

**GENERAL NOTES**

- THE SUBJECT PROPERTY IS ZONED R-A-15 PER THE 2/02/04 COMPREHENSIVE ZONING PLAN.
- THE 4.4 AC. OF FOREST CONSERVATION OBLIGATIONS HAVE BEEN FULFILLED BY ON-SITE RETENTION OF 5.15 AC. OF EXISTING FOREST TO BE PLACED ON FOREST CONSERVATION AREAS WITHIN AN OPEN SPACE LOT TO BE DEDICATED TO HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS. THE FOREST CONSERVATION REPORT WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. DATED MARCH 30, 2004. SURETY IN THE AMOUNT OF \$44,866.80 WILL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT.
- FOREST STAND DELINEATION PLAN WAS PREPARED BY ECO-SCIENCE PROFESSIONALS, INC. DATED MARCH 30, 2004 AND SUBMITTED AS PART OF THESE PLANS.
- THE WETLAND DELINEATION SHOWN ON THESE PLANS IS BASED ON THE STUDY PREPARED BY NAVARRO AND WRIGHT CONSULTING ENGINEERS, INC. DATED JUNE 7, 2001 AND A JURISDICTIONAL DETERMINATION CONDUCTED BY THE ARMY CORP OF ENGINEERS CONDUCTED MARCH 13, 2002 TO VERIFY THE LIMITS.
- NO CLEARING, GRADING OR CONSTRUCTION SHALL OCCUR WITHIN WETLANDS, WETLANDS BUFFERS, STREAMS, STREAM BUFFERS, 100-YR. FLOODPLAIN, OR FOREST CONSERVATION EASEMENTS EXCEPT AS SHOWN ON THESE PLANS.
- ALL LANDSCAPING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY LANDSCAPE MANUAL AND SECTION 16.124(b)(3)(f) OF THE SUBDIVISION REGULATIONS.
- FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE TOTAL AMOUNT OF \$35,880.00 AT THE TIME OF SDP ORIGINAL SUBMITTAL INCLUDING:
  - \$22,200.00 FOR THE REQUIRED 74 SHADE TREES;
  - \$7,500.00 FOR THE REQUIRED 50 EVERGREEN TREES;
  - \$4,020.00 FOR THE REQUIRED 134 SHRUBS;
  - \$1,200.00 FOR THE REQUIRED 120.0 LF OF DUMPSTER FENCING; AND
  - \$600.00 TOTAL FOR THE ALTERNATIVE COMPLIANCE LANDSCAPING (\$360.00 FOR THE NY PLANTINGS & \$600.00 FOR THE SHRUBS)
- 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, 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" @ 1-800-257-7777 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION WORK.
- THE CONTOURS SHOWN HEREON HAVE BEEN TAKEN FROM FIELD RUN TOPOGRAPHIC SURVEYS AT 2' INTERVALS PREPARED BY BENCHMARK ENGINEERING, INC. ON OR ABOUT OCTOBER, 2003.
- VERTICAL CONTROL AND HORIZONTAL CONTROL BASED UPON HOWARD COUNTY NAD '83 CONTROL STATIONS No.3805 & No.3806.
- THIS PROPERTY IS WITHIN THE METROPOLITAN WATER AND SEWER DISTRICT.
- WATER SERVICE FOR THIS PROJECT IS PUBLIC UNDER CONTR. No.14-4222-D CONNECTING TO CONTR. No.14-1580-D. SEWER SERVICE FOR THIS PROJECT IS PRIVATE CONNECTING TO CONTR. No.346-S UNDER CONTR. No.14-4222-D. DRAINAGE AREA IS IN THE PATAPSCO WATERSHED.
- STORMWATER MANAGEMENT QUALITY CONTROL IS BEING PROVIDED BY UNDERGROUND STORMWATER MANAGEMENT FACILITIES. THESE FACILITIES ARE PRIVATELY OWNED AND MAINTAINED. STORMWATER MANAGEMENT QUALITY CONTROL IS BEING PROVIDED BY A BIO-RETENTION FACILITY AND UNDERGROUND SAND FILTERS AS PART OF THIS SUBMISSION; THESE FACILITIES WILL BE PRIVATELY OWNED AND MAINTAINED.
- AN ADEQUATE PUBLIC FACILITIES ORDINANCE TRAFFIC ANALYSIS FOR THIS PROJECT WAS PREPARED BY MARS GROUP, INC. DATED MARCH 2004 AND APPROVED BY DED ON 3/15/2005.
- TRAFFIC CONTROL DEVICES, MARKINGS AND SIGNING SHALL BE IN ACCORDANCE WITH THE MOST CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). ALL STREET AND REGULATORY SIGNS SHALL BE IN PLACE PRIOR TO THE PLACEMENT OF ANY ASPHALT.
- ALL PROPOSED EXTERIOR LIGHTING SHALL BE DIRECTED/REFLECTED AWAY FROM ALL ADJACENT PUBLIC ROADS AND RESIDENTIAL ZONING DISTRICTS IN ACCORDANCE WITH SECTION 134 OF THE HOWARD COUNTY ZONING REGULATIONS.
- EXISTING UTILITIES SHOWN WERE LOCATED BY RECORD DRAWINGS AND FIELD LOCATIONS.
- UNLESS NOTED AS "PRIVATE", ALL EASEMENTS ARE PUBLIC.
- CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO ANY CONSTRUCTION ACTIVITY AND SHALL ADJUST ALL UTILITIES AND RIM ELEVATIONS AS NEEDED TO MATCH THIS PLAN.
- ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
- BPL INDICATES BUILDING RESTRICTION LINE.
- ANY DAMAGE TO THE COUNTY'S RIGHT-OF-WAY SHALL BE CORRECTED AT THE BUILDERS EXPENSE.
- TO THE BEST OF OUR KNOWLEDGE THERE ARE NO CEMETERY LOCATIONS ON-SITE.
- THERE ARE NO EXISTING STRUCTURES LOCATED ON-SITE.
- THIS PLAN CONFORMS TO THE AMENDED FIFTH EDITION OF THE SUBDIVISION AND LAND DEVELOPMENT REGULATIONS PER COUNCIL BILL NO.45-2003.
- THE BOUNDARY SHOWN HEREON IS TAKEN FROM PLAT No.9742 PREPARED BY CLB ASSOCIATES, INC. DATED JUNE, 1989 AND APPROVED UNDER F-90-09.
- PREVIOUS DEPARTMENT OF PLANNING AND ZONING REFERENCE NUMBERS INCLUDE: WP-05-016, F-90-09 (PLATS 9742-9743), F-90-121 (PLATS 9243-9244), SDP-90-06, S-89-12, F-04-167
- WP-05-016 WAS APPROVED BY LETTER DATED 10/10/04 TO WAIVE SECTION 16.116(o)(2) OF THE SUBDIVISION REGULATIONS TO WAIVE THE REQUIRED GRADING, REMOVAL OF VEGETATIVE COVER, AND TREES, PAVING AND NEW CONSTRUCTION WITHIN 75' OF A PERENNIAL STREAM BANK TO ALLOW A PROPOSED PRIVATE ROAD CROSSING AND ASSOCIATED GRADING DISTURBANCE TO PROVIDE ACCESS FOR 60 OF THE PROPOSED 186 APARTMENT UNITS, AND TO WAIVE SECTION 16.121(o)(4) OF THE SUBDIVISION REGULATIONS TO ALLOW THE PROPOSED COMMUNITY SWIMMING POOL/CLUBHOUSE BUILDING AND THE PASSIVE USE OF OPEN SPACE LOT 1 TO FULFILL THE REQUIRED 1.71 AC. (BASED ON 400 S.F. PER UNIT @ 186 UNITS) RECREATIONAL OPEN SPACE REQUIREMENTS AS ALTERNATIVE COMPLIANCE.
- A NOISE STUDY FOR THIS SITE WAS CONDUCTED BY BENCHMARK ENGINEERING, INC. DATED 6/22/04 AND APPROVED BY DED 11/12/2004. A 65DBA NOISE CONTOUR LINE WAS IDENTIFIED AND PLACED ON THE PLANS.
- THE NOISE CONTOUR LINE DRAWN ON THIS PLAN IS ADVISORY AS REQUIRED BY THE HOWARD COUNTY DESIGN MANUAL, CHAPTER 5, REVISED FEBRUARY 1992, AND CANNOT BE CONSIDERED TO EXACTLY LOCATE THE 65DBA EXPOSURE. THE 65DBA EXPOSURE WAS ESTABLISHED BY HOWARD COUNTY TO ALERT DEVELOPERS, BUILDERS AND FUTURE RESIDENTS THAT AREAS BEYOND THIS THRESHOLD MAY EXCEED GENERALLY ACCEPTED NOISE LEVELS ESTABLISHED BY THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.
- A. THIS SITE IS WITHIN A 4 MILE RADIUS OF BWI AIRPORT, A MAA APPROVAL LETTER WAS OBTAINED AND APPROVED UNDER AIRPORT ZONING PERMIT No.04-057 DATED 8/17/04.
- MARYLAND DEPARTMENT OF THE ENVIRONMENT, APPLICATION TRACKING NUMBER 04-NF-0480/2005060903, FOR LETTER OF AUTHORIZATION FOR ROAD CROSSING AND UTILITY CROSSING OF EXISTING STREAM AND WETLANDS.
- THE TANDER PARKING SPACES IN FRONT OF THE GARAGES WILL BE ASSIGNED TO THE GARAGE UNIT, FULFILLING THE PARKING REQUIREMENTS FOR THE UNIT. THE OTHER EXTERIOR PARKING SPACES ARE FOR NON-GARAGE/UNITS AND OVERFLOW PARKING.

# ELKRIDGE TOWN CENTER

## PARCEL E-1 AND OPEN SPACE LOT 1

### APARTMENT BUILDINGS 'A'-'F'; UNITS 1-186

#### PARCEL 526 / ZONE: R-A-15

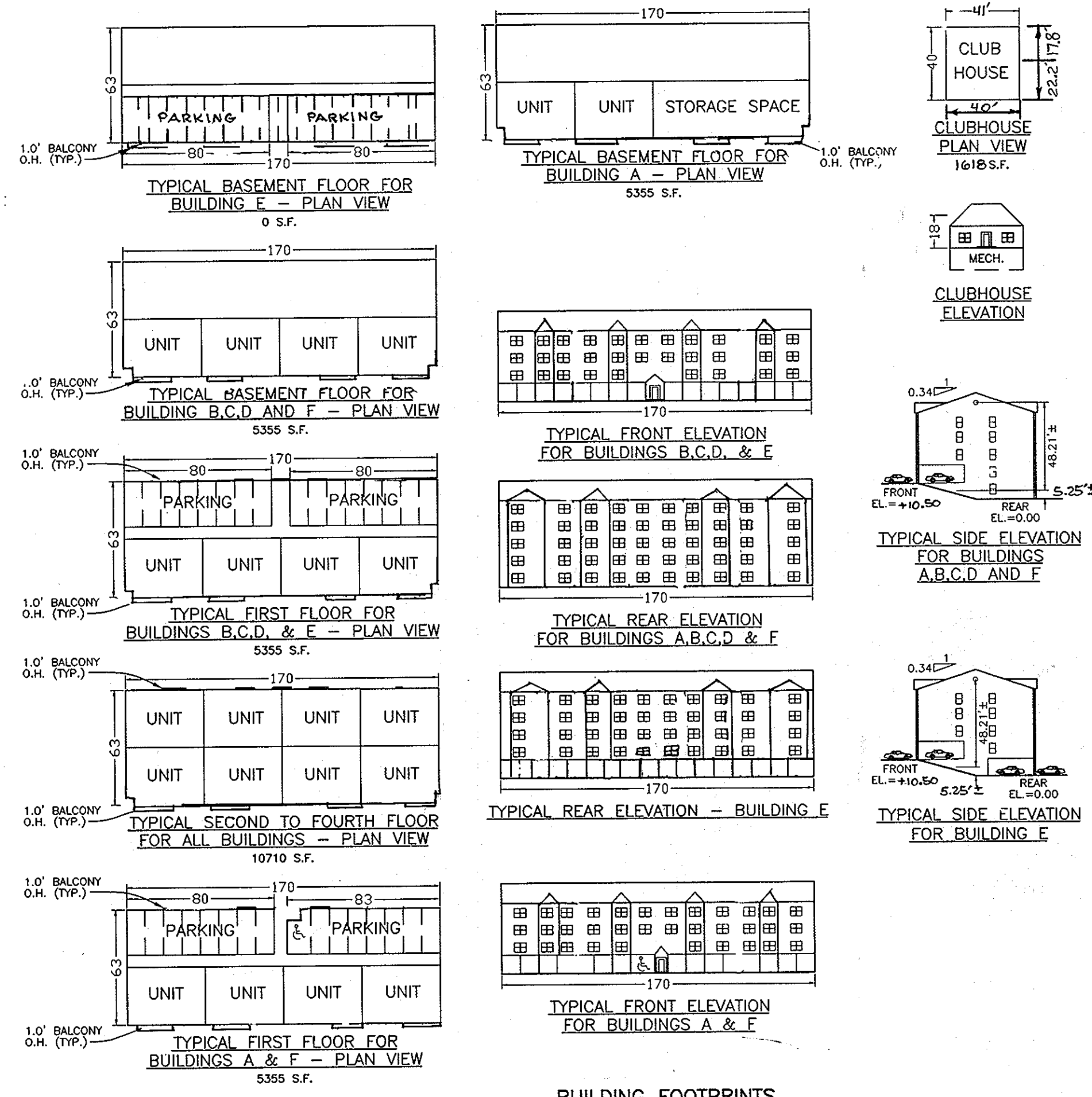
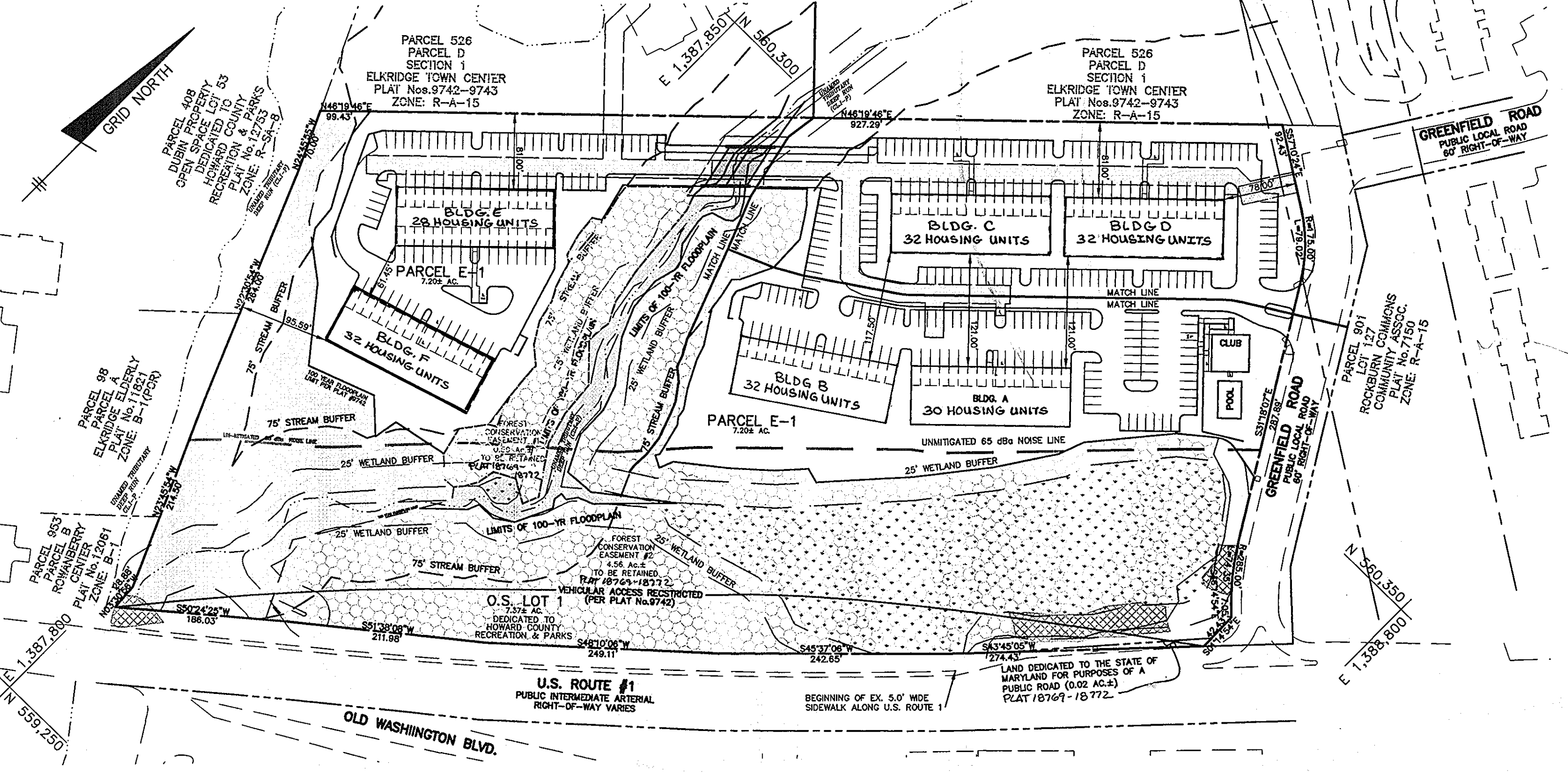
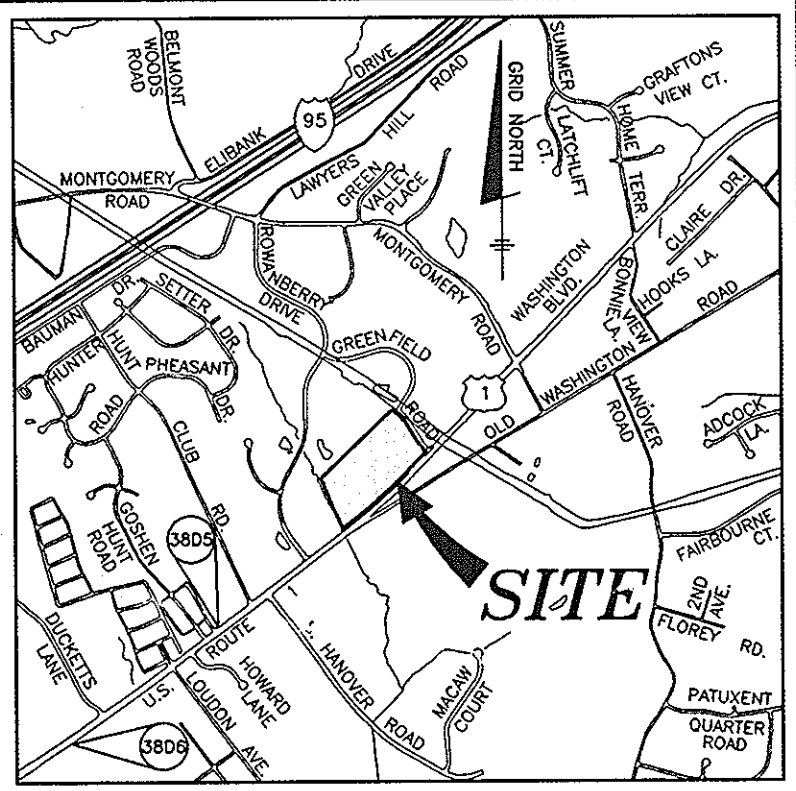
#### 1st ELECTION DISTRICT

#### HOWARD COUNTY, MARYLAND

## SITE DEVELOPMENT PLAN

**BENCH MARKS - NAD '83**

HO. CO. No.3805	EL.193.726
CONC. MONUMENT, 5.5' NORTHWEST OF CONC. CURB OF SOUTHBOND LANE OF U.S. ROUTE 1; 56.5' FROM EX. LP N 558.376.575	E 1.395.524.158
HO. CO. No.3806	EL.175.228
CONC. MONUMENT, 4.6' NORTHWEST OF FENCE ALONG NORTHBOUND LANE OF U.S. ROUTE 1; 44.0' FROM EX. LP N 557.155.459	E 1.394.992.652



**LEGEND**

SOILS CLASSIFICATION	AbC1
SOILS DELINEATION	---
EXISTING CONTOURS	---
PROPOSED CONTOURS	---
LIMIT OF WETLANDS	---
EXISTING WOODS LINE	---
PROPOSED WOODS LINE	---
EXISTING STRUCTURE	---
PROPOSED STRUCTURE	---
DRAINAGE AREA	---
DRAINAGE DIVIDE	---
To STUDY PATH	---
FOREST CONSERVATION EASEMENT	---
STORMWATER CREDIT EASEMENT	---
TREE PROTECTION <25%>	---
STEEP SLOPE FENCE	---
FCE PERMANENT SIGNAGE	---
LIMIT OF DISTURBANCE	---
STABILIZED CONSTRUCTION ENTRANCE	---
SILT DIVERSION FENCE	---
SUPER SILT FENCE	---
EARTH DIKE	---
INLET PROTECTION	---
REMOVABLE PUMP STATION	---
EROSION CONTROL MATTING	---
TEMPORARY SWALE	---

**LOCATION PLAN**

SCALE: 1" = 100'

**SHEET INDEX**

NO.	DESCRIPTION
1	COVER SHEET, NOTES AND DETAILS
2	SITE DEVELOPMENT PLAN, NOTES & DETAILS
3	SITE DEVELOPMENT PLAN, NOTES & DETAILS
4	SITE DEVELOPMENT PLAN, NOTES & DETAILS
5	SEDIMENT & EROSION CONTROL PLAN
6	SEDIMENT & EROSION CONTROL PLAN
7	SEDIMENT & EROSION CONTROL PLAN
8	SEDIMENT & EROSION CONTROL, NOTES AND DETAILS
9	SEDIMENT & EROSION CONTROL, NOTES AND DETAILS
10	STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS
11	STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS
12	STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS
13	STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS
14	STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS
15	STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS
16	BORING LOGS, NOTES AND DETAILS
17	STORM DRAINAGE AREA MAP AND SOILS MAP
18	STORM DRAIN PROFILES, NOTES AND DETAILS
19	STORM DRAIN PROFILES, NOTES AND DETAILS
20	STORM DRAIN PROFILES, NOTES AND DETAILS
21	STORM DRAIN PROFILES, NOTES AND DETAILS
22	PRIVATE SEWER SYSTEM PROFILES, NOTES & DETAILS
23	PRIVATE SEWER SYSTEM PROFILES, NOTES & DETAILS
24	PRIVATE WATER SYSTEM PROFILES, NOTES & DETAILS
25	LANDSCAPE PLAN, NOTES AND DETAILS
26	FOREST STAND DELINEATION PLAN
27	FOREST CONSERVATION PLAN, NOTES AND DETAILS
28	RETAINING STRIPING PLAN, NOTES AND DETAILS
29	RETAINING WALL PROFILES, NOTES & DETAILS
30	RETAINING WALL PROFILES, NOTES & DETAILS
31	RETAINING WALL PROFILES, NOTES & DETAILS
32	RETAINING WALL PROFILES, NOTES & DETAILS
33	CULVERT & HEADWALL PROFILES, NOTES & DETAILS
34	CULVERT & HEADWALL PROFILES, NOTES & DETAILS
35	CULVERT & HEADWALL PROFILES, NOTES & DETAILS
36	CULVERT & HEADWALL PROFILES, NOTES & DETAILS
37	CULVERT & HEADWALL PROFILES, NOTES & DETAILS
38	CULVERT & HEADWALL PROFILES, NOTES & DETAILS

IN ACCORDANCE WITH COUNCIL BILL 23-2006 (EFFECTIVE 8/8/06, THESE ALLOCATIONS MAY BE USED ONLY IF ALL OF THE FOLLOWING CONDITIONS ARE MET:

MODERATE INCOME HOUSING ALLOCATIONS:

- ONLY ONE OR TWO BEDROOM UNITS ARE PROVIDED.
- THE SQUARE FOOTAGE OF A UNIT SHALL NOT EXCEED 900 SQUARE FEET FOR A ONE BEDROOM UNIT OR 1,100 SQUARE FEET FOR A TWO BEDROOM UNIT.
- THE DEVELOPMENT USING MODERATE INCOME HOUSING UNIT ALLOCATIONS SHALL SATISFY ALL REMAINING, APPLICABLE PROVISIONS OF SUBTITLE 11(ADEQUATE PUBLIC FACILITIES)

**ADDRESS CHART**

BLDG.	STREET ADDRESS
A	6221 GREENFIELD ROAD
B	6231 GREENFIELD ROAD
C	6261 GREENFIELD ROAD
D	6271 GREENFIELD ROAD
E	6241 GREENFIELD ROAD
F	6251 GREENFIELD ROAD
CLUBHOUSE	6211 GREENFIELD ROAD

**PERMIT INFORMATION CHART**

SUBDIVISION NAME	ELKRIDGE TOWN CENTER
SECTION/AREA	N/A
LOT/PARCEL	E-1
PLAT No.	18769
BLOCK No.	8
ZONING	R-A-15
TAX MAP	38
ELEC. DIST.	1st
CENSUS	6012.01
WATER CODE	D-09
SEWER CODE	2150533

**PHASE 1**

NOTE: THIS SDP IS FOR THE CONSTRUCTION OF BUILDING 'D', THE POOL AND CLUBHOUSE, SWM FACILITY AND ASSOCIATED PARKING AREAS UNDER THIS SUBMISSION AND WILL BE REDLINED AT A LATER DATE TO ADD THE REMAINING APARTMENT BUILDINGS.

- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY OWNED RIGHT-OF-WAY SHALL BE MOUNTED ON 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 ga.) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (12 ga.) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- THE MODERATE INCOME HOUSING UNIT (MIHU) DECLARATION OF COVENANTS AND RESTRICTIONS WAS RECORDED IN THE HOWARD COUNTY LAND RECORDS AS LIBER 10497 FOLIO III ON 1-30-07. THE MIHU AGREEMENT WAS SIGNED BY THE DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT ON 1-18-07 AND RECORDED IN THE LAND RECORDS ON 1-24-07 AS LIBER 10497 FOLIO 329B.

**SITE ANALYSIS DATA/TABULATION**

A) TOTAL PROJECT AREA.....	14.57±AC.
B) AREA OF 100-YR. FLOODPLAIN.....	1.98±AC. (1.59 EX./0.39 BEI EX.)
C) TOTAL AREA OF STEEP SLOPES ON-SITE.....	0.16±AC.
S.E.P. SLOPES OUTSIDE OF 100YR. FLDPLN.....	0.15±AC.
S.E.P. SLOPES INSIDE OF 100YR. FLDPLN.....	0.01±AC.
D) NET AREA OF SITE(S).....	12.44±AC.
E) NUMBER OF UNITS ALLOWED (DENSITY=150 U./AC.)	186
F) NUMBER OF RESIDENTIAL UNITS PROPOSED.....	186
NUMBER OF MIHU UNITS REQUIRED (10%).....	19
NUMBER OF MIHU UNITS PROVIDED.....	19
G) AREA OF PLAN SUBMISSION.....	14.57±AC.
H) LIMIT OF DISTURBED AREA.....	7.04±AC.
I) OPEN SPACE AREA REQUIRED (25% OF 14.57±AC.)	3.64±AC.(25%)
J) CREDITED OPEN SPACE AREA PROVIDED.....	7.37±AC.
K) NON-CREDITED OPEN SPACE AREA PROVIDED.....	0.00±AC.
L) TOTAL OPEN SPACE AREA PROVIDED.....	7.37±AC.
M) RECREATION OPEN SPACE AREA REQUIRED.....	1.71±AC.
(0.0 S.F./UNIT @ 186 UNITS = 74,400 S.F.)	
N) RECREATION OPEN SPACE PROVIDED.....	(SEE NOTE #30)
O) PRESENT ZONING DESIGNATION.....	R-A-15
P) PROPOSED USES FOR THE SITE AND STRUCTURES	RESIDENTIAL
Q) FLOOR SPACE ON EACH LEVEL OF BUILDING	
ALL BUILDINGS FLOORS TWO THRU FOUR.....	10,710 S.F.
FIRST FLOOR OF ALL BUILDINGS.....	5,355 S.F.
BASEMENT FLOOR BUILDINGS A - E.....	5,355 S.F.
BASEMENT FLOOR BUILDING F.....	0 S.F.
R) MINIMUM LOT SIZE REQUIRED.....	N/A
S) NUMBER OF PARKING SPACES REQUIRED BY	
ZONING REGULATIONS AND/OR FDP CRITERIA	
APARTMENT (2 SPACES PER UNIT).....	372
OVERFLOW (0.3 SPACES PER UNIT).....	56
POOL (1 PERSON/12 SF=83 PERSONS/10 SPACES).....	9
POOL/CLUB (1 SPACE/1000 SF @ 1600 SF).....	1
TOTAL=439	
T) TOTAL NUMBER OF PARKING SPACES PROVIDED	TOTAL=439
ON-SITE.....	TOTAL=439
TOTAL SPACES = 439 (INCLUDING 9 HANDICAPPED PARKINGS w/TWO VAN ACCESS)	

**CLUBHOUSE CREDIT NOTE:**

RECREATIONAL OPEN SPACE  
CLUBHOUSE = 1600 S.F.  
FENCED-IN POOL AREA = 3579 S.F.  
TOTAL = 5179 S.F./0.12 AC.  
(PER WP-05-016)

**PROVIDED PARKING NOTE:**

BUILDINGS A-D & F @ 16 GARAGE UNITS/BUILDING = 160 SPACES (80 INTERIOR + 80 ASSIGNED)  
BUILDING E @ 32 GARAGE UNITS/BUILDING = 64 SPACES (32 INTERIOR + 32 ASSIGNED)  
COMMON PARKING FOR ALL BUILDINGS = 215 SPACES

**TENTATIVE HOUSING UNIT ALLOCATIONS**

PHASE	NO. OF TENTATIVE ALLOCATIONS	ALLOCATION YEAR	SUBMISSION DEADLINE FOR PLAN ORIGINAL (PHASE 1) AND REDLINE REVISION PACKAGES FOR PHASES II THRU IV
I	30 (11N IN THE ELKRIDGE PLANNING AREA, 19 MIHUs)	2009	BETWEEN 8/8/06 AND 12/8/06
II	55	2010	BETWEEN 7/1/07 AND 1/1/08
III	82	2011	7/1/08 AND 7/1/09
IV	19	2012	7/1/09 AND 1/1/10

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION

CHIEF, DIVISION OF LAND DEVELOPMENT

DIRECTOR

**BENCHMARK ENGINEERING, INC.**

ENGINEERS • LAND SURVEYORS • PLANNERS

8480 BALTIMORE NATIONAL PIKE # SUITE 418  
ELICOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6644  
www.bei-civilengineering.com

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

LOCATION: TAX MAP 38 - GRID B  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

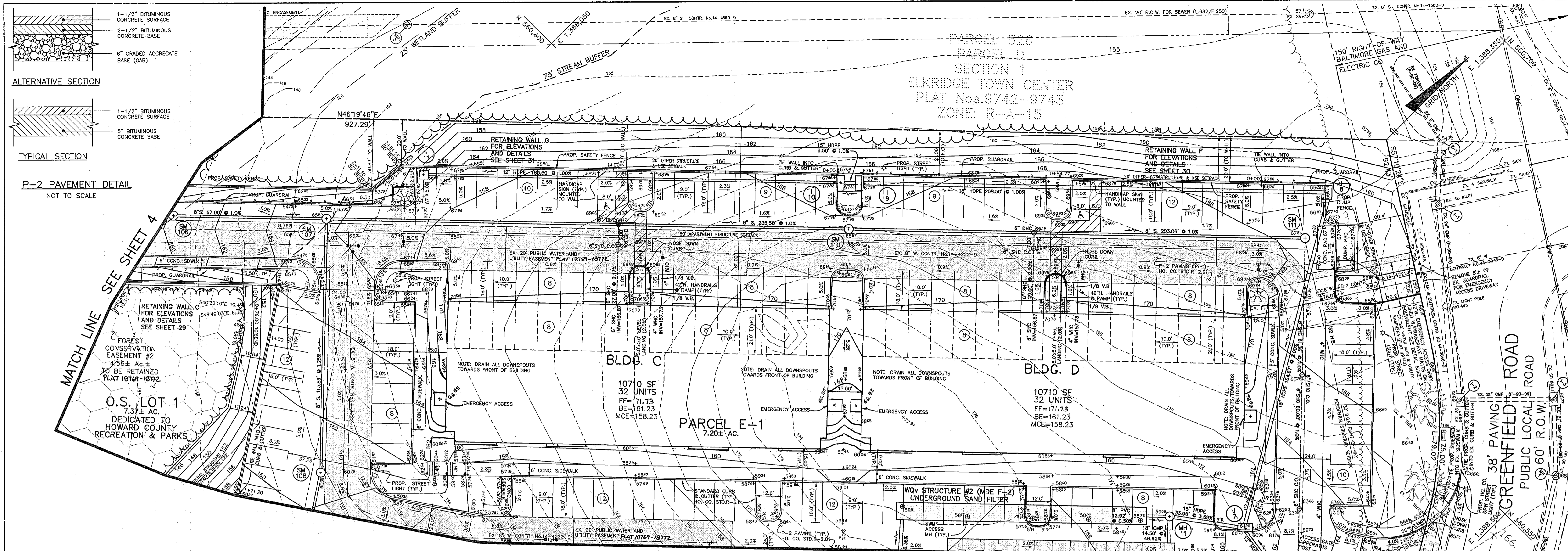
TITLE: COVER SHEET  
NOTES AND DETAILS

DATE: JUNE 3, 2004  
NOVEMBER, 2003

PROJECT NO. 1522

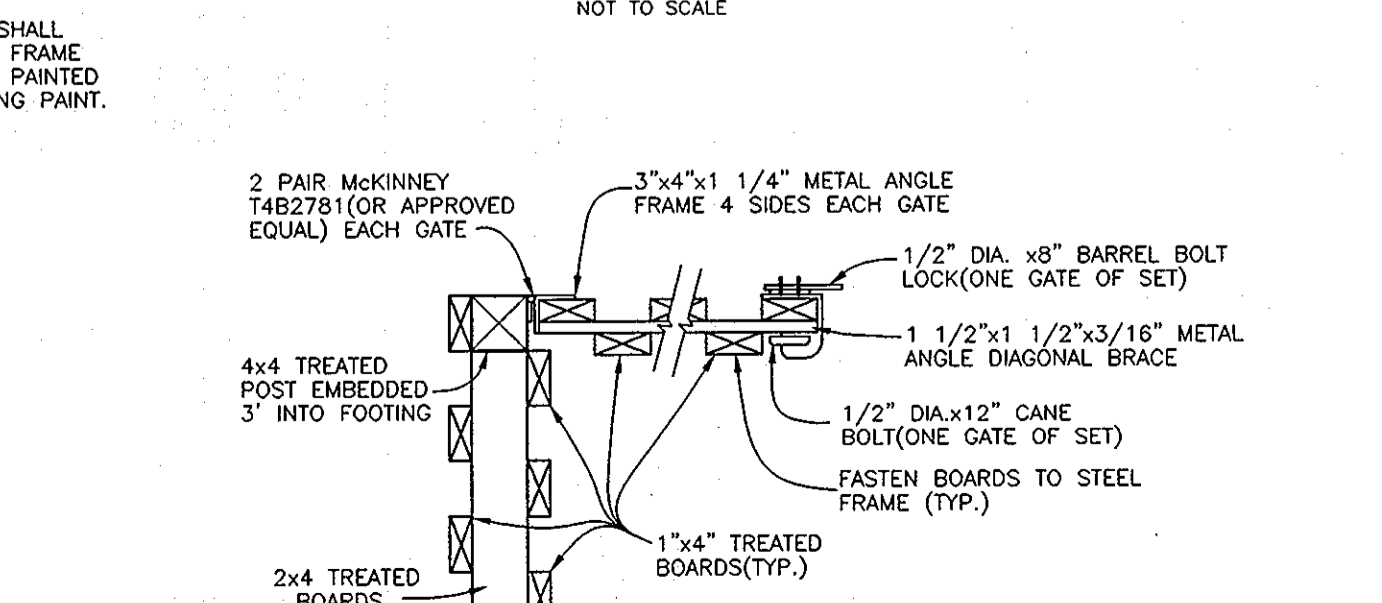
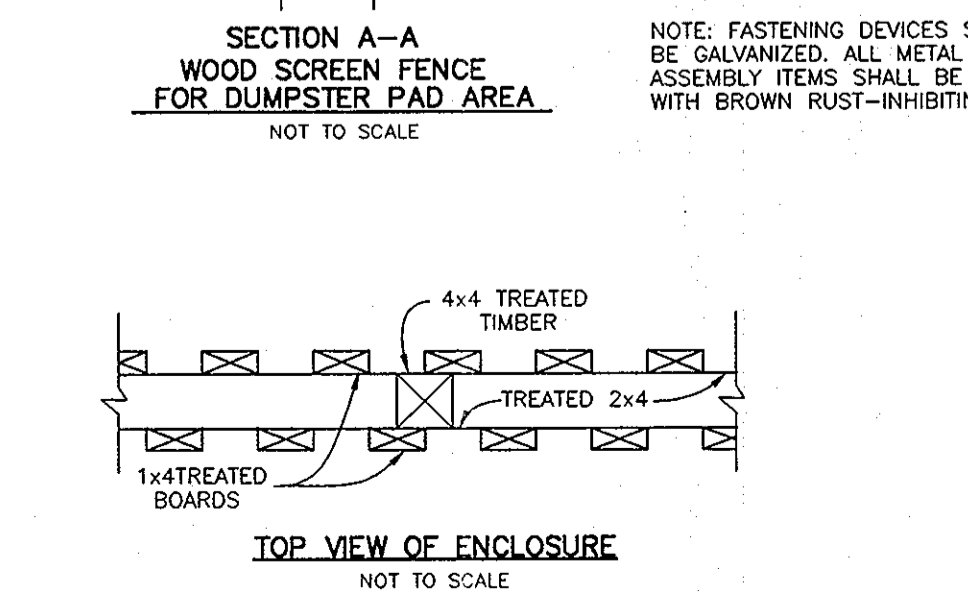
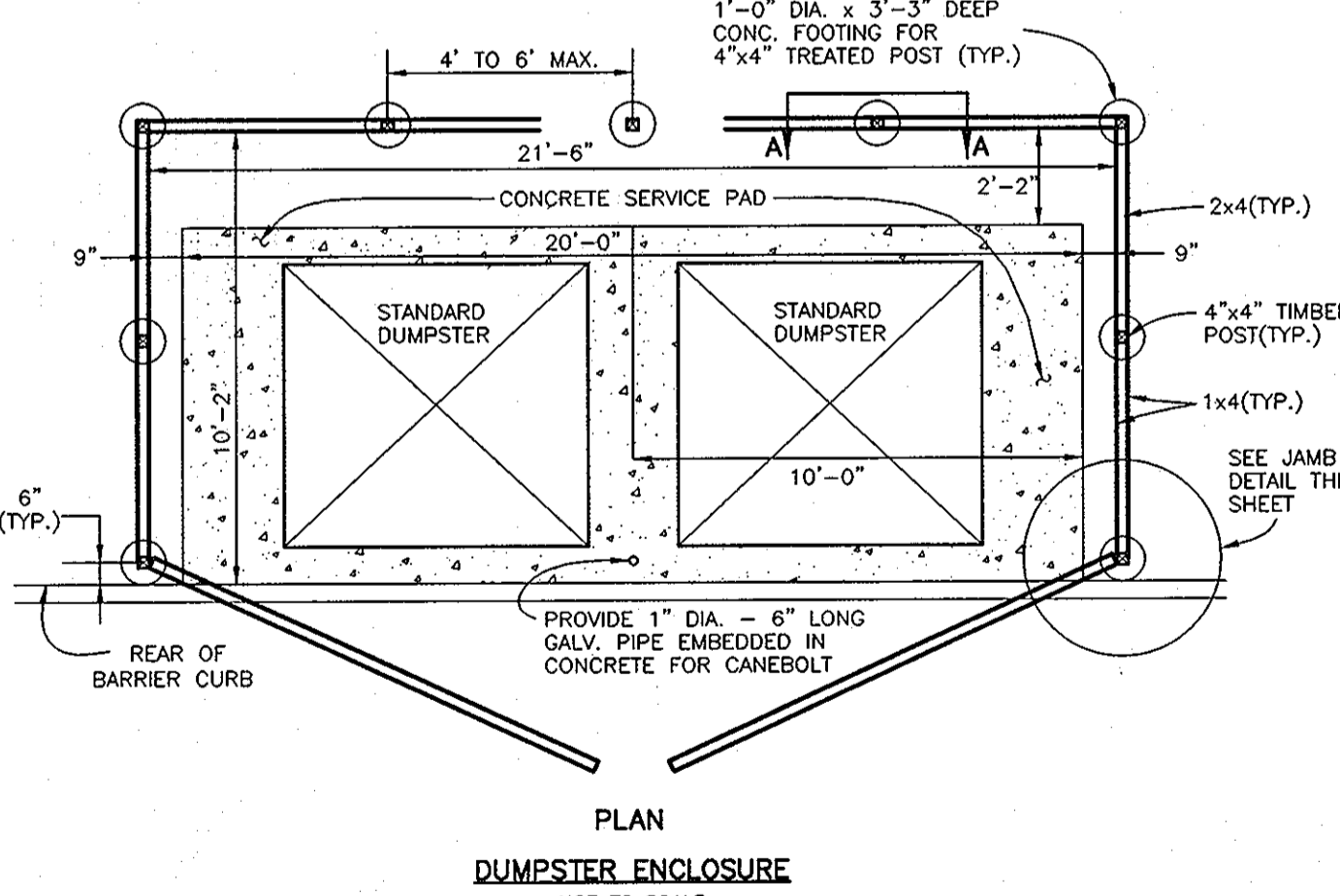
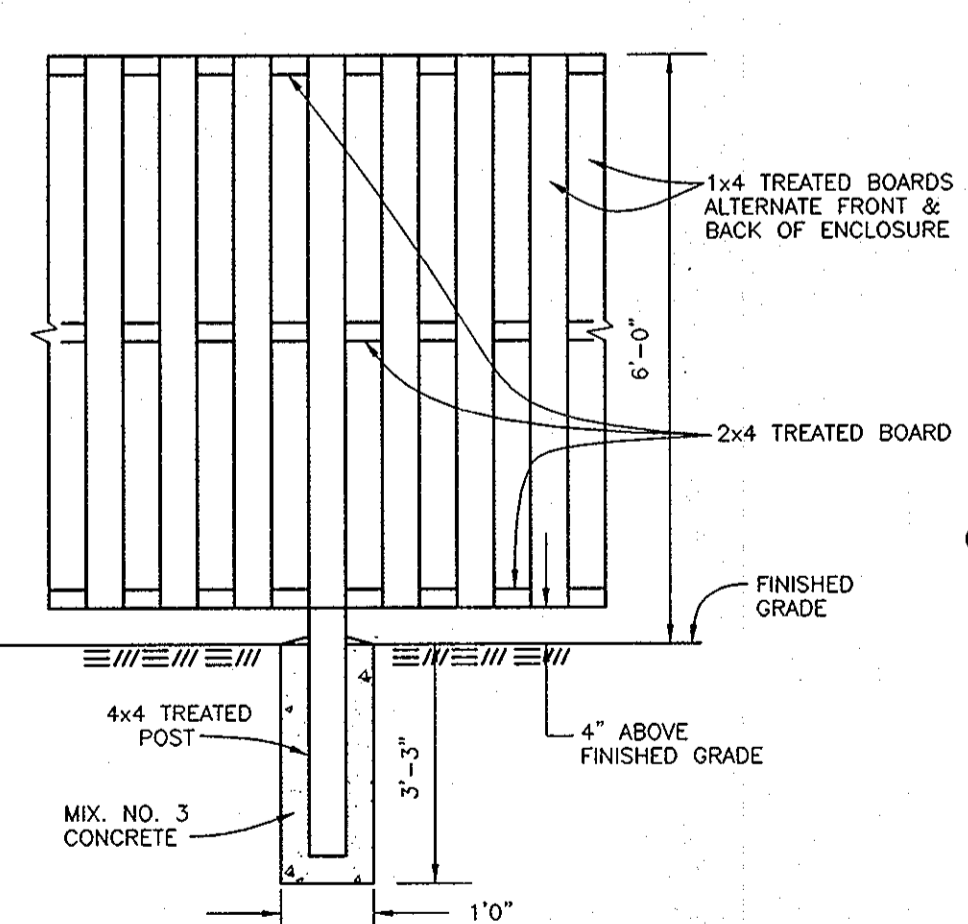
SCALE: AS SHOWN DRAWING 1 OF 38

Design: DAM/MCR Draft: MCR Check: DAM

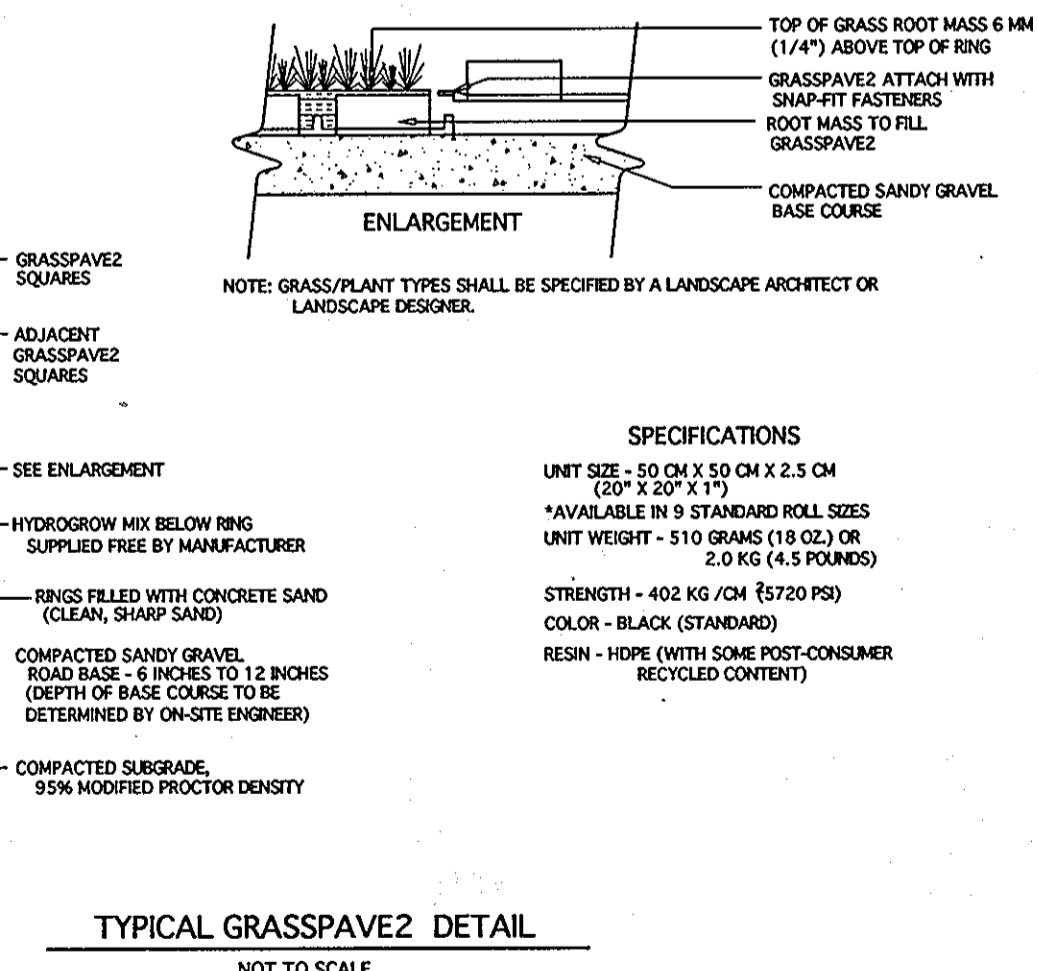
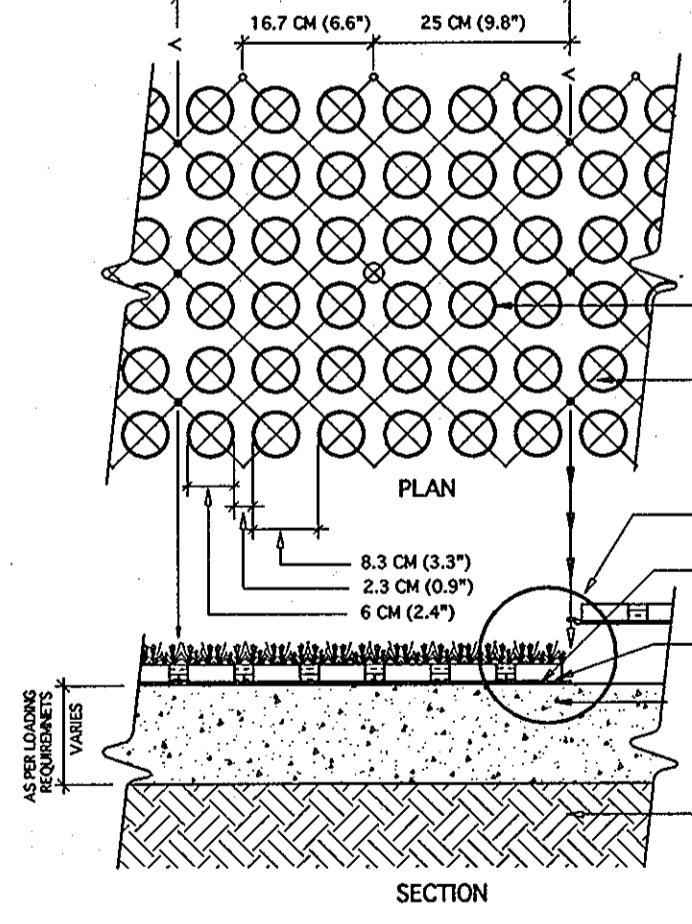
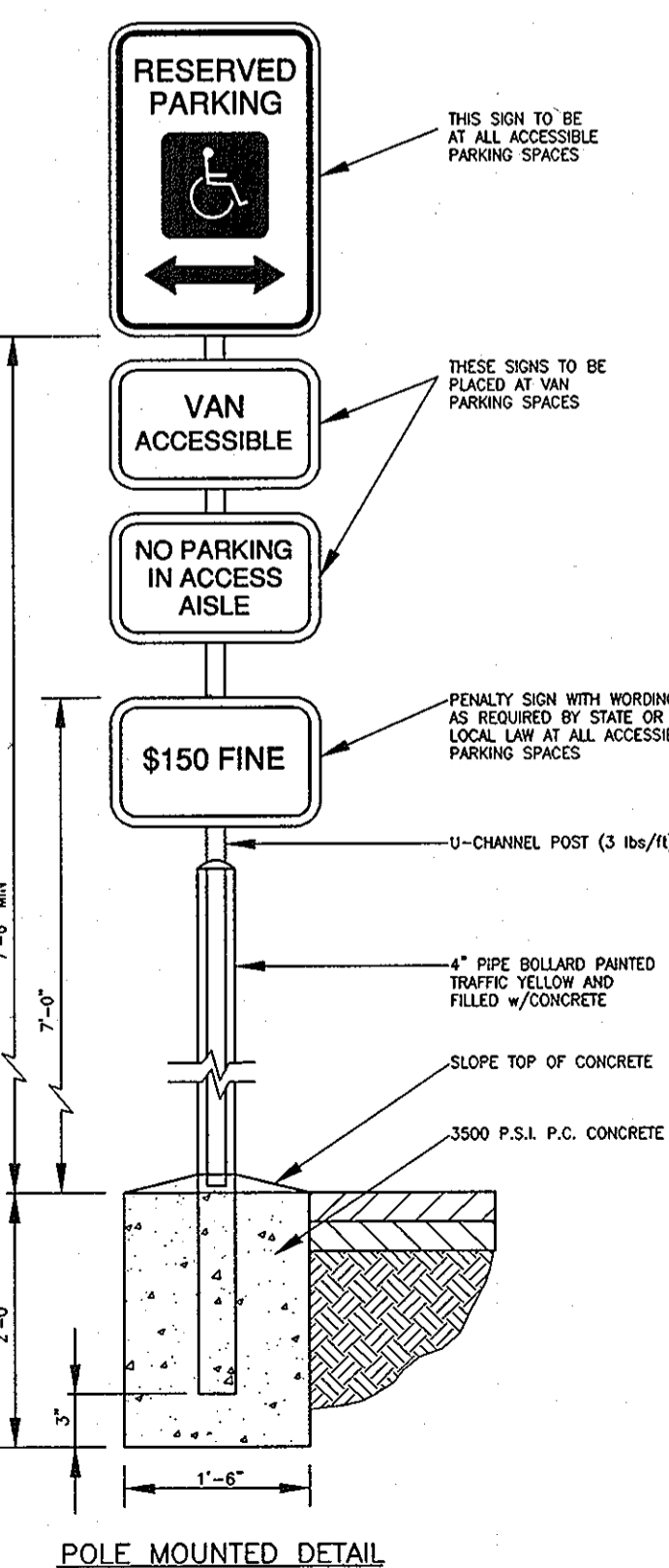


MATCH LINE SEE SHEET 3

PLAN  
 SCALE: 1" = 20'



NOTE: BASED ON HO. CO. STD.-R.11.3  
**DUMPSTER ENCLOSURE DETAILS**



NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: WATER METERS SHALL HAVE INTERIOR SETTINGS

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*[Signature]* 2/2/07  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*[Signature]* 2/2/07  
 DIRECTOR

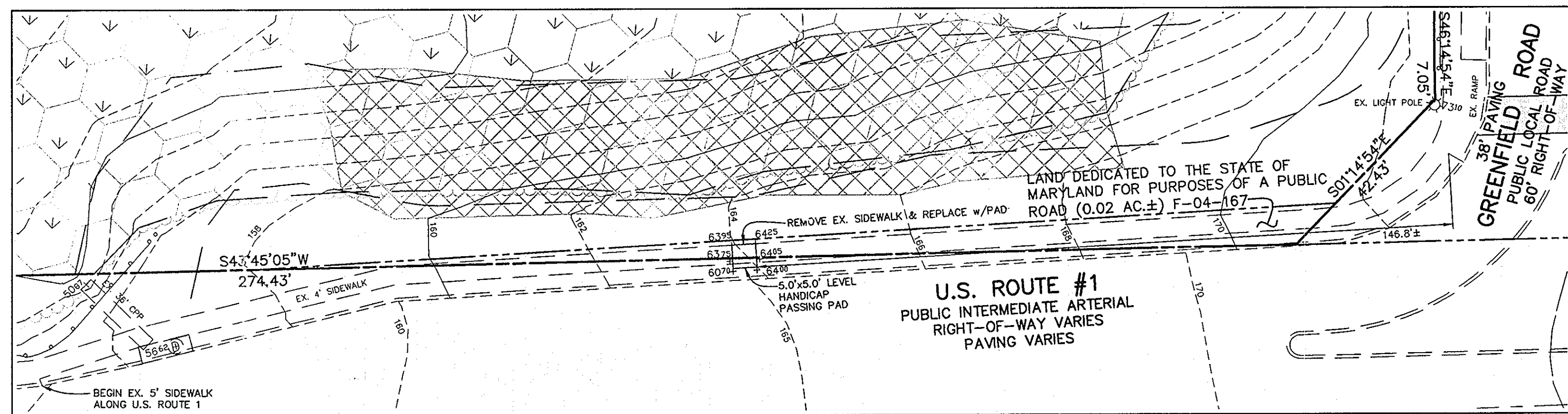
NO.	DATE	REVISION
2-21-08		SHOW BLDG. 'C' AS PROPOSED UNDER THIS PLAN & REVISE F.F. ELEV. & FOOTPRINT
8-10-07		SHOW BLDG. 'D' AS PROPOSED ON THIS PLAN

**BENCHMARK ENGINEERING, INC.**  
 ENGINEERS • LAND SURVEYORS • PLANNERS

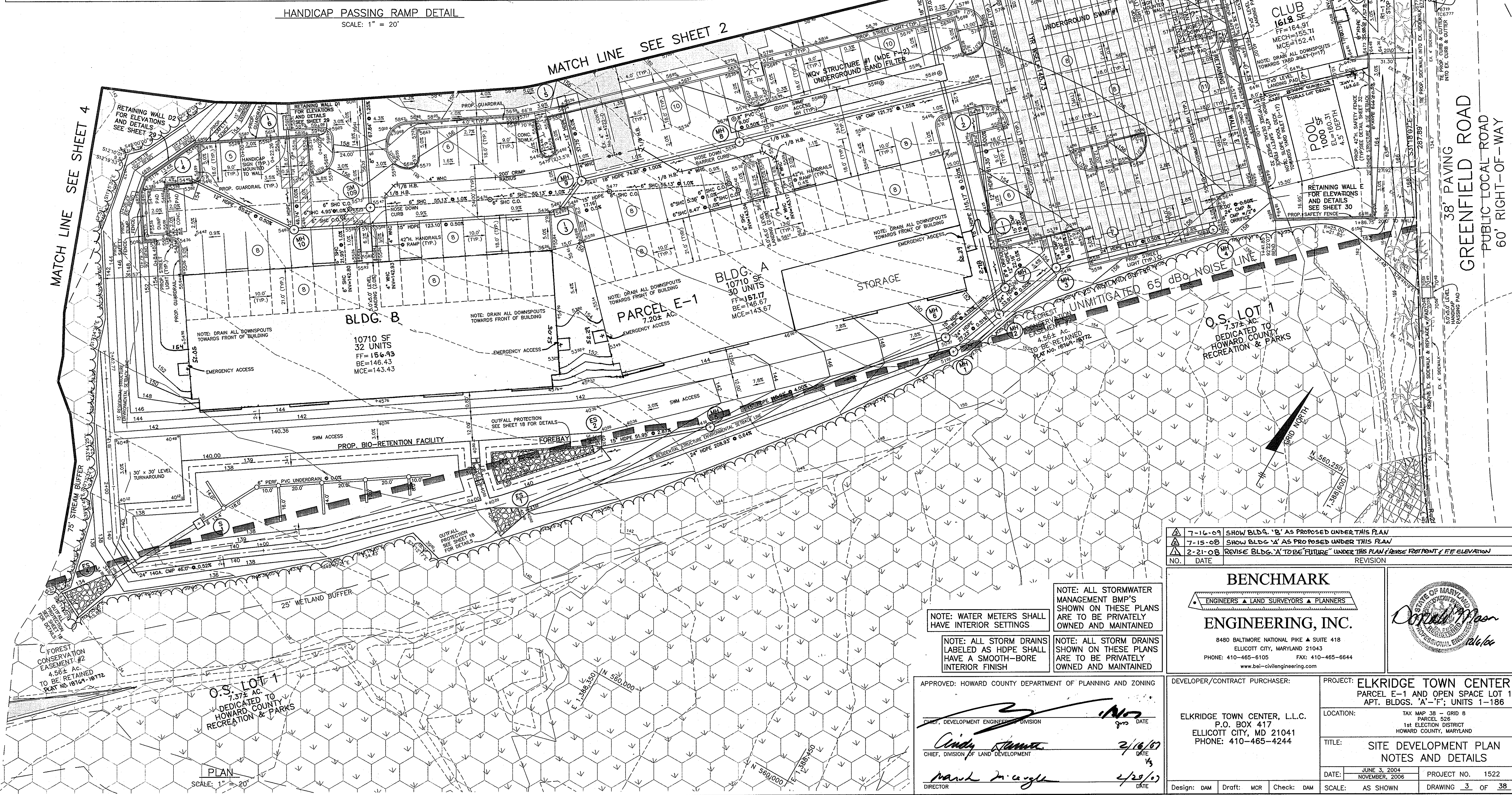
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6644  
 www.bel-civilengineering.com

*[Professional Seal]*

DEVELOPER/CONTRACT PURCHASER: <b>ELK RIDGE TOWN CENTER, L.L.C.</b> P.O. BOX 417 ELLICOTT CITY, MD 21041 PHONE: 410-465-4244	PROJECT: <b>ELK RIDGE TOWN CENTER</b> PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
LOCATION: TAX MAP 38 - GRID B PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND	TITLE: <b>SITE DEVELOPMENT PLAN</b> NOTES AND DETAILS
DATE: JUNE 3, 2004 NOVEMBER, 2006	PROJECT NO. 1522
Design: DAM Draft: MCR Check: DAM	SCALE: AS SHOWN DRAWING 2 OF 38



HANDICAP PASSING RAMP DETAIL  
SCALE: 1" = 20'



MATCH LINE SEE SHEET 2

MATCH LINE SEE SHEET 4

38' PAVING  
GREENFIELD ROAD  
PUBLIC LOCAL ROAD  
60' RIGHT-OF-WAY

NO.	DATE	REVISION
7-16-09		SHOW BLDG. 'B' AS PROPOSED UNDER THIS PLAN
7-15-08		SHOW BLDG. 'A' AS PROPOSED UNDER THIS PLAN
2-21-08		REVISE BLDG. 'A' TO BE "FUTURE" UNDER THIS PLAN & REVISE FOOTPRINT & FF ELEVATION

NOTE: WATER METERS SHALL HAVE INTERIOR SETTINGS

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 2/6/07

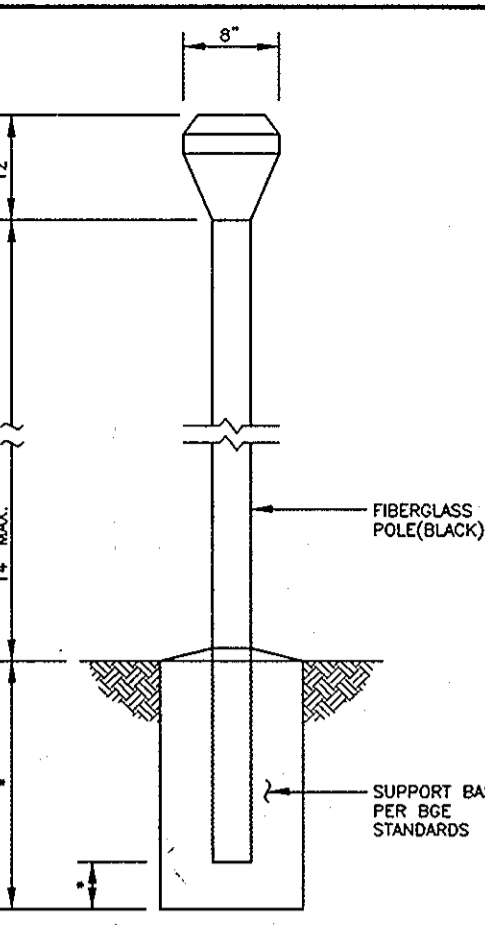
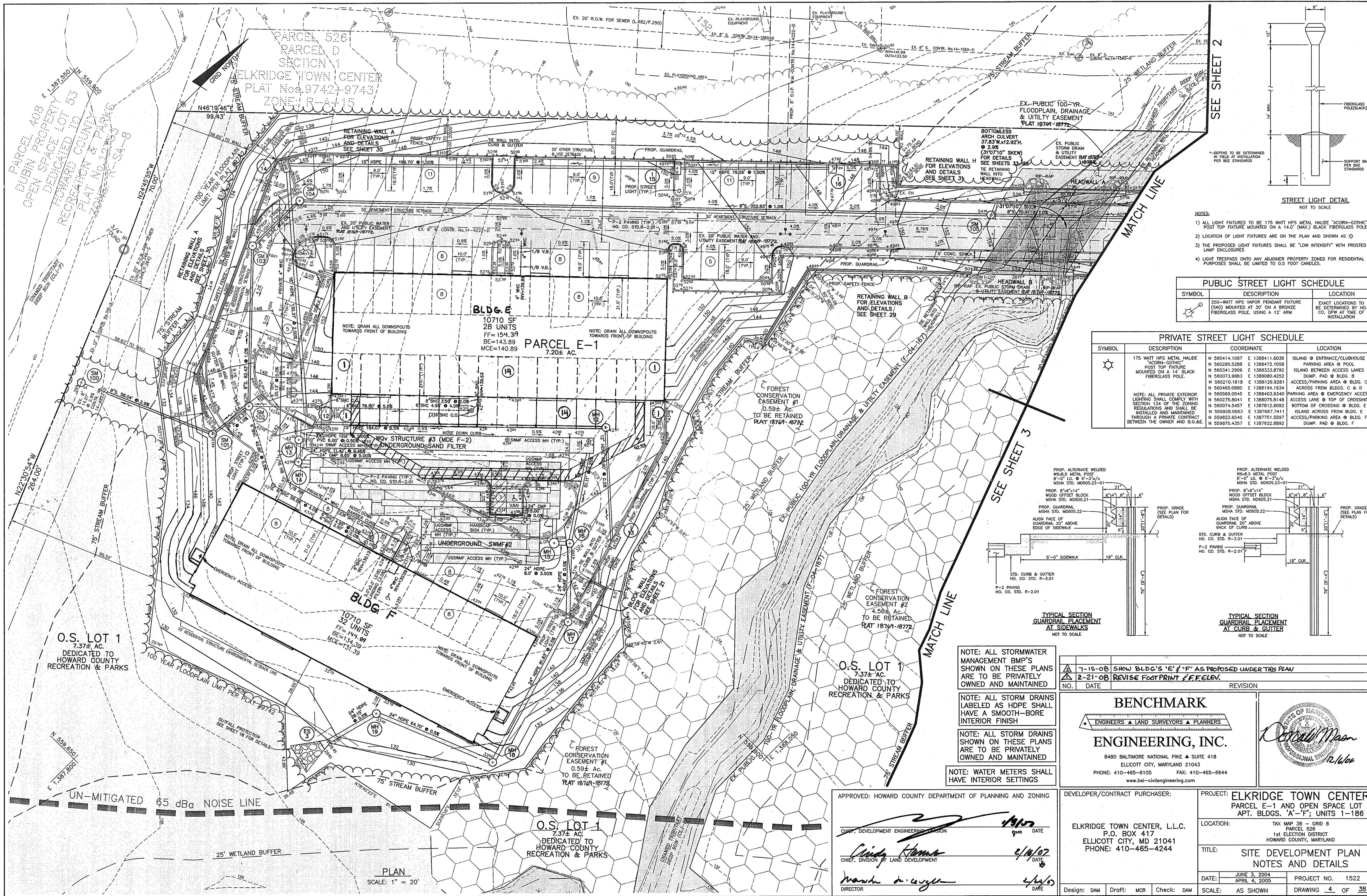
CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 2/20/07

DIRECTOR  
 DATE: 2/20/07

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 ENGINEERS • LAND SURVEYORS • PLANNERS

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 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6644  
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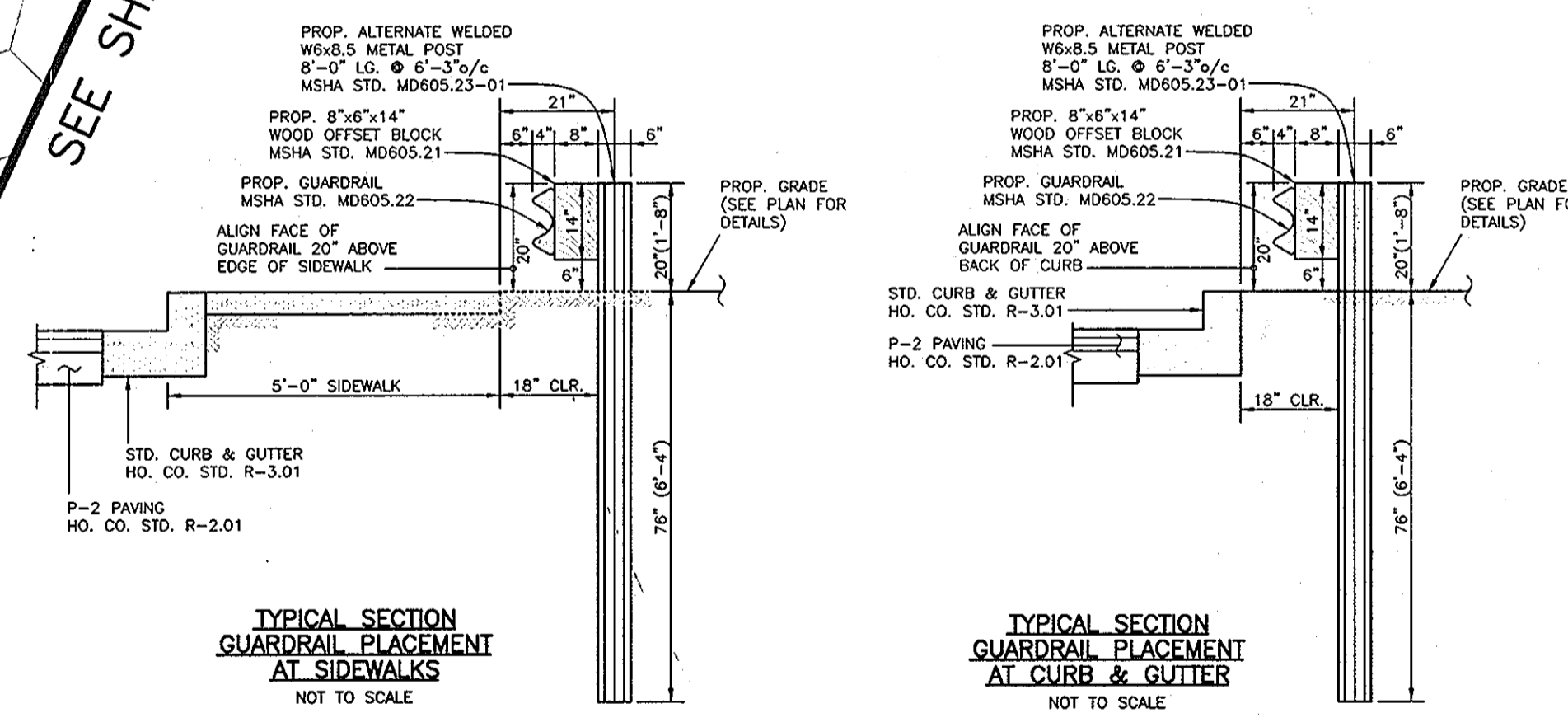
DEVELOPER/CONTRACT PURCHASER: ELKRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLICOTT CITY, MD 21041 PHONE: 410-465-4244	PROJECT: <b>ELKRIDGE TOWN CENTER</b> PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
LOCATION: TAX MAP 38 - GRID B PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND	TITLE: <b>SITE DEVELOPMENT PLAN</b> NOTES AND DETAILS
DATE: JUNE 3, 2004 NOVEMBER, 2006	PROJECT NO. 1522
DESIGN: DAM DRAFT: MCR CHECK: DAM	SCALE: AS SHOWN DRAWING 3 OF 38



- NOTES:
- 1) ALL LIGHT FIXTURES TO BE 175 WATT HPS METAL HALIDE "ACORN-GOTHIC" POST TOP FIXTURE MOUNTED ON A 14'-0" (MAX.) BLACK FIBERGLASS POLE.
  - 2) LOCATION OF LIGHT FIXTURES ARE ON THE PLAN AND SHOWN AS ☼.
  - 3) THE PROPOSED LIGHT FIXTURES SHALL BE "LOW INTENSITY" WITH FROSTED LAMP ENCLOSURES.
  - 4) LIGHT TRESPASS ONTO ANY ADJOINER PROPERTY ZONED FOR RESIDENTIAL PURPOSES SHALL BE LIMITED TO 0.5 FOOT CANDLES.

