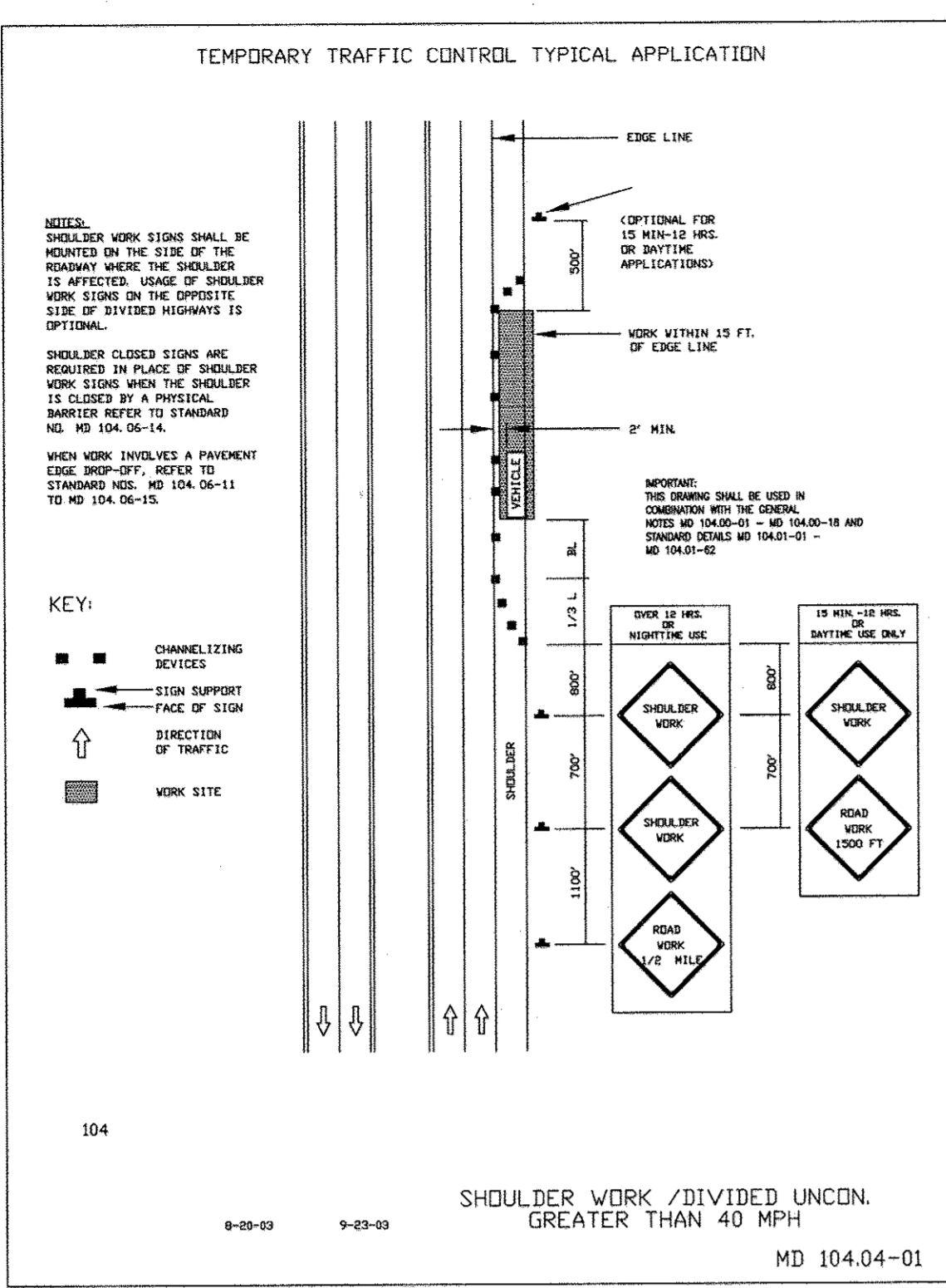


Professional Engineer's Responsibility: I hereby certify that these documents were prepared or approved by me or a duly licensed engineer under my direct supervision and that I am a duly licensed professional engineer under the laws of the State of Maryland.

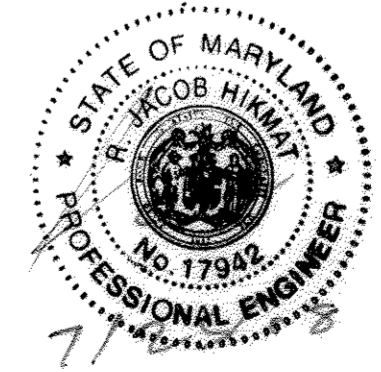
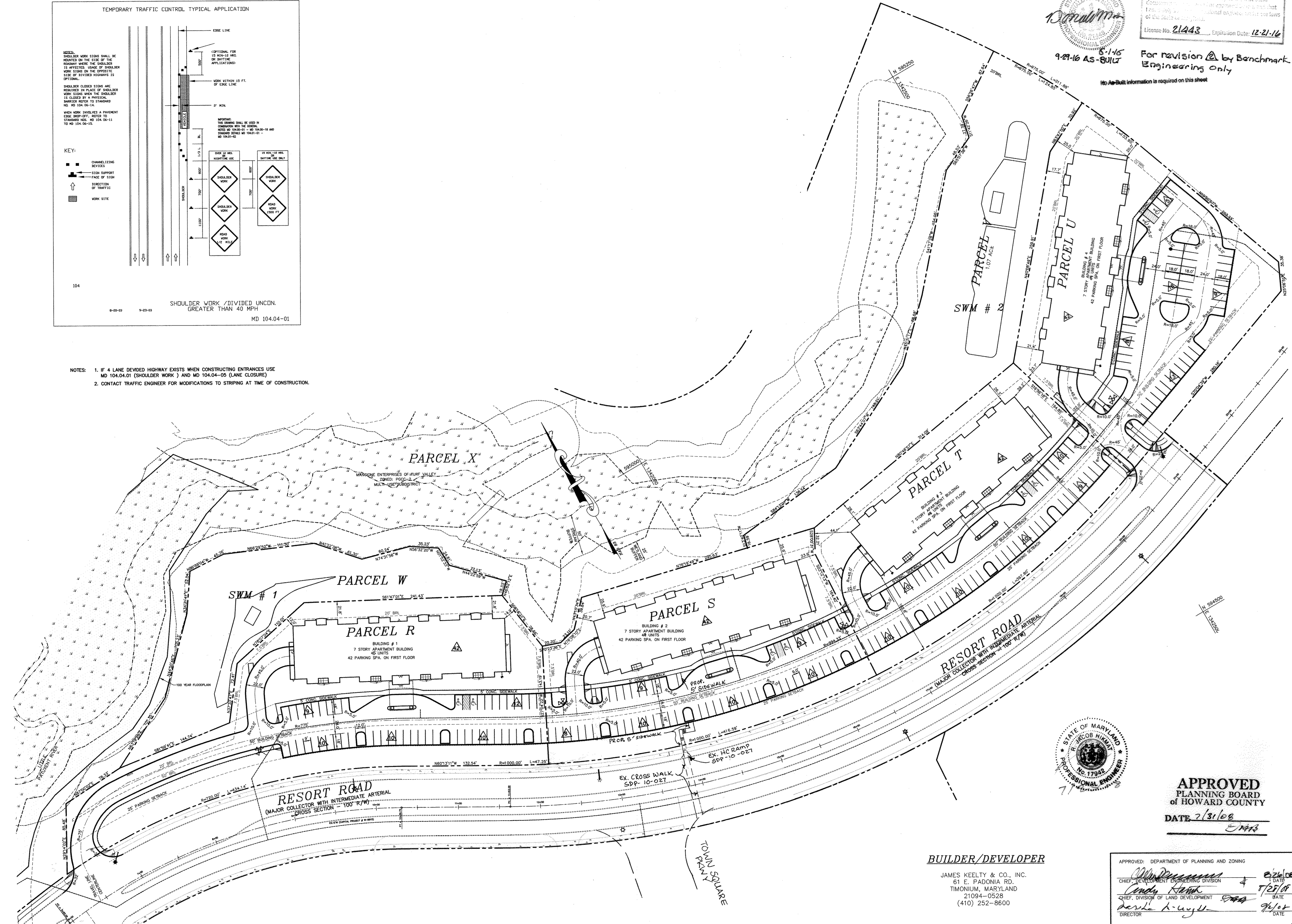
License No. **21443** Expiration Date: **12-21-16**

9-21-16 AS-BUILT  
 For revision by Benchmark Engineering Only

No As-Built information is required on this sheet



- NOTES:
1. IF 4 LANE DIVIDED HIGHWAY EXISTS WHEN CONSTRUCTING ENTRANCES USE MD 104.04.01 (SHOULDER WORK) AND MD 104.04-05 (LANE CLOSURE)
  2. CONTACT TRAFFIC ENGINEER FOR MODIFICATIONS TO STRIPING AT TIME OF CONSTRUCTION.



APPROVED  
 PLANNING BOARD  
 of HOWARD COUNTY  
 DATE 2/3/18  
 [Signature]

**BUILDER/DEVELOPER**  
 JAMES KEELY & CO., INC.  
 61 E. PADONIA RD.  
 TIMONIUM, MARYLAND  
 21094-0528  
 (410) 252-8600

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signature]  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature]  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature]  
 DIRECTOR

DATE 2/25/18  
 DATE 2/25/18  
 DATE 2/25/18

date	DEC.2007	engineering	MMM	approval
project	03-081	illustration	MMM	scale
				1"=50'

no.	1	DATE	2/25/18	DESCRIPTION	REVISIONS
	2	DATE	AS-BUILT	DESCRIPTION	REVISIONS

**OAKMONT AT TURF VALLEY**  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 8, BLOCK 10  
 THIRD ELECTION DISTRICT  
 DIMENSION PLAN

**MILDENBERG, BOENDER & ASSOC., INC.**  
 Planners Surveyors  
 5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland, 21042  
 (410) 997-0296 Balt. (301) 821-5521 Wash. (410) 997-0298 Fax

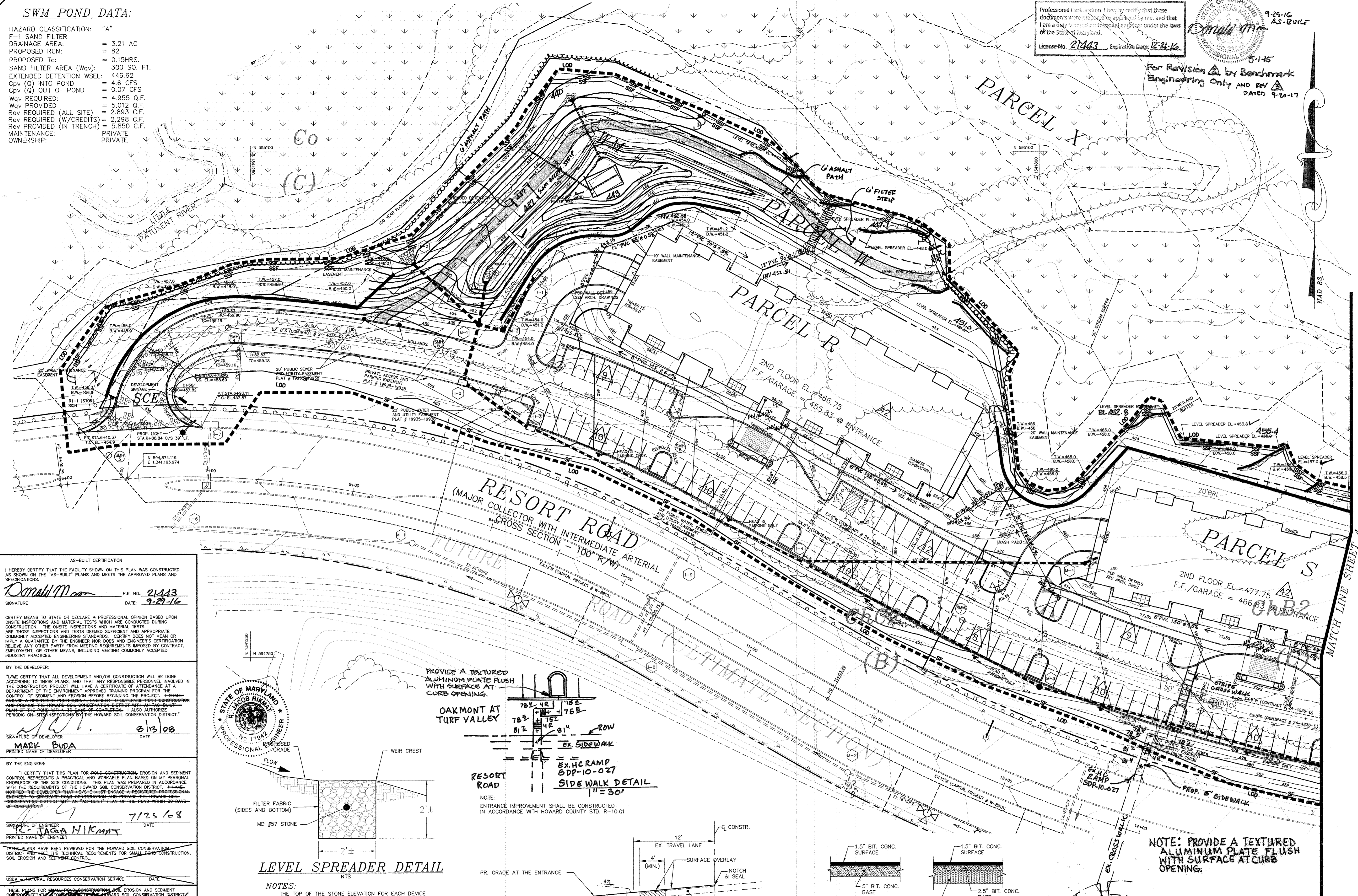


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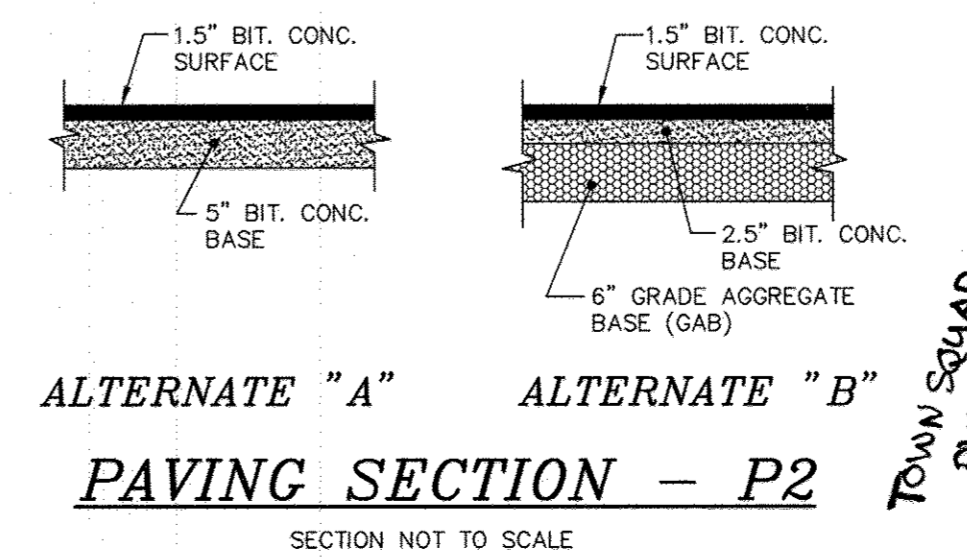
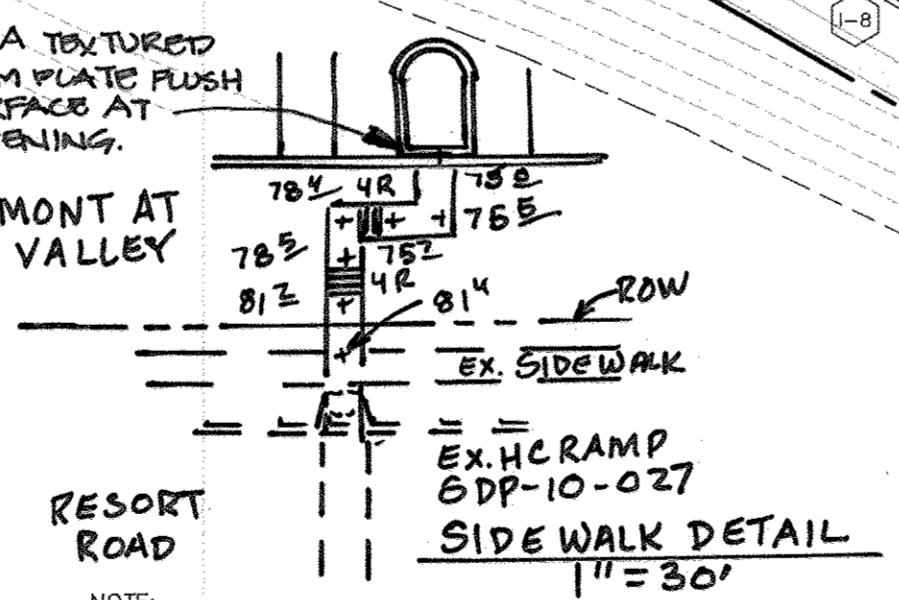
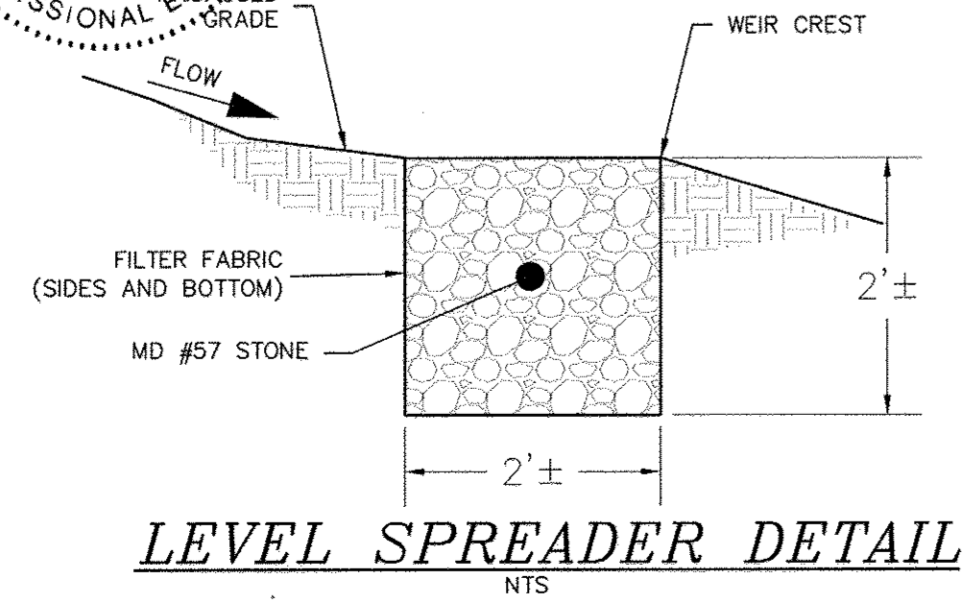
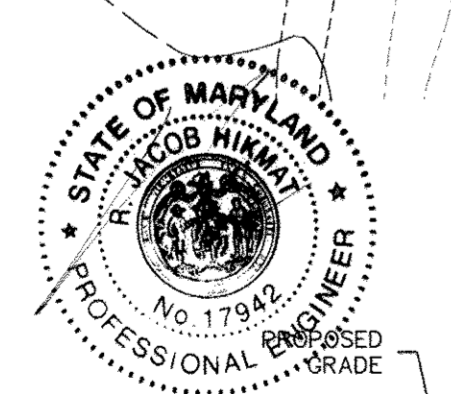
HAZARD CLASSIFICATION: "A"  
 F-1 SAND FILTER  
 DRAINAGE AREA: = 3.21 AC  
 PROPOSED RCN: = 82  
 PROPOSED Tc: = 0.15HRS.  
 SAND FILTER AREA (Wqv): 300 SQ. FT.  
 EXTENDED DETENTION WSEL: 446.62  
 Cpv (Q) INTO POND = 4.6 CFS  
 Cpv (Q) OUT OF POND = 0.07 CFS  
 Wqv REQUIRED: = 4.955 Q.F.  
 Wqv PROVIDED = 5.012 Q.F.  
 Rev REQUIRED (ALL SITE) = 2,893 C.F.  
 Rev REQUIRED (W/CREDITS) = 2,298 C.F.  
 Rev PROVIDED (IN TRENCH) = 5,850 C.F.  
 MAINTENANCE: PRIVATE  
 OWNERSHIP: PRIVATE

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 21443, Expiration Date: 12-31-16

STATE OF MARYLAND  
 PROFESSIONAL ENGINEER  
 9-29-16 AS-BUILT  
 5-1-15  
 For Revision by Benchmark Engineering Only and Rev DATED 9-20-17



AS-BUILT CERTIFICATION  
 I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS.  
 Signature: *Donald M. Carr* P.E. No.: 21443 DATE: 9-27-16  
 Signature of Developer: *MARY BUDA* DATE: 8/13/08  
 Signature of Engineer: *JACOB HIKMATT* DATE: 7/25/08  
 APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Signature: *John C. Blanton* DATE: 8/23/08  
 APPROVED: CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 Signature: *Chris Hants* DATE: 8/27/08  
 APPROVED: CHIEF, DIVISION OF LAND DEVELOPMENT  
 Signature: *David A. Uygul* DATE: 7/5/14



NOTE: PROVIDE A TEXTURED ALUMINUM PLATE FLUSH WITH SURFACE AT CURB OPENING.  
**APPROVED**  
 PLANNING BOARD  
 OF HOWARD COUNTY  
 DATE: 7/31/08

Project	date	description	revision
09-081	DEC.2007	illustration	MM
09-081	DEC.2007	illustration	MM
09-081	DEC.2007	illustration	MM

Project	date	description	revision
09-081	DEC.2007	illustration	MM
09-081	DEC.2007	illustration	MM
09-081	DEC.2007	illustration	MM

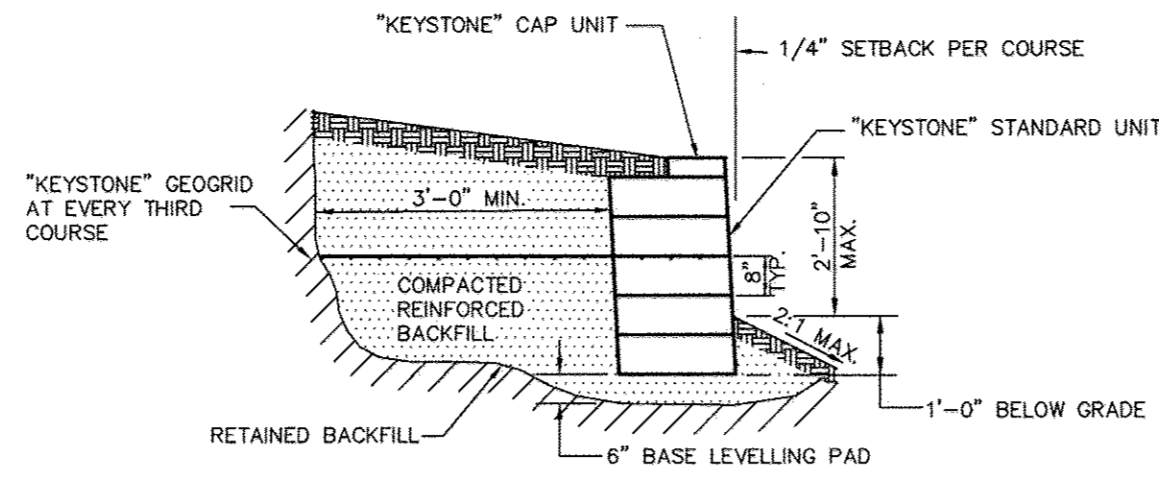
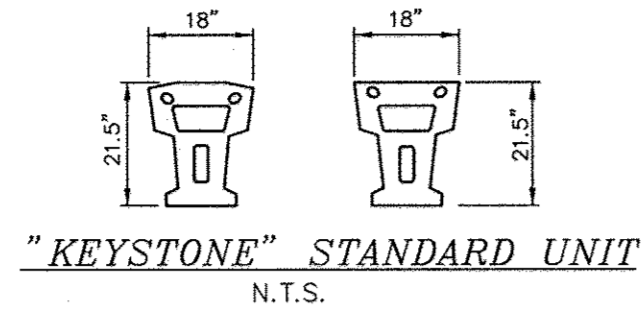
**OAKMONT AT TURF VALLEY**  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 8, BLOCK 10  
 HOWARD COUNTY, MARYLAND  
 THIRD ELECTION DISTRICT  
**GRADING AND SEDIMENT CONTROL PLAN**

**MILDENBERG, BOENDER & ASSOC., INC.**  
 Engineers Planners Surveyors  
 5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042  
 (410) 997-0296 Fax: (301) 621-5521 Wash.  
 SDP-07-062



**SWM POND DATA:**

HAZARD CLASSIFICATION: "A"  
 F-1 SAND FILTER  
 DRAINAGE AREA: = 3.44 AC  
 PROPOSED RCN: = 82  
 PROPOSED Tc: = 0.37 HRS.  
 SAND FILTER AREA (Wqv): 150 SQ. FT.  
 EXTENDED DETENTION WSEL: 473.63  
 Cpv (Q) INTO POND = 2.6 CFS  
 Cpv (Q) OUT OF POND = 0.07 CFS  
 Wqv REQUIRED: = 6,568 C.F.  
 Wqv PROVIDED: = 6,649 C.F.  
 Rev REQUIRED (ALL SITE) = 2,893 C.F.  
 Rev REQUIRED (W/CREDITS) = 2,298 C.F.  
 Rev PROVIDED (IN TRENCH) = 5,950 C.F.  
 MAINTENANCE: PRIVATE  
 OWNERSHIP: PRIVATE



**RETAINING WALL DETAIL**  
 N.T.S.

NOTE: 1. ALL FOOTING AND DESIGN SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.  
 2. COMPACTED REINFORCED BACKFILL SHALL CONSIST OF GRAVEL OR CRUSHED STONE (1/2" TO 3/4") AT 95% STANDARD PROCTOR COMPACTION.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. **2443** Expiration Date: **12-21-16**



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. **28551** Expiration Date: **1-22-2017**

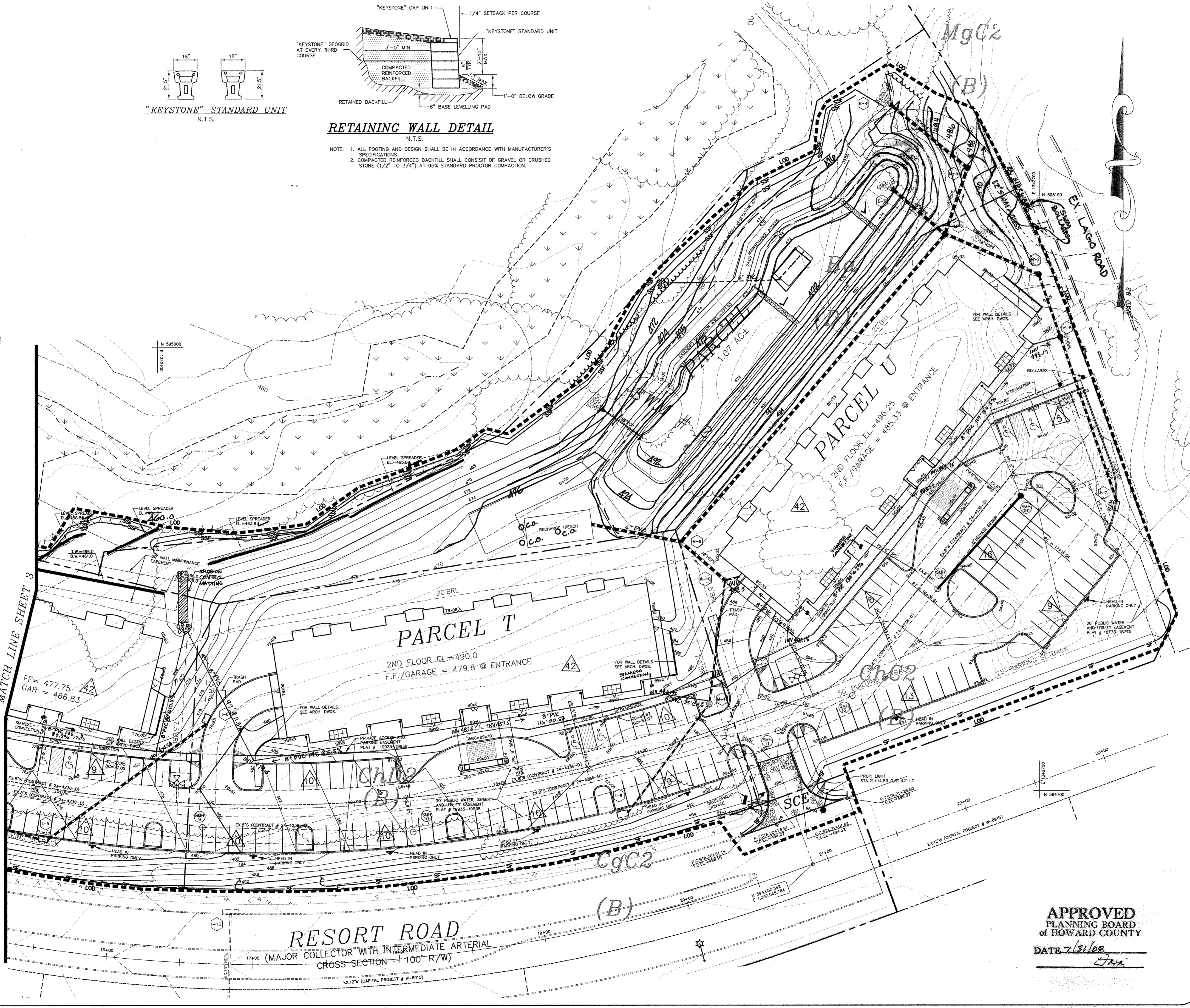
AS-BUILT CERTIFICATION  
 I HEREBY CERTIFY THAT THE FACILITY WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" REVISED PLANS AND SPECIFICATIONS.  
**Ronald M...** 21443 9-29-16  
 SIGNATURE DATE

CERTIFY MEANS TO STATE OR DECIDE, BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS CONDUCTED DURING CONSTRUCTION, THE ON-SITE INSPECTIONS AND TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE UNDER COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES THE ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

BY THE DEVELOPER:  
 I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.  
 SIGNATURE OF DEVELOPER: **MARY BUDA** DATE: **8/13/08**

BY THE ENGINEER:  
 I CERTIFY THAT THIS PLAN FOR EROSION CONTROL, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE AND THAT THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 SIGNATURE OF ENGINEER: **E. JACOB...** DATE: **7/25/08**

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION: **[Signature]** DATE: **8/26/08**  
 CHIEF, DIVISION OF LAND DEVELOPMENT: **[Signature]** DATE: **8/25/08**  
 DIRECTOR: **[Signature]** DATE: **9/1/08**



APPROVED  
 PLANNING BOARD  
 of HOWARD COUNTY  
 DATE: **7/31/08**

Project	03-081	Date	DEC. 2007
Illustration	MMM	Engineering	MMM
Scale	1" = 30'	Approval	MMM

REV.	DESCRIPTION	DATE
1	REV. PLANING BOARD APPROVAL	7-31-08
2	REV. PLANING BOARD APPROVAL	8-26-08

**OAKMONT AT TURF VALLEY**  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 8, BLOCK 10  
 HOWARD COUNTY, MARYLAND  
 THIRD ELECTION DISTRICT  
**GRADING AND SEDIMENT CONTROL PLAN**

**MILDENBERG, BOENDER & ASSOC., INC.**  
 Engineers Planners Surveyors  
 5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042  
 (410) 997-0286, Fax: (301) 621-5521, Wash. (410) 997-0288 Fax.



