

**GENERAL NOTES**

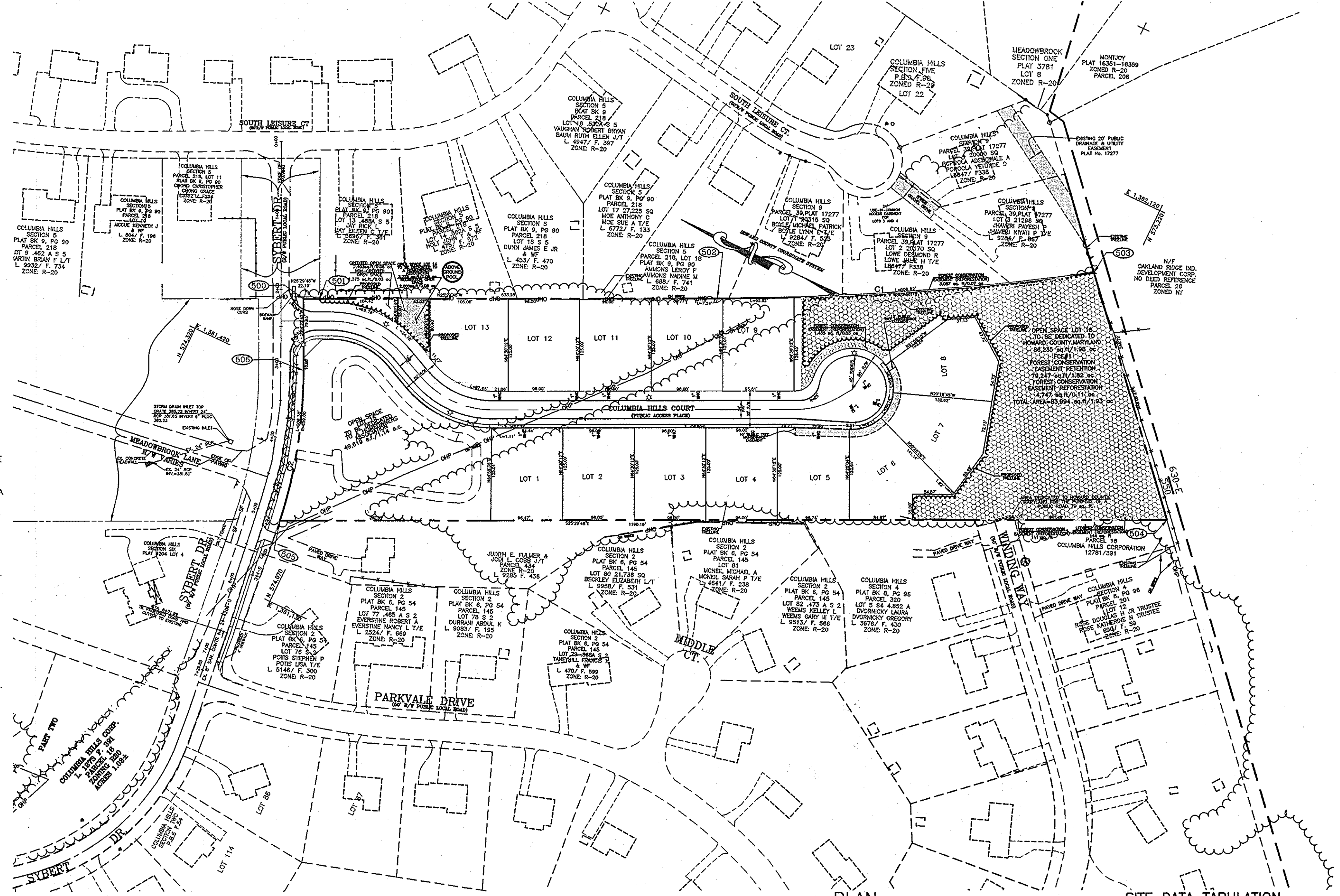
- THE SUBJECT PROPERTY IS ZONED R-20 PER THE 2/02/04 COMPREHENSIVE ZONING PLAN AND PER COMP. LITE ZONING AMENDMENTS EFFECTIVE 7/28/06.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS IF APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410)313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- ALL ASPECTS OF THIS PROJECT SHALL BE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVER(S) HAVE BEEN APPROVED.
- THE BOUNDARY SHOWN IS BASED ON A MSHA PLAT NO. 5698Z.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL MONUMENTS 30C22 & 30C13, WHICH IS BASED ON THE MARYLAND STATE PLANE COORDINATE SYSTEM.
- EXISTING TOPOGRAPHY SHOWN HEREON WAS FIELD RUN BY BENCHMARK ENGINEERING, INC., DATED JANUARY, 2007. CONTOUR INTERVAL IS 2 FEET.
- EXISTING UTILITIES SHOWN HEREON ARE BASED ON FIELD LOCATIONS AND RECORD DRAWINGS.
- CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO ANY CONSTRUCTION ACTIVITY AND SHALL ADJUST ALL UTILITIES AND RIM ELEVATIONS AS NEEDED TO MATCH THIS PLAN.
- THIS SUBDIVISION IS SUBJECTED TO SECTION 18.1228 OF THE HOWARD COUNTY CODE. PUBLIC WATER AND/OR SEWER SERVICE HAS BEEN GRANTED UNDER THE TERMS AND PROVISIONS, THEREOF, EFFECTIVE \_\_\_\_\_ ON WHICH DATE DEVELOPER AGREEMENT #24-4519-D WAS FILED AND ACCEPTED.
- FOREST STAND DELINEATION PLAN WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. DATED MAY, 2007.
- THERE ARE NO 100-YEAR FLOODPLAIN, STEEP SLOPES (25% OR GREATER THAN), WETLANDS AND WETLAND BUFFERS ON THE SITE.
- NO NOISE STUDY IS REQUIRED FOR THIS PROJECT.
- A.P.F.O. TRAFFIC STUDY WAS PREPARED BY THE MARS GROUP, DATED APRIL, 2007 AND APPROVED AUGUST 2, 2007.
- THE GEOTECHNICAL REPORT FOR THIS PROJECT WAS PREPARED BY HILLS-CARNES ENGINEERING ASSOCIATES, DATED MAY 17, 2007.
- THERE ARE NO HISTORIC FEATURES OR CEMETERIES ON THIS SITE.
- THERE ARE NO EXISTING DWELLING/STRUCTURES LOCATED ON THIS SITE.
- UNLESS NOTED AS "PRIVATE", ALL EASEMENTS ARE PUBLIC.
- ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
- BRL INDICATES BUILDING RESTRICTION LINE.
- THIS PLAN IS SUBJECT TO THE 5th EDITION OF THE HOWARD COUNTY SUBDIVISION REGULATIONS AND THE AMENDED HOWARD COUNTY ZONING REGULATIONS.
- STORMWATER MANAGEMENT SHALL BE PROVIDED FOR THIS PROJECT BASED ON GUIDELINES ESTABLISHED BY THE 2000 MARYLAND STORMWATER DESIGN MANUAL VOLUMES I & II. QUANTITY CONTROL SHALL BE PROVIDED BY: AN EXTENDED DETENTION POND (P-3). QUALITY CONTROL SHALL BE PROVIDED BY: A SURFACE SAND FILTER (F-1) AND AN UNDERGROUND STONE REV CHAMBER. THESE BMP'S SHALL BE PRIVATELY OWNED AND MAINTAINED BY THE HOMEOWNER'S ASSOCIATION.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL PERFORATED SQUARE TUBE POST (14 GAUGE), INSERTED INTO A 2-1/2" GALVANIZED STEEL PERFORATED SQUARE TUBE SLEEVE (12 GAUGE) - 3' LONG A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURES AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006) AND POLES SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (2006), SECTION 5.5.A. A MINIMUM OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.
- PERIMETER AND SWM LANDSCAPING SHALL BE PROVIDED AS SHOWN ON THE LANDSCAPE PLAN OF THE ROAD CONSTRUCTION DRAWINGS FOR THIS FINAL PLAN IN ACCORDANCE WITH SECTION 16.124 OF THE LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF \$15,000 (\$0.700 FOR 29 SHADE TREES, \$3,600 FOR 24 EVERGREEN TREES AND \$3,300 FOR 22 ORNAMENTAL TREES) SHALL BE POSTED WITH THE DEVELOPER'S AGREEMENT UNDER THIS FINAL PLAN, F-09-006.
- ALL AREAS OF CONTROLLED FILL TO BE AT 95% COMPACTION PER AASHTO-T180 STANDARDS.
- THE FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT WILL BE MET THROUGH THE ON-SITE RETENTION OF 1.82 AC. OF FOREST AND 0.11 AC. OF ON-SITE REFORESTATION AND A FEE-IN-LIEU PAYMENT OF \$32,670.00 TO THE HOWARD COUNTY FOREST CONSERVATION FUND FOR ONE ACRE OF REFORESTATION. SURETY IN THE AMOUNT OF \$15,849.40 (79,247 SF x \$0.20) FOR 1.82 AC. OF RETENTION AND \$2,373.50 (4,747 SF x \$0.50) FOR 0.11 AC. OF ON-SITE REFORESTATION FOR A TOTAL OF \$18,222.90 SHALL BE POSTED WITH THE DEVELOPER'S AGREEMENT UNDER THIS FINAL PLAN, F-09-006.

# COLUMBIA HILLS SECTION 10

## LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 thru 16

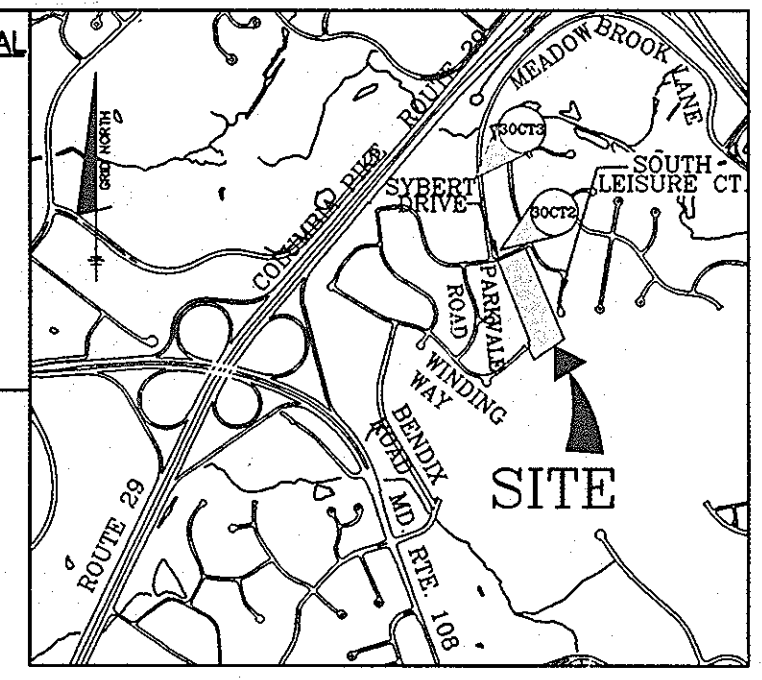
PARCEL 13 / ZONE: R-20  
2nd ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

### FINAL CONSTRUCTION PLANS F-09-006



**BENCH MARKS NAD'83 HORIZONTAL**

HO. CO. #30072 3/8" REBAR WITH RED PLASTIC CAP N 574179.232' E 1361312.723' ELEV. = 388.74
HO. CO. #30073 3/8" REBAR WITH RED PLASTIC CAP N 574812.755' E 1361173.247' ELEV. = 386.42



VICINITY MAP  
SCALE: 1"=2000'  
ADC MAP No. 16-B1

**LEGEND**

- EXISTING CONTOUR: 398, 400, 402, 404, 406, 408, 410
- PROPOSED CONTOUR: 400, 410
- EXISTING WOODS LINE
- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- EX. OVERHEAD WIRE
- EX. UTILITY POLE
- PROPOSED EARTH DIKE
- PROP. SUPER SILT FENCE
- PROP. SILT FENCE
- PROP. LIMIT OF DISTURBANCE
- SOILS BOUNDARY
- PROP. FIRE HYDRANT
- PROP. SOIL BORING
- PROP. REMOVABLE PUMP STATION
- PERMANENT FOREST CONSERVATION SIGNAGE
- PROP. STONE CHAMBER
- BOUNDARY CORNERS
- PROPOSED STREET LIGHT
- L.S. PERIMETER AREAS
- PUBLIC R/W BEARING AND DISTANCE DESIGNATION
- PUBLIC R/W CURVE DESIGNATION
- PROP. STABILIZED CONSTRUCTION ENTRANCE
- 10' PUBLIC TREE MAINTENANCE EASEMENT
- PROP. SIDEWALK
- EXISTING DRAINAGE EASEMENT
- PUBLIC WATER & UTILITY EASEMENT
- PUBLIC DRAINAGE & UTILITY EASEMENT
- PRIVATE DRAINAGE & UTILITY EASEMENT
- FOREST CONSERVATION EASEMENT (RETENTION)
- RECREATIONAL OPEN SPACE
- NON-WOODY VEGETATION AREA
- FOREST CONSERVATION EASEMENT (REFORESTATION)
- PROP. OPEN SPACE SWM
- PROP. SWM ACCESS ROAD

**BOUNDARY COORDINATE TABLE (NAD '83)**

NO.	NORTHING	EASTING
500	574,205.71	1,361,518.39
501	574,185.67	1,361,527.94
502	573,704.33	1,361,757.49
503	573,263.19	1,362,008.20
504	573,030.48	1,361,746.49
505	574,104.76	1,361,234.16
506	574,163.78	1,361,431.05

**BOUNDARY CURVE DATA**

CURVE	RADIUS	ARC	DELTA	TANGENT	CHORD
C1	3706.72'	506.82'	07°50'02"	253.80'	N29°24'49"W 506.42'
C2	659.00'	206.38'	17°56'36"	104.04'	N73°10'05"E 205.64'

**SOILS LEGEND**

MAP SYMBOL	SOIL TYPE	MAPPING UNIT
CH2	B	CHESTER SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
CH2	B	GLENNLEIGH LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
MB2	B	MANOR LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
MC2	B	MANOR LOAM, 8 TO 15 PERCENT SLOPES, MODERATELY ERODED
MC3	B	MANOR LOAM, 8 TO 15 PERCENT SLOPES, SEVERELY ERODED
GC3	B	GLENNLEIGH LOAM, 8 TO 15 PERCENT SLOPES, SEVERELY ERODED
*CH2	C	GLENNLEIGH SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED

SOILS MAP No.20  
\* - INDICATES HYDRIC SOILS

**SHEET INDEX**

NO.	DESCRIPTION
1	COVER SHEET
2	ROAD PLAN, PROFILE, NOTES AND DETAILS
3	GRADING, SEDIMENT & EROSION CONTROL PLAN
4	SEDIMENT & EROSION CONTROL NOTES AND DETAILS
5	STORMWATER MANAGEMENT PROFILES, NOTES AND DETAILS
6	STORMWATER MANAGEMENT PROFILES, NOTES AND DETAILS
7	STORM DRAINAGE AREA MAP, SOIL MAP AND BORING LOGS
8	STORM DRAIN PROFILES, NOTES AND DETAILS
9	LANDSCAPE PLAN, NOTES AND DETAILS
10	ON-SITE FOREST CONSERVATION PLAN, NOTES AND DETAILS
11	PUBLIC ROADWAY IMPROVEMENTS CROSS SECTIONS AND DETAILS
12	PUBLIC ROADWAY IMPROVEMENTS CROSS SECTIONS, FILLET PROFILES AND TRAFFIC CONTROL PLAN

**Drainage Area Summary Table**

STUDY POINTS (DRAINAGE AREAS)	EXISTING DISCHARGE (CFS)			DEVELOPED DISCHARGE (CFS) WITHOUT SWM			DEVELOPED DISCHARGE (CFS) WITH SWM		
	1 YR	10 YR	100 YR	1 YR	10 YR	100 YR	1 YR	10 YR	100 YR
# 1 (Sub A & B)	0.61	6.76	14.56	4.63	16.97	28.64	0.37	8.07	24.74
#2	0.01	0.52	1.38	-	-	-	-	-	-
#3	0.19	3.86	8.99	0.05	1.88	4.69	0.05	1.88	4.69

**SWM Facility Summary**

Facility	Type	WQv (Provided)	WQv (Required)
SWM #1	Surface Sand Filter	0.2009 AC-FT	0.2009 AC-FT
	Total Required	0.2009 AC-FT	0.2009 AC-FT
	Remaining Requirement		0.0 AC-FT

**SITE DATA TABULATION**

- GENERAL SITE DATA
  - PRESENT ZONING: R-20
  - LOCATION: TAX MAP 30 - GRID 05 - PARCEL 13
  - APPLICABLE DPZ FILE REFERENCES: SP-08-001
  - DEED REFERENCE: L10740 / F.151 (PLAT REFERENCE: SHA PLAT 5698Z)
  - PROPOSED USE OF SITE: 13 SFD HOMES
  - PROPOSED WATER AND SEWER SYSTEMS: PUBLIC
- AREA TABULATION
  - TOTAL AREA OF SITE: 7.86 Ac.±
  - AREA OF 100 YEAR FLOODPLAIN (APPROX.): N/A
  - AREA OF STEEP SLOPES (25% OR GREATER): 0.00 Ac.±
  - NET AREA OF SITE: 7.86 Ac.±
  - AREA OF THIS PLAN SUBMISSION: 7.86 Ac.±
  - LIMIT OF DISTURBANCE (APPROX.): 6.24 Ac.±
  - AREA OF PROPOSED BUILDABLE LOTS: 3.58 Ac.±
  - AREA OF OPEN SPACE LOTS: 3.21 Ac.±
  - AREA OF PROPOSED PUBLIC R/W DEDICATION: 1.07 Ac.±
- DENSITY TABULATION
  - NET AREA OF SITE: 7.86 Ac.±
  - UNIT/LOT TABULATION
- TOTAL NUMBER OF RESIDENTIAL LOTS PROPOSED ON THIS SUBMISSION: 13
- TOTAL NUMBER OF OPEN SPACE LOTS PROPOSED ON THIS SUBMISSION: 3
- OPEN SPACE DATA
  - MINIMUM RESIDENTIAL LOT SIZE SELECTED: 12,000 S.F.
  - OPEN SPACE REQUIRED FOR TOTAL AREA OF SITE (40% OF 7.86 Ac.): 3.14 Ac.±
  - TOTAL AREA OF PROPOSED OPEN SPACE LOTS PROVIDED WITH THIS SUBMISSION: 3.21 Ac.±
    - OPEN SPACE AREAS LESS THAN 35' IN WIDTH (NON-CREDITED): 0.03 Ac.±
  - TOTAL AREA OF OPEN SPACE MEETING MINIMUM OPEN SPACE REQUIREMENTS: 3.18 Ac.± (40.5%)
  - AREA OF RECREATIONAL OPEN SPACE REQUIRED @200 SO.F. PER BUILDABLE LOT:
    - TOTAL AREA OF RECREATIONAL OPEN SPACE REQUIRED: 0.06 Ac.±
    - TOTAL AREA OF RECREATIONAL OPEN SPACE PROVIDED: 0.06 Ac.±

\* In developed condition the DA#2 is eliminated and combines with DA# 1.  
\* In the developed condition the site area below the proposed facility is Open Space.  
Therefore, in TR-55 DA#1 Subarea B is considered as Lawn.  
\* The 10-year and 100-year discharge for DA#1 (Sub A&B) is greater than the existing discharge. 24 hour extended detention will be provided for the one year, 24 hour storm event. Discharge from site shall not be erosive under developed conditions

Note: The channel protection and water quality control are fully addressed within SWM Facility #1 & 2

**Summary of General Storage Requirement Drainage Area # 1 (Sub A & B)**

Step	Requirement	Volume Required ac-ft (cfs)	Notes
1.	Water Quality Volume (WQv)	87523 cf (or 0.2009 ac-ft)	0.2009 ac-ft provided within a Surface Sand Filter facility
2.	Recharge Volume (Rev)	0.5675 acres (or 0.05052 ac-ft)	Rev provided within a stone chamber.
3.	Channel Protection Volume (Cpv)	0.2802 ac-ft (or 12209 cf)	0.2220 ac-ft provided within a Extended Detention facility
4.	Overbank Flood Protection Volume (Op)	N/A	Not required
5.	Extreme Flood Volume (Qf)	N/A	Not required

**Summary of General Storage Requirement Drainage Area # 3**

Step	Requirement	Volume Required ac-ft (cfs)	Notes
1.	Water Quality Volume (WQv)	N/A	Because DA#3 is the Open Space (Natural Area Conservation Credit)
2.	Recharge Volume (Rev)	0.5675 acres (or 0.05052 ac-ft)	Rev provided within a stone chamber.
3.	Channel Protection Volume (Cpv)	N/A	Cpv release rate is <2 cfs
4.	Overbank Flood Protection Volume (Op)	N/A	Not required
5.	Extreme Flood Volume (Qf)	N/A	Not required

\* EXTENDED DETENTION POND PROVIDED FOR Cpv,  
SURFACE SAND FILTER PROVIDED FOR WQv AND  
STONE CHAMBER PROVIDED FOR Rev.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. M... 2-19-09*  
CHIEF, BUREAU OF HIGHWAYS DATE:

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Cindy Ham* 2/25/09  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE:

*John ...* 2/24/09  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE:

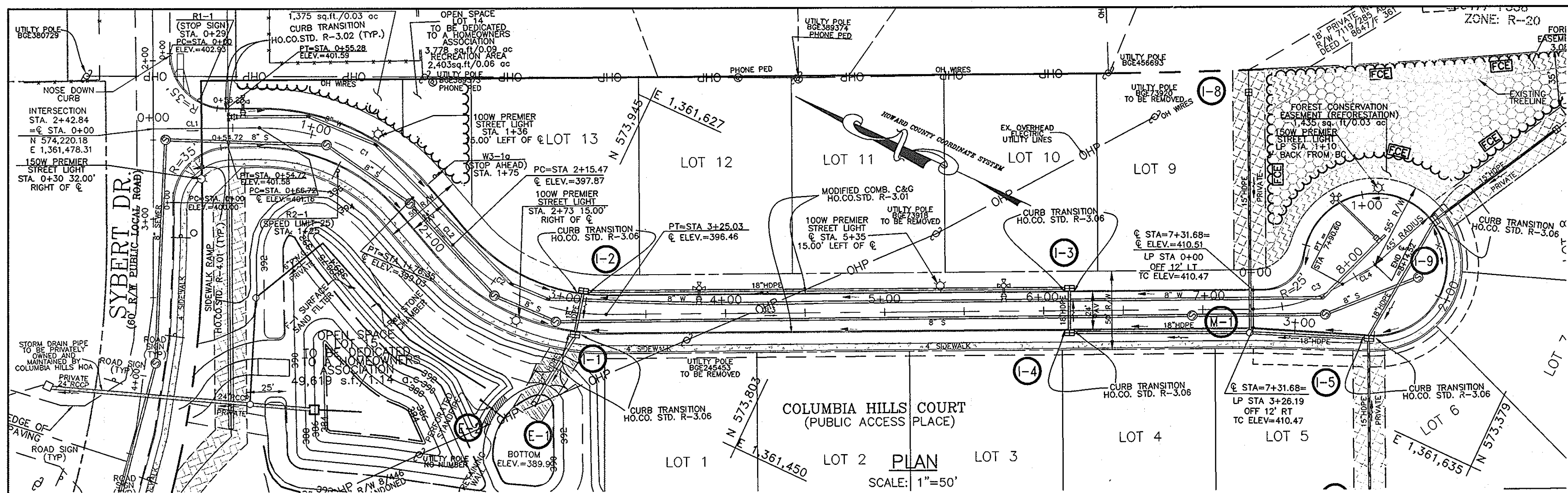
**BENCHMARK ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLICOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6844  
E-MAIL: bel@b-ei-civilengineering.com

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. 28559, Expiration Date: 07-22-2009.

DEVELOPER/CONTRACT PURCHASER: COLUMBIA HILLS, LLC  
P.O. BOX 417  
ELLICOTT CITY, MARYLAND 21041  
PHONE: (410) 465 - 4244

PROJECT: COLUMBIA HILLS SECTION 10  
LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 thru 16  
LOCATION: TAX MAP 30 - GRID 05  
PARCEL 13 - ZONE: R-20  
2nd ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND  
TITLE: COVER SHEET  
DATE: JUNE, 2008 PROJECT NO. 1869  
FEBRUARY, 2009  
SCALE: AS SHOWN DRAWING 1 OF 12

Des: HP Draft: HP Check: BFC



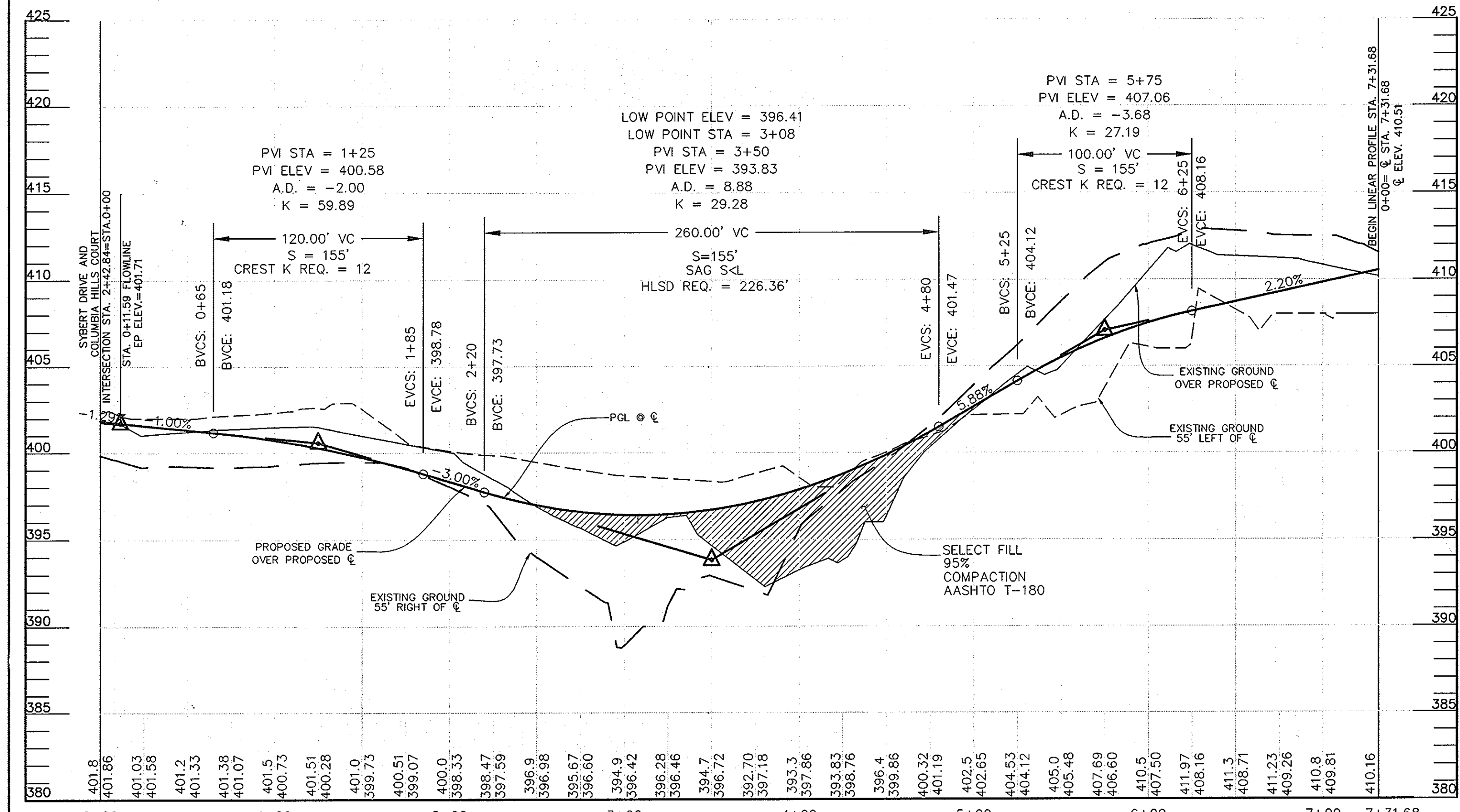
CENTERLINE CONTROL DATA-COORDINATES				
DESCRIPTION	STATION	NORTH	EAST	
P.O.B.	0+00.00	574220.18	1361478.31	
PC C1	0+66.72	574159.97	1361507.02	
PT C1	1+76.35	574053.82	1361507.02	
PC C2	2+15.47	574017.29	1361491.46	
PT C2	3+25.03	573912.20	1361492.17	
P.O.B./END LP = PC C3	7+31.68	573545.16	1361667.22	
PT C3	7+90.60	573501.07	1361705.24	
CUL-DE-SAC	8+14.52	573487.70	1361725.09	

CENTER LINE CURVE DATA						
CURVE	STATION	RADIUS	ARC	DELTA	TANGENT	CHORD
C1	PC=0+66.72	125.00'	109.63'	50°15'07"	58.62'	S00°24'19"E 106.15'
C2	PC=2+15.47	125.00'	109.56'	50°13'03"	58.58'	S00°23'17"E 106.08'
P.O.B./END C3	BEGINNING OF LP: 7+31.68	110.50'	58.92'	30°32'59"	30.18'	S40°46'17"E 58.22'
	PT=7+90.60					

CENTERLINE CONTROL DATA-BEARINGS				
LINE	DESCRIPTION	STATION	LENGTH	BEARING
CL1	P.O.B. PUBLIC R/W-PC C1	0+00.00	0+66.72	66.72' S25°31'52"E
CL2	PT C1 - PC C2	1+76.35	2+15.47	39.12' S24°43'15"W
CL3	PT C2 - PC C3	3+25.03	7+31.68	405.65' S25°29'48"E
CL4	PT C3 - CUL-DE-SAC	7+90.60	8+14.52	23.93' S56°02'46"E

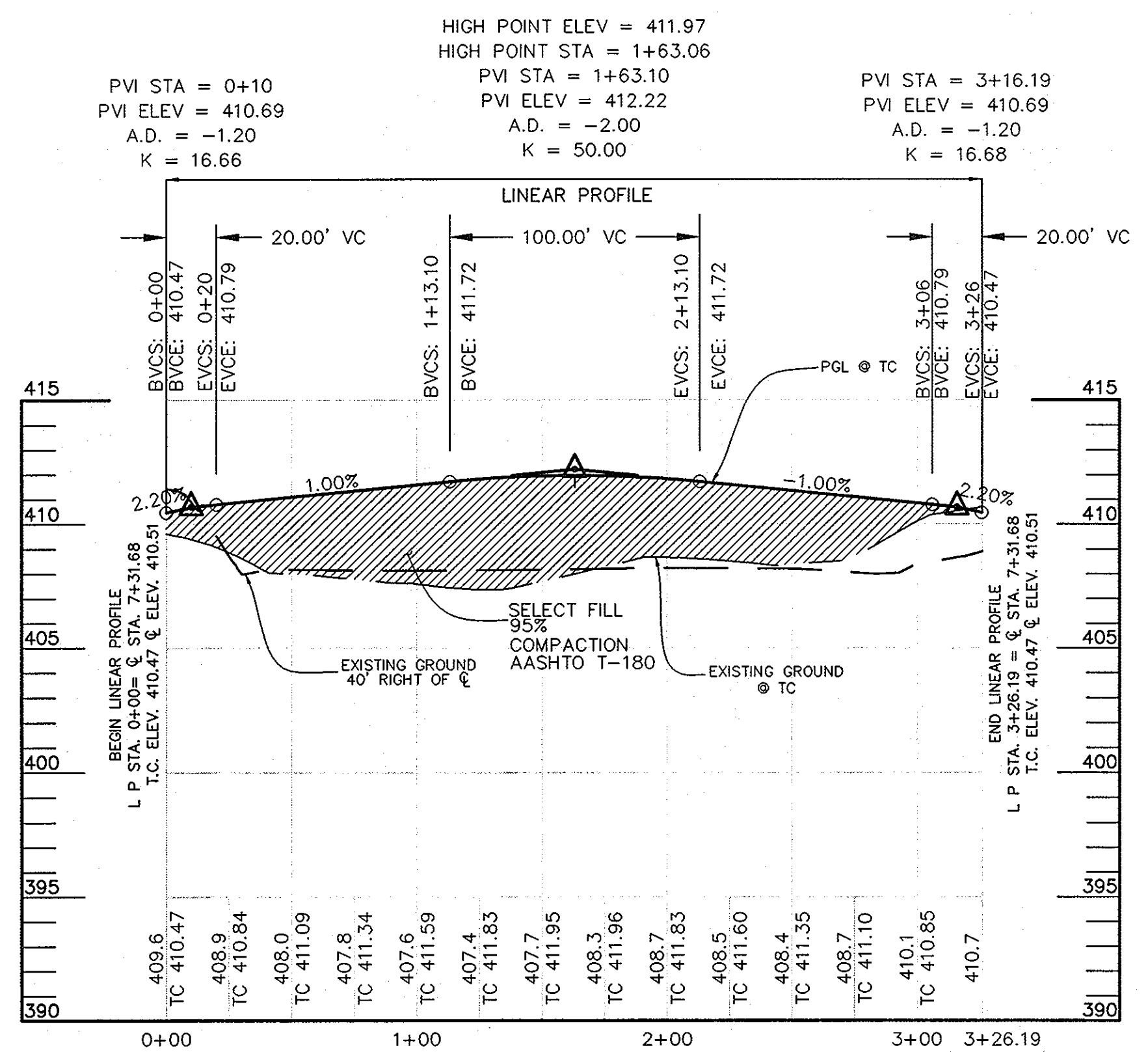
LEGEND

- PROPOSED WOODS LINE
- EXISTING STRUCTURE
- EX. OVERHEAD WIRE
- EX. UTILITY POLE
- PUBLIC DRAINAGE & UTILITY EASEMENT
- FOREST CONSERVATION EASEMENT (REFORESTATION)
- PROP. SIDEWALK
- FOREST CONSERVATION EASEMENT (REFORESTATION)
- PUBLIC WATER & UTILITY EASEMENT
- PRIVATE DRAINAGE & UTILITY EASEMENT
- PROPOSED STREET LIGHT
- PROPOSED FIRE HYDRANT

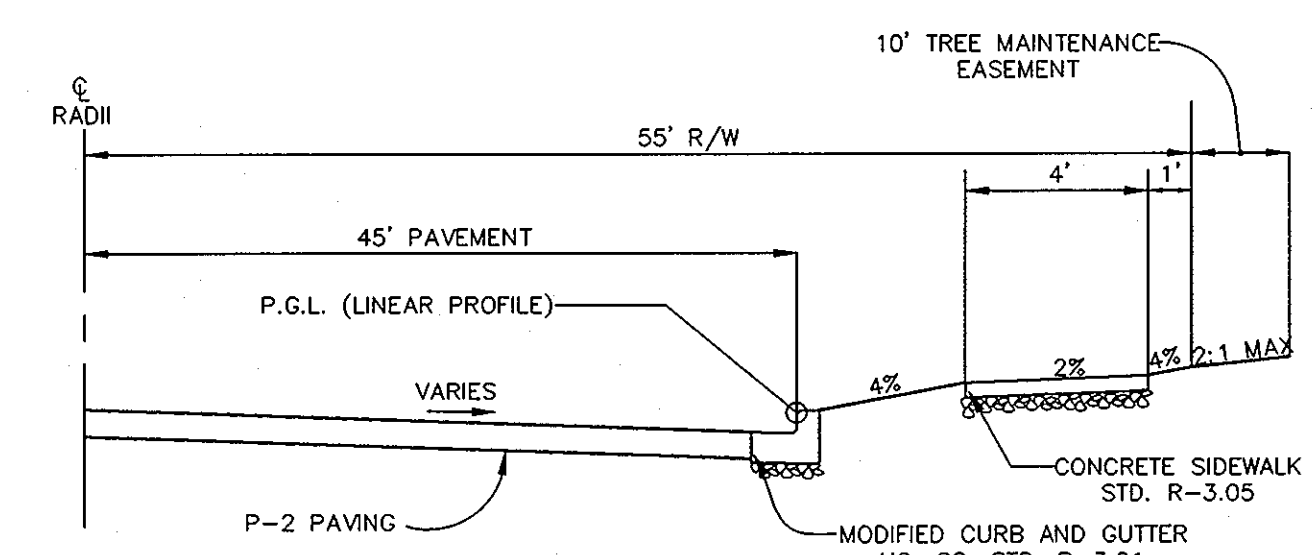


COLUMBIA HILLS COURT PROFILE  
 50' PUBLIC R/W  
 (PUBLIC ACCESS PLACE-DESIGN SPEED : 25 MPH)  
 13 RESIDENTIAL LOTS = 13 X 10ADT = 130 ADT  
 HOR: 1" = 50'  
 VERT: 1" = 5'

STREET LIGHT SCHEDULE		
SYMBOL	LOCATION	DESCRIPTION
☀	COLUMBIA HILLS COURT STA. 0+30.00 - OFFSET 32.00' RIGHT OF C	150 WATT HPS PREMIER POST-TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE
☀	COLUMBIA HILLS COURT STA. 1+36.00 - OFFSET 15' LEFT OF C	100 WATT HPS PREMIER POST-TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE
☀	COLUMBIA HILLS COURT STA. 2+73.00 - OFFSET RIGHT 15.00' OF C	100 WATT HPS PREMIER POST-TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE
☀	COLUMBIA HILLS COURT STA. 5+35.00 - OFFSET LEFT 15.00' OF C	100 WATT HPS PREMIER POST-TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE
☀	COLUMBIA HILLS COURT STA. 1+10.00 - OFFSET 3.00' BACK FROM BC	150 WATT HPS PREMIER POST-TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE



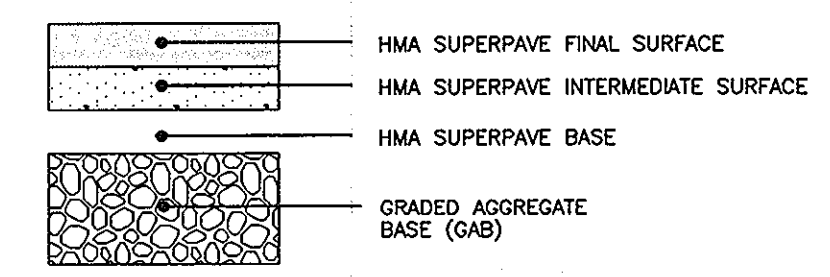
COLUMBIA HILLS COURT CUL-DE-SAC LINEAR PROFILE  
 SCALE: HOR: 1" = 50'  
 VERT: 1" = 5'



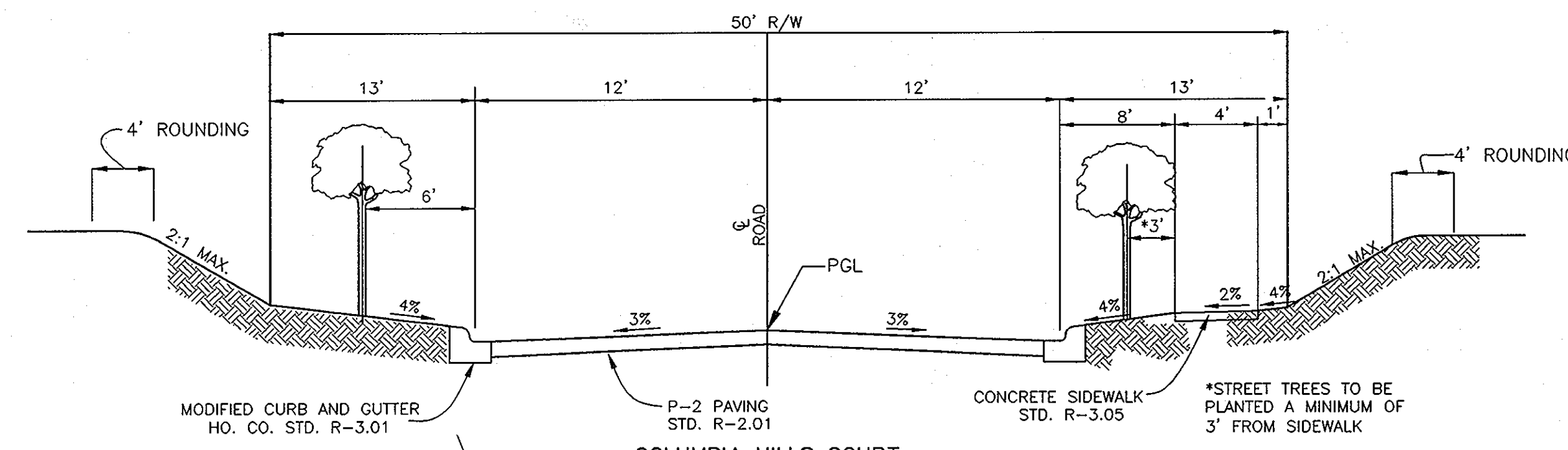
TYPICAL ROADWAY SECTION AT CUL-DE-SAC  
 NOT TO SCALE

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)					
		3 TO <5	5 TO <7	>7	3 TO <5	5 TO <7	>7
P-2	PARKING DRIVE ASILES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SACS: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE					
		9.5 MM, PG 64-22, LEVEL 1 (ESAL)					
		HMA SUPERPAVE INTERMEDIATE SURFACE					
		9.5 MM, PG 64-22, LEVEL 1 (ESAL)					
P-3	PARKING DRIVE ASILES: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 10 HEAVY TRUCKS PER DAY LOCAL ROADS: ACCESS PLACE, ACCESS STREET CUL-DE-SACS: RESIDENTIAL MINOR COLLECTORS: RESIDENTIAL	HMA SUPERPAVE FINAL SURFACE					
		9.5 MM, PG 64-22, LEVEL 1 (ESAL)					
		HMA SUPERPAVE INTERMEDIATE SURFACE					
		9.5 MM, PG 64-22, LEVEL 1 (ESAL)					
		HMA SUPERPAVE BASE					
		19.0 MM, PG 64-22, LEVEL 1 (ESAL)					
		GRADED AGGREGATE BASE (GAB)					
		8.0' 4.0' 3.0' 4.0' 4.0' 4.0'					

PAVING SPECIFICATIONS (HO.CO. STD R-2.01)



SCHEMATIC PAVING DETAIL  
 NOT TO SCALE



TYPICAL ROADWAY SECTION  
 NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 [Signature] 2-19-09  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 2/15/09  
 CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] 2/24/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
 ENGINEERS • LAND SURVEYORS • PLANNERS

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-8105 FAX: 410-465-6644  
 E-MAIL: be@be-civilengineering.com

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. 28559, Expiration Date: 07-22-2009.

