

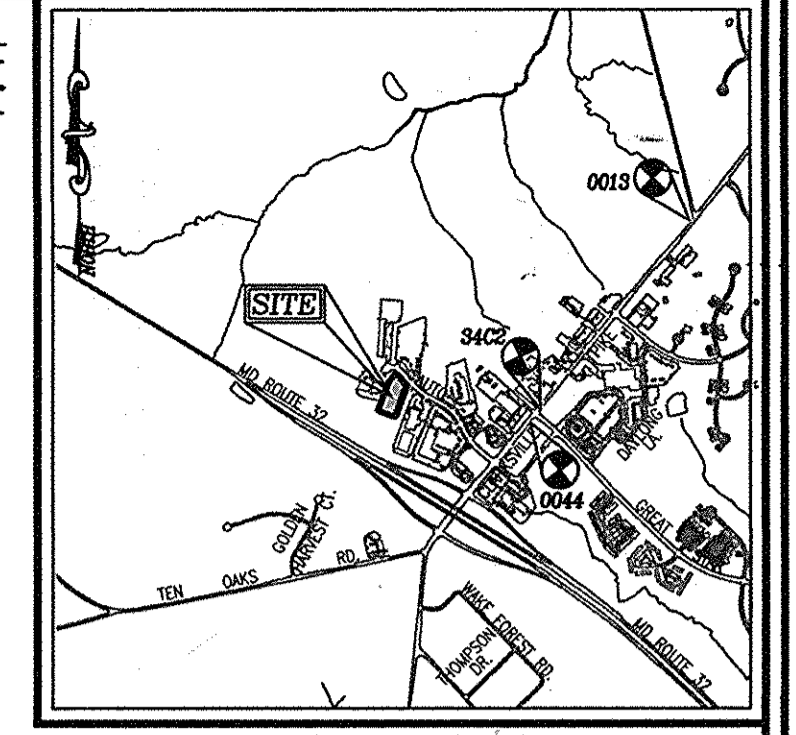
GENERAL NOTES

- 1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY STANDARDS AND SPECIFICATIONS... 2. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE DAYS BEFORE STARTING WORK ON THESE DRAWINGS...

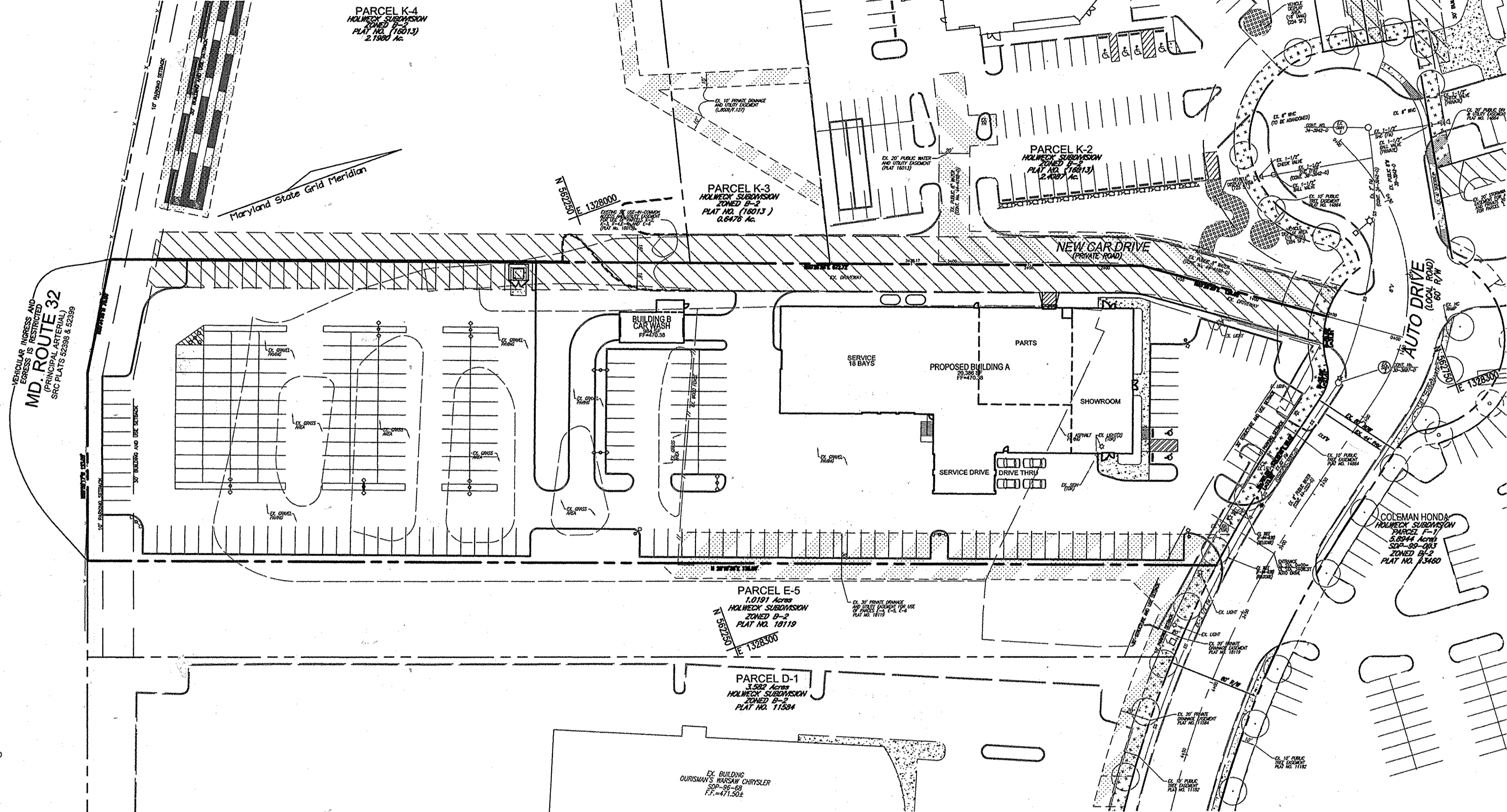
ANTWERPEN HYUNDAI
PARCEL E-7, HOLWECK SUBDIVISION
ZONED: B-2

SITE DEVELOPMENT PLAN

LEGEND
RIGHT-OF-WAY LINE
PROPERTY LINE
ADJACENT PROPERTY LINE
BENCHMARKS
HOWARD COUNTY BENCHMARK 34C2 (DESTROYED)
N 562321.798 E 1329750.722

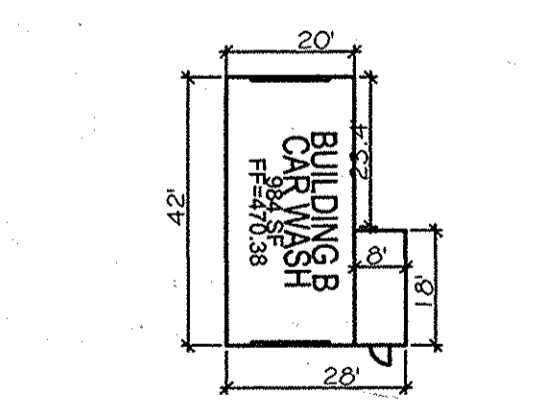
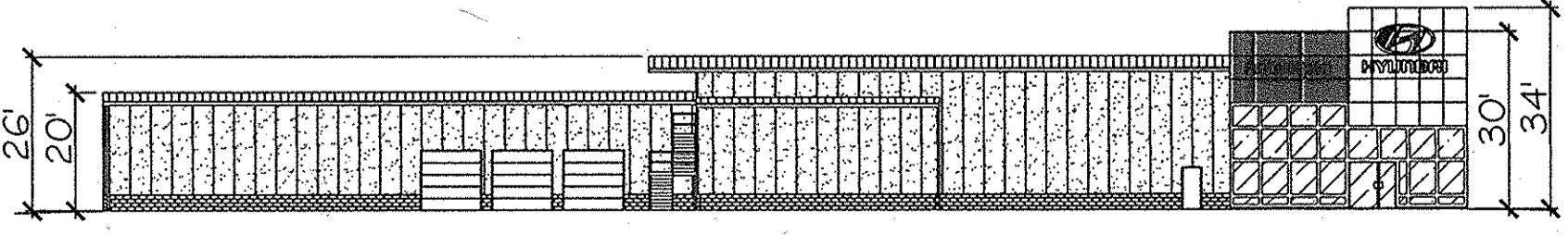
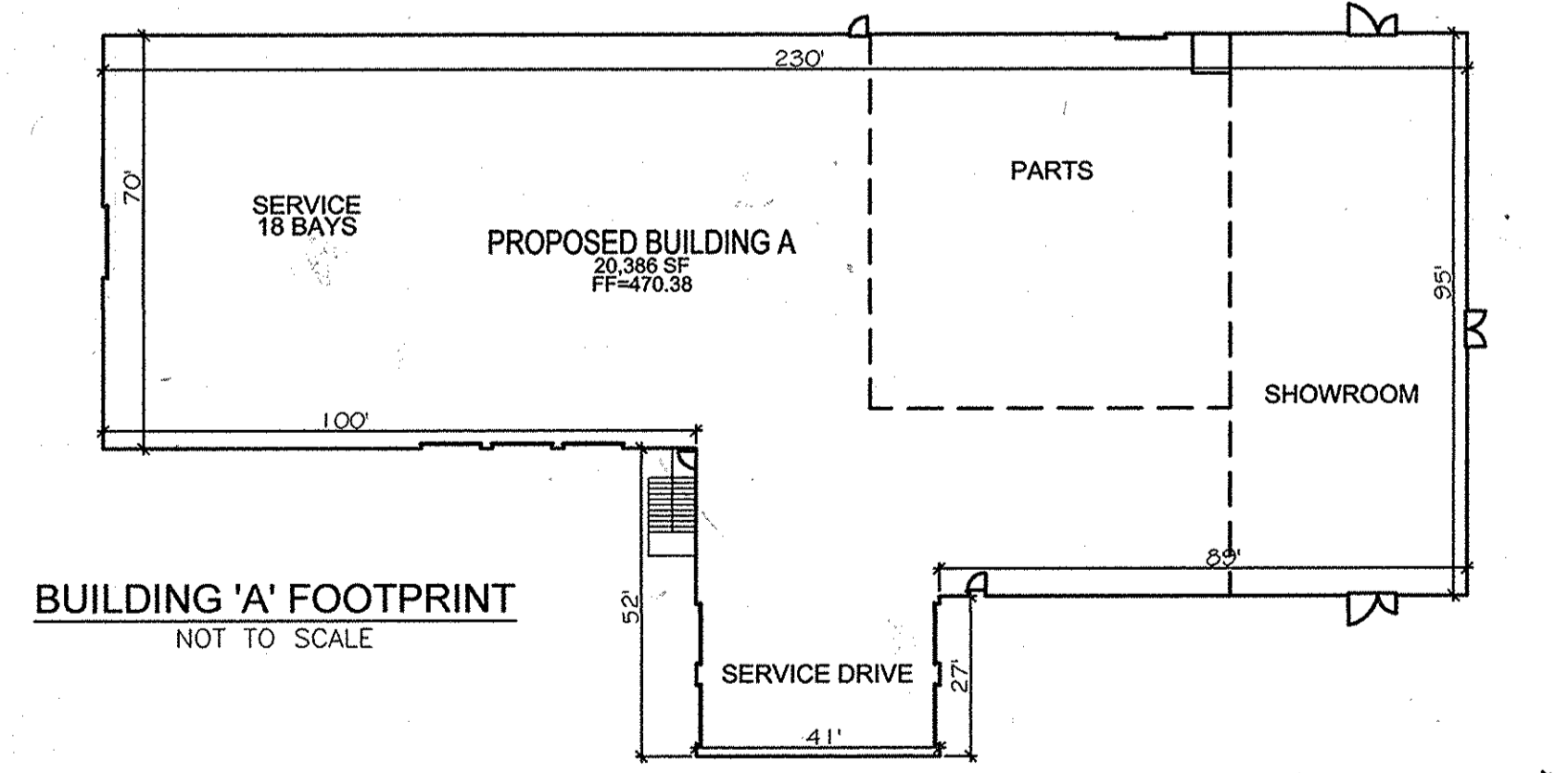
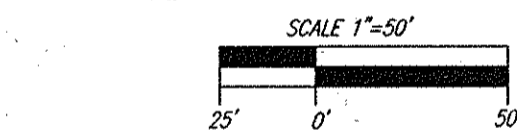


VICINITY MAP
SCALE: 1"=2000'
ADC MAP COORDINATE: 31/D1

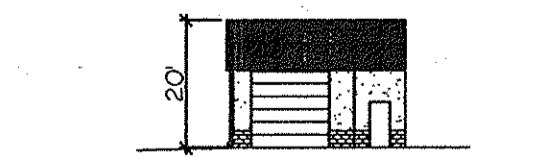


SHEET INDEX table with columns: DESCRIPTION, SHEET NO. Includes entries for COVER SHEET, SITE LAYOUT PLAN, SITE NOTES AND DETAILS, etc.

LOCATION MAP
SCALE: 1"=50'



BUILDING 'B' FOOTPRINT
NOT TO SCALE



BUILDING 'B' ELEVATION
NOT TO SCALE

PARKING TABULATION table showing required and provided spaces for Building A, Building B, and total spaces including handicapped and car storage.

OWNER/PETITIONER
ANTOY LLC
12420 AUTO DRIVE
CLARKSVILLE, MD 21029
(410) 531-5700

Revision table with columns: NO., REVISION, DATE.

SITE DEVELOPMENT PLAN
COVER SHEET
ANTWERPEN HYUNDAI
PARCEL E-7, HOLWECK SUBDIVISION
PLAT 23575
ZONED: B-2
TAX MAP 34, BLOCK 06, 5TH ELECTION DISTRICT

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

Professional seal and certificate for Robert H. Vogel, PE No. 16193, dated March 2015.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
Chief, Development Engineering Division
Date: 10-8-15

APPROVED: FOR PUBLIC WATER AND PUBLIC SEWERAGE SYSTEMS
Director, County Health Office
Date: 10/20/2015

PARCEL K-4
HOLWECK SUBDIVISION
ZONED B-2
PLAT NO. 16013
2.1980 Ac.

PARCEL K-3
HOLWECK SUBDIVISION
ZONED B-2
PLAT NO. 16013
0.6476 Ac.

PARCEL K-2
HOLWECK SUBDIVISION
ZONED B-2
PLAT NO. 16013
2.4987 Ac.

PARCEL E-5
1.0191 Acres
HOLWECK SUBDIVISION
ZONED B-2
PLAT NO. 18119

PARCEL D-1
1.592 Acres
HOLWECK SUBDIVISION
ZONED B-2
PLAT NO. 11584

COLEMAN HONDA
HOLWECK SUBDIVISION
PARCEL F-1
5.8944 Acres
SDP-29-093
ZONED B-2
PLAT NO. 13460

EX. BUILDING
OURISMAN'S WARSAW CHRYSLER
SDP-96-69
F.F.=471.50±

LAYOUT PLAN VIEW
SCALE: 1"=30'

VEHICULAR INGRESS AND
EGRESS IS RESTRICTED
MD. ROUTE 32
(PRINCIPAL ARTERIAL)
SRC PLATS 52386 & 52389

Maryland State Grid Meridian

OWNER/PETITIONER
ANTOY, LLC
12420 AUTO DRIVE
CLARKSVILLE, MD. 21029
(410) 531-5700

SCALE 1"=30'

LEGEND:

- EXISTING CURB AND GUTTER
- PROPOSED CURB AND GUTTER
- EXISTING LIGHT POLE WITH CONCRETE BASE
- EXISTING MAILBOX
- EXISTING SIGN
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY LINE
- EXISTING CLEANOUT
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE
- PROPOSED STORM DRAIN
- PROPOSED STORM DRAIN INLET
- EXISTING FENCE
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- PROPOSED SIDEWALK
- EXISTING TREELINE
- PROPOSED TREELINE
- EX. 20" DRAINAGE & UTILITY EASEMENT PLAT #16103
- EX. 20" WATER & UTILITY EASEMENT PLAT #18119
- EX. 30" USE-IN-COMMON ACCESS EASEMENT PLAT #16103
- PROP. 30" PUBLIC WATER & UTILITY EASEMENT PLAT #23515
- PROP. MICRO-BUSIFICATION AREA (M-6)
- PROP. PERVIOUS PAVEMENT (A-2)
- EX. 10' PUBLIC TREE EASEMENT PLAT #14884

