALE: 0 0.25 0.5 1.0 INCHES
1" = 50'

DATE: NOVEMBER 8, 2010

KCI JOB NO.: 01-043223.26

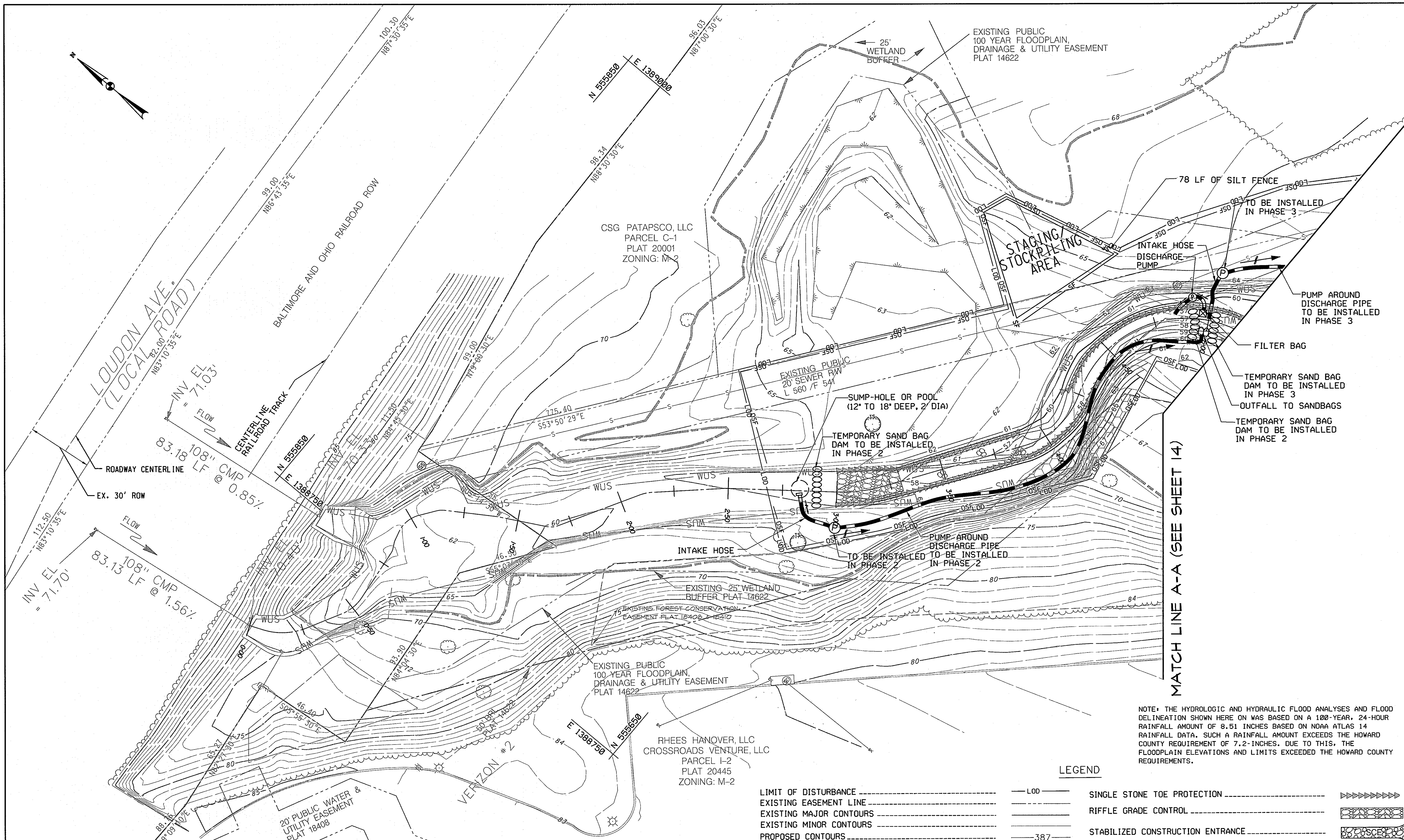
CAPITAL PROJECT NO.: D - 1122

PERMIT ISSUE:

CONSTRUCTION ISSUE:

SHEET NO.: 12 OF 25

SDP-10-095



NOTE: THE HYDROLOGIC AND HYDRAULIC FLOOD ANALYSES AND FLOOD DELINEATION SHOWN HERE ON WAS BASED ON A 100-YEAR, 24-HOUR RAINFALL AMOUNT OF 8.51 INCHES BASED ON NOAA ATLAS 14 RAINFALL DATA. SUCH A RAINFALL AMOUNT EXCEEDS THE HOWARD COUNTY REQUIREMENT OF 7.2-INCHES. DUE TO THIS, THE FLOODPLAIN ELEVATIONS AND LIMITS EXCEEDED THE HOWARD COUNTY REQUIREMENTS.

LEGEND

Item	Symbol
LIMIT OF DISTURBANCE	LOD
EXISTING EASEMENT LINE	
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	387
EXISTING TREE TO BE SAVED	
EXISTING TREE TO BE REMOVED	
EDGE OF TREELINE	
EDGE OF WETLAND	
WETLAND BUFFER (25')	
PROPERTY LINE	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	S
IMBRICATED WALL	
SINGLE STONE TOE PROTECTION	
RIFFLE GRADE CONTROL	
STABILIZED CONSTRUCTION ENTRANCE	SCE
SANDBAG DAM	
SILT FENCE	SF
PUMP	P
INTAKE HOSE AND DISCHARGE PIPE	
ORANGE SAFETY FENCE	OSF
FILTER BAG	⊠
WATERS OF THE UNITED STATES	WUS
EXISTING/PROPOSED 100-YR WSE•	

•MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

20' 0' 20' 40'
GRAPHIC SCALE
1"= 20'

STATE OF MARYLAND
KATHY LYNN HOVERMAN
No. 38311
PROFESSIONAL ENGINEER

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. 38311 EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

Reviewed for HOWARD SCD and meets Technical Requirements.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — Date 2/24/11

PLOTTED: "11:10 AM on Monday, January 03, 2011"
BY: Harmony Miller Division: P050 NaturalRes GMA Emp
FILE: M:\2004\01043223.26\drawings\es03htec.dgn

NO.	REVISIONS DESCRIPTION	DATE

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HI TECH DRIVE STREAM RESTORATION

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STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046

PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

EROSION AND SEDIMENT CONTROL PLAN

SCALE: 0 0.25 0.5 1.0 INCHES
1" = 20'

DATE: NOVEMBER 8, 2010

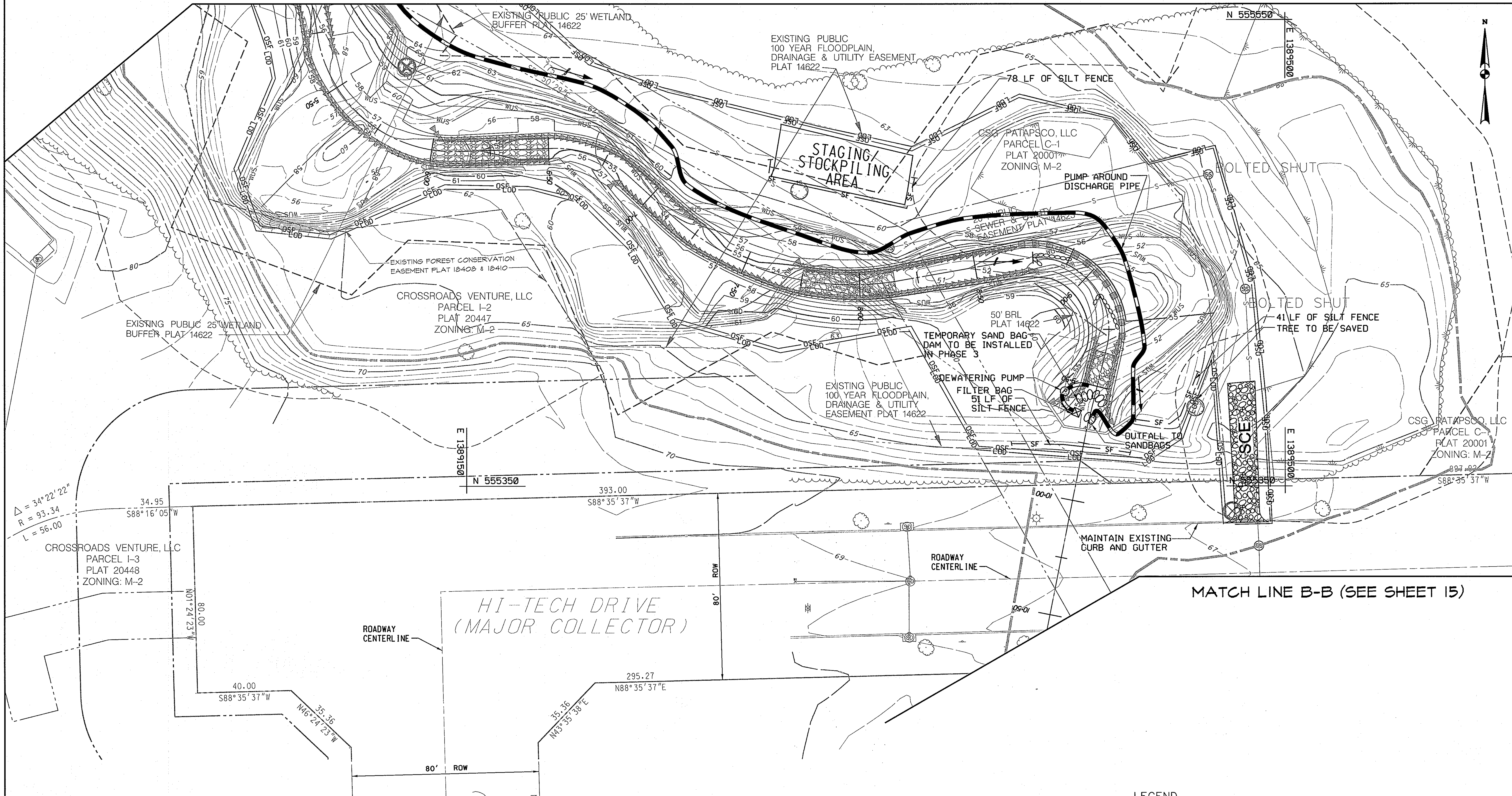
KCI JOB NO.: 01-043223.26

CAPITAL PROJECT NO.: D - 1122

PERMIT ISSUE:

CONSTRUCTION ISSUE:

MATCH LINE A-A (SEE SHEET 13)



MATCH LINE B-B (SEE SHEET 15)

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20' 0' 20' 40'
GRAPHIC SCALE
1"= 20'

LEGEND

LIMIT OF DISTURBANCE	LOD
EXISTING EASEMENT LINE	
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	387
EXISTING TREE TO BE SAVED	
EXISTING TREE TO BE REMOVED	
EDGE OF TREELINE	
EDGE OF WETLAND	
WETLAND BUFFER (25')	
PROPERTY LINE	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	S
IMBRICATED WALL	
SINGLE STONE TOE PROTECTION	
RIFFLE GRADE CONTROL	
STABILIZED CONSTRUCTION ENTRANCE	SCE
SANDBAG DAM	
SILT FENCE	SF
PUMP	P
INTAKE HOSE AND DISCHARGE PIPE	
ORANGE SAFETY FENCE	OSF
FILTER BAG	
WATERS OF THE UNITED STATES	WUS
EXISTING/PROPOSED 100-YR WSE*	

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

STATE OF MARYLAND
PROFESSIONAL ENGINEER
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HOWARD SCD — Date 2/24/11

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TELEPHONE: (410) 316-7800
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www.kci.com
KCI TECHNOLOGIES

NO.	REVISIONS DESCRIPTION	DATE

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HI TECH DRIVE STREAM RESTORATION

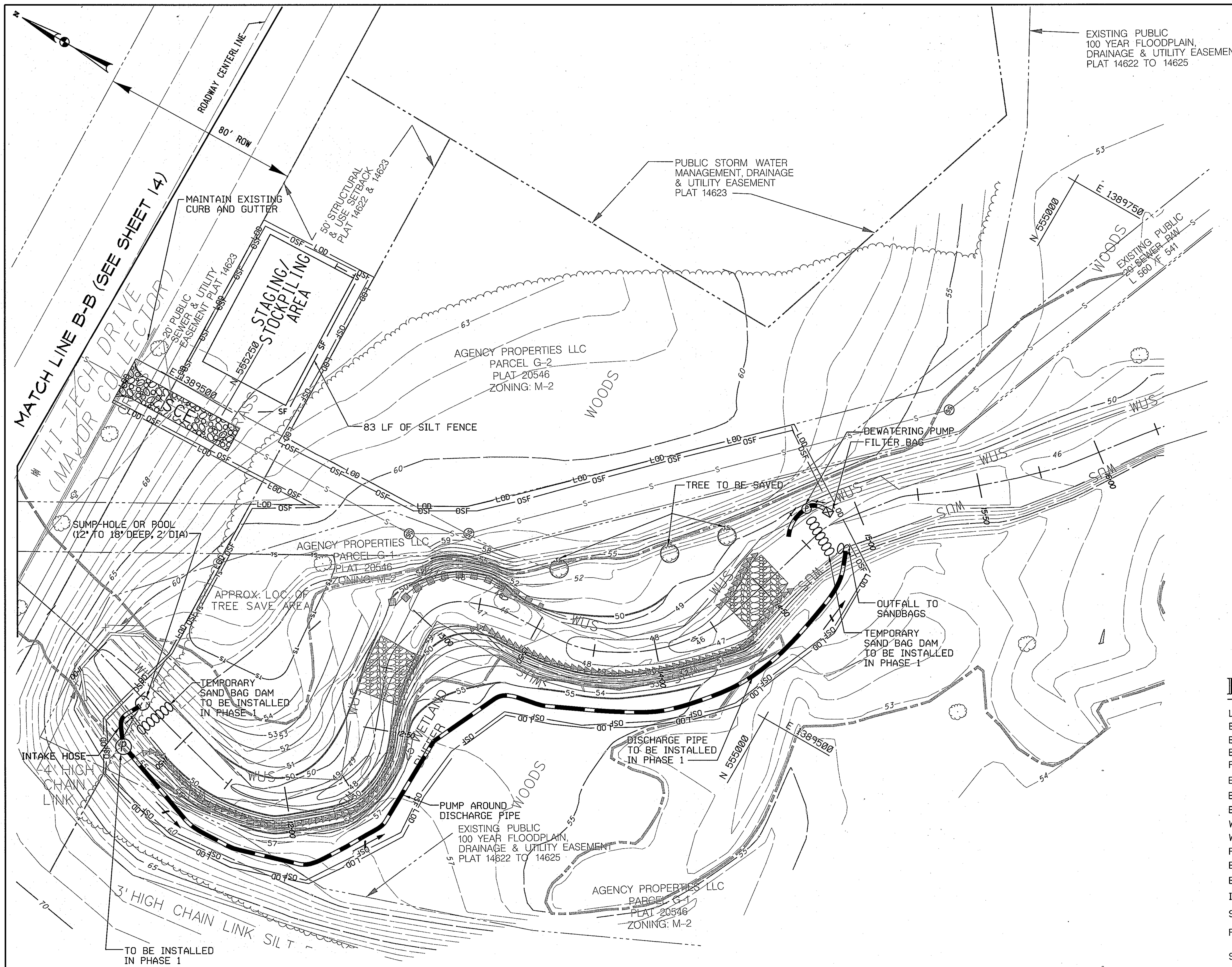
PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

EROSION AND SEDIMENT CONTROL PLAN

SCALE: 1" = 20'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SDP-10-095

PLOTTED: 11:10 AM on Monday, January 03, 2011
FILE: M:\2004\01043223.26\drawings\es02hitec.dgn



SEQUENCE OF CONSTRUCTION

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 FIVE (5) DAYS PRIOR TO BEGINNING ANY WORK.