PUBLIC STREET LIGHT SCHEDULE		
SYMBOL	DESCRIPTION	LOCATION
☼	250-WATT HPS VAPOR PENDANT FIXTURE (SAC) MOUNTED AT 30' ON A BRONZE FIBERGLASS POLE, USING A 12' ARM	EXACT LOCATIONS TO BE DETERMINED BY HO. CO. DPW AT TIME OF INSTALLATION

PRIVATE STREET LIGHT SCHEDULE			
SYMBOL	DESCRIPTION	COORDINATE	LOCATION
☼	175 WATT HPS METAL HALIDE "ACORN-GOTHIC" POST TOP FIXTURE MOUNTED ON A 14' BLACK FIBERGLASS POLE.	N 560414.1087 E 1388411.6036	ISLAND @ ENTRANCE/CLUBHOUSE
		N 560295.5288 E 1388472.1058	PARKING AREA @ POOL
		N 560341.2906 E 1388333.8792	ISLAND BETWEEN ACCESS LANES
		N 560073.9883 E 1388080.4232	DUMP PAD @ BLDG. B
		N 560210.1818 E 1388129.9281	ACCESS/PARKING AREA @ BLDG. C
		N 560465.0880 E 1388194.1934	CROSSING BETWEEN BLDGS. C & D
		N 560569.0545 E 1388403.9340	PARKING AREA @ EMERGENCY ACCESS
		N 560275.8041 E 1388075.8148	ACCESS LANE @ TOP OF CROSSING
		N 560074.5457 E 1387812.6092	BOTTOM OF CROSSING @ BLDG. E
		N 559928.0653 E 1387687.7411	ISLAND ACROSS FROM BLDG. E
		N 559823.6540 E 1387751.5597	ACCESS/PARKING AREA @ BLDG. F
		N 559875.4357 E 1387922.8892	DUMP PAD @ BLDG. F



- NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED
- NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH
- NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED
- NOTE: WATER METERS SHALL HAVE INTERIOR SETTINGS

NO.	DATE	REVISION
7-15-08		SHOW BLDG'S 'E' & 'F' AS PROPOSED UNDER THIS PLAN
2-21-08		REVISE FOOTPRINT & ELEV.

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PHONE: 410-465-6105 FAX: 410-465-6844  
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*Professional Seal*

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*Chief Khanna* 2/14/07  
CHIEF, DIVISION OF LAND DEVELOPMENT  
*Director* 2/14/07

DEVELOPER/CONTRACT PURCHASER:  
ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLCOTT CITY, MD 21041  
PHONE: 410-465-4244

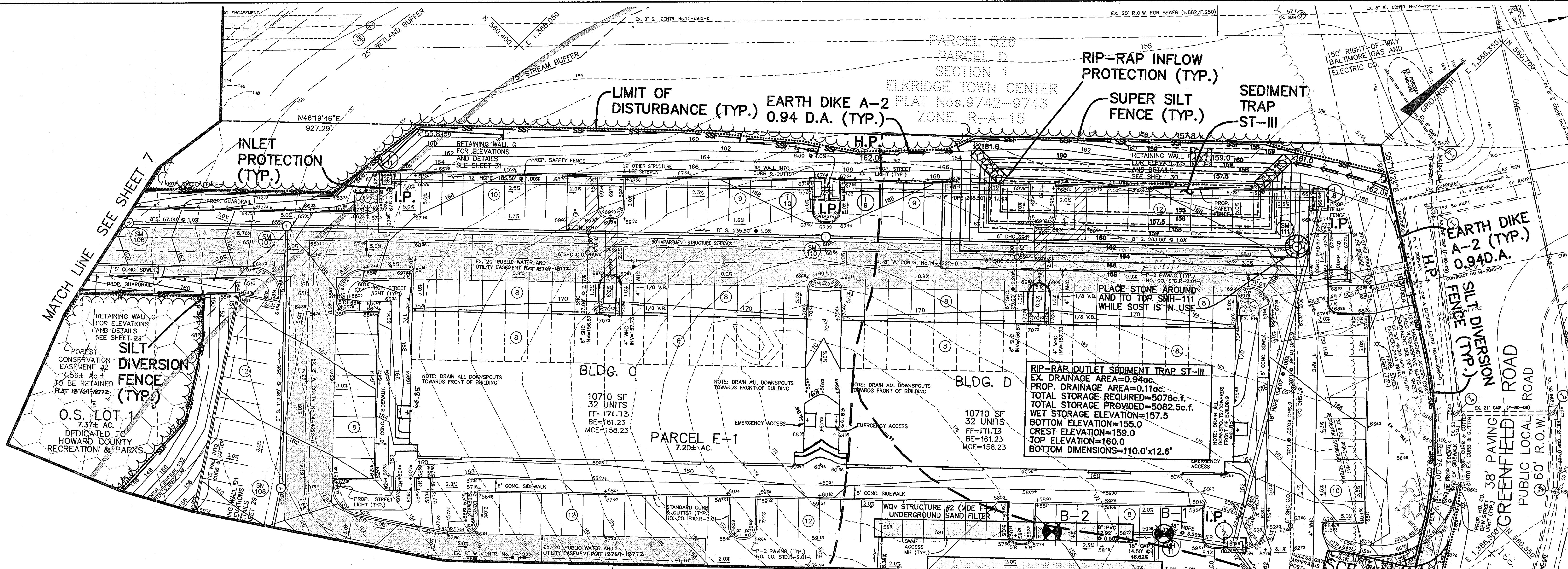
PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

LOCATION: TAX MAP 38 - GRID B  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: SITE DEVELOPMENT PLAN  
NOTES AND DETAILS

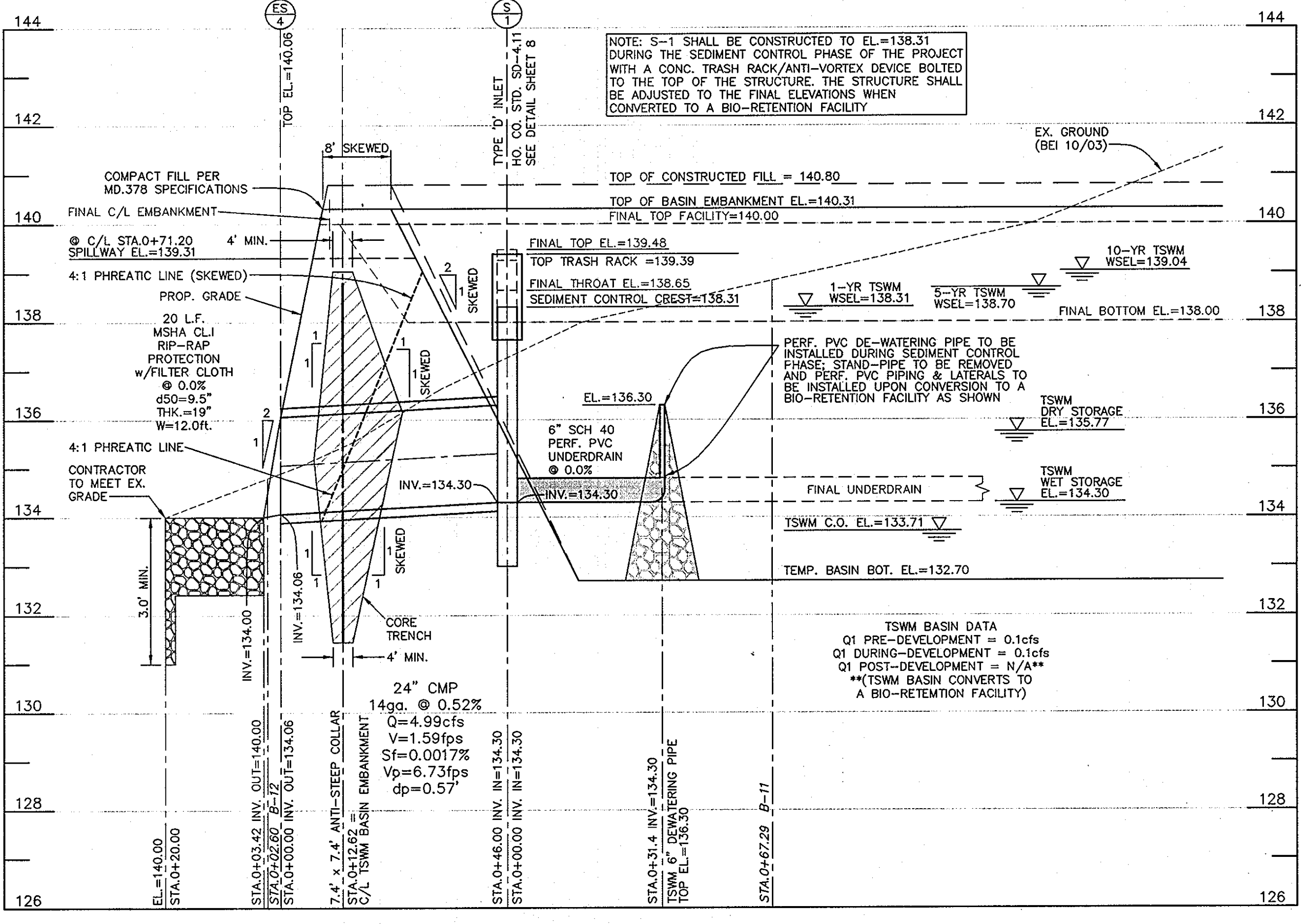
DATE: JUNE 3, 2004 PROJECT NO. 1522  
APRIL 4, 2005  
SCALE: AS SHOWN DRAWING 4 OF 38

Design: DAM Draft: MCR Check: DAM



MATCH LINE SEE SHEET 6

PLAN  
SCALE: 1" = 20'



PROFILE ALONG C/L OF PRINCIPAL SPILLWAY  
HORIZONTAL SCALE: 1" = 20'  
VERTICAL SCALE: 1" = 2'

THIS PLAN IS FOR SEDIMENT AND EROSION CONTROL PURPOSES ONLY

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

- ALL SEDIMENT & EROSION CONTROL FEATURES ARE TO BE REPAIRED IMMEDIATELY IF DISRUPTED BY UTILITY INSTALLATION
- SUPER SILT FENCE IS TO INSPECTED FREQUENTLY & CLEANED, REPAIRED AND/OR RE-INSTALLED IMMEDIATELY AS NECESSARY
- SEDIMENT CONTROL LOCATION AND IMPLEMENTATION SHOWN ON THIS PLAN IS SUBJECT TO REVISIONS IN THE FIELD AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR
- ALL SEDIMENT CONTROL FEATURES SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS SHOWN IN THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

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 THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

DEVELOPER: ELKRIDGE TOWN CENTER, LLC, MEMBER *James R. Moxley III, Member* DATE: 12/16/06

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.

*Donald Mason* DATE: 12/16/06  
ENGINEER: DONALD A. MASON, MD P.E. No. 21443

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

*John W. Selby* DATE: 1/16/07  
HOWARD SOIL CONSERVATION DISTRICT

REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

*Jim Moxley* DATE: 1/16/07  
USDA-NATURAL RESOURCES CONSERVATION SERVICE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Condy Hanna* DATE: 2/16/09  
CHIEF, DIVISION OF LAND DEVELOPMENT

*Marsha K. Ogden* DATE: 4/22/10  
DIRECTOR

NO.	DATE	REVISION
2-21-08		SHOW BLDG 'C' AS PROPOSED UNDER THIS PLAN / REVISE FOOTPRINT / F.F. ELEV.
8-10-07		SHOW BLDG 'D' AS PROPOSED UNDER THIS PLAN

**BENCHMARK ENGINEERING, INC.**  
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ELICOTT CITY, MARYLAND 21043  
PHONE: 410-465-8105 FAX: 410-465-6844  
www.bei-civilengineering.com

DEVELOPER/CONTRACT PURCHASER: ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELICOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

LOCATION: TAX MAP 38 - GRID 8  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: SEDIMENT & EROSION CONTROL PLAN, NOTES AND DETAILS

DATE: JUNE 3, 2004  
NOVEMBER, 2006  
PROJECT NO. 1522

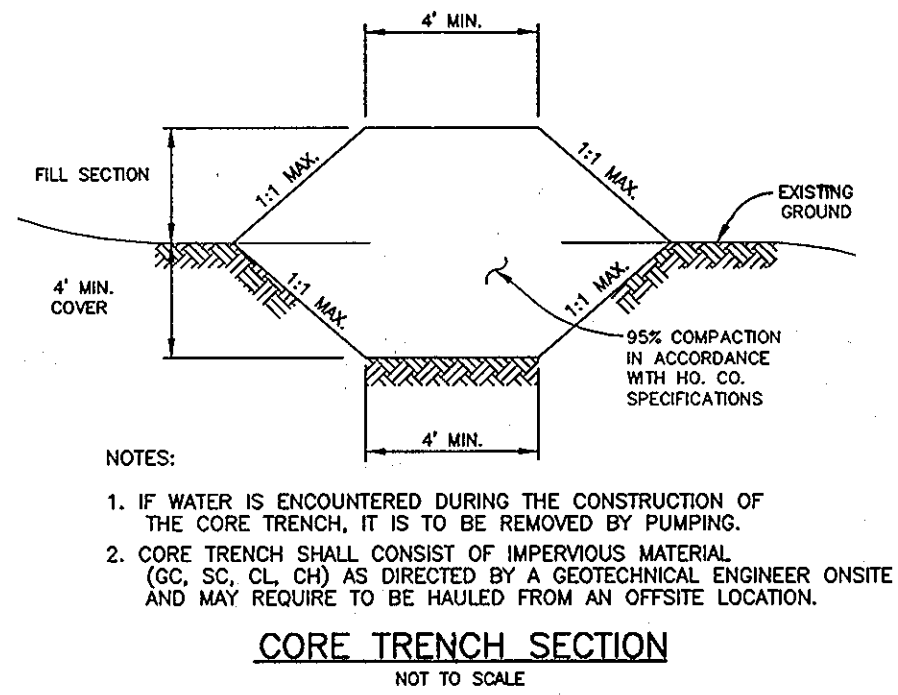
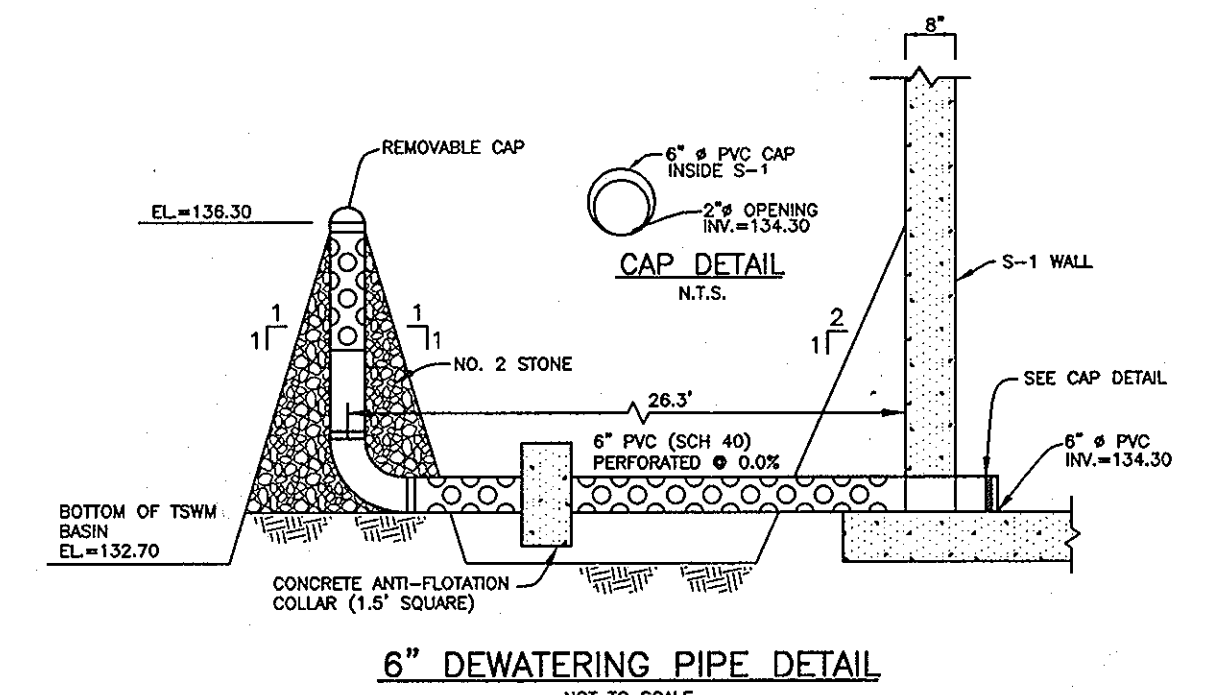
Design: DAM Draft: MCR Check: DAM SCALE: AS SHOWN DRAWING 5 OF 38

**BEST MANAGEMENT PRACTICES FOR WORKING IN  
NONTIDAL WETLANDS, WETLAND BUFFERS,  
WATERWAYS, AND 100-YEAR FLOODPLAINS**

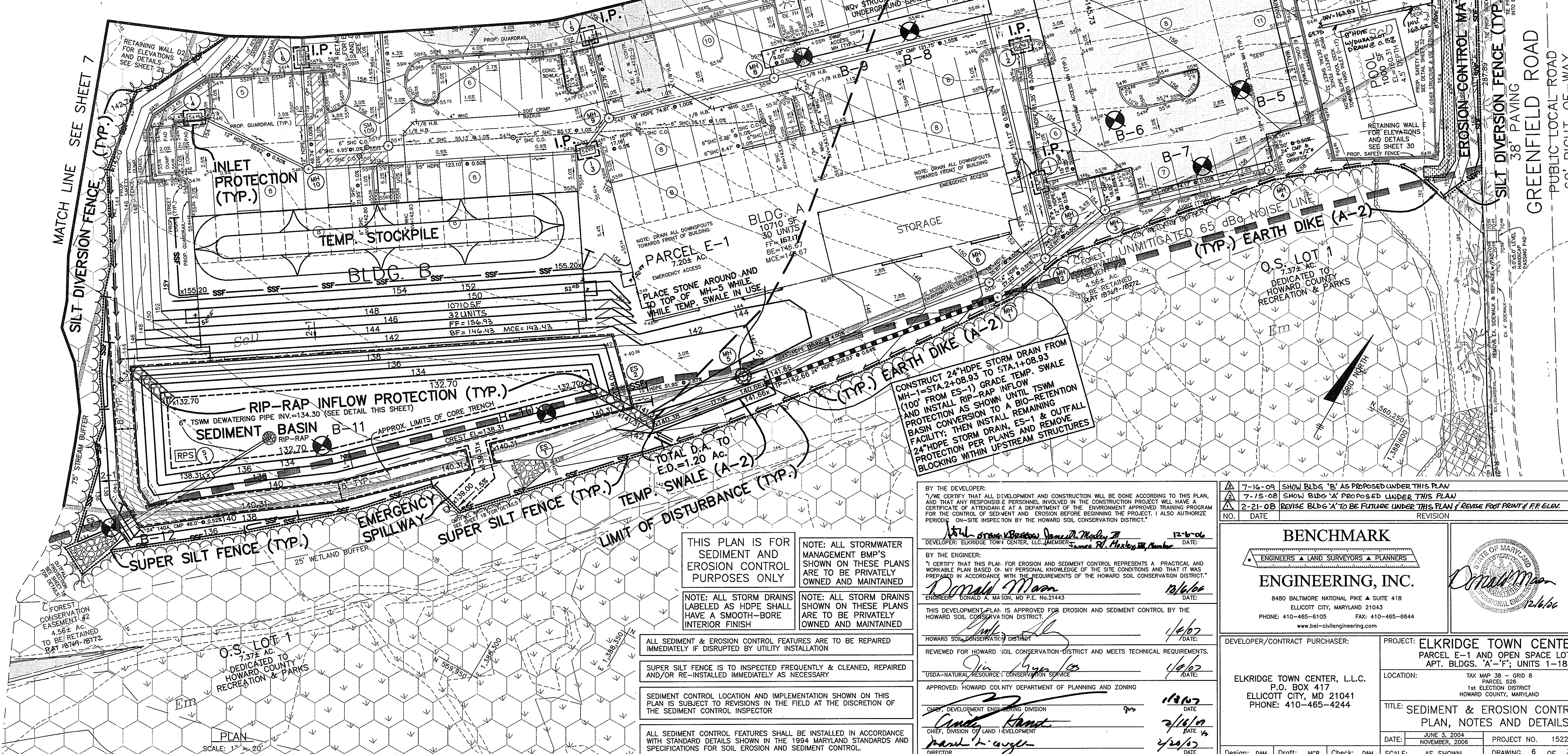
- No excess fill, construction material, or debris shall be stockpiled or stored in nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplains.
- Place materials in a location and manner that does not adversely impact surface or subsurface water flow into or out of nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplains.
- Do not use the excavated material as backfill if it contains waste metal products, unsightly debris, toxic material, or any other deleterious substance. If additional backfill is required, use clean material free of waste metal products, unsightly debris, toxic material, or any other deleterious substance.
- Place heavy equipment on mats or suitably operate the equipment to prevent damage to nontidal wetlands, nontidal wetland buffers, waterways, or the 100-year floodplain. Repair and maintain any serviceable structure or fill so there is no permanent loss of nontidal wetlands, nontidal wetland buffers, or waterways, or permanent modification of the 100-year floodplain in excess of that lost under the originally authorized structure or fill.
- Rectify any nontidal wetlands, wetland buffers, waterways, or 100-year floodplain temporarily impacted by any construction.
- All stabilization in the nontidal wetland and nontidal wetland buffer shall consist of the following species: Annual Ryegrass (*Lolium multiflorum*), Miller (*Spiraea latifolia*), Barley (*Hordeum sp.*), Oats (*Avena sp.*), and/or Rye (*Secale cereale*). These species will allow for the stabilization of the site while also allowing for the voluntary revegetation of natural wetland species. Other non-perennial vegetation may be acceptable, but must be approved by the Nontidal Wetlands and Waterways Division, Kentucky 31 fence shall not be utilized in wetland or buffer areas. The area should be seeded and mulched to reduce erosion after construction activities have been completed.
- After installation has been completed, make post-construction grades and elevations the same as the original grades and elevations in temporarily impacted areas.
- To protect aquatic species, in-stream work is prohibited as determined by the classification of the stream:

SEDIMENT BASIN DATA	
EXISTING D.A.	3.98 AC
PROPOSED D.A.	4.23 AC
STORAGE REQUIRED (WET & DRY)	15,228 CF
STORAGE PROVIDED (WET & DRY)	15,228 CF
EMBANKMENT ELEVATION	140.31
WEIR/ORIFICE CREST ELEVATION	134.30 2" x 138.31' S-1
CLEANOUT ELEVATION	133.71'
BOTTOM ELEVATION	132.70'
WET STORAGE ELEVATION	135.77'
DRY STORAGE ELEVATION	134.30'
Q1 PRE-DEVELOPMENT	0.1 cfs
Q1 DURING-DEVELOPMENT	0.1 cfs
Q1 POST-DEVELOPMENT	N/A

\* - AT POST-DEVELOPMENT STAGE TSM BASIN (STORAGE) CONVERTS INTO A BIO-RETENTION FACILITY (FILTRATION)



MATCH LINE SEE SHEET 5



THIS PLAN IS FOR  
SEDIMENT AND  
EROSION CONTROL  
PURPOSES ONLY

NOTE: ALL STORMWATER  
MANAGEMENT BMP'S  
SHOWN ON THESE PLANS  
ARE TO BE PRIVATELY  
OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS  
LABELED AS HDPE SHALL  
HAVE A SMOOTH-BORE  
INTERIOR FINISH

NOTE: ALL STORM DRAINS  
SHOWN ON THESE PLANS  
ARE TO BE PRIVATELY  
OWNED AND MAINTAINED

ALL SEDIMENT & EROSION CONTROL FEATURES ARE TO BE REPAIRED  
IMMEDIATELY IF DISRUPTED BY UTILITY INSTALLATION

SUPER SILT FENCE IS TO BE INSPECTED FREQUENTLY & CLEANED, REPAIRED  
AND/OR RE-INSTALLED IMMEDIATELY AS NECESSARY

SEDIMENT CONTROL LOCATION AND IMPLEMENTATION SHOWN ON THIS  
PLAN IS SUBJECT TO REVISIONS IN THE FIELD AT THE DISCRETION OF  
THE SEDIMENT CONTROL INSPECTOR

ALL SEDIMENT CONTROL FEATURES SHALL BE INSTALLED IN ACCORDANCE  
WITH STANDARD DETAILS SHOWN IN THE 1994 MARYLAND STANDARDS AND  
SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

CONSTRUCT 24\"/>

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 THE ENVIRONMENT APPROVED TRAINING PROGRAM  
FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE  
PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT.

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

HOWARD SOIL CONSERVATION DISTRICT  
REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

USDA-NATURAL RESOURCE CONSERVATION SERVICE  
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

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

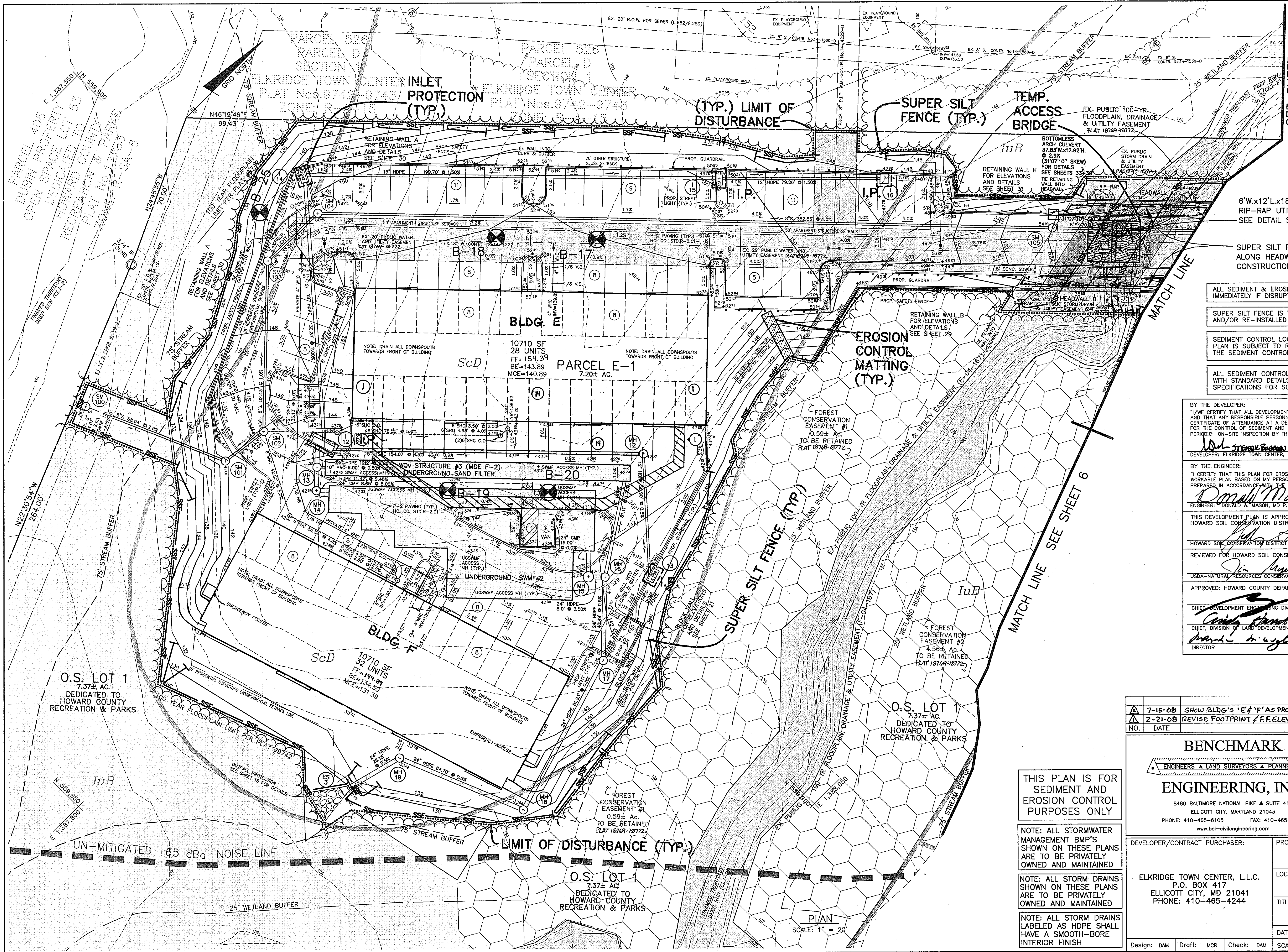
NO.	DATE	REVISION
7-16-09	SHOW BLDG 'B' AS PROPOSED UNDER THIS PLAN	
7-15-08	SHOW BLDG 'A' PROPOSED UNDER THIS PLAN	
2-21-08	REVISE BLDG 'A' TO BE FUTURE UNDER THIS PLAN / REVISE FOOT PRINT / FF ELEV.	

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**ENGINEERING, INC.**

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ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6844  
www.bci-civilengineering.com

DEVELOPER/CONTRACT PURCHASER:	PROJECT:
ELKCRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLCOTT CITY, MD 21041 PHONE: 410-465-4244	ELKCRIDGE TOWN CENTER PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
LOCATION:	TAX MAP 38 - GRID B PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE:	SEDIMENT & EROSION CONTROL PLAN, NOTES AND DETAILS
DATE:	JUNE 3, 2004 NOVEMBER, 2006
PROJECT NO.	1522
Design: DAM	Draft: MCR
Check: DAM	SCALE: AS SHOWN
DRAWING	6 OF 38



SEE SHEET 5

6'Wx12'Lx18"D.  
RIP-RAP UTILITY CROSSING  
SEE DETAIL SHEET NO. 8

SUPER SILT FENCE TO BE INSTALLED  
ALONG HEADWALLS AFTER COMPLETING  
CONSTRUCTION OF BOTTOMLESS ARCH CULVERT

ALL SEDIMENT & EROSION CONTROL FEATURES ARE TO BE REPAIRED  
IMMEDIATELY IF DISRUPTED BY UTILITY INSTALLATION

SUPER SILT FENCE IS TO INSPECTED FREQUENTLY & CLEANED, REPAIRED  
AND/OR RE-INSTALLED IMMEDIATELY AS NECESSARY

SEDIMENT CONTROL LOCATION AND IMPLEMENTATION SHOWN ON THIS  
PLAN IS SUBJECT TO REVISIONS IN THE FIELD AT THE DISCRETION OF  
THE SEDIMENT CONTROL INSPECTOR

ALL SEDIMENT CONTROL FEATURES SHALL BE INSTALLED IN ACCORDANCE  
WITH STANDARD DETAILS SHOWN IN THE 1994 MARYLAND STANDARDS AND  
SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.

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 THE ENVIRONMENT APPROVED TRAINING PROGRAM  
FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE  
PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT."

*Donna M. Mason* *James D. Mosley III*  
DEVELOPER: ELKRIDGE TOWN CENTER, L.L.C., MEMBER, *Howard Soil Conservation District* DATE: 12-1-06

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."

*Donald Maon*  
ENGINEER: DONALD A. MAON, MD P.E. No. 21443 DATE: 12/16/06

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

*John A. Smith* DATE: 1/16/07

REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

*Jim Hughes* DATE: 1/16/07

USDA-NATURAL RESOURCES CONSERVATION SERVICE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 1/16/07

*Carole Hunter* CHIEF, DIVISION OF LAND DEVELOPMENT DATE: 2/20/03

*Wanda D. Taylor* DIRECTOR DATE: 2/20/03

NO.	DATE	REVISION
7-15-08		SHOW BLDG'S 'E' & 'F' AS PROPOSED UNDER THIS PLAN
2-21-08		REVISE FOOTPRINT / F.F. ELEV.

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**ENGINEERING, INC.**

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ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6644  
www.bel-civilengineering.com

DEVELOPER/CONTRACT PURCHASER:  ELKRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLCOTT CITY, MD 21041 PHONE: 410-465-4244	PROJECT: <b>ELKRIDGE TOWN CENTER</b> PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
LOCATION: TAX MAP 38 - GRID 8 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND	TITLE: <b>SEDIMENT &amp; EROSION CONTROL PLAN, NOTES AND DETAILS</b>
DATE: JUNE 3, 2004 NOVEMBER, 2006	PROJECT NO. 1522
Design: DAM Draft: MCR Check: DAM	SCALE: AS SHOWN DRAWING <u>  7  </u> OF <u>  38  </u>

THIS PLAN IS FOR  
SEDIMENT AND  
EROSION CONTROL  
PURPOSES ONLY

NOTE: ALL STORMWATER  
MANAGEMENT BMP'S  
SHOWN ON THESE PLANS  
ARE TO BE PRIVATELY  
OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS  
SHOWN ON THESE PLANS  
ARE TO BE PRIVATELY  
OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS  
LABELED AS HDPE SHALL  
HAVE A SMOOTH-BORE  
INTERIOR FINISH

PLAN  
SCALE: 1" = 20'





**MGWC 4.8: TEMPORARY ACCESS BRIDGE**

**Temporary access crossing intended for minimum corridor disturbance**

**DESCRIPTION**

A temporary access bridge is a stream crossing made of wood, steel, or other material designed to limit the amount of disturbance to the stream banks and bed.

**PURPOSE USES & LIMITATIONS**

Temporary access bridges are the preferred method of roadway crossing since they typically cause the least disturbance to the stream bed and banks, pose the least chance for interference with fish migration, and can be quickly removed and reused.

**MATERIAL SPECIFICATIONS**

- Driftlogs: Driftlogs should be logs, sawn timber, prestressed concrete beams, metal beams, or other approved materials.
- Deck: Non-slip deck materials should be of sufficient strength to support the anticipated load.

**CONSTRUCTION SPECIFICATIONS**

All erosion and sediment control devices, including stream diversions, should be implemented as the first order of business according to a plan approved by the WMA or local authority. Diversions should be built as needed and swales or ditches should be used to prevent surface drainage from entering the area of the bridge crossing. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.) The proposed construction, maintenance, and removal sequence is as follows:

1. Abutments should be placed parallel to, and on, stable banks such that the structure is at or above bankfull depth to prevent the migration of floating materials and debris.
2. Temporary access bridges should be constructed to span the debris channel. If the bankfull channel width exceeds 8 feet (2.4 meters), then a footing, pier, or other bridge support may be constructed within the waterway. No support will be permitted within the debris channel for spans less than 8 feet wide. One additional bridge support will be permitted for each additional 8 feet width of the channel.
3. All decking members should be placed perpendicular to the driftlogs, buried tightly, and securely fastened to the driftlogs. Decking members should be buried tightly to prevent any soil material trapped onto the bridge from falling into the waterway.
4. Although run plates are optional, they may be necessary to properly distribute loads. One run plank should be provided for each track of the equipment wheel and should be securely fastened to the length of the span.
5. Curb or fenders may be installed along the outer sides of the deck to provide additional safety.
6. Bridges should be securely anchored at one end using steel cables or chains to prevent the bridge from floating downstream and possibly causing an obstruction to the flow. Anchoring at only one end will prevent channel migration at the event that flood waters float the bridge. Acceptable anchors are large logs, boulders, or driven steel anchors.
7. All areas disturbed during installation should be stabilized within 14 calendar days in accordance with a revegetation plan approved by the WMA.
8. Periodic inspection should be performed by the user to ensure that the bridge, streambank, and stream banks are maintained and not damaged.
9. Maintenance should be performed as needed to ensure that the structure complies with all standards and specifications. This should include the removal of trapped sediment and debris which should then be disposed of and buried outside the floodplain.
10. When the temporary bridge is no longer needed, all structures including abutments and other bridging materials should be removed within 14 calendar days. In all cases, the bridge materials should be removed within 1 year of installation. Removal of the bridge and clean-up of the area, including protection and stabilization of disturbed stream banks, should be accomplished without the use of construction equipment in the waterway.

**Maryland's Guidelines To Waterway Construction**

**DETAIL 4.8: TEMPORARY ACCESS BRIDGE**

**SKETCH**

**STREAM CROSSINGS** PAGE 4.8 - 3 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**MGWC 4.2: UTILITY CROSSING**

**Temporary in-stream construction**

**DESCRIPTION**

The work should consist of installing erosion control devices in and adjacent to the construction of utility crossings.

**INSTALLATION GUIDELINES**

All erosion and sediment control devices, including diverting basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.) The proposed construction sequence is as follows (refer to Detail 4.2):

1. The contractor should install a continuous perimeter control barrier in place to minimize the amount of pollution entering the flow. A diversion pipe as shown in MGWC 1.4: Diversion Pipe or other measure should be installed and working or some barrier as shown in MGWC 1.5: Sedimentation Diversion should be constructed according to specifications to divert the streamflow.
2. Excavated topsoil and subsoil should be kept separate, placed on the upland side of the excavation, and replaced in their natural bed.
3. All construction should take place during stream low flow. The length of construction time should be limited to a maximum of 2 consecutive days for each crossing.
4. All utility crossings should be placed a minimum of 3 feet (1 meter) beneath the stream bed unless an alternative section is specifically approved by the WMA. For instances where a 3-foot cover is not viable, two alternate stabilization options are given in the Detail 4.2. A low flow channel shall be constructed through all riprap placements across the stream bed.
5. The stream should be diverted by an approved temporary stream diversion, the construction area should be dewatered, and any disturbed banks should be stabilized. The contractor may elect to construct the utility crossing in stages. In this case, a WMA approved flow barrier may be constructed to keep the construction area dry.
6. Once the crossing is completed, the diversion should be removed from system to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal.

**STREAM CROSSINGS** PAGE 4.2 - 3 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 10 - RIP-RAP OUTLET SEDIMENT TRAP - ST III**

**CONSTRUCTION SPECIFICATIONS**

1. The area under 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 treading with equipment while it is being constructed. Maximum height of embankment shall be 4', measured at centerline of embankment.
3. All cut and fill slopes shall be 2:1 or flatter.
4. Elevation of the top of any dike directing water into trap must equal or exceed the height of trap embankment.
5. Storage area provided shall be figured by computing the volume measured from top of excavation. (For storage requirements see Table 10.)
6. Filter cloth shall be placed over the bottom and sides of the outlet channel prior to placement of stone. Section of fabric must overlap at least 1' with section nearest the entrance placed on top. Fabric shall be embedded at least 6" into existing ground of entrance of outlet channel.
7. Stone used in the outlet channel shall be 4" - 12" placed 18" thick.
8. Outlet - An outlet shall be provided, which includes a means of conveying the discharge in an erosion free manner to an existing stable channel. Protection against scour at the discharge end shall be provided as necessary.
9. Outlet channel must have positive drainage from the trap.
10. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/4 of the wall storage depth of the trap (150% of 10').
11. The structure shall be inspected periodically after each rain and repaired as needed.
12. Construction of traps shall be carried out in such a manner that sediment pollution is obviated. Once constructed, this includes a means of conveying the discharge in an erosion free manner to an existing stable channel. Protection against scour at the discharge end shall be provided as necessary.
13. The structure shall be developed by approved methods, removed and the area stabilized when the drainage area has been properly stabilized.

NOTE: MAXIMUM DRAINAGE AREA = 10 AC.

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**RIP-RAP OUTLET SEDIMENT TRAP - ST III**

**CONSTRUCTION SPECIFICATIONS**

1. The area under 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 treading with equipment while it is being constructed. Maximum height of embankment shall be 4', measured at centerline of embankment.
3. All cut and fill slopes shall be 2:1 or flatter.
4. Elevation of the top of any dike directing water into trap must equal or exceed the height of trap embankment.
5. Storage area provided shall be figured by computing the volume measured from top of excavation. (For storage requirements see Table 10.)
6. Filter cloth shall be placed over the bottom and sides of the outlet channel prior to placement of stone. Section of fabric must overlap at least 1' with section nearest the entrance placed on top. Fabric shall be embedded at least 6" into existing ground of entrance of outlet channel.
7. Stone used in the outlet channel shall be 4" - 12" placed 18" thick.
8. Outlet - An outlet shall be provided, which includes a means of conveying the discharge in an erosion free manner to an existing stable channel. Protection against scour at the discharge end shall be provided as necessary.
9. Outlet channel must have positive drainage from the trap.
10. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/4 of the wall storage depth of the trap (150% of 10').
11. The structure shall be inspected periodically after each rain and repaired as needed.
12. Construction of traps shall be carried out in such a manner that sediment pollution is obviated. Once constructed, this includes a means of conveying the discharge in an erosion free manner to an existing stable channel. Protection against scour at the discharge end shall be provided as necessary.
13. The structure shall be developed by approved methods, removed and the area stabilized when the drainage area has been properly stabilized.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE C-9-13A MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 5 - RIP-RAP INFLOW PROTECTION**

**CONSTRUCTION SPECIFICATIONS**

1. All lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 2" (min.) bottom width. The channel shall be lined with 4" to 12" rip-rap to a depth of 18".
2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.
3. Entrance and exit sections shall be installed as shown on the detail section.
4. Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.
5. Gullion Inflow Protection may be used in lieu of Rip-rap Inflow Protection.
6. Rip-rap should blend into existing ground.
7. Rip-rap inflow protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Seals lining criteria.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE C-6-2 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE**

**CONSTRUCTION SPECIFICATIONS**

1. Length - minimum of 50' (150' for slope between 4:1 and 10:1).
2. Width - minimum of 10' (20' for slope between 4:1 and 10:1).
3. Inlet side (down slope) shall be placed on the existing ground to provide a turning radius.
4. Inlet side (up slope) shall be placed on the existing ground to provide a turning radius. The plan approved outline may not require single turn radius to be maintained.
5. Stone - crushed aggregate (2" to 3") or retained or recycled concrete equivalent shall be placed to a depth of 6" deep over the length and width of the entrance.
6. Surface Water - all surface water flowing to or diverted toward construction entrance shall be placed through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a minimum of 21" slope and a minimum of 2" of stone over the pipe. Pipe shall be placed according to the profile when the SDC is located at a high spot and has no design to convey a pipe will not be necessary. Pipe should be placed according to the amount of runoff to be conveyed. A 6" minimum will be required.
7. Location - A stabilized construction entrance shall be located at every spot where construction traffic enters or leaves a construction site. Vehicle turning shall take place over the entire length of the stabilized construction entrance.

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**DETAIL 33 - SUPER SILT FENCE**

**CONSTRUCTION SPECIFICATIONS**

1. Fencing shall be 42" in height and constructed in accordance with the latest Maryland State Highway Details for Chain Link Fencing. The specification for fence shall be used, substituting 42" fabric and 8" length posts.
2. Chain link fence shall be fastened securely to the fence posts with wire ties. The lower tension wire, brace and cross rods, drive anchors and post caps are not required except on the ends of the fence.
3. Filter cloth shall be fastened securely to the chain link fence with ties spaced every 24" of the top and mid section.
4. Filter cloth shall be embedded a minimum of 8" into the ground.
5. When two sections of filter cloth adjoin each other, they shall be overlapped by 6" and folded.
6. Maintenance shall be performed as needed and silt boulders removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height.
7. Filter cloth shall be fastened securely to each fence post with wire ties or staples at top and mid section and meet the following requirements for Geotextile Class F:

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gpm/ft (min/ft)	Test: MSMT 122
Filtering Efficiency	75% (min.)	Test: MSMT 322

**SUPER SILT FENCE DESIGN CRITERIA**

Slope Steadiness	Slope (Maximum)	Silt Fence Length (Maximum)	Silt Fence Length (Minimum)
0 - 10%	0 - 10:1	Unlimited	Unlimited
10 - 20%	10:1 - 6:1	200 feet	1,500 feet
20 - 33%	5:1 - 3:1	100 feet	1,000 feet
33 - 50%	3:1 - 2:1	100 feet	500 feet
50% +	2:1 +	50 feet	250 feet

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**DETAIL 16 - CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE**

**CONSTRUCTION SPECIFICATIONS**

Riser Dia. in.	Trash Rack Cyl. Dia. in.	Minimum Spacing in.	Minimum Support Dia. in.	Minimum Top Thickness	Stiffener
12	18	16	6	16	16 ga.
15	21	16	7	16	16 ga.
18	27	16	8	16	16 ga.
21	30	16	11	16	16 ga.
24	36	16	13	14	14 ga.
27	42	16	15	14	14 ga.
36	54	14	17	12	12 ga.
42	60	14	19	12	12 ga.
48	72	12	21	10	10 ga.
54	78	12	23	10	10 ga.
60	90	12	29	8	8 ga.
66	96	10	33	8	8 ga.
72	102	10	36	8	8 ga.
78	114	10	39	8	8 ga.
84	120	10	42	8	8 ga.

Note: The above trash rack and anti-vortex device information is only for corrugated metal pipe. Concrete risers must meet the requirements of MS 37B.

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**DETAIL 16 - CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE**

**CONSTRUCTION SPECIFICATIONS**

1. The trash rack shall be constructed of galvanized steel pipe with a minimum diameter of 12 inches. The trash rack shall be concentric with the structure.
2. The trash rack shall be supported by a minimum of 16 gauge stiffeners.
3. The trash rack shall be spaced at a minimum of 16 inches.
4. The trash rack shall be supported by a minimum of 16 gauge stiffeners.
5. The trash rack shall be supported by a minimum of 16 gauge stiffeners.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE C-10-26 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 16 - CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE (cont'd)**

**CONSTRUCTION SPECIFICATIONS**

1. The anti-seep collar shall be constructed of galvanized steel pipe with a minimum diameter of 12 inches.
2. The anti-seep collar shall be supported by a minimum of 16 gauge stiffeners.
3. The anti-seep collar shall be spaced at a minimum of 16 inches.
4. The anti-seep collar shall be supported by a minimum of 16 gauge stiffeners.
5. The anti-seep collar shall be supported by a minimum of 16 gauge stiffeners.

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**DETAIL 14 - TYPICAL ANTI-SEEP COLLARS**

**CONSTRUCTION SPECIFICATIONS**

1. The anti-seep collar shall be constructed of galvanized steel pipe with a minimum diameter of 12 inches.
2. The anti-seep collar shall be supported by a minimum of 16 gauge stiffeners.
3. The anti-seep collar shall be spaced at a minimum of 16 inches.
4. The anti-seep collar shall be supported by a minimum of 16 gauge stiffeners.
5. The anti-seep collar shall be supported by a minimum of 16 gauge stiffeners.

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**DETAIL 23C - CURB INLET PROTECTION (C/DG OR CDS INLETS)**

**CONSTRUCTION SPECIFICATIONS**

1. Attach a continuous piece of wire mesh (30" minimum width by throat length plus 4") to the 2" x 4" wall (exceeding throat length plus 2") as shown on the standard.
2. Place a continuous piece of Geotextile Class C in the same dimension as the wire mesh over the wire mesh and secure it to the 2" x 4" wall.
3. Securely fasten the 2" x 4" wall to a 6" top vertical support to be located between the curb and the inlet base (6" apart).
4. Place the assembly against the inlet throat and not (minimum 2" lengths of 2" x 4" to the top of the inlet support location). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
5. The grate shall be placed so that the mesh and apron 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 apply the top of the curb on both sides of the inlet. Place stone 3/4" x 1 1/2" over the mesh and geotextile fabric to a minimum 1" beyond the curb on both sides.
7. The top of protection must be supported properly and the filter cloth and apron replaced when clogged with sediment.
8. Ensure that storm flow does not bypass the inlet by installing a temporary curb or replace curb to direct the flow to the inlet.

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**DETAIL 23B - AT GRADE INLET PROTECTION**

**CONSTRUCTION SPECIFICATIONS**

1. Lift grate and apron with Geotextile Class C to completely cover all openings. Then set grate back in place.
2. Place 3/4" x 1 1/2" stone, 4" thick on the grate to secure the fabric and provide additional filtration.

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**DETAIL 23A - STANDARD INLET PROTECTION**

**CONSTRUCTION SPECIFICATIONS**

1. Excavate completely around the inlet to a depth of 18" below the curb 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 over the inlet just above the curb. The top of the frame elevation must be 6" below adjacent roadway where flooding and safety factors may apply.
3. Stretch the 1/2" x 1/2" wire mesh tightly around the frame and attach securely. The mesh must meet and overlap at 1" on the ends.
4. Stretch the Geotextile Class C tightly over the wire mesh with the geotextile extending from the top of the frame to 18" below the inlet curb elevation. Fasten the geotextile firmly to the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then flattened down.
5. Backfill around the inlet in compacted 6" layers until the top of earth is level with the notch elevation on the ends and the elevation on the frame.
6. If the inlet is not in a curb, construct a concrete curb earth dike across the curb to equivalent pressed into the top of the frame. The ends of the geotextile must meet at a post, be overlapped and folded, then flattened down.
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 PAGE E-18-3 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 2 - TEMPORARY SWALE**

**CONSTRUCTION SPECIFICATIONS**

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or live with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into soil to a minimum 1" layer.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE A-2-4 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 1 - EARTH DIKE**

**CONSTRUCTION SPECIFICATIONS**

1. All temporary earth dikes shall have unsharpened 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 of 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 dikes.
5. The dikes shall be excavated or shaped to line, grade and cross section or repaired to meet the criteria specified herein and be free of bank projections or other obstructions which will impede normal flow.
6. Fill, if necessary, 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 dikes.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE A-1-6 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**OPTIONAL SEDIMENT BASIN DRAINING DEVICE**

**CONSTRUCTION SPECIFICATIONS**

1. The sediment basin shall be constructed of galvanized steel pipe with a minimum diameter of 12 inches.
2. The sediment basin shall be supported by a minimum of 16 gauge stiffeners.
3. The sediment basin shall be spaced at a minimum of 16 inches.
4. The sediment basin shall be supported by a minimum of 16 gauge stiffeners.
5. The sediment basin shall be supported by a minimum of 16 gauge stiffeners.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE C-10-24 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**OPTIONAL SEDIMENT BASIN DRAINING DEVICE**

**CONSTRUCTION SPECIFICATIONS**

1. The sediment basin shall be constructed of galvanized steel pipe with a minimum diameter of 12 inches.
2. The sediment basin shall be supported by a minimum of 16 gauge stiffeners.
3. The sediment basin shall be spaced at a minimum of 16 inches.
4. The sediment basin shall be supported by a minimum of 16 gauge stiffeners.
5. The sediment basin shall be supported by a minimum of 16 gauge stiffeners.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE C-10-24 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 2 - TEMPORARY SWALE**

**CONSTRUCTION SPECIFICATIONS**

1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or live with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into soil to a minimum 1" layer.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE A-2-4 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**DETAIL 1 - EARTH DIKE**

**CONSTRUCTION SPECIFICATIONS**

1. All temporary earth dikes shall have unsharpened 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 of 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 dikes.
5. The dikes 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 obstructions 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 dikes.
8. Inspection and maintenance must be provided periodically and after each rain event.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE PAGE A-1-6 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Maryland's Guidelines To Waterway Construction**

**DETAIL 4.2(a): UTILITY CROSSING**

**Temporary in-stream construction**

**DESCRIPTION**

The work should consist of installing erosion control devices in and adjacent to the construction of utility crossings.

**INSTALLATION GUIDELINES**

All erosion and sediment control devices, including diverting basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.) The proposed construction sequence is as follows (refer to Detail 4.2):

1. The contractor should install a continuous perimeter control barrier in place to minimize the amount of pollution entering the flow. A diversion pipe as shown in MGWC 1.4: Diversion Pipe or other measure should be installed and working or some barrier as shown in MGWC 1.5: Sedimentation Diversion should be constructed according to specifications to divert the streamflow.
2. Excavated topsoil and subsoil should be kept separate, placed on the upland side of the excavation, and replaced in their natural bed.
3. All construction should take place during stream low flow. The length of construction time should be limited to a maximum of 2 consecutive days for each crossing.
4. All utility crossings should be placed a minimum of 3 feet (1 meter) beneath the stream bed unless an alternative section is specifically approved by the WMA. For instances where a 3-foot cover is not viable, two alternate stabilization options are given in the Detail 4.2. A low flow channel shall be constructed through all riprap placements across the stream bed.
5. The stream should be diverted by an approved temporary stream diversion, the construction area should be dewatered, and any disturbed banks should be stabilized. The contractor may elect to construct the utility crossing in stages. In this case, a WMA approved flow barrier may be constructed to keep the construction area dry.
6. Once the crossing is completed, the diversion should be removed from system to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal.

**STREAM CROSSINGS** PAGE 4.2 - 3 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**Maryland's Guidelines To Waterway Construction**

**DETAIL 4.2(b): UTILITY CROSSING**

**Temporary in-stream construction**

**DESCRIPTION**

The work should consist of installing erosion control devices in and adjacent to the construction of utility crossings.

**INSTALLATION GUIDELINES**

All erosion and sediment control devices, including diverting basins, should be implemented as the first order of business according to a plan approved by the WMA or local authority. (See the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control.) The proposed construction sequence is as follows (refer to Detail 4.2):

1. The contractor should install a continuous perimeter control barrier in place to minimize the amount of pollution entering the flow. A diversion pipe as shown in MGWC 1.4: Diversion Pipe or other measure should be installed and working or some barrier as shown in MGWC 1.5: Sedimentation Diversion should be constructed according to specifications to divert the streamflow.
2. Excavated topsoil and subsoil should be kept separate, placed on the upland side of the excavation, and replaced in their natural bed.
3. All construction should take place during stream low flow. The length of construction time should be limited to a maximum of 2 consecutive days for each crossing.
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5. The stream should be diverted by an approved temporary stream diversion, the construction area should be dewatered, and any disturbed banks should be stabilized. The contractor may elect to construct the utility crossing in stages. In this case, a WMA approved flow barrier may be constructed to keep the construction area dry.
6. Once the crossing is completed, the diversion should be removed from system to downstream. Sediment control devices, including perimeter erosion controls, are to remain in place until all disturbed areas are stabilized in accordance with an approved sediment and erosion control plan and the inspection authority approves their removal.

**STREAM CROSSINGS** PAGE 4.2 - 3 MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

**THIS PLAN IS FOR SEDIMENT AND EROSION CONTROL PURPOSES ONLY**

**NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED**

**NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH**

**NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED**

**ALL SEDIMENT & EROSION CONTROL FEATURES ARE TO BE REPAIRED IMMEDIATELY IF DISRUPTED BY UTILITY INSTALLATION**

**SUPER SILT FENCE IS TO BE INSPECTED FREQUENTLY & CLEANED, REPAIRED AND/OR RE-INSTALLED IMMEDIATELY AS NECESSARY**

**SEDIMENT CONTROL LOCATION AND IMPLEMENTATION SHOWN ON THIS PLAN IS SUBJECT TO REVISIONS IN THE FIELD AT THE DISCRETION OF THE SEDIMENT CONTROL INSPECTOR**

**ALL SEDIMENT CONTROL FEATURES SHALL BE INSTALLED IN ACCORDANCE WITH STANDARD DETAILS SHOWN IN THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.**

BY THE DEVELOPER:

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

REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

USDA-NATURAL RESOURCES CONSERVATION SERVICE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

DATE: 12/6/06

DATE: 12/6/06

DATE: 1/6/07

DATE: 2/16/07

DATE: 2/20/07

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**DEVELOPER/CONTRACT PURCHASER:** ELKDRIDGE TOWN CENTER, L.L.C. P.O. BOX 417, ELLCOTT CITY, MD 21041, PHONE: 410-465-4244

**PROJECT:** ELKDRIDGE TOWN CENTER PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186

**LOCATION:** TAX MAP 52 - GRID 8, PARCEL 526, 1ST ELECTION DISTRICT, HOWARD COUNTY, MARYLAND

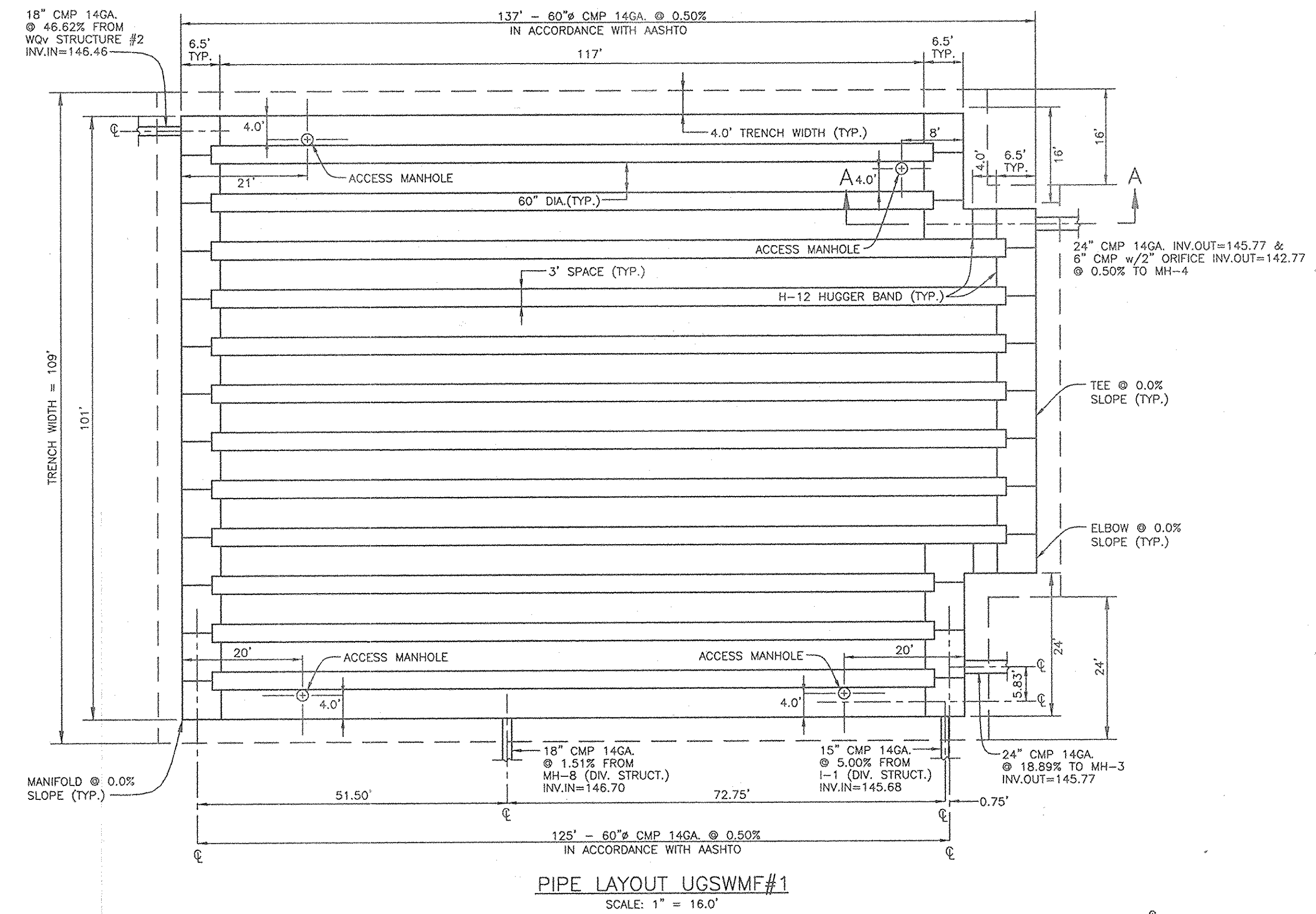
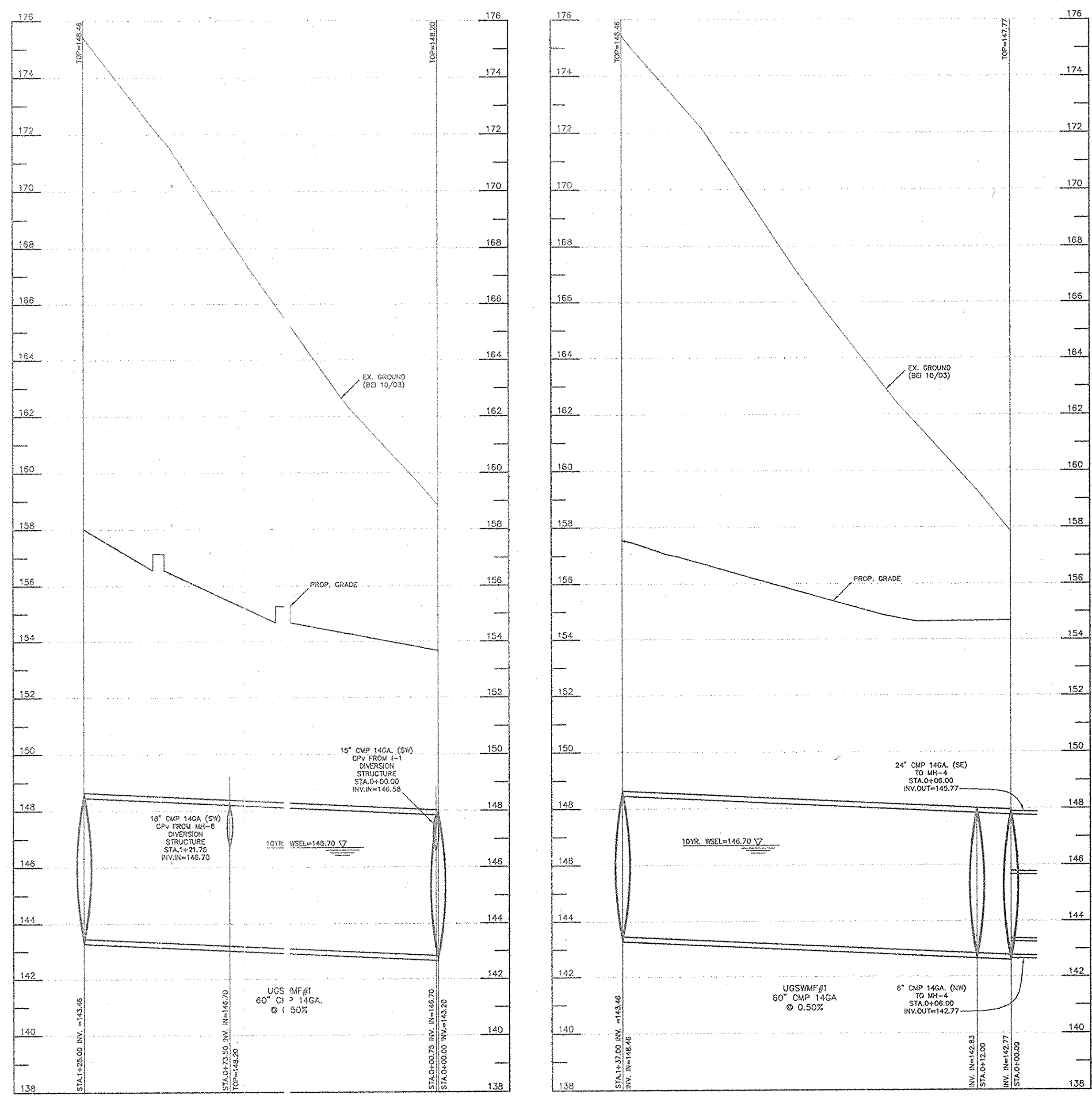
**TITLE:** SEDIMENT & EROSION CONTROL PLAN, NOTES AND DETAILS

**DATE:** JUNE 3, 2004 / NOVEMBER, 2006 / PROJECT NO. 1522

**SCALE:** AS SHOWN / DRAWING 9 OF 38

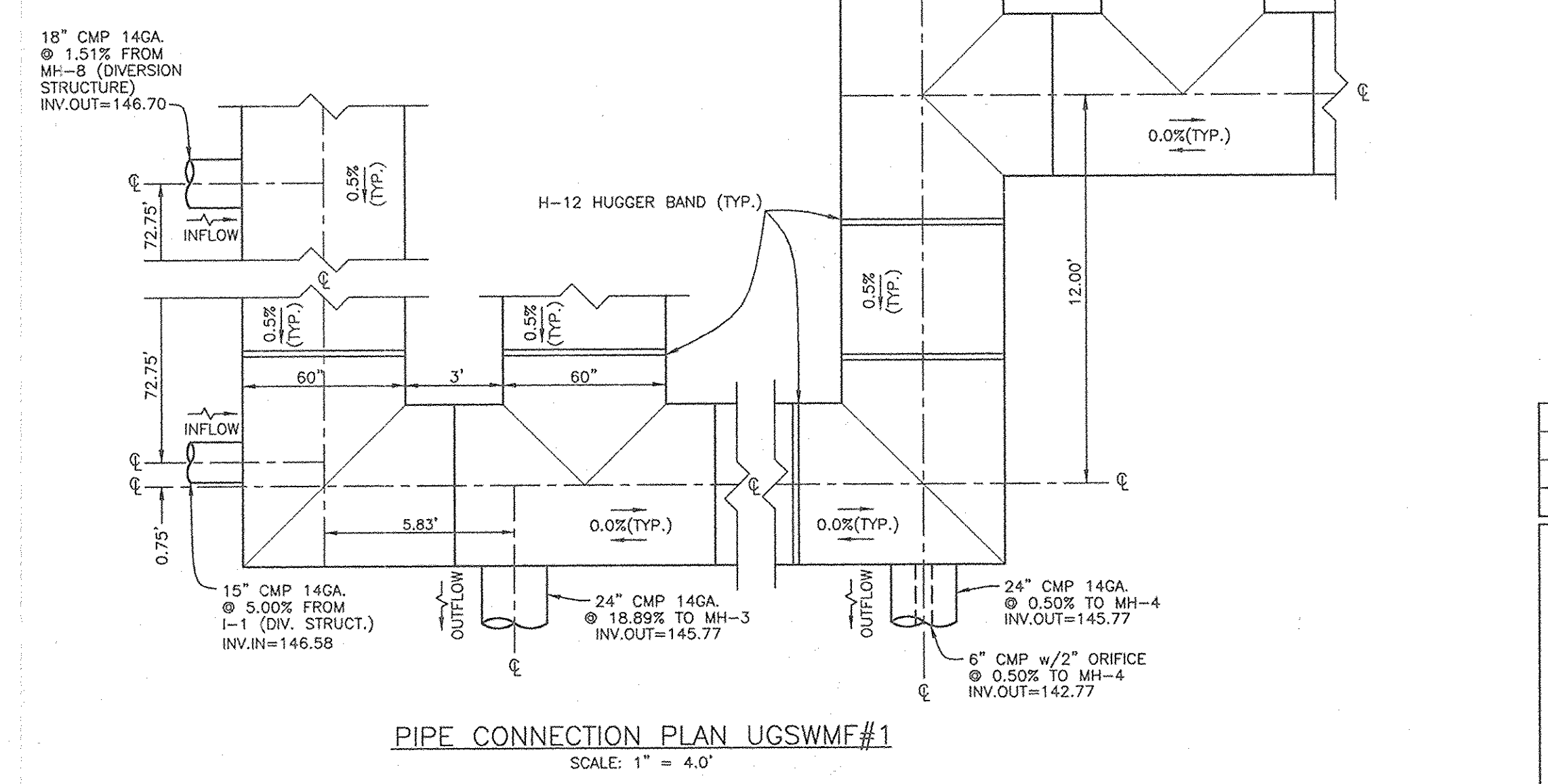
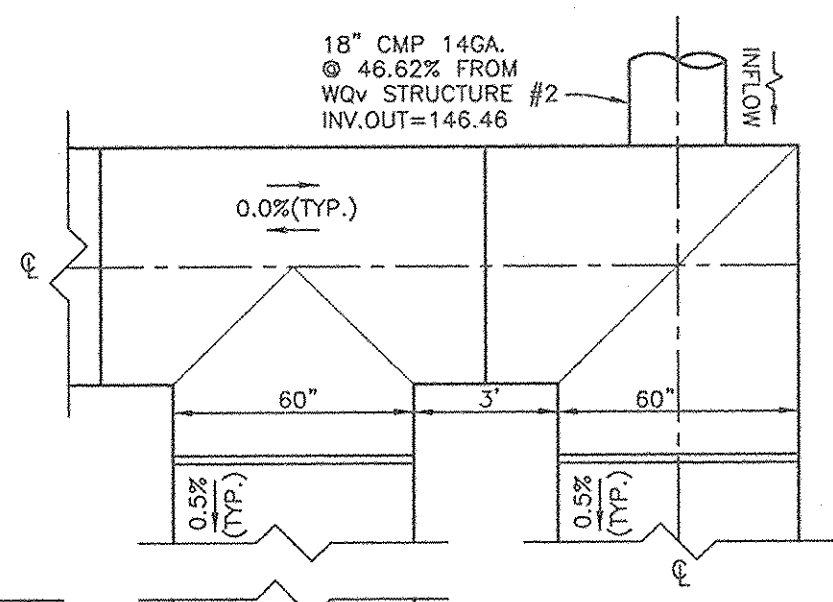
**Design: DAM/MCR Draft: MCR Check: DAM**

SDP-04-152

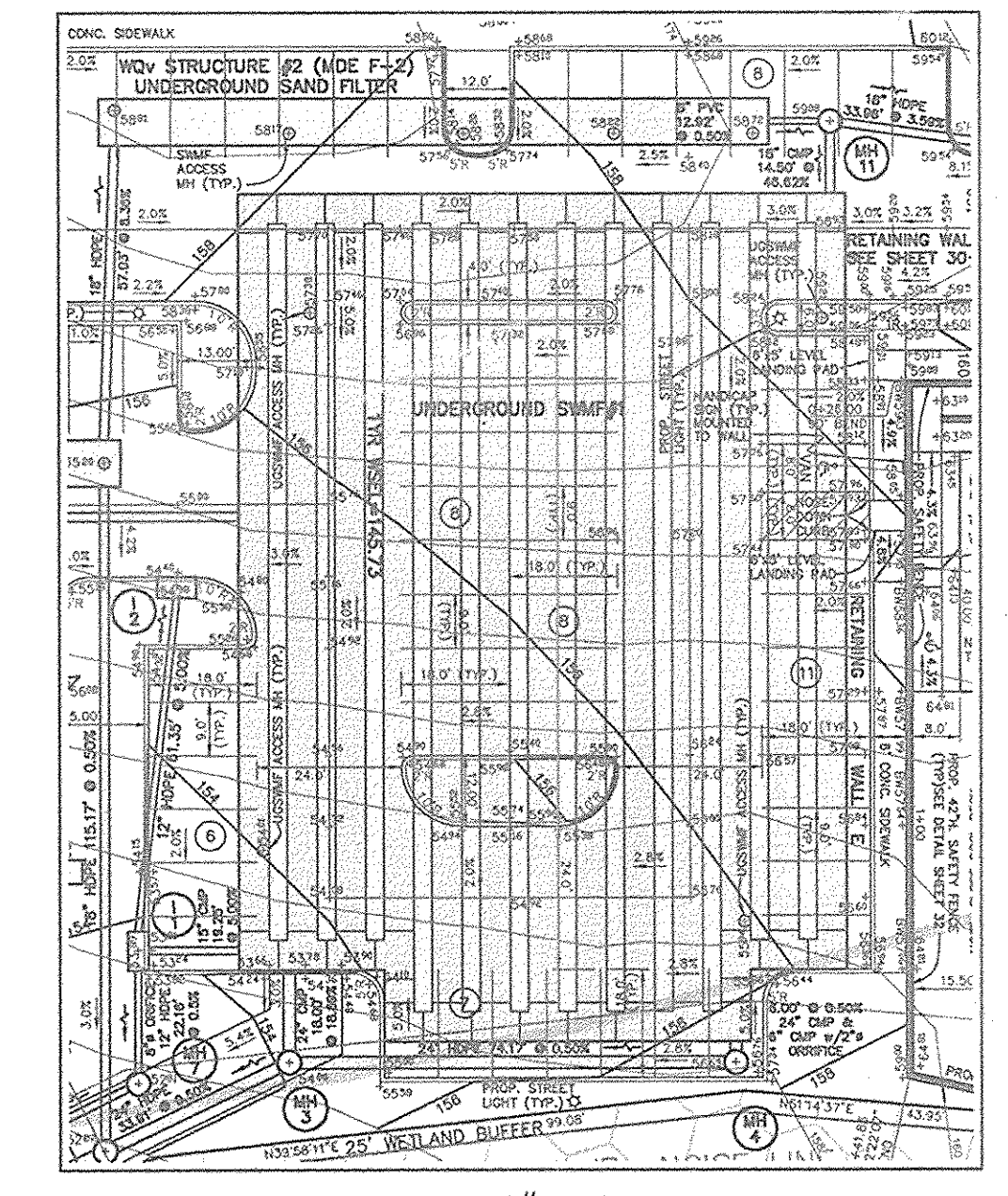


SWM SUMMARY TABLE - D.A.=3.71 AC.±

STORM FREQUENCY (YRS.)	DEVELOPED RUNOFF AND DISCHARGE (cfs)	WSEL (FT.)	STORAGE (AC.-FT.)
1	0.18	145.75	0.442
10	11.25	146.70	0.637
100	21.85	147.24	0.732



- OPERATION AND MAINTENANCE SCHEDULE FOR UNDERGROUND SWM FACILITIES
- THE UNDERGROUND STORM WATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN ITS OPERATION AND FUNCTION.
  - THE UNDERGROUND STORM WATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
  - WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
  - THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEAN-UP OPERATION.
  - THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORM WATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
  - THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX (6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.