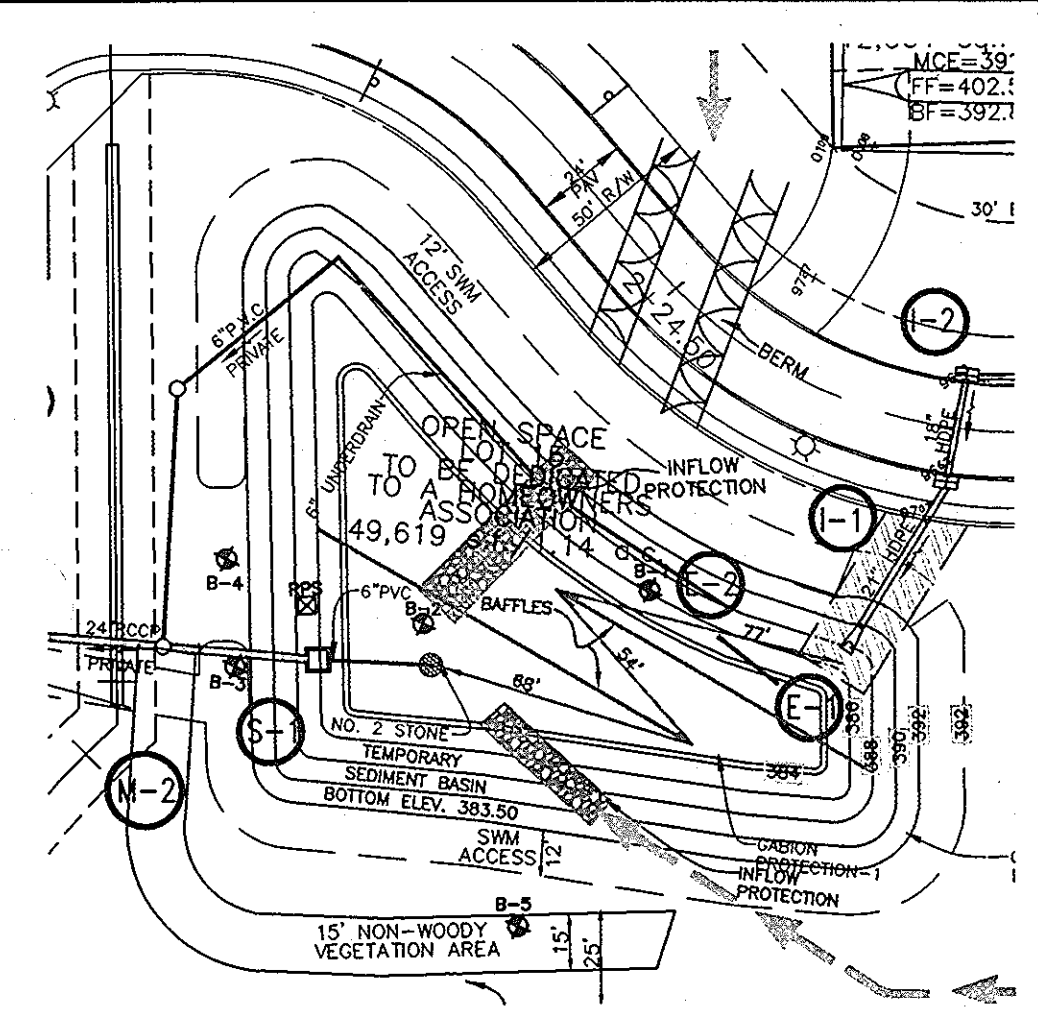
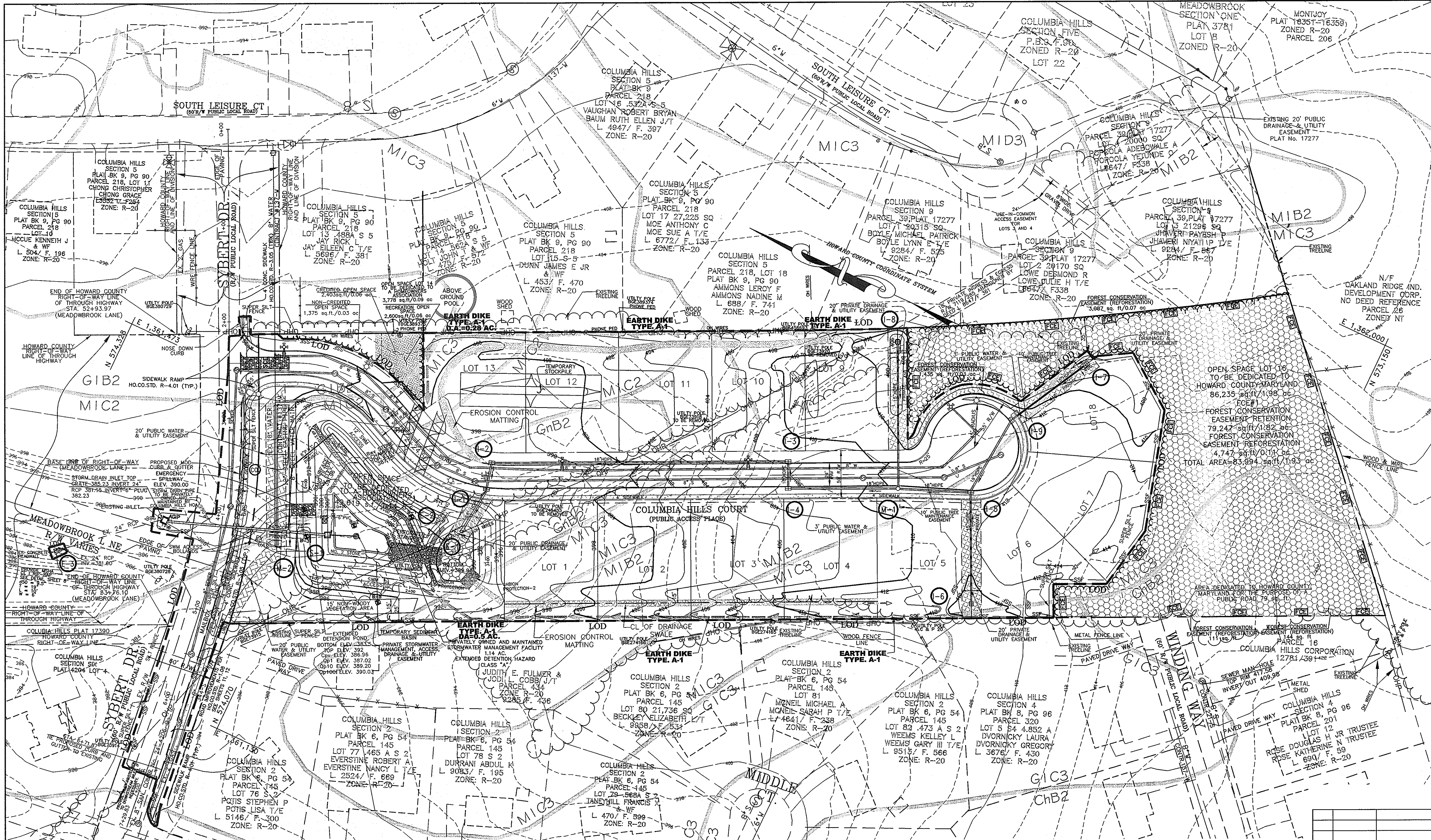
DEVELOPER/CONTRACT PURCHASER: COLUMBIA HILLS, LLC  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 PHONE: (410) 465-4244

PROJECT: COLUMBIA HILLS SECTION 10  
 LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 16  
 LOCATION: TAX MAP 30 - GRID 5  
 PARCEL 13 - ZONE: R-20  
 2nd ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE: ROAD PLAN, PROFILE, NOTES AND DETAILS

DATE: JUNE, 2008  
 FEBRUARY, 2009 PROJECT NO. 1869

Des: HP Draft: HP Check: BFC SCALE: AS SHOWN DRAWING 2 OF 12



**TEMPORARY SEDIMENT BASIN PLAN**  
SCALE: 1"=50'

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT  
DATE: 2/12/09

**AS-BUILT CERTIFICATION**

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

PE NO. \_\_\_\_\_  
DATE \_\_\_\_\_

**ENGINEER'S CERTIFICATE**  
I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, 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 SOIL CONSERVATION DISTRICT. I HAVE NOTICED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE THE POND CONSTRUCTION AND PROVIDE THE HOWARD SOILS CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

ENGINEER - BRIAN F. LEARY, P.E. #28559  
DATE: 2/14/2009

**DEVELOPER'S CERTIFICATE**

I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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 BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOILS CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOILS CONSERVATION DISTRICT.

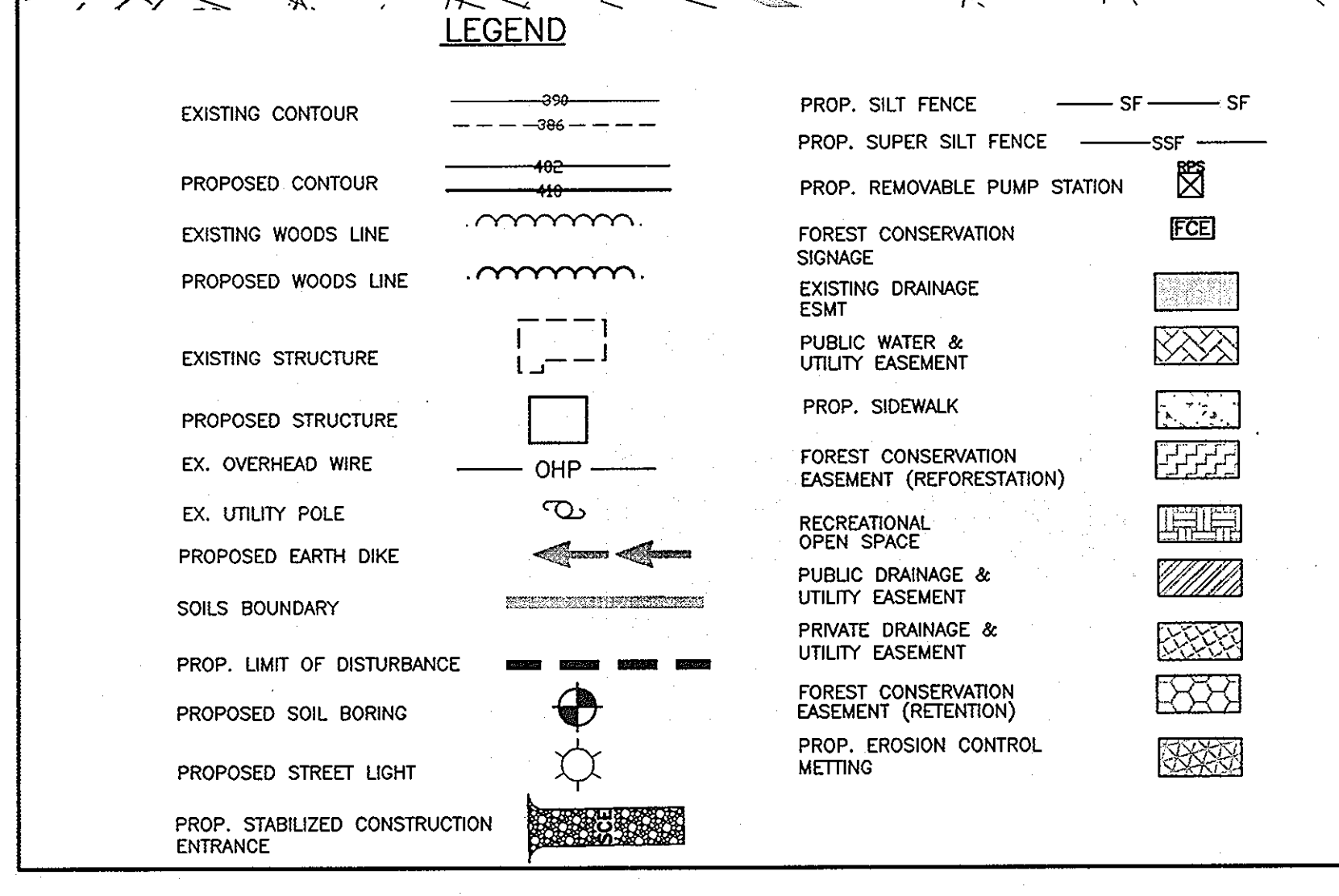
DEVELOPER: JAMES R. MURPHY, III  
DATE: 2/12/09

APPROVED: DEPARTMENT OF PUBLIC WORKS  
DATE: 2-19-09

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
DATE: 2/25/09

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 2/24/09

CHIEF, DEVELOPMENT ENGINEERING DIVISION



**NOTE:**  
STORM DRAIN FROM 18-E1 SHALL BE INSTALLED PRIOR TO DISTURBANCE OF ROADWAY AND DRAINAGE AREA PAST STATION 8+00 IN ORDER TO DIRECT RUNOFF TO TSWMF.

**NOTE:** DISTURBED AREA AROUND 1-8 TO BE STABILIZED WITH SOD AFTER INSTALLATION.

**SYBERT ROAD IMPROVEMENT NOTES**  
1. FOR TYPICAL SECTION SEE SHEET 12.  
2. FOR CROSS SECTIONS SEE SHEET 11.  
3. ROAD WIDENING SHALL BE IN ACCORDANCE WITH HO. CO. R-1.08, SEE SHEET 12.

**PLAN**  
SCALE: 1"=50'

SEDIMENT BASIN DATA	
EXISTING O.A.	5.45 ac.
PROPOSED O.A.	6.88 ac.
STORAGE REQUIRED	17,381 CF
STORAGE PROVIDED	17,381 CF
EMBANKMENT ELEVATION	352.00
RISER CREST ELEVATION	389.00
CLEANOUT ELEVATION	384.46
BOTTOM ELEVATION	383.50
WET STORAGE ELEVATION	385.30
DRY STORAGE ELEVATION	366.88
Q1 PRE-DEVELOPMENT	0.79 cfs
Q1 DURING-DEVELOPMENT	0.44 cfs

SOILS LEGEND		
MAP SYMBOL	SOIL TYPE	MAPPING UNIT
CH2	B	CHESTER SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
CH2	B	GLENELG LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
MIB2	B	MANOR LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED
MIC2	B	MANOR LOAM, 8 TO 15 PERCENT SLOPES, MODERATELY ERODED
MIC3	B	MANOR LOAM, 8 TO 15 PERCENT SLOPES, SEVERELY ERODED
CH2	B	GLENELG LOAM, 8 TO 15 PERCENT SLOPES, SEVERELY ERODED
GnB2	C	GLENVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED

**BENCHMARK**  
ENGINEERS • LAND SURVEYORS • PLANNERS

**ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLICOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6644  
E-MAIL: be@be-civilengineering.com

2/12/09  
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. 28559, Expiration Date: 07-22-2009.

DEVELOPER/CONTRACT PURCHASER:	PROJECT:
COLUMBIA HILLS, LLC P.O. BOX 417 ELLICOTT CITY, MARYLAND 21043 PHONE: (410) 465 - 4244	<b>COLUMBIA HILLS SECTION 10</b>
TITLE:	LOCATION:
<b>GRADING, SEDIMENT AND EROSION CONTROL PLAN</b>	TAX MAP 30 - GRID 05 PARCEL 13 - ZONE: R-20 2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE:	PROJECT NO.:
JUNE, 2008 FEBRUARY, 2009	1869
Des: HP	Draft: HP
Check: BFC	SCALE: AS SHOWN
	DRAWING 3 OF 12

SEDIMENT CONTROL NOTES

- 1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTION, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION 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...
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DITCHES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1, BY 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE...
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE VENCED 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 1984 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS (SEC. 5) SOO (SEC. 5A), TEMPORARY SEEDING (SEC. 5) AND MULCHING (SEC. 5C). 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 7.86 ACRES
AREA DISTURBED 6.24 ACRES
AREA TO BE ROOFED OR PAVED 1.81 ACRES
AREA TO BE VEGETATIVELY STABILIZED 4.35 ACRES
TOTAL CUT 13,390 CY
TOTAL FILL 13,390 CY
OFF SITE BORROW LOCATION 0.00 CY

\*IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY THE SPILL/BORROW SITE AND NOTIFY AND OBTAIN APPROVAL FROM THE SEDIMENT CONTROL INSPECTOR OF THE SITE AND ITS GRADING PERMIT NUMBER AT THE TIME OF CONSTRUCTION.
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 CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

TEMPORARY SEEDBED PREPARATIONS

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.
SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT).
SEEDING: PER PERIOD MARCH 1 THROUGH APRIL 30 AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2-1/2 BUSHELS PER ACRE OF ANNUAL RYE (3.2 LBS/1000 SQ FT). FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS PER ACRE OF WEEPING LOVEGRASS (0.7 LBS/1000 SQ FT). FOR THE PERIOD NOVEMBER 16 THROUGH FEBRUARY 28, PROJECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS/1000 SQ FT) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING, ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES, 8 FT. OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

REFER TO THE 1984 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

PERMANENT SEEDBED PREPARATIONS

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.
SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

- 1. PREFERRED - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1000 SQ FT) BEFORE SEEDING, HARROW OR DISC INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE 30-0-0 UREAFORM FERTILIZER (9 LBS/1000 SQ FT).
2. ACCEPTABLE - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS/1000 SQ FT) AND 1000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1000 SQ FT) BEFORE SEEDING, HARROW OR DISC INTO UPPER THREE INCHES OF SOIL.

SEEDING: FOR THE PERIODS MARCH 1 THROUGH APRIL 30 AND AUGUST 1 THROUGH OCTOBER 15, SEED WITH 60 LBS PER ACRE (1.4 LBS/1000 SQ FT) OF KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS PER ACRE (0.5 LBS/1000 SQ FT) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THROUGH FEBRUARY 28, PROJECT SITE BY: OPTION (1) 2 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 PER ACRE OF KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS PER ACRE OF 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 OR 218 GALLONS PER ACRE (5 GAL/1000 SQ FT) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES, 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL/1000 SQ FT) FOR ANCHORING.

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

TOPSOIL SPECIFICATIONS

- 1. Topsoil salvaged from the existing site may be used provided that it meets the standards 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.
2. Topsoil Specifications - Soil to be used as topsoil must meet the following:
i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting texture subsoils and shall contain less than 5% by volume of cinders, stones, logs, coarse fragments, gravel, rocks, 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, quack grass, johnsongrass, nutgrass, pigweed, etc., or other noxious weeds, or other noxious plants, or other noxious insects, or other noxious animals.
iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

- iii. For sites having disturbed areas under 5 acres:
i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section 1 - Vegetative Stabilization Methods and Materials.
ii. 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 has elapsed (14 days min.) to permit dispersion of phytotoxic materials.
Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist, and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
ii. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section 1 - 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, about 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 adding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
iv. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and needed preparation.
vi. Alternative for Permanent Seeding - Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified:

- i. Composted Sludge Material for use as a soil conditioner for sites having disturbed areas over 5 acres shall be limited to prescriptive amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:
a. Composted sludge shall be applied by, or originate from, a person or persons that are permitted (at the time of application of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
b. Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.
c. Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.

- ii. Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lbs/1,000 square feet, and 1/2 the normal lime application rate. #1.
References: Guidelines Specifications, Soil Preparation and Seeding, MD-19A, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institute, Revised 1975.

30.0 DUST CONTROL

Definition
Controlling dust blowing and movement on construction sites and roads.

Purposes
To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off-site damage, health hazards, and improve traffic safety.

Conditions Where Practices Apply
This practice is applicable to areas subject to dust blowing and movement where on and off-site damage is likely without treatment.

Specifications

- 1. Mulches - See standards for vegetative stabilization with mulches only. Mulch should be crimped or tracked to prevent blowing.
2. Vegetative Cover - See standards for temporary vegetative cover.
3. Tillage - To roughen surface and bring clods to the surface, this is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plow spaced about 12" apart, spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect.
4. Irrigation - This is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. Repeat as needed. At no time should the site be irrigated to the point that runoff begins to flow.
5. Barriers - Solid board fences, silt fences, snow fences, burp fences, snow bales, and similar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents of air velocity of about 10 times their height are effective in controlling soil blowing.
6. Calcium Chloride - Apply at rates that will keep surface moist. May need retreatment.

Permanent Methods

- 1. Permanent Vegetation - See standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may allow valuable protection if left in place.
2. Topsoiling - Covering with less erosive soil materials. See standards for topsoiling.
3. Stone - Cover surface with crushed stone or coarse gravel.

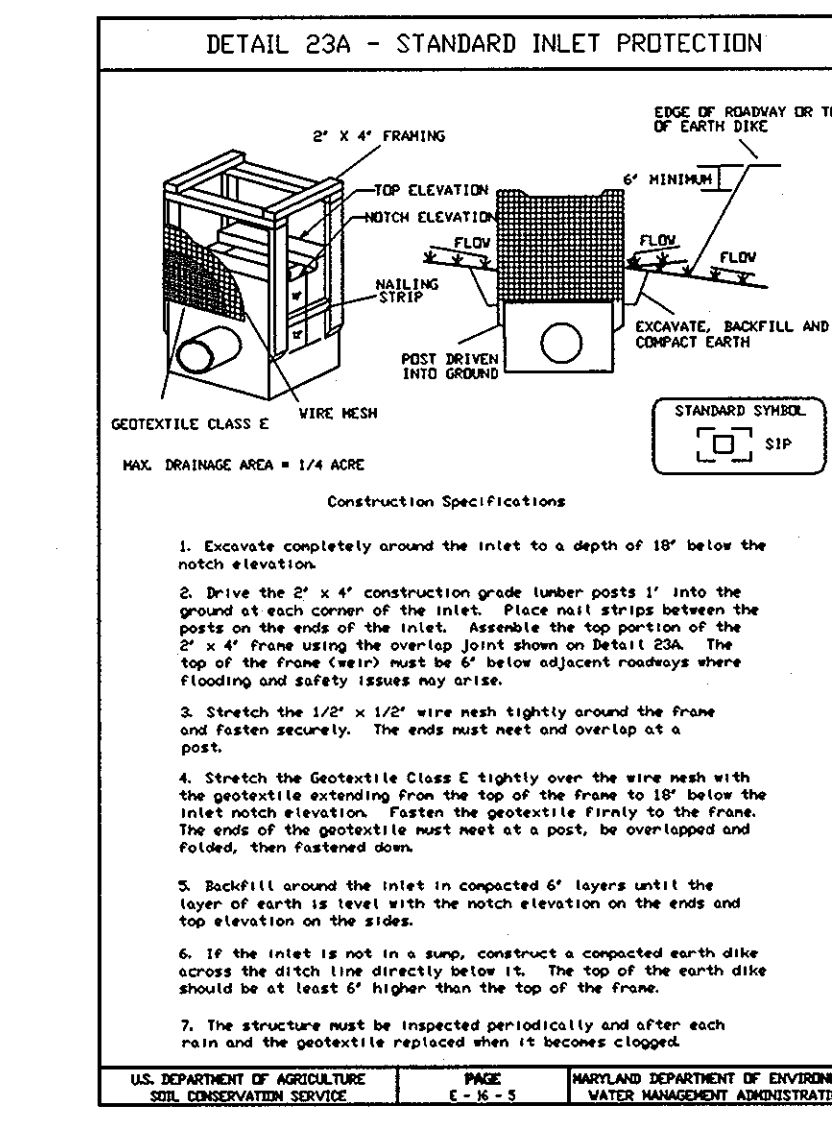
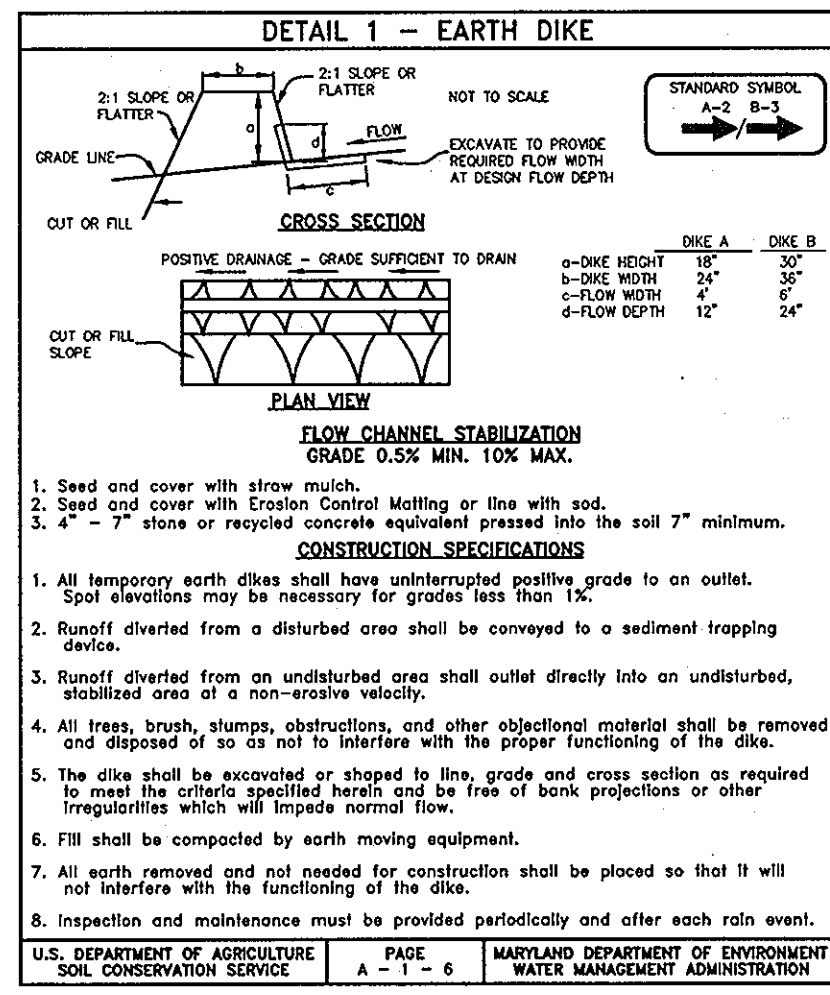
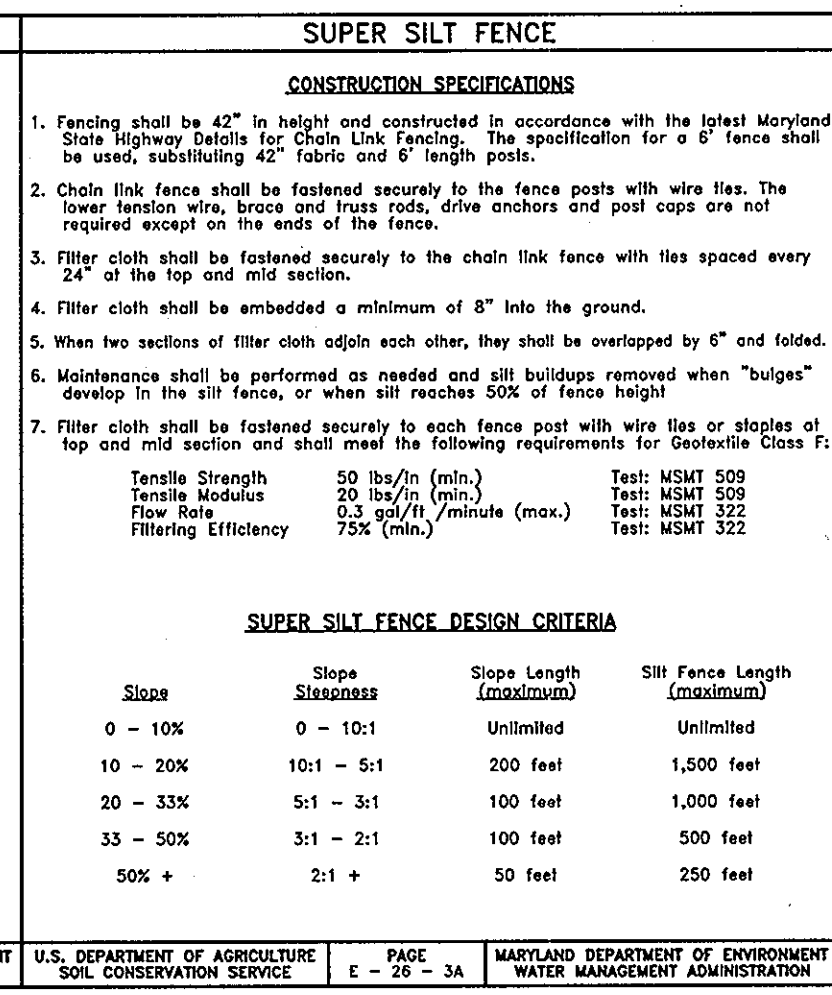
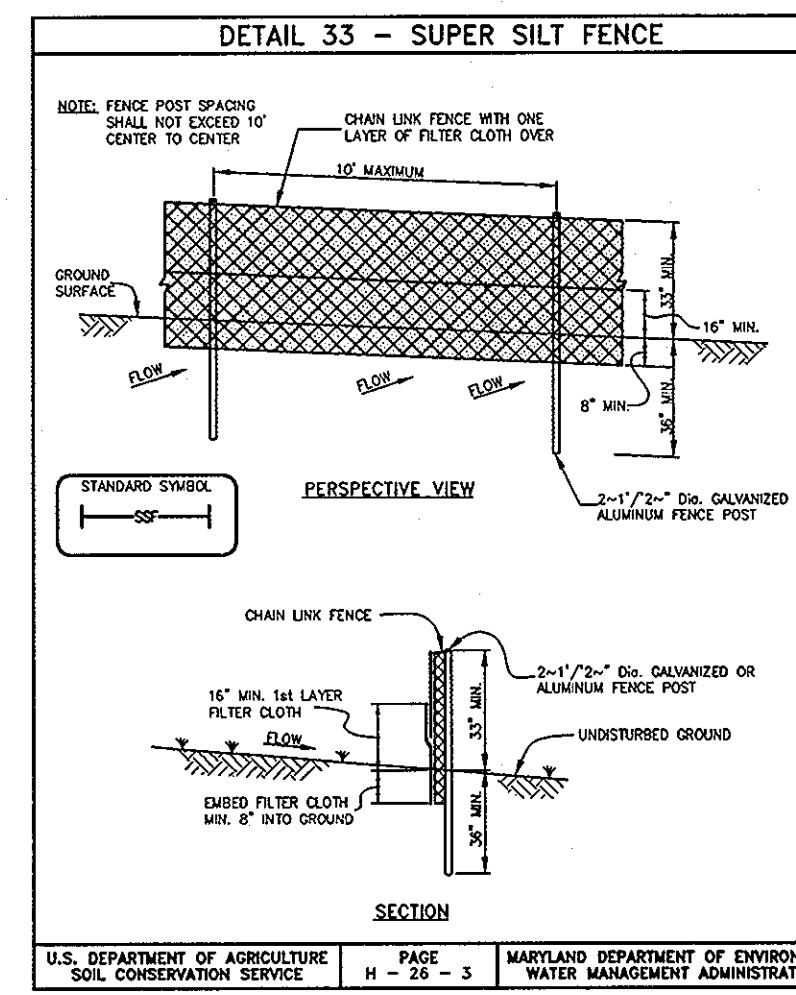
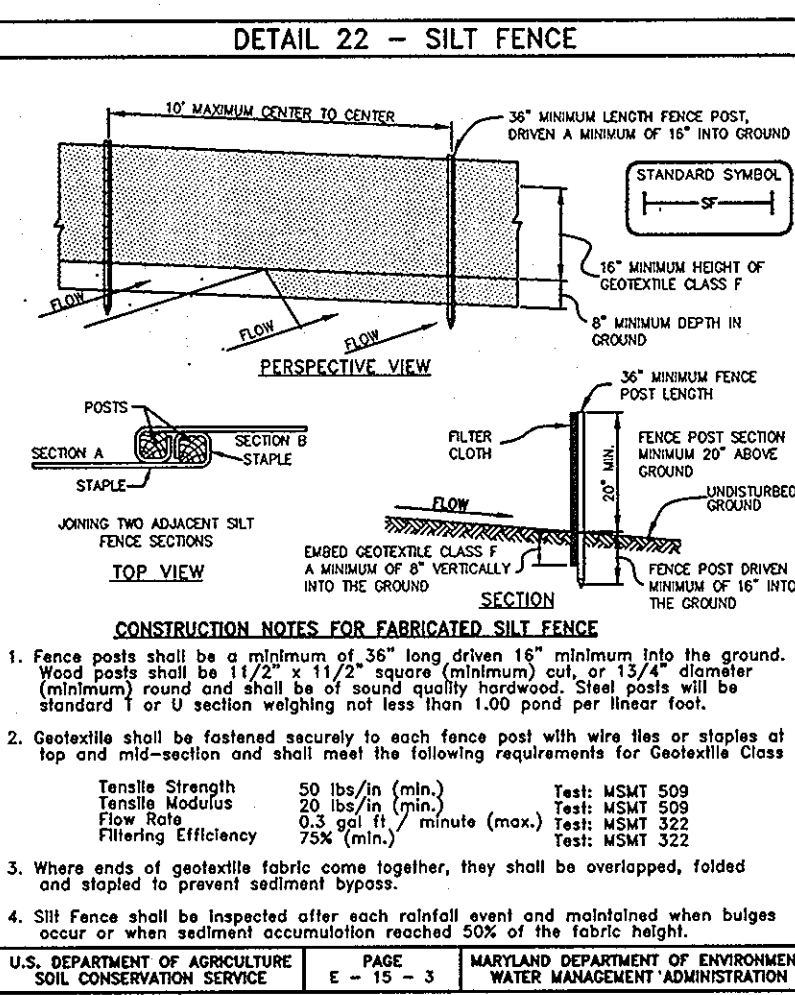
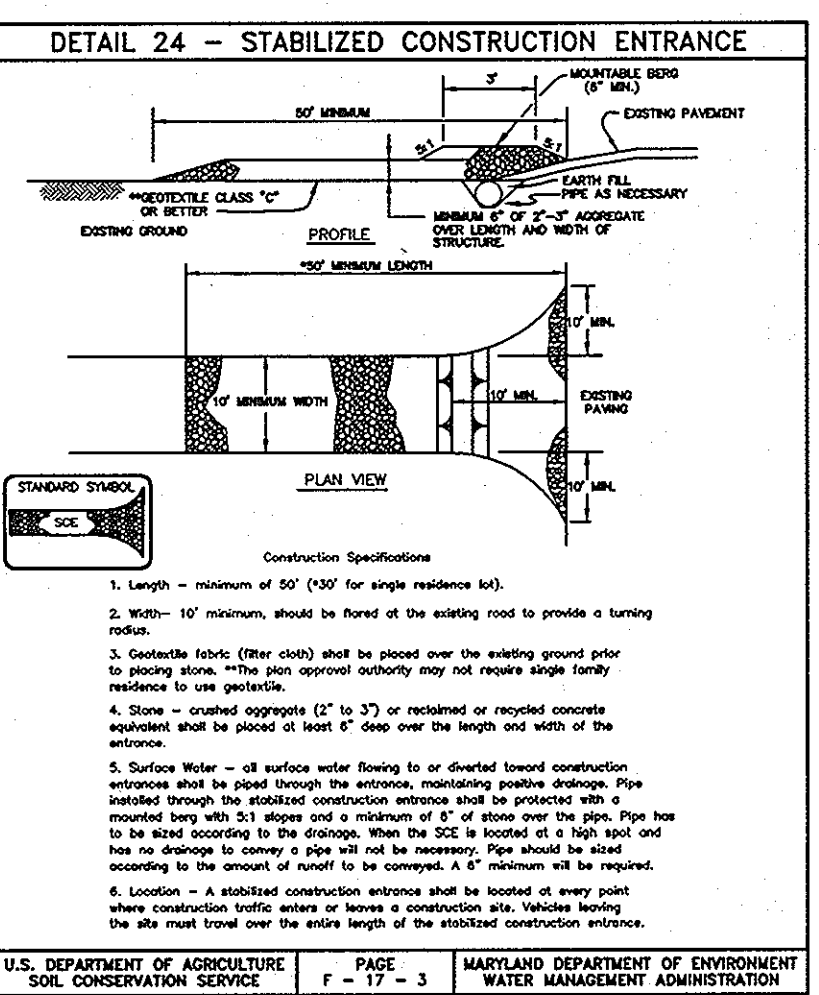
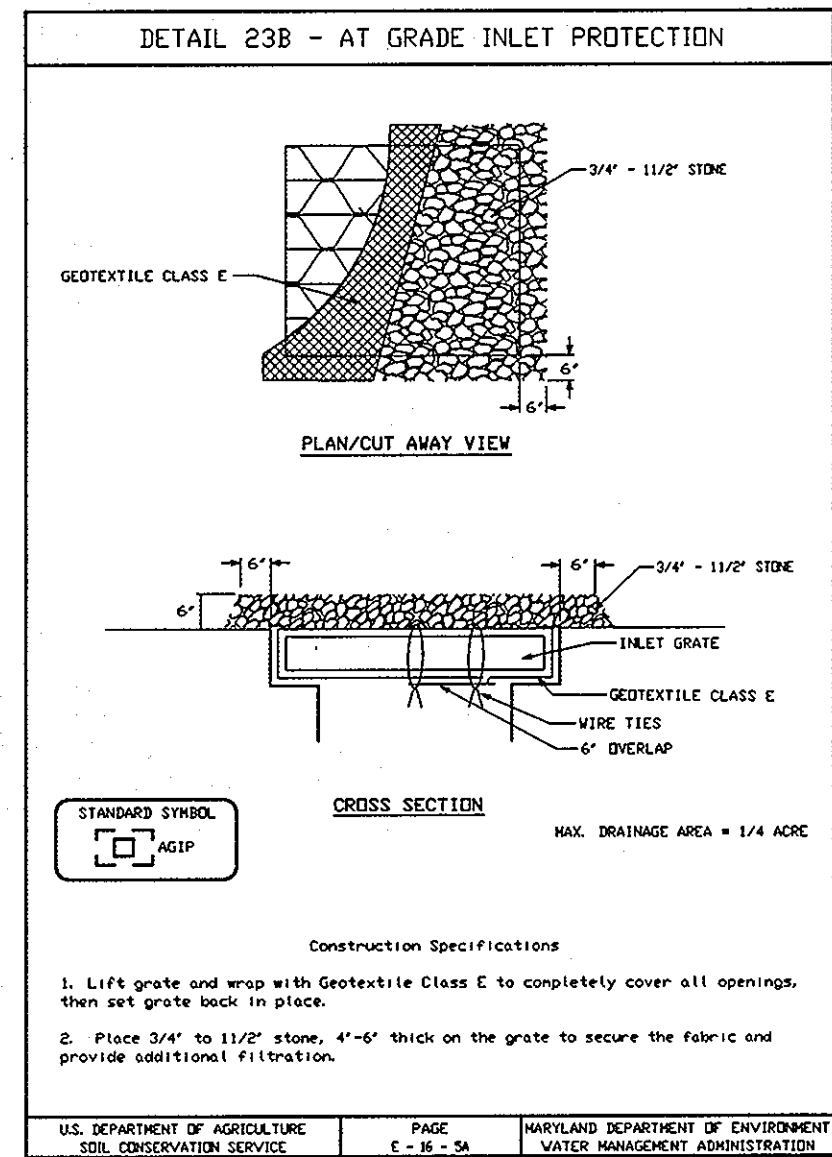
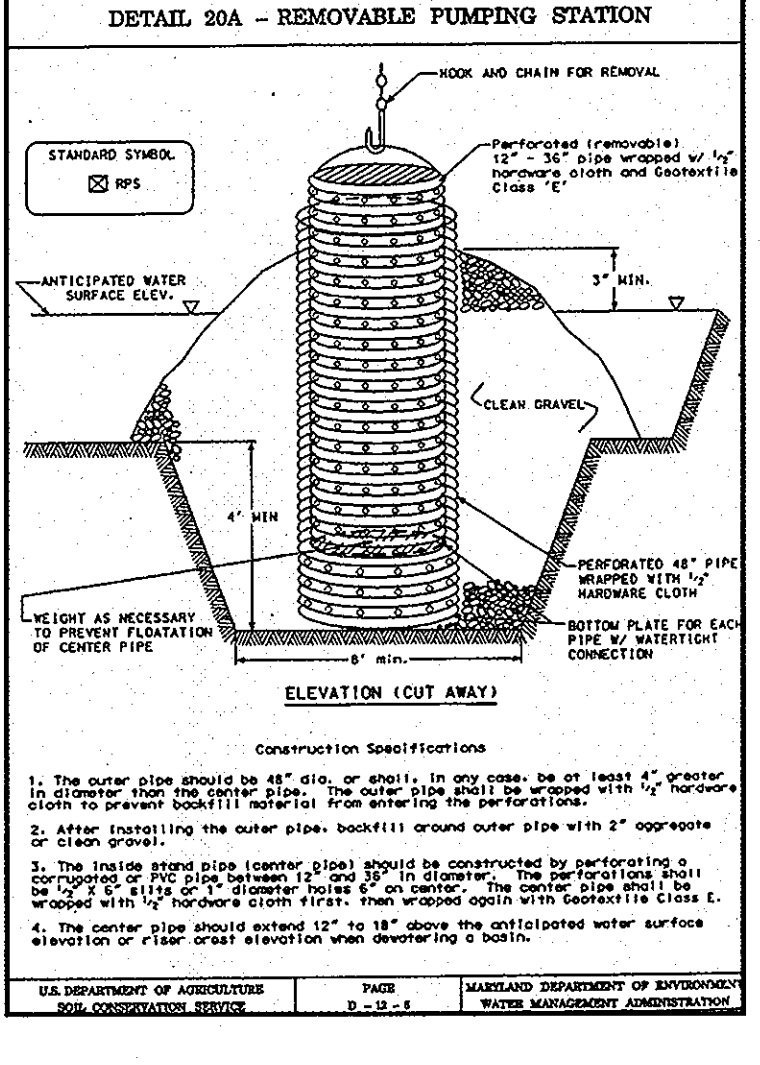
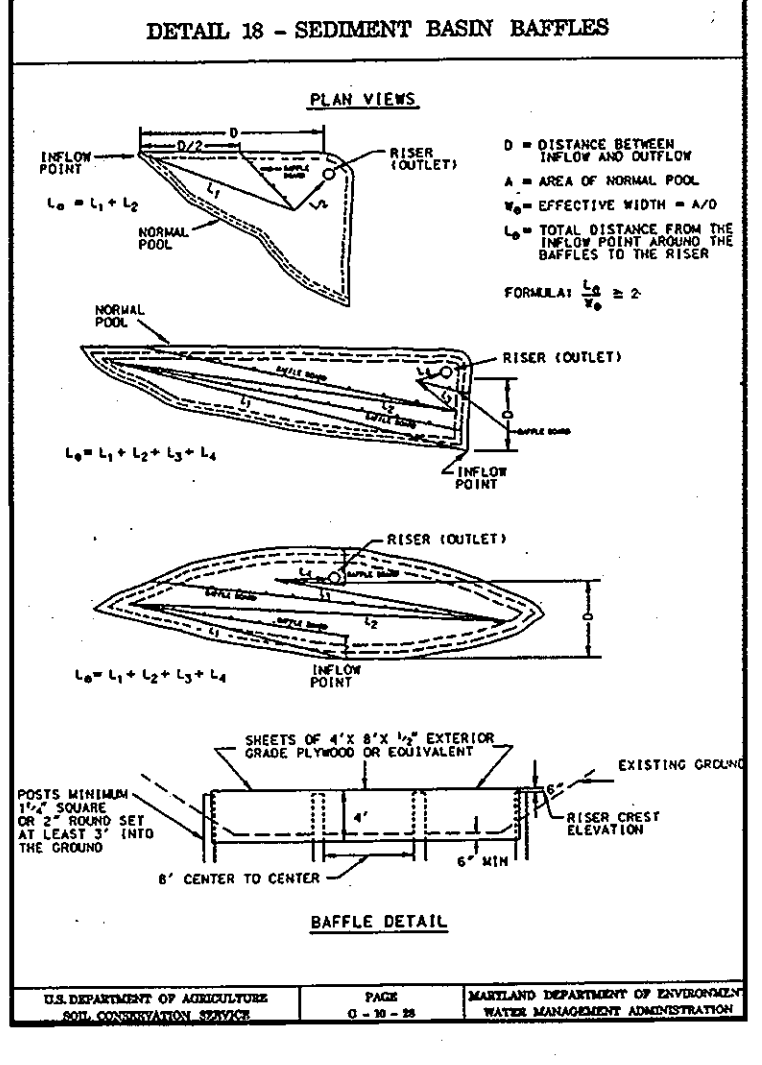
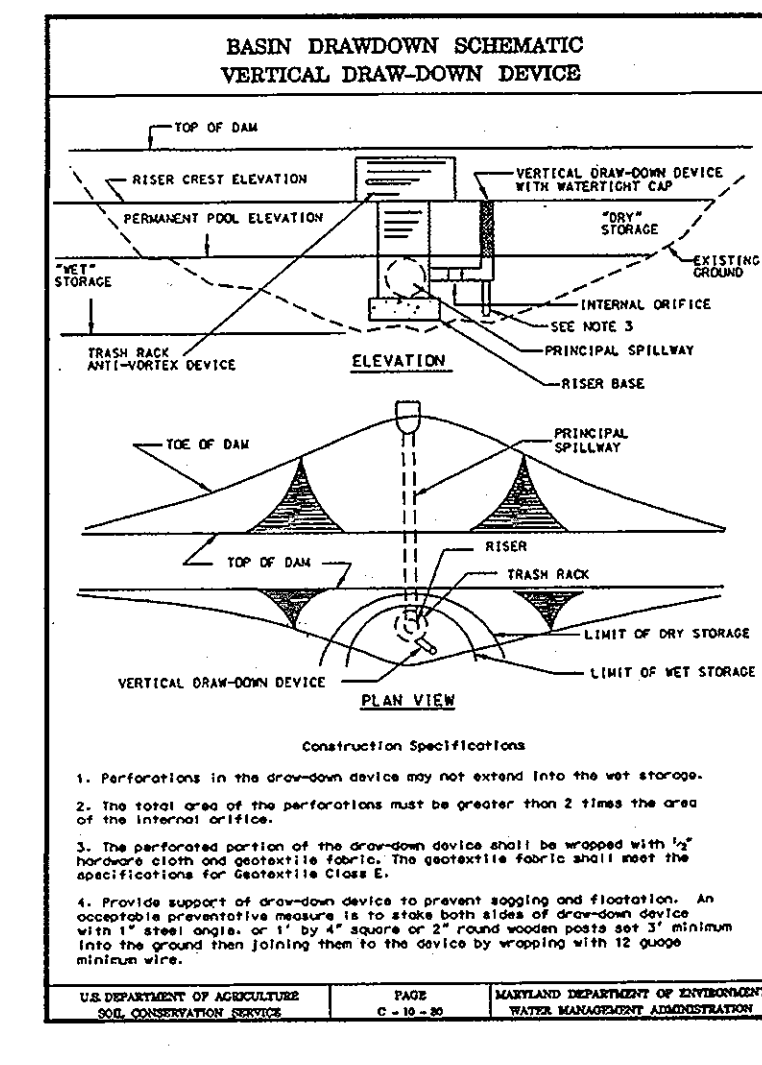
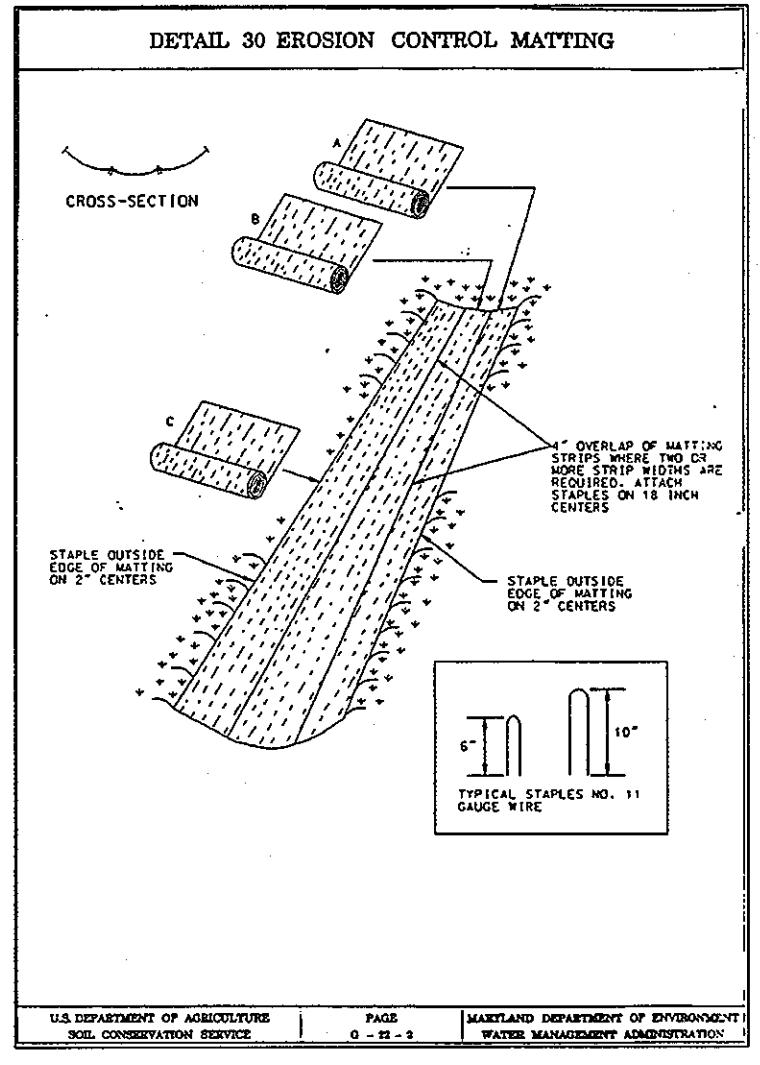
References

