

DORSEY RUN CENTER

7525 MONTEVIDEO ROAD

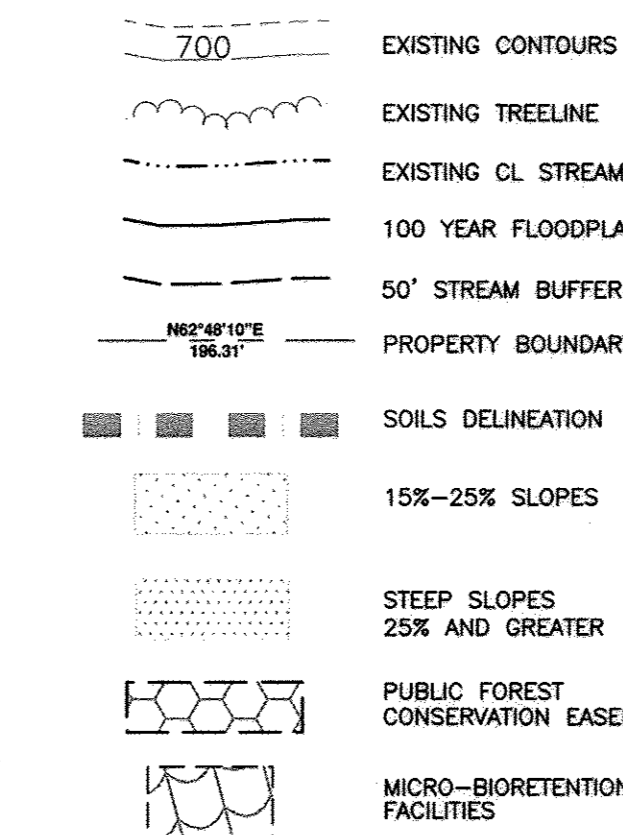
1st ELECTION DISTRICT

HOWARD COUNTY, MARYLAND

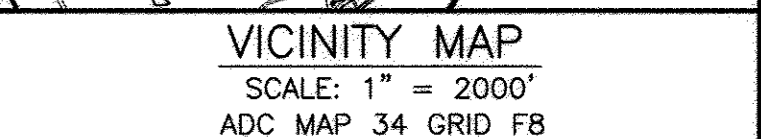
SITE DEVELOPMENT PLAN

SHEET INDEX	
NO.	DESCRIPTION
1	SITE DEVELOPMENT AND GRADING PLAN
2	ESD STORMWATER MANAGEMENT PLAN AND DETAIL, LANDSCAPING PLAN AND DETAILS
3	SEDIMENT AND EROSION CONTROL PLAN AND DETAILS AND SOIL BORING LOGS
4	SEDIMENT AND EROSION CONTROL NOTES AND DETAILS
5	STORM DRAIN AND SEDIMENT CONTROL DRAINAGE AREA MAPS AND STRUCTURE DETAILS
6	STORM DRAIN, W/C AND SHC PROFILES
7	STORMWATER MANAGEMENT OF DRAINAGE AREA MAPS
8	UNDERGROUND STORMWATER MANAGEMENT DETAILS
9-12	RETAINING WALL
13	FOREST CONSERVATION PLAN
14	FOREST CONSERVATION DETAILS

LEGEND

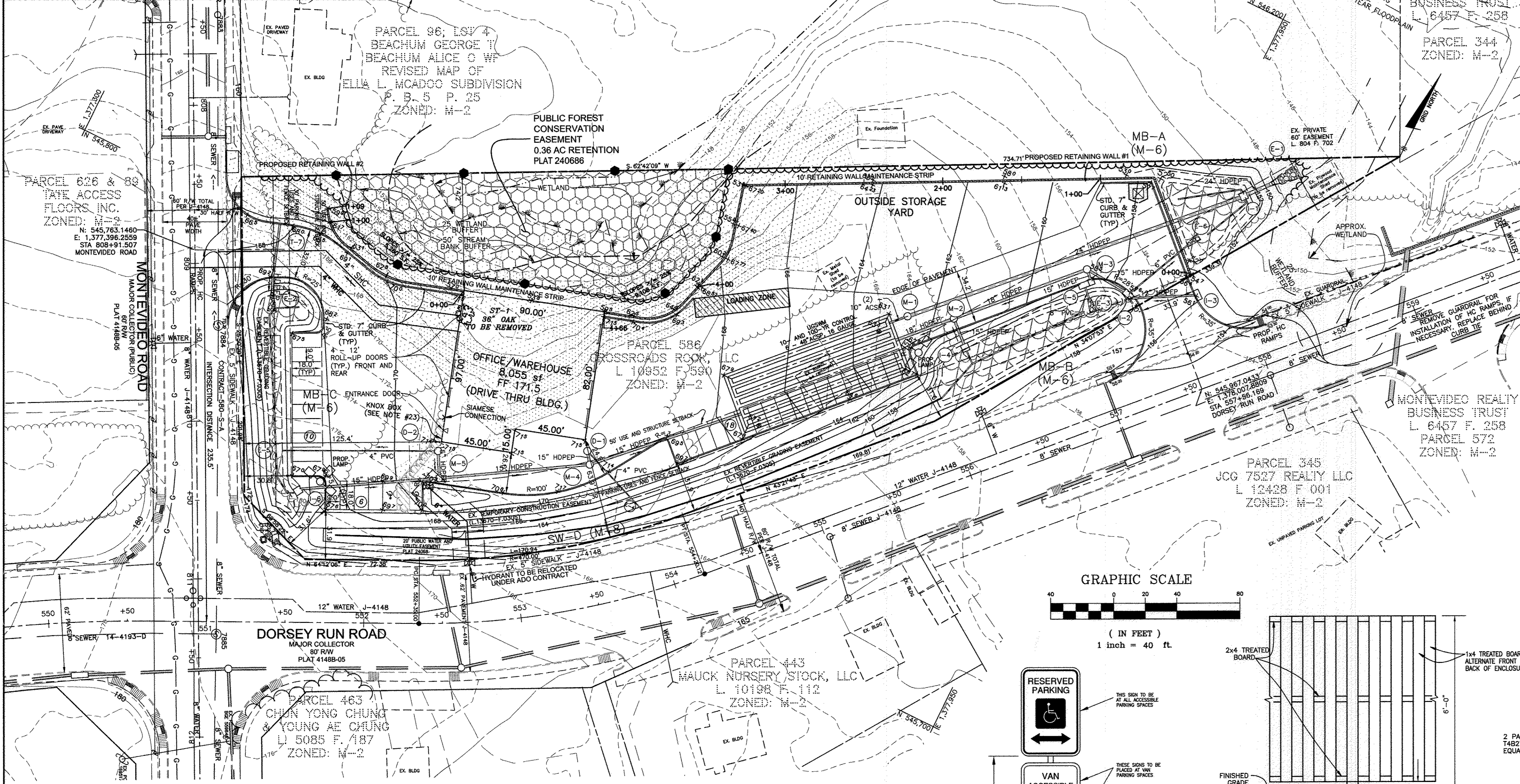
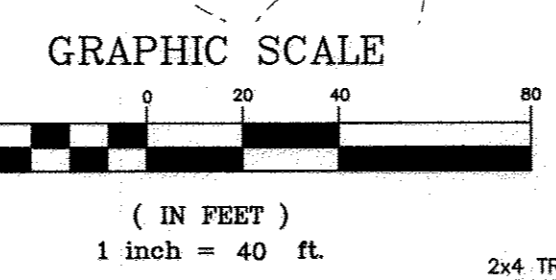


BENCHMARKS NAD'83 HORIZONTAL	
HO. CO. #438C STAMPED DISK SET ON TOP OF CONCRETE BASE N 549,592.091' E 1,375,466.62'	438C
HO. CO. #43ED STAMPED DISK SET ON TOP OF CONCRETE BASE N 548,525.002' E 1,376,022.96'	43ED
HO. CO. #0058 Rivet in concrete headwall on the north side of Montevideo Road east of B&O R.R. tracks along Montevideo Road N 544,813.612' E 1,378,390.04'	0058



GENERAL NOTES

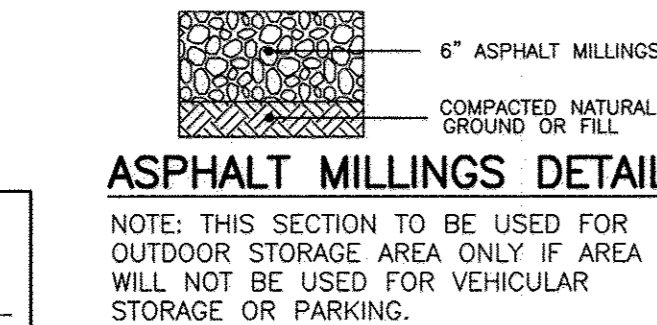
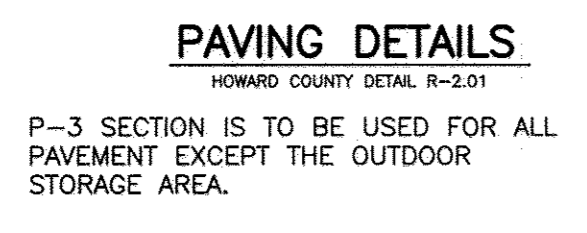
- SUBJECT PROPERTY ZONED M-2 PER THE COMPREHENSIVE ZONING PLAN EFFECTIVE 10-6-2013.
- THIS PROJECT IS SUBJECT TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS AND THE ZONING REGULATIONS EFFECTIVE APRIL 13, 2004.
- PROJECT BOUNDARY AND TOPOGRAPHY WITHIN THE SUBDIVISION AREA ARE BASED ON FIELD RUN BOUNDARY SURVEY AND TOPO PERFORMED BY BENCHMARK ENGINEERING, INC. DATED JUNE, 2007 AND PLAT J-4148-C-05 PREPARED AUGUST, 2009 BY URS.
- NO GRADING, REMOVAL OF VEGETATIVE COVER OR TREES, PAVING AND NEW STRUCTURES SHALL BE PERMITTED WITHIN THE LIMITS OF WETLANDS, STREAM, OR THEIR REQUIRED BUFFERS OR FOREST CONSERVATION EASEMENT AREAS.
- THERE IS NO 100-YEAR FLOODPLAIN ON THIS PROPERTY.
- TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO CEMETERIES LOCATED ON THIS SITE.
- THE FOREST CONSERVATION EASEMENT HAS BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE AND FOREST CONSERVATION ACT. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT UNLESS FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
- THE FOREST CONSERVATION OBLIGATIONS FOR THIS PROJECT WILL BE MET BY THE RETENTION OF 0.36 ACRES OF FOREST AND FEE-IN-LIEU OF 0.57 ACRES OF AFForestation OR \$18,622.00.
- THERE ARE STEEP SLOPES (25% OR GREATER) ON THIS SITE. HOWEVER, THERE ARE NO CONTIGUOUS AREAS IN EXCESS 20% SLOPE. THEREFORE THERE ARE NO REGULATED STEEP SLOPES WITHIN THE PROJECT AREA.
- A WETLAND DELINEATION WAS PERFORMED BY HILLIS-CARNES IN MAY, 2007, AND UPDATED FEBRUARY, 2015.
- A FOREST STAND DELINEATION WAS PERFORMED FEBRUARY, 2012 BY BENCHMARK ENGINEERING, INC., AND WAS UPDATED AUGUST 2014.
- PREVIOUS DPZ FILE NUMBERS: SDP-75-81, SDP-87-116, ECP-12-039 (VOIDED), ECP-15-016
- THERE ARE RUINS OF THREE STRUCTURES ON SITE, CIRCA 1970, WHICH SHALL BE REMOVED.
- A NOISE STUDY WAS NOT REQUIRED FOR THIS PROJECT.
- THE LANDSCAPING FOR THIS PROJECT IS SHOWN WITHIN THIS SITE DEVELOPMENT PLAN, WHICH HAS BEEN PREPARED IN ACCORDANCE WITH SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. SURETY IN THE AMOUNT OF \$14,580 FOR 33 SHADE TREES (INCLUDING 29 PERIMETER SHADE TREES, 2 MITIGATION TREES AND 2 INTERNAL LANDSCAPE TREES), 20 EVERGREEN TREES AND 56 SHRUBS IS REQUIRED TO BE POSTED WITH THE DEVELOPER'S AGREEMENT.
- PROPERTY IS LOCATED WITHIN THE METROPOLITAN DISTRICT. PUBLIC WATER AND SEWER WILL BE UTILIZED, CONNECTING TO EXISTING CONTRACT J-4148 AND 580-5-A.
- TRASH REMOVAL WILL BE PRIVATE.
- EXISTING UTILITIES ARE BASED ON RECORD DRAWINGS AND FIELD LOCATION. ALL UTILITY LOCATIONS SHOULD BE CONFIRMED BY CONTRACTOR BEFORE BEGINNING CONSTRUCTION.
- TRAFFIC CONTROL DEVICES:
 - THE R1-1 ("STOP") SIGNS FOR THIS DEVELOPMENT MUST BE INSTALLED BEFORE THE BASE PAVING IS COMPLETED.
 - ALL TRAFFIC CONTROL DEVICES AND THEIR LOCATIONS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE "MARYLAND MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD).
 - ANY SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED (QUICK PUNCH), SQUARE TUBE POST (1 1/2 GAUGE) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE SLEEVE (1/2 GAUGE) - 3" LONG. THE ANCHOR SHALL NOT EXTEND MORE THAN TWO "QUICK PUNCH" HOLES ABOVE GROUND LEVEL. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
 - THE TRAFFIC CONTROL DEVICE LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MUST BE FIELD APPROVED BY HOWARD COUNTY TRAFFIC DIVISION (410-313-2439) PRIOR TO THE INSTALLATION OF ANY OF THE TRAFFIC CONTROL DEVICES.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MSHA STANDARDS AND SPECIFICATIONS AS APPLICABLE.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
- THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
- KNOX BOX SHALL BE PLACED ON THE FRONT OF ALL BUILDINGS NO MORE THAN 6' TO THE RIGHT OF THE MAIN ENTRANCE AT A HEIGHT OF 4'-5". IT SHALL BE ELECTRONICALLY SUPERVISED TO NOTIFY THE OWNER THAT IT IS BEING ACCESSED (INTEGRATED WITH THE FIRE ALARM SYSTEM).
- ALL ROOF DRAINS AND LANDSCAPE DRAINS SHALL MAINTAIN A MINIMUM 0.5% SLOPE AND BE SIZED APPROPRIATELY.
- THE PROPOSED BUILDING WILL BE UTILIZING AN AUTOMATED SPRINKLER SYSTEM FOR FIRE PROTECTION.
- ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE DEVELOPER'S EXPENSE.
- STORMWATER MANAGEMENT FOR THE SITE IS PROVIDED IN ACCORDANCE WITH THE STORMWATER MANAGEMENT ACT OF 2007 AND THE HOWARD COUNTY DESIGN MANUAL. ENVIRONMENTAL SITE DESIGN HAS BEEN IMPLEMENTED TO THE MAXIMUM EXTENT PRACTICAL BY THE USE OF ESD FACILITIES. ALL ESD PRACTICES SHALL BE PRIVATELY OWNED AND MAINTAINED, AND SHALL BE SUBJECT TO THE REQUIREMENTS AND RESTRICTION OF A RECORDED DECLARATION OF COVENANTS. 10- AND 100-YEAR STORMWATER CONTROLS ARE PROVIDED WITHIN AN ON-SITE UNDERGROUND RETENTION FACILITY.
- THE APPFO STUDY FOR THIS PROJECT WAS PREPARED BY THE MARS GROUP, DATED JUNE, 2015.
- THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL, WHICH IS BASED UPON THE MARYLAND STATE PLANE COORDINATE SYSTEM. HOWARD COUNTY MONUMENT NOS. 438C, 43ED AND 0058 WERE USED FOR THIS PROJECT.
- THE ROAD AND FRONTAGE IMPROVEMENTS FOR DORSEY RUN ROAD AND MONTEVIDEO ROAD ARE UNDER CONSTRUCTION UNDER CAPITAL PROJECT J-4148. THE IMPROVEMENTS INCLUDE ROAD CONSTRUCTION, SIDEWALKS AND STREET TREES.
- THE OUTDOOR STORAGE YARD IS TO BE STABILIZED WITH ASPHALT MILLINGS TO PROVIDE A DUST FREE SURFACE. THIS STORAGE AREA DOES NOT PERMIT PARKING OF ANY VEHICLE ON A TEMPORARY OR PERMANENT BASIS. IF THIS AREA IS TO BE USED FOR PARKING OR STORAGE OF VEHICLES, IT SHALL BE PAVED WITH A P-2 PAVEMENT SECTION, PER THE MINIMUM THICKNESS SECTIONS FOUND IN DESIGN MANUAL VOLUME IV.
- ALL OUTDOOR LIGHTING SHALL COMPLY WITH SECTION 134.0 OF THE ZONING REGULATIONS. THE EXTERIOR LIGHTING SHALL BE DIRECTED/REFLECTED AWAY FROM ALL PUBLIC ROADS.
- WP-16-145 WAS APPROVED JULY 13, 2016, TO ALLOW AN ALTERNATIVE COMPLIANCE TO SECTION 16.1205(a)(7) WHICH REQUIRES THAT SPECIMEN TREES BE RETAINED. THE ALTERNATIVE COMPLIANCE IS REMOVAL OF ONE TREE, AND PROVISION OF TWO 3" CALIPER NATIVE SHADE TREES ALONG THE WESTERN EDGE OF THE FOREST CONSERVATION EASEMENT.
- HEALTH DEPARTMENT APPROVAL OF THIS SITE DEVELOPMENT PLAN DOES NOT ENSURE APPROVAL OF BUILDING PERMIT APPLICATIONS ASSOCIATED WITH THIS PLAN. PLANS FOR CERTAIN FACILITIES TO BE CONSTRUCTED WITHIN THE LIMITS DESCRIBED BY THIS PLAN WILL REQUIRE REVIEW AND APPROVAL BY THE HEALTH DEPARTMENT. SUCH FACILITIES MAY INCLUDE, BUT ARE NOT LIMITED TO, THOSE WHICH HAVE SWIMMING POOLS OR THAT SELL PREPARED OR PACKAGED FOODS, OR THAT MAY HAVE EQUIPMENT THAT EMITS RADIATION.
- IF ANY WELL OR SEPTIC SYSTEMS ARE FOUND BEFORE AND/OR DURING CONSTRUCTION THEY MUST BE PROPERLY ABANDONED AND DOCUMENTATION SENT TO THE HEALTH DEPT.



SITE ANALYSIS DATA CHART

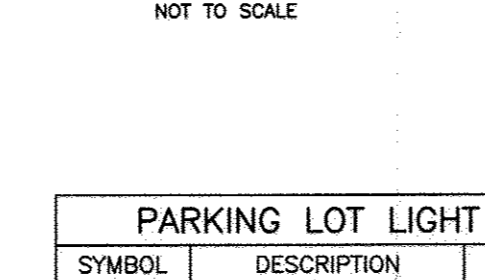
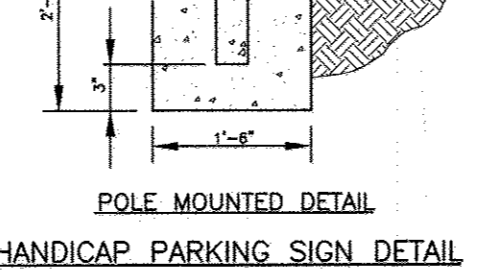
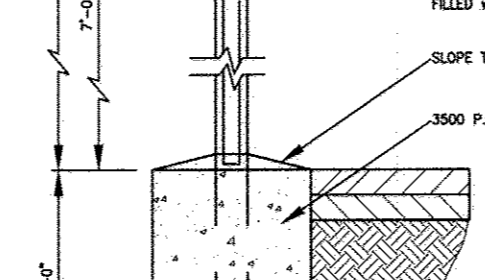
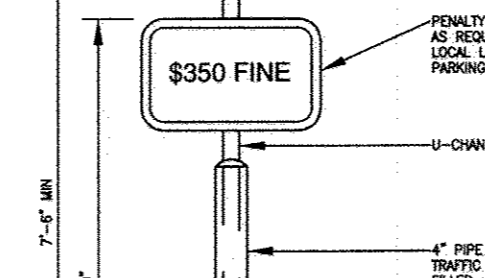
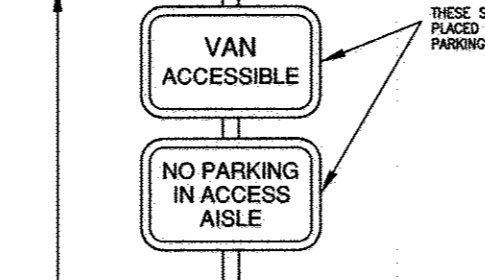
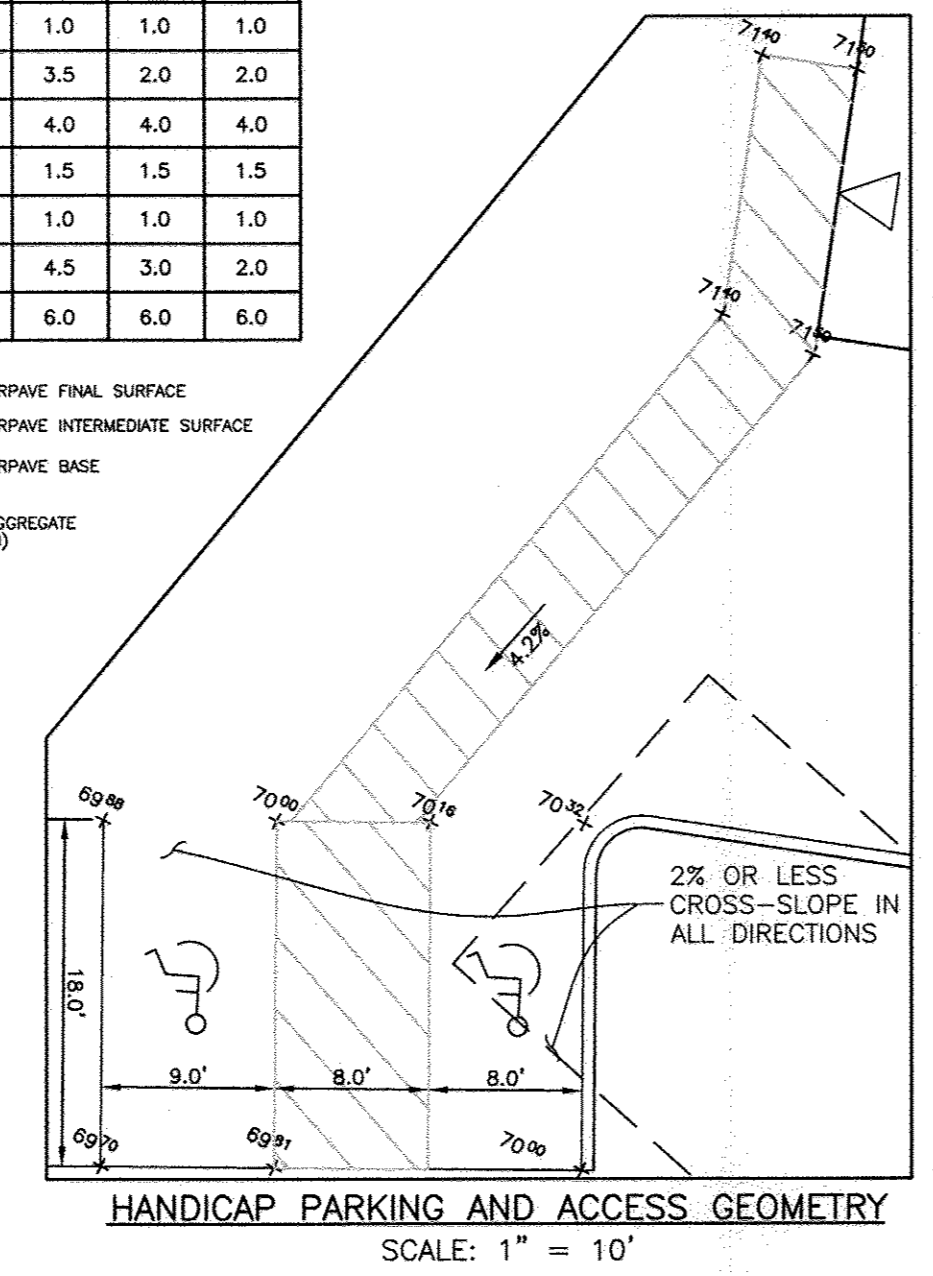
A. TOTAL PROJECT AREA: 2.76± AC.
 B. AREA OF THIS PLAN SUBMISSION: 2.76± AC.
 C. APPROXIMATE LIMIT OF DISTURBANCE: 2.58± AC.
 D. PRESENT ZONING: M-2
 E. PROPOSED USE OF SITE: COMMERCIAL (WAREHOUSE AND OFFICE) (8,444 SF AND 1,611 SF)
 F. TOTAL NUMBER OF UNITS ALLOWED AS SHOWN ON FINAL PLATS: N/A
 G. NUMBER OF PARKING SPACES REQUIRED: OFFICE: 33 SP/1000 SF = 5.3; WAREHOUSE: 0.75 SP/1000 SF = 4.8; TOTAL REQUIRED: 41 SPACES
 H. NUMBER OF PARKING SPACES PROVIDED: 34 SPACES
 I. NUMBER OF EMPLOYEES ON SITE: 5
 J. APPLICABLE DPZ FILE REFERENCES: SDP-75-81, SDP-87-116, BA-08-001C, ECP-12-039 (VOIDED), ECP-15-016, WP-16-145
 K. PROPOSED WATER AND SEWER SYSTEMS: PUBLIC - PRIVATE

SECTION NUMBER	CALIFORNIA BEARING RATIO (CBR)	3 TO <5		5 TO <7		>7	
		MIN	HMA WITH GAB	MIN	HMA WITH GAB	MIN	HMA WITH GAB
P-2	HMA SUPERPAVE FINAL SURFACE	1.5	1.5	1.5	1.5	1.5	1.5
	9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
	HMA SUPERPAVE INTERMEDIATE SURFACE	2.0	2.0	2.0	3.5	2.0	2.0
P-3	HMA SUPERPAVE FINAL SURFACE	1.5	1.5	1.5	1.5	1.5	1.5
	9.5 MM PG 64-22, LEVEL 1 (LOW ESAL)	1.0	1.0	1.0	1.0	1.0	1.0
	HMA SUPERPAVE INTERMEDIATE SURFACE	3.0	3.0	3.0	4.5	3.0	2.0
	18.0 MM PG 64-22, LEVEL 1 (LOW ESAL)	10.0	6.0	3.0	6.0	6.0	6.0



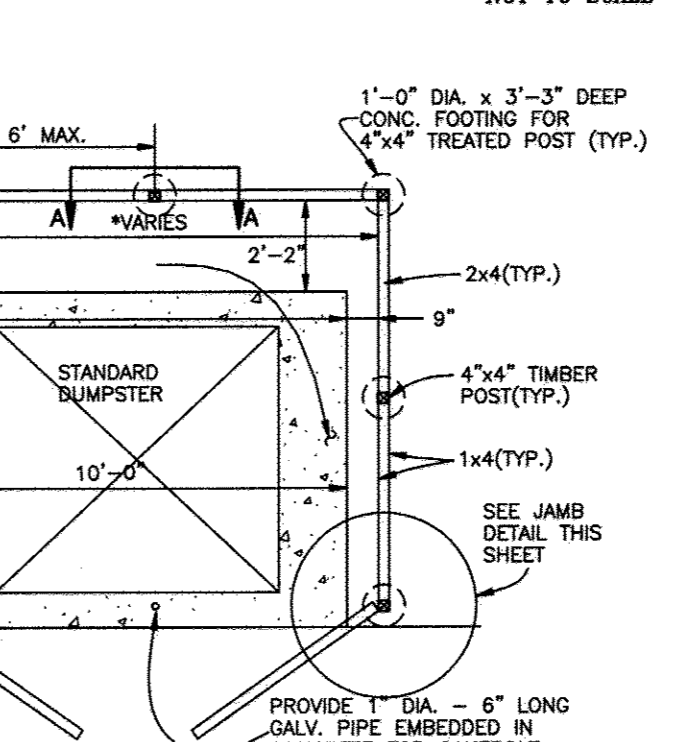
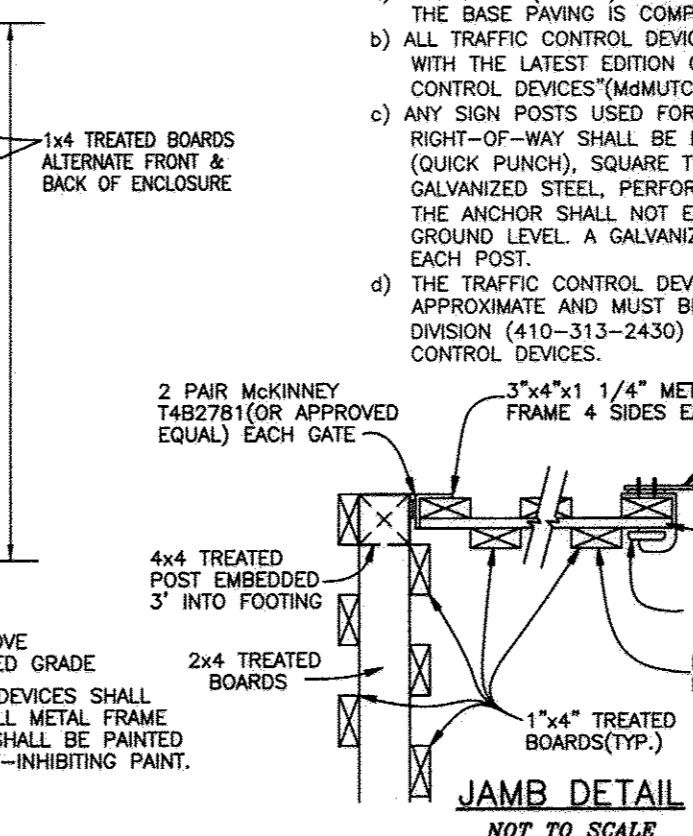
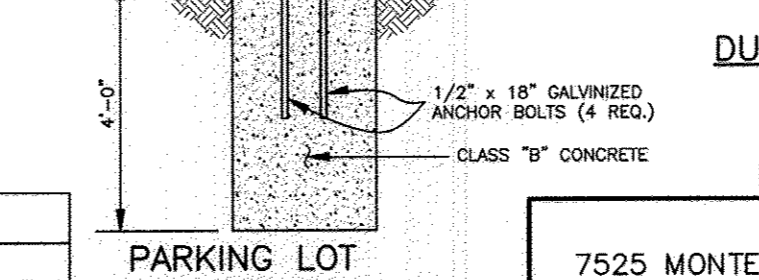
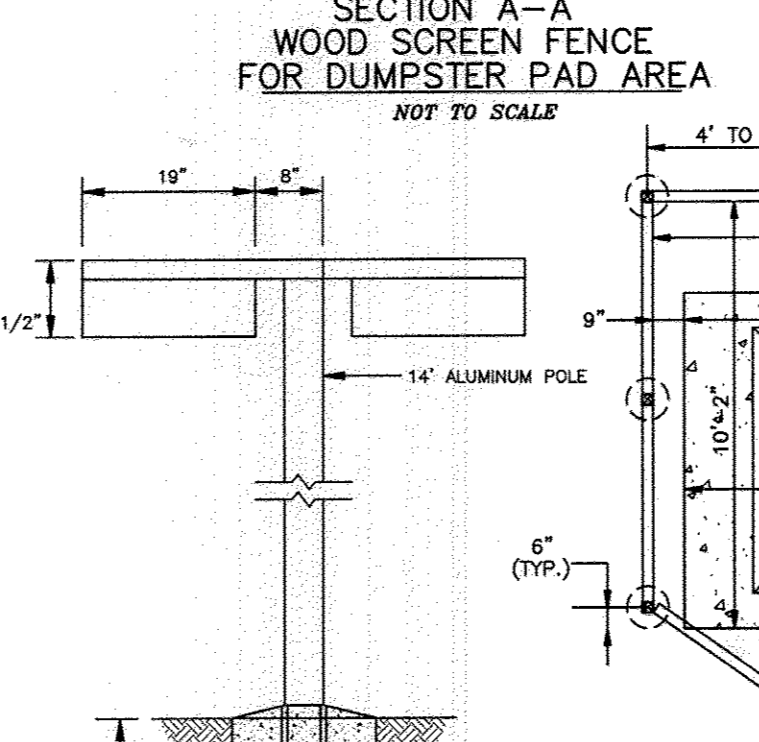
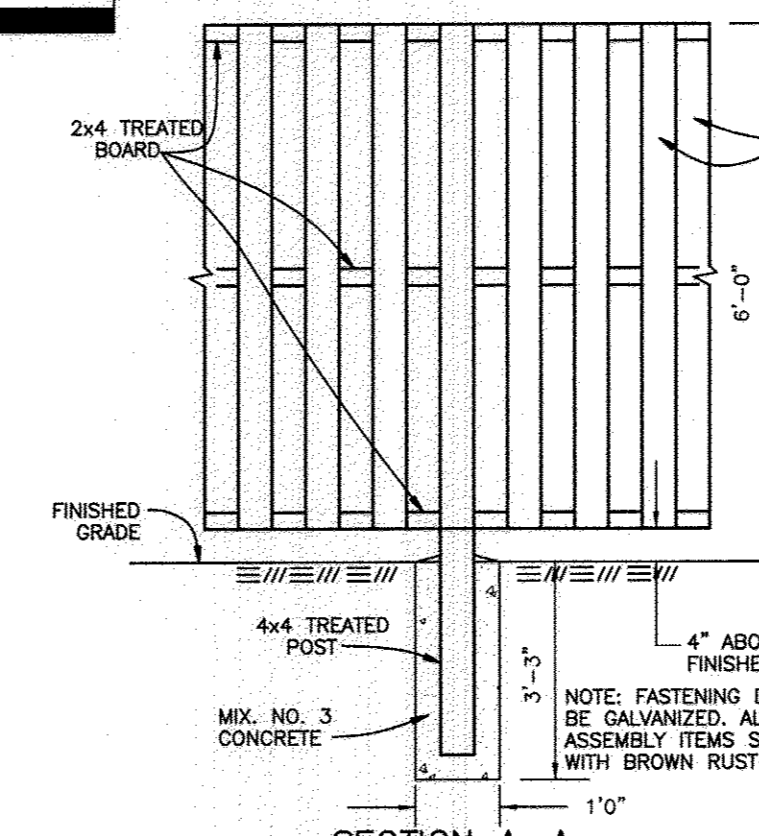
STORMWATER MANAGEMENT PRACTICES CHART

ADDRESS	MICRO-BIORETENTION FACILITY (M-6)	BIO-SWALE (M-8)
7525 MONTEVIDEO ROAD	3	1



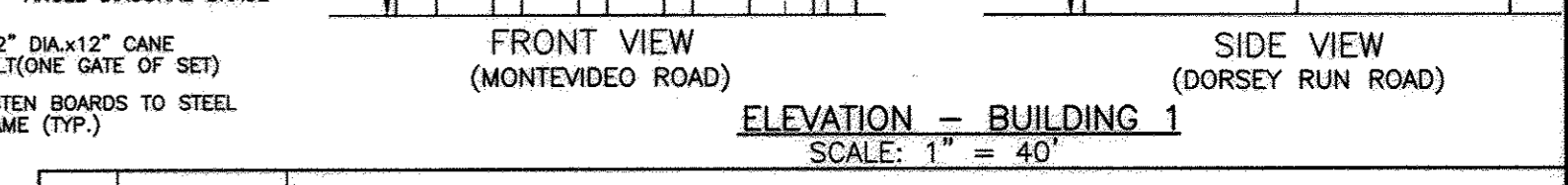
PARKING LOT LIGHT SCHEDULE

SYMBOL	DESCRIPTION	LOCATION
□	(2) 150 WATT HPS VAPOR WITH 14" BLACK FIBERGLASS POLE.	N 545,666.84 E 1,377,532.49 N 545,908.41 E 1,377,836.52



PERMIT INFORMATION CHART

7525 MONTEVIDEO ROAD	SECTION/AREA:	PARCEL:
DEED: L10952 F.00590	BLOCK No. 0016	ZONE: M-2
TAX MAP: 43	ELECTION DISTRICT: 1	CENSUS TRACT: 6012.03



NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.

