

# Site Development Plan For Mass Grading, Road Construction & Stormwater Management Howard County Office Campus

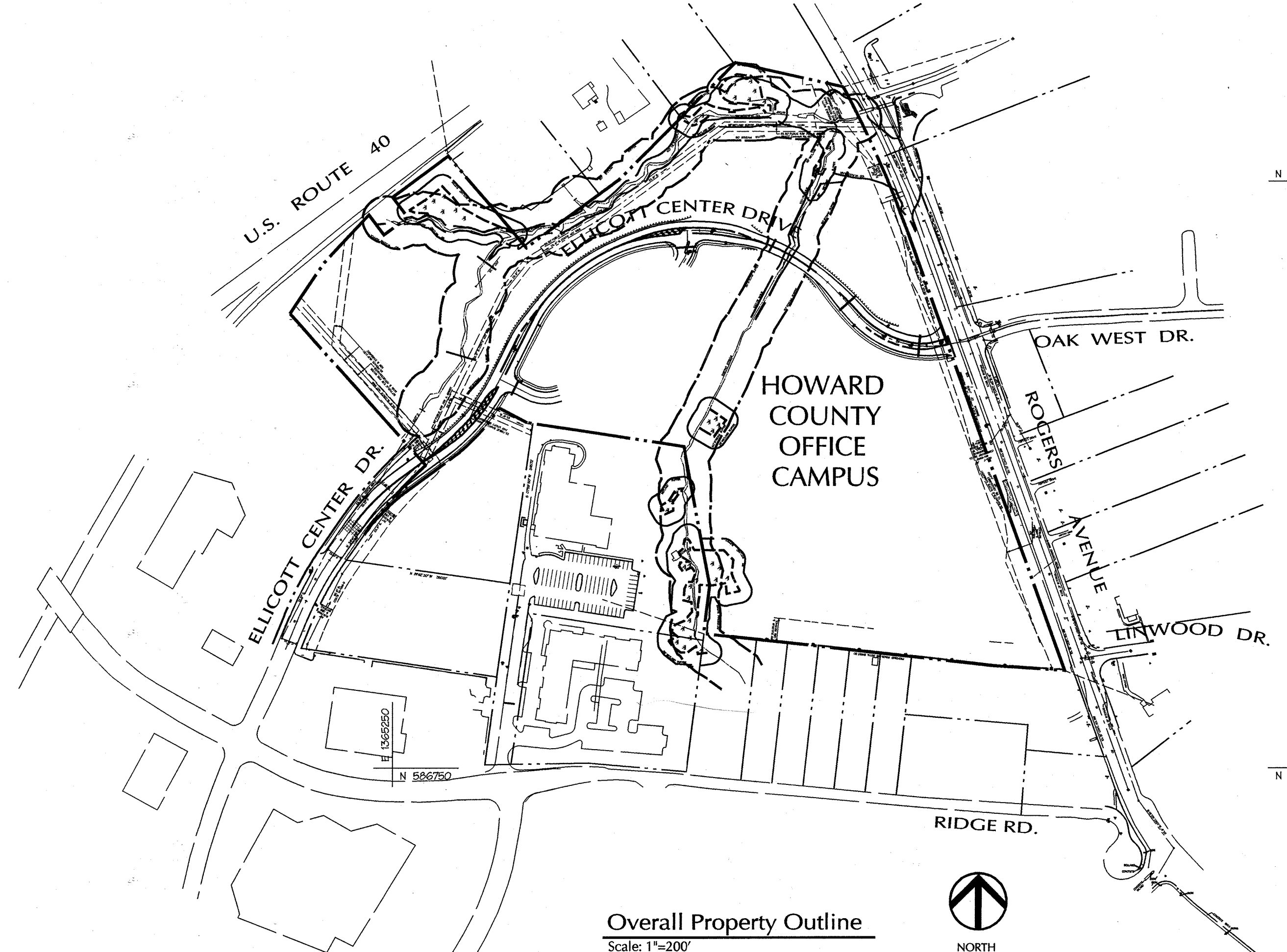
**PARCEL 'A'  
CIP-C-0282**

**Howard County**

**Maryland**

## General Notes

- All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
- The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection Division at 410-313-1880 at least five (5) working days prior to the start of work.
- The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
- Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs be in place prior to the placement of any asphalt.
- All plan dimensions are to face of curb unless otherwise noted.
- The existing topography was field run by DMW in June 2001, and supplemented along Rogers Avenue and Ellcott Center Drive by DMW in June 2002. Wetlands were delineated and field located by DMW in Feb. 2001 and approved by the Army Corps of Engineers on Oct. 11, 2001. Boundary per Millenberg Boender dated 12/2/99.
- The coordinates shown hereon are based upon the Howard County Geodetic Control which is based upon the Maryland State Plane Coordinate System. Howard County Monument Nos. 25A1 and 25A2 were used for this project.
- Water is public, contract no. 44-4074.
- Stormwater Management for this project will be addressed with the installation of three Stormwater Management Facilities (sand filter), two water quality/recharge swales (grass channel credit) and two possible bioretention areas which will control the runoff per the latest approved Design Standards. The facilities will be surface sand filter. They will be owned and maintained by Howard County. The SWM facilities (#2 & #3) will be built as sediment basins/traps during this SDP and converted to sand filters in the future. SWM facility #1 will not be used for sediment control but will be converted to a sand filter in the future. The Howard County Office Campus will provide stormwater management for entire Parcel B-47, which is provided in facility #3 under the ultimate SWM design.
- Existing utilities are based on Construction Plans (contract no.'s 9W, 215, 427) and verified by field survey.
- The floodplain study for this project was prepared by Daft-McCune-Walker, Inc., dated June 12, 2001, and was approved November 13, 2002.
- The wetlands delineation study for this project was prepared by Daft-McCune-Walker, Inc., dated July 2001, revised September, 2001 and approved by the U.S. Army Corps of Engineers on October 11, 2001.
- The geology analysis dated Oct. 8, 2002 for this project was prepared by Wells and Associates, and was approved January 15, 2003.
- Project background information:  
Subdivision Name: Howard County Office Complex  
Tax Map: 24125  
Loc. Parcels: P10, Parcel B52 & P10 P, B47  
Zoning: FOR-MXD-6 per the Comprehensive Zoning Plan  
Election District: 2  
Total Tract Area: 24.6 AC.  
File Numbers: F-03-21
- Street light placement and the type of fixture and pole shall be in accordance with the Howard County Design Manual, Volume III (1993). A minimum spacing of 20' shall be maintained between lights and any tree.
- Sidewalk ramps shall meet current ADA requirements.
- All sidewalks at intersections to have handicaps ramps meeting ADA requirements. See detail on sheet 30.
- Street trees shall be planted at least 5' from any inlet structure.
- Stormwater maintenance responsibility, routine, and non-routine schedule is shown on sheet 18.
- Under Capital Project J4170, improvements will be made to the culvert passing the Sucker Branch floodplain at Rogers Avenue, therefore no 100 year storm water management is provided on-site. Also, a traffic signal at the intersection of Ellcott Center Drive and Rogers Avenue will be proposed under Capital Project J4170. Also under Capital Project J4170, the alignment of Linwood Drive with the project entrance will be restudied.
- No clearing, grading, or construction is permitted within the wetlands, streams, or their required buffers and forest conservation easement areas. (See list of approved disturbances this sheet)
- There are no known cemeteries, historic structures, or scenic roads on or adjacent to this property.
- This plan has been prepared in accordance with provisional section 16.124 of the Howard County Code and the landscape manual.
- This project complies with the requirements of section 16.1200 of the Howard County Code for forest conservation. The total forest conservation requirements for this project is 9.07 acres for Parcel 'A' (8.16 ac) and 'B' (0.91 acres). The total forest conservation easement provided for this property is 10.33 (9.39 ac. credited and 0.95 ac. non-credited)
- This SDP is subject to the 5th Edition of the Howard County Subdivision and Land Development Regulations.
- Geotechnical Study has been prepared by Froehling & Robertson dated August 2002.
- MDE Permit and Tracking No. 200266336
- The existing pipes and old structures in the stream shall be addressed in SDP #2.



**Overall Property Outline**  
Scale: 1"=200'

### AS-BUILT CERTIFICATION

I hereby certify, by my seal, that the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.

### Description of Essential Environmental Disturbances

DPZ-Approved Disturbances per Section 16.116(c) of the Subdivision and Land Development Regulations:

- Essential Stream Crossing and Stream Buffer: Ellcott Center Drive extension requires crossing of a stream and is essential for the function of the campus and the neighborhood. There will be no disturbance to the actual stream or stream channel. Minimization efforts include locating the crossing at a section of the stream with no associated floodplain or wetland; only 9150 sf of grading and construction within the stream buffer; narrowed paving section across the stream and within the buffer; storm drain and public water main located under the roadway and use of a bottomless arch in lieu of a culvert, with footings five feet beyond the stream channel on each side.
- Necessary grading of Steep Slopes: Ellcott Center Drive extension impacts approximately 42,100 sf of steep slopes due to existing 50 foot grade change from the west to east side; the need for access to the employee parking garage and adequate storm water management; and the need for a road with safe horizontal and vertical grades. Minimization efforts include 800 linear feet of retaining walls; provision of a bottomless arch with supporting retaining walls; use of an interlocking block wall to minimize footing; narrowed pavement where turn lanes were not needed; and inclusion of a public water main under the road pavement.
- Employee parking garage will impact approximately 2700 square feet of steep slopes. Minimization efforts include use of structured vs. surface parking; use of curved or segmented garage configuration; location of storm water management facility between the road and the structures; and use of a pedestrian bridge to link the garage to the office buildings.
- Approximately 66,900 sf of steep slopes are impacted for construction of the office buildings. Minimization efforts include stepping the buildings into and down the site top; segmented building configuration; use of a 6 to 7 percent gradient on the access drive; and use of a pedestrian bridge to link the offices buildings to employee parking garage.
- Necessary Disturbance within 100 Year Floodplain: The best location for site storm drain and swm system outfall occurs adjacent to an existing drainage swale within the 100 year floodplain. It maintains an existing drainage pattern; no wetland, stream, related buffer, forest or steep slope is impacted; and the existing channel gradient; minimizes erosion potential. Approximately 1851 sf of floodplain will be disturbed for the outfall. Minimization efforts include a single rather than multiple outfalls for each swm facility; routing minimizes erosion potential to the stream, and reduces the one year velocity; a future capital project will pipe Rogers Avenue improvements in this location, so both improvements will have a single impact.

### Description of Road Design Waivers

Road Design Waiver needed to minimize disturbances to environmentally sensitive features was conditionally approved on August 5, 2002 by DPW. Standards waived include:  
 -Sections 15.1.B, to use the Howard County Office Campus Master Plan (October, 2002) in lieu of a Preliminary Engineering Report;  
 -Table 2.01 (S) 32, Subtable 3, to use minor collector design and posted speed for a roadway with maximum volume of 3,000 VPD.  
 -Table 2.05, to use a 200 foot radius near Rogers Avenue intersection and 51 foot tangent for curve transition.  
 -Section 2.4.1, Figure 2.10, to use a 26 foot road section through stream crossing and stream buffer; to delete a sidewalk on the retaining wall side of the road; to allow mountable curb for a portion of the road, and to set the guard rail 30 inches behind the face of curb.  
 -Table 2.09, to allow a landing grade of 3.5%.

### Description of Design Manual Waiver for Setbacks

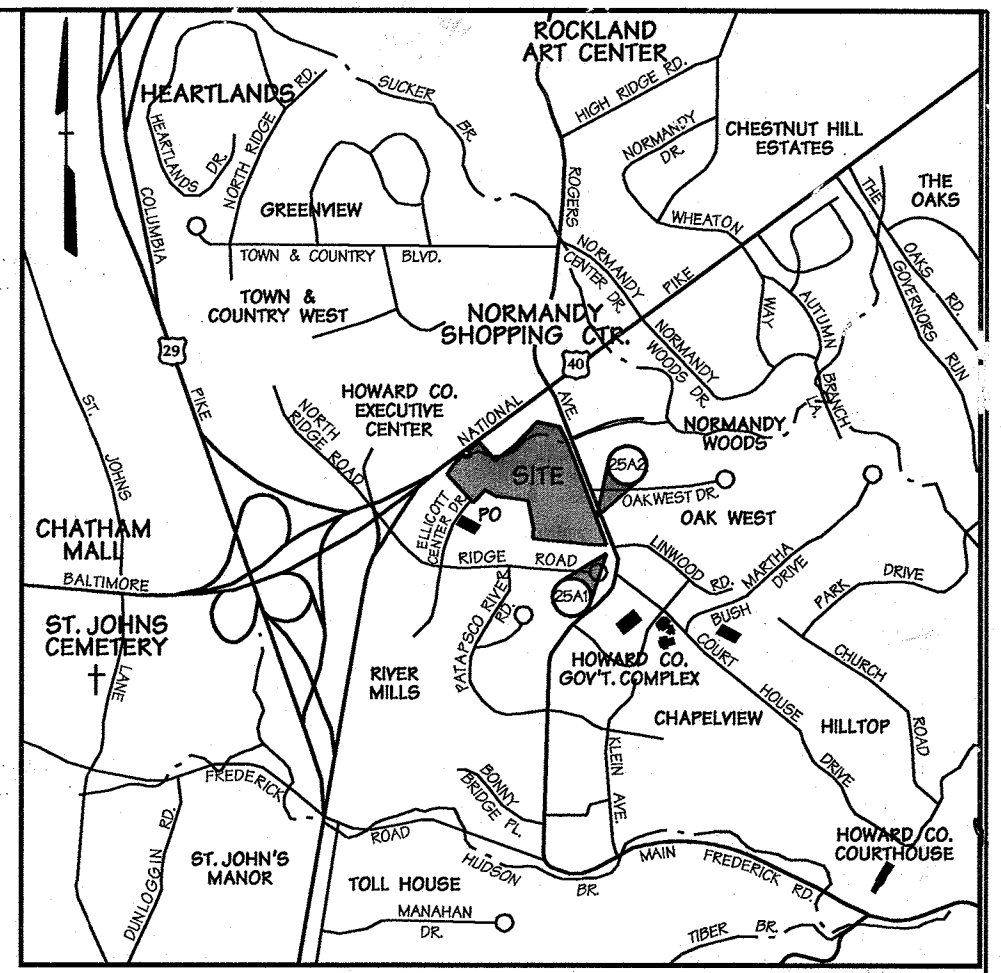
Design manual waiver Volume 1, section 5.2.4.1 was conditionally approved on January 21, 2003 by DPW. Standards waived include:  
 -Section 5.2.4.1, to use a setback that is less than 25 feet from the top of the slope out to a structure for stormwater management facilities 2 and 3.

### Description of Design Manual Waiver for Adequate Sight Distance

Design manual waiver Volume III, section 2.5.2.H was conditionally approved on May 2, 2003 by DPW. Standards waived include:  
 -Section 2.5.2.H requiring an adequate sight distance at the unsignalized intersection of Ellcott Center Drive extension and Rogers Avenue.

SHEET	DESCRIPTION
1	COVER SHEET
2	GRADING PLAN -- EAST SIDE
3	GRADING PLAN -- WEST SIDE
4	SEDIMENT AND EROSION CONTROL PLAN -- EAST SIDE
5	SEDIMENT AND EROSION CONTROL PLAN -- WEST SIDE
6	SEDIMENT AND EROSION CONTROL DETAILS AND SPECIFICATIONS
7	SEDIMENT AND EROSION CONTROL DETAILS (CONTINUED)
8	SEDIMENT AND EROSION CONTROL DETAILS (CONTINUED)
9	SEDIMENT AND EROSION CONTROL SPECIFICATIONS
10	SOIL BORING LOGS
11	SOIL BORING LOGS
12	STORMWATER MANAGEMENT FACILITY 1,3
13	STORMWATER MANAGEMENT FACILITY 2
14	STORMWATER MANAGEMENT RISER DETAILS
15	STORMWATER MANAGEMENT RISER DETAILS & ESC DETAILS
16	STORMWATER MANAGEMENT DETAILS
17	STORMWATER MANAGEMENT PROFILES
18	STORMWATER MANAGEMENT SPECIFICATIONS
19	LANDSCAPE AND STREET TREE PLAN -- EAST SIDE
20	LANDSCAPE AND STREET TREE PLAN -- WEST SIDE
21	LANDSCAPE NOTES AND DETAILS
22	FOREST CONSERVATION PLAN -- EAST SIDE
23	FOREST CONSERVATION PLAN -- WEST SIDE
24	FOREST CONSERVATION NOTES AND DETAILS
25	STORM DRAIN DRAINAGE AREA MAP
26	STORM DRAIN PROFILES
27	STORM DRAIN PROFILES
28	ELLCOTT CENTER DRIVE ROAD PLAN / PROFILE
29	ELLCOTT CENTER DRIVE ROAD PLAN / PROFILE
30	ELLCOTT CENTER DRIVE ROAD DETAILS
31	ELLCOTT CENTER DRIVE PAVEMENT MARKING & SIGNAGE PLAN
32	ELLCOTT CENTER DRIVE-ROGERS AVENUE ROAD INTERSECTION DETAILS
33	RETAINING WALLS #1 & #2 PLAN VIEW
34	RETAINING WALLS #1 & #2 PROFILES AND DETAILS
35	RETAINING WALLS #1 & #2 SPECIFICATIONS
36	RETAINING WALL #3 PLAN AND PROFILE VIEWS
37	RETAINING WALL #3 DETAILS AND SPECIFICATIONS
38	BOTTOMLESS ARCH PLAN VIEW & DETAILS
39	BOTTOMLESS ARCH HEADWALL ELEVATION VIEWS
40	BOTTOMLESS ARCH SPECIFICATIONS
41	RETAINING WALL #4 & #5 PLAN AND DETAILS
42	RETAINING WALL #4 ELEVATION
43	RETAINING WALL #5 ELEVATION
44	RETAINING WALL #5 ELEVATION

### Sheet Index



**VICINITY MAP**  
SCALE: 1"=2000'

### Benchmark

- ✓ 25A1:  
NORTHING: 586557.503  
EASTING: 1366847.149  
ELEVATION: 397.085'
- ✓ 25A2:  
NORTHING: 587502.680  
EASTING: 1366556.401  
ELEVATION: 349.887'

REVISION #1  
ADJUSTMENT TO THE TYPICAL SECTION OF ELLCOTT CENTER DRIVE FROM STATIONS 6+25 TO 14+25 AS WELL AS ANY ASSOCIATED ITEMS IMPACTED BY THIS REVISED ROAD SECTION, SUCH AS STORM DRAIN, LIGHT POLE AND SIGN PLACEMENT, ECT. ADJUSTMENT OF TWO RETAINING WALLS, SIDEWALK FROM WEST BOUNDARY OF SITE TO NORTH RIDGE ROAD, AND REMOVAL OF SWM FACILITY #1. REVISED LIMIT OF DISTURBANCE TO INCLUDE AREAS SURROUNDING NEW RETAINING WALLS AND EXCLUDE SOUTHERN AREA WHERE GRADING WILL NOT TAKE PLACE UNDER THIS EFFORT.

ADDRESS CHART	
PARCEL NUMBERS	STREET ADDRESS
PARCEL A	3320 ROGERS AVENUE

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS		
<i>William J. Walsh</i>	7-11-03	
CHIEF, BUREAU OF HIGHWAYS	DATE	
APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING		
<i>David Damann</i>	7/14/03	
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE	
<i>Andy Hanan</i>	7/6/03	
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE	
<i>Marsha R. Leight</i>	7/21/03	
DIRECTOR	DATE	
Date	No.	Revision Description

## Howard County Office Campus

**PARCEL A  
CIP-C-0282**

OWNER / DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

6-04-03  
Date

6029

TITLE: **COVER SHEET**

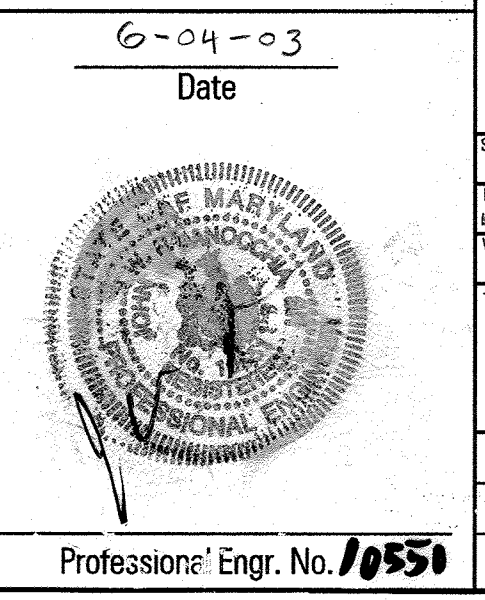
Des. By	Scale: 1"=200'	Proj. No. C1001.C
Drn. By	Date: 9/5/12	1 of 44
Chk. By: <i>RLH</i>	Approved	

**"AS-BUILT" 99P-03-02C**

## SITE ANALYSIS DATA CHART

- General Site Data
  - Present Zoning: FOR-MXD-6
  - Applicable DPZ File References: F-03-21, 6-12-001, 28-1093, WPI18-087
  - Proposed Use of Site or Structure(s): MASS GRADING, ROAD CONSTRUCTION AND STORMWATER MANAGEMENT
  - Proposed Water and Sewer Systems: X Public      Private
- Area Tabulation
  - Total Project Area: 24.6 Acres
  - Area of This Plan Submission: 24.6 Acres
  - Limit of Disturbed Area: 11,255 Acres
  - Building Coverage of Site: 0% Acres and 0% % of Gross Area (Proposed)
  - Area of floodplain: 1.32 Acres
  - Area of steep slopes: 7.65 Acres
  - Net area of site: 17.44 Acres
- Building Area
  - Building Area: N/A
  - Building Coverage of Site: N/A %
- Parking Space Data
  - Number of Parking Spaces Required by Zoning Regulations and Criteria: N/A
  - Total Number of Parking Spaces Provided On-Site: N/A
  - Number of Handicapped Parking Spaces Provided: N/A

MDE PERMIT AND TRACKING No. 200266336





**LEGEND**

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300 MAJOR CONTOURS
- 295 MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- █ SLOPES >25%
- █ SLOPES 15%-25%
- SPECIMEN TREE
- CRITICAL ROOT ZONE
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED TREELINE
- PROPOSED GUARD RAIL
- 100 YR FLOODPLAIN
- LIMIT OF DISTURBANCE
- PROP. RETAINING WALL
- 340 PROPOSED MINOR CONTOUR
- 350 PROPOSED MAJOR CONTOUR
- FOREST CONSERVATION EASEMENT (NATURAL AREA CONSERVATION CREDIT)
- PUBLIC EASEMENT
- 12" W. PROPOSED WATER LINE
- 15" D. PROPOSED STORM DRAIN



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	
<i>William J. White</i>	7-11-03
CHIEF, BUREAU OF HIGHWAYS	DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING	
<i>John J. ...</i>	7/14/03
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
<i>... Harold ...</i>	7/16/03
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
<i>... ...</i>	7/22/03
DIRECTOR	DATE
Date	Revision Description

**Howard County Office Campus**  
**PARCEL A**  
**CIP-C-0282**

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

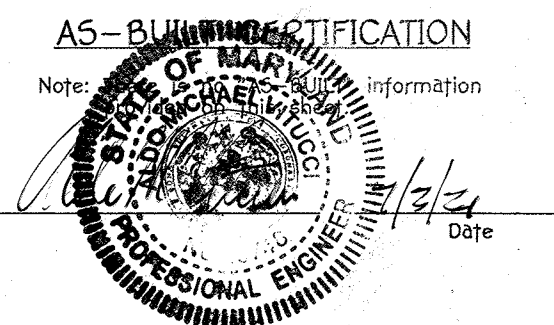
**DMW**  
 Draft-McCune-Walker, Inc.  
 290 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors, Environmental Professionals...

DATE: 6-01-03

SUBDIVISION NAME			
NO. CO. OFFICE CAMPUS	SECTION/AREA	DATE	LOT/PARCEL #
1567-10	6 & 1	24 & 25	052 & P10847
DATE	SCALE	DATE	DATE
6/2/03	1"=50'	7/5/12	6/29
TITLE			
GRADING PLAN -- EAST SIDE			
Des. By	MRT	Scale	1"=50'
Proj. No.	01001.C		
Dm. By		Date	7/5/12
2 of 44			
Chk. By	RLH	Approved	NSP
Professional Engr. No.			

NOTE:  
 SEE SHEETS 28 AND 29 FOR ALL STRUCTURE LABELS.



DATA SOURCES:  
 ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELLICOTT CENTER DRIVE IN JUNE 2002.  
 WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
 NOTE:  
 ALL STREAMS ON SITE ARE PERENNIAL.

MDE PERMIT AND TRACKING No. 200266336

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 900-03-026





**LEGEND**

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300 MAJOR CONTOURS
- 295 MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- █ SLOPES >25%
- █ SLOPES 15%-25%
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED TREELINE
- PROPOSED GUARD RAIL
- 100 YR FLOODPLAIN
- LIMIT OF DISTURBANCE
- PROP. RETAINING WALL
- 348 PROPOSED MINOR CONTOUR
- 350 PROPOSED MAJOR CONTOUR
- █ FOREST CONSERVATION EASEMENT (NATURAL AREA CONSERVATION CREDIT)
- █ PUBLIC EASEMENT
- 12" W. PROPOSED WATER LINE
- 15" D. PROPOSED STORM DRAIN
- 8" S. PROPOSED SEWER LINE
- SPECIMEN TREE
- CRITICAL ROOT ZONE

**ELLICOTT CENTER DRIVE**  
**HOWARD COUNTY LOCAL ROAD**

**U.S. ROUTE 40**  
 (INTERMEDIATE ARTERIAL)

O'DONNELL REALTY CO LLP  
 P.1042  
 35921 77  
 ZONED B2

UNITED STATES  
 POSTAL SERVICE  
 PARCEL B-1  
 PLAT NO. 14096

FORTY TWENTY-NINE ASSOC.  
 LTD. PARTNERSHIP  
 PARCEL B  
 PLAT NO. 15067 (1-08-21) 15348  
 (P.O. #416123)  
 (P.O. #447)  
 ZONED FOR MKD-6

APPROXIMATE  
 BUILDING LOCATION  
 PARCEL B  
 PARK VIEW AT ELLICOTT CITY  
 PLAT NO. 14759  
 ZONED FOR MKD-6

GUARDRAIL  
 SEE DETAIL  
 SHEET 30

**BWM  
 FACILITY  
 #3**

GRADING FOR  
 FUTURE PARKING  
 GARAGE

RETAINING WALL #2  
 (SEE SHEET 29)  
 PEDESTRIAN FENCE  
 (SEE SHEET 30)

GREEN RIDGE  
 LIMITED PARTNERSHIP  
 P.894  
 24411 122  
 ZONED B2

8659 LIMITED PARTNERSHIP  
 P.53  
 8971 236  
 ZONED B2

Owner Name: BUELL FRANKLIN G & WF  
 C/O MONRO MUEFLER BRAKE INC  
 P.895  
 5011 647  
 ZONED B2

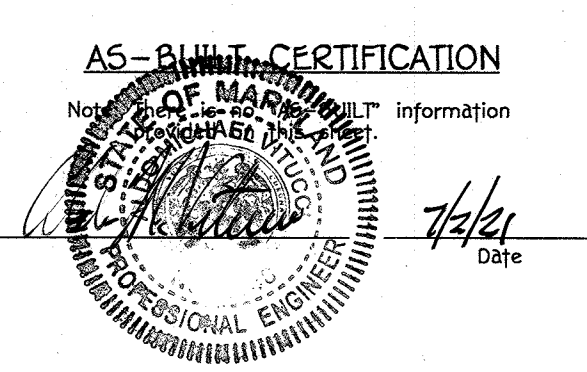
MATCH LINE - SEE SHEET 2

MATCH LINE - SEE SHEET 2

- NOTE:
- SEE SHEET 28 AND 29 FOR ALL STRUCTURE LABELS.
  - FORTY TWENTY-NINE ASSOC. LTD PARTNERSHIP PARCEL B47 (5014/130) WILL BE ROUGH GRADED UNDER A SUBSEQUENT SDP FOR THIS PROJECT.

DATA SOURCES:  
 ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY  
 FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELLICOTT CENTER DRIVE  
 IN JUNE 2002.  
 WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001.  
 BOUNDARY PER MILDENBURG, BOENDER, AND ASSOC., DATED DECEMBER 02, 1999.  
 NOTE:  
 ALL STREAMS ON SITE ARE PERENNIAL.

MDE PERMIT AND TRACKING No. 200266336



6-04-03  
 Date

Professional Engr. No. 8501

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*Walter F. Walker, Jr.* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Walter F. Walker, Jr.* 7/11/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Andy Hamer* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Walter F. Walker, Jr.* 7/22/03  
 DIRECTOR DATE

Date	No.	Revision Description

**Howard County  
 Office Campus  
 PARCEL A  
 CIP-C-0282**

OWNER /DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**DMW**  
 Daft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3353  
 Fax 296-4706

A Team of Land Planners,  
 Landscape Architects,  
 Golf Course Architects,  
 Engineers, Surveyors &  
 Environmental Professionals

SUBMITTAL NAME	SECTION AREA	DATE
HO. CO. OFFICE CAMPUS	NA	852 & P10847
PLAT OF L&P	BOX # 124E	24 & 25
15827-706 & 110R	24 & 25	6029
DATE	DATE	DATE

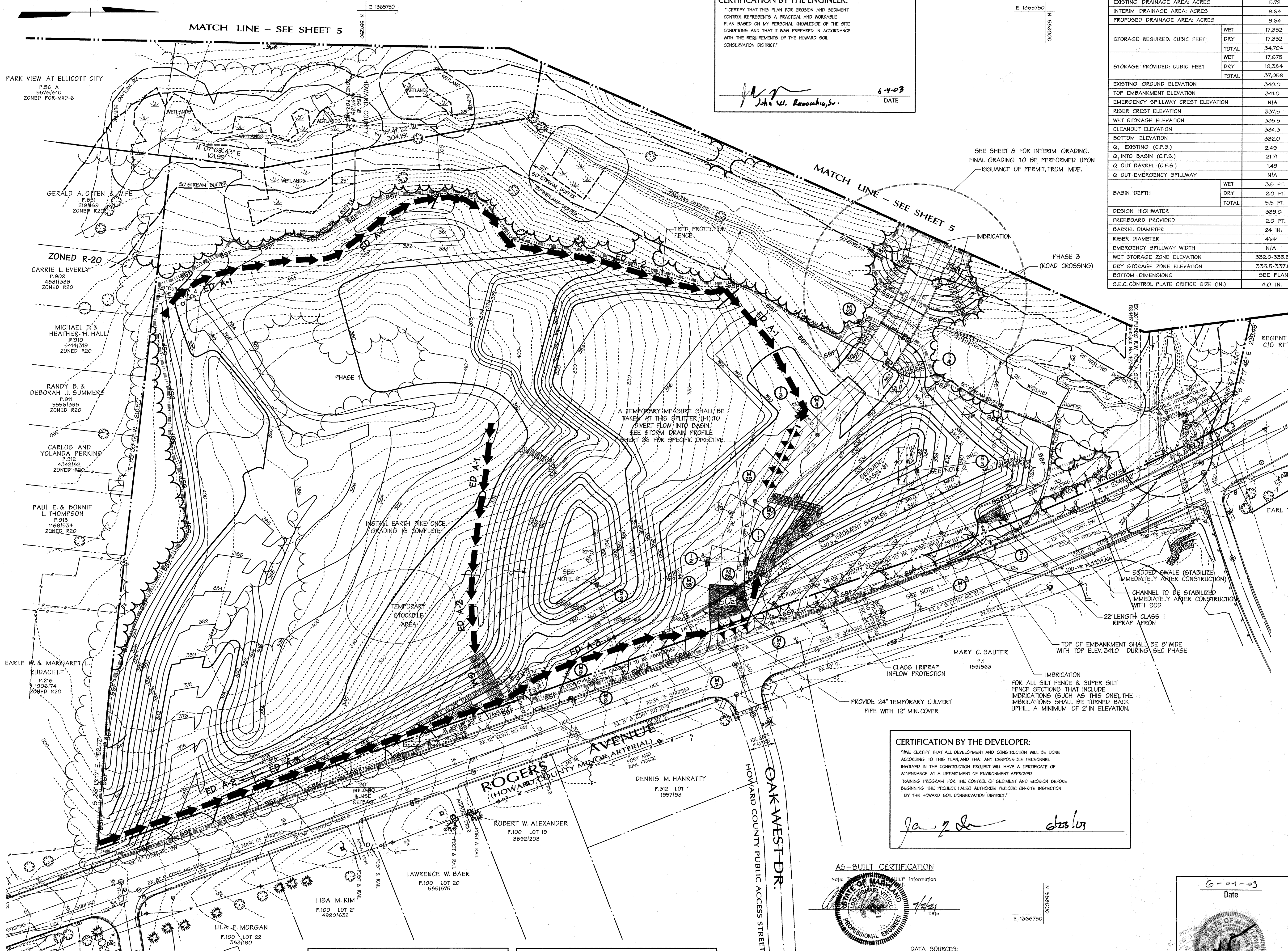
TITLE  
**GRADING PLAN -- WEST SIDE**

Des. By	MRT	Scale	1"=50'	Proj. No.	O1001.C
Drn. By	KDE/MRT	Date	7/5/03	3 of 44	
Chk. By	RLH	Approved			

Professional Engr. No. 8501

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 402-03-012





**CERTIFICATION BY THE ENGINEER:**  
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 John W. Rancovich, Sr. 6-4-03 DATE

**BASIN TABLE**

BASIN NUMBER	1
EXISTING DRAINAGE AREA: ACRES	5.72
INTERIM DRAINAGE AREA: ACRES	9.64
PROPOSED DRAINAGE AREA: ACRES	9.64
STORAGE REQUIRED: CUBIC FEET	WET 17,352
	DRY 17,352
	TOTAL 34,704
STORAGE PROVIDED: CUBIC FEET	WET 17,675
	DRY 19,304
	TOTAL 37,089
EXISTING GROUND ELEVATION	340.0
TOP EMBANKMENT ELEVATION	341.0
EMERGENCY SPILLWAY CREST ELEVATION	N/A
RISER CREST ELEVATION	337.5
WET STORAGE ELEVATION	335.5
CLEANOUT ELEVATION	334.3
BOTTOM ELEVATION	332.0
Q, EXISTING (C.F.S.)	2.49
Q, INTO BASIN (C.F.S.)	21.71
Q, OUT BARREL (C.F.S.)	1.49
Q, OUT EMERGENCY SPILLWAY	N/A
BASIN DEPTH	WET 3.5 FT.
	DRY 2.0 FT.
	TOTAL 5.5 FT.
DESIGN HIGHWATER	339.0
FREEBOARD PROVIDED	2.0 FT.
BARREL DIAMETER	24 IN.
RISER DIAMETER	4'x4'
EMERGENCY SPILLWAY WIDTH	N/A
WET STORAGE ZONE ELEVATION	332.0-335.5
DRY STORAGE ZONE ELEVATION	335.5-337.5
BOTTOM DIMENSIONS	SEE PLAN
S.E.C. CONTROL PLATE ORIFICE SIZE (IN.)	4.0 IN.

- LEGEND**
- PROPERTY LINE
  - ADJACENT PROPERTY LINE
  - 300 MAJOR CONTOURS
  - 295 MINOR CONTOURS
  - STREAM CENTERLINE
  - STREAM BUFFER
  - WETLAND LIMIT
  - WETLAND BUFFER
  - EXISTING FOREST EDGE
  - EXISTING ROADS
  - EARTH DIKE
  - 8'x8' SUPER SILT FENCE
  - GM GABION INFLOW PROTECTION
  - LIMIT OF DISTURBANCE
  - PROPOSED TREELINE
  - PROPOSED GUARD RAIL
  - TREE PROTECTION FENCE
  - STABILIZED CONSTRUCTION ENTRANCE
  - 12" W. PROPOSED WATER LINE
  - 27" D. PROPOSED STORM DRAIN

SEE SHEET 8 FOR INTERIM GRADING.  
 FINAL GRADING TO BE PERFORMED UPON ISSUANCE OF PERMIT FROM MDE.

**NOTES:**  
 1. FOR ALL SILT FENCE & SUPER SILT FENCE SECTIONS THAT INCLUDE IMBRICATIONS, THE IMBRICATIONS SHALL BE TURNED BACK UPHILL A MINIMUM OF 2' IN ELEVATION.  
 2. UPON CONSTRUCTION OF PERMANENT RISER S-2, INSTALL A HORIZONTAL PERFORATED DRAIN-DOWN PIPE IN LIEU OF THE ULTIMATE CONDITION SHIM DRAINAGE DEVICE. THIS PIPE SHALL BE SURROUNDED BY A 1" THICK LAYER OF 2" STONE AND CAPPED AT END. RISER S-3 SHALL HAVE A SEC DRAIN-DOWN DEVICE UNTIL SITE IS STABILIZED AT THAT TIME THE SEC DRAIN-DOWN SHALL BE REMOVED AND REPLACED BY THE HORIZONTAL PERFORATED DRAIN-DOWN DEVICE.

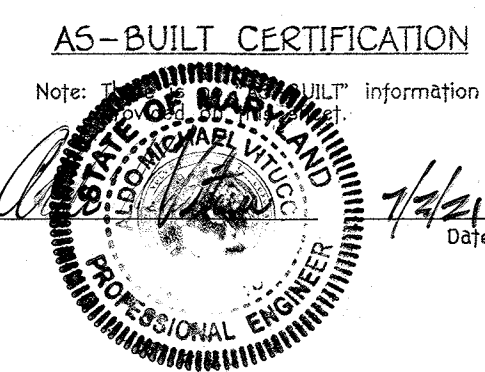
APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 [Signature] 7-11-03 DATE  
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 [Signature] 7/14/03 DATE  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

[Signature] 7/16/03 DATE  
 CHIEF, DIVISION OF LAND DEVELOPMENT

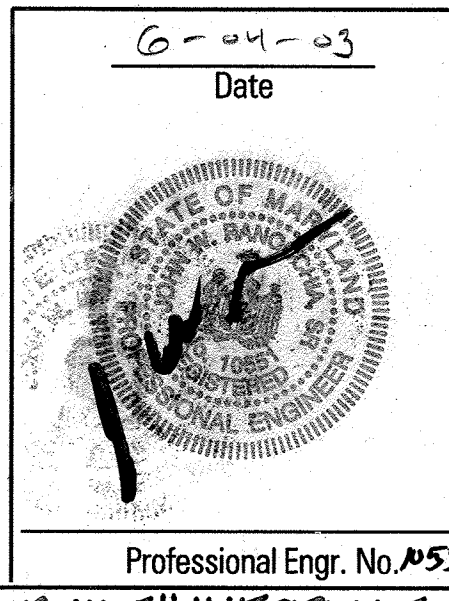
[Signature] 7/16/03 DATE  
 DIRECTOR

**CERTIFICATION BY THE DEVELOPER:**  
 I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I/ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature] 6/23/03 DATE



AS-BUILT CERTIFICATION  
 Note: "AS-BUILT" information  
 [Signature] 7/14/03 DATE

**DATA SOURCES:**  
 ON-SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELLICOTT CENTER DRIVE IN JUNE 2002.  
 WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
 NOTE:  
 ALL STREAMS ON SITE ARE PERENNIAL.



**Howard County Office Campus**  
 PARCEL A  
 CIP-C-0282

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

300 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3353  
 Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SUBMITTAL NAME	HO. CO. OFFICE CAMPUS	SECTION AREA	N/A	LOT/FRAC#	852 & P10847
PLAN #	1587-106 & 1	DATE	2/4 & 25	ELECT. SHEET	2
WORK DATE	6/2/03	DATE		CONTRACT	6029

**SEDIMENT AND EROSION CONTROL PLAN EAST SIDE**

Des. By	RBW	Scale	1"=50'	Proj. No.	01001.C
Drn. By	WDE	Date	7/15/03		
Chk. By	RLH	Approve			4 of 44

Professional Engr. No. 8551

MDE PERMIT AND TRACKING No. 200266336

REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.  
 [Signature] 7/1/03 DATE  
 U.S. NATURAL RESOURCE CONSERVATION SERVICE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature] 7/1/03 DATE  
 HOWARD S.C.D.

EAST SIDE - PHASE 1  
 SEE SHEET 8 FOR PHASE LIMITS.

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 9/20/03-020



MDE PERMIT AND TRACKING No. 200266336

TRAP TABLE

TRAP NUMBER	1	
TRAP TYPE	ST-1	
EXISTING DRAINAGE AREA: ACRES	1.06	
INTERIM DRAINAGE AREA: ACRES	3.56	
PROPOSED DRAINAGE AREA: ACRES	N/A	
STORAGE REQUIRED: CUBIC FEET	CLEAN'T	3,204
	WET	6,408
	DRY	6,408
STORAGE PROVIDED: CUBIC FEET	TOTAL	12,816
	CLEAN'T	3,378
	WET	7,063
STORAGE PROVIDED: CUBIC FEET	DRY	6,805
	TOTAL	13,868
EXISTING GROUND ELEVATION	370	
TOP EMBANKMENT ELEVATION	359	
WEIR CREST ELEVATION	357.50	
WET STORAGE ELEVATION	356.00	
CLEANOUT ELEVATION	355.50	
BOTTOM ELEVATION	365	
DEPTH OF CHANNEL (a)	N/A	
OUTLET WIDTH (b)	N/A	
BOTTOM DIMENSION	SEE PLAN	
TRAP SIDESLOPES	2:1	
TRAP DEPTH	WET	1.00
	DRY	0.80
	TOTAL	1.80
BARREL DIAMETER	21"	
RISER DIAMETER	24"	
WET STORAGE ZONE ELEVATION	355.00 - 356.00	
DRY STORAGE ZONE ELEVATION	356.00 - 356.80	

DATA SOURCES:  
ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELLICOTT CENTER DRIVE IN JUNE 2002. WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
NOTE: ALL STREAMS ON SITE ARE PERENNIAL.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William Z. Mather* 7/1/03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*John W. Ramech, Sr.* 7/1/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Colleen* 7/16/02  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Frank Z. Weger* 7/16/03  
DIRECTOR DATE

Date No. Revision Description

**Howard County Office Campus**  
PARCEL A  
CIP-C-0282

OWNER /DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
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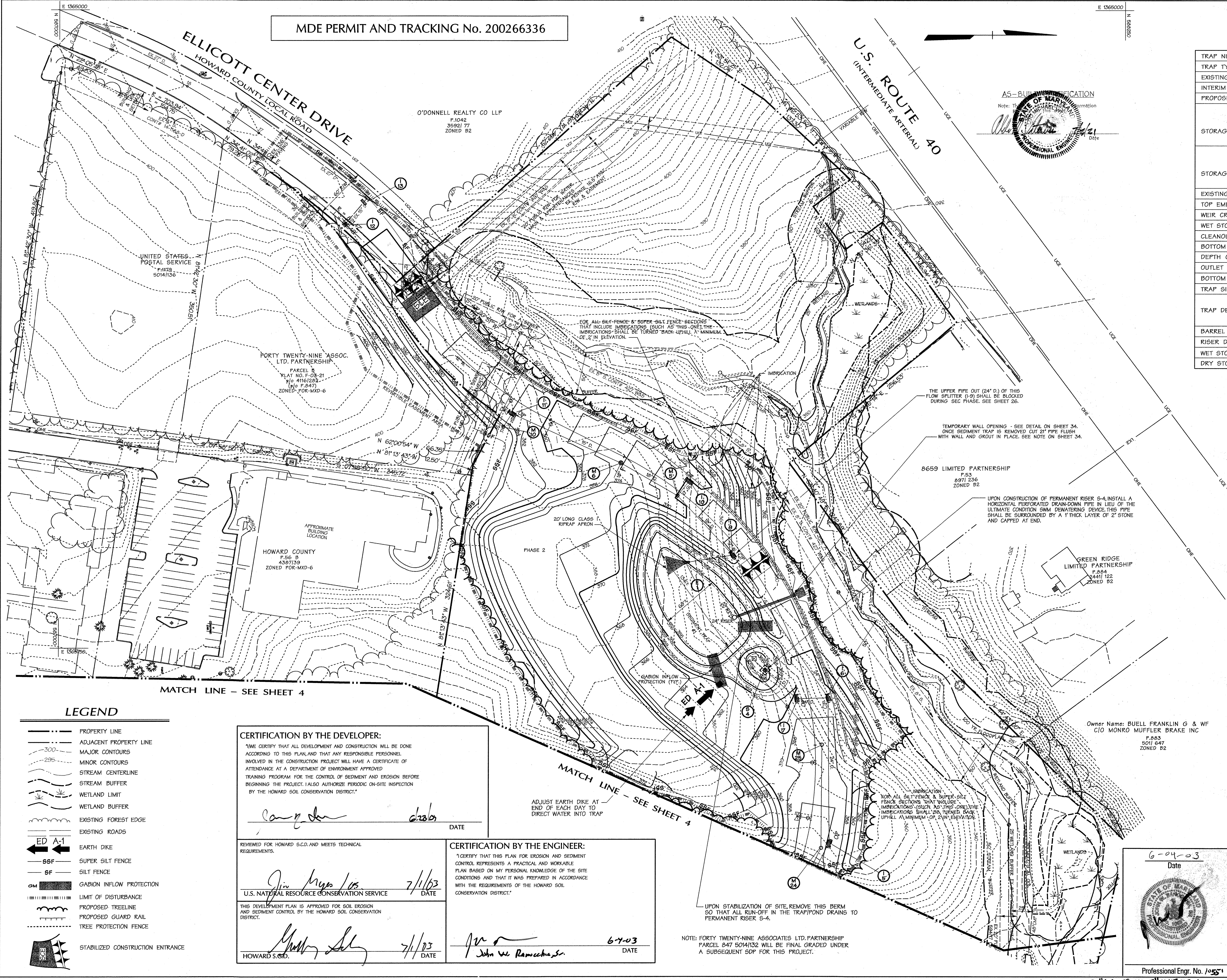
390 East Pennsylvania Avenue  
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Fax 296-4705

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Golf Course Architects,  
Engineers, Surveyors &  
Environmental Professionals

HO. CO. OFFICE CAMPUS NA  
SECTION AREA  
PLAT # OR L.P. BLOCK # ZONE TAX/ZONE MAP 24 & 25 ELEC. DISTRICT 2 CONDS. TRACT 6029  
PAPER SIZE 15.847-706 & 11 FOR COVER SIZE

TITLE  
**SEDIMENT AND EROSION CONTROL PLAN**  
WEST SIDE

Des. By RBW Scale 1"=50' Proj. No. 01001.C  
Dwn. By WDE Date 7/5/12  
Chk. By RLH Approved 5 of 44



- LEGEND**
- PROPERTY LINE
  - ADJACENT PROPERTY LINE
  - 300 MAJOR CONTOURS
  - 295 MINOR CONTOURS
  - STREAM CENTERLINE
  - STREAM BUFFER
  - WETLAND LIMIT
  - WETLAND BUFFER
  - EXISTING FOREST EDGE
  - EXISTING ROADS
  - ED A-1 EARTH DIKE
  - 66F SUPER SILT FENCE
  - 6F SILT FENCE
  - GM GABION INFLOW PROTECTION
  - LIMIT OF DISTURBANCE
  - PROPOSED TREELINE
  - PROPOSED GUARD RAIL
  - TREE PROTECTION FENCE
  - STABILIZED CONSTRUCTION ENTRANCE

**CERTIFICATION BY THE DEVELOPER:**  
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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."  
*Carly* 6/23/03 DATE

REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.  
*Jim Myer* 7/1/03  
U.S. NATURAL RESOURCE CONSERVATION SERVICE DATE

THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.  
*Howard S.G.D.* 7/1/03 DATE

**CERTIFICATION BY THE ENGINEER:**  
"I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT."  
*John W. Ramech, Sr.* 6-7-03 DATE

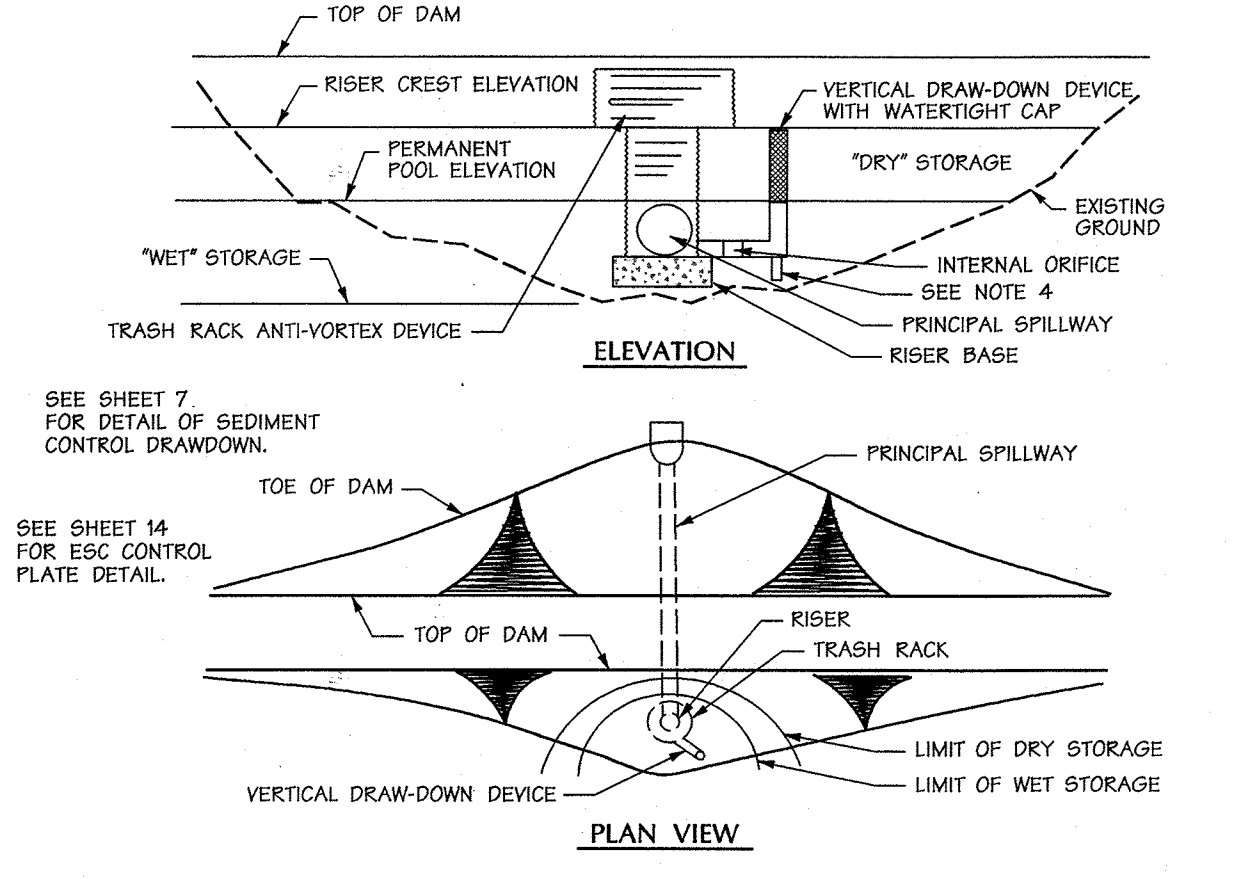
NOTE: FORTY TWENTY-NINE ASSOCIATES LTD. PARTNERSHIP PARCEL 847 5014132 WILL BE FINAL GRADED UNDER A SUBSEQUENT SDP FOR THIS PROJECT.

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 9/7-03-01G



1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (303-1855).
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE MOST CURRENT MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, AND REVISIONS THERE TO.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR RE-DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
  - A SEVEN CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 2:1.
  - FOURTEEN DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12 OF THE "HOWARD COUNTY DESIGN MANUAL: STORM DRAINAGE".
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE "1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL" FOR PERMANENT SEEDINGS (SEC. 51), SODS (SEC. 54), TEMPORARY SEEDINGS (SEC. 50), AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:
 

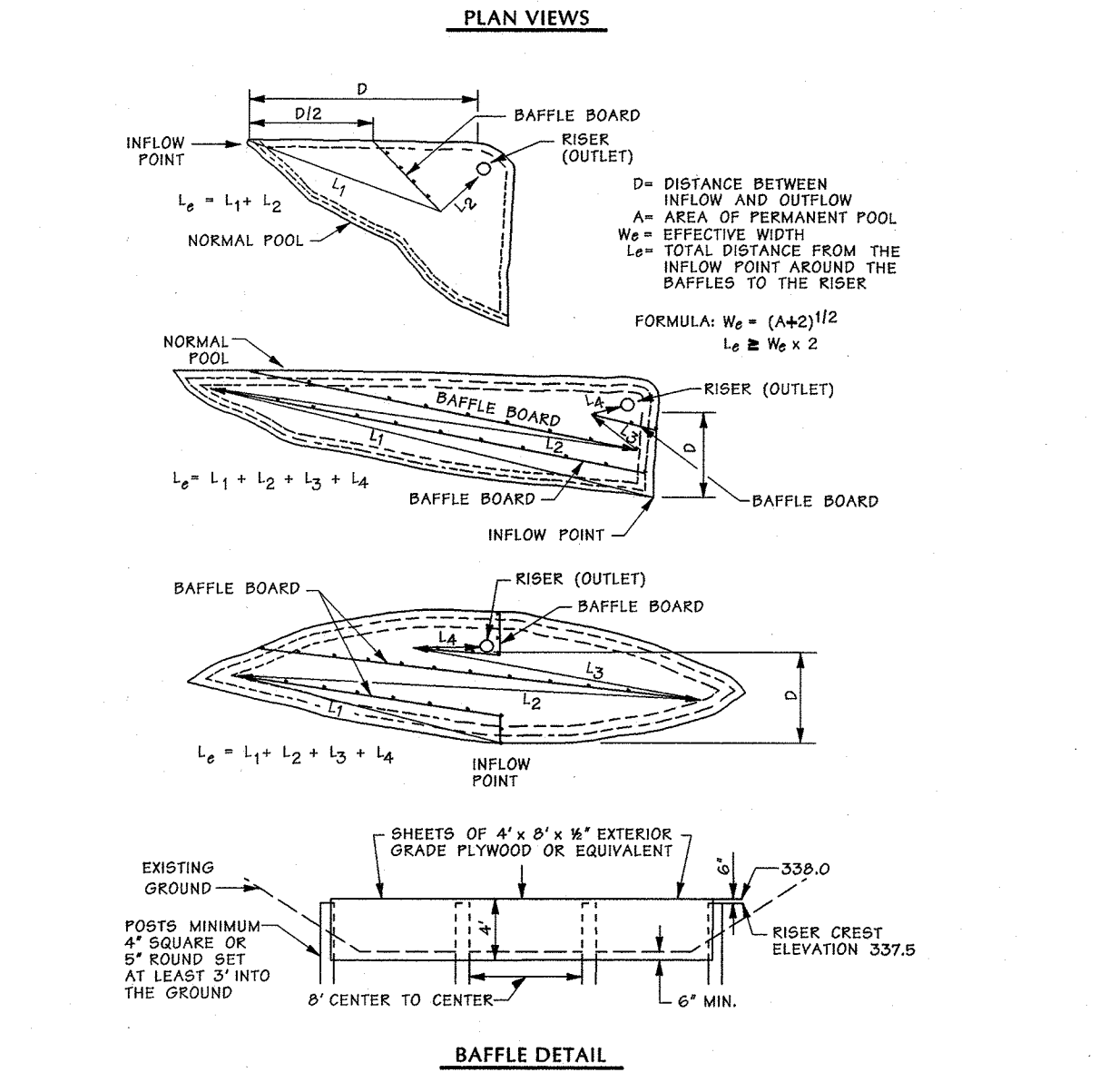
TOTAL AREA ON SITE	= 24.6 ACRES
AREA DISTURBED	= 15.3 ACRES
AREA TO BE ROOFED OR PAVED	= 0 ACRES
AREA TO BE VEGETATIVELY STABILIZED	= 15.3 ACRES
TOTAL CUT	= 197,250 CUBIC YARDS
TOTAL FILL	= 15,130 CUBIC YARDS
WASTE/ BORROW AREA	= 172,720 CUBIC YARDS
8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OR THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.



**CONSTRUCTION SPECIFICATIONS**

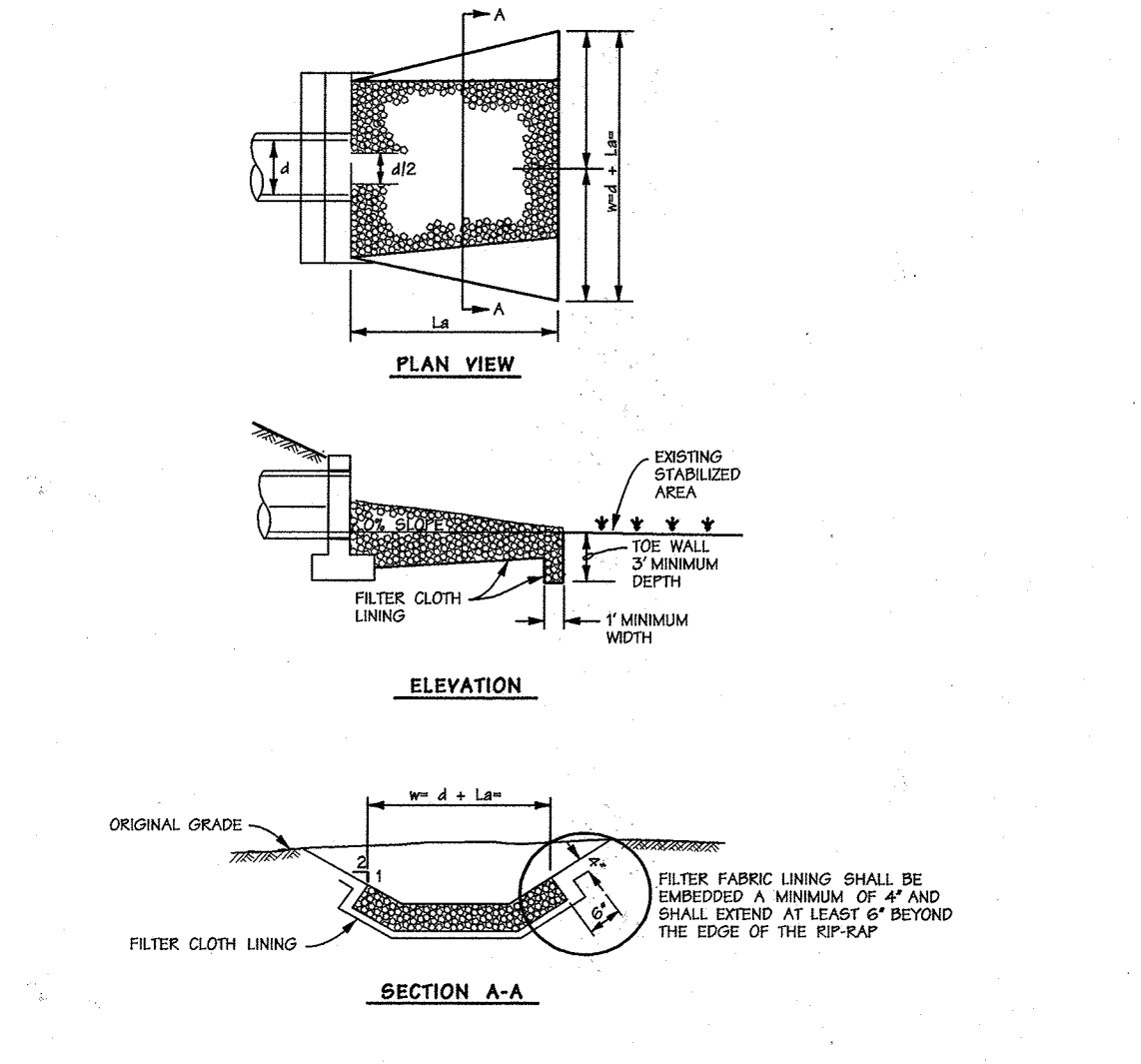
1. PERFORATIONS IN THE DRAW-DOWN DEVICE MAY NOT EXTEND INTO THE WET STORAGE.
2. THE TOTAL AREA OF THE PERFORATIONS MUST BE GREATER THAN 4 TIMES THE AREA OF THE INTERNAL ORIFICE.
3. THE PERFORATED PORTION OF THE DRAW-DOWN DEVICE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH AND GEOTEXTILE FABRIC. THE GEOTEXTILE FABRIC SHALL MEET THE SPECIFICATIONS FOR GEOTEXTILE CLASS E.
4. PROVIDE SUPPORT OF DRAW-DOWN DEVICE TO PREVENT SAGGING AND FLOTTATION. AN ACCEPTABLE PREVENTATIVE MEASURE IS TO STAKE BOTH SIDES OF THE DRAW-DOWN DEVICE WITH 1" STEEL ANGLE OR 2" BY 2" SQUARE OR 2" ROUND WOODEN POSTS SET 3' MINIMUM INTO THE GROUND THEN JOINING THEM TO THE DEVICE BY WRAPPING WITH 12 GAUGE MINIMUM WIRE.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE C-10-30 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



**BAFFLE DETAIL**

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE C-10-25 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



**CONSTRUCTION SPECIFICATIONS**

1. THE SUBGRADE FOR THE FILTER, RIP-RAP, OR GABION SHALL BE PREPARED TO THE REQUIRED LINES AND GRADES. ANY FILL REQUIRED IN THE SUBGRADE SHALL BE COMPACTED TO A DENSITY OF APPROXIMATELY THAT OF THE SURROUNDING UNDISTURBED MATERIAL.
2. THE ROCK OR GRAVEL SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RIP-RAP OR FILTER.
3. GEOTEXTILE CLASS C SHALL BE PROTECTED FROM PUNCHING, CUTTING, OR TEARING. ANY DAMAGE OTHER THAN AN OCCASIONAL SMALL HOLE SHALL BE REPAIRED BY PLACING ANOTHER PIECE OF GEOTEXTILE OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE SHALL BE A MINIMUM OF ONE FOOT.
4. STONE FOR THE RIP-RAP OR GABION OUTLETS MAY BE PLACED BY EQUIPMENT. THEY SHALL BE CONSTRUCTED TO THE FULL COURSE THICKNESS IN ONE OPERATION AND IN SUCH A MANNER AS TO AVOID DISPLACEMENT OF UNDERLYING MATERIALS. THE STONE FOR RIP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL ENSURE THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RIP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
5. THE STONE SHALL BE PLACED SO THAT IT BLENDS IN WITH THE EXISTING GROUND. IF THE STONE IS PLACED TOO HIGH THEN THE FLOW WILL BE FORCED OUT OF THE CHANNEL AND SCOUR ADJACENT TO THE STONE WILL OCCUR.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Sediment Control General Notes** Not to Scale

**TABLE 26 STONE SIZE**

Number	Size Range	D <sub>50</sub>	D <sub>100</sub>	AASHTO	Weight
Number 57 *	3/8" - 1 1/2"	1/4"	1 1/4"	M-43	N/A
Number 1	2" - 3"	2 1/2"	3"	M-43	N/A
Rip-Rap **	4" - 7"	5 1/2"	7"	N/A	N/A
Class I	N/A	9.5"	15"	N/A	150 Lb. max.
Class II	N/A	16"	24"	N/A	700 Lb. max.
Class III	N/A	23"	34"	N/A	2000 Lb. max.

\* This classification is to be used on the inside face of stone outlets and check dams.  
 \*\* This classification is to be used when over small rip-rap is required. The State Highway Administration designation for this stone is stone for gabions (905.01.04).

**STONE FOR GABION BASKETS**

Basket Thickness	Size of Individual Stones	
Inches	MM	MM
6	150	3 - 5
9	225	4 - 7
12	300	4 - 7
18	460	4 - 7
36	910	4 - 12

Note: Recycled concrete equivalent may be substituted for all stone classifications. Recycled concrete equivalent shall be concrete broken into the sizes meeting the appropriate classification, shall contain no steel reinforcement, and shall have a density of 150 pounds per cubic foot.

**TABLE 27 GEOTEXTILE FABRICS**

Class	Apparent Opening Size MM. Max.	Grab Tensile Strength Lb. Min.	Burst Strength PSI. Min.
A	0.30 **	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F (silt fence)	0.40-0.80 **	90	190

\* US Standard sieve CW-02215 \*\* 50 MM max. for silt fence

The properties shall be determined in accordance with the following procedures:  
 - Apparent opening size mm: 325  
 - Grab tensile strength ASTM D 1682: 4 x 8" specimen, 1 x 2" clamps, 12" min. strain rate in both principal directions of geotextile fabric.  
 - Burst strength: ASTM D 3766.

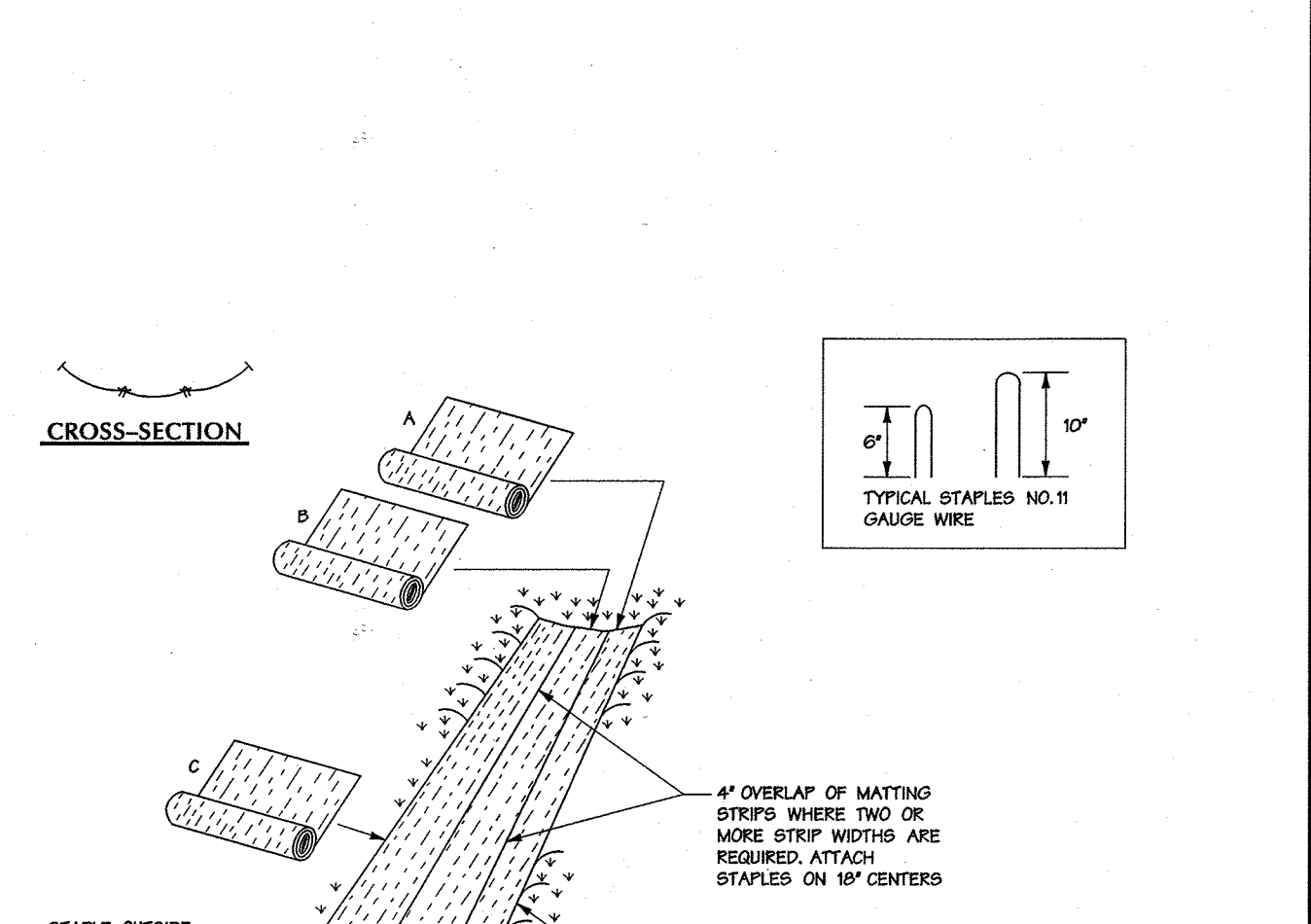
The fabric shall be inert to commonly encountered chemicals and hydrocarbons, and will be rot and mildew resistant. It shall be manufactured from fibers consisting of long chain synthetic polymers, and composed of a minimum of 85% by weight of polypropylene, polyesters, or polyamides. The geotextile fabric shall resist deterioration from ultraviolet exposure.

In addition, classes A through E shall have a 0.01 cm/sec. minimum permeability when tested in accordance with msmt 507, and an apparent minimum elongation of 20 percent (20%) when tested in accordance with the grab tensile strength requirements listed above.

Silt fence  
 Class F geotextile fabric for silt fence shall have a 50 lb./in. minimum tensile strength and a 20 lb./in. minimum tensile modulus when tested in accordance with msmt 509. The material shall also have a 0.3 gal./ft./min. flow rate and seventy-percent (70%) minimum filtering efficiency when tested in accordance with msmt 325. Geotextile fabrics used in the construction of silt fence shall resist deterioration from ultraviolet exposure. The fabric shall contain sufficient amount of ultraviolet ray inhibitors and stabilizers to provide a minimum of 12 months of expected usable construction life at a temperature range of 0 to 150 degrees Fahrenheit.

**Materials Specifications**

**Basin Drawdown Schematic Ver. Drawdown Device** Not to Scale



**CONSTRUCTION SPECIFICATIONS**

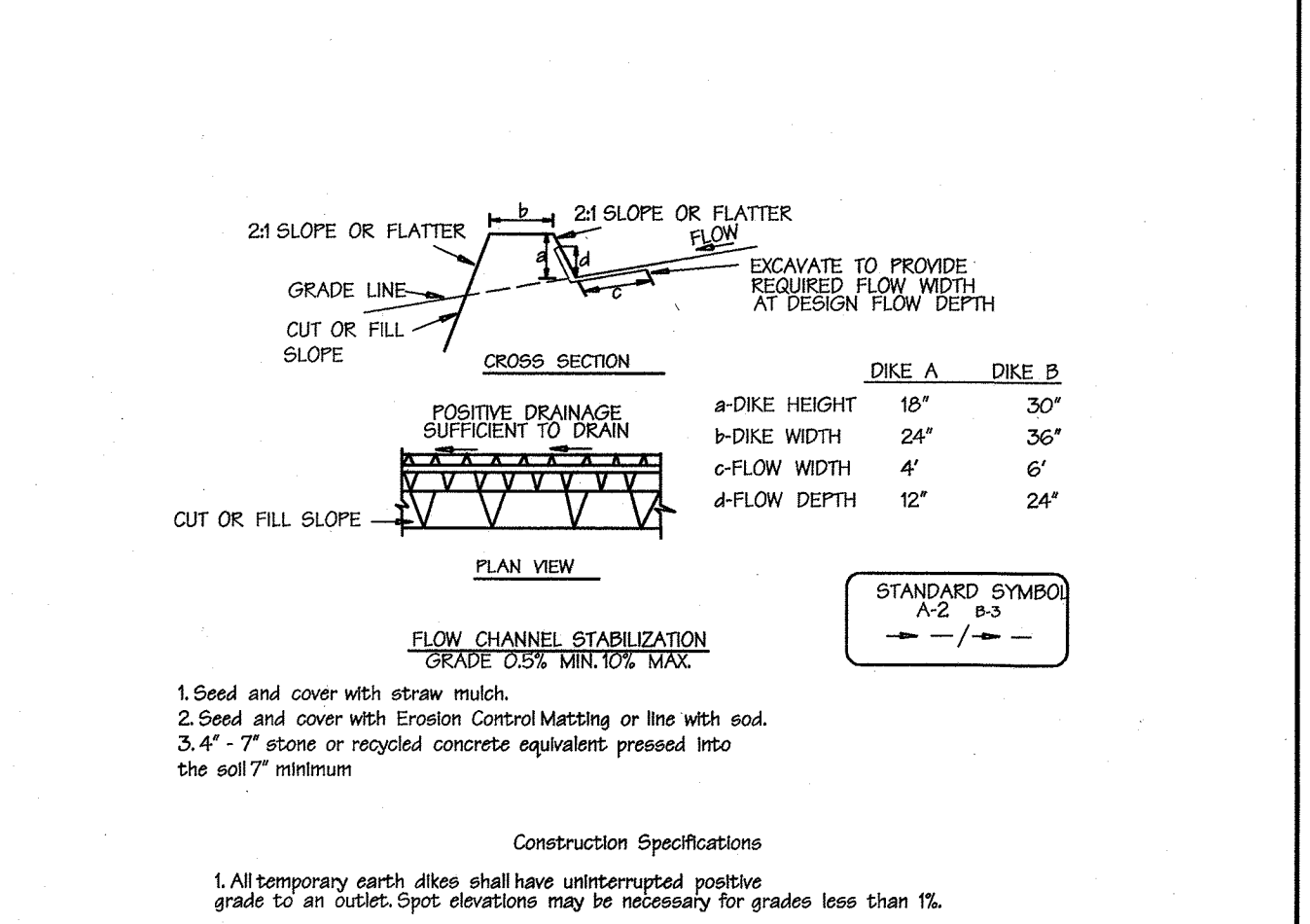
1. KEY-IN THE MATTING BY PLACING THE TOP ENDS OF THE MATTING IN A NARROW TRENCH 6" IN DEPTH. BACKFILL THE TRENCH AND TAMP FIRMLY TO CONFORM TO THE CHANNEL CROSS-SECTION. SECURE WITH A ROW OF STAPLES ABOUT 4" DOWN SLOPE FROM THE TRENCH SPACING BETWEEN STAPLES IN 6".
2. STAPLE THE 4" OVERLAP IN THE CHANNEL CENTER USING AN 18" SPACING BETWEEN STAPLES.
3. BEFORE STAPLING THE OUTER EDGES OF THE MATTING, MAKE SURE THE MATTING IS SMOOTH AND IN FIRM CONTACT WITH THE SOIL.
4. STAPLES SHALL BE PLACED 2" APART WITH 4 ROWS FOR EACH STRIP, 2 OUTER ROWS, AND 2 ALTERNATING ROWS DOWN THE CENTER.
5. WHERE ONE ROLL OF MATTING ENDS AND ANOTHER BEGINS, THE END OF THE TOP STRIP SHALL OVERLAP THE UPPER END OF THE LOWER STRIP BY 4". SHIRLAP FASHION REINFORCE THE OVERLAP WITH A DOUBLE ROW OF STAPLES SPACED 6" APART IN A STAGGERED PATTERN ON EITHER SIDE.
6. THE DISCHARGE END OF THE MATTING LINEER SHOULD BE SIMILARLY SECURED WITH 2 DOUBLE ROWS OF STAPLES.

NOTE: IF FLOW WILL ENTER FROM THE EDGE OF THE MATTING THEN THE AREA EFFECTED BY THE FLOW MUST BE KEPT-IN.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE C-22-2 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Erosion Control Matting** Not to Scale

**Sediment Basin Baffles** Not to Scale



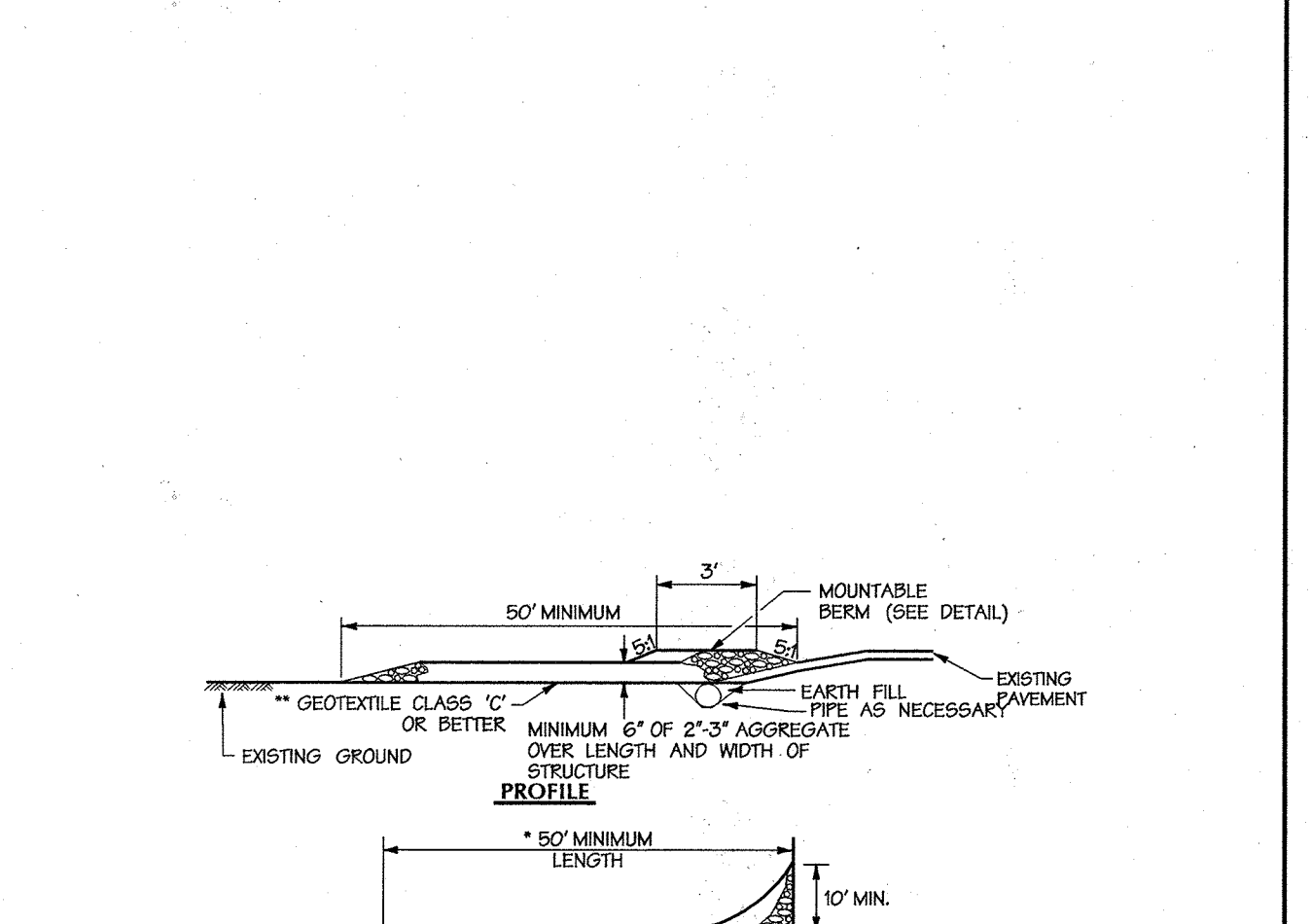
**CONSTRUCTION SPECIFICATIONS**

1. All temporary earth dikes shall have unimpaired positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.
2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.
3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area as a non-erosive velocity.
4. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.
5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.
6. Fill shall be compacted by earth moving equipment.
7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the dike.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE A-1-8 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Earth Dike** Not to Scale

**Rock Outlet Protection III and Specifications** Not to Scale

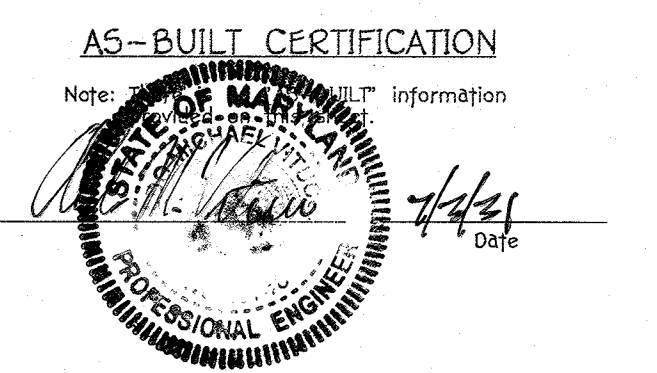


**CONSTRUCTION SPECIFICATIONS**

1. LENGTH - MINIMUM OF 50' (30' FOR SINGLE RESIDENCE LOT).
2. WIDTH - 10' MINIMUM SHOULD BE PLACED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.
3. GEOTEXTILE FABRIC CLASS C (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.
4. 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.
5. SURFACE WATER - ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE, MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 6:1 SLOPES AND A MINIMUM OF 6" OF STONE OVER THE PIPE. PIPE HAS TO BE SIZED ACCORDING TO THE DRAINAGE WHEN THE SITE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE WILL NOT BE NECESSARY. PIPE SHOULD BE SIZED ACCORDING TO THE AMOUNT OF RUNOFF TO BE CONVEYED. A 6" MINIMUM WILL BE REQUIRED.
6. LOCATION - A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED AT EVERY POINT WHERE CONSTRUCTION TRAFFIC ENTERS OR LEAVES A CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE STABILIZED CONSTRUCTION ENTRANCE.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE F-17-3 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Stabilized Construction Entrance** Not to Scale



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 William F. Males, Jr. 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 [Signature] 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

[Signature] 7/16/02  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[Signature] 7/24/02  
 DIRECTOR DATE

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**Howard County Office Campus**  
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 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**DMW**  
 Daft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

NO. CO. OFFICE CAMPUS	SECTION AREA	DATE	DATE
157-7-706 & 1-POR	2A & 25	2	6029

TITLE  
**SEDIMENT AND EROSION CONTROL DETAILS AND SPECIFICATIONS**

Des. By	RLH	Scale	A5 SHOWN	Proj. No.	01001.C
Drn. By	WDE	Date	3/5/12	6 of 44	
Chk. By	RLH	Approved			

Professional Engr. No. 0551

REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.