- 1. Agriculture Handbook 346, Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss.
2. Agriculture Information Bulletin 354, How to Control Wind Erosion, USDA-ARS.

SEQUENCE OF CONSTRUCTION

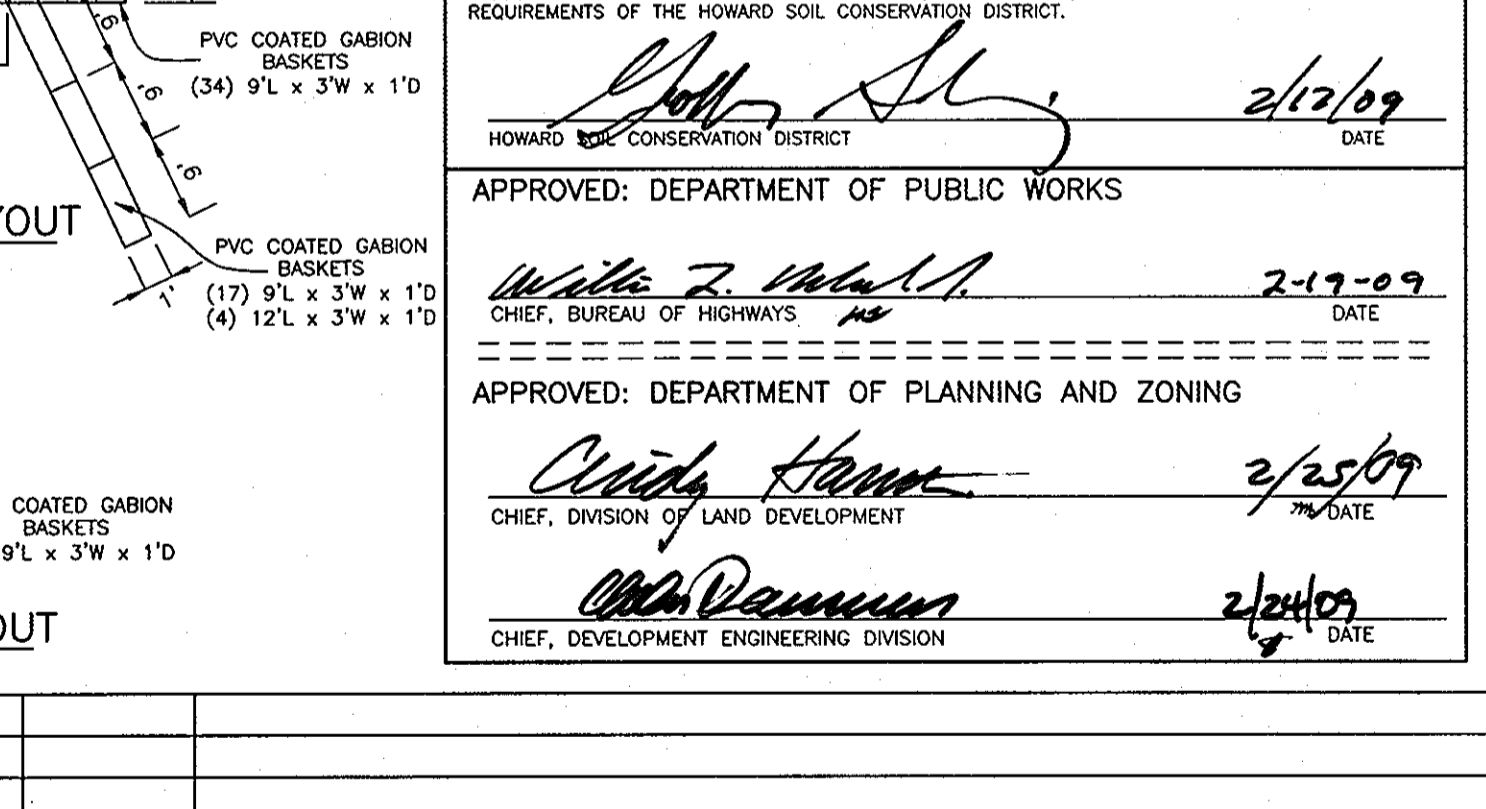
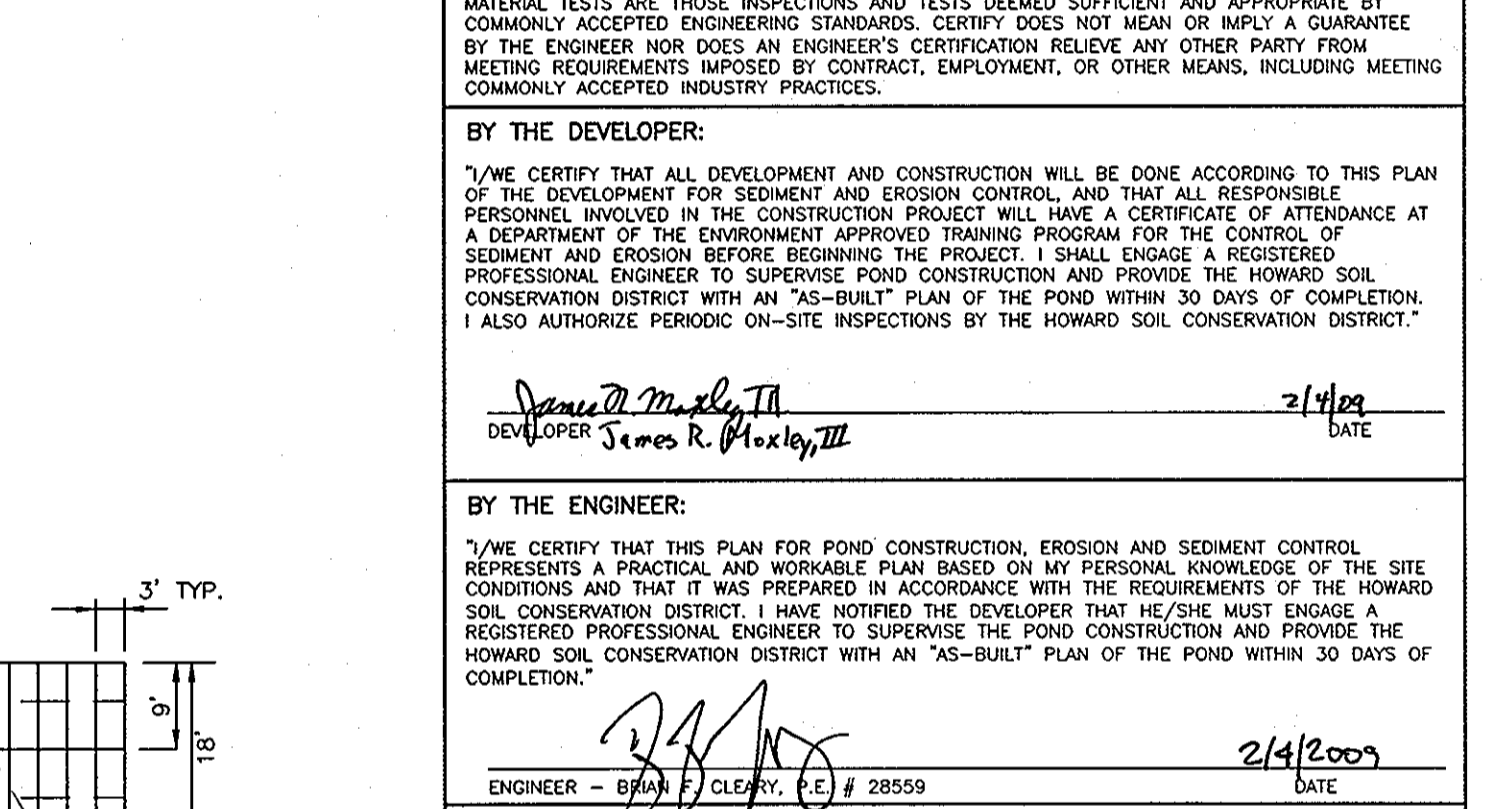
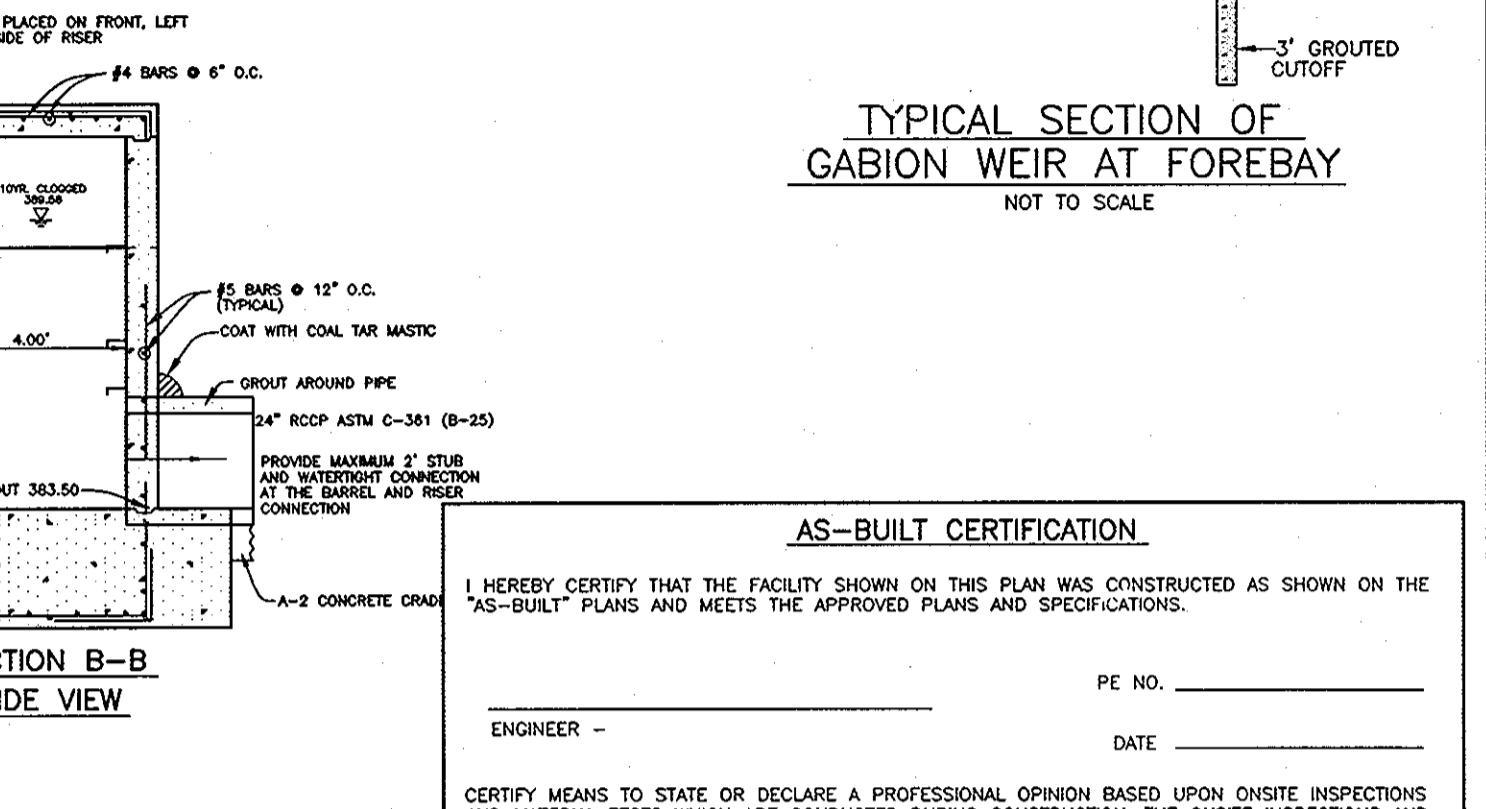
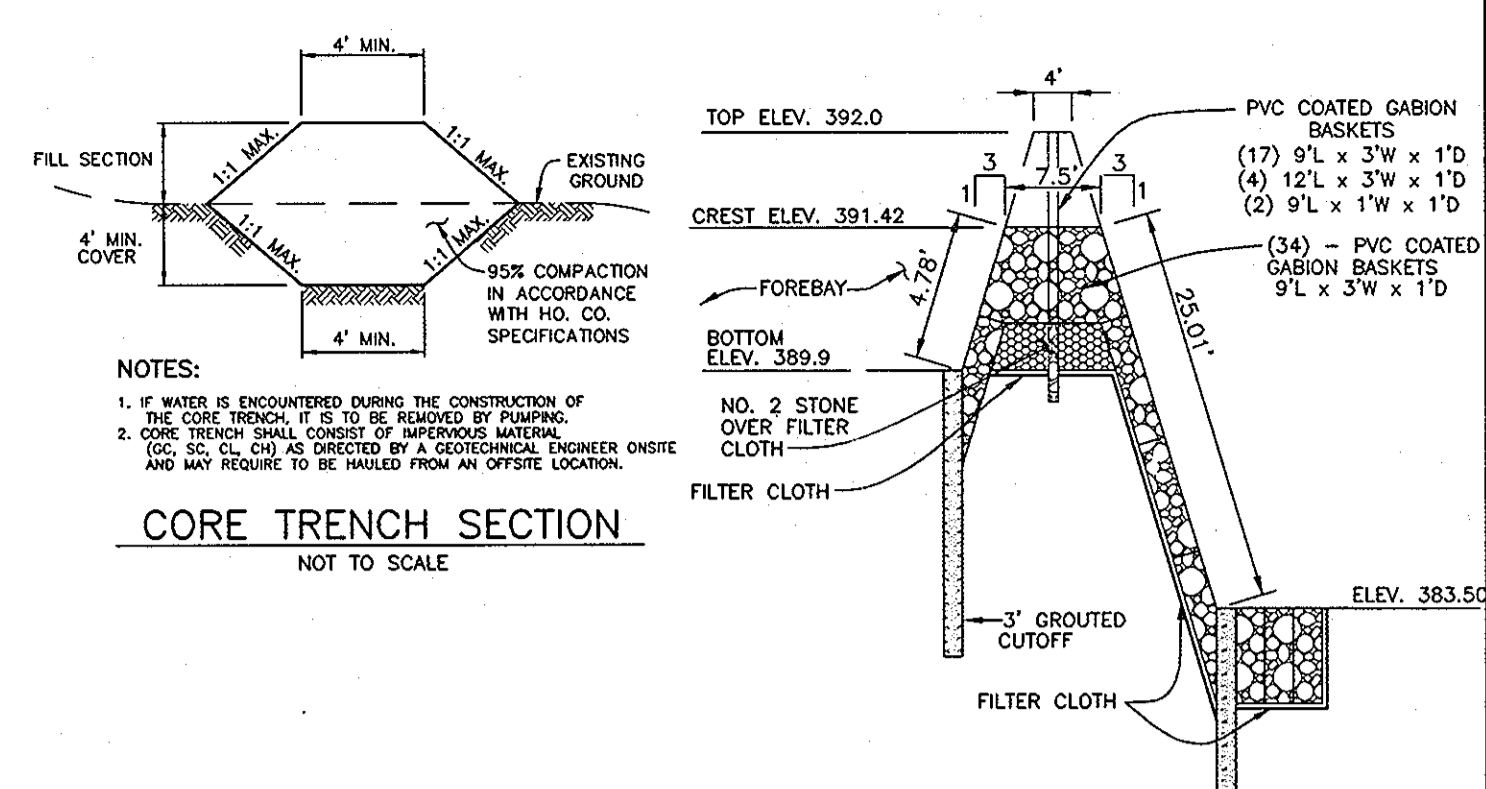
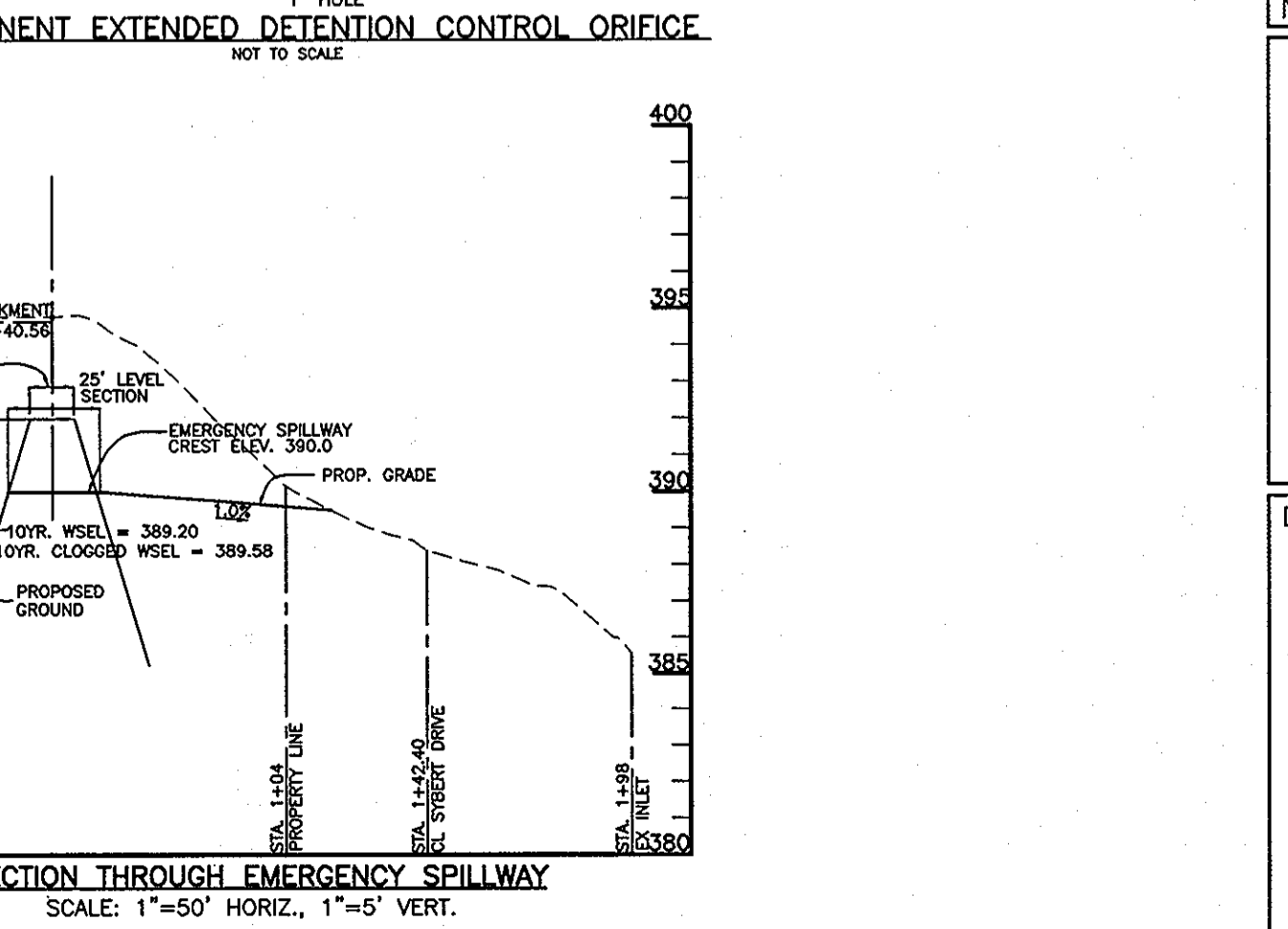
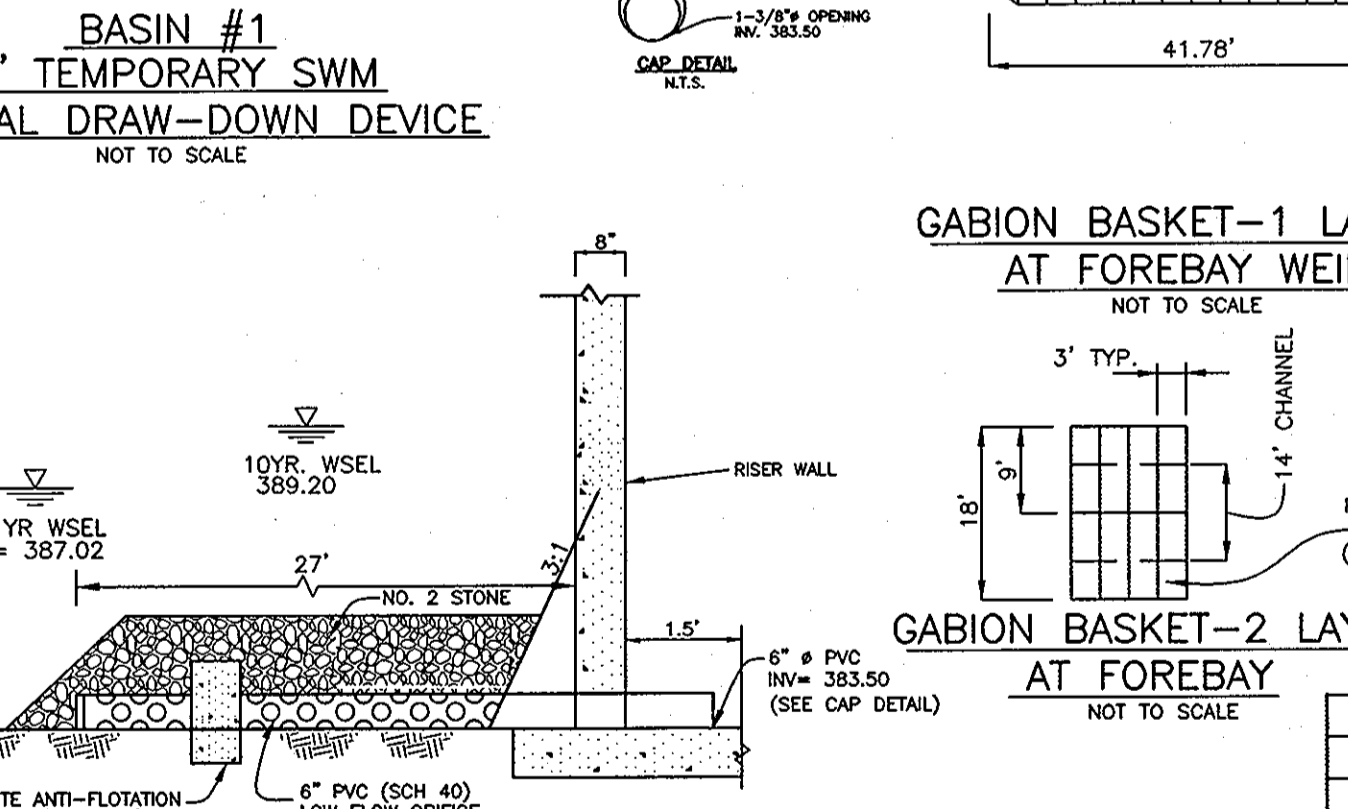
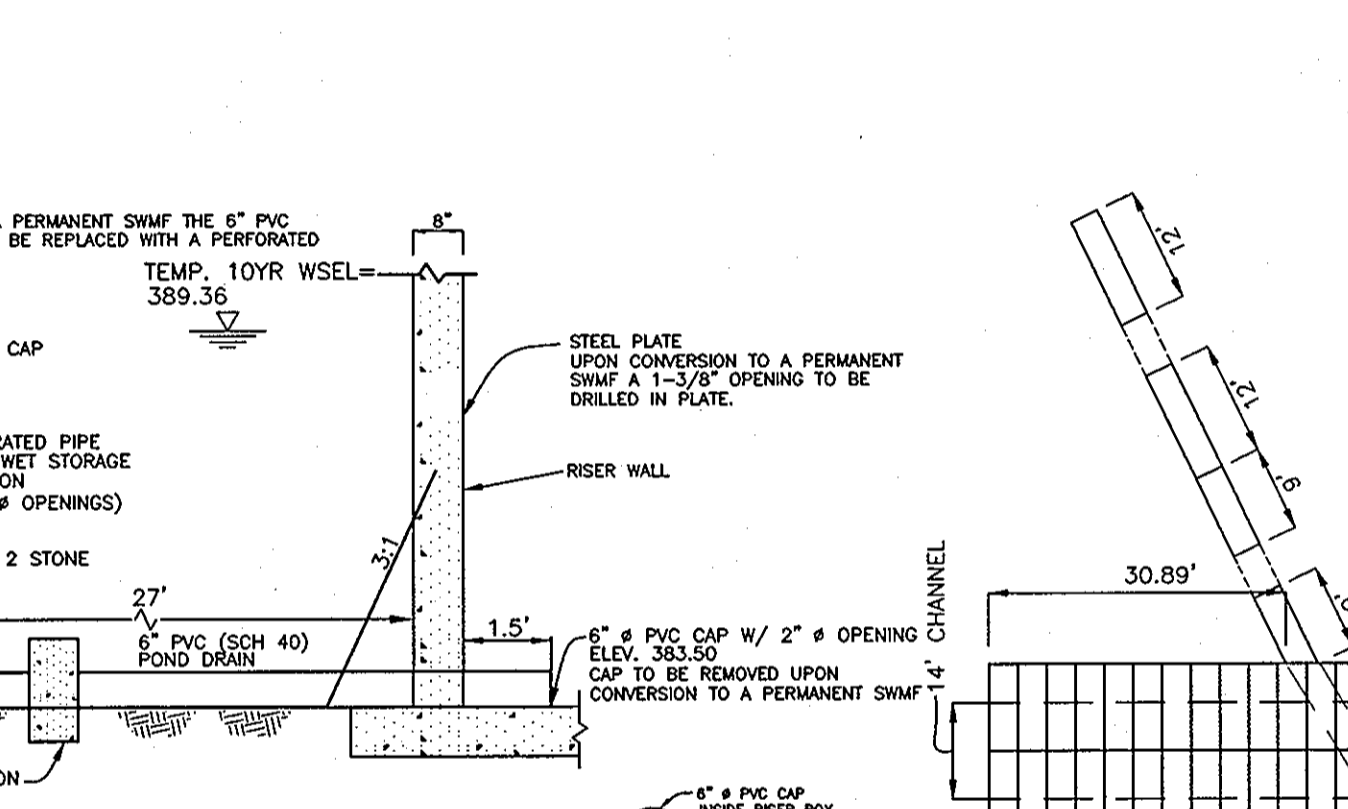
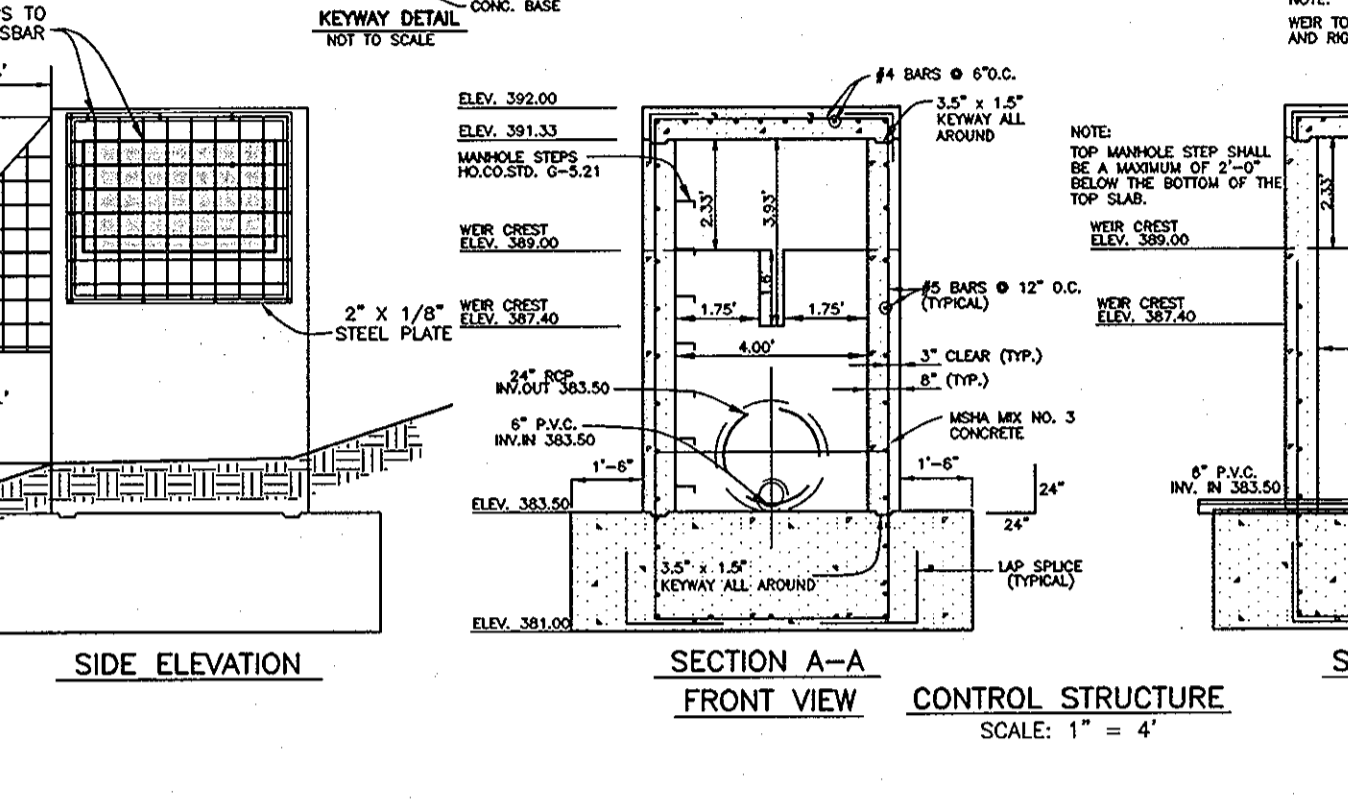
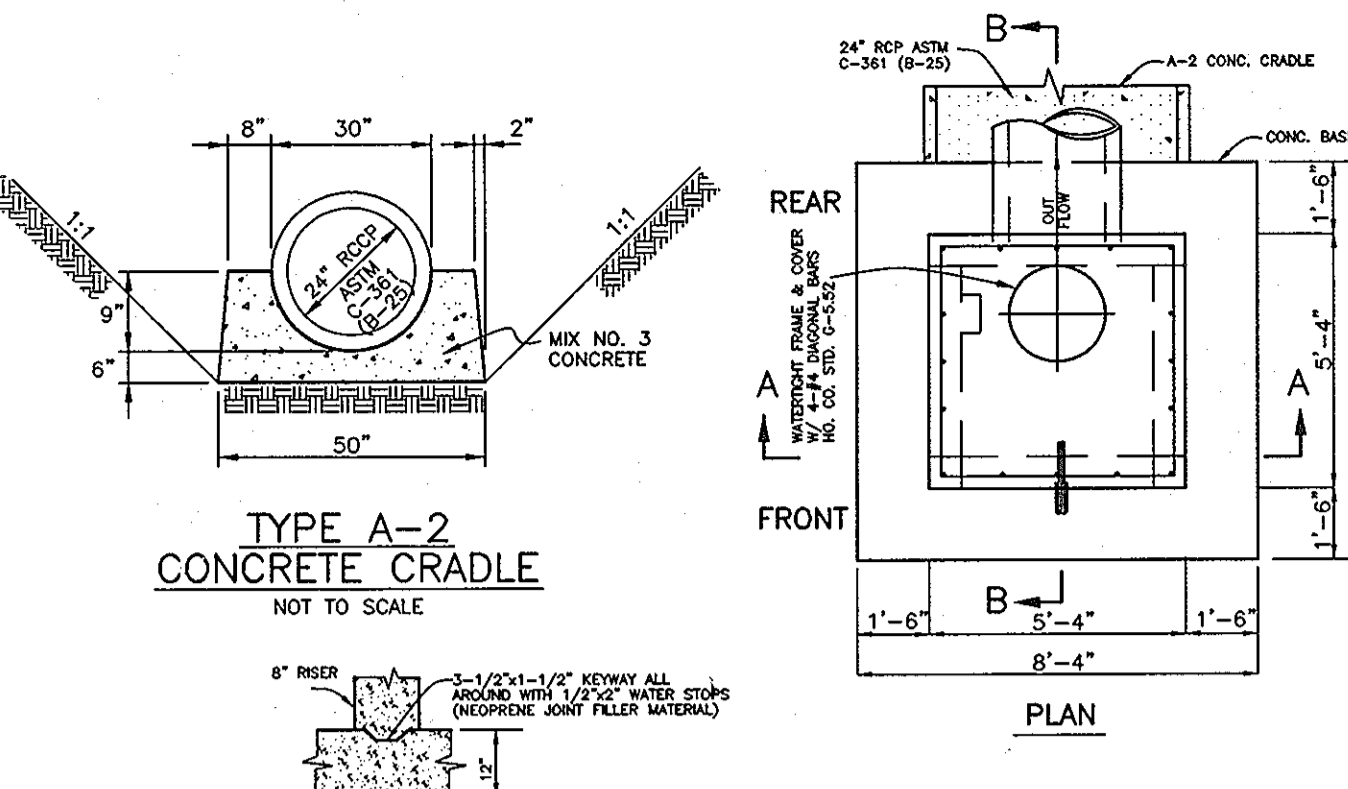
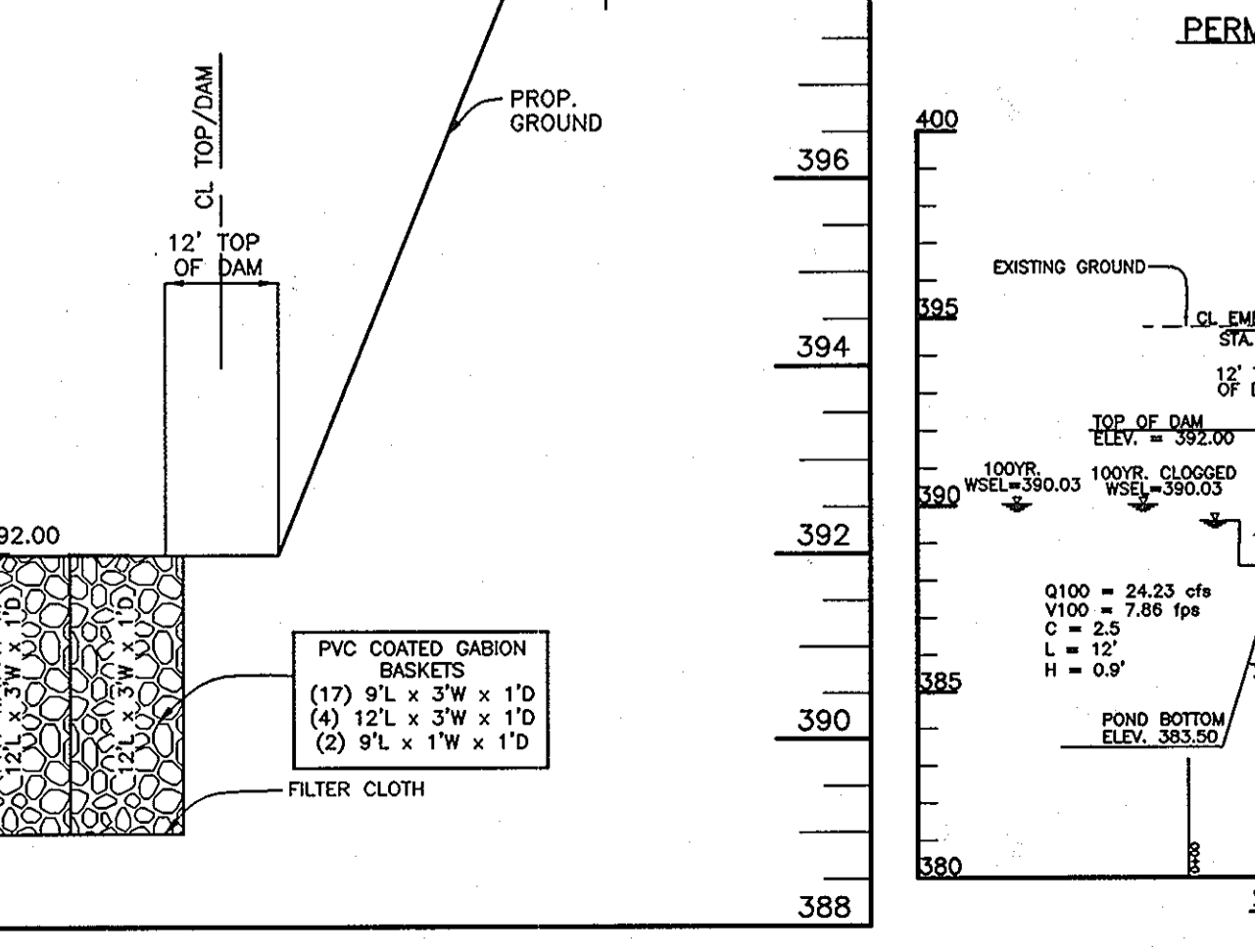
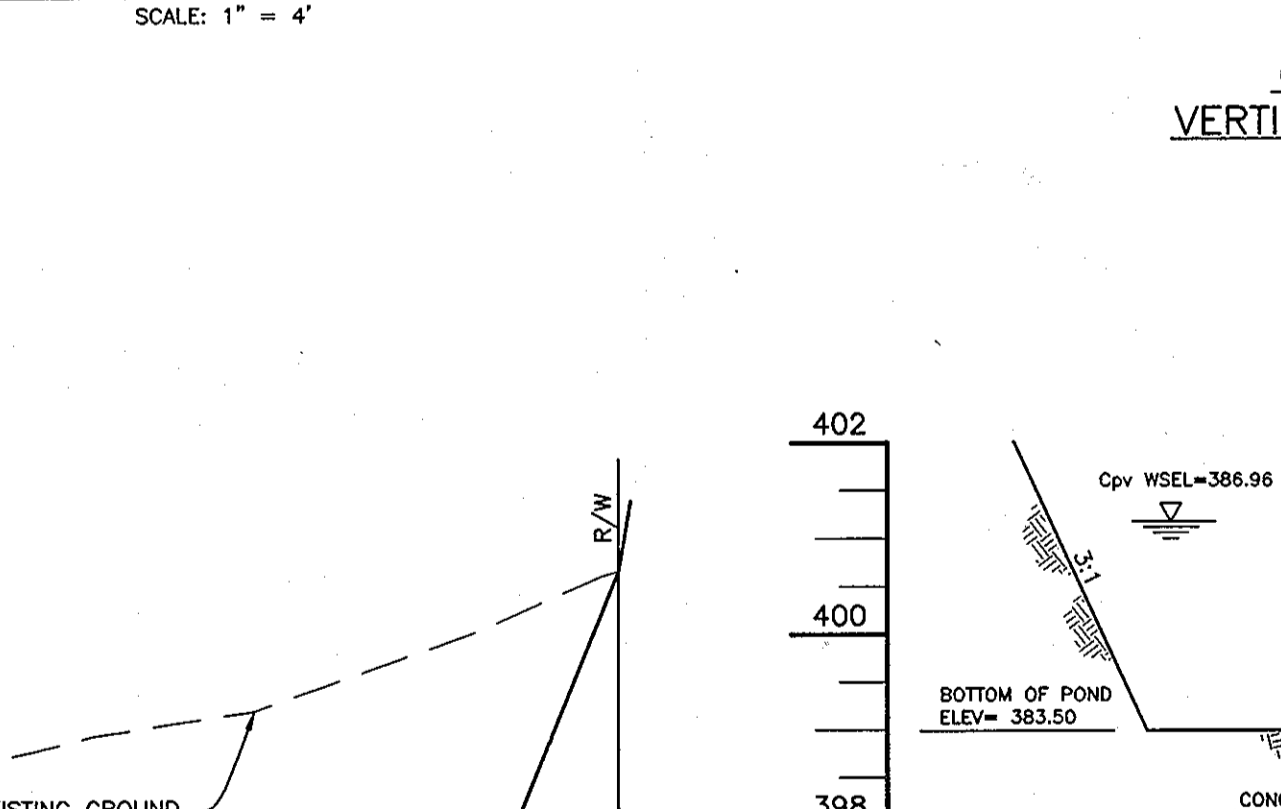
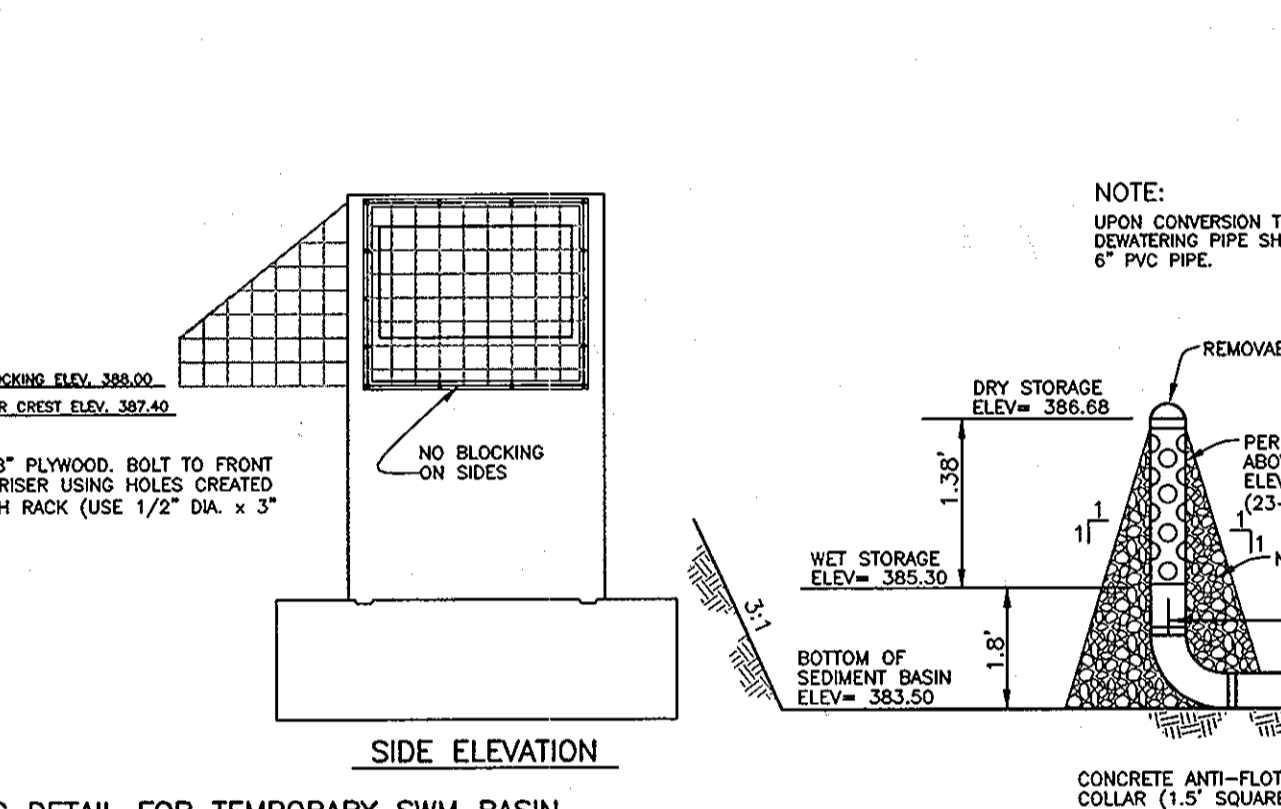
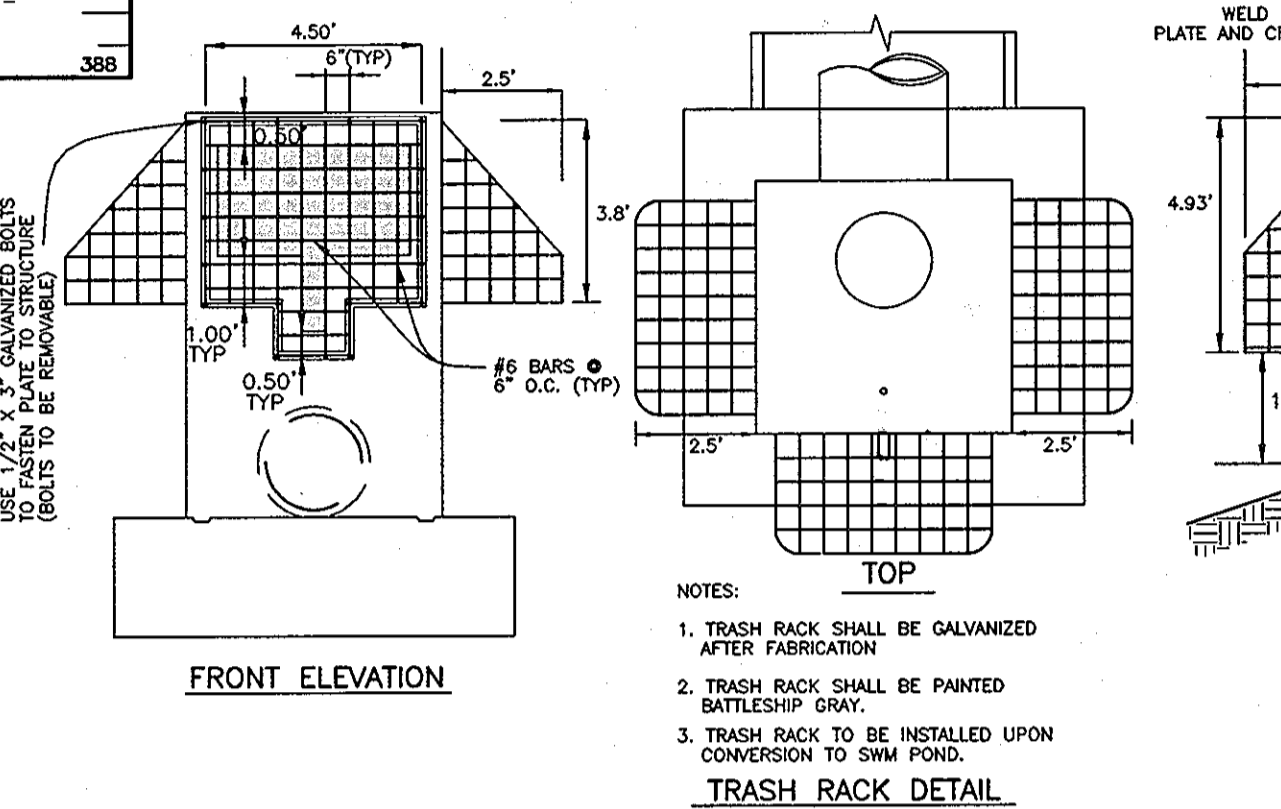
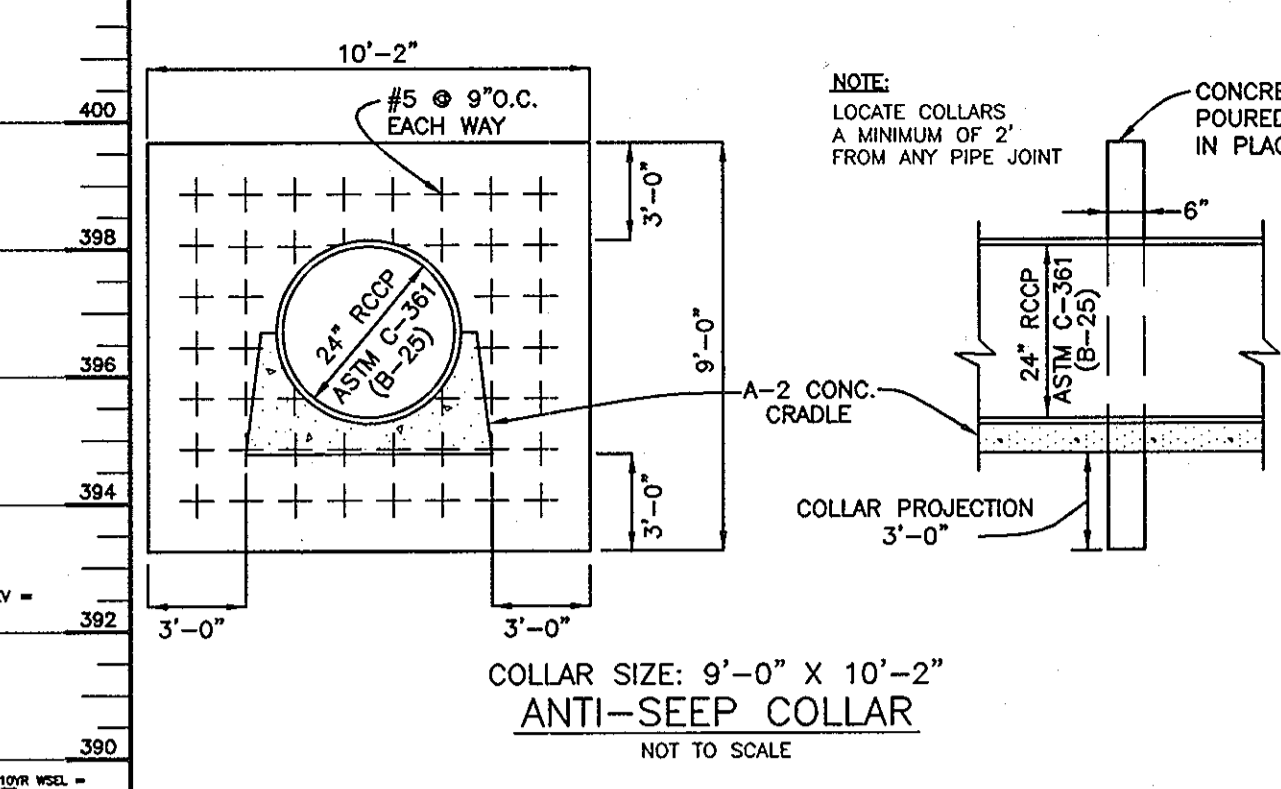
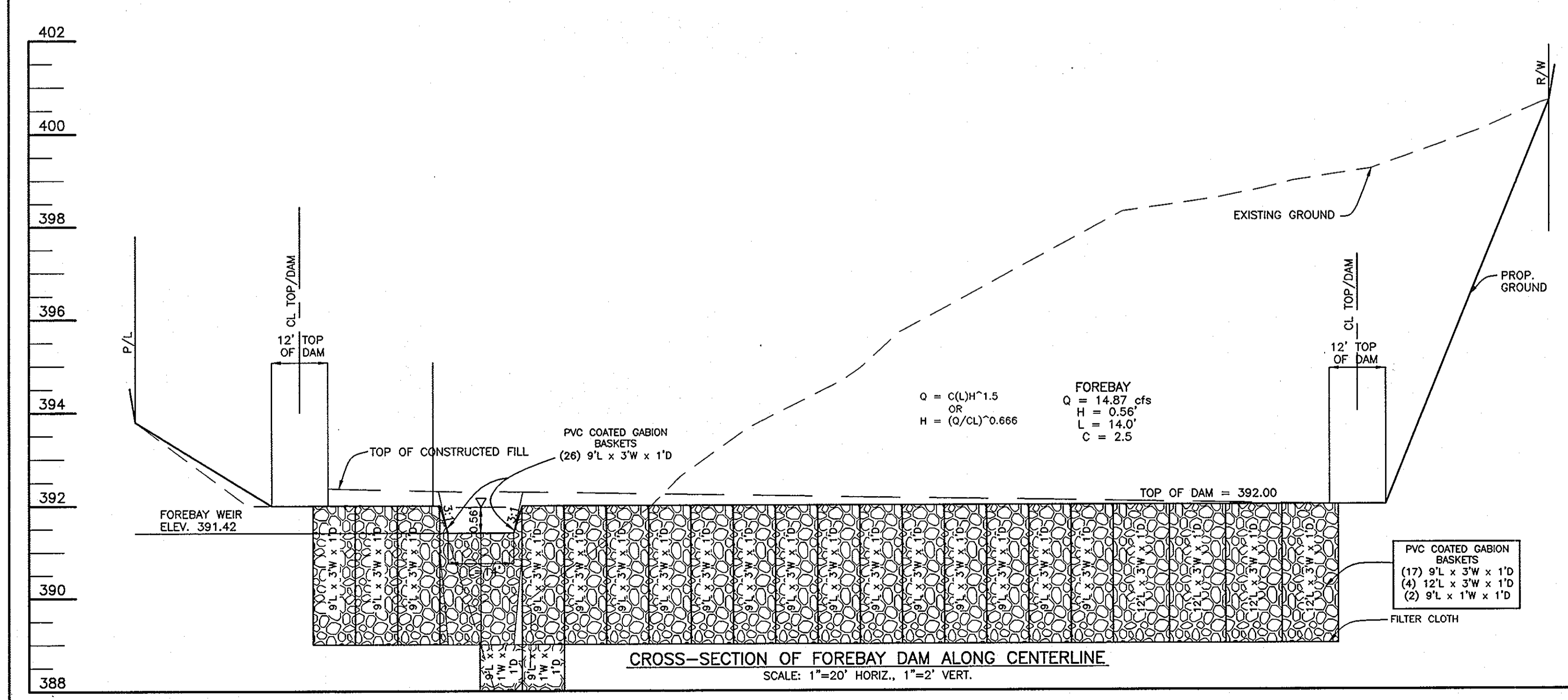
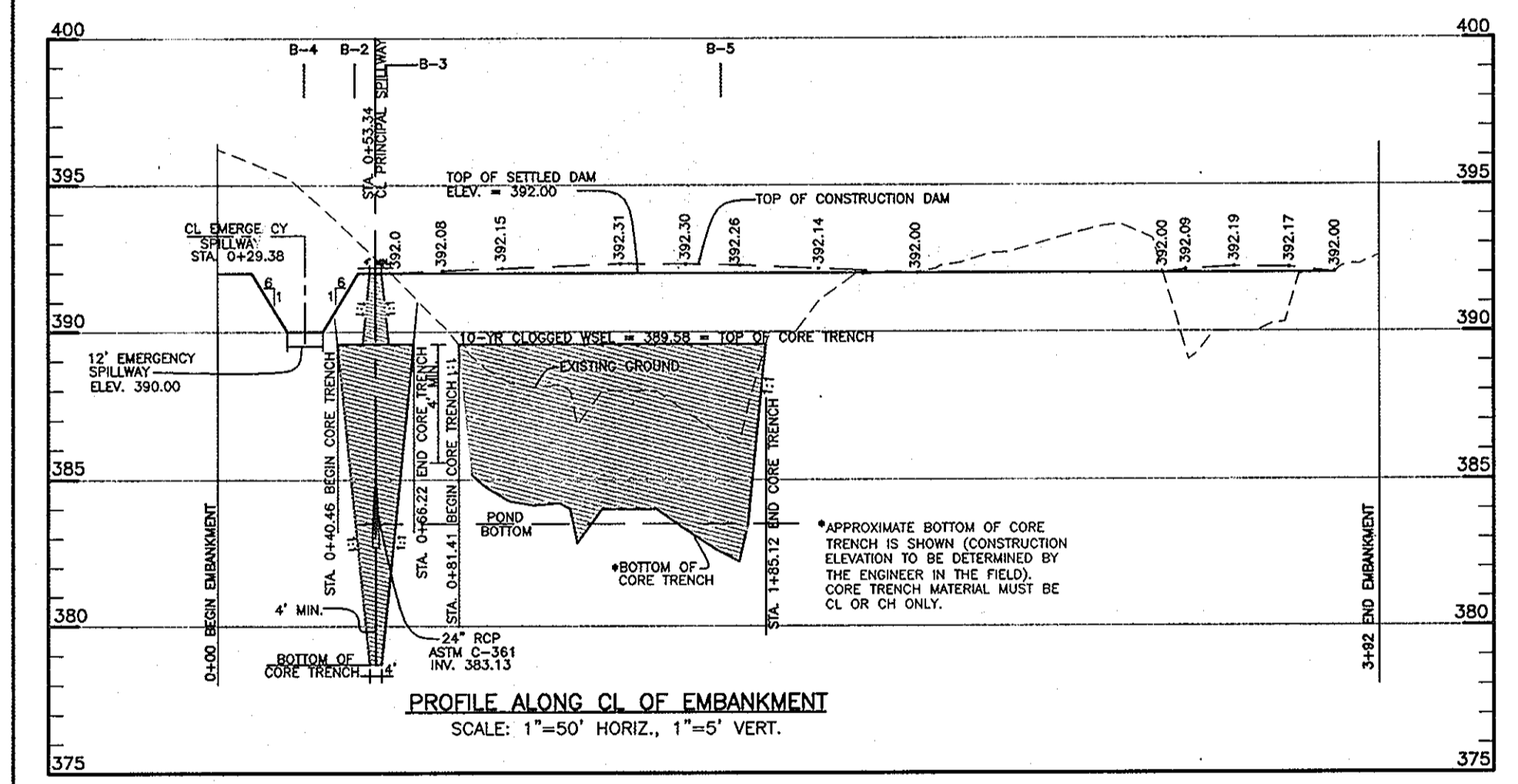
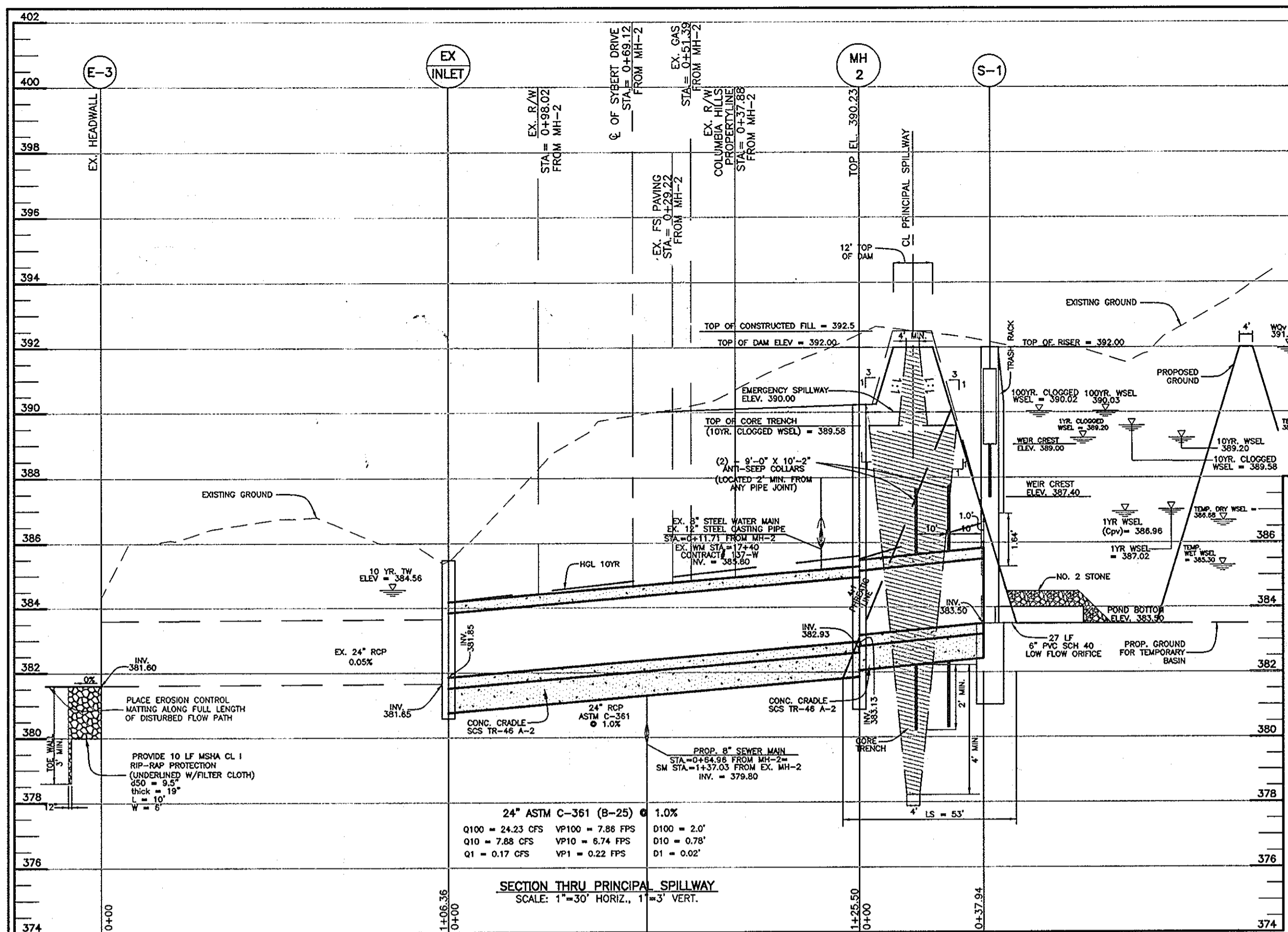
NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION

- 1. OBTAIN GRADING PERMIT. (DAY 1)
2. INSTALL STABILIZED CONSTRUCTION ENTRANCE, TREE PROTECTION FENCES, SUPER SILT FENCES, SILT FENCES, AND TEMPORARY CLEANWATER DIVERSION DIKES. (DAY 2-8)
3. INSTALL TSSM BASIN. (DAY 9-40)
4. INSTALL EARTH DIKES AND ANY REMAINING SEDIMENT CONTROL DEVICES. UPON APPROVAL OF HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, BEGIN MASS GRADING OF SITE. (DAY 41-61)
5. INSTALL STORMDRAIN RUN FROM I-8 TO E-1. DISTURBED AREA AROUND I-8 TO BE STABILIZED WITH SOD AFTER INSTALLATION. (DAY 62-77)
6. BRING ROAD BED TO SUBGRADE AND STABILIZE SLOPES IN ACCORDANCE WITH TEMPORARY SEEDBED NOTES. UTILIZE DUST CONTROL METHODS. (DAY 78-88)
7. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, INSTALL REMAINING STORM DRAIN, WATER, SEWER AND OTHER UTILITIES, REMOVED DIKES AND BERMS, MAINTAINING POSITIVE FLOW TO POND. (DAY 82-108)
8. COMPLETE GRADING OF SITE, INSTALL CURB, PAVE ROADWAYS (DAY 89-129) AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. (DAY 130-140)
9. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, CONVERT TSSM BASIN TO PERMANENT STORMWATER MANAGEMENT FACILITIES. SHAPE FACILITIES PER FINAL GRADES SHOWN ON THE PLANS AND STABILIZE DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. CONTRACTOR SHALL REMOVE ALL OLD AND NEW TRASH, JUNK AND DEBRIS FROM ENTIRE SITE INCLUDING FOREST CONSERVATION AND BUFFER AREAS. (DAY 141-156)
10. UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL DEVICES, AND STABILIZED DISTURBED AREAS IN ACCORDANCE WITH THE PERMANENT SEEDBED NOTES. (DAY 155-170)