**HOWARD SOIL CONSERVATION DISTRICT**

**PERMANENT SEEDING NOTES**

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONG-LIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: IN LIEU OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

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

SEEDING - FOR THE PERIODS MARCH 1 THRU APRIL 30, AND AUGUST 1 THRU OCTOBER 15, SEED WITH 60 LBS. PER ACRE 1.4 LBS./1000 SQ.FT. OF KENTUCKY 31 TALL FESCUE. FOR THE PERIOD MAY 1 THRU JULY 31, SEED WITH 60 LBS. KENTUCKY 31 TALL FESCUE PER ACRE AND 2 LBS. PER ACRE (.05 LBS./1000 SQ.FT.) OF WEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THRU FEBRUARY 28, PROTECT SITE BY: OPTION (1) - 2 TONS PER ACRE OF WELLS ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) - USE SOD. OPTION (3) - SEED WITH 60 LBS./ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS/ACRE WELLS ANCHORED STRAW.

MULCHING - APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS./1000 SQ.FT.) OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GALLONS PER ACRE (5 GAL./1000 SQ.FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES 6 FEET OR HIGHER, USE 348 GALLONS PER ACRE (8 GAL./1000 SQ.FT.) FOR ANCHORING.

MAINTENANCE - INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

**TEMPORARY SEEDING NOTES**

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT-TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, FOR NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: APPLY 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS./1000 SQ.FT.)

SEEDING: FOR PERIODS MARCH 1 THRU APRIL 30 AND FROM AUGUST 15 THRU OCTOBER 15, SEED WITH 2-1/2 BUSHEL PER ACRE OF ANNUAL RYE (32 LBS./1000 SQ.FT.) FOR THE PERIOD MAY 1 THRU AUGUST 14, SEED WITH 3 LBS. PER ACRE OF WEEPING LOVEGRASS (.07 LBS./1000 SQ.FT.). FOR THE PERIOD NOVEMBER 16 THRU NOVEMBER 28, PROTECT SITE BY APPLYING 2 TONS PER ACRE OF WELLS ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: APPLY 1-1/2 TO 2 TONS PER ACRE (70 TO 90 LBS./1000 SQ.FT.) OF UNROTTED WHEE FREE SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 218 GAL. PER ACRE (5 GAL./1000 SQ.FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS, ON SLOPES 6 FEET OR HIGHER, USE 348 GAL. PER ACRE (8 GAL./1000 SQ.FT.) FOR ANCHORING. REFER TO THE 1983 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR ADDITIONAL RATES AND METHODS NOT COVERED.

**STANDARD SEDIMENT CONTROL NOTES**

- 1) A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION, (313-1855).
- 2) ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT "MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL", AND REVISIONS THERETO.
- 3) FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERMETER SEDIMENT CONTROL STRUCTURES, BERMER SLOPES AND ALL SLOPES GREATER THAN 3:1, B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- 4) ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
- 5) ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1991 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDING (SEC.51), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC.52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- 6) ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- 7) SITE ANALYSIS:
 

TOTAL AREA OF SITE:	9.73	ACRES
AREA DISTURBED:	5.0	ACRES
AREA TO BE ROOFED OR PAVED:	4.0	ACRES
AREA TO BE VEGETATIVELY STABILIZED:	1.0	ACRES
TOTAL CUT:	35,000	CU. YDS.
TOTAL FILL:	35,000	CU. YDS.
TOTAL WASTE/BORROW AREA LOCATION:	N/A	

23,600 CU.FT. OF FILL WILL BE OBTAINED FROM PARCEL Q.  
THESE QUANTITIES ARE FOR PERMIT PURPOSES ONLY.  
CONTRACTOR IS REQUIRED TO PROVIDE HIS OWN QUANTITIES MEASUREMENTS.

- 8) ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
- 9) ADDITIONAL SEDIMENT CONTROL MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
- 10) ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
- 11) TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH CAN BE BACK FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

**STANDARD AND SPECIFICATIONS FOR TOPSOIL**

**DEFINITION**

PLACEMENT OF TOPSOIL OVER A PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION.

**PURPOSE**

TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

**CONDITIONS WHERE PRACTICE APPLIES**

- I. THIS PRACTICE IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:
  - a. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
  - b. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
  - c. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
  - d. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
- II. FOR THE PURPOSE OF THESE STANDARDS AND SPECIFICATIONS, AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN FOR ADEQUATE STABILIZATION. AREAS HAVING SLOPES STEEPER THAN 2:1 SHALL HAVE THE APPROPRIATE STABILIZATION SHOWN ON THE PLANS.

**CONSTRUCTION AND MATERIAL SPECIFICATIONS**

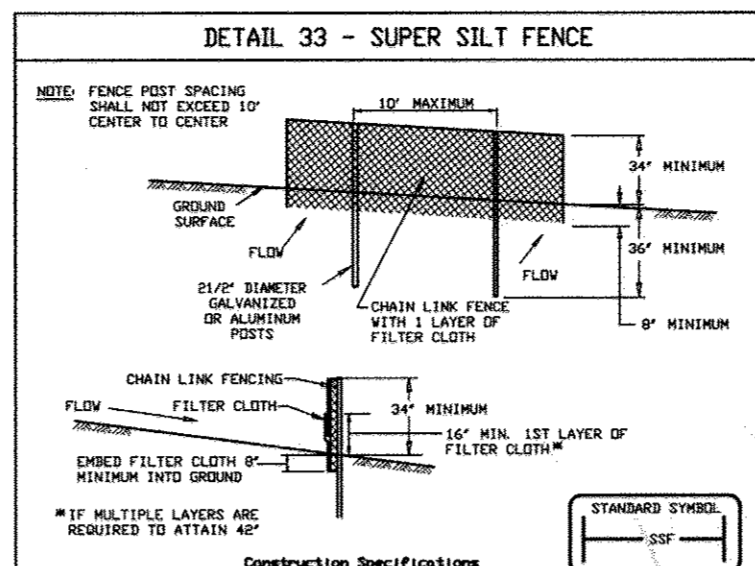
- I. TOPSOIL SALVAGED FROM THE EXISTING SITE MAY BE USED PROVIDED THAT IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-SCS IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENTAL STATION.
- II. TOPSOIL SPECIFICATIONS - SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:
  - i. TOPSOIL SHALL BE A LOAM, SANDY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND, OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND SHALL CONTAIN LESS THAN 5% BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2" IN DIAMETER.
  - ii. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSON-SON GRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
  - iii. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 4-8 TONS/ACRE (200-400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.
- III. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:
  - i. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION - SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS.
- IV. FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES:
  - i. ON SOIL MEETING TOPSOIL SPECIFICATIONS, OBTAIN TEST RESULTS DICTATING FERTILIZER AND LIME AMENDMENTS REQUIRED TO BRING THE SOIL INTO COMPLIANCE WITH THE FOLLOWING:
    - a. pH FOR TOPSOILS SHALL BE BETWEEN 6.0 AND 7.5. IF THE TESTED SOIL DEMONSTRATES A pH OF LESS THAN 6.0, SUFFICIENT LIME SHALL BE PERSCRIBED TO RAISE THE pH TO 6.5 OR HIGHER.
    - b. ORGANIC CONTENT OF TOPSOIL SHALL BE NOT LESS THAN 1.5 PERCENT BY WEIGHT.
    - c. TOPSOIL HAVING SOLUBLE SALT CONTENT GREATER THAN 500 PARTS PER MILLION SHALL NOT BE USED.
    - d. NO SOD OR SEED SHALL BE PLACED ON SOIL WHICH HAS BEEN TREATED WITH SOIL STERILANTS OR CHEMICALS USED FOR WEED CONTROL UNTIL SUFFICIENT TIME HAS ELAPSED (14 DAYS MIN.) TO PERMIT DISSIPATION OF PHYTO-TOXIC MATERIALS.

NOTE: TOPSOIL SUBSTITUTES OR AMENDMENTS, AS RECOMMENDED BY A QUALIFIED AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY, MAY BE USED IN LIEU OF NATURAL TOPSOIL.

- II. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION - SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS.
- V. TOPSOIL APPLICATION
  - i. WHEN TOPSOILING, MAINTAIN NEEDED EROSION AND SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE AND SEDIMENT TRAPS AND BASINS.
  - ii. GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBERT 4" - 8" HIGHER IN ELEVATION.
  - iii. TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN A 4" TO 8" LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SODDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY IRREGULARITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
  - iv. TOPSOIL SHALL NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.
- VI. ALTERNATIVE FOR PERMANENT SEEDING - INSTEAD OF APPLYING THE FULL AMOUNTS OF LIME AND COMMERCIAL FERTILIZER, COMPOSTED SLUDGE AND AMENDMENTS MAY BE APPLIED AS SPECIFIED BELOW:
  - i. COMPOSTED SLUDGE MATERIAL FOR USE AS A SOIL CONDITIONER FOR SITES HAVING DISTURBED AREAS OVER 5 ACRES SHALL BE TESTED TO PRESCRIBE AMENDMENTS AND FOR SITES HAVING AREAS UNDER 5 ACRES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
    - a. COMPOSTED SLUDGE SHALL BE SUPPLIED BY, OR ORIGINATE FROM, A PERSON OR PERSONS WHO ARE PERMITTED (AT THE TIME OF ACQUISITION OF THE COMPOST) BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT UNDER COMAR 26.04.06.
    - b. COMPOSTED SLUDGE SHALL CONTAIN AT LEAST 1 PERCENT NITROGEN, 1.5 PERCENT PHOSPHOROUS, AND 0.2 PERCENT POTASSIUM AND HAVE A Ph OF 7.0 TO 8.0. IF COMPOST DOES NOT MEET THESE REQUIREMENTS, THE APPROPRIATE CONSTITUENTS MUST BE ADDED TO MEET THE REQUIREMENTS PRIOR TO USE.
    - c. COMPOSTED SLUDGE SHALL BE APPLIED AT A RATE OF 1 TON/1,000 SQUARE FEET.
  - ii. COMPOSTED SLUDGE SHALL BE AMENDED WITH A POTASSIUM FERTILIZER APPLIED AT THE RATE OF 4 LB./1,000 SQUARE FEET, AND 1/3 THE NORMAL LIME APPLICATION RATE.

**EROSION AND SEDIMENT CONTROL NOTES**

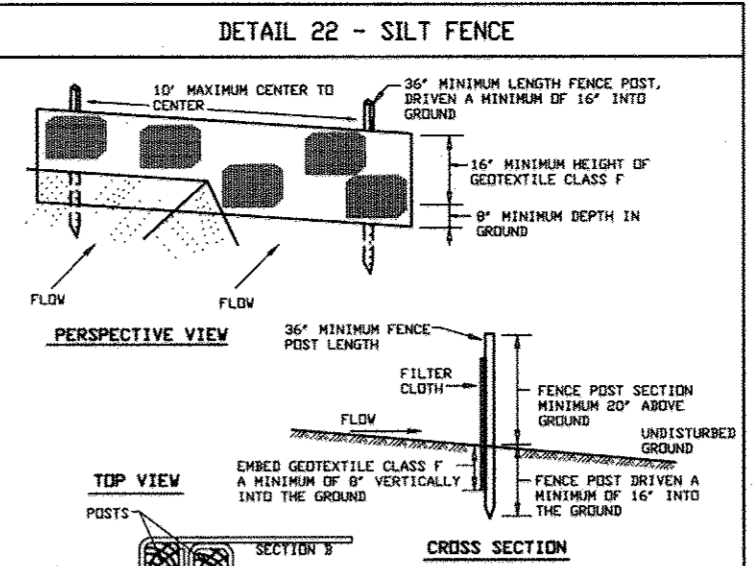
1. ALL SEDIMENT CONTROL OPERATIONS ARE TO BE DONE IN ACCORDANCE WITH SECTION 219 OF THE HOWARD COUNTY VOLUME IV DESIGN MANUAL AND THE STANDARDS AND SPECIFICATIONS FOR SEDIMENT CONTROL IN DEVELOPING AREAS.
2. ALL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS THE FIRST ORDER OF BUSINESS.
3. ALL EXCAVATED MATERIALS SHALL BE STOCKPILED ON THE UPGRADE SIDE OF THE MAIN TRENCH.
4. EXCAVATION AND BACKFILL SHALL BE LIMITED TO THAT WHICH CAN BE STABILIZED WITHIN ONE WORKING DAY.
5. IMMEDIATELY FOLLOWING BACKFILL OF THE SEWER TRENCH, ALL DISTURBED AREAS ARE TO BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION AND SEEDING NOTES SHOWN ON THIS SHEET.
6. THROUGHOUT THE PROJECT, THE CONTRACTOR SHALL REGULARLY INSPECT ALL SEDIMENT CONTROL DEVICES AND PROVIDE ALL NECESSARY MAINTENANCE TO INSURE THAT ALL DEVICES ARE IN OPERATIVE CONDITION.
7. ALL SEDIMENT CONTROL FACILITIES SHALL REMAIN IN PLACE UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.



**SUPER SILT FENCE**

**Design Criteria**

Slope	Silt Fence Length (Maximum)	Silt Fence Length (Maximum)
0 - 10%	0 - 10'	Unlimited
10 - 20%	10 - 5'	200 feet
20 - 30%	5 - 3'	100 feet
30 - 30%	3 - 2'	100 feet
50% +	2 - 1'	50 feet



**SILT FENCE**

**Silt Fence Design Criteria**

Slope Steepness	(Maximum) Silt Fence Length	(Maximum) Silt Fence Length
Flatter than 50:1	Unlimited	Unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	450 feet
3:1 to 2:1	40 feet	300 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2:1 slope and steady soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence will be the only perimeter control required.

**Construction Specifications**

1. Fencing shall be 48" in height and constructed in accordance with the latest Maryland State Highway Safety for Chain Link Fencing. The specification for a 4" fence shall be used, substituting 48" posts and 8" length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, bridle and bridle rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with wire ties spaced every 24" at the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt build-up removed when "mudger" develops in the silt fence, or when silt reaches 50% of fence height.
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and shall meet the following requirements for Geotextile Class F:
 

Tensile Strength	50 lbs/in (min.)	Test MDT 509
Tensile Modulus	20 lbs/in (min.)	Test MDT 509
Flow Rate	0.2 gal/minute (max.)	Test MDT 502
Filtering Efficiency	75% (min.)	Test MDT 502

U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

PAGE 8 - 5 - 3  
HAWKLAND DEPARTMENT OF ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

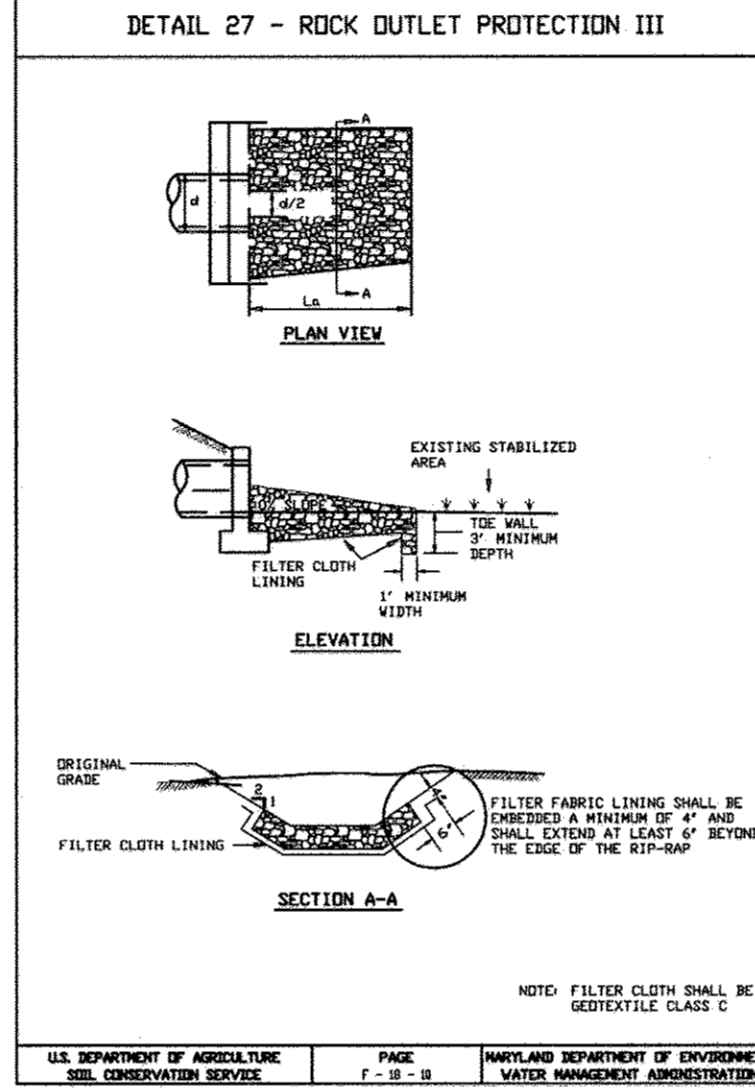
**Construction Specifications**

1. Fence posts shall be a minimum of 30" long driven 12" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square (minimum size, or 1 1/4" diameter (minimum round) and shall be of sound quality hardwood. Steel posts will be standard 1 or 2 section weighting not less than 1.00 pound per linear foot.
2. Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for Geotextile Class F:
 

Tensile Strength	50 lbs/in (min.)	Test MDT 509
Tensile Modulus	20 lbs/in (min.)	Test MDT 509
Flow Rate	0.2 gal/minute (max.)	Test MDT 502
Filtering Efficiency	75% (min.)	Test MDT 502
3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
4. Silt fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of fence height.

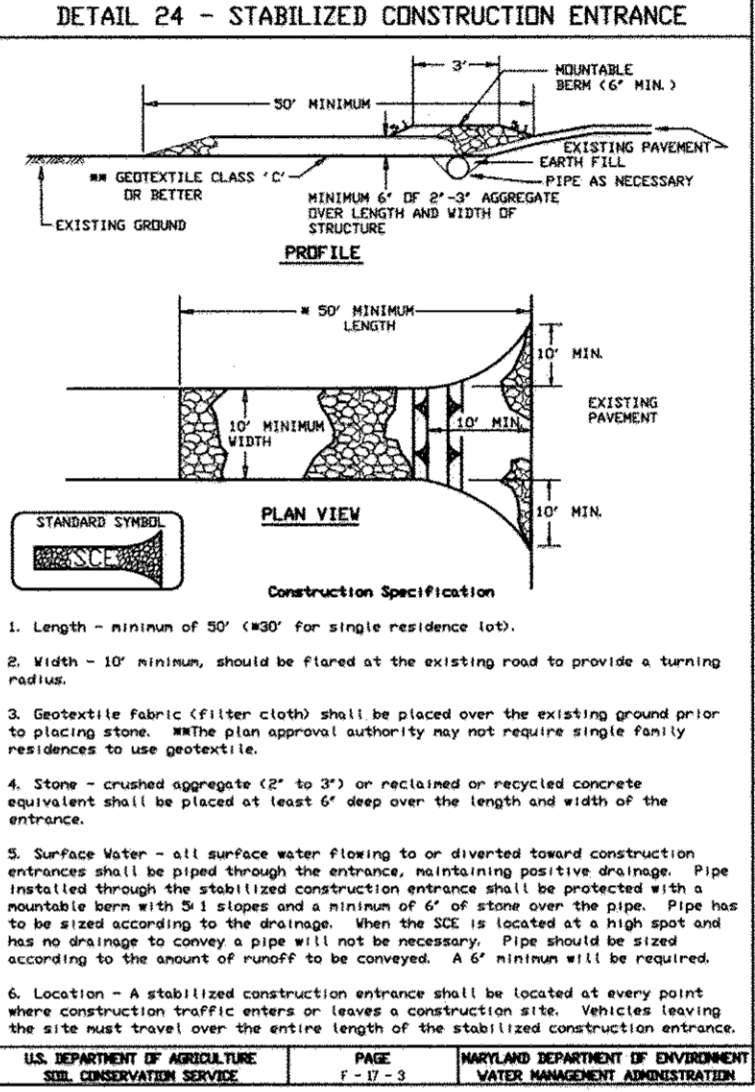
U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

PAGE 8 - 5 - 3  
HAWKLAND DEPARTMENT OF ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION



**CONSTRUCTION SPECIFICATIONS**

1. The aggregate for the filter, riprap, or gabion shall be prepared to the required fines and grades. Any fill required on the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
2. The rock or gravel shall conform to the specified grading limits when installed respectively in the riprap or filter.
3. Geotextile shall be protected from sunbaking, cutting, or tearing. Any damage other than small holes shall be repaired by stitching or by covering with geotextile. All overlaps shall be made in a manner to prevent damage to the filter blanket or geotextile. Stone placement will be required to the extent necessary to prevent damage to the permanent works.
4. Stone for the riprap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for riprap or gabion outlets shall be delivered and placed in a manner to prevent damage to the filter blanket or geotextile. Stone placement will be required to the extent necessary to prevent damage to the permanent works.
5. The stone shall be placed so that it is in line with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.



**CONSTRUCTION SPECIFICATION**

1. Length - minimum of 50' (400' for single residence lots).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. Written plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete (maximum size shall be placed at least 6" deep over the length and width of the entrance).
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a minimum 18" x 18" concrete curb and a minimum 6" of stone over the pipe. Pipe shall be sized according to the drainage. When the SCS is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

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HAWKLAND DEPARTMENT OF ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

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HAWKLAND DEPARTMENT OF ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

**SEQUENCE OF CONSTRUCTION**

1. OBTAIN GRADING PERMIT
2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES, WITH MOUNTABLE BERM, AT LOCATIONS SHOWN. (1 DAY)
3. CONSTRUCT SUPER SILT FENCES AND SILT FENCES. (3 DAYS)
4. WITH PERMISSION OF INSPECTOR BRING SITE TO GRADE, (30 DAYS) DELAY CONSTRUCTION OF SAND FILTERS.
5. CONSTRUCT STORM DRAIN, WATER, AND SEWER SYSTEMS. (10 DAYS)
6. BLOCK INLETS (5 DAYS)
7. CONSTRUCT BUILDINGS, PAVEMENT AND CURB AND GUTTER AS INDICATED (35 DAYS)
8. WHEN ALL CONTRIBUTING AREAS TO STORM DRAIN SYSTEM HAVE BEEN STABILIZED, CONSTRUCT STORMWATER FACILITIES (35 DAYS)
9. STABILIZE ALL REMAINING DISTURBED AREAS. (3 DAYS)
10. WHEN ALL CONTRIBUTING DRAINAGE AREAS TO SEDIMENT CONTROL DEVICES HAVE BEEN STABILIZED AND WITH THE APPROVAL OF THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROL DEVICES AND STABILIZE REMAINING DISTURBED AREAS. (3 DAYS)
- \* CONSTRUCT SEDIMENT BASIN TO PROVIDE OUTFLOW FOR STORM DRAIN.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
License No. 21443 Expiration Date: 12-31-16

**APPROVED**  
**PLANNING BOARD**  
**of HOWARD COUNTY**

DATE 7/31/08  
JTB

STATE OF MARYLAND  
R. JACOB HILKMAT  
PROFESSIONAL ENGINEER

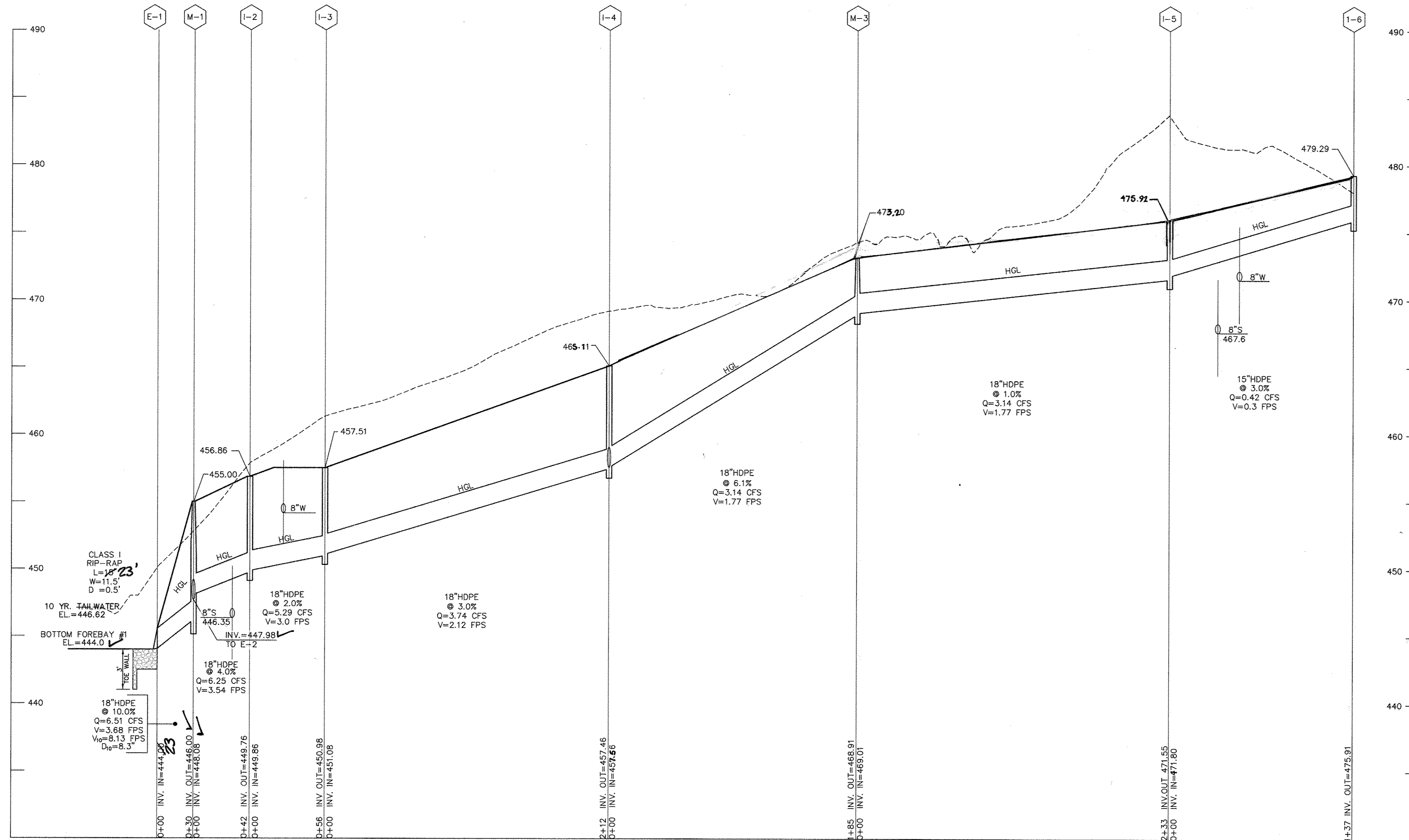
**BUILDER/DEVELOPER**  
JAMES KEELY & CO., INC.  
61 E. PADONIA RD.  
TIMONIUM, MARYLAND  
21094-0528  
(410) 252-8600

OAKMONT AT TURF VALLEY  
PARCELS: R, S, T, U, V & W  
TAX MAP 16, P/O PARCEL 8, BLOCK 10  
HOWARD COUNTY, MARYLAND  
THIRD ELECTION DISTRICT  
SEDIMENT CONTROL NOTES AND DETAILS

MILDENBERG, BOENDER & ASSOC., INC.  
Engineers Planners Surveyors  
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042  
(410) 997-0296 Fax: (301) 621-5521 Wash.