[Signature] 7/1/03  
 U.S. NATURAL RESOURCE CONSERVATION SERVICE DATE

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

[Signature] 7/1/03  
 HOWARD S.C.D. DATE

**CERTIFICATION BY THE ENGINEER:**

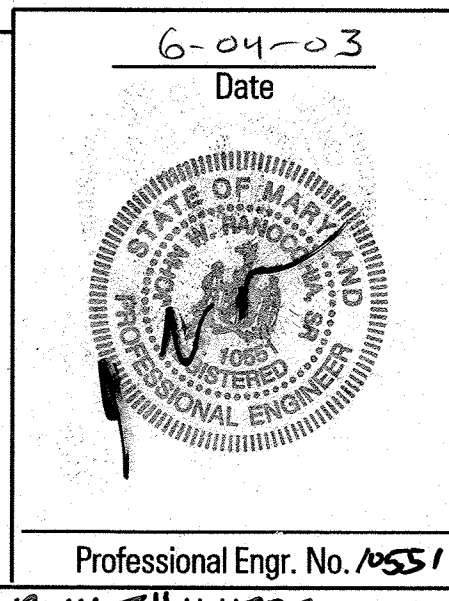
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

[Signature] 6/23/03  
 John W. Rasmussen, Jr. DATE

**CERTIFICATION BY THE DEVELOPER:**

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

[Signature] 6/23/03  
 [Signature] DATE



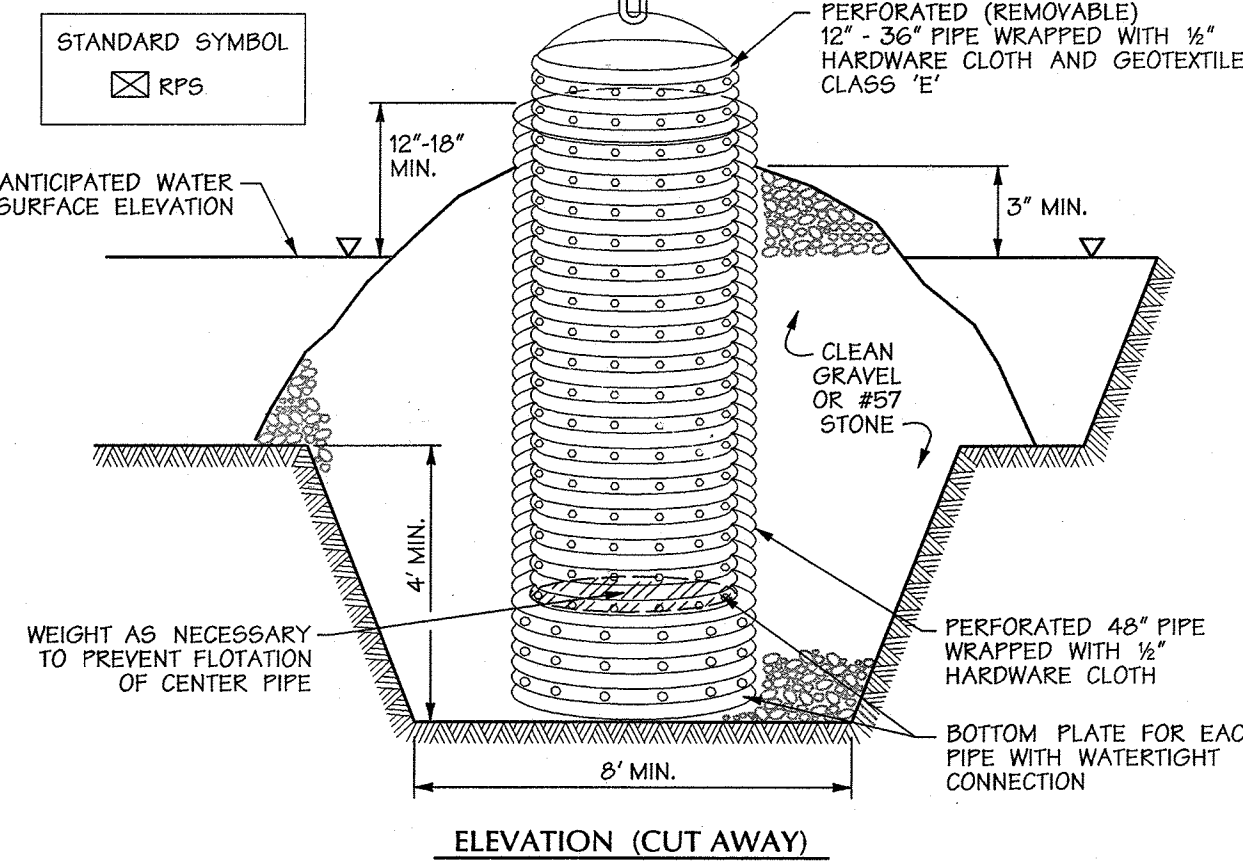
MDE PERMIT AND TRACKING No. 200266336

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 5/19-03-02C



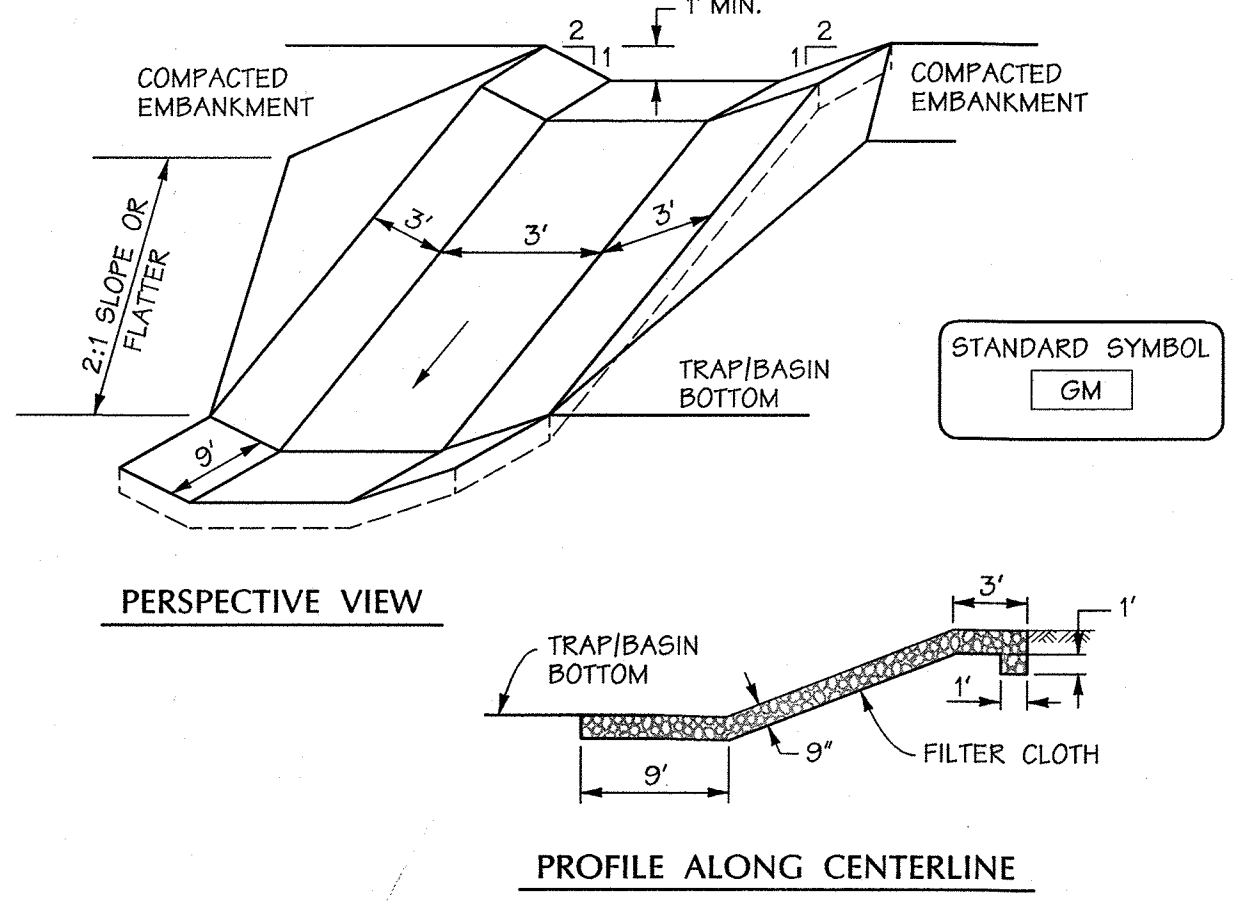
RISER #	LENGTH	WET POOL ELEV.	PERF. RISER HEIGHT	ORIFICE DRILLED HOLE SIZE	PERFORATION SPACING	PERFORATIONS PER VERT. FT.
BASIN 2	7'	336.5	2.0'	4"	2"	36

NOTE: THIS MEASURE MUST BE LOCATED WHERE IT WILL BE READILY ACCESSIBLE TO ALLOW FOR ITS PRACTICAL USAGE.



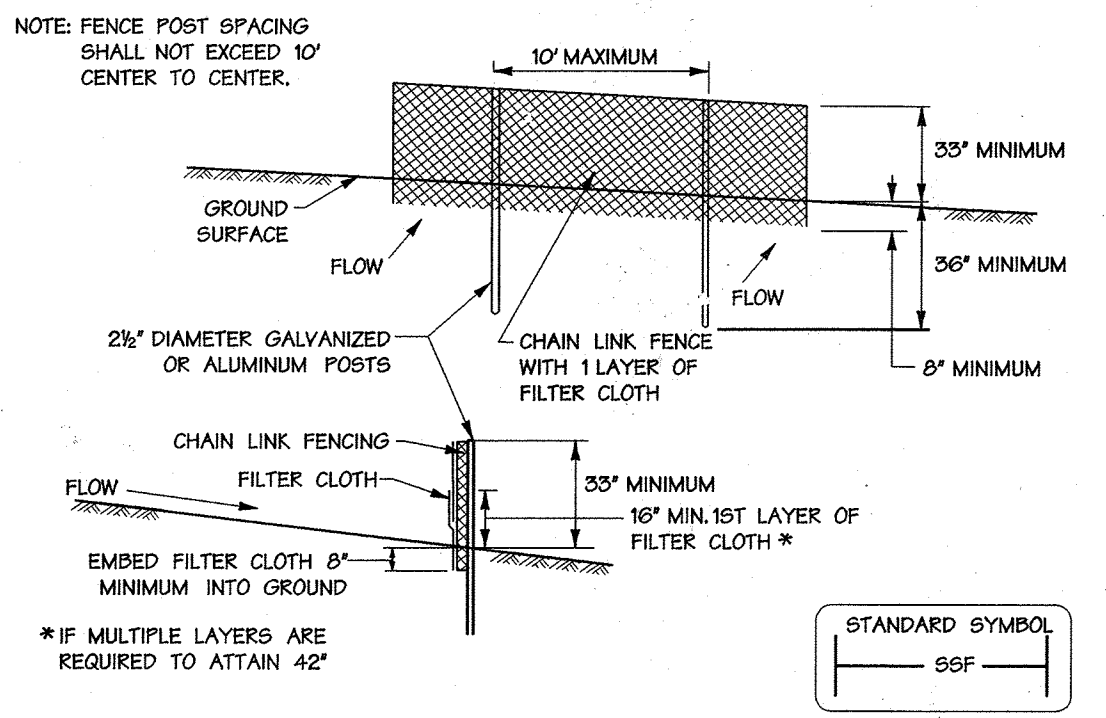
- CONSTRUCTION SPECIFICATIONS**
1. THE OUTER PIPE SHOULD BE 48" DIAMETER OR SHALL, IN ANY CASE, BE AT LEAST 4" GREATER IN DIAMETER THAN THE CENTER PIPE. THE OUTER PIPE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH TO PREVENT BACKFILL MATERIAL FROM ENTERING THE PERFORATIONS.
  2. AFTER INSTALLING THE OUTER PIPE, BACKFILL AROUND OUTER PIPE WITH 2" AGGREGATE OR CLEAN GRAVEL.
  3. THE INSIDE STAND PIPE (CENTER PIPE) SHOULD BE CONSTRUCTED BY PERFORATING A CORRUGATED OR PVC PIPE BETWEEN 12" AND 36" IN DIAMETER. THE PERFORATIONS SHALL BE 1/2" x 6" SLITS OR 1" DIAMETER HOLES 6" ON CENTER. THE CENTER PIPE SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH FIRST, THEN WRAPPED AGAIN WITH GEOTEXTILE CLASS E.
  4. THE CENTER PIPE SHOULD EXTEND 12" TO 18" ABOVE THE ANTICIPATED WATER SURFACE ELEVATION OR RISER CREST ELEVATION WHEN Dewatering A BASIN.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE D - 12 - 5 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



- CONSTRUCTION SPECIFICATIONS**
1. GABION INFLOW PROTECTION SHALL BE CONSTRUCTED OF 9' x 3' x 9' GABION BASKETS FORMING A TRAPEZOIDAL CROSS SECTION 1' DEEP, WITH 2:1 SIDE SLOPES, AND A 3' BOTTOM WIDTH.
  2. GEOTEXTILE CLASS C SHALL BE INSTALLED UNDER ALL GABION BASKETS.
  3. THE STONE USED TO FILL THE GABION BASKETS SHALL BE 4" - 7".
  4. GABIONS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
  5. GABION INFLOW PROTECTION SHALL BE USED WHERE CONCENTRATED FLOW IS PRESENT ON SLOPES STEEPER THAN 4:1.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE B - 7 - 2 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION



- CONSTRUCTION SPECIFICATIONS**
1. FENCING SHALL BE 42 INCHES IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY (SHA) DETAILS FOR CHAIN LINK FENCING. THE SPECIFICATION FOR A 6' FENCE SHALL BE USED SUBSTITUTING 42" FABRIC AND 6" LENGTH POSTS.
  2. THE POSTS DO NOT NEED TO BE SET IN CONCRETE.
  3. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES. THE LOWER TENSION WIRE BRACE AND TRUSS RODS, DRIVE ANCHORS AND POST CAPS ARE NOT REQUIRED EXCEPT ON THE ENDS OF THE FENCE. THE CHAIN LINK FENCING SHALL BE SIX (6) GAUGE OR HEAVIER.
  4. FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
  5. FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
  6. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
  7. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF FENCE HEIGHT.

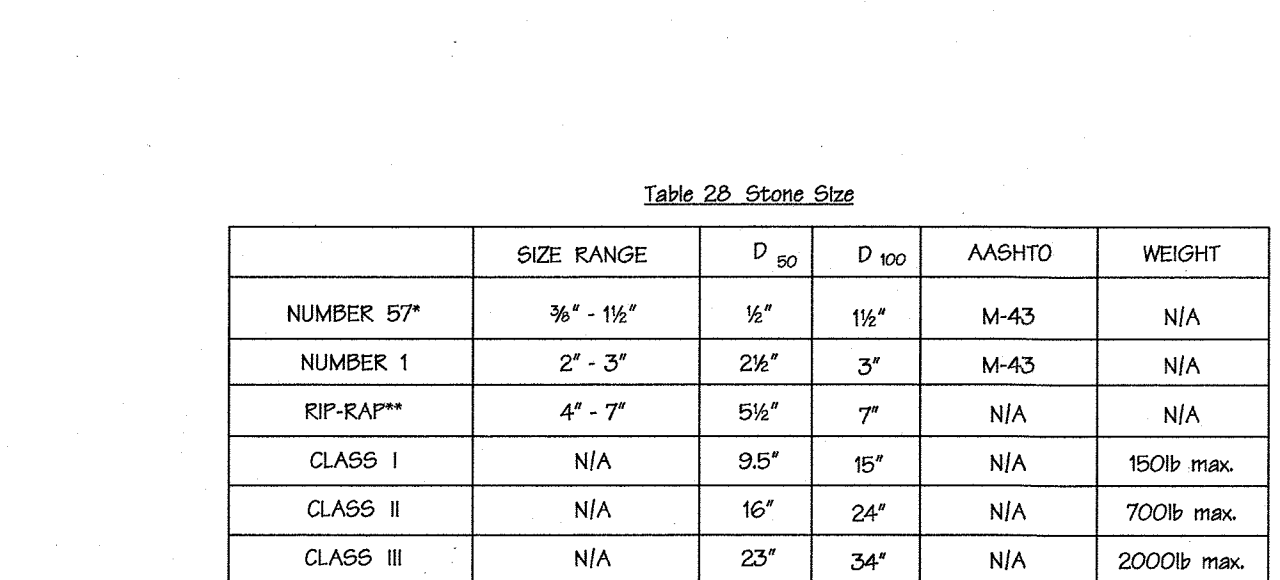
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE H - 26 - 5 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DUST CONTROL SPECIFICATIONS**

- Temporary methods:
1. Mulches - see standards for vegetative stabilization with mulches only. Mulch should be crimped or tacked to prevent blowing.
  2. Vegetative cover - see standards for temporary vegetative cover.
  3. Tillage - to roughen surface and bring clods to the surface. This is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect.
  4. Irrigation - this is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. repeat as needed. At no time should the site be irrigated to the point the runoff begins to flow.
  5. Barriers - solid board fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling soil blowing.
  6. Calcium chloride - apply at a rate that will keep surface moist. May need retreatment.
- Permanent methods:
1. Permanent vegetation - see standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place.
  2. Topsoiling - covering with less erodible soil standards. See standards for topsoiling.
  3. Stone - cover surface with crushed stone or coarse gravel.

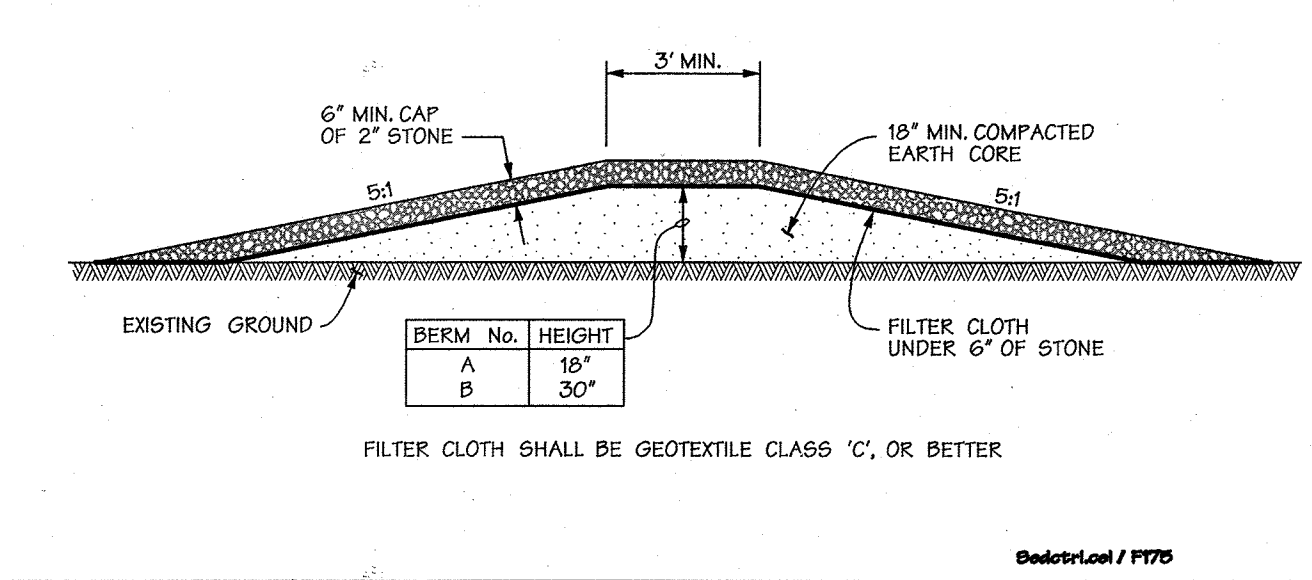
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE H - 30 - 1 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Sediment Control Draw-Down** Not to Scale



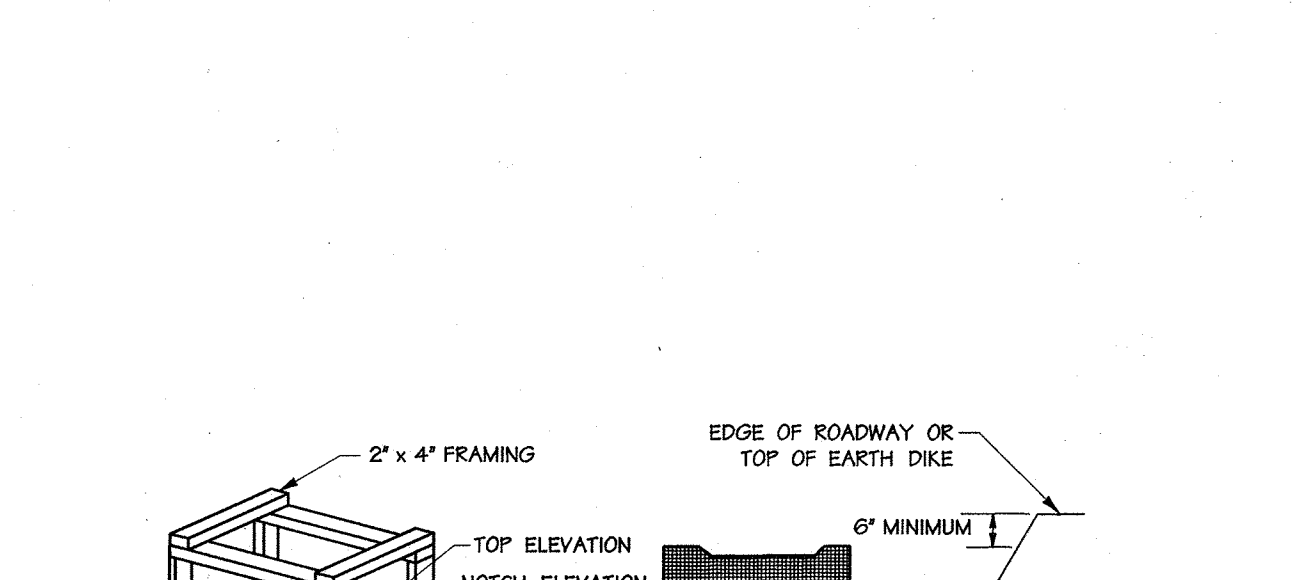
SEE SHEET 6 FOR BASIN DRAINAGE DEVICE SPECIFICATIONS SEE SHEET 14 FOR ESC CONTROL PLATE DETAIL

**Removable Pumping Station** Not to Scale



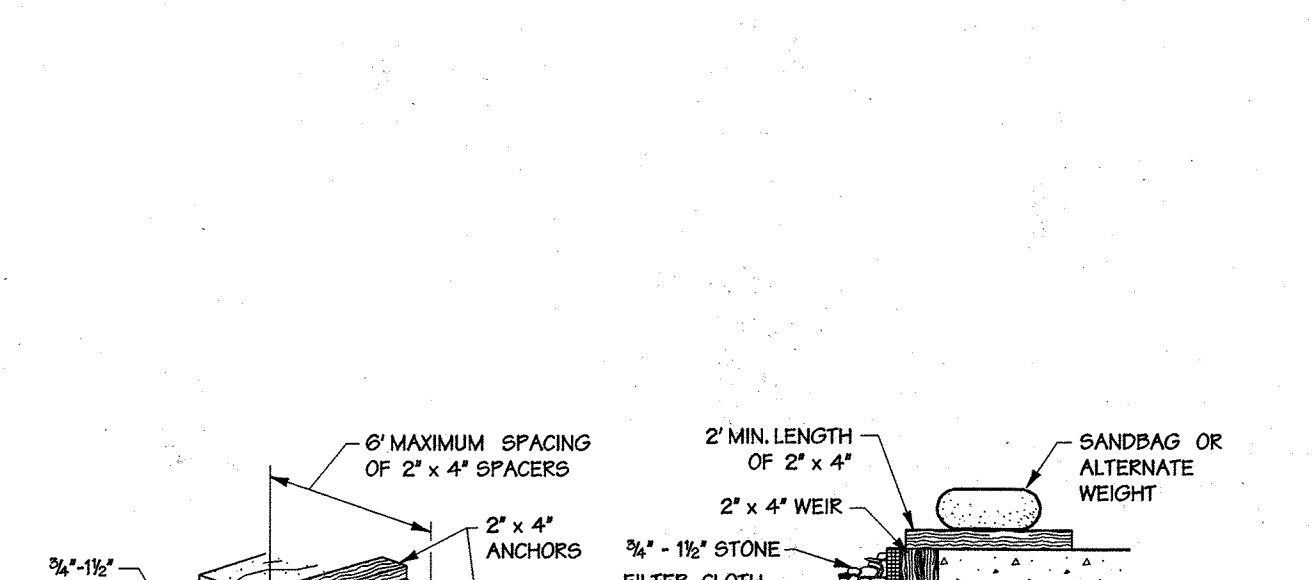
**Mountable Berm Detail** Not to Scale

**Gabion Inflow Protection** Not to Scale



**Standard Inlet Protection** Not to Scale

**Super Silt Fence** Not to Scale



**Curb Inlet Protection (COG or COS Inlets)** Not to Scale

**Dust Control Specifications**

**AS-BUILT CERTIFICATION**

Note: The information provided on this drawing is true and correct to the best of my knowledge and belief.

*Howard County* 7/14/03 Date

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 Chief, Bureau of Highways 7-11-03 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 Chief, Development Engineering Division 7/14/03 DATE

APPROVED: *[Signature]* 7/16/03 DATE  
 Chief, Division of Land Development

APPROVED: *[Signature]* 7/22/03 DATE  
 Director

**Howard County Office Campus**  
 PARCEL A  
 CIP-C-0282

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

Table 26 Stone Size

NUMBER	SIZE RANGE	D <sub>50</sub>	D <sub>100</sub>	AASHTO	WEIGHT
NUMBER 57*	3/4" - 1 1/4"	1/2"	1 1/4"	M-43	N/A
NUMBER 1	2" - 3"	2 1/4"	3"	M-43	N/A
RIP-RAP**	4" - 7"	5 1/2"	7"	N/A	N/A
CLASS I	N/A	9.5"	15"	N/A	150lb max.
CLASS II	N/A	16"	24"	N/A	700lb max.
CLASS III	N/A	23"	34"	N/A	2000lb max.

\* This classification is to be used on the inside face of stone outlets and check dams.  
 \*\* This classification is to be used when over small rip-rap is required. The State Highway Administration designation for this stone is Stone For Gabions (305.01.04)

Table 27 Geotextile Fabric

CLASS	APPARENT OPENING SIZE MM MAX.	GRAB TENSILE STRENGTH LB. MIN.	BURST STRENGTH PSI. MIN.
A	0.30	250	500
B	0.60	200	320
C	0.30	200	320
D	0.60	90	145
E	0.30	90	145
F (SILT FENCE)	0.40-0.80*	90	190

\* US Std. Stone CW-02215 \*\* 150 mm max. for Super Silt Fence

**Geotextile Material Specifications**

**Standard Inlet Protection** Not to Scale

- The properties shall be determined in accordance with the following procedures:
- Apparent opening size MSMT 323
  - Grab tensile strength ASTM D 1682-46g specimen, 1/2" clamps, 12"/min. strain rate in both principal directions of geotextile fabric.
  - Burst strength ASTM D 3786
- The fabric shall be inert to commonly encountered chemicals and hydrocarbons, and will be rot and mildew resistant. It shall be manufactured from fibers consisting of long chain synthetic polymers, and composed of a minimum of 85% by weight of polypropylene, polyesters, or polyamides. The geotextile fabric shall resist deterioration from ultraviolet exposure.
- In addition, Classes A through E shall have a 0.01 cm/sec. minimum permeability when tested in accordance with MSMT 507, and an apparent minimum elongation of 20 percent (20%) when tested in accordance with the grab tensile strength requirements listed above.
- Silt Fence  
 Class F geotextile fabrics for silt fence shall have a 50 lb./in. minimum tensile strength and a 2.0 lb./in. minimum tensile modulus when tested in accordance with MSMT 509. The material shall also have a 0.3 gal./ft./min. flow rate and seventy-five percent (75%) minimum filtering efficiency when tested in accordance with MSMT 322. Geotextile fabrics used in the construction of silt fence shall resist deterioration from ultraviolet exposure. The fabric shall contain sufficient amounts of ultraviolet ray inhibitors and stabilizers to provide a minimum of 12 months of expected usable construction life at a temperature range of 0 to 120 degrees F.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE E - 10 - 5 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Curb Inlet Protection (COG or COS Inlets)** Not to Scale

- CONSTRUCTION SPECIFICATIONS**
1. EXCAVATE COMPLETELY AROUND THE INLET TO A DEPTH OF 18" BELOW THE NOTCH ELEVATION.
  2. 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. THE TOP OF THE FRAME (WEIR) MUST BE 6" BELOW ADJACENT ROADWAYS WHERE FLOODING AND SAFETY ISSUES MAY ARISE.
  3. 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.
  4. 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 FOLDED, THEN FASTENED DOWN.
  5. 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.
  6. IF THE INLET IS NOT IN A SWP, 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.
  7. 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 E - 10 - 5 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Curb Inlet Protection (COG or COS Inlets)** Not to Scale

- CONSTRUCTION SPECIFICATIONS**
1. ATTACH A CONTINUOUS PIECE OF 1/2" x 1/2" WIRE MESH (50" MINIMUM WIDTH BY THROAT LENGTH PLUS 4") TO THE 2' x 4' WEIR (MEASURING THROAT LENGTH PLUS 2") AS SHOWN ON THE STANDARD DRAWING.
  2. PLACE A CONTINUOUS PIECE OF GEOTEXTILE CLASS E THE SAME DIMENSIONS AS THE WIRE MESH OVER THE WIRE MESH AND SECURELY ATTACH IT TO THE 2' x 4' WEIR.
  3. SECURELY NAIL THE 2' x 4' WEIR TO A 9" LONG VERTICAL SPACER TO BE LOCATED BETWEEN THE WEIR AND THE INLET FACE (MAX. 4" APART).
  4. PLACE THE ASSEMBLY AGAINST THE INLET THROAT AND NAIL (MINIMUM 2" LENGTHS OF 2" x 4" TO THE TOP OF THE WEIR AT SPACER LOCATIONS). THESE 2' x 4" ANCHORS SHALL EXTEND ACROSS THE INLET TOP AND BE HELD IN PLACE BY SANDBAGS OR ALTERNATE WEIGHT.
  5. THE ASSEMBLY SHALL BE PLACED SO THAT THE END SPACERS ARE A MINIMUM 1' BEYOND BOTH ENDS OF THE THROAT OPENING.
  6. 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 1/2" STONE OVER THE WIRE MESH AND GEOTEXTILE IN SUCH A MANNER TO PREVENT WATER FROM ENTERING THE INLET UNDER OR AROUND THE GEOTEXTILE.
  7. THIS TYPE OF PROTECTION MUST BE INSPECTED FREQUENTLY AND THE FILTER CLOTH AND STONE REPLACED WHEN CLOGGED WITH SEDIMENT.
  8. ASSURE THAT STORM FLOW DOES NOT BYPASS THE INLET BY INSTALLING A TEMPORARY EARTH OR ASPHALT DIKE TO DIRECT THE FLOW OF THE INLET.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE E - 10 - 5 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS.

*[Signature]* 7/1/03 DATE  
 U.S. NATURAL RESOURCE CONSERVATION SERVICE

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

*[Signature]* 7/1/03 DATE  
 HOWARD S.C.D.

**CERTIFICATION BY THE ENGINEER:**

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

*[Signature]* 6-2-03 DATE  
 John W. Ramonico, S.E.

**CERTIFICATION BY THE DEVELOPER:**

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

*[Signature]* 6-2-03 DATE  
 Howard County

6-04-03 Date

*[Signature]*  
 Professional Engr. No. 10557

**DMW**  
 Draft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SEDIMENT AND EROSION CONTROL DETAILS (CONTINUED)

Des. By RLH Scale AS SHOWN Proj. No. 01001.C  
 Dm. By WDE Date 3/5/12  
 Chk. By RLH Approved 7 of 44

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 909-03-02C



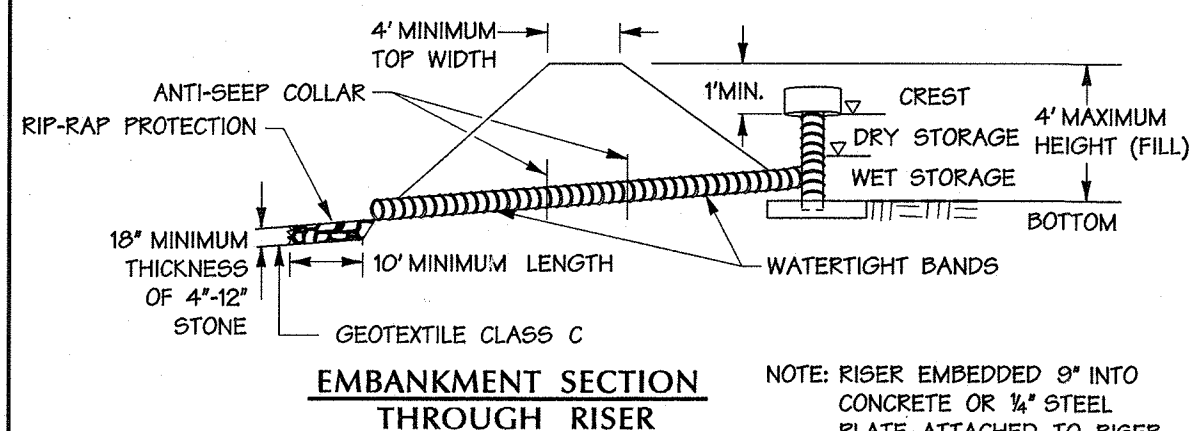
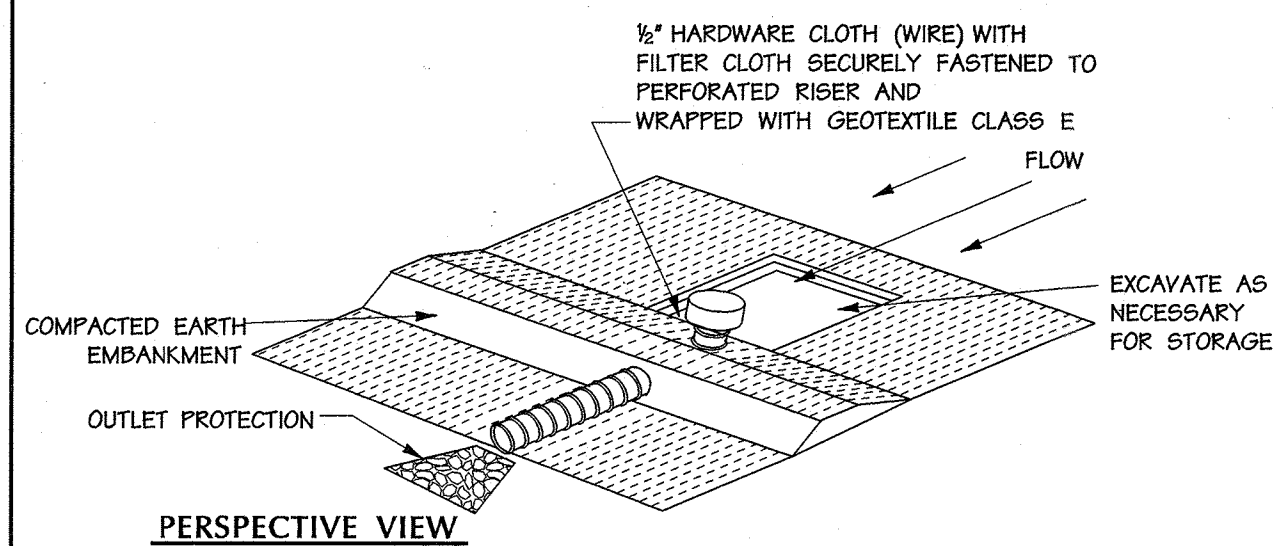
NOTE: DO NOT DISTURB OR GRADE IN STREAM OUTSIDE OF L.O.D. UNTIL MDE PERMIT IS ISSUED. POST FOUR TEMP. SIGNS ON 4x4 WOOD POST @ 5' HEIGHT STATING: 'STREAM DISTURBANCE PROHIBITED - NO ACCESS BEYOND THIS POINT'.

**LEGEND**

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- MAJOR CONTOURS
- MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- EXISTING FOREST EDGE
- EXISTING ROADS
- ED A-1 EARTH DIKE
- SSF SUPER SILT FENCE
- SF SILT FENCE
- GM GABION INFLOW PROTECTION
- LIMIT OF DISTURBANCE
- PROPOSED TREELINE
- PROPOSED GUARD RAIL
- TREE PROTECTION FENCE
- STABILIZED CONSTRUCTION ENTRANCE

Sequence of Construction:

Sequence of Construction	Number of Days
1. Notify Maryland Department of Environment Nontidal Wetlands and Waterways Inspections and Compliance Sections at 410 631 3510 at least five days in advance of beginning any work in streams, 100 year Flood Plain, Nontidal Wetlands and Wetlands Buffers.	1
2. Notify HCD Department of Inspections 410 313 1855 at least 48 hours prior to beginning work.	1
3. If applicable, orange high visibility fence or super silt fence shall be manually installed along the limits of disturbance, where the limits is within 50 feet of the forest conservation easement, 100 year flood plain, wetlands, wetlands buffer, or stream buffer and as shown on sheets 4 and 5. This shall be completed by and inspected at the pre-construction meeting.	5
4. Install stabilized construction entrances at Elliotts Center Drive and at Rogers Ave.	1
5. Notify HCD Department of Inspection, upon completion of said installation.	1
6. Clear and grub for sediment and erosion control measures or devices only with the Sediment Control Inspector's permission.	14
7. Install Perimeter S&F, Sediment Basin #1, Sediment Trap #1 (see sheet 8 for interim conditions), S&F and associated earth dikes. As part of sediment basin #1, install outflow barrel and subsequent storm drains downstream of it (S-3, M-1 and S-1) and outfall apron.	14
8. With the approval of the Sediment Control Inspector clear and grub remainder of site. For sediment control execute, maintain dust control per dust control specifications, sheet 7.	14
9. After first obtaining permission from Sediment Control Inspector, mass grade the East (Phase 1) and West (Phase 2) sides of the site by working the excavation to increase the drainage area into the sediment trap or basin. Contractor is to take great care that disturbance on the steep slopes is fully contained within the prescribed perimeter controls.	6 MONTHS
10. Construct the road, mass grading, including underground utilities. Remove abandoned portion of Elliotts Center Drive. Install retaining walls. Maintain positive outlet at Trap 1 with construction of a temporary opening in the retaining wall. Stabilize disturbed areas between forest buffer and retaining walls as soon as practical after mass grading is complete. Install CIP when inlets are constructed. When storm drains are constructed, the upper pipe out of each flow splitter (1-1, 1-2) shall be blocked so that all flow drains into sediment basin 1 and trap 1 respectively. See sheet 26.	3 MONTHS
11. Once Waterway Construction Permit is issued, install sediment controls for bottomless arch located in the stream buffer (Phase 3), without entering the stream at any time. Install bottomless arch, stabilize with ECM/seed. For conditions of MDE Permit, see tracking number 200266336.	1 MONTH
12. Upon stabilization of site with established vegetation and with permission of the Sediment Control Inspector, remove all sediment control devices except for Sediment Basin 1. (see below) Stabilize newly disturbed areas. Flush storm drain system. Install temp road barrier as needed until road is opened for use. <ul style="list-style-type: none"> <li>a. Sediment basin 1 shall not yet be converted to a SWM facility but shall undergo several changes. The draw-down device shall be removed. A horizontal draw-down pipe shall immediately replace the draw-down device, so that it shall remain dry (and not function as a basin) until the next phase.</li> </ul>	5
13. Perform periodic maintenance of site including sediment basin 1 and general maintenance of stabilized areas.	



SEE SHEET 15 FOR DETAILS

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE C-9-7 MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

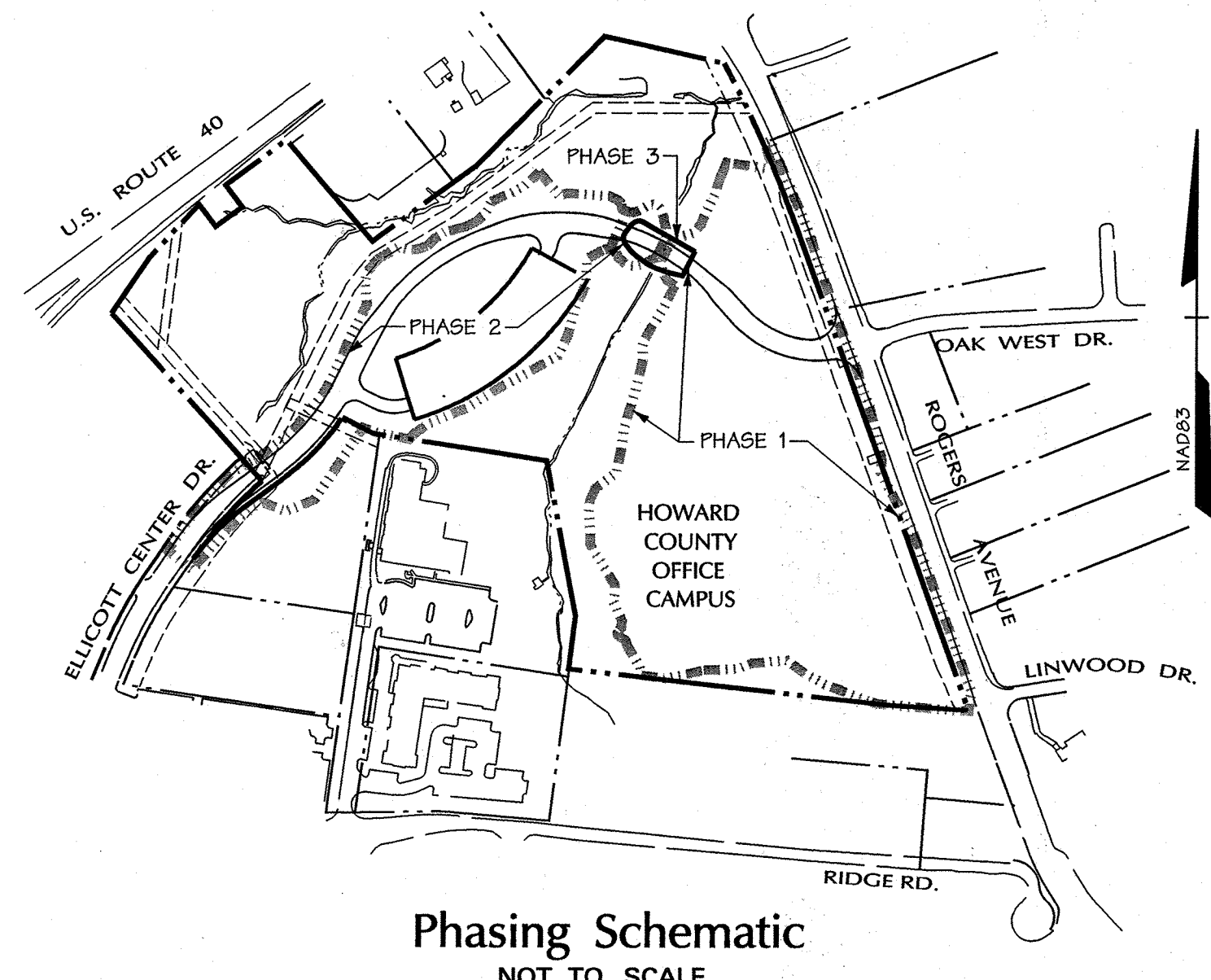
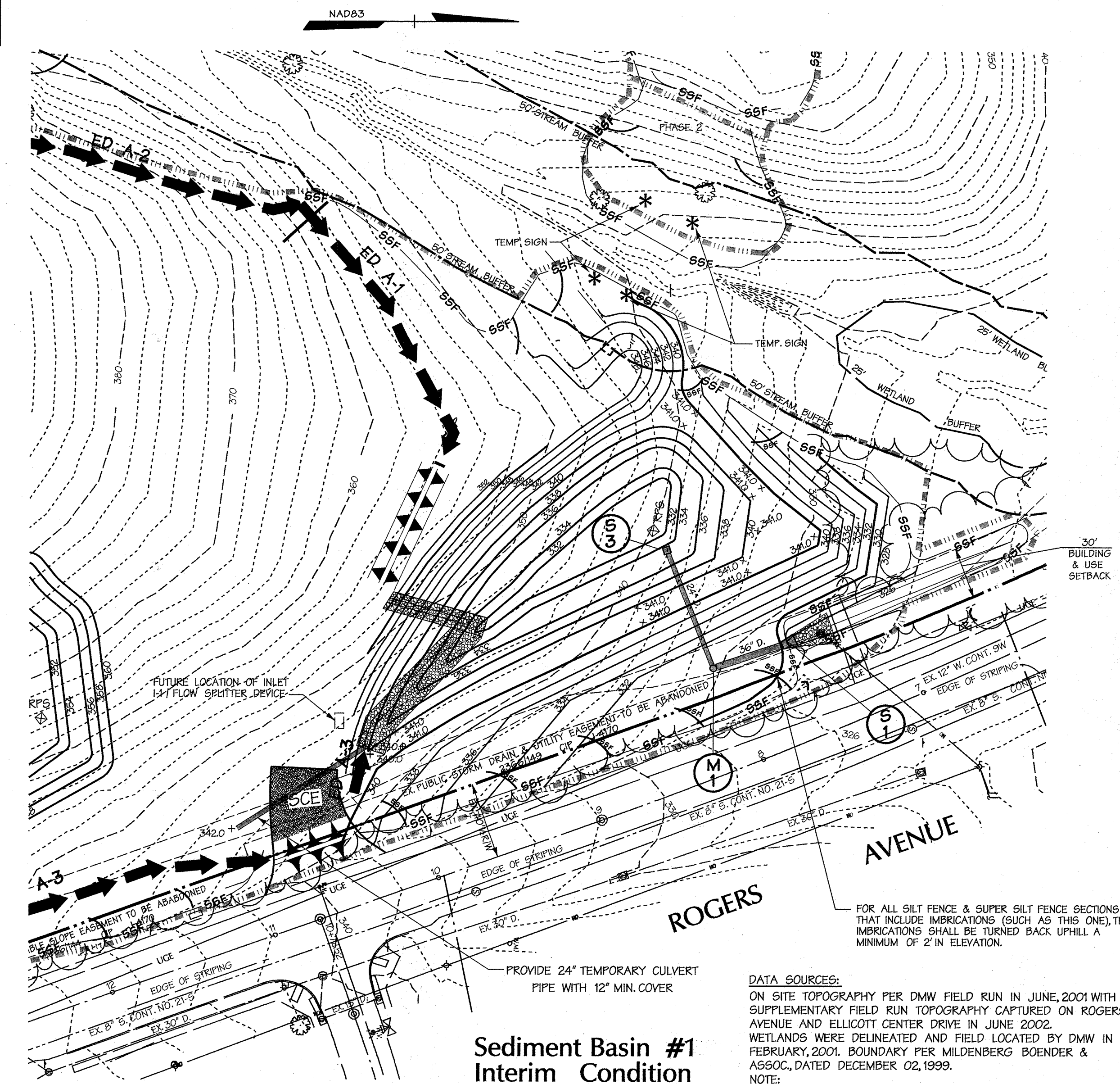
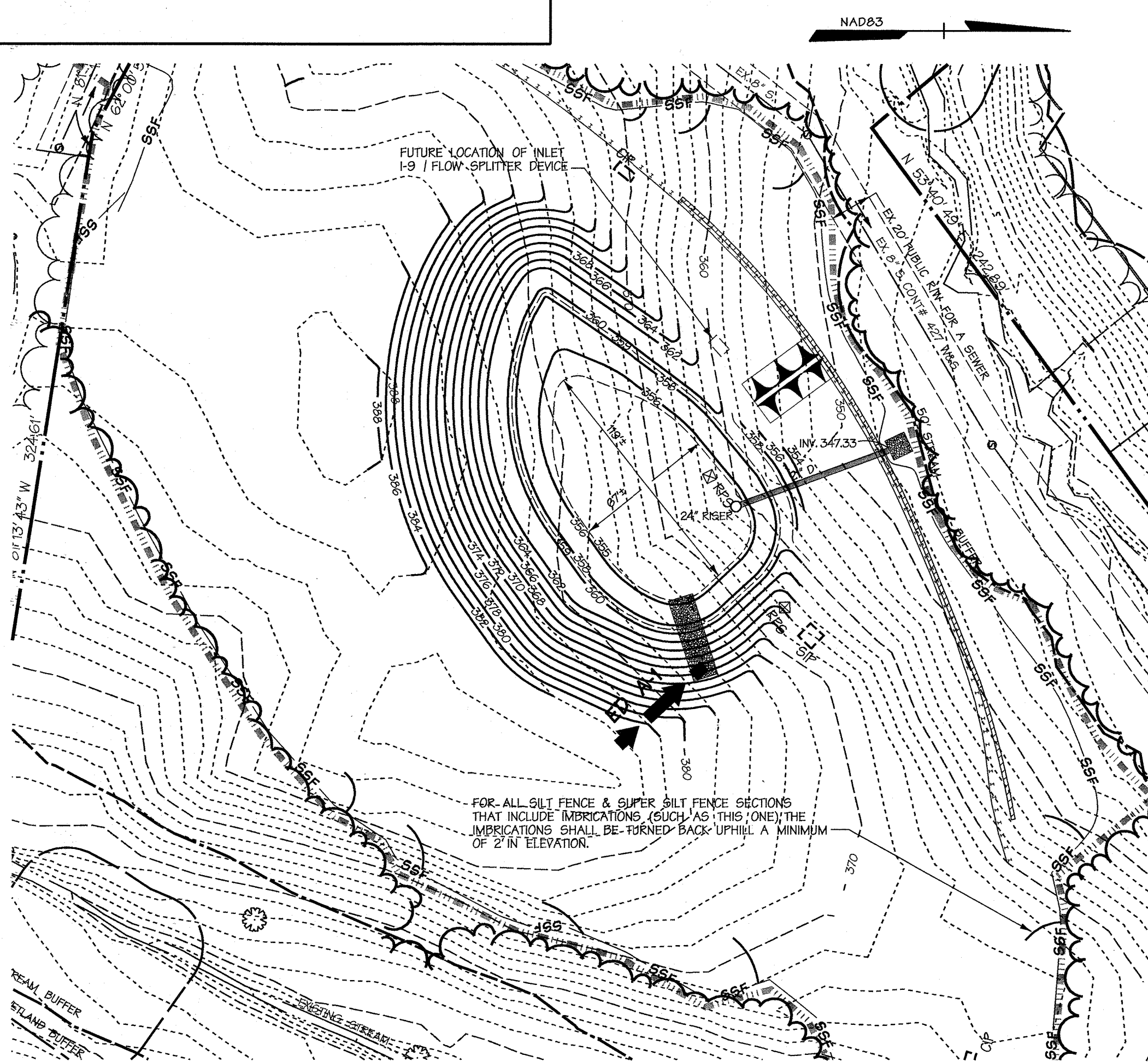
**Pipe Outlet Sediment Trap - ST 1**

**CONSTRUCTION SPECIFICATIONS**

1. THE AREA UNDER THE EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVERSIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. THE TOTAL TRAP VOLUME AS MEASURED FROM THE BOTTOM TO RISER CREST ELEVATION SHALL BE 3600 CUBIC FEET PER ACRE OF DRAINAGE AREA (SEE TABLE 9). THE TOP OF EMBANKMENT MUST BE \* 1' ABOVE THE RISER CREST ELEVATION.
4. SEDIMENT SHALL BE REMOVED AND THE TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE HALF OF THE WET STORAGE DEPTH OF THE TRAP (800 CF/AC). THE SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
5. THE STRUCTURE SHALL BE INSPECTED PERIODICALLY AND AFTER EACH RAIN AND REPAIRS MADE AS NECESSARY.
6. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION ARE ABATED. ONCE CONSTRUCTED, THE TOP AND OUTSIDE FACE OF THE EMBANKMENT SHALL BE STABILIZED WITH SEED AND MULCH. POINTS OF CONCENTRATED INFLOW SHALL BE PROTECTED IN ACCORDANCE WITH GRADE STABILIZATION STRUCTURE CRITERIA. THE REMAINDER OF THE INTERIOR SLOPES SHOULD BE STABILIZED (ONE TIME) WITH SEED AND MULCH UPON TRAP COMPLETION AND MONITORED AND MAINTAINED EROSION FREE DURING THE LIFE OF THE TRAP.
7. THE STRUCTURE SHALL BE REMOVED AND AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
8. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
9. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
10. ABOVE THE WET STORAGE ELEVATION, THE RISER SHALL BE PERFORATED WITH 1/2" WIDE BY 6" LONG SLOTS OR 1" DIAMETER HOLES SPACED 6" VERTICALLY AND HORIZONTALLY. NO PERFORATIONS WILL BE ALLOWED WITHIN 6" OF THE HORIZONTAL BARREL.
11. THE RISER SHALL BE WRAPPED WITH 1/2" HARDWARE CLOTH (WIRE) THEN WRAPPED WITH GEOTEXTILE CLASS E. THE FILTER CLOTH SHALL EXTEND 6" ABOVE THE HIGHEST SILT AND 6" BELOW THE LOWEST SILT. WHERE ENDS OF FILTER CLOTH COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND FASTENED TO PREVENT BYPASS. FILTER CLOTH SHALL BE REPLACED AS NECESSARY TO PREVENT CLOGGING.
12. STRIPS OR CONNECTING BANDS SHALL BE USED TO HOLD THE FILTER CLOTH AND WIRE FABRIC IN PLACE. THEY SHALL BE PLACED AT THE TOP AND BOTTOM OF THE CLOTH.
13. FILL MATERIAL AROUND THE PIPE SPILLWAY SHALL BE HAND COMPACTED IN 4" LAYERS. A MINIMUM OF 2" OF HAND-COMPACTED BACKFILL SHALL BE PLACED OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
14. THE RISER SHALL BE ANCHORED WITH EITHER A CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. CONCRETE BASES SHALL BE AT LEAST TWICE THE RISER DIAMETER AND 12" DEEP WITH THE RISER EMBEDDED 9". STEEL PLATE BASES SHALL BE AT LEAST TWICE THE RISER DIAMETER, 1/2" MINIMUM THICKNESS AND ATTACHED TO THE BOTTOM OF THE RISER BY A CONTINUOUS WELD TO FORM A WATERTIGHT CONNECTION. THEN PLACE 2" OF STONE, GRAVEL OR TAMPED EARTH ON THE PLATE.
15. ANTI-SHEEP COLLARS SHALL BE CONSTRUCTED IN ACCORDANCE WITH PLANS (REF. TABLE 16 AND DETAIL C-10-23 AND C-10-24).
16. CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE DESIGN DETAILS ARE ON DETAIL C-10-26 AND C-10-26A.
17. REFER TO SECTION D FOR DEWATERING REQUIREMENTS OF SEDIMENT TRAPS.
18. OUTLET - AN OUTLET SHALL BE PROVIDED, WHICH INCLUDES A MEANS OF CONVEYING THE DISCHARGE IN AN EROSION FREE MANNER TO AN EXISTING STABLE CHANNEL.
19. WHERE DISCHARGE OCCURS AT THE PROPERTY LINE, LOCAL ORDINANCES AND DRAINAGE EASEMENT REQUIREMENTS SHALL BE MET.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE C-9-7A MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Pipe Outlet Sediment Trap - ST 1**



**AS-BUILT CERTIFICATION**

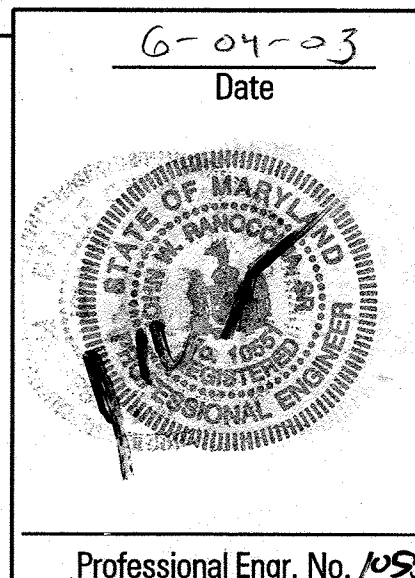
Note: This information is for informational purposes only.



REVIEWED FOR HOWARD S.C.D. AND MEETS TECHNICAL REQUIREMENTS. U.S. NATURAL RESOURCE CONSERVATION SERVICE Date: 7/1/03	THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT. HOWARD S.C.D. Date: 7/1/03
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**CERTIFICATION BY THE ENGINEER:**  
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

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



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	7-11-03
William F. ... CHIEF, BUREAU OF HIGHWAYS	DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING	7/1/03
... CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
... CHIEF, DIVISION OF LAND DEVELOPMENT	7/1/03
... DIRECTOR	7/21/03
DATE	No.
Revision Description	

**Howard County Office Campus**  
 PARCEL A  
 CIP-C-0282

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

<b>DMW</b> DRAFT-McCune-Walker, Inc.		A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals	
SECTION NAME	SECTION AREA	CUT/THROW	852 & P10847
NO. CO. OFFICE CAMPUS	N/A		
PLAN OR LOT	BLK #	ZONE	NAV/ZONE MAP
153-1-70	6 & 1	FOR	24 & 25
WATER CODE	SEWER CODE	ELECT. DISTRICT	2
		CONDS. TRACT	6029
TITLE			
SEDIMENT AND EROSION CONTROL DETAILS AND SPECIFICATIONS (CONTINUED)			
Des. By	RLH	Scale	AS SHOWN
Drn. By	WDE	Date	7/5/12
Chk. By	RLH	Approved	8 of 44

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET



STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION

SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. SITE PREPARATION

- I. Install erosion and sediment control structures (either temporary or permanent) such as diversions, grade stabilization structures, berms waterways, or sediment control basins.
- II. Perform all grading operations at right angles to the slope. Final grading and shaping is not usually necessary for temporary seeding.
- III. Schedule required soil test to determine soil amendment composition and application rates for sites having disturbed area over 5 acres.

B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

- I. Soil test must be performed to determine the exact ratios and application rates for both lime and fertilizer on sites having disturbed areas over 5 acres. Soil analysis may be performed by the University of Maryland or a recognized commercial laboratory. Soil samples taken for engineering purposes may also be used for chemical analysis.
- II. Fertilizers shall be uniform in composition, free flowing and suitable for accurate application by approved equipment. Manure may be substituted for fertilizer with prior approval from the appropriate approval authority. Fertilizers shall be delivered to the site fully labeled according to the applicable state fertilizer laws and shall bear the name, trade name or trademark and warrantee of the producer.
- III. Lime materials shall be ground limestone (hydrated or burnt lime may be substituted) which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Limestone shall be ground to such fineness that at least 50% will pass through a #100 mesh sieve and 98 - 100% will pass through a #20 mesh sieve.
- IV. Incorporate lime and fertilizer into the top 3 - 5 inches of soil by disking or other suitable means.

C. SEEDBED PREPARATION

I. TEMPORARY SEEDING

- A. Seedbed preparation shall consist of loosening soil to a depth of 3 inches to 5 inches by means of suitable agricultural or construction equipment, such as a disc harrow or chisel plow, or rippers mounted on construction equipment. After the soil is loosened it should not be rolled or dragged smooth but left in the roughened condition. Sloped areas (greater than 3:1) should be tracked leaving the surface in an irregular condition with ridges running parallel to the counter of the slope.
- B. Apply fertilizer and lime as prescribed on the plans.
- C. Incorporate lime and fertilizer into the top 3 - 5 inches of soil by disking or other suitable means.

II. PERMANENT SEEDING

- A. Minimum soil conditions required for permanent vegetative establishment:
  1. Soil pH shall be between 6.0 and 7.0.
  2. Soluble salts shall be less than 500 parts per million (PPM).
  3. The soil shall contain less than 40% clay but enough fine grained material (> 30% silt plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if Lovegrass or Berberis Laspedeza is to be planted. Then a sandy soil (< 30% silt plus clay) would be acceptable.
  4. Soil shall contain 1.5% minimum organic matter by weight.
  5. Soil must contain sufficient pore space to permit adequate root penetration.
  6. If these conditions cannot be met by the soils on site, adding topsoil is required in accordance with Section 21 - Standard and Specification for Topsoil.
- B. Areas previously graded in conformance with the drawings shall be maintained in a true and even grade, then scarified or otherwise loosened to a depth of 3 - 5 inches to permit bonding of the topsoil to the surface area and to create horizontal erosion check slots to prevent topsoil from sliding down a slope.
- C. Apply soil amendments as per soil test or as included on the plans.
- D. Mix soil amendments into the top 3 - 5 inches of topsoil by disking or other suitable means. Lawn areas should be raked to smooth the surface, remove large objects like stones and branches, and ready the area for seed application. Where site conditions will not permit normal seedbed preparation, loosen surface soil by dragging with a heavy chain or other equipment to roughen the surface. Steep slopes (steeper than 3:1) should be tracked by a dozer leaving the soil in an irregular condition with ridges running parallel to the contour of the slope. The top 1 - 3 inches of soil should be loose and friable. Seedbed loosening may not be necessary on newly disturbed areas.

E. SEED SPECIFICATIONS

- I. All seed must meet the requirements of the Maryland State Seed Law. All seed shall be subject to re-testing by a recognized seed laboratory. All seed used shall have been tested within the 6 months immediately preceding the date of sowing such material on this job.
 

Note: Seed tags shall be made available to the Inspector to verify type and rate of seed used.
- II. Inoculant - The inoculant for treating legume seed in the seed mixture shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species. Inoculants shall not be used later than the date indicated on the container. Add fresh inoculant as directed on package. Use four times the recommended rate when hydroseeding. Note: It is very important to keep inoculant as cool as possible until used. Temperatures above 75-80° F. can weaken bacteria and make the inoculant less effective.

F. METHODS OF SEEDING

- I. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or cultipacker seeder.
- A. If fertilizer is being applied at the time of seeding, the application rates amount will not exceed the following:
  - Nitrogen: maximum of 100 pounds per acre total of soluble
  - Nitrogen; P2O5 (phosphorous): 200 pounds per acre; K2O (potassium): 200 pounds per acre.
- B. Lime: Use only ground agricultural limestone, up to 3 tons per acre may be applied by hydroseeding. Normally, not more than 2 tons are applied by hydroseeding at any one time. Do not use burnt or hydrated lime when hydroseeding.
- C. Seed and fertilizer shall be mixed on site and seeding shall be done immediately and without interruption.
- II. Dry Seeding: This includes use of conventional drop or broadcast spreaders.
- A. Seed spread dry shall be incorporated into the subsoil at the rates prescribed on the temporary or permanent seeding summaries or tables 25 or 26. The seeded area shall then be rolled with a wheeled roller to provide good seed soil contact.
- B. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

III. Drill or cultipacker seeding: Mechanized seeders that apply and cover seed with soil.

- A. Cultipacker seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of soil covering.
  - Seedbed must be firm after planting.
- B. Where practical, seed should be applied in two directions perpendicular to each other. Apply half the seeding rate in each direction.

F. MULCH SPECIFICATIONS (IN ORDER OF PREFERENCE)

- I. Straw shall consist of thoroughly threshed wheat, rye or oat straw, reasonably bright in color, and shall not be musty, moldy, caked, decayed, or excessively dusty and shall be free of noxious weeds seeds as specified in the Maryland Seed Law.
- II. Wood cellulose fiber mulch (WCFM)
  - A. WCFM shall consist of specially prepared wood cellulose processed into a uniform fibrous physical state.
  - B. WCFM shall be dyed green or contain a green dye in the package that will provide an appropriate color to facilitate visual inspection of the uniformly spread slurry.
  - C. WCFM, including dye shall contain no germination or growth inhibiting factors.
  - D. WCFM materials shall be manufactured and processed in such a manner that the wood cellulose fiber mulch will remain in uniform suspension in water under agitation and will blend with seed, fertilizer and other additives to form a homogeneous slurry. The mulch material shall form a blotter-like ground cover, on application, having moisture absorption and percolation properties and shall cover and hold grass seeds in contact with the soil without inhibiting the growth of the grass seedlings.
  - E. WCFM material shall contain no elements or compounds at concentration levels that will be phytotoxic.
- F. WCFM must conform to the following physical requirements:
  - Fiber length to approximately 10 mm., diameter approximately 1mm., pH range of 4.0 to 8.5, ash content of 1.6% maximum and water holding capacity of 90% minimum.
  - Note: Only sterile straw mulch should be used in areas where one species of grass is desired.

G. MULCHING SEEDED AREAS

- Mulch shall be applied to all seeded areas where one species of grass is desired.

- I. If grading is completed outside of the seeding season, mulch alone shall be applied as prescribed in this section and maintained until the seeding season returns and seeding can be performed in accordance with these specifications.
- II. When straw mulch is used, it shall be spread over all seeded areas at the rate of 2 tons per acre. Mulch shall be applied in a uniform loose depth of between 1 1/2 inches and 2 inches. Mulch applied shall achieve a uniform distribution and depth so that the surface is not exposed. If a mulch anchoring tool is to be used, the rate should be increased to 2.5 tons per acre.
- III. Wood cellulose fiber used as a mulch shall be applied at a net dry weight of 1,500 pounds per acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.

H. SECURING STRAW MULCH

- Mulch anchoring shall be performed immediately following mulch application to minimize loss by wind or water. This may be done by one of the following methods (listed by preference), depending upon size of area and erosion hazard:
  - I. A mulch anchoring tool is a tractor drawn implement design to punch and anchor mulch into the soil surface a minimum of two (2) inches. This practice is most effective on large areas, but is limited to flatter slopes where equipment can operate safely. If used on sloping land, this practice should be used on the contour if possible.
  - II. Wood cellulose fiber may be used for anchoring straw. The fiber binder shall be applied at a net dry weight of 750 pounds per acre. The wood cellulose fiber shall be mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
  - III. Application of liquid binders should be heavier at the edges where wind catches mulch, such as in valleys or on crest of banks. The remainder of area should appear uniform after binder application. Synthetic binders - such as Acrylic DLR (agro-tack), DCA-70, Petrosert, Terra Tax II, Terra Tack AR or other approved equal may be used at rates recommended by the manufacturer to anchor mulch.
  - IV. Lightweight plastic netting may be stapled over the mulch according to manufacturer's recommendations. Netting is usually available in rolls 4' to 15' feet wide and 300 to 3,000 feet long.

SECTION II - TEMPORARY SEEDING

VEGETATION - Annual grass or grain used to provide cover on disturbed areas for up to 12 months. For longer duration of vegetative cover, permanent seeding is required.

Seed Mixture (Hardiness Zone 6B)				Fertilizer Rate (10-10-10)	Lime Rate
No.	Species	Application Rate (Lb./Ac.)	Seeding Dates		
1	Annual Ryegrass	50	2/15 - 4/30 8/15 - 11/1	600 Lbs./Ac. (15 Lbs./1000 SF)	2 Tons/Ac. (100 Lbs./1000 SF)
2	Weeping Lovegrass	4	5/1 - 8/14		

SECTION III - PERMANENT SEEDING

Seeding grass and legumes to establish ground cover for a minimum of one year on disturbed areas generally receiving low maintenance.

Seed Mixture No. 3 (Hardiness Zone 6B)				Fertilizer Rate (10-20-20)			Lime Rate
%	Species	Application Rate (Lb./Ac.)	Seeding * Dates	N	P2O5	K2O	
85	Rebel II Tall Fescue	125	3/1 - 5/15 8/15 - 11/15	90 Lb./Ac. (2 Lb./1000 Sq.Ft.)	175 Lb./Ac. (4 Lb./1000 Sq.Ft.)	175 Lb./Ac. (4 Lb./1000 Sq.Ft.)	2 Tons/Ac. (100 Lb./1000 Sq.Ft.)
10	Pennine Perennial Ryegrass	15		1/4 - 1/2			
5	Kenblue Kentucky Bluegrass	10		1/4 - 1/2			

\* For 5-16 through 8-14 add two (2) pounds of Weeping Lovegrass per acre or ten (10) pounds of Millet per acre to seed mixture (i.e. Mix #3 shown).

SECTION IV - SOD

To provide quick cover on disturbed areas (2:1 grade or flatter)

A. GENERAL SPECIFICATIONS

- I. Class of turfgrass sod shall be Maryland or Virginia State certified or approved. Sod labels shall be made available to the job foreman and inspector.
- II. Sod shall be machine cut at a uniform soil thickness of 3/4", plus or minus 1/8", at the time of cutting. Measurement for thickness shall exclude top growth and thatch. Individual pieces of sod shall be cut to the suppliers width length. Maximum allowable deviation from standard widths and lengths shall be 5 percent. Broken pads and torn or uneven ends will not be acceptable.
- III. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended vertically with a firm grasp on the upper 10 percent of the section.
- IV. Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect its survival.
- V. Sod shall be harvested, delivered, and installed within a period of 36 hours. Sod not transplanted within this period shall be approved by an agronomist or soil scientist prior to its installation.

B. SOD INSTALLATION

- I. During periods of excessively high temperature or in areas having dry subsoil, the subsoil shall be lightly irrigated immediately prior to laying the sod.
- II. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and tightly wedged against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Ensure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which air drying of the roots.
- III. Wherever possible, sod shall be laid with the long edges parallel to the contour and with staggering joints. Sod shall be rolled and tamped, pegged or otherwise secured to prevent slippage on slopes and to ensure solid contact between sod roots and the underlying soil surface.
- IV. Sod shall be watered immediately following rolling or tamping until the underside of the new sod pad and soil surface below the sod are thoroughly wet. The operations laying, tamping and irrigating for any piece of sod shall be completed within eight hours.

C. SOD MAINTENANCE

- I. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of 4 inches. Watering should be done during the heat of the day to prevent wilting.
- II. After the first week, sod watering is required as necessary to maintain adequate moisture content.
- III. The first mowing of sod should not be attempted until the sod is firmly rooted. No more than 1/3 of the grass leaf shall be removed by the initial cutting or subsequent cuttings. Grass height shall be maintained between 2 inches and 3 inches unless otherwise specified.

SECTION V - TURFGRASS ESTABLISHMENT

Areas where turfgrass may be desired may include lawns, parks, playgrounds, and commercial sites which will require a medium high level of maintenance. Areas to receive seed shall be tilled by disking or other approved methods to a depth of 2 to 4 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 mowing of grasses will pose no difficulty.

Note: Choose certified material. Certified material is the best guarantee of cultivar purity. The certification program of the Maryland Department of Agriculture, Turf and Seed Section, provides a reliable means of consumer protection and assures a pure genetic line.

A. TURFGRASS MIXTURES

- I. Kentucky Bluegrass - Full sun mixture - For use in areas that receive intensive management. Irrigation required in the areas of central Maryland and Eastern Shore. Recommended certified Kentucky Bluegrass cultivars seeding rate: 1.5 to 2.0 pounds per 1000 square feet. A minimum of three Bluegrass cultivars should be chosen ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.
- II. Kentucky Bluegrass/Perennial Ryegrass - Full sun mixture - For use in full sun areas where rapid establishment is necessary and when turf will receive medium to intensive management. Certified Perennial Ryegrass cultivars/certified Kentucky Bluegrass seeding rate: 2 pounds mixture per 1000 square feet. A minimum of 3 Kentucky Bluegrass cultivars must be chosen, with each cultivar ranging from 10% to 35% of the mixture by weight.
- III. Tall Fescue/Kentucky Bluegrass - Full sun mixture - For use in drought prone areas and/or for areas receiving low to medium management in full sun to medium shade. Recommended mixture includes: certified Tall Fescue cultivars 95-100%, certified Kentucky Bluegrass cultivars 0 - 5%, seeding rate: 5 to 8 pounds per 1000 square feet. One or more cultivars may be blended.
- IV. Kentucky Bluegrass/Fine Fescue - Shade mixture - For use in areas with shade in Bluegrass lawns. For establishment in high quality, intensively managed turf area. Mixture includes: certified Kentucky Bluegrass cultivars 30-40% and certified Fine Fescue and 60-70%. Seeding rate: 1 1/2 - 3 pounds per 1000 square feet. A minimum of 3 Kentucky Bluegrass cultivars must be chosen. With each cultivar ranging from a minimum of 10% to a maximum of 35% of the mixture by weight.

Note: Turfgrass varieties should be selected from those listed in the most current University of Maryland publication, agronomy mimeo number 77, "Turfgrass Cultivar Recommendations for Maryland".

B. IDEAL TIMES OF SEEDING

- Western Maryland: March 15 - June 1, August 1 - October 1 (hardiness zones - 5B, 6A).
- Central Maryland: March 1 - May 15, August 15 - October 15 (hardiness zone - 6B).
- Southern Maryland, Eastern Shore: March 1 - May 15, August 15 - October 15 (hardiness zones - 7A, 7B).

C. IRRIGATION

If soil moisture is different, supply new seedlings with adequate water for plant growth (1/2" - 1" every 3 to 4 days depending on soil texture) until they are firmly established. This is especially true when seedlings are made late in the planting season, in abnormally dry or hot seasons, or on adverse sites.

D. REPAIRS AND MAINTENANCE

- I. Inspect all seeded areas for failures and make necessary repairs, replacements, and reseeding within the planting season.
- II. Once the vegetation is established, the site shall have 95% groundcover to be considered adequately stabilized.
- III. If the stand provides less than 40% ground coverage, re-establish following original lime, fertilizer, seedbed preparation and seeding recommendations.
- IV. If the stand provides between 40% and 94% ground coverage, overseeding and fertilizing using half of the rates originally applied may be necessary.
- V. Maintenance fertilizer rates for permanent seedings are shown in Table 24, for lawns and other medium high maintenance turfgrass areas, refer to the University of Maryland publication "Lawn Care in Maryland" bulletin number 171.

21.0 STANDARD AND SPECIFICATIONS FOR TOPSOIL

DEFINITION

Placement of topsoil over a prepared subsoil prior to establishment of permanent vegetation.

PURPOSE

To provide a suitable soil medium for vegetative growth. Soils of concern have low moisture content, low nutrient levels, low pH, materials toxic to plants, and/or unacceptable soil gradation.

CONDITIONS WHERE PRACTICE APPLIES

- I. This practice is limited to areas having 2:1 or flatter slopes where:
  - a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.
  - b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.
  - c. The original soil to be vegetated contains material toxic to plant growth.
  - d. The soil is so acidic that treatment with limestone is not feasible.
- II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

CONSTRUCTION AND MATERIAL SPECIFICATIONS

- I. Topsoil salvages from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.
- II. Topsoil Specifications - Soil to be used as topsoil must meet the following:
  - I. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1/2" in diameter.
  - II. Topsoil must be free of plants or plant parts such as bermuda grass, quackgrass, Johnsongrass, nutgrass, poison ivy, thistle, or other as specified.
  - III. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.
  - IV. For sites having disturbed areas under 5 acres:
    - a. On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
      - a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
      - b. Organic content of topsoil shall be not less than 1.5 percent by weight.
      - c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
      - d. No soil or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min) to permit dissipation of phytotoxic materials.
    - Note: Topsoil substitutes or amendments as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
  - II. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.
- V. Topsoil Application
  - I. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Sills Fence and Sediment Traps and Basins.
  - II. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.
  - III. Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
  - IV. Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

VI. Alternative for Permanent Seeding - Instead of applying the full amount of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:

- I. Composted Sludge Material for use as a soil conditioner for sites having disturbed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:
  - a. Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
  - b. Composted sludge shall contain at least 1 percent nitrogen, 15 percent phosphorus, and 0.2 percent potassium and have a Ph of 7.0 to 8.0. If compost does not meet these requirements, the appropriate constituents must be added to meet the requirements prior to use.
  - c. Composted sludge shall be applied at a rate of 1 ton/1000 square feet.
  - iv. Composted sludge shall be amended with a potassium fertilizer applied at a rate of 4 lb/1000 square feet, and 1/3 the normal lime application rate.