11. PROVIDE AS-BUILT CERTIFICATION TO HOWARD SOIL CONSERVATION DISTRICT FOR POND APPROVAL. (DAY 171)



REVISION table with columns for NO., DATE, and REVISION.
BENCHMARK ENGINEERS, LAND SURVEYORS, PLANNERS.
8480 BALTIMORE NATIONAL PIKE A SUITE 418
ELLCOTT CITY, MARYLAND 21043
PHONE: 410-465-6105 FAX: 410-465-6844
E-MAIL: b6@b6i-civilengineering.com
PROJECT: COLUMBIA HILLS SECTION 10
LOT 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 16
TITLE: SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
DATE: JUNE, 2008 PROJECT NO. 1869
SCALE: AS SHOWN DRAWING NO. 09-12

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION, AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.
HOWARD SOIL CONSERVATION DISTRICT DATE 2/12/09
ENGINEER'S CERTIFICATE
I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, 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 SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE THE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.
ENGINEER - BRIAN P. DEARY, P.E. # 28556 DATE 2/4/2009
DEVELOPER'S CERTIFICATE
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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 BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.
James R. Meloy, III DATE 2/4/2009
DEVELOPER James R. Meloy, III
APPROVED: DEPARTMENT OF PUBLIC WORKS
Walter J. Meloy, III DATE 2-19-09
CHIEF, BUREAU OF HIGHWAYS
APPROVED: DEPARTMENT OF PLANNING AND ZONING
Cynthia Hamon DATE 2/25/09
CHIEF, DIVISION OF LAND DEVELOPMENT
Blaine Deary DATE 2/24/09
CHIEF, DEVELOPMENT ENGINEERING DIVISION



**AS-BUILT CERTIFICATION**

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

ENGINEER: \_\_\_\_\_ PE NO. \_\_\_\_\_ DATE: \_\_\_\_\_

DEVELOPER: *James D. Marley III* DATE: 2/1/09

BY THE ENGINEER: *James D. Marley III* DATE: 2/4/2009

BY THE DEVELOPER: *James D. Marley III* DATE: 2/17/09

APPROVED: DEPARTMENT OF PUBLIC WORKS  
*Walter Z. Marshall* DATE: 2-19-09

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
*Christa Hauer* DATE: 2/25/09

*Chris Dammann* DATE: 2/24/09

NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
 8480 BALTIMORE NATIONAL PIKE & SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-8105 FAX: 410-465-8644  
 E-MAIL: bei@bei-civilengineering.com

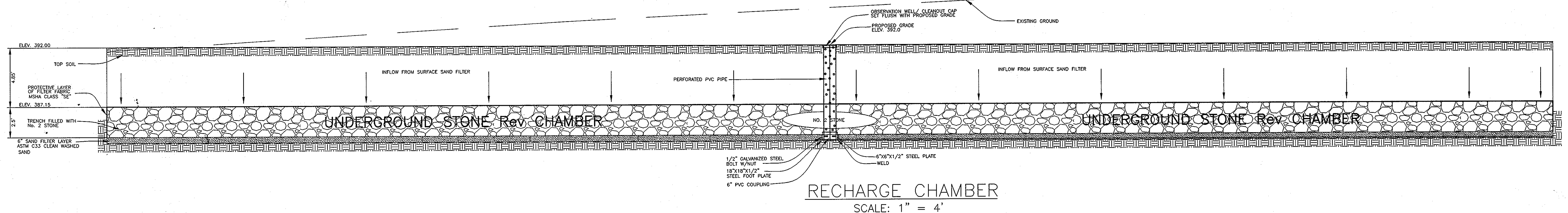
Professional Corporation, I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28559, Expiration Date: 07-22-2009.