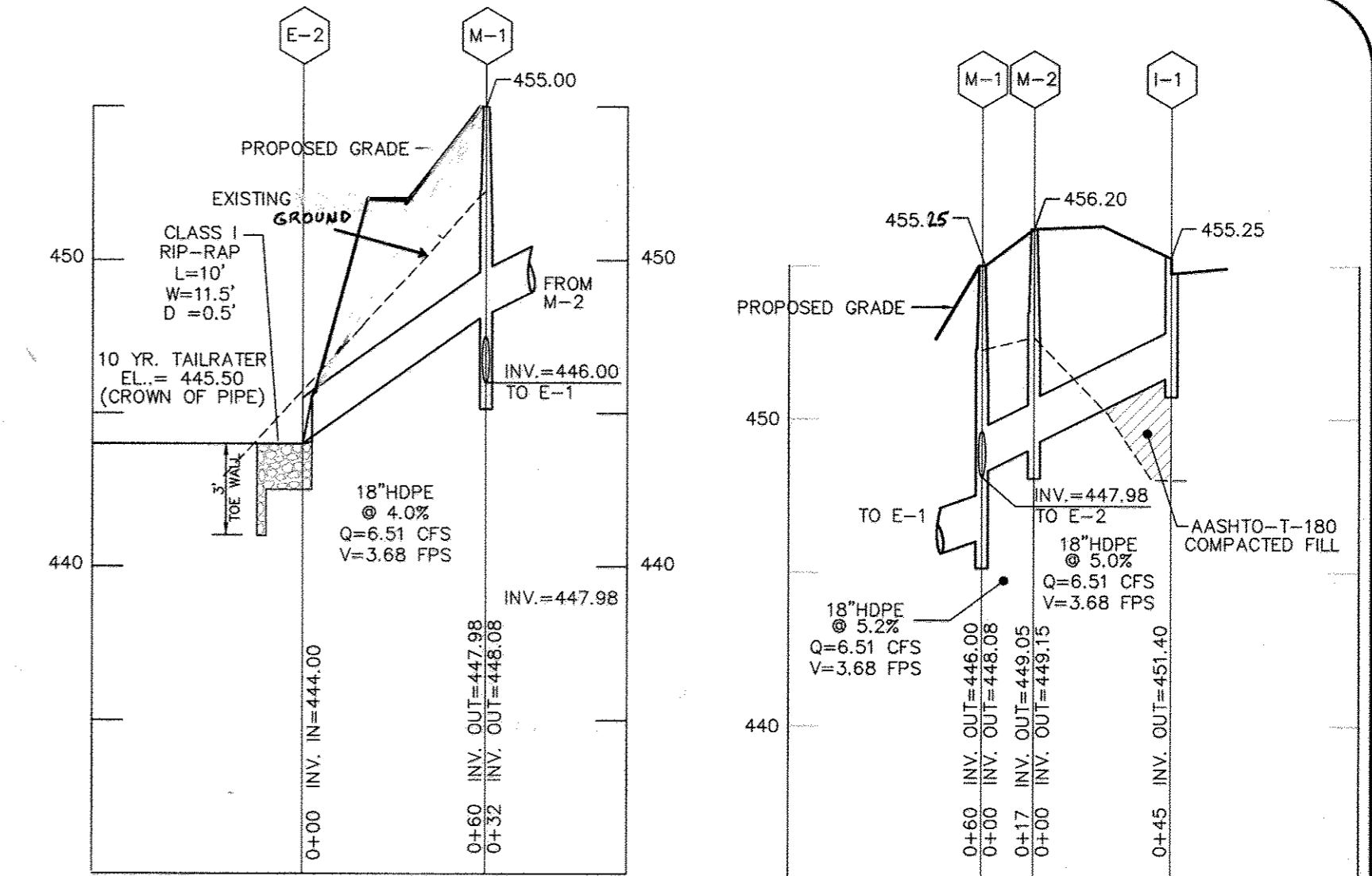
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SDP-07-062





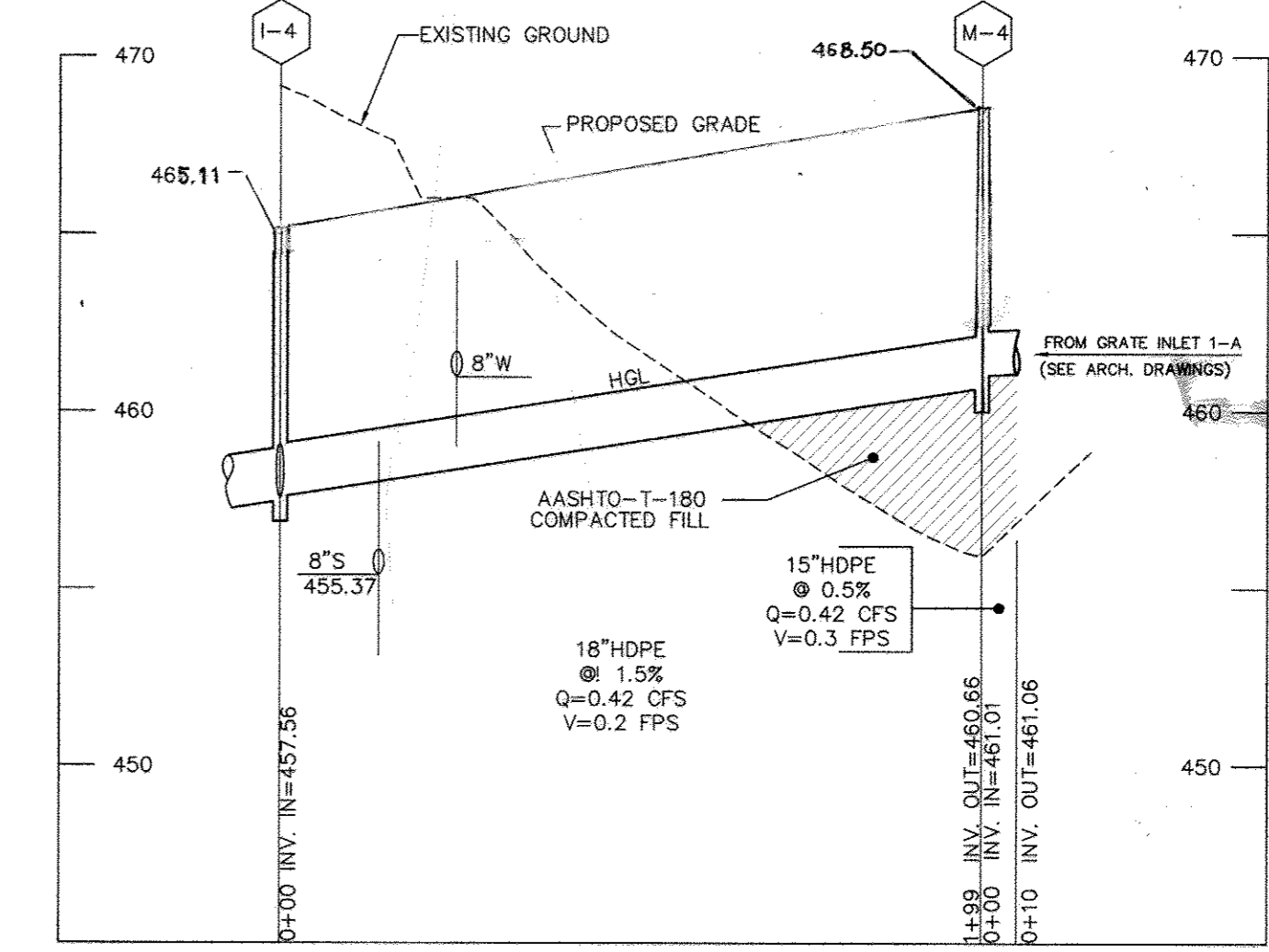
**STORM DRAIN PROFILE**

SCALE: HOR. 1"=50'  
VER. 1"=5'



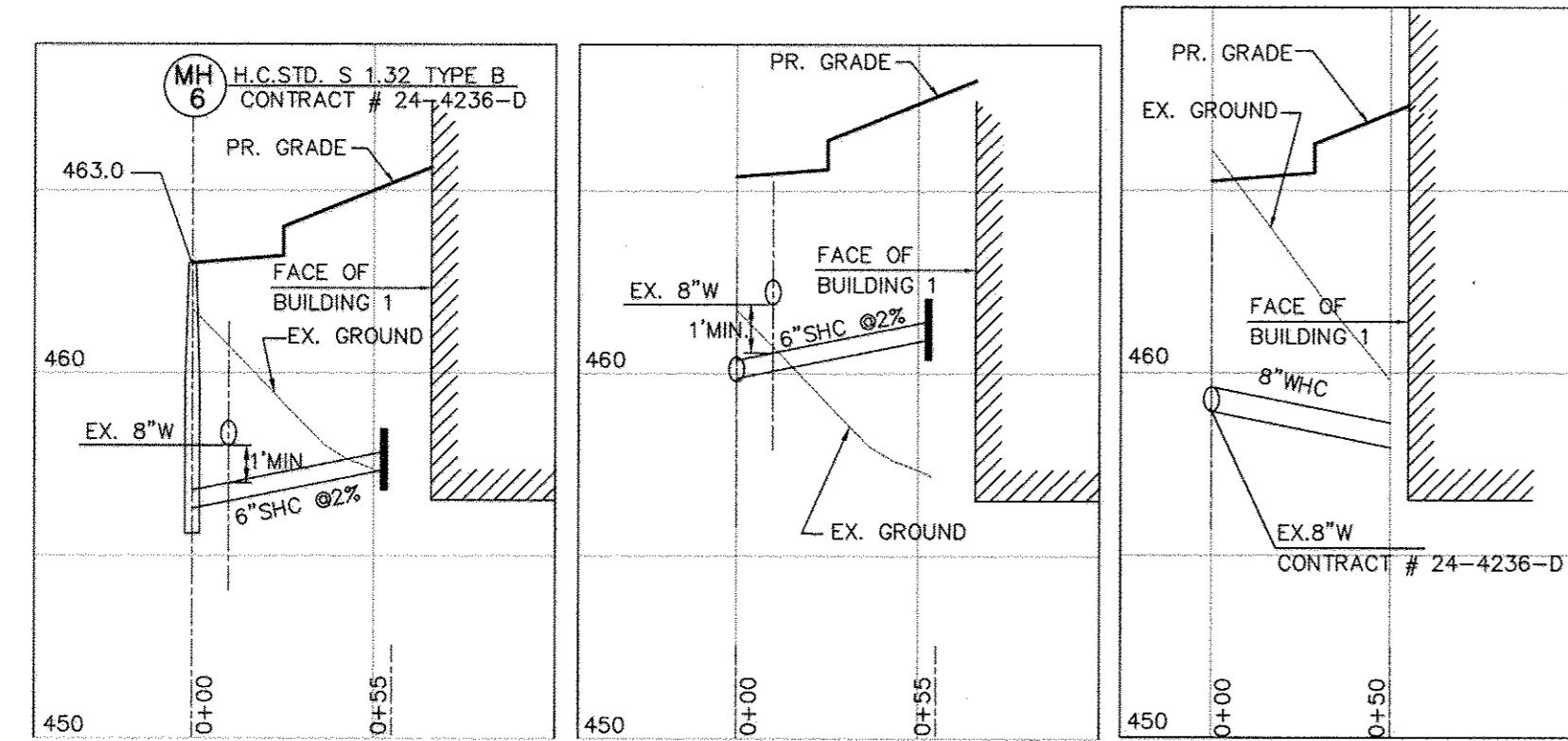
**STORM DRAIN PROFILE** **STORM DRAIN PROFILE**

SCALE: HOR. 1"=50'  
VER. 1"=5'



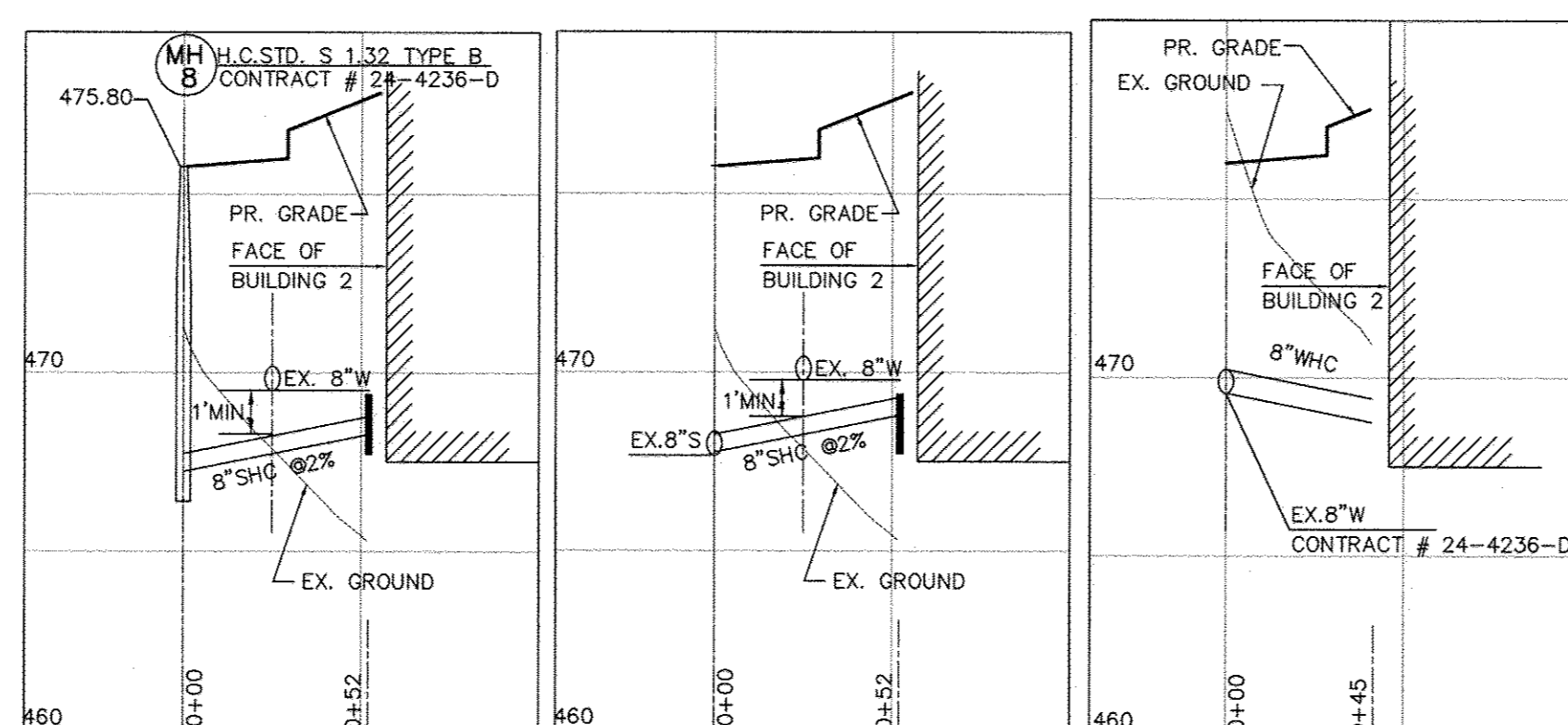
**STORM DRAIN PROFILE**

SCALE: HOR. 1"=50'  
VER. 1"=5'



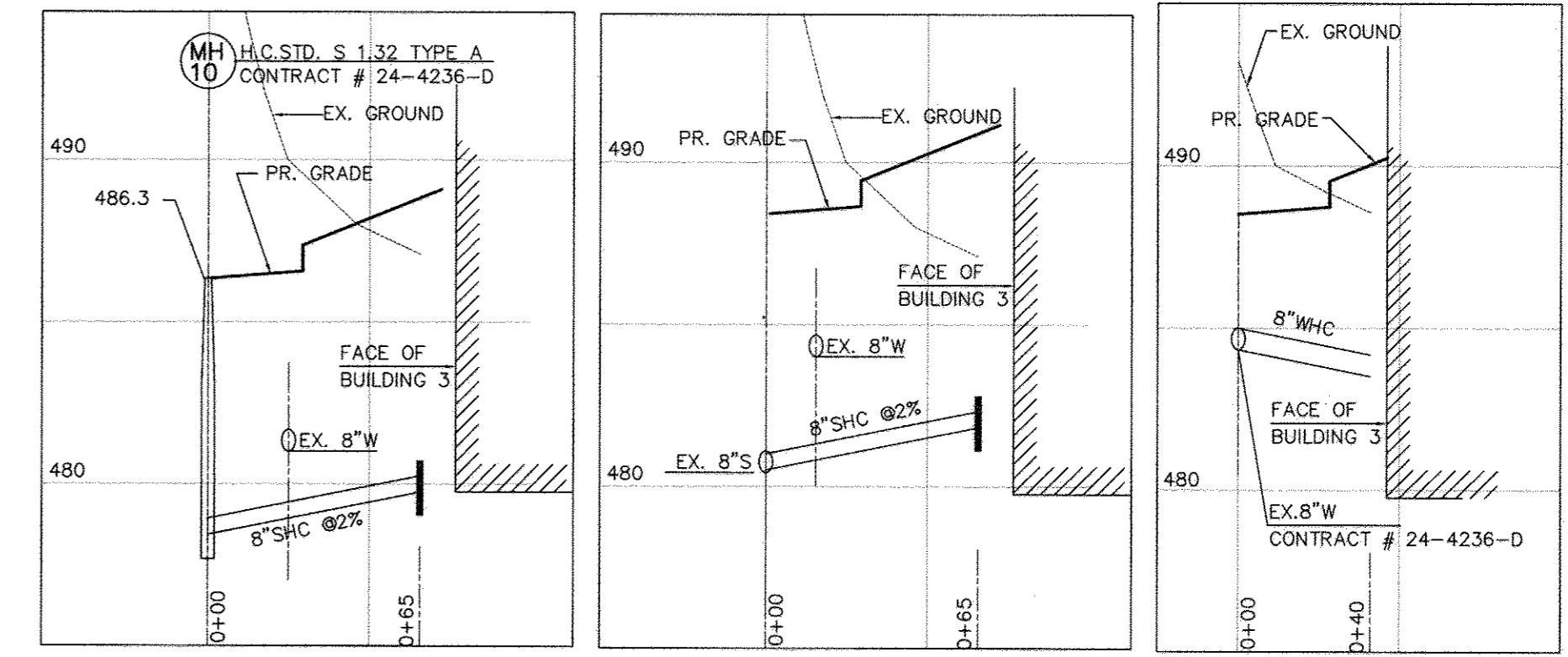
**SHC & WHC PROFILE FOR BUILDING # 1**

SCALE: HOR. 1"=50'  
VER. 1"=5'



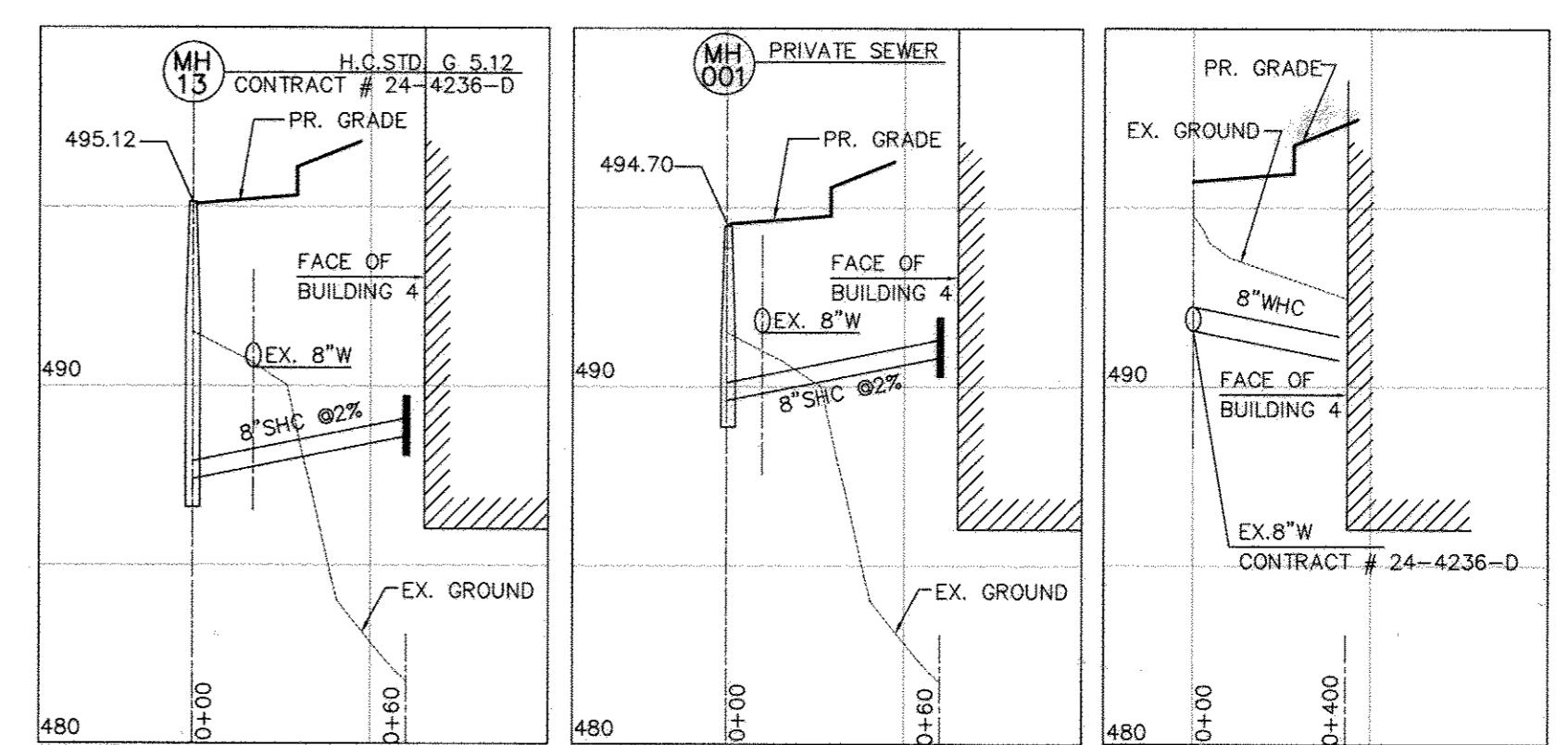
**SHC & WHC PROFILE FOR BUILDING # 2**

SCALE: HOR. 1"=50'  
VER. 1"=5'



**SHC & WHC PROFILE FOR BUILDING # 3**

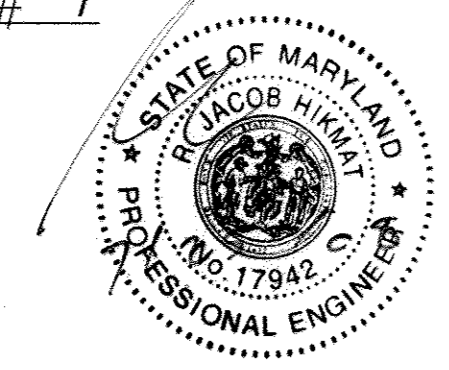
SCALE: HOR. 1"=50'  
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**SHC & WHC PROFILE FOR BUILDING # 4**

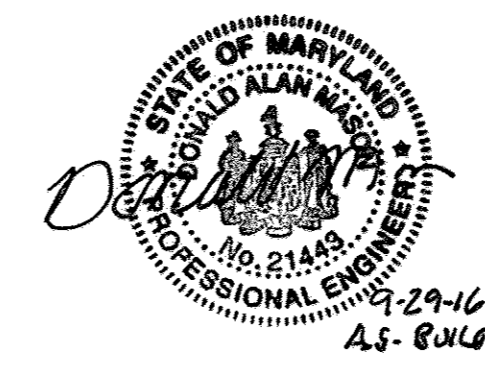
SCALE: HOR. 1"=50'  
VER. 1"=5'

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 Chief, Development Engineering Division  
 Chief, Division of Land Development  
 Director



**APPROVED**  
**PLANNING BOARD**  
**OF HOWARD COUNTY**  
 DATE 2/3/09

AS-BUILT CERTIFICATION  
 I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.  
 Donald Mason, P.E. No. 21443 Date 9-29-16



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 21443 Expiration Date: 12-31-16

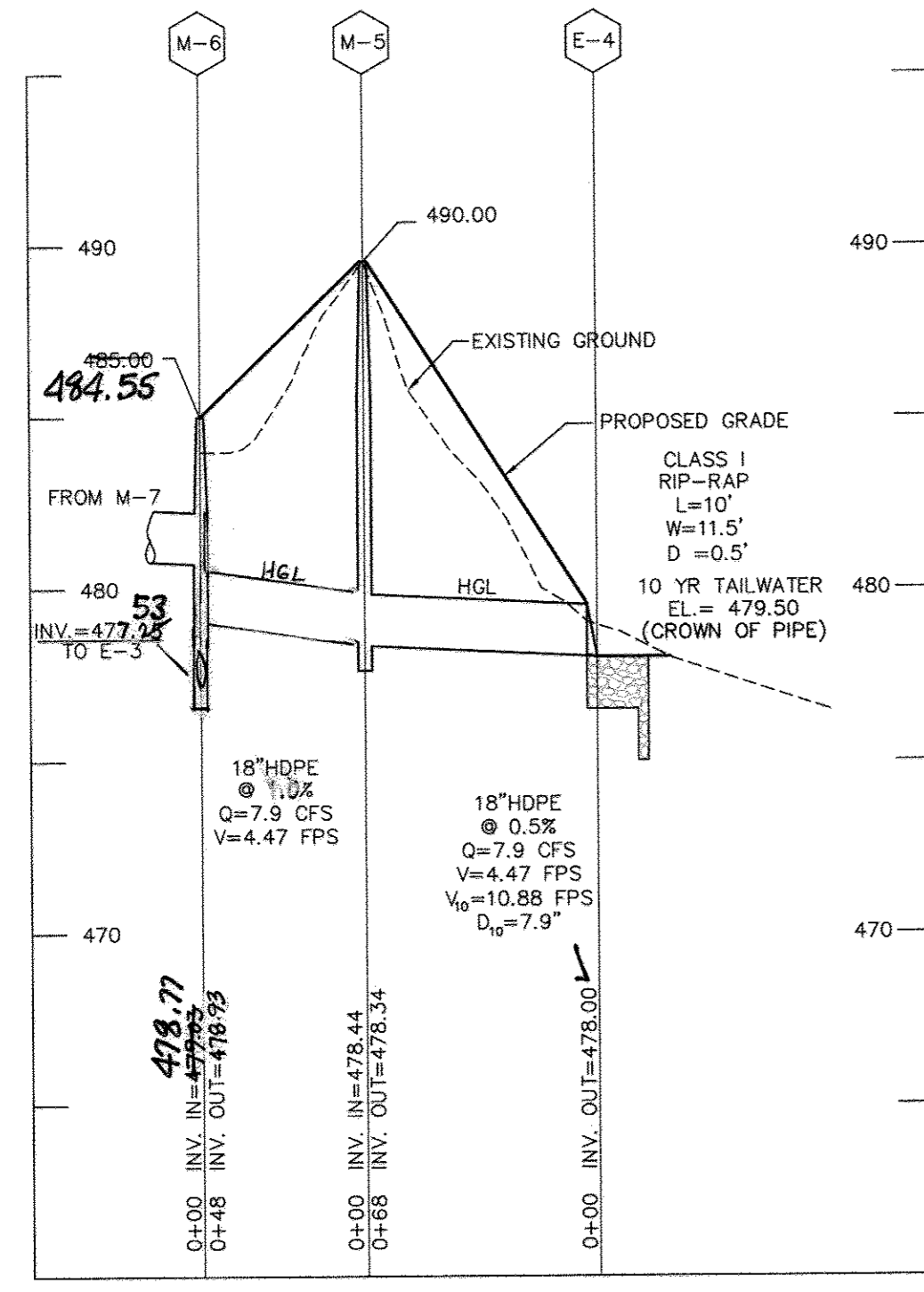
Project	03-081	date	OCT 2007
Illustration	MMM	engineering	MMM
Scale	1"=50'	approval	MMM

no.	1	date	0-7-08
description	CONCRETE FINISHED GARAGE	revisions	

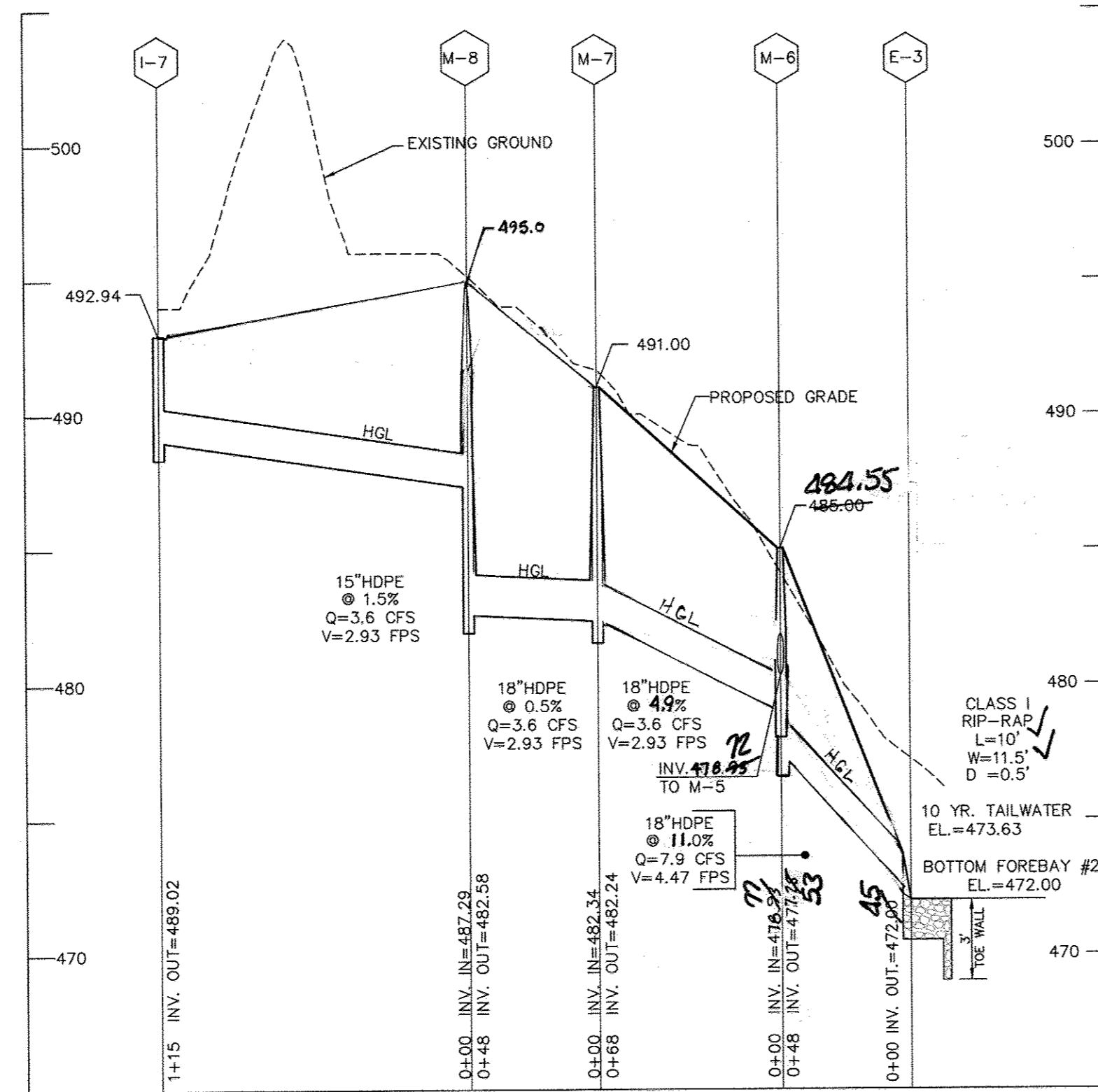
**OAKMONT AT TURF VALLEY**  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 8, BLOCK 10  
 HOWARD COUNTY, MARYLAND  
 THIRD ELECTION DISTRICT  
**STORM DRAIN PROFILES AND SHC & WHC PROFILES**

