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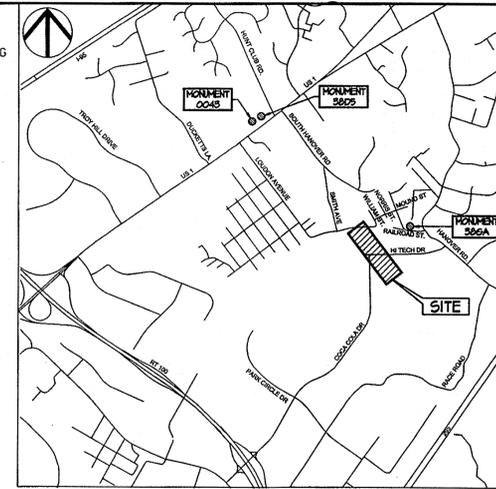
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# SITE DEVELOPMENT PLAN HI TECH DRIVE STREAM RESTORATION

## 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 |      |
| 3805                         | 558378.539 | 1386524.204 | 193.024 |      |
| 38GA                         | 555897.325 | 1390132.118 | 80.840  |      |



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

### 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   |
| 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

- 100-YEAR FLOODPLAIN ELEVATION WILL BE SHOWN ON THE PLANS.
- 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).
- IN-STREAM WORK IS PROHIBITED FROM MARCH 1ST TO JUNE 15TH, INCLUSIVE. STREAM CLASSIFICATION USE I-P.
- CONTRACTOR SHALL CONTINUALLY MONITOR WEATHER FORECASTS DURING WORK ACTIVITIES AND SCHEDULE WORK DURING FAVORABLE CONDITIONS.
- 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 DRILLING OF THE TREE. PROTECTIVE ORANGE FENCING SHALL BE INSTALLED AROUND THE PERIMETER OF THE CRITICAL ROOT ZONE PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL NOT STORE EQUIPMENT, MATERIALS AND/OR SUPPLIES BEYOND THE ORANGE FENCING SHOWN ON THE PLANS.
- UPON COMPLETION OF THE WORK, BUT PRIOR TO DE-MOBILIZATION, THE CONTRACTOR SHALL REMOVE ALL REMNANTS OF CONSTRUCTION MATERIALS FROM THE SITE. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO A CONDITION EQUAL TO OR BETTER THAN THE PRE-CONSTRUCTION CONDITIONS.
- PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES, PHOTOGRAPHS OF THE PROPOSED WORK AREA AND ACCESS SHALL BE TAKEN.
- 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

- TOTAL PROJECT AREA: 2.46 ACRES (107,076 SF).
- DISTURBED AREA: 2.46 ACRES (107,076 SF).
- PRESENT ZONING DESIGNATION: M-2
- PROPOSED USE FOR THE SITE: STABILIZE EXISTING BANK/CHANNEL EROSION
- OPEN SPACE ON SITE: 2.46 AC, 100% OF GROSS AREA
- 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

| PARCELLOT # | 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"

*Kathy L. Hoyerman*  
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE: 1/24/11

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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"

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

#### GENERAL NOTES

- THE SUBJECT PROPERTIES ARE ZONED M-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.
- 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.
- 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.
- THERE ARE NO BURIAL GROUNDS OR CEMETERY SITES LOCATED ON THE PROJECT SITE.
- 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.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS, IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS, BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1800 24 HOURS IN ADVANCE OF ANY WORK BEING DONE.
- THE CONTRACTOR SHALL NOTIFY 'MISS UTILITY' AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- 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, 3805 AND 38GA WERE USED FOR THIS SITE.
- WATER IS PUBLIC.
- SEWER IS PUBLIC.
- 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.
- EXISTING UTILITIES ARE BASED ON FIELD SURVEYS AND AVAILABLE RECORD DRAWINGS.
- 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.
- THE WETLANDS DELINEATION FOR THIS PROJECT WAS PERFORMED BY CHESAPEAKE ENVIRONMENTAL MANAGEMENT, INC. IN NOVEMBER 2007.
- TOPOGRAPHIC SURVEY OF THE SITE WAS PERFORMED BY AB CONSULTANTS, INC. IN AUGUST 2007.
- ALL WORK SHALL BE CONSTRUCTED ACCORDING TO THE REQUIREMENTS OF THE NOTIONAL WETLANDS AND WATERWAYS PERMIT DATED JULY 14, 2010. (TRACKING NO. 10-NT-0074 / 201006235).
- NO TRAFFIC STUDY IS REQUIRED FOR THIS PROJECT.
- 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.
- 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.
- 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.
- 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.
- THIS PROJECT IS TO BE USED FOR WETLAND MITIGATION FOR CAPITAL PROJECT J-4148-B. REFER TO THE MARYLAND STATE PROGRAMMATIC GENERAL PERMIT-3 (MSPGP-3) [CORPS PERMIT NUMBER 2003-61775] FOR MAINTENANCE CONDITIONS.
- 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.

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 ELECTION DISTRICT ZONING M-2  
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:



APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*Kathy L. Hoyerman* 3/1/11  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Kurt Scherlock* 3/10/11  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Thomas R. Sauter* 3/10/11  
DIRECTOR DATE

OWNER: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
6751 COLUMBIA GATEWAY DRIVE  
COLUMBIA, MD 21046  
410-313-3448

DEPARTMENT OF PUBLIC WORKS  
HOWARD COUNTY, MARYLAND

*Janet K.* 1/24/11  
DIRECTOR OF PUBLIC WORKS DATE

*Evelyn Z. Juhl* 1/20/11  
CHIEF, BUREAU OF ENVIRONMENTAL SERVICES DATE

*Howard E. Saltzman* 1/13/11  
CHIEF, STORMWATER MANAGEMENT DIVISION DATE

PERMIT INFORMATION CHART

|                  |                                 |              |     |  |
|------------------|---------------------------------|--------------|-----|--|
| SUBDIVISION NAME | PATAPSCO VALLEY BUSINESS CENTER | SECTION/AREA | 3/3 | LOT/PARCEL* SEE ADDRESS CHART          |
| PLAT* OF L/F     | 20                              | ZONING       | M-2 | TAX MAP NO. ELECT. DISTR. CENSUS TRACT |
| SEE PERMIT       |                                 |              |     | 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: *John R. Blanton* P.E. No. \_\_\_\_\_ Date: 2/24/11

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.

*John R. Blanton*  
HOWARD SCD  
Date: 2/24/11

PLOTTED: 11:02 AM on Monday, January 03, 2011. E:\p...  
FILE: M:\2004\01-043223.26\graphics\101110.dwg





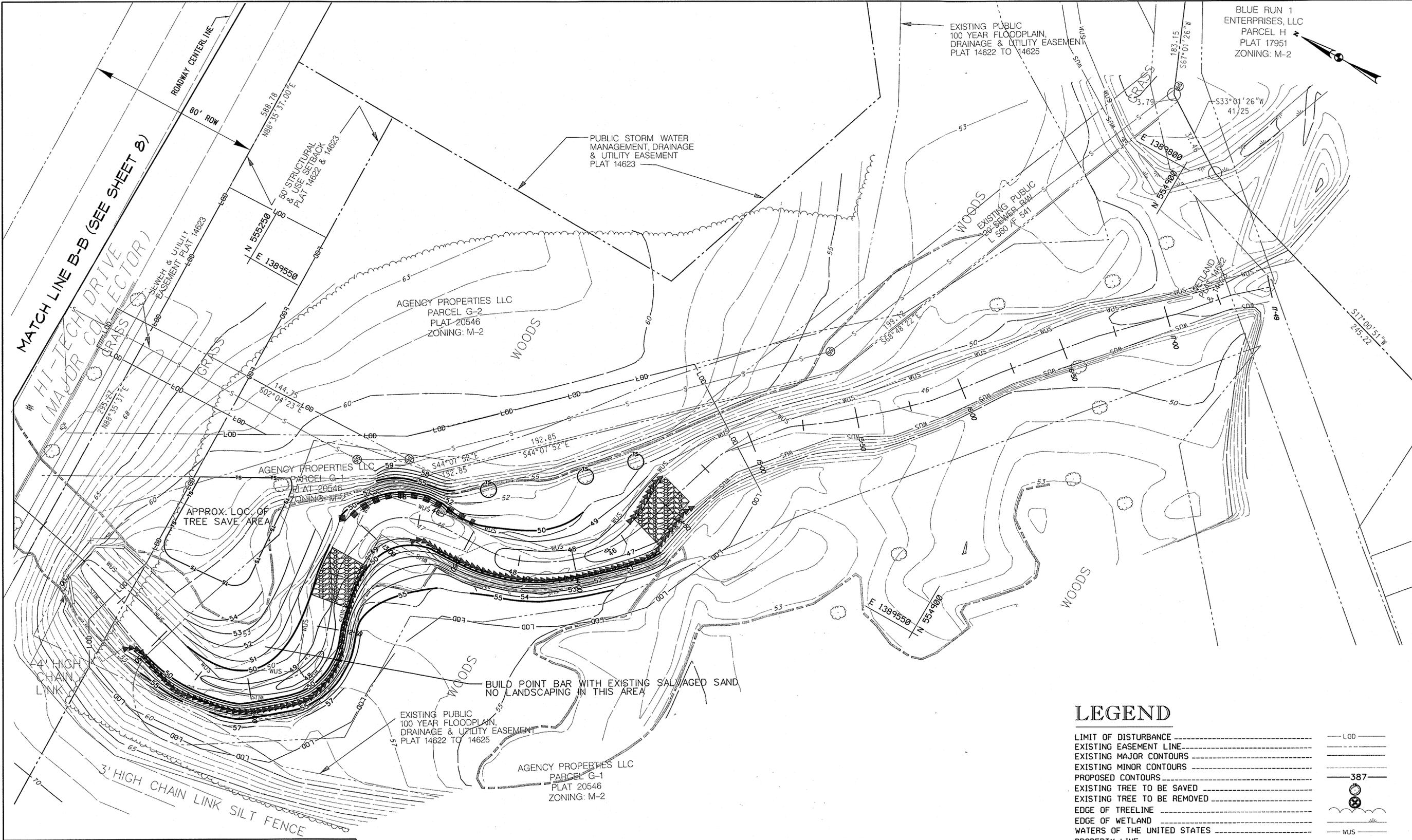












**LEGEND**

- LOD ---
- EXISTING EASEMENT LINE ---
- EXISTING MAJOR CONTOURS ---
- EXISTING MINOR CONTOURS ---
- PROPOSED CONTOURS ---
- EXISTING TREE TO BE SAVED ---
- EXISTING TREE TO BE REMOVED ---
- EDGE OF TREELINE ---
- EDGE OF WETLAND ---
- WATERS OF THE UNITED STATES ---
- PROPERTY LINE ---
- EXISTING ROAD EDGE ---
- EXISTING SEWER LINE ---
- IMBRICATED WALL ---
- STONE TOE PROTECTION ---
- RIFFLE GRADE CONTROL ---
- TREE SAVE AREA ---
- 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      |

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.