2. CONTRACTOR SHALL TAKE EXTRA PRECAUTION FOR TRANSPORTING MATERIALS FROM THE STORAGE AREA TO THE CONSTRUCTION SITE. CONTRACTOR SHALL MINIMIZE THE IMPACT ON EXISTING TREES, WETLANDS, U.S. WATERS, EXISTING UTILITY AND OTHER EXISTING FEATURES.

3. CONTRACTOR SHALL CAUTION THE TRUCK DRIVERS TO TAKE EXTRA PRECAUTION WHILE DRIVING IN THE ACCESS AREA WITHIN THE LIMIT OF DISTURBANCE SO THAT IMPACTS ON STREAMBED, SIDE SLOPES, EXISTING TREES, U.S. WATERS, AND ANY EXISTING FEATURES CAN BE MINIMIZED.

4. ALL NECESSARY EASEMENTS AND/OR RIGHT OF WAYS SHALL BE REQUIRED PRIOR TO THE START OF THE JOB.

5. ALL IN STREAM WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE PUMP AROUND CRITERIA.

6. INSTALL SCE, SILT FENCE FOR ALL PHASE AREAS (1, 2 & 3) AS SHOWN ON THE PLAN OR AS DIRECTED BY THE SEDIMENT CONTROL INSPECTOR. ANY RUTTING, EROSION OR DISTURBANCE SHALL BE STABILIZED WITH STONE OR PROTECTED WITH SILT FENCE AT THE INSPECTOR'S DISCRETION.

PHASE 1: (STA. 11+00 TO STA. 15+00 MAIN CHANNEL)

7. INSTALL SAND BAGS, PUMP, DEWATERING DEVICE, INTAKE PIPE AND DISCHARGE PIPE ON MAIN CHANNEL STARTING FROM STA. 15+00 GOING UPSTREAM.
8. UPON INSPECTOR'S APPROVAL OF EROSION CONTROL DEVICES AND CONDITIONS, COMMENCE IN-STREAM WORK.
9. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON MAIN CHANNEL FROM STA. 15+00 TO STA. 11+00. STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA WHICH CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY THE END OF EACH DAY.
10. WITH PERMISSION FROM INSPECTOR, REMOVE THE PUMP AROUND SYSTEM AND STABILIZE THE AREA DISTURBED BY THIS PHASE. PROCEED WITH PHASE 2.

PHASE 2: (STA. 2+75 TO STA. 5+00 MAIN CHANNEL)

11. INSTALL SAND BAGS, PUMP, DEWATERING DEVICE, INTAKE PIPE AND DISCHARGE PIPE ON MAIN CHANNEL AT STA. 2+75.
12. UPON INSPECTOR'S APPROVAL OF EROSION DEVICES AND CONDITIONS, COMMENCE IN STREAM WORK.
13. PERFORM STREAM GRADING AND STREAM RESTORATION WORK ON MAIN CHANNEL FROM STA. 2+75 TO STA. 5+00. STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA WHICH CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY END OF EACH DAY.
14. WITH PERMISSION FROM INSPECTOR REMOVE THE PUMP AROUND SYSTEM AND STABILIZE THE AREA DISTURBED BY THIS PHASE. PROCEED WITH PHASE 3.

PHASE 3: (STA. 5+00 TO STA. 9+75 MAIN CHANNEL)

15. INSTALL SAND BAGS, PUMP, DEWATERING DEVICE, INTAKE PIPE AND DISCHARGE PIPE ON MAIN CHANNEL AT STA. 5+00.
16. UPON INPSECTOR'S APPROVAL OF EROSION CONTROL DEVICES AND CONDITIONS, COMMENCE IN STREAM WORK.
17. PERFORM STREAM GRADING AND STREAM RESTORATION WORK FROM ON MAIN CHANNEL FROM STA. 5+00 TO STA. 9+75. STABILIZE ALL DISTURBED AREAS AT FINAL GRADE. CONTRACTOR SHALL DISTURB ONLY THAT MUCH AREA WHICH CAN BE BROUGHT TO FINAL GRADE AND STABILIZED BY END OF EACH DAY.
18. WITH PERMISSION FROM INSPECTOR, REMOVE THE PUMP AROUND SYSTEM AND STABILIZE THE AREA DISTURBED BY THIS PHASE.

LEGEND

LIMIT OF DISTURBANCE	LOD
EXISTING EASEMENT LINE	
EXISTING MAJOR CONTOURS	
EXISTING MINOR CONTOURS	
PROPOSED CONTOURS	387
EXISTING TREE TO BE SAVED	
EXISTING TREE TO BE REMOVED	
EDGE OF TREELINE	
WATERS OF THE UNITED STATES	WUS
WETLAND BUFFER (25')	
PROPERTY LINE	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	S
IMBRICATED WALL	
SINGLE STONE TOE PROTECTION	
RIFFLE GRADE CONTROL	
STABILIZED CONSTRUCTION ENTRANCE	SCE
SANDBAG DAM	
SILT FENCE	SF
PUMP	P
INTAKE HOSE AND DISCHARGE PIPE	
ORANGE SAFETY FENCE	OSF
FILTER BAG	
EXISTING/PROPOSED 100-YR WSE*	

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

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20' 0' 20' 40'
GRAPHIC SCALE
1"= 20'

STATE OF MARYLAND — PROFESSIONAL ENGINEER — No. 38311

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311
EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11
DIRECTOR — DATE 3/10/11

Reviewed for HOWARD SCD and meets Technical Requirements.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — Date 2/24/11

PLOTTED: 11:09 AM on Monday, January 03, 2011
FILE: M:\2004\01043223.26\drawings\es01htec.dgn

NO.	REVISIONS DESCRIPTION	DATE

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COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

EROSION AND SEDIMENT CONTROL PLAN

SCALE: 0 0.25 0.5 1.0 INCHES
1" = 20'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SDP-10-095

HOWARD SOIL CONSERVATION DISTRICT

TEMPORARY SEEDING NOTES **

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 loosened.

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

Seeding: -- For periods March 1 - April 30 and from August 15 - October 15, seed with 2-1/2 bushel per acre of annual rye (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 SOIL EROSION AND SEDIMENT CONTROL for additional rates and methods not covered.

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.

Soil Amendments: In lieu of soil test recommendations, use one of the following schedules:

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

2. Acceptable -- Apply 2 tons/acre dolomitic limestone (92 lbs/1000 sq. ft.) and 1000 lbs/acre 10-10-10 fertilizer (23 lbs/1000 sq. ft.) before seeding. Harrow or disk into upper three inches of soil.

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

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

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

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

HOWARD SOIL CONSERVATION DISTRICT
STANDARD SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Public Works, Construction Inspections, prior to the start of any construction.

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

3. Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within: a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all Slopes greater than 3:1, b) 14 days as to all other disturbed or graded areas on the project site.

4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol 1, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.

5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATION FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding (Sec. 51), sod (Sec. 54), temporary seeding (Sec. 50) and mulching (Sec. 52). Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.

6. All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.

7. Site Analysis:

Total Area of Site	2.46 Acres
Area Disturbed	2.46 Acres
Area to be roofed or paved	0.00 Acres
Area to be vegetatively stabilized	2.16 Acres
Total Cut	1965 Cu. Yds.
Total Fill	1219 Cu. Yds.
Offsite waste/borrow area location	None Proposed

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.

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

Definition

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

Purpose

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

Conditions Where Practice Applies

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

a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.

b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.

c. The original soil to be vegetated contains material toxic to plant growth.

d. The soil is so acidic that treatment with limestone is not feasible.

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

Construction and Material Specifications

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

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

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a 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 1 1/2" in diameter.

ii. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be 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:

i. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:

a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.

b. Organic content of topsoil shall be not less than 1.5 percent by weight.

c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.

d. No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time as elapsed (14 days min.) to permit dissipation of 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.

MGWC 1.2: PUMP-AROUND PRACTICE

Temporary measure for dewatering in-channel construction sites

DESCRIPTION

The work shall consist of installing a temporary pump around and supporting measures to divert flow around in-stream construction sites.

IMPLEMENTATION SEQUENCE

Sediment control measures, pump-around practices, and associated channel and bank construction shall be completed in the following sequence (refer to Detail 1.2):

1. Construction activities including the installation of erosion and sediment control measures shall not begin until all necessary easement and/or right-of-ways have been acquired. Utilities should be marked in the field prior to construction. The contractor is responsible for any damage to existing utilities that may result from construction and should repair the damages at his/her own expense to the county's or utility company's satisfaction.

2. The contractor must notify the Maryland Department of the Environment or WMA sediment control inspector at least a minimum of 48 hours before beginning construction. Additionally, the contractor shall inform the local enviromental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.

3. The contractor shall conduct a pre-construction meeting on site with the WMA sediment control inspector, the county project manager, and the engineer to review limits of disturbance, erosion and sediment control requirements, and the sequence of construction. The contractor shall stake out all limits of disturbance prior to the pre-construction meeting so they may be reviewed. The participants must also designate the contractor's staging areas and flag all trees within the limit of disturbance, which will be removed for construction access. Trees should not be removed within the limit of disturbance without approval from the WMA or local authority.

4. Construction shall not begin until all sediment and erosion control measures have been installed and approved by the engineer and the sediment control inspector. The contractor must stay within the limits of the disturbance as shown on the plans and minimize disturbance within the work area whenever possible.

5. Upon installation of all sediment control measures and approval by the sediment control inspector and the local environmental protection and resource management inspection and enforcement division, the contractor shall begin work at the upstream section and proceed downstream beginning with the establishment of stabilized construction entrances. In some cases, work may begin downstream if appropriate. The sequence of construction must be followed unless the contractor gets written approval for deviations from the WMA or local authority. The contractor shall 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 workday, the work area must be stabilized and the pump around removed from the channel.

6. Sandbag dikes shall be situated at the upstream and downstream ends of the work area as shown on the plans, and stream flow should be pumped around the work area. This pump shall discharge into a stable velocity dissipator made of riprap or sandbags.

7. Water from the work area must be pumped to a sediment filtering measure such as a dewatering basin, sediment bag, or other approved source. The measure shall be located such that the water drains back into the channel below the downstream sandbag dike.

8. Traversing a channel reach with equipment within the work area where no work is proposed shall be avoided. If equipment has to traverse such a reach for access to another area, then timber mats or similar measures shall be used to minimize disturbance to the channel. Temporary stream crossings shall be used only when necessary and only where noted on the plans or specified. (See Section 4, Stream Crossings, Maryland Guidelines to Waterway Construction).

9. All stream restoration measures must 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 seed and mulch or seed and matting as specified on the plans.

10. After an area is completed and stabilized, the clean water dike must be removed. After the first sediment flush, a new clean water dike shall be established upstream from the old sediment dike. Finally, upon establishment of a new sediment dike below the old one, the old sediment dike shall be removed.

11. A pump around must be installed on any tributary or storm drain outfall, which contributes baseflow to the work area. This shall 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 must discharge onto the same velocity dissipator used for the main stem pump around.

12. If a tributary is to be restored, construction should take place on the tributary before work on the main steam reaches the tributary confluence. Construction in the tributary, including pump around practices, shall follow the same sequence as for the main stem of the river or stream. When construction on the tributary is completed, work on the main stem shall resume. Water from the tributary shall continue to be pumped around the work area in the main stem.