**MILDENBERG, BOENDER & ASSOC., INC.**  
 Engineers Planners Surveyors  
 5072 Dorsey Hill Drive, Suite 202, Ellicott City, Maryland 21042  
 (410) 987-0286 Fax: (410) 987-0288 Fax

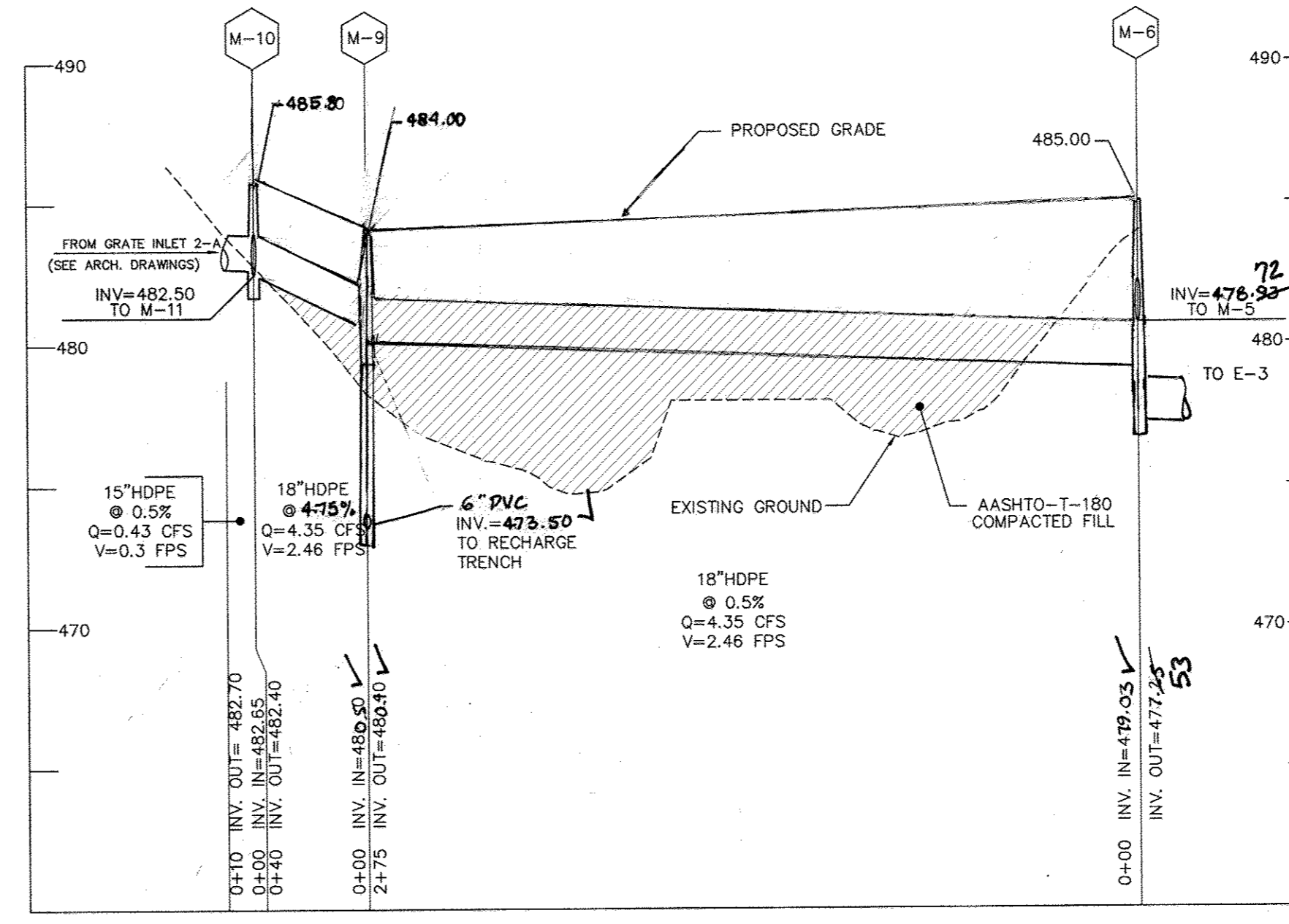




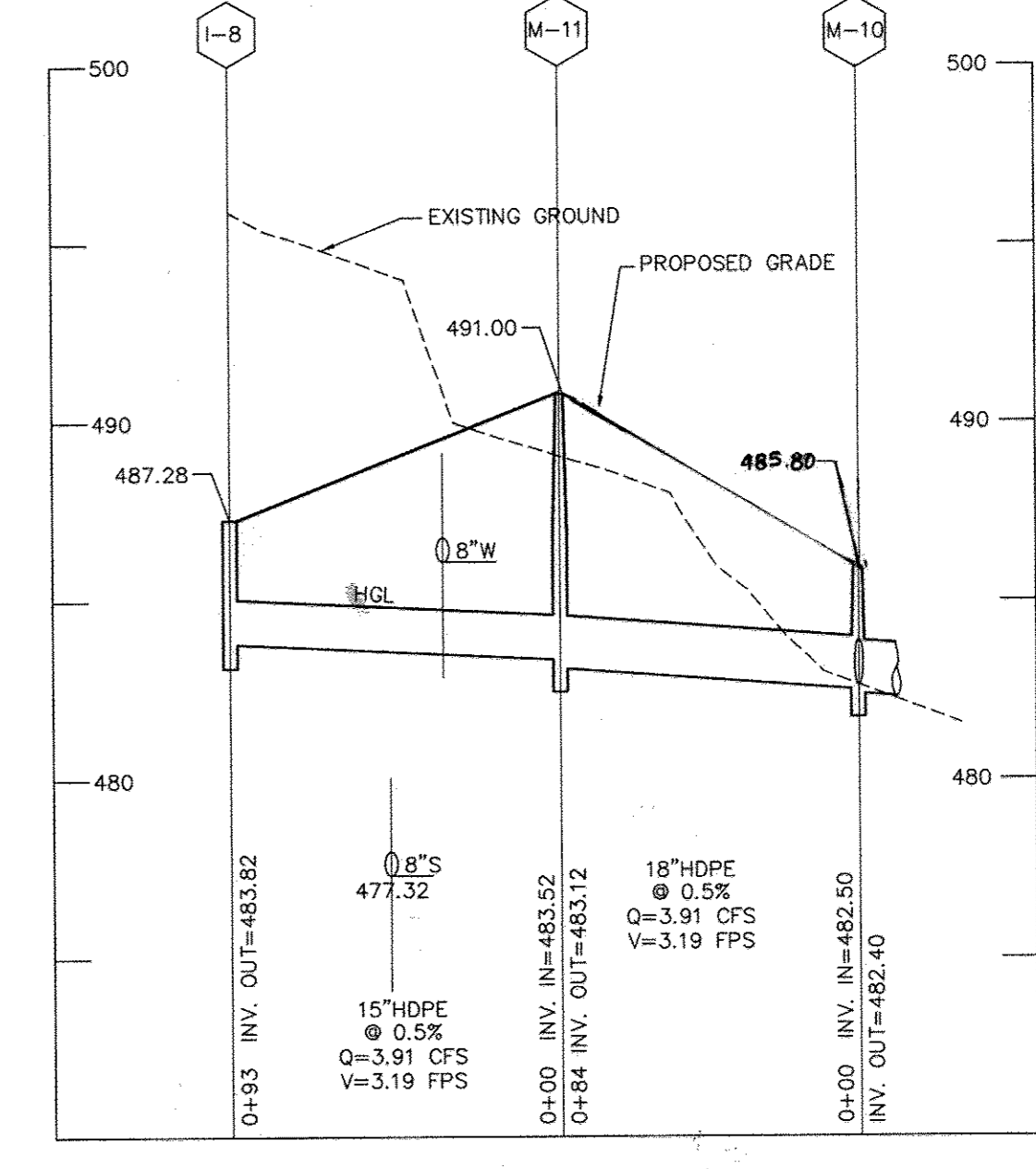
**STORM DRAIN PROFILE**  
SCALE: HOR. 1"=50'  
VER. 1"=5'



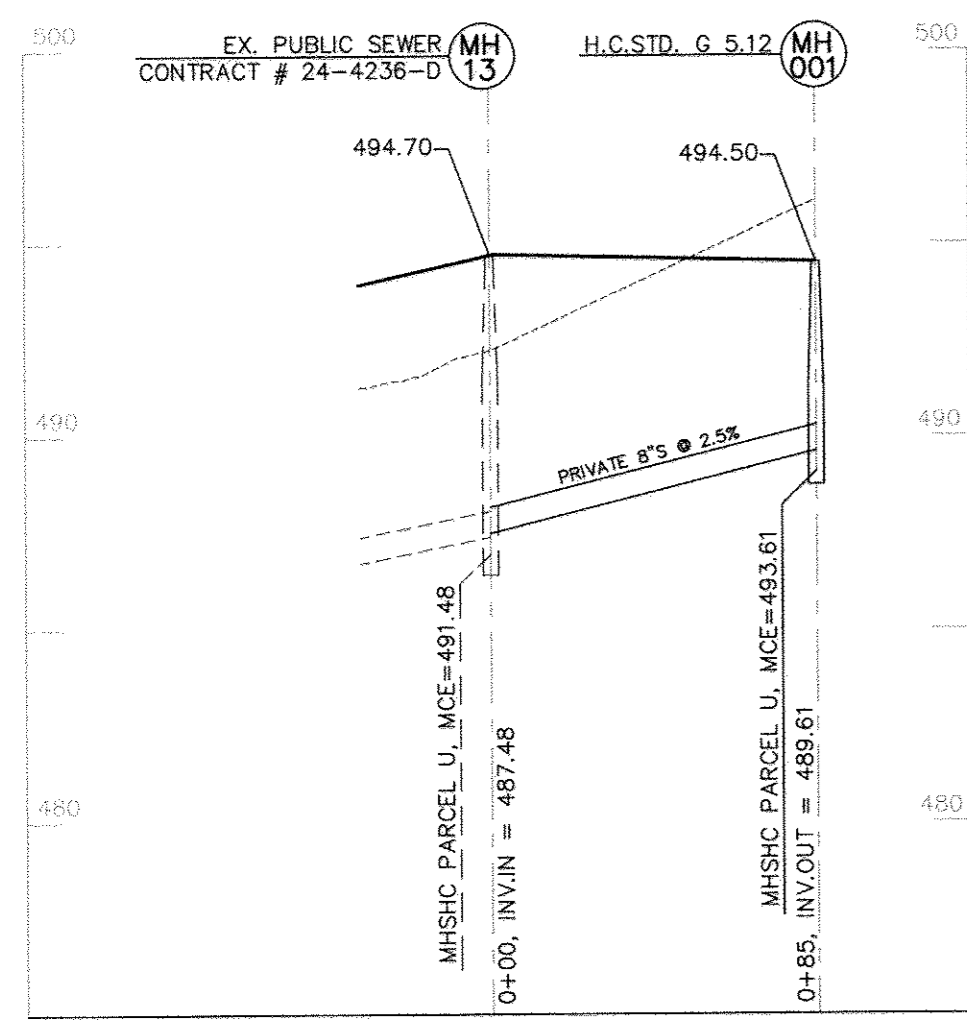
**STORM DRAIN PROFILE**  
SCALE: HOR. 1"=50'  
VER. 1"=5'



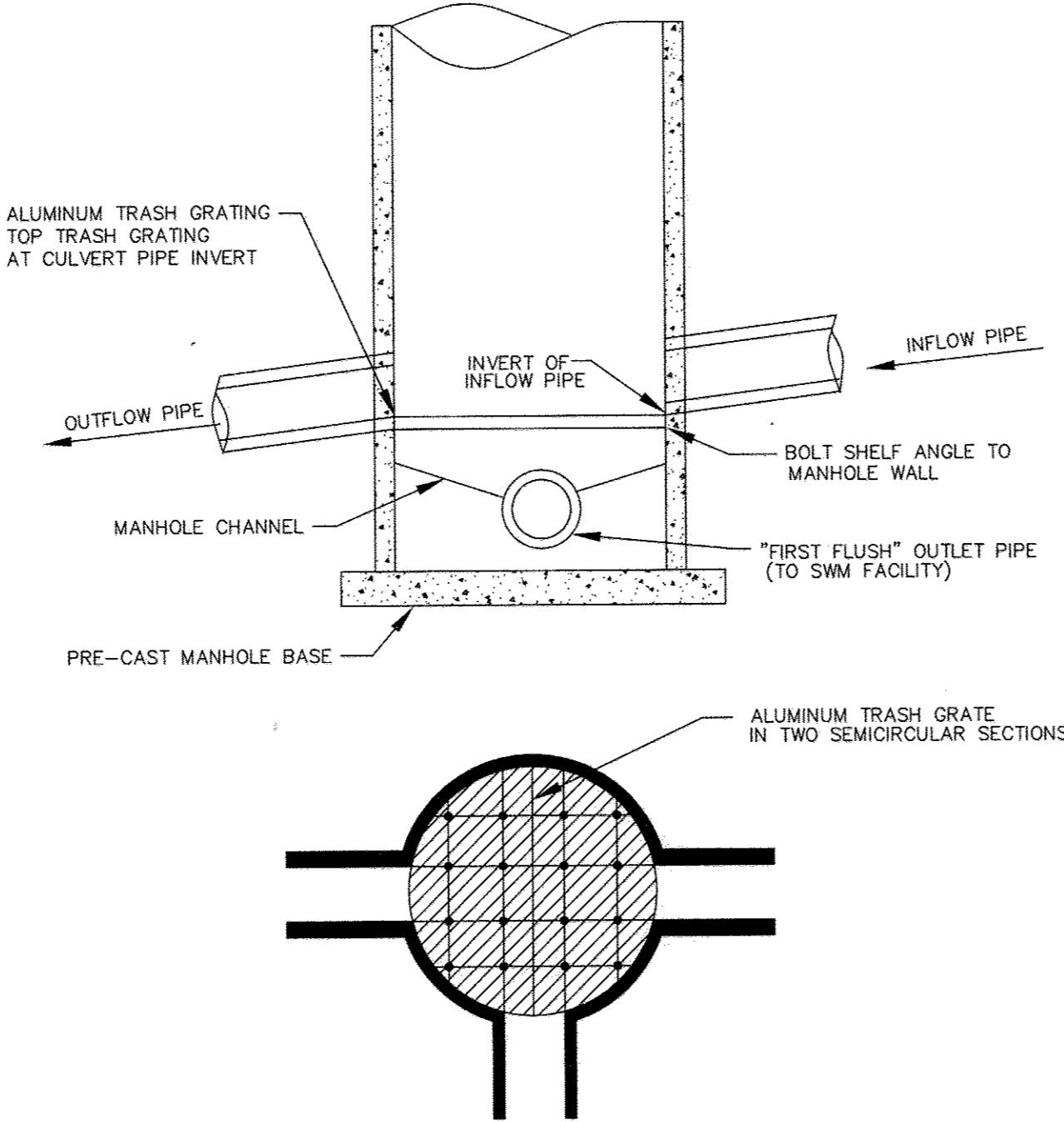
**STORM DRAIN PROFILE**  
SCALE: HOR. 1"=50'  
VER. 1"=5'



**STORM DRAIN PROFILE**  
SCALE: HOR. 1"=50'  
VER. 1"=5'



**PRIVATE SEWER PROFILE**  
SCALE: HOR. 1"=50'  
VER. 1"=5'



**TYP. ISOLATION/DIVERSION MANHOLE FOR MANHOLE # 1, 6 & 9**  
NTS

**STRUCTURE SCHEDULE**

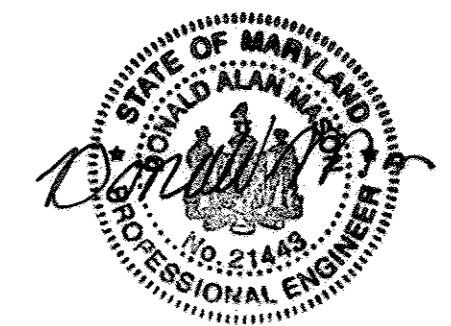
NO.	LOCATION*	TOP**	INV. IN	INV. OUT	COMMENTS
ES-1	N 595,007.5 E 1,341,413.8	-	-	444.00	END SECTION
ES-2	N 595,021.8 E 1,341,364.3	-	-	444.00	END SECTION
ES-3	N 595,106.0 E 1,342,601.4	-	-	472.00	END SECTION
ES-4	N 595,162.7 E 1,342,600.6	-	-	478.00	END SECTION
I-1	N 595,013.9 E 1,341,451.2	455.45	-	451.40	INLET TYPE A-5 (HO. CO. STD SD 4.40)
I-2	N 594,941.7 E 1,341,398.9	456.86	449.86	449.76	INLET TYPE A-5 (HO. CO. STD SD 4.40)
I-3	N 594,908.9 E 1,341,445.8	457.51	451.08	450.98	INLET TYPE A-5 (HO. CO. STD SD 4.40)
I-4	N 594,815.1 E 1,341,636.8	465.11	457.56	457.46	INLET TYPE A-10 (HO. CO. STD SD 4.02)
I-5	N 594,668.1 E 1,342,022.3	475.91	471.80	471.55	INLET TYPE A-10 (HO. CO. STD SD 4.02)
I-6	N 594,747.8 E 1,342,134.3	479.29	-	475.91	INLET TYPE A-5 (HO. CO. STD SD 4.40)
I-7	N 594,892.6 E 1,342,752.4	492.94	-	489.02	INLET TYPE A-5 (HO. CO. STD SD 4.40)
I-8	N 594,686.5 E 1,342,415.8	487.28	-	483.82	INLET TYPE A-5 (HO. CO. STD SD 4.40)
M-1	N 594,980.4 E 1,341,409.3	455.00	448.08	447.98	DIVERSION MANHOLE (SHEET 7) ✓
M-2	N 594,976.7 E 1,341,426.1	456.20	449.15	449.05	MH (HO. CO. STD G 5.01)
M-3	N 594,729.1 E 1,341,800.0	473.20	469.01	468.91	MH (HO. CO. STD G 5.01)
M-4	N 594,814.7 E 1,341,831.7	468.50	461.01	460.66	MH (HO. CO. STD G 5.01)
M-5	N 595,121.2 E 1,342,651.2	490.00	478.44	478.34	MH (HO. CO. STD G 5.01)
M-6	N 595,076.2 E 1,642,635.8	484.65	486.00	479.03	DIVERSION MANHOLE (SHEET 7) ✓
M-7	N 595,049.3 E 1,342,699.6	491.00	482.34	472.24	MH (HO. CO. STD G 5.01)
M-8	N 595,006.8 E 1,342,671.2	495.00	487.29	482.68	MH (HO. CO. STD G 5.01)
M-9	N 594,868.3 E 1,342,456.2	484.39	484.00	480.50	DIVERSION MANHOLE (SHEET 7) ✓
M-10	N 594,842.2 E 1,342,486.1	485.60	482.65	482.40	MH (HO. CO. STD G 5.01)
M-11	N 594,758.9 E 1,342,475.4	491.00	483.52	483.12	MH (HO. CO. STD G 5.01)

\* STATIONS GIVEN TO CENTERLINE FACE OF INLET AT TOP OF CURB FOR INLETS LOCATED WITHIN THE ROAD RIGHT-OF-WAY. STATIONS FOR YARD INLETS TO CL OF INLET. LOCATION OF MANHOLES IS TO CL OF MANHOLE COVER. END SECTION GIVEN TO THE CENTERLINE OF PIPE AT THE CONNECTION OF THE STORM DRAIN PIPE TO THE END SECTION.  
\*\* ELEVATIONS MEASURED TO CENTER OF ALL INLETS.

**PIPE SCHEDULE**

QUANTITY	PIPE SIZE
365	15" HDPE
1768	18" HDPE

AS-BUILT CERTIFICATION  
I hereby certify, by my seal, that the facilities shown on this plan were constructed as shown on this AS-BUILT plan.  
Date 9-29-16  
Donald Mason, P.E. No. 21443



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
License No. 21443, Expiration Date: 12-21-16

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
DATE 8/26/16  
DATE 8/28/16  
DATE 9/1/16



APPROVED  
PLANNING BOARD  
OF HOWARD COUNTY  
DATE 7/31/16

Project	03-081	date	DEC 2007
Illustration	MMM	engineering	MMM
Scale	1"=50'	approval	RJH

REVISIONS  
1. REVISE STORM DRAIN PROFILES TO REFLECT FINISHED CANAL MAINTENANCE, REVISE STRUCTURAL SCHEDULE  
DATE OCT 2008

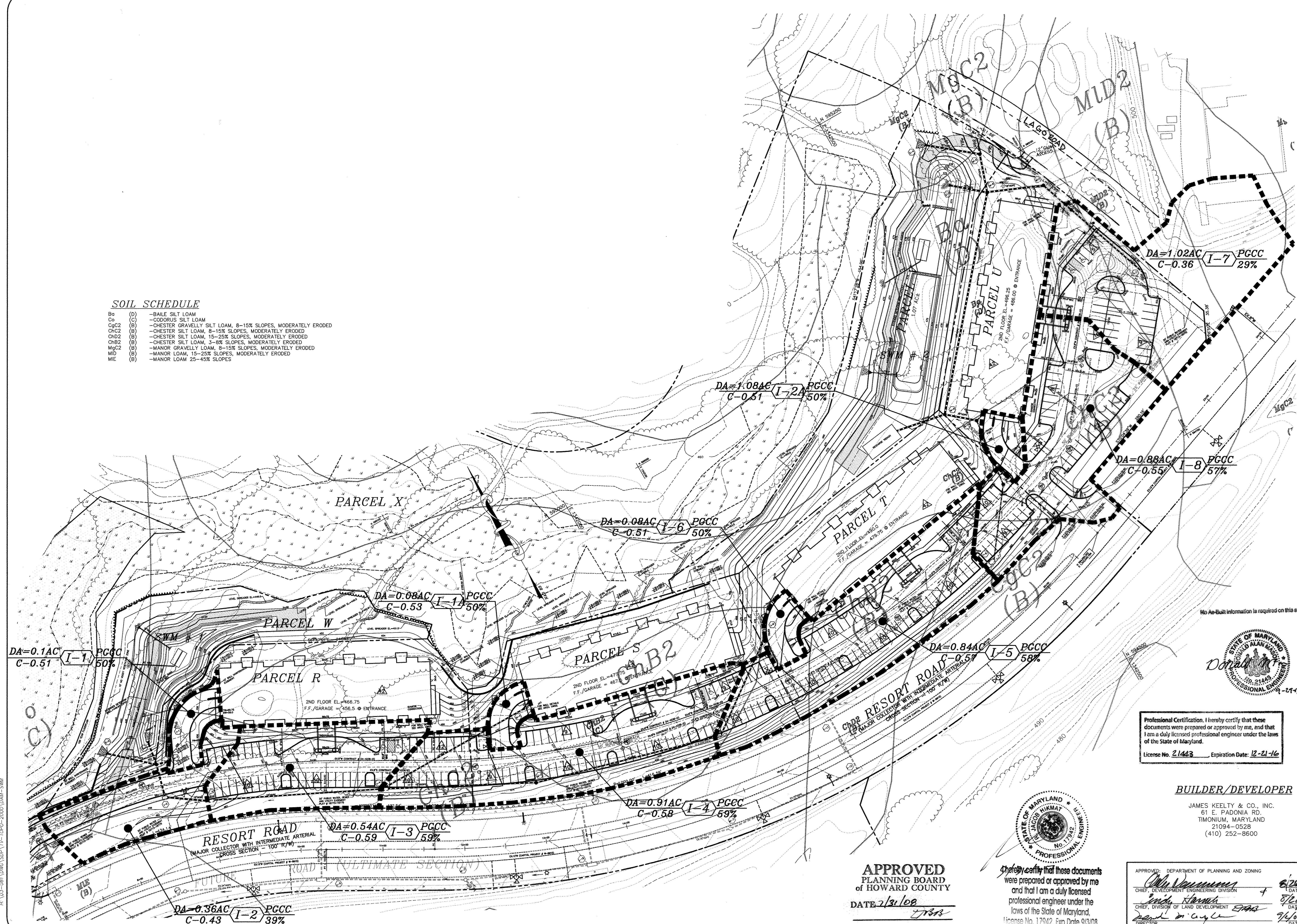
**OAKMONT AT TURF VALLEY**  
PARCELS: R, S, T, U, V & W  
TAX MAP 16, P/O PARCEL 8, BLOCK 10  
THIRD ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND  
STORMDRAIN PROFILES

**MILDENBERG, BOENDER & ASSOC., INC.**  
Engineers Planners Surveyors  
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042  
(410) 997-0296 Bldg. (301) 621-5521 Wash. (410) 997-0298 Fax.



**SOIL SCHEDULE**

Ba	(D)	-BAILE SILT LOAM
Co	(C)	-CODORUS SILT LOAM
CgC2	(B)	-CHESTER GRAVELLY SILT LOAM, 8-15% SLOPES, MODERATELY ERODED
ChC2	(B)	-CHESTER SILT LOAM, 8-15% SLOPES, MODERATELY ERODED
ChD2	(B)	-CHESTER SILT LOAM, 15-25% SLOPES, MODERATELY ERODED
ChB2	(B)	-CHESTER SILT LOAM, 3-8% SLOPES, MODERATELY ERODED
MgC2	(B)	-MANOR GRAVELLY LOAM, 8-15% SLOPES, MODERATELY ERODED
MID	(B)	-MANOR LOAM, 15-25% SLOPES, MODERATELY ERODED
MIE	(B)	-MANOR LOAM 25-45% SLOPES



No As-Built information is required on this sheet



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 21443 Expiration Date: 12-21-16

**BUILDER/DEVELOPER**

JAMES KEELY & CO., INC.  
 61 E. PADONIA RD.  
 TIMONIA, MARYLAND  
 21094-0528  
 (410) 252-8600

**APPROVED**  
 PLANNING BOARD  
 OF HOWARD COUNTY  
 DATE 7/31/08  
 [Signature]

I hereby certify that these documents were prepared or approved by me and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 17942, Exp Date 9/3/08

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signatures and Dates]

AS-BUILT

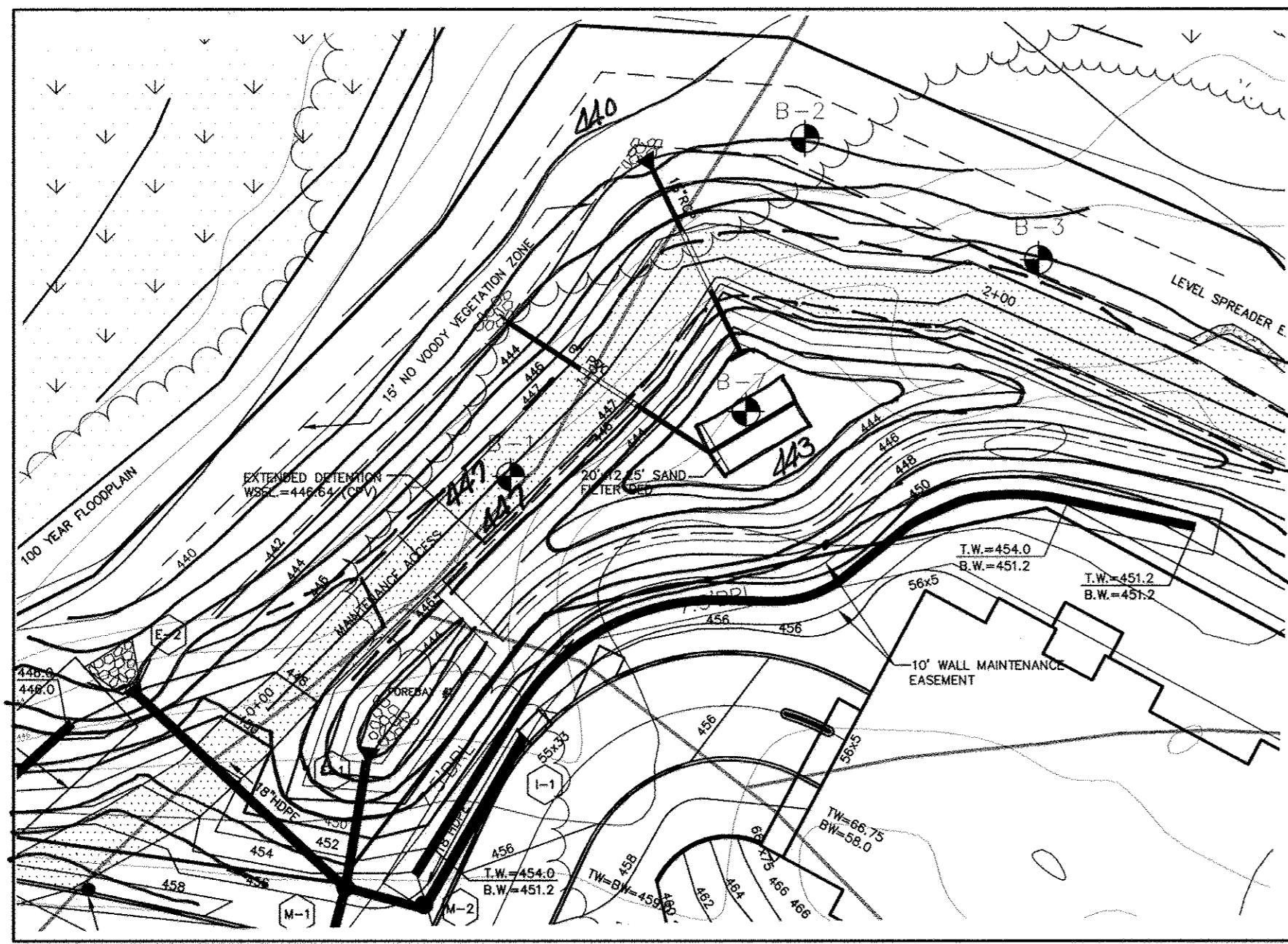
Project	03-081	date	OCT 2007
Illustration	MM	engineering	MM
Scale	MM	approval	MM
Scale	1"=50'		