Facility Summary

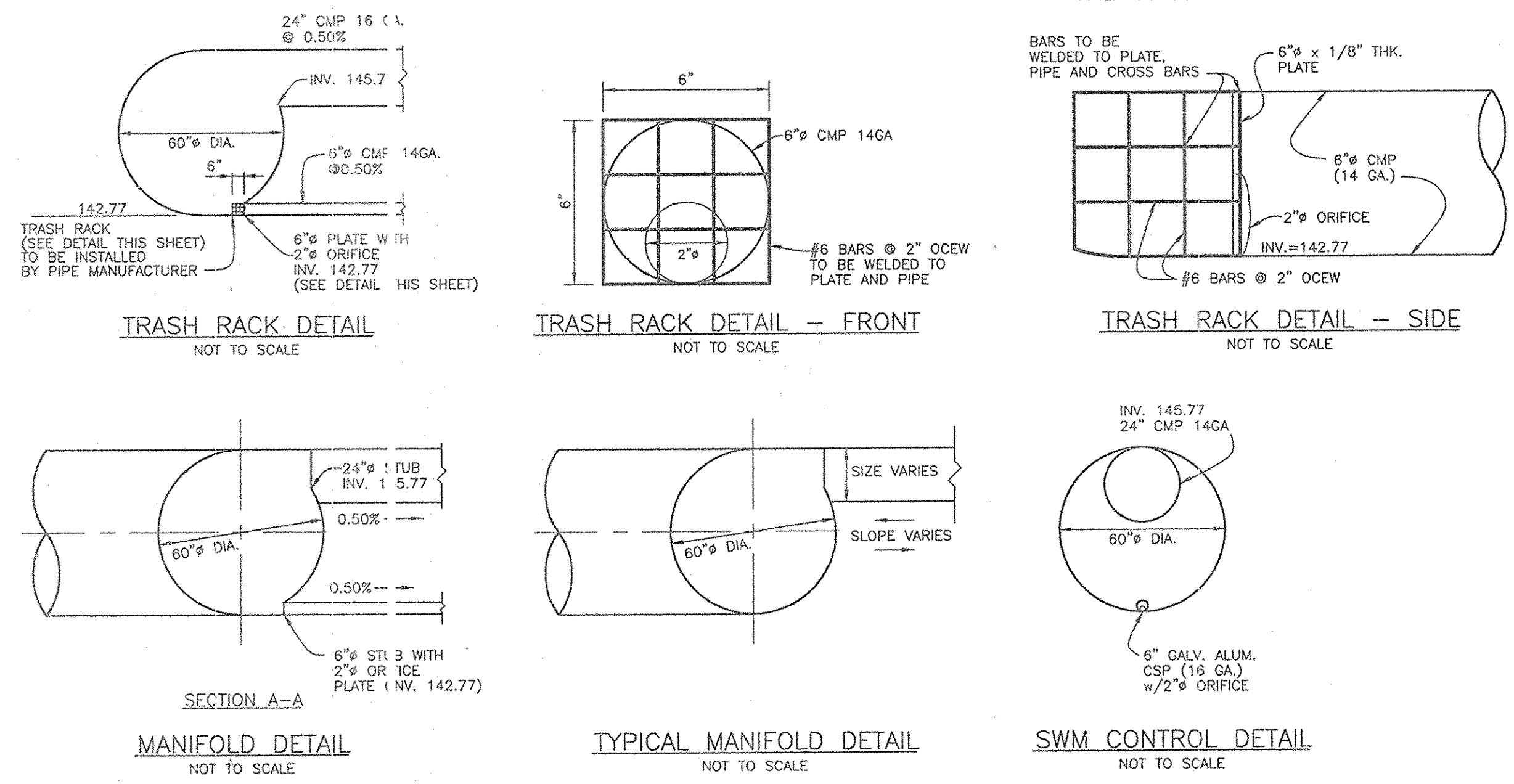
Facility	Type	Pretreatment area Required	Wq <sub>v</sub> Provided
WQ 1	Underground Sand Filter	923cf	3691cf
WQ 2	Underground Sand Filter	1005cf	4021cf
WQ 3	Underground Sand Filter	1213cf	4853cf
BR 1	Bio-retention Facility	819cf	3274cf

Underground Storage Facility No. 1  
1 yr w.s. elev. 145.75, Detention time 19.9 hrs  
10yr w.s. elev. 146.70  
100yr w.s. elev. 147.24

Underground Storage Facility No. 2  
1 yr w.s. elev. 134.95, Detention time 19.9 hrs  
10 yr w.s. elev. 135.63  
100yr w.s. elev. 135.99

Q at the study point

Existing	Developed
1yr 8.86cfs	7.03cfs
10 yr 40.14cfs	42.22cfs
100 yr	82.47cfs



NOTE: FOR TYPICAL CONSTRUCTION DETAILS SEE SHEET 11

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF DEVELOPMENT ENGINEER DIVISION  
*Howard* 11/10/12 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT  
*Candy* 2/10/12 DATE

DIRECTOR  
*Frank* 2/10/12 DATE

NO. DATE REVISION

**BENCHMARK**  
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**ENGINEERING, INC.**

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PHONE: 410-465-6105 FAX: 410-465-6644  
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STATE OF MARYLAND  
Professional Engineer  
*Deborah Moore*  
16166

DEVELOPER/CONTRACT PURCHASER: ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLICOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

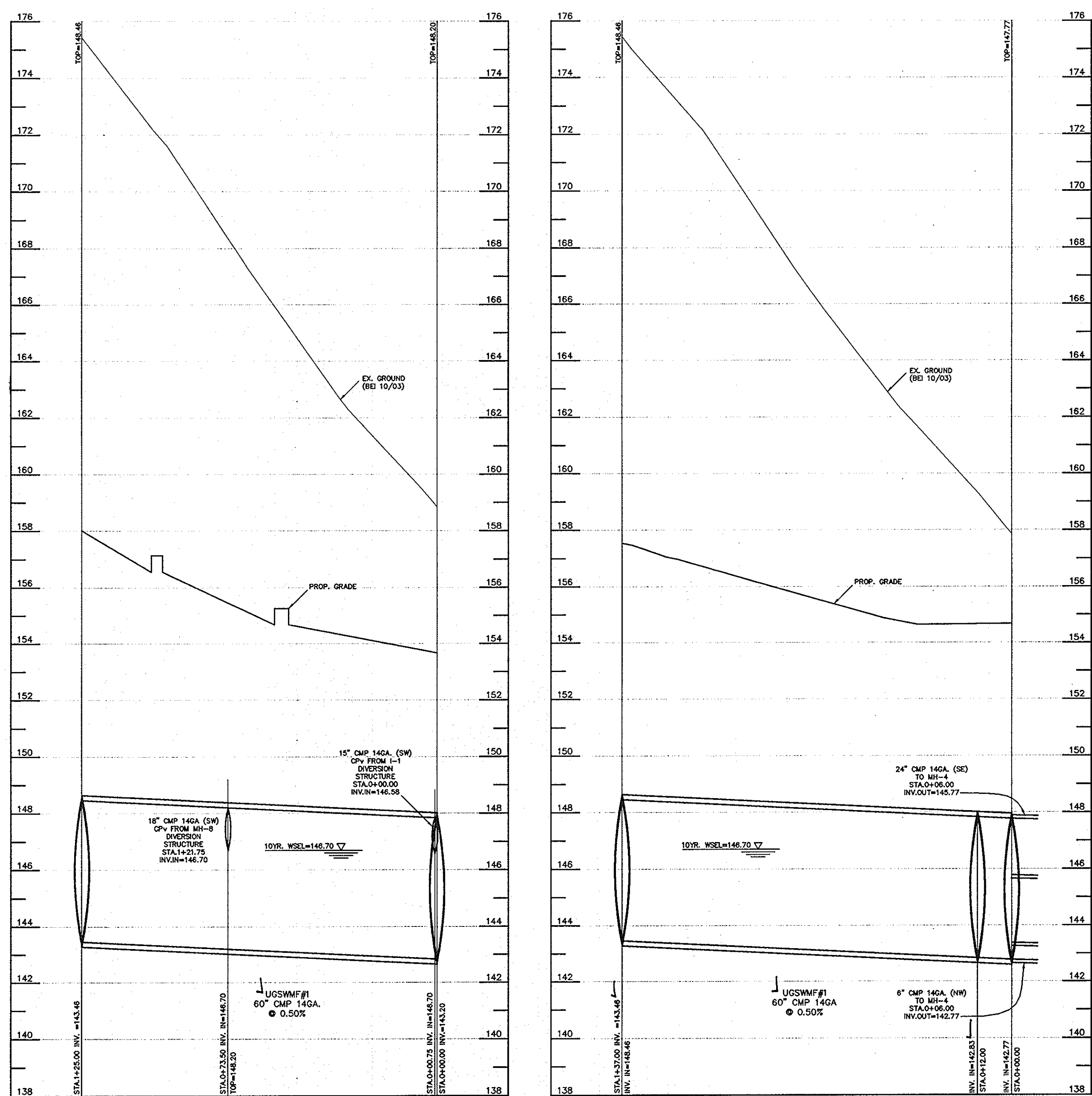
LOCATION: TAX MAP 38 - GRID 8  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS

DATE: JUNE 3, 2004 PROJECT NO. 1522  
NOVEMBER, 2006

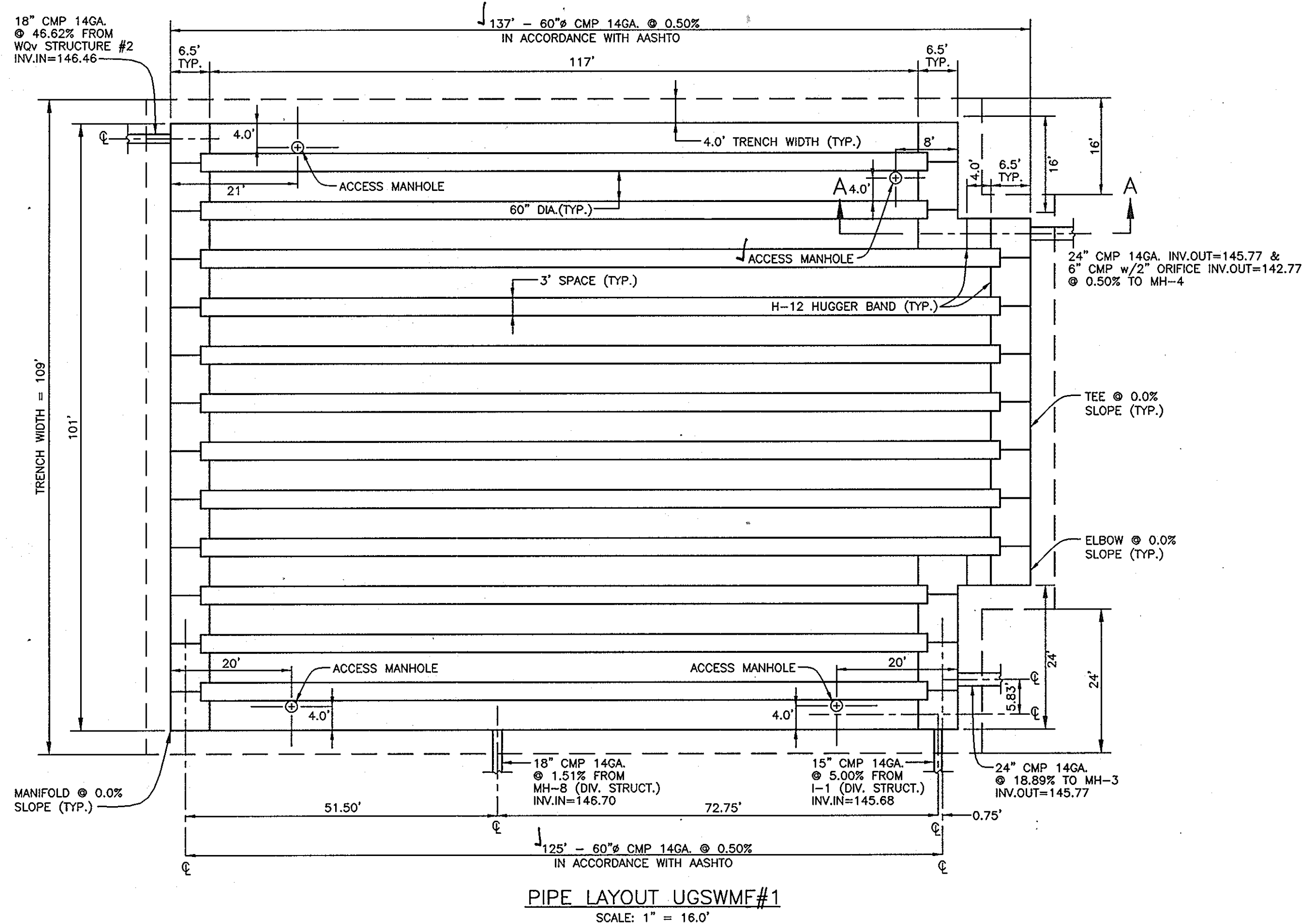
SCALE: AS SHOWN DRAWING 10 OF 38

Design: DAM/MCR Draft: WCR Check: DAM



UGSWMF#1 PROFILE 125' RUN  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=3'

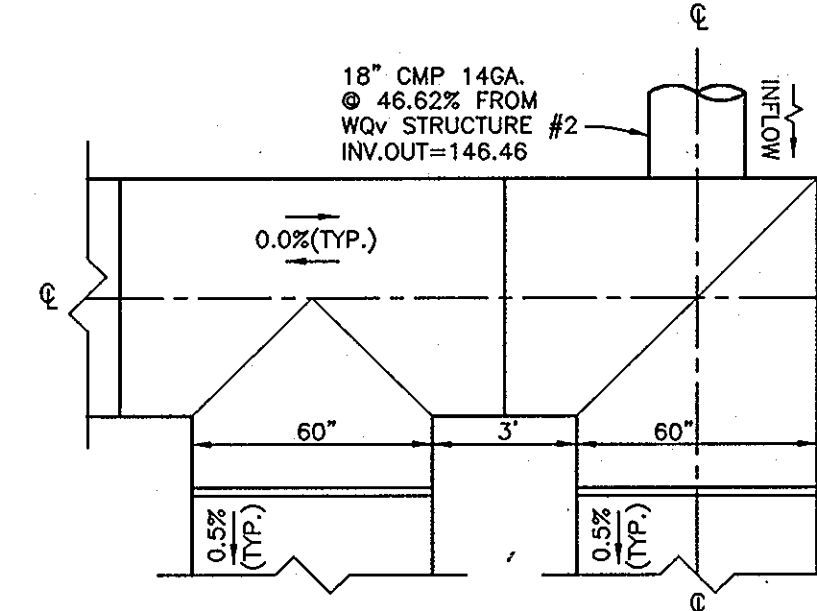
UGSWMF#1 PROFILE 137' RUN  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=3'



PIPE LAYOUT UGSWMF#1  
SCALE: 1" = 16.0'

SWM SUMMARY TABLE - D.A.=3.71 AC.±

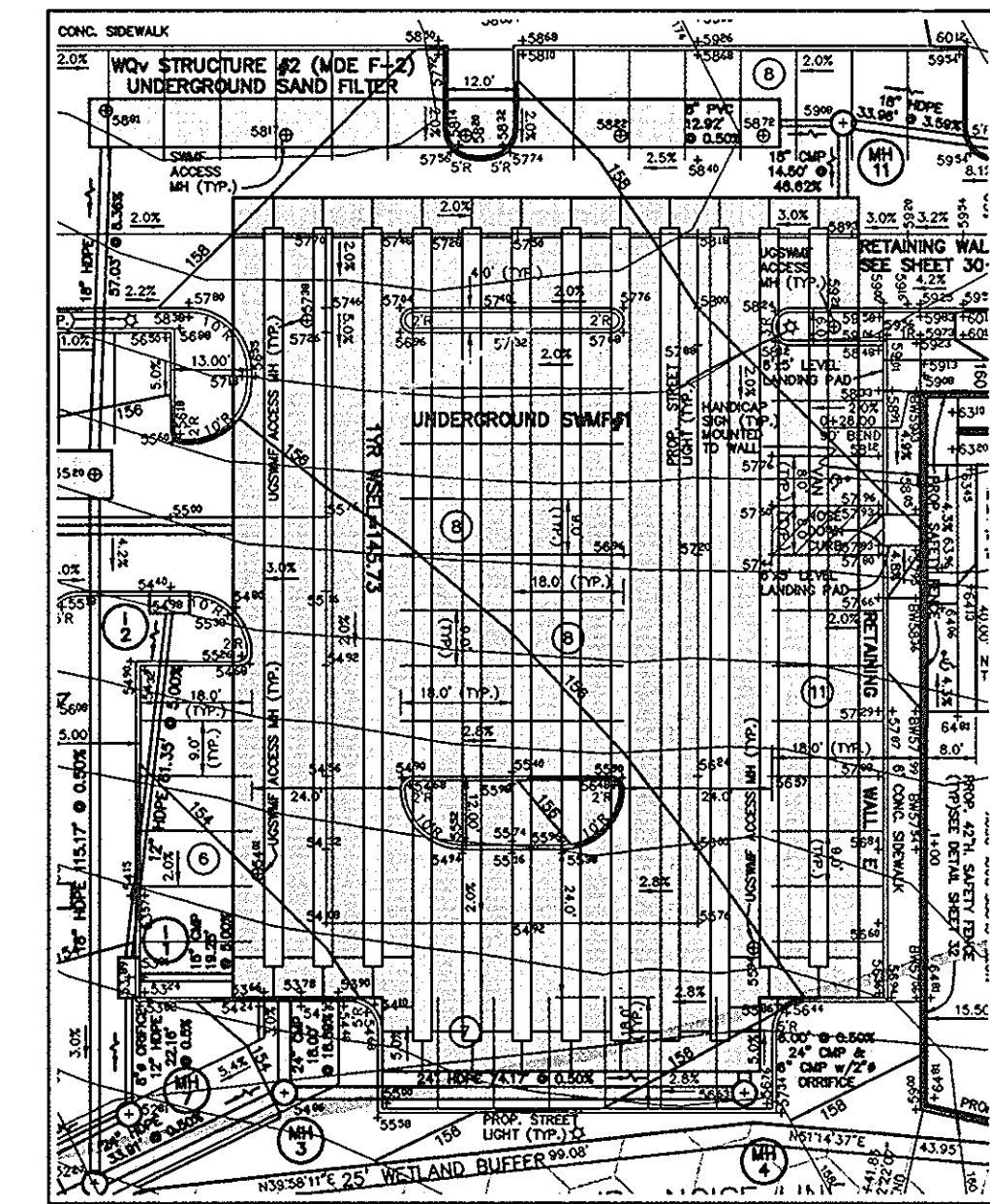
STORM FREQUENCY (YRS.)	DEVELOPED RUNOFF AND DISCHARGE (cfs)	WSEL (FT.)	STORAGE (AC.-FT.)
1	0.18	145.75	0.442
10	11.25	146.70	0.637
100	21.86	147.24	0.732



PIPE CONNECTION PLAN UGSWMF#1  
SCALE: 1" = 4.0'

OPERATION AND MAINTENANCE SCHEDULE FOR UNDERGROUND SWM FACILITIES

1. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN ITS OPERATION AND FUNCTION.
2. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
3. WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
4. THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEAN-UP OPERATION.
5. THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORM WATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
6. THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX (6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.



UGSWMF#1 PLAN  
SCALE: 1"=30'

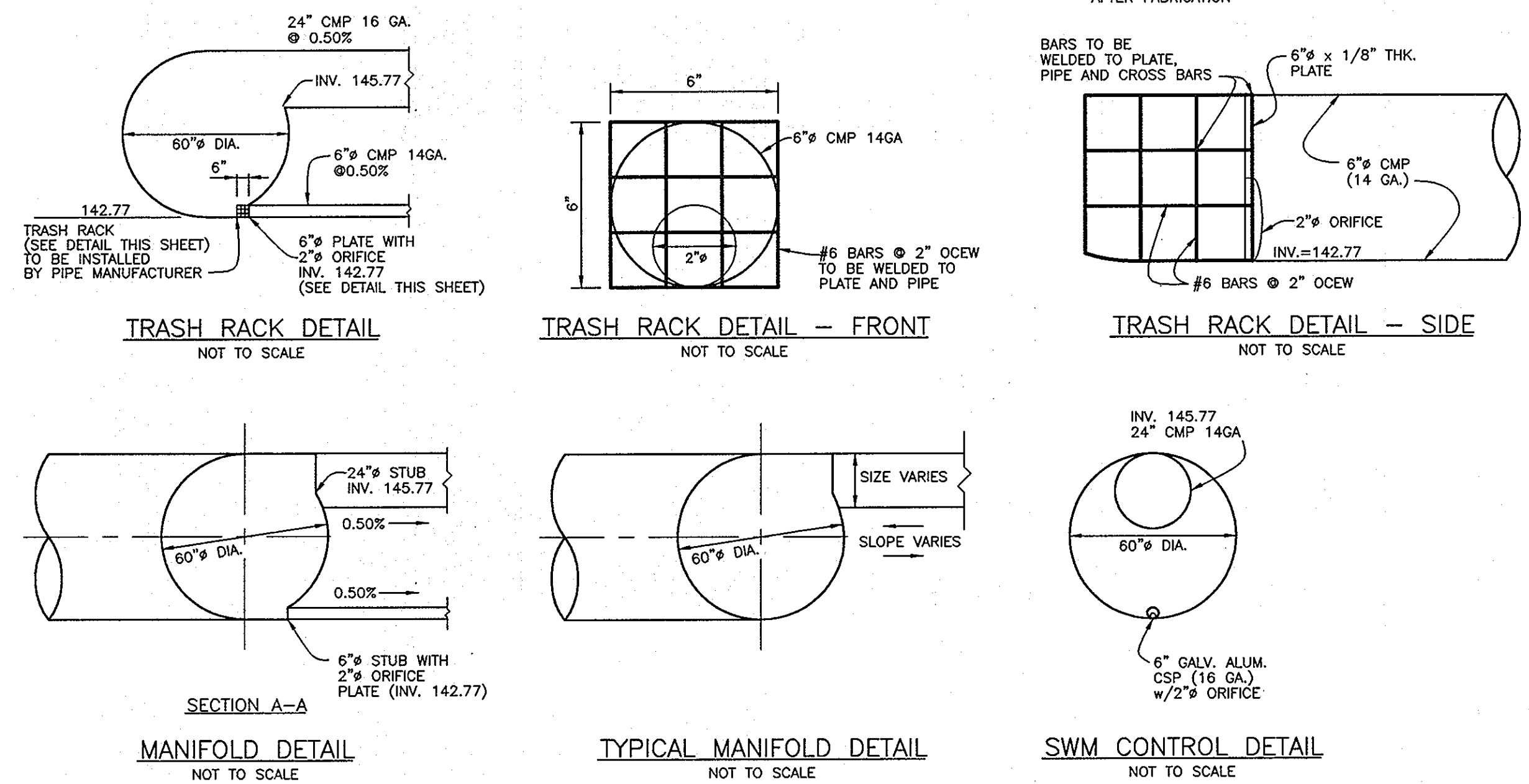
Facility Summary				
Facility	Type	Pretreatment area Required	Wqv Provided	Wqv Required
WQ 1	Underground Sand Filter	923cf	947cf	3691cf
WQ 2	Underground Sand Filter	1005cf	1047cf	4021cf
WQ 3	Underground Sand Filter	1213cf	1214cf	4853cf
BR 1	Bio-retention Facility	819cf	819 cf @ Elev. 139.03	3274cf

Underground Storage Facility No. 1  
1 yr w.s. elev. 145.75, Detention time 19.9 hrs  
10 yr w.s. elev. 146.70  
100 yr w.s. elev. 147.24

Underground Storage Facility No. 2  
1 yr w.s. elev. 134.95, Detention time 19.9 hrs  
10 yr w.s. elev. 135.63  
100 yr w.s. elev. 135.99

Q at the study point

Year	Existing	Developed
1 yr	8.86cfs	7.03cfs
10 yr	40.14cfs	42.22cfs
100 yr		82.47cfs



NOTE: FOR TYPICAL CONSTRUCTION DETAILS SEE SHEET 11

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF DEVELOPMENT ENGINEER'S DIVISION  
*Cathy Harman* 2/16/17  
CHIEF, DIVISION OF LAND DEVELOPMENT

DATE: 2/16/17

DIRECTOR  
*Paula L. Gough* 2/16/17  
DATE: 2/16/17

NO. DATE REVISION

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www.bel-civilengineering.com

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
Howard County, Maryland  
No. 11111  
PS-01111-16-9-10

DEVELOPER/CONTRACT PURCHASER:  
ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLCOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

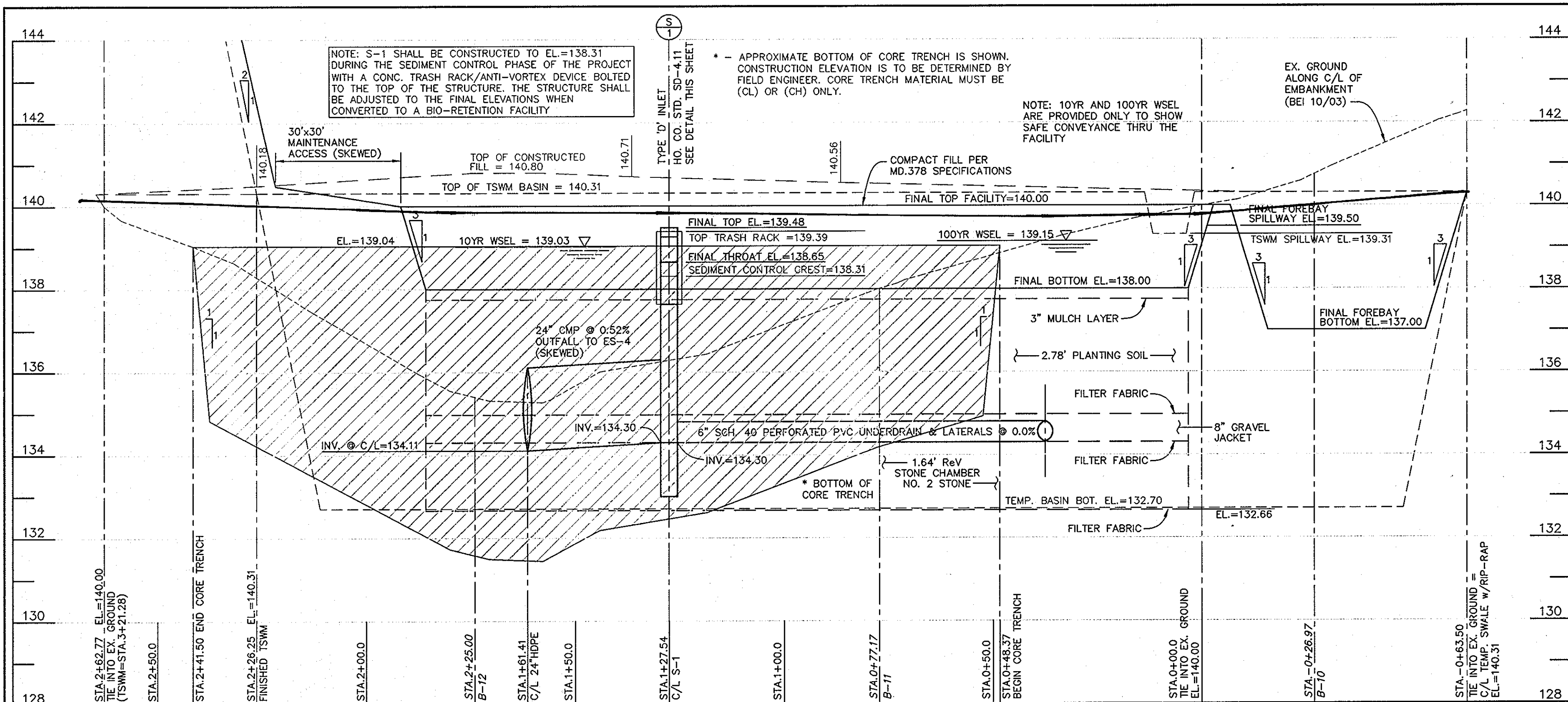
LOCATION: TAX MAP 38 - GRID B  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS

DATE: JUNE 3, 2004  
NOVEMBER, 2006  
PROJECT NO. 1522

SCALE: AS SHOWN DRAWING 10 OF 38

Design: DAM/MCR Draft: MCR Check: DAM



PROFILE ALONG C/L OF EMBANKMENT  
BIO-RETENTION FACILITY

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 2'

SYMBOL	QUANTITY	NAME	REMARKS
(R)	16	RHOODODENDRON CAMANESSE "RHODODENDRON"	2.0' - 2.5' HT. 15" - 18" WIDTH 18" - 24" SPACE MIN.
(Y)	11	ILEX VOMITORIA "YALUON HOLLY"	5.0' - 6.0' HT. UNSHEARED
(G)	63	ANDROPOGON GLOMERATUS "BUSHY BEARDGRASS"	UP TO 12" WHIPS
(S)	12	POPULUS HETEROPHYLLA "SWAMP COTTONWOOD"	2.0' - 2.5' HT. 15" - 18" WIDTH 18" - 24" SPACE MIN.
(B)	14	ANDROMEDA POLIFOLIA "BOG ROSEMARY"	5.0' - 6.0' HT. UNSHEARED
(A)	33	SPARGANIUM EURYCARPUM "SWAMP BURDECK"	UP TO 12" WHIPS

SWMF - LANDSCAPE DATA

HYDROLOGIC ZONE 3 - REGULARLY INUNDED SHORELINE FRINGED (HIGH MARSH)

HYDROLOGIC CONDITION - 0' TO 1'-0" DEEP HARDINESS - TEMPERATE ZONE 6b (-5' TO 0')

SEE SHEET FOR SEQUENCE OF CONSTRUCTION CONTRACTOR RESPONSIBILITIES, PRACTICES AND MAINTENANCE DUTIES

NOTE: REFER TO MDE 2000 MD STORMWATER DESIGN MANUAL VOLUMES 1 & 2 FOR LANDSCAPE CONTRACTOR RESPONSIBILITIES, PRACTICES AND MAINTENANCE DUTIES

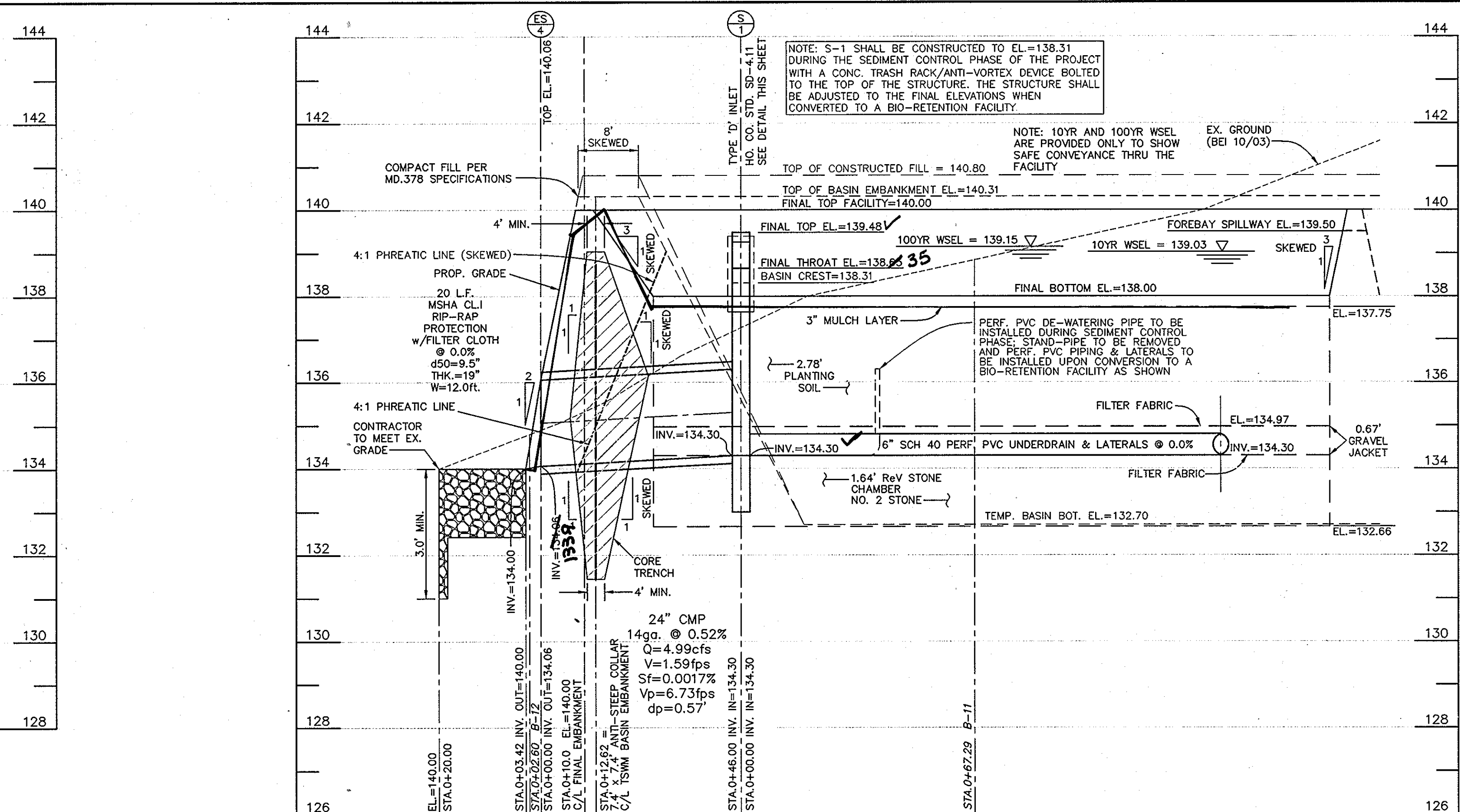
Facility	Type	Pretreatment area Required	Provided	Wqv Required	Provided
WQ1	Underground Sand Filter	923cf	947cf	3691cf	3723cf
WQ2	Underground Sand Filter	1005cf	1047cf	4021cf	4179cf
WQ3	Underground Sand Filter	1213cf	1214cf	4853cf	5471cf
BR1	Bio-retention Facility	819cf	819cf	3274cf	3274cf

Underground Storage Facility No. 1  
1 yr w.s. elev. 145.75, Detention time 19.9 hrs  
10 yr w.s. elev. 146.70  
100 yr w.s. elev. 147.24

Underground Storage Facility No. 2  
1 yr w.s. elev. 134.95, Detention time 19.9 hrs  
10 yr w.s. elev. 135.63  
100 yr w.s. elev. 135.99

Q at the study point

Existing	Developed
1 yr 8.86cfs	7.03cfs
10 yr 42.22cfs	42.22cfs
100 yr 82.47cfs	82.47cfs



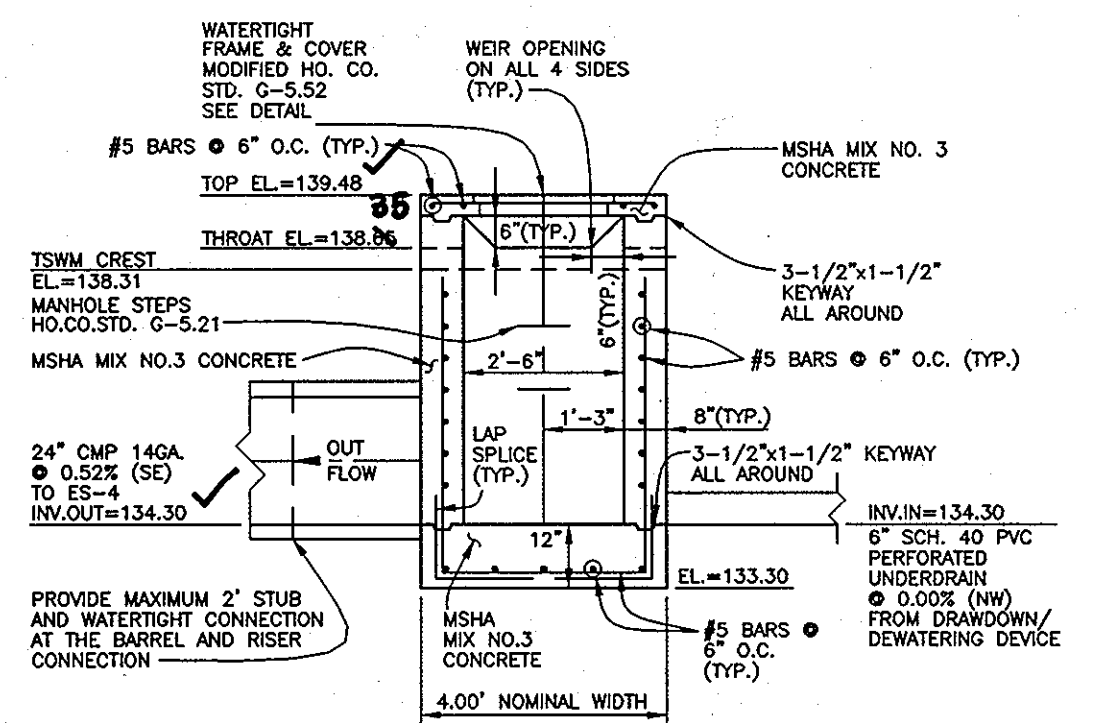
PROFILE ALONG C/L OF PRINCIPAL SPILLWAY

HORIZONTAL SCALE: 1" = 20'

VERTICAL SCALE: 1" = 2'

TABLE B.3.2 MATERIALS AND SPECIFICATIONS FOR BIO-RETENTION

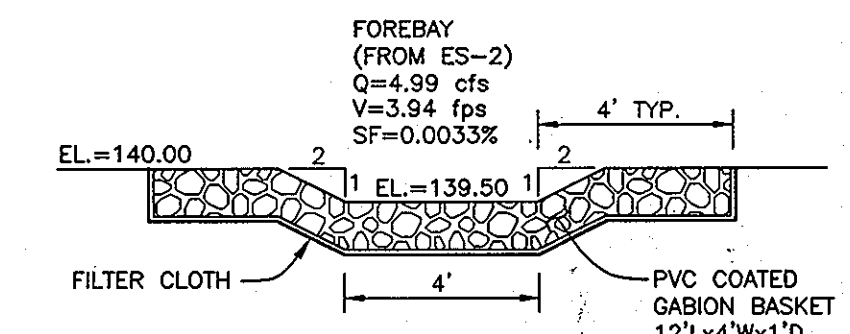
MATERIAL	SPECIFICATION	SIZE	NOTES:
PLANTINGS (IF REQUIRED)	SEE APPENDIX A, TABLE A.4	N/A	PLANTINGS ARE SITE SPECIFIC
PLANTING SOIL (2" TO 4" DEEP)	SAND: 35-50% Silt: 30-50% Clay: 10-25%	N/A	USDA SOIL TYPES: LOAMY SAND, SANDY LOAM OR LOAM
MULCH	SHREDED HARDWOOD	N/A	AGED 6 MONTHS, MINIMUM
PEA GRAVEL DIAPHRAM AND CURTAIN DRAIN	ASTM D-448 ORNAMENTAL STONE WASHED COBBLES	2" TO 5"	FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY
GEOTEXTILE (GLASS 'C')	APPROXIMATE OPENING SIZE: (ASTM D-4751) 100% TENSILE STRENGTH: (ASTM D-4632) PUNCTURE RESISTANCE: (ASTM D-4632)	N/A	FOR USE AS NECESSARY BENEATH UNDERDRAINS ONLY
UNDERDRAIN GRAVEL	ASTM M-43	0.375" TO 0.750"	
UNDERDRAIN PIPING	FRIB, TPE P528 OR AASHTO M-279	4" TO 6" RIGID SCH 40 PVC OR 30R35	3/8" PERFORATED HOLES PER ROW, MINIMUM OF 3" OF GRAVEL OVER PIPES, NOT NECESSARY UNDERNEATH PIPES
POURED-IN-PLACE CONC. (IF REQUIRED)	MISHA MIX NO. 3; FC=3500psi @ 28 DAYS, NORMAL MODUR, AIR ENTRAINMENT, REINFORCING TO MEET ASTM 615-09	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED; 28 DAY STRENGTH TEST AND SLUMP TEST; ALL CONC. DESIGN (CAST IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND; DESIGN TO INCLUDE MEETING AND CODE 5024/PERF. VERTICAL LOADING (H=10 OR H=20) ALLOWABLE HORIZONTAL LOADING (BASED ON SOIL PRESSURES); AND ANALYSIS OF POTENTIAL CRACKING
SAND (1" TO 2" DEEP)	ASTM M-6 OR ASTM C-33	0.075" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DUNESAND AND GRAYSTONE® ARE NOT ACCEPTABLE; NO CALCIUM CARBONATED OR DOLOMITIC SAND SUBSTITUTIONS ARE ACCEPTABLE; NO "ROCK DUST" CAN BE USED FOR SAND



CONFORMS TO 'D' INLET PER HO. CO. STD. SD-4.11  
OUTFALL STRUCTURE - S-1  
SCALE: 1" = 3'

OPERATION & MAINTENANCE SCHEDULE FOR BIO-RETENTION AREAS

- ANNUAL MAINTENANCE OF PLANT MATERIAL, MULCH LAYER AND SOIL LAYER IS REQUIRED. MAINTENANCE OF MULCH AND SOIL IS LIMITED TO CORRECTING AREAS OF EROSION OR WASH-OUT. ANY REPLACEMENT OF MULCH SHALL BE DONE IN THE SPRING. PLANT MATERIAL SHALL BE CHECKED FOR DISEASE & INSECT INFESTATION AND MAINTENANCE WILL ADDRESS DEAD MATERIAL & PRUNING.
- SCHEDULE OF PLANT INSPECTION WILL BE TWICE A YEAR IN THE SPRING AND FALL. THIS INSPECTION WILL INCLUDE: REMOVAL OF DEAD & DISEASED VEGETATION CONSIDERED BEYOND TREATMENT; TREATMENT OF ALL DISEASED TREES & SHRUBS; AND REPLACEMENT OF ALL DEFICIENT STAKES & WIRES.
- MULCH SHALL BE INSPECTED EACH SPRING. REMOVE THE PREVIOUS MULCH LAYER BEFORE APPLYING NEW LAYER ONCE EVERY 2 TO 3 YEARS.
- SOIL EROSION TO BE ADDRESSED ON AN AS-NEEDED BASIS, WITH A MINIMUM OF ONCE PER MONTH AND AFTER HEAVY STORM EVENTS.



PROFILE THROUGH FOREBAY WEIR  
SCALE: 1" = 4'

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
DATE: 1/16/07

CHIEF, DIVISION OF LAND DEVELOPMENT  
DATE: 2/16/07

DIRECTOR  
DATE: 2/20/07

NO. DATE REVISION

**BENCHMARK ENGINEERING, INC.**  
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ELLICOTT CITY, MARYLAND 21043  
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STATE OF MARYLAND PROFESSIONAL ENGINEER

DEVELOPER/CONTRACT PURCHASER: ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLICOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

LOCATION: TAX MAP 38 - GRID 8  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS

DATE: JUNE 3, 2004  
NOVEMBER, 2006

PROJECT NO. 1522

SCALE: AS SHOWN DRAWING 12 OF 38

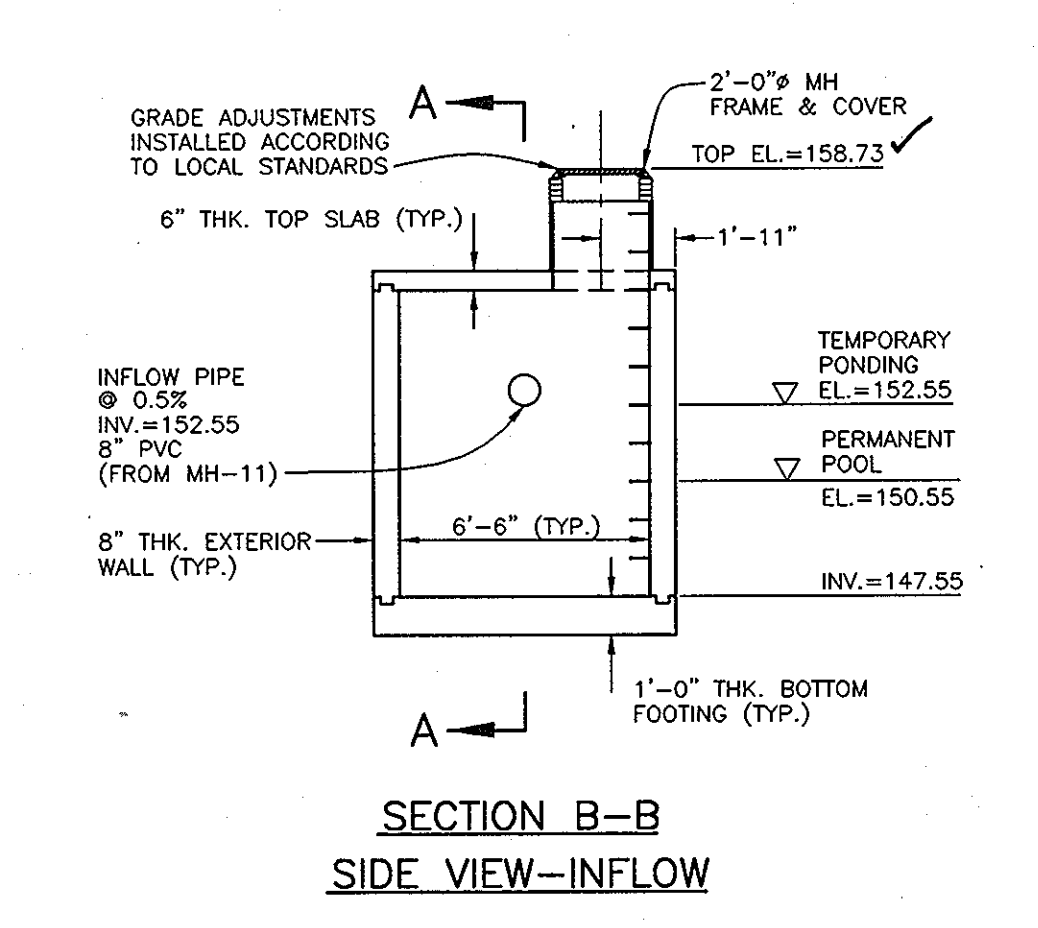
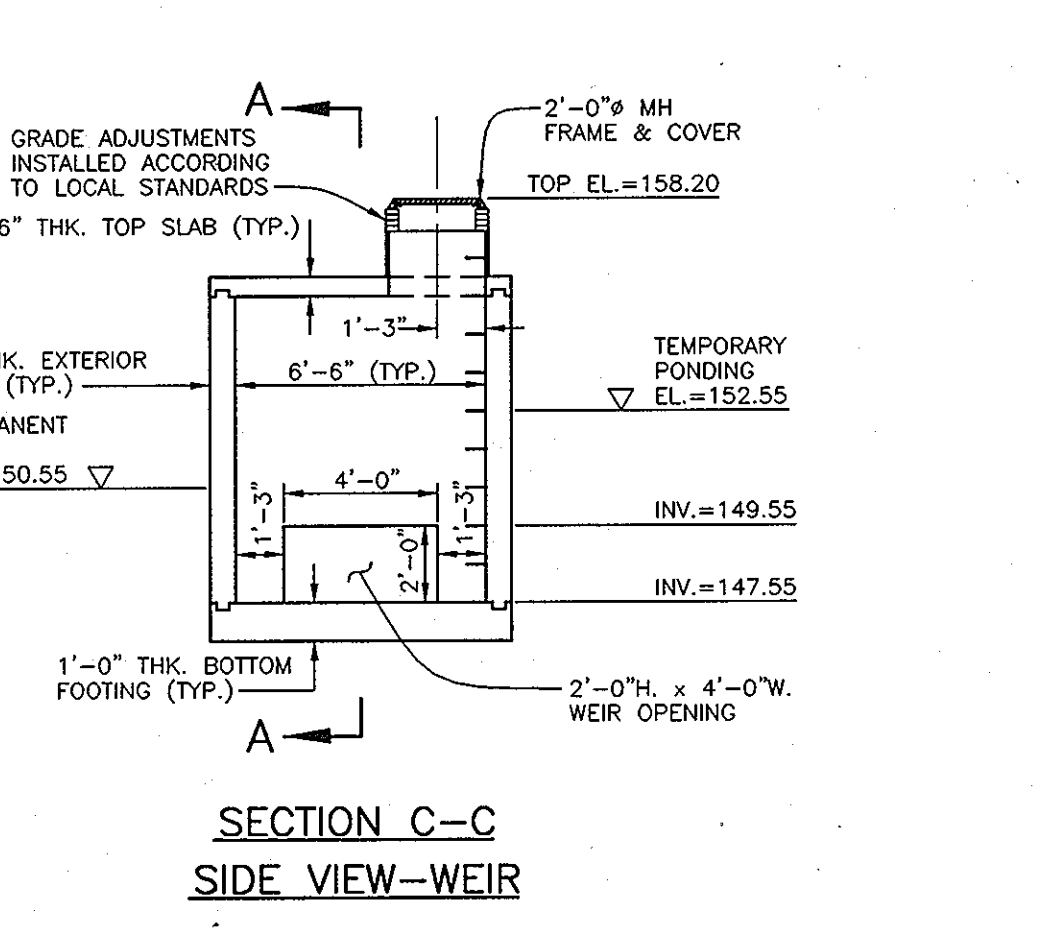
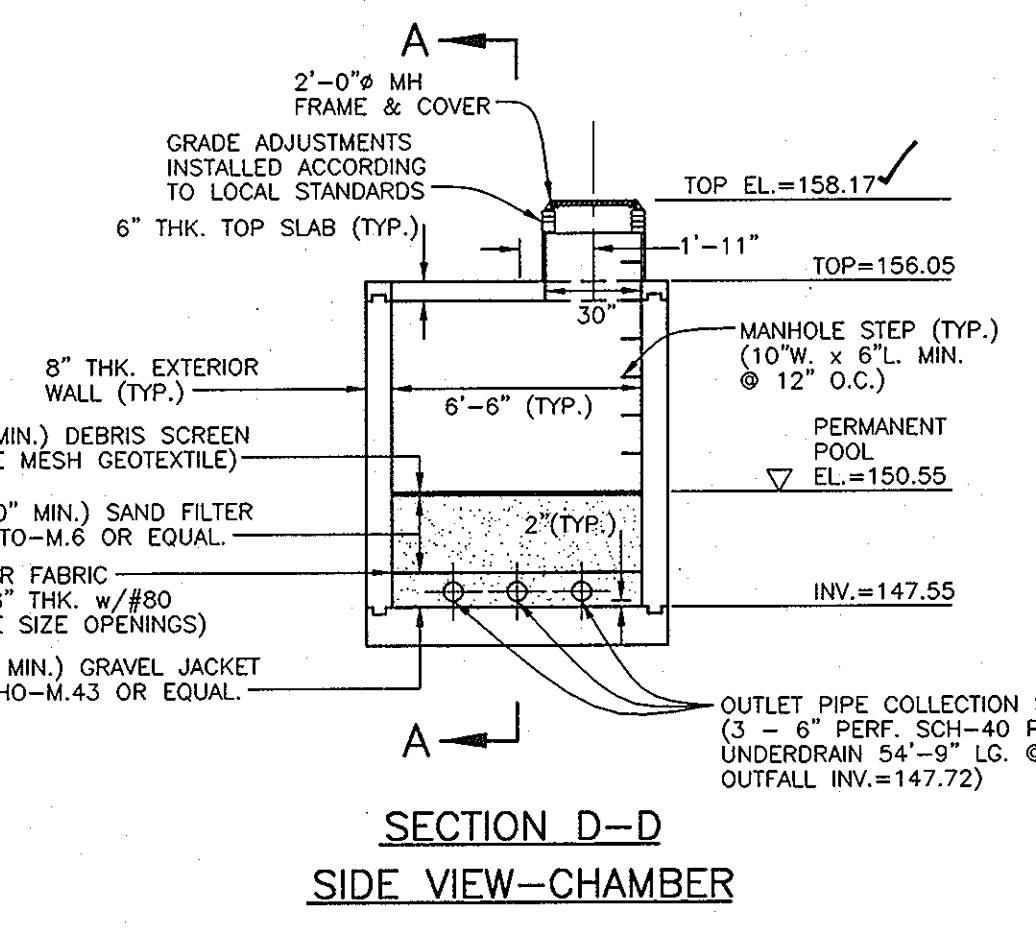
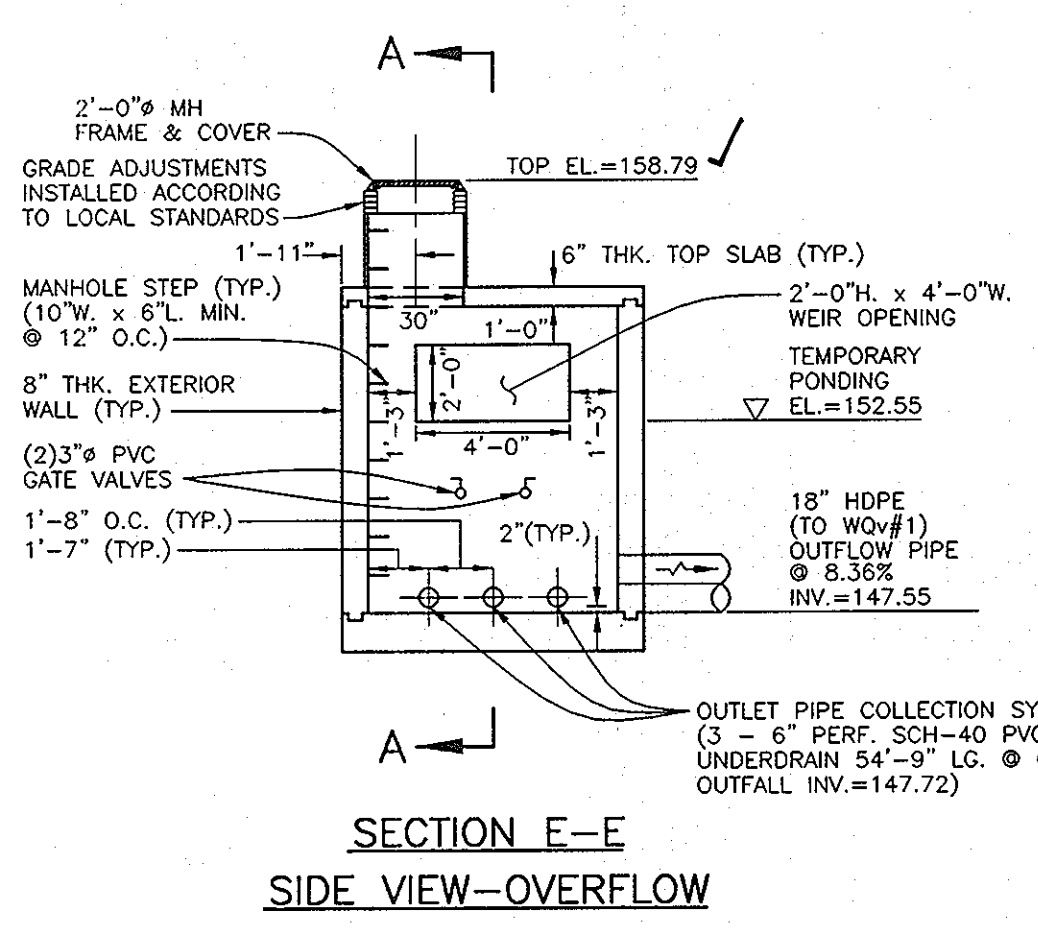
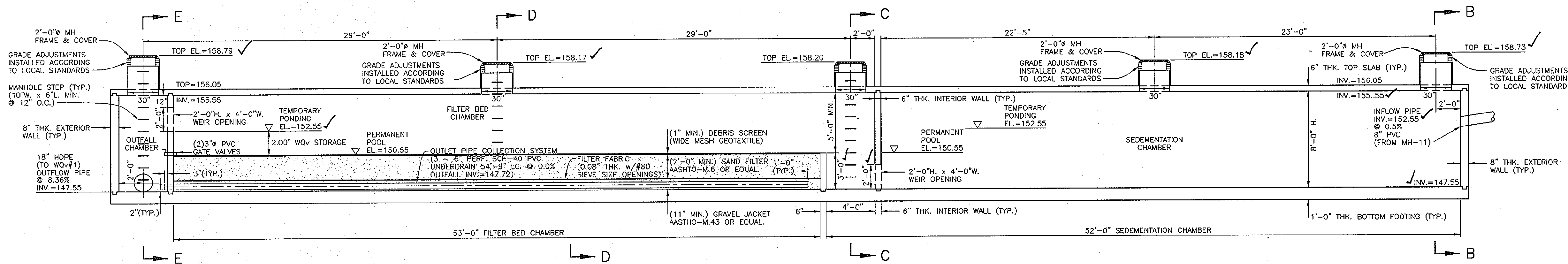
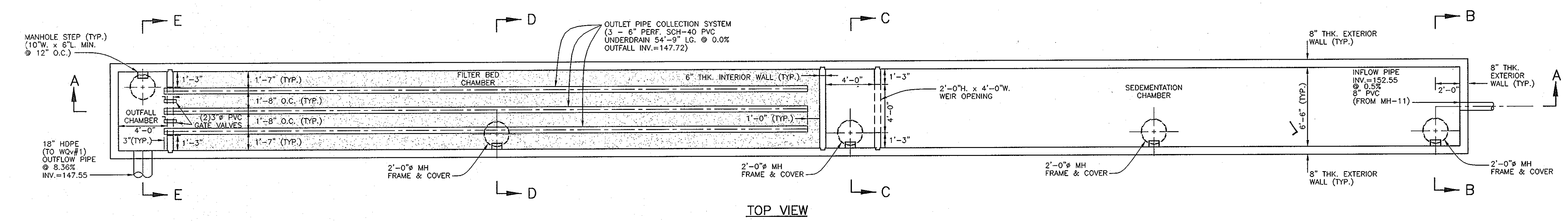
Design: DAM/MCR Draft: MCR Check: DAM



MATERIAL	SPECIFICATION	SIZE	NOTES:
NON-REBAR STEEL	ASTM A-36	N/A	STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM A-123
PEA GRAVEL	ASTM D-448	2" TO 4"	
ORNAMENTS STONE	ASTM D-448	2" TO 4"	
WASHED COBBLES	ASTM D-448	2" TO 4"	
GEOTEXTILE (CLASS "C")	APPARENT OPENING SIZE: (ASTM D-4751) GRAB TENSILE STRENGTH: (ASTM D-4751) PUNCTURE RESISTANCE: (ASTM D-4751)	0.075" THICK EQUIVALENT OPENING SIZE OF 8" PVC	MUST MAINTAIN 125 GPM / SQ. FT. FLOW RATE. NOTE: A PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS
UNDERDRAIN GRAVEL	AASHTO M-43	0.375" TO 0.750"	
UNDERDRAIN PIPING	7785, TYPE PE28 OR AASHTO M-278	4" TO 6" RIGID SCHED 40 PVC OR SD335	3/8" PERF. Ø 6" O.D., 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES; NOT NECESSARY UNDERDRAIN PIPES
POURED-IN-PLACE CONC. (IF REQUIRED)	MSHA MIX NO. 3, (1" x 3/4" MAX. AGGREGATE) Ø 28 DAYS, NORMAL WEIGHT, AIR ENTRAINED; REINFORCING TO MEET ASTM 615-60	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED: 28 DAY STRENGTH TEST AND SLUMP TEST; ALL CONC. DESIGN (CAST IN-PLACE OR PRE-CAST) NOT USUALLY PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS REQUIRES DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND.
SAND (3" DEEP)	AASHTO M-6 OR ASTM C-33	0.075" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DABASE AND GRANITESTONE ARE NOT ACCEPTABLE; NO CALCIUM CARBONATE OR SOLOMIC SAND SUBSTITUTIONS ARE ACCEPTABLE; NO "ROCK DUST" CAN BE USED FOR SAND

**OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED UNDERGROUND STORMWATER FILTRATION SYSTEMS SAND FILTER (WQv#1, WQv#2, WQv#3)**

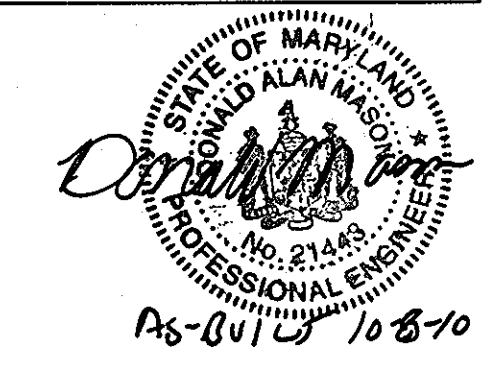
- THE SEDIMENT CHAMBER OUTLET DEVICES SHALL BE CLEANED AND/OR REPAIRED WHEN DRAWDOWN TIMES WITHIN THE CHAMBER EXCEEDS 36 HOURS.
- DEBRIS & LITTER SHALL BE REMOVED AS NECESSARY TO INSURE PROPER OPERATION OF THE SYSTEM.
- SEDIMENT SHALL BE CLEANED-OUT OF THE SEDIMENTATION CHAMBER WHEN IT ACCUMULATES TO A DEPTH OF 6 INCHES.
- WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS & LIQUIDS MUST BE FOLLOWED BY THE OWNER.
- A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
- THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
- ONCE THE PERFORMANCE CHARACTERISTICS OF THE INFILTRATION SYSTEM HAVE BEEN VERIFIED, THE MONITORING SCHEDULE CAN BE REDUCED TO AN ANNUAL BASIS UNLESS THE PERFORMANCE DATA INDICATES THAT A MORE FREQUENT SCHEDULE IS REQUIRED.



**WQv#2 UNDERGROUND SAND FILTER (MDE TYPE F-2)**

SCALE: 1"=5'  
NOTE: STRUCTURE SHALL BE MADE ENTIRELY OF MSHA MIX NO.3 CONC.

NOTE: THE INCOMING PIPE TO THE FACILITIES SHALL BE CAPPED OFF UNTIL THE CONTRIBUTING AREAS HAVE BEEN STABILIZED.



NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *[Signature]* 1/24/07

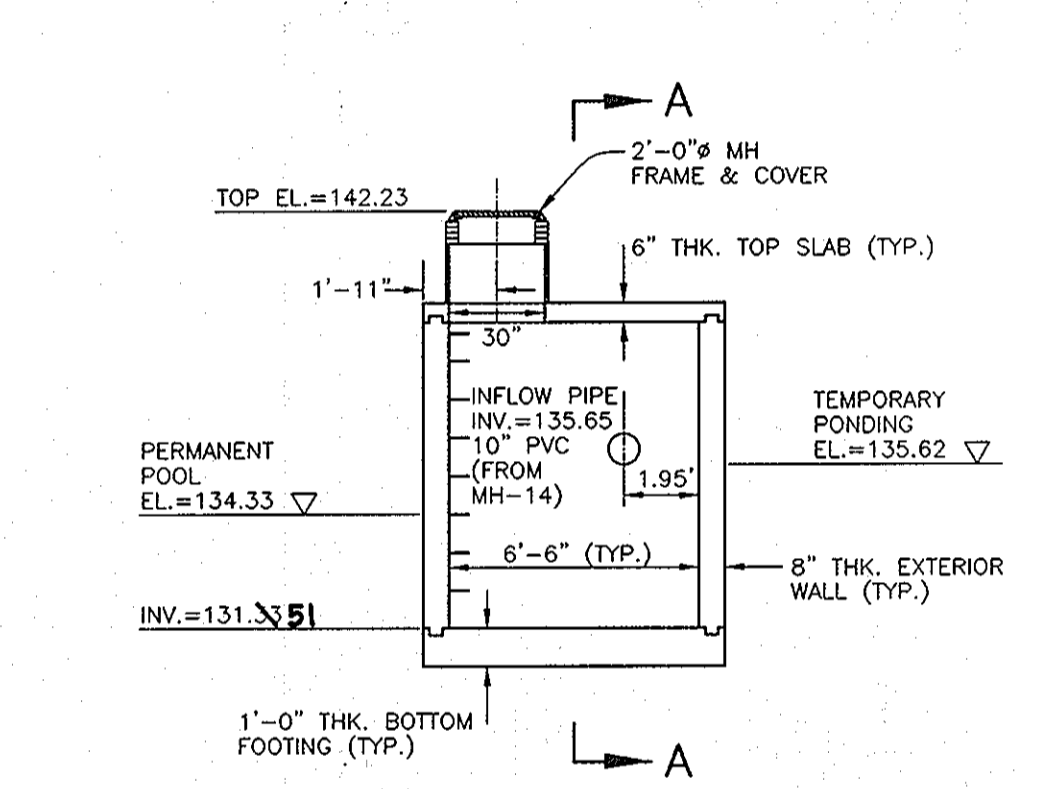
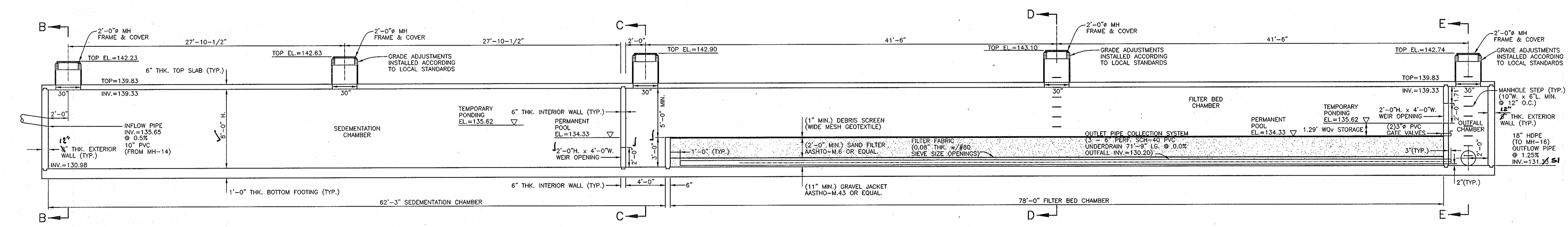
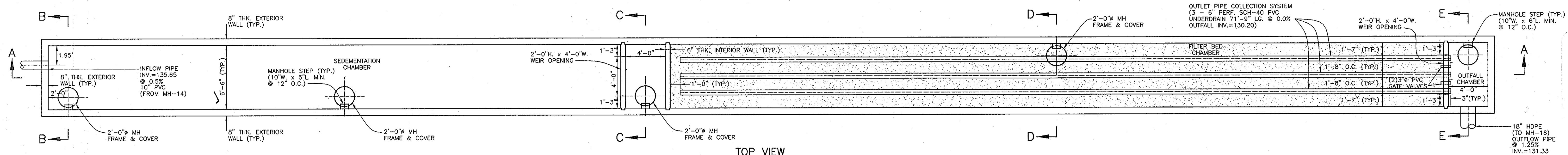
CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 2/16/07

DIRECTOR *[Signature]* 2/20/07

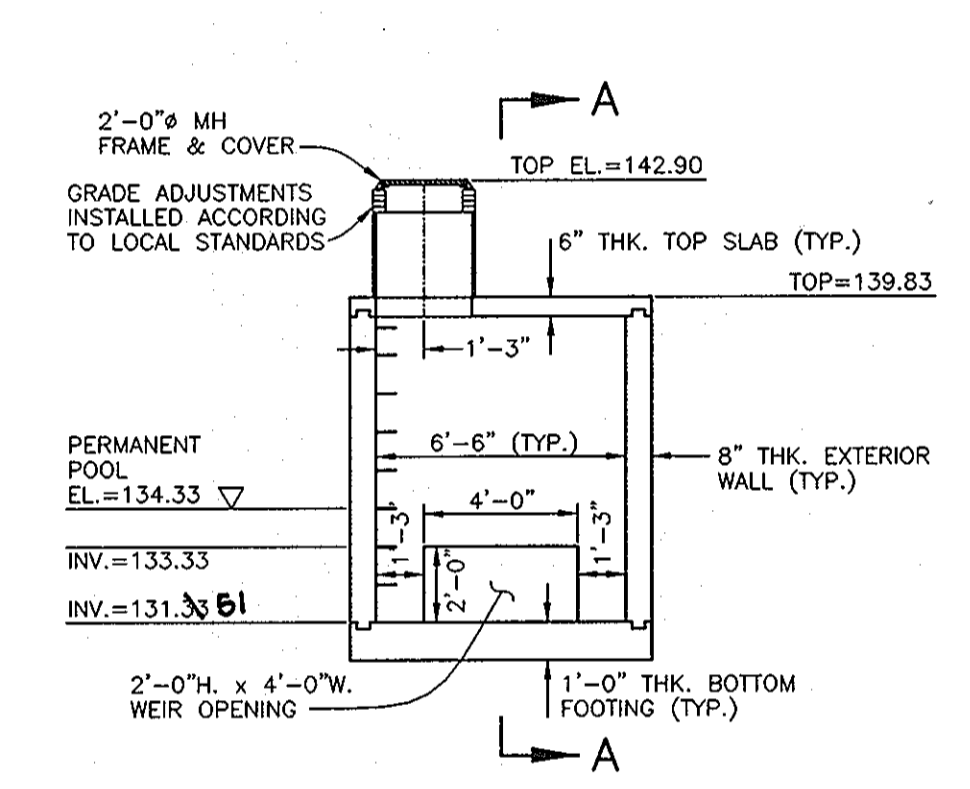
**BENCHMARK ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6644  
www.bei-civilengineering.com

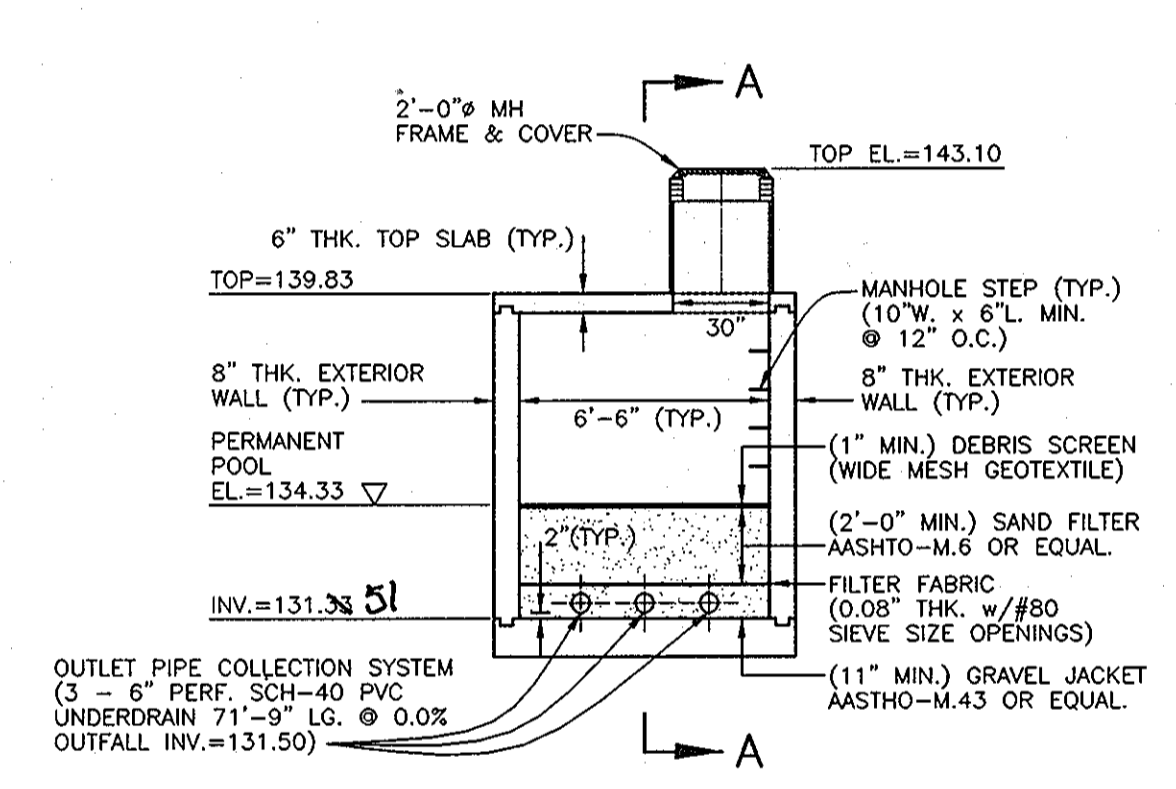
DEVELOPER/CONTRACT PURCHASER: <b>ELKRIDGE TOWN CENTER, L.L.C.</b> P.O. BOX 417 ELLCOTT CITY, MD 21041 PHONE: 410-465-4244	PROJECT: <b>ELKRIDGE TOWN CENTER</b> PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
LOCATION: TAX MAP 38 - GRID 8 PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND	TITLE: <b>STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS</b>
DATE: JUNE 3, 2004 FEBRUARY 10, 2005	PROJECT NO. 1522
Design: DAM/MCR Draft: MCR Check: DAM	SCALE: AS SHOWN DRAWING 14 OF 38



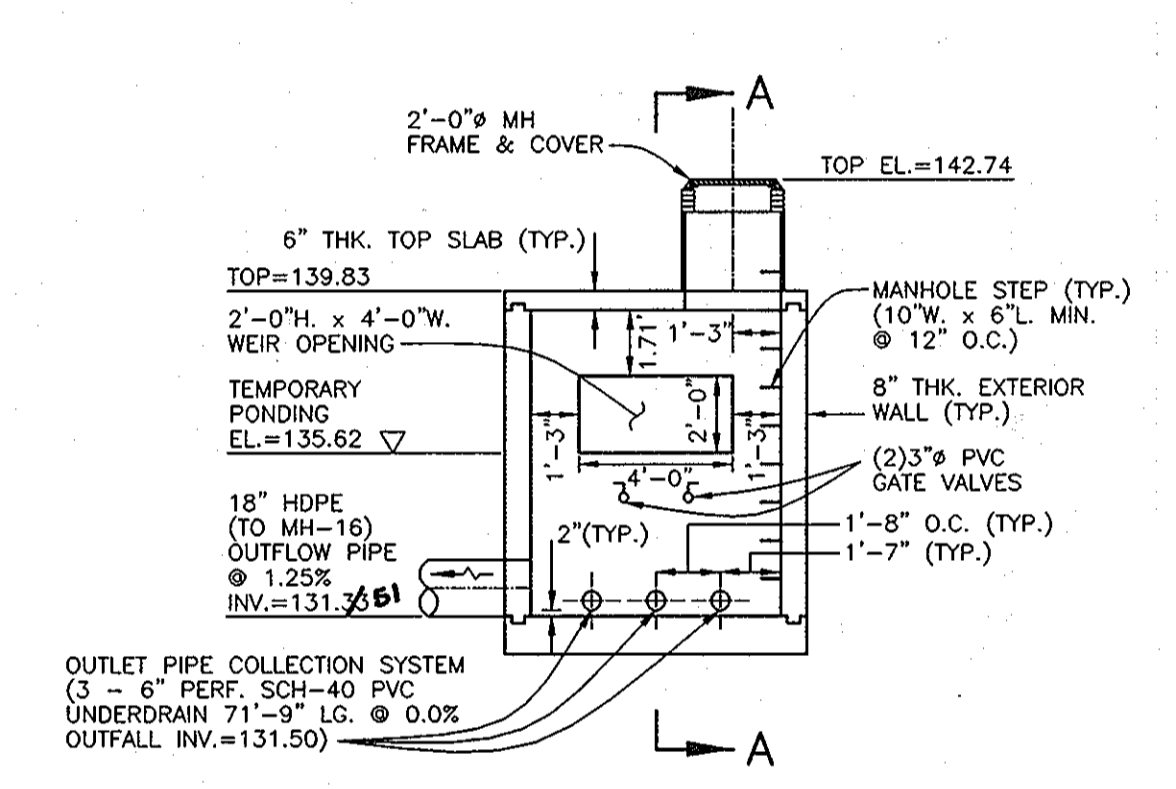
SECTION B-B  
SIDE VIEW-INFLOW



SECTION C-C  
SIDE VIEW-WEIR



SECTION D-D  
SIDE VIEW-CHAMBER



SECTION E-E  
SIDE VIEW-OVERFLOW

**OPERATION & MAINTENANCE SCHEDULE FOR PRIVATELY OWNED AND MAINTAINED UNDERGROUND STORMWATER FILTRATION SYSTEMS SAND FILTER (WQv#1, WQv#2, WQv#3)**

1. THE SEDIMENT CHAMBER OUTLET DEVICES SHALL BE CLEANED AND/OR REPAIRED WHEN DRAWDOWN TIMES WITHIN THE CHAMBER EXCEEDS 36 HOURS.
2. DEBRIS & LITTER SHALL BE REMOVED AS NECESSARY TO INSURE PROPER OPERATION OF THE SYSTEM.
3. SEDIMENT SHALL BE CLEANED-OUT OF THE SEDIMENTATION CHAMBER WHEN IT ACCUMULATES TO A DEPTH OF 6 INCHES.
4. WHEN WATER PONDS ON THE SURFACE OF THE FILTER BED FOR MORE THAN 72 HOURS, THE TOP FEW INCHES OF DISCOLORED MATERIAL SHALL BE REPLACED WITH FRESH MATERIAL. PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIALS & LIQUIDS MUST BE FOLLOWED BY THE OWNER.
5. A LOGBOOK SHALL BE MAINTAINED TO DETERMINE THE RATE AT WHICH THE FACILITY DRAINS.
6. THE MAINTENANCE LOGBOOK SHALL BE AVAILABLE TO HOWARD COUNTY FOR INSPECTION TO INSURE COMPLIANCE WITH OPERATION AND MAINTENANCE CRITERIA.
7. 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.

