

**LEGEND**

EXISTING CONTOUR	---
PROPOSED CONTOUR	---
EXISTING SPOT ELEVATION	x382.56
PROPOSED SPOT ELEVATION	+82.53
DIRECTION OF FLOW	→
LIGHT POLES	⊙
SOIL TYPE	M1B2 MTD3
ADJACENT PROPERTY LINE	---
SITE BOUNDARY	---
RIGHT-OF-WAY LINE	---
EXISTING CURB & GUTTER	---
PROPOSED CURB & GUTTER	---
EXISTING 20" SEWER AND UTILITY EASEMENT PLAT# 8796	---
PROPOSED 20" PUBLIC WATER AND UTILITY EASEMENT PLAT# 22360	---
EXISTING INGRESS AND EGRESS EASEMENT (PLAT#8796)	---
EXISTING 20" PUBLIC RIGHT-OF-WAY (L 548/ F 510)	---
PROPOSED PAVING OVERLAY	---
PROPOSED 20" PUBLIC WATER AND UTILITY EASEMENT PLAT# 22360	---
EXISTING PARKING EASEMENT (L 5592/ F 503) (L 11508/ F 384)	---
EXISTING UTILITY POLE	⊙
EXISTING LIGHT POLE	⊙
EXISTING MAILBOX	⊙
EXISTING SIGN	⊙
EXISTING SANITARY MANHOLE	⊙
EXISTING SANITARY LINE	---
EXISTING CLEANOUT	⊙
EXISTING FIRE HYDRANT	⊙
EXISTING WATER LINE	---
EXISTING FENCE	---
EXISTING STREAM	---
EXISTING STREAM BUFFER	---
EXISTING TREES (FIELD LOCATED)	⊙
EXISTING TREELINE (FIELD LOCATED)	---
PROPOSED TREELINE	---
PROPOSED SIDEWALK	---
PROPOSED STORM DRAIN	---
PROPOSED STORM DRAIN INLET	---
PROPOSED CROSS WALK	---

COLUMBIA LAND LLC  
C/O SIENA CORPORATION  
TM: 42  
PARCEL: 31  
LOT: PAR A2  
PLAT# 14757  
L. 6077 / F. 451  
ZONED: M-1  
USE: INDUSTRIAL

REALTY ASSOCIATE FUND VI LP  
C/O ASSOCIATES REALTY  
TM: 42  
PARCEL: 319  
LOT: PAR B  
PLAT: #8795  
L. 7997 / F. 382  
USE: INDUSTRIAL

TSC/JMJ SNOWDEN RIVER SOUTH LLC, A MD LLC  
TM: 42  
PARCEL: 319  
LOT: PAR C  
PLAT: #8795  
L. 10008 / F. 485  
USE: INDUSTRIAL

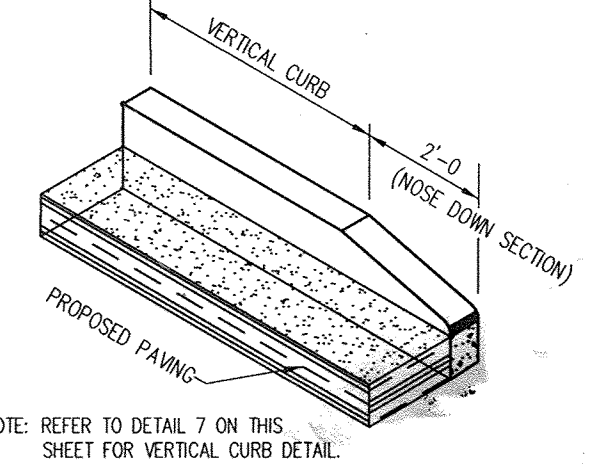
MATCHLINE - SEE SHEET 3

**STREET LIGHT LOCATION CHART**

STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE
SNOWDEN RIVER PARKWAY	13+75	33' RIGHT	250-WAIT HPS VAPOR CORBRA FIXTURE (CUT OFF) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING A 12' ARM
SNOWDEN RIVER PARKWAY	15+00	33' RIGHT	
SNOWDEN RIVER PARKWAY	16+25	33' RIGHT	

NOTE: THE LOCATION OF ALL NEW PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SHALL BE APPROVED BY HOWARD COUNTY TRAFFIC (410-313-5752) PRIOR TO ANY INSTALLATIONS

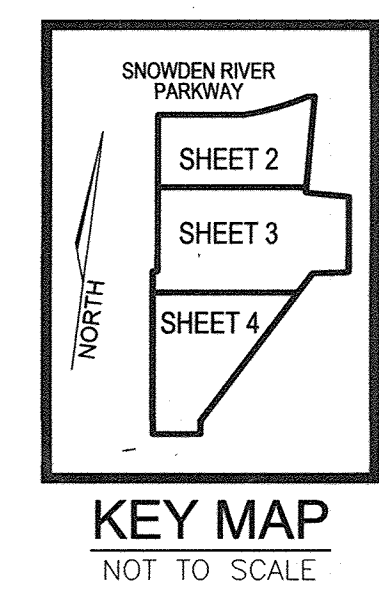
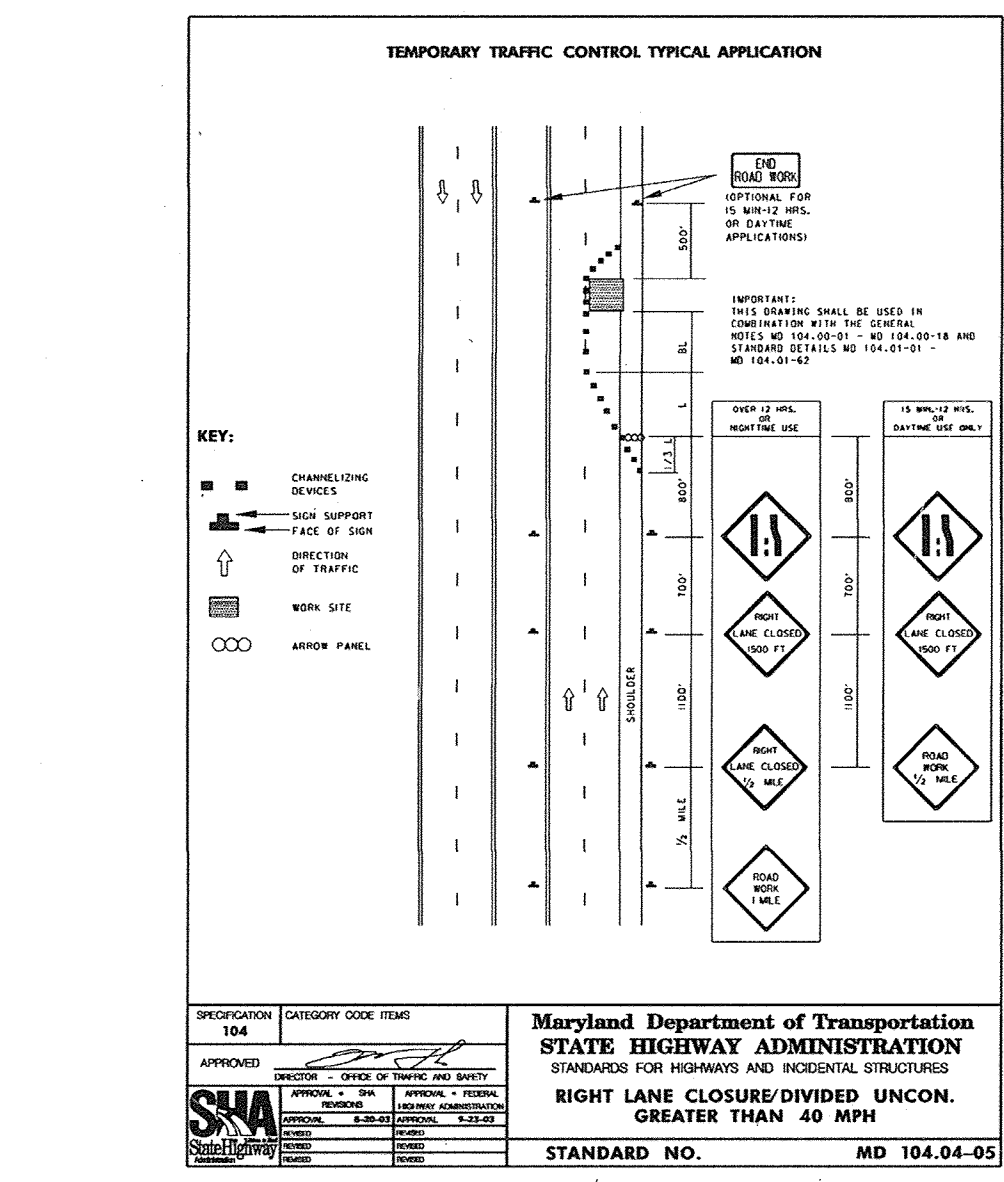
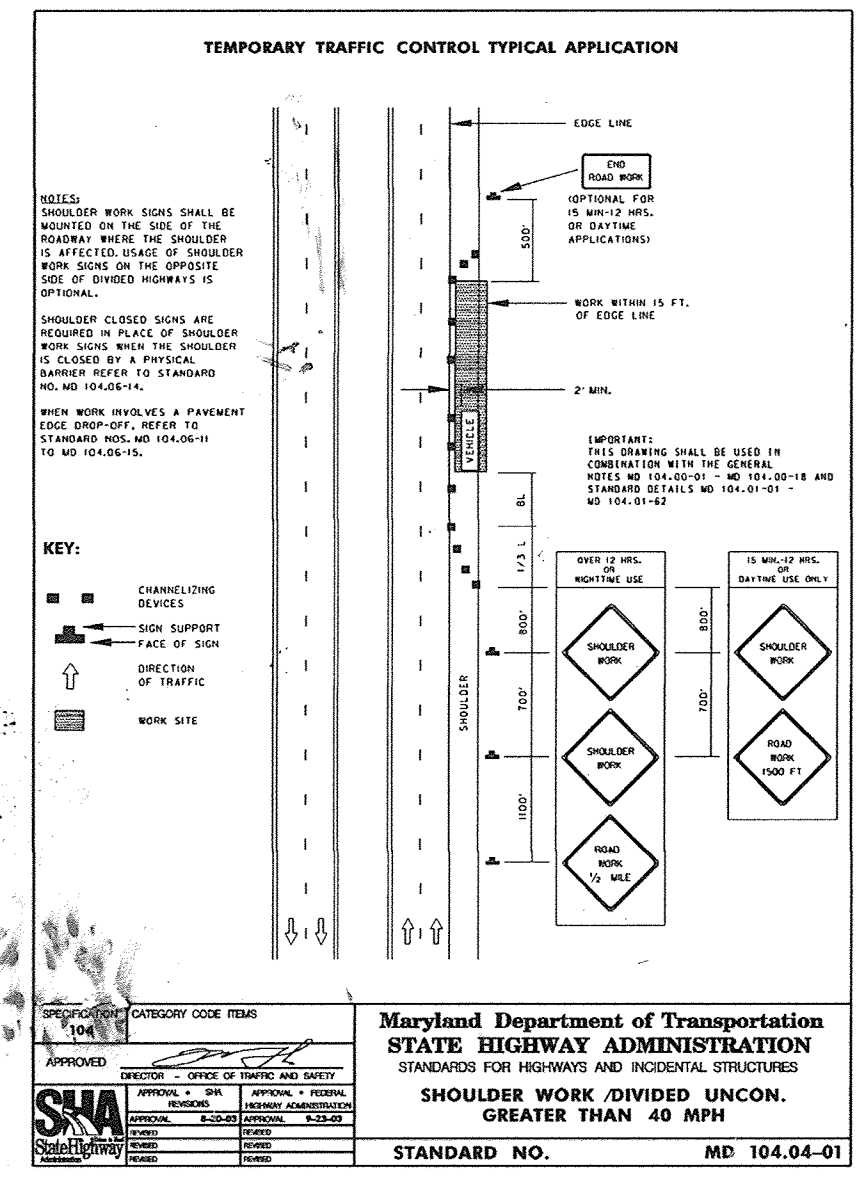
NOTE: THE LOCATION OF ALL NEW PAVEMENT MARKINGS AND TRAFFIC CONTROL SIGNS SHALL BE APPROVED BY HOWARD COUNTY TRAFFIC (410-313-5752) PRIOR TO ANY INSTALLATIONS



APPROVED  
PLANNING BOARD  
OF HOWARD COUNTY  
DATE: APRIL 15, 2010

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

4/2/10 DATE  
4/2/10 DATE  
5/2/10 DATE



AS-BUILT CERTIFICATION FOR PSWM

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND CONFORMS WITH THE APPROVED PLANS AND SPECIFICATIONS. I DECLARE UNDER PENALTY OF PERJURY THAT THE CONTRIBUTING DRAINAGE AREA IS SUBSTANTIALLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

NAME: [Signature] P.E.# 16193 DATE: 6-18-19

SECTION NUMBER	ROAD AND STREET CLASSIFICATION	CALIFORNIA BEARING RATIO (CBR)	PAVEMENT MATERIAL (INCHES)					
			3 TO 4.5 TO 4.7	4.5 TO 4.7	4.7	3 TO 4.5 TO 4.7	4.5 TO 4.7	4.7
P-1	PARKING LANE: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 2 HEAVY TRUCKS PER DAY	19.0 MM PG 84-22, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
			2.0	2.0	2.0	2.0	2.0	2.0
P-2	PARKING DRIVE ALLEYS: RESIDENTIAL AND NON-RESIDENTIAL WITH NO MORE THAN 2 HEAVY TRUCKS PER DAY	19.0 MM PG 84-22, LEVEL 1 (ESAL)	1.5	1.5	1.5	1.5	1.5	1.5
			2.0	2.0	2.0	2.0	2.0	2.0
P-3	LOCAL ROAD: ACCESS PLACE, ACCESS STREET	19.0 MM PG 84-22, LEVEL 1 (ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
			2.0	2.0	2.0	2.0	2.0	2.0
P-4	MINOR COLLECTOR: NON-RESIDENTIAL	19.0 MM PG 84-22, LEVEL 2 (LOW ESAL)	2.0	2.0	2.0	2.0	2.0	2.0
			2.0	2.0	2.0	2.0	2.0	2.0

OWNER/DEVELOPER  
TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
8600 SNOWDEN RIVER PKWY, SUITE 207  
COLUMBIA, MD 21045  
410-953-0222

NO.	REVISION	DATE
6	MODIFY HANDICAP RAMPS, CURBS, AND SIDEWALK AT THE INTERSECTION OF ACCESS ROAD AND SNOWDEN RIVER PARKWAY	6/14/10
1	REVISE STORMFILTERS TO BANFILTERS, INCORPORATE ARCHITECTURAL BRICKS TO THE BUILDINGS, REVISE WIRE AND RAIN WATER MAIN MATERIAL FROM DIP TO C800 PVC, REVISE PARKING AT BLDG. 3	02-12-14

**SITE DEVELOPMENT PLAN**  
**SITE LAYOUT**

MIDWAY BUSINESS CENTER  
SNOWDEN RIVER SOUTH  
SECTION 1, AREA 1  
INDUSTRIAL / FLEX SPACE  
(PLAT 8795, L. 10008/F. 485)

TAX MAP 42 GRID 10  
6TH ELECTION DISTRICT

PARCEL 319, PARCEL C  
HOWARD COUNTY, MARYLAND

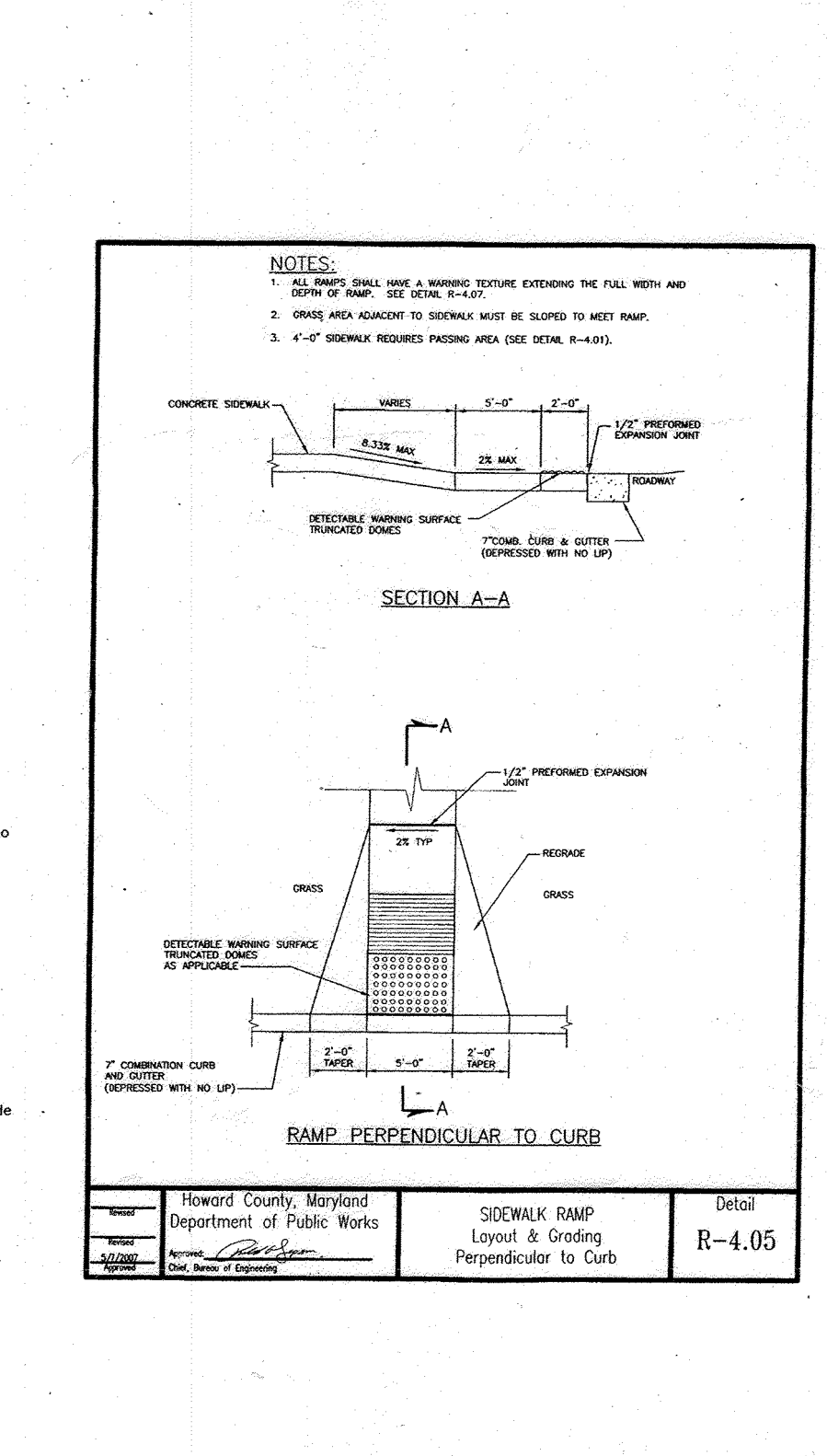
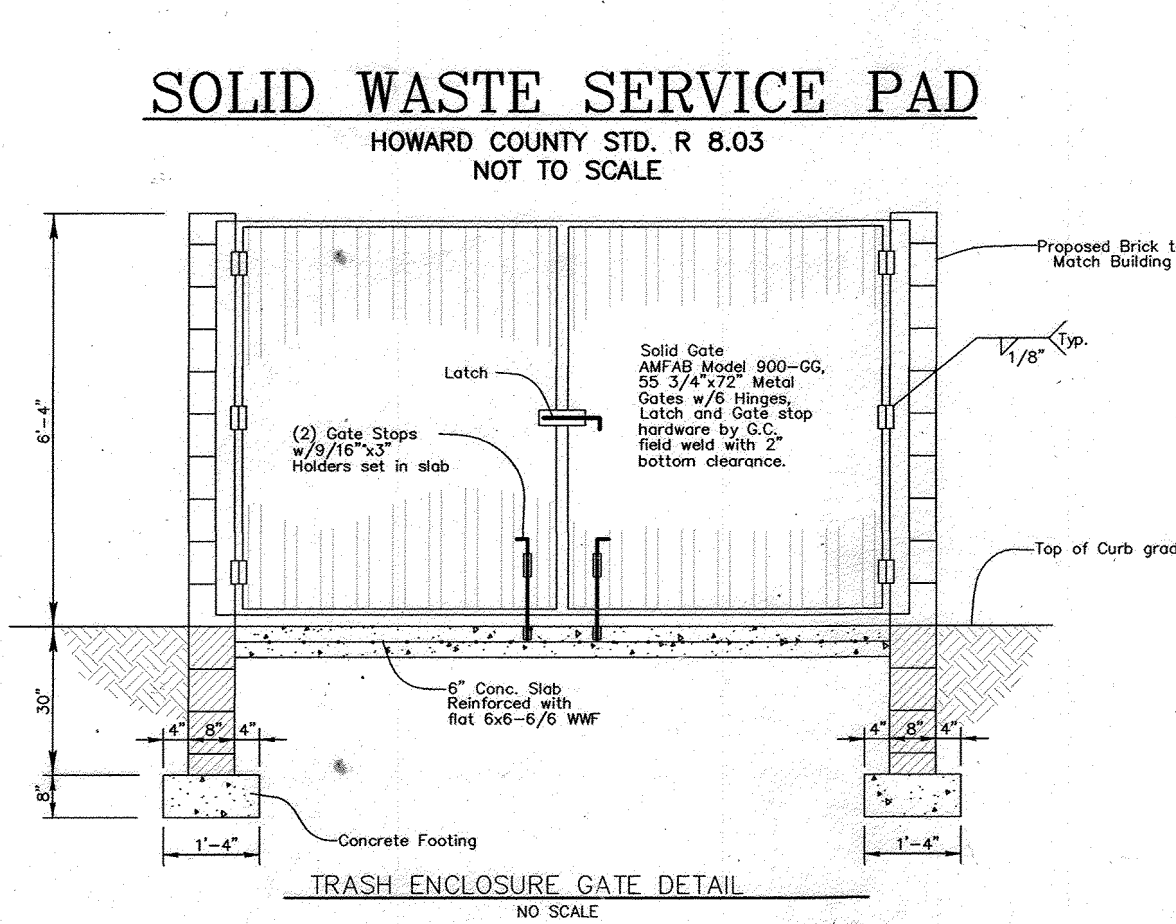
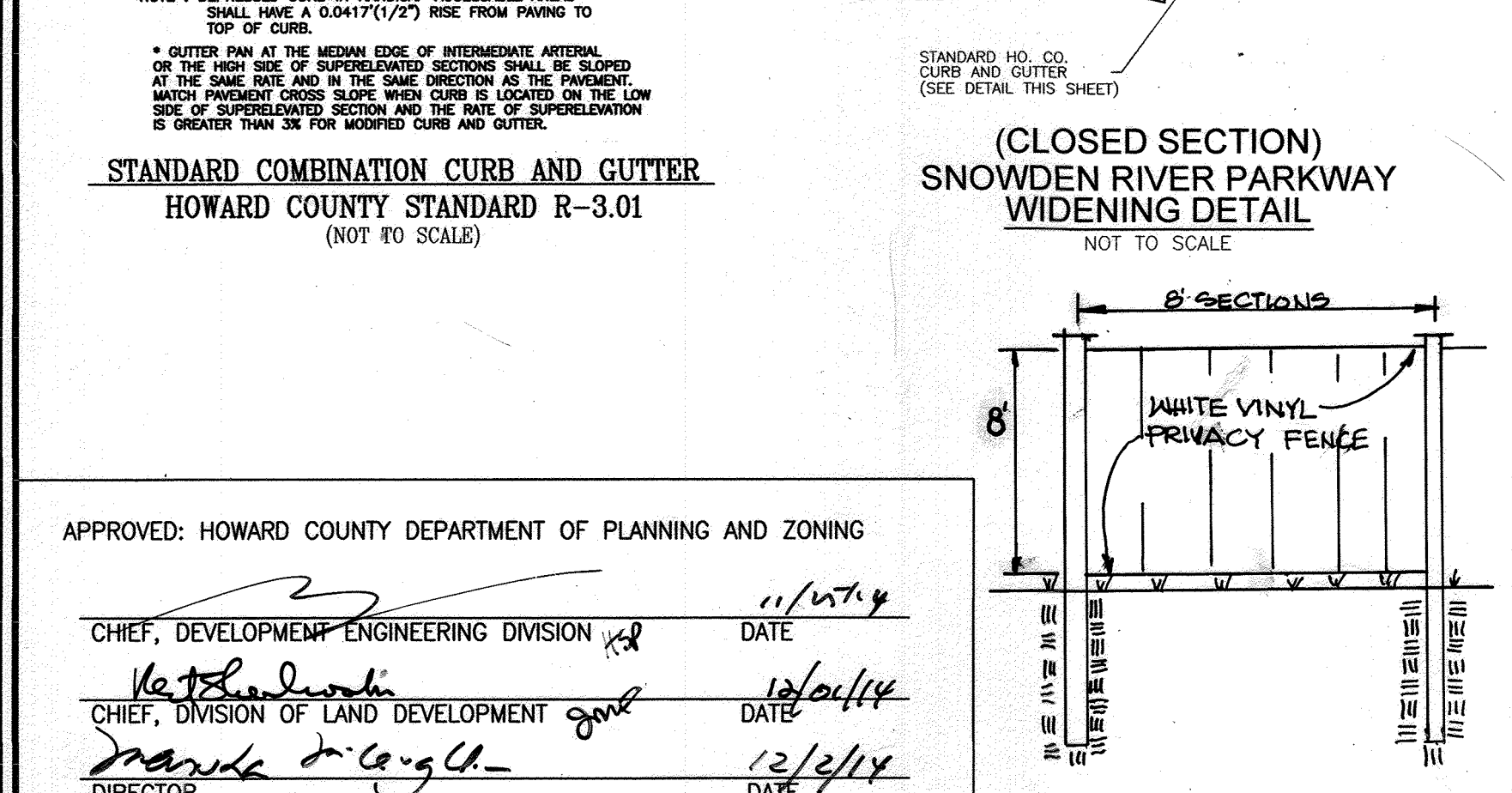
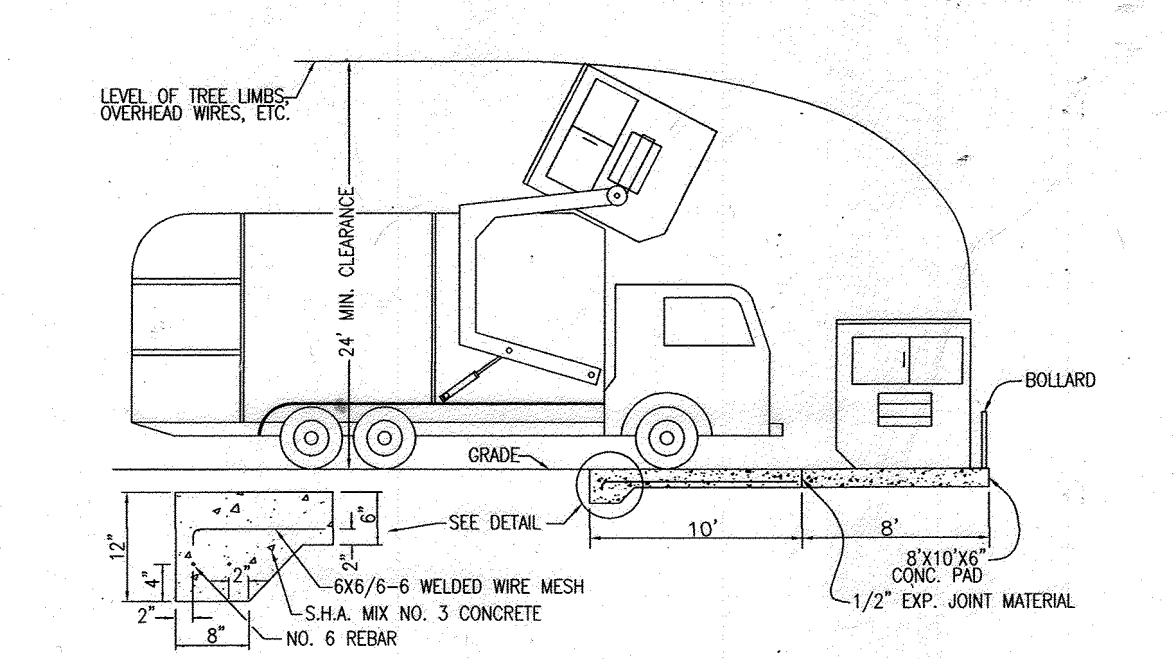
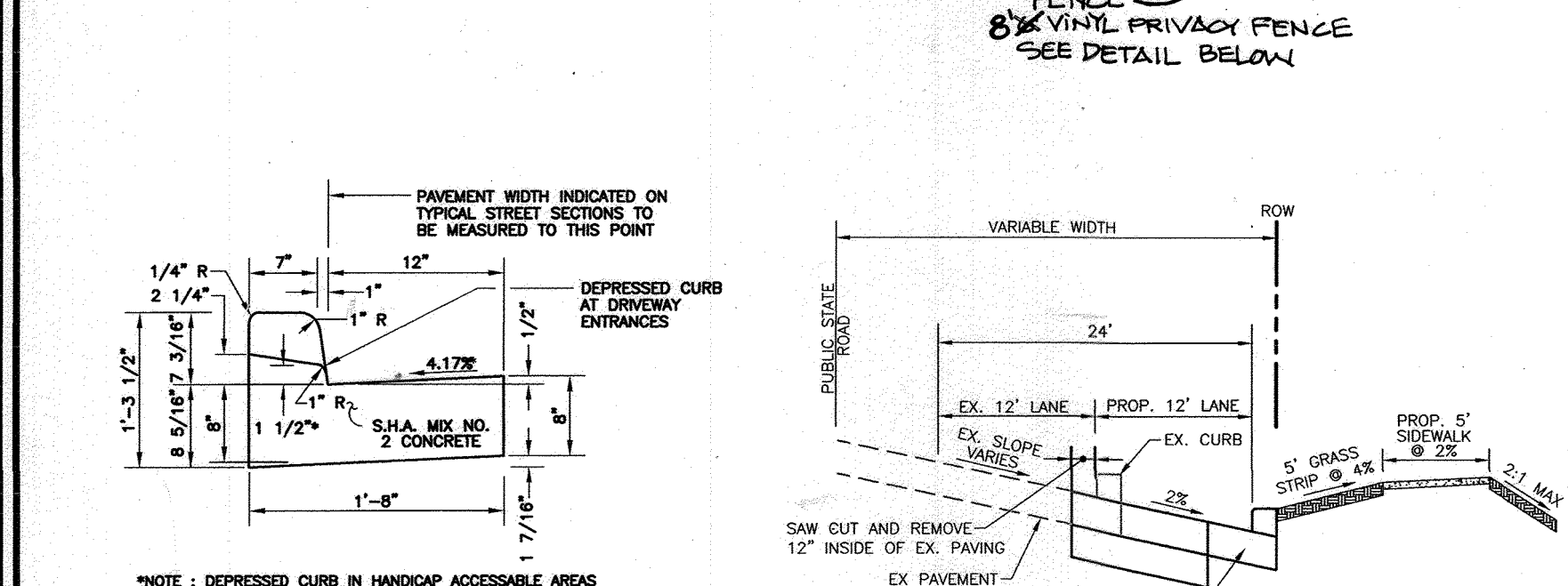
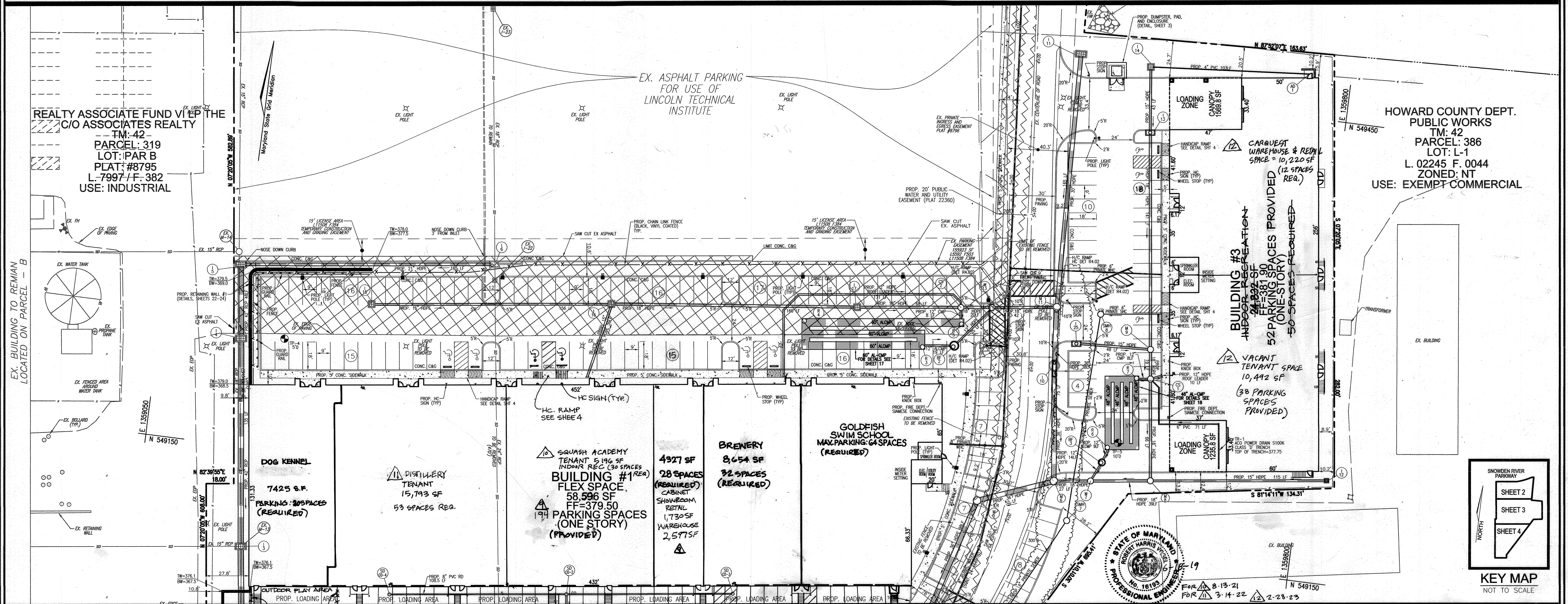
**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET  
ELICOTT CITY, MD 21043  
TEL: 410.461.7666  
FAX: 410.461.8961

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHV  
DATE: MARCH 2013  
SCALE: 1"=30'  
W.O. NO.: 05-03

PROFESSIONAL CERTIFICATE  
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. 16193 EXPIRATION DATE 08-27-2014

2 SHEET OF 24





LEGEND

SYMBOL	DESCRIPTION
(Symbol)	EXISTING CONTOUR
(Symbol)	PROPOSED CONTOUR
(Symbol)	EXISTING SPOT ELEVATION
(Symbol)	PROPOSED SPOT ELEVATION
(Symbol)	DIRECTION OF FLOW
(Symbol)	LIGHT POLES
(Symbol)	SOIL TYPE
(Symbol)	ADJACENT PROPERTY LINE
(Symbol)	SITE BOUNDARY
(Symbol)	RIGHT-OF-WAY LINE
(Symbol)	EXISTING CURB & GUTTER
(Symbol)	PROPOSED CURB & GUTTER
(Symbol)	EXISTING 20' PUBLIC SEWER AND UTILITY EASEMENT
(Symbol)	PROPOSED 20' PUBLIC SEWER AND UTILITY EASEMENT
(Symbol)	EXISTING INGRESS AND EGRESS EASEMENT
(Symbol)	EXISTING 20' PUBLIC RIGHT-OF-WAY
(Symbol)	PROPOSED PAVING OVERLAY
(Symbol)	PROPOSED 20' PUBLIC WATER AND UTILITY EASEMENT
(Symbol)	EXISTING PARKING EASEMENT
(Symbol)	EXISTING LIGHT POLE
(Symbol)	EXISTING MAILBOX
(Symbol)	EXISTING SIGN
(Symbol)	EXISTING SANITARY MANHOLE
(Symbol)	EXISTING SANITARY LINE
(Symbol)	EXISTING CLEANOUT
(Symbol)	EXISTING FIRE HYDRANT
(Symbol)	EXISTING WATER LINE
(Symbol)	EXISTING FENCE
(Symbol)	EXISTING STREAM
(Symbol)	EXISTING STREAM BUFFER
(Symbol)	EXISTING TREES (FIELD LOCATED)
(Symbol)	EXISTING TREELINE (FIELD LOCATED)
(Symbol)	PROPOSED TREELINE
(Symbol)	PROPOSED SIDEWALK
(Symbol)	PROPOSED STORM DRAIN
(Symbol)	PROPOSED STORM DRAIN INLET
(Symbol)	PROPOSED CROSS WALK

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREAS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

DATE: 12-19-19

OWNER/DEVELOPER: TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC, 8600 SNOWDEN RIVER PKWY, SUITE 207, COLUMBIA MD 21045, 410-953-0222

REVISED SITE DEVELOPMENT PLAN

SITE LAYOUT

MIDWAY BUSINESS CENTER  
SNOWDEN RIVER SOUTH  
SECTION 1, AREA 1  
INDUSTRIAL / FLEX SPACE  
(PLAT 8795, L.10008/F.485)

TAX MAP 42 GRID 10  
6TH ELECTION DISTRICT

PARCEL 319, PARCEL C  
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERS, INC.  
ENGINEERS - SURVEYORS - PLANNERS  
8407 MAIN STREET, ELLICOTT CITY, MD 21043  
TEL: 410.461.7666  
FAX: 410.461.8961

NO.	REVISION	DATE
1	REVISE STORMWATERS TO BAYPETERS INCORPORATE ARCHITECTURAL REVISIONS TO THE BUILDINGS, REVISE WIRE AND SIGN AND REVISE WATER MAIN MATERIAL FROM TOP TO GROUND EXPOSURE	02/12/14
2	REVISE PLAN TO ADD SWIM SCHOOL TO BUILDING #1	11/04/14
3	REVISE TO ADD DOG KENNEL TO BLDG #1	10/07/15
4	ADD GYM, TRAMPOLINE GYM AND BREWERY TO BLDG #1	12/01/15
7	DOG KENNEL & PERSONAL TRAINER PARKING	04/05/16
8	REVISE TO INCREASE PARKING AND CHANGE USE	04-24-17
12	MOD. PLAN & PARKING TABULATION FOR SQUASH ACADEMY	8-13-21
12	MOD. PLAN & PARKING TABULATION FOR DISTILLERY	3-14-22
12	MOD. PLAN & PARKING FOR CARQUEST WAREHOUSE & RETAIL SPACE	2-28-23

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHV  
DATE: JANUARY 2014  
SCALE: 1"=30'  
W.O. NO.: 05-03

PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND LICENSE NO. 18193 EXPIRATION DATE 08-27-2014

3 SHEET OF 24

NO AS-BUILT INFORMATION ON THIS SHEET



MATCHLINE - SEE SHEET 3

HOWARD COUNTY DEPT.  
PUBLIC WORKS  
TM: 42  
PARCEL: 386  
LOT: L-1  
L. 02245 / F. 0044  
ZONED: NT  
USE: EXEMPT COMMERCIAL

EALTY ASSOCIATE FUND VI LP THE  
C/O ASSOCIATES REALTY  
TM: 42  
PARCEL: 319  
LOT: PAR B  
PLAT: #8795  
L. 7997 / F. 382  
USE: INDUSTRIAL

EX. BUILDING TO REMAIN  
LOCATED ON PARCEL - B

**BUILDING #2**  
31,355 SF  
FF=376.00  
150 PARKING SPACES  
(ONE-STORY)  
(PROVIDED)  
INDOOR RECREATION  
(PERSONAL TRAINING &  
PHYSICAL THERAPY)  
16,454 SF  
80 SPACES REQ'D  
(CHISELED LIFE)

**(HYPER KIDS)**  
INDOOR RECREATION  
14,907 SF  
56 SPACES (REQ'D)

CSX TRANSPORTATION  
C/O ADMINISTRATOR PROP TAXES  
TM: 42  
PARCEL: 386  
LOT: P-1  
L. 1938 / F. 181  
USE: INDUSTRIAL

BDC OAKLAND MILLS LLC  
TM: 42  
PARCEL: 386  
LOT: PAR K  
L. 4555 / F. 223  
ZONED: NT  
USE: INDUSTRIAL

CSX TRANSPORTATION  
C/O ADMINISTRATOR PROP TAXES  
TM: 42  
PARCEL: 386  
LOT: PAR O  
L. 01938 / F. 0181  
USE: INDUSTRIAL

**LEGEND**

EXISTING CONTOUR	---
PROPOSED CONTOUR	---
EXISTING SPOT ELEVATION	+382.96
PROPOSED SPOT ELEVATION	+82.53
DIRECTION OF FLOW	→
LIGHT POLES	☉
SOIL TYPE	M1B2 M1D3
ADJACENT PROPERTY LINE	---
SITE BOUNDARY	---
RIGHT-OF-WAY LINE	---
EXISTING CURB & GUTTER	---
PROPOSED CURB & GUTTER	---
EXISTING 20' SEWER AND UTILITY EASEMENT PLAT# 8796	---
PROPOSED 20' PUBLIC SEWER AND UTILITY EASEMENT (L. 1548/ F. 510)	---
EXISTING INGRESS AND EGRESS EASEMENT (PLAT#8796)	---
EXISTING 20' PUBLIC RIGHT-OF-WAY (L. 1548/ F. 510)	---
PROPOSED PAVING OVERLAY	---
PROPOSED 20' PUBLIC WATER AND UTILITY EASEMENT (L. 1548/ F. 510)	---
EXISTING PARKING EASEMENT (L. 5592/ F. 503)	---
EXISTING UTILITY POLE	○
EXISTING LIGHT POLE	☉
EXISTING MAILBOX	☐
EXISTING SIGN	○
EXISTING SANITARY MANHOLE	○
EXISTING SANITARY LINE	---
EXISTING CLEANOUT	○
EXISTING FIRE HYDRANT	☉
EXISTING WATER LINE	---
EXISTING FENCE	---
EXISTING STREAM	---
EXISTING STREAM BUFFER	---
EXISTING TREES (FIELD LOCATED)	○
EXISTING TREELINE (FIELD LOCATED)	---
PROPOSE TREELINE	---
PROPOSED SIDEWALK	---
PROPOSED STORM DRAIN	---
PROPOSED STORM DRAIN INLET	---
PROPOSED CROSS WALK	---



AS-BUILT CERTIFICATION FOR PSW/M  
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPLICABLE PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONSTRUCTED DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

**OWNER/DEVELOPER**  
DATE: 6-18-19  
F.L.#: 16193  
TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
8600 SNOWDEN RIVER PKWAY, SUITE 207  
COLUMBIA, MD 21045  
410-953-0222

8	REVISE THE PLAN TO MODIFY THE USE AND INCREASE THE PARKING	1-16-19
8	REVISE TO INCREASE PARKING AND CHANGE USE	04-24-17
7	DOG KENNEL & PERSONAL TRAINER PARKING	04/08/16
4	ADD GYM, TRAMPOLINE GYM, AND RECREATION TO BLDG #1	12/12/15
3	REVISE TO ADD DOG KENNEL TO BLDG #1	10/07/15
1	REVISE STORMWATERS TO BARRIERS, INCORPORATE ARCHITECTURAL REVISIONS TO THE BUILDINGS, REVISE WMC AND SMC, AND REVISE WATER MAIN MATERIAL FROM DIP TO CS90 PIG-BYRE PIPING	02/12/14
NO.	REVISION	DATE

**REVISED SITE DEVELOPMENT PLAN  
SITE LAYOUT**

**MIDWAY BUSINESS CENTER  
SNOWDEN RIVER SOUTH  
SECTION 1, AREA 1  
INDUSTRIAL / FLEX SPACE  
(PLAT #8795, L. 10008/F. 485)**

TAX MAP 42 GRID 10  
6TH ELECTION DISTRICT

**ROBERT H. VOGEL  
ENGINEERS • SURVEYORS • PLANNERS**  
8407 MAIN STREET  
ELICOTT CITY, MD 21043  
TEL: 410.461.7666  
FAX: 410.461.8961

**PROFESSIONAL CERTIFICATE**

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 09-27-2014.