13. The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.

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

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. 38311 EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

Reviewed for HOWARD SCD and meets Technical Requirements.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — Date 2/24/11

PLOTTED: "11:10 AM on Monday, January 03, 2011"
BY: Harmony Miller Division: P050 Natural Res GMA Emp
FILE: M:\2004\01043223.26\drawings\es04htec.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2004 \ 01043223.26 \

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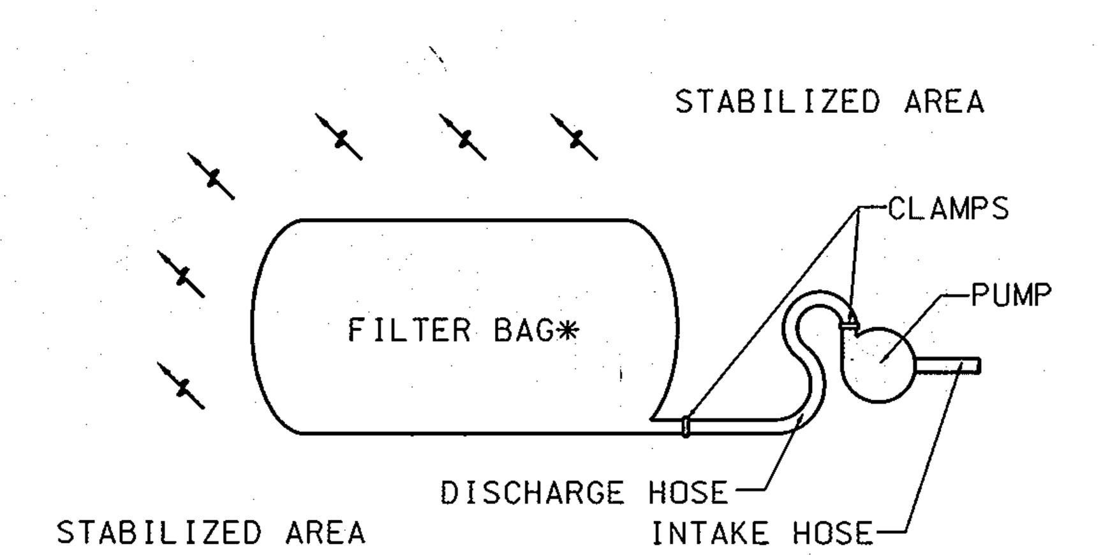
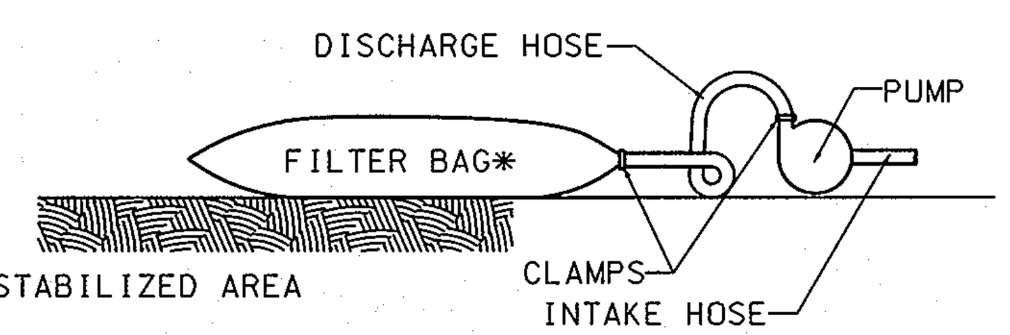
STREAM RESTORATION
PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

EROSION AND SEDIMENT CONTROL NOTES

SCALE: N/A
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:





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

FILTER BAG DEWATERING DEVICE FOR PUMPED WATER

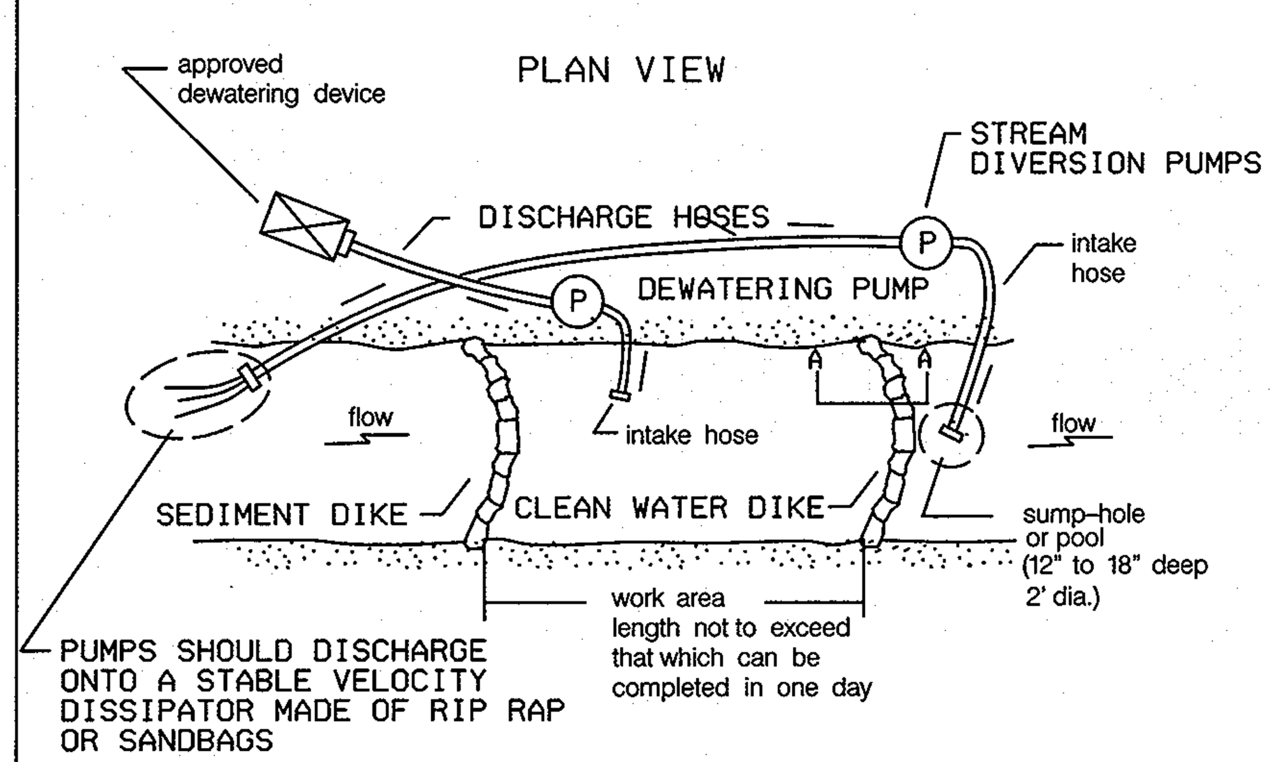
NOT TO SCALE

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 PUMPING RATE.
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. IMMEDIATELY REPLACE WITH A CLEANED OR NEW FILTER BAG.

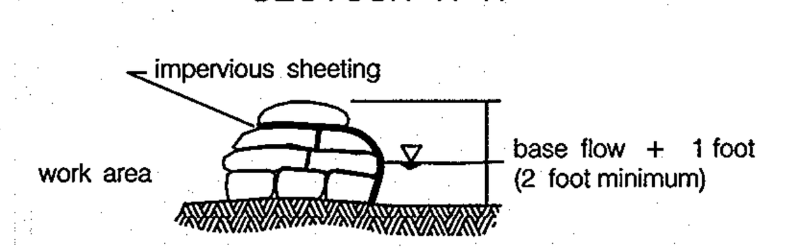
NOTE: ALL WATER COLLECTED WITHIN THE LIMIT OF DISTURBANCE (WITH THE EXCEPTION OF WATER DIVERTED AROUND THE WORK AREA) SHALL BE PUMPED THROUGH THE FILTER BAG.

DETAIL 1.2: PUMP-AROUND PRACTICE

PLAN VIEW



SECTION A-A



CROSS SECTION OF SANDBAG DIKE

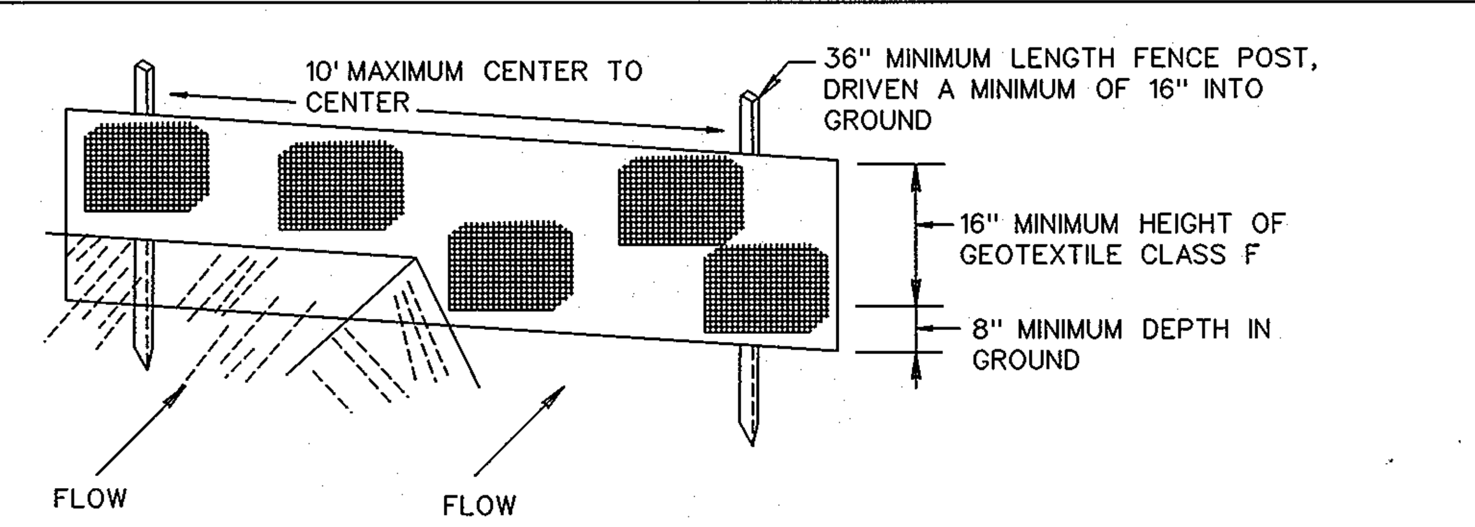
TEMPORARY INSTREAM CONSTRUCTION MEASURES	REVISED NOVEMBER 2000 PAGE 1.2 - 3	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

FILTER BAG SPECIFICATIONS

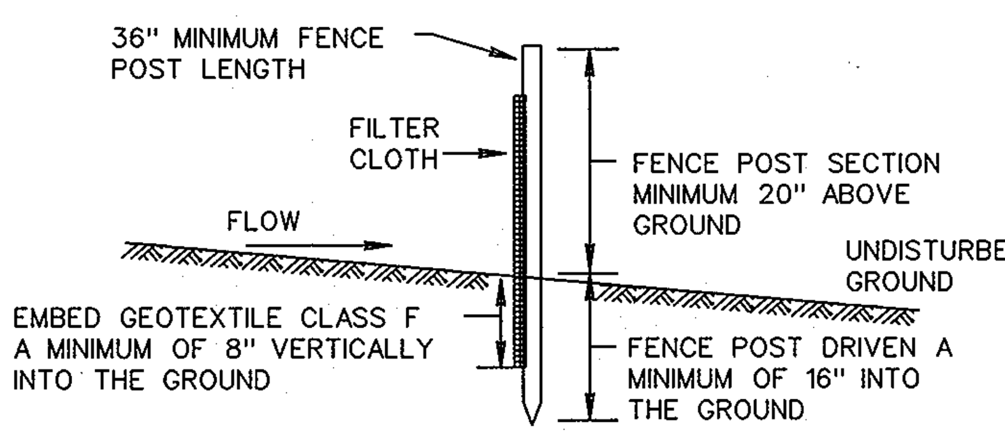
1. FILTER BAG SHALL BE MADE OF NON-WOVEN GEOTEXTILE WITH A MINIMUM SURFACE AREA OF 225 SQUARE FEET PER SIDE.
2. ALL STRUCTURAL SEAMS SHALL BE SEWN WITH A DOUBLE STITCH USING A DOUBLE NEEDLE MACHINE WITH HIGH STRENGTH THREAD. SEAM STRENGTH SHALL WITHSTAND 100 LB/IN USING ASTM D-4884 TEST METHOD.
3. FILTER 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) STABILIZED 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:

WEIGHT	10 OZ/YD	ASTM D-3776
GRAB TENSILE	210 LBS.	ASTM D-4632
PUNCTURE	150 LBS.	ASTM D-4833
FLOW RATE	70 GAL/MIN/FT2	ASTM D-4491
PERMITTIVITY (SEC-1)	1.3 SEC-1	ASTM D-4991
UV RESISTANCE	70% STRENGTH @ 500 HOURS	ASTM D-4355
APPARENT OPENING SIZE (AOS)	0.15-0.18 mm	ASTM D-4751

DETAIL 22 - SILT FENCE

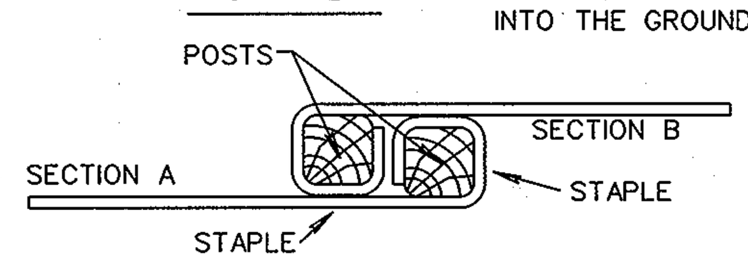


PERSPECTIVE VIEW

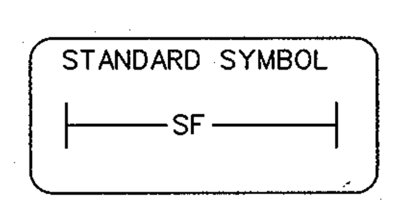


CROSS SECTION

TOP VIEW



JOINING TWO ADJACENT SILT FENCE SECTIONS



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1½" x 1½" square (minimum) cut, or 1¾" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.