MATERIAL	SPECIFICATION	SIZE	NOTES
NON-REBAR STEEL	ASTM A-36	N/A	STRUCTURAL STEEL TO BE HOT-DIPPED GALVANIZED ASTM A-123
PEA GRAVEL	ASTM D-445	PEA GRAVEL: 10.0 TO 20.0	
ORNAMENTAL STONE	ASTM D-445	ORNAMENTAL STONE: 2" TO 2.5"	
WASHED COBBLES	ASTM D-445	WASHED COBBLES: 2" TO 2.5"	
GEOTEXTILE (CLASS "C")	APPARENT OPENING SIZE: (ASTM D-4751) 0.075" (3.0mm) GRAV TENSILE STRENGTH: (ASTM D-4751) 28 LBS/INCH (200 N/CM) PUNCTURE RESISTANCE: (ASTM D-4751) 15 LBS/INCH (100 N/CM)	0.075" (3.0mm)	MUST MAINTAIN 125 GPM / SQ. FT. FLOW RATE. NOTE: A PEA GRAVEL LAYER MAY BE SUBSTITUTED FOR GEOTEXTILES MEANT TO "SEPARATE" SAND FILTER LAYERS
UNDERDRAIN GRAVEL	ASTM M-43	0.375" TO 0.750"	
UNDERDRAIN PIPING	F758, TYPE PS28 OR ASTM M-278	4" TO 6" RIGID SCH40 PVC OR SD355	3/8" PERF. @ 6" O.C., 4 HOLES PER ROW; MINIMUM OF 3" OF GRAVEL OVER PIPES. NOT NECESSARY UNDERNEATH PIPES
POURED-IN-PLACE CONC. (IF REQUIRED)	MSHA MIX NO. 3, (F-30000) @ 28 DAYS. NORMAL WEIGHT, AIR ENTRAINED, REINFORCING TO MEET ASTM 615-60	N/A	ON-SITE TESTING OF POURED-IN-PLACE CONC. REQUIRED; 28 DAY STRENGTH TEST AND SLUMP TEST. ALL CONC. DESIGN (CAST-IN-PLACE OR PRE-CAST) NOT USING PREVIOUSLY APPROVED STATE OR LOCAL STANDARDS. DESIGN DRAWINGS SEALED AND APPROVED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF MARYLAND
SAND (3.0" DEEP)	ASTM M-6 OR ASTM C-33	0.075" TO 0.04"	SAND SUBSTITUTIONS SUCH AS DOLomite AND GRANITIC SAND ARE NOT ACCEPTABLE. NO CALCIUM CARBONATE OR SOLIMINE SAND SUBSTITUTIONS ARE ACCEPTABLE. NO "ROCK DUST" CAN BE USED FOR SAND

Facility	Type	Pretreatment area Required	Pretreatment area Provided	Wqv Required	Wqv Provided
WQ1	Underground Sand Filter	923cf	947cf	3691cf	3723cf
WQ2	Underground Sand Filter	1005cf	1047cf	4021cf	4179cf
WQ3	Underground Sand Filter	1213cf	1214cf	4853cf	5471cf
BR 1	Bio-retention Facility	819cf	819 cf @ Elev. 139.03	3274cf	3274cf

Underground Storage Facility No. 1	
1 yr w.s. elev. 145.75, Detention time 19.9 hrs	
100yr w.s. elev. 146.70	
100yr w.s. elev. 147.24	

Underground Storage Facility No. 2	
1 yr w.s. elev. 134.95, Detention time 19.9 hrs	
10 yr w.s. elev. 135.63	
100yr w.s. elev. 135.99	

Q at the study point		
Existing	Developed	
1yr	8.86cfs	7.03cfs
10yr	40.14cfs	42.22cfs
100yr		82.47cfs

**WQv#3 UNDERGROUND SAND FILTER (MDE TYPE F-2)**  
SCALE: 1"=5'

NOTE: STRUCTURE SHALL BE MADE ENTIRELY OF MSHA MIX NO.3 CONC.

NOTE: THE INCOMING PIPE TO THE FACILITIES SHALL BE CAPPED OFF UNTIL THE CONTRIBUTING AREAS HAVE BEEN STABILIZED

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*[Signature]* 11/2/07  
DATE: 11/2/07

CHIEF, DIVISION OF LAND DEVELOPMENT  
*[Signature]* 2/16/07  
DATE: 2/16/07

DIRECTOR  
*[Signature]* 2/14/07  
DATE: 2/14/07

NO.	DATE	REVISION

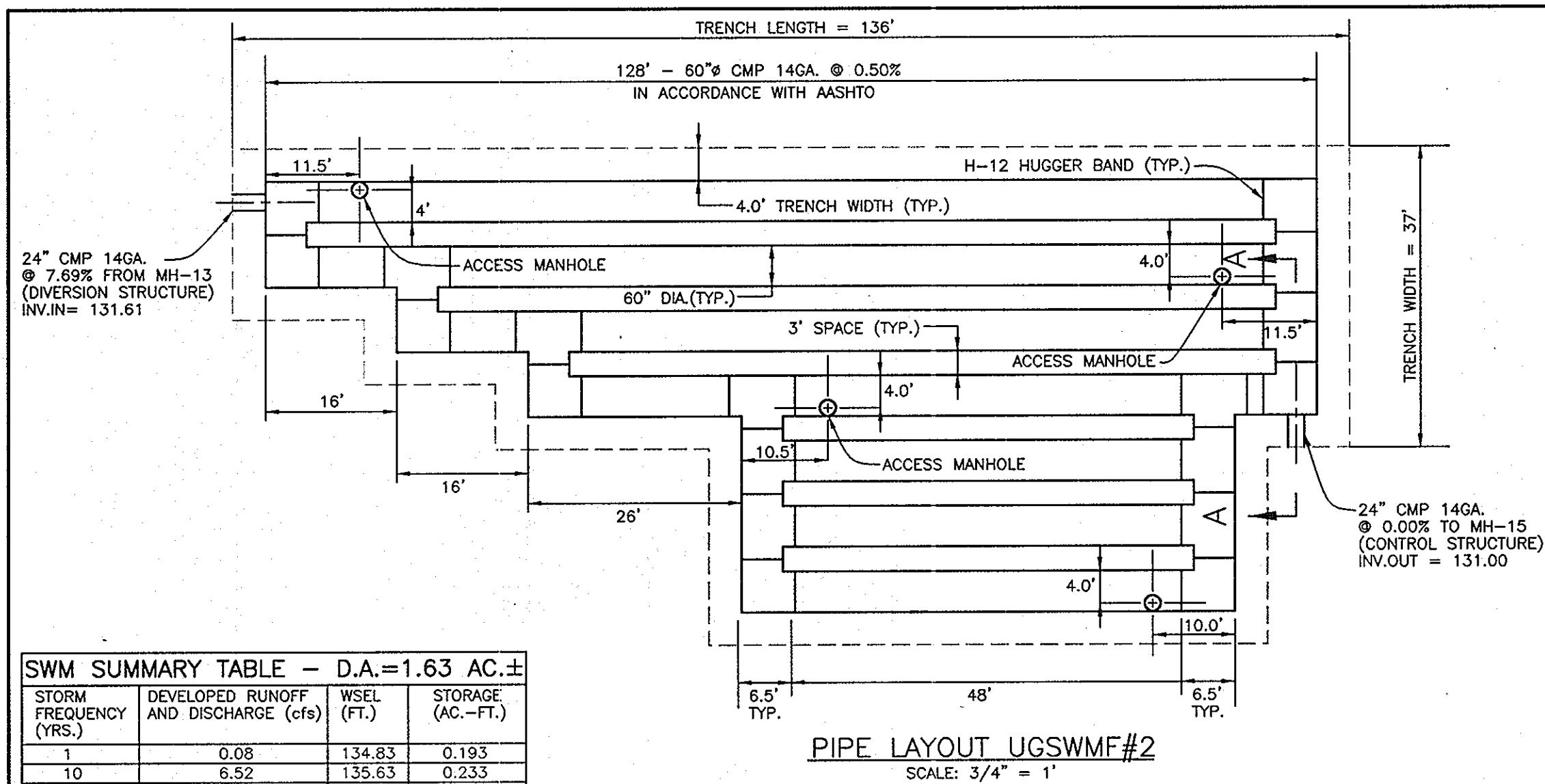
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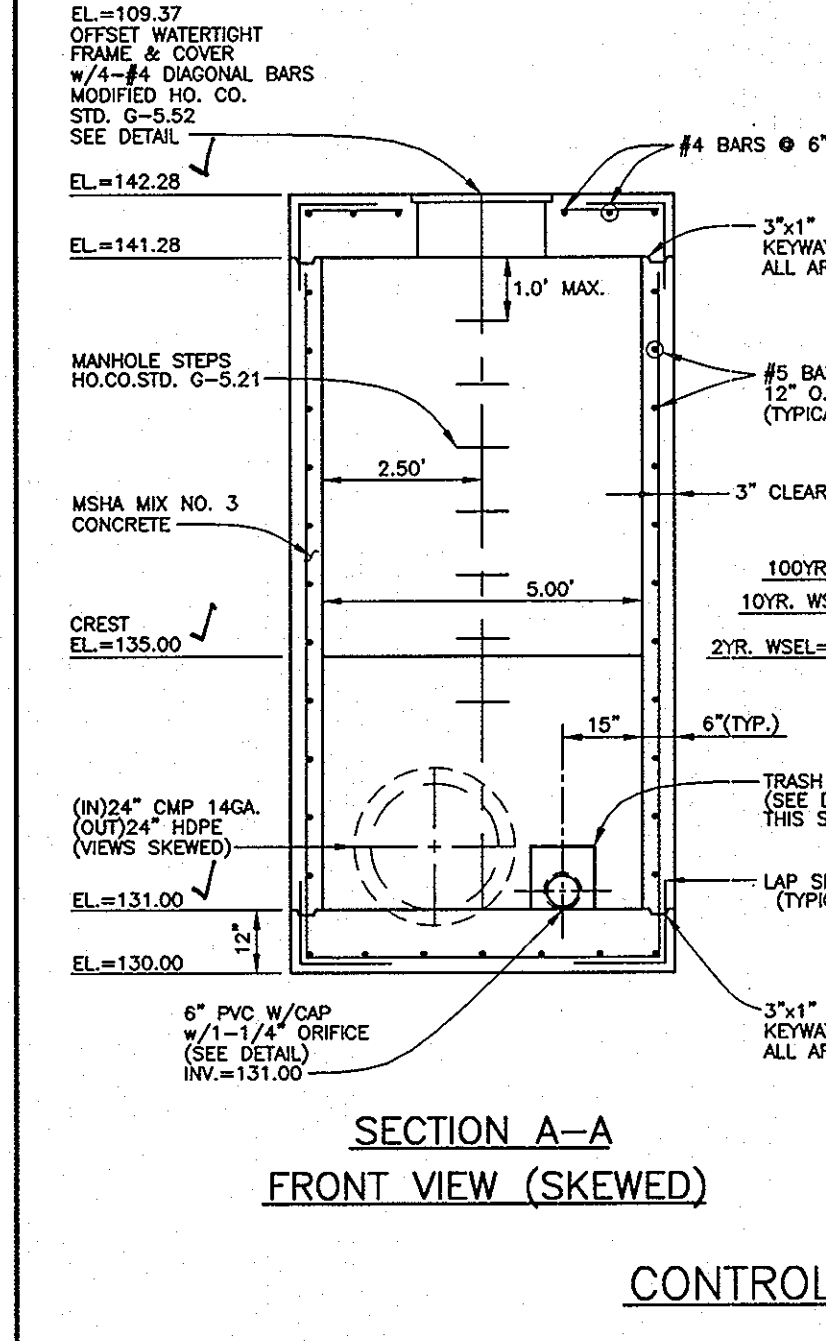
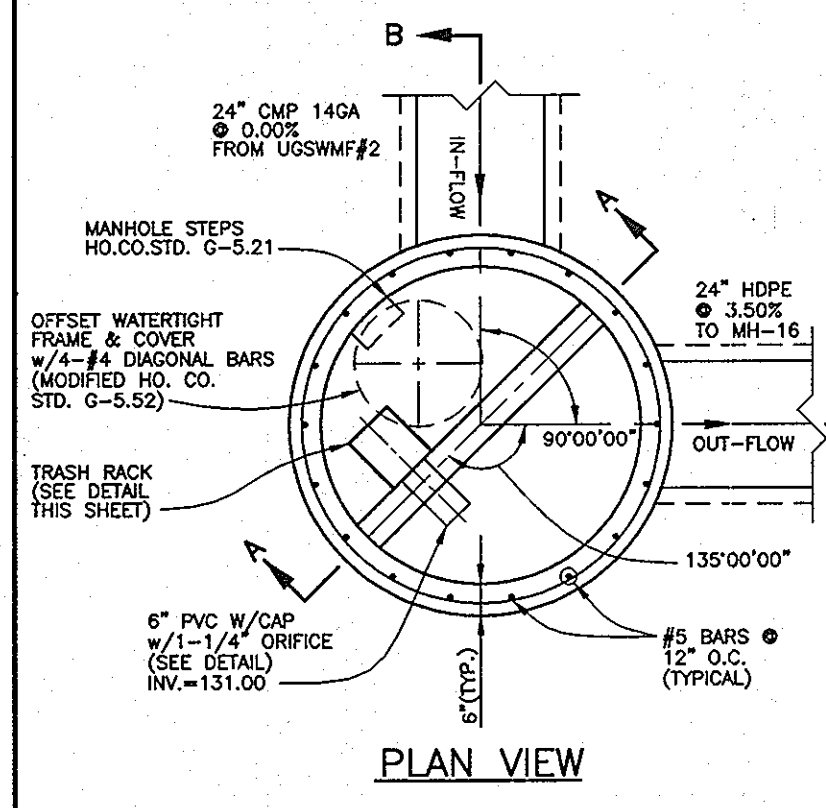
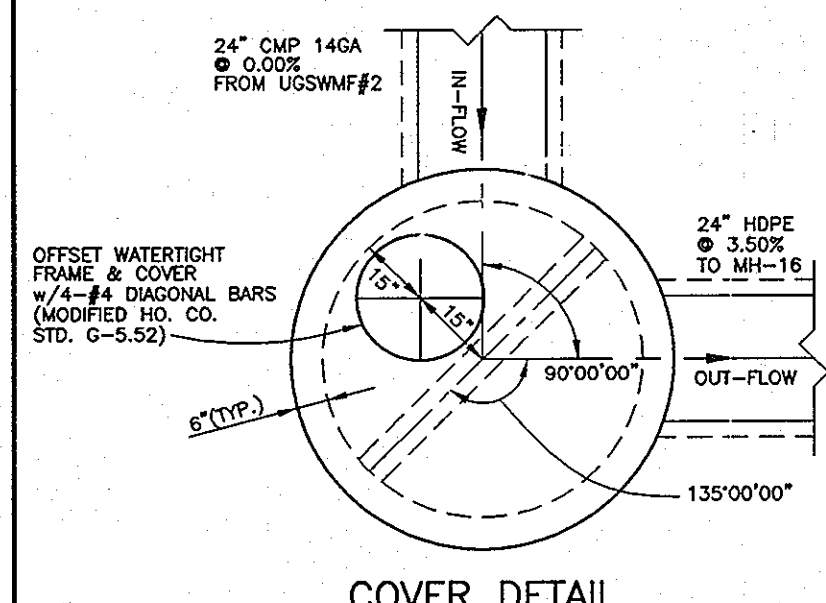
STATE OF MARYLAND  
*[Signature]*  
PROFESSIONAL ENGINEER  
No. 2143  
10-6-10

DEVELOPER/CONTRACT PURCHASER:	PROJECT: ELKRIDGE TOWN CENTER
ELKRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLCOTT CITY, MD 21041 PHONE: 410-465-4244	PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
TITLE: STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS	LOCATION: TAX MAP 38 - GRID B PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE: JUNE 3, 2004 FEBRUARY 10, 2005	PROJECT NO. 1522
Design: DAM/MCR Draft: MCR Check: DAM	SCALE: AS SHOWN DRAWING 15 OF 38

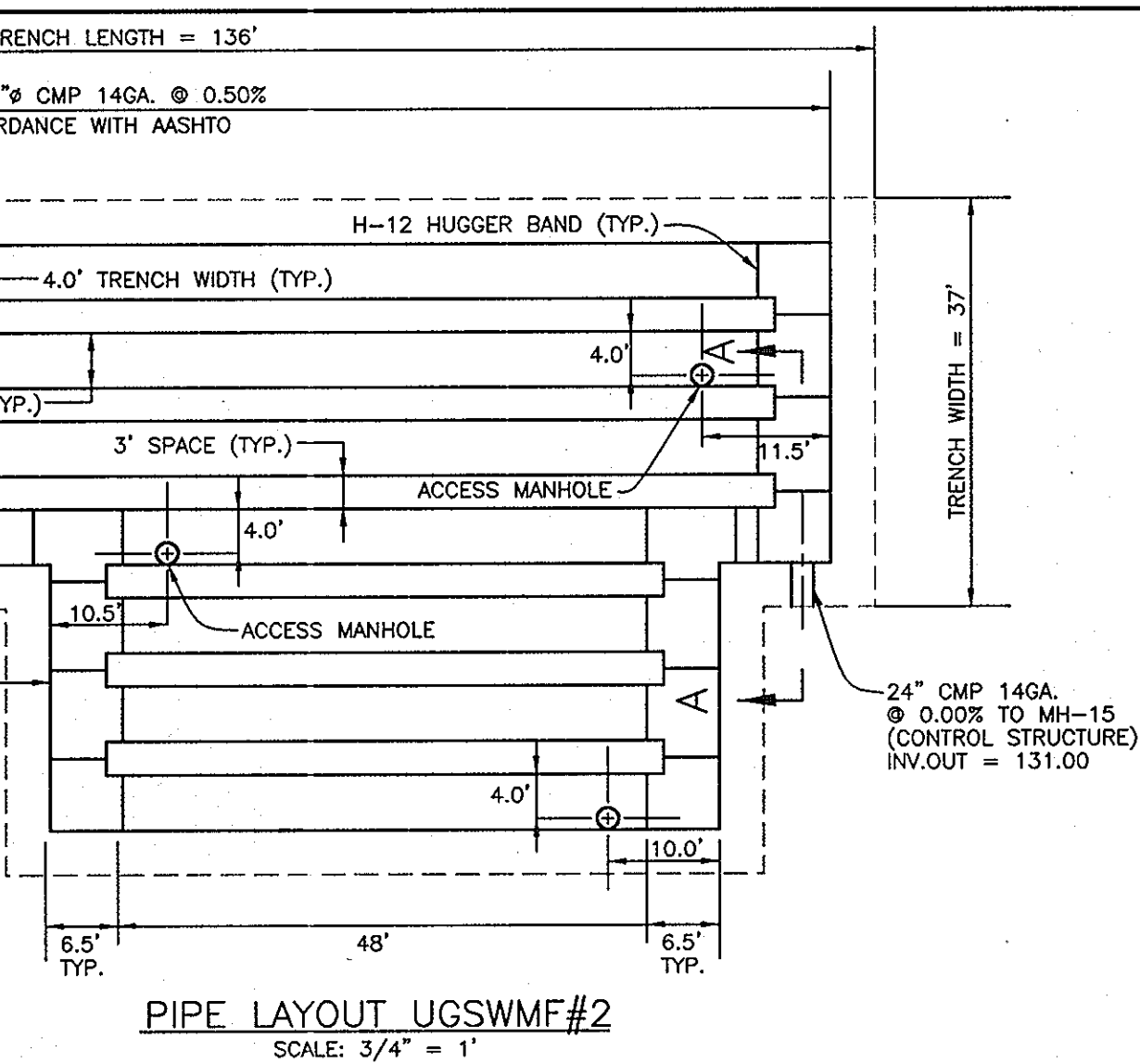


**SWM SUMMARY TABLE - D.A.=1.63 AC.±**

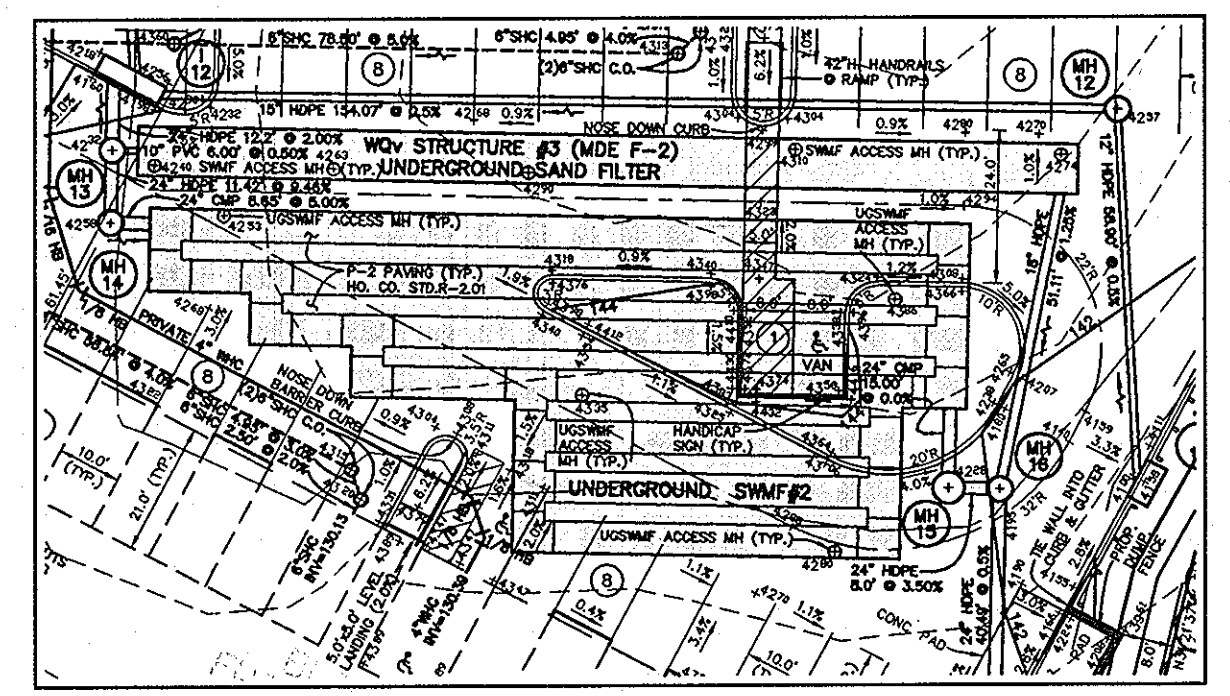
STORM FREQUENCY (YRS.)	DEVELOPED RUNOFF AND DISCHARGE (cfs)	WSEL (FT.)	STORAGE (AC.-FT.)
1	0.08	134.83	0.193
10	6.52	135.63	0.233
100	12.37	135.99	0.246



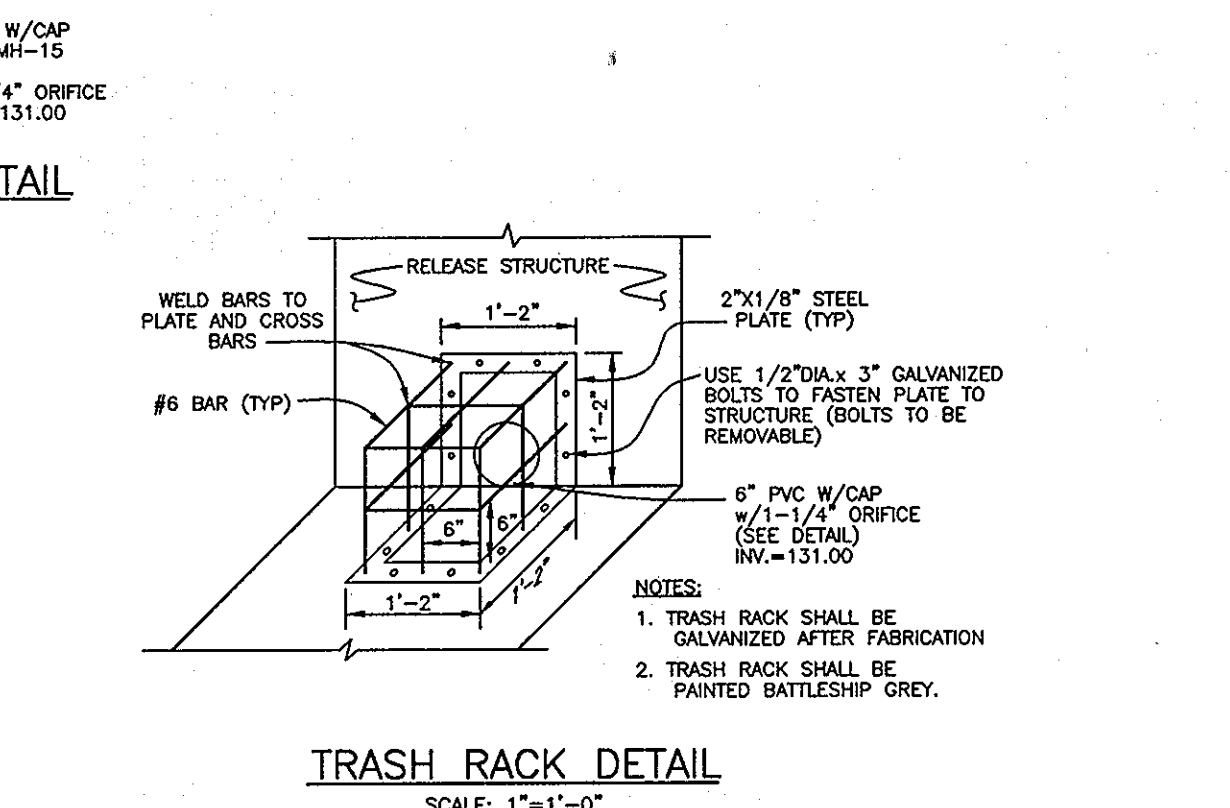
**CONTROL STRUCTURE @ MH-15**  
SCALE: 1"=3"



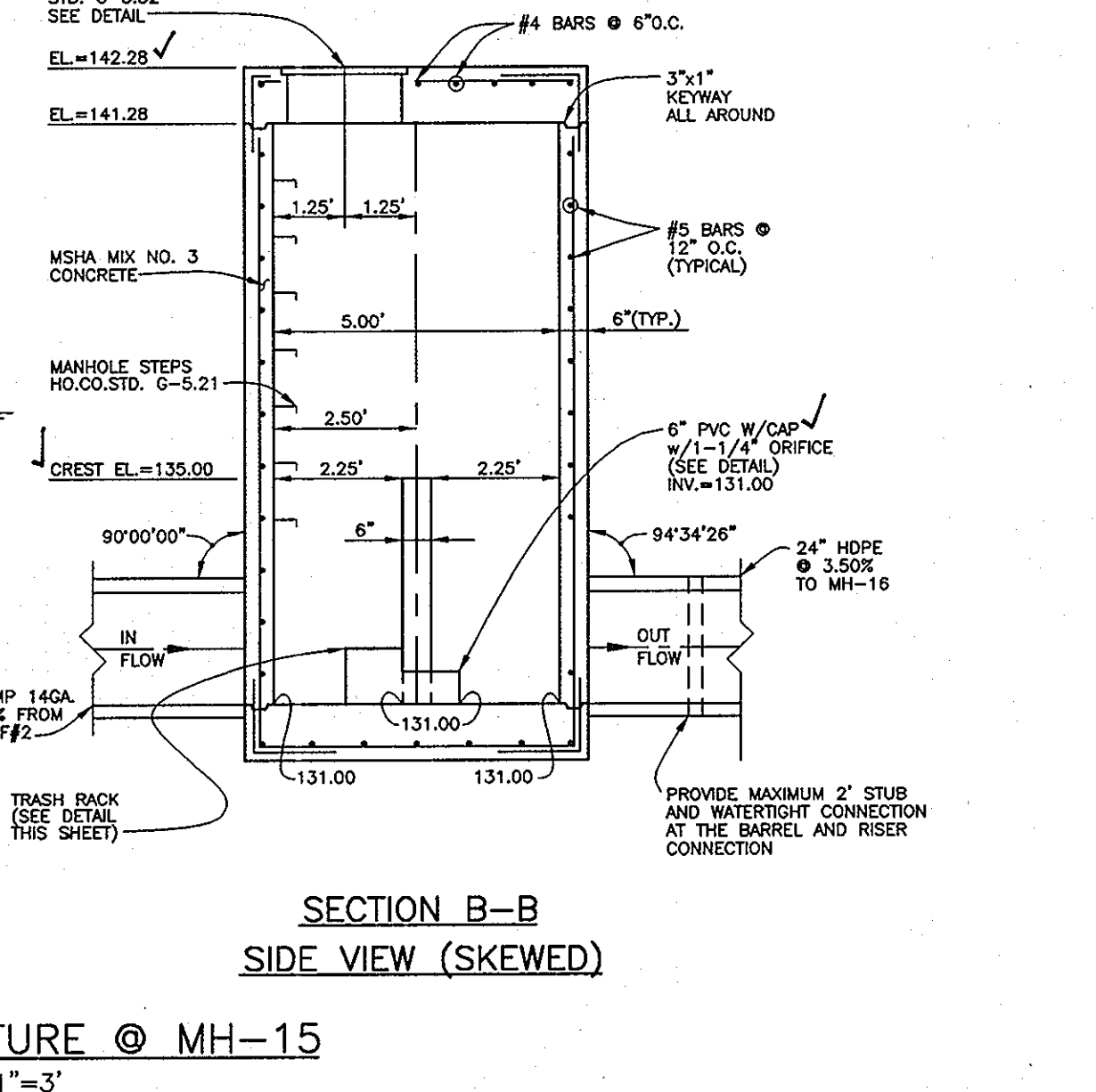
**UGSWMF#2 PROFILE - OUTFALL RUN**  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=3'



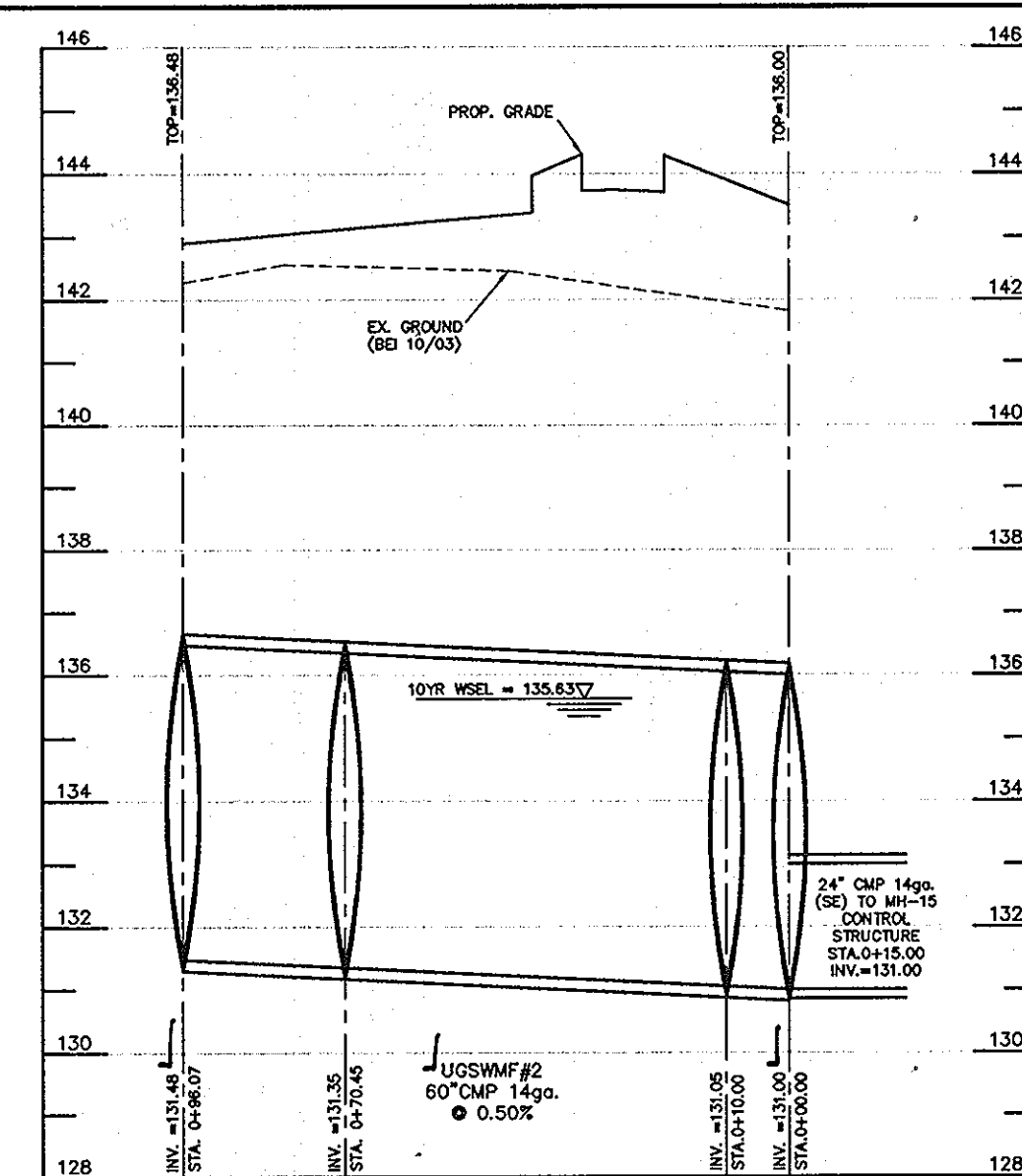
**UGSWMF#2 PLAN**  
SCALE: 1"=30'



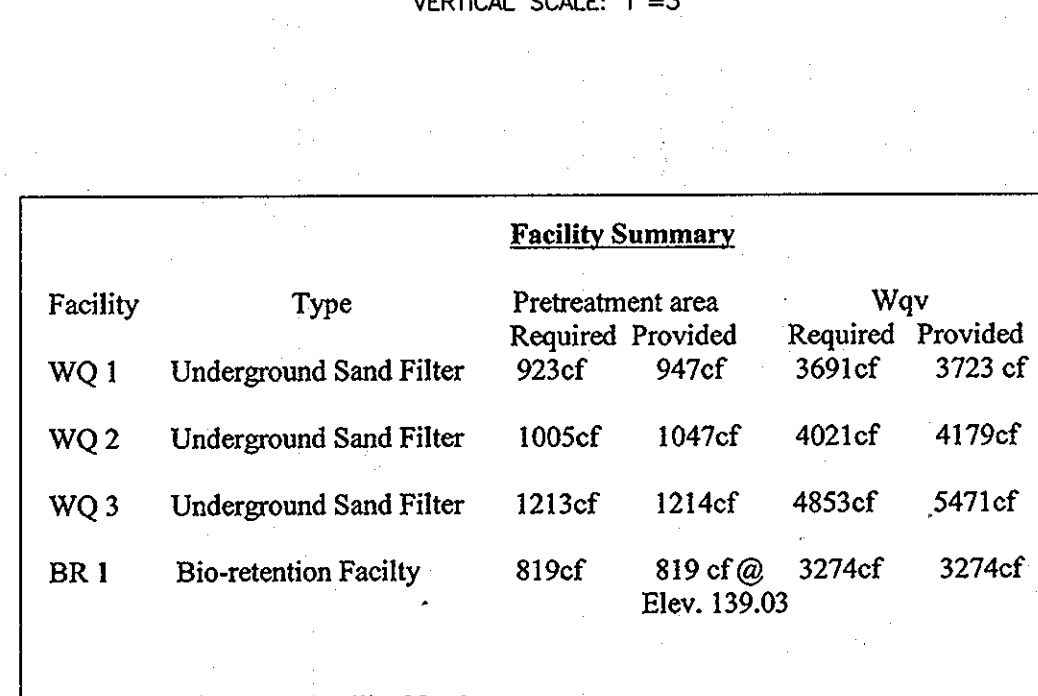
**TRASH RACK DETAIL**  
SCALE: 1"=1'-0"



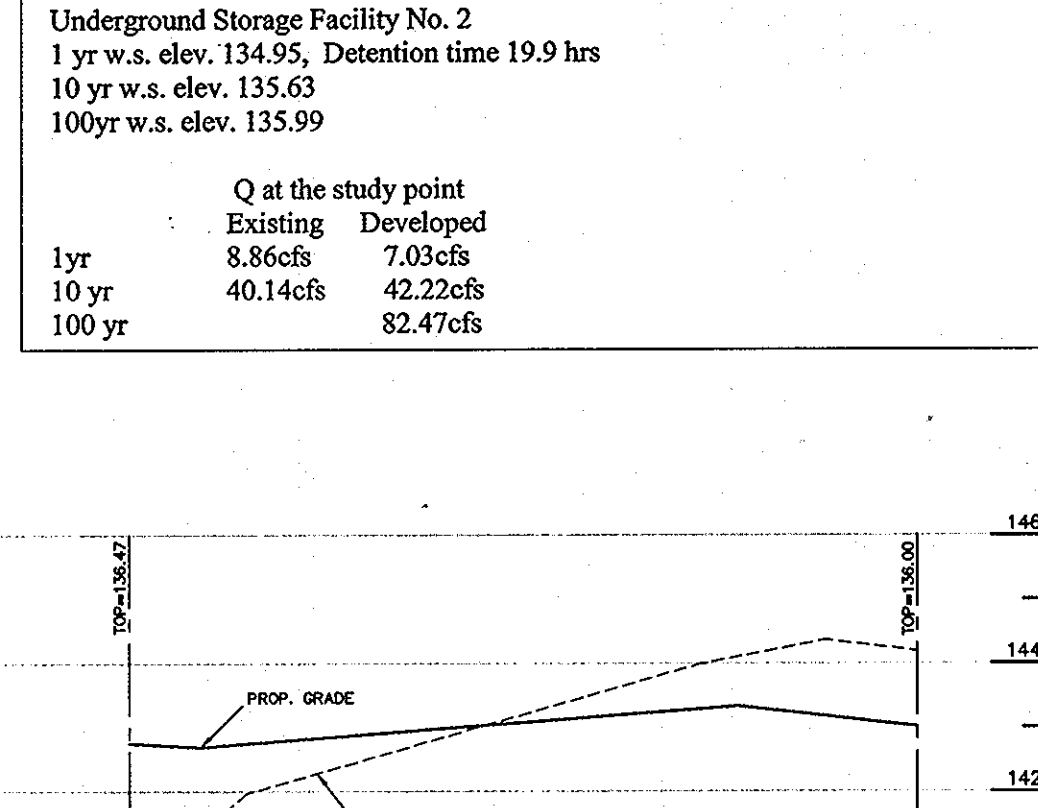
**SECTION B-B SIDE VIEW (SKEWED)**



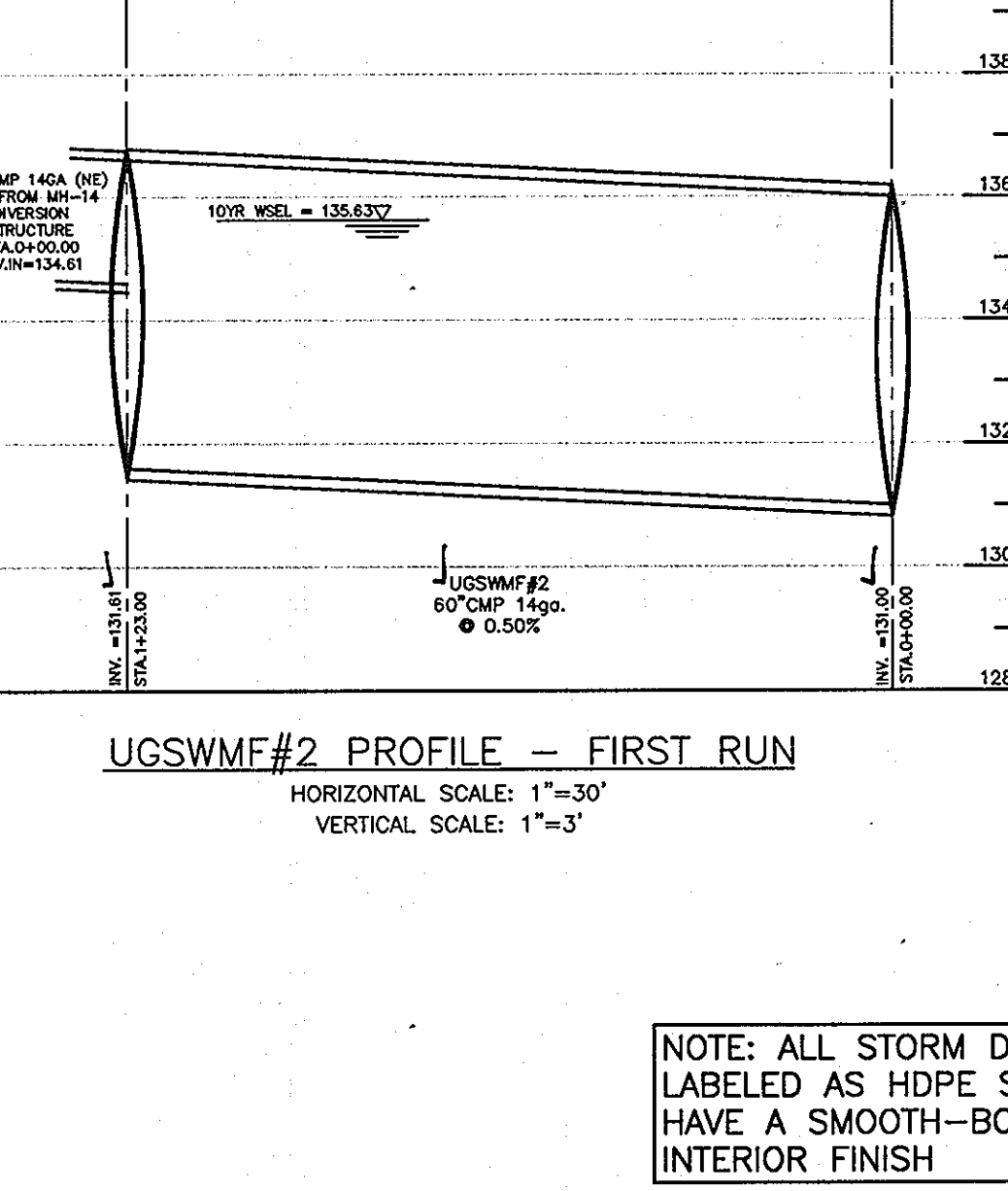
**TYPICAL CSP RISER MANHOLE SLEEVE DETAIL**  
NOT TO SCALE



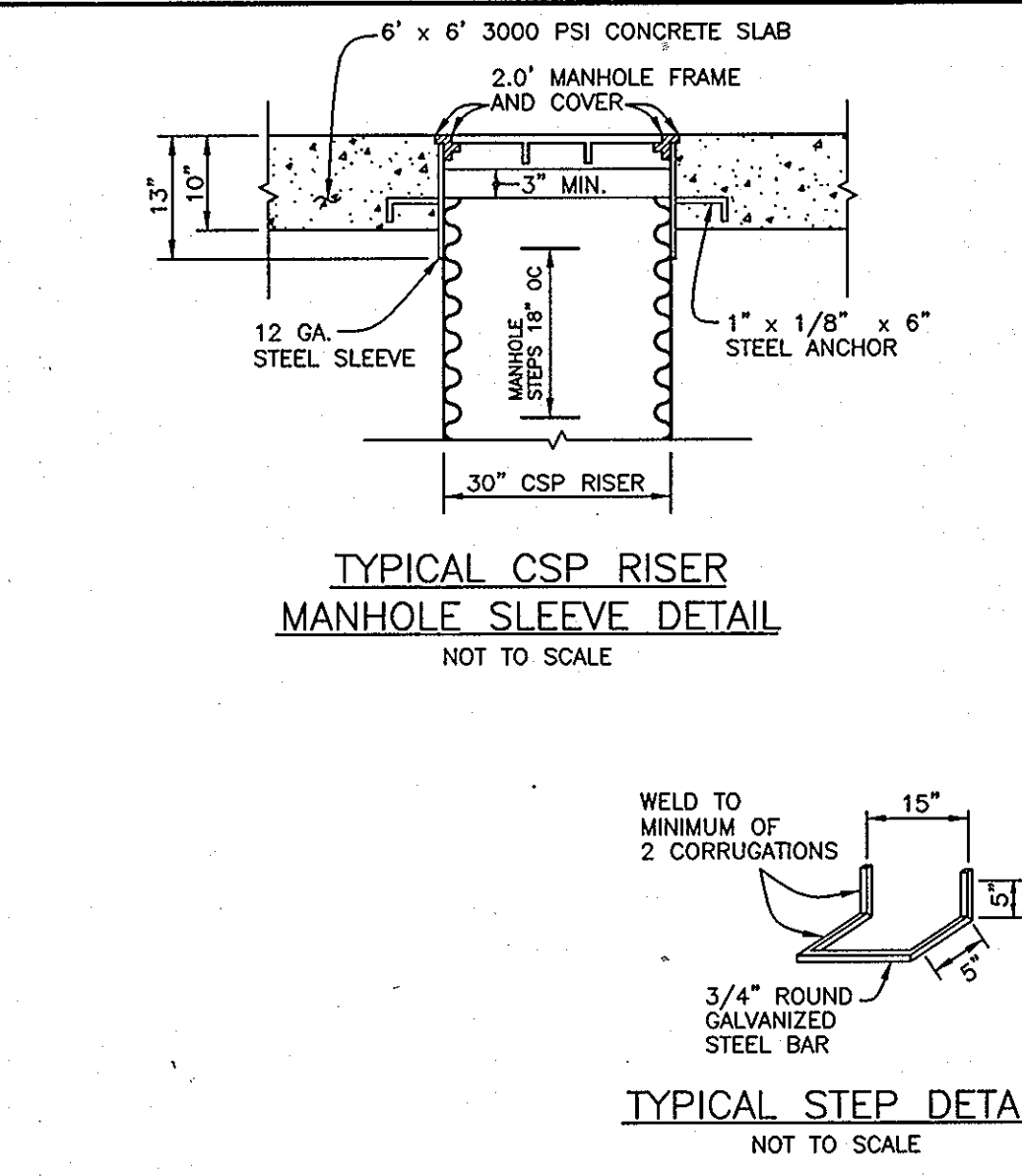
**TYPICAL UGSWMF CONSTRUCTION DETAILS**  
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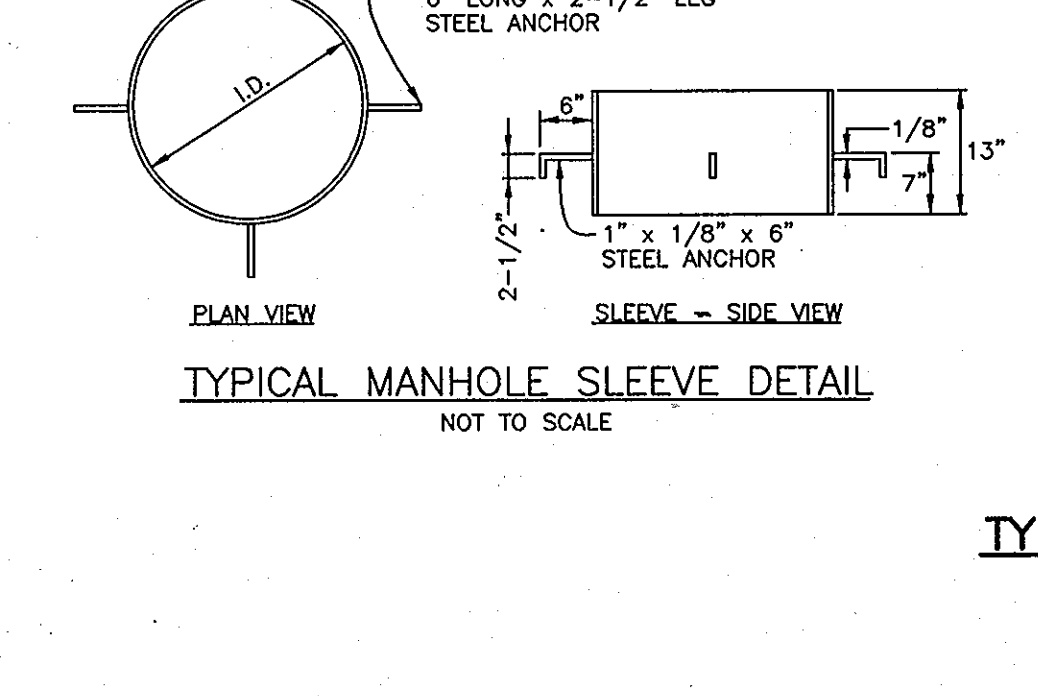
**TYPICAL MANHOLE SLEEVE DETAIL**  
NOT TO SCALE



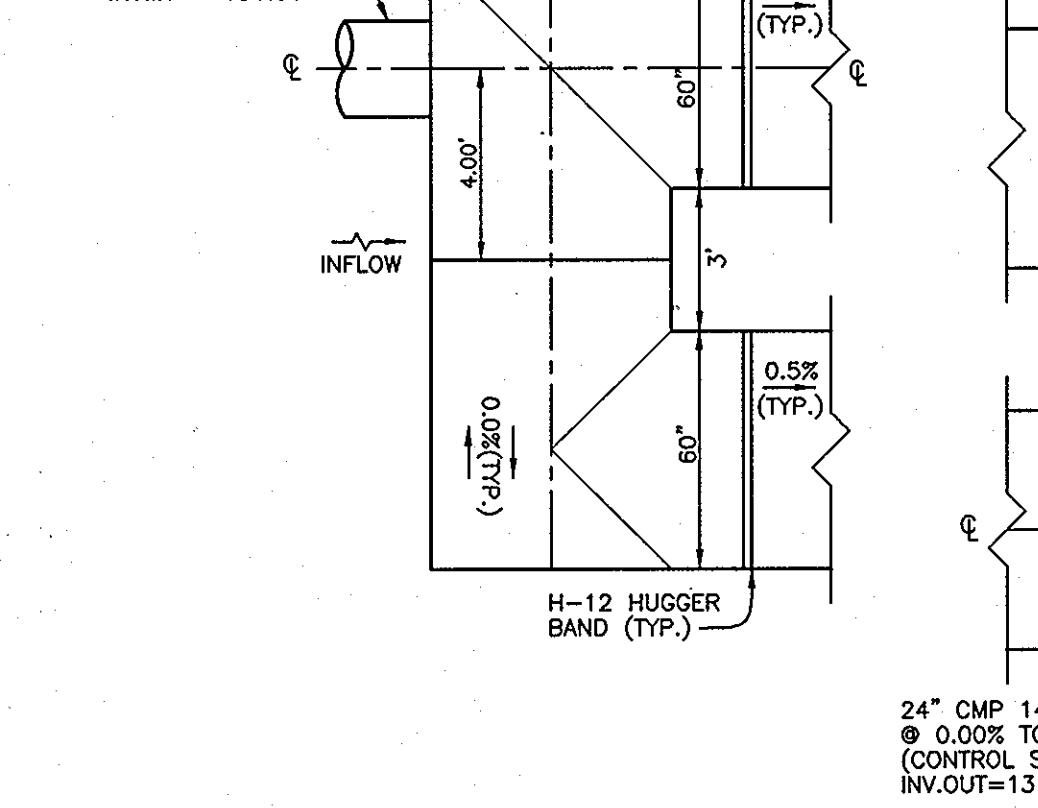
**UGSWMF#2 PROFILE - FIRST RUN**  
HORIZONTAL SCALE: 1"=30'  
VERTICAL SCALE: 1"=3'



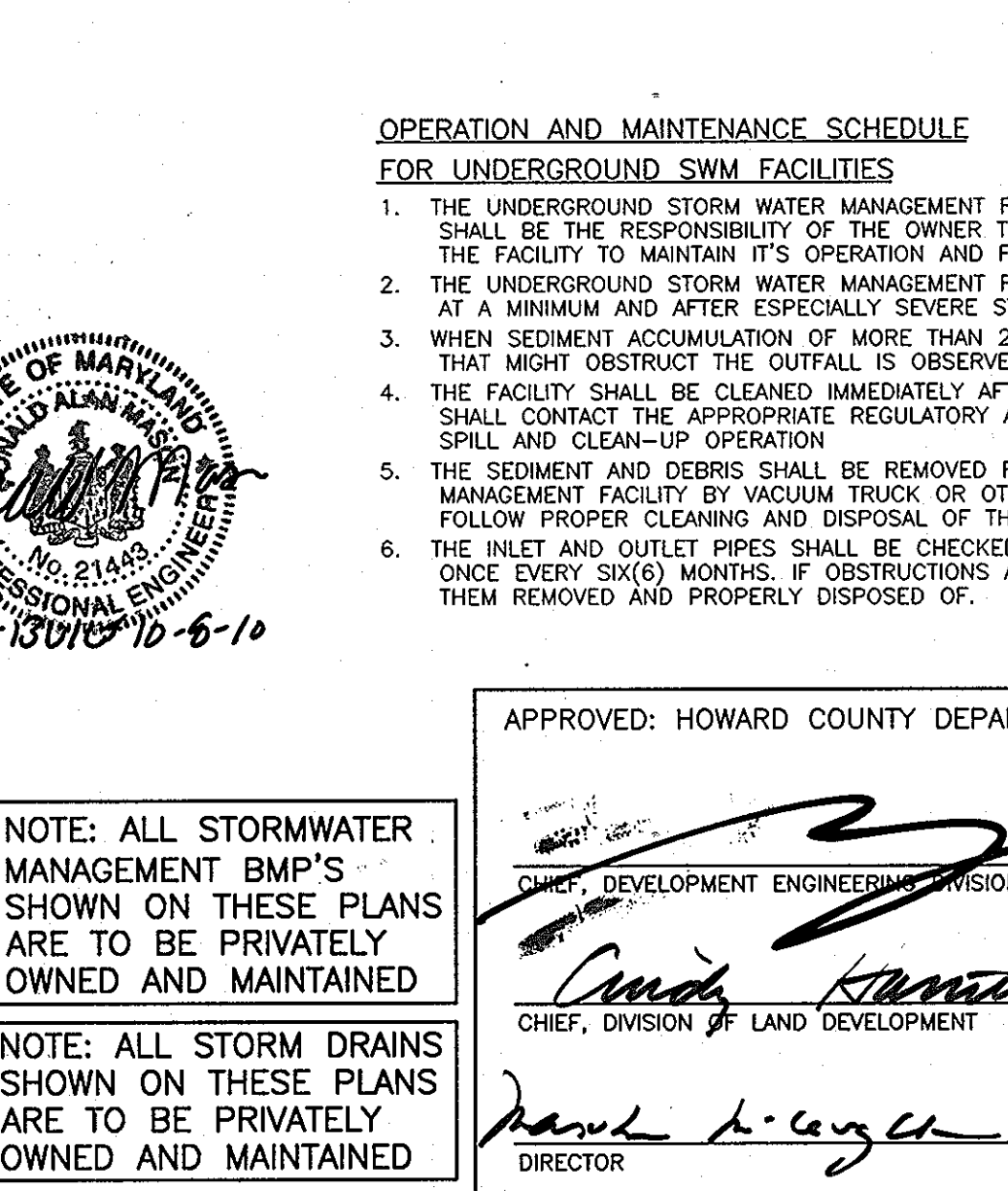
**TYPICAL ELBOW/TEE DETAIL**  
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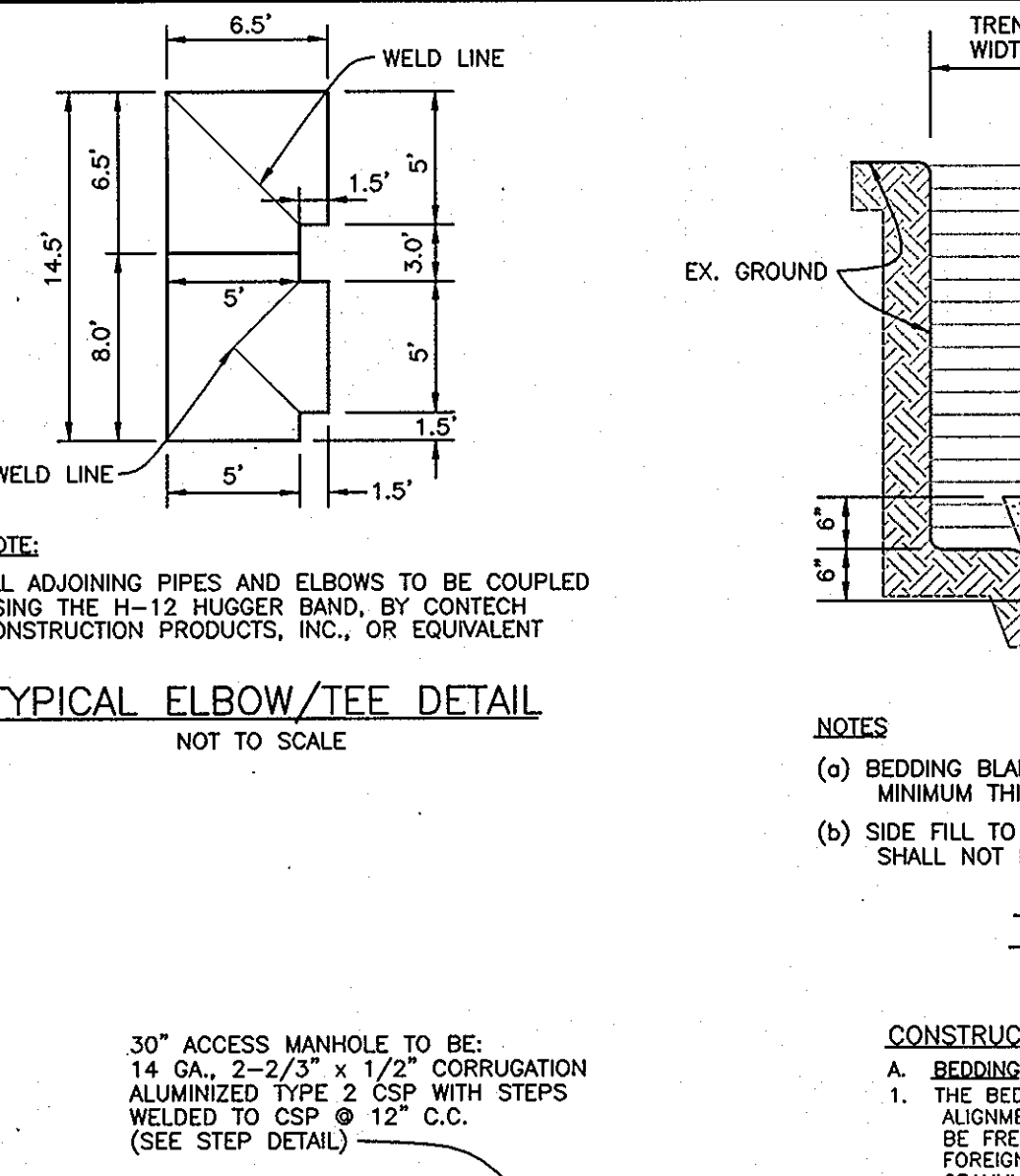
**TYPICAL STEP DETAIL**  
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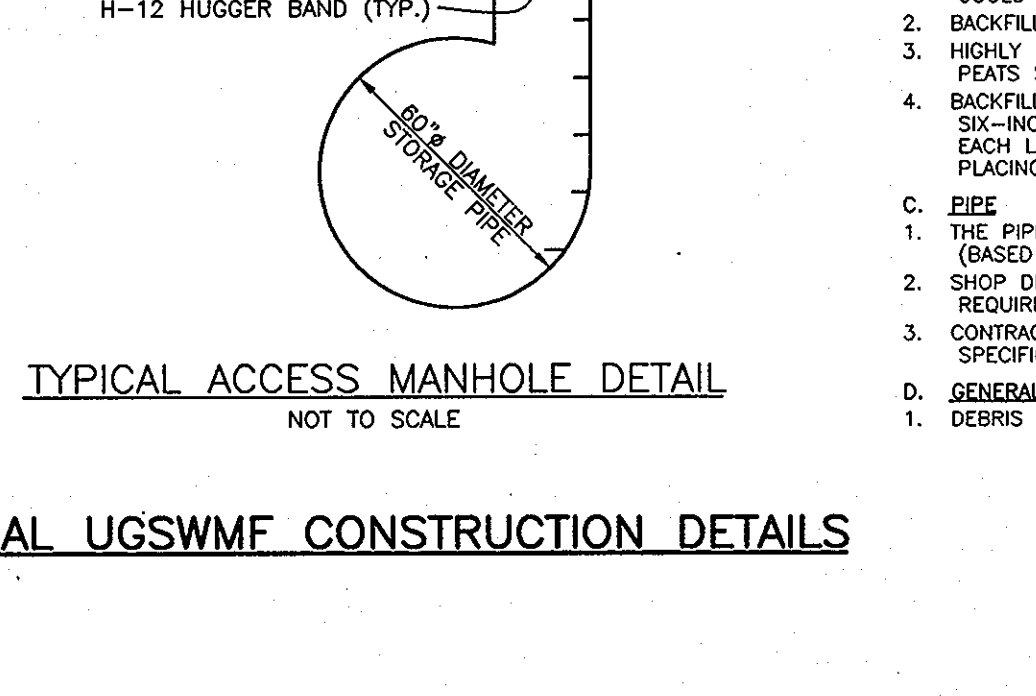
**PIPE CONNECTION PLAN UGSWMF#2**  
SCALE: 1"=4'