8480 BALTIMORE NATIONAL PIKE SUITE 3154 ELICOTT CITY, MARYLAND 21043
 (P) 410-465-8105 (F) 410-465-6844
 WWW.BE-CVENGINEERING.COM

OWNER/DEVELOPER:
 CROSSROADS ROCK, LLC
 6800 DEERPATH ROAD, SUITE 100
 ELK RIDGE, MD 21075
 (410) 579-2442

PROJECT:
DORSEY RUN CENTER
7525 MONTEVIDEO ROAD

LOCATION:
 TAX MAP 43 PARCEL 586
 1ST ELECTION DISTRICT
 ZONED: M-2
 HOWARD COUNTY, MARYLAND

TITLE:
SITE DEVELOPMENT AND GRADING PLAN

DATE: APRIL, 2017
 PROJECT NO. 2039

SCALE: AS SHOWN
 SHEET 1 OF 14

DRAFT: AM DESIGN: AM CHECK: CAM

SDP-16-064

APPROVED FOR PUBLIC WATER AND SEWER
 HOWARD COUNTY HEALTH DEPARTMENT

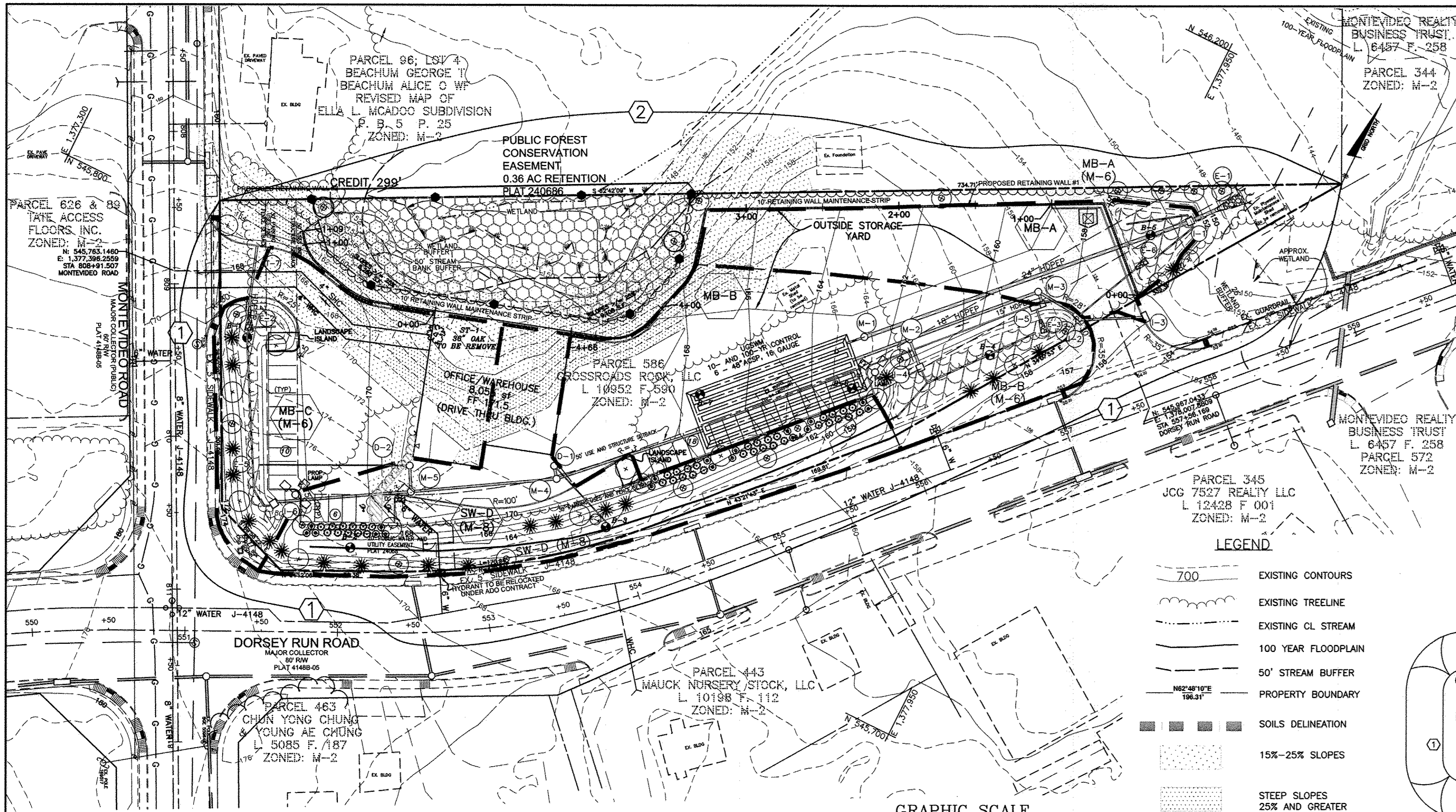
Walter M. Roseman 5/16/2017
 HOWARD COUNTY HEALTH OFFICER DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Walter M. Roseman 5-31-17
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Walter M. Roseman 5-24-17
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Walter M. Roseman 5-31-17
 DIRECTOR DATE



CONSTRUCTION SPECIFICATIONS
B.4.C Specifications for Micro-Bioretentation, Rain Gardens, Landscape Infiltration & Infiltration Basins

- Material Specifications:**
The allowable materials to be used in these practices are detailed in Table B.4.1.
- 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-bioretentation 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 Bermuda grass, Quackgrass, Johnson grass, or other noxious weeds as specified under COMAR 15.06.01.05. 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 a mixture of loamy and (60%-85%) 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 the soil to increase or decrease pH.

- 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-270) in a gravel layer. The preferred material is slotted, 4" rigid pipe (e.g., PVC or HDPE).
 - Perforations - If perforated pipe is used, perforations should be 3/4" diameter located 6" on center with a minimum of four holes per row. Pipe shall be wrapped with a 1/2" (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 (1/2" to 3/4" 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".

- Miscellaneous:**
These practices may not be constructed until all contributing drainage area has been stabilized.
 - Compaction can be alleviated at the base of the bio-retention facility by using a primary filling operation such as a chisel plow, ripper, or subsoiler. These filling operations are to restructure the soil profile through the 12 inch compaction zone. Substitute methods must be approved by the engineer. Rolliters typically do not lift deep enough to reduce the effects of compaction from heavy equipment.
 - Rolliters to 3 inches of sand into the base of the bio-retention facility before backfilling the optional sand layer. Pump any ponded water before preparing (rolliters) base.
 - When backfilling the topsoil over the sand layer, first place 3 to 4 inches of topsoil over the sand, then rolliters the sand/topsoil to create a gradation zone. Backfill the remainder of the topsoil to final grade.
 - When backfilling the bio-retention facility, place soil in lifts 12" to 18". Do not use heavy equipment within the bio-retention basin. Heavy equipment can be used around the perimeter of the basin to supply soils and sand. Grade bio-retention materials with light equipment such as a compact loader or a dozer/loader with marsh tracks.

- Plant Material:**
Recommended plant material for micro-bioretentation practices can be found in Appendix A, Section A.2.3.

- 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. Much should be placed in surrounding to a uniform thickness of 2" to 3". Shredded or chipped hardwood mulch is the only accepted mulch. Fine mulch and wood chips will float and move to the perimeter of the bio-retention 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.

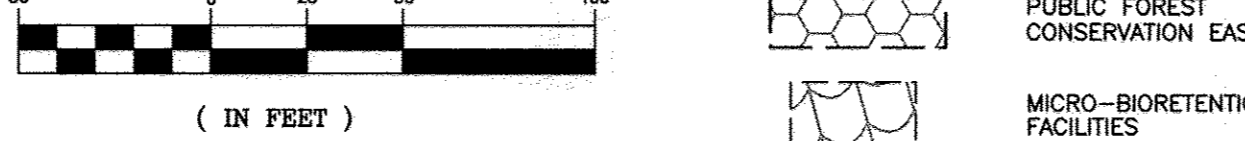
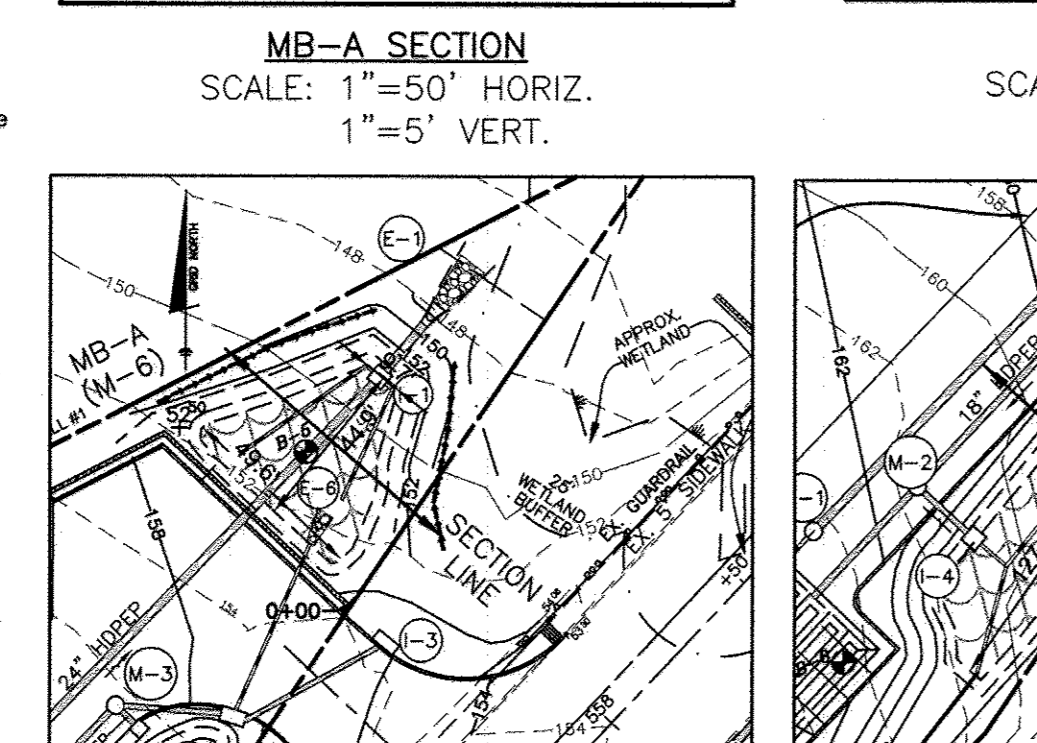
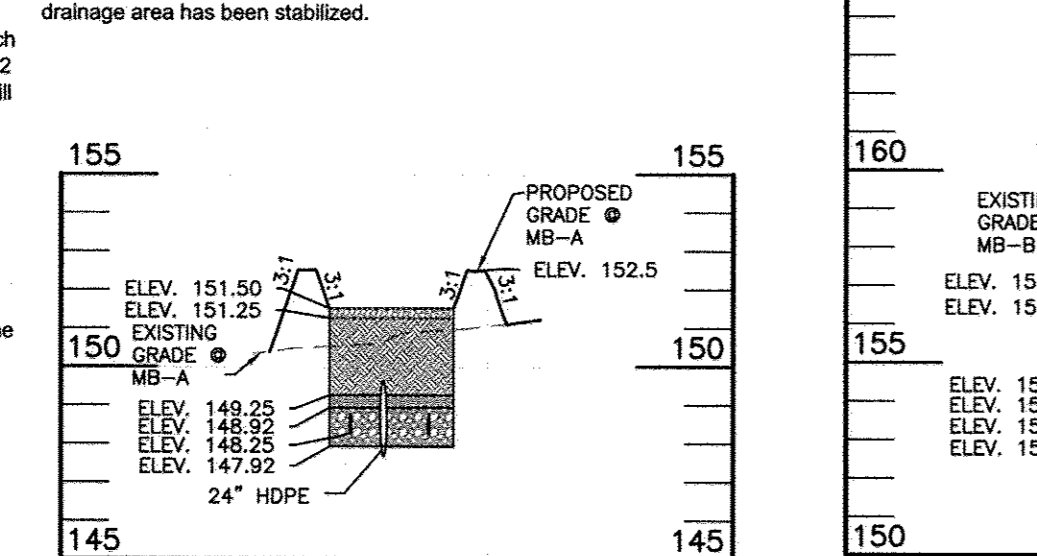
APPROVED: DEPARTMENT OF PLANNING AND ZONING
 [Signature] 6-31-17
 [Signature] 5-24-17
 [Signature] 5-31-17

CONSTRUCTION SPECIFICATIONS (continued)

- 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.

- Underdrains:**
The topsoil specifications provide enough organic material to adequately supply nutrients from natural cycling. The primary function of the bio-retention structure is to improve water quality. Adding fertilizers, deer, or at a minimum, impedes this goal. Only add fertilizer if wood chips or mulch are used to amend the soil. Rolliters use fertilizer at a rate of 2 pounds per 1000 square feet.

- Underdrains:**
The 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).



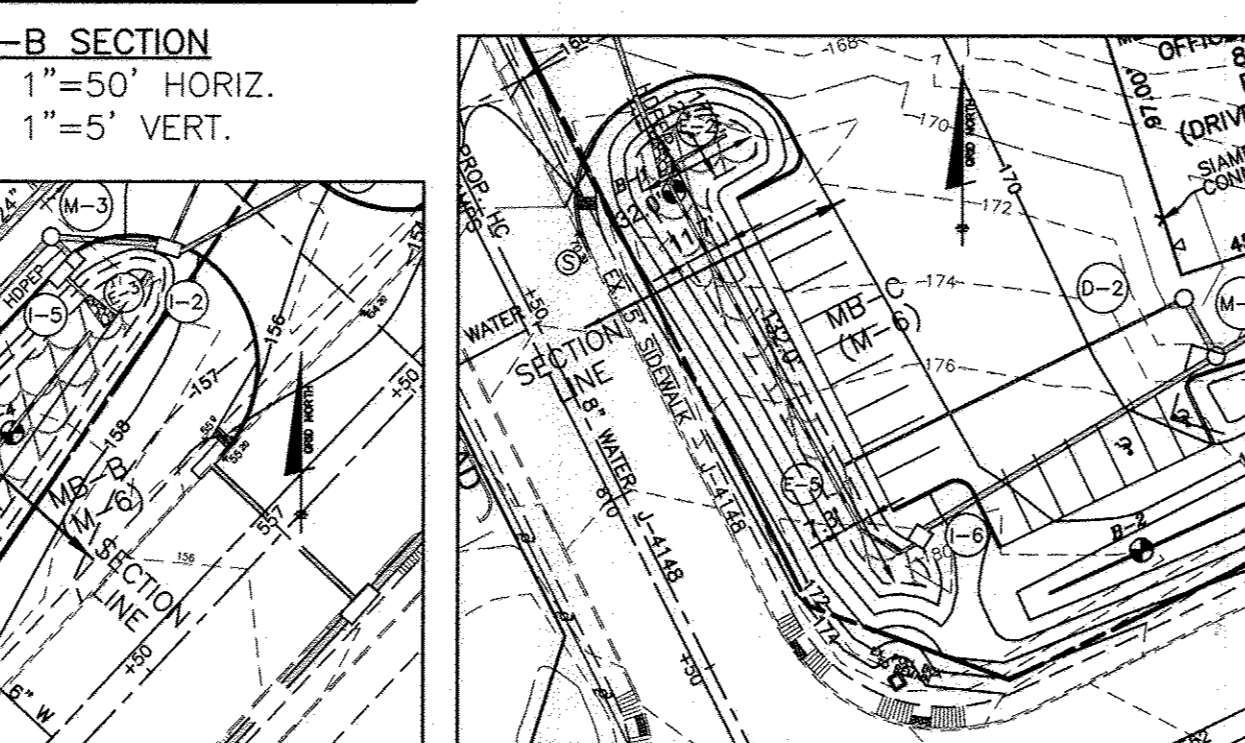
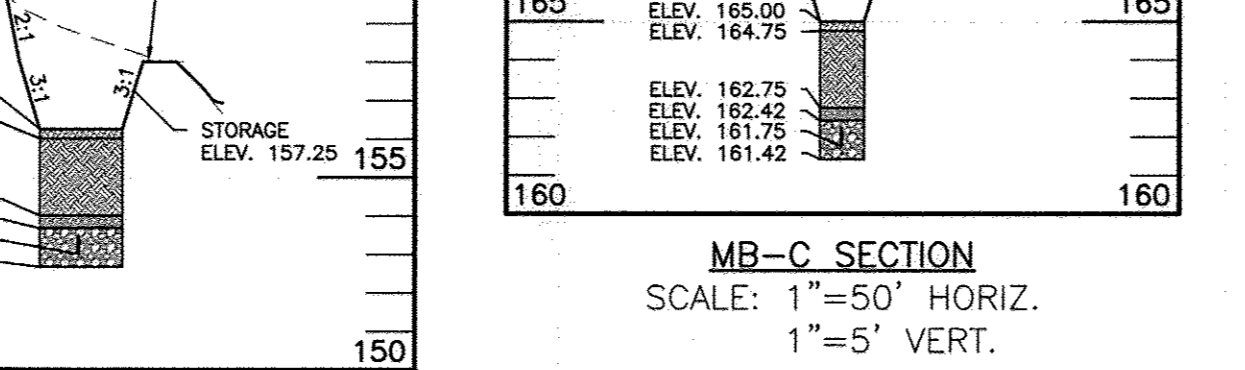
(IN FEET)
1 inch = 50 ft.

LEGEND

- EXISTING CONTOURS
- EXISTING TREELINE
- EXISTING CL STREAM
- 100 YEAR FLOODPLAIN
- 50' STREAM BUFFER
- PROPERTY BOUNDARY
- SOILS DELINEATION
- 15% - 25% SLOPES
- STEEP SLOPES 25% AND GREATER
- PUBLIC FOREST CONSERVATION EASEMENT
- MICRO-BIORETENTION FACILITIES

OPERATION AND MAINTENANCE SCHEDULE FOR MICRO-BIORETENTION (M-6), AND BIO-SWALE (M-8)

- 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 AND 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 INSPECTION IN THE SPRING AND IN THE FALL OF EACH YEAR. DURING THE INSPECTION, THE OWNER SHALL REMOVE DEAD AND DISEASED VEGETATION CONSIDERED BEYOND TREATMENT, REPLACE 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.



DEVELOPER'S/BUILDER'S CERTIFICATE

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

[Signature] 4-17-17
 CROSSROADS ROCK, LLC DATE

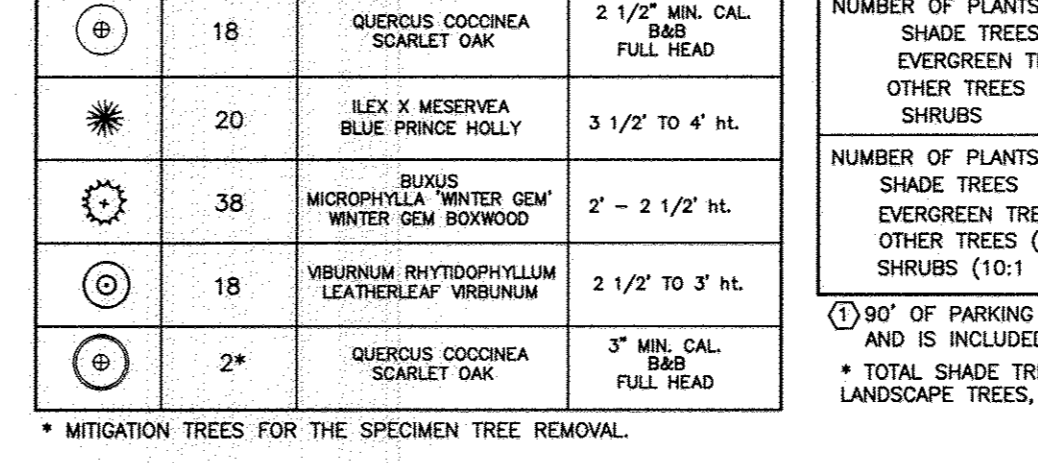
SCHEDULE B - PARKING LOT INTERNAL LANDSCAPING

NUMBER OF PARKING SPACES: 34
 NUMBER OF TREES/LS-ISLES REQUIRED: 2
 NUMBER OF TREES PROVIDED: 2
 OTHER TREES (2:1 SUBSTITUTION): -
 SHRUBS (10:1 SUBSTITUTION): -

LANDSCAPE PLANTING LIST

SYMBOL	QUANTITY	NAME	REMARKS
(+)	13	PLANTANUS ACERIFOLIA 'BLOODGOOD' (Bloodgood London Plane)	2 1/2" MIN. CAL. 3/8" FULL HEAD
(B)	18	QUERCUS COCCINEA SCARLET OAK	2 1/2" MIN. CAL. 3/8" FULL HEAD
(*)	20	ILEX X MESSERIAE BLUE PRINCE HOLLY	3 1/2" TO 4" HT.
(*)	38	BIORUS MICROPHYLLA WINTER GEM WINTER GEM BOXWOOD	2' - 2 1/2" HT.
(D)	18	VIBURNUM RHYTHIDIOPHYLLUM LEATHERLEAF VIBURNUM	2 1/2" TO 3" HT.
(E)	2*	QUERCUS COCCINEA SCARLET OAK	3" MIN. CAL. 3/8" FULL HEAD

* MITIGATION TREES FOR THE SPECIMEN TREE REMOVAL.



MICROBIORETENTION PLANTING SCHEDULE

- IRIS VERSICOLOR (IRIS)
- LOBELIA CARDINALIS CARDINAL FLOWER
- RUBEBCKIA SUBTOMENTOSA - SWEET CONEFLOWER
- CALLUNA VULGARIS (HEATHER)

MICROBIORETENTION PLANTING DATA

- PLANTINGS WITHIN THE PONDING AREA OF A MEDIUM TO HIGH WATER TOLERANCE
- PLANTINGS ALONG THE PERIMETER (BERM) AREA OF THE MICRO-BIORETENTION FACILITY ARE TO BE OF A LOW TO MEDIUM WATER TOLERANCE
- AVOID PLANTINGS WITH EXCESSIVE ROOT MASS IN POND AREA OF THE MICRO-BIORETENTION FACILITY NEAR O.B. PIPE AND UNDERDRAIN.

PLANTING SCHEDULE

FACILITY	(+)	(B)	(*)	(D)	(E)	(S)	(SHRUB)
MB-A	65	48	48	15	15		
MB-B	107	80	80	24	24		
MB-C	71	53	53	18	18		

PROJECT: 7525 Montevideo Road [DATE: 03/24/16]

DETAILED SIZING OF PRACTICES

Scale: 1" = 1.9 inches

Drainage Area MB-A Micro-Bioretentation (M-6)

Drainage Area	Elevation	Area	Average	Contour	Incremental	Total
(ft)	(ft)	(sf)	(sf)	(ft)	(ft ³)	(ft ³)
Total Drainage Area:		16975 s.f.				
Impervious Area:		14615 s.f.				
Impervious:		15200	1453	1702.5	1.00	1702.5
Rv =		0.825				
ESDV =		2209.3 c.f.				
75% Req'd Storage:		1657				
Min. Area of Filter (@ 2% DA):						339.5 OK

Drainage Area MB-B Micro-Bioretentation (M-6)

Drainage Area	Elevation	Area	Average	Contour	Incremental	Total
(ft)	(ft)	(sf)	(sf)	(ft)	(ft ³)	(ft ³)
Total Drainage Area:		31865 s.f.				
Impervious Area:		23485 s.f.				
Impervious:		745	2404	2832.5	1.00	2832.5
Rv =		0.713				
ESDV =		3598.4 c.f.				
75% Req'd Storage:		2690				
Min. Area of Filter (@ 2% DA):						637.3 OK

Drainage Area MB-C Micro-Bioretentation (M-6)

Drainage Area	Elevation	Area	Average	Contour	Incremental	Total
(ft)	(ft)	(sf)	(sf)	(ft)	(ft ³)	(ft ³)
Total Drainage Area:		23559 s.f.				
Impervious Area:		17397 s.f.				
Impervious:		745	1597	2093.0	1.00	2093.0
Rv =		0.714				
ESDV =		2654.9 c.f.				
75% Req'd Storage:		1991				
Min. Area of Filter (@ 2% DA):						471.0 OK

Drainage Area SW-D Swale Storage Computations

Swale Slope	Swale length	Bottom width	Side Slopes	Average Depth	Cross Sec. Area	ESDV Provided
0.02%/ft	400' ft	3'	2:1	0.42' ft	3.7	1472.0
Total Drainage Area:						
Impervious Area:						
Impervious:						
Rv =						
Required ESDV =						1441.2 c.f.

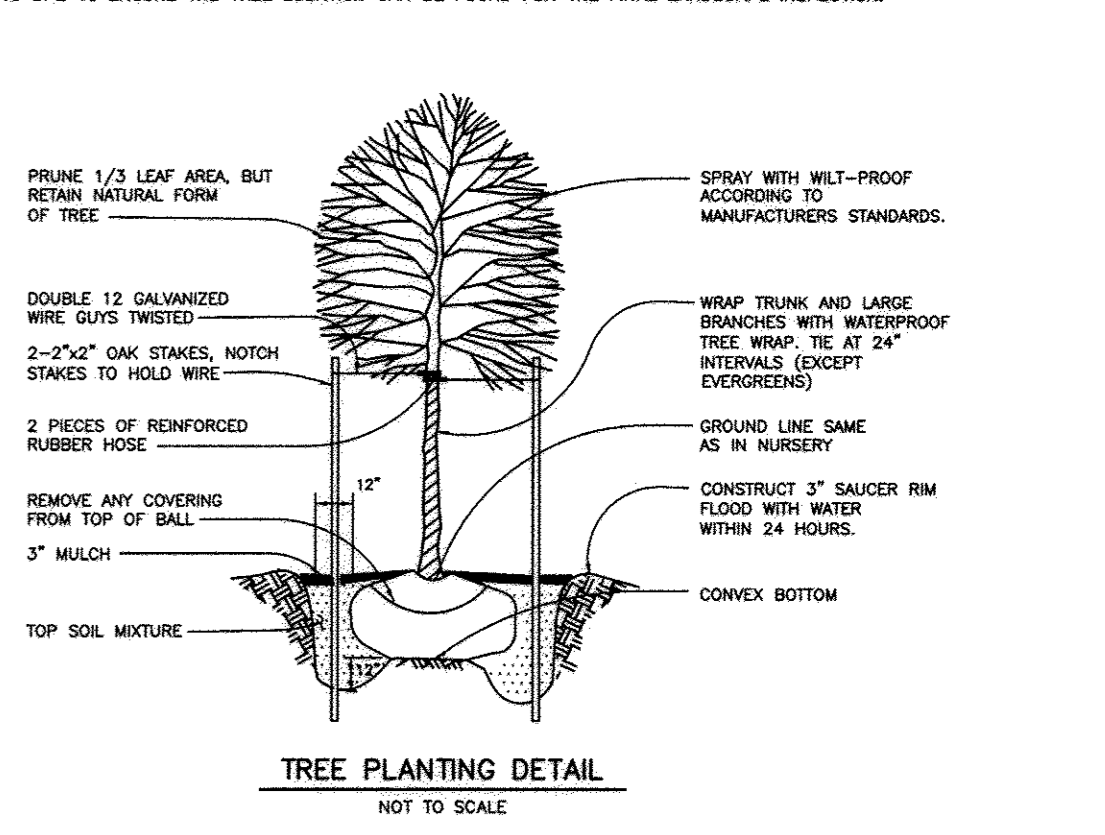
LANDSCAPING NOTES

- PERIMETER LANDSCAPING SHALL BE PROVIDED BY THE DEVELOPER AS SHOWN ON THESE PLANS.
- TREES MUST BE A MINIMUM OF FOUR(4) FEET FROM PAVEMENT AND MUST BE A MINIMUM OF FIVE(5) FEET FROM ANY STORM DRAIN, IF APPLICABLE.
- TREE MUST BE PLANTED A MINIMUM OF TEN (10) FEET FROM A DRIVEWAY APPROX.
- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SEC. 16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
- THIS LANDSCAPE PLAN IS IN ACCORDANCE WITH SECTION 16.124 OF HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. SURETY IN THE AMOUNT OF \$14,580 FOR 33 SHADE TREES (INCLUDING 29 PERIMETER SHADE TREES, 2 MITIGATION TREES AND 2 INTERNAL LANDSCAPE TREES), 20 EVERGREEN TREES AND 56 SHRUBS IS REQUIRED TO BE POSTED WITH THE DEVELOPER'S AGREEMENT.
- ONE SPECIMEN TREE HAS BEEN IDENTIFIED FOR REMOVAL ON THIS PLAN (S1-1).
- SHOULD ANY TREE DESIGNATED FOR PRESERVATION FOR WHICH LANDSCAPING CREDIT IS GIVEN, DIE PRIOR TO RELEASE OF BONDS, THE OWNER WILL BE REQUIRED TO REPLACE THE TREE WITH THE EQUIVALENT SPECIES OR WITH A TREE WHICH WILL OBTAIN THE SAME HEIGHT, SPREAD AND GROWTH CHARACTERISTICS. THE REPLACEMENT TREE MUST BE A MINIMUM OF 3 INCHES IN CALIPER AND INSTALLED AS REQUIRED IN THE HOWARD COUNTY LANDSCAPE MANUAL.
- THE OWNER, TENANT 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 MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION AND WHEN NECESSARY, REPAIRED OR REPLACED.
- AT THE TIME OF INSTALLATION, ALL SHRUBS AND OTHER PLANTINGS HEREIN LISTED AND APPROVED FOR THIS SITE SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR REDUCTIONS OF THE REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL OR DELAY IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED PLANTINGS ARE PLANTED AND EXISTING TREES ARE MAINTAINED IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL.
- TWO (2) CALIPER TREES ARE SHOWN FOR MITIGATION OF THE SPECIMEN TREE REMOVAL. THESE TREES ARE TO BE LOCATED WITHIN THE FOREST CONSERVATION AREA. THE LOCATIONS SHOWN ARE NOT EXACT, RATHER CARE SHOULD BE TAKEN TO SELECT AN AREA WHERE EXISTING TREES ARE LESS DENSE, TO ALLOW FOR THE GROWTH AND DEVELOPMENT OF THE NEW TREES. THE FINAL LOCATION SHALL BE NOTED ON A PLAN AND PROVIDED TO DPZ TO ENSURE THE TREE LOCATION CAN BE FOUND FOR THE FINAL LANDSCAPE INSPECTION.

SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO:	FRONT & SIDE TO ROW TO ROW	ADJACENT PARINGS M-2 TO M-2	TOTAL
LANDSCAPE TYPE	(1) B	(1) E	(2) A	
LINEAR FEET OF PERIMETER	788'	222'	735'	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	YES 298'	
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	
NUMBER OF PLANTS REQUIRED				
SHADE TREES	16	6	7	29
EVERGREEN TREES	20	-	-	20
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	-
SHRUBS	-	56	-	56
NUMBER OF PLANTS PROVIDED				
SHADE TREES	16	6	7	29*
EVERGREEN TREES	20	-	-	20*
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	-
SHRUBS (10:1 SUBSTITUTION)	-	56	-	56

* 90' OF PARKING ALONG MONTEVIDEO ROAD IS 3' OR MORE BELOW THE ROAD GRADE, AND IS INCLUDED IN THE 'FRONT TO ROW' COMPUTATION.
 * TOTAL SHADE TREE COUNT IN THE PLANTING LIST IS 33, INCLUDING 2 INTERNAL LANDSCAPE TREES, AND TWO MITIGATION TREES FOR THE SPECIMEN TREE REMOVAL.



STORMWATER MANAGEMENT PRACTICES CHART

ADDRESS	MICRO-BIORETENTION FACILITY (M-6)	BIO-SWALE (M-8)
7525 MONTEVIDEO ROAD	3	1

MATERIALS & SPECIFICATIONS FOR MICRO-BIORETENTION

MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS	SEE APPENDIX A, TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL	LOAMY SAND 60-85% COMPOST 35-40% OR SANDY LOAM 30% COARSE SAND 30% & COMPOST 40%	N/A	USDA SOIL TYPES: LOAMY SAND OR SANDY LOAM; CLAY CONTENT <5%
ORGANIC CONTENT	MIN 10% BY DRY WEIGHT ASTM D 2974	N/A	
MULCH	SHREDDED HARDWOOD (1/4" WIRE MESH)	N/A	AGED 6 MONTHS, MINIMUM, NO PINE OR WOOD CHIPS
GEOTEXTILE (CLASS 'C')	N/A	PE TYPE 1 NONWOVEN	
GEOTEXTILE (1/4" WIRE MESH)	N/A	1/4" WIRE MESH	
UNDERDRAIN GRAVEL	AMSHTO M-43	NO. 57 OR NO. 9	3/8" PER 6" O.C. 4 HOLES PER ROW; MINIMUM 0.375' TO 0.750'
UNDERDRAIN PIPING	F758, TYPE PS28 (OR AMSHTO M-278)	4" TO 6" RIGID SCH.40 PVC, SDR35 OR HDPE	
IMPERVIOUS LINER	ASTM-D-4833 (THICKNESS) LOAM-D-412 (TENSILE STRENGTH 1,100 LB., ELONGATION 200%) ASTM-D-624 (TEAR RESISTANCE - 150 LB./IN) ASTM-D-471 (WATER ADSORPTION - TO -2% MASS)	30 MIL THICK	3/8" PER 6" O.C. 4 HOLES PER ROW; MINIMUM 0.375' TO 0.750' UNDERDEATH PIPES. LINER TO BE ULTRAVIOLET RESISTANT, A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
GEOTEXTILE (BELOW IMPREV. LINER)	ASTM-D-4833 (PUNCTURE STRENGTH 125LB) ASTM-D-4832 (TENSILE STRENGTH 300 LB.)		