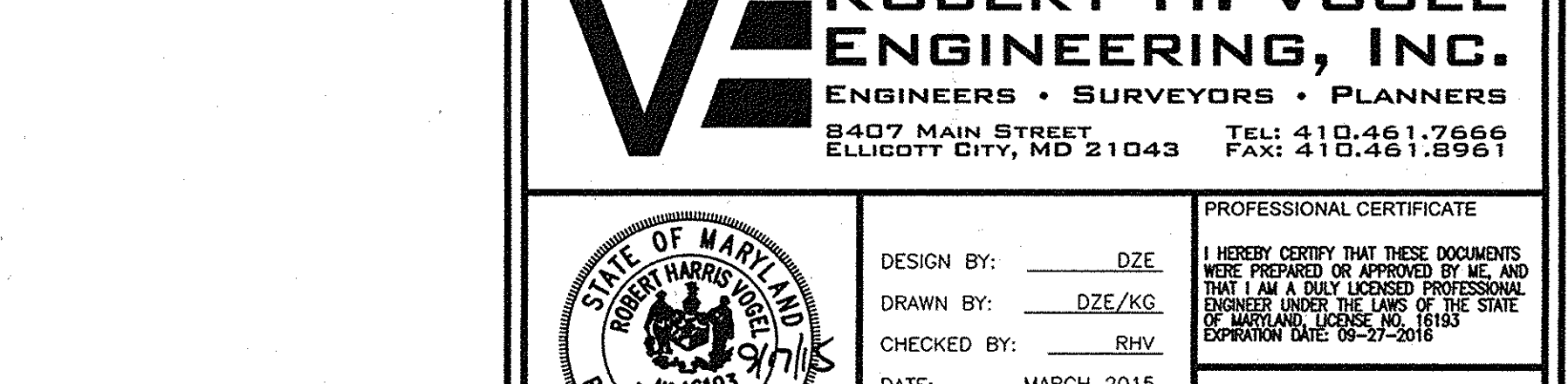
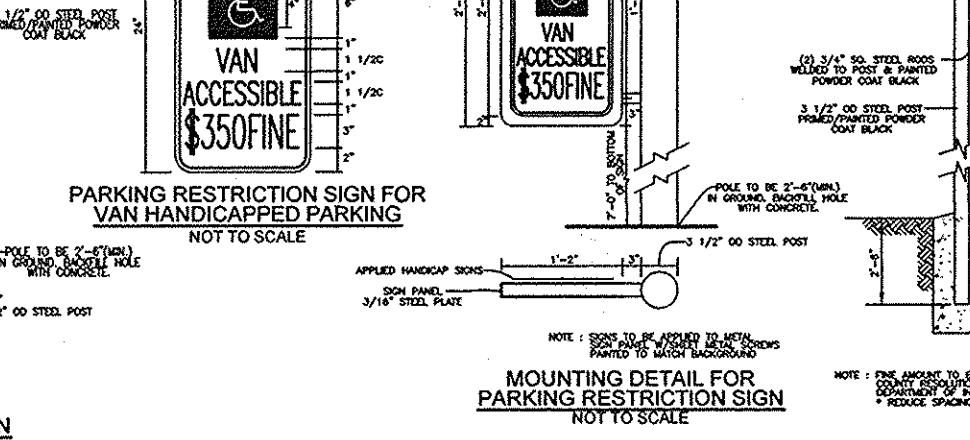
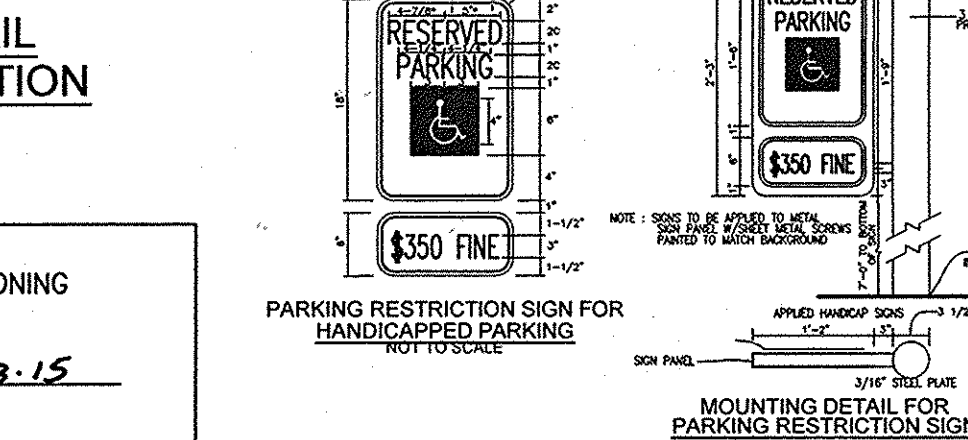
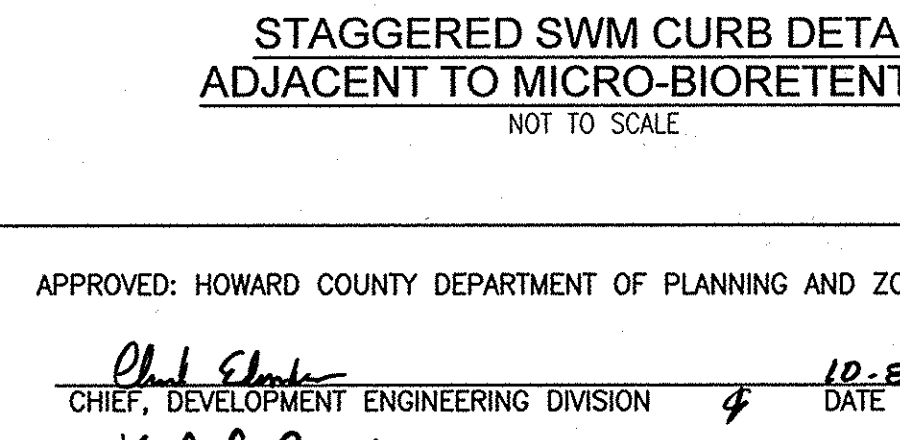
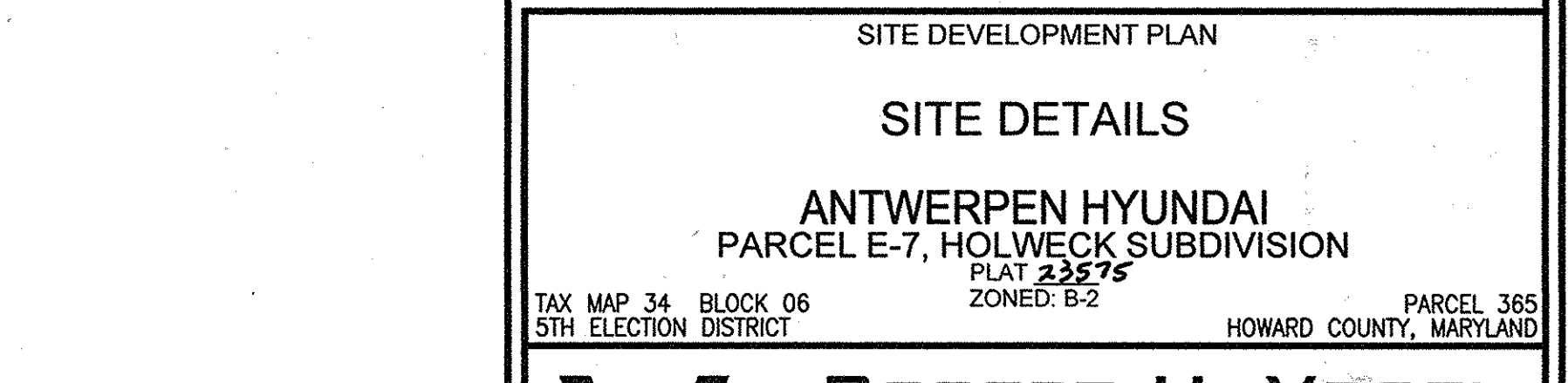
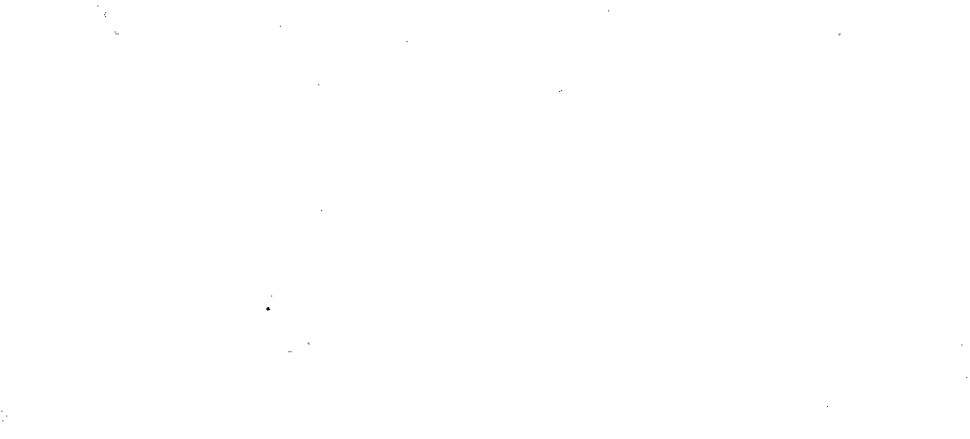
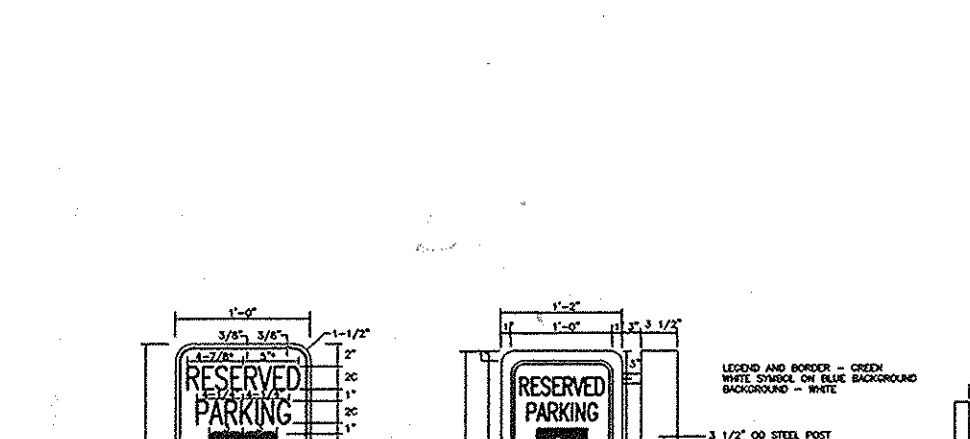
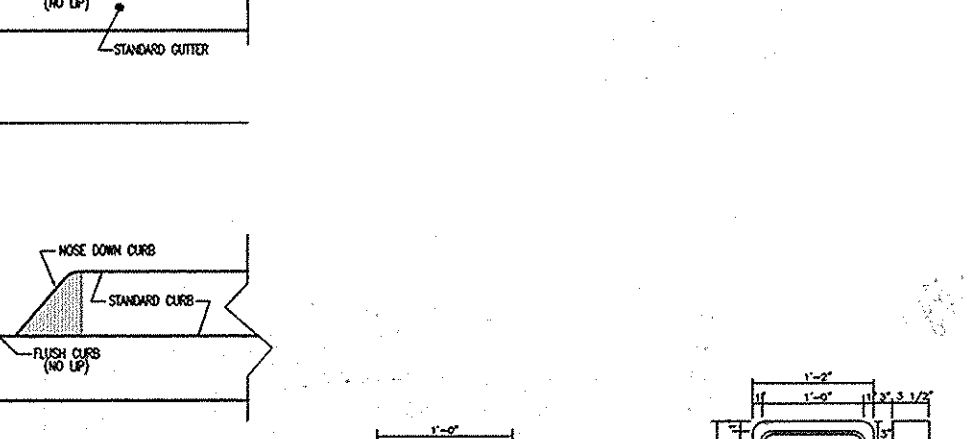
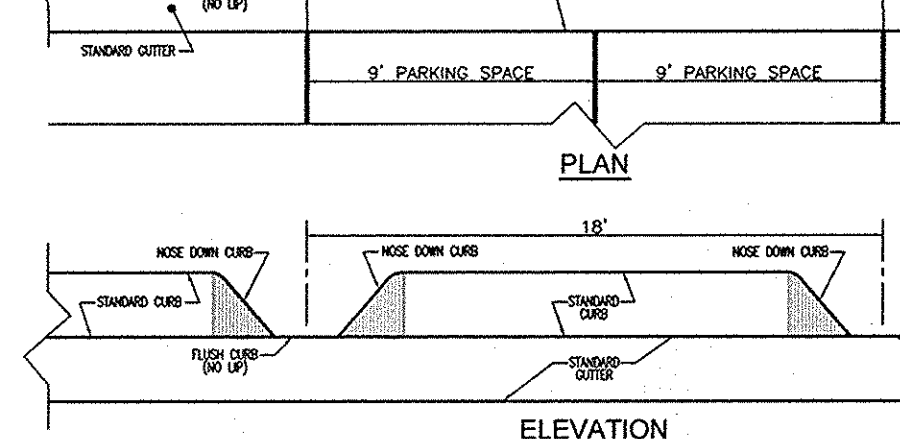
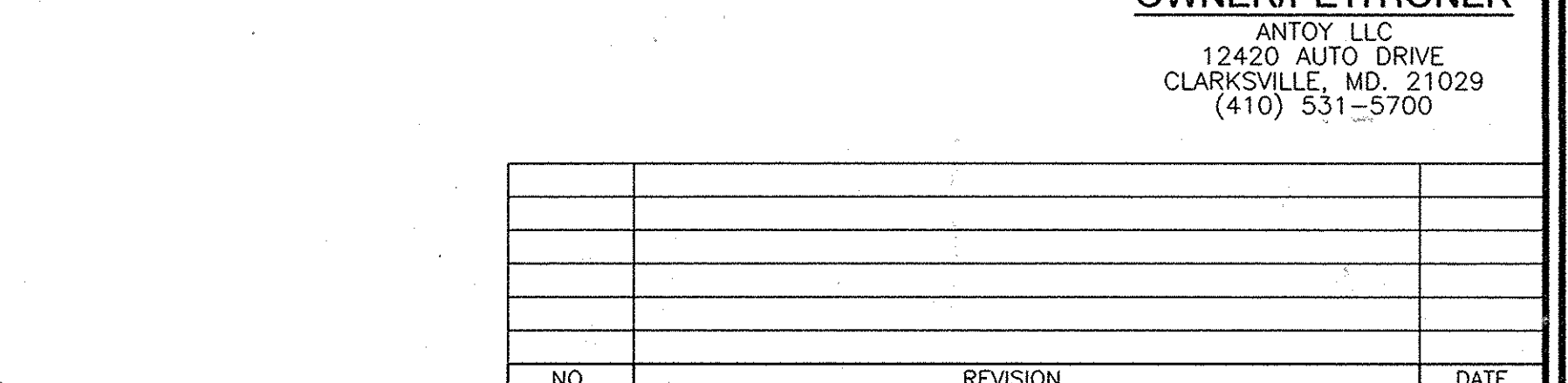
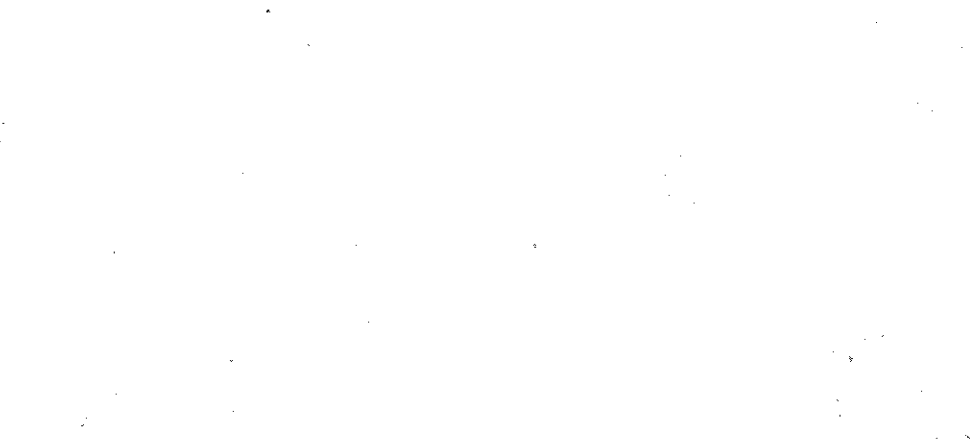
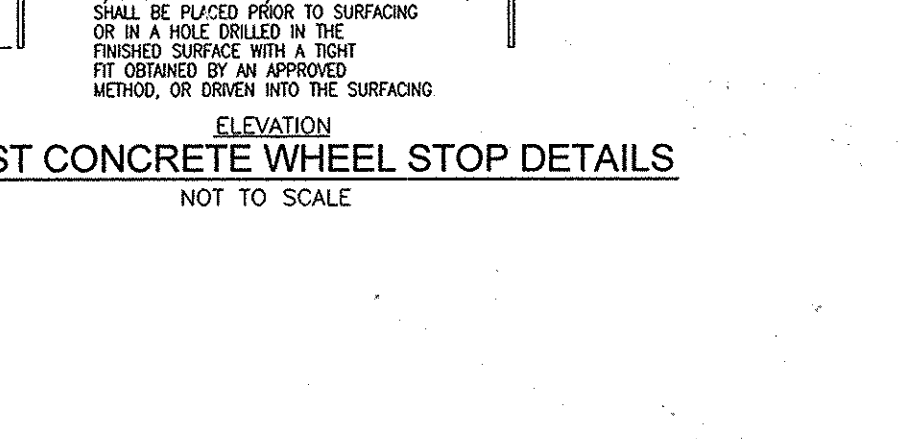
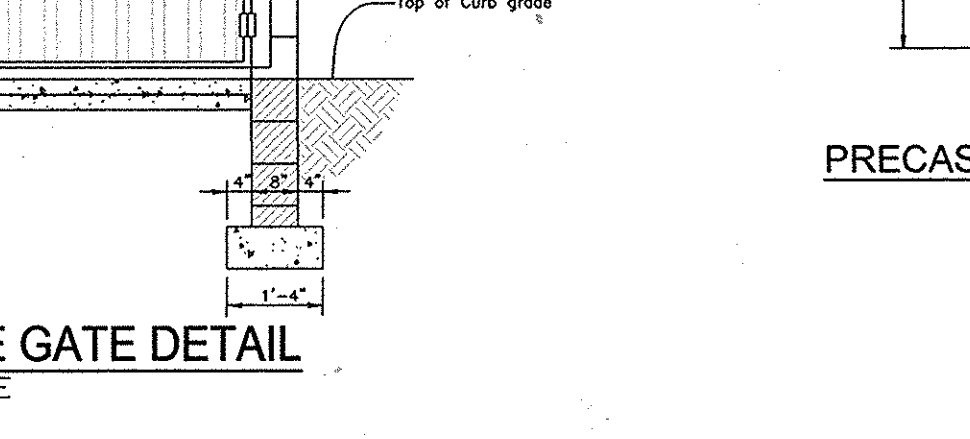
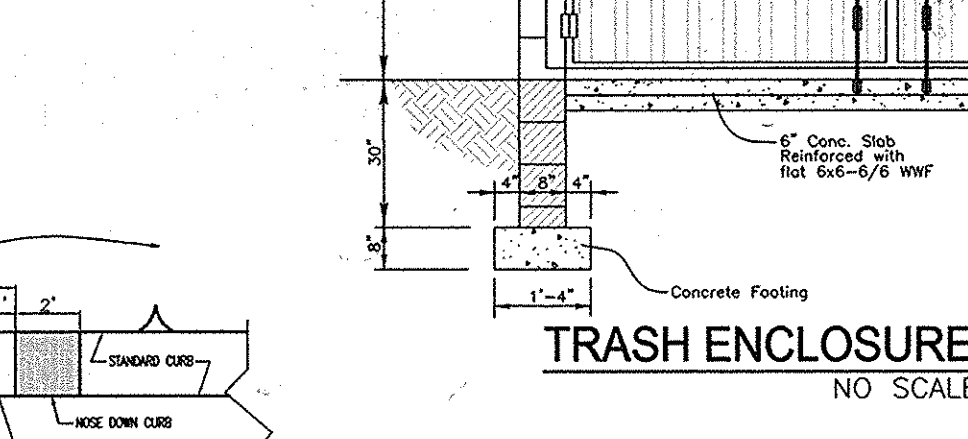
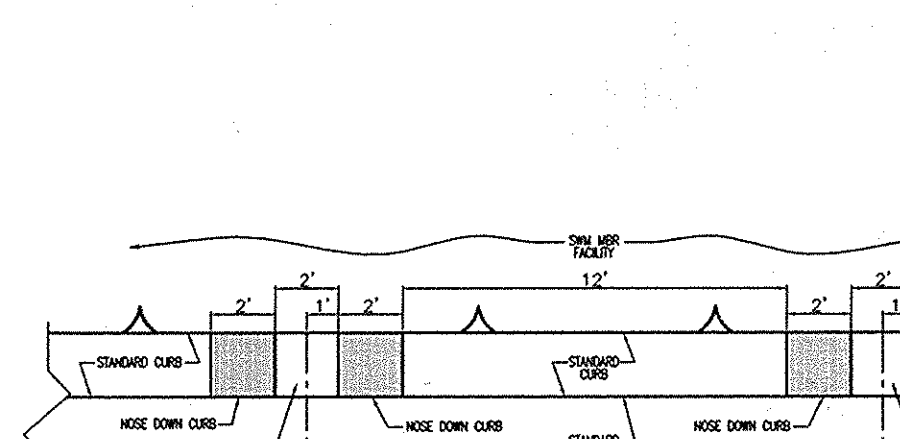
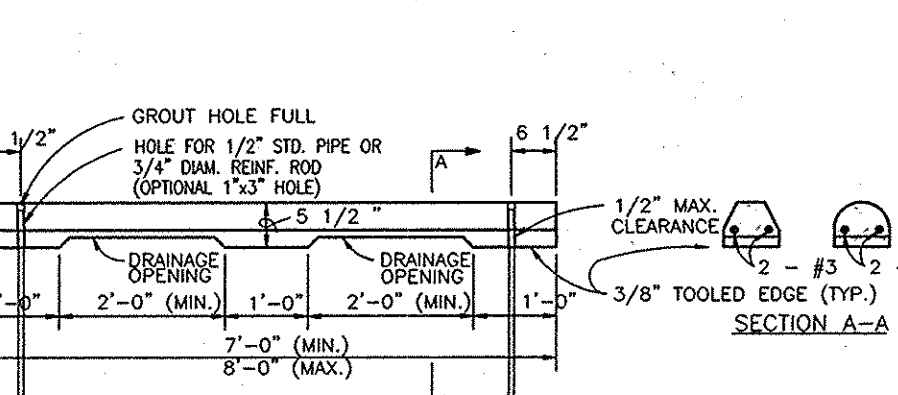
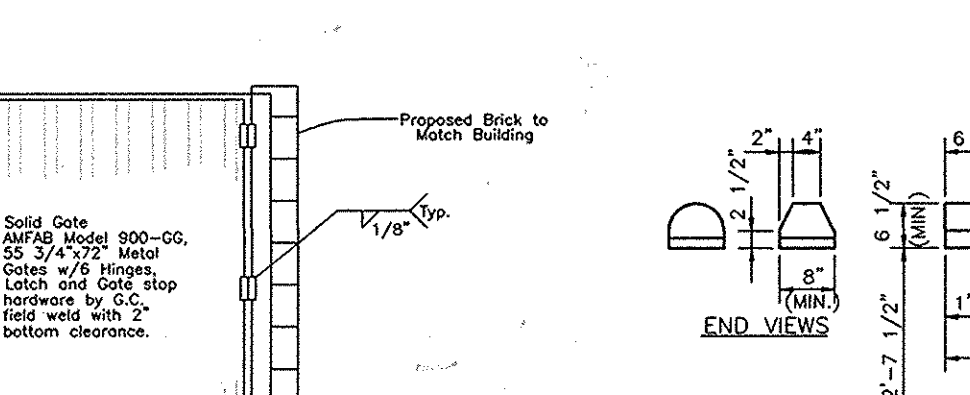
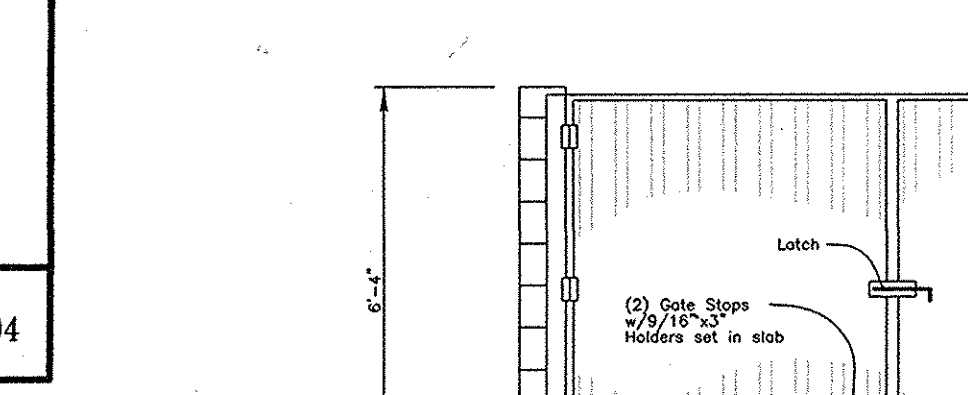
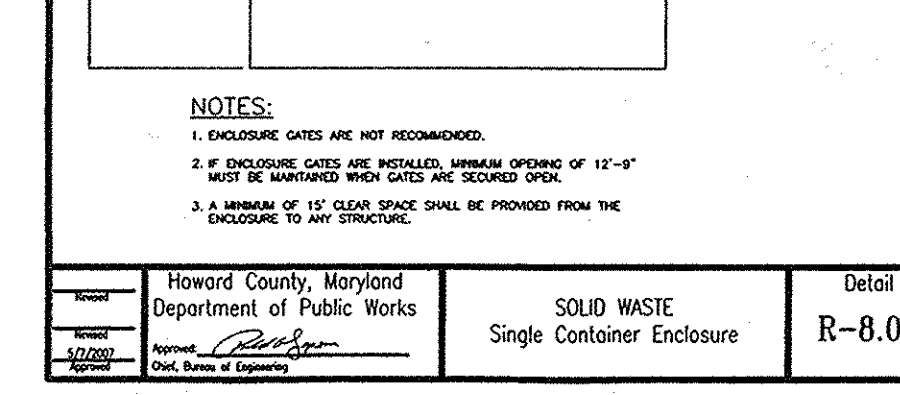
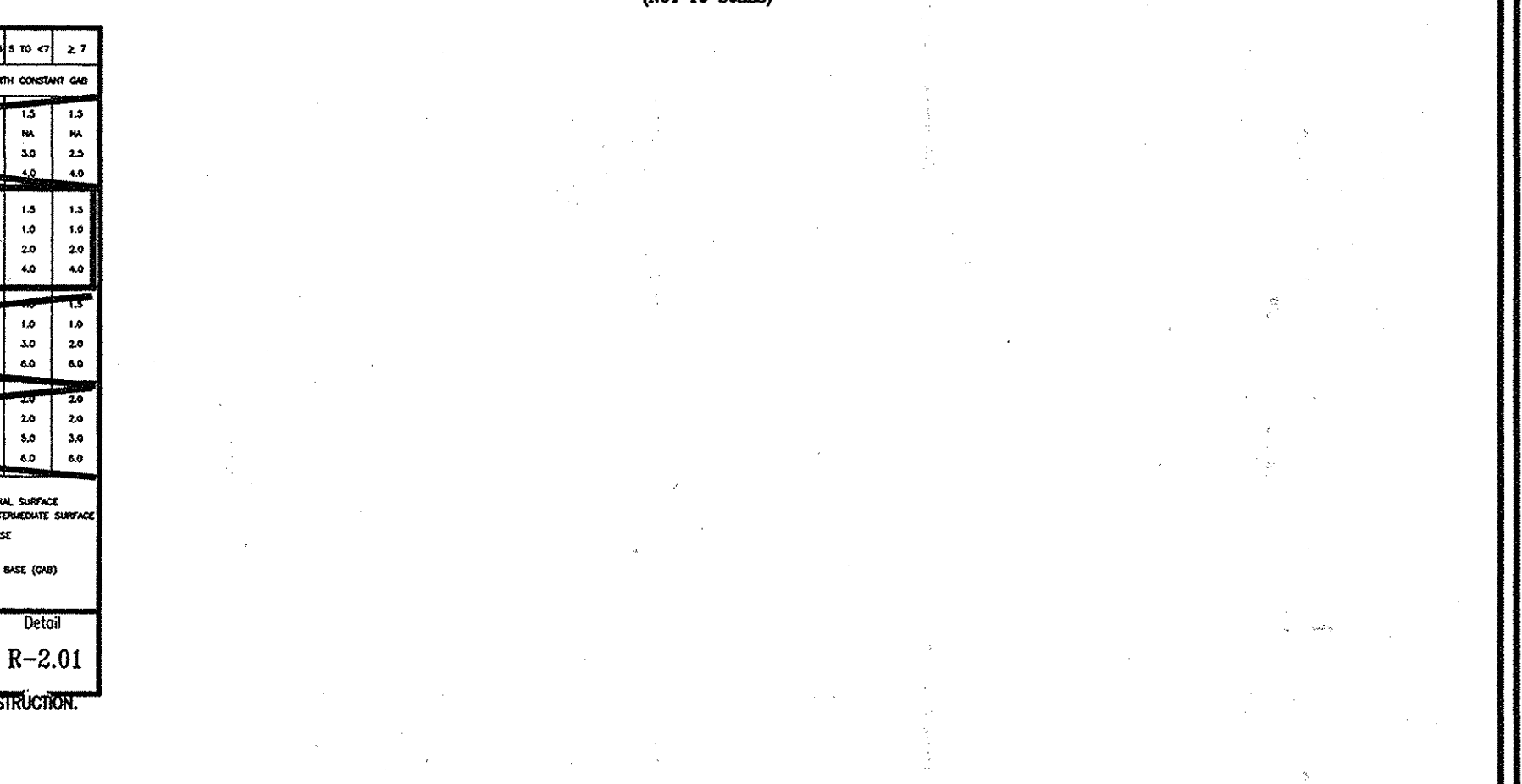
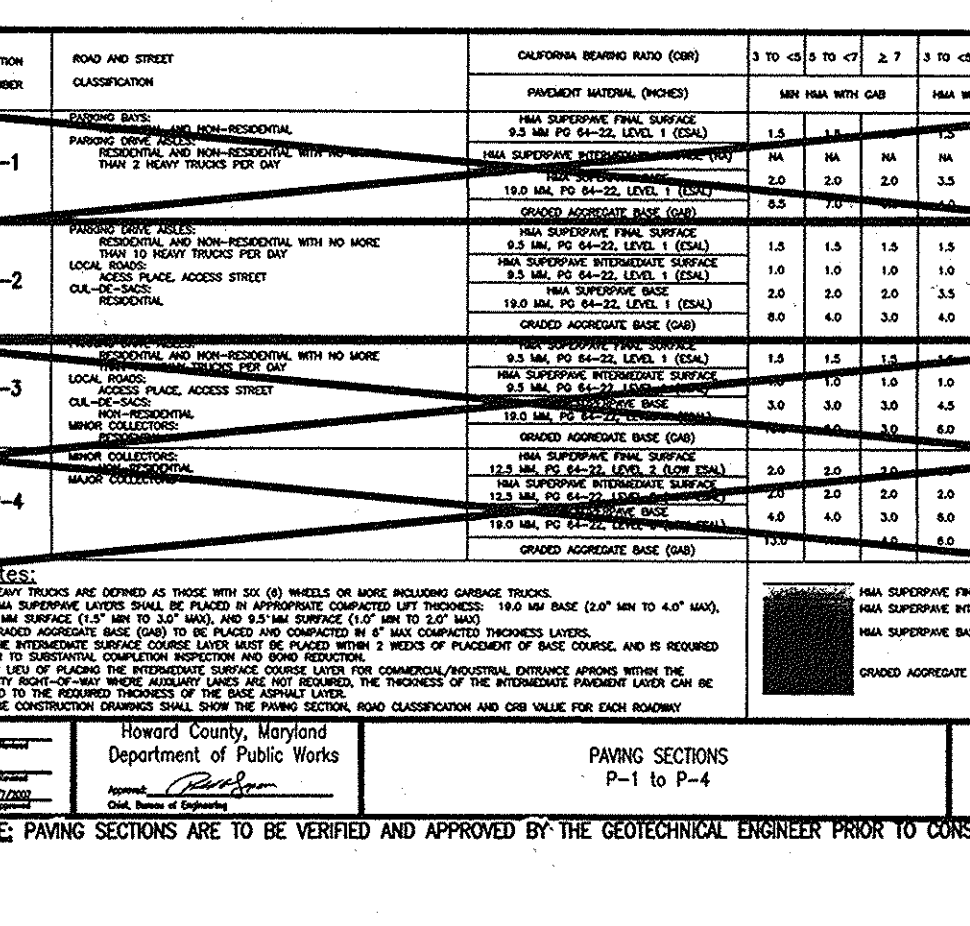
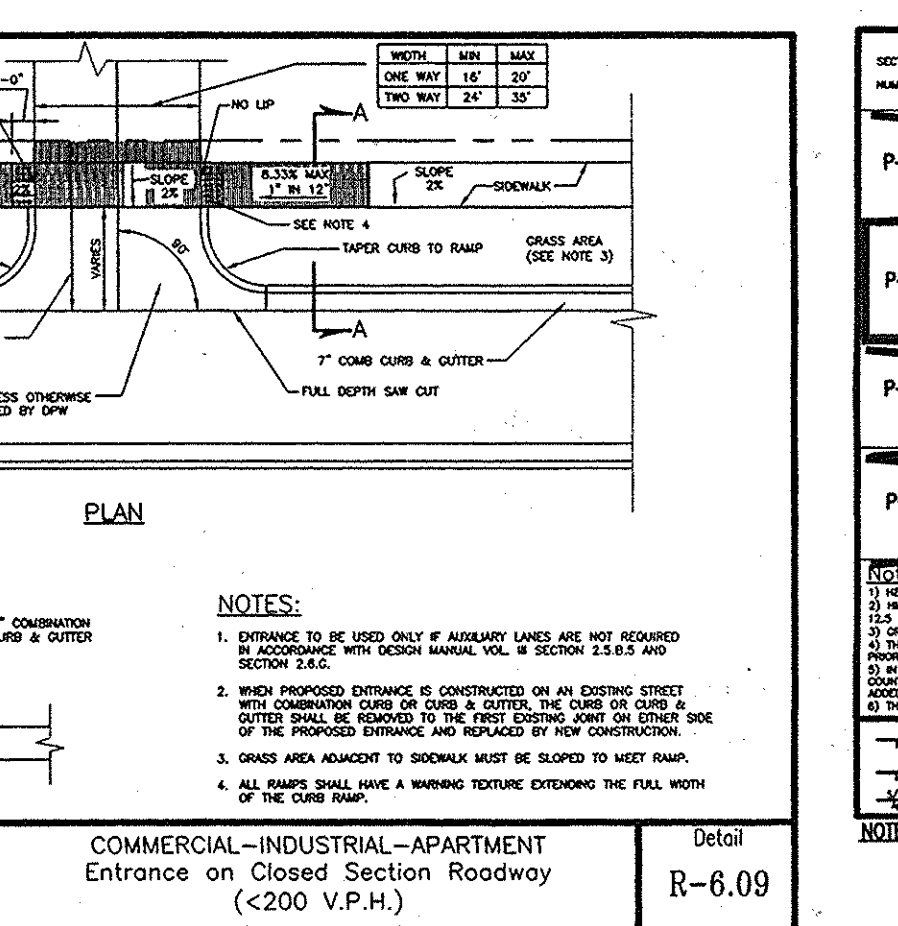
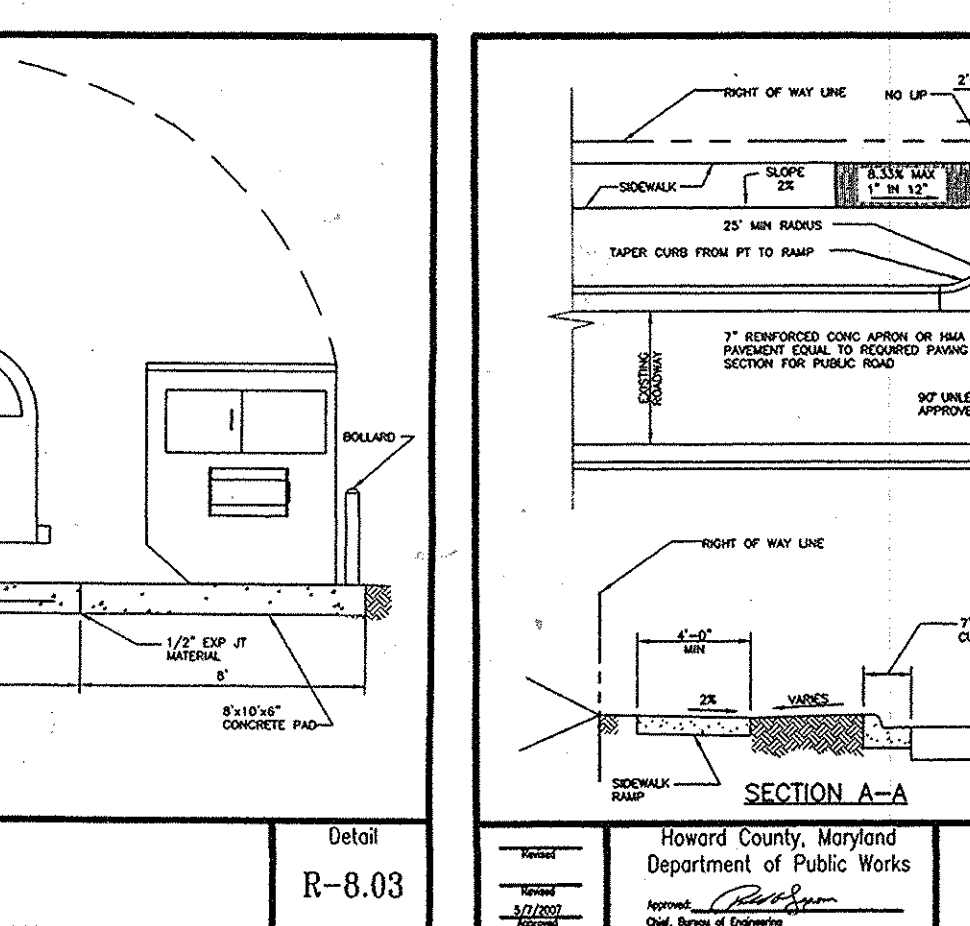
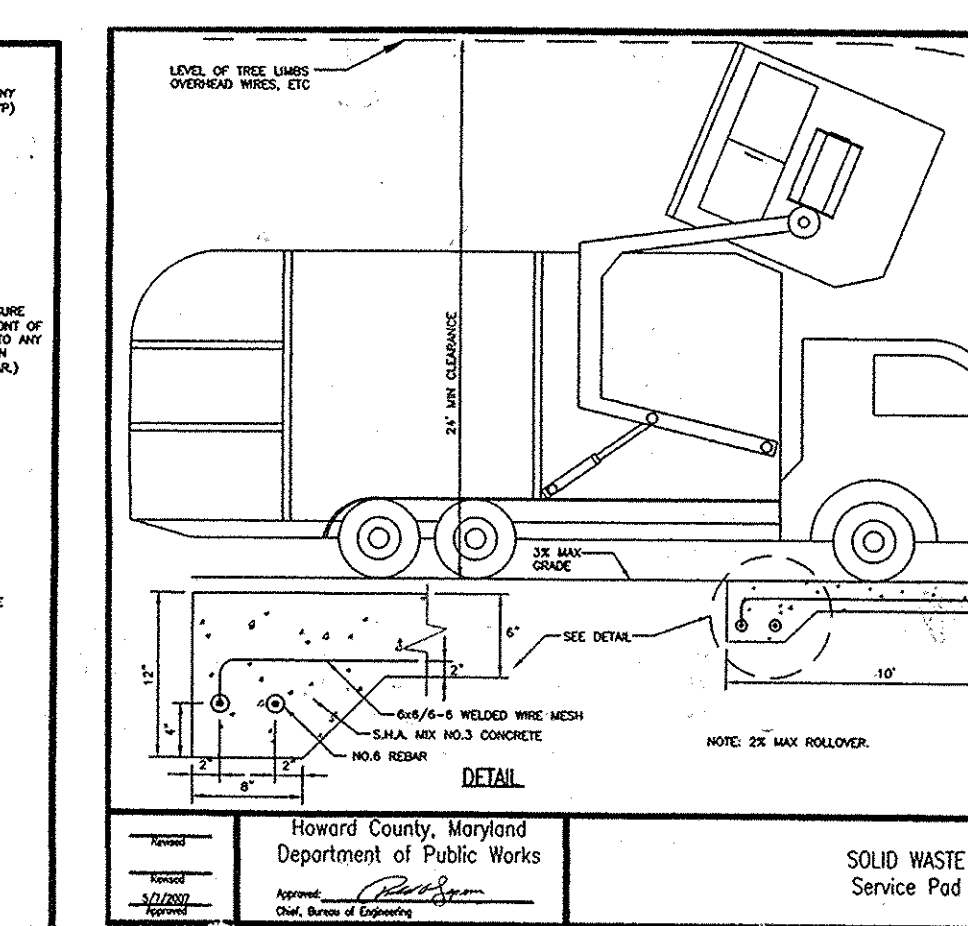
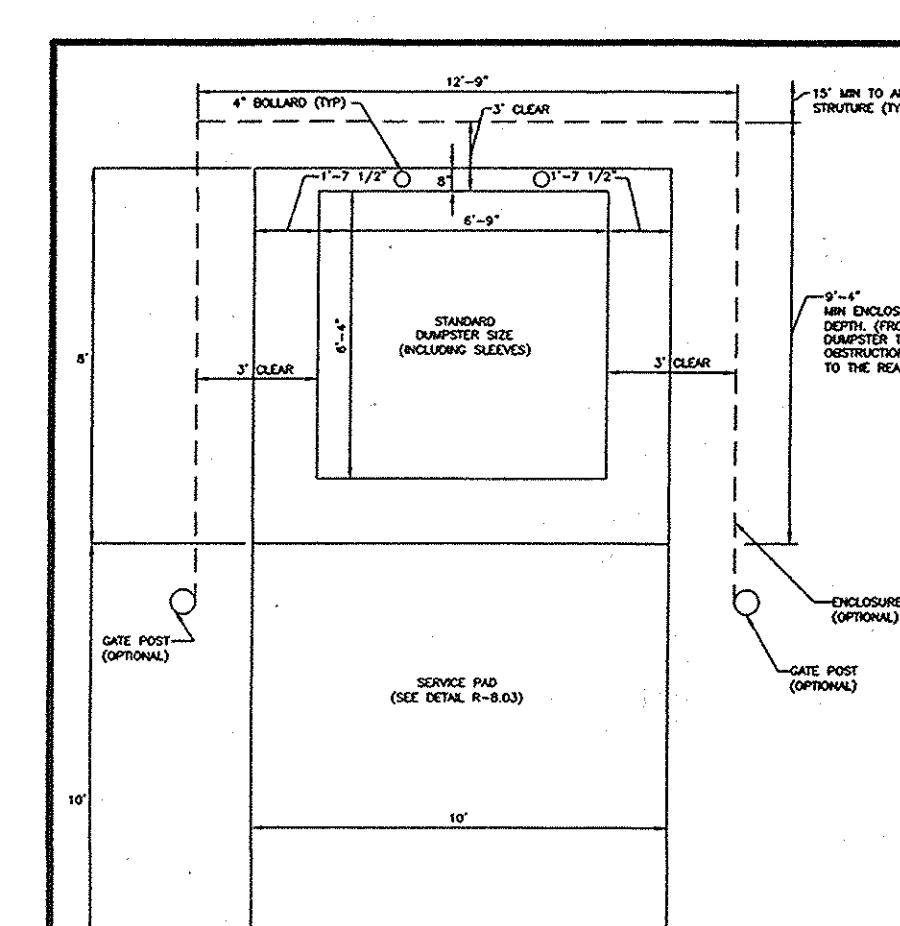
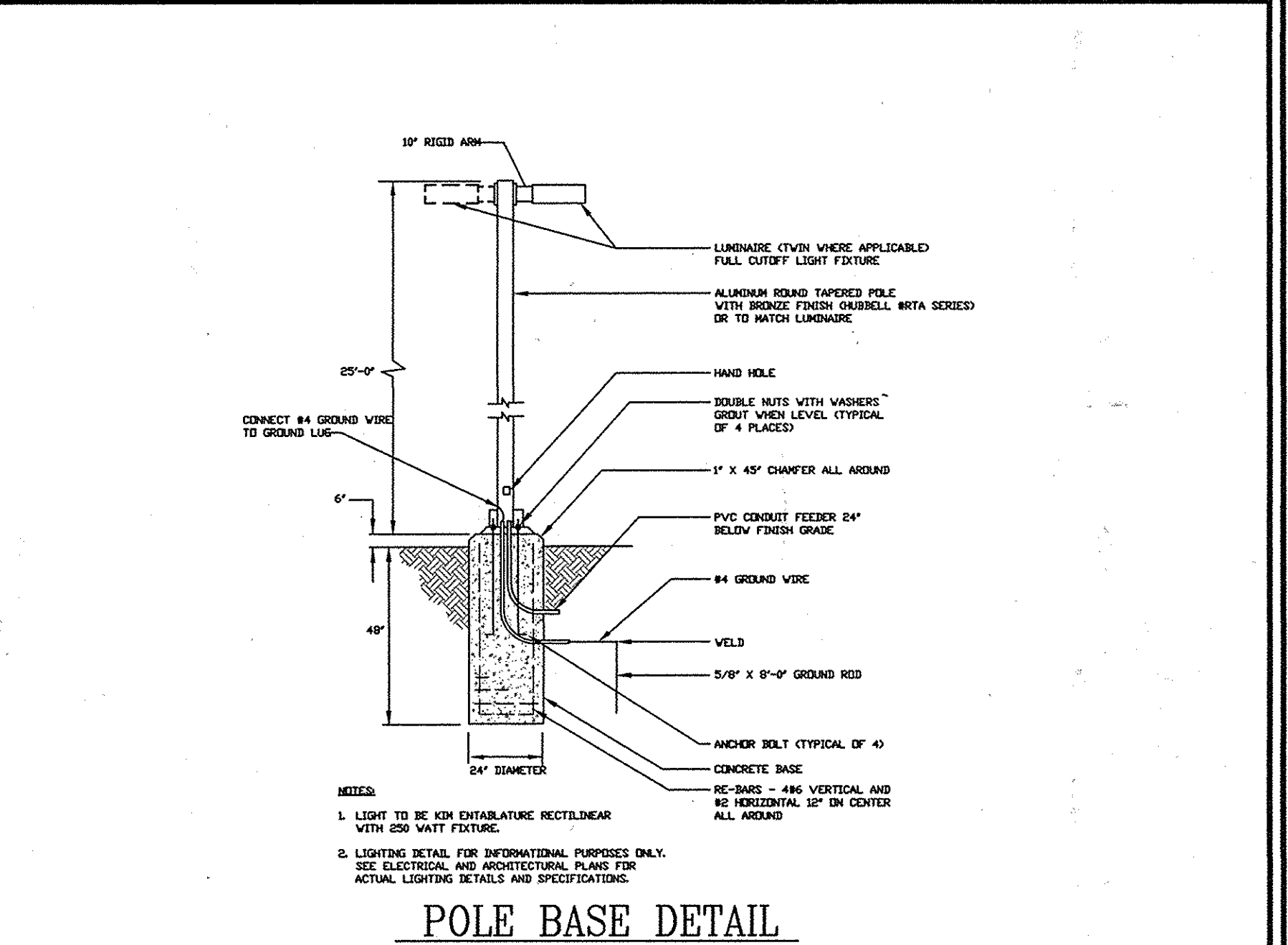
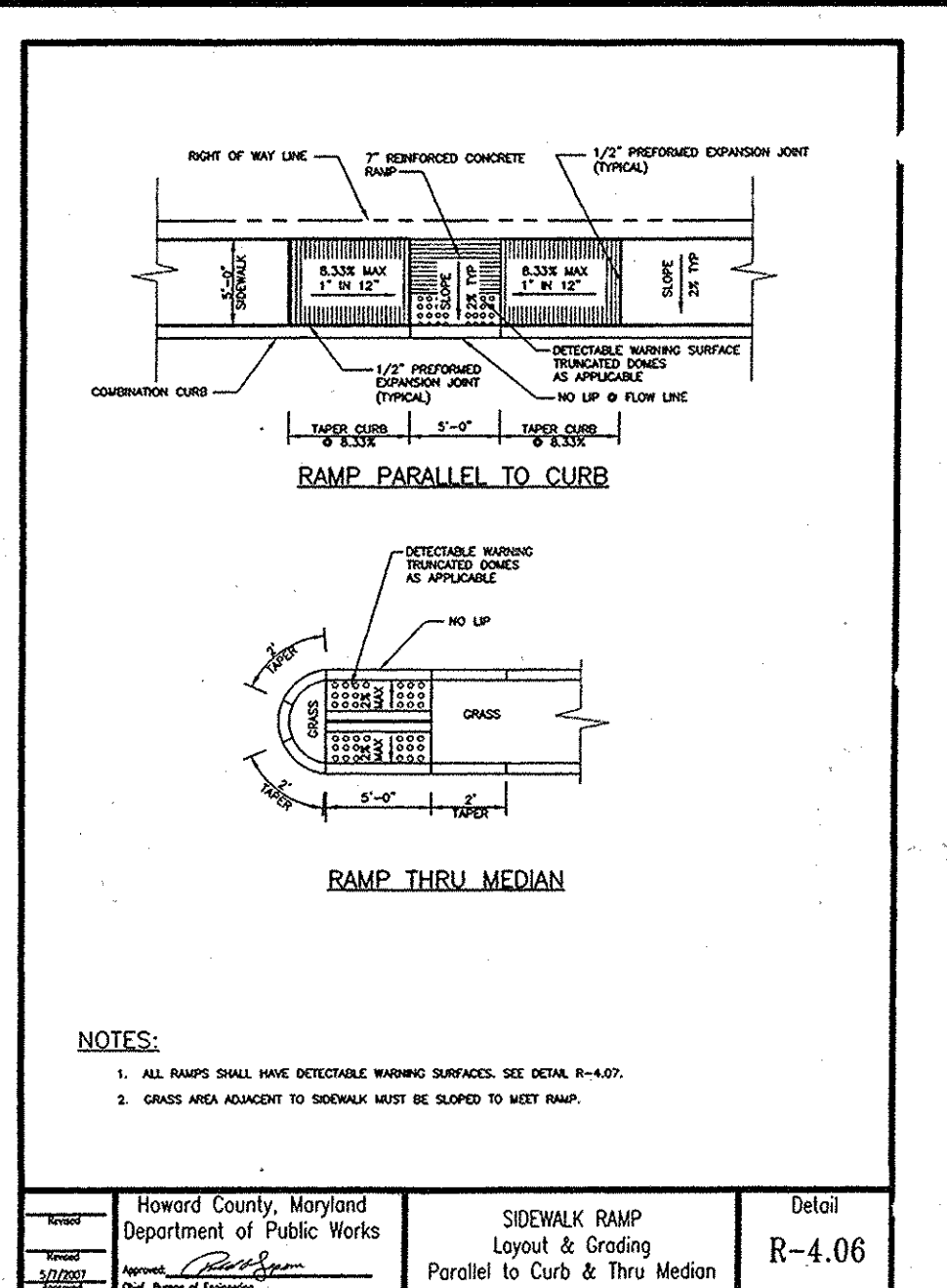
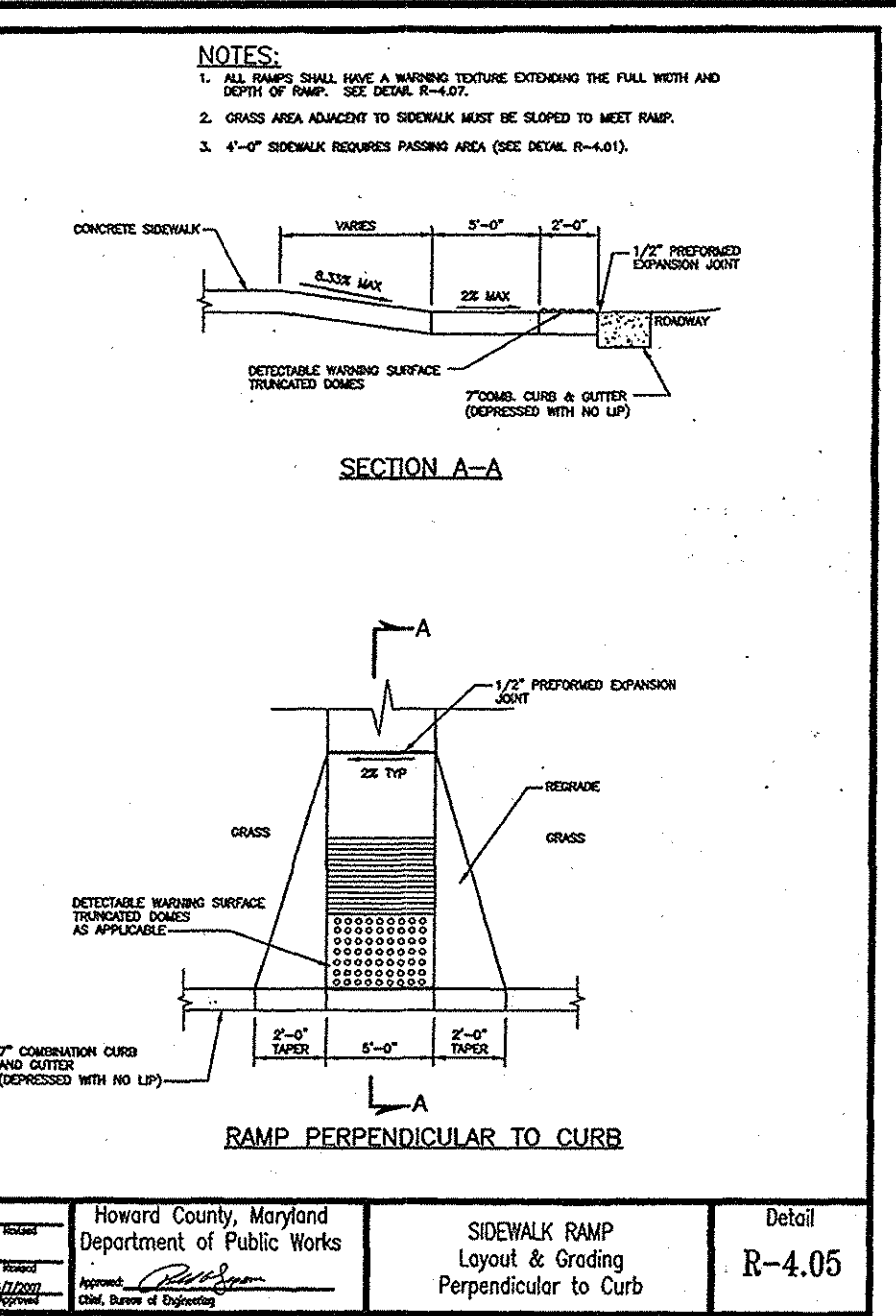
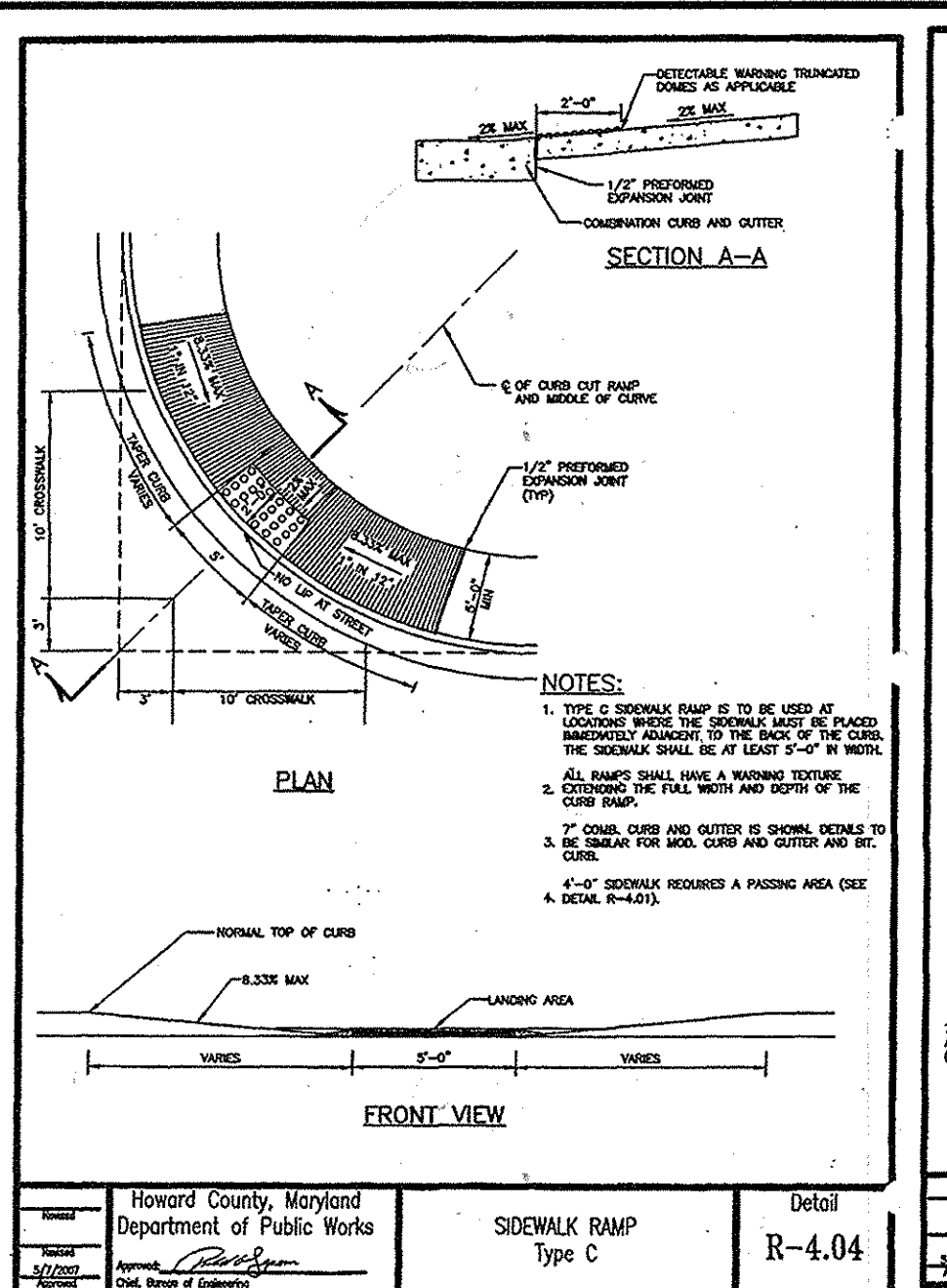
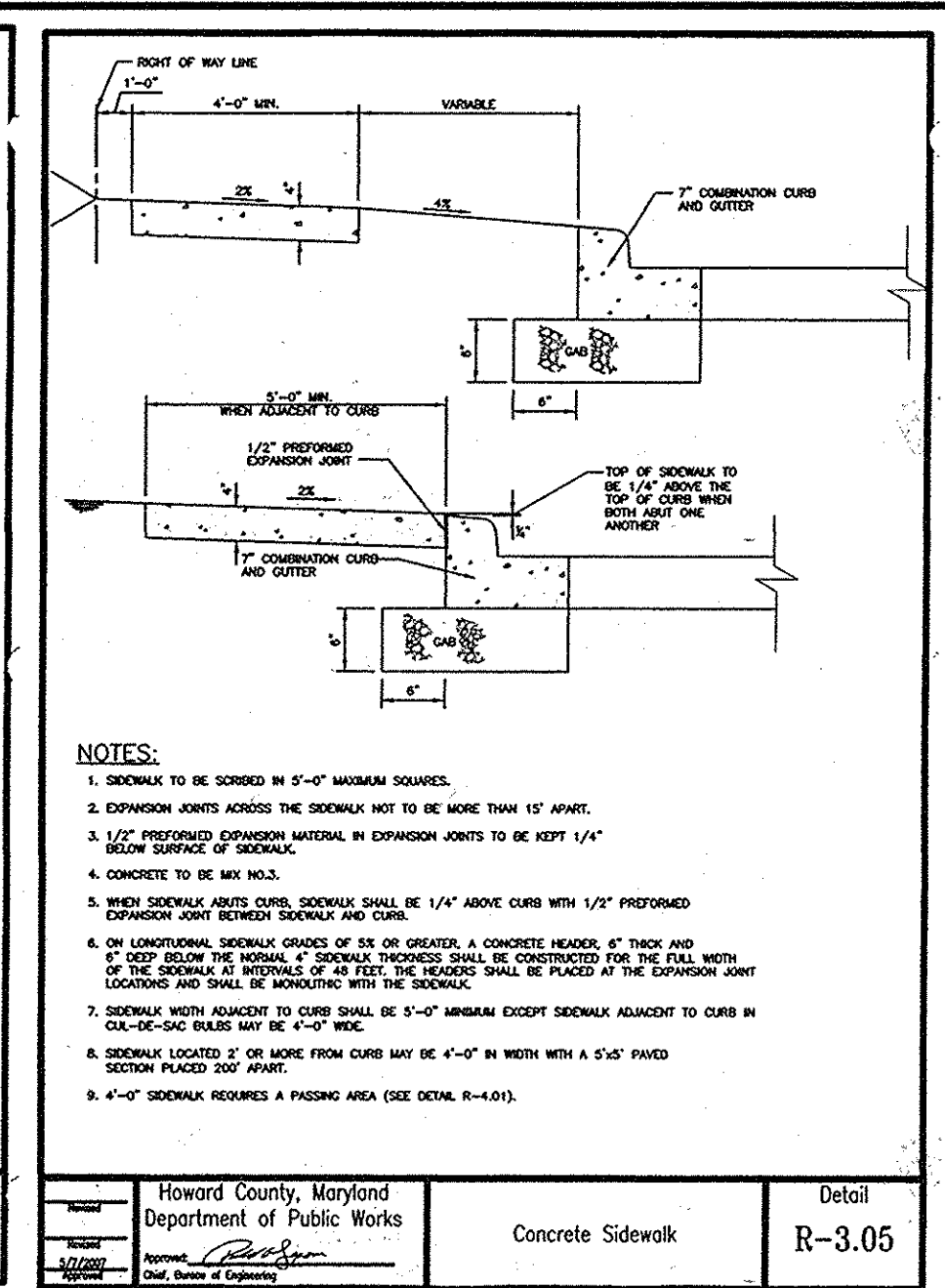
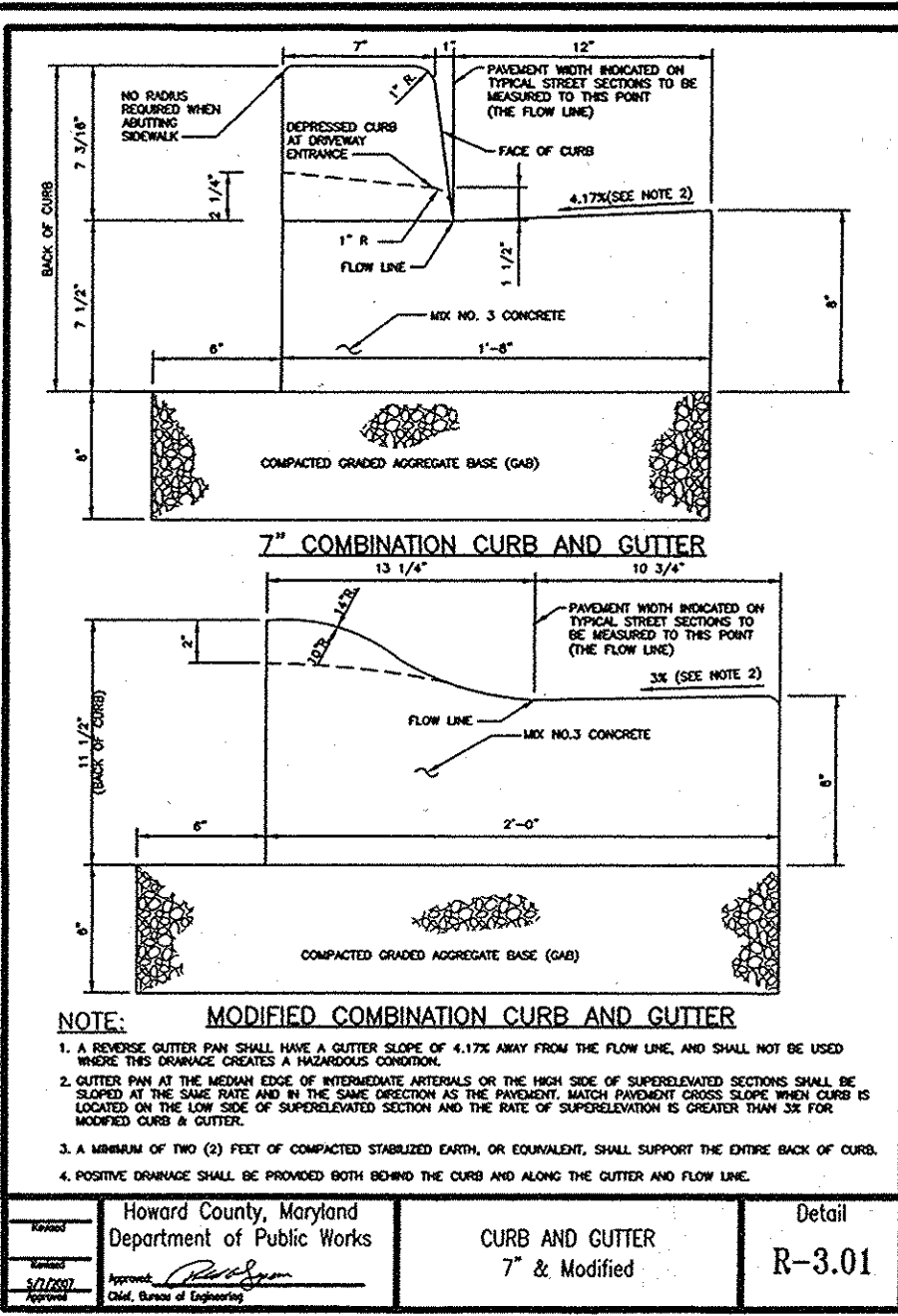
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[Signature] 10-9-15
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 12-29-15
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 12-30-15
DIRECTOR DATE