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHV  
DATE: JANUARY 2014  
SCALE: 1"=30'  
W.O. NO.: 05-03

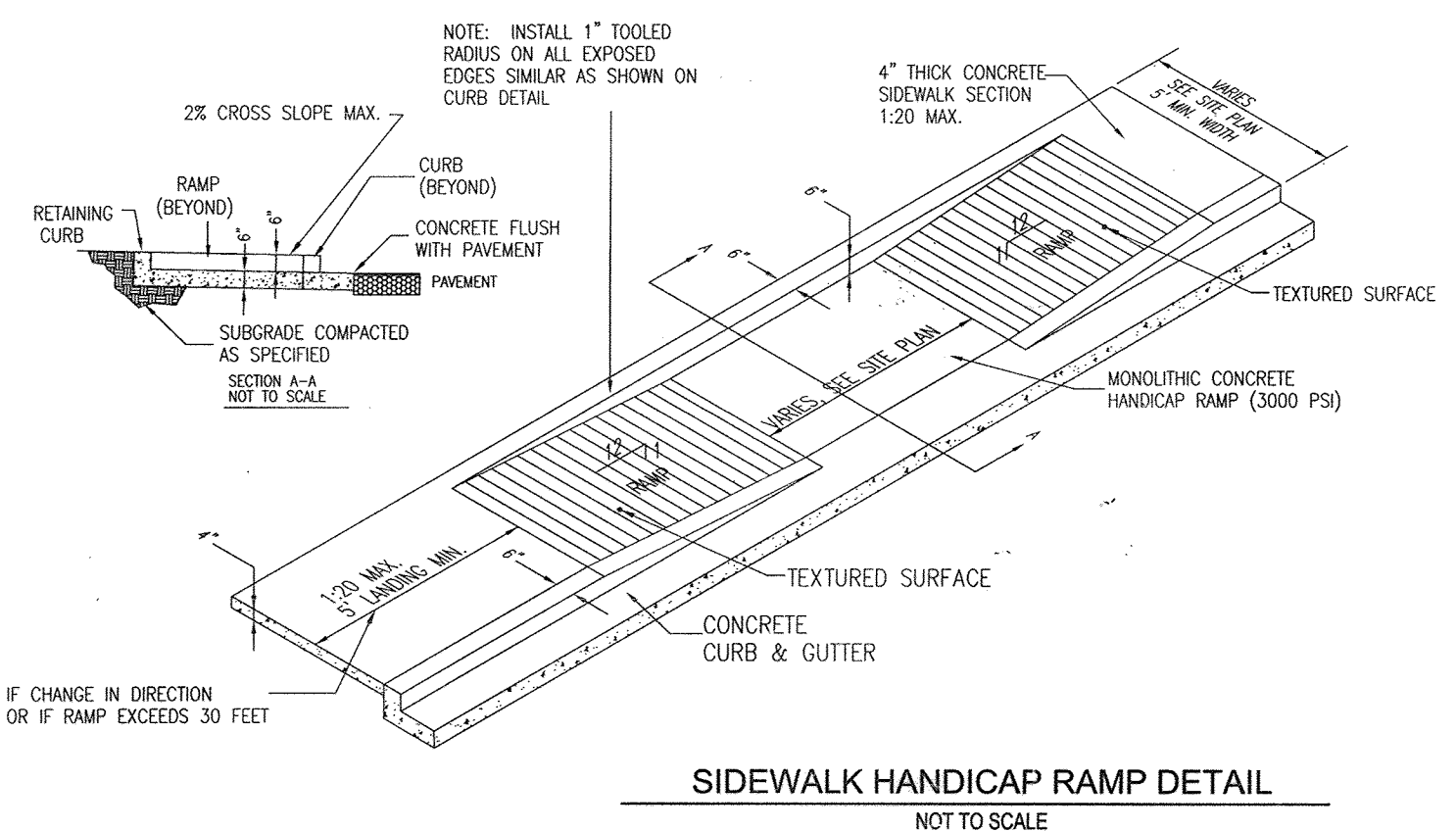
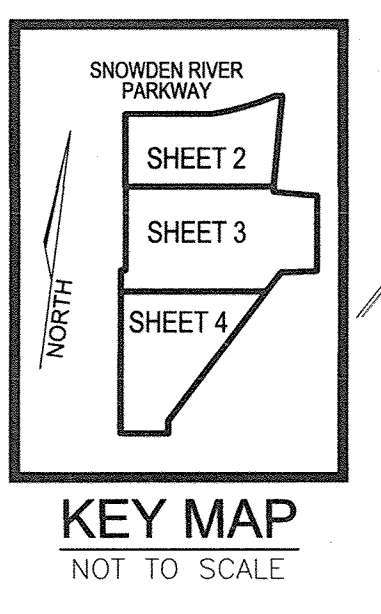
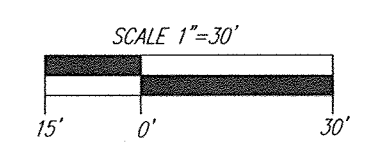
4 SHEET OF 24

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 1/15/14

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 1/14/14

DIRECTOR  
DATE: 1/14/14

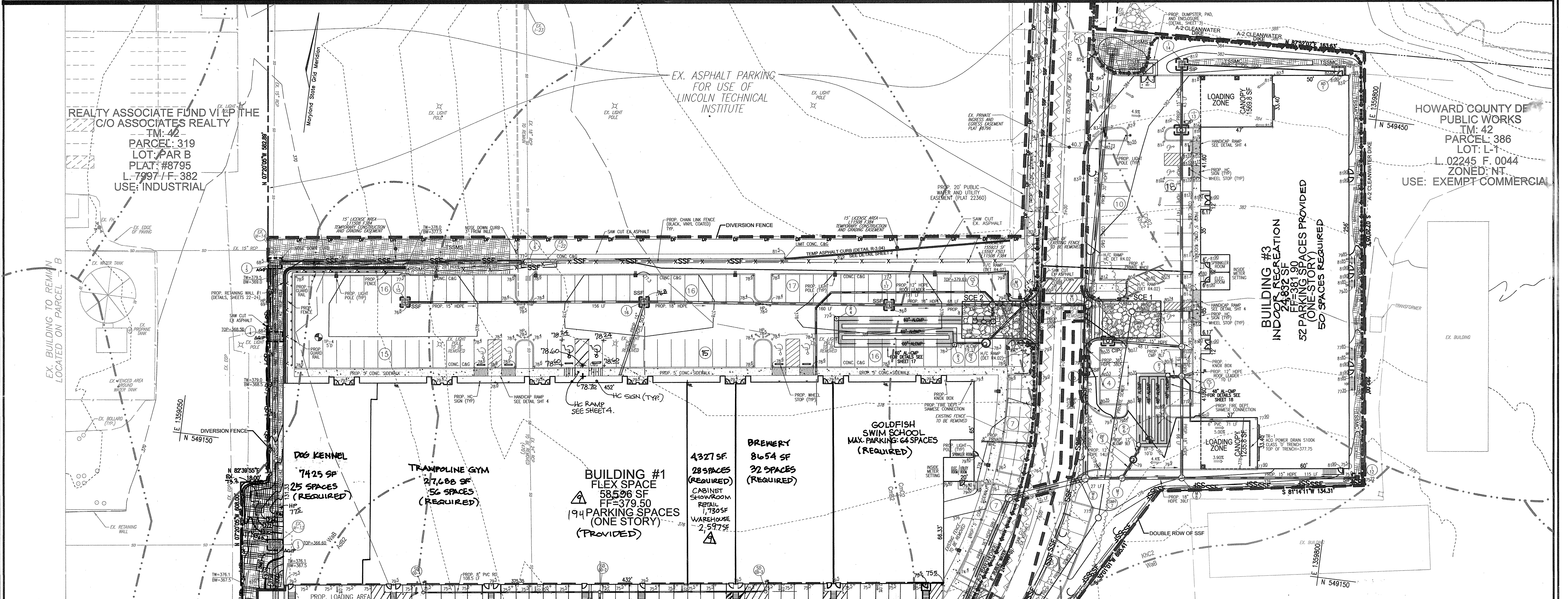








MATCHLINE - SEE SHEET 5



REALTY ASSOCIATE FUND VI LP THE  
C/O ASSOCIATES REALTY  
TM: 42  
PARCEL: 319  
LOT: PAR B  
PLAT: #8795  
L: 7997 / F: 382  
USE: INDUSTRIAL

HOWARD COUNTY DE  
PUBLIC WORKS  
TM: 42  
PARCEL: 386  
LOT: L-1  
L: 02245 F: 0044  
ZONED: NT  
USE: EXEMPT COMMERCIAL

BUILDING #3  
INDOOR RECREATION  
24,832 SF  
FF=381.90  
52 PARKING SPACES PROVIDED  
50 SPACES REQUIRED

DOG KENNEL  
7425 SF  
25 SPACES  
(REQUIRED)

TRAMPOLINE GYM  
27,688 SF  
56 SPACES  
(REQUIRED)

BUILDING #1  
FLEX SPACE  
58,596 SF  
FF=379.50  
194 PARKING SPACES  
(ONE STORY)  
(PROVIDED)

4327 SF  
28 SPACES  
(REQUIRED)  
CABINET  
SHOWROOM  
RETAIL  
1,730 SF  
WAREHOUSE  
2,577 SF

BREWERY  
8654 SF  
32 SPACES  
(REQUIRED)

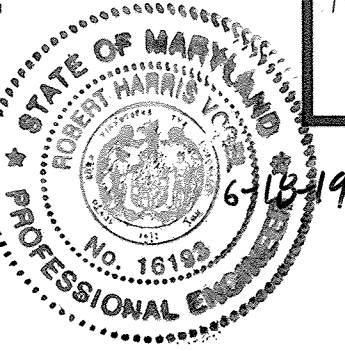
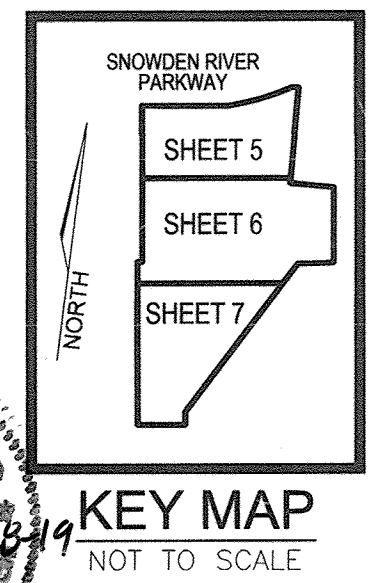
GOLDFISH SWIM SCHOOL  
MAX. PARKING: 64 SPACES  
(REQUIRED)

- NOTES FOR UTILITY INSTALLATION**
- CALL "MISS UTILITY" AT 1-800-257-7777 48 HOURS PRIOR TO THE START OF WORK.
  - ONLY ENOUGH TRENCH SHOULD BE EXCAVATED WHICH CAN BE BACKFILLED DAILY.
  - EXCAVATED TRENCH MATERIALS SHOULD BE PLACED ON THE HIGH SIDE OF THE TRENCH.
  - IMMEDIATELY FOLLOWING UTILITY INSTALLATION, THE TRENCH SHALL BE BACKFILLED, COMPACTED AND STABILIZED AT THE END OF EACH WORKING DAY. NO MORE TRENCH SHALL BE OPENED THAN CAN BE COMPLETED IN THE SAME DAY.
  - MULCHING OF ALL DISTURBED AREAS AND DAILY ON BACKFILL WILL BE REQUIRED.
  - ANY SEDIMENT CONTROL PRACTICES WHICH ARE DISTURBED DURING UTILITY CONSTRUCTION SHALL BE REPAIRED OR REPLACED IMMEDIATELY.
  - ANY DITCHES OR DRAINAGE WAYS DISTURBED DURING CONSTRUCTION WILL BE RESTORED TO ORIGINAL CONDITION.

**NOTE:**  
ALL UNDERGROUND SWM STRUCTURES MUST REMAIN SEPARATE OR BULKHEADED FROM ENTERING STORMDRAIN UNTIL ALL CONTRIBUTING AREAS ARE PERMANENTLY STABILIZED AND WRITTEN PERMISSION IS PROVIDED BY INSPECTOR TO ALLOW OPENING FOR FLOW. ANY WATER COLLECTED IN WORK AREA SHALL BE PUMPED THROUGH FILTERBAG.

**LEGEND**

EXISTING CONTOUR	--- 382.0	EXISTING INGRESS AND EGRESS EASEMENT (PLAT #8795)	[Symbol]	EXISTING UTILITY POLE	[Symbol]	EXISTING TREES (FIELD LOCATED)	[Symbol]
PROPOSED CONTOUR	--- 382.0	EXISTING 20' PUBLIC RIGHT-OF-WAY (L 5484 / F 510)	[Symbol]	EXISTING LIGHT POLE	[Symbol]	EXISTING TREELINE (FIELD LOCATED)	[Symbol]
EXISTING SPOT ELEVATION	+382.56	PROPOSED PAWING OVERLAY	[Symbol]	EXISTING MAILBOX	[Symbol]	PROPOSED TREELINE	[Symbol]
PROPOSED SPOT ELEVATION	+82.53	PROPOSED 20' PUBLIC WATER AND UTILITY EASEMENT (L 5502 / F 503) (L 11508 / F 384)	[Symbol]	EXISTING SIGN	[Symbol]	PROPOSED SIDEWALK	[Symbol]
DIRECTION OF FLOW	[Symbol]	EXISTING PARKING EASEMENT (L 5502 / F 503) (L 11508 / F 384)	[Symbol]	EXISTING SANITARY MANHOLE	[Symbol]	PROP. DIVERSION FENCE	DF
LIGHT POLES	[Symbol]	PROPOSED STORM DRAIN	[Symbol]	EXISTING SANITARY LINE	[Symbol]	PROP. SILT FENCE	SF
SOIL TYPE	M1B2	PROPOSED STORM DRAIN INLET	[Symbol]	EXISTING FIRE HYDRANT	[Symbol]	PROP. SUPER SILT FENCE	SSF
ADJACENT PROPERTY LINE	[Symbol]			EXISTING WATER LINE	[Symbol]	PROP. LIMIT OF DISTURBANCE	[Symbol]
SITE BOUNDARY	[Symbol]			EXISTING FENCE	[Symbol]	PROP. CURB INLET PROTECTION	CIP
RIGHT-OF-WAY LINE	[Symbol]			EXISTING STREAM	[Symbol]	PROP. STABILIZED CONSTRUCTION ENTRANCE	[Symbol]
EXISTING CURB & GUTTER	[Symbol]			EXISTING STREAM BUFFER	[Symbol]	PROP. EROSION CONTROL MATTING	[Symbol]
PROPOSED CURB & GUTTER	[Symbol]			PROPOSED CROSS WALK	[Symbol]		
EXISTING SEWER AND UTILITY EASEMENT (PLAT # 8795)	[Symbol]						
PROPOSED 20' PUBLIC SEWER AND UTILITY EASEMENT (L 5502 / F 503)	[Symbol]						



AS-BUILT CERTIFICATION FOR PSWM

- NOTE:**
- GRADING FOR THE INLETS IS TO BE STABILIZED WITH SOD IMMEDIATELY.
  - ALL SEDIMENT CONTROLS DAMAGED DURING CONSTRUCTION TO BE REPAIRED IMMEDIATELY.

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTROLLING DRAINAGE AREA IS PROPERLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

DATE: 12/18/19  
SCALE: 1"=30'

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 11/27/14

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 12/01/14

DIRECTOR  
DATE: 12/1/14

BY THE DEVELOPER:

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

DATE: 3/11/14

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR 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.

DATE: 11/20/14

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

DATE: 11/20/14

**OWNER/DEVELOPER**  
TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLLC  
8600 SNOWDEN RIVER PKWY, SUITE 207  
COLUMBIA MD 21045  
410-953-0222

8	REVISE THE PLAN TO MODIFY THE USE AND INCREASE THE PARKING	1-16-19
8	REVISE TO INCREASE PARKING AND CHANGE USE	04-24-17
7	DOG KENNEL & PERSONAL TRAINER PARKING	04/05/16
5	MODIFY GRADES	04/05/16
4	ADD GYM, TRAMPOLINE GYM, AND BREWERY TO BLDG #1	12/02/15
2	REVISE PLAN TO ADD SWIM SCHOOL TO BUILDING #1	11/04/14
1	REVISE STABILIZATION TO BAYLETS, INCORPORATE ARCHITECTURAL REVISIONS TO THE BUILDINGS, REVISE WIND AND SHG, AND REVISE WATER MAIN MATERIALS FROM DIP TO CORO. PIP. PERFORM CHANGES TO THE PLAN.	02/12/14
NO.	REVISION	DATE

**REVISED SITE DEVELOPMENT PLAN**  
SITE GRADING, SEDIMENT AND EROSION CONTROL PLAN

MIDWAY BUSINESS CENTER  
SNOWDEN RIVER SOUTH  
SECTION 1, AREA 1  
INDUSTRIAL / FLEX SPACE  
(PLAT #795, L 10008/F 485) PARCEL 319, PARCEL C  
HOWARD COUNTY, MARYLAND

TAX MAP 42 GRID 10  
6TH ELECTION DISTRICT

**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET  
ELLICOTT CITY, MD 21043  
TEL: 410.461.7666  
FAX: 410.461.8961

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHV  
DATE: JANUARY 2014  
SCALE: 1"=30'  
W.O. NO.: 05-03

PROFESSIONAL CERTIFICATE  
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. 16193, EXPIRATION DATE: 09-27-2014.

6 SHEET OF 24

AS-BUILT - DECEMBER 2018



MATCHLINE - SEE SHEET 6

LEGEND	
EXISTING CONTOUR	-392
PROPOSED CONTOUR	-382.56
EXISTING SPOT ELEVATION	+82.53
PROPOSED SPOT ELEVATION	+82.53
DIRECTION OF FLOW	→
RIGHT-OF-WAY LINE	—
EXISTING CURB & GUTTER	—
PROPOSED CURB & GUTTER	—
EXISTING 20' PUBLIC RIGHT-OF-WAY (L548/ F 510)	—
PROPOSED PAVING OVERLAY	—
PROPOSED 20' PUBLIC WATER AND UTILITY EASEMENT (L 11508/ F 384)	—
EXISTING PARKING EASEMENT (L 5592/ F 503) (L 11508/ F 384)	—
PROPOSED STORM DRAIN	—
PROPOSED STORM DRAIN INLET	—
PROPOSED LIMIT OF DISTURBANCE	—
PROPOSED CURB INLET PROTECTION	—
PROPOSED STABILIZED CONSTRUCTION ENTRANCE	—
PROPOSED EROSION CONTROL MATTING	—
PROPOSED CROSS WALK	—

REALTY ASSOCIATE FUND VI LP THE C/O ASSOCIATES REALTY  
 TM: 42  
 PARCEL: 319  
 LOT: PAR B  
 PLAT: #8795  
 L. 7997 / F. 382  
 USE: INDUSTRIAL

**BUILDING #2**  
 31,355 SF  
 FF=376.00  
 150 PARKING SPACES (ONE-STORY)  
 (PROVIDED)

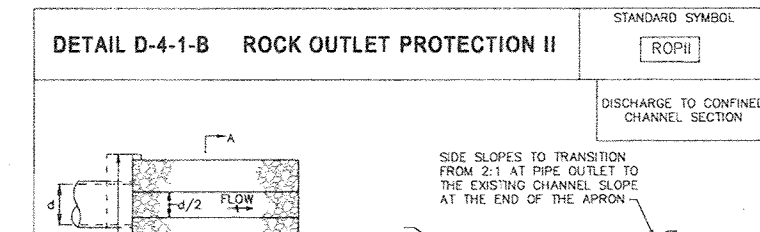
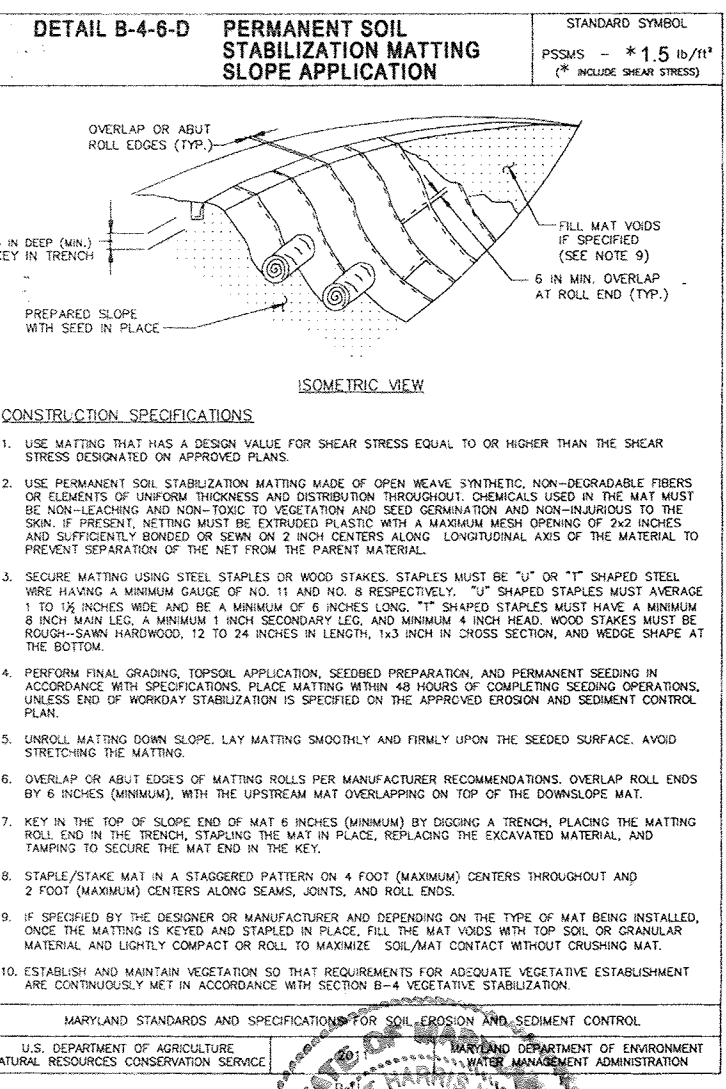
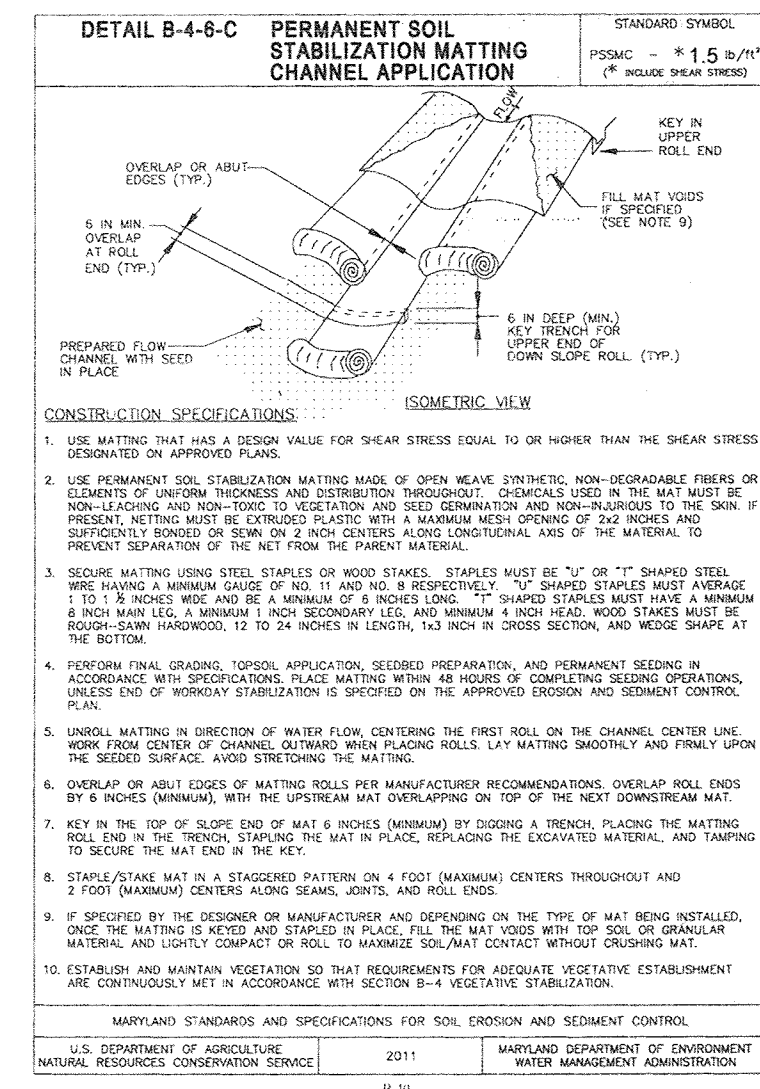
**INDOOR RECREATION (PERSONAL TRAINING & PHYSICAL THERAPY)**  
 16,455 SF  
 80 SPACES (REQ'D)  
 (CHISELED LIFE)

**INDOOR RECREATION (HYPER KIDS)**  
 14,901 SF  
 56 SPACES (REQ'D)

USE: INDUSTRIAL  
 L. 1938 / F. 181  
 PARCEL: 386  
 TM: 42 / LOT: P-1  
 CSX TRANSPORTATION  
 C/O ADMINISTRATOR PROP TAXES  
 TM: 42  
 PARCEL: 386  
 LOT: P-1  
 L. 1838 / F. 181  
 USE: INDUSTRIAL

BD OAKLAND MILLS LLC  
 TM: 42  
 PARCEL: 386  
 LOT: PAR K  
 L. 4555 / F. 223  
 ZONED: NT  
 USE: INDUSTRIAL

CSX TRANSPORTATION  
 C/O ADMINISTRATOR PROP TAXES  
 TM: 42  
 PARCEL: 386  
 LOT: PAR O  
 L. 01938 / F. 0181  
 USE: INDUSTRIAL



AS-BUILT CERTIFICATION FOR PSWM  
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

DATE: 6-18-19  
 NAME: TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
 ADDRESS: 8600 SNOWDEN RIVER PKWY, SUITE 207, COLUMBIA MD 21045  
 PHONE: 410-953-0222

NO.	REVISION	DATE
1	REVISE THE PLAN TO MODIFY THE USE AND INCREASE THE PARKING	1-16-19
2	REVISE TO INCREASE PARKING AND CHANGE USE	04-24-17
3	DOG KENNEL & PERSONAL TRAINER PARKING	04/05/16
4	MODIFY GRADES	04/05/16
5	ADD GYM, TRAMPOLINE CITY AND BRENNEVY TO BLDG #1	12/09/15
6	REVISE STORMFILTERS TO BAYPILERS, INCORPORATE ARCHITECTURAL REVIEWS TO THE BUILDINGS, REVISE WHC AND SHC, AND REVISE WATER MAIN MATERIAL FROM DIP TO C900 PVC PIPE	02/12/14

REVISED SITE DEVELOPMENT PLAN  
 SITE GRADING, SEDIMENT AND EROSION CONTROL PLAN  
 MIDWAY BUSINESS CENTER  
 SNOWDEN RIVER SOUTH  
 SECTION 1, AREA 1  
 INDUSTRIAL / FLEX SPACE  
 (PLAT #8795, L. 10008/F.485)  
 TAX MAP 42 GRID 10  
 6TH ELECTION DISTRICT

**ROBERT H. VOGEL ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 8407 MAIN STREET  
 ELLICOTT CITY, MD 21043  
 TEL: 410.461.7666  
 FAX: 410.461.8961

DESIGN BY: JAR  
 DRAWN BY: JAR  
 CHECKED BY: RHV  
 DATE: JANUARY 2014  
 SCALE: AS SHOWN  
 W.O. NO.: 05-03

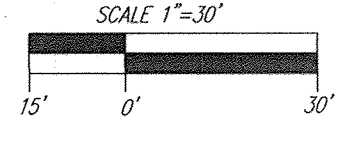
PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 16193  
 EXPIRATION DATE: 06-27-2014

7 SHEET OF 24

NOTE:  
 1. GRADING FOR THE INLETS IS TO BE STABILIZED WITH SOD IMMEDIATELY.  
 2. ALL SEDIMENT CONTROLS DAMAGED DURING CONSTRUCTION TO BE REPAIRED IMMEDIATELY.

PHASE II  
 PLAN VIEW  
 SCALE: 1"=30'

NOTE:  
 ALL UNDERGROUND SWM STRUCTURES MUST REMAIN SEPARATE OR BULKHEADED FROM ENTERING STORMDRAIN UNTIL ALL CONTRIBUTING AREAS ARE PERMANENTLY STABILIZED AND WRITTEN PERMISSION IS PROVIDED BY INSPECTOR TO ALLOW OPENING FOR FLOW. ANY WATER COLLECTED IN WORK AREA SHALL BE PUMPED THROUGH FILTERBAG.



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 1/15/14

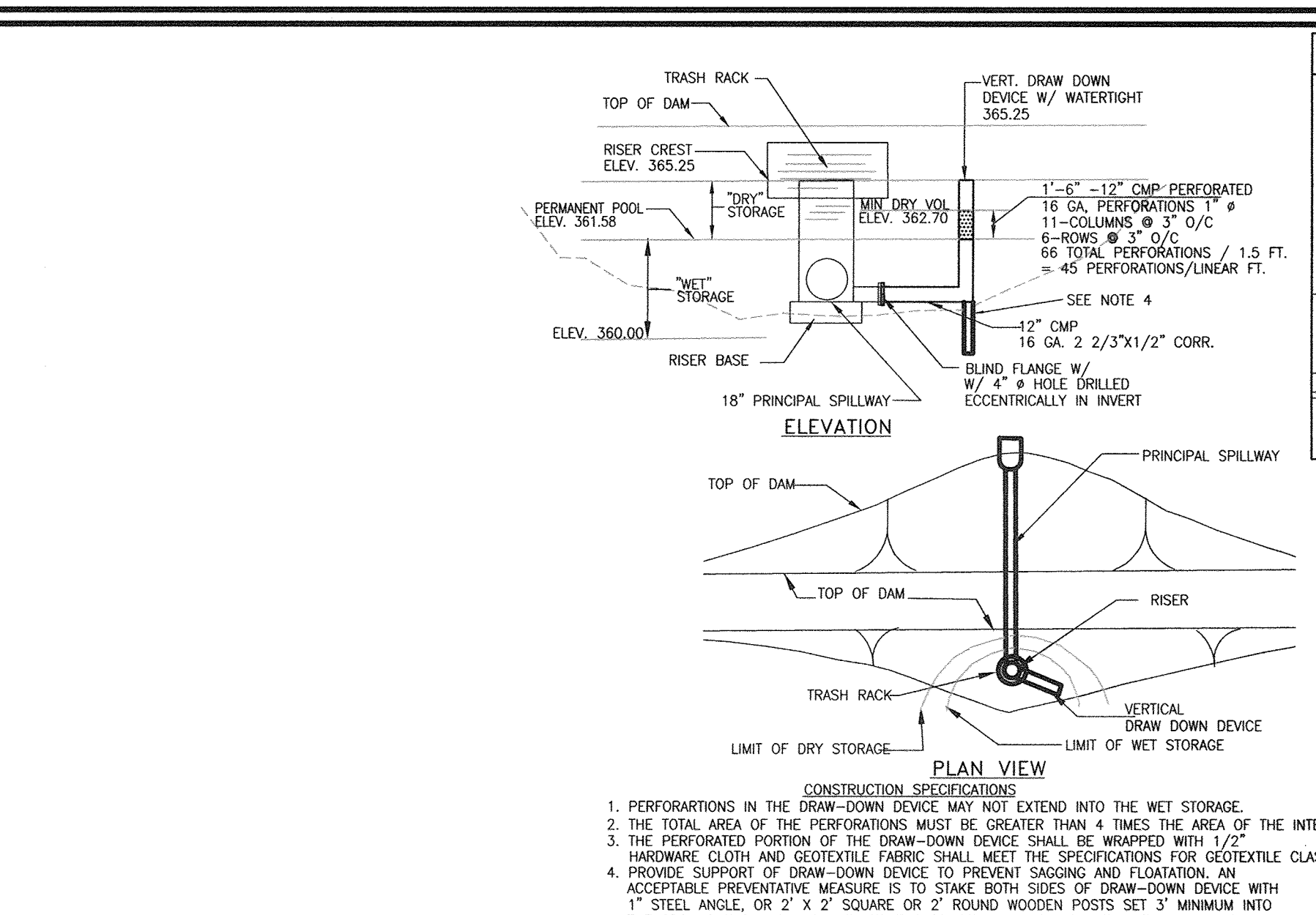
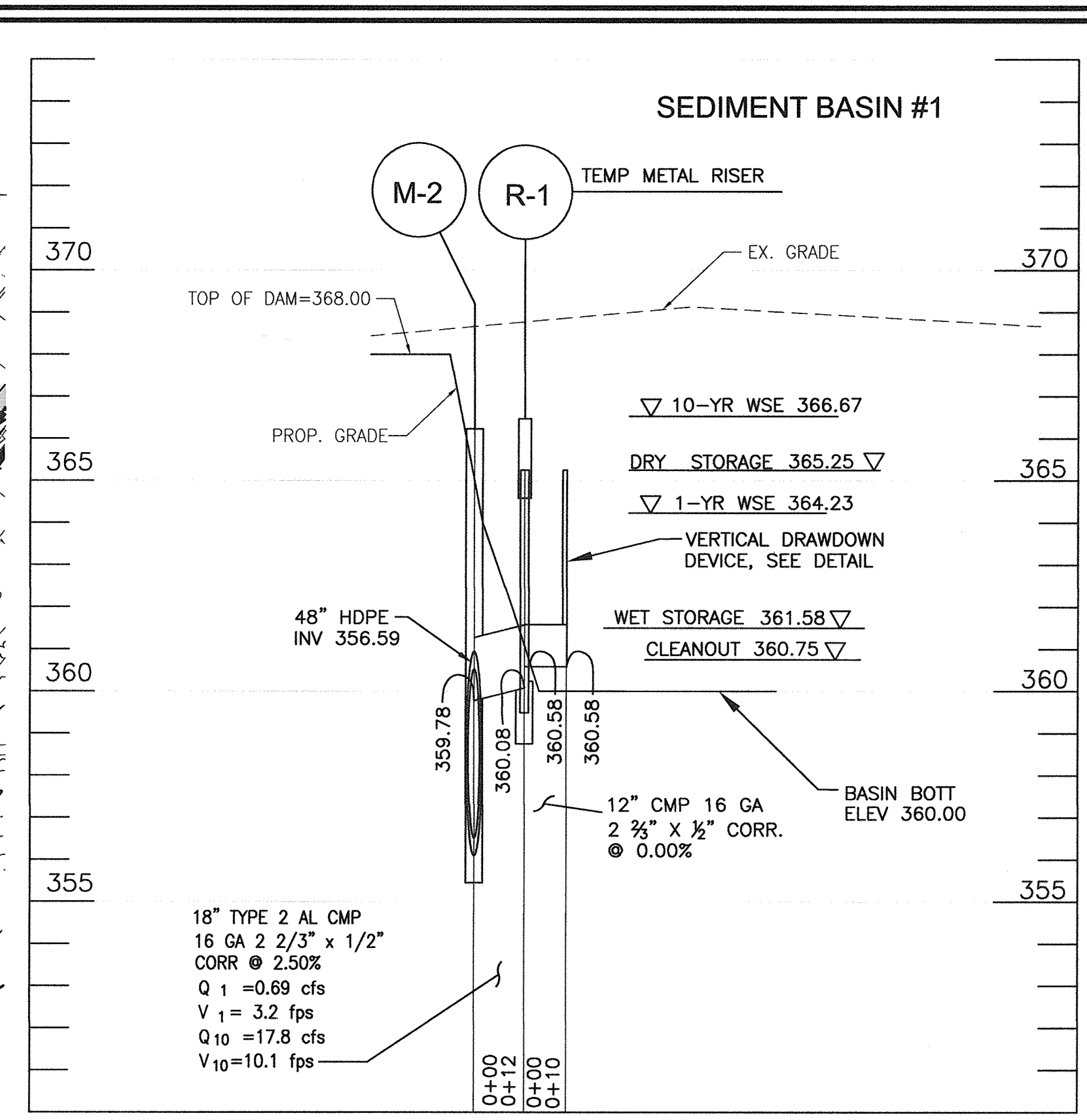
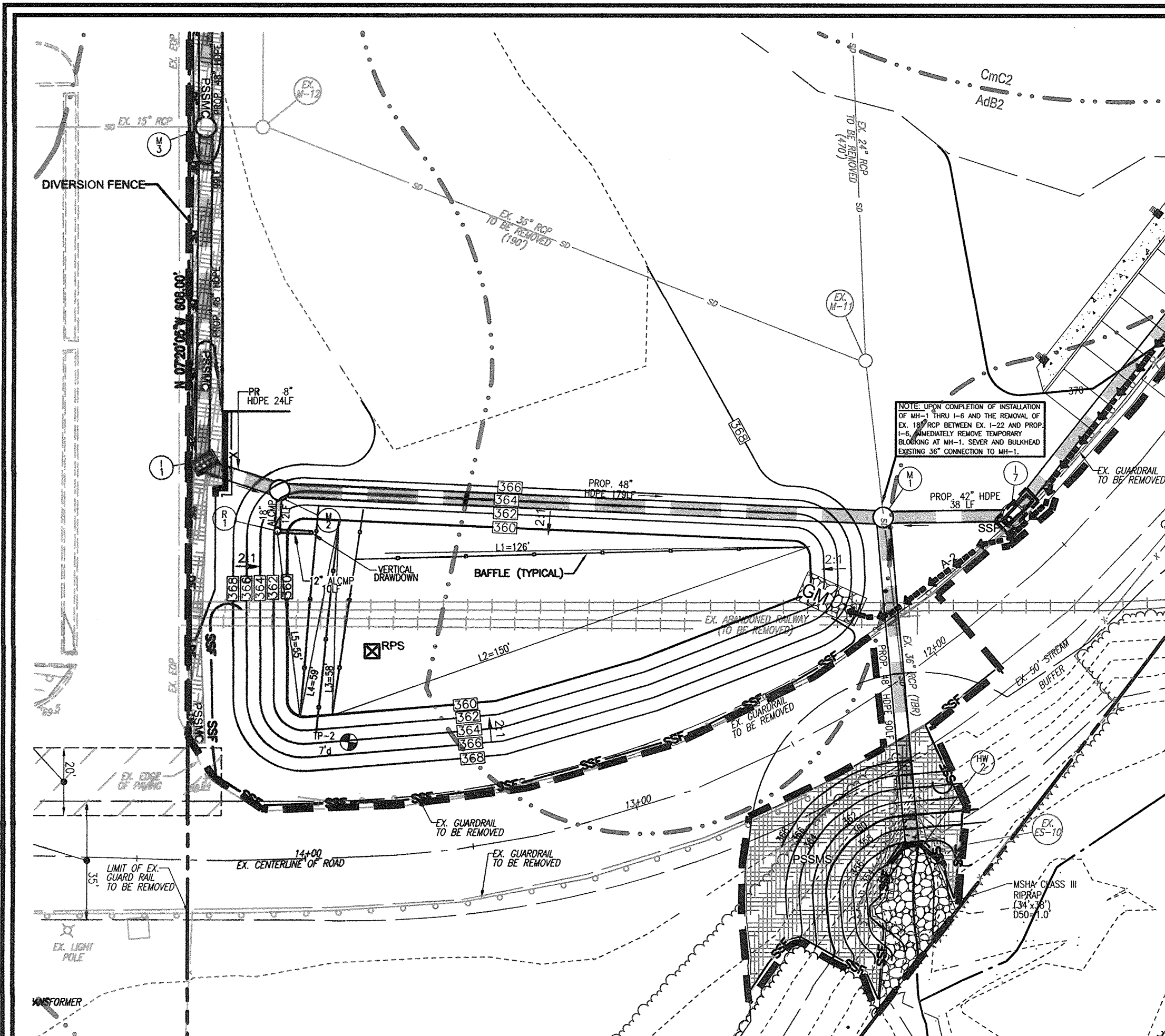
BY THE DEVELOPER:  
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING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

BY THE ENGINEER:  
 I CERTIFY THAT THIS PLAN FOR 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.

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 JOHN L. RICHARDS  
 HOWARD S.C.D.  
 DATE: 4/18/14

AS-BUILT-DECEMBER 2018



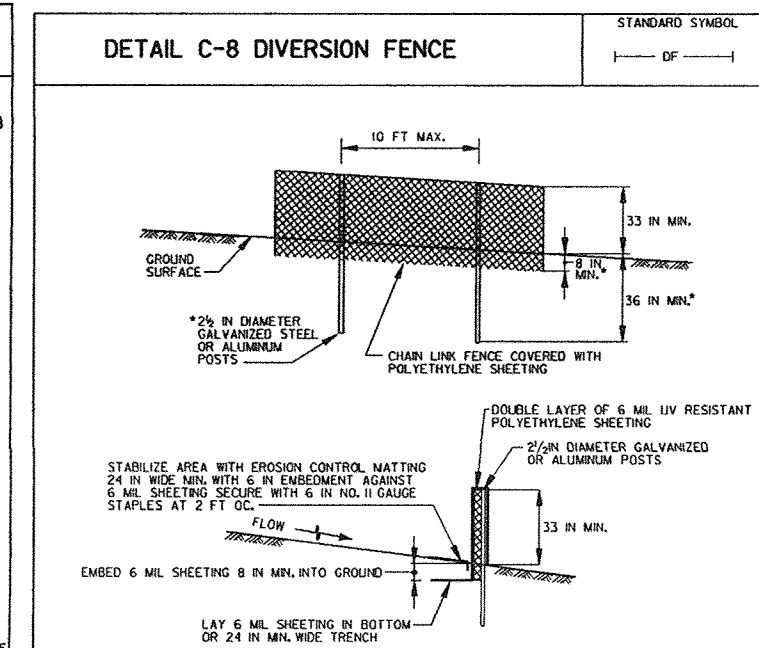
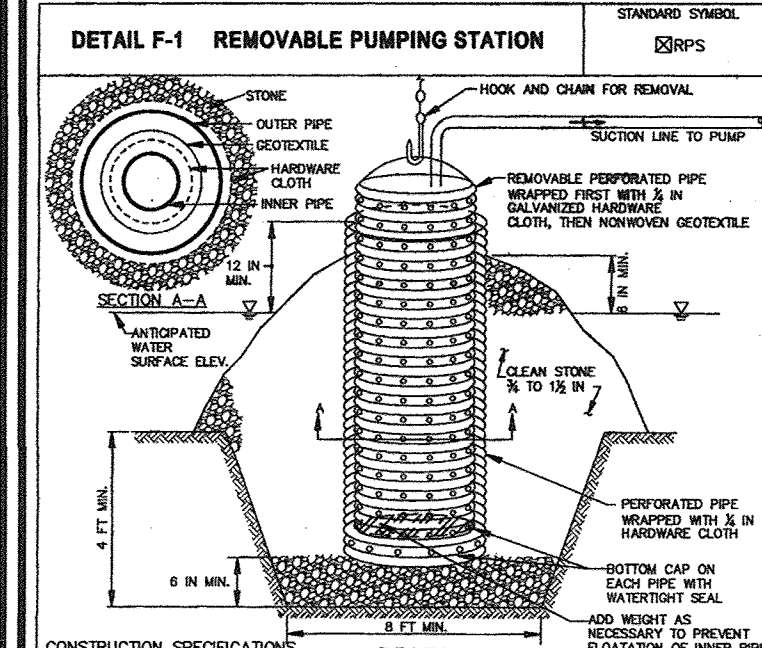


SEDIMENT BASIN #1 POND DATA				
LOCATION:	LITTLE PATENT RIVER			
DRAINAGE AREA:	5.4 ACRES			
MD 378:	NO			
TYPE OF FACILITY:	URBAN			
EXCAVATED:	NO			
STRUCTURE CLASS:	A			
STORAGE HEIGHT PRODUCT:	15.3 = AC-FT <sup>2</sup>			
MAX. HEIGHT OF FILL:	0.4 FT			
FREEDBOARD REQUIRED:	1.0 FT			
FREEDBOARD PROVIDED:	1.7 FT			
PRINCIPAL SPILLWAY CAPACITY AT 10 YEAR STORM:	17.8 cfs			
EMERGENCY SPILLWAY CAPACITY:	N/A			
DESIGN STORM	PROPOSED SWM FACILITY INFLUY	PROPOSED SWM FACILITY DISCHARGE	WATER SURFACE ELEV. W/ PROVIDED FACILITY	STORAGE SURFACE ELEV. W/ PROVIDED FACILITY
1 YEAR	14.59	0.7	364.23	0.8872 (ABOVE PERM POOL)
10 YEAR	30.30	17.6	366.57	1.3228 (ABOVE PERM POOL)

SEDIMENT BASIN #1	
DRAINAGE AREA: EXISTING	= 5.4 AC
PROPOSED	= 5.4 AC
STORAGE: REQUIRED	19,440 CF
PROVIDED	46,283 CF
WET STORAGE: REQUIRED	9,720 CF
PROVIDED	11,682 CF
DRY STORAGE: REQUIRED	9,720 CF
PROVIDED	34,601 CF
CLEANOUT: REQUIRED	5,562 CF
PROVIDED	5,562 CF
WET STORAGE ELEV.:	361.58
DRY STORAGE ELEV.:	365.25
EX. GROUND AT C/L EMBANKMENT:	368.41
BASIN BOTTOM:	360.00
WET STORAGE ZONE:	360.00-361.58
DRY STORAGE ZONE:	361.58-365.25
CLEANOUT ELEVATION:	360.75
BOTTOM DIMENSION:	(IRREGULAR)
SIDE SLOPES:	2:1 (MAXIMUM) OR AS SHOWN
EMBANKMENT ELEVATION:	368.41
BARREL DIAMETER:	18" CMP
RISER:	36" CMP
TRASH RACK:	54" CMP

**PHASE I - SEDIMENT BASIN #1**  
SCALE: 1" = 30'

NOTE:  
1. ALL SEDIMENT CONTROLS DAMAGED DURING CONSTRUCTION TO BE REPAIRED IMMEDIATELY.