NO.	DATE	REVISION

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELIJAH CITY, MARYLAND 21043
 (P) 410-465-8105 (F) 410-465-8644
 WWW.BM-ENGINEERING.COM

[Professional Engineer Seal]

OWNER/DEVELOPER: CROSSROADS ROCK, LLC, 6800 DEERPATH ROAD, SUITE 100 ELKRIDGE, MD 21075 (410) 579-2442

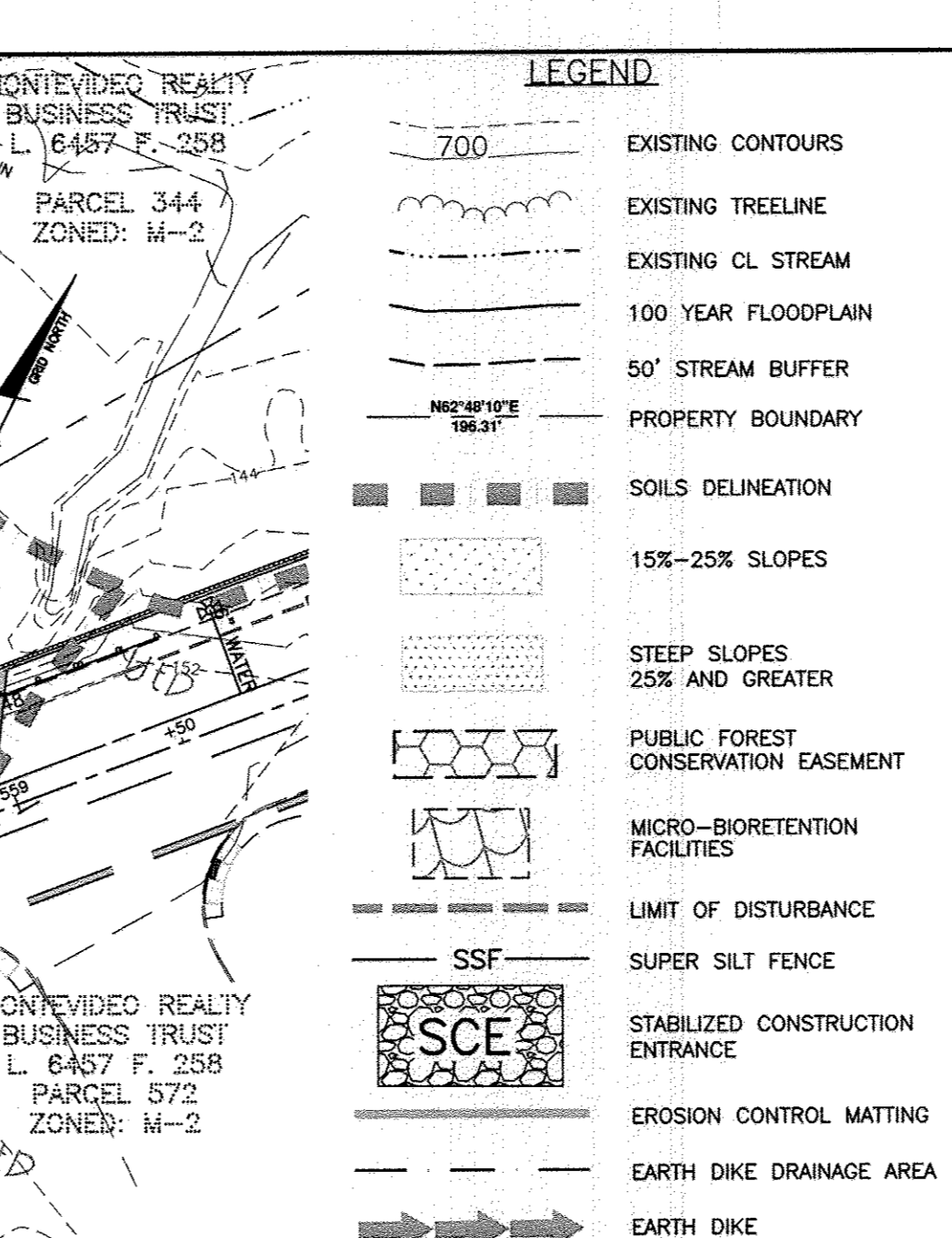
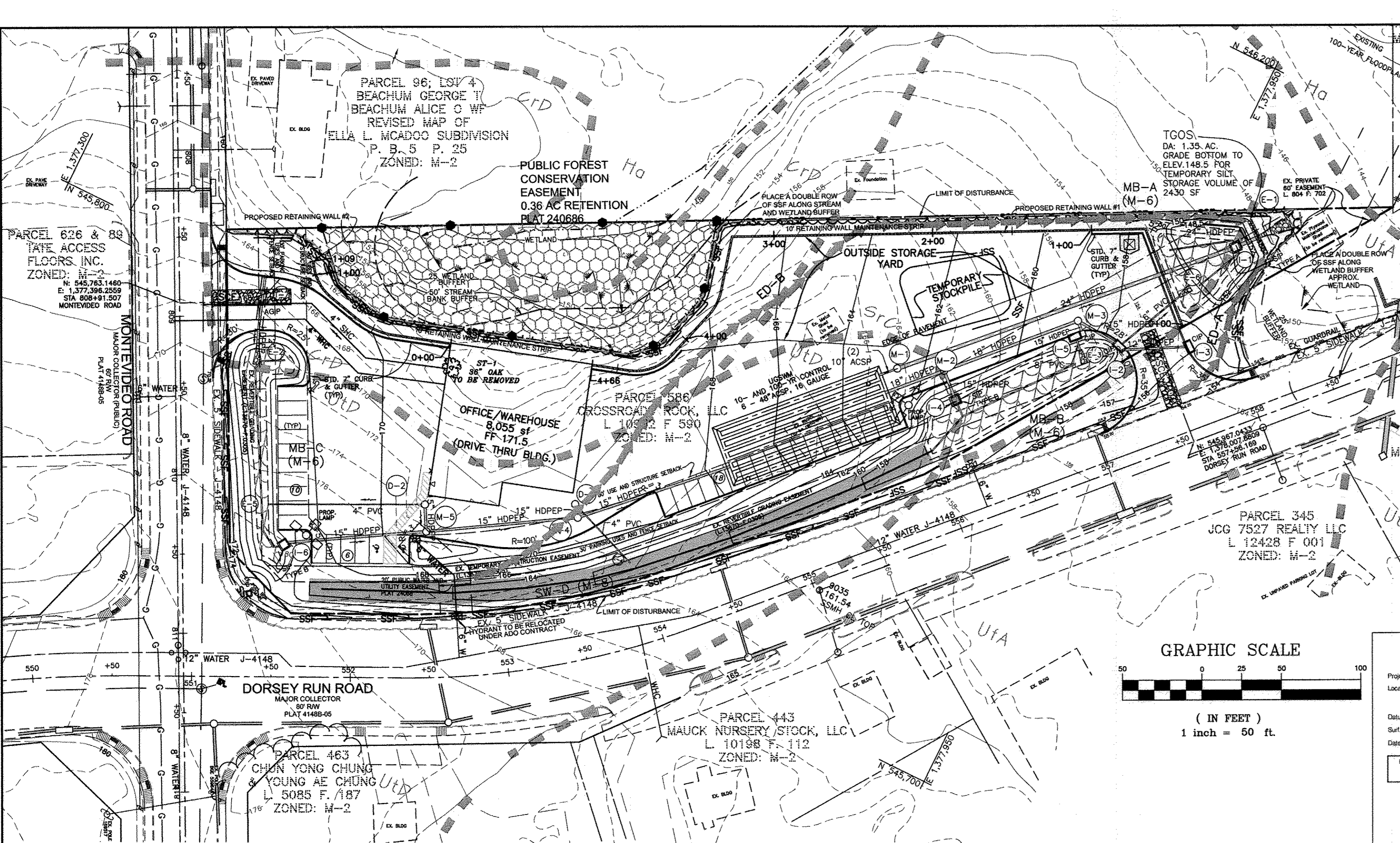
PROJECT: DORSEY RUN CENTER 7525 MONTEVIDEO ROAD

LOCATION: TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND

TITLE: ESD STORMWATER MANAGEMENT PLAN AND DETAILS, LANDSCAPE PLAN AND DETAILS

DATE: APRIL, 2017 **PROJECT NO:** 2039

DRAFT: AM **DESIGN:** AM **CHECK:** CAM **SCALE:** AS SHOWN **SHEET:** 2 OF 14



SEQUENCE OF CONSTRUCTION

- NOTIFY SEDIMENT CONTROL DIVISION 48 HOURS PRIOR TO START OF CONSTRUCTION
- OBTAIN GRADING PERMIT. (DAY 1)
 - INSTALL STABILIZED CONSTRUCTION ENTRANCE, SUPER SILT FENCE, EARTH DIKE ED-A, THE TOGS AND THE PORTION OF ED-B WHICH RUNS ALONG THE NORTHERN PROPERTY LINE. (DAY 2-6)
 - UPON APPROVAL OF HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, CLEAR AND GRUB ENTIRE SITE. (DAY 7-14)
 - INSTALL REMAINING EARTH DIKE ED-B. (DAY 15-16)
 - BEGIN MASS GRADING EASTERN SIDE OF SITE WITHIN EARTH DIKE AND INSTALL UNDERGROUND STORMWATER STORAGE TO M1 AND M4. (DAY 17-31)
 - BEGIN CONSTRUCTION OF RETAINING WALL #1 FROM 0+50 TO 2+50. MAINTAIN DRAINAGE TO DIKE A AND TOGS WHILE WALL CONSTRUCTION AND GRADING COMMENCE. (DAY 32-38)
 - BRING EASTERN SIDE OF SITE (WITHIN EARTH DIKE) TO GRADE, STABILIZING AREAS AS FINAL GRADE IS ACHIEVED. WITH PERMISSION OF INSPECTOR, REMOVE WESTERN PORTIONS OF EARTH DIKE AS POSITIVE FLOW TOWARD THE EAST IS ESTABLISHED, AND REMOVE REMAINING EARTH DIKE AND TOGS WHEN DRAINAGE AREA IS STABILIZED. COMPLETE FINE GRADING OF AREAS OUTSIDE OF EARTH DIKE. (DAY 39-44)
 - CONSTRUCT OUTFALL C-1 TO M-1 AND RETAINING WALL #1 FROM 0+00 TO 0+50. (DAY 45-50)
 - INSTALL EASTERN STORM DRAINS FROM UG50M TO I-1 THROUGH I-5 WITH INLET PROTECTION AND BLOCK DIVERSION OUTFALLS TO SWM. (DAY 51-55)
 - BEGIN MASS GRADES ON WESTERN SIDE OF SITE. PLACE STRUCTURAL FILL WITHIN BUILDING FOOTPRINT. (DAY 56-60)
 - COMPLETE RETAINING WALLS #1 AND #2, BUILDING FOUNDATION AND MASS GRADES. (DAY 60-80)
 - INSTALL WATER AND SEWER HOUSE CONNECTIONS, ALL STORM DRAINS WITH INLET PROTECTION, BLOCK DIVERSION OUTFALLS TO MICRO-BIORETENTION FACILITIES AND SWALE. BUILDING CONSTRUCTION MAY COMMENCE WHILE SITE CONSTRUCTION CONTINUES. (DAY 81-97)
 - FINE GRADE, PLACE PAVEMENT BASE STONE, CURB AND GUTTERS. (DAY 98-110)
 - WHEN STORMWATER FACILITY DRAINAGE AREAS ARE STABILIZED, AND WITH PERMISSION FROM INSPECTOR, STORMWATER MANAGEMENT FACILITIES MAY BE CONSTRUCTED. PERMANENT EROSION CONTROL MATTING OR SOD SHALL BE APPLIED TO SWALE-D AT COMPLETION OF STONE, UNDERDRAN AND FINISHING SOIL PLACEMENT. (DAY 111-125)
 - INSTALL BASE PAVEMENT. (DAY 126-130)
 - REMOVE ANY SEDIMENT FROM DIVERSION STRUCTURES, AND UNBLOCK DIVERSIONS TO SWM FACILITIES. (DAY 131-133)
 - INSTALL FINAL PAVEMENT. (DAY 134-136)
 - UPON APPROVAL OF THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR, REMOVE ALL REMAINING SEDIMENT CONTROL DEVICES, AND STABILIZED DISTURBED AREAS IN ACCORDANCE TO THE PERMANENT SEEDBED NOTES. (DAY 137-140)

SOILS LEGEND

MAP SYMBOL	SOIL GROUP	K ² FACTOR	SOIL TYPE
CrD**	C	0.37	CROOM AND EVESBORO SOILS, 10 TO 15 PERCENT SLOPES
*Ho**	D	0.37	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES
SrC**	B	0.37	SASSAFRAS AND CROOM SOILS, 5 TO 10 PERCENT SLOPES
UD	D	0.28	URBAN LAND - UDORTHERS COMPLEX, 0 TO 15 PERCENT SLOPES
Ufa*	D	0.24	URBAN LAND-FALLSINGTON COMPLEX, 0 TO 2 PERCENT SLOPES

TAKEN FROM NRCS WEB SOIL SURVEY, JUNE 2014, HOWARD COUNTY SOIL SURVEY MAP NO. 25
 **INDICATES HYDRIC SOIL GROUP
 ***INDICATES HIGHLY ERODIBLE SOIL GROUP. ADDITIONAL OR MORE STRINGENT SEDIMENT CONTROL MEASURES MAY BE NECESSARY.

- SEDIMENT CONTROL NOTES**
- A pre-construction meeting must occur with the Howard County Department of Public Works, Construction Inspection Division (CID), 410-313-1858 after the future LOD and protected areas are marked clearly in the field. A minimum of 48 hour notice to CID must be given at the following stages:
 - Prior to the start of earth disturbance.
 - Upon completion of the installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading.
 - Prior to the start of another phase of construction or opening of another grading unit.
 - Prior to the removal or modification of sediment control practices.
 Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made. Other related state and federal permits shall be referenced to ensure coordination and to avoid conflicts with this plan.
 - All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
 - Following initial soil disturbance or re-disturbance, permanent or temporary stabilization is required within three (3) calendar days as to the surface of all perimeter controls, dikes, swales, ditches, perimeter slopes, and all slopes steeper than 3 horizontal to 1 vertical (3:1), and seven (7) calendar days as to all other disturbed areas on the project site except for those under active grading.
 - All disturbed areas must be stabilized within the time period specified above in accordance with the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for topsoil (Sec. B-4-2), permanent seeding (Sec. B-4-5), temporary seeding (Sec. B-4-4) and mulching (Sec. B-4-3). Temporary stabilization with mulch alone can only be applied between the fall and spring seeding dates if the ground is frozen. Incremental stabilization (Sec. B-4-1) specifications shall be enforced in areas with >15% of cut and/or fill. Stockpiles (Sec. B-4-8) in excess of 20 ft. must be benched with stable outlet. All concentrated flow, steep slope, and highly erodible areas shall receive soil stabilization matting (Sec. B-4-6).
 - All sediment control structures are to remain in place, and are to be maintained in operative condition until permission for their removal has been obtained from the CID.
 - Site Analysis:
 - Total Area of Site: 2.76 Acres
 - Area to be roofed or paved: 2.50 Acres
 - Area to be vegetatively stabilized: 1.06 Acres
 - Total Cut: 800 Cu. Yds.
 - Total Fill: 800 Cu. Yds.
 Offsite waste/borrow area location: TO BE DETERMINED BY CONTRACTOR
 - Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
 - Additional sediment control must be provided, if deemed necessary by the CID. The site and all controls shall be inspected by the contractor weekly, and the next day after each rain event. A written report by the contractor, made available upon request, is part of every inspection and should include:
 - Inspection type (routine, pre-storm event, during rain event)
 - Name and title of inspector
 - Weather information (current conditions as well as time and amount of last recorded precipitation)
 - Brief description of project's status (e.g., percent complete) and/or current activities
 - Evidence of sediment discharges
 - Identification of plan deficiencies
 - Identification of sediment controls that require maintenance
 - Identification of missing or improperly installed sediment controls
 - Compliance status regarding the sequence of construction and stabilization requirements
 - Photographs
 - Monitoring/sampling
 - Maintenance and/or corrective action performed
 - Other inspection items as required by the General Permit for Stormwater Associated with Construction Activities (NPDES, MDC).
 - Repairs for the construction of utilities is limited to three pipe lengths or that which can and shall be back-filled and stabilized by the end of each workday, whichever is shorter.
 - Any major changes or revisions to the plan or sequence of construction must be reviewed and approved by the HSCD prior to proceeding with construction. Minor revisions may be approved by the CID per the list of HSCD-approved field changes.
 - Disturbance shall not occur outside the L.O.D. A project is to be sequenced so that grading activities begin on one grading unit (maximum area of 20 ac. per grading unit) at a time. Work may proceed to a subsequent grading unit when at least 50 percent of the disturbed area in the preceding grading unit has been stabilized and approved by the CID. Unless otherwise specified and approved by the HSCD, no more than 30 acres cumulatively may be disturbed at a given time.
 - Runoff water from any equipment, vehicles, wheels, pavement, and other sources must be treated in a sediment basin or other approved washout structure.
 - Topsoil shall be stockpiled and preserved on-site for redistribution onto final grade.
 - All Silt Fence and Super Silt Fence shall be placed on-the-contour, and be infiltrated at 25-minimum intervals, with lower ends curled uphill by 2" in elevation.
 - Stream channels which are to be disturbed during the following restricted time periods (inclusive):
 - Use I and IP March 1 - June 15
 - Use III and IIP October 1 - April 30
 - Use IV March 1 - May 25
 - A copy of this plan, the 2011 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and associated permits shall be on-site and available when the site is active.

ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Alice A. Miller 4-11-17
 ALICE A. MILLER, P.E. MD REGISTRATION P.E. 28376

DEVELOPER'S CERTIFICATE

I, THE UNDERSIGNED, HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION OR DEVELOPMENT WILL BE DONE PURSUANT TO THIS APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS AND THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN WILL BE MAINTAINED THROUGHOUT THE CONSTRUCTION OF A MARYLAND DEPARTMENT OF THE ENVIRONMENT PROVIDED TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENT PROBLEMS, AND THAT THE PROJECT WILL BE MAINTAINED FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY HOWARD SOIL CONSERVATION DISTRICT AND/OR IDE.

Mark Levy 4-17-17
 MARK LEVY, CROSSROADS ROCK, LLC DATE

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

John Blanton 5/24/17
 HOWARD SOIL CONSERVATION DISTRICT

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kristen L. ... 5-31-17
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

John ... 5-24-17
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Walter ... 5-31-17
 DIRECTOR DATE

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

Project Name: 7525 Montevideo SWM Boring No. B-6 Location: Jessup, MD Job # 16100A

Elevation/Depth	SOIL SYMBOL/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Roc. (NMI)	SPT Blows	SPT Blows/Foot	
						N	Cu/Fr %
111.0	D	White tan, moist, loose sandy silt (SM-SPLoamy Sand)	Topsoil - 4"	11	4.4	2-0	5
108.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		12	6.6	6-6	11
105.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		13	10.5	7.5-5	10
102.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		12	4.4	4-4	9
99.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		13	5.6	5-6	12

Bottom of boring at 18.0'

GROUND WATER: 17.8' n
 CAVEIN DEPTH: 18.8' n
 BORING METHOD: HSA-HOLLOW STEM AUGERS
 SAMPLE CONDITIONS: D-DISCONTINUED
 AT COMPLETION: DY n
 AFTER 24 HRS: DY n
 AFTER 72 HRS: DY n

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

Project Name: 7525 Montevideo SWM Boring No. B-7 Location: Jessup, MD Job # 16100A

Elevation/Depth	SOIL SYMBOL/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Roc. (NMI)	SPT Blows	SPT Blows/Foot	
						N	Cu/Fr %
111.0	D	White tan, moist, loose sandy silt (SM-SPLoamy Sand)	Topsoil - 4"	10	12.7	4-7-10	17
108.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		10	4.4	4-4	13
105.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		6	4-8	4-8	15
102.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		10	5.6	5-6	14
99.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		7	2-4	2-4	10

Bottom of boring at 20.0'

GROUND WATER: 17.8' n
 CAVEIN DEPTH: 18.8' n
 BORING METHOD: HSA-HOLLOW STEM AUGERS
 SAMPLE CONDITIONS: D-DISCONTINUED
 AT COMPLETION: DY n
 AFTER 24 HRS: DY n
 AFTER 72 HRS: DY n

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

Project Name: 7525 Montevideo SWM Boring No. B-8 Location: Jessup, MD Job # 16100A

Elevation/Depth	SOIL SYMBOL/ SAMPLE CONDITIONS	Description	Boring and Sampling Notes	Roc. (NMI)	SPT Blows	SPT Blows/Foot	
						N	Cu/Fr %
111.0	D	White tan, moist, loose sandy silt (SM-SPLoamy Sand)	Topsoil - 4"	10	12.7	4-7-10	17
108.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		10	4.4	4-4	13
105.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		6	4-8	4-8	15
102.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		10	5.6	5-6	14
99.0	D	Orange-brown, moist, loose, silty sand, trace organic, trace silt (SM-Sandy Loam)		7	2-4	2-4	10

Bottom of boring at 20.0'

GROUND WATER: 17.8' n
 CAVEIN DEPTH: 18.8' n
 BORING METHOD: HSA-HOLLOW STEM AUGERS
 SAMPLE CONDITIONS: D-DISCONTINUED
 AT COMPLETION: DY n
 AFTER 24 HRS: DY n
 AFTER 72 HRS: DY n

SEE SHEET 2 FOR BORING LOCATIONS

BENCHMARK ENGINEERING, INC.
 ENGINEERS & LAND SURVEYORS & PLANNERS
 8480 BALTIMORE NATIONAL PIKE & SUITE 315 ELLEWOOD CITY, MARYLAND 21043
 (703) 410-6510 (703) 410-6511
 WWW.BE-CIVLENGINEERING.COM

Professional Certificate No. 17177
 License No. 28376, Expiration Date: 1-1-2019.

OWNER/DEVELOPER: CROSSROADS ROCK, LLC
 6800 DEERPATH ROAD, SUITE 100 ELKCRIDGE, MD 21075 (410) 579-2442

PROJECT: DORSEY RUN CENTER 7525 MONTEVIDEO ROAD

LOCATION: TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND

TITLE: SEDIMENT AND EROSION CONTROL PLAN, NOTES AND SOIL BORING LOGS

DATE: APRIL, 2017 **PROJECT NO.:** 2039

DRAFT: AM **DESIGN:** AM **CHECK:** CAM **SCALE:** AS SHOWN **SHEET:** 3 OF 14

SDP-16-064

B-4-5 STANDARDS AND SPECIFICATIONS FOR PERMANENT STABILIZATION

Definition: To stabilize disturbed soils with permanent vegetation.

Purpose: To use long-term techniques to establish permanent ground cover on disturbed soils.

Conditions Where Practice Applies: Exposed soils where ground cover is needed for 6 months or more.

Criteria:

1. Select one or more of the species or mixtures listed in Table B.3 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.
2. Additional planting specifications for exceptional sites such as shorelines, stream banks, or dunes or for special purposes such as wildlife habitat treatment may be found in USDA-NRCS Technical Field Office Guide, Section 342 Critical Area Planting.
3. For sites having disturbed areas over 5 acres, use and show the rates recommended by the soil testing agency.
4. For areas receiving low maintenance, apply urea form fertilizer (46-0-0) at 3 1/2 pounds per 1000 square feet (150 pounds per acre) at the time of seeding and install the soil amendments shown in the Permanent Seeding Summary.

2. Turfgrass Mixtures

a. Areas where turfgrass may be desired include lawns, parks, playgrounds, and commercial sites which will receive a medium to high level of maintenance.

b. Select one or more of the species or mixtures listed below based on the site conditions or purpose. Enter selected mixture(s), application rates, and seeding dates in the Permanent Seeding Summary. The summary is to be placed on the plan.

- i. Kentucky Bluegrass: Full Sun Mixture: For use in areas that receive intensive maintenance. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended Kentucky Bluegrass Cultivars: Seeding Rate: 1.5 to 2.0 pounds per 1000 square feet. Choose a minimum of three Kentucky Bluegrass Cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
- ii. Kentucky Bluegrass/Perennial Ryegrass: Full Sun Mixture: For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive maintenance. Certified Kentucky Bluegrass Cultivars/Certified Kentucky Bluegrass Seeding Rate: 2 pounds mixture per 1000 square feet. Choose a minimum of three Kentucky Bluegrass cultivars with each ranging from 10 to 35 percent of the total mixture by weight.
- iii. Tall Fescue/Kentucky Bluegrass: Full Sun Mixture: For use in drought prone areas and/or for areas receiving low to medium maintenance in full sun to medium shade. Recommended mixture includes: Certified Tall Fescue Cultivars 95 to 100 percent. Certified Kentucky Bluegrass Cultivars 0 to 5 percent. Seeding Rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
- iv. Kentucky Bluegrass/Fine Fescue: Shade Mixture: For use in areas with shade in Seeding Rate: 1.5 to 3 pounds per 1000 square feet.

c. Select turfgrass varieties from those listed in the most current University of Maryland Publication, Agronomy Memo #77 "Turfgrass Substrates Recommendations for Maryland".

d. Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Station, provides a reliable means of consumer protection.

e. Ideal times of Seeding for Turf Grass Mixtures

Hardness Zone: Maryland: August 1 to October 1 (Hardness Zones: 5b, 6b)
 Central MD: March 1 to May 15, August 15 to October 15 (Hardness Zones: 7a, 7b)
 Southern MD, Eastern Shore: March 1 to May 15, August 15 to October 15 (Hardness Zones: 7a, 7b)

f. Till areas to receive seed by disking or other approved methods to a depth of 2 to 4 inches. Level and rake the area to prepare a proper seedbed. Remove stones and debris over 1 1/2 inches in diameter. The resulting seedbed must be in such condition that future mowing of grasses will pose no difficulty.

g. If soil moisture is deficient, water for plant growth at a rate of 1/2 to 1 inch every 3 to 4 days depending on soil texture) until they are firmly established. This is not especially true in areas where seeds are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

h. Soils to provide quick cover on disturbed areas (2:1 or flatter).

3. General Specifications

- a. Class of turfgrass must be Maryland State Certified. Sod labels must be made available to the job foreman and inspector.
- b. Sod must be machine cut at a uniform soil thickness of 1/2 inch, plus or minus 1/4 inch, at the time of cutting. Measurement for thickness must exclude top growth and thatch. Broken pads and torn or uneven ends will not be acceptable.
- c. Standard size sections of sod must be strong enough to support their own weight and retain their size and shape when suspended vertically in water for 24 hours. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should follow the contour.
- d. Sod must not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- e. Sod must be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period must be approved by an agronomist or soil scientist prior to its installation.
- f. During periods of excessively high temperature or in areas having dry subsoil, lightly irrigate the subsoil immediately prior to laying the sod.
- g. Lay the first row of sod in a straight line with subsequent rows placed parallel to it and tightly wedged against each other. Stagger lateral joints to promote more uniform growth and strength. Ensure that sod is laid in a staggered pattern and that all joints are buttled light in order to prevent water from causing air drying of the roots.
- h. Whenever possible, lay sod with the long edges parallel to the contour and with staggering joints. Roll and tamp, pat or otherwise secure the sod to prevent slippage on slopes. Ensure solid contact exists between sod roots and the underlying soil surface.
- i. After the sod is immediately following rolling and tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. Complete the operations of laying, tamping and irrigating for any piece of sod within eight hours.
- j. In the absence of adequate rainfall, water daily during the first week or as often and sufficiently as necessary to maintain moisture to a depth of 4 inches. Water during the heat of the day to prevent surface drying.
- k. Do not mow until the sod is firmly rooted. No more than 1/3 of the grass leaf must be removed by the initial cutting, subsequent to a grass height of at least 3 inches unless otherwise specified.

B-4-4 STANDARDS AND SPECIFICATIONS FOR TEMPORARY STABILIZATION

Definition: To stabilize disturbed soils with vegetation for up to 6 months.

Purpose: To use temporary techniques that provide cover on disturbed soils.

Conditions Where Practice Applies: Exposed soils where ground cover is needed for a period of 6 months or more.

Criteria:

1. Select one or more of the species or seed mixtures listed in Table B.1 for the appropriate Plant Hardiness Zone (from Figure B.3) and based on the site condition or purpose found on Table B.2. Enter selected mixture(s), application rates, seeding dates and seeding depths. If this Summary is not put on the plan and completed, then Table B.1 plus fertilizer and lime rates must be put on the plan.
2. For sites having soil tests performed, use and show the recommended rates by the testing agency. Soil tests are not required for Temporary Seeding.
3. When stabilization is required outside of a seeding season, apply seed and mulch or straw mulch alone as prescribed in Section B-4-3.A.1.b and maintain until the next seeding season.

B-4-2 STANDARDS AND SPECIFICATIONS FOR SOIL PREPARATION, TOPSOILING, AND SOIL AMENDMENTS

A. Soil Preparation

1. Temporary Stabilization
 - a. Seedbed preparation consists of loosening soil to a depth of 3 to 5 inches by means of suitable agricultural or construction equipment, such as disc harrows or chisel plows or rippers mounted on construction equipment. After the soil is loosened, it must not be rolled or dragged smooth but left in the roughened condition. Slopes 3:1 or flatter are to be trenched with ridges running parallel to the contour of the slope.
 - b. Apply fertilizer and lime as prescribed on the plans.
 - c. Incorporate lime and fertilizer into the top 3 to 5 inches of soil by disking or other suitable means.
2. Permanent Stabilization
 - a. A soil test is required for any earth disturbance of 5 acres or more. The minimum soil conditions required for permanent vegetative establishment are:
 - i. Soil pH between 6.0 and 7.0
 - ii. Soluble salts less than 500 parts per million (ppm)
 - iii. Soil contains less than 40 percent clay but enough fine grained material (greater than 30 percent silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception: If leavages will be planted, then a sandy soil (less than 30 percent silt plus clay) would be acceptable.
 - iv. Soil contains 1.5 percent minimum organic matter by weight.
 - v. Soil contains sufficient pore space to permit adequate root penetration.
 - b. Application of amendments or topsoil is required if on-site soils do not meet the above conditions.
 - c. Graded areas must be maintained in a true and even grade as specified on the approved plan, then scarified or otherwise loosened to a depth of 3 to 5 inches.
 - d. Apply soil amendments as specified on approved plans or as indicated by the results of a soil test.
 - e. Mix soil amendments into the top 3 to 5 inches of soil by disking or other suitable means. Rake loose areas to smooth the surface, remove large objects like stones and branches, and reseed the area for seed application. Loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface where soil conditions will not provide for permanent vegetation. Trench slopes 3:1 or flatter with tracked equipment leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. Leave the top 1 to 3 inches of soil loose and friable. Seeded loosening may be unnecessary on newly disturbed areas.

Permanent Seeding Summary

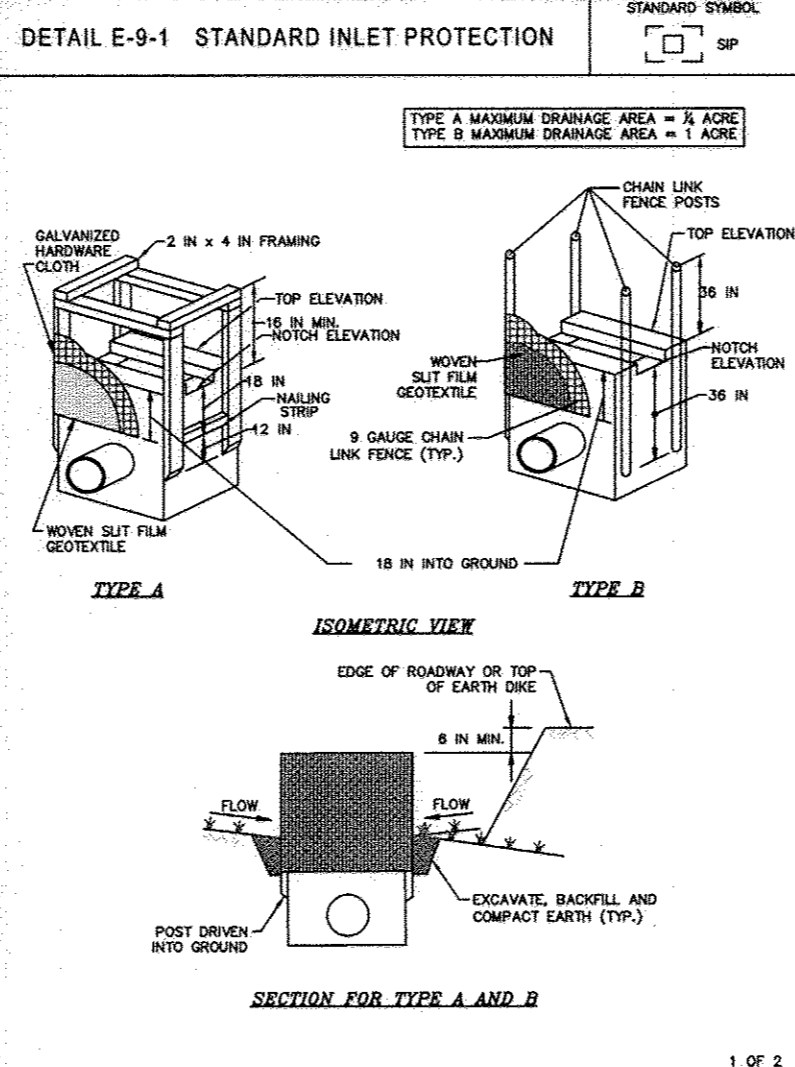
No.	Species	Application Rate (lb./ac)	Seeding		Fertilizer Rate (10-20-20)			Lime Rate
			Rate	Depth	N	P2O5	K2O	
9	Fescue, Tall	60	Mar 1 to May 15	1/4 - 1/2 in	45 pounds per acre	90 lb/ac	90 lb/ac	2 tons/ac
			Aug 1 to Oct 15	1/4 - 1/2 in	(1.0 lb/1000 ft ²) (100#)	(2 lb/1000 ft ²) (200#)	(1000#)	(3000#)
9	Bluegrass, Kentucky	40	Mar 1 to May 15	1/4 - 1/2 in	45 pounds per acre	90 lb/ac	90 lb/ac	2 tons/ac
			Aug 1 to Oct 15	1/4 - 1/2 in	(1.0 lb/1000 ft ²) (100#)	(2 lb/1000 ft ²) (200#)	(1000#)	(3000#)

Table B.1: Temporary Seeding for Site Stabilization

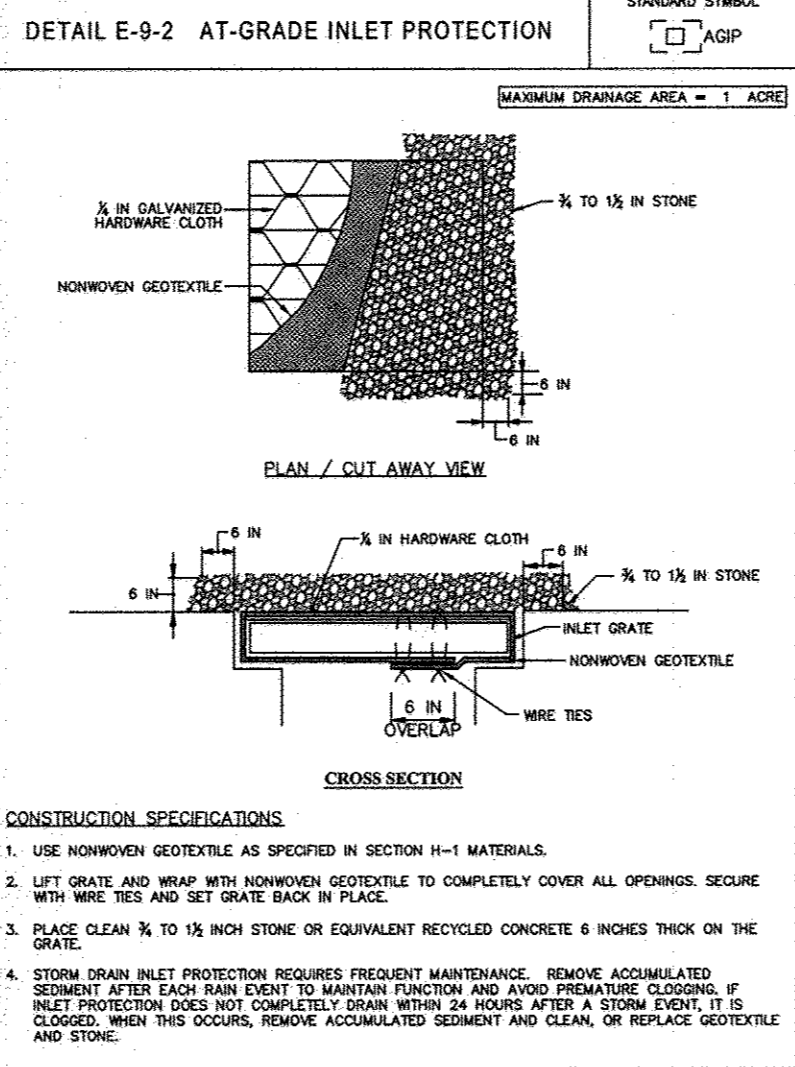
Plant Species	Seeding Rate 1/2 (lb/1000ft ²)	Seeding Depth 2/ (inches)	Recommended Seeding Dates by Plant Hardiness Zone 3/	
			5b and 6a	6b 7a and 7b
Cool-Season Grasses				
Annual Ryegrass (Lolium perenne ssp. Multiflorum)	40	1.0	0.5	Mar 15 to May 31; Aug 1 to Sep 30
Barley (Hordeum vulgare)	96	2.0	1.0	Mar 15 to May 31; Aug 1 to Sep 30
Oats (Avena sativa)	72	1.7	1.0	Mar 15 to May 31; Aug 1 to Sep 30
Wheat (Triticum aestivum)	120	2.8	1.0	Mar 15 to May 31; Aug 1 to Sep 30
Cereal Rye (Secale cereale)	112	2.8	1.0	Mar 15 to May 31; Aug 1 to Oct 31
Warm-Season Grasses				
Foxtail Millet (Setaria italica)	30	0.7	0.5	Jun 1 to Jul 31
Pearl Millet (Pennisetum glaucum)	20	0.5	0.5	Jun 1 to Jul 31

Notes:

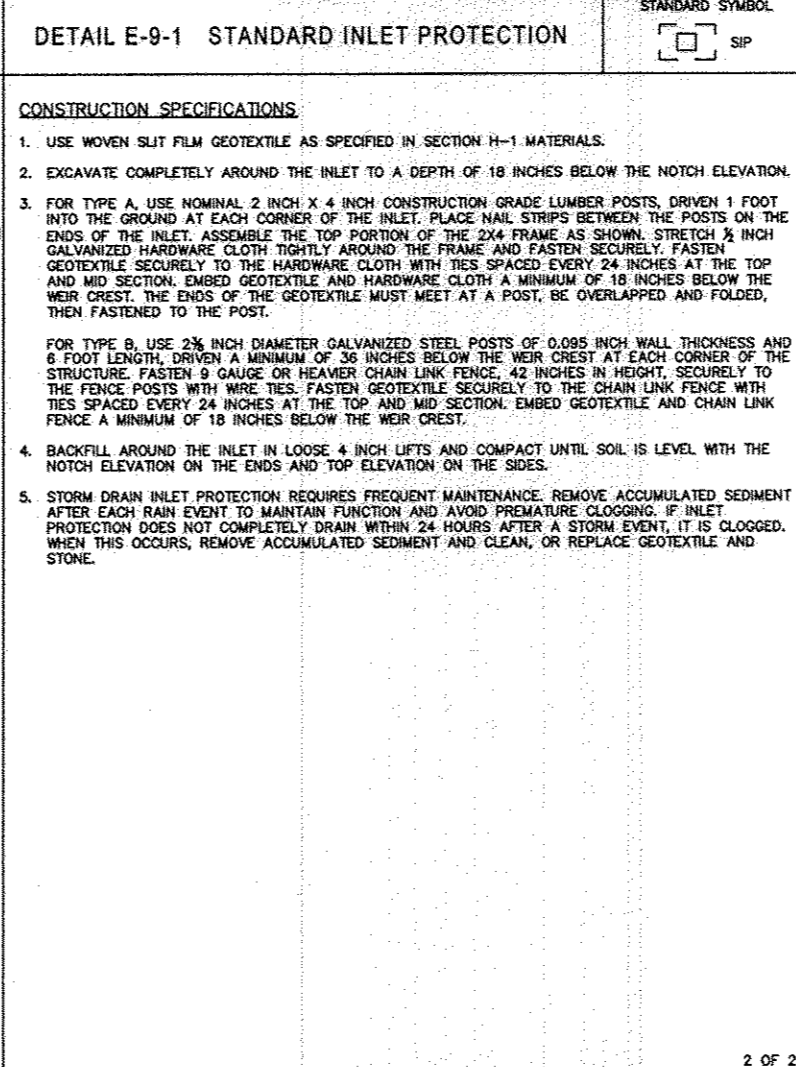
- 1/ Seeding rates for the warm season grasses are in pounds of Pure Live Seed (PLS). Actual planting rates shall be adjusted to reflect percent seed germination and purity, as tested. Adjustments are usually not needed for the cool-season grasses.
- 2/ Seeding rates listed above are for temporary seedings, when planted alone. When planted as a nurse crop with permanent seed mixes, use 1/3 of the seed rate listed above for barley, oats, and wheat. For smaller-seeded grasses (annual ryegrass, pearl millet, foxtail millet), do not exceed more than 5% of the overall permanent seeding mix. Cereal rye generally should not be used as a nurse crop, unless planting will occur very late fall beyond the seeding dates for other temporary seedings. Cereal rye has allelopathic properties that inhibit the germination and growth of other plants. If it must be used as a nurse crop, seed at 1/3 of the rate listed above.
- 3/ Oats are the recommended nurse crop for warm-season grasses.
- 4/ For sandy soils, plant seeds at twice the depth listed above.
- 5/ The planting dates listed are averages for each zone and may require adjustment to reflect local conditions, especially near the boundaries of the zone.