NO.	REVISION	DATE
SITE DEVELOPMENT PLAN		
SITE LAYOUT PLAN		
ANTWERPEN HYUNDAI		
PARCEL E-7, HOLWECK SUBDIVISION		
PLAT 23515		
TAX MAP 34 BLOCK 06	PARCEL 365	
5TH ELECTION DISTRICT	HOWARD COUNTY, MARYLAND	
ROBERT H. VOGEL		
ENGINEERS • SURVEYORS • PLANNERS		
8407 MAIN STREET TEL: 410.461.7666		
ELLCOTT CITY, MD 21043 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: 09-27-2018		
DESIGN BY: DZE	DZE/KG	
CHECKED BY: RHY		
DATE: MARCH 2015		
SCALE: AS SHOWN		
W.O. NO.: 12-48		
2 SHEET		11



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 10-8-15
 DATE

12-29-15
 DATE

12-30-15
 DATE

HANDICAP PARKING SIGNS
 (NOT TO SCALE)

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 Chief, Development Engineering Division
 10-8-15
 DATE

12-29-15
 DATE

12-30-15
 DATE

OWNER/PETITIONER
 ANTOY LLC
 12420 AUTO DRIVE
 CLARKSVILLE, MD 21029
 (410) 531-5700

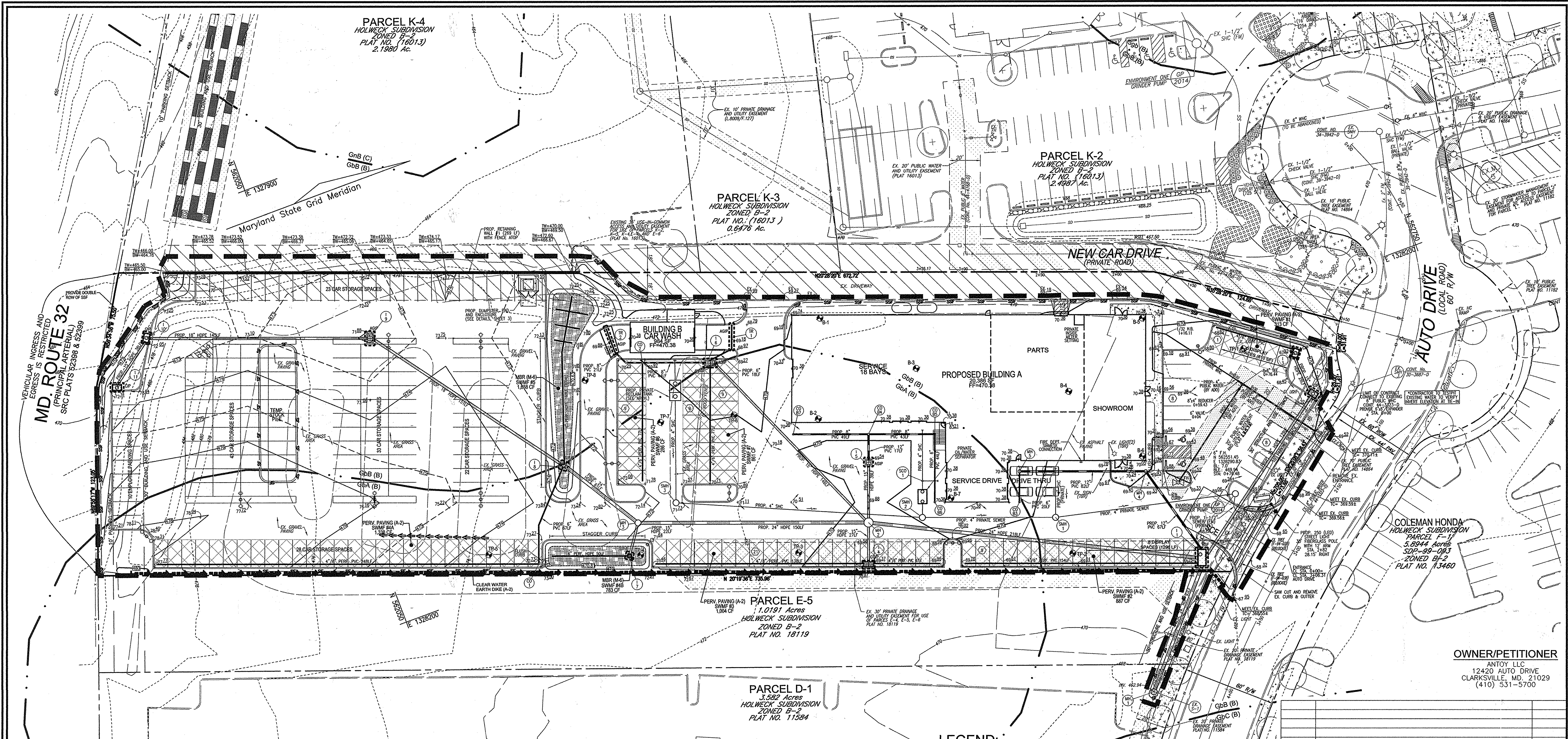
SITE DEVELOPMENT PLAN
 SITE DETAILS
 ANTWERPEN HYUNDAI
 PARCEL E-7, HOLWECK SUBDIVISION
 PLAT 23575
 TAX MAP 34 BLOCK 06 PARCEL 365
 5TH ELECTION DISTRICT ZONED: B-2 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET TEL: 410.461.7666
 ELLICOTT CITY, MD 21043 FAX: 410.61.8961

DESIGN BY: DZE
 DRAWN BY: DZE/KG
 CHECKED BY: RHY
 DATE: MARCH 2015
 SCALE: AS SHOWN
 W.O. NO.: 12-48

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: 09-27-2018

3 SHEET OF 11



PLAN VIEW
SCALE: 1"=30'

SOILS LEGEND HOWARD COUNTY SOILS MAP #16		
SYMBOL	NAME / DESCRIPTION	GROUP
GBA	GLADSTONE LOAM, 0 TO 3 PERCENT SLOPES	B
GBB	GLADSTONE LOAM, 3 TO 8 PERCENT SLOPES	B

SEDIMENT CONTROL NOTE:
SEDIMENT CONTROLS INTERRUPTED BY THE INSTALLATION OF STORM DRAINS ARE TO BE REPAIRED IMMEDIATELY.