References: Guidelines Specifications, Soil Preparation and Sodding, MD/VA, Pub. #1, Cooperative Extension Service, University of Maryland and Virginia Polytechnic Institutes, Revised 1973.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 William J. Walsh  
 CHIEF, BUREAU OF HIGHWAYS  
 7-11-03  
 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 [Signature]  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 7/14/03  
 DATE

[Signature]  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 7/16/03  
 DATE

[Signature]  
 DIRECTOR  
 7/16/03  
 DATE

Date	No.	Revision Description

Howard County Office Campus  
 PARCEL A  
 CIP-C-0282

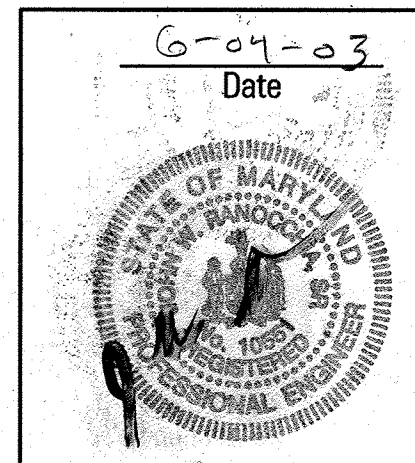
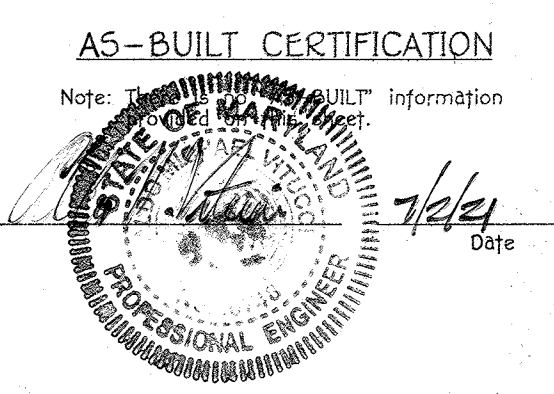
OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

DMW  
 Draft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705  
 A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

PROJECT NO.	SECTION AREA	DATE
HC CO. OFFICE CAMPUS	NA	7/16/03
PLAT OR L.P.	BOOK #	DATE
1554-1-70	6 & 1	POR 24 & 25
VOL. CODE		SEWER CODE

SEDIMENT AND EROSION CONTROL SPECIFICATIONS

Des. By	RLH	Scale	AS SHOWN	Proj. No.	21001.C
Drn. By	WDE	Date	3/5/12		
Chk. By	RLH	Approved		9 of 44	



REVIEWED FOR HOWARD S.C.D. AND METS TECHNICAL REQUIREMENTS.  
 [Signature]  
 U.S. NATURAL RESOURCE CONSERVATION SERVICE  
 7/11/03  
 DATE

CERTIFICATION BY THE ENGINEER:  
 I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS AND THAT IT WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature]  
 7/11/03  
 DATE

CERTIFICATION BY THE DEVELOPER:  
 I ME CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.  
 [Signature]  
 6-28-03  
 DATE

HOWARD S.C.D.  
 [Signature]  
 7/11/03  
 DATE

MDE PERMIT AND TRACKING No. 200266336

Professional Engr. No. 10551

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 908-03-026



**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-1 (1 of 1) Elev. 25.5' Elev. 368.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
365.8	2.8	Surficial Soil	7-10-14	1.5	24	
363.8	4.8	Medium dense silt SAND AND ROCK FRAGMENTS, fine mica, damp, brown, gray (SM-SM) - Residuum	10-15-13	3.0	30	
361.8	6.8	Medium dense silt SAND, trace decomposed rock, moist, brown (SM) - Residuum	10-15-13	4.0	18	Dry
359.8	8.8	Medium dense silt SAND AND ROCK FRAGMENTS, trace mica, damp, brown, gray (SM-SM) - Residuum	5-8-14	6.0	22	
357.8	10.8	Medium dense silt SAND, moist, wet, green-brown, (SM) - Residuum	10-13-7	8.0	14	
355.8	12.8	Medium dense sandy SILT, little mica, trace decomposed rock fragments (SM) - Residuum	3-5-6	10.0	11	
353.8	14.8	Very dense silt SAND, trace rock fragments, moist, brown (SM-SM) - Soft Weathered Rock	24-34-4	12.0	70	
351.8	16.8	Very dense silt SAND, trace decomposed rock fragments, moist, gray (SM-SM) - Soft Weathered Rock	20-30-5	14.0	16.9	
349.8	18.8	Very dense SAND AND ROCK FRAGMENTS, trace mica, wet, brown (SM-SM) - Soft Weathered Rock	44-50-7	16.0	18.8	
347.8	20.8	Very dense silt SAND, trace rock fragments, wet, green (SM) - Soft Weathered Rock	50-5	18.0	20.0	
345.8	22.8	No Recovery	50-1	20.0	24.0	
343.8	24.8	No Recovery	50-1	22.0	24.0	
342.3	25.3	Boring Terminated at 25.5 feet				

DRAFT

**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-2 (1 of 1) Elev. 5.5' Elev. 358.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
357.5	0.5	Surficial Soil	3-4-5	0.5	10	
356.0	2.0	Loose silt SAND, moist, brown (SM)	3-7-7	2.0	14	Dry, Cave-In at 2 feet
354.0	4.0	Loose sandy CLAY, trace root matter, damp, brown (CL)	3-4-7	3.5	13	
352.5	5.5	Medium dense silt SAND, dry-damp, brown (SM) - Residuum	3-4-7	5.0	11	Boring Terminated at 5.5 feet

DRAFT

**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-3 (1 of 1) Elev. 9.5' Elev. 364.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
363.5	0.5	Surficial Soil	3-3-3	0.5	6	
361.5	2.0	Loose clayey SAND, damp, brown (SC)	4-4-3	1.5	9	
359.8	4.0	Loose silt SAND, damp, brown (SM)	3-5-6	3.5	11	Dry, Cave-In at 4.5 feet
358.0	6.0	Clayey to trace decomposed rock fragments, damp, brown (SM) - Residuum	4-5-6	5.5	11	
356.8	8.0	Clayey to Moist	6-6-7	7.5	13	
354.3	9.5	Boring Terminated at 9.5 feet		9.5		

DRAFT

**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-4 (1 of 1) Elev. 10.0' Elev. 327.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
326.5	0.5	Surficial Soil	3-3-4	0.5	5	
325.0	2.0	Loose clayey SAND, trace silt, moist, brown (CL)	3-4-4	1.5	12	Water at 3 feet at 0 hours
323.0	4.0	Medium dense silt SAND, trace decomposed rock fragments, moist, green (SM)	3-4-4	3.5	8	
321.0	6.0	Medium silt sandy SILT, trace decomposed rock fragments, moist, green (SM) - Residuum	4-3-4	5.5	7	Cave-In at 5.5 feet
318.5	8.5	No Recovery	3-3-3	8.0	10	Free water encountered at 8 feet during drilling
317.0	10.0	Loose silt SAND, moist-wet, orange (SM) - Residuum	3-3-3	9.5	10	Water at 7.8 feet at 0 hours
		Boring Terminated at 10 feet				Cave-In at 8.6 feet

DRAFT

**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-5 (1 of 1) Elev. 36.0' Elev. 330.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
329.4	0.5	Surficial Soil	3-3-3	0.5	5	
327.4	2.0	Loose silt SAND (SM) black to brown, damp	3-3-3	1.5	10	
325.5	4.0	Loose silt sandy ROCK FRAGMENTS (SM) beige and white, damp	3-3-3	3.5	4.0	
323.7	6.0	Very loose silt SAND (SM) brown and beige, damp	3-3-3	5.5	6.0	
321.7	8.0	Red grades more coarse	3-1-2	7.5	3	Water at 7.8 feet at 0 hours
319.7	10.0	Clayey to loam	3-1-2	9.5	3	Cave-In at 8.6 feet
317.7	12.0	Medium dense silt SAND AND ROCK FRAGMENTS (SM-SM) dark brown, damp	11-12-1	11.5	26	Free water encountered at 16 feet during drilling
309.7	20.0	Dense SAND, trace silt (SM-SM) red-white, damp - Residuum	7-16-19	19.0	37	
307.7	22.0	Dense silt SAND (SM) brown, damp - Residuum	11-25-26	21.0	46	
305.7	24.0	Very dense SAND, trace silt (SM-SM) brown-white, damp - Residuum	21-35-41	23.5	75	
303.7	26.0	Boring Terminated at 26 feet		26.0		

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**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-6 (1 of 1) Elev. 16.0' Elev. 331.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
330.2	0.5	Surficial Soil	4-4-3	0.5	20	
328.6	2.0	Loose silt SAND, moist, brown (SM)	6-5-3	1.5	6	
326.6	4.0	Loose silt SAND, moist, brown-white (SM)	6-5-3	3.5	6	
324.6	6.0	Loose silt SAND, damp, decomposed rock fragments, brown (SM)	23-4	5.0	7	
322.6	8.0	Clayey to moist-wet	3-3-4	7.5	7	Water at 7.3 feet at 0 hours
320.6	10.0	Medium dense silt SAND, damp, decomposed rock fragments, brown (SM) - Residuum	5-8-11	9.5	15	Cave-In at 8.2 feet
318.6	12.0	Free water encountered at 10.5 feet during drilling	6-7-9	11.5	13	
316.6	14.0	Free water encountered at 16 feet	6-7-9	13.5	16.6	
		Boring Terminated at 16 feet				

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**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-7 (1 of 1) Elev. 29.3' Elev. 364.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
363.5	0.5	Surficial Soil	6-5-3	0.5	18	
362.0	2.0	Medium dense silt SAND (SM) dark and light brown, damp	6-5-3	1.5	10	
360.0	4.0	Clayey to gray, brown and white	7-12-13	3.5	23	
358.0	6.0	Clayey to trace rock fragments	7-12-13	5.5	36	
356.0	8.0	Clayey to trace rock fragments	7-12-13	7.5	46	
354.0	10.0	Clayey to very mica, trace rock fragments	27-33-43	9.5	77	
352.0	12.0	Sand becoming more coarse, beige and brown, damp (SM) - Residuum	11-17-21	11.5	26	
350.0	14.0	Sand becoming more coarse, beige and brown, damp (SM) - Residuum	12-13-13	13.5	26	
348.0	16.0	Very dense silt SAND, damp, brown (SM) - Soft Weathered Rock	7-8-14	15.5	22	
346.0	18.0	Very dense silt SAND, damp, brown (SM) - Soft Weathered Rock	10-14-14	17.5	28	Dry, Cave-In at 17 feet
344.0	20.0	Very dense silt SAND, damp, brown (SM) - Soft Weathered Rock	10-19-24	19.5	43	
342.0	22.0	Clayey to gray and white - Residuum	27-31-37	21.5	38	Free water encountered at 21 feet during drilling
340.0	24.0	Clayey to gray and white - Residuum	7-8-13	23.5	23	
338.0	26.0	Clayey to gray and white - Residuum	24-30-38	25.5	65	
336.0	28.0	Clayey to gray and white - Residuum	24-30-38	27.5	65	
334.0	30.0	Very dense silt SAND (SM) dark and light brown, mica - Soft Weathered Rock	24-30-38	29.5	50	
332.0	32.0	Boring Terminated at 30.3 feet		30.3		

DRAFT

**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-8 (1 of 1) Elev. 19.5' Elev. 358.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
357.4	0.5	Surficial Soil	3-3-3	0.5	11	
355.9	2.0	Loose to medium dense silt SAND, damp, brown (SM)	9-10-10	1.5	20	
353.9	4.0	Clayey to trace mica, moist	5-6-5	3.5	11	
351.9	6.0	Clayey to trace mica, moist	5-6-5	5.5	10	
349.9	8.0	Clayey to trace mica, moist	6-7-7	7.5	14	Dry, Cave-In at 8.4 feet
347.9	10.0	Free water encountered at 10 feet during drilling	3-4-5	9.5	17	
345.9	12.0	Medium dense to dense silt SAND, damp, brown (SM) - Residuum	10-25-24	11.5	47	
343.9	14.0	Medium dense to dense silt SAND, damp, brown (SM) - Residuum	9-12-13	13.5	25	
341.9	16.0	Very dense silt SAND, damp, brown (SM) - Soft Weathered Rock	37-30-5	15.5	169	
339.9	18.0	Very dense silt SAND, damp, brown (SM) - Soft Weathered Rock	37-30-5	17.5	184	
337.9	20.0	Boring Terminated at 19.5 feet		19.5		

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**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: SWM-9 (1 of 1) Elev. 35.2' Elev. 352.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
351.1	0.5	Surficial Soil	4-5-4	0.5	11	
349.1	2.0	Medium silt clayey SAND, dry-damp, brown (SC)	6-4-4	1.5	14	
347.1	4.0	Loose to medium dense silt SAND, moist, tan (SM) - Residuum	7-7-9	3.5	16	
345.1	6.0	Clayey to trace mica, damp, brown	4-5-5	5.5	10	
343.1	8.0	Clayey to trace mica, damp, brown	4-4-10	7.5	16	
341.1	10.0	Free water encountered at 10 feet during drilling	3-4-5	9.5	17	Water at 9.5 feet at 24 hours
339.1	12.0	Free water encountered at 10 feet during drilling	1-15-15	11.5	21	Water at 10 feet at 0 hours
337.1	14.0	Dense to very dense silt SAND, moist, brown (SM) - Residuum	3-15-23	13.5	46	Cave-In at 10.2 feet
335.1	16.0	Dense to very dense silt SAND, moist, brown (SM) - Residuum	3-15-23	15.5	61	
333.1	18.0	Very dense to silt SAND, moist, brown (SM) - Soft Weathered Rock	15-25-28	17.5	18.9	
331.1	20.0	Boring Terminated at 19.3 feet		19.3		

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**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: 1-1 (1 of 1) Elev. 8.0' Elev. 364.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
363.7	0.3	Surficial Soil	10-12	0.3	14	
360.0	4.0	Medium dense silt SAND, and decomposed rock fragments, moist, orange-brown (SM) - Residuum	10-12	3.7	21	
359.0	5.0	Very dense silt SAND, damp-moist, tan (SM) - Soft Weathered Rock	12-20	4.0	14	Dry
		Boring Terminated at 5 feet				Auger Refused, Base Rod, Total Auger

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**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: 1-1A (1 of 1) Elev. 10.0' Elev. 371.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
370.5	0.5	Surficial Soil	3-4-5	0.5	9	
369.0	2.0	Loose sandy SILT, trace mica (SM) tan-brown, dry	3-3-3	1.5	2.0	6
367.0	4.0	Loose silt SAND (SM) gray-brown, dry	3-3-3	3.5	4.0	6
365.0	6.0	Loose silt SAND (SM) orange, white & brown, dry (Residuum) (SM-SM)	3-3-3	5.5	6.0	6
363.0	8.0	Loose silt SAND (SM) orange, white & brown, dry (Residuum) (SM-SM)	4-4-4	7.5	8.0	14
361.0	10.0	Boring Terminated at 10 feet		10.0		

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**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: 1-2 (1 of 1) Elev. 10.0' Elev. 367.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
366.1	0.4	Surficial Soil	3-4-5	0.4	13	
364.1	2.0	Loose to medium dense silt SAND, trace mica, and brown, damp (SM)	3-4-5	1.6	9	
362.5	4.0	Clayey to tan and/or orange	3-4-5	3.6	11	Dry
360.5	6.0	Clayey to tan and/or orange	3-4-5	5.6	10	
358.5	8.0	Clayey to tan and/or orange	3-4-5	7.6	11	
356.5	10.0	Boring Terminated at 10 feet		10.0		

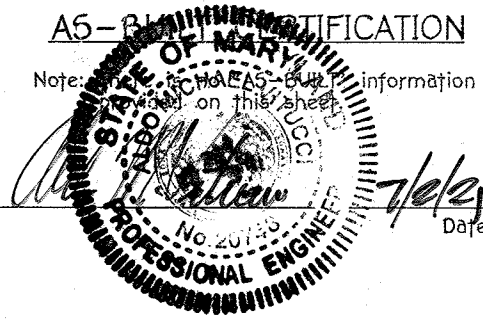
DRAFT

**BORING LOG**

Report No. CSB-0902  
Client: Transmill Crew Company  
Project: Howard County Gov't Office Campus, Ellicott City, MD  
Boring No.: 1-2A (1 of 1) Elev. 10.0' Elev. 367.4' Location: See Boring Location Plan

Elevation	Depth	DESCRIPTION OF MATERIALS (Classification)	Sample No.	Depth (feet)	N Value (blows/ft)	REMARKS
366.0	0.5	Surficial Soil	2-3-5	0.5	8	
364.5	2.0	Loose silt SAND, trace mica (SM) brown, damp	2-3-5	1.5	6	
362.5	4.0	Loose clayey to silt SAND, trace mica (SM-SM) brown, damp	2-3-5	3.5	20	Dry
360.5	6.0	Medium dense to dense SAND AND SILT, little mica (SM-SM) gray & brown, dry-damp - Residuum (SM-SM)	20-10-10	5.5	10	Off to 20 feet south of 1-2
358.5	8.0	Medium dense to dense SAND AND SILT, little mica (SM-SM) gray & brown, dry-damp - Residuum (SM-SM)	6-9-9	7.5	9	
356.5	10.0	Boring Terminated at 10 feet	15-25-25	9.5	40	

DRAFT



MDE PERMIT AND TRACKING No. 200266336

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. White* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Paul D. ...* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*...* 7/16/03



**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-3 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
349.0	0.5	Surficial Soil	3-5-3	0.5	6	
		Loose sandy SILT (ML) dry, dark brown				
345.5	4.0	Dense silty SAND (SM) dry, brown	6-14-14	3.5	28	Day, Cave-in at 4 feet
343.5	6.0	Very dense SAND AND ROCK FRAGMENTS (GP-SP) dry, brown - Soft Weathered Rock	592	5.5	40	
341.5	8.0	Very dense SAND AND ROCK FRAGMENTS (GP-SP) dry, brown - Residual	15-20-20	7.5	40	
339.5	10.0	Boring Terminated at 10 feet		10.0		

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**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-4 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
353.4	0.5	Surficial Soil	3-5-3	0.5	6	
		Loose SILT (ML) dry, brown				
347.9	6.0	Medium dense silty SAND, trace mica and decomposed rock fragments (SM) damp, brown - Residual	4-5-4	5.5	11	Day, Cave-in at 6 feet
343.9	10.0	Boring Terminated at 10 feet		10.0		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-5 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
356.3	0.5	Surficial Soil	6-7-7	0.5	14	
		Medium dense silty SAND (SC) damp, dark brown				
354.8	2.0	Medium dense SILT AND SAND (SM-ML) damp, tan to brown	5-6-7	1.5	13	
		Grades to sandy SILT				
348.8	8.0	Very dense silty SAND AND ROCK FRAGMENTS (GM-SC) dry, brown - Soft Weathered Rock	4-5-5	7.5	13	
346.8	10.0	Boring Terminated at 10 feet		10.0		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-6 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
377.5	0.5	Surficial Soil	4-5-5	0.5	10	
		Loose sandy SILT (ML) damp, orange				
376.0	2.0	Medium dense silty SAND AND ROCK FRAGMENTS (GM-SM) dry, brown	16-9-9	1.5	15	
		Grades to with trace clay				
374.0	4.0	Grades to without trace clay, orange and beige	4-4-4	3.5	8	
		Grades to without trace clay, orange and beige	4-6-6	5.5	12	
370.0	8.0	Grades to with decomposed rock fragments, gray	3-4-4	7.5	8	Day, Cave-in at 9 feet
368.0	10.0	Grades to orange-beige	4-5-5	9.5	10	
366.0	12.0	Very dense sandy SILT (ML) damp, orange-beige - Residual	4-5-5	11.5	81	
364.0	14.0	Very dense sandy SILT (ML) damp, gray - Soft Weathered Rock	23-35-48	13.5		
362.5	15.5	Boring Terminated at 15.5 feet		15.5		

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**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-7 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
377.5	0.5	Surficial Soil	3-5-3	0.5	6	
		Loose sandy SILT (ML) damp, brown				
376.0	2.0	Grades to with trace clay	4-4-4	1.5	8	
		Grades to without trace clay, orange and beige	4-4-4	3.5	8	
		Grades to without trace clay, orange and beige	4-6-6	5.5	12	
370.0	8.0	Grades to with decomposed rock fragments, gray	3-4-4	7.5	8	Day, Cave-in at 9 feet
368.0	10.0	Grades to orange-beige	4-5-5	9.5	10	
366.0	12.0	Very dense sandy SILT (ML) damp, orange-beige - Residual	4-5-5	11.5	81	
364.0	14.0	Very dense sandy SILT (ML) damp, gray - Soft Weathered Rock	23-35-48	13.5		
362.5	15.5	Boring Terminated at 15.5 feet		15.5		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-8 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
404.3	0.5	Surficial Soil	3-4-4	0.5	7	
		Loose SILT AND SAND (ML-SM) damp, dark brown				
401.0	4.0	Loose sandy ROCK FRAGMENTS, trace silt and mica (GP) dry, brown - Residual	4-4-5	3.5	4	
397.0	8.0	Loose SILTY SAND (SM) dry, brown - Residual	3-2-3	7.5	5	
395.0	10.0	Very dense SILTY SAND AND ROCK FRAGMENTS (GM-SM) damp, brown - Soft Weathered Rock	44-204	9.5	47	
393.0	12.0	Very dense SILTY SAND AND ROCK FRAGMENTS (GM-SM) damp, gray-brown - Residual	9-25-25	11.5	47	
391.0	14.0	Very dense SILTY SAND, with decomposed rock fragments (SM-ML) damp, gray-brown - Soft Weathered Rock	35-205	13.5	149	Day, Cave-in at 14 feet
389.0	16.0	Very dense SILTY SAND AND ROCK FRAGMENTS (GM-SM) dry, tan brown and gray - Soft Weathered Rock	502	15.5	340	
			502	17.5	300	
			502	19.5	220	
			502	21.5	240	
379.5	25.5	Boring Terminated at 25.5 feet		25.5		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-9 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
399.0	0.5	Surficial Soil	3-4-7	0.5	11	
		Medium dense SILTY SAND (SM) damp, trace rock fragments, damp, brown				
389.5	4.0	Medium dense SILTY SAND (SM-ML) damp, brown - Residual	4-4-4	3.5	8	
387.5	6.0	Loose SAND, trace silt (SP-SM) dry, brown	4-4-4	5.5	8	
385.5	8.0	Medium dense clayey, silty SAND (SM-SC) damp, brown	4-5-5	7.5	10	
383.5	10.0	Grades to silty SAND (SM) gray and beige	7-8-13	9.5	23	Day, Cave-in at 11.5 feet
381.5	12.0	Grades to dense to very dense	26-25-27	11.5	52	
			12-17-25	13.5	37	
			17-22-23	15.5	45	
			11-16-18	17.5	34	
374.0	19.5	Boring Terminated at 19.5 feet		19.5		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-10 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
391.1	0.4	Surficial Soil	3-5-5	0.4	7	
		Medium dense SILTY SAND AND SILT, trace mica and mica, damp, brown (ML)				
389.5	2.0	Loose SILTY SAND to sandy SILT, trace decomposed rock fragments, mica, damp, brown (SM-ML)	8-5-8	1.6	13	
387.5	4.0	Grades to without rock fragments, damp to moist	2-3-5	3.6	7	
385.5	6.0	Very stiff sandy SILT to silty sand, trace rock fragments, mica, damp, brown (SM-ML) - Residual	6-12-16	5.6	28	
383.5	8.0	Dense to very dense silty SAND, trace rock fragments and mica, dry, brown (SM) - Residual	8-26-19	7.6	39	
380.5	11.0	Dense to very dense silty SAND, little rock fragments and mica, dry, brown (SM) - Soft Weathered Rock (Member)	18-38-304	10.6	27	
			12-10	12.6	27	
377.5	14.0	Grades to without rock fragments	8-14-21	13.6	35	
375.5	16.0	Grades to trace rock fragments	18-21-3	15.6	24	Day, Cave-in at 16 feet
373.5	18.0	Very dense silty SAND (SM) little mica, dry, brown - Soft Weathered Rock	36-200	17.6	118	
371.5	20.0	Boring Terminated at 20 feet		20.0		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-12 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
400.3	0.5	Surficial Soil	2-5-4	0.5	7	
		Loose silty SAND (SM) dry, brown				
398.8	2.0	Grades to trace rock fragments	4-4-5	1.5	9	
396.8	4.0	Medium dense to very dense silty SAND, dry, brown - Residual	3-7-8	3.5	15	
			10-21-20	5.5	41	
			11-13-13	7.5	24	
			3-4-3-3	9.5	43	
			2-2	11.5	44	
388.8	12.0	Medium dense to dense silty SAND (SM-ML) dry, brown - Residual	64-20-21	11.5	44	
			29-40-302	13.5	144	
385.8	15.0	Very dense SILTY SAND (SM-ML) - Soft Weathered Rock	46-202	14.5	167	Day, Cave-in at 16 feet
382.8	18.0	Grades to with decomposed rock fragments	502	17.5	180	
380.8	20.0	Boring Terminated at 20 feet		20.0		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-13 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
400.7	0.5	Surficial Soil	3-4-4	0.5	7	
		Loose sandy SILT (ML) dry, brown				
397.7	4.0	Medium dense to very dense sandy SILT (ML) dry, brown - Residual	4-5-7	3.5	12	
			3-5-7	5.5	12	
			9-15-13	7.5	30	
			17-23-30	9.5	52	
392.7	12.0	Very dense sandy SILT (ML) dry, brown - Soft Weathered Rock	6-20-0	11.5	124	Day, Cave-in at 13 feet
388.7	16.0	Very dense silty SAND (SM) dry, brown and white - Soft Weathered Rock	309	15.5	140	
386.7	18.0	Very dense silty SAND (SM) dry, brown and white - Soft Weathered Rock	309	17.5	180	
			309	19.5	200	
382.7	22.0	Grades to silty sandy ROCK FRAGMENTS (GM) dry, gray - Hard Weathered Rock	309	21.5	240	
380.7	24.0	No Recovery - Hard Weathered Rock	309	23.5	240	
379.2	25.5	Boring Terminated at 25.5 feet		25.5		

DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-14 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
397.7	0.5	Surficial Soil	9-4-8	0.5	14	
		Medium dense silty SAND, little decomposed rock fragments, damp, brown (SM) - Residual				
394.0	4.0	Loose silty fine SAND, little mica, little weathered rock fragments, damp, gray-brown (SM) - Residual	5-5-5	3.5	10	
392.0	6.0	Grades to medium dense with some mica, brown	2-9-9	5.5	15	
390.0	8.0	Hard fine sandy SILT, trace rock fragments, some mica, damp, brown (ML) - Residual	18-18-27	7.5	45	Day, Cave-in at 9 feet
388.0	10.0	Very dense silty SAND, some decomposed rock fragments, damp, brown (SM) - Residual	7-18-30	9.5	48	
386.0	12.0	Grades to trace mica, some decomposed rock fragments, green-brown	18-23-21	11.5	42	
384.0	14.0	Very dense silty SAND to fine sandy SILT, damp, tan-brown (SM-ML) - Residual	13-18-21	13.5	94	
382.0	16.0	Hard sandy SILT, some mica, dry, tan-brown (ML) - Soft Weathered Rock	28-206	15.5	160	
380.0	18.0	Hard sandy SILT, some mica, dry, tan-brown (ML) - Residual	10-26-30	17.5	174	
378.5	19.5	Hard sandy SILT, some mica, dry, tan-brown (ML) - Soft Weathered Rock	501	19.0	50	
376.0	20.0	Boring Terminated at 20 feet		20.0		

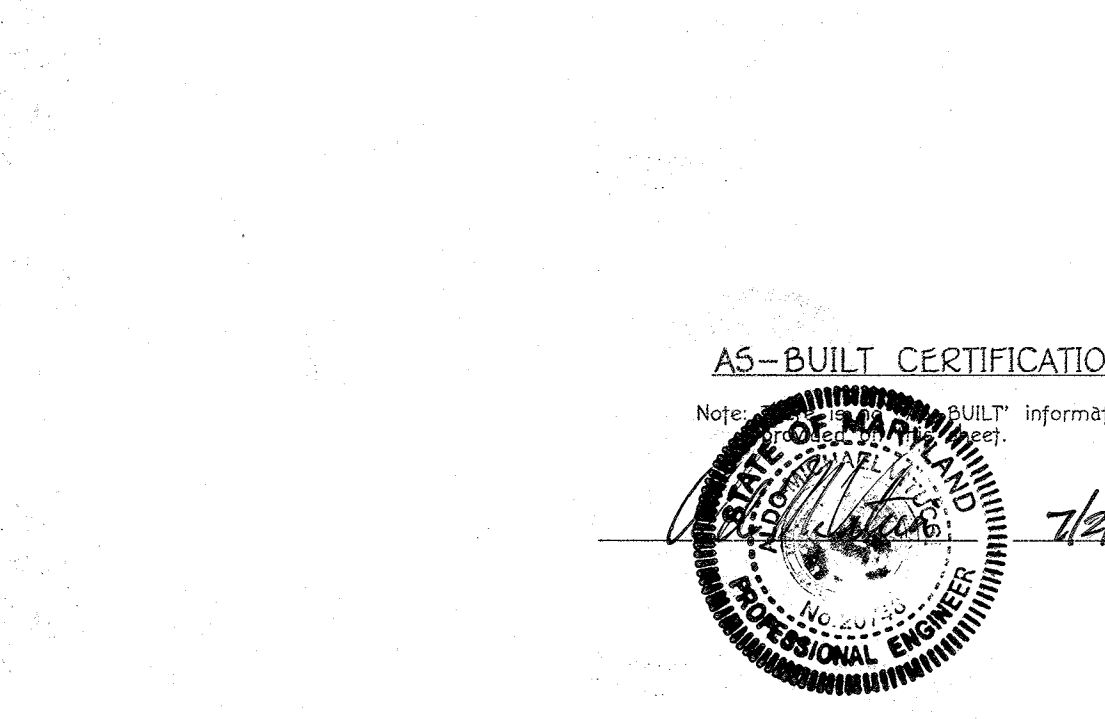
DRAFT

**BORING LOG**

Client: Trammell Crow Company  
 Project: Howard County Gov't Office Campus, Ellicott City, MD  
 Boring No. 1-15 (1 of 1) Date: 7-26-02

Station	Depth	DESCRIPTION OF MATERIALS (Classification)	* Sample No.	Depth (ft)	N Value (blows)	REMARKS
397.7	0.4	Surficial Soil	2-5-4	0.4	8	
		Loose silty SAND (SM) dry, brown				
396.8	4.0	Grades to dense to very dense	6-10-23	3.6	40	
			25-24-24	5.6	48	
			17-23-303	7.6	84	
392.4	9.0	Very dense silty SAND, trace mica and rock fragments, trace little decomposed rock fragments (SM) gray-brown, dry - Soft Weathered Rock	8-12-21	8.6	35	
390.4	12.0	Trace to very dense silty SAND, trace mica and rock fragments, trace little decomposed rock fragments (SM) gray-brown, dry - Residual	6-10-23	11.6	118	
			309	13.6	140	
			309	15.6	160	
			309	17.6	180	Day, Cave-in at 17.5 feet
382.4	20.0	Very dense sandy ROCK FRAGMENTS, trace silt and mica, damp, brown, dry - Soft Weathered Rock	309	19.6	300	
376.4	26.0	Boring Terminated at 26 feet		26.0		

DRAFT



MDE PERMIT AND TRACKING No. 200266336

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. Mahan* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Chris Damann* 7/16/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Chris Damann* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mark A. Layton* 7/16/03  
 DIRECTOR DATE

Date	No.	Revision Description

**Howard County Office Campus**  
 PARCEL A  
 CIP-C-0282

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELICOTT CITY, MD 21043

**DMW**  
 Daft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705

SECTION / AREA: 852 & P10847  
 PLAN / OR / LT: N/A  
 BLOCK # / ZONE: 24 & 25  
 SHEET NO.: 2  
 SHEET DATE: 6/29

TITLE: SOIL BORING LOGS

Des. By: LC Scale: AS SHOWN Proj. No. 01001.C  
 D. by: Date: 3/5/12  
 Chk. By: RLN Approved: 11 of 44

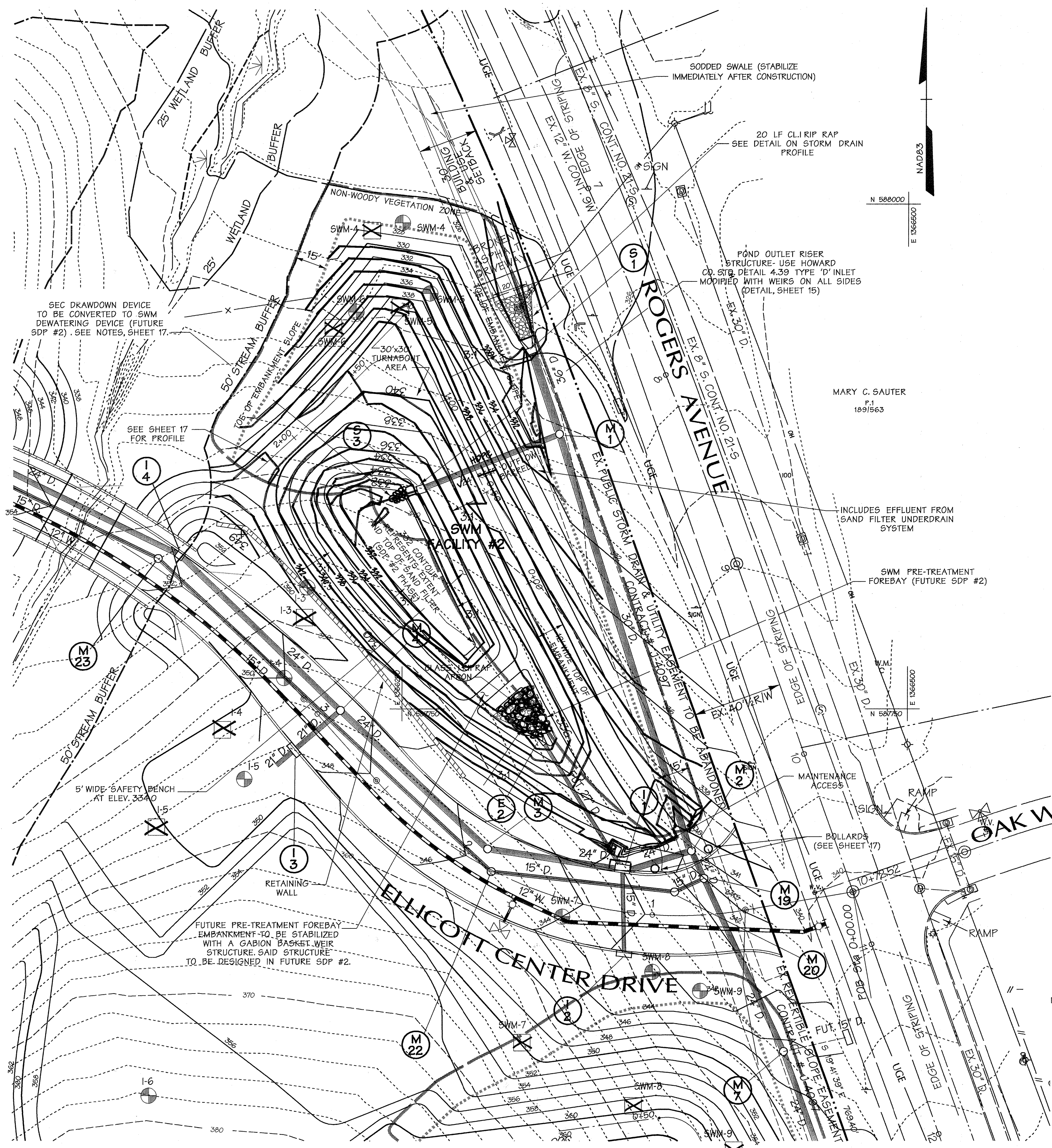
Professional Engr. No. 10557

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 50P-03-02G









**SWM FACILITY #2**  
SCALE: 1"=30'

NOTES: SEE SHEET 2 FOR GRADING UNDER THIS SDP.  
PLANTING WITHIN SWM FACILITIES DEFERRED TO SDP#2.

Legend	
--- 304 ---	EXISTING MINOR CONTOURS
--- 310 ---	EXISTING MAJOR CONTOURS
---	PROPOSED MINOR CONTOURS
---	PROPOSED MAJOR CONTOURS
⊗	SOIL BORING
⊗	AS-BUILT SOIL BORING
---	PROPERTY LINE
---	ROADWAY RIGHT-OF-WAY
---	EXISTING STORM DRAIN
---	TOE OF EMBANKMENT SLOPE DELINEATOR LINE
---	NON-WOODY VEGETATION ZONE
---	25' WETLAND BUFFER
---	50' STREAM BUFFER
---	PROP. STORM DRAIN
---	RETAINING WALL
---	ORDINARY HIGH WATER MARK

**AS-BUILT CERTIFICATION**  
I hereby certify, by my seal, that the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.

*John W. Ranocchia, Sr.*  
Professional Engineer  
7/4/03  
Date

FACILITY #2 DESIGN FLOW SUMMARY PROPOSED CONDITIONS	
Structure Type	Sand Filter
Water Quality Type	Surface Sand Filter (F-1)
Structure Classification	'A'
Watershed Area to Facility	0.0049 Sq. Mi.
Level of Management: Required	1-Year, Cpv
Level of Management: Provided	1-Year, Cpv
Top Width Provided	12'
Maximum Height of Fill	10.0'
Freshboard Required	2.0'
Freshboard Provided	2.0'
Water Quality Vol. WQ <sub>1</sub> , Required (Ac-ft)	0.11
Water Quality Vol. WQ <sub>2</sub> , Provided (Ac-ft)	0.11
Recharge Vol. R <sub>1</sub> , Provided (Ac-ft)	See Pond 1 Chart
Channel Protection Vol. Cp, Required (Ac-ft)	0.295
Channel Protection Vol. Cp, Provided (Ac-ft)	0.663
WQ <sub>1</sub> Water Surface Elev.	333.6
Cp Water Surface Elev.	337.5
Riser Crest Elev.	337.5
100 Yr. Clogged Water Surface Elev.	338.0
Pond Volume Below 100 Yr. Clogged WSE (Ac-ft)	0.910

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS		
<i>William Z. ...</i> CHIEF, BUREAU OF HIGHWAYS	7-11-03 DATE	
APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING		
<i>...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	7/1/03 DATE	
<i>...</i> CHIEF, DIVISION OF LAND DEVELOPMENT	7/6/03 DATE	
<i>...</i> DIRECTOR	7/8/03 DATE	
Date	No.	Revision Description

Howard County Office Campus PARCEL A CIP-C-0282			
OWNER / DEVELOPER: HOWARD COUNTY DEPT. OF PUBLIC WORKS 3430 COURT HOUSE DRIVE ELLICOTT CITY, MD 21043			
<b>DMW</b> Daft-McCune-Walker, Inc. 200 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-3353 Fax 296-4705			
A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals			
SUBMITTER NAME	SECTION AREA	DATE	PROJECT #
HO. CO. OFFICE CAMPUS	NA	7/1/03	852 & P10B47
PLAT OR LOT	BOX #	ZONE	PERMITS
156-7-70	6 & 1	POR 24 & 25	2
WATER CODE			6029
TITLE			
STORMWATER MANAGEMENT FACILITY #2			
Des. By	LC/MRT	Scale	1"=30'
Proj. No.			01001.C
Drn. By		Date	7/5/03
Chk. By	RLH/MRT	Approved	
Professional Engr. No.			13 of 44

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

*Jim Meyer*  
U.S.D.A. NATURAL RESOURCE CONSERVATION SERVICE  
7/1/03  
DATE

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

APPROVED: *...*  
HOWARD SOIL CONSERVATION DISTRICT  
7/1/03  
DATE

PLAN NUMBER

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

*John W. Ranocchia, Sr.*  
SIGNATURE OF DEVELOPER  
PRINT NAME BELOW SIGNATURE  
DATE

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

*John W. Ranocchia, Sr.*  
SIGNATURE OF ENGINEER  
PRINT NAME BELOW SIGNATURE  
REG. NO. 10551  
DATE 6-11-03

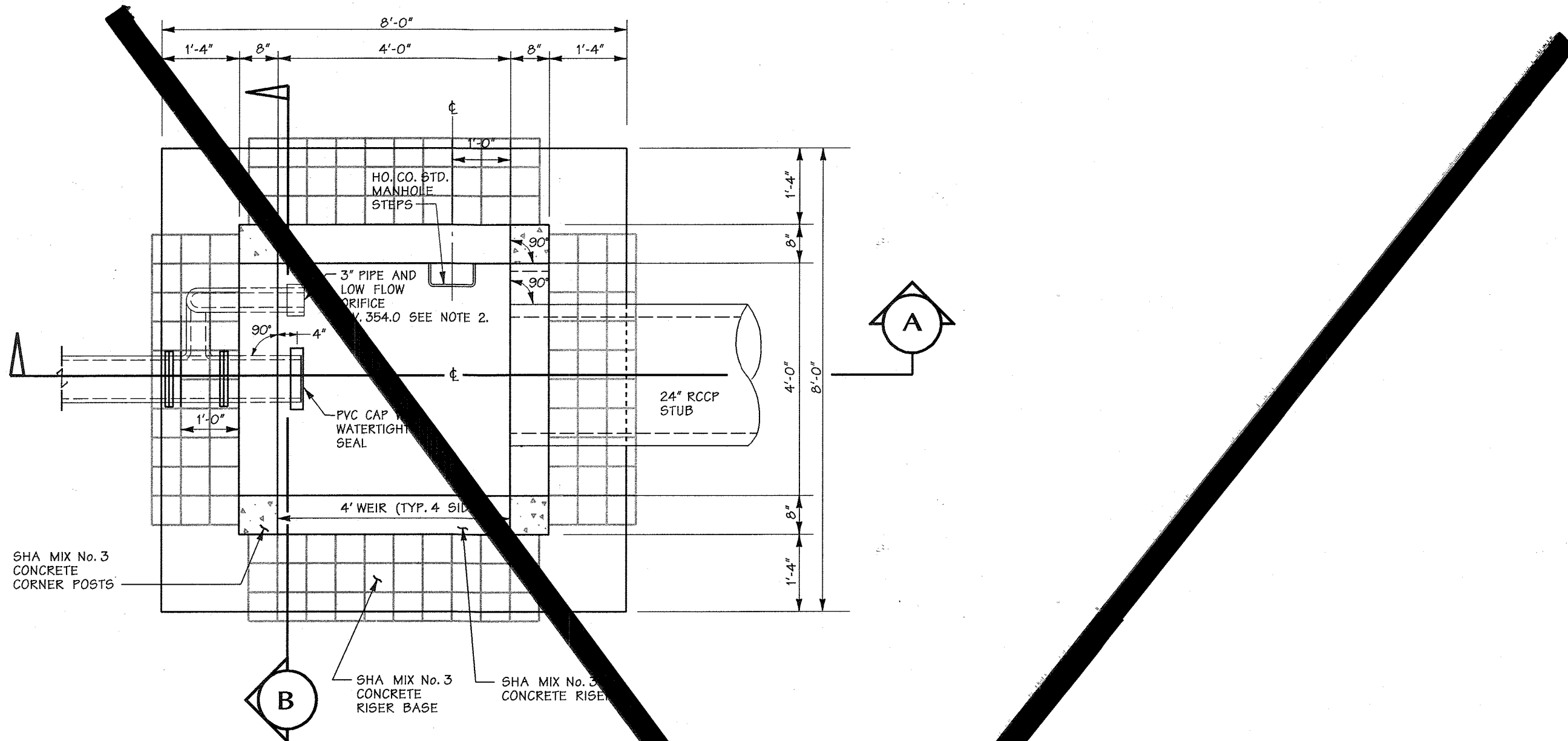
MDE PERMIT AND TRACKING No. 200266336

6-04-03  
Date

*John W. Ranocchia, Sr.*  
Professional Engr. No. 10551

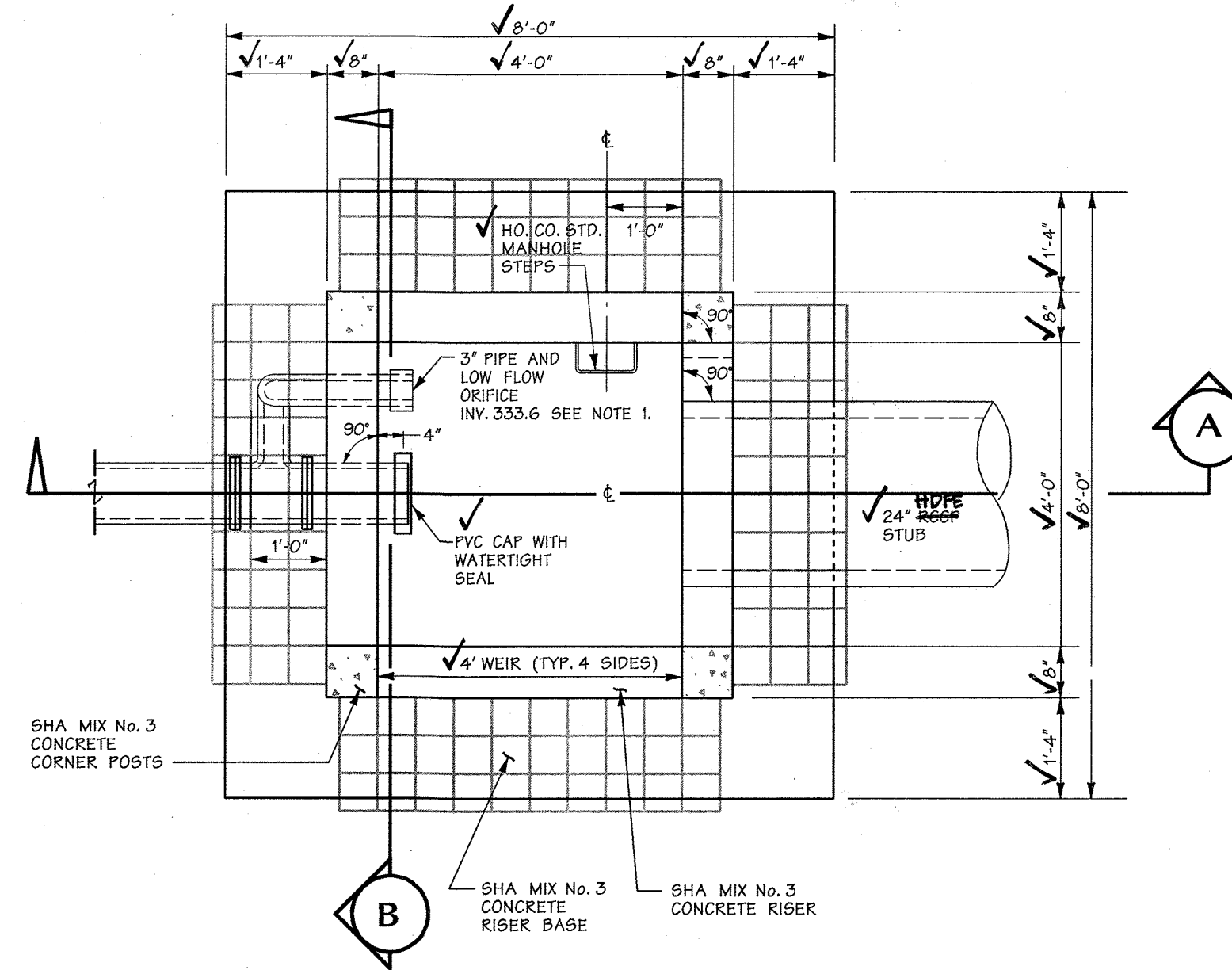
"AS-BUILT" 909-09-026





S-2 RISER PLAN (TOP SLAB REMOVED) - SWM FACILITY #1

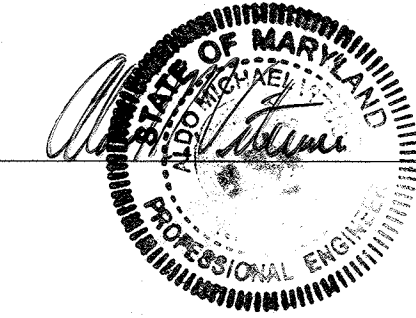
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CAST IN PLACE



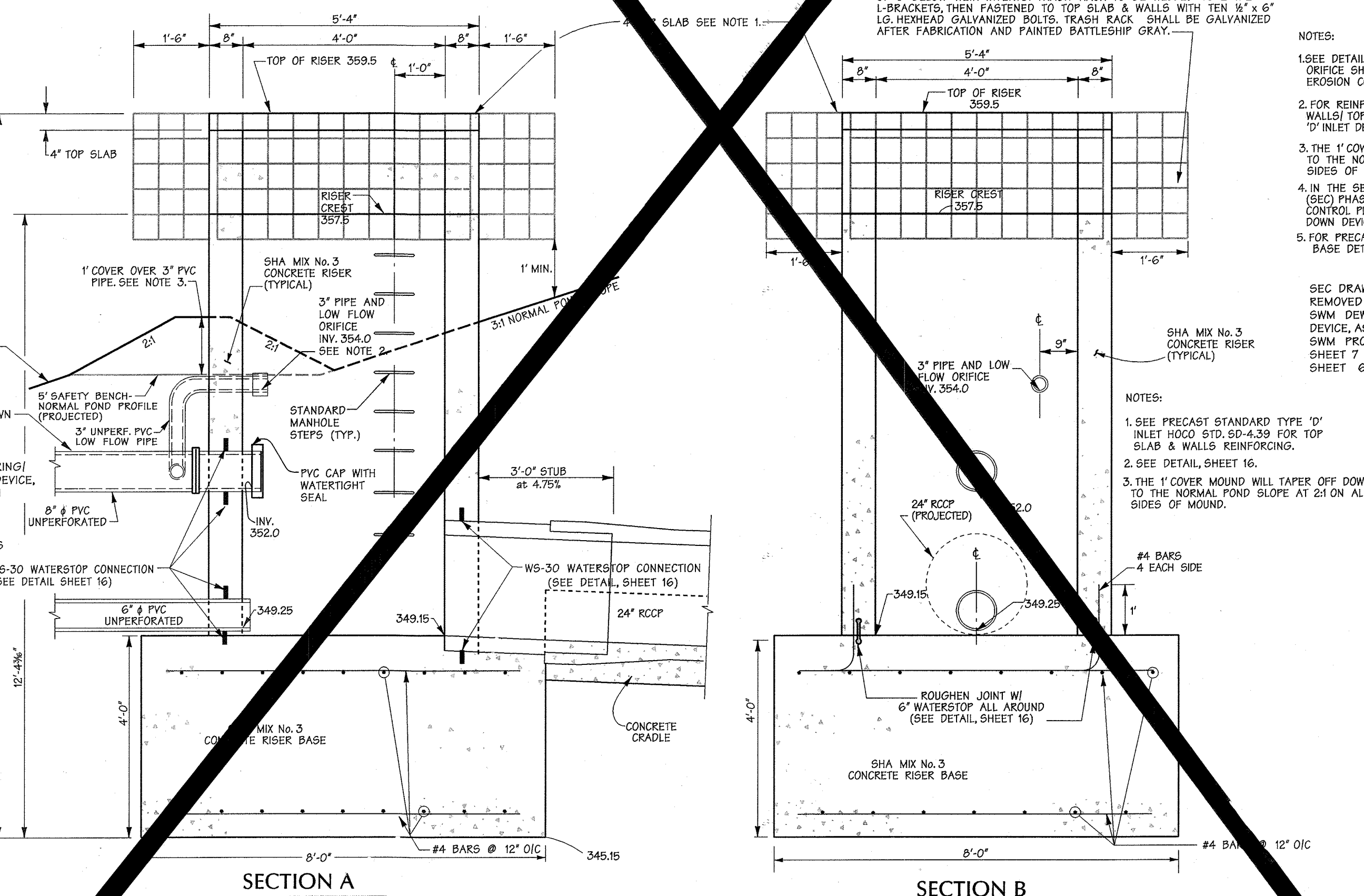
S-3 RISER PLAN (TOP SLAB REMOVED) - SWM FACILITY #2

Scale: 1/2" = 1'-0"  
CAST IN PLACE

**AS-BUILT CERTIFICATION**  
I hereby certify, by my seal, that the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.

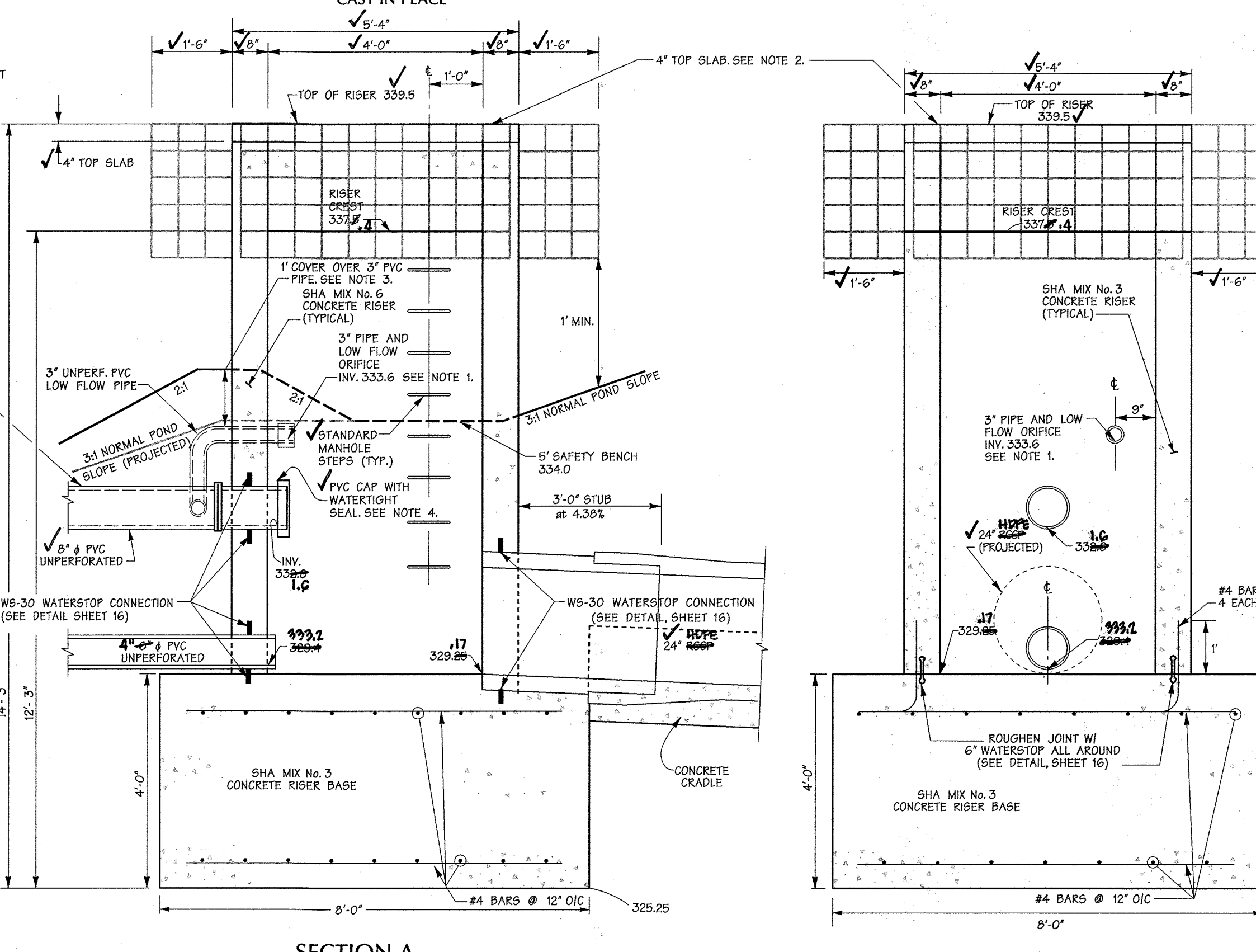


Date: 7/1/03



S-2 RISER DETAIL FOR POND - SWM FACILITY #1

Scale: 1/2" = 1'-0"  
CAST IN PLACE



S-3 RISER DETAIL FOR POND - SWM FACILITY #2

Scale: 1/2" = 1'-0"  
CAST IN PLACE

- NOTES:
- SEE DETAIL SHEET 16. LOW FLOW ORIFICE SHALL BE BLOCKED DURING SEDIMENT EROSION CONTROL (SEC) PHASE.
  - FOR REINFORCEMENT IN THE RISER WALLS TOP SLAB, SEE PRECAST STD. TYPE 'D' INLET DETAIL, HO. CO. STD. 50-4-39.
  - THE 1' COVER MOUND WILL TAPER OFF DOWN TO THE NORMAL POND SLOPE AT 2:1 ON ALL SIDES OF MOUND.
  - IN THE SEDIMENT AND EROSION CONTROL (SEC) PHASE THIS CAP WILL SERVE AS A CONTROL PLATE WITH ORIFICE FOR DRAIN-DOWN DEVICE. SEE DETAIL SHEET 16.
  - FOR PRECAST RISER TIE-IN SEE RISER BASE DETAIL SHEET 15.

SEC DRAW-DOWN DEVICE, TO BE REMOVED AND REPLACED BY SWM DEWATERING POND DRAIN DEVICE, AS SHOWN ON SWM PROFILE. SEE DETAIL SHEET 7 AND SPECIFICATIONS SHEET 6.

- NOTES:
- SEE PRECAST STANDARD TYPE 'D' INLET HOOD STD. 50-4-39 FOR TOP SLAB & WALLS REINFORCING.
  - SEE DETAIL SHEET 16.
  - THE 1' COVER MOUND WILL TAPER OFF DOWN TO THE NORMAL POND SLOPE AT 2:1 ON ALL SIDES OF MOUND.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
W. J. W. 7-11-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
C. D. 7/14/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
D. M. 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE  
D. M. 7/21/03  
DIRECTOR DATE

Date	No.	Revision Description

**Howard County Office Campus**  
PARCEL A  
CIP-C-0282  
OWNER / DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

**DMW**  
Daft-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21288  
(410) 296-3333  
Fax 296-4705  
A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME	HO. CO. OFFICE CAMPUS	SECTION/AREA	N/A	DATE	8/2 & P10B47
PLAN TITLE	STORM WATER MANAGEMENT RISER DETAILS	DATE	7/1/03	DESIGNER	KDE
WATER CODE	6029	SEWER CODE			

Des. By	RLH/LC/MRT	Scale	AS SHOWN	Proj. No.	0100..C
Drn. By	KDE	Date	7/1/03		
Cnk. By	MRT	Approved			

6-4-03  
Date  
Professional Engr. No. 10551

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.  
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE  
7/1/03  
DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT.  
7/1/03  
DATE

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

Signature: [Signature]  
Date: 6/21/03

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

Signature: [Signature]  
Date: 6-4-03

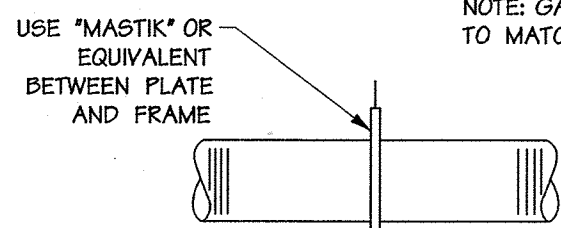
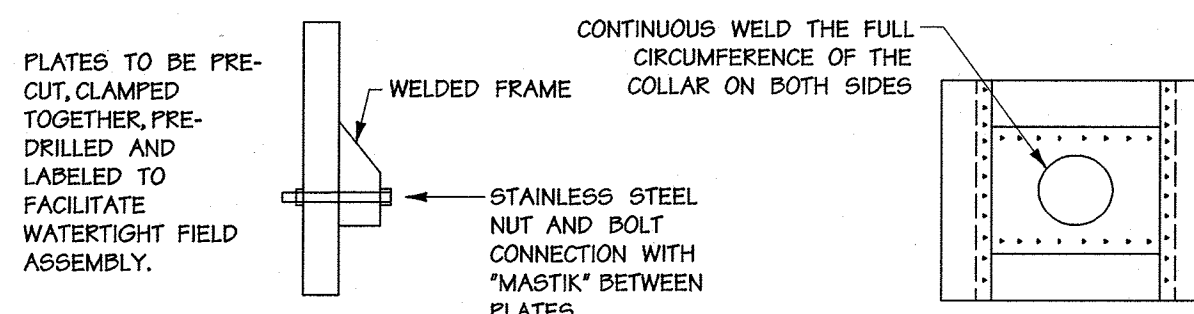
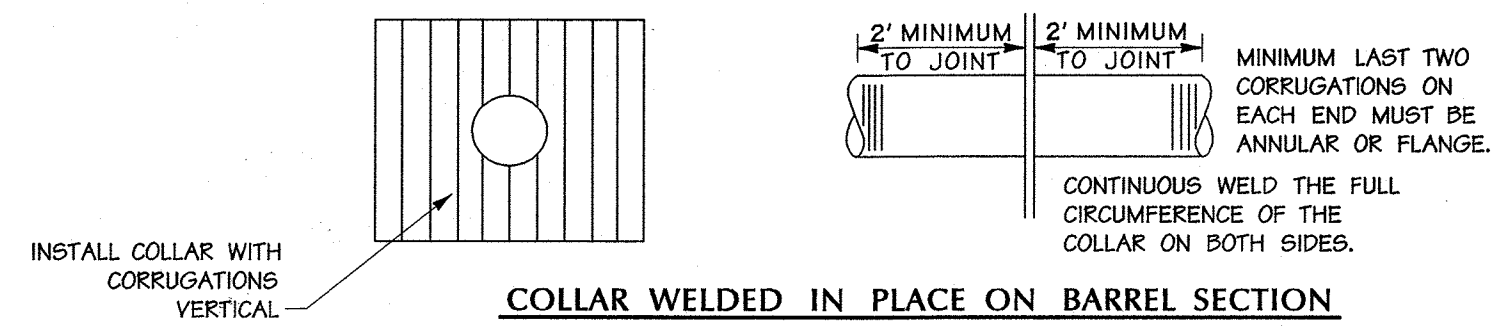
**DATA SOURCES:**  
ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELLICOTT CENTER DRIVE IN JUNE, 2002.  
WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
NOTE:  
ALL STREAMS ON SITE ARE PERENNIAL.



**AS-BUILT CERTIFICATION**  
I hereby certify, by my seal, that the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.



7/1/13  
Date

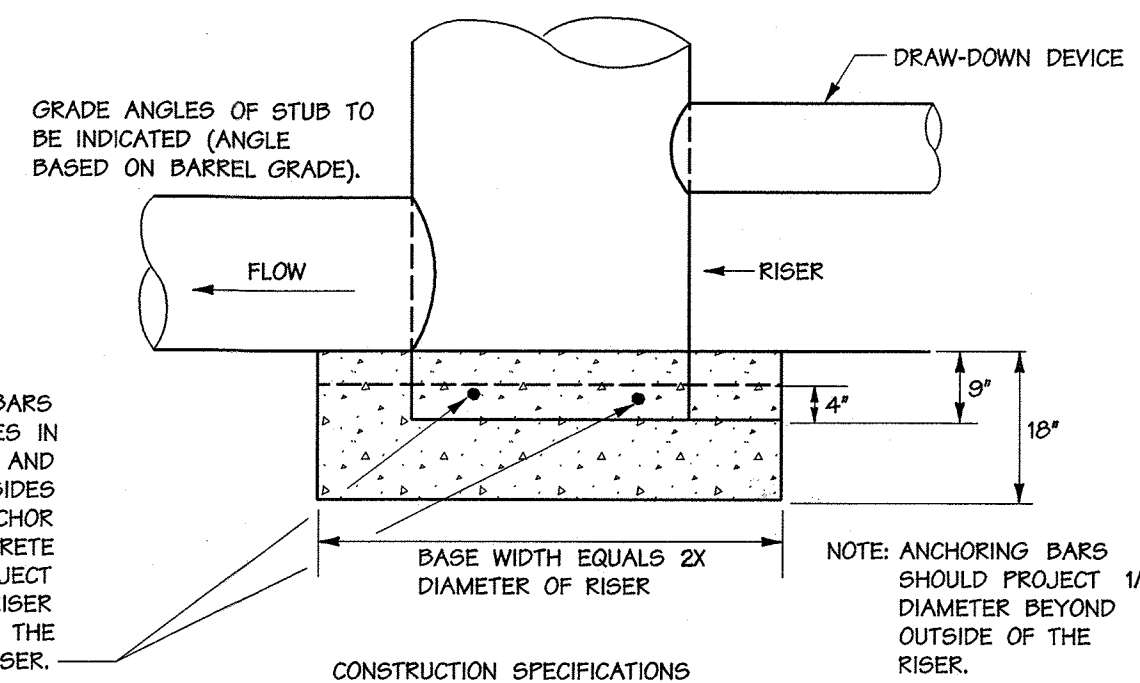


U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

C - 10 - 24

MARYLAND DEPARTMENT OF ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

**Typical Anti-Seep Collars (METAL PIPE)** Not To Scale



THE RISER SHALL HAVE A BASE ATTACHED WITH A WATER-TIGHT CONNECTION AND SHALL HAVE SUFFICIENT WEIGHT TO PREVENT FLOTATION OF THE RISER. TWO APPROVED BASES FOR RISERS 10" OR LESS IN HEIGHT ARE:  
1. A CONCRETE BASE 18" THICK WITH THE RISER EMBEDDED 9" IN THE BASE  
2. A 1/4" MINIMUM THICKNESS STEEL PLATE ATTACHED TO THE RISER BY A CONTINUOUS WELD AROUND THE CIRCUMFERENCE OF THE RISER TO FORM A WATER-TIGHT CONNECTION. THE PLATE SHALL HAVE 2" OF STONE, GRAVEL, OR COMPACTED EARTH PLACED ON IT TO PREVENT FLOTATION. IN EITHER CASE, EACH SIDE OF THE SQUARE BASE SHALL BE TWICE THE RISER DIAMETER.  
NOTE: FOR RISERS GREATER THAN TEN FEET HIGH, COMPUTATIONS SHALL BE MADE TO DESIGN A BASE WHICH WILL PREVENT FLOTATION. THE MINIMUM FACTOR OF SAFETY SHALL BE 1.20 (DOWNWARD FORCES = 1.20 X UPWARD FORCES).

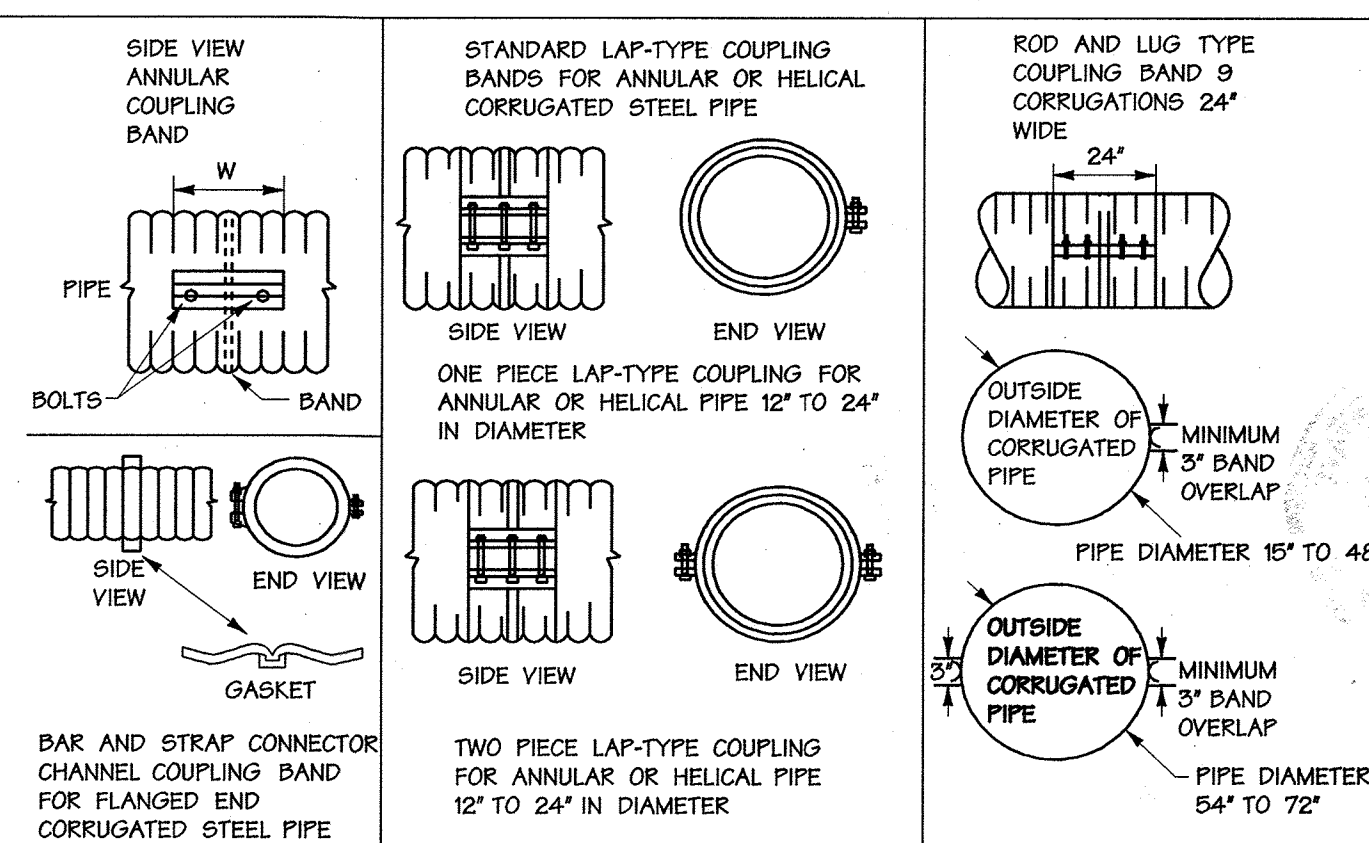
U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

C - 10 - 25

MARYLAND DEPARTMENT OF ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

**Riser Base Detail**

(ALL CONNECTOR BANDS REQUIRE NEOPRENE GASKETS)



U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

C - 10 - 27

MARYLAND DEPARTMENT OF ENVIRONMENT  
WATER MANAGEMENT ADMINISTRATION

**Types of Couplers for Corrugated Steel Pipe** Not To Scale

**ENGINEERS CERTIFICATE:**

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

Signature of Engineer: John W. Ramcharan  
REG. NO. 10551  
DATE: 6-4-03

**DEVELOPERS CERTIFICATE:**

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

Signature of Developer: [Signature]  
DATE: 7/1/03

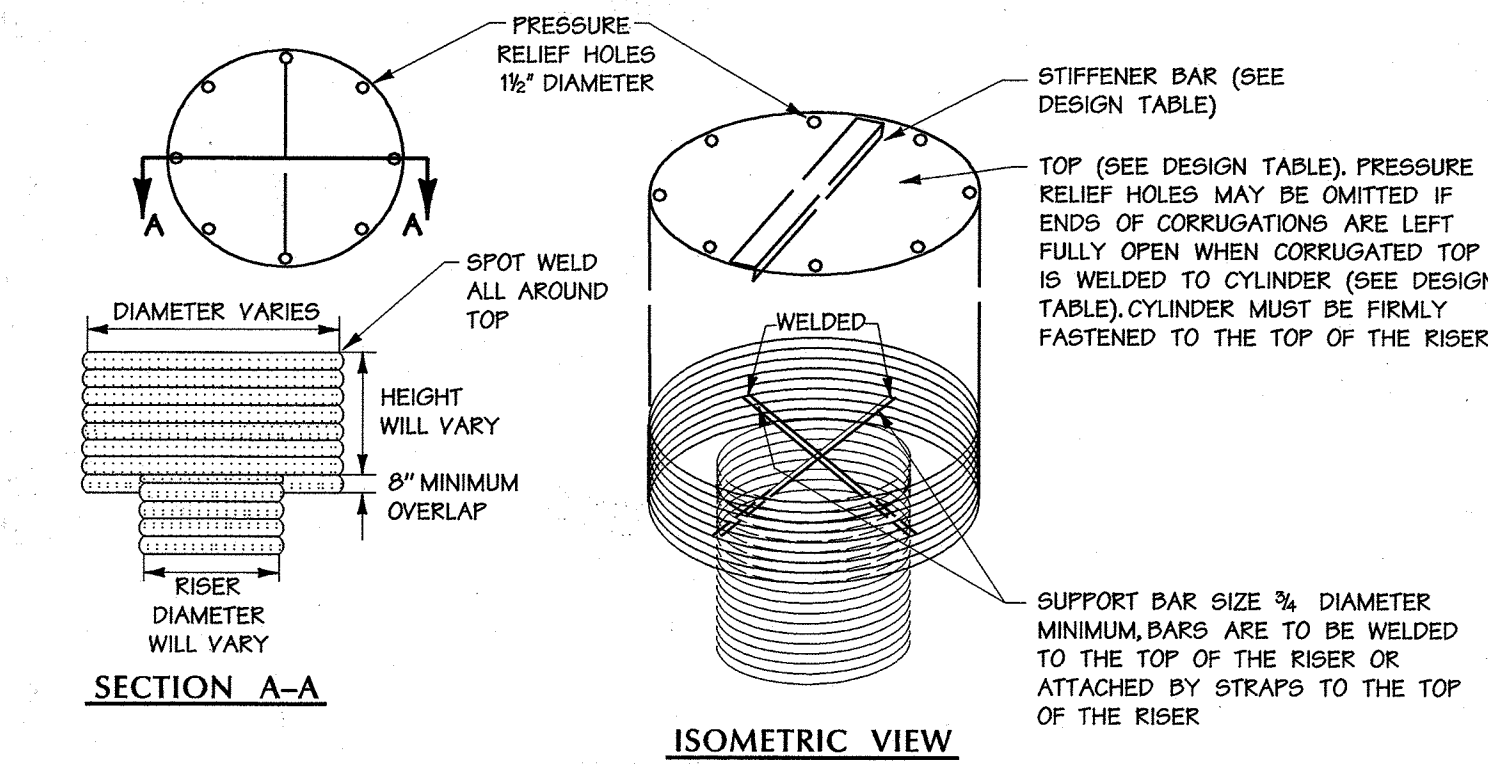
THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.

Signature: [Signature]  
DATE: 7/1/03

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

Signature: [Signature]  
DATE: 7/1/03

PLAN NUMBER: [Blank]



RISER DIAM., IN.	TRASH RACK CYLINDER DIAM. THICK. IN. GAGE	H. IN.	MINIMUM SIZE SUPPORT BAR	MINIMUM TOP THICKNESS STIFFENER
12	18	6	#6 REBAR	16 GA.
15	21	7	"	"
18	27	8	"	"
21	30	11	"	"
24	36	16	"	14 GA.
27	42	15	"	14 GA.
36	54	17	#8 REBAR	12 GA.
42	60	19	1-1/4" PIPE OR 1-1/4 x 1-1/4 x 1/4 ANGLE	10 GA.
48	72	21	1-1/2" PIPE OR 1-1/2 x 1-1/2 x 1/4 ANGLE	8 GA.
54	78	25	2" PIPE OR 2 x 2 x 3/8 ANGLE	8 GA. 2 x 2 x 1/4 W/ STIFFENER
60	90	29	2-1/2" PIPE OR 2-1/2 x 2-1/2 x 1/4 ANGLE	8 GA. 2-1/2 x 2-1/2 x 1/4 ANGLE
66	96	33	2 x 2 x 3/8 ANGLE	8 GA. 2-1/2 x 2-1/2 x 1/4 ANGLE
72	102	36	2-1/2" PIPE OR 2-1/2 x 2-1/2 x 1/4 ANGLE	8 GA. 2-1/2 x 2-1/2 x 1/4 ANGLE
78	114	39	2 x 2 x 3/8 ANGLE	8 GA. 2-1/2 x 2-1/2 x 1/4 ANGLE
84	120	42	2-1/2" PIPE OR 2-1/2 x 2-1/2 x 1/4 ANGLE	8 GA. 2-1/2 x 2-1/2 x 1/4 ANGLE

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE  
C - 10 - 28  
MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Concentric Trash Rack & Anti-Vortex Device** Not To Scale

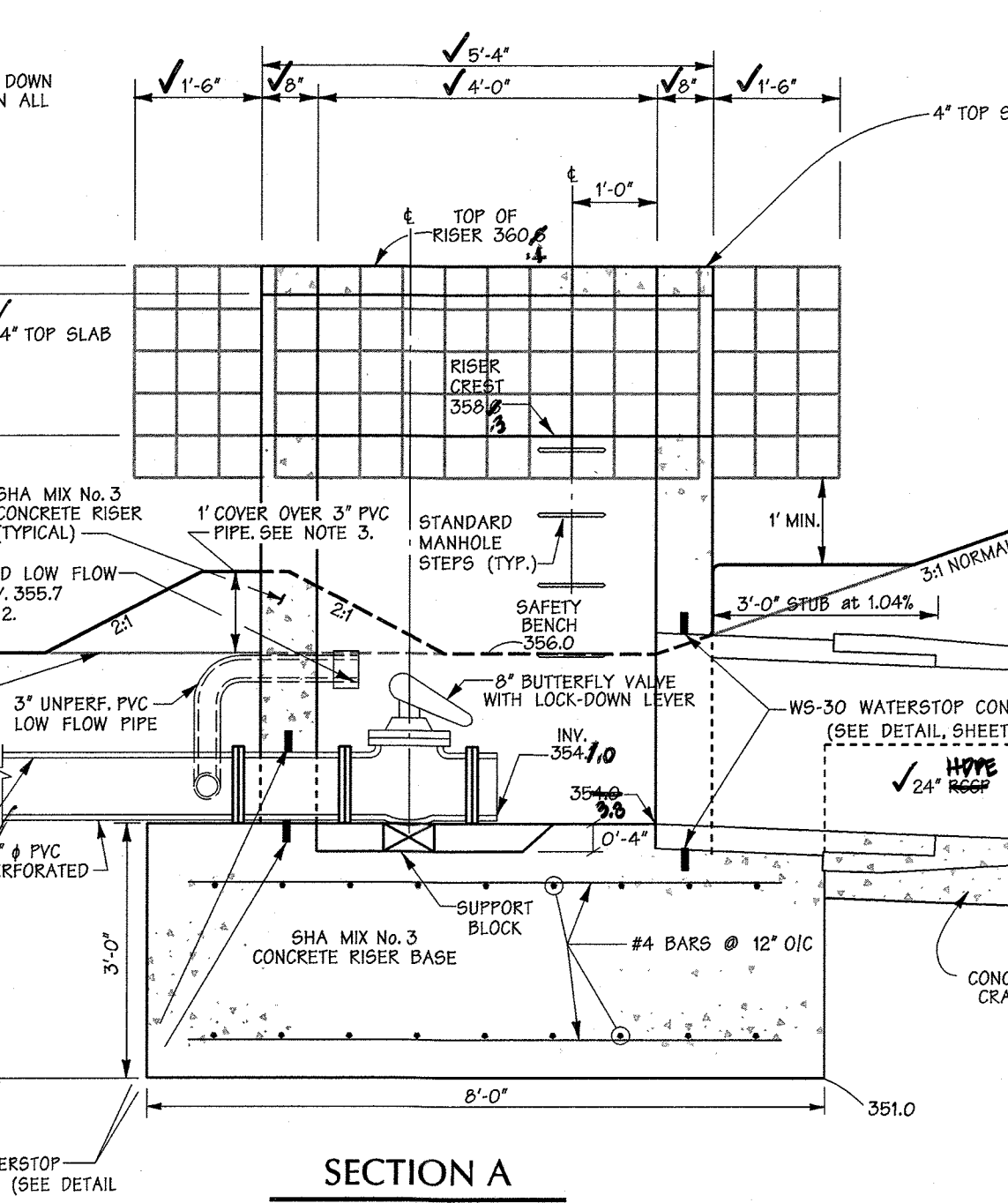
MDE PERMIT AND TRACKING No. 200266336

NOTES:

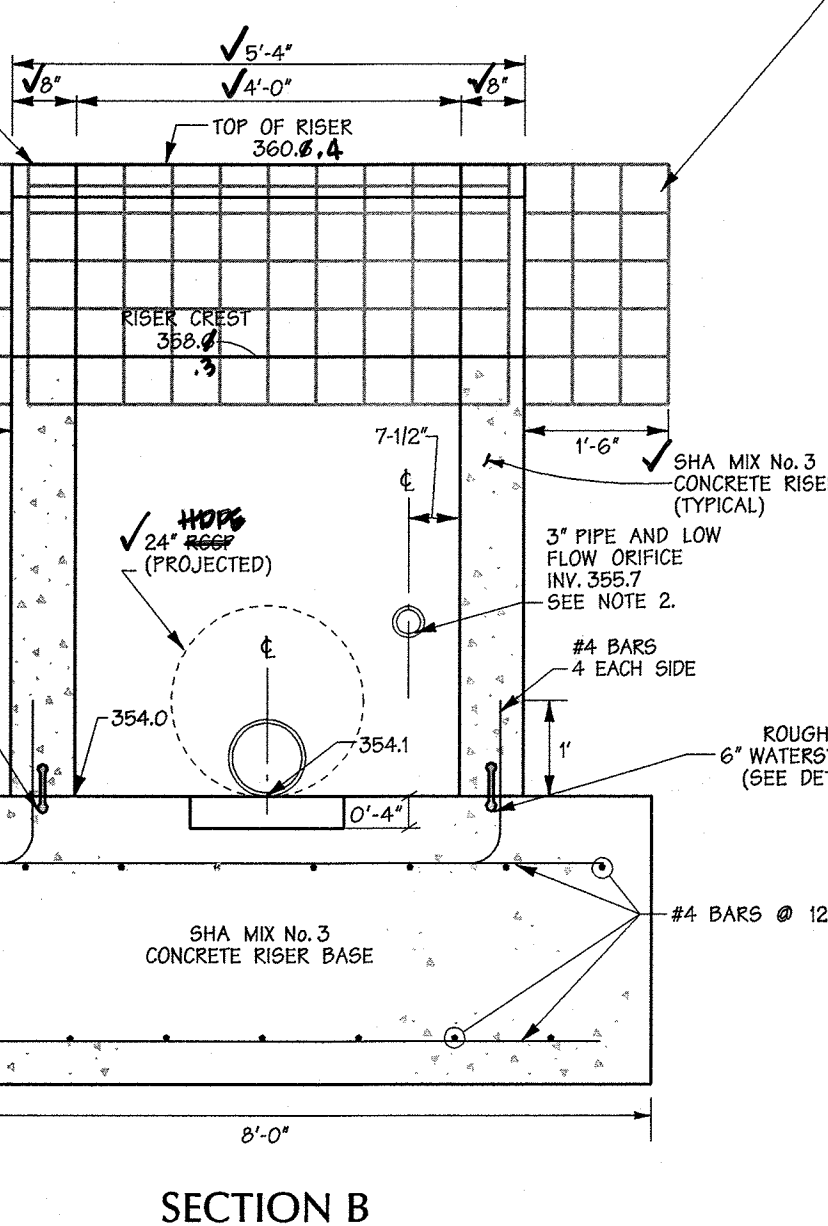
- FOR REINFORCEMENT IN THE RISER WALLS TOP SLAB, SEE PRECAST STD. TYPE 'D' INLET DETAIL, HO. CO. STD. 04-39.
- SEE DETAIL SHEET 16.
- THE 1' COVER MOUND WILL TAPER OFF DOWN TO THE NORMAL POND SLOPE AT 2:1 ON ALL SIDES OF MOUND.

**S-4 RISER PLAN (TOP SLAB REMOVED) - SWM FACILITY #3**

Scale: 1/2" = 1'-0" CAST IN PLACE



TRASH RACK 2'-6" x 5'-0" (OUTSIDE DIMENSION) x 1'-6" DEEP #8 BENT BARS @ 6" O.C. TRASH RACK SHALL EXTEND A MINIMUM OF 6" BELOW WEIR INVERTS. TRASH RACK TO BE WELDED TO 2" x 2" L-BRACKETS, THEN FASTENED TO TOP SLAB & WALLS WITH TEN 3/4" x 6" L6. HEAVY GALVANIZED BOLTS. TRASH RACK SHALL BE GALVANIZED AFTER FABRICATION AND PAINTED BATTLESHIP GRAY.