DEVELOPER/CONTRACT PURCHASER: **COLUMBIA HILLS SECTION 10**  
 COLUMBIA HILL LLC  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 PHONE: (410) 465-4244

PROJECT: **COLUMBIA HILLS SECTION 10**  
 LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 16  
 LOCATION: TAX MAP 30 - GRID 5  
 PARCEL 13 - ZONE: R-20  
 2nd ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND  
 TITLE: **STORMWATER MANAGEMENT PROFILES, NOTES AND DETAILS**

DATE: JUNE, 2008 PROJECT NO. 1869  
 FEBRUARY, 2009  
 SCALE: AS SHOWN DRAWING 5 OF 12

Des: HP Draft: HP Check: BFC



**RECHARGE CHAMBER**  
SCALE: 1" = 4'

**CONSTRUCTION SPECIFICATIONS**

These specifications are appropriate to all ponds within the scope of the Standard for practice MD-378. All references to ASTM and AASHTO specifications apply to the most recent

**Site Preparation**  
Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped to topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

**Earth Fill**  
Material - The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable material. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification CC, SC, CH, or CL and must have at least 20% passing the #200 sieve. Consideration may be given to use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer.

Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

**Placement** - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The material shall be installed concurrently with fill placement and not excavated into the embankment.

**Compaction** - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within ±2% of the optimum. Each layer of fill shall be compacted to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

**Cut-Off Trench** - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

**Embankment Core** - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability. In addition, the core shall be placed concurrently with the outer shell of the embankment.

**Structure Backfill**  
Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of the structure or pipe. Circumstances such equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi, 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that a minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the side of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to ensure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill material outside the structure backfill (flowable fill) zone shall be of the type and quality conforming to that specified for the core of the embankment or other embankment materials.

**Pipe Conduits**  
All pipes shall be circular in cross section.  
**Corrugated Metal Pipe** - all of the following criteria shall apply for corrugated metal pipe:  
1. Materials - (Polymer Coated Steel Pipe) - Steel pipes with polymeric coatings shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with waterproof coating band rings.  
Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-198 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-198 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

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**PLANTING/SOIL SPECIFICATIONS**

1. PLANTING OF NURSERY STOCK SHALL TAKE PLACE BETWEEN MARCH 15TH AND APRIL 30TH. CONTAINER STOCK MAY BE PLANTED BETWEEN SEPTEMBER 1ST AND OCTOBER 30TH.
2. A TWELVE (12) INCH LAYER OF TOPSOIL SHALL BE SPREAD OVER ALL REFORESTATION AREAS IMPACTED BY SITE GRADING TO ASSURE A SUITABLE PLANTING AREA. DISTURBED AREAS SHALL BE SEEDED AND STABILIZED AS PER GENERAL CONSTRUCTION PLAN FOR PROJECT. PLANTING AREAS NOT IMPACTED BY SITE GRADING SHALL HAVE NO ADDITIONAL TOPSOIL INSTALLED.
3. ALL BAREROOT PLANTING STOCK SHALL HAVE THEIR ROOT SYSTEMS DIPPED INTO AN ANTI-DESICCANT GEL PRIOR TO PLANTING.
4. PLANTS SHALL BE INSTALLED SO THAT THE TOP OF ROOT MASS IS LEVEL WITH THE TOP OF EXISTING GRADE. BACKFILL IN THE PLANTING PITS SHALL CONSIST OF 3 PARTS EXISTING SOIL TO 1 PART FINE FINES OR EQUIVALENT.
5. FERTILIZER SHALL CONSIST OF AGRIFORM 22-8-2, OR EQUIVALENT, APPLIED AS PER MANUFACTURER'S SPECIFICATIONS.
6. A TWO (2) INCH LAYER OF HARDWOOD MULCH SHALL BE PLACED OVER THE ROOT AREA OF ALL PLANTINGS.
7. PLANT MATERIAL SHALL BE TRANSPORTED TO THE SITE IN A TARPED OR COVERED TRUCK. PLANTS SHALL BE KEPT MOIST PRIOR TO PLANTING.
8. ALL NON-ORGANIC DEBRIS ASSOCIATED WITH THE PLANTING OPERATION SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

**SEQUENCE OF CONSTRUCTION**

1. PLANTS SHALL BE INSTALLED AS PER PLANT SCHEDULE AND PLANTING/SOIL SPECIFICATIONS FOR THE PROJECT.
2. PLANTINGS SHALL BE MAINTAINED AND GUARANTEED IN ACCORDANCE WITH THE MAINTENANCE AND GUARANTEE REQUIREMENTS FOR PROJECT.

**MAINTENANCE OF PLANTINGS**

1. MAINTENANCE OF ALL PLANTINGS SHALL LAST FOR A PERIOD OF 24 MONTHS.
2. ALL PLANT MATERIAL SHALL BE WATERED TWICE A MONTH DURING THE 1ST GROWING SEASON. WATERING MAY BE MORE OR LESS FREQUENT DEPENDING ON WEATHER CONDITIONS DURING SECOND GROWING SEASON, ONCE A MONTH DURING MAY-SEPTEMBER, IF NEEDED.
3. LAYING PIPE - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the pipe. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.
4. Backfilling shall conform to "Structure Backfill".
5. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings. Plastic Pipe - The following criteria shall apply for plastic pipe:  
1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" - 10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.  
2. Joints and connections to anti-seep collars shall be completely watertight.  
3. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soil, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.  
4. Backfilling shall conform to "Structure Backfill".
5. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings. Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

**GUARANTEE REQUIREMENTS**

1. AFTER ONE GROWING SEASON, PLANT MATERIAL SHALL BE MAINTAINED AT 90% SURVIVAL THRESHOLD. A 75% SURVIVAL RATE FOR FORESTATION PLANTINGS WILL BE REQUIRED AT THE END OF THE 24 MONTH MAINTENANCE PERIOD. ALL PLANT MATERIAL BELOW THE 75% THRESHOLD WILL BE REPLACED AT THE BEGINNING OF THE NEXT GROWING SEASON.
2. THE CONTRACTOR WILL NOT BE LIABLE FOR PLANT LOSS DUE TO THEFT OR VANDALISM.

**GEOTECHNICAL ENGINEER RECOMMENDATIONS:**

**EMBANKMENT AND CUT-OFF TRENCH CONSTRUCTION**  
THE AREAS OF THE PROPOSED SWM FACILITIES SHOULD BE STRIPPED OF TOPSOIL AND ANY OTHER UNSUITABLE MATERIALS FROM THE EMBANKMENT OR STRUCTURE AREAS IN ACCORDANCE WITH SOIL CONSERVATION GUIDELINES. AFTER STRIPPING OPERATIONS HAVE BEEN COMPLETED, THE EXPOSED SUBGRADE MATERIALS SHOULD BE PROTECTED WITH A LOADED DUMP TRUCK OR SIMILAR EQUIPMENT IN THE PRESENCE OF A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE. FOR AREAS THAT ARE NOT ACCESSIBLE TO A DUMP TRUCK, THE EXPOSED MATERIALS SHOULD BE OBSERVED AND TESTED BY A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE UTILIZING A DYNAMIC CONE PENETROMETER. ANY EXCESSIVELY SOFT OR LOOSE MATERIALS IDENTIFIED BY PROFFERORING OR PENETROMETER TESTING SHOULD BE EXCAVATED TO SUITABLE FIRM SOIL, AND THEN GRADERS RE-ESTABLISHED BY BACKFILLING WITH SUITABLE SOIL.

A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER SHOULD BE PRESENT TO MONITOR PLACEMENT AND COMPACTION OF FILL FOR THE EMBANKMENT AND CUT-OFF TRENCH. IN ACCORDANCE WITH NRCS-MD CODE NO. 378 POND STANDARDS/SPECIFICATIONS, SOILS CONSIDERED SUITABLE FOR THE CENTER OF EMBANKMENT AND CUT-OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION CC, SC, CH, OR CL AND MUST HAVE AT LEAST 30% PASSING THE #200 SIEVE.

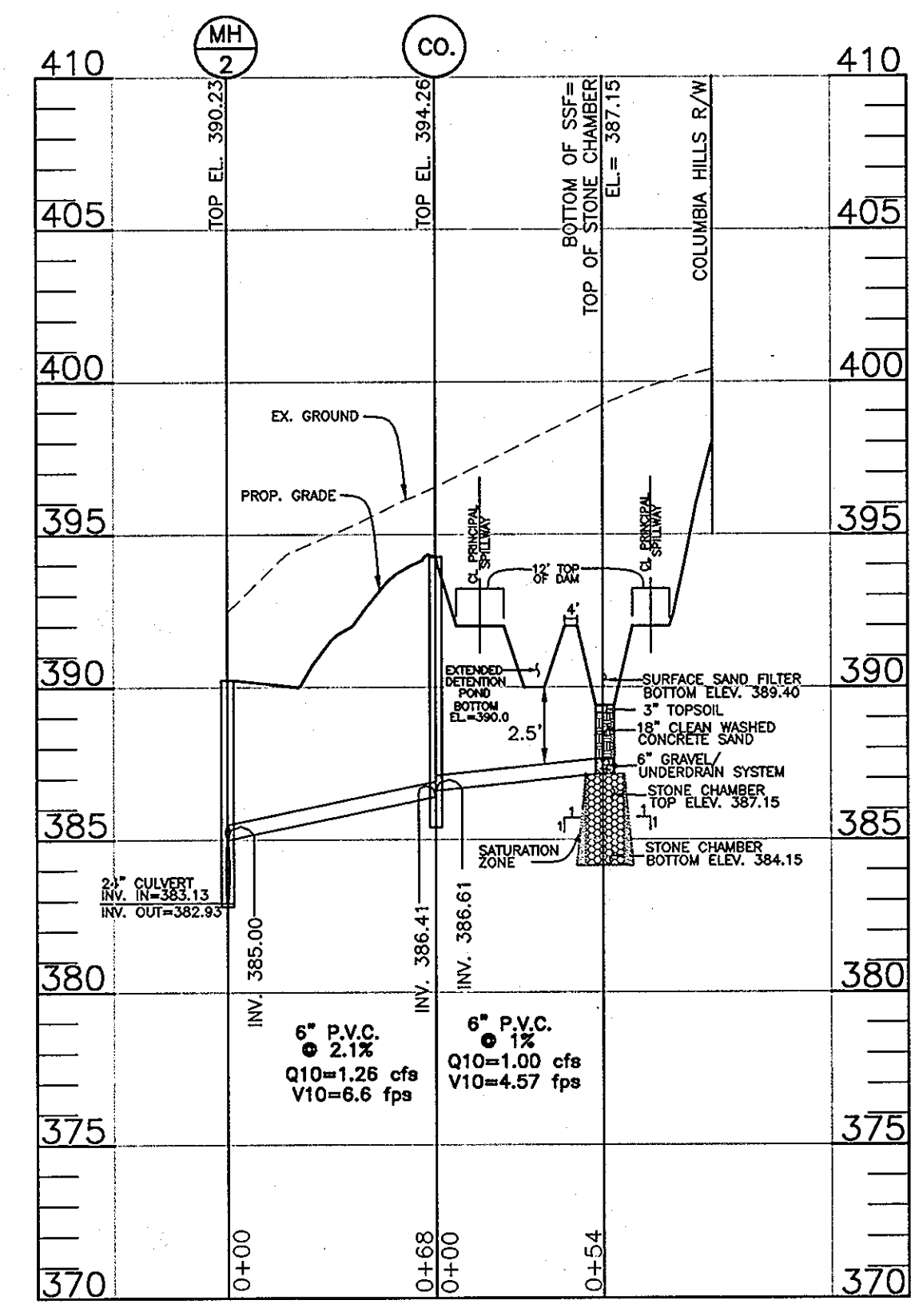
IT IS OUR PROFESSIONAL OPINION THAT IN ADDITION TO THE SOIL MATERIALS DESCRIBED ABOVE, A FINE-GRAINED SOIL, INCLUDING SILT(M) WITH A PLASTICITY INDEX OF 10 OR MORE CAN BE UTILIZED FOR THE CENTER OF THE EMBANKMENT AND CORE TRENCH. ALL FILL MATERIALS MUST BE PLACED AND COMPACTED IN ACCORDANCE WITH NRCS-MD CODE NO. 378 SPECIFICATIONS.

**HOWARD SCD - OPERATION, MAINTENANCE, AND INSPECTION**

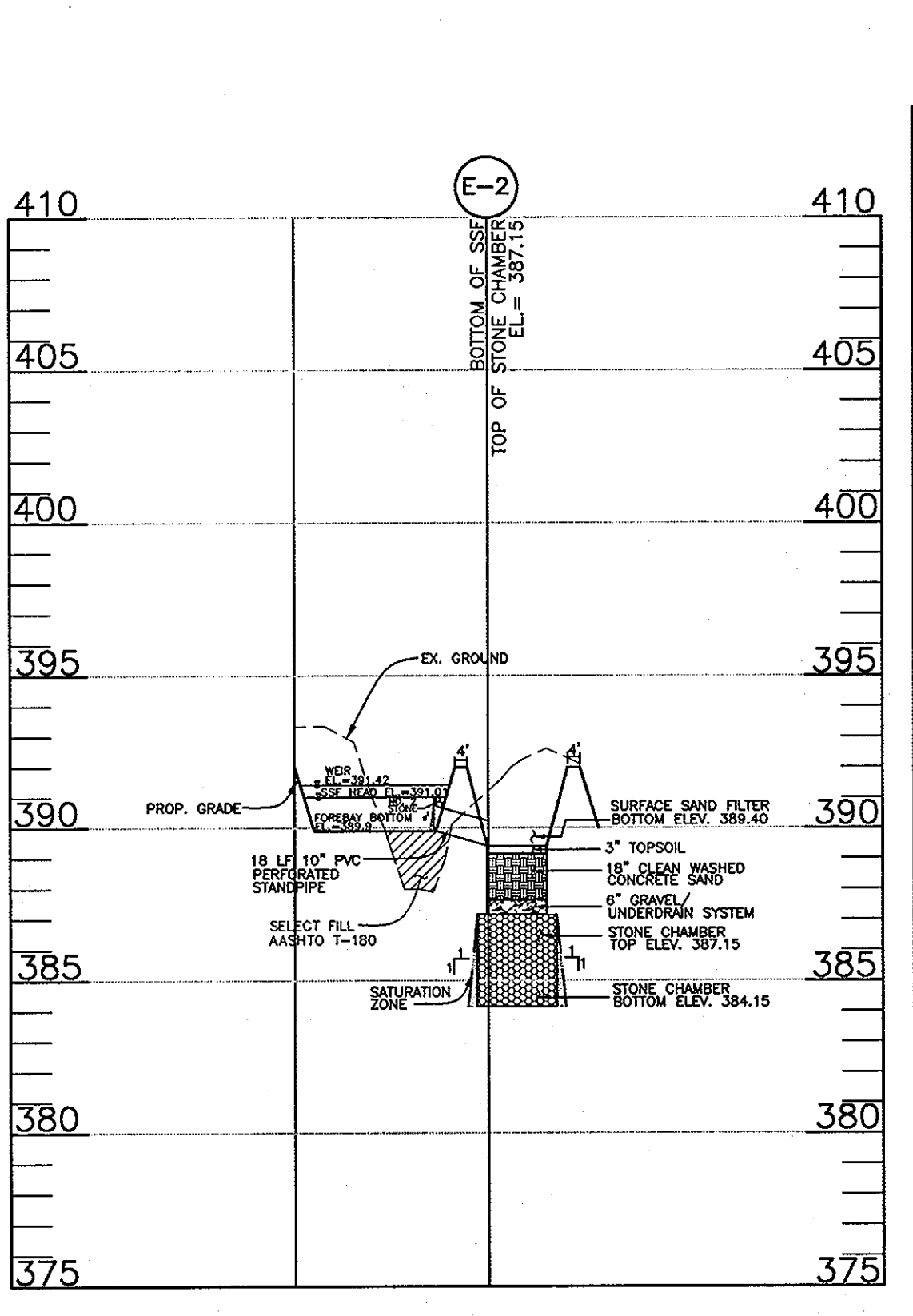
INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED ANNUALLY IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA-NRCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378). THE POND(S) OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND(S) OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING, OR SLUMPING.

All borrow areas shall be graded to provide proper drainage and left in a slightly condition. All exposed surfaces of the embankment, spillway, spot and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

**Erosion and Sediment Control**  
Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures.



**STORM DRAIN PROFILE FROM MH-2 TO SURFACE SAND FILTER**  
SCALE: HORIZONTAL: 1"=50'  
VERTICAL: 1"=5'



**STORM DRAIN PROFILE FROM SURFACE SAND FILTER TO FOREBAY**  
SCALE: HORIZONTAL: 1"=50'  
VERTICAL: 1"=5'

**OPERATION AND MAINTENANCE SCHEDULE PRIVATELY OWNED AND MAINTAINED EXTENDED DETENTION POND ROUTINE MAINTENANCE TO BE PERFORMED BY H.O.A.:**

1. FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE POND IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES PER YEAR. ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED.
3. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS THE RIP-RAP OR TABION OUTLET AREA SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
5. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON THE DETECTION OF ANY DAMAGE. THE COMPONENTS SHALL BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
6. SEDIMENTS SHALL BE REMOVED FROM THE POND, AND FOREBAY, NO LATER THAN WHEN THE CAPACITY OF THE POND, OR FOREBAY IS HALF FULL OF SEDIMENT, OR, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, UPON APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS.

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEM (F-1)**

1. THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
2. THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE PER YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.
3. FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF THREE (3) TIMES PER GROWING SEASON TO MAINTAIN A MAXIMUM GRASS HEIGHT OF LESS THAN 12 INCHES.
4. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
5. VISIBLE SIGNS OF EROSION IN THE FACILITY SHALL BE REPAIRED AS SOON AS IT IS NOTICED.
6. REMOVE SILT WHEN IT EXCEEDS FOUR (4) INCHES DEEP IN THE FOREBAY.
7. WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.
8. A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAWS.
9. THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
10. ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

**AS-BUILT CERTIFICATION**

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

ENGINEER - \_\_\_\_\_ DATE \_\_\_\_\_  
CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE NONE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE. COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES AN ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

**BY THE DEVELOPER:**  
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT 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 BEGINNING THE PROJECT. I SHALL ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

James M. McPherson 2/11/09 DATE  
DEVELOPER James R. McPherson III

**BY THE ENGINEER:**  
I/WE CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT 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 SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE THE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

ENGINEER - BRIAN J. CLEARY, P.E. 28599 2/11/09 DATE  
THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

APPROVED: DEPARTMENT OF PUBLIC WORKS  
William J. McPherson 2-19-09 DATE  
CHIEF, BUREAU OF HIGHWAYS

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
Cindy Hahn 2/25/09 DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
Cindy Hahn 2/25/09 DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT

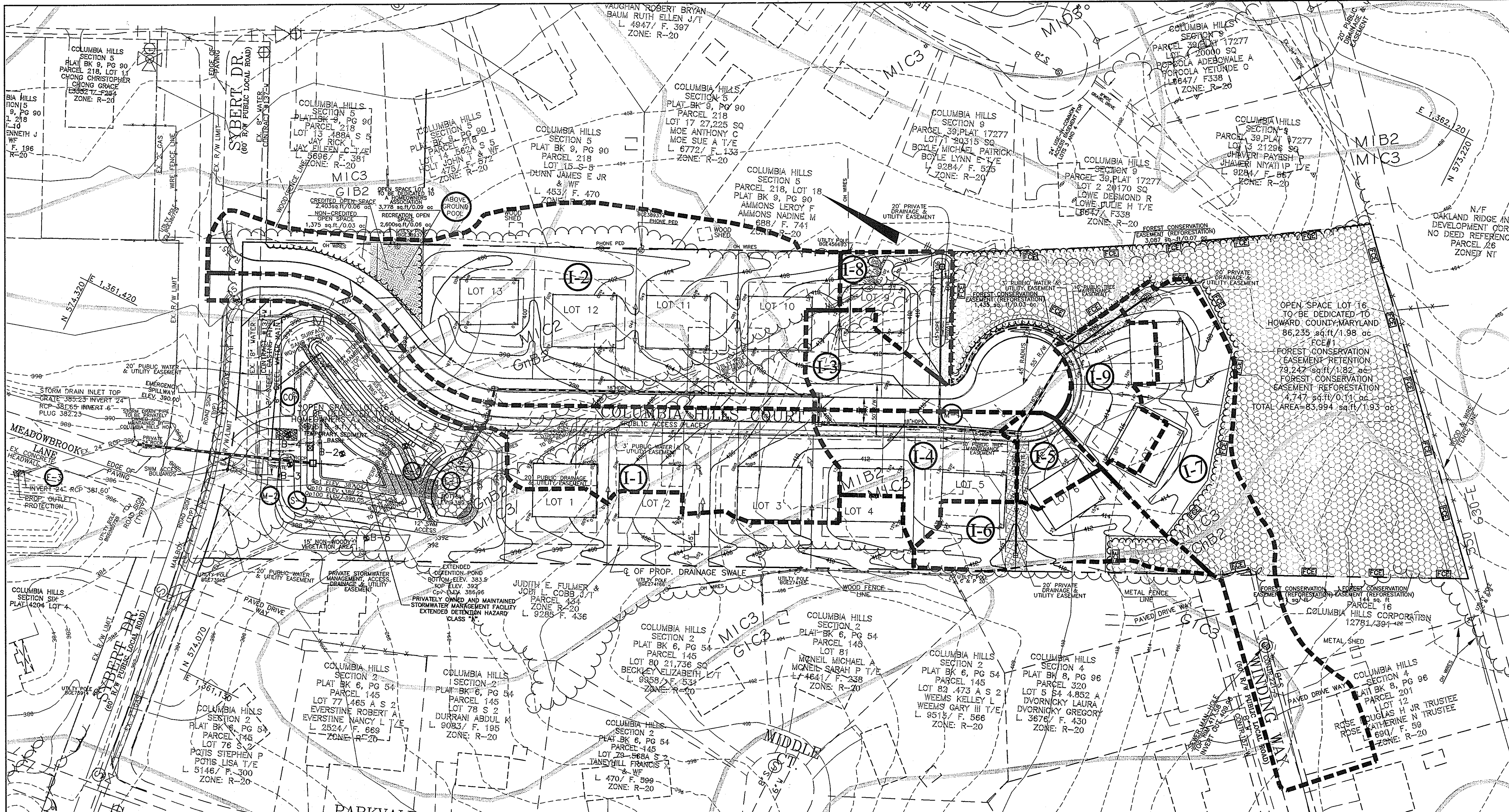
APPROVED: DEPARTMENT OF PLANNING AND ZONING  
Cindy Hahn 2/25/09 DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
Cindy Hahn 2/25/09 DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT

NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6444  
E-MAIL: bai@bai-civilengineering.com

DEVELOPER/CONTRACT PURCHASER: \_\_\_\_\_ PROJECT: **COLUMBIA HILLS SECTION 10**  
LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 16  
LOCATION: TAX MAP 30 - GRID 5  
PARCEL 13 - ZONE: R-20  
2nd ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND  
TITLE: **STORMWATER MANAGEMENT PROFILES, NOTES AND DETAILS**  
DATE: JUNE, 2008 PROJECT NO. 1869  
FEBRUARY, 2009 DRAWING 6 OF 12  
Des: HP Draft: HP Check: BFC SCALE: AS SHOWN



**SOIL BORING LOG B-1**

ENGINEERING ASSOCIATES, INC.  
RECORD OF SOIL EXPLORATION

Project Name: Columbia Hills Section 5 Storm Drainage Area  
Location: Howard County, Maryland

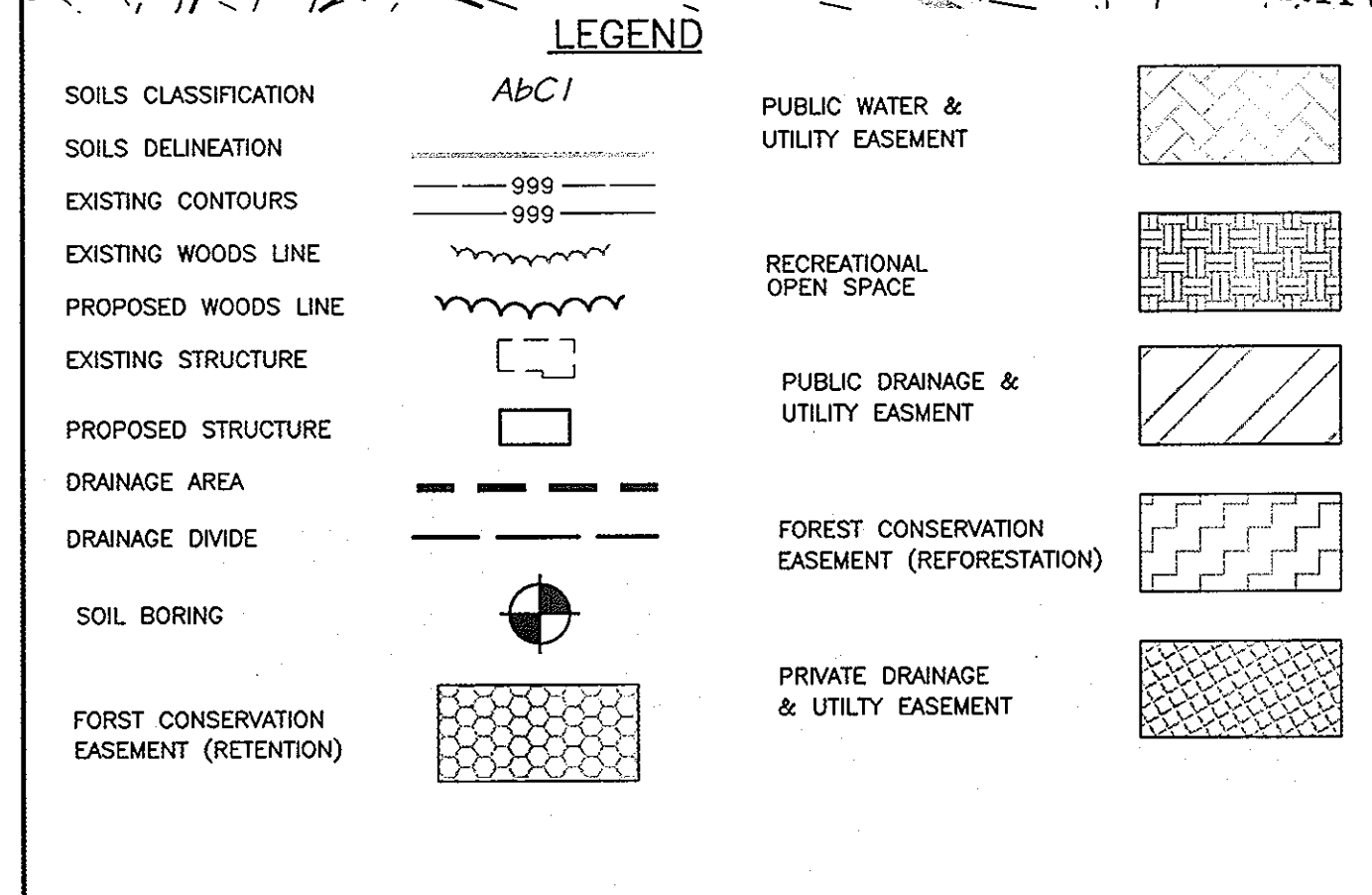
Depth (ft)	Soil Description	Soil Type	Moisture (%)	Plasticity (%)	SPC (%)	LC (%)
0-12	Topsoil (T)	T-1	45.7	11	10	10
12-14	Medium sand, medium clay (MS)	MS-1	44.5	5	10	10
14-16	Medium sand, medium clay (MS)	MS-1	34.5	5	10	10
16-18	Medium sand, medium clay (MS)	MS-1	34.5	5	10	10
18-20	Medium sand, medium clay (MS)	MS-1	45.8	11	10	10

**SOIL BORING LOG B-2**

ENGINEERING ASSOCIATES, INC.  
RECORD OF SOIL EXPLORATION

Project Name: Columbia Hills Section 5 Storm Drainage Area  
Location: Howard County, Maryland

Depth (ft)	Soil Description	Soil Type	Moisture (%)	Plasticity (%)	SPC (%)	LC (%)
0-12	Topsoil (T)	T-1	70.8	12	10	10
12-14	Medium sand, medium clay (MS)	MS-1	56.8	18	10	10
14-16	Medium sand, medium clay (MS)	MS-1	45.8	12	10	10
16-18	Medium sand, medium clay (MS)	MS-1	60.7	13	10	10



**STORM DRAINAGE AREA TABLE**

Area	AC	C	IMP	Z
(I-1)	0.88	0.53	54%	R-20
(I-2)	1.82	0.42	40%	R-20
(I-3)	0.48	0.54	61%	R-20
(I-4)	0.45	0.41	49%	R-20
(I-5)	0.12	0.36	44%	R-20
(I-6)	0.29	0.27	32%	R-20
(I-7)	0.92	0.28	29%	R-20
(I-8)	0.17	0.29	35%	R-20
(I-9)	0.22	0.25	37%	R-20

**PLAN**  
SCALE: 1"=50'

**SOIL BORING LOG B-3**

ENGINEERING ASSOCIATES, INC.  
RECORD OF SOIL EXPLORATION

Depth (ft)	Soil Description	Soil Type	Moisture (%)	Plasticity (%)	SPC (%)	LC (%)
0-12	Topsoil (T)	T-1	44.3	11	10	10
12-14	Medium sand, medium clay (MS)	MS-1	45.8	11	10	10
14-16	Medium sand, medium clay (MS)	MS-1	45.7	12	10	10
16-18	Medium sand, medium clay (MS)	MS-1	59.1	20	10	10

**SOIL BORING LOG B-4**

ENGINEERING ASSOCIATES, INC.  
RECORD OF SOIL EXPLORATION

Depth (ft)	Soil Description	Soil Type	Moisture (%)	Plasticity (%)	SPC (%)	LC (%)
0-12	Topsoil (T)	T-1	43.3	11	10	10
12-14	Medium sand, medium clay (MS)	MS-1	45.8	11	10	10
14-16	Medium sand, medium clay (MS)	MS-1	45.8	12	10	10
16-18	Medium sand, medium clay (MS)	MS-1	45.8	14	10	10

**SOIL BORING LOG B-5**

ENGINEERING ASSOCIATES, INC.  
RECORD OF SOIL EXPLORATION

Depth (ft)	Soil Description	Soil Type	Moisture (%)	Plasticity (%)	SPC (%)	LC (%)
0-12	Topsoil (T)	T-1	15.4	11	10	10
12-14	Medium sand, medium clay (MS)	MS-1	45.8	14	10	10
14-16	Medium sand, medium clay (MS)	MS-1	45.7	12	10	10
16-18	Medium sand, medium clay (MS)	MS-1	38.0	15	10	10

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter J. ...* 2-19-09  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Candy ...* 2/25/09  
 CHIEF, DIVISION OF LAND DEVELOPMENT

*Chad ...* 2/25/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

**BENCHMARK ENGINEERING, INC.**  
 ENGINEERS • LAND SURVEYORS • PLANNERS

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-8105 FAX: 410-465-8644  
 E-MAIL: be@be-civilengineering.com

Professional Certificate No. 12607, expires 12/31/2009

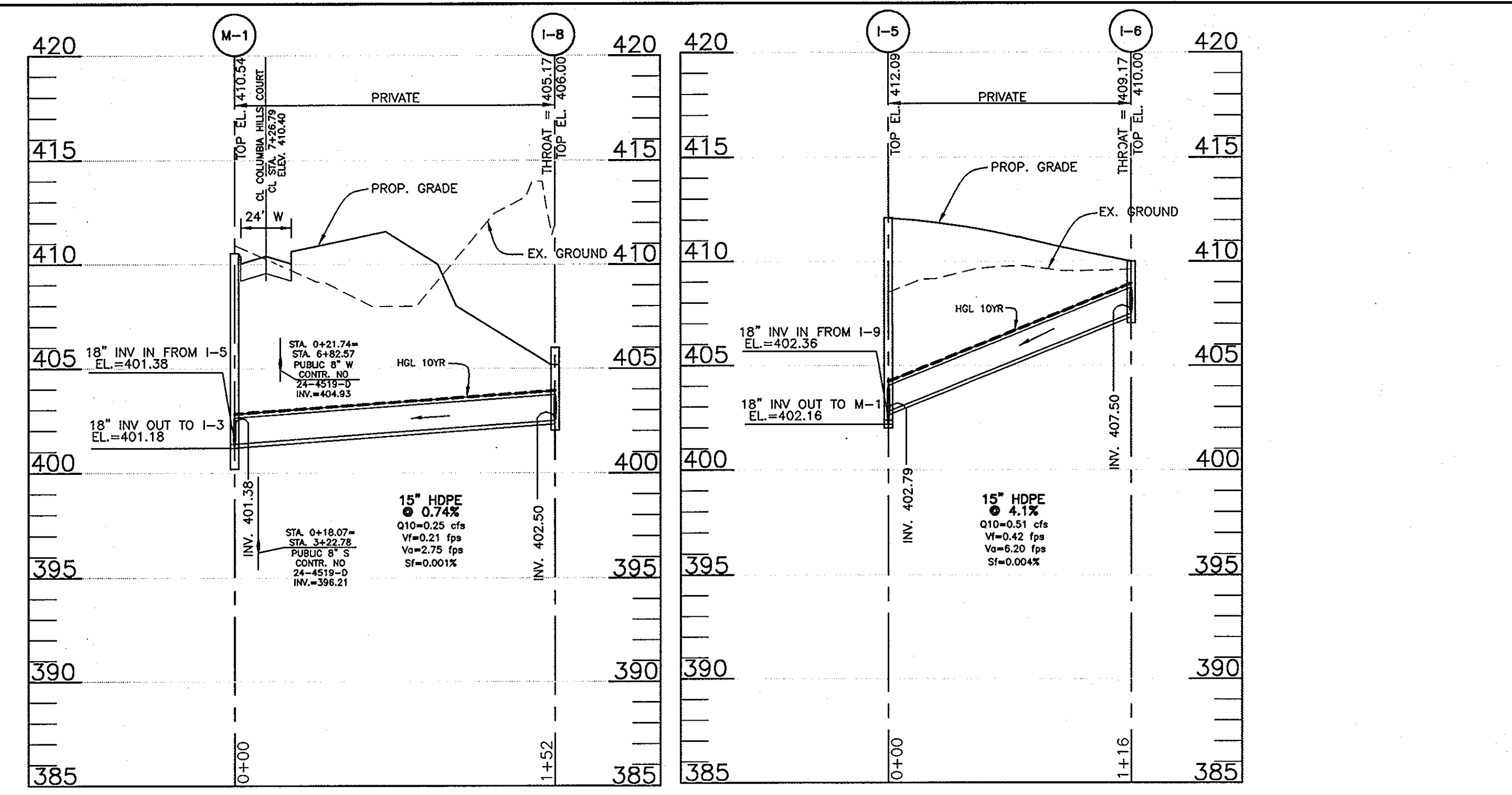
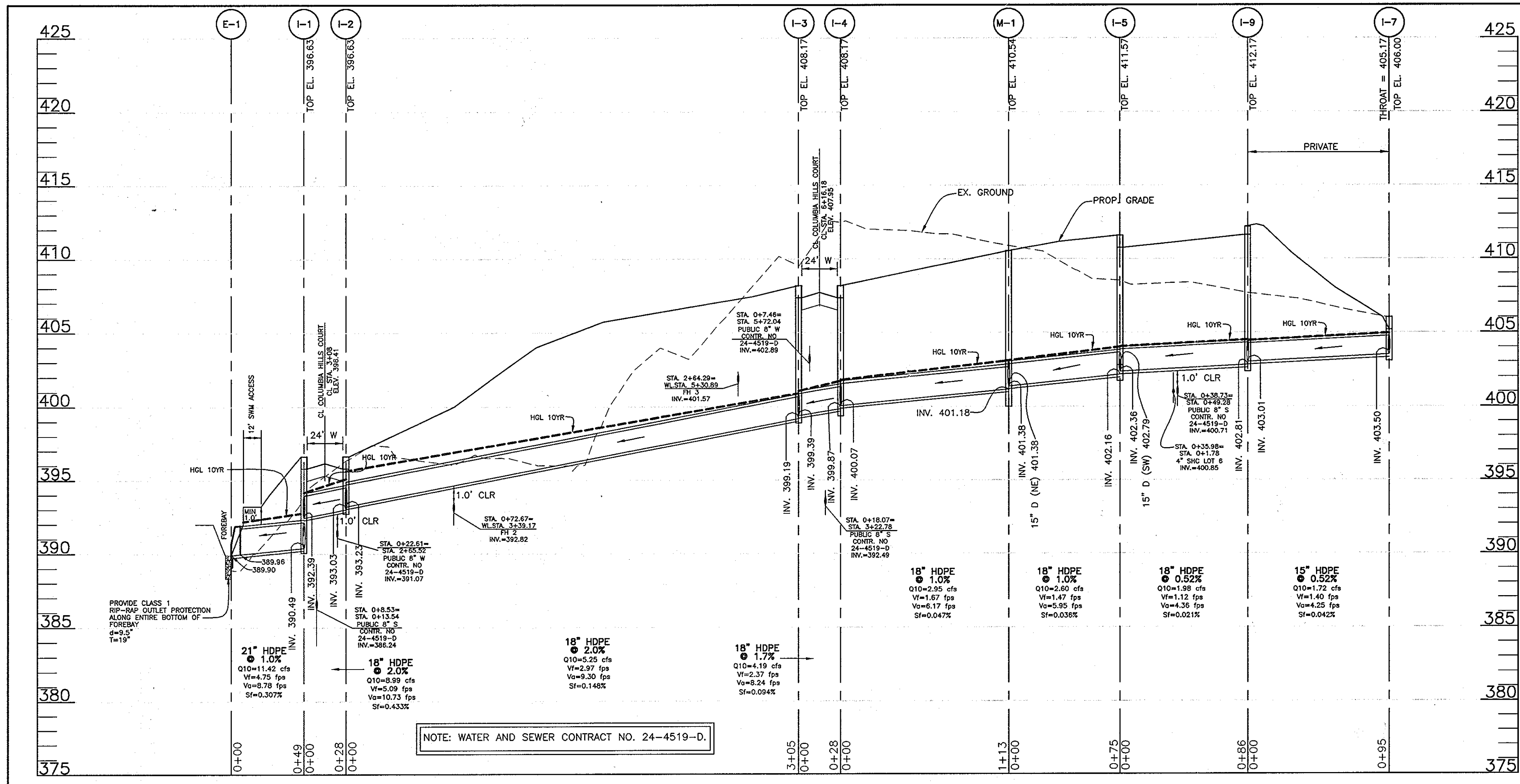
DATE: JUNE, 2008  
 SCALE: AS SHOWN

PROJECT: COLUMBIA HILLS SECTION 10  
 LOCATION: TAX MAP 30 - GRID 5 PARCEL 13 - ZONE: R-20  
 TITLE: STORM DRAIN DRAINAGE AREA MAP, SOIL MAP AND BORING LOGS

DEVELOPER/CONTRACT PURCHASER: COLUMBIA HILL LLC  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 PHONE: (410) 465 - 4244

PROJECT NO. 1869  
 DRAWING 7 OF 12

P1869 COLUMBIA HILLS SECTION 5, 2/25/09 4:45:00 PM, hpc, C:\10000\H01 for mtr\...