NOTE:
*PROPOSED SETBACK TO BE APPROVED BY THE HOWARD COUNTY PLANNING BOARD.

LEGEND:

---	EXISTING CONTOUR	---	M1B2	SOILS BOUNDARY
-+00-	PROPOSED CONTOUR	---	M1D3	SOILS BOUNDARY
+40.00	PROPOSED SPOT ELEVATION	---	---	PROPOSED SIDEWALK
+40.25	EXISTING SPOT ELEVATION	---	---	EX. 20" DRAINAGE & UTILITY EASEMENT PLAT #1819
---	EXISTING CURB AND GUTTER	---	---	EX. 20" WATER & UTILITY EASEMENT PLAT #1819
---	PROPOSED CURB AND GUTTER	---	---	EX. 30" USE-IN-COMMON ACCESS EASEMENT PLAT #1819
☀	EXISTING LIGHT POLE	---	---	PROP. 20" PUBLIC WATER & UTILITY EASEMENT PLAT #2281E
☑	EXISTING MAILBOX	---	---	PROP. MICRO BIORETENTION AREA (M-6)
⊙	EXISTING SANITARY MANHOLE	---	---	PROP. PERVIOUS PAVEMENT (A-2)
SS	EXISTING SANITARY LINE	---	---	EX. 10" PUBLIC TREE EASEMENT PLAT #11182
⊙	EXISTING CLEANOUT	---	---	PROP. MICRO BIORETENTION AREA (M-6)
⊙	EXISTING FIRE HYDRANT	---	---	---
W	EXISTING WATER LINE	---	---	---
---	PROPOSED STORM DRAIN	---	---	---
---	PROPOSED STORM DRAIN INLET	---	---	---
---	PROPOSED TREELINE	---	---	---
---	EXISTING TREELINE	---	---	---
---	EXISTING FENCE PROPERTY LINE	---	---	---
---	RIGHT-OF-WAY LINE	---	---	---

OWNER/PETITIONER
ANTOY LLC
12420 AUTO DRIVE
CLARKSVILLE, MD 21029
(410) 531-5700

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
GRADING, SEDIMENT AND EROSION CONTROL PLAN; SOILS MAP
ANTWERPEN HYUNDAI
PARCEL E-7, HOLWECK SUBDIVISION
PLAT #2381E
TAX MAP 34 BLOCK 06
5TH ELECTION DISTRICT
PARCEL 365
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
DESIGN BY: DZE
DRAWN BY: DZE/KG
CHECKED BY: RRV
DATE: MARCH 2015
SCALE: AS SHOWN
W.O. NO.: 12-48

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. 11833, EXPIRATION DATE: 09-27-2018.

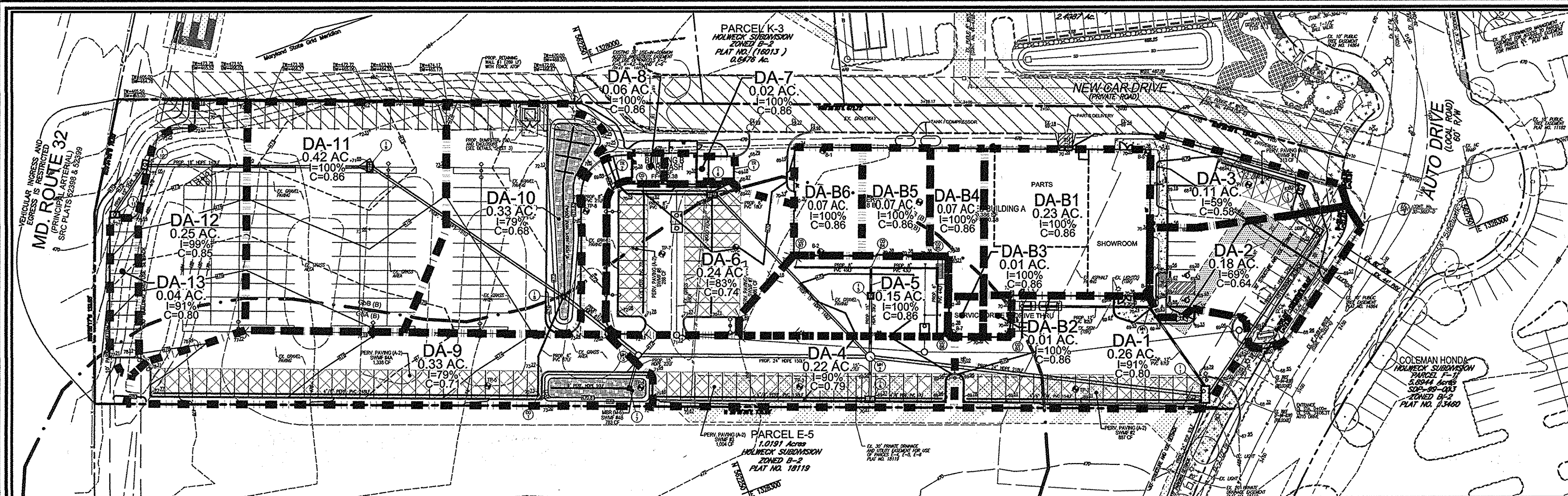
4 SHEET OF 11

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
10-8-15
12-29-15
12-30-15

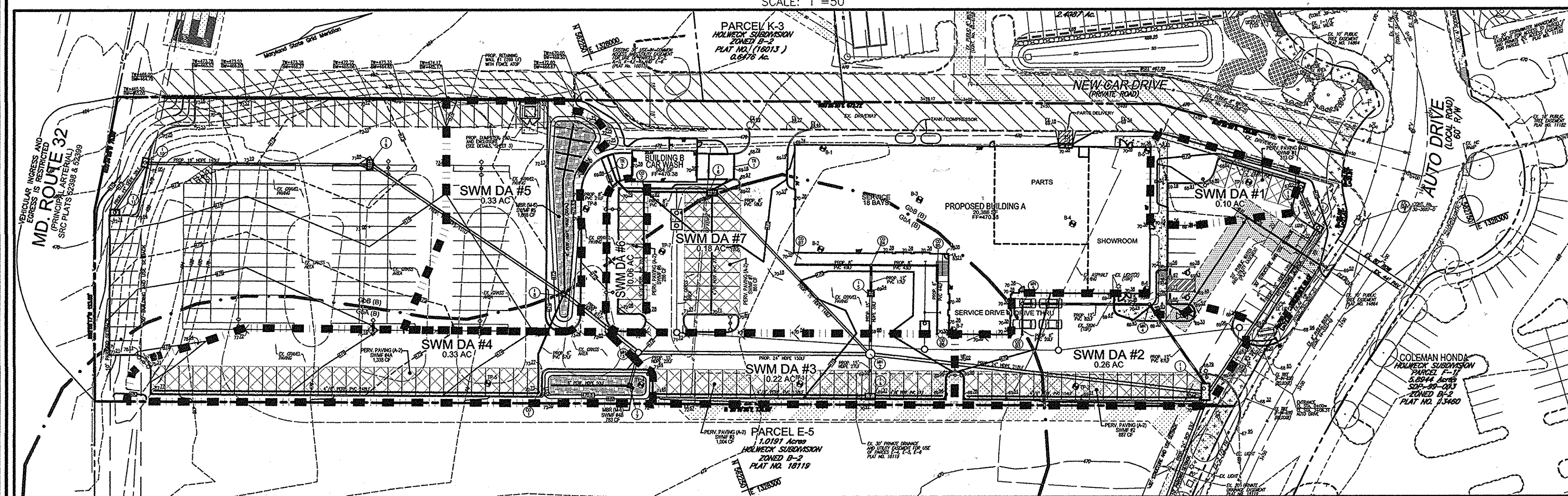
BY THE DEVELOPER:
I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING 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.

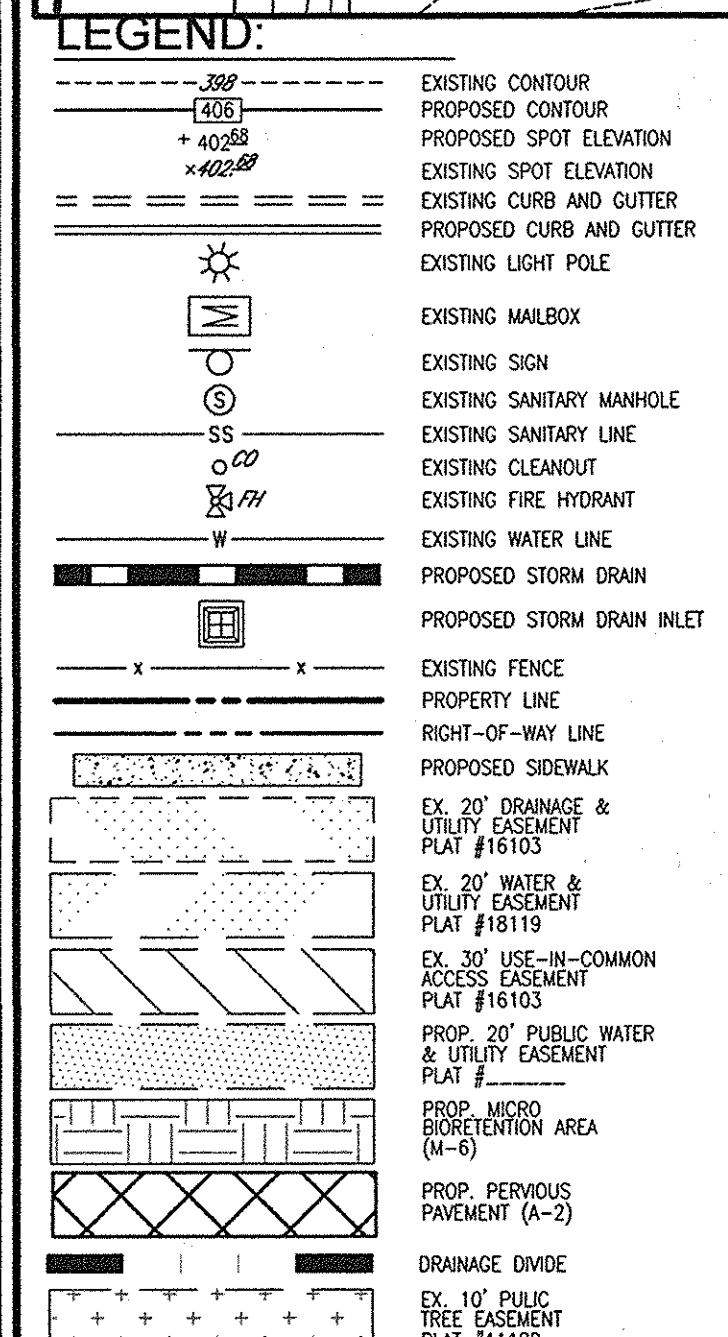
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.



STORMDRAIN DRAINAGE AREA MAP
SCALE: 1"=50'



SWM DRAINAGE AREA MAP
SCALE: 1"=50'

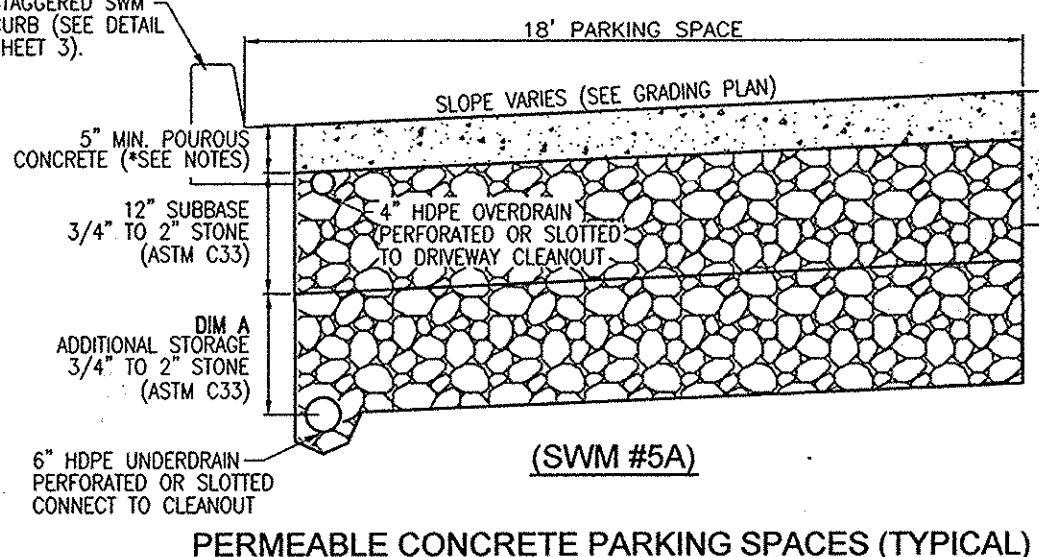


Appendix B.4. Construction Specifications for Environmental Site Design Practices

Table B.4.1. Materials Specifications for Micro-Bioretention, Rain Gardens & Landscape Infiltration

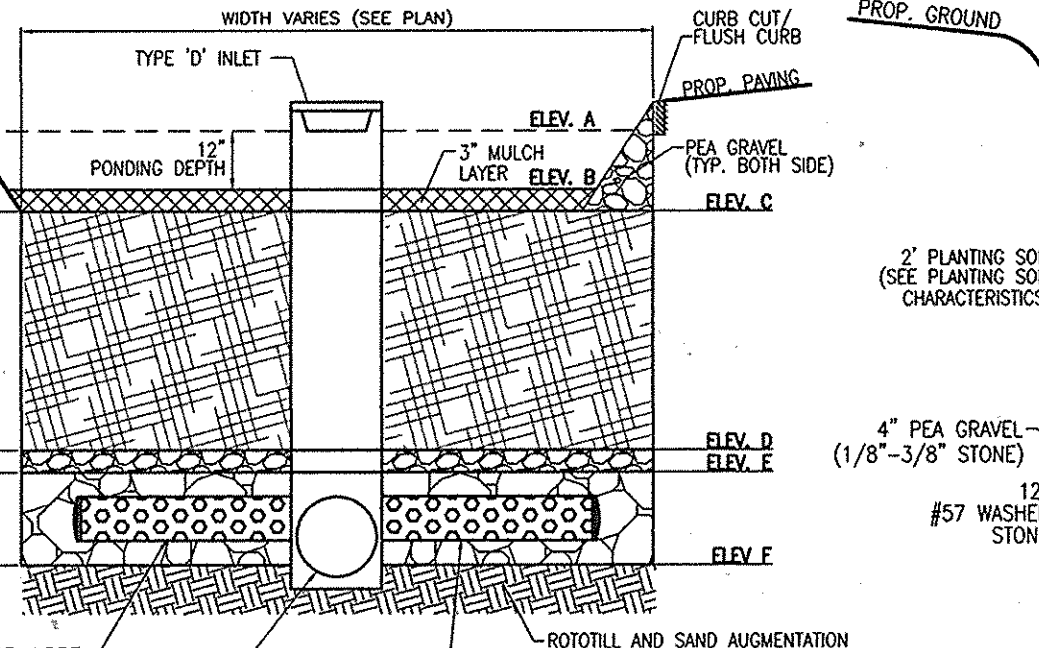
Material	Specifications	Notes
Plantings	see Appendix A, Table A.4	plantings are site-specific.
Planting soil	loamy sand (90-95%) & compost (5-10%)	USDA soil type loamy sand or sandy loam; clay content < 5%
Organic content	Min. 10% by dry weight (ASTM D 2970)	
Mulch	shredded hardwood	aged 6 months, minimum no pine or wood chips
Pea gravel/diaphragm	pea gravel: ASTM D-448	NO. 8 OR NO. 9 (1/8" TO 3/8")
Curtain drain	ornamental stone: washed cobble	size: 2" to 5"
Geotextile		see Table 1, nonwoven
Gravel (underdrains and infiltration berms)	AASHTO M-43	NO. 57 OR NO. 6 AGGREGATE (1/2" TO 3/4")
Underdrain piping	F-758, Type PE 28 or AASHTO M-278	4" to 6" rigid schedule 40 PVC or HDPE
Poured in place concrete (if required)	MSHA Mix No. 3, F _c = 3500 psi @ 28 days, normal weight, air-entrained; conforming to most ASTM-61-50	
Sand	AASHTO M-64 or ASTM-C-33	0.075" to 0.04"

TEST PIT #	DEPTH	COMMENTS
1	9.5'	No Water (bottom trench)
2	9'	No Water (bottom trench)
3	9'	No Water (bottom trench)
4	10'	No Water (bottom trench)
5	10'	No Water (bottom trench)
6	9.5'	No Water (bottom trench)
7	9.5'	No Water (bottom trench)
8	10.5'	No Water (bottom trench)



PERMEABLE CONCRETE PARKING SPACES (TYPICAL)
(FOR ELEVATIONS AND INVERTS, SEE PROFILES) NOT TO SCALE

- NOTE:
 1. PAVEMENT CROSS SECTION TO BE CONFIRMED BY GEOTECHNICAL ENGINEER.
 2. POROUS CONCRETE SECTION TO CONFORM TO APPENDIX B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS AND DESIGNED BY THE PROJECT GEOTECHNICAL ENGINEER.
 3. UNDERDRAINS/OVERDRAINS SHALL CONNECT INTO A TRAFFIC BEARING CLEANOUT AS SHOWN ON THE PLANS.



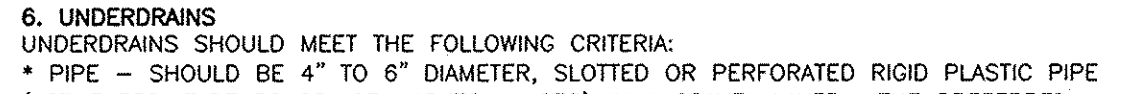
MICRO-BIORETENTION (SWM #5)
NOT TO SCALE

PERVIOUS CONCRETE DATA CHART

MR Facility	Add. Depth of Stone Storage (ft.)
PerVIOUS Paving #1:	0.42
PerVIOUS Paving #2:	0.42
PerVIOUS Paving #3:	0.33
PerVIOUS Paving #4:	0.00
PerVIOUS Paving #7:	0.33

APPENDIX B.4.C SPECIFICATIONS FOR MICRO-BIORETENTION, RAIN GARDEN, LANDSCAPE INFILTRATION & INFILTRATION BERMS

- 1. MATERIAL SPECIFICATIONS**
 THE ALLOWABLE MATERIALS TO BE USED IN THESE PRACTICES ARE DETAILED IN TABLE B.4.1.
- 2. FILTERING MEDIA OR 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 MICRO-BIORETENTION PRACTICE THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHALL BE FREE OF BERMIUDA 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:
 • SOIL COMPONENT - LOAMY SAND OR SANDY LOAM (USDA SOIL TEXTURAL CLASSIFICATION).
 • ORGANIC CONTENT - MINIMUM 10% BY DRY WEIGHT (ASTM D 2974). IN GENERAL, THIS CAN BE MET WITH 1 AND 2% OF LOAMY SAND (90-95%) AND COMPOST (35% TO 40%) OR SANDY LOAM (30%), COARSE SAND (30%), AND COMPOST (40%).
 • CLAY CONTENT - MEDIA SHALL HAVE A CLAY CONTENT OF LESS THAN 5%.
 • PH RANGE - SHOULD BE BETWEEN 5.5 - 7.0. AMENDMENTS (E.G., LIME, IRON SULFATE PLUS SULFUR) MAY BE MIXED IN TO THE SOIL TO INCREASE.
- THIS SHALL BE AT LEAST ONE SOIL TEST PER PROJECT. EACH TEST SHALL CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURAL ANALYSIS SHALL BE PERFORMED FOR EACH LOCATION WHERE THE TOPSOIL WAS EXCAVATED.
- 3. COMPACTION**
 IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF BIORETENTION PRACTICES AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL. IF PRACTICES ARE EXCAVATED USING LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYRE TIRES. 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 ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACATURE 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 REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.
- ROTTILL TO 2 TO 3 INCHES OF SAND INTO THE BASE OF THE BIORETENTION FACILITY BEFORE BACKFILLING THE OPTIONAL SAND LAYER. PUMP ANY PONDED WATER BEFORE PREPARING (ROTTOTILING) 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 12" 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 MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.
- 4. PLANT MATERIAL**
 RECOMMENDED PLANT MATERIAL FOR MICRO-BIORETENTION PRACTICES CAN BE FOUND IN APPENDIX A, SECTION A.2.3.
- 5. PLANT INSTALLATION**
 COMPOST IS A BETTER ORGANIC MATERIAL SOURCE, IS LESS LIKELY TO FLOAT, AND SHOULD BE PLACED IN THE INVERT AND OTHER LOW AREAS. MULCH SHOULD BE PLACED IN SURROUNDING TO A UNIFORM THICKNESS OF 2" TO 3". SHREDDED OR CHIPPED 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.
- ROOTSTOCK 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 PLANTING PIT SHALL BE AT LEAST SIX INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.
- 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-GRASS 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, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF WOOD CHIPS OR MULCH ARE USED TO AMEND THE SOIL. ROTOTILL UREA FERTILIZER AT A RATE OF 2 POUNDS PER 1000 SQUARE FEET.
- 6. UNDERDRAINS**
 UNDERDRAINS SHOULD MEET THE FOLLOWING CRITERIA:
 • PIPE - SHOULD BE 4" TO 6" DIAMETER, SLOTTED OR PERFORATED RIGID PLASTIC PIPE (ASTM F 758, TYPE PS 28, OR AASHTO-M-278) IN A GRAVEL LAYER. THE PREFERRED MATERIAL IS SLOTTED, 4" RIGID PIPE (E.G., PVC OF HDPE).
 • PERFORATIONS - IF PERFORATED PIPE IS USED, PERFORATIONS SHOULD BE 3/8" DIAMETER LOCATED 6" ON CENTER WITH A MINIMUM OF FOUR HOLES PER ROW. PIPE SHALL BE WRAPPED WITH 1/4" (NO. 4 OR 4X4) GALVANIZED HARDWARE CLOTH.
 • GRAVEL - THE GRAVEL LAYER (NO. 57 STONE PREFERRED) SHALL BE AT LEAST 3" THICK ABOVE AND BELOW THE UNDERDRAIN.
 • THE MAIN COLLECTOR PIPE SHALL BE AT A MINIMUM 0.5% SLOPE.
 • A RIGID, NON-PERFORATED OBSERVATION WELL MUST BE PROVIDED (ONE PER EVERY 1,000 SQUARE FEET) TO PROVIDE A CLEAN-OUT PORT AND MONITOR PERFORMANCE OF THE FILTER.
 • A 4" LAYER OF PEA GRAVEL (1/8" TO 3/8" STONE) SHALL BE LOCATED BETWEEN THE FILTER MEDIA AND UNDERDRAIN TO PREVENT MIGRATION OF FINES INTO THE UNDERDRAIN. THIS LAYER MAY BE CONSIDERED PART OF THE FILTER BED WHEN BED THICKNESS EXCEEDS 24".
- THIS MAIN COLLECTOR PIPE FOR UNDERDRAIN SYSTEMS SHALL BE CONSTRUCTED AT A MINIMUM SLOPE OF 0.5%. OBSERVATION WELLS AND/OR CLEAN-OUT PIPES MUST BE PROVIDED (ONE MINIMUM PER EVERY 1000 SQUARE FEET OF SURFACE AREA).
- 7. MISCELLANEOUS**
 THESE PRACTICES MAY NOT BE CONSTRUCTED UNTIL ALL CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.



MICRO-BIORETENTION (SWM #4B)
NOT TO SCALE

MICRO-BIORETENTION DATA CHART

MR Facility	Ponding Elevation (Elev. A)	Top of Planting Media (Elev. B)	Bottom of Planting Media (Elev. C)	Bottom of Filter Media (Elev. D)	Bottom of Underdrain (Elev. E)	Bottom of Stone (Elev. F)	Invert of Underdrain (Inv. Elev. G)
4B	471.81	470.81	470.56	468.23	1.00	467.23	467.48
5	471.63	470.63	470.38	468.38	1.00	467.65	467.30

- MICROBIORETENTION NOTES:**
 1. ONLY THE SIDES OF MICROBIORETENTION ARE TO BE WRAPPED IN FILTER FABRIC. FILTER FABRIC BETWEEN LAYER OR AT THE BOTTOM OF THE MICROBIORETENTION WILL CAUSE THE MBR TO FAIL, AND THEREFORE SHALL NOT BE INSTALLED.
 2. WRAP THE PERFORATED MBR UNDERDRAIN PIPE WITH 1/4" MESH (4x4) OR SMALLER GALVANIZED HARDWARE CLOTH.