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.

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*John P. ...* 3/9/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Keith She ...* 3/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Thomas F. ...* 3/10/11  
 DIRECTOR DATE

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
|     |                       |      |
|     |                       |      |
|     |                       |      |
|     |                       |      |

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**HI TECH DRIVE  
 STREAM RESTORATION**

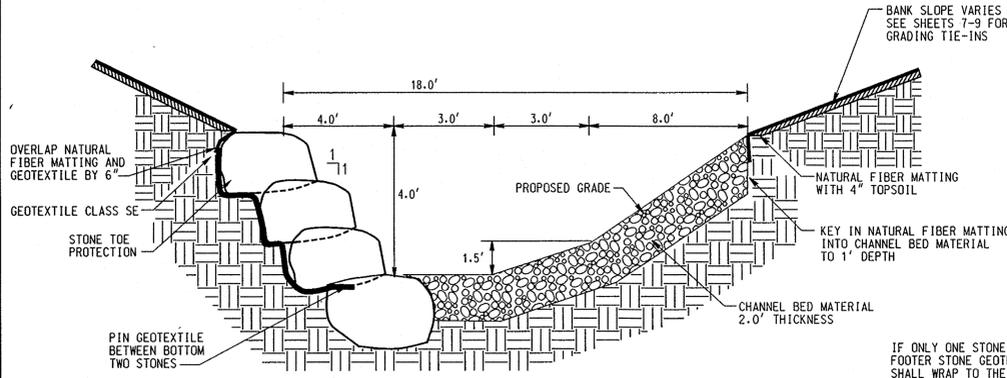
PATAPSCO VALLEY BUSINESS CENTER  
 SECTION 3, AREA 3  
 HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS  
 STORMWATER MANAGEMENT DIVISION  
 COLUMBIA, MARYLAND 21046  
 PARCEL 285, TAX MAP 38, ZONING M-2  
 ELECTION DISTRICT 01  
 HOWARD COUNTY, MARYLAND

**GRADING PLAN**

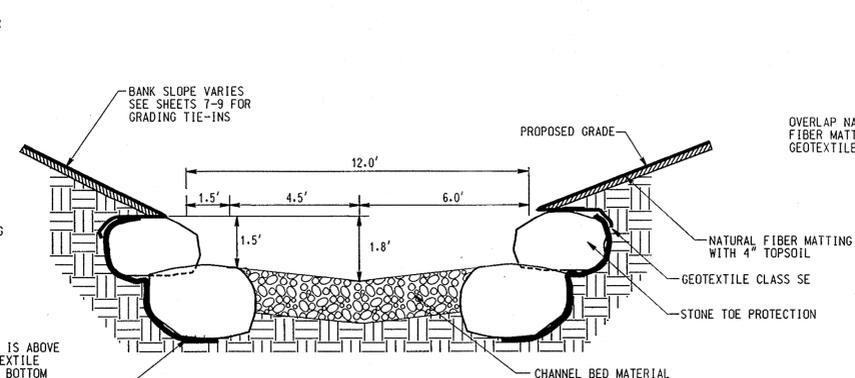
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 1" = 20'

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 KCI JOB NO.: 01-043223.26  
 CAPITAL PROJECT NO.: D - 1122  
 PERMIT ISSUE:  
 CONSTRUCTION ISSUE:

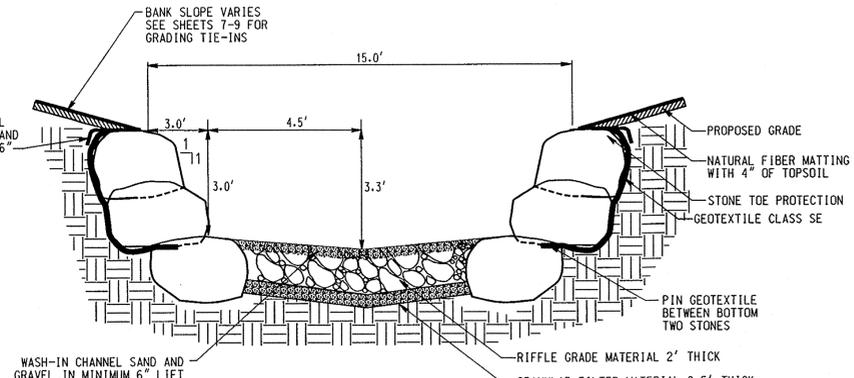
SHEET NO.: 9 OF 25  
 SDP-10-095



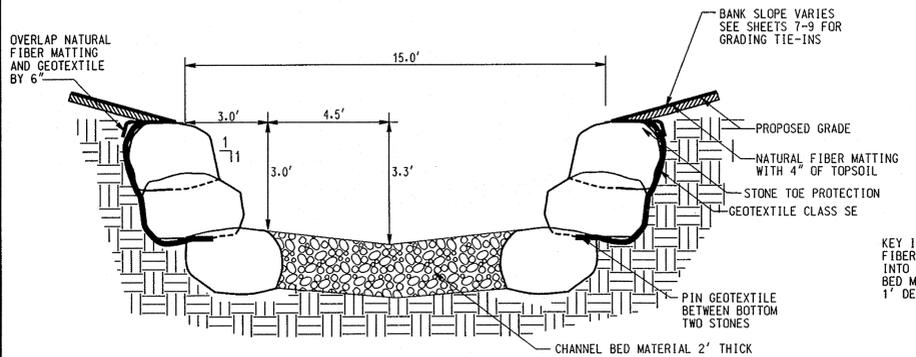
TYPICAL SECTION - POOL  
 NOT TO SCALE



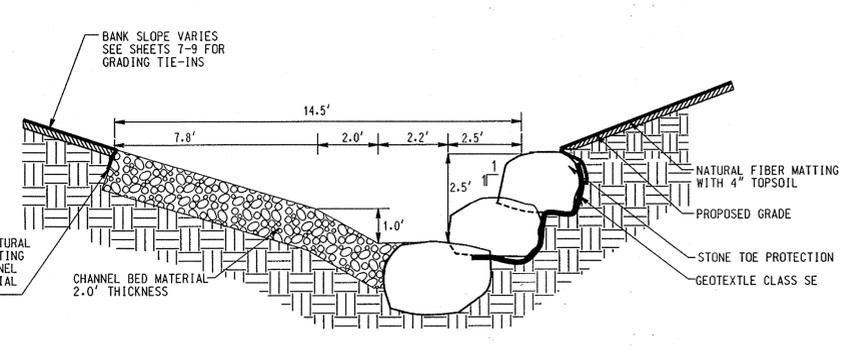
TYPICAL SECTION - RIFFLE APPLIED ONLY AT STATION 5+35  
 NOT TO SCALE



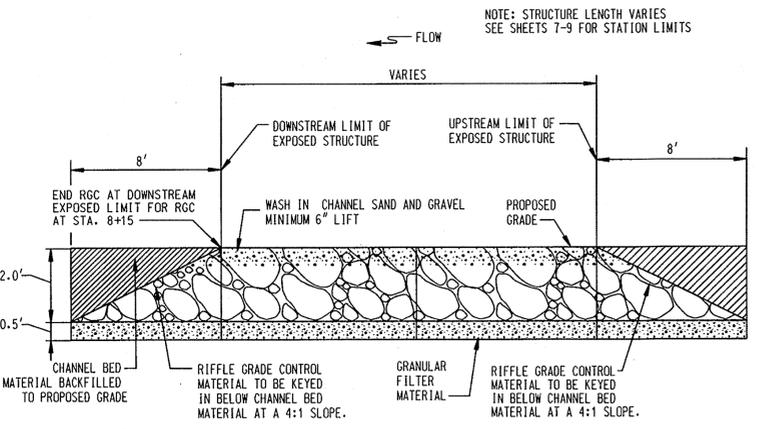
TYPICAL SECTION - RIFFLE GRADE CONTROL  
 NOT TO SCALE



TYPICAL SECTION - RIFFLE  
 NOT TO SCALE

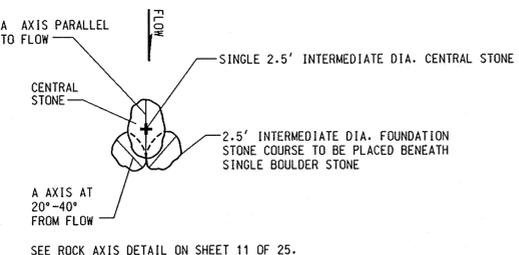


TYPICAL SECTION - POOL APPLIED ONLY FROM STATION 5+35 TO 5+80  
 NOT TO SCALE

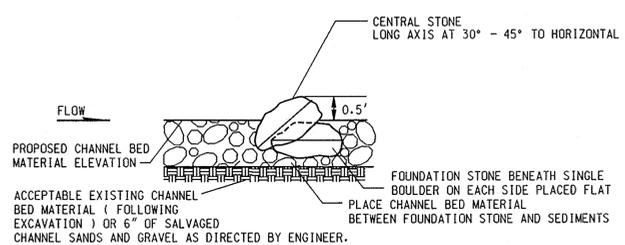


TYPICAL RIFFLE GRADE CONTROL PROFILE  
 NOT TO SCALE

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.