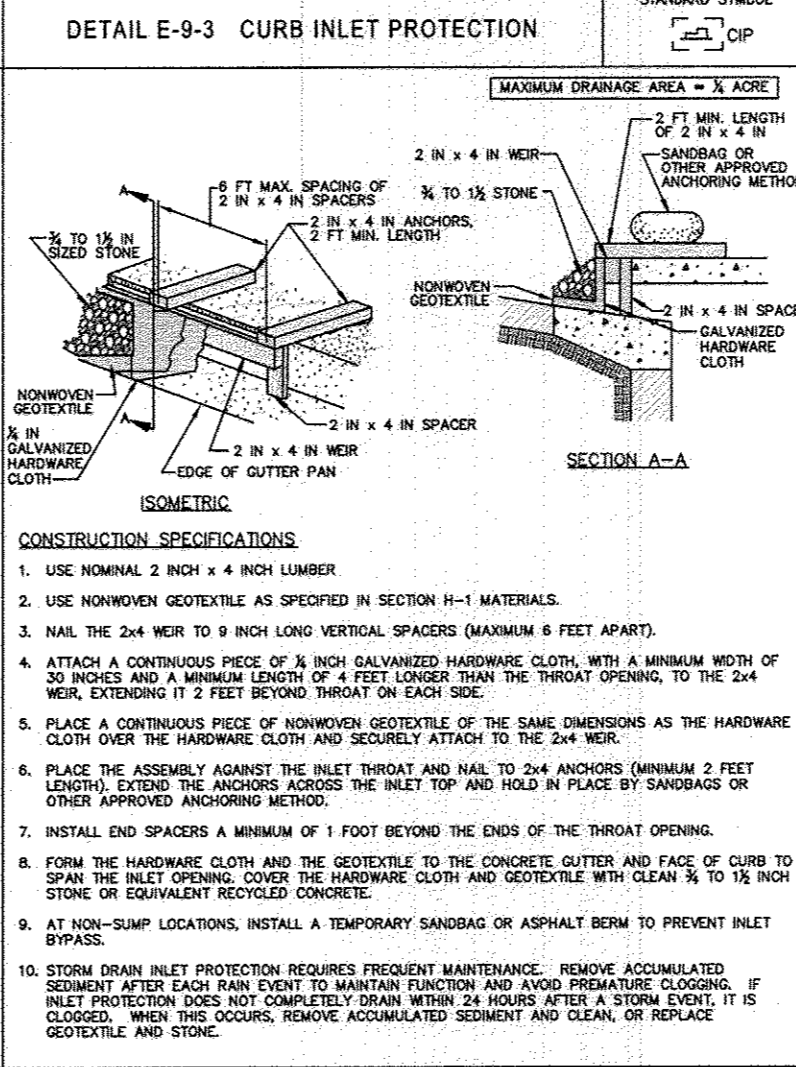
1 OF 2



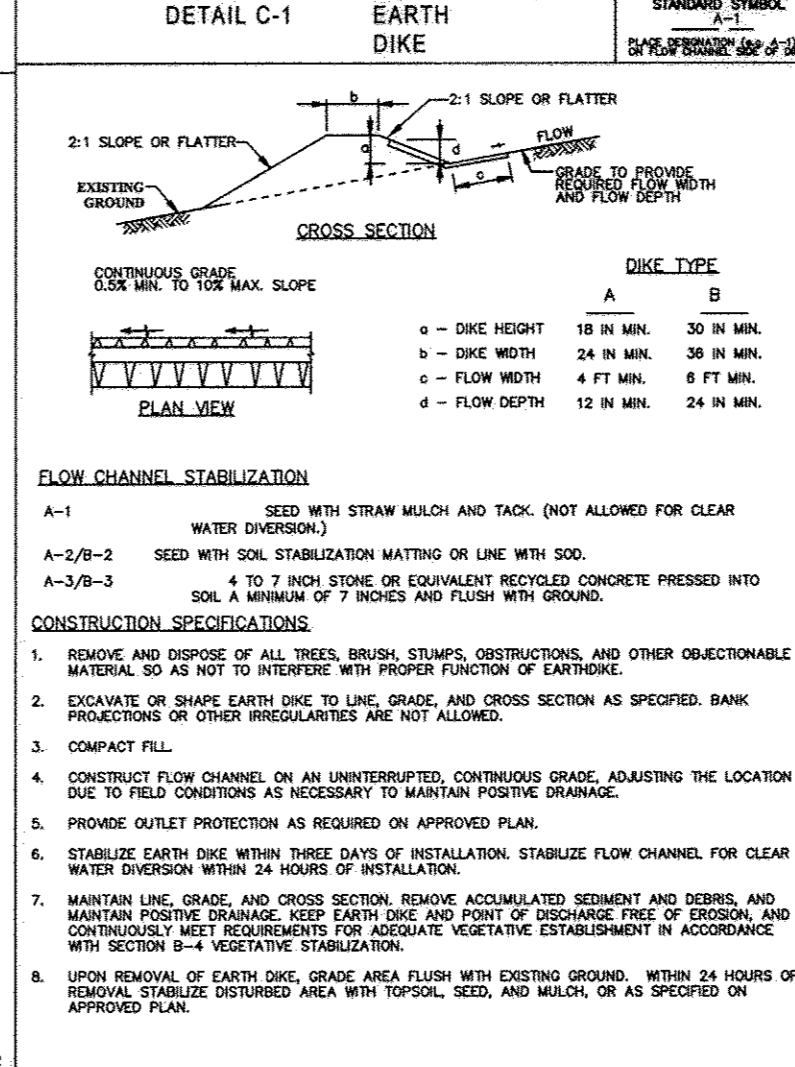
1 OF 2



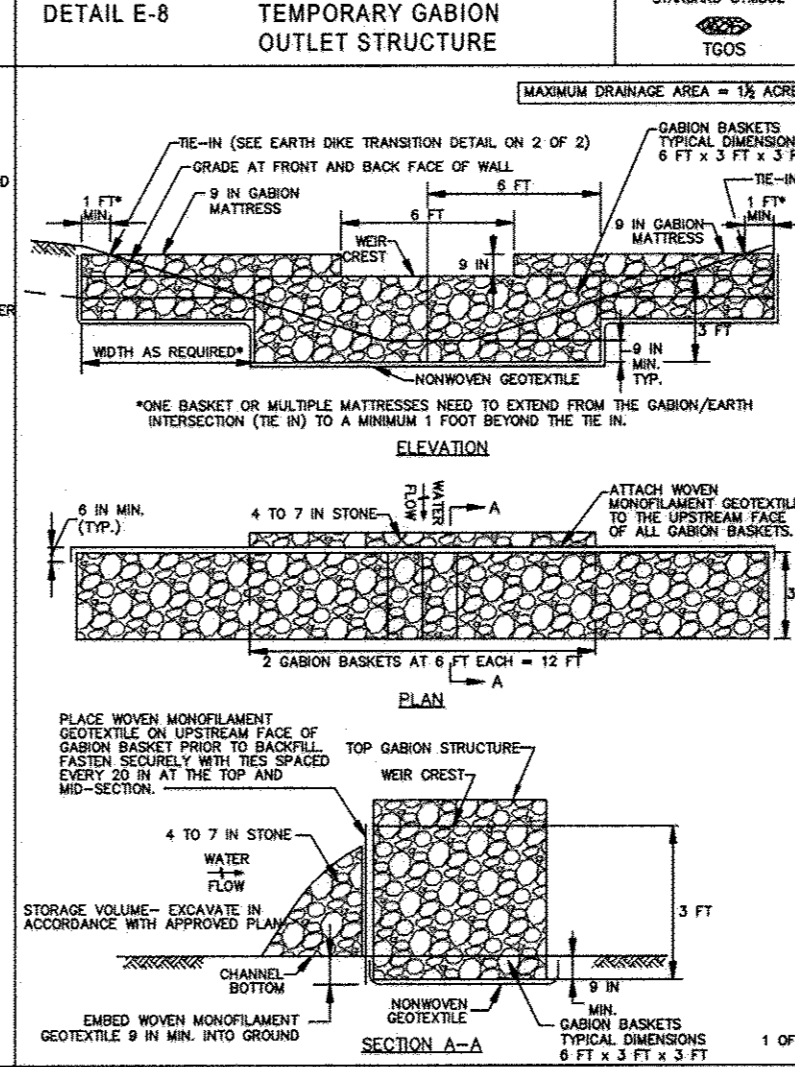
2 OF 2



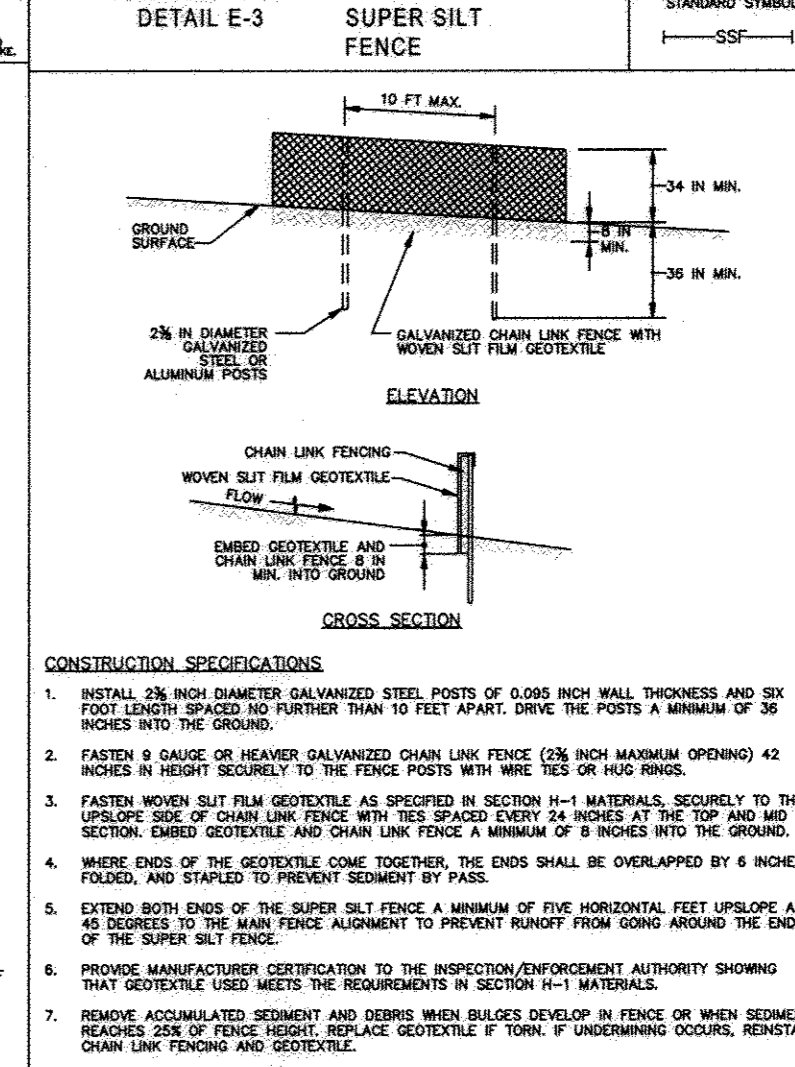
1 OF 2



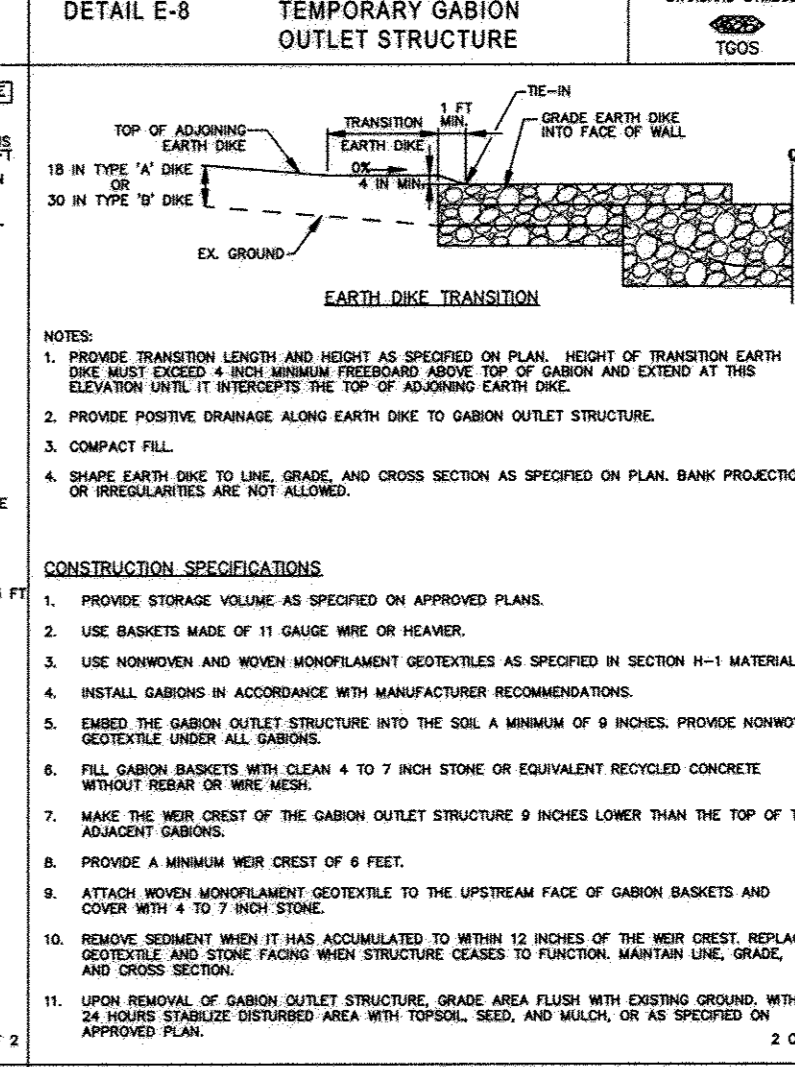
1 OF 2



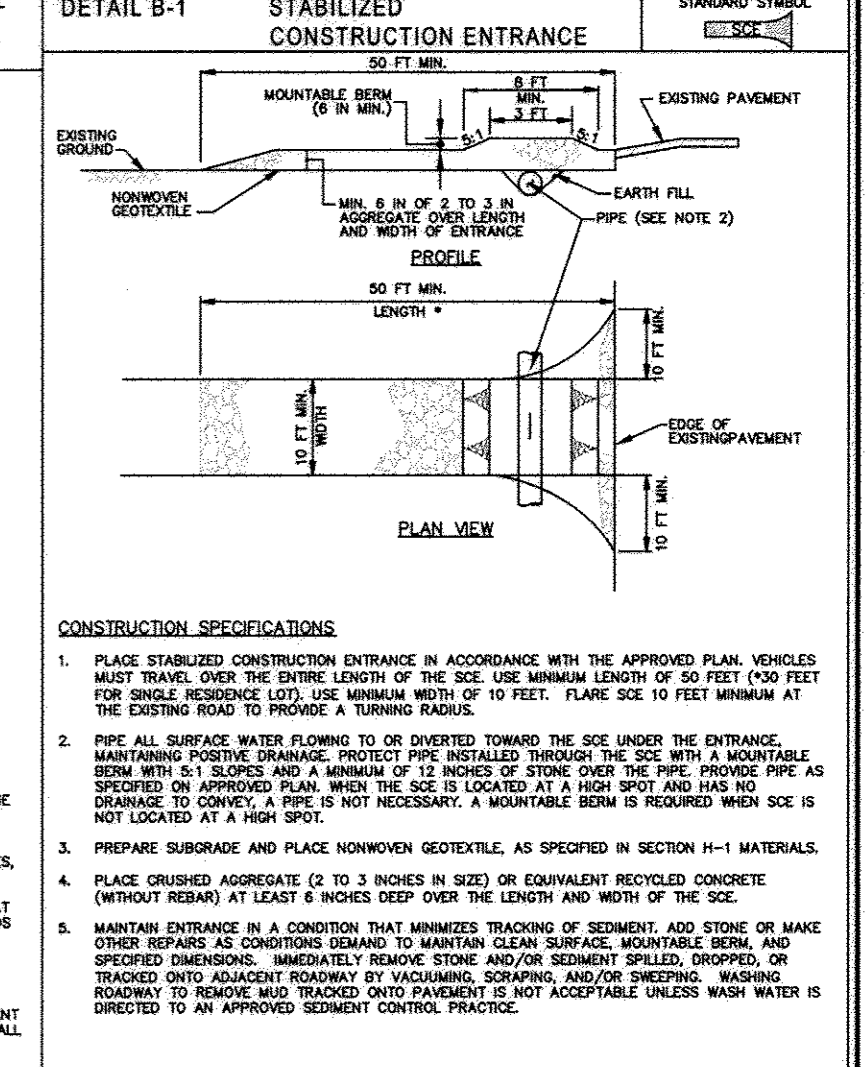
1 OF 2



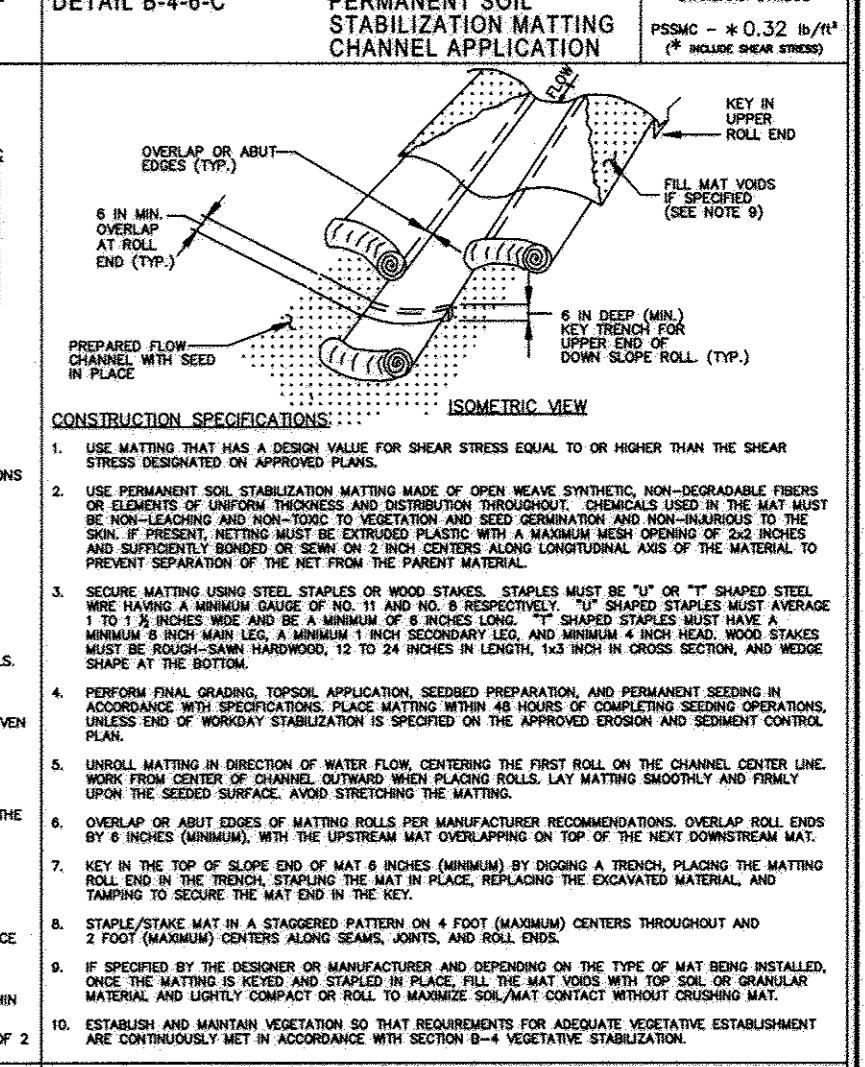
1 OF 2



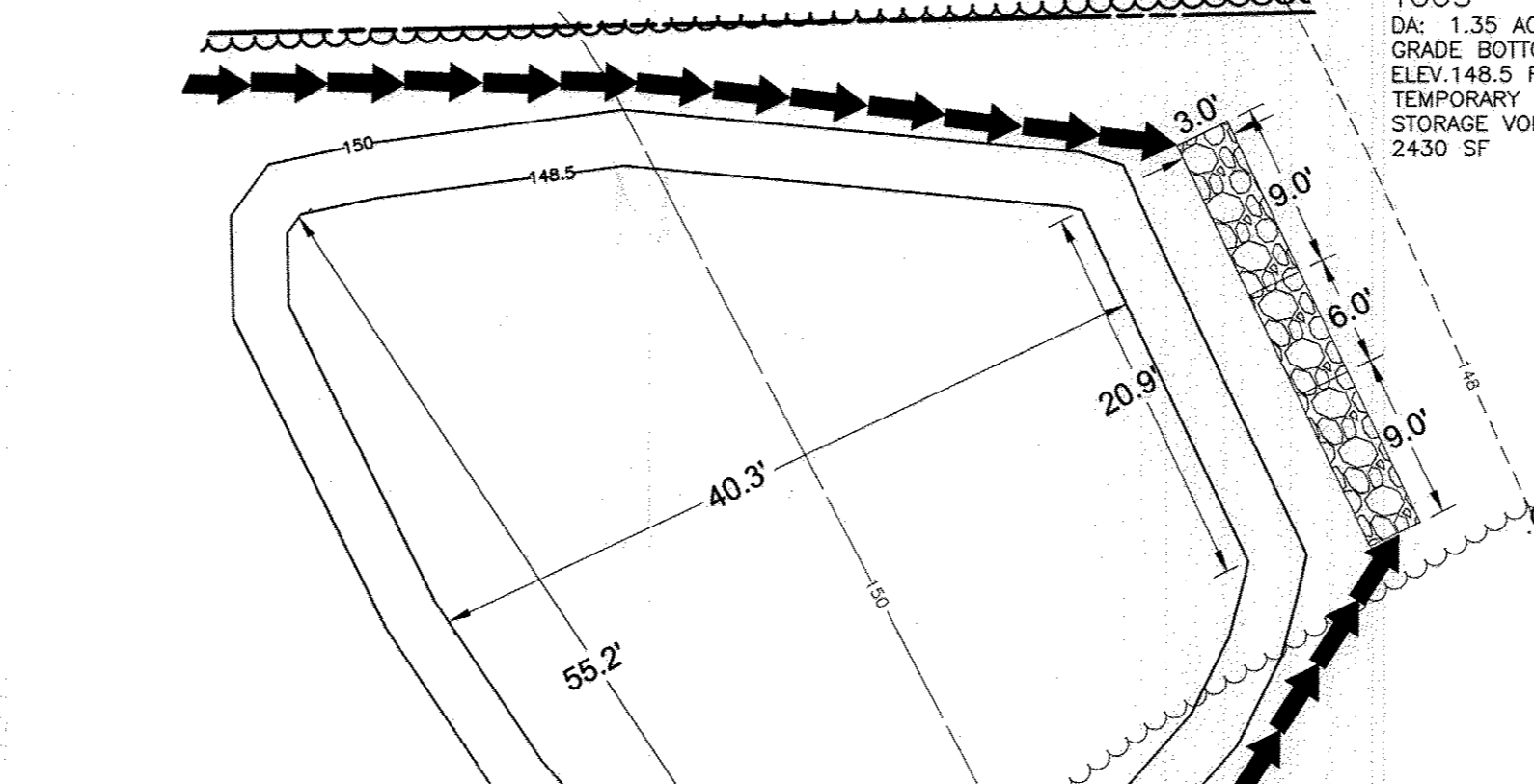
2 OF 2



1 OF 2



1 OF 2



TSOS STORAGE SIZING:

DA: 1.35 AC
 GRADE BOTTOM TO ELEV. 14.65 FEET
 DRAINAGE AREA: 1.35 AC
 1800 CF/AC * 1.35 AC = 2,430 CF
 STORAGE VOLUME OF 2,430 SF

ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS, AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Mark Levy 4-11-17
 MARK LEVY, CROSSROADS, ROCK LLC
 P.E. MD REGISTRATION P.E. 28376

DEVELOPER'S CERTIFICATE

I/WE HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION, OR DEVELOPMENT WILL BE DONE PURSUANT TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENTATION TO BEGINNING INTERMEDIATE, CREDIT RIGHT-OF-CUTTER FOR PERIODIC ON-SITE EVALUATION BY HOWARD COUNTY SOIL CONSERVATION DISTRICT AND/OR MDC.

Mark Levy 4-17-17
 MARK LEVY, CROSSROADS, ROCK LLC
 DATE

BENCHMARK ENGINEERING, INC.

ENGINEERS & LAND SURVEYORS & PLANNERS

8480 BALTIMORE NATIONAL PIKE & SUITE 315A ELLICOTT CITY, MARYLAND 21043
 (P) 410-410-6644
 WWW.BEC-ENGINEERING.COM

NO. DATE REVISION

OWNER/DEVELOPER: CROSSROADS, ROCK, LLC
 6800 DEERPATH ROAD, SUITE 100
 ELKRIE, MD 21075
 (410) 579-2442

PROJECT: DORSEY RUN CENTER
 7525 MONTEVIDEO ROAD

LOCATION: TAX MAP 43, PARCEL 586
 1ST ELECTION DISTRICT
 ZONED: M-2
 HOWARD COUNTY, MARYLAND

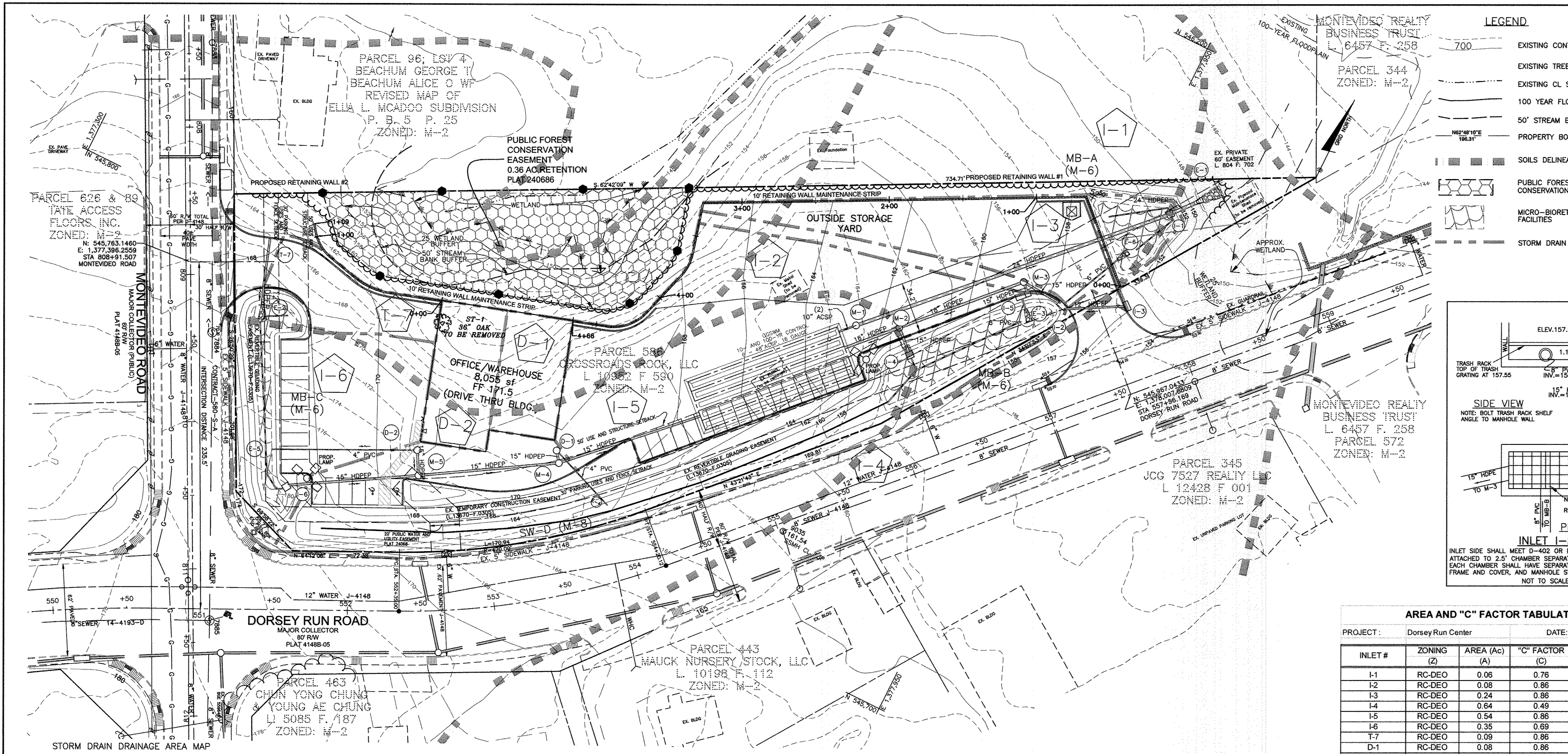
TITLE: EROSION AND SEDIMENT CONTROL SPECIFICATIONS AND DETAILS

DATE: APRIL, 2017 **PROJECT NO.:** 2039
SCALE: AS SHOWN **SHEET 4 OF 14**

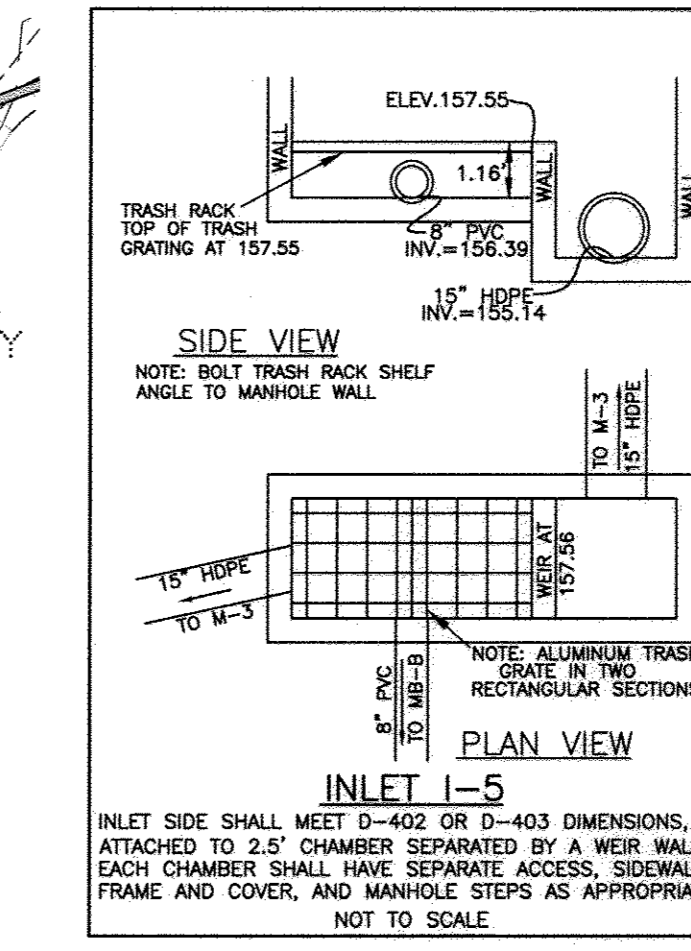
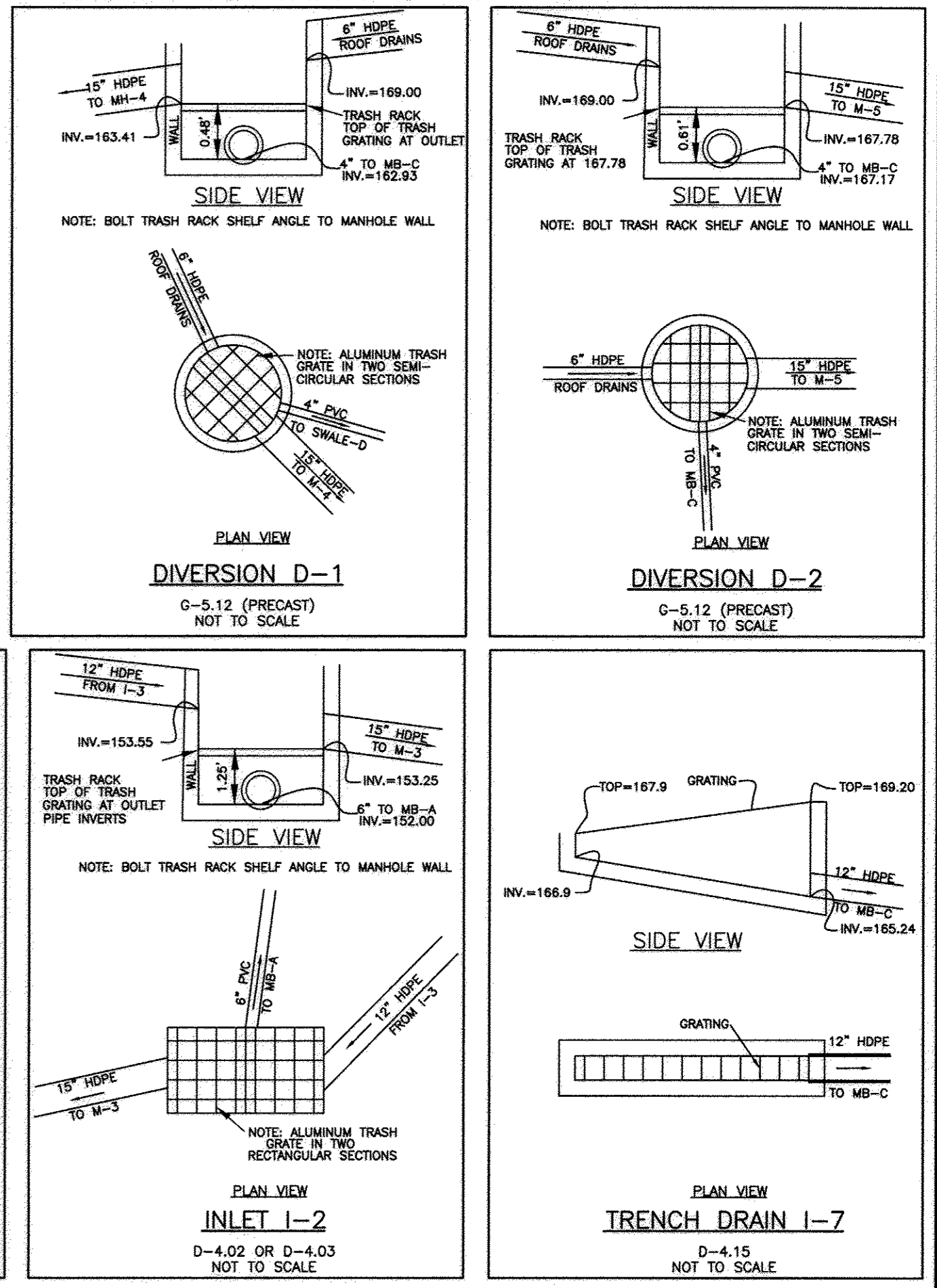
DRAFT: AM **DESIGN:** AM **CHECK:** CAM

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am an active licensed professional engineer under the laws of the State of Maryland, License No. 28376, expiration date: 1-1-2019.