B.4.B SPECIFICATIONS FOR PERMEABLE PAVEMENTS & REINFORCED TURF

- THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS AND ARE NOT EXCLUSIVE. LIMITING THE DESIGNER IS RESPONSIBLE FOR DEVELOPING SPECIFICATIONS FOR INDIVIDUAL PROJECTS AND SPECIFIC CONDITIONS.
- 1. PERVIOUS CONCRETE SPECIFICATIONS**
 DESIGN THICKNESS - PERVIOUS CONCRETE APPLICATIONS SHALL BE DESIGNED SO THAT THE THICKNESS OF THE CONCRETE SLAB SHALL SUPPORT THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED. APPLICATIONS MAY BE DESIGNED USING STANDARD PAVEMENT PROCEDURES (E.G., AASHTO, ACI 325.5R, ACI 330R) OR USING STRUCTURAL VALUES DERIVED FROM FLEXIBLE PAVEMENT DESIGN PROCEDURES.
- MIX & INSTALLATION - TRADITIONAL PORTLAND CEMENTS (ASTM C 1507) MAY BE USED IN PERVIOUS CONCRETE APPLICATIONS. PHOSPHORUS ADMIXTURES MAY ALSO BE USED. MATERIALS SHOULD BE TESTED (E.G., TRIAL BATCHING) PRIOR TO CONSTRUCTION SO THAT CRITICAL PROPERTIES (E.G., SETTING TIME, RATE OF STRENGTH DEVELOPMENT, POROSITY, PERMEABILITY) CAN BE DETERMINED.
- AGGREGATE - PERVIOUS CONCRETE CONTAINS A LIMITED FINE AGGREGATE CONTENT. COMMONLY USED GRADATIONS INCLUDE ASTM C 33 NO. 67 (3/4" IN. TO NO. 4), NO. 8 (3/8" IN. TO NO. 16) AND NO. 89 (3/8" IN. TO NO.50) SIEVES. SINGLE-SIZED AGGREGATE (UP TO 1 INCH) MAY ALSO BE USED.
- WATER CONTENT - WATER-TO-CEMENT RATIOS BETWEEN 0.27 AND 0.30 ARE USED ROUTINELY WITH PROPER INCLUSION OF CHEMICAL ADMIXTURES. WATER QUALITY SHOULD MEET ACI 308. AS A GENERAL RULE, POTABLE WATER SHOULD BE USED UNLESS OTHERWISE SPECIFIED. RECOMMENDED PRODUCTION WATER MEETING ASTM C 94 OR AASHTO M 157 MAY ALSO BE USED.
- ADMIXTURES - CHEMICAL ADMIXTURES (E.G., RETARDERS OR HYDRATION-STABILIZERS) ARE USED TO OBTAIN SPECIAL PROPERTIES IN PERVIOUS CONCRETE. USE OF ADMIXTURES SHOULD MEET ASTM C 494 (CHEMICAL ADMIXTURES) AND ASTM C 260 (AIR ENTRAINING ADMIXTURES) AND CLOSELY FOLLOW MANUFACTURER'S RECOMMENDATIONS. THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).
- 2. PERMEABLE INTERLOCKING CONCRETE PAVEMENTS (PICP)**
 THE PAVEMENT SURFACES TO REDUCE SEWAGE ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY, SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. SWEEPING ON COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
- INFILL MATERIALS AND LEVELING COURSE - OPENINGS SHALL BE FILLED WITH ASTM C-33 GRADED SAND OR SANDY LOAM. PICP BLOCKS SHALL BE PLACED ON A ONE-INCH THICK LEVELING COURSE OF ASTM C-33 SAND.
- BASE COURSE - THE BASE COURSE SHALL BE AASHTO NO. 3 OR 4 COURSE AGGREGATE WITH AN ASSUMED OPEN PORE SPACE OF 30% (n=0.30).
- 3. REINFORCED TURF**
 REINFORCED GRASS PAVEMENT (RGP) - WHETHER USED WITH GRASS OR GRAVEL, THE RGP THICKNESS SHALL BE AT LEAST 1-3/4" THICK WITH A LOAD CAPACITY CAPABLE OF SUPPORTING THE TRAFFIC AND VEHICLE TYPES THAT WILL BE CARRIED.

OPERATION AND MAINTENANCE SCHEDULE FOR LANDSCAPE INFILTRATION (M-3), MICRO-BIORETENTION (M-6), RAIN GARDENS (M-7), BIORETENTION SWALE (M-8), AND ENHANCED FILTERS (M-9)

- THE OWNER SHALL MAINTAIN THE PLANT MATERIAL, MULCH LAYER AND SOIL LAYER ANNUALLY. 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 PRUNING. ACCEPTABLE REPLACEMENT PLANT MATERIAL IS LIMITED TO THE FOLLOWING: 2000 MARYLAND STORMWATER DESIGN MANUAL, VOLUME II, TABLE A.4.1 AND 2.
- THE OWNER SHALL PERFORM A PLANT IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT. REMOVE DEAD PLANT MATERIAL WITH ACCEPTABLE REPLACEMENT PLANT MATERIAL. TREAT DISEASED TREES AND SHRUBS, AND REPLACE ALL DEFICIENT STAKES AND WIRES.
- THE OWNER SHALL INSPECT THE MULCH EACH SPRING. THE MULCH SHALL BE REPLACED EVERY TWO TO THREE YEARS. THE PREVIOUS MULCH LAYER SHALL BE REMOVED BEFORE THE NEW LAYER IS APPLIED.
- THE OWNER SHALL CORRECT SOIL EROSION ON AN AS NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER EACH HEAVY STORM.

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED PERMEABLE PAVEMENT (A-2)

- THE OWNER SHALL PERIODICALLY SWEEP (OR VACUUM POROUS CONCRETE) THE PAVEMENT SURFACES TO REDUCE SEWAGE ACCUMULATION AND ENSURE CONTINUED SURFACE POROSITY. SWEEPING SHOULD BE PERFORMED AT LEAST TWICE ANNUALLY WITH A COMMERCIAL CLEANING UNIT. SWEEPING ON COMPRESSED AIR UNITS SHOULD NOT BE USED TO PERFORM SURFACE CLEANING.
- THE OWNER SHALL PERIODICALLY CLEAN DRAINAGE PIPES, INLETS, STONE EDGE DRAINS AND OTHER STRUCTURES WITHIN OR DRAINING TO THE SUBBASE.
- THE OWNER SHALL USE DECISERS IN MODERATION. DECISERS SHOULD BE NON-TOXIC AND BE APPLIED EITHER AS CALCIUM MAGNESIUM ACETATE OR PRETREATED SALT.
- THE OWNER SHALL ENSURE SNOW PLOWING IS PERFORMED CAREFULLY WITH BLADES SET ONE INCH ABOVE THE SURFACE. PLOWED SNOW PILES AND SNOWMELT SHOULD NOT BE DIRECTED TO PERMEABLE PAVEMENT.

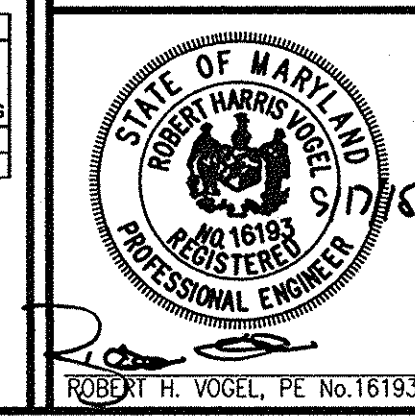
OWNER/PETITIONER
 ANTOY LLC
 12420 AUTO DRIVE
 CLARKSVILLE, MD 21029
 (410) 531-5700

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
DRAINAGE AREA MAPS;
SWM NOTES AND DETAILS

ANTWERPEN HYUNDAI
 PARCEL E-7, HOLWECK SUBDIVISION
 PLAT 235-15
 ZONED: B-2
 TAX MAP 34 BLOCK 06 PARCEL 365
 5TH ELECTION DISTRICT HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET TEL: 410.461.7666
 ELLICOTT CITY, MD 21043 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. MY LICENSE NO. IS 16193. EXPIRATION DATE: 09-30-2018.

DESIGN BY: DZE
 DRAWN BY: DZE/KG
 CHECKED BY: RHY
 DATE: MARCH 2015
 SCALE: AS SHOWN
 W.O. NO.: 12-48

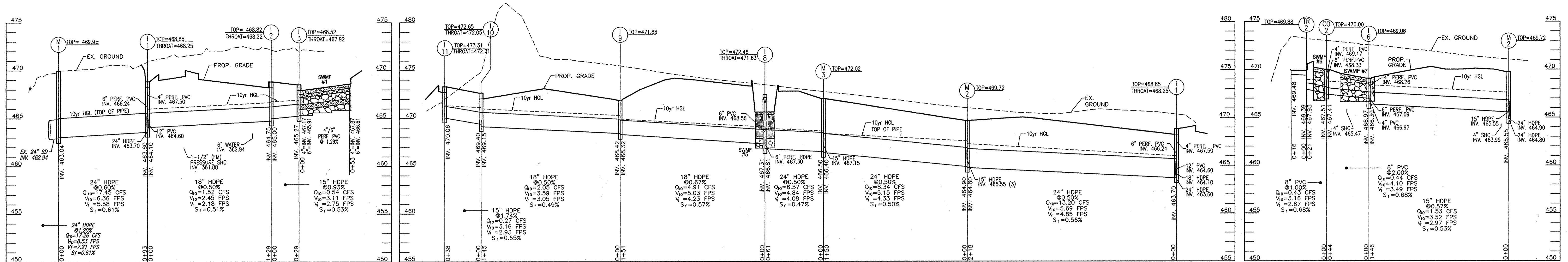
6 SHEET OF 11

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Paul S. ... 10-9-15
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Valley ... 12-30-15
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

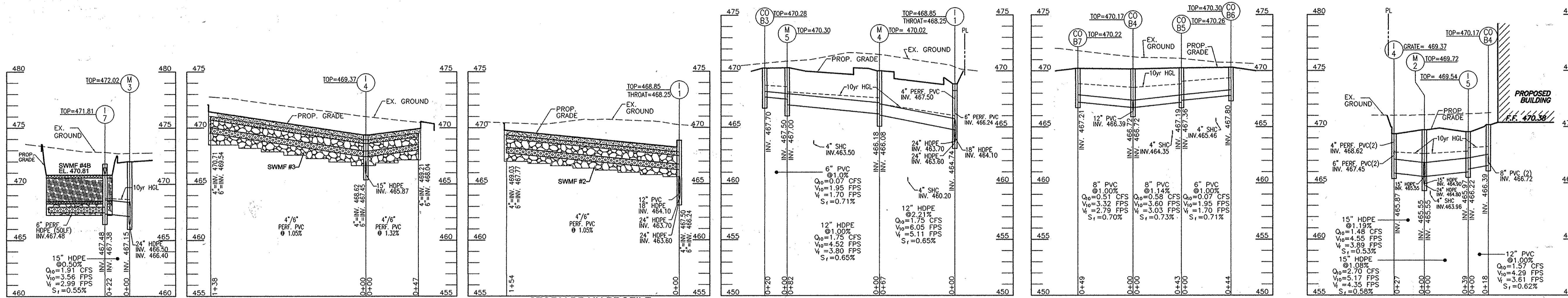
Valley ... 12-30-15
 DIRECTOR DATE



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'

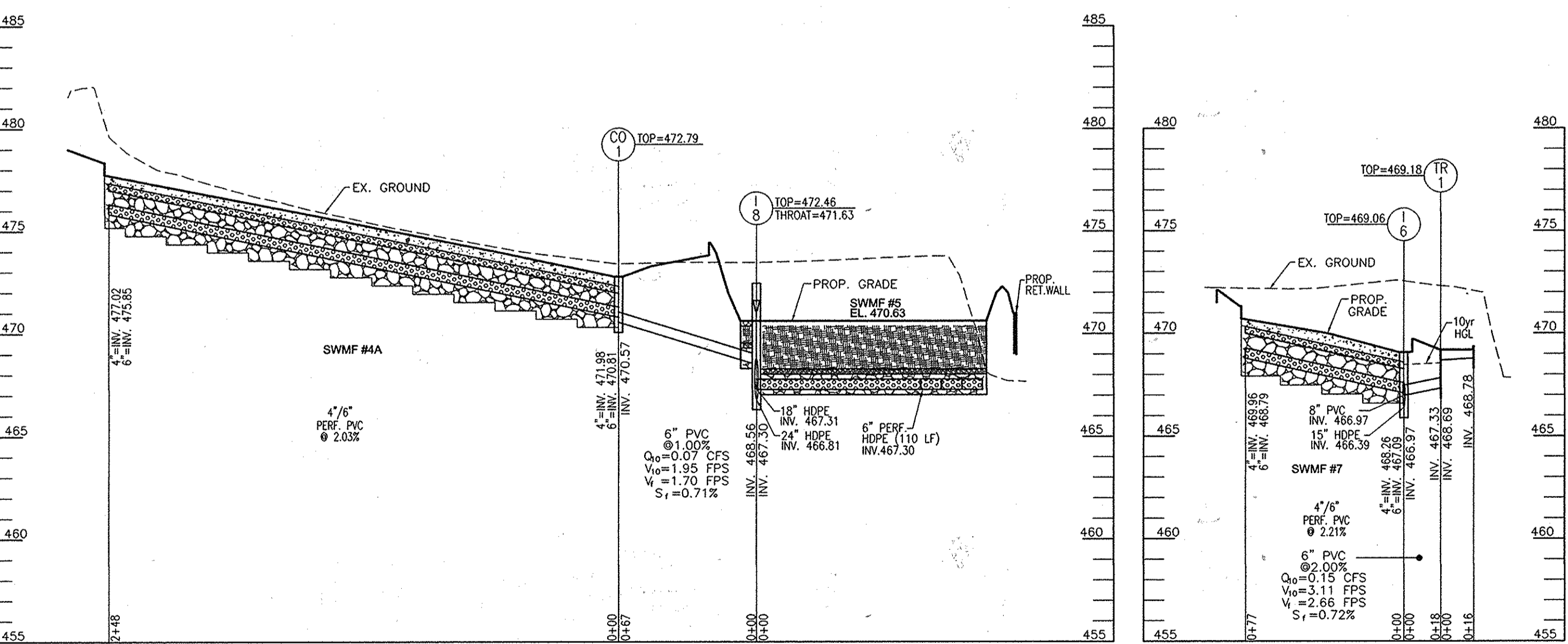
STORM DRAIN PROFILE
SCALE: HORIZONTAL - 1"=50'
VERTICAL - 1"=5'

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

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

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'

STRUCTURE SCHEDULE							
NO.	TYPE	LOCATION	TOP ELEV.	THROAT ELEV.	INV. IN	INV. OUT	COMMENTS
I-1	TYPE "A-10" INLET	N 562548.7 E 1328342.4	468.85	468.25	463.60	463.60	HO. CO. STD. D-403
I-2	TYPE "A-5" INLET	N 562653.6 E 1328267.4	468.82	468.22	465.00	464.75	HO. CO. STD. D-401
I-3	TYPE "A-5" INLET	N 562652.2 E 1328238.7	468.52	467.92	465.27	465.27	HO. CO. STD. D-401
I-4	DOUBLE "WR" INLET	N 562344.6 E 1328269.8	-	469.37	465.87	465.87	HO. CO. STD. D-4-35
I-5	TYPE "S" INLET	N 562367.7 E 1328208.0	469.54	-	466.22	465.97	HO. CO. STD. SD-4.22
I-6	DOUBLE "S" INLET	N 562293.8 E 1328111.4	469.06	-	466.39	466.39	HO. CO. STD. D-4.23
I-7	"YARD" INLET	N 562200.8 E 1328210.6	471.81	-	467.48	467.38	HO. CO. STD. SD-4.14
I-8	"D" INLET	N 562181.3 E 1328140.3	472.46	471.63	466.81	466.81	HO. CO. STD. D-4-10
I-9	DOUBLE "S" INLET	N 562092.5 E 1328018.6	471.88	-	468.42	468.32	HO. CO. STD. D-4-23
I-10	TYPE "A-5" INLET	N 561956.6 E 1327967.5	472.65	472.05	469.40	469.15	HO. CO. STD. D-4-01
I-11	TYPE "A-5" INLET	N 561927.2 E 1327991.1	473.31	472.41	470.06	470.06	HO. CO. STD. D-4-01
MH-1	4'-0" STANDARD PRECAST MANHOLE	N 562469.1 E 1328413.0	469.94	-	463.04	462.94	HO. CO. STD. G-5-12
MH-2	4'-0" STANDARD PRECAST MANHOLE	N 562353.9 E 1328244.8	469.72	-	465.55	465.50	MD 384.05
MH-3	4'-0" STANDARD PRECAST MANHOLE	N 562213.6 E 1328192.4	472.02	-	467.15	466.40	HO. CO. STD. G-5-12
MH-4	4'-0" STANDARD PRECAST MANHOLE	N 562354.2 E 1328276.6	470.02	-	466.18	466.08	HO. CO. STD. G-5-12
MH-5	4'-0" STANDARD PRECAST MANHOLE	N 562457.4 E 1328247.9	470.30	-	467.50	467.00	HO. CO. STD. G-5-12
SMH-1	4'-0" STANDARD PRECAST MANHOLE	N 562468.9 E 1328284.2	469.69	-	466.84	466.12	HO. CO. STD. G-5-12
SMH-2	4'-0" STANDARD PRECAST MANHOLE	N 562387.9 E 1328253.9	470.06	-	466.12	466.09	HO. CO. STD. G-5-12
SMH-3	4'-0" STANDARD PRECAST MANHOLE	N 562387.9 E 1328253.9	471.80	-	464.67	464.57	HO. CO. STD. G-5-12
GP-2014	ENVIRONMENT ONE GRINDER PUMP	N 562241.3 E 1328188.8	469.74	-	459.06	460.11	
TR-1	ACO TRENCH DRAIN (SLOPED CHANNEL)	N 562310.1 E 1328107.7	469.18	-	468.78	468.69	KLASSIKRAIN K1-K5
TR-2	ACO TRENCH DRAIN (SLOPED CHANNEL)	N 562238.4 E 1328082.8	469.88	-	469.48	469.39	KLASSIKRAIN K1-K5
SCO-1	CLEANOUT	N 562396.2 E 1328231.6	470.18	-	466.39	466.34	HO. CO. STD. S-2-22
CO-1	CLEANOUT	N 562143.8 E 1328194.8	472.23	-	469.41	469.31	HO. CO. STD. S-2-22
CO-2	CLEANOUT	N 562252.7 E 1328095.7	471.87	-	469.37	469.77	HO. CO. STD. S-2-22
CO-B3	CLEANOUT	N 562450.4 E 1328266.6	470.28	-	467.70	467.70	HO. CO. STD. S-2-22
CO-B4	CLEANOUT	N 562374.1 E 1328190.8	470.17	-	466.88 (2)	466.55	HO. CO. STD. S-2-22
CO-B5	CLEANOUT	N 562414.4 E 1328205.8	470.26	-	467.48	467.31	HO. CO. STD. S-2-22
CO-B6	CLEANOUT	N 562398.9 E 1328247.4	470.30	-	467.92	467.92	HO. CO. STD. S-2-22
CO-B7	CLEANOUT	N 562328.2 E 1328173.7	470.23	-	467.21	467.21	HO. CO. STD. S-2-22

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

PIPE SCHEDULE					
SIZE	TYPE	LENGTH	SIZE	TYPE	LENGTH
4"	DIP WHC (PUBLIC)	5 LF	15"	HDPE (SD)	301 LF
4"	DIP WHC (PRIVATE)	60 LF	12"	PVC (SD)	166 LF
6"	DIP (PUBLIC)	76 LF	6"	PVC (SD)	157 LF
8"	DIP (PUBLIC)	59 LF	6"	PVC (SD)	149 LF
4"	PVC (SEWER)	534 LF	6"	PERF. HDPE (SWM)	210 LF
1-1/2"	FM (SEWER)	15 LF	4"	PERF. PVC (SWM)	794 LF
24"	HDPE (SD)	522 LF	6"	PERF. PVC (SWM)	794 LF
18"	HDPE (SD)	425 LF			

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 [Signature] 10-8-15
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 [Signature] 12-28-15
 CHIEF, DIVISION OF LAND DEVELOPMENT
 [Signature] 12-30-15
 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."
 [Signature] 9/17/15
 SIGNATURE OF DEVELOPER

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 I WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."
 [Signature] 9/30/15
 SIGNATURE OF ENGINEER

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
 [Signature] 9/30/15
 HOWARD S.C.D.

