

# SITE DEVELOPMENT PLAN

## 7125 TROY HILL DRIVE

### TROY HILL CORPORATE CENTER

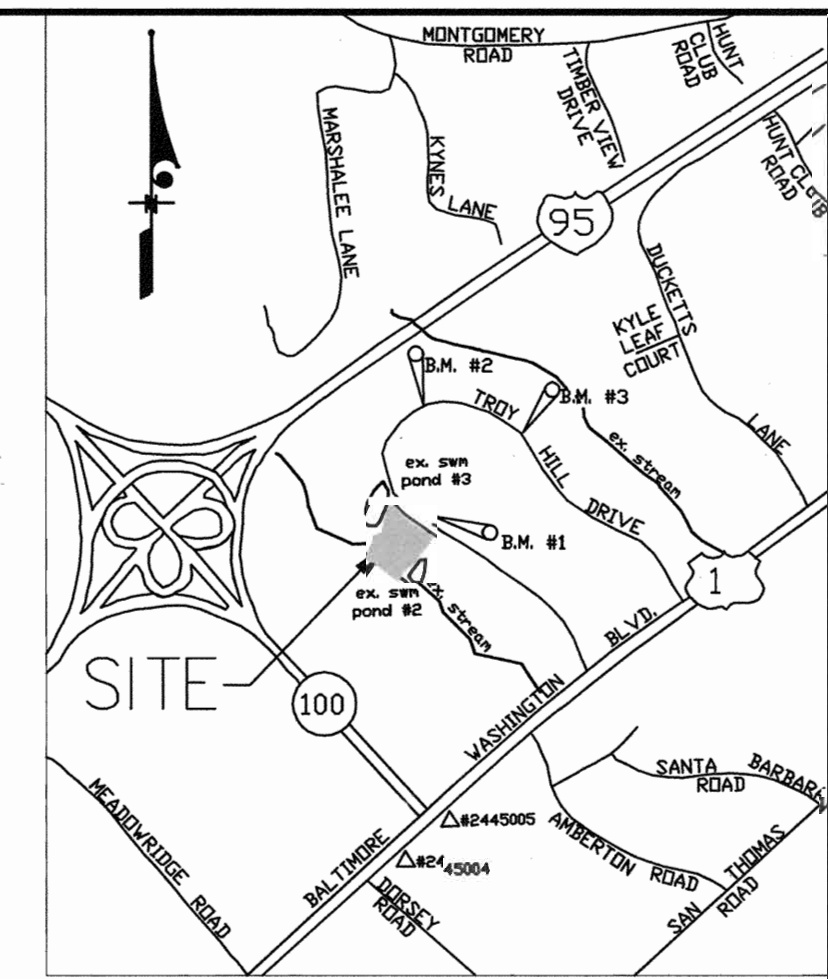
#### PARCEL A-13

#### 1st ELECTION DISTRICT

#### HOWARD COUNTY, MARYLAND

**GENERAL NOTES**

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY AND MSHA STANDARDS, IF APPLICABLE.
2. THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT (800) 257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
3. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
4. ALL EXTERIOR LIGHTING SHALL COMPLY WITH ZONING REGULATIONS, SECTION 134.
5. TO THE BEST OF OUR KNOWLEDGE AND PER PUBLIC RECORD NO CEMETERIES OR BURIAL GROUNDS EXIST ON-SITE.
6. TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
7. ALL PLAN DIMENSIONS ARE TO FACE OF CURB OR FACE OF BUILDING UNLESS OTHERWISE NOTED.
8. SPOT ELEVATIONS SHOWN FOR CURB ARE BOTTOM OF CURB UNLESS OTHERWISE NOTED.
9. THE TOPOGRAPHY AND SITE BOUNDARY WERE COMPLETED BY MORRIS & RITCHIE ASSOCIATES, INC. ON JANUARY 22, 2002, DATUM NAD 83/91.
10. THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLAN COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NOS. 2445004 AND 2445005 WERE USED FOR THIS PROJECT.
11. EXISTING WATER IS PUBLIC. CONTRACT NO: 14-3715-D
12. EXISTING SEWER IS PUBLIC. CONTRACT NO: 14-3715-D (SEE TITLE SHEET FOR PUBLIC W/S EXTENSIONS)
13. APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE. EXISTING UTILITIES ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION.
14. A 100-YEAR FLOODPLAIN STUDY IS NOT REQUIRED FOR THIS PROJECT. THE 100-YEAR FLOODPLAIN HAS BEEN PREVIOUSLY DELINEATED PER PLAT #13842 & 13844 AND SHOWN AS A PART OF THIS PLAN.
15. WETLANDS EXIST ON THIS SITE AND HAVE BEEN PREVIOUSLY DELINEATED PER PLAT #13842 & 13844 AND SHOWN AS A PART OF THIS PLAN.
16. A TRAFFIC ENGINEER'S ESTIMATE OF PEAK HOUR VEHICULAR SITE TRIP GENERATION HAS BEEN PROVIDED FOR THIS SITE AS REQUIRED BY PLAT #13838.
17. A NOISE STUDY FOR THIS PROJECT IS NOT REQUIRED.
18. A GEOTECHNICAL STUDY WAS PREPARED BY GEO-TECHNOLOGY ASSOCIATES, INC. ON OCTOBER 18, 2001.
19. WATER QUANTITY MANAGEMENT FOR THIS SITE IS PROVIDED IN STORMWATER MANAGEMENT POND #2 AND #3, OWNED BY TROY HILL BUSINESS PARK PARTNERSHIP. POND #2 AND POND #3 WAS DESIGNED AND BUILT PER F-98-103 AND SDP-98-143 RESPECTIVELY. WATER QUALITY FOR THIS SITE IS PROVIDED BY SURFACE SAND FILTERS AS SHOWN BY THIS PLAN.
20. THE CONTRACTOR SHALL TEST PIT ALL EXISTING UTILITIES AT LEAST FIVE (5) DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE DRAWINGS.
21. ALL INLETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH HOWARD COUNTY STANDARDS.
22. THIS SITE IS EXEMPT FROM THE FOREST CONSERVATION ACT IN ACCORDANCE WITH SECTION 16.12(2)(1)(V). A PLANNED OFFICE PARK.
23. CONTRACTOR TO SEE ELECTRICAL PLANS FOR EXACT LOCATION AND DETAILS OF SITE LIGHTING FIXTURES (BY OTHERS).
24. NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE WETLAND(S), STREAM(S), FLOODPLAIN(S), OR THEIR BUFFERS/SETBACKS AND WITHIN FOREST CONSERVATION EASEMENT AREAS.
25. THE BUILDING WILL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
26. THE WETLAND AND WETLAND BUFFER AT THE NORTHEAST CORNER OF THE SITE, AS SHOWN ON PLAT 13844, ADJACENT TO TROY HILL DRIVE HAS BEEN FILLED IN ACCORDANCE WITH CORPS OF ENGINEERS NATIONWIDE PERMIT CEN48-OP-RP90-00883-3, MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER QUALITY CERTIFICATE 91-WQC-0326, MARYLAND WATER RESOURCES ADMINISTRATION WATERWAYS CONSTRUCTION PERMIT 90-WC-0647 AND HOWARD COUNTY WAIVER PETITION FILE #WP 99-07.
27. ALL CURB RADII 5' UNLESS OTHERWISE NOTED.
28. THE SUBJECT PROPERTY IS ZONED M-1 (MANUFACTURING: LIGHT) PER THE OCTOBER 18, 1993 COMPREHENSIVE ZONING PLAN.
29. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
30. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING IN THE AMOUNT OF \$21,690.00 IS PART OF THE DEVELOPER'S AGREEMENT.
31. PLAT OF CORRECTION (PLAT NO.15728 & 15729) HAS BEEN RECORDED FOR THE PRIVATE SWM ACCESS AND MAINTENANCE EASEMENT ON PARCEL A-9, AND FOR THE PUBLIC WATER & UTILITY EASEMENTS, AND SEWER & UTILITY EASEMENT, ON PARCEL A-13.
32. A PRIVATE MAINTENANCE AND EASEMENT AGREEMENT BETWEEN TANGO, LLC AND TROY HILL BUSINESS PARK MANAGEMENT ASSOCIATION, INC. WAS RECORDED ON NOVEMBER 21, 2002, LIBER 6625 FOLIO 0512.

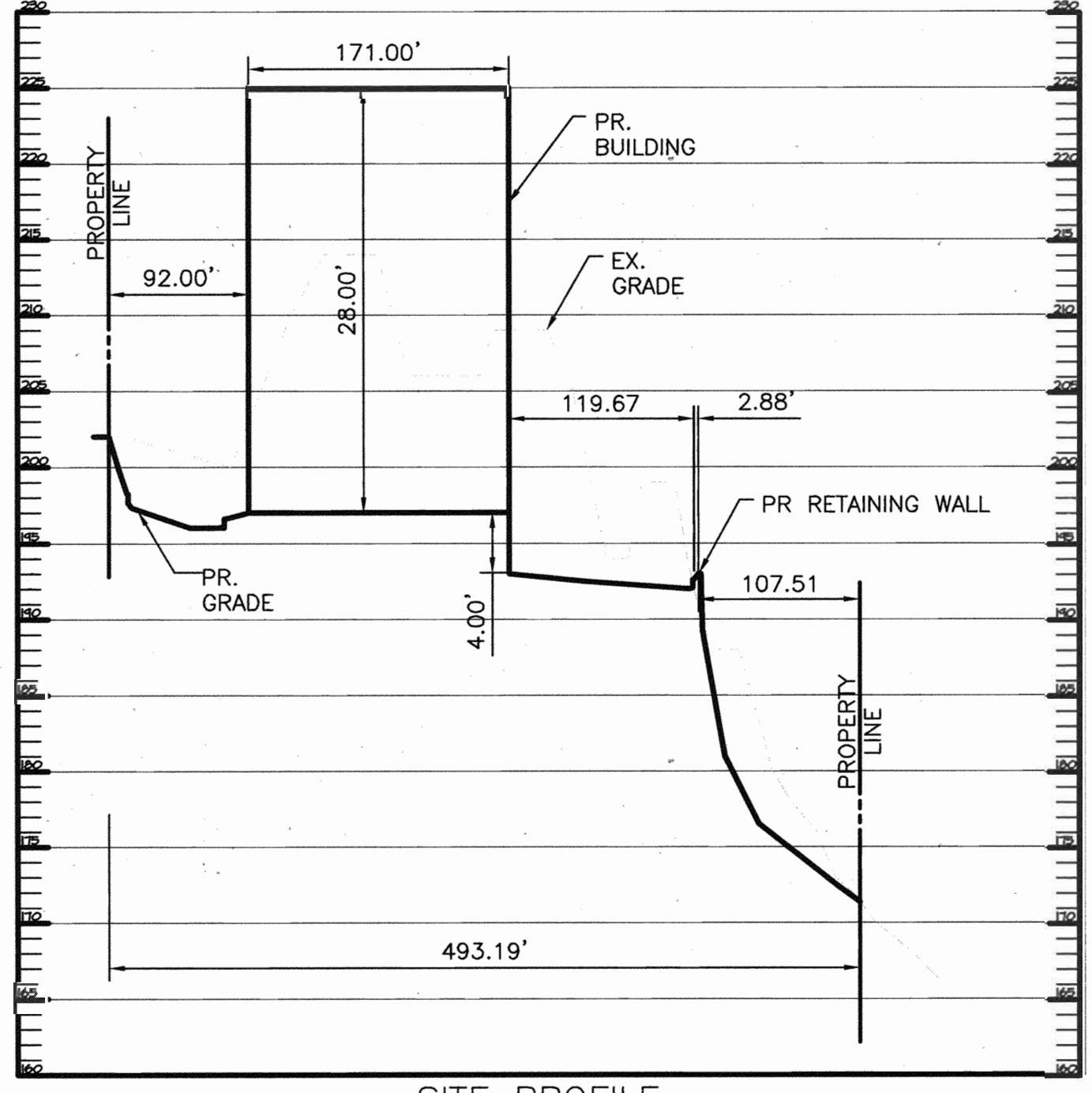
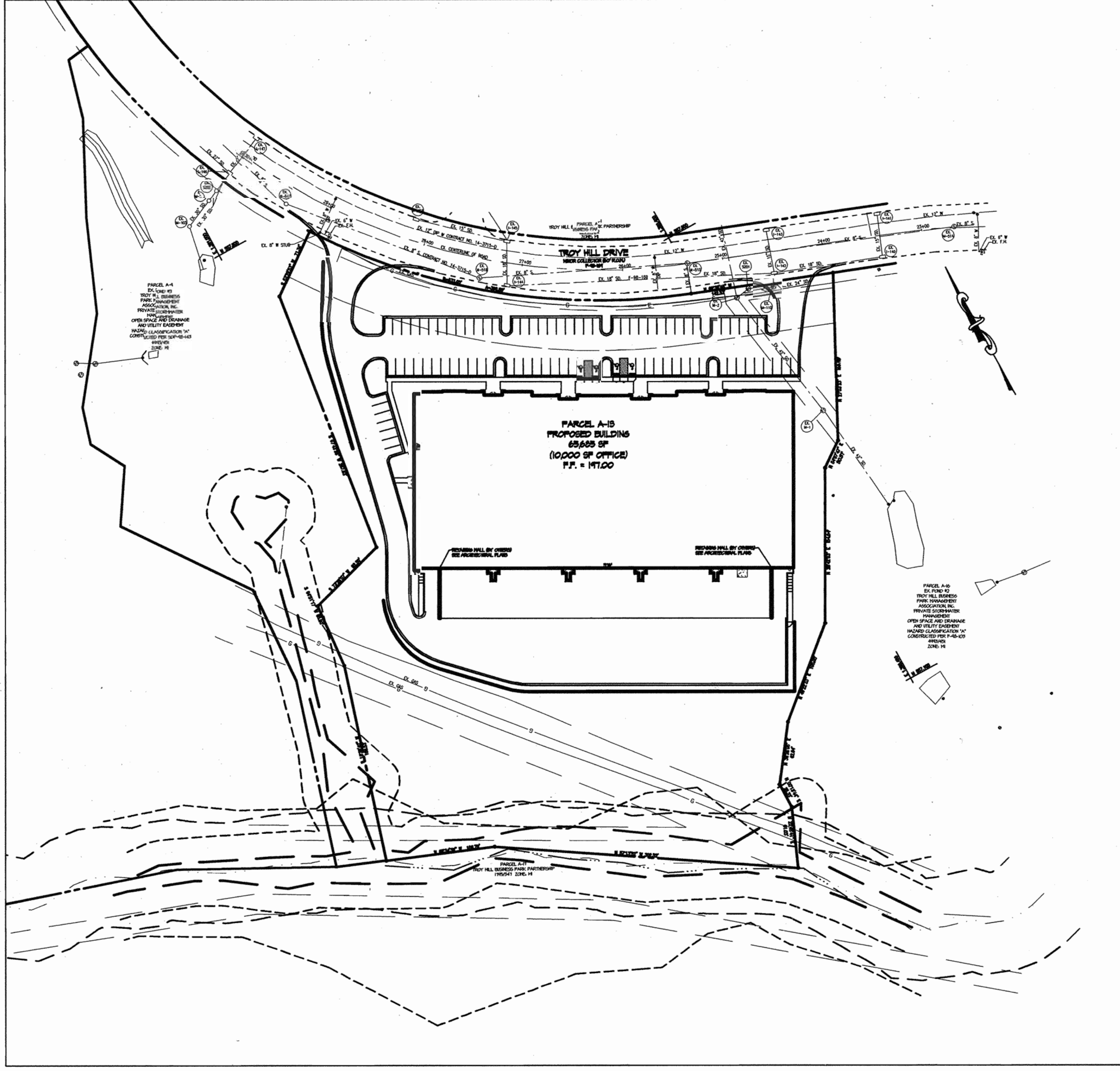


**SHEET INDEX**

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- C-2 SITE LAYOUT PLAN
- C-3 GRADING AND UTILITY PLAN
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**SITE ANALYSIS DATA CHART**

1. TOTAL PROJECT AREA: 6.2087 ACRES OR 270,450.97 SF
2. LIMIT OF DISTURBANCE: 5.18 ACRES OR 225,640.8 SF
3. PRESENT ZONING: M-1
4. PROPOSED USE: INDUSTRIAL (OFFICE/WAREHOUSE)
5. AREA OF BUILDING: 65,885 SF TOTAL (10,000 SF OFFICE SPACE)
6. BUILDING COVERAGE OF SITE: 1.51 ACRES OR 24.29% OF GROSS SITE AREA
7. PROPOSED BUILDING HEIGHT: 28 FEET
8. NUMBER OF PARKING SPACES REQUIRED: 3.3/1,000 SF OF OFFICE SPACE  
0.5/1,000 SF OF WAREHOUSE  
(10,000 SF)/(3.3/1,000 SF) + (55,885 SF)/(0.5/1,000 SF) = 60.84, 61 SPACES REQUIRED
9. NUMBER OF PARKING SPACES PROVIDED: 86 SPACES INCLUDING 4 HANDICAP SPACES
10. DPZ FILE REFERENCES:  
F-96-136  
F-98-103  
F-98-169  
SDP-98-143  
WATER AND SEWER CONTRACT NO. 14-3715-D  
PLAT 15728 & 15729



**SITE PROFILE**  
SCALE: 1"=100' HORIZONTAL  
1"=10' VERTICAL

**NOTE:**  
THE CONTRACTOR OR DEVELOPER SHALL CONTACT THE CONSTRUCTION INSPECTION DIVISION 24 HOURS IN ADVANCE OF COMMENCEMENT OF WORK AT (410) 313-1880.

ADDRESS CHART	
LOT/PARCEL#	STREET ADDRESS
A-13/135	7125 TROY HILL DRIVE

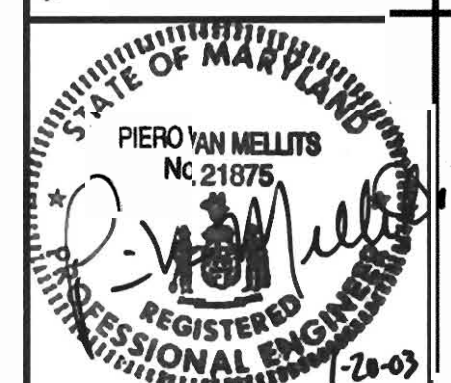
  

PERMIT INFORMATION CHART			
Subdivision Name	Section/Area	Lot/Parcel#	
TROY HILL CORPORATE CENTER	6.2087 ACRES	A-13/135	
PLAT# 15728 & 15729	Zoning M-1	Tax Map 37	Elect Distr. 1
Water Code CO4	Sewer Code	4020000	

**OWNER/DEVELOPER** FAX NO.: (410) 712-0620  
**A. NAME:** DAVIS EMORY **B. DAYTIME TELEPHONE:** (410) 712-4466  
**C. COMPANY:** TANGO, LLC  
**D. ADDRESS:** 7250 PARKWAY DRIVE, SUITE 130  
**E. CITY:** HANOVER **STATE:** MD **ZIP:** 21076

**C-1**

**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
 9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395



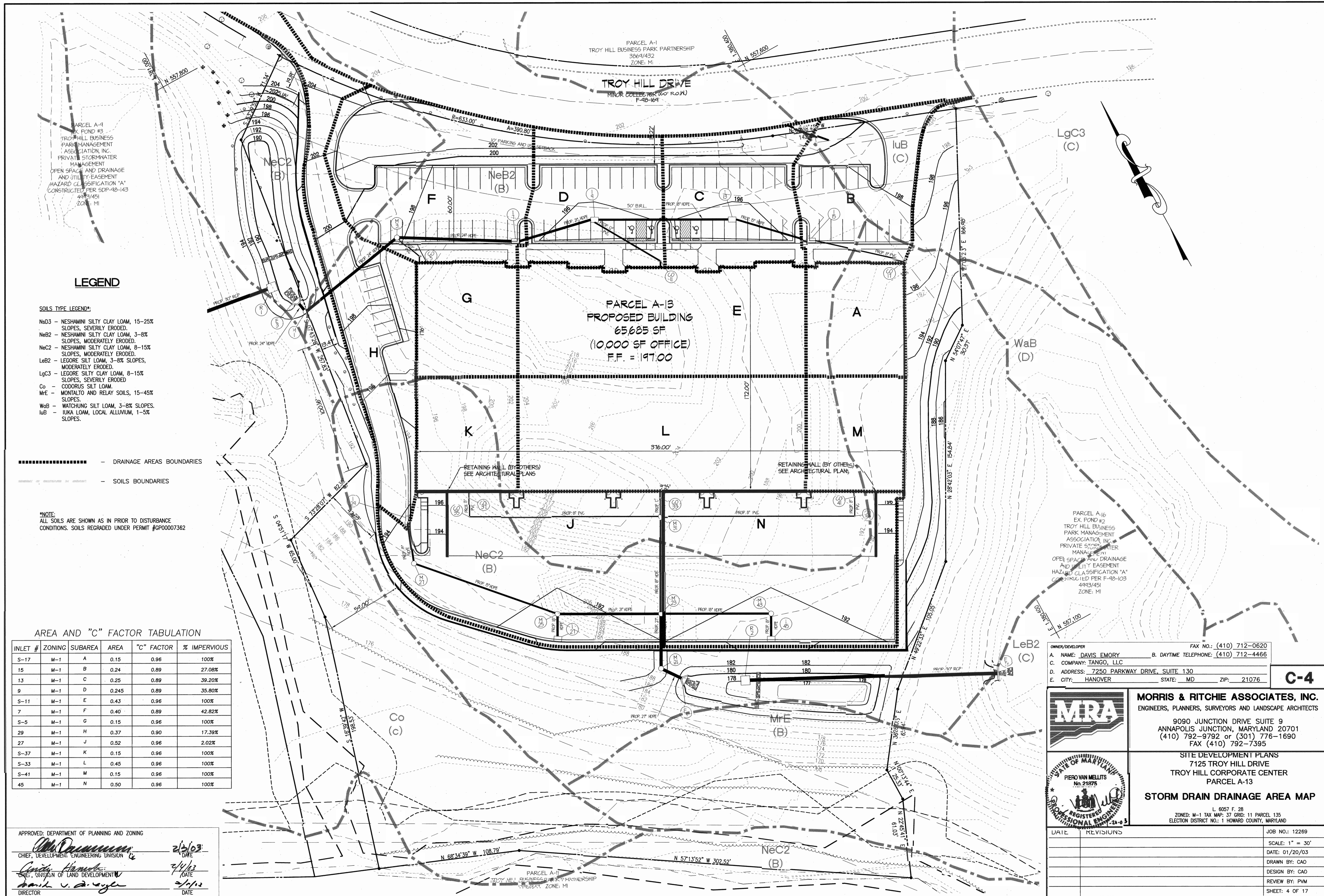
**SITE DEVELOPMENT PLANS**  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
**TITLE SHEET**  
 L 8057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO: 1 HOWARD COUNTY, MARYLAND

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

DATE	REVISIONS	JOB NO.:
		12269
		SCALE: AS SHOWN
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 1 OF 17

SDP-02-150





**LEGEND**

**SOILS TYPE LEGEND:**

- NeD3 - NESHAMIN SILTY CLAY LOAM, 15-25% SLOPES, SEVERELY ERODED.
- NeB2 - NESHAMIN SILTY CLAY LOAM, 3-8% SLOPES, MODERATELY ERODED.
- NeC2 - NESHAMIN SILTY CLAY LOAM, 8-15% SLOPES, MODERATELY ERODED.
- LeB2 - LEGORE SILT LOAM, 3-8% SLOPES, MODERATELY ERODED.
- LgC3 - LEGORE SILTY CLAY LOAM, 8-15% SLOPES, SEVERELY ERODED.
- Co - CODORUS SILT LOAM.
- MrE - MONTALTO AND RELAY SOILS, 15-45% SLOPES.
- WaB - WATCHUNG SILT LOAM, 3-8% SLOPES.
- IuB - IUKA LOAM, LOCAL ALLUVIUM, 1-5% SLOPES.

- DRAINAGE AREAS BOUNDARIES
- SOILS BOUNDARIES

**\*NOTE:**  
ALL SOILS ARE SHOWN AS IN PRIOR TO DISTURBANCE CONDITIONS. SOILS REGRADED UNDER PERMIT #GP0007362

**AREA AND "C" FACTOR TABULATION**

INLET #	ZONING	SUBAREA	AREA	"C" FACTOR	% IMPERVIOUS
S-17	M-1	A	0.15	0.96	100%
15	M-1	B	0.24	0.89	27.08%
13	M-1	C	0.25	0.89	39.20%
9	M-1	D	0.245	0.89	35.80%
S-11	M-1	E	0.43	0.96	100%
7	M-1	F	0.40	0.89	42.82%
S-5	M-1	G	0.15	0.96	100%
29	M-1	H	0.37	0.90	17.39%
27	M-1	J	0.52	0.96	2.02%
S-37	M-1	K	0.15	0.96	100%
S-33	M-1	L	0.45	0.96	100%
S-41	M-1	M	0.15	0.96	100%
45	M-1	N	0.50	0.96	100%

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*Matthew J. ...*  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*... ..*  
CHIEF, DIVISION OF LAND DEVELOPMENT  
*... ..*  
DIRECTOR

2/2/03  
DATE  
2/4/03  
DATE  
2/1/03  
DATE

OWNER/DEVELOPER  
A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
C. COMPANY: TANGO, LLC  
D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
E. CITY: HANOVER STATE: MD ZIP: 21076

**C-4**



**MORRIS & RITCHIE ASSOCIATES, INC.**  
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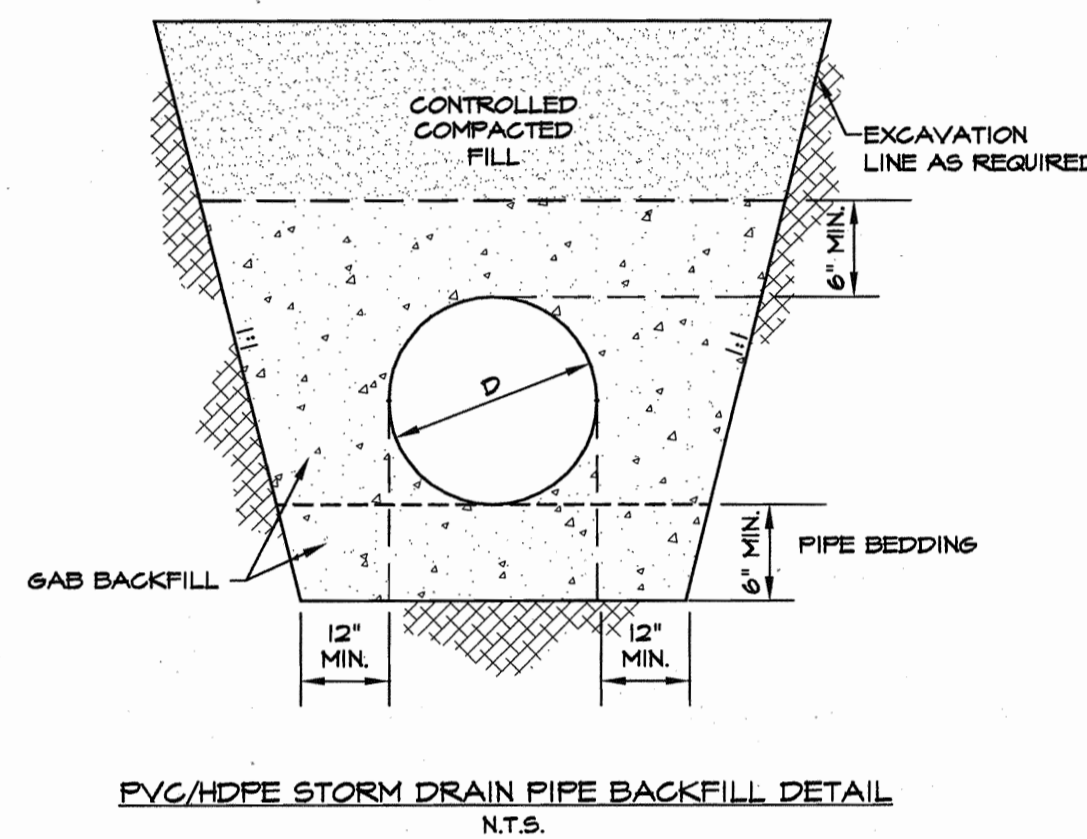
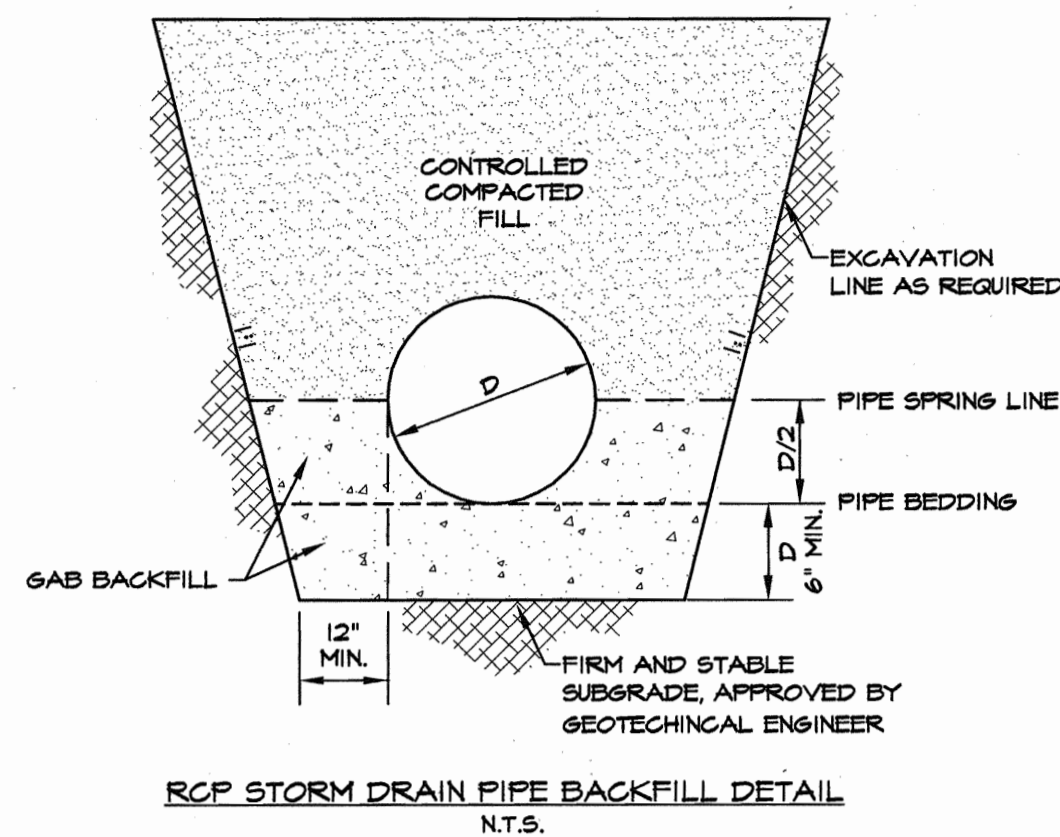
**SITE DEVELOPMENT PLANS**  
7125 TROY HILL DRIVE  
TROY HILL CORPORATE CENTER  
PARCEL A-13  
**STORM DRAIN DRAINAGE AREA MAP**

DATE	REVISIONS	JOB NO.:
		12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 4 OF 17



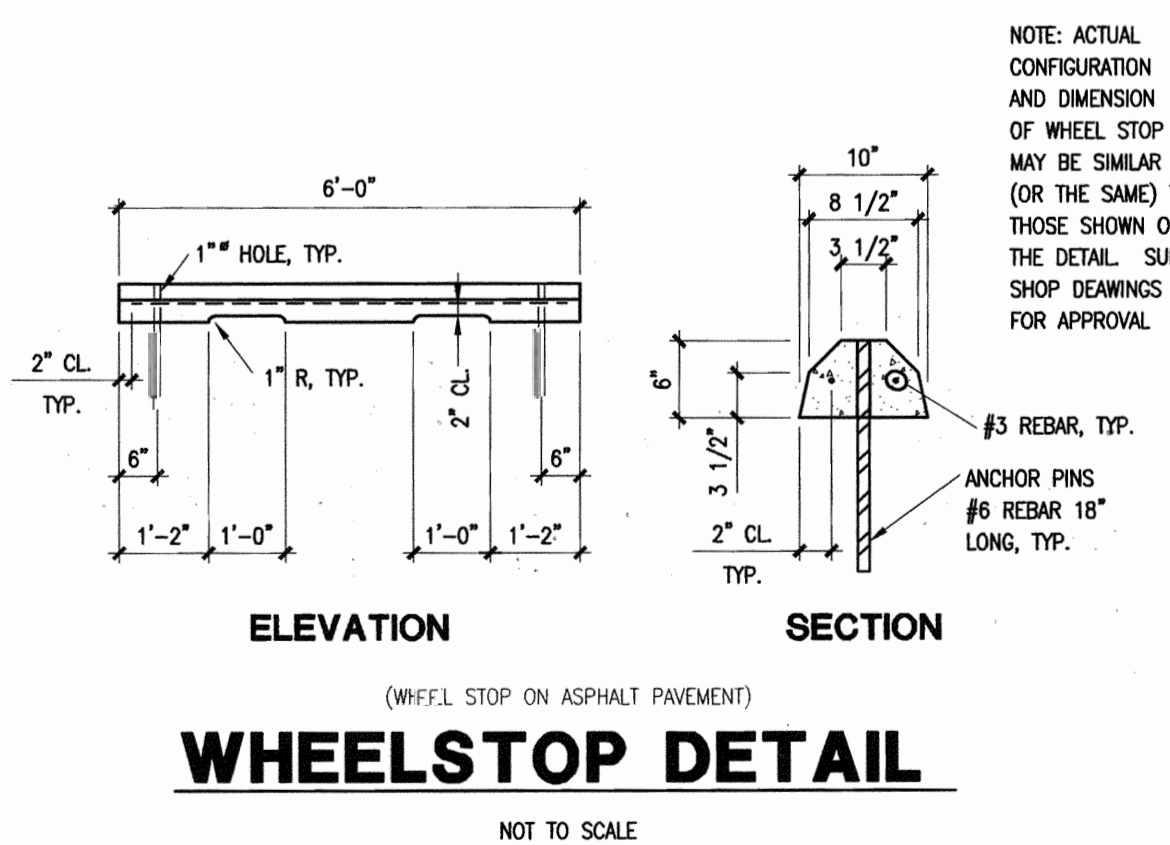
GENERAL SITEWORK NOTES

- The correctness or completeness of existing information shown on the Drawings is not warranted or guaranteed. The Contractor shall verify the location of utilities and underground facilities, by test pits or other methods approved by the Owner's Representative, as required to verify exact locations and depths within the Limit of Disturbance (LOD). All discrepancies between information shown on the Drawings and that verified in the field shall be reported to the Owner's Representative prior to beginning work.
- The Contractor shall notify "Miss Utility" (1-800-257-7777), the City of Frederick Permits and Code Management at (301)-360-3802 a minimum of three (3) working days prior to beginning layout and construction, and again prior to the beginning of planting operations.
- Existing utilities are to remain and shall be adjusted to proposed finish grade unless noted otherwise on the Drawings. The Contractor is responsible for all costs and work required to adjust existing and install proposed utilities to finish grade within the Limit of Disturbance (LOD), including off-site easements and public rights-of-way, as applicable.
- The Contractor shall stake out the Limit of Disturbance (LOD), the location of proposed building and retaining wall lines and corners, utilities, road and driveway centerlines, and parking areas for review and approval by the Owner's Representative prior to beginning work. Dimensions are to the face of curb, buildings, and retaining walls unless noted otherwise on the Drawings.
- Existing curb and gutter, paving and base, walkways, steps, and other existing surfaces and features within the Limit of Disturbance (LOD) shall be removed unless noted otherwise on the Drawings, or as specified by the applicable Special Construction Notes.
- Existing trees and plant material within the Limit of Disturbance (LOD) shall be removed unless noted otherwise on the Drawings. Trees and plant material located outside of the LOD and those designated to remain shall be protected throughout the construction period, in accordance with the applicable notes and details if shown on the Drawings, as required to maintain a healthy condition.
- Construction shall be in accordance with City of Frederick standard details and specifications along with applicable federal, state, county and local regulations, standards and specifications. Refer to the drawings, and Project Manual if part of the contract documents, for designated modifications and additional information. Contractor shall comply with applicable Occupational Safety & Health Administration (OSHA) laws and regulations for work on this project.
- The Contractor shall be responsible for obtaining all permits, not obtained and furnished to the Contractor by the Owner, and paying related fees required to complete the work on this project.
- The Contractor shall replace at no additional cost to the Owner, existing curb and gutter, paving, sidewalks, trees, plant material and other items designated to remain on the site and within the public rights-of-way which are damaged during construction. Areas disturbed, but not designated for paving or planting areas, shall be permanently stabilized by seeding or sodding in accordance with the vegetative stabilization notes on the Drawings, and specifications in the Project Manual when applicable.
- Curb and gutter shall be constructed with "regular cross slope" or "reverse cross slope" as required to reflect the direction of slope on adjacent paving. Refer to the Drawings for curb and gutter details. Curb and gutter shall be constructed with smooth vertical curve transitions at all high point, low point and inlet locations.
- Sanitary sewer and storm drain pipe elevations are to the invert unless noted otherwise on the Drawings. Utility manholes and storm drain structure frames, grates, and inlet headpieces shall be adjusted and installed at the same line, grade and cross slope of proposed finish grade in adjacent lawn and paved areas.
- Water lines shall be installed with a minimum cover of four feet (4'-0") above the top of pipe unless noted otherwise on the Drawings.
- Sanitary sewer, roof and storm drain cleanouts located within paved areas shall be a "flush type" installed at the same elevation as the surrounding pavement. Refer to the Drawings for additional information.
- Areas adjacent to buildings, unless otherwise noted on the Drawings, shall be graded to divert water away at the following minimum gradients:  
Concrete and impervious surfaces: 1% minimum  
Lawn and pervious surfaces: 2% minimum
- Where new curb and gutter meets existing curb and gutter, the existing shall be removed to the nearest joint, or saw cut to provide a clean, uniform joint with the new curb and gutter.
- Proposed spot elevations shown in driveways, service and parking areas are the top of paved surfaces and bottom of curbs unless noted otherwise on the Drawings.
- Where new curb is installed adjacent to existing pavement which is to receive an overlay, the overlay thickness may vary as required (minimum of 1-inch) in order to maintain the specified curb reveal as shown on the details. It is anticipated that minor field adjustment to the top of curb elevations noted on the Drawings may be necessary in order to provide a uniform curb reveal, provide smooth transition of the finished surface and maintain flow along the curbline into drainage structures. Contact the Owner's Representative for approval of adjustments prior to installing new curb.
- Refer to construction documents prepared by the Mechanical or Electrical Engineer for disposition of existing and construction of new lighting, communication, and electrical services, unless noted otherwise on the Drawings.
- When new on-site water service is required, the new service tap, meter, vault and related appurtenances shall be constructed in accordance with the approved Howard County standards and specifications for utility construction.
- Construction, inspection, testing and certification of all fire service piping and related appurtenances shall be in accordance with the National Fire Protection Association "Standard for the Installation of Private Fire Service Mains and Their Appurtenances (NFPA 24)", latest edition.
- Prior to beginning construction, the Contractor shall verify if a Fire Main permit has been obtained for installation of on-site fire service mains and related appurtenances. If applicable, the Owner will be required to retain an Engineer registered in the State of Maryland to inspect and certify that the fire main and related components have been installed in accordance with the Fire Main Permit requirements.
- All taps to existing waterlines to be performed by the contractor/developer at the contractor's/developer's expense.
- The storm drain pipes should be furnished and installed with "O-ring gasketed" bell and spigot joints to provide a watertight joint.



HDPE PIPE INSTALLATION

- Installation of HDPE pipe shall be performed according to all standards and specifications set forth by Advanced Drainage Systems (A.D.S.) Inc.
- All HDPE pipe as shown on these plans is to be A.D.S. N-12 pipe.
- Pipe joints are to be water-tight per A.D.S. recommendations.
- Contractor is to coordinate with A.D.S. prior to commencing installation of any HDPE pipe as shown on these plans.
- Pipe connections into storm drain structures are to be water-tight, flexible joints per A.D.S. specifications.



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

DATE: 01/15  
 DATE: 2/4/16  
 DATE: 2/11/16

UTILITY TRENCH BACKFILL

- Materials
  - Pipe Bedding Material - pipe bedding material shall consist of Graded Asphalt Base (GAB).
  - Backfill Materials - Use GAB as backfill material to the minimum extent shown on the plans. The backfill for the remainder of the trench shall consist of on-site or off-site soils conforming to the requirement of the geotechnical report and City/County specifications. No stones larger than 2 inches should be allowed within 2 feet of the utility. Larger stone, up to 6 inches in the largest dimension can be used in lifts 2 feet above the utility. No organic material shall be allowed. For granular soils (less than 35% passing #200 sieve), the soil moisture should be within 3 percentage points of optimum unless otherwise directed by project engineer or County specifications. For fine-grained soils (greater than 35% passing #200 sieve), the soil moisture should be within 0 to plus 4 percent of optimum unless otherwise directed by engineer or County specifications.

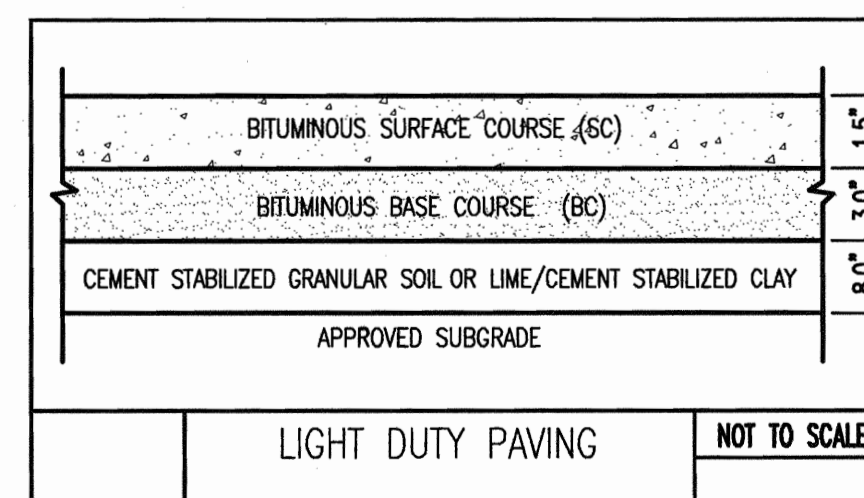
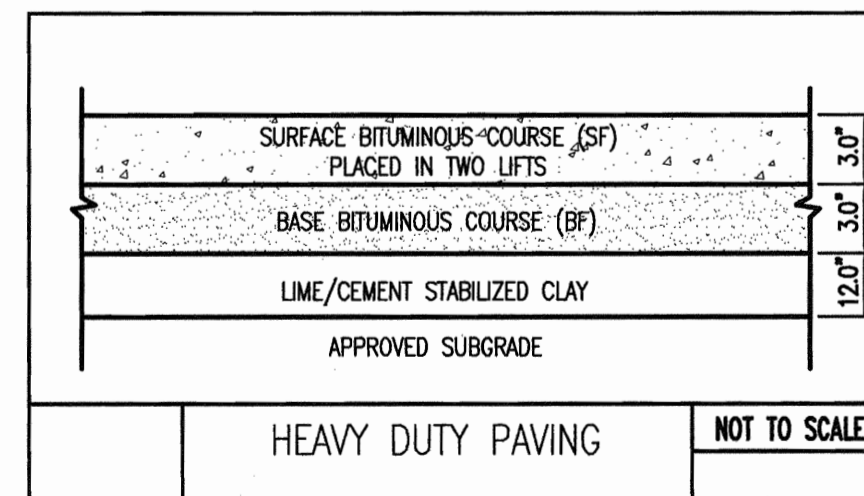
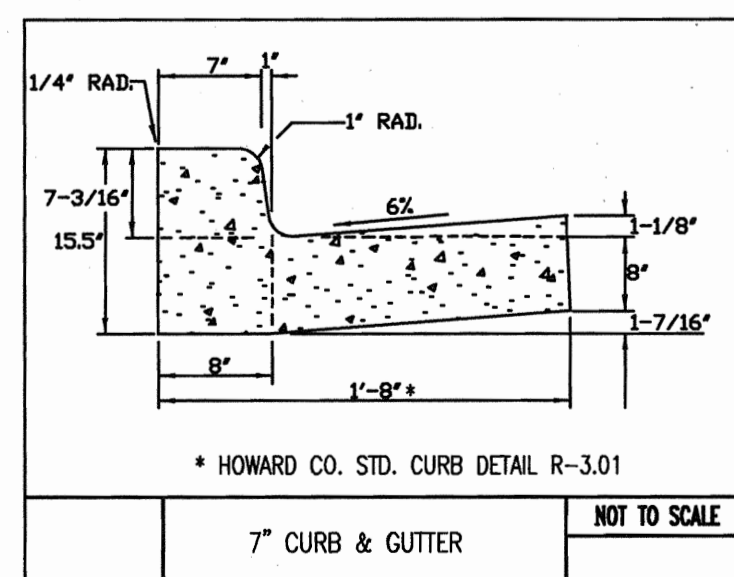
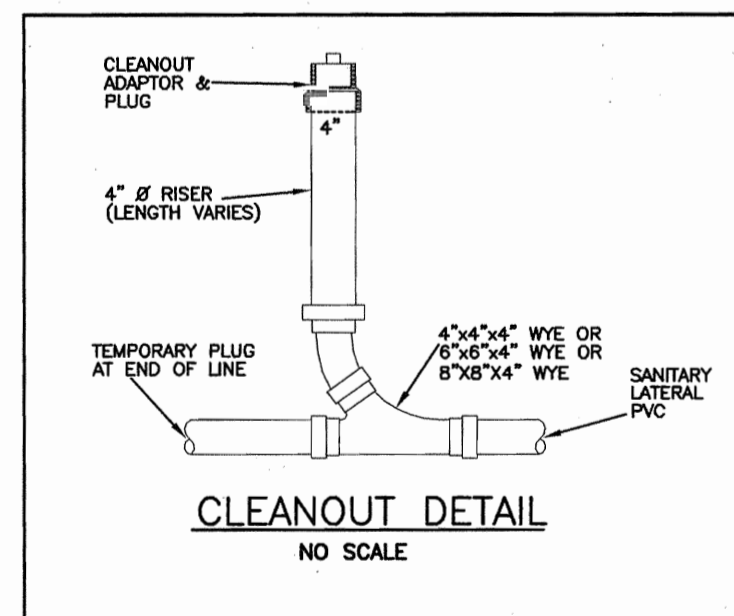
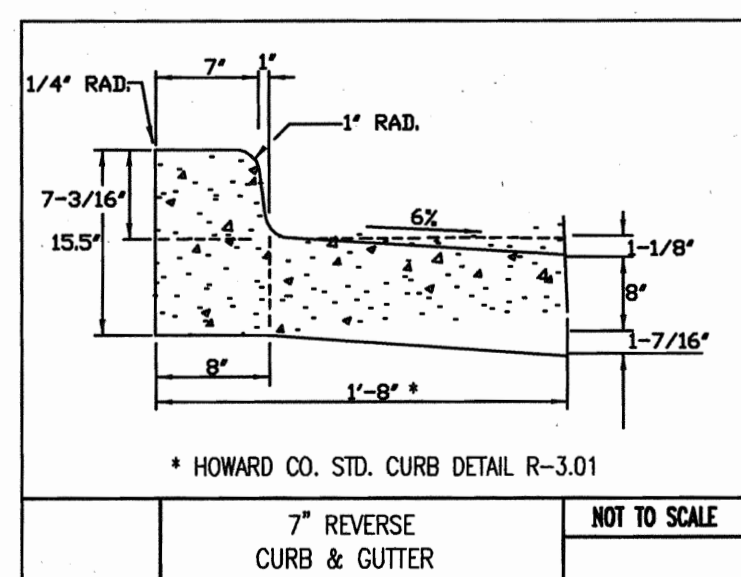
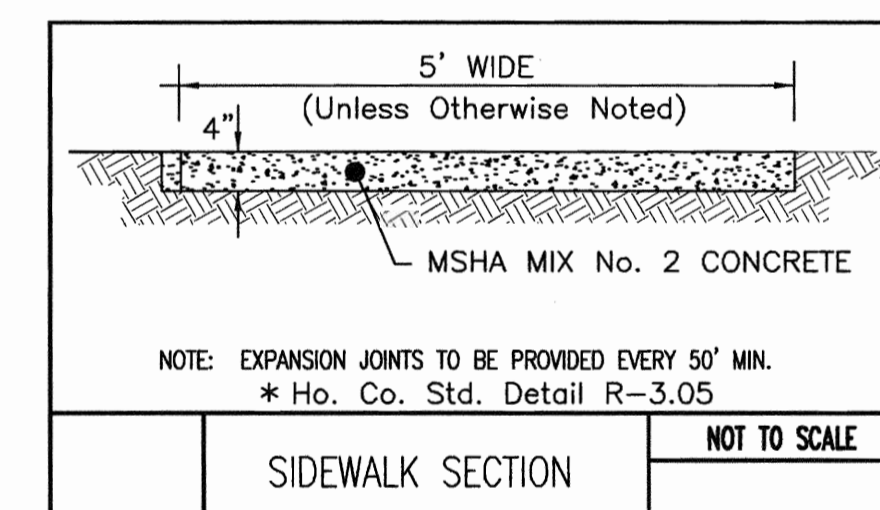
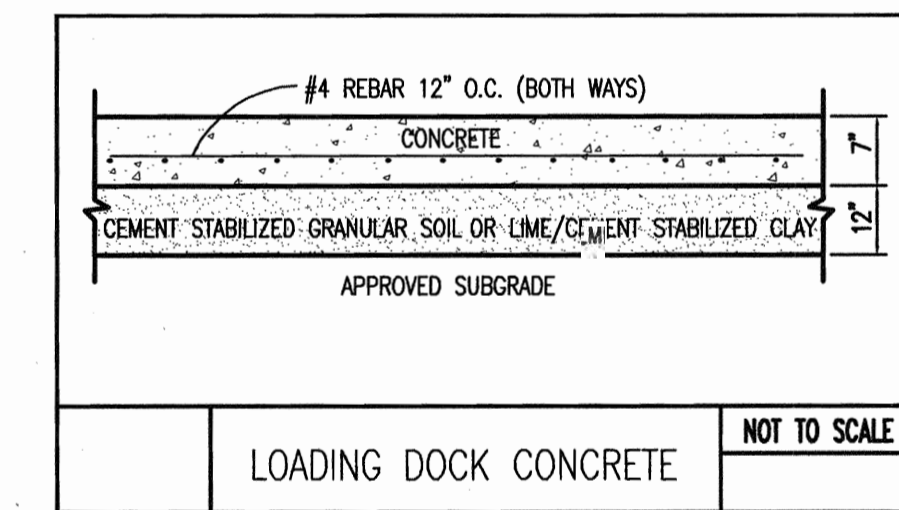
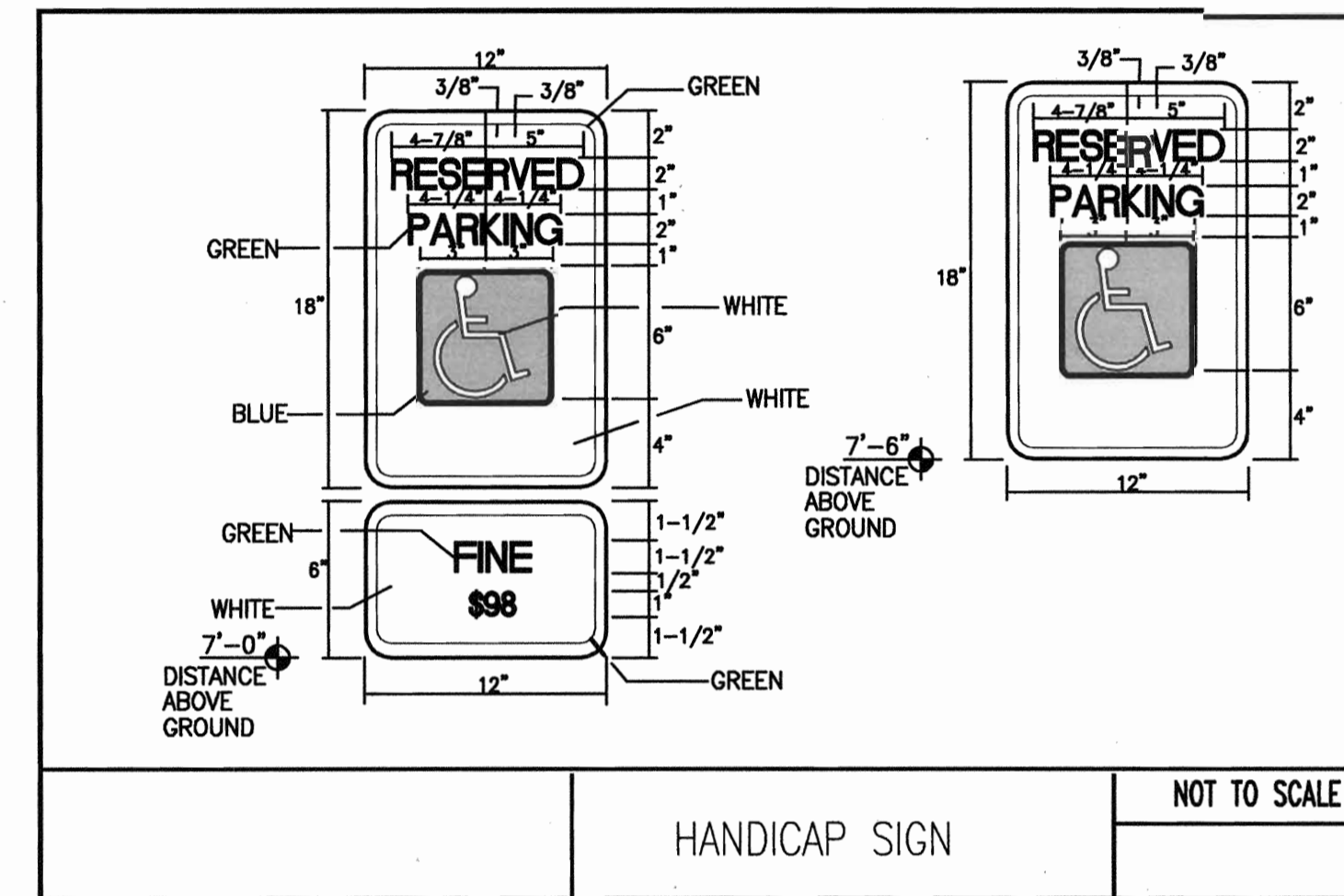
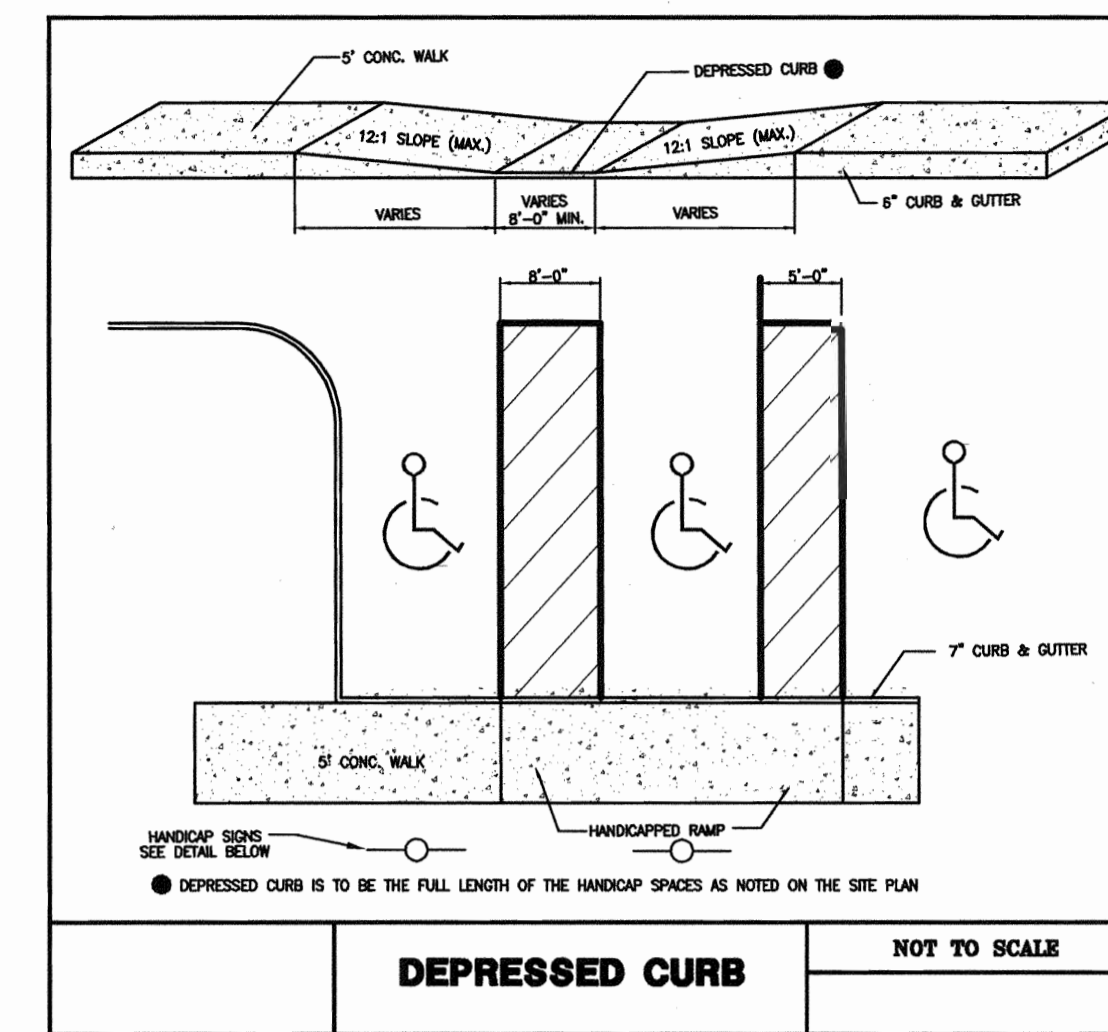
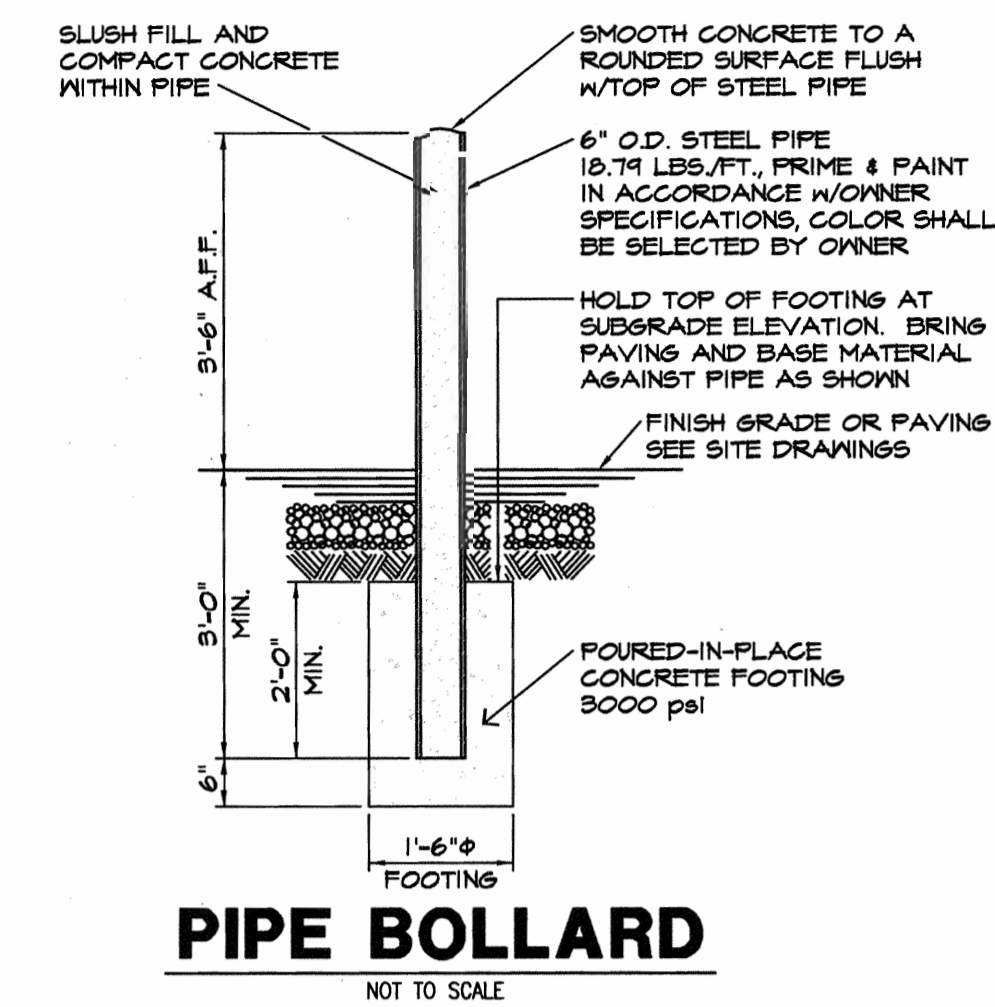
The compaction requirement shall be 92 percent of the Modified Proctor (ASTM D-1557) maximum dry density for material placed below the top 12-inches of roadway subgrade. The top 12 inches should be compacted to 95% unless otherwise recommended by the geotechnical engineer. The top 12 to 24 inches of soil may be required to meet certain material properties for subgrade support for pavements.

Backfilling Procedures

- Contractor shall place level lifts of soil adjacent and above the utility. The lift thickness shall be dependent upon the type of equipment being used for compaction and the materials. The following shall be used as a guide:
  - Fine-Grained Materials - fine-grained materials (materials with more than 35% passing #200 sieve) should be compacted with sheeps-foot type roller. The lift thickness should not exceed 4 inches if hand operated equipment is used. Hand equipment will be required for compaction around manholes, structures and adjacent to and over the utility. If heavy construction sheeps-foot compaction equipment is used, a maximum loose lift thickness should be no greater than the length of the sheeps-foot or a maximum of eight inches. Each lift should be uniformly compacted with a sufficient number of passes to obtain the required degree of compaction. The soil clods and voids must be eliminated during backfilling, resulting in a homogeneous soil matrix.
  - Granular Soils - granular soils (materials with less than 35% passing #200 sieve) should be compacted with a vibratory type compaction equipment. The loose lift thickness should not exceed 4 inches for hand operated equipment. Hand equipment will be required around manholes, structures and adjacent to and above the utility. If heavy vibratory compaction equipment is used, then the loose lift thickness can be increased to 8 inches. Each lift should be uniformly compacted with a sufficient number of passes to obtain the recommended degree of compaction.
  - The backfill should be worked using hand tools around pipe haunch to provide uniform and firm support.

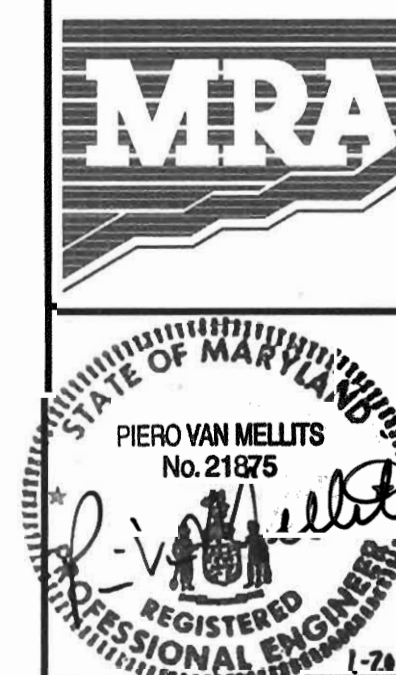
Testing

Each lift of fill should be monitored for stability, lift thickness and compactive effort. A density test should be performed for each lift of fill placed per every 150 feet of trench. This requirement includes the utility lateral connections. The test procedure should be the sand cone method (ASTM D-1556) or the nuclear gauge method (ASTM D-2922). The test results should be made available to the contractor upon the completion of the test. For each test, the technician should record the following: Date; test location; test elevation; material type; degree of compaction; one-point results; lift thickness; and moisture content.