2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:

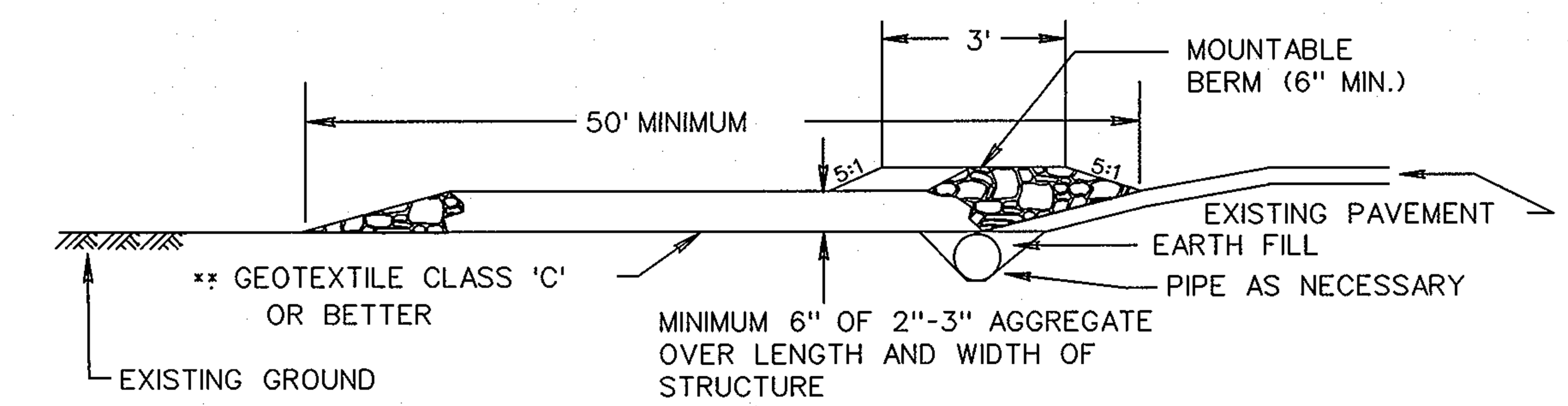
Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal ft^2/ minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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

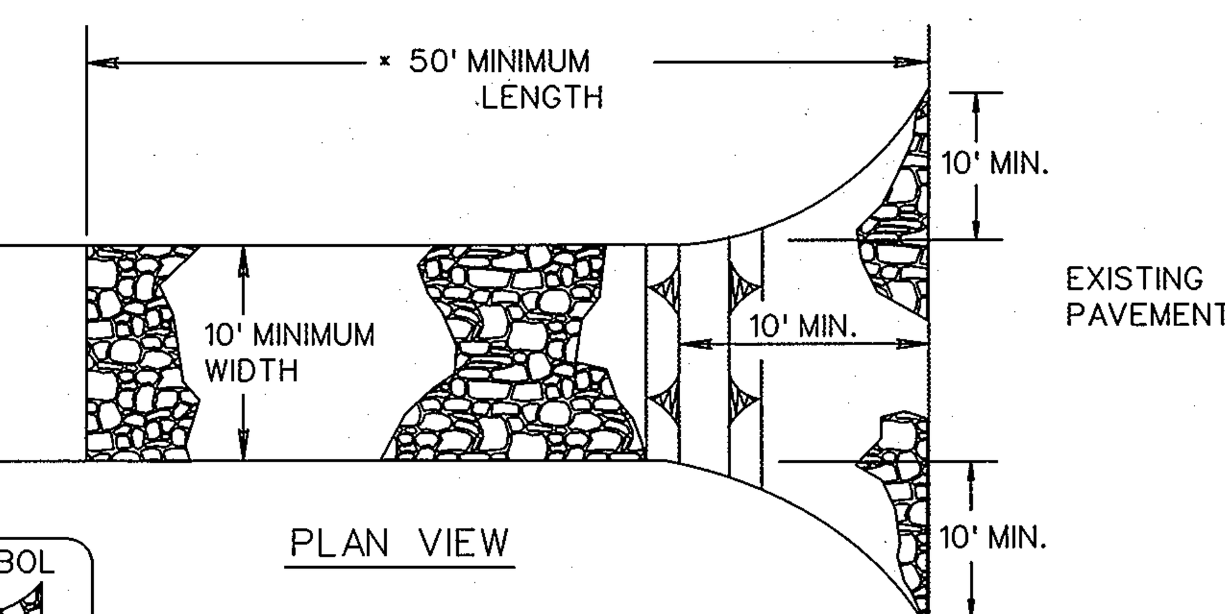
4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

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

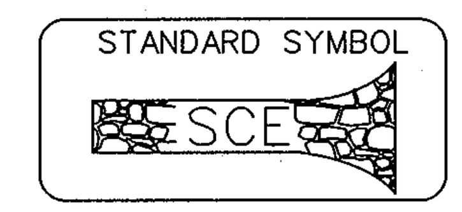
DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



PROFILE



PLAN VIEW



Construction Specification

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

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

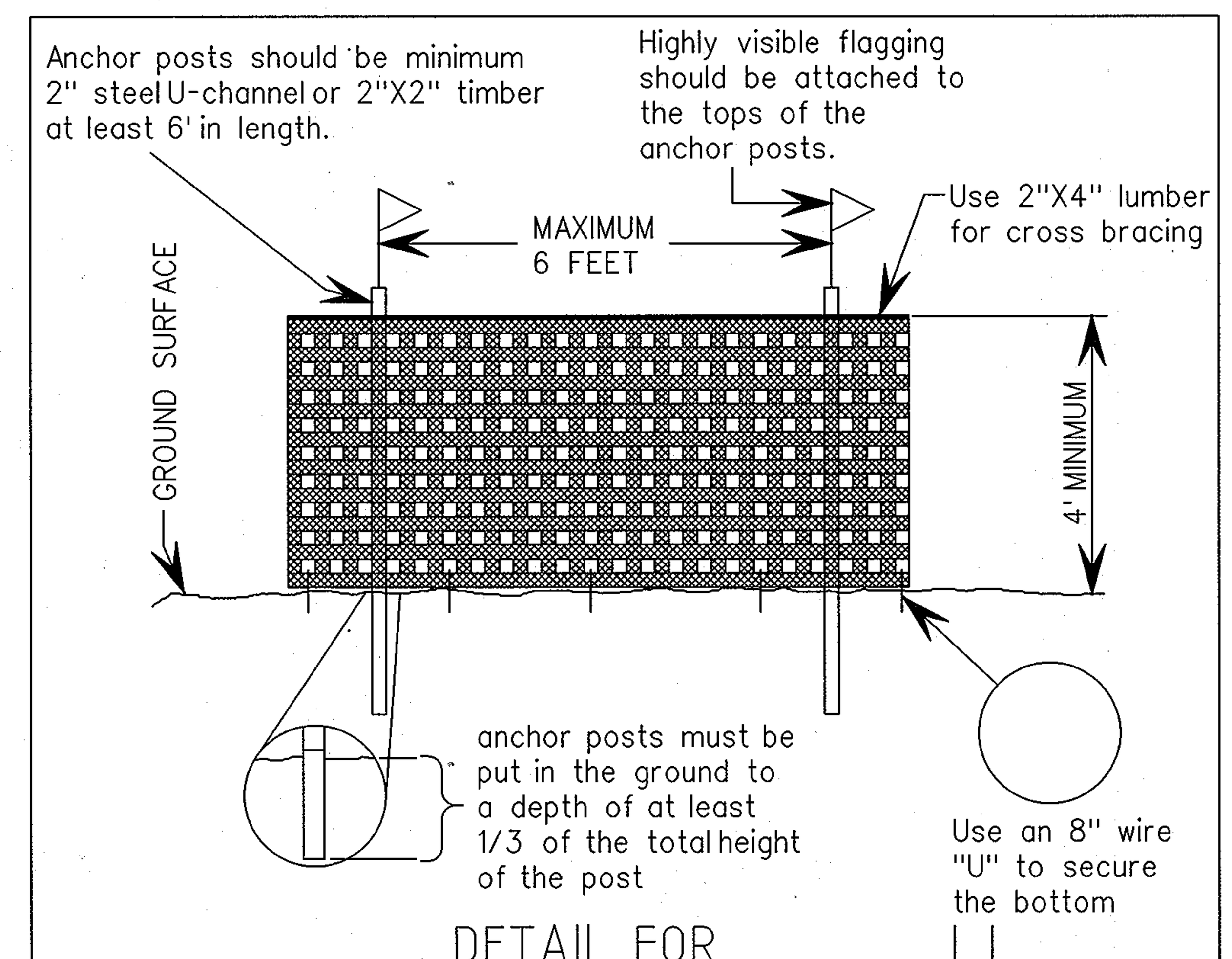
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

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

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

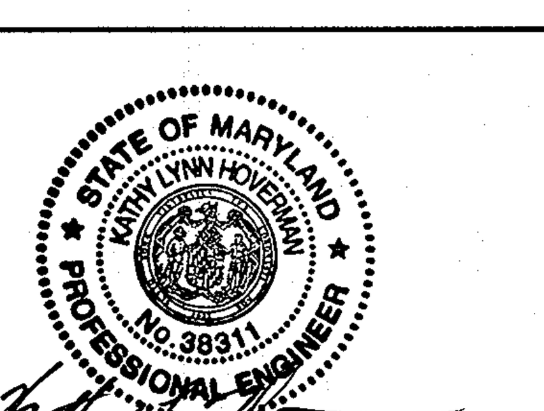
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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



DETAIL FOR BLAZE ORANGE PLASTIC MESH SAFETY FENCE

NOT TO SCALE



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311 EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/18/11

Reviewed for HOWARD SCD and meets Technical Requirements.

This development plan is approved for soil erosion and sediment control by the HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SCD — Date 2/24/11

PLOTTED: "11:11 AM on Monday, January 03, 2011" BY: Kenney Miller Sigma Emp FILE: M:\2004\01043223.26\drawings\es05htec.dgn

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\ 2004 \ 01043223.26 \

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

HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS STORMWATER MANAGEMENT DIVISION 6751 COLUMBIA GATEWAY DRIVE COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2 ELECTION DISTRICT 01 HOWARD COUNTY, MARYLAND

EROSION AND SEDIMENT CONTROL DETAILS

SCALE: AS SHOWN

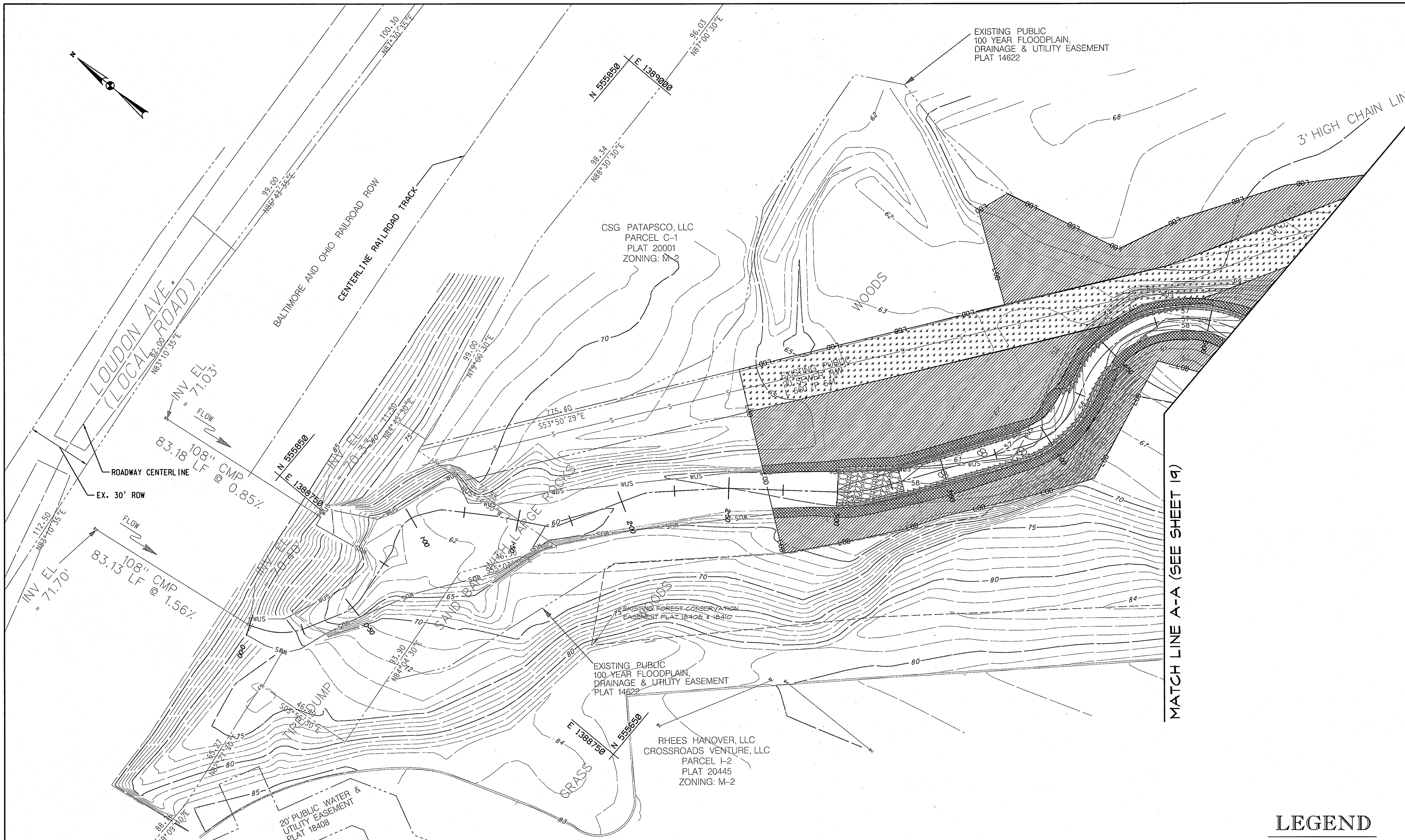
DATE: NOVEMBER 8, 2010

KCI JOB NO.: 01-043223.26

CAPITAL PROJECT NO.: D - 1122

PERMIT ISSUE:

CONSTRUCTION ISSUE:



LEGEND

- LIVE STAKES ZONE
- RIPARIAN ZONE
- TURF ZONE

KCI TECHNOLOGIES
936 Ridgebrook Road
Sparks, Maryland 21152
Telephone: (410) 316-7800
Fax: (410) 316-7818
www.kci.com

NO.	REVISIONS DESCRIPTION	DATE

KCIFILE: M:\ 2004 \ 01043223.26 \

HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

LANDSCAPE PLAN

SCALE: 0 0.25 0.5 1.0 INCHES
1" = 20'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