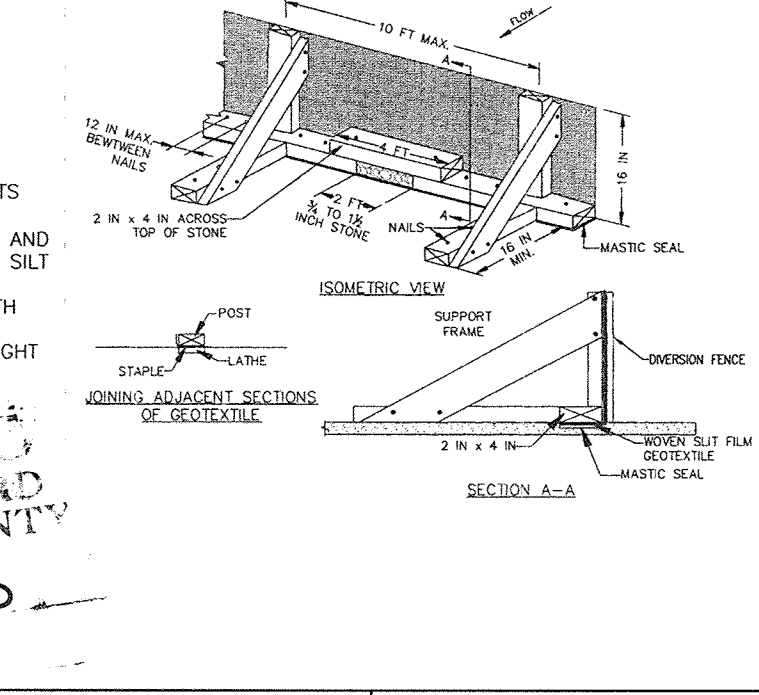
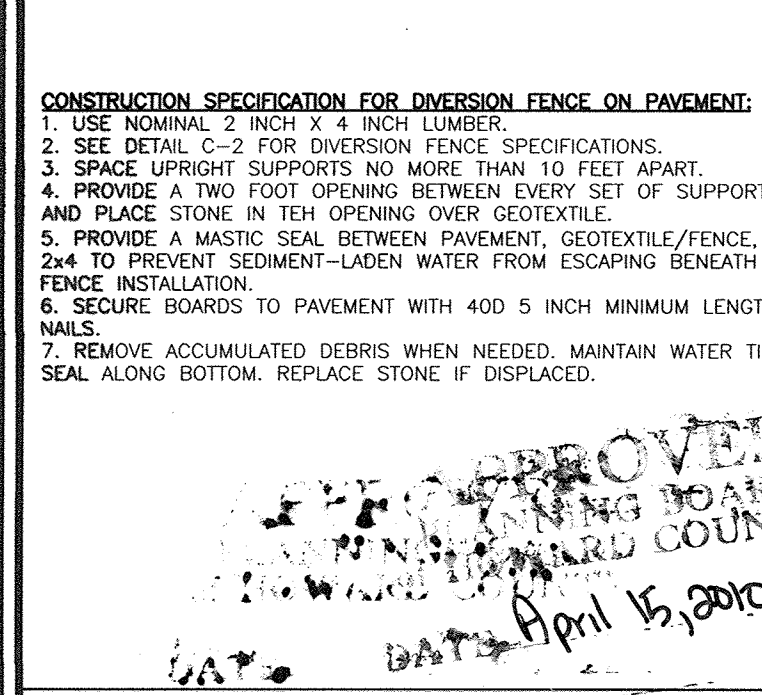


**CONSTRUCTION SPECIFICATIONS FOR REMOVABLE PUMPING STATION:**

- USE CORRUGATED METAL OR PLASTIC PIPE WITH 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
- SET TOP OF INNER AND OUTER PIPES MINIMUM 18" ABOVE ADJACENT WATER SURFACE ELEVATION OR RISER GROUND ELEVATION WHEN DRAINING A BASIN.
- BACKFILL AROUND OUTER PIPE WITH 1/2" TO 3/4" WASH CLEAN SAND OR EQUIVALENT RECYCLED CONCRETE. EXCEED EXISTING SURFACE ELEVATION BY 18" TO 24" TO PREVENT FLOODING.
- DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
- A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEKSTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

**CONSTRUCTION SPECIFICATIONS FOR DIVERSION FENCE ON PAVEMENT:**

- USE NOMINAL 2" X 4" LUMBER.
- SEE DETAIL C-2 FOR DIVERSION FENCE SPECIFICATIONS.
- SPACE UPRIGHT SUPPORTS NO MORE THAN 10 FEET APART.
- PROVIDE A TWO FOOT OPENING BETWEEN EVERY SET OF SUPPORTS AND PLACE STONE IN THE OPENING OVER GEOTEKSTILE.
- PROVIDE A MASTIC SEAL BETWEEN PAVEMENT, GEOTEKSTILE/FENCE, AND STAKE TO PREVENT SEDIMENT-LADEN WATER FROM ESCAPING BEHIND SILT FENCE INSTALLATION.
- SECURE BOARDS TO PAVEMENT WITH 400 5/8" MINIMUM LENGTH NAILS.
- REMOVE ACCUMULATED DEBRIS WHEN NEEDED. MAINTAIN WATER TIGHT SEAL ALONG BOTTOM. REPLACE STONE IF DISPLACED.

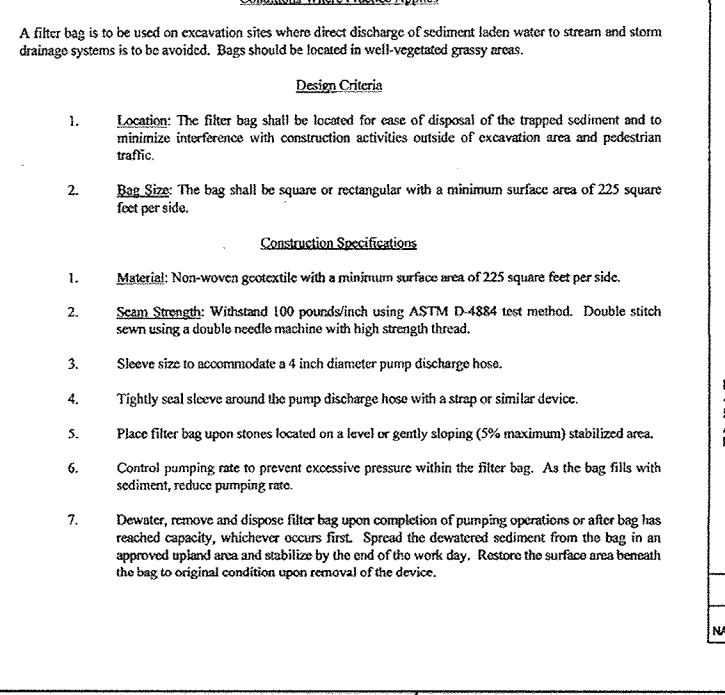
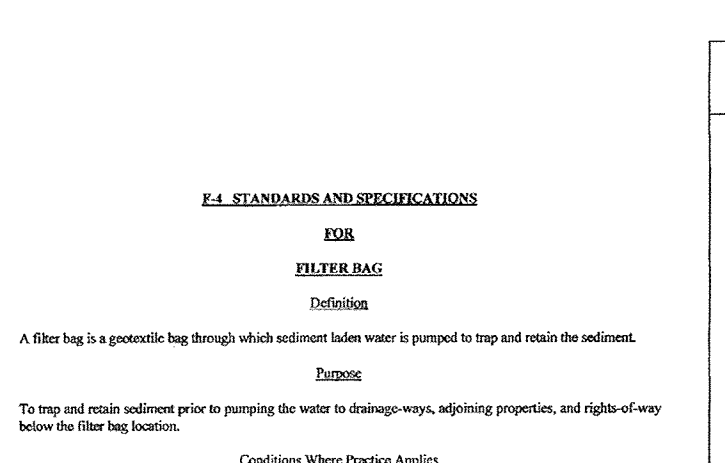
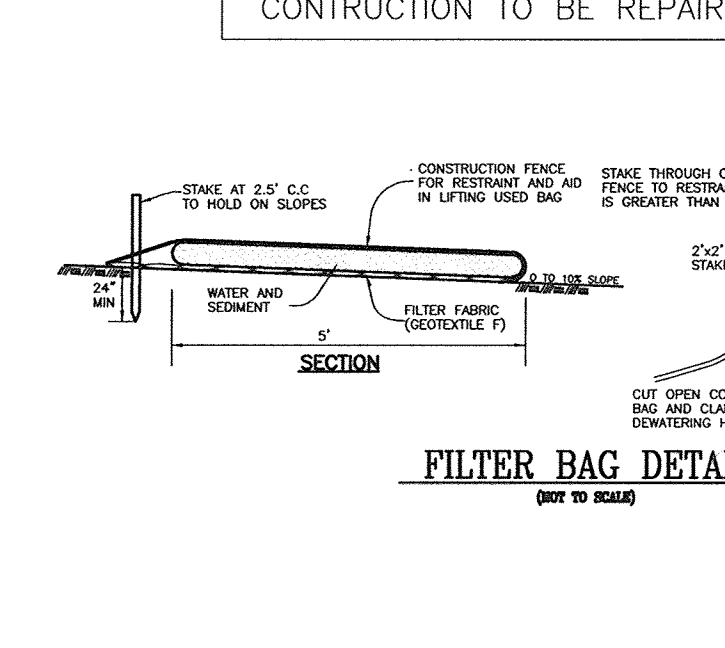


**CONSTRUCTION SPECIFICATIONS FOR FILTER BAG DETAIL:**

- USE 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
- SET TOP OF INNER AND OUTER PIPES MINIMUM 18" ABOVE ADJACENT WATER SURFACE ELEVATION OR RISER GROUND ELEVATION WHEN DRAINING A BASIN.
- BACKFILL AROUND OUTER PIPE WITH 1/2" TO 3/4" WASH CLEAN SAND OR EQUIVALENT RECYCLED CONCRETE. EXCEED EXISTING SURFACE ELEVATION BY 18" TO 24" TO PREVENT FLOODING.
- DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
- A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEKSTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

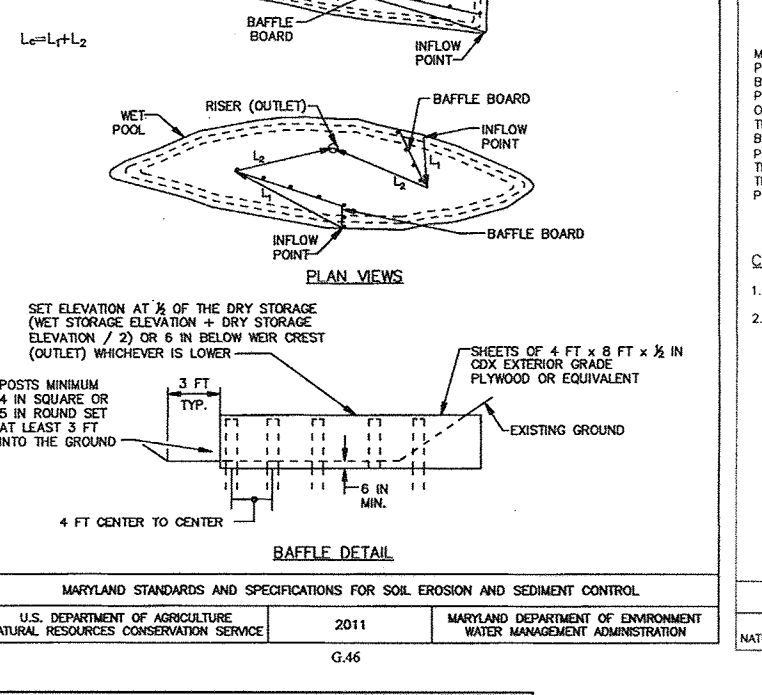
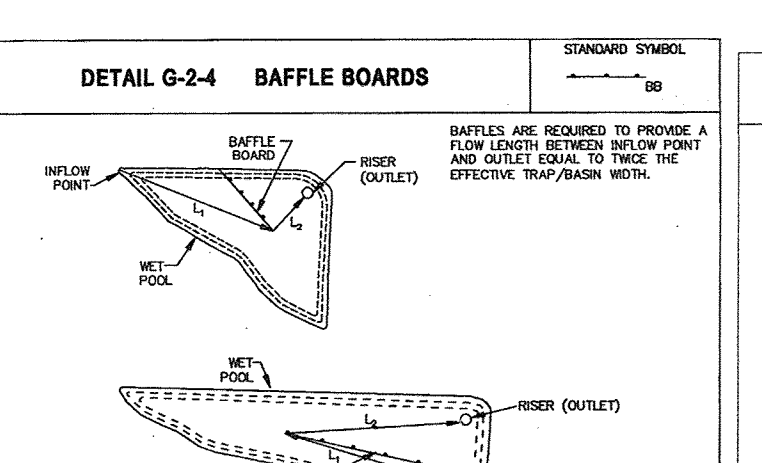
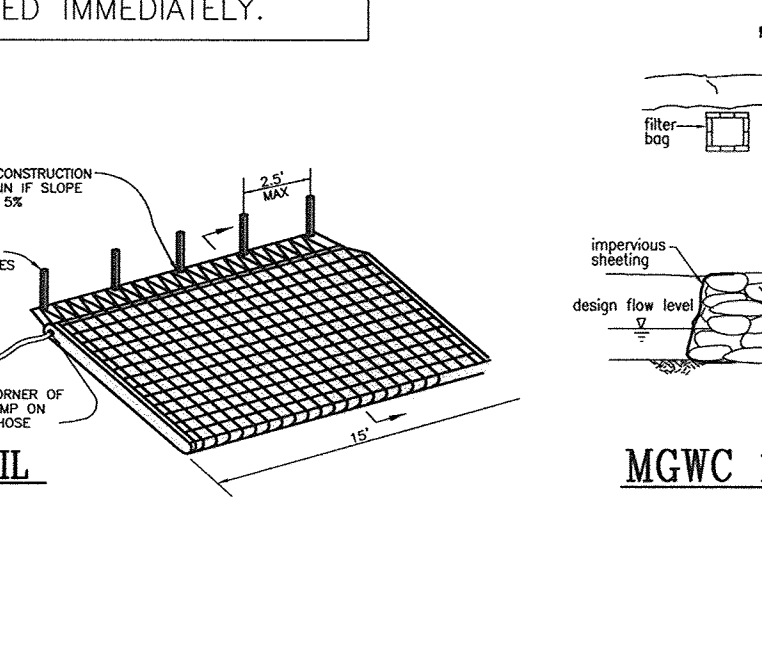
**CONSTRUCTION SPECIFICATIONS FOR DIVERSION PIPE:**

- USE 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
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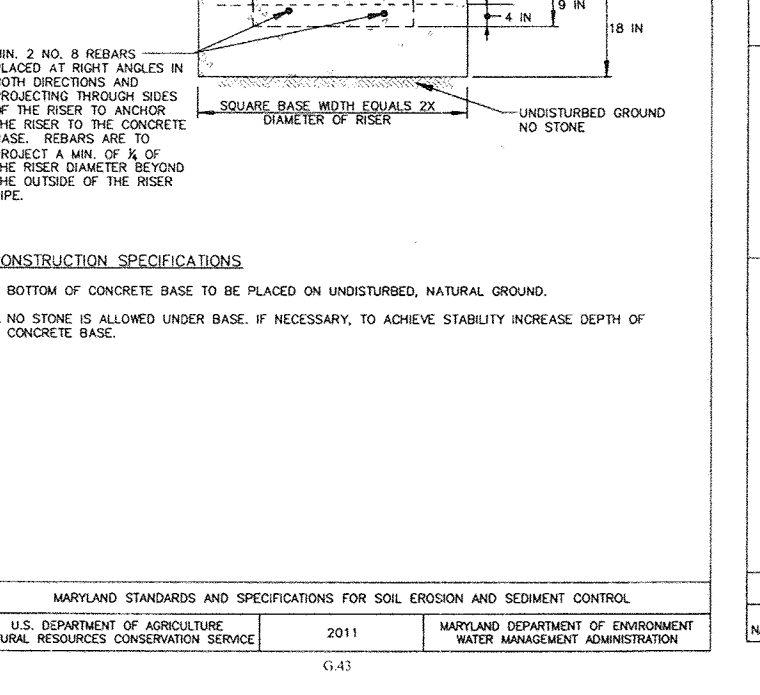
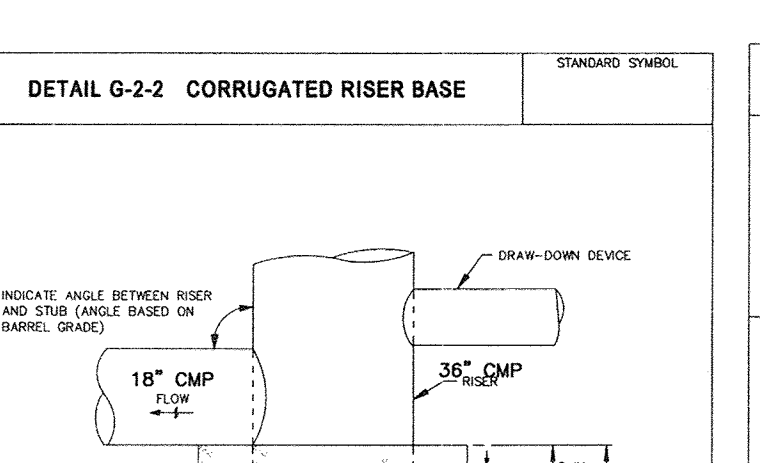
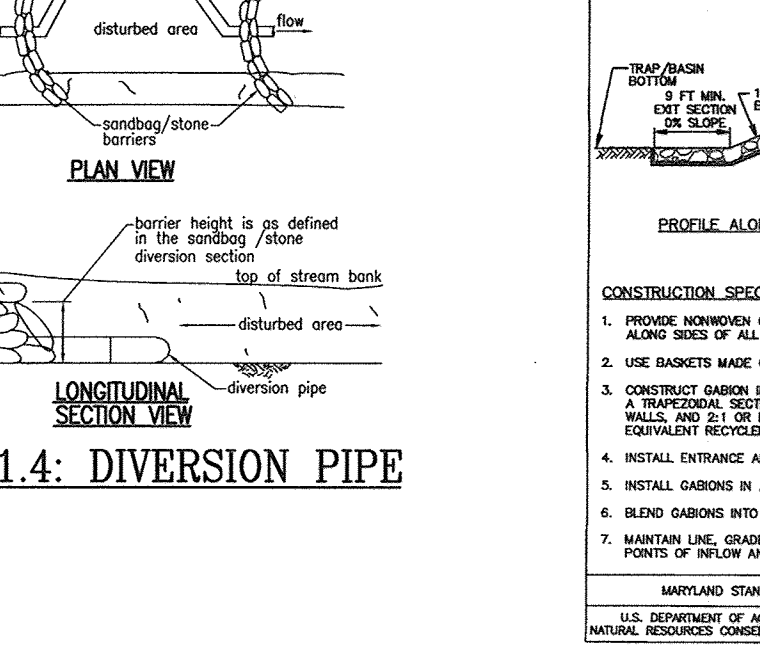
**CONSTRUCTION SPECIFICATIONS FOR DIVERSION PIPE:**

- USE 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
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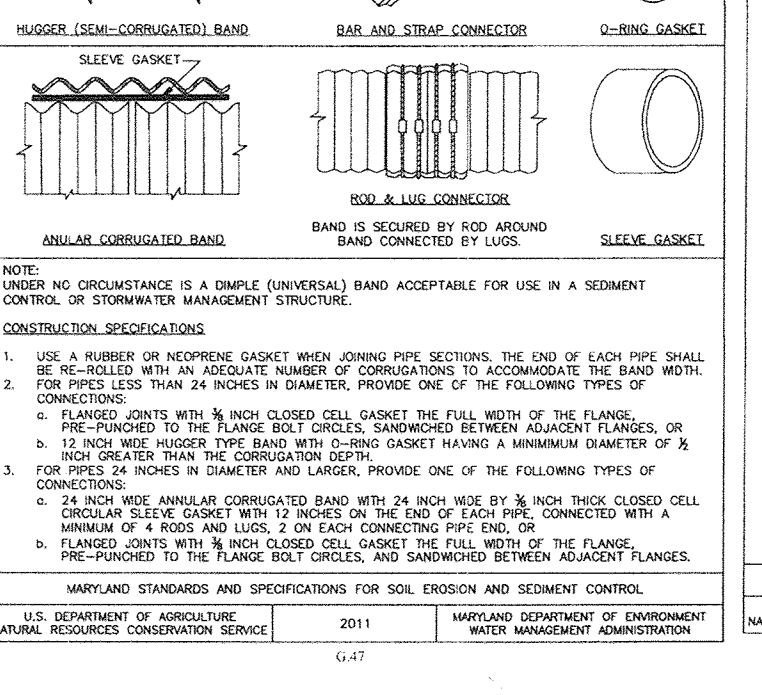
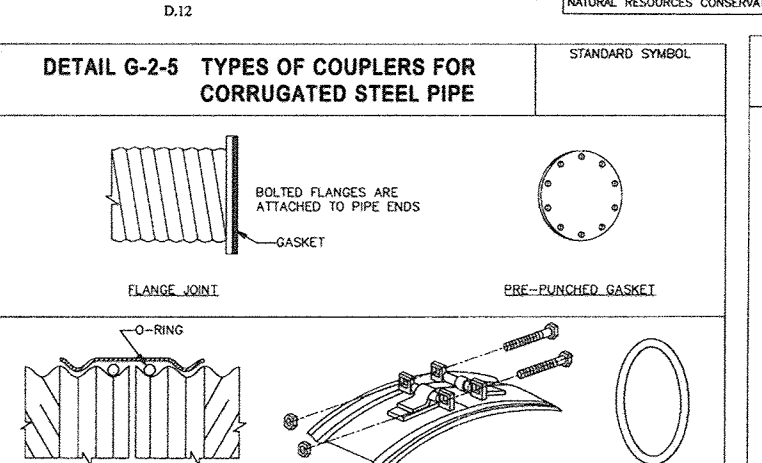
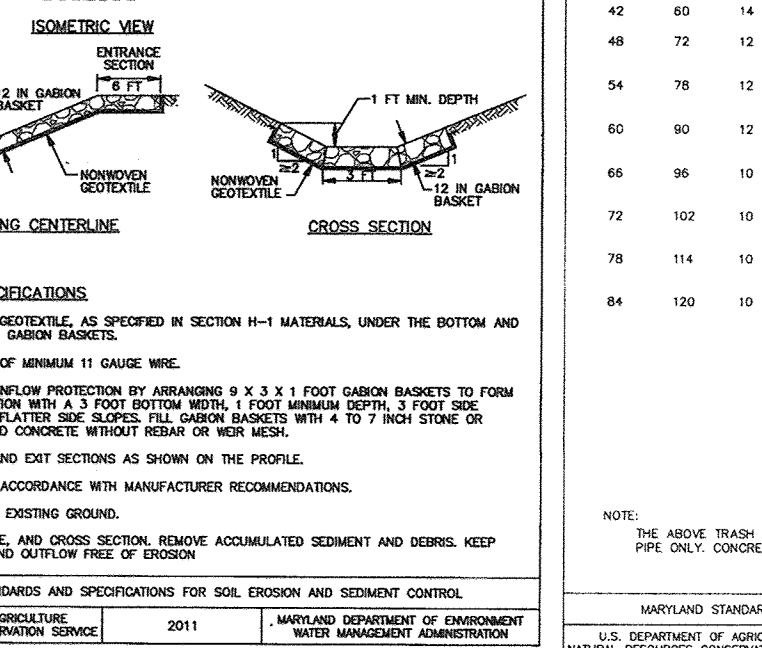
**CONSTRUCTION SPECIFICATIONS FOR DIVERSION PIPE:**

- USE 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
- SET TOP OF INNER AND OUTER PIPES MINIMUM 18" ABOVE ADJACENT WATER SURFACE ELEVATION OR RISER GROUND ELEVATION WHEN DRAINING A BASIN.
- BACKFILL AROUND OUTER PIPE WITH 1/2" TO 3/4" WASH CLEAN SAND OR EQUIVALENT RECYCLED CONCRETE. EXCEED EXISTING SURFACE ELEVATION BY 18" TO 24" TO PREVENT FLOODING.
- DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
- A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEKSTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.



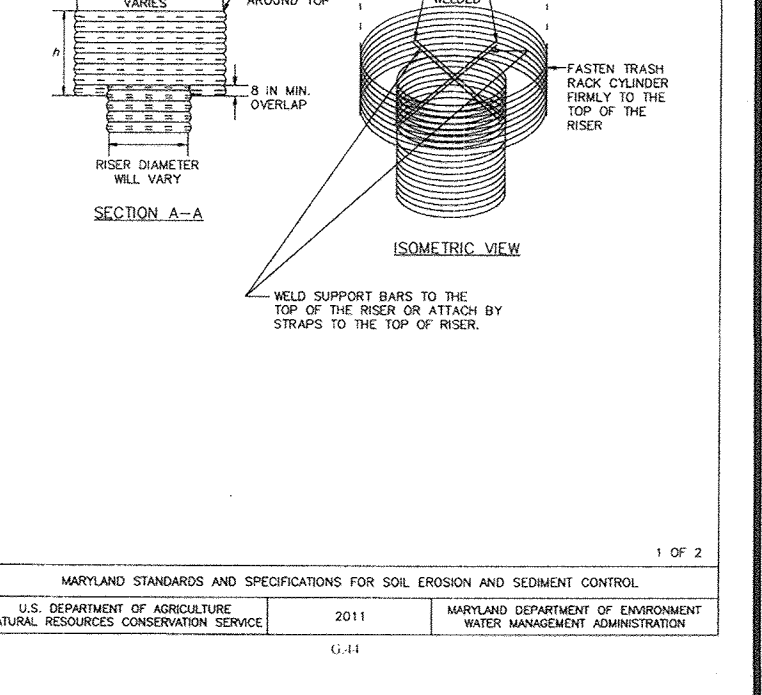
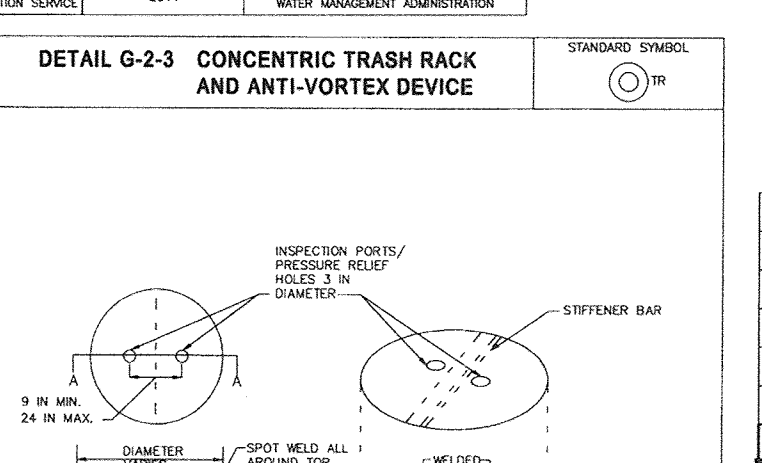
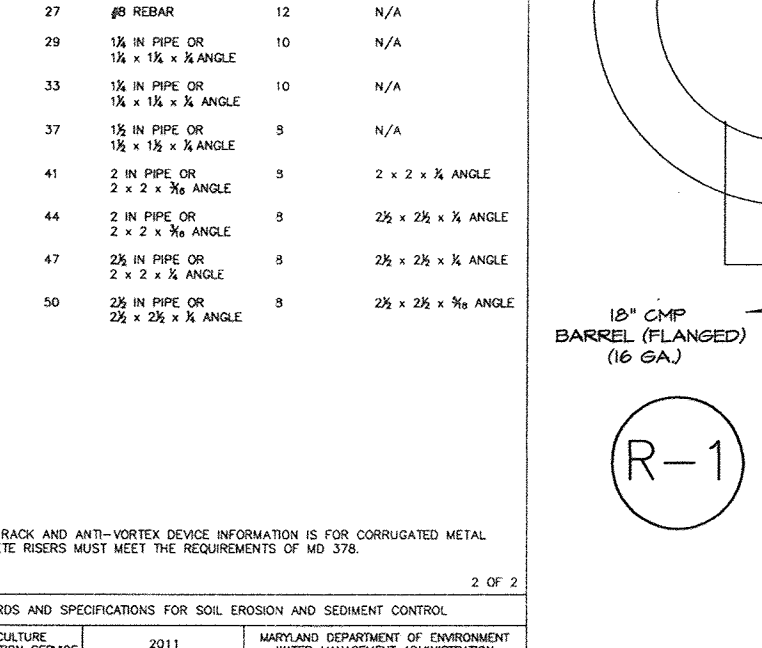
**CONSTRUCTION SPECIFICATIONS FOR DIVERSION PIPE:**

- USE 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
- SET TOP OF INNER AND OUTER PIPES MINIMUM 18" ABOVE ADJACENT WATER SURFACE ELEVATION OR RISER GROUND ELEVATION WHEN DRAINING A BASIN.
- BACKFILL AROUND OUTER PIPE WITH 1/2" TO 3/4" WASH CLEAN SAND OR EQUIVALENT RECYCLED CONCRETE. EXCEED EXISTING SURFACE ELEVATION BY 18" TO 24" TO PREVENT FLOODING.
- DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
- A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEKSTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.



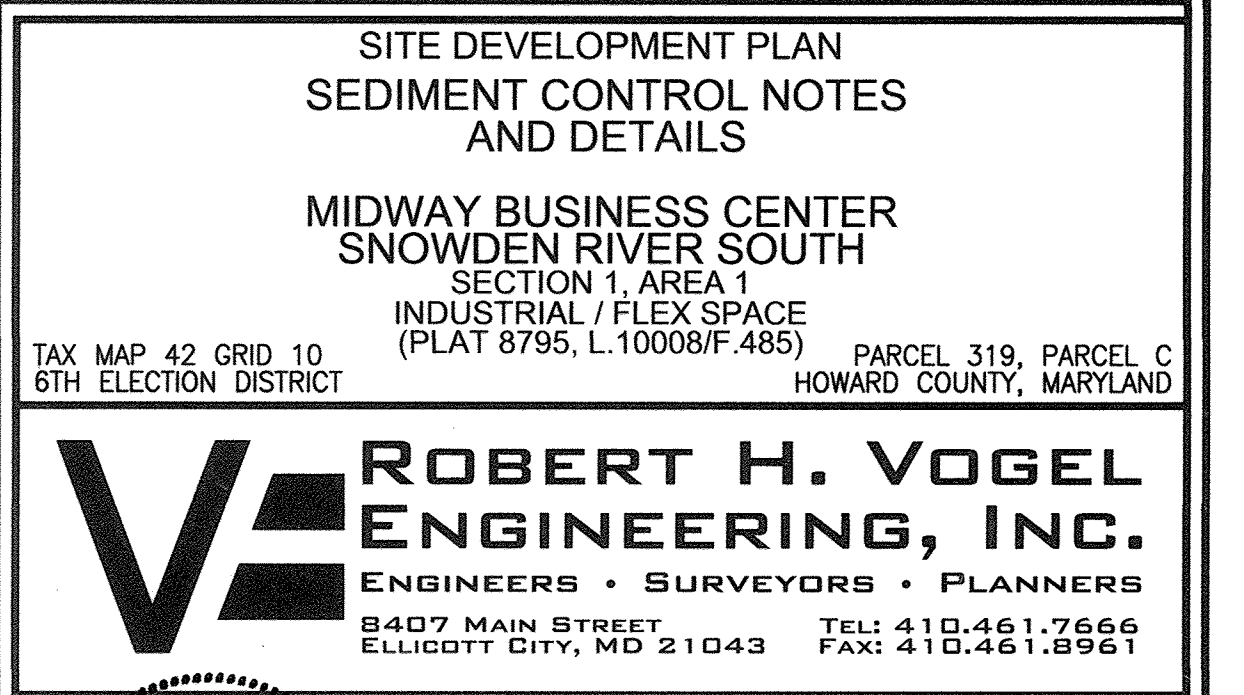
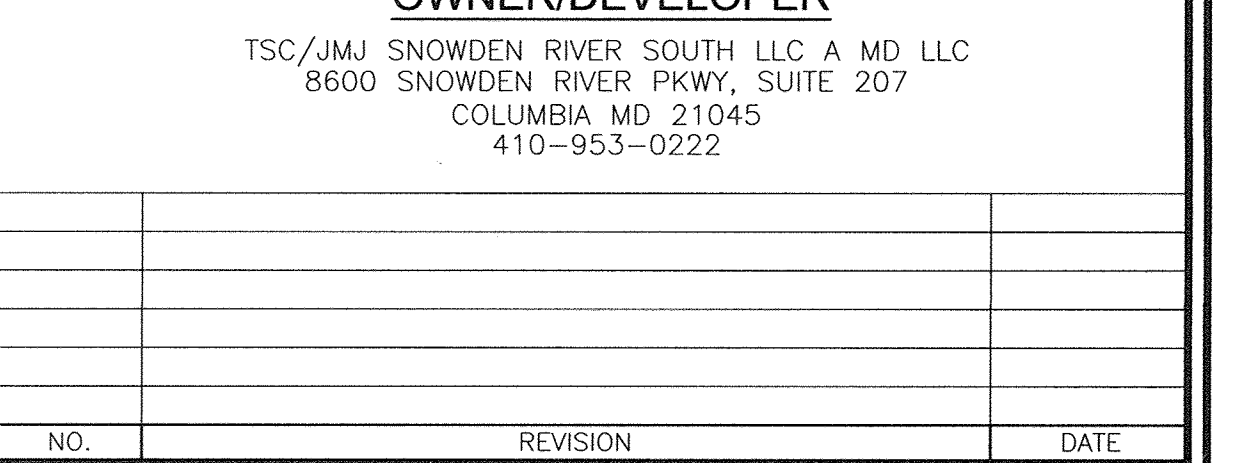
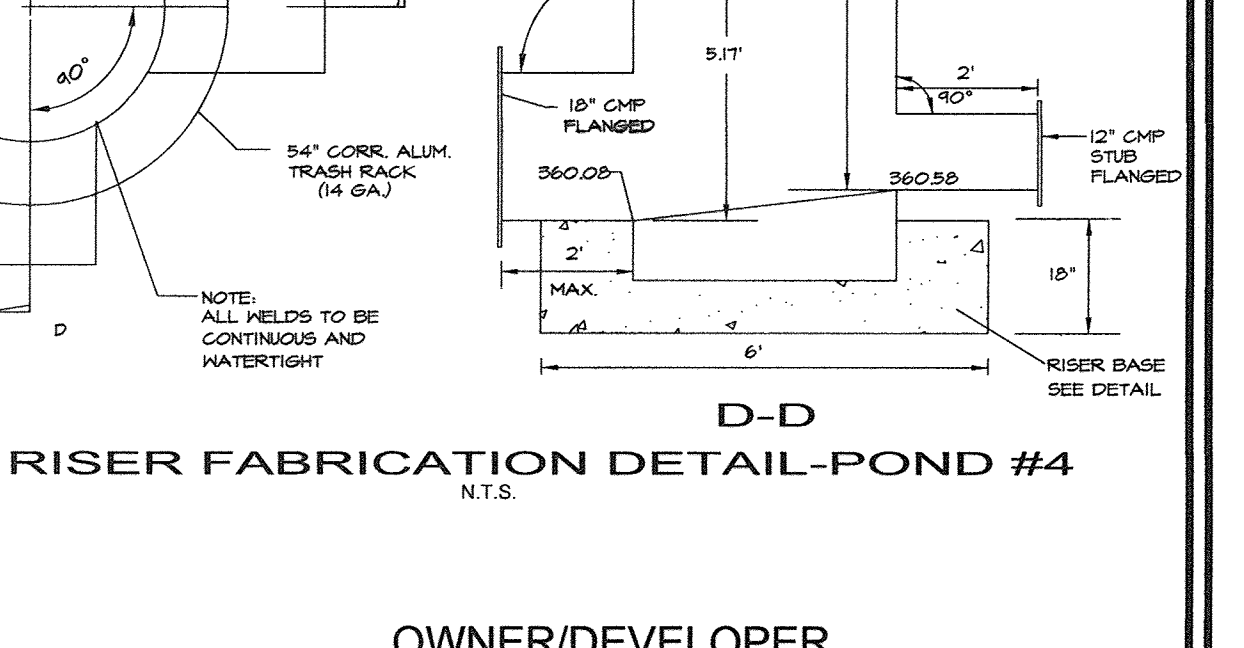
**CONSTRUCTION SPECIFICATIONS FOR CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE:**

- USE CORRUGATED METAL OR PLASTIC PIPE WITH 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
- SET TOP OF INNER AND OUTER PIPES MINIMUM 18" ABOVE ADJACENT WATER SURFACE ELEVATION OR RISER GROUND ELEVATION WHEN DRAINING A BASIN.
- BACKFILL AROUND OUTER PIPE WITH 1/2" TO 3/4" WASH CLEAN SAND OR EQUIVALENT RECYCLED CONCRETE. EXCEED EXISTING SURFACE ELEVATION BY 18" TO 24" TO PREVENT FLOODING.
- DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
- A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEKSTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.



**CONSTRUCTION SPECIFICATIONS FOR CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE:**

- USE CORRUGATED METAL OR PLASTIC PIPE WITH 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
- SET TOP OF INNER AND OUTER PIPES MINIMUM 18" ABOVE ADJACENT WATER SURFACE ELEVATION OR RISER GROUND ELEVATION WHEN DRAINING A BASIN.
- BACKFILL AROUND OUTER PIPE WITH 1/2" TO 3/4" WASH CLEAN SAND OR EQUIVALENT RECYCLED CONCRETE. EXCEED EXISTING SURFACE ELEVATION BY 18" TO 24" TO PREVENT FLOODING.
- DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
- A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEKSTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.



**CONSTRUCTION SPECIFICATIONS FOR RISER FABRICATION DETAIL-POND #4:**

- USE CORRUGATED METAL OR PLASTIC PIPE WITH 1/2" DIA. PERFORATIONS 6" ON CENTER.
- USE A MINIMUM 12" DIA. INLET PIPE WITH AN OUTER PIPE WITH A MINIMUM 8" DIA. LARGER IN DIAMETER. BOTTOM OF EACH PIPE MUST BE WITHIN 1" OF WATER TIGHT SEAL.
- WELD EACH PIPE WITH 1/2" DIA. GALVANIZED HANGING CLIPS. ON INNER PIPE WELD NON-WORKING GEOTEKSTILE, AS SHOWN IN SECTION. HANGING CLIPS MUST BE 1/2" DIA. LARGER IN DIAMETER THAN EQUIVALENT REINFORCING CONCRETE. 8" HOLES IN OUTER PIPE FOR PIPE PLACEMENT.
- SET TOP OF INNER AND OUTER PIPES MINIMUM 18" ABOVE ADJACENT WATER SURFACE ELEVATION OR RISER GROUND ELEVATION WHEN DRAINING A BASIN.
- BACKFILL AROUND OUTER PIPE WITH 1/2" TO 3/4" WASH CLEAN SAND OR EQUIVALENT RECYCLED CONCRETE. EXCEED EXISTING SURFACE ELEVATION BY 18" TO 24" TO PREVENT FLOODING.
- DISCHARGE TO A STABLE AREA AT A NON-EROSIVE RATE.
- A REMOVABLE PUMPING STATION REQUIRES FREQUENT MAINTENANCE. IF SYSTEM CLOGS, PULL OUT INNER PIPE AND REPLACE GEOTEKSTILE. KEEP POINT OF DISCHARGE FREE OF EROSION.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signature]  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 4/23/13

BY THE DEVELOPER:  
 [Signature]  
 DATE: 4.9.13

BY THE ENGINEER:  
 [Signature]  
 DATE: 4/10/13

SITE UTILITY NOTES:  
 1. PLACE EXCAVATED MATERIAL ON UPHILL SIDE OF TRENCH.  
 2. BACKFILL AND STABILIZE TRENCH AT THE END OF EACH DAY.  
 3. MAINTAIN VEHICLE ACCESS ALONG DRIVEWAY AT ALL TIMES.

NO AS-BUILT INFORMATION ON THIS SHEET  
 NOTE:  
 ALL UNDERGROUND SWM STRUCTURES MUST REMAIN SEPARATE OR BULKHEADED FROM ENTERING STORMDRAIN UNTIL ALL CONTRIBUTING AREAS ARE PERMANENTLY STABILIZED AND WRITTEN PERMISSION IS PROVIDED BY INSPECTOR TO ALLOW OPENING FOR FLOW. ANY WATER COLLECTED IN WORK AREA SHALL BE PUMPED THROUGH FILTERBAG.

PROFESSIONAL CERTIFICATE  
 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.  
 EXPIRATION DATE: 08-31-2014  
 [Signature]  
 ROBERT H. VOGEL, PE No. 16193

**SITE DEVELOPMENT PLAN  
 SEDIMENT CONTROL NOTES  
 AND DETAILS**

MIDWAY BUSINESS CENTER  
 SNOWDEN RIVER SOUTH  
 SECTION 1, AREA 1  
 INDUSTRIAL / FLEX SPACE  
 (PLAT 8795, L.10008/F.485)

TAX MAP 42 GRID 10  
 6TH ELECTION DISTRICT

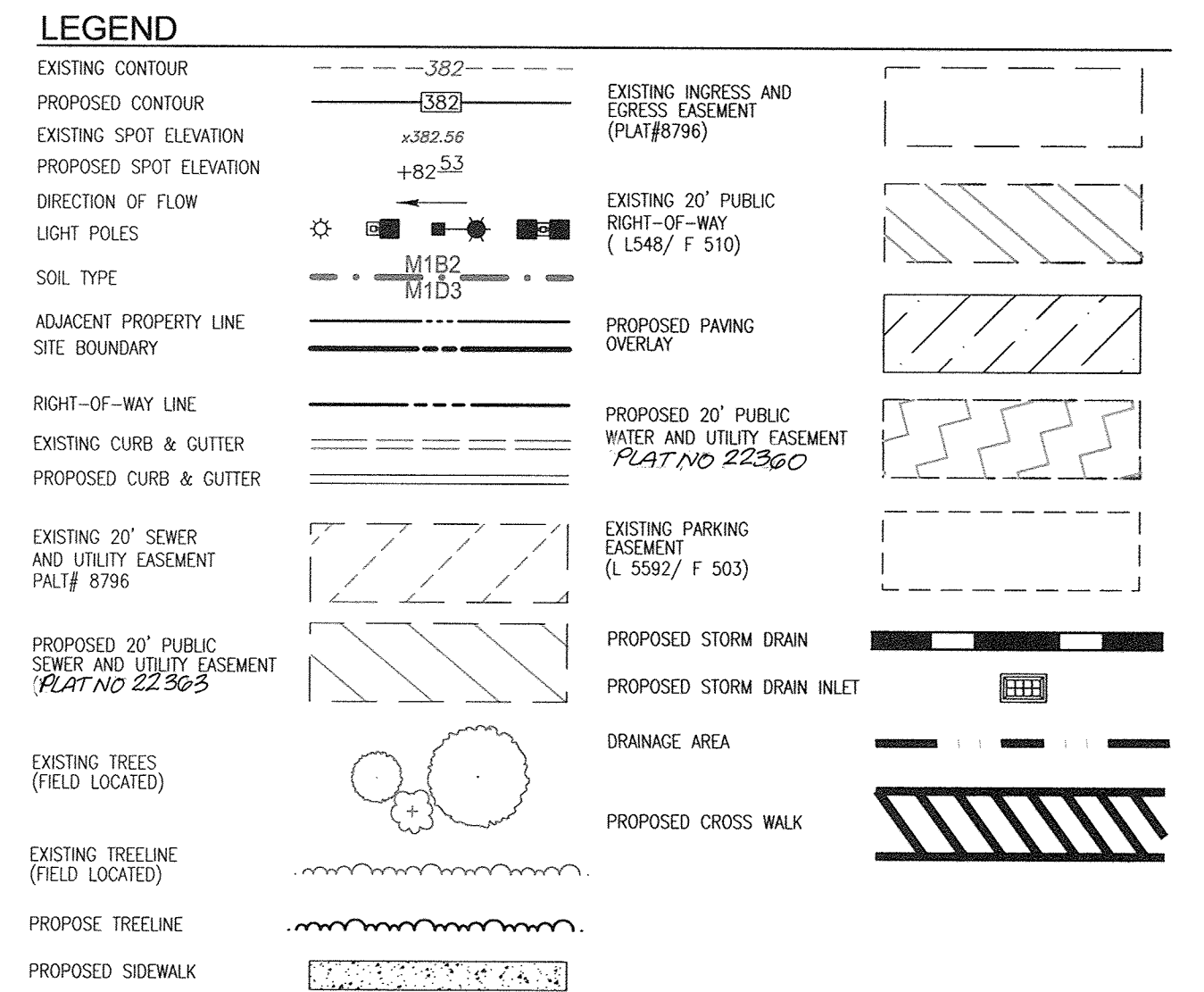
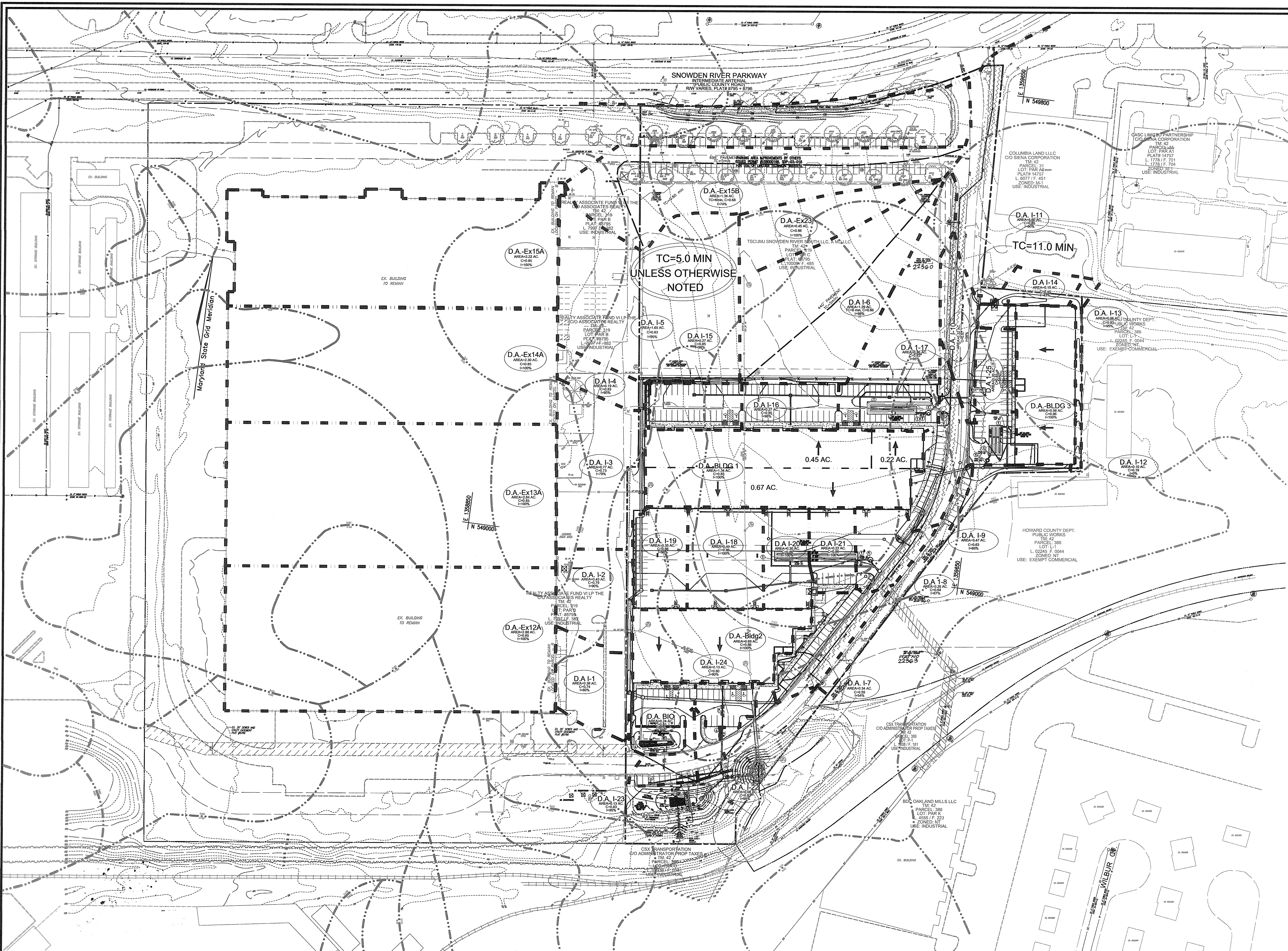
PARCEL 319, PARCEL C  
 HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL  
 ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 8407 MAIN STREET  
 ELLICOTT CITY, MD 21043  
 TEL: 410.461.7666  
 FAX: 410.461.8961









**SOILS LEGEND**

SYMBOL	NAME / DESCRIPTION	GROUP
AdB2	ALDINO SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	D
CmB2	CHILLUM SILT LOAM, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	C
CmC2	CHILLUM SILT LOAM, 5 TO 10 PERCENT SLOPES, MODERATELY ERODED	C
CnB2	CHILLUM FAIRFAX LOAMS, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	C
DnB2	DELANCO SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
KnC2	KEYPORT SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	C
NnB2	NESHAMINY SILT LOAM, 3 TO 8 PERCENT SLOPES, MODERATELY ERODED	B
SlB2	SASSAFRAS LOAM, 1 TO 5 PERCENT SLOPES, MODERATELY ERODED	B
WnB2	WATCHUNG SILT LOAM, 3 TO 8 PERCENT SLOPES	D

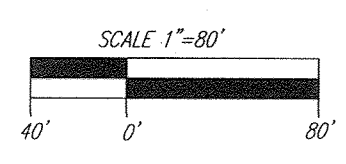
**OWNER/DEVELOPER**  
 TSC/JM SNOWDEN RIVER SOUTH LLC A MD LLC  
 8600 SNOWDEN RIVER PKWY, SUITE 207  
 COLUMBIA MD 21045  
 410-953-0222

NO.	REVISION	DATE

**PLAN VIEW**  
 SCALE: 1"=80'

**AS-BUILT CERTIFICATION FOR PSWM**  
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE AS-BUILT PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWIM FACILITY.