OWNER/DEVELOPER: DAVIS EMORY  
 A. NAME: DAVIS EMORY  
 B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076

C-5



**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
 9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395

**SITE DEVELOPMENT PLANS**  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13

**SITE NOTES AND DETAILS**

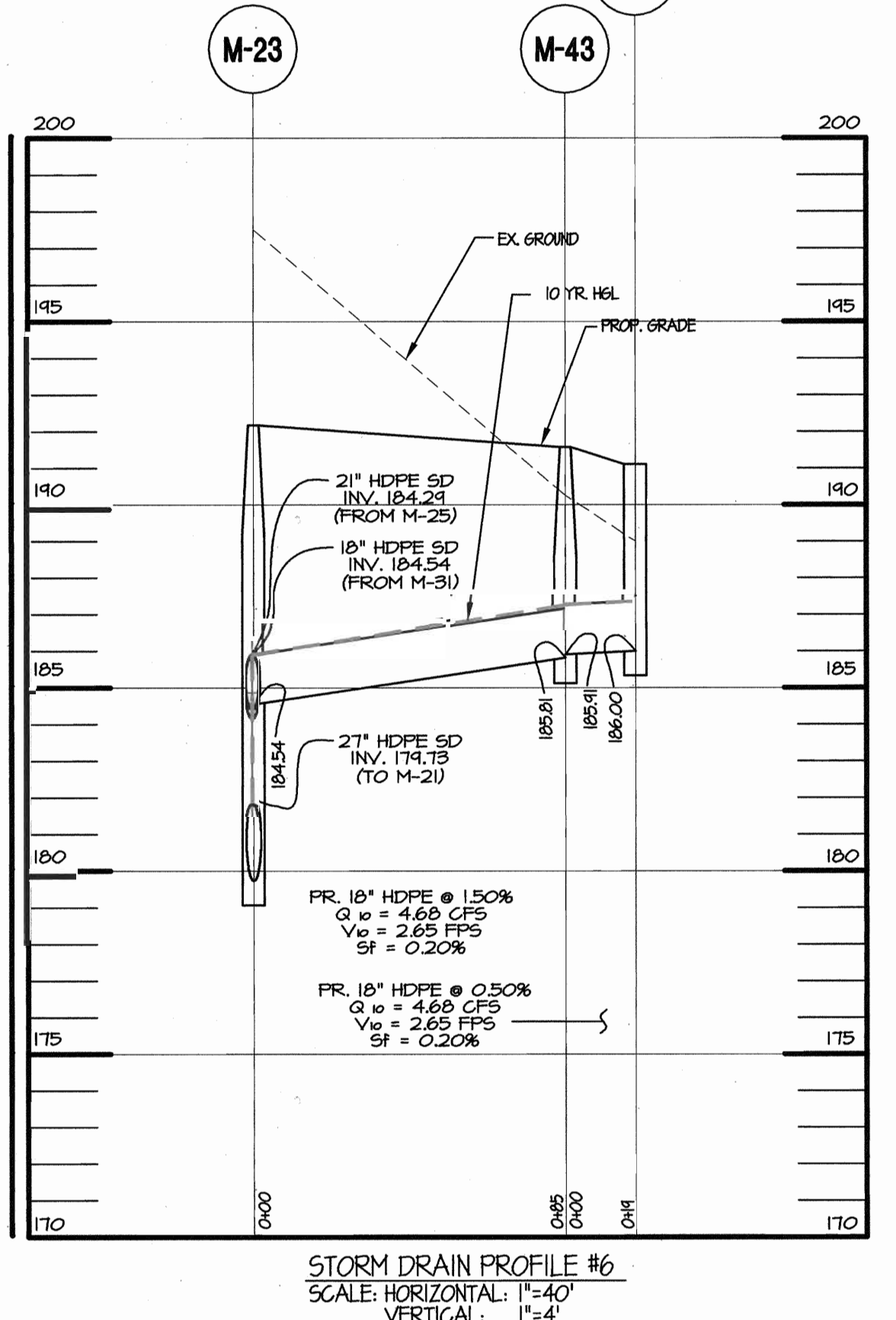
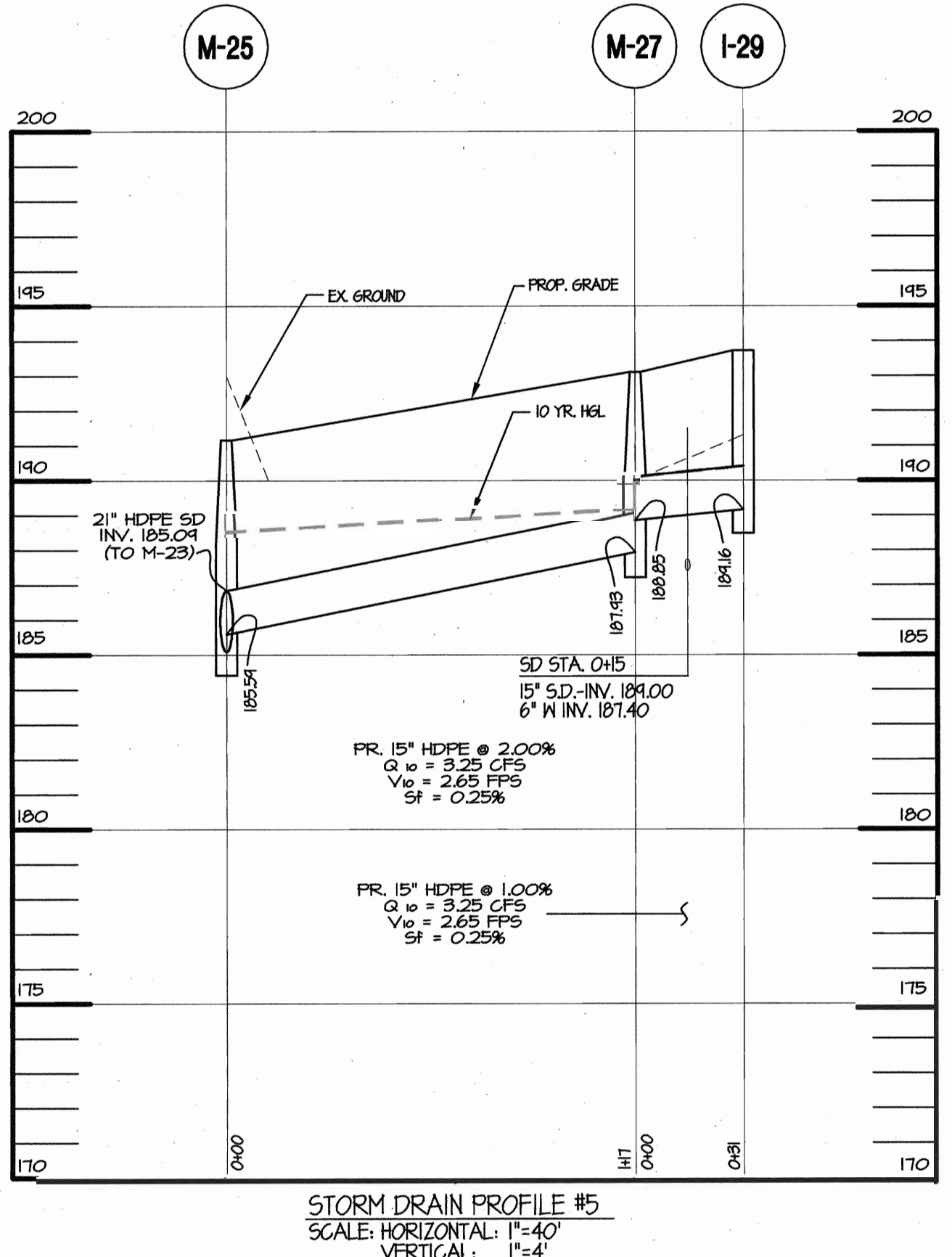
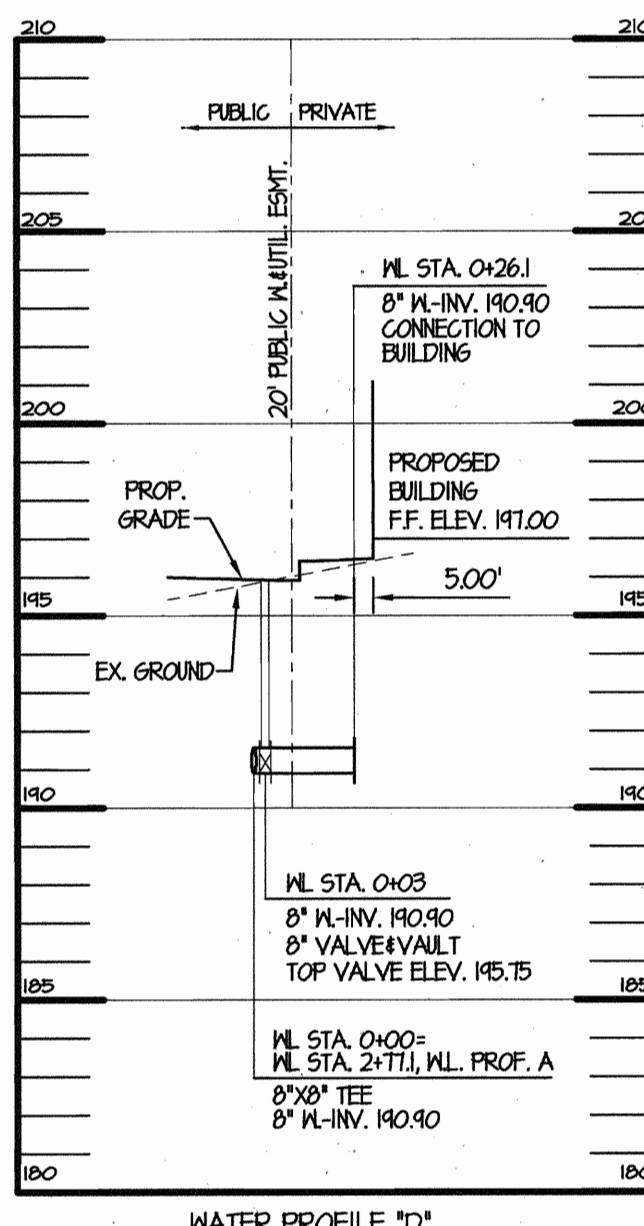
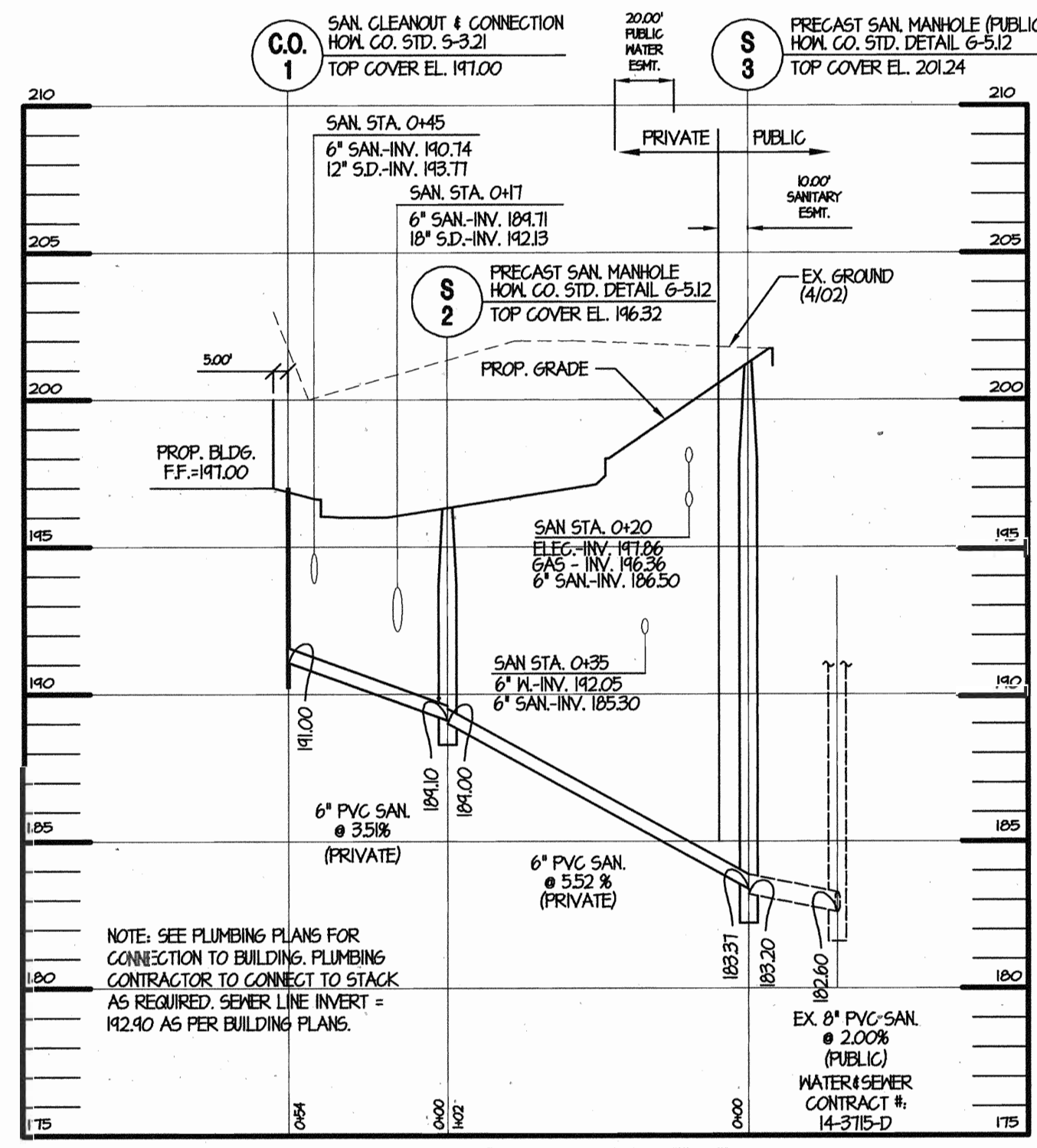
L. 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.: 12269
		SCALE: AS SHOWN
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 5 OF 17



SEWER PIPE AND FITTINGS SCHEDULE		
6" SAN. (PVC-SCH. 40)	146'	
PRECAST SAN. MANHOLE	1	
SAN. CLEAN-OUT	1	

WATER PIPE AND FITTINGS SCHEDULE		
8" WATER MAIN	26'	
8" CAP	1	



**Dimensions**

Dimensions	A	B	C	D
18 3/8"	10 3/8"	12"	9 7/8"	
158 mm	264 mm	305 mm	251 mm	

**Specifications**

Housing/Door: Die cast aluminum housing provides rugged protection for the internal components. Cast door frame snaps securely to the housing with twin spring steel latches. Seal is provided by a silicone gasket on the door and the housing edge. Glass lens is tempered for thermal shock and impact resistance. Lens/Door can be removed without tools for cleaning or maintenance. Both castings are protected by Hubbell's Lektrocoat® finish for durability and appearance.

Reflector System: Multi-faceted reflector, designed for wide beam spread with excellent uniformity, combines with mogul base lamps for high efficiencies. Socket is heavy-duty porcelain securely mounted to the cast housing for cooler operation and long lamp life. Lenses are included on all sizes.

Ballast: Ballast available from 70-400 watts. Sources include metal halide, compact fluorescent and high pressure sodium. Dual voltage (200/300) HPS Quartz® unit is available for distribution stock allowing versatility from one SKU. 50 Hz and less ballast options are also available. All units are NRTL/C listed for wet conditions. Higher Ambient (40°C) available on units below 400 watt.

Mounting: Available in yoke (Y) or integral knuckle (K) designs. Steel yoke has Hubbell's three hole pattern which allows one 3/4" bolt or two 1/2" bolt attachment to flat surfaces or adapters. The knuckle mount allows 2.38" O.D. pipe or tenons. Wire access cover allows "hands free" wiring to desired voltage after mounting.

TEST NUMBER: HP-08348

**Ordering**

UNLUCKING INFORMATION	Catalog Number <sup>1</sup>	Catalog Number <sup>2</sup>	Lamps/Wattage
MHS-Y400H-468-1	MHS-K400H-468-1	400 MH ED37	
MHS-Y250H-468-1	MHS-K250H-468-1	250 MH ED37	
MHS-Y175H-468-1	MHS-K175H-468-1	175 MH ED37	
MHS-Y400P-468-1	MHS-K400P-468-1	400 PS ED37	
MHS-Y250P-468-1	MHS-K250P-468-1	250 PS ED37	
MHS-Y175P-468-1	MHS-K175P-468-1	175 PS ED37	

**PERFORMANCE**

TYPE	7 H X 6 V	1250 L
AVG. OF 10 HOURS	1176.2	
BEAM DIVERGENCE (AT 50% MAX. CD)	62.4	
BEAM DIMENSION	14.111	
BEAM EFFICIENCY	42.63%	
FIELD SPREAD (AT 10% MAX. CD)	133.3	
FIELD VERTICAL	128.3	
FIELD HORIZONTAL	223.8	
FIELD EFFICIENCY	67.55%	
TOTAL EFFICIENCY	69.85%	
TEST DISTANCE	36.3	

**PERIALITER® II**

**Dimensions**

Dimensions	A	B	C	D
14 7/8"	15 5/8"	9 7/8"	6 3/4"	
378 mm	397 mm	251 mm	171 mm	

**Specifications**

Applications: Ideally suited for security lighting applications as well as commercial and industrial lighting for parking lots, office buildings, stores, shopping centers, fast food restaurants, banks, warehouses, and parking garages. Typical mounting height is 20'-25' (7 meters).

Rear Housing: One-piece, heavy duty, die cast aluminum for long life and cooler operation. Bronze Lektrocoat® finish is standard. Mounts over 3/4" and 4" recessed junction box. Two 3/4" side emitters for surface conduit mounting.

Reflector: Precision formed specular aluminum for optimum performance.

Reflector/Door: Full front access is available by hinging front door. Two Hubbell Guard bezel fasteners provide tight seal to door. Die cast aluminum door frame with protective Lektrocoat® finish holds prismatic borosilicate glass reflector.

Reflector/Door (continued): Lens is thermal shock and impact resistant. Engineered to form standard four-to-one spacing to mounting height. Lens is held in place by standard four-to-one spacing to mounting height. Lens is held in place by standard four-to-one spacing to mounting height. Lens is held in place by standard four-to-one spacing to mounting height.

Ballast: Class H Insulated, -40°F starting (-20°F for MH), 60 Hz HPS. An aluminum ballast compartment cover isolates electrical components from the optical assembly.

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**SITE DEVELOPMENT PLANS**  
7125 TROY HILL DRIVE  
TROY HILL CORPORATE CENTER  
PARCEL A-13  
**UTILITY PROFILES AND LIGHTING DETAILS**

8057 E. 28  
ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
ELECTION DISTRICT NO: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.:
		12269
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		SHEET: 6 OF 17

**VERSALUX**

[400 WATT MAX.]

**SPECIFICATIONS**

**HOUSING:** ONE PIECE HEAVY GAUGE DIE FORMED ALUMINUM CONSTRUCTION WITH SEPARATE BALLAST COMPARTMENT.

**LENS ASS'Y:** ONE PIECE HINGED HEAVY GAUGE DIE FORMED ALUMINUM DOOR FRAME SURROUNDS 3/16" CLEAR TEMPERED GLASS LENS. GLASS IS SEALED TO DOOR WITH HIGH TEMPERATURE SILICONE SEAL. TWO CAPTIVE THUMB SCREWS DISENGAGE LENS ASSEMBLY FROM HOUSING WITHOUT THE USE OF TOOLS.

**OPTICS:** COMPUTER DESIGNED ONE PIECE SEMI SPECULAR HYDROFORMED REFLECTOR COMBINED WITH LENS TO PRODUCE A HIGHLY EFFICIENT, SHARP CUTOFF. OPTICS ARE FIELD ROTATABLE.

**GASKETING:** CLOSED CELL EPDM GASKETING COMPRESSED BETWEEN DOOR AND HOUSING SEALS OPTICAL CHAMBER.

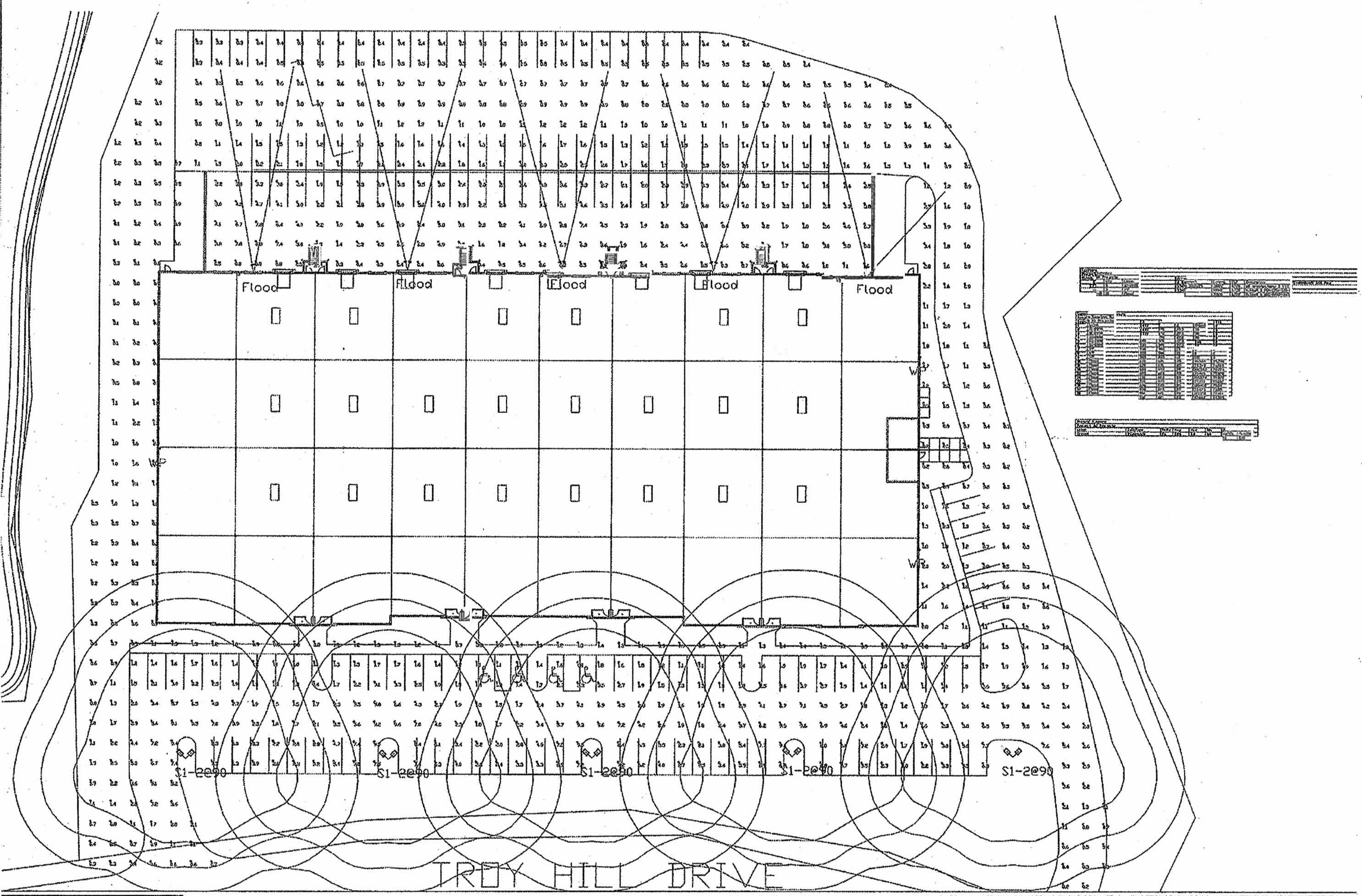
**LAMP HOLDER:** MOGUL BASE PORCELAIN.

**LAMP:** (BY OTHERS)

**BALLAST:** H.P.F./C.W.A. AUTOTRANSFORMER. -20° STARTING TEMPERATURE. ELECTRICAL COMPONENTS ARE MOUNTED TO HINGED REMOVABLE TRAY FOR EASY ACCESS.

**ARM:** 3"X5"X6" LONG HEAVY WALL EXTRUDED ALUMINUM. ARM IS SECURED TO HOUSING AND TO POLE WITH STAINLESS STEEL RODS.

**FINISH:** POLYESTER POWDER COAT-STATE OF THE ART 20 PSI PRESSURE POWER WASH AT 140° TEMPERATURE INCORPORATES FOUR STEP IRON PHOSPHATE PROCESS TO CLEANSE AND PRETREAT THE METAL SURFACE FOR MAXIMUM PAINT ADHESION. ELECTROSTATICALLY APPLIED TEXTURED POLYESTER POWDER TOP COAT IS BAKED AT 400° TEMPERATURE FOR MAXIMUM HARDNESS AND EXTERIOR DURABILITY.



APPROVED: DEPARTMENT OF PLANNING AND ZONING

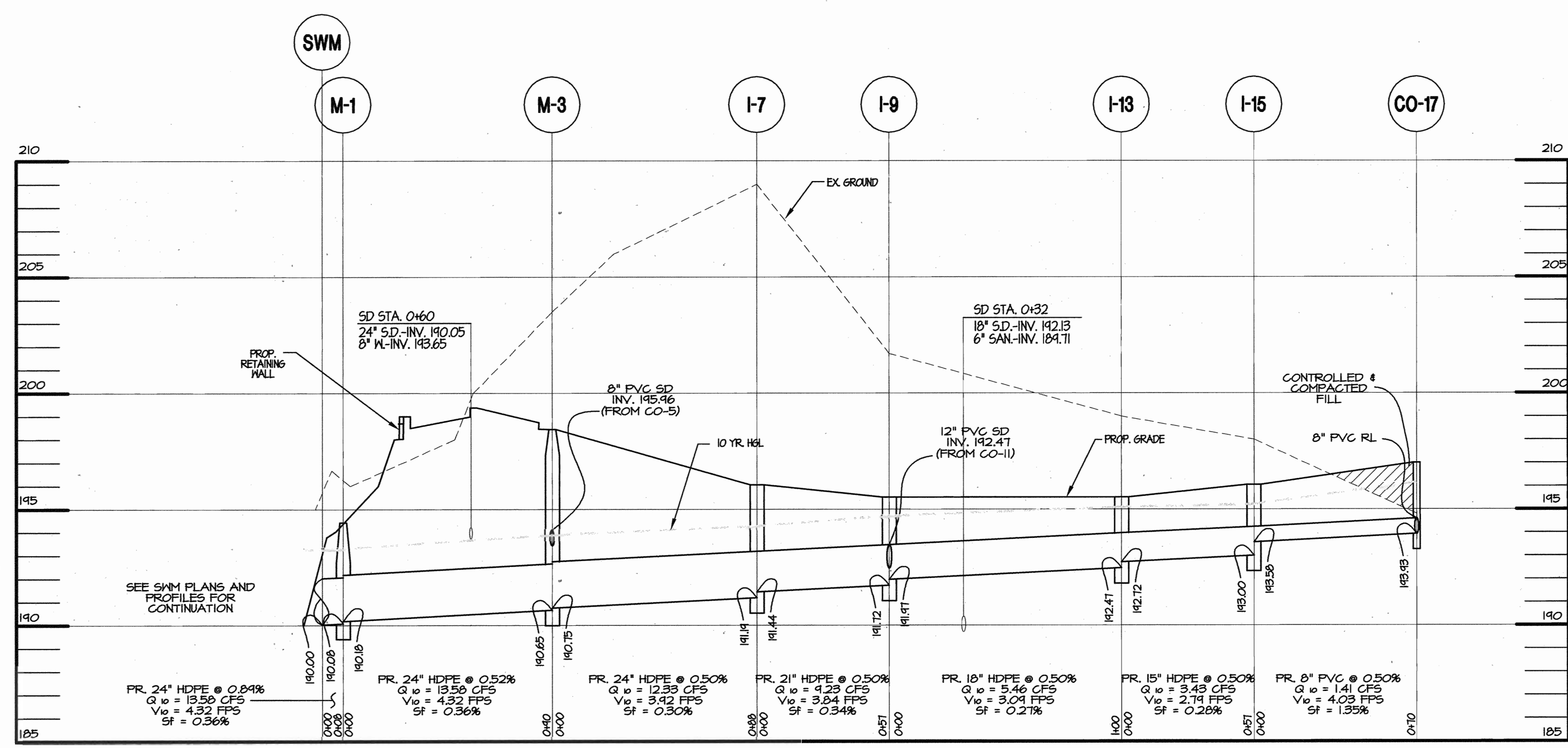
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DATE

*[Signature]* 2/4/03  
DATE

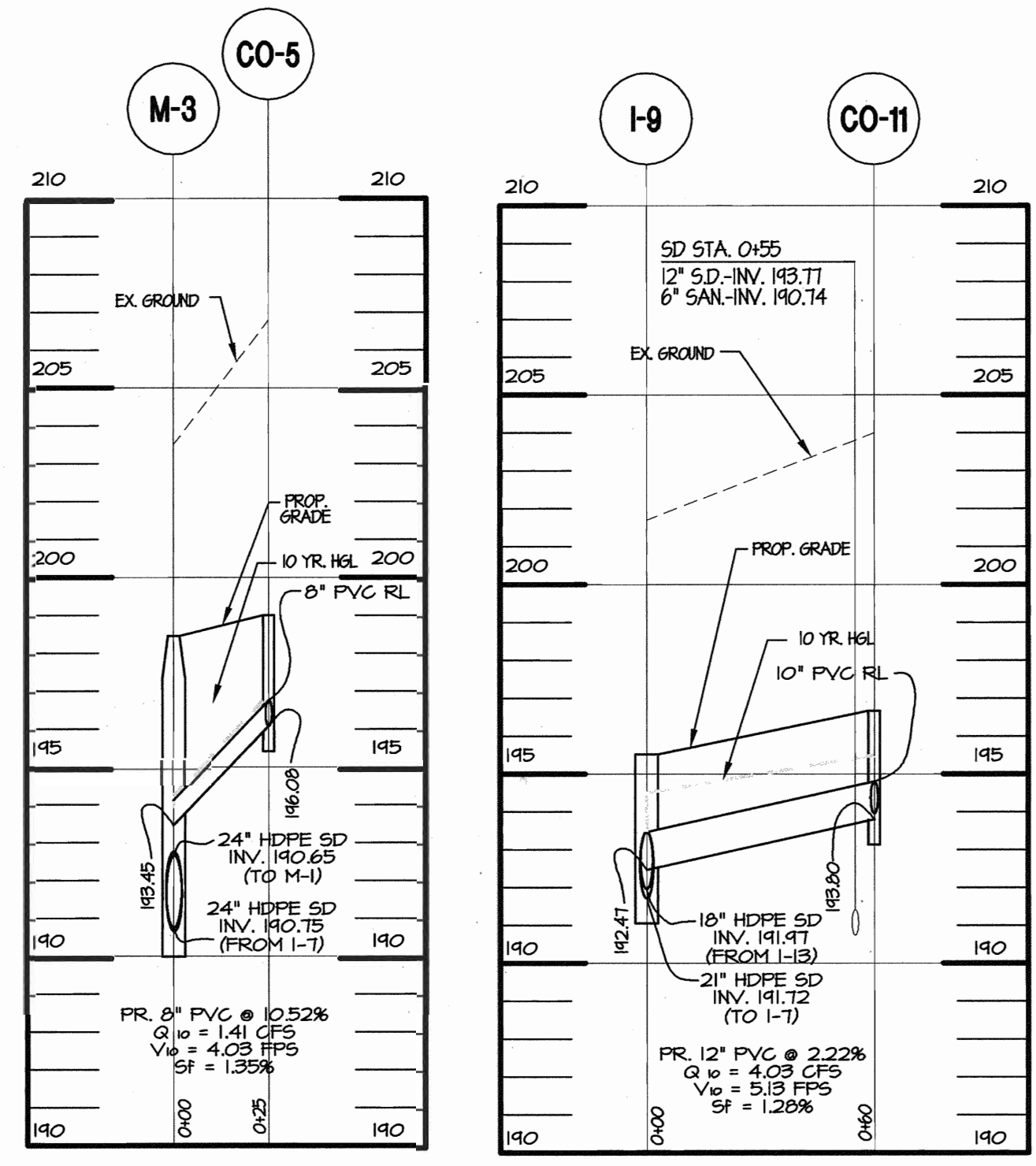
*[Signature]* 2/1/03  
DATE

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

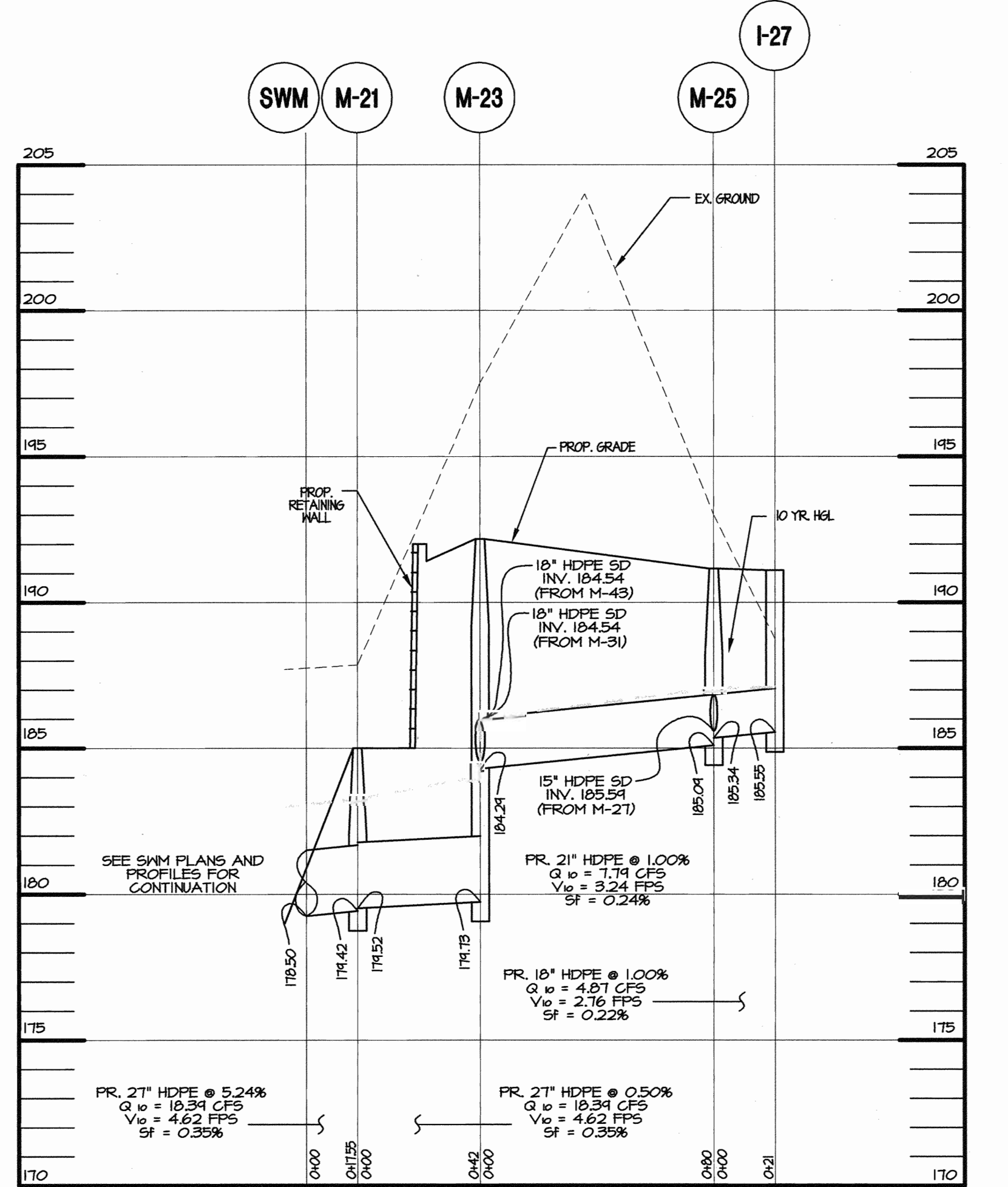




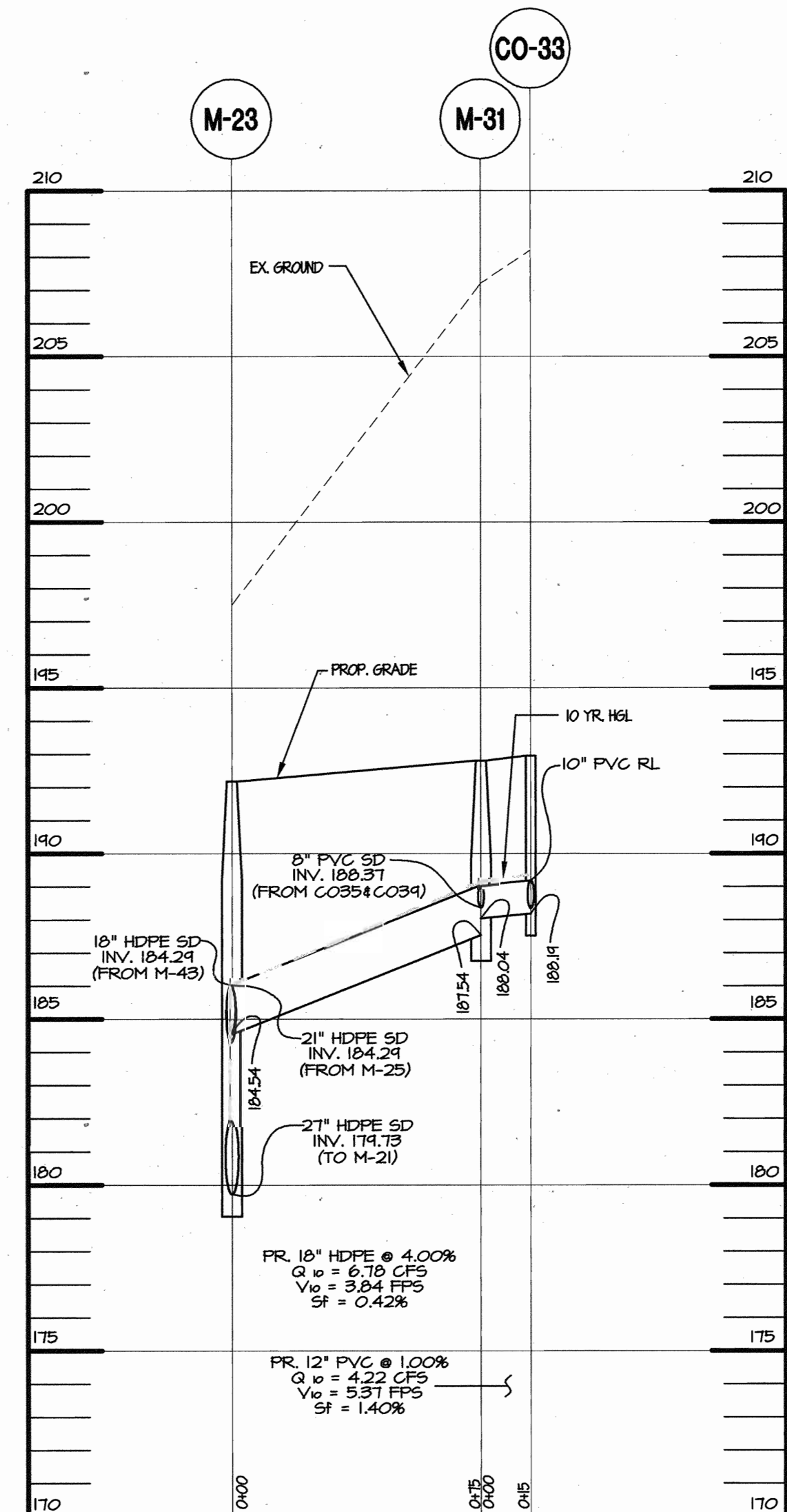
STORM DRAIN PROFILE #1  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'



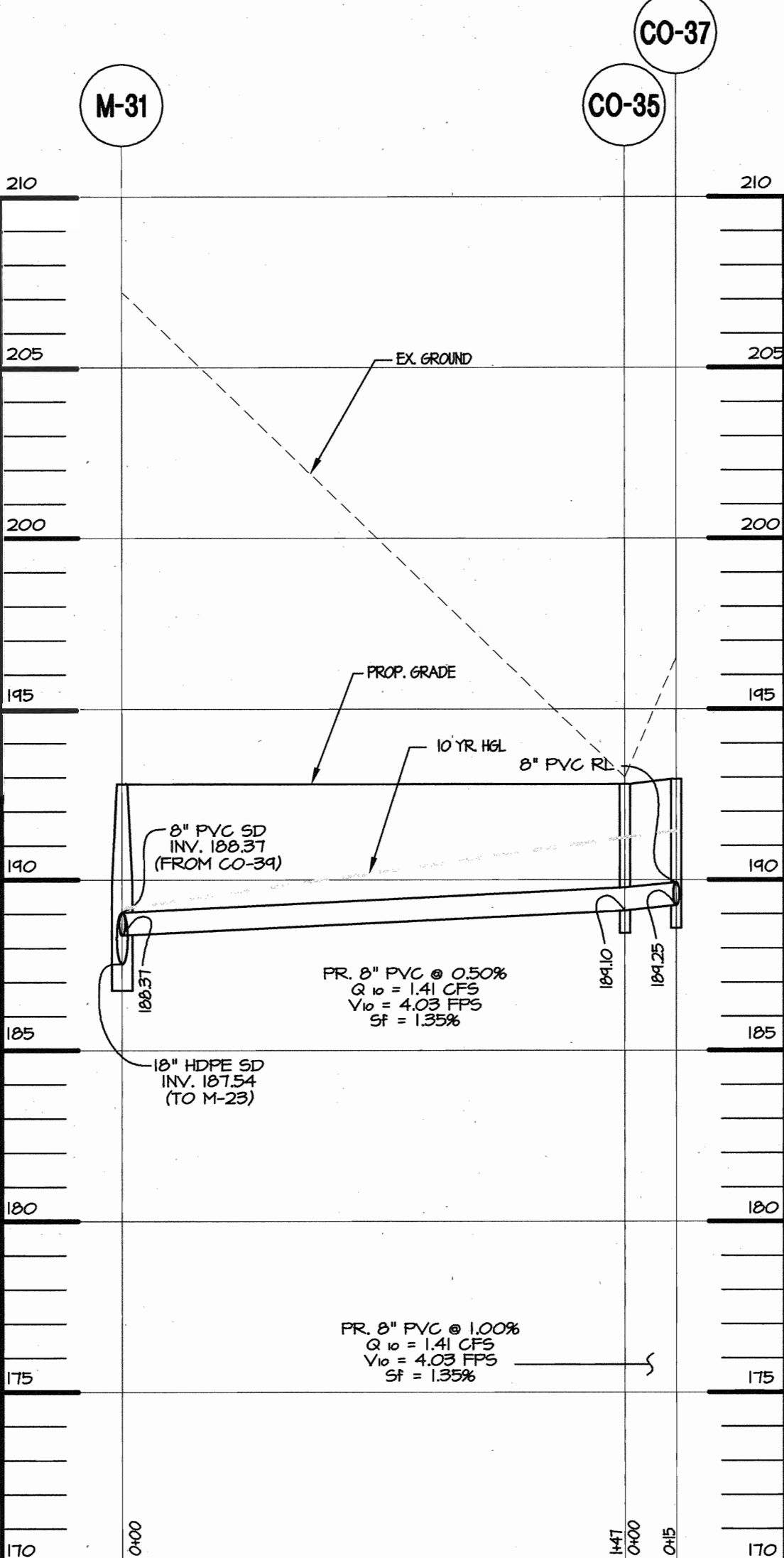
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VERTICAL: 1"=4'



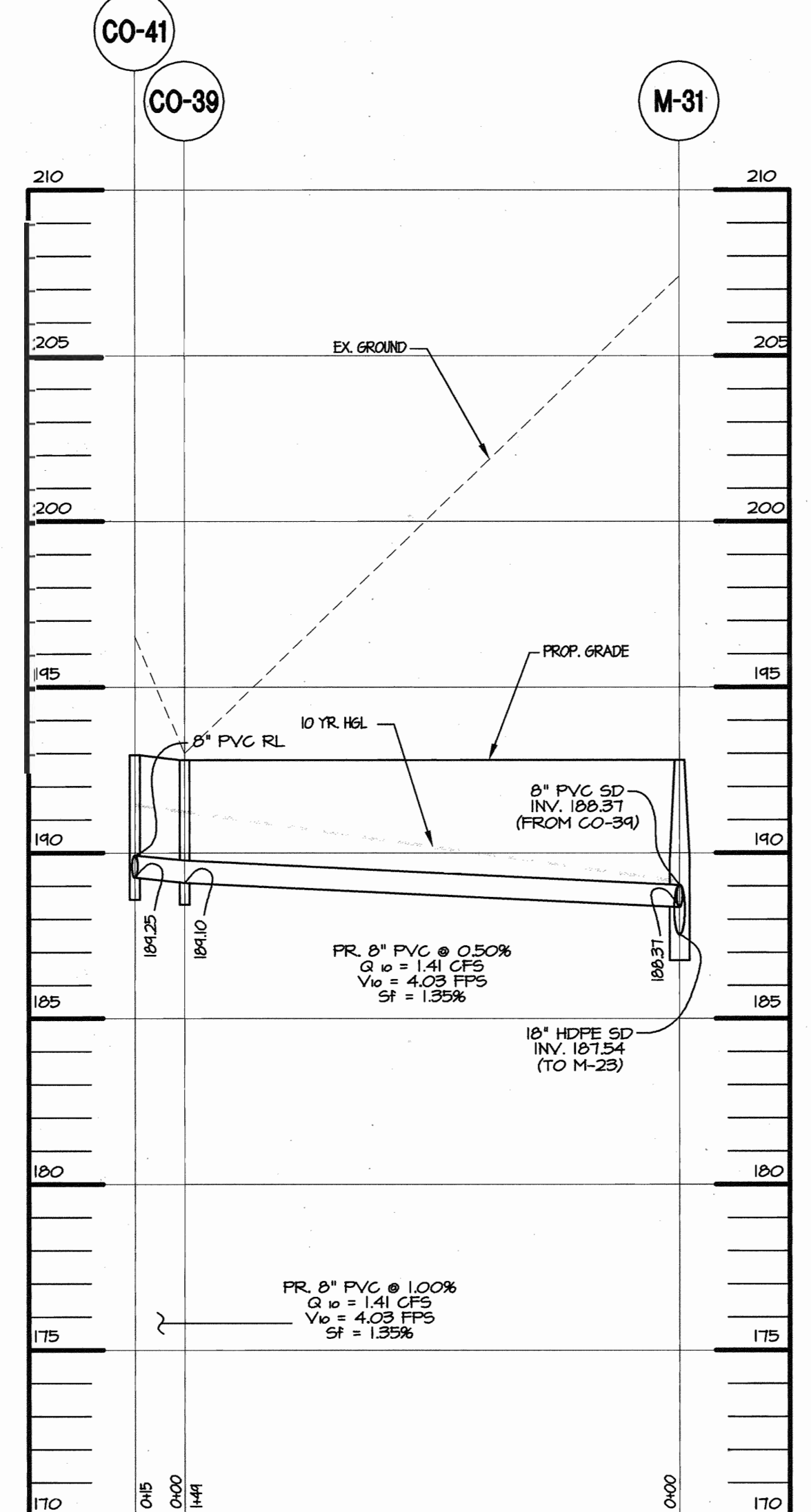
STORM DRAIN PROFILE #3  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'



STORM DRAIN PROFILE #4  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'



STORM DRAIN PROFILE #5  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'



STORM DRAIN PROFILE #6  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'

SIZE	TYPE	LENGTH
8"	PVC (SCH. 40)	421'
12"	PVC (SCH. 40)	75'
15"	HDPE (A.D.S. N-12)	205'
18"	HDPE (A.D.S. N-12)	300'
21"	HDPE (A.D.S. N-12)	137'
24"	HDPE (A.D.S. N-12)	195'
27"	HDPE (A.D.S. N-12)	67'

SIZE	TYPE	NUMBER
8"	45' H.B. (SCH. 40)	2
12"	45' H.B. (SCH. 40)	1
8"	90' H.B. (SCH. 40)	2
8"	CLEAN-OUTS	6
12"	CLEAN-OUTS	2

• COORDINATES TO CENTER OF STRUCTURE AT FACE OF CURB FOR INLETS, CENTER OF STRUCTURE FOR MANHOLES  
\* TOP OF GRADE ELEVATION AT CENTER OF STRUCTURE AT FACE OF CURB. MANHOLE/CLEANOUT ELEVATIONS ARE AT CENTER OF RIM

STR. NO.	TOP ELEV.	IN. DIA.	TYPE	REMARKS	NOTES	LOCATION	COORDS.
M-1	194.00	18.00	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.12		557,395.25	1,381,012.81
M-3	198.45	18.00	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.13		557,611.52	1,381,101.75
M-21	185.00	17.92	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.13		557,222.14	1,381,119.94
M-23	192.17	17.92	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.13		557,258.24	1,381,140.26
M-25	191.57	18.00	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.12		557,297.51	1,381,070.36
M-27	193.10	18.93	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.12		557,384.92	1,380,992.26
M-31	192.80	18.74	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.12		557,325.03	1,381,176.27
M-43	191.57	18.81	SHALLOW PRECAST MANHOLE	HOWARD CO. STD. DETAIL G-5.12		557,218.51	1,381,214.68
I-7	196.06	19.19	DOUBLE TYPE S COMB. INLET	HOWARD CO. STD. DET. SD-4.34		557,565.09	1,381,180.39
I-9	195.52	19.72	DOUBLE TYPE S INLET	HOWARD CO. STD. DET. SD-4.23		557,550.23	1,381,241.78
I-13	195.72	19.27	DOUBLE TYPE S INLET	HOWARD CO. STD. DET. SD-4.23		557,499.24	1,381,334.80
I-15	196.06	19.30	DOUBLE TYPE S COMB. INLET	HOWARD CO. STD. DET. SD-4.34		557,455.44	1,381,380.39
I-27	191.10	18.55	DOUBLE TYPE S COMB. INLET	HOWARD CO. STD. DET. SD-4.34		557,277.09	1,381,059.08
I-29	193.72	18.91	DOUBLE TYPE S COMB. INLET	HOWARD CO. STD. DET. SD-4.34		557,418.40	1,381,094.52
I-45	191.10	18.60	DOUBLE TYPE S COMB. INLET	HOWARD CO. STD. DET. SD-4.34		557,197.81	1,381,203.40
CO-5	198.50	19.68	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,590.50	1,381,109.94
CO-11	196.70	19.30	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,497.83	1,381,270.83
CO-17	197.00	19.33	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,407.77	1,381,435.38
CO-33	192.95	18.81	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,338.19	1,381,183.48
CO-35	192.80	18.91	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,395.79	1,381,047.05
CO-37	192.95	18.25	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,408.94	1,381,054.25
CO-39	192.80	18.91	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,253.32	1,381,307.26
CO-41	192.95	18.92	MODIFIED CLEANOUT	HOWARD CO. STD. DETAIL S-3.21		557,266.47	1,381,314.46

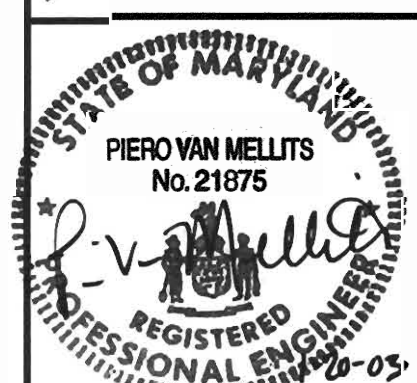
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 [Signature] 2/10/12  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 2/14/12  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature] 2/14/12  
 DIRECTOR

OWNER/DEVELOPER: [Blank] FAX NO.: (410) 712-0620  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
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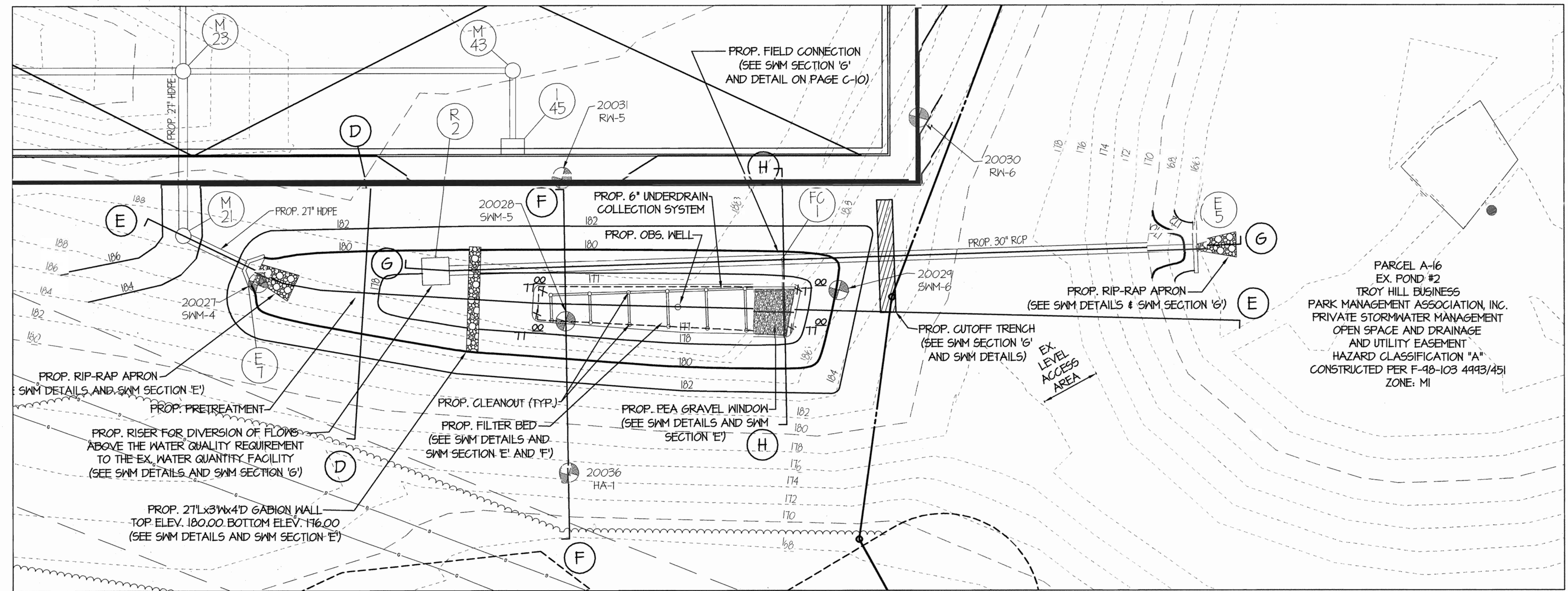
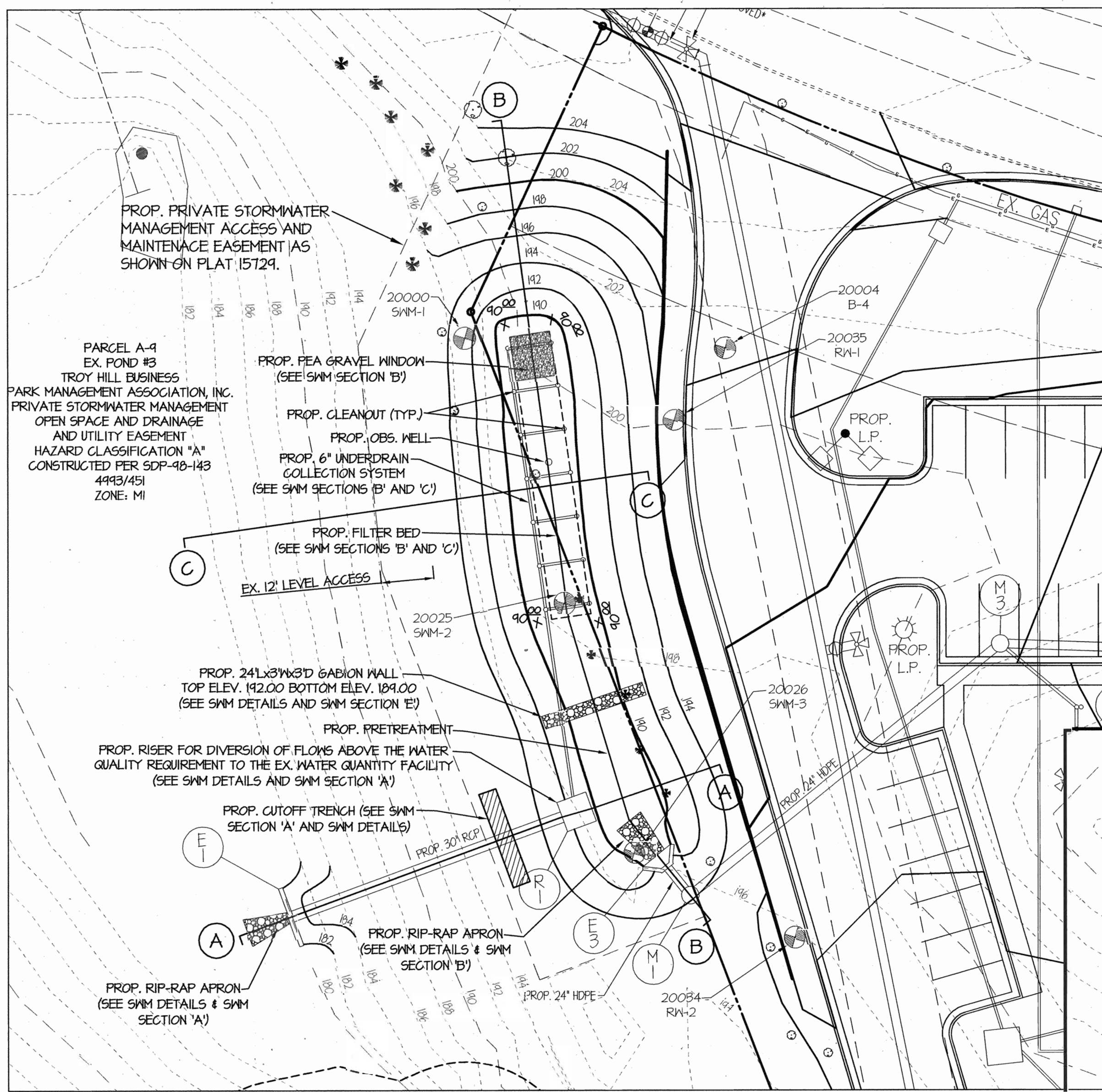
SITE DEVELOPMENT PLANS  
 7125 TROY HILL DRIVE  
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UTILITY PROFILES

L 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL: 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

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		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 7 OF 17





**SUMMARY OF POCKET SAND FILTER #1**

DESIGN STORM	Proposed Facility Inflow (cfs)	Proposed Facility Discharge (cfs)	Facility Water Surface Elevation (ft)	Facility Storage Volume* (acre-ft)
WQV	-	-	192.50	0.1594
1 year	8.44	8.44	192.80	0.1892
10 year	17.74	17.74	192.99	0.2080
100 year	25.54	25.54	193.13	0.2220

Drainage Area 2.1594\*\* acres  
Impervious Area 1.9433\*\* acres

**SUMMARY OF POCKET SAND FILTER #2**

DESIGN STORM	Proposed Facility Inflow (cfs)	Proposed Facility Discharge (cfs)	Facility Water Surface Elevation (ft)	Facility Storage Volume* (acre-ft)
WQV	-	-	180.50	0.1985
1 year	10.88	10.88	180.85	0.2371
10 year	22.31	22.31	181.07	0.2615
100 year	31.95	31.95	181.23	0.2791

Drainage Area 2.467\*\* acres  
Impervious Area 2.368\*\* acres

\* THE FACILITY STORAGE VOLUME DOES NOT INCLUDE THE VOLUME PROVIDED IN THE FILTER BED AREA OR THE RECHARGE AREA.

\*\* THE POCKET SAND FILTER WAS DESIGNED USING THE DRAINAGE AREA ALLOWED TO DRAIN TO THE EXISTING STORMWATER MANAGEMENT FACILITY, THE ACTUAL DRAINAGE AREA AND IMPERVIOUS AREA TO THE POCKET SAND FILTERS ARE LESS.

\*\*\* WATER QUANTITY MANAGEMENT PROVIDED FOR THIS SITE BY EX. STORMWATER MANAGEMENT FACILITIES. WATER QUALITY VOLUME WILL BE PROVIDED BY POCKET SAND FILTERS AND THE RECHARGE VOLUME WILL BE PROVIDED BY A STONE FILLED RESERVOIR DIRECTLY BELOW THE FILTER BED'S UNDERDRAIN SYSTEM.