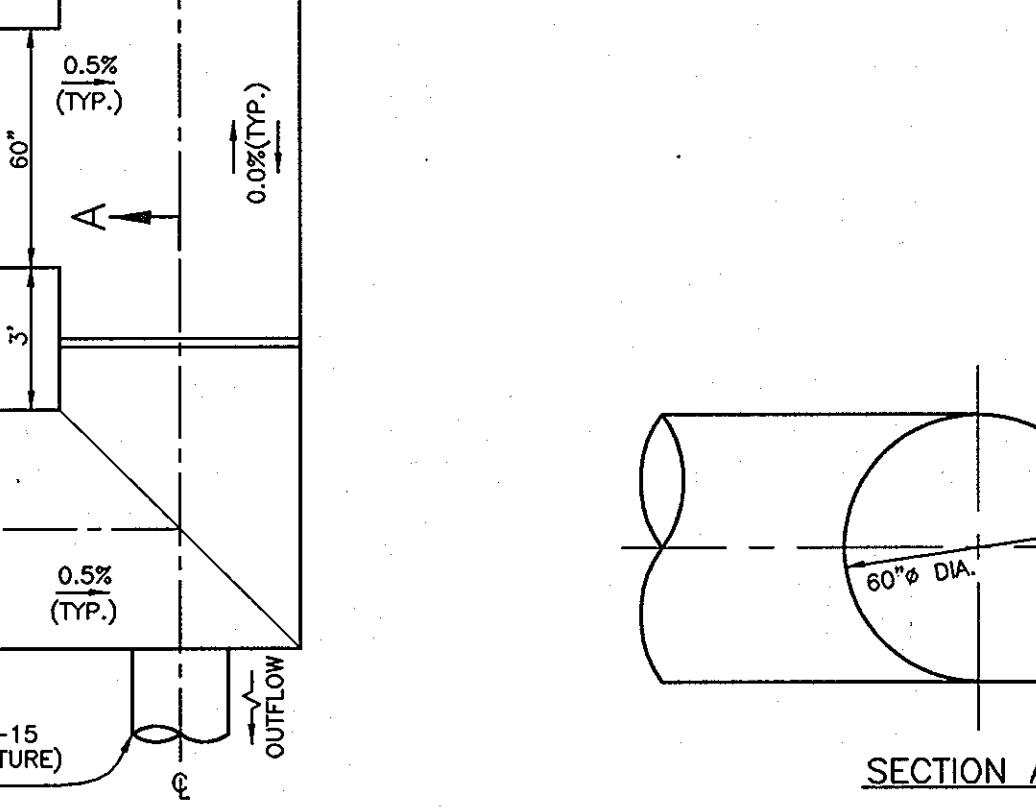
**SECTION A-A MANIFOLD DETAIL**  
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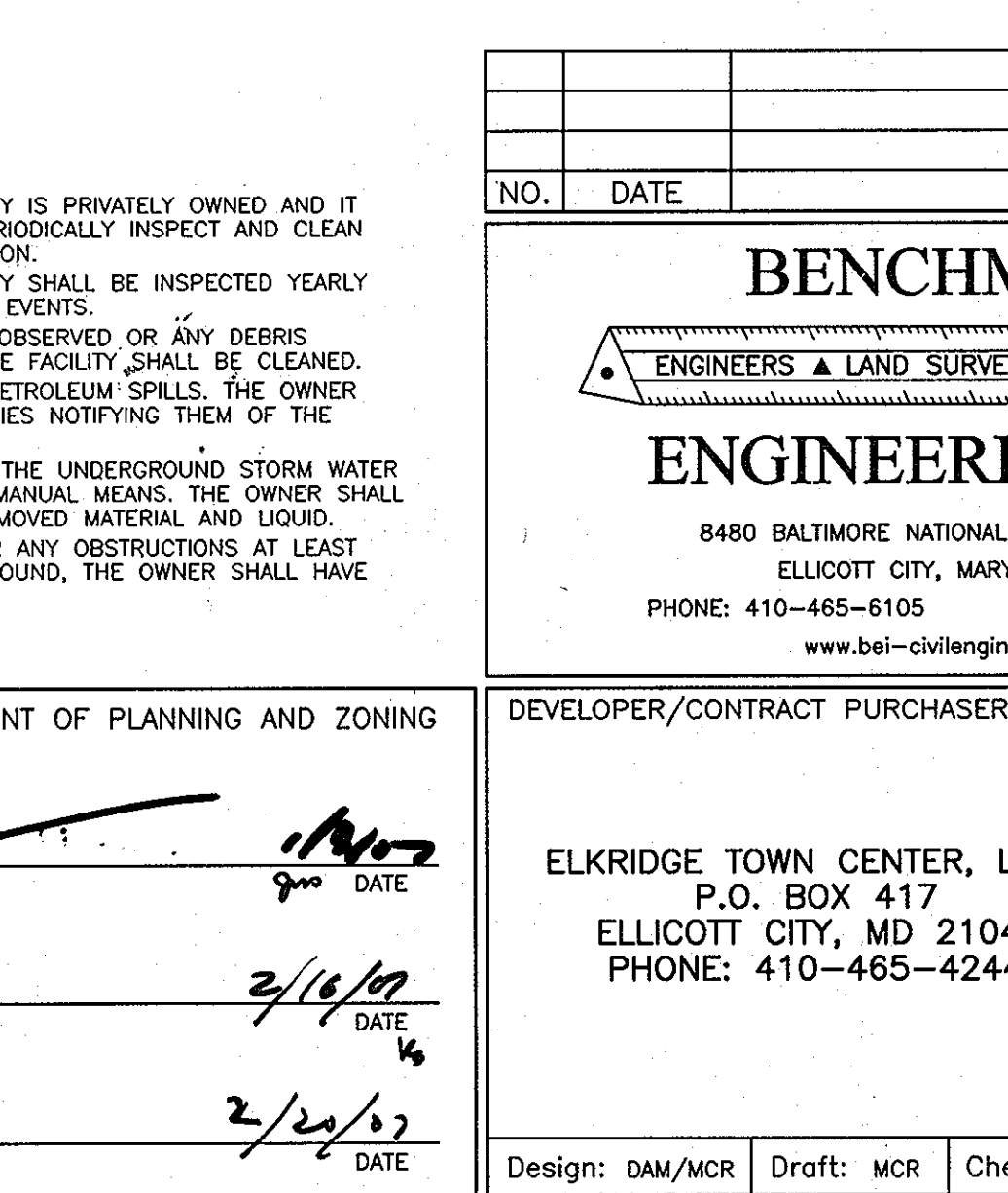
**TYPICAL ACCESS MANHOLE DETAIL**  
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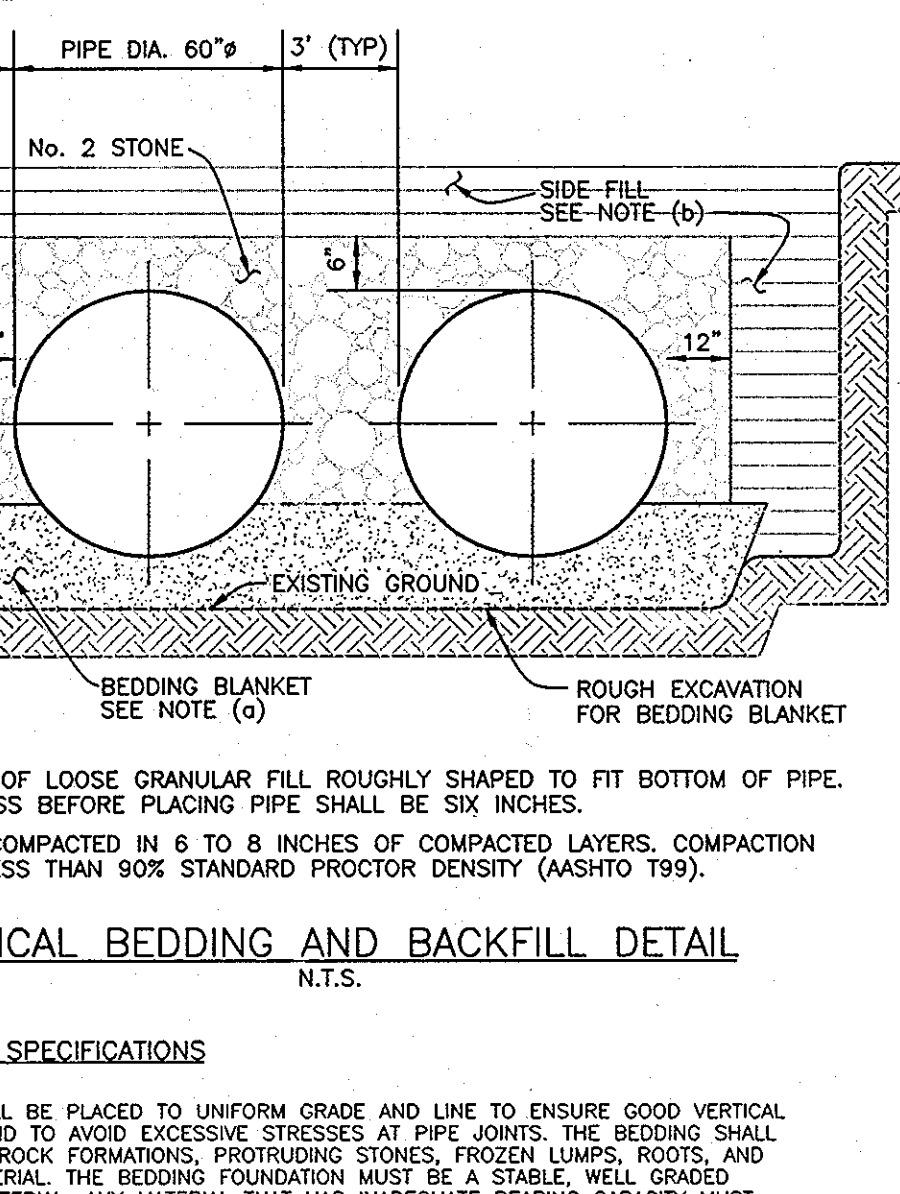
**TYPICAL UGSWMF CONSTRUCTION DETAILS**  
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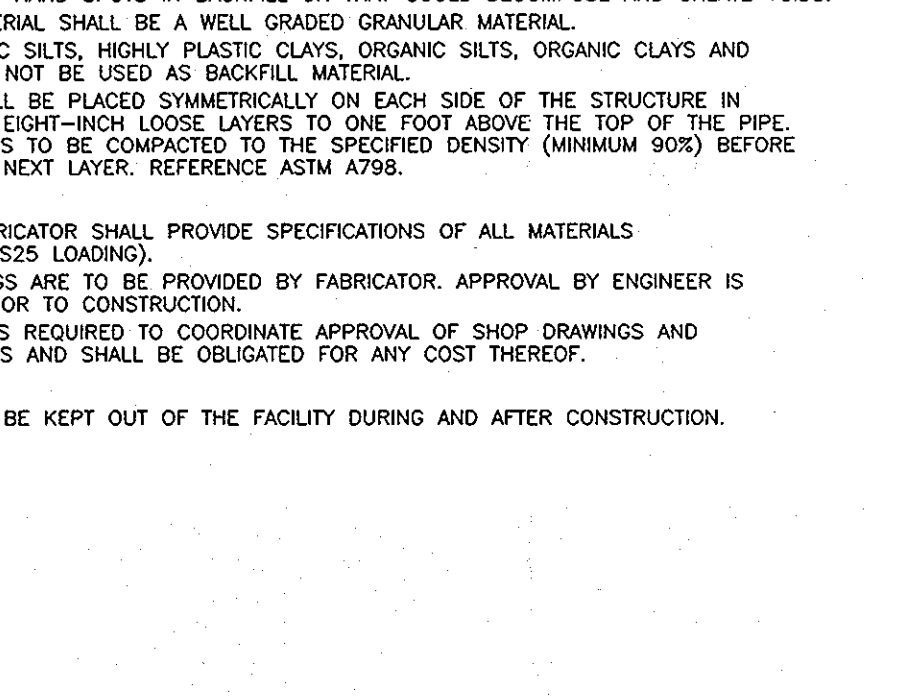
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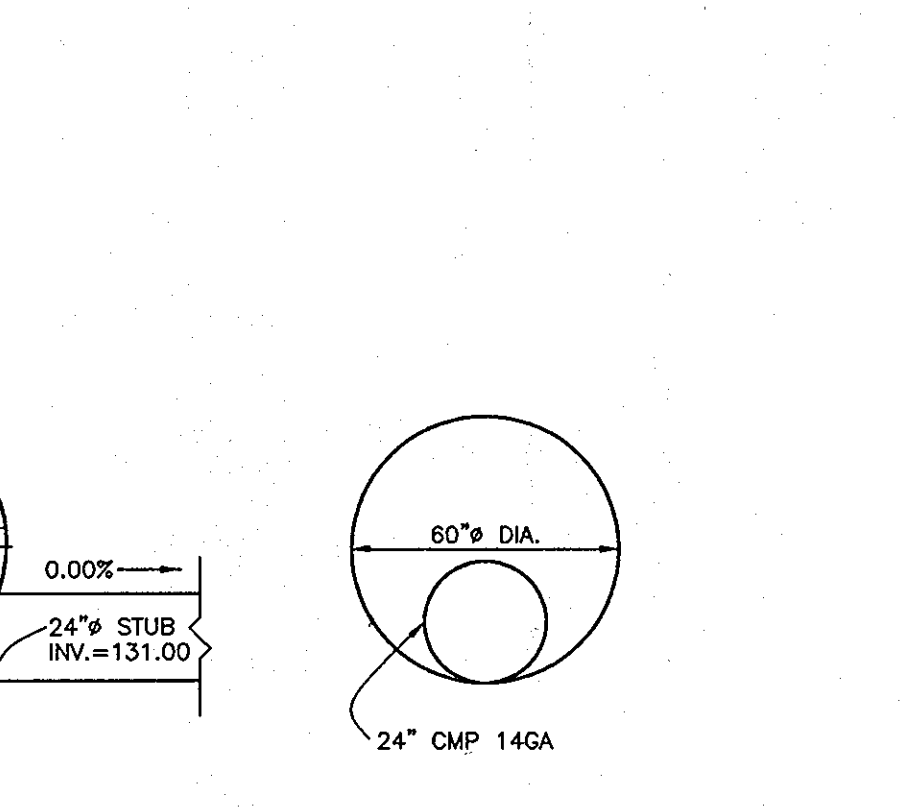
**TYPICAL UGSWMF CONSTRUCTION DETAILS**  
NOT TO SCALE



**TYPICAL BEDDING AND BACKFILL DETAIL**  
N.T.S.



**CONSTRUCTION SPECIFICATIONS**



**CONSTRUCTION SPECIFICATIONS**

**Facility Summary**

Facility	Type	Pretreatment area Required	Pretreatment area Provided	Wqv Required	Wqv Provided
WQ 1	Underground Sand Filter	923cf	947cf	3691cf	3723cf
WQ 2	Underground Sand Filter	1005cf	1047cf	4021cf	4179cf
WQ 3	Underground Sand Filter	1213cf	1214cf	4853cf	5471cf
BR 1	Bio-retention Facility	819cf	819cf @ Elev. 139.03	3274cf	3274cf

**Underground Storage Facility No. 1**  
1 yr w.s. elev. 145.75, Detention time 19.9 hrs  
10 yr w.s. elev. 146.70  
100 yr w.s. elev. 147.24

**Underground Storage Facility No. 2**  
1 yr w.s. elev. 134.95, Detention time 19.9 hrs  
10 yr w.s. elev. 135.63  
100 yr w.s. elev. 135.99

**Q at the study point**

Year	Existing	Developed
1 yr	8.86cfs	7.03cfs
10 yr	40.14cfs	42.22cfs
100 yr	40.14cfs	82.47cfs

**OPERATION AND MAINTENANCE SCHEDULE FOR UNDERGROUND SWM FACILITIES**

1. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY IS PRIVATELY OWNED AND IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO PERIODICALLY INSPECT AND CLEAN THE FACILITY TO MAINTAIN ITS OPERATION AND FUNCTION.
2. THE UNDERGROUND STORM WATER MANAGEMENT FACILITY SHALL BE INSPECTED YEARLY AT A MINIMUM AND AFTER ESPECIALLY SEVERE STORM EVENTS.
3. WHEN SEDIMENT ACCUMULATION OF MORE THAN 2" IS OBSERVED OR ANY DEBRIS THAT MIGHT OBSTRUCT THE OUTFALL IS OBSERVED, THE FACILITY SHALL BE CLEANED.
4. THE FACILITY SHALL BE CLEANED IMMEDIATELY AFTER PETROLEUM SPILLS. THE OWNER SHALL CONTACT THE APPROPRIATE REGULATORY AGENCIES NOTIFYING THEM OF THE SPILL AND CLEAN-UP OPERATION.
5. THE SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE UNDERGROUND STORM WATER MANAGEMENT FACILITY BY VACUUM TRUCK OR OTHER MANUAL MEANS. THE OWNER SHALL FOLLOW PROPER CLEANING AND DISPOSAL OF THE REMOVED MATERIAL AND LIQUID.
6. THE INLET AND OUTLET PIPES SHALL BE CHECKED FOR ANY OBSTRUCTIONS AT LEAST ONCE EVERY SIX(6) MONTHS. IF OBSTRUCTIONS ARE FOUND, THE OWNER SHALL HAVE THEM REMOVED AND PROPERLY DISPOSED OF.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION

*David K. Goyler* 2/16/07 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT

*David K. Goyler* 2/20/07 DATE

DIRECTOR

**REVISION**

NO.	DATE	REVISION

**BENCHMARK ENGINEERS, LAND SURVEYORS & PLANNERS, INC.**

8480 BALTIMORE NATIONAL PIKE A SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-8105 FAX: 410-465-6844  
www.bei-civilengineering.com

DEVELOPER/CONTRACT PURCHASER:  
ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLCOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

LOCATION: TAX MAP 38 - GRID B  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: STORMWATER MANAGEMENT PLAN, NOTES AND DETAILS

DATE: JUNE 3, 2004  
FEBRUARY 10, 2005 PROJECT NO. 1522

SCALE: AS SHOWN DRAWING 11 OF 38

Design: DAM/MCR Draft: MCR Check: DAM

STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
No. 21,993  
D. J. M. M. M.  
Professional Engineer

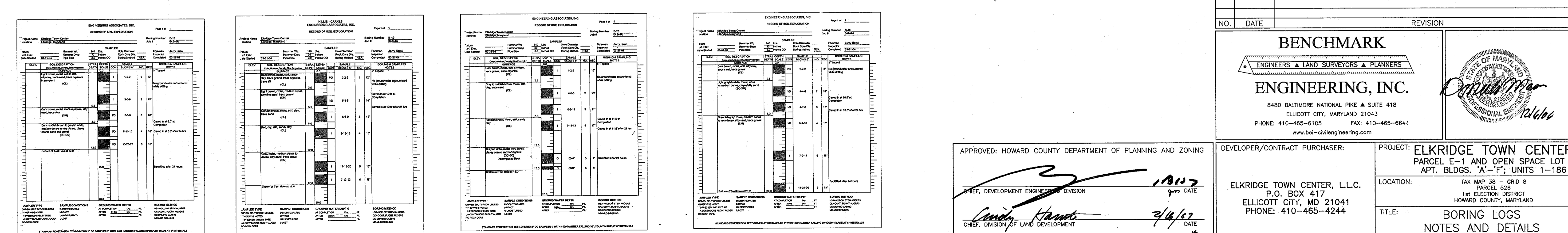
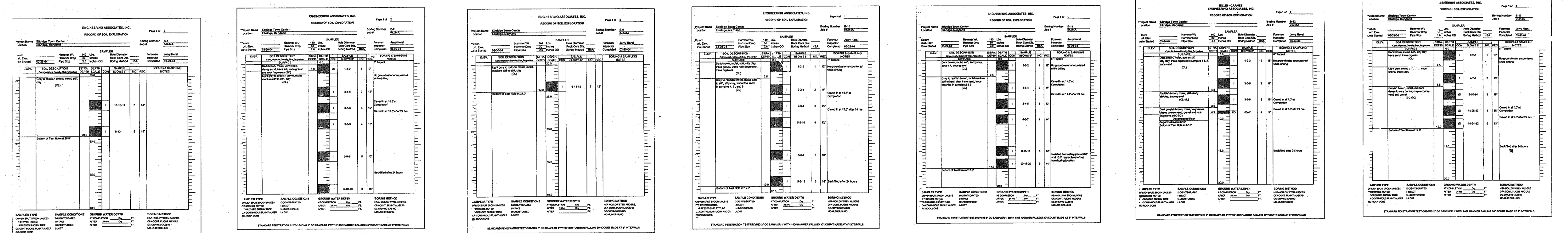
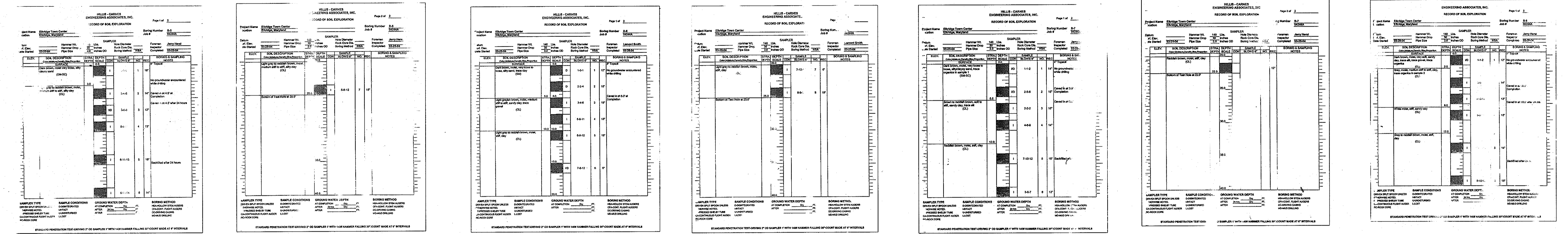
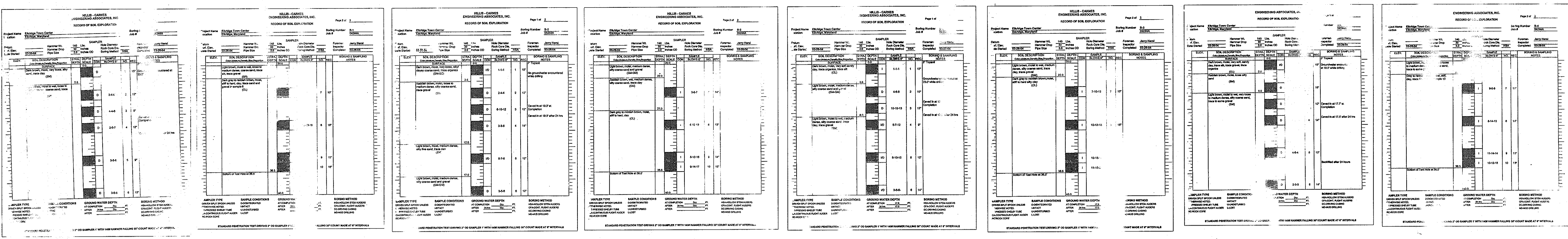
DESIGNER: DAM/MCR

DATE: 2/16/07

DATE: 2/20/07

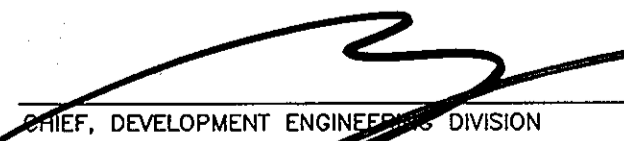
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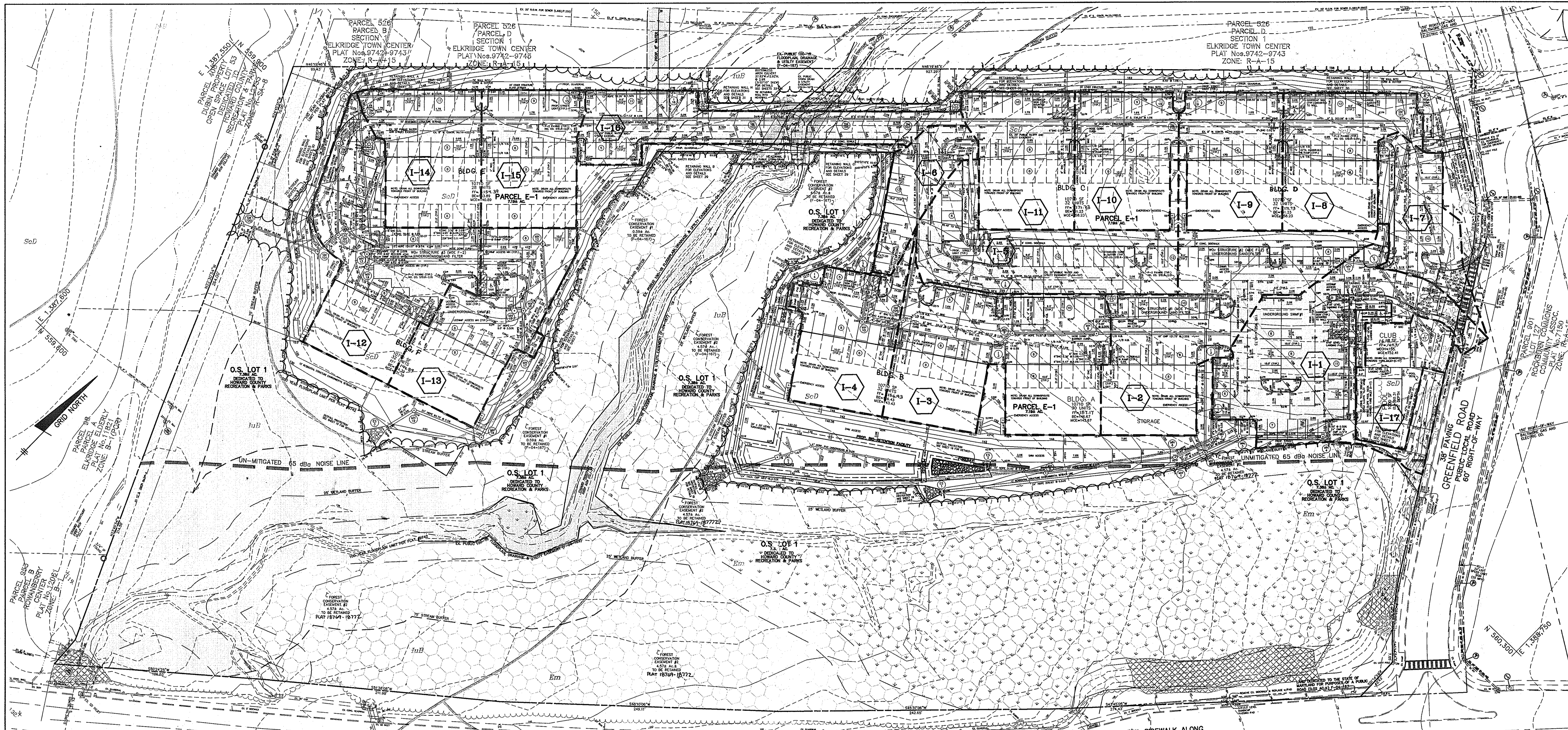


NO.	DATE	REVISION
<b>BENCHMARK</b> ENGINEERS • LAND SURVEYORS • PLANNERS <b>ENGINEERING, INC.</b> 8490 BALTIMORE NATIONAL PIKE • SUITE 418 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6641 www.bai-civilengineering.com		
DEVELOPER/CONTRACT PURCHASER: <b>ELKRIDGE TOWN CENTER, L.L.C.</b> P.O. BOX 417 ELLICOTT CITY, MD 21041 PHONE: 410-465-4244		PROJECT: <b>ELKRIDGE TOWN CENTER</b> PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186 LOCATION: TAX MAP 38 - GRID B PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE: <b>BORING LOGS</b> <b>NOTES AND DETAILS</b>		
DATE: MAY 11, 2004	PROJECT NO. 1522	
SCALE: AS SHOWN	DRAWING 16 OF 38	

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 2/16/07

  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 2/20/07



STORM DRAIN DATA					
INLET NO.	AREA (AC)	% IMPERVIOUS	SOIL CLASS	ZONING	'C' FACTOR
I-1	0.5295	81	C	R-A-15	0.74
I-2	0.4965	85	C	R-A-15	0.76
I-3	0.5225	97	C	R-A-15	0.84
I-4	0.2537	98	C	R-A-15	0.85
I-5	0.3617	76	C	R-A-15	0.70
I-6	0.1288	92	C	R-A-15	0.81
I-7	0.1906	79	C	R-A-15	0.72
I-8	0.2769	99	C	R-A-15	0.85
I-9	0.2499	98	C	R-A-15	0.85
I-10	0.2500	96	C	R-A-15	0.83
I-11	0.2550	99	C	R-A-15	0.85
I-12	0.4461	89	C	R-A-15	0.79
I-13	0.3443	95	C	R-A-15	0.83
I-14	0.2608	98	C	R-A-15	0.85
I-15	0.2469	98	C	R-A-15	0.85
I-16	0.2832	100	C	R-A-15	0.87
I-17	0.1560	71	C	R-A-15	0.78

SOILS LEGEND		
MAP SYMBOL	SOIL TYPE	MAPPING UNIT
Em	C	BELTSVILLE SILT LOAM - 1 TO 5 PERCENT SLOPES - MODERATELY ERODED
Em	D	ELKTON SILT LOAM
IvB	C	BUKA LOAM, LOCAL ALLUVIUM - 1 TO 5 PERCENT SLOPES
ScD	C	SANDY AND CLAYEY LAND - MODERATELY SLOPING

PLAN  
SCALE: 1" = 40'

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
 CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*Cindy Kuntz* 2/16/07  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
*David P. Cagle* 2/20/07

NO.	DATE	REVISION
1	7-16-09	SHOW BLDG 'B' AS PROPOSED UNDER THIS PLAN
2	7-15-08	SHOW BLDG'S 'A', 'E', 'F' AS PROPOSED UNDER THIS PLAN
3	2-21-08	SHOW BLDG 'C' TO BE PROPOSED UNDER THIS PLAN & REVISE F.F. ELEV.
4	8-10-07	SHOW BLDG 'D' PROPOSED UNDER THIS PLAN

**BENCHMARK ENGINEERING, INC.**  
 ENGINEERS • LAND SURVEYORS • PLANNERS  
 8480 BALTIMORE NATIONAL PIKE & SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6844  
 www.bei-civilengineering.com

DEVELOPER/CONTRACT PURCHASER:  
 ELKTRIDGE TOWN CENTER, L.L.C.  
 P.O. BOX 417  
 ELLICOTT CITY, MD 21041  
 PHONE: 410-465-4244

PROJECT: ELKTRIDGE TOWN CENTER  
 PARCEL E-1 AND OPEN SPACE LOT 1  
 APT. BLDGS. 'A'-'F'; UNITS 1-186

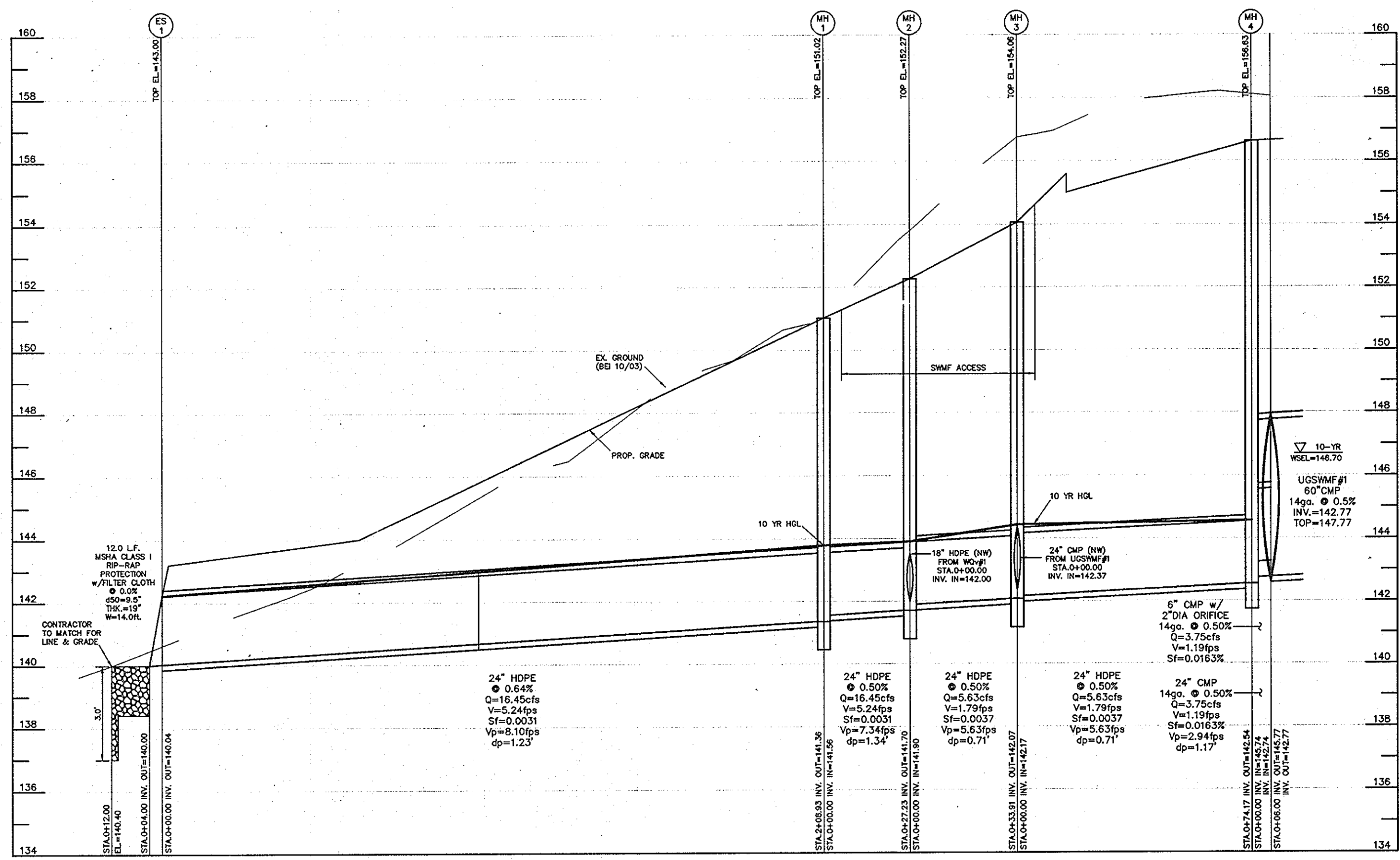
LOCATION: TAX MAP 38 - GRID B  
 PARCEL 526  
 1st ELECTION DISTRICT  
 HOWARD COUNTY, MARYLAND

TITLE: STORM DRAIN DRAINAGE AREA  
 MAP AND SOILS MAP

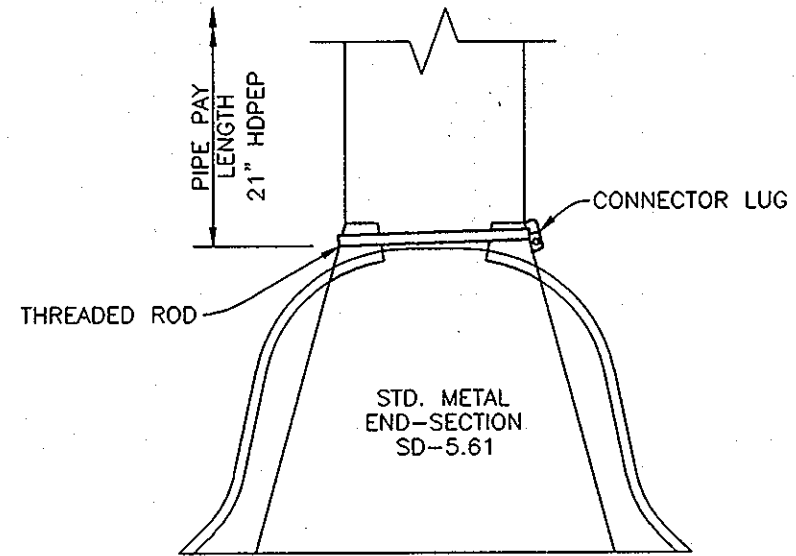
DATE: JUNE 3, 2004  
 NOVEMBER, 2006 PROJECT NO. 1522

SCALE: AS SHOWN DRAWING 17 OF 38

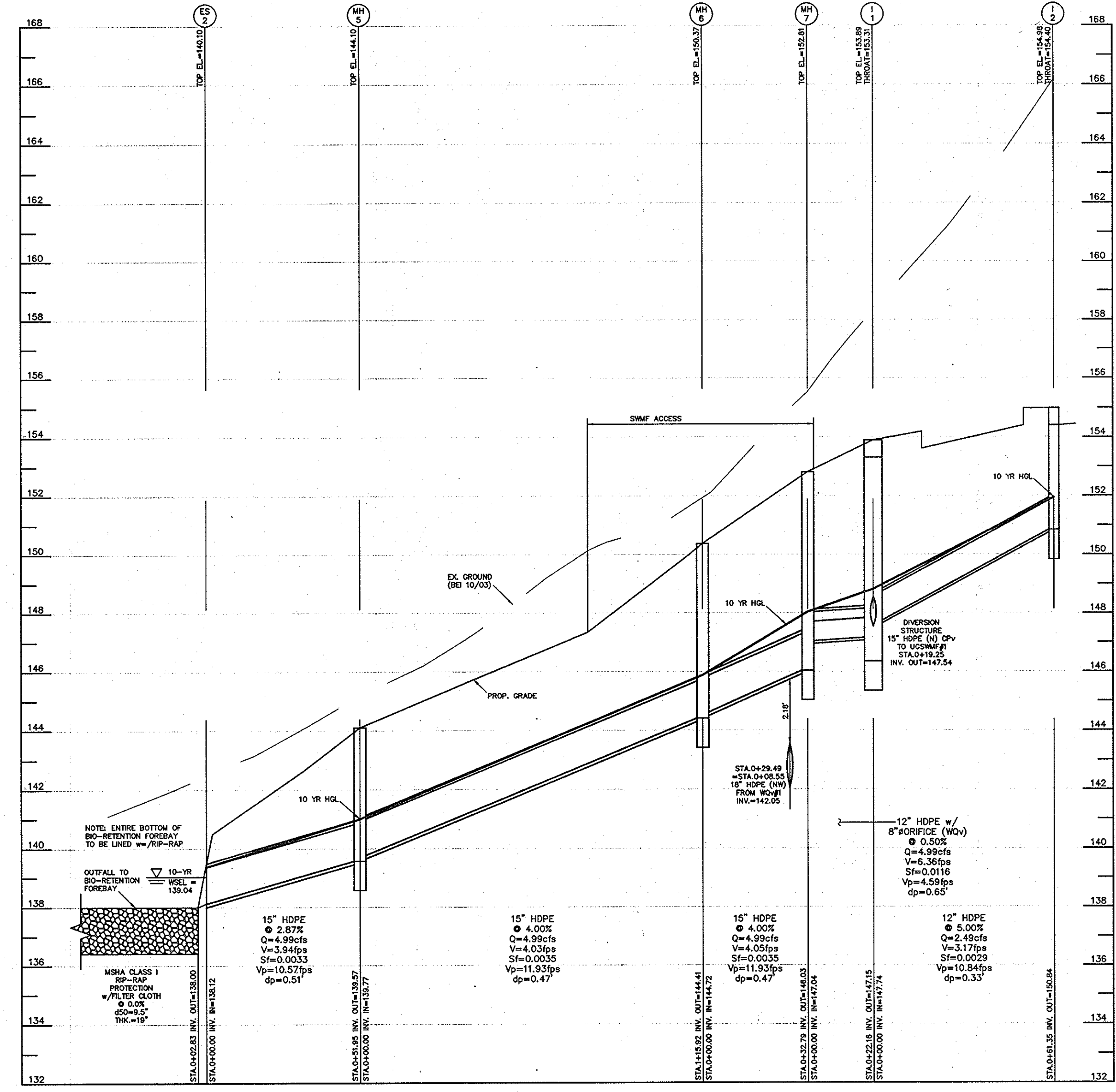
Design: DAM Draft: MCR Check: DAM



**STORM DRAIN PROFILE FROM ES-1 TO MH-4**  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



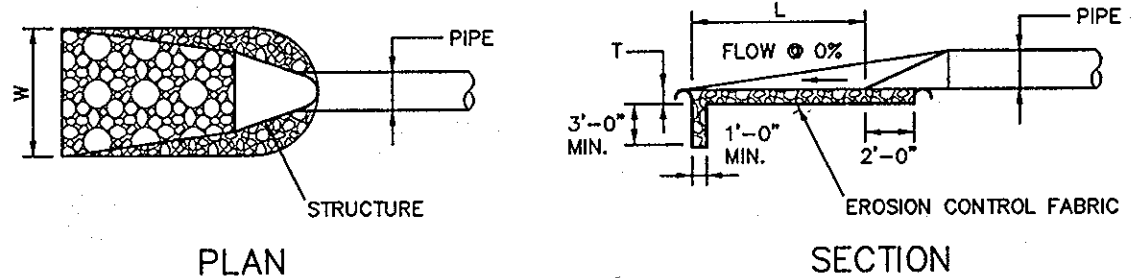
**CONNECTION FOR HDPE TO METAL END-SECTION**  
 NOT TO SCALE



**STORM DRAIN PROFILE FROM ES-2 TO I-2**  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'

STORM DRAIN STRUCTURE SCHEDULE											
NO.	TYPE	LOCATION	INVERT IN	INVERT IN	INVERT OUT	INVERT OUT	TOP ELEV.	THROAT EL.	HO. CO. STD.	REMARKS	FRONT TO BACK INSIDE DIM. OF INLET
ES-1	24" HDPE END	N 560049.6856 E 1388283.4613	140.02	--	--	140.00	142.02	--	--	UNDERGROUND SWM#1	--
ES-2	15" HDPE END	N 560091.4713 E 1388298.7470	138.08	--	--	138.00	139.33	--	--	FOREBAY BIO-RET. FACILITY	--
ES-3	24" HDPE END	N 559748.1024 E 1387885.8020	128.85	--	--	128.85	130.85	--	--	USWMP#2 & WQV FACILITY #3	--
ES-4	24" HDPE END	N 559928.4134 E 1388134.0104	134.06	--	--	134.00	139.65	--	--	BIO-RETENTION FACILITY #4	--
FINAL S-1	CONFORMS TO INLET	N 559969.1168 E 1388155.4401	134.30	6" PVC	--	134.30	139.48	138.65	CONFORMS TO SD-4.11	OPEN ON 4 SIDES	2'-6"
TSM S-1	CONFORMS TO INLET	N 559969.1168 E 1388155.4401	134.30	6" PVC	--	134.30	138.31	138.31	CONFORMS TO SD-4.11	OPEN ON TOP	2'-8"
I-1	A-5 INLET	N 560263.6033 E 1388407.4104	147.74	--	147.15 (WQV)	147.54	153.89	--	SD-4.40	DIVERSION STRUCTURE	2.50'
I-2	A-5 INLET	N 560312.5143 E 1388369.9909	--	--	--	150.84	154.98	--	SD-4.40	--	2.50'
I-3	A-5 INLET	N 560176.9689 E 1388227.9306	150.02	150.02 (8")	--	149.62	154.85	--	SD-4.40	--	2.50'
I-4	A-5 INLET	N 560103.6169 E 1388070.4959	--	--	--	151.12	154.40	--	SD-4.40	--	2.50'
I-5	"S" COMB. INLET	N 560221.3974 E 1388202.8630	--	--	--	151.34	156.34 (TC)	--	SD-4.32	--	3.42'
I-6	A-5 INLET	N 560150.1140 E 1388097.9082	--	--	--	151.34	159.29	--	SD-4.40	--	2.50'
I-7	A-5 INLET	N 560484.0387 E 1388422.2724	155.34	155.34	--	155.14	161.28	--	SD-4.40	--	2.50'
I-8	A-5 INLET	N 560596.3924 E 1388342.2365	158.63	--	--	158.43	166.80	--	SD-4.40	--	2.50'
I-9	A-5 INLET	N 560452.4209 E 1388191.4239	160.92	160.92 (8")	--	160.72	167.80	--	SD-4.40	--	2.50'
I-10	A-5 INLET	N 560446.5516 E 1388185.2758	161.21	161.21 (8")	--	161.01	167.80	--	SD-4.40	--	2.50'
I-11	WR "S" INLET	N 560318.4619 E 1388051.0993	--	--	--	163.07	166.61	--	SD-4.22	--	3.92'
I-12	A-10 INLET	N 559856.7698 E 1387759.5710	136.97	136.97	--	136.77	142.18	--	SD-4.41	--	2.50'
I-13	A-5 INLET	N 559923.7941 E 1387916.6996	138.94	138.94 (12")	--	138.24	141.58	--	SD-4.40	--	2.50'
I-14	A-5 INLET	N 55942.2340 E 1387611.1289	139.78	--	--	139.58	149.92	--	SD-4.40	--	2.50'
I-15	A-5 INLET	N 560082.1816 E 1387803.5915	142.98	142.98 (8")	--	142.78	150.25	--	SD-4.40	--	2.50'
I-16	"S" COMB. INLET	N 560137.9919 E 1387895.8768	--	--	--	144.17	147.82 (TC)	--	SD-4.32	--	3.42'
I-17	YARD INLET	N 560451.3820 E 1388498.9874	159.33	159.33 (8")	--	159.23	163.40	--	SD-4.14	--	2.00'
MH-1	STD. 4.0' PRE-CAST	N 560210.4541 E 1388416.8804	141.56	--	--	141.36	151.02	--	G-5.12	--	--
MH-2	STD. 4.0' PRE-CAST	N 560235.9342 E 1388426.1070	141.80	142.00	--	141.70	152.27	--	G-5.12	--	--
MH-3	STD. 4.0' PRE-CAST	N 560267.6579 E 1388438.4972	142.17	142.17	--	142.07	154.08	--	G-5.12	--	--
MH-4	STD. 4.0' PRE-CAST	N 560318.8742 E 1388492.4712	145.74	142.74	--	142.54	156.63	--	G-5.12	--	--
MH-5	STD. 4.0' PRE-CAST	N 560124.5074 E 1388377.385	139.77	--	--	139.57	144.10	--	G-5.12	--	--
MH-6	STD. 4.0' PRE-CAST	N 560214.4371 E 1388410.4442	144.41	--	--	144.41	150.37	--	G-5.12	--	--
MH-7	STD. 4.0' PRE-CAST	N 560247.8721 E 1388422.7144	147.04	--	--	146.03	152.81	--	G-5.12	--	--
MH-8	STD. 4.0' PRE-CAST	N 560246.7477 E 1388283.0352	148.79	148.79 (12")	147.88 (WQV)	148.59	155.56	--	G-5.12	DIVERSION STRUCTURE	--
MH-9	STD. 4.0' PRE-CAST	N 560194.0944 E 1388228.9275	149.74	--	--	149.54	154.87	--	G-5.12	--	--
MH-10	STD. 4.0' PRE-CAST	N 560108.7201 E 1388125.4817	150.84	150.84	--	150.64	154.86	--	G-5.12	--	--
MH-11	STD. 4.0' PRE-CAST	N 560443.8456 E 1388394.9649	153.92	--	152.62 (WQV)	153.72	159.08	--	G-5.12	DIVERSION STRUCTURE	--
MH-12	STD. 4.0' PRE-CAST	N 559962.1284 E 1387871.9840	137.94	137.94 (8")	--	137.74	142.57	--	G-5.12	--	--
MH-13	STD. 4.0' PRE-CAST	N 559847.0903 E 1387765.3027	136.52	136.52 (8")	--	135.68	142.32	--	G-5.12	DIVERSION STRUCTURE	--
MH-14	STD. 4.0' PRE-CAST	N 559838.8300 E 1387773.1883	135.24	--	--	135.14	142.58	--	G-5.12	--	--
MH-15	STD. 5.0' PRE-CAST	N 559901.4408 E 1387895.2542	131.00	--	--	131.00	142.28	--	G-5.11 (REFERENCE)	CONTROL STRUCTURE	--
MH-16	STD. 4.0' PRE-CAST	N 559906.9691 E 1387901.0452	130.72	130.72	--	130.52	141.95	--	G-5.12	--	--
MH-17	STD. 4.0' PRE-CAST	N 559877.6842 E 1387929.0018	130.32	--	--	130.12	142.80	--	G-5.12	--	--
MH-18	STD. 4.0' PRE-CAST	N 559799.4117 E 1387952.8845	129.71	--	--	129.51	133.66	--	G-5.12	--	--
MH-19	STD. 4.0' PRE-CAST	N 559775.3638 E 1387892.8214	129.19	--	--	128.99	133.42	--	G-5.12	--	--

PIPE SCHEDULE		
SIZE	LENGTH	TYPE & CLASS
24"	591.0	HDPE
18"	825.8	HDPE
15"	728.0	HDPE
12"	627.6	HDPE
24"	93.7	CMP
18"	136.3	CMP
15"	19.3	CMP
6"	6.0	CMP
10"	8.0	PVC
8"	21.9	PVC



**OUTLET PROTECTION DETAIL**  
 NOT TO SCALE

STRUCTURE	dSO	LENGTH(L)	WIDTH(W)	THICK.(T)	SHA CLASS
ES-1	9.5"	12' 0" 0%	14'	19"	I
ES-2	9.5"	16' 0" 0%	17'	19"	I
ES-3	9.5"	14' 0" 0%	16'	19"	I
ES-4	9.5"	10' 0" 0% (20')	12'	19"	I

\* ENTIRE BOTTOM OF BIO-RETENTION FOREBAY AT ES-2 TO BE LINED W/ RP-RAP

- THE SUBGRADE FOR THE FILTER, RP-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.
- THE ROCK OR GABION SHALL CONFORM TO THE SPECIFIED GRADING LIMITS WHEN INSTALLED RESPECTIVELY IN THE RP-RAP OR FILTER.
- GEOTEXTILE CLASS C-28 OR BETTER 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 FABRIC OVER THE DAMAGED PART OR BY COMPLETELY REPLACING THE GEOTEXTILE FABRIC. ALL OVERLAPS WHETHER FOR REPAIRS OR FOR JOINING TWO PIECES OF GEOTEXTILE FABRIC SHALL BE A MINIMUM OF ONE FOOT.
- STONE FOR THE RP-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 THE RP-RAP OR GABION OUTLETS SHALL BE DELIVERED AND PLACED IN A MANNER THAT ENSURES THAT IT IS REASONABLY HOMOGENEOUS WITH THE SMALLER STONES AND SPALLS FILLING THE VOIDS BETWEEN THE LARGER STONES. RP-RAP SHALL BE PLACED IN A MANNER TO PREVENT DAMAGE TO THE FILTER BLANKET OR GEOTEXTILE FABRIC. HAND PLACEMENT WILL BE REQUIRED TO THE EXTENT NECESSARY TO PREVENT DAMAGE TO THE PERMANENT WORKS.
- 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.

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

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APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

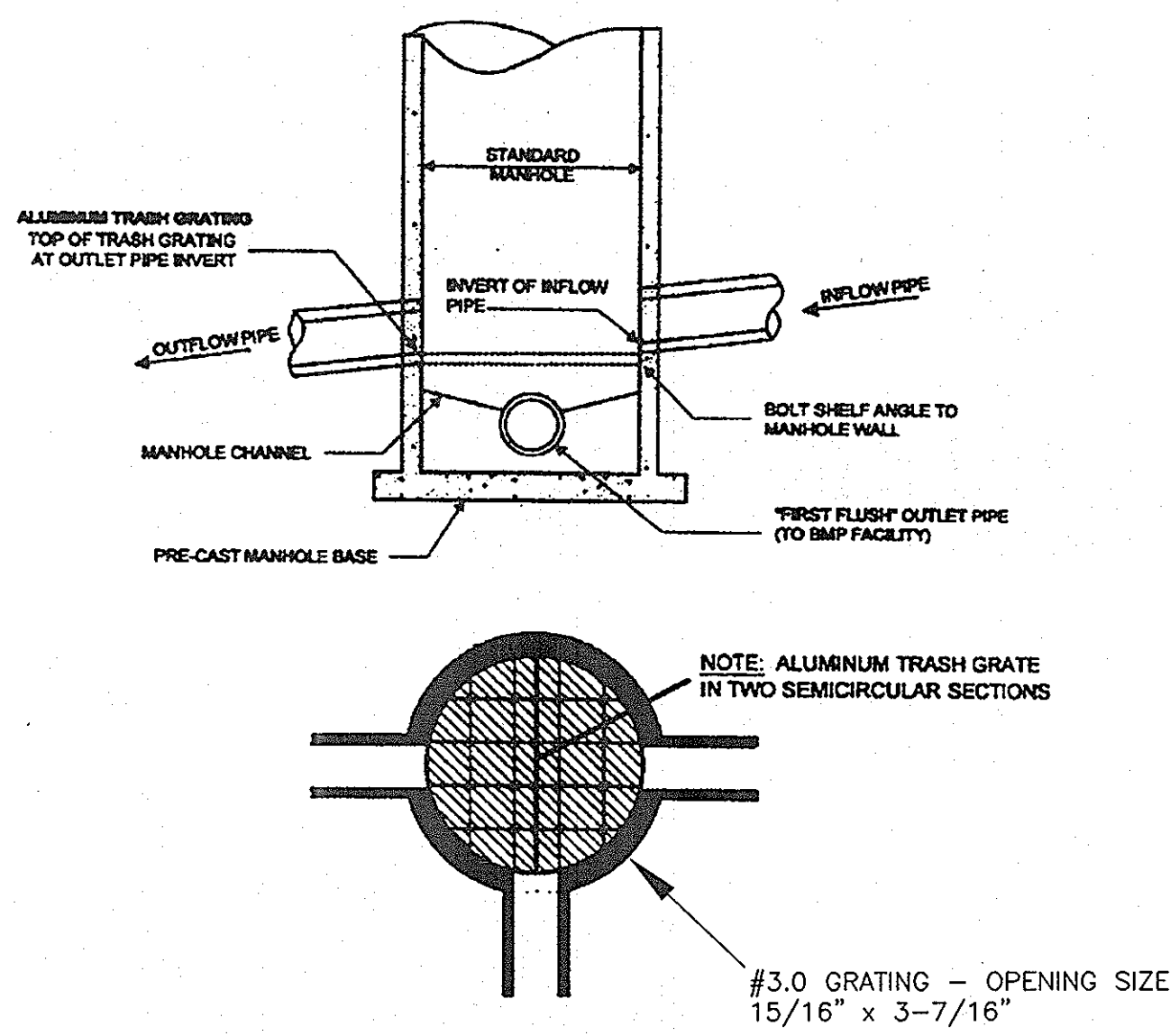
CHIEF, DEVELOPMENT ENGINEERING DIVISION

*Condy Hamilton* 2/16/07  
 CHIEF, DIVISION OF LAND DEVELOPMENT

*Paul L. Loyell* 2/21/07  
 DIRECTOR

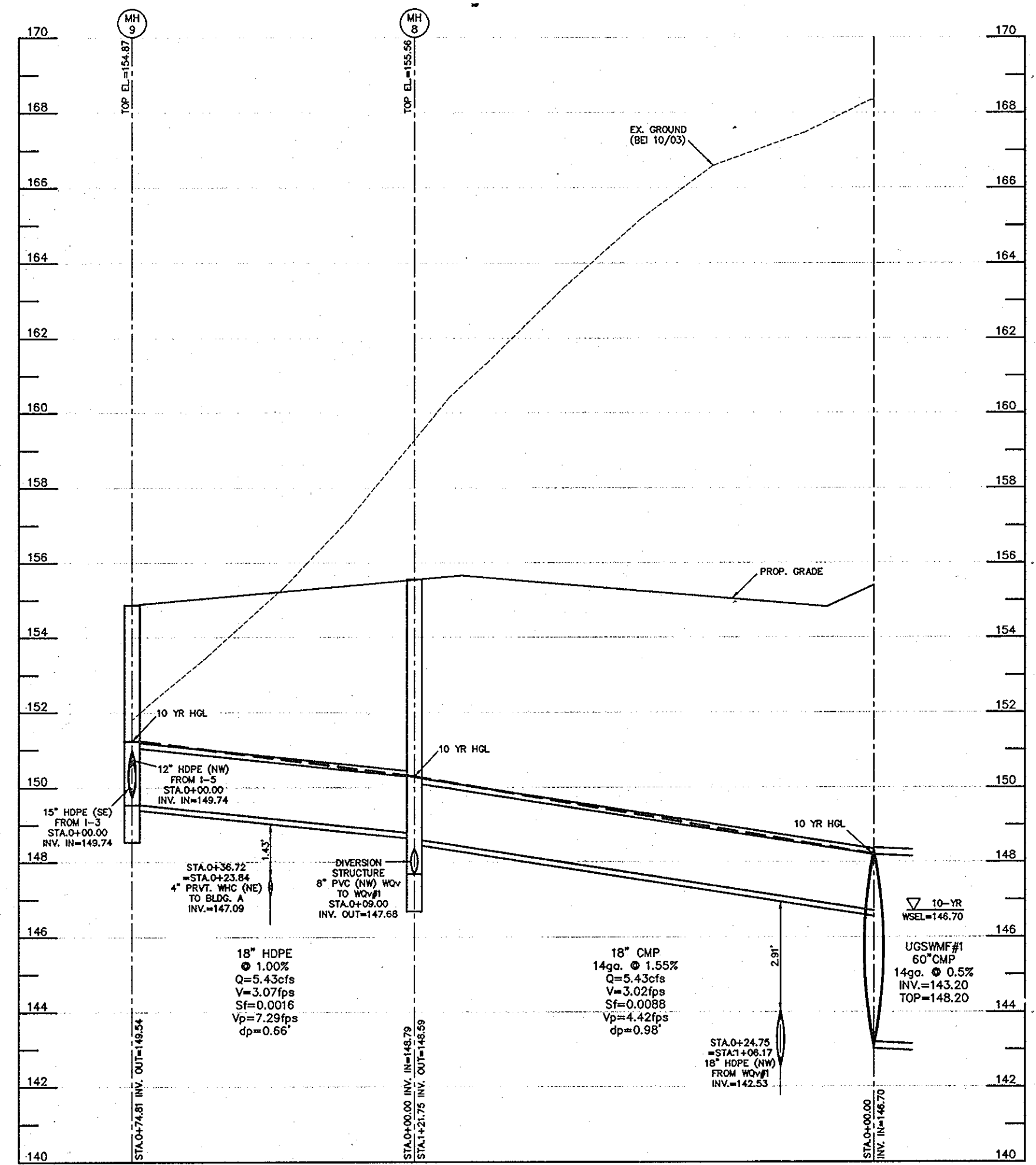
<b>BENCHMARK ENGINEERING, INC.</b> 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6644 www.bei-civilengineering.com		
2-21-08 NO. DATE	REVISE STORM DRAIN STRUCTURE SCHEDULE REVISION	
DEVELOPER/CONTRACT PURCHASER: ELKRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLICOTT CITY, MD 21041 PHONE: 410-465-4244		PROJECT: <b>ELKRIDGE TOWN CENTER</b> PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-F; UNITS 1-186
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE: 2/16/07		LOCATION: TAX MAP 38 - GRID 8 PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE: <b>STORM DRAIN PROFILES</b> NOTES AND DETAILS		DATE: JUNE 3, 2004 APRIL 4, 2005
Design: DAM Draft: MCR Check: DAM		PROJECT NO. 1522 SCALE: AS SHOWN DRAWING 18 OF 38

Detail 6 Isolation Diversion Structure

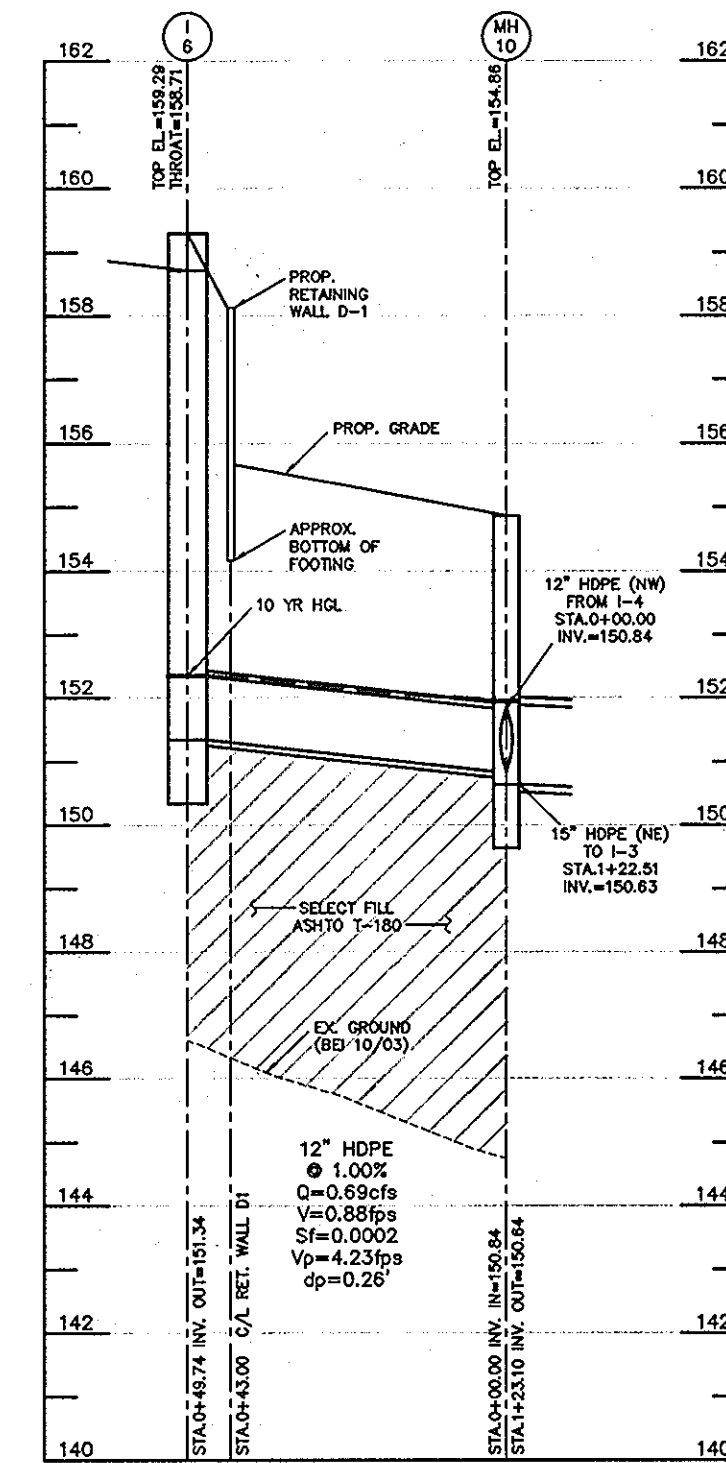


TYPICAL ISOLATION / DIVERSION MANHOLE

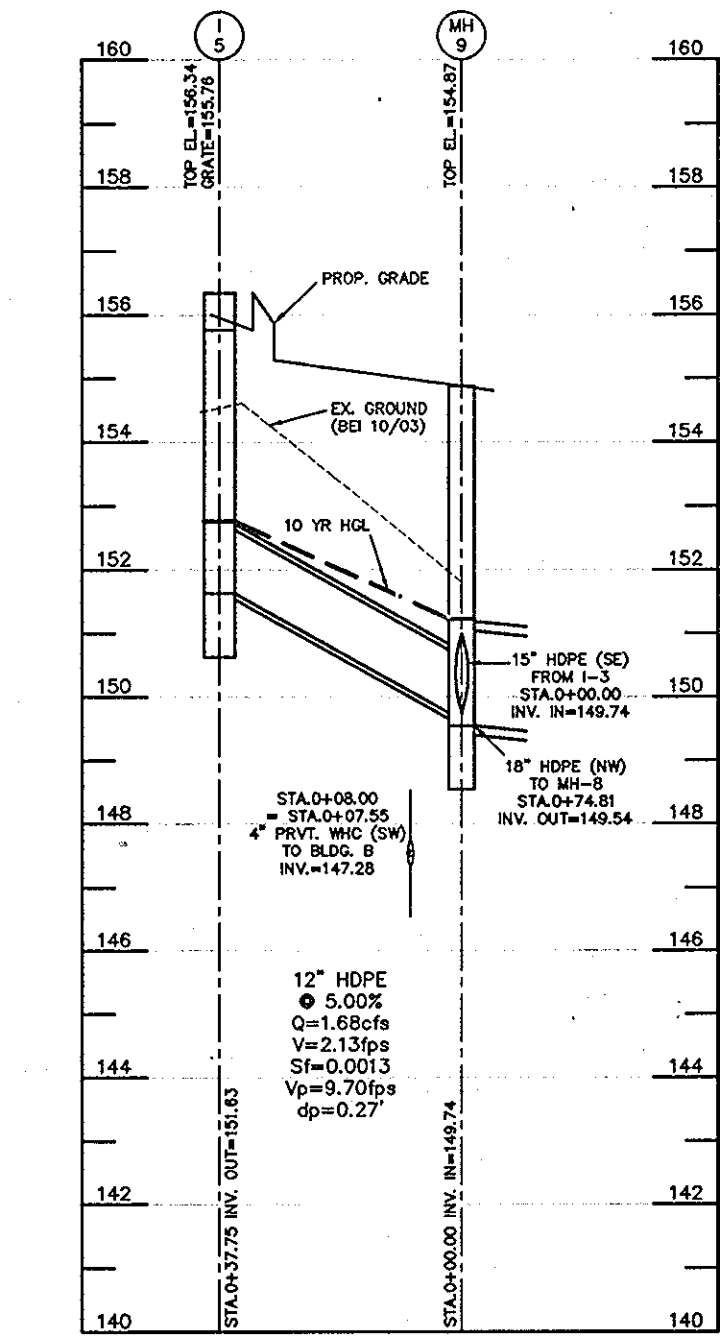
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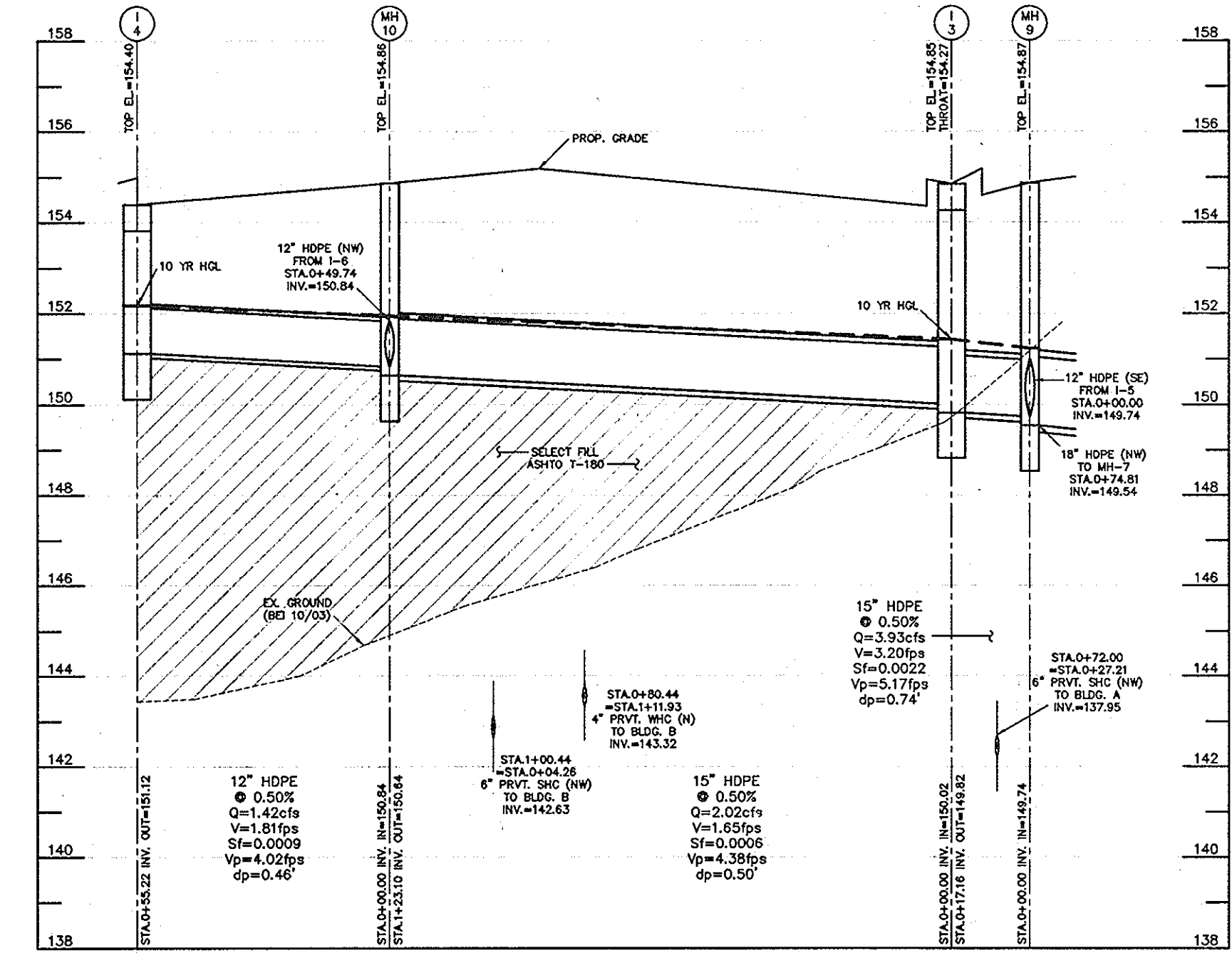
STORM DRAIN PROFILE FROM MH-10 TO I-6  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



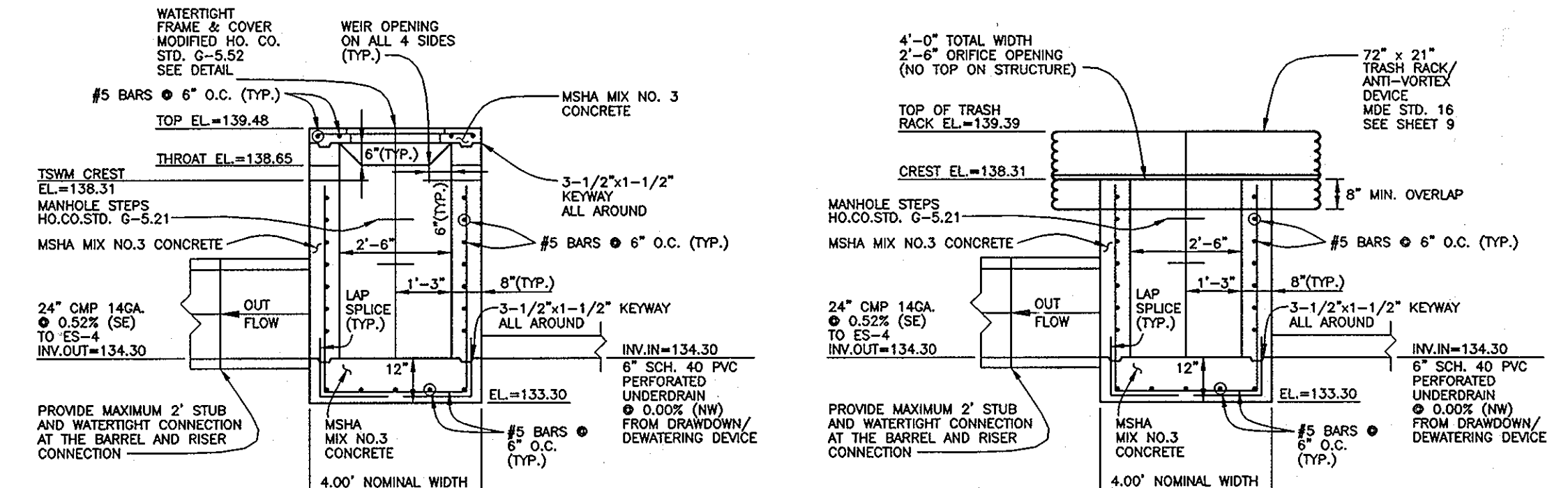
STORM DRAIN PROFILE FROM MH-9 TO I-5  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



STORM DRAIN PROFILE FROM MH-9 TO I-4  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



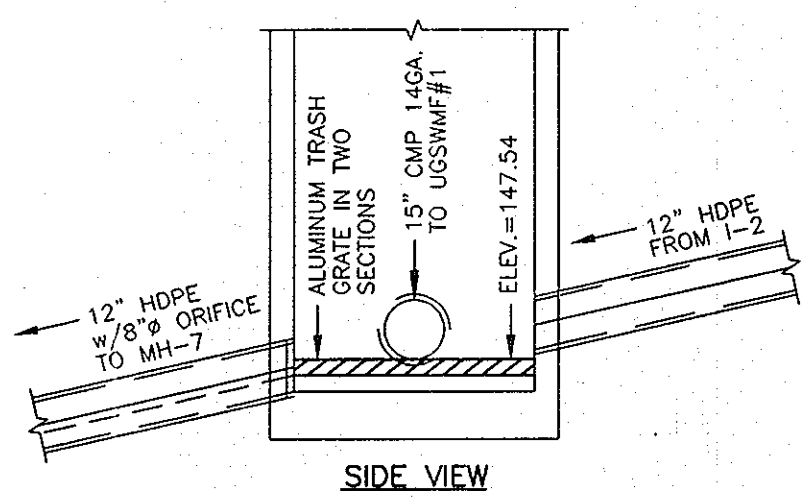
STORM DRAIN PROFILE FROM UGSWMF#1 TO MH-9  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



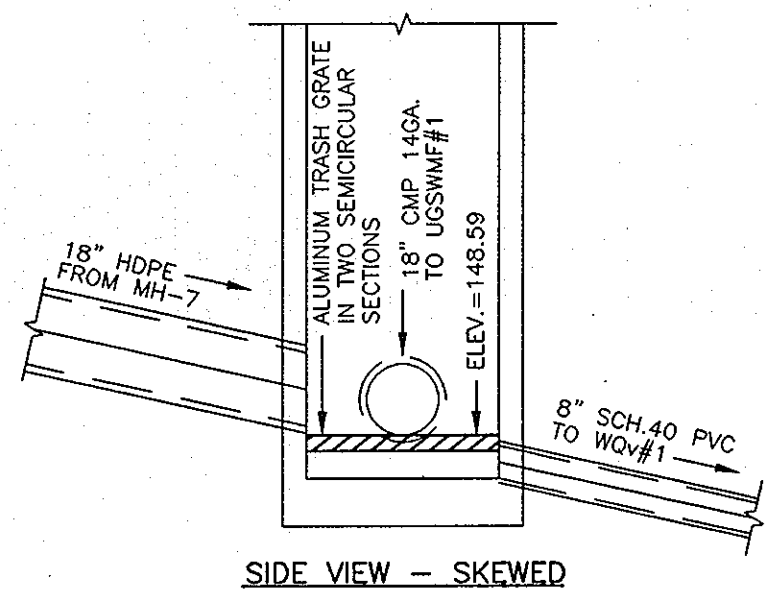
FINAL CONDITION

CONFORMS TO 'D' INLET PER HO. CO. STD. SD-4.11  
OUTFALL STRUCTURE - S-1  
SCALE: 1" = 3'