STATE OF MARYLAND
KATHY LYNN HOVERMAN
No. 38311
PROFESSIONAL ENGINEER

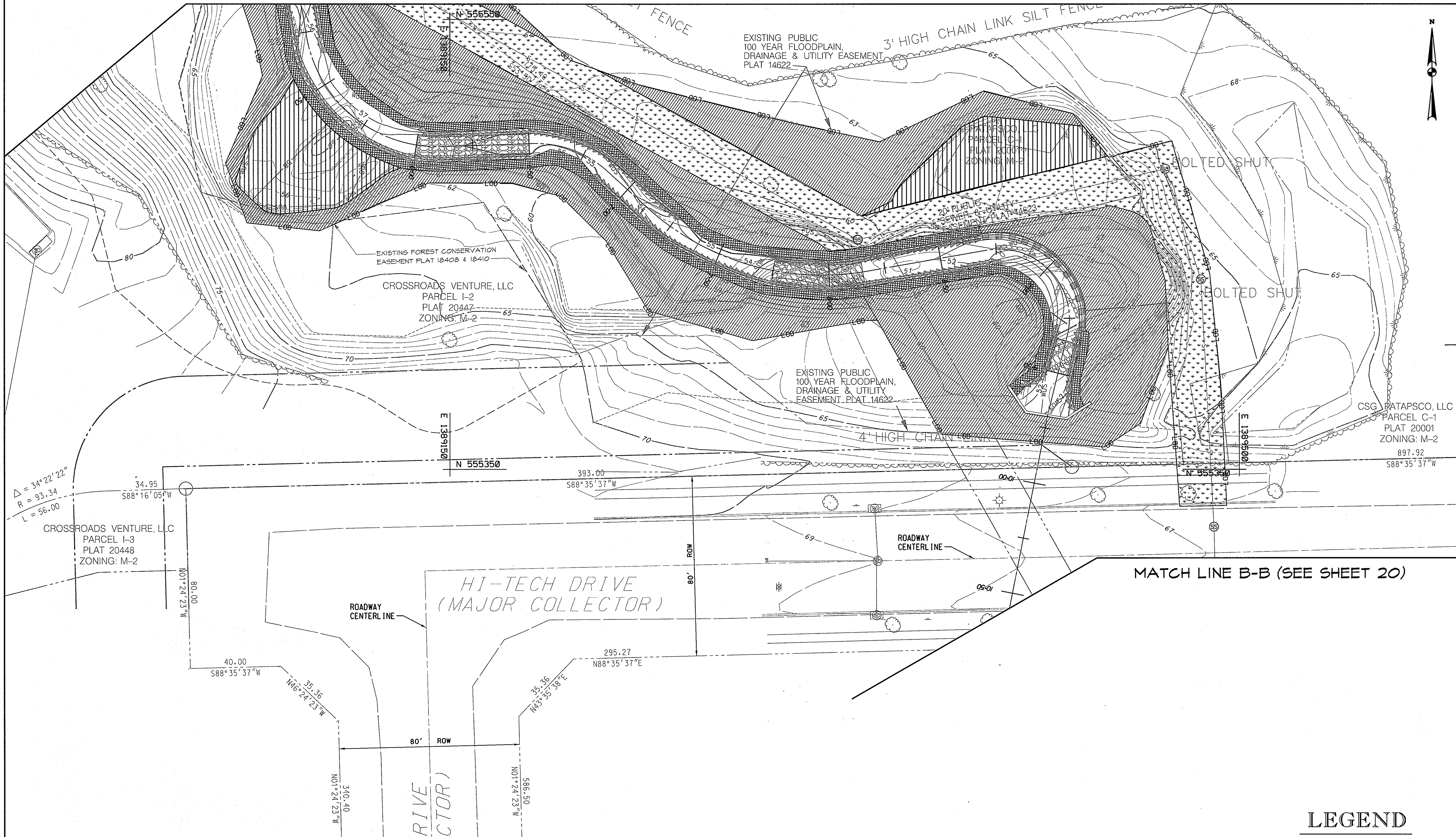
PROFESSIONAL CERTIFICATION. I HERERBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME , AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311 EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11
DIRECTOR — DATE 3/10/11

PLOTTED: "11:12 AM on Monday, January 03, 2011"
BY: Harmony Miller Division: P050 NaturalRes GMA Emp
FILE: M:\2004\01043223.26\drawings\ls03htec.dgn

MATCH LINE A-A (SEE SHEET 18)



MATCH LINE B-B (SEE SHEET 20)

LEGEND

- LIVE STAKES ZONE
- RIPARIAN ZONE
- TURF ZONE
- FLOODPLAIN ZONE

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 39311 EXPIRATION DATE: JANUARY 06, 2012

STATE OF MARYLAND — KATHY LYNN HOVERMAN — No. 39311 — PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 3/9/11
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 3/10/11
DIRECTOR	DATE 3/10/11

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NO.	REVISIONS DESCRIPTION	DATE

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HI TECH DRIVE STREAM RESTORATION

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6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

LANDSCAPE PLAN

SCALE: 1" = 20'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SDP-10-095

MATCH LINE B-B (SEE SHEET 19)

HI-TECH DRIVE (MAJOR COLLECTOR)

ROADWAY CENTERLINE

80' ROW

588.78
N88°35'37.00"E

50' STRUCTURAL & USE SETBACK PLAT 14622 & 14623

20' PUBLIC SEWER & UTILITY EASEMENT PLAT 14623

N88°35'37"E 205.22

N 555250

E 1389300

PUBLIC STORM WATER MANAGEMENT, DRAINAGE & UTILITY EASEMENT PLAT 14623

AGENCY PROPERTIES LLC
PARCEL G-2
PLAT 20546
ZONING: M-2

EXISTING PUBLIC
100 YEAR FLOODPLAIN,
DRAINAGE & UTILITY EASEMENT
PLAT 14622 TO 14625

BLUE RUN 1
ENTERPRISES, LLC
PARCEL H
PLAT 17951
ZONING: M-2

N 555000

E 1389750

EXISTING PUBLIC
25' SEWER EASEMENT
L 360 F 541

S67°01'26"W 183.15

S33°01'26"W 41.25

S17°00'51"W 245.22

S68°48'22"E 199.72

N88°35'37"E 144.75

APPROX. LOC. OF TREE SAVE AREA

44' HIGH CHAIN LINK

BUILD POINT BAR WITH EXISTING SALVAGED SAND
NO LANDSCAPING IN THIS AREA

EXISTING PUBLIC
100 YEAR FLOODPLAIN,
DRAINAGE & UTILITY EASEMENT
PLAT 14622 TO 14625

AGENCY PROPERTIES LLC
PARCEL G-1
PLAT 20546

3' HIGH CHAIN LINK SILT FENCE

25' WETLAND BUFFER

WETLAND
PLAT 14623

WOODS

GRASS

E 1389500

N 555000

LEGEND

- LIVE STAKES ZONE
- RIPARIAN ZONE
- BRUSH MATTRESS ZONE
- TURF ZONE

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311 EXPIRATION DATE: JANUARY 06, 2012

STATE OF MARYLAND · MARY LYNN HOVEMAN · No. 38311 · PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/5/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

NO.	REVISIONS DESCRIPTION	DATE

KCI FILE: M:\2004\01043223.26\

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

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3

HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046

PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 6
HOWARD COUNTY, MARYLAND

LANDSCAPE PLAN

SCALE: 1" = 20' (0 0.25 0.5 1.0 INCHES)

DATE: NOVEMBER 8, 2010

KCI JOB NO.: 01-043223.26

CAPITAL PROJECT NO.: D - 1122

PERMIT ISSUE:

CONSTRUCTION ISSUE:

SHEET NO.: 20 OF 25

SDP-10-095

PLOTTED: 11:11 AM on Monday, January 03, 2011
By: thomas.miller
File: M:\2004\01043223.26\Drawings\Landscape.dwg

MASTER PLANT SCHEDULE

SYMBOL

LIVE STAKES (SHEETS 18-20)

(7847 SF / 0.18 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
491 ea.	Salix lucida	Shining willow	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.
491 ea.	Salix sericea	Silky willow	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.
491 ea.	Salix exigua ssp interior	Sandbar willow	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.
491 ea.	Salix nigra	Black willow	3' Length 1"-1.5" dia.	Dormant stems	2' O.C.

BRUSH MATTRESS ZONE (SHEETS 18-20)

(882 SF / 0.02 AC)

Botanical Name	Common Name
Salix sericea	Silky willow
Salix lucida	Shining willow

AN EQUAL AMOUNT OF EACH SPECIES SHALL BE RANDOMLY PLACED AS SPECIFIED TO COVER THE TOTAL AREA.

TURF GRASS ZONE (SHEETS 19-21)

(24731 SF / 0.57 AC)

Qty(lbs)	Botanical Name
57	Seed mix No. 1 (920.04.02)

*APPLICATION RATE 100 LBS PER ACRE

RIPARIAN ZONE (SHEETS 18-20)

(46731 SF / 1.07 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
SHRUBS					
96 ea.	Ilex glabra*	Inkberry holly	3' Height	Container	6'-8' O.C.
96 ea.	Lindera benzoin*	Spicebush	3' Height	Container	6'-8' O.C.
96 ea.	Rhododendron atlanticum	Dwarf azalea	3' Height	Container	6'-8' O.C.
96 ea.	Spiraea alba	Meadow sweet	3' Height	Container	6'-8' O.C.
TREES					
46 ea.	Liriodendron tulipifera	Tulip poplar	5' Height	Container	10'-12' O.C.
46 ea.	Nyssa sylvatica	Black gum	5' Height	Container	10'-12' O.C.
46 ea.	Platanus occidentalis	Sycamore	5' Height	Container	10'-12' O.C.
46 ea.	Carpinus caroliniana	Musclewood	5' Height	Container	10'-12' O.C.
46 ea.	Salix nigra	Black willow	5' Height	Container	10'-12' O.C.

*NOTE: PLANTS SELECTED FOR ILEX GLABRA AND LINDERA BENZOIN MUST BE MALE, STERILE OR NON-FRUIT PRODUCING SPECIES

FLOODPLAIN ZONE (SHEET 19)

(4,222 SQ FT / 0.10 AC)

Qty	Botanical Name	Common Name	Size	Form	Spacing/Rate
SHRUBS					
9 ea.	Ilex glabra*	Inkberry holly	3' Height	Container	6'-8' O.C.
9 ea.	Lindera benzoin*	Spicebush	3' Height	Container	6'-8' O.C.
9 ea.	Rhododendron atlanticum	Dwarf azalea	3' Height	Container	6'-8' O.C.
9 ea.	Spiraea alba	Meadow sweet	3' Height	Container	6'-8' O.C.
TREES					
4 ea.	Liriodendron tulipifera	Tulip poplar	5' Height	Container	10'-12' O.C.
4 ea.	Nyssa sylvatica	Black gum	5' Height	Container	10'-12' O.C.
4 ea.	Platanus occidentalis	Sycamore	5' Height	Container	10'-12' O.C.
4 ea.	Carpinus caroliniana	Musclewood	5' Height	Container	10'-12' O.C.
4 ea.	Salix nigra	Black willow	5' Height	Container	10'-12' O.C.

PERMANENT SEEDING FOR RIPARIAN ZONE (SHEETS 18-20)

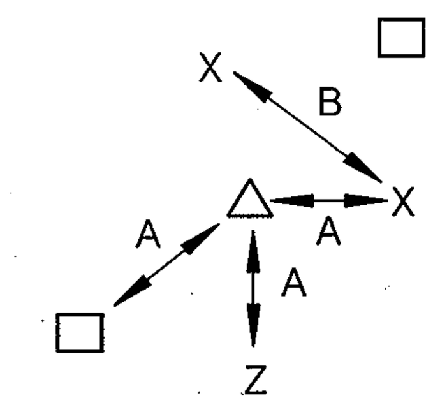
(46731 SF / 1.07 AC)

Botanical Name	Common Name	Application Rate (lbs/ac)	% of Mix	Quantity (lbs)
Panicum virgatum	Switchgrass	18.0	24%	19.2
Poa trivialis	Rough bluegrass	30.0	40%	32.0
Panicum clandestinum	Deer tongue grass	18.0	24%	19.2
Bromus ciliatus	Fringed brome	9.0	12%	9.6
	TOTALS	75.0	100%	80.0

FLOODPLAIN SEEDING FOR LIVE STAKE, BRUSH MATTRESS AND FLOODPLAIN ZONES (SHEETS 18-20)

(12961 SF / 0.30 AC)

	Botanical Name	Common Name	% of Mix	Quantity (lbs)
	Carex vulpinoidea	Fox sedge	10.0	0.65
	Elymus virginicus	Virginia wild rye	15.0	0.98
	Elymus villosus	Silky wild rye	15.0	0.98
	Andropogon gerardii, Niagara	Niagara big bluestem	40.0	2.60
	Verbena hastata	Blue vervain	10.0	0.65
	Desmodium canadense	Showy tick trefoil	10.0	0.65
Total Application Rate of 1/2 lb/ 1000 SF		TOTALS	100.0	6.51