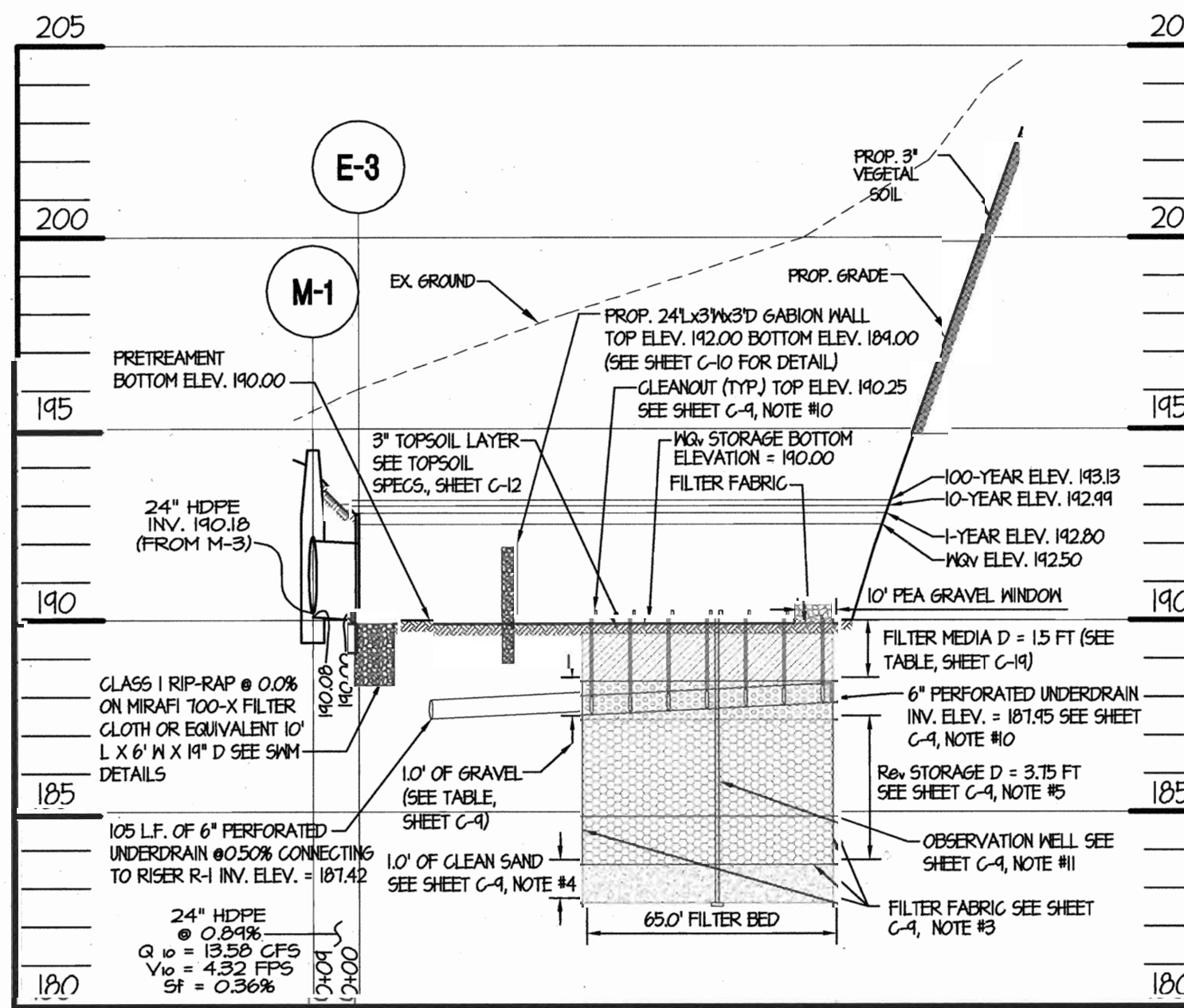
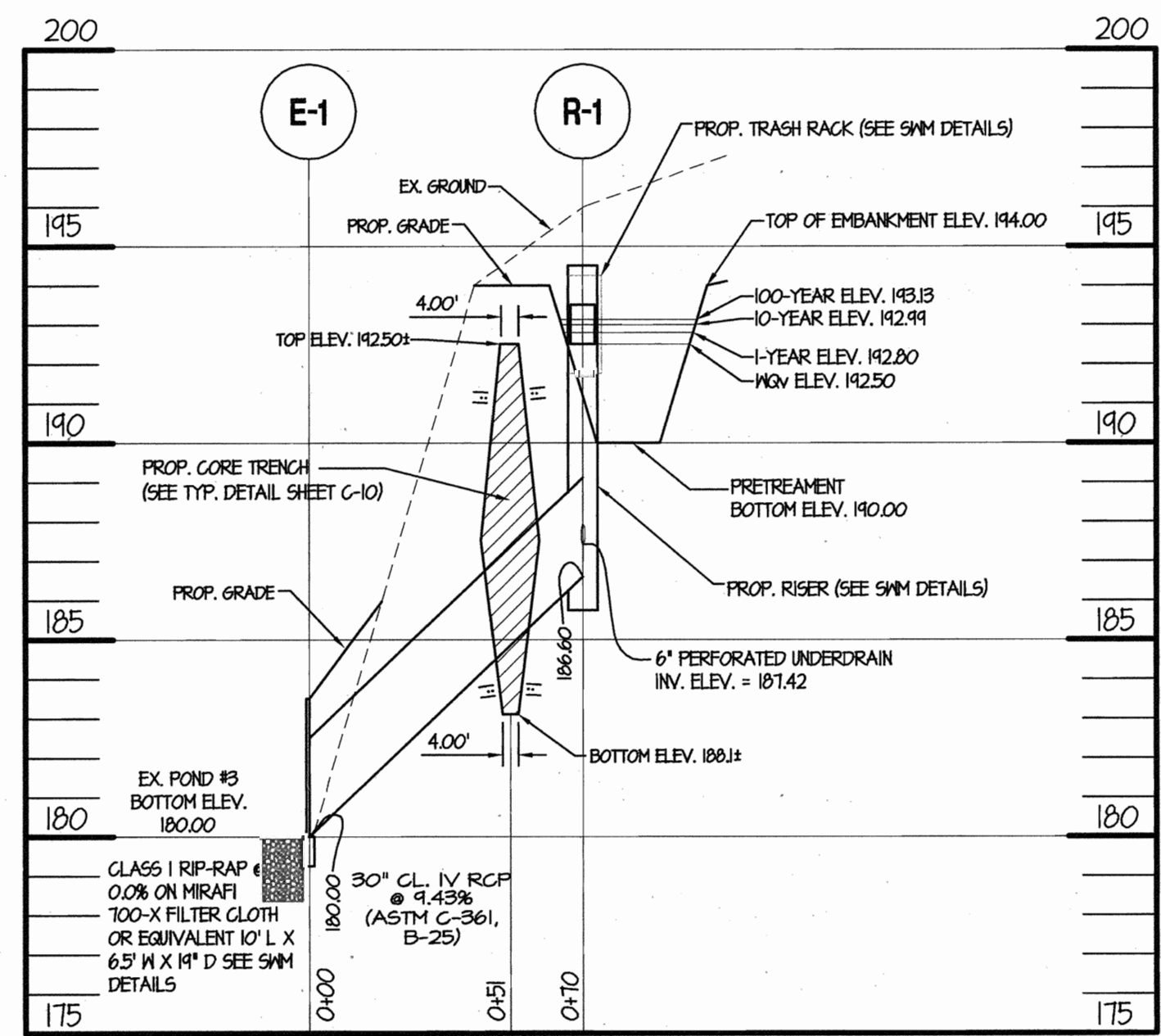
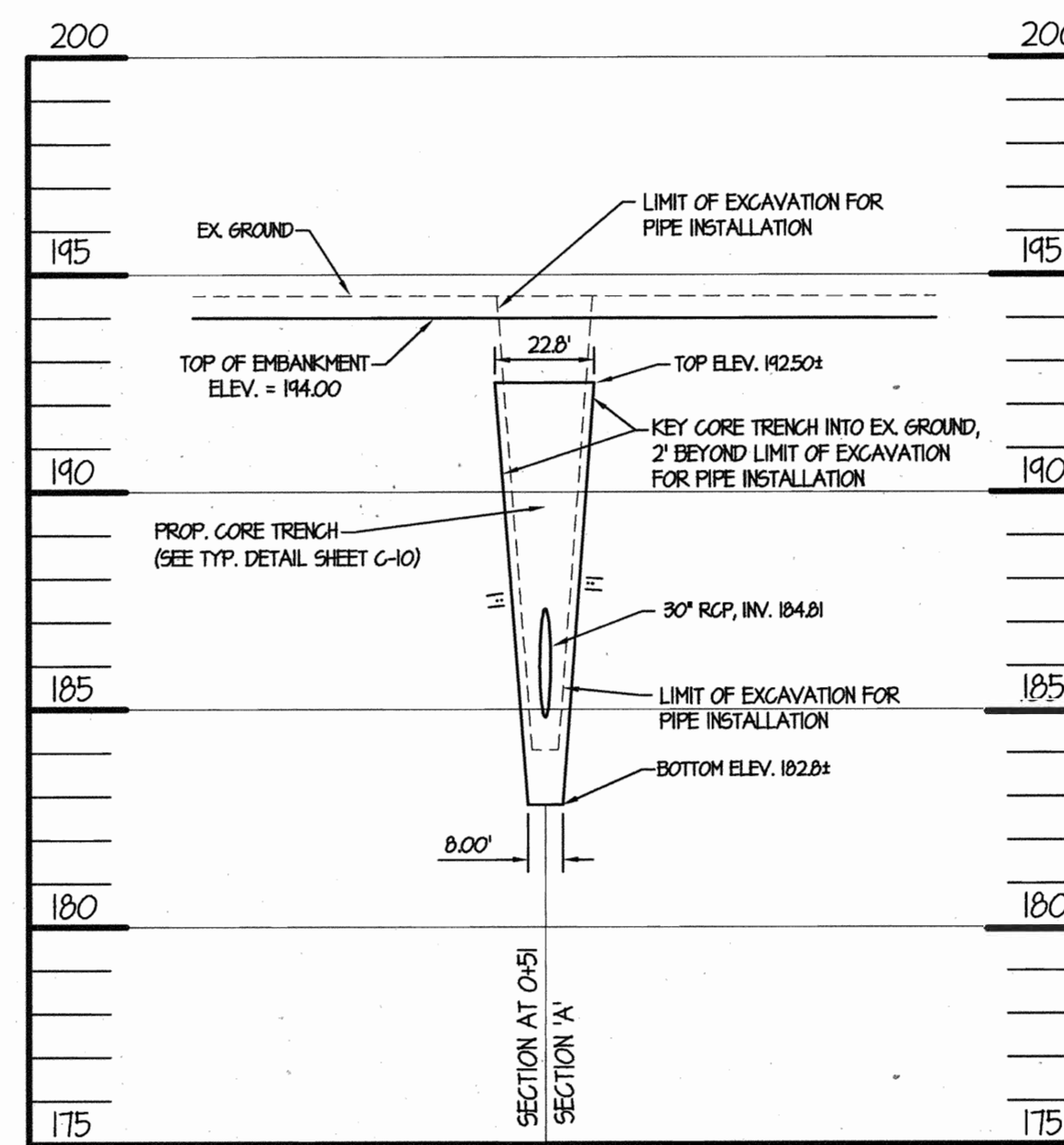
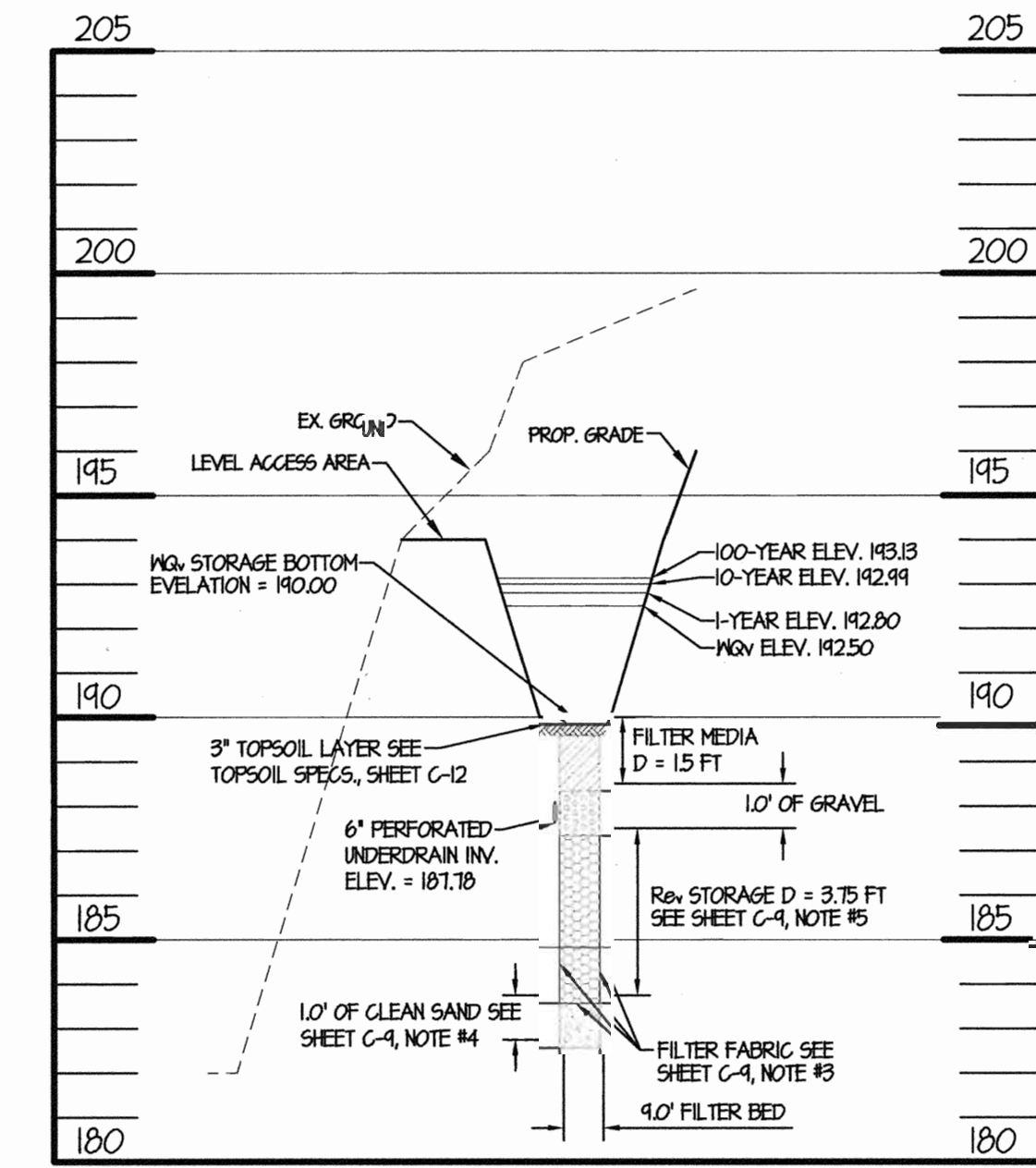
+ HOWARD COUNTY REQUIRES A MINIMUM PRETREATMENT AREA OF 363 C.F. PER ACRE OF IMPERVIOUS SURFACE. THIS VOLUME IS SEPARATE FROM THE WQV REQUIREMENT, THEREFORE THE TOTAL VOLUME OF THE FACILITY SHALL BE EQUAL TO OR GREATER THAN THE WQV REQUIREMENT PLUS THE HOWARD COUNTY PRETREATMENT REQUIREMENT.

GENERAL SWM REQUIREMENTS TO EX. SWM POND # 3

STEP	REQUIREMENT	VOLUME REQUIRED	VOLUME PROVIDED	NOTES
1	WATER QUALITY VOLUME (WQV)	0.1383 AC-FT.	0.1513 AC-FT.	+ 0.0162 AC-FT FOR HO. CO. PRETREATMENT
2	RECHARGE VOLUME (REV)	0.0201 AC-FT.	0.0201 AC-FT.	
3	CHANNEL PROTECTION VOLUME (CPV)	N/A***	N/A	
4	OVERBANK FLOOD PROTECTION VOLUME (OPV)	N/A***	N/A	
5	EXTREME FLOOD VOLUME (EFV)	N/A***	N/A	

GENERAL SWM REQUIREMENTS TO EX. SWM POND # 2

STEP	REQUIREMENT	VOLUME REQUIRED	VOLUME PROVIDED	NOTES
1	WATER QUALITY VOLUME (WQV)	0.1691 AC-FT.	0.1879 AC-FT.	+ 0.0187 AC-FT FOR HO. CO. PRETREATMENT
2	RECHARGE VOLUME (REV)	0.0244 AC-FT.	0.0245 AC-FT.	
3	CHANNEL PROTECTION VOLUME (CPV)	N/A***	N/A	
4	OVERBANK FLOOD PROTECTION VOLUME (OPV)	N/A***	N/A	
5	EXTREME FLOOD VOLUME (EFV)	N/A***	N/A	



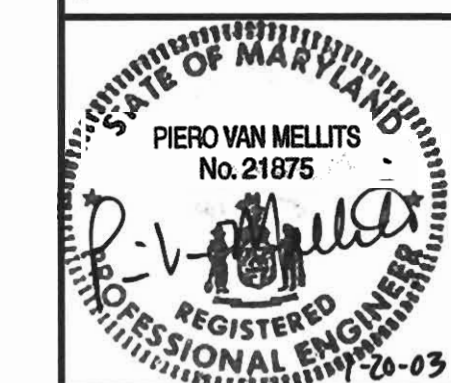
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SITE DEVELOPMENT PLANS  
7125 TROY HILL DRIVE  
TROY HILL CORPORATE CENTER  
PARCEL A-13  
**STORMWATER MANAGEMENT PLAN**

L 6057 F, 28  
ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/2/02  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE

*[Signature]* 2/4/02  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE

*[Signature]* 2/1/02  
DIRECTOR  
DATE

DATE	REVISIONS	JOB NO.: 12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 8 OF 17



**INFILTRATION TRENCH GENERAL NOTES AND SPECIFICATIONS**

AN INFILTRATION TRENCH MAY NOT RECEIVE RUN-OFF UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE INFILTRATION TRENCH HAS RECEIVED FINAL STABILIZATION.

- HEAVY EQUIPMENT AND TRAFFIC SHALL BE RESTRICTED FROM TRAVELING OVER THE PROPOSED LOCATION OF THE INFILTRATION TRENCH TO MINIMIZE COMPACTION OF THE SOIL.
- EXCAVATE THE INFILTRATION TRENCH TO THE DESIGN DIMENSIONS. EXCAVATED MATERIALS SHALL BE PLACED AWAY FROM THE TRENCH SIDES TO ENHANCE TRENCH WALL STABILITY. LARGE TREE ROOTS MUST BE TRIMMED FLUSH WITH THE TRENCH SIDES IN ORDER TO PREVENT FABRIC PUNCTURING OR TEARING OF THE FILTER FABRIC DURING SUBSEQUENT INSTALLATION PROCEDURES. THE SIDE WALLS OF THE TRENCH SHALL BE ROUGHENED WHERE SHEARED AND SEALED BY HEAVY EQUIPMENT.
- A CLASS "C" GEOTEXTILE OR BETTER (SEE SECTION 24.0, MATERIAL SPECIFICATIONS, 1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, MDE, 1994) SHALL INTERFACE BETWEEN THE TRENCH SIDE WALLS AND BETWEEN STONE RESERVOIR AND GRAVEL FILTER LAYERS. A PARTIAL LIST OF NON-WOVEN FABRICS THAT MEET THE CLASS "C" CRITERIA FOLLOWS. ANY ALTERNATIVE FILTER FABRIC MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.

AMOCO 4552 CARTRIDGE FX-805  
 GEOLON N70 MIRAFI 180-N  
 WERTEC N07

THE WIDTH OF GEOTEXTILE MUST INCLUDE SUFFICIENT MATERIAL TO CONFORM TO THE TRENCH PERIMETER IRREGULARITIES AND FOR A 6-INCH MINIMUM TOP OVERLAP. THE FILTER FABRIC SHALL BE TUCKED UNDER THE SAND LAYER ON THE BOTTOM OF THE INFILTRATION TRENCH FOR A DISTANCE OF 6 TO 12 INCHES. STONES OR OTHER ANCHORING OBJECTS SHOULD BE PLACED ON THE FABRIC AT THE EDGE OF THE TRENCH TO KEEP THE TRENCH OPEN DURING WINDY PERIODS. WHEN OVERLAPS ARE REQUIRED BETWEEN ROLLS, THE UP-HILL ROLL SHOULD LAP A MINIMUM OF 2 FEET OVER THE DOWN-HILL ROLL IN ORDER TO PROVIDE A SHINGLED EFFECT.

4. IF A 6" SAND FILTER LAYER IS PLACED ON THE BOTTOM OF THE INFILTRATION TRENCH, THE SAND FOR THE FILTRATION TRENCH SHALL BE WASHED AND MEET AASHTO-M-43, SIZE NO. 9 OR NO. 10. ANY ALTERNATIVE SAND GRADATION MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.

5. THE STONE AGGREGATE SHOULD BE PLACED IN A MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES. THE GRAVEL (ROUNDED "BANK RUN" GRAVEL IS PREFERRED) FOR THE INFILTRATION TRENCH SHALL BE WASHED AND MEET ONE OF THE FOLLOWING: AASHTO-M-43, SIZE NO. 2 OR NO. 3.

6. FOLLOWING THE STONE AGGREGATE PLACEMENT, THE FILTER FABRIC SHALL BE FOLDED OVER THE STONE AGGREGATE TO FORM A 6-INCH MINIMUM LONGITUDINAL LAP. THE DESIRED FILL SOIL OR STONE AGGREGATE SHALL BE PLACED OVER THE LAP AT SUFFICIENT INTERVALS TO MAINTAIN THE LAP DURING SUBSEQUENT BACKFILLING.

7. CARE SHALL BE EXERCISED TO PREVENT NATURAL OR FILL SOILS FROM INTERMIXING WITH THE STONE AGGREGATE. ALL CONTAMINATED STONE AGGREGATE SHALL BE REMOVED AND REPLACED WITH UNCONTAMINATED STONE AGGREGATE.

8. VOIDS MAY OCCUR BETWEEN FABRIC AND THE EXCAVATION SIDES SHALL BE AVOIDED. REMOVING BOULDERS OR OTHER OBSTACLES FROM THE TRENCH WALLS IS ONE SOURCE OF SUCH VOIDS. THEREFORE, NATURAL SOILS SHOULD BE PLACED IN THOSE VOIDS AT THE MOST CONVENIENT TIME DURING CONSTRUCTION TO ENSURE FABRIC CONFORMITY TO THE EXCAVATION SIDES.

9. VERTICALLY EXCAVATED WALLS MAY BE DIFFICULT TO MAINTAIN IN AREAS WHERE SOIL MOISTURE IS HIGH OR WHERE SOFT COHESIVE OR COHESIONLESS SOILS ARE DOMINANT. THESE CONDITIONS MAY REQUIRE LAYING BACK OF THE SIDE SLOPES TO MAINTAIN STABILITY.

10. PVC DISTRIBUTION PIPES SHALL BE SCHEDULE 40 AND MEET ASTM-D-1785. ALL FITTINGS SHALL MEET ASTM-D-2729. PERFORATIONS SHALL BE 3/8" IN DIAMETER. A PERFORATED PIPE SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT OF THE INFILTRATION TRENCH WALL. THE END OF THE PVC PIPE SHALL BE CAPPED. NOTE: PVC PIPE WITH A WALL THICKNESS CLASSIFICATION OF SDR-35 MEETING ASTM-D-3034 IS AN ACCEPTABLE SUBSTITUTE FOR THE SCHEDULE 40 PIPE.

11. THE OBSERVATION WELL IS TO CONSIST OF 6-INCH DIAMETER PERFORATED PVC SCHEDULE 40 PIPE (M278 OR F758, TYPE PS 28) WITH A CAP SET FLUSH TO FINAL PAVED SURFACE AND IS TO BE LOCATED NEAR THE LONGITUDINAL CENTER OF THE INFILTRATION TRENCH. THE PIPE SHALL HAVE A PLASTIC COLLAR WITH RISERS TO PREVENT ROTATION WHEN REMOVING THE CAP. THE SCREW TOP LID SHALL BE A CLEANOUT WITH A LOCKING MECHANISM OR SPECIAL BOLT TO DISCOURAGE VANDALISM. THE DEPTH TO THE INERT SHALL BE MARKED ON THE LID. THE PIPE SHALL BE PLACED VERTICALLY WITHIN THE GRAVEL PORTION OF THE INFILTRATION TRENCH AND A CAP PROVIDED AT THE BOTTOM OF THE PIPE. THE BOTTOM OF THE CAP SHALL REST ON THE INFILTRATION TRENCH BOTTOM.

12. CORRUGATED METAL DISTRIBUTION PIPES SHALL CONFORM TO AASHTO-M-36, AND SHALL BE ALUMINIZED IN ACCORDANCE WITH AASHTO-M-274. ALUMINIZED PIPE IN CONTACT WITH CONCRETE SHALL BE COATED WITH AN INERT COMPOUND CAPABLE OF PREVENTING THE DELETERIOUS EFFECT OF ALUMINUM ON THE CONCRETE. PERFORATED DISTRIBUTION PIPES SHALL CONFORM TO AASHTO-M-36, CLASS 2 AND SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT OF THE INFILTRATION TRENCH WALL. AN ALUMINIZED METAL PLATE SHALL BE WELDED TO THE END OF THE PIPE.

13. IF A DISTRIBUTION STRUCTURE WITH A WET WELL IS USED, A 4-INCH DRAIN PIPE SHALL BE PROVIDED AT OPPOSITE ENDS OF THE INFILTRATION TRENCH DISTRIBUTION STRUCTURE. TWO (2) CUBIC FEET OF POROUS BACKFILL MEETING AASHTO-M-43, SIZE NO. 57 SHALL BE PROVIDED AT EACH DRAIN.

14. IF A DISTRIBUTION STRUCTURE IS USED, THE MANHOLE COVER SHALL BE BOLTED TO THE FRAME.

**SAND FILTER SPECIFICATIONS**

1. MATERIAL SPECIFICATIONS FOR SAND FILTER

THE ALLOWABLE MATERIALS FOR SAND FILTER CONSTRUCTION ARE DETAILED IN TABLE B.3.1. (SEE PAGE SDP-3)

2. SAND FILTER TESTING SPECIFICATIONS

UNDERGROUND SAND FILTERS, FACILITIES WITHIN SENSITIVE GROUNDWATER AQUIFERS, AND FILTERS DESIGNED TO SERVE URBAN HOT SPOTS ARE TO BE TESTED FOR WATER TIGHTNESS PRIOR TO PLACEMENT OF FILTER MEDIA. ENTRANCES AND EXITS SHOULD BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO LEAKAGE FOR A PERIOD OF 8 HOURS.

ALL OVERFLOW WEIRS, MULTIPLE ORIFICES AND FLOW DISTRIBUTION SLOTS ARE TO BE FIELD-TESTED TO VERIFY ADEQUATE DISTRIBUTION OF FLOWS.

3. SAND FILTER CONSTRUCTION SPECIFICATIONS

PROVIDE SUFFICIENT MAINTENANCE ACCESS (I.E., 12-FOOT-WIDE ROAD WITH LEGALLY RECORDED EASEMENT). VEGETATED ACCESS SLOPES ARE TO BE MAXIMUM OF 10%; GRAVEL SLOPES TO 15%; PAVED SLOPES TO 25%. ABSOLUTELY NO RUNOFF IS TO ENTER THE FILTER UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED. SURFACE OR FILTER BED IS TO BE LEVEL.

ALL UNDERGROUND SAND FILTERS SHOULD BE CLEARLY DELINEATED WITH SIGNS SO THAT THEY MAY BE LOCATED WHEN MAINTENANCE IS DUE.

SURFACE SAND FILTERS MAY BE PLANTED WITH APPROPRIATE GRASSES. SEE APPENDIX A. "POCKET" SAND FILTERS (AND RESIDENTIAL BIORETENTION FACILITIES TREATING AREAS LARGER THAN AN ACRE) SHALL BE SIZED WITH A STONE "WINDOW" THAT COVERS APPROXIMATELY 10% OF THE FILTER AREA. THIS "WINDOW" SHALL BE FILLED PEA GRAVEL (3/8 INCH STONE).

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS**

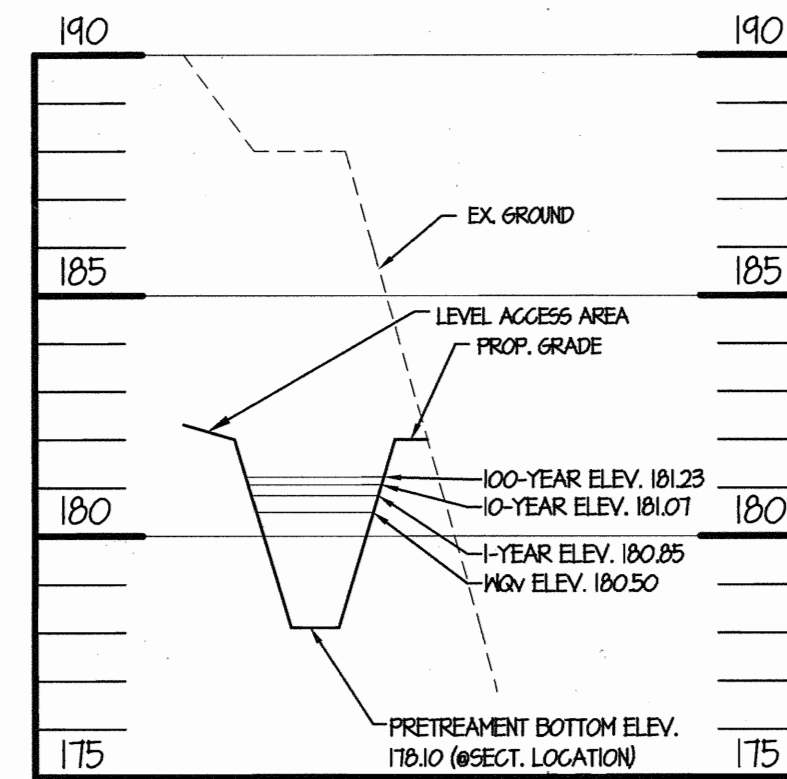
- THE STORMWATER WETLAND FACILITY SHALL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHALL BE PERFORMED DURING WET WEATHER TO DETERMINE IF THE FACILITY IS FUNCTIONING PROPERLY.
- THE TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF ONCE A YEAR, WHEN VEGETATION REACHES 18"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

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/3/02  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*[Signature]* 4/4/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*[Signature]* 2/1/02  
 DIRECTOR

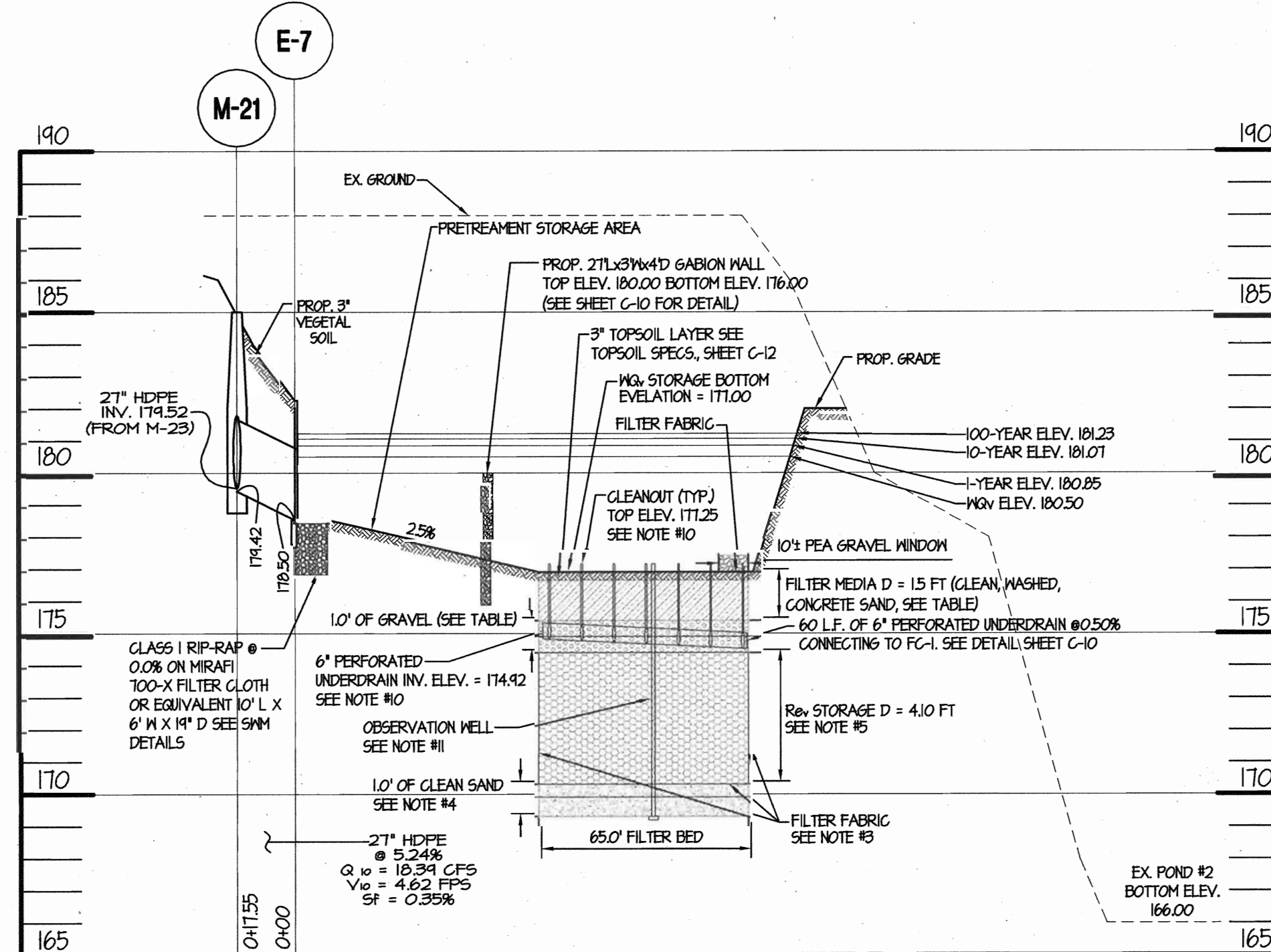
**TABLE B.3.1 MATERIAL SPECIFICATIONS FOR SAND FILTERS**

MATERIAL	SPECIFICATION/TEST METHOD	SIZE	NOTES
SAND	CLEAN AASHTO-M-6 OR ASTM-C-33 CONCRETE SAND	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DABASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
PEAT	ASH CONTENT: <15% PH RANGE: 5.2 TO 4.9 LOOSE BULK DENSITY 0.12 TO 0.15 G/CC	N/A	THE MATERIAL MUST BE REED-SOGE HEMIC PEAT, SHREDDED, UNCOMPACTED, UNIFORM, AND CLEAN.
LEAF COMPOST		N/A	
UNDERDRAIN GRAVEL	AASHTO-M-43	0.375" TO 0.75"	
GEOTEXTILE FABRIC (IF REQUIRED)	ASTM-D-4833 (PUNCTURE STRENGTH-125 LB.) ASTM-D-4832 (TENSILE STRENGTH-300 LB.)	0.08" THICK EQUIVALENT OPENING SIZE OF #80 SIEVE	MUST MAINTAIN 125 GPM PER SQ. FT. FLOW RATE. NOTE: A 4" PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS.
IMPERMEABLE LINER (IF REQUIRED)	ASTM-D-4833 (THICKNESS) ASTM-D-412 (TENSILE STRENGTH 1,100 LB., ELONGATION 200%) ASTM-D-624 (TEAR RESISTANCE - 150 LB./IN.) ASTM-D-471 (WATER ADSORPTION: +8 TO +28% MASS)	30 MIL THICKNESS	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR AASHTO-M-278	4"-6" RIGID SCH. 40 PVC OR SDR35	3/4" PERFORATED ON CENTER, 4 HOLES PER ROW. MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES
CONCRETE (CAST-IN-PLACE)	MSHA STANDARDS AND SPECS. SECTION 902, MIX NO. 3, Fc = 3500 PSI, NORMAL WEIGHT, AIR ENTRAINING; REINFORCING TO MEET ASTM-615-60	N/A	ON SITE TESTING OF POURED-IN-PLACE CONCRETE REQUIRED: 28 DAY STRENGTH AND SLUMP TEST; ALL CONCRETE DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND.
CONCRETE (PRECAST)	PER PRE-CAST MANUFACTURER	N/A	SEE ABOVE NOTE
NON-REBAR STEEL	ASTM A-36	N/A	STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM-A-123

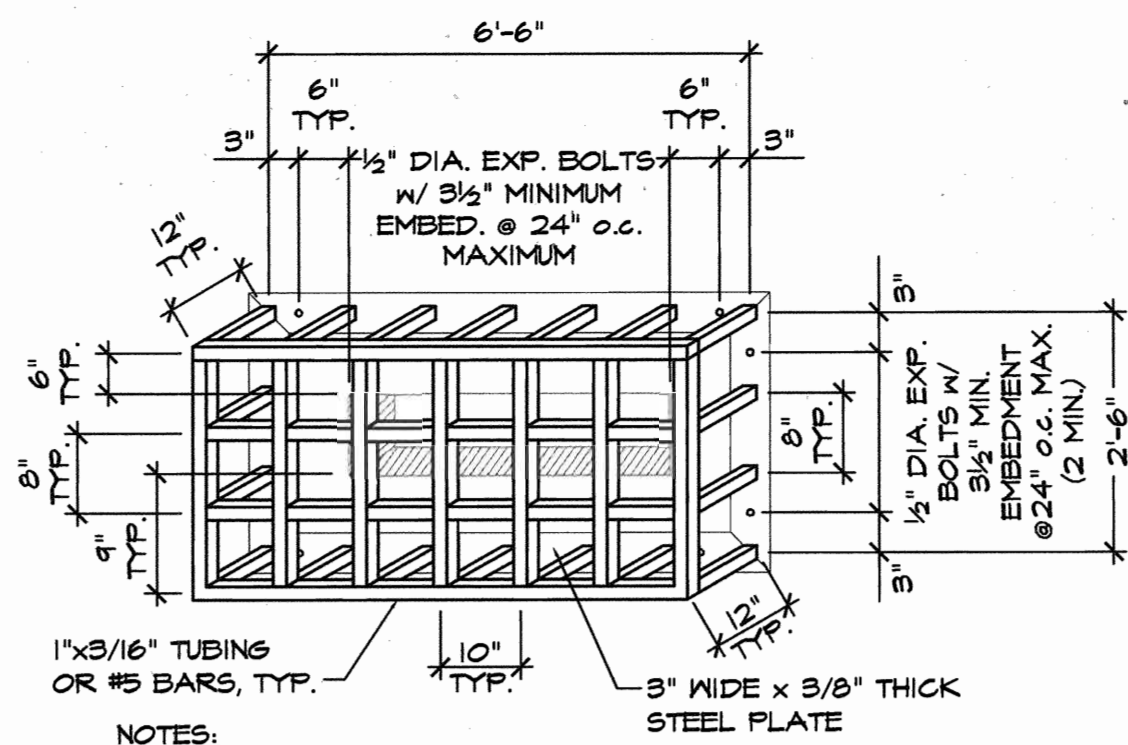


**SWM SECTION 'D'**

SCALE: HOR. 1" = 40'  
 VERT. 1" = 4'



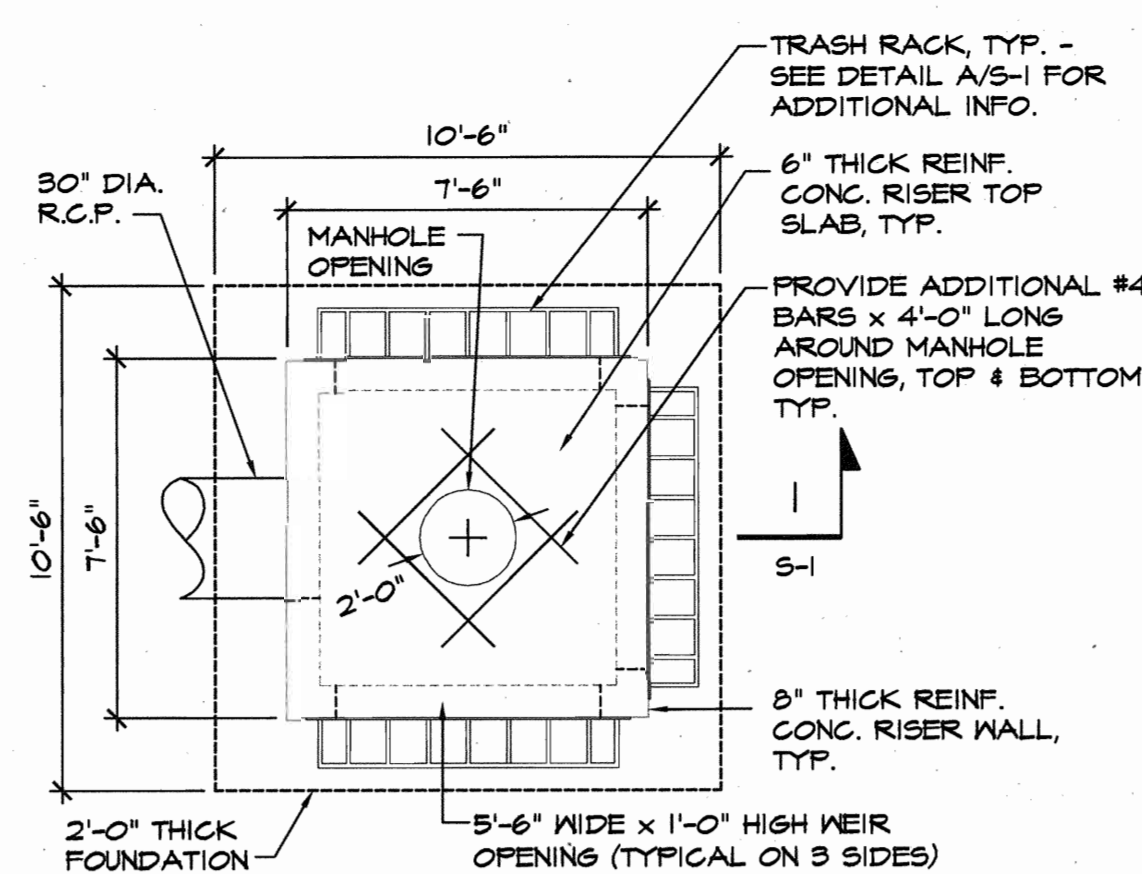




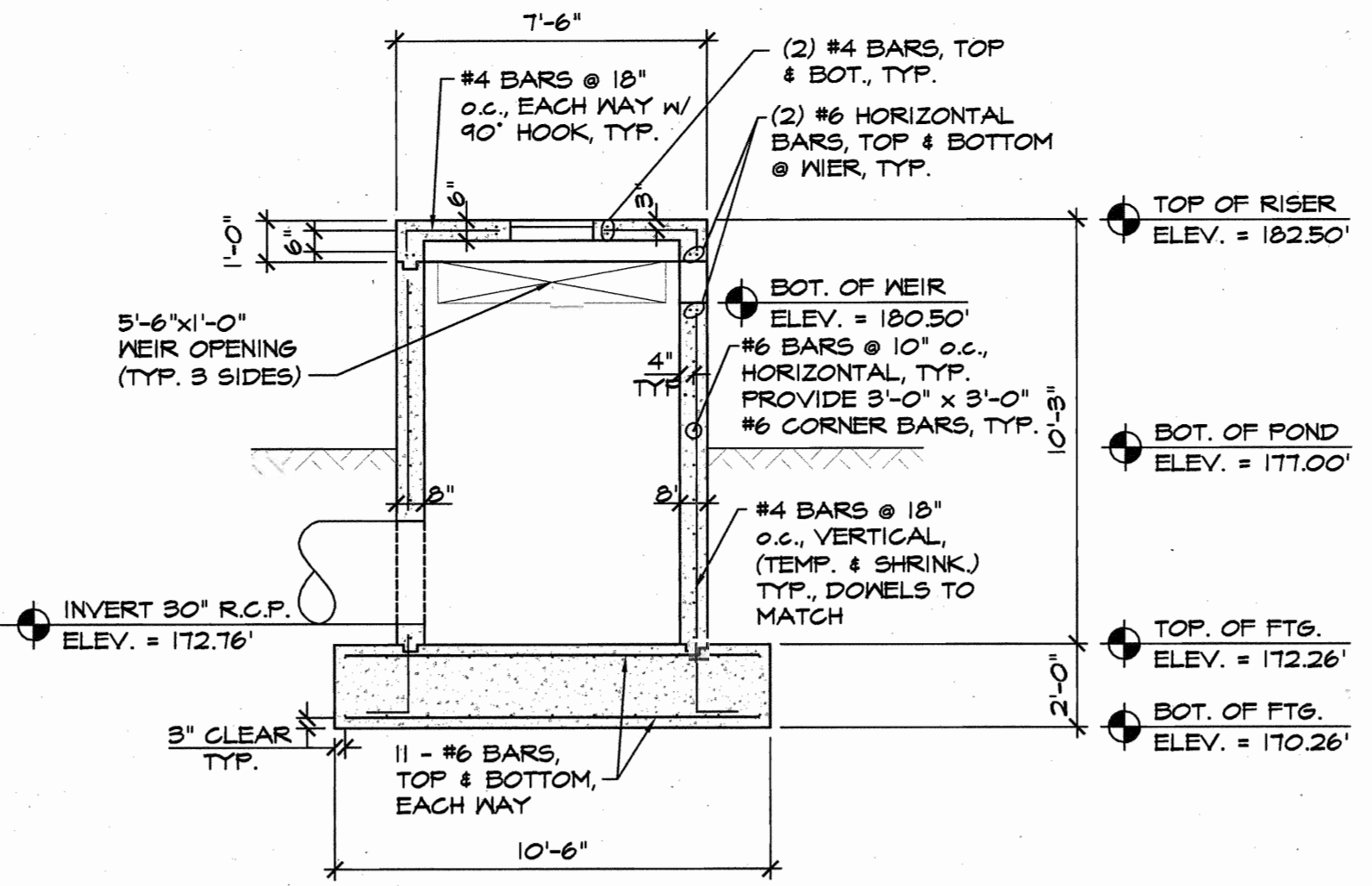
- NOTES:
- ALL MATERIALS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
  - #5 BARS SHALL BE WELDED AT CROSS-POINTS AND WHERE BAR MEETS STEEL CONNECTION PLATE.
  - TRASH RACK BARS ARE TO BE PAINTED "BATTLESHIP GREY" IN ACCORDANCE WITH HOW. CO. STANDARDS.

TYPICAL 5'-6" WEIR TRASH RACK

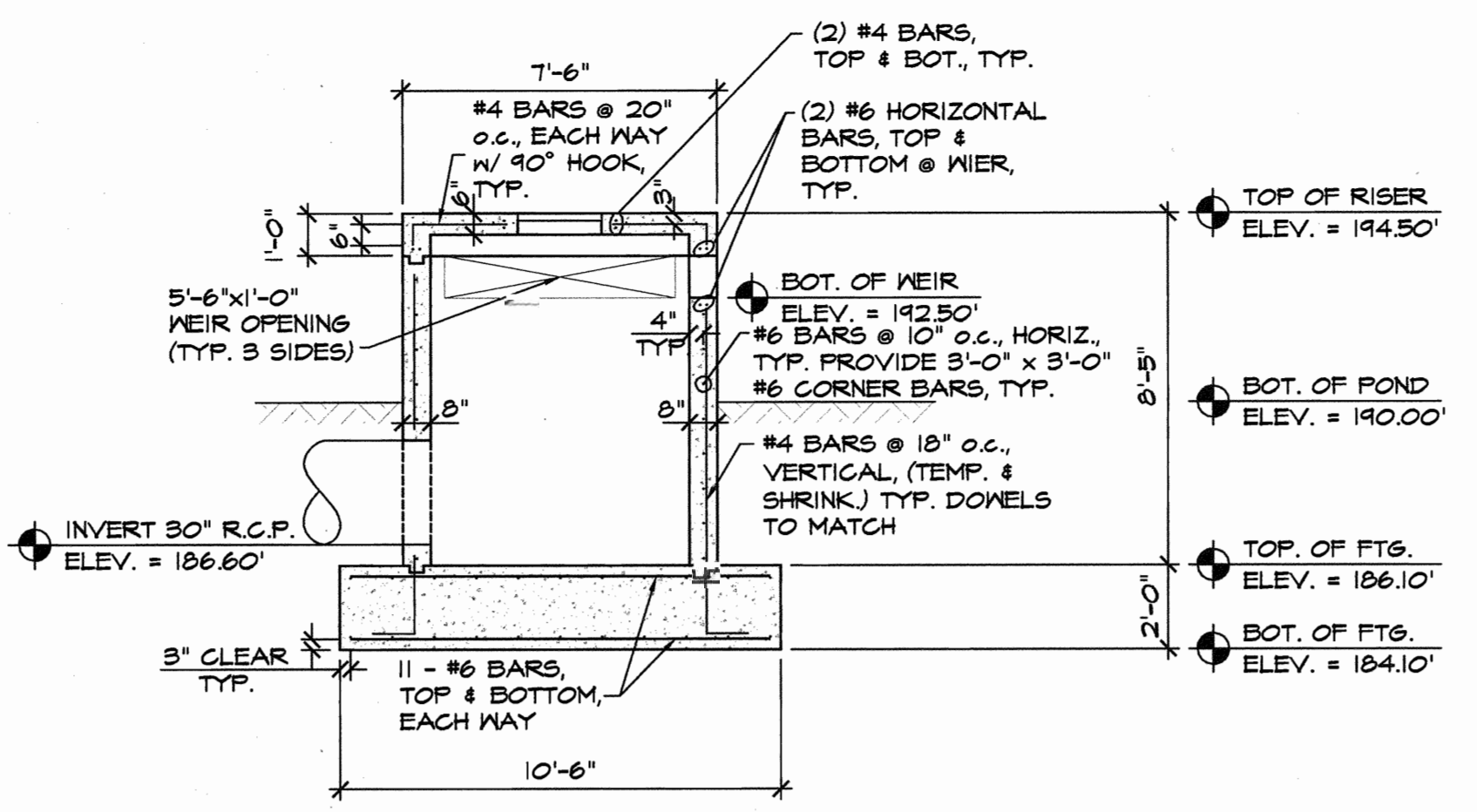
DETAIL A S/1  
N.T.S.



TYP. RISER PLAN  
SCALE: 1/4" = 1'-0"



TYPICAL @ R2  
SECTION 1/S-1  
SCALE: 1/4" = 1'-0"



TYPICAL @ R-1  
SECTION 1/S-1  
SCALE: 1/4" = 1'-0"

SWM PIPE SCHEDULE		
SIZE	TYPE	LENGTH
6"	PERF. PVC (SCH. 80)	96'
6"	PVC (SCH. 40)	282'
24"	CLASS IV RCP	12'
27"	CLASS IV RCP	27'
30"	CLASS IV RCP	260'

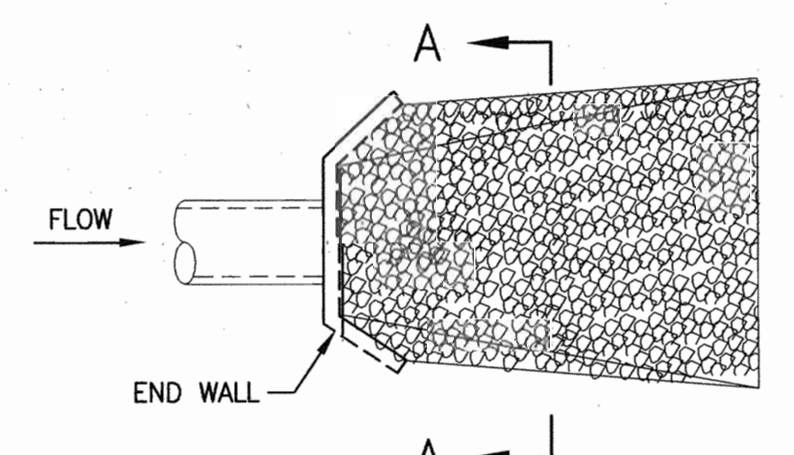
SWM FITTINGS SCHEDULE		
SIZE	TYPE	NUMBER
6"x30"	FIELD CONNECTION	1
N/A*	RISER	2
TYPE C	ENDWALL	2
6"	CLEAN-OUTS	28

NOTE:  
EXISTING UNCONTROLLED FILL, TOPSOIL AND UNSTABLE MATERIALS ARE NOT CONSIDERED SUITABLE FOR SUPPORT OF THE PROPOSED CONCRETE STRUCTURES. PRIOR TO CONSTRUCTION OF THE OUTFALLS, AREAS SUPPORTING THE PROPOSED STRUCTURES SHOULD BE STRIPPED AND GRUBBED TO REMOVE UNCONTROLLED FILL, TOPSOIL AND ANY ORGANIC MATTER. AFTER REMOVAL, EXISTING FILL MEETING THE PROJECT REQUIREMENTS FOR STRUCTURAL FILL, AND FREE DELETERIOUS MATERIALS MAY BE USED.

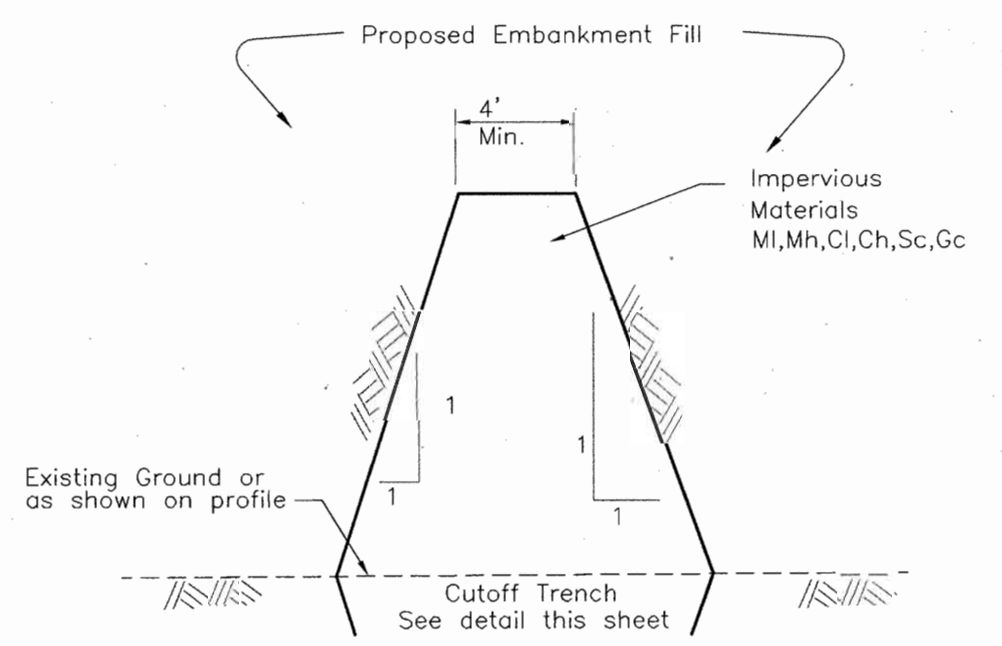
COORDINATES TO CENTER OF STRUCTURE FOR RISERS, MIDPOINT OF FRONT FACE OF HEADWALLS

STR. NO.	SWM STRUCTURE SCHEDULE		LOCATION	
	TOP ELEV.	INV. ELEV.	NORTHING	EASTING
R-1	194.50	186.60	557,623.95	1,380,999.52
R-2	182.50	172.76	557,183.85	1,381,172.69
E-1	183.50	180.00	557,634.58	1,380,930.89
E-3	193.50	190.00	557,803.91	1,381,010.89
E-5	189.50	186.00	557,094.50	1,381,347.42
E-7	182.25	178.50	557,207.19	1,381,130.64

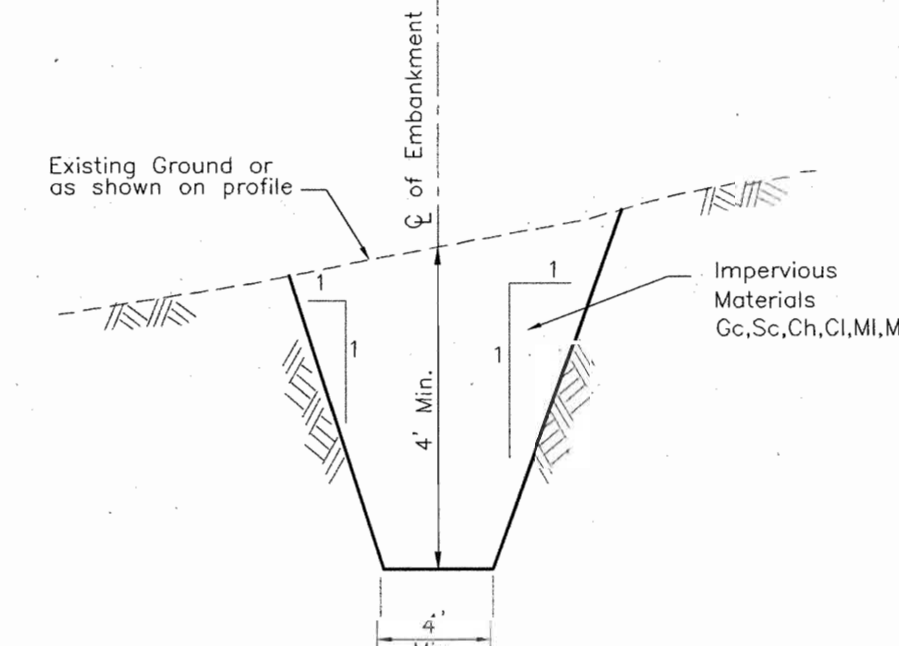
\* FOR RISER DIMENSIONS SEE DETAILS THIS SHEET.



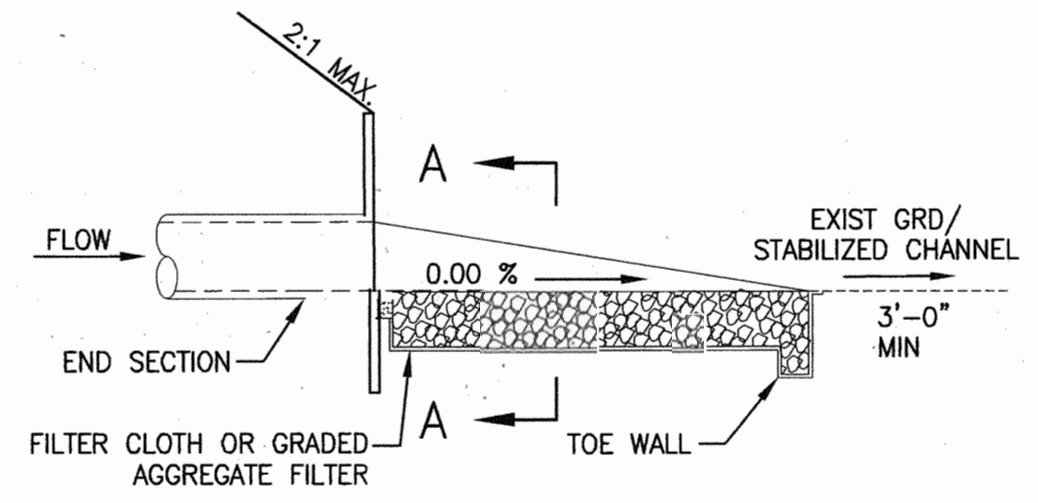
DISCHARGE TO UNCONFINED SECTION (FLARED OUTLET) MINIMUM TAILWATER CONDITION  
PLAN VIEW



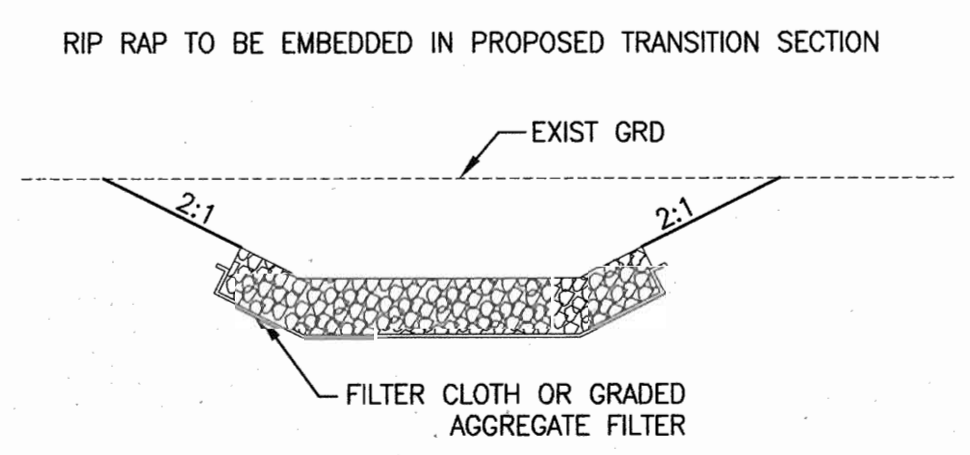
CORE TRENCH  
NOT TO SCALE



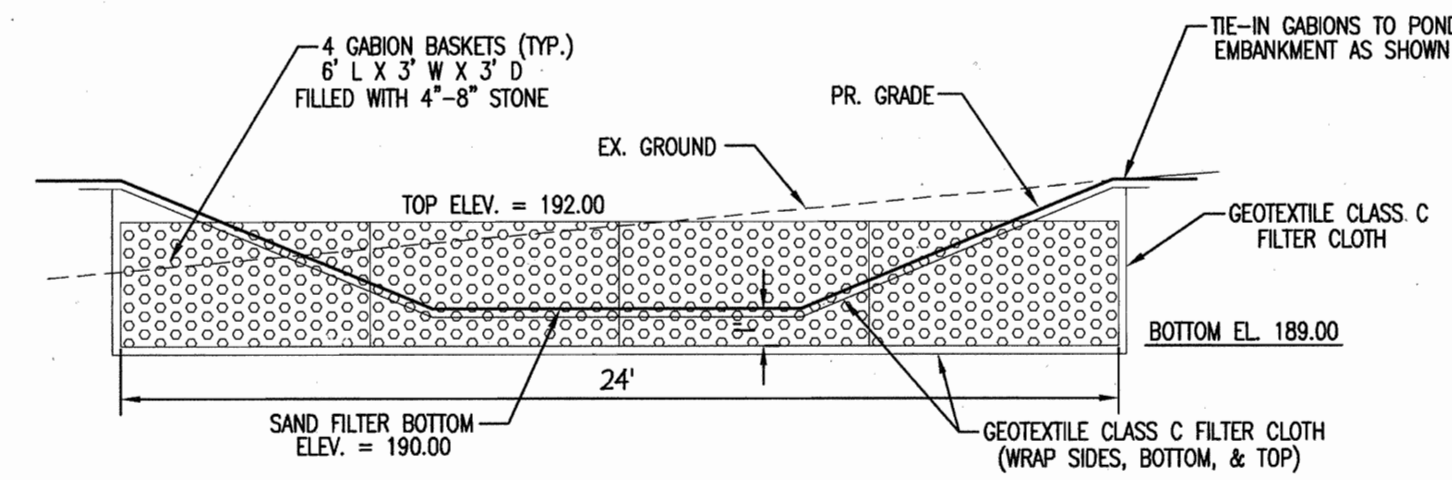
CUTOFF TRENCH  
NOT TO SCALE



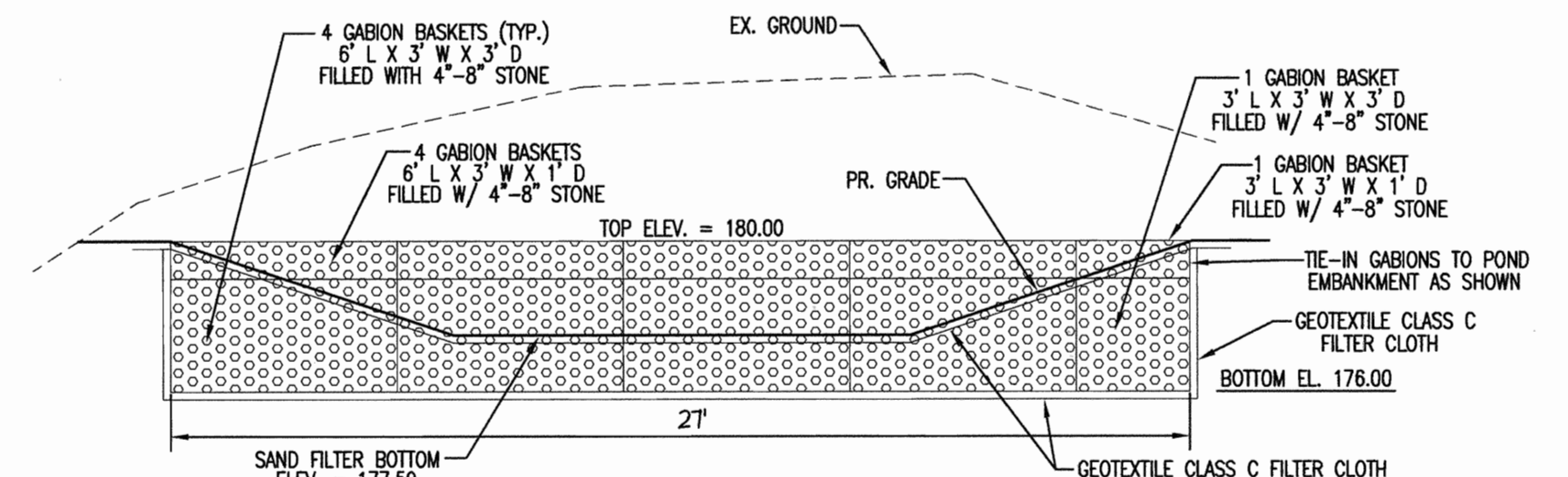
PROFILE



RIP RAP OUTFALL  
NOT TO SCALE

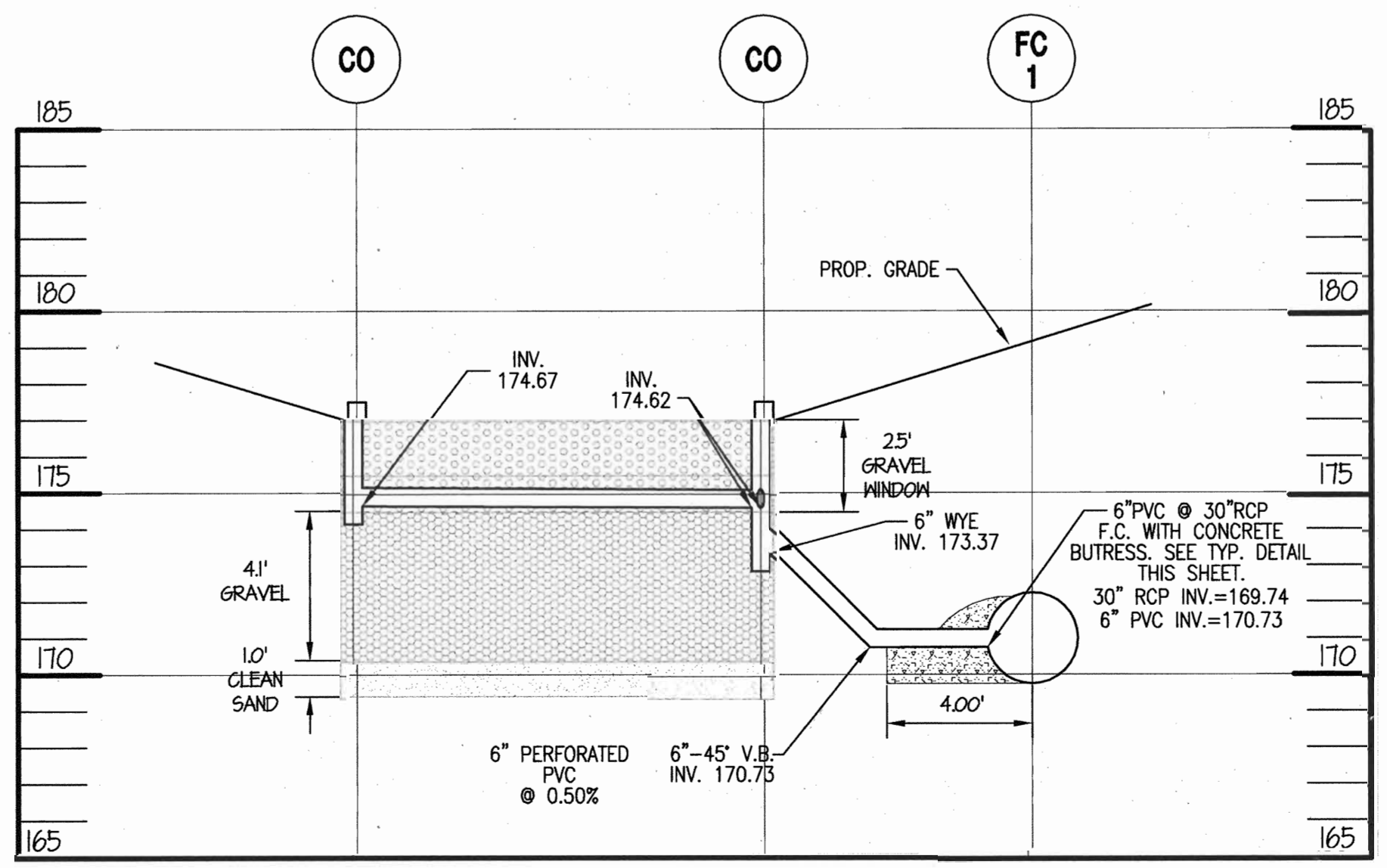


GABION OUTFALL DETAIL SWMF #1  
NOT TO SCALE

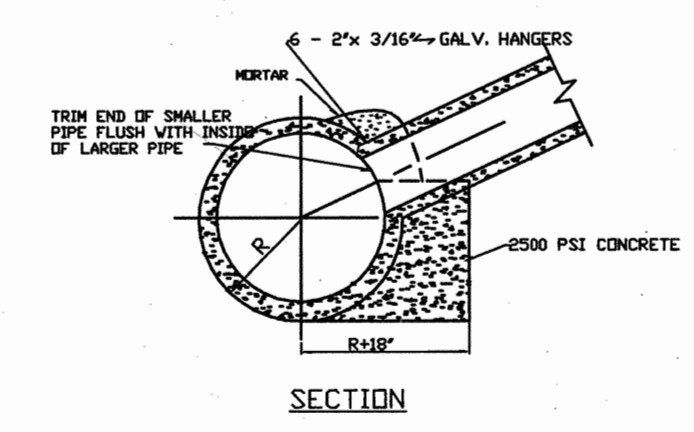


GABION OUTFALL DETAIL SWMF #2  
NOT TO SCALE

- INSTALLATION NOTES:
- GABION BASKETS SHALL BE CONSTRUCTED OF GALVANIZED U.S. GAUGE 11 MESH WIRE OR APPROVED EQUIVALENT.
  - GABION INSTALLATION SHALL BE PERFORMED ACCORDING TO GABION MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.
  - TOP GABION BASKETS TO BE STAGGERED OVER BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.
  - TOP GABION BASKETS TO BE FASTENED TO BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.