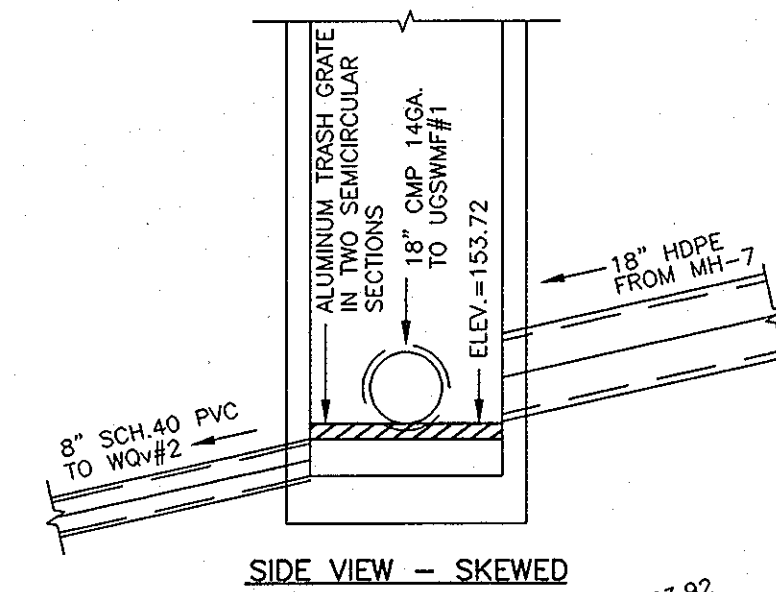
TSWM CONDITION



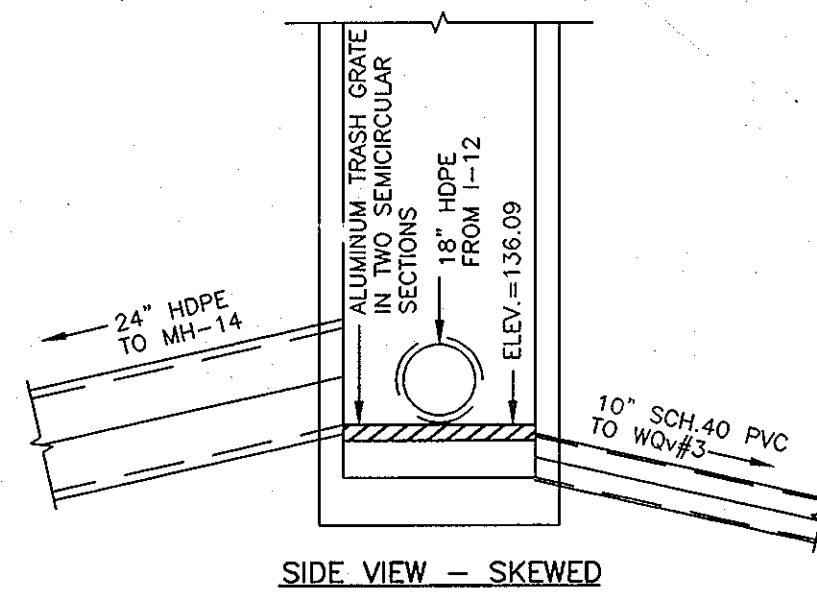
SIDE VIEW



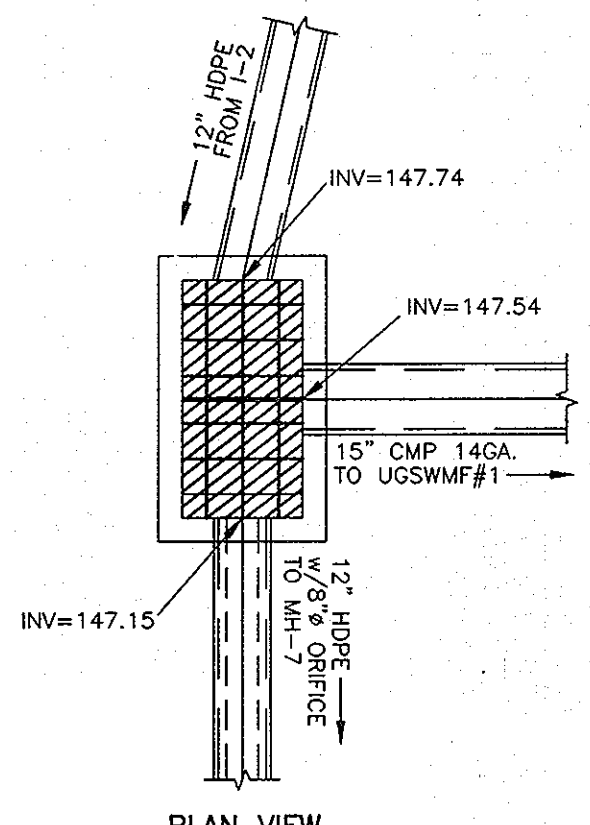
SIDE VIEW - SKEWED



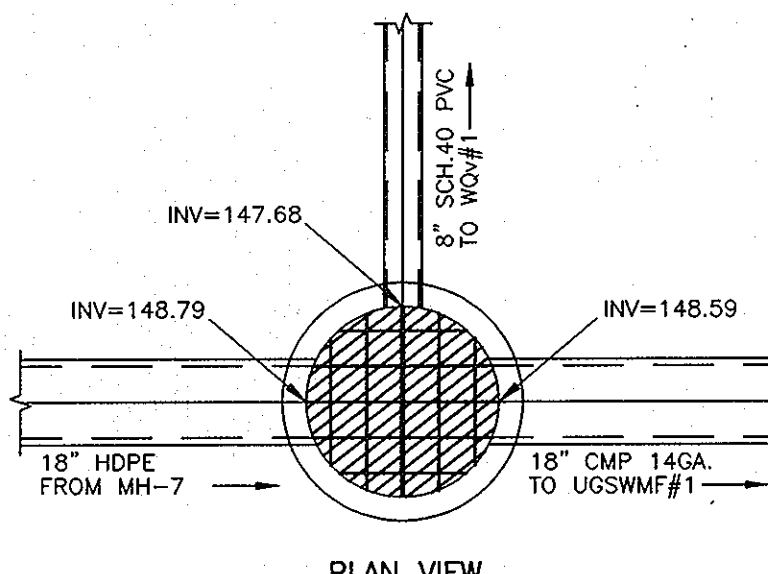
SIDE VIEW - SKEWED



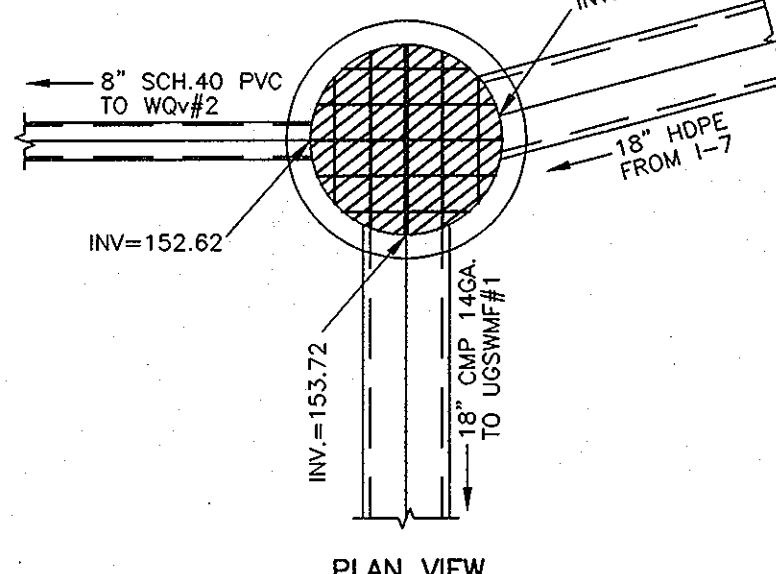
SIDE VIEW - SKEWED



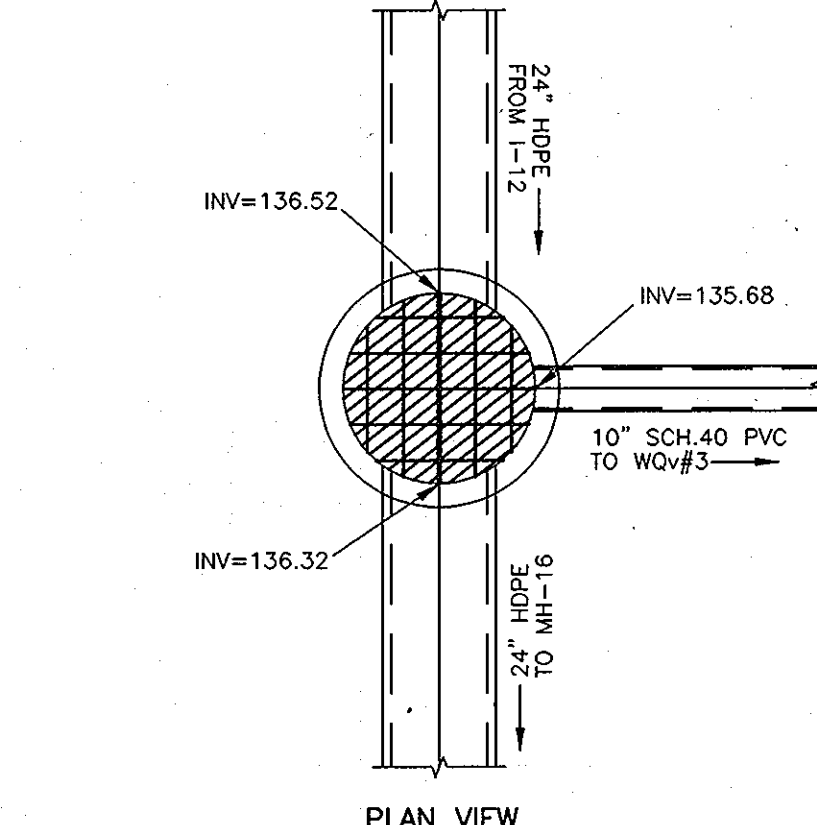
PLAN VIEW



PLAN VIEW



PLAN VIEW



PLAN VIEW

I-1 TO BIO-RETENTION FACILITY  
HO.CO. STD. SD-4.40  
A-5 INLET (PRECAST)

MH-8 TO WQV#1  
HO.CO. STD. G-5.13  
(PRECAST)

MH-11 TO WQV#2  
HO.CO. STD. G-5.13  
(PRECAST)

MH-13 TO WQV#3  
HO.CO. STD. G-5.13  
(PRECAST)

DIVERSION STRUCTURES  
SCALE: 1" = 4'

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*Cindy Hamer* 2/16/07 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT  
*Frankie D. Loyd* 2/16/07 DATE

DIRECTOR

NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
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8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
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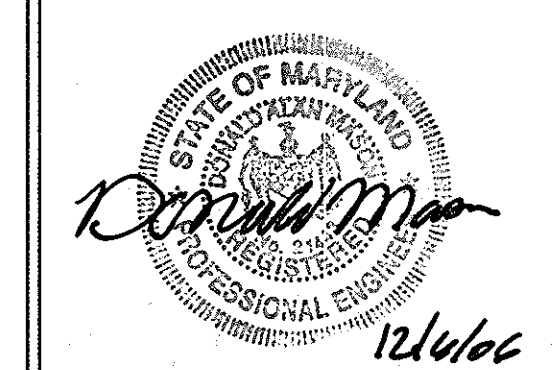
PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

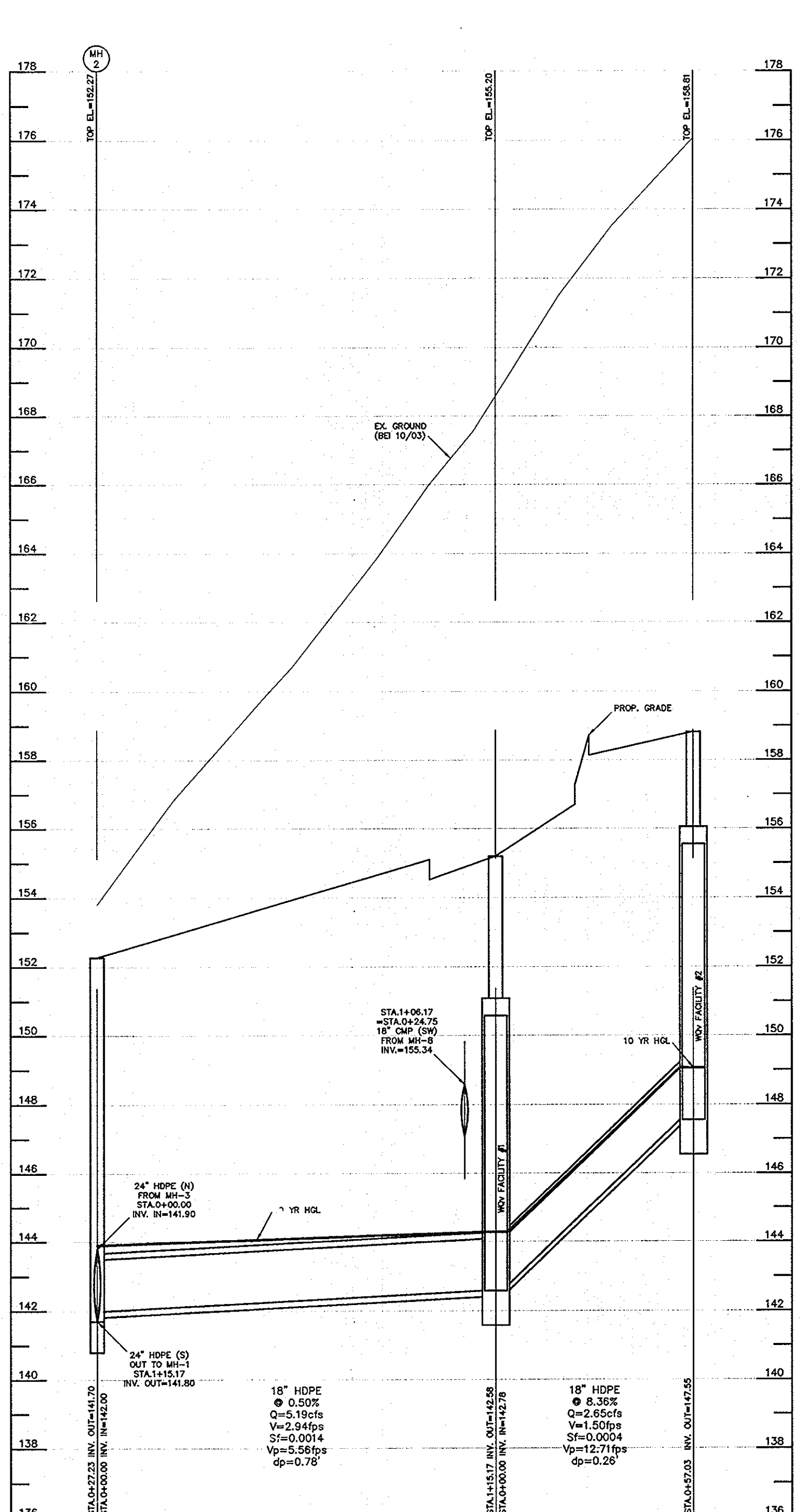
LOCATION: TAX MAP 38 - GRID 8  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: STORM DRAIN PROFILES  
NOTES AND DETAILS

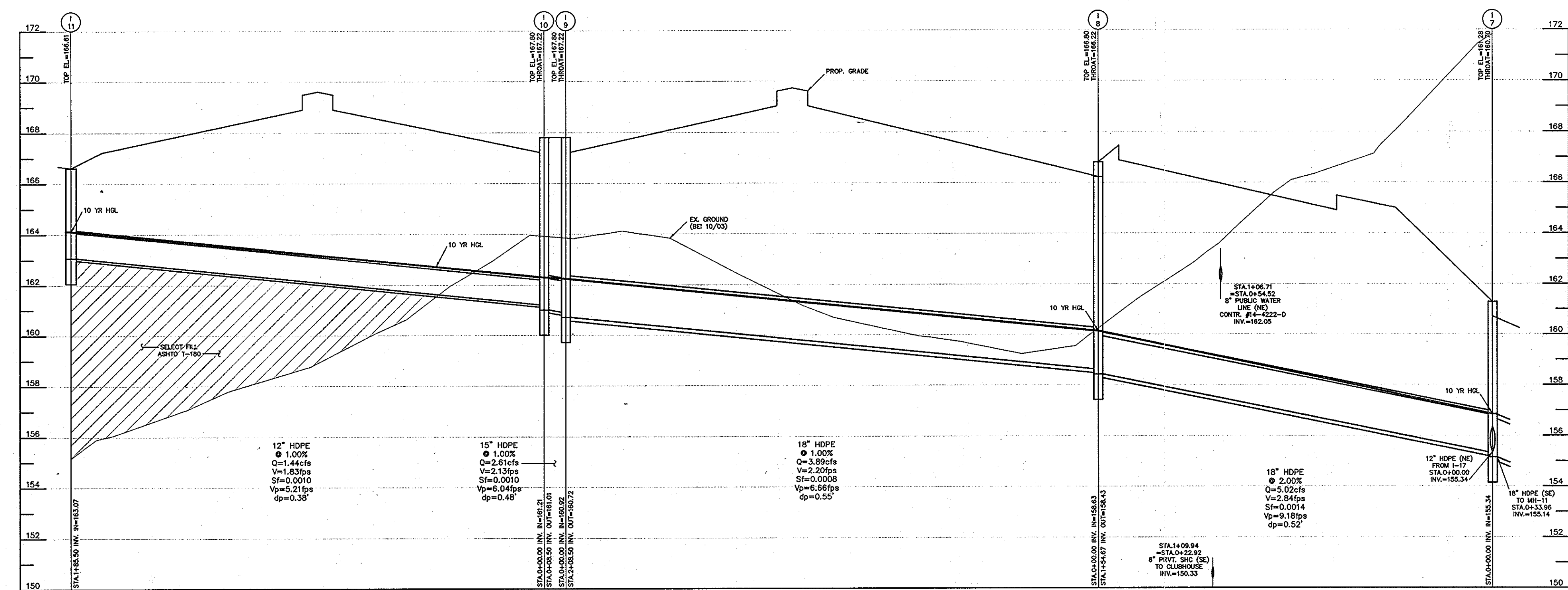
DATE: JUNE 3, 2004  
APRIL 4, 2005 PROJECT NO. 1522

Design: DAM Draft: MCR Check: DAM SCALE: AS SHOWN DRAWING 19 OF 38

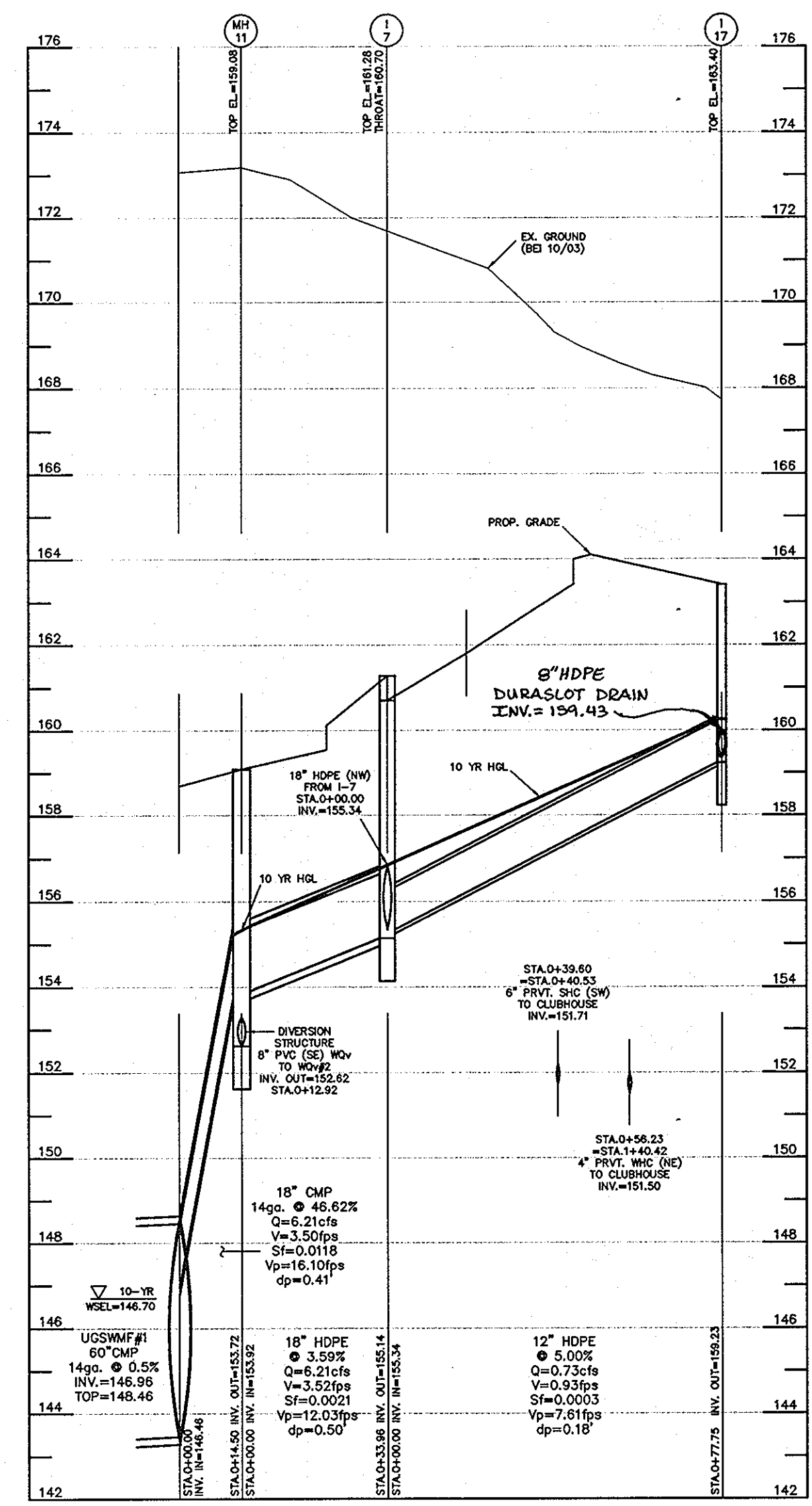




**STORM DRAIN PROFILE  
FROM MH-2 TO WQV#2**  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



**STORM DRAIN PROFILE  
FROM I-7 TO I-1**  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



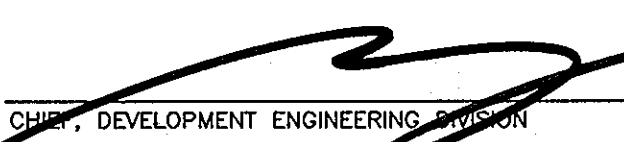

**STORM DRAIN PROFILE  
FROM UGSWMF#1 TO I-17**  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

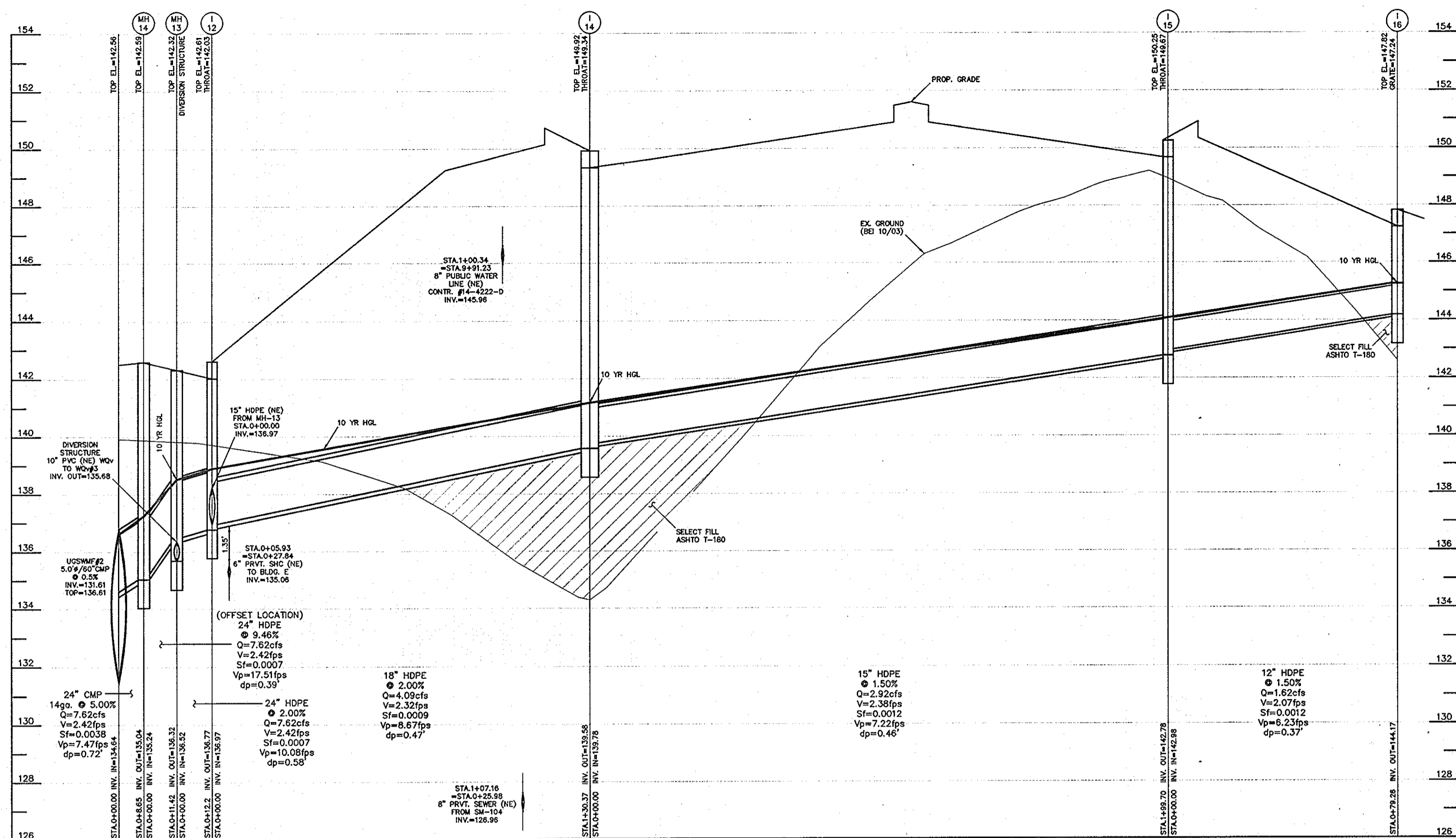
 2/16/07  
 CHIEF, DIVISION OF LAND DEVELOPMENT  
 2/21/07  
 DIRECTOR

NO.	DATE	REVISION
2-21-08		SHOW DURASLOT @ DRAIN

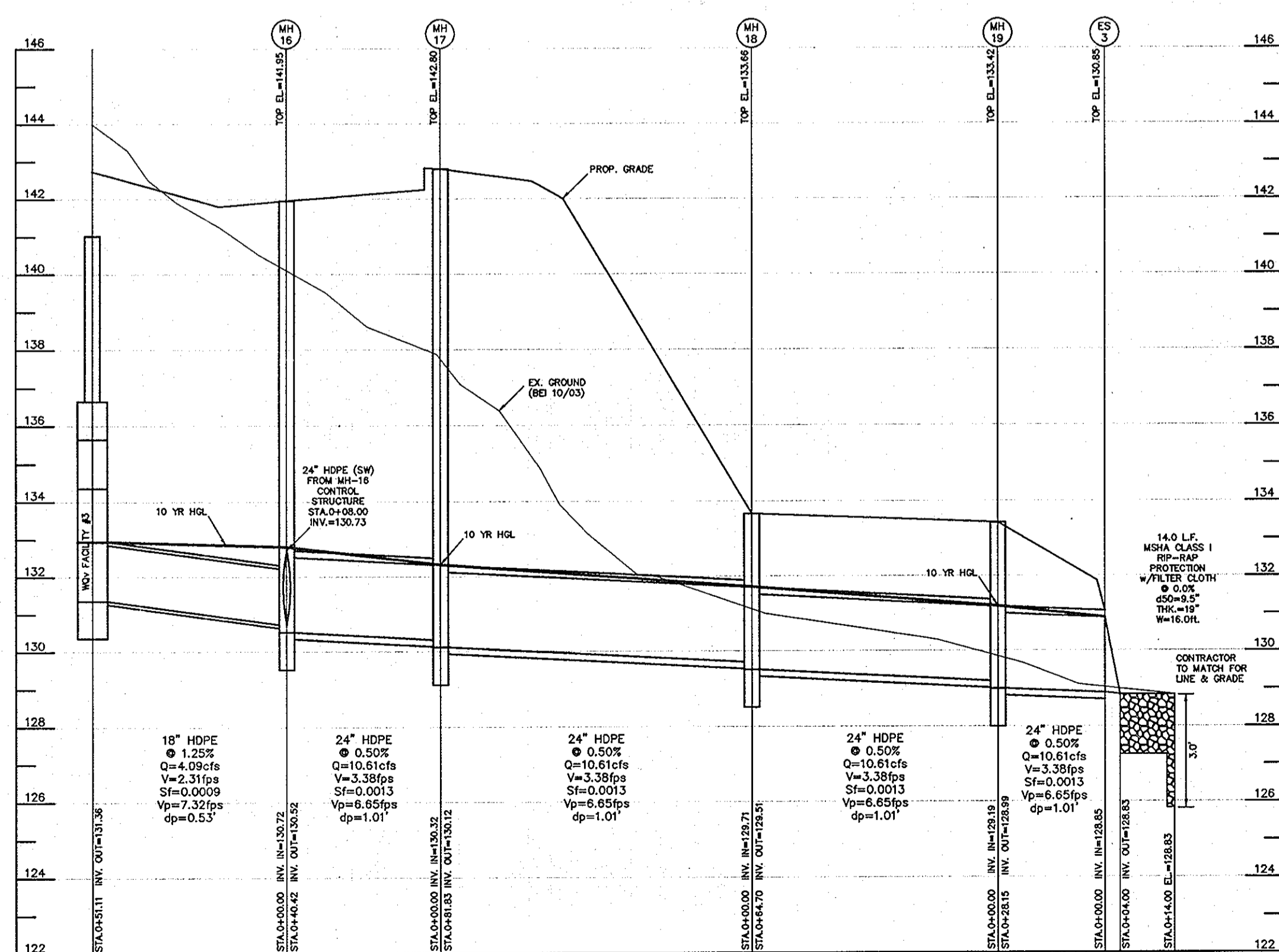
**BENCHMARK ENGINEERING, INC.**  
 ENGINEERS • LAND SURVEYORS • PLANNERS  
 8480 BALTIMORE NATIONAL PIKE • SUITE 418  
 ELLICOTT CITY, MARYLAND 21043  
 PHONE: 410-465-6105 FAX: 410-465-6644  
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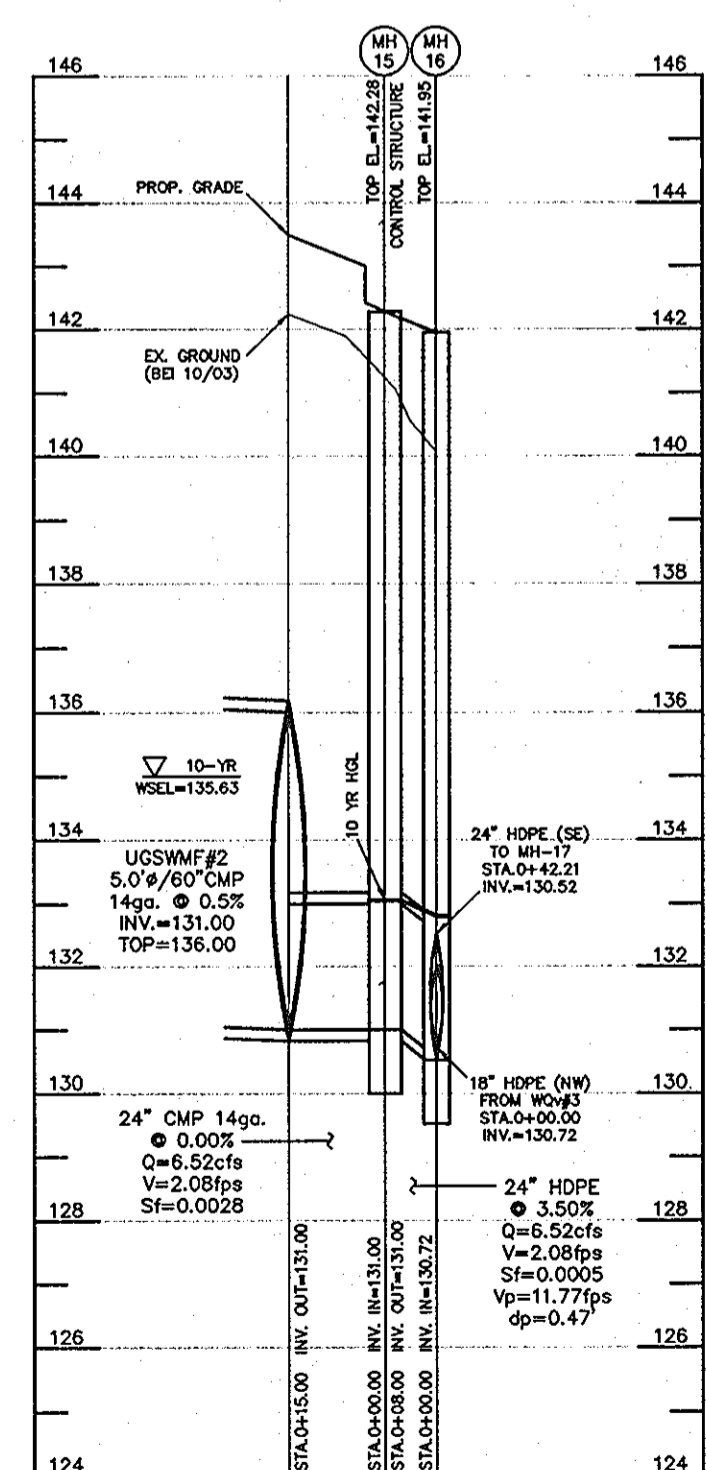
DEVELOPER/CONTRACT PURCHASER:	PROJECT:
ELKTRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLICOTT CITY, MD 21041 PHONE: 410-465-4244	ELKTRIDGE TOWN CENTER PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-F'; UNITS 1-186
TITLE:	LOCATION:
STORM DRAIN PROFILES NOTES AND DETAILS	TAX MAP 39 - GRID 8 PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE:	PROJECT NO.
JUNE 3, 2004 FEBRUARY 10, 2005	1522
SCALE:	DRAWING NO.
AS SHOWN	20 OF 38



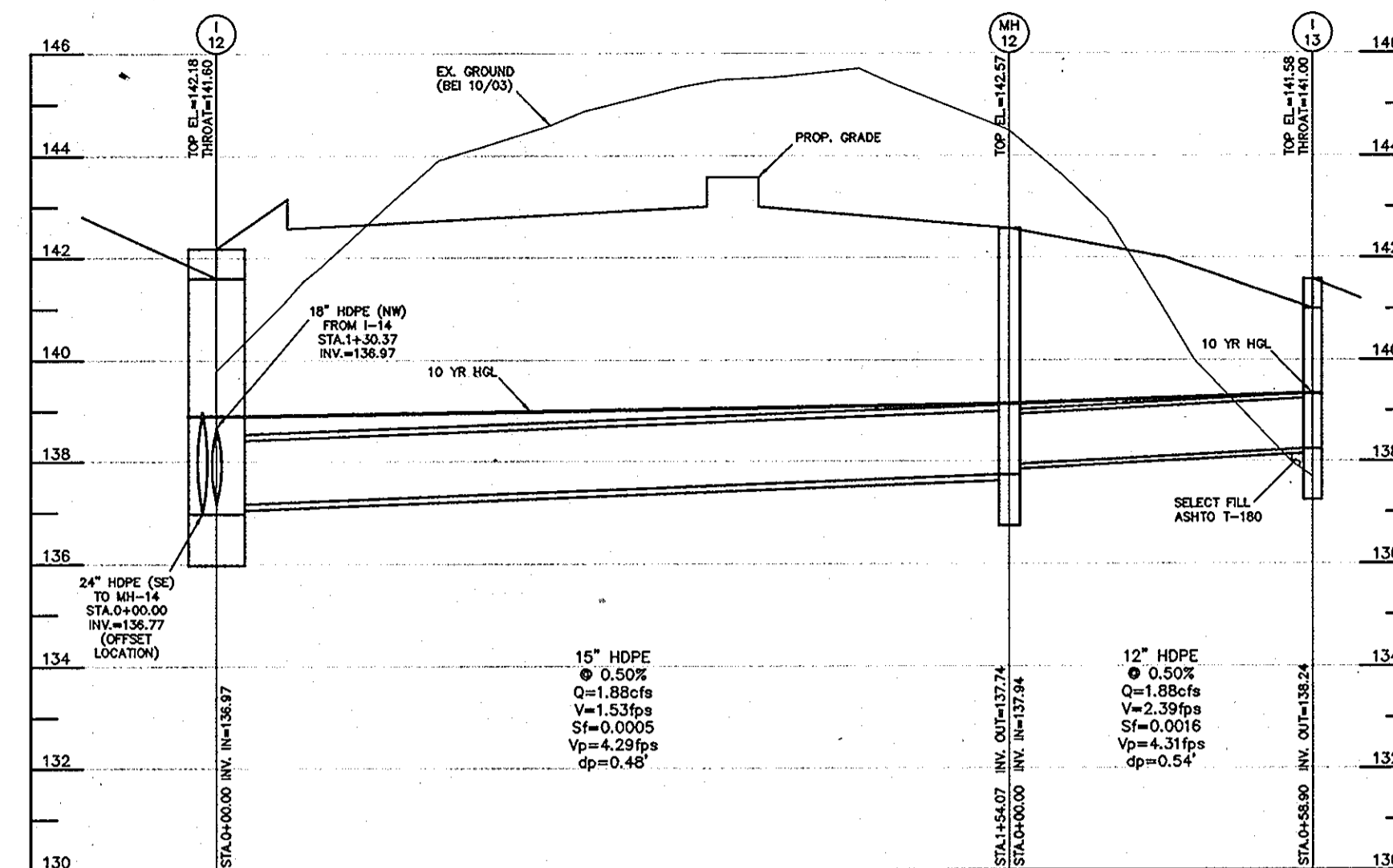
**STORM DRAIN PROFILE  
FROM UGSWMF#2 TO I-16**  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



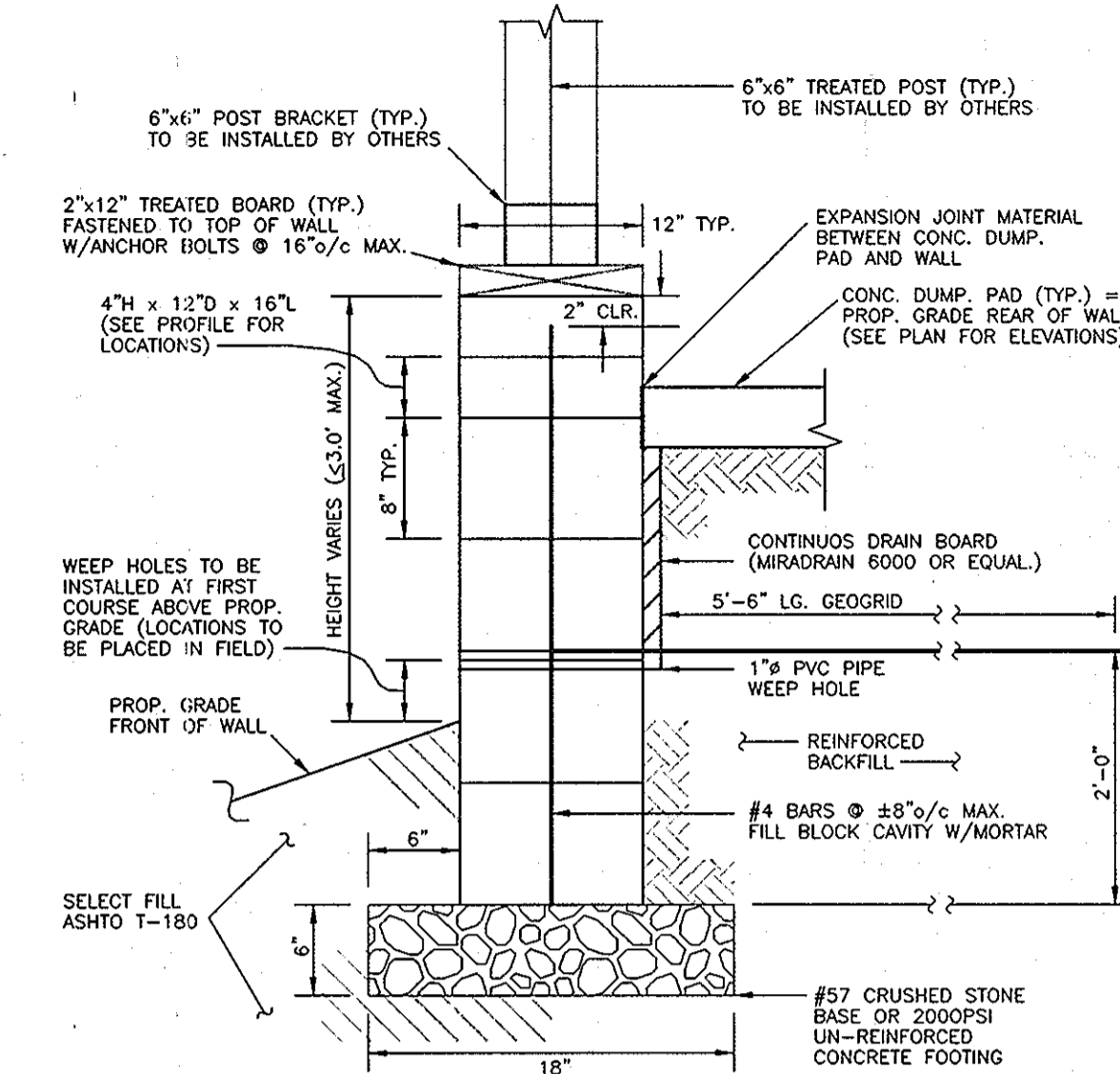
**STORM DRAIN PROFILE  
FROM ES-3 TO WQV#3**  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



**STORM DRAIN PROFILE  
FROM UGSWMF#2 TO MH-16**  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'



**STORM DRAIN PROFILE  
FROM I-12 TO I-13**  
HORIZONTAL SCALE: 1" = 30'  
VERTICAL SCALE: 1" = 3'

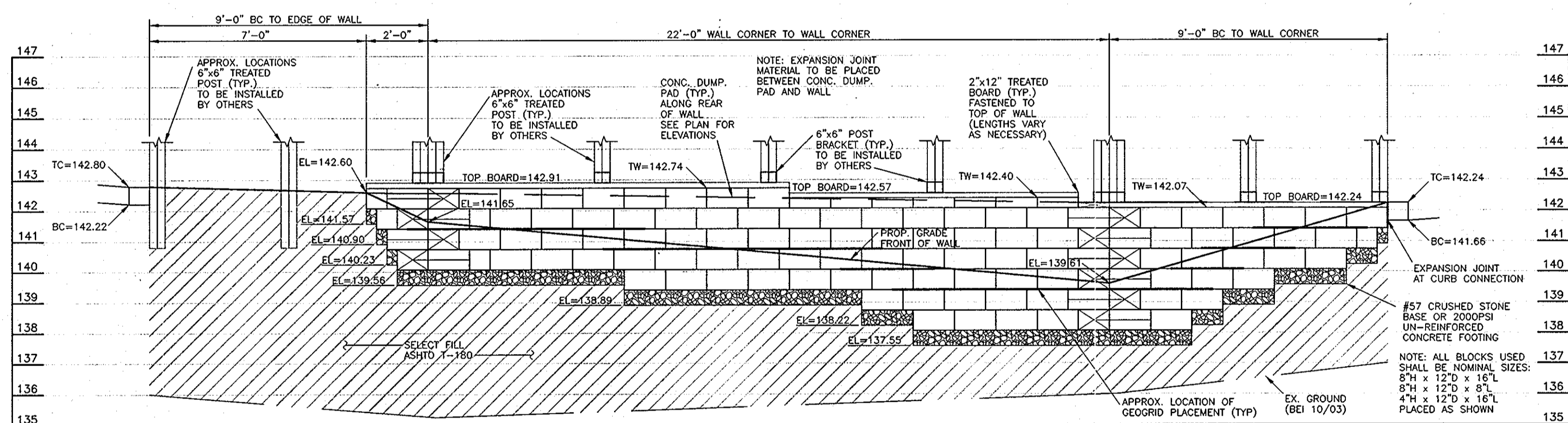


**TYPICAL SECTION - BLOCK WALL**  
SCALE: 1" = 1'

- NOTES:
- 1) PLACE GEGRID (TENSOR UNK140065 OR EQUAL) AT 2'-0" ABOVE WALL FOUNDATION. GEGRID SHALL EXTEND A MINIMUM OF 5'-0" FROM THE BACK OF WALL INTO REINFORCED BACKFILL.
  - 2) REFERENCE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR PROPER GEGRID INSTALLATION.
- 2.08 REINFORCED BACKFILL
- A. REINFORCED BACKFILL SHALL BE FREE OF DEBRIS OR ORGANIC MATERIAL MEETING THE FOLLOWING GRADATION:
 

SILO SIZE	PASSING
3/4"	100-75
NO. 40	100-75
NO. 200	0-35

 PLASTICITY INDEX (PI) < 15 AND LIQUID LIMIT < 40 PER ASTM D-4318
  - B. THE MAXIMUM AGGREGATE SIZE SHALL BE LIMITED TO 2" UNLESS FIELD TESTS HAVE BEEN PERFORMED TO EVALUATE POTENTIAL STRENGTH REDUCTION TO INSTALLATION.
  - C. MATERIAL CAN BE SITE EXCAVATED MATERIAL WHEN THE ABOVE REQUIREMENTS ARE MET. UNSUITABLE SOILS FOR BACKFILL (HIGH PLASTIC CLAYS OR ORGANIC MATERIALS) SHALL NOT BE USED IN THE REINFORCED SOIL MASS.
  - D. CONTRACTOR SHALL SUBMIT REINFORCED FILL SAMPLE AND TEST RESULTS TO THE ARCHITECT/ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.



**PROFILE VIEW - BLOCK WALL**  
HORIZONTAL AND VERTICAL SCALE: 1" = 3'

NOTE: ALL STORMWATER MANAGEMENT BMP'S SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

NOTE: ALL STORM DRAINS LABELED AS HDPE SHALL HAVE A SMOOTH-BORE INTERIOR FINISH

NOTE: ALL STORM DRAINS SHOWN ON THESE PLANS ARE TO BE PRIVATELY OWNED AND MAINTAINED

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF DEVELOPMENT ENGINEERING DIVISION  
*Handwritten signature*  
 DATE: 2/16/07

CHIEF, DIVISION OF PLANNING AND DEVELOPMENT  
*Handwritten signature*  
 DATE: 2/20/07

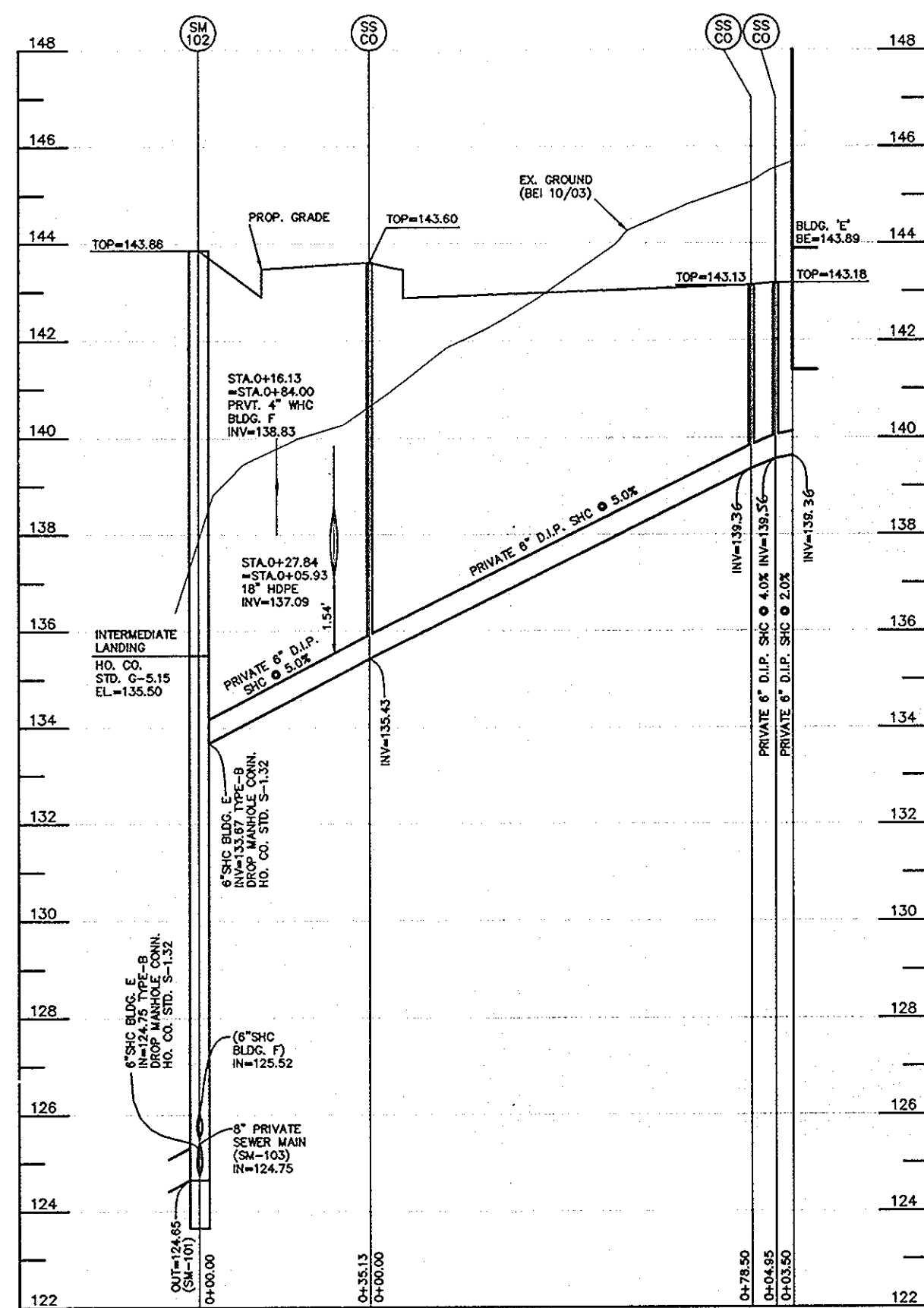
NO.	DATE	REVISION

**BENCHMARK**  
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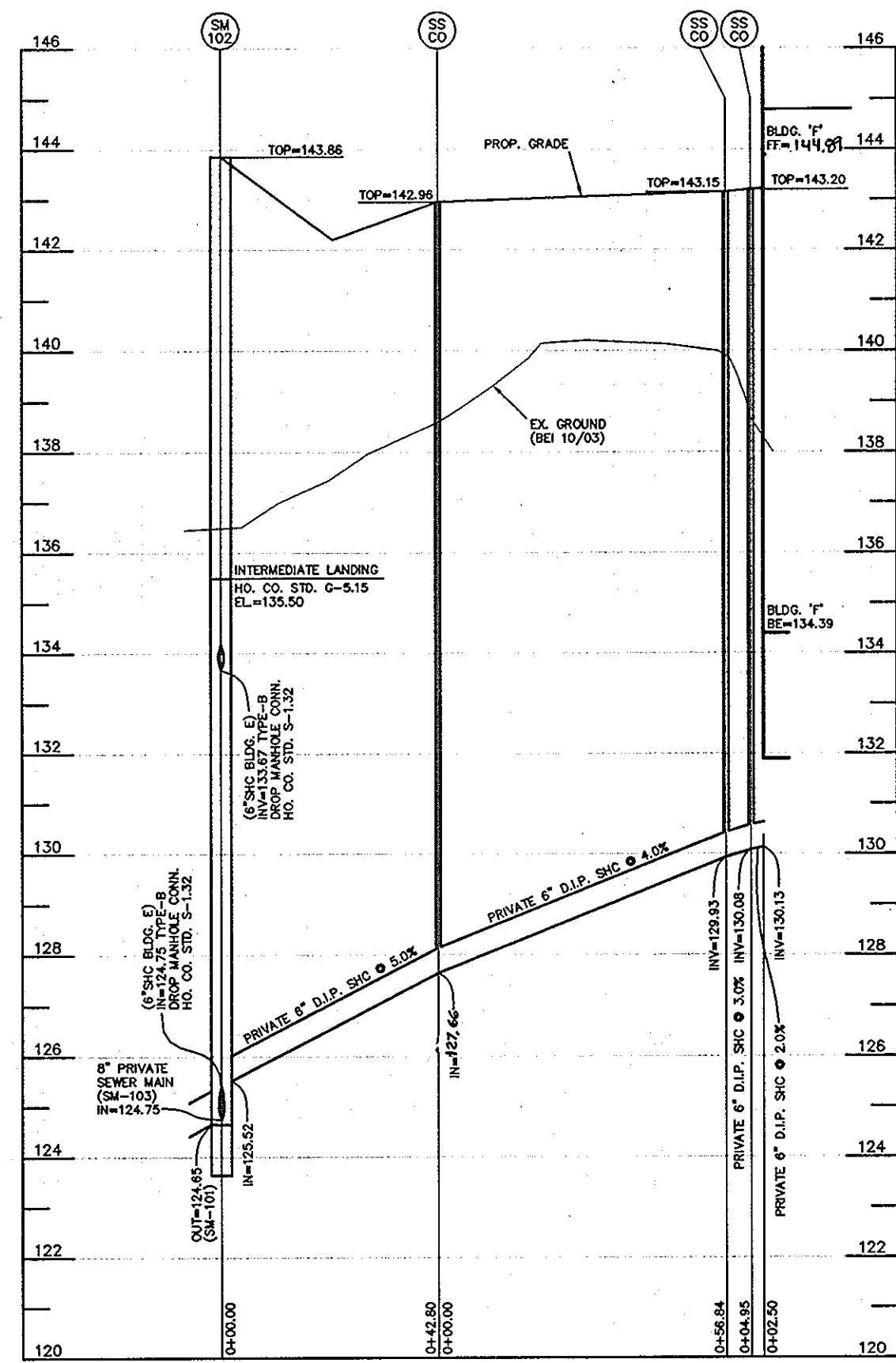
**ENGINEERING, INC.**

8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6844  
www.bai-civilengineering.com

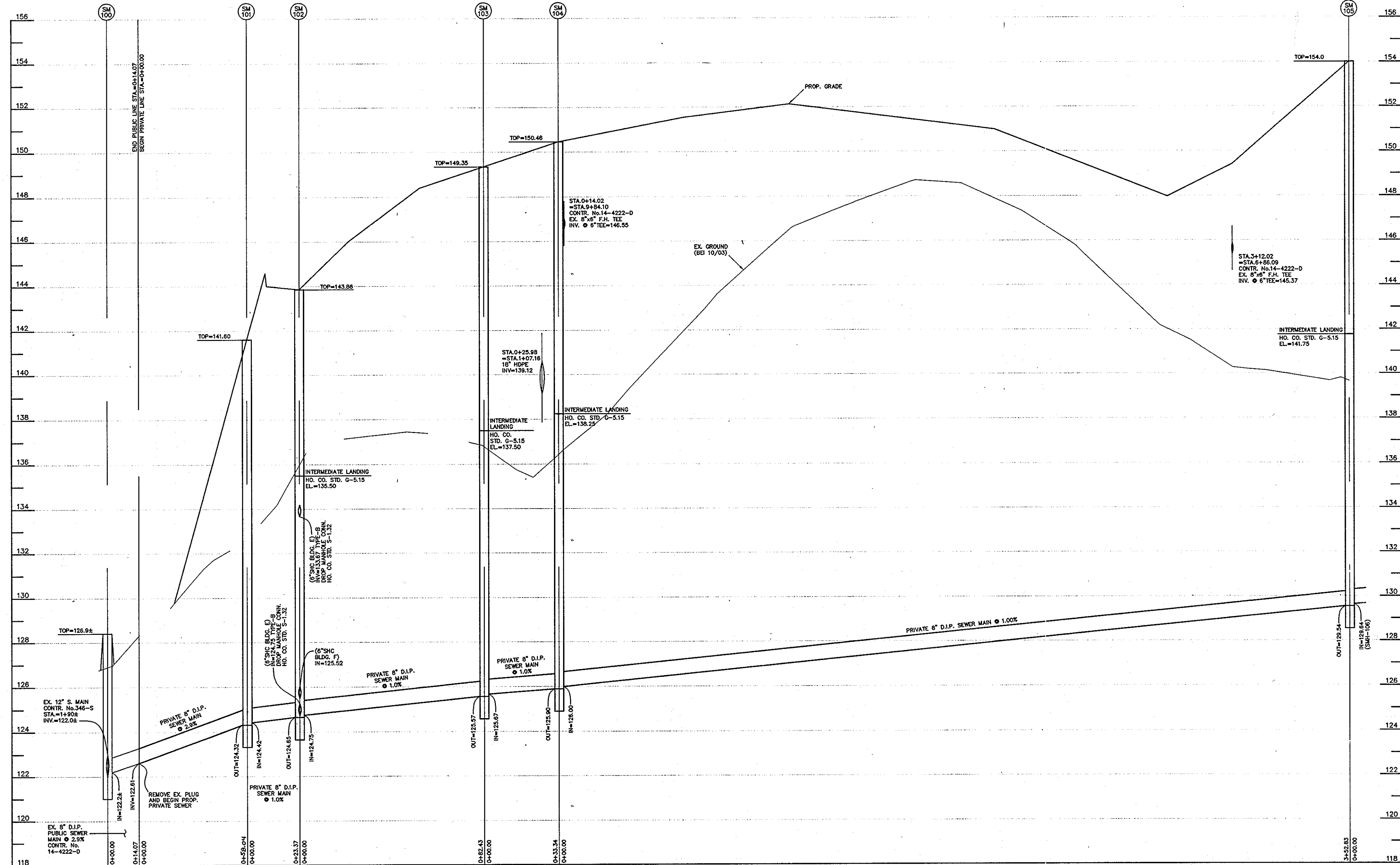
DEVELOPER/CONTRACT PURCHASER:	PROJECT: ELKRIDGE TOWN CENTER
ELKRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLCOTT CITY, MD 21041 PHONE: 410-465-4244	PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
LOCATION:	TAX MAP 38 - GRID 8 PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE:	STORM DRAIN PROFILES NOTES AND DETAILS
DATE:	JUNE 3, 2004 FEBRUARY 10, 2005
PROJECT NO. 1522	SCALE: AS SHOWN
DESIGN: DAM	DRAFT: MCR
CHECK: DAM	DATE: 2/20/07
SCALE: AS SHOWN	PROJECT NO. 1522
DATE: 2/20/07	PROJECT NO. 1522



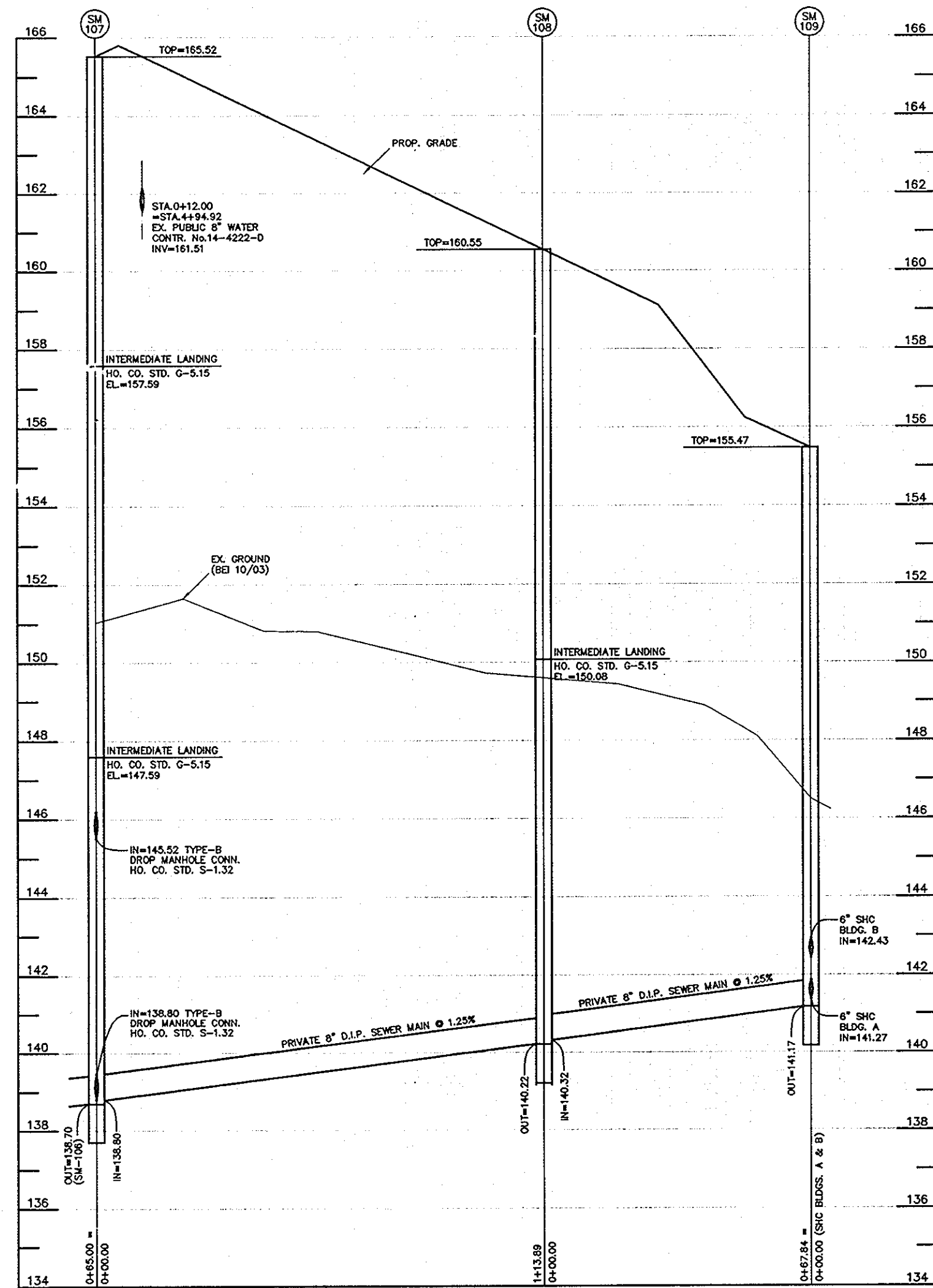
SHC FOR BUILDING E  
HORIZONTAL SCALE: 1" = 30"  
VERTICAL SCALE: 1" = 3"



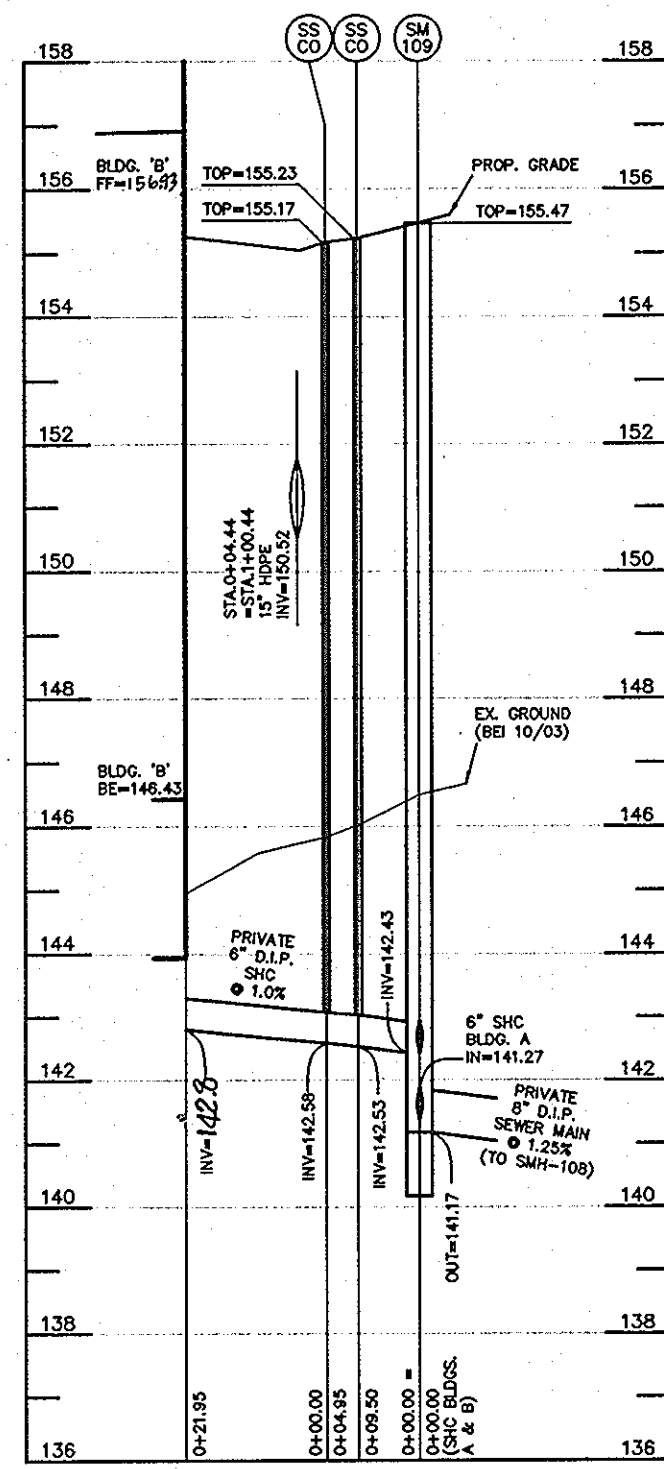
SHC FOR BUILDING F  
HORIZONTAL SCALE: 1" = 30"  
VERTICAL SCALE: 1" = 3"



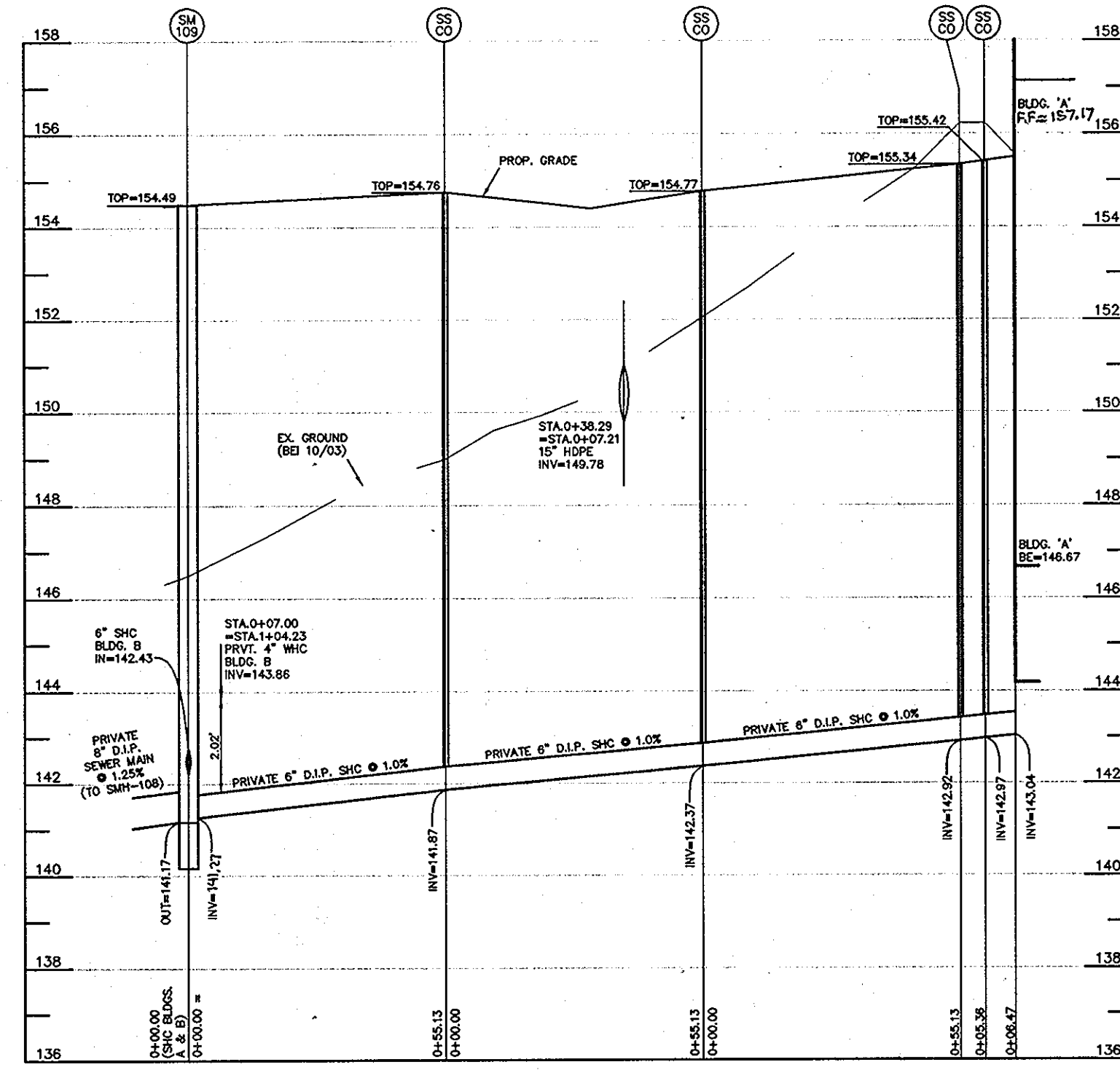
SM-100 TO SM-105  
HORIZONTAL SCALE: 1" = 30"  
VERTICAL SCALE: 1" = 3"



SM-108 TO SM-109  
HORIZONTAL SCALE: 1" = 30"  
VERTICAL SCALE: 1" = 3"



SHC FOR BUILDING B  
HORIZONTAL SCALE: 1" = 30"  
VERTICAL SCALE: 1" = 3"



SHC FOR BUILDING A  
HORIZONTAL SCALE: 1" = 30"  
VERTICAL SCALE: 1" = 3"

SM NO.	NORTHING	EASTING	ELEV.
100	559,789.7358	1,387,665.7541	128.44
101	559,818.2505	1,387,732.0017	141.60
102	559,841.4342	1,387,734.9642	143.86
103	559,901.0550	1,387,678.0478	149.35
104	559,934.3841	1,387,678.8213	150.48
105	560,178.0149	1,387,934.0289	154.00
107	560,273.9336	1,388,034.5054	165.52
108	560,191.5564	1,388,113.1458	160.55
109	560,135.0976	1,388,150.7573	155.47