Project	03-081	date	8-12-16
Illustration	MM	description	1 SHOU SWM ACCESS ZLEGO ROAD
Scale	MM	revisions	
Scale	1"=50'		

**OAKMONT AT TURF VALLEY**  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 8, BLOCK 10  
 HOWARD COUNTY, MARYLAND  
 THIRD ELECTION DISTRICT  
 DRAINAGE AREA MAP

**MILDENBERG, BOENDER & ASSOC., INC.**  
 Engineers Planners Surveyors  
 5072 Dorsey Hall Drive, State 202, Ellicott City, Maryland 21042  
 (410) 997-0286 Buit. (301) 621-5521 Wash. (410) 997-0298 Fax

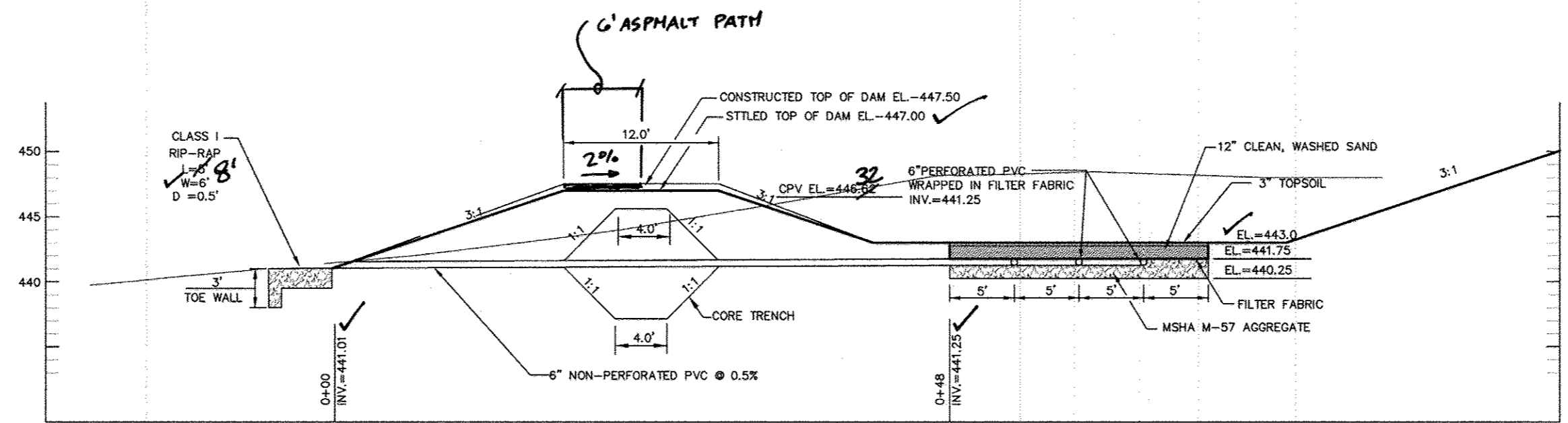




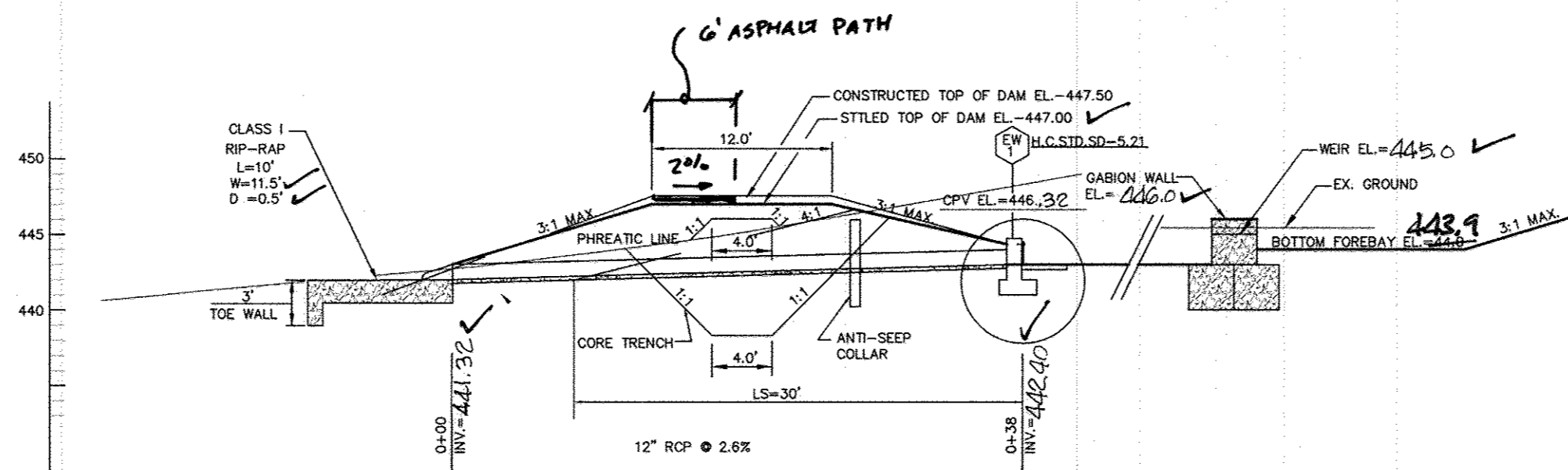
**SWM POND # 1 PLAN**  
SCALE: 1"=30'

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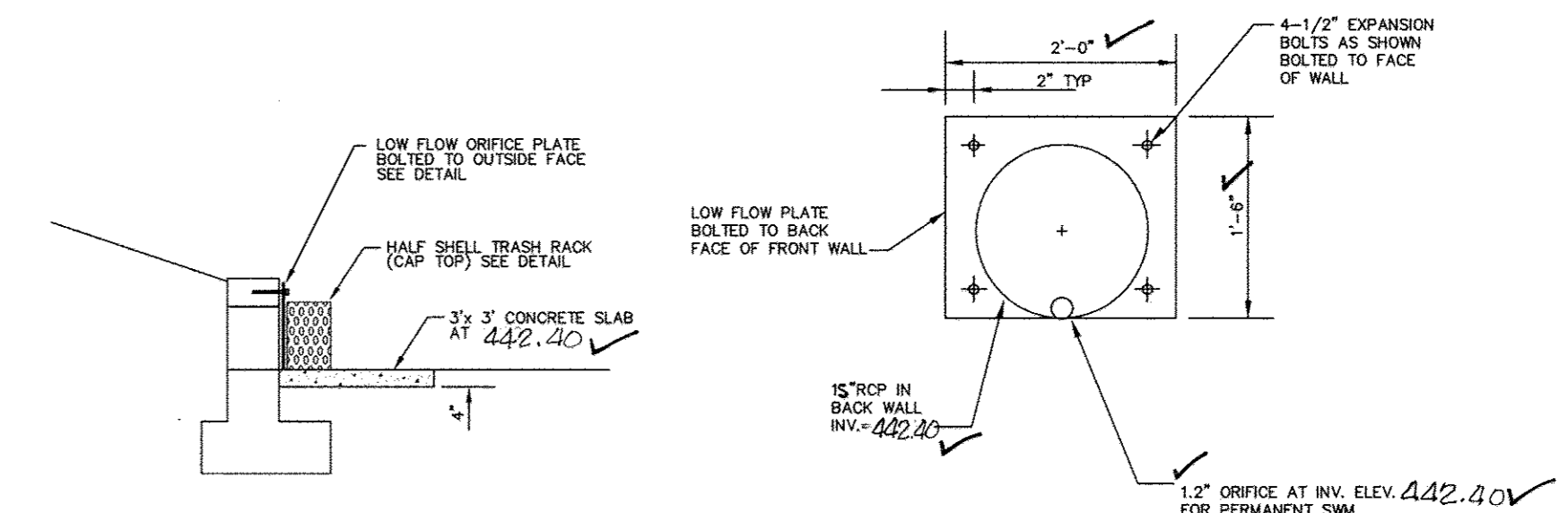
HAZARD CLASSIFICATION: "A"  
 F-1 SAND FILTER = 3.21 AC  
 DRAINAGE AREA: = 82  
 PROPOSED RCN: = 82  
 PROPOSED Tc: = 0.15HRS.  
 SAND FILTER AREA (Wqv): 300 SQ. FT.  
 EXTENDED DETENTION WSEL: 446.62  
 Cp (Q) INTO POND = 4.6 CFS  
 Cp (Q) OUT OF POND = 0.07 CFS  
 Wqv REQUIRED: = 4.955 Q.F.  
 Wqv PROVIDED = 5.012 Q.F.  
 Rev REQUIRED (ALL SITE) = 2.893 C.F.  
 Rev REQUIRED (W/CREDITS) = 2.298 C.F.  
 Rev PROVIDED (IN TRENCH) = 5.850 C.F.  
 MAINTENANCE: PRIVATE  
 OWNERSHIP: PRIVATE



**SAND FILTER PROFILE**  
**SWM POND # 1**  
SCALE: 1"=10'

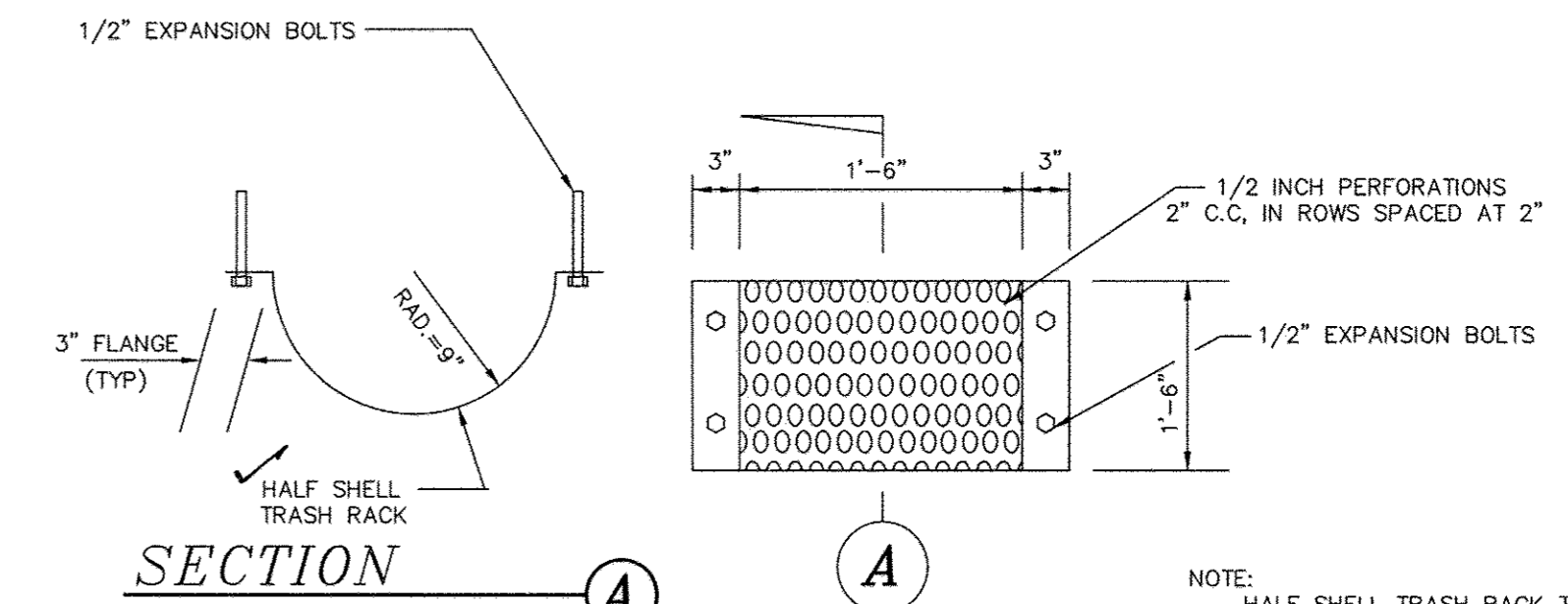


**PRINCIPAL SPILLWAY PROFILE**  
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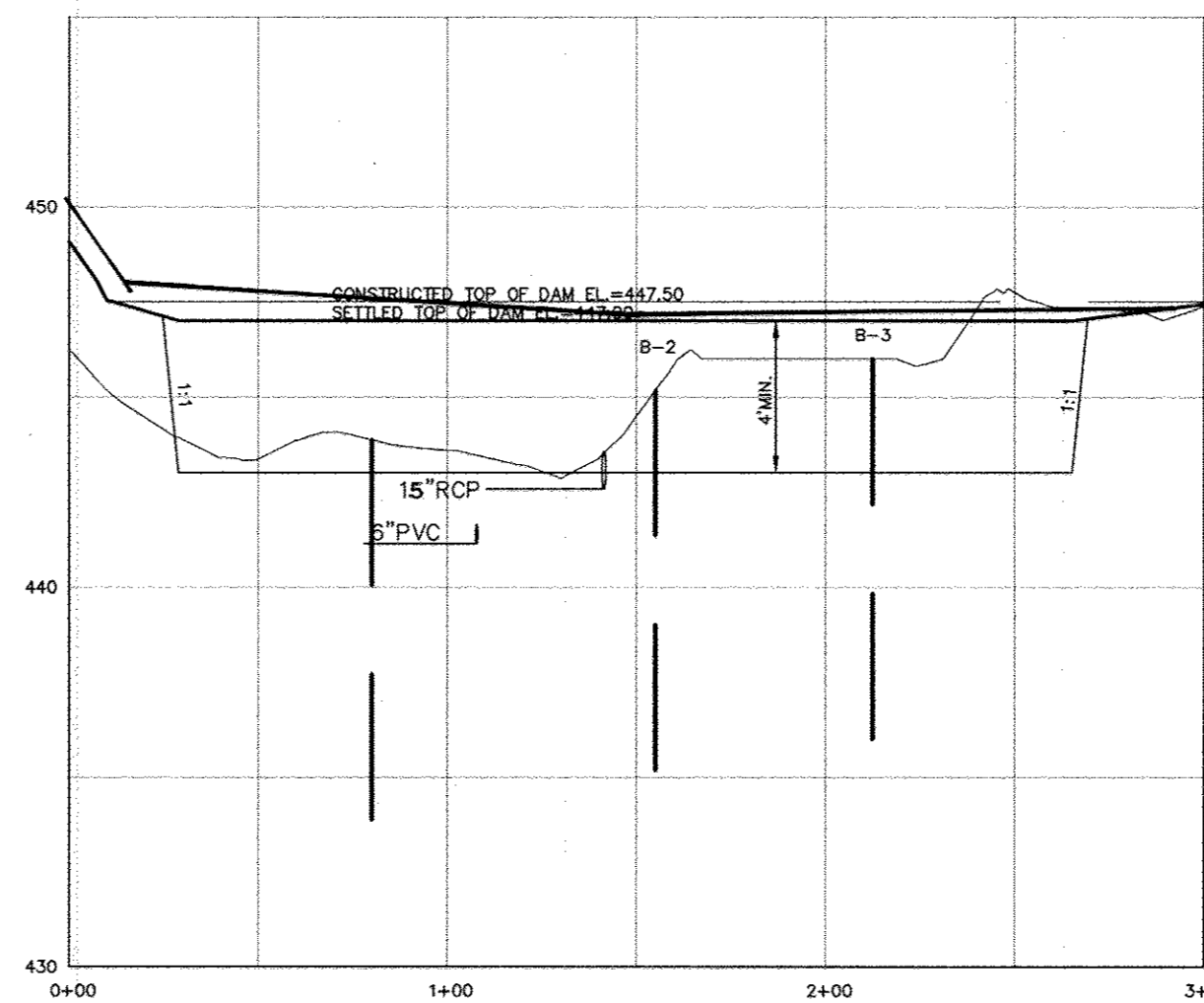


**LOW FLOW DETAIL**  
SCALE: 1"=3'

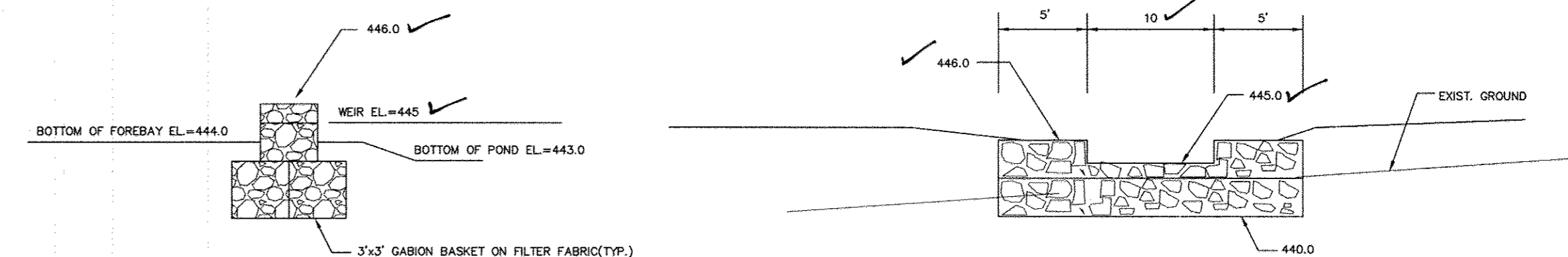
**LOW FLOW ORIFICE DETAIL**  
NTS



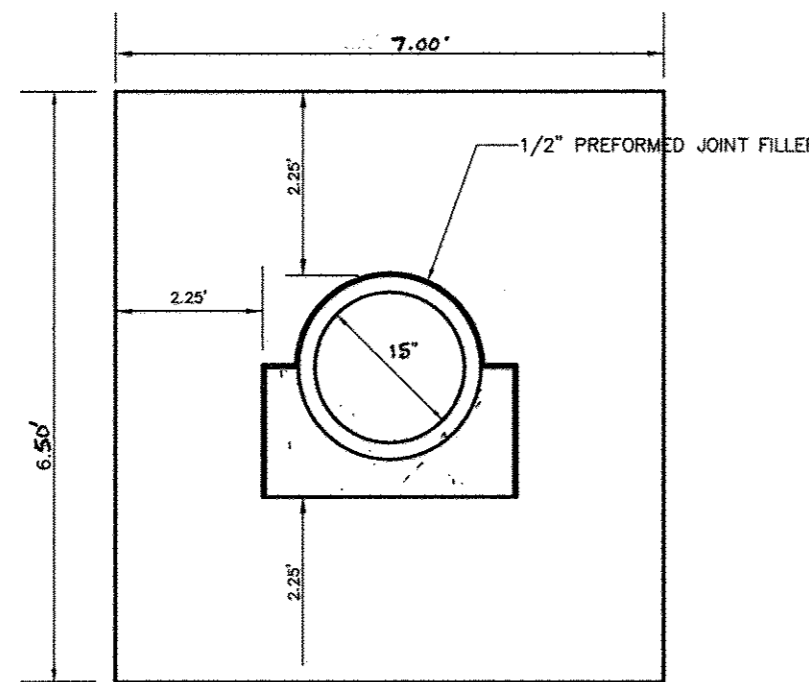
**HALF SHELL TRASH RACK**  
NTS



**CENTERLINE DAM PROFILE**  
SCALE: HOR: 1"=50' VER: 1"=5'



**GABIION WALL DETAIL**  
NTS



**ANTI-SEEP COLLAR DETAIL**

**AS-BUILT CERTIFICATION**

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

Signature: *Donald Mon* P.E. NO. 21443 DATE: 9-29-16

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER NOR DOES THE ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

BY THE DEVELOPER:

I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I/WE, ENGINEER, REGISTERED PROFESSIONAL ENGINEER, TO SUPERVISE HOME CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT.

Signature of Developer: *MARY BUDA* DATE: 8/13/08

BY THE ENGINEER:

I CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I NOTICED THE DEVELOPER THAT HE/SHE MUST ENGAGE A REGISTERED PROFESSIONAL ENGINEER TO SUPERVISE POND CONSTRUCTION AND PROVIDE THE HOWARD SOIL CONSERVATION DISTRICT WITH AN "AS-BUILT" PLAN OF THE POND WITHIN 30 DAYS OF COMPLETION.

Signature of Engineer: *R. JACOB HIKMAT* DATE: 9/13/07

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE: 8/23/08

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

Signature: *John Hunter* DATE: 8/23/08

APPROVED: DEPARTMENT OF PUBLIC WORKS

CHEF BUREAU OF HIGHWAYS DATE:

APPROVED: DEPARTMENT OF PLANNING AND ZONING

Signature: *Andy Harris* DATE: 8/28/08

Signature: *David A. Coyle* DATE: 7/11/08

**OWNER/DEVELOPER**

JAMES KEELY & CO., INC.  
 61 E. PADONIA RD.  
 TIMONIUM, MARYLAND  
 21094-0528  
 (410) 252-8600

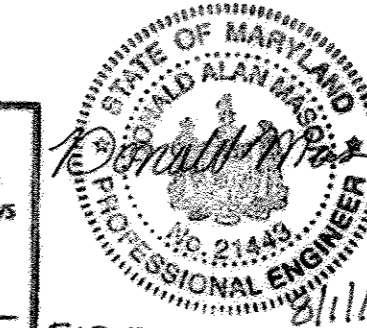


I hereby certify that these documents were prepared or approved by me and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 17942, Exp Date 9/3/08

**APPROVED PLANNING BOARD OF HOWARD COUNTY**

DATE: 7/31/08

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 21443, Expiration Date: 12-21-16



9/29/16 AS-BUILT  
 FOR REVISIONS BY B.E.I. DATED 8/11/16 AND 9-20-17

AS-BUILT

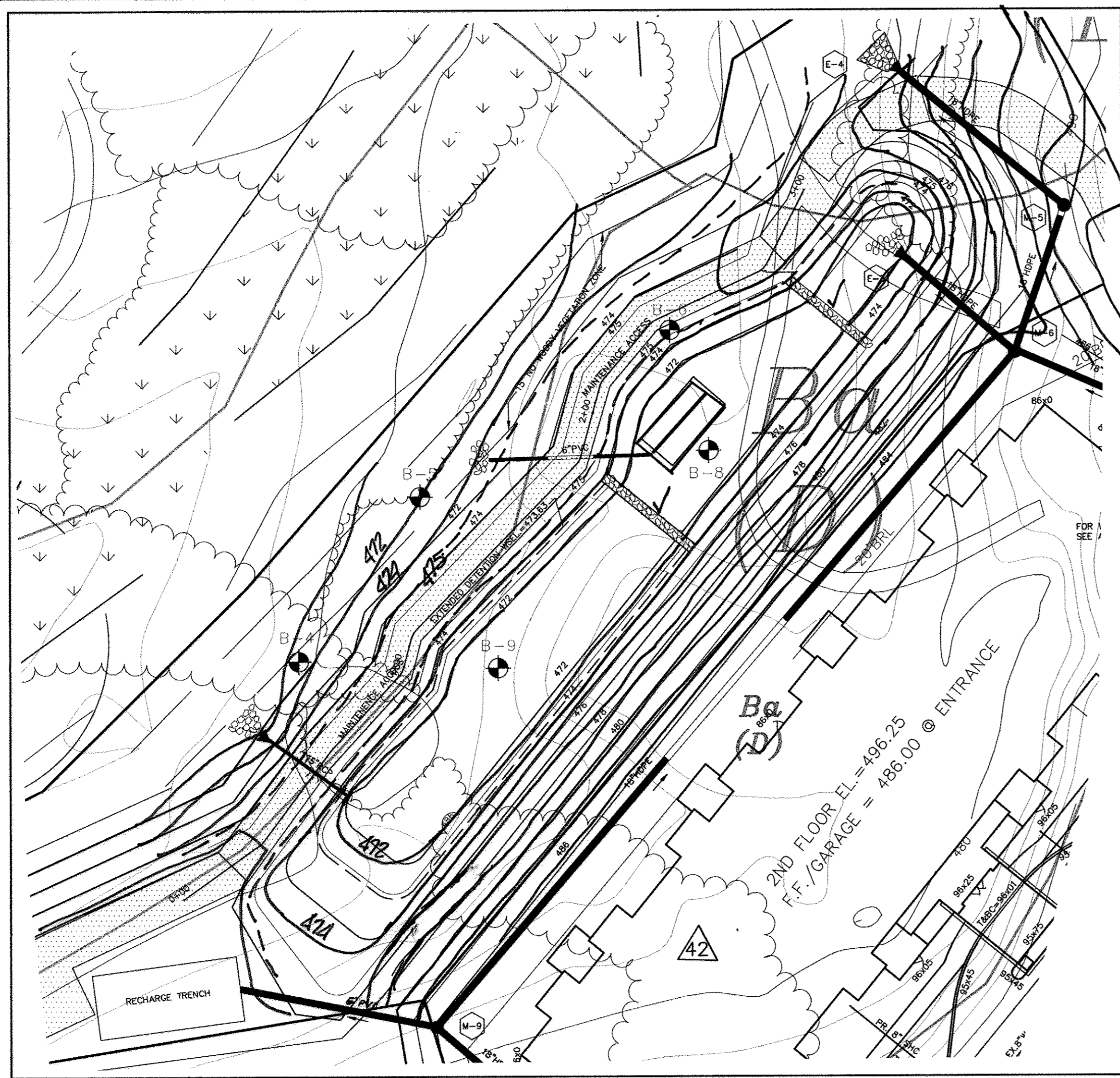
Project	03-081	date	OCT 2007
Illustration	MMM	engineering	MMM
scale	AS SHOWN	approval	MMM

ADD G. PATH ALONG EMBANKMENT	9-20-17	date	9/20/17
REVISE SWM #1 CUTWALL ELEVATION	8/11/16	description	8/11/16
CHANGE PLY #18	OCT 2008	revisions	OCT 2008

**OAKMONT AT TURF VALLEY**  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 8, BLOCK 10  
 HOWARD COUNTY, MARYLAND  
 THIRD ELECTION DISTRICT  
**STORMWATER MANAGEMENT DETAIL - POND # 1**

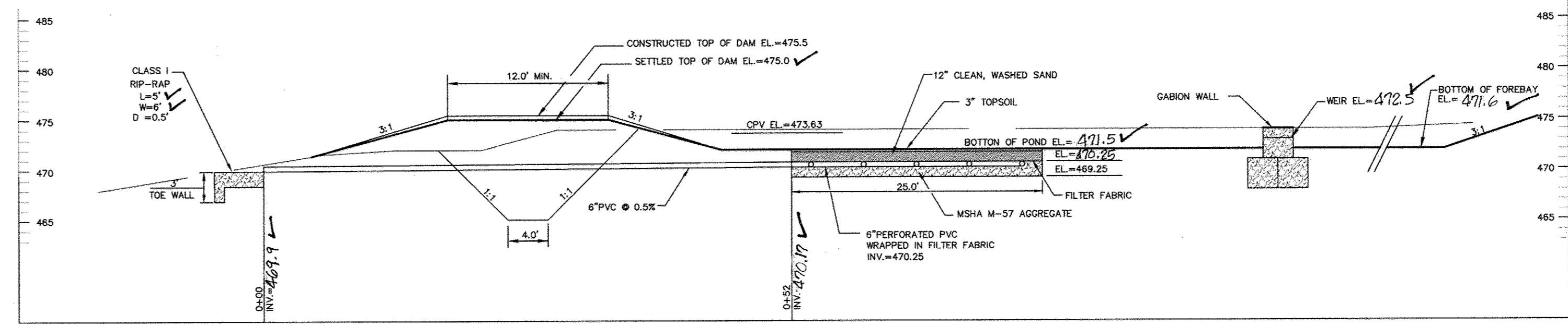
**MILDENBERG, BOENDER & ASSOC., INC.**  
 Surveyors  
 Engineers Planners  
 5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland 21042  
 (410) 997-0236 Fax: (301) 621-5521 Wash. (410) 997-0298 Fax.