SWM SECTION 'H'  
SCALE: HOR. 1" = 4'  
VERT. 1" = 4'



STANDARD FIELD CONNECTION  
NTS

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/3/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* 2/4/03  
CHIEF, DIVISION OF LAND DEVELOPMENT

*[Signature]* 2/1/03  
DIRECTOR

OWNER/DEVELOPER: DAVIS EMORY  
FAX NO.: (410) 712-0620  
B. DAYTIME TELEPHONE: (410) 712-4466

C. COMPANY: TANGO, LLC

D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130

E. CITY: HANOVER STATE: MD ZIP: 21076



**MORRIS & RITCHIE ASSOCIATES, INC.**  
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

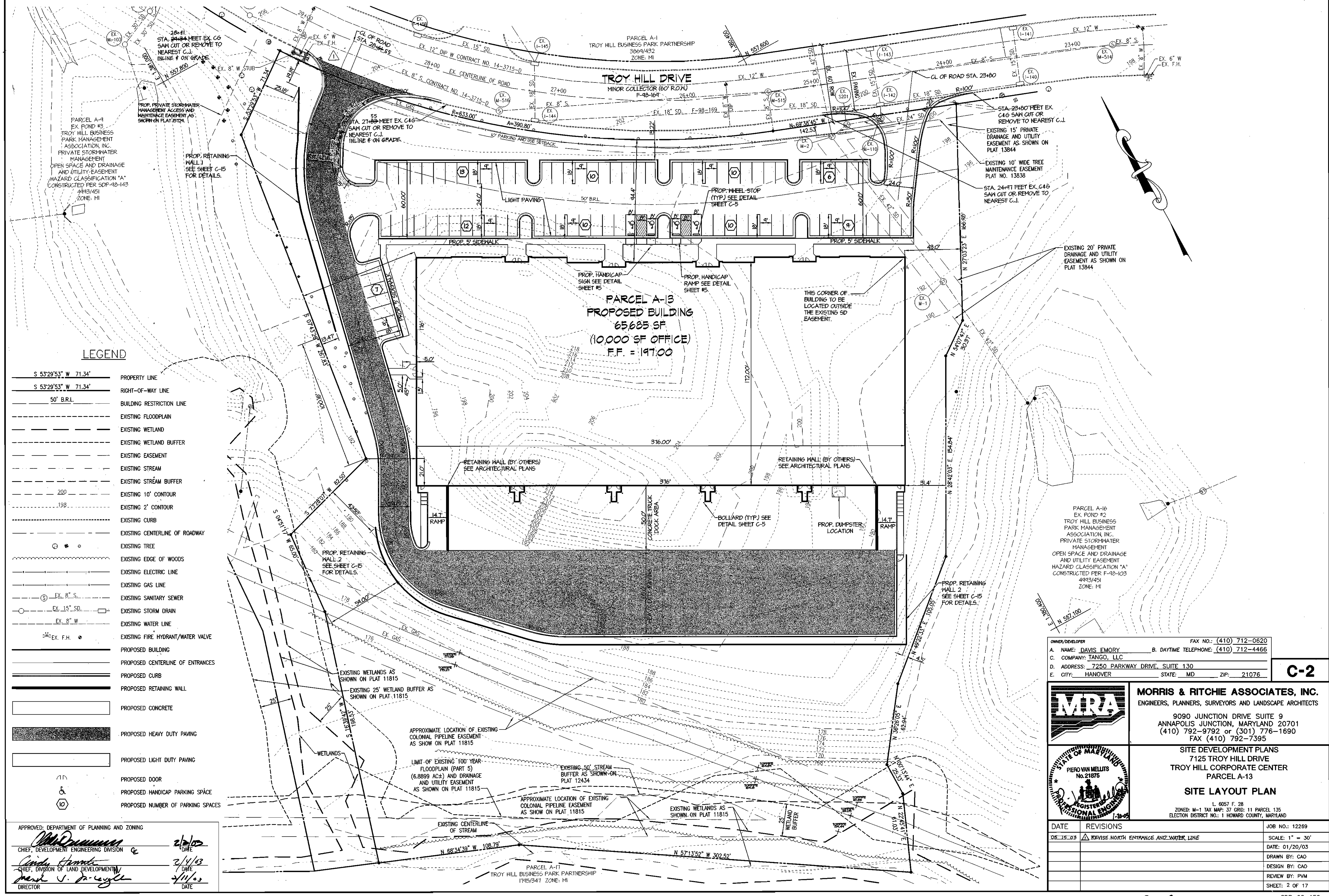
9090 JUNCTION DRIVE SUITE 9  
ANNAPOLIS JUNCTION, MARYLAND 20701  
(410) 792-9792 or (301) 776-1690  
FAX (410) 792-7395



SITE DEVELOPMENT PLANS  
7125 TROY HILL DRIVE  
TROY HILL CORPORATE CENTER  
PARCEL A-13  
**STORMWATER MANAGEMENT NOTES AND DETAILS**

DATE	REVISIONS	JOB NO.:
		12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 10 OF 17





**LEGEND**

- S 53°29'53" W 71.34' — PROPERTY LINE
- S 53°29'53" W 71.34' — RIGHT-OF-WAY LINE
- 50' B.R.L. — BUILDING RESTRICTION LINE
- — EXISTING FLOODPLAIN
- — EXISTING WETLAND
- — EXISTING WETLAND BUFFER
- — EXISTING EASEMENT
- — EXISTING STREAM
- — EXISTING STREAM BUFFER
- 200 — EXISTING 10' CONTOUR
- 198 — EXISTING 2' CONTOUR
- — EXISTING CURB
- — EXISTING CENTERLINE OF ROADWAY
- \* ○ — EXISTING TREE
- — EXISTING EDGE OF WOODS
- — EXISTING ELECTRIC LINE
- — EXISTING GAS LINE
- — EXISTING SANITARY SEWER
- — EXISTING STORM DRAIN
- — EXISTING WATER LINE
- — EXISTING FIRE HYDRANT/WATER VALVE
- — PROPOSED BUILDING
- — PROPOSED CENTERLINE OF ENTRANCES
- — PROPOSED CURB
- — PROPOSED RETAINING WALL
- — PROPOSED CONCRETE
- — PROPOSED HEAVY DUTY PAVING
- — PROPOSED LIGHT DUTY PAVING
- — PROPOSED DOOR
- — PROPOSED HANDICAP PARKING SPACE
- — PROPOSED NUMBER OF PARKING SPACES

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/2/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* 2/14/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT

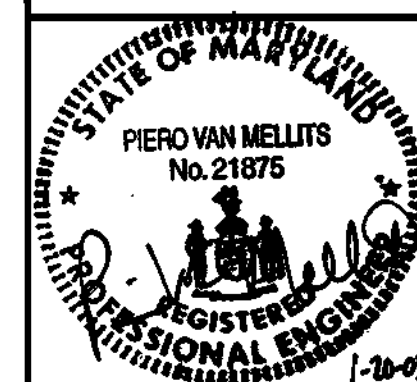
*[Signature]* 2/11/03  
 DIRECTOR

OWNER/DEVELOPER: TROY HILL BUSINESS PARK MANAGEMENT ASSOCIATION, INC.  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-0620  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076

**C-2**



**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
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 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395

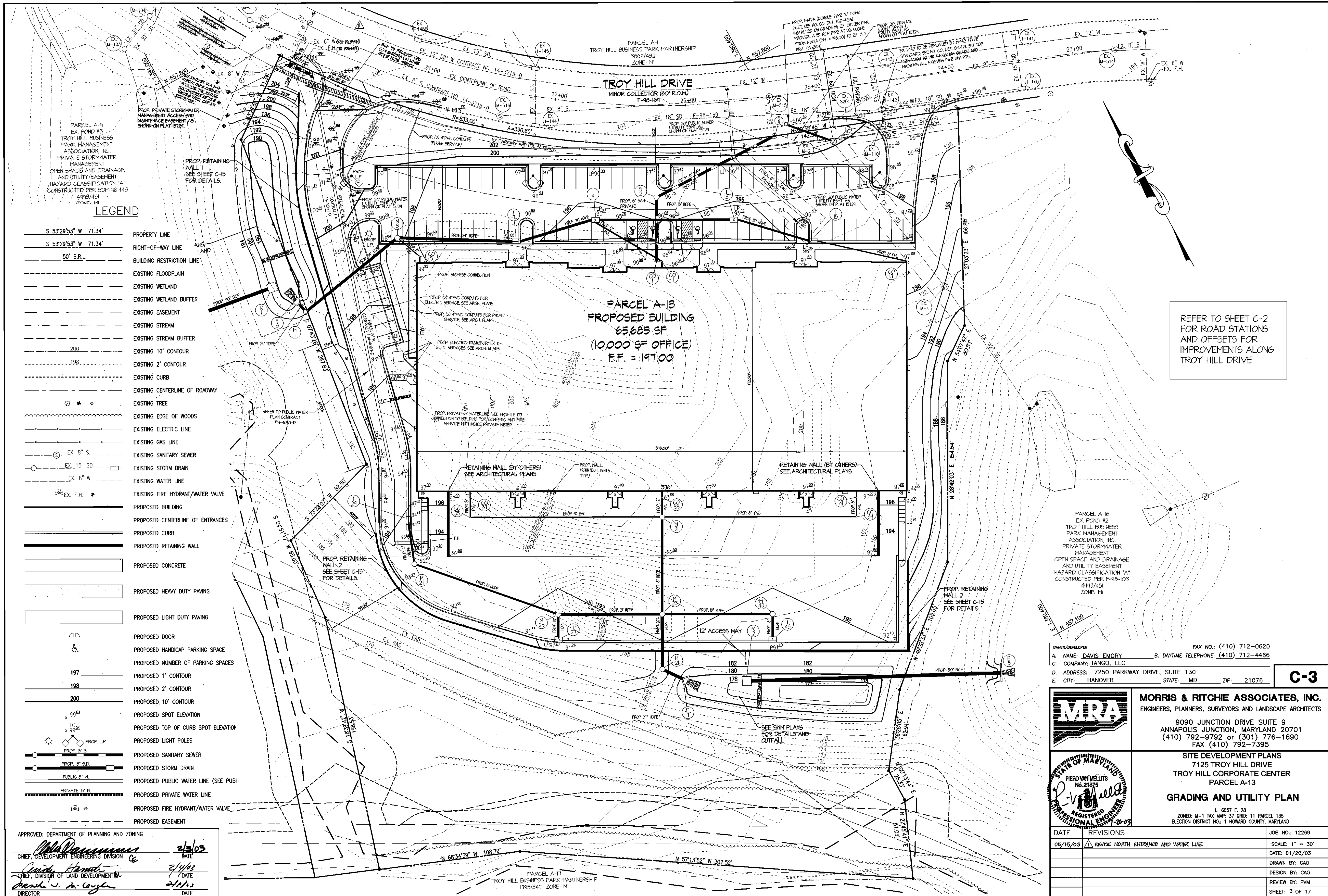


**SITE DEVELOPMENT PLANS**  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
**SITE LAYOUT PLAN**

DATE	REVISIONS	JOB NO.:
05-15-03	REVISION NORTH ENTRANCE AND WATER LINE	12269

SCALE: 1" = 30'  
 DATE: 01/20/03  
 DRAWN BY: CAO  
 DESIGN BY: CAO  
 REVIEW BY: PVM  
 SHEET: 2 OF 17





**LEGEND**

- S 53°29'53" W 71.34'
- S 53°29'53" W 71.34'
- 50' B.R.L.
- PROPERTY LINE
- RIGHT-OF-WAY LINE
- BUILDING RESTRICTION LINE
- EXISTING FLOODPLAIN
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- EXISTING EASEMENT
- EXISTING STREAM
- EXISTING STREAM BUFFER
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING CURB
- EXISTING CENTERLINE OF ROADWAY
- EXISTING TREE
- EXISTING EDGE OF WOODS
- EXISTING ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER LINE
- EXISTING FIRE HYDRANT/WATER VALVE
- PROPOSED BUILDING
- PROPOSED CENTERLINE OF ENTRANCES
- PROPOSED CURB
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED HEAVY DUTY PAVING
- PROPOSED LIGHT DUTY PAVING
- PROPOSED DOOR
- PROPOSED HANDICAP PARKING SPACE
- PROPOSED NUMBER OF PARKING SPACES
- PROPOSED 1' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED TOP OF CURB SPOT ELEVATION
- PROPOSED LIGHT POLES
- PROPOSED SANITARY SEWER
- PROPOSED STORM DRAIN
- PROPOSED PUBLIC WATER LINE (SEE PUBI)
- PROPOSED PRIVATE WATER LINE
- PROPOSED FIRE HYDRANT/WATER VALVE
- PROPOSED EASEMENT

REFER TO SHEET C-2 FOR ROAD STATIONS AND OFFSETS FOR IMPROVEMENTS ALONG TROY HILL DRIVE

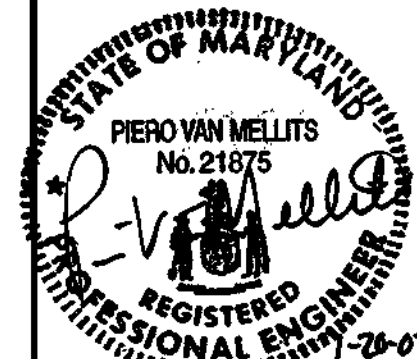
PARCEL A-16  
EX. POND #2  
TROY HILL BUSINESS PARK MANAGEMENT ASSOCIATION, INC.  
PRIVATE STORMWATER MANAGEMENT  
OPEN SPACE AND DRAINAGE AND UTILITY EASEMENT  
HAZARD CLASSIFICATION "A"  
CONSTRUCTED PER F-40-103  
4993/451  
ZONE: M1

OWNER/DEVELOPER: DAVIS EMORY  
A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
C. COMPANY: TANGO, LLC  
D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
E. CITY: HANOVER STATE: MD ZIP: 21076

**C-3**



**MORRIS & RITCHIE ASSOCIATES, INC.**  
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
9090 JUNCTION DRIVE SUITE 9  
ANNAPOLIS JUNCTION, MARYLAND 20701  
(410) 792-9792 or (301) 776-1690  
FAX (410) 792-7395



**SITE DEVELOPMENT PLANS**  
TROY HILL CORPORATE CENTER  
PARCEL A-13  
**GRADING AND UTILITY PLAN**  
L. 6057 F. 28  
ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

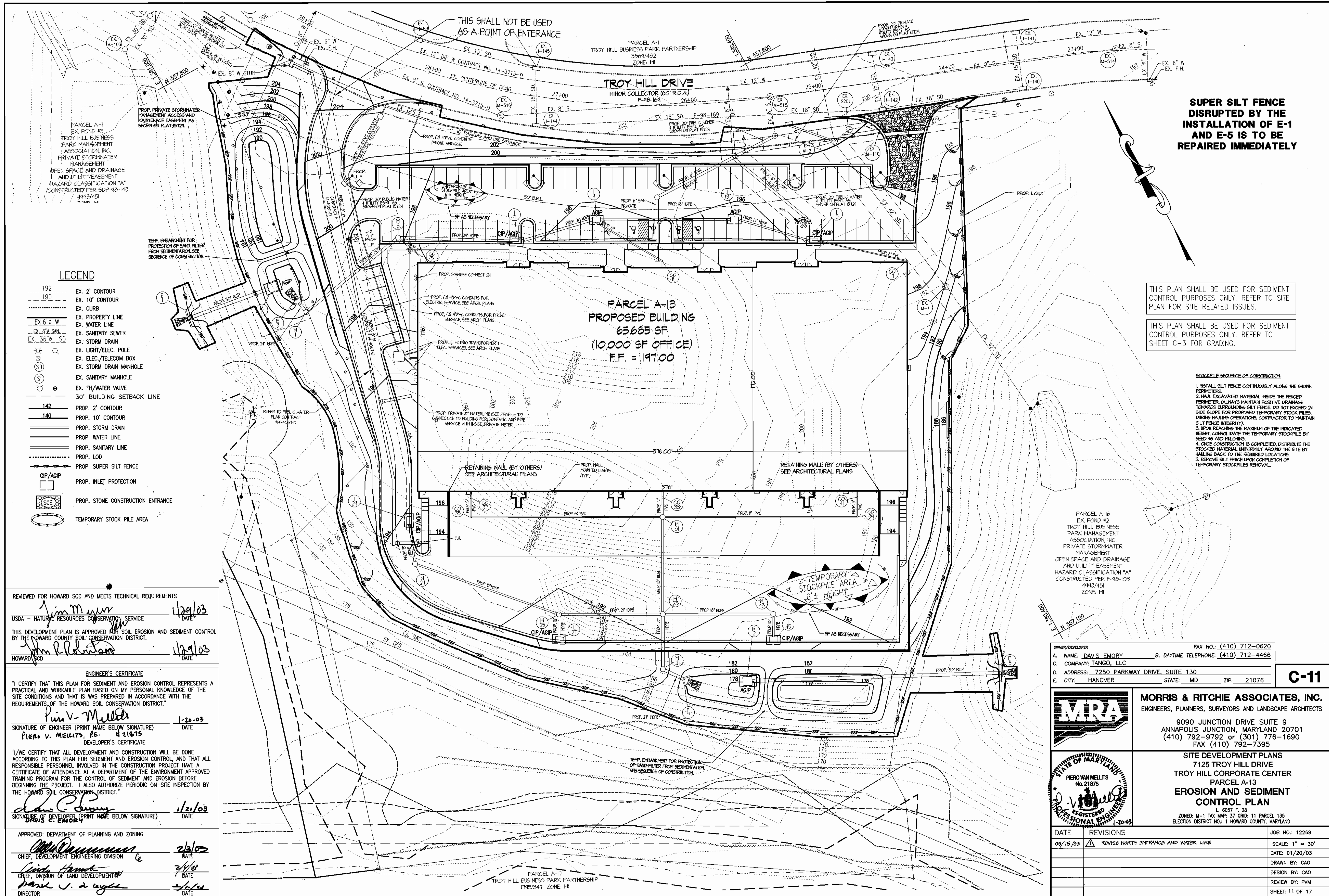
APPROVED: DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 2/3/03  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 2/4/03  
  
 DIRECTOR  
 DATE: 2/11/03

DATE	REVISIONS	JOB NO.:
05/15/03	REVISE NORTH ENTRANCE AND WATER LINE	12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 3 OF 17

SDP-02-150

SDP-02-150





**SUPER SILT FENCE DISRUPTED BY THE INSTALLATION OF E-1 AND E-5 IS TO BE REPAIRED IMMEDIATELY**

THIS PLAN SHALL BE USED FOR SEDIMENT CONTROL PURPOSES ONLY. REFER TO SITE PLAN FOR SITE RELATED ISSUES.

THIS PLAN SHALL BE USED FOR SEDIMENT CONTROL PURPOSES ONLY. REFER TO SHEET C-3 FOR GRADING.

- STOCKPILE SEQUENCE OF CONSTRUCTION:**
1. INSTALL SILT FENCE CONTINUOUSLY ALONG THE SHOWN PERIMETERS.
  2. Haul excavated material inside the fenced perimeter. ALWAYS MAINTAIN POSITIVE DRAINAGE TOWARDS SURROUNDING SILT FENCE. DO NOT EXCEED 24" SIDE SLOPE FOR PROPOSED TEMPORARY STOCK PILES. DURING HAULING OPERATIONS, CONTRACTOR TO MAINTAIN SILT FENCE INTEGRITY.
  3. UPON REACHING THE MAXIMUM OF THE INDICATED HEIGHT, CONSOLIDATE THE TEMPORARY STOCKPILE BY SEEDING AND MULCHING.
  4. ONCE CONSTRUCTION IS COMPLETED, DISTRIBUTE THE STOCKPILED MATERIAL UNIFORMLY AROUND THE SITE BY HAULING BACK TO THE REQUIRED LOCATIONS.
  5. REMOVE SILT FENCE UPON COMPLETION OF TEMPORARY STOCKPILE REMOVAL.

**LEGEND**

- 192 --- EX. 2' CONTOUR
- 190 --- EX. 10' CONTOUR
- --- EX. CURB
- EX. 6" W --- EX. PROPERTY LINE
- EX. 8" S.W. --- EX. WATER LINE
- EX. 36" S.D. --- EX. SANITARY SEWER
- --- EX. STORM DRAIN
- --- EX. LIGHT/ELEC. POLE
- --- EX. ELEC./TELECOM BOX
- --- EX. STORM DRAIN MANHOLE
- --- EX. SANITARY MANHOLE
- --- EX. FH/WATER VALVE
- --- 30' BUILDING SETBACK LINE
- 142 --- PROP. 2' CONTOUR
- 140 --- PROP. 10' CONTOUR
- --- PROP. STORM DRAIN
- --- PROP. WATER LINE
- --- PROP. SANITARY LINE
- --- PROP. LOD
- --- PROP. SUPER SILT FENCE
- CIP/AGIP --- PROP. INLET PROTECTION
- SCE --- PROP. STONE CONSTRUCTION ENTRANCE
- --- TEMPORARY STOCK PILE AREA

**PARCEL A-13  
PROPOSED BUILDING  
65,685 SF  
(10,000 SF OFFICE)  
F.F. = 197.00**

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS  
 USA - NATURAL RESOURCES CONSERVATION SERVICE 1/29/03  
 DATE  
 THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.  
 HOWARD SCD 1/29/03  
 DATE

**ENGINEER'S CERTIFICATE**  
 "I CERTIFY THAT THIS PLAN FOR SEDIMENT AND EROSION CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IS WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."  
 Pina V. Mellits 1-20-03  
 SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE  
 Pina V. Mellits, P.E. #21875  
 DEVELOPER'S CERTIFICATE

"I, WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN FOR SEDIMENT AND EROSION CONTROL, AND THAT ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."  
 Davis E. Emory 1/21/03  
 SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE  
 DAVIS E. EMORY

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 2/3/03  
 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT 2/4/03  
 DATE  
 DIRECTOR 2/1/03  
 DATE

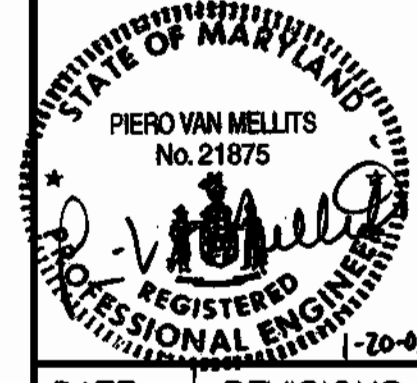
PARCEL A-16  
 EX. POND #2  
 TROY HILL BUSINESS PARK MANAGEMENT ASSOCIATION, INC.  
 PRIVATE STORMWATER MANAGEMENT  
 OPEN SPACE AND DRAINAGE AND UTILITY EASEMENT  
 HAZARD CLASSIFICATION "A"  
 CONSTRUCTED PER F-40-103  
 4493/451  
 ZONE: M1

OWNER/DEVELOPER FAX NO.: (410) 712-0620  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076

**C-11**



**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
 9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
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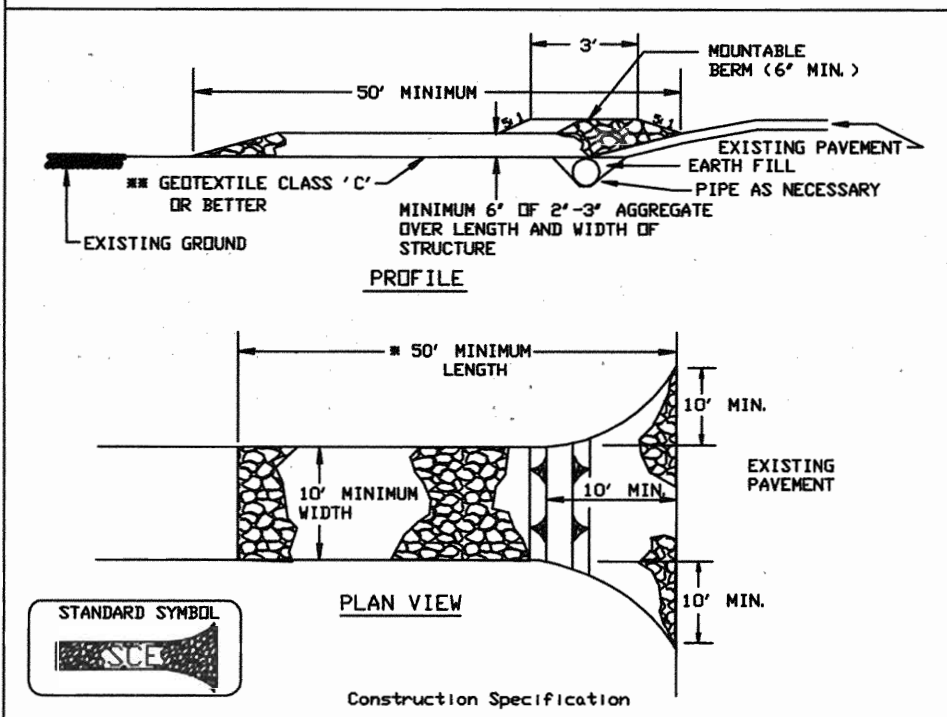


**SITE DEVELOPMENT PLANS  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
 EROSION AND SEDIMENT CONTROL PLAN**  
 L. 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.:
08/15/03	REVISE NORTH ENTRANCE AND WATER LINE	12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 11 OF 17



DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

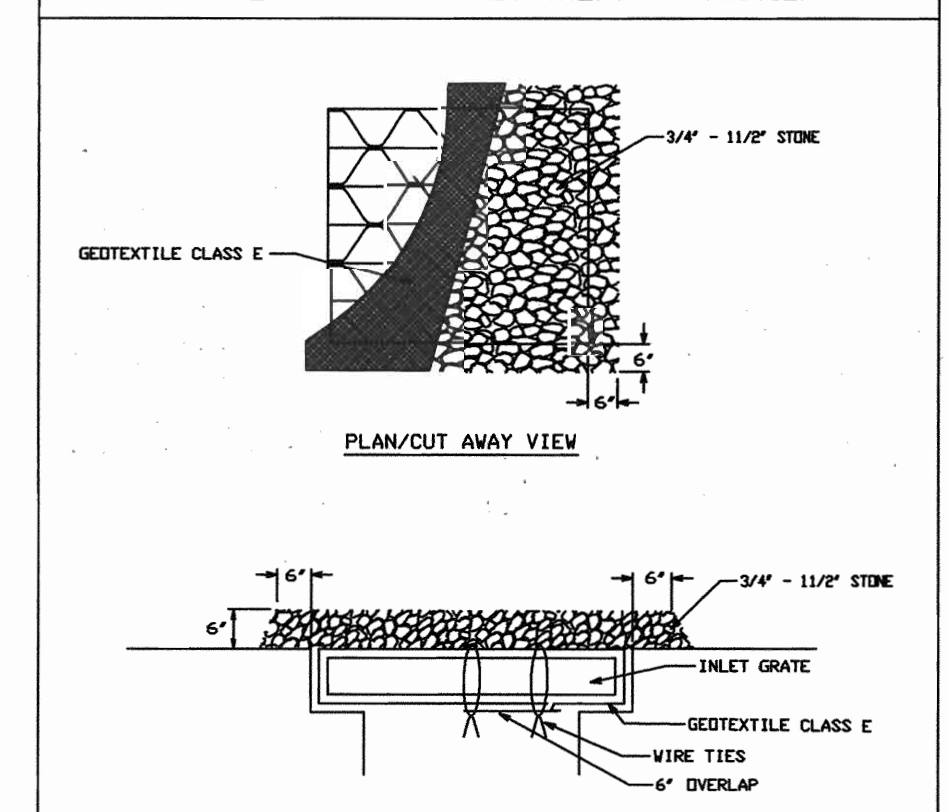


**Construction Specifications**

- Length - minimum of 30' (+30' for single residence lot).
- Width - 10' minimum, should be flared at the existing road to provide a turning radius.
- Geotextile fabric (Filter cloth) shall be placed over the existing ground prior to placing stone. #The plan approval authority may not require single family residences to use geotextile.
- Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
- 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 mounded berm with 3:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SEE 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.
- 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 PAGE 18-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 23B - AT GRADE INLET PROTECTION



**Construction Specifications**

- Lift grate and wrap with Geotextile Class E to completely cover all openings, then set grate back in place.
- Place 3/4" to 1 1/2" stone, 4" to 6" thick on the grate to secure the fabric and provide additional filtration.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-35-38 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

Jim Murray 1/29/03  
USDA - NATURAL RESOURCES CONSERVATION SERVICE DATE

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

John H. Roberts 1/29/03  
HOWARD SCD DATE

**ENGINEER'S CERTIFICATE**

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

Piero V. Mellits 1-20-03  
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE

Piero V. Mellits, P.E. #21075  
DEVELOPER'S CERTIFICATE

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

1/2/03  
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

DAVIS E. EMORY

APPROVED: DEPARTMENT OF PLANNING AND ZONING

1/2/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

1/2/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

1/2/03  
DIRECTOR DATE

**STANDARDS AND SPECIFICATION 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, MATERIAL TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

**CONDITIONS WHEN PRACTICE APPLIES**

- THIS PRACTICE IS LIMITED TO AREAS HAVING 24 OR FLATTER SLOPES WHERE:
  - THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
  - 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.
  - THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
  - THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.
- FOR THE PURPOSE OF THESE STANDARDS AND SPECIFICATIONS, AREAS HAVING SLOPES STEEPER THAN 24 SHOULD REQUIRE SPECIAL CONSIDERATION AND DESIGN FOR ADEQUATE STABILIZATION. AREA HAVING SLOPES STEEPER THAN 24 SHALL HAVE THE APPROPRIATE STABILIZATION SHOWN ON THE PLANS.

**CONSTRUCTION AND MATERIAL SPECIFICATIONS**

- TOPSOIL SALVAGED FROM THE EXISTING SITE MAY BE USED PROVIDED THAT IT MEETS STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SITE CAN BE FOUND IN REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USAGRICULTURE IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENTAL STATION.
- TOPSOIL SPECIFICATIONS-SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:
  - TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRICULTURIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURES SUBSILTS AND SHALL CONTAIN LESS THAN 5% BY VOLUME OF CONCRETE, STONES, SLAG, COARSE FRAGMENTS, GRAVELS, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2" IN DIAMETER.
  - TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUICKGRASS, JOINTVETCH, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
  - 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 SF) 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.
- FOR SITE HAVING DISTURBED AREAS UNDER 5 ACRE:
  - PLACE TOPSOIL OF REQUIRED AND APPLY SOIL AMENDMENTS AS SPECIFIED IN SOIL VEGETATION STABILIZATION SECTION I-VEGETATIVE STABILIZATION METHODS AND MATERIALS.
  - TOPSOIL APPLICATION:
    - 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.
    - GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBERT 4" OR HIGHER IN ELEVATION.
    - TOPSOIL SHALL BE UNIFORMLY DISTRIBUTED IN A 4"-6" LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PERFORMED IN SUCH A MANNER THAT SEEDING OR SEEDING CAN PROCEED WITH A MINIMUM OF ADDITIONAL SOIL PREPARATION AND TILLAGE. ANY SPECIAL ACTIVITIES IN THE SURFACE RESULTING FROM TOPSOILING OR OTHER OPERATIONS SHALL BE CORRECTED IN ORDER TO PREVENT THE FORMATION OF DEPRESSIONS OR WATER POCKETS.
    - 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.
  - 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.
- COMPOSTED SLUDGE MATERIAL FOR USE AS SOIL CONDITIONER FOR SITES HAVING DISTURBED AREAS OVER 5 ACRE SHALL BE TESTED TO PRESCRIBE AMENDMENTS AND FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
  - COMPOSTED SLUDGE SHALL BE SUPPLIED BY, OR OBTAINED FROM, A PERSON OR PERSONS THAT ARE PERMITTED BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT UNDER CDMAF 26.04.06.
  - COMPOSTED SLUDGE SHALL CONTAIN AT LEAST 1 PERCENT NITROGEN, 15 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.
  - COMPOSTED SLUDGE SHALL BE APPLIED AT A RATE OF 1 TON/1,000 SF.
  - COMPOSTED SLUDGE SHALL BE AMENDED WITH A POTASSIUM FERTILIZER APPLIED AT THE RATE OF 4 LB/1,000 SF, AND 1/3 THE NORMAL LIME APPLICATION RATE.

REFERENCES: GUIDELINE SPECIFICATIONS, SOIL PREPARATION AND SEEDINGS MD-VI, PUB. #1, COOPERATIVE EXTENSION SERVICE, UNIVERSITY OF MARYLAND AND VIRGINIA POLYTECHNIC INSTITUTE, REVISED 1973.

**STANDARDS AND SPECIFICATIONS FOR LAND GRADING**

**DEFINITION**  
RESHAPING OF THE EXISTING LAND SURFACE IN ACCORDANCE WITH A PLAN AS DETERMINED BY ENGINEERING SURVEY AND LAYOUT.

**PURPOSE**  
THE PURPOSE OF A LAND GRADING SPECIFICATION IS TO PROVIDE FOR EROSION CONTROL PRACTICES ESTABLISHED ON THESE AREAS WHERE THE EXISTING LAND SURFACE IS TO BE RESHAPED BY GRADING ACCORDING TO PLAN.

**DESIGN CRITERIA**  
THE GRADING PLAN SHOULD BE BASED UPON THE INCORPORATION OF BUILDING DESIGNS AND STREET LAYOUTS THAT FIT AND UTILIZE EXISTING TOPOGRAPHY AND DESIRABLE NATURAL SURROUNDINGS TO AVOID EXTREME GRADE MODIFICATIONS. INFORMATION SUBMITTED MUST PROVIDE SUFFICIENT TOPOGRAPHIC SURVEYS AND SOIL INVESTIGATIONS TO DETERMINE LIMITATIONS THAT MUST BE IMPOSED ON THE GRADING OPERATION RELATED TO SOIL STABILITY, EFFECT ON ADJACENT PROPERTIES AND DRAINAGE PATTERNS, MEASURES FOR DRAINAGE AND WATER REMOVAL AND VEGETATIVE TREATMENT, ETC.

MANY COUNTIES HAVE REGULATIONS AND DESIGN PROCEDURES ALREADY ESTABLISHED FOR LAND GRADING AND CUT AND FILL SLOPES. WHERE THESE REQUIREMENTS EXIST, THEY SHALL BE FOLLOWED. THE PLAN MUST SHOW EXISTING AND PROPOSED CONTOURS OF THE AREAS TO BE GRADED. THE PLAN SHALL ALSO INCLUDE PRACTICES FOR EROSION CONTROL, SUCH AS STABILIZATION STRUCTURES, EARTH DIKES, SLOPE SILT FENCE AND SEDIMENT TRAPS AND BASINS. REVERSE SLOPE BENCHES, GRADE AND CROSS SECTIONS, GRADE STABILIZATION STRUCTURES, RETAINING WALLS, AND SURFACE AND SUBSURFACE DRAINAGE. THE PLAN SHALL ALSO INCLUDE PHASING OF THESE PRACTICES. THE FOLLOWING SHALL BE INCORPORATED INTO THE PLAN:

- PROVISIONS SHALL BE MADE TO SAFELY CONDUIT SURFACE RUNOFF TO STORM DRAINS, PROTECTED BUILT-UP DRAINAGE COURSES TO INSURE THAT SURFACE RUNOFF WILL NOT DAMAGE COURSES OR OTHER GRADED AREAS.
- CUT AND FILL SLOPES THAT ARE TO BE STABILIZED WITH GRASSES SHALL NOT BE STEEPER THAN 2:1. WHERE THE SLOPE IS TO BE COVERED WITH PERMANENT VEGETATION, SLOPES SHALL NOT BE STEEPER THAN 3:1. IF SAFETY FACTORS RELATED TO MOUND STEEP SLOPES EXCEEDING 2:1 SHALL REQUIRE SPECIAL DESIGN AND STABILIZATION CONSIDERATIONS THAT SHALL BE ADEQUATELY SHOWN ON THE PLANS.
- REVERSE BENCHES SHALL BE PROVIDED WHENEVER THE VERTICAL INTERVAL (HEIGHT) OF ANY 24 SLOPE EXCEEDS 20 FEET FOR 24 SLOPES AND 10 FEET FOR SLOPES EXCEEDING 2:1 AND FOR 4:1 TO 40 FEET. BENCHES SHALL BE LOCATED TO DIVIDE THE SLOPE FACE AS EQUALLY AS POSSIBLE AND SHALL CONVEY THE WATER TO A STABLE OUTLET. SOILS, SEEPS, ROCK OUTCROPS, ETC., SHALL ALSO BE TAKEN INTO CONSIDERATION WHEN DESIGNING BENCHES.
  - BENCHES SHALL BE A MINIMUM OF SIX FEET WIDE TO PROVIDE FOR EASE OF MAINTENANCE.
  - BENCHES SHALL BE DESIGNED WITH THE UPPER SLOPE OF 6:1 OR FLATTER TO THE TOP OF THE REVERSE SLOPE AND WITH A MINIMUM OF ONE FOOT BY DEPTHS OF BENCH GRADIENT TO THE OUTLET SHALL BE BETWEEN 2 PERCENT AND 3 PERCENT, UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS.
  - THE FLOW LENGTH WITHIN A BENCH SHALL NOT EXCEED 800' UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS. FOR FLOW CHANNEL STABILIZATION SEE TEMPORARY SWALE.
  - SURFACE WATER SHALL BE DIVERTED FROM THE FACE OF ALL CUT AND/OR FILL SLOPES BY THE USE OF EARTH DIKES, DITCHES AND CHANNEL STABILIZATION BY THE USE OF A DESIGNED STRUCTURE, EXCEPT WHERE:
    - THE FACE OF THE SLOPE IS OR SHALL BE STABILIZED AND THE FACE OF ALL GRADED SLOPES SHALL BE STABILIZED.
    - THE FACE OF SLOPE SHALL NOT BE SUBJECT TO ANY CONCENTRATED FLOWS OF SURFACE WATER SUCH AS FROM NATURAL DRAINAGEWAYS, GRADED SWALES, DOWNSPOUTS, ETC.
    - THE FACE OF THE SLOPE WILL BE PROTECTED BY SPECIAL EROSION CONTROL MATERIALS TO INCLUDE, BUT NOT LIMITED TO APPROVED VEGETATIVE STABILIZATION PRACTICES (SEE SECTION 6D, RIP-RAP OR OTHER APPROVED STABILIZATION METHODS).
  - CUT SLOPES OCCURRING IN RIPABLE ROCK SHALL BE SERATED AS SHOWN IN THE FOLLOWING DIAGRAM. THESE SERATIONS SHALL BE MADE WITH CONVENTIONAL EQUIPMENT AS THE EXCAVATION IS MADE. EACH STEP OR SERATION SHALL BE CONSTRUCTED ON THE CONTOUR AND WILL HAVE STEPS CUT AT NOMINAL TWO-FOOT INTERVALS WITH NOMINAL THREE-FOOT HORIZONTAL SHELVES. THESE STEPS WILL VARY DEPENDING ON THE SOIL TYPE AND THE SLOPE. STEPS SHALL BE MADE TO HOLD MOISTURE, LIME, FERTILIZER AND SEED THIS PRODUCING A MUCH QUICKER AND LONGER LIVED VEGETATIVE COVER AND BETTER SOIL STABILIZATION. OVERLAND FLOW SHALL BE DIVERTED FROM THE TOP BY ALL SERATED CUT SLOPES AND CARRIED TO A SUITABLE OUTLET.
  - SUBSURFACE DRAINAGE SHALL BE PROVIDED WHERE NECESSARY TO INTERCEPT SEEPAGE THAT WOULD OTHERWISE ADVERSELY AFFECT SLOPE STABILITY OR CREATE EXCESSIVELY WET SITE CONDITIONS.
  - SLOPES SHALL NOT BE CREATED SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTIES WITHOUT ADEQUATELY PROTECTING SUCH PROPERTIES AGAINST SEDIMENTATION, EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED DAMAGES.
  - FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, STONES, LOGS, STUMPS, BUILDING DEBRIS, AND OTHER DICTICIONABLE MATERIAL. IT SHOULD BE FREE OF STONES OVER TWO INCHES IN DIAMETER WHERE COMPACTED BY HAND OR MECHANICAL TAMPERS OR OVER EIGHT OR MORE INCHES IN DIAMETER WHERE COMPACTED BY ROLLERS OR OTHER EQUIPMENT. FROZEN MATERIAL SHALL NOT BE PLACED IN THE FILL NOR SHALL THE FILL MATERIAL BE PLACED ON A FROZEN FOUNDATION.
  - STOCKPILES, BORROW AREAS AND SPILL SHALL BE SHOWN ON THE PLANS AND SHALL BE SUBJECT TO THE PROVISIONS OF THIS STANDARD AND SPECIFICATIONS.
  - ALL DISTURBED AREAS SHALL BE STABILIZED STRUCTURALLY OR VEGETATIVELY IN COMPLIANCE WITH SOIL STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION.

**VEGETATIVE STABILIZATION**

**PERMANENT AND TEMPORARY SEEDING, SOODING AND MULCHING**

**I. SITE PREPARATION**  
PERMANENT OR TEMPORARY VEGETATION SHALL BE ESTABLISHED WITHIN SEVEN (7) DAYS ON THE SURFACE OF ALL SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BENCHES, WATERWAYS, SEDIMENT CONTROL BASINS, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND WITHIN 14 DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE. MULCHING MAY ONLY BE USED ON DISTURBED AREAS AS TEMPORARY COVER WHERE VEGETATION IS NOT FEASIBLE OR WHERE SEEDING CAN NOT BE COMPLETED BECAUSE OF WEATHER.

**II. SEED PREPARATION AND SEEDING APPLICATION**  
LOOSEN THE TOP LAYER OF THE SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT SUCH AS DISC HARROWS, CHESEL PLOWS OR RIPPER. THE REMAINDER OF THE AREA SHOULD APPEAR UNIFORM AFTER BINDER AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF THE SOIL BY DISCING OR BY OTHER SUITABLE MEANS. ROUGH AREAS SHOULD NOT BE ROLLED OR DRAGGED SMOOTH, BUT LEFT IN A ROUGHENED CONDITION. STEEP SLOPES GREATER THAN 3:1 SHOULD BE TRACKED BY A ROZER, LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL SHOULD BE LOOSE AND FRAGILE. PERMANENT COVER MAY REQUIRE AN APPLICATION OF TOPSOIL. IF SO, IT MUST MEET THE REQUIREMENTS SET FORTH IN SECTION 2.10 STANDARDS AND SPECIFICATIONS FOR TOPSOIL FROM THE 1994 STANDARDS AND SPECIFICATIONS.

**III. SOIL AMENDMENTS**  
SOIL TESTS SHALL BE MADE ON SITES OVER FIVE ACRES TO DETERMINE THE EXACT REQUIREMENTS FOR BOTH LIME AND FERTILIZER FOR SITES UNDER 5 ACRES, IN LIEU OF A SOIL TEST, APPLY THE FOLLOWING:

FERTILIZER NITROGEN 2 LBS/1000 SF (90 LBS/AC)  
P2O5 4 LBS/1000 SF (175 LBS/AC)  
K2O 4 LBS/1000 SF (174 LBS/AC)

GROUND LIMESTONE 2 TONS/AC

**IV. SEDIMENT CONTROL PRACTICE SEEDING**  
SELECT A SEEDING MIXTURE FROM TABLE 25 OR 26 IN SECTION 6D OF THE 1994 STANDARDS AND SPECIFICATIONS. DOCUMENT SEEDING ON THE EROSION AND SEDIMENT CONTROL PLAN USING APPROPRIATE CHART BELOW.

NOTE: IF SEDIMENT CONTROL PRACTICES ARE IN FOR LONGER THAN 12 MONTHS, PERMANENT SEEDING IS REQUIRED.

**V. TEMPORARY/PERMANENT SEEDING MIXTURES AND RATES**  
SELECT A SEEDING MIXTURE FROM APPROPRIATE TABLE 25 OR 26 IN SECTION 6D OF THE 1994 STANDARDS AND SPECIFICATIONS. DOCUMENT SEEDING ON THE EROSION AND SEDIMENT CONTROL PLAN USING APPROPRIATE CHART BELOW.

**VI. TURFGRASS ESTABLISHMENT**

THIS INCLUDES LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE. AREA TO RECEIVE SEED SHALL BE TILLED BY DISCING OR BY OTHER APPROVED METHODS TO A DEPTH OF 3 TO 5 INCHES. LEVELED AND RAKED TO PREPARE A PROPER SEEDBED. STONES AND DEBRIS OVER 1/2 INCHES IN DIAMETER SHALL BE REMOVED. THE RESULTING SEEDBED SHALL BE IN SUCH CONDITION THAT FUTURE MOISTURE STRESS THROUGHOUT THE PERIOD FROM PASTE 6-20 OF THE 1994 STANDARDS AND SPECIFICATIONS OR SELECT FROM THE LIST IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND".

**TEMPORARY SEEDING SUMMARY**

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATE	SEEDING DEPTH	FERTILIZER RATE (10-10-10)	LIME RATE
1	BARLEY OR RYE PLUS FOXTAIL MILLET	8/15-11/30	8/15-11/30	1/4"-1/2"	600 LB/AC (15 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)

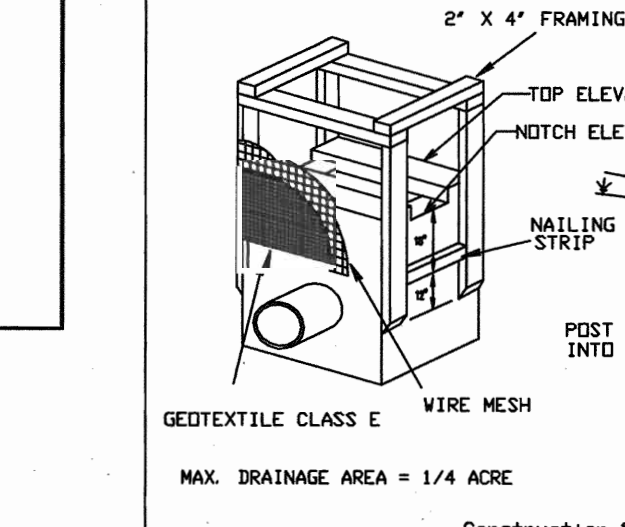
**PERMANENT SEEDING SUMMARY**

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATE	SEEDING DEPTH	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FERTILIZER RATE (10-10-10)	LIME RATE
3	FALL FESCUE (85%) CHEVINGS FESCUE (10%) KENTUCKY BLUE GRASS (5%)	8/15-11/30	8/15-11/30	1/4"-1/2"	2 LB/1000 SF	4 LB/1000 SF	4 LB/1000 SF	2 TONS/AC (100 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)

**VI. TURFGRASS ESTABLISHMENT**

THIS INCLUDES LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE. AREA TO RECEIVE SEED SHALL BE TILLED BY DISCING OR BY OTHER APPROVED METHODS TO A DEPTH OF 3 TO 5 INCHES. LEVELED AND RAKED TO PREPARE A PROPER SEEDBED. STONES AND DEBRIS OVER 1/2 INCHES IN DIAMETER SHALL BE REMOVED. THE RESULTING SEEDBED SHALL BE IN SUCH CONDITION THAT FUTURE MOISTURE STRESS THROUGHOUT THE PERIOD FROM PASTE 6-20 OF THE 1994 STANDARDS AND SPECIFICATIONS OR SELECT FROM THE LIST IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND".

DETAIL 23A - STANDARD INLET PROTECTION



**Construction Specifications**

- Excavate completely around the inlet to a depth of 18" below the notch elevation.
- Drive the 2' x 4' construction grade lumber posts 1' into the ground at each corner of the inlet. Place nail strips between the posts on the ends of the inlet. Assemble the top portion of the 2' x 4' frame using the overlap joint shown on Detail 23A. The top of the frame (wire) must be 6" below adjacent roadways where flooding and safety issues may arise.
- Stretch the 1/2" x 1/2" wire mesh tightly around the frame and fasten securely. The ends must meet and overlap at a post.
- Stretch the Geotextile Class E tightly over the wire mesh with the geotextile extending from the top of the frame to 18" below the inlet notch elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and fastened, then fastened down.
- Backfill around the inlet in compacted 6" layers until the layer of earth is level with the notch elevation on the ends and top elevation on the sides.
- If the inlet is not in a sump, construct a compacted earth dike across the ditch line directly below it. The top of the earth dike should be at least 6" higher than the top of the frame.
- The structure must be inspected periodically and after each rain and the geotextile replaced when it becomes clogged.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE E-36-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**VEGETATIVE STABILIZATION**

**PERMANENT AND TEMPORARY SEEDING, SOODING AND MULCHING**

**I. SITE PREPARATION**  
PERMANENT OR TEMPORARY VEGETATION SHALL BE ESTABLISHED WITHIN SEVEN (7) DAYS ON THE SURFACE OF ALL SEDIMENT CONTROL PRACTICES SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BENCHES, WATERWAYS, SEDIMENT CONTROL BASINS, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND WITHIN 14 DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE. MULCHING MAY ONLY BE USED ON DISTURBED AREAS AS TEMPORARY COVER WHERE VEGETATION IS NOT FEASIBLE OR WHERE SEEDING CAN NOT BE COMPLETED BECAUSE OF WEATHER.

**II. SEED PREPARATION AND SEEDING APPLICATION**  
LOOSEN THE TOP LAYER OF THE SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT SUCH AS DISC HARROWS, CHESEL PLOWS OR RIPPER. THE REMAINDER OF THE AREA SHOULD APPEAR UNIFORM AFTER BINDER AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF THE SOIL BY DISCING OR BY OTHER SUITABLE MEANS. ROUGH AREAS SHOULD NOT BE ROLLED OR DRAGGED SMOOTH, BUT LEFT IN A ROUGHENED CONDITION. STEEP SLOPES GREATER THAN 3:1 SHOULD BE TRACKED BY A ROZER, LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL SHOULD BE LOOSE AND FRAGILE. PERMANENT COVER MAY REQUIRE AN APPLICATION OF TOPSOIL. IF SO, IT MUST MEET THE REQUIREMENTS SET FORTH IN SECTION 2.10 STANDARDS AND SPECIFICATIONS FOR TOPSOIL FROM THE 1994 STANDARDS AND SPECIFICATIONS.

**III. SOIL AMENDMENTS**  
SOIL TESTS SHALL BE MADE ON SITES OVER FIVE ACRES TO DETERMINE THE EXACT REQUIREMENTS FOR BOTH LIME AND FERTILIZER FOR SITES UNDER 5 ACRES, IN LIEU OF A SOIL TEST, APPLY THE FOLLOWING:

FERTILIZER NITROGEN 2 LBS/1000 SF (90 LBS/AC)  
P2O5 4 LBS/1000 SF (175 LBS/AC)  
K2O 4 LBS/1000 SF (174 LBS/AC)

GROUND LIMESTONE 2 TONS/AC

**IV. SEDIMENT CONTROL PRACTICE SEEDING**  
SELECT A SEEDING MIXTURE FROM TABLE 25 OR 26 IN SECTION 6D OF THE 1994 STANDARDS AND SPECIFICATIONS. DOCUMENT SEEDING ON THE EROSION AND SEDIMENT CONTROL PLAN USING APPROPRIATE CHART BELOW.

NOTE: IF SEDIMENT CONTROL PRACTICES ARE IN FOR LONGER THAN 12 MONTHS, PERMANENT SEEDING IS REQUIRED.

**V. TEMPORARY/PERMANENT SEEDING MIXTURES AND RATES**  
SELECT A SEEDING MIXTURE FROM APPROPRIATE TABLE 25 OR 26 IN SECTION 6D OF THE 1994 STANDARDS AND SPECIFICATIONS. DOCUMENT SEEDING ON THE EROSION AND SEDIMENT CONTROL PLAN USING APPROPRIATE CHART BELOW.

**VI. TURFGRASS ESTABLISHMENT**

THIS INCLUDES LAWNS, PARKS, PLAYGROUNDS, AND COMMERCIAL SITES WHICH WILL RECEIVE A MEDIUM TO HIGH LEVEL OF MAINTENANCE. AREA TO RECEIVE SEED SHALL BE TILLED BY DISCING OR BY OTHER APPROVED METHODS TO A DEPTH OF 3 TO 5 INCHES. LEVELED AND RAKED TO PREPARE A PROPER SEEDBED. STONES AND DEBRIS OVER 1/2 INCHES IN DIAMETER SHALL BE REMOVED. THE RESULTING SEEDBED SHALL BE IN SUCH CONDITION THAT FUTURE MOISTURE STRESS THROUGHOUT THE PERIOD FROM PASTE 6-20 OF THE 1994 STANDARDS AND SPECIFICATIONS OR SELECT FROM THE LIST IN THE MOST CURRENT UNIVERSITY OF MARYLAND PUBLICATION, AGRONOMY MEMO #77, "TURFGRASS CULTIVAR RECOMMENDATIONS FOR MARYLAND".

**TEMPORARY SEEDING SUMMARY**

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATE	SEEDING DEPTH	FERTILIZER RATE (10-10-10)	LIME RATE
1	BARLEY OR RYE PLUS FOXTAIL MILLET	8/15-11/30	8/15-11/30	1/4"-1/2"	600 LB/AC (15 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)

**PERMANENT SEEDING SUMMARY**

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATE	SEEDING DEPTH	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	FERTILIZER RATE (10-10-10)	LIME RATE
3	FALL FESCUE (85%) CHEVINGS FESCUE (10%) KENTUCKY BLUE GRASS (5%)	8/15-11/30	8/15-11/30	1/4"-1/2"	2 LB/1000 SF	4 LB/1000 SF	4 LB/1000 SF	2 TONS/AC (100 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)

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**VEGETATIVE STABILIZATION**

**PERMANENT AND TEMPORARY SEEDING, SOODING AND MULCHING**

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**IV. SEDIMENT CONTROL PRACTICE SEEDING**  
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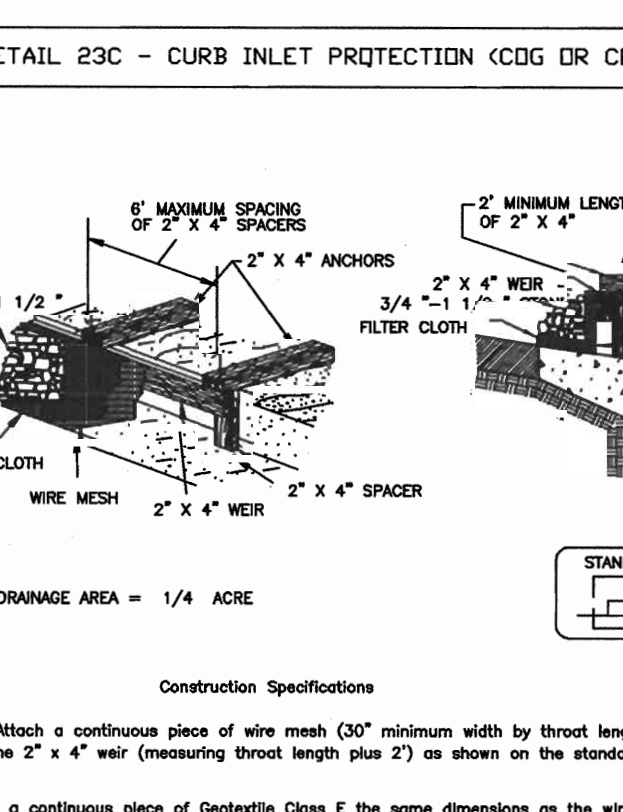
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**V. TEMPORARY/PERMANENT SEEDING MIXTURES AND RATES**  
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DETAIL 23C - CURB INLET PROTECTION (CGD OR CDS INLETS)

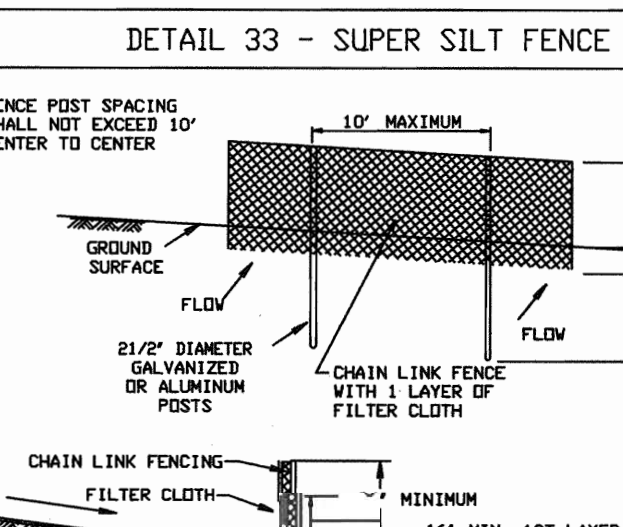


**Construction Specifications**

- Place a continuous line of wire mesh (30" minimum width by throat length plus 4") to the 2' x 4' curb (measuring throat length plus 2") as shown on the standard drawing.
- Place a continuous line of Geotextile Class E the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2' x 4' curb.
- Securely nail the 2' x 4' curb to a 6" long vertical support to be located between the curb and the inlet face (max. 4" apart).
- Place the 1/2" x 1/2" wire mesh against the inlet throat and nail (minimum 2" lengths of 2' x 4' to the top of the curb at spacer locations). These 2' x 4' anchors shall extend across the inlet throat and be held in place by sandbags or alternate weight.
- The assembly shall be placed so that the sandbags are a minimum 1" beyond both ends of the throat opening.
- Form the 1/2" x 1/2" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean 3/4" x 1/2" stones over the wire mesh and geotextile in such a manner to prevent water from entering the inlet under or around the geotextile.
- This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment. These 2' x 4' anchors shall be replaced when they are damaged or loose. A temporary support shall be installed on each side of the curb to support the curb and prevent it from tilting or sagging due to the weight of the filter cloth.
- Ensure that storm flow does not bypass inlet by installing a temporary curb or catch pit dike to direct the flow to the inlet.

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DETAIL 33 - SUPER SILT FENCE

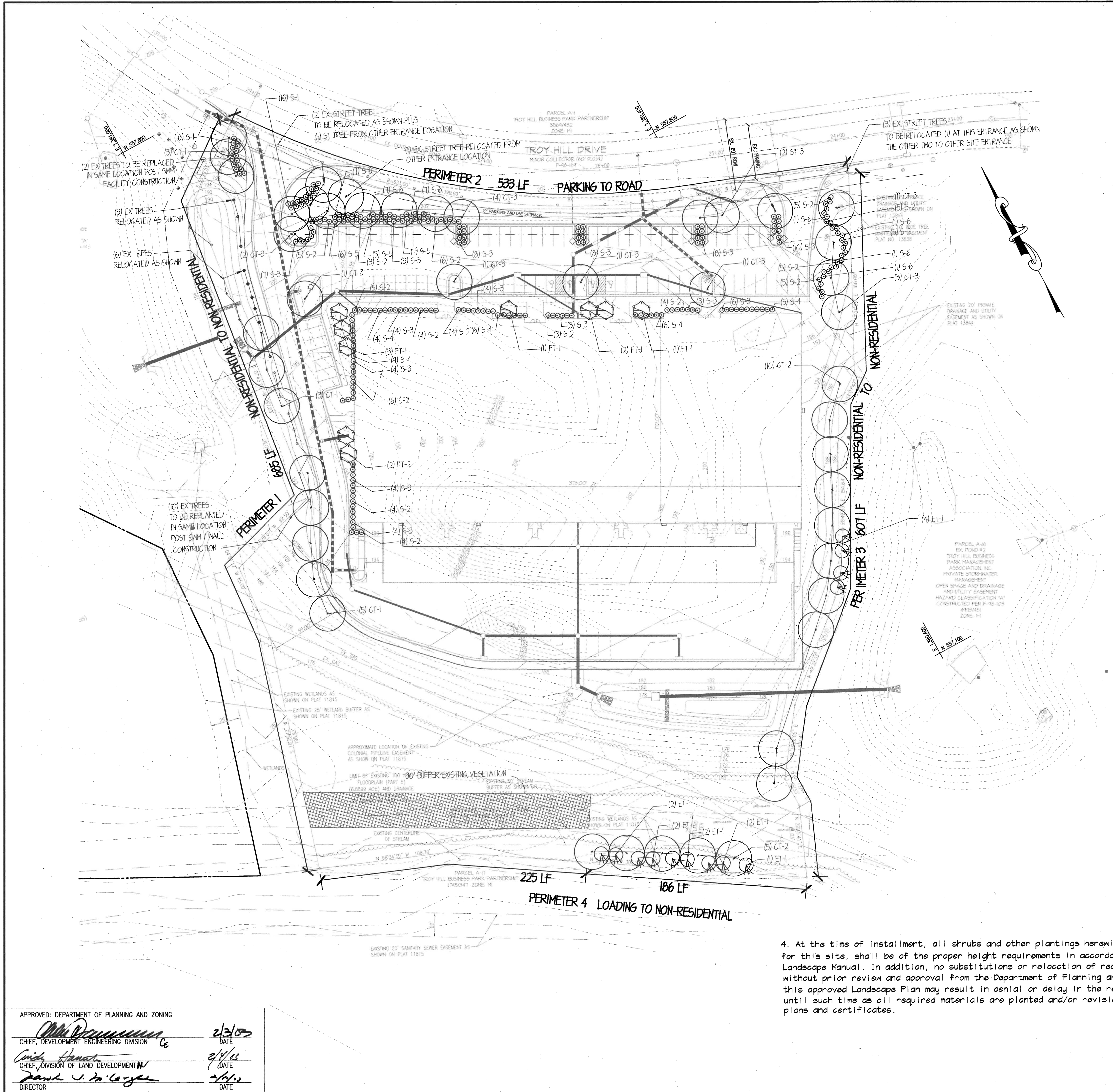


**Construction Specifications**

- Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Bureau for Chain Link Fencing. The specification for a 6' fence shall be used, substituting 42" fabric and 6' length posts.
- Chain link fence shall be fastened securely to the concrete gutter with wire ties. The lower tension wire, brace and frame posts, drive anchors and post caps are not required except on the ends of the fence.
- Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" at the top and mid section.
- Filter cloth shall be embedded a minimum of 8" into the ground.
- When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
- Maintenance shall be performed as needed and silt buildups removed when "bump" develop in the silt fence, or when silt reaches 50% of fence height.
- 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 E:
 

Tensile Strength	30 lbs/in (min.)	Test MSMT 509
Tensile Modulus	20	





SCHEDULE 'A' PERIMETER LANDSCAPE EDGE			
PERIMETER	PLANTS REQUIRED	PLANTS PROVIDED	EDGE TYPE
① 665 LF NON-RESIDENTIAL TO NON-RESIDENTIAL	1:60 = 11 SHADE TREES	11 SHADE TREES	(A)
② 533 LF PARKING TO ROAD	1:40 = 13 SHADE TREES 1:4 = 123 SHRUBS	14 SHADE TREES = 4 SHADE TREES + 5 EXISTING STREET TREES (RELOCATED) 140 SHRUBS	(E)
③ 607 LF NON-RESIDENTIAL TO NON-RESIDENTIAL	1:60 = 10 SHADE TREES	14 SHADE TREES 4 EVERGREEN 18 SHRUBS	(A)
④ 225 LF LOADING TO NON-RESIDENTIAL 186 LF LOADING TO NON-RESIDENTIAL	1:40 = 6 SHADE TREES 1:20 = 11 EVERGREEN TREES 1:40 = 5 SHADE TREES 1:20 = 4 EVERGREEN TREES	30' WIDE BUFFER OF EXISTING VEGETATION 5 SHADE TREES 4 EVERGREEN TREES	(C)
SCHEDULE 'B' PARKING LOT INTERNAL LANDSCAPING			
NUMBER OF PARKING SPACES	PLANTS REQUIRED	PLANTS PROVIDED	
81	1:20 = 4 SHADE TREES	4 SHADE TREES	

PLANT LIST					
KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
<b>CANOPY TREES</b>					
CT-1	11	<i>Fagus grandifolia</i>	American Beech	2 1/2" - 3' cal.	B&B
CT-2	15	<i>Fraxinus pennsylvanica</i> 'Marshall's Seedless Green Ash'	Marshall's Seedless Green Ash	2 1/2" - 3' cal.	B&B
CT-3	16	<i>Quercus phellos</i>	Willow Oak	2 1/2" - 3' cal.	B&B
<b>EVERGREEN TREES</b>					
ET-1	13	<i>Pinus taeda</i>	Loblolly Pine	5' - 6'	B&B
<b>FLOWERING TREES</b>					
FT-1	7	<i>Cercis canadensis</i>	Eastern Redbud	6' - 8'	B&B
FT-2	2	<i>Magnolia stellata</i>	Star Magnolia	6' - 8'	B&B
<b>SHRUBS</b>					
S-1	32	<i>Chaenactis speciosa</i>	Flowering Quince	2 1/2" - 3'	cont.
S-2	68	<i>Euonymus alatus</i> 'Compacta'	Dwarf Winged Euonymus	2 1/2" - 3'	cont.
S-3	76	<i>Ilex glabra</i>	Irishbarry	2 1/2" - 3'	cont.
S-4	30	<i>Prunus laurocerasus</i> 'SCHIJKENSIS'	Skip Cherry Laurel	2 1/2" - 3'	cont.
S-5	18	<i>Toxicus baccata</i> 'Fastigata'	Irish yew	2 1/2" - 3'	cont.
S-6	25	<i>Viburnum prunifolium</i>	Blackthorn Viburnum	2 1/2" - 3'	cont.