R. H. VOGEL  
 P.E. NAME      P.E. # 16193      DATE 6-18-19



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION      DATE 4/2/19  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT      DATE 5/01/13  
  
 DIRECTOR      DATE 5/6/10

APPROVED:  
 PLANNING BOARD  
 HOWARD COUNTY  
 DATE: April 15, 2010

**SITE DEVELOPMENT PLAN**  
**STORM DRAIN DRAINAGE AREA MAP**  
**AND SOILS MAP**

**MIDWAY BUSINESS CENTER**  
**SNOWDEN RIVER SOUTH**  
 SECTION 1, AREA 1  
 INDUSTRIAL / FLEX SPACE  
 (PLAT 8795, L.10008/F.485)

TAX MAP 42, GRID 10, 6TH ELECTION DISTRICT      PARCEL 319, PARCEL C, HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL**  
**ENGINEERS • SURVEYORS • PLANNERS**  
 8407 MAIN STREET      TEL: 410.461.7666  
 ELLICOTT CITY, MD 21043      FAX: 410.461.8961

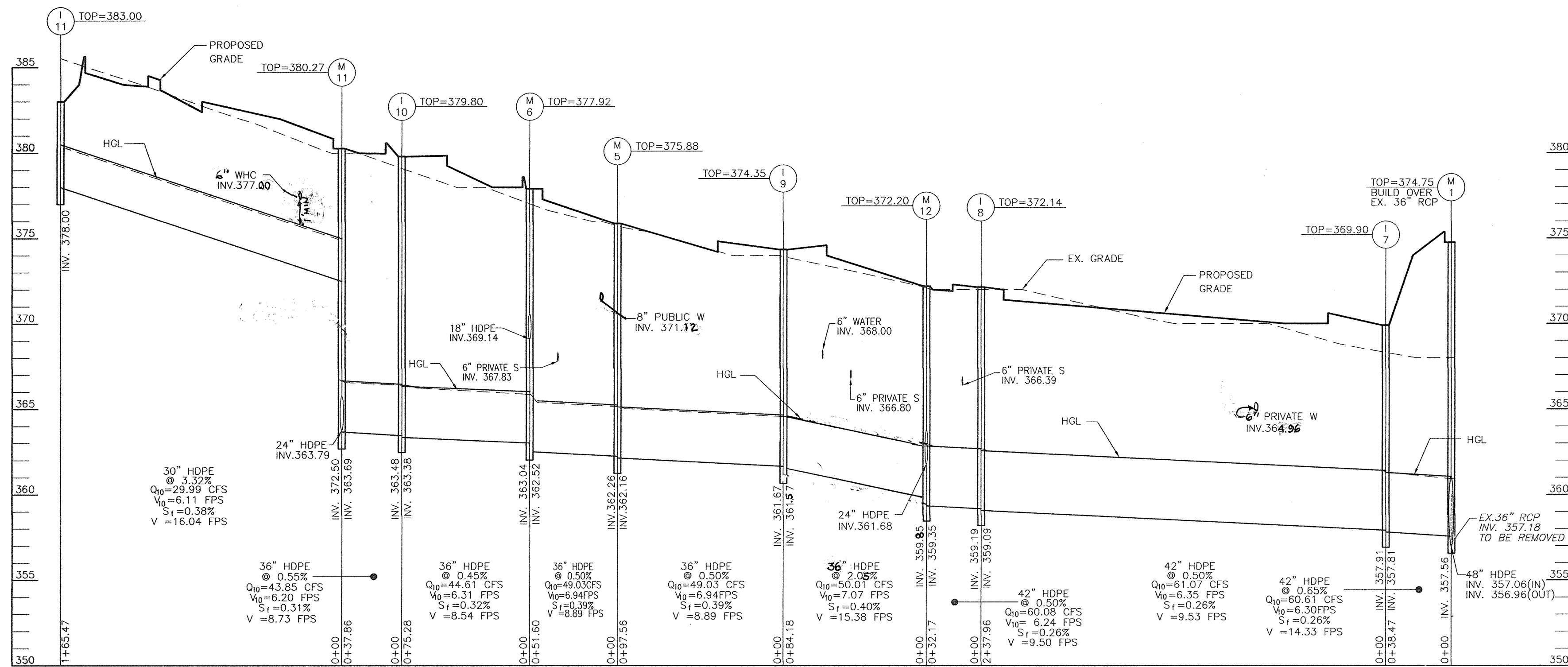
**PROFESSIONAL CERTIFICATE**

DESIGN BY: JAR  
 DRAWN BY: JAR  
 CHECKED BY: RHV  
 DATE: MARCH 2013  
 SCALE: 1"=80'  
 W.O. NO.: 05-03

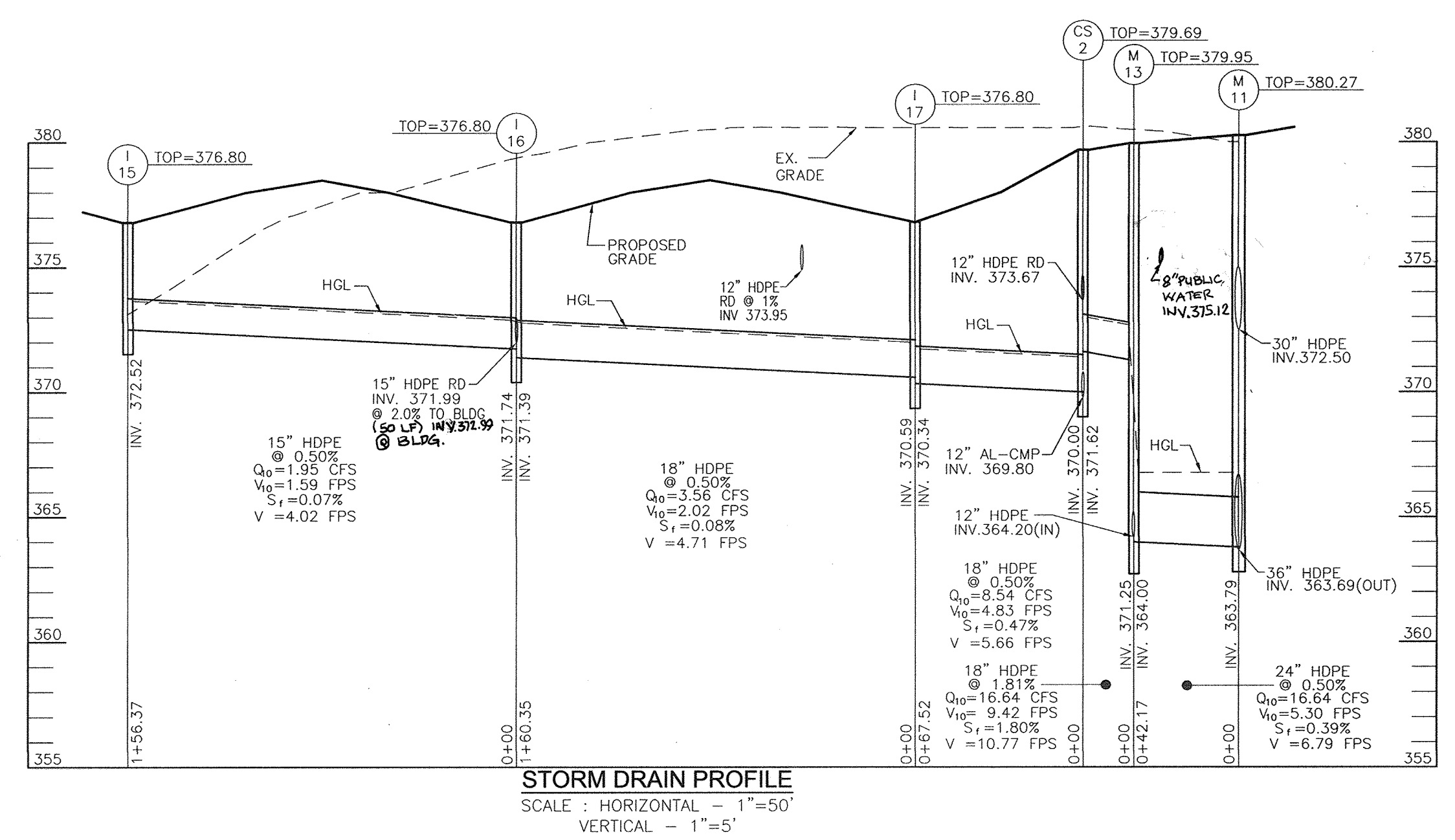
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE 06-27-2014.

ROBERT H. VOGEL, P.E. No. 16193

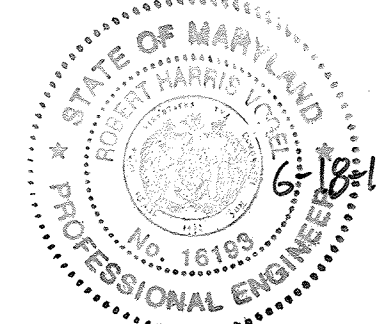




**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL = 1"=50'  
VERTICAL = 1"=5'

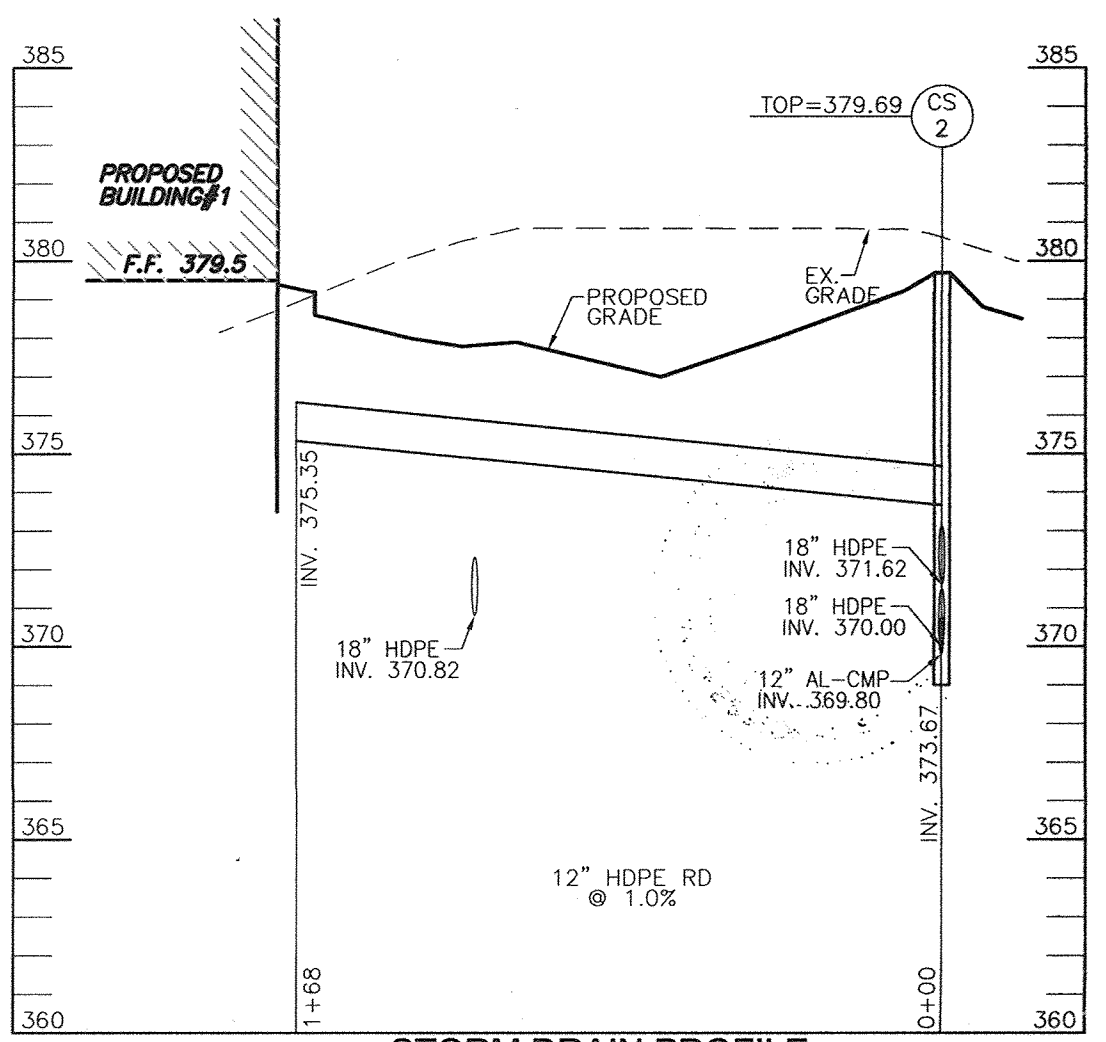


**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL = 1"=50'  
VERTICAL = 1"=5'



AS-BUILT CERTIFICATION FOR PSWM  
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT EROSION OF THE UNDERGROUND SWEDE FACILITY.

16193 6-18-19  
R.H.V. DATE



**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL = 1"=50'  
VERTICAL = 1"=5'

**OWNER/DEVELOPER**

TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
8600 SNOWDEN RIVER PKWY, SUITE 207  
COLUMBIA MD 211045  
410-953-0222

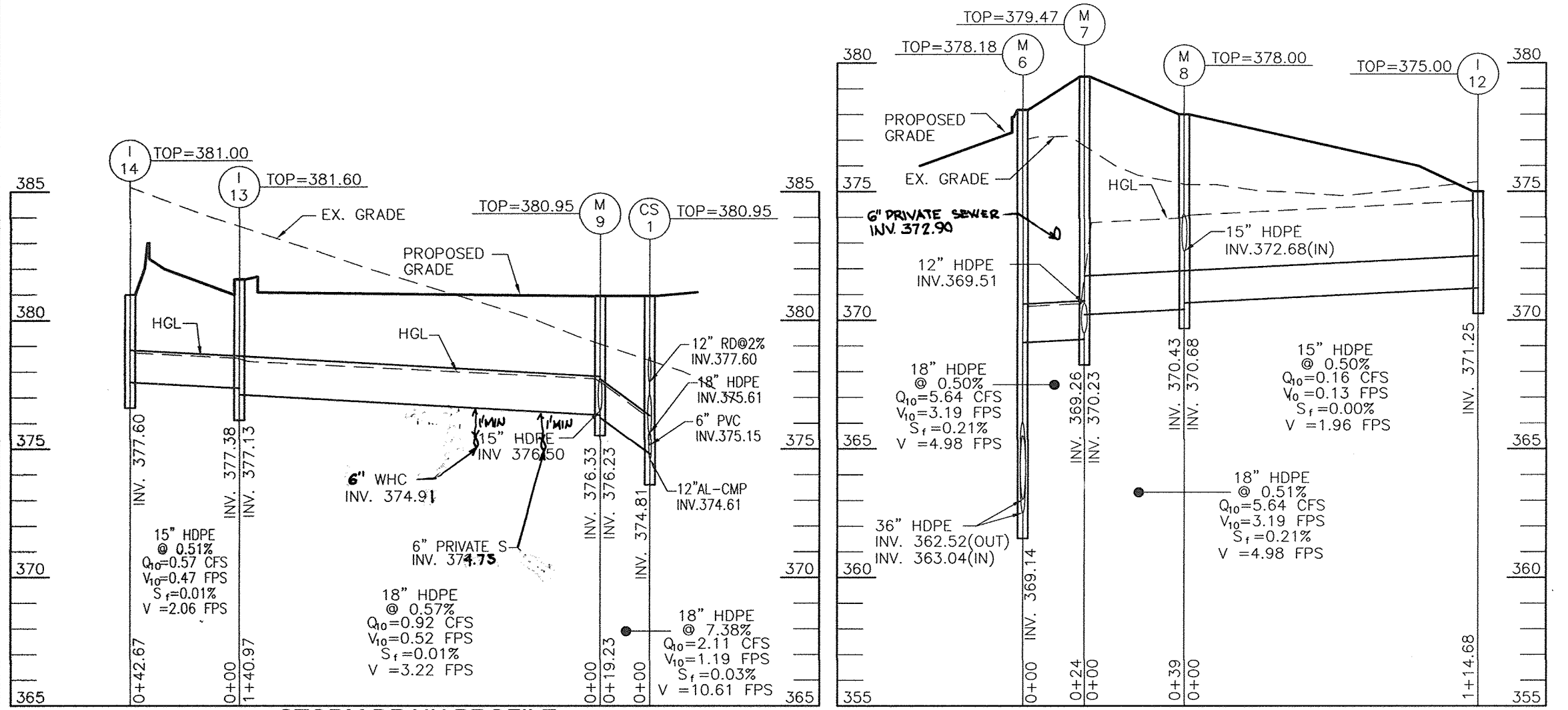
NO.	TYPE	LOCATION	TOP ELEV.	INV. IN	INV. OUT	COMMENTS
I-1	DOUBLE TYPE 'S' INLET	N 548762.86 E 1359144.44	367.10	358.24	358.14	HO. CO. STANDARD D-4.23
I-2	DOUBLE TYPE 'S' INLET	N 548910.45 E 1359125.47	366.70	359.03	359.93	HO. CO. STANDARD D-4.23
I-3	DOUBLE TYPE 'S' INLET	N 549085.41 E 1359120.73	366.60	359.87	359.87	HO. CO. STANDARD D-4.23
I-4	DOUBLE TYPE 'S' INLET	N 549219.57 E 1359103.66	368.50	360.61	360.51	HO. CO. STANDARD D-4.23
I-5	DOUBLE TYPE 'S' INLET	N 549267.35 E 1359097.38	368.50	360.88	360.85	HO. CO. STANDARD D-4.23
I-6	MSHA 20' COG	N 549288.52 E 1359261.37	378.10	371.42	370.28	MSHA 374.31
I-7	MSHA 10' COG (MODIFIED FOR 7" CURB)	N 548778.24 E 1359384.17	369.90	357.91	357.81	MSHA 374.62 (72" DIA)
I-8	MSHA 10' COG (MODIFIED FOR 7" CURB)	N 548981.99 E 1359507.10	372.14	359.19	359.09	MSHA 374.62 (72" DIA)
I-9	MSHA 10' COG (MODIFIED FOR 7" CURB)	N 549082.16 E 1359566.10	374.35	361.67	361.57	MSHA 374.62 (60" DIA)
I-10	MSHA 10' COG (MODIFIED FOR 7" CURB)	N 549269.45 E 1359631.76	379.80	363.48	363.38	MSHA 374.62 (60" DIA)
I-11	DOUBLE TYPE 'S' INLET	N 549472.56 E 1359623.30	383.00	-	378.00	HO. CO. STANDARD D-4.23
I-12	YARD INLET	N 549217.35 E 1359817.36	375.00	-	371.25	HO. CO. STANDARD D-4.14
I-13	TYPE 'A'-5' INLET	N 549429.39 E 1359674.65	381.60	377.38	377.13	HO. CO. STANDARD D-4.01
I-14	SINGLE TYPE 'S' INLET	N 549469.86 E 1359669.50	381.00	-	377.60	HO. CO. STANDARD D-4.14
I-15	SINGLE TYPE 'S' INLET	N 549252.68 E 1359185.10	376.80	-	372.52	HO. CO. STANDARD D-4.22
I-16	SINGLE TYPE 'S' INLET	N 549272.58 E 1359340.26	376.80	371.74	371.39	HO. CO. STANDARD D-4.22
I-17	SINGLE TYPE 'S' INLET	N 549290.68 E 1359499.52	376.80	370.59	370.34	HO. CO. STANDARD D-4.22
I-18	SINGLE TYPE 'S' INLET	N 548946.07 E 1359278.40	371.10	367.25	367.00	HO. CO. STANDARD D-4.22
I-19	SINGLE TYPE 'S' INLET	N 548930.87 E 1359159.30	371.20	-	367.85	HO. CO. STANDARD D-4.22
I-20	SINGLE TYPE 'S' INLET	N 548972.95 E 1359379.95	371.10	367.18	366.38	HO. CO. STANDARD D-4.22
I-21	TYPE 'A'-5' INLET	N 548979.40 E 1359423.10	371.60	-	367.50	HO. CO. STANDARD D-4.01
I-22	SINGLE TYPE 'S' INLET	N 548656.60 E 1359309.58	369.50	364.02	363.77	HO. CO. STANDARD D-4.22
I-23	SINGLE TYPE 'S' INLET	N 548621.74 E 1359197.66	368.50	-	364.64	HO. CO. STANDARD D-4.22
I-24	TYPE 'A'-5' INLET	N 548725.10 E 1359302.11	373.30	369.45	369.20	HO. CO. STANDARD D-4.01
I-25	TYPE 'A'-5' INLET	N 549285.31 E 1359644.29	380.57	-	376.74	HO. CO. STANDARD D-4.01
I-26	TYPE 'D' INLET	N 548685.82 E 1359173.53	371.83	367.33	365.03	HO. CO. STANDARD D-4.11
M-1	4'-0" STANDARD PRECAST MANHOLE	N 548772.70 E 1359346.10	374.75	367.56	352.21	MSHA MD-384.05
M-2	6'-0" STANDARD PRECAST MANHOLE	N 548757.59 E 1359167.45	374.95	368.09	357.95	MSHA MD-384.05
M-3	6'-0" STANDARD PRECAST MANHOLE	N 548861.03 E 1359131.85	367.80	368.74	358.64	MSHA MD-384.05
M-4	6'-0" STANDARD PRECAST MANHOLE	N 548928.64 E 1359142.04	371.40	359.23	359.13	MSHA MD-384.05
M-5	5'-0" STANDARD PRECAST MANHOLE	N 549175.51 E 1369593.08	375.88	362.26	362.16	MSHA MD-384.03
M-6	5'-0" STANDARD PRECAST MANHOLE	N 549194.75 E 1359641.11	378.18	369.14	362.52	HO. CO. STANDARD G-5.13
M-7	4'-0" STANDARD PRECAST MANHOLE	N 549197.84 E 1359664.91	379.47	370.23	369.26	HO. CO. STANDARD G-5.12
M-8	4'-0" STANDARD PRECAST MANHOLE	N 549202.86 E 1359703.59	378.00	372.68	370.43	HO. CO. STANDARD G-5.12
M-9	4'-0" STANDARD PRECAST MANHOLE	N 549287.69 E 1359692.68	380.95	376.33	376.23	HO. CO. STANDARD G-5.12
M-10	NOT USED					
M-11	5'-0" STANDARD PRECAST MANHOLE	N 549307.17 E 1359628.54	380.27	374.90	363.69	MSHA MD-384.03
M-12	6'-0" STANDARD PRECAST MANHOLE	N 549010.71 E 1359521.61	372.20	361.83	359.35	MSHA MD-384.05
M-13	4'-0" STANDARD PRECAST MANHOLE	N 549301.72 E 1359586.73	379.95	364.25	364.00	HO. CO. STANDARD G-5.12
M-14	4'-0" STANDARD PRECAST MANHOLE	N 549016.76 E 1359511.36	372.00	367.47	361.78	HO. CO. STANDARD G-5.12
M-15	4'-0" STANDARD PRECAST MANHOLE	N 548650.74 E 1359331.63	366.30	363.33	364.75	HO. CO. STANDARD G-5.12
M-16	NOT USED					
HW-1	TYPE 'A' HEADWALL (18" DIA PIPE)	N 548549.60 E 1359255.38	356.00	-	353.00	HO. CO. STANDARD D-5.21
HW-2	TYPE 'A' HEADWALL (48" DIA PIPE)	N 548677.52 E 1359367.31	355.75	-	350.25	HO. CO. STANDARD D-5.21
HW-3	TYPE 'A' HEADWALL (18" DIA PIPE)	N 548657.01 E 1359358.99	353.25	-	350.25	HO. CO. STANDARD D-5.21
ES-1	END SECTION (12" DIA PIPE)	N 548615.33 E 1359289.35	-	-	362.38	HO. CO. STANDARD D-5.51
CS-1	4'-0" STANDARD PRECAST MANHOLE	N 549268.62 E 1359695.14	380.95	375.15	374.61	HO. CO. STANDARD G-5.12
CS-2	4'-0" STANDARD PRECAST MANHOLE	N 549295.49 E 1359565.53	379.69	374.00	370.80	HO. CO. STANDARD G-5.12
CS-3	4'-0" STANDARD PRECAST MANHOLE	N 548997.95 E 1359370.94	372.67	368.88	368.18	HO. CO. STANDARD G-5.12
CS-4	4'-0" STANDARD PRECAST MANHOLE	N 548647.16 E 1359316.04	368.34	363.33	363.23	HO. CO. STANDARD G-5.12
TR-1	ACO POWER DRAIN S100K	N 549230.86 E 1359744.87	377.75	-	376.22	CLASS 'D' TRENCH

SIZE	TYPE	LENGTH
6"	PVC-SEWER	814 LF
6"	HDPE ROOF DRAIN	181 LF
6"	SOLID PVC	115 LF
6"	PERF PVC	100 LF
7"	AL-CMP - 16 GA	71 LF
18"	CMP - 16 GA	72 LF
12"	HDPE	384 LF
15"	HDPE	690 LF
18"	HDPE	879 LF
24"	HDPE	336 LF
30"	HDPE	207 LF
36"	HDPE	341 LF
42"	HDPE	675 LF
48"	HDPE	450 LF
8"	AL-CMP	416 LF
60"	AL-CMP	273 LF
8"	DI WATER CLASS 54	142 LF

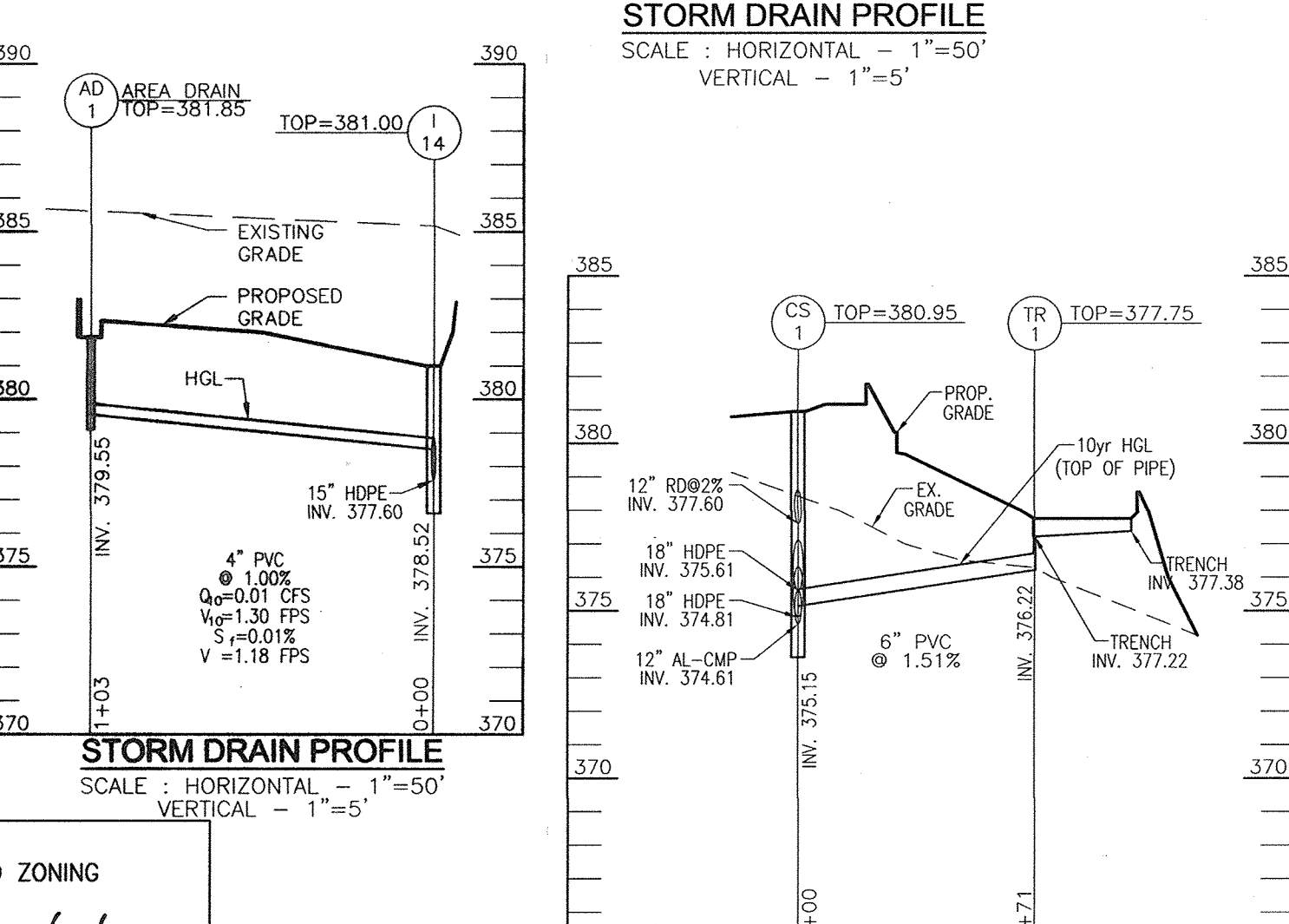
PIPE BEDDING TO BE CLASS "C", SEE GENERAL NOTE 24.

SMH-2	4'-0" STANDARD PRECAST MANHOLE	N 548974.89 E 1359541.31	372.00	368.33	366.12	HO. CO. STANDARD G-5.12
SMH-3	4'-0" STANDARD PRECAST MANHOLE	N 549062.32 E 1359521.62	373.70	367.03	366.93	HO. CO. STANDARD G-5.12
SMH-4	4'-0" STANDARD PRECAST MANHOLE	N 549038.98 E 1359341.45	374.50	368.06	367.96	HO. CO. STANDARD G-5.12
SMH-5	4'-0" STANDARD PRECAST MANHOLE	N 548930.23 E 1359515.00	372.35	366.56	366.46	HO. CO. STANDARD G-5.12
SMH-6	4'-0" STANDARD PRECAST MANHOLE	N 549032.26 E 1359572.74	373.10	368.84	366.54	HO. CO. STANDARD G-5.12
SMH-7	4'-0" STANDARD PRECAST MANHOLE	N 549112.47 E 1359617.02	374.68	367.45	366.35	HO. CO. STANDARD G-5.12
SMH-8	4'-0" STANDARD PRECAST MANHOLE	N 549201.14 E 1359627.06	377.32	367.99	367.89	HO. CO. STANDARD G-5.12
SMH-9	4'-0" STANDARD PRECAST MANHOLE	N 549297.95 E 1359617.04	380.07	368.58	368.48	HO. CO. STANDARD G-5.12

NOTE: 1. TOP ELEVATIONS ARE AT CENTER TOP OF HEADPIECE FOR TYPE 'A'-10' AND TOP OF MANHOLE COVER FOR PRECAST MANHOLES.  
2. FOR TOP SLOPE SLOPES SEE GRADING PLAN.  
3. SEE ARCHITECTURAL PLANS FOR ROOF DRAIN DETAILS.  
4. ALL CUSTOM AND NON-STANDARD STRUCTURES TO BE DESIGNED BY A QUALIFIED STRUCTURAL ENGINEER.



**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL = 1"=50'  
VERTICAL = 1"=5'



**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL = 1"=50'  
VERTICAL = 1"=5'

APPROVED  
PLANNING BOARD  
of HOWARD COUNTY  
DATE April 15, 2010

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DIRECTOR

**SITE DEVELOPMENT PLAN**  
**STORM DRAIN PROFILES**  
**MIDWAY BUSINESS CENTER**  
**SNOWDEN RIVER SOUTH**  
SECTION 1, AREA 1  
INDUSTRIAL / FLEX SPACE  
(PLAT 8795, L.10008/F.485) PARCEL 319, PARCEL C  
HOWARD COUNTY, MARYLAND

TAX MAP 42 GRID 10  
6TH ELECTION DISTRICT

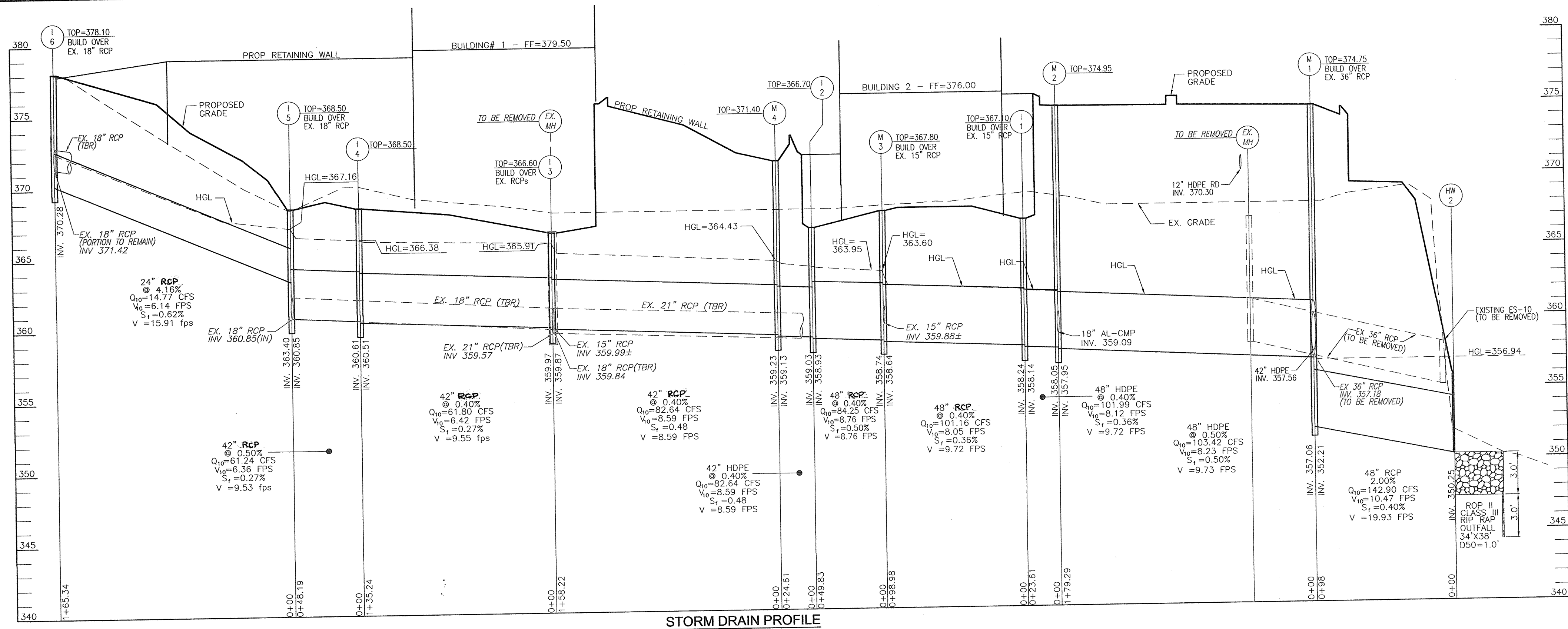
**ROBERT H. VOGEL**  
**ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET  
ELICOTT CITY, MD 21043  
TEL: 410.461.7666  
FAX: 410.461.8961

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHV  
DATE: MARCH 2013  
SCALE: AS SHOWN  
W.O. NO.: 05-03

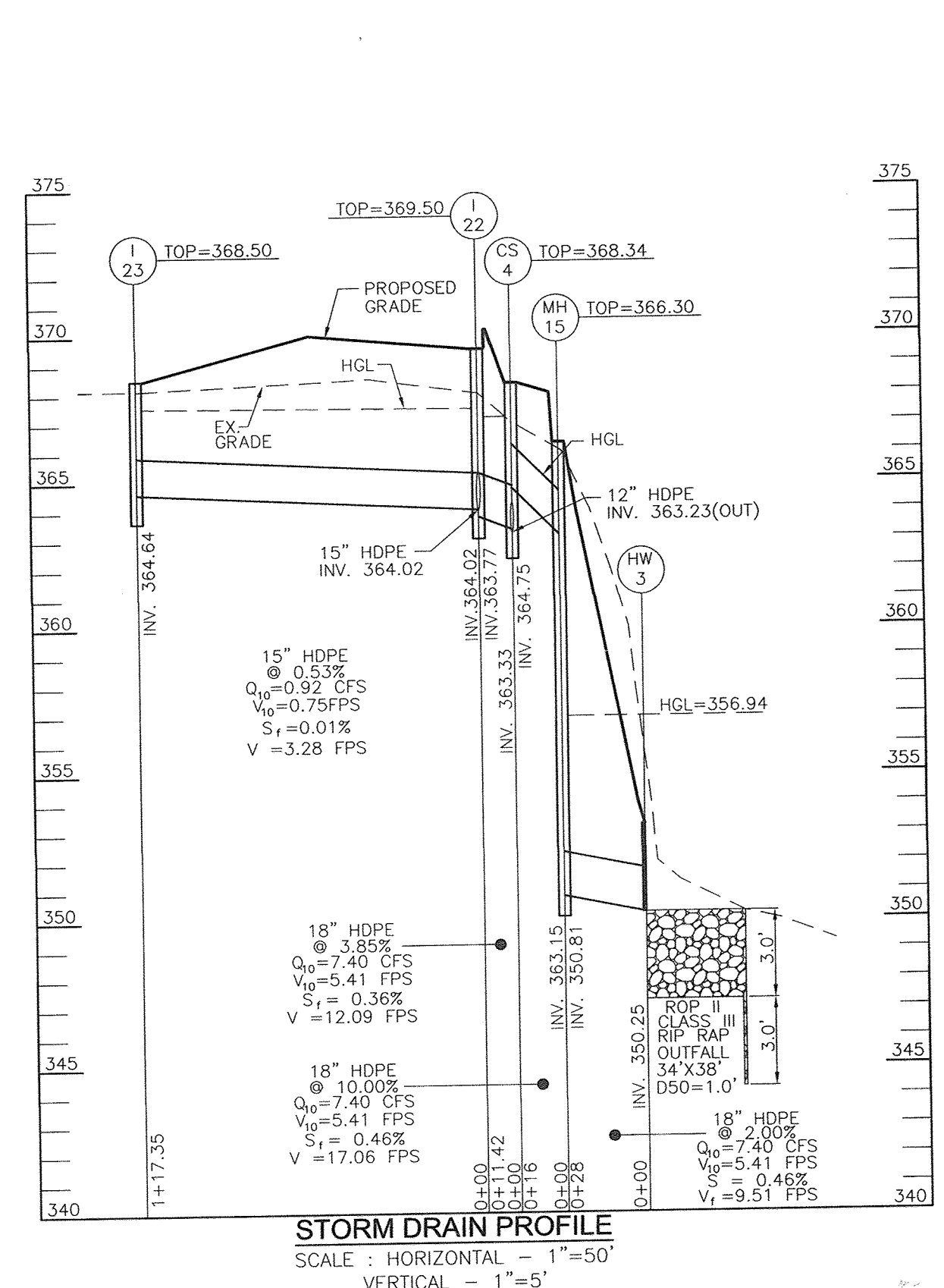
PROFESSIONAL CERTIFICATE  
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A duly licensed PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. MY LICENSE NO. IS 16193. EXPIRATION DATE 08-27-2014

11 SHEET OF 24

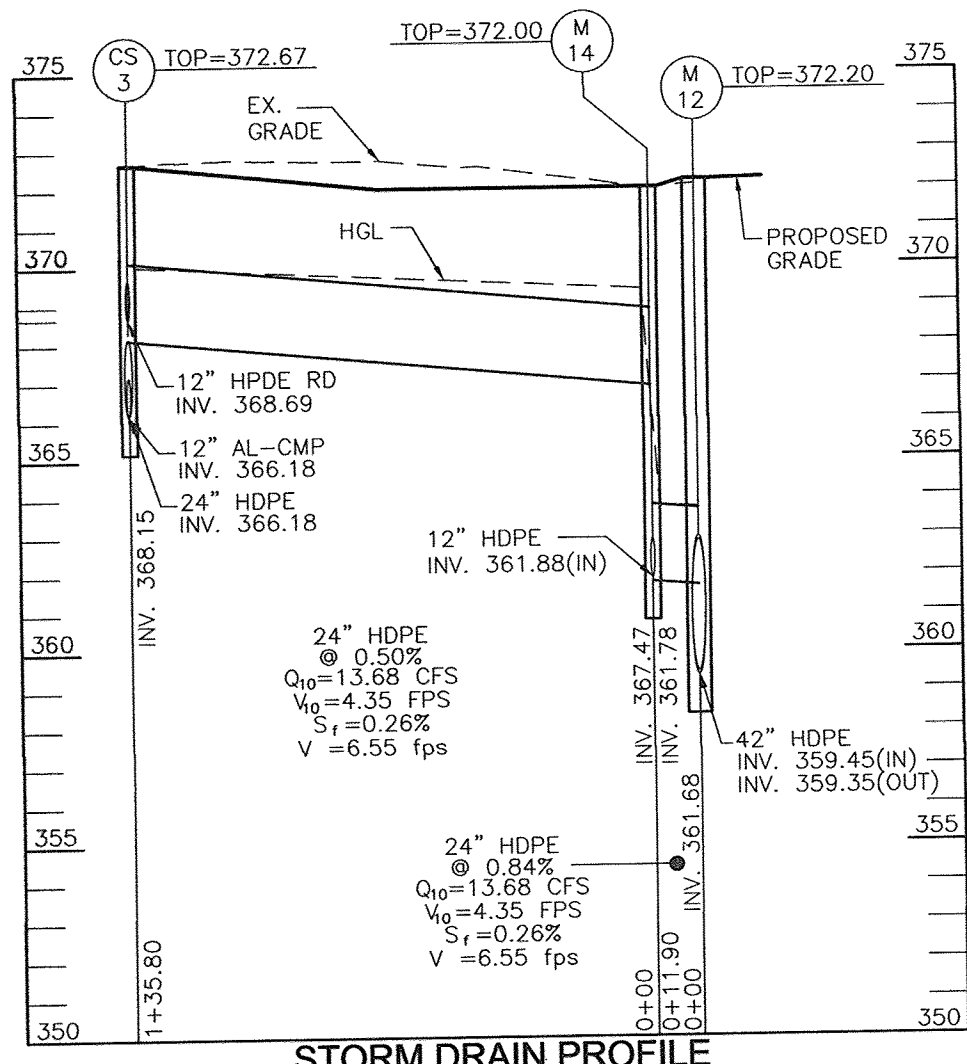




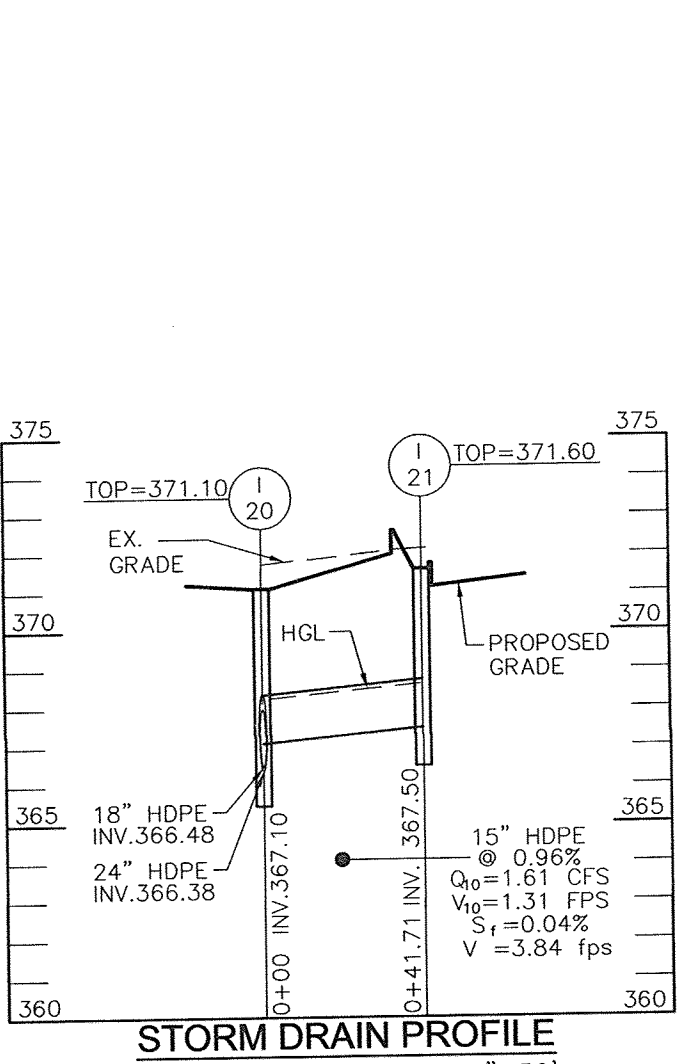
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