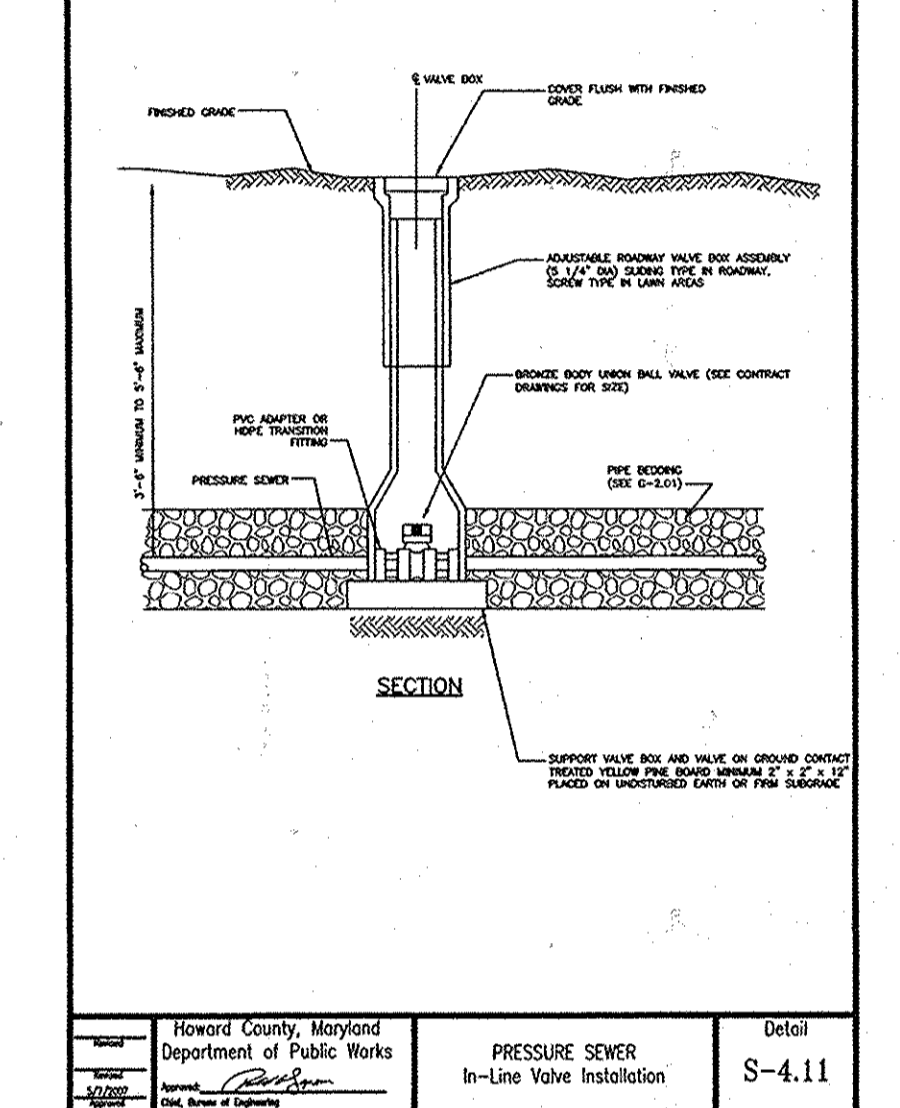
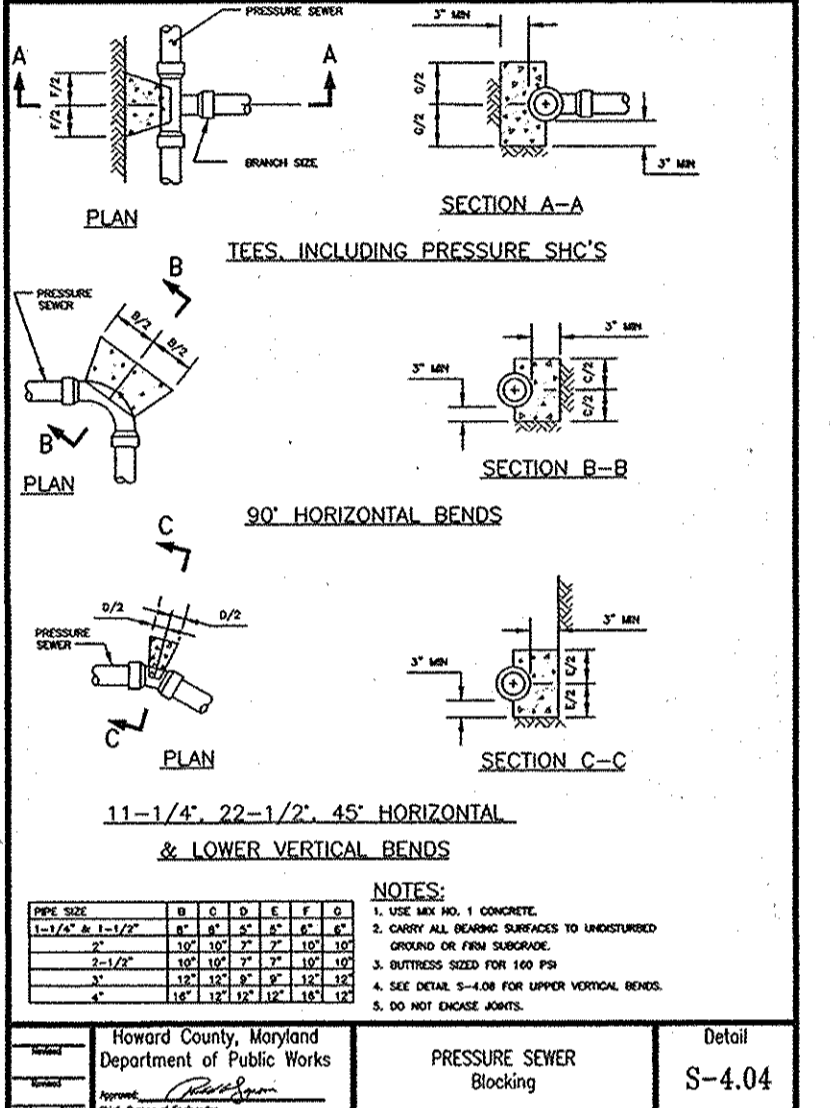
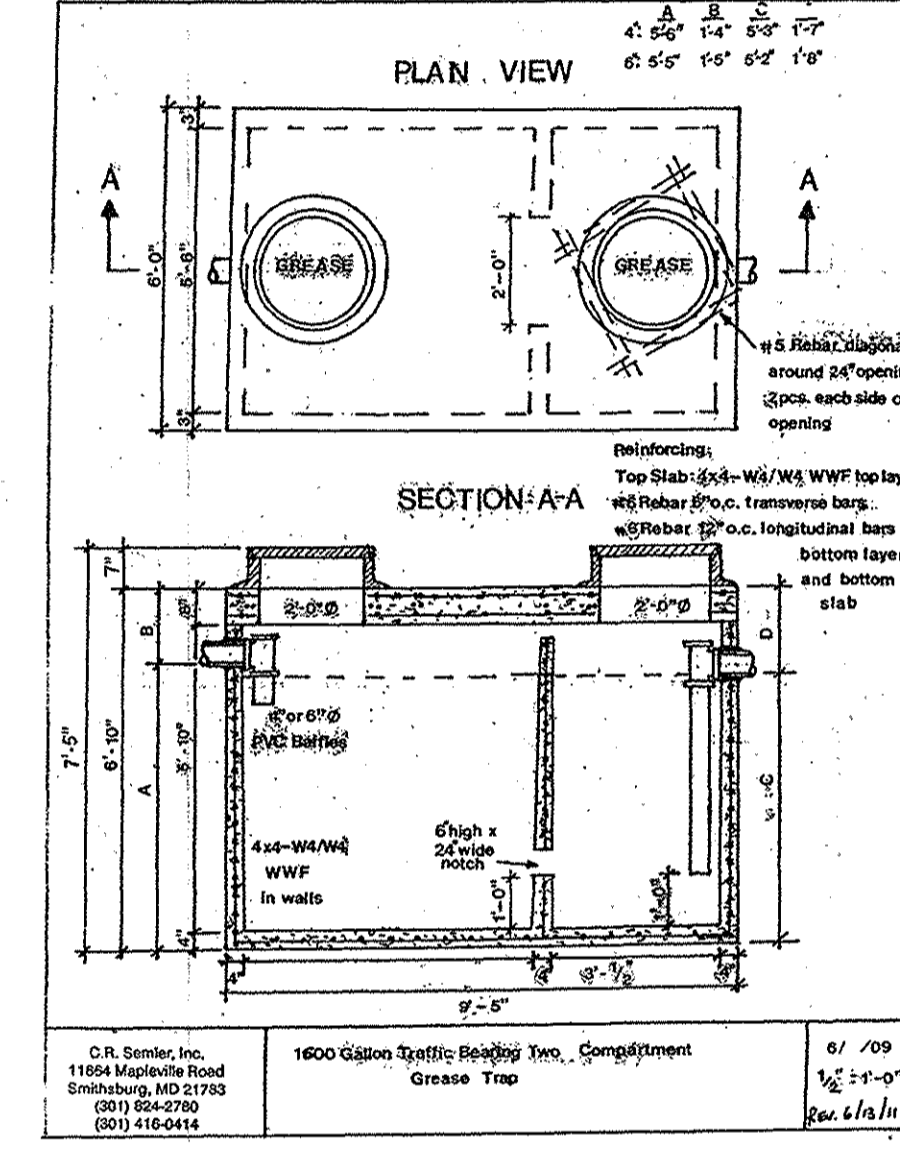
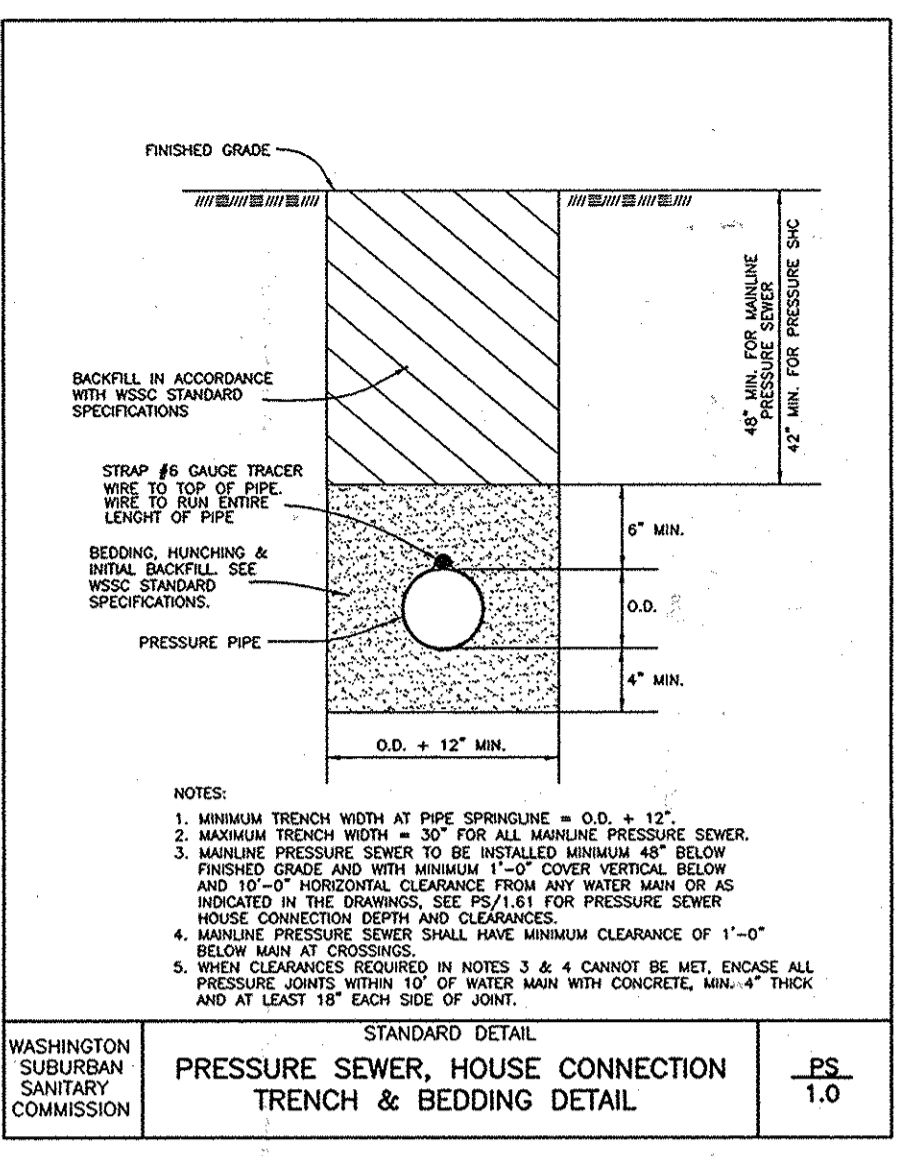
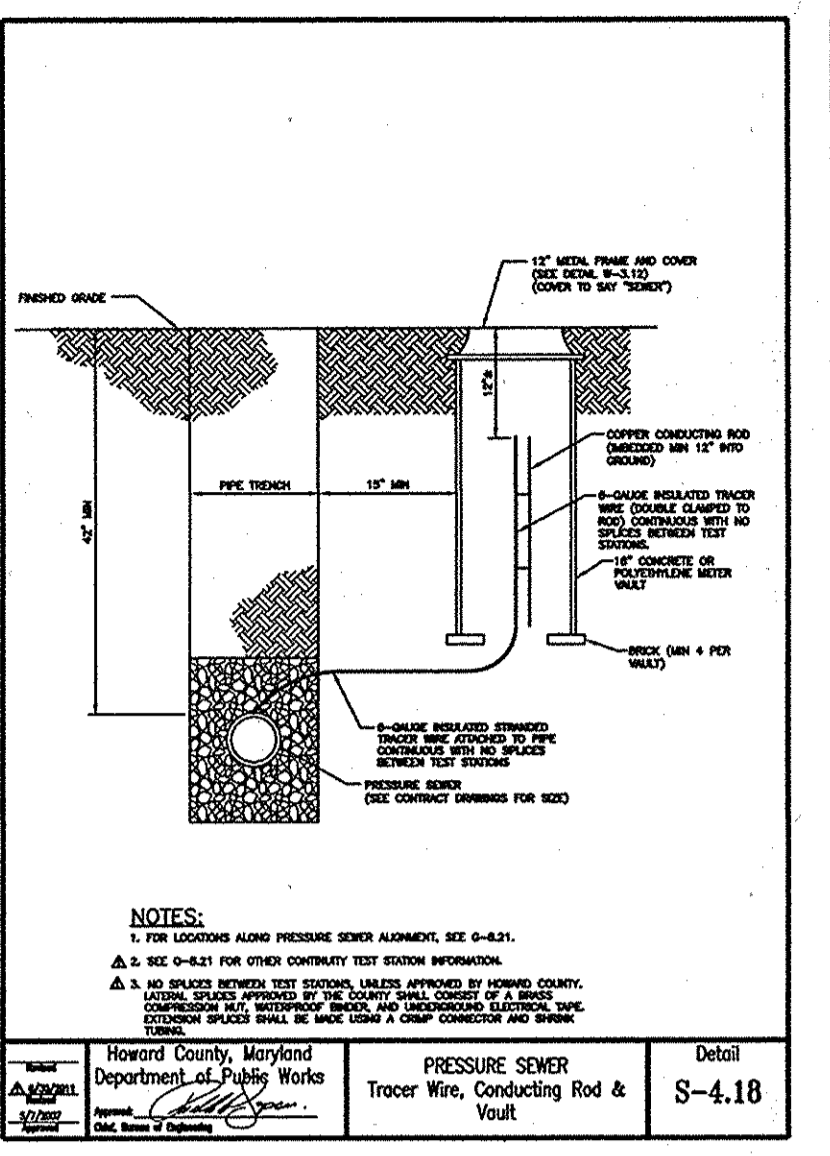
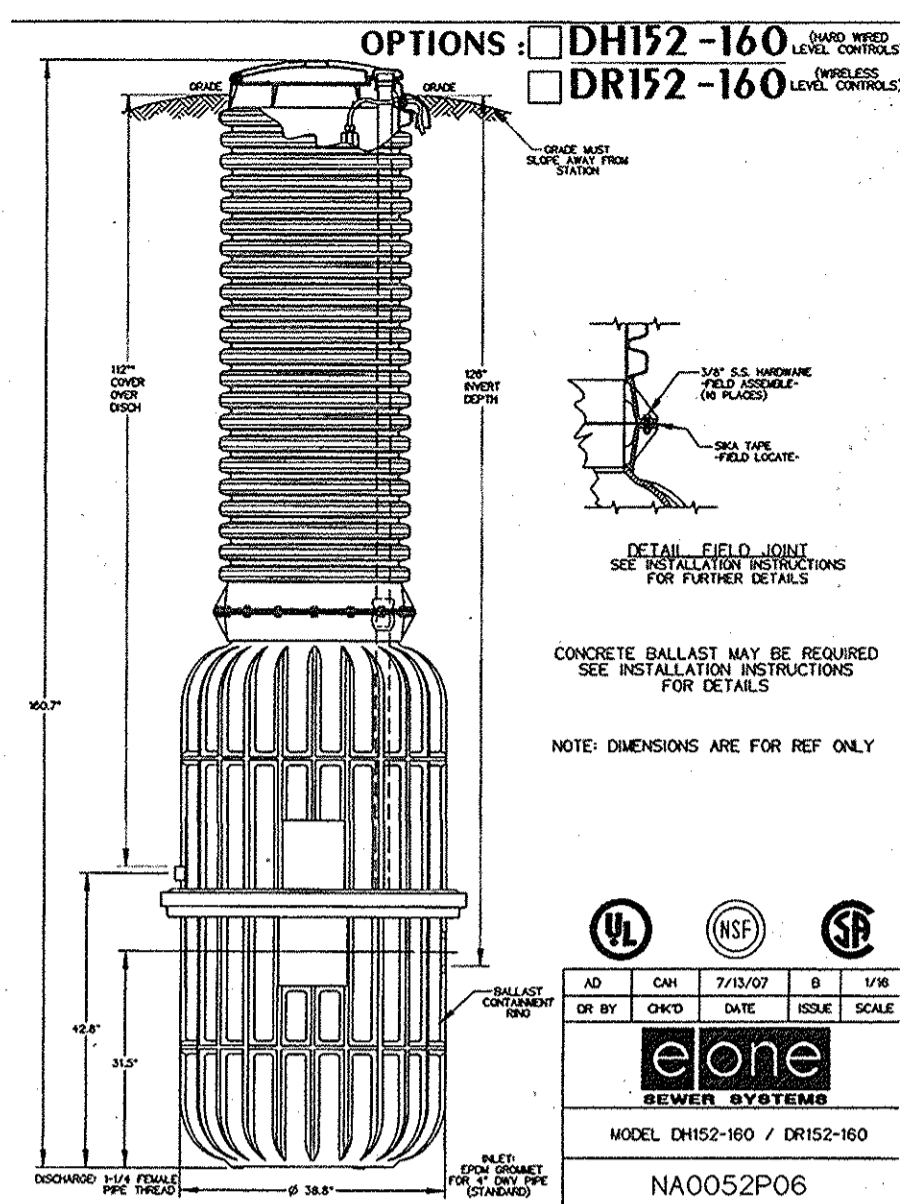
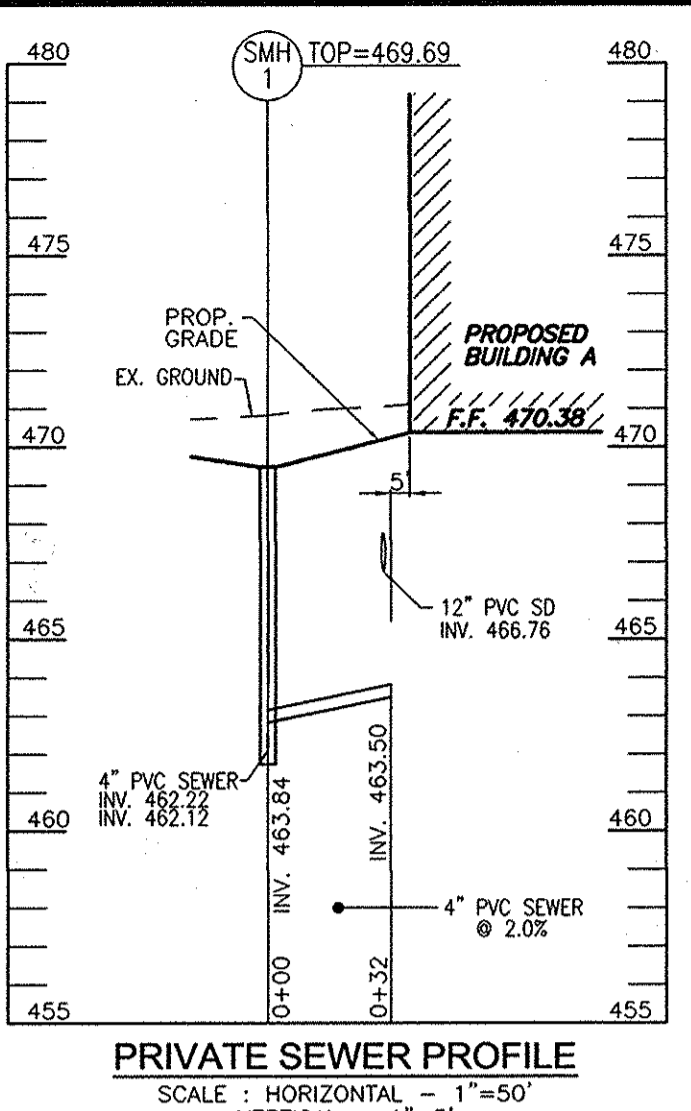
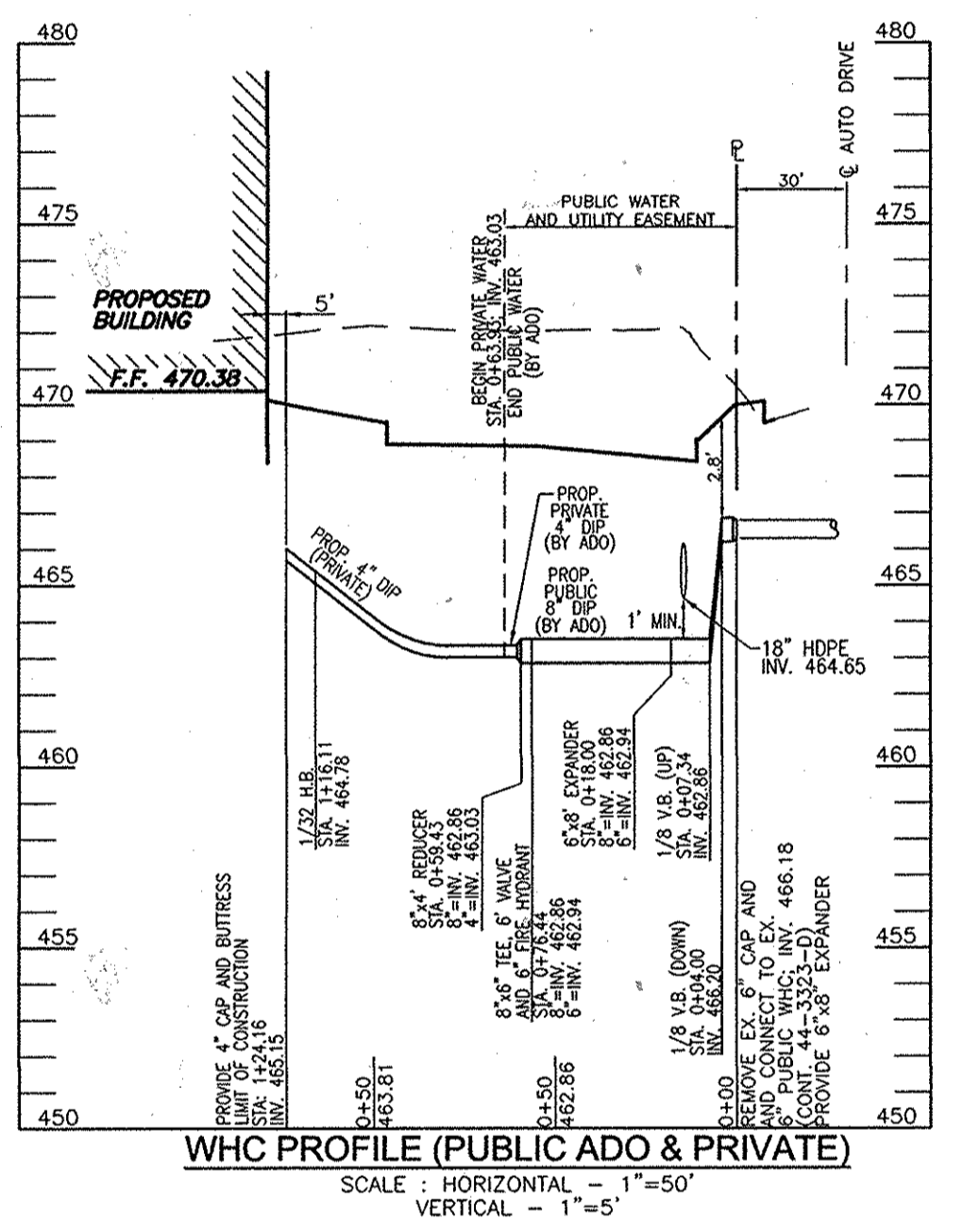
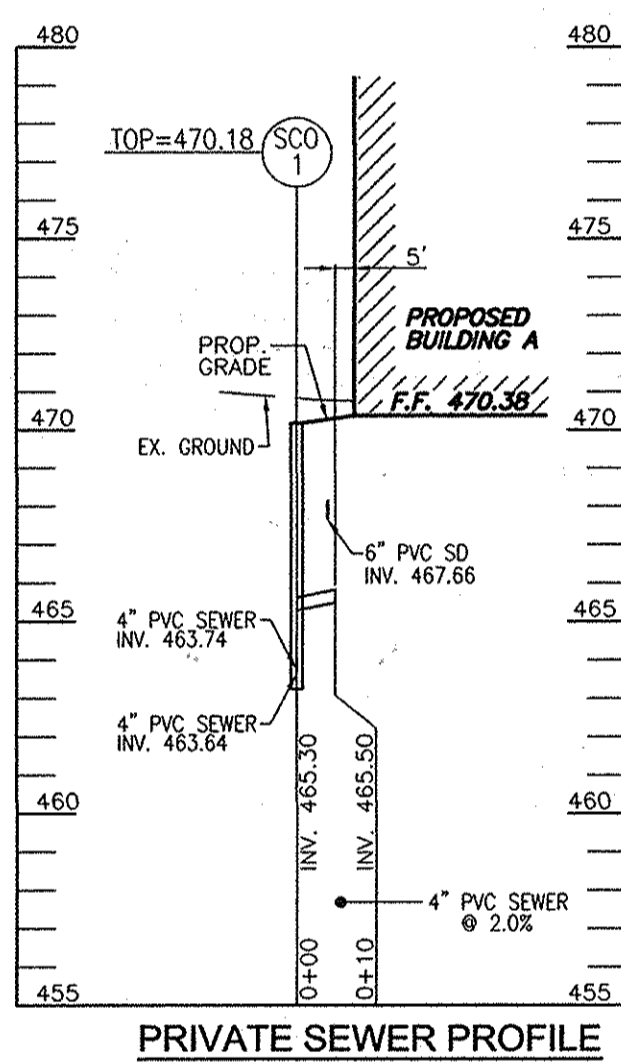
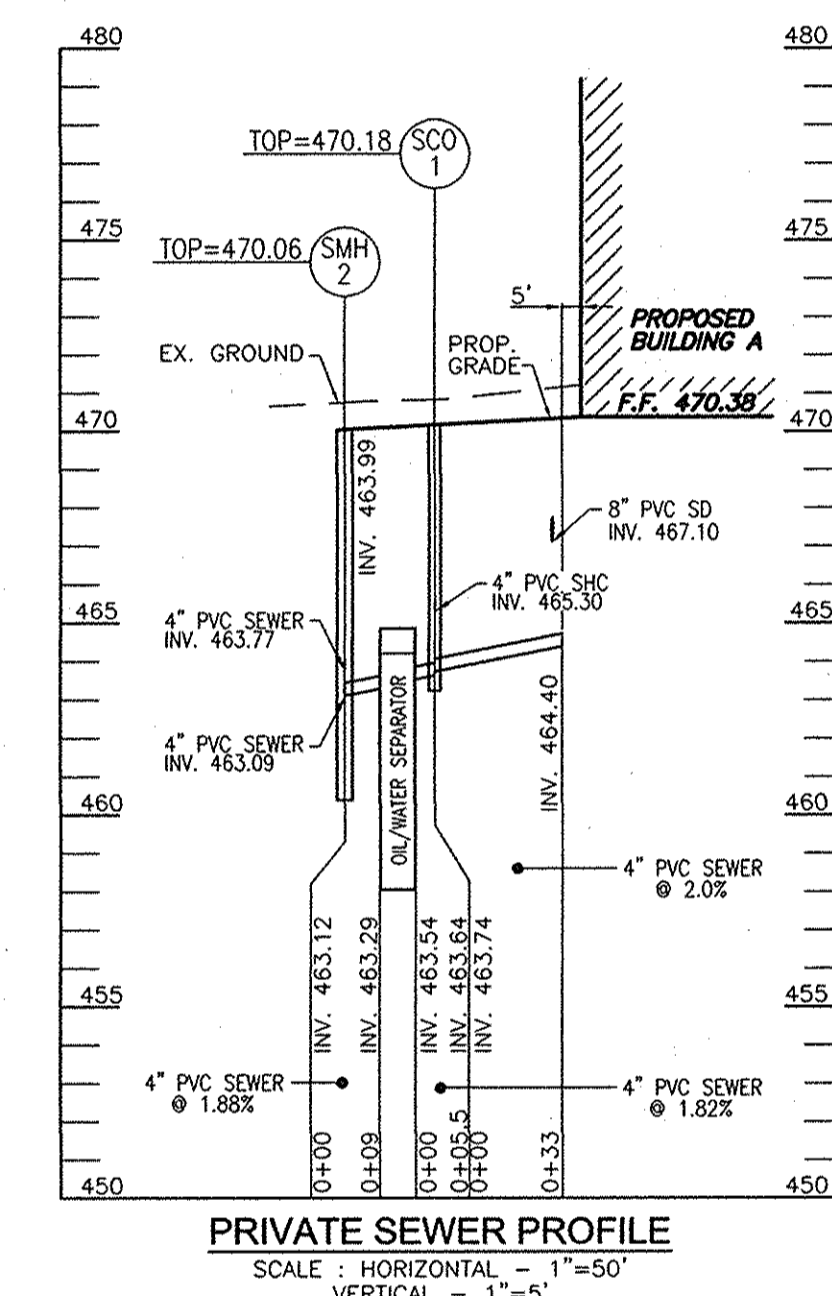
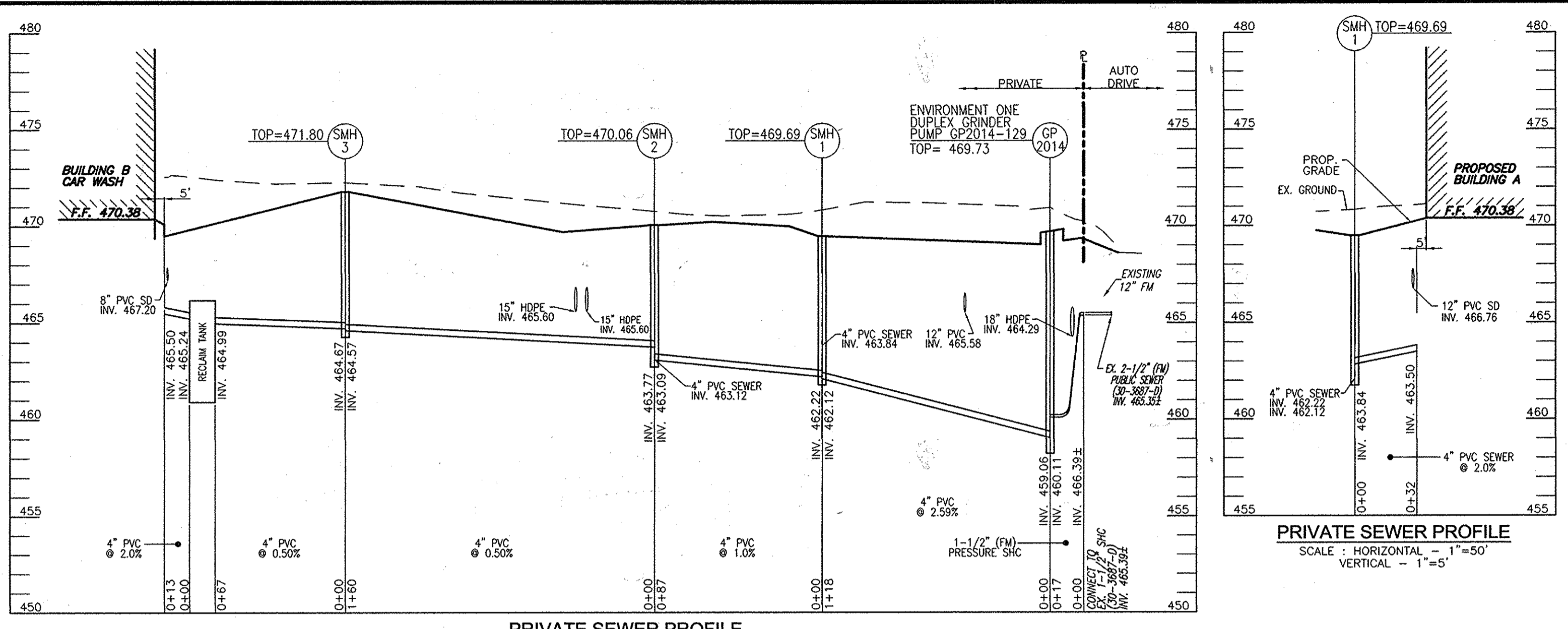
OWNER/PETITIONER
 ANTOPY LLC
 12420 AUTO DRIVE
 CLARKSVILLE, MD, 21029
 (410) 531-5700

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
STORM DRAIN PROFILES
 ANTWERPEN HYUNDAI
 PARCEL E-7, HOLWECK SUBDIVISION
 PLAT 23275
 TAX MAP 34, BLOCK 06
 5TH ELECTION DISTRICT
 ZONED: B-2
 PARCEL 365
 HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 9407 MAIN STREET
 ELLICOTT CITY, MD 21043
 TEL: 410.461.7666
 FAX: 410.461.6161

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 08-31-2018.
 DESIGN BY: DZE
 DRAWN BY: DZE/KG
 CHECKED BY: RHW
 DATE: MARCH 2015
 SCALE: AS SHOWN
 W.D. NO.: 12-48
 7 SHEET OF 11



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

10-8-15
12-28-15
12-30-16

OWNER/PETITIONER
ANTOY LLC
12420 AUTO DRIVE
CLARKSVILLE, MD 21029
(410) 531-5700

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN
UTILITY DETAILS AND PROFILES

ANTWERPEN HYUNDAI
PARCEL E-7, HOLWECK SUBDIVISION
PLAT 23573
ZONED: B-2

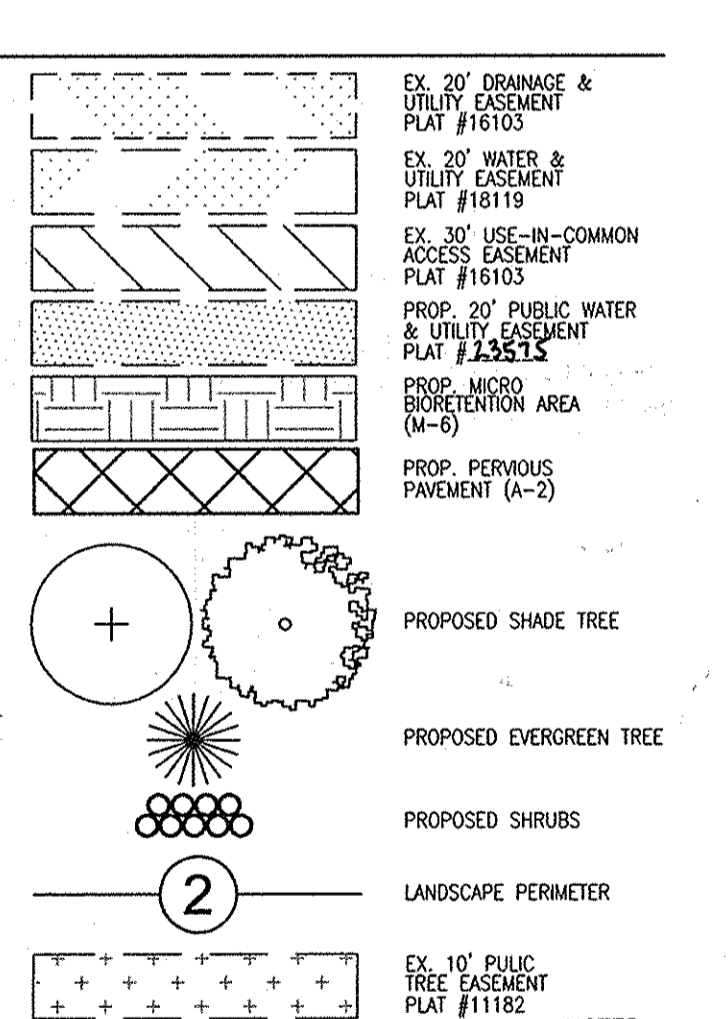
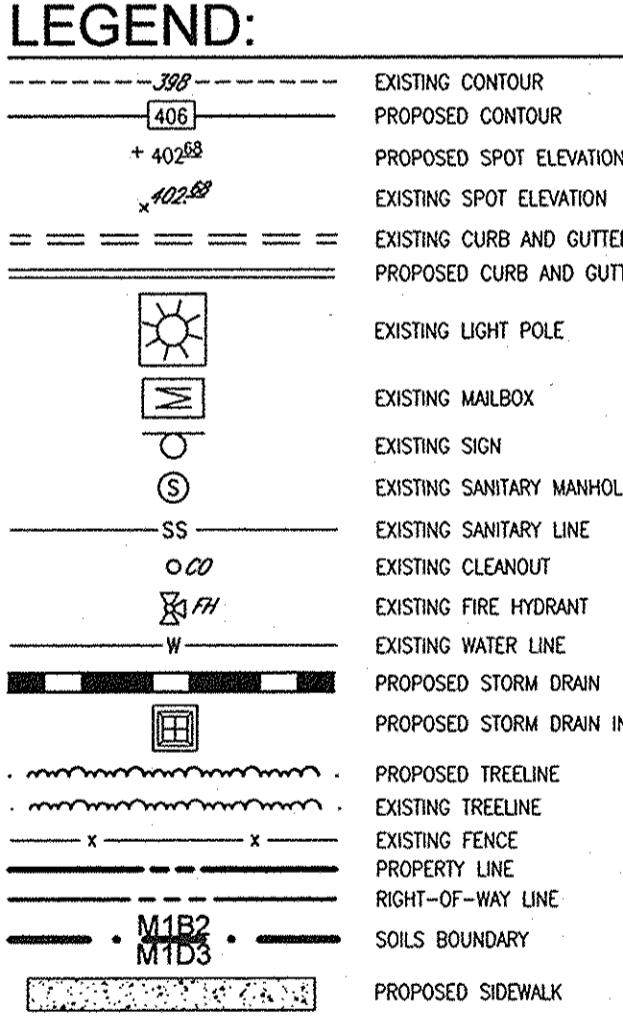
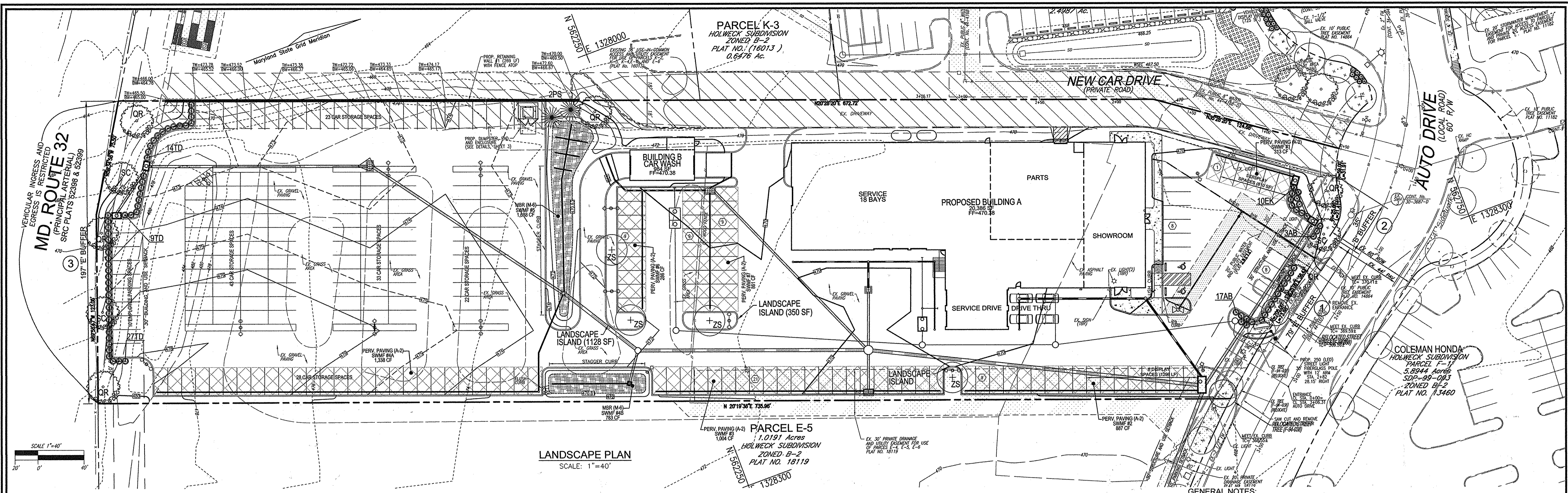
TAX MAP 34 BLOCK 06
5TH ELECTION DISTRICT
PARCEL 365
HOWARD COUNTY, MARYLAND

ROBERT H. VOGEL ENGINEERING, INC.
ENGINEERS • SURVEYORS • PLANNERS
8407 MAIN STREET
ELUGOTT 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. MY LICENSE NUMBER IS 16193 AND MY EXPIRATION DATE IS 09-30-2018.