**SECTION A**

**SECTION B**

**S-4 RISER DETAIL FOR POND - SWM FACILITY #3**

Scale: 1/2" = 1'-0" CAST IN PLACE

SEC DRAW-DOWN DEVICE, TO BE REMOVED AND REPLACED BY SWM DEWATERING POND DRAIN DEVICE AS SHOWN ON SWM PROFILE, SEE DETAIL SHT. 7 AND SPECIFICATIONS SHT. 6.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
Signature: [Signature]  
CHIEF, BUREAU OF HIGHWAYS  
DATE: 7-11-03

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
Signature: [Signature]  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 7/1/03

Signature: [Signature]  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 7/1/03

Signature: [Signature]  
DIRECTOR  
DATE: 7/1/03

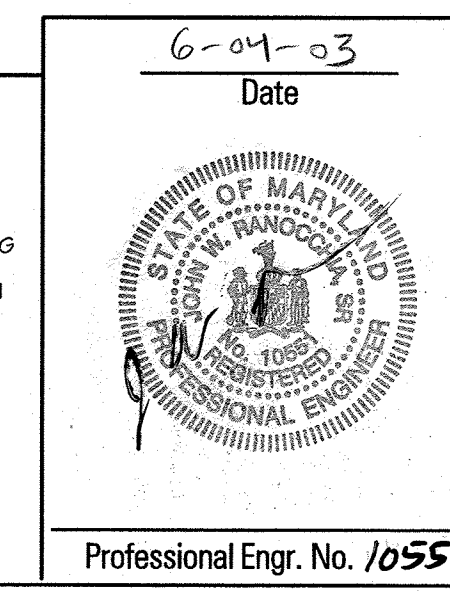
**Howard County Office Campus**  
PARCEL A  
CIP-C-0282

OWNER / DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

**DMW**  
Duff-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3832  
Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SECTION/AREA: NA  
HO. CO. OFFICE CAMPUS  
DATE: 6-23-03  
SHEET NO.: 24  
SHEET TOTAL: 2  
SHEET NO.: 2  
SHEET TOTAL: 6029



Professional Engr. No. 10551

**TITLE**  
STORMWATER MANAGEMENT  
RISER DETAILS & EROSION SEDIMENT CONTROL DETAILS

Des. By: RLH/LC/MRT  
Scale: AS SHOWN  
Proj. No. 01001.C

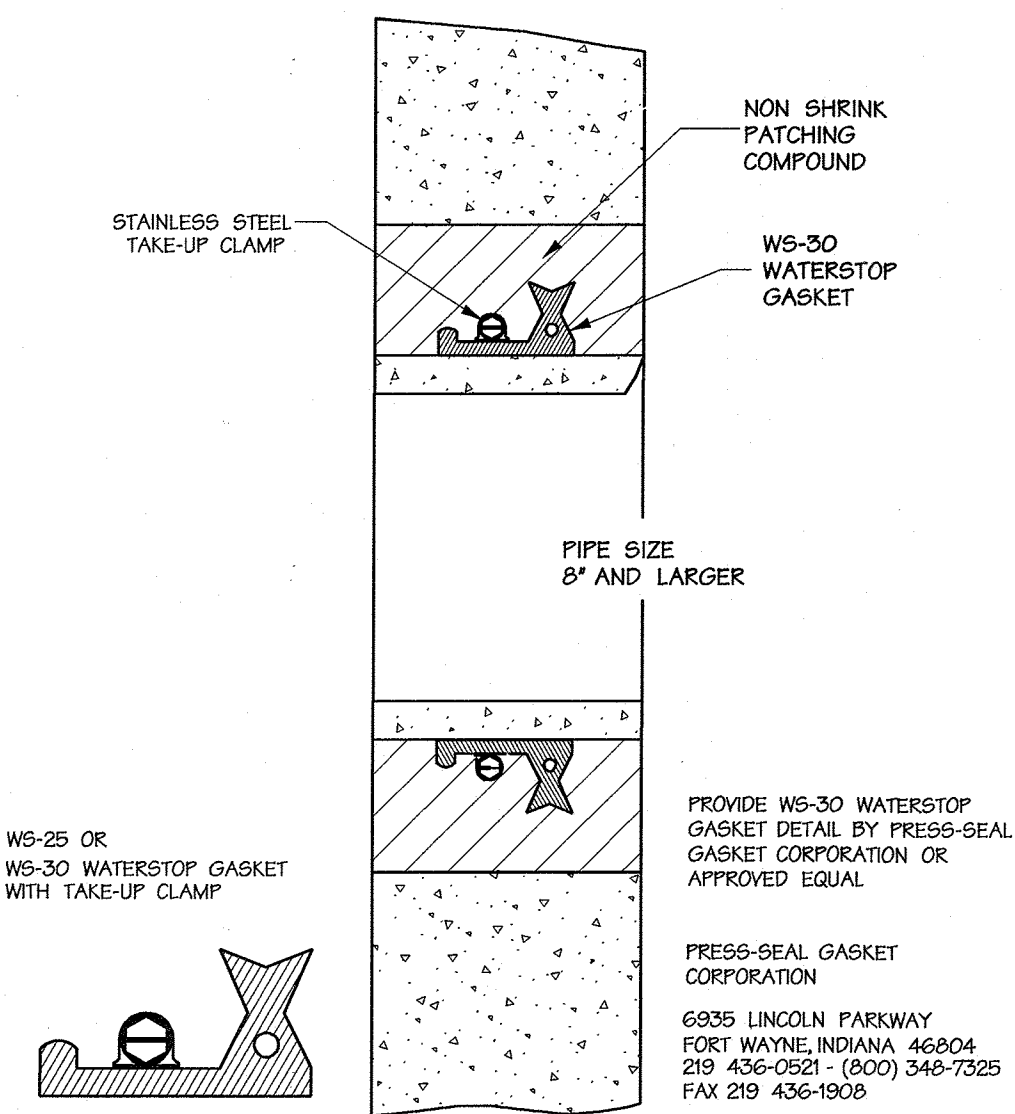
Dim. By: KDE  
Date: 3/15/12

Chk. By: RLH/MRT  
Approved: [Signature]  
Date: 7/1/03

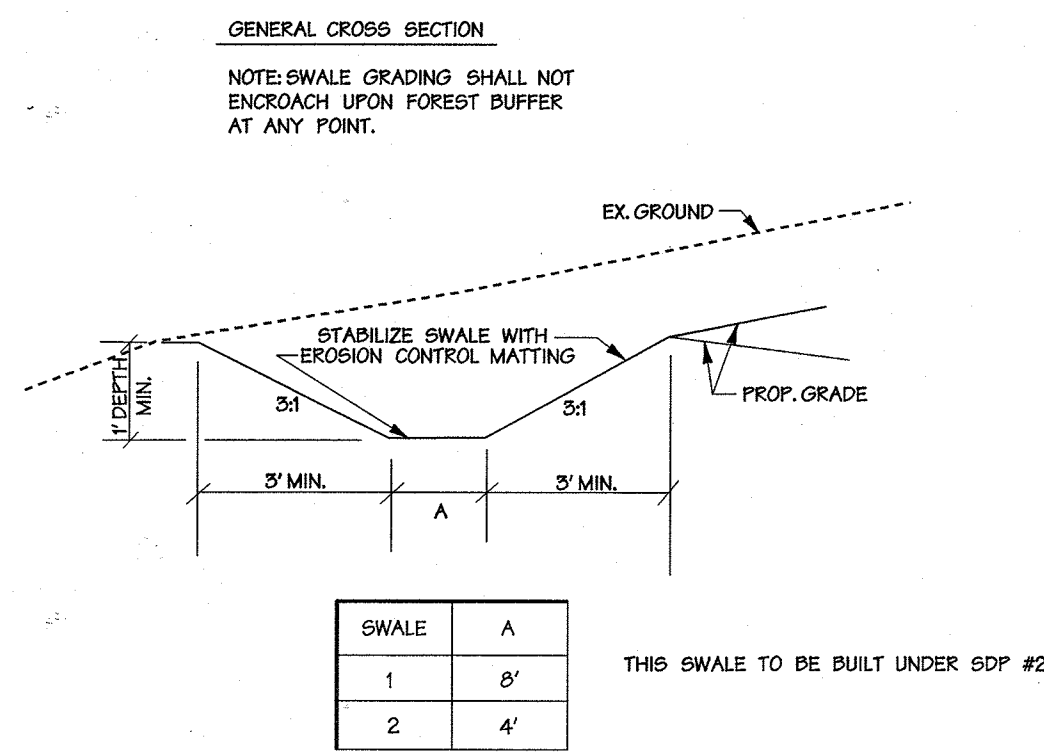
15 of 44

"AS-BUILT" 6/23/03

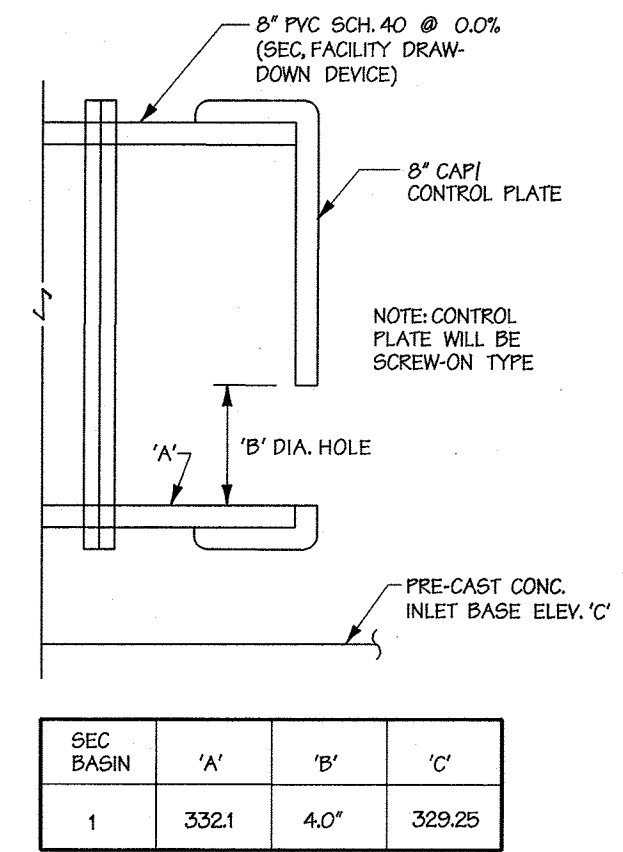




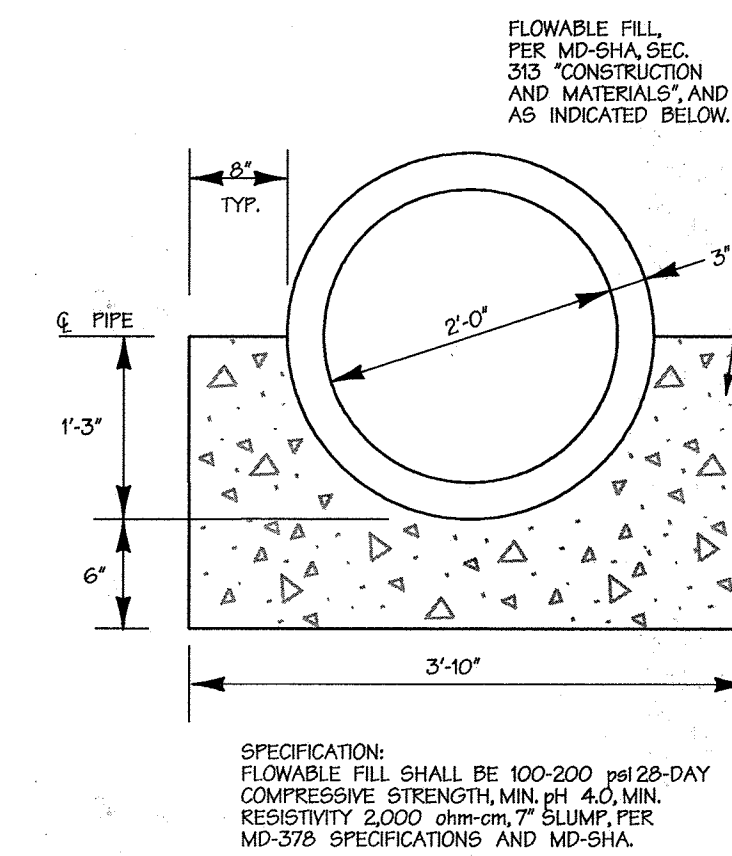
**WS-30 WATERSTOP PIPE WATERSTOP DETAIL**  
NOT TO SCALE



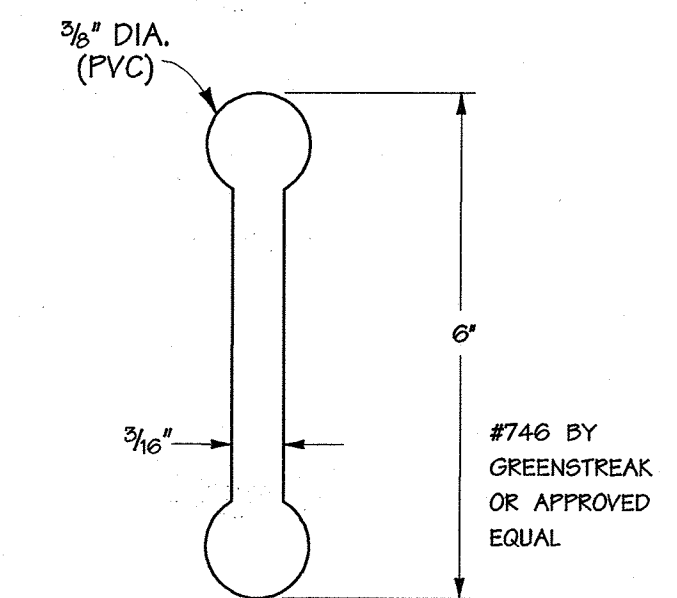
**PERMANENT WATER QUALITY AND RECHARGE SWALE DETAIL**  
NOT TO SCALE



**SEDIMENT AND EROSION CONTROL 8\"/>**



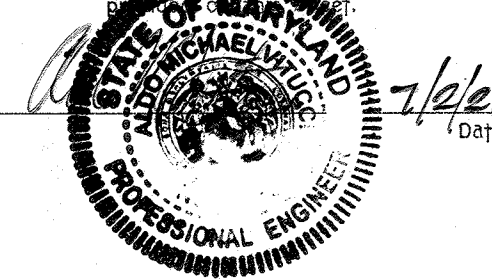
**CONCRETE CRADLE DETAIL**  
NTS



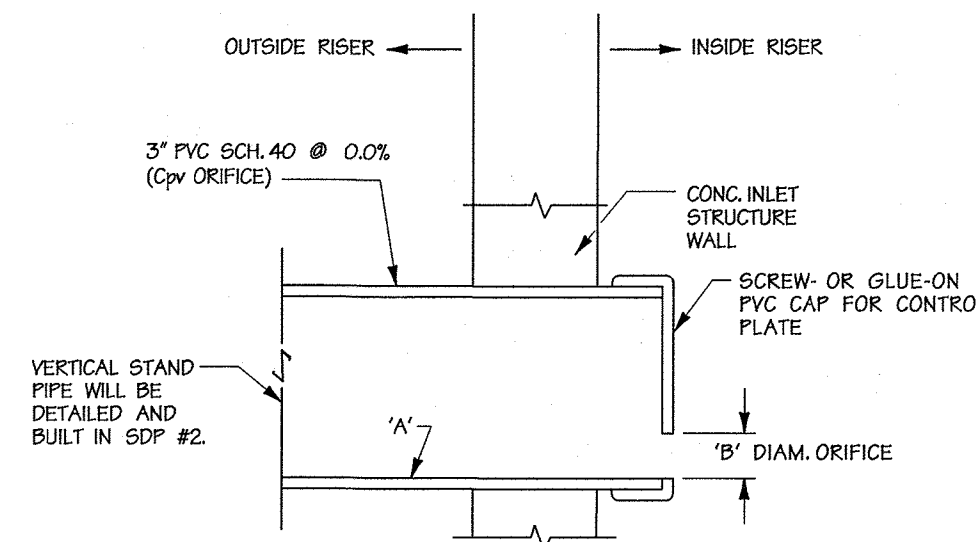
**6\"/>**

**AS-BUILT CERTIFICATION**

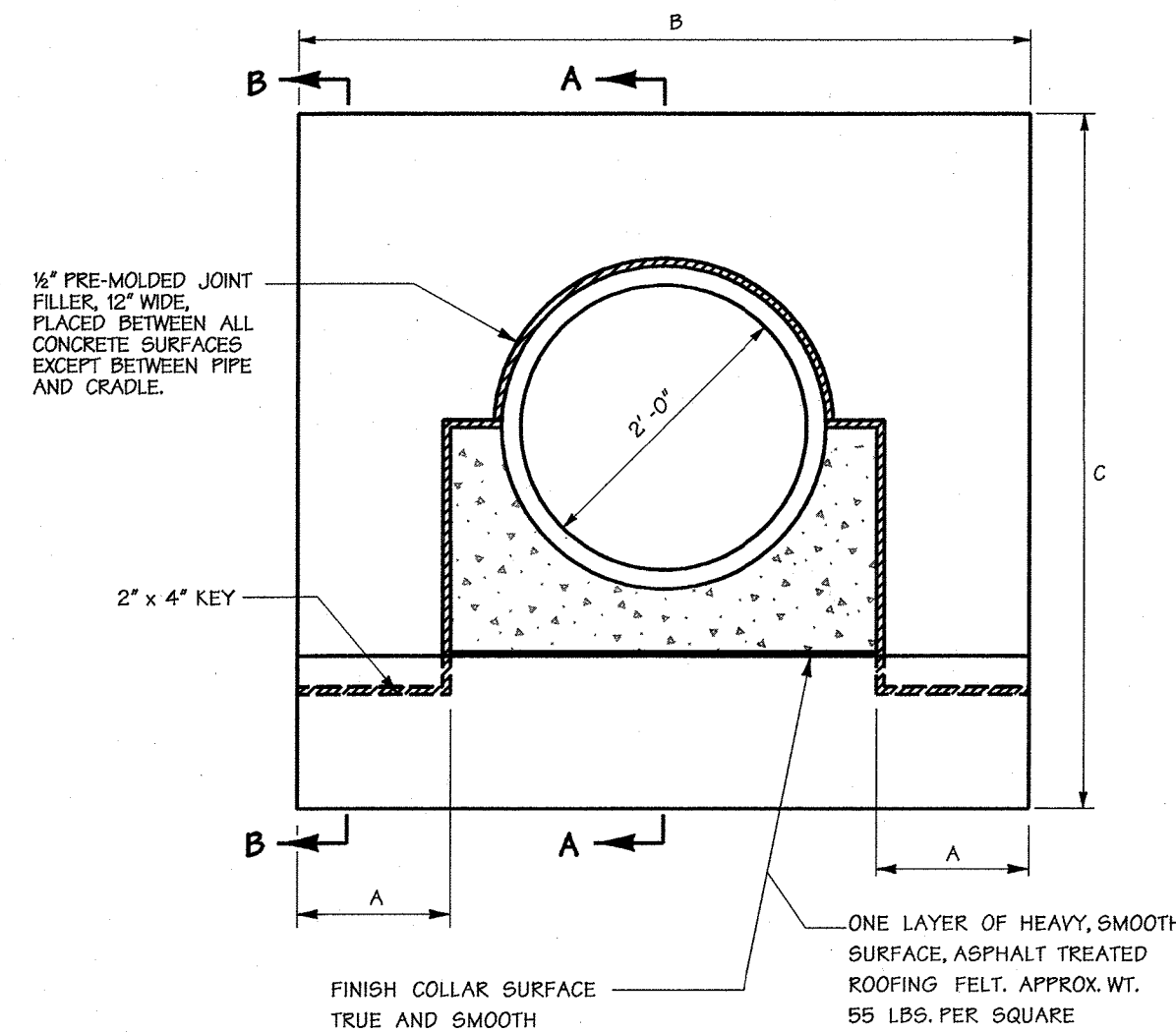
Note: This information is for AS-BUILT information



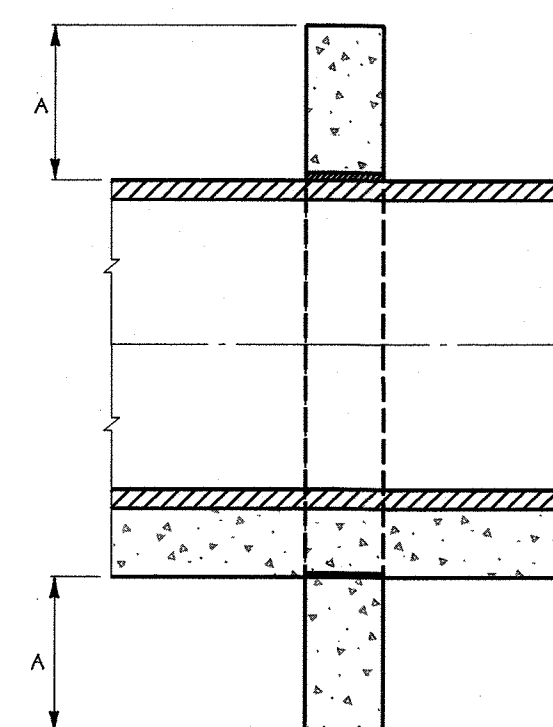
SWM FACILITY	INVERT 'A'	DIAM. 'B'
1	354.0	2'
2	333.6	14"
3	355.7	24"



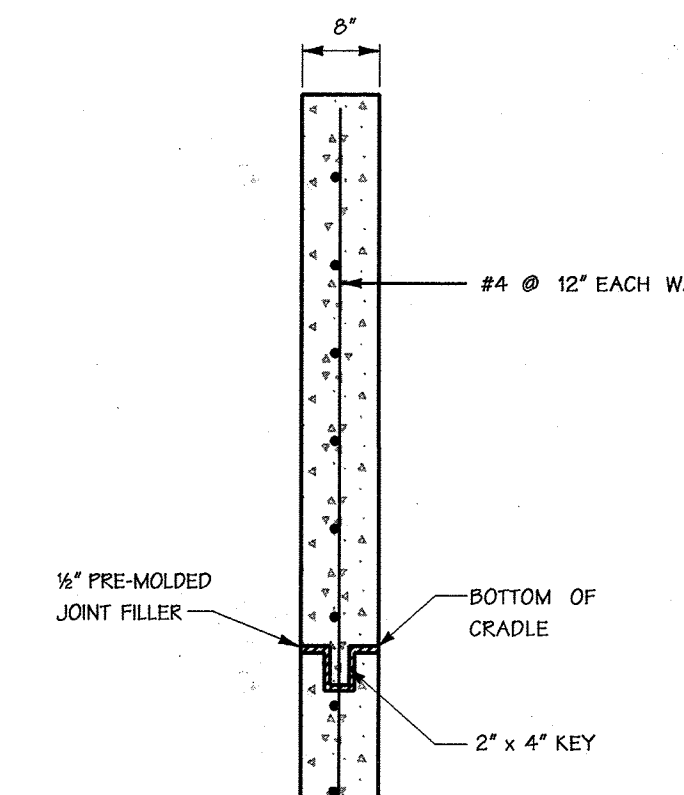
**CHANNEL PROTECTION (Cpv) CONTROL PLATE DETAIL**  
NTS



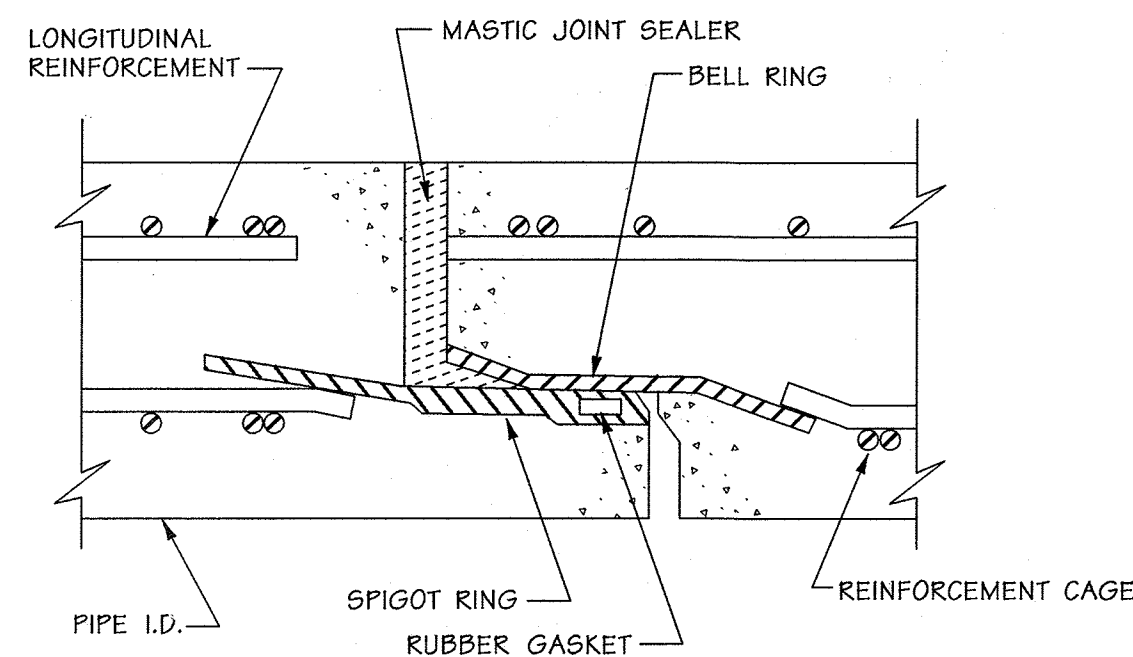
**ANTI - SEEP COLLAR DETAIL**  
CAST IN PLACE - NOT TO SCALE  
SEE SPECIFICATIONS SHEET 18



SWM FACILITY	'A'	'B'	'C'
1	2'-9"	9'-4"	8'-6"
2	2'-9"	9'-4"	8'-6"
3	2'-6"	8'-10"	8'-0"



**SECTION B-B**



**BARREL JOINT SEAL DETAIL**  
NTS

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

*John Meyer* 7/1/03  
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE DATE

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

APPROVED: *John Meyer* 7/1/03  
HOWARD SOIL CONSERVATION DISTRICT DATE

PLAN NUMBER

**DEVELOPERS CERTIFICATE:**

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

*John W. Ramonchick* 6/23/03  
SIGNATURE OF DEVELOPER DATE

**ENGINEERS CERTIFICATE:**

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

*John W. Ramonchick* 10551 6-4-03  
SIGNATURE OF ENGINEER REG. NO. DATE

6-4-03  
Date

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. Walker* 7-11-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*John Meyer* 7/14/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Candy Hammett* 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Wanda D. Lough* 7/16/03  
DIRECTOR DATE

Howards County  
Office Campus  
PARCEL A  
CIP-C-0282

OWNER /DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLICOTT CITY, MD 21043

**DMW**  
Duff-MoCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3333  
Fax 296-4705

A Team of Land Planners,  
Landscape Architects,  
Golf Course Architects,  
Engineers, Surveyors &  
Environmental Professionals

SUBDIVISION NAME	NO. CO. OFFICE CAMPUS	SECTION AREA	UTHPARCEL #
MAP OR TITLE	BLOCK #	TAX/ZONE MAP	GENRES TRACT
WATER CODE	6 & 1	POR 24 & 25	2
		SEWER CODE	6029

**TITLE**  
STORMWATER MANAGEMENT  
DETAILS

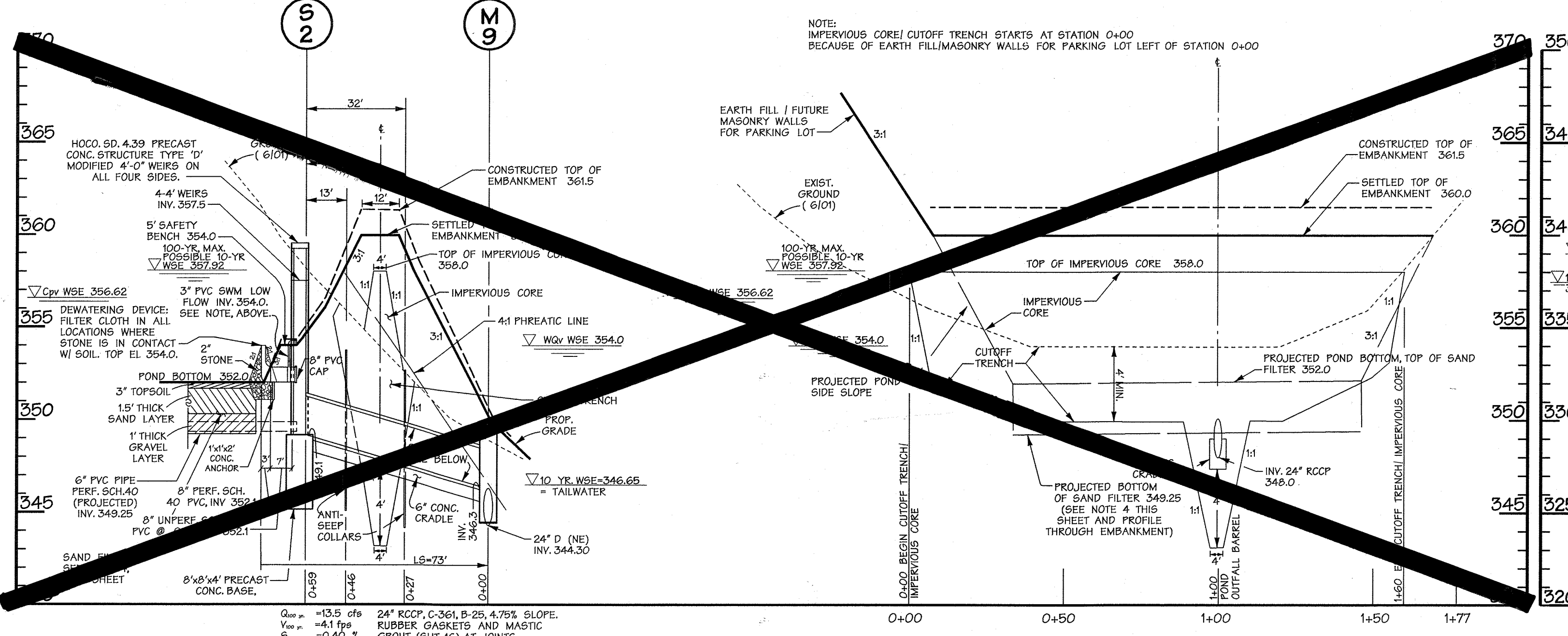
Des. By MRT Scale AS SHOWN Proj. No. 01001.C  
Dm. By MRT/JB Date 3/9/02  
Chk. By RLH/MRT Approved

16 of 44  
97P-03-02G

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET



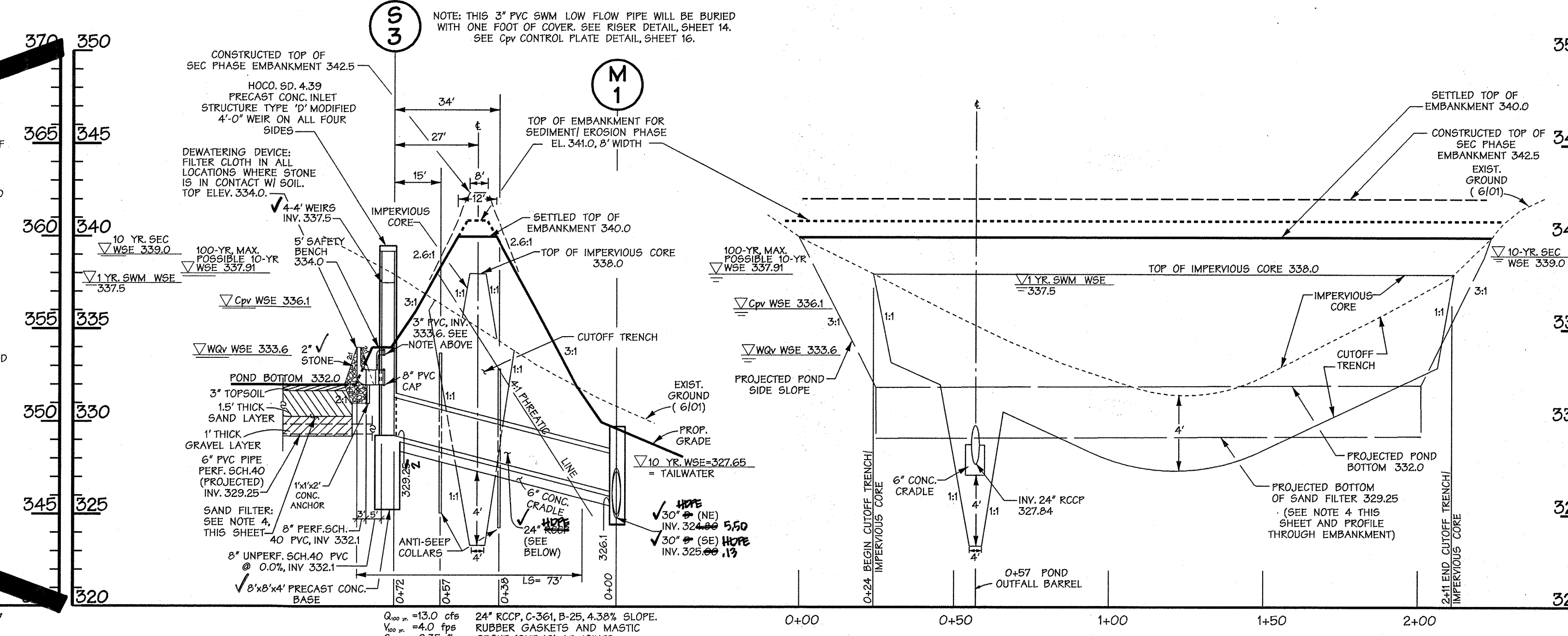
NOTE: THIS LOW FLOW PIPE WILL BE BURIED WITH ONE FOOT OF COVER. SEE RISER DETAIL, SHEET 14. SEE C/PV CONTROL PLATE DETAIL, SHEET 16.



PROFILE THROUGH EMBANKMENT  
SCALE: HORIZ. 1" = 30'  
VERT. 1" = 5'

SWM FACILITY #1  
(SAND FILTER)

PROFILE ALONG EMBANKMENT  
SCALE: HORIZ. 1" = 30'  
VERT. 1" = 5'



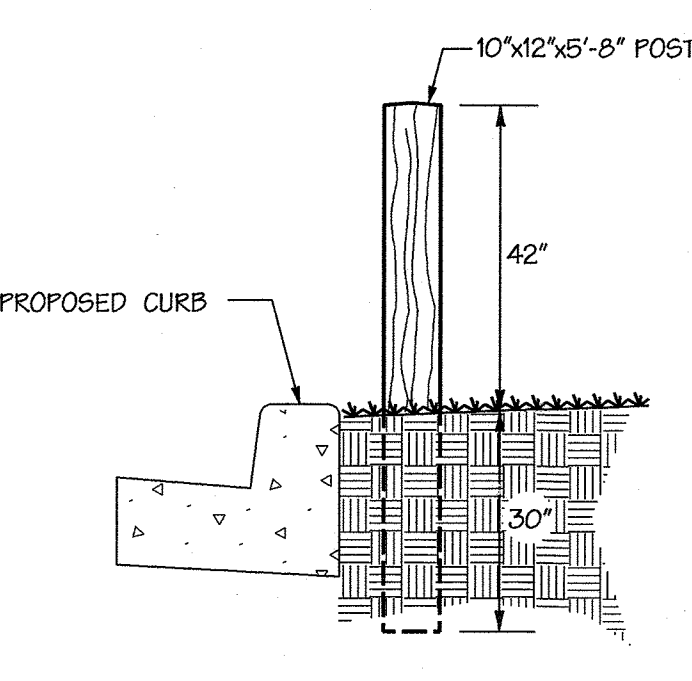
PROFILE THROUGH EMBANKMENT  
SCALE: HORIZ. 1" = 30'  
VERT. 1" = 5'

SWM FACILITY #2  
(SAND FILTER)

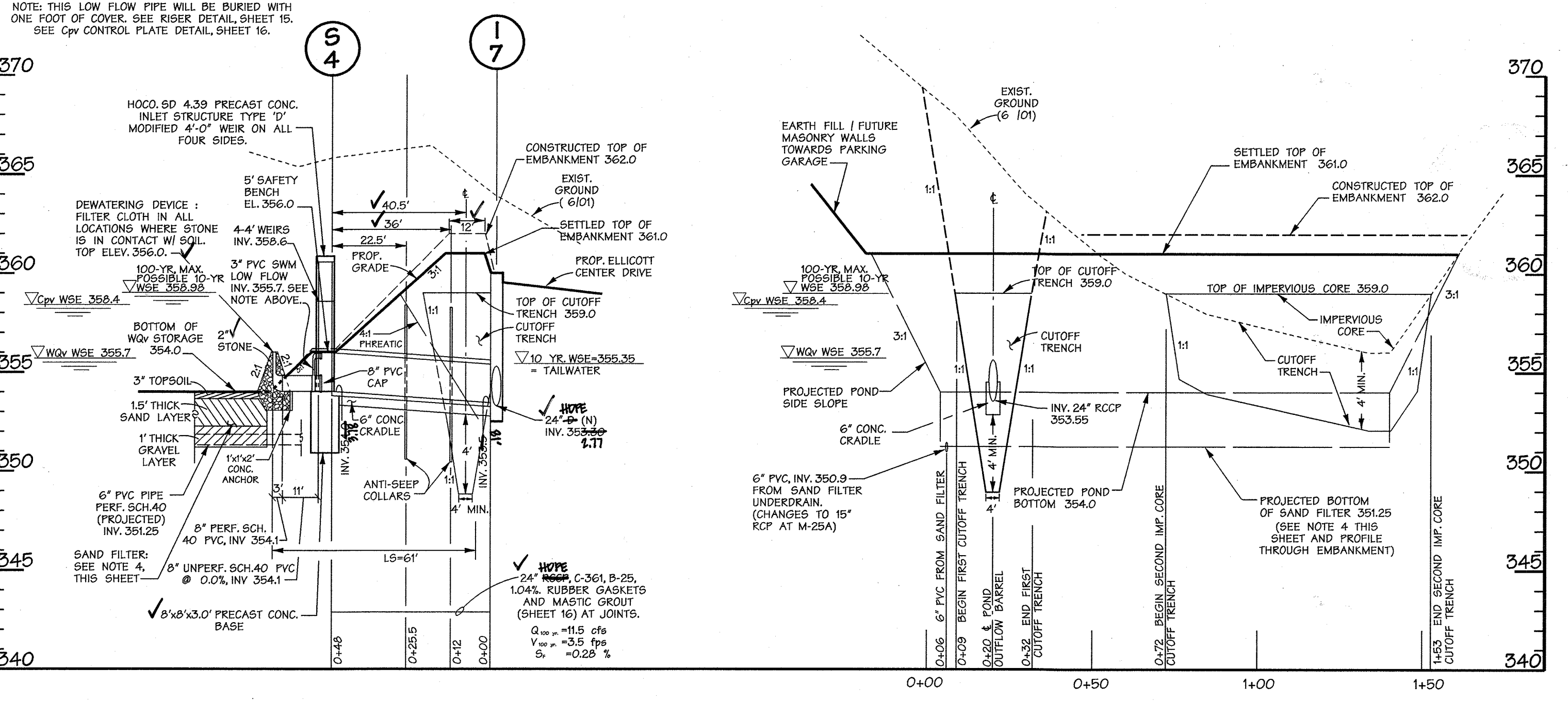
PROFILE ALONG EMBANKMENT  
SCALE: HORIZ. 1" = 30'  
VERT. 1" = 5'

NOTES:

- FACILITIES #1 AND #3 WILL NOT BE USED AS SEDIMENT BASINS. ONCE DRAINAGE AREAS TO THESE TWO FACILITIES ARE STABILIZED, INSTALL 8" UNPERF. SCH. 40 PVC AND DRAWDOWN DEVICE, PER DETAIL SHEET 7. DO NOT REMOVE DRAWDOWN DEVICE AND INSTALL 8" UNPERF. SCH. 40 PVC DRAWDOWN DEVICE UNTIL SDP #2.
- FACILITY #3 WILL FUNCTION AS A SEDIMENT TRAP PRIOR TO ITS USE AS A SWM FACILITY. WATER IN THIS TRAP SHALL BE DISCHARGED VIA TEMPORARY PIPE OUTLET. SEE TRAP DETAIL AND SPECIFICATIONS, SHEET 8.
- FACILITY #2 WILL FUNCTION AS A SEDIMENT BASIN PRIOR TO ITS USE AS A SWM FACILITY. DURING THE BASIN PHASE, RUNOFF WILL BE DISCHARGED THROUGH THE CONCRETE INLET STRUCTURE. A DRAW-DOWN DEVICE WILL TEMPORARILY REPLACE THE DEWATERING DEVICE SHOWN IN THE PROFILE - SEE DETAIL SHEET 7. THE 8" PVC CAP INSIDE THE INLET STRUCTURE WILL HAVE A 4-INCH ORIFICE DRILLED AT INVERT ELEVATION 332.1. THIS CAP WILL BE REPLACED BY A CAP WITHOUT ORIFICE WHEN CONVERTED TO SWM FACILITY. THE EMBANKMENT WILL BE CONSTRUCTED TO A TOP ELEVATION OF NO LOWER THAN 341.5 FOR THE SEC BASIN PHASE.
- THE SAND FILTER PORTION OF EACH FACILITY WILL BE CONSTRUCTED IN A FUTURE PHASE OF THIS DESIGN (SDP 2).



BOLLARD  
N.T.S.



PROFILE THROUGH EMBANKMENT  
SCALE: HORIZ. 1" = 30'  
VERT. 1" = 5'

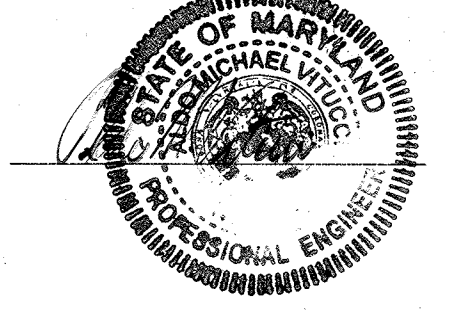
SWM FACILITY #3  
(SAND FILTER)

PROFILE ALONG EMBANKMENT  
SCALE: HORIZ. 1" = 30'  
VERT. 1" = 5'

NOTE: ROCK MAY BE ENCOUNTERED DURING EXCAVATION FOR THIS FACILITY. ANY ROCK SHALL BE UNDERCUT TO 4" BELOW PROPOSED BOTTOM OF EXCAVATION INDICATED IN THE PROFILES ABOVE. THE ROCK SURFACE SHALL THEN BE DIRECTLY COVERED BY FILTER CLOTH AND 4" OF SOIL AT THE TIME OF THIS UNDERCUTTING PROCEDURE. THE GEOTECHNICAL ENGINEER SHALL BE PRESENT TO DETERMINE THE LIMITS OF UNDERCUTTING.

AS-BUILT CERTIFICATION

I hereby certify, by my seal, that the facilities shown on the plan were constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.



7/14/03  
Date

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

William J. Walker  
CHIEF, BUREAU OF HIGHWAYS  
7-11-03  
DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING

John Dammann  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
7/14/03  
DATE

John Dammann  
CHIEF, DIVISION OF LAND DEVELOPMENT  
7/16/03  
DATE

Mark A. Wright  
DIRECTOR  
7/21/03  
DATE

Date	No.	Revision Description

Howard County  
Office Campus  
PARCEL A  
C/P-C-0282

OWNER /DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLICOTT CITY, MD 21043

**DMW**  
Darr-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 286-3300  
Fax 286-4705

NO. CO. OFFICE CAMPUS	SECTION/AREA	CUT/PARCEL #
15067-746 & 1108	24 & 25	552 & P10847

STORMWATER MANAGEMENT  
PROFILES

Des. By	Scale	AS SHOWN	Proj. No.	01001.C
RLH/LC/MRT				
Drn. By	KDE	Date	7/15/03	
Chk. By	RLH/MRT	Approved		17 of 44

"AS-BUILT" 000-03-026

MDE PERMIT AND TRACKING No. 200266336

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

U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE  
7/12/03  
DATE

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

APPROVED: Howard Soil Conservation District  
7/1/03  
DATE

PLAN NUMBER

DEVELOPERS CERTIFICATE:

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

Signature: John W. Panocchio, S.  
DATE: 6/23/03

ENGINEERS CERTIFICATE:

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

Signature: John W. Panocchio, S.  
REG. NO.: 1059  
DATE: 6-24-03

DATA SOURCES:  
ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELLICOTT CENTER DRIVE IN JUNE 2002.  
WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
NOTE:  
ALL STREAMS ON SITE ARE PERENNIAL.



Professional Engr. No. 10597



**STORMWATER MANAGEMENT POND  
GENERAL CONSTRUCTION SPECIFICATIONS**

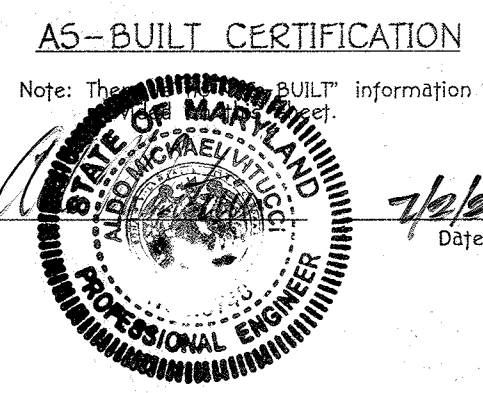
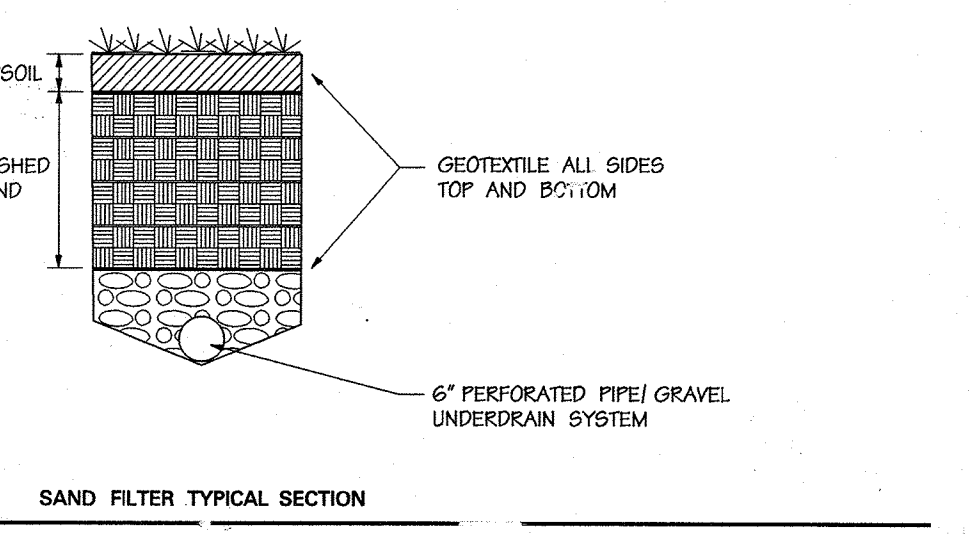
- GENERAL**  
STORMWATER MANAGEMENT FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH HOWARD COUNTY'S STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (1985) AND THE N.R.C.S. MARYLAND STANDARDS AND SPECIFICATIONS FOR PONDS (MD-378, 2000).  
THESE SPECIFICATIONS ARE APPROPRIATE TO ALL PONDS WITHIN THE SCOPE OF THE STANDARD PRACTICE MD-378. ALL REFERENCES TO ASTM AND AASHTO SPECIFICATIONS APPLY TO THE MOST RECENT VERSION.
- SITE PREPARATION**  
AREAS DESIGNATED FOR BORROW AREAS, EMBANKMENT, AND STRUCTURAL WORKS SHALL BE CLEARED, GRUBBED AND STRIPPED OF TOPSOIL. ALL TREES, VEGETATION, ROCKS AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED. CHANNEL BANKS AND SHOULDER BREAKS SHALL BE SLOPED TO NO STEEPER THAN 1:1. ALL TREES SHALL BE CLEARED AND GRUBBED WITHIN 15 FEET OF THE TOE OF THE EMBANKMENT.  
AREAS TO BE COVERED BY THE RESERVOIR WILL BE CLEARED OF ALL TREES, BRUSH, LOGS, FENCES, RUBBISH AND OTHER OBJECTIONABLE MATERIAL UNLESS OTHERWISE DESIGNATED ON THE PLANS. TREES, BRUSH AND STUMPS SHALL BE CUT APPROXIMATELY LEVEL WITH THE GROUND SURFACE FOR DRY STORMWATER MANAGEMENT PONDS, A MINIMUM OF A 25-FOOT RADIUS AROUND THE INLET STRUCTURE SHALL BE CLEARED.  
ALL CLEARED AND GRUBBED MATERIAL SHALL BE DISPOSED OF OUTSIDE AND BELOW THE LIMITS OF THE DAM AND RESERVOIR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE. WHEN SPECIFIED, A SUFFICIENT QUANTITY OF TOPSOIL WILL BE STOCKPILED IN A SUITABLE LOCATION FOR USE ON THE EMBANKMENT AND OTHER DESIGNATED AREAS.
- EARTH FILL**  
MATERIAL - THE FILL MATERIAL SHALL BE TAKEN FROM APPROVED DESIGNATED BORROW AREAS. IT SHALL BE FREE OF ROOTS, STUMPS, WOOD, RUBBISH, STONES GREATER THAN 6" FROZEN OR OTHER OBJECTIONABLE MATERIALS. FILL MATERIAL FOR THE CENTER OF THE EMBANKMENT AND CUT OFF TRENCH SHALL CONFORM TO UNIFIED SOIL CLASSIFICATION AND GRADE AT LEAST 50% PASSING THE #200 SIEVE. CONSIDERATION MAY BE GIVEN TO THE USE OF OTHER MATERIALS IN THE EMBANKMENT IF DESIGNED BY A GEOTECHNICAL ENGINEER. SUCH SPECIAL DESIGNS MUST HAVE CONSTRUCTION SUPERVISED BY A GEOTECHNICAL ENGINEER.  
MATERIALS USED IN THE OUTER SHELL OF THE EMBANKMENT MUST HAVE THE CAPABILITY TO SUPPORT VEGETATION OF THE QUALITY REQUIRED TO PREVENT EROSION OF THE EMBANKMENT.  
PLACEMENT - AREAS ON WHICH FILL IS TO BE PLACED SHALL BE SCARIFIED PRIOR TO PLACEMENT OF FILL. FILL MATERIALS SHALL BE PLACED IN MAXIMUM 6" THICK (BEFORE COMPACTION) LAYERS WHICH ARE TO BE CONTINUOUS OVER THE ENTIRE LENGTH OF THE FILL. THE MOST PERMEABLE BORROW MATERIAL SHALL BE PLACED IN THE DOWNSTREAM PORTION OF THE EMBANKMENT. THE PRINCIPAL SPILLWAY MUST BE INSTALLED CONCURRENTLY WITH FILL PLACEMENT AND NOT EXCAVATED INTO THE EMBANKMENT.  
COMPACTION - THE MOVEMENT OF THE HAULING AND SPREADING EQUIPMENT OVER THE FILL SHALL BE CONTROLLED SO THAT THE ENTIRE SURFACE OF EACH LIFT SHALL BE TRAVERSED BY NOT LESS THAN ONE TREAD TRACK OF THE EQUIPMENT OR COMPACTION SHALL BE ACHIEVED BY A MINIMUM OF FOUR COMPLETE PASSES OF A SHEEPSFOOT, RUBBER TRED OR VIBRATORY ROLLER. FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SUCH THAT THE REQUIRED DEGREE OF COMPACTION WILL BE OBTAINED WITH THE EQUIPMENT USED. THE FILL MATERIAL SHALL CONTAIN SUFFICIENT MOISTURE SO THAT IF FORMED INTO A BALL IT WILL NOT CRUMBLE, YET NOT BE SO WET THAT WATER CAN BE SQUEEZED OUT.  
WHEN REQUIRED BY THE REVIEWING AGENCY THE MINIMUM REQUIRED DENSITY SHALL NOT BE LESS THAN 98% OF THE MAXIMUM DRY DENSITY WITH A MOISTURE CONTENT WITHIN +/- 2% OF THE OPTIMUM EACH LAYER OF FILL SHALL BE COMPACTED AS NECESSARY TO OBTAIN THAT DENSITY AND IS TO BE CERTIFIED BY THE ENGINEER AT THE TIME OF CONSTRUCTION. ALL COMPACTION IS TO BE DETERMINED BY AASHTO METHOD T-99 (STANDARD PRACTICE).  
CUT OFF TRENCH - THE CUT OFF TRENCH SHALL BE EXCAVATED INTO IMPERVIOUS MATERIAL ALONG OR PARALLEL TO THE CENTERLINE AS SHOWN ON THE PLANS. THE TRENCH SHALL BE EXCAVATED TO A MINIMUM OF FOUR FEET BELOW THE BOTTOM WIDTH OF THE TRENCH. THE DEPTH SHALL BE AT LEAST 4 FEET BELOW EXISTING GRADE OR AS SHOWN ON THE PLANS. THE SIDE SLOPE SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY.  
EMBANKMENT CORE - THE CORE SHALL BE PARALLEL TO THE CENTERLINE OF THE EMBANKMENT AS SHOWN ON THE PLANS. THE TOP WIDTH OF THE CORE SHALL BE A MINIMUM OF FOUR FEET. THE HEIGHT SHALL EXTEND UP TO AT LEAST THE 10 YEAR WATER ELEVATION OR AS SHOWN ON THE PLANS. THE SIDE SLOPE SHALL BE 1 TO 1 OR FLATTER. THE CORE SHALL BE COMPACTED WITH CONSTRUCTION EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.
- STRUCTURE BACKFILL**  
BACKFILL ADJACENT TO PIPES OR STRUCTURES SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE ADJOINING FILL. MATERIAL THE FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 4 INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL NEEDS TO BE PLACED COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPES AT NO TIME DURING THE OPERATION. THE OPERATION SHALL BE ALLOWED TO OPERATE CLOSER THAN 4 FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A CONCRETE STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE.  
STRUCTURE BACKFILL MAY BE FLOWABLE FILL MEETING THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 902. MATERIAL SHALL HAVE A 100-200 PPS 28 DAY UNCONFINED COMPRESSIVE STRENGTH. THE FLOWABLE FILL SHALL HAVE A MINIMUM PH OF 4.0 AND A MINIMUM RESISTIVITY OF 2,000 OHM-CM. MATERIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7" TO ASSURE FLOWABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING OF THE PIPE WHEN USING FLOWABLE FILL. ALL METAL PIPE SHALL BE BURNISHED COATED. ANY ADJOINING FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED FOUR INCHES IN THICKNESS AND COMPACTED BY HAND TAMPERS OR OTHER MANUALLY DIRECTED COMPACTION EQUIPMENT. THE MATERIAL SHALL COMPLETELY FILL ALL VOIDS ADJACENT TO THE FLOWABLE FILL ZONE. AT NO TIME DURING THE BACKFILLING OPERATION SHALL DRIVEN EQUIPMENT BE ALLOWED TO OPERATE CLOSER THAN 4 FEET, MEASURED HORIZONTALLY, TO ANY PART OF A STRUCTURE UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE, UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURAL BACKFILL (FLOWABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE EMBANKMENT OR OTHER EMBANKMENT MATERIALS.
- REMOVAL AND REPLACEMENT OF DEFECTIVE FILL**  
FILL PLACED AT DENSITIES LOWER THAN SPECIFIED MINIMUM DENSITY OR AT MOISTURE CONTENTS OUTSIDE THE SPECIFIED ACCEPTABLE RANGE OF MOISTURE CONTENT OR OTHERWISE NOT CONFORMING TO THE REQUIREMENTS OF THE SPECIFICATIONS SHALL BE REWORKED TO MEET THE REQUIREMENTS OR REMOVED AND REPLACED. THE BOTTOMS OF SUCH EXCAVATIONS SHALL BE FINISHED FLAT OR GENTLY CURVING AND AT THE SIDES OF SUCH EXCAVATIONS THE ADJACENT SOUND FILL SHALL BE TRIMMED TO A SLOPE NOT STEEPER THAN 3:1 HORIZONTALLY TO 1 FOOT VERTICALLY EXTENDING FROM THE BOTTOM OF THE EXCAVATION TO THE FILL SURFACE.
- PIPE CONDUITS**  
ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION. ALL PERFORATED PIPES SHALL HAVE A MINIMUM OF 3:1 SQUARE INCHES OF OPENING PER SQUARE FOOT OF PIPE SURFACE (E.G. 30 3/8-INCH HOLES PER SQUARE FOOT). PERFORATIONS ARE TO BE UNIFORMLY SPACED AROUND THE FULL PERIPHERY OF THE PIPE. ANY HOLES BLOCKED OR PARTIALLY BLOCKED BY BITUMINOUS COATINGS SHALL BE OPENED PRIOR TO INSTALLATION.  
REINFORCED CONCRETE PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR REINFORCED CONCRETE PIPE:  
1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361.  
2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING FOR THEIR ENTIRE LENGTH. THIS BEDDING (GRADE) SHALL CONSIST OF HIGH SLUMP CONCRETE PLACED UNDER THE PIPE AND UP THE SIDES OF THE PIPE AT LEAST 50 PERCENT OF ITS OUTSIDE DIAMETER WITH A MINIMUM THICKNESS OF 6 INCHES. WHERE CONCRETE GRADE IS NOT NEEDED FOR STRUCTURAL REASONS, FLOWABLE FILL MAY BE USED AS DESCRIBED IN THE "STRUCTURE BACKFILL" SECTION OF THIS STANDARD. GRAVEL BEDDING IS NOT PERMITTED.  
3. LAYING PIPE - BELL AND SPIGOT PIPE SHALL BE PLACED WITH THE BELL END UPSTREAM. JOINTS SHALL BE MADE IN ACCORDANCE WITH RECOMMENDATIONS OF THE MANUFACTURER OF THE MATERIAL. AFTER THE JOINTS ARE SEALED FOR THE ENTIRE LINE, THE BEDDING SHALL BE PLACED SO THAT ALL SPACES UNDER THE PIPE ARE FILLED. CARE SHALL BE TAKEN TO PREVENT ANY DEVIATION FROM THE ORIGINAL LINE AND GRADE OF THE PIPE. THE FIRST JOINT MUST BE LOCATED WITHIN 4 FEET FROM THE RISER.  
4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".  
5. CONNECTIONS - ALL CONNECTIONS (TO ANTI-SEEP COLLARS, RISER, ETC.) SHALL BE WATERTIGHT.  
6. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.  
PLASTIC PIPE - ALL OF THE FOLLOWING CRITERIA SHALL APPLY FOR PLASTIC PIPE:  
1. MATERIALS - PVC PIPE SHALL BE PVC-1120 OR PVC-1220 CONFORMING TO ASTM D-1785 OR ASTM D-2241 CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE), COUPLINGS AND FITTINGS SHALL CONFORM TO THE FOLLOWING: 4" - 10" INCH PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M252 TYPE 5, AND 12" THROUGH 24" SHALL MEET THE REQUIREMENTS OF AASHTO M294 TYPE 5.  
2. JOINTS AND CONNECTIONS TO ANTI-SEEP COLLARS SHALL BE COMPLETELY WATERTIGHT.  
3. BEDDING - THE PIPE SHALL BE FIRMLY AND UNIFORMLY BEDDED THROUGHOUT ITS ENTIRE LENGTH. WHERE ROCK OR SOFT, SPONGY OR OTHER UNSTABLE SOIL IS ENCOUNTERED, ALL SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE EARTH COMPACTED TO PROVIDE ADEQUATE SUPPORT.  
4. BACKFILLING SHALL CONFORM TO "STRUCTURE BACKFILL".  
5. OTHER DETAILS (ANTI-SEEP COLLARS, VALVES, ETC.) SHALL BE AS SHOWN ON THE DRAWINGS.

- CONCRETE**  
CONCRETE SHALL MEET THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 404, MIX NO. 3.  
CAST-IN-PLACE CONCRETE STRUCTURES  
1. SPECIFICATIONS: MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, LATEST EDITION.  
AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, LATEST EDITION, FOR DESIGN CONCRETE DESIGN BY THE "SERVICE LOAD DESIGN METHOD".  
2. CONCRETE SHALL MEET THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 404 AND 302, MIX NO. 3.  
3. CONTRACTOR MAY ADD COLOR MIX AT PLANT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION "C-12 MESA BEIGE" AS MANUFACTURED BY L.M. SCOFIELD COMPANY (203) 723-8226.  
CONTRACTOR SHALL SUPPLY MIX DESIGN FOR APPROVAL PRIOR TO APPLICATION. LOAD AND MIX TICKETS SHALL BE SUPPLIED FOR EACH TRUCK DELIVERY. NO PARTIAL FIELD MIXES SHALL BE ALLOWED.  
ALL EXPOSED EDGES SHALL BE CHAMFERED "X". ALL CONSTRUCTION KEYS ARE SHOWN NOMINAL SIZE.  
4. REINFORCING STEEL: REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60, WHERE NOT INDICATED. BAR LAY SPICES SHALL BE IN ACCORDANCE WITH AASHTO SPECIFICATIONS. THE MINIMUM CONCRETE COVER SHALL BE 2 INCHES UNLESS OTHERWISE NOTED. DESIGN FS = 24,000 PSI.  
5. FOUNDATION PRESUMED SOIL BEARING CAPACITY = 2,500 PSF. THE ENGINEER MUST APPROVE ALL FOUNDATIONS PRIOR TO CONCRETE PLACEMENT. IF UNSUITABLE MATERIAL IS ENCOUNTERED, THE MATERIAL SHALL BE UNDERCUT AND BACKFILLED WITH STRUCTURAL BACKFILL.  
6. STRUCTURAL BACKFILL: CAST-IN-PLACE CONCRETE STRUCTURES AND PIPE SHALL BE BACKFILLED WITH SELECT GRANULAR BACKFILL MEETING THE REQUIREMENTS OF SHA GRADED AGGREGATE-SUBBASE. STRUCTURAL FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT TO EXCEED 4 INCHES AND COMPACTED TO 96 PERCENT OF THE STANDARD PROCTOR. MAXIMUM DRY DENSITY IN ACCORDANCE WITH AASHTO T-99. THE STATIC WEIGHT OF EQUIPMENT USED ADJACENT TO WALLS SHALL NOT EXCEED 3,000 POUNDS. NO BACKFILL SHALL BE PLACED AGAINST THE CAST-IN-PLACE WALLS UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED 28 DAY STRENGTH.  
PRE-CAST CONCRETE STRUCTURES  
SHOP DRAWINGS FOR PRE-CAST STRUCTURES WITH SUPPORTING STRUCTURAL COMPUTATIONS (SIGNED AND SEALED BY A MARYLAND REGISTERED PROFESSIONAL ENGINEER) MEETING ASTM REQUIREMENTS FOR PRE-CAST STRUCTURES MUST BE SUBMITTED TO THE ENGINEER AND THE APPROVING AGENCY (HOWARD COUNTY DEVELOPMENT ENGINEERING DIVISION) FOR APPROVAL PRIOR TO FABRICATION.  
2. **ROCK RIP-RAP**  
ROCK RIP-RAP SHALL MEET THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311.  
GEOTEXTILE SHALL BE PLACED UNDER ALL RIP-RAP AND SHALL MEET THE REQUIREMENTS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 902.05, CLASS C.  
THE RIP-RAP SHALL BE PLACED TO THE REQUIRED THICKNESS IN ONE OPERATION. THE ROCK SHALL BE DELIVERED AND PLACED IN A MANNER THAT WILL INSURE THE RIP-RAP IN PLACE SHALL BE REASONABLY HOMOGENEOUS WITH THE LARGER ROCKS UNIFORMLY DISTRIBUTED AND FIRMLY IN CONTACT ONE TO ANOTHER WITH THE SMALLER ROCKS FILLING THE VOIDS BETWEEN THE LARGER ROCKS.  
3. **CARE OF WATER DURING CONSTRUCTION**  
ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM THE VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO PREVENT OBSTRUCTION IN ANY DEGREE. WHATSOEVER OF THE FLOW OF WATER TO THE SPILLWAY OR OUTLET WORKS AND SO AS NOT TO INTERFERE IN ANY WAY WITH THE OPERATION OR MAINTENANCE OF THE STRUCTURE. STREAM DIVERSIONS SHALL BE MAINTAINED UNTIL THE FILL FLOW CAN BE PASSED THROUGH THE PERMANENT WORKS. THE REMOVAL OF WATER FROM THE REQUIRED EXCAVATION AND THE FOUNDATION SHALL BE ACCOMPLISHED IN A MANNER AND TO THE EXTENT THAT WILL MAINTAIN STABILITY OF THE EXCAVATED SLOPES AND BOTTOM OF REQUIRED EXCAVATIONS AND WILL ALLOW SATISFACTORY PERFORMANCE OF ALL CONSTRUCTION OPERATIONS. DURING THE PLACING AND COMPACTION OF MATERIAL IN REQUIRED EXCAVATIONS, THE WATER LEVEL AT THE LOCATIONS BEING REFILLED SHALL BE MAINTAINED AT THE EXCAVATION AT SUCH LOCATIONS WHICH MAY REQUIRE DRAINING THE WATER TO SUMP FROM WHICH THE WATER SHALL BE PUMPED.  
4. **STABILIZATION**  
ALL BORROW AREAS SHALL BE GRADED TO PROVIDE PROPER DRAINAGE AND LEFT IN A SLIGHTLY CONDITON. ALL EXPOSED SURFACES OF THE EMBANKMENT, SPILLWAY, SPILL AND BORROW AREAS, AND BERMS SHALL BE STABILIZED BY SEEDING, MULCHING, FERTILIZING AND MULCHING IN ACCORDANCE WITH THE NATURAL RESOURCES CONSERVATION SERVICE STANDARDS AND SPECIFICATIONS FOR CRITICAL AREA PLANTING (MD-342) OR AS SHOWN ON THE ACCOMPANYING DRAWINGS.  
5. **EROSION AND SEDIMENT CONTROL**  
CONSTRUCTION OPERATIONS WILL BE CARRIED OUT IN SUCH A MANNER THAT EROSION WILL BE CONTROLLED AND WATER AND AIR POLLUTION MINIMIZED. STATE AND LOCAL LAWS CONCERNING POLLUTION ABATEMENT WILL BE FOLLOWED. CONSTRUCTION PLANS SHALL DETAIL EROSION AND SEDIMENT CONTROL MEASURES TO BE EMPLOYED DURING THE CONSTRUCTION PROCESS.  
ALL DISTURBED AREAS SHALL BE CONTROLLED BY AN EROSION AND SEDIMENT CONTROL PLAN WHICH HAS BEEN APPROVED BY THE HOWARD COUNTY SOIL CONSERVATION DISTRICT.  
6. **SEEDING**  
SEEDING, FERTILIZING AND MULCHING SHALL BE AS FOLLOWS:  
SEED MIX: 50% KENTUCKY BLUEGRASS (125 LBS. PER ACRE)  
10% PENNLANW OBERING RED FESCUE  
10% STREAKER REDTOP  
APPLIED AT A RATE OF 150 LBS. PER ACRE.  
OR  
REBEL II TALL FESCUE (125 LBS. PER ACRE)  
PENNLANW PERENNIAL REGRASS (75 LBS. PER ACRE)  
KENTUCKY BLUEGRASS (70 LBS. PER ACRE)  
OR  
PENNLANW CREEPING RED FESCUE (70 LBS. PER ACRE)  
AURORA HARD FESCUE (50 LBS. PER ACRE)  
COMMON WHITE CLOVER (6 LBS. PER ACRE)  
OR  
70% FORAGER TALL FESCUE  
30% CHEMUNG CROWNBEACH, INOCULATED  
APPLIED AT A RATE OF 55 LBS. PER ACRE.  
OPTIMUM SEEDING DATES: MARCH 1 TO APRIL 30.  
LIME: 2 TONS/ACRE DOLOMITIC LIMESTONE.  
FERTILIZER: 600 LBS./ACRE 10-10-10 FERTILIZER BEFORE SEEDING,  
400 LBS./ACRE 30-0-0 UREAFORM FERTILIZER AT TIME OF SEEDING.  
MULCH: STRAW AT 4,000 LBS. PER ACRE.  
ANCHORING: MULCHING TOOL OR WOOD CELLULOSE FIBER BINDER AT A NET DRY BINDER RATE OF 750 POUNDS PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER OR AT RATES RECOMMENDED BY THE MANUFACTURER.

- FILTER CLOTH**  
A FILTER CLOTH SHALL CONFORM TO THE 1984 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, OR THE LATEST EDITION.
- GABIONS**  
ALL GABIONS SHALL BE PVC COATED WOVEN WIRE BASKETS. STONE SIZE SHALL BE 4 INCHES TO 7 INCHES. (CLASS IV GABIONS).
- CONSTRUCTION INSPECTION BY DESIGNATED ENGINEERS**  
THE CONSTRUCTION OF THE POND AND EMBANKMENT, AND CERTIFICATION THAT THE POND AND EMBANKMENT HAVE BEEN BUILT IN ACCORDANCE WITH THE PLANS SHALL BE UNDER THE SUPERVISION OF A REGISTERED PROFESSIONAL ENGINEER. THE ENGINEER SHALL BE NOTIFIED SUFFICIENTLY IN ADVANCE OF CONSTRUCTION IN ORDER THAT ARRANGEMENTS CAN BE MADE FOR (1) INSPECTION OF PIPE TRENCH AND BEDDING, (2) INSPECTION OF RISER AND ANTI-SEEP COLLARS, AND (3) SUPERVISION OF EMBANKMENT CONSTRUCTION AND COMPACTION TESTING. THE ENGINEER SHALL DIRECT THE HANDLING OF WATER DURING CONSTRUCTION, MINOR CHANGES NOT AFFECTING THE INTEGRITY OF THE DAM IN ORDER TO COMPENSATE FOR UNUSUAL SOIL CONDITIONS, AND THE REMOVAL AND REPLACEMENT OF DEFECTIVE FILL.
- INSPECTION SCHEDULE**  
1. PRIOR NOTIFICATION SHALL BE GIVEN TO THE ENGINEER SO THAT INSPECTIONS MAY BE MADE AT THE FOLLOWING STAGES:  
(1) UPON COMPLETION OF EXCAVATION TO SUBFOUNDATION AND WHERE REQUIRED, INSTALLATION OF STRUCTURAL SUPPORTS OR REINFORCEMENT FOR STRUCTURES, INCLUDING BUT NOT LIMITED TO:  
(i) CORE TRENCHES FOR STRUCTURAL EMBANKMENTS,  
(ii) INLET-OUTLET STRUCTURES AND ANTI-SEEP STRUCTURES, WATERTIGHT CONNECTORS ON PIPES AND  
(iii) TRENCHES FOR ENCLOSED STORM DRAINAGE FACILITIES.  
(2) DURING BACKFILL OF FOUNDATIONS AND CONCRETE, AND INSTALLATION OF PIPING AND CATCH BASINS.  
(3) DURING BACKFILL OF FOUNDATIONS AND TRENCHES.  
(4) DURING EMBANKMENT CONSTRUCTION AND  
(5) UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.  
NO WORK SHALL PROCEED UNTIL THE ENGINEER INSPECTS AND APPROVES THE WORK PREVIOUSLY COMPLETED.  
2. GEOTECHNICAL COMPACTION TESTING OF THE FACILITY EMBANKMENT IS REQUIRED. CERTIFICATION MUST BE PROVIDED TO THE DESIGNATED ENGINEER IN CHARGE OF THE AS-BUILT.  
3. A COPY OF ALL MATERIAL SUPPLY TICKETS MUST BE GIVEN TO THE DESIGNATED ENGINEER IN CHARGE OF THE AS-BUILT.
- MAINTENANCE SCHEDULE**  
1. THE FACILITY SHALL BE INSPECTED TWICE ANNUALLY, MARCH AND SEPTEMBER, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USQA SCS STANDARDS AND SPECIFICATIONS FOR PONDS (MD-378), THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.  
2. VEGETATED COVER SHALL BE MAINTAINED AT ALL TIMES.  
3. RILLS ON THE SLOPES OF THE DAM AND WASHED IN THE EARTH SPILLWAY SHALL BE FILLED WITH SUBSTRATE AND THOROUGHLY COMPACTED. THESE AREAS SHALL BE RESEDED OR RESEDED, LIMED, AND FERTILIZED AS NEEDED.  
4. ALL APERTURES SHALL BE KEPT FREE OF TRASH.  
5. SEDIMENT SHALL BE REMOVED FROM FOREBAYS WHEN THE DEPTH EXCEEDS 12".  
6. TRASH AND DEBRIS SHALL BE REMOVED AS NECESSARY.  
7. VEGETATION SHALL BE MAINTAINED AS NECESSARY. VEGETATION SHALL NOT EXCEED 18" IN HEIGHT.  
8. TOP AND OUTSIDE SIDE SLOPE OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER INSIDE SIDE SLOPE, AND MAINTENANCE SHALL BE MOWED AS NEEDED. CARE SHALL BE TAKEN NOT TO MOW ANY OF THE WETLAND PLANTINGS IN THE VICINITY OF THE SAFETY BENCH.  
9. **OPERATION, MAINTENANCE AND INSPECTION**  
INSPECTION OF PONDS SHOWN HEREON SHALL BE PERFORMED AT LEAST TWICE ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USQA SCS STANDARDS AND SPECIFICATIONS FOR PONDS (MD-378), THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE POND AND THE CONTINUED OPERATION, SURVEILLANCE, INSPECTION, AND MAINTENANCE THEREOF. THE POND OWNER(S) SHALL PROMPTLY NOTIFY THE SOIL CONSERVATION DISTRICT OF ANY UNUSUAL OBSERVATIONS THAT MAY BE INDICATORS OF DISTRESS SUCH AS EXCESSIVE SEEPAGE, TURBID SEEPAGE, SLIDING OR SLUMPING.  
10. **UTILITIES**  
NO UTILITIES MAY BE CONSTRUCTED WITHIN/ALONG ANY MD-378 EMBANKMENT.
- OPERATION AND MAINTENANCE SCHEDULE**  
The major 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.  
1. The top and side slopes of the embankment shall be mowed a minimum of once per year, when vegetation reaches 18-inches in height or as needed.  
2. Filters that have a grass cover shall be mowed a minimum of three times per growing season to maintain a maximum grass height of less than 12 inches.  
3. Debris and litter shall be removed during regular mowing operations and as needed.  
4. Visible signs of erosion in the facility shall be repaired as soon as it is noticed.  
5. Remove silt when it exceeds four inches deep in the forebay.  
6. When water ponds on the surface of the filter bed for more than 72 hours, the top few inches of desloped material shall be replaced with fresh material. Proper cleaning and disposal of the removed materials and liquid must be followed by the owner.  
7. A log book shall be maintained to determine the rate at which the facility drains.  
8. The maintenance log book shall be available to Howard County for inspection to insure compliance with operation and maintenance criteria.  
9. 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.

Table B.3.1 Material Specifications for Sand Filters

Material	Specification/Test Method	Size	Notes
sand	clean AASHTO M-60 or ASTM C-33 concrete sand	0.075" to 0.04"	Sand substitutions such as Diabase and Graystone #10 are not acceptable. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
peat	ash content <15 percent pH range: 5.2 to 4.9 soak bulk density 0.12 to 0.15 g/cc	n/a	The material must be read-sealed hemic peat shavings. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
leaf compost	AASHTO M-43	0.375" to 0.75"	The material must be read-sealed hemic peat shavings. No calcium carbonated or dolomitic sand substitutions are acceptable. No "rock dust" can be used for sand.
geotextile fabric (if required)	ASTM-D-4833 (puncture strength - 125 lb.) ASTM-D-4632 (tenile strength - 300 lb.)	0.09" 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 geotextile meant to "separate" said filter layers.
impermeable liner (if required)	ASTM-D-4833 (thickness) ASTM-D-412 (tenile strength 1,100 lb., elongation 200%) ASTM-D-624 (tear resistance - 150 lb./in.) ASTM-D-471 (water absorption: +8 to 2 percent mass)	30 mil thickness	3/8" per ft. 6' on center, 4 holes per row; minimum of 3' of gravel over pipes; not necessary under mesh pipes.
underdrain piping	F 75A, Type PS 28 or AASHTO M-276	4" - 6" n/d schedule 40 PVC or SDR 35	3/8" per ft. 6' on center, 4 holes per row; minimum of 3' of gravel over pipes; not necessary under mesh pipes.
concrete (cast-in-place)	MSHA Standards and Specs. Section 902, Mix No. 3, F <sub>c</sub> = 3500 psi, normal weight aggregate - 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 re: test design drawings sealed and approved by a professional structural engineer licensed in the State of Maryland.
concrete (pre-cast)	per pre-cast manufacturer	n/a	SEE ABOVE NOTE
non-rebar steel	ASTM A-36	n/a	structural steel to be hot-dipped galvanized ASTM A-123



**B.3.A SAND FILTER SPECIFICATIONS**

- Material Specifications for Sand Filters  
The allowable materials for sand filter construction are detailed in Table B.3.1.
- Sand Filter Testing Specifications  
Underground sand filters, facilities with 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.
- Sand Filter Construction Specifications  
Provide sufficient maintenance access (i.e., 12-foot-wide road with legally recorded easement). Vegetated access slopes are to be a maximum of 10 percent; gravel slopes to 15 percent; paved slopes to 25 percent.  
Absolutely no runoff is to enter the filter until all contributing drainage areas have been stabilized.  
Surface of 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.  
"Pockets" sand filters shall be sized with a stone "window" that covers approximately 10 percent of the filter area. This "window" shall be filled with pea gravel (3/4-inch stone).

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. Madsen* 7/16/03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*John Damman* 7/16/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Franklin A. Wagner* 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE  
DIRECTOR

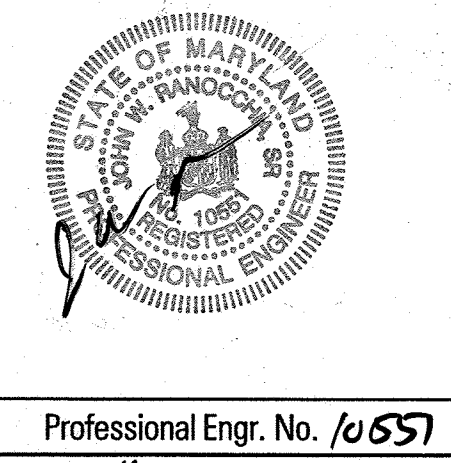
Date	No.	Revision Description

**Howard County  
Office Campus  
PARCEL A  
CIP-C-0282**

OWNER / DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3436 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

**DMW**  
Duff-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3333  
Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals



**MDE PERMIT AND TRACKING No. 200266336**

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL-SCALE CONSTRUCTION SOIL EROSION AND SEDIMENT CONTROL.  
*John W. Ramoche* 7/1/03  
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE DATE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT.  
*John W. Ramoche* 7/1/03  
APPROVED: HOWARD SOIL CONSERVATION DISTRICT DATE

PLAN NUMBER: \_\_\_\_\_

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

*John W. Ramoche* 6/23/03  
SIGNATURE OF DEVELOPER  
PRINT NAME BELOW SIGNATURE DATE

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

*John W. Ramoche* 10551 6-24-03  
SIGNATURE OF ENGINEER  
PRINT NAME BELOW SIGNATURE REG. NO. DATE

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET  
SDP-03-02C



**STREET LIGHT LEGEND**

- ☼ 250 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PENDANT FIXTURE (SAG) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING 12' ARM.
- ☼ 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PREMIER POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE.

**Plant List (Perimeter Landscaping and Street Trees)**

QTY	SYM	BOTANICAL NAME/COMMON NAME	SIZE	REMARKS
<b>SHADE TREES</b>				
4	AR	ACER RUBRUM RED MAPLE	2 1/2" - 3" CAL. 12'-14" HT	B & B FULL HEAD
3	QC	QUERCUS COCCINEA SCARLET OAK	2 1/2" - 3" CAL. 12'-14" HT	B & B FULL HEAD
6	QP	QUERCUS PALUSTRIS PIN OAK	2 1/2" - 3" CAL. 12'-14" HT	B & B FULL HEAD
68	PA	PLATANUS ACERIFOLIA LONDON PLANE TREE	2 1/2" - 3" CAL. 12'-14" HT	B & B FULL HEAD
<b>EVERGREEN TREES</b>				
27	IO	ILLEX OPACA AMERICAN HOLLY	6'-8" HT.	B & B ONE MALE / HEAVY / 1 CENTRAL LEADER
21	PS	FINUS STROBUS WHITE PINE	6'-8" HT.	B & B HEAVY / UNSHEARED / 1 CENTRAL LEADER
16	TO	THUJA OCCIDENTALIS 'GREEN GIANT' GIANT ARBORVITAE	6'-8" HT.	B & B HEAVY / 1 CENTRAL LEADER
<b>SHRUBS</b>				
61	LB	LINDERA BENZON SPICEBUSH	30" - 36" HT.	7 O.C. 15 CANE MINIMUM
18	VD	VIBURNUM DENTATUM ARROWWOOD VIBURNUM	30" - 36" HT.	7 O.C. 15 CANE MINIMUM
42	VP	VIBURNUM PRUNIFOLIA BLACKHAW VIBURNUM	30" - 36" HT.	7 O.C. 15 CANE MINIMUM

**LEGEND**

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300' MAJOR CONTOURS
- 250' MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- 100 YR FLOODPLAIN
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED FOREST EDGE (RETENTION)
- FOREST CONSERVATION EASEMENT
- PROPOSED REFORESTATION
- EXISTING UTILITY EASEMENTS
- NON-WOODY VEGETATION ZONE
- PROPOSED SHADE TREE
- ☼ PROPOSED EVERGREEN TREE
- ☼ PROPOSED SHRUBS
- STREET TREE PROVIDED BY OTHERS

NOTES:  
SEE PLANT LIST ON THIS SHEET.  
SEE PLANTING NOTES AND DETAILS  
ON SHEET 21.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*Walter J. Walker, Jr.* 7-11-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Chris Dammann* 7/14/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Chris Dammann* 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mark A. Taylor* 7/16/03  
DIRECTOR DATE

Date	No.	Revision Description

**Howard County  
Office Campus  
PARCEL A  
CIP-C-0282**

OWNER / DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELICOTT CITY, MD 21043

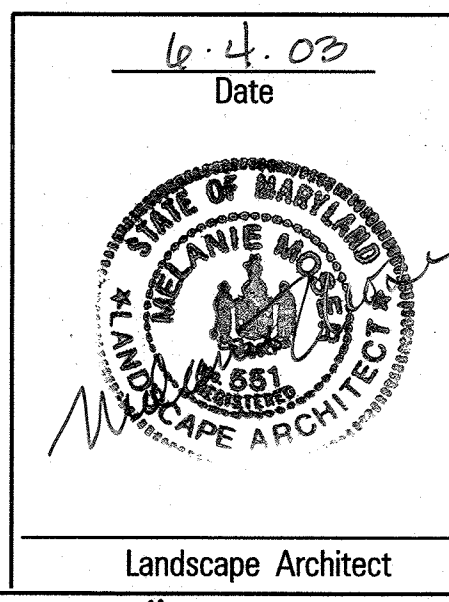
**DMW**  
Daft-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3333  
Fax 296-4705

A Team of Land Planners,  
Landscape Architects,  
Golf Course Architects,  
Engineers, Surveyors &  
Environmental Professionals

SECTION NAME	NO. CO. OFFICE CAMPUS	SECTION AREA	DATE	852 & P10B47
PLAT OR LP	BOOK # 25 & 1	TAX/ZONE MAP	ELECT. DISTRICT	CENSUS TRACT
DATE CODE	1527-20	24 & 25	2	6029
REVISION CODE				

**LANDSCAPE & STREET TREE PLAN  
EAST SIDE**

Des. By	FPB	Scale	1"=50'	Proj. No.	01001.C
Dim. By	BKC	Date	7/9/12	19 of 44	
Chk. By	RLA	Approved		APP-09-012	



**A5-BUILT CERTIFICATION**

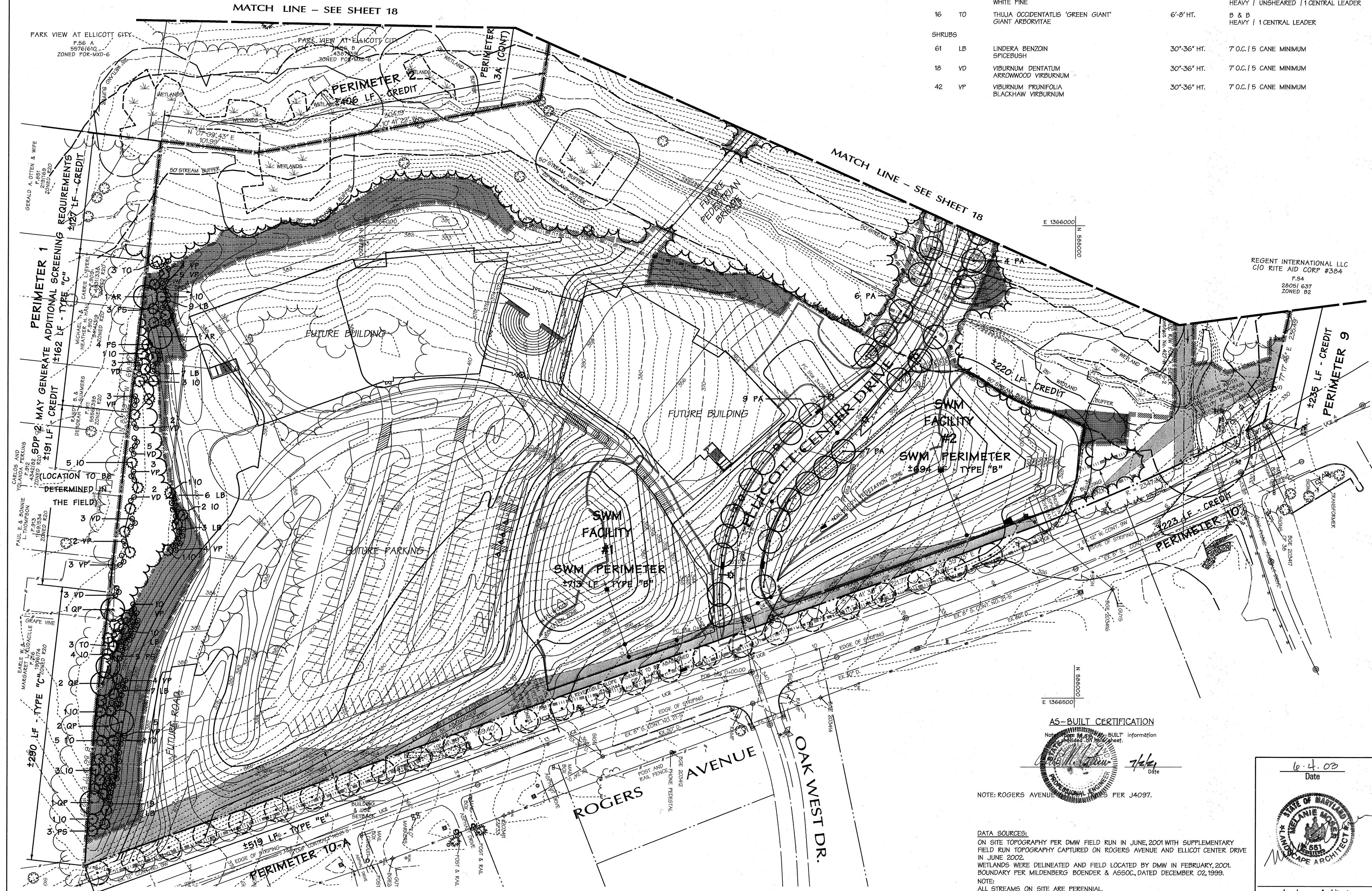
Notwithstanding to what is shown on this sheet, the information provided is for informational purposes only.