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

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  
 [Signature] 2/9/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
 [Signature] 2/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE  
 [Signature] 2/10/11  
 DIRECTOR DATE

| NO. | REVISIONS DESCRIPTION | DATE |
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|     |                       |      |
|     |                       |      |

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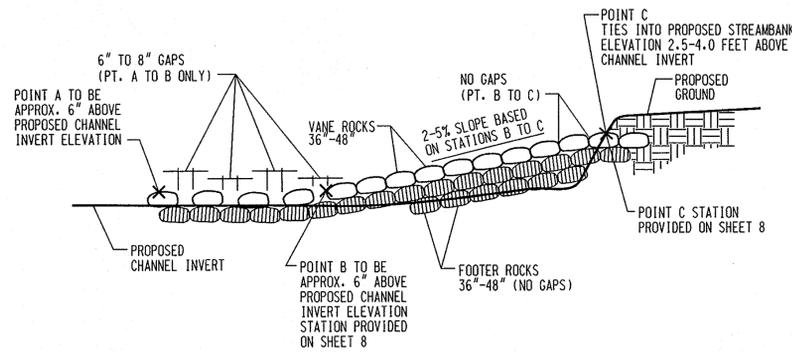
KCI TECHNOLOGIES

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

DETAILS

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

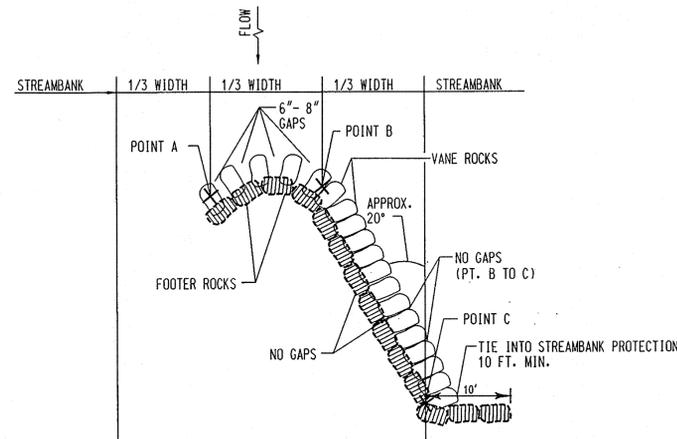
SHEET NO.: 10 OF 25



CROSS-SECTION VIEW

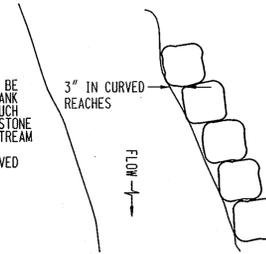
J-HOOK VANE  
NOT TO SCALE

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.



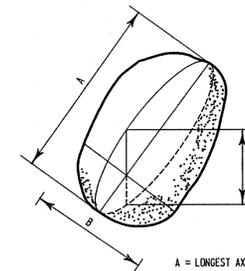
PLAN VIEW

NOTE: STONES SHALL BE ROTATED INTO THE BANK DURING PLACEMENT SUCH THAT THE UPSTREAM STONE OVERLAPS THE DOWNSTREAM STONE BY A MINIMUM OF 3 INCHES IN CURVED REACHES.



TYPICAL PLAN VIEW  
IMBRICATED BANK PROTECTION

NOT TO SCALE

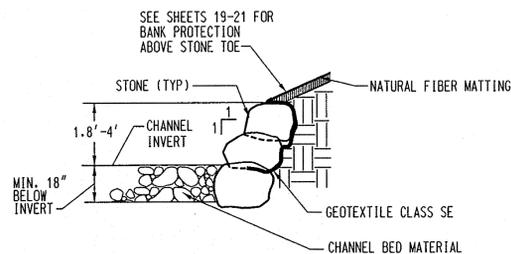


A = LONGEST AXIS (LENGTH)  
B = INTERMEDIATE AXIS (WIDTH)  
C = SHORTEST AXIS (THICKNESS)

ROCK AXIS DEFINITION

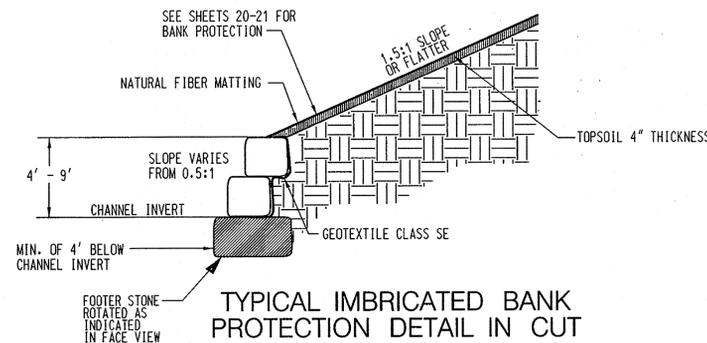
NOT TO SCALE

| 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'         |



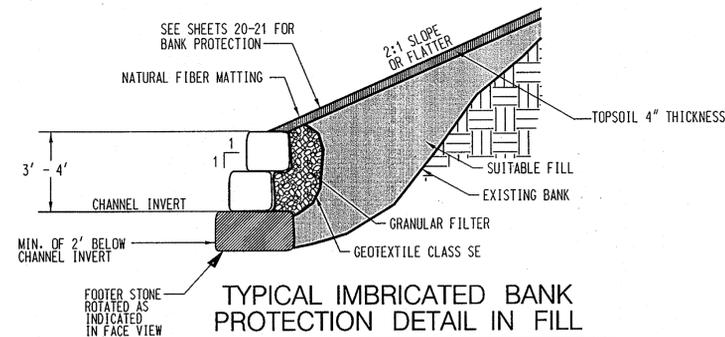
TYPICAL STONE TOE PROTECTION DETAIL

NOT TO SCALE



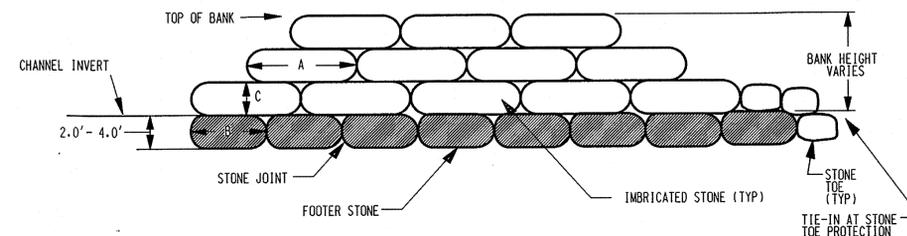
TYPICAL IMBRICATED BANK PROTECTION DETAIL IN CUT

NOT TO SCALE



TYPICAL IMBRICATED BANK PROTECTION DETAIL IN FILL

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. CHASE 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



APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*Howard County Seal*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 8/9/11

*Robert Shadlock*  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE 3/10/14

*Thomas P. Buttle*  
DIRECTOR DATE 3/10/14

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. 33311 EXPIRATION DATE: JANUARY 06, 2012

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
|     |                       |      |
|     |                       |      |
|     |                       |      |
|     |                       |      |

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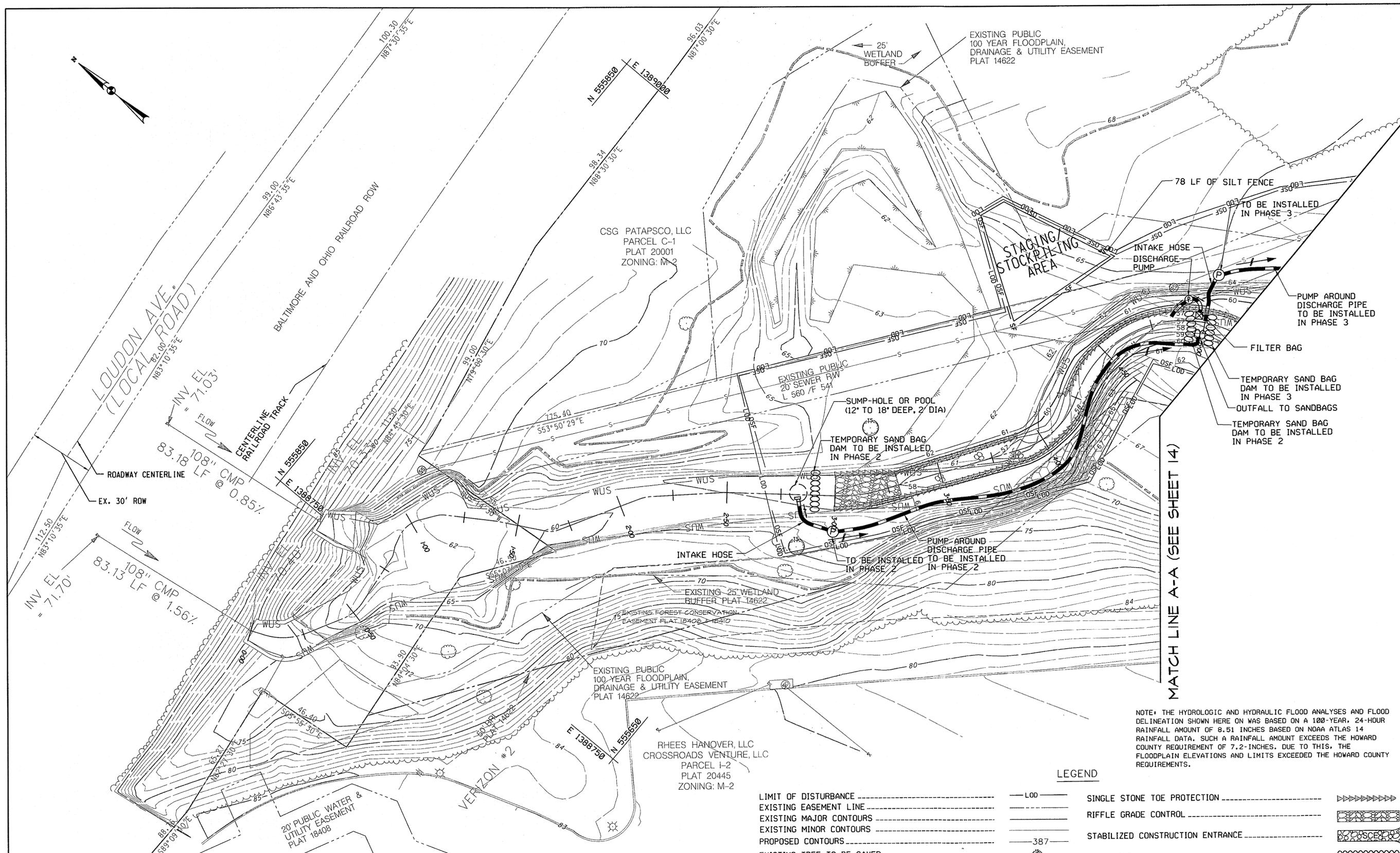
HITECH DRIVE  
STREAM RESTORATION  
PATAPSCO VALLEY BUSINESS CENTER  
SECTION 3, AREA 3  
HOWARD COUNTY DEPARTMENT OF PLANNING AND PARKS  
STORMWATER MANAGEMENT DIVISION  
6751 COLUMBIA GATEWAY DRIVE  
COLUMBIA, MARYLAND 21046  
PARCEL 285 TAX MAP 98 ZONING M-2  
ELECTION DISTRICT 00  
HOWARD COUNTY, 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:

SHEET NO.: 11 OF 25





MATCH LINE A-A (SEE SHEET 14)

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**

|       |     |       |                                  |
|-------|-----|-------|----------------------------------|
| ----- | L00 | ----- | SINGLE STONE TOE PROTECTION      |
| ----- |     | ----- | RIFFLE GRADE CONTROL             |
| ----- |     | ----- | STABILIZED CONSTRUCTION ENTRANCE |
| ----- | 387 | ----- | SANDBAG DAM                      |
| ----- |     | ----- | SILT FENCE                       |
| ----- |     | ----- | PUMP                             |
| ----- |     | ----- | INTAKE HOSE AND DISCHARGE PIPE   |
| ----- |     | ----- | ORANGE SAFETY FENCE              |
| ----- |     | ----- | FILTER BAG                       |
| ----- |     | ----- | WATERS OF THE UNITED STATES      |
| ----- |     | ----- | EXISTING/PROPOSED 100-YR WSE     |



STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 JOHN R. BELANTON  
 LICENSE NO. 38311  
 EXPIRATION DATE: JANUARY 04, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*[Signature]* 2/9/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 3/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 3/10/11  
 DIRECTOR 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.

*[Signature]*  
 HOWARD SCD  
 Date: 2/24/11

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
|     |                       |      |
|     |                       |      |
|     |                       |      |

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**KCI**  
 TECHNOLOGIES

**HI TECH DRIVE  
 STREAM RESTORATION**

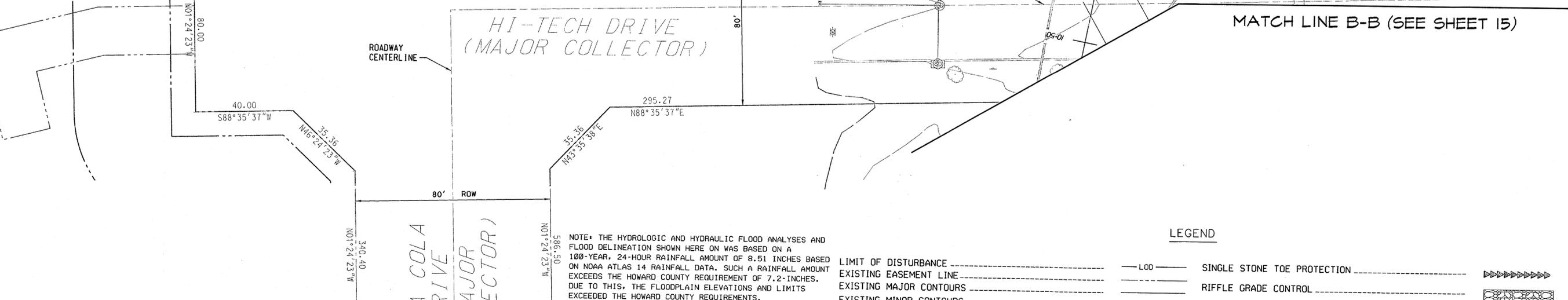
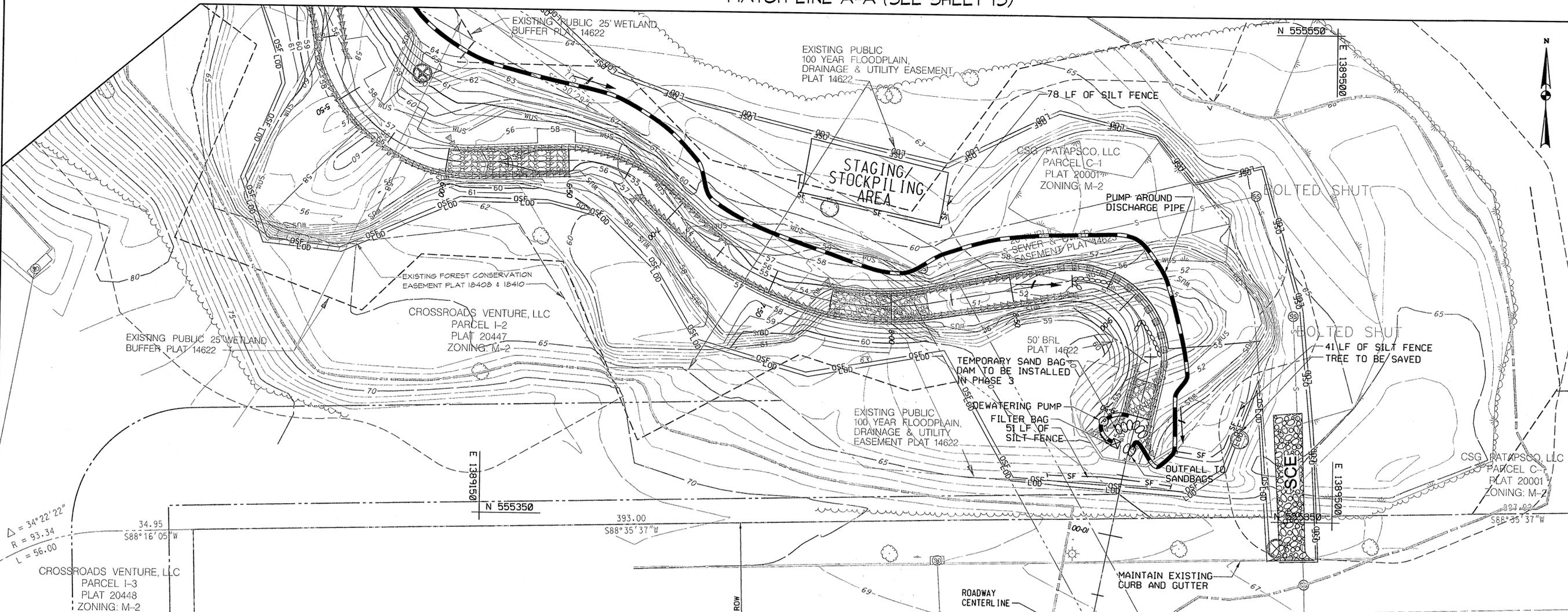
PATAPSCO VALLEY BUSINESS CENTER  
 SECTION 3, AREA 3  
 HOWARD COUNTY DEPARTMENT OF ENVIRONMENT AND PARKS  
 STORM WATER MANAGEMENT DIVISION  
 6751 COLUMBIA GATEWAY DRIVE  
 COLUMBIA, MARYLAND 21046  
 PARCEL 285 TAX MAP 38 ZONING M-2  
 ELECTION DISTRICT 01  
 HOWARD COUNTY, MARYLAND

**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:

SHEET NO.: 13 OF 25  
 SDP-10-095

MATCH LINE A-A (SEE SHEET 13)



APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*[Signature]* 2/9/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* 3/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT

*[Signature]* 3/10/11  
 DIRECTOR

STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 NO. 38311  
 EXPIRATION DATE: JANUARY 06, 2012

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.

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

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.