DESIGN BY: DZE
DRAWN BY: DZE/KG
CHECKED BY: RHW
DATE: MARCH 2015
SCALE: AS SHOWN
W.O. NO.: 12-48

8 SHEET OF 11



SCHEDULE 'A' PERIMETER LANDSCAPE EDGE

CATEGORY	1	2	3	DUMPS/STER D
PERIMETER/FRONTAGE DESIGNATION	E	B	E	D
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	79'	35'	197'	21'
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO
NUMBER OF PLANTS REQUIRED	1*40	2	1*50	1*10
SHADE TREES	1	1	1	1
EVERGREEN TREES	1	1	1	1
SHRUBS	1	1	1	1
NUMBER OF PLANTS PROVIDED	1	1	1	1
SHADE TREES	2	1	5	1
EVERGREEN TREES	1	1	1	2
EX SHADE TREES	1	1	1	1
OTHER TREES (2:1 SUBSTITUTION)	1	1	1	1
SHRUBS (10:1 SUBSTITUTION)	20	10*	50	1
DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED				
TOTALS				
	9	3	70	

* 10 SHRUBS PLANTED IN SUBSTITUTION OF 1 EVERGREEN TREE IN PERIMETER 2.

LANDSCAPE SCHEDULE

KEY	QUAN.	BOTANICAL NAME	SIZE	CAT
QR	6	QUERCUS RUBRA NORTHERN RED OAK	2 1/2"-3" CAL.	B & B
SC	3	PRUNUS ARGENTEA SARGENT CHERRY	2 1/2"-3" CAL.	B & B
ZS	4	ZELKOVA SERBATA VILLAGE GREEN ZELKOVA JAPANESE ZELKOVA	2 1/2"-3" CAL.	B & B
PS	2	PRINUS STROBUS EASTERN WHITE PINE	6"-8" HT.	B & B
AB	20	AZALEA 'BLAUW'S PRIN' BLAUW'S PRIN AZALEA	18"-24" SPREAD	B & B
EK	10	EDONIVUS KAUNTSCHOWICUS MANHATTAN EDONIVUS	2 1/2"-3" HT.	B & B
TD	50	TAXUS MEDIA 'CONDENSIFORMIS' CONDENSIFORMIS YEW	2 1/2"-3" HT.	B & B

SCHEDULE B PARKING LOT INTERNAL LANDSCAPING

NUMBER OF PROPOSED PARKING SPACES	NUMBER OF TREES REQUIRED (1/20 SPACES)	NUMBER OF TREES PROVIDED
73	4	4
4	4	4
4	4	4

BIORETENTION PLANTING REQUIREMENTS

MR	AREA	STEMS REQUIRED	STEMS PROVIDED
48	378 SF	12	61
5	2209 SF	67	128

BIORETENTION AREAS ARE TO BE PLANTED BASED ON A MINIMUM DENSITY OF 1000 STEMS PER PLANTED ACRE (2229 STEMS PER SQ. FT.)

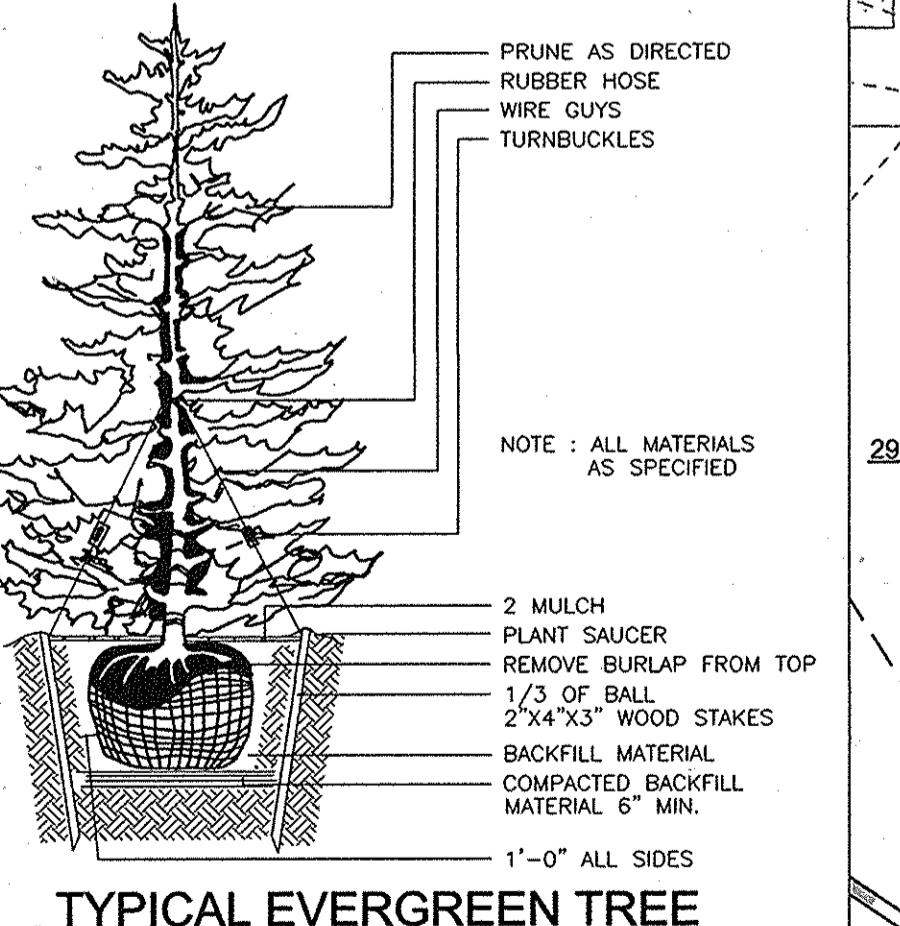
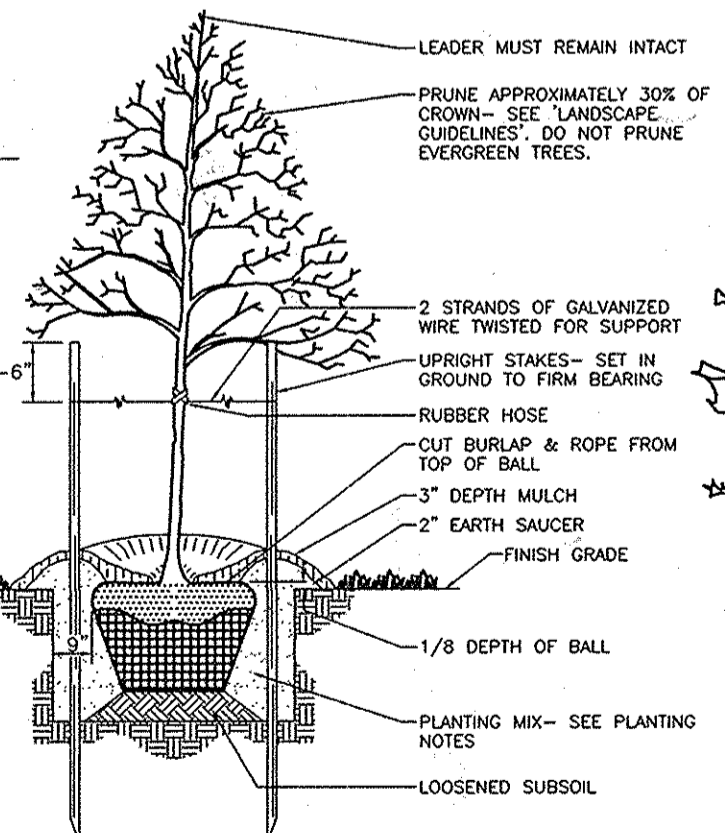
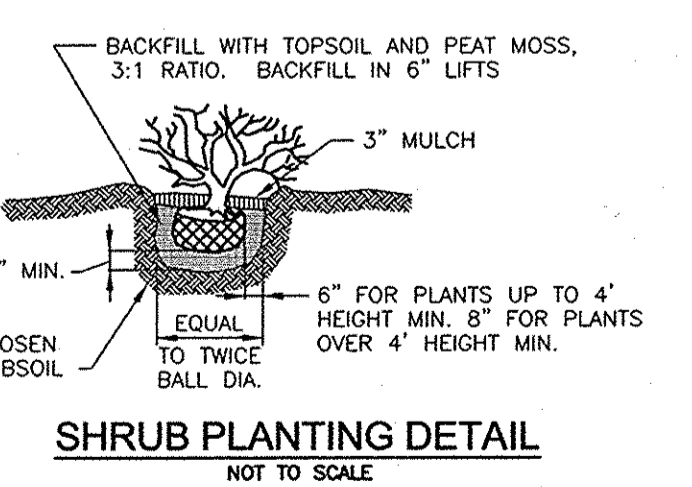
GENERAL NOTES:

- 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 DEVELOPER'S AGREEMENT IN THE AMOUNT OF \$6,600 FOR THE REQUIRED 13 SHADE TREES, 2 EVERGREEN TREES, AND 80 SHRUBS.

LANDSCAPE SCHEDULE NOTE:

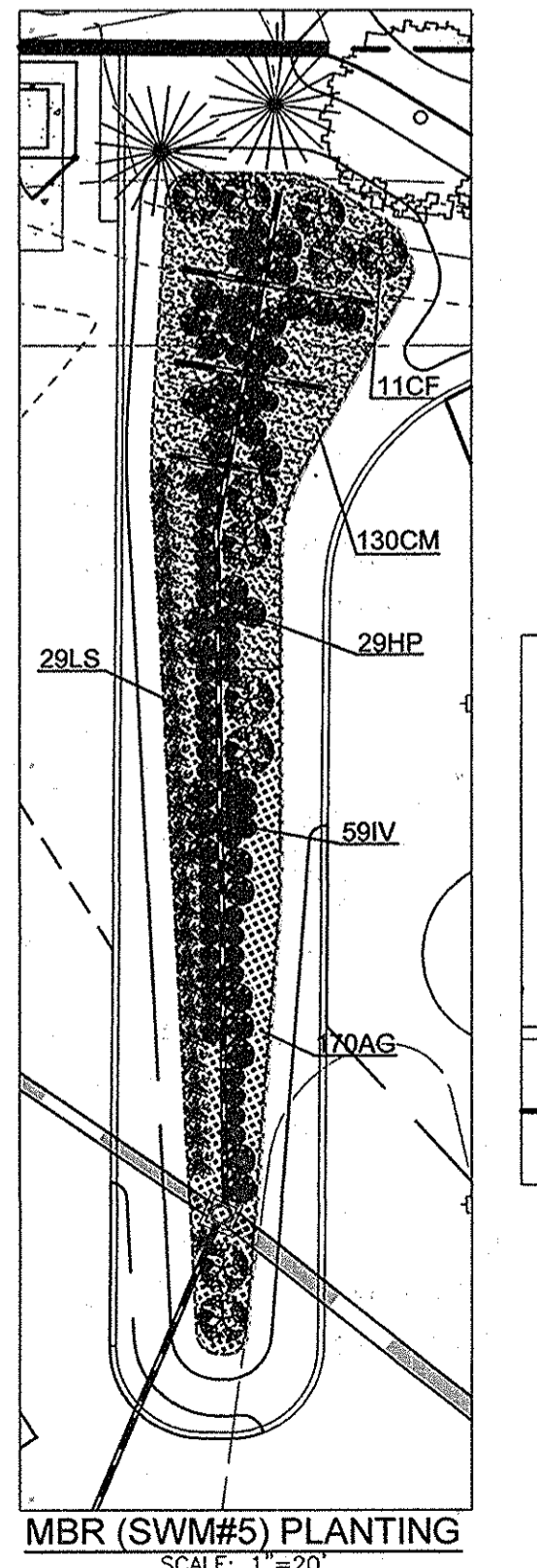
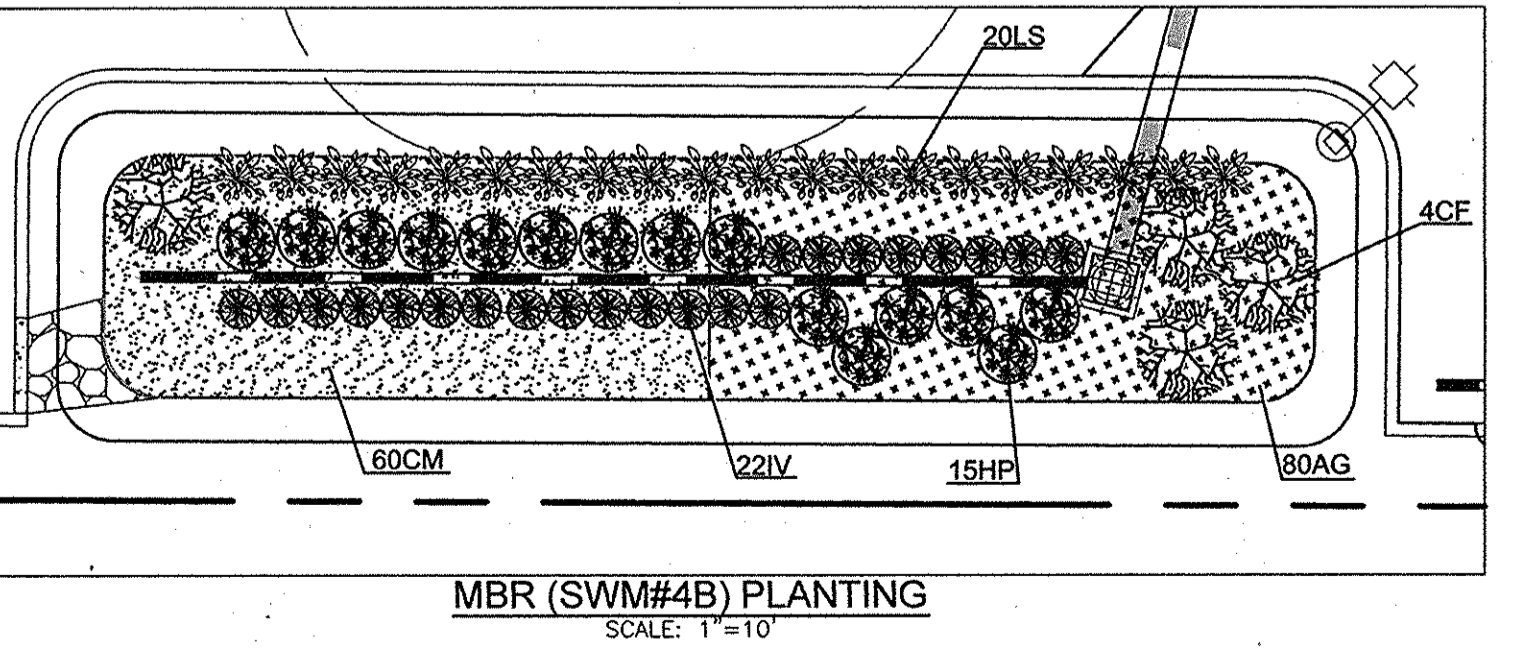
- ALL PLANT MATERIALS SHALL BE FULL AND HEAVY, BE WELL FORMED AND SYMMETRICAL CONFORMING TO THE MOST CURRENT MAN SPECIFICATIONS AND BE INSTALLED IN ACCORDANCE WITH H20 PLANTING SPECIFICATIONS.
- CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO DIGGING.
- FINAL LOCATION OF PLANT 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.
- NO SUBSTITUTION SHALL BE MADE WITHOUT PRIOR APPROVAL FROM HOWARD COUNTY DPZ AND THE OWNER OR HIS REPRESENTATIVE.
- AT THE TIME OF PLANT INSTALLATION, ALL SHRUBS AND TREES LISTED AND APPROVED ON THE LANDSCAPE PLAN, SHALL COMPLY WITH THE PROPER HEIGHT REQUIREMENT IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THE APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO THE APPLICABLE PLANS.
- THE OWNER, TENANTS AND/OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIAL TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

OWNER/PETITIONER
 ANTOY LLC
 12420 AUTO DRIVE
 CLARKSVILLE, MD 21029
 (410) 531-5700



BIORETENTION PLANTING SCHEDULE

KEY	QTY	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
IV	81	IRIS VERSICOLOR 'BLUE FLAG' BLUE FLAG	1 GALLON	18" O.C.
HP	44	HEMEROCALLIS X 'PRAIRIE BLUE EYES' PRAIRIE BLUE EYES DAYLILY	1 GALLON	30" O.C.
LS	48	LOBELIA SIPHILITICA GREAT BLUE LOBELIA	1"-4" HT	30" O.C.
CF	15	CORNUS SERICEA 'FLAVIRAMEA' YELLOW TWIGGED DOGWOOD	5"-6" HT	36" O.C.
	201	CONVALLARIA MAJALIS LILY-OF-THE-VALLEY	1 QT.	12" O.C.
	265	ACORUS GRAMINEUS 'OGON' GOLDEN VARIEGATED SWEET FLAG	1 QT.	12" O.C.



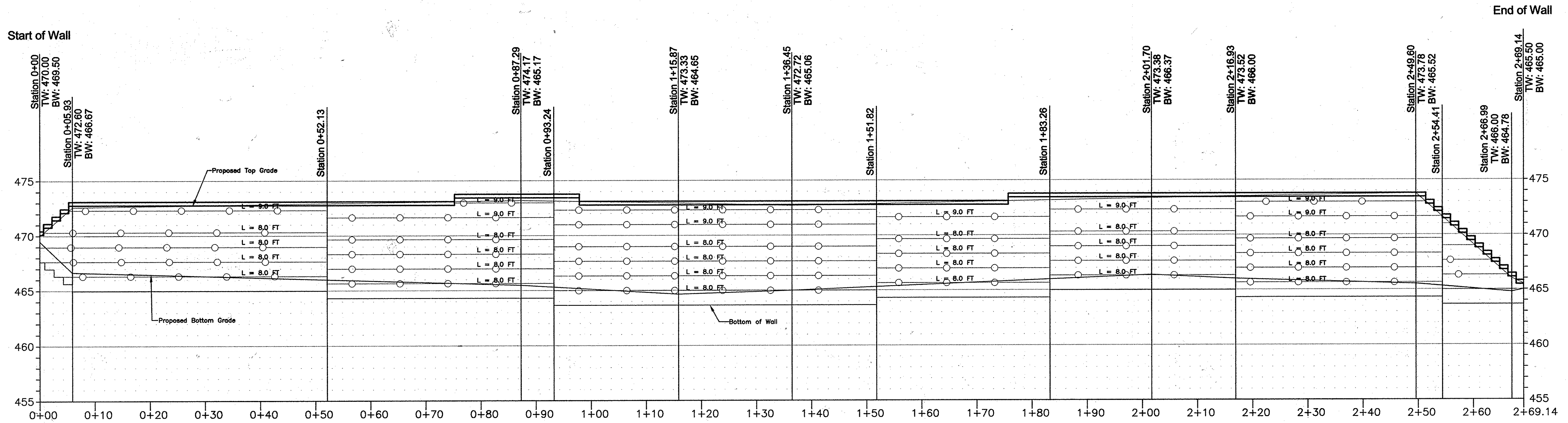
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 10-8-15
 DATE: 12-29-15
 DATE: 12-30-15

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: 9/17/15

SITE DEVELOPMENT PLAN
LANDSCAPE PLAN, NOTES AND DETAILS
 ANTWERPEN HYUNDAI
 PARCEL E-7, HOLWECK SUBDIVISION
 PLAT 235-15
 ZONED B-2
 TAX MAP 34 BLOCK 06
 5TH ELECTION DISTRICT
 HOWARD COUNTY, MARYLAND
ROBERT H. VOGEL ENGINEERING, INC.
 ENGINEERS • SURVEYORS • PLANNERS
 8407 MAIN STREET
 ELLIOTT CITY, MD 21043
 TEL: 410.461.7666
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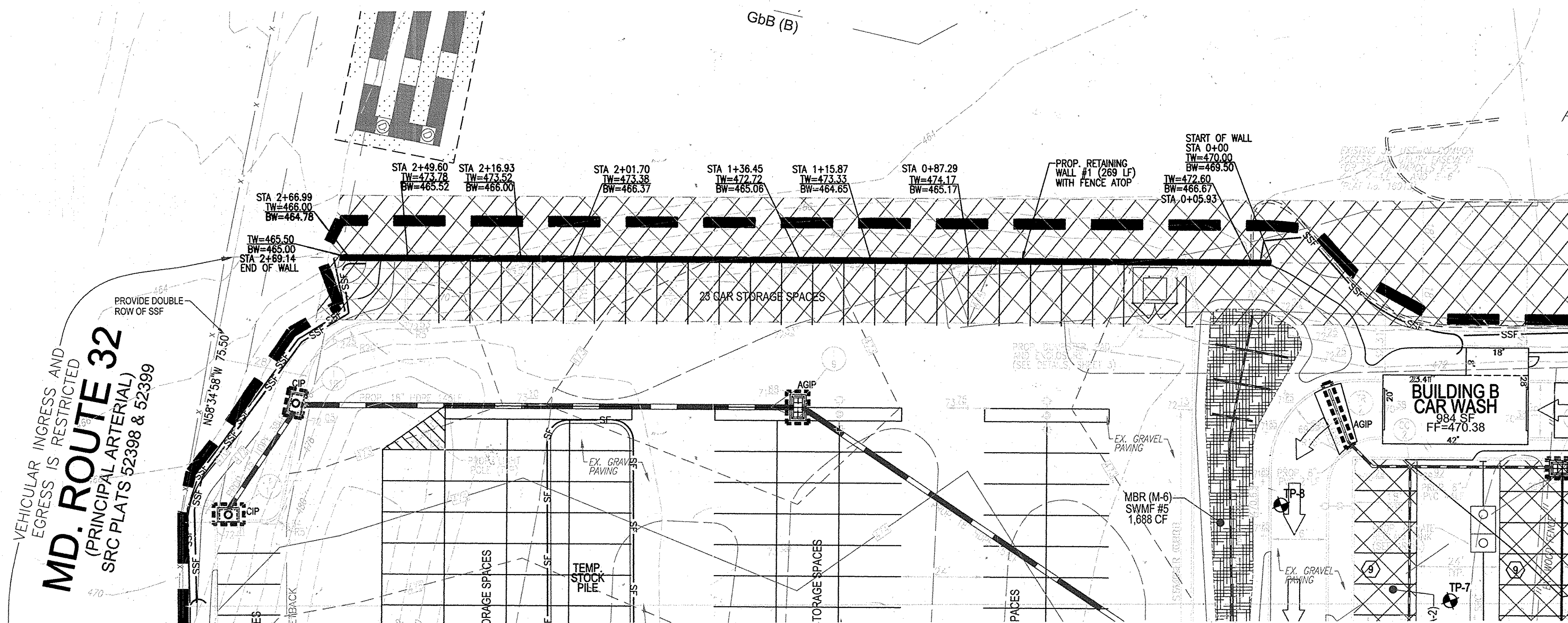


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 DESIGN BY: DZE
 DRAWN BY: DZE/KG
 CHECKED BY: RHY
 DATE: MARCH 2015
 SCALE: AS SHOWN
 W.O. NO.: 12-48
 9 SHEET OF 11



WALL PROFILE
 HORIZONTAL SCALE: 1"=10'
 VERTICAL SCALE: 1"=5'

NOTE: ALL GEOGRIDS CONSIST OF MIRAFI 5XT



PLAN (BASED ON SITE DEVELOPMENT PLAN)
 PROVIDED BY ROBERT H. VOGEL ENGINEERING, INC)
 SCALE: 1"=20'

OWNER/PETITIONER

ANTWERPEN HYUNDAI
 12420 ALTO DRIVE
 CLARKSVILLE, MD. 21029
 (410) 531-6700

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Robert H. Vogel
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 10-8-15

Kurt Schaefer
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 10-29-15

Nicholas J. Jorgensen
 DIRECTOR
 DATE: 12-30-16

NO.	REVISION	DATE
SITE DEVELOPMENT PLAN		
ANTWERPEN HYUNDAI		
PARCEL E-7, HOLWECK SUBDIVISION		
TAX MAP 34 BLOCK 06 5TH ELECTION DISTRICT	PLAT 23875 ZONED: B-2	PARCEL 365 HOWARD COUNTY, MARYLAND
ECS		1340 CHARWOOD ROAD SUITE A HANOVER, MARYLAND 21076 PHONE: (410) 859-4300 FAX: (410) 859-4324
		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. 29553, EXPIRATION DATE: 12-31-2015.
DRAWN BY: [] CHECKED BY: [] DATE: MARCH, 2015 SCALE: AS SHOWN W.D. NO.: 7351		10 SHEET OF 11

RETAINING WALL SPECIFICATION GUIDELINES

PART 1: GENERAL

- 1.01 Description**
- Retaining walls must be constructed under the supervision of a Maryland Registered Professional Engineer.
 - Work includes furnishing and installing concrete modular block retaining wall units to the lines and grades shown on the construction drawings and as specified herein.
 - Work includes preparing foundation soil, furnishing and installing leveling pad, unit fill and reinforced backfill to the lines and grades shown on the construction drawings.
 - Work includes furnishing and installing all related materials required for construction of the retaining wall as shown on the construction drawings.
- 1.02 Reference Standards**
- ASTM C 90 Load Bearing Concrete Masonry Units.
 - ASTM C 140 Sampling and Testing Concrete Masonry Units.
 - ASTM D 448 Sizes of Aggregate for Road and Bridge Construction.
 - ASTM D 698 Laboratory Compaction Characteristics using Standard Effort.
- 1.03 Delivery, Storage and Handling**
- Contractor shall check the materials upon delivery to assure that proper materials have been received.
 - Contractor shall prevent excessive mud, wet cement, epoxy, and similar materials (which may affect themselves) from coming in contact with the materials.
 - Contractor shall protect the materials from damage and exposure to sunlight. Damaged materials shall not be incorporated into the retaining wall structure and backfill.
- 1.04 Quality Assurance**
- Owner will be responsible for soil testing and construction observations for quality control during earthwork and retaining wall construction operations.