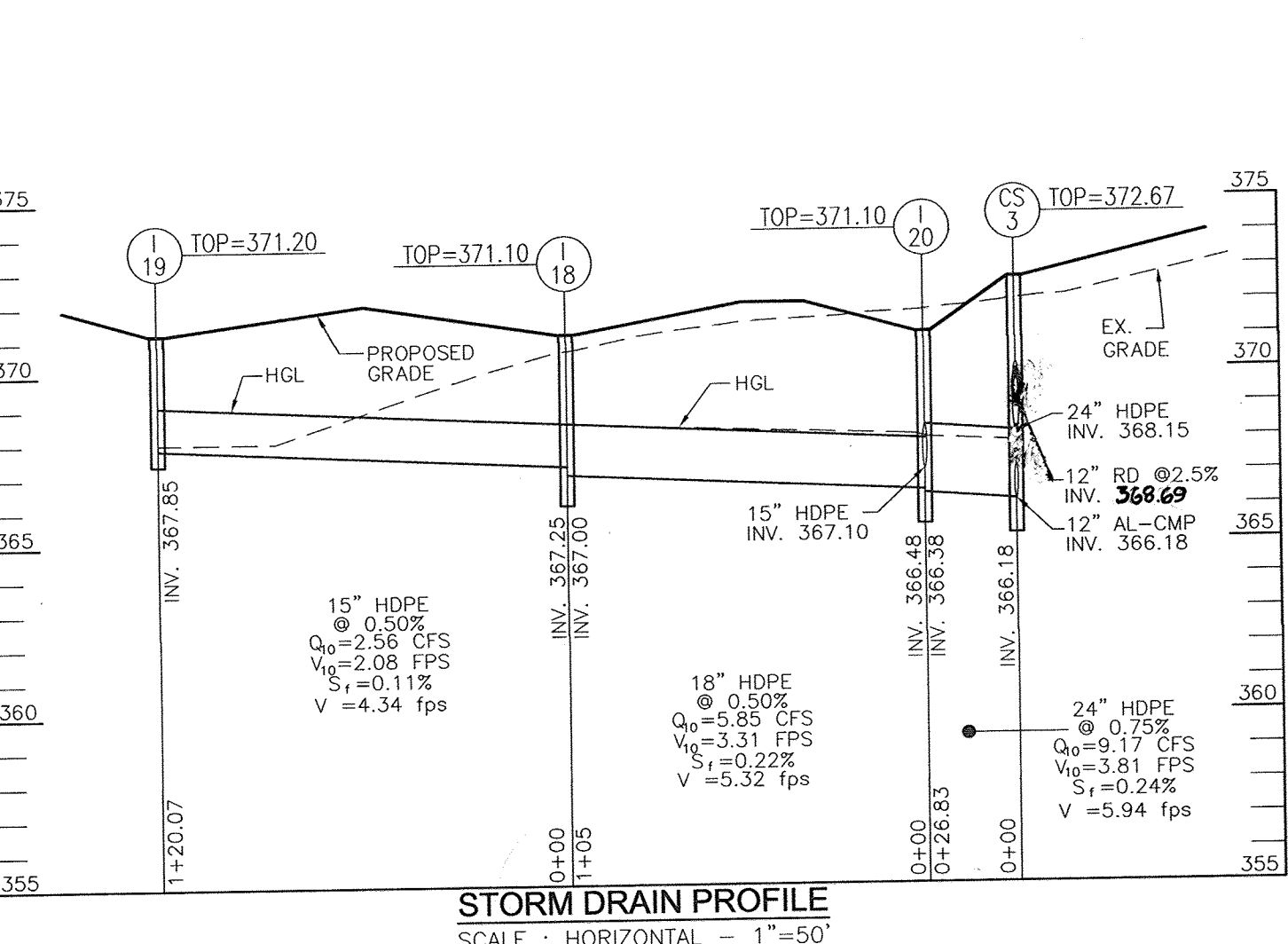
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



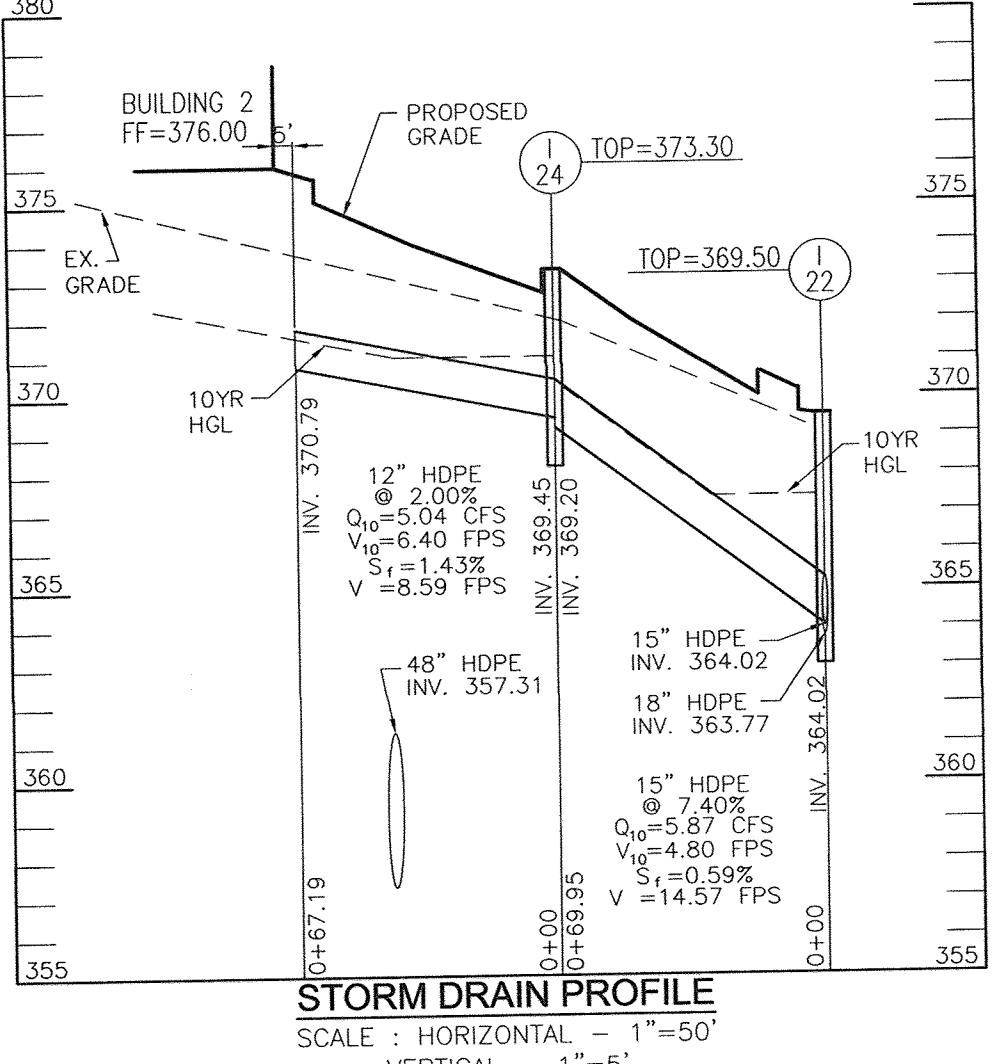
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



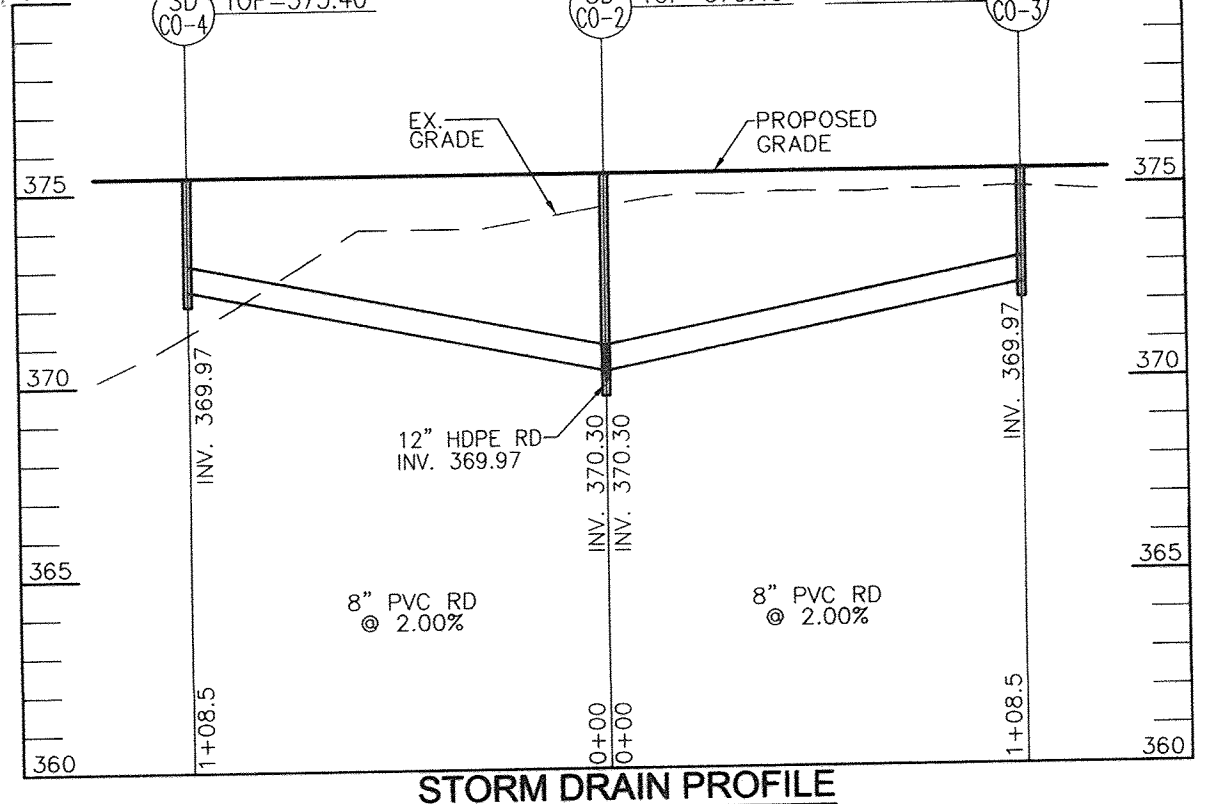
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



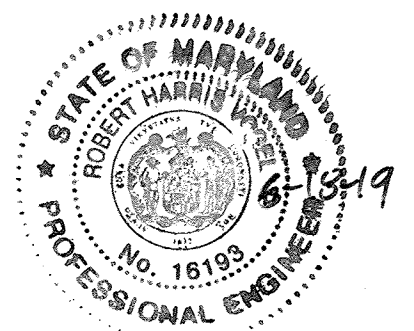
**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



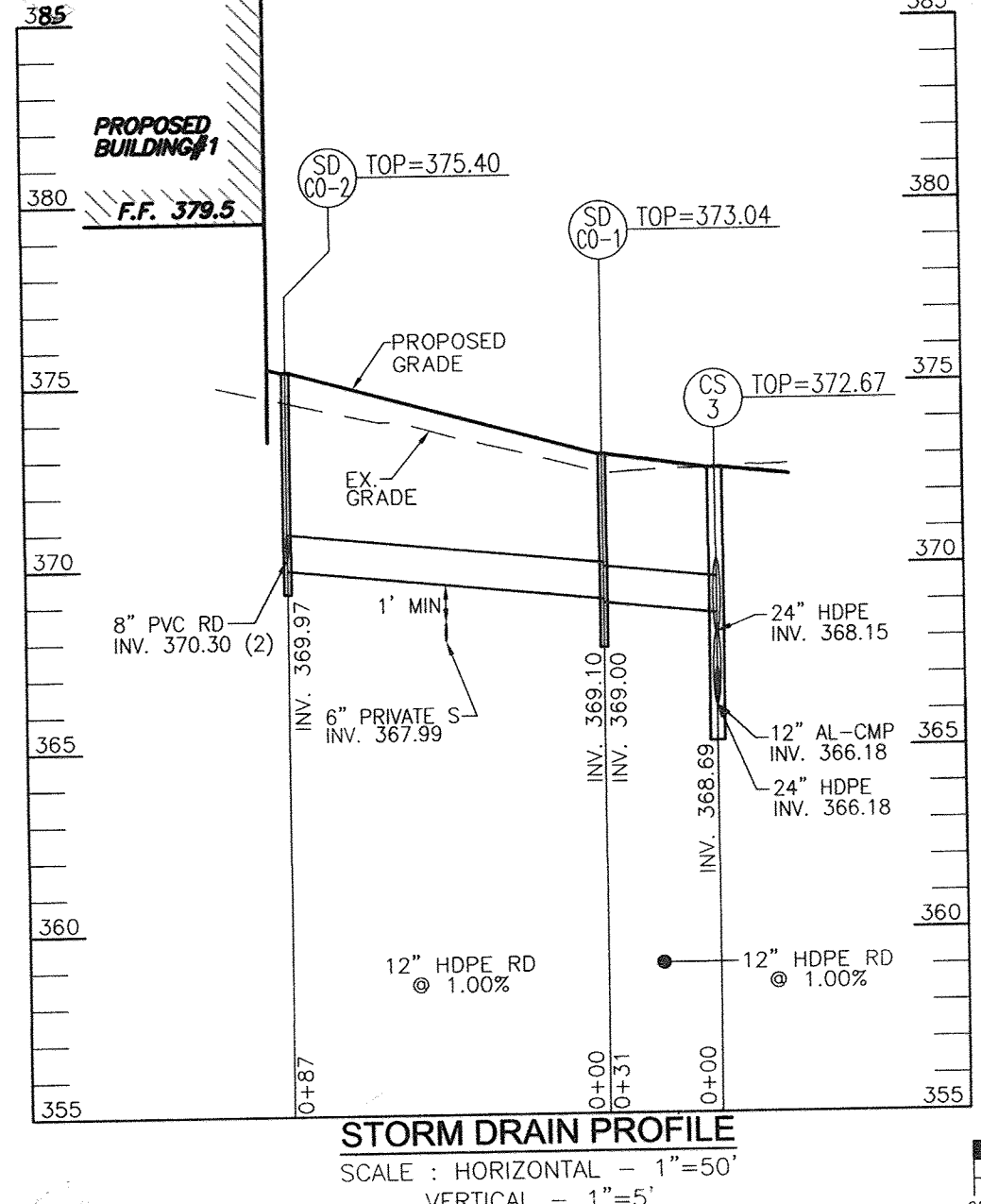
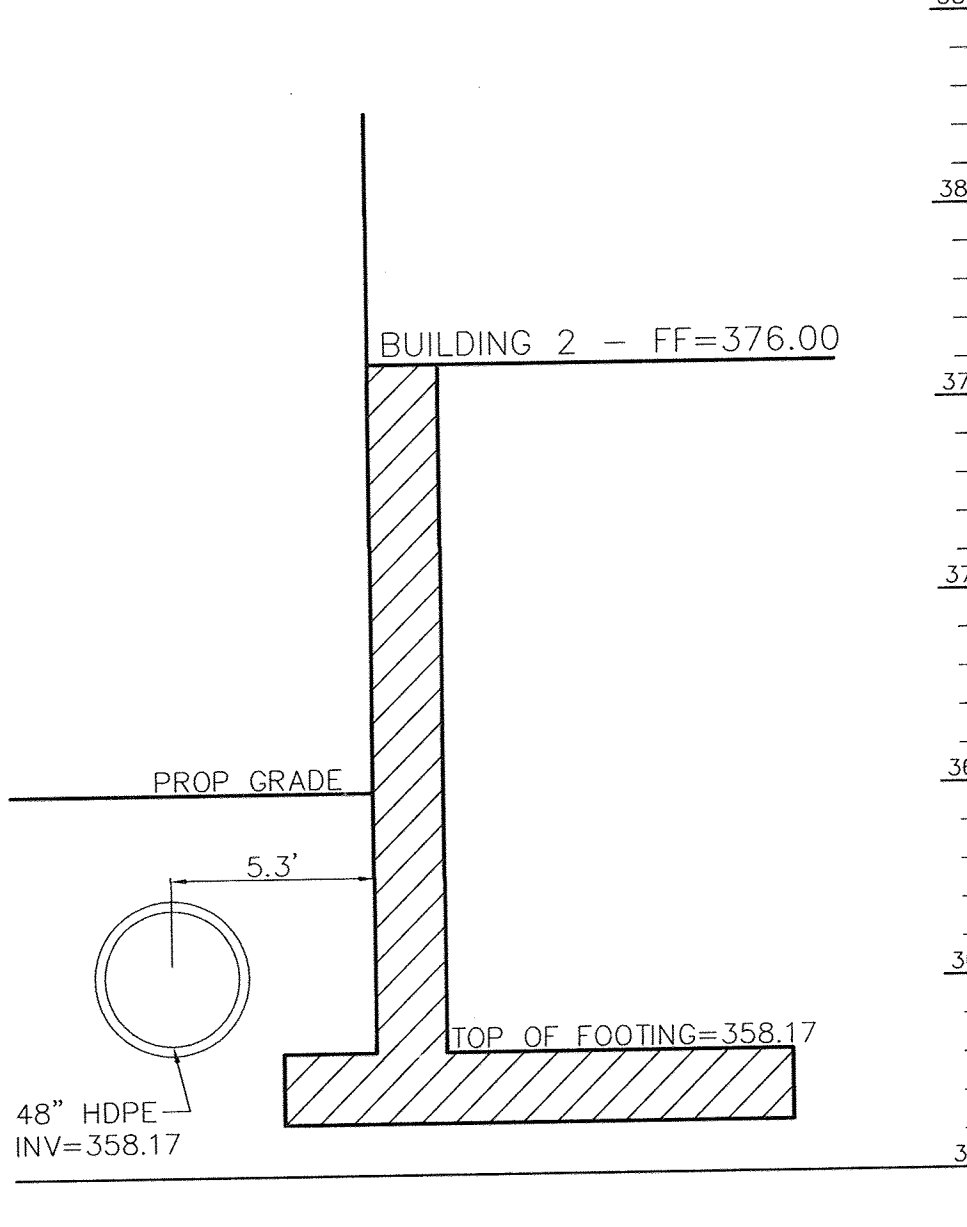
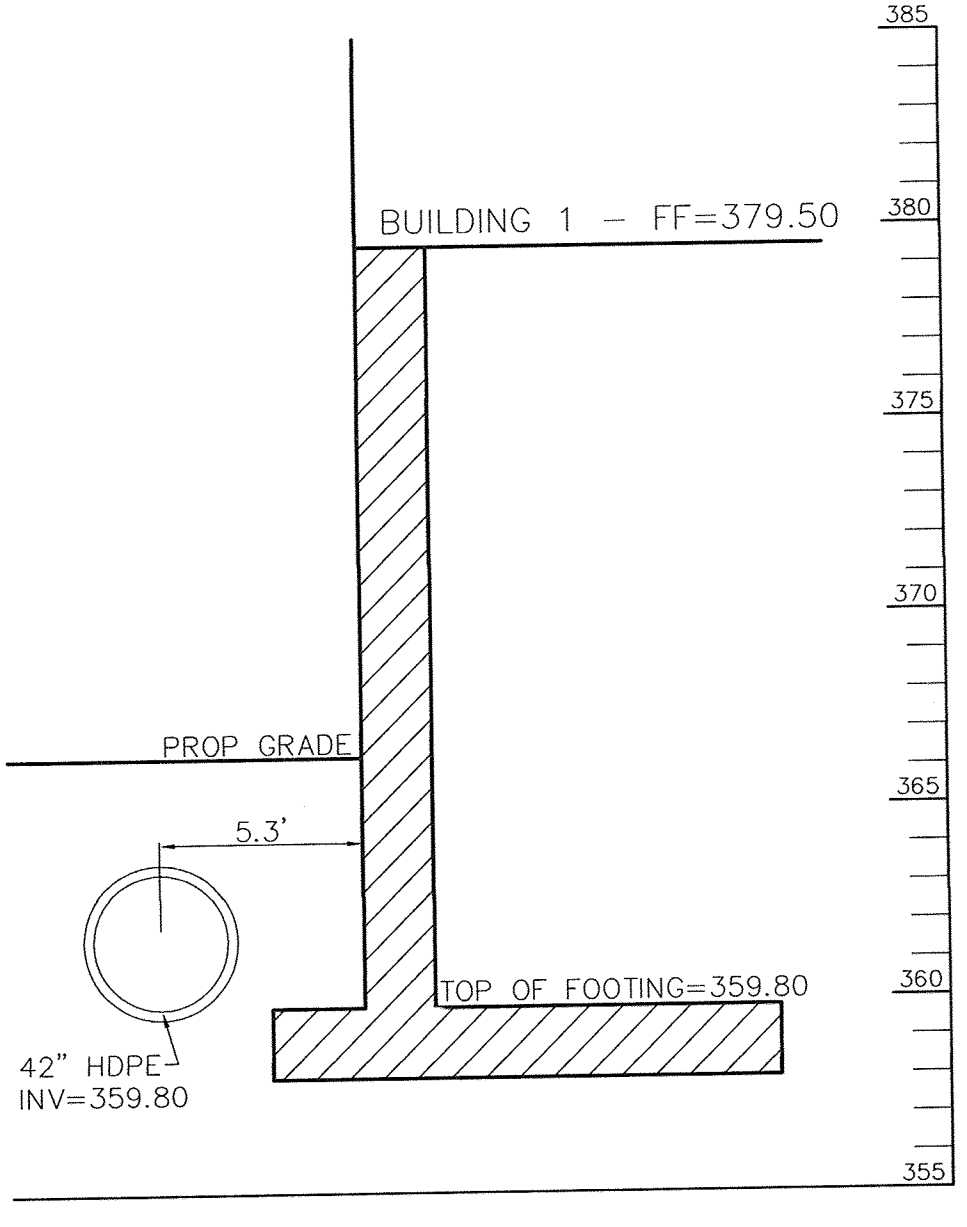
AS-BUILT CERTIFICATION FOR PWSM  
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

J.P.E. NAME: 16193 P.E.# 6-18-19 DATE

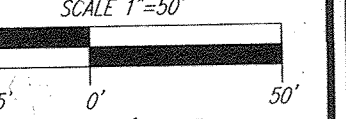
**OWNER/DEVELOPER**  
TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
3600 SNOWDEN RIVER PKWY, SUITE 207  
COLUMBIA MD 21045  
410-953-0222

APPROVED  
PLANNING BOARD  
OF HOWARD COUNTY  
DATE: April 16, 2018

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION: 4/23/18  
CHIEF, DIVISION OF LAND DEVELOPMENT: 5/01/18  
DIRECTOR: 5/24/18



**STORM DRAIN PROFILE**  
SCALE: HORIZONTAL - 1"=50'  
VERTICAL - 1"=5'



NO AS-BUILT INFORMATION ON THIS SHEET

1	REVISE SPECIFICATIONS TO MATCH OTHERS, INCORPORATE ARCHITECTURAL REVISIONS WITH BUILDINGS	02-12-14
	REVISE VARIOUS SPECIFICATIONS TO MATCH OTHERS, FROM D-12 TO C-3000 FACILITY, DRAINING	
	REVISION	DATE

**SITE DEVELOPMENT PLAN**  
**STORM DRAIN PROFILES**  
**MIDWAY BUSINESS CENTER**  
**SNOWDEN RIVER SOUTH**  
SECTION 1, AREA 1  
INDUSTRIAL / FLEX SPACE  
(PLAT 8795, L.10008/F.485) PARCEL 319, PARCEL C  
HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL**  
**ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET TEL: 410.461.7666  
ELLCOTT CITY, MD 21043 FAX: 410.461.6911

PROFESSIONAL CERTIFICATE  
DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHW  
DATE: MARCH 2013  
SCALE: AS SHOWN  
W.O. NO.: 05-03

12 SHEET OF 24

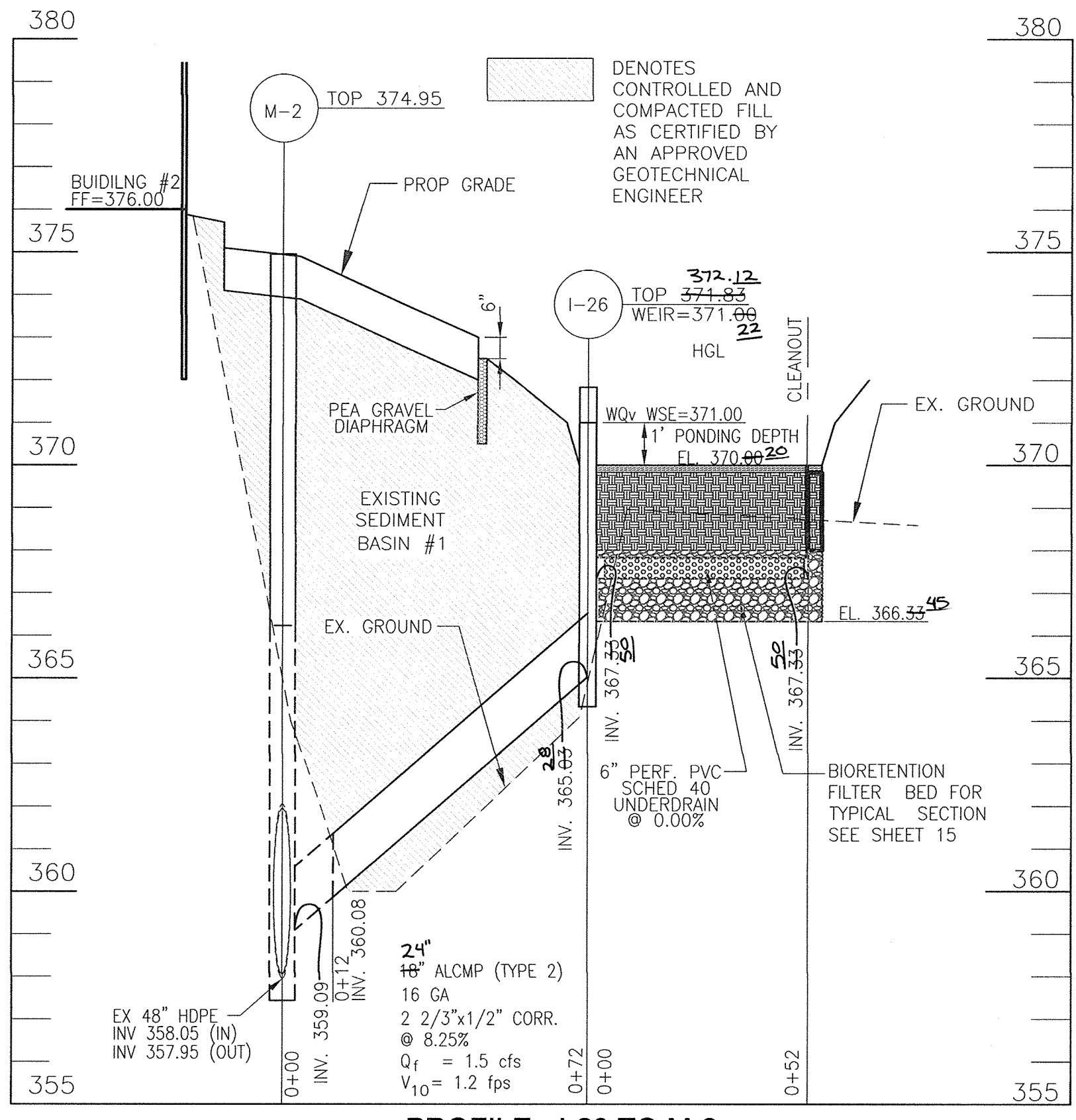
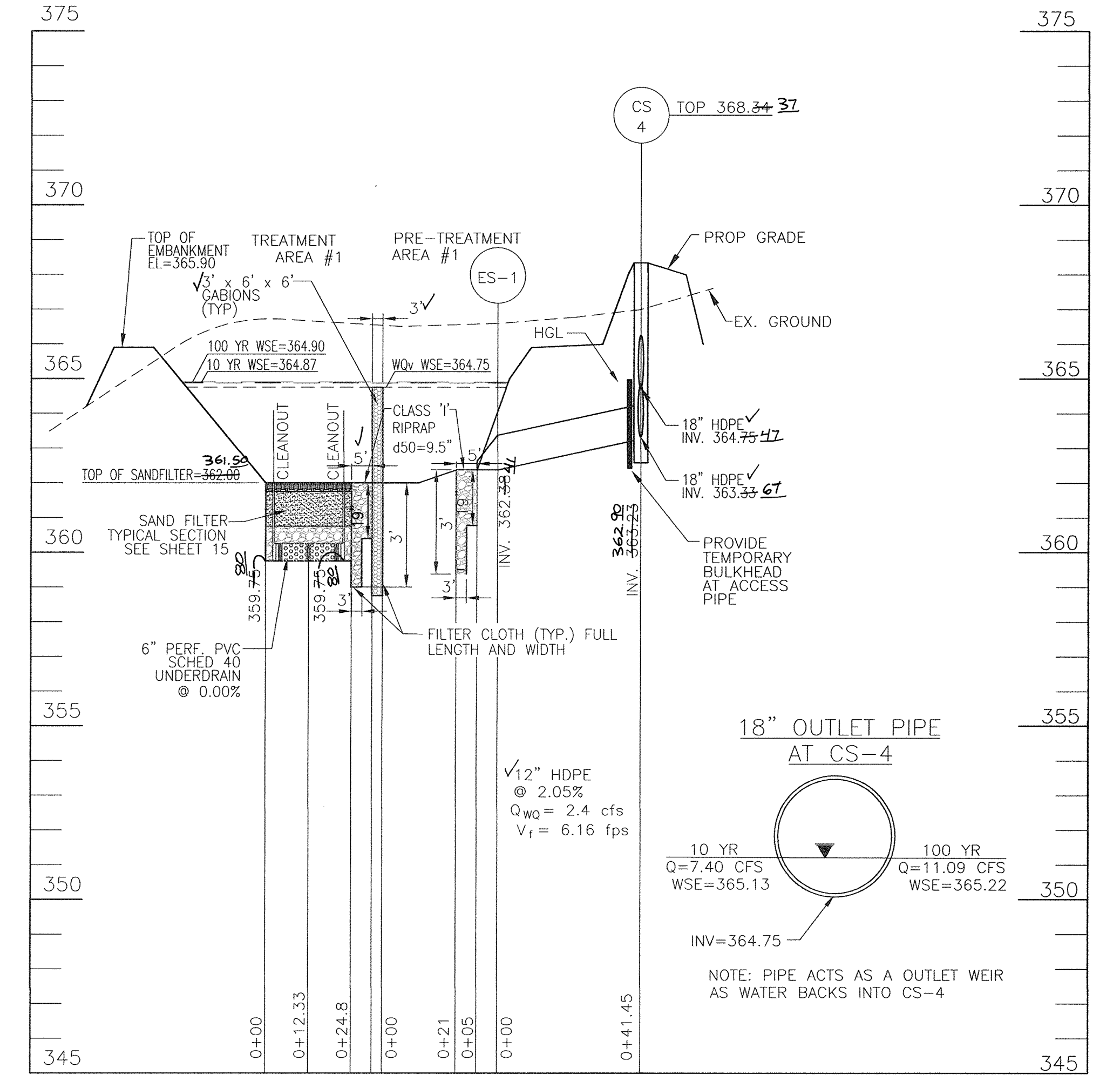
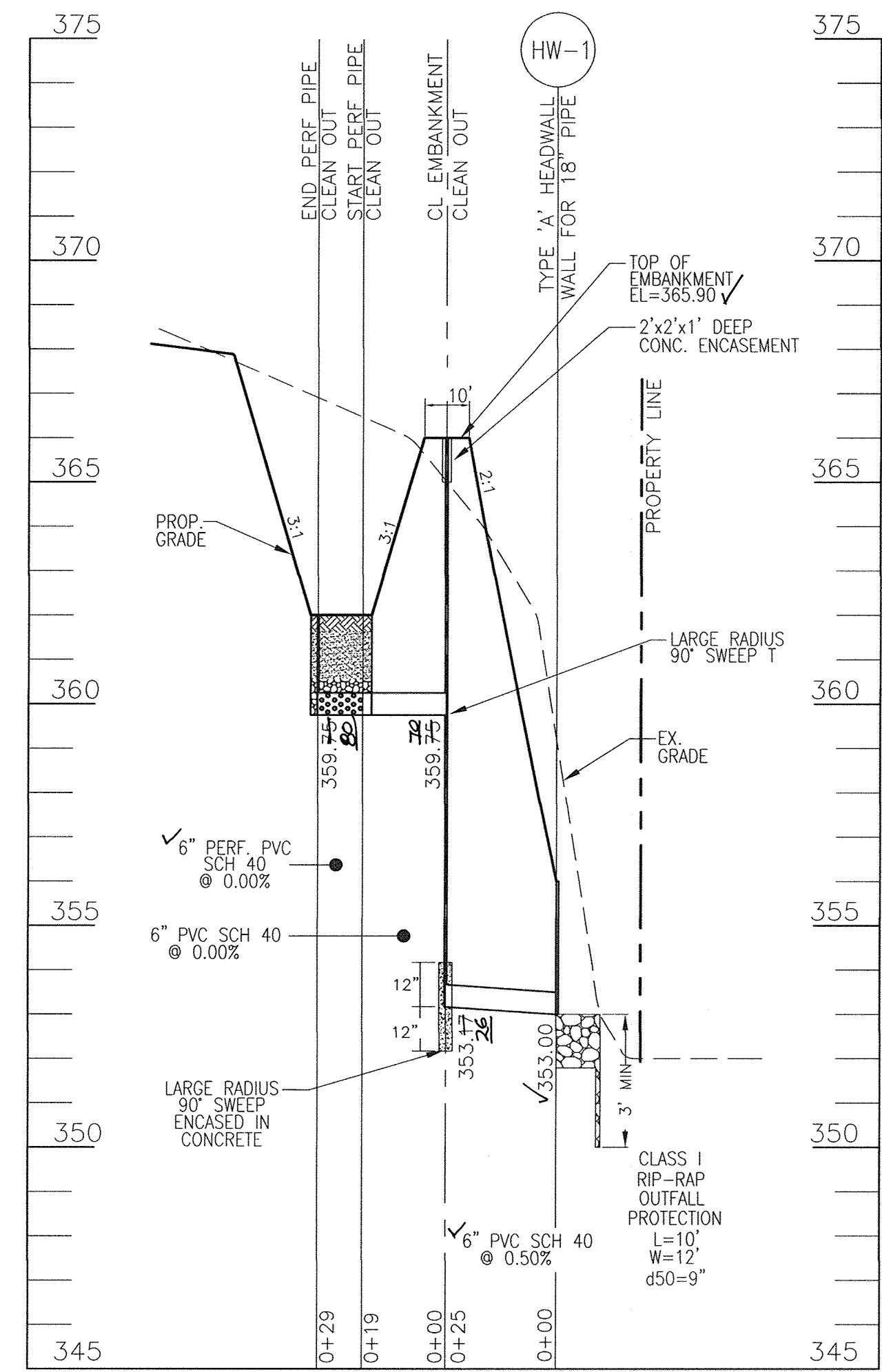
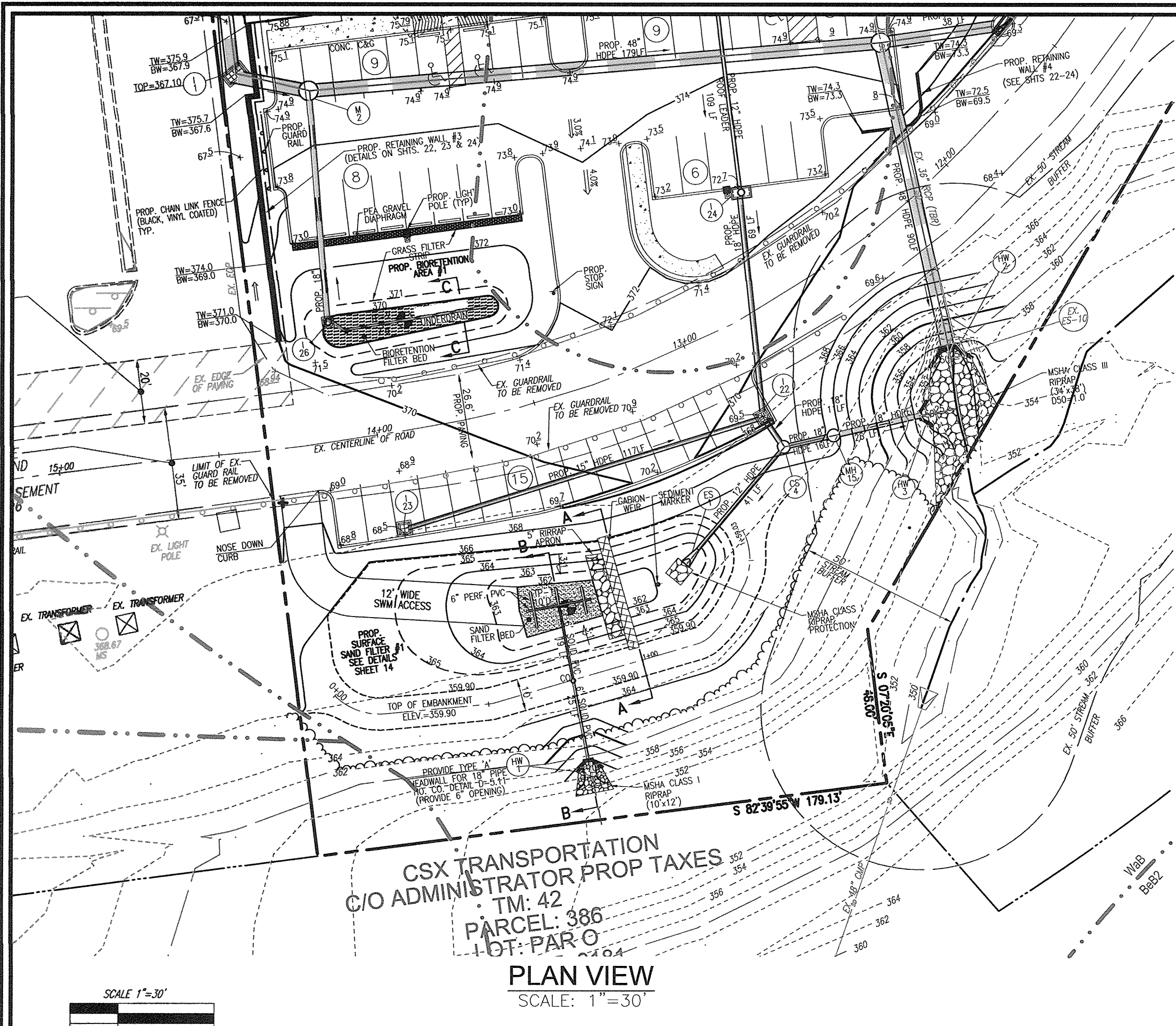
ROBERT H. VOGEL, PE No.16193

AS-BUILT-DECEMBER 2018



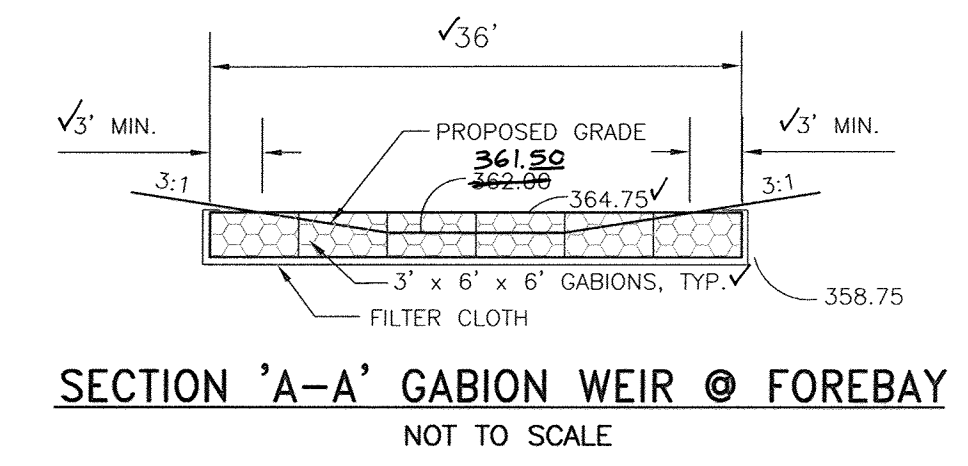
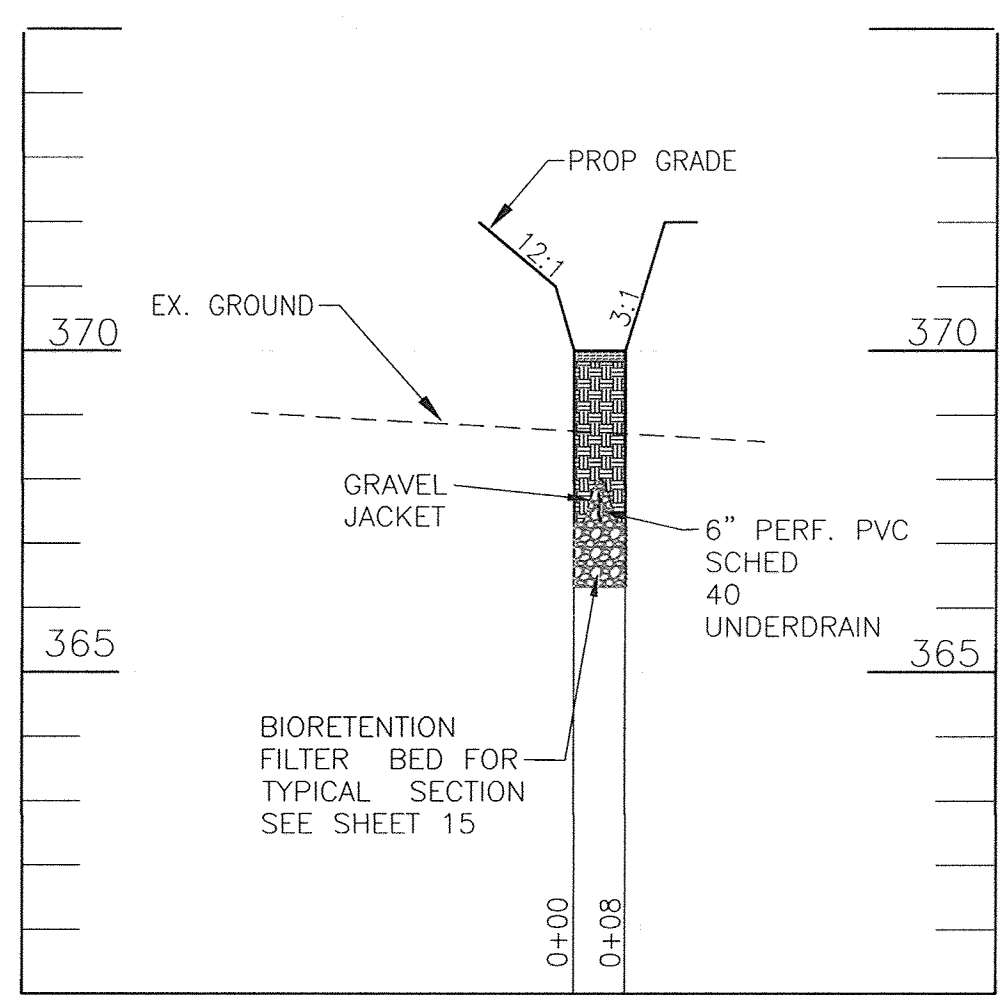






SECTION 'B-B' SAND FILTER UNDERDRAIN  
SCALE: HORIZONTAL - 1"=30'  
VERTICAL - 1"=3'

PROFILE - ES-1 TO CS-2 AND SAND FILTER  
SCALE: HORIZ.:1"=30'  
VERT.:1"=3'



SECTION 'C-C' BIOTETENTION AREA  
SCALE: HORIZ.:1"=30'  
VERT.:1"=3'

SECTION 'A-A' GABION WEIR @ FOREBAY  
NOT TO SCALE

OWNER/DEVELOPER  
TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
8600 SNOWDEN RIVER PKWY, SUITE 207  
COLUMBIA MD 21045  
410-953-0222

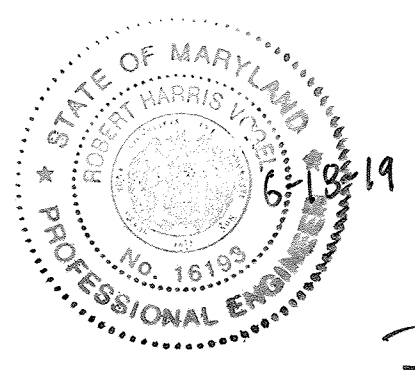
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
APPROVED: PLANNING BOARD OF HOWARD COUNTY  
DATE: APRIL 15, 2010

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DIRECTOR

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

BY THE ENGINEER:  
I CERTIFY THAT THIS PLAN FOR 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.

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



AS-BUILT CERTIFICATION FOR PSWM  
I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

AS-BUILT CERTIFICATION  
I Herby Certify That The Facility Shown On This Plan Was Constructed As Shown On The "As-Built" Plans And Meets The Approved Plans And Specifications.

Signature: \_\_\_\_\_ P.E. No. \_\_\_\_\_  
Date: \_\_\_\_\_  
Certify Means To State Or Declare A Professional Opinion Based Upon Onsite Inspections And Material Tests Which Are Conducted During Construction. The Onsite Inspections And Material Tests Are Those 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.