**STORM DRAIN PROFILE FROM E-1 TO I-7**  
SCALE: HORIZONTAL: 1"=50'  
VERTICAL: 1"=5'

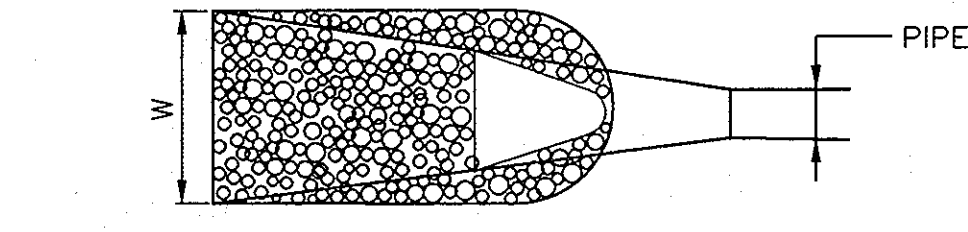
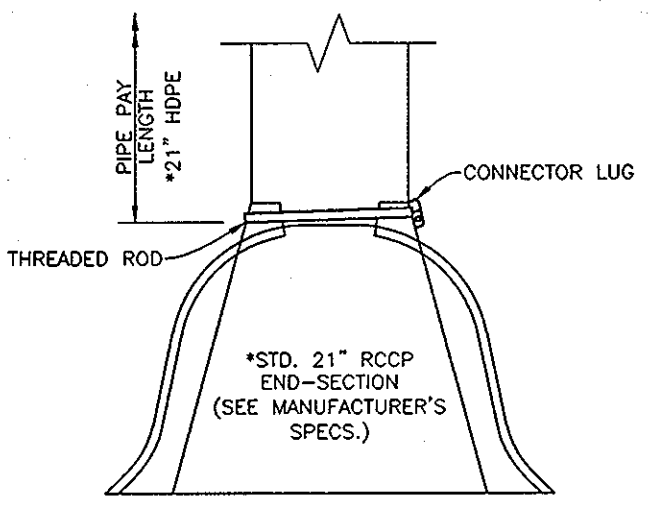
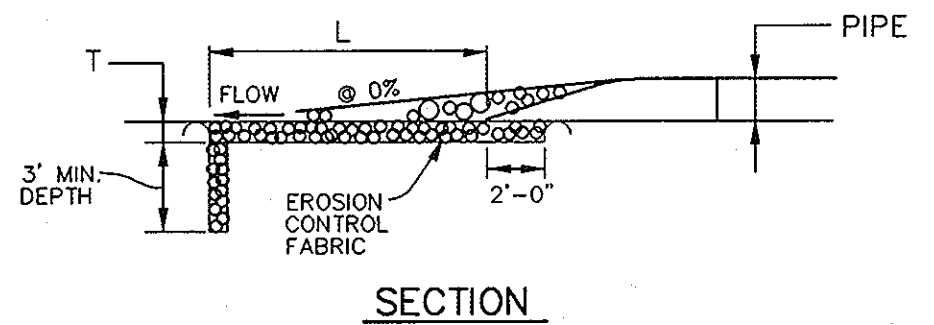
**STORM DRAIN PROFILE FROM M-1 TO I-8**  
SCALE: HORIZONTAL: 1"=50'  
VERTICAL: 1"=5'

**STORM DRAIN PROFILE FROM I-5 TO I-6**  
SCALE: HORIZONTAL: 1"=50'  
VERTICAL: 1"=5'

NOTE: FOR PROFILE OF STORM DRAIN FROM S-1 TO EX. INLET AND LOWFLOW Q<sub>W</sub> PROFILE, SEE SHEET NO. 6

**CONSTRUCTION SPECIFICATIONS**

1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
3. GEOTEXTILE CLASS C28 OR BETTER SHALL BE PROTECTED FROM PUNCTURING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE PREPARED BY PLACING ANOTHER PIECE OF GEOTEXTILE FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT; THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR THE RIP-RAP OR GABION OUTLETS SHALL BE EQUIPPED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.



STRUCTURE	D-50	LENGTH (L)	WIDTH (W)	THICKNESS (T)	SHA CLASS
E-1	9.5"	FOREBAY	10'	19"	I
E-2	9.5"	10'	10'	19"	I
E-3	9.5"	10'	6'	19"	I

**OUTLET PROTECTION DETAIL**  
NOT TO SCALE

NO.	TYPE	LOCATION	THROAT INV.	INVERT IN	INVERT OUT	TOP ELEV.	HO. CO. STD.	REMARKS	INTERIOR DIMENSION	MAINT.
I-1	'A'-5'	© STA=3+08 OFFSET 12'		392.46	390.57	396.63	D-4.01 OR 4.02		2'-6"	PUBLIC
I-2	'A'-5'	© STA=3+08 OFFSET 12'		393.23	393.03	396.63	D-4.01 OR 4.02		2'-6"	PUBLIC
I-3	'A'-5'	© STA=6+16.18 OFFSET 12'		399.39	399.19	408.17	D-4.01 OR 4.02		2'-6"	PUBLIC
I-4	'A'-5'	© STA=6+16.18 OFFSET 12'		400.07	399.87	408.17	D-4.01 OR 4.02		2'-6"	PUBLIC
I-5	'A'-5'	LINEAR PROFILE. STA=+533.35		402.36	402.79	402.16	D-4.01 OR 4.02		2'-6"	PUBLIC
I-6	'D'	N 573,421.60 E 1,361,676.60	409.17		407.50	410.00	D-4.10	OPEN 4 SIDES		PRIVATE
I-7	'D'	N 573,420.69 E 1,361,850.80	405.17		403.50	406.00	D-4.10	OPEN 4 SIDES		PRIVATE
I-8	'D'	N 573,608.81 E 1,361,789.03	405.17		402.50	406.00	D-4.10	OPEN 4 SIDES		PRIVATE
I-9	'A'-5'	LINEAR PROFILE. STA=+1+50.00		403.01	402.81	412.17	D-4.01 OR 4.02		2'-6"	PUBLIC
M-1	4'-0" MANHOLE	N 573,540.79 E 1,361,652.51		(2) 401.38	401.18	410.54	G-5.12		4.0' DIA	PUBLIC
M-2	4'-0" MANHOLE	N 574,090.69 E 1,361,345.94		383.13	385.0	382.93	G-5.12		4.0' DIA	PRIVATE
CO.		N 574,116.10 E 1,361,408.76		386.61	386.41	394.26				PRIVATE
E-1	24" HDPE END SECT.	N 573,928.81 E 1,361,425.77		390.14	389.90	NA	D-5.51	FOREBAY OUTFALL		PUBLIC
S-1	CUSTOM STRUCTURE	N 574,052.74 E 1,361,359.95		383.50 (6" PVC)		392.00	NA	SWMF		PRIVATE

- 1) STRUCTURE TOP ELEVATION AND LOCATION FOR MANHOLES IS AT THE TOP AND CENTER OF RIM.
- 2) STRUCTURE TOP ELEVATION AND LOCATION FOR INLETS IS AT THE TOP AND CENTER OF INLET. AT CURB LINE FOR TYPE 'A' INLET OR CENTER OF STRUCTURE FOR TYPE 'D' INLET.

SIZE	LENGTH	TYPE & CLASS	OWNED & MAINT.
21"	49'	HDPE HI-Q	PUBLIC
18"	63'	HDPE HI-Q	PUBLIC
15"	363'	HDPE HI-Q	PRIVATE
24"	164'	RCCP CLASS IV	PRIVATE
6"	288'	P.V.C.	PRIVATE
10"	18'	P.V.C.	PRIVATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*William J. ...*  
CHIEF, BUREAU OF HIGHWAYS  
DATE: 2-19-09

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Chad ...*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*Cam ...*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 2/25/09

NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-485-8105 FAX: 410-485-6844  
E-MAIL: be@bei-civilengineering.com

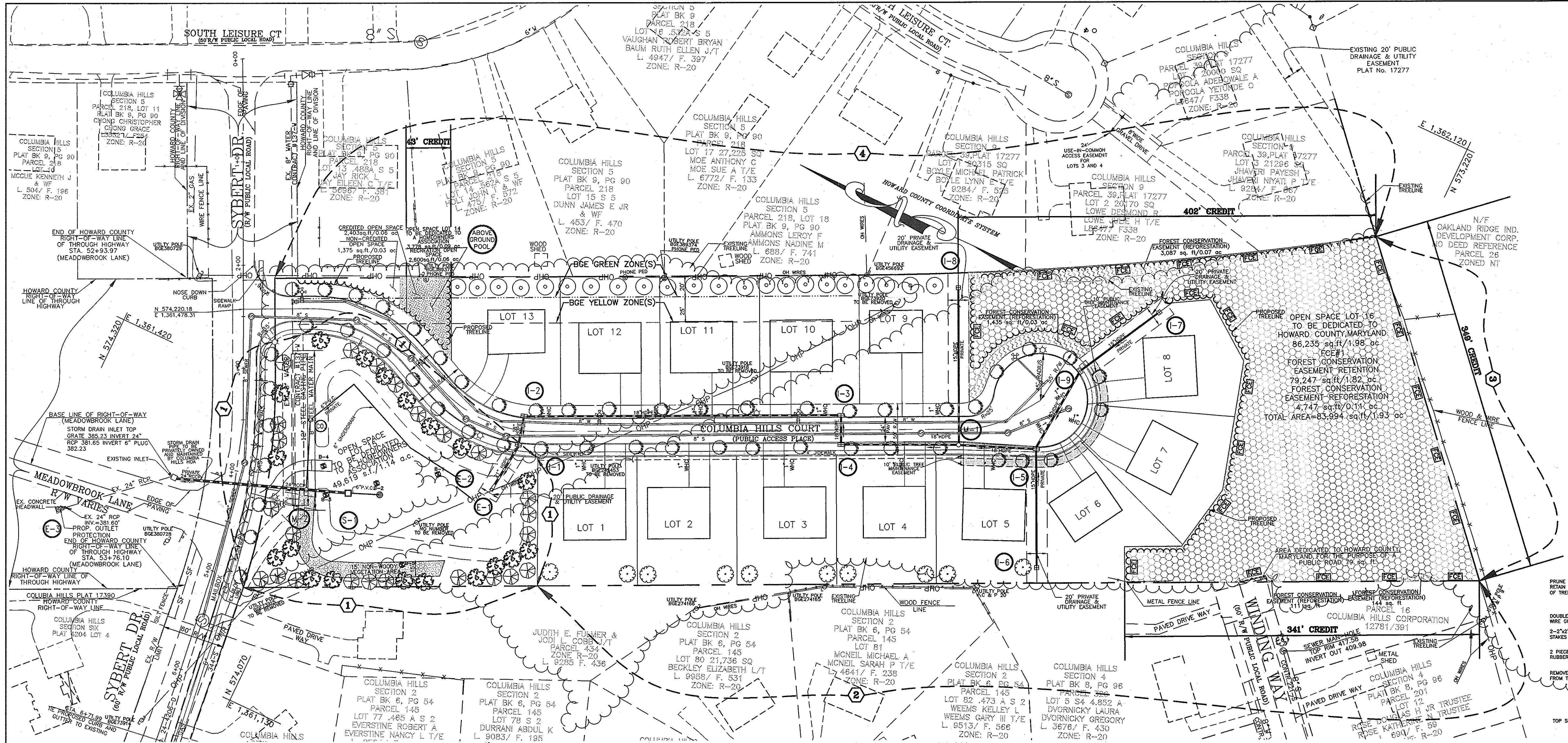
**DEVELOPER/CONTRACT PURCHASER:**  
COLUMBIA HILL LLC  
P.O. BOX 417  
ELLCOTT CITY, MARYLAND 21041  
PHONE: (410) 465-4244

**PROJECT:** COLUMBIA HILLS SECTION 10  
LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 16  
**LOCATION:** TAX MAP 30 - GRID 5  
PARCEL 13 - ZONE: R-20  
2nd ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND  
**TITLE:** STORM DRAIN PROFILES, NOTES AND DETAILS

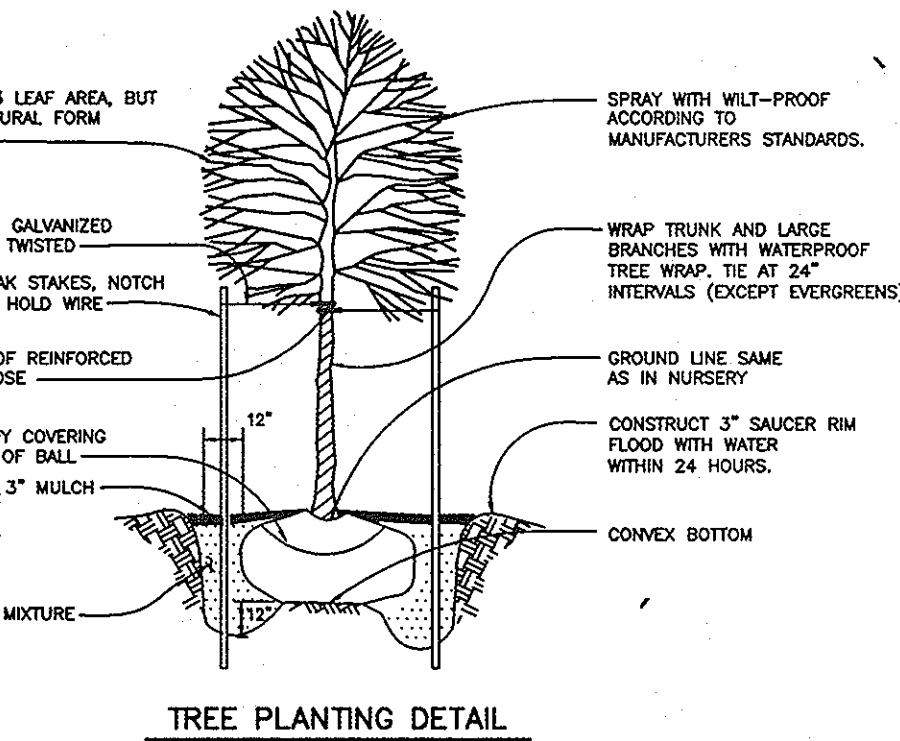
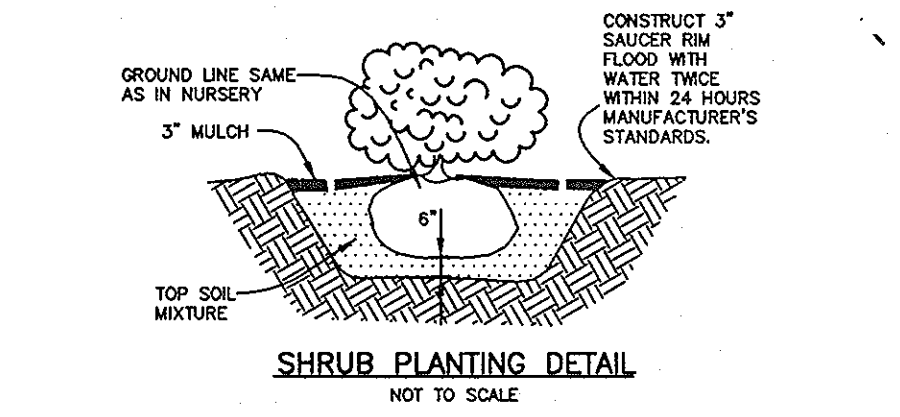
DATE: JUNE 2008  
FEBRUARY 2009  
PROJECT NO. 1869  
SCALE: AS SHOWN  
DRAWING 8 OF 12

Des: HP Draft: HP Check: BFC





- ### LANDSCAPING NOTES
- PERIMETER LANDSCAPING SHALL BE PROVIDED BY THE EXISTING VEGETATION TO REMAIN AND BY THE PLANTINGS AS SHOWN ON THESE PLANS.
  - SEE TREE PLANTING DETAIL - THIS SHEET.
  - THE DEVELOPER SHALL BE RESPONSIBLE FOR THE PRESERVATION OF THE PERIMETER VEGETATION AND FOR THE PERIMETER PLANTINGS AS SHOWN ON THESE PLANS. BONDING FOR PLANTINGS IS THE OBLIGATION OF THE DEVELOPER AS PART OF THE DEVELOPERS AGREEMENT.
  - STREET TREES SHALL BE PLANTED A MINIMUM OF FOUR (4) FEET FROM THE CURB OR SIDEWALK, A MINIMUM OF SIX (6) FEET BEHIND FACE OF CURB WHEN THERE IS NO SIDEWALK AND MUST BE A MINIMUM OF FIVE (5) FEET FROM ANY STORM DRAIN.
  - A MINIMUM DISTANCE OF TWENTY (20) FEET MUST BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND FROM ANY STREET LIGHTS.
  - THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SEC-16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
  - STREET TREES SHALL BE PLANTED A MINIMUM OF FIVE (5) FEET FROM OPEN SPACE ACCESS STRIP AND 10' FROM DRIVEWAY.
  - AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREIN LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATIONS.
  - PERIMETER AND SWM LANDSCAPING SHALL BE PROVIDED AS SHOWN ON THE LANDSCAPE PLAN OF THE ROAD CONSTRUCTION DRAWINGS FOR THIS FINAL PLAN IN ACCORDANCE WITH SECTION 16.124 OF THE LANDSCAPE MANUAL. FINANCIAL SURETY IN THE AMOUNT OF \$15,600 (\$8,700 FOR 29 SHADE TREES, \$3,600 FOR 24 EVERGREEN TREES AND \$3,300 FOR 22 ORNAMENTAL TREES) SHALL BE POSTED WITHIN THE DEVELOPER'S AGREEMENT UNDER THIS FINAL PLAN, F-09-008.
  - THERE ARE NO SPECIMEN TREES ON THIS PLAN.
  - SMALL ORNAMENTAL TREES SHALL BE PLANTED ALONG PERIMETER 4 IN ACCORDANCE WITH BGE "GREEN ZONE".

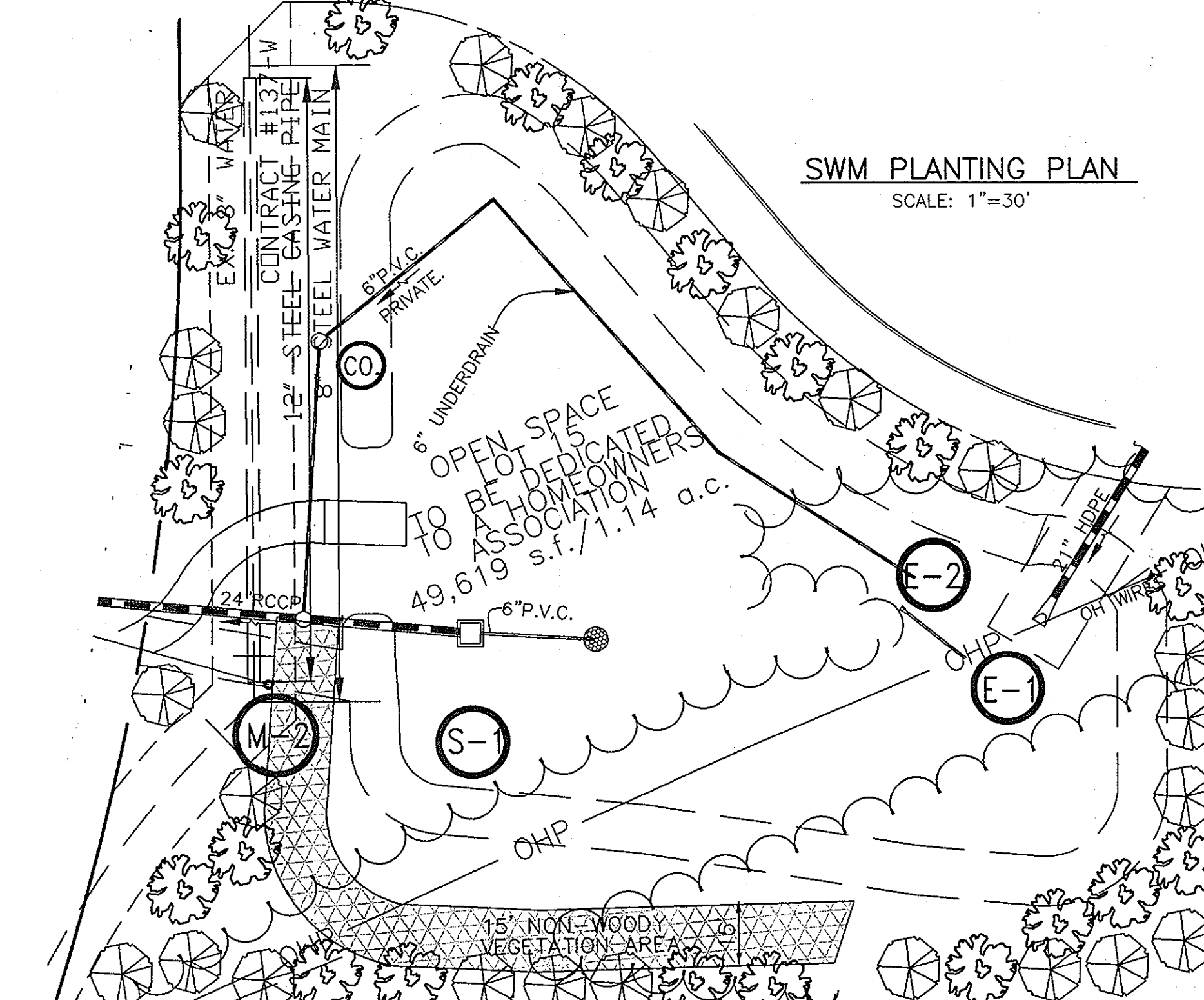


- ### NOTES:
- LOOSEN SOIL IN PLANTING ZONES TO A DEPTH OF THREE TO FIVE INCHES BEFORE PLANTING.
  - PLANTING HOLES TO HAVE A DIAMETER 6" GREATER THAN THE ROOT BALL BEING PLANTED IN THEM.
  - NO WOODY VEGETATION IS PERMITTED WITHIN 15' OF THE TOE OF SLOPE OR 25' OF THE SPILLWAY.

**DEVELOPER'S/BUILDER'S CERTIFICATE**

I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION OF A LETTER OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE-YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

Steve Breeden  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
 APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING



### SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING

LINEAR FEET OF PERIMETER PERIMETER TYPE	① 934' TYPE 'B'
NUMBER OF TREES REQUIRED	
SHADE TREES (1:50)	19
EVERGREEN TREES (1:40)	24
CREDIT FOR EXISTING VEGETATION (NO, YES AND %)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	NO
NO. OF TREES PROVIDED	
SHADE TREES	19
EVERGREEN TREES	24

### SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAY			ADJACENT TO PERIMETER PROPERTIES		
	NO	NO	NO	YES	YES	YES
PERIMETER NO. / LANDSCAPE TYPE	② A	③ A	④ A	⑤ A	⑥ A	⑦ A
LINEAR FEET OF (FRONTAGE/PERIMETER)	908'	349'	1062'			
CREDIT FOR EXISTING VEGETATION: (NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED))	YES 341' FCE	YES 349' FCE	YES 402' FCE	YES 43' REC		
CREDIT FOR WALL, FENCE OR BERM: (NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED))	NO	NO	NO			
NUMBER OF PLANTS REQUIRED:						
SHADE TREES	10	0	10			
EVERGREEN TREES	-	-	-			
OTHER TREES (2:1 SUBSTITUTE)	-	-	-			
SHRUBS	-	-	-			
NUMBER OF PLANTS PROVIDED:						
SHADE TREES	10	0	0			
EVERGREEN TREES	-	-	-			
OTHER TREES (2:1 SUBSTITUTE)	-	-	-			22*
SHRUBS (10:1 SUBSTITUTE)	-	-	-			-
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)						

NOTE: \* SMALL ORNAMENTAL TREES SHALL BE PLANTED ALONG PERIMETER 4 IN ACCORDANCE WITH BGE "GREEN ZONE"

### STREET TREE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS
①	51	PRUNUS ARGENTENSIS "ARGENT CHERRY"	2.5"-3.0" MIN. CAL. B & B FULL HEAD

### SWMF PERIMETER PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS
②	19	ACER RUBRA "RED MAPLE"	2-1/2"-3.0" MIN. CAL. B & B FULL HEAD
③	24	CUPRESSODIOPSIS LEVANDI "ISLAND CYPRESS"	5.0"-6.0" MIN. HT. UNSHARED

### PERIMETER PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS
④	10	ACER SACCHARUM "SUGAR MAPLE"	2.5"-3.0" MIN. CAL. B & B FULL HEAD
⑤	22	ACER ORBICUM "PAPERBARK MAPLE"	1-1/2"-2.0" MIN. CAL.

### LEGEND

EXISTING CONTOUR	--- 399 ---	PERIMETER AREAS	③
PROPOSED CONTOUR	--- 386 ---	FOREST CONSERVATION SIGNAGE	FCE
EXISTING WOODS LINE	~~~~~	EXISTING DRAINAGE ESMT	ESMT
PROPOSED WOODS LINE	~~~~~	10' PUBLIC TREE MAINTENANCE EASEMENT	PTME
EXISTING STRUCTURE	---	PROP. SIDEWALK	PS
PROPOSED STRUCTURE	---	FOREST CONSERVATION EASEMENT (REFORESTATION)	FCE
EX. OVERHEAD WIRE	---	CREDITED RECREATION OPEN SPACE	CRS
EX. UTILITY POLE	---	FOREST CONSERVATION EASEMENT (RETENTION)	FCE
PROP. SOIL BORING	---	NON-WOODY VEGETATION AREA	NWVA
PROPOSED STREET LIGHT	---	PROP. FIRE DRAYANT	FD

### STREET TREE CALCULATIONS PROPOSED COLUMBIA HILLS COURT

STREET TREES REQUIRED FOR 1802 LF OF RIGHT-OF-WAY 1802/40 = 45 TREES REQUIRED  
45 TREES PROVIDED

### STREET TREE CALCULATIONS SYBERT DRIVE

STREET TREES REQUIRED FOR 223 LF OF RIGHT-OF-WAY WITH 0 LF OF CREDIT FOR PRESERVING EXISTING VEGETATION 223/40 = 6 TREES REQUIRED  
6 TREES PROVIDED

**BENCHMARK ENGINEERING, INC.**  
 ENGINEERS • LAND SURVEYORS • PLANNERS

8480 BALTIMORE NATIONAL PIKE A SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6844  
 E-MAIL: be@beinc-civilengineering.com

Professional Seal: [Seal]

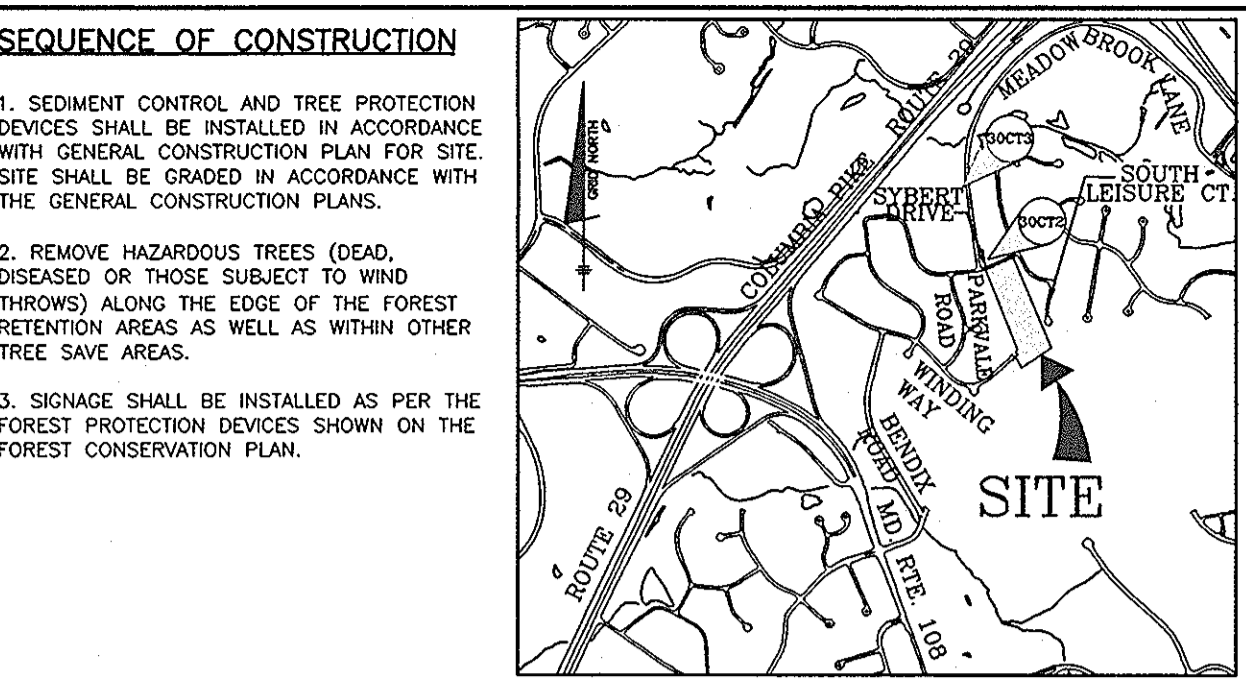
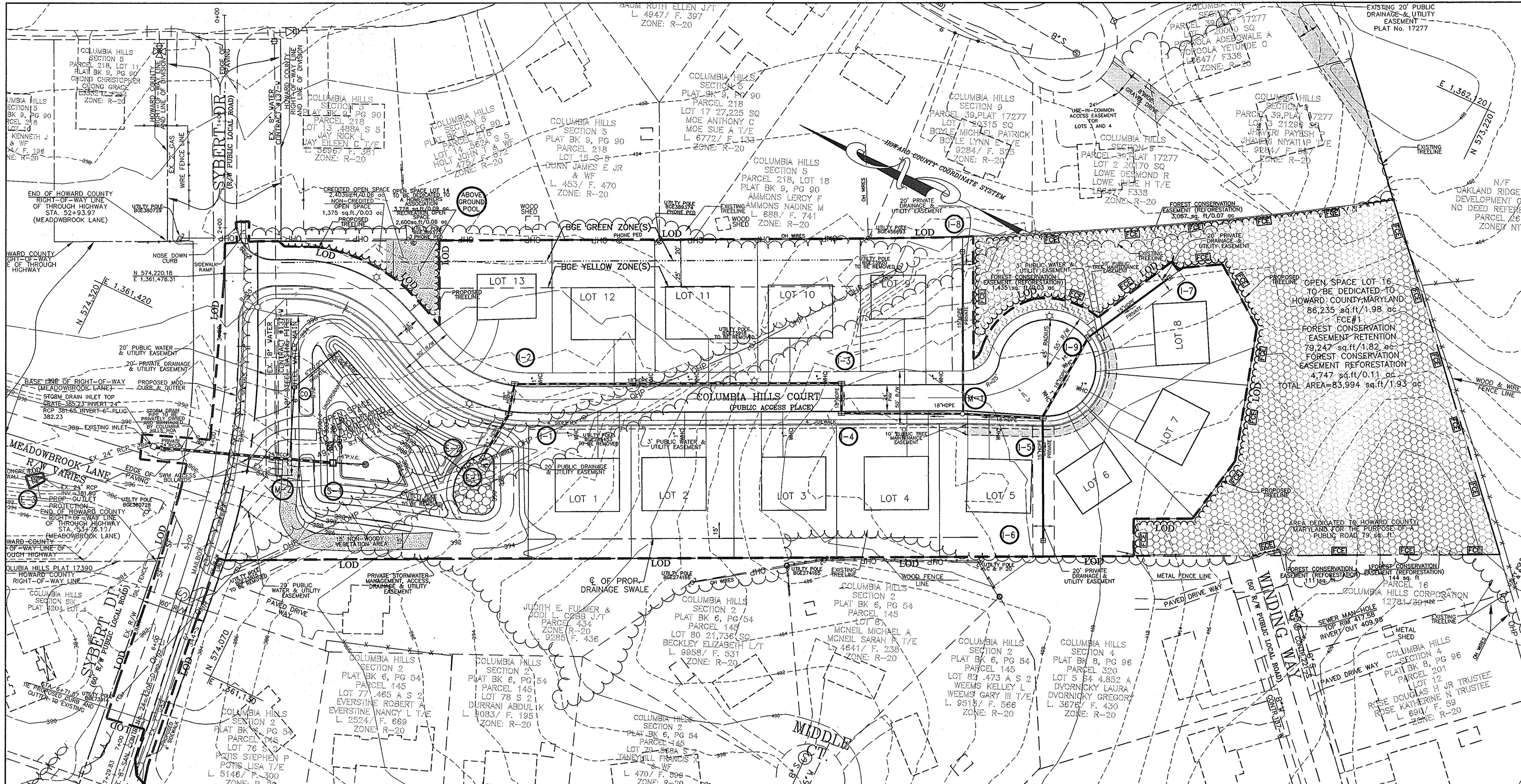
DEVELOPER/CONTRACT PURCHASER: COLUMBIA HILLS, LLC  
 P.O. BOX 417  
 ELLICOTT CITY, MARYLAND 21041  
 PHONE: (410) 465 - 4244

PROJECT: COLUMBIA HILLS SECTION 10  
 LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 thru 16  
 LOCATION: TAX MAP 30 - GRID 05  
 PARCEL 13 - ZONE: R-20  
 2nd ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE: LANDSCAPE PLAN, NOTES AND DETAILS

DATE: JUNE, 2008 PROJECT NO. 1869  
 FEBRUARY, 2009  
 SCALE: AS SHOWN DRAWING 9 OF 12

Des: HP Draft: HP Check: BFC



- ### SEQUENCE OF CONSTRUCTION
- SEEDMENT CONTROL AND TREE PROTECTION DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH GENERAL CONSTRUCTION PLAN FOR SITE. SITE SHALL BE GRADED IN ACCORDANCE WITH THE GENERAL CONSTRUCTION PLAN.
  - REMOVE HAZARDOUS TREES (LOAD, DISEASED OR THOSE SUBJECT TO WIND THROWS) ALONG THE EDGE OF THE FOREST RETENTION AREAS AS WELL AS WITHIN OTHER TREE SAVE AREAS.
  - SIGNAGE SHALL BE INSTALLED AS PER THE FOREST PROTECTION DEVICES SHOWN ON THE FOREST CONSERVATION PLAN.
- ### CONSTRUCTION PERIOD PROTECTION PROGRAM
- Forest Protection Techniques**
    - Soil Protection Area (Critical Root Zone)**  
The soil protection area, or critical root zone, of a tree is that portion of the soil column where most of its roots may be found. The majority of roots responsible for water and nutrient uptake are located just below the soil surface. Temporary fencing shall be placed around the critical root zone of the forest in areas where the forest limits occur within 25 feet of the limit of disturbance.
    - Fencing and Signage**  
Existing forest limits occurring within 50 feet of the limits of disturbance shall be protected using temporary protective fencing. Permanent signage shall be placed around the disturbance area prior to plant installation, as shown on the plan.
    - Pre-Construction Meeting**  
Upon staking of limits of disturbance a pre-construction meeting will be held between the developer, contractor and appropriate County Inspector. The purpose of the meeting will be to verify that all sediment control is in order, and to notify the contractor of possible penalties for non-compliance with the FCP.
    - Storage Facilities/Equipment Cleaning**  
All equipment storage, parking, sanitary facilities of the proposed Forest Conservation Easement. Cleaning of equipment will be limited to area within the LOD of the proposed homesteads. Wastewater resulting from equipment cleaning will be controlled to prevent runoff into environmentally sensitive areas.
  - Sequence of Construction**  
The following timetable represents the proposed timetable for development of the subject property. The items outlined in the Forest Conservation Plan will be enacted within two (2) years of subdivision approval.
    - Below find a proposed sequence of construction.
      - Install all signage and sediment control devices.
      - Hold pre-construction meeting between developer, contractor and County Inspector.
      - Build access roads, install water and sewer, and construct houses. Stabilize all disturbed areas accordingly.
      - Remove sediment control.
      - Hold post-construction meeting with County Inspectors to assure compliance with FCP. Submit Certification of Retention.
    - Construction Monitoring**  
Eco-Science Professionals, or another qualified professional designated by the developer, will monitor construction of the project to ensure that all activities are in compliance with the Forest Conservation Plan.
    - Post-Construction Meeting**  
Upon completion of construction, Eco-Science Professionals, or another qualified professional designated by the developer, will notify the County that construction has been completed and arrange for a post-construction meeting to review the project site. The meeting will allow the County Inspector to verify that retention requirements have been met.
- ### POST-CONSTRUCTION MANAGEMENT PLAN
- Howard County requires a two year post-construction management plan to be prepared as part of the Forest Conservation Plan. The plan shall be prepared in accordance with the Forest Conservation Plan and approved by the County. Eco-Science Professionals, or another qualified professional designated by the developer, will be responsible for implementation of the post-construction management plan.
- The following items will be incorporated into the plan for the subject property:
- Fencing and Signage**  
Permanent signage indicating the limits of the retention/planting area shall be maintained.
  - General Site Inspections**  
Site inspections will be performed to insure that retention of the forest is met in accordance with this plan and that the forest edge remains healthy and stable.
  - Education**  
The developer will provide appropriate materials to property owners informing them of the location and purpose of the forest conservation easement. Materials may include site plans and information explaining the intent of the forest conservation law.
  - Final Inspection**  
At the end of the two year post-construction management period, Eco-Science Professionals, or another qualified professional, will submit to the administrator of the Howard County Forest Conservation Program certification that all retention/afforestation requirements have been met. Upon acceptance of this certification, the County will release the developer from all future obligations and release the developer's bond.
- ### FOREST CONSERVATION EASEMENTS
- Easements are a legal means of providing permanent protection of forests, farmland and open space. In accordance with the criteria outlined in the Howard County Forest Conservation Manual, a forest conservation easement will be recorded for the retention areas the subject property. Submission of the easements for recordation will occur prior to commencement of construction activities.