PART 2: MATERIALS

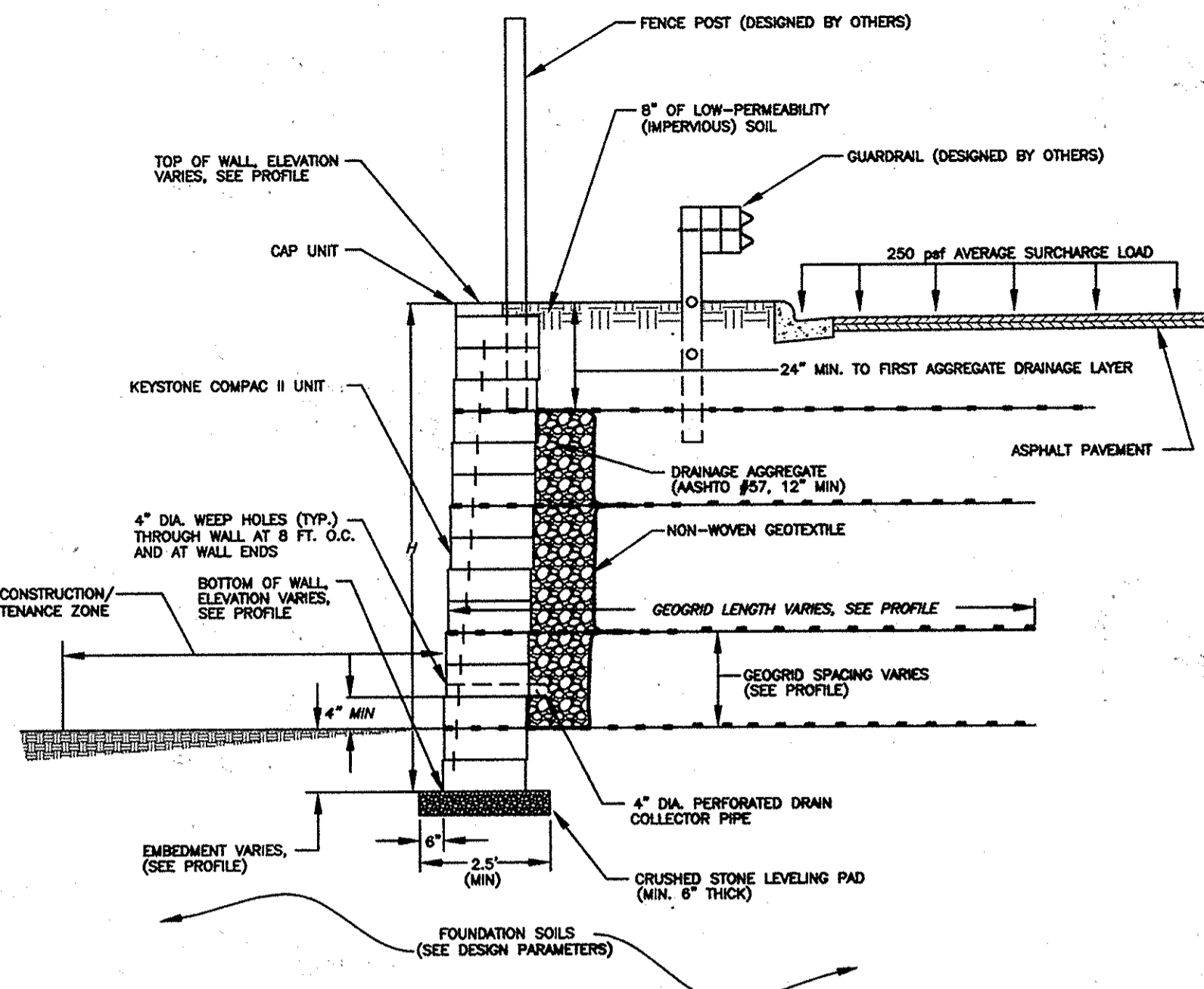
- 2.01 Definitions**
- Modular Wall Units - KEYSTONE modular concrete facing and corner units, machine made from portland cement, water, and mineral aggregates.
 - Structural Geogrid - a structural geogrid formed by a regular network of integrity connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
 - Unit Fill/Drainage Aggregate - drainage aggregate, such as No. 57 Stone, which is placed within the cells of the modular concrete units and immediately behind the units to a width of at least 12 inches.
 - Reinforced Backfill - Compacted soil which is within the reinforced soil volume as shown on the plans.
 - Excavation Face - The interface between the reinforced backfill and the retained fill. During construction, measures shall be taken to avoid developing a shear plane at this interface.
 - Retained Backfill - On-site material located behind the reinforced zone of soil.
- 2.02 Concrete Units**
- Concrete segmental units shall conform to the requirements of NCMA TEK 2-4 and have a minimum 28-day compression strength of 4,000 psi. The units shall also pass 150 freeze thaw cycles in water with less than 1% weight loss or samples tested in accordance with ASTM C-1292.
 - Wall Face Units for general wall construction shall be KEYSTONE Compac II Units. Sculptured face or straight (flat) face may be used.
 - Top of wall Cap Units shall be KEYSTONE Cap Units with fiberglass connecting pins.
 - KEYSTONE Compac II Units shall be tan in color, based on manufacturer's availability.
- 2.03 Fiberglass Connecting Pins**
- Connecting pins shall be 1/2" diameter thermostat isophthalic polyester resin-pultruded fiberglass reinforcement rods supplied by the unit manufacturer.
- 2.04 Construction Adhesive**
- Construction adhesive for top of wall cap blocks shall be KEYSTONE KapSealTM. Material shall conform to ASTM 2339 and shall be supplied by the block unit supplier.
- 2.06 Soil Fill Materials**
- A. Base Leveling and Pad Material**
- Material shall consist of crushed stone (GA S/B) as shown on the construction drawing. The leveling pad shall be, at a minimum, 6-inches thick. MSHA No. 57 Stone or pea gravel is not permitted.
- B. Unit Fill/Drainage Aggregate**
- Fill for units shall be free draining crushed stone or gravel, with a maximum aggregate size of 1/2" to 3/4" and no more than 5% passing the No. 50 sieve and conforming to ASTM D 448. Gradation of the unit fill shall be approved by the Geotechnical Engineer. Pea gravel shall not be used. MSHA No. 57 stone may be used.
- C. Reinforced Backfill**
- Material shall consist of soil classified as SM or more granular soils per USCS with minimum soil parameters as indicated under design parameters. The backfill material shall contain no particles greater than 2.5 inches in diameter. The backfill material shall contain at least 30 percent by weight retained on the US Standard No. 200 sieve. Other backfill materials may be approved by the Geotechnical Engineer.
- D. Impervious Soil**
- Material may be imported or site excavated soils exhibiting a USCS designation of a lean clay (CL) or clayey sand (SC). The material shall contain no less than 40 percent by weight passing the US Standard No. 200 sieve and exhibit a plasticity index no less than 4 and no greater than 20. Other materials may be approved by the Geotechnical Engineer.
- E. Sample Submittal**
- The contractor shall submit samples and material specifications of the proposed backfill soils (unit fill, pad material, reinforced backfill) to the Geotechnical Engineer for approval.
 - Soil must meet or exceed the friction angle specified in design parameters.
- 2.07 Structural Geogrid**
- The geogrid identified for the retaining wall consists of the following: Mirofi 5XT.
 - The material shall be protected from sunlight and weather while stored on site in accordance with the manufacturer's recommendation.
- 2.08 Geotextile**
- A non-woven geotextile shall be utilized as shown on the plans to provide a filter between the unit fill/drainage aggregate and the reinforced backfill.
 - The geotextile shall consist of a Mirofi 140N.
 - Where geotextiles are located, the geotextile shall be placed as illustrated on the plans. At junctions and ends, the geotextile shall be overlapped at least 12 inches. The geotextile shall be placed so that intimate contact is made between the geotextile and the backfill material.
 - Ripped or otherwise damaged material shall not be used. The material shall be protected from sunlight and weather while stored on site in accordance with the manufacturer's recommendation.

PART 3: INSTALLATION

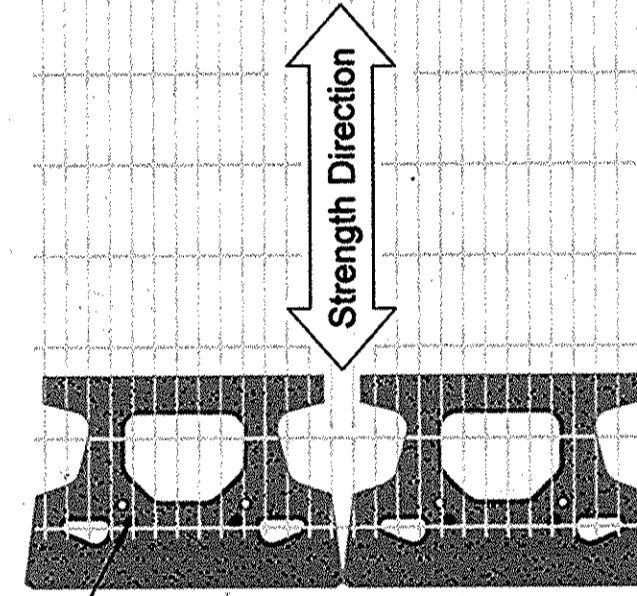
- 3.01 Excavation**
- Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall be careful not to disturb embankment and foundation materials beyond lines shown.
 - All existing topsoil, roots and other soft or unsuitable materials shall, at a minimum, be removed from the footprint of the retained soil mass.
 - If groundwater is encountered during the excavation of the backslope, a backslope drainage system shall be utilized. The system shall be into the internal wall drainage system to provide adequate release of any water which accumulates behind the reinforced zone.
- 3.02 Foundation Preparation**
- Foundation shall be excavated as required for leveling pad dimensions shown on the construction drawings, or as directed by the Geotechnical Engineer.
 - The required bearing pressure beneath the footing of the wall must be verified in the field by a Geotechnical Engineer.
 - Unsuitable soils shall be removed and replaced with approved material.
 - Over-excavated areas shall be backfilled with approved, compacted backfill material or as approved by the Geotechnical Engineer.
- 3.03 Base Leveling Pad**
- The first course of concrete modular units shall be placed upon an approved foundation as shown on the construction drawings to a minimum thickness of 8 inches.
 - Aggregate material shall be compacted to provide a dense, level surface on which to place the first course of modular units. Compaction shall be to at least 95% of the maximum dry density as determined by the Standard Proctor compaction test (ASTM D 698). Leveling pad shall be prepared and leveled to ensure complete contact of retaining wall unit with base.
- 3.04 Unit Installation**
- The first course of concrete modular units shall be carefully placed on the base leveling pad. Each unit shall be checked for level (in both directions) and alignment.
 - Install fiberglass connecting pins and fill all voids in and around the modular units with unit fill material. Tamp or rod unit fill to ensure that all voids are completely filled.
 - Sweep excess material from top of units and install the next course. Ensure that the units of each course are completely filled, backfilled and compacted prior to proceeding to next course.
 - Place each subsequent course, ensuring that pins protrude into adjoining courses a minimum of 1 inch. Two pins are required per unit. Pull each unit forward to obtain the desired offset (as noted on the plans), away from the fill zone, locking against the pins in the previous course and backfill as the course is completed.
 - Repeat procedure to the extent of wall height. Wall construction shall not exceed 2 courses in height before reinforced backfill is placed.
 - Follow wall erection and unit fill placement closely with any other backfilling required. Compaction of all soils shall be to 95% of the maximum dry density as determined in accordance with ASTM D 698.
 - As appropriate where the wall changes elevation, units can be stepped with the grade or turned into the embankment with a convex return end. Provide appropriate buried units on compacted leveling pad in area of convex return end.
- 3.05 Geogrid Installation**
- The geogrid type and length (direction perpendicular to the wall face) shall conform to those indicated on the construction drawings. Geogrid shall be laid continuously at the proper elevations and orientation as shown on the construction drawings or as directed by the Geotechnical Engineer.
 - Correct orientation (roll direction) of the geogrid shall be verified by the Contractor.
 - The geogrid shall be connected to the modular wall units by placing the geogrid over fiberglass pins and laying the grid back to the fill side.
 - A filtering, non-woven geotextile shall be located between the drainage aggregate/unit fill and the reinforced backfill. The geotextile shall be folded back parallel, above and below the geogrid as necessary to ensure continuous grid placement.
 - The geogrid shall be pulled taut to set the geogrid against the fiberglass pins and to eliminate loose folds in the material. The fill surface shall be level. To tension the geogrid, backfill shall be placed over the geogrid from immediately behind the wall to the back end of the geogrid.
 - No geogrid overlap will be allowed in any length of geogrid perpendicular to the wall face except at corners or angled locations. The geogrid shall overlap rather than provide no coverage. A minimum of 4 inches of soil cover is required between overlapping layers of geogrid.
- 3.06 Drainage Installation**
- Provide 4-inch weep holes every 8 feet along the wall.
- 3.07 Fill Placement**
- Backfill material shall be placed in 8 inch loose lifts and compacted to at least 95% of the maximum dry density as determined by ASTM D 698. The in-place moisture content shall be in the range of the optimum moisture content to 2 percentage points higher than the optimum moisture content, as determined in accordance with ASTM D 698.
 - Backfill shall be placed, spread and compacted in such a manner that minimizes the development of slack or loss of pretension of the geogrid. Backfill shall be placed in horizontal layers. The excavation face shall be stepped or notched to provide compaction of backfill on a level surface and to increase the interlock between the retained soils and the reinforced backfill.
 - Only hand-operated compaction equipment shall be allowed within 5 feet of the back surface of the KEYSTONE or equivalent units.
 - Backfill shall be placed from immediately behind the wall towards the excavation face/retained soils and compacted to the specifications presented herein with appropriate compaction equipment.
 - Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles shall not be permitted over the geogrid.
 - Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds (less than 10 mph). Avoid sudden braking and sharp turning.
 - The suitability of the fill material must be confirmed by a Geotechnical Engineer.
 - The upper 8 inches of wall backfill shall consist of impervious soil, compacted to at least 95% of the maximum dry density as determined by ASTM D 698. The in-place moisture content shall be in the range of the optimum moisture content to 2 percentage points higher than the optimum moisture content, as determined in accordance with ASTM D 698.
- 3.08 Cap Installation**
- Provide permanent mechanical connection to wall units with KEYSTONE KapSealTM. Apply adhesive to top surface of lower unit and place cap unit atop adhesive.
 - Place Cap Units over projecting pins from the units below. Pull forward to setback position.
 - Backfill and compact to finished grade.

DESIGN PARAMETERS

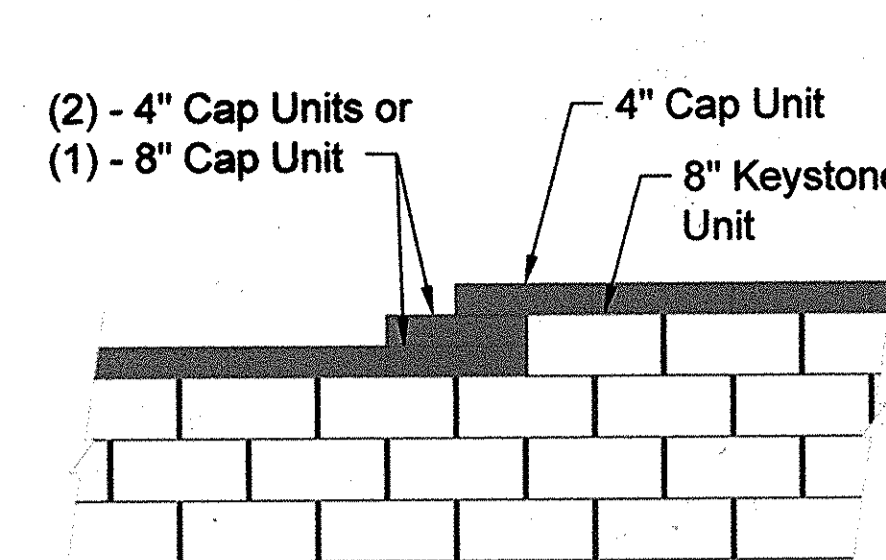
Characteristics:	Configuration:	Battered face wall (4 DEG.)	Soil Parameters:	Minimum Friction Angle	Minimum Unit Weight (pcf)
Maximum Exposed Wall Height / Minimum Allowable Bearing Pressure (psf):		10'-6" / 3,000	Reinforced fill (SM, SC, or more granular)	30	120
Backslope Angle:		Varies (3H:1V maximum)	Retained soils	28	120
Toe Slope Angle:		Varies (10H:1V maximum)	Foundation soils	28	120
Wall Embedment:		Varies (12 inches minimum) (See Profile)			



Typical Reinforced Wall Section Standard Unit - 1' Setback

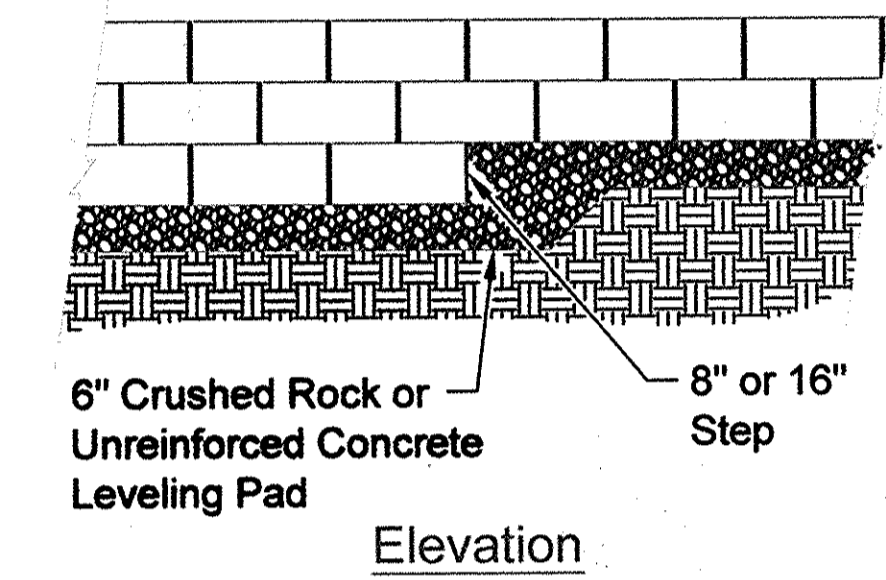


Grid & Pin Connection



Note:
1. Secure all cap units with Keystone Kapseal or equal.

Top of Wall Steps



Compac II Elevation

Compac II Plan

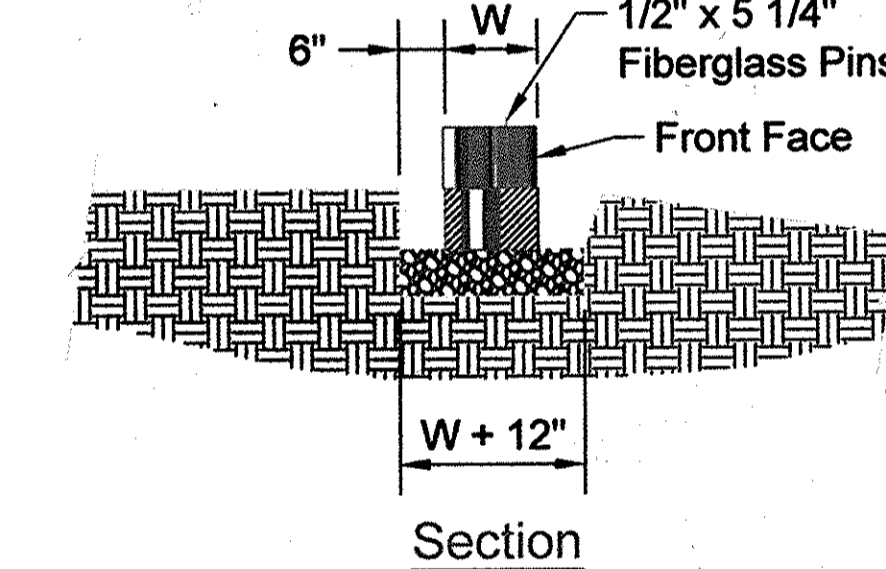
Compac II Unit
*Dimensions May Vary by Region

Cap Unit Elevation

Cap Unit Plan

Straight Split Cap Unit Option

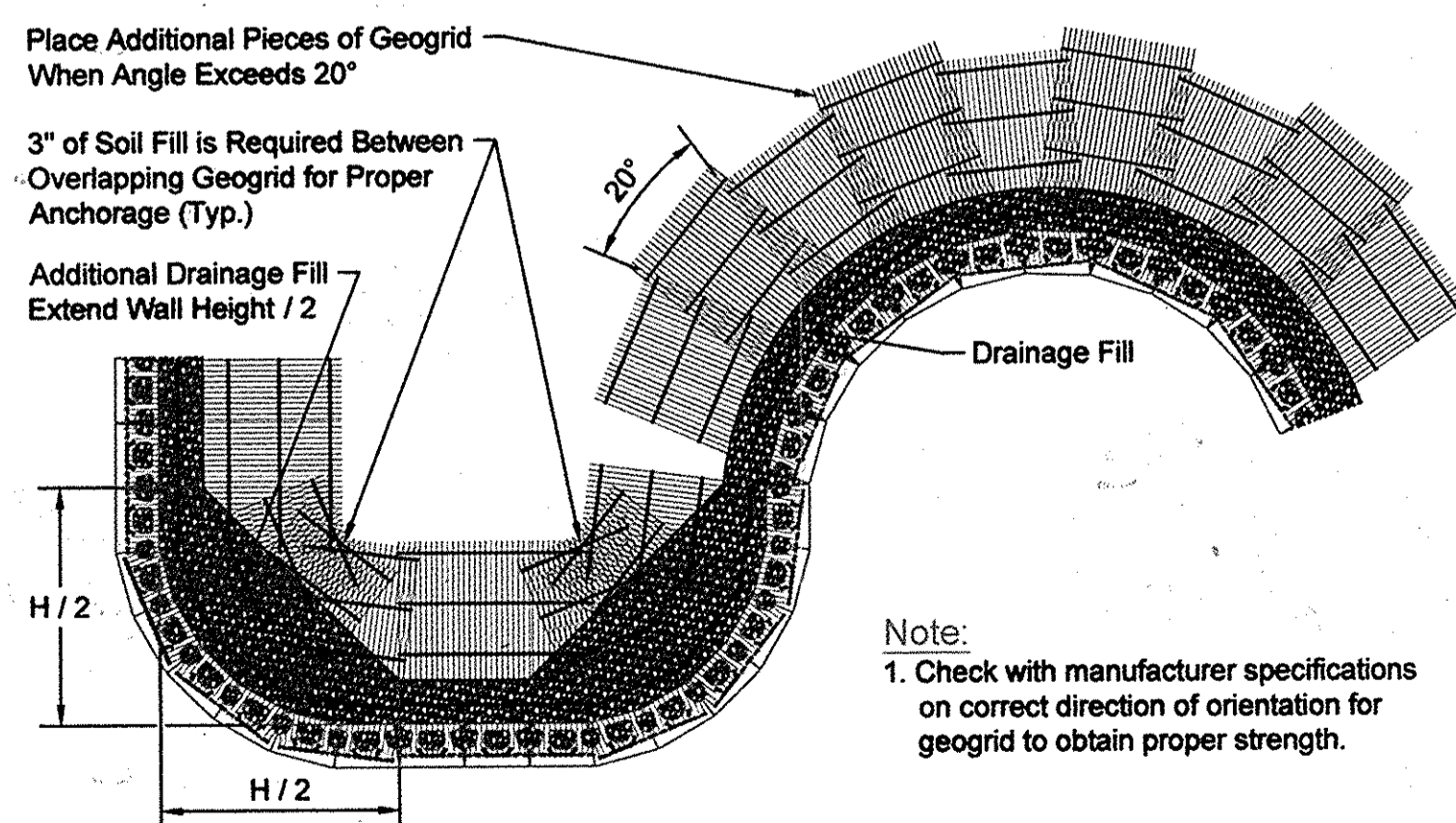
- Note:**
- The leveling pad is to be constructed of crushed stone or 2000 psi ± unreinforced concrete.



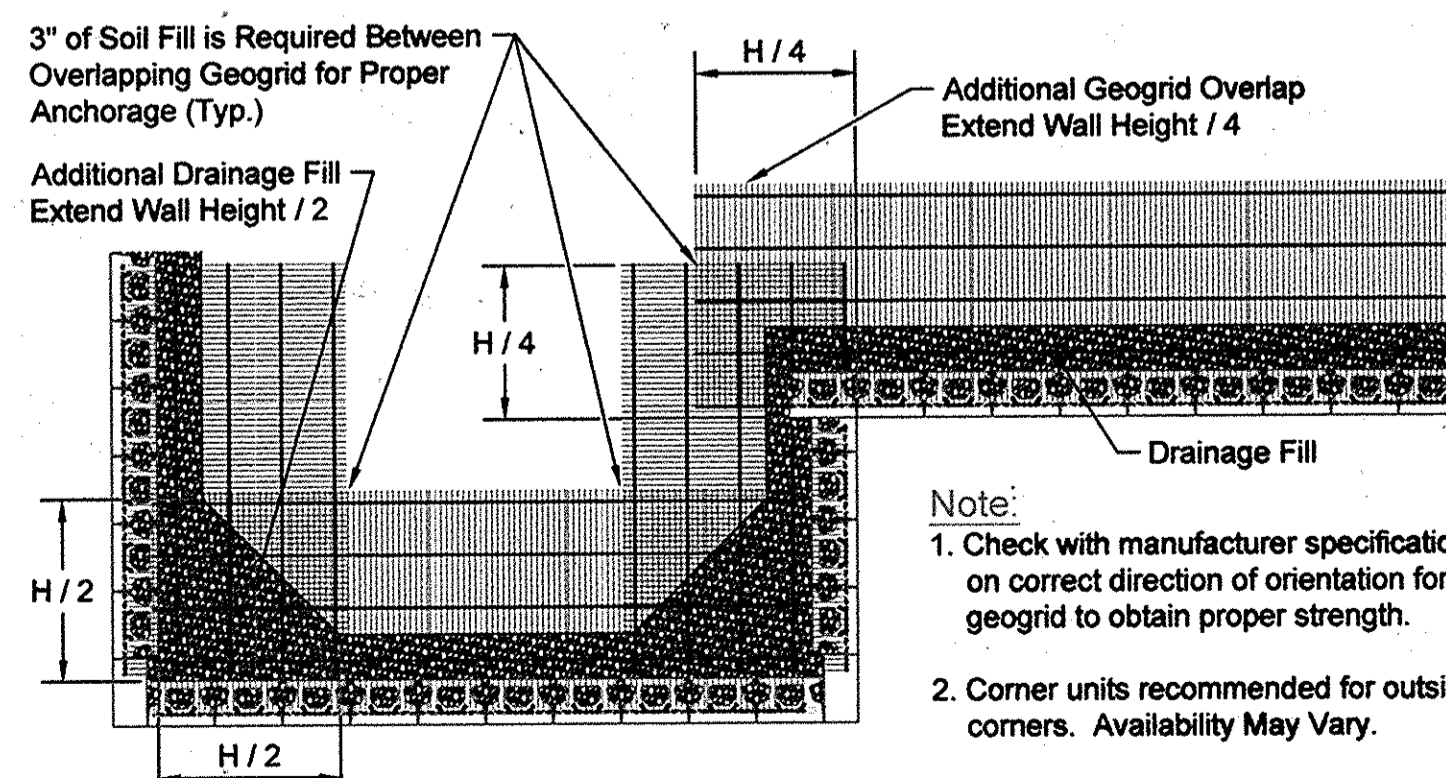
Leveling Pad Detail

OWNER/PETITIONER

DATE: 10/23/15
SCALE: AS SHOWN
SHEET NO. 11 OF 11



Geogrid Installation on Curves



Geogrid Installation at Corners

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE: 10-8-15

 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE: 12-29-15

 DIRECTOR
 DATE: 12-30-15

NO.	REVISION	DATE

SITE DEVELOPMENT PLAN

ANTWERPEN HYUNDAI
PARCEL E-7, HOLWECK SUBDIVISION
PLAT 23520
ZONED: B-2

TAX MAP 34 BLOCK 06
5TH ELECTION DISTRICT

PARCEL 365
HOWARD COUNTY, MARYLAND

ECS

1340 CHARWOOD ROAD
SUITE A
HANOVER, MARYLAND 21076
PHONE: (410) 859-4300
FAX: (410) 859-4324

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. 95553 EXPIRATION DATE: 12-31-2018

DESIGN BY: [Signature]
CHECKED BY: [Signature]
DATE: MARCH 2016
SCALE: AS SHOWN

11 SHEET OF 11