Notes:

- Five existing street trees bonded and installed under Road Plan F-98-169 dated Feb 10, 1999, are to be relocated as designated on this plan.
- Other existing trees are to be removed before grading and replanted or relocated as designated on the plan after construction of the SHM facility.
- This site is exempt from the Forest Conservation Act in accordance with section 16.1202(b)(1)(v), a planned office park.
- SCHEDULE 'D' STORMWATER MANAGEMENT AREA LANDSCAPING: Landscaping of stormwater management areas is not required for zone M-1 where these areas are not adjacent to residential zoning or a public road.

NOTE: THIS PLAN SHALL BE USED FOR LANDSCAPE PURPOSES ONLY REFER TO SITE PLAN FOR ALL OTHER SITE ISSUES.

OWNER/DEVELOPER: DAVIS EMORY  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076

**C-13**

**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395

SITE DEVELOPMENT PLANS  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13

**LANDSCAPE PLAN**

L. 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL: 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.: 12269
		SCALE: 1" = 40'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 13 OF 17

4. At the time of installment, all shrubs and other plantings herewith listed and approved for this site, shall be of the proper height requirements in accordance with the Howard County Landscape Manual. In addition, no substitutions or relocation of required plantings may be made without prior review and approval from the Department of Planning and Zoning. Any deviation from this approved Landscape Plan may result in denial or delay in the release of landscape surety until such time as all required materials are planted and/or revisions are made to applicable plans and certificates.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/3/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 2/4/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 2/1/03  
 DIRECTOR DATE



**PLANTING SPECIFICATIONS**

**PART 1 GENERAL:**

- 1.01 DESCRIPTION:**
- A. Work consists of all labor, materials, equipment and services necessary for and incidental to the execution and completion of the FINAL LANDSCAPE PLAN as indicated on the Drawings and specified herein.
  - B. Include:
    1. Layout.
    2. Furnishing of tree protection and planting materials.
    3. Preparation, planting operations, mulching and staking.
    4. Maintenance.
- 1.02 REFERENCES AND QUALITY ASSURANCE:**
- A. Landscape Contractors Association MD-DC-VA (LCA), Landscape Specification Guidelines, latest edition except where superseded by specific requirements herein.
  - B. American Association of Nurserymen (A.A.N.): American Standard for Nursery Stock, A.N.S.I. 260.1, latest edition.
  - C. Nomenclature: In accordance with Hortus Third, latest edition, by the staff of the L. H. Bailey Hortorium, Cornell University.
  - D. Federal Specification: Q-P-166e as applicable to Peat Moss.
  - E. National Arborist Association, Standard for Pruning of Shade Trees, Guying of Shade Trees, Fertilizing Shade and Ornamental Trees and Pesticides Application Operations, latest edition.
  - F. Maryland Department of Transportation, State Highway Administration (MSHA) Standard Specifications for Construction and Materials, October 1993, as amended to date. Delete references to "Measurement and Payment".
- 1.03 STANDARD OF COMPARISON:**
- A. When requested by the Owner's Representative, the Contractor shall obtain approval of a "standard" of comparison, prior to the delivery of plant material to the site.
    1. Contact the Owner's Representative to schedule an inspection for approval of the "standards" for plant material to be installed at the project site.
    2. "Standards" shall be assembled at the project site for review and approval, or at the Contractor's principal business location, as determined by the Owner's Representative. Approved "standards" may be planted at the project site.
- 1.04 SUBMITTALS:**
- A. Source: Notify the Owner's Representative, in writing, of the source of all material at least ten (10) working days prior to delivery at the project site.
  - B. Samples and Certifications:
    1. If requested, a mulch sample shall be provided at the site for approval by the Owner's Representative (1 C.F. minimum).
    2. Submit certification of peat moss compliance with referenced specifications.
- 1.05 DELIVERY, STORAGE AND HANDLING:**
- A. Store plants that cannot be planted within 8 hours in a sheltered place. Water and maintain as required until planted.
  - B. Transport and handle plants so that foliage and roots are protected from breakage, sun and wind. Tops or roots of plants allowed to dry out or which have been damaged or disturbed root systems may be rejected.
  - C. B & B (balled and burlapped) plants: Firm, natural balls of soil, with size and depth of ball in accordance with A.A.N. Standards.
- 1.07 PROJECT CONDITIONS:**
- A. Planting Season:
    1. Primary planting season: September 15 to May 15.
    2. Other periods with written approval from the Owner's Representative.
  - B. Existing Conditions: Notify Miss Utility (1-800-257-7777), and the Owner's Representative prior to planting operations. Verify the location of underground utilities.
- 1.08 DEFINITIONS:**
- A. Diameter at Breast Height (DBH): The diameter of a tree measured at a point on the trunk 4.5 feet above the ground.
  - B. Initial Acceptance: Occurs when all plant material is in place in accordance with the specifications and approved by the Owner's Representative.
  - C. Maintenance Period: From initial acceptance of the plantings, and continuing thereafter for a period of 12 months.
  - D. Owner's Representative: The Landscape Architect or other Qualified Professional designated by the Owner or Developer of the Project.
  - E. Retention: The deliberate holding and protecting of existing trees, shrubs or herbaceous plants on the site.
  - F. Specimen Tree: A tree which exists on the project site prior to construction or planting having a 30 inch or greater DBH, or tree having 75 percent or more of the diameter of the current state or county champion tree of that same species.
  - G. Start of Planting: Installation of plant material into excavated pits or beds.
  - H. Final Acceptance: Occurs after Contractor has completed all outstanding items, as determined by the Owner's Representative, at the end of the maintenance period.
- 1.09 SURVIVAL REQUIREMENT AND REPLACEMENTS:**
- A. The minimum survival rate shall be 100 percent of the total number of trees and shrubs planted at the end of the 12-month maintenance period.
  - B. Replacement materials shall be the same size as the original plant material taking into account any growth that has occurred since original installation.
  - C. Methods of installation shall be identical to the original.
- 1.10 PENALTY FOR VIOLATION:**
- A. Immediately following the completion of construction and installation of the plantings, the owner or owner's representative will be notified for an inspection of the entire project site.
  - B. If, upon Final Acceptance Inspection, trees and other vegetation designated as retention plant material are found to be damaged or dead due to mechanical intrusion or related construction activities associated with the landscape contractors installation and maintenance of the said plan, then replacement equivalent will be required.

**PART 2 PRODUCTS:**

- 2.01 PLANTS:**
- A. Plant materials shall meet or exceed the requirements of A.A.N. standards, or as amended herein.
  - B. Plants shall be typical of the species and variety, and have a normal habit of growth with well established root systems.
  - C. Sound, healthy, vigorous, free from plant diseases, insect pests or their eggs and without suckers or evidence of suckering.
  - D. Plants cut back from larger sizes or pruned prior to delivery will not be accepted.
  - E. Measurements: The caliper of deciduous trees (except seedlings and whips) shall be measured 6-inches above ground level for trees up to and including 4 inch caliper and 12 inches above ground level for material larger than 4 inch caliper. Seedlings and whips shall be measured at the root collar.
- 2.02 DECIDUOUS STREET TREES:**
- A. Single straight leader, well branched, and symmetrical, without suckers or evidence of suckering, according to their normal habit.
  - B. Trees planted within five (5) feet of pedestrian ways, parking lots or roads shall be free from branches up to eight (8) feet in height from finish grade.
- 2.03 EVERGREENS:**
- Sheared evergreen plant material shall not be acceptable.
- 2.04 SHRUBS:**
- At least 75% of the individual branches or canes of a shrub shall be to the height specified.
- 2.05 HERBICIDES:**
- A. Contact herbicide shall be "Round-up" or approved equal.
  - B. Pre-emergence herbicide shall be "Snapshot" or approved equal.
- 2.06 TOPSOIL FOR AMENDING EXISTING SOIL:**
- A. General Requirements (only where required by details on the Drawings):
    1. Natural, friable sand loam topsoil which is free of subsoil, clay lumps, stones, stumps, roots or similar objects larger than 1-inch.
    2. Free of brush, objectionable weeds and litter or other substance which is harmful to plant growth.
  - B. In accordance with M.S.H.A. Item 920.01.02 for Furnished Topsoil if borrow topsoil is required from an off-site location.
- 2.07 FERTILIZER FOR POST PLANTING:**
- |  |    |
|--|----|
| A. 5-10-5 (Plant food by minimum percentages.) | 10 |
| (N) Total Nitrogen                             | 5  |
| (P2O2) Available Phosphoric Acid               | 10 |
| (K2) Soluble Potash                            | 5  |
- B. Fertilizer shall be slow release over a minimum 3 year period. Fertilizer shall be delivered to the site with formulas attached.
- 2.08 PEAT MOSS:**
- Baled sphagnum peat moss, Type I-A, conforming to Federal Specification Q-P-166e.
- 2.09 MULCH:**
- A. Mulch shall be the following as indicated on the Drawings.
    1. Shredded hardwood.
    2. Pine Straw.
  - B. Mulch shall have been prepared within the last four (4) months.
- 2.10 WATER:**
- Portable: If not available at the site from a public water supply, the Contractor shall provide water at no additional cost to the Owner.
- 2.11 ANTI-TRANSPIRANT:**
- Shall be the following or approved equal:  
 "Wilt-Pruf"  
 Wilt-Pruf Products Inc.  
 P. O. Box 469  
 Essex, CT 06426  
 (203) 767-7033  
 or approved equal.
- 2.12 ACCESSORIES:**
- A. Tree guying:
    1. Stakes: 2 inch x 2 inch rough sawn oak stakes, notched to hold wire, length as required to secure the tree.
    2. Wire: Galvanized steel wire, doubled.
    3. Sleeves: Nylon reinforced green vinyl hose.
  - B. Tree shelters, netting and stakes: Extruded twin-walled polypropylene with ultra-violet stabilizer and anti-abrasion rim as manufactured by:
    - Tubex  
 P.O. Box 7097  
 Saint Paul, MN 55107  
 (612) 228-0535  
 or approved equal.
  - 1. Stake shall be oak, pointed, 1 inch x 1 inch x 3 feet nominal.
  - 2. Protective netting: Flexible plastic mesh capable of covering the top opening of the tube to prevent entry by birds.

**PART 3 EXECUTION:**

- 3.01 INITIAL INSPECTIONS:**
- A. Pre-construction meeting:
    1. Prior to the beginning of any clearing, grading or disturbance of the site, a meeting at the project site shall be held with the Contractor and Owner's Representative.
    2. The following items, and others as deemed necessary, will be reviewed as applicable to the Project:
      - a) Staked limits of required retention areas and protection fencing, proposed limits of clearing and grubbing, the proposed location of sediment control devices, and the sequence of operations.
      - b) Staking and flagging shall be completed by the Contractor prior to the pre-construction meeting.
    3. Designated adjustments to the proposed limits and locations of items reviewed in the field during the pre-construction meeting shall be incorporated prior to beginning construction.
  - B. Pre-planting meeting:
    1. Prior to the beginning of planting operations, a meeting shall be held at the project site with the Contractor and Owner's Representative to review the following, as applicable to the project:
      - a) Staked limits, of proposed planting areas, completed prior to the meeting.
      - b) Areas to receive selective application of herbicides prior to planting, if applicable.
      - c) Proposed location of temporary and permanent fencing.
      - d) Proposed schedule, sequence of planting operations and other requirements.

**3.02 PREPARATION:**

- A. Tree protection fencing, signage and other pre-construction activities noted on the Drawings for retention areas shall be installed prior to any on-site clearing or grading operations.
- B. Additional temporary, and permanent fencing, shall be installed in conjunction with or prior to planting operations as shown on the Drawings.
- C. Plant Locations: As shown on the Drawings, to dimensions if shown, or as detailed if not specifically labeled. Locations subject to review by the Owner's Representative prior to planting.
- D. Utilities: The Contractor shall locate existing and proposed utilities prior to excavation of planting holes.
  1. If a conflict is identified between the location of utilities and proposed planting locations, the Owner's Representative shall establish an alternate location for plants as required to avoid the conflict.
  2. Bidders shall notify the Owner's Representative of potential conflicts identified prior to submission of a Bid.
- E. No plant material shall be installed until the Owner's Representative has approved the finish grade of areas to receive planting.

**3.03 EXCAVATION:**

- A. Unclassified: Excavate and remove surplus materials encountered, without additional cost to the Owner. Retain only sufficient soil to form soil wells as shown on the Drawings. Disposal of surplus material may be on-site if approved by the Owner's Representative.
- B. Underground obstruction, rock or other obstructions too massive to remove: Notify Owner's Representative for further direction. Alternate locations will be selected. Make such relocations without additional compensation.

**3.04 PLANTING PROCEDURES:**

- A. Do not plant when ground is frozen or excessively wet.
- B. Set plants straight and plumb and at such a level, that after settlement the first lateral root is flush with the adjacent ground surface.
- C. When B&B or container plants are set, planting soil shall be carefully tamped around the base of the balls to prevent voids. All burlap, rope, wires, etc., shall be removed from the tops of balls. Plastic/nylon cords or cloth shall not be left in place on balled materials.
- D. Backfill plants and tamp to two-thirds depth of pit and thoroughly water before bringing backfill up to proper grade. Thoroughly water the plant again after the soil well has been completely formed in-place.
- E. Wells Around Trees and Shrubs: After planting is complete, form a soil well around designated plants, extending to the outer limit of the plant pit in accordance with the planting details shown on the Drawings.
- F. Designated Planting Beds: All vegetative growth shall be removed to a sufficient depth to insure a weed-free bed. Till the existing soil to a depth of 8-inches throughout the designated bed areas. The edge of all planting beds shall be cut vertically and the soil recessed within 1 foot of the bed edge so that the mulch is flush with adjacent grade when the installation has been completed.

**3.05 MULCHING:**

Plants and beds shall receive a 2 to 4 inch cover of mulch. Mulch shall be installed within 8 hours after planting has been completed.

**3.06 STAKING, WRAPPING AND GUYING:**

- A. Stake trees, which require staking as shown on the Drawings, during the same day as planting.
- B. Guying:
  1. Guying shall be in accordance with the Details.
  2. Stakes shall be securely driven in ground and plants guyed to provide and maintain adequate support.

**3.07 PRUNING AND ANTI-TRANSPIRANT APPLICATION:**

- A. Pruning: Any broken or damaged branches shall be removed. Damage, removal or pruning of tree leaders shall be cause for rejection.
- B. Anti-transpirant: Deciduous plants, installed from May 1st to September 15th shall receive application in accordance with the manufacturer's recommendations.

**3.08 POST-PLANTING FERTILIZATION:**

- A. Notify Owner's Representative prior to fertilizing operations.
- B. Approximately 1 year after planting, but prior to the maintenance agreement's expiration, the Contractor shall fertilize all plant material. Plant foliage shall be completely dry at the time of application. Fertilizer adhering to plant foliage after application shall be removed. Water thoroughly after application.
- C. Rate of application shall be in accordance with the fertilizer manufacturer's recommendations or the following:
  1. Shrubs: 4 pounds of 5-10-5 per 100 square feet.
  2. Trees: 2 pounds of 5-10-5 per inch of caliper distributed uniformly in planting well.

**3.09 CLEAN-UP:**

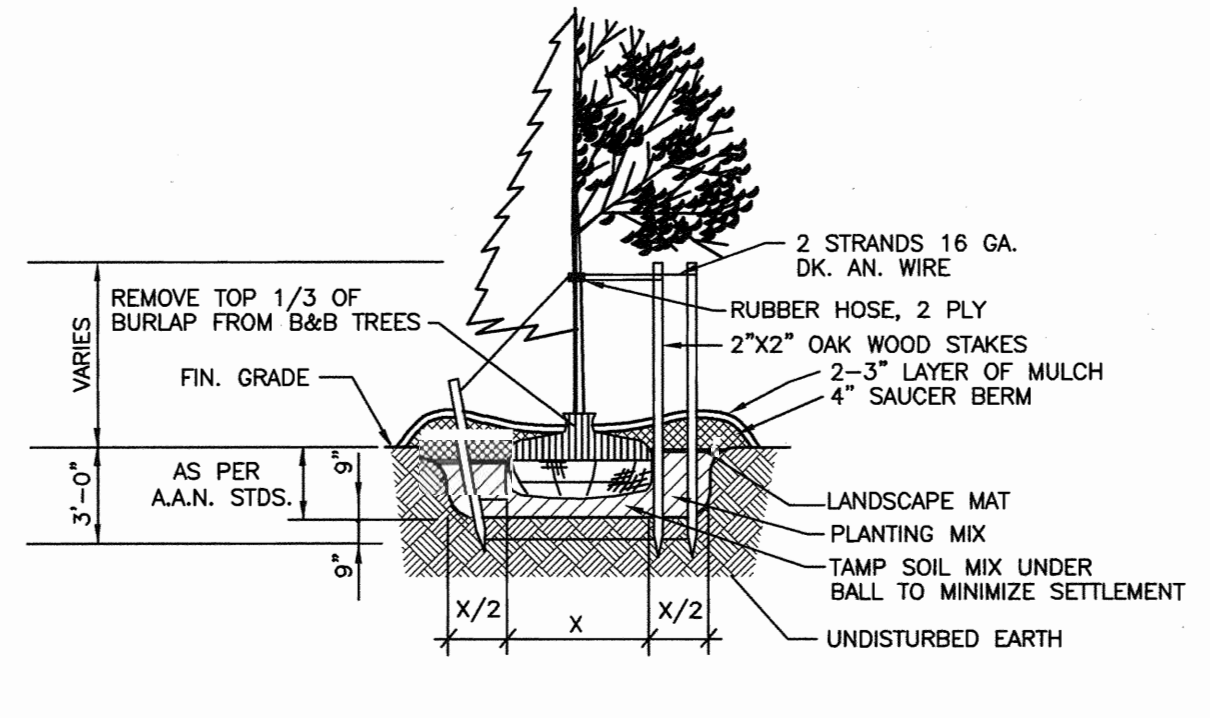
- A. Excess and waste materials shall be removed from the site before or upon completion of planting operations, or daily if required by the Owner's Representative.
- B. Repair turf areas and other existing conditions damaged during planting operations, including regrading, seeding and mulching to the satisfaction of the Owner's Representative.

**3.10 MAINTENANCE:**

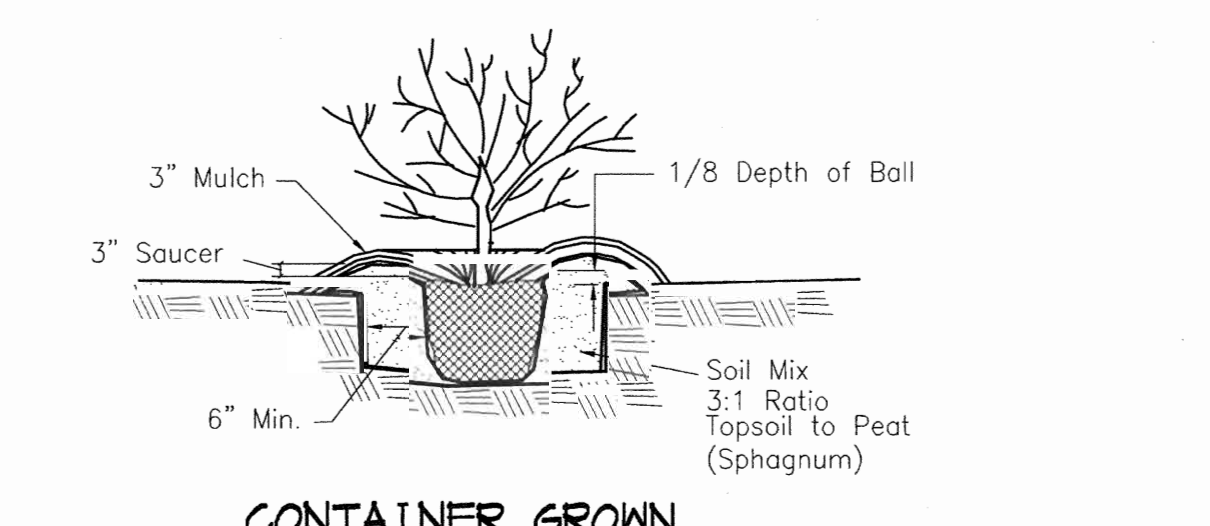
- A. Contractor shall inspect and provide necessary services throughout the 12-month maintenance period.
  1. Watering as required for local conditions.
  2. Inspection for pests and disease shall be performed a minimum of two (2) times within the initial year, after spring leaf-out and at mid-summer, or more frequently if necessary to control problems.
  3. Weeding and removal of invasive plants shall be performed a minimum of four (4) times per year, during the first two weeks of the months of May, June, July and August.
  4. Plant material shall be re-mulched, just prior to the maintenance agreement's expiration, with a minimum 1-inch depth of new mulch.
  5. Fencing, signs, stakes and guys shall be tightened, repaired or replaced as necessary throughout the maintenance period in accordance with original details and installation requirements.
- B. Remove and replace dead or damaged plant material to comply with the Minimal Survival requirement in accordance with Item 1.09 above.
- C. Notify Owner's Representative prior to initiating maintenance operations.

**GENERAL NOTES:**

1. ALL PLANT MATERIAL SHALL CONFORM TO THE STANDARDS OF NURSERY STOCK OF THE AMERICAN ASSOCIATION OF NURSERYMEN.
2. TREES AND SHRUBS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, HAVE NORMAL GROWTH HABITS, WELL DEVELOPED, DENSELY FOLIATED BRANCHES, AND VIGOROUS, FIBROUS ROOT SYSTEMS.
3. TREES AND SHRUBS SHALL BE FRESHLY DUG AND NURSERY GROWN. THEY SHALL HAVE BEEN GROWN UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCALITY OF THE PROJECT OR PROPERLY ACCLIMATED TO CONDITIONS OF THE LOCALITY OF THE PROJECT.
4. TREES AND SHRUBS SHALL BE FREE FROM DEFECTS AND INJURIES AND CERTIFIED BY APPROPRIATE FEDERAL AND STATE AUTHORITIES TO BE FREE OF DISEASES AND INSECT INFESTATIONS.
5. THE LANDSCAPE CONTRACTOR SHALL WARRANT ALL PLANT MATERIAL FOR A PERIOD OF ONE (1) FULL YEAR AFTER THE DATE OF SUBSTANTIAL COMPLETION AGAINST DEFECTS, UNSATISFACTORY GROWTH, DISEASE OR DEATH. UNSATISFACTORY, UNHEALTHY, DYING OR DEAD PLANT MATERIAL (IN THE OPINION OF THE LANDSCAPE ARCHITECT) SHALL BE REPLACED WITH THE SAME SIZE AND SPECIES.
6. IT SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR TO ADEQUATELY AND PROPERLY MAINTAIN THE LANDSCAPED AREAS, WHICH SHALL INCLUDE WATERING, CLEANING OF WEEDS AND DEBRIS, PRUNING AND TRIMMING, REPLACEMENT OF DEAD OR DISEASED PLANTINGS, AND FERTILIZING TO MAINTAIN HEALTHY GROWTH FOR THE ONE YEAR WARRANTY PERIOD.
7. THE LANDSCAPE CONTRACTOR SHALL STAKEOUT PLANT LOCATIONS IN THE FIELD. THE LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE SHALL OBSERVE THESE LOCATIONS PRIOR TO COMMENCING PLANT PIT EXCAVATION. THE LANDSCAPE CONTRACTOR SHALL MAKE ANY ADJUSTMENTS AS REQUESTED BY THE LANDSCAPE ARCHITECT.
8. ALL PLANT SAUCERS AND PLANT BEDS SHALL BE MULCHED WITH DOUBLE SHREDDED HARDWOOD MULCH OR PINE STRAW, A MINIMUM OF 3" IN DEPTH.
9. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE PERMITTED WITHOUT WRITTEN AUTHORIZATION OF HOWARD COUNTY PLANNING AND ZONING. THIS SHALL APPLY TO SUBSTITUTIONS OF SPECIES, SIZE, QUANTITY AND LOCATION.
10. THE LANDSCAPE CONTRACTOR SHALL INSTALL SHREDDED HARDWOOD BARK MULCH TO A DEPTH OF 3" UNDER AND SURROUNDING ALL NEW LANDSCAPED MASS PLANTING AREAS TO PROVIDE A UNIFORM AND CONTINUOUS SURFACE AND APPEARANCE BETWEEN AND AROUND ALL PLANT MATERIAL, BUILDING LINES AND PAVED AREAS. IN GENERAL, THIS PERTAINS TO ALL PLANT MATERIAL THAT IS PLANTED CLOSER THAN SIX (6) FEET CENTER TO CENTER. IT IS THE INTENT OF THIS CONTRACT TO INSTALL LANDSCAPE MAT UNDER THE ENTIRE AREA OF SHREDDED BARK MULCH.
11. TREES SHALL BE LOCATED A MINIMUM OF 5' FROM SEWER/WATER CONNECTIONS. CONTRACTOR SHALL BE LIABLE FOR DAMAGE TO ANY AND ALL PUBLIC AND PRIVATE UTILITIES, WATER AND SEWER LINES.
12. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED PLANTS AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.
13. CONTRACTOR SHALL SLIGHTLY ADJUST PLANT LOCATIONS IN THE FIELD AS NECESSARY TO BE CLEAR OF DRIVES, SWALES AND UTILITIES. FINISHED PLANTING BEDS SHALL BE GRADED SO AS NOT TO IMPEDE DRAINAGE AWAY FROM BUILDINGS.
14. TREE STAKING AND GUYING SHALL BE DONE PER DETAILS. CONTRACTOR SHALL ENSURE THAT TREES REMAIN PLUMB AND UPRIGHT FOR THE DURATION OF THE GUARANTEE PERIOD.
15. ALL TREE PITS, SHRUB BEDS, AND PREPARED PLANTING BEDS ARE TO BE COMPLETELY EXCAVATED IN ACCORDANCE WITH THE PLANTING DETAILS.
16. CROWN OF ROOT BALL SHALL BE HIGHER (AFTER SETTING) THAN ADJACENT SOIL.
17. SHADE TREES: HEIGHT SHALL BE MEASURED FROM THE CROWN OF THE ROOT BALL TO THE TOP OF MATURE GROWTH. SPREAD SHALL BE MEASURED TO THE END OF BRANCHING EQUALLY AROUND THE CROWN FROM THE CENTER OF THE TRUNK. MEASUREMENTS ARE NOT TO INCLUDE ANY TERMINAL GROWTH. SINGLE TRUNK TREES SHALL BE FREE OF "V" CROTCHES THAT COULD BE POINTS OF WEAK LIMB STRUCTURE OR DISEASE INFESTATION.
18. CONTRACTOR MUST CONTACT THE OWNER AT LEAST TEN WORKING DAYS IN ADVANCE TO SCHEDULE ACCEPTANCE INSPECTION(S). CONTRACTOR MUST REPLACE ALL DEAD OR UNACCEPTABLE PLANTS DURING THE FOLLOWING RECOMMENDED PLANTING SEASON.
19. TREES SHALL BE PLANTED DURING ACCEPTABLE PLANTING SEASONS: BETWEEN MARCH 15 AND MAY 15 AND BETWEEN AUGUST 15 AND NOVEMBER 15 OR AS APPROVED BY OWNERS REPRESENTATIVE.
20. ALL TREE STAKING AND GUYING SHALL BE REMOVED BY THE CONTRACTOR AFTER THE TREES ARE ESTABLISHED.
21. SEEDED AREAS THAT WASH OUT MUST BE FILLED AND GRADED AS NECESSARY AND RESEEDED. SOME TYPE OF ANCHORING METHOD SHOULD THEN BE USED TO HOLD SEED AND MULCH IN PLACE; THIS IS ESPECIALLY IMPORTANT AROUND WATER COURSED, IN SWALES AND AREAS OF CONCENTRATED FLOWS, AND ON SLOPES.
22. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
23. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING MUST BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT IN THE AMOUNT OF \$ 21,690.00 (49 SHADE TREES @ \$300.00 ea., 20 EVERGREEN TREES @ \$150.00 ea., AND 133 SHRUBS @ \$30.00 ea.).
24. NO LANDSCAPING MAY BE PLANTED WITHIN A PUBLIC EASEMENT.



**SHADE, FLOWERING OR EVERGREEN TREE PLANTING DETAIL**  
NOT TO SCALE



**CONTAINER GROWN SHRUB PLANTING DETAIL**  
Not to Scale

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

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

NAME \_\_\_\_\_ DATE \_\_\_\_\_

THE OWNER, TENANT, AND / OR THEIR AGENTS SHALL BE RESPONSIBLE FOR MAINTENANCE OF THE REQUIRED LANDSCAPING, INCLUDING BOTH PLANT MATERIALS AND BERMS, FENCES AND WALLS. ALL PLANT MATERIALS SHALL BE MAINTAINED IN GOOD GROWING CONDITION, AND WHEN NECESSARY, REPLACED WITH NEW MATERIALS TO ENSURE CONTINUED COMPLIANCE WITH APPLICABLE REGULATIONS. ALL OTHER REQUIRED LANDSCAPING SHALL BE PERMANENTLY MAINTAINED IN GOOD CONDITION, AND WHEN NECESSARY, REPAIRED OR REPLACED.

AT THE TIME OF INSTALLMENT, ALL SHRUBS AND OTHER PLANTINGS HEREWITH LISTED AND APPROVED FOR THIS SITE, SHALL BE OF THE PROPER HEIGHT REQUIREMENTS IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL. IN ADDITION, NO SUBSTITUTIONS OR RELOCATION OF REQUIRED PLANTINGS MAY BE MADE WITHOUT PRIOR REVIEW AND APPROVAL FROM THE DEPARTMENT OF PLANNING AND ZONING. ANY DEVIATION FROM THIS APPROVED LANDSCAPE PLAN MAY RESULT IN DENIAL IN THE RELEASE OF LANDSCAPE SURETY UNTIL SUCH TIME AS ALL REQUIRED MATERIALS ARE PLANTED AND/OR REVISIONS ARE MADE TO APPLICABLE PLANS AND CERTIFICATES.

OWNER/DEVELOPER: **DAVIS EMORY** FAX NO.: (410) 712-0620  
 A. NAME: **DAVIS EMORY** B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: **TANGO, LLC**  
 D. ADDRESS: **7250 PARKWAY DRIVE, SUITE 130**  
 E. CITY: **HANOVER** STATE: **MD** ZIP: **21076**

**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395

**SITE DEVELOPMENT PLANS**  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13

**LANDSCAPE NOTES AND DETAILS**

L 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.: 12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PYM
		SHEET: 14 OF 17

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/5/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 2/10/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 2/10/03  
 DIRECTOR DATE



**SEGMENTAL RETAINING WALL SPECIFICATIONS**

**PART 1 - GENERAL**

1.1 Work includes furnishing and installing segmental retaining wall units, geogrid reinforcement, wall fill, and backfill to the lines and grades shown on the construction drawings and as specified herein. The contract also includes the furnishing and installing of equipment, materials, equipment, and labor required for construction of the geogrid reinforced, segmental retaining wall.

**1.2 REFERENCE STANDARDS**

- A. ASTM C90-75 (1981 rev) - Hollow Load Bearing Masonry Units
- B. ASTM C140-75 (1981 rev) - Sampling and Testing Concrete Masonry Units
- C. ASTM C145-75 (1981 rev) - Solid Load Bearing Concrete Masonry Units
- D. Geosynthetic Research Institute (GRI), GRI-GG4 - Determination of Long Term Design Strength of Geogrids.
- E. ASTM D 638 - Test Method for Tensile Properties of Plastic
- F. ASTM D 1248 - Specification of Polyethylene Plastics Molding and Extrusion Materials
- G. ASTM D 4218 - Test Method for Carbon Black Content in Polyethylene Compounds by the Muffle Furnace Technique
- H. ASTM D 3034 - Specification for Polyvinyl Chloride (PVC) Pipe

**1.3 DELIVERY, STORAGE AND HANDLING**

- A. Contractor should check the materials upon delivery to assure that proper material has been received.
- B. Contractor should prevent excessive mud, wet cement, epoxy, and like materials which may affix themselves, from coming in contact with the materials.
- C. Geogrids should be stored above -20 degrees F.
- D. Contractor should protect the materials from damage. Damaged material should not be incorporated into the retaining wall.

**PART 2 - PRODUCTS**

**2.1 DEFINITIONS**

- A. Geogrid is a high density polyethylene grid, specifically fabricated for use as a soil reinforcement.
- B. Concrete retaining wall units are as detailed on the drawings and as specified herein.
- C. Geosynthetic Drainage Composites are polyethylene net structure with non-woven geotextiles bonded to both sides.
- D. Erosion Control Blankets consist of a web of polyolefin fibers securely bound by polyolefin threads between two high strength polyolefin nets.
- E. Backfill is the soil which is used as fill for the reinforced soil mass.
- F. Foundation soil is the in-situ soil or controlled compacted fill placed below the bottom of the retaining wall and geogrid zone.

**2.2 MATERIALS**

The contractor should submit manufacturer's catalog and samples of the proposed materials for approval by the project geotechnical engineer a minimum of seven days before the start of construction. Materials should be transported to the site only after approval of the proposed materials by the project geotechnical engineer.

**A. Concrete Units**

- 1. Masonry units should be Keystone Standard Retaining Wall Units. Substitution of other concrete units may be allowed with the prior approval of the Geotechnical Engineer.
- 2. Concrete wall units should have a minimum 28 day compressive strength of 3000 psi, in accordance with ASTM C-50. The concrete should have adequate freeze/thaw protection with a maximum moisture absorption of 6 to 8 percent.
- 3. Exterior dimensions may vary. Units are required to have a minimum of one square foot of face area each.
- 4. Units should have angled sides and be capable of attaining concave and convex alignment curves in accordance with manufacturer's recommendations.
- 5. Units should be interlocked with non-corrosive reinforced fiberglass pins.
- 6. Units should be interlocked as to provide a maximum of 1-1/4 inch of setback per block.

**B. Leveling Pad**

Material for leveling pad/footing should consist of compacted free-draining coarse aggregates meeting the requirements of Graded Aggregate Base (GAB) per Maryland State Highway Administration Standard Specifications for Construction and Materials. A minimum of 6 inches deep and 36 inches wide compacted leveling pad is required.

**C. Fiberglass Connecting Pins**

- 1. Thermoset isophthalic polyester resin pultruded fiberglass reinforcements rods, minimum one-half inch in diameter.
- 2. Pins should have a minimum flexural strength of 128,000 psi and short beam shear of 6400 psi.
- 3. For substitute concrete units, use of other compatible connector system may be allowed with the prior approval of the Geotechnical Engineer.

**D. Geogrid**

Geogrid should be Tensor UX 1400SB or equivalent as approved by the geotechnical engineer. The geogrid should have a long term design strength of 1,335 pounds/foot for UX 1400SB geogrid.

**E. Reinforced Backfill**

Reinforced backfill soils should be non-plastic, controlled fill meeting the requirements of AASHTO A-2-4 or more granular. The test borings performed for the project indicate that sufficient quantities of A-2-4 material are not likely available on site. Contractor should be prepared to import the majority of suitable AASHTO A-2-4 materials from off-site sources. (Approx. 2,500 CY may be required)

**F. Controlled Fill**

Controlled fill soils to be placed outside the Reinforced Backfill area and where specified should be soils meeting the requirements of AASHTO A-4, or more granular.

**G. Low permeability soil.**

Low permeability soil to be placed where specified should contain at least 30% fines (material passing #200 sieve)

**H. Drainage Pipe**

The drainage pipes should be perforated or slotted PVC pipe manufactured in accordance with ASTM D-3034.

**I. Filter Fabric**

Filter Fabric should be non-woven, polypropylene geotextile, 140 N manufactured by Nicolon Mirafi Group or approved equivalent.

**J. Drainage Composite**

Drainage Geocomposite should be DC 4200 Geotextile, manufactured by Evergreen Technologies, Inc. or an approved equivalent.

**K. Erosion Control Blanket**

Erosion Control Blanket should be Tensor TB 1000 manufactured by the Tensor Corporation or or an approved equivalent.

**PART 3 - EXECUTION**

**A. Excavation**

- 1. The contractor should excavate to the lines and grades shown on the construction drawings. Under no circumstances should the excavation lines and grades be exceeded, except with owner's approval. The contractor should protect the excavation from sloughing by placing a membrane over the face of the excavation.
- 2. Excavations should be sloped or otherwise supported in accordance with Occupation Safety and Health Administration (OSHA) and other local and state regulations.

**B. Foundation Subgrade Preparation**

- 1. Foundation soil should be excavated as required for installation of leveling pad, geogrid and other elements and as shown on the construction drawings.
- 2. Manmade fills may be present at and below the foundation level of the retaining walls in localized areas. The existing fill should be reviewed by the Engineer to evaluate if actual foundation soil strength meets the assumed design strength. Soils not meeting required strength should be removed and replaced with controlled, compacted material. Some undercutting and replacement of soft and loose fills will likely be required.
- 3. Over-excavated areas should be filled with select and approved material and compacted to 92 percent of maximum dry density in accordance with the Modified Proctor, ASTM D-1557.
- 4. Allowable bearing pressure for natural and controlled, compacted fill soils should be at least 2,000 psf for the retaining walls.
- 5. The exposed foundation subgrade should be proofrolled with a loaded dump truck. Any soft or unstable areas identified during proofrolling should be overexcavated and backfilled with Controlled Fill.
- 6. Fill required to establish the sloping surface in front of the wall should consist of Controlled Fill and should be placed, compacted and field tested in accordance with the requirements specified herein.

**C. Leveling Pad**

- 1. The leveling pad should be placed as shown on the construction drawings with a minimum thickness of 6 inches.
- 2. Leveling pad materials should be installed upon undisturbed in-situ soils or controlled, compacted backfill.
- 3. Leveling pad should be prepared to insure complete contact of retaining wall unit with base. Gaps should not be allowed.

**D. Unit Installation**

- 1. First course of concrete wall units should be placed on the footing. The units should be checked for level and alignment. The first course is the most important to insure accurate and acceptable results.
- 2. Insure that units are in full contact with base.
- 3. Units are placed side by side for full length of wall alignment. Alignment may be done by means of a string line or offset from base line.
- 4. Install fiberglass connecting pin.
- 5. Lay up each course insuring that the connecting pins are inserted through front slot of the unit, and into the receiving slot in the course beneath. Repeat procedure to the extent of wall height.
- 6. At the end of each course where the wall changes elevation, units should be turned into the backfill. Units should be laid as to create the minimum radius possible. Unless otherwise shown on the drawing a minimum of one unit should be installed into the grade. Only the front face of the units should be visible from the side of the wall.
- 7. Standard Units should be used to make convex and concave curves in accordance with manufacturer's recommendations.
- 8. Cap units should be installed and bonded with construction adhesive or epoxy cement as required by manufacturer.
- 9. Contractor should provide positive drainage for the back of the retaining wall during construction.

**E. Geogrid Installation**

- 1. All utilities in the vicinity of any retaining wall or geogrid reinforcement must be installed and properly backfilled prior to placing the geogrid soil reinforcement or constructing the wall.
- 2. The geogrid soil reinforcement should be laid horizontally on compacted backfill, connected to the concrete wall units. Hook grid over the fiberglass connecting pin, pull taut, and anchor before backfill is placed on the geogrid.
- 3. Stock in the geogrid at the wall unit connections should be removed in a manner, and to such a degree, as approved by the Engineer.
- 4. Geogrid should be laid at the proper elevation and orientation as shown on the construction drawings or as directed by the Engineer.
- 5. Correct orientation (roll direction) of the geogrid should be verified by the Contractor.
- 6. Geogrid should be secured in-place with staples, pins, sand bags, or backfill as required by fill properties, fill placement procedures, or weather conditions, or as directed by the Engineer.
- 7. Overlaps
  - a. Uniaxial geogrid does not need to be overlapped in the cross the roll direction, except to contain the fill of the slope face when wrap-around fabric is used. Uniaxial grid should be overlapped 48" in the rolled direction.
  - b. A layer of soil a minimum of 4 inches in thickness should be spread between uniaxial geogrid layers in the area to be overlapped, or as directed.

**F. Fill Placement**

- 1. Wall backfill material should be placed in no more than 8-inch lifts and compacted to 92 percent of the Modified Proctor (ASTM D-1557).
- 2. Backfill should be placed, spread, and compacted in such a manner that minimizes the development of wrinkles in and/or movement of the geogrid.
- 3. Only hand-operated compaction equipment should be allowed within 4 feet of the wall face. Backfill should be placed from the wall outward to insure that the geogrid remains taut.
- 4. Tracked construction equipment should not be operated behind or above the wall.
- 5. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning should be avoided.
- 6. Place filter fabric between the unit core fill and the reinforced backfill as shown on plans. The filter fabric should be embedded a minimum of two feet into the reinforced fill.
- 7. The finished sloping surface on the toe side of the retaining wall should be protected by installing the permanent erosion control blanket and seeding in accordance with project requirements.

**G. DRAINAGE**

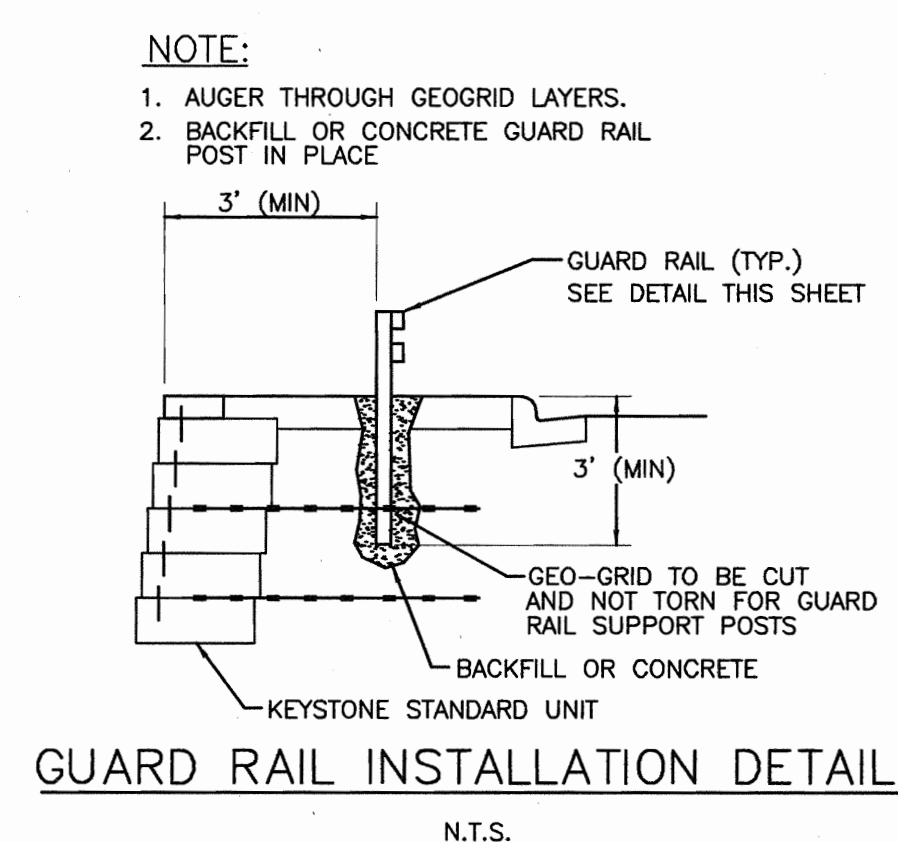
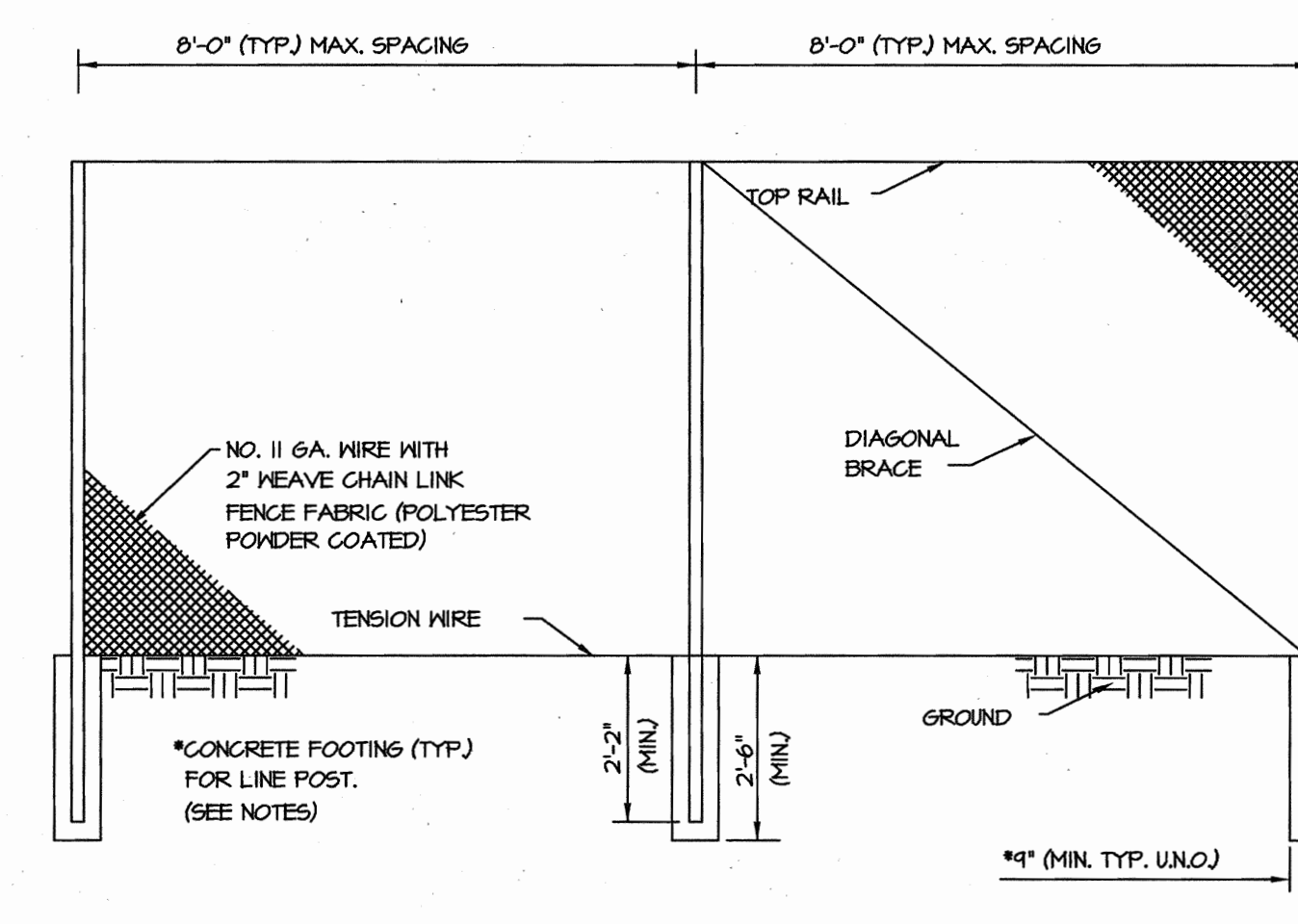
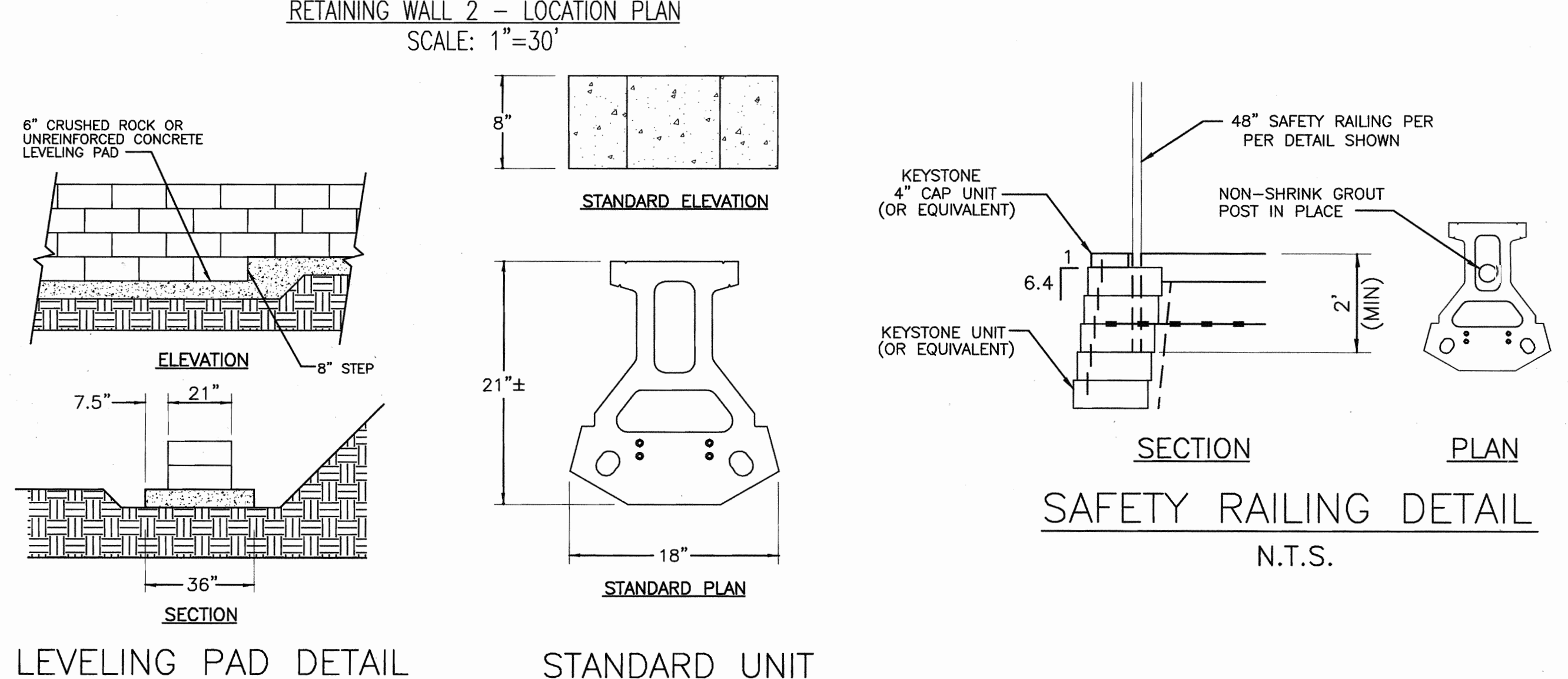
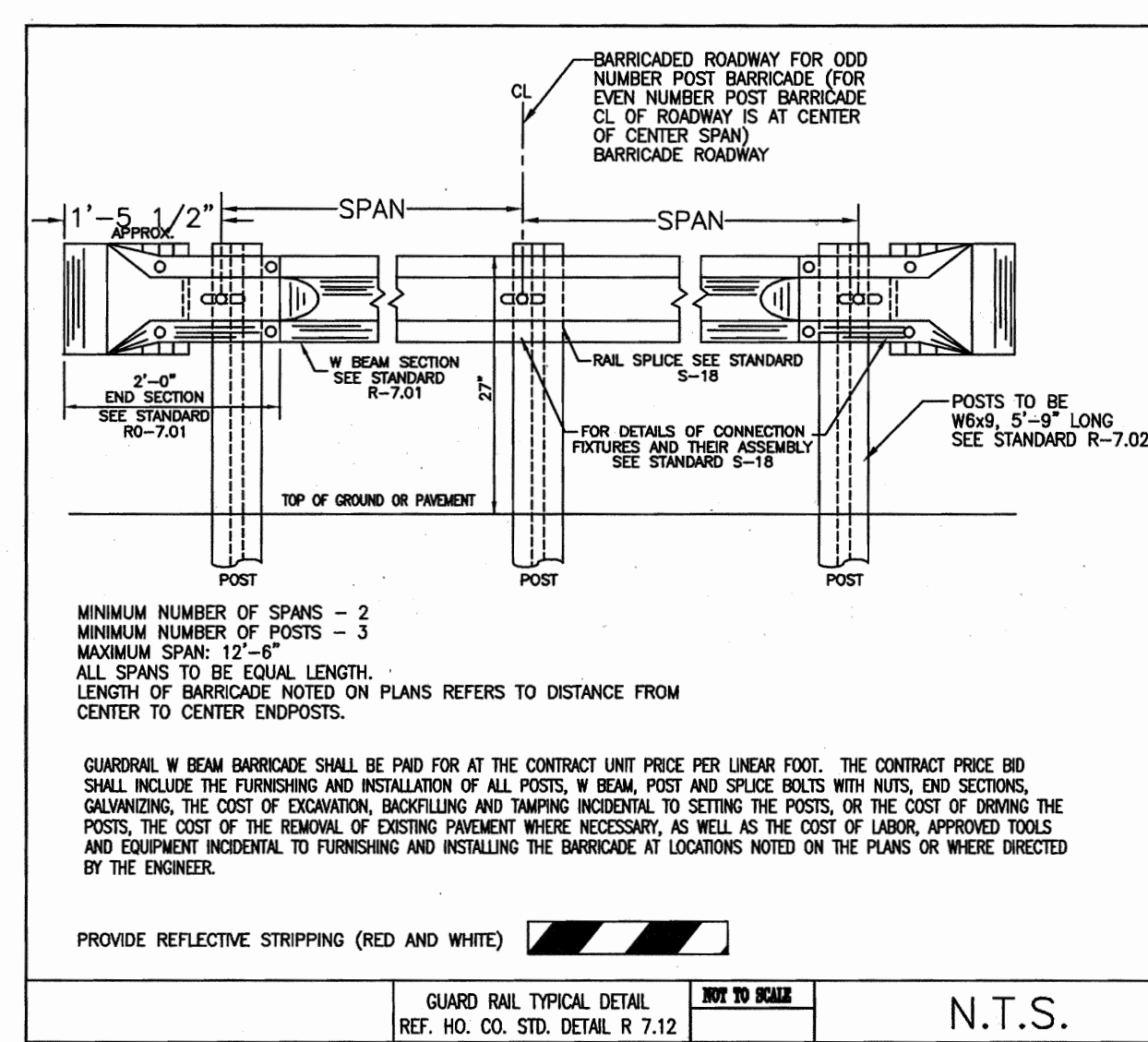
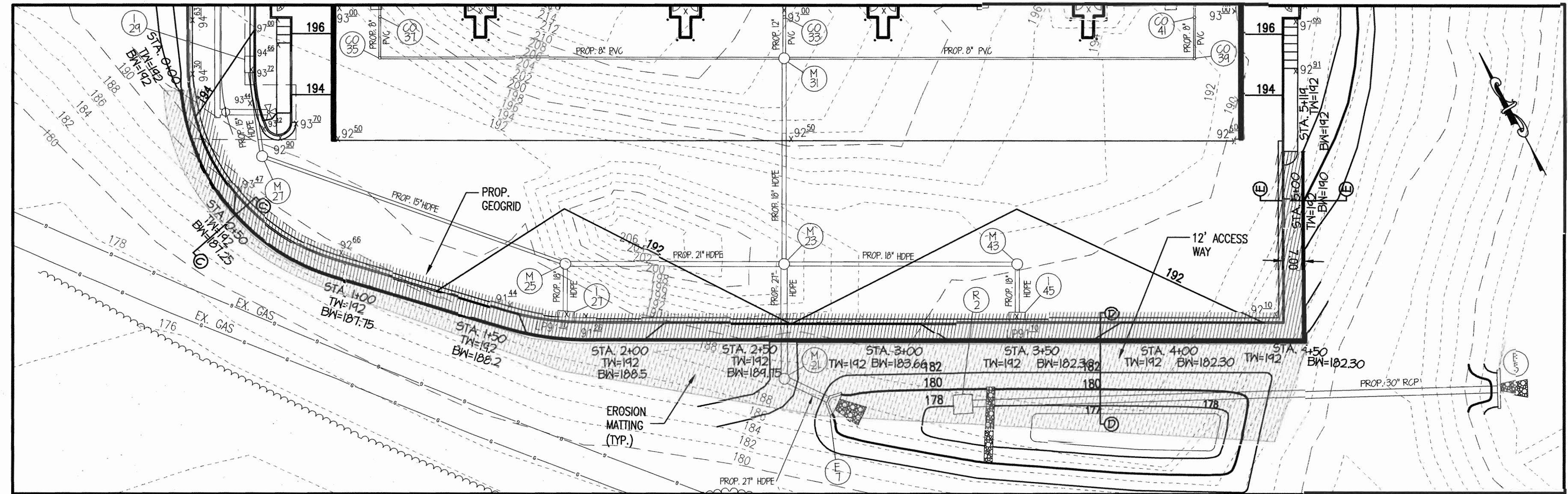
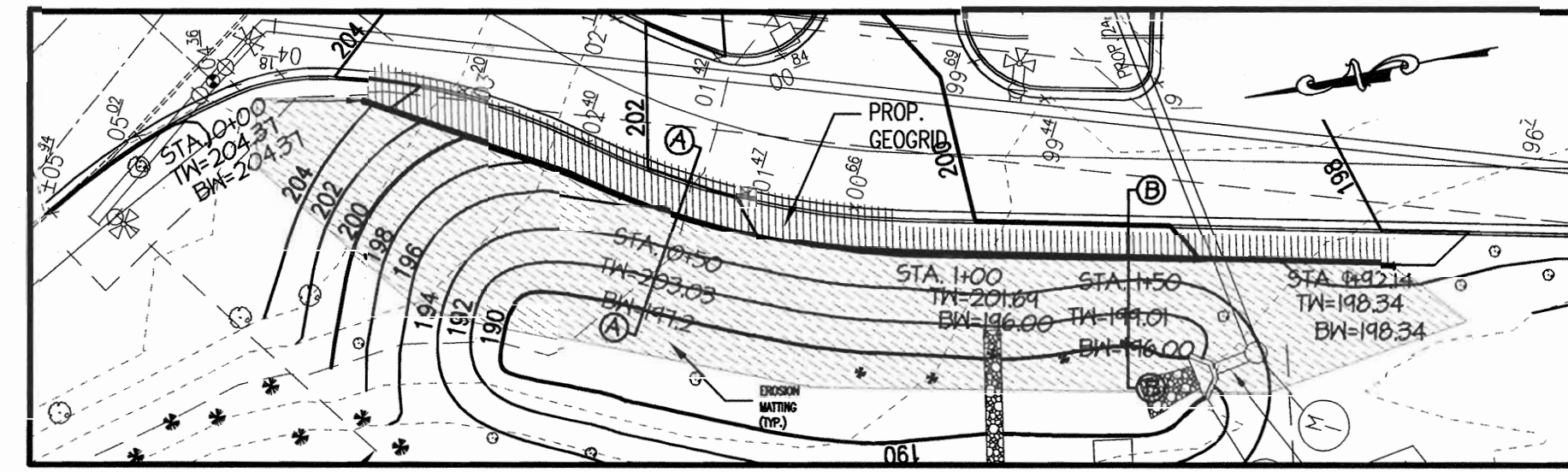
- 1. Drainage fill should be placed behind the wall to the limits shown. The drainage fill should be a minimum of 12-inches thick. The drainage fill should be ASTM #57 stone. The drainage fill should be wrapped in filter fabric (Mirafi 140N or equal) as shown on the drawings.
- 2. Positive drainage should be maintained during and after construction. Soils within the reinforced zone that become wet during construction should be dried to optimum moisture or removed.
- 3. Install the perforated drainage pipes and lateral drainage pipes incrementally along with installation of concrete units and placement of fill.
- 4. The groundwater levels should be evaluated during construction. If the groundwater levels is encountered within the retaining wall excavations, a field underdrain system shall be installed to lower the groundwater levels.

**PART 4 - CONSTRUCTION OBSERVATION AND TESTING**

- A. The required leveling pad subgrade bearing capacity should be certified by a Maryland Registered Professional Geotechnical Engineer prior to footing placement.
- B. Construction of retaining wall should be performed under the observations of a Maryland Professional Engineer. Performance testing should be performed to verify material engineering properties. Upon completion of the work, the engineer should submit a signed and sealed report stating that the retaining wall was constructed in accordance with the plans, specifications, and accepted modifications (if applicable).

**PART 5 - DESIGN CRITERIA**

- 1. Required minimum allowable foundation bearing pressure is 2,000 psf.
- 2. Design internal friction angle = 32 degrees (for reinforced backfill)
- 3. Design unit weight = 125 pcf (for reinforced backfill)
- 4. Retaining walls are not designed to resist hydrostatic pressure.
- 5. Retained soil internal friction angle = 28 degrees or cohesion = 1,000 psf.
- 6. This design includes a surcharge of 250 psf for traffic live load at the top of the wall.