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Chief, Development Engineering Division*  
DATE: 2/10/07

*Chief, Division of Land Development*  
DATE: 2/20/07

*Director*  
DATE: 2/20/07

2-21-08 REVISE F.F. ELEV. ON SHC PROFILES

**BENCHMARK ENGINEERING, INC.**  
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8480 BALTIMORE NATIONAL PIKE • SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6644  
www.bel-civilengineering.com

DEVELOPER/CONTRACT PURCHASER: ELK RIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLCOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELK RIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

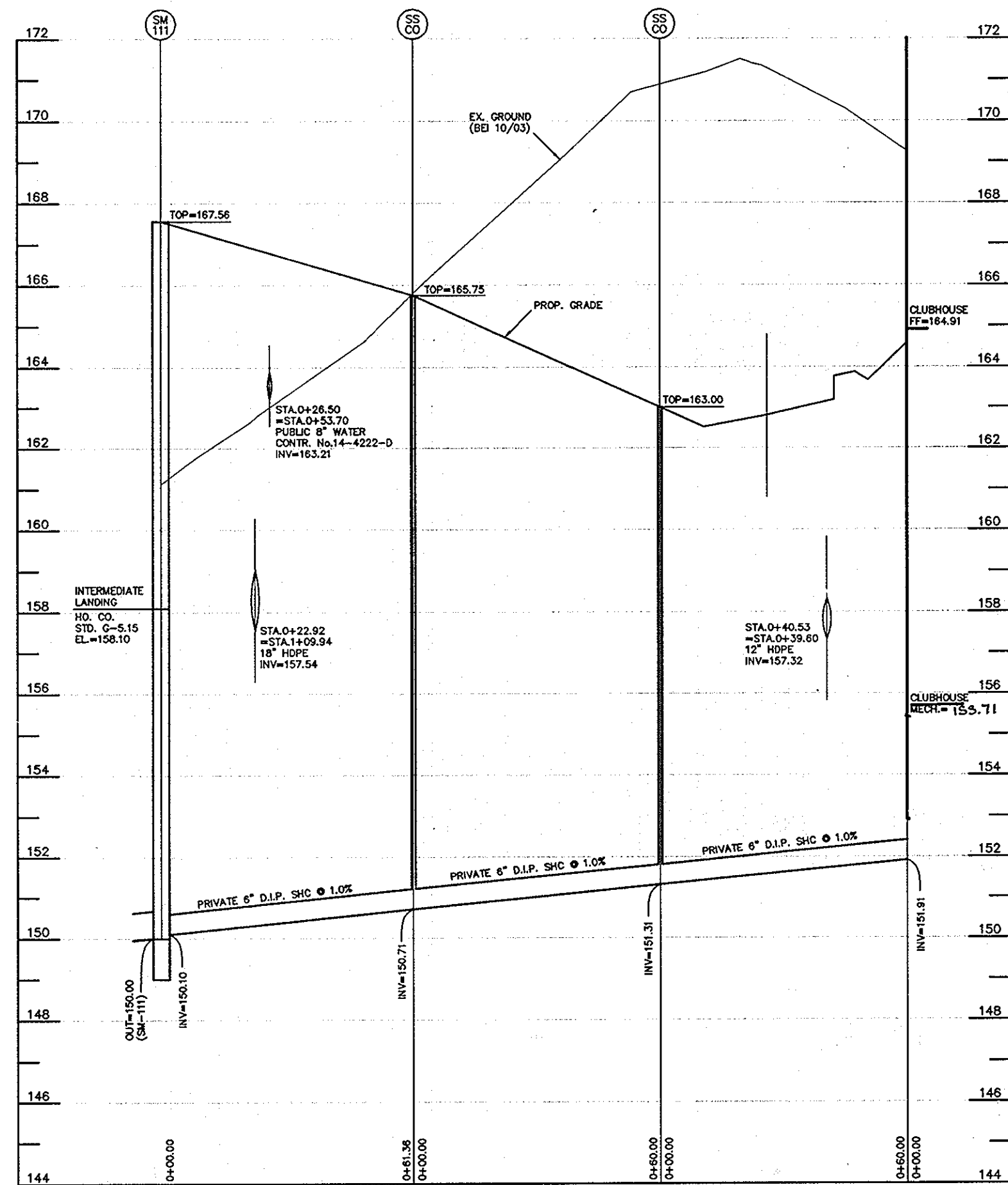
LOCATION: TAX MAP 38 - GRID 8  
PARCEL 528  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: PRIVATE SEWER SYSTEM PROFILES, NOTES & DETAILS

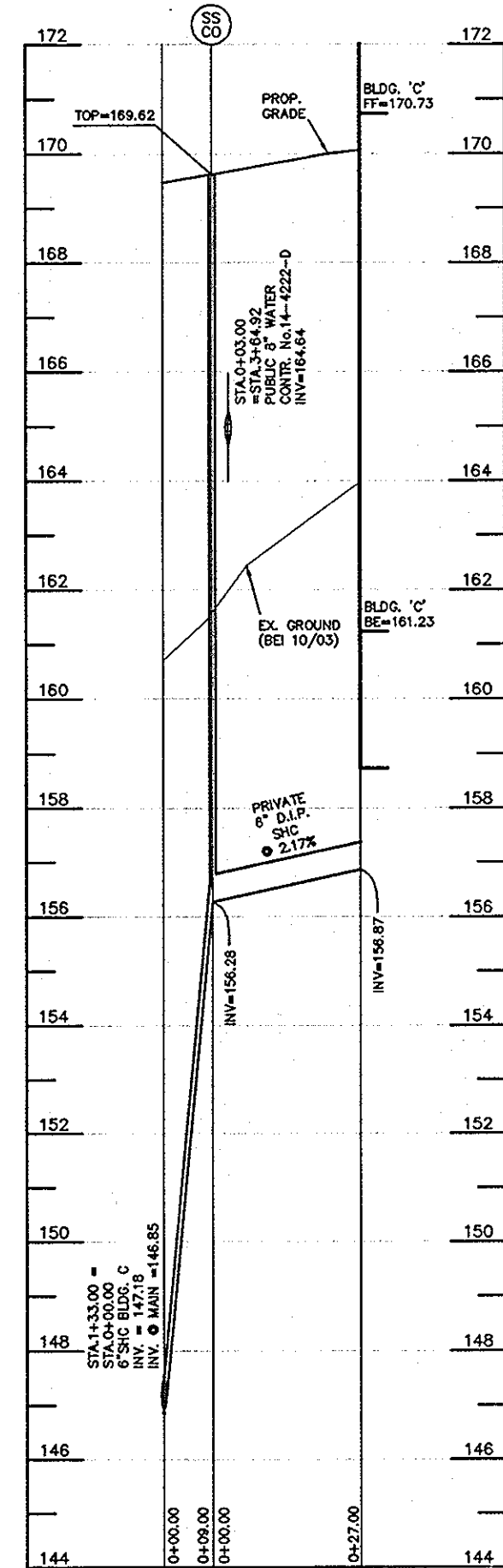
DATE: JUNE 3, 2004  
FEBRUARY 10, 2005

PROJECT NO. 1522

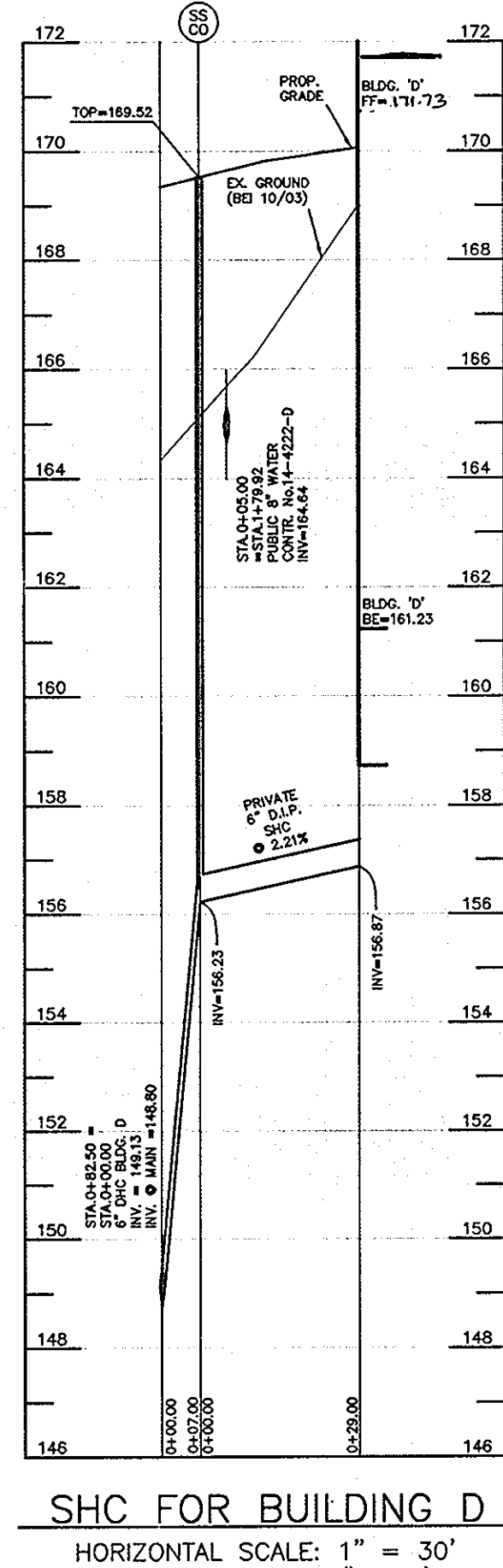
Design: DAM Draft: MCR Check: DAM SCALE: AS SHOWN DRAWING 22 OF 38



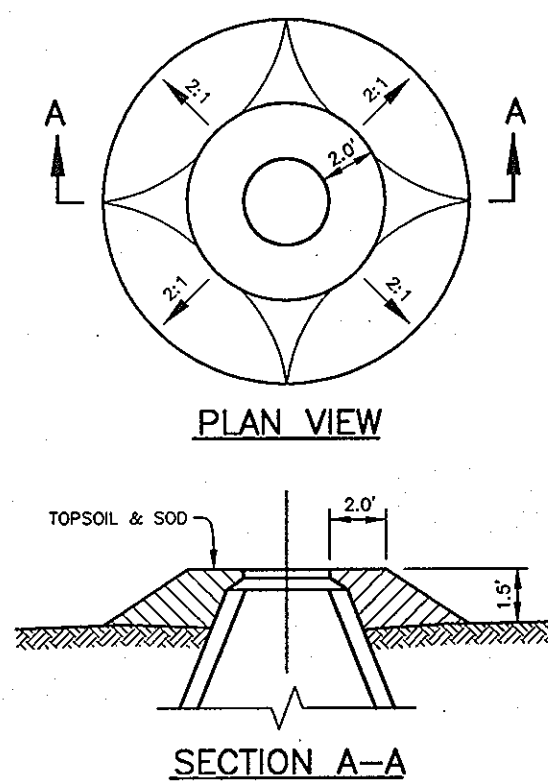
**SHC FOR CLUBHOUSE**  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



**SHC FOR BUILDING C**  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'

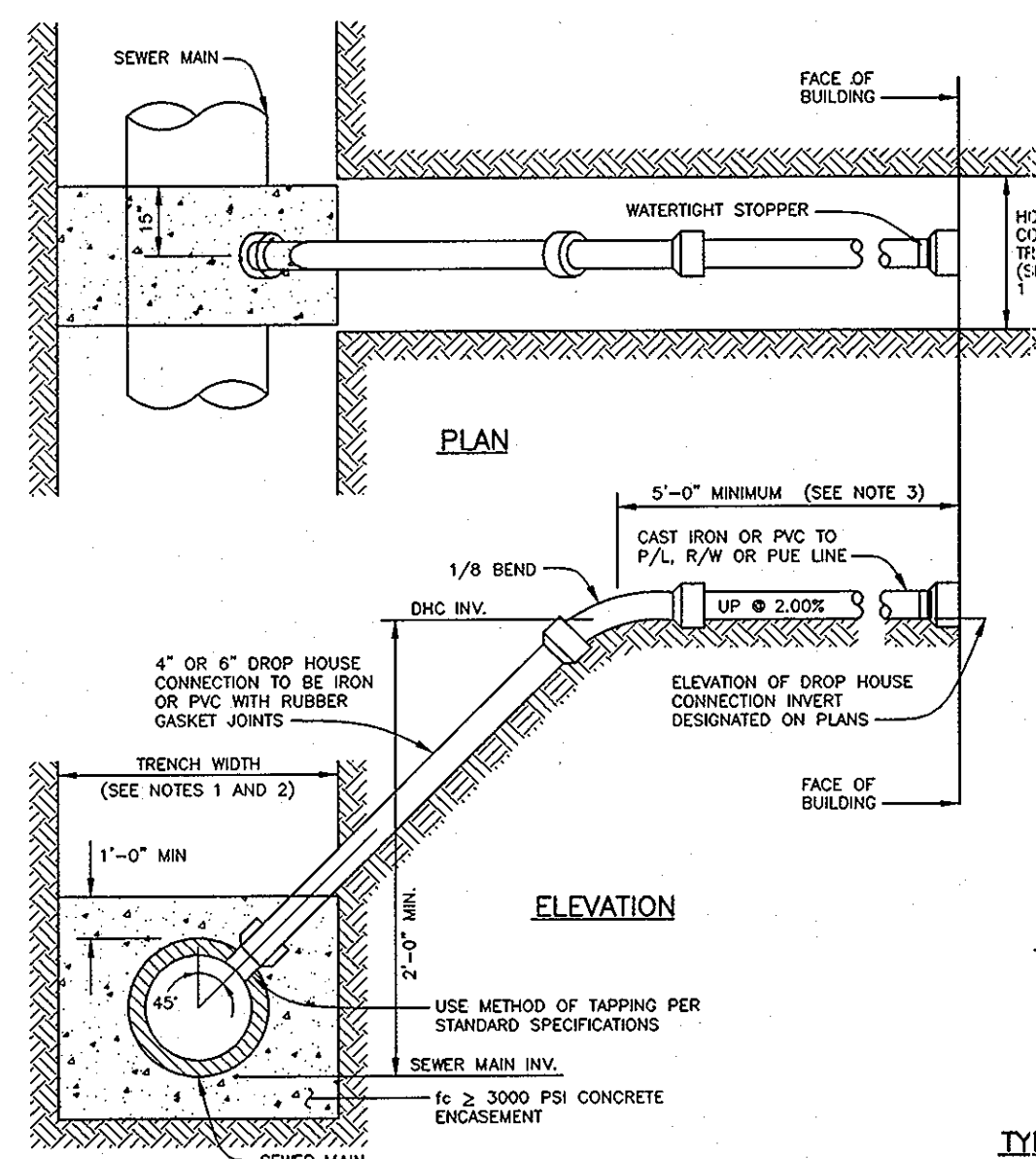


**SHC FOR BUILDING D**  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'

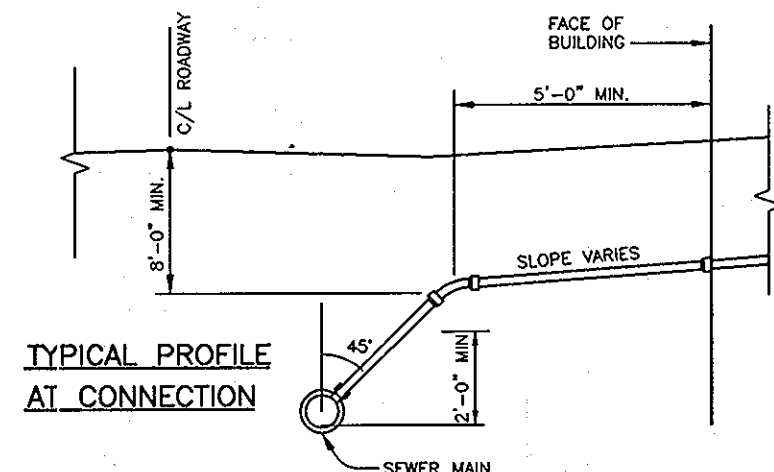


- NOTES:**
1. ALL MANHOLE FRAME AND COVERS SHALL BE FLUSH WITH GRADE EXCEPT WHEN SHOWN ON PROFILE TO BE SET HIGHER THAN GRADE.
  2. MANHOLE FRAME AND COVERS TO BE SET HIGHER THAN GRADE SHALL BE SET IN ACCORDANCE WITH THIS DETAIL.

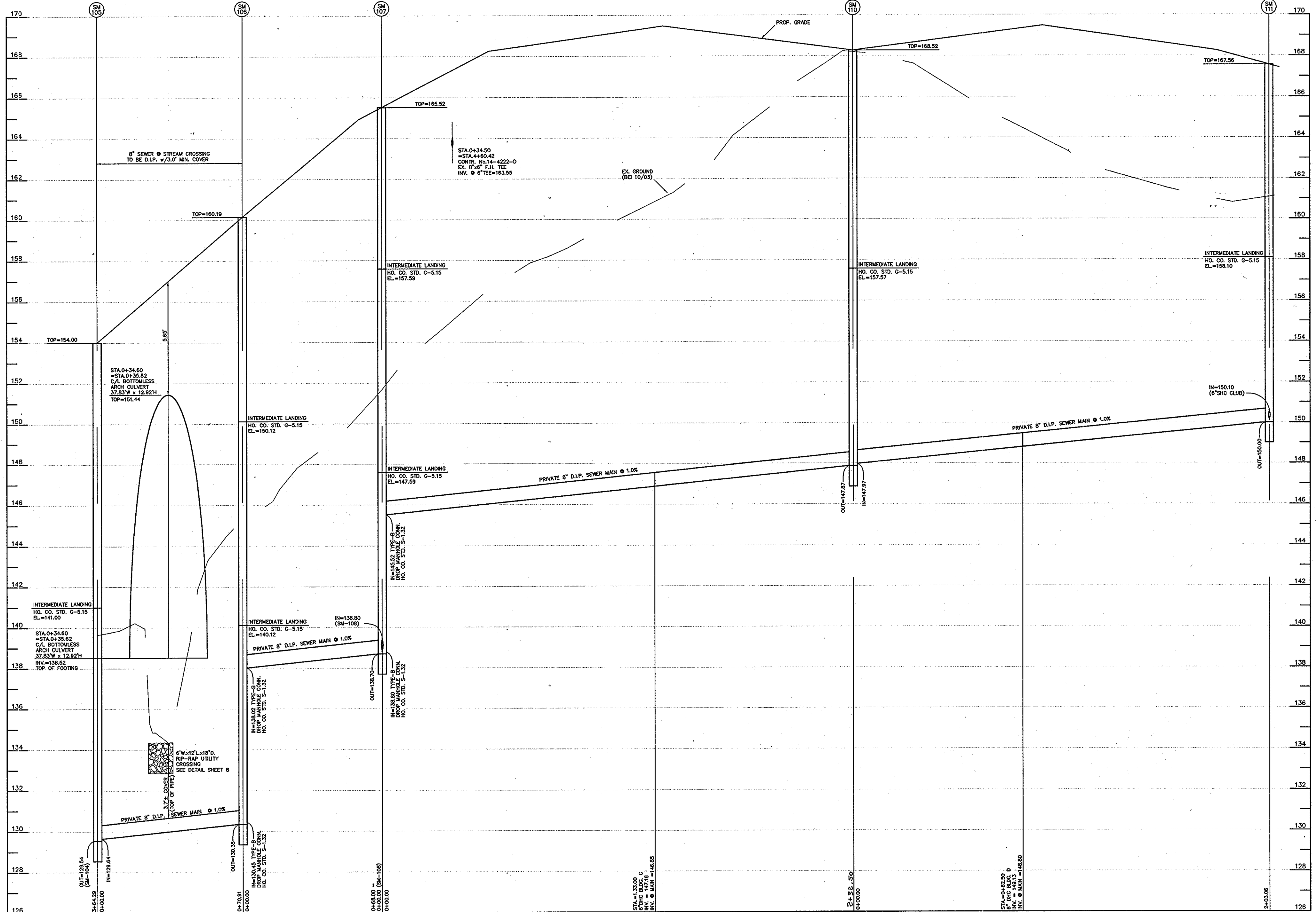
**FILL AROUND MANHOLE**  
 NOT TO SCALE



**6" DROP HOUSE CONNECTION TO SEWER MAIN**  
 NOT TO SCALE  
 HOWARD COUNTY DESIGN MANUAL - VOL II  
 WATER AND SEWER - APPENDIX 13



- NOTES:**
1. S.H.C. TO 8" THRU 12" SEWER MAIN USE SADDLE.
  2. S.H.C. TO PROP. SEWER MAINS USE REES. SEE VOL. IV, STD. DET. S-2.12.
  3. S.H.C. AT P/L SHALL TERMINATE WITH MIN. PIPE LENGTH OF 5'-0" DETAIL IS NOT APPLICABLE FOR A SHORTER LENGTH THAN 5'-0" AT THE P/L.



**SM-105 TO SM-107 AND SM-111**  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'

SM COORDINATE TABLE			
SM NO.	NORTHING	EASTING	ELEV.
105	560,178.0149	1,387,934.0289	154.00
106	560,226.9789	1,387,985.3195	160.19
107	560,273.9336	1,388,034.5054	165.52
110	560,434.4773	1,388,202.6178	168.27
111	560,574.6935	1,388,349.5567	167.56

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

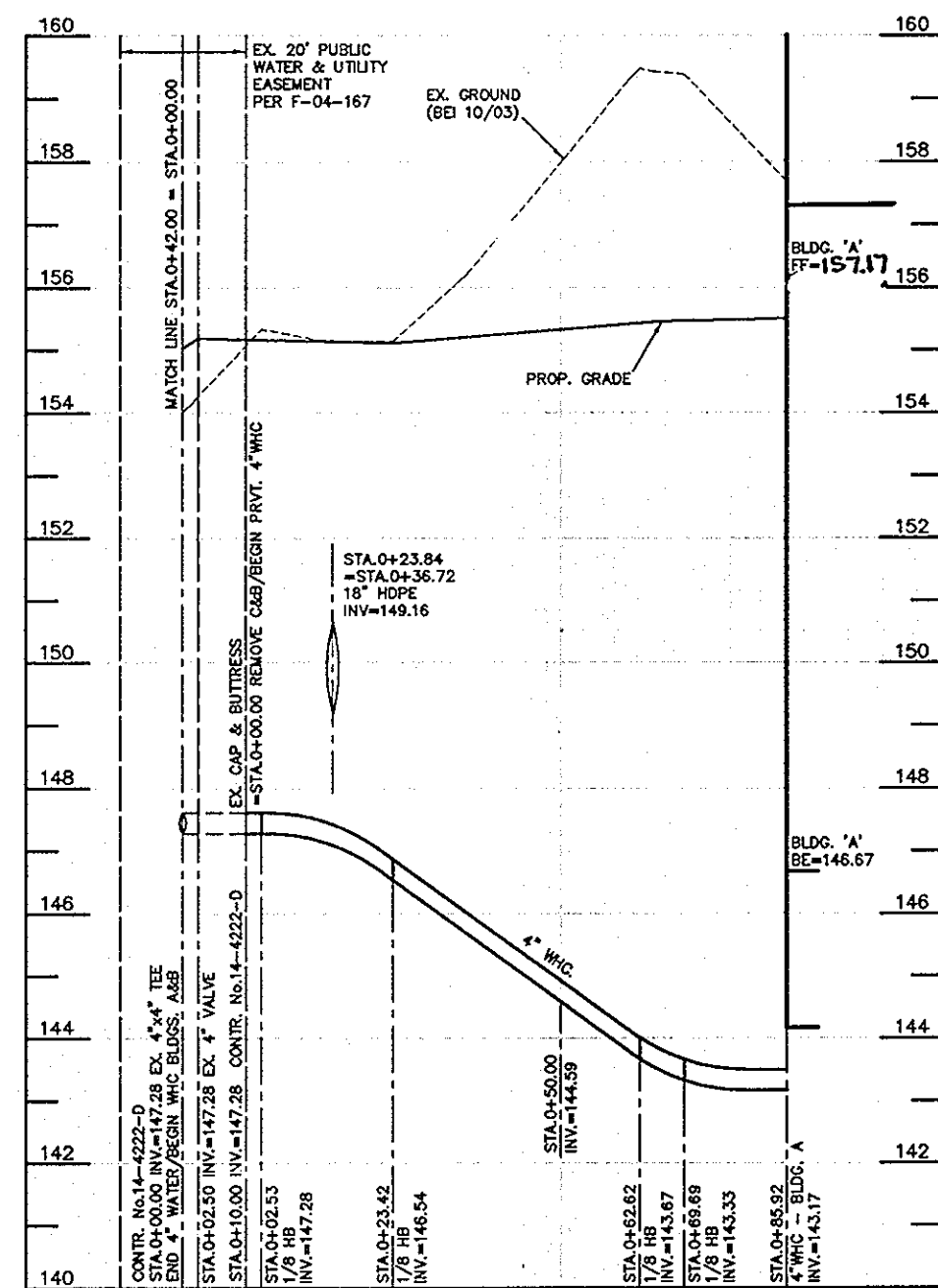
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
 DATE: 2/19/07

CHIEF, DIVISION OF LAND DEVELOPMENT  
 DATE: 2/23/07

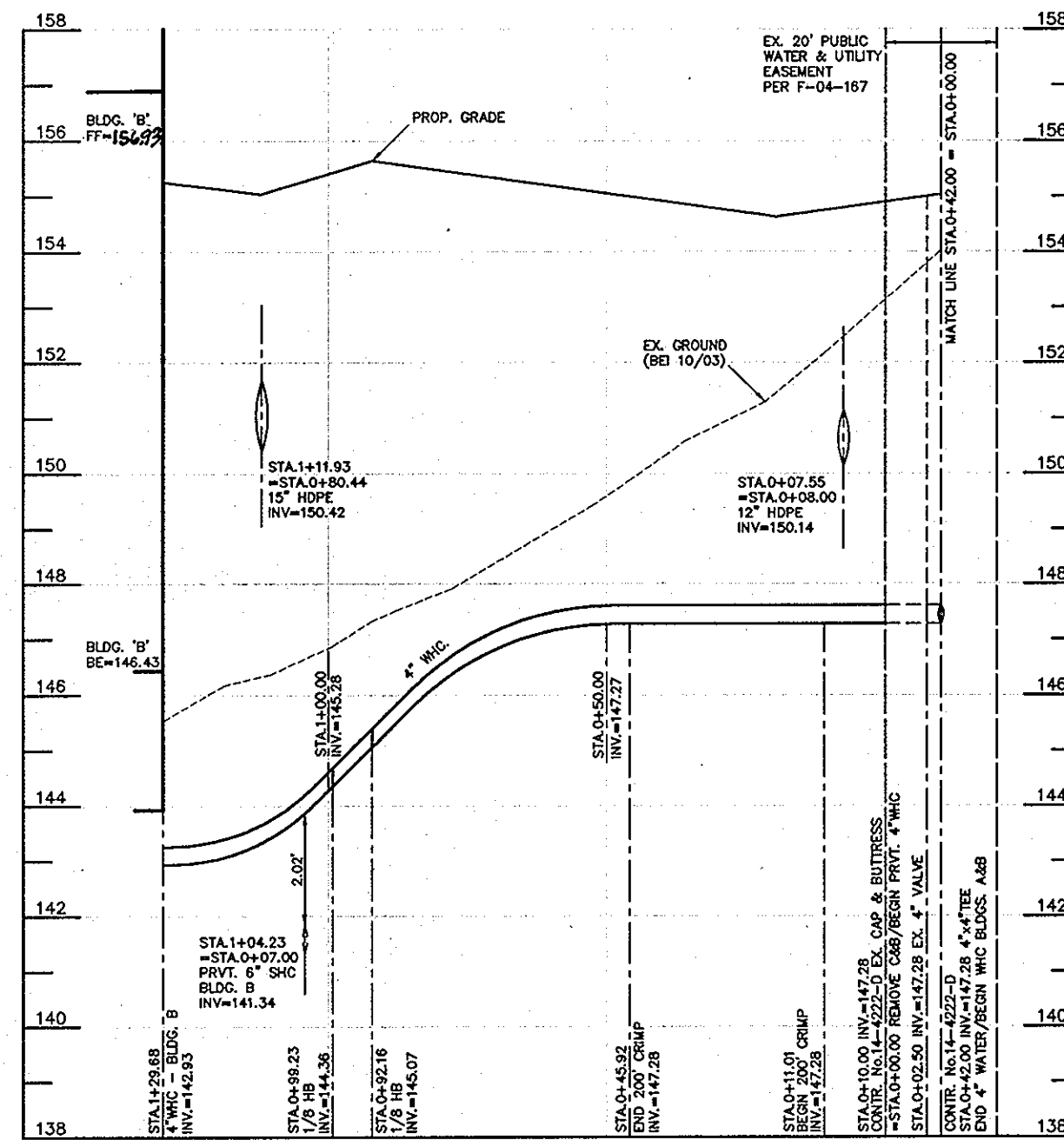
DIRECTOR

2-21-08 REVISE F.F. ELEV. ON SHC PROFILES & REVISE SM COORD TABLE NO. DATE REVISION	
<b>BENCHMARK</b> ENGINEERS & LAND SURVEYORS & PLANNERS <b>ENGINEERING, INC.</b> 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6644 www.bel-civilengineering.com	
DEVELOPER/CONTRACT PURCHASER: ELKRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLICOTT CITY, MD 21041 PHONE: 410-465-4244	
PROJECT: ELKRIDGE TOWN CENTER PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186	
LOCATION: TAX MAP 38 - GRID 8 PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND	
TITLE: PRIVATE SEWER SYSTEM PROFILES, NOTES & DETAILS	
DATE: JUNE 3, 2004 FEBRUARY 10, 2005 PROJECT NO. 1522	
Design: DAM Draft: MCR Check: DAM SCALE: AS SHOWN DRAWING 23 OF 38	

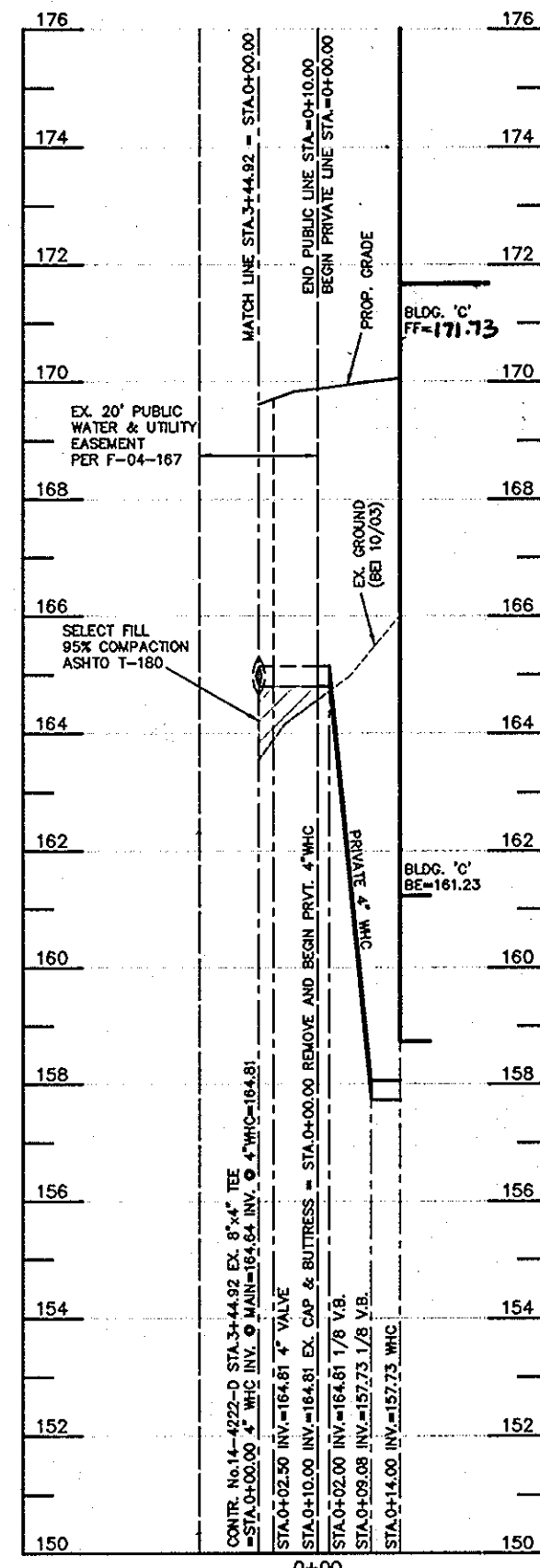




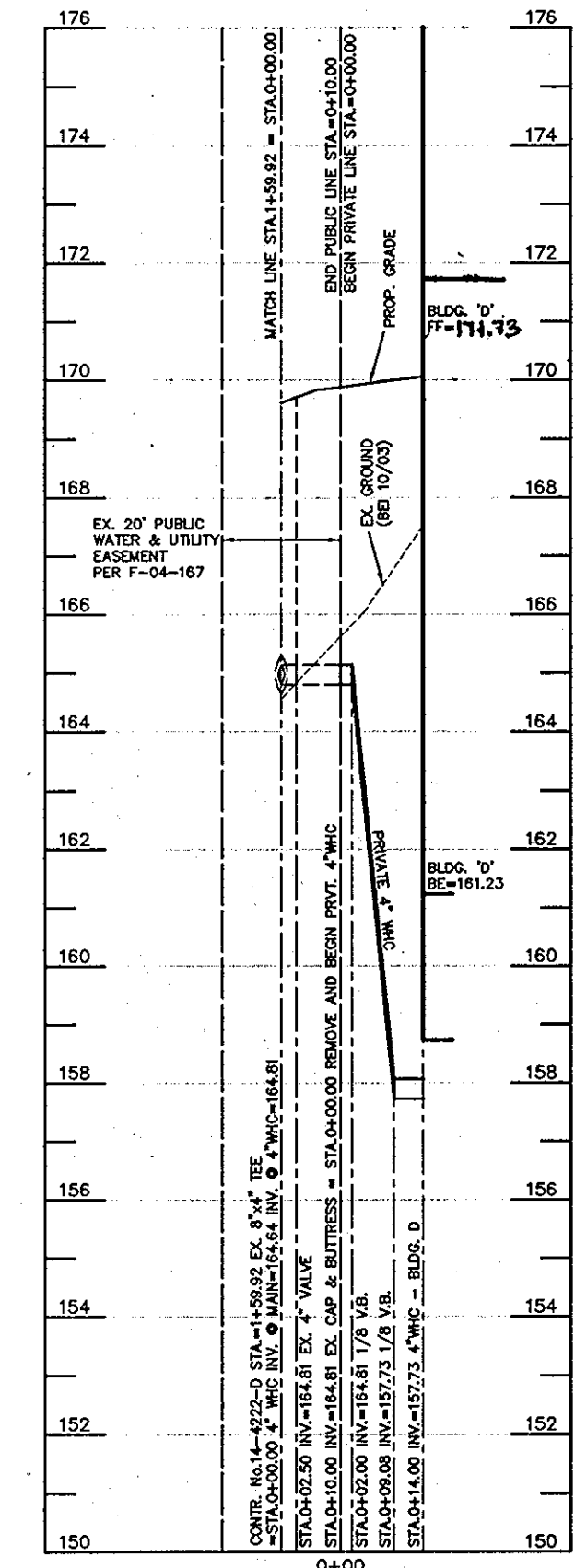
4" WHC FOR BUILDING A  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



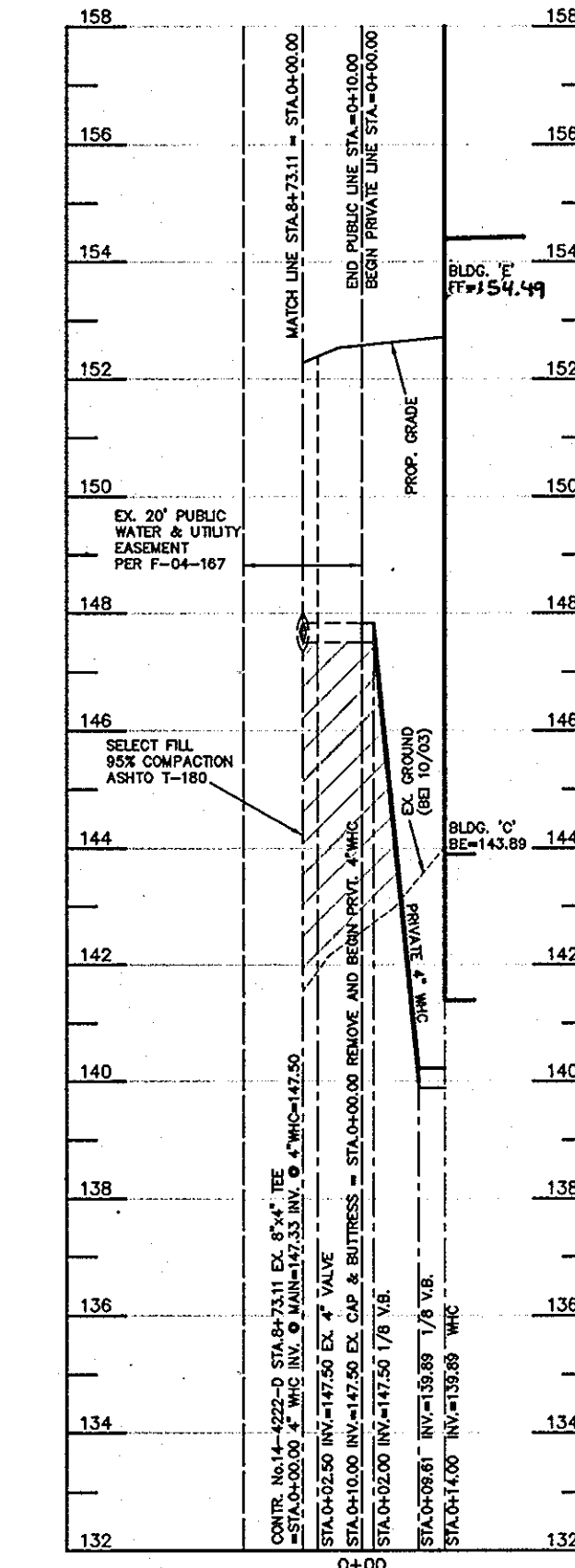
4" WHC FOR BUILDING B  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



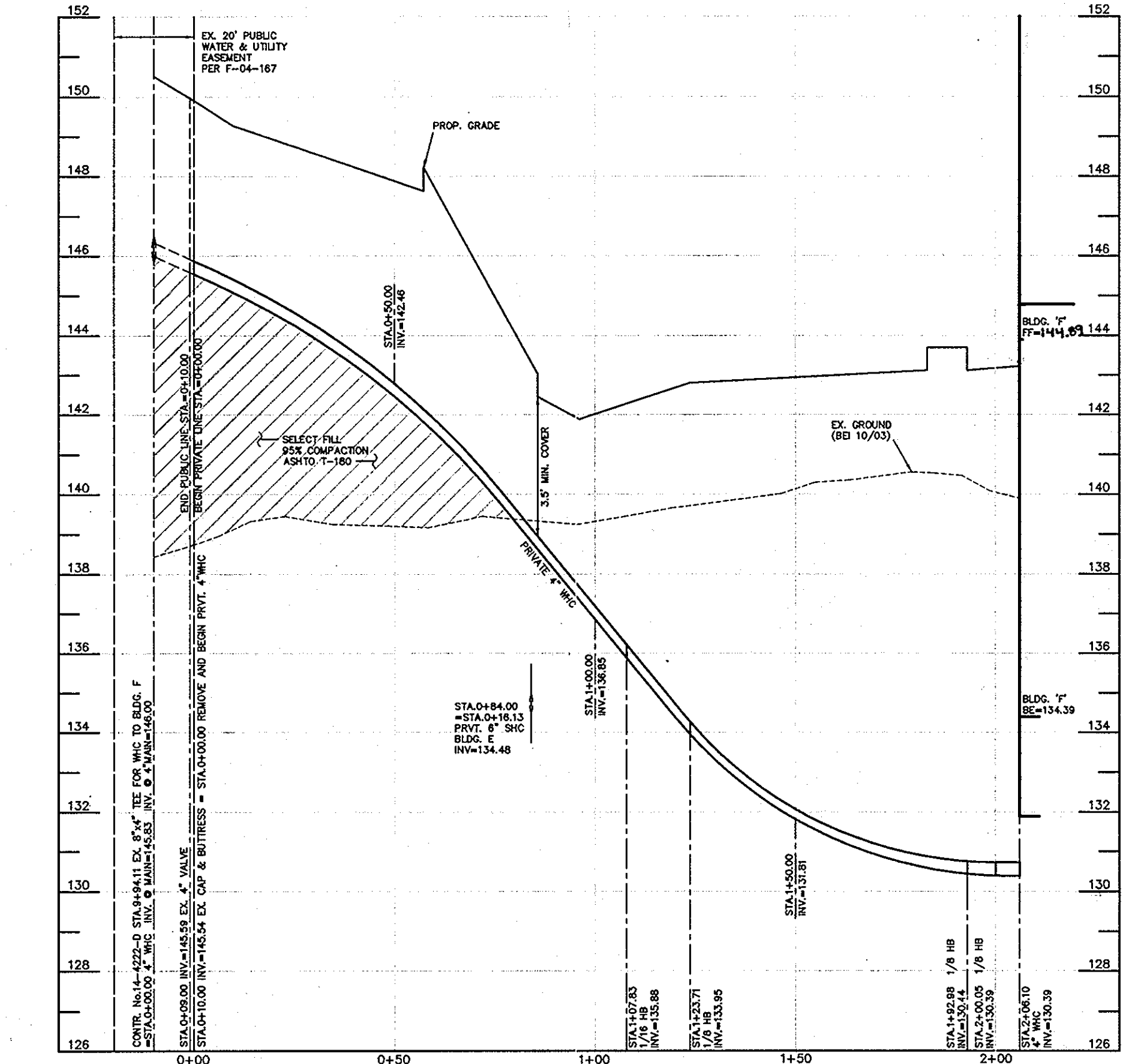
4" WHC FOR BUILDING C  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



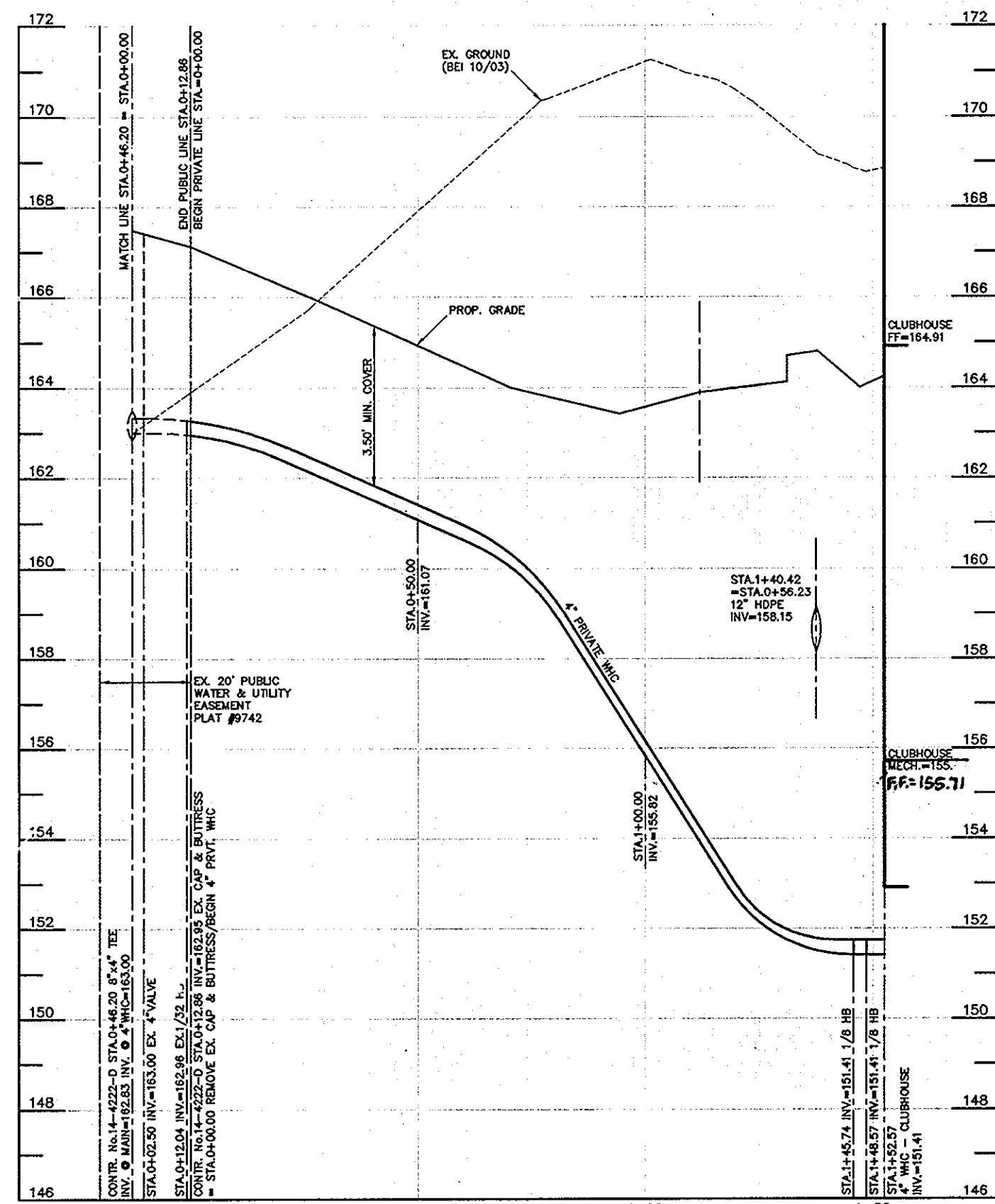
4" WHC FOR BUILDING D  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



4" WHC FOR BUILDING E  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



4" WHC FOR BUILDING F  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'



4" WHC FOR CLUBHOUSE  
 HORIZONTAL SCALE: 1" = 30'  
 VERTICAL SCALE: 1" = 3'

NOTE: WATER METERS SHALL HAVE INTERIOR SETTINGS

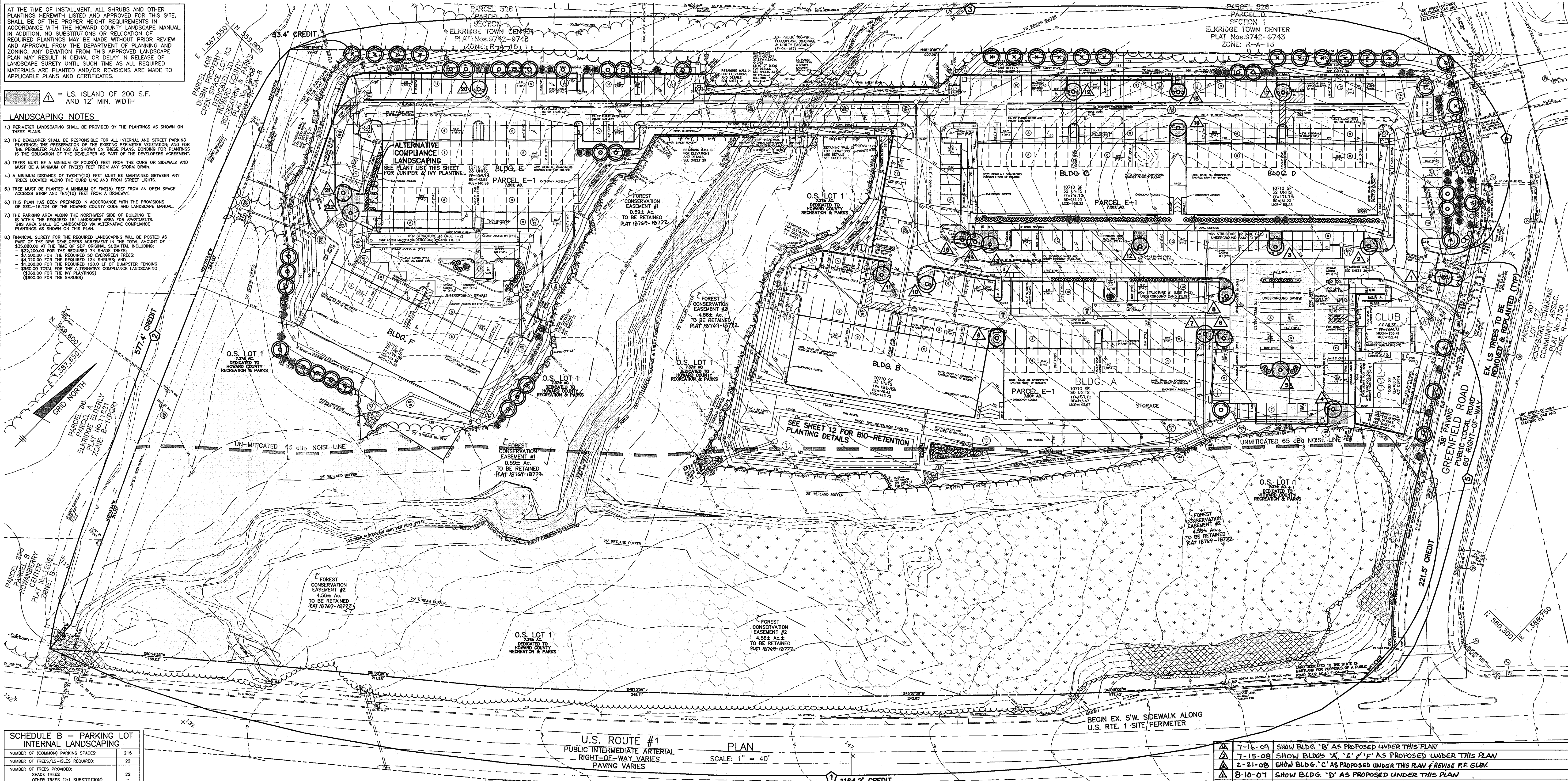
2-21-08 REVISE FF ELEV ON WHC PROFILES		REVISION
NO.	DATE	
<b>BENCHMARK</b> ENGINEERS • LAND SURVEYORS • PLANNERS <b>ENGINEERING, INC.</b> 8480 BALTIMORE NATIONAL PIKE & SUITE 418 ELLICOTT CITY, MARYLAND 21043 PHONE: 410-465-6105 FAX: 410-465-6844 www.bei-civilengineering.com		
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  CHIEF, DEVELOPMENT ENGINEERING DIVISION  CHIEF, DIVISION OF LAND DEVELOPMENT		DEVELOPER/CONTRACT PURCHASER: ELK RIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLICOTT CITY, MD 21041 PHONE: 410-465-4244
PROJECT: ELK RIDGE TOWN CENTER PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186		LOCATION: TAX MAP 38 - GRID 8 PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
TITLE: PRIVATE WATER SYSTEM PROFILES, NOTES & DETAILS		DATE: JUNE 3, 2004 FEBRUARY 10, 2005 PROJECT NO. 1522
Design: DAM	Draft: MCR	Check: DAM
SCALE: AS SHOWN	DRAWING 24 OF 38	

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

△ = L.S. ISLAND OF 200 S.F. AND 12' MIN. WIDTH

**LANDSCAPING NOTES**

- 1) PERIMETER LANDSCAPING SHALL BE PROVIDED BY THE PLANTINGS AS SHOWN ON THESE PLANS.
- 2) THE DEVELOPER SHALL BE RESPONSIBLE FOR ALL INTERNAL AND STREET PARKING PLANTINGS; THE PRESERVATION OF THE EXISTING PERIMETER VEGETATION AND FOR THE PERIMETER PLANTINGS AS SHOWN ON THESE PLANS. BONDING FOR PLANTINGS IS THE OBLIGATION OF THE DEVELOPER AS PART OF THE DEVELOPER'S AGREEMENT.
- 3) TREES MUST BE A MINIMUM OF FOUR(4) FEET FROM THE CURB OR SIDEWALK AND MUST BE A MINIMUM OF FIVE(5) FEET FROM ANY STORM DRAIN.
- 4) A MINIMUM DISTANCE OF TWENTY(20) FEET MUST BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND FROM STREET LIGHTS.
- 5) TREES MUST BE PLANTED A MINIMUM OF FIVE(5) FEET FROM AN OPEN SPACE ACCESS STRIP AND TEN(10) FEET FROM A DRIVEWAY.
- 6) THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SEC.-16.124 OF THE HOWARD COUNTY CODE AND LANDSCAPE MANUAL.
- 7) THE PARKING AREA ALONG THE NORTHWEST SIDE OF BUILDING 'E' IS WITHIN THE REQUIRED 15' LANDSCAPE AREA FOR APARTMENTS. THIS AREA SHALL BE LANDSCAPED VIA ALTERNATIVE COMPLIANCE PLANTINGS AS SHOWN ON THIS PLAN.
- 8) FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING WILL BE POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE TOTAL AMOUNT OF \$30,000.00 AT THE TIME OF SUBMITTAL INCLUDING:
  - \$22,000.00 FOR THE REQUIRED 50 EVERGREEN TREES;
  - \$4,000.00 FOR THE REQUIRED 74 SHADE TREES;
  - \$1,200.00 FOR THE REQUIRED 30 DIVERSE TREES;
  - \$1,200.00 FOR THE REQUIRED 134 SHRUBS; AND
  - \$950.00 TOTAL FOR THE REQUIRED 1/2" OF DUMPSTER FENCING (100' PERIMETER) (100' PERIMETER)
  - \$200.00 FOR THE SHRUBS



**SCHEDULE B - PARKING LOT INTERNAL LANDSCAPING**

NUMBER OF (COMMON) PARKING SPACES:	215
NUMBER OF TREES/LS-ISLES REQUIRED:	22
NUMBER OF TREES PROVIDED:	22
SHADE TREES	22
OTHER TREES (2:1 SUBSTITUTION)	-
SHRUBS (10:1 SUBSTITUTION)	-

**SCHEDULE C RESIDENTIAL INTERNAL LANDSCAPING**

NUMBER OF DWELLING UNITS:	186
NUMBER OF TREES REQUIRED: (1/4" DIA. SPA - 1/2" DIA. APT.)	62
NUMBER OF TREES PROVIDED:	62
SHADE TREES	28
OTHER TREES (2:1 SUBSTITUTION)	34
SHRUBS (10:1 SUBSTITUTION)	120

**SCHEDULE A PERIMETER LANDSCAPE EDGE**

CATEGORY	ADJACENT TO ROADWAY		ADJACENT TO PERIMETER PROPERTIES	
	YES	NO	YES	NO
PERIMETER NO. 7 LANDSCAPE TYPE	①	②	③	④
LINEAR FEET OF ROADWAY (FRONTAGE/PERIMETER)	3164.2'	577.4'	1026.7' (973.3')	349.5' (128.0')
CREDIT FOR EXISTING VEGETATION: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	YES	1164.2'	YES	53.4'
CREDIT FOR WALL, FENCE OR BERM: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO
NUMBER OF PLANTS REQUIRED: SHADE TREES	-	-	16	5
EVERGREEN TREES	-	-	-	3
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	3
SHRUBS	-	-	44	-
NUMBER OF PLANTS PROVIDED: SHADE TREES	-	-	16	5
EVERGREEN TREES	-	-	-	3
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	3
SHRUBS (10:1 SUBSTITUTION)	-	-	44	-
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	-	-	-	-

**ALTERNATIVE COMPLIANCE PLANTING LIST**

SYMBOL	QUANTITY	NAME	REMARKS
△	12	HEDERA ARABICA "EVERGREEN IVY"	PLANTINGS ALONG EMERGENCY ACCESS SIDEWALK SLOPE.
⊖	20	JUNIPERUS CHINENSIS "COMPACT PYRIZER JUNIPER"	2.0'-2.5' HT.

**DUMPSTER/LOADING/SERVICE AREA LANDSCAPING**

CATEGORY	ADJACENT TO ROADWAY			ADJACENT TO RESIDENTIAL			ADJACENT TO NON-RESIDENTIAL		
	YES	NO	NO	YES	NO	YES	NO	YES	NO
LANDSCAPE / BUFFER TYPE	D	D	D	D	D	D	D	D	D
LOCATION OF DUMPSTER/LOADING/SERVICE AREA:	BLDG. A	BLDG. B	BLDG. D	BLDG. B	BLDG. D	BLDG. D	BLDG. D	BLDG. D	BLDG. D
CREDIT FOR WALL OR FENCE: NO OR YES (w/LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	YES	40.8'	YES	40.8'	YES	40.8'	YES	40.8'	YES
NUMBER OF PLANTS REQUIRED: SHADE TREES	-	-	-	-	-	-	-	-	-
EVERGREEN TREES	-	-	-	-	-	-	-	-	-
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	-	-	-	-	-	-
SHRUBS	-	-	-	-	-	-	-	-	-
NUMBER OF PLANTS PROVIDED: SHADE TREES	-	-	-	-	-	-	-	-	-
EVERGREEN TREES	-	-	-	-	-	-	-	-	-
OTHER TREES (2:1 SUBSTITUTION)	-	-	-	-	-	-	-	-	-
SHRUBS (10:1 SUBSTITUTION)	-	-	-	-	-	-	-	-	-
(DESCRIBE PLANT SUBSTITUTION CREDITS BELOW IF NEEDED)	-	-	-	-	-	-	-	-	-

**PERIMETER PLANTING LIST**

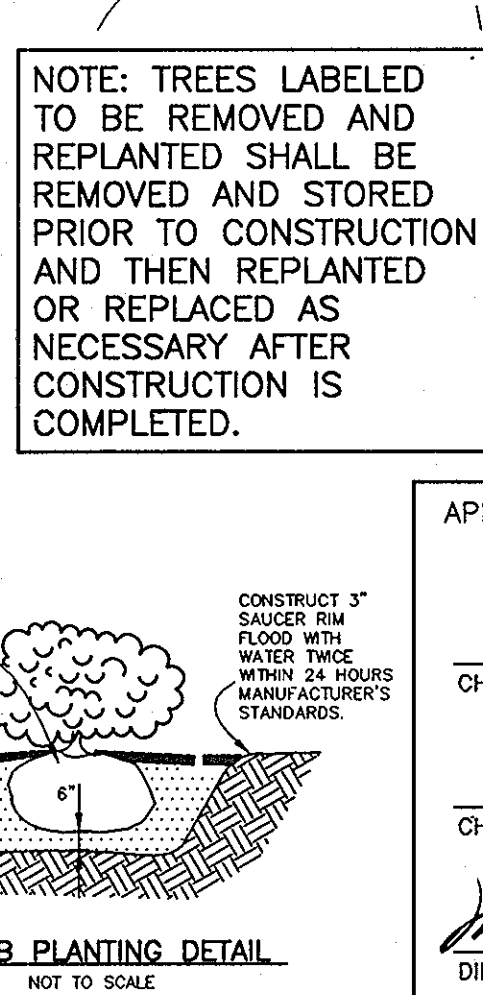
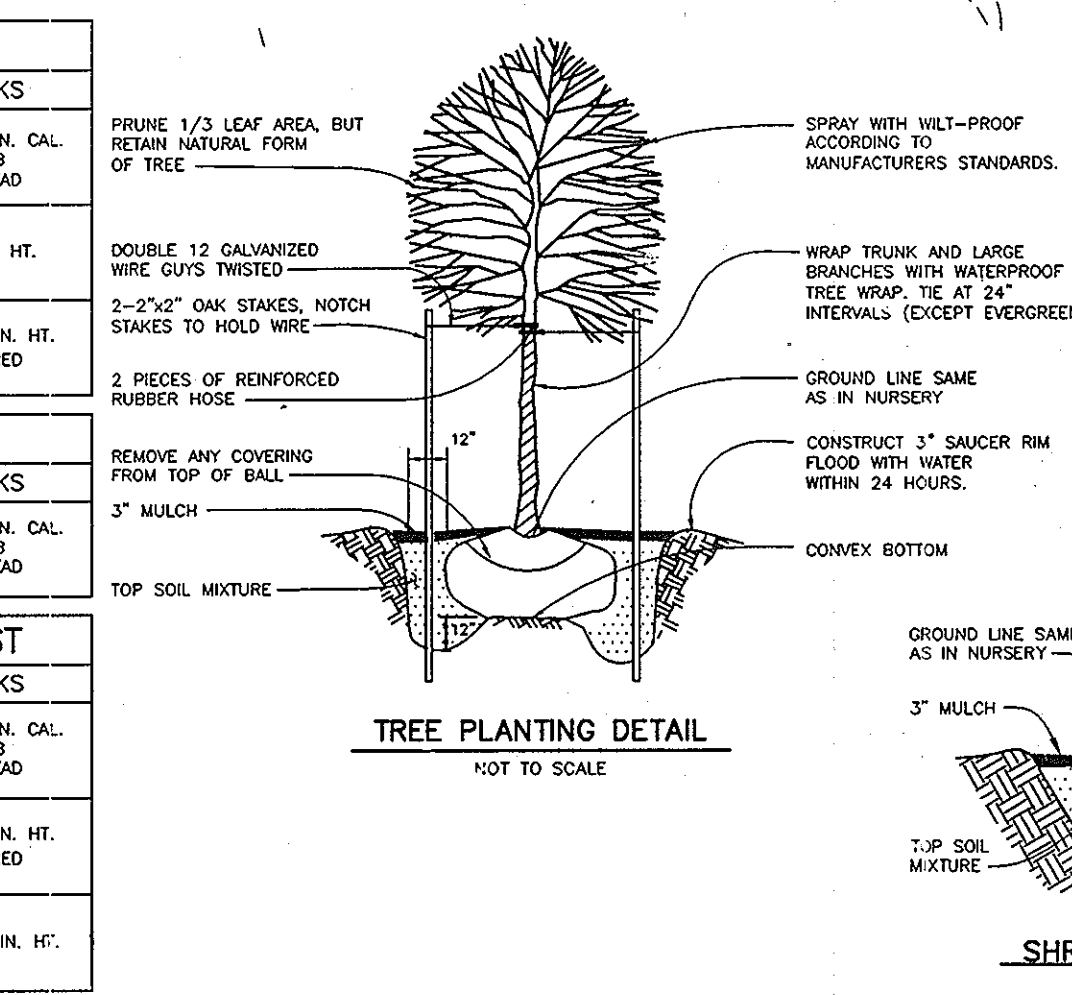
SYMBOL	QUANTITY	NAME	REMARKS
+	24	PLATANUS ACERIFOLIA "BLOODGOOD LONDON PLANE"	2.5'-3.0' MIN. CAL. B & B FULL HEAD
○	14	PHOTINIA X FRASERI "FRASERS PHOTINIA"	3.0'-3.5' HT.
☼	6	PINUS STROBUS "EASTERN WHITE PINE"	6.0'-8.0' MIN. HT. UNSHEARED

**INTERNAL PARKING PLANTING LIST**

SYMBOL	QUANTITY	NAME	REMARKS
○	22	ACER RUBRA "RED MAPLE"	2.5'-3.0' MIN. CAL. B & B FULL HEAD

**INTERNAL RESIDENTIAL PLANTING LIST**

SYMBOL	QUANTITY	NAME	REMARKS
⊙	28	ACER SACCHARUM "SUGAR MAPLE"	2.5'-3.0' MIN. CAL. B & B FULL HEAD
☼	44	PINUS STROBUS "EASTERN WHITE PINE"	6.0'-8.0' MIN. HT. UNSHEARED
⊗	120	EUONYMUS ALTA COMPACTA "DWARF WINGED EUONYMUS"	2.5'-3.0' MIN. HT.



**NOTE: TREES LABELED TO BE REMOVED AND REPLANTED SHALL BE REMOVED AND STORED PRIOR TO CONSTRUCTION AND THEN REPLANTED OR REPLACED AS NECESSARY AFTER CONSTRUCTION IS COMPLETED.**

**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 LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

*James R. Morby, II*  
DEVELOPER: ELKRIDGE TOWN CENTER, L.L.C. DATE: 12-6-06

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*Cindy Kromer*  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE: 2/16/07

*James R. Morby, II*  
DIRECTOR DATE: 2/20/07

**BENCHMARK ENGINEERING, INC.**  
ENGINEERS • LAND SURVEYORS • PLANNERS

8480 BALTIMORE NATIONAL PIKE • SUITE 418  
ELLCOTT CITY, MD 21043  
PHONE: 410-465-6105 FAX: 410-465-6844  
www.bel-civilengineering.com

DEVELOPER/CONTRACT PURCHASER: ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLCOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

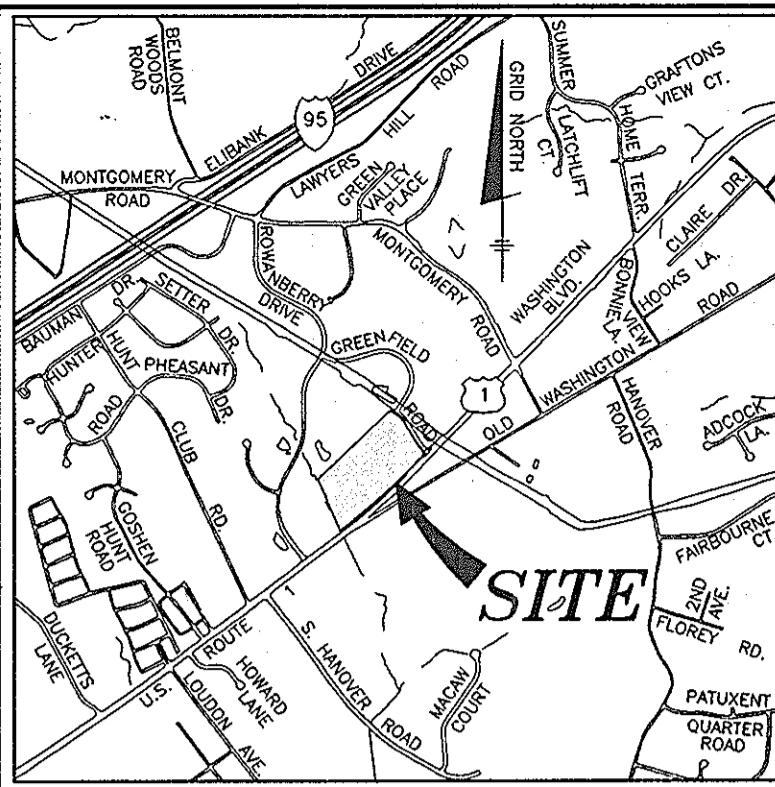
LOCATION: TAX MAP 38 - GRID B  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: LANDSCAPING PLAN  
NOTES AND DETAILS

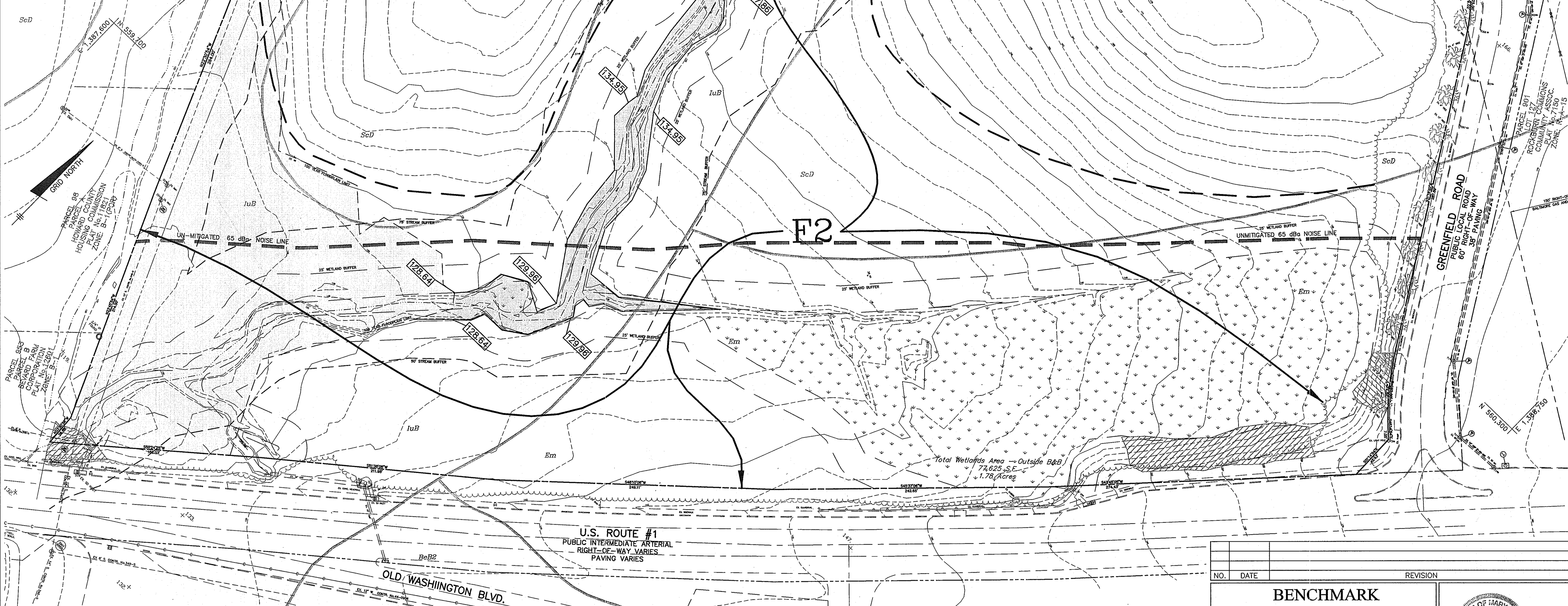
DATE: JUNE 3, 2004 PROJECT NO. 1522  
NOVEMBER, 2006

SCALE: AS SHOWN DRAWING 25 OF 38

Design: DAM Draft: MCR Check: DAM



VICINITY MAP  
SCALE: 1" = 2000'



**Forest Stand Data**

Key	Community Type	Acreage	Dominant Vegetation	General Condition	Priority Acreage
F1	Virginia Pine	5.2 (nta)	Pinus virginiana, Liriodendron tulipifera, Acer rubrum	Fair	0.3 ± buffers
F2	Poplar/Maple	6.9 (nta)	Liriodendron tulipifera, Acer rubrum, Prunus serotina, Pinus virginiana	Fair	6.9 ± buffers/wetlands

See accompanying report for complete stand descriptions

- FSD NOTES:**
- No rare, threatened or endangered species were observed on the property.
  - Surrounding land use is primarily high density residential and commercial.
  - Wetland and stream locations delineated by Navarre-Wright.