*Chris Dammann* 7/16/12  
Date

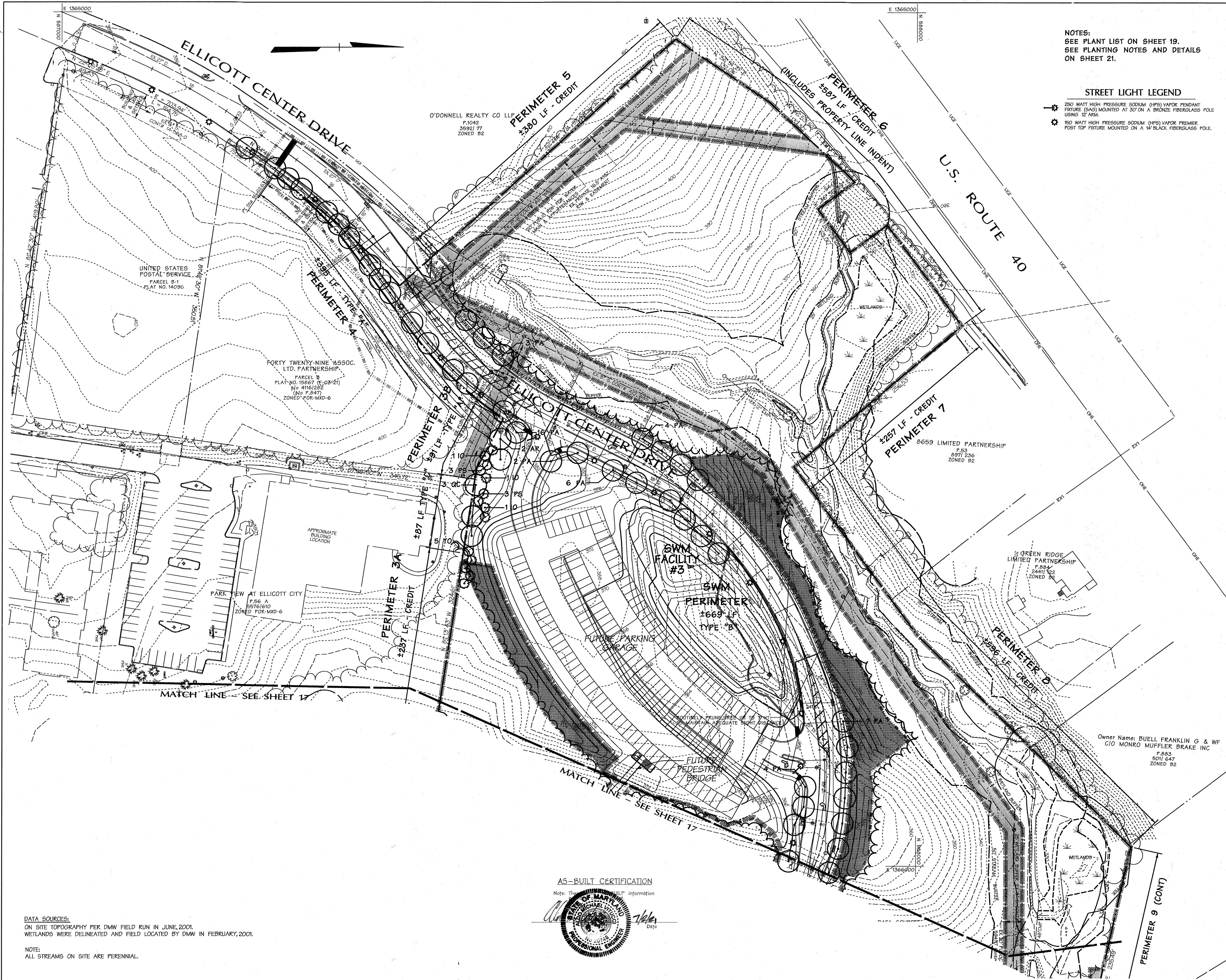
NOTE: ROGERS AVENUE PERMANENT LINES PER J4097.

DATA SOURCES:  
ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELICOTT CENTER DRIVE IN JUNE 2002.  
WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
NOTE:  
ALL STREAMS ON SITE ARE PERENNIAL.

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET







NOTES:  
 SEE PLANT LIST ON SHEET 19.  
 SEE PLANTING NOTES AND DETAILS  
 ON SHEET 21.

**STREET LIGHT LEGEND**  
 250 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PENDANT  
 FIXTURE (BAG) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE  
 USING 12 AWG.  
 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PREMIER  
 POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE.

- LEGEND**
- PROPERTY LINE
  - ADJACENT PROPERTY LINE
  - 300' MAJOR CONTOURS
  - 295' MINOR CONTOURS
  - STREAM CENTERLINE
  - STREAM BUFFER
  - WETLAND LIMIT
  - WETLAND BUFFER
  - 100 YR FLOODPLAIN
  - EXISTING FOREST EDGE
  - EXISTING ROADS
  - PROPOSED FOREST EDGE (RETENTION)
  - FOREST CONSERVATION EASEMENT
  - PROPOSED REFORESTATION
  - EXISTING UTILITY EASEMENTS
  - NON-WOODY VEGETATION ZONE
  - PROPOSED SHADE TREE
  - ⊙ PROPOSED EVERGREEN TREE
  - STREET TREE PROVIDED BY OTHERS

6.4.03  
 Date

Landscape Architect

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William Z. White* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*John Dammann* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Andy Hantz* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mark S. Campbell* 7/21/03  
 DIRECTOR DATE

Date	No.	Revision Description

**Howard County  
 Office Campus**  
 PARCEL A  
 CIP-C-0282

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**DMW**  
 Daft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
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A Team of Land Planners,  
 Landscape Architects,  
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 Environmental Professionals

SECTION NAME	NO. CO. OFFICE CAMPUS	SECTION AREA	SECTION #	DATE
LANDSCAPE & STREET TREE PLAN	NA	24 & 25	2	6/29

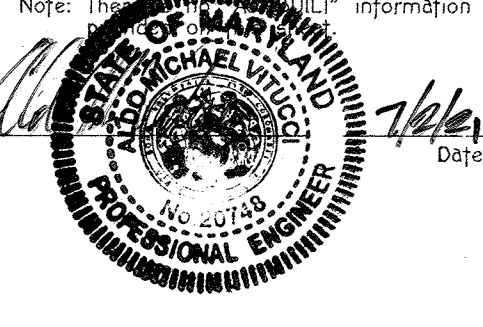
TITLE  
**LANDSCAPE & STREET TREE PLAN  
 WEST SIDE**

Des. By	FPB	Scale	1"=50'	Proj. No.	01001.C
Drn. By	BRC	Date	3/5/12	20 of 44	
Chk. By	RLN	Approved	90P-03-02G		

DATA SOURCES:  
 ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001.  
 WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001.

NOTE:  
 ALL STREAMS ON SITE ARE PERENNIAL.

AS-BUILT CERTIFICATION  
 Note: This is an AS-BUILT information



THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET



# Landscaping Notes

- The contractor shall review architectural/engineering plans to become thoroughly familiar with grading and surface utilities.
- All equipment and tools shall be placed so as not to interfere or hinder the pedestrian and vehicular traffic flow. No vehicles, equipment, tools, etc. shall be placed on or within any tree protection zone. No staging (storing or stockpiling of supplies or material) within the tree protection zones.
- The contractor shall coordinate with lighting and irrigation contractors regarding timing of installation of plant material.
- The contractor shall insure that his work does not interrupt established or projected drainage patterns.
- During planting operations, excess waste materials from landscape installation shall be removed daily.
- The contractor is advised of the existence of underground utilities on the site. Their exact location shall be verified in the field with the owner or general contractor prior to the commencement of any digging operations. In the event they are uncovered, the contractor shall be held responsible for all damage to utilities and such damage shall not result in any additional expenses to the owner.
- If utility lines are encountered in excavation of tree pits, other locations for trees shall be made by the contractor without additional compensation. No changes of location shall be made without approval of the landscape architect.
- Maintain positive drainage out of planting beds at a minimum 2% slope. All grades, dimensions, and existing conditions shall be verified by the contractor on site before construction begins. Any discrepancies shall be brought to the attention of the landscape architect or owner.
- Every possible safeguard shall be taken to protect building surfaces, equipment, existing trees and furnishing. The contractor shall be responsible for any damage or injury to person or property which may occur as a result of his negligence in the execution of the work.
- In the event of variation between quantities shown on the plant list and the plans, the plant list shall control. The contractor is responsible for verifying all plant quantities prior to the commencement of work. Sod quantity take-offs are the responsibility of the contractor. All discrepancies shall be reported to the landscape architect for clarification prior to bidding. The contractor shall furnish plant material in sizes as specified in plant list.
- The contractor shall stake all material located on the site for review and/or adjustment by the landscape architect prior to planting. All locations are to be approved by the landscape architect before excavation.

- Interlock all protective hose sections when wiring the trees.
- Do not twist wires. Hand tighten wires around stakes so that they are slightly slack.
- Remove top 2/3 of wire baskets on root balls.
- No mulch is to be placed against trunk and stems of trees and shrubs.
- A minimum spacing of 20" shall be maintained between lights and any trees.

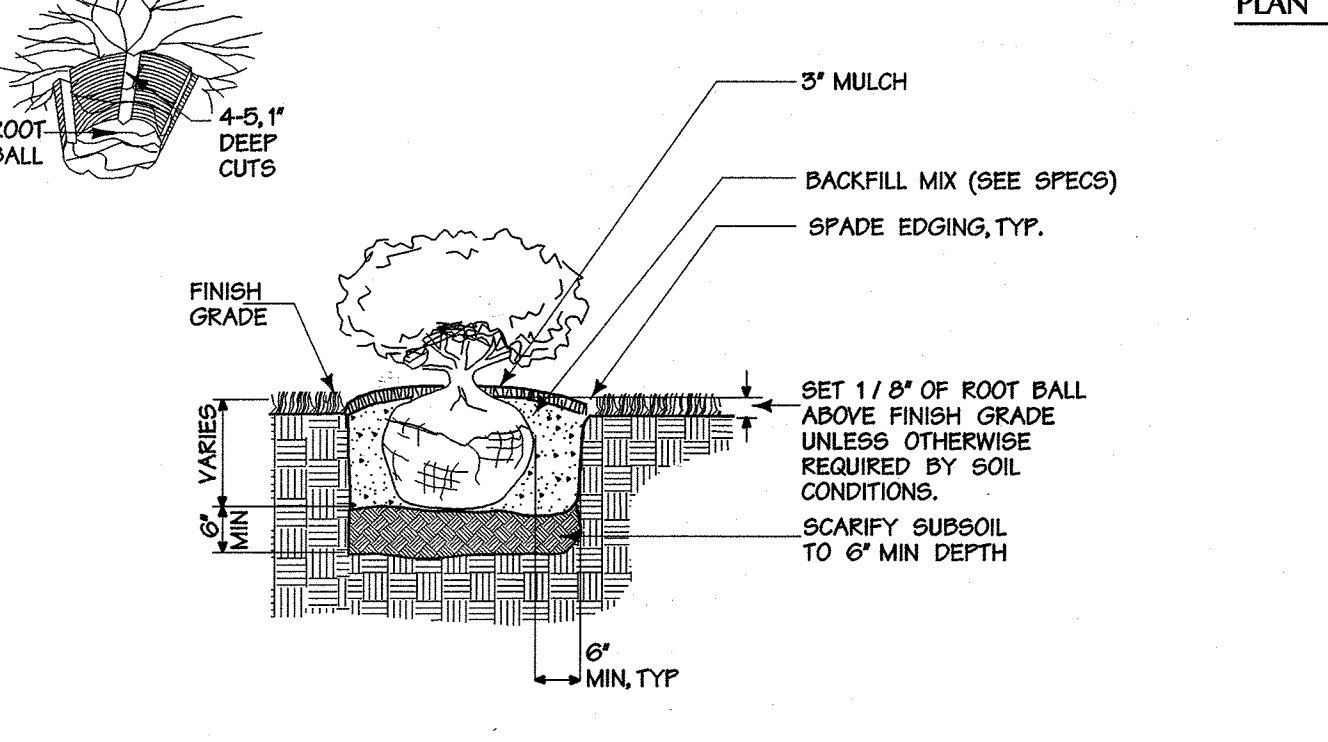
### General Planting Notes

- All plant material to meet A.A.N. Standards.
- All planting procedures shall conform to Landscape Contractors Association (LCA) specification guidelines for Baltimore/Washington metropolitan area (latest edition) LCA Landscape Specification Guidelines (5th Ed.) section 116, replacement and conditions, item F. Plant losses due to abnormal weather does not apply.
- No substitutions to be made without consent of Landscape Architect or Owner.
- All beds to be topped with three inches of hardwood mulch.
- Landscape Contractor to verify location of utilities with Owner before planting.
- Landscape Architect/Owner select, verify and/or approve all plant material. At Owner's discretion, specimen and other plant material will be selected.
- Landscape Contractor shall coordinate plant bed filling operations and plant material installation with General Contractor and Utilities Contractor. At the time of final inspection with acceptance, all electric, water, drainage, and fountain utilities, as well as all plant materials, shall remain undamaged. Likewise, Landscape Contractor and Utilities Contractor shall coordinate efforts to ensure that surface utilities are at the proper elevation relative to final grades.
- Contractor shall notify Miss Utility 72 hours prior to construction.
- 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.
- This plan has been prepared in accordance with the provisions of Section 16.124 of the Ho. Co. Code.
- As the time of installation, all shrubs and other plantings herewith listed and approved for this site, shall be of proper height requirements in accordance with the Howard County Landscape Manual. In addition, no substitutions or relocation of required plantings as shown on this plan may be made without prior 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.
- 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 letter of notice of landscape installation, accompanied by an executed one-year guarantee of plant materials, will be submitted to the Department of Planning and Zoning.

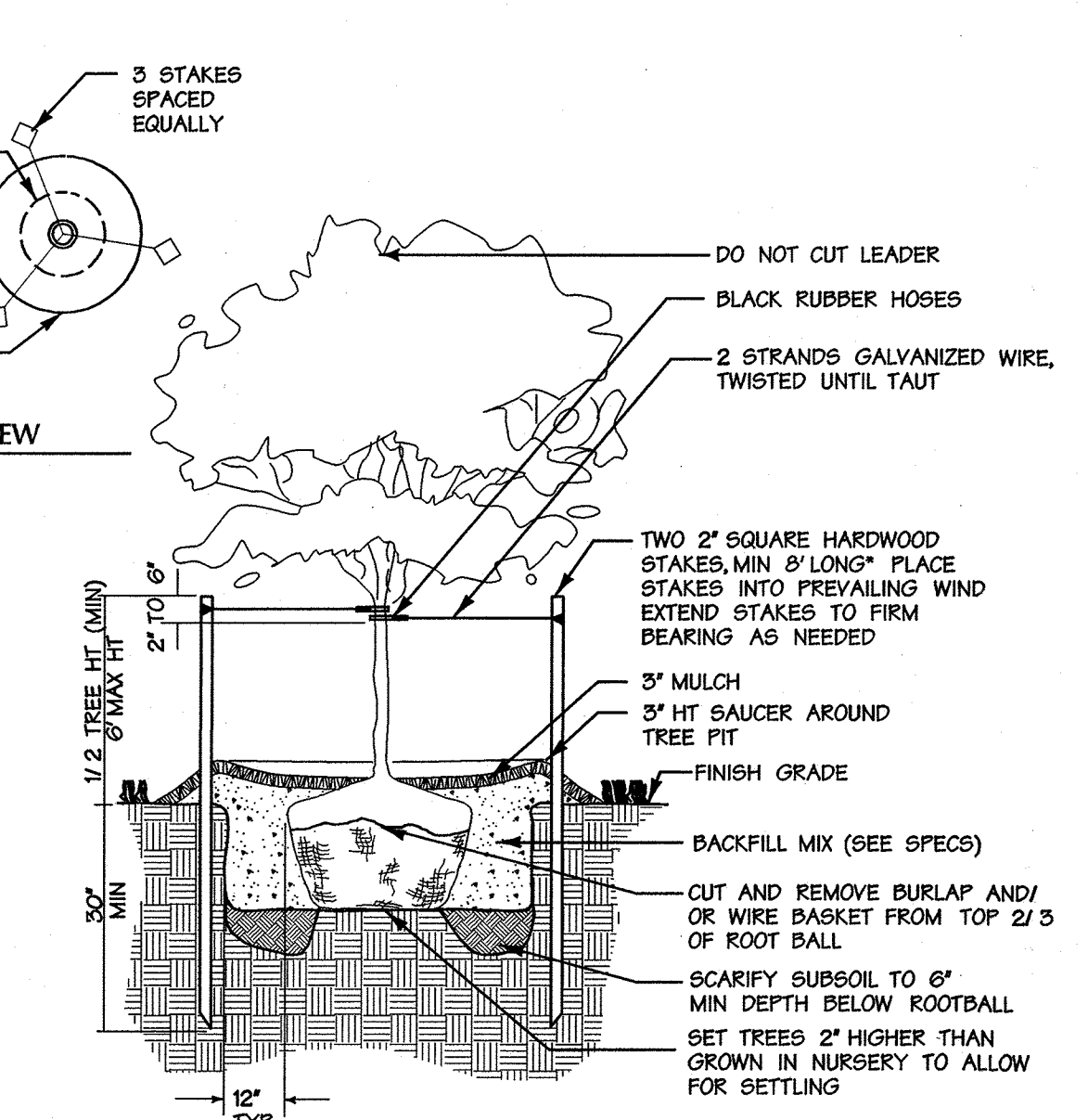
NAME: *Ja...* DATE: *6/25/03*

- NOTES:
- FOR CONTAINER SHRUBS, COMPLETELY REMOVE ALL NON-BIODEGRADABLE CONTAINERS AND SCARIFY ROOTBALL BY USING A SHARP BLADE AND MAKING 4 TO 6 ONE INCH CUTS THE LENGTH OF THE ROOTBALL.
  - FOR B&B SHRUBS, CUT AND REMOVE BURLAP FROM TOP 1/3 OF ROOT BALL.



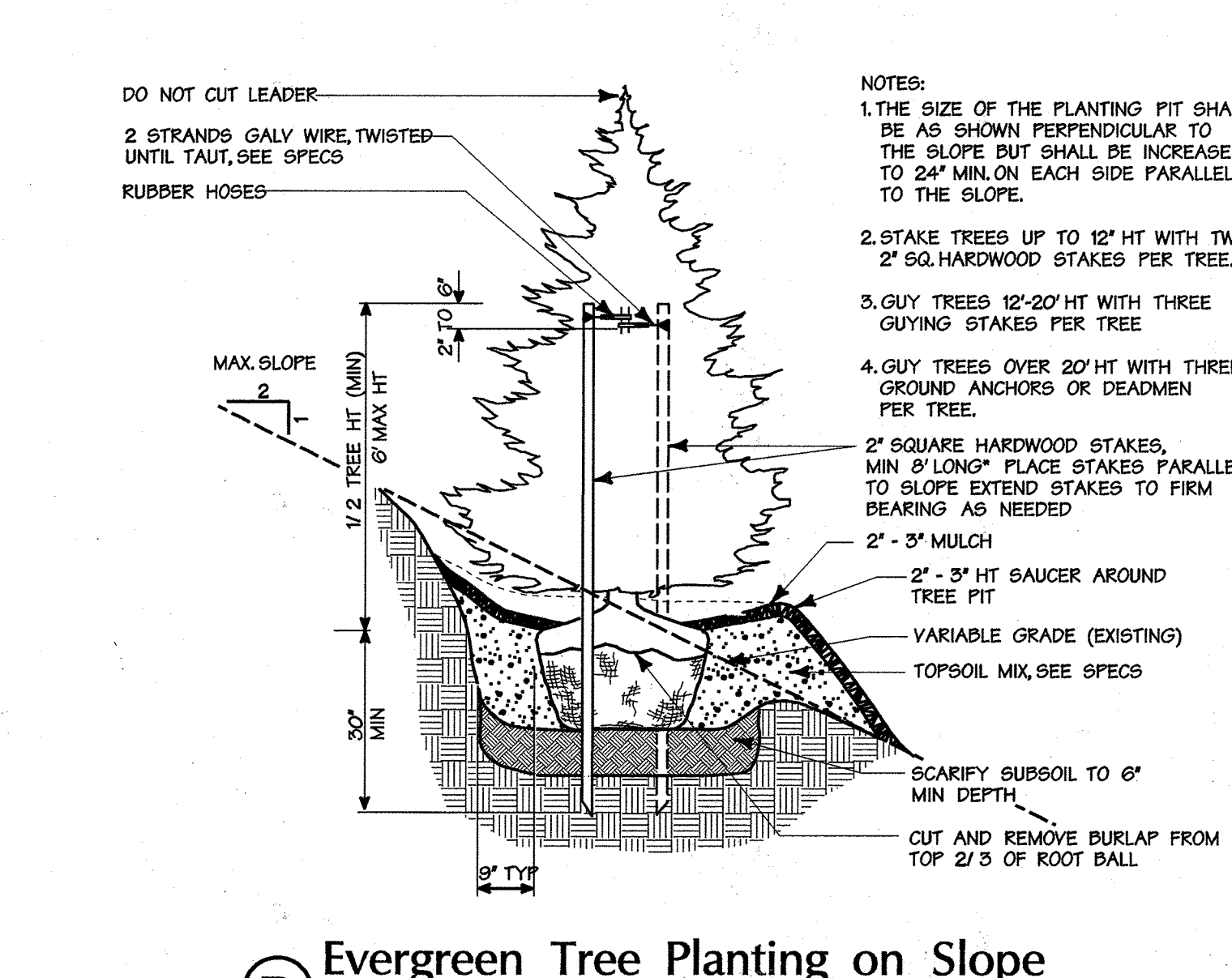
**A** Shrub Bed Planting  
Not To Scale

**B** Evergreen Tree Planting  
Not To Scale



**C** Less Than 3\" Cal. Tree Planting  
Not To Scale

**D** Evergreen Tree Planting on Slope  
Not To Scale



**E** Tree Planting on Slope  
Not To Scale



**F** Tree Planting on Slope  
Not To Scale



**G** Tree Planting on Slope  
Not To Scale



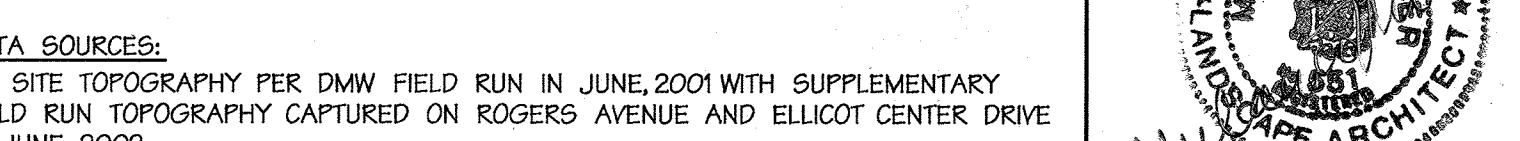
**H** Tree Planting on Slope  
Not To Scale



**I** Tree Planting on Slope  
Not To Scale



**J** Tree Planting on Slope  
Not To Scale



**K** Tree Planting on Slope  
Not To Scale



## SCHEDULE A PERIMETER LANDSCAPE EDGE

CATEGORY	ADJACENT TO ROADWAYS					ADJACENT TO PERIMETER PROPERTIES						
	P 10	P 6	P 1	P 2	P 3A	P 3B	P 4	P 5	P 7	P 8	P 9	
LANDSCAPE TYPE "A"						91	395	380	257	596	225	
LINEAR FEET OF PERIMETER												
LANDSCAPE TYPE "B"	223											
LINEAR FEET OF PERIMETER												
LANDSCAPE TYPE "C"												
LINEAR FEET OF PERIMETER		587	770	406	324							
LANDSCAPE TYPE "E"												
LINEAR FEET OF PERIMETER		519										
CREDIT FOR EXISTING VEGETATION (DESCRIBE BELOW IF NEEDED)	223	519	587	318	406	227	N/A	***	380	257	596	225
PERIMETER REMAINING AFTER CREDIT	0	519	0	452	0	87	N/A	N/A	0	0	0	0
CREDIT FOR BERM (DESCRIBE BELOW IF NEEDED)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
NUMBER OF PLANTS REQUIRED												
SHADE TREES	0	13	0	11	0	2	0	0	0	0	0	0
EVERGREEN TREES	0	0	0	23	0	4	0	0	0	0	0	0
SHRUBS	0	130	0	0	0	0	0	0	0	0	0	0
PLANTING DEFERRED UNTIL LATER PHASE	N/A	YES SDP 2	N/A	NO**	N/A	NO	NO	N/A	N/A	N/A	N/A	N/A
NUMBER OF PLANTS PROVIDED												
SHADE TREES	0	0	0	8*	0	3	2	0	0	0	0	0
EVERGREEN TREES	0	0	0	50	0	9	5	0	0	0	0	0
OTHER TREES (2:1 SUBSTITUTION)	0	0	0	0	0	0	0	0	0	0	0	0
SHRUBS (10:1 SUBSTITUTION)				121								
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)												

\* - 6 EVERGREEN TREES HAVE BEEN SUBSTITUTED FOR 3 SHADE TREES  
 \*\* - SDP 2 MAY GENERATE ADDITIONAL SCREENING REQUIREMENTS  
 \*\*\* - P4 LANDSCAPING SHALL BE DEFERRED UNTIL SDP 2 FOR PARCEL B-WEISSBERG PROPERTY

## SCHEDULE D STORMWATER MANAGEMENT AREA LANDSCAPING

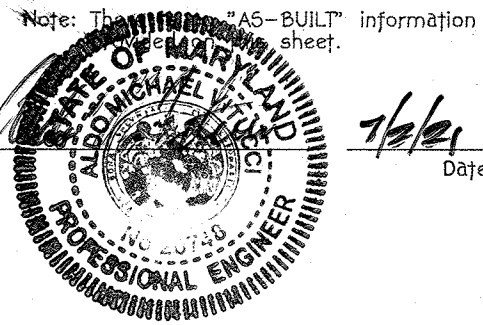
STORMWATER MANAGEMENT AREA	I	II	III
LANDSCAPE TYPE "B" (LINEAR FT OF PERIMETER)	713 LF	694 LF	669 LF
NUMBER OF TREES REQUIRED			
SHADE TREES @ 1/50 LF	14	14	14
EVERGREEN TREES @ 1/40 LF	18	17	17
CREDIT FOR EXISTING VEGETATION	N/A	220	N/A
CREDIT FOR OTHER LANDSCAPING	N/A	N/A	N/A
PLANTING DEFERRED UNTIL LATER PHASE	YES SDP 2	YES SDP 2	YES SDP 2
NUMBER OF TREES PROVIDED			
SHADE TREES	0	0	0
FLOWERING TREES	0	0	0
EVERGREEN TREES	0	0	0

## ELICOTT CENTER DRIVE STREET TREE REQUIREMENT

LINEAR FEET OF ROADWAY (BOTH SIDES OF ELICOTT CENTER DRIVE)	2720
NUMBER OF TREES REQUIRED @ 140'	68
NUMBER OF TREES PROVIDED	68

DATA SOURCES:  
 ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELICOTT CENTER DRIVE IN JUNE 2002.  
 WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
 NOTE:  
 ALL STREAMS ON SITE ARE PERENNIAL.

### AS-BUILT CERTIFICATION



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William F. Walker* 7/1/03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*John Damann* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

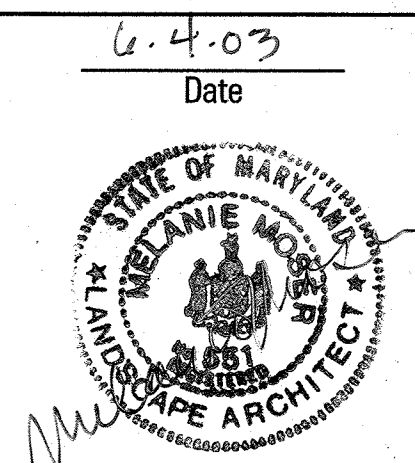
*Quinn Stewart* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Franklin D. Wright* 7/16/03  
 DIRECTOR DATE

## Howard County Office Campus PARCEL A CIP-C-0282

OWNER /DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELICOTT CITY, MD 21043

**DMW**  
 Daft-McCune-Walker, Inc. A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals  
 200 East Pennsylvania Avenue, Towson, Maryland 21286  
 (410) 296-3353 Fax 296-4705



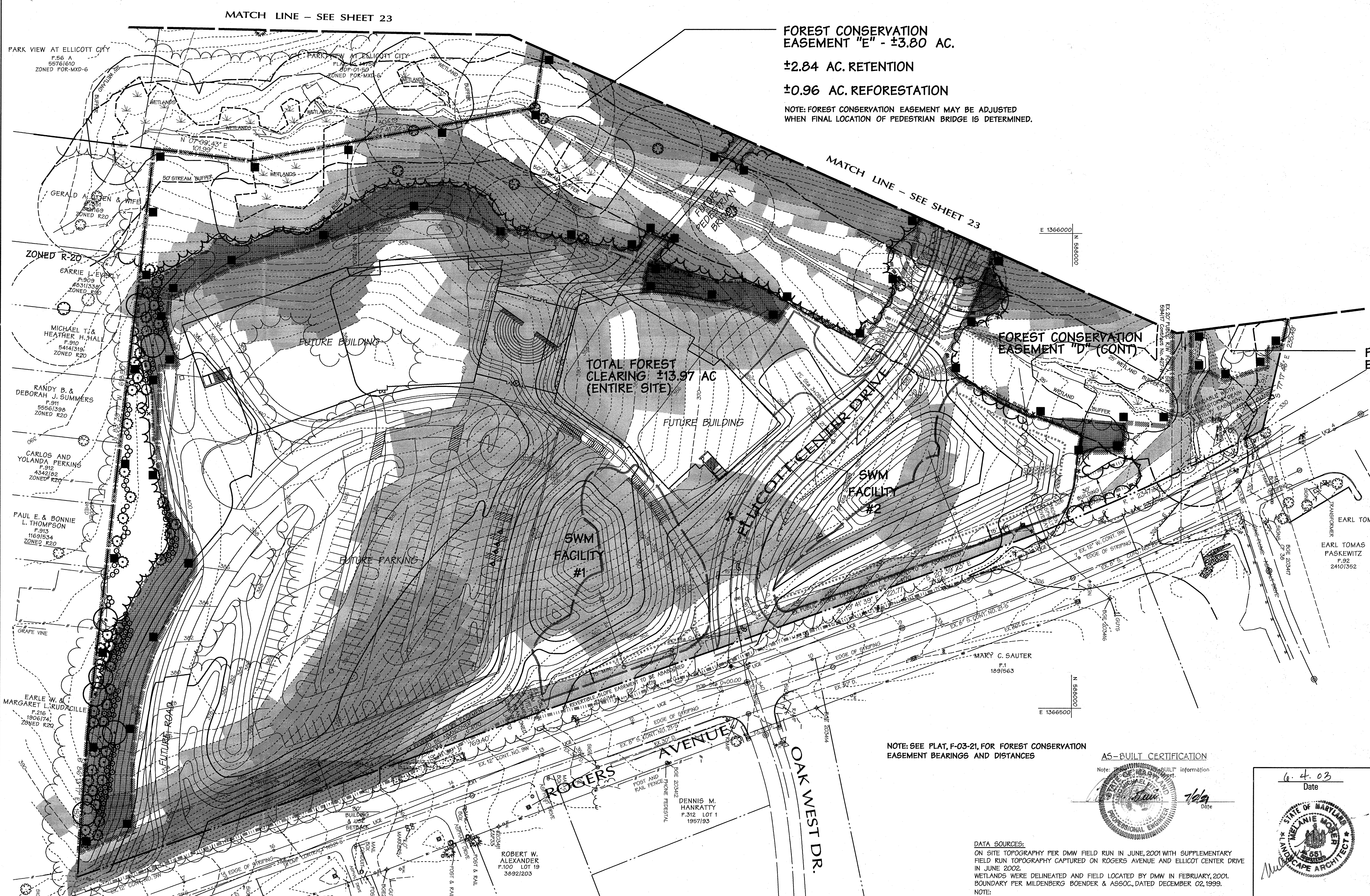
DESIGNER NAME	NO. CO. OFFICE CAMPUS	SECTION/AREA	TITLE/PARCEL
DAFT-MCCUNE-WALKER, INC.	15067-106 & 11	24 & 25	052 & P10B47
PLANS ON THIS SHEET	NO. OF SHEETS	DATE	DATE
15067-106 & 11	2	7/5/12	6029
TITLE: LANDSCAPE NOTES & DETAILS			
Des. By	Scale AS NOTED	Proj. No. C1001.C	
Drn. By	Date 7/5/12		
Chk. By RLH	Approved		21 of 44

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 5/27-03-02G



LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300 MAJOR CONTOURS
- 295 MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- 100 YR FLOODPLAIN
- █ SLOPES >25%
- █ SLOPES 15%-25%
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED FOREST EDGE (RETENTION)
- █ FOREST CONSERVATION EASEMENT
- █ PROPOSED REFORESTATION
- █ EXISTING UTILITY EASEMENTS
- NON-WOODY VEGETATION LIMIT
- SWM FACILITY TOE OF SLOPE
- █ PERMANENT FOREST PROTECTION SIGNAGE
- x --- FOREST PROTECTION FENCE
- LIMIT OF DISTURBANCE
- SPECIMEN TREE
- CRITICAL ROOT ZONE



**FOREST CONSERVATION EASEMENT "E" - ±3.80 AC.**  
**±2.84 AC. RETENTION**  
**±0.96 AC. REFORESTATION**

NOTE: FOREST CONSERVATION EASEMENT MAY BE ADJUSTED WHEN FINAL LOCATION OF PEDESTRIAN BRIDGE IS DETERMINED.

TOTAL FOREST CLEARING: ±13.97 AC (ENTIRE SITE)

FOREST CONSERVATION EASEMENT "D" (CONT.)

FOREST CONSERVATION EASEMENT "C" (CONT.)

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William F. ...* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Earl Tomasz Paskewitz* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Earl Tomasz Paskewitz* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Joseph ...* 7/21/03  
 DIRECTOR DATE

Date	No.	Revision Description

**Howard County Office Campus**  
**PARCEL A**  
**CIP-C-0282**

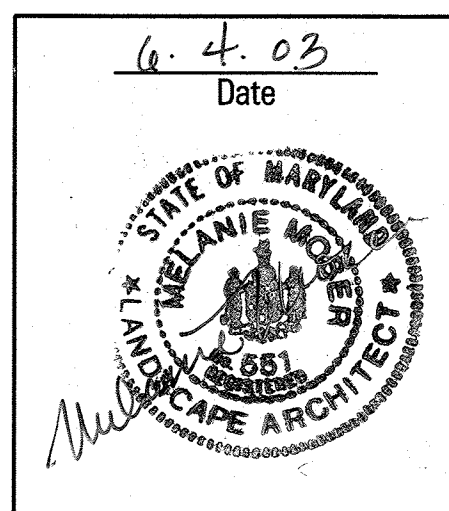
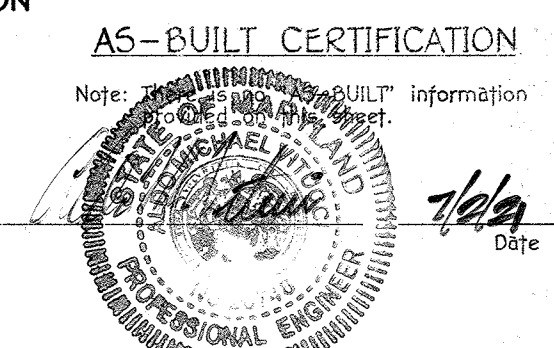
OWNER /DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**DMW**  
 Daft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

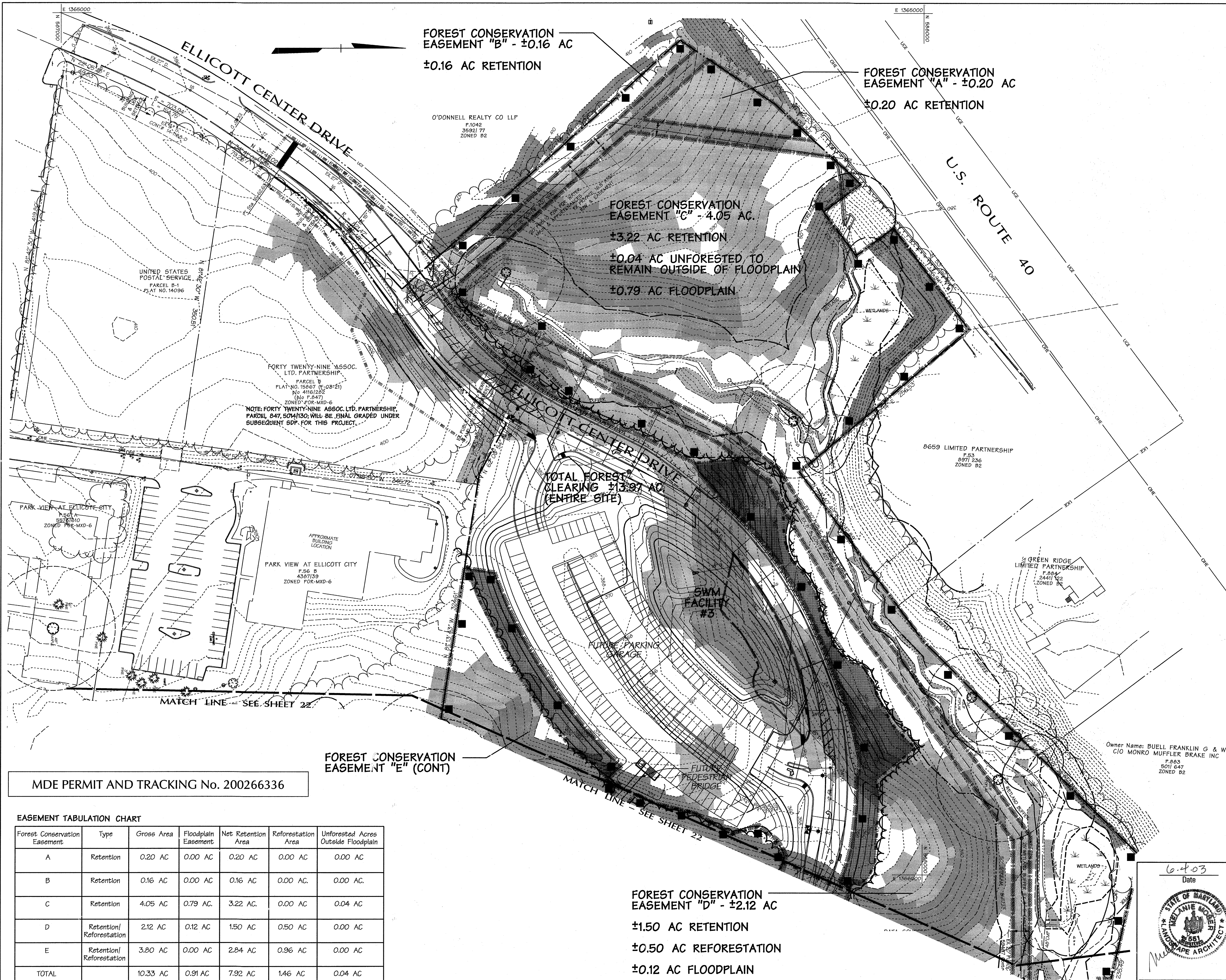
SUBDIVISION NAME	NO. CO. OFFICE CAMPUS	SECTION AREA	NO.	DATE
FILE NO.	15017-06	BLOCK #	24 & 25	
MAP	6 & 1 POR	SECTION	2	
REVISION CODE				
TITLE	FOREST CONSERVATION PLAN - EAST SIDE			
Des. By	MRT	Scale	1"=50'	Proj. No. 01001.C
Dim. By	BKC	Date	3/15/12	22 of 44
Chk. By	RLH	Approved		

DATA SOURCES:  
 ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELLICOTT CENTER DRIVE IN JUNE 2002.  
 WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001. BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
 NOTE:  
 ALL STREAMS ON SITE ARE PERENNIAL.



THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 90P-03-02C



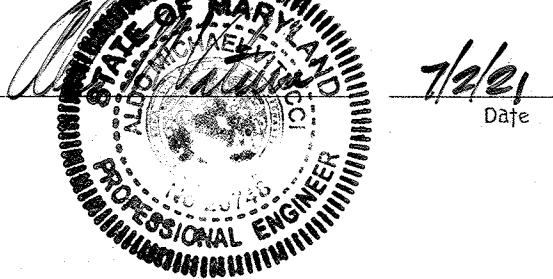


**LEGEND**

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300 MAJOR CONTOURS
- 295 MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- 100 YR FLOODPLAIN
- █ SLOPES >25%
- █ SLOPES 15%-25%
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED FOREST EDGE (RETENTION)
- █ FOREST CONSERVATION EASEMENT
- █ PROPOSED REFORESTATION
- █ EXISTING UTILITY EASEMENTS
- NON-WOODY VEGETATION LIMIT
- █ PERMANENT FOREST PROTECTION SIGNAGE
- X --- FOREST PROTECTION FENCE
- LIMIT OF DISTURBANCE
- SPECIMEN TREE
- CRITICAL ROOT ZONE

**AS-BUILT CERTIFICATION**

Note: This AS-BUILT information is for informational purposes only.



**DATA SOURCES:**  
ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001.  
WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001.  
NOTE:  
ALL STREAMS ON SITE ARE PERENNIAL.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. Walker* 7-11-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Chad D. ...* 7/11/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Candy ...* 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*David ...* 7/21/03  
DIRECTOR DATE

Date	No.	Revision Description

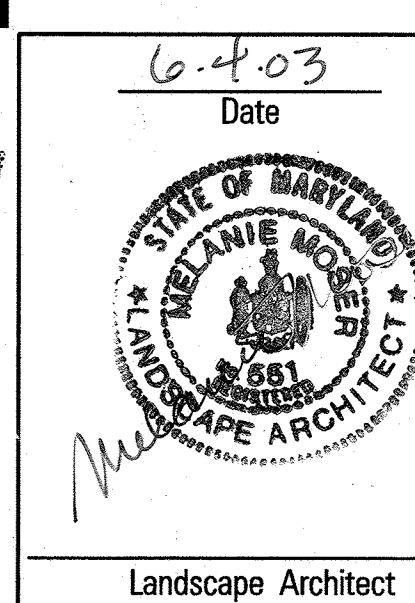
**Howard County Office Campus**  
PARCEL A  
CIP-C-0282

OWNER /DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLICOTT CITY, MD 21043

**DMW**  
Daft-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 286-3333  
Fax 286-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SECTION AREA: 852 & P10847  
DATE: 6.4.03



MDE PERMIT AND TRACKING No. 200266336

**EASEMENT TABULATION CHART**

Forest Conservation Easement	Type	Gross Area	Floodplain Easement	Net Retention Area	Reforestation Area	Unforested Acres Outside Floodplain
A	Retention	0.20 AC	0.00 AC	0.20 AC	0.00 AC	0.00 AC
B	Retention	0.16 AC	0.00 AC	0.16 AC	0.00 AC	0.00 AC
C	Retention	4.05 AC	0.79 AC	3.22 AC	0.00 AC	0.04 AC
D	Retention/Reforestation	2.12 AC	0.12 AC	1.50 AC	0.50 AC	0.00 AC
E	Retention/Reforestation	3.80 AC	0.00 AC	2.84 AC	0.96 AC	0.00 AC
TOTAL		10.33 AC	0.91 AC	7.92 AC	1.46 AC	0.04 AC







N 588500  
E 1366750

N 588500  
E 1366750

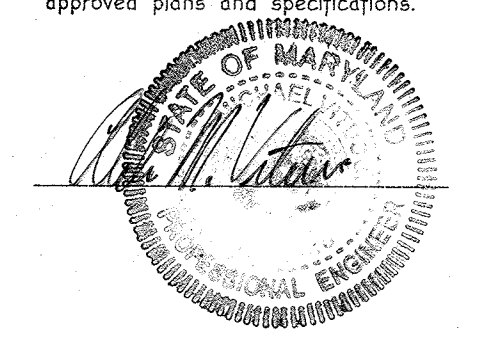
LEGEND

- EX. CONTOURS
- EX. BUILDING
- ~ PROP. WOODS LINE
- ~ EX. WOODS LINE
- SOIL LINE
- PROPERTY LINE
- PROPOSED DA LIMITS
- Area=1.35 Ac. Imp= 16% C = 0.29 PROPOSED DA LABEL



AS-BUILT CERTIFICATION

I hereby certify, by my seal, that the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.



7/1/12  
Date

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

*William F. Walker* 7-1-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING

*Chris Dammann* 7/1/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Chris Hamilton* 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Sharon M. Cargill* 7/16/02  
DIRECTOR DATE

Date	No.	Revision Description

**Howard County  
Office Campus  
PARCEL A  
CIP-C-0282**

OWNER /DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELICOTT CITY, MD 21043

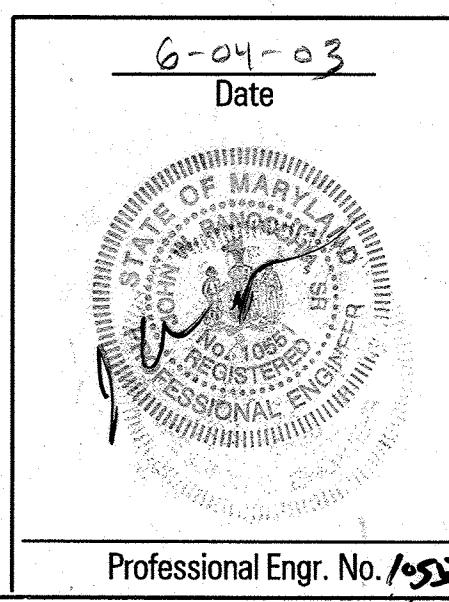
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3333  
Fax 296-4705

A Team of Land Planners,  
Landscape Architects,  
Golf Course Architects,  
Engineers, Surveyors &  
Environmental Professionals

SECTION NAME	NO. CO. OFFICE CAMPUS	SECTION/AREA	NA	LOT/FRANCE #	852 & P10B47
PLAT OR LEV	6 & 1	TAX/ZONE MAP	24 & 25	ELECT. DISTRICT	2
WATER CODE	15817-70	SEWER CODE	6029		

STORM DRAIN DRAINAGE AREA MAP

Des. By	Scale	1"=100'	Proj. No.	01201.C
Drn. By	Date	7/9/12		
Chk. By	Approved	<i>RLN</i>		



6-04-03  
Date  
Professional Engr. No. 1555

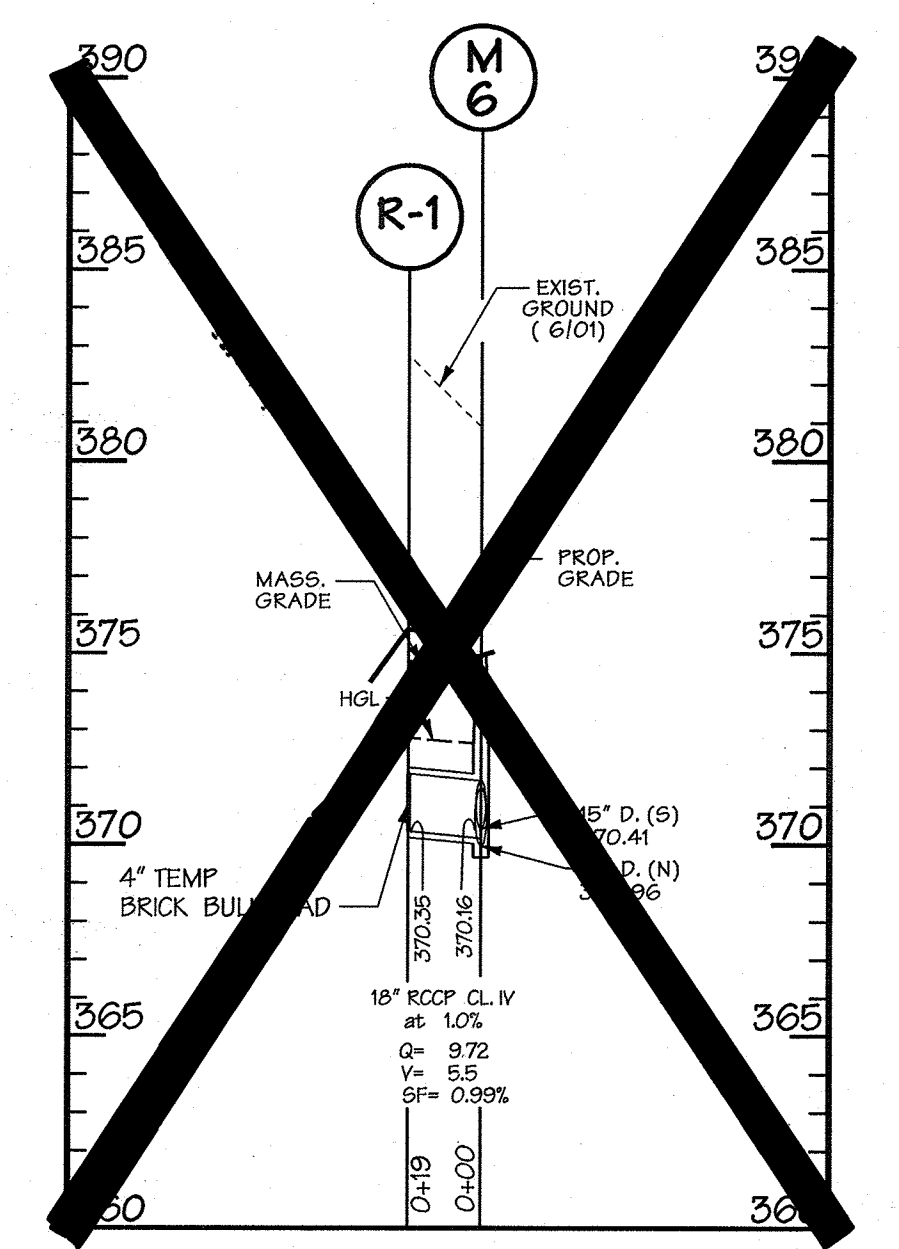
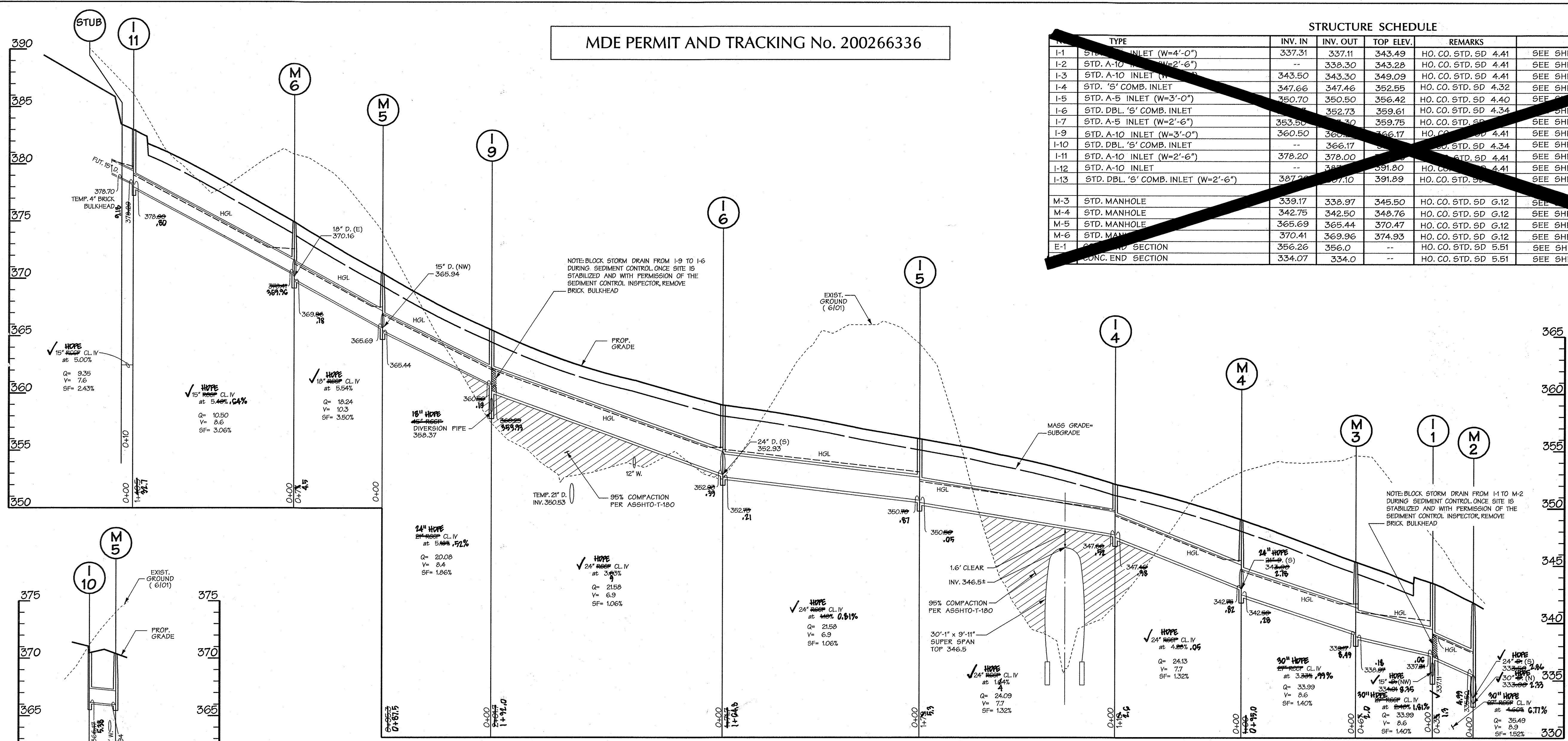
DATA SOURCES:  
ON SITE TOPOGRAPHY PER DMW FIELD RUN IN JUNE, 2001 WITH SUPPLEMENTARY  
FIELD RUN TOPOGRAPHY CAPTURED ON ROGERS AVENUE AND ELICOTT CENTER DRIVE  
IN JUNE 2002.  
WETLANDS WERE DELINEATED AND FIELD LOCATED BY DMW IN FEBRUARY, 2001.  
BOUNDARY PER MILDENBERG BOENDER & ASSOC., DATED DECEMBER 02, 1999.  
NOTE:  
ALL STREAMS ON SITE ARE PERENNIAL.

MDE PERMIT AND TRACKING No. 200266336

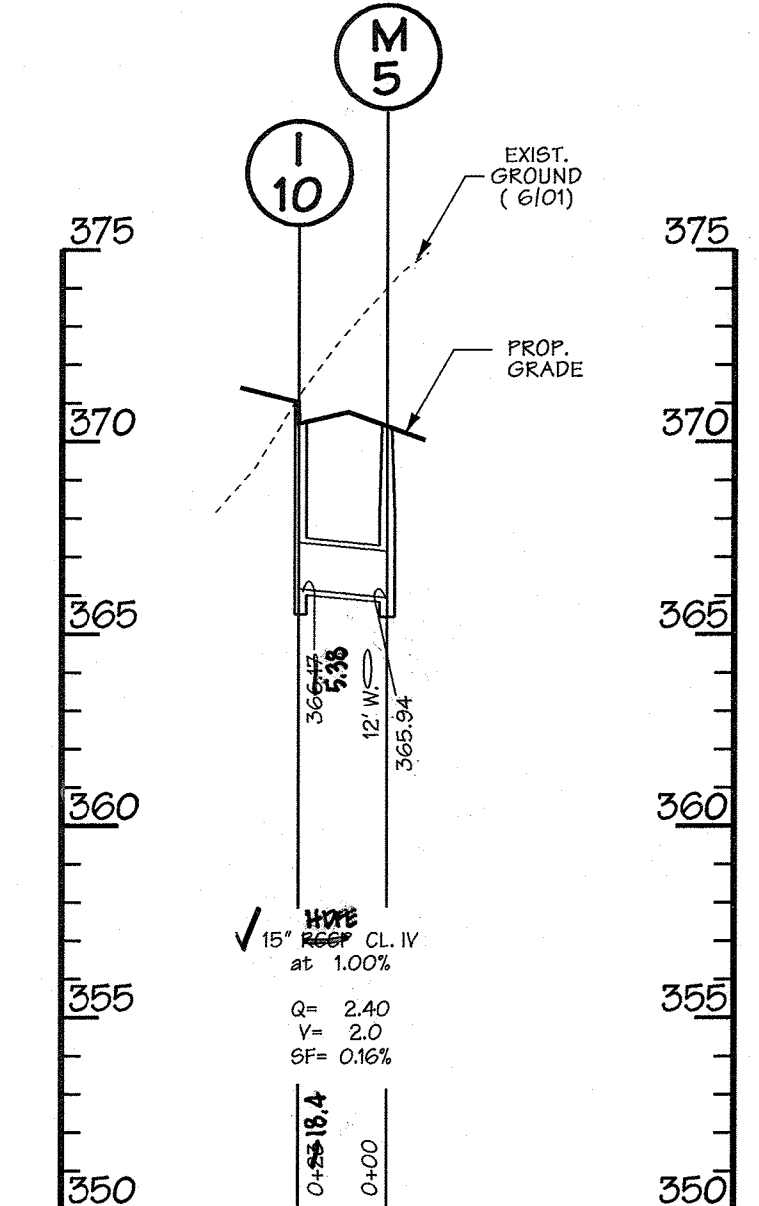
"AS-BUILT" 500-03-020



STRUCTURE SCHEDULE							
TYPE	INV. IN	INV. OUT	TOP ELEV.	REMARKS	LOCATION	SEE SHEET	INVENTORY #
I-1	337.31	337.11	343.49	HO. CO. STD. SD 4.41	INV. 334.91 15' D. INTO FACILITY #2	SEE SHEET 28	
I-2	---	338.30	343.28	HO. CO. STD. SD 4.41		SEE SHEET 28	
I-3	343.50	343.30	349.09	HO. CO. STD. SD 4.41		SEE SHEET 28	
I-4	347.66	347.46	352.55	HO. CO. STD. SD 4.32		SEE SHEET 28	
I-5	350.70	350.50	356.42	HO. CO. STD. SD 4.40		SEE SHEET 28	
I-6	---	352.73	359.61	HO. CO. STD. SD 4.34		SEE SHEET 28	
I-7	353.50	353.30	359.75	HO. CO. STD. SD 4.41		SEE SHEET 28	
I-9	360.50	360.30	366.17	HO. CO. STD. SD 4.41	INV. 358.37 15' D. INTO FACILITY #3	SEE SHEET 28	
I-10	---	366.17	---	HO. CO. STD. SD 4.34		SEE SHEET 28	
I-11	378.20	378.00	---	HO. CO. STD. SD 4.41		SEE SHEET 29	
I-12	---	387.20	391.80	HO. CO. STD. SD 4.41		SEE SHEET 29	
I-13	387.20	387.10	391.89	HO. CO. STD. SD 4.41		SEE SHEET 29	
M-3	339.17	338.97	345.50	HO. CO. STD. SD G.12		SEE SHEET 28	
M-4	342.75	342.50	348.76	HO. CO. STD. SD G.12		SEE SHEET 28	
M-5	365.69	365.44	370.47	HO. CO. STD. SD G.12		SEE SHEET 29	
M-6	370.41	369.96	374.93	HO. CO. STD. SD G.12		SEE SHEET 29	
E-1	356.26	356.0	---	HO. CO. STD. SD 5.51		SEE SHEET 28	
E-1	334.07	334.0	---	HO. CO. STD. SD 5.51		SEE SHEET 28	



STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'



STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'

STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'

AS-BUILT CERTIFICATION

I hereby certify, by my seal, that the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.

Professional Engineer Seal: *William J. Walker*, License No. 10551, State of Maryland.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. Walker*, 7-11-03, CHIEF, BUREAU OF HIGHWAYS

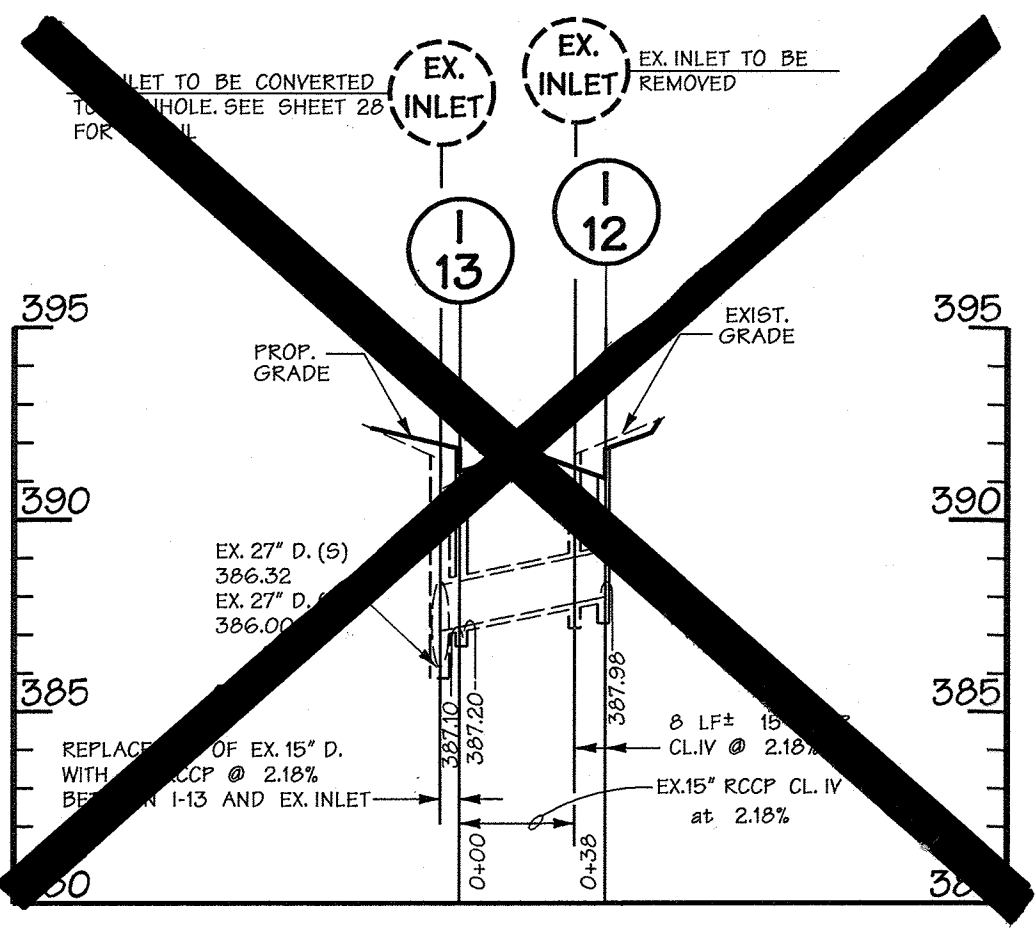
APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Carol Dammann*, 7/14/03, CHIEF, DEVELOPMENT ENGINEERING DIVISION

APPROVED: *Andy Stambaugh*, 7/16/03, CHIEF, DIVISION OF LAND DEVELOPMENT

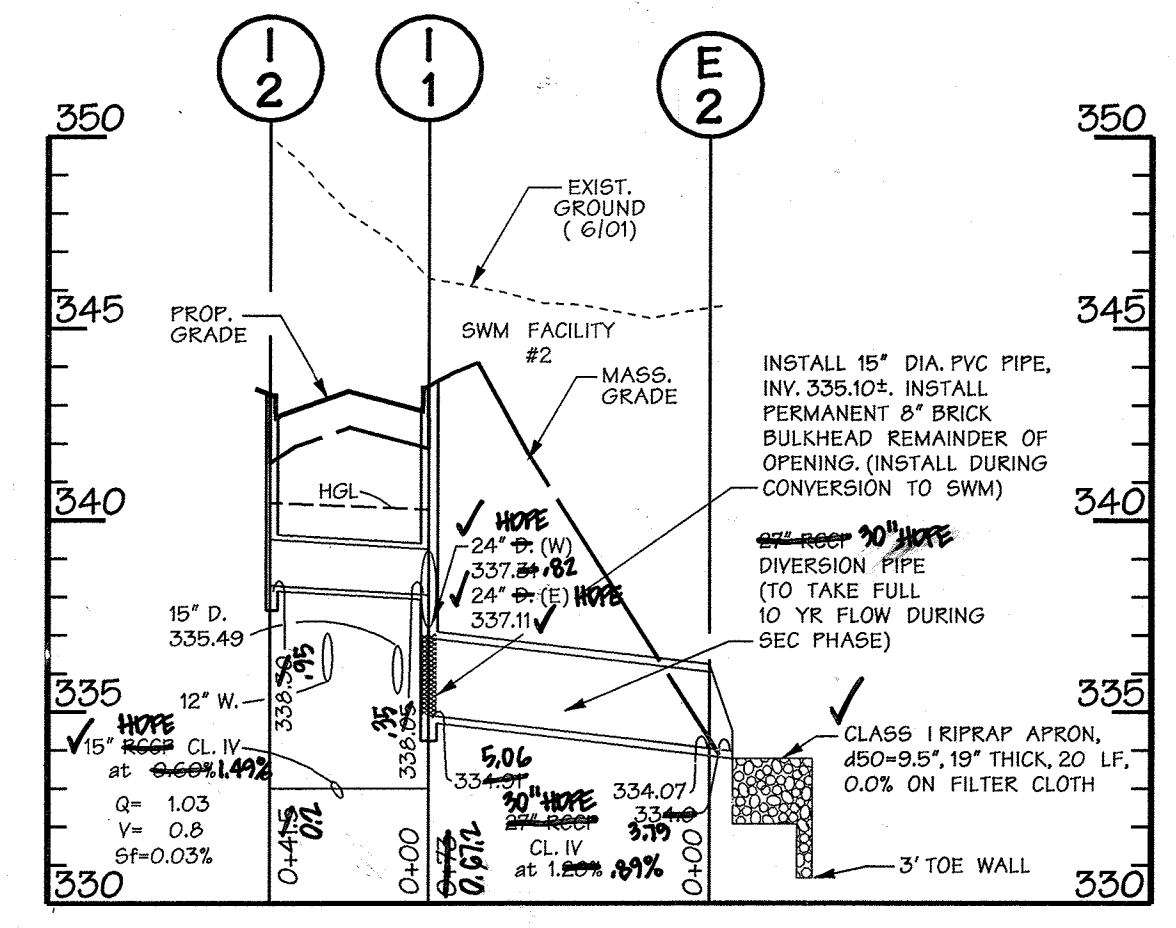
APPROVED: *Thomas G. Goggin*, 7/21/03, DIRECTOR

(IN.)	CATEGORY	L
18	RCCP CL. IV	146'
21	RCCP CL. IV	232'
24	RCCP CL. IV	700'
27	RCCP CL. IV	243'

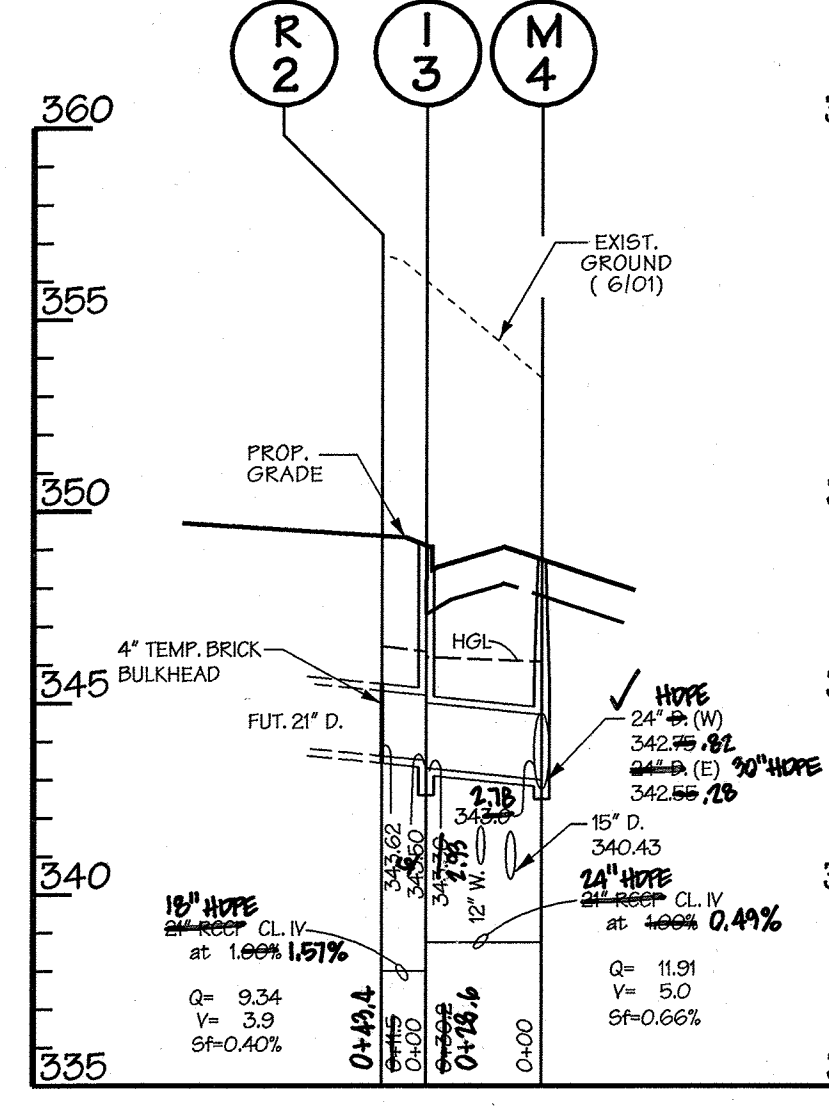
SEE SHEET 27 FOR PIPE SCHEDULE



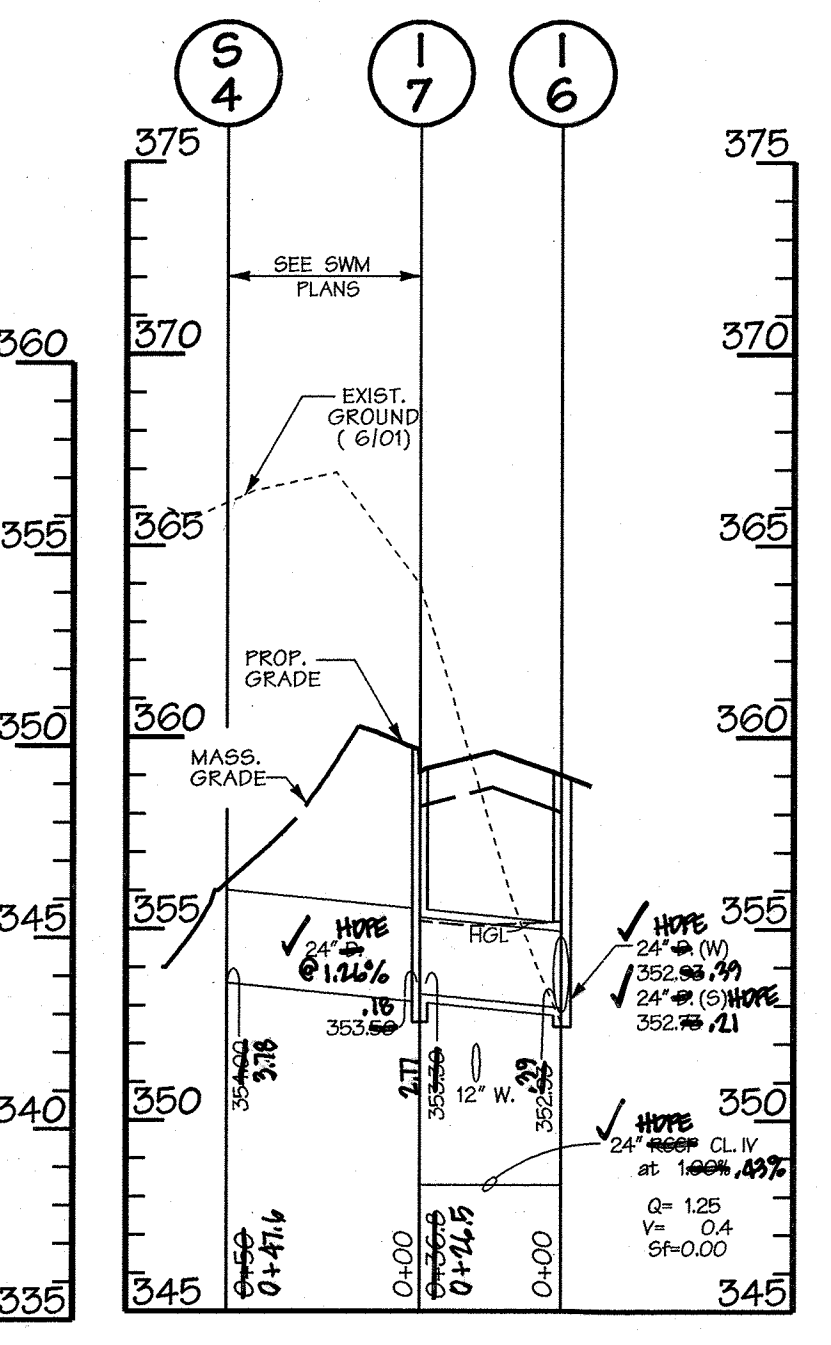
STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'



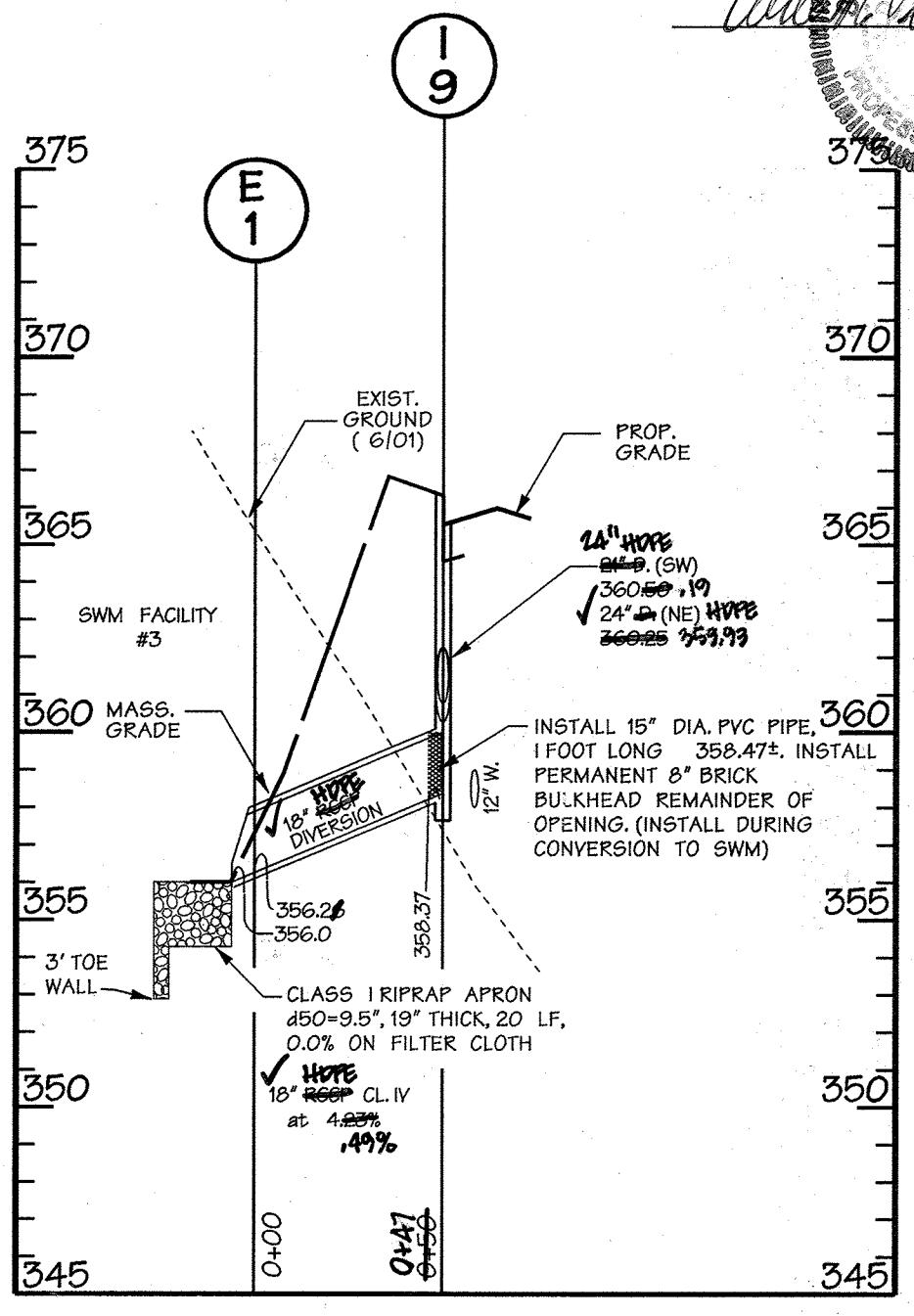
STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'



STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'



STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'



STORM DRAIN PROFILE  
SCALE: HORZ. 1" = 50'  
VERT. 1" = 5'

**Howard County Office Campus**  
PARCEL A  
CIP-C-0282

OWNER / DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
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**DMW**  
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200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3333  
Fax 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

BLK # 25, LOT # 10, SUBDIVISION # 852 & P10847  
DATE: 6-04-03

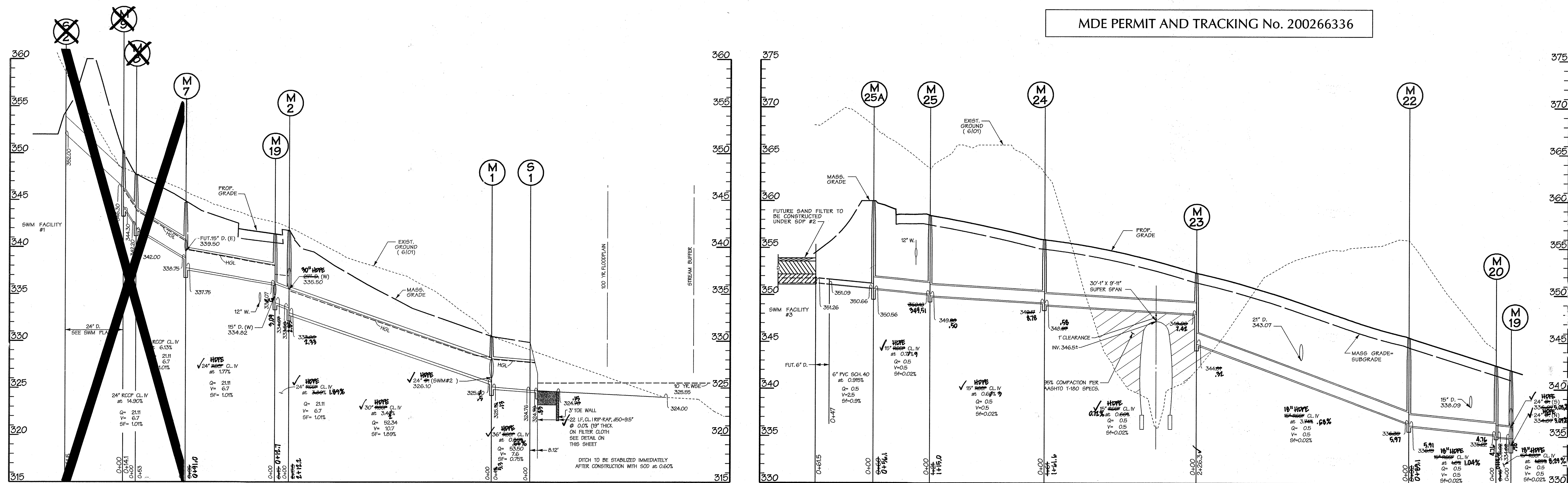
STORM DRAIN PROFILES

Des. By: WDE  
Dwn. By: WDE  
Chk. By: RLH

Scale: AS SHOWN  
Date: 7/15/03  
Approved: [Signature]

Proj. No. 01001.C  
26 of 44  
"AS-BUILT" 909-03-026





**STORM DRAIN PROFILE**  
SCALE: HORIZ. 1" = 50'  
VERT. 1" = 5'

**CLEAN WATER STORM DRAIN PROFILE**  
SCALE: HORIZ. 1" = 50'  
VERT. 1" = 5'

No.	TYPE	INV. IN	INV. OUT	TOP ELEV.	REMARKS	LOCATION
I-1	STD. A-10 INLET (W=4'-0")	337.06 (30')/338.35 (19')	335.06 (30')/334.91 (19')	343.27	HO. CO. STD. 50 4.41	SEE SHEET 28
I-2	STD. A-10 INLET (W=2'-8")		338.95 (19')	343.22	HO. CO. STD. 50 4.41	SEE SHEET 28
I-3	STD. A-10 INLET (W=2'-8")	346.50 (18')	342.93 (24')	349.04	HO. CO. STD. 50 4.41	SEE SHEET 28
I-4	STD. 5" COMB. INLET	347.52 (24')	350.05 (24')	356.48	HO. CO. STD. 50 4.40	SEE SHEET 28
I-5	STD. A-5 INLET (W=3'-0")	350.87 (24')	352.21 (24')	359.22	HO. CO. STD. 50 4.34	SEE SHEET 28
I-6	STD. DR. 15" COMB. INLET	353.18 (24')	352.77 (24')	359.94	HO. CO. STD. 50 4.40	SEE SHEET 28
I-7	STD. A-5 INLET (W=2'-8")	360.19 (24')	359.93 (24')/357.19 (18')	366.10	HO. CO. STD. 50 4.41	SEE SHEET 28
I-9	STD. A-10 INLET (W=3'-0")	378.20 (19')	378.00 (19')	370.44	HO. CO. STD. 50 4.34	SEE SHEET 28
I-10	STD. 5" COMB. INLET		383.08	HO. CO. STD. 50 4.41	SEE SHEET 29	
I-11	STD. A-10 INLET (W=2'-8")		391.10 (19')	395.40	HO. CO. STD. 50 4.10	SEE SHEET 27
I-12	STD. D INLET					
M-3	STD. MANHOLE	338.49 (30')	338.18 (19')	345.52	HO. CO. STD. 50 G.12	SEE SHEET 28
M-4	STD. MANHOLE	342.82 (24')	342.28 (30')	348.57	HO. CO. STD. 50 G.12	SEE SHEET 28
M-5	STD. MANHOLE	359.96 (19')	359.78 (18')	375.19	HO. CO. STD. 50 G.12	SEE SHEET 28
M-6	STD. MANHOLE	356.26 (18')	356.33 (18')		HO. CO. STD. 50 5.51	SEE SHEET 28
E-1	CONC. END SECTION	334.07 (30')				SEE SHEET 28
E-2	CONC. END SECTION					SEE SHEET 28

No.	TYPE	INV. IN	INV. OUT	TOP ELEV.	REMARKS	LOCATION
M-1	STD. MANHOLE	325.50 (30')	325.13 (36')/326.10 (24')	330.46	HO. CO. STD. G.5.13	SEE SHEET 28
M-2	STD. MANHOLE	333.59 (30')/332.89 (24')	332.33 (30')	341.42	HO. CO. STD. G.5.13	SEE SHEET 28
M-7	STD. MANHOLE	338.75 (24')	337.75 (24')/339.50 (19')	347.00	HO. CO. STD. G.5.12	SEE SHEET 27
M-14	STD. MANHOLE	386.88 (19')	386.83 (18')	395.10	HO. CO. STD. G.5.12	SEE SHEET 27
M-15	STD. MANHOLE	389.25 (18')/374.73 (12')	374.36	391.63	HO. CO. STD. G.5.12	SEE SHEET 28
M-19	STD. MANHOLE	335.07 (24')	333.09 (24')/333.55 (18')	341.08	HO. CO. STD. G.5.12	SEE SHEET 28
M-20	STD. MANHOLE	334.98 (19')	334.76 (19')	341.98	HO. CO. STD. G.5.12	SEE SHEET 28
M-22	STD. MANHOLE	335.97 (19')	335.91 (19')	345.47	HO. CO. STD. G.5.12	SEE SHEET 28
M-23	STD. MANHOLE	344.47 (19')	344.32 (18')	352.30	HO. CO. STD. G.5.12	SEE SHEET 28
M-24	STD. MANHOLE	348.78 (19')	348.58 (19')	356.04	HO. CO. STD. G.5.12	SEE SHEET 28
M-25	STD. MANHOLE	349.51 (19')	349.50 (19')	358.45	HO. CO. STD. G.5.12	SEE SHEET 28
M-26	STD. MANHOLE	350.66 (18')	350.56 (19')	359.68	HO. CO. STD. G.5.12	SEE SHEET 29
M-28	STD. MANHOLE	387.77 (19')	387.77 (19')	391.62	HO. CO. STD. G.5.12	SEE SHEET 28
S-1	CONC. END SEC.	324.76 (21')	324.85 (15')		HO. CO. STD. 50-5.12	SEE SHEET 28
Ex Inlet	EX. STD. DR. 15" COMB. INLET (W=2'-8")	387.10 (24')/386.32 (19')	386.00 (19')	392.00	HO. CO. STD. D.4.23	SEE SHEET 29
I-14	10" INLET		387.00	392.00	HO. CO. STD. D.4.10	SEE SHEET 29
I-15	A-9 INLET	386.20 (12')	387.80 (18')	392.68	HO. CO. STD. D.4.01	SEE SHEET 29

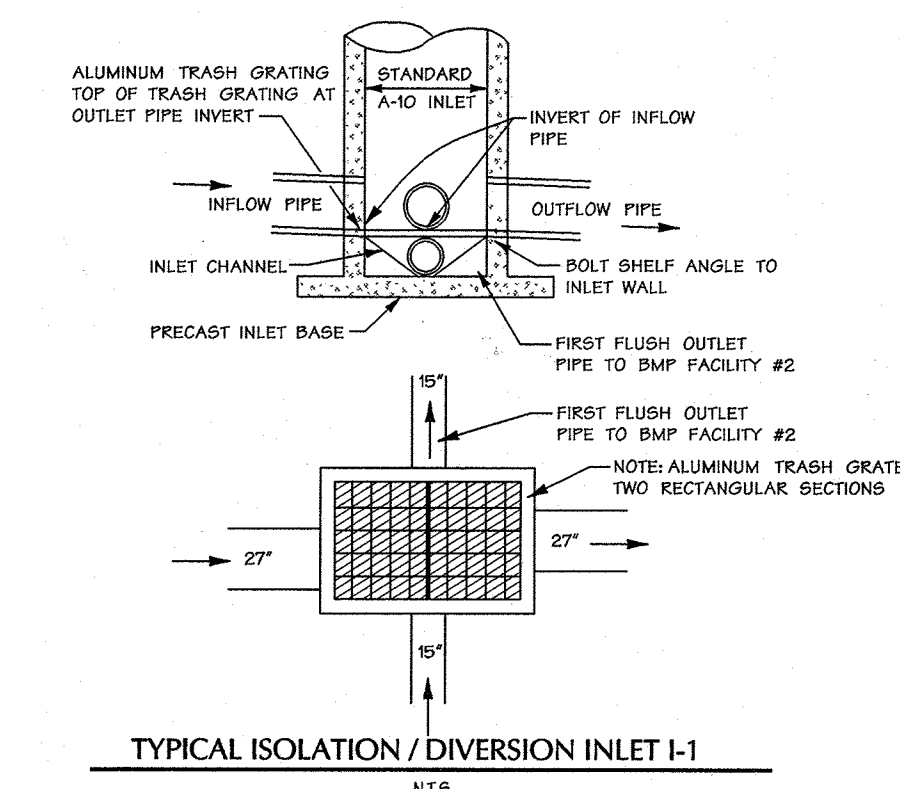
\* DENOTES THROAT OPENING

Note: Contractor shall Test Pit And Verify The Location And And Elevation Of The Existing Electric And Gas Lines Prior To Storm Drain Construction.