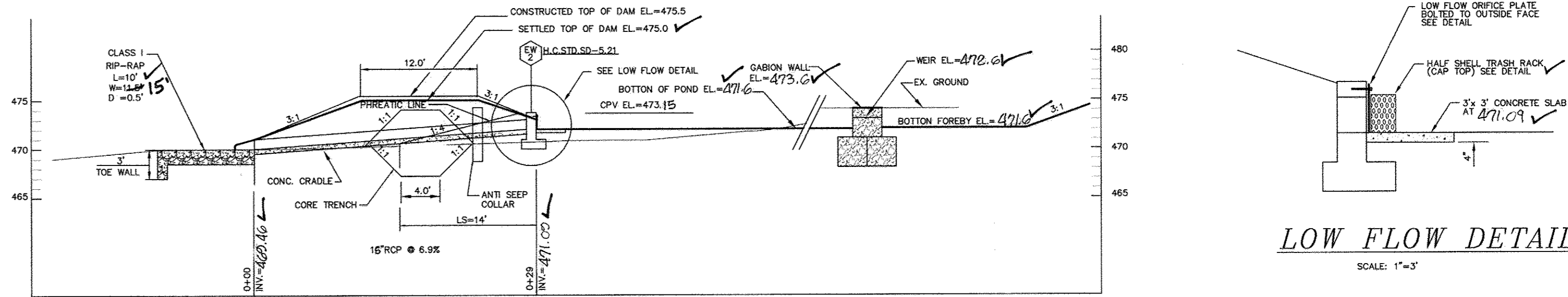
**SWM POND # 2 PLAN**

SCALE: 1"=30'



**SAND FILTER PROFILE**  
SWM POND # 2

SCALE: 1"=10'

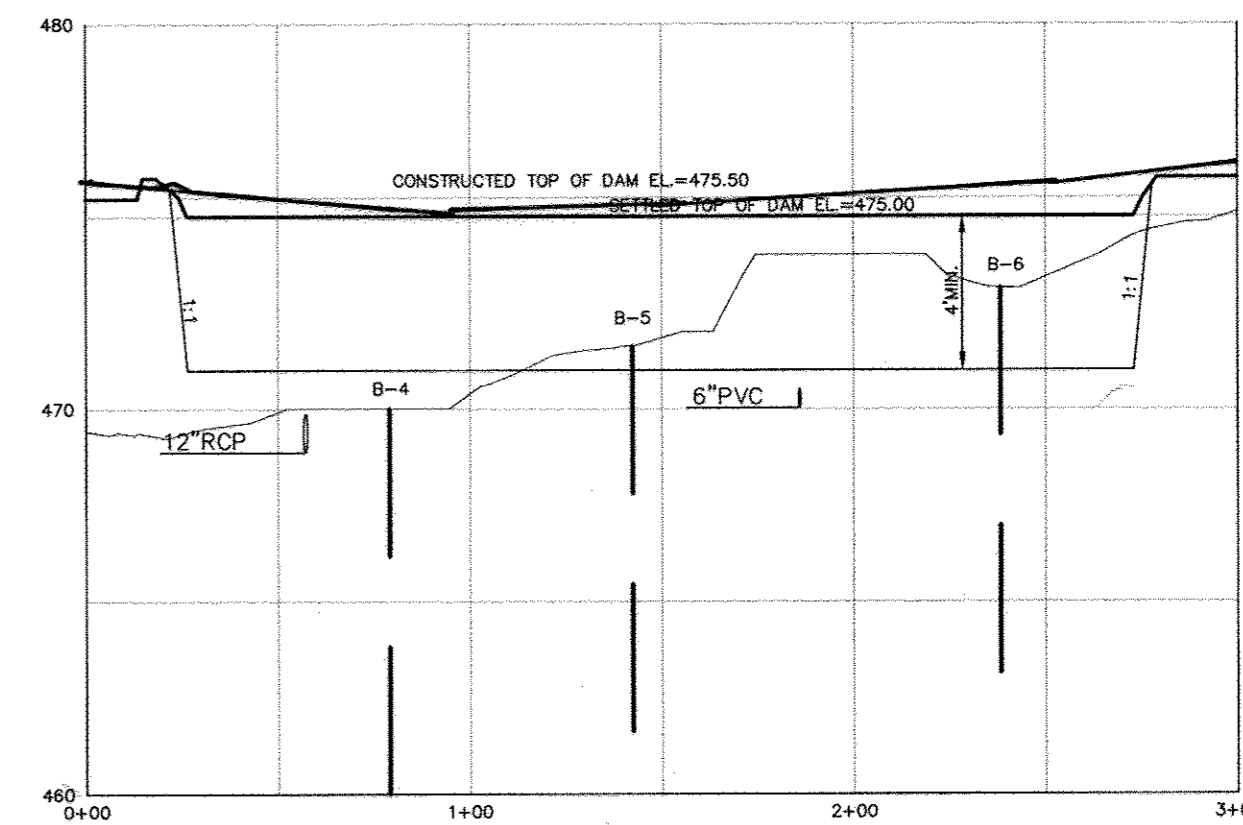


**PRINCIPAL SPILLWAY PROFILE**

SCALE: 1"=10'

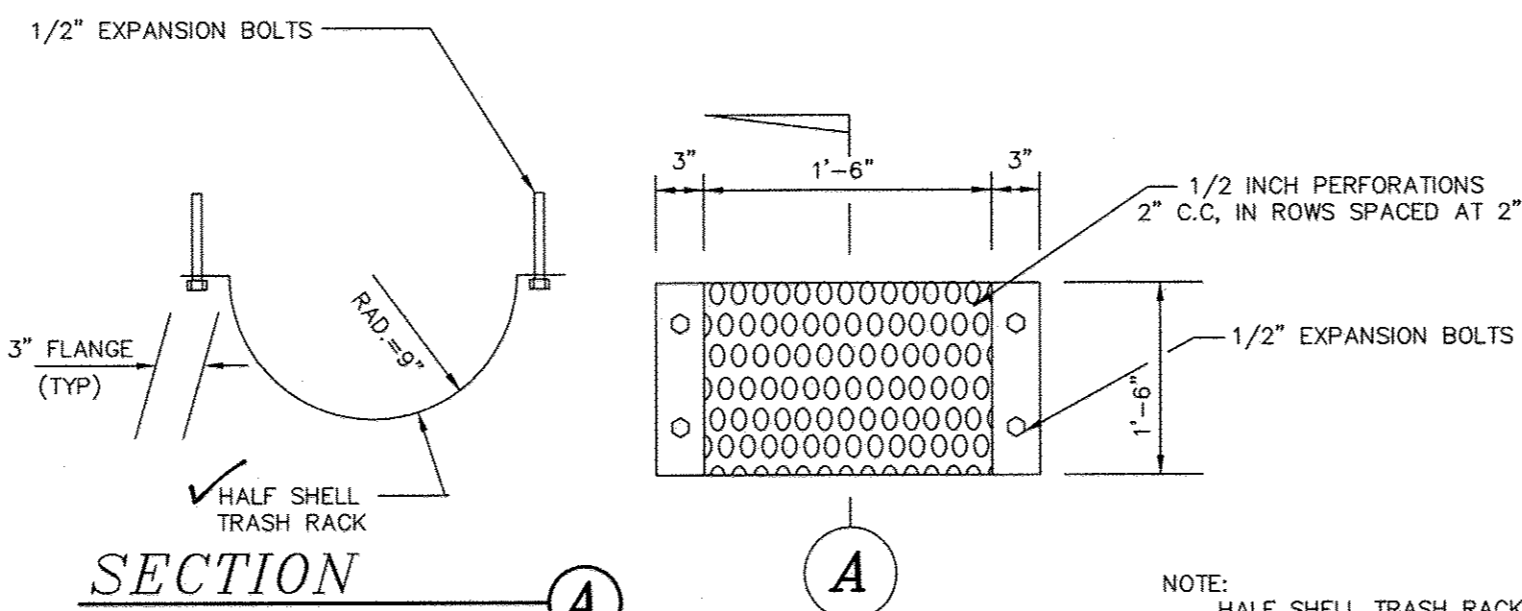
**LOW FLOW DETAIL**

SCALE: 1"=3'



**CENTERLINE DAM PROFILE**

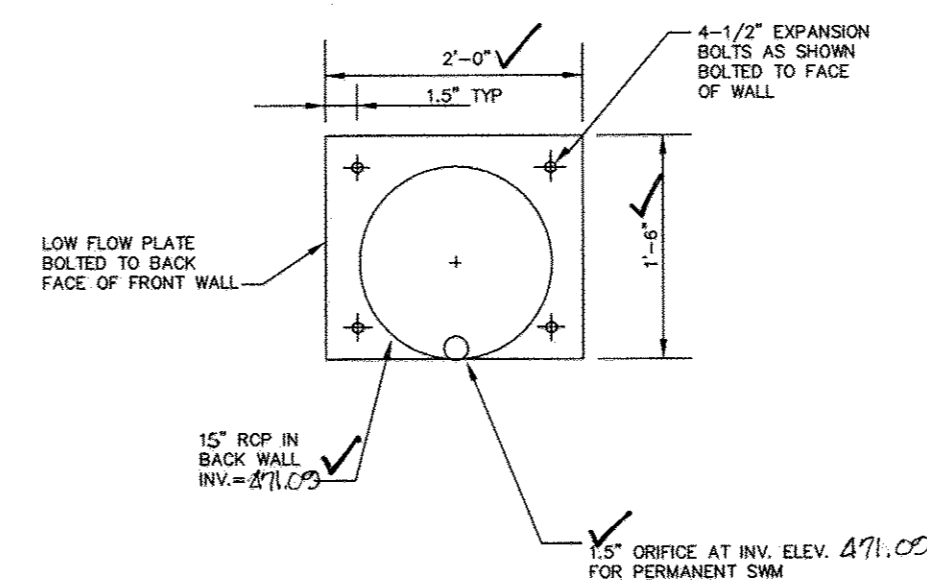
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VER: 1"=5'



**SECTION A**

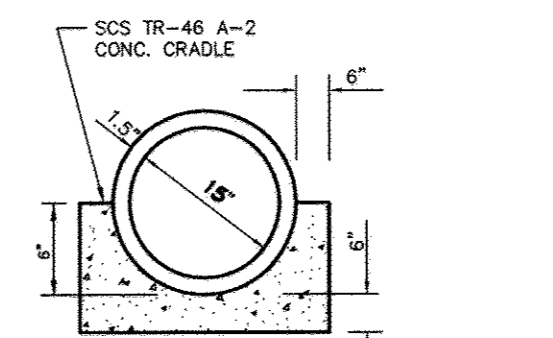
**HALF SHELL TRASH RACK**

NOTE: HALF SHELL TRASH RACK TO BE HOT DIPPED GALVANIZED AND PAINTED BATTLESHIP GRAY.



**LOW FLOW ORIFICE DETAIL**

NTS



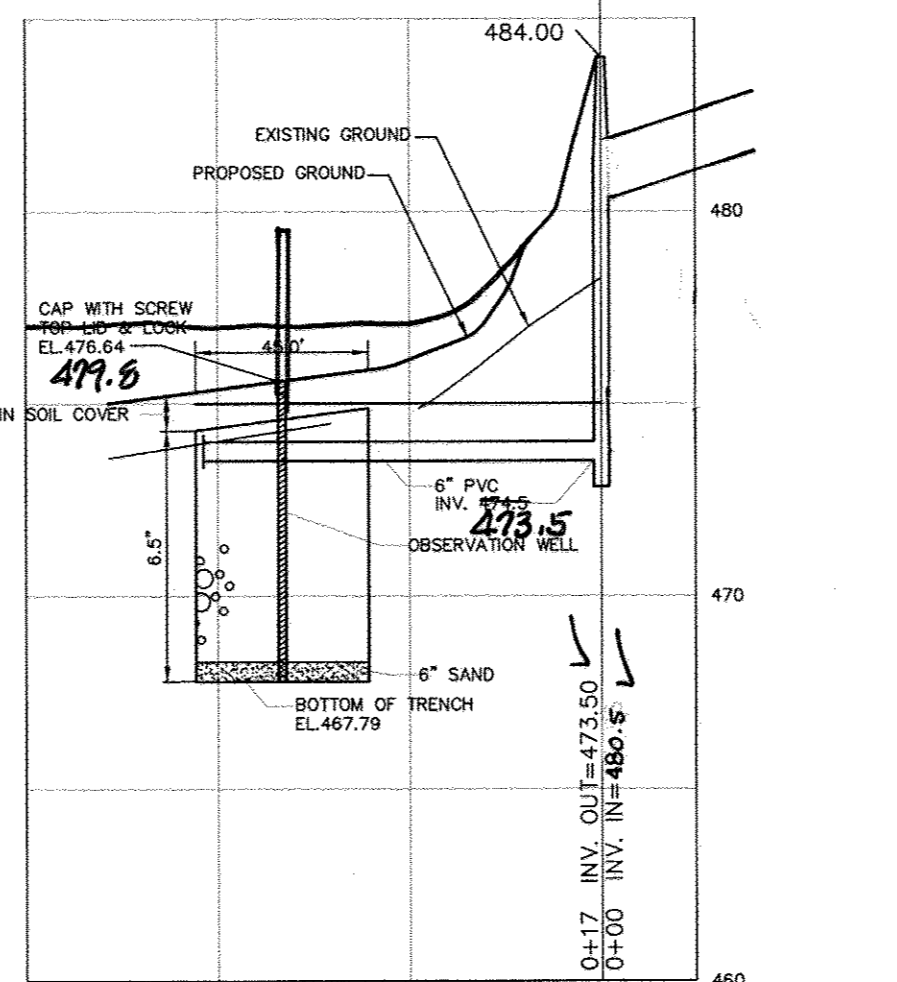
**CONCRETE CRADLE DETAIL**

N.T.S.

**APPROVED**  
PLANNING BOARD  
OF HOWARD COUNTY

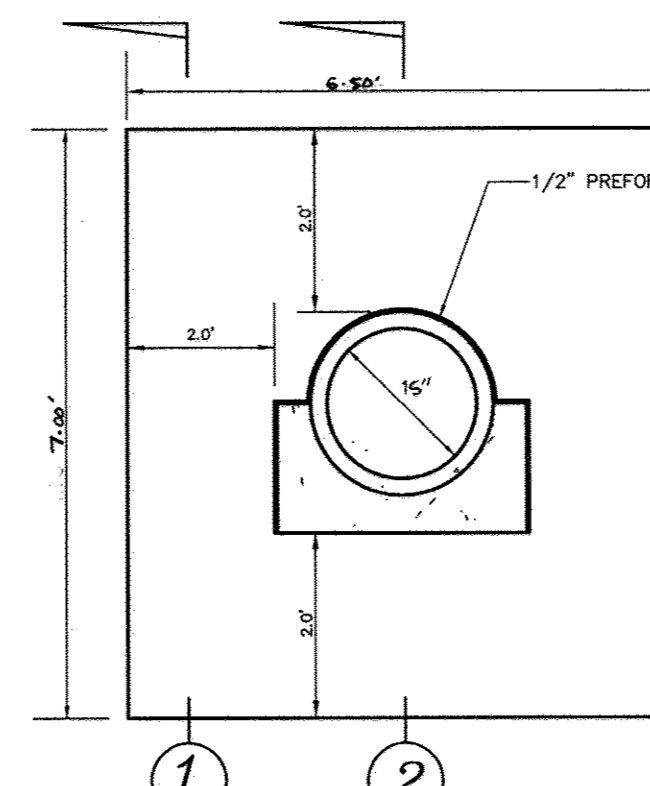
DATE: 7/31/08

LJA/3



**STONE RECHARGE TRENCH SECTION**

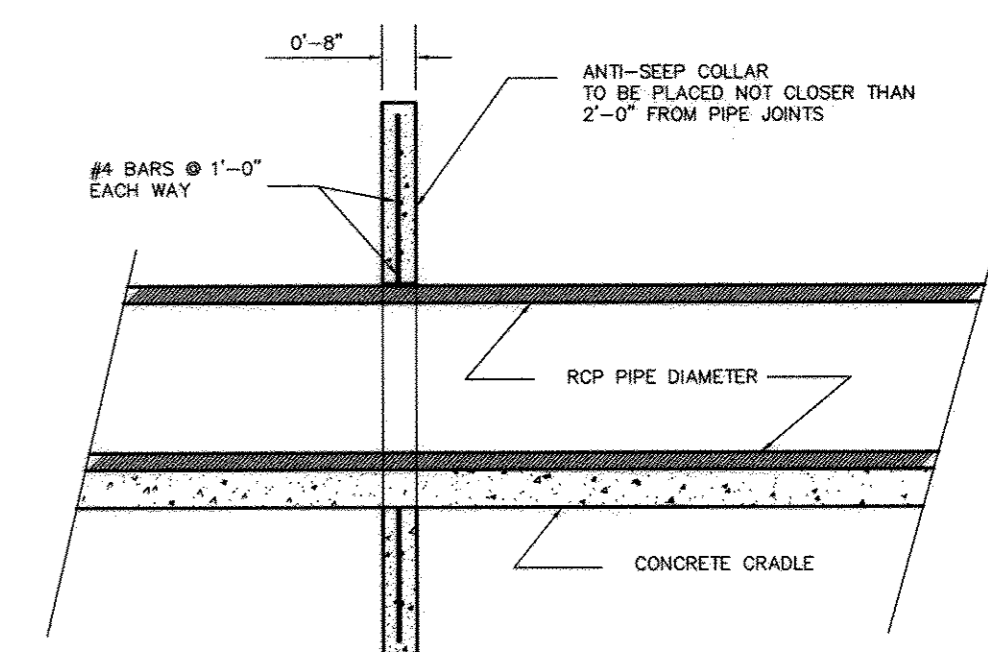
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VER: 1"=5'



**ANTI-SEEP COLLAR DETAIL**

SECTION 1

N.T.S.



SECTION 2

N.T.S.

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
License No. 21443, Expiration Date: 12-21-16



FOR REVISIONS BY EBI DATED 8-1-16

**A5-BUILT**

**AS-BUILT CERTIFICATION**

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

Signature: *Dorald Man*  
P.E. No.: 21443  
DATE: 9-29-16

CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE COMMONLY ACCEPTED ENGINEERING STANDARDS. CERTIFY DOES NOT MEAN OR IMPLY A GUARANTEE BY THE ENGINEER FOR WORK DONE AND ENGINEER'S CERTIFICATION RELIEVE ANY OTHER PARTY FROM MEETING REQUIREMENTS IMPOSED BY CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

**BY THE DEVELOPER:**

I, THE DEVELOPER, CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT.

Signature: *MARY BUDA*  
DATE: 8/13/08

Signature of Developer: *MARY BUDA*  
DATE: 8/13/08

**BY THE ENGINEER:**

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

Signature of Engineer: *R. JACOB HIKMAT*  
DATE: 9/13/07

Signature of Engineer: *R. JACOB HIKMAT*  
DATE: 9/13/07

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

USA - NATURAL RESOURCES CONSERVATION SERVICE

Signature: *John K. Hinton*  
DATE: 8/27/08

APPROVED: DEPARTMENT OF PUBLIC WORKS

Signature: *Mr. Vanneman*  
DATE: 9/24/08

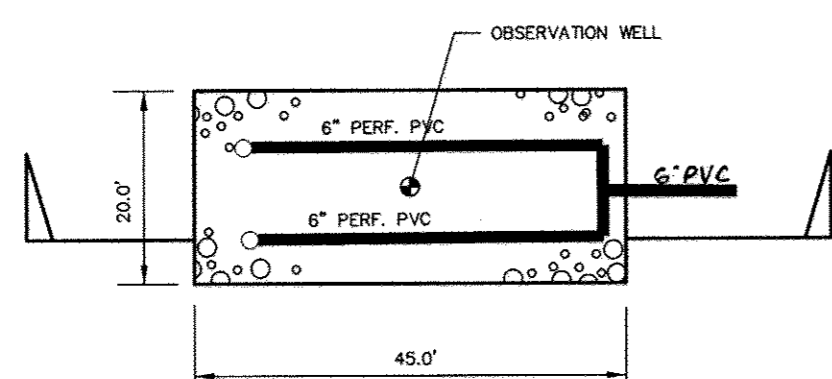
Signature: *Candy Hunt*  
DATE: 8/28/08

Signature: *David A. Engler*  
DATE: 7/14/08

Signature: *David A. Engler*  
DATE: 7/14/08

**SWM POND DATA:**

- HAZARD CLASSIFICATION: "A"
- F-1 SAND FILTER
- DRAINAGE AREA: = 3.44 AC
- PROPOSED RCN: = 82
- PROPOSED Tc: = 0.37 HRS.
- SAND FILTER AREA (Wqv): 150 SQ. FT.
- EXTENDED DETENTION WSEL: 473.63
- Cpv (Q) INTO POND = 2.6 CFS
- Cpv (Q) OUT OF POND = 0.07 CFS
- Wqv REQUIRED: = 6,568 C.F.
- Wqv PROVIDED: = 6,849 C.F.
- Rev REQUIRED (ALL SITE) = 2,893 C.F.
- Rev REQUIRED (W/CREDITS) = 2,298 C.F.
- Rev PROVIDED (IN TRENCH) = 5,850 C.F.
- MAINTENANCE: PRIVATE
- OWNERSHIP: PRIVATE



**STONE RECHARGE TRENCH**

**OWNER/DEVELOPER**

JAMES KEELY & CO., INC.  
61 E. PADONIA RD.  
TIMONIUM, MARYLAND  
21094-0528  
(410) 252-8600



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date	OCT.2007	engineering	MMM	approval
project	03-081	illustration	MMM	scale
revision	1	description	AS SHOWN	revisions

date	8/1/08	description	OUTFALL ELEVATION
revision	1	description	CHANGE PIPE SIZE

**OAKMONT AT TURF VALLEY**  
PARCELS: R, S, T, U, V & W  
TAX MAP 16, P/O PARCEL 8, BLOCK 10  
HOWARD COUNTY, MARYLAND  
THIRD ELECTION DISTRICT  
**STORMWATER MANAGEMENT DETAILS - POND # 2**

**MILDENBERG, BOENDER & ASSOC., INC.**  
Engineers Planners Surveyors  
5072 Dorsey Hall Drive, Suite 202, Ellicott City, Maryland, 21042  
(410) 997-0296 Fax: (301) 621-5521 Wash. (410) 997-0298 Fax.



MD-378 POND SPECIFICATIONS (JANUARY 2000)

CONSTRUCTION SPECIFICATIONS

THESE SPECIFICATIONS ARE APPROPRIATE TO ALL PONDS WITHIN THE SCOPE OF THE STANDARD FOR PRACTICE MD-378. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT EDITION.

SITE PREPARATION

AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED. RUBBISH AND OTHER OBJECTIONABLE MATERIALS DESIGNATED ON THE PLANS. TREES, TREES SHALL BE REMOVED. CHANNEL BANKS AND SHARP BERRKS SHALL BE SLOPED TO NO STEEPER THAN 1:1. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 15 FEET OF THE TOE OF THE EMBANKMENT.

AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. TREES, BRUSH, AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE. FOR DRY STORM WATER MANAGEMENT PONDS, A MINIMUM OF A 25-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED.

EARTH FILL

MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6" FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT AND CUT OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION CC, SC, CH OR CL AND MUST PASS THE #200 SIEVE.

PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 8 INCH THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE FILL. THE MOST PERMISSIBLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTIONS OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.

COMPACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED. THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF HEAVY EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TIERED OR VIBRATORY ROLLER. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE TO BE COMPACTED TO THE MAXIMUM DENSITY PERMITTED BY THE EQUIPMENT USED.

CUT OFF TRENCH - THE CUTOFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE BOTTOM WIDTH OF THE TRENCH SHALL BE COVERED WITH THE MINIMUM WIDTH BEING FOUR FEET. THE DEPTH SHALL BE AT LEAST FOUR FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPES OF THE TRENCH SHALL BE 1 TO 1 OR FLATTER. THE BACKFILL SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY.

EMBANKMENT CORE - THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPES SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

STRUCTURAL BACKFILL

BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL MATERIAL. THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN FOUR FEET MEASURED HORIZONTALLY TO ANY PART OF A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE STRUCTURE. BACKFILL MAY BE FLOWABLE FILL MEETING THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 313 AS MODIFIED. THE MIXTURE SHALL HAVE A MINIMUM OF 28 DAYS OF CURE BEFORE THE FILL SHALL BE PLACED. THE FILL SHALL HAVE A MINIMUM PH OF 4.0 AND A MINIMUM RESISTIVITY OF 2,000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7". TO ASSURE FLOWABILITY OF THE MATERIAL, ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING THE PIPE.

PIPE CONDUIT

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION. CORRUGATED METAL PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR CORRUGATED METAL PIPE:

1. MATERIALS - (POLYMER COATED STEEL PIPE) - STEEL PIPES WITH POLYMERIC COATINGS SHALL HAVE A MINIMUM COATING THICKNESS OF 0.01 INCH (0.10 MIL) ON BOTH SIDES OF THE PIPE. THIS PIPE AND ITS APPURTENANCES SHALL CONFORM TO THE REQUIREMENTS OF AASHTO SPECIFICATIONS M-245 & M-246 WITH WATER TIGHT COUPLING BANDS OR FLANGES.

2. COUPLING BANDS, ANTI-SEEP COLLARS, AND SECTIONS, ETC., MUST BE COMPOSED OF THE SAME MATERIAL AND COATINGS AS THE PIPE. METALS MUST BE INSULATED FROM DISSIMILAR MATERIALS WITH USE OF RUBBER OR PLASTIC INSULATING MATERIALS AT LEAST 24 MILS IN THICKNESS.

3. CONNECTIONS - ALL CONNECTIONS WITH PIPES MUST BE COMPLETELY WATER TIGHT. THE DRAIN PIPE OR BARREL CONNECTION TO THE RISER SHALL BE WELDED ALL AROUND WHEN THE PIPE AND RISER ARE METAL. ANTI-SEEP COLLARS SHALL BE CONNECTED TO THE PIPE IN SUCH A MANNER AS TO BE COMPLETELY WATER TIGHT. DIMPLE BANDS ARE NOT CONSIDERED TO BE WATER TIGHT.

ALL CONNECTIONS SHALL USE A RUBBER OR NEOPRENE GASKET WHEN JOINING PIPE SECTIONS. THE END OF EACH PIPE SHALL BE RE-ROLLED AN ADEQUATE NUMBER OF CORRUGATIONS TO ACCOMMODATE THE BANDWIDTH. THE FOLLOWING TYPE CONNECTIONS ARE ACCEPTABLE FOR PIPES LESS THAN 24 INCHES IN DIAMETER. FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR 3/8" INCH CLOSED CELL FOAM NEOPRENE GASKET PLUNGED TO THE FLANGE BOLT CIRCLE, SANDWICHED BETWEEN ADJACENT FLANGES; A 12-INCH WIDE STANDARD LAP TYPE BAND WITH 12-INCH WIDE BY 3/8-INCH THICK CLOSED CELL CIRCULAR NEOPRENE GASKET; AND A 12-INCH WIDE HUGGER TYPE BAND WITH O-RING GASKETS HAVING A MINIMUM DIAMETER OF THE CORRUGATION DEPTH. PIPES 24 INCHES IN DIAMETER AND LARGER SHALL BE CONNECTED BY A 24 INCH LONG ANNUAL CORRUGATED BAND USING A MINIMUM OF 4 (FOUR) RINGS AND LUGS, 2 ON EACH CONNECTING PIPE END. A 24-INCH WIDE BY 3/8-INCH THICK CIRCULAR RING OR NEOPRENE GASKET WILL BE INSTALLED WITH 12 INCHES ON THE END OF EACH PIPE. FLANGE JOINTS WITH 3/8 INCH CLOSED CELL GASKETS THE FULL WIDTH OF THE FLANGE IS ALSO ACCEPTABLE.

4. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

5. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL"

6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

REINFORCED CONCRETE PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361.

2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING/CRADLE FOR THEIR ENTIRE LENGTH. THIS BEDDING/CRADLE SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 50% OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE A CONCRETE CRADLE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOWABLE FILL MAY BE USED AS DESCRIBED IN THE "STRUCTURE BACKFILL" SECTION OF THIS STANDARD. GRAVEL BEDDING IS NOT PERMITTED.

3. LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE EXERCISED TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RISER.

4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL"

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

PLASTIC PIPE - THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:

1. MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D1785 OR ASTM D-2241 CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE. COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING: 4" - 10" INCH PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M252 TYPE S, AND 12" THROUGH 24" INCH SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE 5.

2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATER TIGHT.

3. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.

4. BACKFILL SHALL CONFORM TO "STRUCTURE BACKFILL"

5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

DRAINAGE DIAPHRAGMS - WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL DRAINAGE THE DESIGN AND CONSTRUCTION INSPECTION.

CONCRETE

CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

ROCK RIPRAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311.

GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 921.09, CLASS C.

CARE OF WATER DURING CONSTRUCTION ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK.

STABILIZATION ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SLIGHTLY CONDITION ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPOIL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, LIMING, FERTILIZING AND MULCHING IN ACCORDANCE WITH THE NATURAL RESOURCES CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MD-342) OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.

EROSION AND SEDIMENT CONTROL CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. CONSTRUCTION PLANS SHALL DETAIL EROSION AND SEDIMENT CONTROL MEASURES.