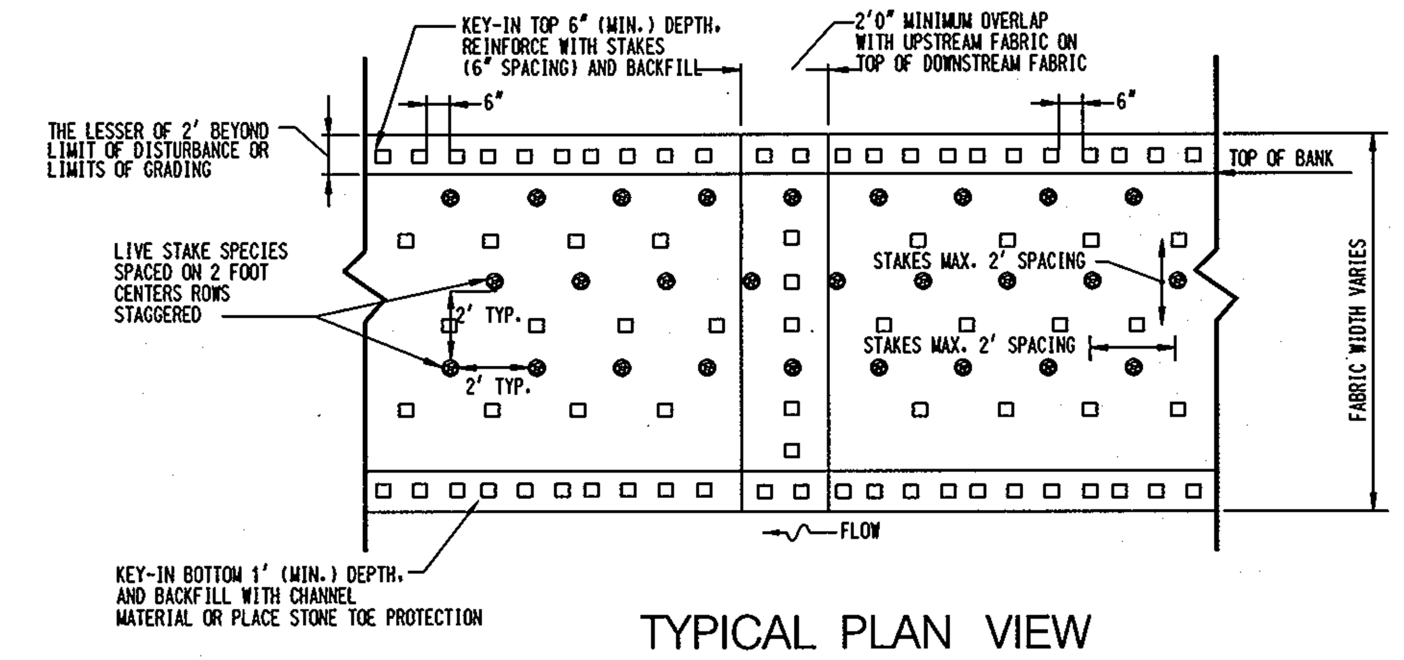


△, □ TREE SPECIES A: MINIMUM SPACING PER SCHEDULE

X, Z SHRUB SPECIES B: DUPLICATE SPECIES SPACING MINIMUM 2 TIMES MINIMUM SPACING

TREE AND SHRUB RANDOM SPACING

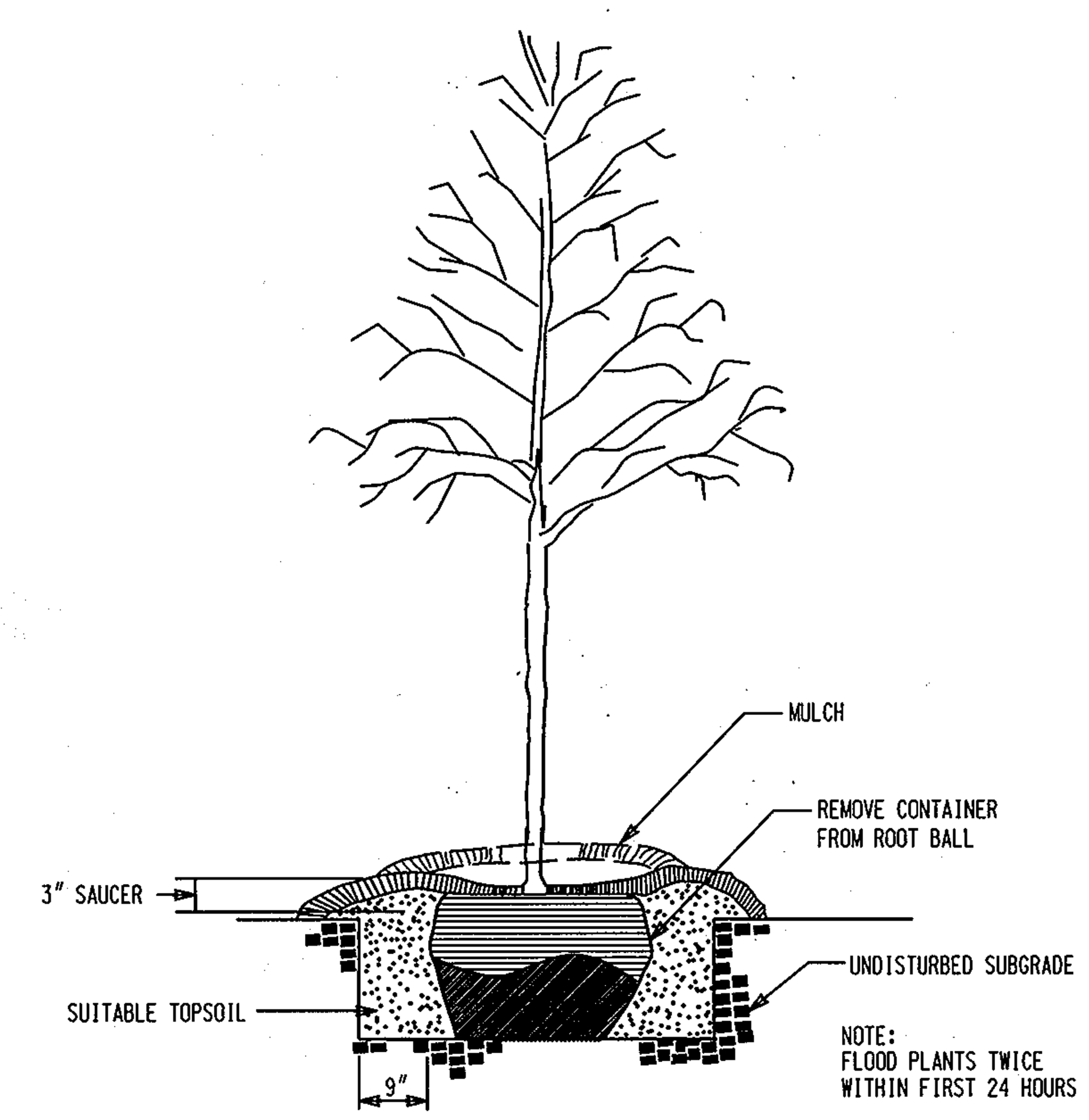
NOT TO SCALE



TYPICAL PLAN VIEW NATURAL FIBER MATTING WITH LIVE STAKES

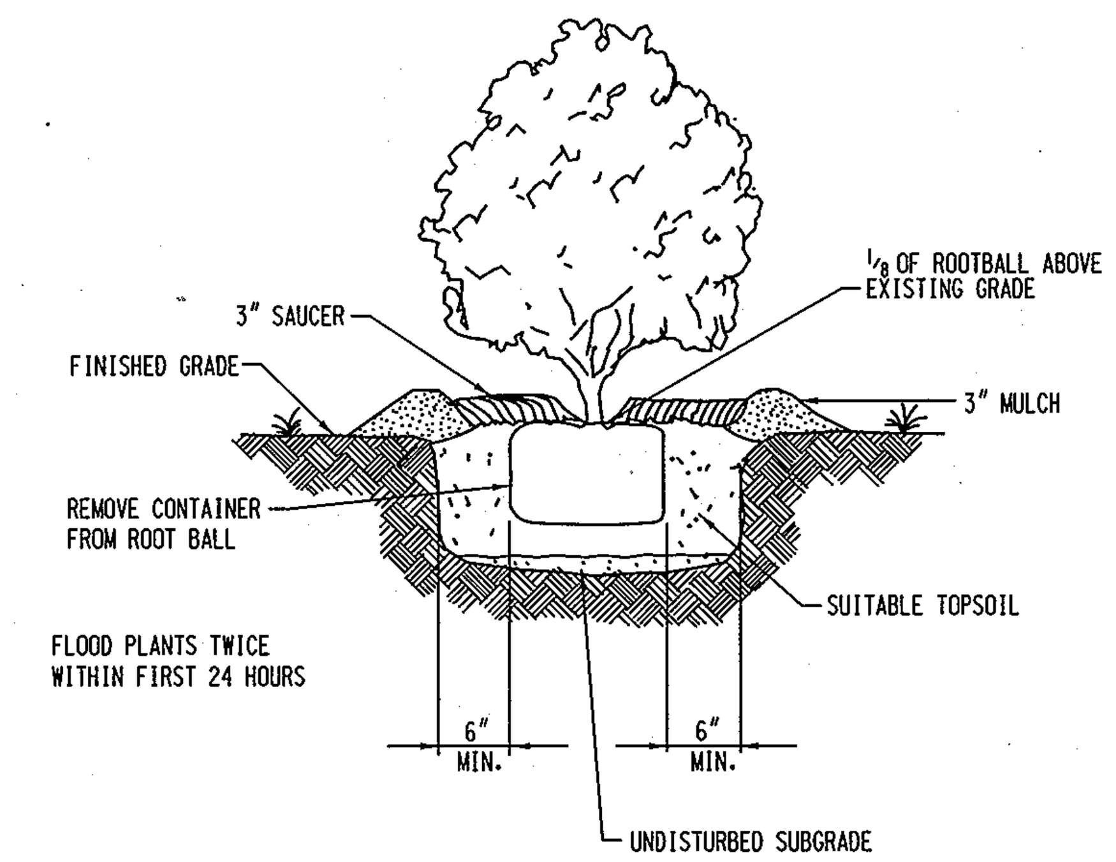
NOT TO SCALE

NOTES:
1. 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)
2. NATURAL FIBER MATTING IS TO BE INSTALLED ON ALL GRADED BANK SLOPES THAT ARE NOT PROTECTED BY STONE TOE, IMBRICATED BANK PROTECTIONS, OR BRUSH MATTRESS.



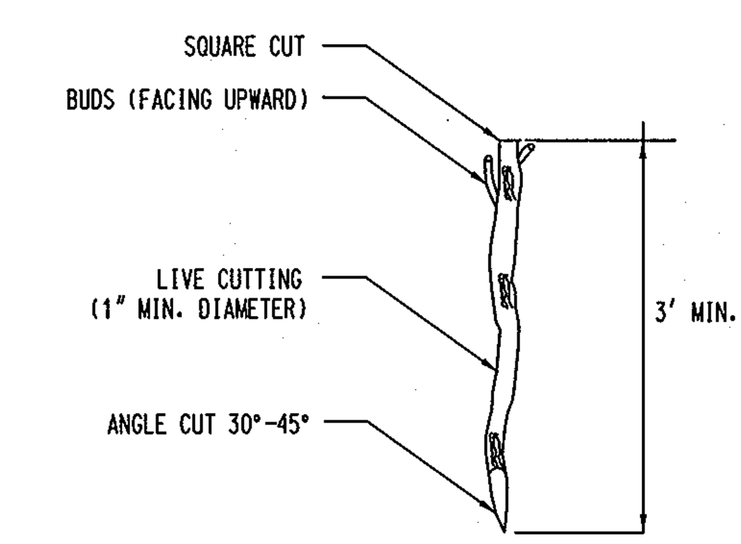
TREE PLANTING DETAIL

NOT TO SCALE



TREE & SHRUB PLANTING DETAIL

NOT TO SCALE



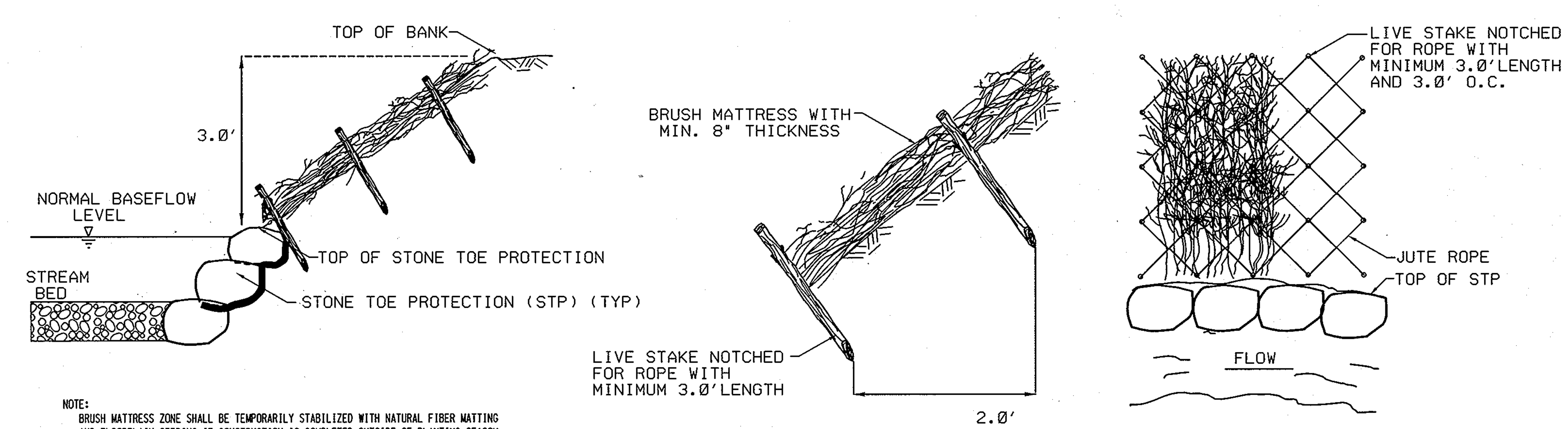
LIVE STAKE DETAIL

NOT TO SCALE

SECTION VIEW

DETAIL

PLAN VIEW



NOTE:
BRUSH MATTRESS ZONE SHALL BE TEMPORARILY STABILIZED WITH NATURAL FIBER MATTING AND FLOODPLAIN SEEDING IF CONSTRUCTION IS COMPLETED OUTSIDE OF PLANTING SEASON. PLANTING SEASON FOR BRUSH MATTRESS IS NOVEMBER 1 TO APRIL 30.