Professional Engineer: *Mark Levy* 4-11-17



- LEGEND**
- 700 EXISTING CONTOURS
 - EXISTING TREELINE
 - EXISTING CL STREAM
 - 100 YEAR FLOODPLAIN
 - 50' STREAM BUFFER
 - PROPERTY BOUNDARY
 - SOILS DELINEATION
 - PUBLIC FOREST CONSERVATION EASEMENT
 - MICRO-BIORETENTION FACILITIES
 - STORM DRAIN DRAINAGE AREA



AREA AND "C" FACTOR TABULATION

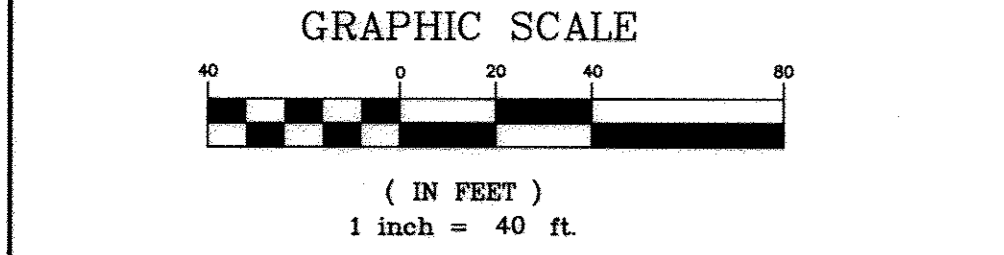
PROJECT: Dorsey Run Center DATE: 02/10/16

INLET #	ZONING (Z)	AREA (A)	"C" FACTOR (C)	% IMPERVIOUS (P) CALCULATED
I-1	RC-DEO	0.06	0.76	81
I-2	RC-DEO	0.08	0.86	100
I-3	RC-DEO	0.24	0.96	100
I-4	RC-DEO	0.64	0.49	35
I-5	RC-DEO	0.54	0.96	100
I-6	RC-DEO	0.35	0.89	73
I-7	RC-DEO	0.09	0.86	100
D-1	RC-DEO	0.08	0.86	100
D-2	RC-DEO	0.10	0.86	100

SOILS LEGEND

MAP SYMBOL	SOIL GROUP	"K" FACTOR	SOIL TYPE
CrD**	C	0.37	CROOM AND EYEBORO SOILS, 10 TO 15 PERCENT SLOPES
HgD**	D	0.37	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES
SrC**	B	0.37	SASSAFRAS AND CROOM SOILS, 5 TO 10 PERCENT SLOPES
UHD	D	0.28	URBAN LAND - UDORTHENTS COMPLEX, 0 TO 15 PERCENT SLOPES
UA*	D	0.24	URBAN LAND-FALLSINGTON COMPLEX, 0 TO 2 PERCENT SLOPES

TAKEN FROM NRCS WEB SOIL SURVEY, JUNE 2014, HOWARD SOIL SURVEY MAP NO. 25
 *INDICATES HYDRIC SOIL GROUP
 **INDICATES HIGHLY ERODIBLE SOIL GROUP. ADDITIONAL OR MORE STRINGENT SEDIMENT CONTROL MEASURES MAY BE NECESSARY.



ENGINEER'S CERTIFICATE
 I HEREBY CERTIFY THAT THIS PLAN HAS BEEN DESIGNED IN ACCORDANCE WITH CURRENT MARYLAND EROSION AND SEDIMENT CONTROL LAWS, REGULATIONS AND STANDARDS, THAT IT REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE, AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

Alice A. Miller, P.E. MD REGISTRATION P.E. 28376
 4-11-17

DEVELOPER'S CERTIFICATE
 I HEREBY CERTIFY THAT ANY CLEARING, GRADING, CONSTRUCTION OR DEVELOPMENT WILL BE DONE PURSUANT TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN, INCLUDING INSPECTING AND MAINTAINING CONTROLS, AND THAT THE RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF TRAINING AT A MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL ON EROSION AND SEDIMENT PRIOR TO BEGINNING THE PROJECT. I AM AWARE OF MY OBLIGATIONS AND OBLIGATIONS OF MY EMPLOYEES AND CONTRACTORS TO THE HOWARD COUNTY SOIL CONSERVATION DISTRICT AND/OR NE.

Mark Levy, Crossroads Rock LLC
 4-17-17

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

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

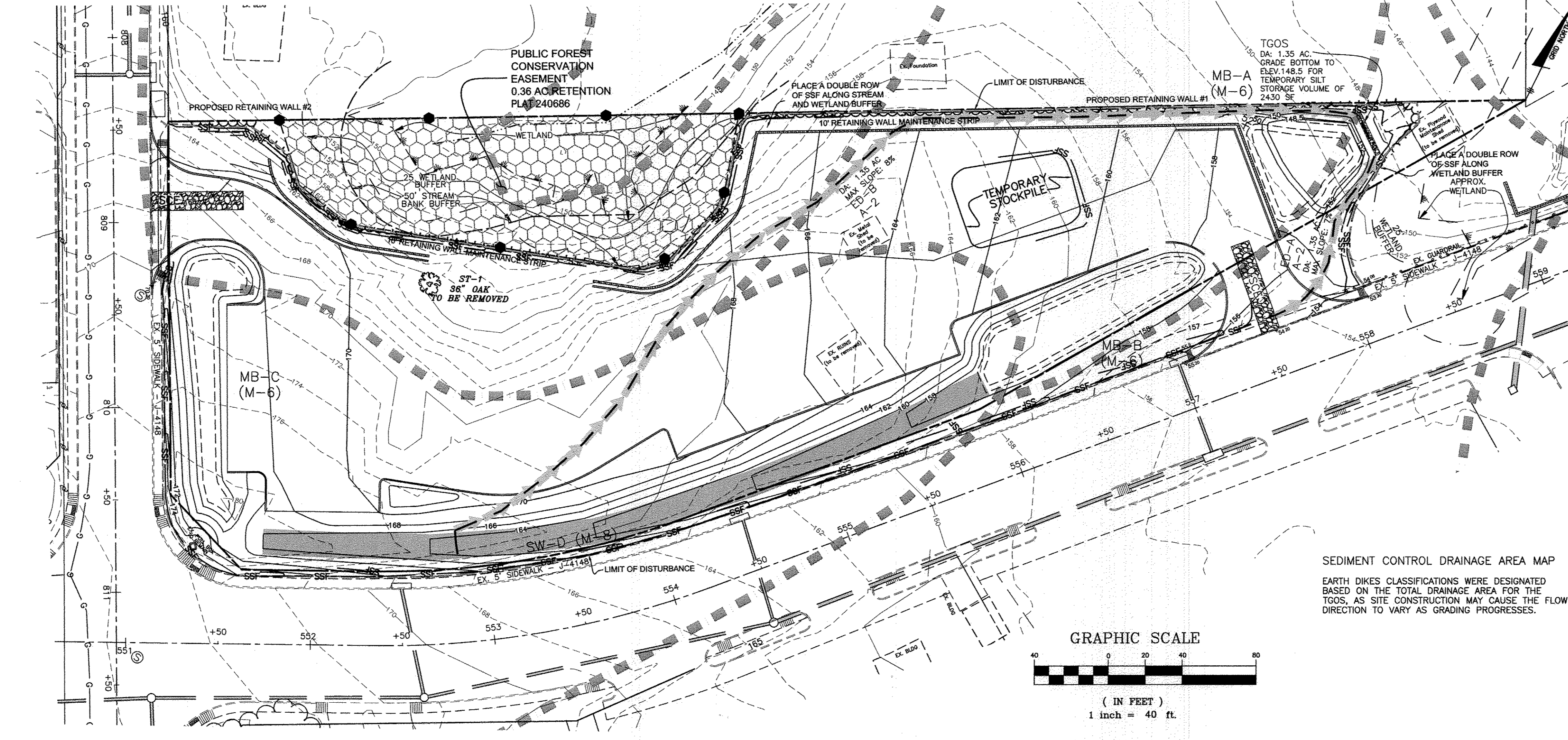
Howard Soil Conservation District
 5/2/17

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Chief, Development Engineering Division
 5-31-17

Chief, Development Engineering Division
 5-24-17

Director
 5-31-17



BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 8480 BALTIMORE NATIONAL PIKE SUITE 315 & ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-8105 (F) 410-465-8644
 WWW.BE-CIVILENGINEERING.COM

PROFESSIONAL ENGINEER
 ALICE A. MILLER
 LICENSE NO. 28376
 EXPIRES 12-31-17

Professional Certification: I 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. 28376, Expiration Date: 1-1-2019.

OWNER/DEVELOPER:
 CROSSROADS ROCK, LLC.
 6800 DEERPATH ROAD, SUITE 100
 ELK RIDGE, MD 21075
 (410) 579-2442

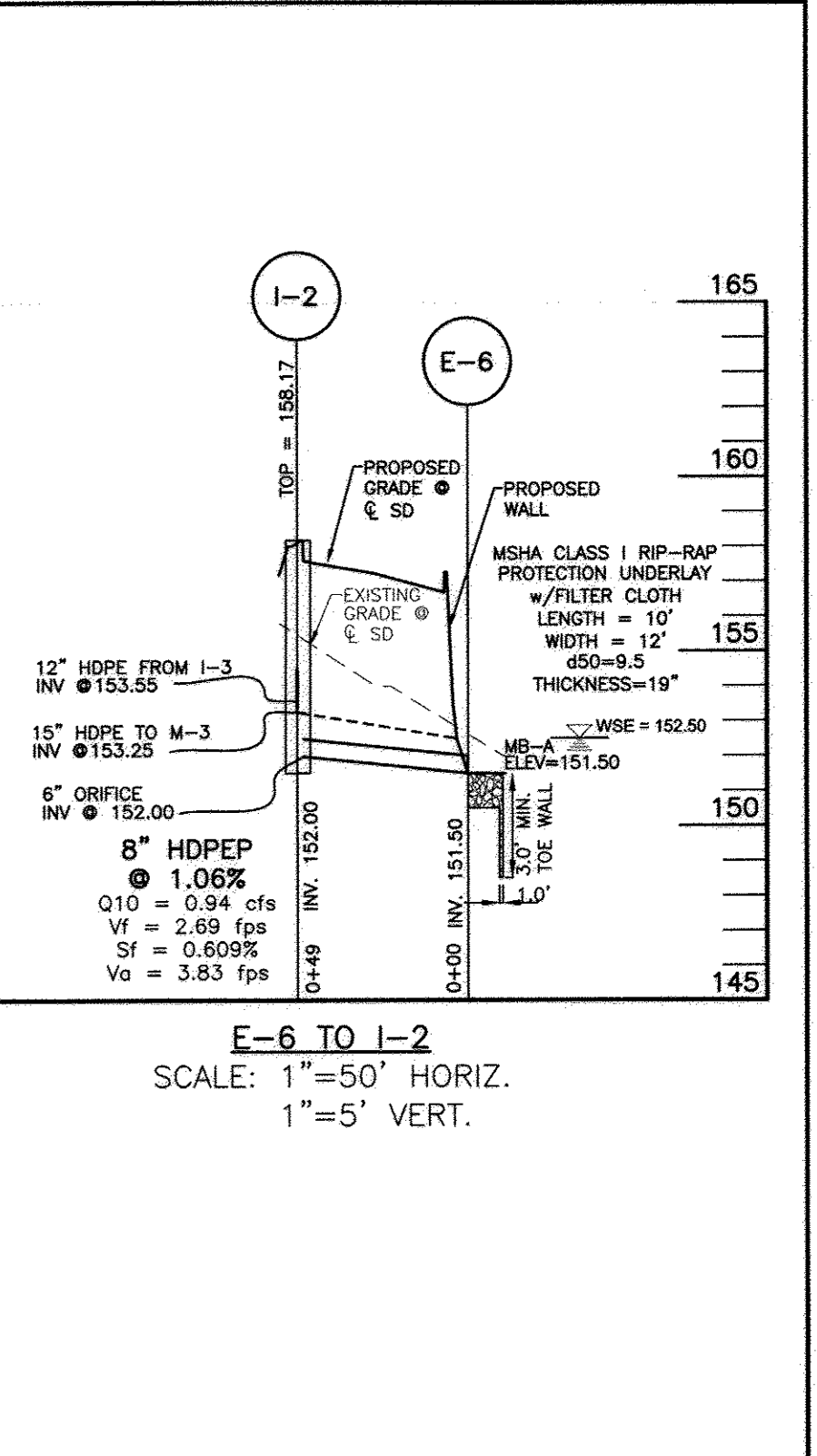
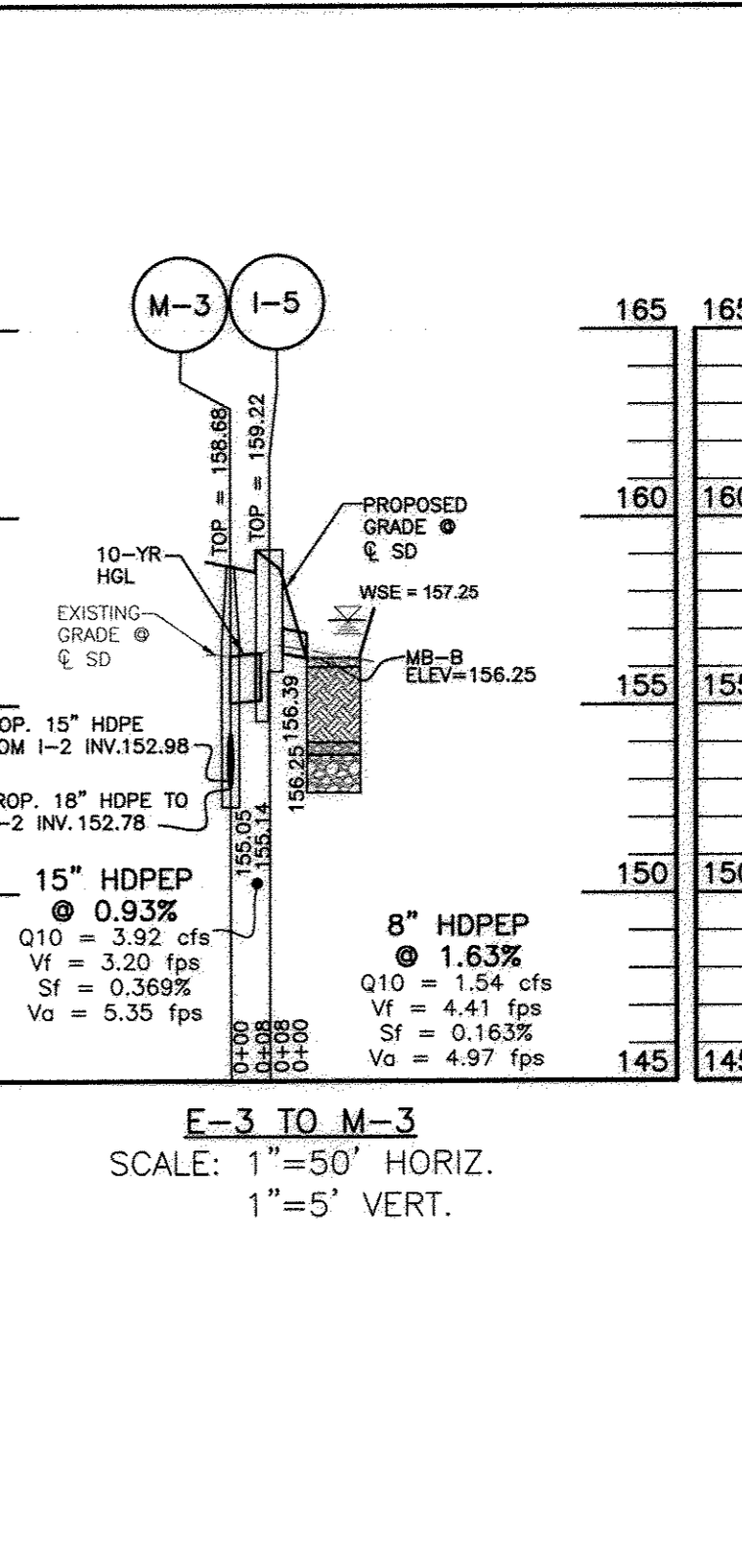
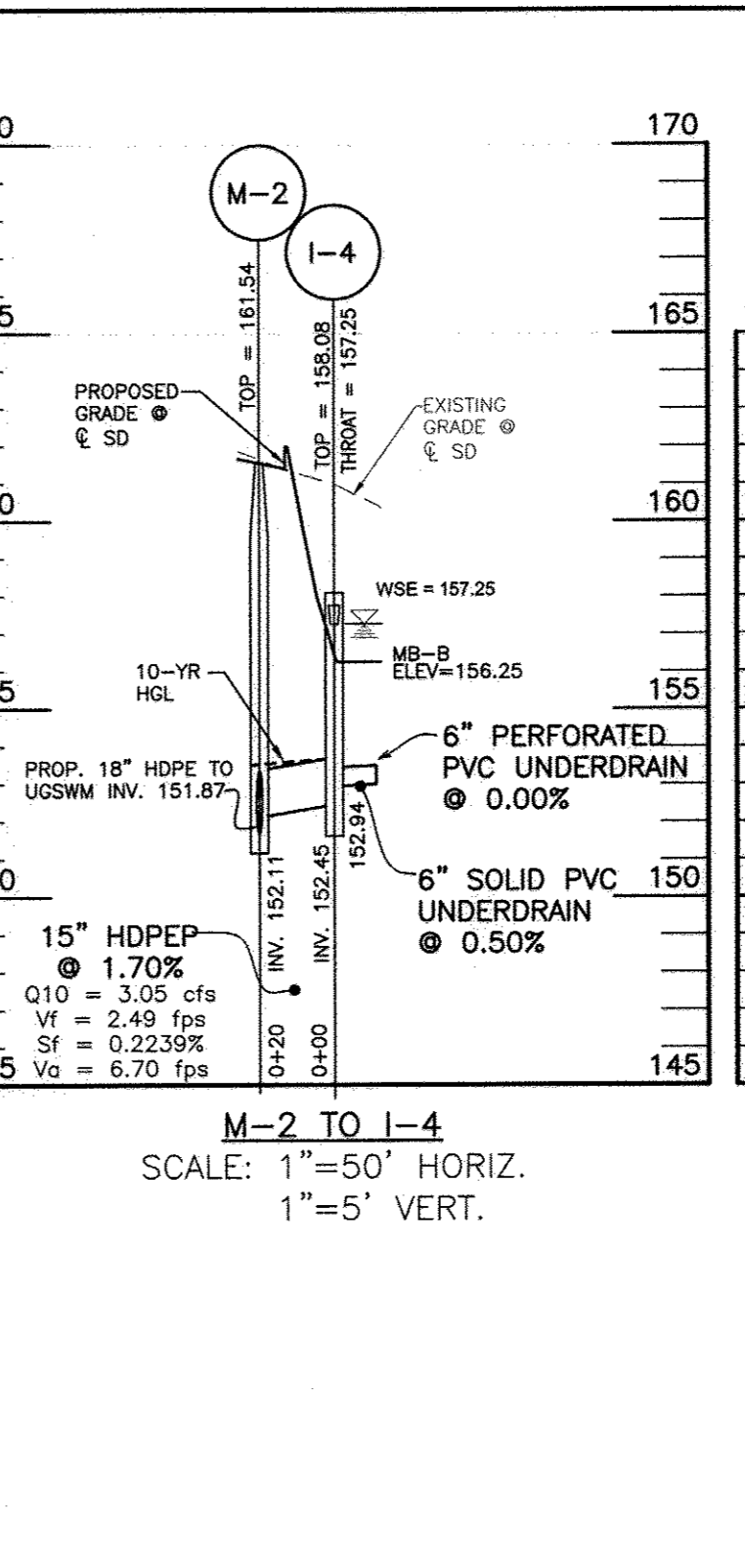
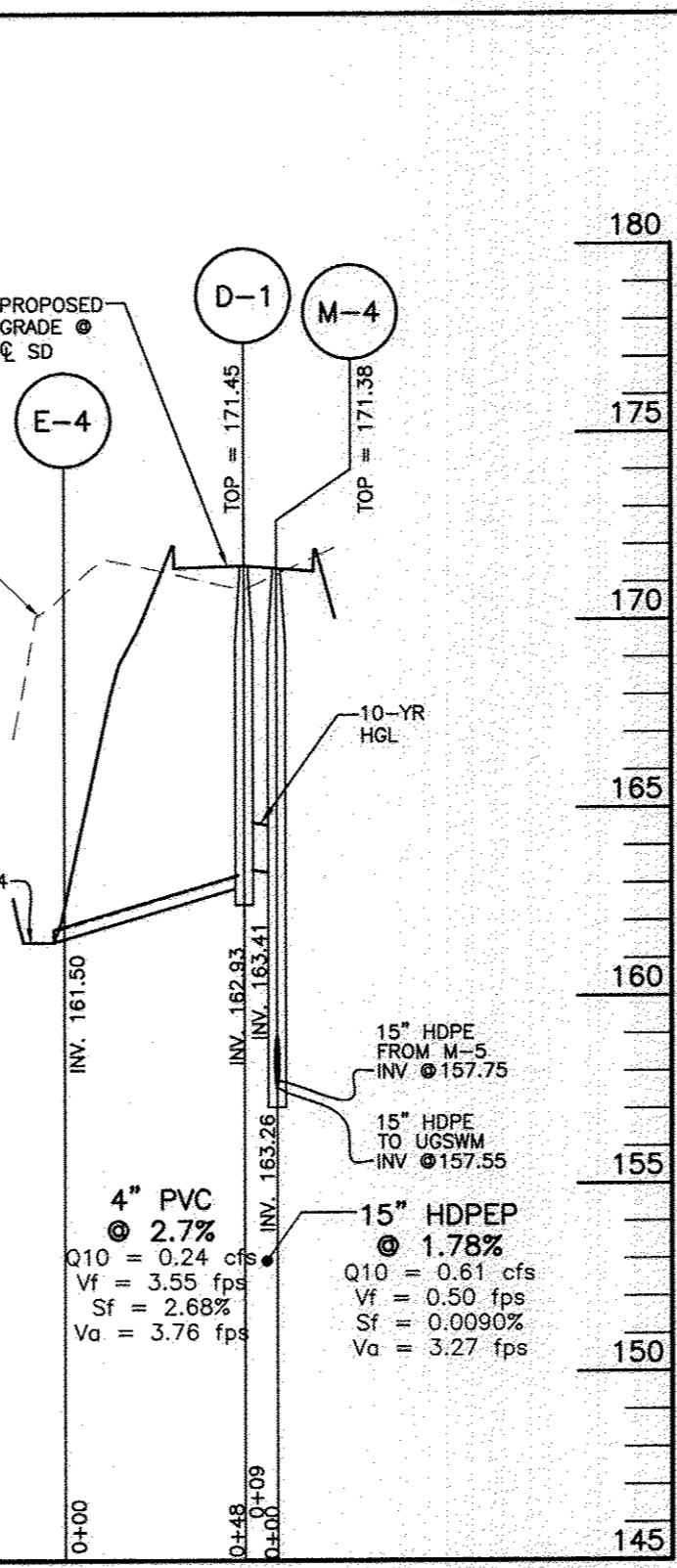
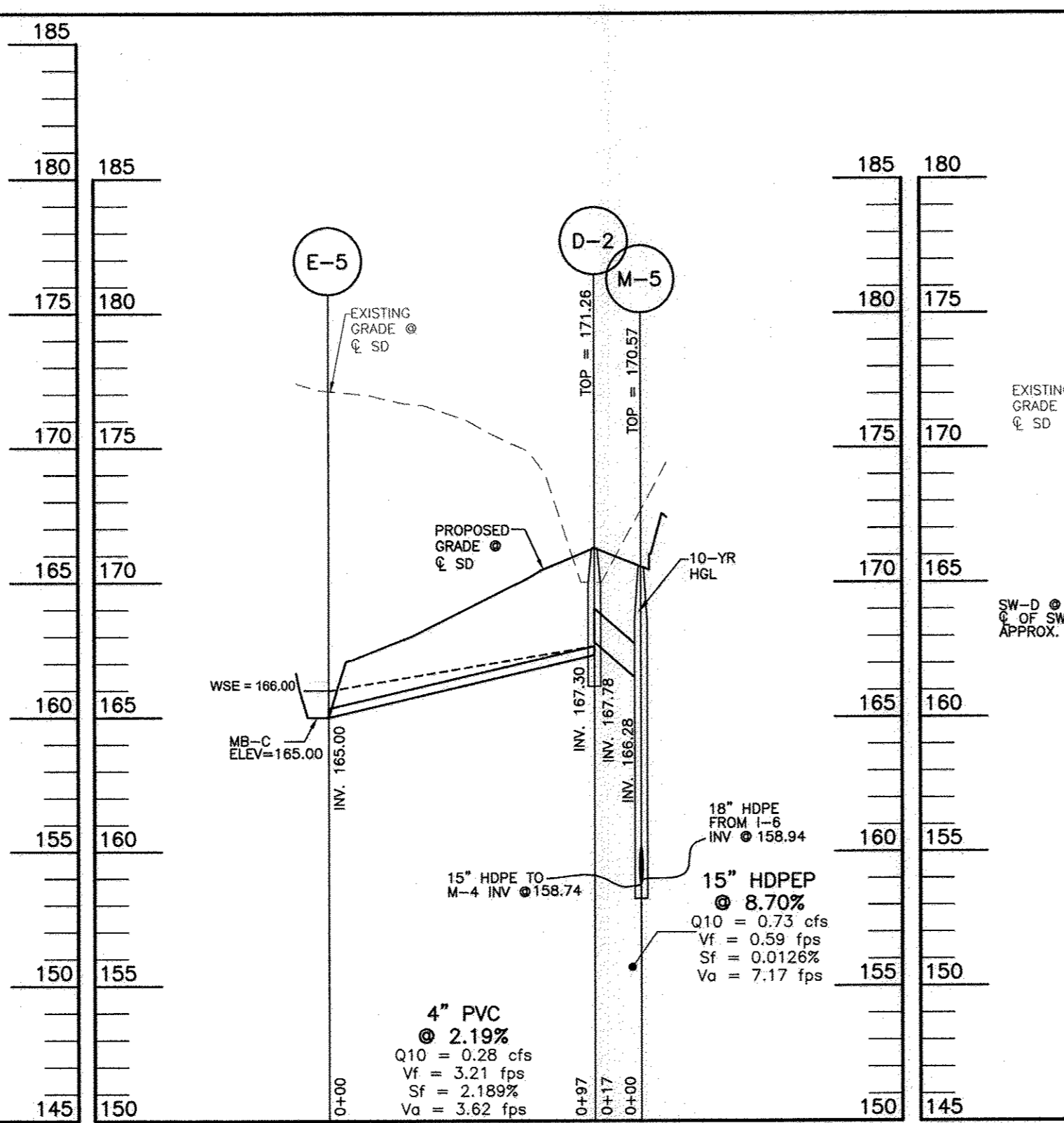
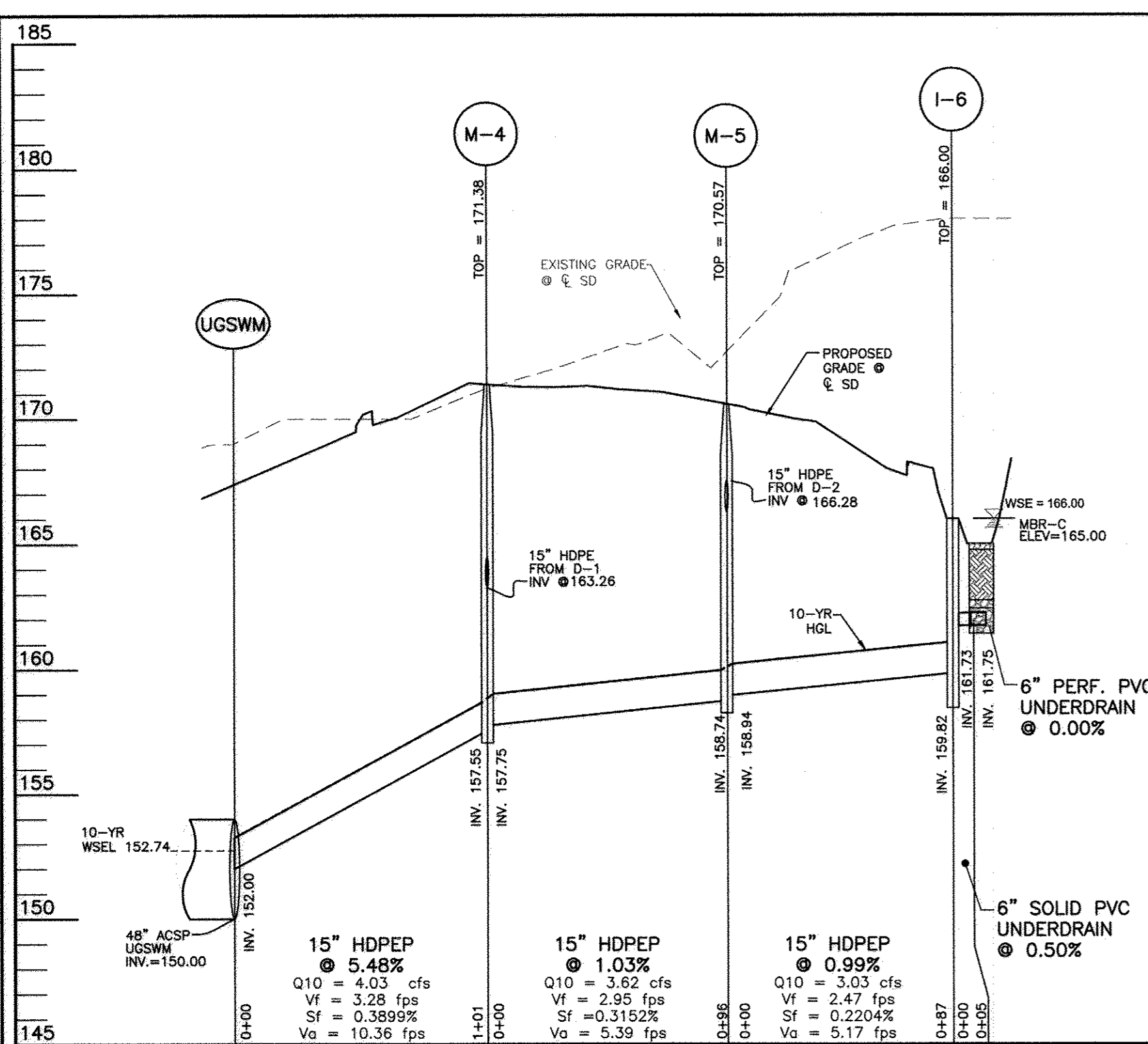
PROJECT:
**DORSEY RUN CENTER
 7525 MONTEVIDEO ROAD**

LOCATION:
 TAX MAP 43 PARCEL 586
 1ST ELECTION DISTRICT
 ZONED: M-2
 HOWARD COUNTY, MARYLAND

TITLE:
**STORM DRAIN AND SEDIMENT CONTROL
 DRAINAGE AREA MAPS AND STRUCTURE DETAILS**

DATE: APRIL, 2017 PROJECT NO. 2039
 SCALE: AS SHOWN SHEET 5 OF 14

DRAFT: AM DESIGN: AM CHECK: CAM



UGSWM TO I-6
SCALE: 1"=50' HORIZ.
1"=5' VERT.

E-5 TO M-5
SCALE: 1"=50' HORIZ.
1"=5' VERT.

E-4 TO M-4
SCALE: 1"=50' HORIZ.
1"=5' VERT.

M-2 TO I-4
SCALE: 1"=50' HORIZ.
1"=5' VERT.

E-3 TO M-3
SCALE: 1"=50' HORIZ.
1"=5' VERT.

E-6 TO I-2
SCALE: 1"=50' HORIZ.
1"=5' VERT.