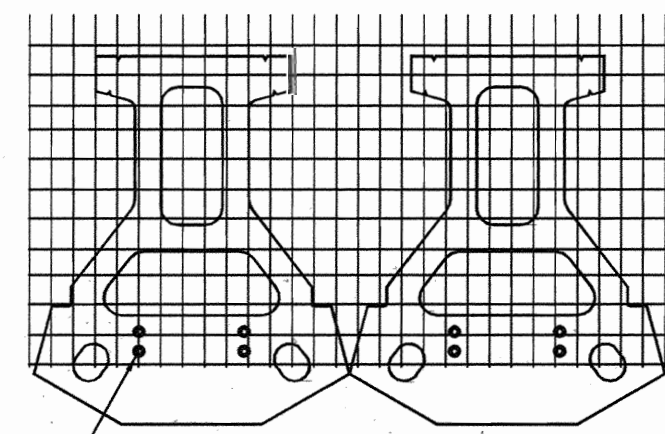
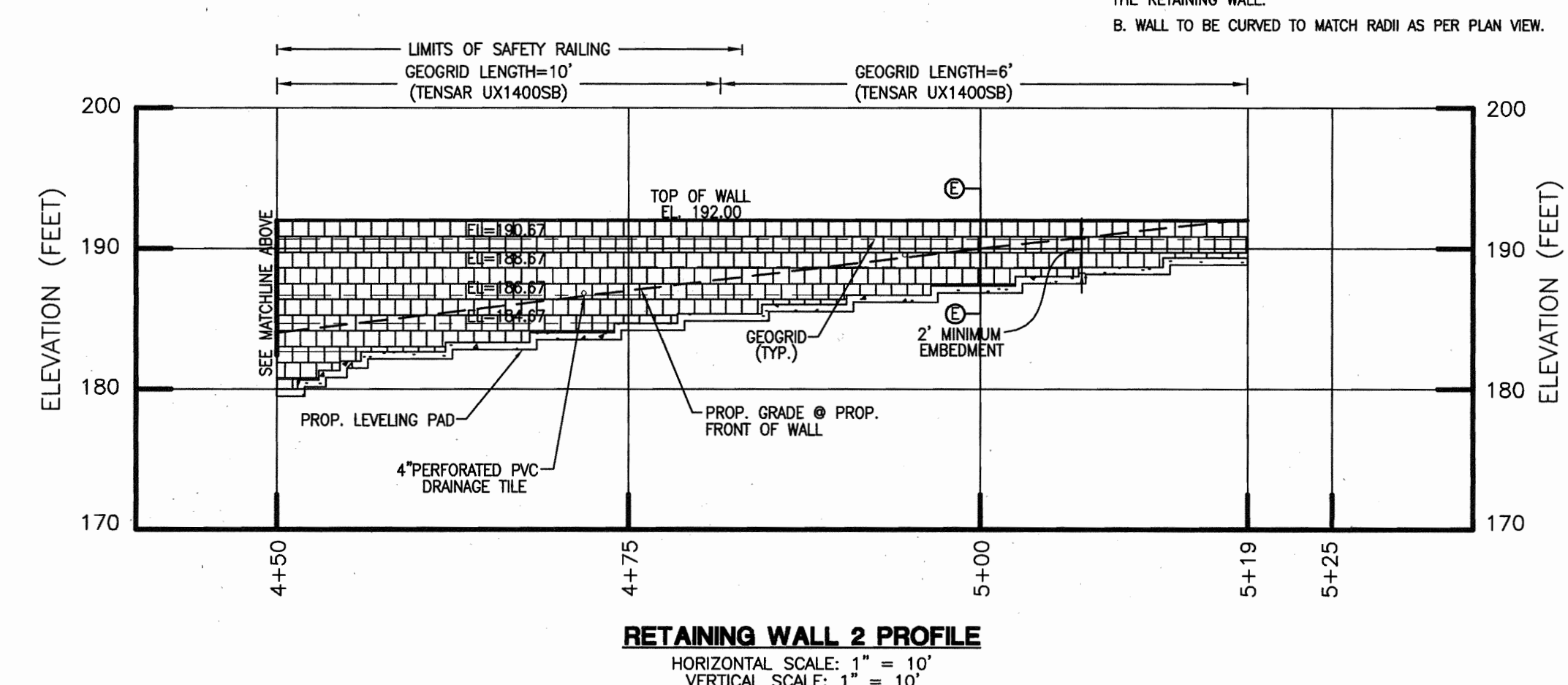
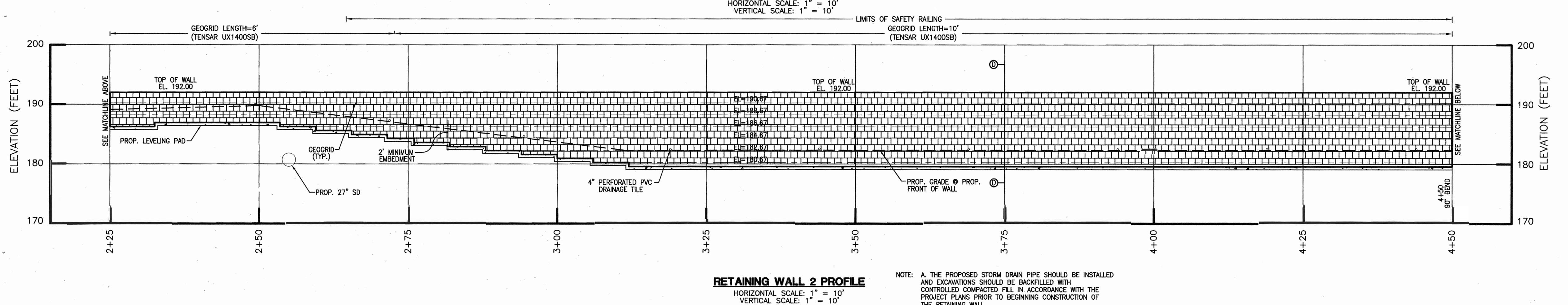
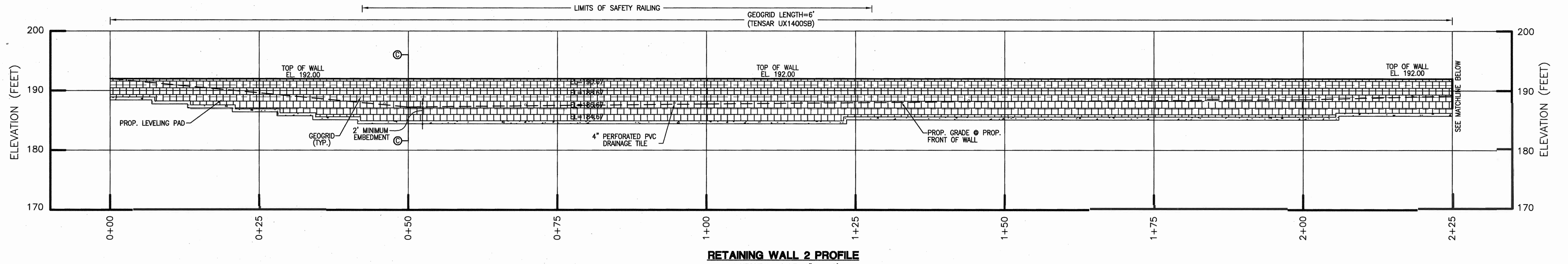
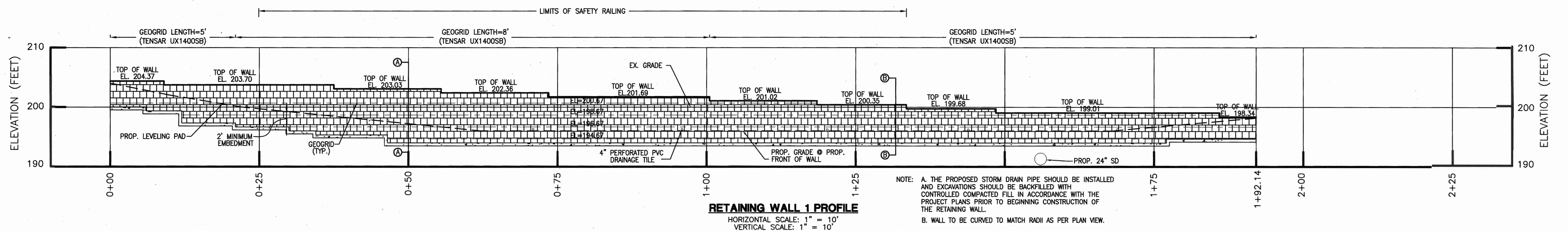


APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 2/1/09  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 2/1/09  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature] 2/1/09  
 DIRECTOR

- 1. THE BOTTOM OF CONSTRUCTION BASE IS TO BE SET BELOW FROST LINE. (SEE LOCAL CODES) CONCRETE BASE IS RECOMMENDED MINIMUM AND SHOULD BE REDESIGNED FOR CONDITIONS WHERE SOIL IS POOR. PROVIDE CONCRETE WITH A 28 DAY STRENGTH 3000 PSI/PPF (MIN).
- 2. PROVIDE A DIAGONAL BRACE ROD AND TURN BUCKLE AS SHOWN ON BOTH SIDES OF THE GATE.
- 3. CORNER POST SHALL BE 2 1/2" DIA. (MIN)
- 4. LINE POST SHALL BE 2.0" DIA. (MIN)
- 5. PROVIDE A DIAGONAL BRACE ROD AND TURN BUCKLE AS SHOWN ON BOTH SIDES OF THE GATE.

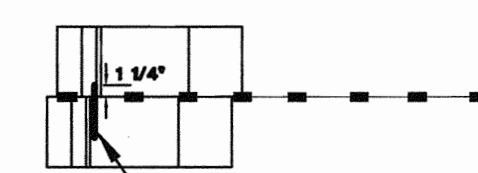
OWNER/DEVELOPER A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466		FAX NO.: (410) 712-0620	
C. COMPANY: TANGO, LLC		STATE: MD	
D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130		ZIP: 21076	
E. CITY: HANOVER		C-15	
<b>MORRIS &amp; RITCHIE ASSOCIATES, INC.</b> ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS			
9090 JUNCTION DRIVE SUITE 9 ANNAPOLIS JUNCTION, MARYLAND 20701 (410) 792-9792 or (301) 776-1690 FAX (410) 792-7395			
SITE DEVELOPMENT PLANS 7125 TROY HILL DRIVE TROY HILL CORPORATE CENTER PARCEL A-13 <b>RETAINING WALLS PLAN &amp; MISC. DETAILS</b> L 6057 F. 28 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135 ELECTION DISTRICT NO: 1 HOWARD COUNTY, MARYLAND			
DATE	REVISIONS	JOB NO.: 12269	
		SCALE: AS SHOWN	
		DATE: 01/20/03	
		DRAWN BY: CAO	
		DESIGN BY: CAO	
		REVIEW BY: PVM	
		SHEET: 15 OF 17	



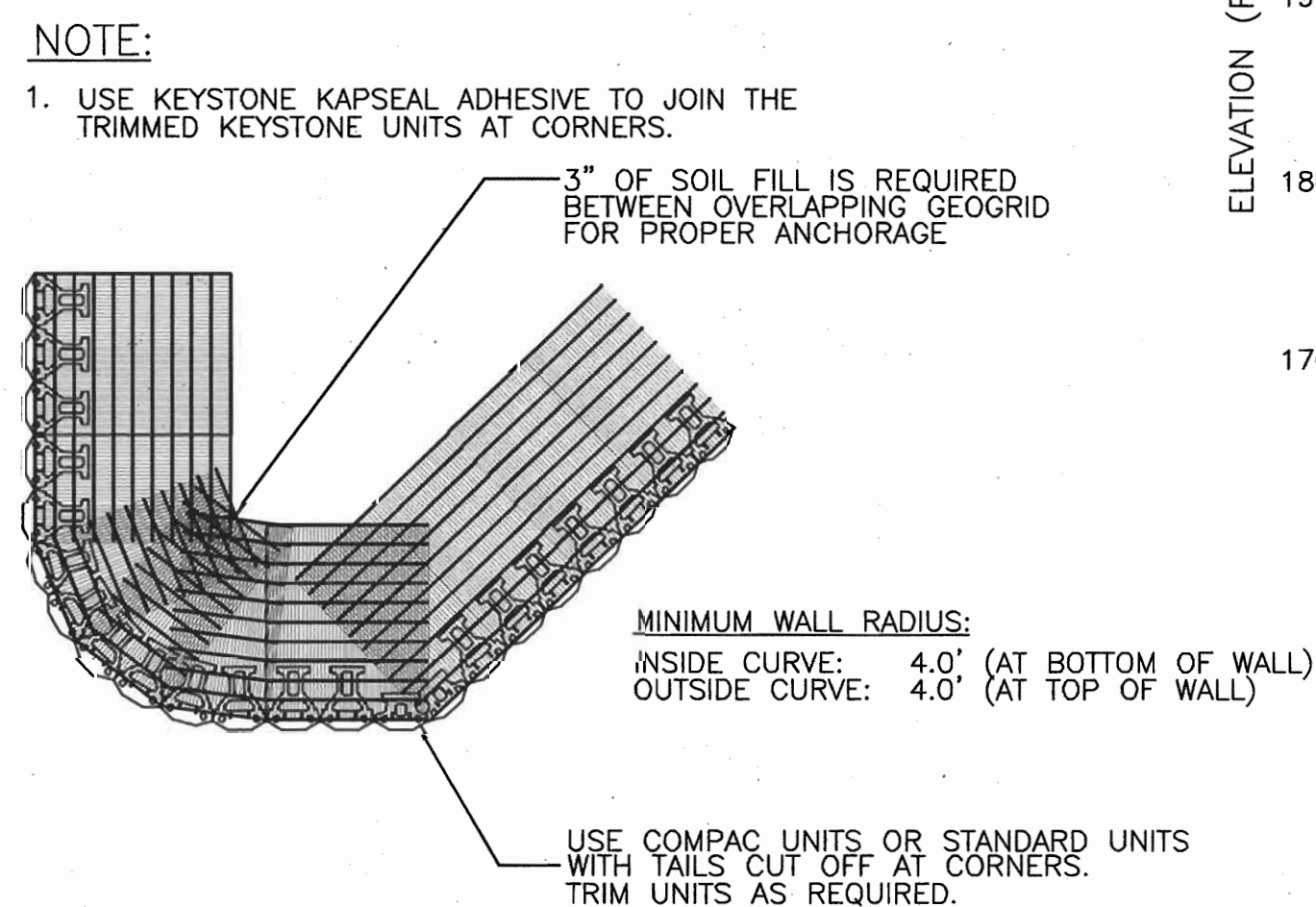
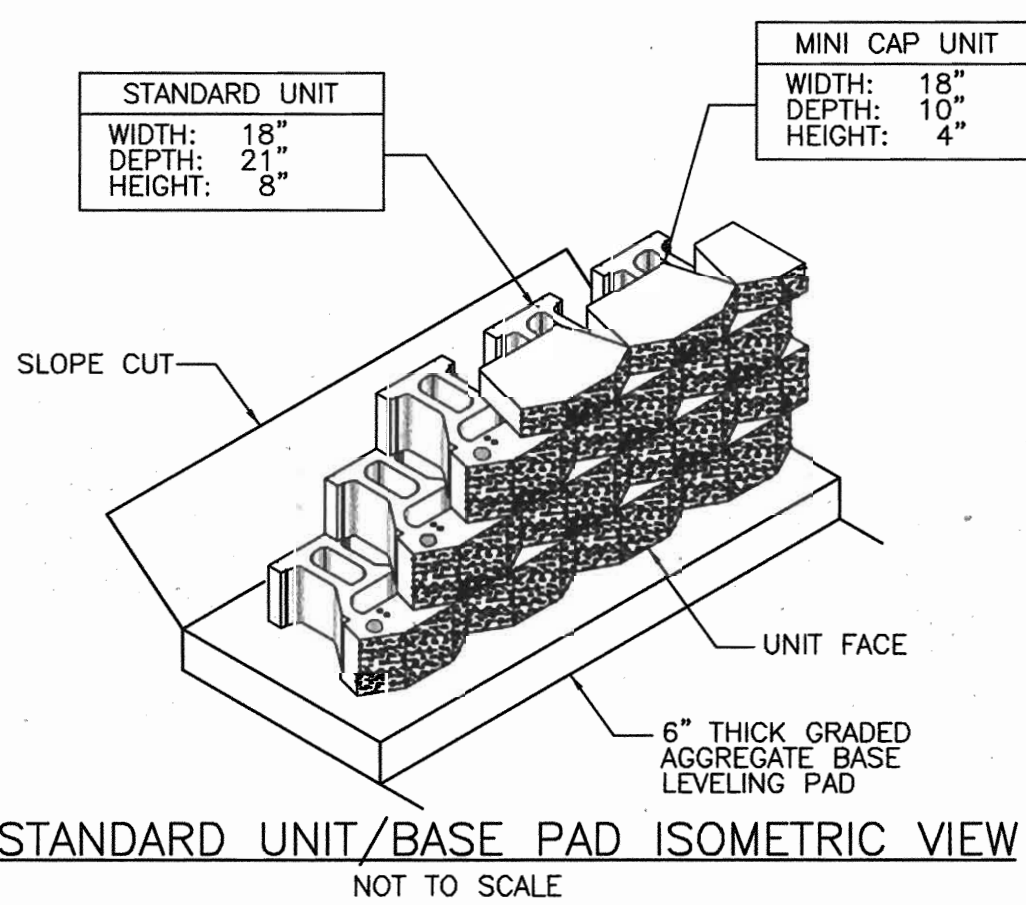


GEOGRID IS TO BE PLACED ON LEVEL BACKFILL AND EXTENDED OVER THE FIBERGLASS PINS. PLACE NEXT UNIT. PULL GRID TIGHT AND BACKFILL. STAKE AS REQUIRED.

**GRID & PIN CONNECTION**  
 NOT TO SCALE



**GRID/PIN CONNECTION DETAIL**  
 NOT TO SCALE



OWNER/DEVELOPER: FAX NO.: (410) 712-0620  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076

C-16

**MRA**  
**MORRIS & RITCHIE ASSOCIATES, INC.**  
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 ANNAPOLIS JUNCTION, MARYLAND 20701  
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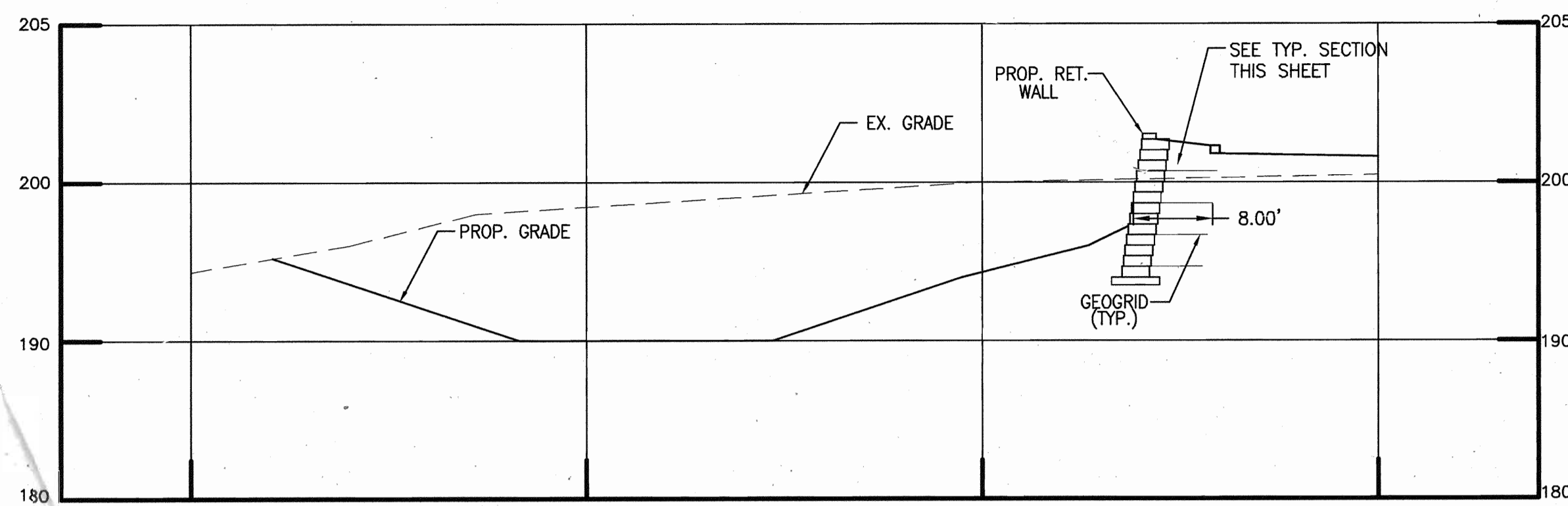
STATE OF MARYLAND  
 PIERO VAN MELLITS  
 No. 21875  
 REGISTERED PROFESSIONAL ENGINEER  
 -20-15

**RETAINING WALLS - PROFILES**  
 SITE DEVELOPMENT PLANS  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
 L. 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO. 1 HWMARD: FIDINITY, MARYLAND

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 2/2/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 2/4/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature] 2/1/03  
 DIRECTOR

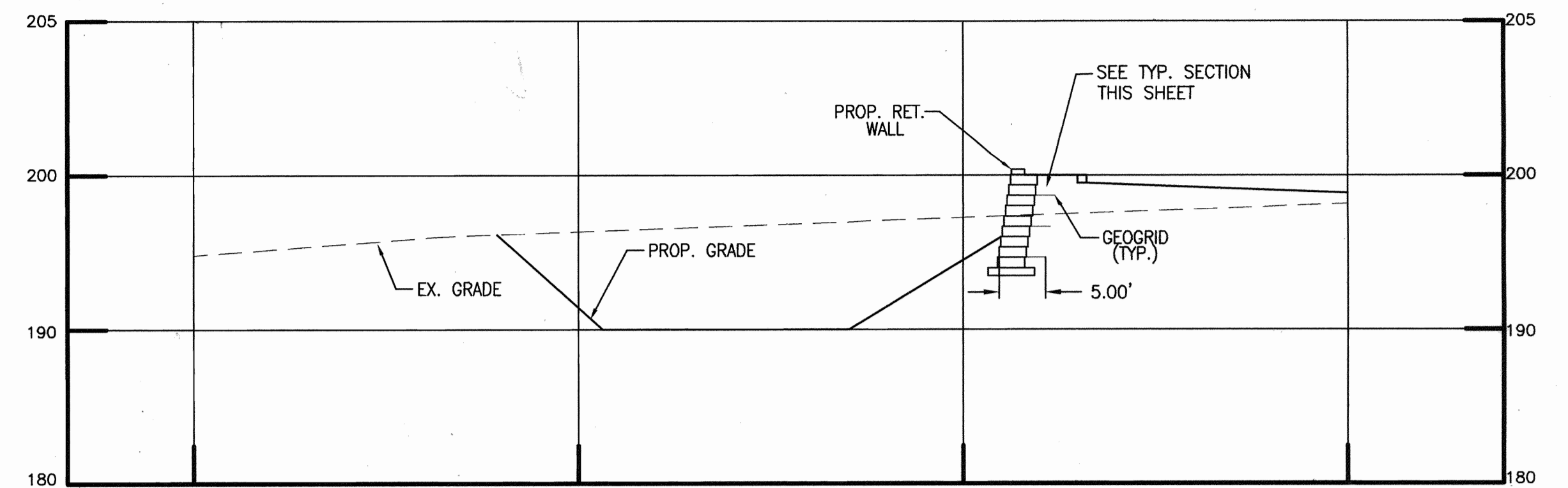
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		REVIEW BY: PVM
		SHEET: 16 OF 17





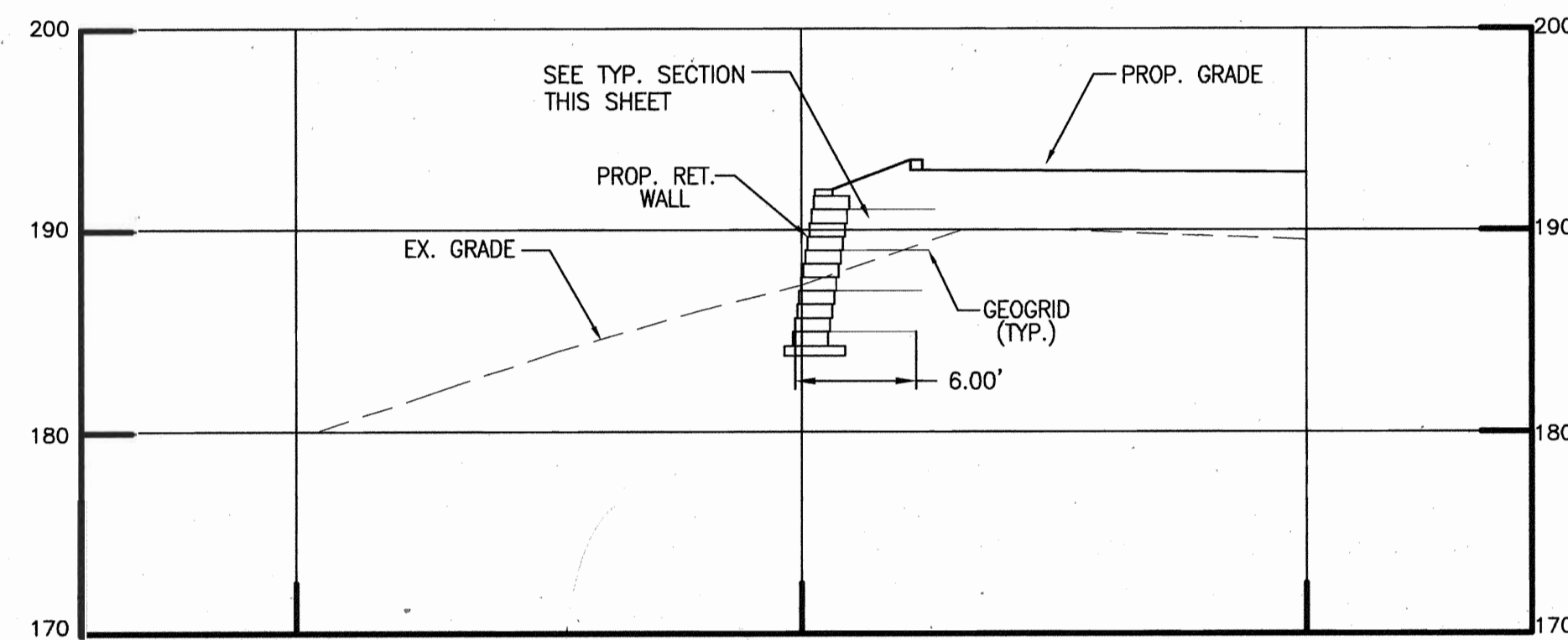
**RETAINING WALL 1 - SECTION A-A (STA. 0+50)**

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VERTICAL SCALE: 1" = 8'



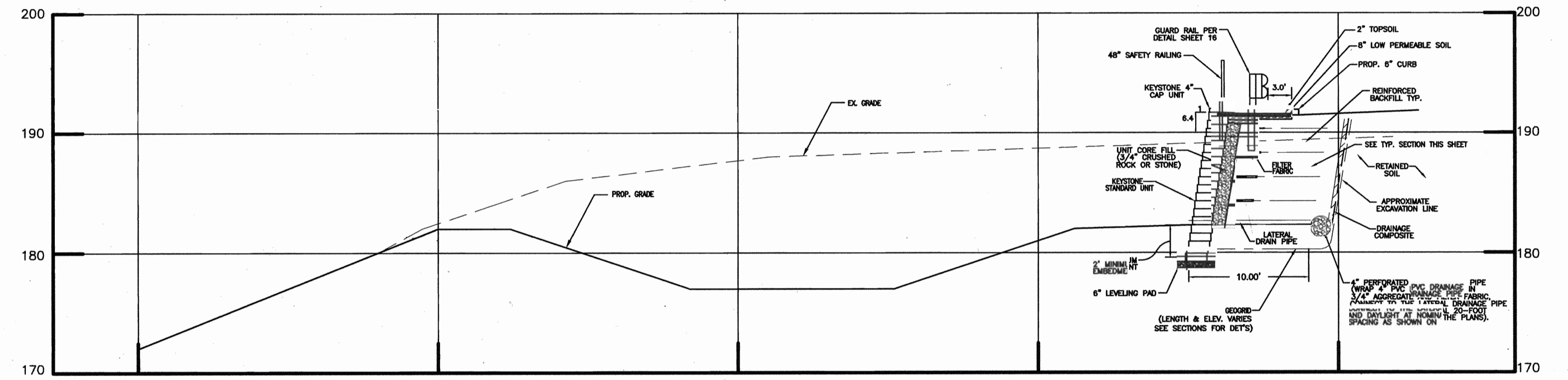
**RETAINING WALL 1 - SECTION B-B (STA. 1+50)**

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VERTICAL SCALE: 1" = 8'



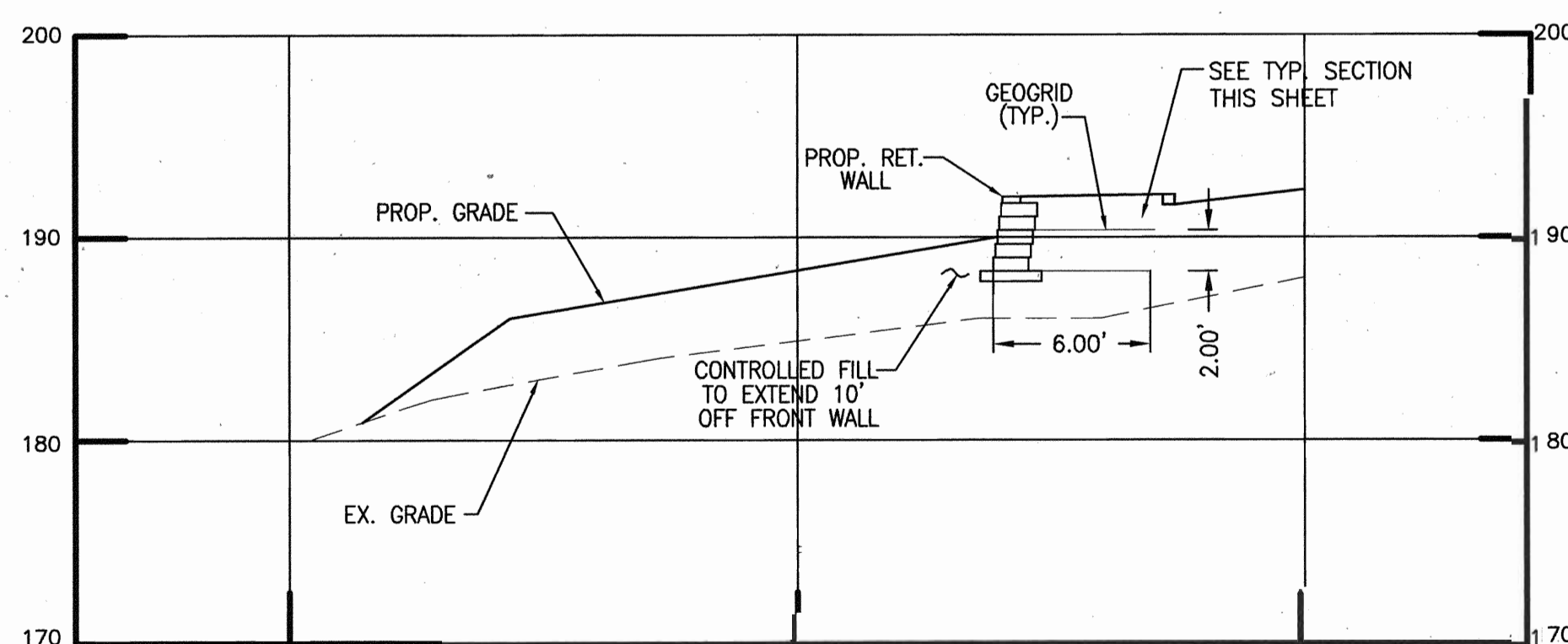
**RETAINING WALL 2 - SECTION C-C (STA. 0+50)**

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VERTICAL SCALE: 1" = 8'



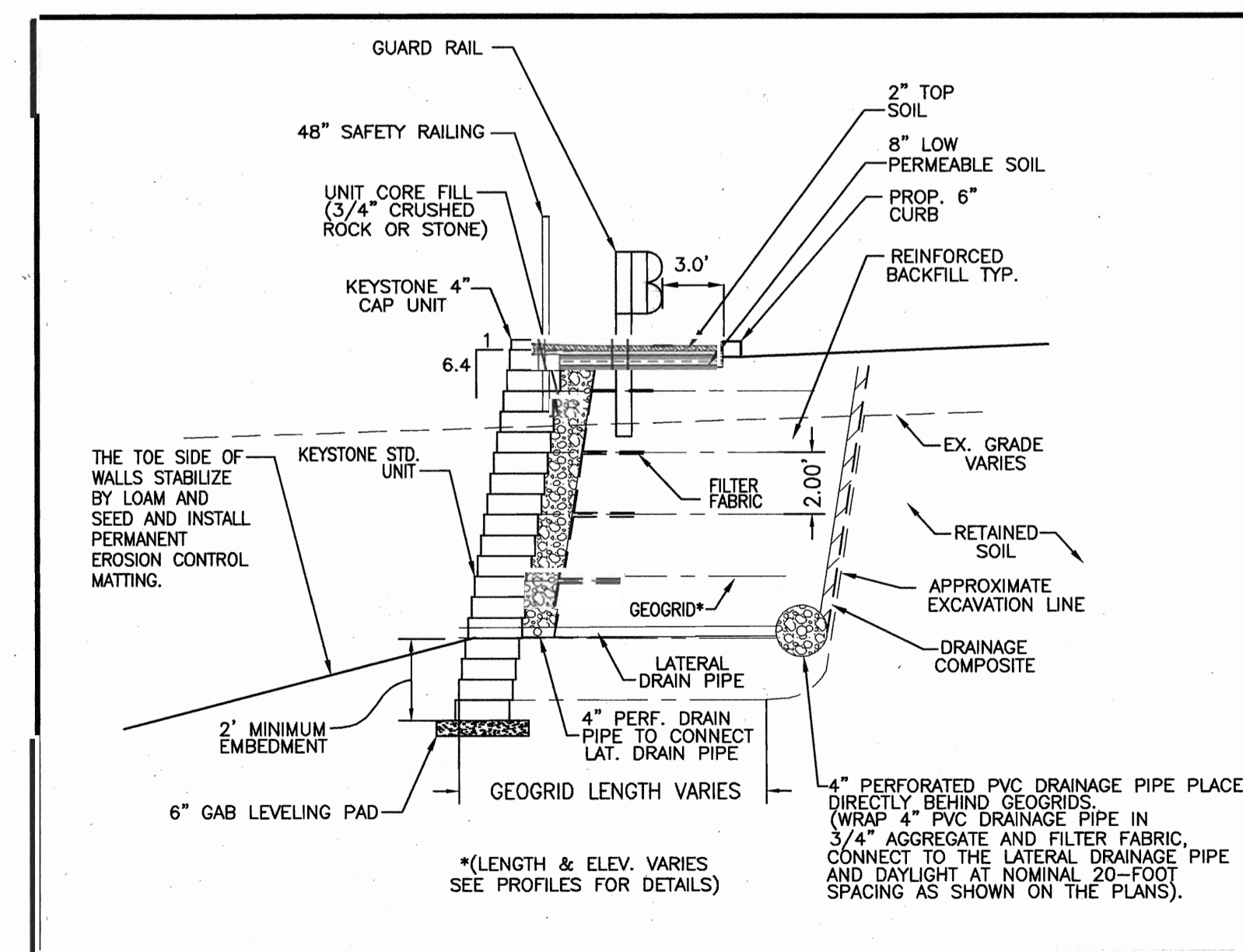
**RETAINING WALL 2 - SECTION D-D (STA. 3+75)**

HORIZONTAL SCALE: 1" = 8'  
VERTICAL SCALE: 1" = 8'



**RETAINING WALL 2 - SECTION E-E (STA. 5+00)**

HORIZONTAL SCALE: 1" = 8'  
VERTICAL SCALE: 1" = 8'



**TYPICAL RETAINING WALL SECTION**

N.T.S.

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*[Signature]* 2/1/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*[Signature]* 2/1/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*[Signature]* 2/1/03  
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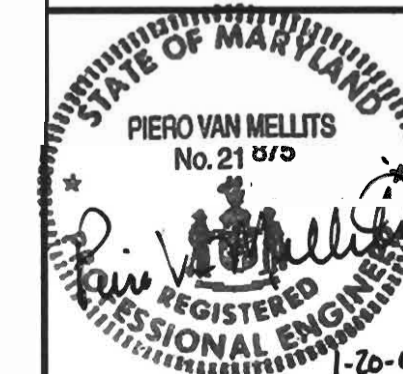
OWNER/DEVELOPER FAX NO.: (410) 712-0620  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076

**C-17**



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SITE DEVELOPMENT PLANS  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
**RETAINING WALLS - SECTIONS**

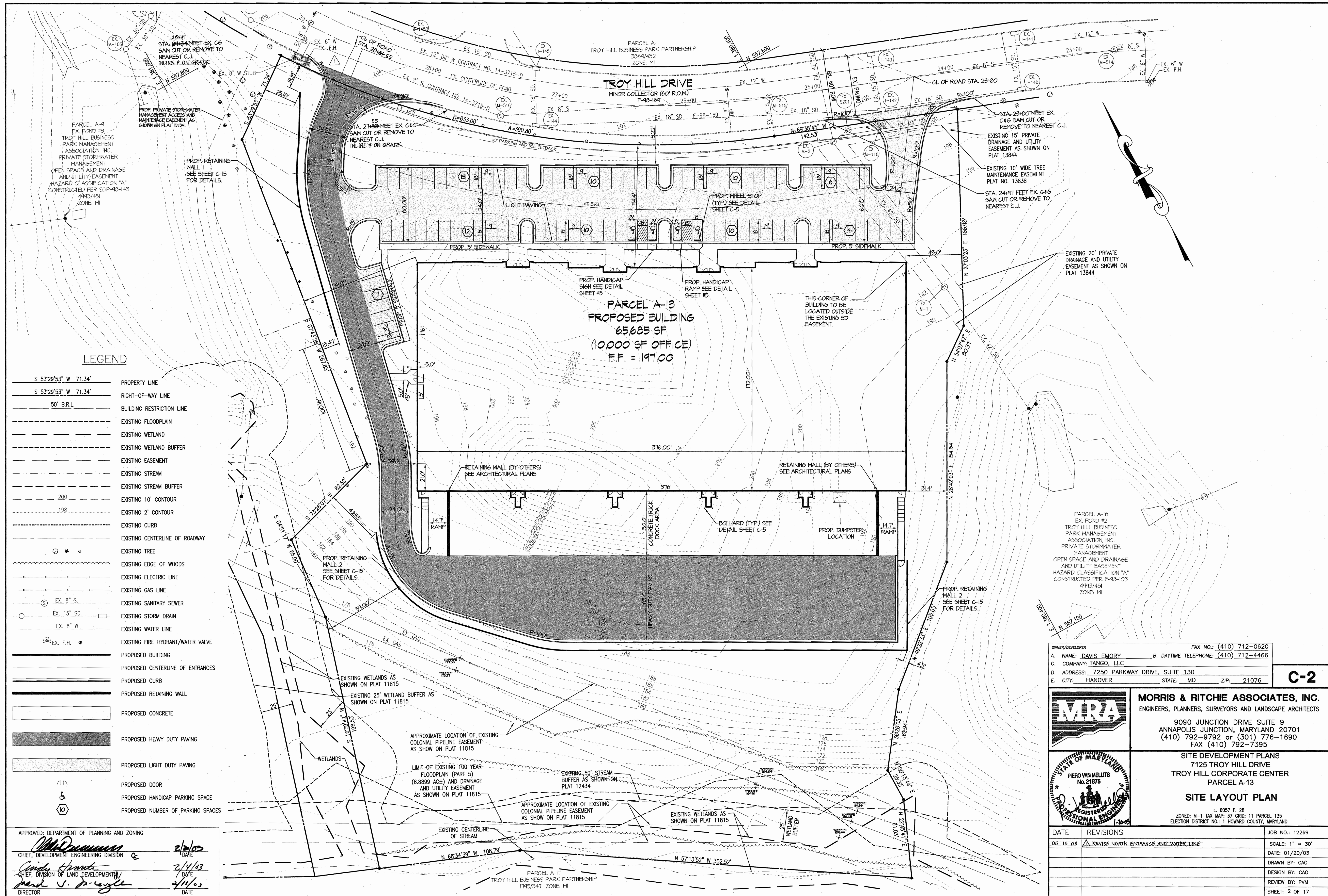
L. 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.: 12269
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		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 17 OF 17

SDR-02-150

SDP-02-150





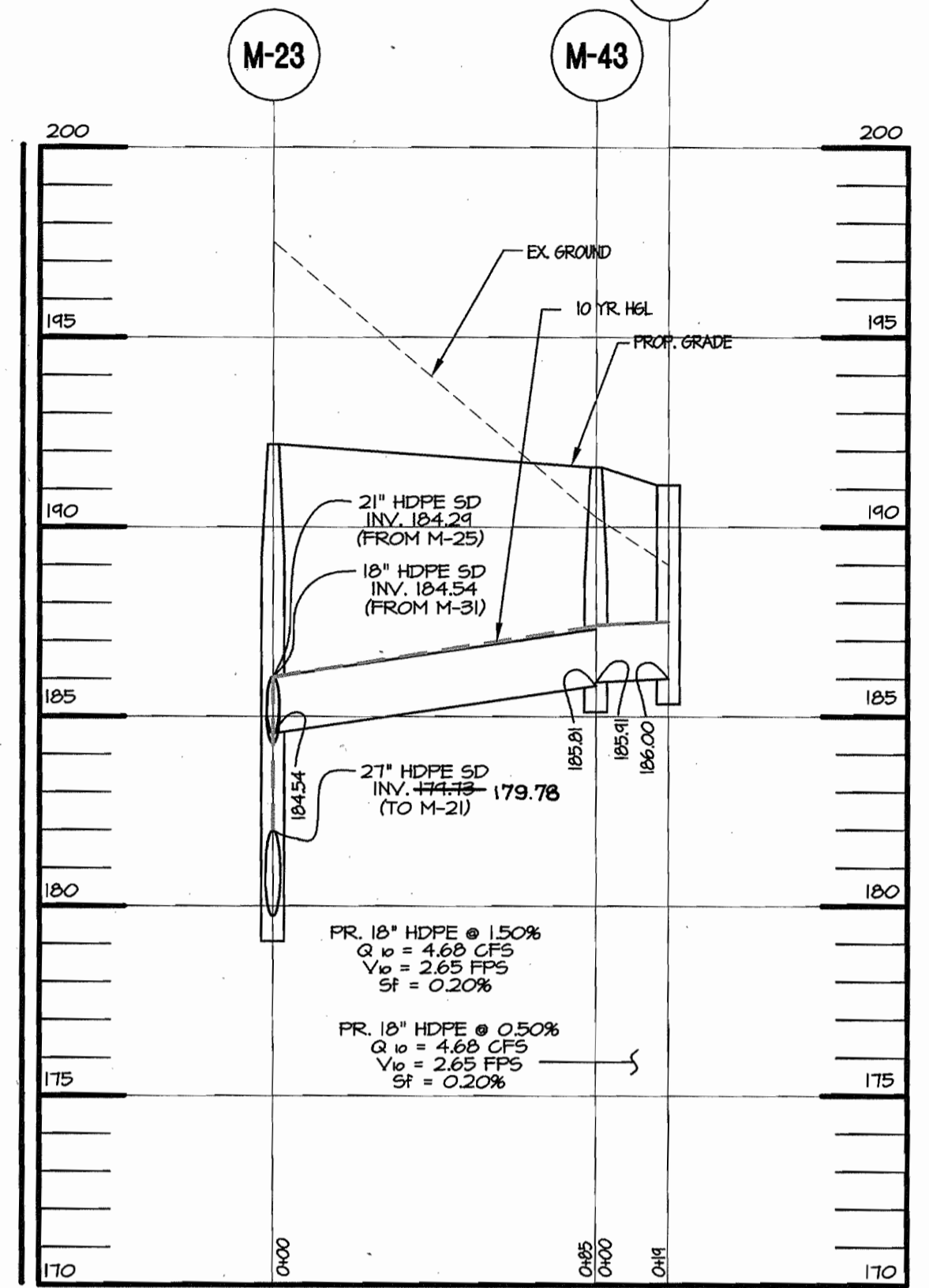
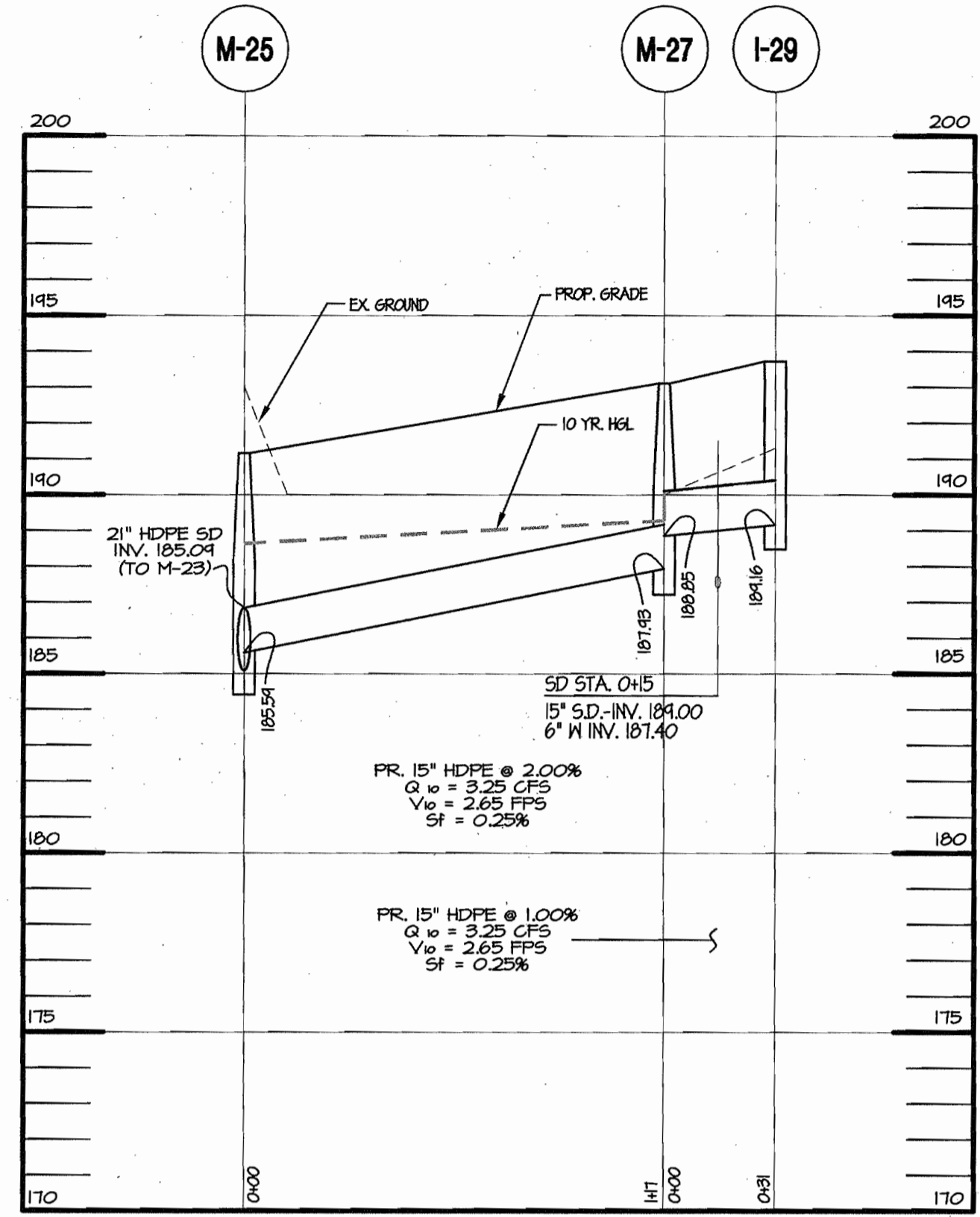
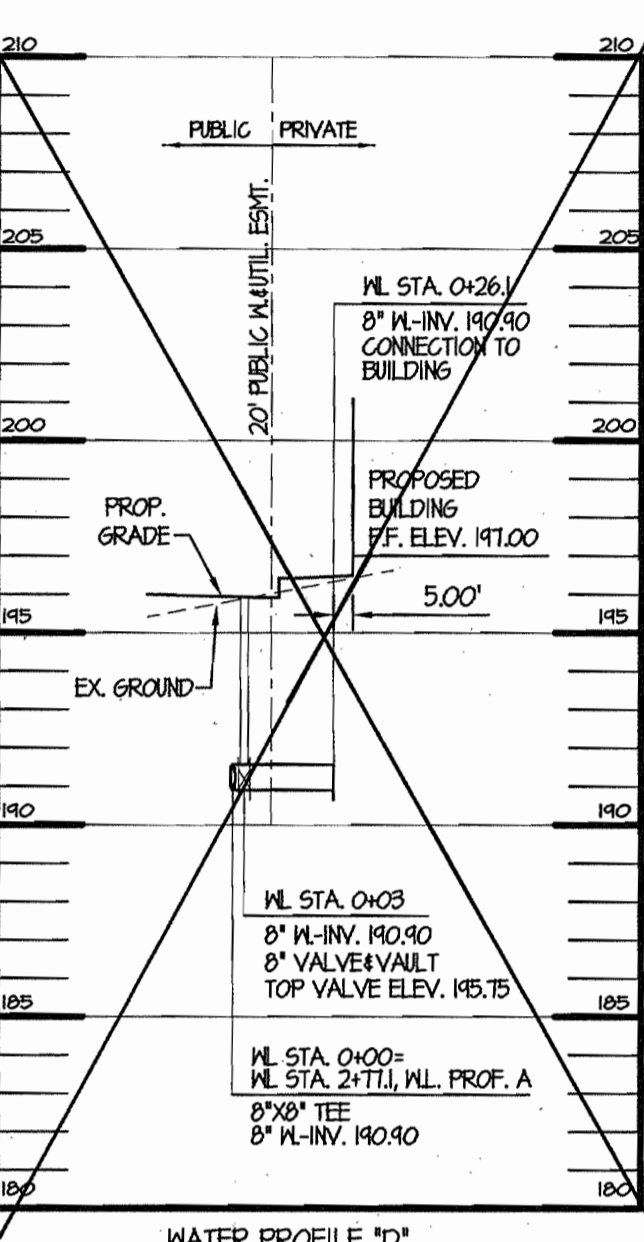
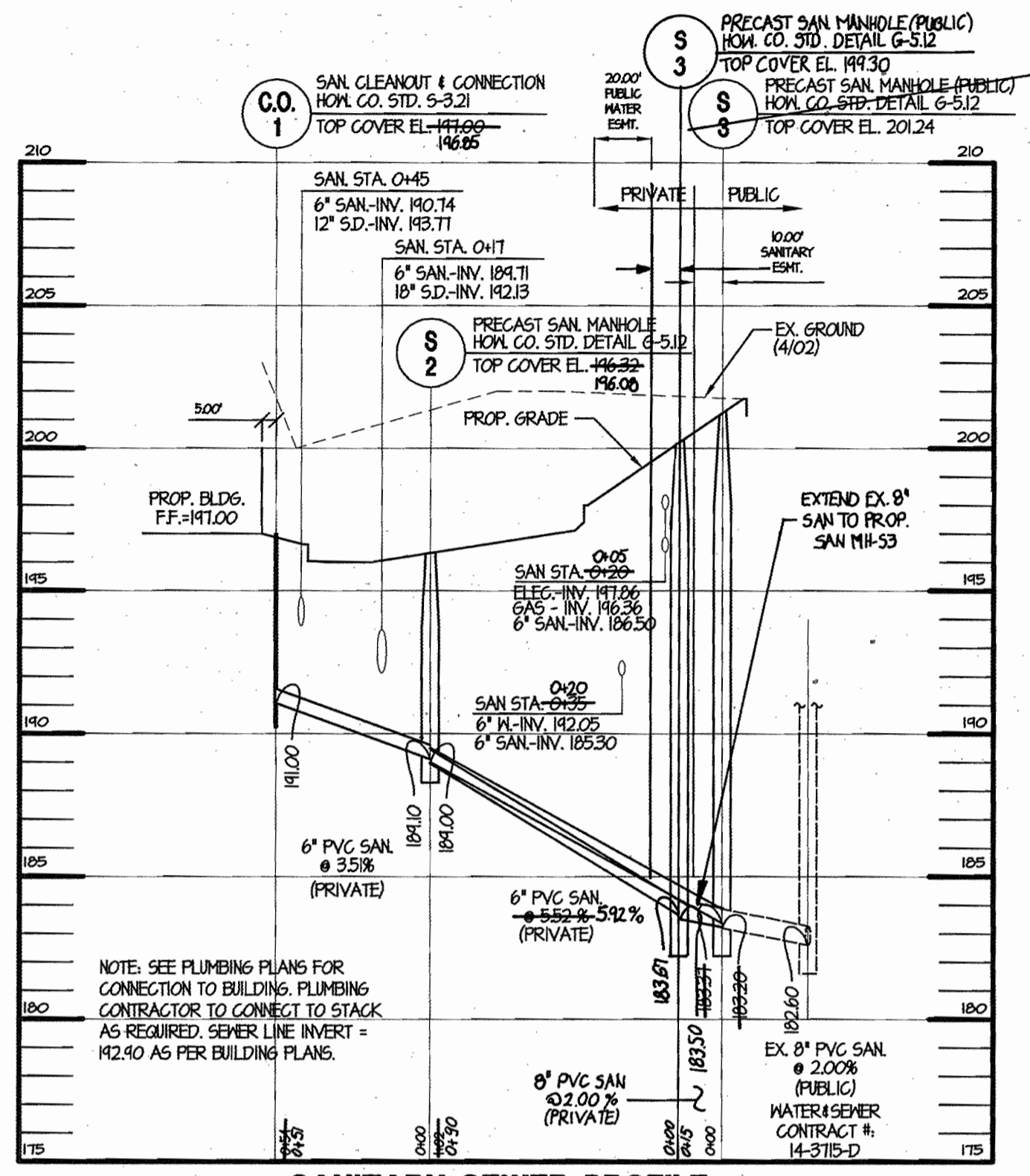
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SDP-02-150



SEWER PIPE AND FITTINGS SCHEDULE	
6" SAN. (PVC-SCH. 40)	146'
PRECAST SAN. MANHOLE	1
SAN. CLEAN-OUT	1

WATER PIPE AND FITTINGS SCHEDULE	
8" WATER MAIN	26'
8" CWP	1



**Dimensions**

MHS	A	B	C	D
6 1/8"	10 3/8"	12"	9 7/8"	158 mm
158 mm	284 mm	305 mm	251 mm	
MHS	E	F	G	H
16 3/8"	3 1/8"	1 1/2" Dia.	7/8" DIA.	
416 mm	80 mm	13 mm	22 mm	

I  
18 1/2"  
470 mm

**Specifications**

**Housing/Door**  
Die cast aluminum housing provides rugged protection for the internal components. Cast door frame snaps securely to the housing with twin spring steel latches. Seal is provided by a silicone gasket on the door and the housing edge. Glass lens is tempered for thermal shock and impact resistance. Lens/Door can be removed without tools for cleaning or maintenance. Both casings are protected by Hubbell's Leifco® finish for durability and appearance.

**Reflector System**  
Multi-piece reflector, designed for wide spread with excellent uniformity, combines with mogul base lamps for high efficiencies. Sockets are heavy-duty porcelain securely mounted to the cast housing for cooler operation and long lamp life. Lenses are included on all single wattage fixtures.

**Ballastry**  
Units are available from 70-400 watts. Sources include metal halide, pulse start metal halide and high pressure sodium. Dual wattage 250/400 HPS QuadTap® unit is available for distribution stock allowing versatility from one SIKU 50 HZ and less ballast options are also available. All units are NRTLAC listed for wet conditions. Higher Ambient (40°C) available on units below 400 watt.

**Mounting**  
Available in yoke (Y) or knuckle (K) designs. Steel yoke has Hubbell's three hole pattern which allows one 3/4" bolt or two 1/2" bolt attachment to flat surfaces or adapters. The knuckle mount elicits 2 3/8" O.D. pipe or fenums. Wire access cover allows "hands free" wiring to desired voltage after mounting.

TEST NUMBER: HF-08348

**ORDERING INFORMATION**

Catalog Number	Catalog Number	Lamps/Wattage
MHS-Y400H-468-1	MHS-K400H-468-1	400 MH ED37
MHS-Y250H-468-1	MHS-K250H-468-1	250 MH ED28
MHS-Y175H-468-1	MHS-K175H-468-1	175 MH ED28

**PERFORMANCE**

TYPE	7	8	6	V
MAXIMUM CANDELA	13501			
FOCUS OF MAX. CD	-5.08	± 8.79		
AVERTAGE OF 10 BEAMS	11762			
BEAM SPREAD (AT 50' MAX. CD)				
DEG. HORIZONTAL	62.4			
DEG. VERTICAL	96.4			
BEAM DIMENSIONS	14111			
BEAM EFFICIENCY	62.6%			
FIELD SPREAD (AT 10' MAX. CD)	133.3			
DEG. HORIZONTAL	128.3			
DEG. VERTICAL	223.6			
FIELD DIMENSIONS	67.534			
TOTAL EFFICIENCY	69.8%			
TEST DISTANCE	36.3			

**PERIMALITER® II**

**Specifications**

**Applications**  
Ideally suited for security lighting applications as well as commercial and architectural lighting for parking lots, office buildings, stores, shopping centers, fast food restaurants, banks, warehouses, and parking garages. Typical mounting height is 20-25' (7 meters).

**Rear Housing**  
One-piece, heavy duty, die cast aluminum for long life and cooler operation. Bronze Leifco® finish is standard. Mounts over 3/2" and 4" recessed junction box. Two 1/2" side entries for surface conduit mounting.

**Reflector**  
Precision formed specular aluminum for optimum performance.

**Reflector/Door**  
Full front access is available by hinging front door. Two Hubbell Guard® hex head fasteners provide tight seal to door gasket. Die cast aluminum door frame with protective Leifco® finish securely holds prismatic borosilicate glass refractor.

**Reflector/Door (continued)**  
Lens is thermal shock and impact resistant. Engineered to outperform standard four-one spacing to mounting height glass wall packs. Door assembly is hinged and can be easily removed for front access.

**Ballast**  
Class H Insulated, -40°F starting (-20°F for MH), 60 Hz HPS. An aluminum ballast compartment cover isolates electrical components from the optical assembly.

**OWNER/DEVELOPER** FAX NO.: (410) 712-0620

**A. NAME: DAVIS EMORY** B. DAYTIME TELEPHONE: (410) 712-4466

**C. COMPANY: TANGO, LLC**

**D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130**

**E. CITY: HANOVER** STATE: MD ZIP: 21076

**MORRIS & RITCHE ASSOCIATES, INC.**  
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

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ANNAPOLIS JUNCTION, MARYLAND 20701  
(410) 792-9792 or (301) 776-1690  
FAX (410) 792-7395

**SITE DEVELOPMENT PLANS**  
7125 TROY HILL DRIVE  
TROY HILL CORPORATE CENTER  
PARCEL A-13  
**UTILITY PROFILES AND LIGHTING DETAILS**

L. 6057 F. 28  
ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

**MRA**  
PIERO VAN MELLITS  
No. 21875  
REGISTERED PROFESSIONAL ENGINEER  
No. 03

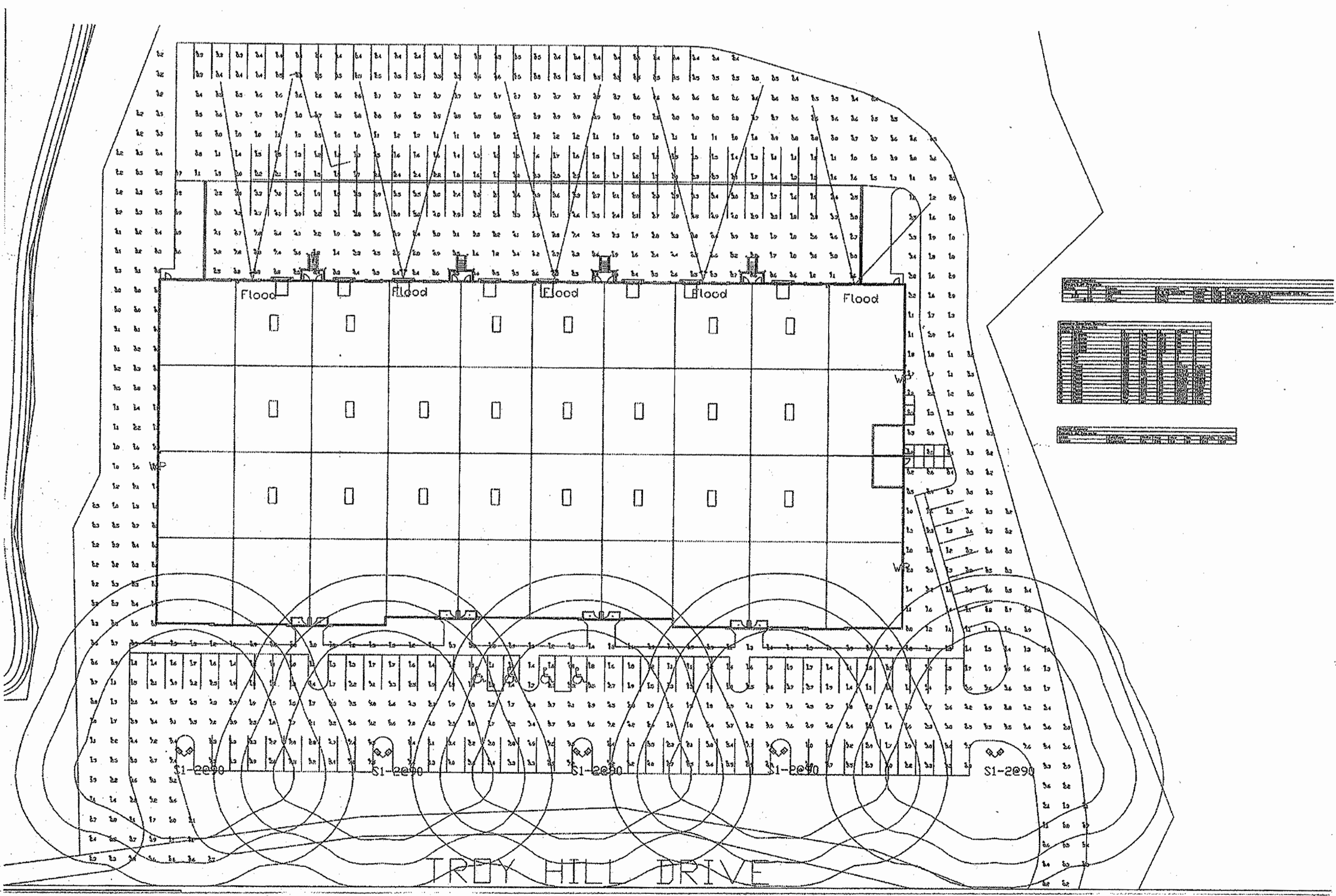
DATE	REVISIONS	JOB NO.:
04/19/04	AS-BUILT	12269

SCALE: AS SHOWN  
DATE: 01/20/03  
DRAWN BY: CAO  
DESIGN BY: CAO  
REVIEW BY: PVM  
SHEET: 6 OF 17

**VERSALUX**

**Specifications**

- HOUSING:** ONE PIECE HEAVY GAUGE DIE FORMED ALUMINUM CONSTRUCTION WITH SEPARATE BALLAST COMPARTMENT.
- LENS ASSY:** ONE PIECE HINGED HEAVY GAUGE DIE FORMED ALUMINUM DOOR FRAME SURROUNDS 3/16" CLEAR TEMPERED GLASS LENS. GLASS IS SEALED TO DOOR WITH HIGH TEMPERATURE SILICONE SEAL. TWO CAPTIVE THUMB SCREWS DISENGAGE LENS ASSEMBLY FROM HOUSING WITHOUT THE USE OF TOOLS.
- OPTICS:** COMPUTER DESIGNED ONE PIECE SEMI SPECULAR HYDROFORMED REFLECTOR COMBINES WITH LENS TO PRODUCE A HIGHLY EFFICIENT, SHARP CUTOFF. OPTICS ARE FIELD ROTATABLE.
- GASKETING:** PRESSED CELL SPERM GASKETING COMPRESSED BETWEEN DOOR AND HOUSING SEALS OPTICAL CHAMBER.
- LAMP HOLDER:** MOGUL BASE PORCELAIN.
- LAMP:** (BY OTHERS)
- BALLAST:** H.P.F./C.W.A. AUTOTRANSFORMER, .20" STARTING TEMPERATURE. ELECTRICAL COMPONENTS ARE MOUNTED TO HINGED REMOVABLE TRAY FOR EASY ACCESS.
- ARM:** 3"x5"x6" LONG HEAVY WALL EXTRUDED ALUMINUM. ARM IS SECURED TO HOUSING AND TO POLE WITH STAINLESS STEEL RODS.
- FINISH:** POLYESTER POWDER COAT STATE OF THE ART 20 PSI PRESSURE POWER WASH AT 140° TEMPERATURE INCORPORATES FOUR STEP IRON PHOSPHATE PROCESS TO CLEANSE AND PREPARE THE METAL SURFACE FOR MAXIMUM PAINT ADHESION. ELECTROSTATICALLY APPLIED TEXTURED POLYESTER POWDER TOP COAT IS BAKED AT 400° TEMPERATURE FOR MAXIMUM HARDNESS AND EXTERIOR DURABILITY.