BRUSH MATTRESS

NOT TO SCALE

ADAPTED FROM USDA-SCS (1994)
DETAIL 2.8: BRUSH MATTRESSES
REVISED NOVEMBER 2000
PAGE 2.8 - 3

STATE OF MARYLAND — PROFESSIONAL ENGINEER — No. 38311

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 38311 EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/8/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/16/11

NO. | REVISIONS DESCRIPTION | DATE

KCIFILE: MA\ 2004 \ 01043223.26 \

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HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER SECTION 3, AREA 3

HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS STORMWATER MANAGEMENT DIVISION 6751 COLUMBIA GATEWAY DRIVE COLUMBIA, MARYLAND 21046

PARCEL 285, TAX MAP 38, ZONING M-2 ELECTION DISTRICT 01 HOWARD COUNTY, MARYLAND

LANDSCAPE NOTES & DETAILS

SCALE: NOT TO SCALE

DATE: NOVEMBER 8, 2010

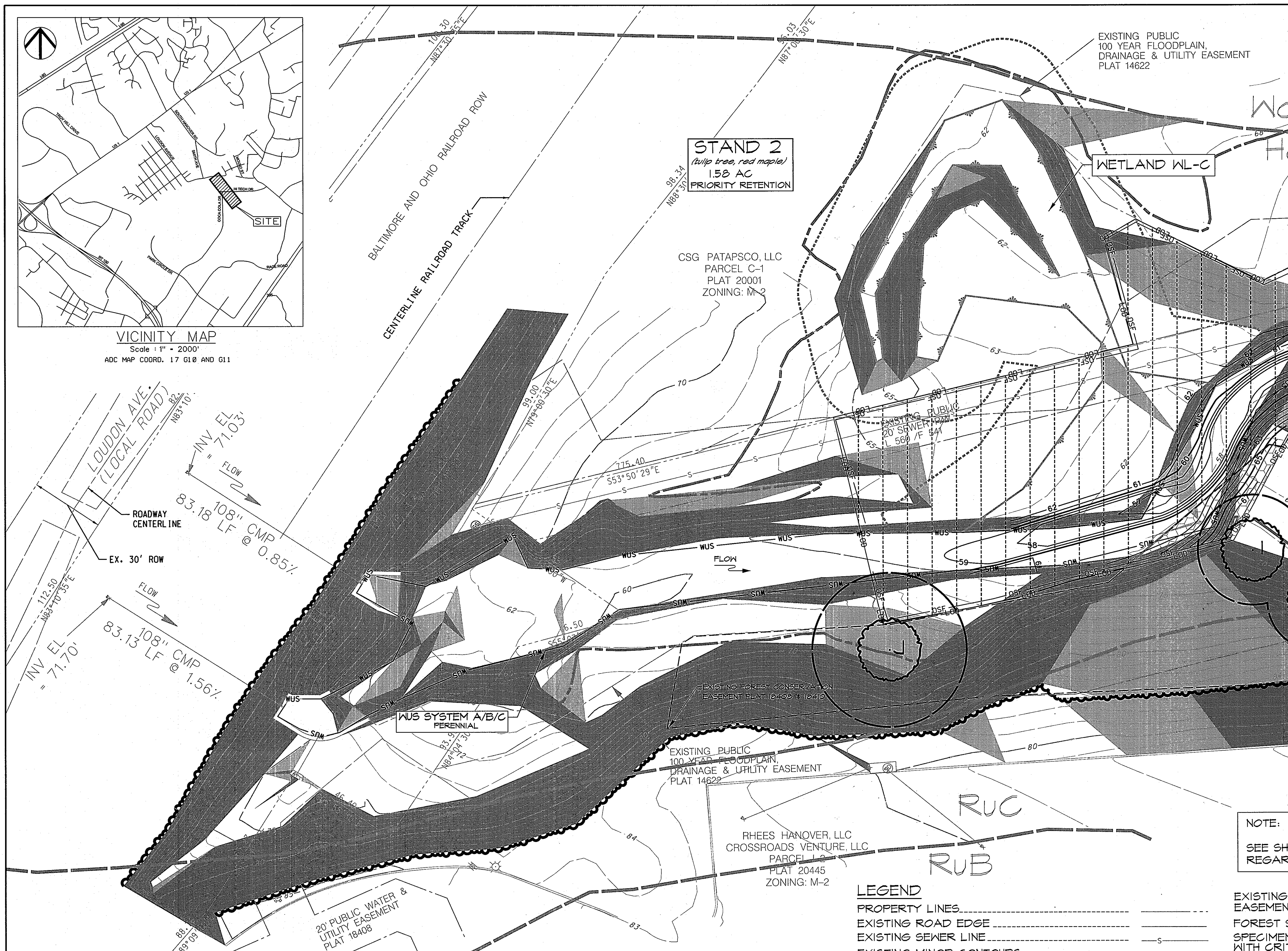
KCI JOB NO.: 01-043223.26

CAPITAL PROJECT NO.: D - 1122

PERMIT ISSUE:

CONSTRUCTION ISSUE:

SDP-10-095



NOTE:

SEE SHEET 25 OF 25 FOR ADDITIONAL INFORMATION REGARDING THE FOREST CONSERVATION PLAN.

LEGEND

PROPERTY LINES	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	S
EXISTING MINOR CONTOURS	
EXISTING MAJOR CONTOURS	50
PROPOSED MINOR CONTOURS	61
PROPOSED MAJOR CONTOURS	50
EXISTING EASEMENTS	
WATERS OF THE UNITED STATES	WUS
STREAM BUFFER	
EXISTING NONTIDAL WETLAND	
25-FOOT NONTIDAL WETLAND BUFFER	
SOILS BOUNDARY AND MAP UNIT LABELS	RuB
EXISTING/PROPOSED 100-YR WSE*	
EXISTING FOREST CONSERVATION EASEMENT (FCE)	
FOREST STAND TREELINE	
SPECIMEN TREE WITH CRITICAL ROOT ZONE	
SPECIMEN TREE TO BE REMOVED	
15 TO 25% SLOPES	
25% AND STEEPER SLOPES	
STUDY AREA BOUNDARY (LIMITS OF DISTURBANCE)	LOD
TREE PROTECTION FENCING	OSF
FOREST TO BE CLEARED	
EXISTING FCE FOREST CLEARING IMPACTS	

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

STATE OF MARYLAND KATHY LYNN HOVERMAN No. 38311 PROFESSIONAL ENGINEER

"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311, EXPIRATION DATE: January 6, 2017."

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 3/9/11
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 3/10/11
DIRECTOR	DATE 3/18/11

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

SIGNATURE — DATE 04.JAN.2011

PLOTTED: "11:14 AM on Monday, January 03, 2011"
BY: Harmony Miller Division: P050 NaturalRes GMA Emp
FILE: M:\2004\01043223.26\drawings\fcp03htec.dgn

NO.	REVISIONS DESCRIPTION	DATE

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HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
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6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 01
HOWARD COUNTY, MARYLAND

FOREST CONSERVATION PLAN

SCALE: 0 0.25 0.5 1.0 INCHES
1" = 20'

DATE: NOVEMBER 8, 2010

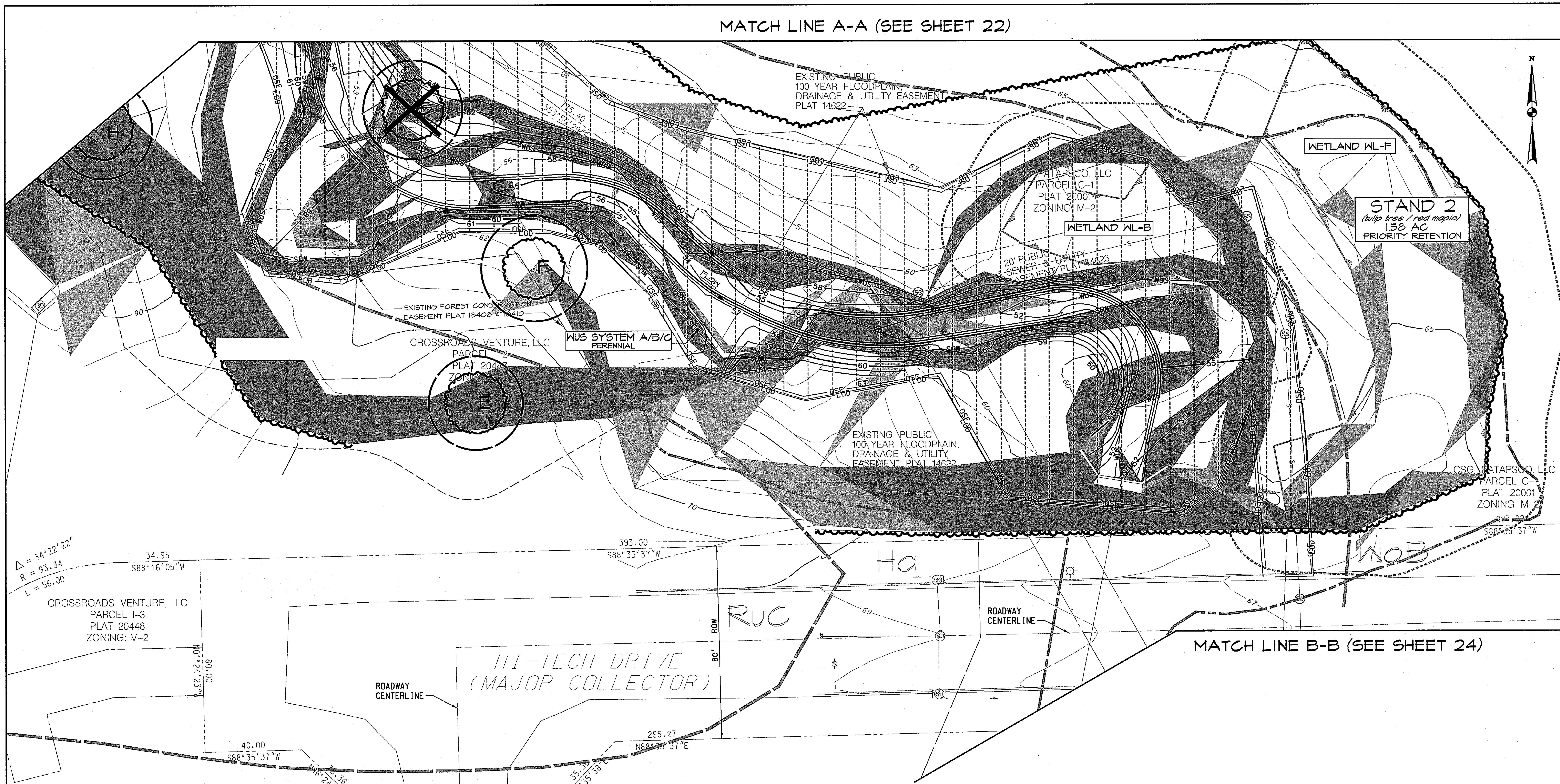
KCI JOB NO.: 01-043223.26

CAPITAL PROJECT NO.: D - 1122

PERMIT ISSUE:

CONSTRUCTION ISSUE:

SDP-10-095



NOTE:

SEE SHEET 25 OF 25 FOR ADDITIONAL INFORMATION REGARDING THE FOREST CONSERVATION PLAN.

LEGEND

- PROPERTY LINES
- EXISTING ROAD EDGE
- EXISTING SEWER LINE
- EXISTING MINOR CONTOURS
- EXISTING MAJOR CONTOURS — 50
- PROPOSED MINOR CONTOURS — 61
- PROPOSED MAJOR CONTOURS — 50
- EXISTING EASEMENTS
- WATERS OF THE UNITED STATES — WUS
- STREAM BUFFER
- EXISTING NONTIDAL WETLAND
- 25-FOOT NONTIDAL WETLAND BUFFER
- SOILS BOUNDARY AND MAP UNIT LABELS — RuB
- EXISTING/PROPOSED 100-YR WSE*
- EXISTING FOREST CONSERVATION EASEMENT (FCE)
- FOREST STAND TREELINE
- SPECIMEN TREE WITH CRITICAL ROOT ZONE
- SPECIMEN TREE TO BE REMOVED
- 15 TO 25% SLOPES
- 25% AND STEEPER SLOPES
- STUDY AREA BOUNDARY (LIMITS OF DISTURBANCE) — LOD
- TREE PROTECTION FENCING — OSF
- EXISTING FCE FOREST CLEARING IMPACTS
- FOREST TO BE CLEARED

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

STATE OF MARYLAND
KATHY LYNN HOVERMAN
No. 38311
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EXPIRATION DATE: January 6, 2012

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CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

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SCALE: 1" = 20'
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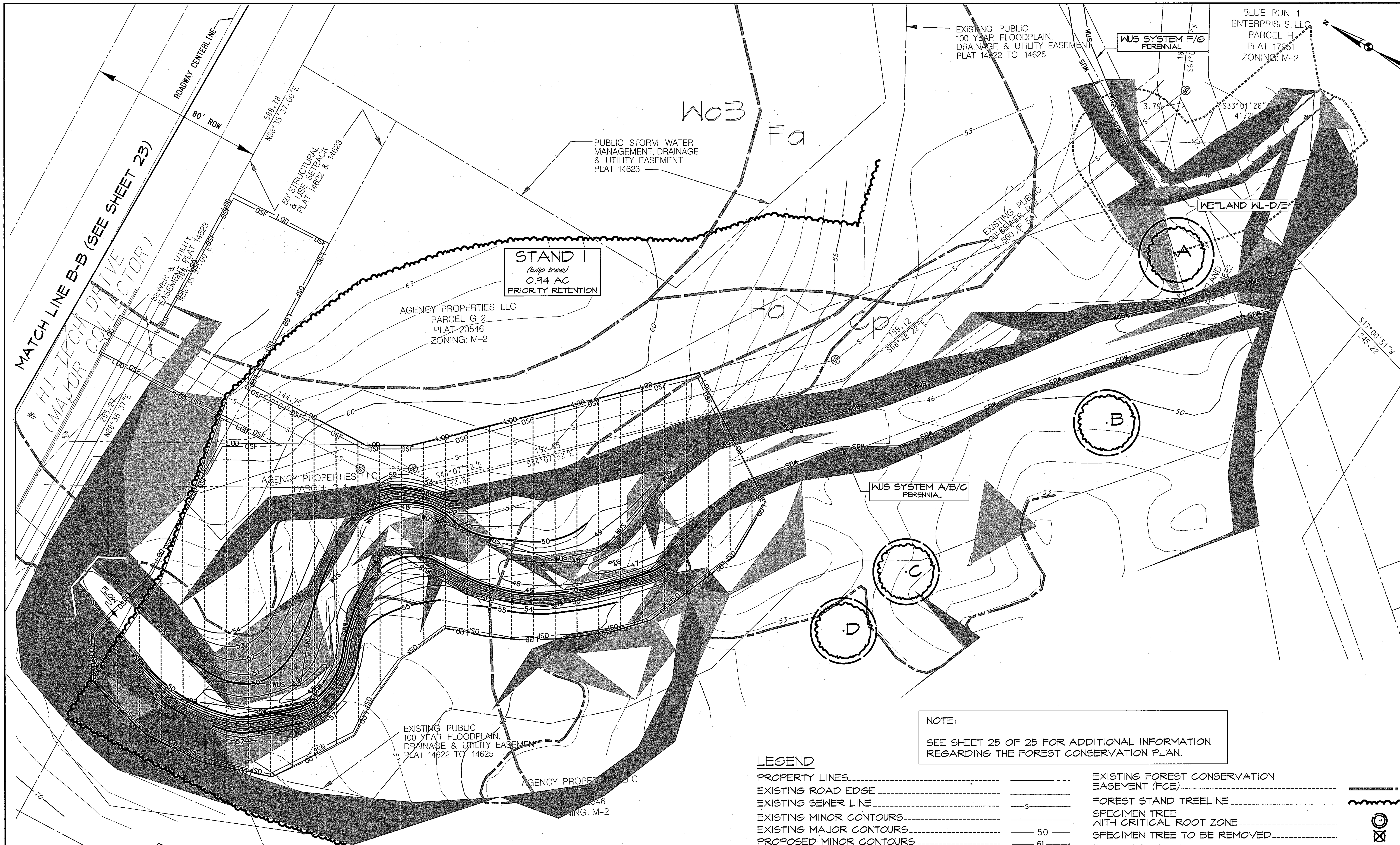

NOTE:

SEE SHEET 25 OF 25 FOR ADDITIONAL INFORMATION REGARDING THE FOREST CONSERVATION PLAN.