*[Signature]*  
 HOWARD SCD  
 Date: 2/24/11

LEGEND

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

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

|     |                       |      |
|-----|-----------------------|------|
| NO. | REVISIONS DESCRIPTION | DATE |
|     |                       |      |
|     |                       |      |

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**KCI**  
 TECHNOLOGIES

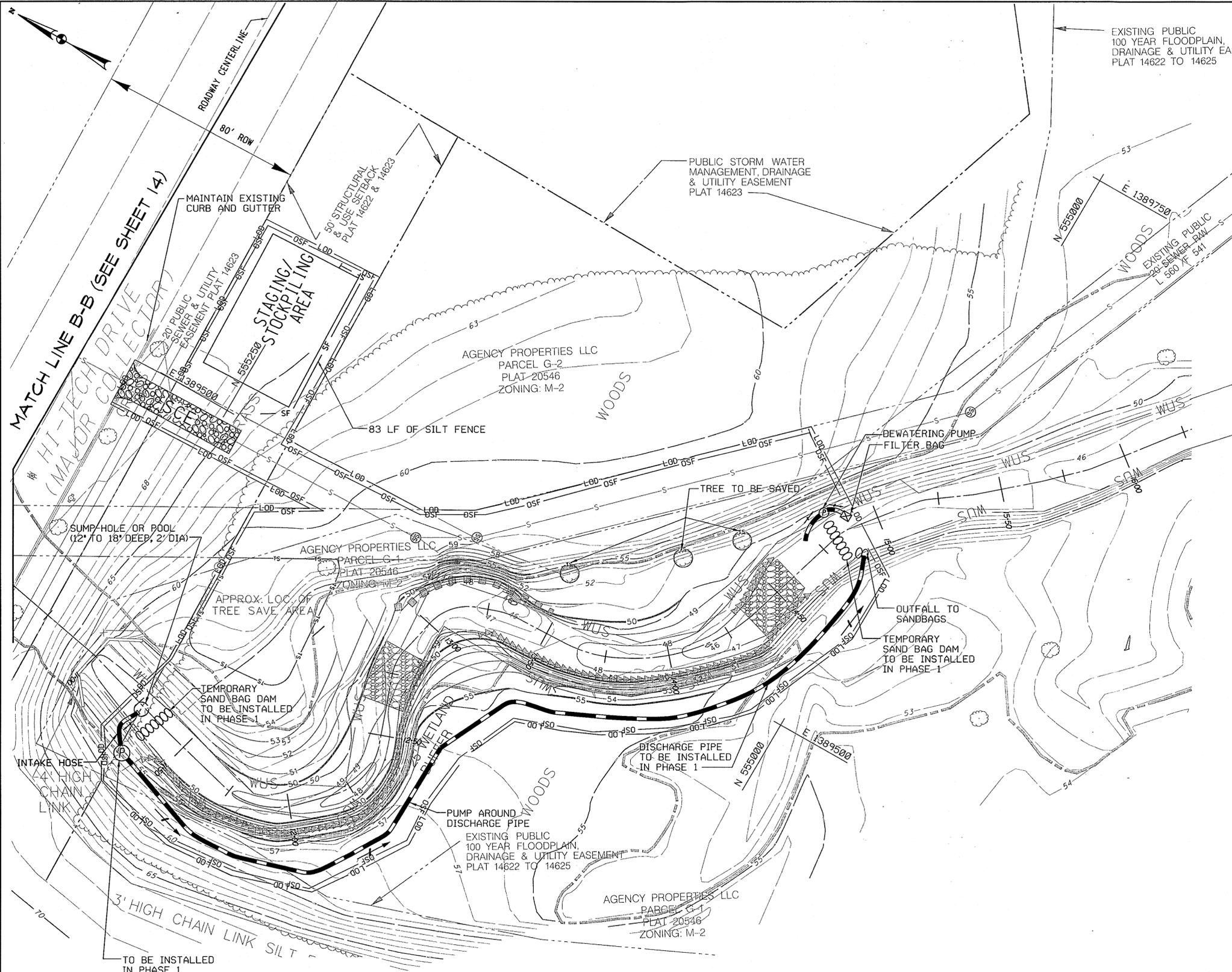
HITECH DRIVE  
 STREAM RESTORATION  
 PATAPSCO VALLEY BUSINESS CENTER  
 SECTION 3, AREA 3  
 HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS  
 STORMWATER MANAGEMENT DIVISION  
 67 COLUMBIA MARYLAND PARKWAY  
 PARCEL 285 TAX MAP 98 ZONING M-2  
 HOWARD COUNTY, MARYLAND

EROSION AND  
 SEDIMENT  
 CONTROL  
 PLAN

SCALE: 0 20 40 80  
 1" = 20'

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

SHEET NO.: 14 OF 25  
 SDP-10-095



SEQUENCE OF CONSTRUCTION

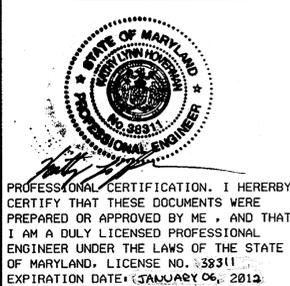
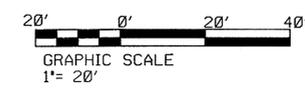
1. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777, HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/ CONSTRUCTION INSPECTION DIVISION (410)-313-1880 AND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION (410)-537-3510 AT LEAST FIVE (5) DAYS PRIOR TO BEGINNING ANY 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 INSPECTOR'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             | --- | L0D |
| 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 | ▩   |     |
| SANDBAG DAM                      | ⊖   |     |
| SILT FENCE                       | ⊕   | SF  |
| PUMP                             | ⊙   |     |
| 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.

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.



APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*[Signature]* 3/9/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 3/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 3/10/11  
 DIRECTOR 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.

*[Signature]* 2/24/11  
 HOWARD SCD Date

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
|     |                       |      |
|     |                       |      |
|     |                       |      |
|     |                       |      |

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HI TECH DRIVE  
 STREAM RESTORATION  
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 SECTION 3, AREA 3  
 HOWARD COUNTY DEPARTMENT OF ENGINEERING AND PUBLIC WORKS  
 STORM WATER 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:

SHEET NO.: 15 OF 25

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 ryegrass (3.2 lbs/1000 sq. ft.). For the period May 1 - August 14, seed with 3 lbs/acre of weeping lovegrass (.07 lbs/1000 sq. 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  
**PERMANENT SEEDING NOTES \*\***  
 Apply to graded or cleared areas not subject to immediate further disturbance where a permanent long-lived vegetative cover is needed.

**Seedbed Preparation:** Loosen upper three inches of soil by raking, disking or other acceptable means before seeding, if not previously loosened.

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

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

**Seeding** - For the periods March 1 - April 30, and August 1 - October 15, seed with 60 lbs/acre (1.4 lbs/1000 sq. ft.) of Kentucky 31 Tall Fescue. For the period May 1 - July 31, seed with 60 lbs Kentucky 31 Tall Fescue per acre and 2 lbs/acre (.05 lbs/1000 sq. 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**

- 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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.
  - 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
  - Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
  - Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
  - 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.
  - 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**
- This practice is limited to areas having 2:1 or flatter slopes where:
    - The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
    - 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.
    - The original soil to be vegetated contains material toxic to plant growth.
    - The soil is so acidic that treatment with limestone is not feasible.

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.

*John K. Robertson*  
 HOWARD SCD  
 Date: 2/24/11

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

- 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 Experiment Station.
- Topsoil Specifications - Soil to be used as topsoil must meet the following:
  - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1 1/2" in diameter.
  - Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnson grass, nutsedge, poison ivy, thistle, or others as specified.
  - Where the subsoils are 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 procedures.
- For sites having disturbed areas under 5 acres:
  - Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section \* - Vegetative Stabilization Methods and Materials.
- For sites having disturbed areas over 5 acres:
  - On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
    - 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.
    - Organic content of topsoil shall be not less than 1.5 percent by weight.
    - Topsoil having soluble salt content greater than 500 parts per million shall not be used.
    - No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time as elapsed (14 days min.) to permit dissipation of phytotoxic materials.

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

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

- Topsoil Application**
  - 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.
  - Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.
  - Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
  - Topsoil shall not be placed while the topsoil or subsoils in a frozen or muddy condition, when the subsoils are excessively wet or in a condition that may 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):

- 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.
- 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 environmental protection and resource management inspection and enforcement division and the provider of local utilities a minimum of 48 hours before starting construction.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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.
- 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.
- 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.
- If a tributary is to be restored, construction should take place on the tributary before work on the main stem reaches the tributary confluence. Construction in the tributary, including pump around practices, 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.
- The contractor is responsible for providing access to and maintaining all erosion and sediment control devices until the sediment control inspector approves their removal.
- After construction, all disturbed areas must be regraded and revegetated as per the planting plan.

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*John J. ...* 3/9/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Ken ...* 3/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Thomas ...* 3/10/11  
 DIRECTOR DATE

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

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.

*John K. Robertson*  
 HOWARD SCD  
 Date: 2/24/11

|                       |  |
|-----------------------|--|
| DATE                  |  |
| NO.                   |  |
| REVISIONS DESCRIPTION |  |

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 STORMWATER MANAGEMENT DIVISION  
 60 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:

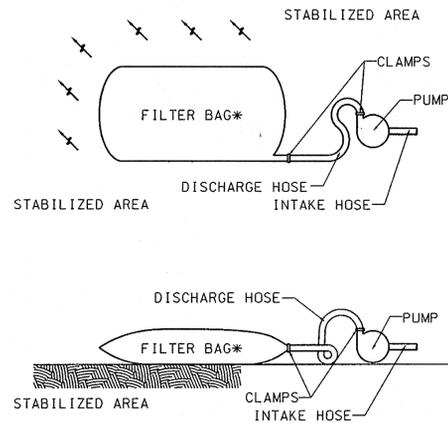
SHEET NO.: 16 OF 25

SDP-10-095

### 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 |



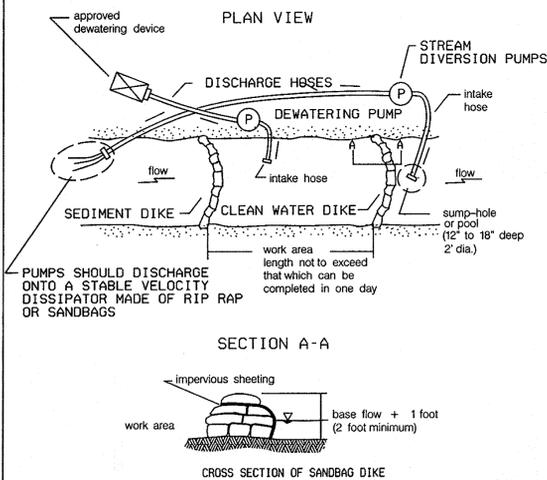
\* NON-WOVEN GEOTEXTILE FILTER BAG WHICH RETAINS ALL SEDIMENT PARTICLES LARGER THAN 150 MICRONS.