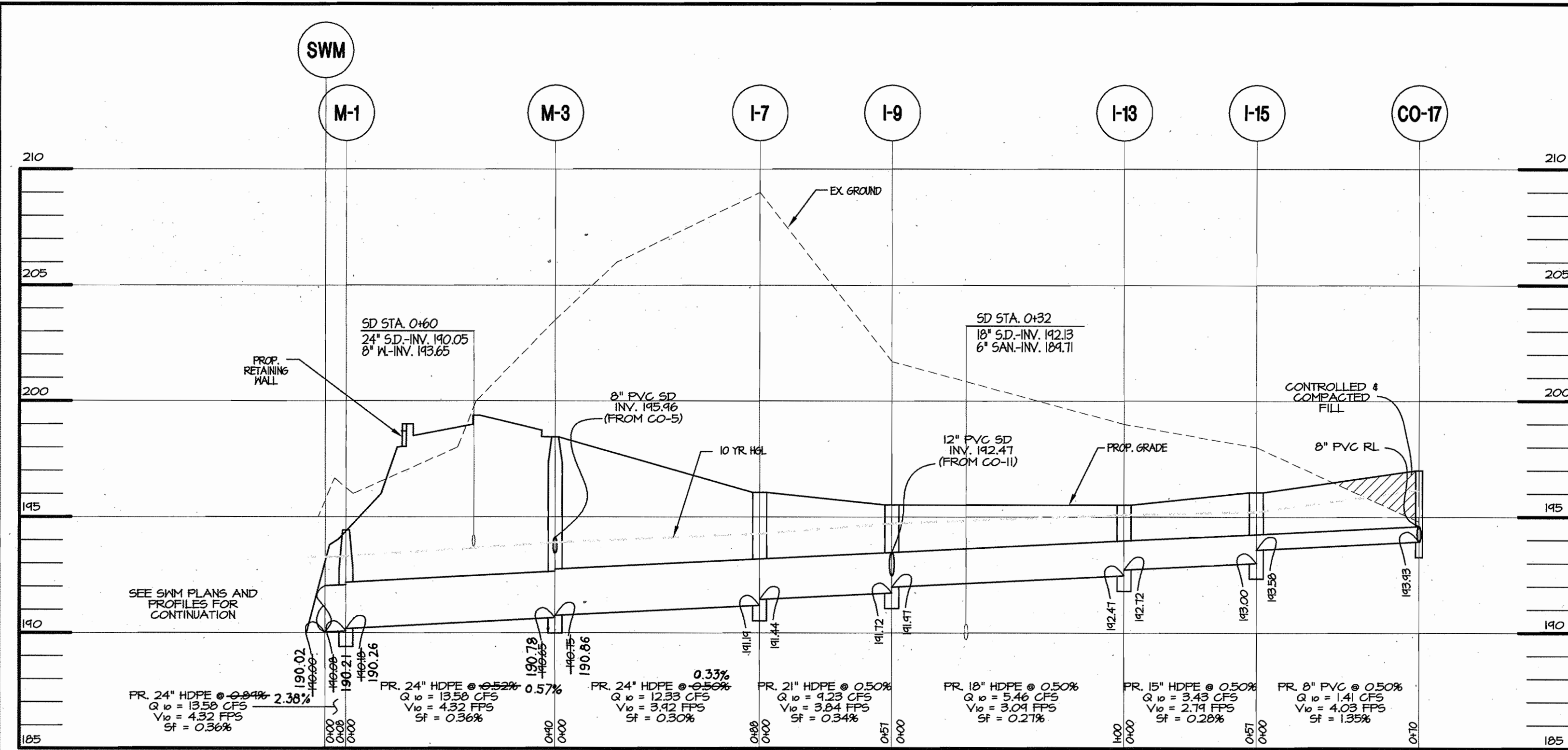
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*[Signature]* 2/3/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

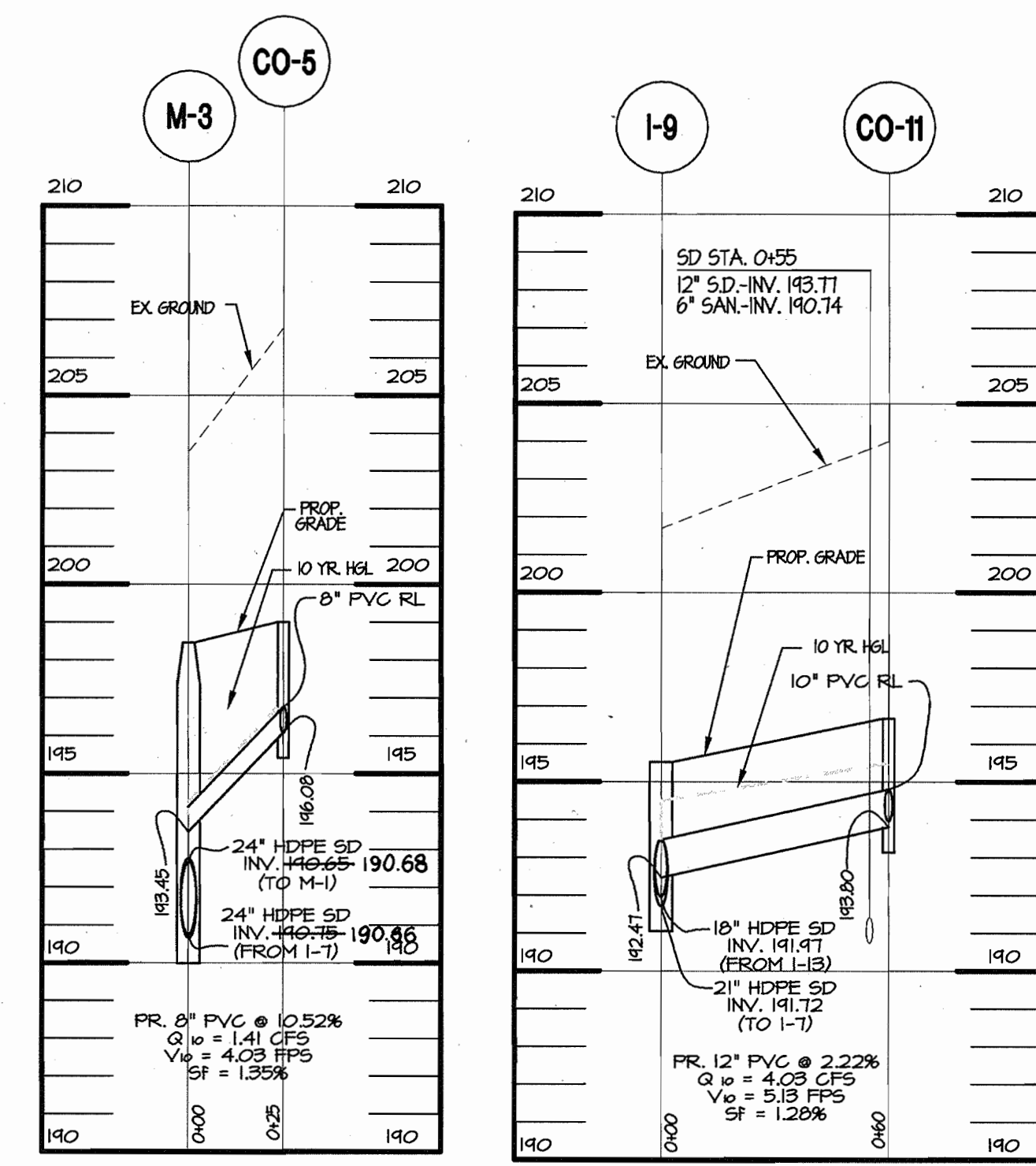
*[Signature]* 2/4/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 2/1/02  
DIRECTOR DATE

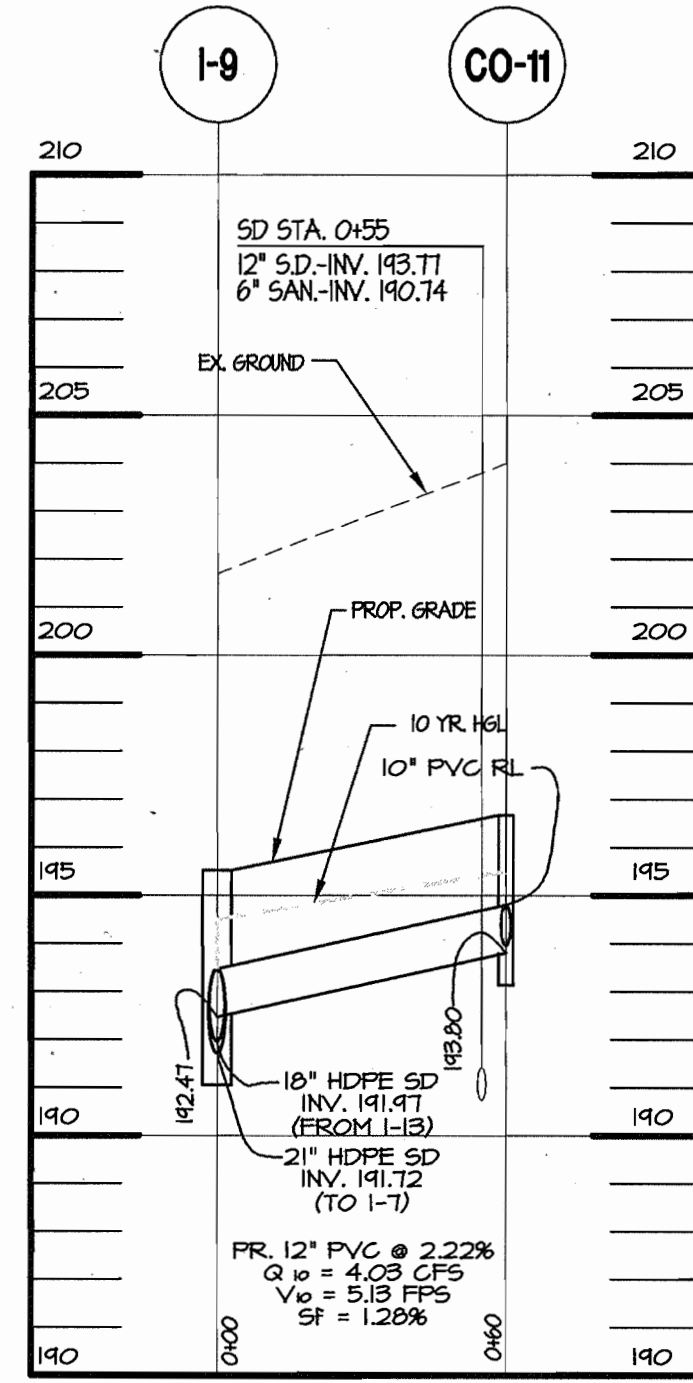




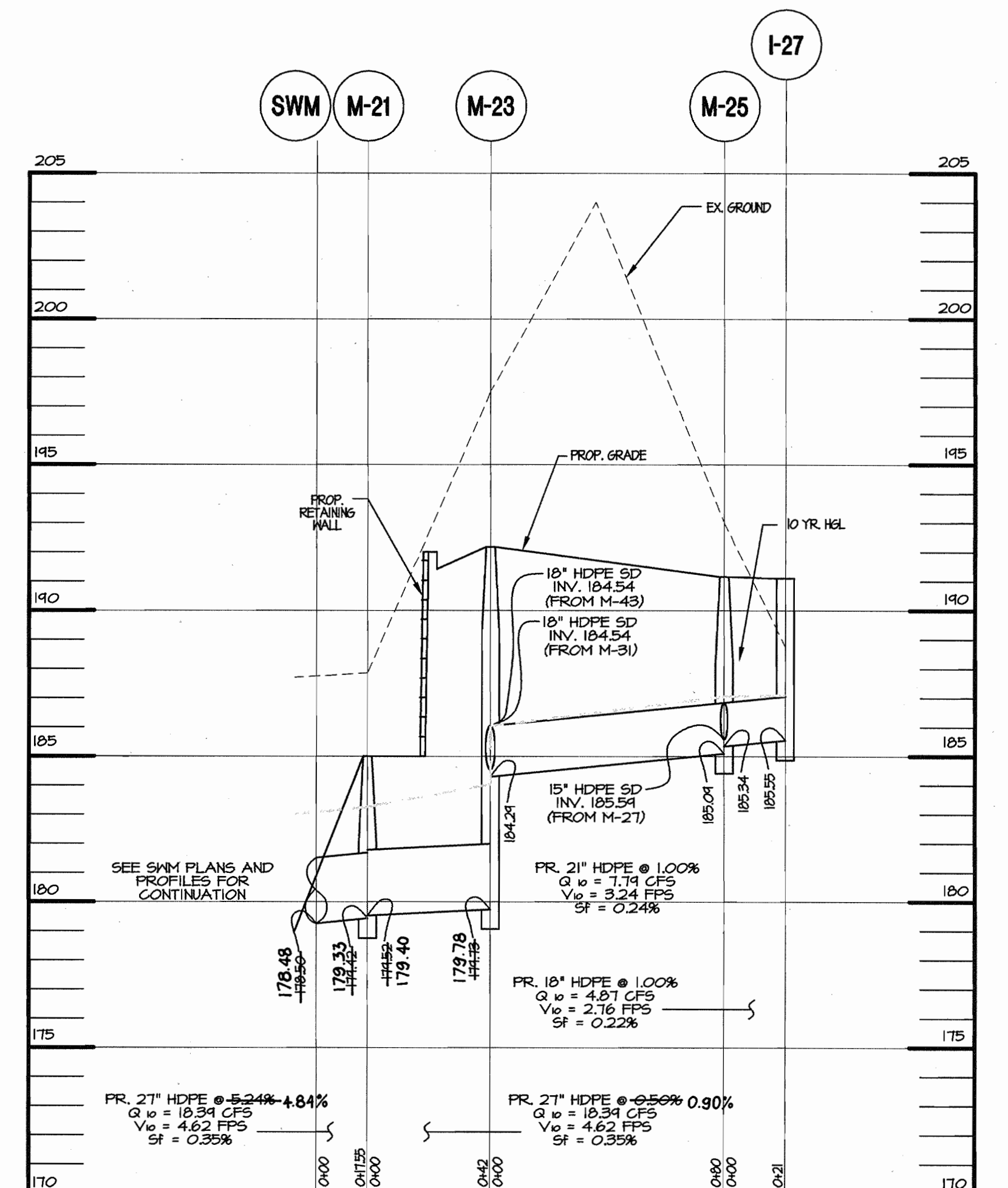
STORM DRAIN PROFILE #1  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'



STORM DRAIN PROFILE #2  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'



STORM DRAIN PROFILE #3  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'



STORM DRAIN PROFILE #4  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'

SIZE	TYPE	LENGTH
8"	PVC (SCH. 40)	421'
12"	PVC (SCH. 40)	75'
15"	HDPE (A.D.S. N-12)	205'
18"	HDPE (A.D.S. N-12)	300'
21"	HDPE (A.D.S. N-12)	137'
24"	HDPE (A.D.S. N-12)	195'
27"	HDPE (A.D.S. N-12)	67'

SIZE	TYPE	NUMBER
8"	45' H.B. (SCH. 40)	2
12"	45' H.B. (SCH. 40)	1
8"	90' H.B. (SCH. 40)	2
8"	CLEAN-OUTS	6
12"	CLEAN-OUTS	2

INV. OUT	STORM DRAIN STRUCTURE SCHEDULE				REMARKS	NORTHING	EASTING
	STR. NO.	TOP ELEV.	INV. OUT	LOCATION			
190.21	M-1	194.00	190.00	SHALLOW PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.12	557,295.25	1,381,022.81	
190.78	M-3	198.45	190.66	STD. PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.13	557,611.52	1,381,101.75	
179.33	M-21	185.00	179.42	STD. PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.13	557,222.14	1,381,119.94	
179.78	M-23	192.17	179.78	STD. PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.13	557,259.24	1,381,140.26	
	M-25	191.57	185.09	SHALLOW PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.12	557,297.51	1,381,070.28	
	M-27	193.10	187.93	SHALLOW PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.12	557,384.92	1,380,982.26	
	M-31	192.80	187.54	SHALLOW PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.12	557,325.03	1,381,176.27	
	M-43	191.57	185.81	SHALLOW PRECAST MANHOLE HOWARD CO. STD. DETAIL G-5.12	557,218.51	1,381,214.66	
	I-7	196.06	191.19	DOUBLE TYPE S COMB. INLET HOWARD CO. STD. DET. SD-4.34	557,565.09	1,381,180.39	
	I-9	195.52	191.72	DOUBLE TYPE S INLET HOWARD CO. STD. DET. SD-4.23	557,550.23	1,381,241.76	
	I-13	195.72	192.47	DOUBLE TYPE S INLET HOWARD CO. STD. DET. SD-4.23	557,499.24	1,381,334.80	
	I-15	196.06	193.00	DOUBLE TYPE S COMB. INLET HOWARD CO. STD. DET. SD-4.34	557,455.44	1,381,380.39	
	I-27	191.10	185.55	DOUBLE TYPE S COMB. INLET HOWARD CO. STD. DET. SD-4.34	557,277.09	1,381,059.08	
	I-29	193.72	189.16	DOUBLE TYPE S COMB. INLET HOWARD CO. STD. DET. SD-4.34	557,416.40	1,381,004.52	
	I-45	191.10	186.00	DOUBLE TYPE S COMB. INLET HOWARD CO. STD. DET. SD-4.34	557,197.81	1,381,203.40	
	CO-5	198.50	196.08	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,590.50	1,381,099.94	
	CO-11	196.70	193.80	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,497.83	1,381,270.83	
	CO-17	197.00	193.93	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,407.77	1,381,435.38	
	CO-33	192.95	188.19	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,338.19	1,381,183.48	
	CO-35	192.80	189.10	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,395.79	1,381,047.05	
	CO-37	192.95	189.25	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,408.94	1,381,054.25	
	CO-39	192.80	189.11	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,283.32	1,381,307.26	
	CO-41	192.95	189.26	MODIFIED CLEANOUT HOWARD CO. STD. DETAIL S-3.21	557,266.47	1,381,314.46	

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
 [Signature] 2/2/05  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 [Signature] 2/4/05  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 [Signature] 2/4/05  
 DIRECTOR

STORM DRAIN PROFILE #1  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'

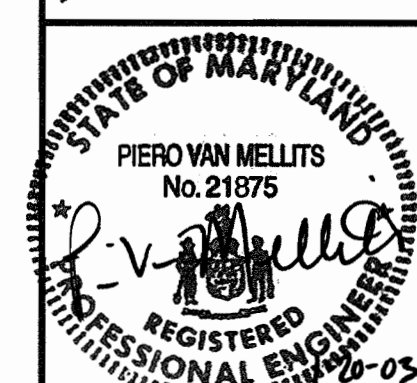
STORM DRAIN PROFILE #2  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'

STORM DRAIN PROFILE #3  
SCALE: HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'

OWNER/DEVELOPER: \_\_\_\_\_ FAX NO.: (410) 712-0620  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076



**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
 9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395



SITE DEVELOPMENT PLANS  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
 UTILITY PROFILES  
 L 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.:
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**INFILTRATION TRENCH GENERAL NOTES AND SPECIFICATIONS**

AN INFILTRATION TRENCH MAY NOT RECEIVE RUN-OFF UNTIL THE ENTIRE CONTRIBUTING DRAINAGE AREA TO THE INFILTRATION TRENCH HAS RECEIVED FINAL STABILIZATION.

1. HEAVY EQUIPMENT AND TRAFFIC SHALL BE RESTRICTED FROM TRAVELING OVER THE PROPOSED LOCATION OF THE INFILTRATION TRENCH TO MINIMIZE COMPACTION OF THE SOIL.

2. EXCAVATE THE INFILTRATION TRENCH TO THE DESIGN DIMENSIONS. EXCAVATED MATERIALS SHALL BE PLACED AWAY FROM THE TRENCH SIDES TO ENHANCE TRENCH WALL STABILITY. LARGE TREE ROOTS MUST BE TRIMMED FLUSH WITH THE TRENCH SIDES IN ORDER TO PREVENT FABRIC PUNCTURES OR TEARING OF THE FILTER FABRIC DURING SUBSEQUENT INSTALLATION PROCEDURES. THE SIDE WALLS OF THE TRENCH SHALL BE ROUGHENED WHERE SHEARED AND SEALED BY HEAVY EQUIPMENT.

3. A CLASS "C" GEOTEXTILE OR BETTER (SEE SECTION 24.0 MATERIAL SPECIFICATIONS, 1994 STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, MDE, 1994) SHALL INTERFACE BETWEEN THE TRENCH SIDE WALLS AND BETWEEN STONE RESERVOIR AND GRAVEL FILTER LAYERS. A PARTIAL LIST OF NON-WOVEN FABRICS THAT MEET THE CLASS "C" CRITERIA FOLLOWS. ANY ALTERNATIVE FILTER MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.

- AMOCO 4552 GEOLON N70 WESTEC N07
- CARTHAGE FX-805 MIRAFI 180-N

THE WIDTH OF GEOTEXTILE MUST INCLUDE SUFFICIENT MATERIAL TO CONFORM TO THE TRENCH PERIMETER IRREGULARITIES AND FOR A 6-INCH MINIMUM TOP OVERLAP. THE FILTER FABRIC SHALL BE TUCKED UNDER THE SAND LAYER ON THE BOTTOM OF THE INFILTRATION TRENCH FOR A DISTANCE OF 6 TO 12 INCHES. STONES OR OTHER ANCHORING OBJECTS SHOULD BE PLACED ON THE FABRIC AT THE EDGE OF THE TRENCH TO KEEP THE TRENCH OPEN DURING WINDY PERIODS. WHEN OVERLAPS ARE REQUIRED BETWEEN ROLLS, THE UPHILL ROLL SHOULD LAP A MINIMUM OF 2 FEET OVER THE DOWNHILL ROLL IN ORDER TO PROVIDE A SHINGLED EFFECT.

4. IF A 6" SAND FILTER LAYER IS PLACED ON THE BOTTOM OF THE INFILTRATION TRENCH, THE SAND FOR THE FILTRATION TRENCH SHALL BE WASHED AND MEET ASHTO-M-43, SIZE NO. 9 OR NO. 10. ANY ALTERNATIVE SAND GRADATION MUST BE APPROVED BY THE PLAN APPROVAL AUTHORITY.

5. THE STONE AGGREGATE SHOULD BE PLACED IN A MAXIMUM LOOSE LIFT THICKNESS OF 12 INCHES. THE GRAVEL (ROUNDED "BANK RUN" GRAVEL IS PREFERRED) FOR THE INFILTRATION TRENCH SHALL BE WASHED AND MEET ONE OF THE FOLLOWING ASHTO-M-43, SIZE NO. 2 OR NO. 3.

6. FOLLOWING THE STONE AGGREGATE PLACEMENT, THE FILTER FABRIC SHALL BE FOLDED OVER THE STONE AGGREGATE TO FORM A 6-INCH MINIMUM LONGITUDINAL LAP. THE DESIRED FILL SOIL OR STONE AGGREGATE SHALL BE PLACED OVER THE LAP AT SUFFICIENT INTERVALS TO MAINTAIN THE LAP DURING SUBSEQUENT BACKFILLING.

7. CARE SHALL BE EXERCISED TO PREVENT NATURAL OR FILL SOILS FROM INTERMIXING WITH THE STONE AGGREGATE. ALL CONTAMINATED STONE AGGREGATE SHALL BE REMOVED AND REPLACED WITH UNCONTAMINATED STONE AGGREGATE.

8. VOIDS MAY OCCUR BETWEEN FABRIC AND THE EXCAVATION SIDES SHALL BE AVOIDED. REMOVING BOULDERS OR OTHER OBSTACLES FROM THE TRENCH WALLS IS ONE SOURCE OF SUCH VOIDS. THEREFORE, NATURAL SOILS SHOULD BE PLACED IN THOSE VOIDS AT THE MOST CONVENIENT TIME DURING CONSTRUCTION TO ENSURE FABRIC CONFORMITY TO THE EXCAVATION SIDES.

9. VERTICALLY EXCAVATED WALLS MAY BE DIFFICULT TO MAINTAIN IN AREAS WHERE SOIL MOISTURE IS HIGH OR WHERE SOFT COHESIVE OR COHESIONLESS SOILS ARE DOMINANT. THESE CONDITIONS MAY REQUIRE LAYING BACK OF THE SIDE SLOPES TO MAINTAIN STABILITY.

10. PVC DISTRIBUTION PIPES SHALL BE SCHEDULE 40 AND MEET ASTM-D-1785. ALL FITTINGS SHALL MEET ASTM-D-2729. PERFORATIONS SHALL BE 3/8" IN DIAMETER. A PERFORATED PIPE SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT OF THE INFILTRATION TRENCH WALL. THE END OF THE PVC PIPE SHALL BE CAPPED. NOTE: PVC PIPE WITH A WALL THICKNESS CLASSIFICATION OF SDR-35 MEETING ASTM-D-3034 IS AN ACCEPTABLE SUBSTITUTE FOR THE SCHEDULE 40 PIPE.

11. THE OBSERVATION WELL IS TO CONSIST OF 6-INCH DIAMETER PERFORATED PVC SCHEDULE 40 PIPE (M278 OR F758, TYPE PS 28) WITH A CAP SET FLUSH TO FINAL PAVED SURFACE AND IS TO BE LOCATED NEAR THE LONGITUDINAL CENTER OF THE INFILTRATION TRENCH. THE PIPE SHALL HAVE A PLASTIC COLLAR WITH RISERS TO PREVENT ROTATION WHEN REMOVING THE CAP. THE SCREW TOP LID SHALL BE A CLEANOUT WITH A LOCKING MECHANISM OR SPECIAL BOLT TO DISCOURAGE VANDALISM. THE DEPTH TO THE INVERT SHALL BE MARKED ON THE LID. THE PIPE SHALL BE PLACED VERTICALLY WITHIN THE GRAVEL PORTION OF THE INFILTRATION TRENCH AND A CAP PROVIDED AT THE BOTTOM OF THE PIPE. THE BOTTOM OF THE CAP SHALL REST ON THE INFILTRATION TRENCH BOTTOM.

12. CORRUGATED METAL DISTRIBUTION PIPES SHALL CONFORM TO ASHTO-M-36, AND SHALL BE ALUMINIZED IN ACCORDANCE WITH ASHTO-M-274. ALUMINIZED PIPE IN CONTACT WITH CONCRETE SHALL BE COATED WITH AN INERT COMPOUND CAPABLE OF PREVENTING THE DELETERIOUS EFFECT OF ALUMINUM ON THE CONCRETE. PERFORATED DISTRIBUTION PIPES SHALL CONFORM TO ASHTO-M-36, CLASS 2 AND SHALL BE PROVIDED ONLY WITHIN THE INFILTRATION TRENCH AND SHALL TERMINATE 1 FOOT SHORT OF THE INFILTRATION TRENCH WALL. AN ALUMINIZED METAL PLATE SHALL BE WELDED TO THE END OF THE PIPE.

13. IF A DISTRIBUTION STRUCTURE WITH A WET WELL IS USED, A 4-INCH DRAIN PIPE SHALL BE PROVIDED AT OPPOSITE ENDS OF THE INFILTRATION TRENCH DISTRIBUTION STRUCTURE. TWO (2) CUBIC FEET OF POROUS BACKFILL MEETING ASHTO-M-43, SIZE NO. 57 SHALL BE PROVIDED AT EACH DRAIN.

14. IF A DISTRIBUTION STRUCTURE IS USED, THE MANHOLE COVER SHALL BE BOLTED TO THE FRAME.

**SAND FILTER SPECIFICATIONS**

1. MATERIAL SPECIFICATIONS FOR SAND FILTER

THE ALLOWABLE MATERIALS FOR SAND FILTER CONSTRUCTION ARE DETAILED IN TABLE B.3.1. (SEE PAGE SDP-3)

2. SAND FILTER TESTING SPECIFICATIONS

UNDERGROUND SAND FILTERS, FACILITIES WITHIN SENSITIVE GROUNDWATER AQUIFERS, AND FILTERS DESIGNED TO SERVE URBAN HOT SPOTS ARE TO BE TESTED FOR WATER TIGHTNESS PRIOR TO PLACEMENT OF FILTER MEDIA. ENTRANCES AND EXITS SHOULD BE PLUGGED AND THE SYSTEM COMPLETELY FILLED WITH WATER TO DEMONSTRATE WATER TIGHTNESS. WATER TIGHTNESS MEANS NO LEAKAGE FOR A PERIOD OF 8 HOURS.

ALL OVERFLOW WEIRS, MULTIPLE ORIFICES AND FLOW DISTRIBUTION SLOTS ARE TO BE FIELD-TESTED TO VERIFY ADEQUATE DISTRIBUTION OF FLOWS.

3. SAND FILTER CONSTRUCTION SPECIFICATIONS

PROVIDE SUFFICIENT MAINTENANCE ACCESS (I.E., 12-FOOT-WIDE ROAD WITH LEGALLY RECORDED EASEMENT). VEGETATED ACCESS SLOPES ARE TO BE MAXIMUM OF 10%; GRAVEL SLOPES TO 15%; PAVED SLOPES TO 25%. ABSOLUTELY NO RUNOFF IS TO ENTER THE FILTER UNTIL ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN STABILIZED. SURFACE OR FILTER BED IS TO BE LEVEL.

ALL UNDERGROUND SAND FILTERS SHOULD BE CLEARLY DELINEATED WITH SIGNS SO THAT THEY MAY BE LOCATED WHEN MAINTENANCE IS DUE. SURFACE SAND FILTERS MAY BE PLANTED WITH APPROPRIATE GRASSES. SEE APPENDIX A. "POCKET" SAND FILTERS (AND RESIDENTIAL BIORETENTION FACILITIES TREATING AREAS LARGER THAN AN ACRE) SHALL BE SIZED WITH A STONE "WINDOW" THAT COVERS APPROXIMATELY 10% OF THE FILTER AREA. THIS "WINDOW" SHALL BE FILLED PEA GRAVEL (3/8 INCH STONE)

**OPERATION AND MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED SURFACE STORMWATER FILTRATION SYSTEMS**

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 A YEAR, WHEN VEGETATION REACHES 18" IN HEIGHT OR AS NEEDED.

3. FILTERS THAT HAVE A GRASS COVER SHALL BE MOWED A MINIMUM OF 3 (THREE) 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 4 (FOUR) INCHES DEEP IN THE FOREBAY.


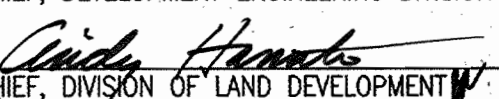
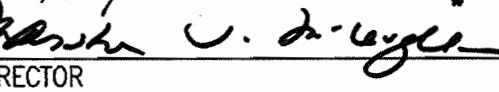
7. WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS AND LIQUID MUST BE FOLLOWED BY THE OWNER.

8. A LOG BOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH FACILITY DRAINS.

9. THE MAINTENANCE LOG BOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.

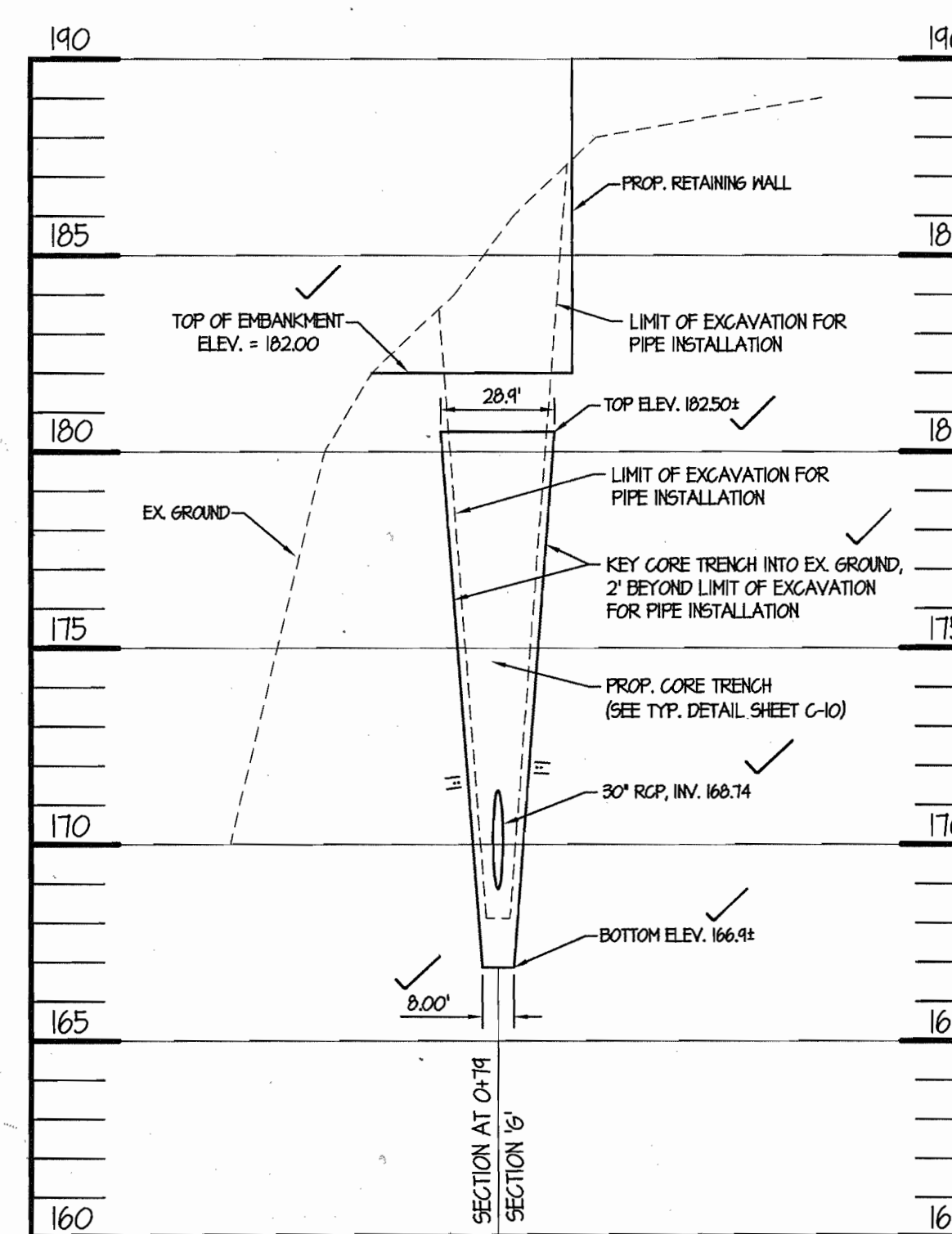
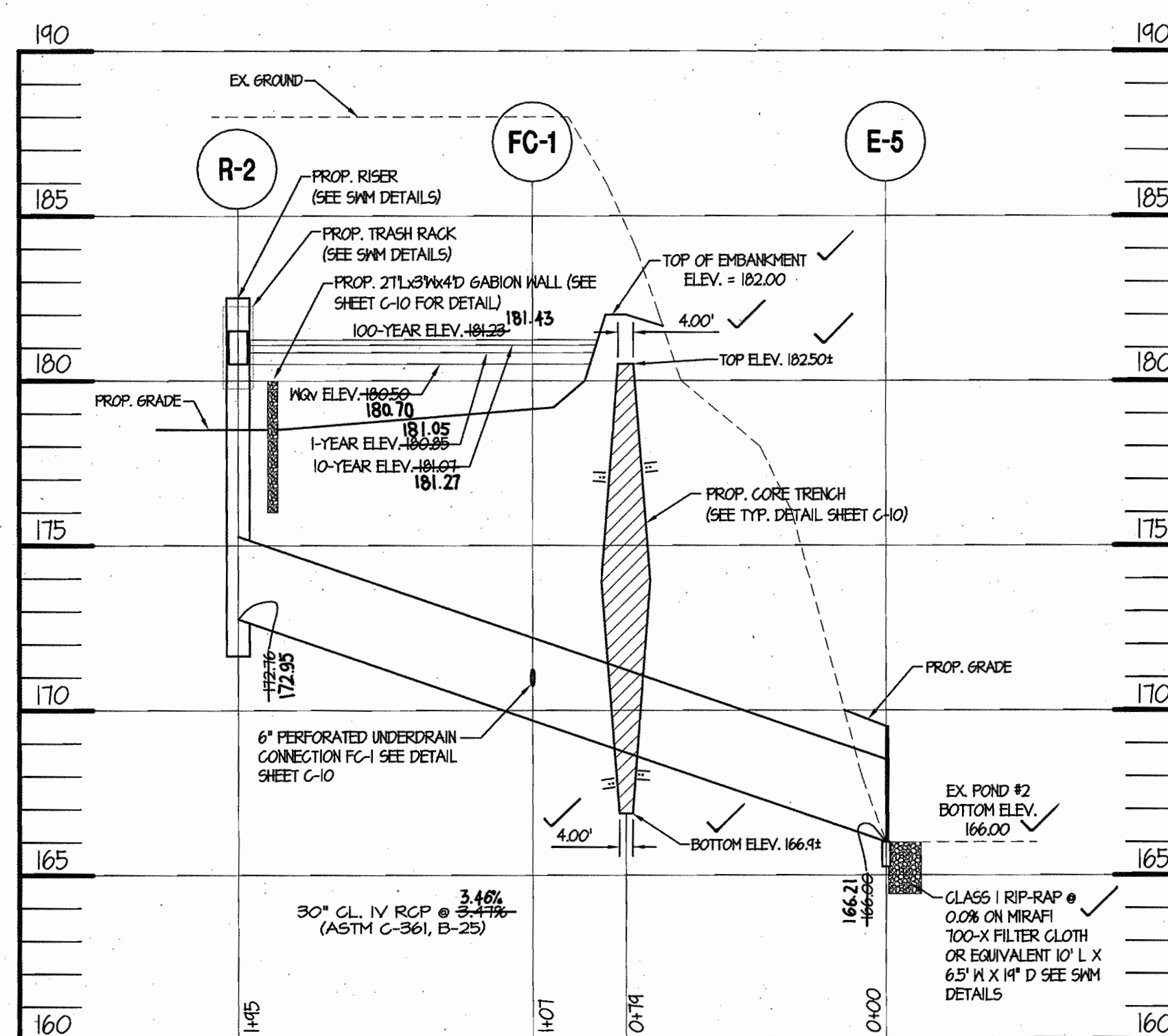
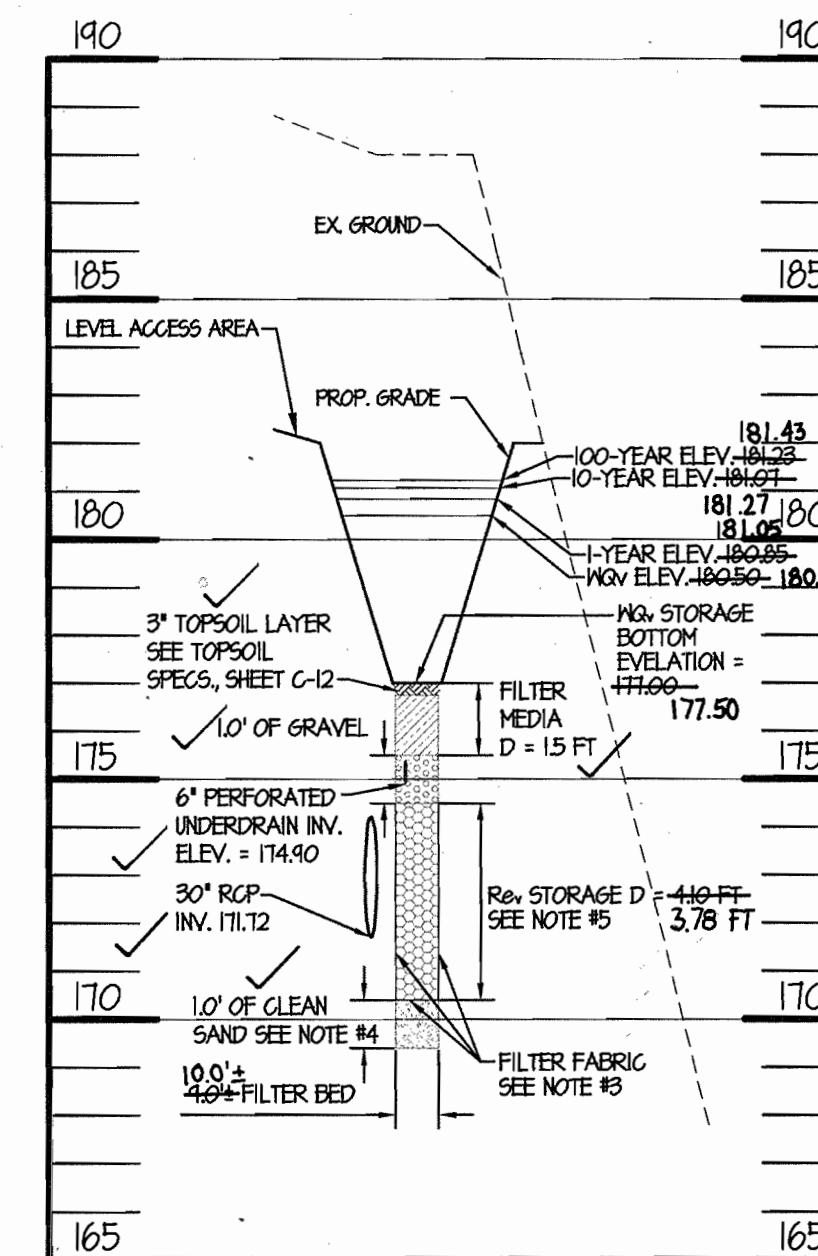
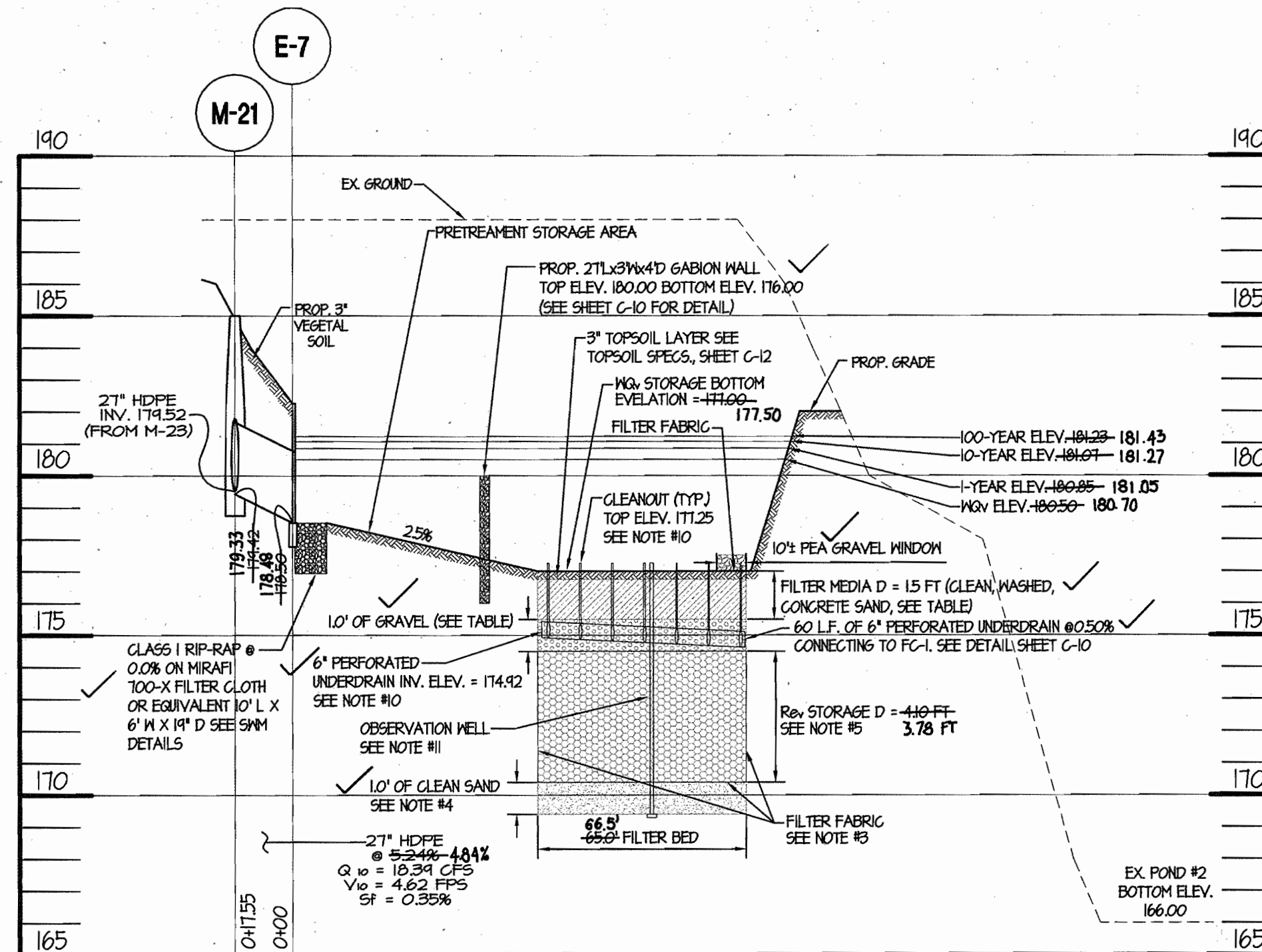
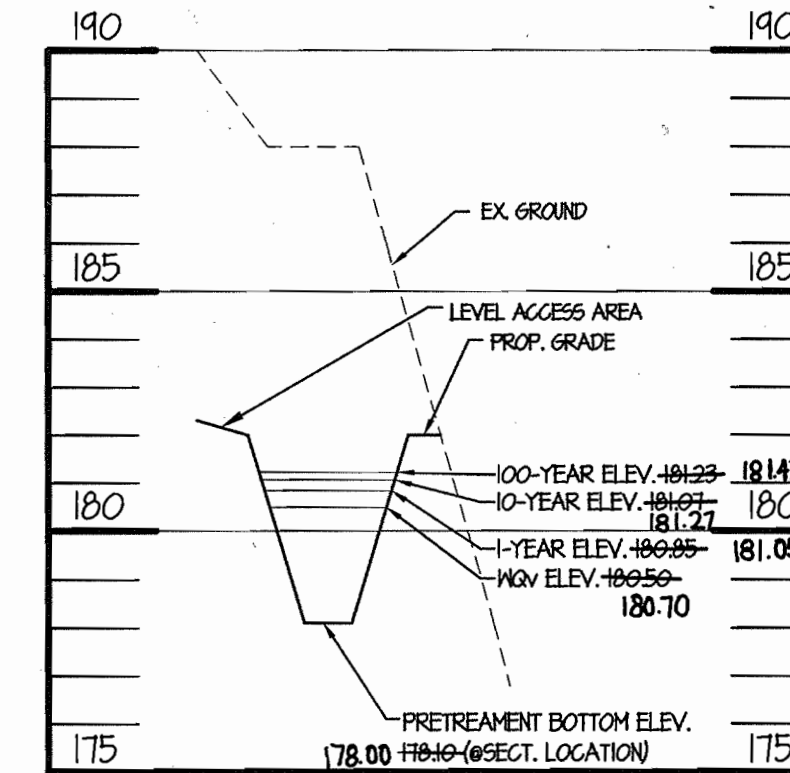
10. ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

 2/2/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 4/4/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 2/1/02  
 DIRECTOR

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

MATERIAL	SPECIFICATION/TEST METHOD	SIZE	NOTES
SAND	CLEAN ASHTO-M-6 OR ASTM-C-33 CONCRETE SAND	0.02" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DIBASE AND GRAYSTONE #10 ARE NOT ACCEPTABLE. NO CALCIUM CARBONATE OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND.
PEAT	ASH CONTENT: <15% PH RANGE: 5.2 TO 4.9 LOOSE BULK DENSITY 0.12 TO 0.15 G/CC	N/A	THE MATERIAL MUST BE REED-SOGE HEMIC PEAT, SHREDDED, UNCOMPACTED, UNIFORM, AND CLEAN.
LEAF COMPOST		N/A	
UNDERDRAIN GRAVEL	ASHTO-M-43	0.375" TO 0.75"	
GEOTEXTILE FABRIC (IF REQUIRED)	ASTM-D-4833 (PUNCTURE STRENGTH-125 LB.) ASTM-D-4632 (TENSILE STRENGTH-300 LB.)	0.08" THICK EQUIVALENT OPENING SIZE OF #80 SIEVE	MUST MAINTAIN 125 GPM PER SQ. FT. FLOW RATE. NOTE: A 4" PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS.
IMPERMEABLE LINER (IF REQUIRED)	ASTM-D-4833 (THICKNESS) ASTM-D-412 (TENSILE STRENGTH 1,100 LB. ELONGATION 200%) ASTM-D-624 (TEAR RESISTANCE - 150 LB./IN) ASTM-D-471 (WATER ADSORPTION: 4% TO 2% MASS)	30 MIL THICKNESS	LINER TO BE ULTRAVIOLET RESISTANT. A GEOTEXTILE FABRIC SHOULD BE USED TO PROTECT THE LINER FROM PUNCTURE.
UNDERDRAIN PIPING	F 758, TYPE PS 28 OR ASHTO-M-278	4"-6" RIGID SCH. 40 PVC OR SDR35	3" PERFOR. Ø 6" ON CENTER, 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERNEATH PIPES
CONCRETE (CAST-IN-PLACE)	MSHA STANDARDS AND SPECS. SECTION 902, MIX NO. 3, F <sub>c</sub> = 3500 PSI. NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM-615-60	N/A	ON SITE TESTING OF POURED-IN-PLACE CONCRETE REQUIRED: 28 DAY STRENGTH AND SLUMP TEST; ALL CONCRETE DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND.
CONCRETE (PRECAST)	PER PRE-CAST MANUFACTURER	N/A	SEE ABOVE NOTE
NON-REBAR STEEL	ASTM A-36	N/A	STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM-A-123



**CONCRETE GENERAL NOTES**

- CODE
  - ALL CONSTRUCTION SHALL CONFORM WITH THE PROVISIONS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS AND THE 1992 ASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, AND ITS SUPPLEMENTS.
- DESIGN LOADING
  - DEAD LOAD - ACTUAL SOIL COVER PLUS 2' SURCHARGE.
- CAST-IN-PLACE CONCRETE
  - ALL CONCRETE WORK SHALL CONFORM TO ALL PROVISIONS OF THE "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301-84), AND TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-83).
  - ADDITIONALLY THE CONCRETE SHALL CONFORM TO ALL PROVISIONS OF THE FOLLOWING PUBLICATIONS:
    - ACI 308R-77 (82) RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING.
    - ACI 308R-78 RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING.
    - ACI 347-78 RECOMMENDED PRACTICE FOR CONCRETE FORMWORK.
  - ALL CONCRETE SHALL BE MARYLAND DEPARTMENT OF TRANSPORTATION MIX NO. 3 HAVING A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI AT 28 DAYS.
  - ALL REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60. ALL REINFORCING SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI'S MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES (ACI 315).
  - PROVIDE MINIMUM 40 BAR DIAMETER LAP SPLICE FOR ALL REINFORCING STEEL, UNLESS OTHERWISE NOTED ON DRAWINGS.
  - PROVIDE WATER STOPS IN ALL CONSTRUCTION AND CONTROL JOINTS IN CONCRETE BELOW SUBGRADE.
  - LOADS GREATER THAN THE DESIGN LIVE LOADS SHALL NOT BE PLACED ON THE STRUCTURE. A CONCRETE STRUCTURE MAY NOT SUPPORT ITS DESIGN LIVE LOAD AND SUPERIMPOSED DEAD LOADS FOR 28 DAYS.

**CONSTRUCTION INSPECTION SCHEDULE**

**DETENTION AND RETENTION STRUCTURES**

- INSPECTIONS SHALL BE CONDUCTED BY THE AS-BUILT CERTIFYING ENGINEER:
  - UPON THE COMPLETION OF EXCAVATION TO SUB-FOUNDATION AND WHEN REQUIRED, AND UPON THE INSTALLATION OF STRUCTURAL SUPPORTS OR REINFORCEMENT FOR STRUCTURES. INCLUDING BUT NOT LIMITED TO:
    - CORE TRENCHES FOR STRUCTURAL EMBANKMENT.
    - INLET OR OUTLET STRUCTURES AND ANTI-SLEEP STRUCTURES.
    - WATER-TIGHT CONNECTORS ON PIPES.
    - TRENCHES FOR ENCLOSED STORM DRAIN FACILITIES.
    - UTILITY CROSSINGS OF EMBANKMENT.
  - DURING THE PLACEMENT OF STRUCTURAL FILL AND CONCRETE, AND INSTALLATION OF PIPING AND CATCH BASINS.
  - DURING BACKFILL OF FOUNDATIONS AND TRENCHES.
  - DURING EMBANKMENT CONSTRUCTION.
  - UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

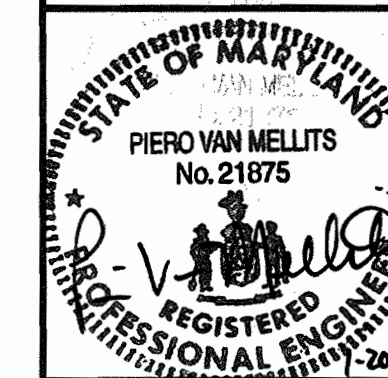
OWNER/DEVELOPER: DAVIS EMORY  
 COMPANY: TANGO, LLC  
 ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 CITY: HANOVER, STATE: MD, ZIP: 21076

**C-9**



**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395



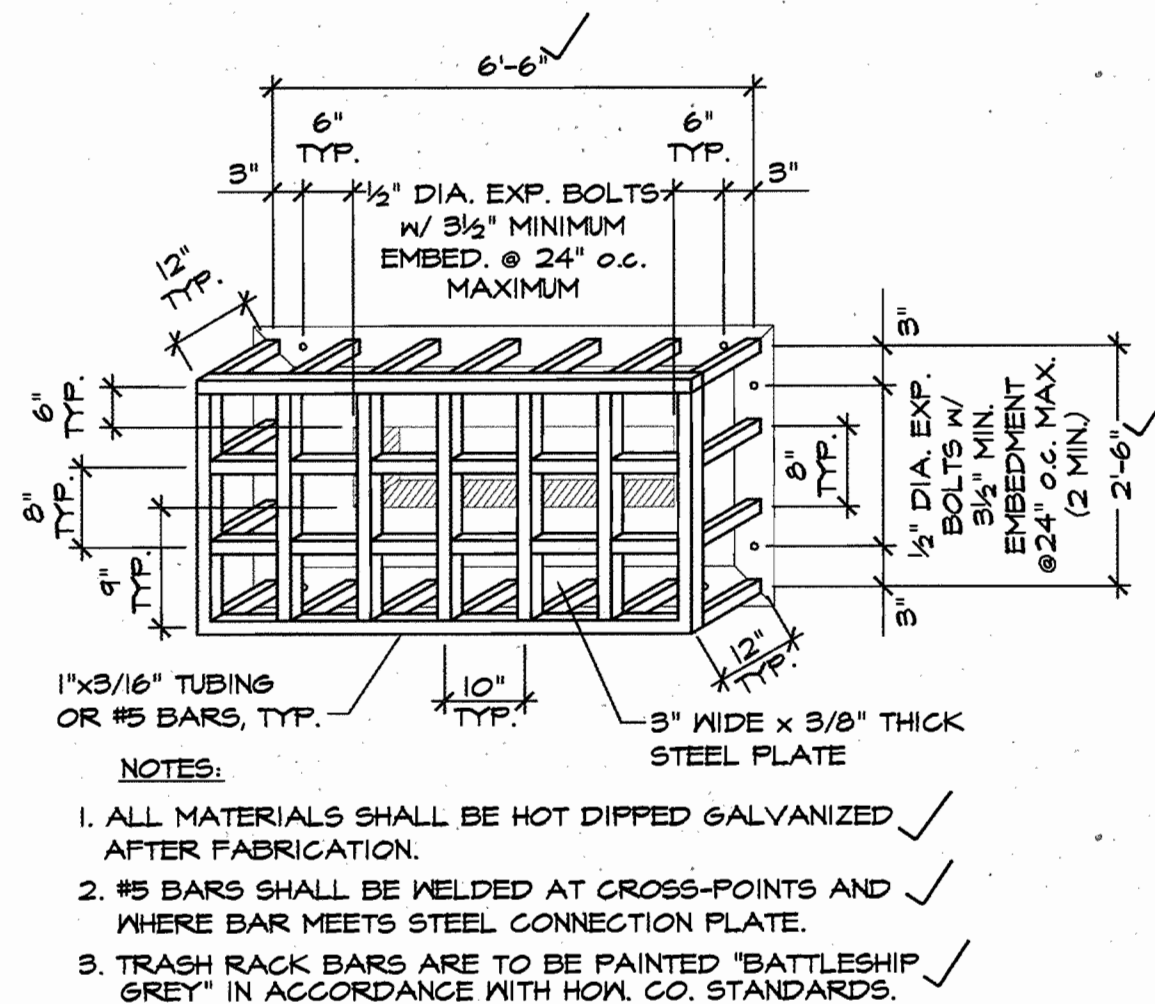
**SITE DEVELOPMENT PLANS**  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
**STORMWATER MANAGEMENT NOTES AND DETAILS**  
 L 8057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.:
04/19/04	AS-BUILT	12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 9 OF 17

SDP-02-150

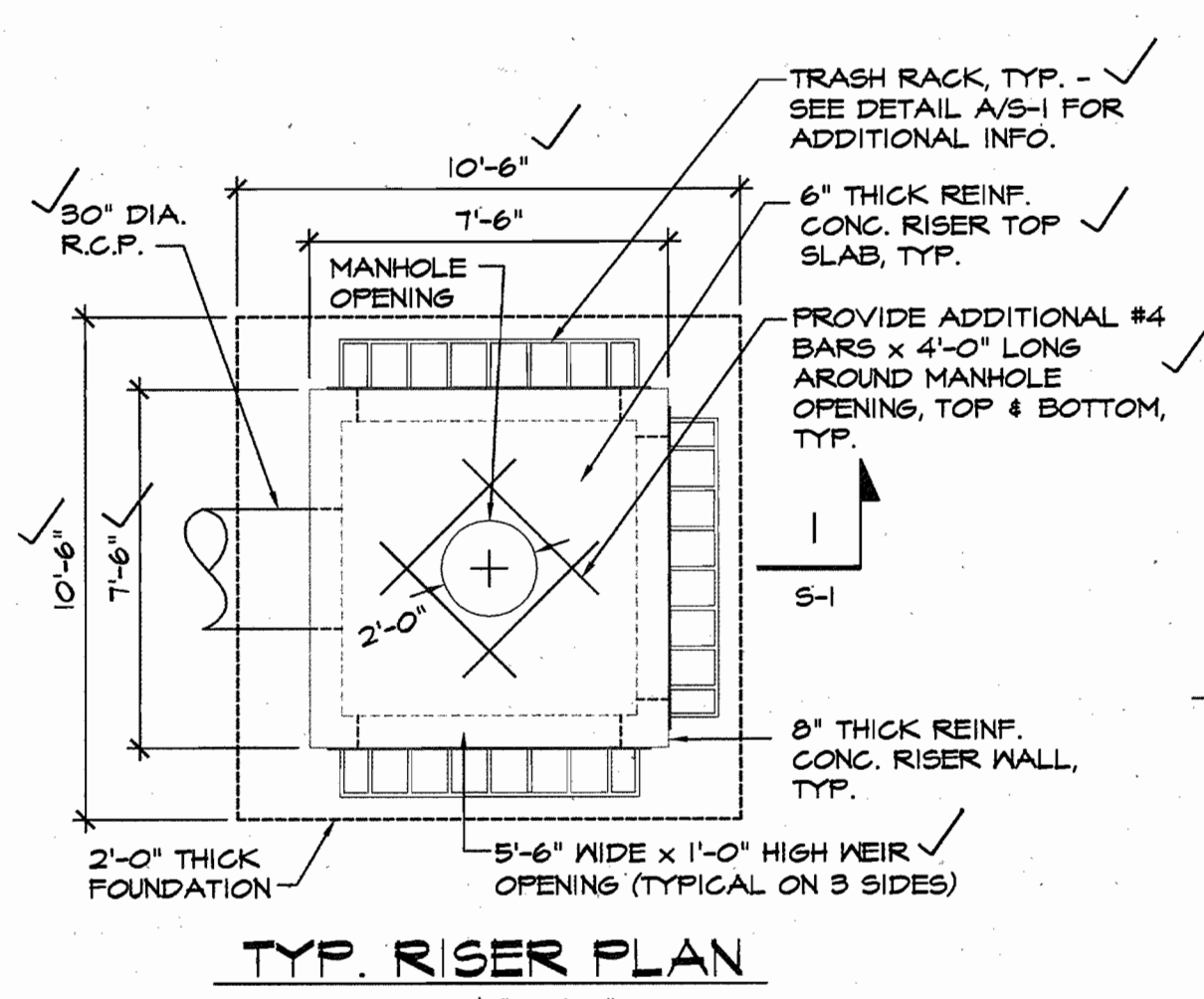
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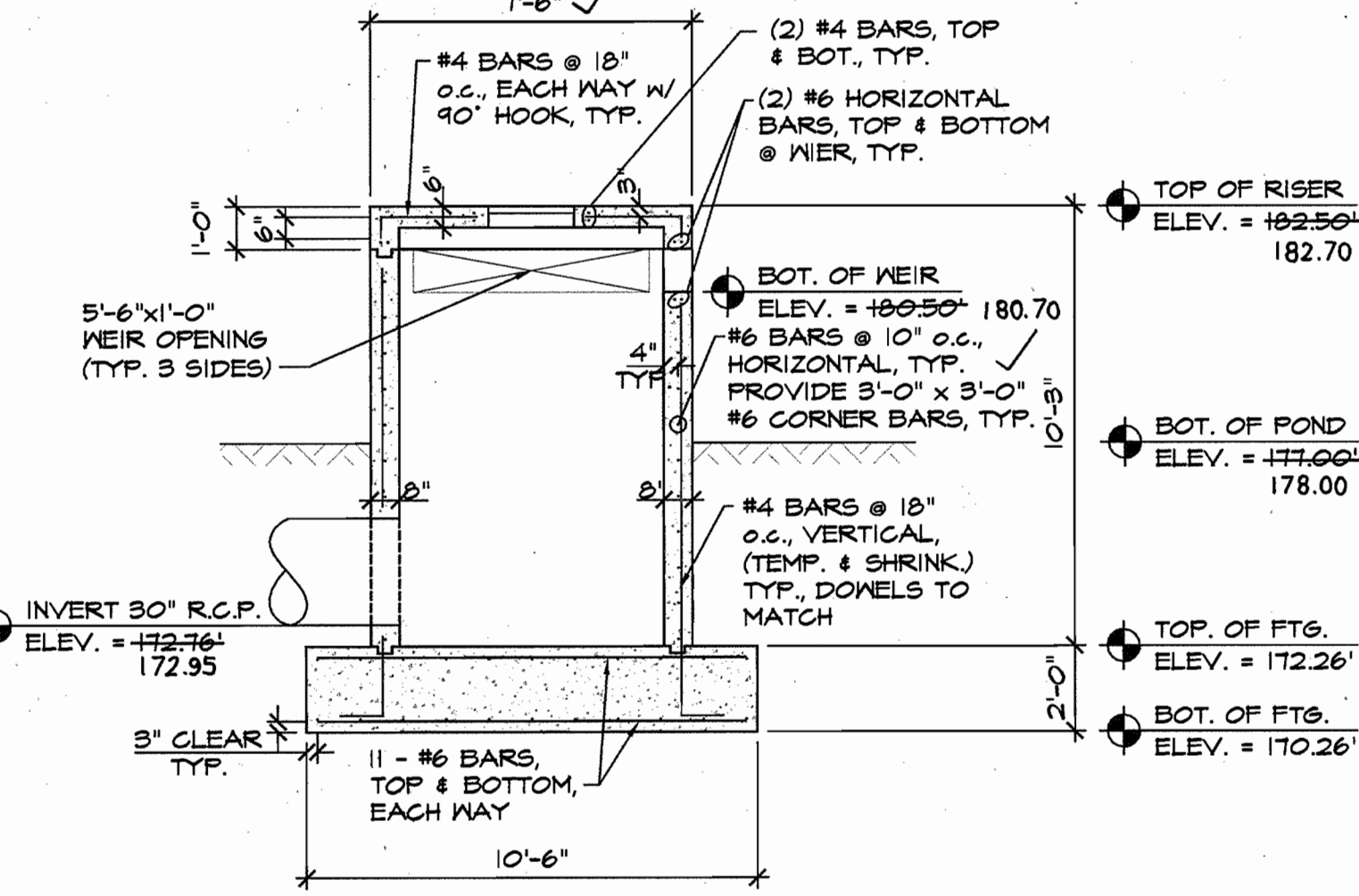


- NOTES:
1. ALL MATERIALS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
  2. #5 BARS SHALL BE WELDED AT CROSS-POINTS AND WHERE BAR MEETS STEEL CONNECTION PLATE.
  3. TRASH RACK BARS ARE TO BE PAINTED "BATTLESHIP GREY" IN ACCORDANCE WITH HOW. CO. STANDARDS.