OPERATION, MAINTENANCE AND INSPECTION

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

OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE SAND FILTER

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

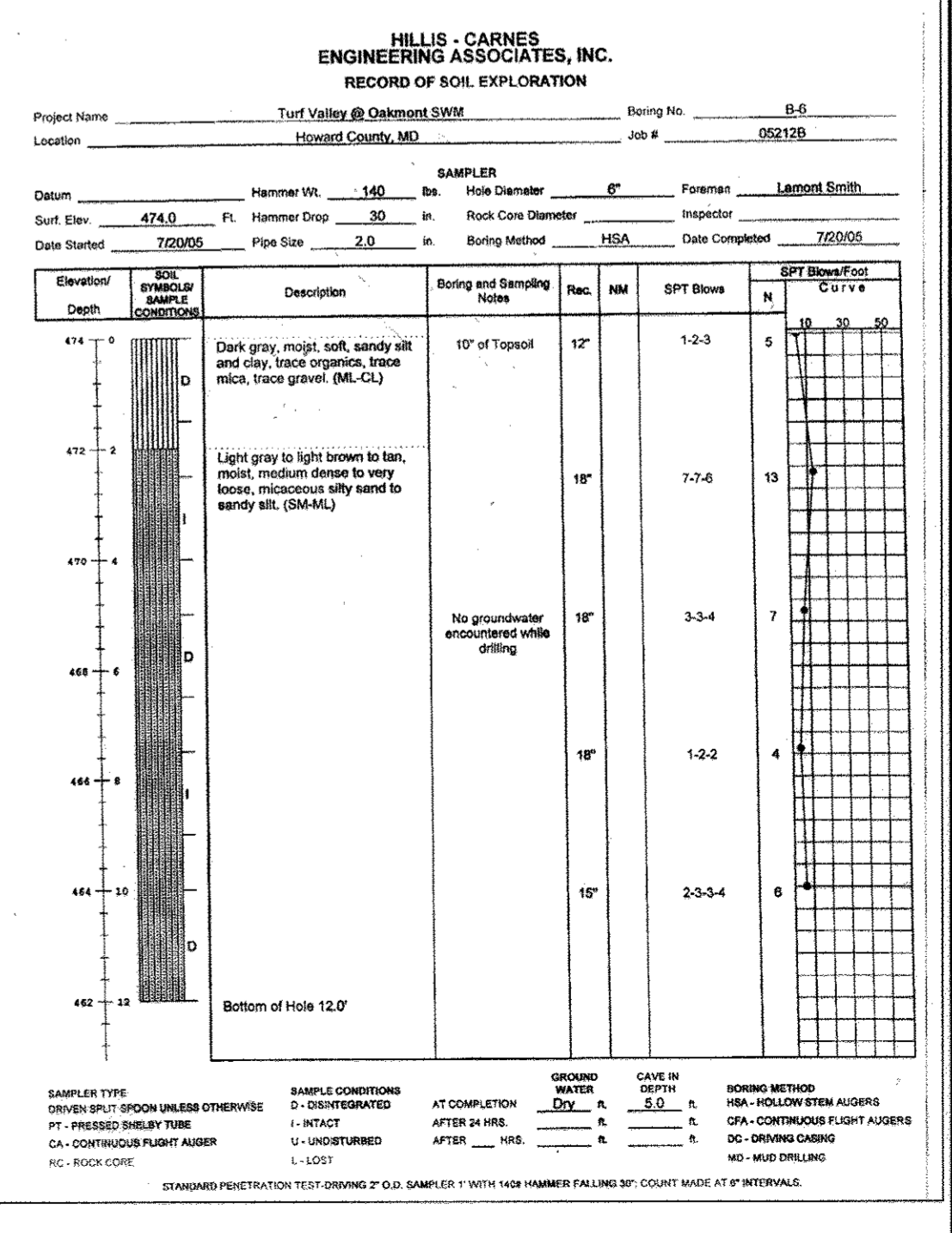
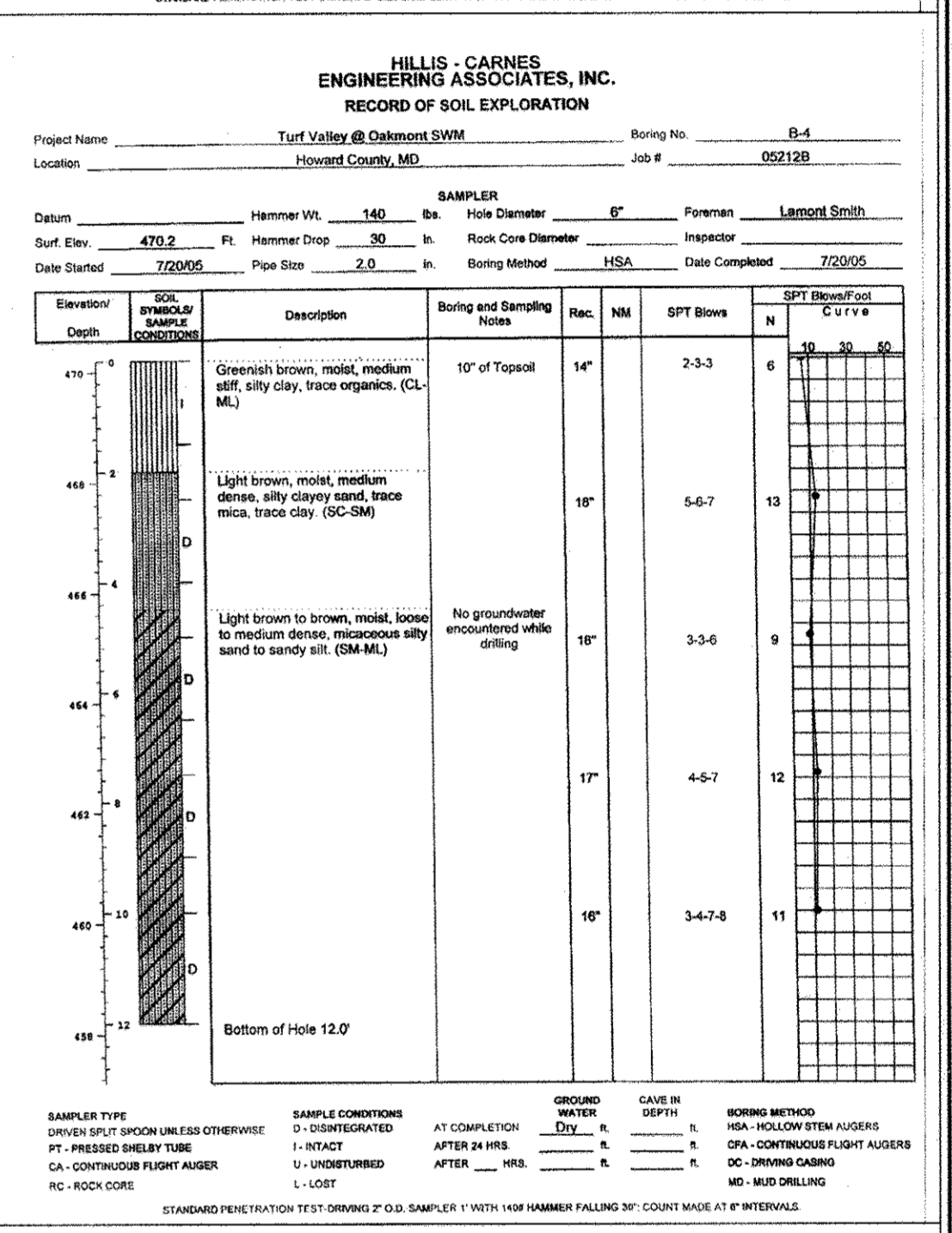
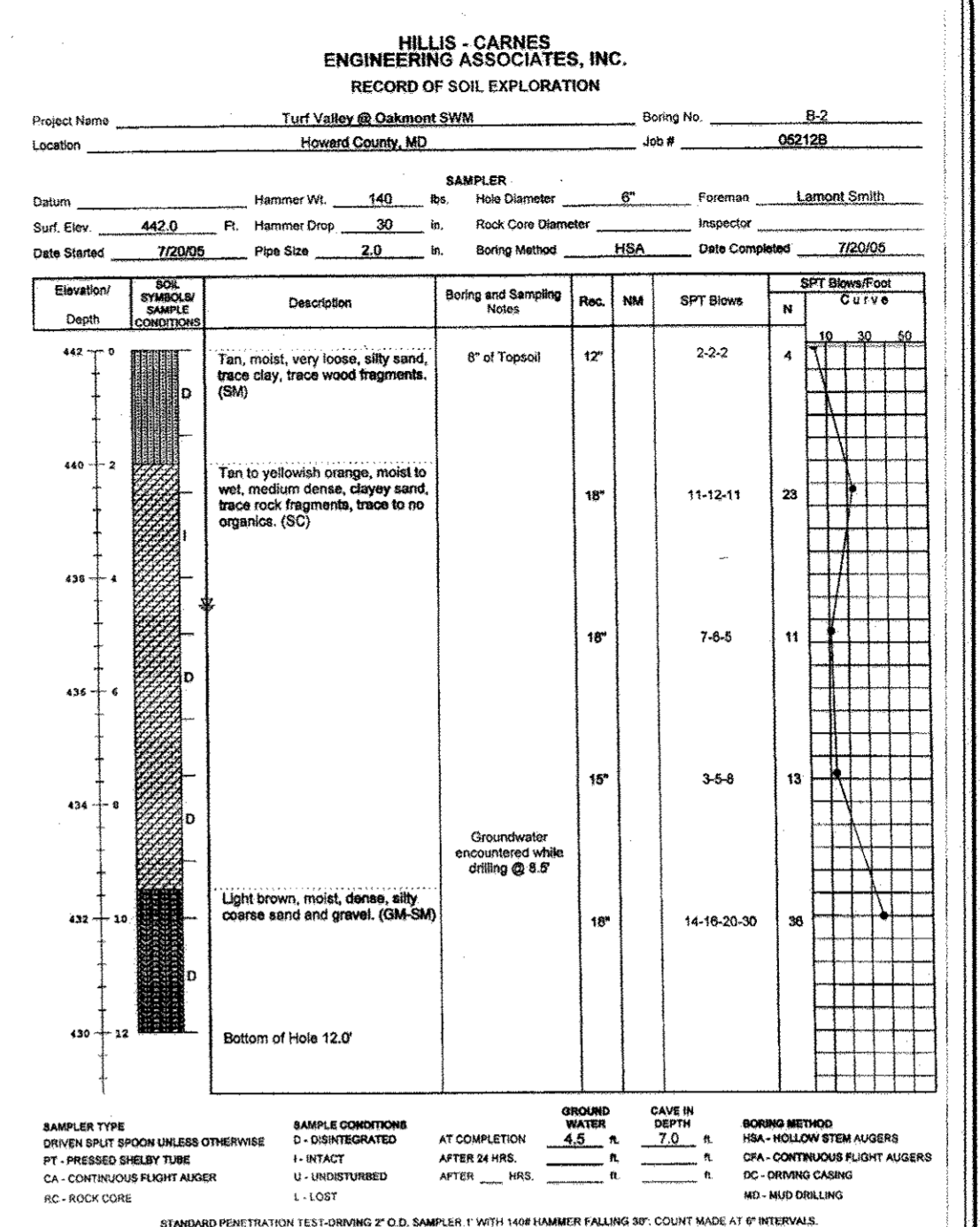
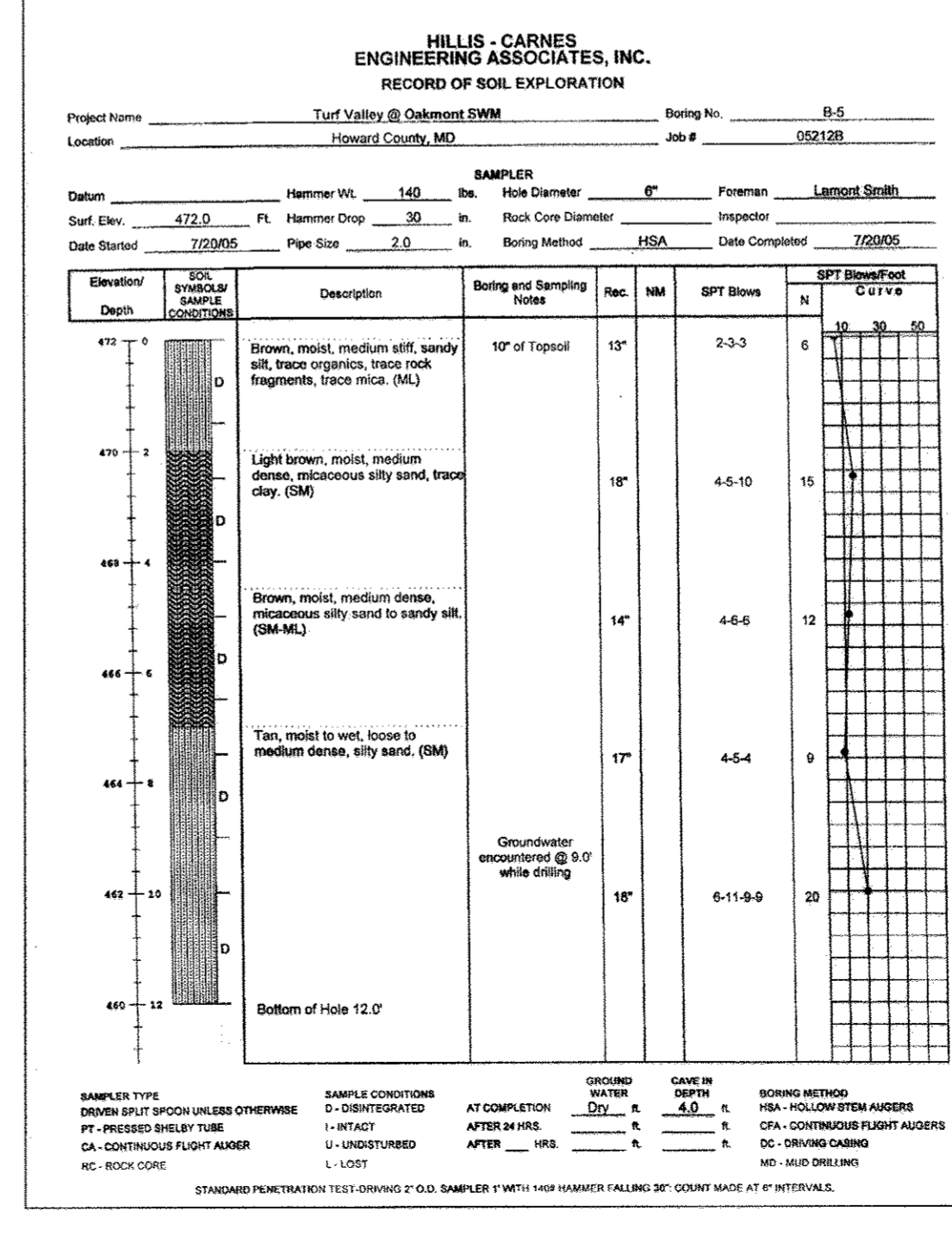
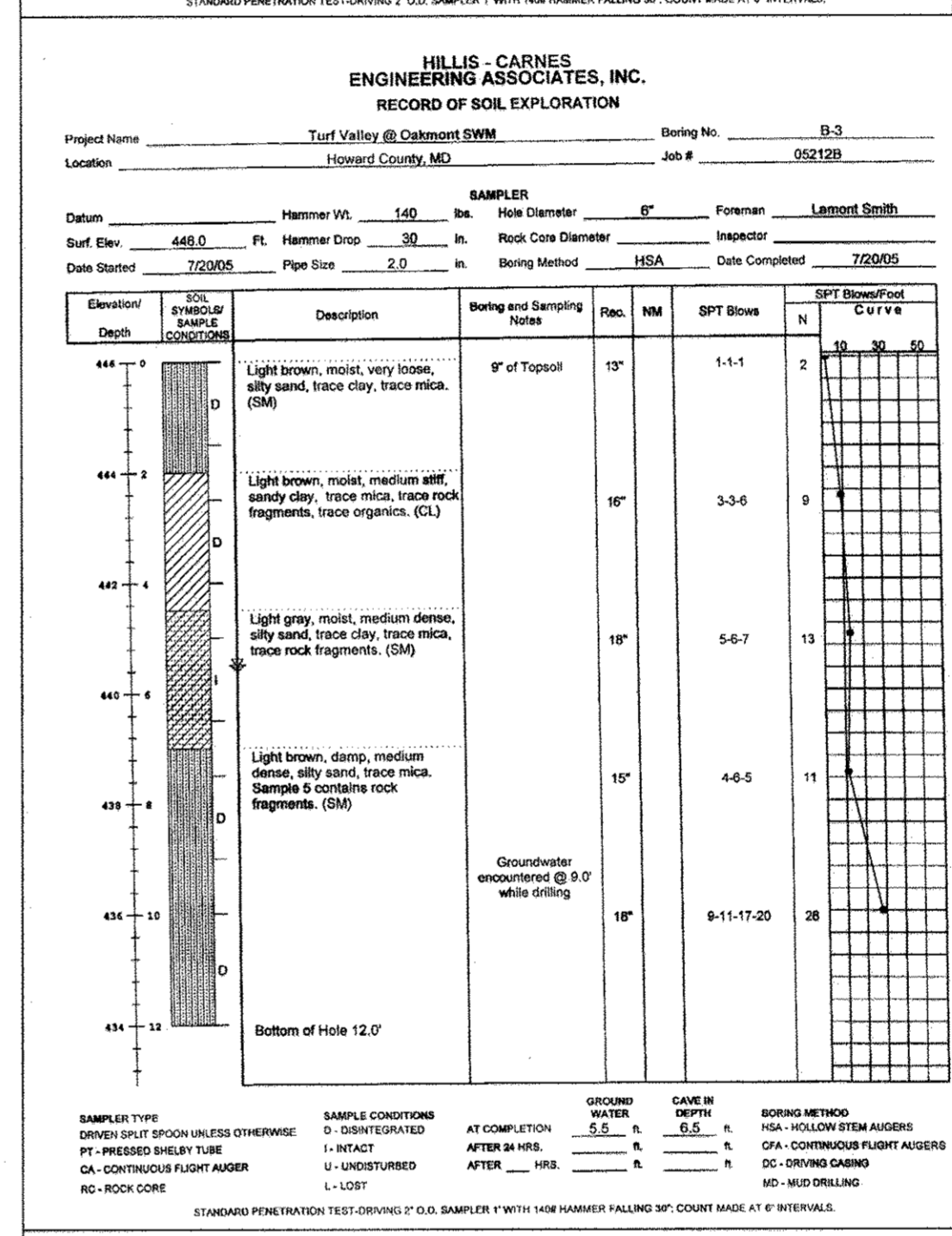
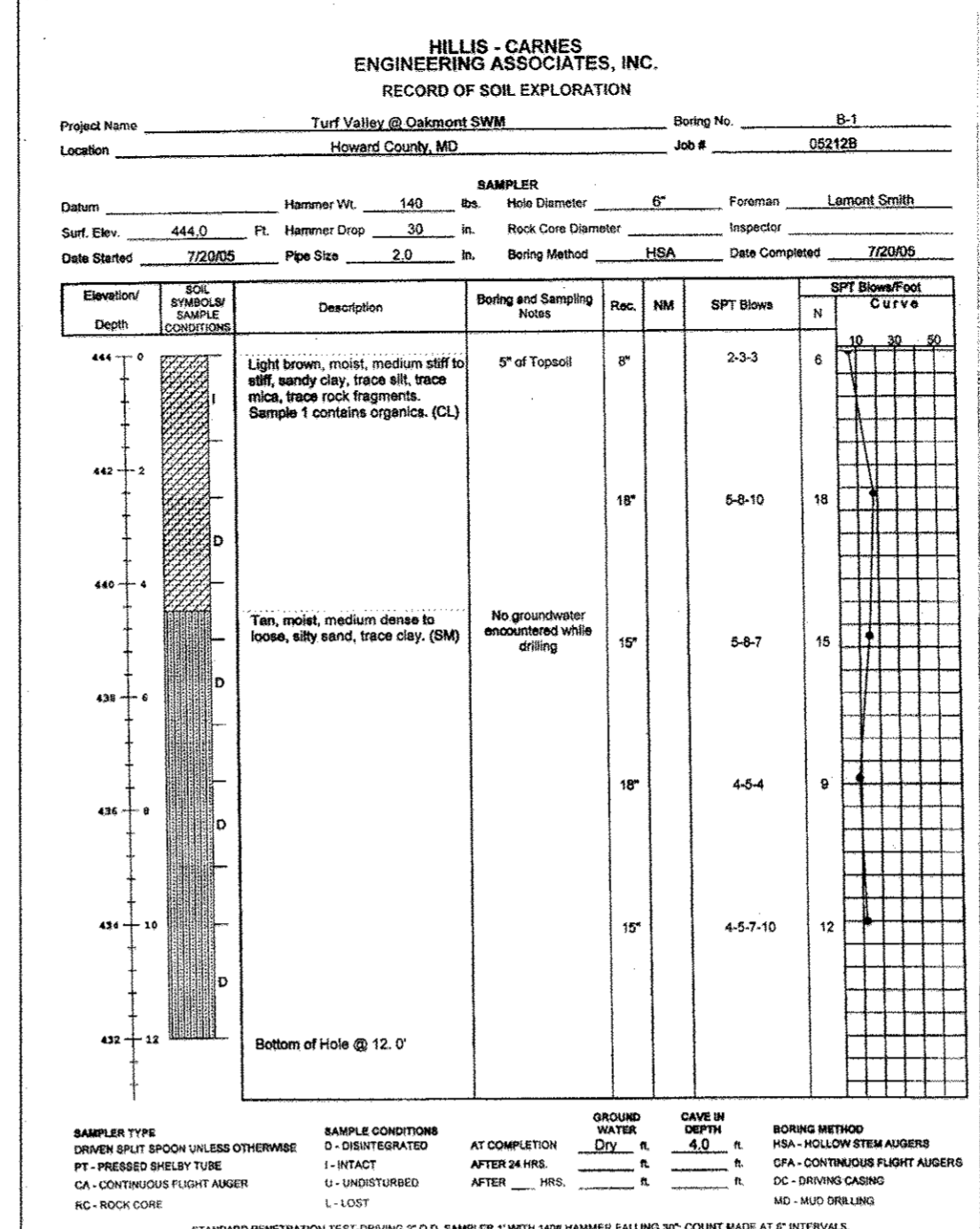
GEOTECHNICAL RECOMMENDATIONS:

THE AREA OF THE PROPOSED SWM FACILITY SHOULD BE STRIPPED OF TOPSOIL AND ANY OTHER UNSUITABLE MATERIALS FROM THE EMBANKMENT OR STRUCTURE AREA IN ACCORDANCE WITH SOIL CONSERVATION GUIDELINES. AFTER STRIPPING OPERATIONS HAVE BEEN COMPLETED, THE EXPOSED SUBGRADE MATERIALS SHOULD BE PROTECTED WITH A LOADED DUMP TRUCK OR SIMILAR EQUIPMENT IN THE PRESENCE OF A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE.

FOR AREAS THAT ARE NOT ACCESSIBLE TO A DUMP TRUCK, THE EXPOSED MATERIALS SHOULD BE OBSERVED AND TESTED BY A GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE UTILIZING A DYNAMIC CONE PENETROMETER. ANY EXCESSIVELY SOFT OR LOOSE MATERIALS IDENTIFIED BY PROFFERROLLING OR PENETROMETER TESTING SHOULD BE EXCAVATED TO SUITABLE FIRM SOIL, AND THEN GRADES RE-ESTABLISHED BY BACKFILLING WITH SUITABLE SOIL.

A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER SHOULD BE PRESENT TO MONITOR PLACEMENT AND COMPACTION OF FILL FOR THE EMBANKMENT AND CUT-OFF TRENCH. IN ACCORDANCE WITH MARYLAND SOIL CONSERVATION SPECIFICATIONS 378 SOILS CONSIDERED SUITABLE FOR CENTER OF EMBANKMENT AND CUT-OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION GC, SC, CH OR CL.

IT IS OUR PROFESSIONAL OPINION THAT IN ADDITION TO THE SOIL MATERIALS DESCRIBED ABOVE A FINE-GRAINED SOIL, INCLUDING SILT (ML) WITH A PLASTICITY INDEX OF 10 OR MORE CAN BE UTILIZED FOR THE CENTER OF THE EMBANKMENT AND CORE TRENCH. ALL FILL MATERIALS MUST BE PLACED AND COMPACTED IN ACCORDANCE WITH MD 555 17B SPECIFICATIONS.



AS-BUILT CERTIFICATION I HEREBY CERTIFY THAT THE FACILITY SHOWN ON THIS PLAN WAS CONSTRUCTED AS SHOWN ON THE "AS-BUILT" PLANS AND MEETS THE APPROVED PLANS AND SPECIFICATIONS. P.E. NO. DATE SIGNATURE DATE CERTIFY MEANS TO STATE OR DECLARE A PROFESSIONAL OPINION BASED UPON ON-SITE INSPECTIONS AND MATERIAL TESTS WHICH ARE CONDUCTED DURING CONSTRUCTION. THE ON-SITE INSPECTIONS AND MATERIAL TESTS ARE THOSE INSPECTIONS AND TESTS DEEMED SUFFICIENT AND APPROPRIATE TO VERIFY THAT THE CONSTRUCTION WORKS SHOWN ON THE PLANS COMPLY WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311, AND ANY OTHER PARTS OF THE MEETING RECORDS, RECORDS OF CONTRACT, EMPLOYMENT, OR OTHER MEANS, INCLUDING MEETING COMMONLY ACCEPTED INDUSTRY PRACTICES.

I hereby certify that these documents were prepared or approved by me and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 17942, Exp Date 9/3/08



BUILDER/DEVELOPER JAMES KEELY & CO., INC. 61 E. PADONIA RD. TIMONIUM, MARYLAND 21094-0528 (410) 252-8600

APPROVED PLANNING BOARD OF HOWARD COUNTY DATE 1/31/08

Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 21443, Expiration Date 12-31-16



Project date OCT-2007 05-081 illustration MAM scale 1"=50'

description revisions

OAKMONT AT TURF VALLEY PARCELS: R, S, T, U, V & W TAX MAP 16, P/O PARCEL 8, BLOCK 10 HOWARD COUNTY, MARYLAND THIRD ELECTION DISTRICT SWM SPECIFICATIONS AND SOIL BORINGS

MILDENBERG & ASSOC., INC. Engineers Planners Surveyors 5072 Dorsey Hall Drive, Suite 202, Elkton City, Maryland 21042 (410) 997-0236 Fax: (410) 997-0236



**SCHEDULE A : PERIMETER LANDSCAPED EDGE**

CATEGORY	ADJACENT TO ROADWAYS	ADJACENT TO PERIMETER PROPERTIES		TOTAL
LANDSCAPE TYPE	E ( PERIMETER 1)	A ( PERIMETERS 2)	A (PERIMETERS 3)	
LINEAR FEET OF PERIMETER	1800 LF	432 LF	2021 LF	
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET)	NO	NO	NO	
CREDIT FOR WALL, FENCE, OR BERM (YES, NO, LINEAR FEET)	NO	NO	NO	
NUMBER OF PLANTS REQUIRED				
SHADE TREES	45 SHADE TREES	7 SHADE TREES	34 SHADE TREES	86 SHADE TREES
EVERGREEN TREES	0 EVERGREEN TREES	0 EVERGREEN TREES	0 EVERGREEN TREES	0 EVERGREEN TREES
SHRUBS	450 SHRUBS	0 SHRUBS	0 SHRUBS	120 SHRUBS
NUMBER OF PLANTS PROVIDED				
SHADE TREES	45 SHADE TREES	7 SHADE TREES	34 SHADE TREES	86 SHADE TREES
EVERGREEN TREES	0 EVERGREEN TREES	0 EVERGREEN TREES	0 EVERGREEN TREES	0 EVERGREEN TREES
OTHER TREES (2:1 SUBSTITUTION)	0 SUBSTITUTION TREES	0 SUBSTITUTION TREES	0 SUBSTITUTION TREES	0 SUBSTITUTION TREES
SHRUBS (10:1 SUBSTITUTION)	450 SHRUBS	0 SHRUBS	0 SHRUBS	450 SHRUBS

**SCHEDULE B: PARKING LOT INTERNAL LANDSCAPING**

NUMBER OF PARKING SPACES	218
NUMBER OF PLANTING ISLANDS REQUIRED	22
NUMBER OF PLANTING ISLANDS PROVIDED	22
NUMBER OF TREES REQUIRED	22 SHADE TREES
NUMBER OF TREES PROVIDED	22 SHADE TREES
OTHER TREES (2:1 SUBSTITUTION)	0 TREES

**SCHEDULE D : STORMWATER MANAGEMENT AREA LANDSCAPING**

LINEAR FEET OF PERIMETER	1154 LF
CREDIT FOR EXISTING VEGETATION (NO, YES AND LINEAR FEET)	NO
CREDIT FOR OTHER LANDSCAPING (NO, YES AND %)	NO
NUMBER OF TREES REQUIRED	23 SHADE TREES
EVERGREEN TREES	29 EVERGREEN TREES
NUMBER OF TREES PROVIDED	23 SHADE TREES
SHADE TREES	29 EVERGREEN TREES
OTHER TREES (2:1 SUBSTITUTION)	0 TREES (0 SUBSTITUTION TREES)

**SCHEDULE C: RESIDENTIAL DEVELOPMENT INTERNAL LANDSCAPING**

NUMBER OF DWELLING UNITS	192
NUMBER OF TREES REQUIRED (1:3)	64 SHADE TREES
NUMBER OF TREES PROVIDED	64 SHADE TREES
SHADE TREES	0 TREES
OTHER TREES (2:1 SUBSTITUTION)	0 TREES

**LANDSCAPE REQUIREMENT PLANTING SCHEDULE**

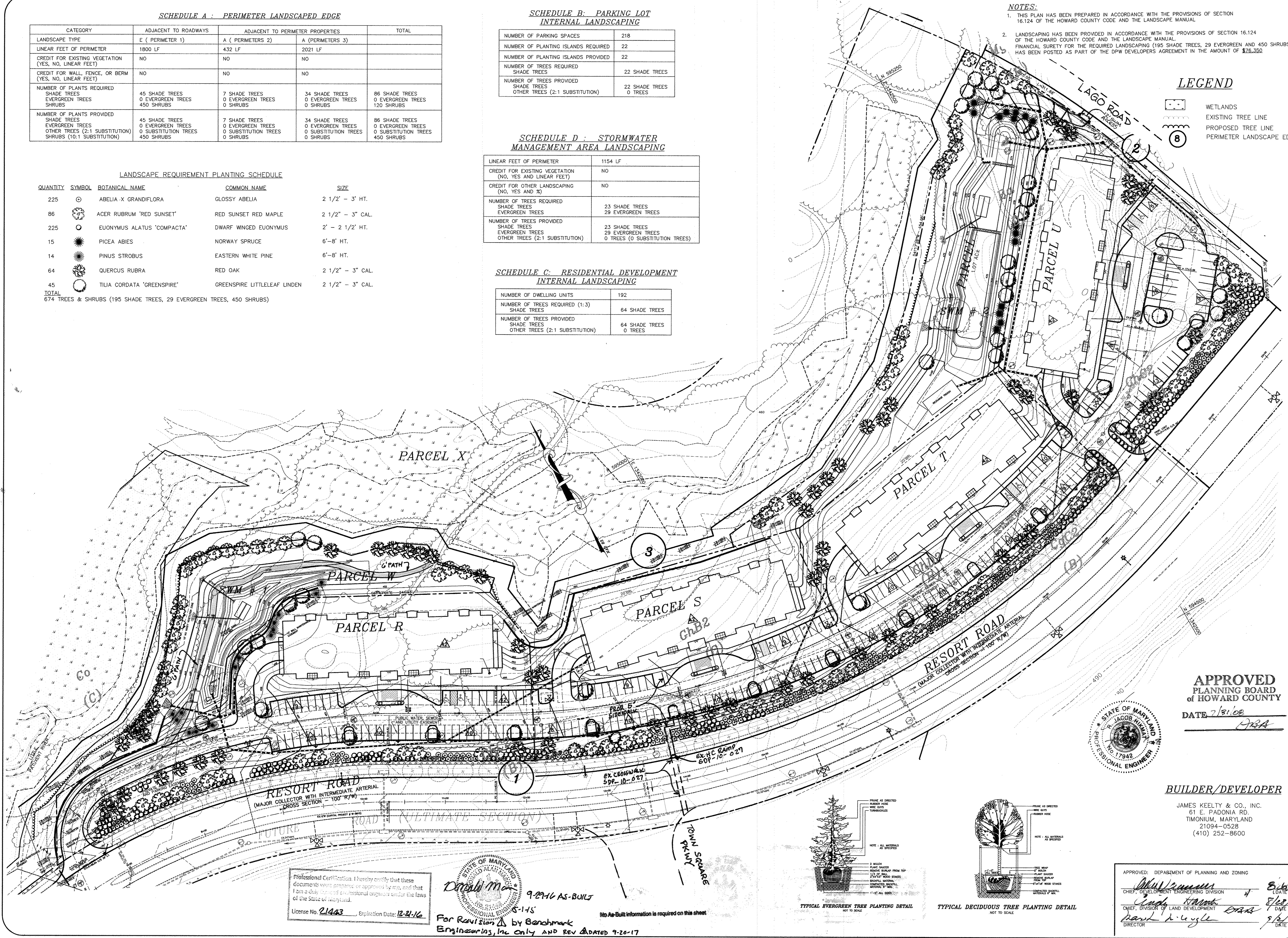
QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE
225	⊙	ABELIA X GRANDIFLORA	GLOSSY ABELIA	2 1/2" - 3" HT.
86	⊙	ACER RUBRUM 'RED SUNSET'	RED SUNSET RED MAPLE	2 1/2" - 3" CAL.
225	⊙	EUONYMUS ALATUS 'COMPACTA'	DWARF WINGED EUONYMUS	2' - 2 1/2' HT.
15	⊙	PICEA ABIES	NORWAY SPRUCE	6'-8" HT.
14	⊙	PINUS STROBUS	EASTERN WHITE PINE	6'-8" HT.
64	⊙	QUERCUS RUBRA	RED OAK	2 1/2" - 3" CAL.
45	⊙	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LITTLELEAF LINDEN	2 1/2" - 3" CAL.
<b>TOTAL</b>				
674 TREES & SHRUBS (195 SHADE TREES, 29 EVERGREEN TREES, 450 SHRUBS)				

**NOTES:**

- THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
- LANDSCAPING HAS BEEN PROVIDED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING (195 SHADE TREES, 29 EVERGREEN AND 450 SHRUBS) HAS BEEN POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF \$76,350.