STRUCTURE TABLE					
ALL STRUCTURES ARE PRIVATE					
NUMBER	TYPE	LOCATION	INVERT IN	INVERT OUT	TOP ELEV.
D-1	48" MH HO. CO. G-5.12 See Detail Sheet 5	N 454,762.550 E 1,377,673.341	162.93(4") 163.41(15")		171.48
D-2	48" MH HO. CO. G-5.12 See Detail Sheet 5	N 545,716.458 E 1,377,589.099	167.30(4") 167.78(15")		171.18
E-1	24" END SECTION HO. CO. D-5.51	N 546,107.027 E 1,377,992.756		147.06(24")	
E-2	12" END SECTION HO. CO. D-5.51	N 545,753.025 E 1,377,449.882		165.12(12")	
I-1	D-INLET HO. CO. D-4.10	N 546,088.436 E 1,377,977.307	147.24(24") 148.42(6") 148.42(6")	147.24(24")	153.33
I-2	A-5 HO. CO. D-4.01 OR D-4.02	N 546,002.027 E 1,377,939.808	153.55(12")	152.00(6") 153.25(15")	158.17
I-3	A-5 HO. CO. D-4.01 OR D-4.02	N 546,018.920 E 1,377,978.242		153.76(12")	156.66
I-4	D-INLET HO. CO. D-4.10	N 545,924.317 E 1,377,861.684	152.94(6")	152.45(15")	158.08
I-5	A-5-Modified See Detail Sheet 5	N 545,995.874 E 1,377,911.322		156.39(8") 155.14(15")	159.22
I-6	S-INLET HO. CO. D-4.22	N 545,655.383 E 1,377,522.510	161.73(6")	159.82(15")	166.00
M-1	48" MH HO. CO. G-5.12	N 545,926.063 E 1,377,819.972	149.80(10") 151.76(10")	149.63(24")	162.62
M-2	48" MH HO. CO. G-5.12	N 545,937.753 E 1,377,846.975	151.86(18") 152.12(15")	151.66(15")	161.54
M-3	48" MH HO. CO. G-5.12	N 546,003.063 E 1,377,908.753	155.05(15") 152.98(15")	152.78(18")	158.68
M-4	48" MH HO. CO. G-5.12	N 545,752.550 E 1,377,681.032	157.75(15") 163.26(15")	157.55(15")	171.38
M-5	48" MH HO. CO. G-5.12	N 545,717.459 E 1,377,591.021	158.94(15") 166.28(15")	158.74(15")	172.55

PIPE TABLE			
OWNERSHIP	SIZE / MATERIAL	LENGTH	
PRIVATE	4" PVC	152	
PRIVATE	6" PVC	387	
PRIVATE	8" HDPEP	8	
PRIVATE	12" HDPEP	88	
PRIVATE	15" HDPEP	381	
PRIVATE	18" HDPEP	130	
PRIVATE	24" HDPEP	243	
PRIVATE	10" ACSP	24	
PRIVATE	48" ACSP	1228	

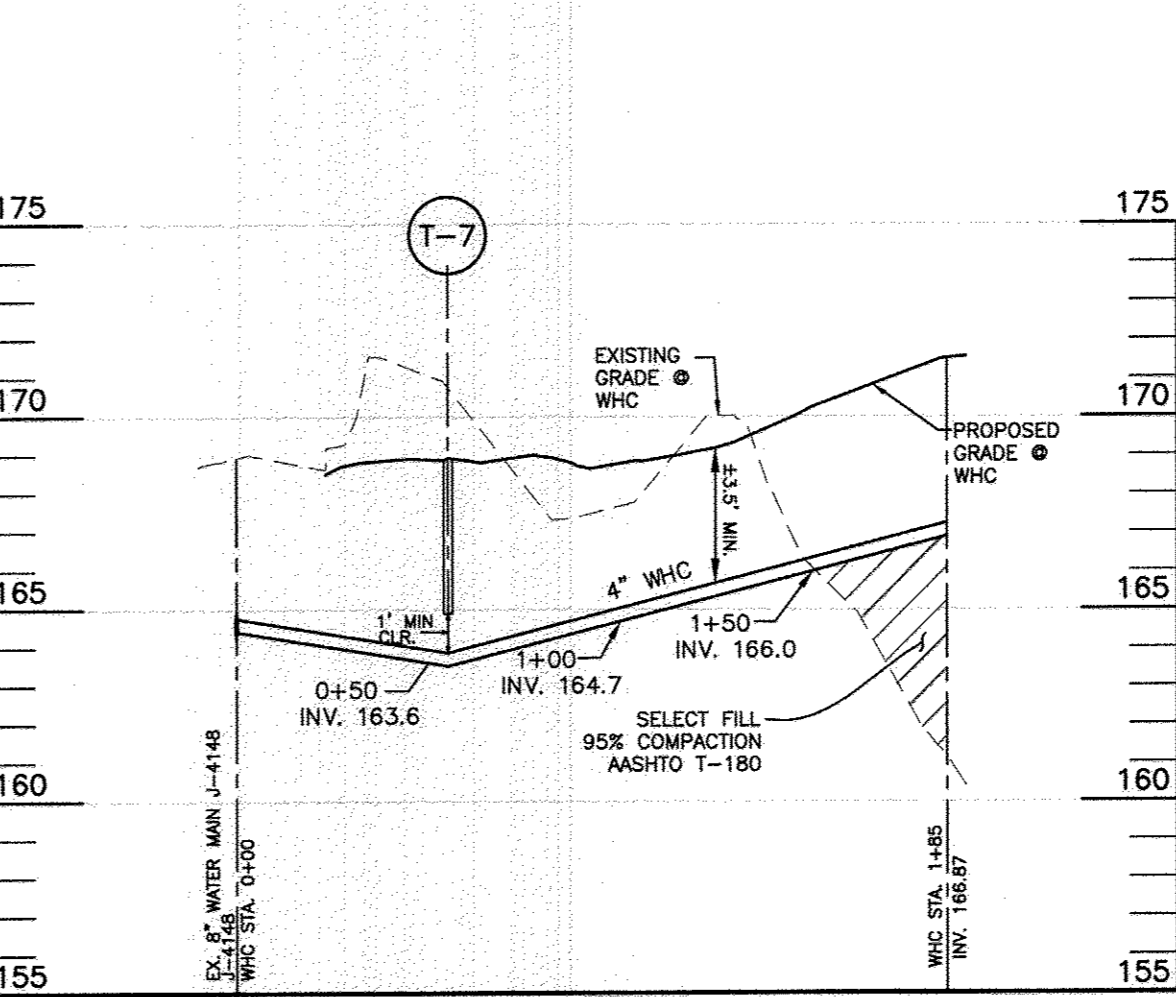
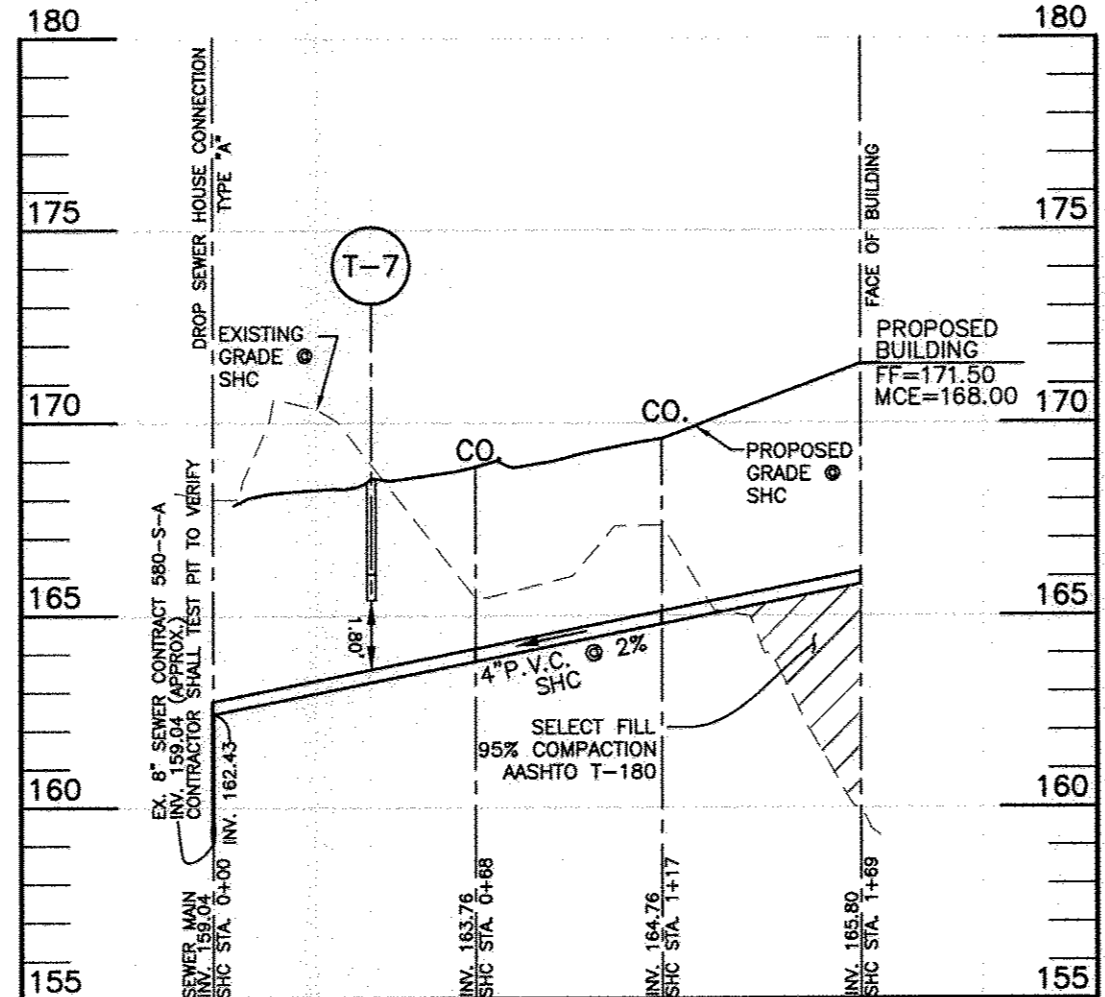
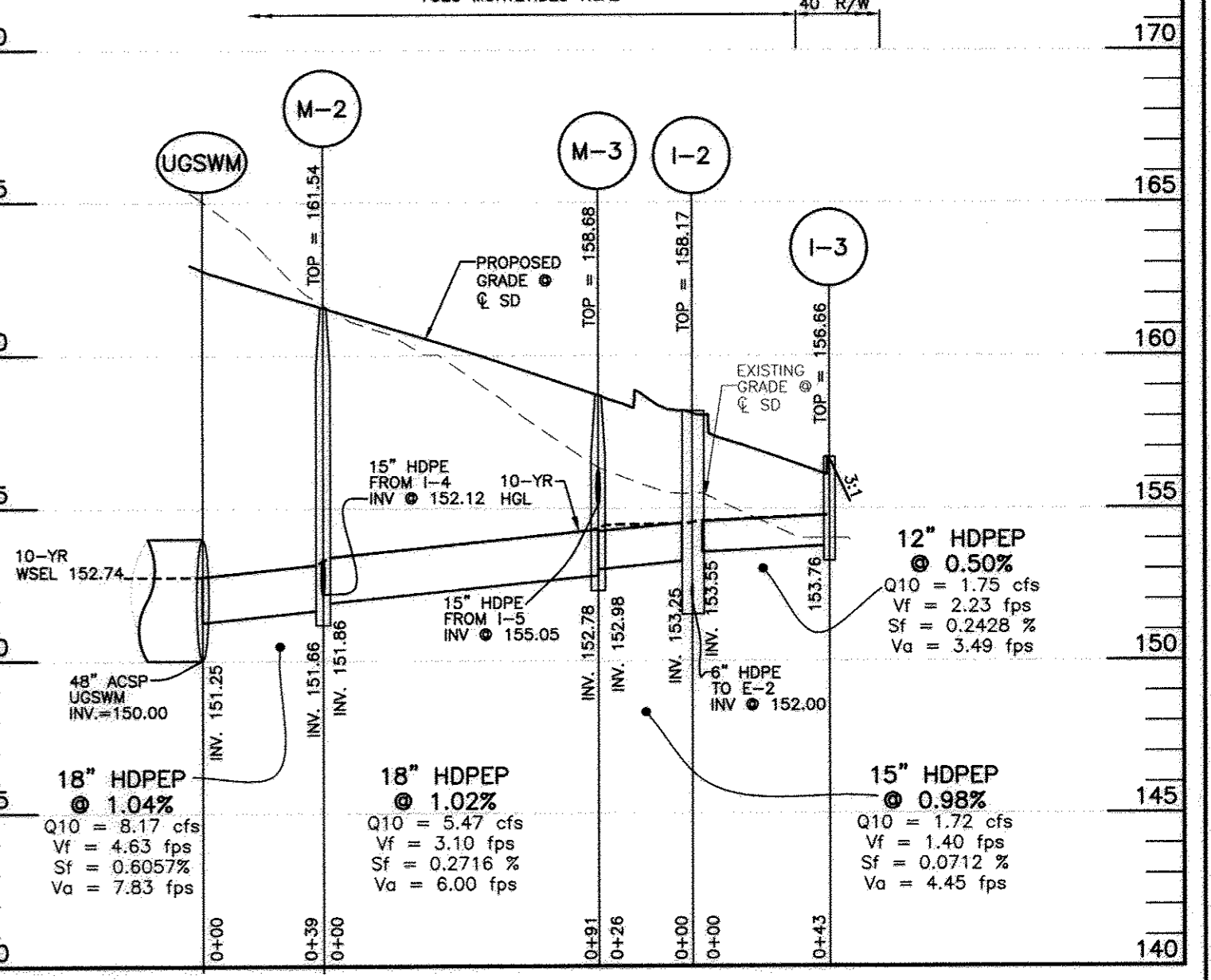
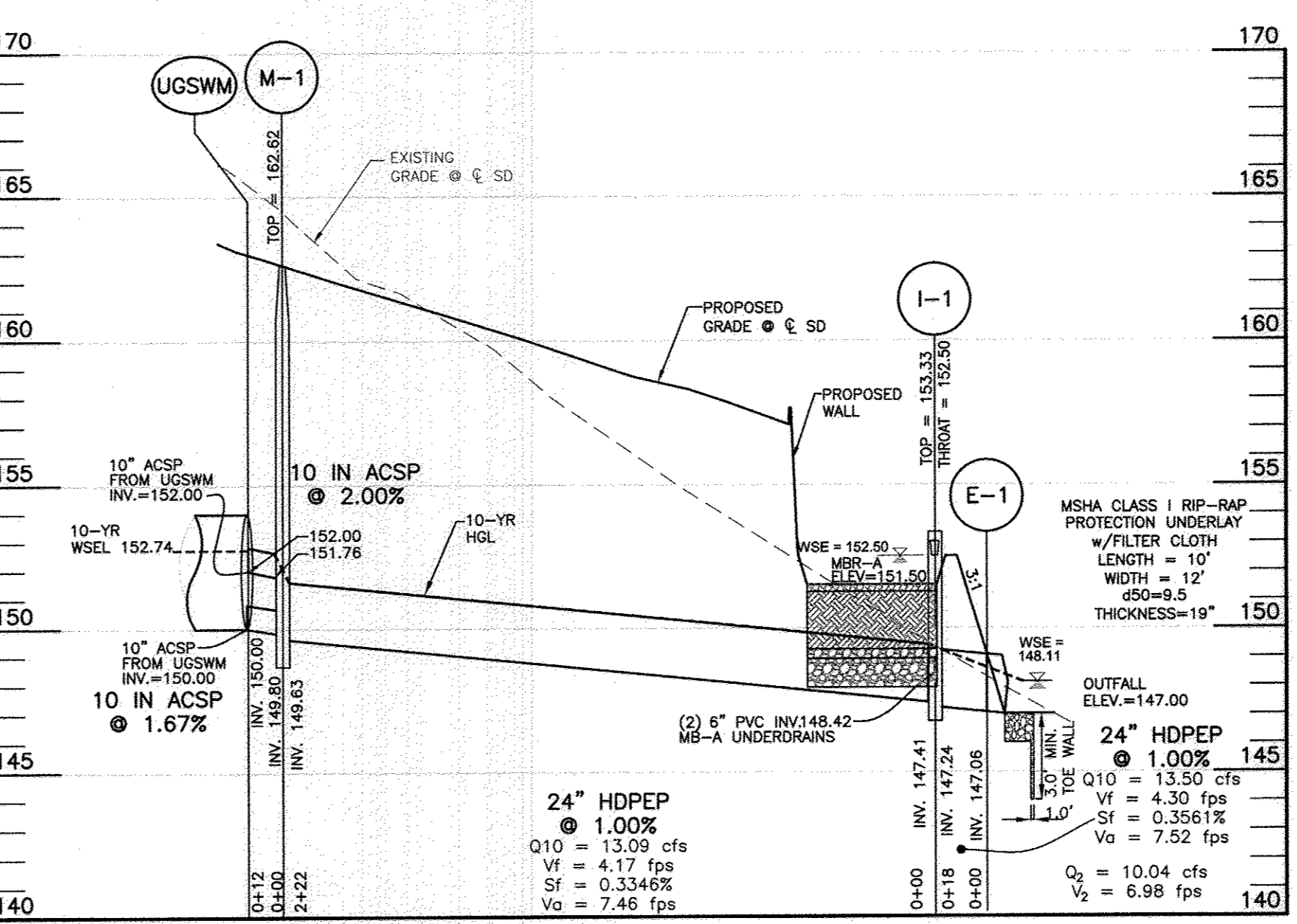
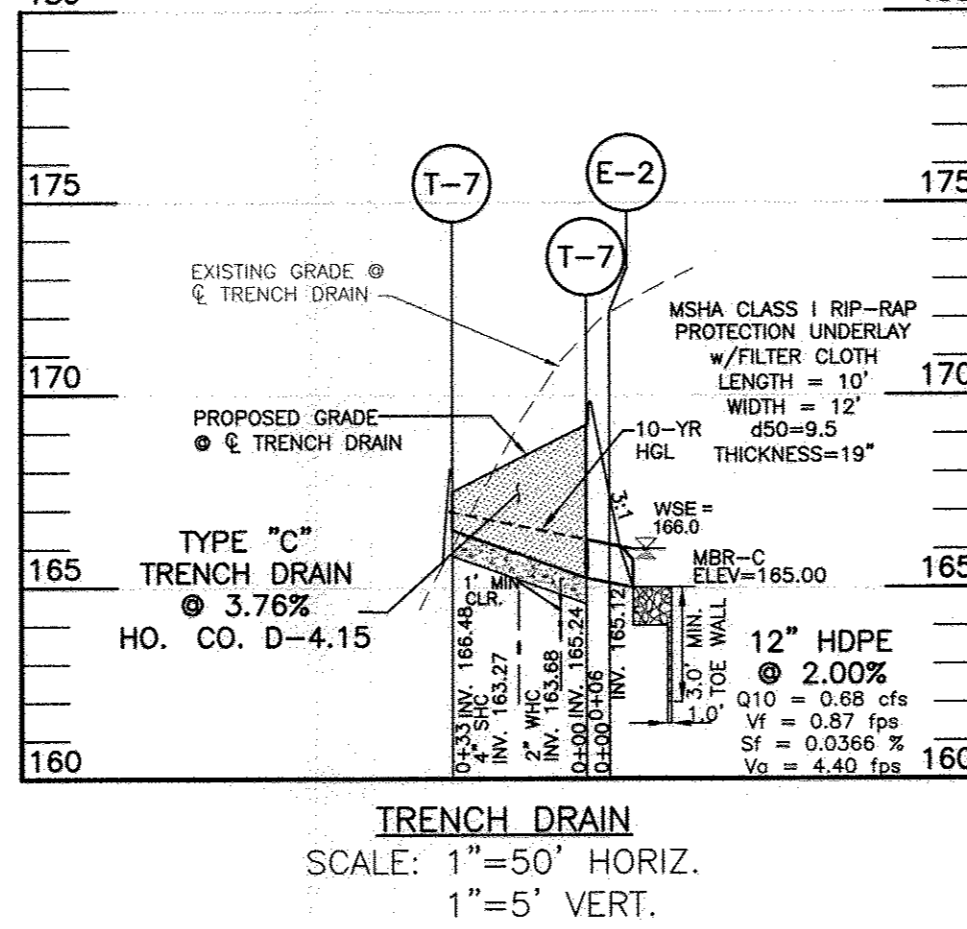
NOTE: ACSP = ALUMINIZED CORRUGATED STEEL PIPE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Seiden 5-31-17
CHIEF, DIVISION OF LAND DEVELOPMENT

Al Ch... 5-24-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION

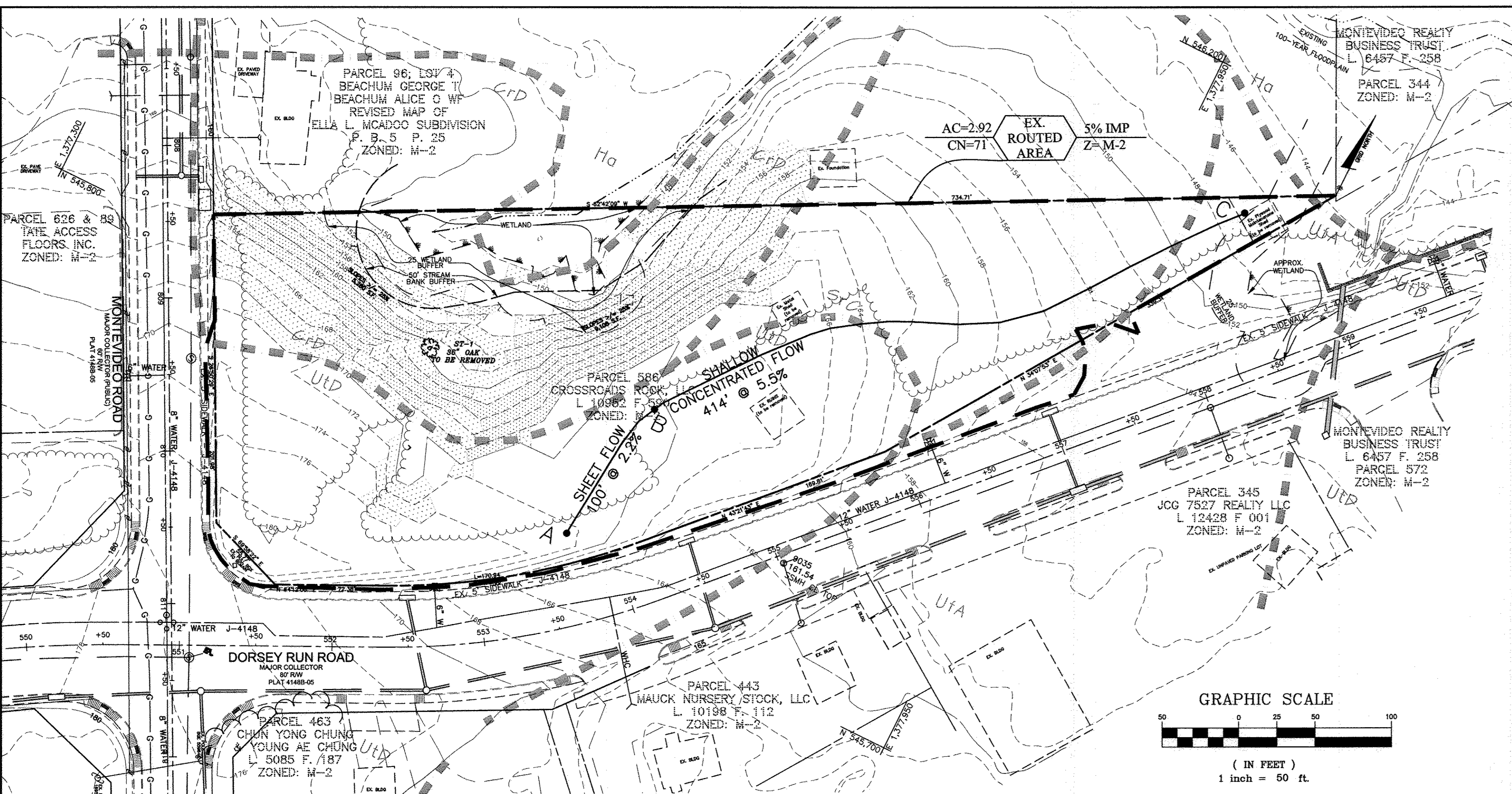
N... 5-31-17
DIRECTOR



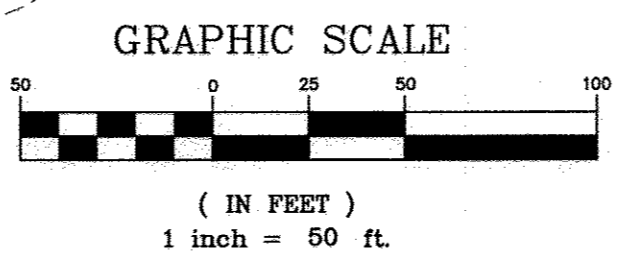
SHC PROFILE
SCALE: 1"=50' HORIZ.
1"=5' VERT.

WHC PROFILE
SCALE: 1"=50' HORIZ.
1"=5' VERT.

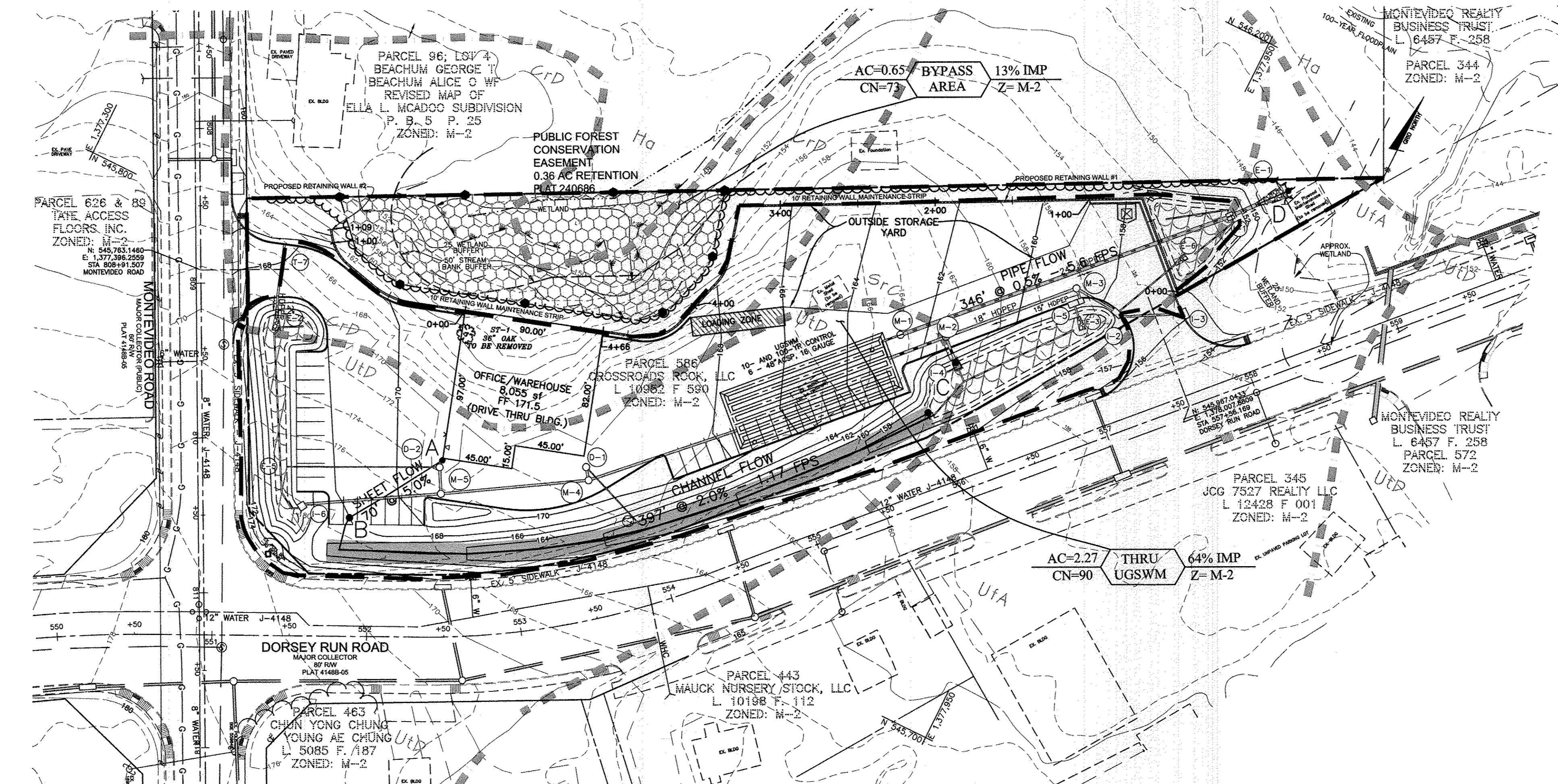
NO.	DATE	REVISION
BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 8480 BALTIMORE NATIONAL PIKE SUITE 315 A ELLETTT CITY, MARYLAND 21043 (P) 410-465-8105 (F) 410-465-6644 WWW.BE-CIVLENGINEERING.COM		
OWNER/DEVELOPER:		PROJECT:
CROSSROADS ROCK, LLC. 6800 DEERPATH ROAD, SUITE 100 ELKRIDGE, MD 21075 (410) 579-2442		DORSEY RUN CENTER 7525 MONTEVIDEO ROAD
LOCATION:		TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND
TITLE: STORM DRAIN, WHC AND SHC PROFILES		
DATE:	APRIL, 2017	PROJECT NO. 2039
DRAFT:	AM	DESIGN:
CHECK:	CAM	SCALE:
	AS SHOWN	SHEET 6 OF 14



EXISTING CONDITIONS



- LEGEND**
- EXISTING CONTOURS
 - EXISTING TREELINE
 - EXISTING CL STREAM
 - 100 YEAR FLOODPLAIN
 - 50' STREAM BUFFER
 - PROPERTY BOUNDARY
 - SOILS DELINEATION
 - 15%-25% SLOPES
 - STEEP SLOPES 25% AND GREATER
 - PUBLIC FOREST CONSERVATION EASEMENT



DEVELOPED CONDITIONS

SOILS LEGEND

MAP SYMBOL	SOIL GROUP	"K" FACTOR	SOIL TYPE
CrD**	C	0.37	CROOM AND EVESBORO SOILS, 10 TO 15 PERCENT SLOPES
*Ho**	D	0.37	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES
SrC**	B	0.37	SASSAFRAS AND CROOM SOILS, 5 TO 10 PERCENT SLOPES
UdD	D	0.28	URBAN LAND - UDORTENTS COMPLEX, 0 TO 15 PERCENT SLOPES
UfA*	D	0.24	URBAN LAND-FALLSINGTON COMPLEX, 0 TO 2 PERCENT SLOPES

TAKEN FROM NRCS WEB SOIL SURVEY, JUNE 2014, HOWARD SOIL SURVEY MAP NO. 25
 *INDICATES HYDRIC SOIL GROUP
 **INDICATES HIGHLY ERODIBLE SOIL GROUP. ADDITIONAL OR MORE STRINGENT SEDIMENT CONTROL MEASURES MAY BE NECESSARY.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Karl S. [Signature] 5-31-17
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 5-29-17
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

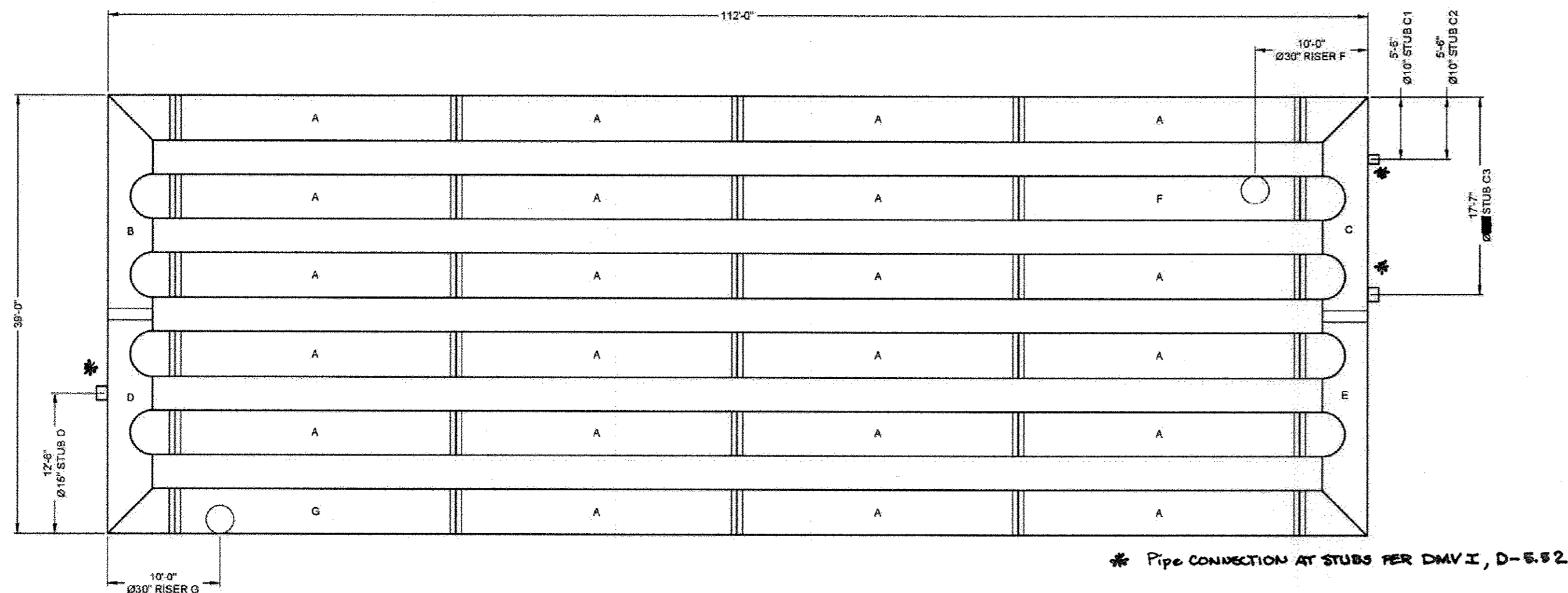
[Signature] 5-31-17
 DIRECTOR DATE

NO.	DATE	REVISION

BENCHMARK
 ENGINEERS & LAND SURVEYORS & PLANNERS
ENGINEERING, INC.
 6480 BALTIMORE NATIONAL PIKE & SUITE 315A ELICOTT CITY, MARYLAND 21043
 (P) 410-465-6108 (F) 410-465-6644
 WWW.BE-CIVLENGINEERING.COM

<p>OWNER/DEVELOPER: CROSSROADS ROCK, LLC. 6800 DEERPATH ROAD, SUITE 100 ELK RIDGE, MD 21075 (410) 579-2442</p>	<p>PROJECT: DORSEY RUN CENTER 7525 MONTEVIDEO ROAD</p>
<p>LOCATION: TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND</p>	<p>TITLE: STORMWATER MANAGEMENT OF DRAINAGE AREA MAPS</p>
<p>DATE: APRIL, 2017</p>	<p>PROJECT NO. 2039</p>
<p>DRAFT: AM DESIGN: AM CHECK: CAM</p>	<p>SCALE: AS SHOWN SHEET 7 OF 14</p>

SDP-16-064



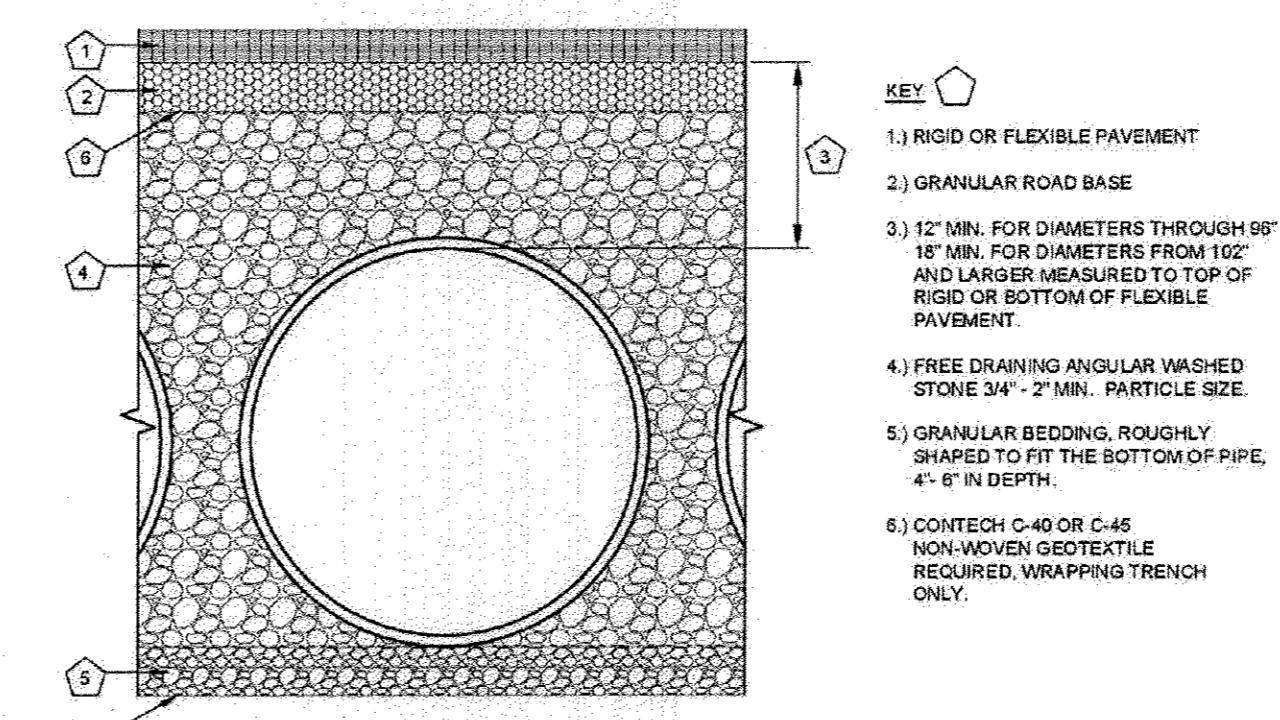
ASSEMBLY
 SCALE: 1" = 10'
 PIPE VOLUME: 8,822 CF
 STONE VOLUME: 10,008 CF
 TOTAL VOLUME: 18,830 CF
 LOADING: H20M25
 SYSTEM INV = 150.00±

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (XX) PAGES INCLUDING THE FOLLOWING:
 • VOLUME = 8,822 CF
 • MAINLINE PIPE GAGE = 16
 • WALL TYPE = PERFORATED
 • DIAMETER = 48"
 • FINISH = ALT2
 • CORRUGATION = 2 2/3X1/2

PIECE	STUB INVERT	SYSTEM INVERT
Ø10" STUB C1	152.00	150.00
Ø10" STUB C2	150.00	150.00
Ø15" STUB C3	151.25	150.00
Ø15" STUB G	152.00	150.00

PIECE	RIM ELEV.	SYSTEM INVERT
Ø30" RISER F	163.3	150.00
Ø30" RISER G	167.2	150.00

- NOTES**
- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
 - ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
 - ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
 - ALL RISERS AND STUBS ARE 2 3/4" X CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
 - RISERS TO BE FIELD TRIMMED TO GRADE.
 - QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.