**PIPE SCHEDULE**

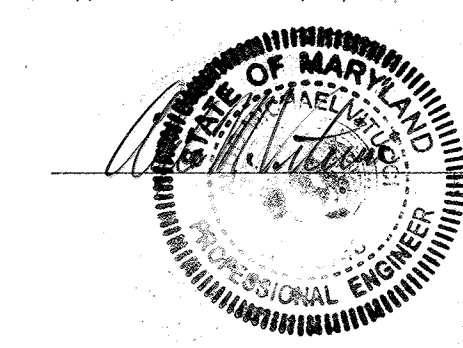
SIZE (IN.)	CATEGORY	L (FT.)
15"	RCCP CL. IV	1080-617
24"	RCCP CL. IV	688-772
30"	RCCP CL. IV	218
36"	RCCP CL. IV	42
6"	PVC	107
12"	RCCP CL. IV	62
18"	RCCP CL. IV	170
21"	RCCP CL. IV	190
27"	RCCP CL. IV	262

NOTE: RCCP CL. IV MAY BE SUBSTITUTED WITH HDPE PIPE MATERIAL



**AS-BUILT CERTIFICATION**

I hereby certify, by my seal, that the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.



Date: 7/15/12

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 Chief, Bureau of Highways  
 DATE: 7-11-03

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 Chief, Development Engineering Division  
 DATE: 7/14/03  
 Chief, Division of Land Development  
 DATE: 7/16/10  
 Director  
 DATE: 7/21/10

**Howard County Office Campus**  
 PARCEL A  
 CIP-C-0282  
 OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**DMW**  
 Draft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705  
 A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

Date	No.	Revision Description

Des. By DFM Scale AS SHOWN Proj. No. 01001.C  
 Dm. By WDE Date 7/5/12  
 Chk. By RLW Approved 27 of 44

"AS-BUILT" 90P-03-01G



LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- - - 300' MAJOR CONTOURS
- - - 205' MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED GUARD RAIL
- 100 YR FLOODPLAIN
- PROP. RETAINING WALL
- PROP. CURB & GUTTER
- PROP. REVERSE CURB & GUTTER

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William R. ...* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Bill ...* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Chris ...* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mark ...* 7/24/03  
 DIRECTOR DATE

Date	No.	Revision Description
7/5/12	1	REVISION ASSOCIATED WITH PERMITS SUBMIT ON SHEET 1

**Howard County Office Campus**  
 PARCEL A  
 CIP-C-0282

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**DMW**  
 Draft-McCune-Walker, Inc.  
 300 East Pennsylvania Avenue  
 Towson, Maryland 21286  
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 Fax: 296-4705

A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME	HO. CO. OFFICE CAMPUS	SECTION / AREA	NA	LOT / PARCEL #	B52 & P10B47
DATE OF THIS PLAN	7/5/12	DATE OF MAP	24 & 25	BLOCK DISTRICT	2
WATER CODE	5247-706 & 11 FOR	SEWER CODE	24 & 25	CENSUS TRACT	6029

TITLE: **ELLICOTT CENTER DRIVE ROAD PLAN / PROFILE**

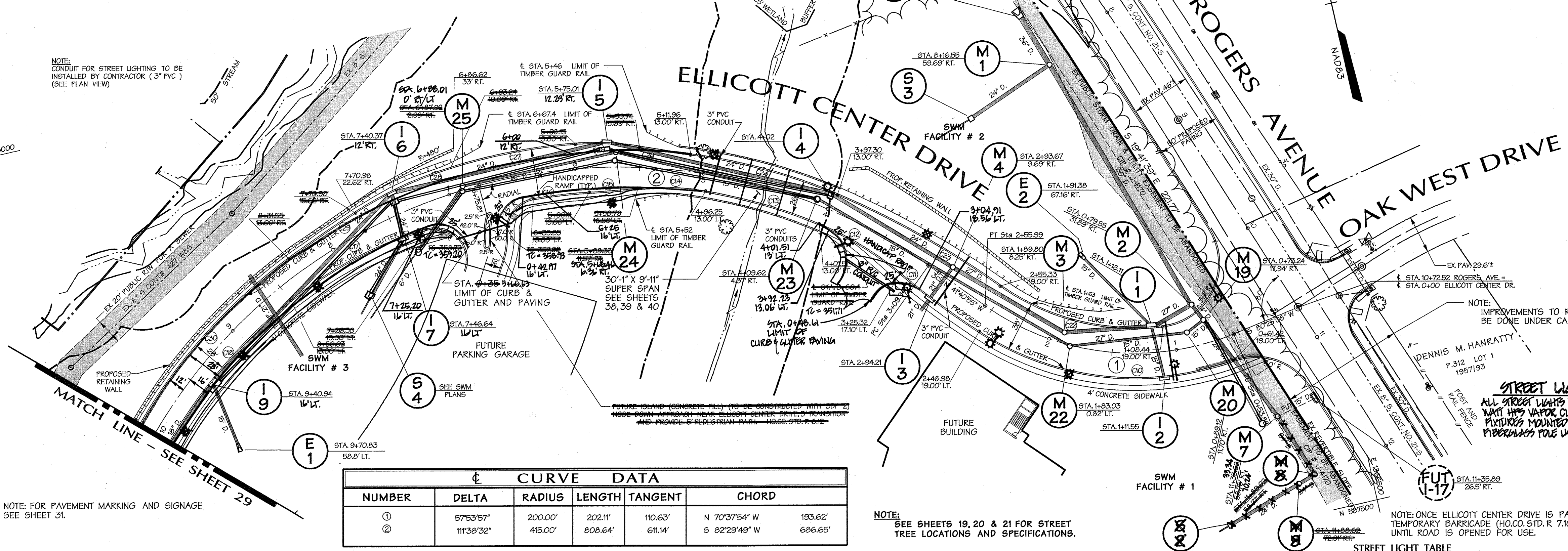
Des. By	DFM	Scale	1"=50'	Proj. No.	01001.C
Drn. By	WDE	Date	7/5/12	28 of 44	
Chk. By		Approved			

**STREET LIGHT LEGEND**

- ⊙ 250 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PENDANT FIXTURE (SAS) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING 12" ARM.
- ⊙ 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PREMIER POST TOP FIXTURE MOUNTED ON A 14" BLACK FIBERGLASS POLE.

NOTE: CONDUIT FOR STREET LIGHTING TO BE INSTALLED BY CONTRACTOR (3" PVC) (SEE PLAN VIEW)

NOTE: FOR PAVEMENT MARKING AND SIGNAGE SEE SHEET 31.



NUMBER	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	57°53'57"	200.00'	202.11'	110.63'	N 70°37'54" W 193.62'
②	111°38'32"	415.00'	808.64'	611.14'	S 82°29'49" W 686.65'

NOTE: SEE SHEETS 19, 20 & 21 FOR STREET TREE LOCATIONS AND SPECIFICATIONS.

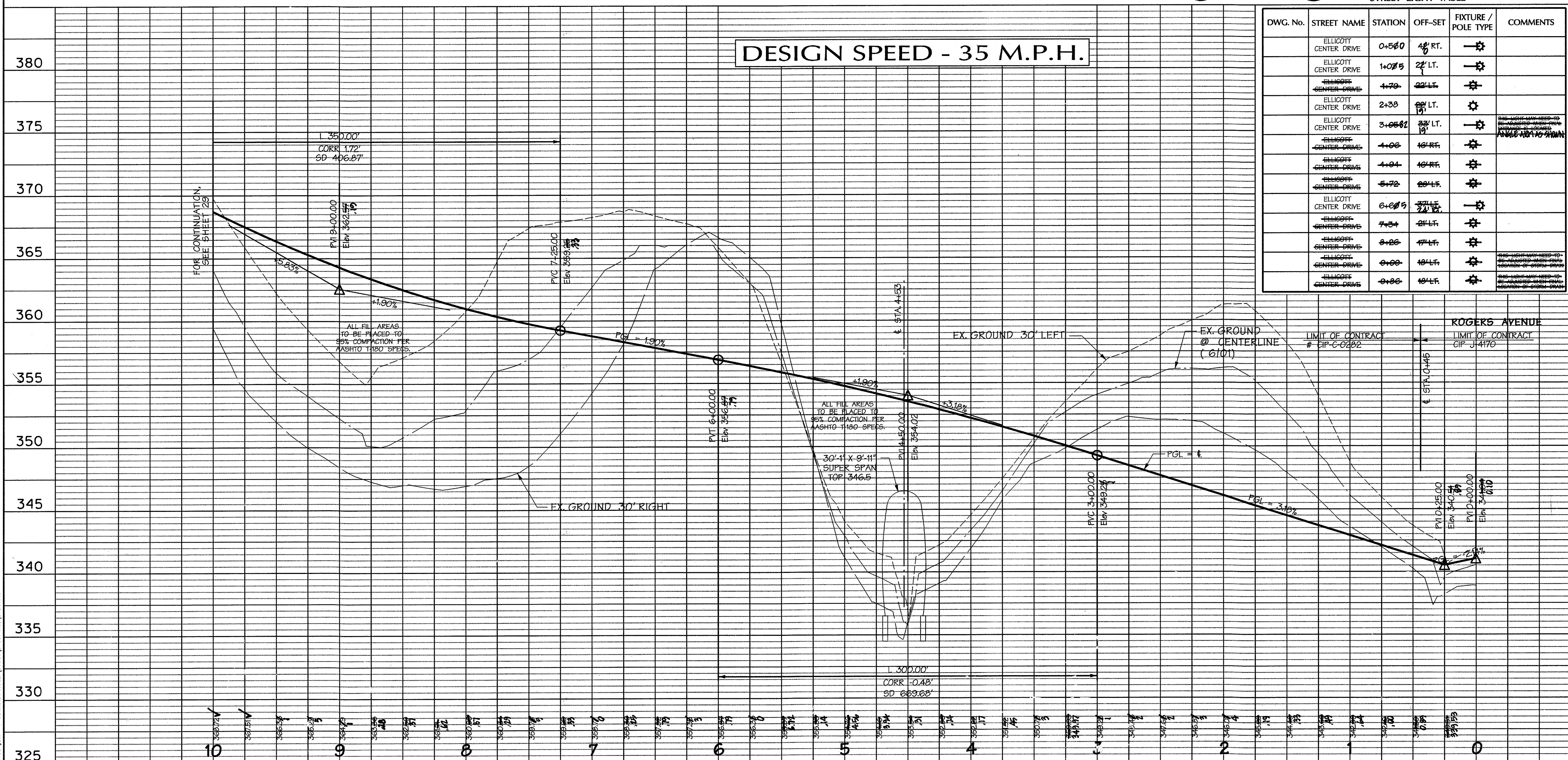
NOTE: ONCE ELLICOTT CENTER DRIVE IS PAVED PROVIDE TEMPORARY BARRICADE (HOCO, STD. R 7.10) AS NEEDED UNTIL ROAD IS OPENED FOR USE.

**STREET LIGHT TABLE**

DWG. No.	STREET NAME	STATION	OFF-SET	FIXTURE / POLE TYPE	COMMENTS
	ELLICOTT CENTER DRIVE	0+56.0	4' RT.	⊙	
	ELLICOTT CENTER DRIVE	1+07.5	2' LT.	⊙	
	ELLICOTT CENTER DRIVE	1+70.0	62' LT.	⊙	
	ELLICOTT CENTER DRIVE	2+30.0	15' LT.	⊙	
	ELLICOTT CENTER DRIVE	3+06.0	15' LT.	⊙	
	ELLICOTT CENTER DRIVE	4+06.0	16' RT.	⊙	
	ELLICOTT CENTER DRIVE	4+04.0	16' RT.	⊙	
	ELLICOTT CENTER DRIVE	6+70.0	68' LT.	⊙	
	ELLICOTT CENTER DRIVE	6+07.5	32' LT.	⊙	
	ELLICOTT CENTER DRIVE	7+04.0	24' LT.	⊙	
	ELLICOTT CENTER DRIVE	8+06.0	17' LT.	⊙	
	ELLICOTT CENTER DRIVE	9+00.0	10' LT.	⊙	
	ELLICOTT CENTER DRIVE	9+06.0	10' LT.	⊙	

CURB	CURVE DATA				CHORD
	DELTA	RADIUS	LENGTH	TANGENT	
⑩	53°43'55"	219.00'	205.38'	110.94'	N 70°33'18" W 197.93'
⑪	06°15'19"	700.00'	76.42'	38.25'	N 40°33'41" W 76.38'
⑫	16°53'25"	250.00'	73.70'	37.12'	N 45°52'45" W 73.43'
⑬	13°04'50"	402.00'	91.78'	46.09'	N 60°51'52" W 91.58'
⑭	15°07'20"	200.00'	52.79'	26.55'	N 74°57'58" W 52.63'
⑮	02°09'48"	1000.00'	37.76'	18.88'	N 81°26'44" W 37.76'
⑯	06°18'54"	396.00'	43.65'	21.85'	N 83°31'16" W 43.62'
⑰	22°48'52"	300.00'	119.46'	60.53'	S 75°09'33" W 118.67'
⑱	23°04'35"	402.00'	161.91'	82.07'	S 52°12'49" W 160.82'
⑲	42°04'51"	181.00'	132.94'	69.63'	N 62°54'37" W 129.97'
⑳	11°52'27"	700.00'	145.07'	72.80'	N 47°48'25" W 144.81'
㉑	15°49'45"	428.00'	118.24'	59.50'	N 61°39'30" W 117.87'
㉒	02°18'17"	1000.00'	40.22'	20.11'	N 68°25'15" W 40.22'
㉓	14°12'19"	200.00'	49.59'	24.92'	N 74°22'17" W 49.46'
㉔	13°07'38"	434.00'	99.44'	49.94'	N 88°02'15" W 99.22'
㉕	15°30'18"	300.00'	81.18'	40.84'	S 77°38'47" W 80.94'
㉖	03°35'26"	1000.00'	62.67'	31.34'	S 68°05'53" W 62.66'
㉗	25°43'18"	428.00'	192.14'	97.72'	S 53°26'33" W 190.53'

**DESIGN SPEED - 35 M.P.H.**



**AS-BUILT CERTIFICATION**

I hereby certify, by my seal, that the information shown on the plan was constructed as shown on the "AS-BUILT" plan and meets the approved plans and specifications.

*[Signature]* 7/6/12  
 Date

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



CURVE DATA					
NUMBER	DELTA	RADIUS	LENGTH	TANGENT	CHORD
2	111°38'32"	415.00'	808.64'	611.14'	S 82°29'49" W 686.65'
3	26°55'22"	415.00'	195.00'	99.34'	S 40°08'14" W 193.22'
4	18°54'53"	425.00'	140.30'	70.20'	S 44°08'28" W 139.67'

**STREET LIGHT LEGEND**

- 250 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PENDANT FIXTURE (6'6" MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE USING 12' ARM.
- 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PREMIER POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE.

**STREET LIGHT TABLE**

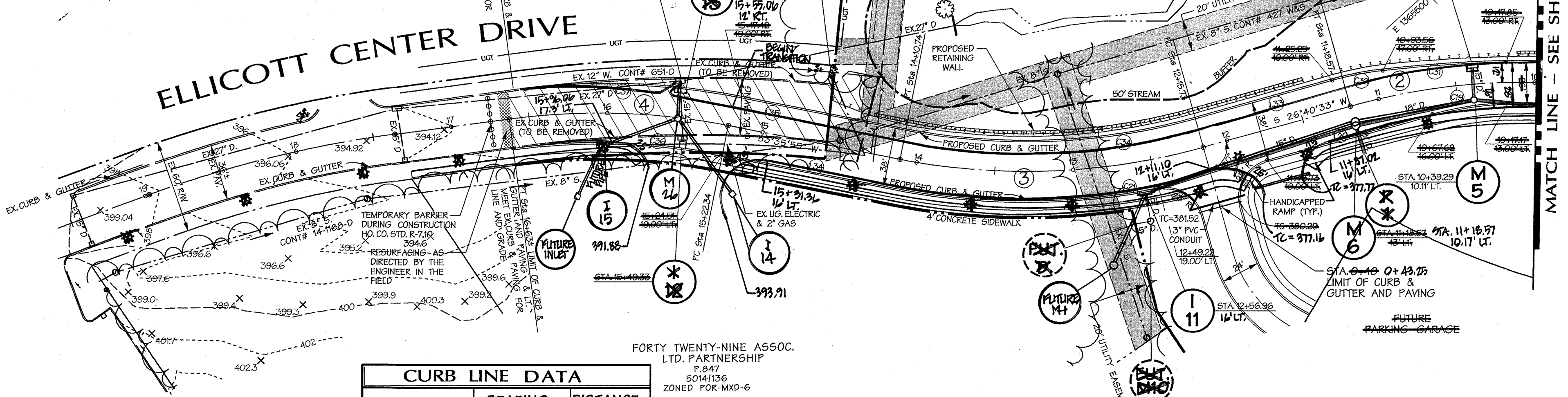
DWG. No.	STREET NAME	STATION	OFF-SET	FIXTURE / POLE TYPE	COMMENTS
10-72	ELLCOTT CENTER DR.	11+54.95	22' LT.	250W HPS	
40-85	ELLCOTT CENTER DR.	45+02	22' LT.	250W HPS	
45+02	ELLCOTT CENTER DR.	45+02	22' LT.	250W HPS	
45+02	ELLCOTT CENTER DR.	45+02	22' LT.	250W HPS	
44+07	ELLCOTT CENTER DR.	44+07	22' LT.	250W HPS	
45+17	ELLCOTT CENTER DR.	45+17	22' LT.	250W HPS	
46+02	ELLCOTT CENTER DR.	46+02	22' LT.	250W HPS	
46+02	ELLCOTT CENTER DR.	46+02	22' LT.	250W HPS	
47+00	ELLCOTT CENTER DR.	47+00	22' LT.	250W HPS	
48+00	ELLCOTT CENTER DR.	48+00	22' LT.	250W HPS	
49+00	ELLCOTT CENTER DR.	49+00	22' LT.	250W HPS	
51+10	ELLCOTT CENTER DR.	51+10	22' LT.	250W HPS	

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William R. ...* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*John ...* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Cindy ...* 7/6/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mark ...* 7/21/03  
 DIRECTOR DATE



**CURB LINE DATA**

STATION	BEARING	DISTANCE
(L20)	S 26°40'33" W	109.03'
(L33)	S 26°40'33" W	90.49'
(L34)	S 53°35'55" W	113.67'
(L36)	S 53°35'55" W	106.68'

**CURB CURVE DATA**

STATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
(C19)	13°59'59"	200.00'	48.87'	24.56'	S 33°40'32" W 48.75'
(C20)	22°17'57"	434.00'	168.91'	85.54'	S 42°26'56" W 167.85'
(C31)	04°29'46"	1000.00'	78.47'	39.26'	S 38°20'01" W 78.45'
(C32)	09°24'39"	200.00'	32.85'	16.46'	S 31°22'50" W 32.81'
(C34)	26°55'22"	396.00'	186.08'	94.79'	S 40°08'14" W 184.37'
(C36)	18°35'04"	406.00'	131.68'	66.43'	S 44°18'23" W 131.11'
(C37)	17°50'33"	444.00'	138.27'	69.70'	S 44°40'38" W 137.71'

- LEGEND**
- PROPERTY LINE
  - ADJACENT PROPERTY LINE
  - MAJOR CONTOURS
  - MINOR CONTOURS
  - STREAM CENTERLINE
  - STREAM BUFFER
  - WETLAND LIMIT
  - WETLAND BUFFER
  - EXISTING FOREST EDGE
  - EXISTING ROADS
  - PROPOSED GUARD RAIL
  - 100 YR FLOODPLAIN
  - PROP. RETAINING WALL
  - PROP. CURB & GUTTER
  - PROP. REVERSE CURB & GUTTER
  - EXISTING PAVING TO BE REMOVED

6-04-03  
 Date

Professional Engr. No. 10557

**Howard County Office Campus**  
 PARCEL A  
 CIP-C-0282

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

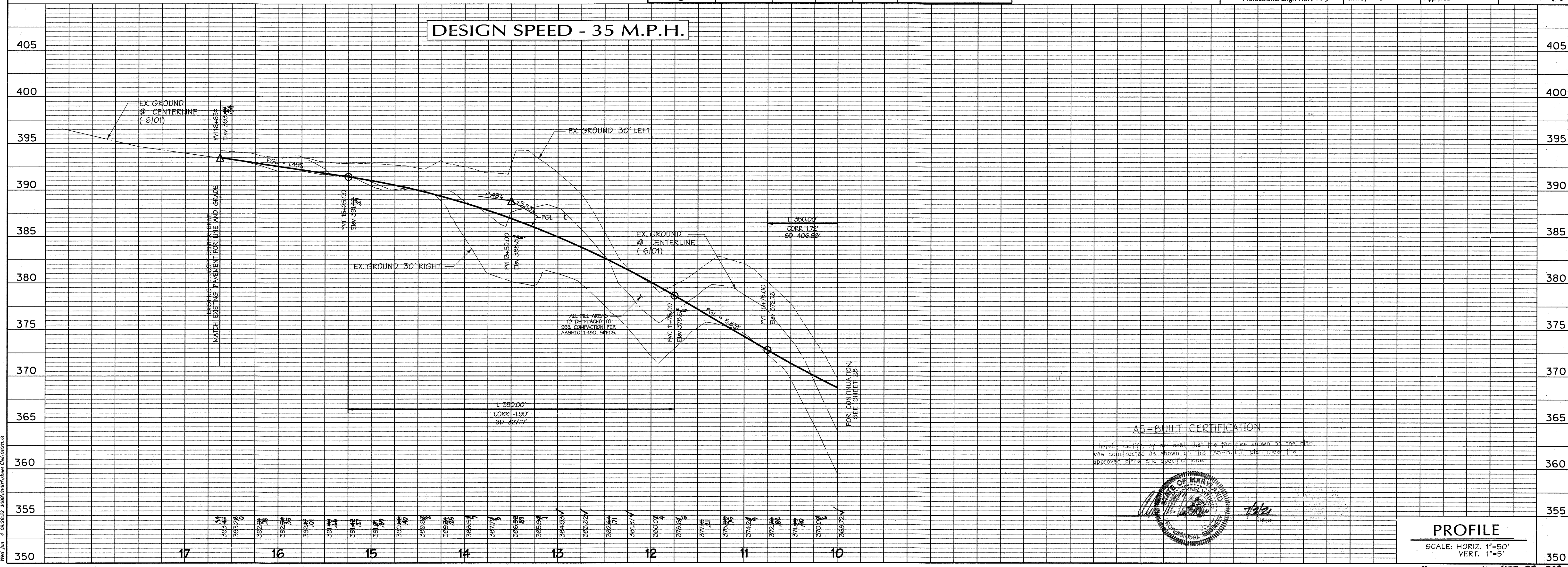
**DMW**  
 Dan McCune Walker, Inc.  
 300 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705

A Team of Land Planners,  
 Landscape Architects,  
 Golf Course Architects,  
 Engineers, Surveyors &  
 Environmental Professionals

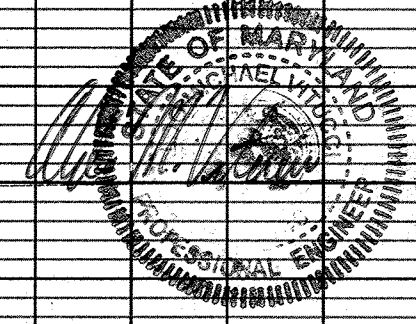
MDE PERMIT AND TRACKING No. 200266336

NOTE:  
 SEE SHEETS 19, 20 & 21 FOR STREET TREE LOCATIONS AND SPECIFICATIONS.

DESIGN SPEED - 35 M.P.H.



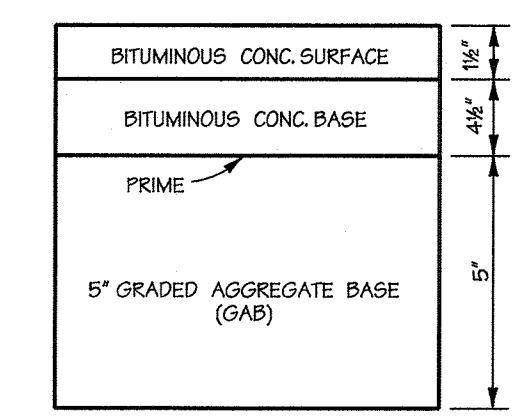
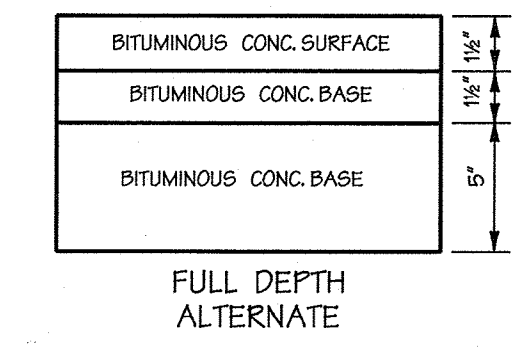
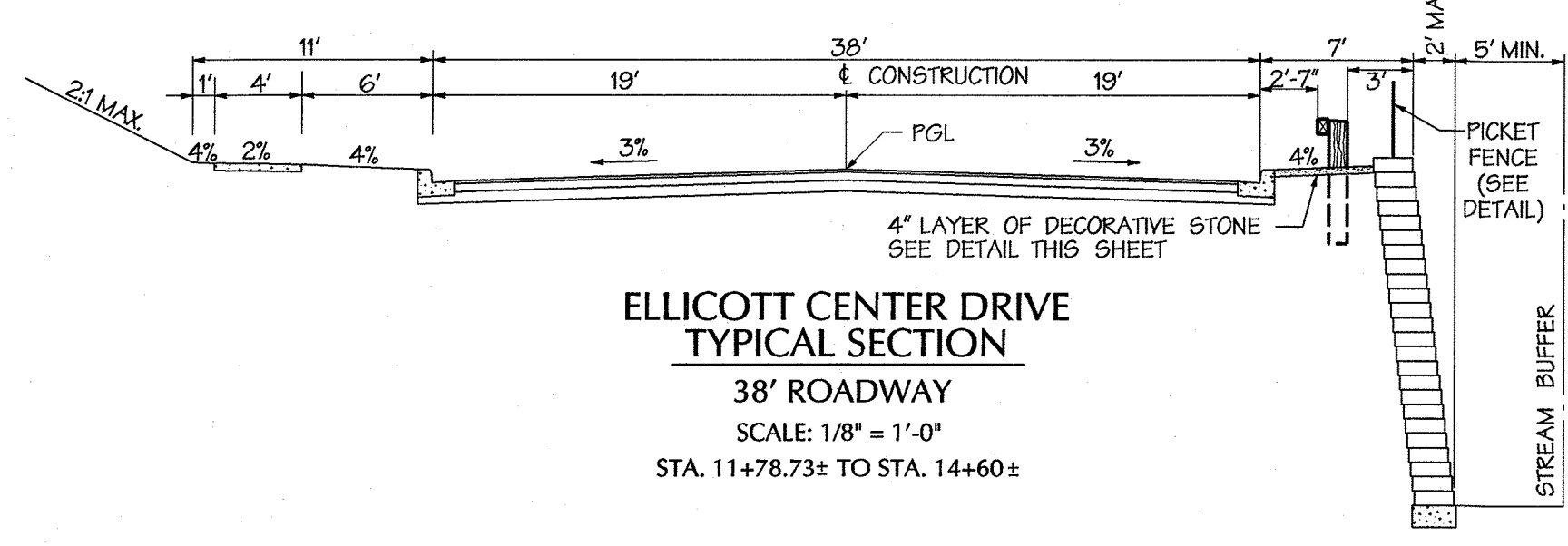
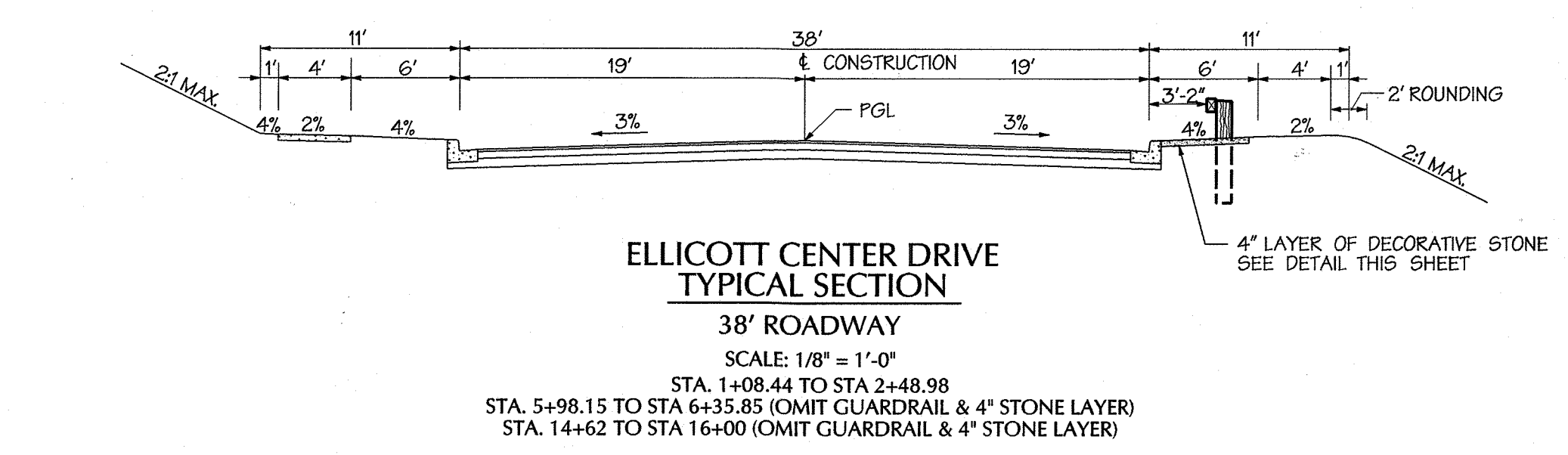
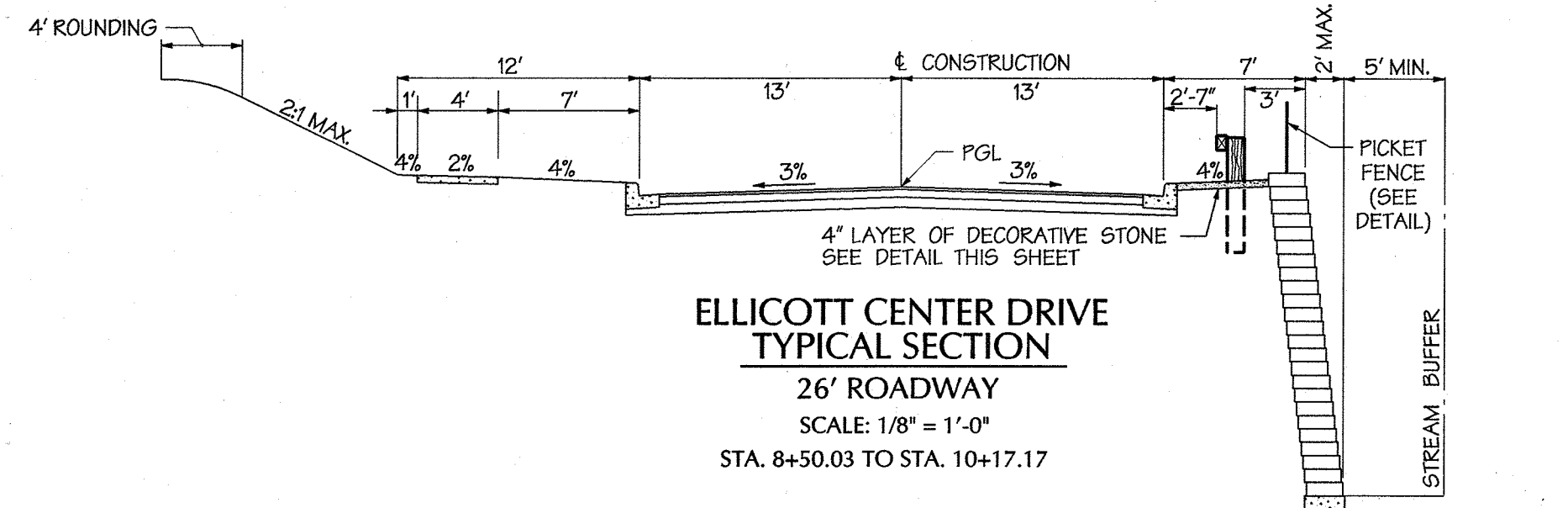
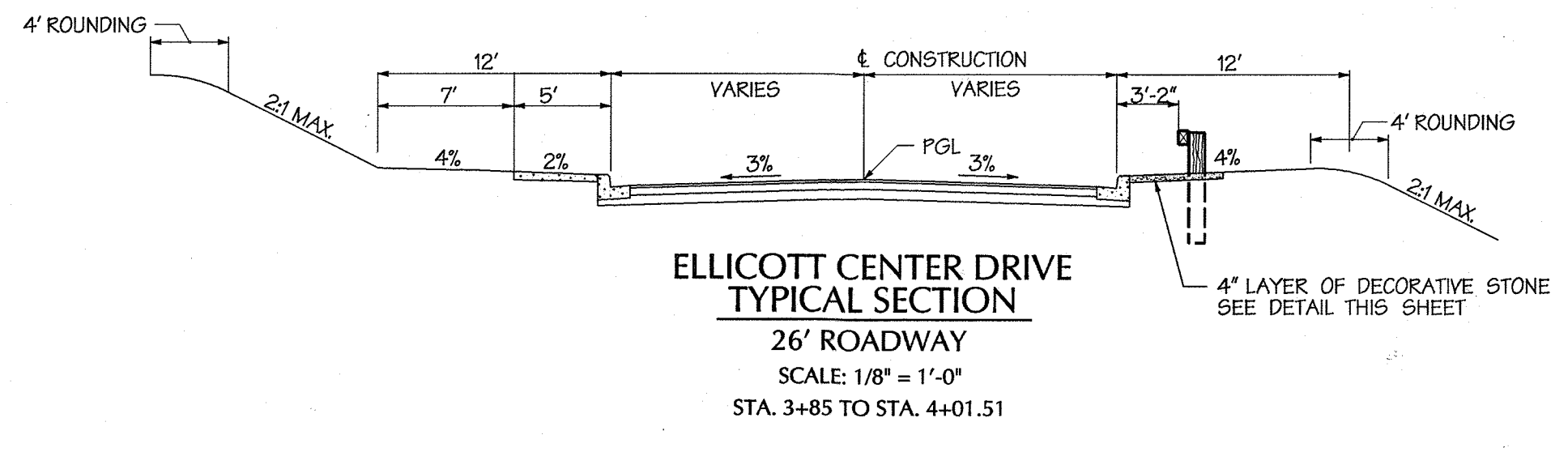
**A5-BUILT CERTIFICATION**  
 I hereby certify by my seal that the facilities shown on the plan were constructed as shown on this "A5-BUILT" plan meet the approved plans and specifications.



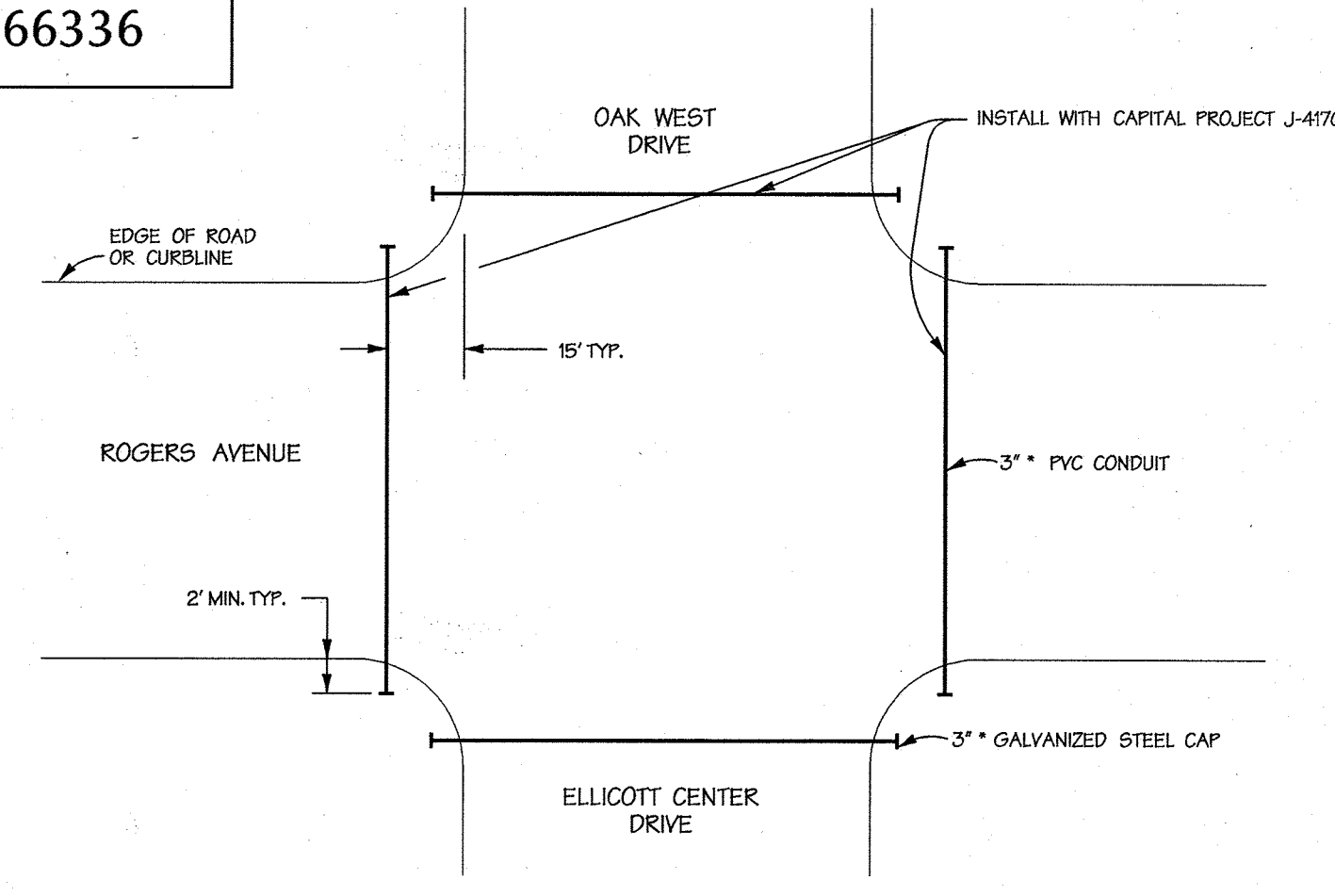
**PROFILE**  
 SCALE: HORIZ. 1"=50'  
 VERT. 1"=5'

29 of 44



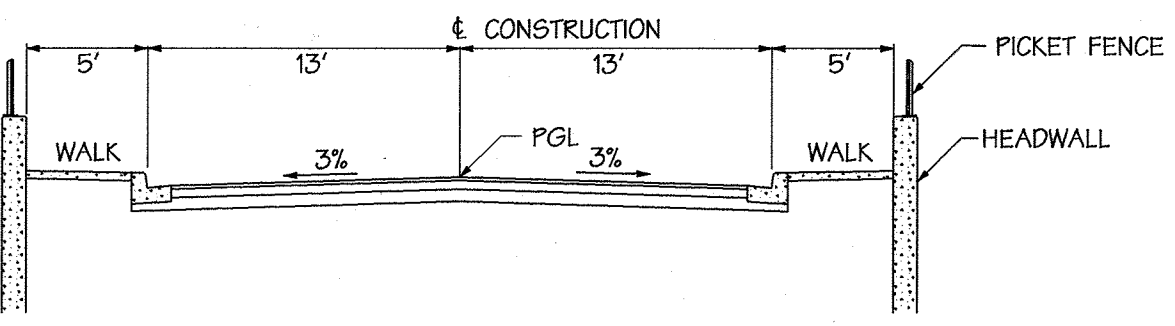


PAVING SECTION P-3  
MINOR COLLECTORS  
NO SCALE



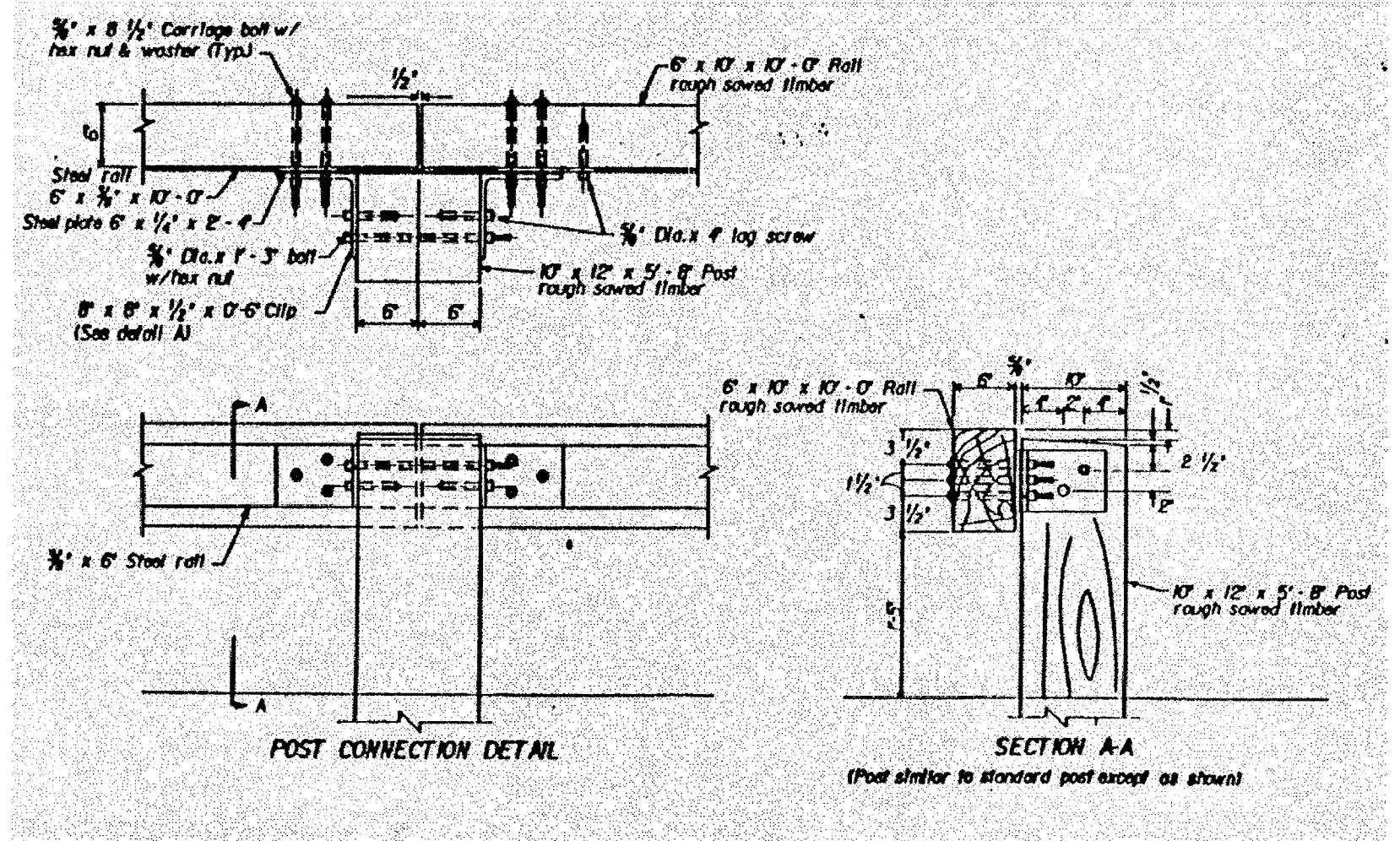
NOTES:  
1. CONDUITS SHALL BE INSTALLED WHEN DIRECTED BY THE DEPT. OF PUBLIC WORKS. SEE SHEET 28 & 29 FOR LOCATIONS.  
2. CONDUITS SHALL BE LAID AT A DEPTH OF 18", SLOPED TO DRAIN, AND THE ENDS CAPPED.  
3. SEE FIGURES 216 AND 219 OF DESIGN MANUAL FOR LOCATION OF UTILITIES.

HOWARD COUNTY DETAIL R-9.01  
NO SCALE

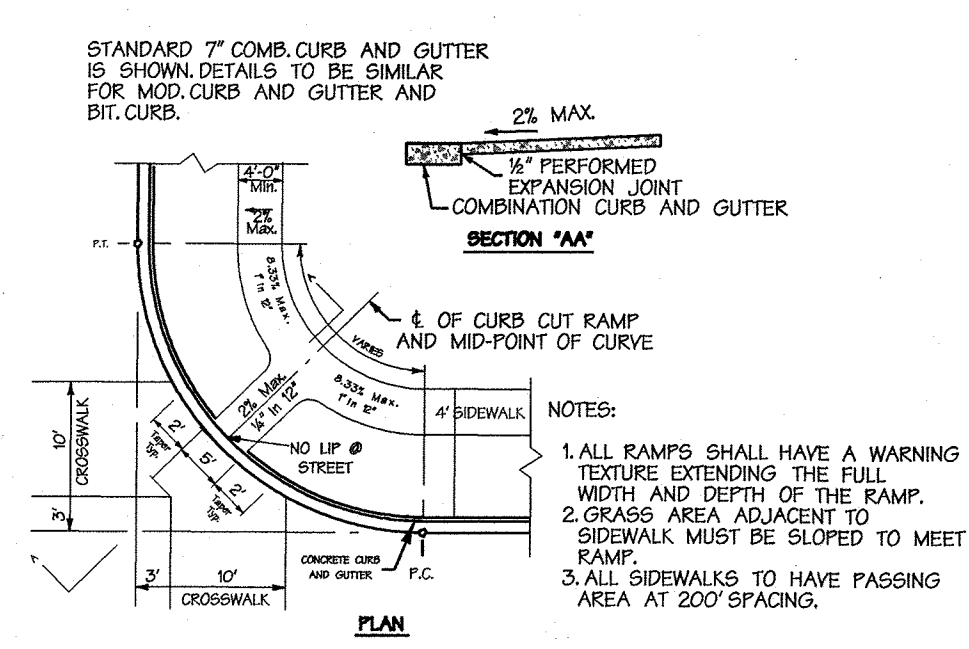


TYPICAL SECTION  
26' ROADWAY OVER SUPER SPAN  
SCALE: 1/8" = 1'-0"  
STA. 4+01.51 TO STA. 4+96.25

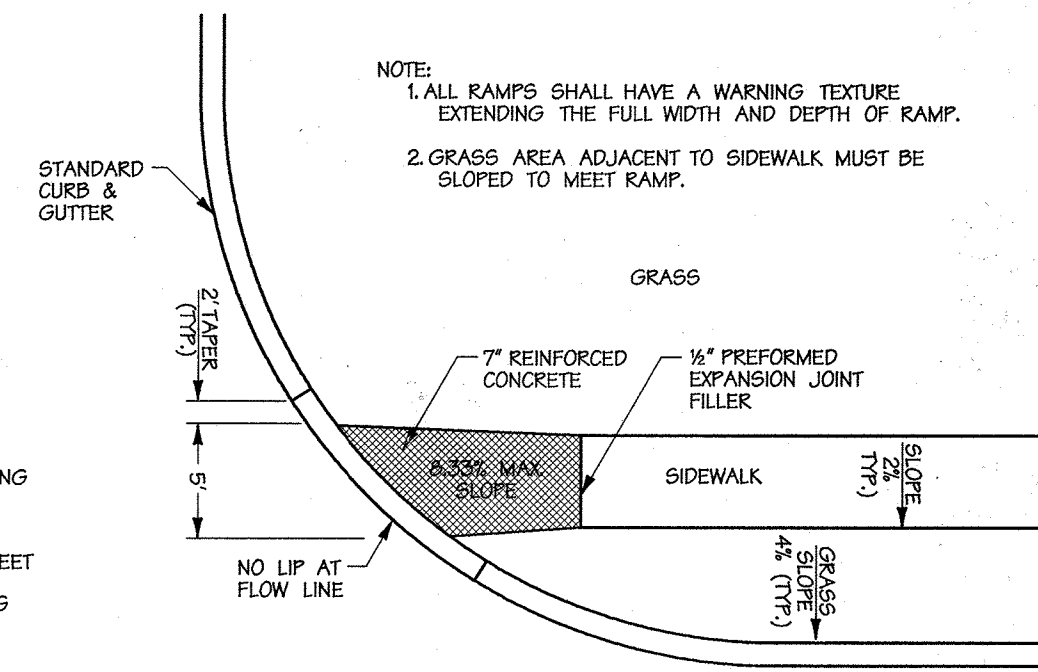
NOTE:  
SEE SHEETS 28 AND 29 FOR LIMITS OF EACH TYPICAL SECTION AND TRANSITIONS.



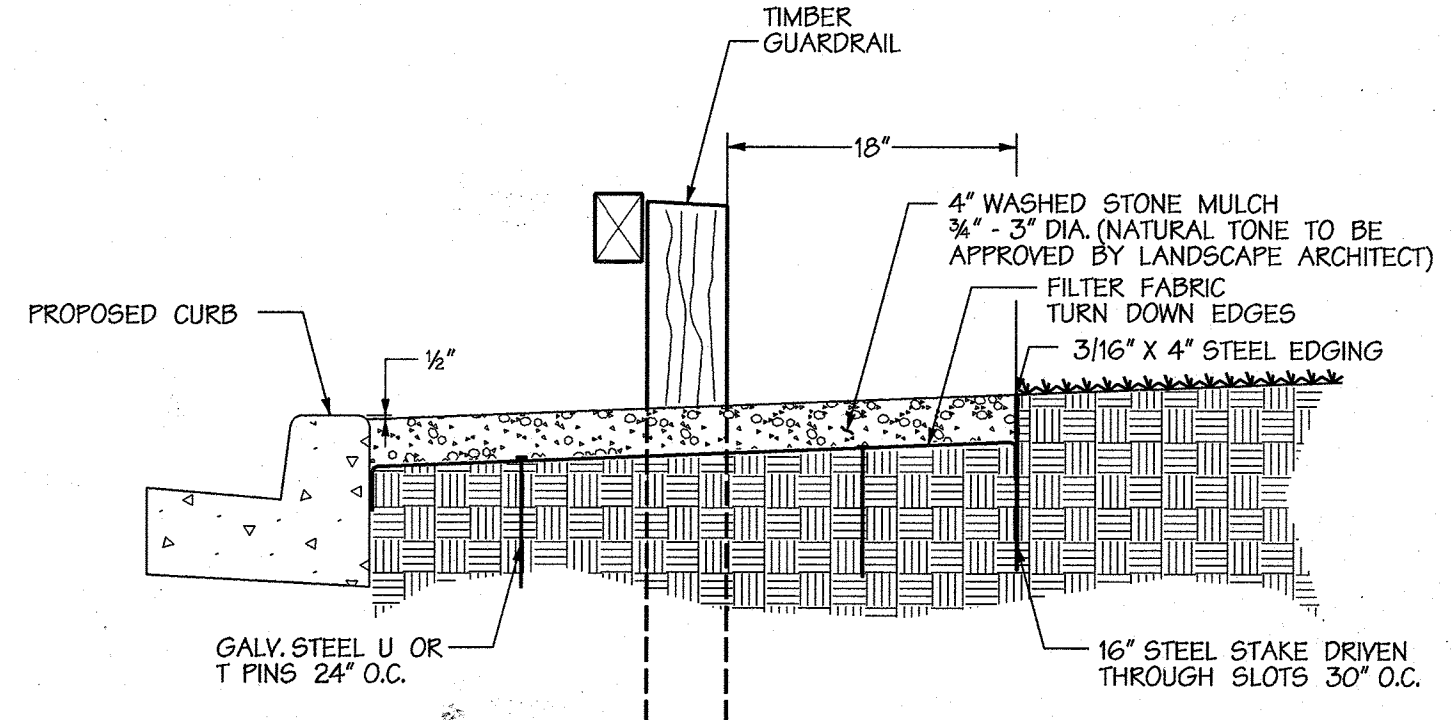
TIMBER GUARDRAIL  
NO SCALE



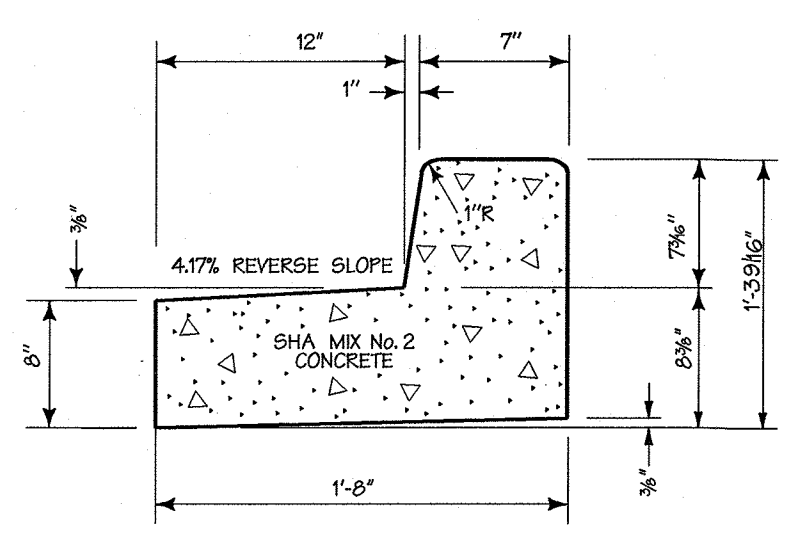
SIDEWALK RAMP  
TYPE 'A'



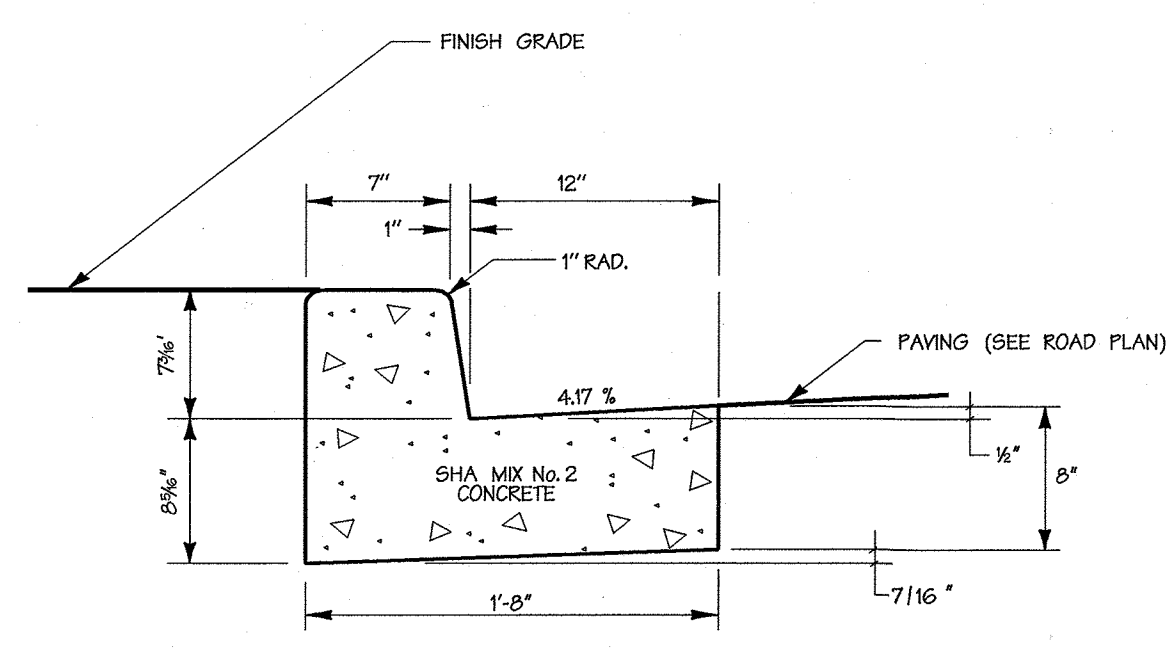
SIDEWALK RAMP  
RAMP PERPENDICULAR TO CURB  
NO SCALE



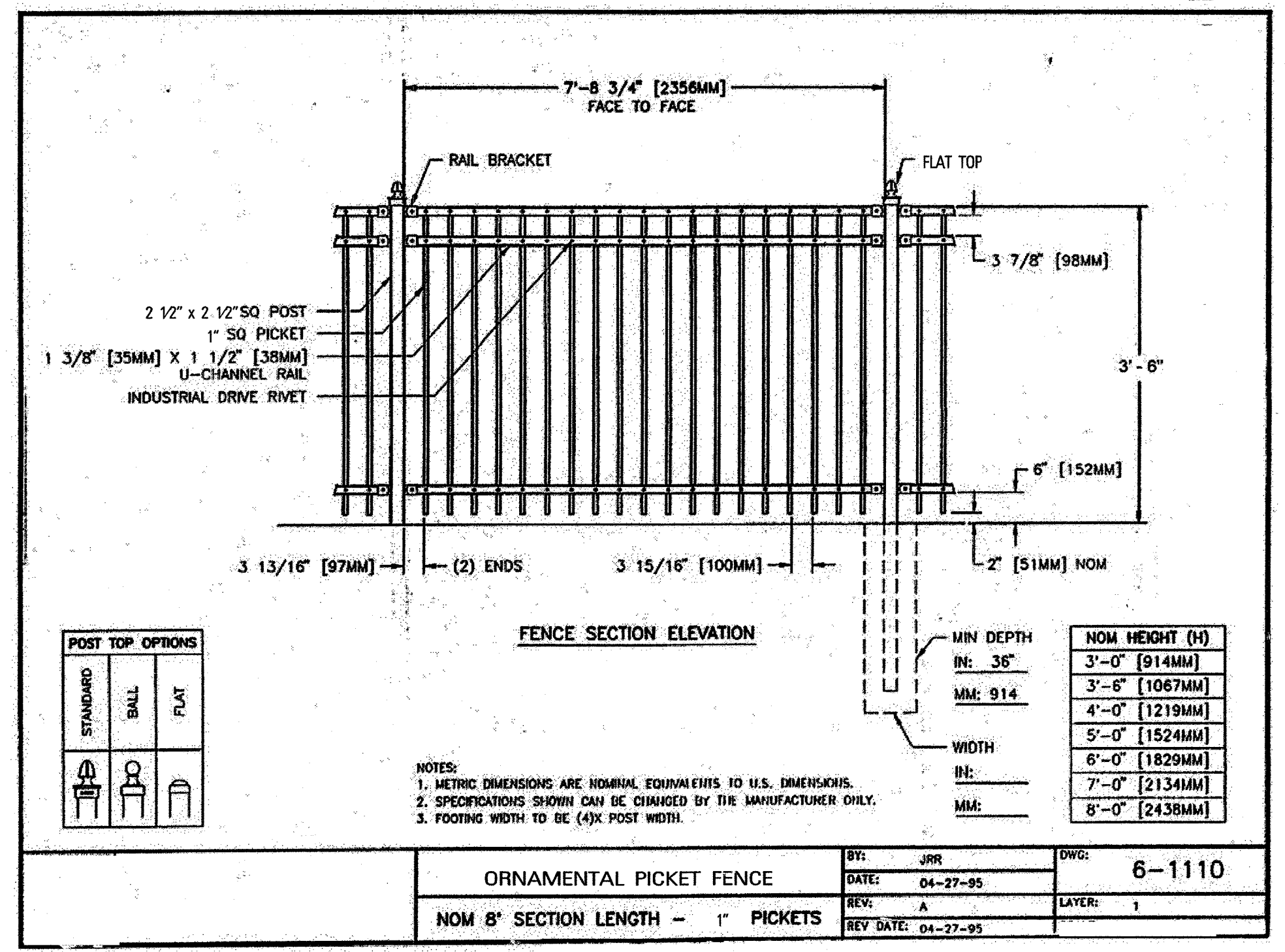
MOWING STRIP @ GUARDRAIL  
NO SCALE



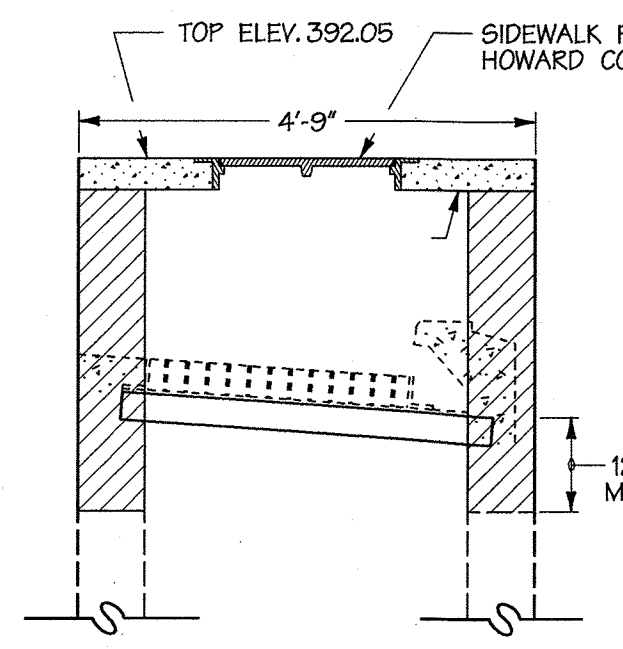
REVERSE 7" COMBINATION  
CURB & GUTTER  
NO SCALE



SECTION  
7" COMBINATION CURB AND GUTTER  
NO SCALE



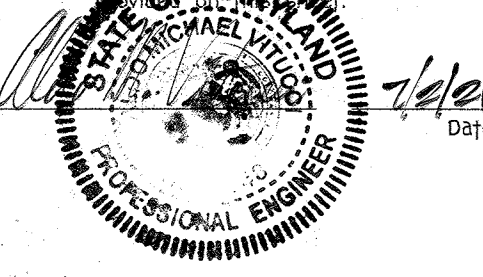
FENCE DETAIL  
NO SCALE



DETAIL DOUBLE 'S' COMBINATION INLET  
CONVERSION TO MANHOLE  
SCALE: 1/2" = 1'-0"

GENERAL NOTES:  
1. REMOVE HEAD PIECE, FRAME & GRATE.  
2. BRICK UP AND PLACE TOP SLAB TO PROPOSED ELEVATION.  
3. CONCRETE SHOULD CONFORM TO HOWARD CO. SPECIFICATIONS.  
4. REINFORCING SHALL BE DEFORMED BARS (EPOXY COATED).  
5. ALL MATERIALS TO CONFORM TO HOWARD CO. SPECIFICATIONS.

AS-BUILT CERTIFICATION



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
William T. Watson, Jr. 7-11-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
Carl Dammann 7/14/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE  
Cindy Hamilton 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE  
Martha L. Weyler 7/21/03  
DIRECTOR DATE

Howard County  
Office Campus  
PARCEL A  
CIP-C-0282

OWNER /DEVELOPER:  
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3430 COURT HOUSE DRIVE  
ELLICOTT CITY, MD 21043

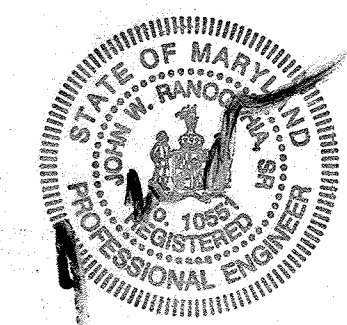
DMW  
Daft-McCune-Walker, Inc.  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3333  
Fax 296-4705

SUBDIVISION NAME	HQ. CO. OFFICE CAMPUS	SECTION/AREA	DATE
104-7-70	6 & 11 FOR	24 & 25	2

TITLE  
ELLICOTT CENTER DRIVE  
ROAD DETAILS

Des. By	DFM	Scale	AS SHOWN	Proj. No.	O1001.C
Dwn. By	WDE	Date	7/9/12		
Chk. By	RLW	Approved			

6-04-03  
Date

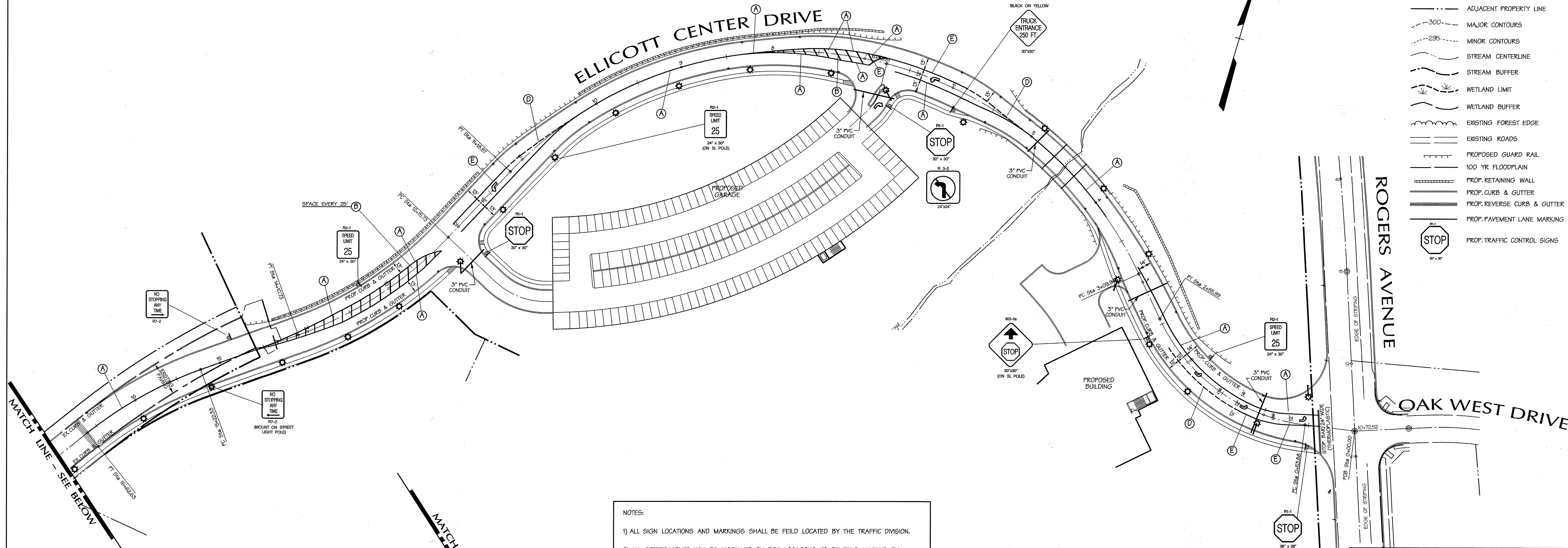


Professional Engr. No. 10555



LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- - - 300' MAJOR CONTOURS
- - - 295' MINOR CONTOURS
- - - STREAM CENTERLINE
- - - STREAM BUFFER
- - - WETLAND LIMIT
- - - WETLAND BUFFER
- - - EXISTING FOREST EDGE
- - - EXISTING ROADS
- - - PROPOSED GUARD RAIL
- - - 100 YR FLOODPLAIN
- - - PROP. RETAINING WALL
- - - PROP. CURB & GUTTER
- - - PROP. REVERSE CURB & GUTTER
- - - PROP. PAVEMENT LANE MARKING
- STOP 30" x 30" PROP. TRAFFIC CONTROL SIGNS



NOTES:

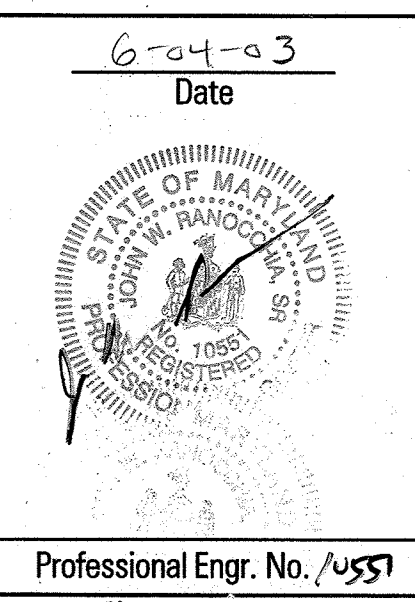
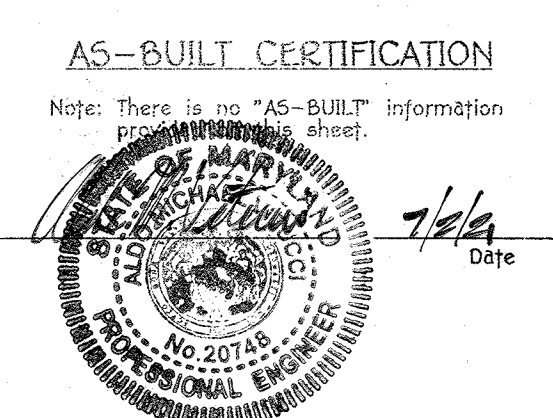
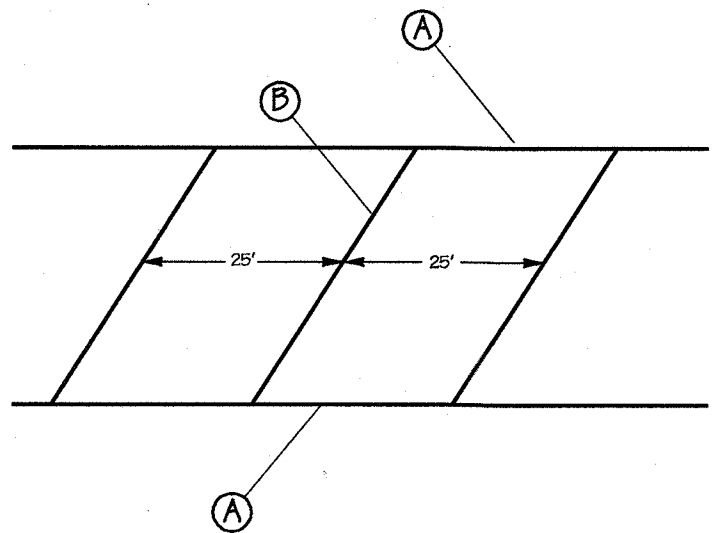
- 1) ALL SIGN LOCATIONS AND MARKINGS SHALL BE FIELD LOCATED BY THE TRAFFIC DIVISION.
- 2) ALL STREET LIGHTS WILL BE INSTALLED BY BGE. LOCATIONS TO BE FIELD MARKED BY THE TRAFFIC DIVISION.
- 3) 3" PVC CONDUITS (18" DEEP) SHALL BE INSTALLED FOR STREET LIGHT CABLE AND LOCATED (AT ENDS) BY MAGNETIC DISKS FURNISHED BY BGE. TO REQUEST PLEASE CALL HOWARD COUNTY TRAFFIC DIVISION :410-313-5752
- 4) IT IS POSSIBLE THAT SOME "NO PARKING" SIGNS R7-1(1) MAY BE REQUIRED. THE NEED FOR THESE SIGNS WILL BE DETERMINED BY THE TRAFFIC DIVISION IN THE FIELD.
- 5) A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN LIGHTS AND ANY TREES.

Note: All arrow markings - thermoplastic.