**LEGEND**

- ⊙ WETLANDS
- EXISTING TREE LINE
- - - PROPOSED TREE LINE
- ⊙ PERIMETER LANDSCAPE EDGE



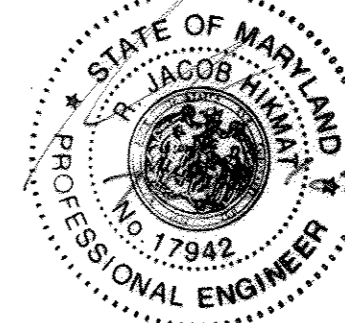
Project	date
03-081	DEC-2007

Illustration	date
MMM	9-20-17
MMM	5-12-16
MMM	4-27-15

**OAKMONT AT TURF VALLEY**  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 6, BLOCK 10  
 THIRD ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND  
**LANDSCAPE PLAN**

**MILDENBERG, BOENDER & ASSOC., INC.**  
 Engineers Planners Surveyors  
 5072 Dorsy Hall Drive, Suite 202, Ellicott City, Maryland, 21042  
 (410) 987-0296 Fax: (301) 621-5521 Wash. (410) 987-0298 Fax

**APPROVED**  
 PLANNING BOARD  
 OF HOWARD COUNTY  
 DATE 7/31/08



**BUILDER/DEVELOPER**

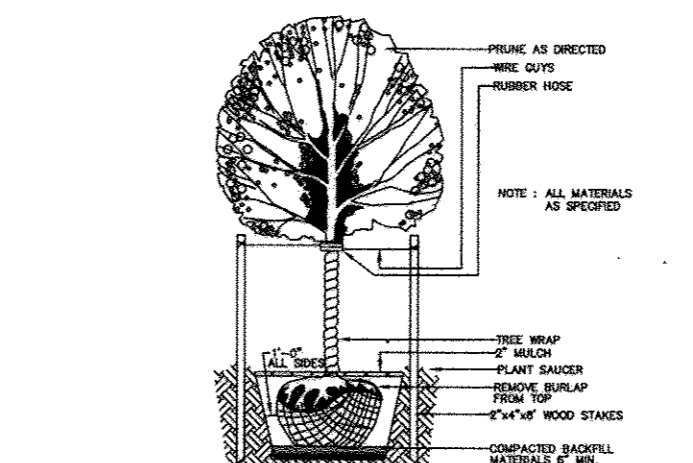
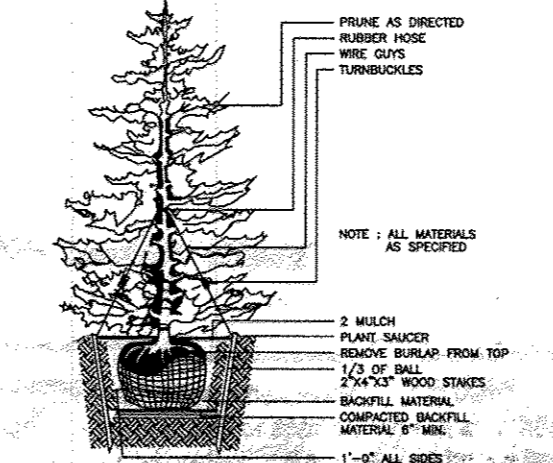
JAMES KEELY & CO., INC.  
 61 E. PADONIA RD.  
 TIMONIUM, MARYLAND  
 21094-0528  
 (410) 252-8600

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 21443 Expiration Date: 12-21-16

Professional Seal of David M. ... 9-20-16 AS-BUILT

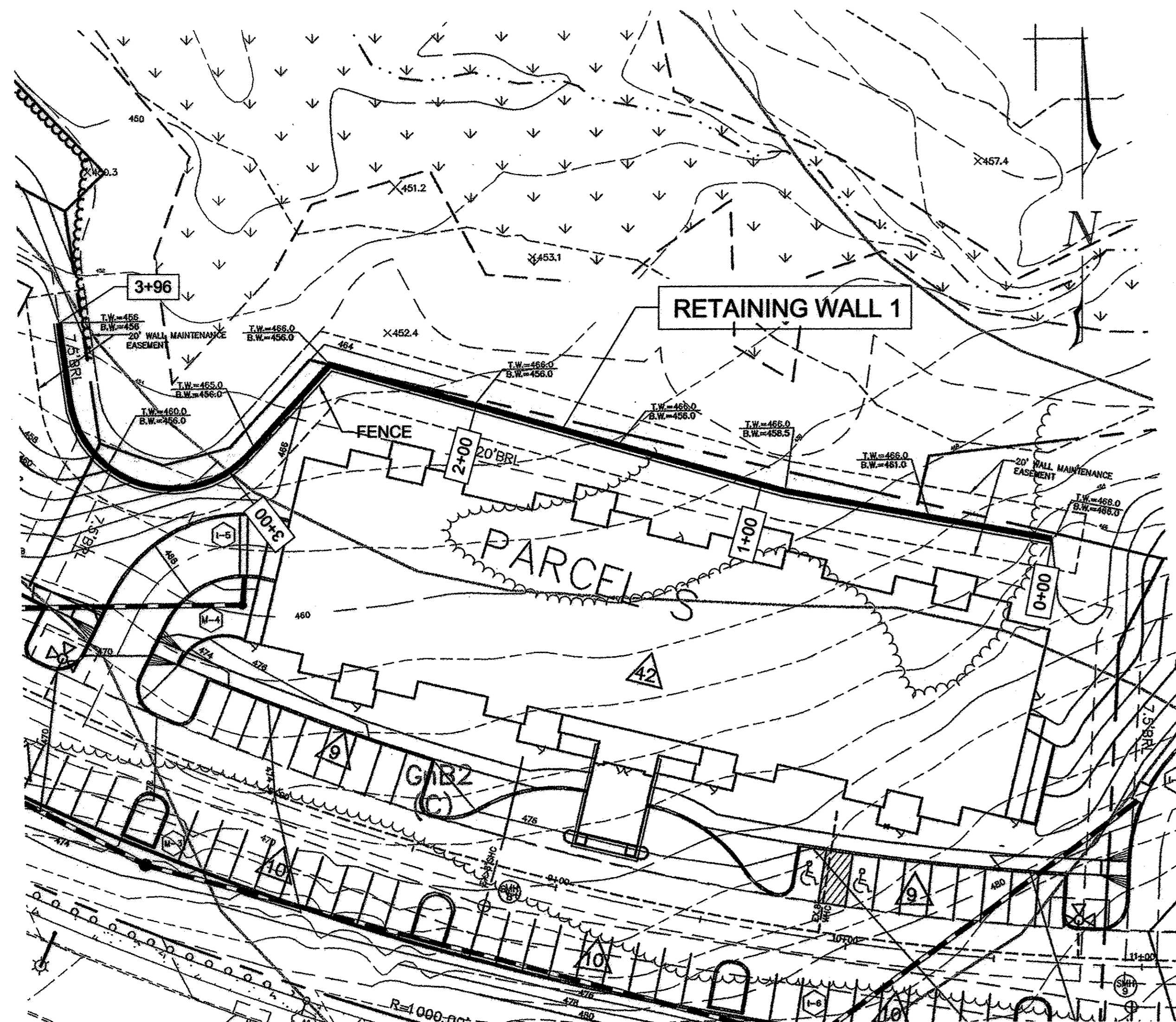
For Revision by Benchmark Engineering, Inc. only AND REV DATED 9-20-17

No As-Built information is required on this sheet



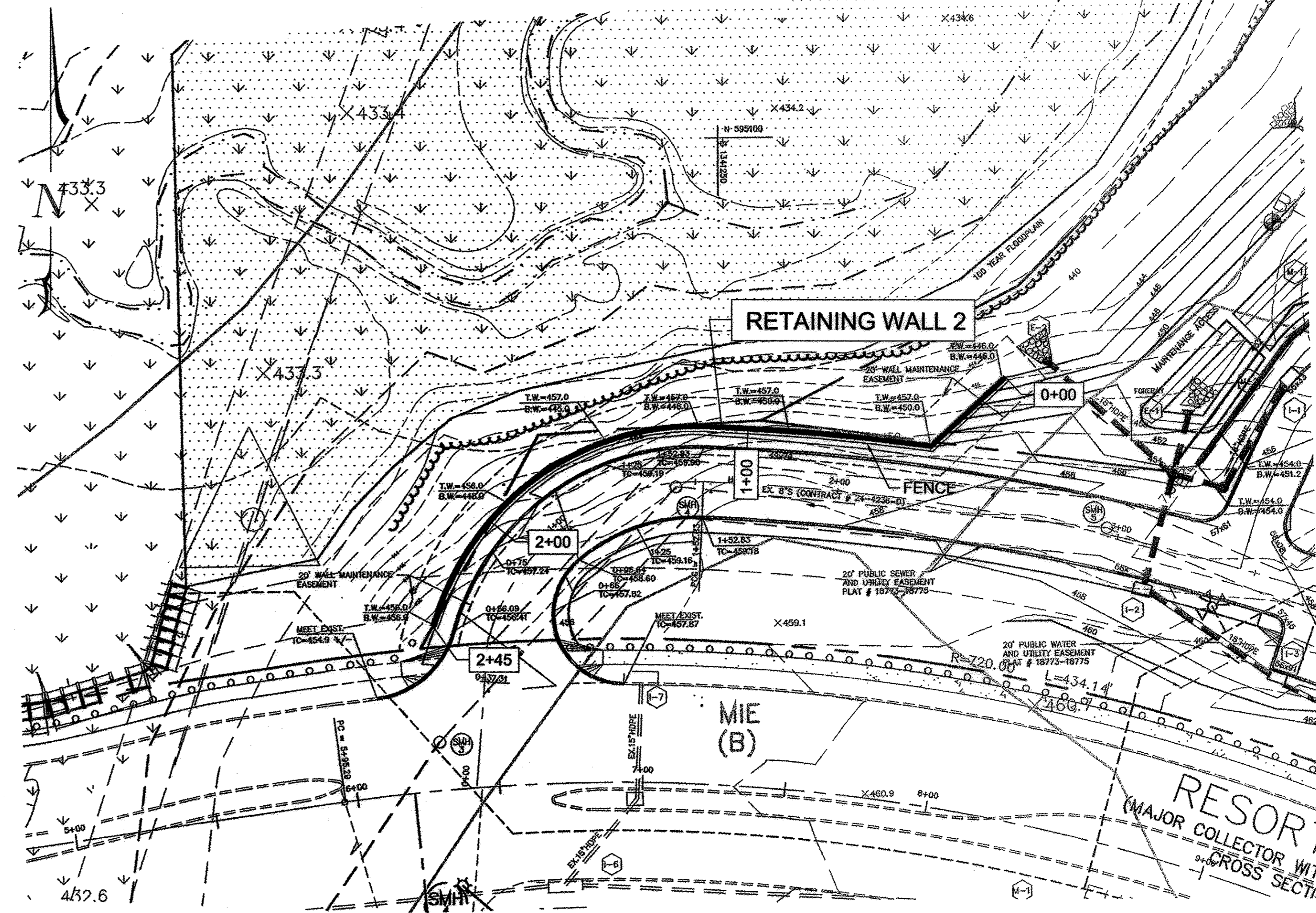
APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signatures and Dates]





WALL #1 LOCATION PLAN

1" = 30'



WALL #2 LOCATION PLAN

1" = 30'

**SPECIFICATIONS**

**KEYSTONE MODULAR CONCRETE BLOCK RETAINING WALL**

**PART 1: GENERAL**

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

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

**PART 2: PRODUCTS**

- 2.01 Modular Concrete Retaining Wall Units
  - A. Modular concrete units shall conform to the following architectural requirements:
    - face color - concrete gray - standard manufacturers' color may be specified by the Owner.
    - face finish - sculptured rock face in angular tri-planer configuration. Other face finishes will not be allowed without written approval of Owner.
    - bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
    - exposed surfaces of units shall be free of chips, cracks or other imperfections when viewed from a distance of 10 feet under diffused lighting.
  - B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.
  - C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:
    - compressive strength = 3000 psi minimum; absorption = 8% maximum (6% in northern states) for standard weight aggregates;
    - dimensional tolerances = ± 1/8" from nominal unit dimensions not including rough split unit dimensions not including rough split face, ± 1/16" unit height - top and bottom planes;
    - unit size - 8" (H) x 16" (W) x 22" (D) minimum;
    - unit weight - 100 lbs/unit minimum for standard weight

- aggregates;
  - inlet-unit shear strength - 600 pcf minimum at 2 psi normal pressure;
  - geogrid/unit peak connection strength - 600 pcf minimum at 2 psi normal force.
- 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-protected fiberglass reinforcement rods or equivalent to provide connection between vertically and horizontally adjacent units. Strength of shear connectors between vertical adjacent units shall be applicable over a design temperature of 10 degrees F to +100 degrees F.
- B. Shear connectors shall be capable of holding the geogrid in the proper design position during grid pre-tensioning and backfilling.

**2.03 Base Leveling Pad Material**

- A. Material shall consist of a compacted #57 crushed stone base as shown on the construction drawings.

**2.04 Unit Drainage Fill**

- A. Unit drainage fill shall consist of #57 crushed stone.

**2.05 Reinforced Backfill**

- A. Reinforced backfill shall type SM, be free of debris and meet the following gradation tests 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	0-80
No. 200	0-40
- 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.

Plasticity Index (PI) <10 and Liquid Limit <40 per ASTM D-4318.

- B. Material can be site excavated soils where the above requirements can be met. Unsuitable soils for backfill (high plastic clays or organic soils) shall not be used in the reinforced soil mass.

**2.06 Geogrid Soil Reinforcement**

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

**2.07 Drainage Pipe**

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

**PART 3 EXECUTION**

**3.01 Excavation**

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

**3.02 Base Leveling Pad**

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

**3.03 Modular Unit Installation**

- A. First course of units shall be placed on the leveling pad at the appropriate line and grade. Alignment and level shall be checked in all directions and insure that all units are in full contact with the base and properly seated.
- B. Place the front of units side-by-side. Do not leave gaps between adjacent units. Layout of corners and curves shall be in accordance with manufacturer's recommendations.
- C. Install sheetrock 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. 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.
- 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 stack 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 D688. 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.

**3.05 Cap Installation**

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

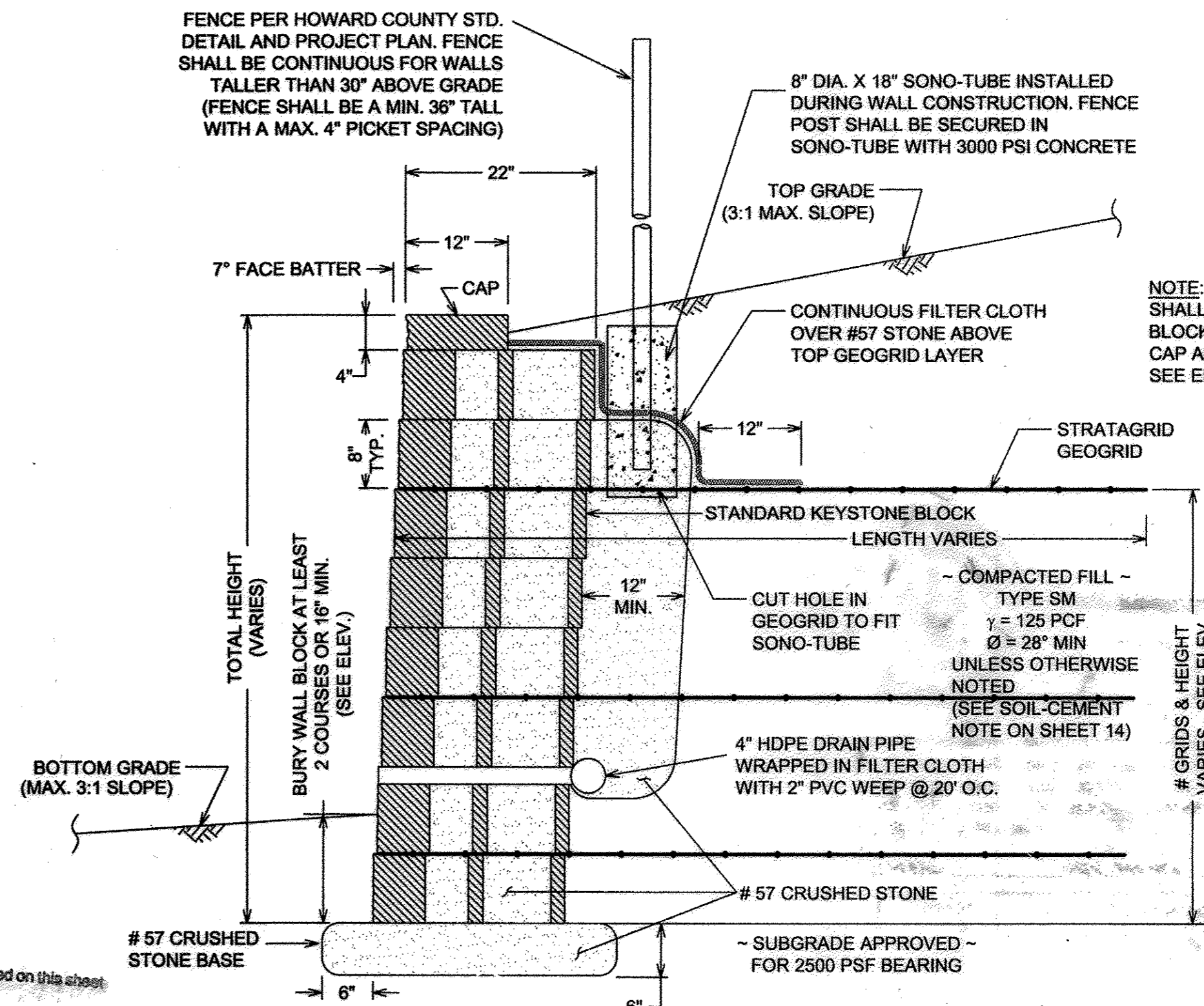
**3.07 Field Quality Control**

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

**NOTES:**

- No trees shall be planted within 10 feet of the top of the retaining wall.
- Retaining walls shall only be constructed under the observation of a registered professional engineer and a (NICET, WACEL, or equiv.) 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 95% standard proctor density and the testing report shall be made available to the Howard County Inspector upon completion of construction.
- Walls shall not be constructed on uncertified fill materials.
- Walls shall not be constructed within a Howard Co. right-of-way or easement.

FENCE PER HOWARD COUNTY STD. DETAIL AND PROJECT PLAN. FENCE SHALL BE CONTINUOUS FOR WALLS TALLER THAN 30" ABOVE GRADE (FENCE SHALL BE A MIN. 36" TALL WITH A MAX. 4" PICKET SPACING)



NOTE: TOP GRID LAYER SHALL BE LOCATED 2 BLOCK COURSES BELOW CAP ALONG ENTIRE WALL - SEE ELEVATION

**TYPICAL WALL SECTION**

N.T.S.

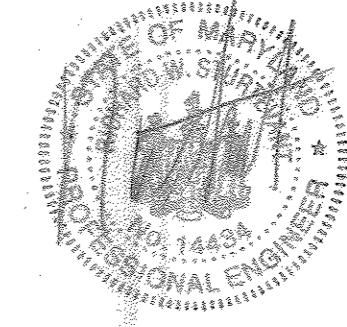
APPROVED: DEPARTMENT OF PLANNING AND ZONING

Approved: *[Signature]* DATE: 7/3/08  
 CHIEF, DEVELOPMENT ENGINEER DIVISION  
 Approved: *[Signature]* DATE: 7/3/08  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 Approved: *[Signature]* DATE: 7/3/08  
 DIRECTOR

APPROVED  
 PLANNING BOARD  
 OF HOWARD COUNTY  
 DATE: 7/3/08  
*[Signature]*



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 21448 Expiration Date: 12-31-16



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: 05/13/09

date	drawn by	approved by
04/08/2-F	HTM	RWS
design by	scale	as shown
HTM		

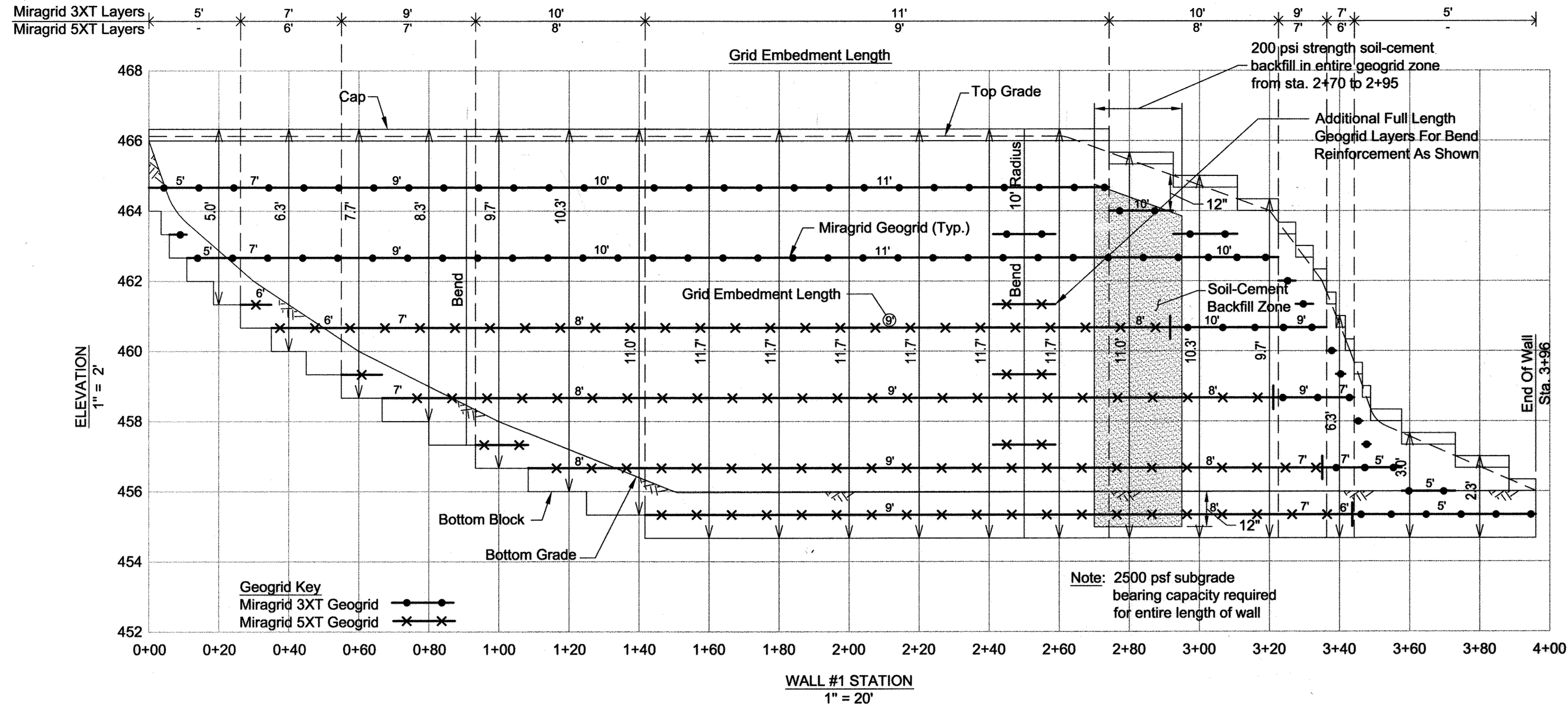
no.	description	date

OAKMONT AT TURF VALLEY  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, PIO PARCEL 8, BLOCK 10  
 HOWARD COUNTY, MARYLAND  
 THIRD ELECTION DISTRICT  
**RETAINING WALL LOCATION PLAN & DETAILS**

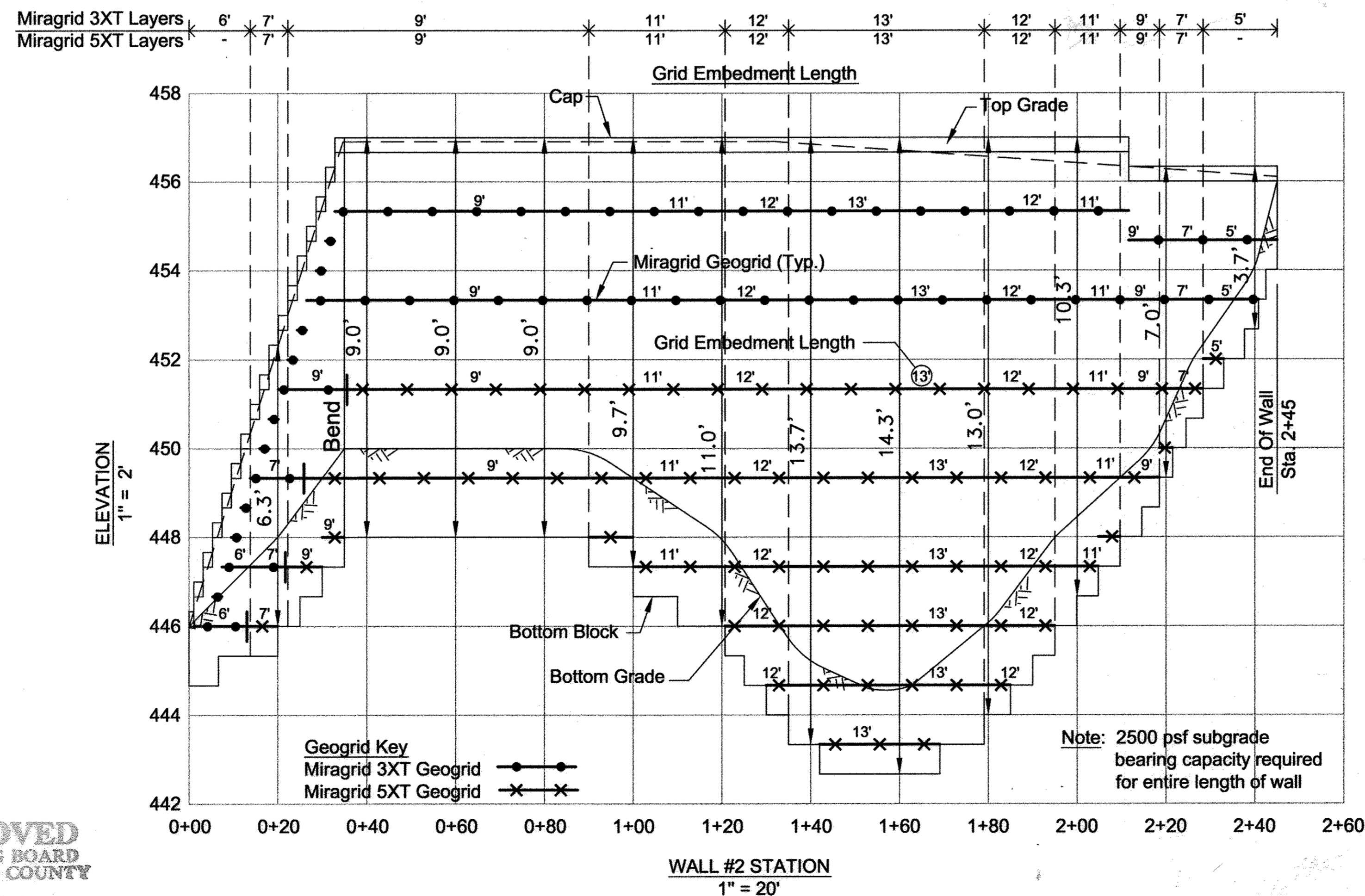
**HILLIS-CARNES**  
 ENGINEERING ASSOCIATES  
 10975 Guilford Road, Suite A  
 Annapolis Junction, MD  
 (410) 860-4068  
 Fax: (410) 860-4068

A5-BUILT





WALL #1 ELEVATION



WALL #2 ELEVATION

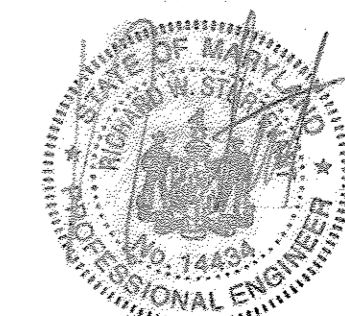
**Soil-Cement Backfill Note:**  
 Where shown and noted, backfill entire geogrid reinforced soil zone from 1 ft. below proposed bottom grade to 1 ft. below proposed top grade with compacted soil-cement. The soil-cement shall consist of a ratio of at least 140 lbs. portland cement thoroughly mixed with 1 yd.<sup>3</sup> of type SM soil at 3% over optimum moisture content to achieve a min. 28 day compressive strength of 200 psi.

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEER DIVISION  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DIRECTOR

APPROVED  
 PLANNING BOARD  
 of HOWARD COUNTY  
 DATE 7/31/08



Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.  
 License No. 21443 Expiration Date: 12-21-16



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: 05/13/09

Project no.	04082-F
date	
design by	HTM
drawn by	HTM
approved by	RWS
scale	as shown

no.	description	date
	revisions	

OAKMONT AT TURF VALLEY  
 PARCELS: R, S, T, U, V & W  
 TAX MAP 16, P/O PARCEL 8, BLOCK 10  
 HOWARD COUNTY, MARYLAND  
 THIRD ELECTION DISTRICT  
 RETAINING WALL ELEVATIONS

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