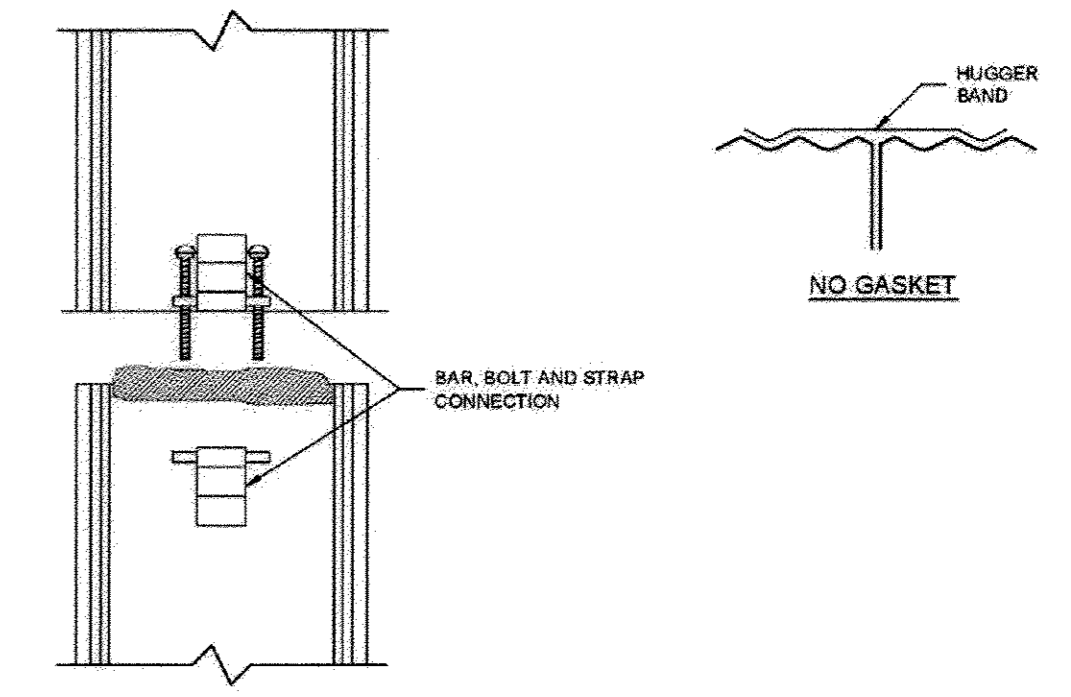


FOUNDATION/BEDDING PREPARATION
 PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER. ONCE THE FOUNDATION PREPARATION IS COMPLETE, THE 4 INCHES OF A WELL-GRADED GRANULAR MATERIAL SHALL BE PLACED AS THE BEDDING.

BACKFILL
 THE BACKFILL MATERIAL SHALL BE FREE-DRAINING ANGULAR WASHED STONE 3/4" - 2" PARTICLE SIZE. MATERIAL SHALL BE PLACED IN 6"-10" MAXIMUM LIFTS. MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR-TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHOD. COMPACTOR IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE PROJECT ENGINEER OR HIS REPRESENTATIVE IS SATISFIED WITH THE LEVEL OF COMPACTION. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE DEFLECTIONS WITHIN THE SYSTEM AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.

EQUIPMENT USED TO PLACE AND COMPACT THE BACKFILL SHALL BE OF A SIZE AND TYPE SO AS NOT TO DISTORT, DAMAGE, OR DISPLACE THE PIPE. ATTENTION MUST BE GIVEN TO PROVIDING ADEQUATE MINIMUM COVER FOR SUCH EQUIPMENT, AND MAINTAINING BALANCED LOADING ON ALL PIPES IN THE SYSTEM, DURING ALL SUCH OPERATIONS.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS. REFER TO TYPICAL BACKFILL DETAIL FOR MATERIAL REQUIRED.



CONNECTION DETAIL
 SINGLE BOLT, BAR AND STRAP

GENERAL NOTES

- BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
 12" THRU 48", 1-PIECE
 54" THRU 96", 2-PIECE
 102" THRU 144", 3-PIECES
- BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS
- RECORDED ANNUAL RND CORRUGATIONS ARE NORMALLY 2 3/4" X 1/2" DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES

2 H-12 HUGGER BAND DETAIL
 P2 N.T.S.

1 BACKFILL DETAIL
 SCALE: N.T.S.

CONTECH ENGINEERED SOLUTIONS LLC
 www.contechES.com
 9225 Centre Pointe Dr., Suite 400, West Chester, OH 45399
 800-338-1122 513-945-7000 513-945-7993 FAX

CONTECH CMP DETENTION SYSTEMS
 CONTECH PROPOSAL 200-0002

48" UNDERGROUND DETENTION SYSTEM - 538997-010
 DORSEY RUN CENTER
 ELKCRIDGE, MD
 SITE DESIGNATION: UGSWM

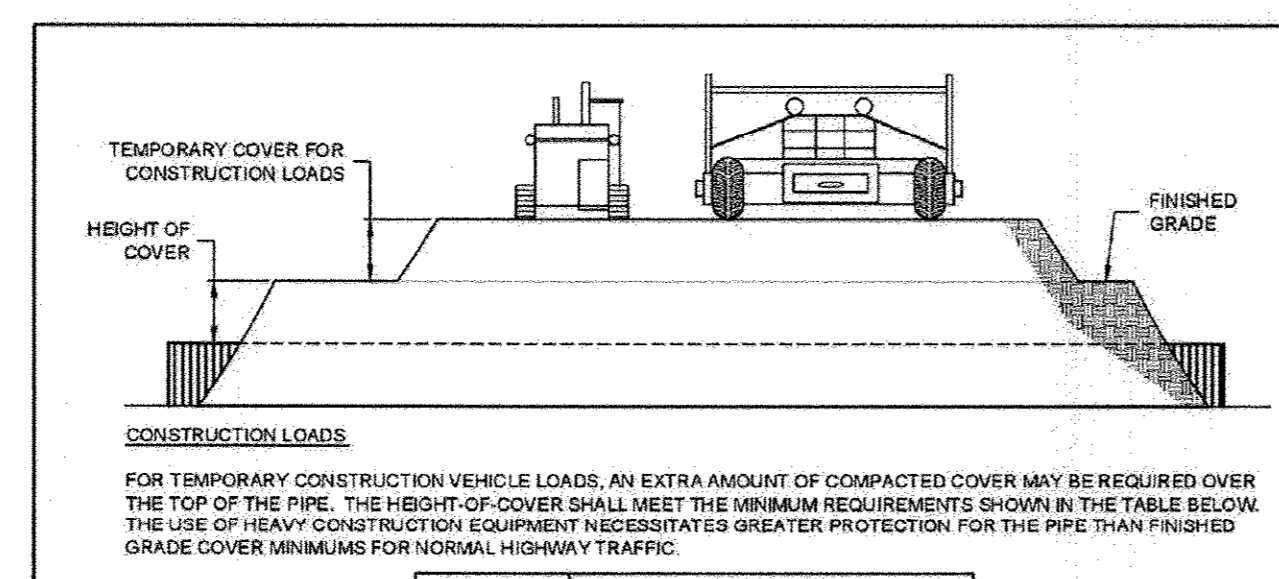
PROJECT No. 538997
 SHEET No. 010
 DATE 3/16/2016
 DESIGNED BY BAS
 CHECKED BY APPROVED BY
 SHEET No. C1 of XX

CONTECH ENGINEERED SOLUTIONS LLC
 www.contechES.com
 9225 Centre Pointe Dr., Suite 400, West Chester, OH 45399
 800-338-1122 513-945-7000 513-945-7993 FAX

CONTECH CMP DETENTION SYSTEMS
 CONTECH PROPOSAL 200-0002

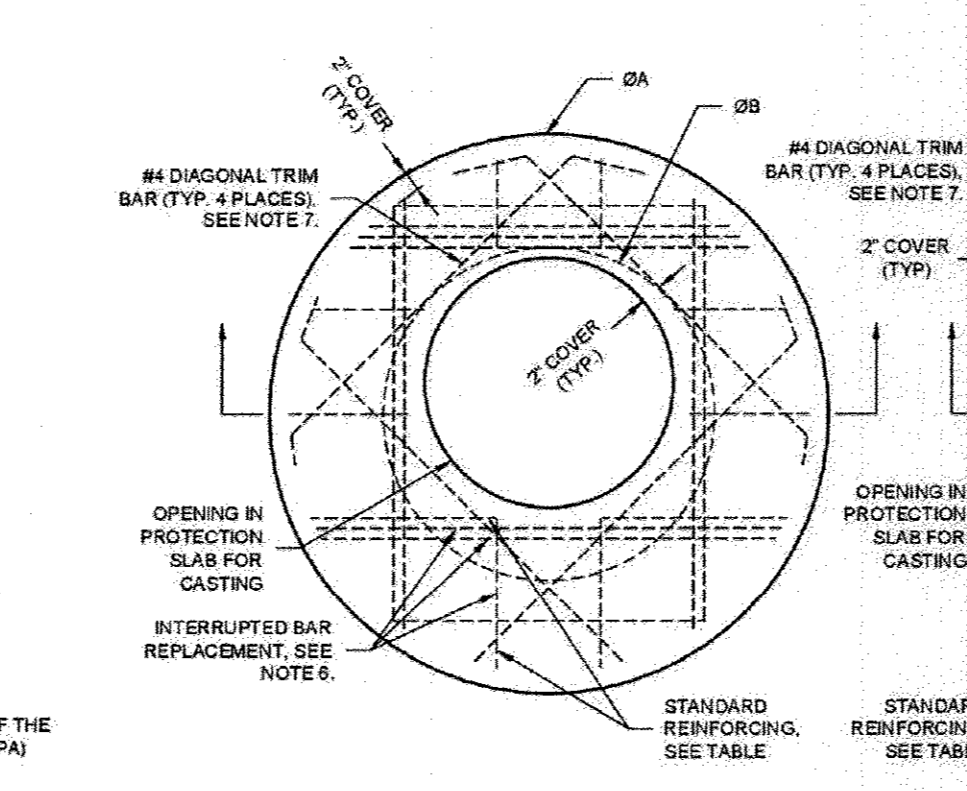
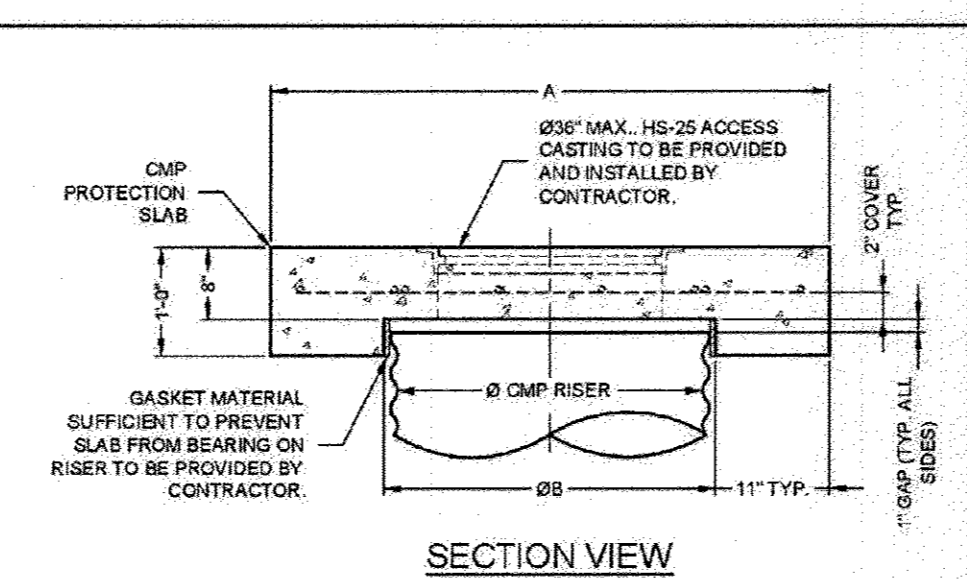
48" UNDERGROUND DETENTION SYSTEM - 538997-010
 DORSEY RUN CENTER
 ELKCRIDGE, MD
 SITE DESIGNATION: UGSWM

PROJECT No. 538997
 SHEET No. 010
 DATE 3/16/2016
 DESIGNED BY BAS
 CHECKED BY APPROVED BY
 SHEET No. P2 of XX



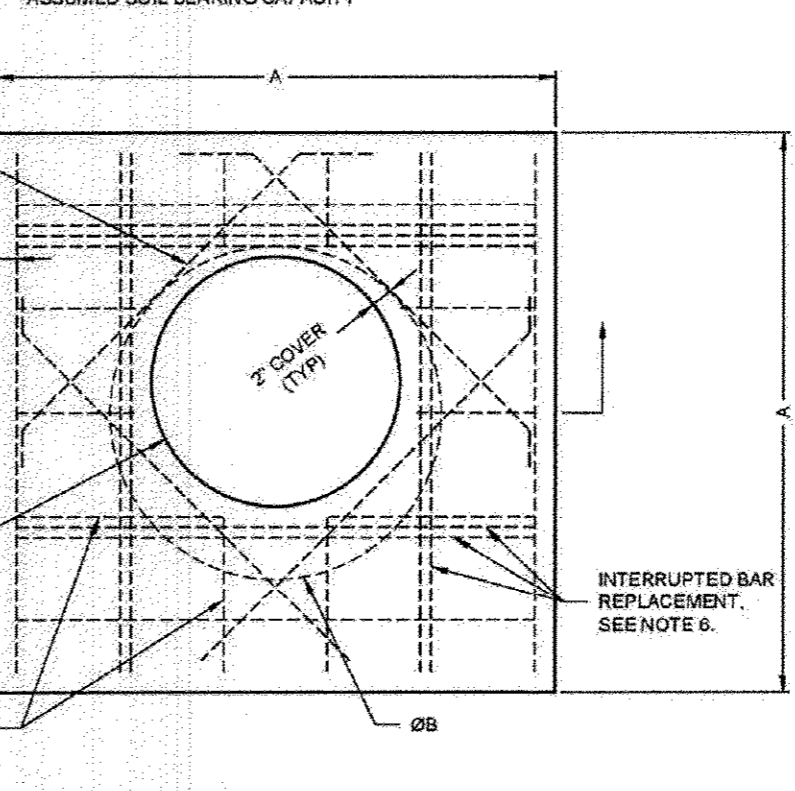
PIPE SPAN, INCHES	AXLE LOADS (Kips)		
	18-50	50-75	75-110
12-42	2.0	2.5	3.0
48-72	3.0	3.0	3.5
78-102	3.0	3.5	4.0
126-144	3.5	4.0	4.5

3 CONSTRUCTION LOADING DIAGRAM
 P3 N.T.S.



4 MATERIAL SPECIFICATION
 P3

Ø CMP RISER	A	Ø B	REINFORCING	BEARING PRESSURE (PSF)
24"	Ø 4"	26"	#5 @ 10" OCEW #5 @ 10" OCEW	2,540 1,900
30"	Ø 4-6"	32"	#5 @ 10" OCEW #5 @ 9" OCEW	2,260 1,670
36"	Ø 5"	38"	#5 @ 9" OCEW #5 @ 8" OCEW	2,050 1,500
42"	Ø 5-6"	44"	#5 @ 8" OCEW #5 @ 8" OCEW	1,490 1,370
48"	Ø 6"	50"	#5 @ 7" OCEW #5 @ 7" OCEW	1,210 1,270



5 MANHOLE CAP DETAIL
 P3 N.T.S.

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 STEEL
 SCOPE
 THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.
 MATERIAL
 THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.
 PIPE
 THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M58 OR ASTM A790. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.
 ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

- NOTES**
- DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION AND A93.50.
 - DESIGN LOAD HS25.
 - EARTH COVER = 1' MAX.
 - CONCRETE STRENGTH = 4,000 psi
 - REINFORCING STEEL = ASTM A615, GRADE 60.
 - PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED. HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
 - TRIM OPENING WITH DIAGONAL #4 BARS. EXTEND BARS A MINIMUM OF 12" BEYOND OPENING. BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
 - PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
 - DETAIL DESIGN BY DELTA ENGINEERS, ARCHITECTS AND LAND SURVEYORS, ENDEWELL, NY.

*BEI SIGNATURE/SEAL IS FOR CONFIRMATION THAT THE CONTECH DESIGN MEETS THE VOLUME REQUIREMENTS FOR THE STORMWATER MANAGEMENT. CONTRACTOR SHALL OBTAIN SEALED SHOP DRAWINGS FROM CONTECH BEFORE CONSTRUCTION COMMENCES.

BENCHMARK ENGINEERING, INC.
 ENGINEERS • LAND SURVEYORS • PLANNERS
 6480 BALTIMORE NATIONAL PIKE & SUITE 315A ELLICOTT CITY, MARYLAND 21043
 (P) 410-465-8108 (F) 410-465-6644
 WWW.BE-ENGINEERING.COM

STATE OF MARYLAND
 PROFESSIONAL ENGINEER
 No. 28376
 II-17

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Chief, Division of Land Development
 5-31-17
 Chief, Development Engineering Division
 5-28-17
 Director
 5-31-17

CONTECH ENGINEERED SOLUTIONS LLC
 www.contechES.com
 9225 Centre Pointe Dr., Suite 400, West Chester, OH 45399
 800-338-1122 513-945-7000 513-945-7993 FAX

CONTECH CMP DETENTION SYSTEMS
 CONTECH PROPOSAL 200-0002

48" UNDERGROUND DETENTION SYSTEM - 538997-010
 DORSEY RUN CENTER
 ELKCRIDGE, MD
 SITE DESIGNATION: UGSWM

PROJECT No. 538997
 SHEET No. 010
 DATE 3/16/2016
 DESIGNED BY BAS
 CHECKED BY APPROVED BY
 SHEET No. P3 of XX

OWNER/DEVELOPER:
 CROSSROADS ROCK, LLC
 6800 DEERPATH ROAD, SUITE 100
 ELKCRIDGE, MD 21075
 (410) 579-2442

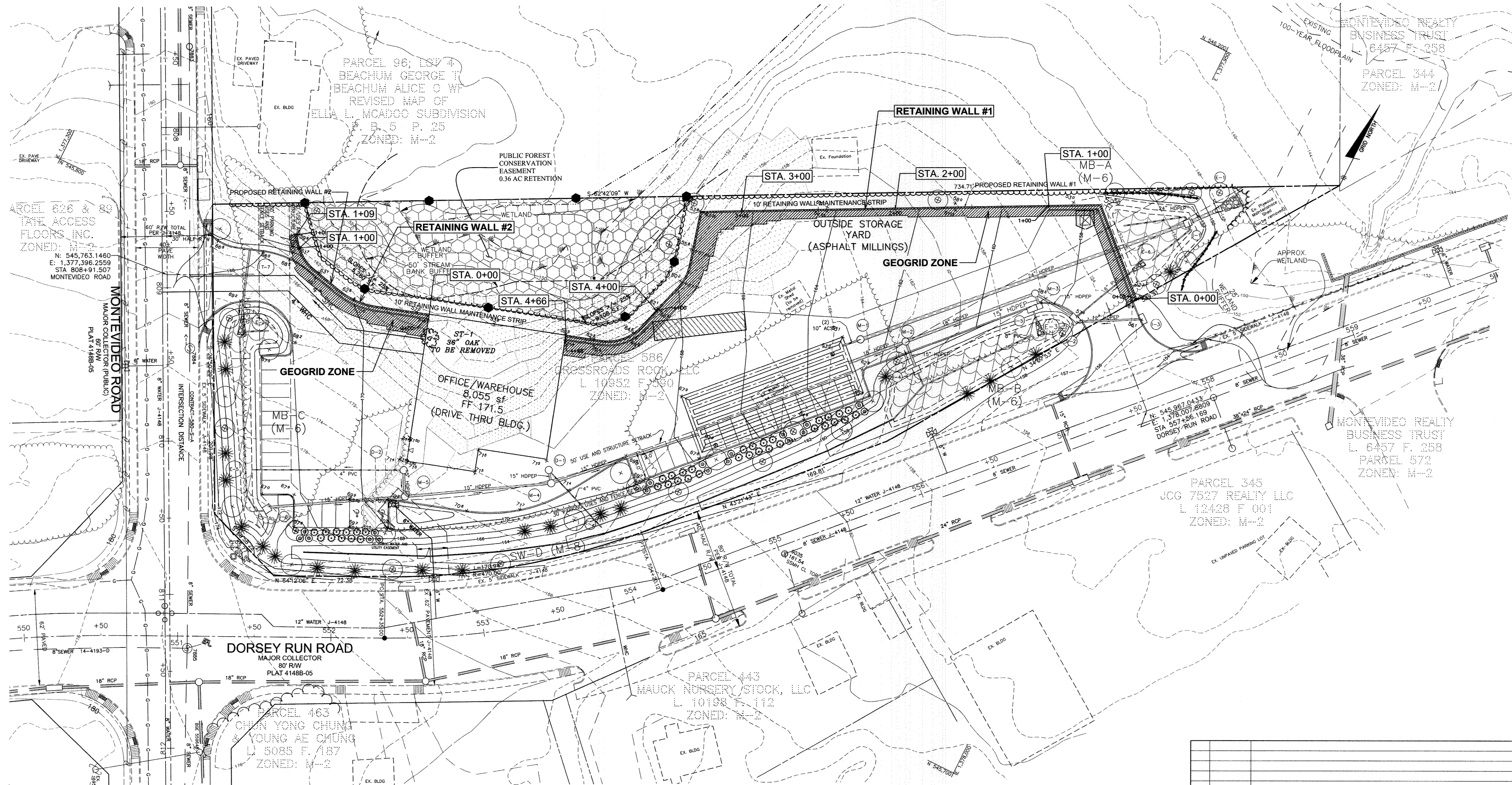
PROJECT:
**DORSEY RUN CENTER
 7525 MONTEVIDEO ROAD**

LOCATION:
 TAX MAP 43 PARCEL 586
 1ST ELECTION DISTRICT
 ZONED: M-2
 HOWARD COUNTY, MARYLAND

TITLE:
**UNDERGROUND STORMWATER
 MANAGEMENT DETAILS**

DATE: APRIL, 2017 PROJECT NO. 2039
 SCALE: AS SHOWN SHEET 8 OF 14
 DRAFT: AM DESIGN: AM CHECK: CAM

SDP-16-064



WALL LOCATION PLAN
1" = 30'

NO.	DATE	REVISION

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

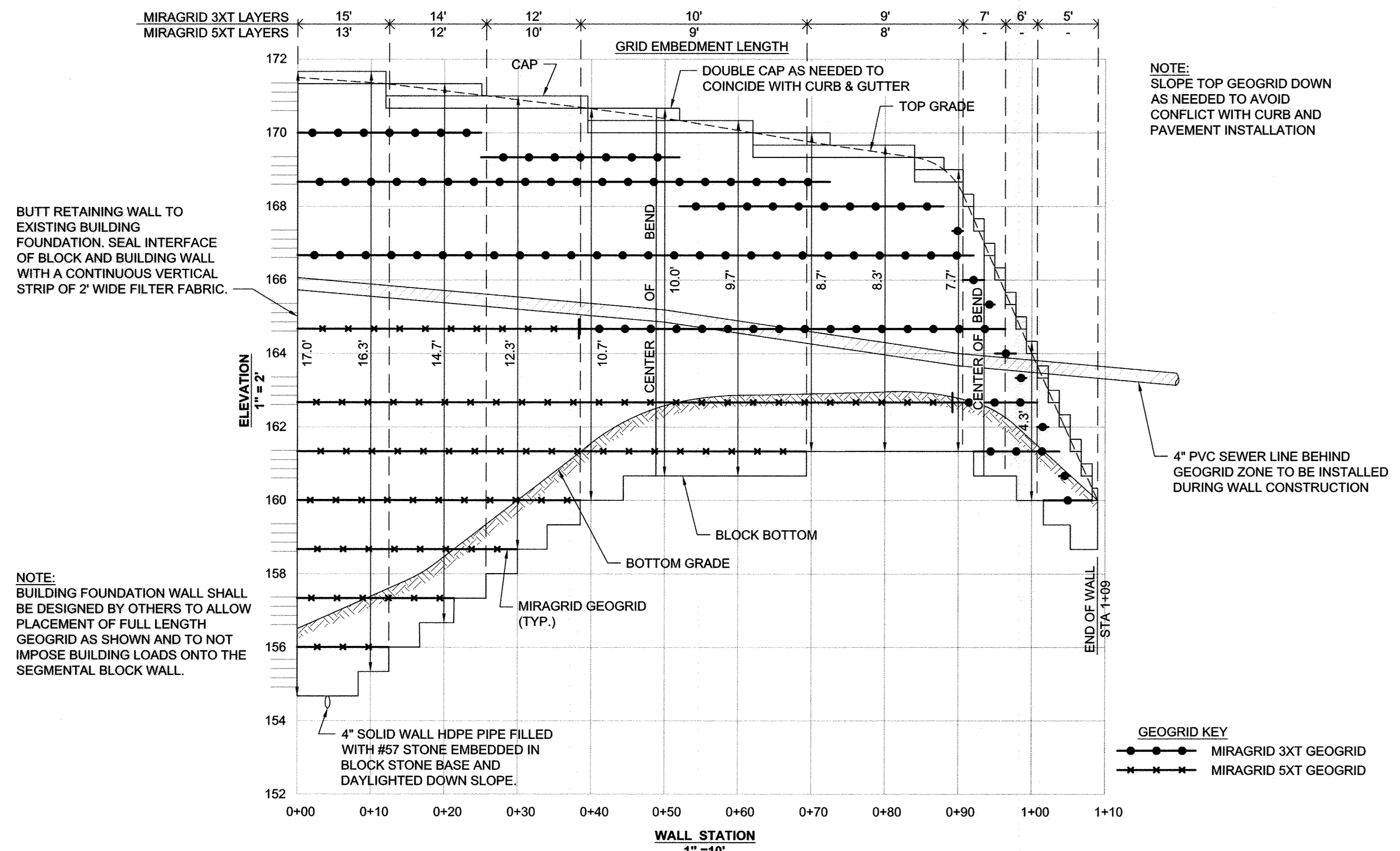
<p>OWNER/DEVELOPER: CROSSROADS ROCK, LLC. 6800 DEERPATH ROAD, SUITE 100 ELKRIDGE, MD 21075 (410) 579-2442</p>	<p>PROJECT: DORSEY RUN CENTER 7525 MONTEVIDEO ROAD</p>
<p>LOCATION: TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND</p>	<p>TITLE: RETAINING WALL LOCATION PLAN</p>
<p>DATE: APRIL, 2017 SCALE: AS SHOWN</p>	<p>HCEA PROJECT NO.: 16100-B SHEET 9 OF 14</p>
<p>DRAFT: HM DESIGN: HM CHECK: RWS</p>	<p>SDP-16-064</p>

APPROVED: DEPARTMENT OF PLANNING AND ZONING

[Signature] 5-31-17
DATE

[Signature] 5-24-17
DATE

[Signature] 5-31-17
DATE



SPECIFICATIONS
MODULAR CONCRETE BLOCK RETAINING WALL

PART 1: GENERAL

1.01 DESCRIPTION

- A. WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTION OF A MODULAR 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 - COLOR MAY BE SPECIFIED BY THE OWNER.
FACE FINISH - SCULPTURED ROCK FACE IN ANGULAR TRI-PLANNER OR FLAT 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 16" (W) X 12" (D) MINIMUM;
UNIT WEIGHT - 75 LBS/UNIT MINIMUM FOR STANDARD WEIGHT AGGREGATES;
INTER-UNIT SHEAR STRENGTH - 1000 PLF MINIMUM AT 2 PSI NORMAL PRESSURE; AT 2 PSI NORMAL FORCE.
GEOGRID/UNIT PEAK CONNECTION STRENGTH - 1000 PLF MINIMUM
 - D. MODULAR CONCRETE UNITS SHALL CONFORM TO THE FOLLOWING CONSTRUCTABILITY REQUIREMENTS:
VERTICAL SETBACK = 1/8"± PER COURSE (NEAR VERTICAL) OR 1"± PER COURSE PER THE 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-PROFUSED 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 BE 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	0-35

PLASTICITY INDEX (PI) <10 AND LIQUID LIMIT <35 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

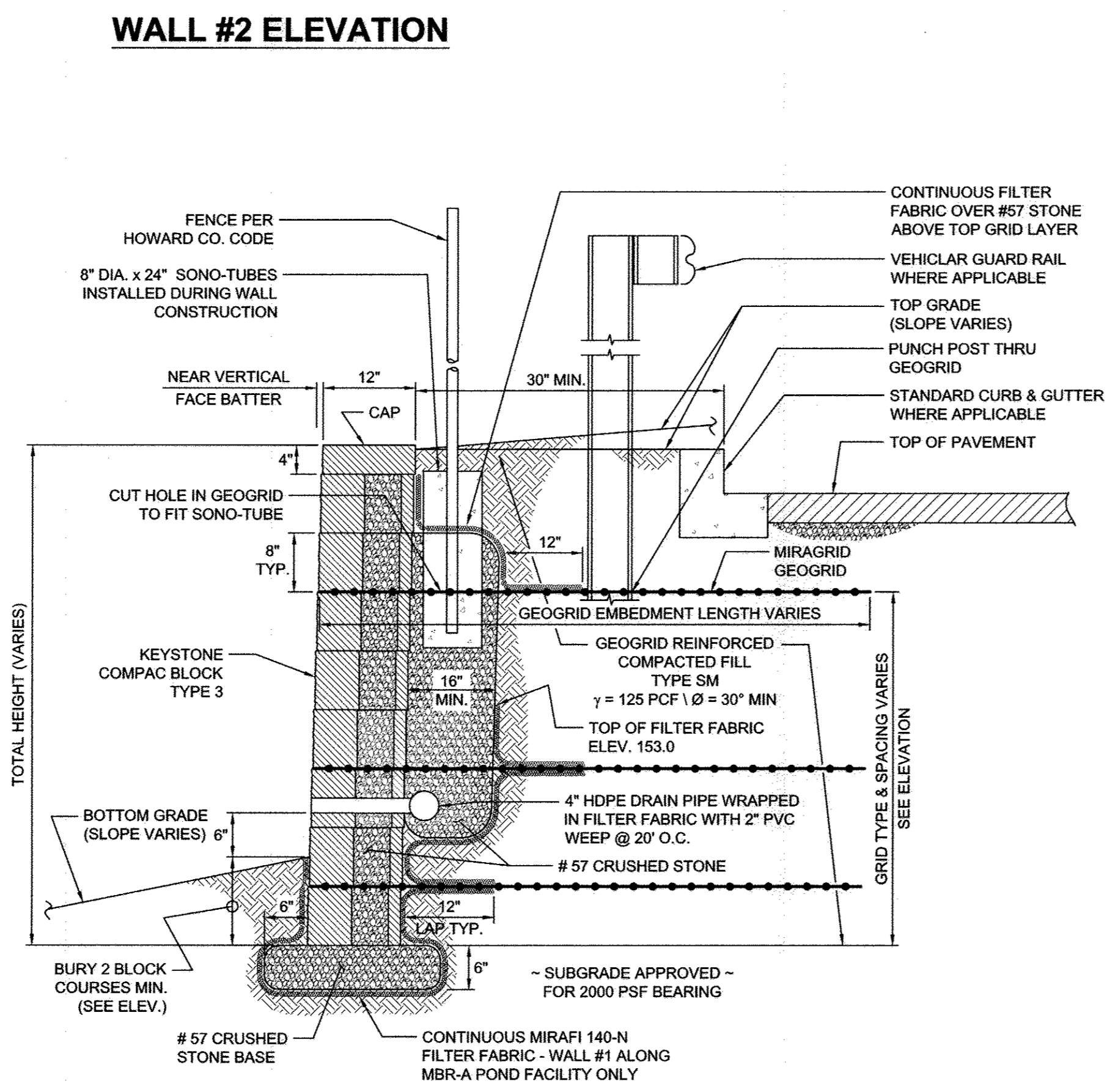
- A. REINFORCED BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOGRID AND INSTALLATION DAMAGE.
- B. REINFORCED BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES WHERE HAND COMPACTION IS USED, OR 8 - 10 INCHES WHERE 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.



APPROVED: DEPARTMENT OF PLANNING AND ZONING

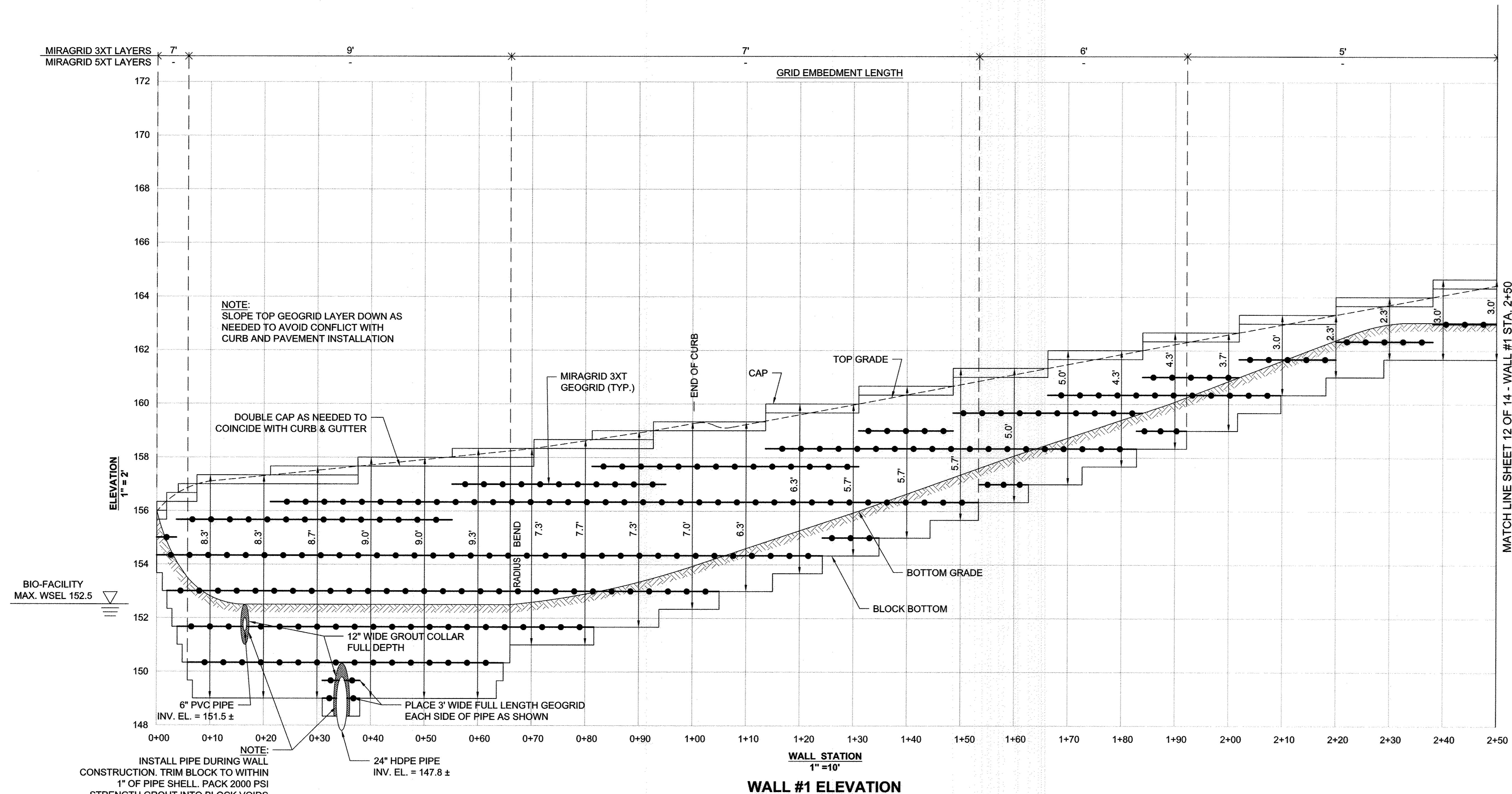
Kate S. L... 5-31-17
CHIEF, DIVISION OF LAND DEVELOPMENT

... 5-28-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION

... 5-31-17
DIRECTOR

- HOWARD COUNTY 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, WACEL, OR EQUIVALENT) CERTIFIED SOILS TECHNICIAN.
 - 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 OF 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 COUNTY RIGHT-OF-WAY OR EASEMENT.
 - FOR "CRITICAL" WALLS, ONE SOIL BORING IS REQUIRED FOR 100' ALONG LENGTH OF THE WALL. COPIES OF THE BORING REPORT SHALL BE PROVIDED TO THE HOWARD COUNTY INSPECTOR UPON COMPLETION OF CONSTRUCTION.