LEGEND

PROPERTY LINES	
EXISTING ROAD EDGE	
EXISTING SEWER LINE	—S—
EXISTING MINOR CONTOURS	
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STUDY AREA BOUNDARY (LIMITS OF DISTURBANCE)	LOD
TREE PROTECTION FENCING	OSF
FOREST TO BE CLEARED	

*MINIMAL CHANGES BETWEEN EXISTING AND PROPOSED 100-YR WSE. SEE THE HI TECH DRIVE STREAM HYDROLOGY AND HYDRAULICS REPORT FOR FURTHER INFORMATION.

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/9/11

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/10/11

DIRECTOR — DATE 3/10/11

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

SIGNATURE — 04 JAN 2011 — DATE

STATE OF MARYLAND — KATHY LYNN HOVERMAN — No. 38311 — PROFESSIONAL ENGINEER

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NO.	REVISIONS DESCRIPTION	DATE

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HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
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PARCEL 285, TAX MAP 38, ZONING M-2
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FOREST CONSERVATION PLAN

SCALE: 1" = 20'
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

TABLE 1. SPECIMEN TREES

SPECIMEN TREE ID	SCIENTIFIC NAME	COMMON NAME	DBH (")	VIGOR
A	*Liriodendron tulipifera*	tulip tree	34	GOOD
B	*Quercus rubra*	red oak	30	GOOD
C	*Platanus occidentalis*	American sycamore	30	GOOD
D	*Quercus rubra*	red oak	30	GOOD
E	*Quercus rubra*	red oak	31	GOOD
F	*Liriodendron tulipifera*	tulip tree	44	GOOD
G	*Liriodendron tulipifera*	tulip tree	48	FAIR
H	*Liriodendron tulipifera*	tulip tree	41	EXCELLENT
I	*Liriodendron tulipifera*	tulip tree	45	EXCELLENT
J	*Acer rubrum*	red maple	33	FAIR

TABLE 2. SOILS

MAPPING UNIT	DESCRIPTION	K' VALUE
Cp	Codorous and Hatboro soil, 0 to 2% slope	0.37
Fa	Fallsington sandy loam, 0 to 2% slope	0.02
Ha	Hatboro-Codorous silt loams, 0 to 3% slope	0.37
RsC	Russett fine sandy loam, 5 to 10% slope	0.28
RuB	Russett and Beltsville soils, 2 to 5% slope	0.37
RuC	Russett and Beltsville soils, 5 to 10% slope	0.28
WoB	Woodstown sandy loam, 2 to 5% slope	0.24

GENERAL NOTES:

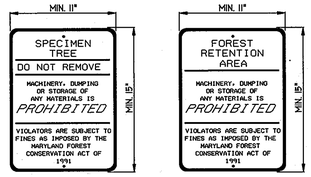
1. TOPOGRAPHICAL SURVEY WAS COMPLETED IN SEPTEMBER 2007 BY AB CONSULTANTS, INC.
2. THE EXISTING LAND USE IS OPEN SPACE LAND DEEDED TO HOWARD COUNTY AND SURROUNDING LAND USE IS AN INDUSTRIAL PARK.
3. EXISTING ZONING IS MANUFACTURING - HEAVY (M-2).
4. THE LIMIT OF DISTURBANCE IS 107,076 SF; 2.46 AC.
5. CRITICAL HABITATS CONSIST OF NON-TIDAL WETLAND, THEIR BUFFERS, STEEP SLOPES, AND THE UNNAMED PERENNIAL TRIBUTARY TO DEEP RUN.
6. 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 MARYLAND DEPARTMENT OF NATURAL RESOURCES INDICATES THERE ARE NO RECORDS OF HISTORIC RESOURCES OR RARE, THREATENED, OR ENDANGERED SPECIES WITHIN THE STUDY AREA.
7. THE STUDY AREA INCLUDES THE APPROXIMATED LIMITS OF DISTURBANCE ANTICIPATED FOR THE PROJECT.

WATER RESOURCES NOTES:

1. WATERS OF THE UNITED STATES (WUS) WERE DELINEATED BY CHESAPEAKE ENVIRONMENTAL MANAGEMENT (CEM), INC. ON AUGUST 10, 2007.
2. WETLANDS SHOWN REPRESENT THE VERIFIED WATERS OF THE UNITED STATES BOUNDARIES BASED ON A MARCH 2010 FIELD VISIT WITH MDE AND USACE.
3. THE FEMA 100-YEAR FLOODPLAIN WITHIN THE LOD TOTALS 80,497 SF; 1.85 AC.
4. THE TOTAL AREA OF WATERS OF THE UNITED STATES WITHIN THE STUDY AREA IS 57,810 SF; 1.33 AC.
5. TOTAL LINEAR FEET OF STREAMS WITHIN THE STUDY AREA 1962 LF.

FOREST RESOURCES NOTES:

1. THE FOREST STAND DELINEATION WAS COMPLETED BY CEM, INC. ON AUGUST 14, 2007.
2. FOREST STANDS EXTEND BEYOND STUDY AREA BOUNDARY.
3. SEE NOTE 22 ON SHEET 1 OF 25 REGARDING THE WAIVER PETITION AND THE USE OF THE LOD AS THE NET TRACT AREA.
4. THE TOTAL GROSS TRACT AREA IS 107,076 SF; 2.46 AC.
5. THE TOTAL NET TRACT AREA IS 0.59 AC.
6. TOTAL FORESTED AREA WITHIN LOD IS 99,140 SF; 2.28 AC.
7. TOTAL FORESTED AREA WITHIN THE FLOODPLAIN WITHIN THE LOD IS 80,197 SF; 1.84 AC.
8. TOTAL AREA OF FOREST CONSERVATION EASEMENT WITHIN LOD IS 1,087 SF; 0.02 AC.
9. TWO FOREST STANDS WERE OBSERVED DURING FIELD INVESTIGATIONS AND BOTH ARE PRIORITY RETENTION.
10. THE PLANTING REQUIREMENT SHALL BE MET THROUGH REPLANTING AND STABILIZATION WITHIN THE LOD.
11. SEE SHEETS 18 - 21 OF 25 FOR LANDSCAPE PLANS AND RELATED NOTES AND DETAILS.
12. THE TOTAL REFORESTATION AND AFFORESTATION REQUIREMENT IS 0.27 AC.
13. THE TOTAL AREA TO BE REPLANTED IN AREAS BEYOND THE EXISTING UTILITY EASEMENT IS 78,844 SF; 1.81 AC.

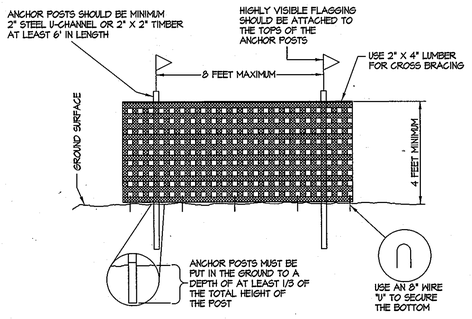


FOREST CONSERVATION SIGNAGE

NOT TO SCALE

NOTES:

1. BOTTOM OF SIGN TO BE HIGHER THAN TREE PROTECTION FENCE.
2. SIGNS TO BE PLACED 50 TO 100' APART. CONDITION ON SITE AFFECTING VISIBILITY MAY WARRANT PLACING SIGNS CLOSER OR FARTHER APART WITHIN THE ACCEPTABLE NOTED RANGE.
3. ATTACHMENT OF SIGNS TO TREES IS PROHIBITED.
4. SIGNS MAY BE REMOVED FROM RESIDENTIAL LOTS UPON ISSUANCE OF USE AND OCCUPANCY RETENTION FOREST ONLY.
5. ALL SIGNAGE MUST REMAIN DURING THE MAINTENANCE PERIOD.
6. THE SIGNS NOTIFY CONSTRUCTION WORKERS AND FUTURE RESIDENTS OF THE NEWLY PLANTED MATERIAL, IMPROVING THE TREES' SURVIVAL RATES.
7. SIGNS MAY BE ADAPTED BY RESIDENTS FOR IDENTIFICATION OF FOREST RETENTION AREAS.



BLAZE ORANGE PLASTIC MESH FENCE DETAIL

NOT TO SCALE

PLACEMENT OF ORANGE HIGH VISIBILITY FENCE:

1. ORANGE HIGH VISIBILITY FENCE SHALL BE MANUALLY INSTALLED ALONG THE LIMITS OF DISTURBANCE, WHERE THAT LIMIT IS WITHIN 50' OF THE FOREST CONSERVATION/ FOREST BUFFER EASEMENTS AND SHALL FUNCTION AS A FOREST PROTECTION DEVICE.
2. RETENTION AREA HILL BE SET AS PART OF THE REVIEW PROCESS.
3. BOUNDARIES OF THE RETENTION AREA SHALL BE STAKES AND FLAGGED PRIOR TO INSTALLING THE DEVICE.
4. ROOT DAMAGE SHALL BE AVOIDED.
5. PROTECTIVE SIGNAGE MAY ALSO BE USED.
6. DEVICE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

KCI Technologies, Inc. 5/26/2010

Forest Conservation Worksheet

Net Tract Area			
A.	Total Tract Area	A=	2.46 ac.
B.	Area within 100-year Floodplain	B=	1.85 ac.
B1.	Area within existing Forest Conservation Easement *	B1=	0.02 ac.
C.	Area to Remain in Agricultural Production	C=	0.00 ac.
D.	Net Tract Area (D=(A-B-B1-C))	D=	0.59 ac.
Land Use Category : Commercial and Industrial Use Areas			
E.	Afforestation Threshold (D x 15%)	E=	0.09 ac.
F.	Conservation Threshold (D x 15%)	F=	0.09 ac.
Existing Forest Cover			
G.	Existing Forest Cover (excluding floodplain)	G=	0.44 ac.
H.	Area of Forest Above Afforestation Threshold	H=	0.35 ac.
I.	Area of Forest Above Conservation Threshold	I=	0.35 ac.
Break Even Point			
J.	Forest Retention Above Threshold with no Mitigation (1) If I<0 then J=(0.2 xl)=F, go to K (2) If I=0, J=0, go to L	J=	0.16 ac.
K.	Clearing Permitted Without Mitigation (K=G-J)	K=	0.28 ac.
Proposed Forest Clearing			
L.	Total Area of Forest to be Cleared	L=	0.44 ac.
M.	Total Area of Forest to be Retained (M=G-L)	M=	0.00 ac.
Planting Requirements			
N.	Reforestation for Clearing Above the Conservation Threshold	N=	0.09 ac.
P.	Reforestation for Clearing Below the Conservation Threshold	P=	0.18 ac.
Q.	Credit for Retention Above the Conservation Threshold	Q=	0.00 ac.
R.	Total Reforestation Required	R=	0.27 ac.
S.	Total Afforestation Required	S=	0.00 ac.
T.	Total Reforestation and Afforestation Requirement T=(R+S)	T=	0.27 ac.

*Value calcualted to exclude area within the floodplain. Clearing within the existing Forest Conservation Easement will be replanted.

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FOREST CONSERVATION PLAN MITIGATION NOTES:

1. MITIGATION REQUIREMENTS SHALL BE MET THROUGH FEE-IN-LIEU AT THE RATE OF $0.75/SF FOR A TOTAL OF $8820.90 TO THE FOREST CONSERVATION FUND.
2. THE EXISTING FOREST CONSERVATION EASEMENT WILL BE REPLANTED BASED UPON THE LANDCAPE PLAN (SHEETS 18-19 OF 25) AND LANDSCAPE NOTES & DETAILS (SHEET 21 OF 25).

STATE OF MARYLAND
KEVIN LYNN HOFFMAN
No. 38311
PROFESSIONAL ENGINEER

"PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 38311 EXPIRATION DATE: January 6, 2012."

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 3/9/11
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 3/10/11
DIRECTOR	DATE 3/10/11

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

Harmony A Miller 09 JAN 2011
SIGNATURE DATE

PLOTTED: 11:14 AM on Monday, January 03, 2011
BY: Harmony Miller
FILE NAME: M:\2004\01043223.26\drawings\construction\fcnotes.dgn

NO.	REVISIONS	DESCRIPTION	DATE

KCIFILE: M:\ 2004 \ 01043223.26 \

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HI TECH DRIVE STREAM RESTORATION

PATAPSCO VALLEY BUSINESS CENTER
SECTION 3, AREA 3
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS
STORMWATER MANAGEMENT DIVISION
6751 COLUMBIA GATEWAY DRIVE
COLUMBIA, MARYLAND 21046
PARCEL 285, TAX MAP 38, ZONING M-2
ELECTION DISTRICT 6
HOWARD COUNTY, MARYLAND

FOREST CONSERVATION NOTES

SCALE: NOT TO SCALE
DATE: NOVEMBER 8, 2010
KCI JOB NO.: 01-043223.26
CAPITAL PROJECT NO.: D - 1122
PERMIT ISSUE:
CONSTRUCTION ISSUE:

SHEET NO.: 25 OF 25

SDP-10-095