### 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.

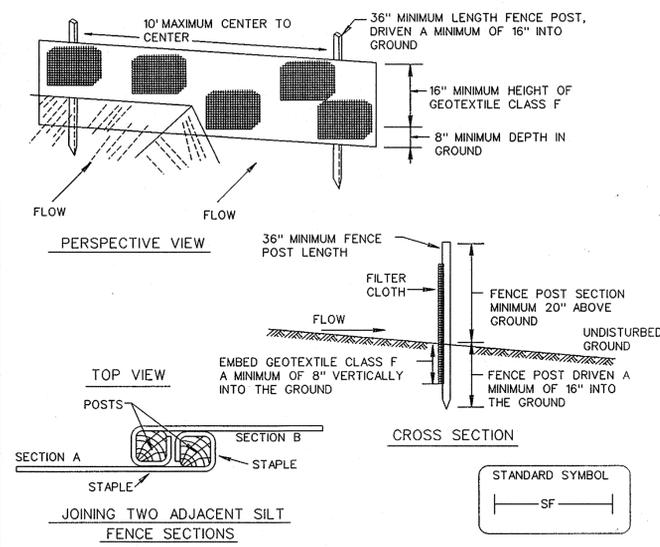
NOTE: ALL WATER COLLECTED WITHIN THE LIMIT OF DISTURBANCE (WITH THE EXCEPTION OF WATER DIVERTED AROUND THE WORK AREA) SHALL BE PUMPED THROUGH THE FILTER BAG.

### DETAIL 1.2: PUMP-AROUND PRACTICE



TEMPORARY INSTREAM CONSTRUCTION MEASURES  
REVISED NOVEMBER 2000  
MARYLAND DEPARTMENT OF THE ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

### DETAIL 22 - SILT FENCE

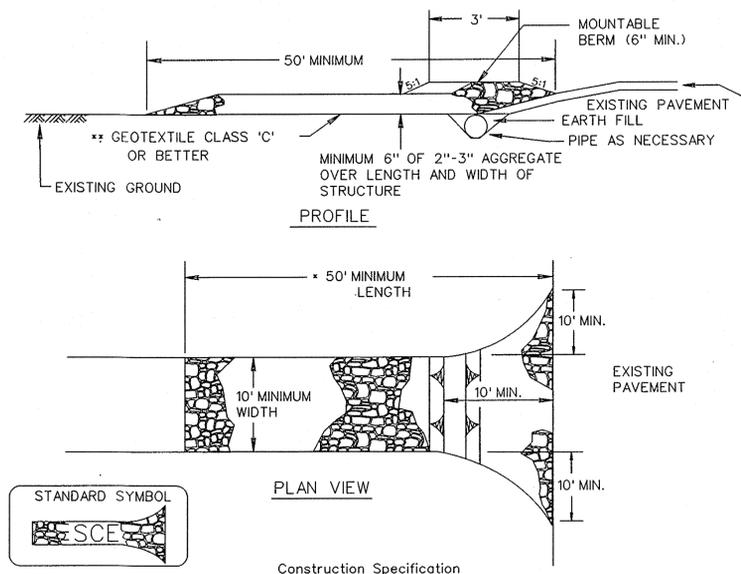


- Construction Specifications
1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum) cut, or 1 1/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound per linear foot.
  2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:
 

|                      |   |                |
|----------------------|---|----------------|
| Tensile Strength     | 50 lbs/in (min.)                        | Test: MSMT 509 |
| Tensile Modulus      | 20 lbs/in (min.)                        | Test: MSMT 509 |
| Flow Rate            | 0.3 gal ft <sup>2</sup> / 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.

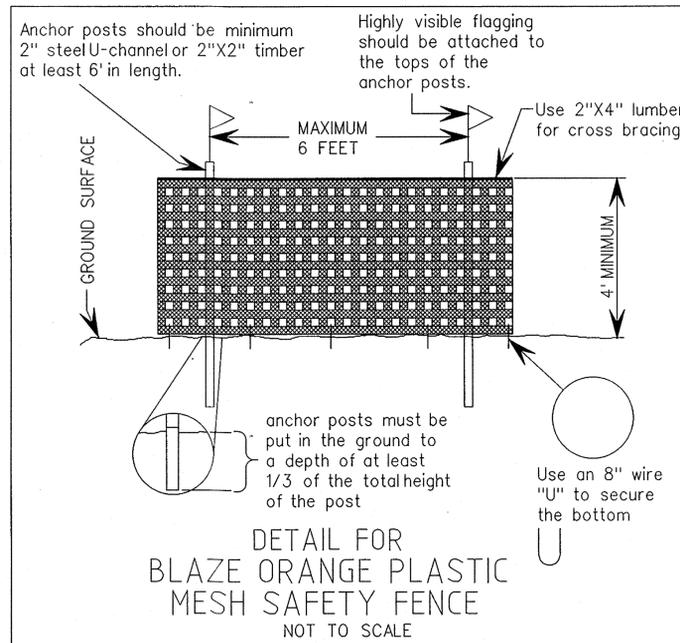
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE  
PAGE E - 15 - 3  
MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

### DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



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

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
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675 COLUMBIA GATEWAY DRIVE  
COLUMBIA, MARYLAND 21046  
PARCEL ELECTION DISTRICT #17  
HOWARD COUNTY, MARYLAND

### EROSION AND SEDIMENT CONTROL DETAILS

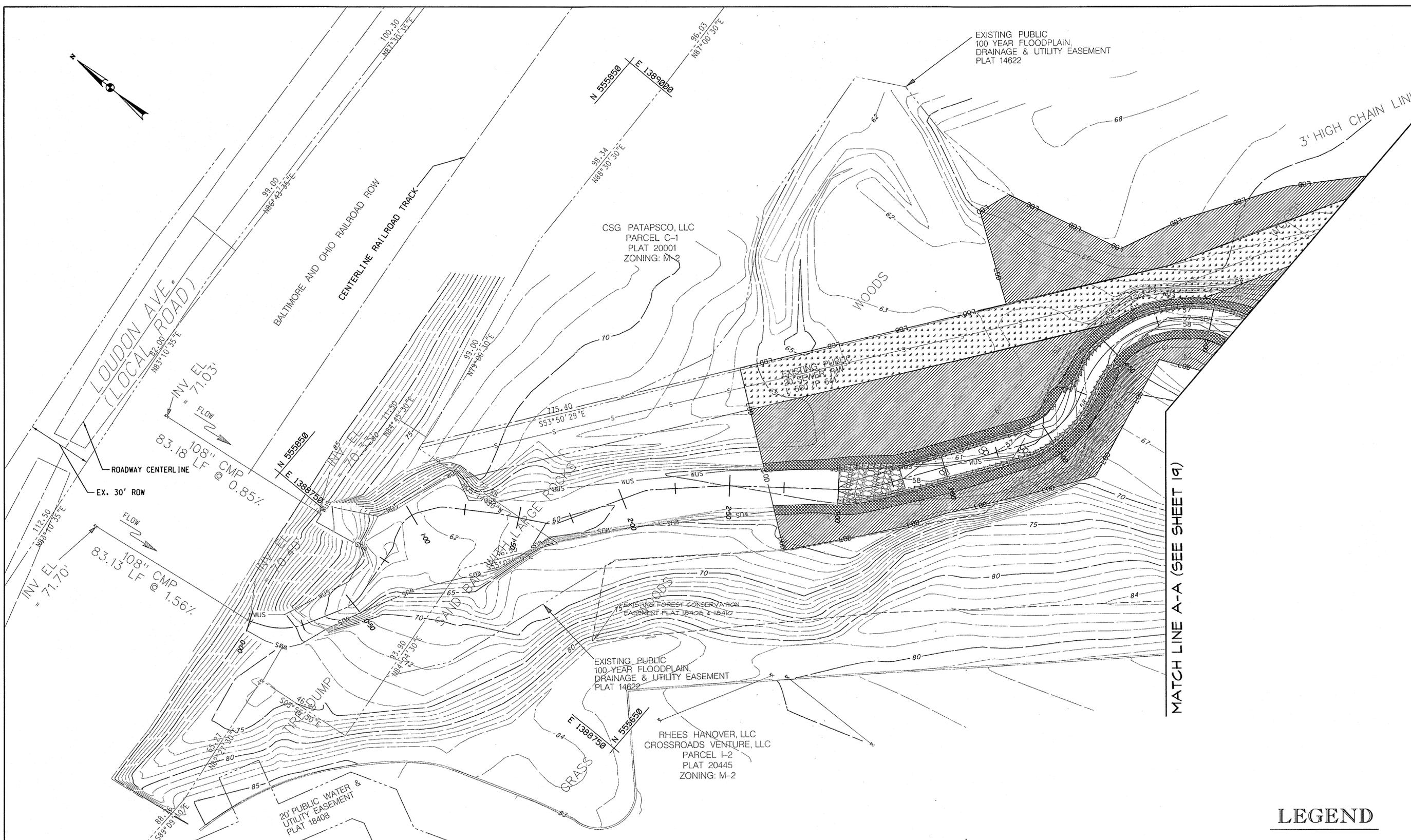
SCALE: AS SHOWN  
DATE: NOVEMBER 8, 2010  
KCIJOB NO.: 01-043223.26  
CAPITAL PROJECT NO.: D - 1122  
PERMIT ISSUE:  
CONSTRUCTION ISSUE:

SHEET NO.: 17 OF 25  
SDP-10-095

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  
 [Signature] 3/1/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 3/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature] 3/10/11  
 DIRECTOR

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.  
 [Signature] 2/24/11  
 HOWARD SCD  
 Date



MATCH LINE A-A (SEE SHEET 19)

| 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

**LANDSCAPE PLAN**

**LEGEND**

- LIVE STAKES ZONE
- RIPARIAN ZONE
- TURF ZONE

SCALE: 0 0.25 0.5 1.0  
 1" = 20'  
 DATE: NOVEMBER 8, 2010  
 KCI JOB NO.: 01-043223.26  
 CAPITAL PROJECT NO.: D - 1122  
 PERMIT ISSUE:  
 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. 38311, EXPIRATION DATE: JANUARY 06, 2012.