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN  
STORMWATER MANAGEMENT SURFACE SAND FILTER & BIOTETENTION FACILITIES  
MIDWAY BUSINESS CENTER  
SNOWDEN RIVER SOUTH  
SECTION 1, AREA 1  
INDUSTRIAL / FLEX SPACE  
(PLAT 8795, L. 10008/F.485)  
TAX MAP 42 GRID 10 6TH ELECTION DISTRICT  
PARCEL 319, PARCEL C  
HOWARD COUNTY, MARYLAND

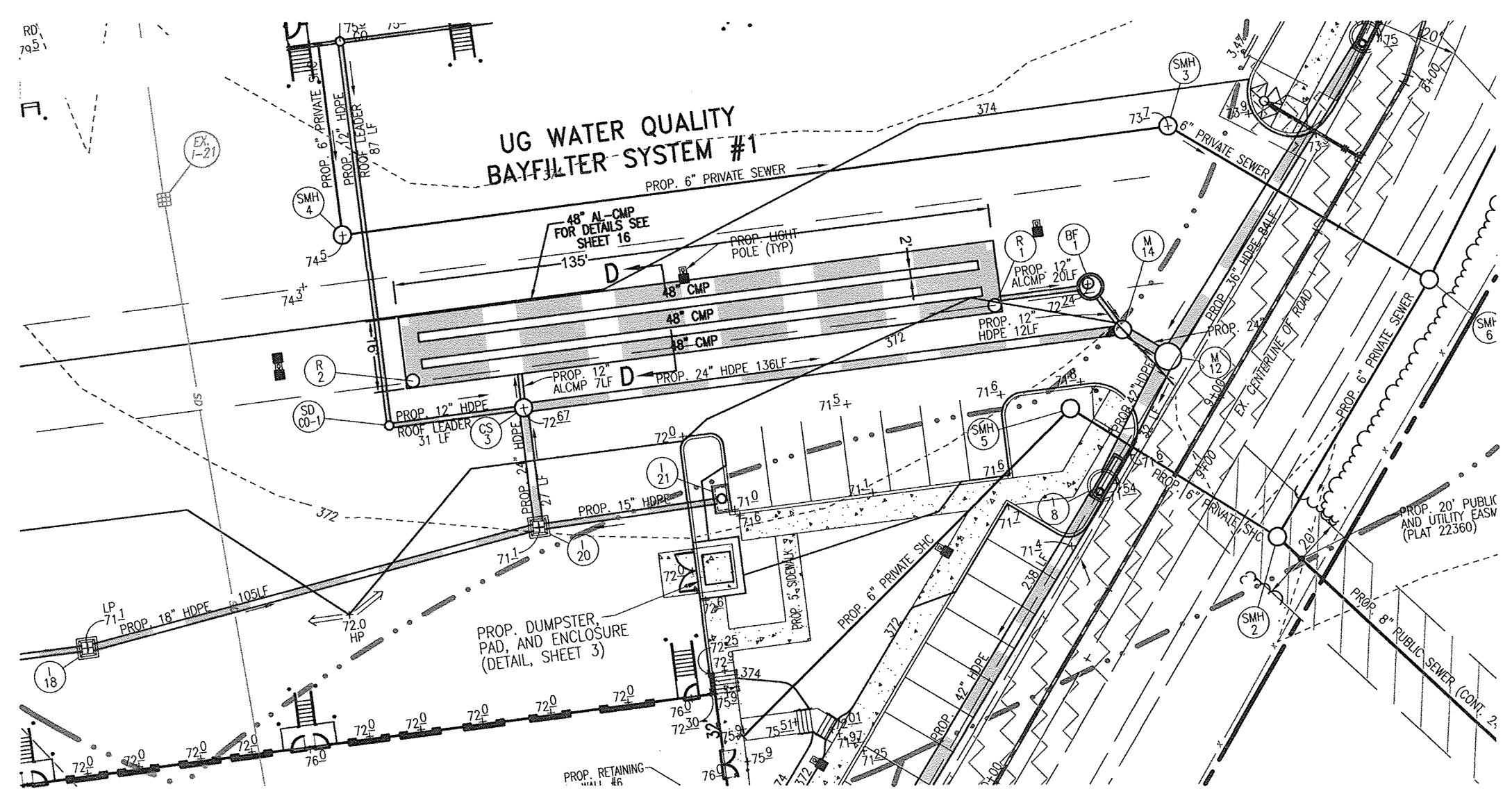
**ROBERT H. VOGEL ENGINEERING, INC.**  
ENGINEERS • SURVEYORS • PLANNERS  
8407 MAIN STREET  
ELLCOTT CITY, MD 21043  
TEL: 410.461.7666  
FAX: 410.461.8969

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RRV  
DATE: MARCH 2013  
SCALE: AS SHOWN  
W.D. NO.: 05-03  
PROFESSIONAL CERTIFICATE  
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. 16193 EXPIRATION DATE: 08-27-2016  
14 SHEET OF 24

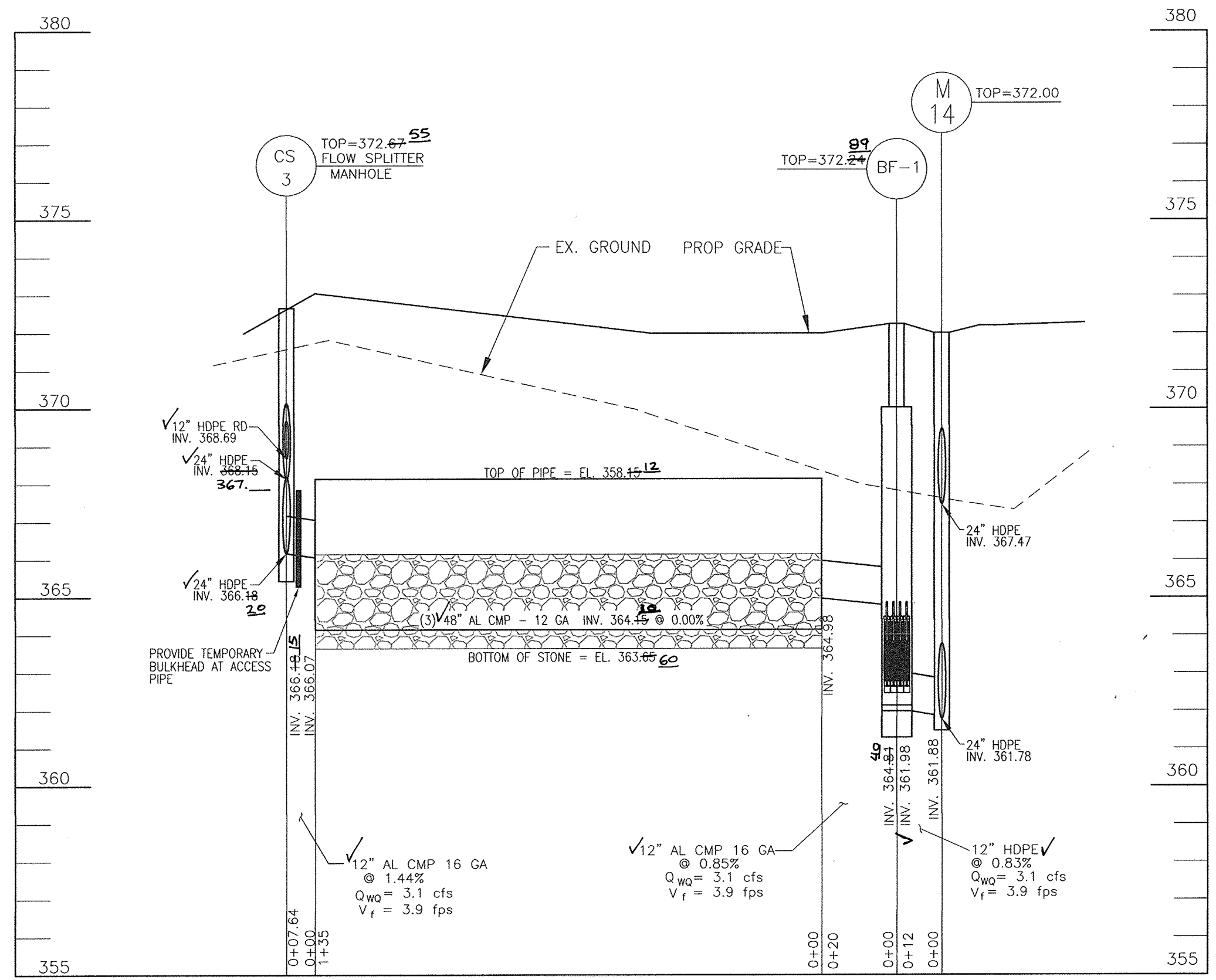




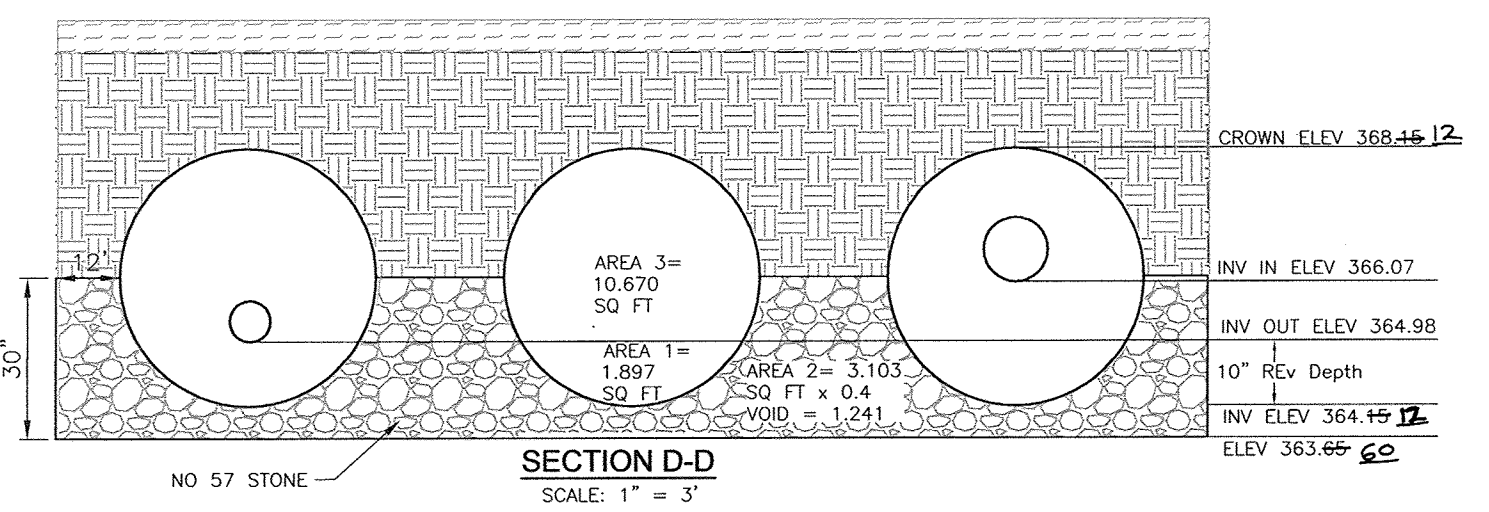




PLAN - UG WATER QUALITY BAYFILTER SYSTEM #1  
SCALE: 1"=30'



PROFILE - UG BAYFILTER SYSTEM #1  
HORIZ. 1"=30' SCALE;  
VERT. 1"=3'



SECTION D-D  
SCALE: 1"=3'

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: Snowden River South SWM Location: Howard County, Maryland Boring No.: TP-3 Job #: 09073A

Date: 2-25-09

Elevation/Depth	Description	Boring and Sampling Notes	SPT Blows		SPT Blows/ft	
			N	NM	N	C U V X
0	Brown/gray, moist, medium stiff sandy clay (CL) with mica (CL) F1	5' Topsoil	18"	2-2-3	6	10
1	Orange/gray, moist, medium stiff sandy clay (CL) Possible F1	No groundwater encountered while drilling	18"	3-4-4	12	7
2	Brown/gray, moist, medium dense silty clayey sand, some gravel (SM-SC) Possible F1		18"	5-6-6	14	8
3	Possible F1					
4	Bottom of Hole at 5' 0"					

SAMPLER TYPE: DRIVEN SPT UNLESS OTHERWISE NOTED  
SAMPLING METHOD: HSA - HOLLOWSTEM AUGERS  
SAMPLING MEDIA: L-LOST

HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: Snowden River South SWM Location: Howard County, Maryland Boring No.: TP-4 Job #: 09073A

Date: 2-25-09

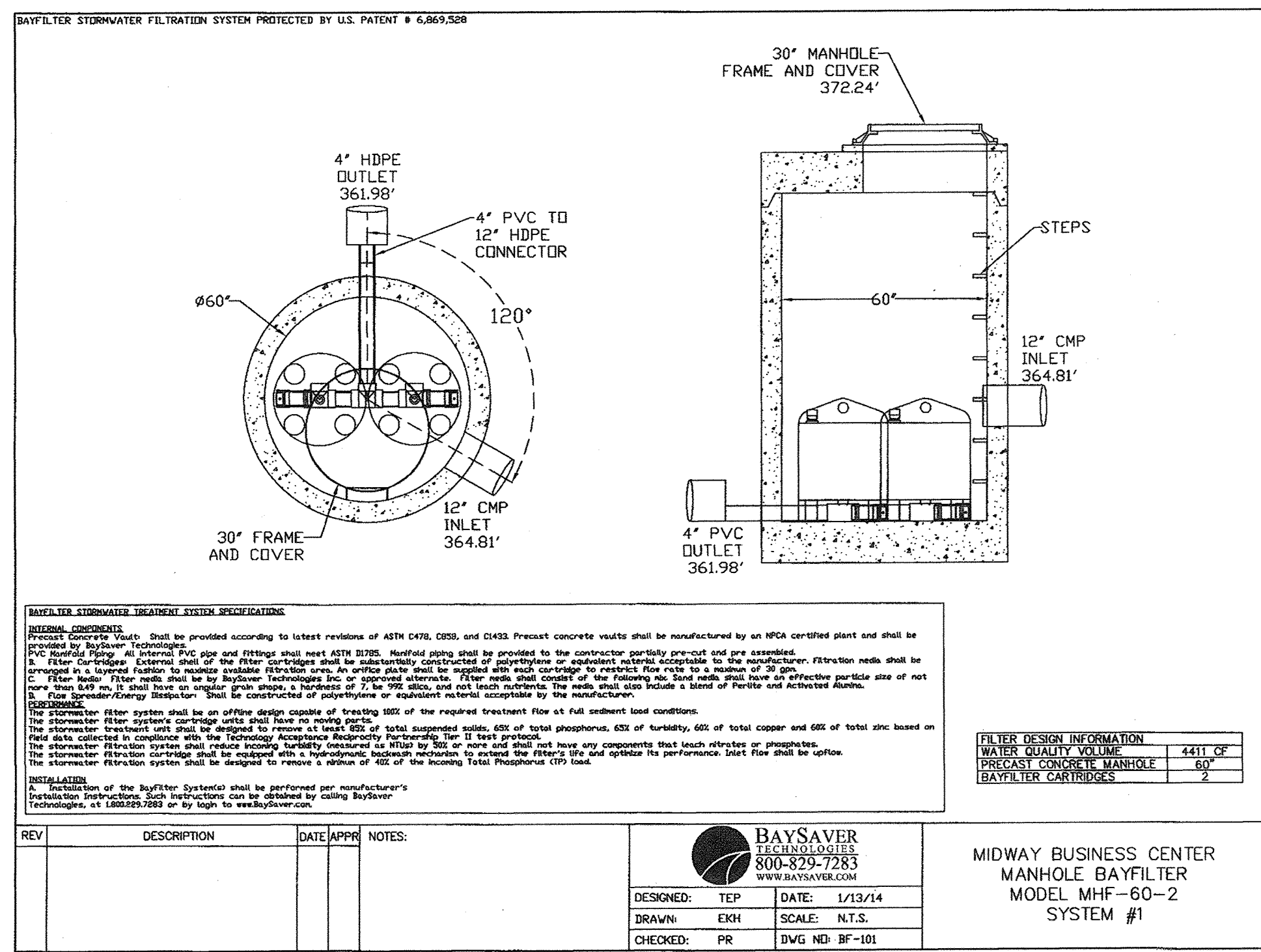
Elevation/Depth	Description	Boring and Sampling Notes	SPT Blows		SPT Blows/ft	
			N	NM	N	C U V X
0	Brown/gray, moist, medium stiff sandy clay (CL) with mica (CL) F1	4' Topsoil	18"	2-3-4	7	10
1	Light brown, moist, medium dense fine to coarse sand, some gravel, trace silt and clay (SM-SC) Bottom of Hole at 5' 0"	No groundwater encountered while drilling	24"	6-8-18-15	27	10
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HILLIS - CARNES ENGINEERING ASSOCIATES, INC. RECORD OF SOIL EXPLORATION

Project Name: Snowden River South SWM Location: Howard County, Maryland Boring No.: TP-5 Job #: 09073A

Date: 2-25-09

Elevation/Depth	Description	Boring and Sampling Notes	SPT Blows		SPT Blows/ft	
			N	NM	N	C U V X
0	Dark brown, moist, very loose sandy silt to silty sand, trace clay, gravel, and organic (ML-SM) F1	3' Topsoil	10"	2-3-3	5	10
1	Orange/gray, moist, medium dense silty clayey sand, some gravel (SM-SC) Possible F1	No groundwater encountered while drilling	18"	4-5-5	10	10
2	Brown/gray, moist, medium dense silty clayey sand, some gravel (SM-SC) Possible F1		18"	5-6-6	10	10
3	Possible F1					
4	Bottom of Hole at 10' 0"					



FOR BAYFILTER SPECIFICATIONS, INSTALLATION AND MAINTENANCE NOTES, SEE SHEET 17.

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.

SIGNATURE: \_\_\_\_\_ P.E. NO. \_\_\_\_\_  
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 THOSE 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.

OWNER/DEVELOPER  
TSC/JMI SNOWDEN RIVER SOUTH LLC A MD LLC  
8600 SNOWDEN RIVER PKWY, SUITE 207  
COLUMBIA MD 21045  
410-953-0222



STORM DRAIN STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	THROAT ELEV.	INV. IN	INV. OUT	COMMENTS
BF-1	MANHOLE BAYFILTER MODEL MHF-60-2	N 549026.38 E 1359504.12	372.24	364.81	364.81	361.98	SEE DETAIL, THIS SHEET
R-1	36" RISER ACCESS MANHOLE	N 549022.19 E 1359482.60	371.98	364.81	-	-	INV 48" CMP 364.46 10
R-2	36" RISER ACCESS MANHOLE	N 549005.63 E 1359351.64	372.25	364.81	-	-	INV 48" CMP 364.46 10

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DIRECTOR

BY THE DEVELOPER:

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

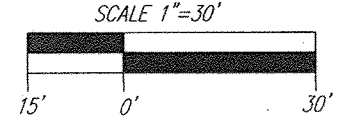
BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR 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.

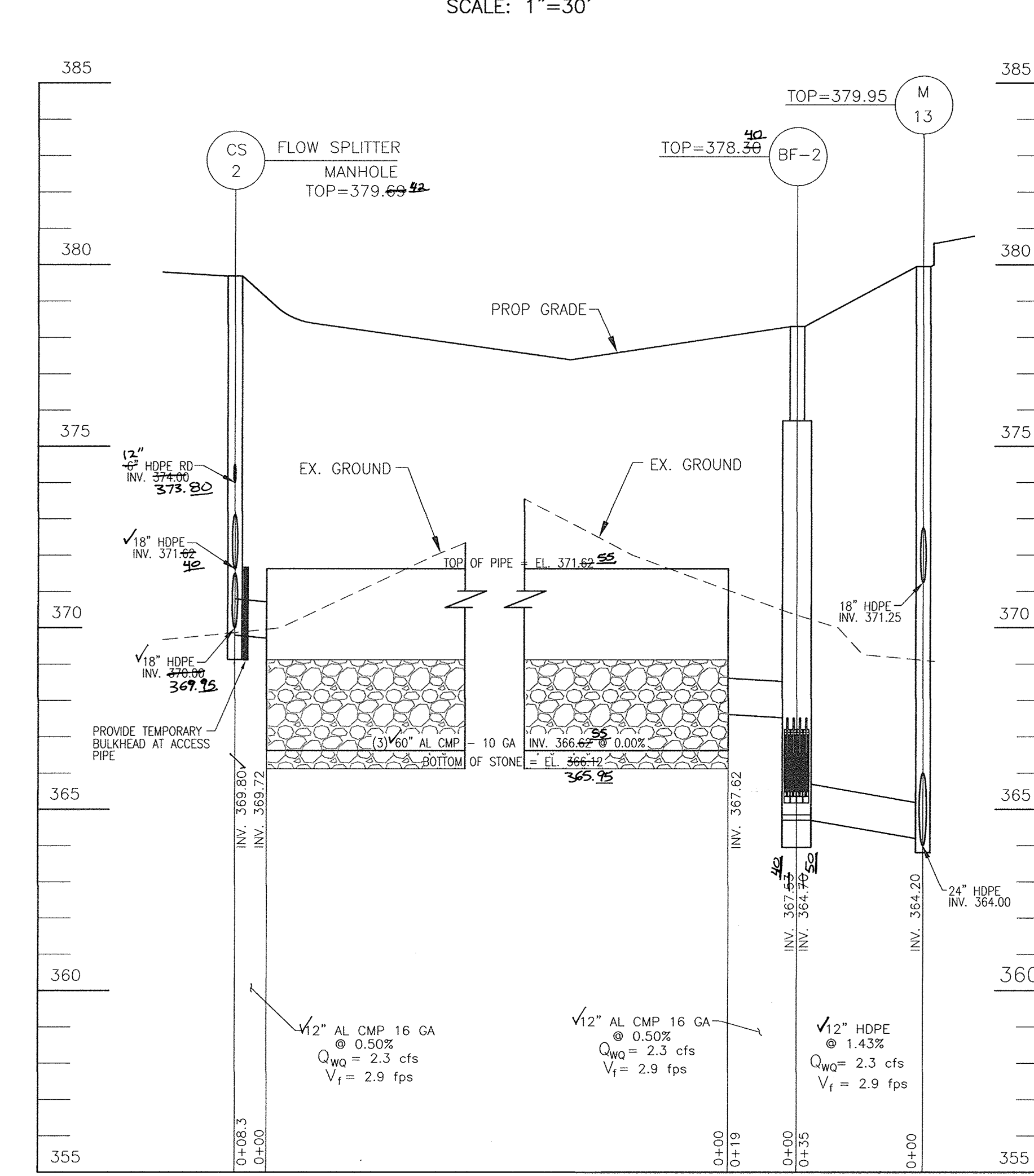
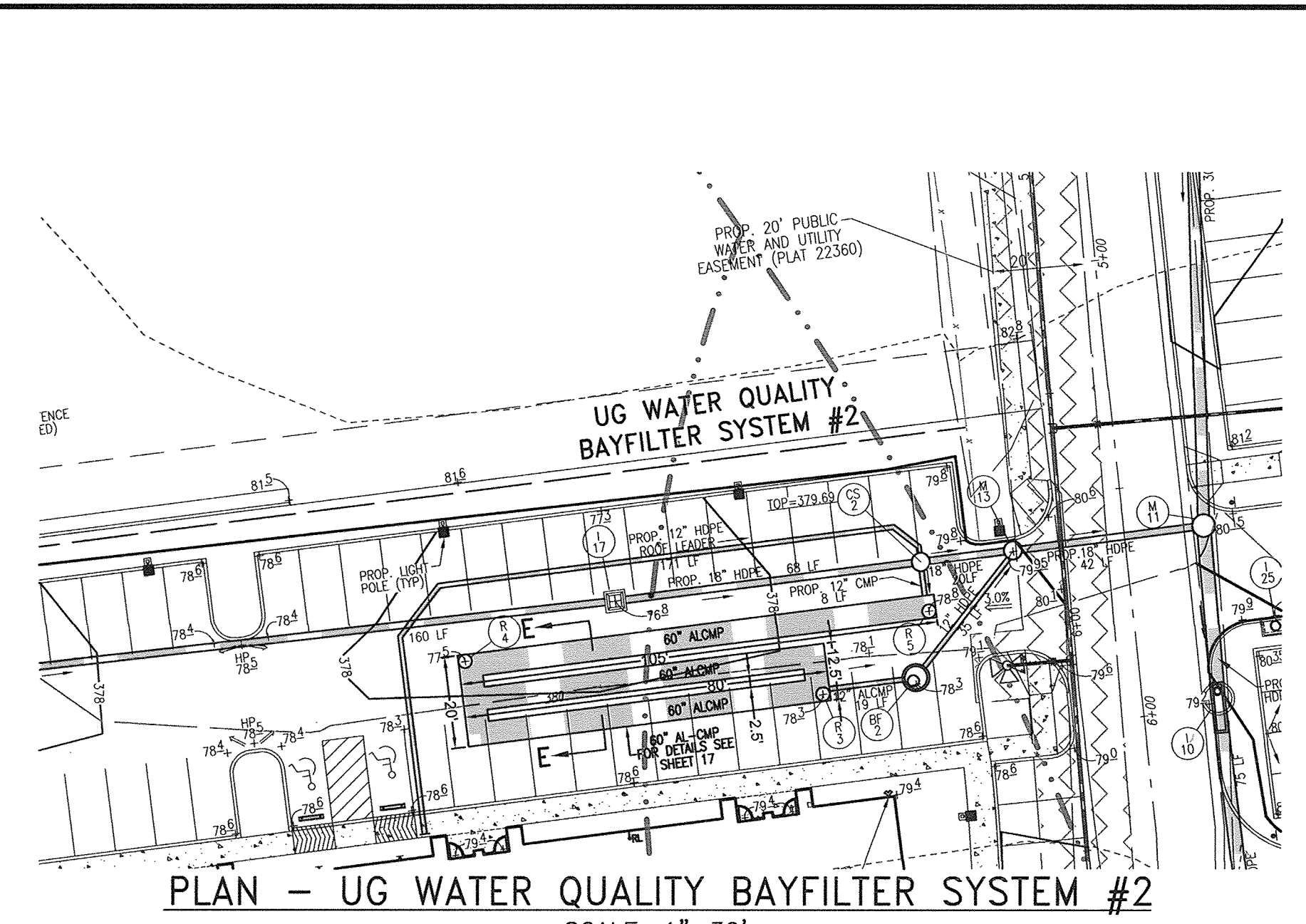
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHW  
DATE: JANUARY 2014  
SCALE: AS SHOWN  
W.D. NO.: 05-03

PROFESSIONAL CERTIFICATE  
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. 16193, EXPIRATION DATE: 08-20-2014.







PROFILE - UG BAYFILTER SYSTEM #2  
HORIZ.: 1"=30' SCALE;  
VERT.: 1"=3'

STORM DRAIN STRUCTURE SCHEDULE							
NO.	TYPE	LOCATION	TOP ELEV.	THROAT ELEV.	INV. IN	INV. OUT	COMMENTS
BF-2	MANHOLE BAYFILTER MODEL MHF-60-2	N 549299.19 E 1359566.51	378.30	NA	367.55	364.76	SEE DETAILS, THIS SHEET
R-3	36" RISER ACCESS MANHOLE	N 549270.39 E 1359545.08	378.30	NA	-	-	INV 60" CMP 366.62 55
R-4	36" RISER ACCESS MANHOLE	N 549277.48 E 1359466.51	377.50	NA	-	-	INV 60" CMP 366.62 55
R-5	36" RISER ACCESS MANHOLE	N 549288.49 E 1359568.35	378.00	NA	-	-	INV 60" CMP 366.62 55

**BAYFILTER™ SPECIFICATIONS**

**PART 1.0 GENERAL**

**1.1 DESCRIPTION**

A. The BayFilter™ system's internal components manufacturer selected by the Contractor and approved by the Engineer, shall furnish all filter materials, equipment and incidentals required to manufacture the BayFilter system components specified herein in accordance with the attached drawings and these specifications.

B. Concrete structures and any apparatus that form an integral part of the BayFilter™ system shall be described in Part 2.00 of these specifications.

**1.2 QUALITY CONTROL/INSPECTION**

A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection by the Engineer. Such inspection may be made at the place of manufacture, or on the work site after delivery, or at both places, and shall be subject to reinspection at any time if material conditions fail to meet any of the specification requirements. If a BayFilter system component is rejected after delivery to the site, it shall be marked for identification and removed from the site. Any BayFilter system component(s) which have been damaged beyond repair during delivery will be rejected.

**1.3 SUBMITTALS**

A. Plan, elevation, and profile dimensional drawings shall be submitted to the Engineer for review and approval. The Contractor shall be provided with the approved plan, elevation, and profile dimensional drawings.

**PART 2.00 PRODUCTS**

**2.1 INTERNAL COMPONENTS**

A. All components including concrete structures, PVC manifold piping and filter cartridges, shall be provided by BaySaver Technologies Inc., 1030 Deer Hollow Drive, Mount Airy, MD (800.229.7283).

B. PVC Manifold Piping: All internal PVC pipe and fittings shall meet ASTM D1785. Manifold piping shall be provided to the contractor partially pre-cut and pre-assembled.

C. Filter Cartridges: External shell of the filter cartridges shall be substantially constructed of polyethylene or equivalent material acceptable to the manufacturer. Filtration media shall be arranged in a layered fashion to maximize available filtration area. An arifice glass shall be supplied with each cartridge to restrict flow rate to a maximum of 30 gpm.

D. Filter Media: Filter media shall be provided by BaySaver Technologies Inc. or approved alternate. Filter media shall consist of the following mix. Sand media shall have an effective particle size of not more than 0.6mm. It shall have an angular grain shape, a hardness of 7, be 90% silica, and not leach nutrients. The media shall also include a blend of Perlite and Activated Alumina.

**2.2 PERFORMANCE**

A. The stormwater filter system shall be capable of treating 100% of the required treatment flow at full sediment load conditions.

B. The stormwater filter system's cartridges shall have no moving parts.

C. The stormwater treatment unit shall be designed to remove at least 80% of the suspended solids load. Sand removal shall be based on full-scale testing using SIL-CAS-100 media gradation with a  $d_{50}$  of 23 microns (manufactured by US Silica) or equivalent. Sand full scale testing shall have included sediment capture based on actual total mass collected by the stormwater filtration system.

D. The stormwater filtration system shall reduce incoming turbidity (measured as NTU) by 50% or more and shall not have any components that leach nitrate or phosphate.

E. The stormwater filtration cartridge shall be equipped with a hydrodynamic backwash mechanism to extend the filter's life and optimize its performance. Inlet flow shall be upflow.

F. The stormwater filtration system shall be designed to remove a minimum of 50% of the incoming Total Phosphorus (TP) load.

G. The stormwater filtration system's cartridges shall have the following minimum flow and sediment load capacities:

Design Flow per BFC (gpm)	Treated Sediment Load (lb)
30	150
20	200
10	250
5	300

**2.3 PRECAST CONCRETE VAULT COMPONENTS**

A. Concrete structures shall be designed for 18-20 traffic loading and applicable soil loads or as otherwise determined by a Licensed Professional Engineer. The materials and structural design of the devices shall be per ASTM C887 and ASTM C888.

B. The minimum compressive strength of the concrete shall be 4000 psi.

C. Cement shall conform to the requirements for Portland cement of Specification C150.

D. Aggregates shall conform to Specification C33, except that the requirement for gradation shall not apply.

E. Reinforcement shall consist of wire conforming to Specification A82 or Specification A95, or of wire fabric conforming to Specification A183 or Specification A497, or of bars of Grade 40 steel conforming to Specification A615/A618M.

F. The access cover shall be designed for HS20-44 traffic loading and shall provide a minimum 30 inch clear opening.

G. All joints shall be waterproof with wrapped gaskets or sealed with a mastic treatment.

H. Any grid used within the system shall meet the ASTM C 1107 "Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink)" Grades A, B and C at a pourable and plastic consistency at 70° F. CRD C 621 "Code of Engineers Specification For Non-Shrink Grout".

**2.4 CONTRACTOR PROVIDED COMPONENTS**

Specifications for all contractor-provided components are minimum requirements. If a higher standard is shown on the plans or described in another section of the technical specifications, then the higher standard shall govern.

A. Sub-base: Sub-base shall be six-inch minimum of 1/2-inch minus rock, 95% compaction. Compact undisturbed sub-grade materials to 95% of maximum density at 100% of optimum moisture content. Unstable material below sub-grade shall be replaced to engineer's approval.

B. The minimum compressive strength of the concrete for cast in place structures shall be 4000 psi.

C. Silicone Sealant: Shall be pure RTV silicone conforming to Federal Specification Number TT 5001541A or TT 800230C or Engineer approved.

D. Grout: Grout shall be non-shrink grout meeting the requirements of Corps of Engineers CRD-C88. Specimens molded, cured and tested in accordance with ASTM C-109 shall have minimum compressive strength of 6,200 psi. Grout shall not exhibit visible bleeding.

E. Backfill: Backfill shall be 1/2-inch minus rock at 95% compaction.

**PART 3.00 EXECUTION**

**3.1 PRECAST CONCRETE VAULT**

A. Vault top finish grade shall be even with surrounding finish grade surface unless otherwise noted on plans.

B. Contractor shall grout all inlet and outlet pipes flush with vault interior walls.

C. Sanded PVC fittings shall be used on all PVC inlet and outlet pipes.

**3.2 ANTILOTTATION BALLAST (Where Required)**

A. Ballast shall be to the dimensions specified by the engineer and noted on the data block. Ballast shall run the entire length of the long side of the vault on both sides. Ballast shall not encase the inlet and/or outlet piping. Provide 12" clearance from outside diameter of pipe.

**3.3 CLEAN UP**

A. Remove all excess materials, rocks, roots, or foreign debris, leaving the site in a clean, complete condition approved by the engineer. All filter components shall be free of any foreign materials including concrete.

**3.4 FILTER CARTRIDGES**

A. Filter cartridges shall not be installed until the project site is clean and stabilized or if the inlet and outlet pipes are temporarily blocked off. The project site includes any surface that contributes stormwater runoff to the BayFilter system. All impervious surfaces shall be clean and free of dirt and debris. All catch basins, manholes and pipes shall be free of dirt and sediments.

**3.5 INSTALLATION NOTES**

A. Contractor to strictly follow the approved design and construction specifications. Any substitutions are to be pre-approved by the inspector and design engineer in writing prior to placement of materials.

B. The stormwater filtration system(s) may not be activated until all contributing drainage areas to each facility are scrubbed. Construction of the facility shall not proceed without prior authorization of the inspector.

C. No "rock dust" can be used for sand.

D. Contact "Mess Utility" at 1-800-257-7777 at least 48 hours prior to the start of construction.

**PART 4.00 EXECUTION**

**4.1 INSTALLATION**

A. Installation of the BayFilter System(s) shall be performed per manufacturer's Installation Instructions. Such instructions can be obtained by calling BaySaver Technologies, Inc. at 1-800-229-7283 or by login to www.BaySaver.com.

**Installation of a BayFilter™ System**

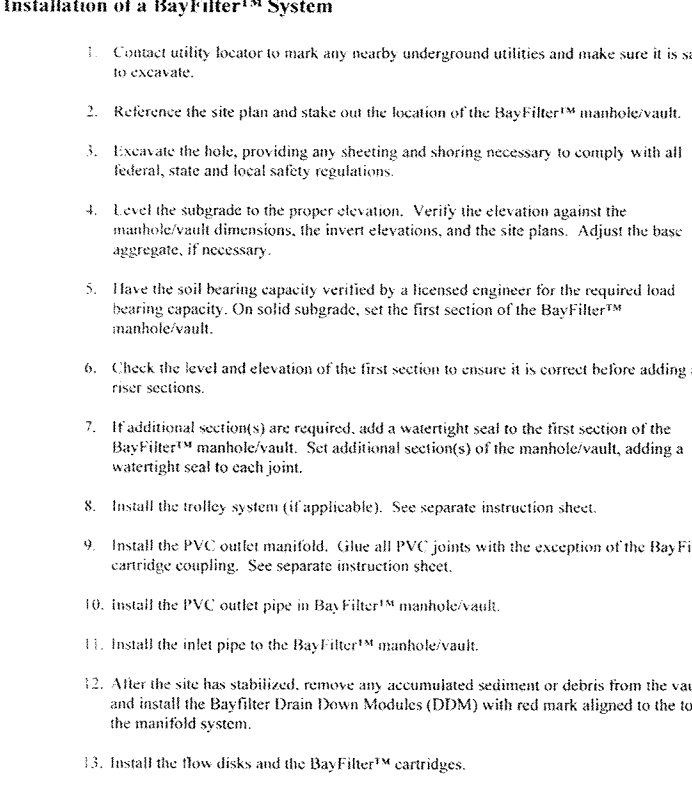
- Contact utility locator to mark any nearby underground utilities and make sure it is safe to excavate.
- Reference the site plan and stake out the location of the BayFilter™ manhole/vault.
- Excavate the hole, providing any shoring and shoring necessary to comply with all federal, state and local safety regulations.
- Level the subgrade to the proper elevation. Verify the elevation against the manhole/vault dimensions, the invert elevations, and the site plans. Adjust the base as required, if necessary.
- Have the soil bearing capacity verified by a licensed engineer for the required load bearing capacity. On solid subgrade, set the first section of the BayFilter™ manhole/vault.
- Check the level and elevation of the first section to ensure it is correct before adding any more sections.
- If additional sections are required, add a watertight seal to the first section of the BayFilter™ manhole/vault. Set additional section(s) of the manhole/vault, adding a watertight seal to each joint.
- Install the utility system (if applicable). See separate instruction sheet.
- Install the PVC outlet manifold. Use all PVC joints with the exception of the BayFilter cartridge coupling. See separate instruction sheet.
- Install the PVC inlet pipe to the BayFilter™ manhole/vault.
- Install the inlet pipe to the BayFilter™ manhole/vault.
- After the site has stabilized, remove any accumulated sediment or debris from the vault and install the BayFilter Drain Down Module (DDM) with no mark marking up to the top of the manifold system.
- Install the flow disks and the BayFilter™ cartridges.

**TOOL LIST:**

- PVC GLUE AND PRIMER
- CRANE LIFTING MECHANISM TO LOWER THE CARTRIDGES IN THE VAULT (EACH CARTRIDGE WEIGHS 30 LBS)
- SCHEWELER OR MET DRUMMER FOR FERRIS COUPLERS
- SOFT TROWEL HAMMER
- SAW (IN CASE PVC CUT-UP PIPING LENGTH NEEDS TO BE ADJUSTED)

Midway Business Center  
Howard County, MD  
December 9, 2013

BayFilter Model	Flow Rate (gpm)	Flow Rate (cfs)
BF-2	4,411	4.533
BF-3	2,600	2.660
BF-4	2,600	2.660
BF-5	2,600	2.660
BF-6	2,600	2.660
BF-7	2,600	2.660
BF-8	2,600	2.660
BF-9	2,600	2.660
BF-10	2,600	2.660



**Maintenance of the BayFilter System**

The BayFilter™ system requires periodic maintenance to continue operating at the design efficiency. The maintenance process comprises the removal and replacement of each BayFilter™ cartridge and drain down module and the cleaning of the vault or manhole with a vacuum truck. BayFilter™ maintenance should be performed by a BaySaver Technologies, Inc. certified maintenance contractor.

The maintenance cycle of the BayFilter™ system will be driven mostly by the actual solids load to the filter. The system should be periodically monitored to be certain it is operating correctly. Since stormwater solids load can be variable, it is possible that the maintenance cycle could be more or less than the projected duration.

The BayFilter system in New Development applications are designed to treat the WQ in 24 hours routinely. 1 filter in the cycle three cartridges will flow at a slower rate, and when the filter does drain down within 10-60 hours after the storm event, the system must be maintained.

When a BayFilter™ system is first installed, it is recommended that if it is inspected every six (6) months. When the filter system catches flows below design levels the system should be maintained. Filter cartridge replacement should also be considered when sediment levels are at or above the level of the 4 inch manifold system. Please contact the BaySaver Technologies Inc. Engineering Department for maintenance cycle estimation or assistance at 1-800-229-7283.

**Maintenance Procedures**

- Remove the manifold covers and open all access hatches.
- Before entering the system make sure the air is safe per OSHA Standards or use a breathing apparatus. Use low O<sub>2</sub>, high CO<sub>2</sub>, or other applicable warning device per regulatory requirements.
- Using a vacuum truck remove any liquid and sediments that can be removed prior to entry.
- Using a small lift on the boom of the vacuum truck, remove the used cartridges by lifting them out.
- Any cartridges that cannot be readily lifted directly out of the vault should be removed from their location and carried to the lifting point using the Trolley system installed in the Vault (if applicable).
- When all cartridges and drain down modules are removed, remove the balance of the solids and water that remain the manifold clamps on the Ferris couplings in the pipe manifold, remove the drain pipes as well. Carefully scan the manifold and the Ferris's and rinse the floor removing the balance of the collected solids.
- Clean the manifold pipes, inspect, and re-install.
- Install the exchange cartridges and close all covers.
- The used cartridges must be sent back to BaySaver Technologies, Inc. for exchanging and credit on undamaged items (1030 Deer Hollow Drive, Mount Airy, MD 21171). Phone: 800-229-7283.

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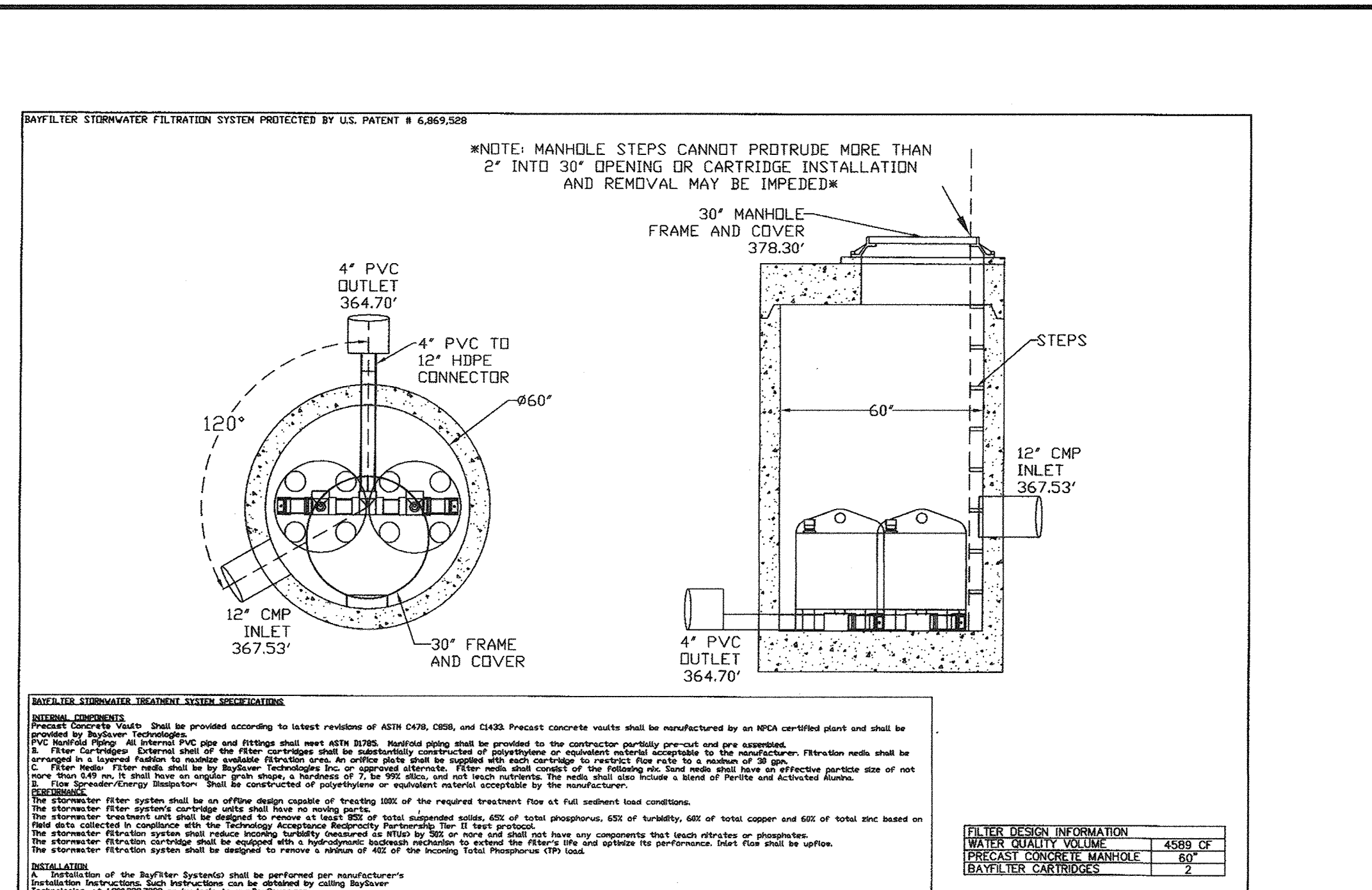
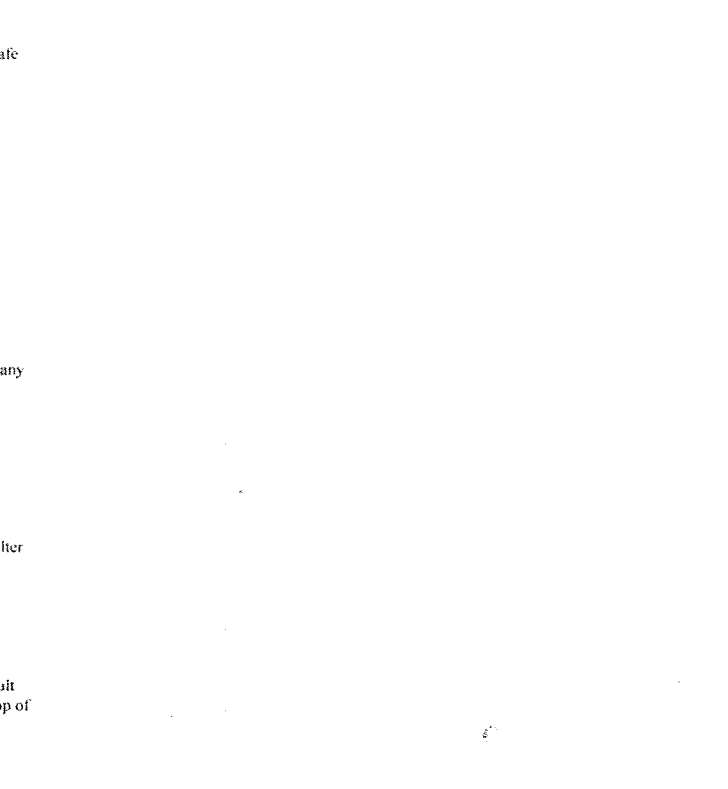
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Midway Business Center  
Howard County, MD  
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**REVISIONS**

REV.	DESCRIPTION	DATE	APPR. NOTES:
1	REVISE STORMWATER FILTRATION SYSTEM PROTECTED BY U.S. PATENT # 6,869,920	12/12/14	

**DESIGNED:** TEP **DATE:** 1/23/14  
**DRAWN:** EXH **SCALE:** N.T.S.  
**CHECKED:** PR **DWG NO:** BF-101

**BAYSAYER TECHNOLOGIES**  
800-229-7283  
WWW.BAYSAYER.COM

**MIDWAY BUSINESS CENTER**  
MANHOLE BAYFILTER  
MODEL MHF-60-2  
SYSTEM #2

**OWNER/DEVELOPER**  
TSC/JM/J SNOWDEN RIVER SOUTH LLC A MD LLC  
8600 SNOWDEN RIVER PKWY, SUITE 207  
COLUMBIA, MD 21045  
410-953-0222

**AS-BUILT CERTIFICATION FOR PSWM**

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT OCCURRENCE OF THE UNDERGROUND SWM FACILITY.

**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.

SIGNATURE: \_\_\_\_\_ P.E. NO. \_\_\_\_\_  
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 THOSE 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.