### FCP NOTES

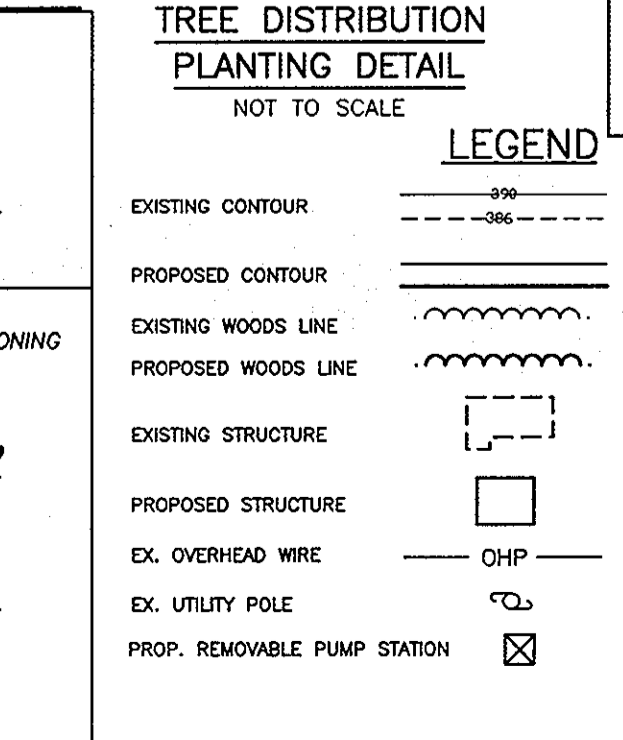
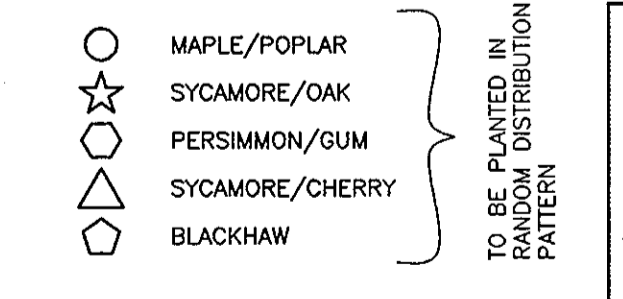
- Any Forest Conservation Easement (FCE) area shown hereon is subject to protective covenants which may be found in the Land Records of Howard County which restrict the disturbance and use of these areas.
- Forested areas occurring outside of the FCE shall not be considered part of the FCE and shall not be subject to protective land coverments.
- Limits of disturbance shall be restricted to areas outside the limit of temporary fencing on the FCE boundary, whichever is greater.
- There shall be no clearing, grading, construction or disturbance of vegetation in the Forest Conservation Easement, except as permitted by Howard County DPZ.
- No stockpiles, parking areas, equipment cleaning areas, etc. shall occur within areas designated as Forest Conservation Easements.
- Temporary fencing shall be used to protect the specimen trees during construction. Fencing shall be installed along limits of disturbance occurring within 50 feet of the specimen trees to be retained. Permanent signage will be posted at a 50-100 foot intervals along all FCE limits.
- The Forest Conservation Act requirements for this project will be met through the onsite retention of 1.82 acres of forest on the site and 0.11 acres of onsite planting and payment of \$2,670 to the Howard County Forest Conservation Fund for one acre of reforestation. Surety in the amount of \$15,849.40 (29.247 SF x \$540.20) for 1.82 ac. of retention and \$2,373.50 (4,747 SF x \$500) for 0.11 ac. of on-site reforestation for a total of \$18,222.90 shall be posted with the developer's agreement under this final plan, 7-20-09.
- The Forest Conservation Signage must be in place for perpetuity.

Onsite Planting Area - 0.11 acres  
FCE #1

Qty	Species	Size	Spacing
8	Acer rubrum - Red maple	2-3" whip	11' o.c.
6	Acer saccharinum - Silver maple	2-3" whip	11' o.c.
8	Cornus florida - Flowering dogwood	2-3" whip	11' o.c.
5	Liriodendron tulipifera - Tulip poplar	2-3" whip	11' o.c.
4	Prunus serotina - Black cherry	2-3" whip	11' o.c.
4	Quercus alba - White oak	2-3" whip	11' o.c.
4	Quercus rubra - Red Oak	2-3" whip	11' o.c.

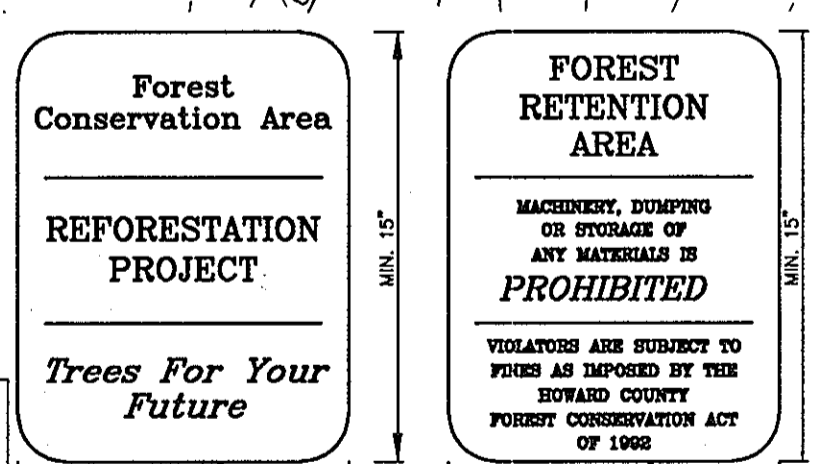
Total Qty = 39

Note: Whips will be planted with Tree Shelters.



### PLAN

Scale: 1"=50'



### FCE ACREAGE CHART

EASEMENT	RETENTION (NTA)	REFORESTATION	TOTAL FCE
FCE #1	1.82 ACRE	0.11 ACRE	1.93
TOTAL	1.82 ACRES	0.11 ACRE	1.93

NOTE: PLANTING NOTES AND SPECIFICATIONS SEE SHEET NO. 6

### SITE DATA TABULATION

- GENERAL SITE DATA
  - GENERAL ZONING: R-20
  - LOCATION: TAX MAP 30 - GRID 05 - PARCEL 13
  - APPLICABLE DPZ FILE REFERENCES: SP-08-001
  - DEED REFERENCE: L10740 / F.151 (PLAT REFERENCE: SHA PLAT 56982)
  - PROPOSED USE OF SITE: 13 SFD HOMES
  - PROPOSED WATER AND SEWER SYSTEMS: PUBLIC
- AREA TABULATION
  - TOTAL AREA OF SITE: 7.86 Ac.±
  - AREA OF 100 YEAR FLOODPLAIN (APPROX.): N/A
  - AREA OF STEEP SLOPES (25% OR GREATER): 0.00 Ac.±
  - NET AREA OF SITE: 7.86 Ac.±
  - AREA OF THIS PLAN SUBMISSION: 7.86 Ac.±
  - LIMIT OF DISTURBANCE (APPROX.): 6.24 Ac.±
  - AREA OF PROPOSED BUILDABLE LOTS: 3.58 Ac.±
  - AREA OF OPEN SPACE LOTS: 3.21 Ac.±
  - AREA OF PROPOSED PUBLIC R/W DEDICATION: 1.07 Ac.±
- DENSITY TABULATION
  - NET AREA OF SITE: 7.86 Ac.±
  - UNIT/LOT TABULATION
    - TOTAL NUMBER OF RESIDENTIAL LOTS PROPOSED ON THIS SUBMISSION: 13
    - TOTAL NUMBER OF OPEN SPACE LOTS PROPOSED ON THIS SUBMISSION: 3
  - OPEN SPACE DATA
    - MINIMUM RESIDENTIAL LOT SIZE SELECTED: 12,000 S.F.
    - OPEN SPACE REQUIRED FOR TOTAL AREA OF SITE (40% OF 7.86 Ac.): 3.14 Ac.±
    - TOTAL AREA OF PROPOSED OPEN SPACE LOTS PROVIDED WITH THIS SUBMISSION: 3.21 Ac.±
      - OPEN SPACE AREAS LESS THAN 35' IN WIDTH (NON-CREATED): 0.03 Ac.±
      - TOTAL AREA OF OPEN SPACE MEETING MINIMUM OPEN SPACE REQUIREMENTS: 3.18 Ac.± (40.5%)
    - AREA OF RECREATIONAL OPEN SPACE REQUIRED (9200 SQ. FT. PER BUILDABLE LOT): 0.06 Ac.±
      - TOTAL AREA OF RECREATIONAL OPEN SPACE REQUIRED: 0.06 Ac.±
      - TOTAL AREA OF RECREATIONAL OPEN SPACE PROVIDED: 0.06 Ac.±

**Eco-Science Professionals, Inc.**  
CONSULTING ECOLOGISTS  
P.O. Box 5066 Glen Artn, MD 21057 (410) 992-6152  
Professional Certification by the State of Maryland, License No. 28559, Expiration Date: 07-22-2009.

**BENCHMARK ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6644  
E-MAIL: be@benchmark-engineering.com

Professional Certification by the State of Maryland, License No. 28559, Expiration Date: 07-22-2009.

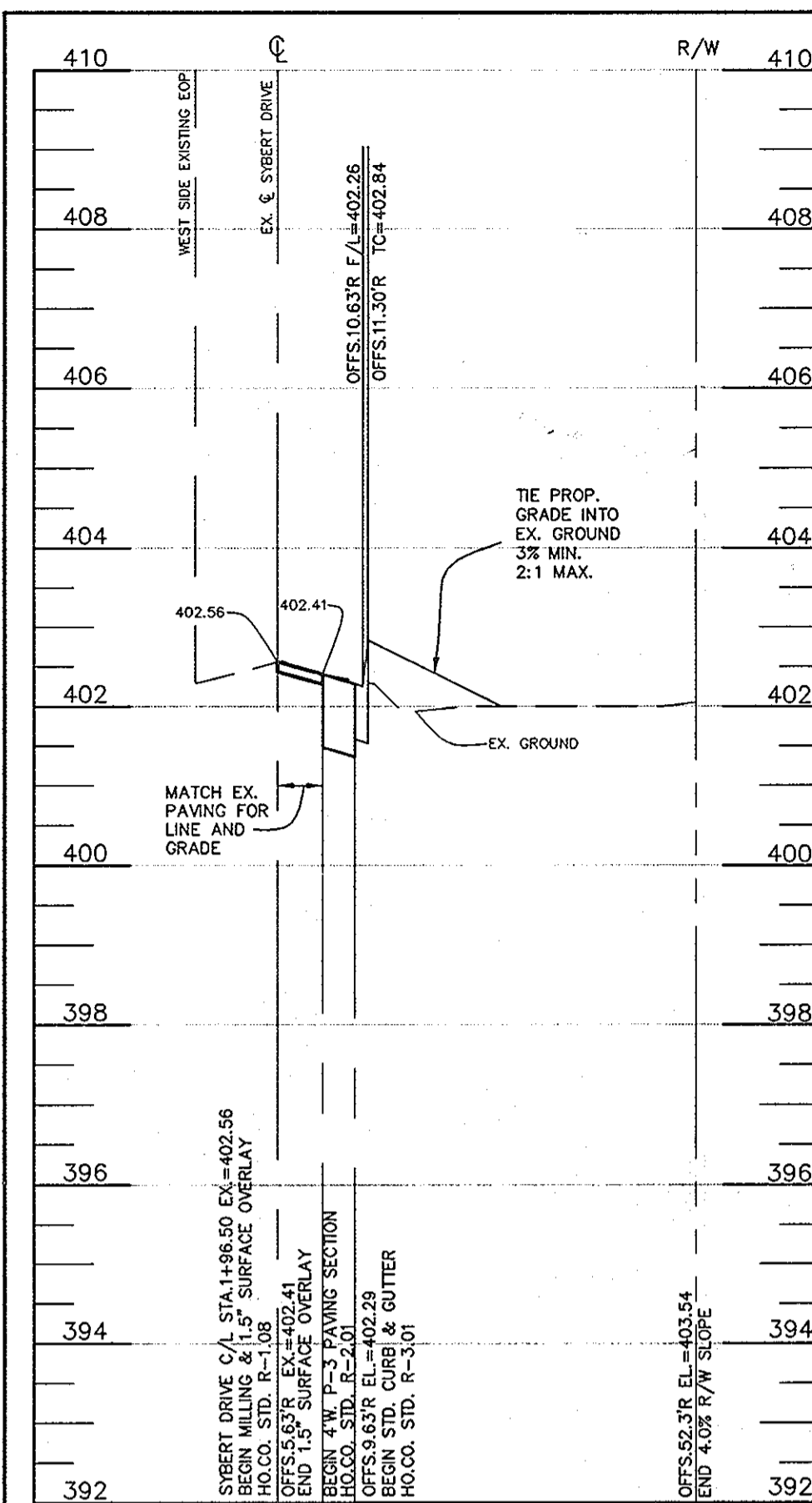
DEVELOPER/CONTRACT PURCHASER: COLUMBIA HILLS, LLC  
P.O. BOX 417  
ELLCOTT CITY, MARYLAND 21041  
PHONE: (410) 465 - 4244

PROJECT: COLUMBIA HILLS SECTION 10  
LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 16  
LOCATION: TAX MAP 30 - GRID 05 PARCEL 13 ZONE: R-20  
2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND

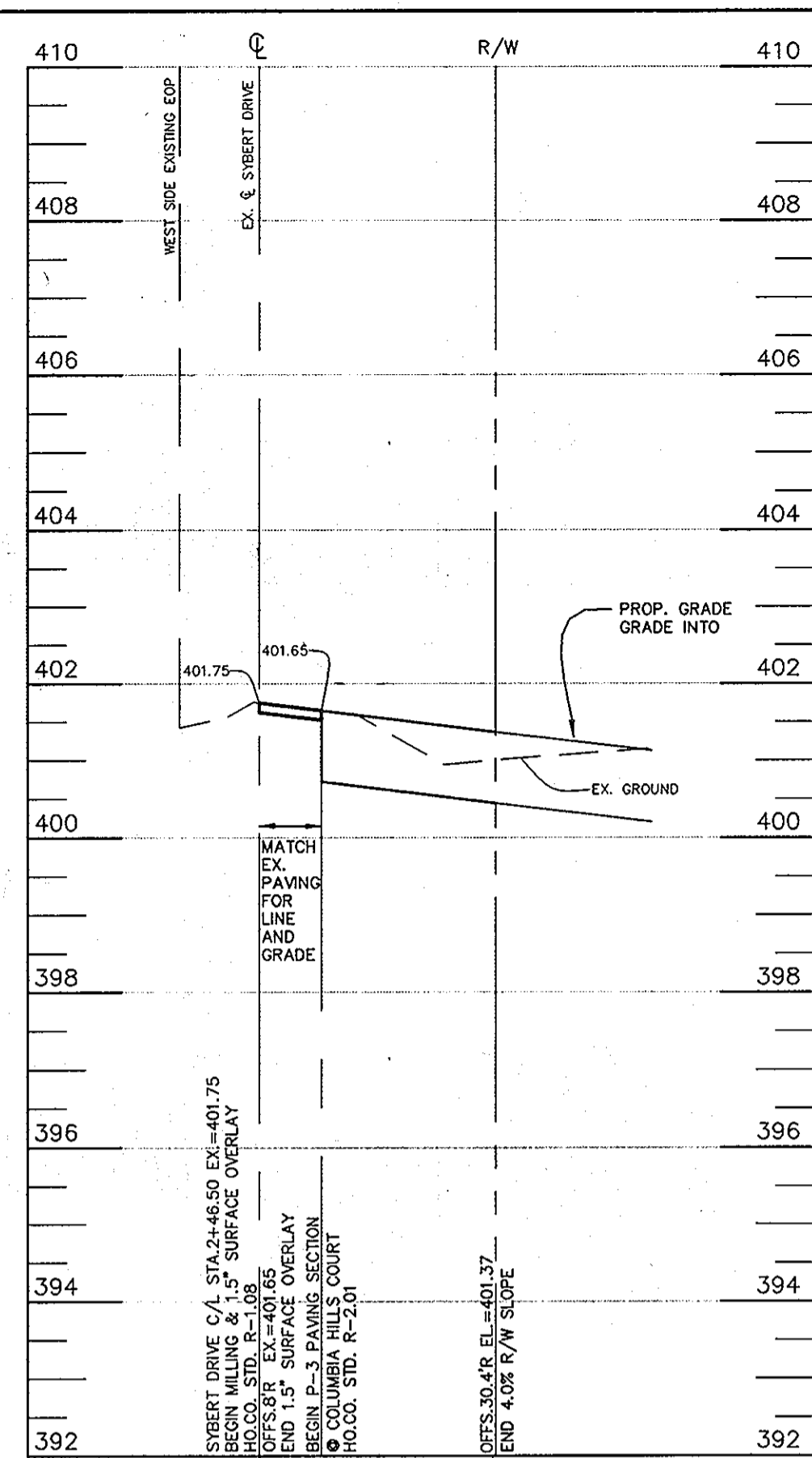
TITLE: ON-SITE FOREST CONSERVATION PLAN, NOTES AND DETAILS

DATE: JUNE 2008 / FEBRUARY, 2009 PROJECT NO: 1869  
SCALE: AS SHOWN DRAWING 10 OF 12

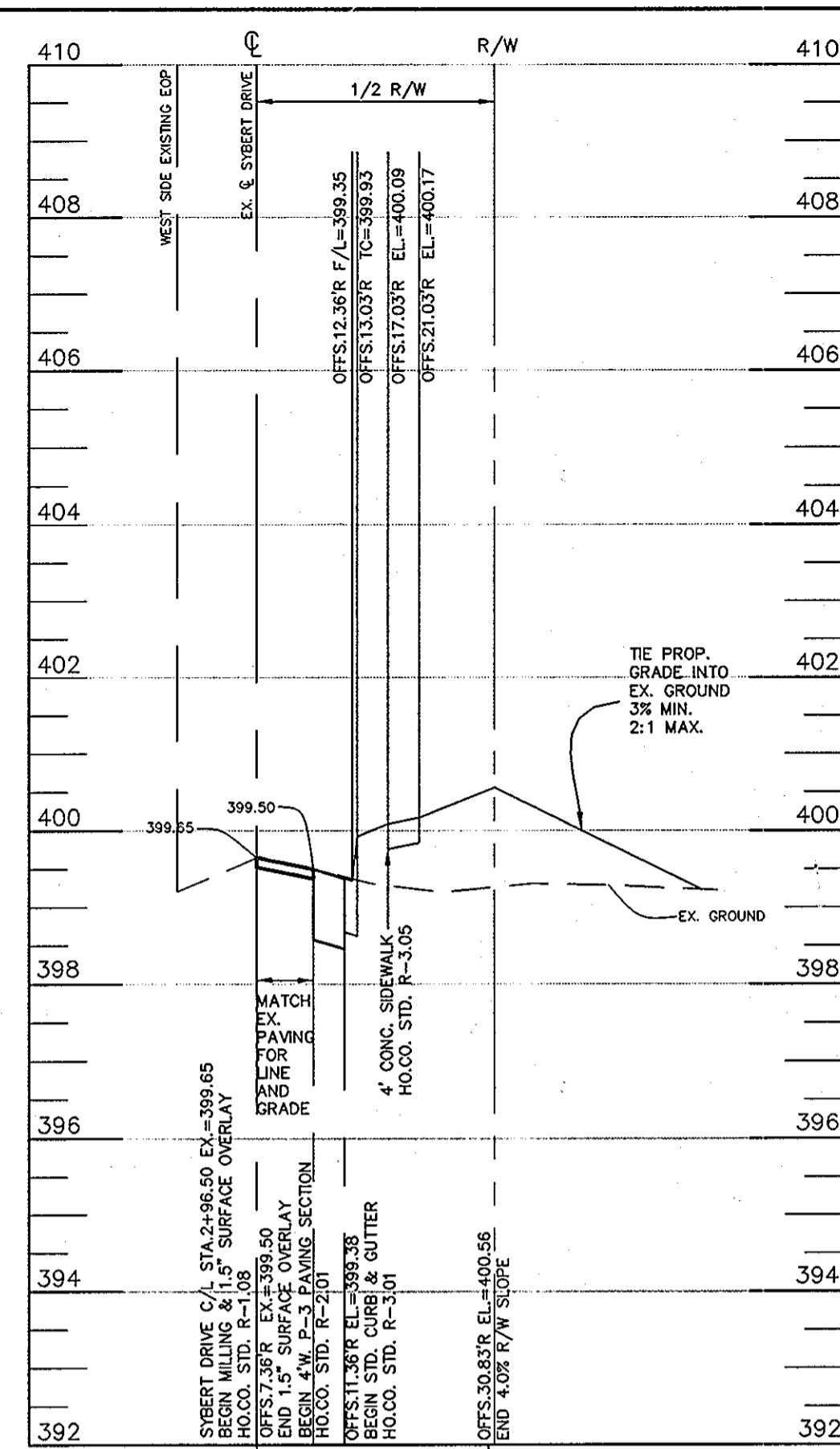
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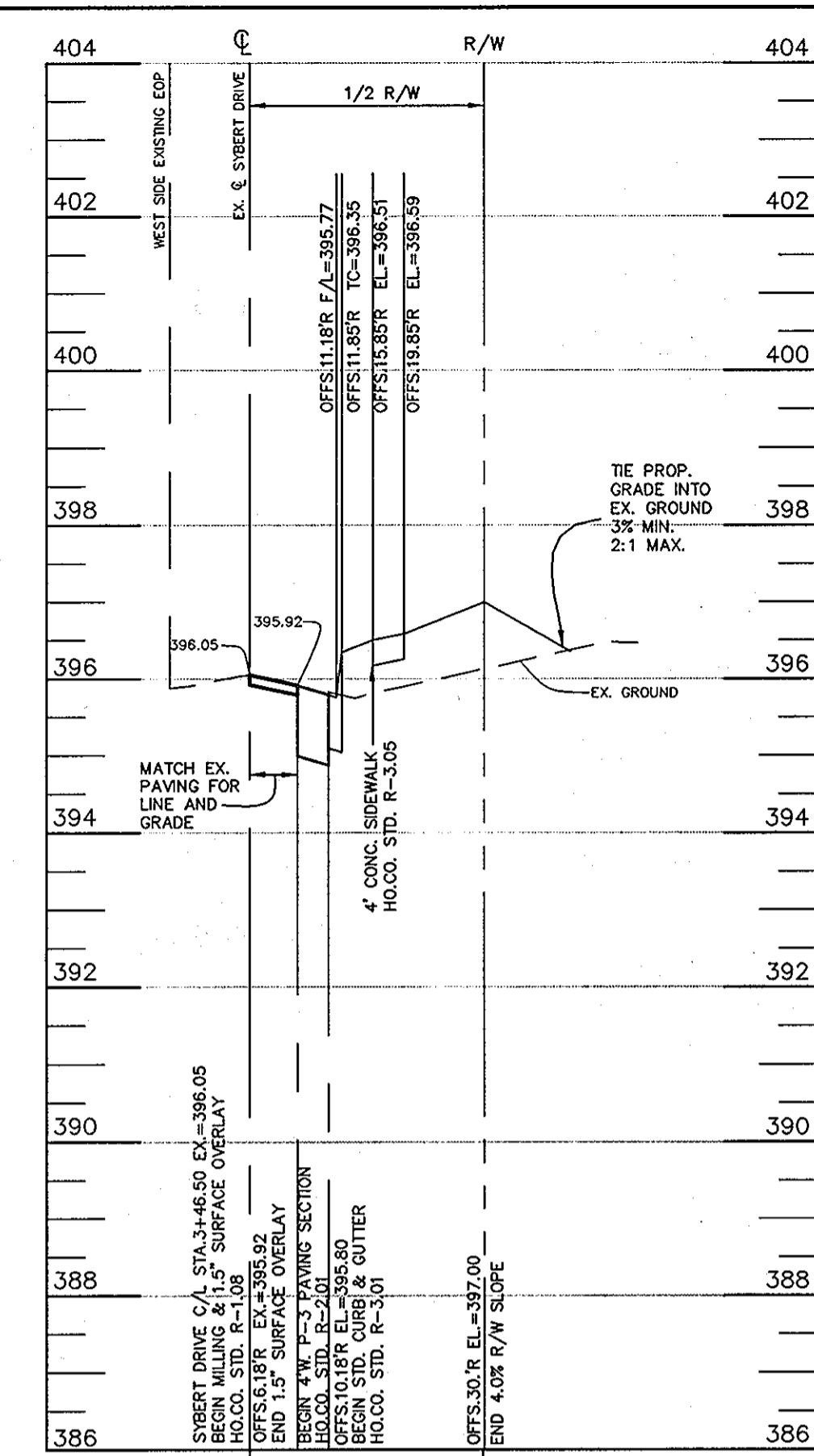
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@ X-SECTION 1**



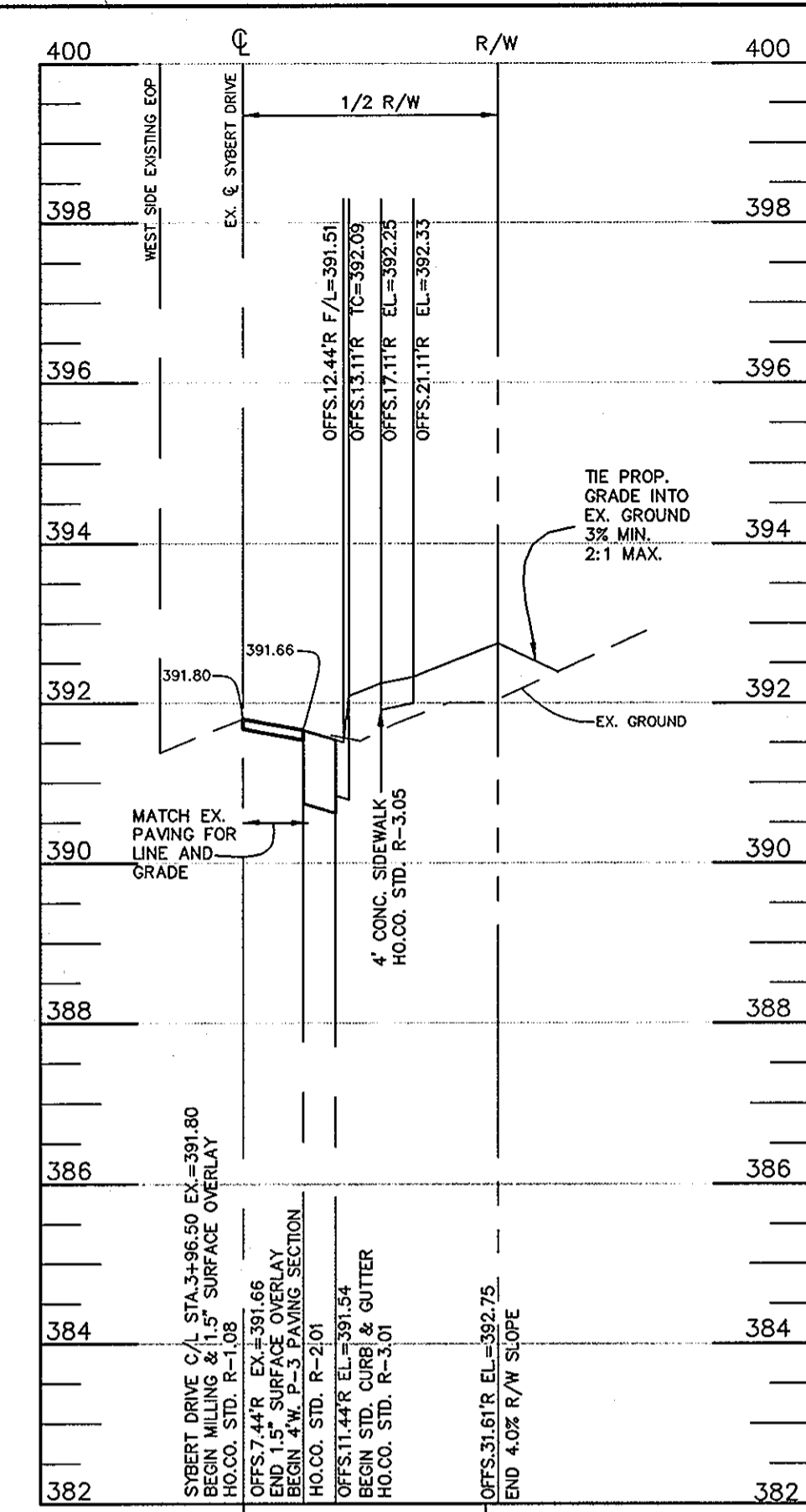
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@ X-SECTION 2**



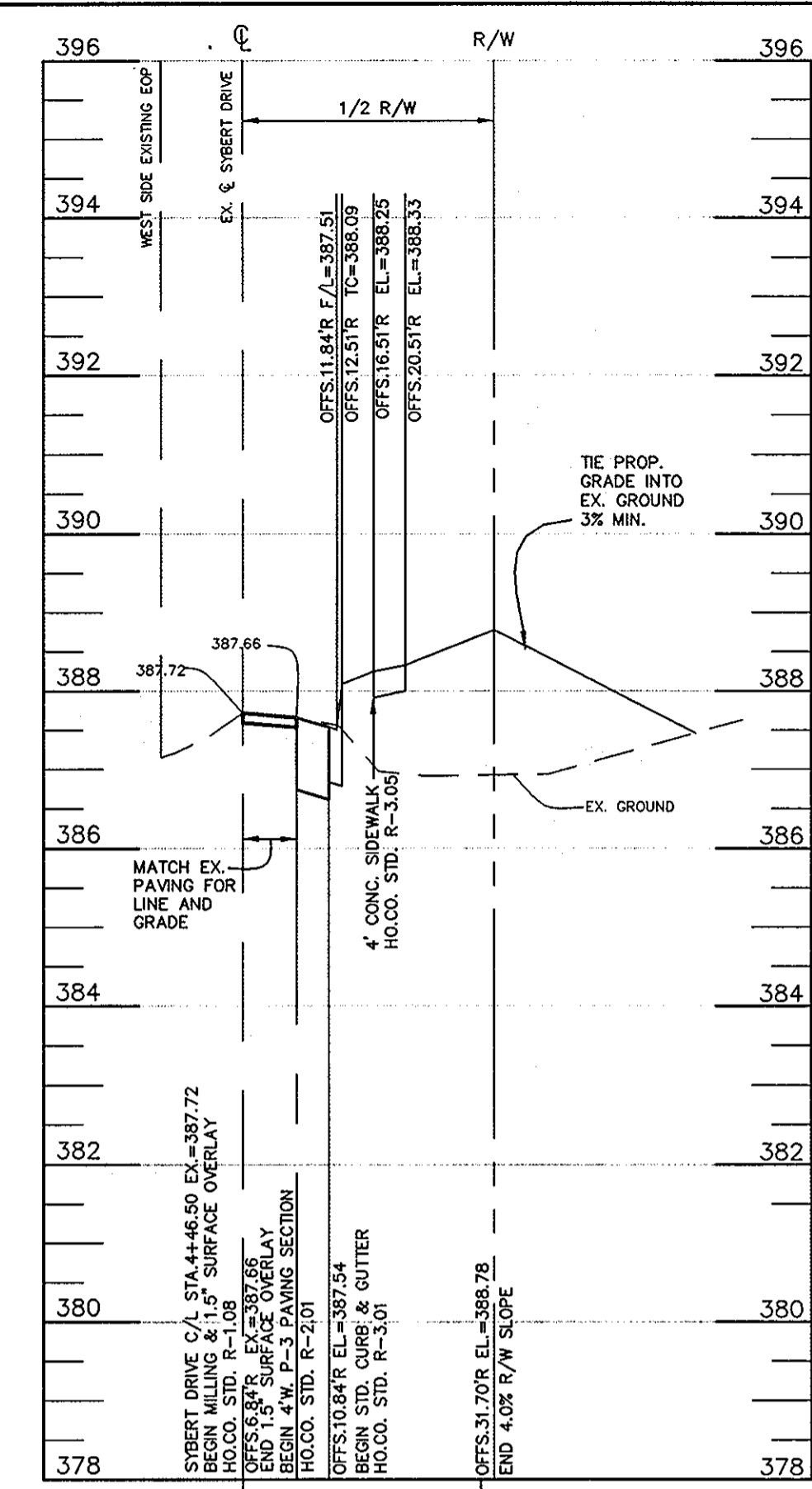
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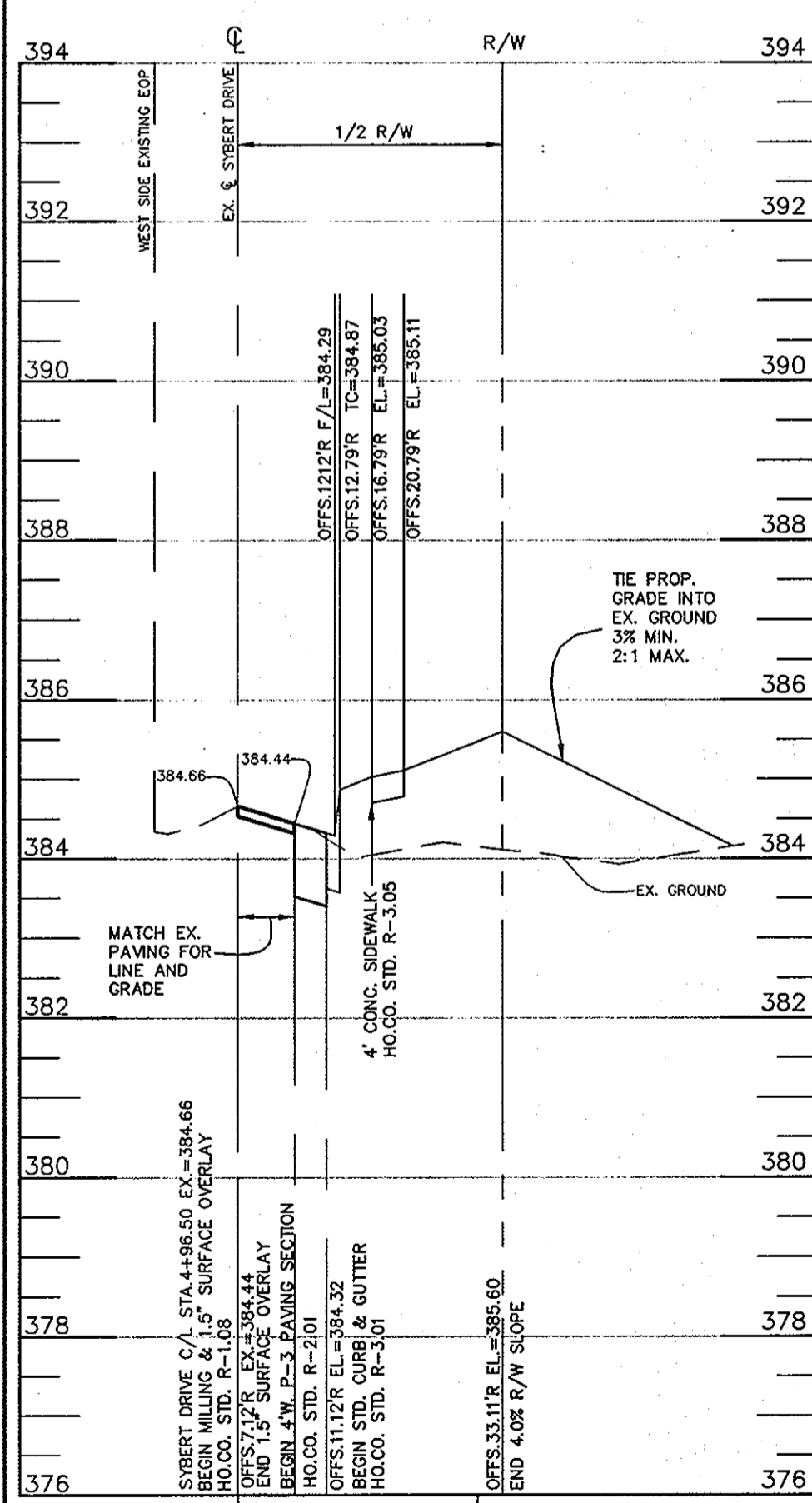
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@ X-SECTION 4**



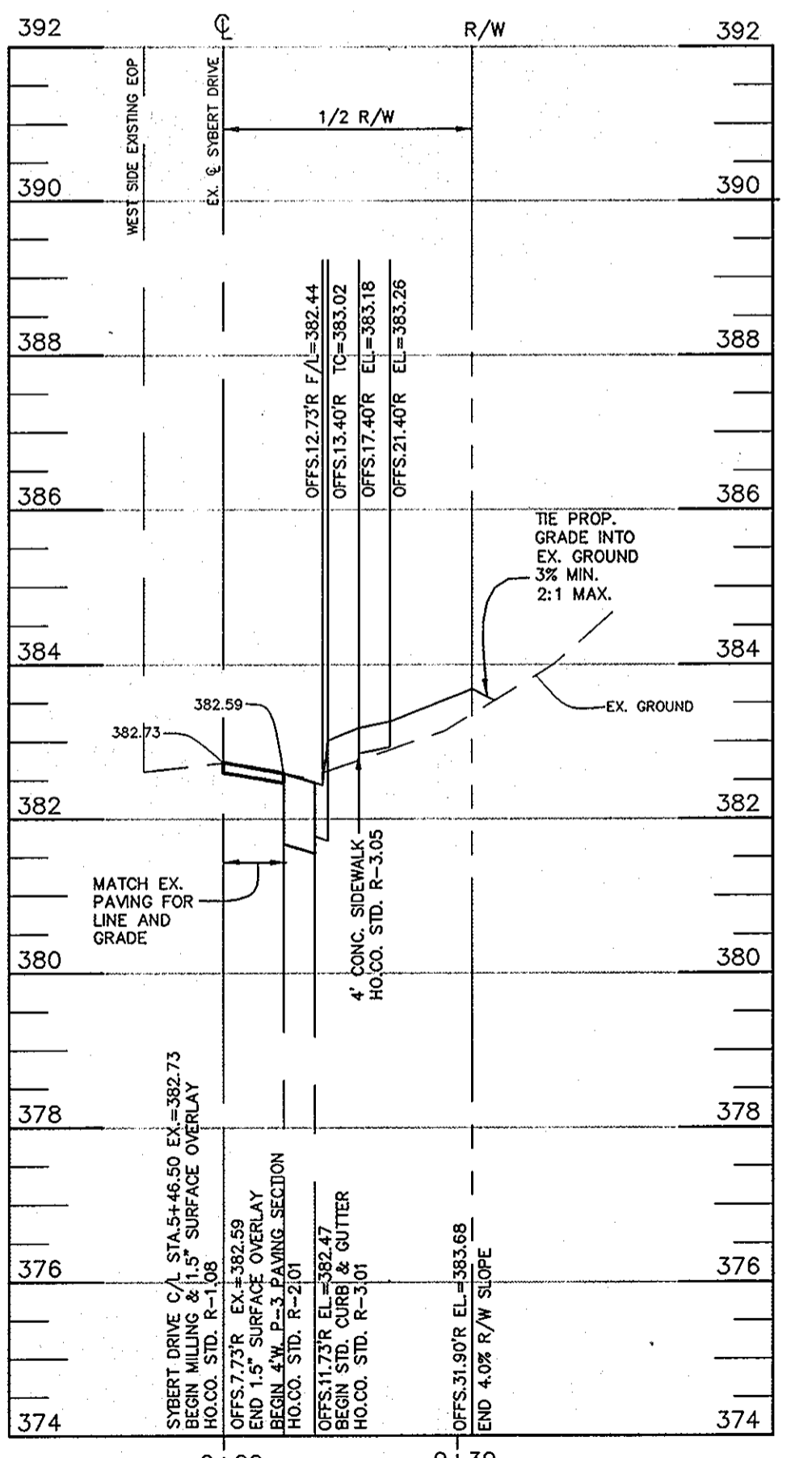
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@ X-SECTION 5**