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*Chris Dorman* 3/9/11  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Kat Sheehy* 3/10/11  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Thomas J. Butler* 3/10/11  
 DIRECTOR DATE





# 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 |
|---------------|-------------------------|----------------|-----------|-----------|--------------|
| <b>SHRUBS</b> |                         |                |           |           |              |
| 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.   |
| <b>TREES</b>  |                         |                |           |           |              |
| 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 |
|---------------|-------------------------|----------------|-----------|-----------|--------------|
| <b>SHRUBS</b> |                         |                |           |           |              |
| 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.   |
| <b>TREES</b>  |                         |                |           |           |              |
| 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)

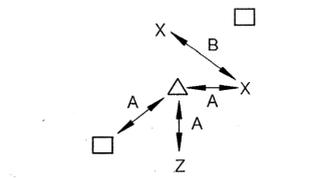
(46731 SF / 1.07 AC)

| 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)

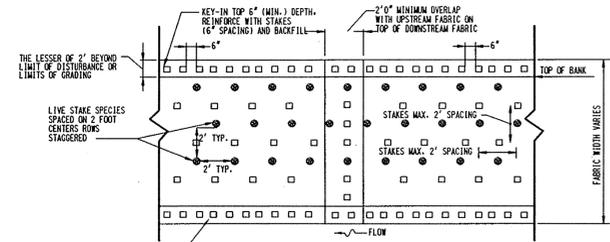
(12961 SF / 0.30 AC)

| 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   | 6.51           |



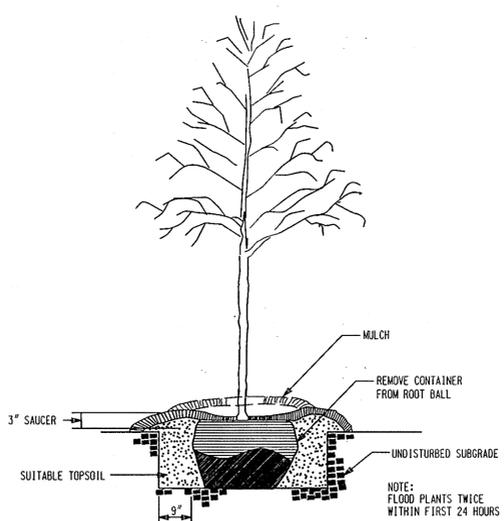
△, □ TREE SPECIES A: MINIMUM SPACING PER SCHEDULE  
 X, Z SHRUB SPECIES B: DUPLICATE SPECIES SPACING MINIMUM 2 TIMES MINIMUM SPACING

TREE AND SHRUB RANDOM SPACING  
 NOT TO SCALE

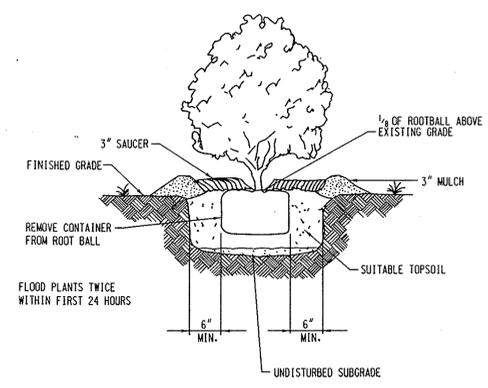


TYPICAL PLAN VIEW  
 NATURAL FIBER MATTING WITH LIVE STAKES  
 NOT TO SCALE

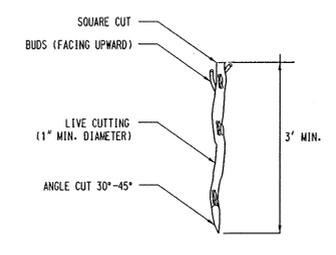
NOTES:  
 1. NATURAL FIBER MATTING TO BE ROLLED LENGTHWISE ALONG STREAMBANK EXTENDING TO THE BOTTOM OF THE PROTECTION AND A MINIMUM OF ONE FOOT PAST TOP OF BANK. IF MORE THAN ONE ROLL IS REQUIRED, MID-BANK OVERLAP SHOULD BE A MINIMUM OF ONE FOOT AND SECURELY FASTENED WITH STAKES. (SEE SPECIFICATIONS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



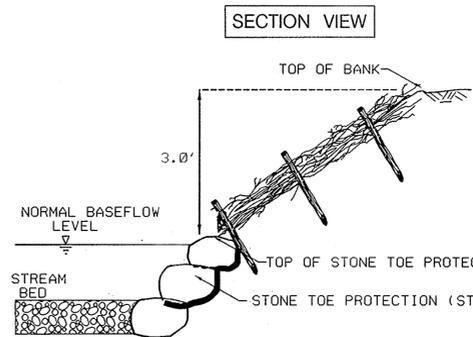
TREE PLANTING DETAIL  
 NOT TO SCALE



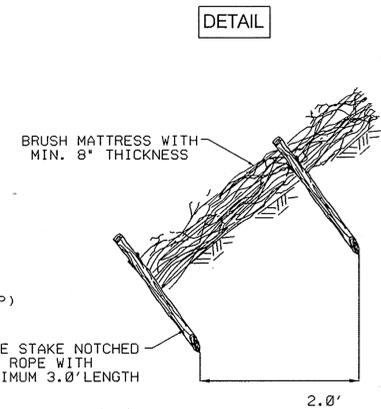
TREE & SHRUB PLANTING DETAIL  
 NOT TO SCALE



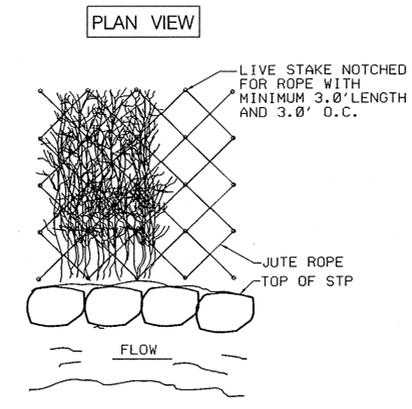
LIVE STAKE DETAIL  
 NOT TO SCALE



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 2008  
 PAGE 2.8 - 3

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
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936 RIDGEBROOK ROAD  
 SPARKS, MARYLAND 21152  
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 FAX: (410) 316-7818  
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HI TECH DRIVE  
 STREAM RESTORATION  
 PATAPSCO VALLEY BUSINESS CENTER  
 SECTION 3, AREA 3  
 HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS  
 11000 GREENBERRY 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:

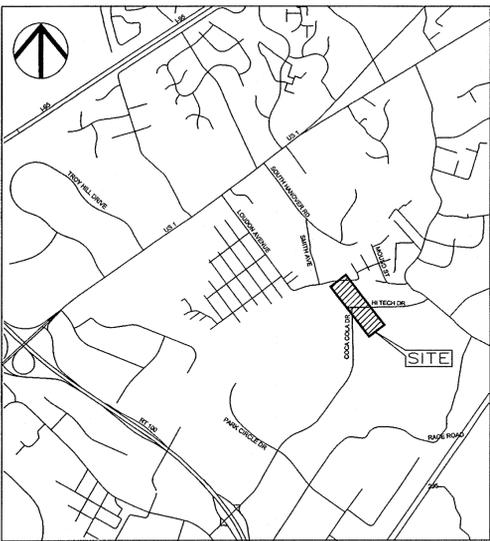
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 32311 EXPIRATION DATE: JANUARY 06, 2012

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

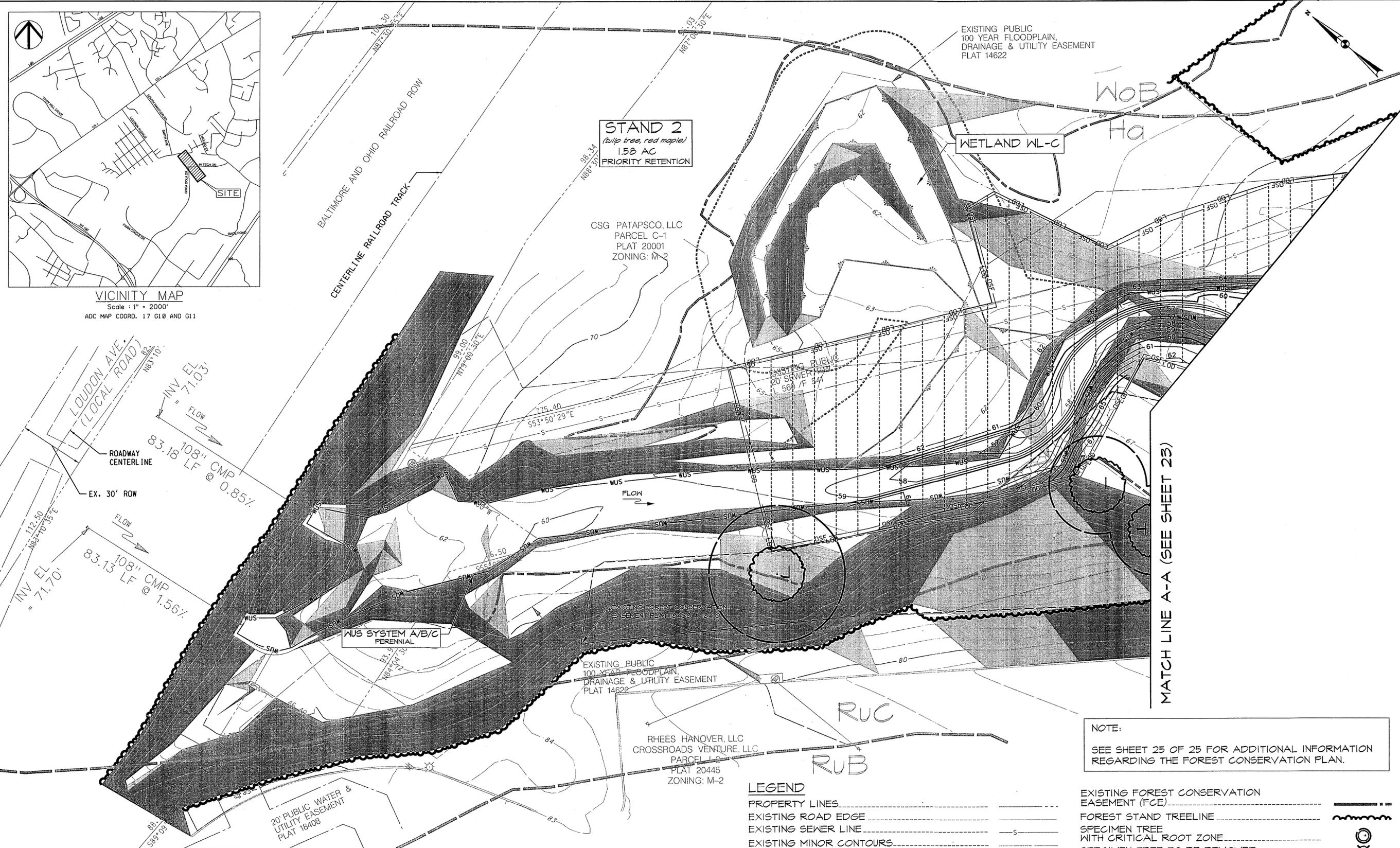
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 3/11/11