**PROFESSIONAL CERTIFICATE**

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. MY LICENSE NUMBER IS 16193. EXPIRATION DATE: 09-27-2014.

**ROBERT H. VOGEL**  
ENGINEERING, INC.  
8407 MAIN STREET  
ELLIOTT CITY, MD 21043  
TEL: 410.461.7666  
FAX: 410.461.8961

**REVISED SITE DEVELOPMENT PLAN**  
STORMWATER MANAGEMENT UNDERGROUND  
BAYFILTER SYSTEM #2 PLAN & PROFILE

**MIDWAY BUSINESS CENTER**  
SNOWDEN RIVER SOUTH  
SECTION 1, AREA SPACE  
INDUSTRIAL / FLEX SPACE  
(PLAT 8795, L. 10008/F.485) PARCEL 319, PARCEL C  
6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

TAX MAP 42 GRID 10  
6TH ELECTION DISTRICT

**ROBERT H. VOGEL**  
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TEL: 410.461.7666  
FAX: 410.461.8961

DESIGN BY: JAR  
DRAWN BY: JAR  
CHECKED BY: RHW  
DATE: JANUARY 2014  
SCALE: AS SHOWN  
W.O. NO.: 05-03

17 SHEET OF 24

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 11/20/14

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 12/16/14

DIRECTOR  
DATE: 12/16/14

BY THE DEVELOPER:

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

SIGNATURE OF DEVELOPER: \_\_\_\_\_  
DATE: 3/11/14

BY THE ENGINEER:

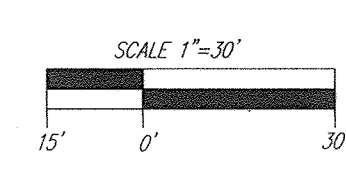
I HEREBY CERTIFY THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

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

SIGNATURE OF ENGINEER: \_\_\_\_\_  
DATE: 3/11/14

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

SIGNATURE OF HOWARD S.C.D. MEMBER: \_\_\_\_\_  
DATE: 3/11/14









**MARYLAND 378  
STORMWATER MANAGEMENT POND CONSTRUCTION SPECIFICATIONS**

**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 version.

**Site Preparation**

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of 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 materials. 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 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if directed 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 principal spillway must 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 tread track of heavy equipment or compaction shall be achieved by a minimum of four complete passes of a sheepfoot, rubber tired or vibratory roller. Fill material shall be compacted to 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 as necessary 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 operated closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall 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 material shall have a 100-200 psi, 28 day uncured 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 minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and, on the sides 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 assure 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 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 the 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 (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 coating 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 watertight coupling bands or flanges.

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.

**POND BOTTOM SOIL CONDITIONS**

If broken rock fragments are encountered at finished pond bottom, under cut a minimum of 12" below basin grade and to a horizontal distance of at least 18" beyond each edge of the broken rock and backfill with fine-grained ML or CL soils compacted to a firm condition. This procedure should be performed under the supervision of the project Geotechnical Engineer.

**APPROVED**  
PLANNING BOARD  
OF HOWARD COUNTY  
DATE: April 16, 2012

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DIRECTOR

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

BY THE ENGINEER:  
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS 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.

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

John P. Hinton  
HOWARD S.C.D.  
4/16/12

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant 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.

Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight. All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be rolled on an adequate number of corrugations to accommodate the bandwidth. The following pipe connections are acceptable for pipes less than 24 inches diameter: flanges on both ends of the pipe with a circular 3/8 inch thick closed circle circular neoprene gasket; and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4(our) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed circle circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8-inch closed circle gaskets will be installed with the full width of the flange is also acceptable.

Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.
5. Backfilling shall conform to "Structure Backfill."
6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe - All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.
2. Bedding - Reinforced concrete pipe conduits shall be laid in a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe to least 50% of its outside diameter with a minimum thickness of 6 inches. Where a concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Grave bedding is not permitted.
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 material. 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 soft, 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 as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete structures shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

Rock Riprap - Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction Materials, Section 311.

Geotextile shall be placed under all riprap and shall meet requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.03, Class C.

**Care of Water during Construction**  
All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect and be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slopes and bottom required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water sumps from which the water shall be pumped.

**Stabilization**  
All borrow areas shall be graded to provide proper drainage and left in a slightly condition. All exposed surfaces of the embankment, spillway, spoil 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.

**APPENDIX B.3. CONSTRUCTION SPECIFICATIONS FOR SAND FILTERS, BIORETENTION AND OPEN CHANNELS SPECIFICATIONS FOR BIORETENTION**

**1. MATERIAL SPECIFICATIONS**  
THE ALLOWABLE MATERIALS TO BE USED IN BIORETENTION AREA ARE DETAILED IN TABLE B.3.2.

**2. PLANTING SOIL**  
THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES. NO OTHER MATERIALS OR SUBSTANCES SHALL BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH OR PROVE A HINDRANCE TO PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMUDA GRASS, QUACKGRASS, JOHNSON GRASS, OR OTHER NOXIOUS WEEDS AS SPECIFIED UNDER COMAR 15.08.01.05.

THE PLANTING SOIL SHALL BE TESTED AND SHALL MEET THE FOLLOWING CRITERIA:  
PH RANGE: 6.2 - 7.0  
ORGANIC MATTER: 1.5-4 % (BY WEIGHT)  
MAGNESIUM: 35 LB./AC  
PHOSPHORUS (GEOPTHITE - P025) 75 LB./AC  
POTASSIUM (POTASH - K20) 85 LB./AC

ALL BIORETENTION AREAS SHALL HAVE A MINIMUM OF ONE TEST. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, PHOSPHORUS, AND POTASSIUM AND ADDITIONAL TEST OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOP SOIL WAS EXCAVATED, SINCE DIFFERENT LAB CALIBRATE THEIR TESTING EQUIPMENT DIFFERENTLY. ALL TESTING RESULTS SHALL COME FROM THE SAME TESTING FACILITY. SHOULD THE PH FALL OUT OF THE ACCEPTABLE RANGE, IT MAY BE MODIFIED (HIGHER) WITH LIME OR (LOWER) WITH IRON SULFATE PLUS SULLUR.

**3. COMPACTION**  
IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE HOES TO REMOVE ORIGINAL SOIL. IF BIORETENTION AREAS ARE EXCAVATED USING LOADERS, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TIRES. THE USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL, FLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACTURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER. ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REVERSE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

ROTOTILL 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE REQUIRED SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTOTILLING) BASE.

WHEN BACKFILLING THE TOPSOIL OVER THE SAND LAYER, FIRST PLACE 3 TO 4 INCHES OF TOPSOIL OVER THE SAND, THEN ROTOTILL THE SAND/TOPSOIL TO CREATE A GRADATION ZONE. BACKFILL THE REMAINDER OF THE TOPSOIL TO FINAL GRADE.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS 2" TO 18". DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION BASIN. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SAND. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

**4. PLANT MATERIAL**  
RECOMMENDED PLANT MATERIAL FOR BIORETENTION AREAS CAN BE FOUND IN APPENDIX A, SECTION A.2.3. OF THE 2000 MARYLAND STORMWATER DESIGN MANUAL.

**5. PLANT INSTALLATION**  
MULCH SHOULD BE PLACED TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO THE PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE. SHREDDED MULCH MUST BE WELL AGED (6 TO 12 MONTHS) FOR ACCEPTANCE.

ROOT STOCK OF THE PLANT MATERIAL SHALL BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. THE DIAMETER OF THE MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS.

TREES SHALL BE BRACED USING 2" BY 2" STAKES ONLY AS NECESSARY AND FOR THE FIRST GROWING SEASON ONLY. STAKES ARE TO BE EQUALLY SPACED ON THE OUTSIDE OF THE TREE BALL.

GRASSES AND LEGUME SEED SHOULD BE DRILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHALL BE PLANTED FOLLOWING THE NON-CRASS GROUND COVER PLANTING SPECIFICATIONS.

THE TOPSOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS, OR AT A MINIMUM, IMPROVES THIS GOAL. ONLY A MINIMUM AMOUNT OF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS OF NITROGEN PER 1000 SQUARE FEET.

**6. UNDERDRAINS**  
UNDERDRAINS ARE TO BE PLACED ON A 3"-0" WIDE SECTION FILTER CLOTH. PIPE IS PLACED NEXT, FOLLOWED BY THE GRAVEL BEDDING. THE ENDS OF UNDERDRAIN PIPES NOT TERMINATING IN AN OBSERVATION WELL SHALL BE CAPPED. THE MAIN COLLECTION PIPE UNDERDRAIN SYSTEMS SHALL BE LOCATED AT A MINIMUM SOLE OF 0.5%.

**7. MISCELLANEOUS**  
BIORETENTION FACILITY MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

**UNDERGROUND SAND FILTER CONSTRUCTION SPECIFICATIONS**

1. PROVIDE MANHOLE AND/OR GRATES TO ALL UNDERGROUND AND BELOW GRADE STRUCTURES. MANHOLES SHALL BE IN COMPLIANCE WITH STANDARD SPECIFICATIONS FOR EACH COUNTY, BUT DIAMETERS SHOULD BE 30" MINIMUM (TO COMPLY WITH OSHA CONFINED SPACE REQUIREMENTS). ALUMINUM AND STEEL MANHOLES SHOULD BE ACCEPTABLE. TEN INCH WIDE (MINIMUM) MANHOLE STEPS (12"O.C.) SHALL BE CAST IN PLACE OR DRILLED AND MORTARED INTO THE WALL BELOW EACH MANHOLE. A 5' MINIMUM HEIGHT CLEARANCE (FROM THE TOP OF THE SAND LAYER TO THE BOTTOM OF THE UPPER SURFACE GRAB) IS REQUIRED FOR ALL PERMANENT UNDERGROUND STRUCTURES. LIFT RINGS ARE TO BE APPLIED TO REMOVE/REPLACE TOP SLABS ON PRE-FABRICATED STRUCTURES. MANHOLE COVERS SHOULD ALLOW FOR PROPER VENTILATION.
2. UNDERGROUND SANDFILERS SHOULD BE CONSTRUCTED WITH A GATE VALVE LOCATED JUST ABOVE THE TOP OF THE FILTER BED FOR DEWATERING IN THE EVENT THAT CLOGGING OCCURS.
3. UNDERGROUND SAND BEDS SHALL BE PROTECTED FROM TRASH ACCUMULATION BY A WIDE MESH GEOTEXTILE SCREEN TO BE PLACED ON THE SURFACE OF THE SAND BED. SCREEN IS TO BE ROLLED UP, REMOVED, CLEANED AND RE-INSTALLED DURING MAINTENANCE OPERATIONS.

**DEWATERING STRATEGY**  
Dewatering refers to the act of removing and discharging water from excavated areas on construction sites or from sediment traps or basins on construction sites. Standards and specifications for dewatering practices follow:

These standards apply to removal and discharge of water from any excavated area or sediment trap or basin of any construction site. Given the unique conditions at any particular construction site, any or all of the practices may apply. Regardless of the applicability of the practices listed herein, operators are required to use acceptable procedures for maintenance and dewatering. In all cases, every effort shall be made to eliminate sediment pollution associated with dewatering.

Designers shall specify the preferred procedures for dewatering on plans. In particular, designers should identify procedures for dewatering sediment traps and basins and to elimination of the just sediment control facility on the site or prior to conversion of sediment control facilities to stormwater management facilities. Recommended procedures shall be consistent with these standards. Atypical site conditions may require innovative dewatering designs. Dewatering measures not referenced in this standard may be used with the consent of the approved authority.

**Dewatering of Excavated Areas**

1. Designers shall specify on plans, and in sequences of construction included on plans, the practices for dewatering of excavated areas. Plan reviewers shall check to see that procedures for dewatering are included on plans.
2. In all cases, water removed from excavated areas shall be discharged such that it shall pass through a sediment control device prior to entering receiving waters. Sediment control devices include sediment traps and basins, in addition to the practices in this section.

**Approved Practices for Dewatering of Excavated Areas**

1. Pumping of water to an existing sediment basin or trap in which the entire volume of water from the area to be dewatered can be contained without discharge to receiving waters.
2. Pumping of water to an existing sediment basin or trap such that the entire volume of water from the area to be dewatered can be managed without exceeding the design outflow from the sediment control structure.
3. Removable Pumping Station ? Standards and specifications for Removable Pumping Station are on Detail 20A.
4. Use of a Sump Pit ? Standards and specifications for a sump pit are on Detail 20B.
5. Sediment Tank ? Standards and specifications for a sump pit are on Detail 21.

**Dewatering of Sediment Traps and Basins**  
Designers shall specify on plans, and in sequences of construction included on plans, the practices for dewatering of traps and basins. Plan reviewers shall check to see that procedures for dewatering to be used are included on plans. In all cases, water removed from traps and basins shall be discharged so that it passes through a sediment control device prior to entering receiving waters.

**Approved Practices for Dewatering of Traps and Basins**

1. Removable pumping station.
2. Use of a Sump Pit.
3. Use of a floating suction hose to pump the cleaner water from the top of the pond. As the cleaner water is pumped the suction hose will lower and eventually encounter sediment laden water. When this happens the pumping operation will cease. Provision shall be made to filter water.

**TABLE B.3.2 MATERIALS SPECIFICATION FOR BIORETENTION/RAINGARDEN**

MATERIALS	SPECIFICATIONS	SIZE	NOTES
PLANTINGS	SEE APPENDIX A, TABLE A-4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2.5' TO 4' DEEP)	SAND 35-60% SILT 30-55% CLAY 0-3%	N/A	USDA SOIL TYPES LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDDED HARDWOOD		AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAGM AND CURTAIN DRAIN	PEA GRAVEL: ASTM-D-448 ORNAMENTAL STONE: WASHED CLOBBLES	PEA GRAVEL: NO. 6 STONE: 2" TO 5"	
GEOTEXTILE	CLASS "C" - APPARENT OPENING SIZE (ASTM-D-4751), GRADE TENSILE STRENGTH (ASTM-D-4632), PUNCTURE RESISTANCE (ASTM-D-4833)	N/A	FOR USE BENEATH UNDERDRAINS ONLY
UNDERDRAIN GRAVEL	AASHTO M-43	0.375" TO 0.75"	
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO M-278	4" TO 6" RIGID SCHEDULE 40 PVC OR SDR35	3/8" PERF. @ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER IPES; NOT NECESSARY UNDERNEATH PIPES
POURED IN PLACE CONCRETE (IF REQUIRED)	MSHA MIX NO. 3; F'C=3500 PSI/28 DAYS, NORMAL WEIGHT, AIR-ENTRAINED, REINFORCED TO MEET ASTM-615-60	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONCRETE REQUIRED; 28 DAY STRENGTH AND SLUM TEST; ALL CONCRETE DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRED DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND DESIGN TO INCLUDE MEETING ACI CODE: 350R/89 VERTICAL LOADING (H-10 OR H-20); ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING
SAND (1' DEEP)	AASHTO-M-6 OR ASTM-C-33	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.

**TABLE B.3.1 MATERIAL SPECIFICATIONS FOR SAND FILTERS**

MATERIAL	SPECIFICATIONS / TEST METHOD	SIZE	NOTES
SAND	CLEAN AASHTO-M-6 OR ASTM-C-33 CONCRETE SAND	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
UNDERDRAIN GRAVEL	AASHTO-M-43	0.375" TO 0.75"	
COLLECTION PIPE	ASTM-D-1785 OR ASTM-D-3034 FITTINGS SHALL MEET ASTM-D-2729	RIGID SCHEDULE 40 OR SDR 35	PERFORATIONS TO BE 3/8 INCH DIAMETER ROWS 6" O/C MINIMUM 4-HOLES / ROW
OBSERVATION WELL / CLEANOUT	M 278 OR F 758, TYPE PS 28	6" RIGID SCHEDULE 40 OR SDR 35	PERFORATIONS TO BE 3/8 INCH DIAMETER ROWS 6" O/C MINIMUM 4-HOLES / ROW
GEOTEXTILE FABRIC (IF REQUIRED)	ASTM-D-4833 (PUNCTURE STRENGTH - 125 LB.) ASTM-D-4632 (TENSILE STRENGTH - 300 LB.)	0.08" THICK EQUIVALENT OPENING SIZE OF #80 SIEVE	MUST MAINTAIN 125 spm PER SQ. FT. FLOW RATE. NOTE: A 4" PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS.
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO-M-278	4"-6" RIGID SCHEDULE 40 PVC OR SDR35	3/8" PERF. @ 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES.
CONCRETE (CAST-IN PLACE)	MSHA STANDARDS AND SPECS, SECTION 902, MIX NO. 3, F'c = 3500 psi, NORMAL WEIGHT, AIR-ENTRAINED, RE-INFORCING TO MEET ASTM-615-60	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONCRETE REQUIRED; 28 DAY STRENGTH AND SLUMP TEST; ALL CONCRETE DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRED DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND.
CONCRETE (PRE-CAST)	PER PRE-CAST MANUFACTURER	N/A	SEE ABOVE NOTE
NON-REBAR STEEL	ASTM A-36	N/A	STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM-A-123
TOPSOIL	SAND 35-60% SILT 30-55% CLAY 0%	N/A	THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN 1"

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED UNDERGROUND STORMWATER FILTRATION SYSTEM (F-2)**

1. THE SEDIMENT CHAMBER OUTLET DEVICES SHALL BE CLEANED AND/OR REPAIRED WHEN DRAIN-DOWN TIMES WITHIN THE CHAMBER EXCEED 36 HOURS.
2. DEBRIS AND LITTER SHALL BE REMOVED AS NECESSARY TO ENSURE PROPER OPERATION OF THE SYSTEM.
3. SEDIMENT SHALL BE CLEANED OUT OF THE SEDIMENTATION CHAMBER WHEN IT ACCUMULATES TO A DEPTH OF 6 INCHES. VEGETATION WITHIN THE SEDIMENT CHAMBER SHALL BE LIMITED TO A HEIGHT OF 18 INCHES.
4. 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.
5. A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
6. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO ENSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
7. 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.

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS (F-1, F-4, AND F-5)**

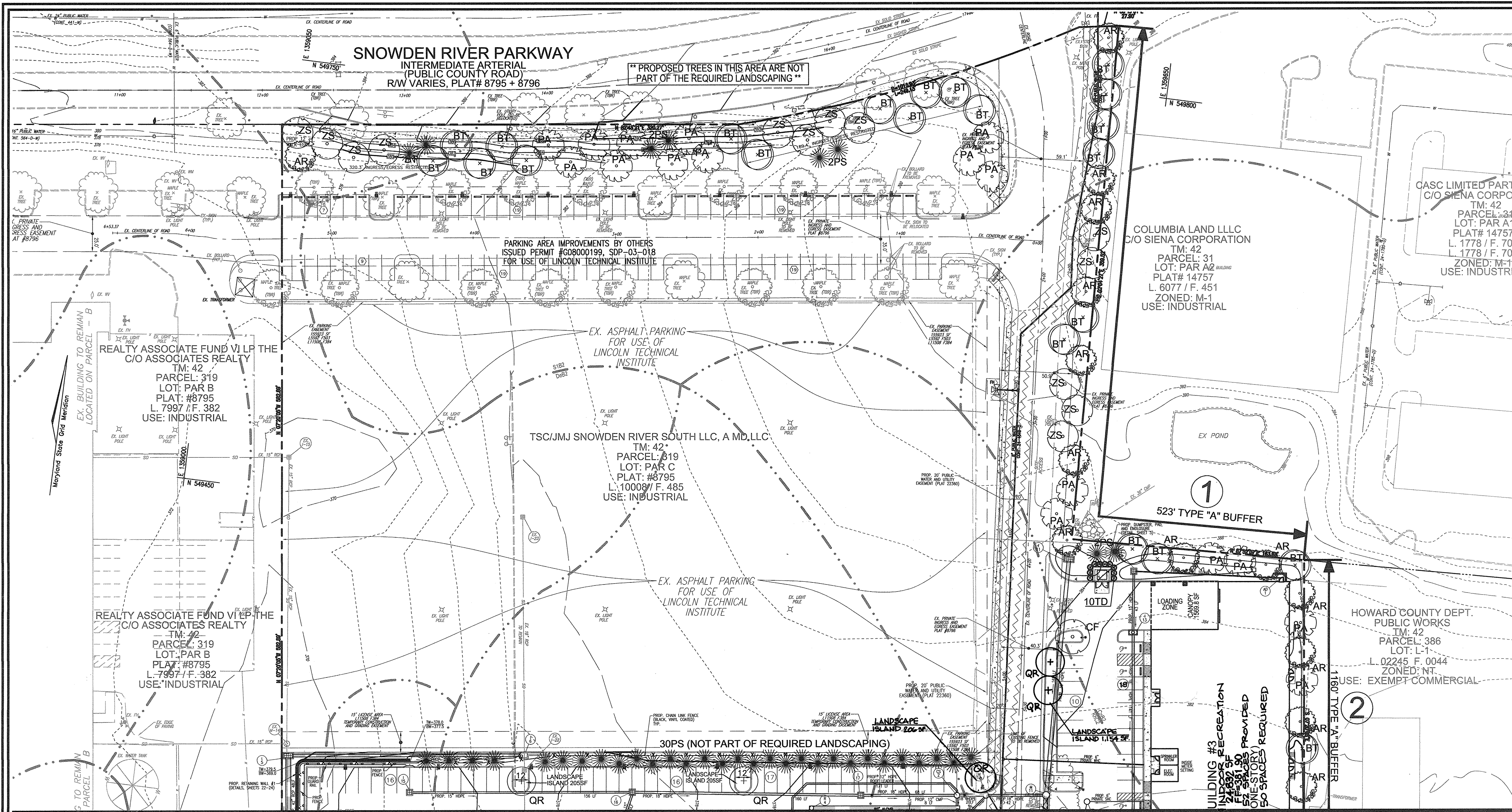
1. THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
2. THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE PER YEAR, WHEN VEGETATION REACHES 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 SLT 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 DRAINS.
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.

**OPERATION AND MAINTENANCE SCHEDULE FOR AS-BUILT CERTIFICATION FOR PSWM**

1. ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH OUT. ANY MULCH REPLACEMENT SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE AND INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL AND PRUNING.
2. SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN SPRING AND DECEMBER. THIS INSPECTION WILL INCLUDE REMOVAL OF DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, TREATMENT OF ALL DEFICIENT STAKES AND WIRES.
3. MULCH SHALL BE INSPECTED EACH SPRING. REMOVE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER EVERY 2 TO 3 YEARS.
4. SOIL RESOURCES TO BE ADDRESSED ON AN AS NEEDED WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.





### LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- DIRECTION OF FLOW
- LIGHT POLES
- SOIL TYPE
- ADJACENT PROPERTY LINE
- SITE BOUNDARY
- RIGHT-OF-WAY LINE
- EXISTING CURB & GUTTER
- PROPOSED CURB & GUTTER
- EXISTING 20' PUBLIC RIGHT-OF-WAY (L 1548 / F 510)
- PROPOSED PAVING OVERLAY
- PROPOSED 20' PUBLIC RIGHT-OF-WAY AND UTILITY EASEMENT (L 5592 / F 503)
- EXISTING PARKING EASEMENT (L 5592 / F 503)
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- EXISTING FENCE
- EXISTING STREAM
- EXISTING STREAM BUFFER
- PROPOSED CROSS WALK
- EXISTING INGRESS AND EGRESS EASEMENT (PLAT#8796)
- PROPOSED 20' PUBLIC RIGHT-OF-WAY (L 5592 / F 510)
- EXISTING TREES (FIELD LOCATED)
- EXISTING TREELINE (FIELD LOCATED)
- PROPOSED TREELINE
- PROPOSED SIDEWALK
- PROPOSED SHADE TREE
- PROPOSED EVERGREEN TREE
- PROPOSED SHRUBS
- LANDSCAPE PERIMETER
- QR
- AR
- PS
- TD

- ### GENERAL NOTES:
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. THE REQUIRED PARKING AND PERIMETER LANDSCAPING WILL BE BONDED PER THIS SUBMISSION.
  - FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$13,500.00 FOR THE REQUIRED 43 SHADE TREES, AND 4 EVERGREEN TREES.
- ### LANDSCAPE SCHEDULE NOTE:
- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL, CONFORM TO THE MOST CURRENT AAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH HRD PLANTING SPECIFICATIONS.
  - CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
  - FINAL LOCATION OF PLANT MATERIAL MAY NEED TO VARY TO MEET FINAL FIELD CONDITIONS. TREES SHALL NOT BE PLANTED IN THE BOTTOM OF DRAINAGE SWALES.
  - CONTRACTOR SHALL VERIFY PLANT QUANTITIES PRIOR TO BIDDING. IF PLAN DIFFERS FROM LANDSCAPE SCHEDULE, THE PLAN SHALL GOVERN.

**OWNER/DEVELOPER**  
 TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
 8600 SNOWDEN RIVER PKWY, SUITE 207  
 COLUMBIA MD 21045  
 410-953-0222

MATCHLINE - SEE SHEET 21  
**PLAN VIEW**  
 SCALE: 1"=40'

**SCHEDULE B  
 PARKING LOT INTERNAL LANDSCAPING**

NUMBER OF PARKING SPACES	396
NUMBER OF TREES REQUIRED	20
NUMBER OF TREES PROVIDED	20
SHADE TREES (2:1 SUBSTITUTION)	20

**SCHEDULE A  
 PERIMETER LANDSCAPE EDGE**

CATEGORY	ADJACENT TO PERIMETER AND ROADWAYS		ADJACENT TO DUMPSTER		ADJACENT TO DUMPSTER	
	1	2	3	4	5	6
PERIMETER/FRONTAGE DESIGNATION	A	A	A	C	C	C
LANDSCAPE TYPE	523	1160	179	33	33	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET (DESCRIBE BELOW IF NEEDED))	NO	NO	YES	NO	NO	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET (DESCRIBE BELOW IF NEEDED))	NO	NO	YES	NO	NO	
NUMBER OF PLANTS REQUIRED	1:60	1:60	20	1:40	1:40	1*
SHADE TREES				1:20	1:20	2
EVERGREEN TREES						0*
NUMBER OF PLANTS PROVIDED						
SHADE TREES	9	19		0*	0*	
EVERGREEN TREES				2	2	
SHADE TREES ABOVE REQUIREMENT	17	23	17			
OTHER TREES (2:1 SUBSTITUTION)						
SHRUBS (10:1 SUBSTITUTION)				10	10	

\* SUBSTITUTE TO SHRUBS FOR ONE SHADE TREE AT BOTH DUMPSTER AREAS.

**LANDSCAPE SCHEDULE - REQUIRED PLANTING**

KEY	QUAN.	BOTANICAL NAME	SIZE	CAT.
AR	29	ACER RUBRUM OCTOBER GLORY RED MAPLE	2 1/2"-3" CAL.	B & B
QR	20	QUERCUS PHellos WILLOW OAK	2 1/2"-3" CAL.	B & B
PS	4	PINUS STROBUS EASTERN WHITE PINE	6"-8" HT.	B & B
TD	20	TAXUS MEDIA 'DENSIFORMIS' DENSIFORMIS YEW	2 1/2"-3" HT.	B & B

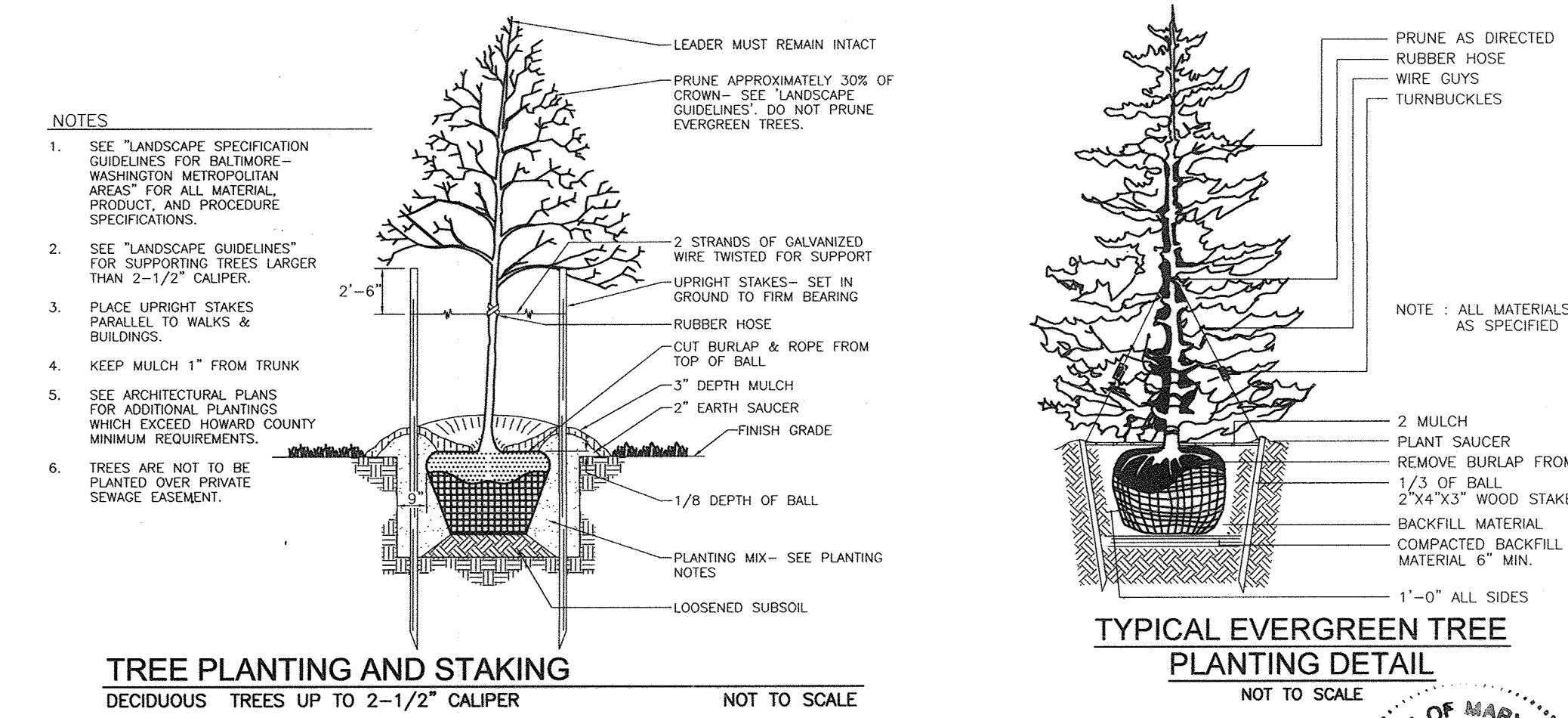
**LANDSCAPE SCHEDULE - ADDITIONAL PLANTING**

KEY	QUAN.	BOTANICAL NAME	SIZE	CAT.
PS	36	PINUS STROBUS EASTERN WHITE PINE	6"-8" HT.	B & B
AR	4	ACER RUBRUM OCTOBER GLORY RED MAPLE	2 1/2"-3" CAL.	B & B
CF	2	DOGWOOD CORNUS FLORIDA	2 1/2"-3" CAL.	B & B
BT	34	BETULA NIGRA 'HERITAGE' HERITAGE CLUMP RIVER BIRCH	2 1/2"-3" CAL.	B & B
PA	34	PLATANUS X ACERIFOLIA 'COLUMBIA' COLUMBIA LONDON PLANE	2 1/2"-3" CAL.	B & B
ZS	32	ZELKOVA SERRATA 'VILLAGE GREEN' VILLAGE GREEN JAPANESE ZELKOVA	2 1/2"-3" CAL.	B & B
TD	44	TAXUS MEDIA 'DENSIFORMIS' DENSIFORMIS YEW	2 1/2"-3" HT.	B & B

**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, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

DATE: 11/15/14  
 DATE: 12/10/14  
 DATE: 12/1/14



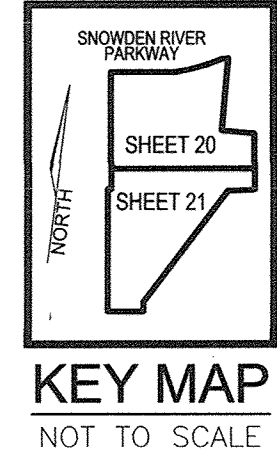
**TREE PLANTING AND STAKING**  
 DECIDUOUS TREES UP TO 2-1/2" CALIPER NOT TO SCALE

**TYPICAL EVERGREEN TREE PLANTING DETAIL**  
 NOT TO SCALE

AS-BUILT CERTIFICATION FOR PSMW

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND CONFORMS WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE RESULTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SSMW FACILITY.

DATE: 6-18-19  
 P.E. NO. 16193



NO.	REVISION	DATE
8	REVISE TO INCREASE PARKING AND CHANGE USE	04-24-17
1	REVISE STORMFILTERS TO BAYFILTERS, INCORPORATE ARCHITECTURAL REVISIONS TO THE BUILDINGS	02/12/14
	REVISE WIRE AND SHG. AND REVISE WATER MAIN MATERIAL FROM DPW TO 6000 PLS. PER 6/15/15	

**REVISED SITE DEVELOPMENT PLAN  
 LANDSCAPE PLAN**

**MIDWAY BUSINESS CENTER  
 SNOWDEN RIVER SOUTH**

SECTION 1, AREA 1  
 INDUSTRIAL/FLEX SPACE  
 (PLAT# 8795, L. 10008/F. 485)

TAX MAP 42, GRID 10  
 6TH ELECTION DISTRICT

PARCEL 319, PARCEL C  
 HOWARD COUNTY, MARYLAND.

**ROBERT H. VOGEL  
 ENGINEERING, INC.**

ENGINEERS • SURVEYORS • PLANNERS

8407 MAIN STREET  
 ELLICOTT CITY, MD 21043

TEL: 410.461.7666  
 FAX: 410.461.8961

**PROFESSIONAL CERTIFICATE**

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. 16193, EXPIRATION DATE: 08-27-2014.

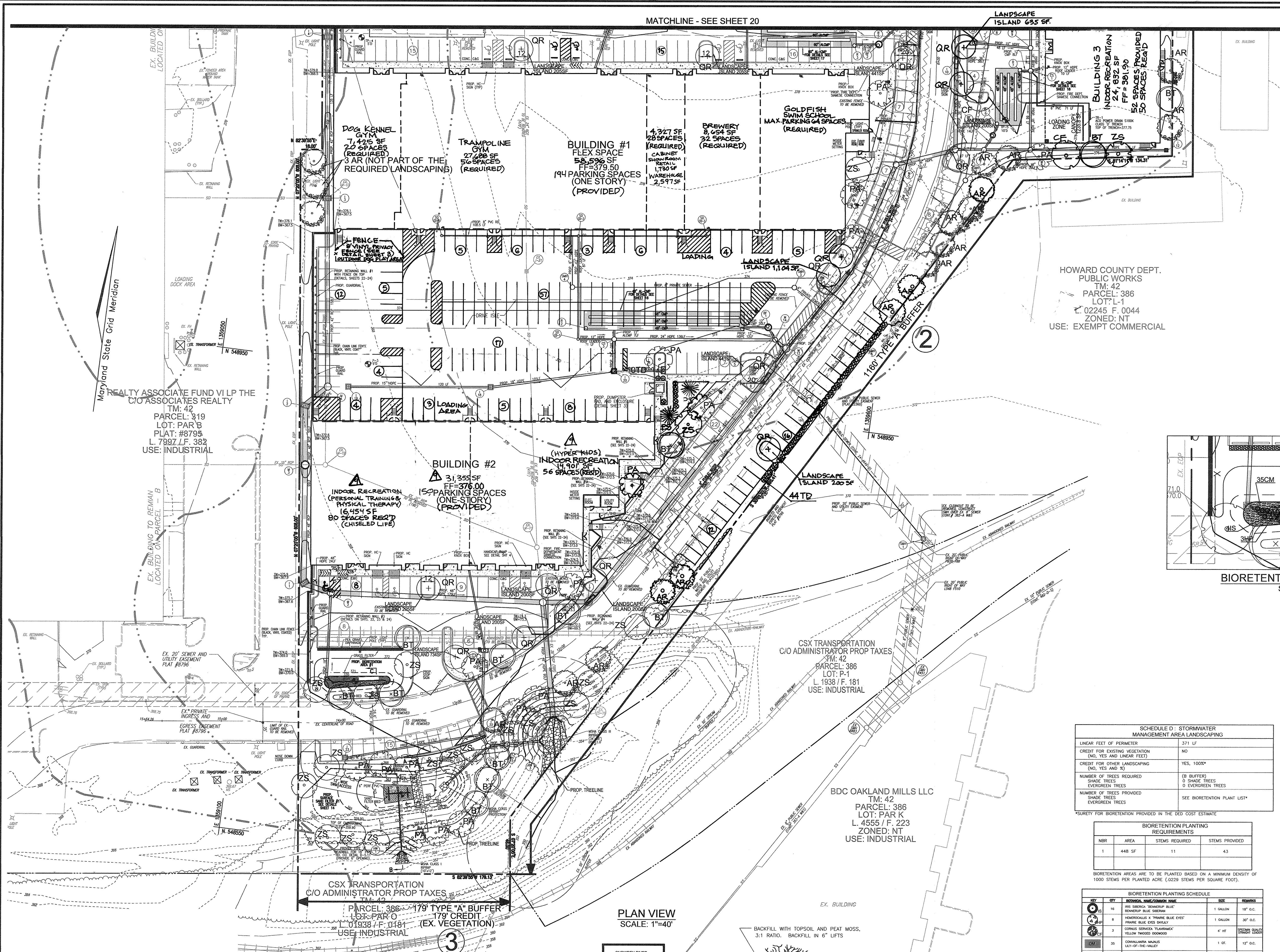
DESIGN BY: JAR  
 DRAWN BY: JAR  
 CHECKED BY: RHY  
 DATE: JANUARY 2014  
 SCALE: AS SHOWN  
 W.O. NO.: 05-03

20 SHEET OF 24



MATCHLINE - SEE SHEET 20

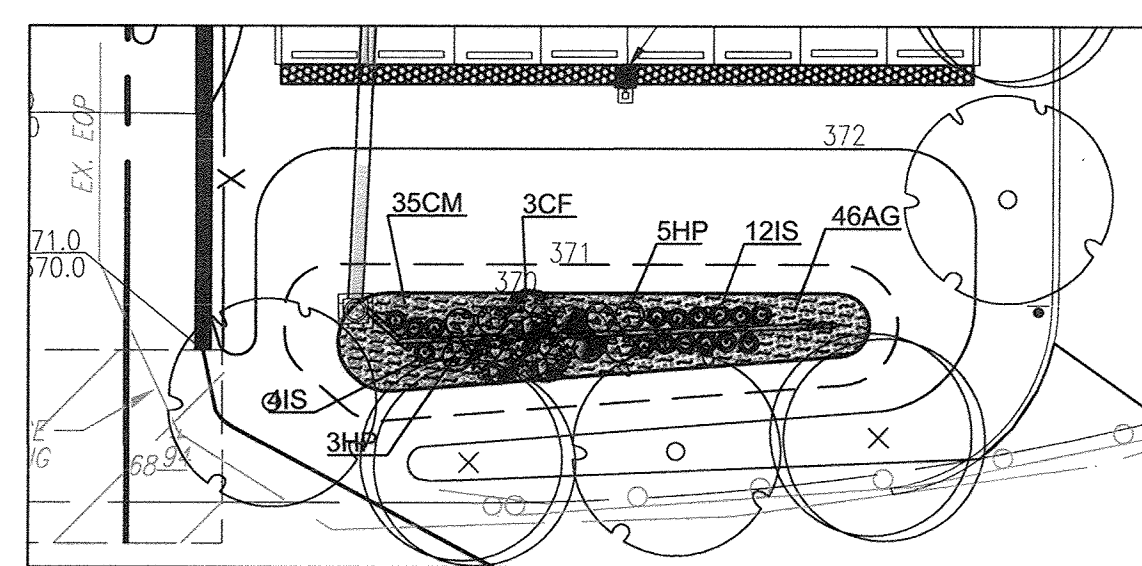
LANDSCAPE ISLAND 655 SF.



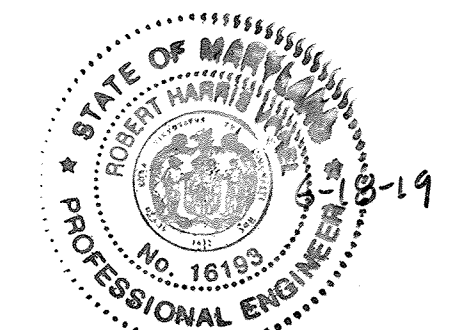
**LEGEND**

EXISTING CONTOUR	---	EXISTING INGRESS AND EGRESS EASEMENT (PLAT #8795)	
PROPOSED CONTOUR	---	EXISTING 20' PUBLIC RIGHT-OF-WAY (L 5482 / F 510)	
EXISTING SPOT ELEVATION	+	EXISTING 20' PUBLIC WATER AND UTILITY EASEMENT (L 5592 / F 503)	
PROPOSED SPOT ELEVATION	+	EXISTING PARKING EASEMENT (L 5592 / F 503)	
DIRECTION OF FLOW	→	EXISTING TREES (FIELD LOCATED)	
LIGHT POLES	☀	EXISTING TREELINE (FIELD LOCATED)	
SOIL TYPE	M1B2 M1D3	PROPOSE TREELINE	
ADJACENT PROPERTY LINE	---	PROPOSED SIDEWALK	
SITE BOUNDARY	---	PROPOSED SHADE TREE	
RIGHT-OF-WAY LINE	---	PROPOSED EVERGREEN TREE	
EXISTING CURB & GUTTER	---	PROPOSED SHRUBS	
PROPOSED CURB & GUTTER	---	LANDSCAPE PERIMETER	
EXISTING 20' SEWER AND UTILITY EASEMENT (L 5592 / F 503)	---		
PROPOSED 20' PUBLIC SEWER AND UTILITY EASEMENT (L 5592 / F 503)	---		
EXISTING UTILITY POLE	---		
EXISTING LIGHT POLE	---		
EXISTING MAILBOX	---		
EXISTING SIGN	---		
EXISTING SANITARY MANHOLE	---		
EXISTING SANITARY LINE	---		
EXISTING CLEANOUT	---		
EXISTING FIRE HYDRANT	---		
EXISTING WATER LINE	---		
EXISTING FENCE	---		
EXISTING STREAM	---		
EXISTING STREAM BUFFER	---		
PROPOSED CROSS WALK	---		

HOWARD COUNTY DEPT. PUBLIC WORKS  
 TM: 42  
 PARCEL: 386  
 LOT: 1  
 L. 02245 F. 0044  
 ZONED: NT  
 USE: EXEMPT COMMERCIAL



**BIORETENTION PLANTING PLAN**  
 SCALE: 1"=20'



AS-BUILT CERTIFICATION FOR PSWM

I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND COMPLIES WITH THE APPROVED PLANS AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONTRIBUTING DRAINAGE AREA IS SUFFICIENTLY STABILIZED TO PREVENT CLOGGING OF THE UNDERGROUND SWM FACILITY.

DATE: 6-18-19  
 P.E. # 16193

**OWNER/DEVELOPER**

TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
 8600 SNOWDEN RIVER PKWY, SUITE 207  
 COLUMBIA MD 21045  
 410-953-0222

**SCHEDULE D: STORMWATER MANAGEMENT AREA LANDSCAPING**

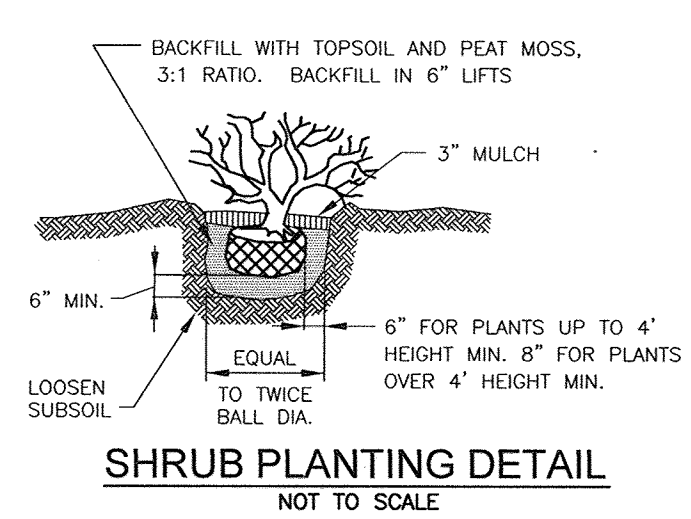
LINEAR FEET OF PERIMETER	271 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	YES, 100%*
NUMBER OF TREES REQUIRED (SHADE TREES, EVERGREEN TREES)	(10 BUFFER) 0 SHADE TREES 0 EVERGREEN TREES
NUMBER OF TREES PROVIDED (SHADE TREES, EVERGREEN TREES)	SEE BIORETENTION PLANT LIST*

**BIORETENTION PLANTING REQUIREMENTS**

NBR	AREA	STEMS REQUIRED	STEMS PROVIDED
1	448 SF	11	43

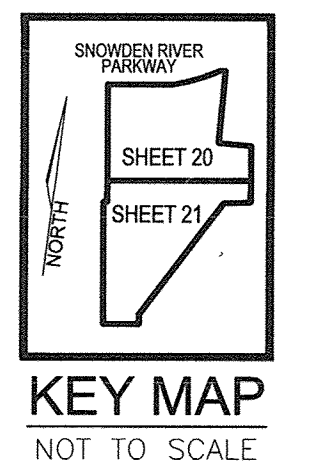
**BIORETENTION PLANTING SCHEDULE**

NO.	QTY	COMMON NAME	SIZE	FINISH
1	16	JOB SBERG 'REMBUR' BLUE BERRY/BLUE SEEDLING	1 GALLON	18" O.C.
2	9	HOOPNIGHTS 'NIRVANA BLUE CHEE'	1 GALLON	30" O.C.
3	3	CORTALIS 'SERENA' PLUMBERRY	4" HT	SPACING EQUAL TO BALL DIA.
4	35	CONVALLARIA MAJALIS 'LILY OF THE VALLEY'	1 QT.	12" O.C.
5	46	AROUS 'ORANGE' YOUNG GOLDEN WAREHED SHEET FLAG	1 QT.	12" O.C.