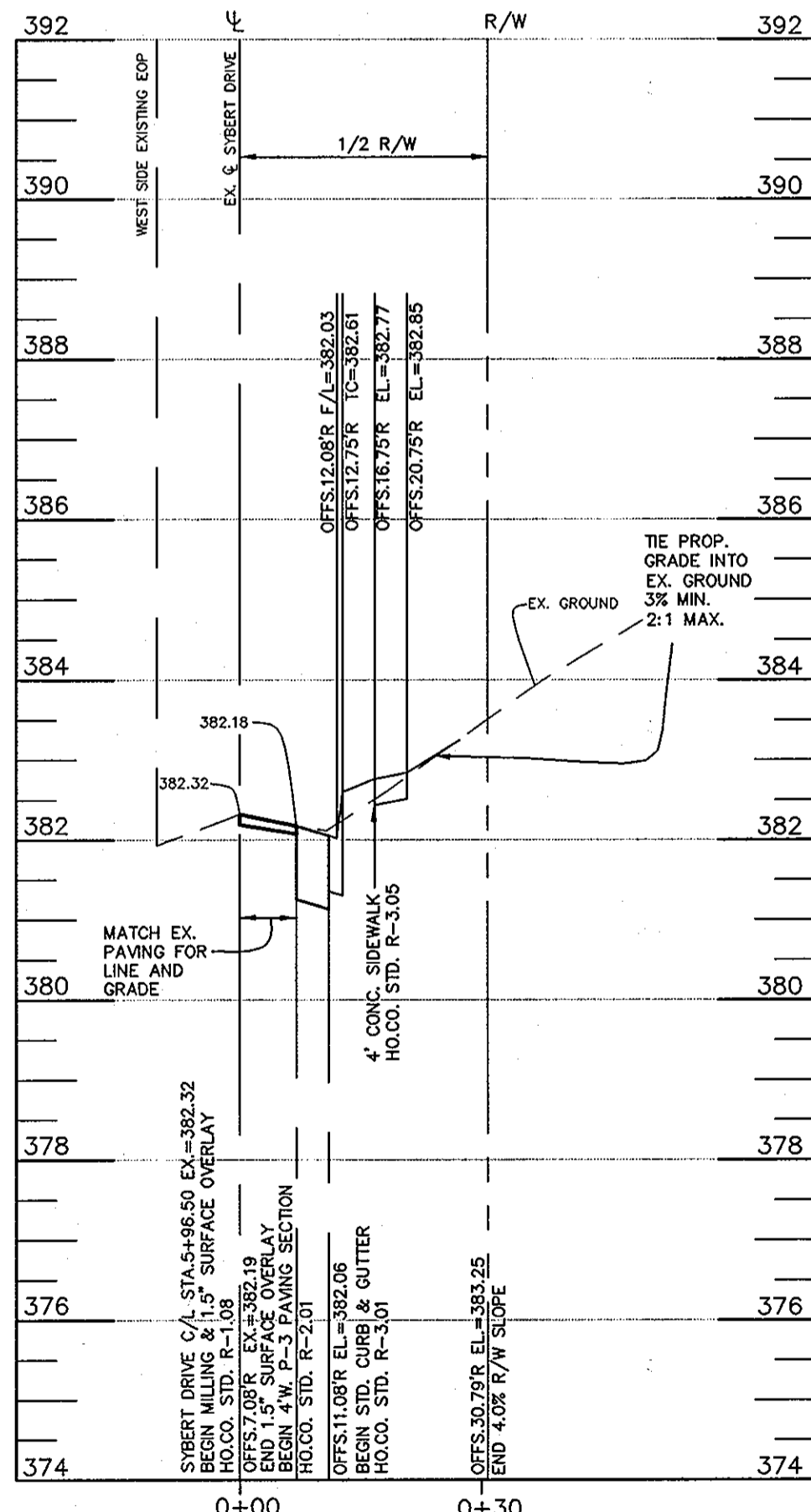
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@ X-SECTION 6**



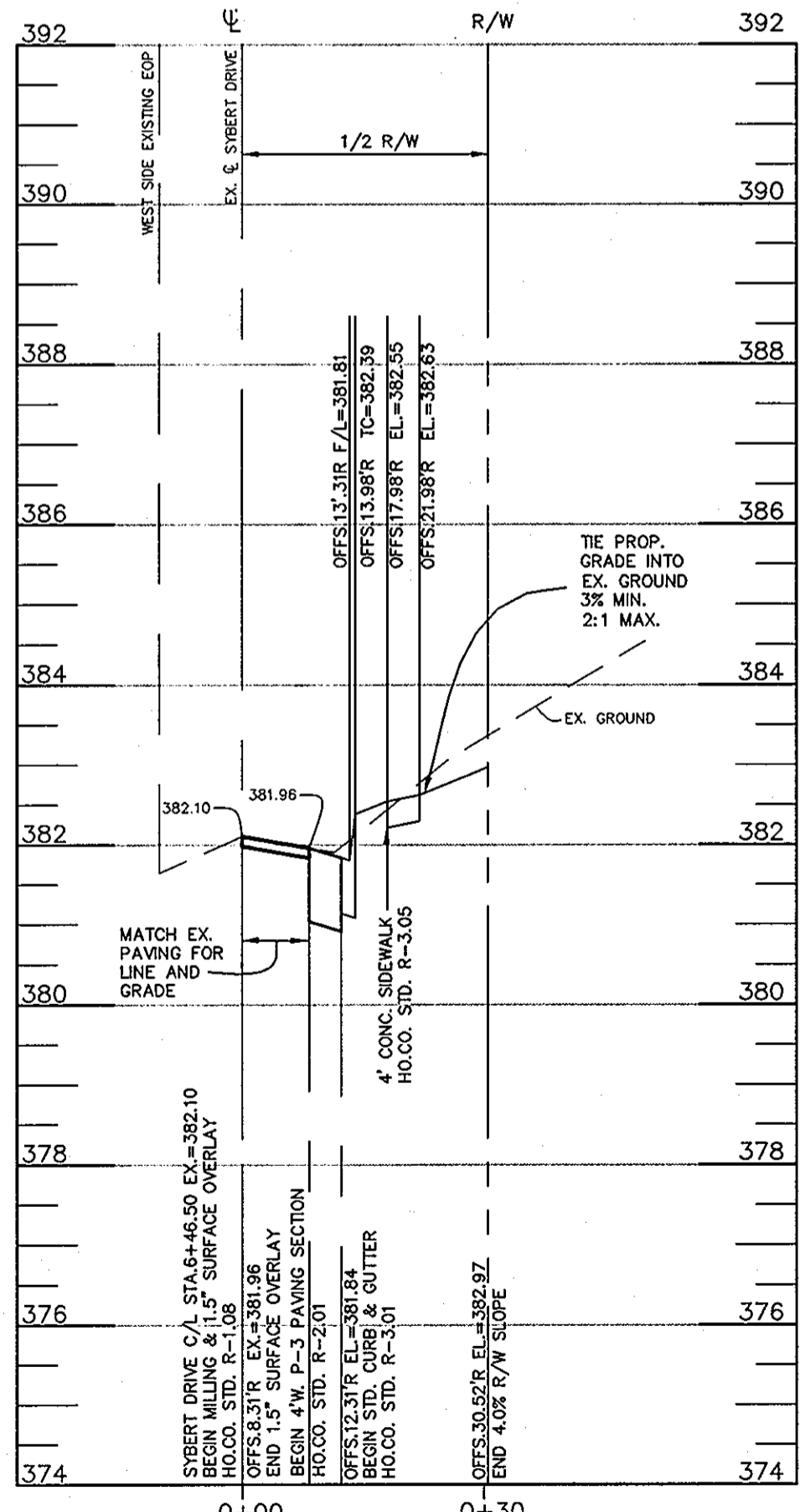
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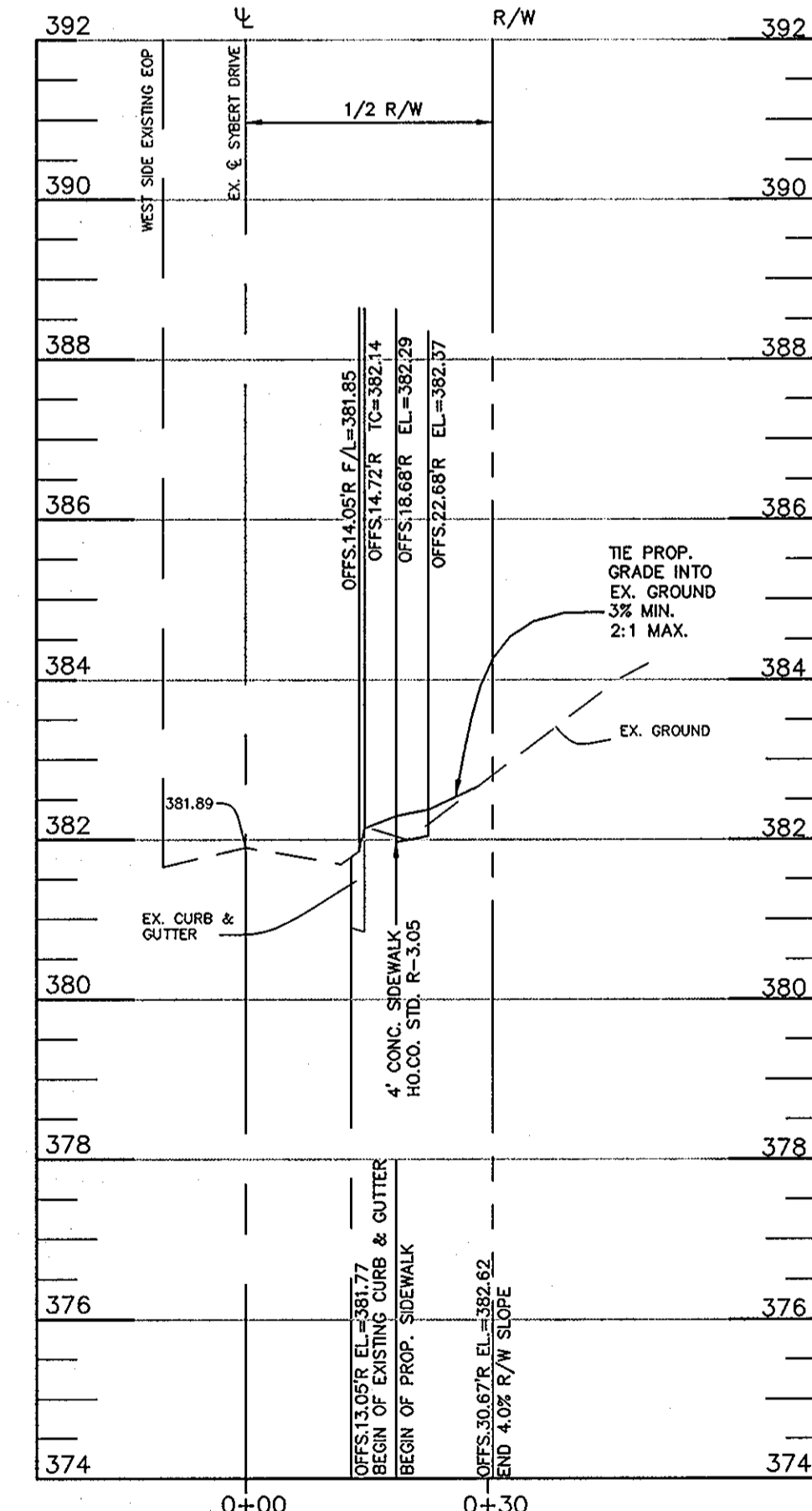
**SYBERT DRIVE @ STATION 5+46.5  
@ X-SECTION 8**



**SYBERT DRIVE @ STATION 5+96.5  
@ X-SECTION 9**



**SYBERT DRIVE @ STATION 6+46.5  
@ X-SECTION 10**



**SYBERT DRIVE @ STATION 6+96.5  
@ X-SECTION 11**

NOTE: FOR CROSS-SECTION LOCATIONS  
SEE PLAN VIEW ON SHEET NO. 12.

NOTE: TYPICAL ROADWAY SECTION FOR  
IMPROVEMENTS SEE SHEET NO. 12

NOTE: ROADWAY SECTIONS ARE  
LOOKING DOWN STATION.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter F. Ward* 2/19/09  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Cindy Harris* 2/25/09  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Chris Danner* 2/24/09  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

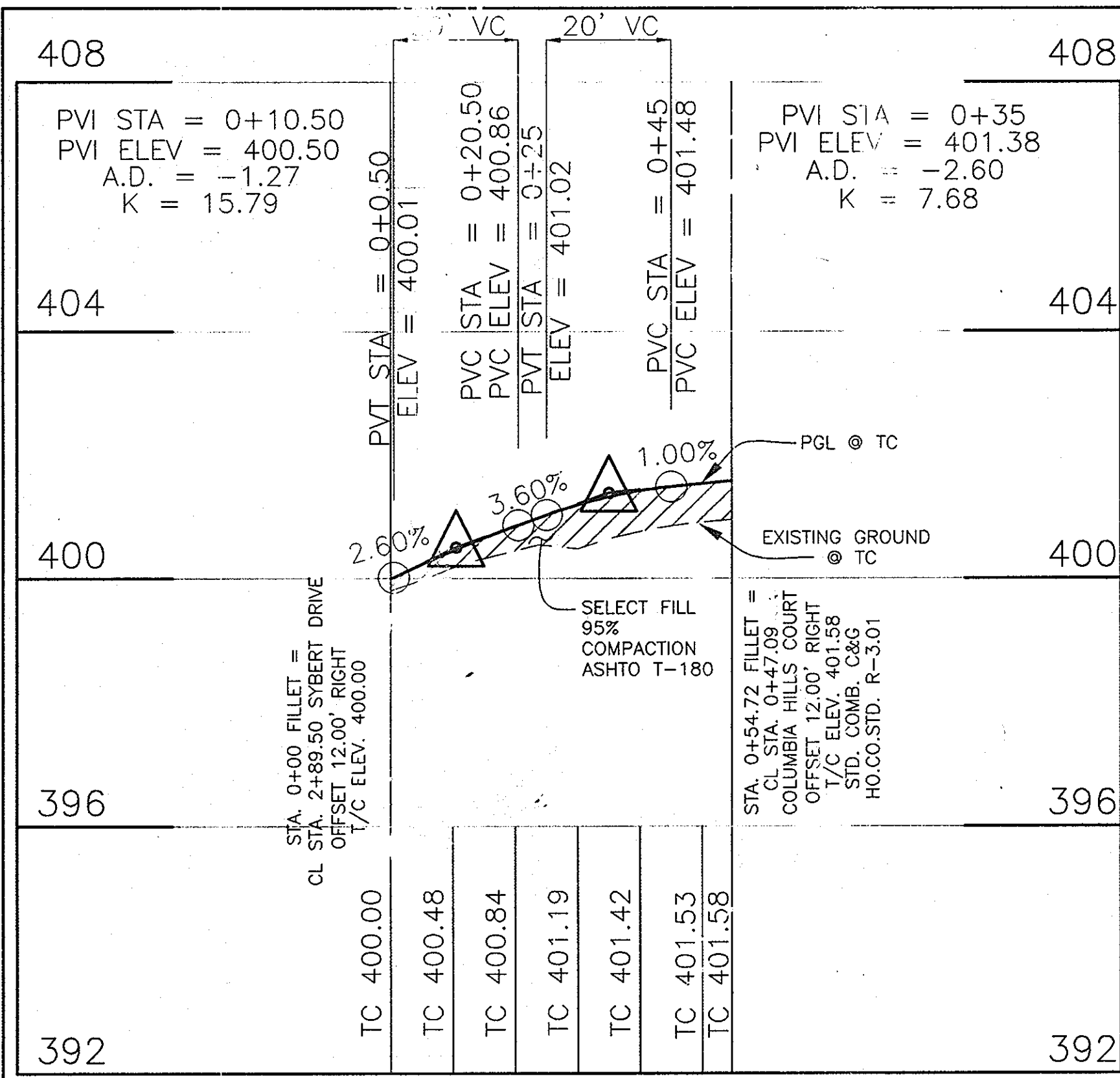
NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE A SUITE 418  
ELlicOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6844  
E-MAIL: be@benchmark-engineering.com

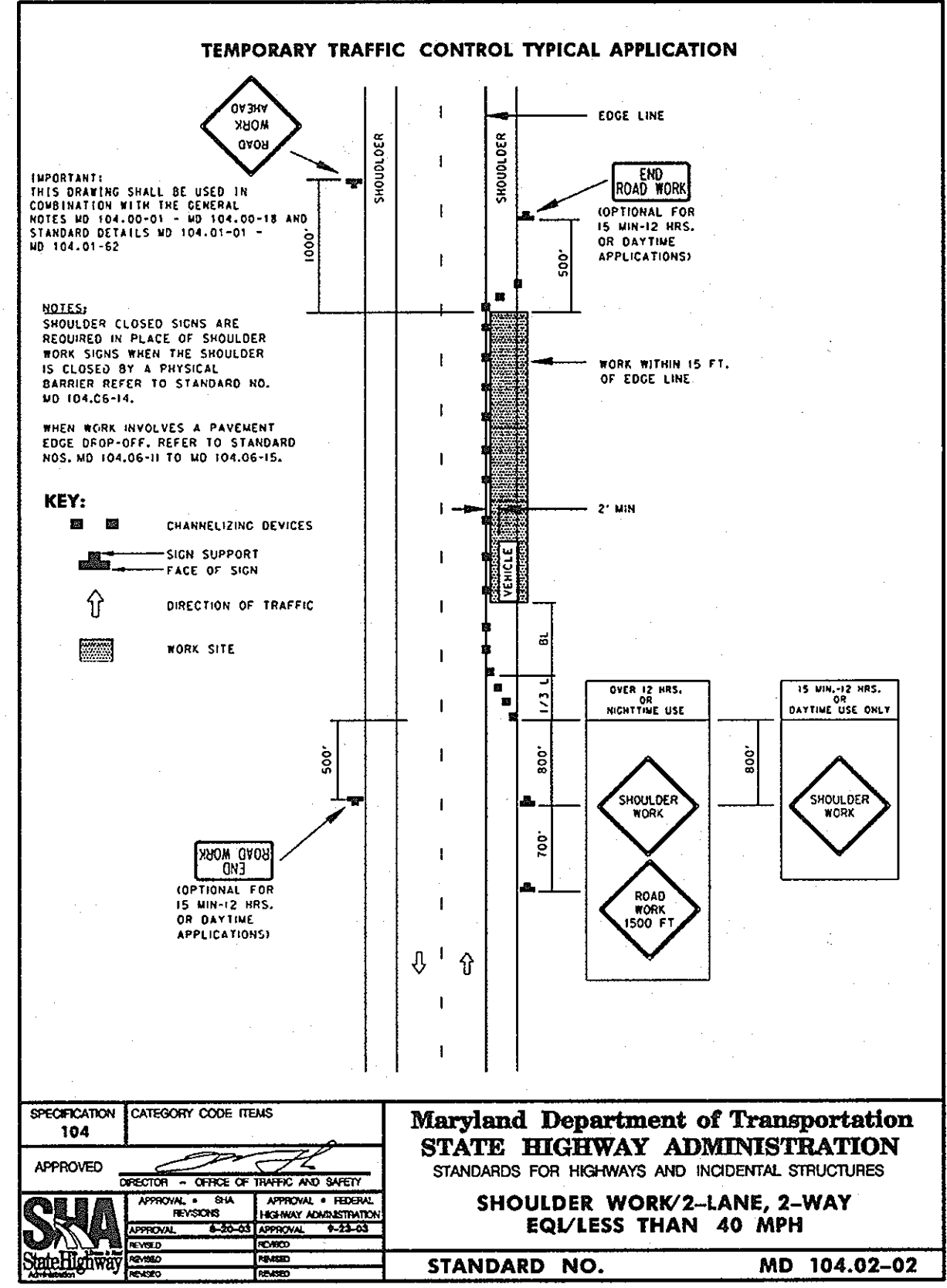
Professional Certification: I hereby certify that these documents were prepared by or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 28550, Expiration Date: 07-22-2009.

DEVELOPER/CONTRACT PURCHASER: COLUMBIA HILL LLC  
PROJECT: COLUMBIA HILLS SECTION 10  
LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 THRU 16  
LOCATION: TAX MAP 30 - GRID 05  
PARCEL 13 - ZONE: R-20  
2nd ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND  
TITLE: PUBLIC ROADWAY/IMPROVEMENTS  
SYBERT DRIVE CROSS SECTIONS  
AND DETAILS  
DATE: JUNE 2008  
FEBRUARY 2009 PROJECT NO. 1869  
SCALE: AS SHOWN DRAWING 11 OF 12

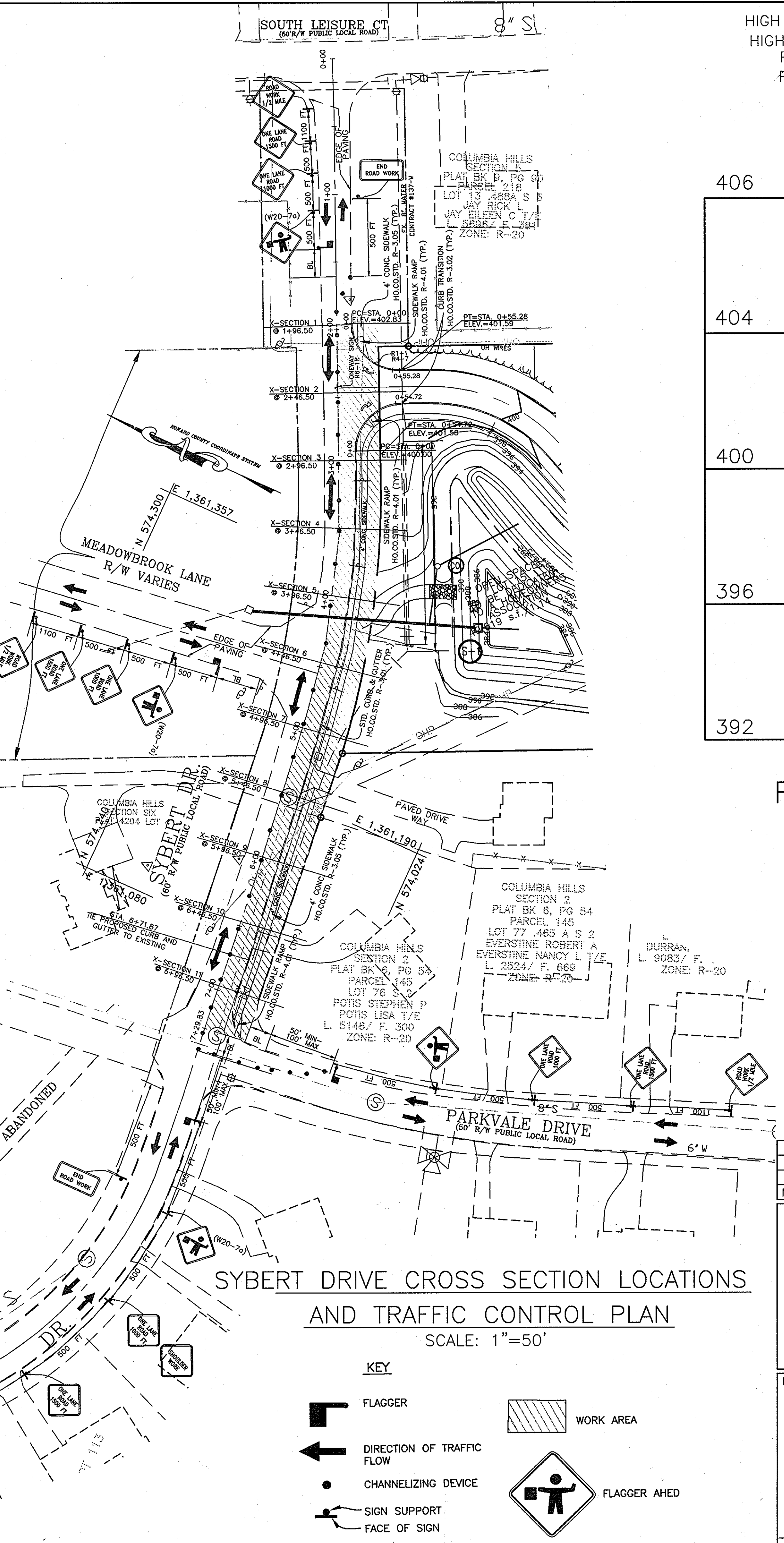
**SYBERT DRIVE CROSS SECTIONS**  
SCALE:  
1" = 2' VERTICAL  
1" = 20' HORIZONTAL



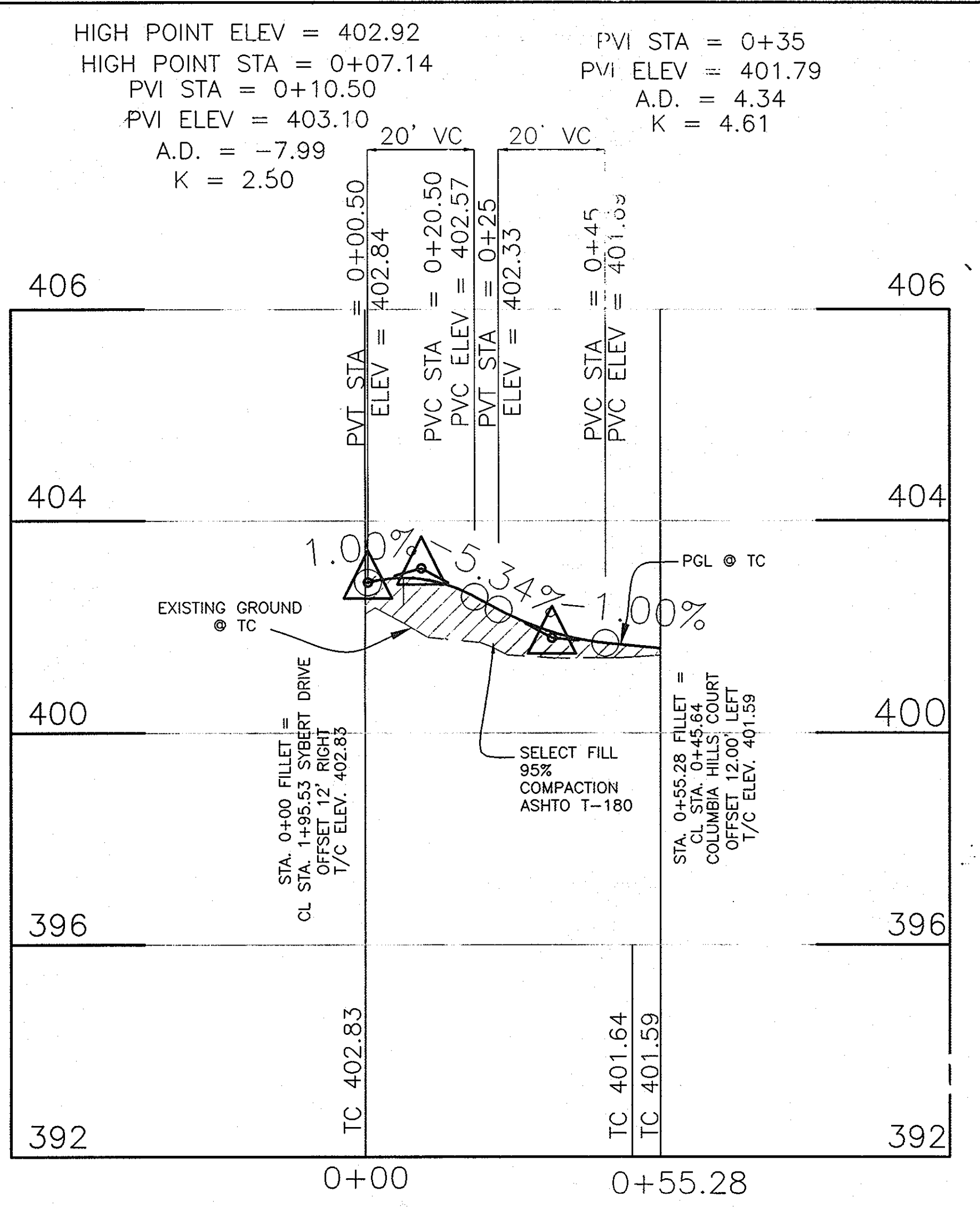
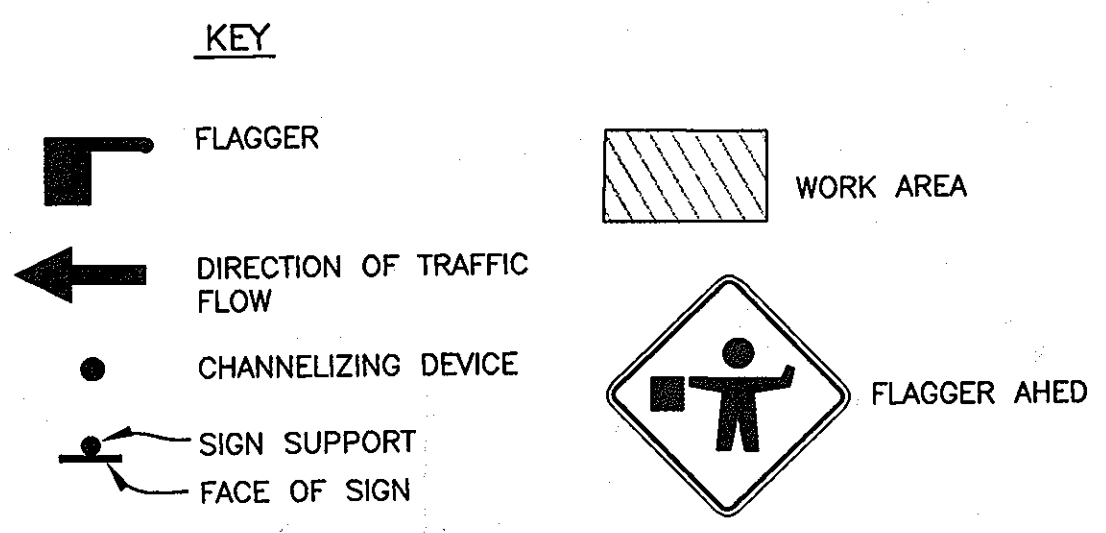
FILLET PROFILE - WEST CORNER  
COLUMBIA HILLS COURT  
SCALE: 1"=20' HORIZ., 1"=2' VERT.



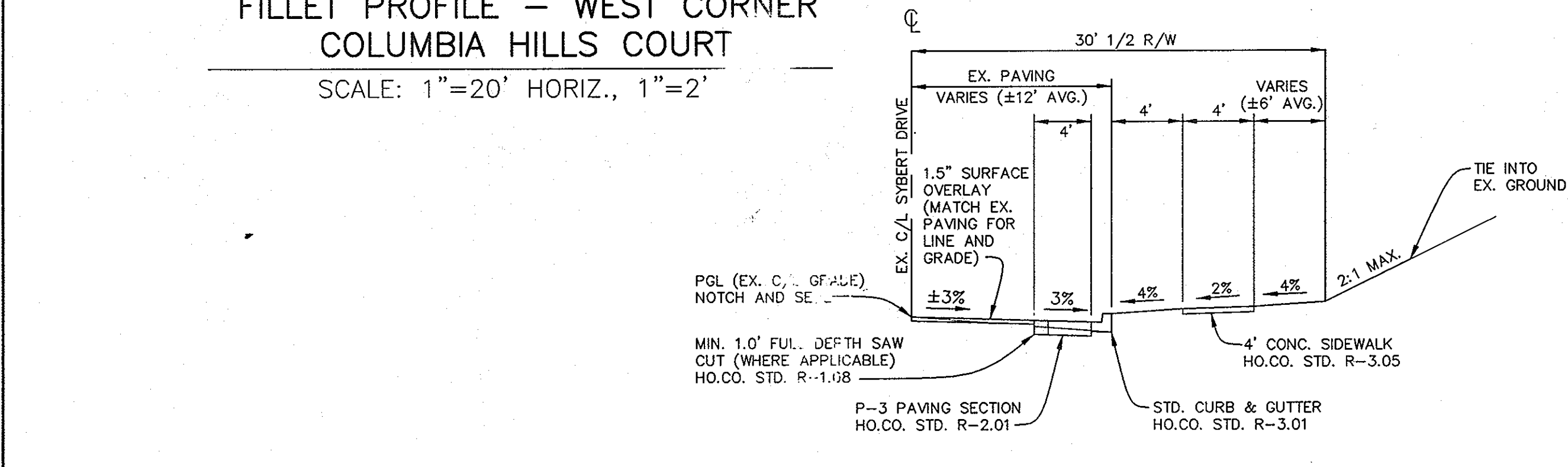
Maryland Department of Transportation  
STATE HIGHWAY ADMINISTRATION  
STANDARDS FOR HIGHWAYS AND INCIDENTAL STRUCTURES  
SHOULDER WORK/2-LANE, 2-WAY  
EQ/LESS THAN 40 MPH  
STANDARD NO. MD 104.02-02



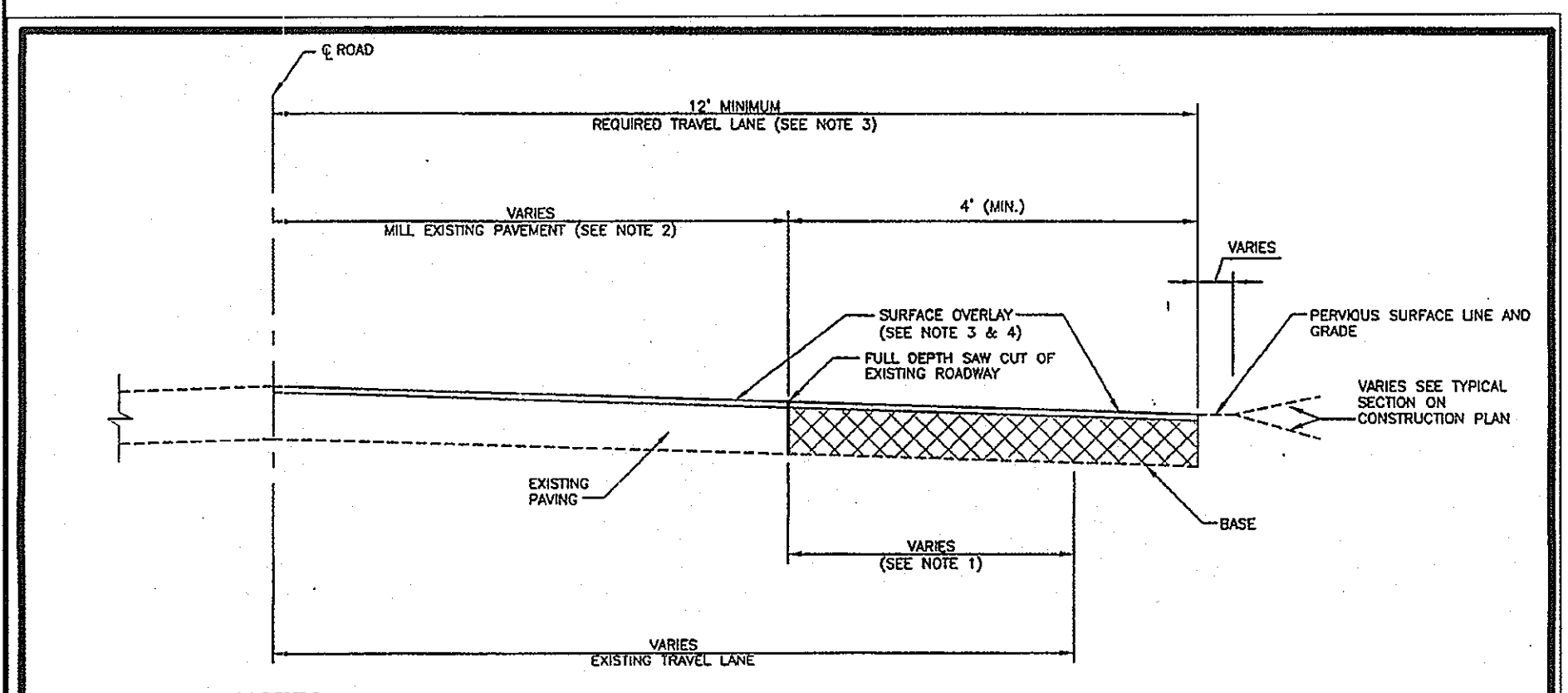
SYBERT DRIVE CROSS SECTION LOCATIONS  
AND TRAFFIC CONTROL PLAN  
SCALE: 1"=50'



FILLET PROFILE - EAST CORNER  
COLUMBIA HILLS COURT  
SCALE: 1"=20' HORIZ., 1"=2' VERT.



SYBERT DRIVE (HO.CO.)  
PUBLIC LOCAL ROAD - 60' R/W  
POSTED SPEED: 30 MPH  
FROM EX. STA. 1+96.50  
TO EX. STA. 7+29.66 @ EX. CURB & GUTTER  
NOTE: THIS DETAIL CONFORMS TO HO.CO. STD. R-1.08  
TYPICAL SECTION - PAVEMENT WIDENING  
NOT TO SCALE



EXISTING ROADWAY WIDENING STRIP  
DETAIL R-1.08

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS  
*Walter Z. ...* 2-19-09  
CHIEF, BUREAU OF HIGHWAYS  
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
*Cindy ...* 2/25/09  
CHIEF, DIVISION OF LAND DEVELOPMENT  
*...* 2/24/09  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-8105 FAX: 410-465-6644  
E-MAIL: bel@bei-civilengineering.com

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. 28559, Expiration Date: 07-22-2009.

DEVELOPER/CONTRACT PURCHASER: COLUMBIA HILL LLC P.O. BOX 417 ELLCOTT CITY, MARYLAND 21041 PHONE: (410) 465 - 4244	PROJECT: COLUMBIA HILLS SECTION 10 LOTS 1 THRU 13 AND OPEN SPACE LOTS 14 thru 16 LOCATION: TAX MAP 30 - GRID 05 PARCEL 13 - ZONE: R-20 2nd ELECTION DISTRICT HOWARD COUNTY, MARYLAND TITLE: PUBLIC ROADWAY IMPROVEMENTS CROSS SECTIONS, FILLET PROFILES AND TRAFFIC CONTROL PLAN DATE: JUNE-2008 FEBRUARY, 2009 PROJECT NO. 1869 SCALE: AS SHOWN DRAWING 12 OF 12
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Des: HP Draft: HP Check: BFC