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

DIRECTOR DATE: 3/10/11



VICINITY MAP  
Scale: 1" = 2000'  
ADC MAP COORD. 17 G10 AND G11



**STAND 2**  
(tulip tree, red maple)  
1.58 AC  
PRIORITY RETENTION

CSG PATAPSCO, LLC  
PARCEL C-1  
PLAT 20001  
ZONING: M-2

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

WETLAND WL-C

WoB  
Ha

BALTIMORE AND OHIO RAILROAD ROW  
CENTERLINE RAILROAD TRACK

LOUDDON AVE.  
(LOCAL ROAD)  
ROADWAY CENTERLINE  
EX. 30' ROW  
INV EL. = 71.03'  
FLOW  
83.18 LF @ 0.85%  
INV EL. = 71.70'  
FLOW  
83.13 LF @ 1.56%

WUS SYSTEM A/B/C  
PERENNIAL

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

RHEES HANOVER, LLC  
CROSSROADS VENTURE, LLC  
PARCEL L-8  
PLAT 20445  
ZONING: M-2

MATCH LINE A-A (SEE SHEET 23)

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
- PROPOSED MINOR CONTOURS
- PROPOSED MAJOR CONTOURS
- EXISTING EASEMENTS
- WATERS OF THE UNITED STATES
- STREAM BUFFER
- EXISTING NONTIDAL WETLAND
- 25-FOOT NONTIDAL WETLAND BUFFER
- SOILS BOUNDARY AND MAP UNIT LABELS
- 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)
- TREE PROTECTION FENCING
- 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.



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: 3/15/11

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

HARMONY MILLER  
 DATE: 04 JAN. 2011

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
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|     |                       |      |
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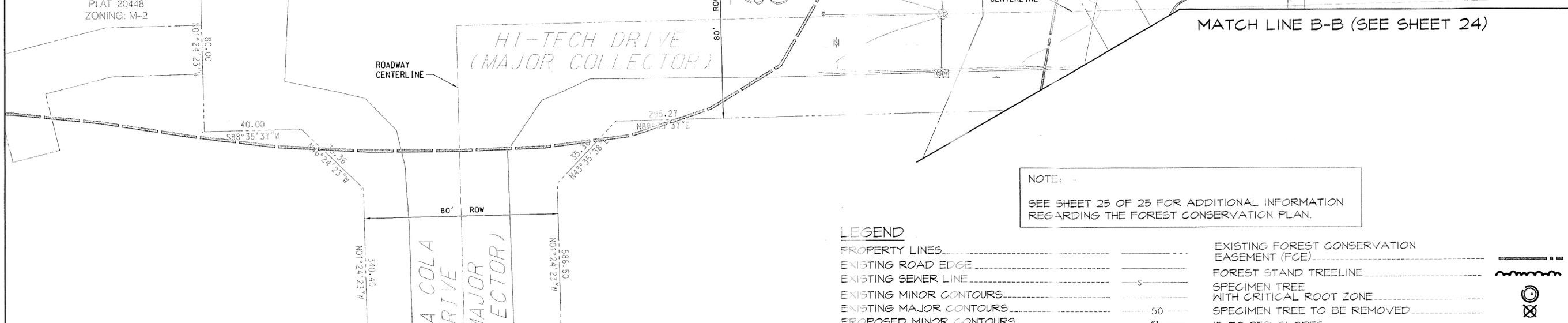
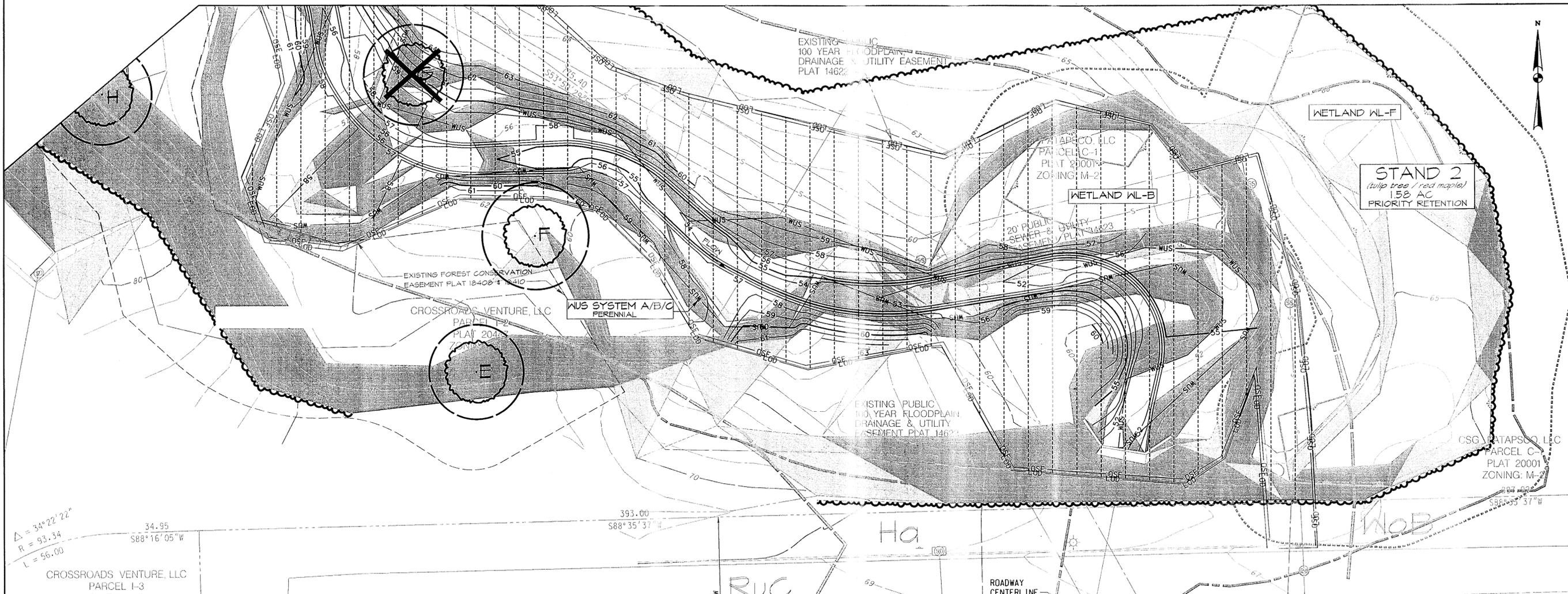


HITECH DRIVE  
STREAM RESTORATION  
PATAPSCO VALLEY BUSINESS CENTER  
SECTION 3, AREA 3  
HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS  
STORMWATER MANAGEMENT DIVISION  
675 COLUMBIA GATEWAY DRIVE  
PARCEL ELECTION DISTRICT 21166  
HOWARD COUNTY, MARYLAND

**FOREST CONSERVATION PLAN**

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

MATCH LINE A-A (SEE SHEET 22)



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

**LEGEND**

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

| NO. | REVISIONS DESCRIPTION | DATE |
|-----|-----------------------|------|
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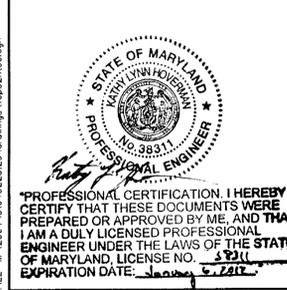
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**HITECH DRIVE  
STREAM RESTORATION**  
PATAPSCO VALLEY BUSINESS CENTER  
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HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS  
STORMWATER MANAGEMENT DIVISION  
6750 COLUMBIA GATEWAY DRIVE  
PARCEL 285 TAX MAP 58 ZONING M-2  
ELECTION DISTRICT 01  
HOWARD COUNTY, MARYLAND

**FOREST CONSERVATION PLAN**

SCALE: 0 0.25 0.5 1.0 FEET  
DATE: NOVEMBER 8, 2010  
KCI JOB NO.: 01-043223.26  
CAPITAL PROJECT NO.: D - 1122  
PERMIT ISSUE:  
CONSTRUCTION ISSUE:



APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

*John P. ...* 3/9/11  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Pat ...* 3/10/11  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Thomas G. ...* 3/16/11  
DIRECTOR DATE

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

*Harmony Miller* 04 JAN 2011  
SIGNATURE DATE