**PAVEMENT MARKING LEGEND**

- A - 5 IN. SOLID DOUBLE YELLOW PAVEMENT MARKING LINE
- B - 12 IN. SOLID YELLOW PAVEMENT MARKING LINE (HATCH LINES)
- D - PUPPY TRACKS - WHITE PAVEMENT MARKING LINE
- E - 5 IN. SOLID WHITE PAVEMENT MARKING LINE

\* NOTE:  
 SKIPS LINE = 10 FT. LINE, 30 FT. GAP  
 PUPPY TRACKS LINE = 2 FT. LINE, 6 FT. GAP



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William F. ...* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Chris ...* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Chris ...* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mark ...* 7/16/03  
 DIRECTOR DATE

Date	No.	Revision Description

**Howard County Office Campus**  
**PARCEL A**  
**CIP-C-0282**

OWNER /DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

**DMW**  
 Daft-McCune-Walker, Inc.  
 200 East Pennsylvania Avenue  
 Towson, Maryland 21286  
 (410) 296-3333  
 Fax 296-4705

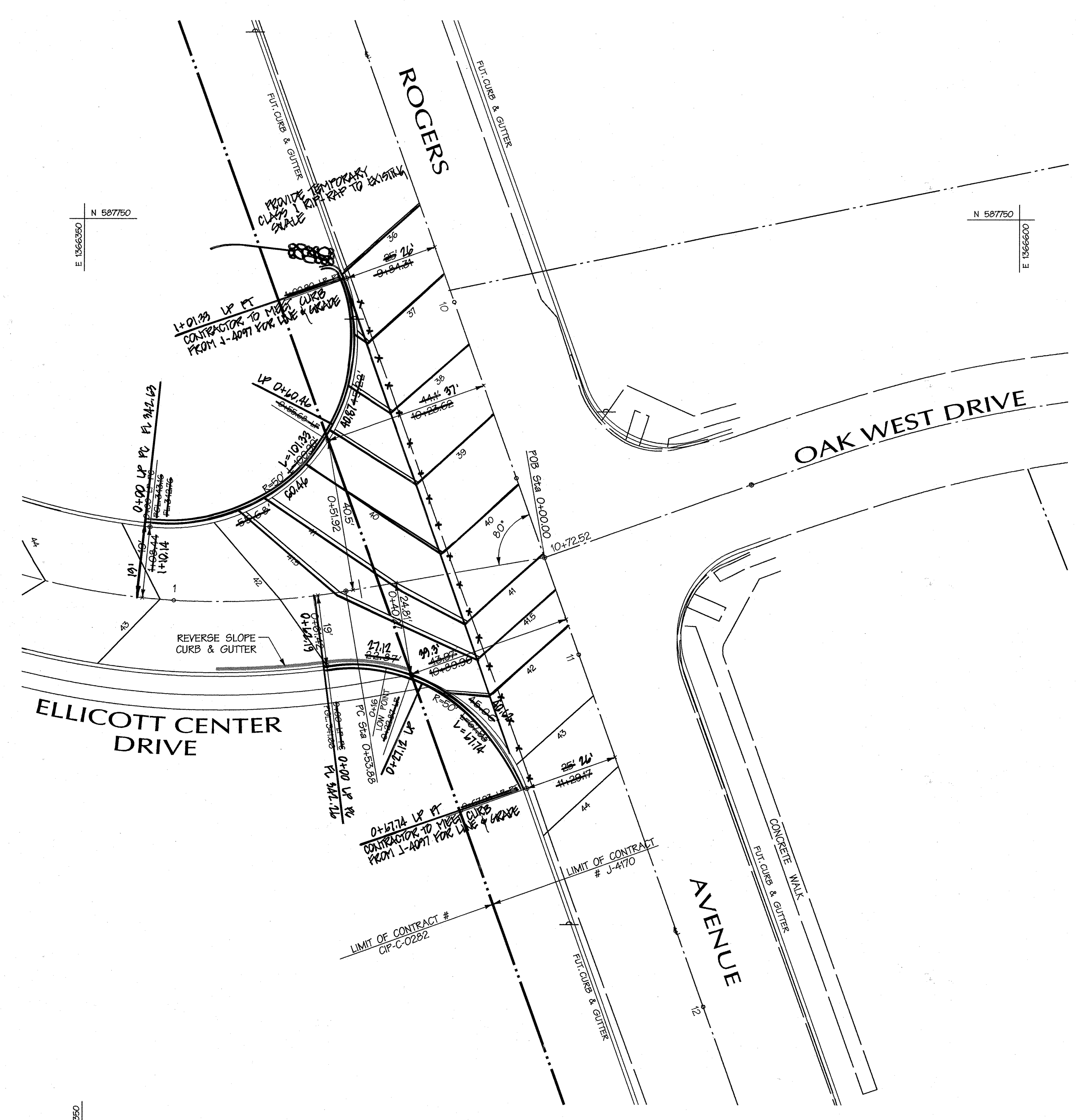
A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals

SUBDIVISION NAME: N/A SECTION/AREA: N/A LOT/FACILITY #: 852 & P10847  
 NO. CO. OFFICE CAMPUS: N/A PLAN # BOX # DATE: 24 & 25 TYPED MAP: 2 ELEC. SHEETS: 2 PERMITS TRACED: 6029  
 WATER CODE: N/A SEWER CODE: N/A

TITLE: **ELLICOTT CENTER DRIVE PAVEMENT MARKING & SIGNAGE PLAN**

Des. By: DFM Scale: 1"=50' Proj. No. 01001.C  
 Dwn. By: WDE/KDE Date: 7/16/12  
 Chk. By: RLH Approved: 31 of 44





PLAN  
SCALE: 1"=20'

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300- MAJOR CONTOURS
- 295- MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED GUARD RAIL
- 100 YR FLOODPLAIN
- PROP. RETAINING WALL
- PROP. CURB & GUTTER
- PROP. REVERSE CURB & GUTTER

AS-BUILT CERTIFICATION

I hereby certify, by my seal, that the facilities shown on the plans constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.



NOTE:  
THE DEMARCATION LINE BETWEEN CIP-C-0282 AND J-4170 MAY BE ALTERED IN CONJUNCTION WITH FUTURE CAPITAL CONTRACT.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	
<i>William F. ...</i> CHIEF, BUREAU OF HIGHWAYS	7-11-03 DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING	
<i>Chris ...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	7/14/03 DATE
<i>Linda ...</i> CHIEF, DIVISION OF LAND DEVELOPMENT	7/15/03 DATE
<i>Paul ...</i> DIRECTOR	7/21/03 DATE

Date	No.	Revision Description
3/15/12	1	REVISIONS ASSOCIATED WITH PURPOSE STATEMENT ON SHEET 1

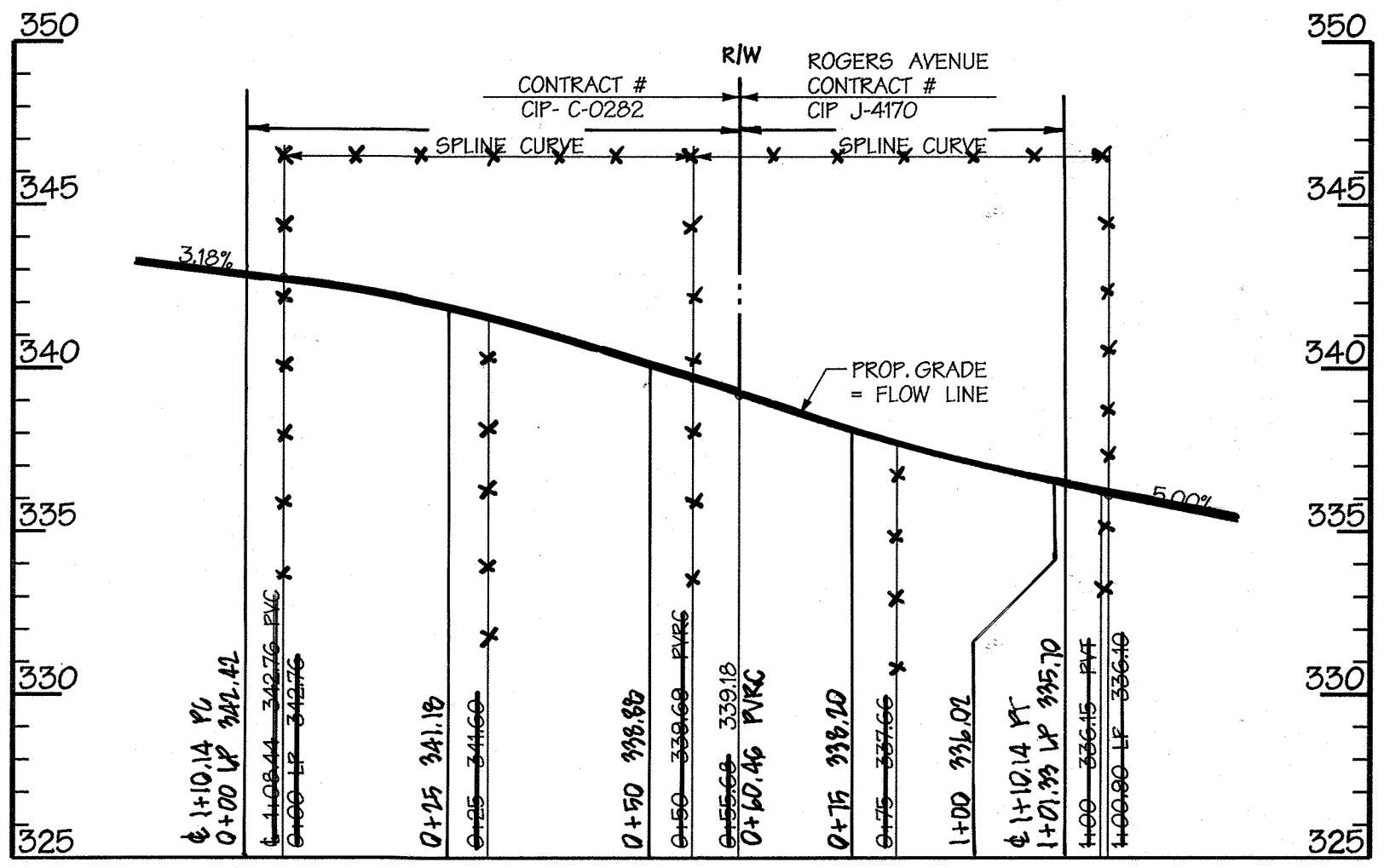
Howard County  
Office Campus  
PARCEL A  
CIP-C-0282

OWNER /DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

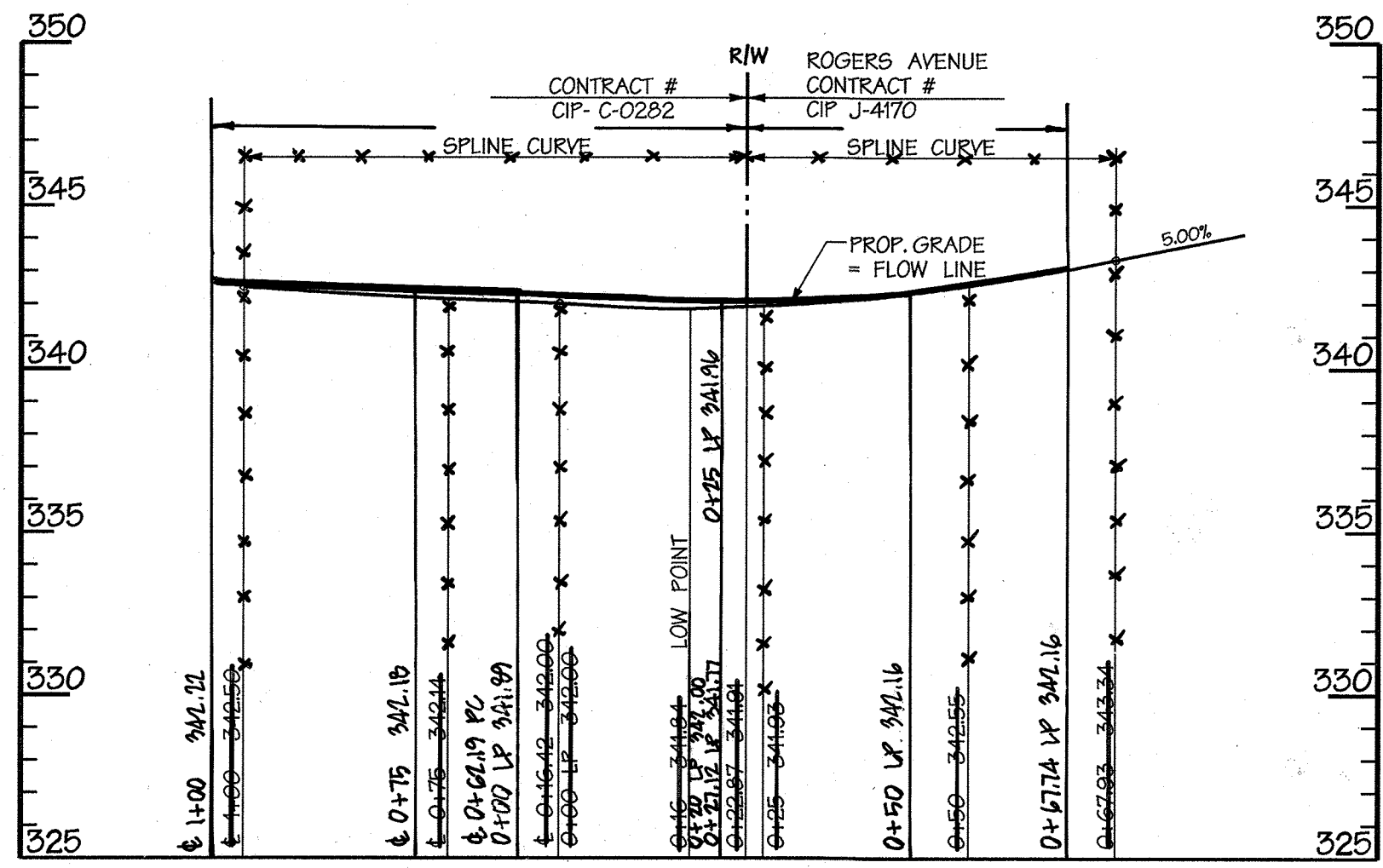
**DMW**  
Daft-McCune-Walker, Inc.  
A Team of Land Planners, Landscape Architects, Golf Course Architects, Engineers, Surveyors & Environmental Professionals  
200 East Pennsylvania Avenue  
Towson, Maryland 21286  
(410) 296-3333  
Fax 296-4705

6-04-03  
Date

Professional Engr. No. 70557



LINEAR PROFILE  
NORTHWEST CURB RETURN  
SCALE: HORZ. 1"=20'  
VERT. 1"=5'

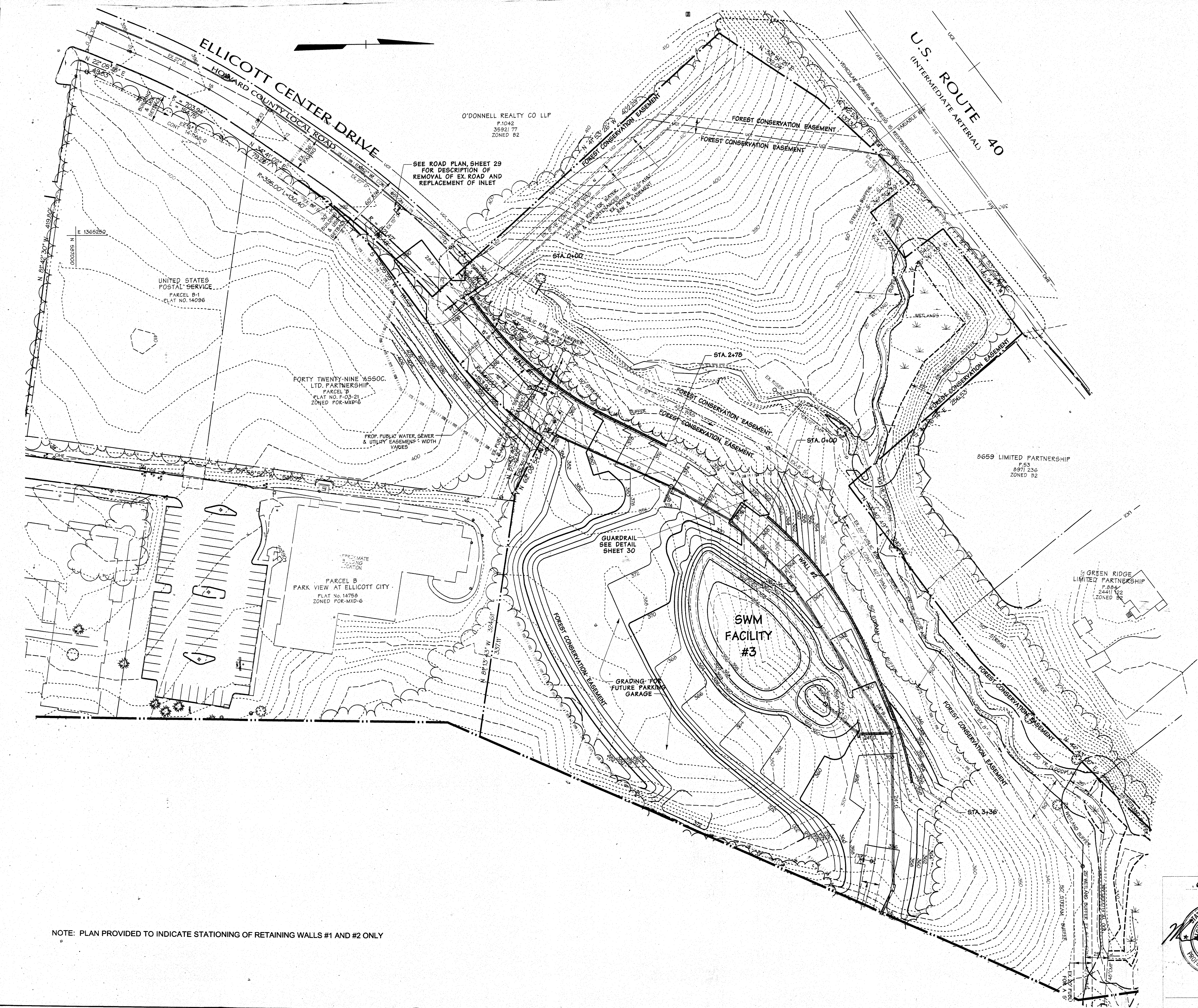


LINEAR PROFILE  
SOUTHWEST CURB RETURN  
SCALE: HORZ. 1"=20'  
VERT. 1"=5'

ELLCOTT CENTER DRIVE - ROGERS AVE  
ROAD INTERSECTION DETAILS

Des. By	DFM	Scale	AS SHOWN	Proj. No.	01001.C
Dwn. By	WDE	Date	6/5/12		
Chk. By	RLN	Approved			





**LEGEND**

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300- MAJOR CONTOURS
- 295- MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- SLOPES >25%
- SLOPES 15%-25%
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED TREELINE
- PROPOSED GUARD RAIL
- 100 YR FLOODPLAIN
- LIMIT OF DISTURBANCE
- PROP. RETAINING WALL
- 348 PROPOSED MINOR CONTOUR
- 350 PROPOSED MAJOR CONTOUR
- FOREST CONSERVATION EASEMENT (NATURAL AREA CONSERVATION CREDIT)
- PUBLIC EASEMENT
- 12" W. PROPOSED WATER LINE
- 15" D. PROPOSED STORM DRAIN
- 8" S. PROPOSED SEWER LINE

**AS-BUILT CERTIFICATION**

Note: This is not to be used for "AS-BUILT" information.  
  
 Date: 7/11/03

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 William J. White  
 CHIEF, BUREAU OF HIGHWAYS 7-11-03 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 Chad Dammann  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 7/14/03 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 Cindy Spontak  
 CHIEF, DIVISION OF LAND DEVELOPMENT 7/15/03 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
 Mark J. ...  
 DIRECTOR 7/2/03 DATE

Date No. Revision Description

**Howard County Office Campus**  
**PARCEL A**  
**CIP-C-0282**

OWNER / DEVELOPER:  
 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

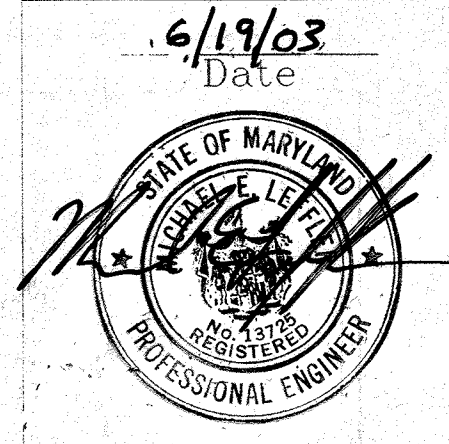
**ECS** ENGINEERING CONSULTING SERVICES, LTD.  
 1340 CHARWOOD ROAD, SUITE P  
 HANOVER, MARYLAND 21076  
 (410) 859-4300  
 (410) 859-4324 (FAX)

6/19/03 Date

HO CO OFFICE CAMPUS  
 15% 7-70 6 POR 24 2 6029

**RETAINING WALLS #1 AND #2**  
**PLAN VIEW**

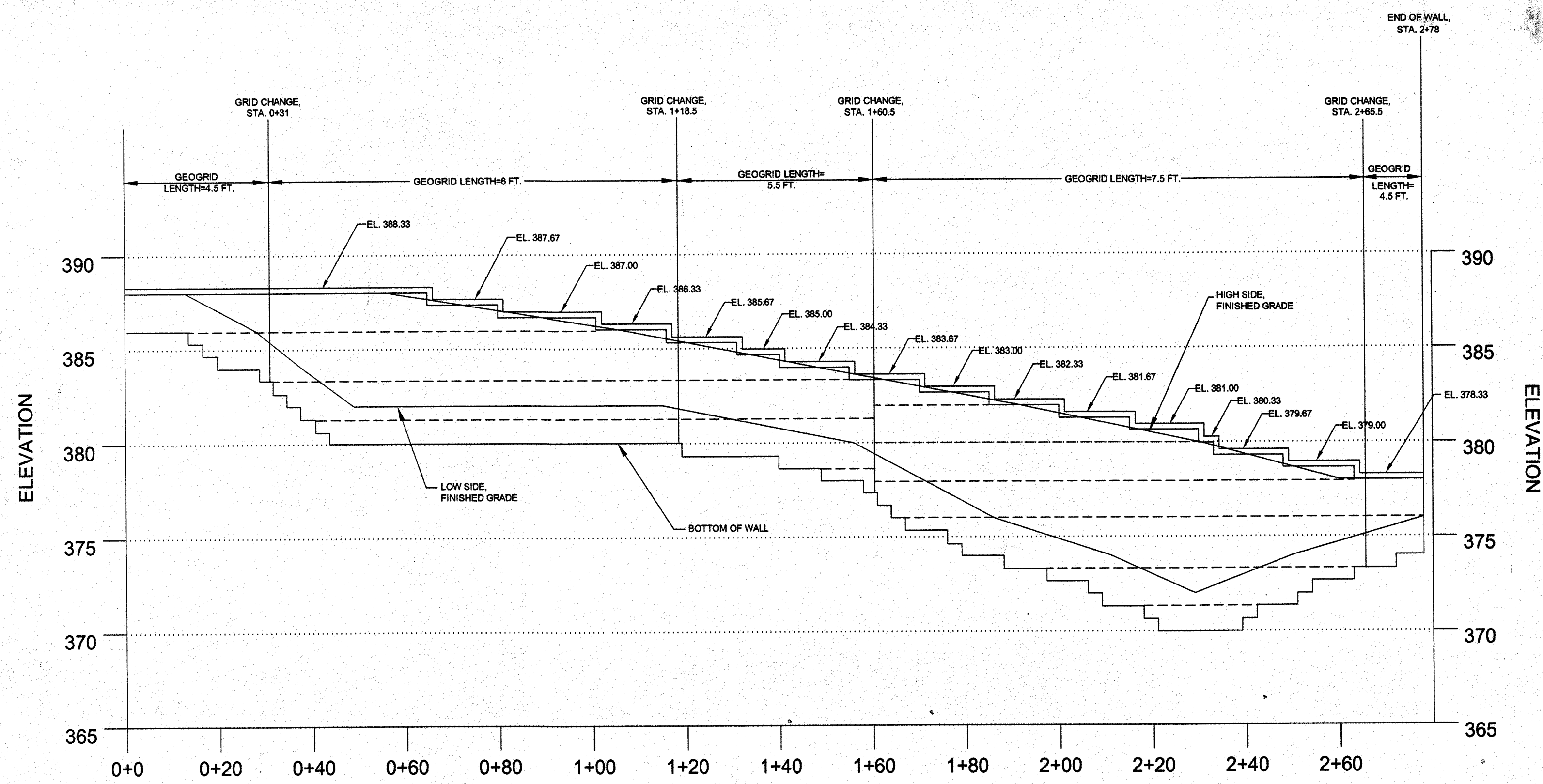
Des. By: NCH Scale: 1"=50' Proj. No.: 02-2584  
 Dwn. By: KDR Date: 7/5/12  
 Chk. By: Approved



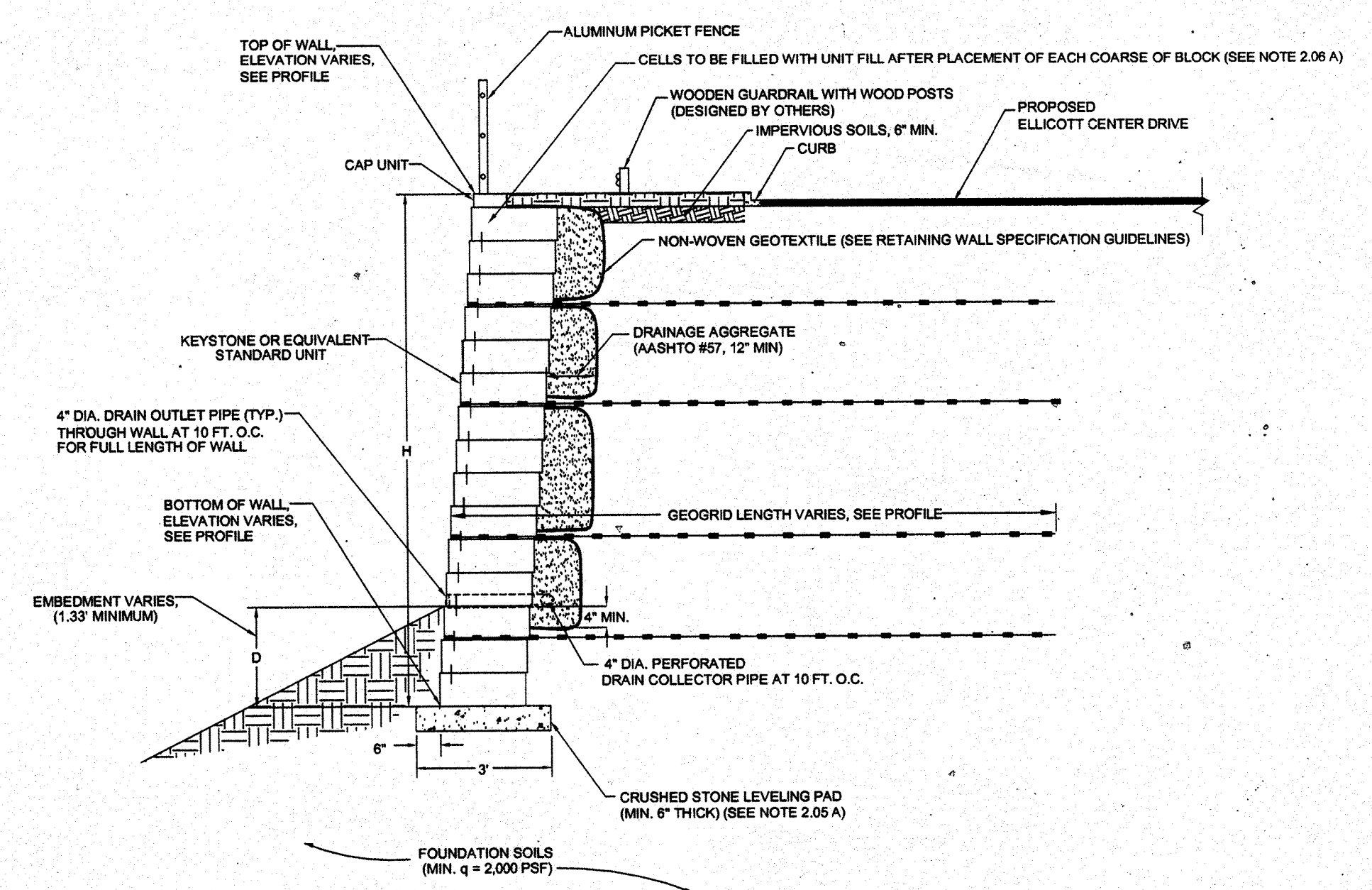
NOTE: PLAN PROVIDED TO INDICATE STATIONING OF RETAINING WALLS #1 AND #2 ONLY

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 33 of 44 700.03-022

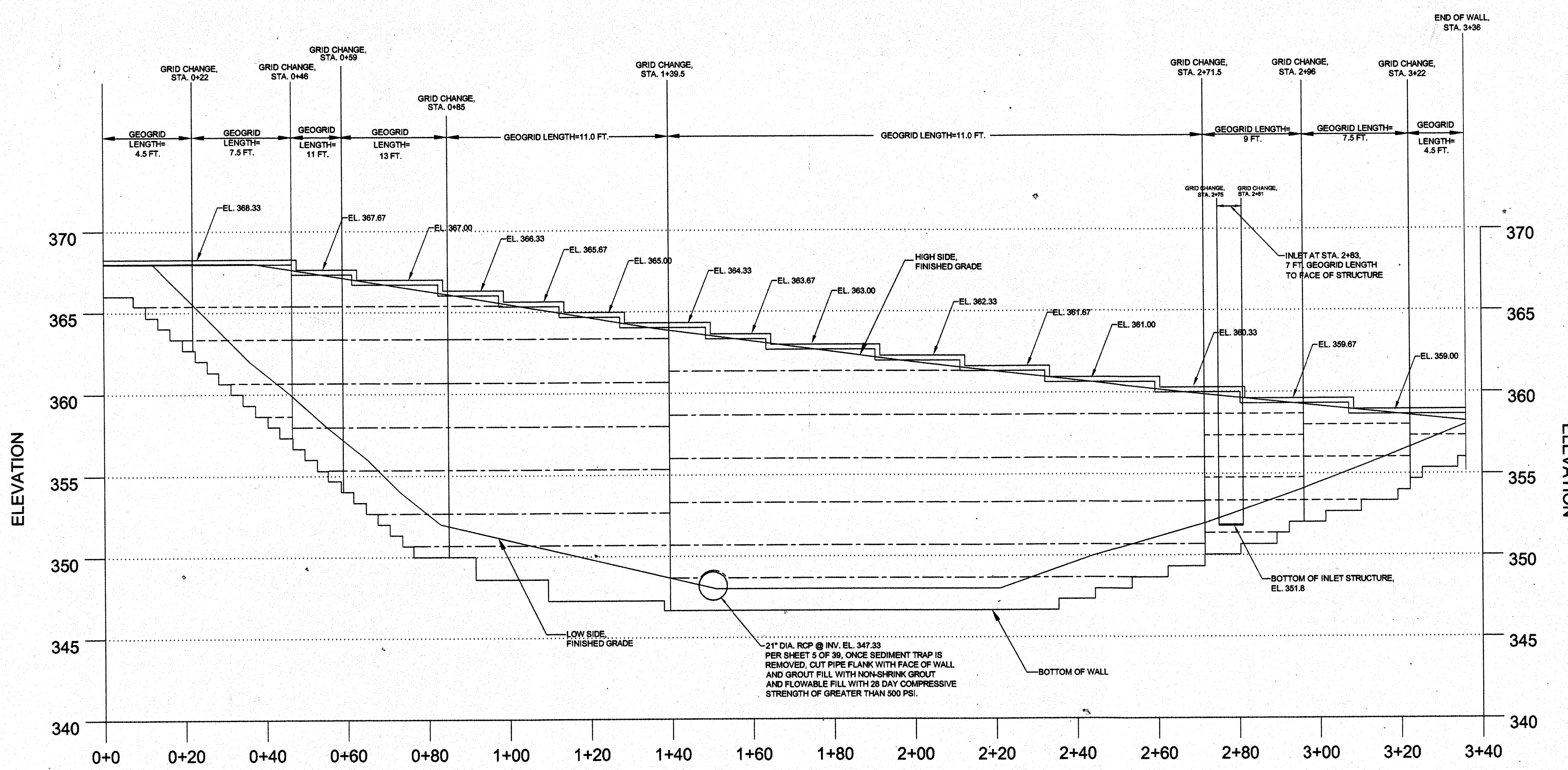




WALL #1  
SCALE  
VERTICAL SCALE 1"=5'  
HORIZONTAL SCALE 1"=20'



1 TYPICAL RETAINING WALL DETAIL  
34 4% BATTERED FACE  
SCALE: NTS



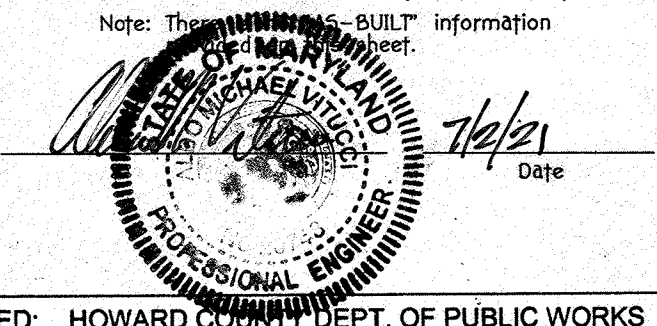
WALL #2  
SCALE  
VERTICAL SCALE 1"=5'  
HORIZONTAL SCALE 1"=20'

LEGEND

-----	TENSAR UX1400SB TYPE GEOGRID
-----	TENSAR UX1500SB TYPE GEOGRID

AS-BUILT CERTIFICATION

Note: This information is "AS-BUILT" information.



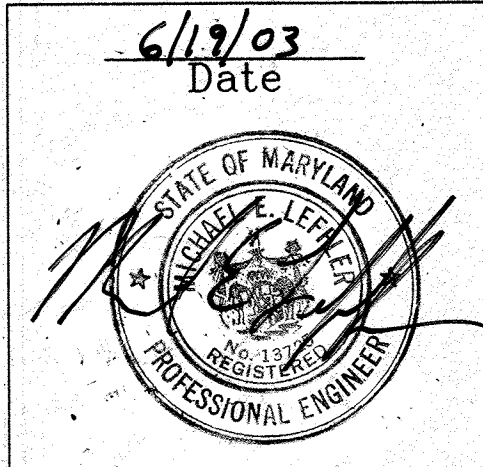
APPROVED:	HOWARD COUNTY DEPT. OF PUBLIC WORKS	DATE	7-11-03
	<i>W. John P. ...</i>	DATE	7/14/03
APPROVED:	HOWARD COUNTY DEPT. OF PLANNING & ZONING	DATE	7/16/03
	<i>Chad ...</i>	DATE	7/16/03
	<i>Cindy ...</i>	DATE	7/16/03
	<i>Mark ...</i>	DATE	7/16/03

Date	No.	Revision	Description

**Howard County  
Office Campus  
PARCEL A  
CIP-C-0282**

OWNER / DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLICOTT CITY, MD 21043

**ECS** ENGINEERING CONSULTING SERVICES, LTD.  
1340 CHARWOOD ROAD, SUITE P  
HANOVER, MARYLAND 21076  
(410) 859-4300  
(410) 859-4324 (FAX)



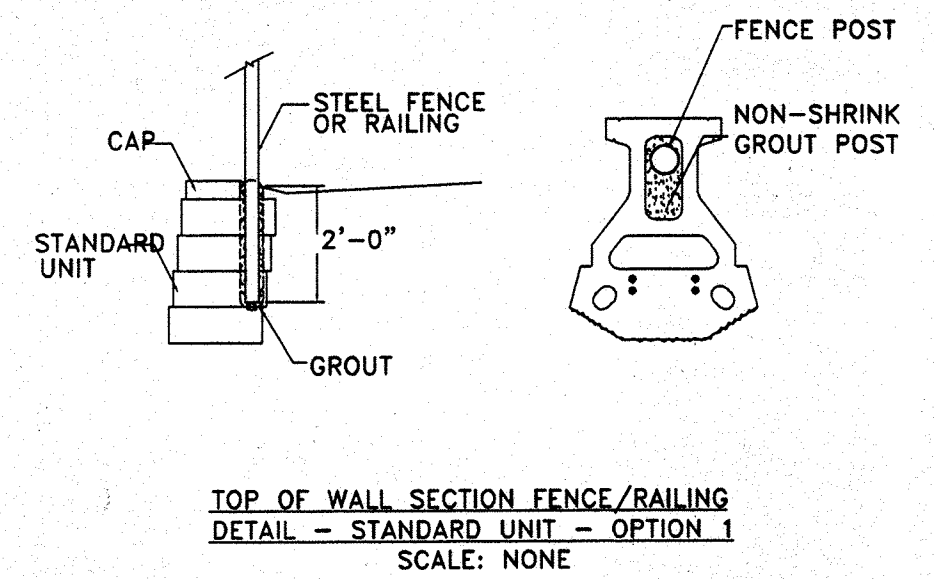
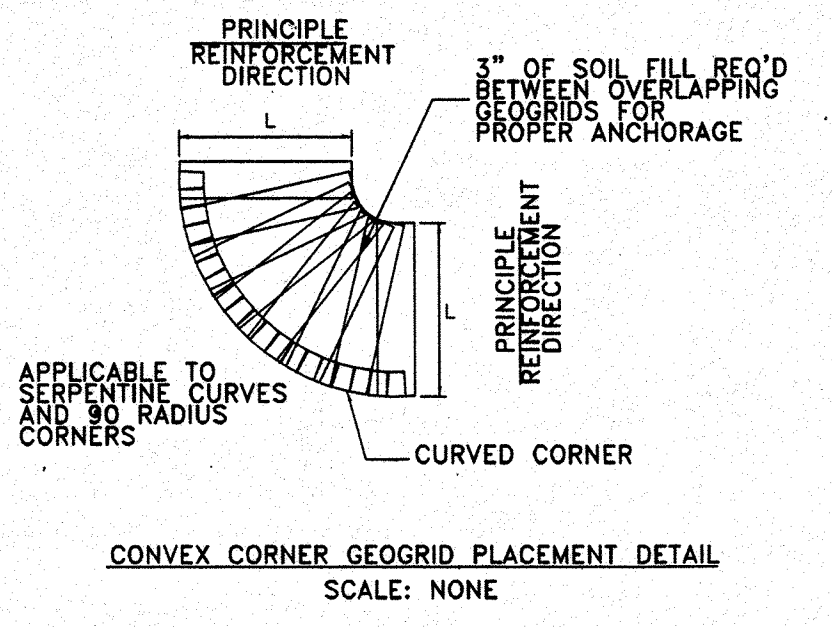
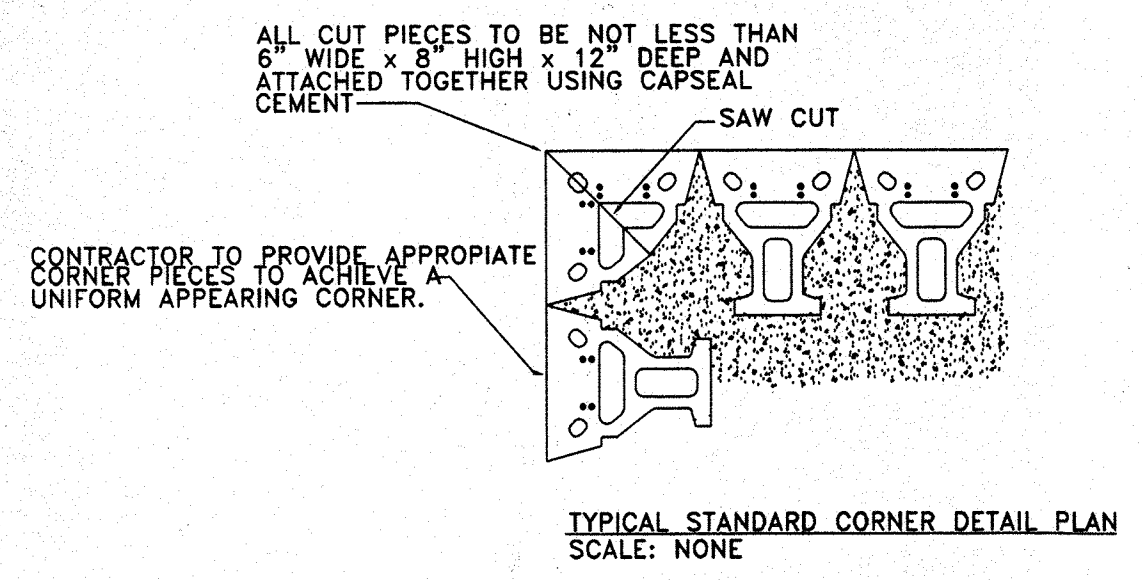
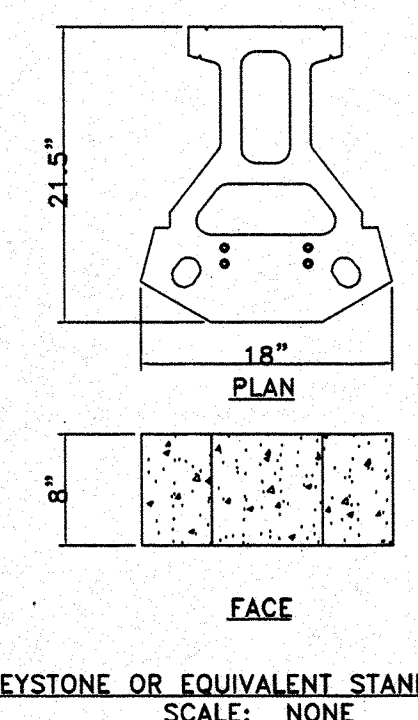
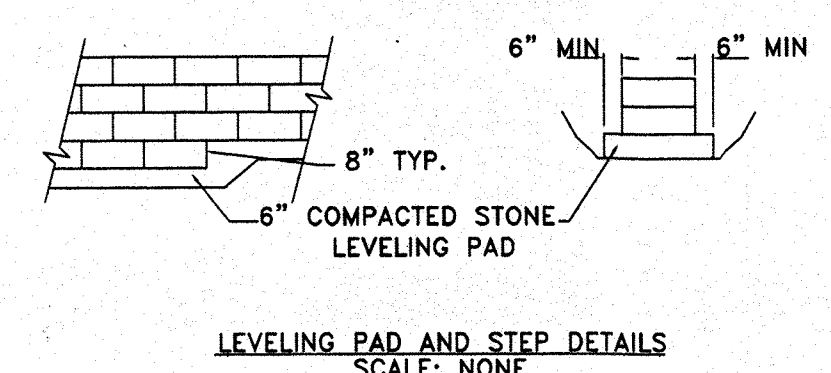
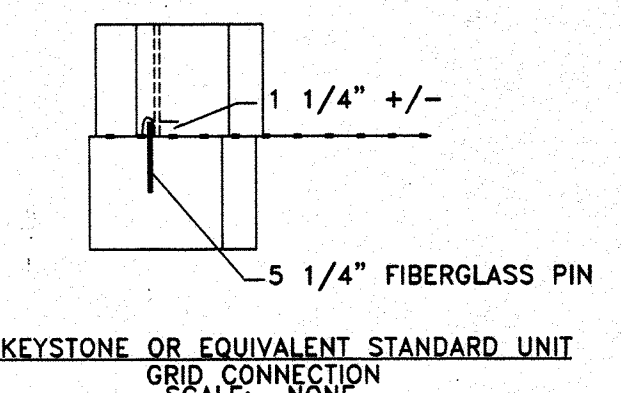
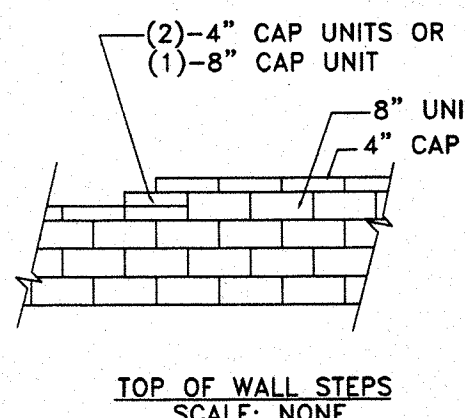
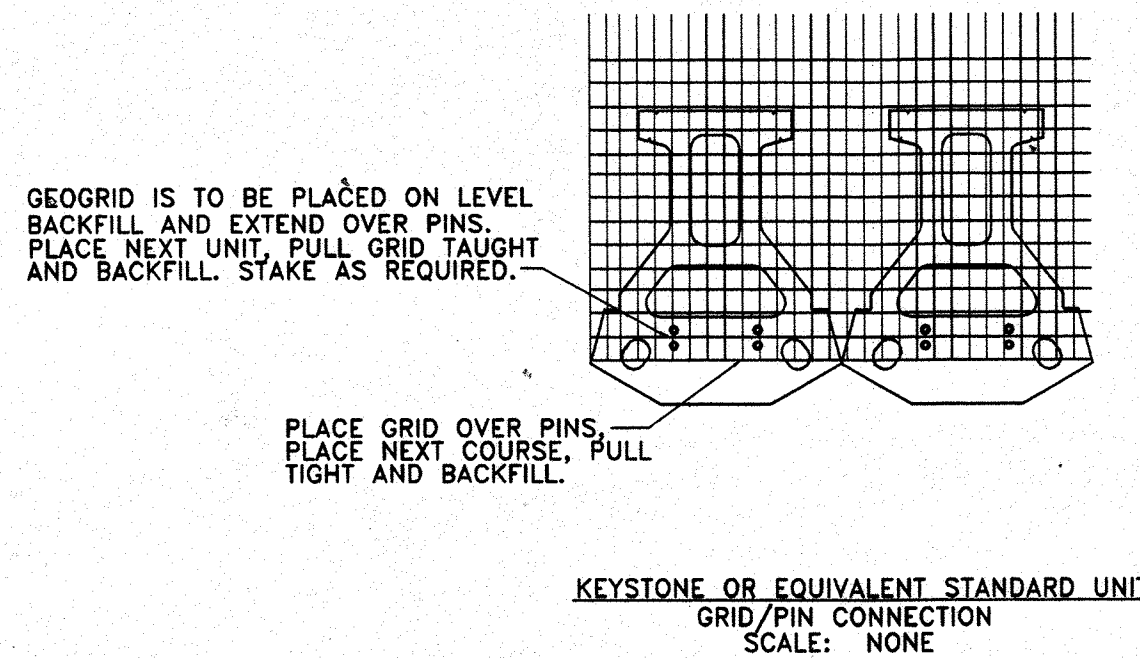
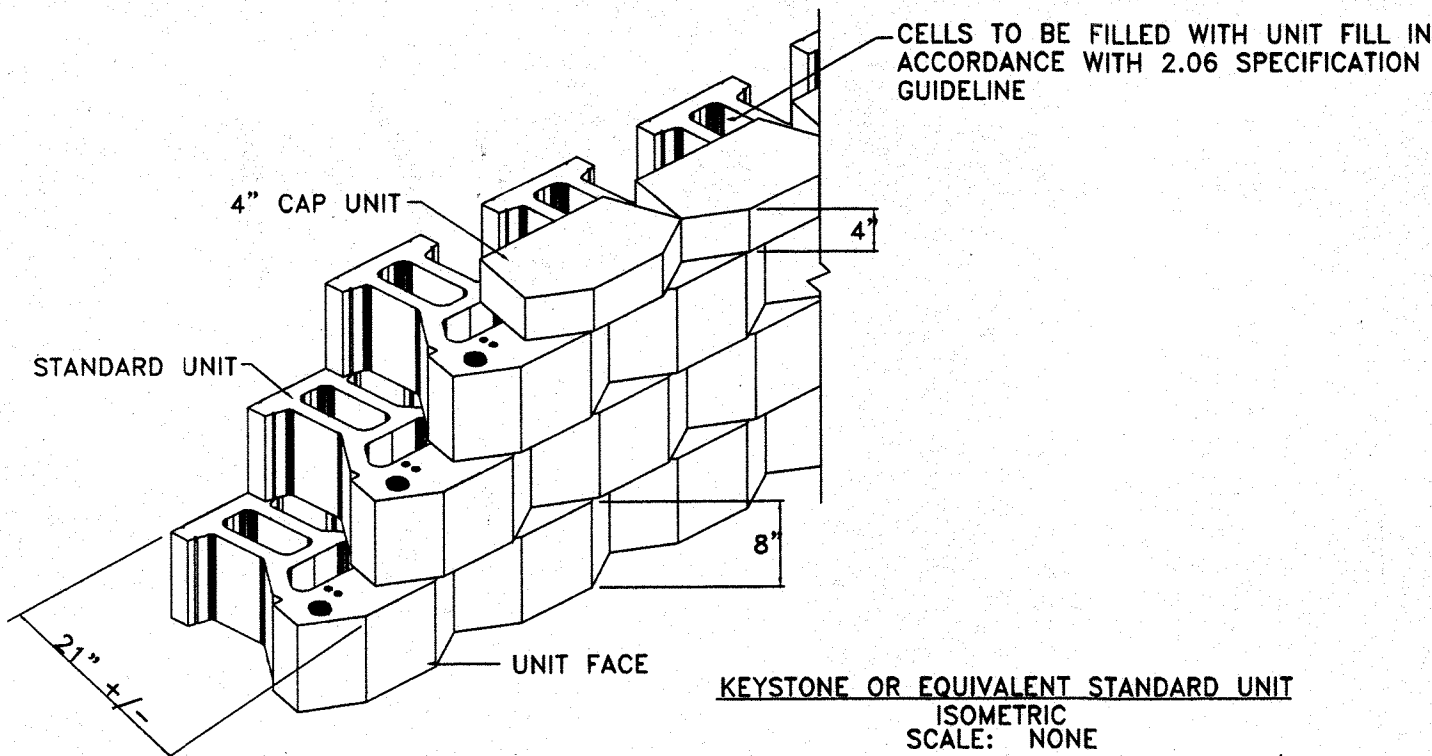
NO. CO. OFFICE CAMPUS	SECTION AREA	LOT PARCEL #
PLATE NO. 17 BLOCK #1 HOME	MAX. BORE MAX	ELICOTT DISTRICT
15667-70 811 POR	24425	6029
WATER CODE	SEWER CODE	

RETAINING WALLS #1 AND #2  
PROFILE VIEWS AND DETAIL

Des. By	NCH	Scale	NTS	Proj. No.	02-2594
Dwn. By	KDR	Date	3/5/12		
Chk. By	Approved				

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 900-03-026





RETAINING WALL SPECIFICATION GUIDELINES

PART 1: GENERAL

1.01 Description

- A. Retaining walls must be constructed under the supervision of a Maryland Registered Professional Engineer.
- B. Work includes furnishing and installing concrete modular block retaining wall units to the lines and grades shown on the construction drawings and as specified herein.
- C. Work includes preparing foundation soil, furnishing and installing leveling pad, unit fill and reinforced backfill to the lines and grades shown on the construction drawings.
- D. Work includes furnishing and installing all related materials required for construction of the retaining wall as shown on the construction drawings.

1.02 Reference Standards

- A. ASTM C 90 Load Bearing Concrete Masonry Units.
- B. ASTM C 140 Sampling and Testing Concrete Masonry Units.
- C. ASTM D 448 Sizes of Aggregate for Road and Bridge Construction.
- D. ASTM D 698 Laboratory Compaction Characteristics using Standard Effort.

1.03 Delivery, Storage and Handling

- A. Contractor shall check the materials upon delivery to assure that proper materials have been received.
- B. Contractor shall prevent excessive mud, wet cement, epoxy, and similar materials (which may affix themselves) from coming in contact with the materials.
- C. Contractor shall protect the materials from damage and exposure to sunlight. Damaged materials shall not be incorporated into the retaining wall structure and backfill.

1.04 Quality Assurance

- A. Owner will be responsible for soil testing and construction observations for quality control during earthwork and retaining wall construction operations.

PART 2: MATERIALS

2.01 Definitions

- A. Modular Wall Units - KEYSTONE or equivalent modular concrete facing units, machine made from portland cement, water and mineral aggregates.
- B. Structural Geogrid - a structural geogrid formed by a regular network of integrity connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.
- C. Unit Fill/Drainage Aggregate - drainage aggregate, such as No. 57 Stone, which is placed within the cells of the modular concrete units and immediately behind the units to a width of at least 12 inches.
- D. Reinforced Backfill - Compacted soil which is within the reinforced soil volume as shown on the plans.
- E. Excavation Face - The interface between the reinforced backfill and the retained fill. During construction, measures shall be taken to avoid developing a shear plane at this interface.
- F. Retained Backfill - On-site material located behind the reinforced zone of soil.

2.02 Concrete Units

- A. Concrete segmental units shall conform to the requirements of NCMATX 2-4 and have a minimum 28-day compressive strength of 4,000 psi. The units shall also pass 150 freeze thaw cycles in water with less than 1% weight loss for samples tested in accordance with ASTM C-1262.
- B. KEYSTONE or equivalent units for general wall construction shall be Standard Units. Sculptured face or straight (flat) face may be used.
- C. KEYSTONE or equivalent Cap Units for general wall construction may be either angular-sided or straight-sided units.

2.03 Fiberglass Connecting Pins

- A. Connecting pins shall be 1/2" diameter thermoset isophthalic polyester resin-pultruded fiberglass reinforcement rods supplied by the unit manufacturer.

2.04 Construction Adhesive

- A. Construction adhesive for Capstones and corner blocks shall be KEYSTONE KapSealTM or equivalent construction adhesive, or an approved equivalent. Material shall conform to ASTM 2339 and shall be supplied by the KEYSTONE or equivalent unit supplier.

2.05 Base Leveling and Pad Material

- A. Material shall consist of crushed stone (GA 5/8) as shown on the construction drawing. The leveling pad shall be, at a minimum, 6-inches thick. MSHA No. 57 Stone or pea gravel is not permitted.

2.06 Unit Fill

- A. Fill for units shall be free draining crushed stone or gravel, 1/2" to 3/4", with no more than 5% passing the No. 50 sieve and conforming to ASTM D 448. Gradation of the unit fill shall be approved by the Geotechnical Engineer. "Pea Gravel" shall not be used. MSHA No. 57 stone may be used.

2.07 Reinforced Backfill

- A. Material shall consist of silty sand (SM) or more granular soils per USCS. The material shall contain no particles greater than 2.5 inches in diameter. The material shall contain no more than 35 percent by weight passing the US Standard No. 200 sieve. Other materials may be approved by the Geotechnical Engineer. The contractor shall submit samples and material specifications of the proposed backfill soils (unit fill, pad material, reinforced backfill, and impervious soils) to the Geotechnical Engineer for approval.
- B. Soil must meet or exceed friction angle specified in design parameters.
- C. Direct shear testing is required for all soil samples used for wall backfill.

2.08 Impervious Soil

- A. Material may be site excavated soils exhibiting a USCS designation of a lean clay (CL) or clayey sand (SC). The material shall contain no less than 40 percent by weight passing the US Standard No. 200 sieve and exhibit a plasticity index no less than 4 and no greater than 20. Other materials may be approved by the Geotechnical Engineer.

2.09 Structural Geogrid

- A. The geogrid identified for the retaining wall consists of the following:  
Tensor UX1400 SB,  
Tensor UX1500 SB,

2.10 Geotextile

- Other geogrid may be utilized provided the materials meet or exceed the minimum strength with similar or better strain characteristics of the Tensor Geogrid and are approved by the Geotechnical Engineer for use with soil backfill. At corners or angled locations, the geogrid shall overlap and where overlaps occur, a layer of fill material (1 to 3 inches thick) shall be placed between the geogrids. Overlapping geogrids shall not be permitted at the wall face. The material shall be protected from sunlight and weather while stored on site in accordance with the manufacturer's recommendation.

- A. A non-woven geotextile shall be utilized as shown on the plans to provide a filter between the unit fill/drainage aggregate and the reinforced backfill. The geotextile shall conform to the criteria for a Geotextile Class A or Class B (depending on the reinforced backfill material used) according to the Maryland Department of Transportation Standards and Specifications for Construction and Materials, Section 921.09. Where geogrids are located, the geotextile shall be placed as illustrated on the plans. At junctions and ends, the geotextile shall be overlapped at least 12 inches. The geotextile shall be placed so that intimate contact is made between the geotextile and the backfill material. Ripped or otherwise damaged material shall not be used. The material shall be protected from sunlight and weather while stored on site in accordance with the manufacturer's recommendation.

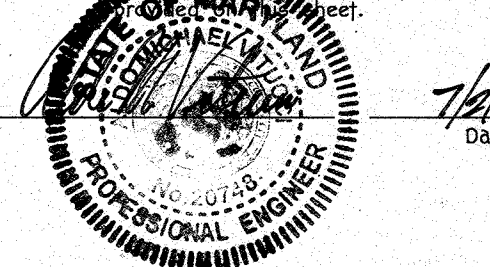
DESIGN PARAMETERS

Characteristics	Value
Configuration:	Battered face wall (4.4%)
Maximum Exposed Height:	14.0 feet
Backslope Angle:	Varies
Bearing Capacity:	See profile
Wall Embedment:	See profile
Surcharge:	250 psf for roadway

Soil Parameters:	Friction Angle	Cohesion	Unit Weight (pcf)
Reinforced fill	30	0	125
Retained soils	28	0	125
Foundation soils	28	0	125

AS-BUILT CERTIFICATION

Note: "AS-BUILT" information must be provided to the Engineer.



PART 3:

3.01 Excavation

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. Contractor shall be careful not to disturb embankment and foundation materials beyond lines shown.
- B. All existing topsoil, rootmats and other soft or unsuitable materials shall, at a minimum, be removed from the footprint of the retained soil mass.
- C. If groundwater is encountered during the excavation of the backslope, a backslope drainage system shall be installed. The system shall tie into the internal wall drainage system to provide adequate release of any water which accumulates behind the reinforced zone.

3.02 Foundation Preparation

- A. Foundation shall be excavated as required for leveling pad dimensions shown on the construction drawings, or as directed by the Engineer.
- B. The required bearing pressure beneath the footing of the wall must be verified in the field by a Geotechnical Engineer.
- C. Unsuitable soils shall be removed and replaced with approved material.
- D. Over-excavated areas shall be backfilled with approved, compacted backfill material or as approved by the Engineer.

3.03 Base Leveling Pad

- A. Leveling pad materials shall be placed upon an approved foundation as shown on the construction drawings to a minimum thickness of 6 inches.
- B. Aggregate material shall be compacted to provide a dense, level surface on which to place the first course of modular units. Compaction shall be to at least 95% of the maximum dry density as determined by the Standard Proctor Compaction Test (ASTM D 698). Leveling pad shall be prepared and leveled to ensure complete contact of retaining wall unit with base.

3.04 Unit Installation

- A. The first course of concrete modular wall units shall be carefully placed on the base leveling pad. Each unit shall be checked for level (in both directions) and alignment.
- B. At locations where the new wall is constructed over the existing wall, the existing cap block must be removed.
- C. Ensure that all units are in full contact with the base and properly seated.
- D. Install fiberglass connecting pins and fill all voids in and around the modular units with unit fill material. Tamp or rod unit fill to ensure that all voids are completely filled.
- E. Sweep excess material from top of units and install the next course. Ensure that the units of each course are completely filled, backfilled and compacted prior to proceeding to next course.
- F. Place each subsequent course, ensuring that pins protrude into adjoining courses a minimum of 1 inch. Two pins are required per unit. Pull each unit forward to obtain the desired offset (as noted on the plans), away from the fill zone, locking against the pins in the previous course and backfill as the course is completed.
- G. Repeat procedure to the extent of wall height. Wall construction shall not exceed 2 courses in height before reinforced backfill is placed.
- H. Follow wall erection and unit fill placement closely with any other backfilling required. Compaction of all soils shall be to 95% of the maximum dry density as determined in accordance with ASTM D 698. Backfill shall be a low permeability soil (impervious soils as described above) to reduce surface water runoff from directly entering the drainage aggregate/unit fill or reinforced soil zones.
- I. As appropriate where the wall changes elevation, units can be stepped with the grade or turned into the embankment with a convex return end. Provide appropriate buried units on compacted leveling pad in area of convex return end.

3.05 Geogrid Installation

- A. The geogrid type and length (direction perpendicular to the wall face) shall conform to those indicated on the construction drawings. Geogrid shall be laid continuously at the proper elevations and orientation as shown on the construction drawings or as directed by the Engineer. A minimum of 4 inches of soil cover is required between layers of geogrid.
- B. Correct orientation (roll direction) of the geogrid shall be verified by the Contractor.
- C. The geogrid shall be connected to the modular wall units by placing the geogrid over fiberglass pins and laying the grid back to the fill side.
- D. A filtering, non-woven geotextile shall be located between the drainage aggregate/unit fill and the reinforced backfill. The geotextile shall be folded back parallel above and below the geogrid as necessary to ensure continuous grid placement.
- E. The geogrid shall be pulled taut to set the geogrid against the fiberglass pins and to eliminate loose folds in the material. The fill surface shall be level. To tension the geogrid, backfill shall be placed over the geogrid from immediately behind the wall to the back end of the geogrid.
- F. No geogrid overlaps will be allowed in any length of geogrid perpendicular to the wall face except at corners or angled locations, the geogrid shall overlap rather than provide no coverage.

3.06 Fill Placement

- A. Backfill material shall be placed in 8 inch lifts and compacted to at least 95% of the maximum dry density as determined by the Standard Proctor Compaction Test (ASTM D 698). The in-place moisture content shall be within +/-3% of the optimum moisture content, as determined in accordance with ASTM D 698.
- B. Backfill shall be placed, spread and compacted in such a manner that minimizes the development of slack or loss of pretension of the geogrid. Backfill shall be placed in horizontal layers. The excavation face shall be stepped or notched to provide compaction of backfill on a level surface and to increase the interlock between the retained soils and the reinforced backfill.
- C. Only hand-operated compaction equipment shall be allowed within 5 feet of the back surface of the KEYSTONE or equivalent units.
- D. Backfill shall be placed from immediately behind the wall towards the excavation face/retained soils and compacted to the specifications presented herein with appropriate compaction equipment.
- E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 8 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles shall not be permitted overtop the geogrid.
- F. Rubber-tired equipment may pass over the geogrid reinforcement at slow speeds (less than 10 mph). Avoid sudden braking and sharp turning.
- G. The suitability of the fill material must be confirmed by a Geotechnical Engineer.

3.07 Cap Installation

- A. Place KEYSTONE or equivalent cap units over projecting pins from the units below. Pull forward to setback position. Backfill and compact to finished grade with low permeability soil (impervious soil as described herein). Provide permanent mechanical connection wall units with KEYSTONE KapSealTM or equivalent construction adhesive.
- B. Apply adhesive to top surface of lower unit and place cap unit atop adhesive.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

<i>William J. ...</i>	7-11-03
CHIEF, BUREAU OF HIGHWAYS	DATE
<i>...</i>	7/14/03
CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE
<i>...</i>	7/6/03
CHIEF, DIVISION OF LAND DEVELOPMENT	DATE
<i>...</i>	7/6/03
DIRECTOR	DATE

Date No. Revision Description

Howard County  
Office Campus  
PARCEL A  
CIP-C-0282

OWNER/DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

<b>ECS</b> ENGINEERING CONSULTING SERVICES, LTD.	1340 CHARWOOD ROAD SUITE P HANOVER, MD 21076 (410) 859-4300 (410) 859-4324 (FAX)
---	--

NO.	DATE	DESCRIPTION	BY
1	7/14/03	ISSUED FOR PERMIT	...

RETAINING WALLS #1 AND #2  
DETAILS AND SPECIFICATIONS

Des. By	NCH	Scale	NTS	Proj. No.	02-2594
Dim. By	KDR	Date	7/9/02		
Chk. By		Approved			

35 of 44

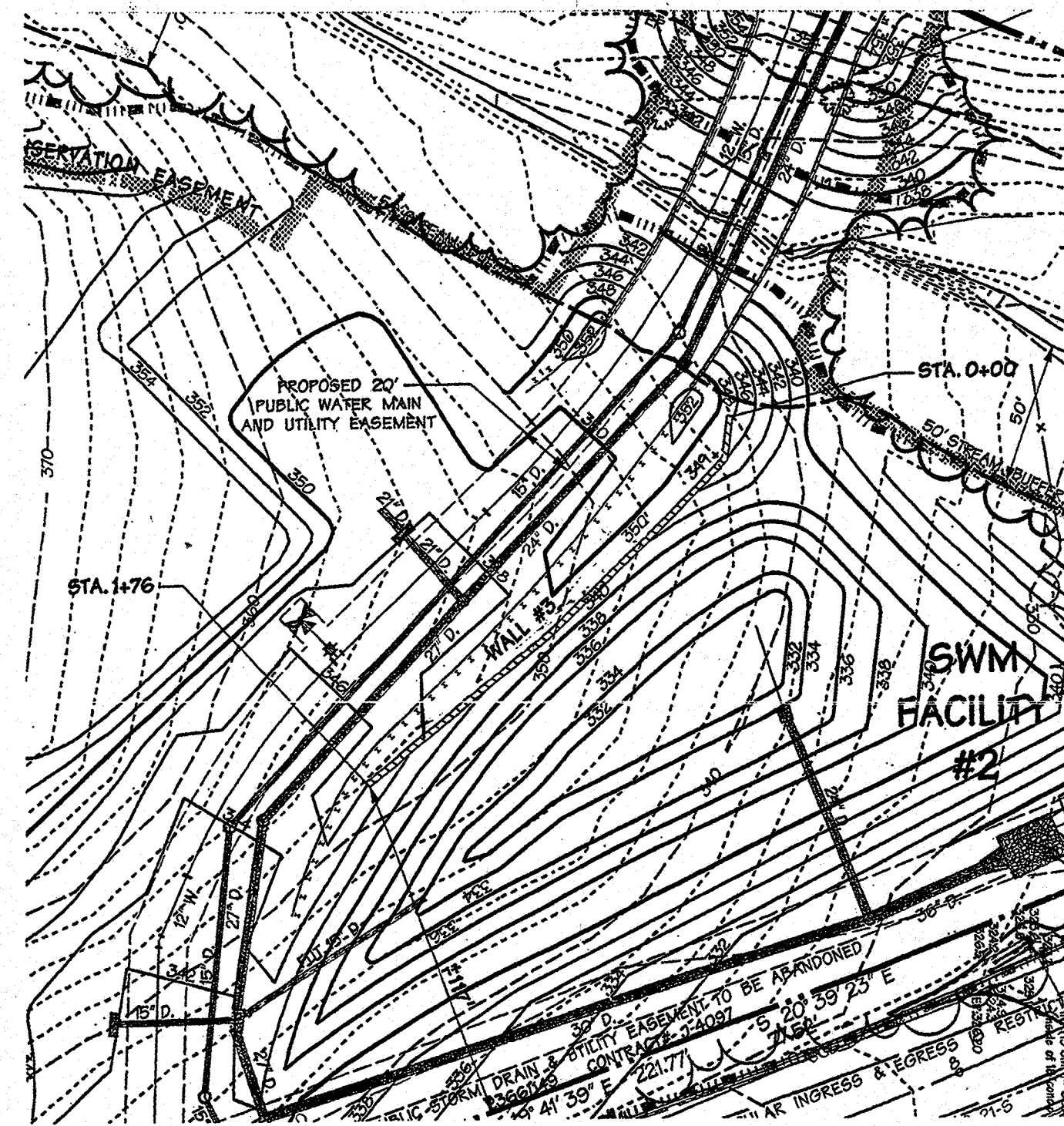
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EXP-03-02C

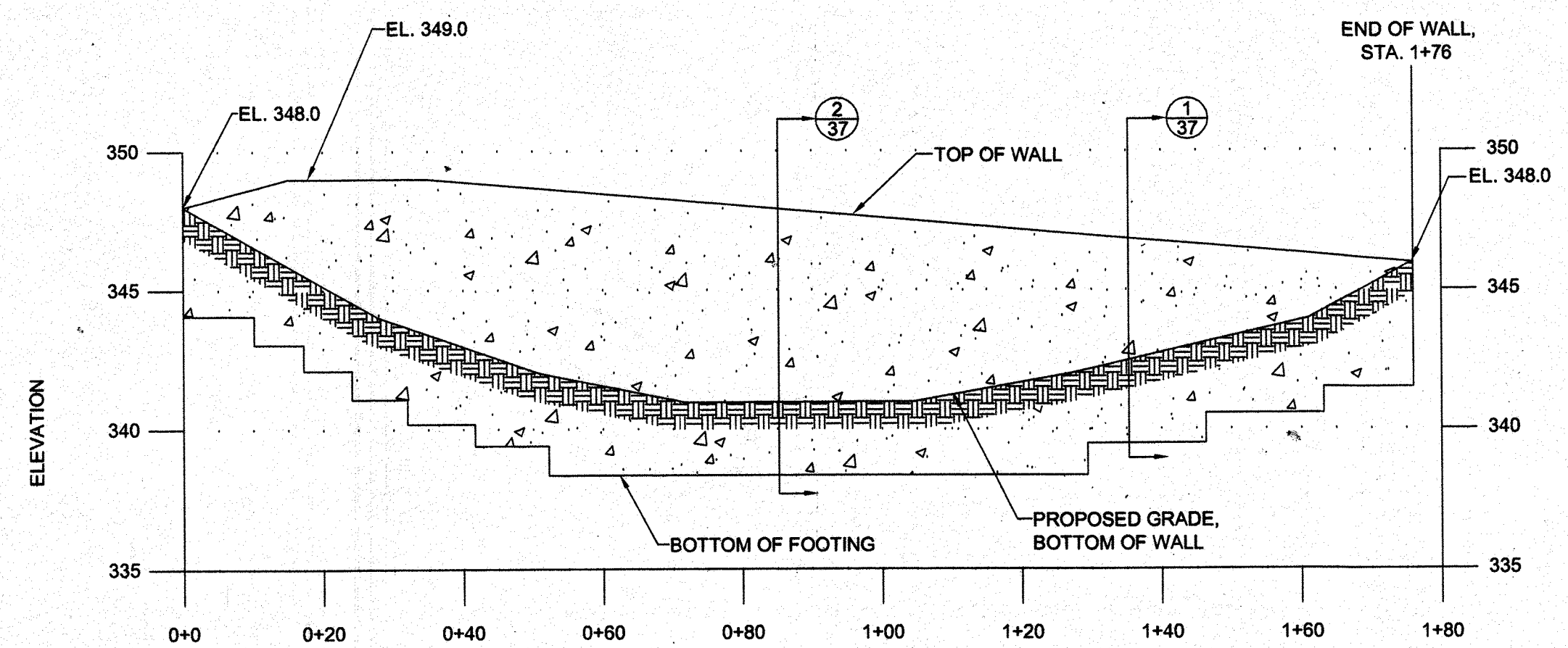


**LEGEND**

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- 300- MAJOR CONTOURS
- 295- MINOR CONTOURS
- STREAM CENTERLINE
- STREAM BUFFER
- WETLAND LIMIT
- WETLAND BUFFER
- SLOPES >25%
- SLOPES 15%-25%
- EXISTING FOREST EDGE
- EXISTING ROADS
- PROPOSED TREELINE
- PROPOSED GUARD RAIL
- 100 YR FLOODPLAIN
- LIMIT OF DISTURBANCE
- PROP. RETAINING WALL
- 345 PROPOSED MINOR CONTOUR
- 350 PROPOSED MAJOR CONTOUR
- FOREST CONSERVATION EASEMENT (NATURAL AREA CONSERVATION CREDIT)
- PUBLIC EASEMENT
- 12' W. PROPOSED WATER LINE
- 15' D. PROPOSED STORM DRAIN



PLAN VIEW  
SCALE: 1"=50'



WALL #3  
SCALE  
VERTICAL SCALE 1"=5'  
HORIZONTAL SCALE 1"=20'

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William F. ...* 7-11-03  
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*Paul ...* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Wanda ...* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Mark ...* 7/21/03  
 DIRECTOR DATE

Date	No.	Revision Description

**Howard County  
Office Campus  
PARCEL A  
CIP-C-0282**

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HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

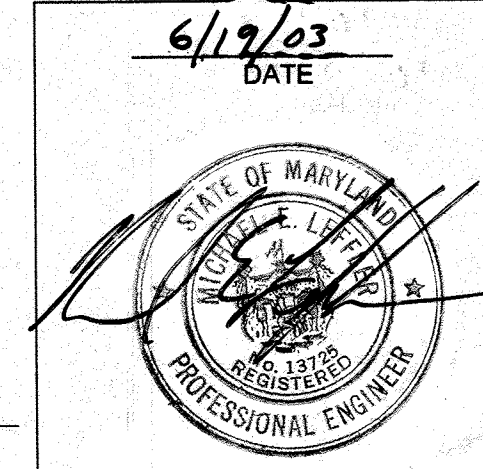
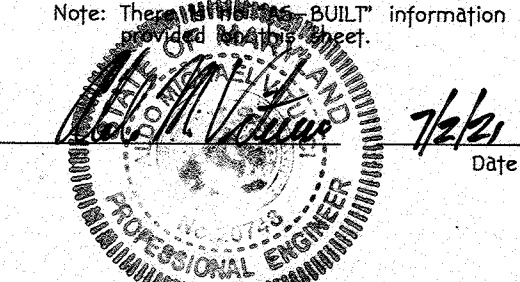
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1340 CHARWOOD ROAD  
SUITE P  
HANOVER, MD 21076  
(410) 859-4300  
(410) 859-4324 (FAX)

6/19/03  
DATE

**RETAINING WALL #3  
PLAN AND PROFILE VIEWS**

Des. By	NCH	Scale	NOTED	Proj. No.	02-2594
Drn. By	KDR	Date	3/5/12		
Chk. By	Approved				

AS-BUILT CERTIFICATION  
 Note: The information provided is for informational purposes only.