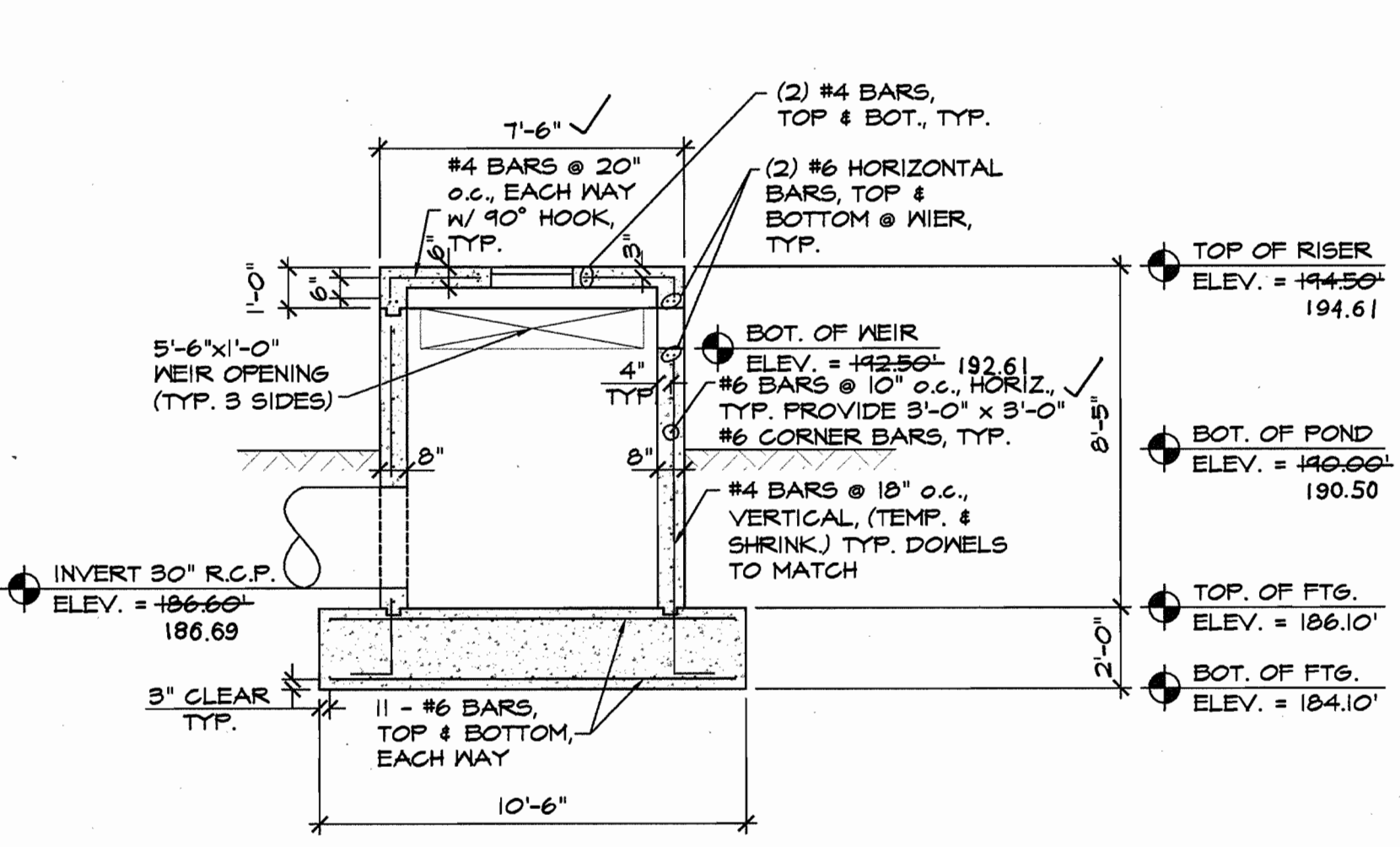
**TYPICAL 5'-6" WEIR TRASH RACK**  
**DETAIL A S/1**  
 N.T.S.



**TYP. RISER PLAN**  
 SCALE: 1/4" = 1'-0"



**TYPICAL @ R2**  
**SECTION 1/S-1**  
 SCALE: 1/4" = 1'-0"



**TYPICAL @ R-1**  
**SECTION 1/S-1**  
 SCALE: 1/4" = 1'-0"

SWM PIPE SCHEDULE		
SIZE	TYPE	LENGTH
6"	PERF. PVC (SCH. 80)	96'
6"	PVC (SCH. 40)	282'
24"	CLASS IV RCP	12'
27"	CLASS IV RCP	27'
30"	CLASS IV RCP	260'

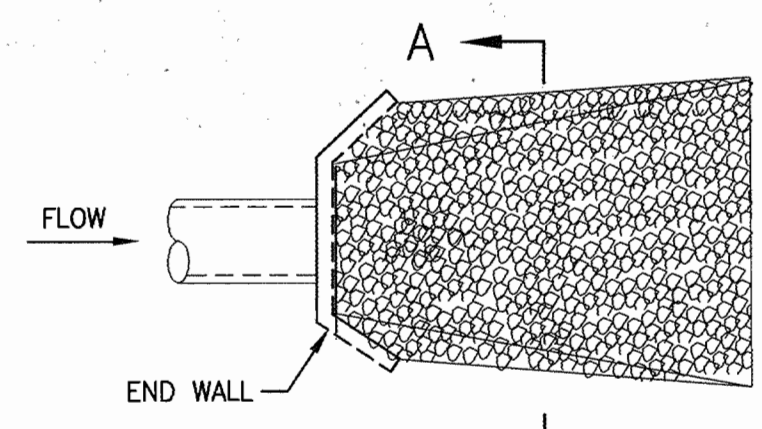
SWM FITTINGS SCHEDULE		
SIZE	TYPE	NUMBER
6"x30"	FIELD CONNECTION	1
N/A*	RISER	2
TYPE C	ENDWALL	2
6"	CLEAN-OUTS	28

\* FOR RISER DIMENSIONS SEE DETAILS THIS SHEET.

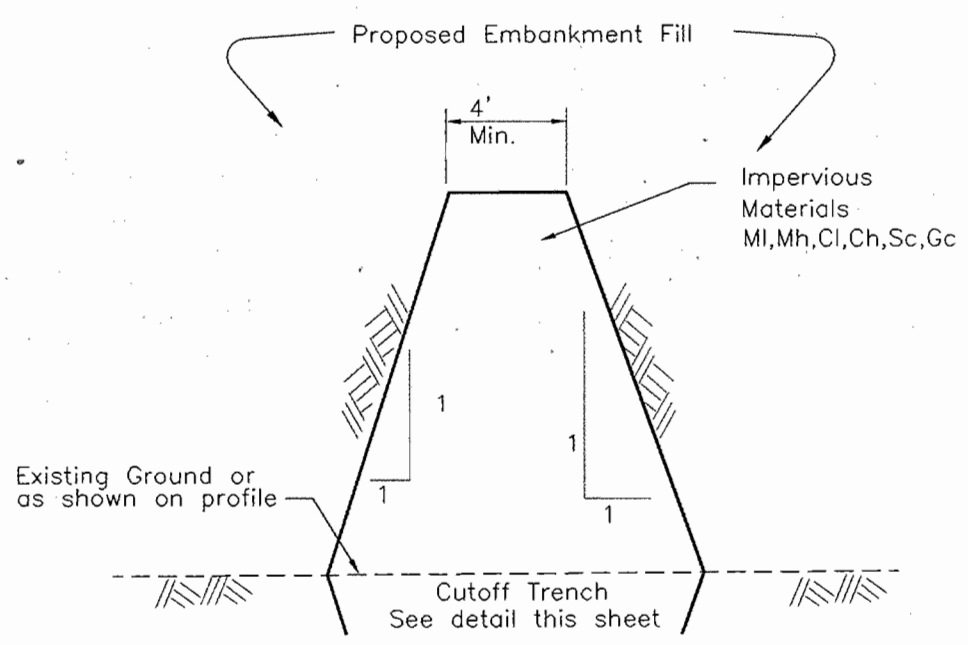
NOTE:  
 EXISTING UNCONTROLLED FILL, TOPSOIL AND UNSTABLE MATERIALS ARE NOT CONSIDERED SUITABLE FOR SUPPORT OF THE PROPOSED CONCRETE STRUCTURES. PRIOR TO CONSTRUCTION OF THE OUTFALLS, AREAS SUPPORTING THE PROPOSED STRUCTURES SHOULD BE STRIPPED AND GRUBBED TO REMOVE UNCONTROLLED FILL, TOPSOIL AND ANY ORGANIC MATTER. AFTER REMOVAL, EXISTING FILL MEETING THE PROJECT REQUIREMENTS FOR STRUCTURAL FILL, AND FREE DELETERIOUS MATERIALS MAY BE USED.

• COORDINATES TO CENTER OF STRUCTURE FOR RISERS, MIDPOINT OF FRONT FACE OF HEADWALLS

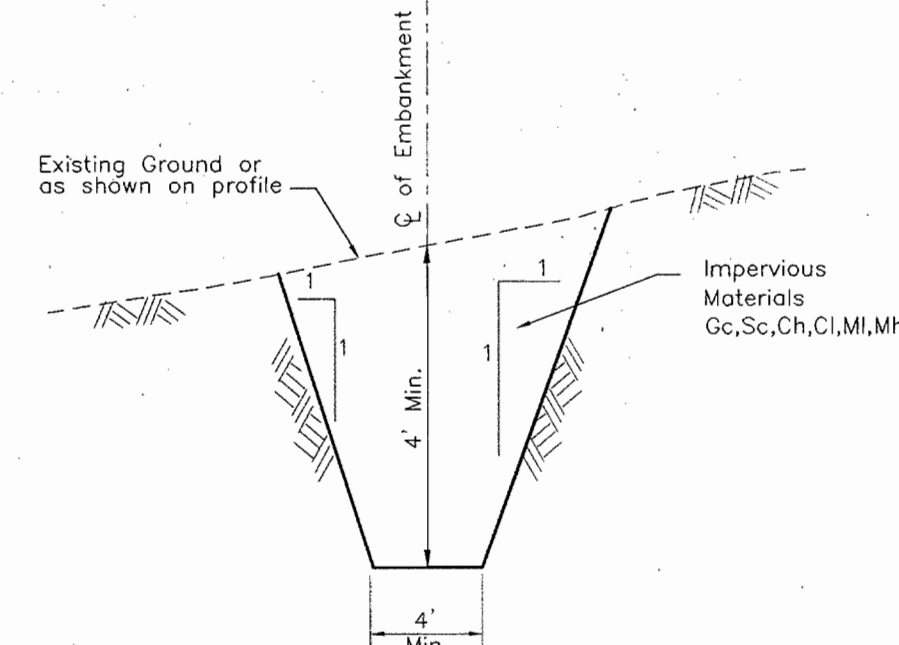
TOP ELEV	INV OUT	STR NO.	TOP ELEV	INV OUT	TYPE	REMARKS	NORTHING	EASTING
191.64	186.69	R-1	194.50	186.60	RISER (SEE DETAILS THIS PAGE FOR ALL DIMENSIONS)		557,623.95	1,380,999.52
182.70	172.95	R-2	182.50	172.76	RISER (SEE DETAILS THIS PAGE FOR ALL DIMENSIONS)		557,183.85	1,381,172.69
183.80	180.15	E-1	183.80	180.99	TYPE "C" ENDWALL, HOW. CO. STD. DETAIL SD-5.21		557,634.58	1,380,930.89
190.92	180.92	E-3	193.50	180.99	TYPE "A" HEADWALL, HOW. CO. STD. DETAIL SD-5.11		557,603.91	1,381,010.89
169.90	166.21	E-5	169.50	166.90	TYPE "C" ENDWALL, HOW. CO. STD. DETAIL SD-5.21		557,094.50	1,381,347.42
182.50	178.48	E-7	182.26	178.60	TYPE "A" HEADWALL, HOW. CO. STD. DETAIL SD-5.11		557,207.19	1,381,130.64



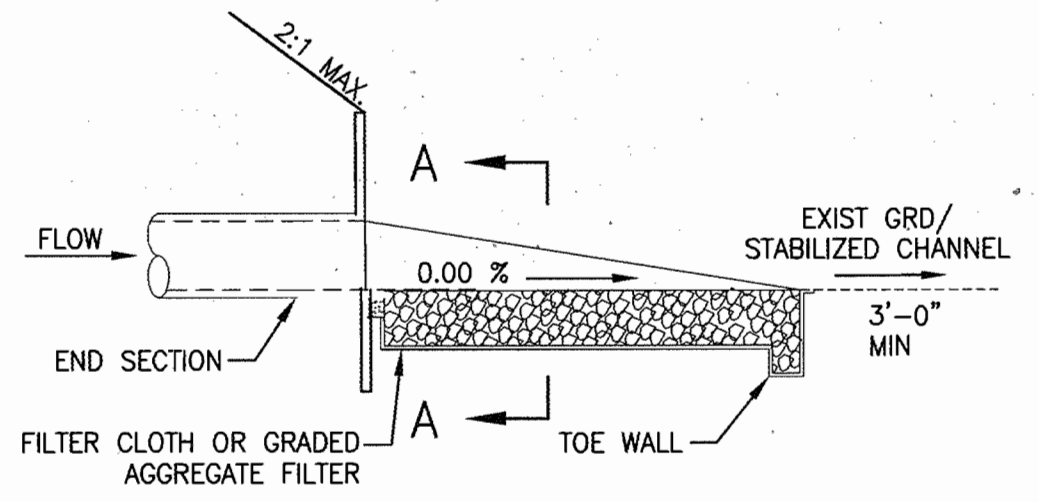
**PLAN VIEW**  
 DISCHARGE TO UNCONFINED SECTION (FLARED OUTLET) MINIMUM TAILWATER CONDITION



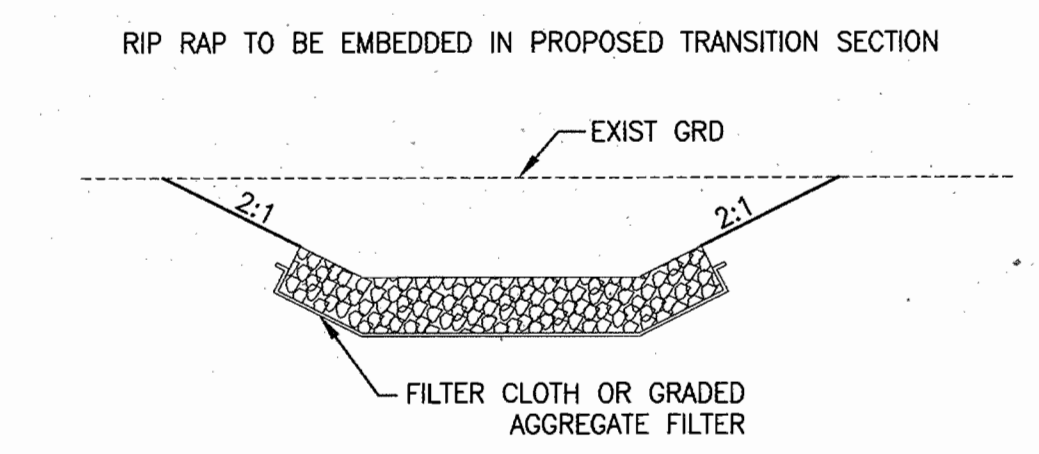
**CORE TRENCH**  
 NOT TO SCALE



**CUTOFF TRENCH**  
 NOT TO SCALE

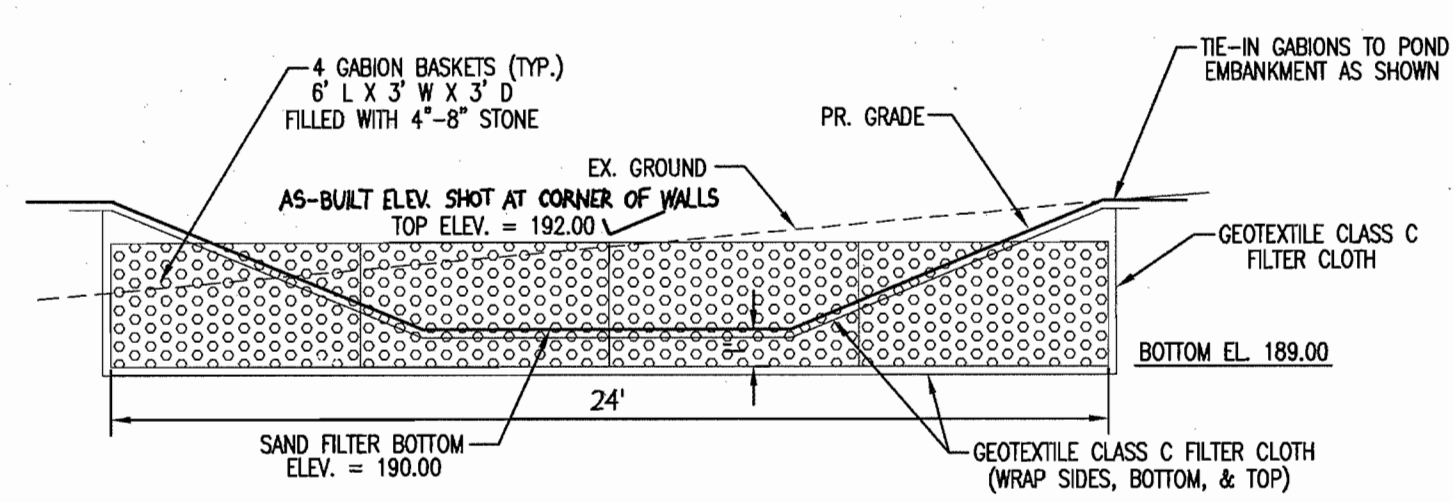


**PROFILE**

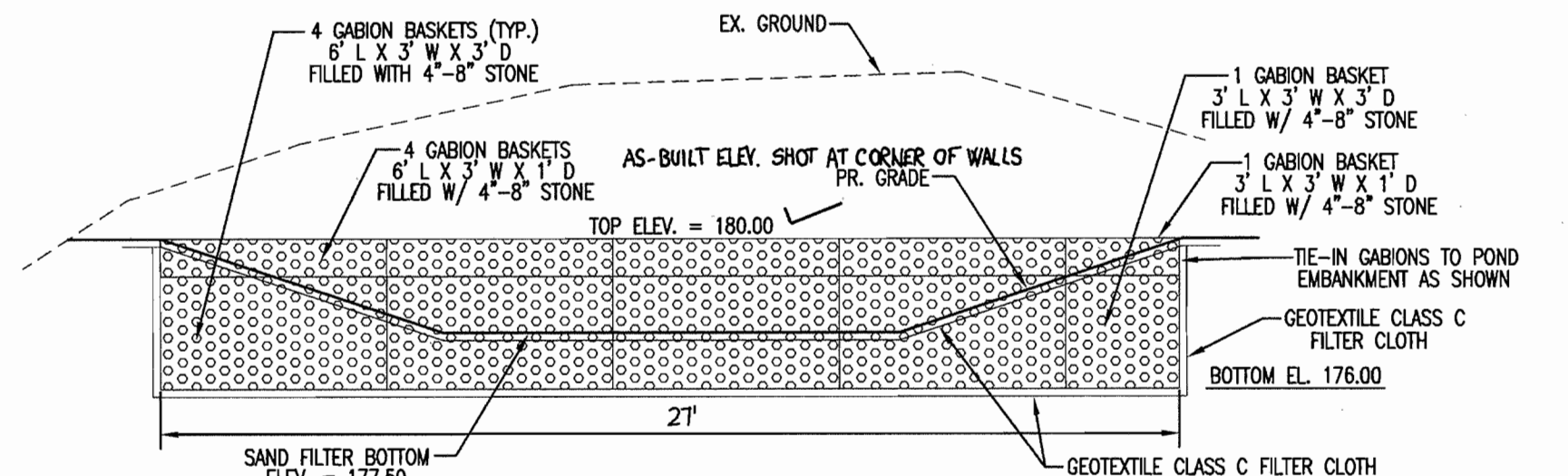


**SECTION A-A**

**RIP RAP OUTFALL**  
 NOT TO SCALE

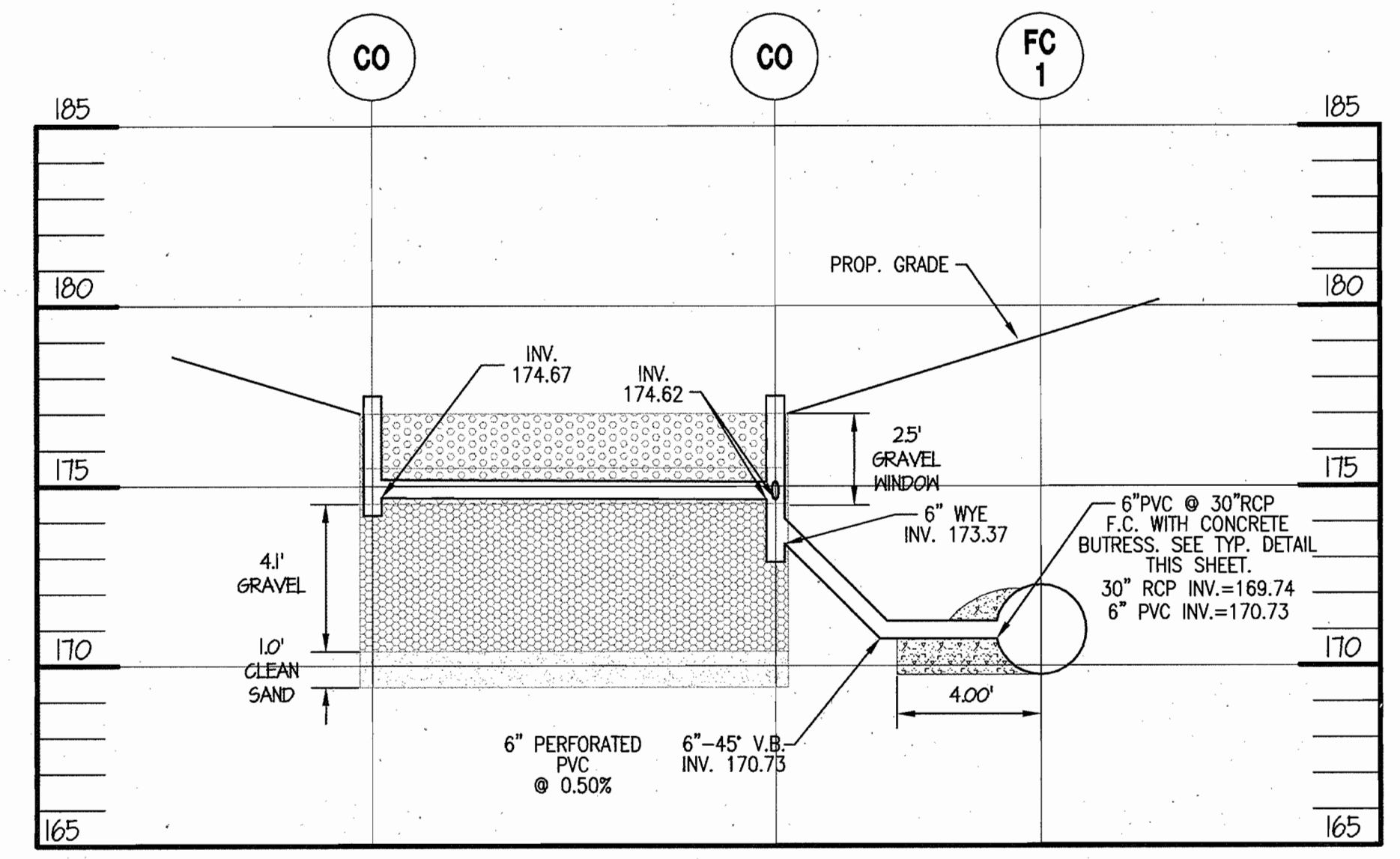


**GABION OUTFALL DETAIL SWMF #1**  
 NOT TO SCALE

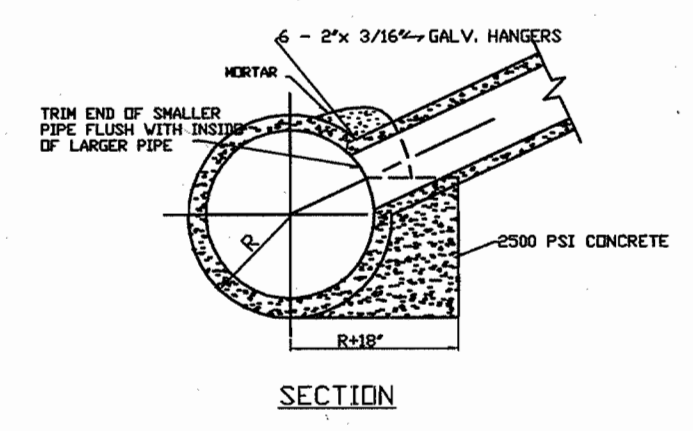


**GABION OUTFALL DETAIL SWMF #2**  
 NOT TO SCALE

- INSTALLATION NOTES:
1. GABION BASKETS SHALL BE CONSTRUCTED OF GALVANIZED US GAUGE 11 MESH WIRE OR APPROVED EQUIVALENT.
  2. GABION INSTALLATION SHALL BE PERFORMED ACCORDING TO GABION MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS.
  3. TOP GABION BASKETS TO BE STAGGERED OVER BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.
  4. TOP GABION BASKETS TO BE FASTENED TO BOTTOM BASKETS PER MANUFACTURER'S RECOMMENDATIONS.



**SWM SECTION 'H'**  
 SCALE: HOR. 1" = 4'  
 VERT. 1" = 4'



**STANDARD FIELD CONNECTION**  
 N.T.S.

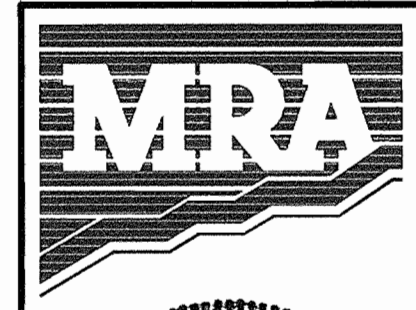
APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/3/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* 2/4/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT

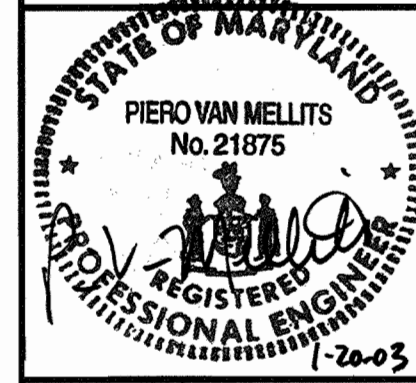
*[Signature]* 4/1/03  
 DIRECTOR

OWNER/DEVELOPER: FAX NO.: (410) 712-0620  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076



**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

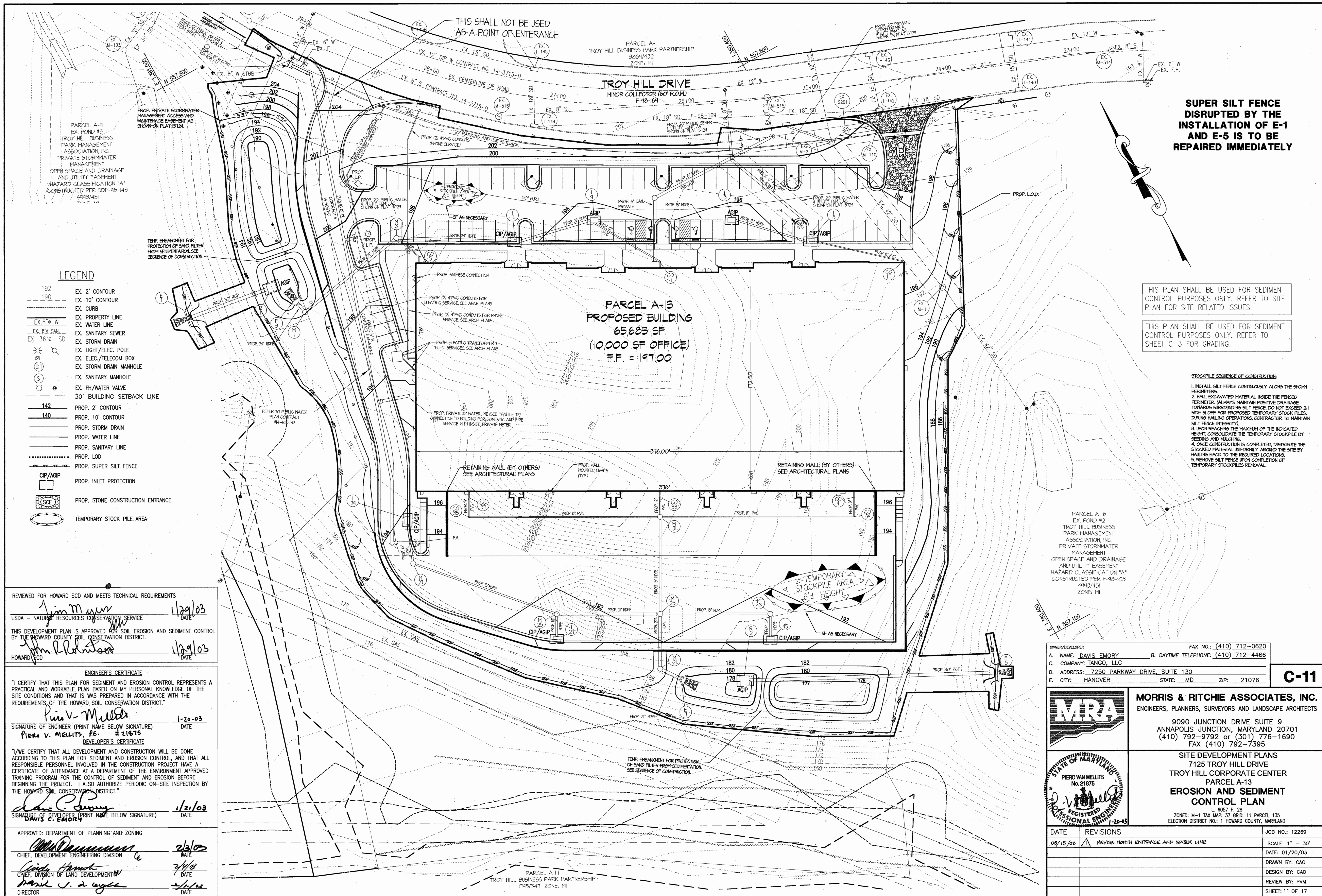
9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395



**SITE DEVELOPMENT PLANS**  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13  
**STORMWATER MANAGEMENT**  
**NOTES AND DETAILS**  
 L. 8057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.:
04/19/04	AS-BUILT	12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 10 OF 17





**SUPER SILT FENCE DISRUPTED BY THE INSTALLATION OF E-1 AND E-5 IS TO BE REPAIRED IMMEDIATELY**

THIS PLAN SHALL BE USED FOR SEDIMENT CONTROL PURPOSES ONLY. REFER TO SITE PLAN FOR SITE RELATED ISSUES.

THIS PLAN SHALL BE USED FOR SEDIMENT CONTROL PURPOSES ONLY. REFER TO SHEET C-3 FOR GRADING.

- STOCKPILE SEQUENCE OF CONSTRUCTION**
1. INSTALL SILT FENCE CONTINUOUSLY ALONG THE SHOWN PERIMETERS.
  2. Haul excavated material inside the fenced perimeter. ALWAYS MAINTAIN POSITIVE DRAINAGE TOWARDS SURROUNDING SILT FENCE. DO NOT EXCEED 2:1 SIDE SLOPE FOR PROPOSED TEMPORARY STOCK PILES. DURING HAULING OPERATIONS, CONTRACTOR TO MAINTAIN SILT FENCE INTEGRITY.
  3. UPON REACHING THE MAXIMUM OF THE INDICATED HEIGHT, CONSOLIDATE THE TEMPORARY STOCKPILE BY SEEDING AND MULCHING.
  4. ONCE CONSTRUCTION IS COMPLETED, DISTRIBUTE THE STOCKED MATERIAL UNIFORMLY AROUND THE SITE BY HAULING BACK TO THE REQUIRED LOCATIONS.
  5. REMOVE SILT FENCE UPON COMPLETION OF TEMPORARY STOCKPILE REMOVAL.

- LEGEND**
- 192 --- EX. 2' CONTOUR
  - 190 --- EX. 10' CONTOUR
  - --- EX. CURB
  - --- EX. PROPERTY LINE
  - --- EX. WATER LINE
  - --- EX. SANITARY SEWER
  - --- EX. STORM DRAIN
  - --- EX. LIGHT/ELEC. POLE
  - --- EX. ELEC./TELECOM BOX
  - --- EX. STORM DRAIN MANHOLE
  - --- EX. SANITARY MANHOLE
  - --- EX. FH/WATER VALVE
  - --- 30' BUILDING SETBACK LINE
  - --- PROP. 2' CONTOUR
  - --- PROP. 10' CONTOUR
  - --- PROP. STORM DRAIN
  - --- PROP. WATER LINE
  - --- PROP. SANITARY LINE
  - --- PROP. L.O.D.
  - --- PROP. SUPER SILT FENCE
  - --- PROP. INLET PROTECTION
  - --- PROP. STONE CONSTRUCTION ENTRANCE
  - --- TEMPORARY STOCK PILE AREA

REVIEWED FOR HOWARD SCD AND MEETS TECHNICAL REQUIREMENTS

*Jim M. ...* 1/29/03  
USDA - NATURAL RESOURCES CONSERVATION SERVICE  
DATE

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

*John R. ...* 1/29/03  
HOWARD SCD  
DATE

**ENGINEER'S CERTIFICATE**

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

*Piero V. Mellits* 1-20-03  
SIGNATURE OF ENGINEER (PRINT NAME BELOW SIGNATURE) DATE  
Piero V. Mellits, P.E. #21675  
DEVELOPER'S CERTIFICATE

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

*Davis E. Emory* 1/21/03  
SIGNATURE OF DEVELOPER (PRINT NAME BELOW SIGNATURE) DATE

APPROVED: DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 2/3/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

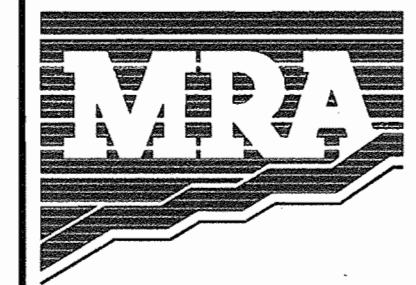
*[Signature]* 2/1/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 2/1/03  
DIRECTOR DATE

PARCEL A-16  
EX. POND #2  
TROY HILL BUSINESS PARK MANAGEMENT ASSOCIATION, INC.  
PRIVATE STORMWATER MANAGEMENT  
OPEN SPACE AND DRAINAGE AND UTILITY EASEMENT  
HAZARD CLASSIFICATION "A"  
CONSTRUCTED PER F-40-103  
4493/451  
ZONE: M1

OWNER/DEVELOPER  
A. NAME: DAVIS EMORY  
B. DAYTIME TELEPHONE: (410) 712-4466  
C. COMPANY: TANGO, LLC  
D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
E. CITY: HANOVER STATE: MD ZIP: 21076

**C-11**



**MORRIS & RITCHE ASSOCIATES, INC.**  
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

9090 JUNCTION DRIVE SUITE 9  
ANNAPOLIS JUNCTION, MARYLAND 20701  
(410) 792-9792 or (301) 776-1690  
FAX (410) 792-7395



**SITE DEVELOPMENT PLANS**  
TROY HILL CORPORATE CENTER  
PARCEL A-13  
**EROSION AND SEDIMENT CONTROL PLAN**

L. 6057 F. 28  
ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.:
08/15/03	REVISE NORTH ENTRANCE AND WATER LINE	12269
		SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 11 OF 17



# SITE DEVELOPMENT PLAN

## 7125 TROY HILL DRIVE

### TROY HILL CORPORATE CENTER

#### PARCEL A-13

#### 1st ELECTION DISTRICT

#### HOWARD COUNTY, MARYLAND

- GENERAL NOTES**
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY AND MSHA STANDARDS, IF APPLICABLE.
  - THE CONTRACTOR SHALL NOTIFY "MISS UTILITY" AT (800) 257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK BEING DONE.
  - THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS/BUREAU OF ENGINEERING/CONSTRUCTION INSPECTION DIVISION AT (410) 313-1880 AT LEAST FIVE (5) WORKING DAYS PRIOR TO THE START OF WORK.
  - ALL EXTERIOR LIGHTING SHALL COMPLY WITH ZONING REGULATIONS, SECTION 134.
  - TO THE BEST OF OUR KNOWLEDGE AND PER PUBLIC RECORD, NO CEMETERIES OR BURIAL GROUNDS EXIST ON-SITE.
  - TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
  - ALL PLAN DIMENSIONS ARE TO FACE OF CURB OR FACE OF BUILDING UNLESS OTHERWISE NOTED.
  - SPOT ELEVATIONS SHOWN FOR CURB ARE BOTTOM OF CURB UNLESS OTHERWISE NOTED.
  - THE TOPOGRAPHY AND SITE BOUNDARY WERE COMPLETED BY MORRIS & RITCHIE ASSOCIATES, INC. ON JANUARY 22, 2002, DATUM NAD 83/91.
  - THE COORDINATES SHOWN HEREON ARE BASED UPON THE HOWARD COUNTY GEODETIC CONTROL WHICH IS BASED UPON THE MARYLAND STATE PLAN COORDINATE SYSTEM. HOWARD COUNTY MONUMENTS NOS. 2445004 AND 2445005 WERE USED FOR THIS PROJECT.
  - EXISTING WATER IS PUBLIC. CONTRACT NO: 14-3715-D.
  - EXISTING SEWER IS PUBLIC. CONTRACT NO: 14-3715-D (SEE TITLE SHEET FOR PUBLIC W/S EXTENSIONS).
  - APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED DUE TO CONTRACTOR'S OPERATION SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE. EXISTING UTILITIES ARE SHOWN BASED ON THE BEST AVAILABLE INFORMATION.
  - A 100-YEAR FLOODPLAIN STUDY IS NOT REQUIRED FOR THIS PROJECT. THE 100-YEAR FLOODPLAIN HAS BEEN PREVIOUSLY DELINEATED PER PLAT #13842 & 13844 AND SHOWN AS A PART OF THIS PLAN.
  - WETLANDS EXIST ON THIS SITE AND HAVE BEEN PREVIOUSLY DELINEATED PER PLAT #13842 & 13844 AND SHOWN AS A PART OF THIS PLAN.
  - A TRAFFIC ENGINEER'S ESTIMATE OF PEAK HOUR VEHICULAR SITE TRIP GENERATION HAS BEEN PROVIDED FOR THIS SITE AS REQUIRED BY PLAT #13838.
  - A NOISE STUDY FOR THIS PROJECT IS NOT REQUIRED.
  - A GEOTECHNICAL STUDY WAS PREPARED BY GEO-TECHNOLOGY ASSOCIATES, INC. ON OCTOBER 16, 2001.
  - WATER QUANTITY MANAGEMENT FOR THIS SITE IS PROVIDED IN STORMWATER MANAGEMENT POND #2 AND #3, OWNED BY TROY HILL BUSINESS PARK PARTNERSHIP, POND #2 AND POND #3 WAS DESIGNED AND BUILT PER F-98-103 AND SDP-98-143 RESPECTIVELY. WATER QUALITY FOR THIS SITE IS PROVIDED BY SURFACE SAND FILTERS AS SHOWN BY THIS PLAN.
  - THE CONTRACTOR SHALL TEST PIT ALL EXISTING UTILITIES AT LEAST FIVE (5) DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE DRAWINGS.
  - ALL INLETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH HOWARD COUNTY STANDARDS.
  - THIS SITE IS EXEMPT FROM THE FOREST CONSERVATION ACT IN ACCORDANCE WITH SECTION 16.1202(D)(1)(C), A PLANNED OFFICE PARK.
  - CONTRACTOR TO SEE ELECTRICAL PLANS FOR EXACT LOCATION AND DETAILS OF SITE LIGHTING FIXTURES (BY OTHERS).
  - NO CLEARING, GRADING, OR CONSTRUCTION IS PERMITTED WITHIN THE WETLAND(S), STREAM(S), FLOODPLAIN(S), OR THEIR BUFFERS/SETBACKS AND WITHIN FOREST CONSERVATION EASEMENT AREAS.
  - THE BUILDING WILL HAVE AN AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEM.
  - THE WETLAND AND WETLAND BUFFER AT THE NORTHEAST CORNER OF THE SITE, AS SHOWN ON PLAT 13844, ADJACENT TO TROY HILL DRIVE HAS BEEN FILLED IN ACCORDANCE WITH CORPS OF ENGINEERS NATIONWIDE PERMIT CENAB-07-RP90-00883-3, MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER QUALITY CERTIFICATE 91-WQC-0326, MARYLAND WATER RESOURCES ADMINISTRATION WATERWAYS CONSTRUCTION PERMIT 90-WC-0647 AND HOWARD COUNTY WAIVER PETITION FILE #WP 99-07.
  - ALL CURB RADII 5' UNLESS OTHERWISE NOTED.
  - THE SUBJECT PROPERTY IS ZONED M-1 (MANUFACTURING: LIGHT) PER THE OCTOBER 18, 1993 COMPREHENSIVE ZONING PLAN.
  - THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.
  - FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING IN THE AMOUNT OF \$21,690.00 IS PART OF THE DEVELOPER'S AGREEMENT.
  - PLAT OF CORRECTION (PLAT NO. 15728 & 15729) HAS BEEN RECORDED FOR THE PRIVATE SWM ACCESS AND MAINTENANCE EASEMENT ON PARCEL A-9, AND FOR THE PUBLIC WATER & UTILITY EASEMENTS, AND SEWER & UTILITY EASEMENT, ON PARCEL A-13.
  - A PRIVATE MAINTENANCE AND EASEMENT AGREEMENT BETWEEN TANGO, LLC AND TROY HILL BUSINESS PARK MANAGEMENT ASSOCIATION, INC. WAS RECORDED ON NOVEMBER 21, 2002, LIBER 6625 FOLIO 0512.

- BENCHMARKS**
- BENCHMARK #1  
IRON PIN @ TRAVERSE #1066 (GWS)  
N 496,501.3597 E 869,134.4576  
ELEVATION=175.92'
- BENCHMARK #2  
IRON PIN @ TRAVERSE #1061 (GWS)  
N 498,036.6945 E 868,791.1502  
ELEVATION=242.49'
- BENCHMARK #3  
IRON PIN @ TRAVERSE #1034 (GWS)  
N 497,636.7437 E 869,835.6586  
ELEVATION=214.85'
- COORDINATES BASED ON NAD 27  
AS PROJECTED BY HOWARD COUNTY  
GEODETIC CONTROL STATIONS  
#2445004, #2445005



**SHEET INDEX**

C-1	TITLE SHEET
C-2	SITE LAYOUT PLAN
C-3	GRADING AND UTILITY PLAN
C-4	STORM DRAIN DRAINAGE AREA MAP
C-5	SITE NOTES AND DETAILS
C-6	UTILITY PROFILES
C-7	UTILITY PROFILES
C-8	STORMWATER MANAGEMENT PLAN
C-9	STORMWATER MANAGEMENT NOTES AND DETAILS
C-10	STORMWATER MANAGEMENT NOTES AND DETAILS
C-11	EROSION AND SEDIMENT CONTROL PLAN
C-12	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
C-13	LANDSCAPE PLAN
C-14	LANDSCAPE NOTES AND DETAILS
C-15	RETAINING WALLS PLAN & MISC. DETAILS
C-16	RETAINING WALLS - PROFILES
C-17	RETAINING WALLS - SECTIONS

**SITE ANALYSIS DATA CHART**

- TOTAL PROJECT AREA: 6.2087 ACRES OR 270,450.97 SF
- LIMIT OF DISTURBANCE: 5.18 ACRES OR 225,640.8 SF
- PRESENT ZONING: M-1
- PROPOSED USE: INDUSTRIAL (OFFICE/WAREHOUSE)
- AREA OF BUILDING: 65,685 SF TOTAL (10,000 SF OFFICE SPACE)
- BUILDING COVERAGE OF SITE: 1.51 ACRES OR 24.29% OF GROSS SITE AREA
- PROPOSED BUILDING HEIGHT: 28 FEET
- NUMBER OF PARKING SPACES REQUIRED: 3,311,000 SF OF OFFICE  
0.5/1,000 SF OF WAREHOUSE  
(10,000 SF)\*(3.3/1,000 SF) + (55,685 SF)\*(0.5/1,000 SF) = 60.84, 61 SPACES REQUIRED
- NUMBER OF PARKING SPACES PROVIDED: 86 SPACES INCLUDING 4 HANDICAP SPACES

DPZ FILE REFERENCES:  
F-96-136  
F-98-103  
F-98-169  
SDP-98-143  
WATER AND SEWER CONTRACT NO. 14-3715-D  
PLAT 15728 & 15729

**ADDRESS CHART**

LOT/PARCEL#	STREET ADDRESS
A-13/135	7125 TROY HILL DRIVE

**PERMIT INFORMATION CHART**

Subdivision Name	Section/Area	Lot/Parcel#
TROY HILL CORPORATE CENTER	6.2087 ACRES	A-13/135
PLAT# 15728 & 15729	Zoning M-1	Tax Map 37
		Elect. Distr. 1
		Census Tract 6011.02
Water Code C04	Sewer Code 4020000	

OWNER/DEVELOPER: **DAVIS EMORY** FAX NO: (410) 712-0620  
 A. NAME: **DAVIS EMORY** B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: **TANGO, LLC**  
 D. ADDRESS: **7250 PARKWAY DRIVE, SUITE 130**  
 E. CITY: **HANOVER** STATE: **MD** ZIP: **21076**

**C-1**

**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS

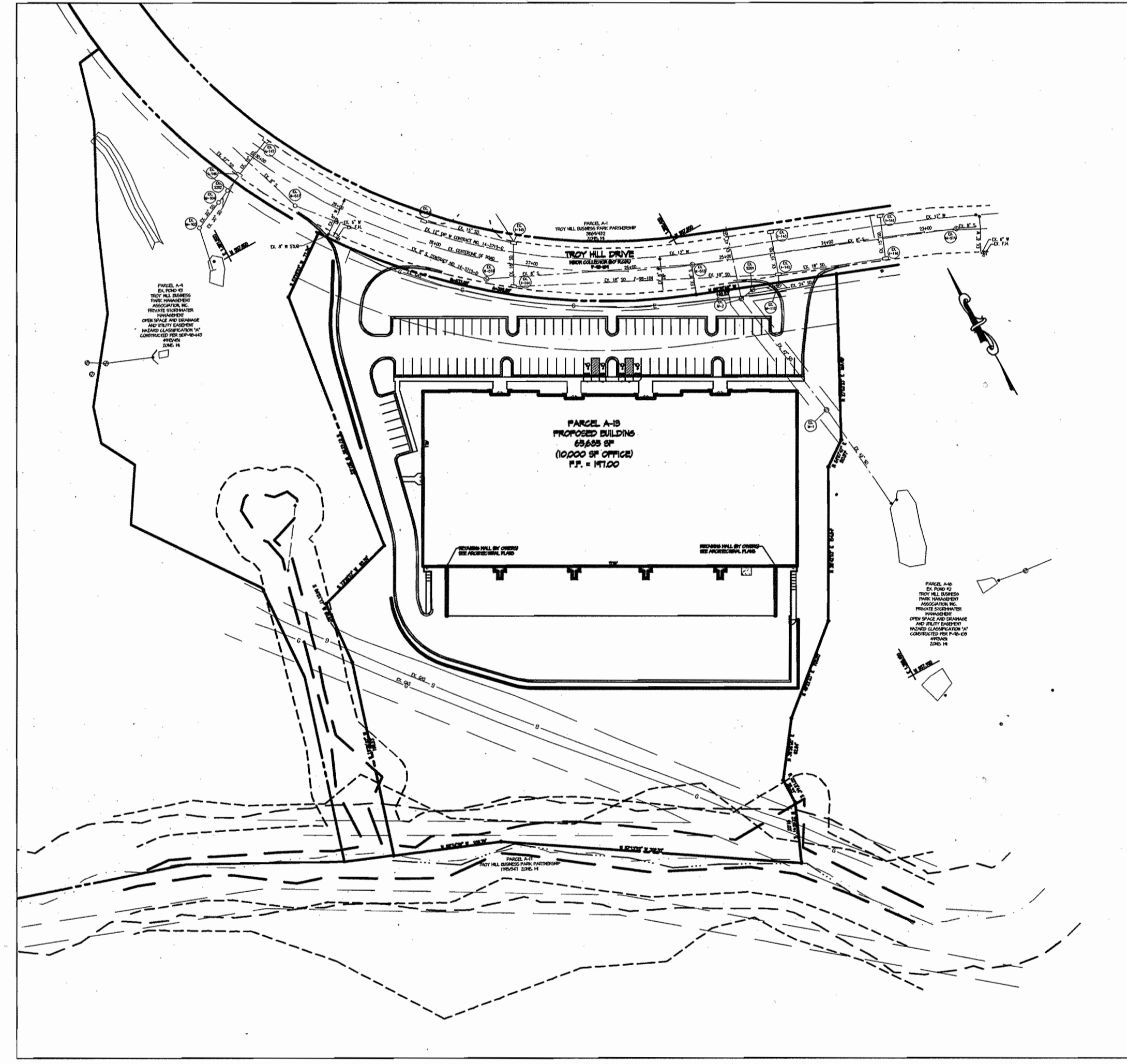
9090 JUNCTION DRIVE SUITE 9  
 ANNAPOLIS JUNCTION, MARYLAND 20701  
 (410) 792-9792 or (301) 776-1690  
 FAX (410) 792-7395

**SITE DEVELOPMENT PLANS**  
 7125 TROY HILL DRIVE  
 TROY HILL CORPORATE CENTER  
 PARCEL A-13

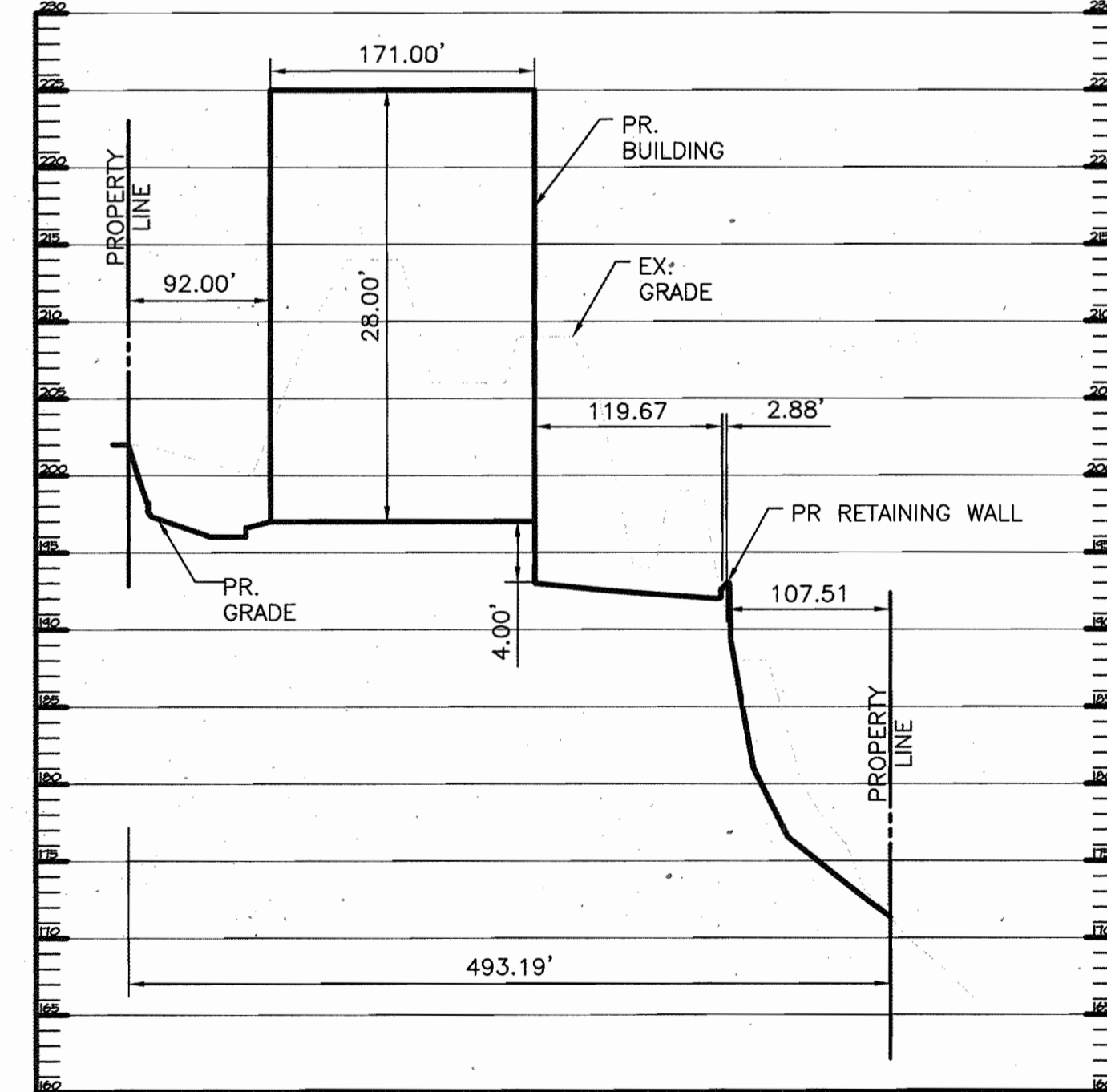
**TITLE SHEET**

L. 8657 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

DATE	REVISIONS	JOB NO.:
05/15/03	REVISION NORTH ENTRANCE AND WATER LINE	12269
05/19/04	REVISION WATER AND SEWER UTILITIES AND EASEMENTS	SCALE: AS SHOWN
		DATE: 01/20/03
		DESIGN BY: CAO
		DRAWN BY: CAO
		REVIEW BY: PWM
		SHEET: 1 OF 17



LOCATION MAP  
SCALE: 1"=100'



SITE PROFILE  
SCALE: 1"=100' HORIZONTAL  
1"=10' VERTICAL

**NOTE:**  
 THE CONTRACTOR OR DEVELOPER SHALL CONTACT THE CONSTRUCTION INSPECTION DIVISION 24 HOURS IN ADVANCE OF COMMENCEMENT OF WORK AT (410) 313-1880.

APPROVED: DEPARTMENT OF PLANNING AND ZONING

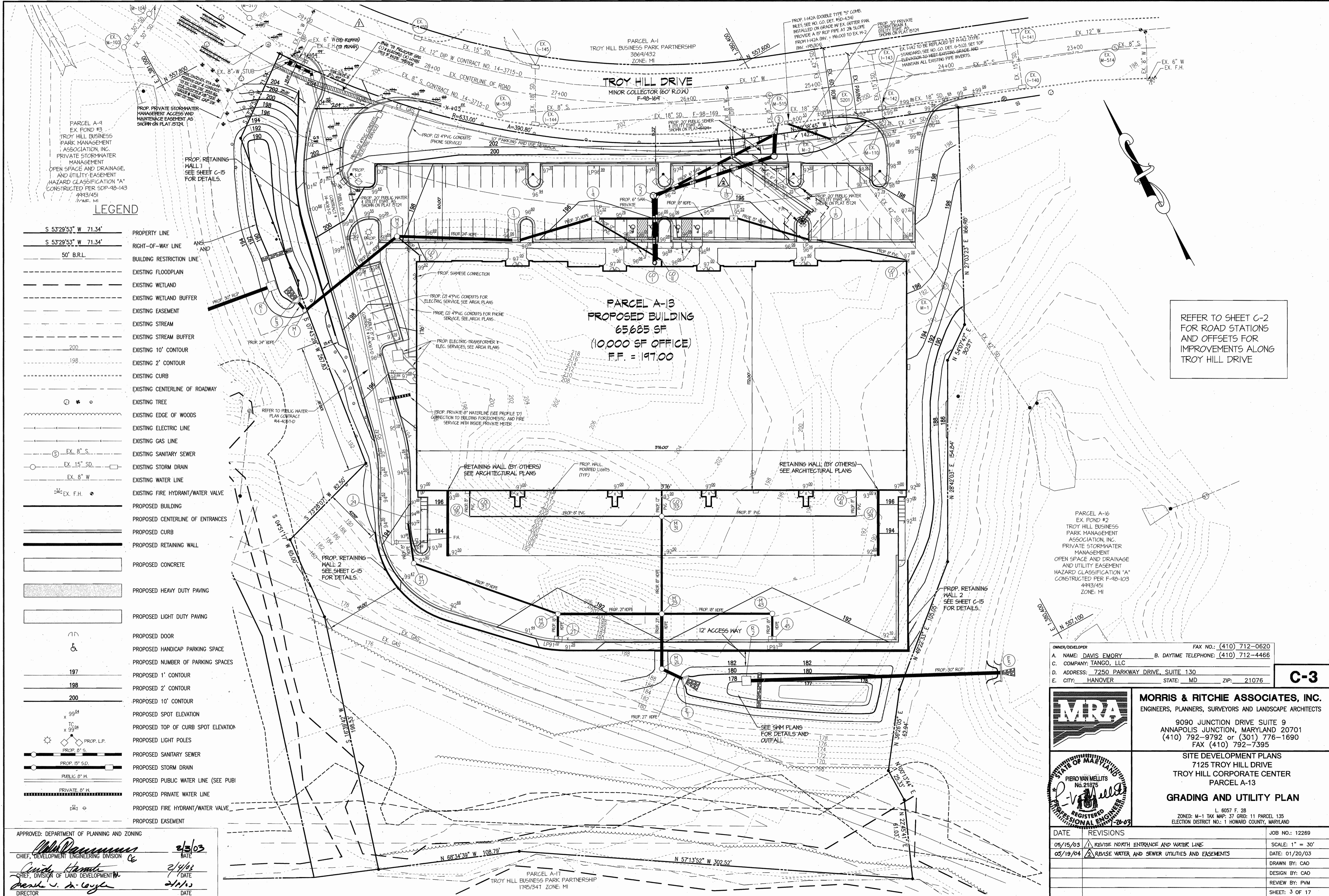
*John D. ...* 2/3/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

*Cathy ...* 2/4/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT

*Mark ...* 2/11/03  
 DIRECTOR

SDP-02-150





**LEGEND**

- PROPERTY LINE
- RIGHT-OF-WAY LINE
- BUILDING RESTRICTION LINE
- EXISTING FLOODPLAIN
- EXISTING WETLAND
- EXISTING WETLAND BUFFER
- EXISTING EASEMENT
- EXISTING STREAM
- EXISTING STREAM BUFFER
- EXISTING 10' CONTOUR
- EXISTING 2' CONTOUR
- EXISTING CURB
- EXISTING CENTERLINE OF ROADWAY
- EXISTING TREE
- EXISTING EDGE OF WOODS
- EXISTING ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER LINE
- EXISTING FIRE HYDRANT/WATER VALVE
- PROPOSED BUILDING
- PROPOSED CENTERLINE OF ENTRANCES
- PROPOSED CURB
- PROPOSED RETAINING WALL
- PROPOSED CONCRETE
- PROPOSED HEAVY DUTY PAVING
- PROPOSED LIGHT DUTY PAVING
- PROPOSED DOOR
- PROPOSED HANDICAP PARKING SPACE
- PROPOSED NUMBER OF PARKING SPACES
- PROPOSED 1' CONTOUR
- PROPOSED 2' CONTOUR
- PROPOSED 10' CONTOUR
- PROPOSED SPOT ELEVATION
- PROPOSED TOP OF CURB SPOT ELEVATION
- PROPOSED LIGHT POLES
- PROPOSED SANITARY SEWER
- PROPOSED STORM DRAIN
- PROPOSED PUBLIC WATER LINE (SEE PUBI)
- PROPOSED PRIVATE WATER LINE
- PROPOSED FIRE HYDRANT/WATER VALVE
- PROPOSED EASEMENT

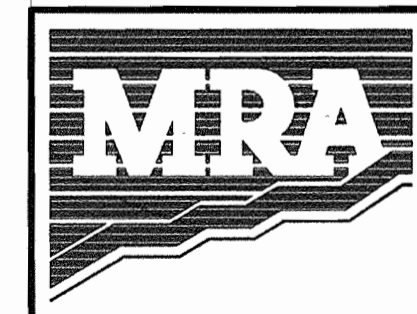
**PARCEL A-13**  
**PROPOSED BUILDING**  
**65685 SF**  
**(10,000 SF OFFICE)**  
**F.F. = 197.00**

REFER TO SHEET C-2  
 FOR ROAD STATIONS  
 AND OFFSETS FOR  
 IMPROVEMENTS ALONG  
 TROY HILL DRIVE

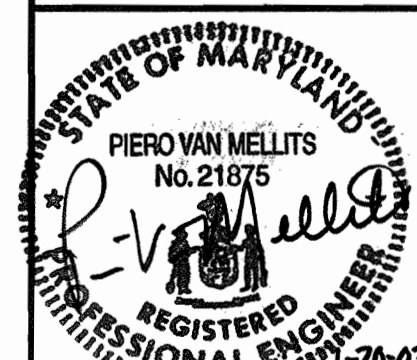
PARCEL A-16  
 EX. POND #2  
 TROY HILL BUSINESS  
 PARK MANAGEMENT  
 ASSOCIATION, INC.  
 PRIVATE STORMWATER  
 MANAGEMENT  
 OPEN SPACE AND DRAINAGE  
 AND UTILITY EASEMENT  
 HAZARD CLASSIFICATION "A"  
 CONSTRUCTED PER F-40-103  
 4/93/451  
 ZONE: M1

OWNER/DEVELOPER: FAX NO.: (410) 712-0620  
 A. NAME: DAVIS EMORY B. DAYTIME TELEPHONE: (410) 712-4466  
 C. COMPANY: TANGO, LLC  
 D. ADDRESS: 7250 PARKWAY DRIVE, SUITE 130  
 E. CITY: HANOVER STATE: MD ZIP: 21076

**C-3**



**MORRIS & RITCHIE ASSOCIATES, INC.**  
 ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS  
 9090 JUNCTION DRIVE SUITE 9  
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**SITE DEVELOPMENT PLANS**  
**7125 TROY HILL DRIVE**  
**TROY HILL CORPORATE CENTER**  
**PARCEL A-13**  
**GRADING AND UTILITY PLAN**  
 L. 6057 F. 28  
 ZONED: M-1 TAX MAP: 37 GRID: 11 PARCEL: 135  
 ELECTION DISTRICT NO.: 1 HOWARD COUNTY, MARYLAND

APPROVED: DEPARTMENT OF PLANNING AND ZONING  
  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 2/3/03  
  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 2/4/03  
  
 DIRECTOR  
 DATE: 2/11/03

DATE	REVISIONS	JOB NO.:
05/15/03	1. REVISE NORTH ENTRANCE AND WATER LINE	12269
05/19/04	2. REVISE WATER AND SEWER UTILITIES AND EASEMENTS	SCALE: 1" = 30'
		DATE: 01/20/03
		DRAWN BY: CAO
		DESIGN BY: CAO
		REVIEW BY: PVM
		SHEET: 3 OF 17

SDP-02-150

SDP-02-150