**SHRUB PLANTING DETAIL**  
 NOT TO SCALE

**PLAN VIEW**  
 SCALE: 1"=40'



**KEY MAP**  
 NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 1/14/14

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 1/14/14

DIRECTOR  
 DATE: 1/14/14

**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, A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE (1) YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

SIGNATURE OF DEVELOPER: [Signature]  
 DATE: 3/11/14

NO.	REVISION	DATE
1	REVISE THE PLAN TO MODIFY THE USE AND INCREASE THE PARKING	1-16-19
2	REVISE TO INCREASE PARKING AND CHANGE USE	04-24-17
3	REVISE TO INCREASE PARKING AND CHANGE USE	02/12/14

**REVISED SITE DEVELOPMENT PLAN**

**LANDSCAPE PLAN**

**MIDWAY BUSINESS CENTER**  
**SNOWDEN RIVER SOUTH**  
 SECTION 1, AREA 1  
 INDUSTRIAL / FLEX SPACE  
 (PLAT 8795, L. 10008/F. 485)

TAX MAP 42 GRID 10  
 6TH ELECTION DISTRICT

PARCEL 319, PARCEL C  
 HOWARD COUNTY, MARYLAND

**ROBERT H. VOGEL ENGINEERING, INC.**  
 ENGINEERS • SURVEYORS • PLANNERS  
 8407 MAIN STREET  
 ELICOTT CITY, MD 21043  
 TEL: 410.461.7666  
 FAX: 410.461.1595

**PROFESSIONAL CERTIFICATE**

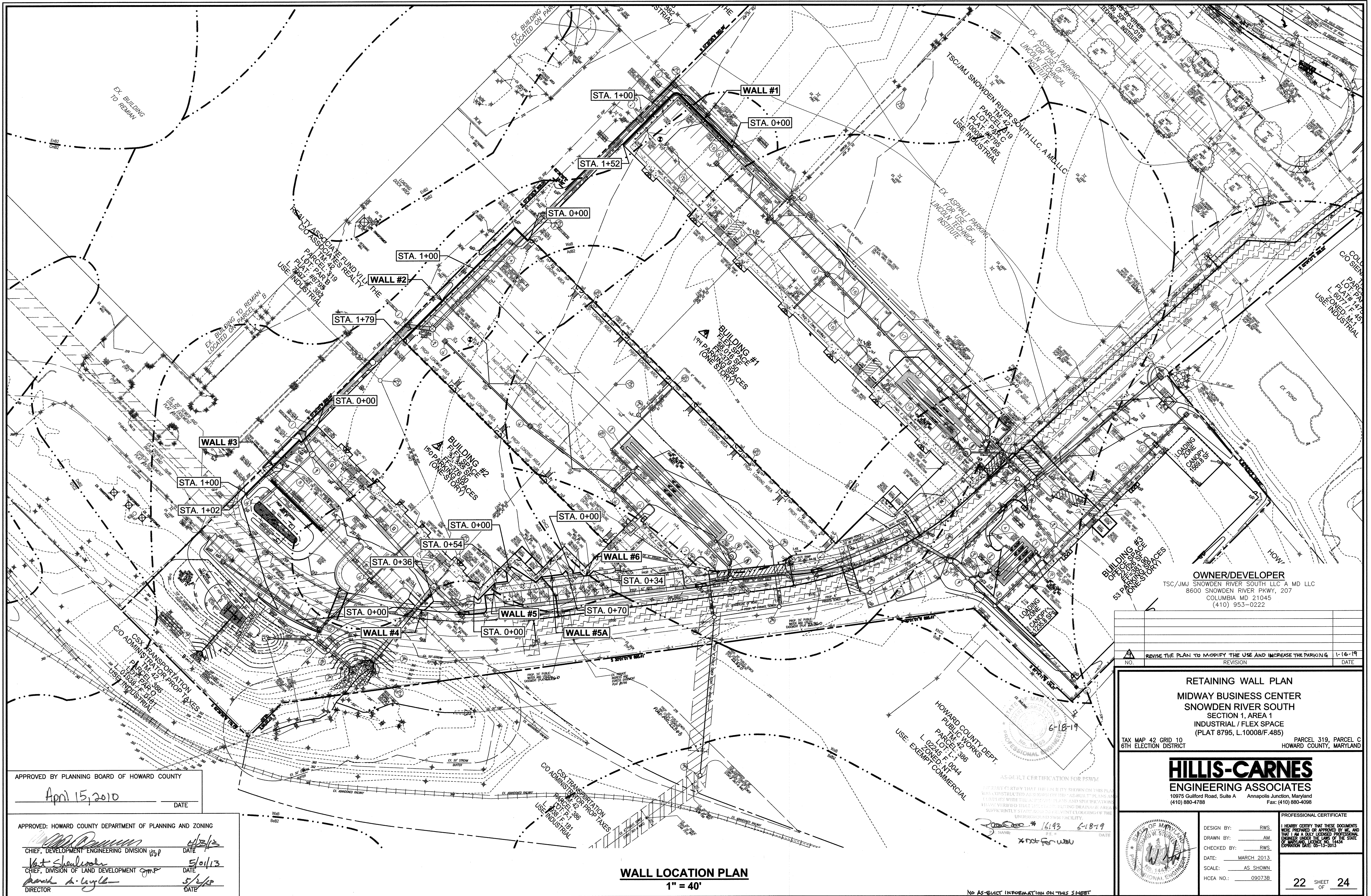
DESIGN BY: JAR  
 DRAWN BY: JAR  
 CHECKED BY: RHV  
 DATE: JANUARY 2014  
 SCALE: AS SHOWN  
 W.O. NO.: 05-03

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. 16193, EXPIRATION DATE: 06-27-2014.

21 SHEET OF 24

AS-BUILT - DECEMBER 2018





**OWNER/DEVELOPER**  
 TSC/JMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
 8600 SNOWDEN RIVER PKWY, 207  
 COLUMBIA MD 21045  
 (410) 953-0222

NO.	REVISION	DATE
1	REVISE THE PLAN TO MODIFY THE USE AND INCREASE THE PARKING	1-16-19

**RETAINING WALL PLAN**  
**MIDWAY BUSINESS CENTER**  
**SNOWDEN RIVER SOUTH**  
 SECTION 1, AREA 1  
 INDUSTRIAL / FLEX SPACE  
 (PLAT 8795, L.10008/F.485)

TAX MAP 42 GRID 10 PARCEL 319, PARCEL C  
 6TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
**ENGINEERING ASSOCIATES**  
 10975 Guilford Road, Suite A Annapolis Junction, Maryland  
 (410) 880-4788 Fax: (410) 880-4088



**PROFESSIONAL CERTIFICATE**  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 14434, EXPIRATION DATE 12-15-2013.

DESIGN BY: RWS  
 DRAWN BY: AM  
 CHECKED BY: RWS  
 DATE: MARCH 2013  
 SCALE: AS SHOWN  
 HCEA NO.: 09073B

**WALL LOCATION PLAN**  
 1" = 40'

APPROVED BY PLANNING BOARD OF HOWARD COUNTY  
 April 15, 2010  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 4/22/13  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 5/01/13  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 5/14/13  
 DIRECTOR DATE

NO AS-BUILT INFORMATION ON THIS SHEET



**SPECIFICATIONS**

**KEYSTONE MODULAR CONCRETE BLOCK RETAINING WALL**

**PART 1: GENERAL**

**1.01 Description**  
 A. Work shall consist of furnishing and construction of a KEYSTONE Retaining Wall System in accordance with these specifications and in reasonably close conformity with the lines, grades, design, and dimensions shown on the plans.  
 B. Work includes preparing foundation soil, furnishing and installing leveling pad, unit drainage fill and backfill to the lines and grades shown on the construction drawings.  
 C. Work includes furnishing and installing geogrid soil reinforcement of the type, size, location, and lengths designated on the construction drawings.

**1.02 Delivery, Storage and Handling**  
 A. Contractor shall check all materials upon delivery to assure that the proper type, grade, color, and certification has been received.  
 B. Contractor shall protect all materials from damage due to job site conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

**PART 2: PRODUCTS**

**2.01 Modular Concrete Retaining Wall Units**  
 A. Modular concrete units shall conform to the following architectural requirements:  
 face color - concrete gray - standard manufacturer's color may be specified by the Owner.  
 face finish - scullured rock face in angular tri-planer configuration. Other face finishes will not be allowed without written approval of Owner.  
 bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.  
 exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 10 feet under diffused lighting.  
 B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.  
 C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:  
 compressive strength = 3000 psi minimum;  
 absorption = 8 % maximum (6% in northern states) for standard weight aggregates;  
 dimensional tolerances = ± 1/8" from nominal unit dimensions - not including rough split face, ±1/16" unit height - top and bottom planes;  
 unit size - 8" (H) x 18" (W) x 12" (D) minimum;  
 unit weight - 75 lbs/unit minimum for standard weight

aggregates;  
 inter-unit shear strength - 1000 pif minimum at 2 psi normal pressure;  
 geogrid unit peak connection strength - 1000 pif minimum at 2 psi normal force.  
 D. Modular concrete units shall conform to the following constructability requirements:  
 vertical setback = 10's per course (near vertical) or 1" per course per design;  
 alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;  
 maximum horizontal gap between erected units shall be 1/2 inch.

**2.02 Shear Connectors**  
 A. Shear connectors shall be 1/2 inch diameter thermoset isophthalic polyester resin-protuded fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units.  
 Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to + 100 degrees F.  
 B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

**2.03 Base Leveling Pad Material**  
 A. Material shall consist of a compacted #57 crushed stone base as shown on the construction drawings.

**2.04 Unit Drainage Fill**  
 A. Unit drainage fill shall consist of #57 crushed stone

**2.05 Reinforced Backfill**  
 A. Reinforced backfill shall type SM, be free of debris and meet the following gradation tested in accordance with ASTM D-422 and meet other properties shown on the plan:  

Sieve Size	Percent Passing
2 inch	100-75
3/4 inch	100-75
No. 40	0-60
No. 200	0-40

 Plasticity Index (PI) <10 and Liquid Limit <40 per ASTM D-4318.  
 B. Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the reinforced soil mass.

**2.06 Geogrid Soil Reinforcement**

A. Geosynthetic reinforcement shall consist of geogrids manufactured specifically for soil reinforcement applications and shall be manufactured from high tenacity polyester yarn.

**2.07 Drainage Pipe**  
 A. The drainage pipe shall be perforated corrugated HDPE pipe manufactured in accordance with ASTM D-1248.

**PART 3 EXECUTION**

**3.01 Excavation**  
 A. Contractor shall excavate to the lines and grades shown on the construction drawings. Owner's representative shall be responsible for inspecting and approving the excavation prior to placement of leveling material or fill soils.

**3.02 Base Leveling Pad**  
 A. Leveling pad material shall be placed to the lines and grades shown on the construction drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6' in front and behind the modular wall unit.  
 B. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

**3.03 Modular Unit Installation**  
 A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.  
 B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.  
 C. Install shear/connecting devices per manufacturer's recommendations.  
 D. Place and compact drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.  
 E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed three courses.

**3.04 Structural Geogrid Installation**  
 A. Geogrid shall be oriented with the highest strength axis perpendicular to the wall alignment.  
 B. Geogrid reinforcement shall be placed at the strengths, lengths, and elevations shown on the construction design drawings or as directed by the Engineer.  
 C. The geogrid shall be laid horizontally on compacted backfill and attached to the modular wall units. Place the next course of modular concrete units over the geogrid. The geogrid shall be pulled taut, and anchored prior to

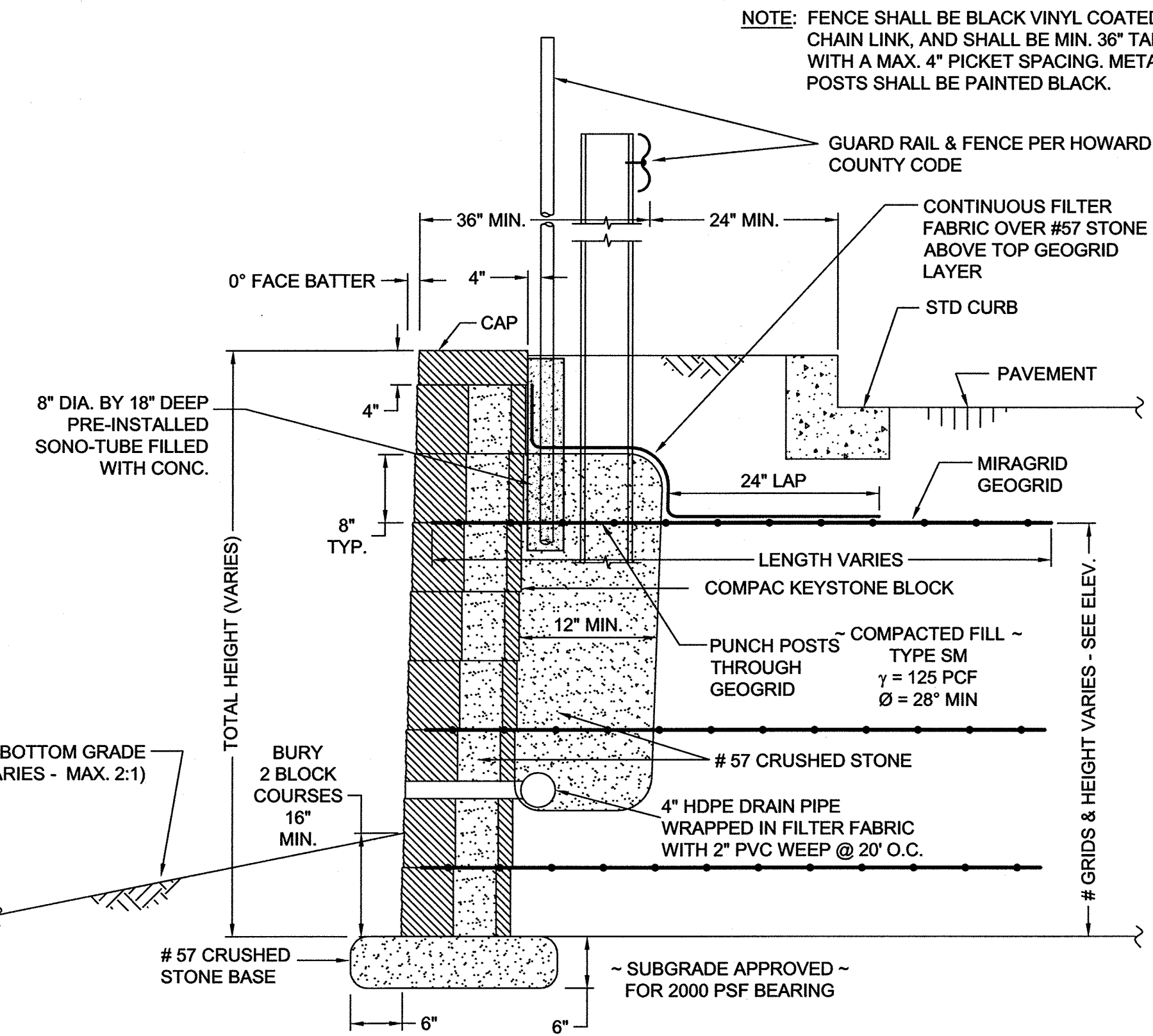
backfill placement on the geogrid.  
 D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps between adjacent pieces of geogrid are not permitted.

**3.05 Reinforced Backfill Placement**  
 A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.  
 B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 - 10 inches where heavy compaction equipment is used. Lift thickness shall be decreased to achieve the required density as required.  
 C. Reinforced backfill shall be compacted to 95% of the maximum density as determined by ASTM D698. The moisture content of the backfill material prior to and during compaction shall be uniformly distributed throughout each layer and shall be + 3% to - 3% of optimum.  
 D. Only lightweight hand-operated equipment shall be allowed within 3 feet from the tail of the modular concrete unit.  
 E. Tracked construction equipment shall not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicle turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.  
 F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning shall be avoided.  
 G. At the end of each day's operation, the Contractor shall slope the last lift of reinforced backfill away from the wall units to direct runoff away from wall face. The Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

**3.06 Cap Installation**  
 A. Cap units shall be glued to underlying units with an all-weather adhesive recommended by the manufacturer.

**3.07 Field Quality Control**  
 A. The Owner shall engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction.  
 B. As a minimum, quality assurance testing should include foundation soil inspection, soil and backfill testing, verification of design parameters, and observation of construction for general compliance with design drawings and specifications.

- NOTES:**
- No trees shall be planted within 10 feet of the top of the retaining wall.
  - Retaining walls shall only be constructed under the observation of a registered professional engineer and a (NICET, WACE, or equiv.) certified soils technician.
  - One soil boring shall be required every one hundred feet along the entire length of the wall. Copies of all boring reports shall be provided to the Howard County Inspector Prior to the start of construction.
  - The required bearing pressure beneath the wall system shall be verified in the field by a certified soils technician. Testing documentation must be provided to the Howard County Inspector prior to start of construction. The required bearing test shall be the Dynamic Cone Penetrometer test ASTM STP-399.
  - The suitability of fill material shall be confirmed by the on-site soils technician. Each 8" lift must be compacted to a minimum 95% standard proctor density and the testing report shall be made available to the Howard County Inspector upon completion of construction.
  - Walls shall not be constructed on uncertified fill materials.
  - Walls shall not be constructed within a Howard Co. right-of-way or easement.

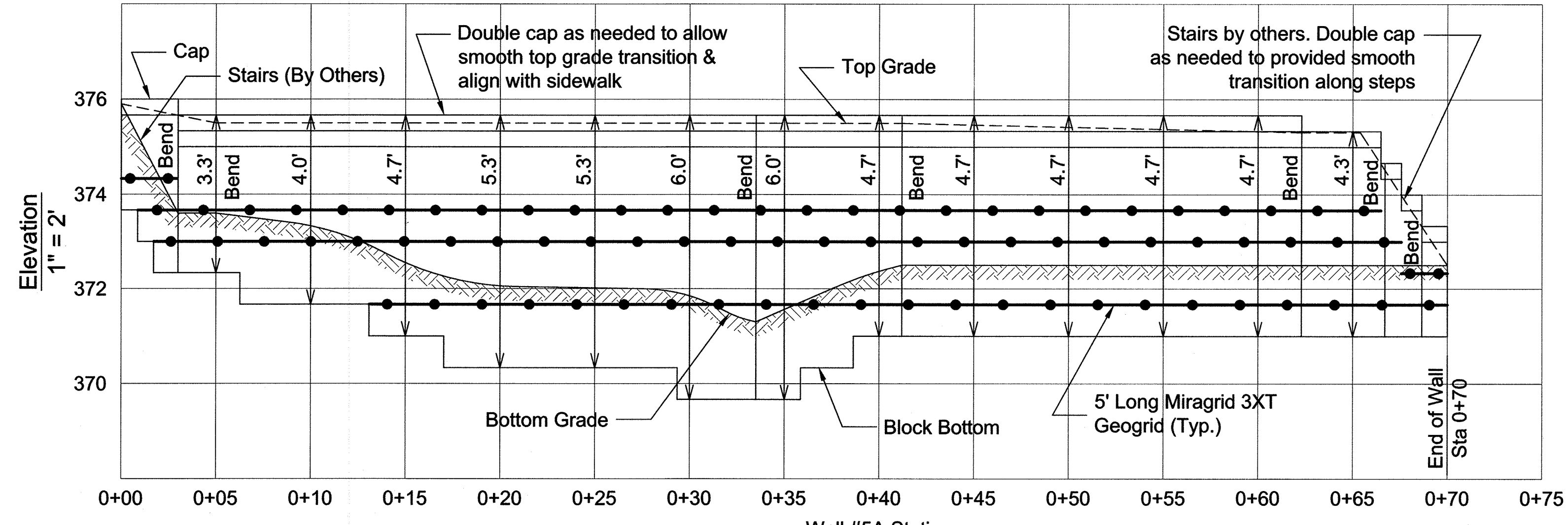


NOTE: FENCE SHALL BE BLACK VINYL COATED CHAIN LINK, AND SHALL BE MIN. 36" TALL WITH A MAX. 4" PICKET SPACING. METAL POSTS SHALL BE PAINTED BLACK.

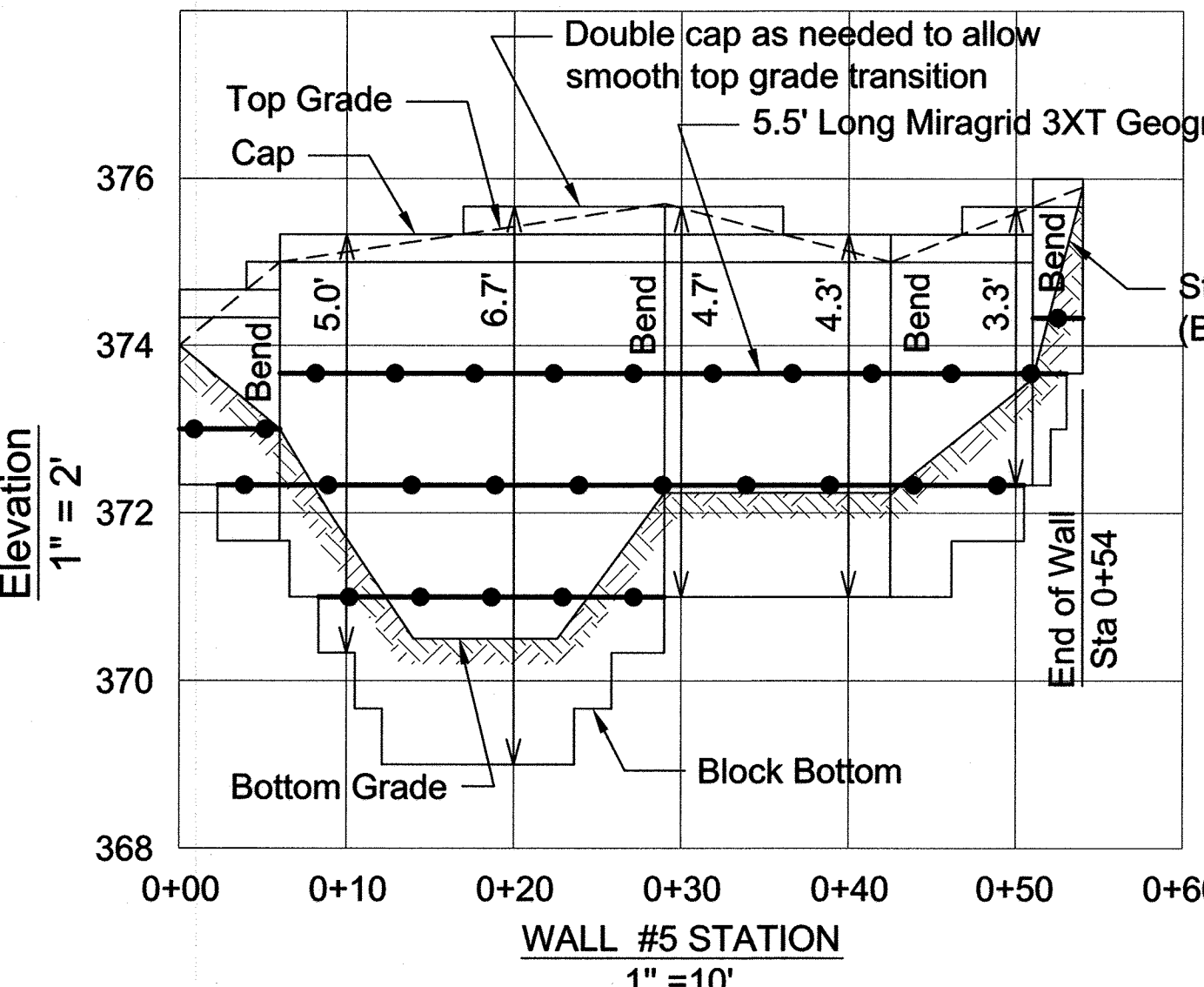
GUARD RAIL & FENCE PER HOWARD COUNTY CODE

APPROVED BY PLANNING BOARD OF HOWARD COUNTY  
 April 15, 2010  
 DATE

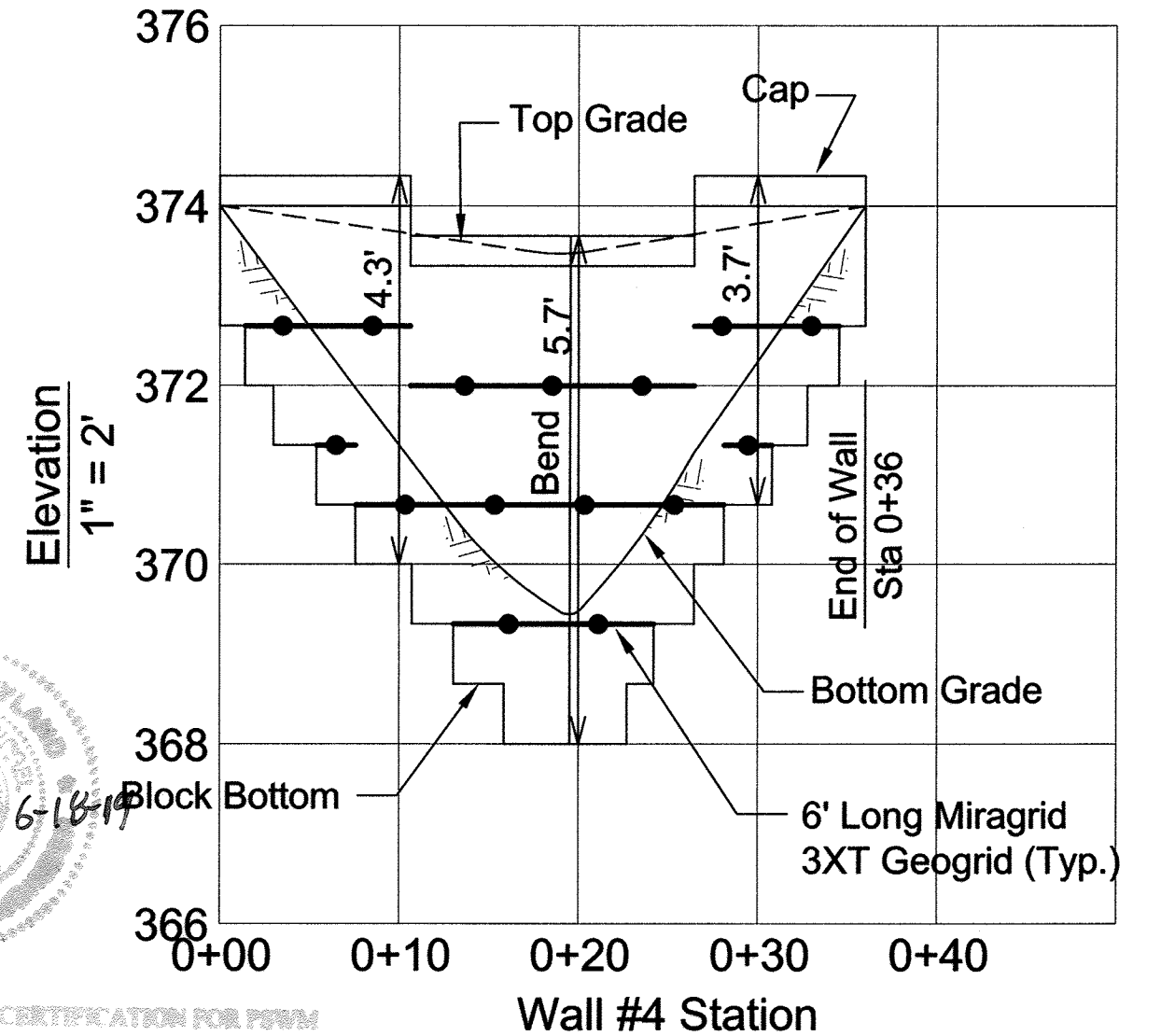
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signatures and Dates]  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DIRECTOR



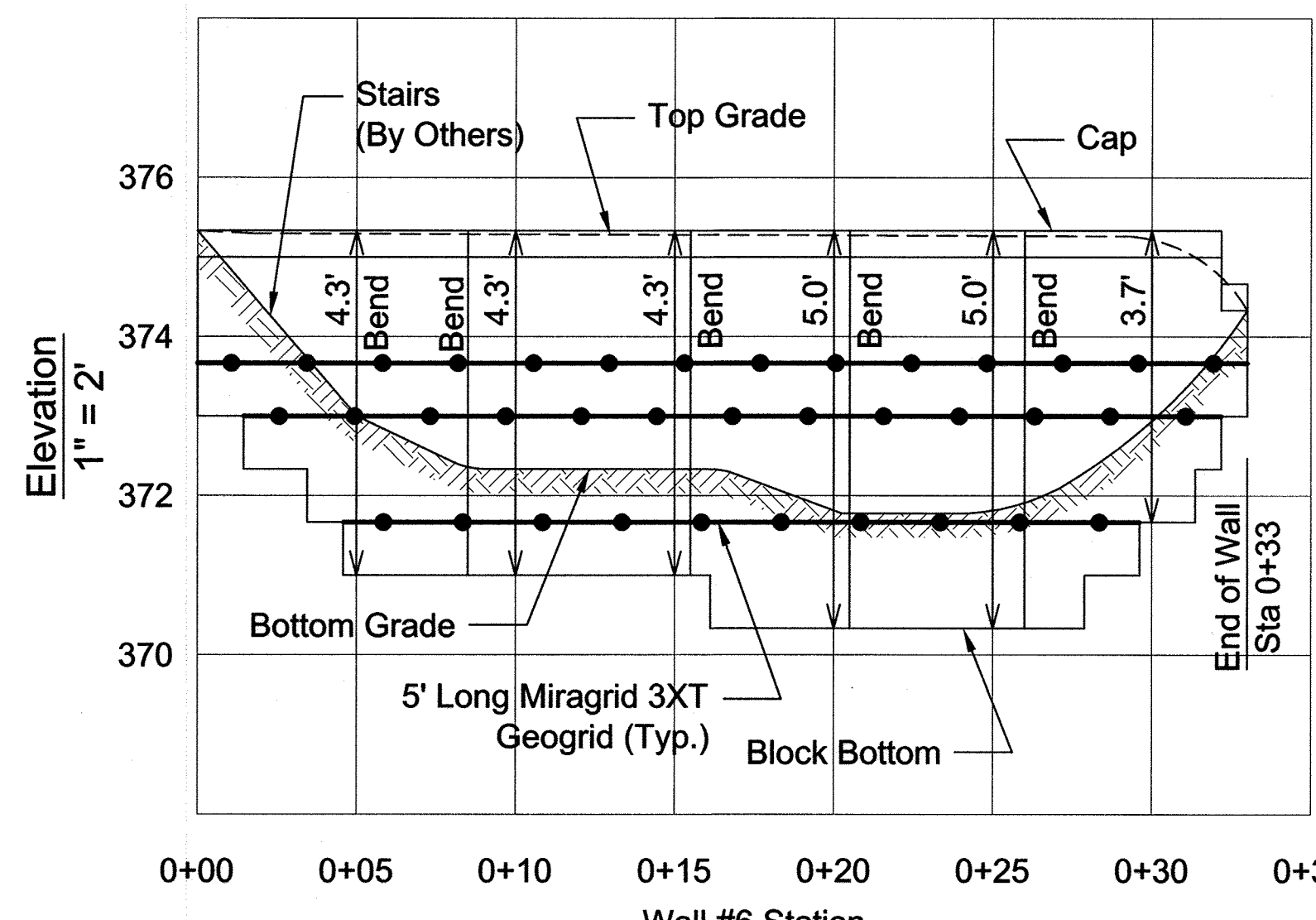
**WALL #5A ELEVATION**  
 1" = 5"



**WALL #5 ELEVATION**  
 1" = 10"



**WALL #4 ELEVATION**  
 1" = 10"



**WALL #6 ELEVATION**  
 1" = 5"



AS-BUILT CERTIFICATION FOR PAVING  
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED IN ACCORDANCE WITH THE AS-BUILT PLANS AND EXAMINED WITH THE APPROPRIATE TEST AND SPECIFICATIONS. I HAVE VERIFIED THAT THE CONSTRUCTION WORKING AREA IS SUFFICIENTLY STABILIZED TO PERMIT CONSTRUCTION OF THE WORK INDICATED ON THIS FACILITY.  
 DATE: 6-18-19  
 OWNER/DEVELOPER  
 TSC/JMU SNOWDEN RIVER SOUTH LLC A MD LLC  
 8600 SNOWDEN RIVER PKWY, 207  
 COLUMBIA MD 21045  
 (410) 953-0222

NO.	REVISION	DATE

**RETAINING WALL DETAILS AND ELEVATIONS**  
 MIDWAY BUSINESS CENTER  
 SNOWDEN RIVER SOUTH  
 SECTION 1, AREA 1  
 INDUSTRIAL / FLEX SPACE  
 (PLAT 8795, L.10008/F.485)  
 TAX MAP 42, GRID 10, PARCEL 319, PARCEL C  
 6TH ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

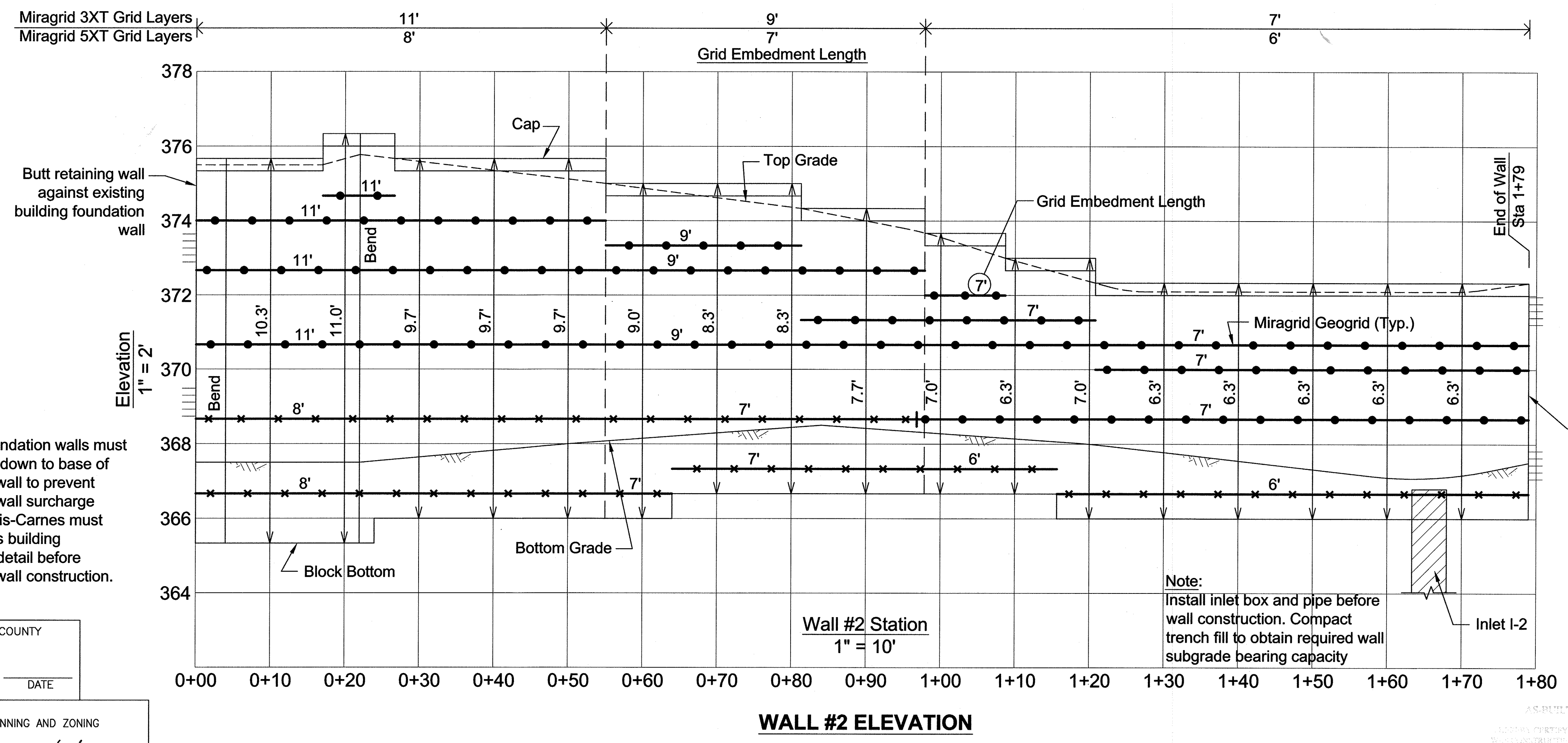
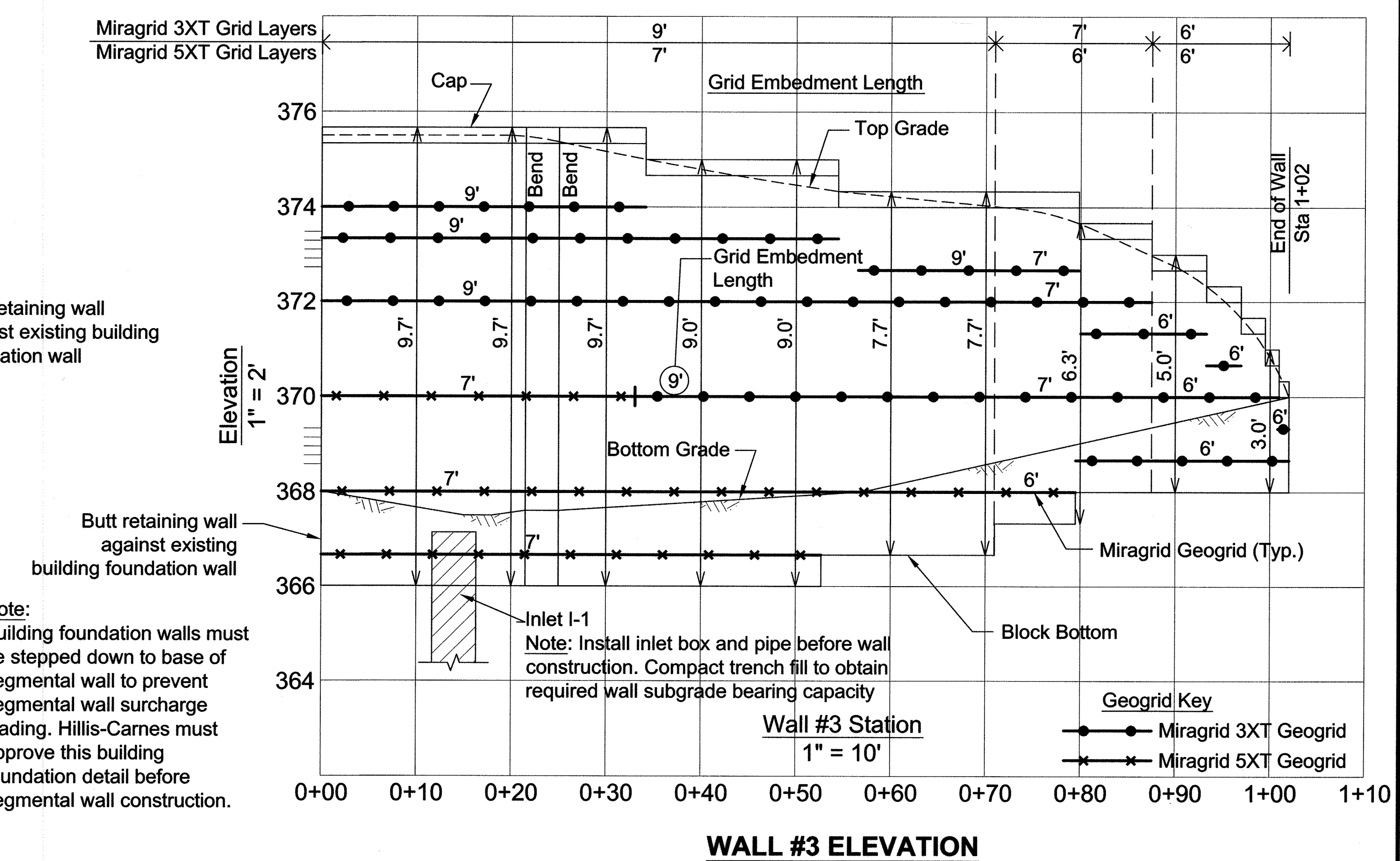
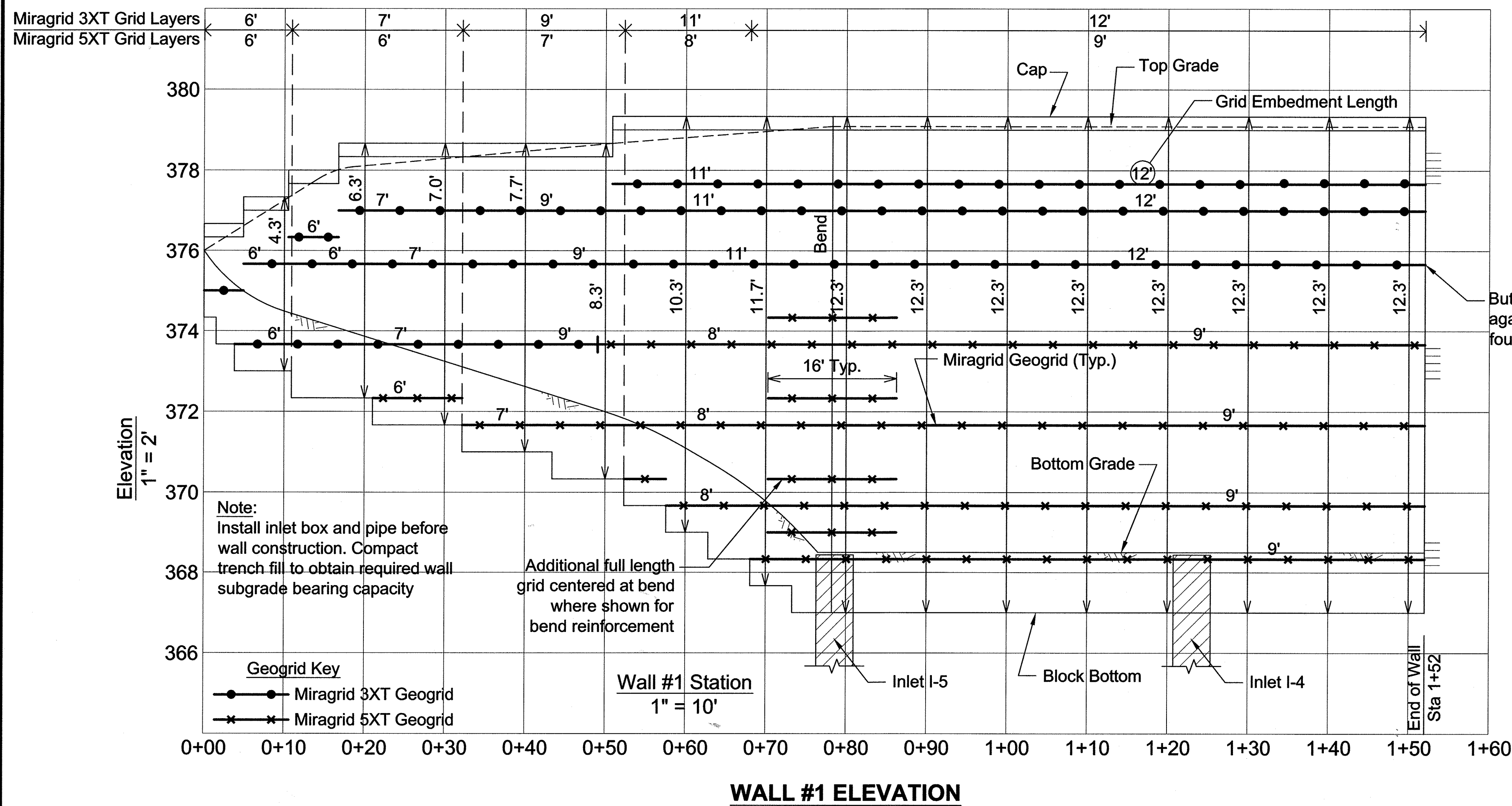
**HILLIS-CARNES**  
 ENGINEERING ASSOCIATES  
 10975 Guilford Road, Suite A Annapolis Junction, Maryland  
 (410) 880-4788 Fax: (410) 880-4098

DESIGN BY: RWS  
 DRAWN BY: AM  
 CHECKED BY: RWS  
 DATE: MARCH 2013  
 SCALE: AS SHOWN  
 HCEA NO.: 09073B

PROFESSIONAL CERTIFICATE  
 I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 16193, EXPIRATION DATE: 06-13-2013

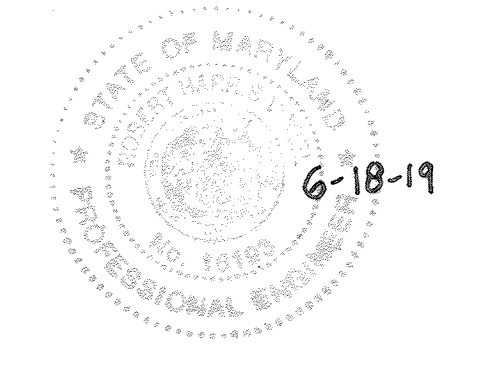
AS-BUILT - DECEMBER 2018





APPROVED BY PLANNING BOARD OF HOWARD COUNTY  
 APRIL 15, 2010  
 DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 [Signatures and Dates]  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DIRECTOR



**OWNER/DEVELOPER**  
 TSC/UMJ SNOWDEN RIVER SOUTH LLC A MD LLC  
 8600 SNOWDEN RIVER PKWY, 207  
 COLUMBIA MD 21045  
 (410) 953-0222

NO.	REVISION	DATE

**RETAINING WALL ELEVATIONS**  
**MIDWAY BUSINESS CENTER**  
 SNOWDEN RIVER SOUTH  
 SECTION 1, AREA 1  
 INDUSTRIAL / FLEX SPACE  
 (PLAT 8795, L.10008/F.485)

TAX MAP 42 GRID 10  
 6TH ELECTION DISTRICT

PARCEL 319, PARCEL C  
 HOWARD COUNTY, MARYLAND

**HILLIS-CARNES**  
 ENGINEERING ASSOCIATES  
 10975 Guilford Road, Suite A Annapolis Junction, Maryland  
 (410) 880-4788 Fax: (410) 880-4098

**PROFESSIONAL CERTIFICATE**  
 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. 14454 EXPIRATION DATE: 06-13-2013

DESIGN BY: RWS  
 DRAWN BY: AM  
 CHECKED BY: RWS  
 DATE: MARCH 2013  
 SCALE: AS SHOWN  
 HCEA NO.: 09073B

24 SHEET OF 24

AS-BUILT - DECEMBER 2018