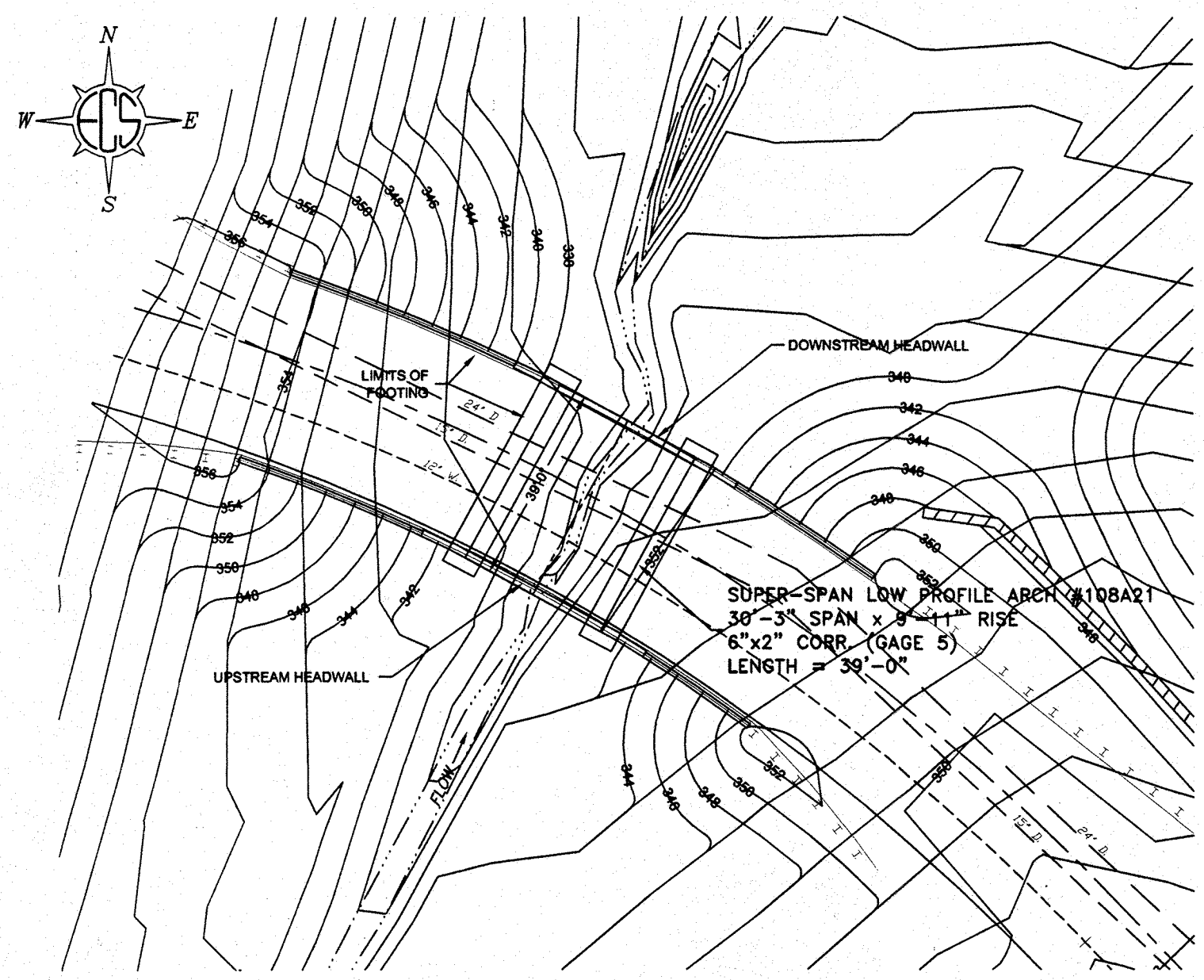
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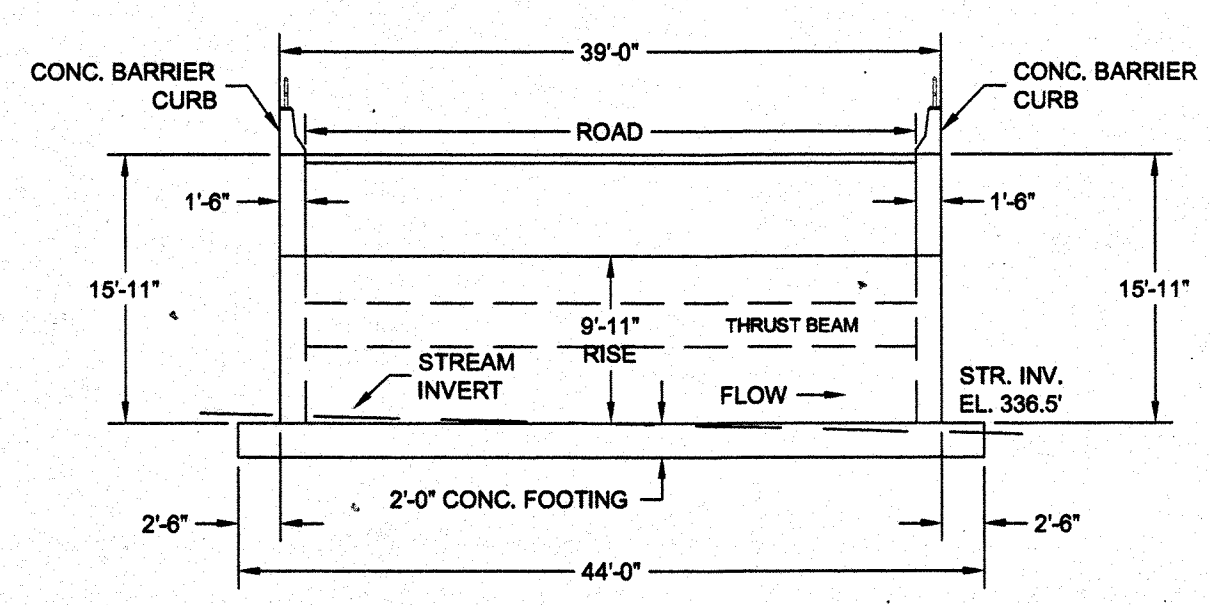




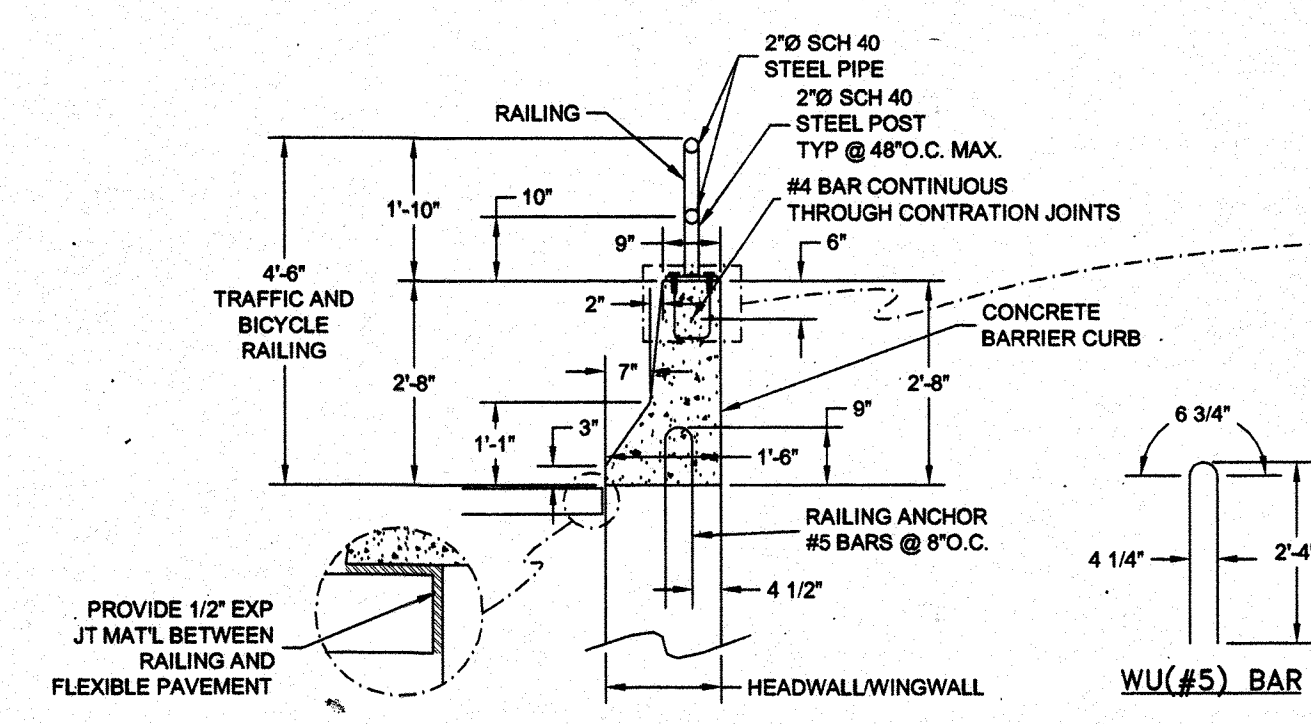
STRUCTURE NO.:	108A21
SIZE:	30'-3" - 9'-11"
END AREA:	237.1 FT. SQ.
LENGTH:	45.0'
PAVEMENT TYPE:	ASPHALT
MIN. HT. OF COVER:	3.0'
MAX. HT. OF COVER:	20.0'



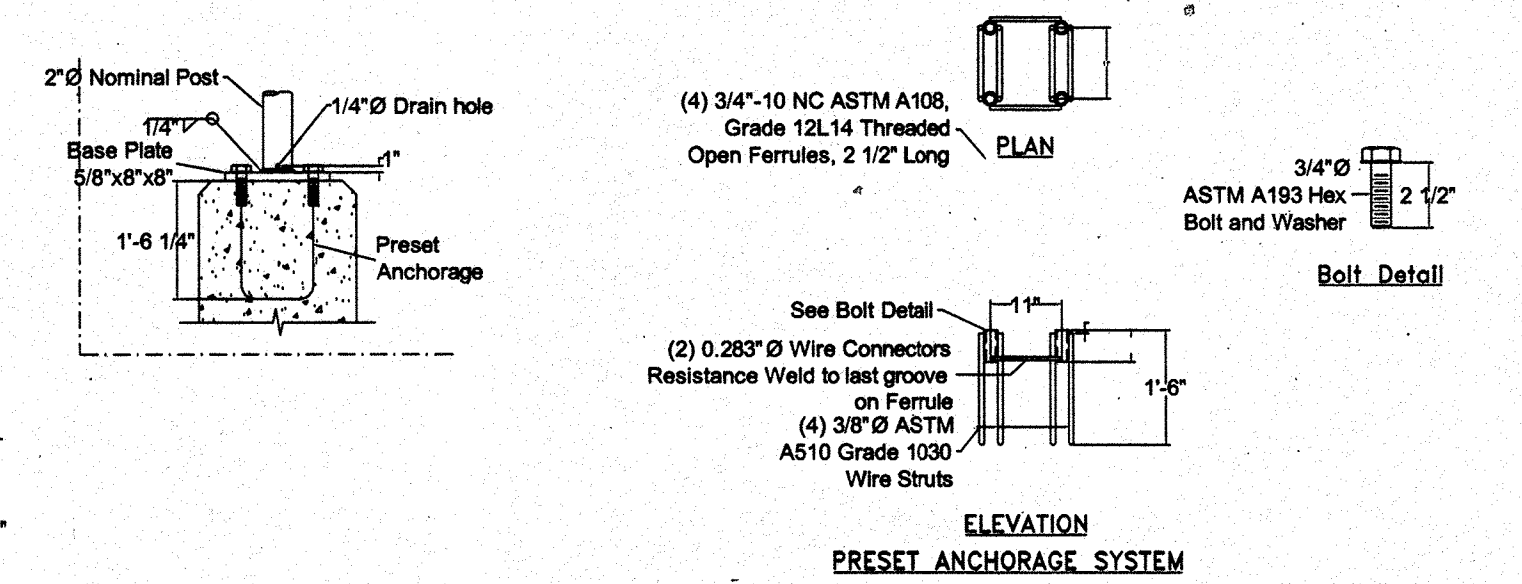
PLAN VIEW  
SCALE: 1"=30'



PROFILE THRU C OF SUPER-SPAN



CONCRETE BARRIER CURB

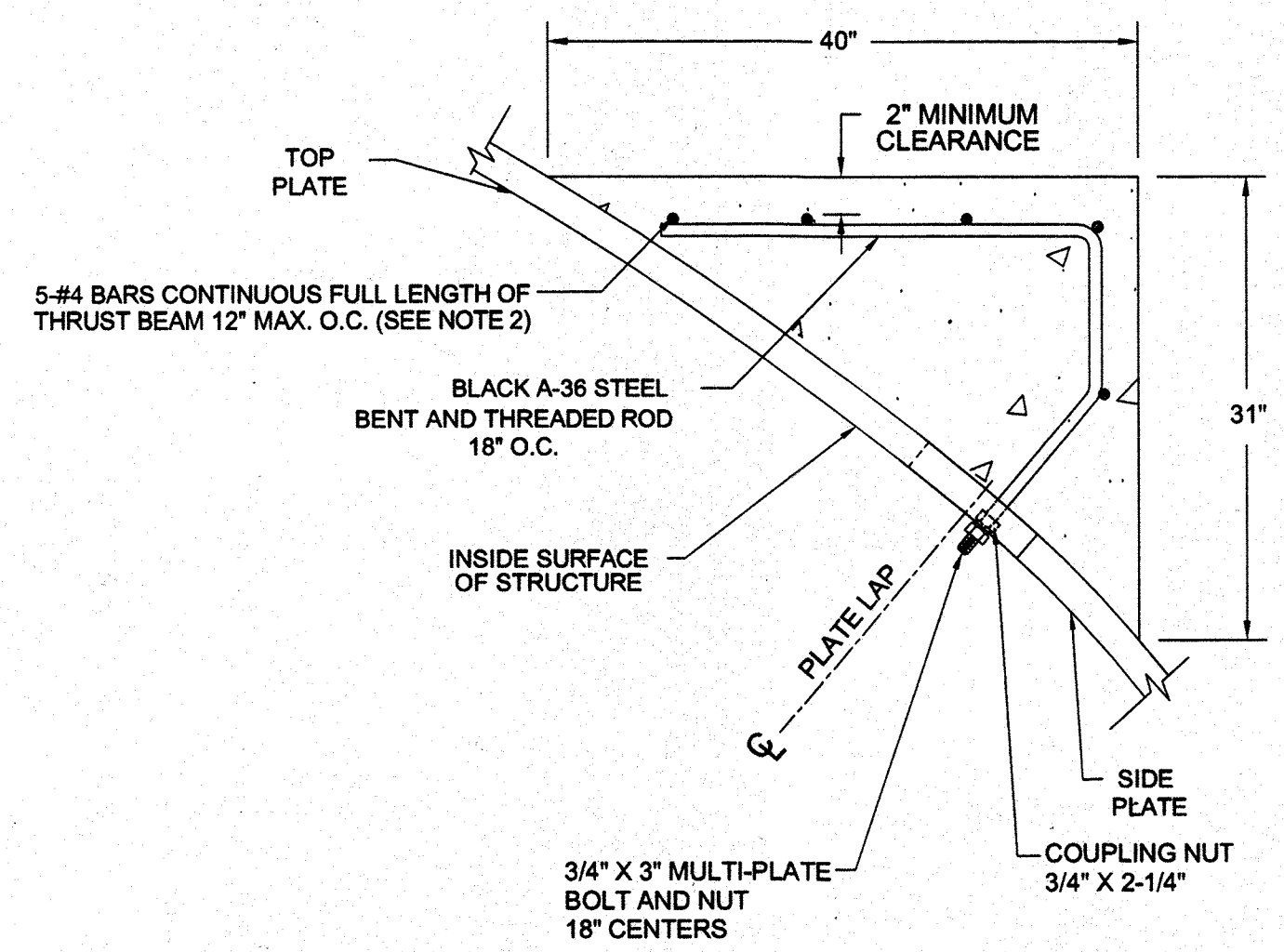


PRESET ANCHORAGE SYSTEM

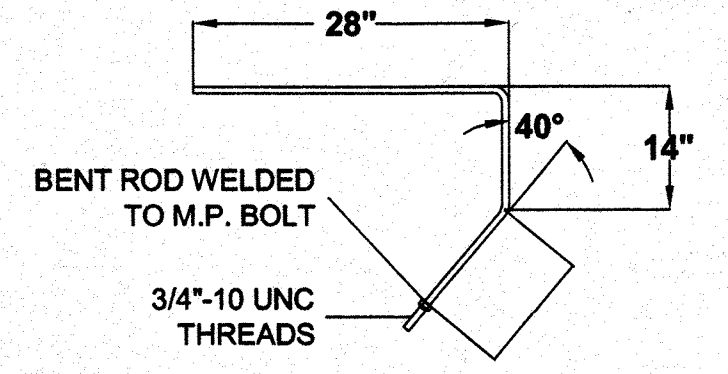
- ADDITIONAL NOTES FOR RAILING:**
- 1.) All posts shall be installed plumb.
  - 2.) All rails shall be parallel to the top of the wall.
  - 3.) Steel posts and rails shall conform to the requirements of ASTM A53, Type E or S, Grade B or with AASHTO M 161, Grade 2 and shall not be pvc coated.
  - 4.) Base plates and steel plates, including plate washers, shall conform to the requirements of ASTM A307, Grade A. Washers shall be standard size conforming to the requirements of ASTM F844.
  - 5.) Bolts shall conform to the requirements of ASTM A307, Grade A. Washers shall be standard size conforming to the requirements of ASTM F844.
  - 6.) Post and base plate assemblies, anchorages and other structural steel shall be hot-dip galvanized after fabrication in accordance with ASTM A123.

PRELIMINARY ESTIMATED QUANTITIES

	CONCRETE (cu.yd.)	STEEL (lbs)	COMPACTED GRANULAR MAT. (cu.yd.)	TENSAR (sq.yd.)	BACKFILL (cu.yd.)
ARCH FOOTINGS	47.6	4150			
HEADWALLS	40.3	7000			
WINGWALLS	149.6	17900			
THRUST BEAMS	10.4	580			
FOUNDATION IMPROV.			450	1650	
SELECT BACKFILL					400

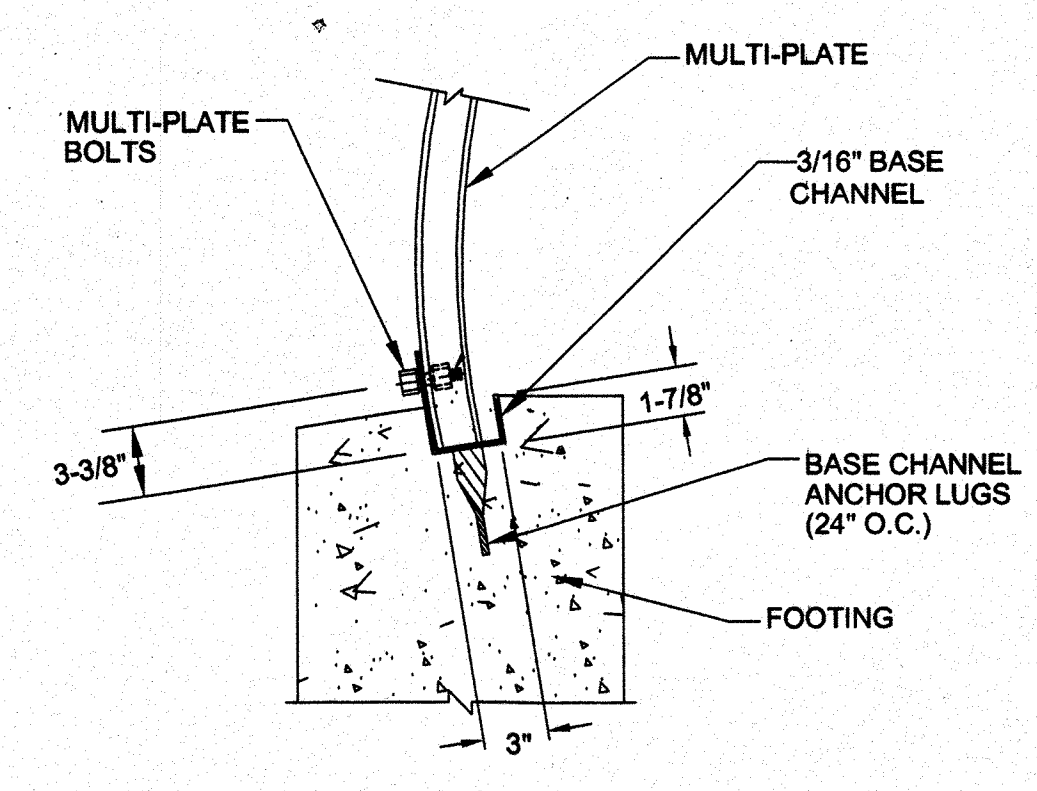


THRUST BEAM DETAIL

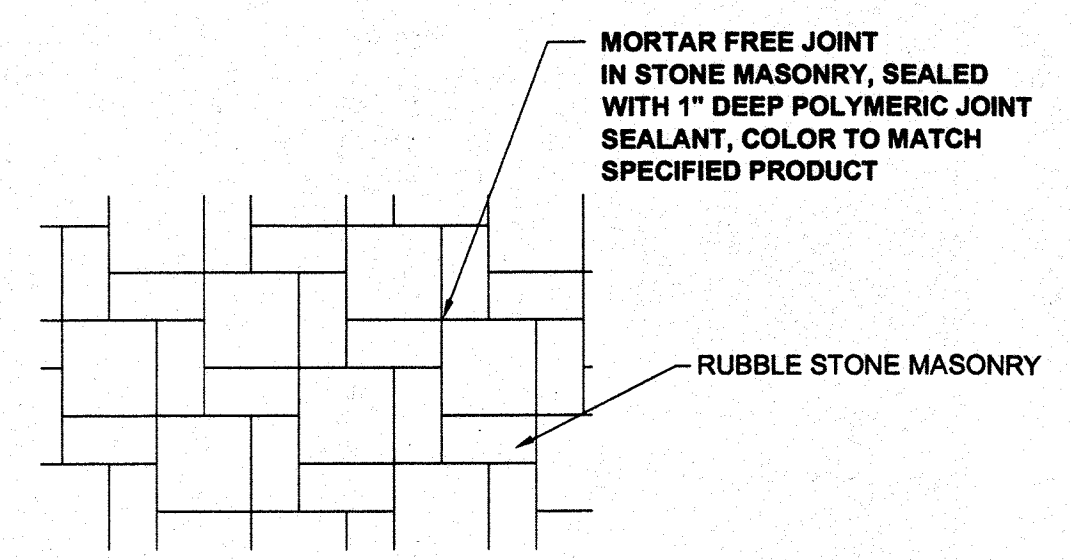


BENT ROD

- ADDITIONAL NOTES FOR THRUST BEAM:**
- 1.) REINFORCED CONCRETE THRUST BEAMS TO BE POURED IN A MANNER TO MAINTAIN A BALANCED LOADING ON EACH SIDE OF THE STRUCTURE.
  - 2.) LONGITUDINAL REINFORCING BARS MAY BE PLACED ON EITHER SIDE OF BENT ROD.
  - 3.) CONCRETE MAY BE  $f_c = 2,400$  psi.
  - 4.) REINFORCEMENT SHALL BE ASTM A-615 GRADE 40.

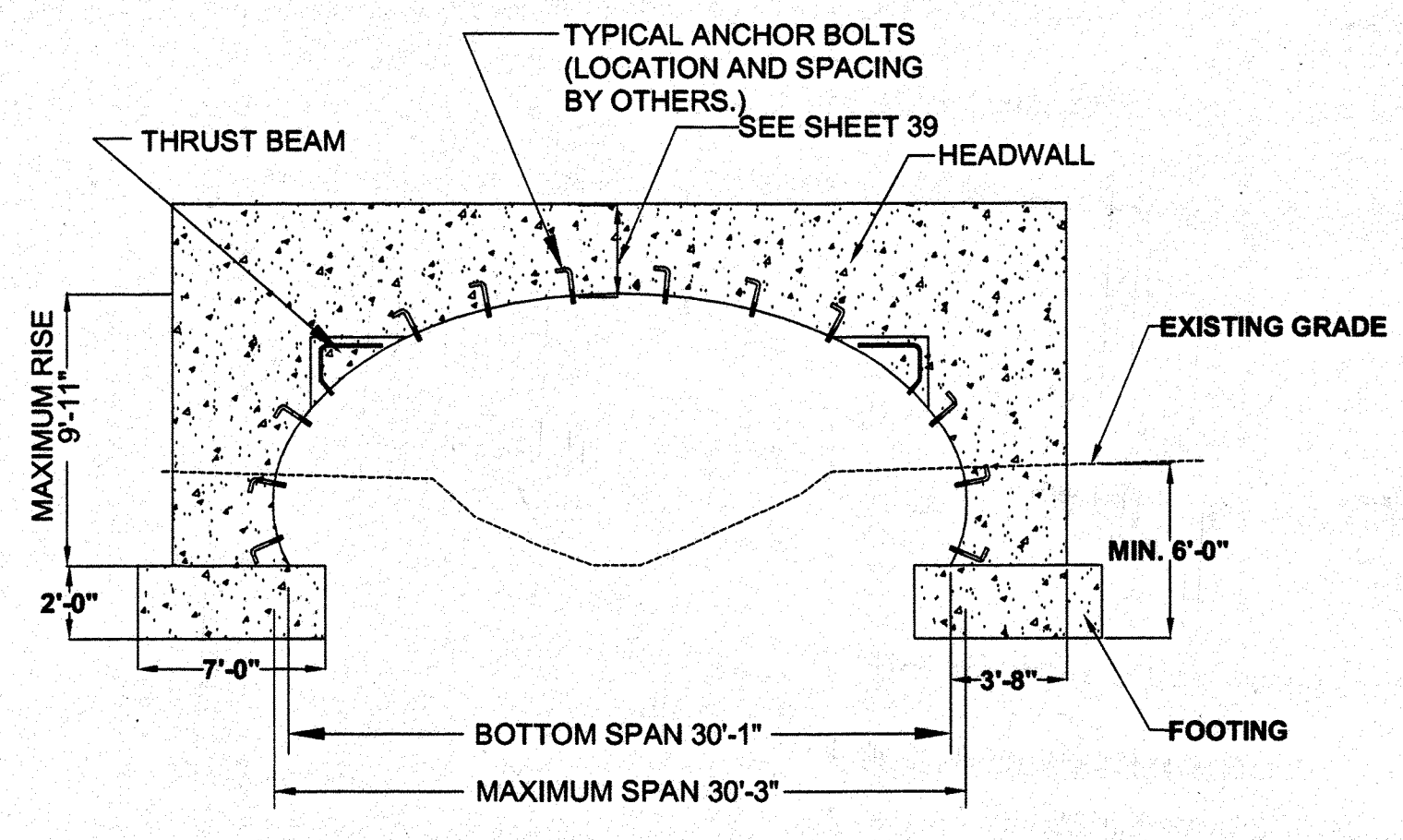


BASE CHANNEL DETAIL

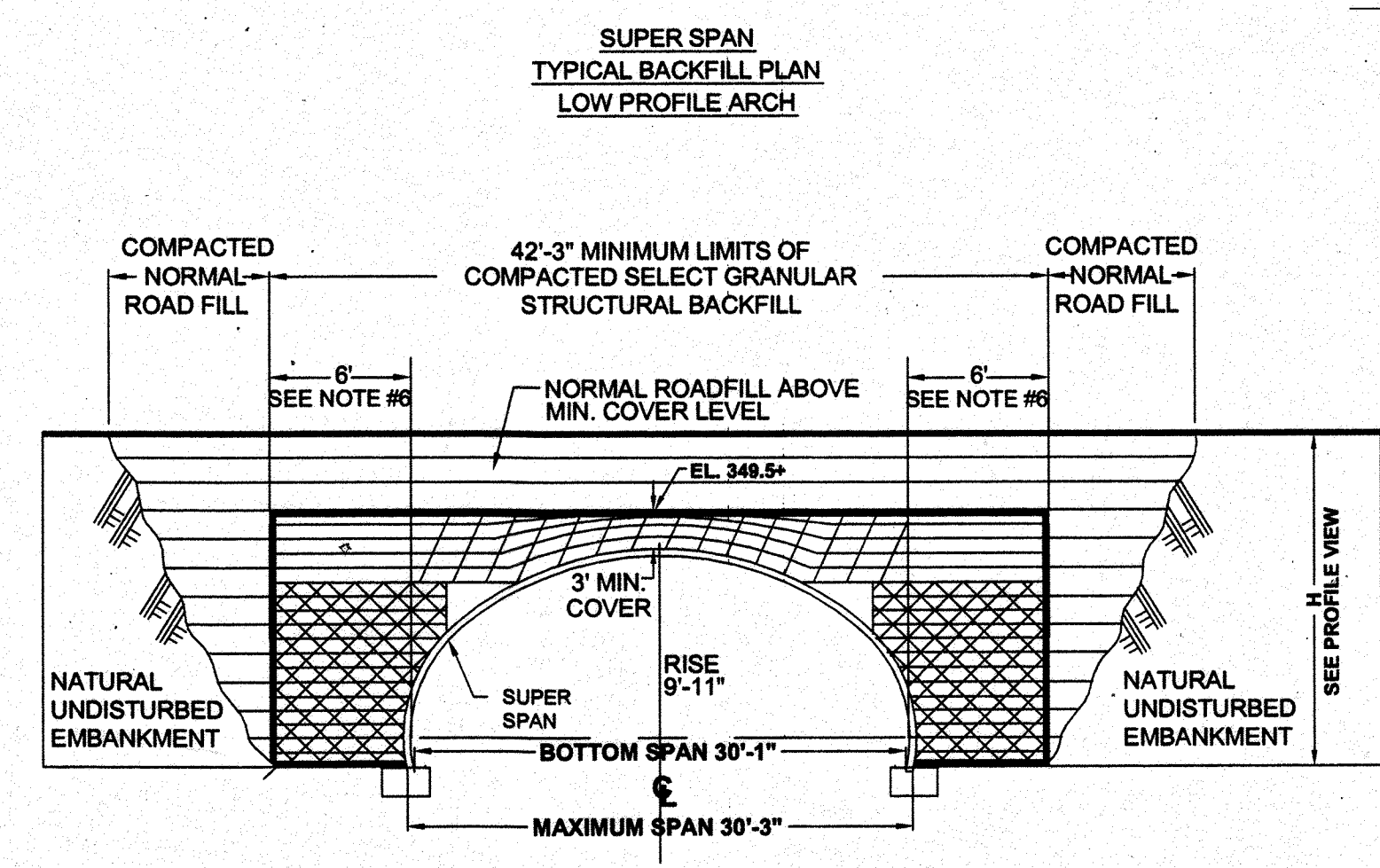


LEGEND

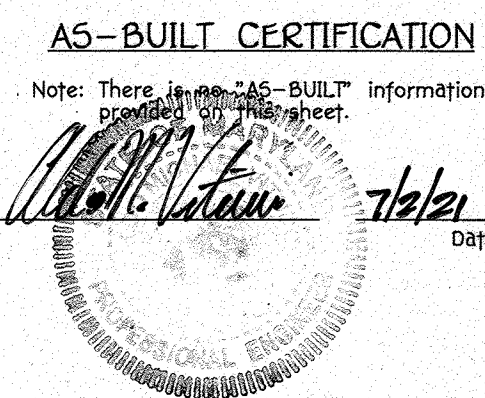
- CRITICAL BACKFILL ZONE, PRESSURE ON SOIL GREATEST HERE.
- INITIAL LIFTS OVER CROWN OF STRUCTURE AS INDICATED BY SHADED AREA TO BE COMPACTED TO REQUIRED DENSITY WITH HAND OPERATED EQUIPMENT OR WITH SMALL TRACTOR (D-4 OR SMALLER) DRAWN EQUIPMENT.
- SELECT GRANULAR STRUCTURAL BACKFILL LIMITS.



END VIEW OF SUPER SPAN



SECTION



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

*Willa F. ...* 7-11-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING

*...* 7/14/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Cindy ...* 7/16/12  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*...* 7/21/12  
DIRECTOR DATE

Date No. Revision Description

**Howard County Office Campus**  
**PARCEL A**  
**CIP-C-0282**

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3430 COURT HOUSE DRIVE  
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(410) 859-4324 (FAX)

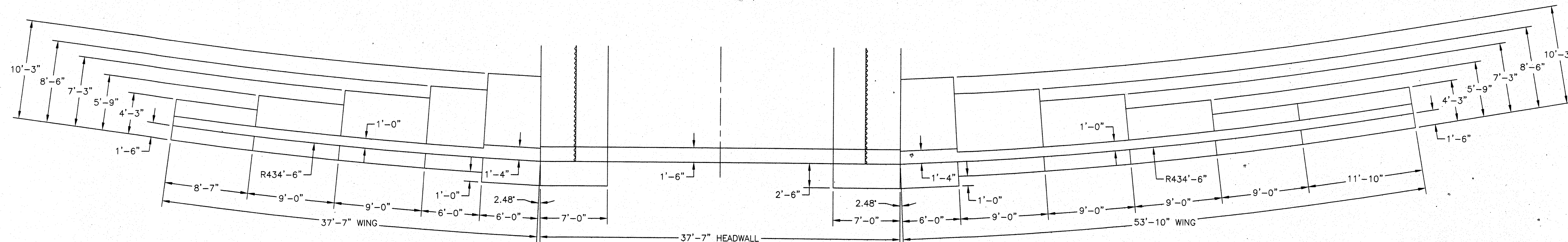
NO. CO. OFFICE CAMPUS  
TAX CODE MAP 248.25  
WATER CODE 611 POR  
SEWER CODE 2  
SERVICED TRACT 6029

**BOTTOMLESS ARCH**  
**PLAN VIEW AND DETAILS**

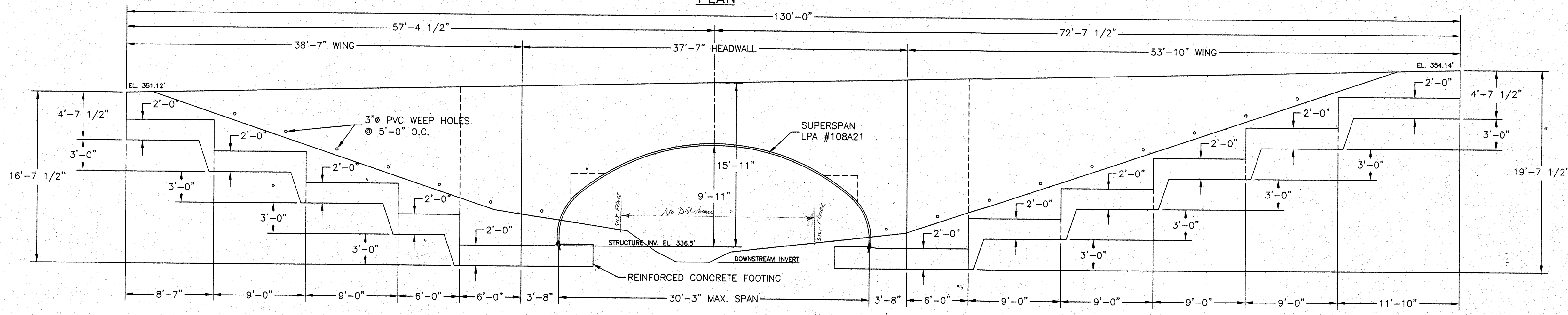
Des. By	MEL	Scale	NTS	Proj. No.	02-2594
Drn. By	KDR	Date	3/5/12		
Chk. By		Approved			

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET 90P-03-02G

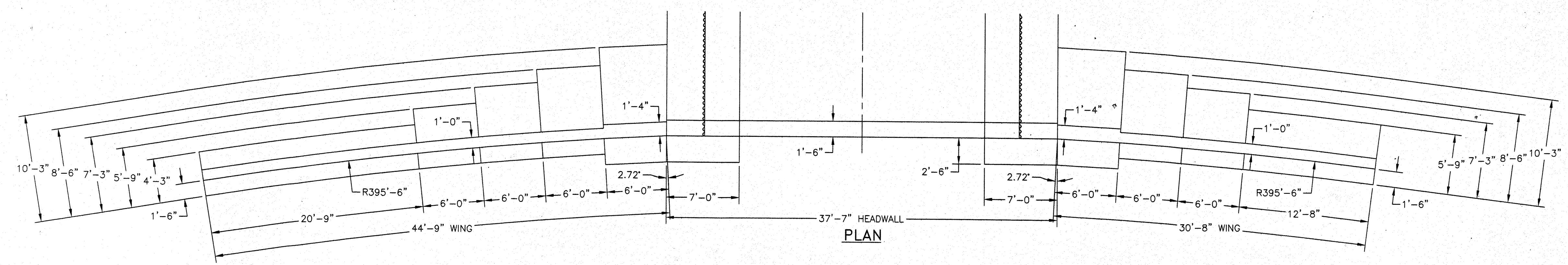




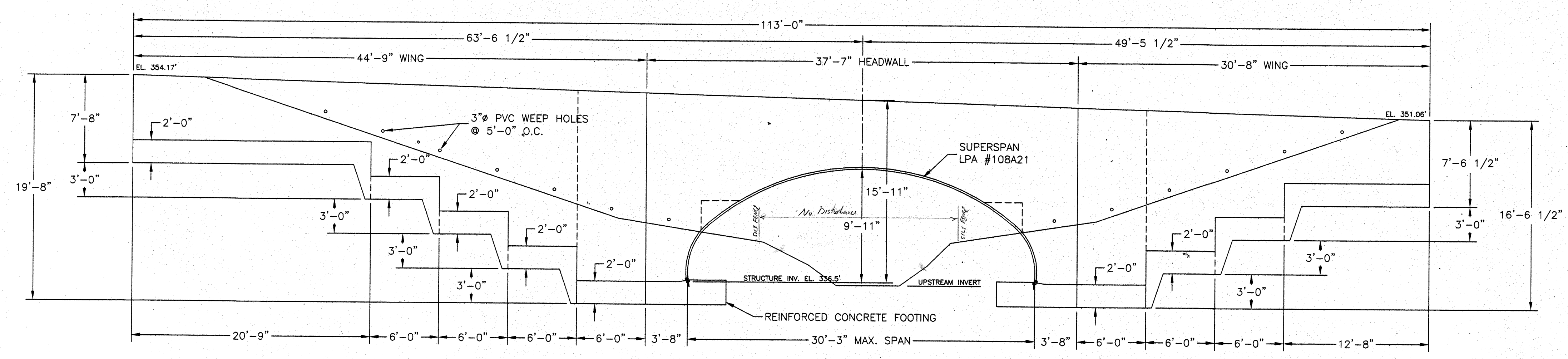
PLAN



DOWNSTREAM HEADWALL ELEVATION VIEW



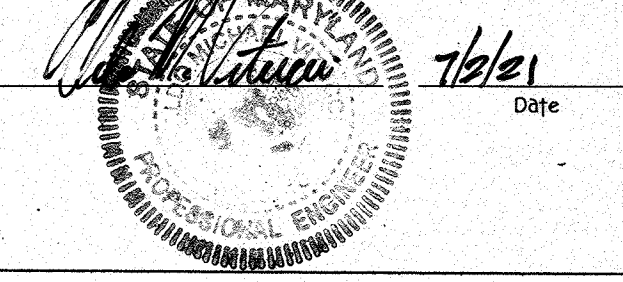
PLAN



UPSTREAM HEADWALL ELEVATION VIEW

AS-BUILT CERTIFICATION

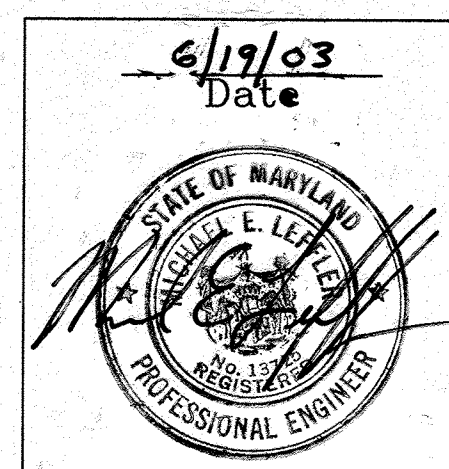
Note: There is no "AS-BUILT" information provided on this sheet.



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS  
*William J. ...* 7/11/03  
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 APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING  
*...* 7/14/03  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 APPROVED: *...* 7/16/03  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 APPROVED: *...* 7/21/03  
 DIRECTOR

Date No. Revision Description  
**Howard County  
 Office Campus  
 PARCEL A  
 CIP-C-0282**  
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 HOWARD COUNTY DEPT. OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043

<b>EGS LTD</b>		ENGINEERING CONSULTING SERVICES, LTD.	
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PROJ. NO. 852 & P/0847	SECTION AREA	LOT PARCEL #	
HO. CO. OFFICE CAMPUS	TAX ROW MAP	BLK. SURVEY	SECTION TRACT
15847-70	621 POR	24 & 25	6029
WATER CODE	SEWER CODE		



**BOTTOMLESS ARCH  
 HEADWALL ELEVATION VIEWS**

Des. By MEL Scale NTS Proj. No. 02-2594  
 Dwn. By KDR Date 3/5/12  
 Chk. By Approved

THERE IS NO "AS-BUILT" INFORMATION PROVIDED ON THIS SHEET. 90P-03-02C



1. GENERAL DESCRIPTION

THE LONG SPAN STEEL STRUCTURAL PLATE STRUCTURE, CONFORMING TO THE DIMENSIONS SHOWN ON THE PLANS AND SPECIFICATIONS, SHALL BE INSTALLED AT THE LOCATION DESIGNATED. THE DESIGN AND INSTALLATION SHALL CONFORM TO AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION I, "SOIL-CORRUGATED METAL STRUCTURE INTERACTIONS SYSTEMS", SECTION 12.7, "LONG SPAN STRUCTURAL PLATE STRUCTURES", AND DIVISION II, SECTION 26, "METAL CULVERTS" AND DIVISION II, SECTION 8, "CONCRETE STRUCTURES".

2. MATERIALS

THE GALVANIZED STEEL STRUCTURAL PLATE SHALL HAVE 6"x2" CORRUGATIONS AND SHALL BE OF THE GAGE SHOWN ON THE PLANS. THE PLATES SHALL BE MANUFACTURED IN CONFORMANCE WITH AASHTO SPECIFICATION M167. BOLTS AND NUTS SHALL MEET THE PROVISIONS OF ASTM A 449, TYPE 1 AND ASTM A 563, GRADE C, RESPECTIVELY. THE STEEL ANCHOR BOLTS SHALL CONFORM TO ASTM A 307, GRADE A.

3. LONGITUDINAL STRUCTURAL STIFFENERS (THRUST BEAMS)

LONGITUDINAL STIFFENERS SHALL BE LOCATED AT THE RADIUS TRANSITION AT THE ENDS OF THE TOP ARC. THE THRUST BEAMS SHALL CONSIST OF REINFORCED CONCRETE CONFORMING TO DIVISION II, SECTION 8, CLASS B OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES HAVING A MINIMUM COMPRESSION STRENGTH OF 2,400 PSI. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, HAVING A MINIMUM YIELD STRENGTH OF 40,000 PSI. THRUST BEAMS SHALL BE FORMED AND POURED CONFORMING TO THE PLAN DIMENSIONS WHEN THE BACKFILL REACHES THE BOTTOM ELEVATION OF THE THRUST BEAMS.

4. DESIGN

THE LONG SPAN STRUCTURE SHALL BE DESIGNED IN ACCORDANCE WITH THE LATEST AASHTO DESIGN CRITERIA AND SHALL BE REQUIRED TO INCORPORATE THE USE OF CONTINUOUS LONGITUDINAL STRUCTURAL STIFFENERS (CONCRETE THRUST BEAMS). THE MATERIAL SUPPLIER SHALL BE A QUALIFIED MANUFACTURER OF STEEL STRUCTURAL PLATE AND LONG SPAN STRUCTURES WITH A MINIMUM OF 50 SUCCESSFUL INSTALLATIONS. THE FOUNDATION, STRUCTURAL BACKFILL AND END TREATMENT SHALL BE AS REQUIRED HEREIN AND DETAILED ON THE PLANS.

5. STRUCTURE ERECTION

THE STRUCTURE SHALL BE ERECTED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND TO THE DESIGN SHAPE SHOWN ON THE PLANS. PLATES SHALL BE ASSEMBLED ACCORDING TO PLATE ASSEMBLY DRAWINGS SUPPLIED BY THE MANUFACTURER.

6. STRUCTURAL BACKFILL MATERIAL

A GRANULAR TYPE OF MATERIAL SHALL BE USED AROUND AND OVER THE STRUCTURE. THIS SELECT STRUCTURAL BACKFILL MATERIAL SHALL CONFORM TO ONE OF THE FOLLOWING CLASSIFICATIONS OF SOIL FROM AASHTO SPECIFICATION M-145, AS MODIFIED IN THE INCLUDED TABLE FOR A-1, A-2-4, OR A-2-5.

AASHTO M-145 TABLE 2 (MODIFIED\*)

GROUP CLASSIFICATION	A-1		A-2	
	A-1-a	A-1-b	A-2-4	A-2-5
SIEVE ANALYSIS, PERCENT PASSING:				
NO. 10 (2.00 mm)	50 MAX.	--	--	--
NO. 40 (0.425 mm)	30 MAX.	50 MAX.	--	--
NO. 100 (0.150 mm)	--	--	50 MAX.	50 MAX.
NO. 200 (0.075 mm)	15 MAX.	25 MAX.	20 MAX.	20 MAX.
CHARACTERISTICS OF FRACTION PASSING NO. 40 (0.425 mm)				
LIQUID LIMIT	--		40 MAX.	41 MAX.
PLASTICITY INDEX	6 MAX.		10 MAX.	10 MAX.
USUAL TYPES OF SIGNIFICANT CONSTITUENT MATERIALS	STONE FRAGMENTS GRAVEL AND SAND		SILTY OR CLAYEY GRAVEL AND SAND	

7. ADDITIONAL REQUIREMENTS

7.1. MATERIALS MUST BE DENSE-GRADED (OPEN-GRADED OR GAP-GRADED MATERIALS ARE NOT ALLOWED).

7.2. FINE BEACH SANDS, WINDBLOWN SANDS, STREAM DEPOSITED SANDS EXHIBITING FLUE, ROUNDED PARTICLES AND TYPICALLY CLASSIFIED BY AASHTO M-145 AS A-3 MATERIALS ARE NOT ALLOWED.

7.3. ON-SITE MIXING OR BLENDING TO ACHIEVE SPECIFIED GRADATION IS NOT ALLOWED.

MAXIMUM PARTICLE SIZE SHALL NOT EXCEED 3 INCHES. FOR THE A-2 MATERIALS, MOISTURE CONTENT MUST BE BETWEEN -3% TO +2% OPTIMUM AS DEFINED BY AASHTO T-180.

ALL SOIL CLASSIFICATIONS ARE LIMITED IN HEIGHT OF COVER AND STRUCTURE SHAPE APPLICATIONS AS FOLLOWS:

- A) A-1-a MATERIAL IS SUITABLE FOR ALL LONG SPAN SHAPES, SIZES AND FILL HEIGHTS.
- B) A-1-b MATERIAL IS SUITABLE ONLY FOR USE WITH HIGH PROFILE ARCH AND PEAR SHAPE STRUCTURES TO A 12' MAXIMUM FILL HEIGHT AND FOR USE WITH ELLIPTICAL AND LOW PROFILE ARCH STRUCTURES TO A 20' MAXIMUM FILL HEIGHT.
- C) A-2-4 AND A-2-5 MATERIALS ARE RESTRICTED TO MAXIMUM HEIGHTS OF COVER OF 12'.

THESE MATERIALS ARE NOT ALLOWED FOR USE WITH PEAR, PEAR-ARCH AND HIGH-PROFILE ARCHES WITH MORE THAN 30 pi IN THE SIDE ARC. OTHER BACKFILL MATERIALS WHICH PROVIDE EQUIVALENT STRUCTURAL PROPERTIES, LONG TERM, IN THE ENVIRONMENTAL CONDITIONS EXPECTED (SATURATION, FREEZE-THAW, ETC.) MAY BE USED. SUCH MATERIALS SHALL BE APPROVED ONLY AFTER THOROUGH INVESTIGATION AND TESTING BY A SOILS ENGINEER FAMILIAR WITH THE REQUIREMENTS FOR STRUCTURAL BACKFILL OF LONG SPAN STRUCTURES.

8. BACKFILL ENVELOPE LIMITS

THE BACKFILL ENVELOPE LIMITS ARE AS DETAILED ON THE PLANS.

9. BACKFILL PLACEMENT

BEFORE BACKFILLING, THE ERECTED STRUCTURE SHALL MEET THE TOLERANCE AND SYMMETRY REQUIREMENTS OF AASHTO AND THE MANUFACTURER.

APPROVED BACKFILL MATERIAL SHALL BE PLACED IN HORIZONTAL UNIFORM LAYERS NOT EXCEEDING 8" IN THICKNESS BEFORE COMPACTION, AND SHALL BE BROUGHT UP UNIFORMLY ON BOTH SIDES OF THE STRUCTURE. EACH LAYER OF BACKFILL SHALL BE COMPACTED TO A RELATIVE DENSITY OF NOT LESS THAN 90% MODIFIED PROCTOR PER AASHTO TEST METHOD NO. T-180. FIELD DENSITY TESTS OF COMPACTED BACKFILL WILL BE MADE AT REGULAR INTERVALS DURING BACKFILL.

LONG-SPAN STRUCTURES, DUE TO THEIR SIZE AND SHAPE, ARE SENSITIVE TO THE TYPES AND WEIGHTS OF EQUIPMENT USED TO PLACE AND COMPACT THE SELECT BACKFILL MATERIAL. THIS IS ESPECIALLY CRITICAL IN THE AREAS IMMEDIATELY ADJACENT TO AND ABOVE THE STRUCTURE. THEREFORE, EQUIPMENT TYPES WILL BE RESTRICTED IN THOSE CRITICAL ZONES. COMPACTION EQUIPMENT OR METHODS THAT PRODUCE HORIZONTAL OR VERTICAL EARTH PRESSURES WHICH CAUSE EXCESSIVE DISTORTION OR DAMAGE TO STRUCTURES SHALL NOT BE USED.

CONTRACTORS SHOULD PLAN TO HAVE A D4 (APPROXIMATELY 20,000 LBS.) OR SIMILAR WEIGHT TRACKED DOZER TO PLACE AND GRADE BACKFILL IMMEDIATELY ALONGSIDE AND ABOVE THE STRUCTURE UNTIL MINIMUM COVER LEVEL IS REACHED. LIGHTWEIGHT VIBRATORY PLATE OR ROLLER TYPE COMPACTION EQUIPMENT MUST BE USED TO COMPACT THE BACKFILL IN THESE ZONES. USE OF HEAVIER EQUIPMENT AND/OR RUBBER Tired EQUIPMENT SUCH AS SCRAPERS, GRADERS AND FRONT END LOADERS WILL LIKELY BE PROHIBITED INSIDE THE SELECT FILL ENVELOPE ZONE UNTIL APPROPRIATE MINIMUM COVER HEIGHT HAS BEEN OBTAINED.

10. SHAPE CONTROL MONITORING

CONTECH SHALL PROVIDE A SHAPE CONTROL TECHNICIAN WHO IS A QUALIFIED REPRESENTATIVE OF A PROFESSIONAL SOILS ENGINEERING FIRM OR OTHER QUALIFIED ORGANIZATION TO MONITOR THE INSTALLATION AND BACKFILLING OF THE STRUCTURE. THE SHAPE CONTROL TECHNICIAN SHALL MONITOR THE STRUCTURE SHAPE DURING THE PLACEMENT OF THE STRUCTURE BACKFILL TO THE MINIMUM COVER HEIGHT OVER THE STRUCTURE. THE SHAPE CONTROL TECHNICIAN SHALL TAKE INITIAL MEASUREMENTS OF THE ERECTED STRUCTURE BEFORE BACKFILLING, OBSERVE ALL BACKFILL MATERIALS, THEIR PLACEMENT AND RECORD COMPACTION DENSITIES. HE SHALL RECORD ALL DENSITY READINGS AND ENSURE THEY MEET THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. HOWEVER, IN NO CASE SHALL THE RELATIVE DENSITIES BE LESS THAN 90% PER AASHTO T-180. NO STRUCTURAL BACKFILL SHALL BE PLACED WITHOUT THE SHAPE CONTROL TECHNICIAN ON SITE. THE SHAPE CONTROL TECHNICIAN SHALL:

- A) MONITOR THE STRUCTURE'S SHAPE THROUGHOUT THE BACKFILLING OPERATION AND REPORT SHAPE CHANGE RATES TO THE CONTRACTOR.
- B) CONTACT THE CONTECH REGION ENGINEER IMMEDIATELY IF THERE ARE PROBLEMS IN MEETING THE ESTABLISHED TOLERANCES, AND HAVE FULL AUTHORITY TO STOP BACKFILL WORK IF NECESSARY.

11. PRE-CONSTRUCTION CONFERENCE

PRIOR TO CONSTRUCTION, A MEETING WILL BE HELD TO REVIEW THE CONSTRUCTION PROCEDURES. A QUALIFIED REPRESENTATIVE OF THE MANUFACTURER OF THE STRUCTURE WILL BE PRESENT TO DISCUSS METHODS AND RESPONSIBILITY FOR SHAPE MONITORING AND CONTROL, BACKFILL MATERIAL SELECTION, TESTING AND PLACEMENT, AND COMPACTION METHODS AND TESTING. A REPRESENTATIVE OF THE ENGINEER, PRIME CONTRACTOR, AND ANY INVOLVED SUBCONTRACTORS MUST BE PRESENT.

12. CONCRETE AND REBAR

12.1. CONCRETE SHALL HAVE NATURAL SAND FINE AGGREGATE AND NORMAL WEIGHT COARSE AGGREGATE CONFORMING TO ASTM C 150, AND SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.

12.2. CONCRETE MIX DESIGNS SHALL BE SUBMITTED TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF CONCRETE.

12.3. MIXING, TRANSPORTING AND PLACING OF CONCRETE SHALL CONFORM TO ACI 301.

12.4. CONCRETE REINFORCING BARS SHALL CONFORM TO ASTM A 615, GRADE 60. REINFORCING BARS SHALL NOT BE TACK WELDED, WELDED, OR HEATED OR CUT UNLESS INDICATED ON THE CONTRACT DOCUMENTS.

12.5. REINFORCING BARS SHALL HAVE A MINIMUM CONCRETE COVERAGE OF 3 INCHES (MAXIMUM 4 INCHES) WHERE THE FACE OF CONCRETE WILL BE IN CONTACT WITH GROUND AND 1.75 INCHES (MAXIMUM 2.5 INCHES) WHEN THE FACE OF CONCRETE WILL BE IN CONTACT WITH THE ATMOSPHERE.

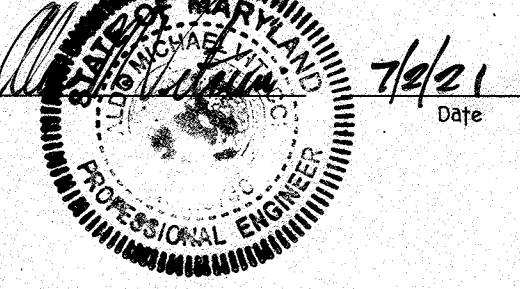
12.6. REINFORCEMENT SPLICES SHALL LAP A MINIMUM OF 36 BAR DIAMETERS.

12.7. PROVIDE STANDARD BAR CHAIRS AND SPACERS AS REQUIRED TO MAINTAIN CONCRETE PROTECTION SPECIFIED.

12.8. DETAILING OF CONCRETE REINFORCING BARS AND ACCESSORIES SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 31 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND ACI SP-66 "DETAILING MANUAL". PLACING OF REINFORCING BARS SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 315R "MANUAL OF ENGINEERING AND PLACING DRAWINGS FOR REINFORCED CONCRETE STRUCTURES" AND CRSI "MANUAL OF STANDARD PRACTICE".

AS-BUILT CERTIFICATION

Note: There is no "AS-BUILT" information provided on this sheet.



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

*William J. Mahesh* 7-11-03  
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING & ZONING

*Charles J. Mahesh* 7/14/03  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*Charles J. Mahesh* 7/16/03  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*Charles J. Mahesh* 7/16/03  
DIRECTOR DATE

Date	No.	Revision Description

**Howard County  
Office Campus  
PARCEL A  
CIP-C-0282**

OWNER/DEVELOPER:  
HOWARD COUNTY DEPT. OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

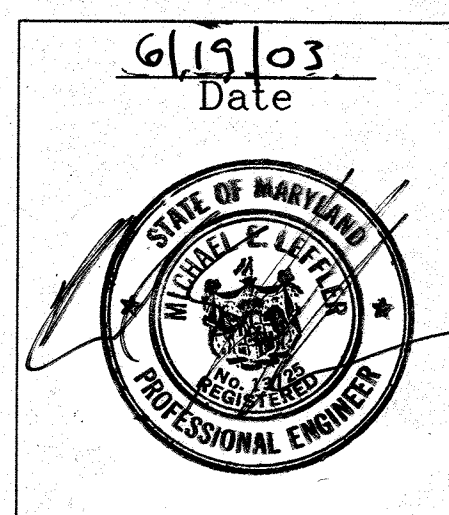
**ECS** ENGINEERING CONSULTING SERVICES, LTD.  
1340 CHARWOOD ROAD  
SUITE P  
HANOVER, MD 21076  
(410) 859-4300  
(410) 859-4324 (FAX)

NO. CO. OFFICE CAMPUS	SECTION AREA	LOT PARCELS
1586 7-74 611 POR	24 & 25	2
		8029

**BOTTOMLESS ARCH  
SPECIFICATIONS**

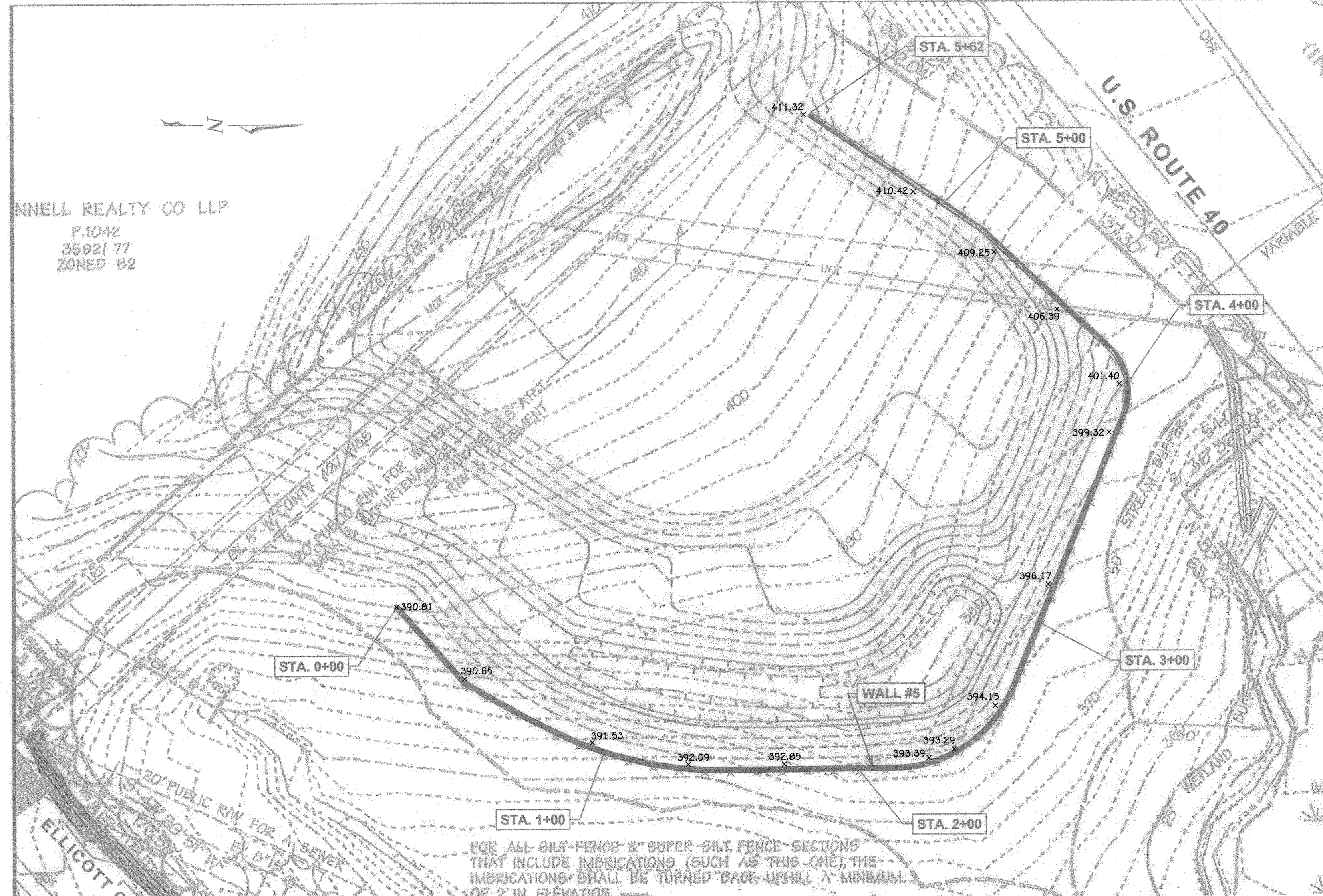
Des. By MEL Scale NTS Proj. No. 02-2594  
 Dwn. By KDR Date 7/6/03  
 Chk. By Approved

**40 of 44**

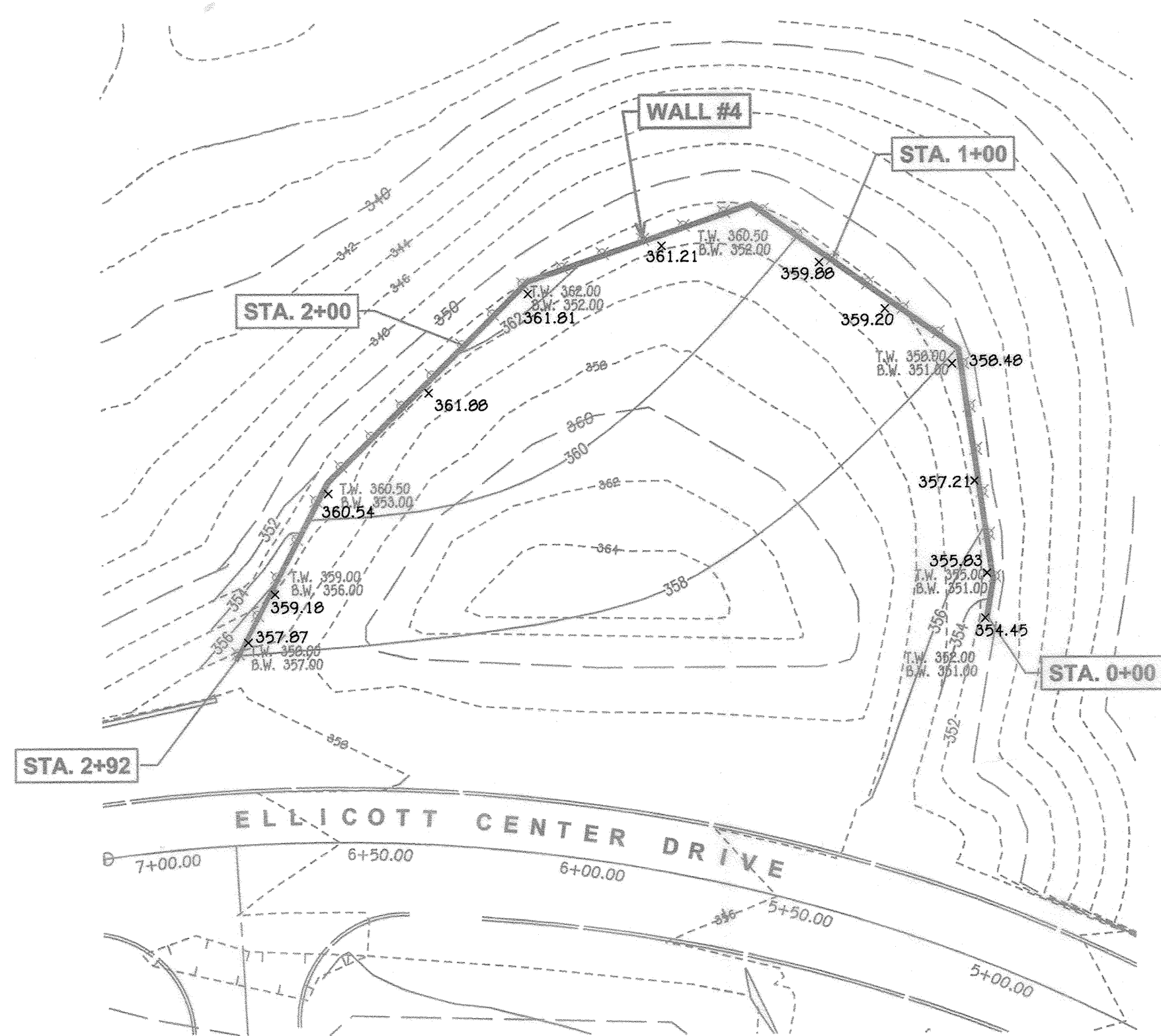




ANNELL REALTY CO LLP  
P.1042  
35921 77  
ZONED B2



WALL #5 LOCATION PLAN  
1" = 30'



WALL #4 LOCATION PLAN  
1" = 30'

## SPECIFICATIONS

### KEYSTONE MODULAR CONCRETE BLOCK RETAINING WALL

#### PART 1: GENERAL

##### 1.01 Description

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

##### 1.02 Delivery, Storage and Handling

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

#### PART 2: PRODUCTS

##### 2.01 Modular Concrete Retaining Wall Units

- A. Modular concrete units shall conform to the following architectural requirements:
  - face color - concrete gray - standard manufacturers' color may be specified by the Owner;
  - face finish - sculptured rock face in angular tri-planer configuration. Other face finishes will not be allowed without written approval of Owner.
  - bond configuration - running with bonds nominally located at midpoint vertically adjacent units, in both straight and curved alignments.
- B. Modular concrete materials shall conform to the requirements of ASTM C1372 - Standard Specifications for Segmental Retaining Wall Units.
- C. Modular concrete units shall conform to the following structural and geometric requirements measured in accordance with appropriate references:
  - compressive strength = 3000 psi minimum;
  - absorption = 8 % maximum (8% in northern states) for standard weight aggregates;
  - dimensional tolerances = ± 1/8" from nominal unit dimensions not including rough split face, ±1/16" unit height - top and bottom planes;
  - unit size - 8" (H) x 18" (W) x 22" (D) minimum;
  - unit weight - 100 lbs/unit minimum for standard weight

- aggregates;
  - inter-unit shear strength - 1000 pcf minimum at 2 psi normal pressure;
  - geogrid/unit peak connection strength - 1000 pcf minimum at 2 psi normal force.
- D. Modular concrete units shall conform to the following constructability requirements:
  - vertical setback = 1/8"± per course (near vertical) or 1"± per course per the design;
  - alignment and grid positioning mechanism - fiberglass pins, two per unit minimum;
  - maximum horizontal gap between erected units shall be 1/2 inch.

##### 2.02 Shear Connectors

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

##### 2.03 Base Leveling Pad Material

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

##### 2.04 Unit Drainage Fill

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

##### 2.05 Reinforced Backfill

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

Sieve Size	Percent Passing
2 inch	100-75
3/4 inch	100-75
No. 40	0-50
No. 200	0-35

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

##### 2.06 Geogrid Soil Reinforcement

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

##### 2.07 Drainage Pipe

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

#### PART 3 EXECUTION

##### 3.01 Excavation

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

##### 3.02 Base Leveling Pad

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

##### 3.03 Modular Unit Installation

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

##### 3.04 Structural Geogrid Installation

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

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

##### 3.05 Reinforced Backfill Placement

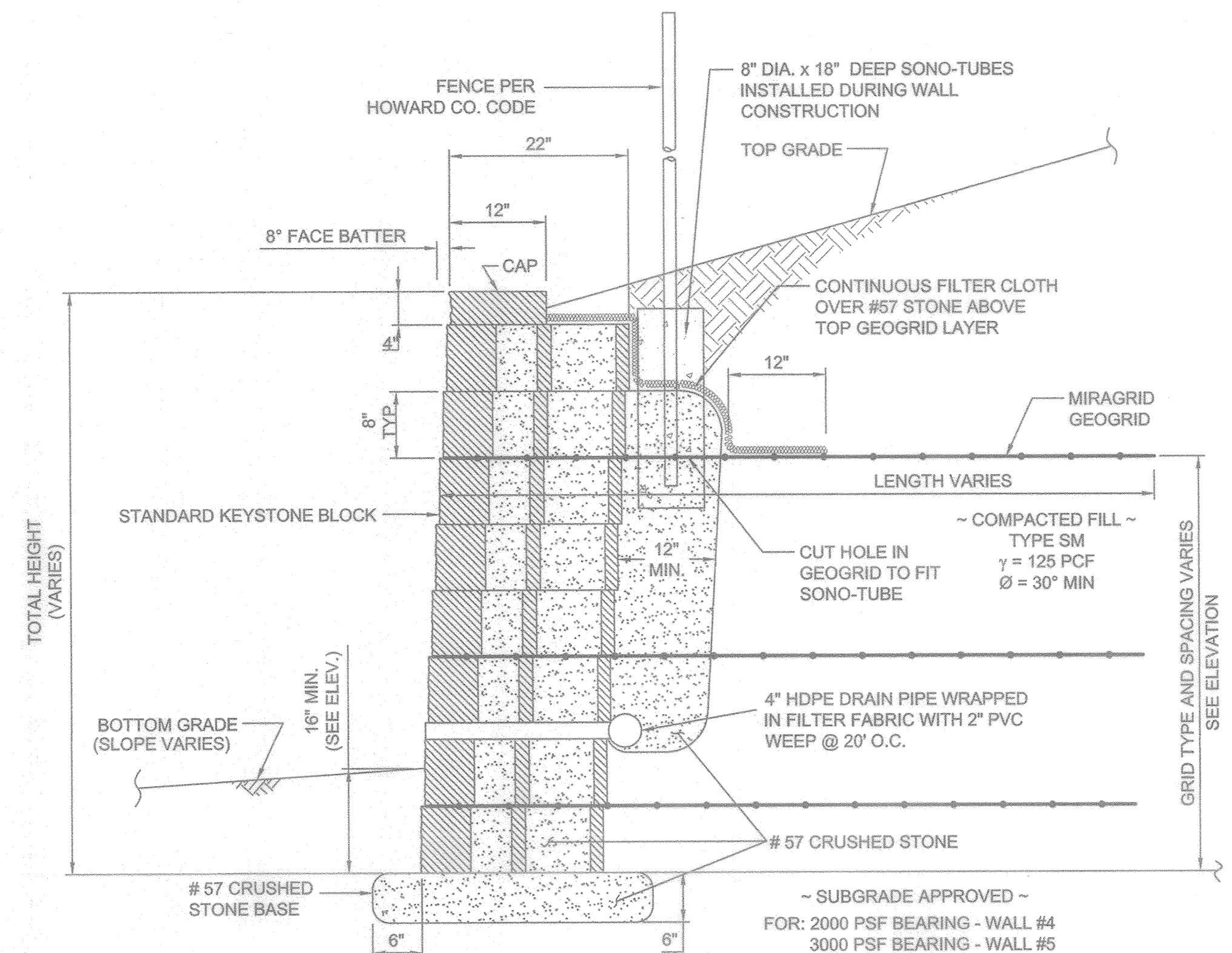
- A. Reinforced backfill shall be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid and installation damage.
- B. Reinforced backfill shall be placed and compacted in lifts not to exceed 6 inches where hand compaction is used, or 8 - 10 inches where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

##### 3.06 Cap Installation

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

##### 3.07 Field Quality Control

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



TYPICAL WALL SECTION  
N.T.S.

#### AS-BUILT CERTIFICATION

I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.



*Aldo M. Vitucci*  
Date: 9/1/12

ALDO MICHAEL VITUCCI #207146

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

RETAINING WALL #4 & #5 PLAN AND DETAILS  
HOWARD COUNTY OFFICE CAMPUS  
PARCEL A CIP-C-0282  
HOWARD COUNTY, MARYLAND

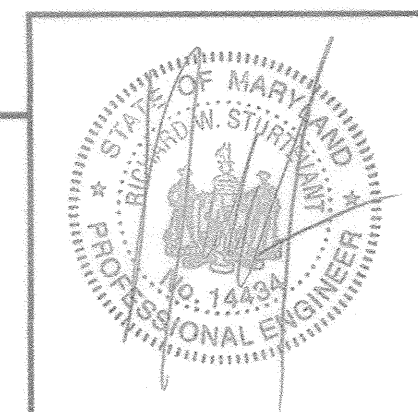
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PLAT # OR L/F	15867-70	BLOCK #	6 & 1	ZONE	POR
				TAX / ZONE MAP	24 & 25
				ELECT. DISTRICT	2

REV. NO.:	DATE:

OWNER/DEVELOPER:  
HOWARD COUNTY DEPART.  
OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

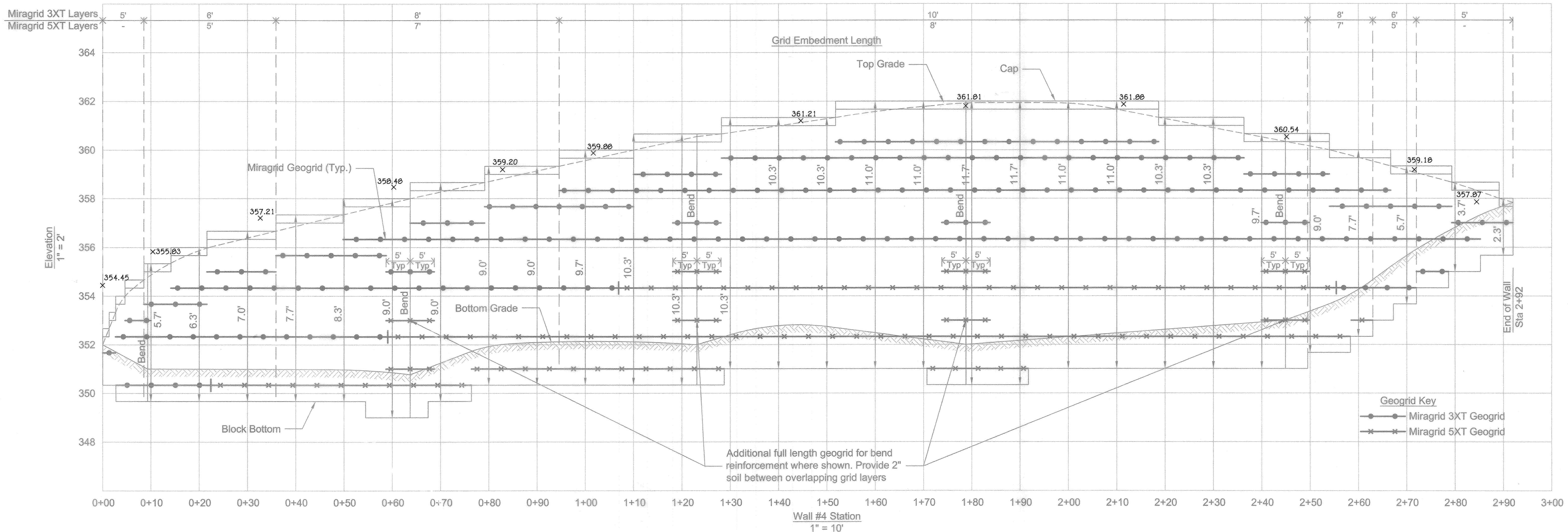
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING	
Chief, Development Engineering Division	Date
Chief, Division of Land Development	Date
Director	Date

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 14434, EXPIRATION DATE: 05/13/13.



DESIGNED BY:	RWS
DRAWN BY:	AM
PROJECT NO.:	11351-A
DATE:	01/20/12
SCALE:	AS SHOWN
DRAWING NO.:	41 OF 44





WALL #4 ELEVATION

AS-BUILT CERTIFICATION

I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.



*Aldo Michael Vitucci*  
Date: 9/7/12  
ALDO MICHAEL VITUCCI #20746

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

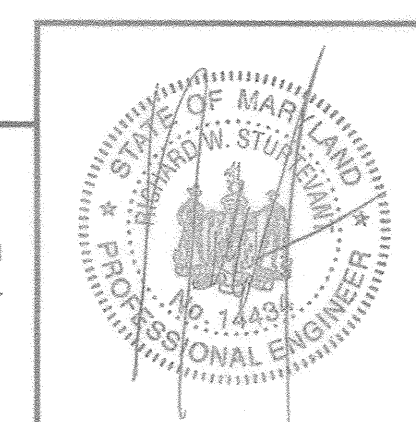
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PLAT # OR LIF	15867-70	BLOCK #	6 & 1
CENSUS TRACT	6029	TAX / ZONE MAP	24 & 25
ELECT. DISTRICT	2		

REV. NO.:	DATE:

OWNER/DEVELOPER:  
HOWARD COUNTY DEPART.  
OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

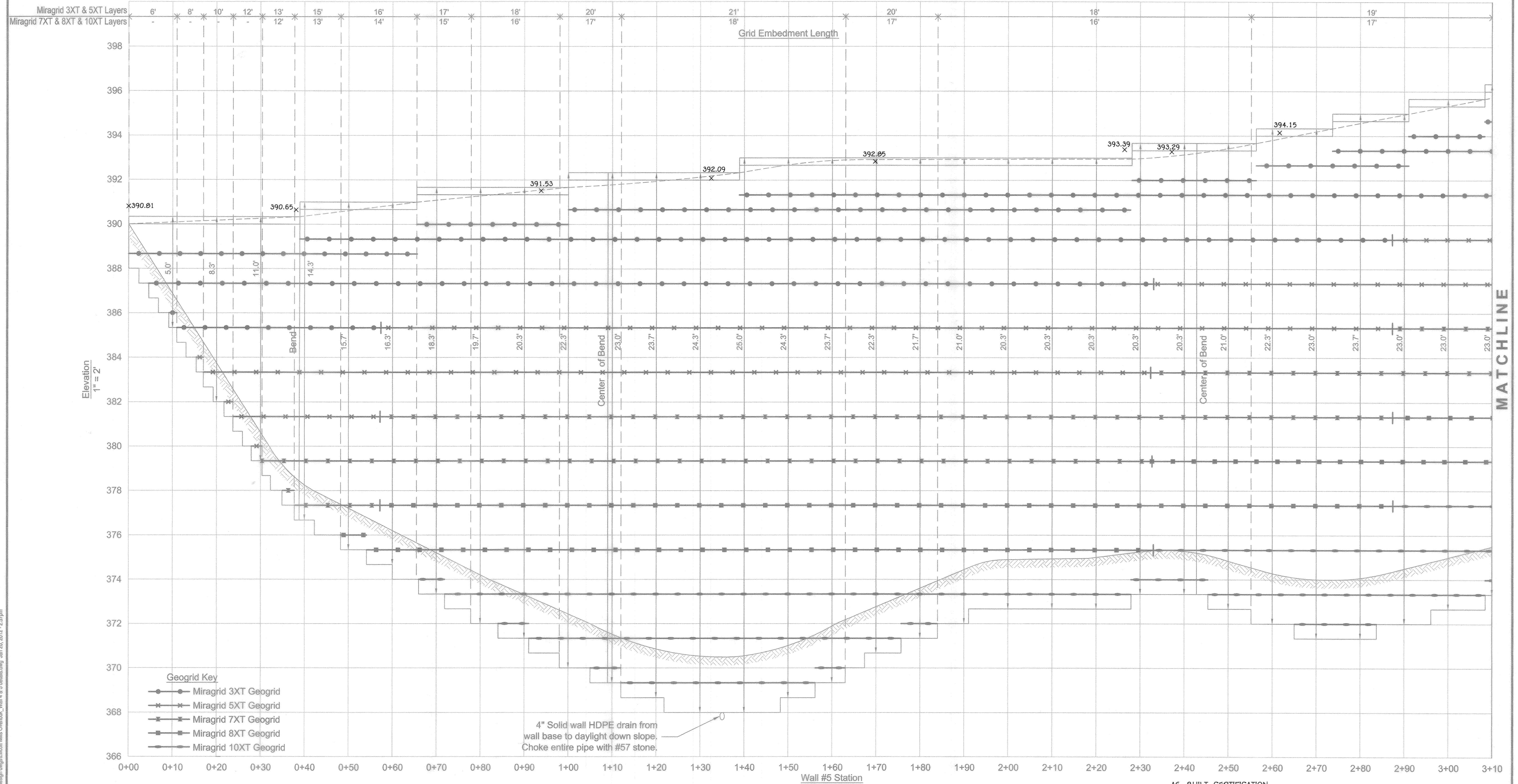
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING	
Chief, Development Engineering Division	Date
Chief, Division of Land Development	Date
Director	Date

PROFESSIONAL CERTIFICATION  
I HEREBY CERTIFY THAT THESE  
PLANS WERE PREPARED OR  
APPROVED BY ME, AND THAT I AM  
A DULY LICENSED PROFESSIONAL  
ENGINEER UNDER THE LAWS OF  
THE STATE OF MARYLAND,  
LICENSE NO. 14434,  
EXPIRATION DATE: 05/13/13.



DESIGNED BY:	RWS
DRAWN BY:	AM
PROJECT NO.:	11351-A
DATE:	01/20/12
SCALE:	AS SHOWN
DRAWING NO.:	42 OF 44





- Geogrid Key**
- Miragrid 3XT Geogrid
  - ×—× Miragrid 5XT Geogrid
  - Miragrid 7XT Geogrid
  - Miragrid 8XT Geogrid
  - Miragrid 10XT Geogrid

4" Solid wall HDPE drain from wall base to daylight down slope. Choke entire pipe with #57 stone.

**WALL #5 ELEVATION**

**AS-BUILT CERTIFICATION**

I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.

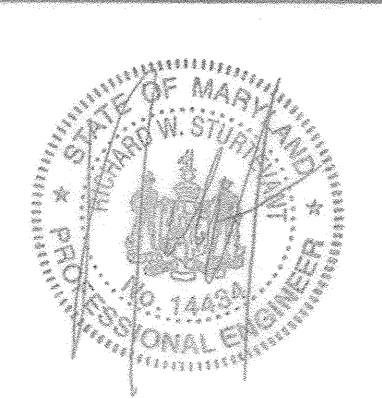


*Aldo M. Vitucci*  
Date: 9/7/12  
ALDO MICHAEL VITUCCI #20746

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Development Engineering Division \_\_\_\_\_ Date \_\_\_\_\_  
 Chief, Division of Land Development \_\_\_\_\_ Date \_\_\_\_\_  
 Director \_\_\_\_\_ Date \_\_\_\_\_

PROFESSIONAL CERTIFICATION  
 I HEREBY CERTIFY THAT THESE PLANS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 14434, EXPIRATION DATE: 05/13/13.



DESIGNED BY:	RWS
DRAWN BY:	AM
PROJECT NO:	11351-A
DATE:	01/20/12
SCALE:	AS SHOWN
DRAWING NO.	43 OF 44

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

<b>RETAINING WALL #5 ELEVATION</b>			
HOWARD COUNTY OFFICE CAMPUS			
PARCEL A		CIP-C-0282	
HOWARD COUNTY, MARYLAND			
SUBDIVISION NAME	HOWARD CO. OFFICE CAMPUS	LOT / PARCEL #	852 & P10847
CENSUS TRACT	6029		
PLAT # OR LF	15867-70	BLOCK #	6 & 1
ZONE	POR	TAX / ZONE MAP	24 & 25
ELECT. DISTRICT	2		

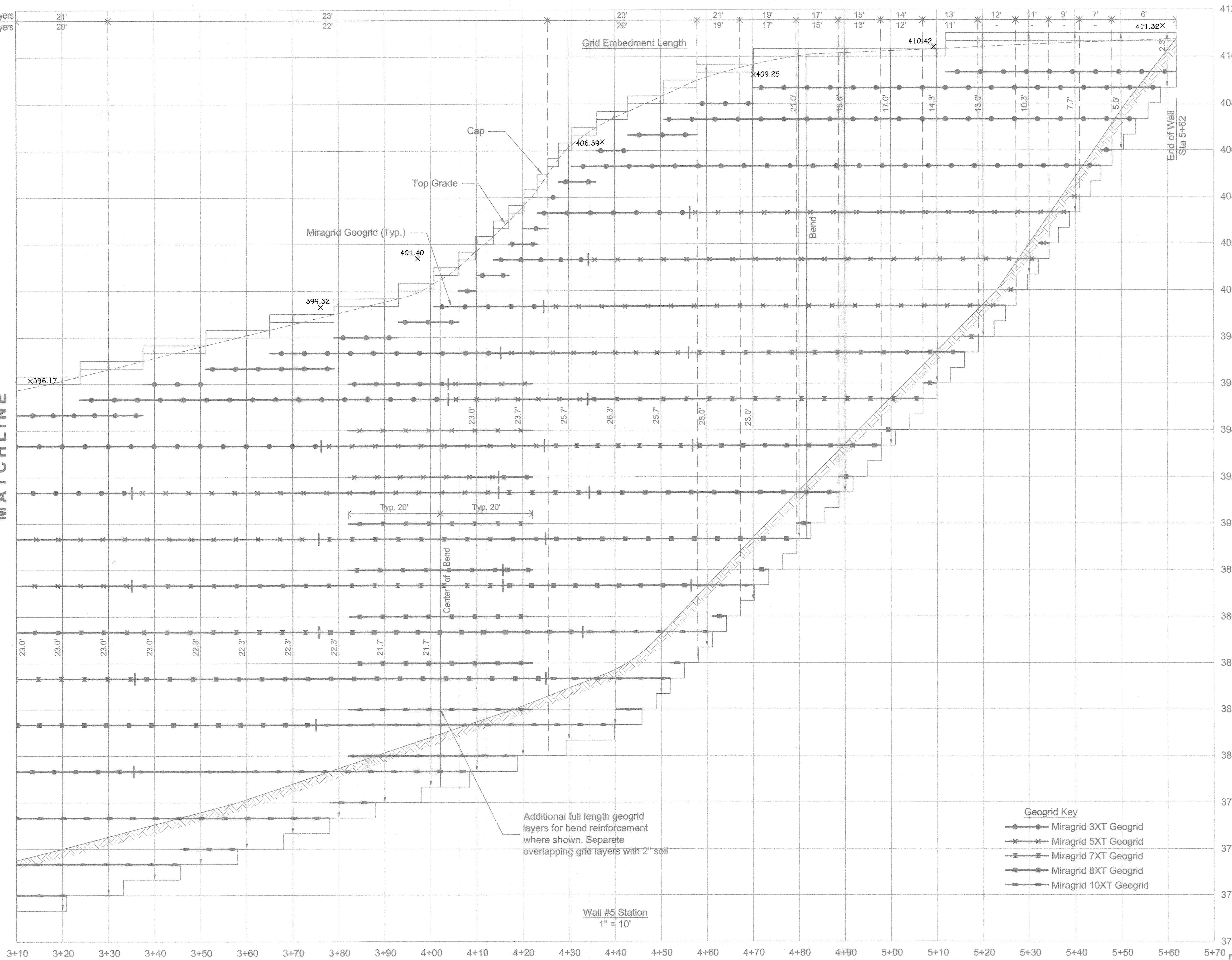
REV. NO.:	DATE:

OWNER/DEVELOPER:  
 HOWARD COUNTY DEPART.  
 OF PUBLIC WORKS  
 3430 COURT HOUSE DRIVE  
 ELLICOTT CITY, MD 21043



Miragrid 3XT & 5XT Layers  
Miragrid 7XT & 8XT & 10XT Layers

MATCHLINE



Elevation  
1" = 2'

**AS-BUILT CERTIFICATION**  
I hereby certify, by my seal, that to the best of my knowledge and belief the facilities shown on the plan was constructed as shown on this "AS-BUILT" plan meet the approved plans and specifications.

*[Signature]* *[Date]*  
ALDO MICHAEL VITUCCI #20748



- Geogrid Key**
- Miragrid 3XT Geogrid
  - × Miragrid 5XT Geogrid
  - Miragrid 7XT Geogrid
  - Miragrid 8XT Geogrid
  - Miragrid 10XT Geogrid

Wall #5 Station  
1" = 10'

**WALL #5 ELEVATION**

**HILLIS-CARNES**  
ENGINEERING ASSOCIATES  
10975 Guilford Road, Suite A Annapolis Junction, MD  
(410) 880-4798 Fax: (410) 880-4098

<b>RETAINING WALL #5 ELEVATION</b>			
HOWARD COUNTY OFFICE CAMPUS			
PARCEL A CIP-C-0282			
HOWARD COUNTY, MARYLAND			
SUBDIVISION NAME	HOWARD CO. OFFICE CAMPUS	LOT/PARCEL #	852 & P10847
CENSUS TRACT	6029		
PLAT # OR L/F	15867-70	BLOCK #	6 & 1
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**OWNER/DEVELOPER:**  
HOWARD COUNTY DEPART.  
OF PUBLIC WORKS  
3430 COURT HOUSE DRIVE  
ELLCOTT CITY, MD 21043

**APPROVED:** HOWARD COUNTY DEPARTMENT OF PLANNING & ZONING

Chief, Development Engineering Division	Date
Chief, Division of Land Development	Date
Director	Date

**PROFESSIONAL CERTIFICATION**  
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DESIGNED BY:	RWS
DRAWN BY:	AM
PROJECT NO.:	11351-A
DATE:	01/20/12
SCALE:	AS SHOWN
DRAWING NO.:	44 OF 44

I:\area\DCI\VA\Project Files\2011\11351A\Ellicott Mills Overlook Wall\wall design.dwg Ellcott Mills Overlook Wall 4 & 5 details.dwg Jan 20, 2012 - 2:57pm