NO.	DATE	REVISION
<p>HILLIS-CARNES ENGINEERING ASSOCIATES</p> <p>10975 Guilford Road, Suite A Annapolis Junction, Maryland (410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098</p>		
<p>Professional Certification - I hereby certify that these plans 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. 14434, Expiration Date: 05/13/17.</p>		
OWNER/DEVELOPER:	CROSSROADS ROCK, LLC. 6800 DEERPATH ROAD, SUITE 100 ELKBRIDGE, MD 21075 (410) 579-2442	PROJECT: DORSEY RUN CENTER 7525 MONTEVIDEO ROAD
LOCATION:	TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND	TITLE: RETAINING WALL #2 ELEVATION & CONSTRUCTION DETAILS
DATE:	APRIL, 2017	HCEA PROJECT NO.: 16100-B
DRAFT: HM	DESIGN: HM	CHECK: RWS
SCALE:	AS SHOWN	SHEET 10 OF 14



NOTE:
INSTALL PIPE DURING WALL
CONSTRUCTION. TRIM BLOCK TO WITHIN
1" OF PIPE SHELL. PACK 2000 PSI
STRENGTH GROUT INTO BLOCK VOIDS
WITHIN 12" OF PIPE SHELL FOR FULL
DEPTH OF BLOCK TO CREATE COLLAR.

WALL #1 ELEVATION
1" = 10'


MATCH LINE SHEET 12 OF 14 - WALL #1 STA. 2+50

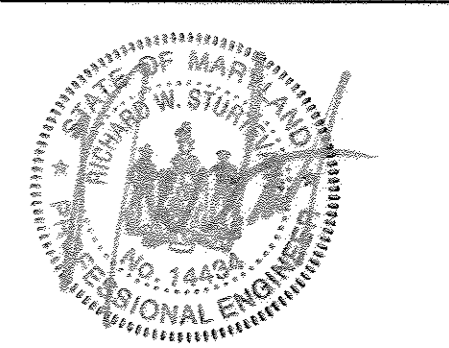
APPROVED: DEPARTMENT OF PLANNING AND ZONING

Kent Stalwood 5-31-17
CHIEF, DIVISION OF LAND DEVELOPMENT

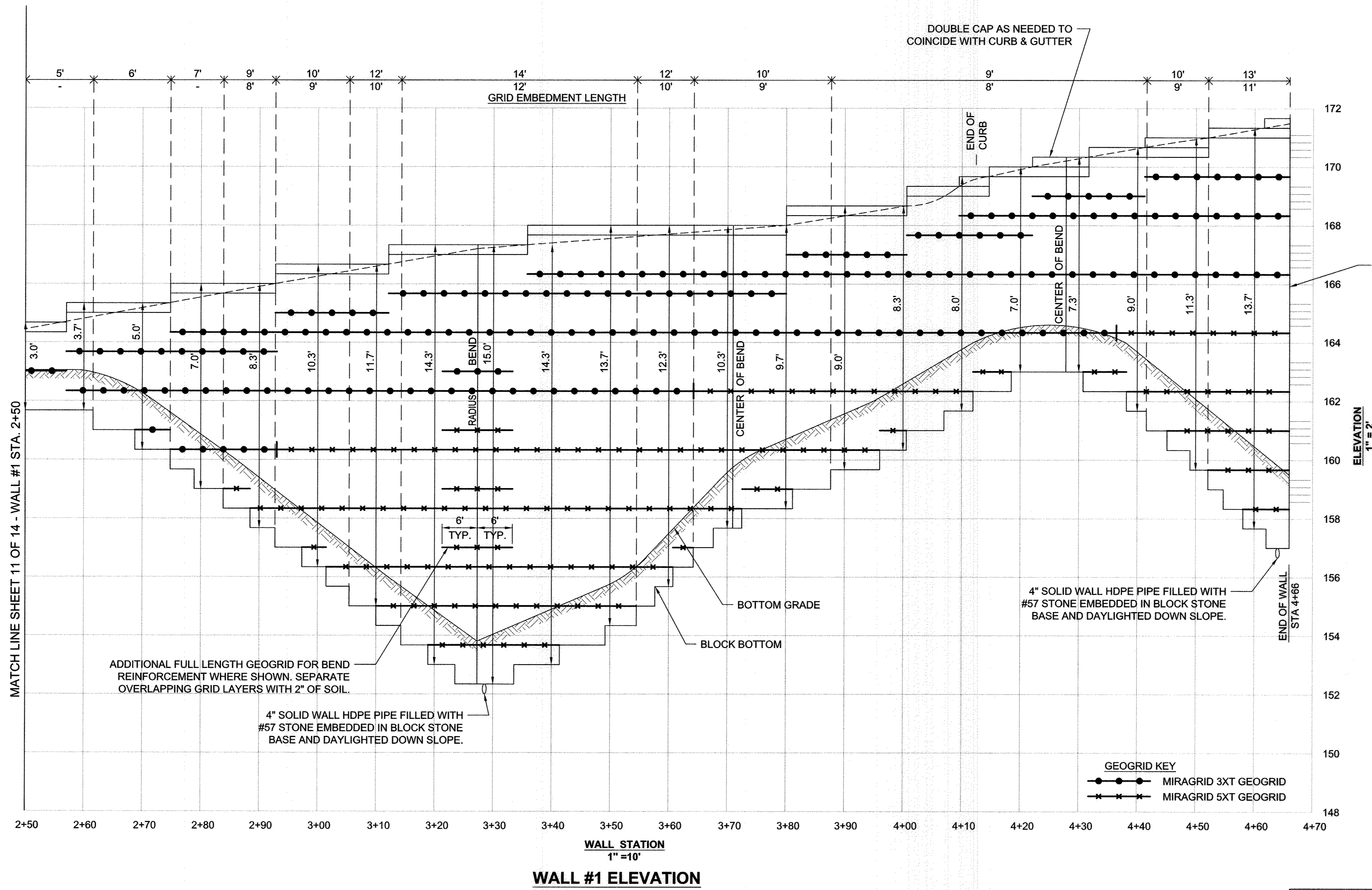
Chad E. Hill 5-29-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION

N. J. J. J. 5-31-17
DIRECTOR

NO.		DATE		REVISION	
 HILLIS-CARNES ENGINEERING ASSOCIATES 10975 Gullford Road, Suite A Annapolis Junction, Maryland (410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098					
OWNER/DEVELOPER:			PROJECT:		
CROSSROADS ROCK, LLC. 6800 DEERPATH ROAD, SUITE 100 ELKRIDGE, MD 21075 (410) 579-2442			DORSEY RUN CENTER 7525 MONTEVIDEO ROAD		
LOCATION:			TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND		
TITLE:			RETAINING WALL #1 ELEVATION (STA. 0+00 TO 2+50)		
DATE:		APRIL, 2017		HCEA PROJECT NO.: 16100-B	
DRAFT:		HM		SCALE:	
DESIGN:		HM		AS SHOWN	
CHECK:		RWS		SHEET 11 OF 14	



Professional Certification - I hereby certify that these plans 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. 14434, Expiration Date: 05/13/17.



BUTT RETAINING WALL TO EXISTING BUILDING FOUNDATION. SEAL INTERFACE OF BLOCK AND BUILDING WALL WITH A CONTINUOUS VERTICAL STRIP OF 2' WIDE FILTER FABRIC.

NOTE: BUILDING FOUNDATION WALL SHALL BE DESIGNED BY OTHERS TO ALLOW PLACEMENT OF FULL LENGTH GEOGRID AS SHOWN AND TO NOT IMPOSE BUILDING LOADS ONTO THE SEGMENTAL BLOCK WALL.

4" SOLID WALL HDPE PIPE FILLED WITH #57 STONE EMBEDDED IN BLOCK STONE BASE AND DAYLIGHTED DOWN SLOPE.

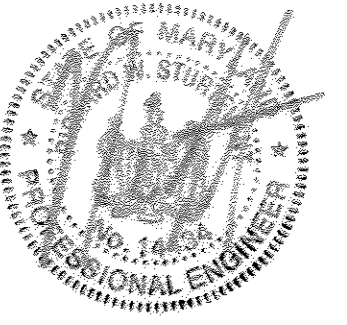
ADDITIONAL FULL LENGTH GEOGRID FOR BEND REINFORCEMENT WHERE SHOWN. SEPARATE OVERLAPPING GRID LAYERS WITH 2" OF SOIL.

4" SOLID WALL HDPE PIPE FILLED WITH #57 STONE EMBEDDED IN BLOCK STONE BASE AND DAYLIGHTED DOWN SLOPE.

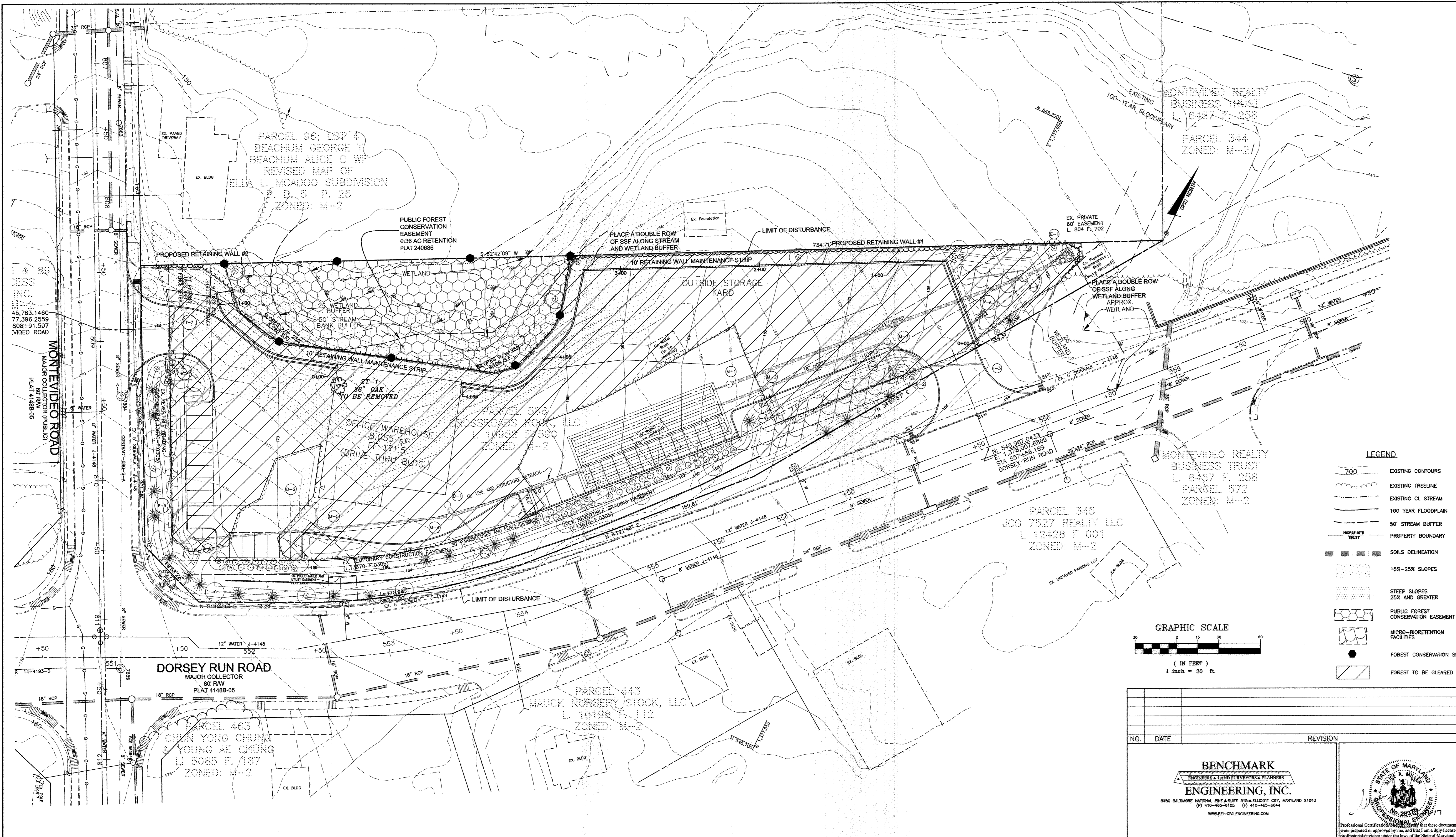
GEOGRID KEY
 ●●●●● MIRAGRID 3XT GEOGRID
 ××××× MIRAGRID 5XT GEOGRID

APPROVED: DEPARTMENT OF PLANNING AND ZONING
 Kent S. Anderson 5-31-17
 CHIEF, DIVISION OF LAND DEVELOPMENT
 DATE
 Chief Development Engineering Division 5-24-17
 DATE
 Director 5-31-17
 DATE

NO.		DATE		REVISION	
<p>HILLIS-CARNES ENGINEERING ASSOCIATES 10975 Guilford Road, Suite A Annapolis Junction, Maryland (410) 880-4788 WWW.HCEA.COM Fax: (410) 880-4098</p>					
<p>OWNER/DEVELOPER: CROSSROADS ROCK, LLC. 6800 DEERPETH ROAD, SUITE 100 ELKRIDGE, MD 21075 (410) 579-2442</p>					
<p>PROJECT: DORSEY RUN CENTER 7525 MONTEVIDEO ROAD</p>					
<p>LOCATION: TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND</p>					
<p>TITLE: RETAINING WALL #1 ELEVATION (STA. 2+50 TO 4+66)</p>					
DATE: APRIL, 2017		HCEA PROJECT NO.: 16100-B			
DRAFT: HM		DESIGN: HM		CHECK: RWS	
SCALE: AS SHOWN		SHEET 12 OF 14			



Professional Certification - I hereby certify that these plans 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. 14434, Expiration Date: 05/13/17.



45,763.1486
77,396.2559
808+91.507
VIDEO ROAD

DORSEY RUN ROAD
MAJOR COLLECTOR
80' RW
PLAT 4148B-05

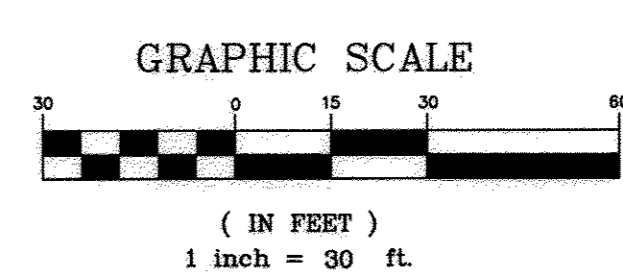
APPROVED: DEPARTMENT OF PLANNING AND ZONING
Kent Shadlock 5-31-17
CHIEF, DIVISION OF LAND DEVELOPMENT
DL Edmond 5-24-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION
Nalini Jagan 5-31-17
DIRECTOR

SOILS LEGEND			
MAP SYMBOL	SOIL GROUP	K* FACTOR	SOIL TYPE
CrD**	C	0.37	CROOM AND EVESBORO SOILS, 10 TO 15 PERCENT SLOPES
Hg**	D	0.37	HATBORO-CODORUS SILT LOAMS, 0 TO 3 PERCENT SLOPES
SrC**	B	0.37	SASSAFRAS AND CROOM SOILS, 5 TO 10 PERCENT SLOPES
Utd	D	0.28	URBAN LAND - UDORTHERTS COMPLEX, 0 TO 15 PERCENT SLOPES
UfA*	D	0.24	URBAN LAND-FALLSINGTON COMPLEX, 0 TO 2 PERCENT SLOPES

TAKEN FROM NRCS WEB SOIL SURVEY, JUNE 2014, HOWARD SOIL SURVEY MAP NO. 25
*INDICATES HYDRIC SOIL GROUP
**INDICATES HIGHLY ERODIBLE SOIL GROUP. ADDITIONAL OR MORE STRINGENT SEDIMENT CONTROL MEASURES MAY BE NECESSARY.

J. Chris Ogle
J. CHRIS OGLE
DNR QUALIFIED PROFESSIONAL

- LEGEND**
- EXISTING CONTOURS
 - EXISTING TREELINE
 - EXISTING CL STREAM
 - 100 YEAR FLOODPLAIN
 - 50' STREAM BUFFER
 - PROPERTY BOUNDARY
 - SOILS DELINEATION
 - 15%-25% SLOPES
 - STEEP SLOPES 25% AND GREATER
 - PUBLIC FOREST CONSERVATION EASEMENT
 - MICRO-BIORETENTION FACILITIES
 - FOREST CONSERVATION SIGN
 - FOREST TO BE CLEARED



NO.	DATE	REVISION

BENCHMARK
ENGINEERS • LAND SURVEYORS • PLANNERS
ENGINEERING, INC.
8480 BALTIMORE NATIONAL PIKE & SUITE 315 • ELICOTT CITY, MARYLAND 21043
(P) 410-465-8108 (F) 410-465-6644
WWW.BE-CVLENGINEERING.COM

OWNER/DEVELOPER: CROSSROADS ROCK, LLC. 6800 DEERPATH ROAD, SUITE 100 ELKRIDGE, MD 21075 (410) 579-2442	PROJECT: DORSEY RUN CENTER 7525 MONTEVIDEO ROAD
LOCATION: TAX MAP 43 PARCEL 596 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND	TITLE: FOREST CONSERVATION PLAN
DRAFT: AM DESIGN: JCO CHECK: JCO	DATE: APRIL, 2017 PROJECT NO. 2039 SCALE: AS SHOWN SHEET 13 OF 14

FOREST CONSERVATION NOTES:

1. ANY FOREST CONSERVATION EASEMENT (FCE) AREA SHOWN HEREON IS SUBJECT TO PROTECTIVE COVENANTS WHICH MAY BE FOUND IN THE LAND RECORDS OF HOWARD COUNTY WHICH RESTRICT THE DISTURBANCE AND USE OF THESE AREAS.
2. THE FOREST CONSERVATION EASEMENTS HAVE BEEN ESTABLISHED TO FULFILL THE REQUIREMENTS OF SECTION 16.1200 OF THE HOWARD COUNTY CODE, FOREST CONSERVATION ACT. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENTS; HOWEVER, FOREST MANAGEMENT PRACTICES AS DEFINED IN THE DEED OF FOREST CONSERVATION EASEMENT ARE ALLOWED.
3. LIMITS OF DISTURBANCE SHALL BE RESTRICTED TO AREAS OUTSIDE THE LIMIT OF TEMPORARY FENCING OR THE FCE BOUNDARY, WHICHEVER IS GREATER.
4. THERE SHALL BE NO CLEARING, GRADING, CONSTRUCTION OR DISTURBANCE OF VEGETATION IN THE FOREST CONSERVATION EASEMENT, EXCEPT AS PERMITTED BY HOWARD COUNTY DPZ.
5. NO STOCKPILES, PARKING AREAS, EQUIPMENT CLEANING AREAS, ETC. SHALL OCCUR WITHIN AREAS DESIGNATED AS FOREST CONSERVATION EASEMENTS.
6. TEMPORARY FENCING SHALL BE USED TO PROTECT FOREST RESOURCES DURING CONSTRUCTION. THE FENCING SHALL BE PLACED ALONG ALL FCE BOUNDARIES WHICH OCCUR WITHIN 15 FEET OF THE PROPOSED LIMITS OF DISTURBANCE.
7. PERMANENT SIGNAGE SHALL BE PLACED 50-100' APART ALONG THE BOUNDARIES OF ALL AREAS INCLUDED IN FOREST CONSERVATION EASEMENTS.
8. THE FOREST CONSERVATION OBLIGATION FOR THIS SITE SHALL BE MET BY THE ON-SITE RETENTION AMOUNT OF 0.36 ACRES. THE REMAINING 0.57 WILL BE PROVIDED BY FEE-IN-LIEU (\$18,622.00).

**FOREST CONSERVATION WORKSHEET
DORSEY RUN CENTER**

5-Aug-02

NET TRACT AREA:

A. Total tract area ...	2.76
B. Land dedication acres (parks, county facility, etc.) ...	0.00
C. Land dedication for roads or utilities (not being constructed by this plan) ...	0.00
D. Area to remain in commercial agricultural production/use ...	0.00
E. Other deductions (specify) FLOODPLAIN	0.00
F. Net Tract Area	2.76

LAND USE CATEGORY: (from Trees Technical Manual)

Input the number "1" under the appropriate land use, limit to only one entry.

ARA	MDR	IDA	HDR	MPD	CIA
0	0	0	0	0	1

G. Afforestation Threshold ...	15%	x F =	0.41
H. Conservation Threshold ...	15%	x F =	0.41

EXISTING FOREST COVER:

I. Existing forest cover	2.28
J. Area of forest above afforestation threshold	1.87
K. Area of forest above conservation threshold	1.87

BREAK EVEN POINT:

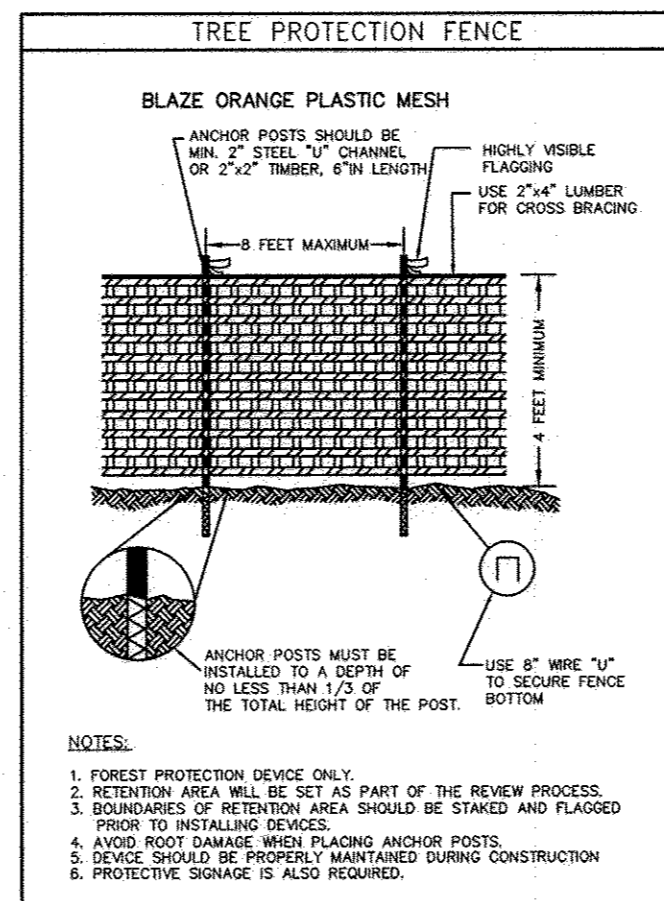
L. Forest retention above threshold with no mitigation	0.79
M. Clearing permitted without mitigation	1.49

PROPOSED FOREST CLEARING:

N. Total area of forest to be cleared	1.92
O. Total area of forest to be retained	0.36

PLANTING REQUIREMENTS:

P. Reforestation for clearing above conservation threshold	0.47
Q. Reforestation for clearing below conservation threshold	0.11
R. Credit for retention above conservation threshold	0.00
S. Total reforestation required	0.57
T. Total afforestation required	0.00
U. Credit for landscaping (may not exceed 20% of "S")	0.00
V. Total reforestation and afforestation required	0.57



FOREST PROTECTION PROCEDURES - Preconstruction Phase

- 1) The edge of the woods to be protected will be marked (staked or flagged) in the field per the limits of forest conservation easement shown in the approved site development plan prior to the start of construction activity. All areas within protective easement are to be considered "off limits" to any construction activities. The optional protective fencing shall be installed at the outside edge of forested areas and should be combined with sediment control devices when possible. The limit of the critical root zone and therefore the location of the protective devices is to be determined as follows:
Edge of Forested Area - 1 foot of protective radius/inch of DBH or an eight foot protective radius, whichever is greater.
Critical Root Zone for the forest on this site is an average of 12 feet from the trunk of the trees. Critical root zone for the 36" Specimen Tree is approximately 45'.
Placing or stockpiling backfill or top soil in protected areas
Driving construction equipment into or through protected areas
Burning in or in close proximity to protected areas
Stacking or storing supplies of any kind
Concrete wash-off areas
Conducting trenching operations
Grading beyond the limits of disturbance
Parking vehicles or construction equipment
Removal of root mat or topsoil
Siting and construction of:
Utility lines
Access roads
Impervious surfaces
Stormwater management devices
Staging areas
- 2) Construction activities expressly prohibited within the preservation areas are:
Removal of temporary structures:
a) No burial of discarded materials will occur onsite within the conservation area.
b) No open burning within 100 feet of a wooded area.
c) All temporary forest protection structures will be removed after construction.
d) Remove temporary roads by removing stone or broadcasting mulch; pre-construction elevation should be maintained.
e) Aerate compacted soil.
f) Replant disturbed sites with trees, shrubs and/or herbaceous plants.
g) Retain signs for retention areas or specimen trees.
h) A County official shall inspect the entire site.
- 3) Protective fencing (see Figure "Protective Fencing") shall be the responsibility of the general contractor. The general contractor shall affix signs to the fencing at 25' minimum intervals indicating that these areas are "Forest Retention Area" (see Figure "Signage"). The general contractor shall take great care to assure the restricted areas are not violated and that root systems are protected from smothering, flooding, excessive wetting from dewatering operations, off-site runoff, spillage, and drainage or solutions containing materials hazardous to tree roots.
- 4) The general contractor shall be responsible for any tree damaged or destroyed within the preservation areas whether caused by the contractor, his agents, employees, subcontractors, or licensees.
- 5) Foot traffic shall be kept to a minimum in the protective areas.
- 6) All trees which are not to be preserved within fifty feet of any tree preservation areas are to be removed in a manner that will not damage those trees that are designated for preservation. It is highly recommended that tree stumps within this fifty foot area be ground out with a stump grinding machine to minimize damage.
- 7) The general contractor shall designate a "wash out" area onsite for concrete trucks which will not drain toward a protected area.
- 8) A pre-construction meeting shall be held with local authorities before any disturbance has taken place on site.

FOREST PROTECTION PROCEDURES - Construction Phase

- Forest and tree conditions should be monitored during construction and corrective measures taken when appropriate. The following shall be monitored:
- a) Soil compaction
 - b) Root injury - prune and monitor; consider crown reduction
 - c) Limb injury - prune and monitor
 - d) Flooded conditions - drain and monitor; correct problem
 - e) Drought conditions - water and monitor; correct problem
 - f) Other stress signs - determine reason, correct, and monitor
- FOREST PROTECTION PROCEDURES - Post Construction Phase**
- The following measures shall be taken:
- 1) Corrective measures if damages were incurred due to negligence:
 - a) Stress reduction
 - b) Removal of dead or dying trees. This may be done only if trees pose an immediate safety hazard.
 - 2) Removal of temporary structures:
 - a) No burial of discarded materials will occur onsite within the conservation area.
 - b) No open burning within 100 feet of a wooded area.
 - c) All temporary forest protection structures will be removed after construction.
 - d) Remove temporary roads by removing stone or broadcasting mulch; pre-construction elevation should be maintained.
 - e) Aerate compacted soil.
 - f) Replant disturbed sites with trees, shrubs and/or herbaceous plants.
 - g) Retain signs for retention areas or specimen trees.
 - h) A County official shall inspect the entire site.
 - 3) Future protection measures:
 - a) Howard County and the developer shall arrange for the dedication of an appropriate forest conservation easement at a later date.

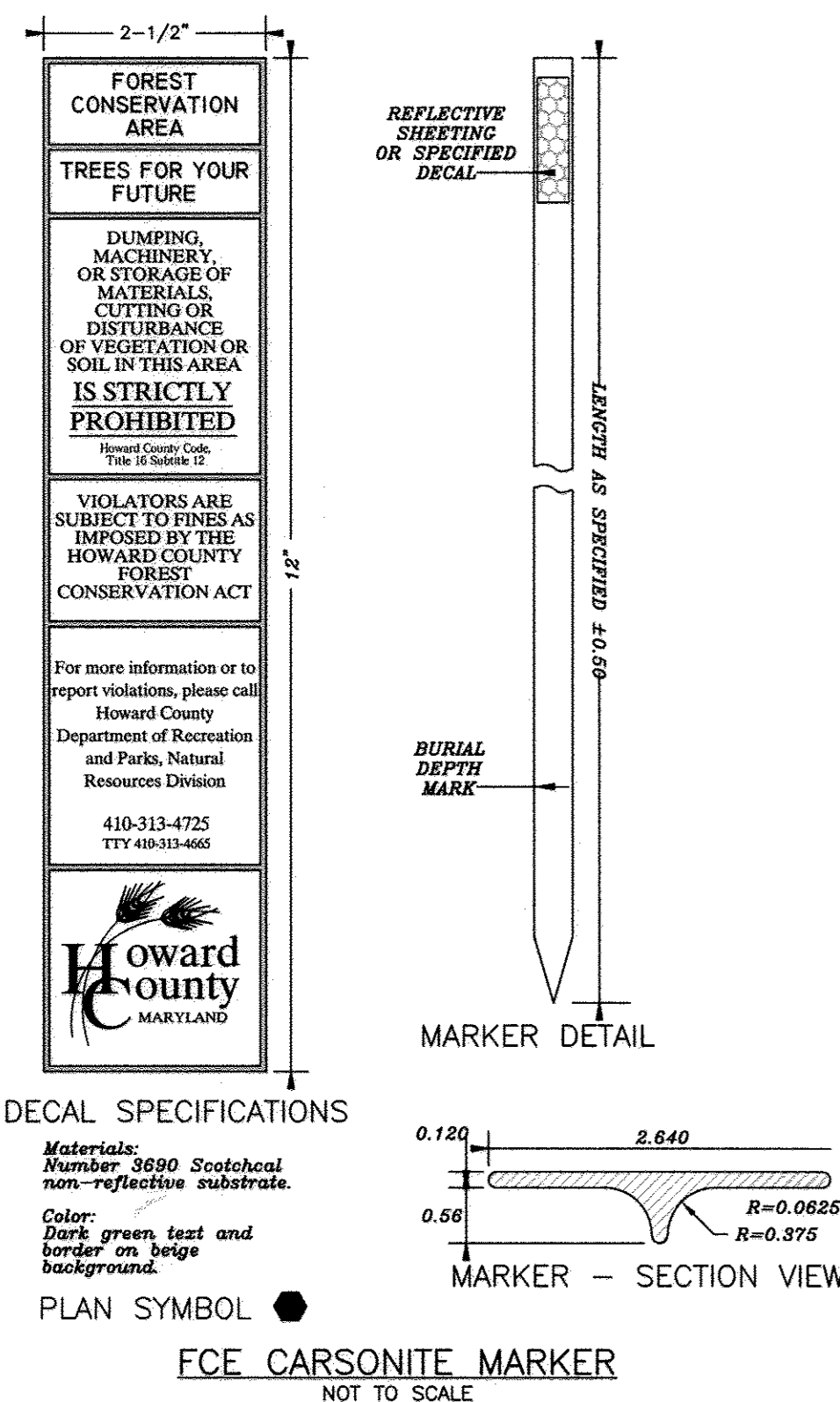
FOREST PROTECTION PROCEDURES - Preconstruction Phase

- Stress Reduction and Protection of Specimen Trees isolated from Forest Retention Areas and General Forest Retention Areas (as they may apply)
- Isolated specimen trees that are to be preserved will be examined to determine if stress reduction techniques are needed. Protective measures and their evaluation criteria are provided on this plan only if they are employed herein.
- Root Pruning Evaluation Criteria**
- Will the critical root zone be affected by construction activities such as grade changes, digging for foundations and roads or utility installation?
- Design Considerations**
- a) Prune prior to construction as shown on the plan (see Figure "Root Pruning Detail.")
 - b) Prune root with a clean cut using proper pruning equipment such as a vibratory knife.
 - c) Exact location of pruning trench should be identified, and immediately backfilled to cover exposed roots after pruning with soil removed other topsoil, peat moss, or other suitable material or with other high organic soil.
 - d) For trees over 15" in diameter, root pruning may be done up to one year in advance of construction.
 - e) Tree(s) will be monitored for signs of stress.
- Crown Reduction or Pruning Evaluation Criteria**
- Has the root system been significantly reduced (>30%) or are there dead, damaged, or diseased limbs?
- Design Considerations**
- a) Reduce only at specified times of the year:
Flowering trees - only after flowering and before bud set
Non-flowering trees - in late winter, early spring or mid summer
 - b) No more than 1/3 of the crown should be removed at one time using acceptable pruning methods (see Figure "Crown Reduction Detail")
 - c) Monitor for signs of stress
- Watering Evaluation Criteria**
- Will construction activities alter the hydrology of the site? Has or will root pruning occur?
- Design Considerations**
- a) Water only as necessary
 - b) Monitor for signs of stress (see Figure "Tree Planting and Maintenance Calendar")
- Fertilizing Evaluation Criteria**
- Is or will be tree(s) be under stressful conditions? Has or will root pruning occur?
- Design Considerations**
- a) Use low nitrogen and slow release fertilizers.
 - b) Apply in late fall or early spring (see Figure "Tree Planting and Maintenance Calendar")
 - c) For small trees (<3" in diameter), use punch hole method or pressurized injection method (see Figure "Application of Fertilizers by Injection.")
 - d) For larger trees (>3" diameter), use punch hole method or pressurized injection method (see Figure "Application of Fertilizers by Injection.")
 - e) Do not apply fertilizer any closer than 3' from tree trunk for pressurized injection method.
 - f) Monitor for signs of stress.

THE WATERSHED FOR THIS DRAINAGE AREA IS THE PATAPSCO RIVER, DNR LISTING NUMBER 2130906.

SPECIMEN TREE TABLE

NO.	COMMON NAME	DBH (IN.)	CONDITION RATING	STATUS
1	OAK	36	GOOD	TO BE REMOVED



APPROVED: DEPARTMENT OF PLANNING AND ZONING

Keith S. Lawrence 5-31-17
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Chris Ogles 5-29-17
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Walter J. Griffin 5-31-17
DIRECTOR DATE

Chris Ogles
J. CHRIS OGLES
DNR QUALIFIED PROFESSIONAL

NO.	DATE	REVISION
 BENCHMARK ENGINEERS & LAND SURVEYORS & PLANNERS ENGINEERING, INC. 6800 BALTIMORE NATIONAL PKE & SUITE 315A ELLICOTT CITY, MARYLAND 21043 (P) 410-465-8100 (F) 410-465-6844 WWW.BE-CVLENGINEERING.COM		
 PROFESSIONAL ENGINEER License No. 28376, Expiration Date: 1-1-2019		
OWNER/DEVELOPER:	PROJECT:	
CROSSROADS ROCK, LLC. 6800 DEERPATH ROAD, SUITE 100 ELK RIDGE, MD 21075 (410) 579-2442	DORSEY RUN CENTER 7525 MONTEVIDEO ROAD	
LOCATION:	TAX MAP 43 PARCEL 586 1ST ELECTION DISTRICT ZONED: M-2 HOWARD COUNTY, MARYLAND	
TITLE:	FOREST CONSERVATION DETAILS	
DATE: APRIL, 2017	PROJECT NO. 2039	
SCALE: AS SHOWN	SHEET 14 OF 14	
DRAFT: AM DESIGN: JCO CHECK: JCO		