PLAN  
SCALE: 1" = 40'

**Eco-Science Professionals, Inc.**  
CONSULTING ECOLOGISTS  
P.O. Box 5006 Glen Arm, MD 21057 (410) 592-4752

NO.	DATE	REVISION

**BENCHMARK ENGINEERING, INC.**  
ENGINEERS • LAND SURVEYORS • PLANNERS  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6844  
www.bei-civilengineering.com

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*[Signature]* 1/18/07 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT  
*[Signature]* 2/16/07 DATE

DIRECTOR  
*[Signature]* 2/20/07 DATE

DEVELOPER/CONTRACT PURCHASER:  
ELKRIDGE TOWN CENTER, L.L.C.  
P.O. BOX 417  
ELLCOTT CITY, MD 21041  
PHONE: 410-465-4244

PROJECT: ELKRIDGE TOWN CENTER  
PARCEL E-1 AND OPEN SPACE LOT 1  
APT. BLDGS. 'A'-'F'; UNITS 1-186

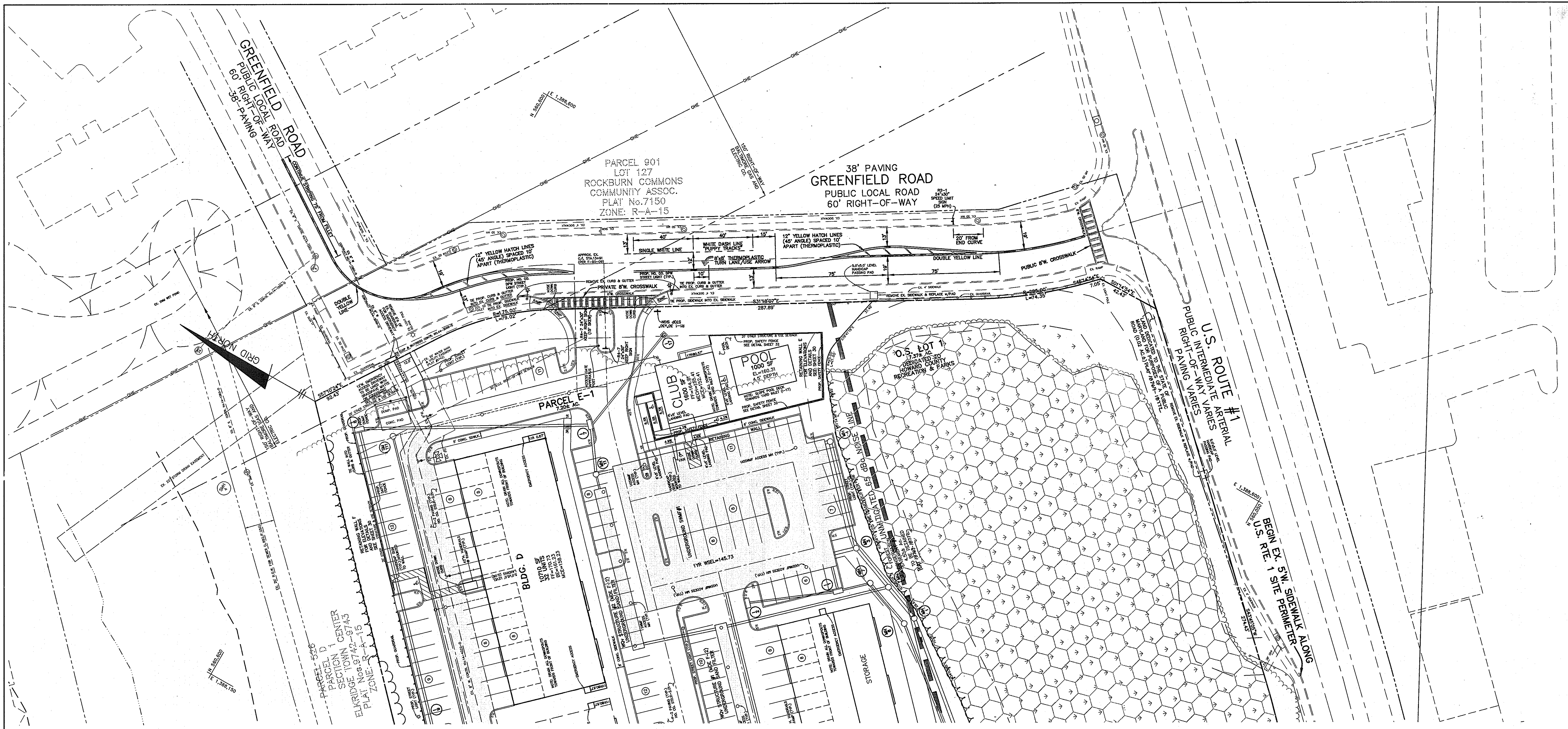
LOCATION: TAX MAP 38 - GRID B  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE: FOREST STAND DELINEATION  
PLAN, NOTES AND DETAILS

DATE: JUNE 3, 2004  
FEBRUARY 10, 2005 PROJECT NO. 1522

Design: DAM Draft: MCR Check: DAM SCALE: AS SHOWN DRAWING 26 OF 38

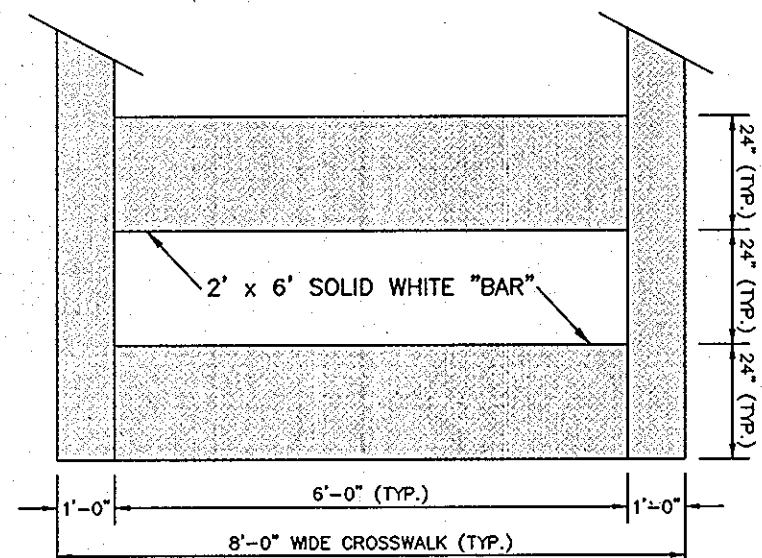




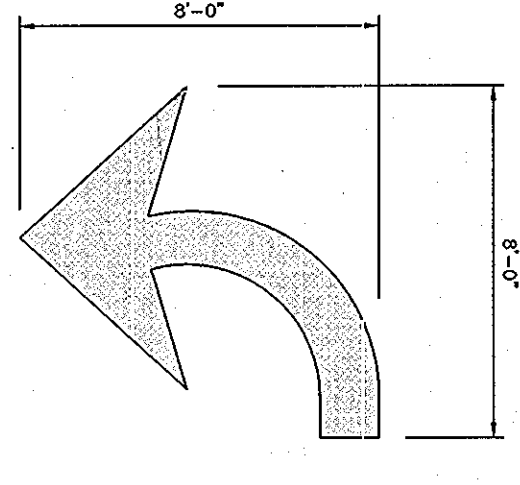
PLAN  
SCALE: 1" = 30'

**PAVEMENT MARKING NOTES**

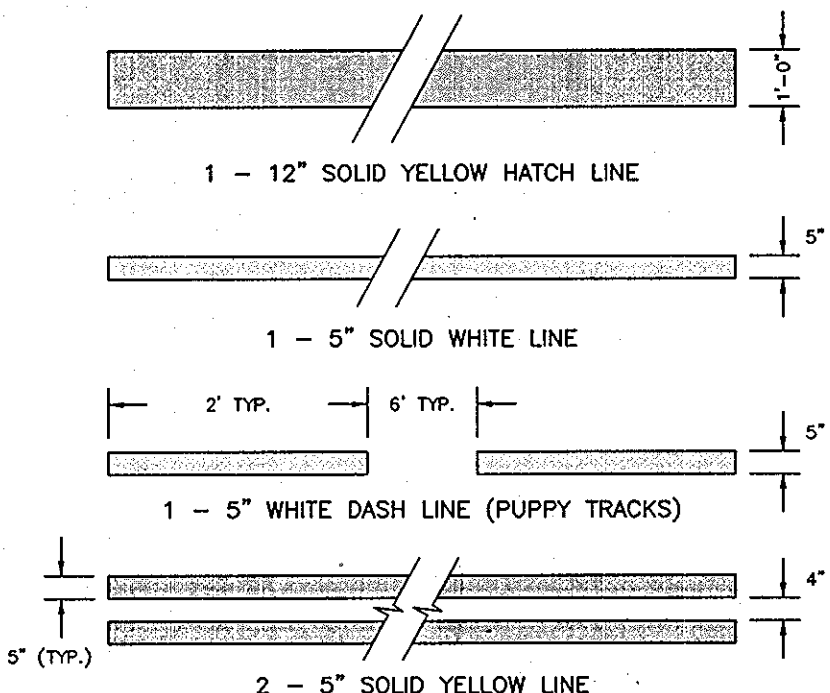
- ALL PAVEMENT MARKINGS TO BE 5" WIDE REFLECTIVE THERMOPLASTIC PAVEMENT MARKINGS. A SINGLE HEAT APPLIED REFLECTIVE THERMOPLASTIC "LEFT-TURN" ARROW SHALL BE APPLIED IN THE LEFT-TURN LANE
- ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (2003 EDITION)
- ALL PAVEMENT MARKINGS SHALL BE LAYED-OUT AND APPROVED BY THE TRAFFIC ENGINEER BEFORE INSTALLATION.
- ALL SIGN POSTS USED FOR TRAFFIC CONTROL SIGNS INSTALLED IN THE COUNTY OWNED RIGHT-OF-WAY SHALL BE MOUNTED ON A 2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (14 ga.) INSERTED INTO A 2-1/2" GALVANIZED STEEL, PERFORATED, SQUARE TUBE POST (12 ga.) - 3' LONG. A GALVANIZED STEEL POLE CAP SHALL BE MOUNTED ON TOP OF EACH POST.
- EXACT LOCATION OF HO. CO. DPW STREET LIGHTS TO BE DETERMINED BY DPW INSPECTOR AT TIME OF INSTALLATION.
- STREET TREES MUST BE A MINIMUM OF FOUR(4) FEET FROM THE CURB OR SIDEWALK AND MUST BE A MINIMUM OF FIVE(5) FEET FROM ANY STORM DRAIN. A MINIMUM DISTANCE OF TWENTY(20) FEET MUST BE MAINTAINED BETWEEN ANY TREES LOCATED ALONG THE CURB LINE AND FROM STREET LIGHTS. TREES MUST BE PLANTED A MINIMUM OF FIVE(5) FEET FROM AN OPEN SPACE ACCESS STRIP AND TEN(10) FEET FROM A DRIVEWAY.



TRAFFIC STRIPING  
CROSSWALK DETAIL  
NOT TO SCALE  
THERMOPLASTIC OR HEAT APPLIED TAPE



TRAFFIC STRIPING  
PAVEMENT SYMBOL  
NOT TO SCALE



TRAFFIC STRIPING  
PAVEMENT LINES  
NOT TO SCALE

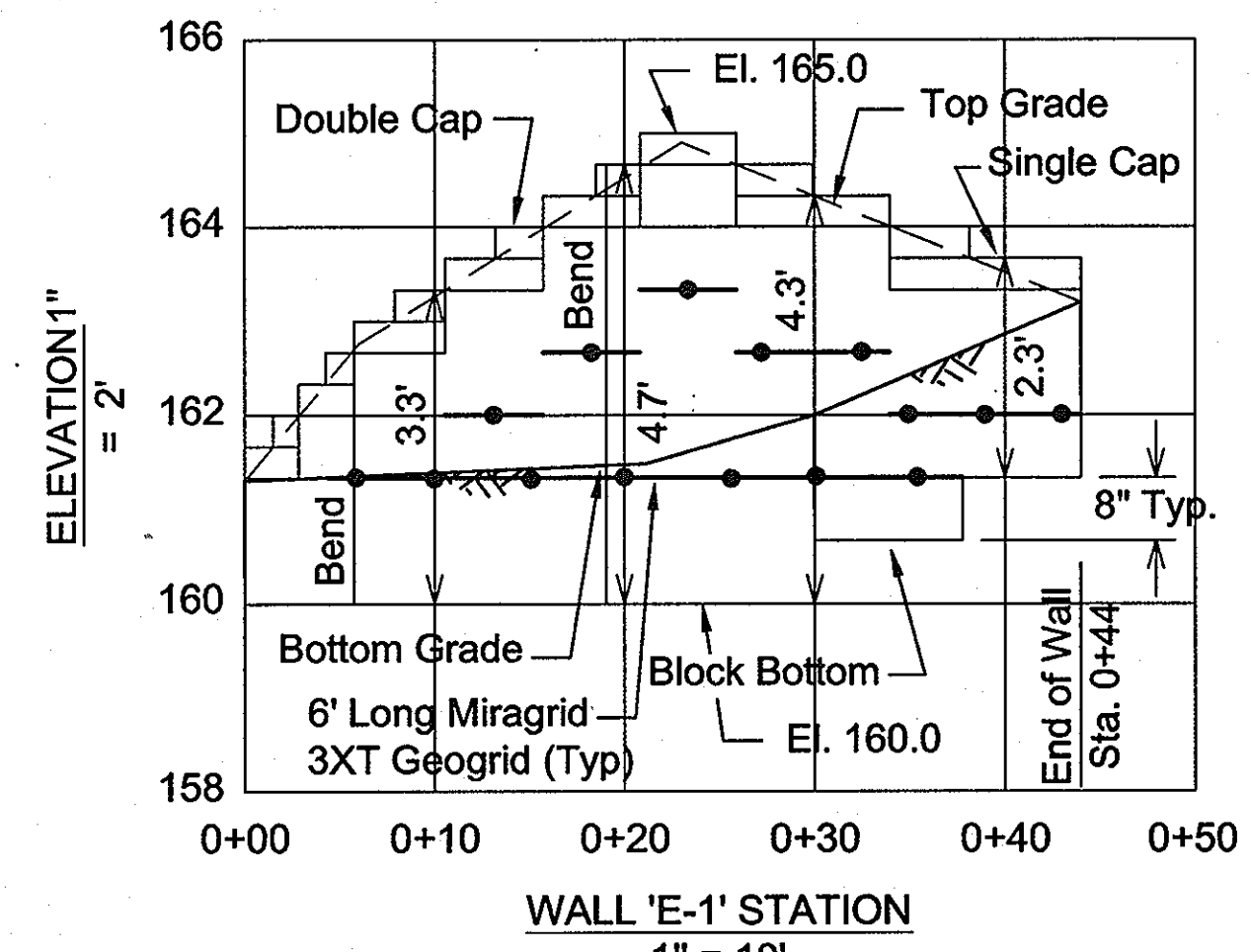
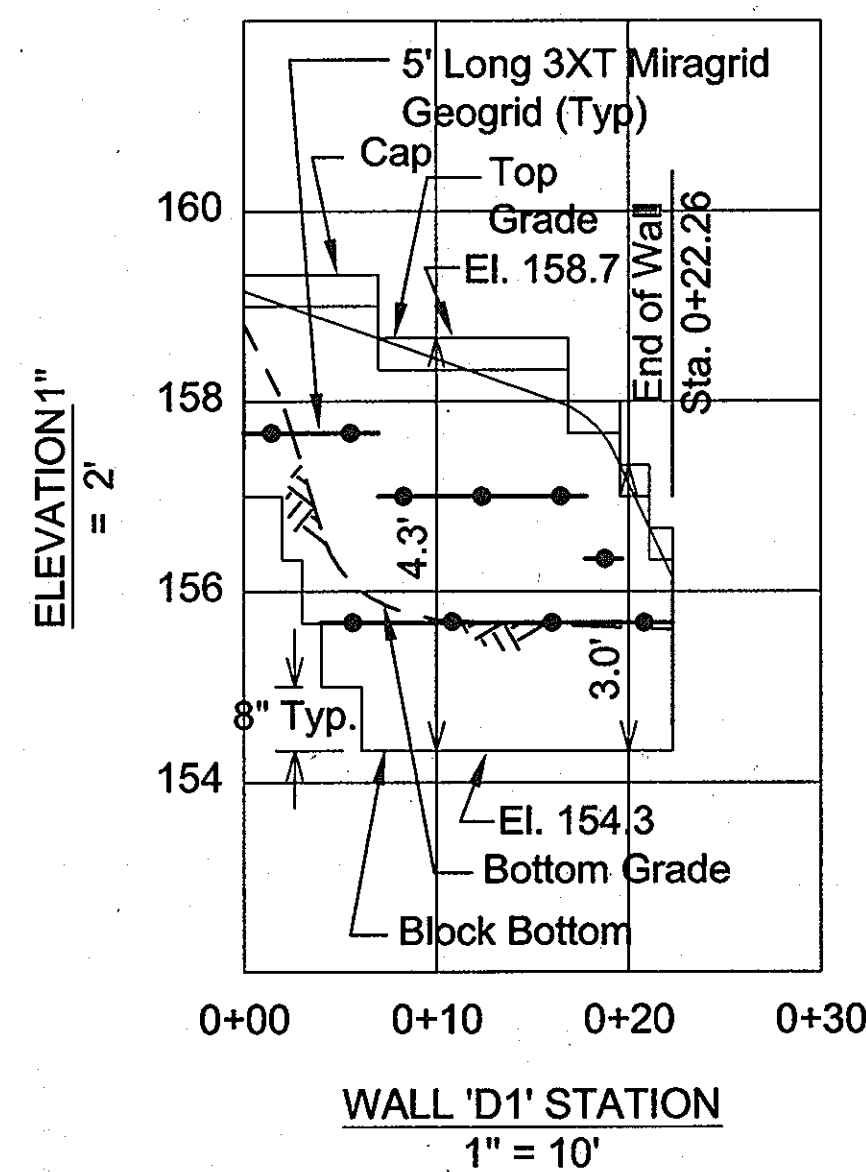
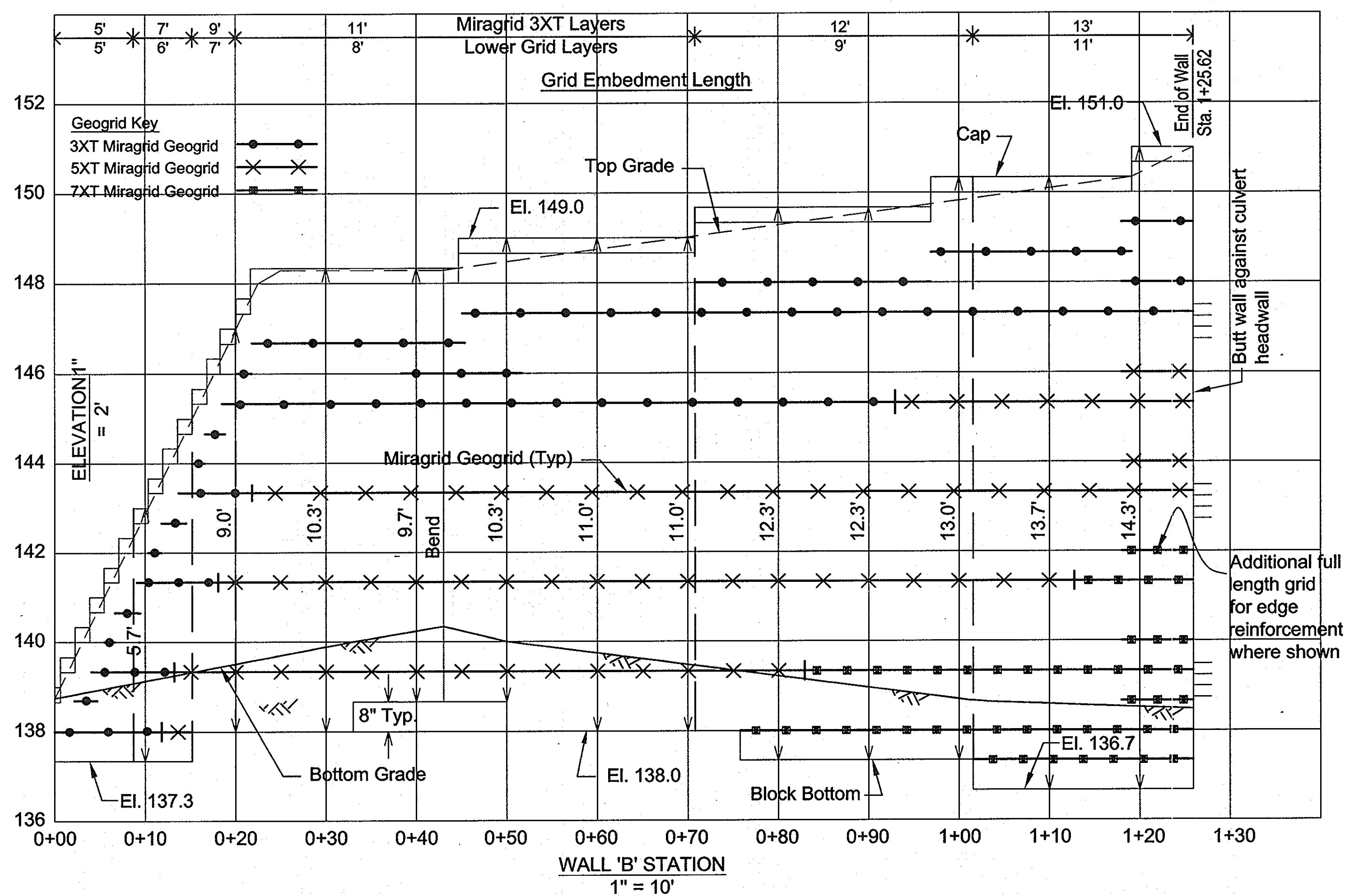
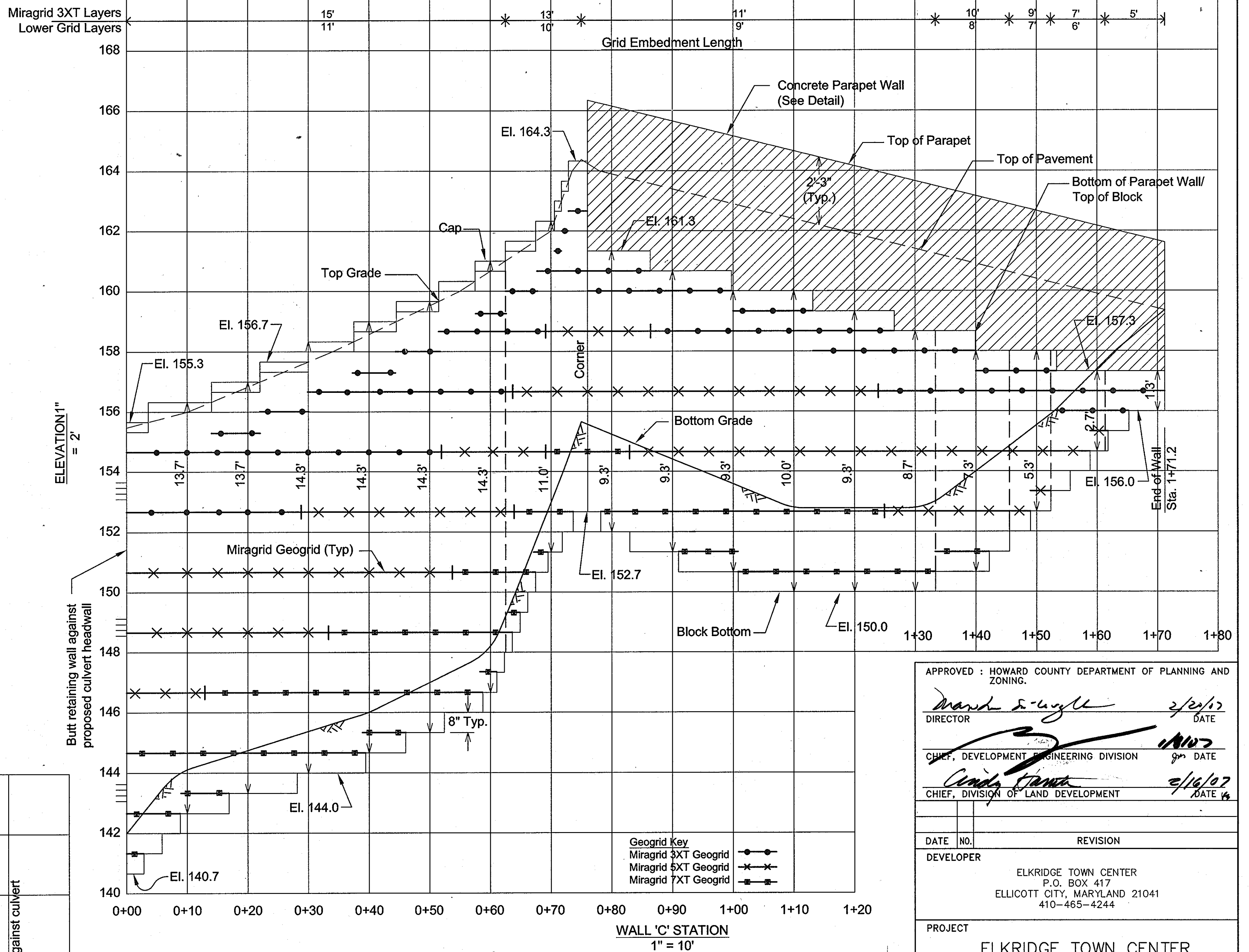
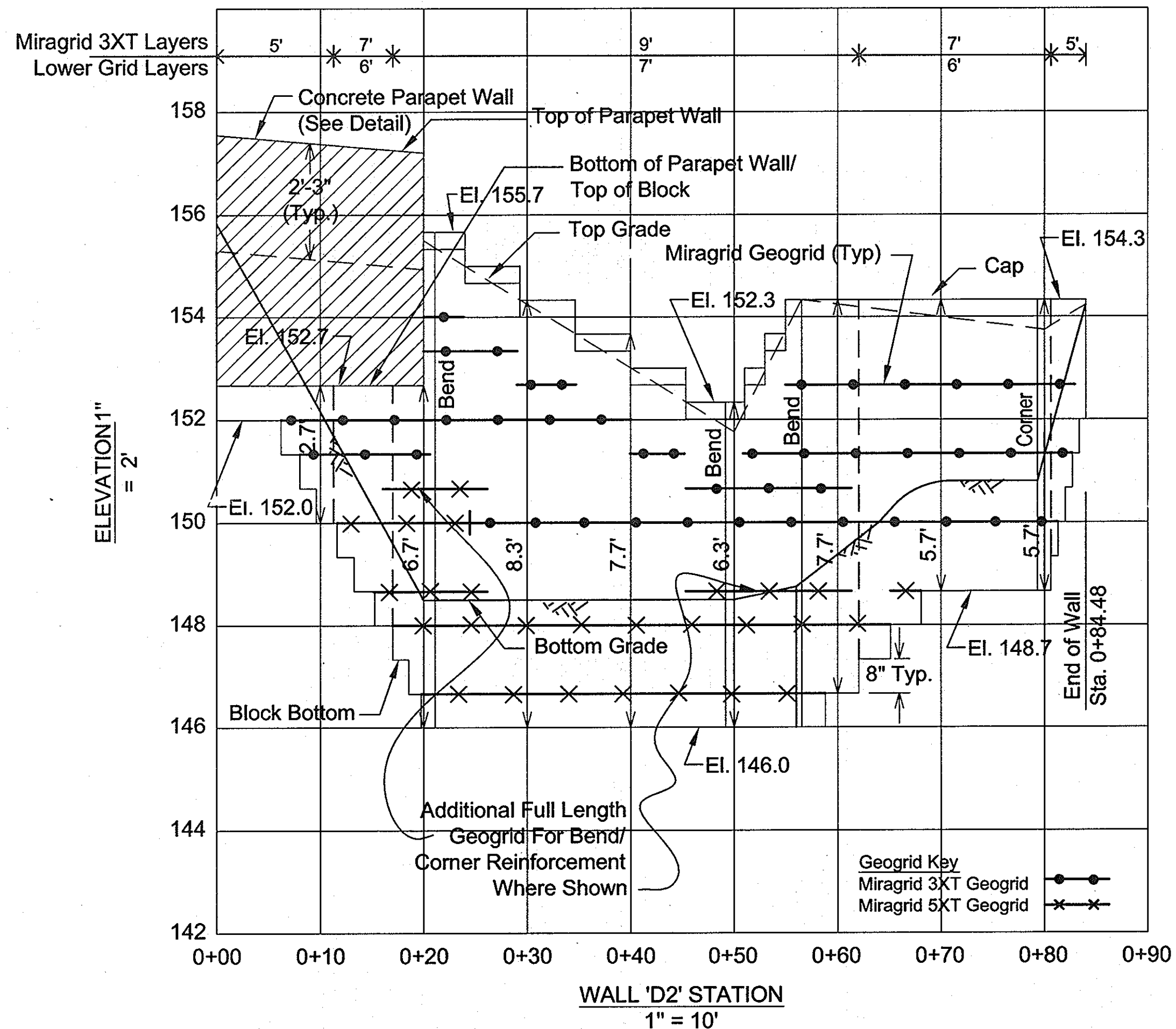
THIS PLAN FOR  
TRAFFIC STRIPING/SIGNAGE  
PURPOSES ONLY

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
*Chris R. Smith* 1/30/07  
CHIEF, DIVISION OF LAND DEVELOPMENT  
*Mark A. Coyle* 2/16/07  
DIRECTOR DATE

NO.	DATE	REVISION
8-10-07		SHOW BLDG. 'D' AS PROPOSED UNDER THIS PLAN

**BENCHMARK**  
ENGINEERS • LAND SURVEYORS • PLANNERS  
**ENGINEERING, INC.**  
8480 BALTIMORE NATIONAL PIKE & SUITE 418  
ELLCOTT CITY, MARYLAND 21043  
PHONE: 410-465-6105 FAX: 410-465-6644  
www.bml-civilengineering.com

DEVELOPER/CONTRACT PURCHASER:	PROJECT:
ELKRIDGE TOWN CENTER, L.L.C. P.O. BOX 417 ELLCOTT CITY, MD 21041 PHONE: 410-465-4244	ELKRIDGE TOWN CENTER PARCEL E-1 AND OPEN SPACE LOT 1 APT. BLDGS. 'A'-'F'; UNITS 1-186
TITLE:	LOCATION:
TRAFFIC STRIPING/SIGNAGE PLAN, NOTES AND DETAILS	TAX MAP 38 - GRID B PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND
DATE:	PROJECT NO.
JUNE 3, 2004 NOVEMBER, 2006	1522
DESIGN: DAM	DRAFT: MCR
CHECK: DAM	SCALE: AS SHOWN
DRAWING 28 OF 38	



APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.

*March 2, 2005* 2/20/05 DATE  
DIRECTOR

*[Signature]* 1/10/05 DATE  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* 2/16/07 DATE  
CHIEF, DIVISION OF LAND DEVELOPMENT

DATE	NO.	REVISION

DEVELOPER  
ELKRIDGE TOWN CENTER  
P.O. BOX 417  
ELLCOTT CITY, MARYLAND 21041  
410-465-4244

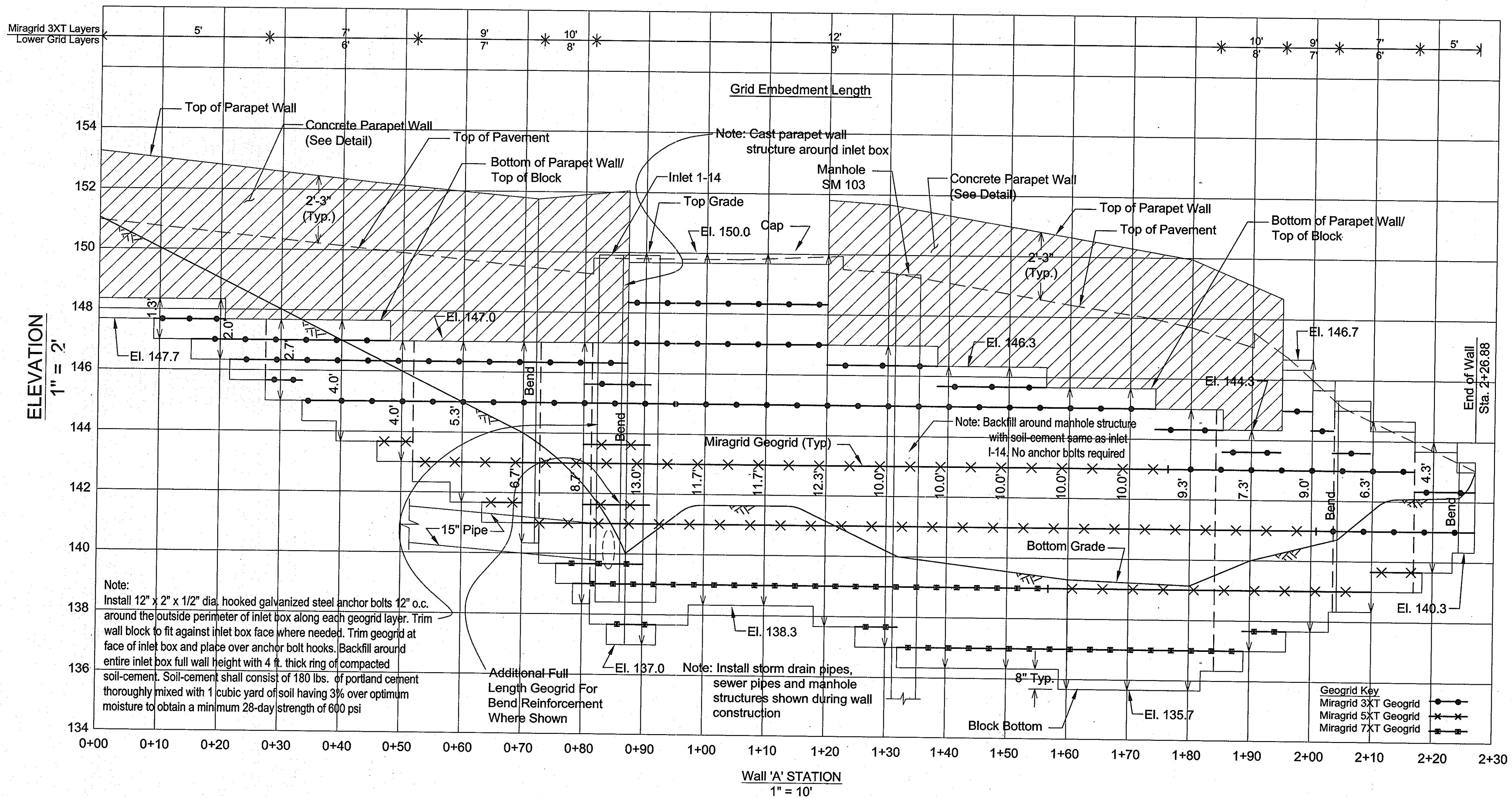
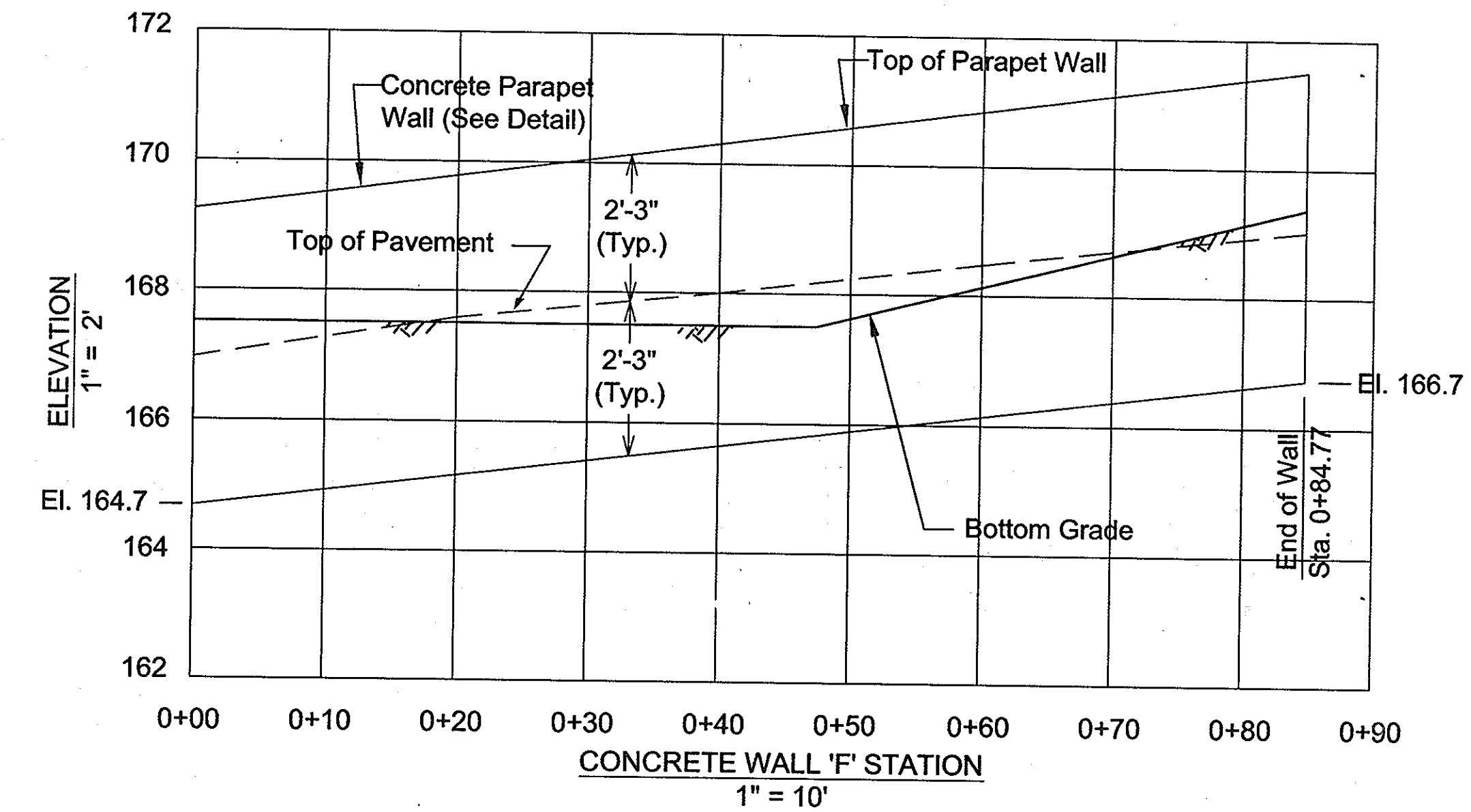
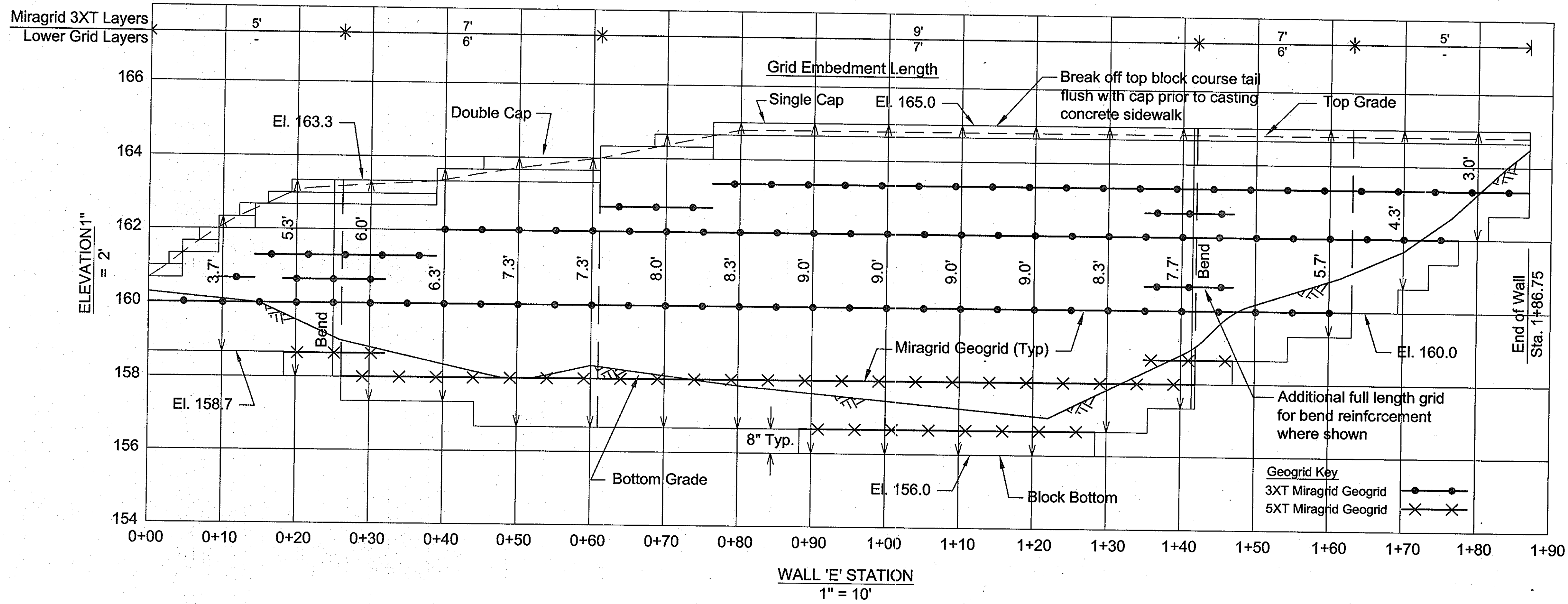
PROJECT  
ELKRIDGE TOWN CENTER

AREA  
TAX MAP 38 - GRID 8  
PARCEL 526  
1st ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

TITLE  
RETAINING WALL ELEVATIONS

**HILLIS-CARNES**  
ENGINEERING ASSOCIATES, INC.  
12011 Gullford Road - Suite 106 Annapolis Junction, Maryland  
Telephone: (410) 880-4788 Fax: (410) 880-4088

DESIGNED BY : RWS  
DRAWN BY : AM  
PROJECT NO : 02042-B  
DATE : FEBRUARY 10, 2005  
SCALE : AS SHOWN  
DRAWING NO. 29 OF 38

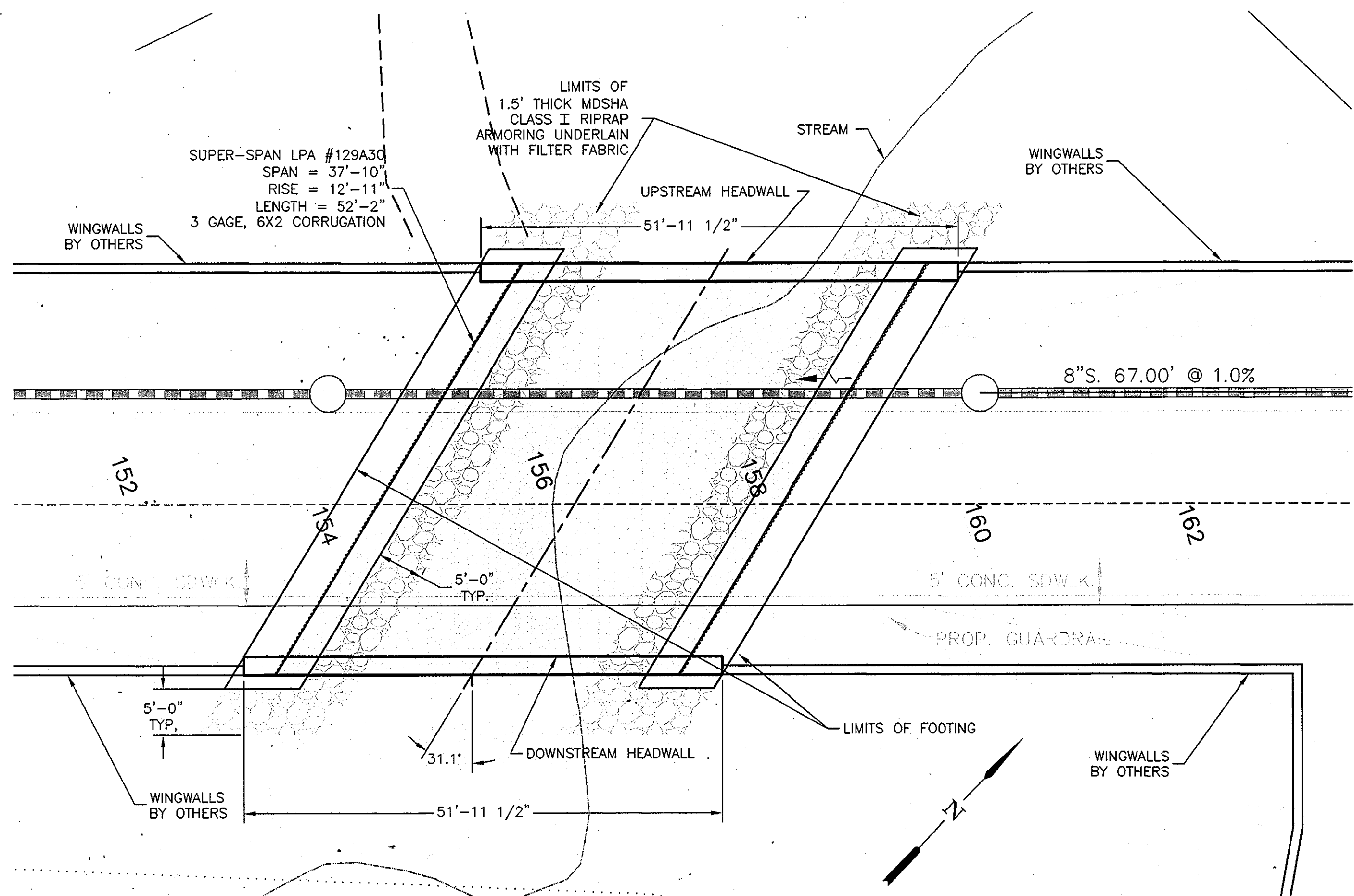


APPROVED : HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING.	
<i>Barbara L. Goyette</i>	2/20/07 DATE
DIRECTOR	
<i>[Signature]</i>	1/10/07 DATE
CHIEF, DEVELOPMENT ENGINEERING DIVISION	
<i>Cynthia Harshbarger</i>	2/16/07 DATE
CHIEF, DIVISION OF LAND DEVELOPMENT	
DATE NO.	REVISION
DEVELOPER ELKRIDGE TOWN CENTER P.O. BOX 417 ELLCOTT CITY, MARYLAND 21041 410-465-4244	
PROJECT ELKRIDGE TOWN CENTER	
AREA TAX MAP 38 - GRID 8 PARCEL 526 1st ELECTION DISTRICT HOWARD COUNTY, MARYLAND	
TITLE RETAINING WALL ELEVATIONS	
<b>HILLIS-CARNES</b> <b>ENGINEERING ASSOCIATES, INC.</b> 12011 Guilford Road - Suite 106 Annapolis Junction, Maryland Telephone: (410) 880-4788 Fax: (410) 880-4090	
DESIGNED BY :	RWS
DRAWN BY :	AM
PROJECT NO :	02042-B
DATE :	FEBRUARY 10, 2005
SCALE :	AS SHOWN
DRAWING NO.	30 F 38

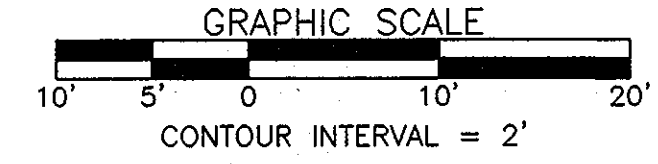




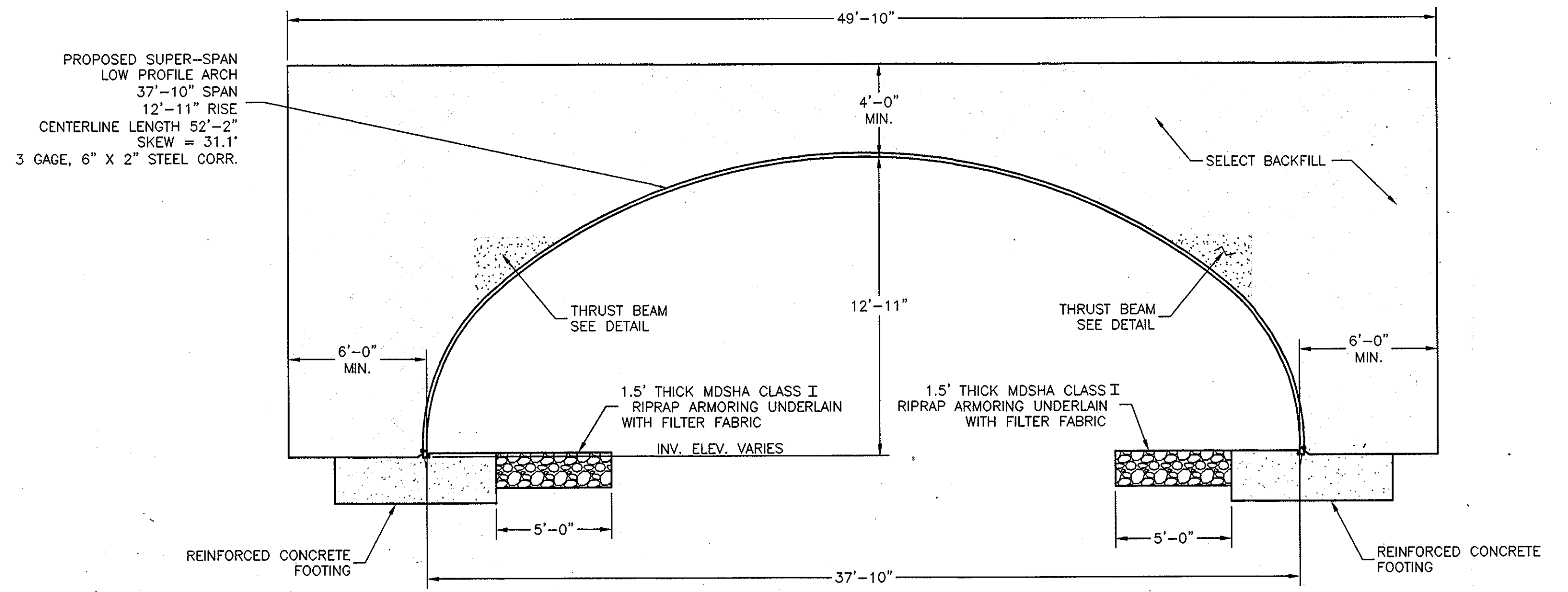




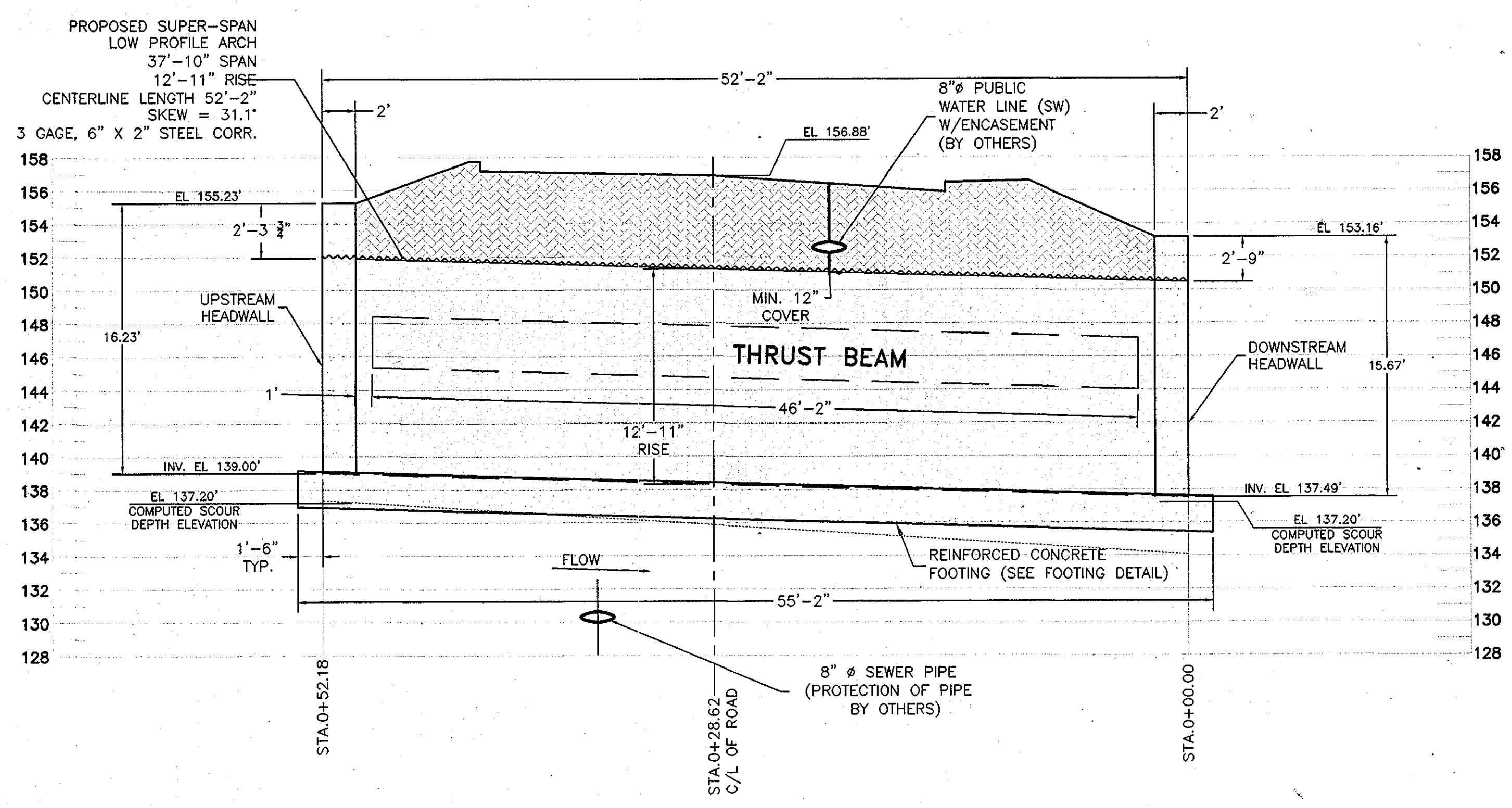
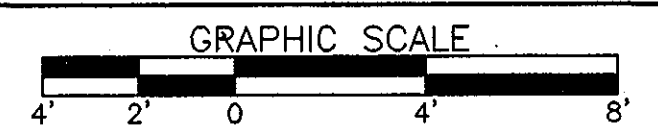
**PLAN VIEW**



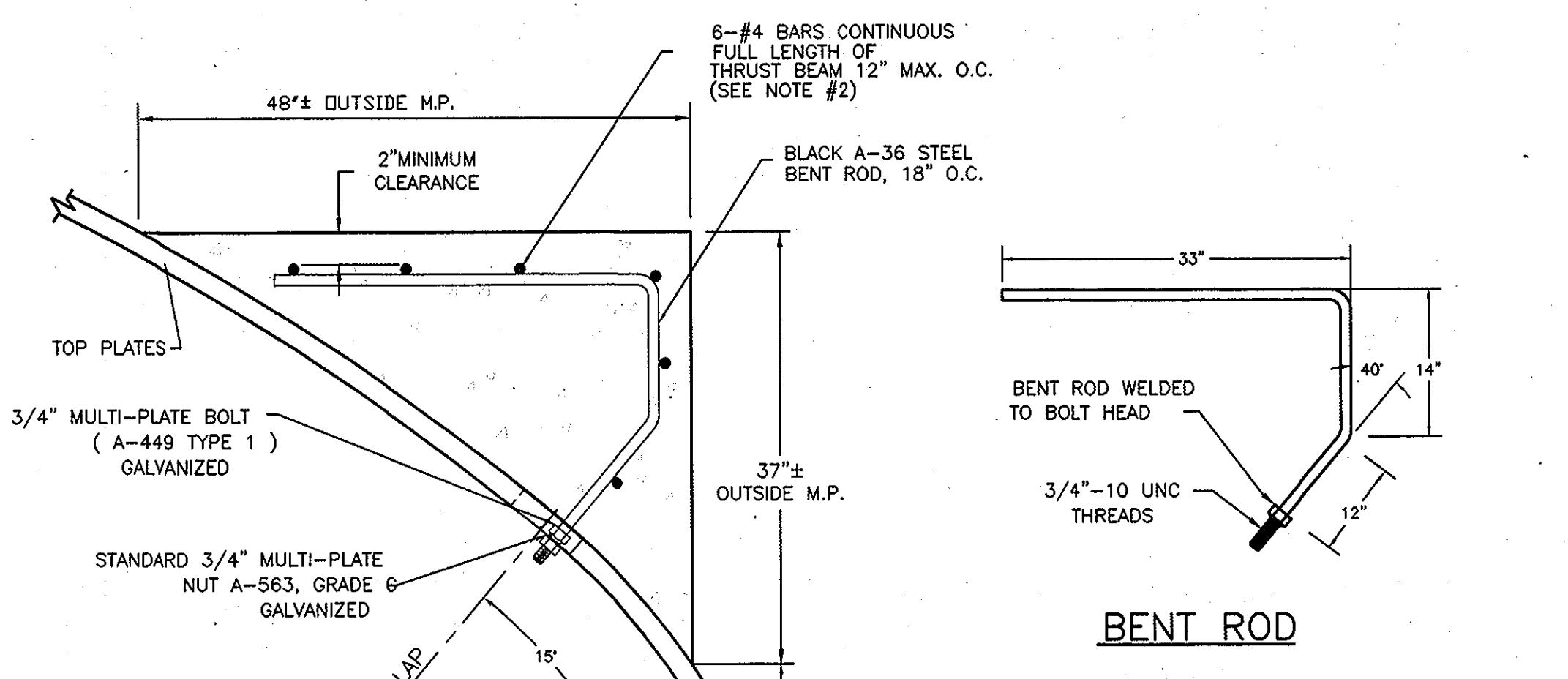
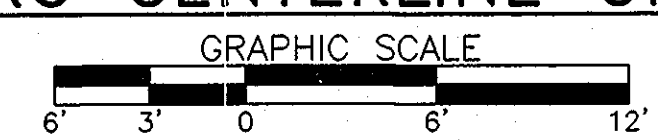
NOTE: SCOUR PROTECTION OF WINGWALLS IS THE RESPONSIBILITY OF OTHERS.



**TYPICAL BACKFILL SECTION**



**PROFILE THRU CENTERLINE OF STRUCTURE**



**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) LOOKING DOWNSTREAM BENT ROD WILL BE IN HIGH HOLE ON OPPOSITE SIDE OF STRUCTURE.

**DETAIL OF THRUST BEAM**  
NOT TO SCALE

Developer/Owner:  
**Elkridge Town Center, L.L.C.**  
P.O. Box 417  
Ellicott City, Maryland  
Phone: 410-465-6105

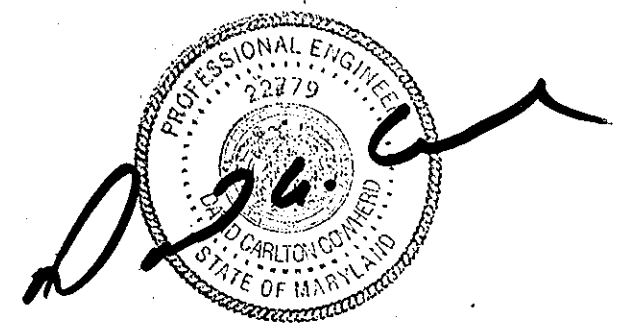
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 1/16/07  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

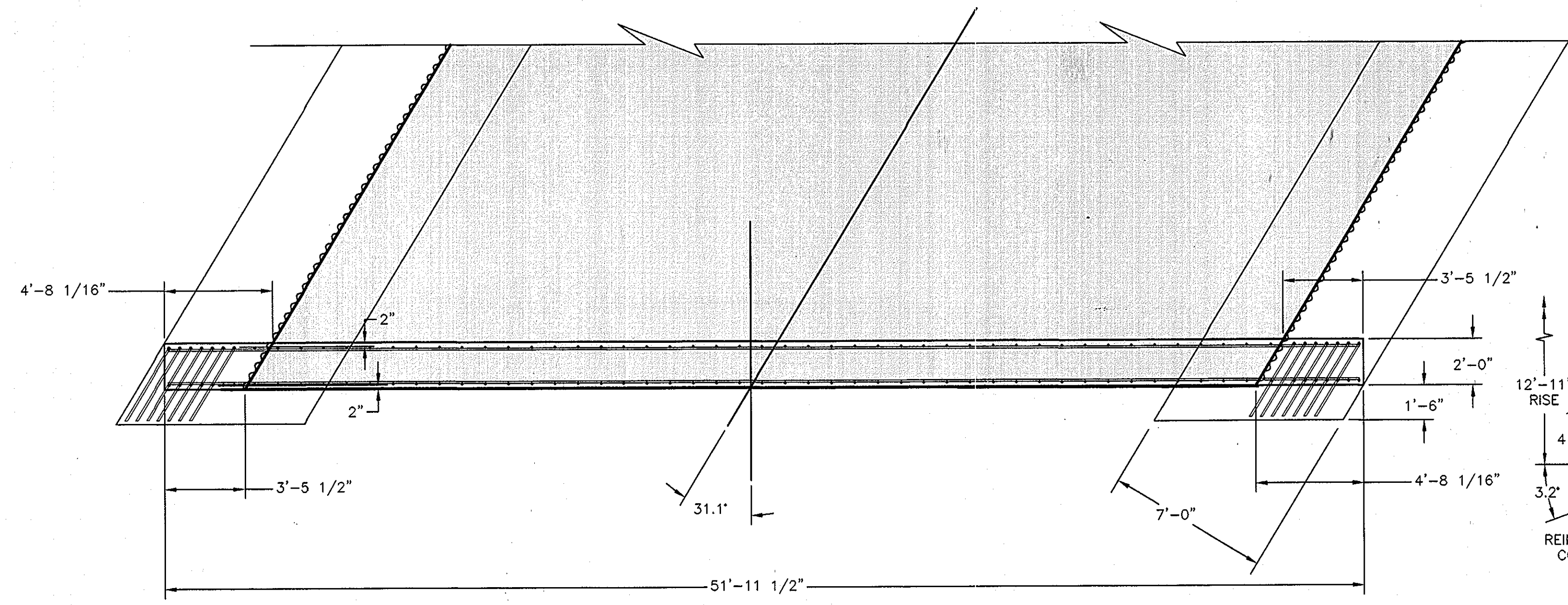
*[Signature]* 2/16/07  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 2/20/07  
DIRECTOR DATE

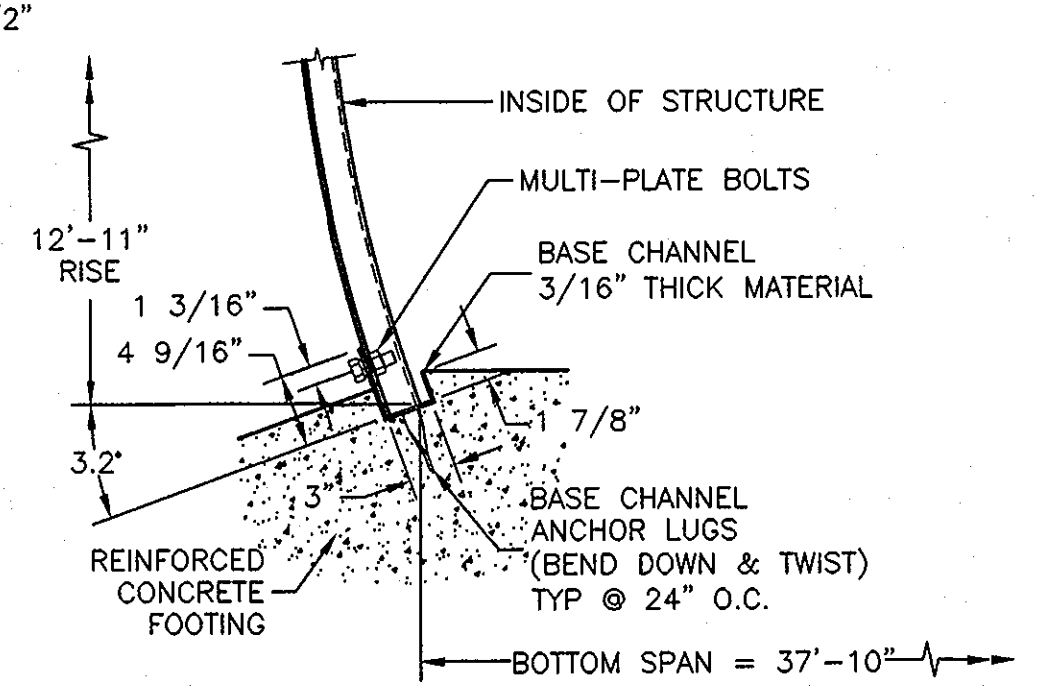
NOTE:  
1.) CONCRETE SHALL BE f'c = 4,000 psi  
2.) ALL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60



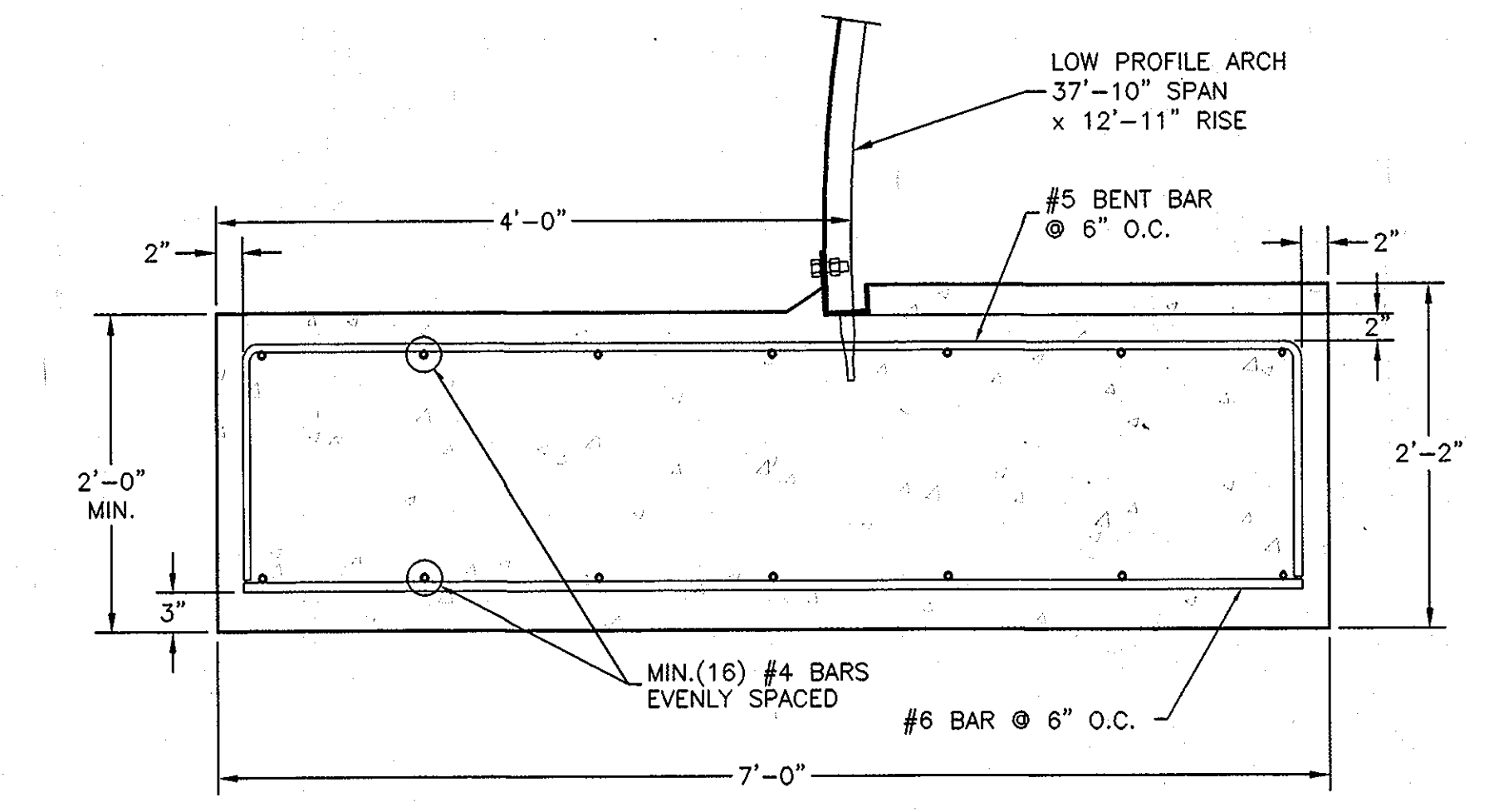
1	12/4/06	DJH	ADDED SCOUR DEPTHS/ REV. SIGNATURE BLOCKS
<b>CBC ENGINEERS</b> DAYTON, OHIO			
<b>PLAN, PROFILE, &amp; DETAILS</b>			
Drawn By JBE	Date 11/11/04	CONTECH CONSTRUCTION PRODUCTS, INC. DESIGN OF SUPER-SPAN LOW PROFILE ARCH FOR ELKRIDGE TOWN CENTER HOWARD COUNTY, MD	
Approved By	Date	Project No. CBC-6406	Rev. 1 Sheet 33 OF 38
Scale GRAPHIC			



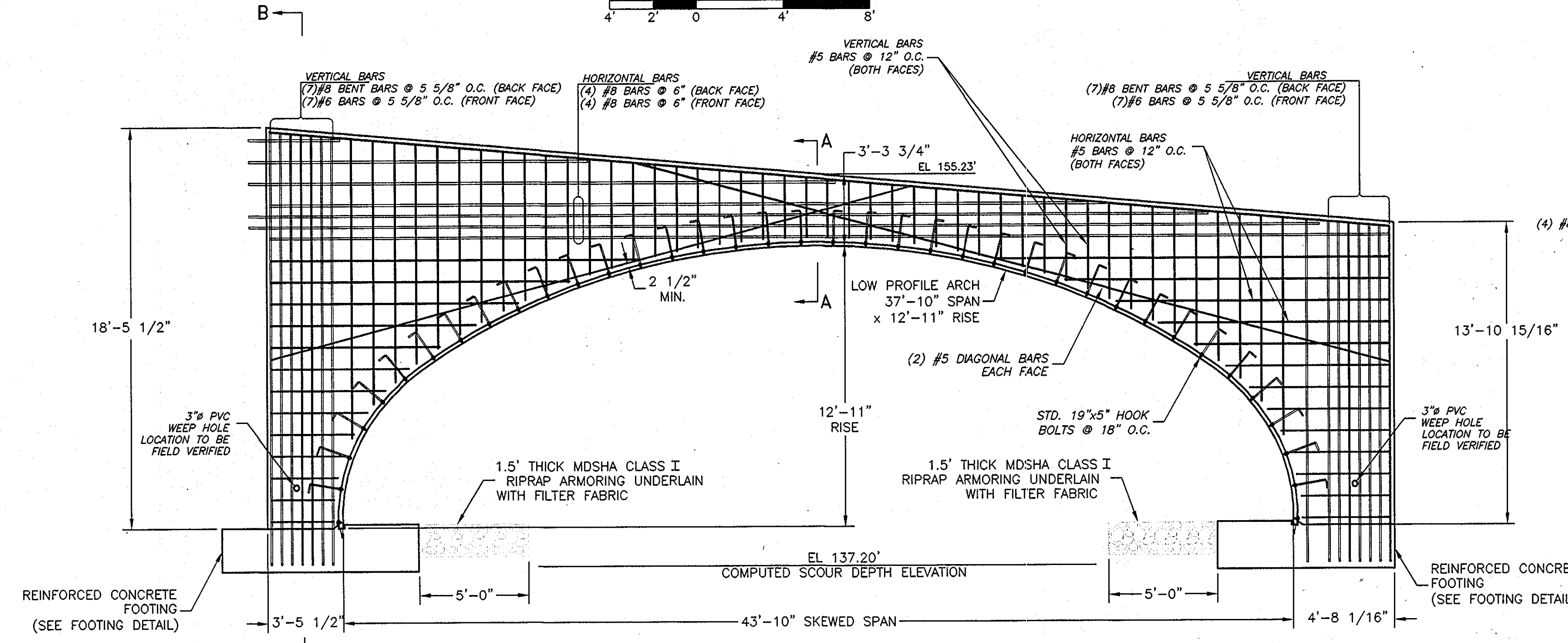
**PLAN VIEW**  
GRAPHIC SCALE  
0 2 4 8



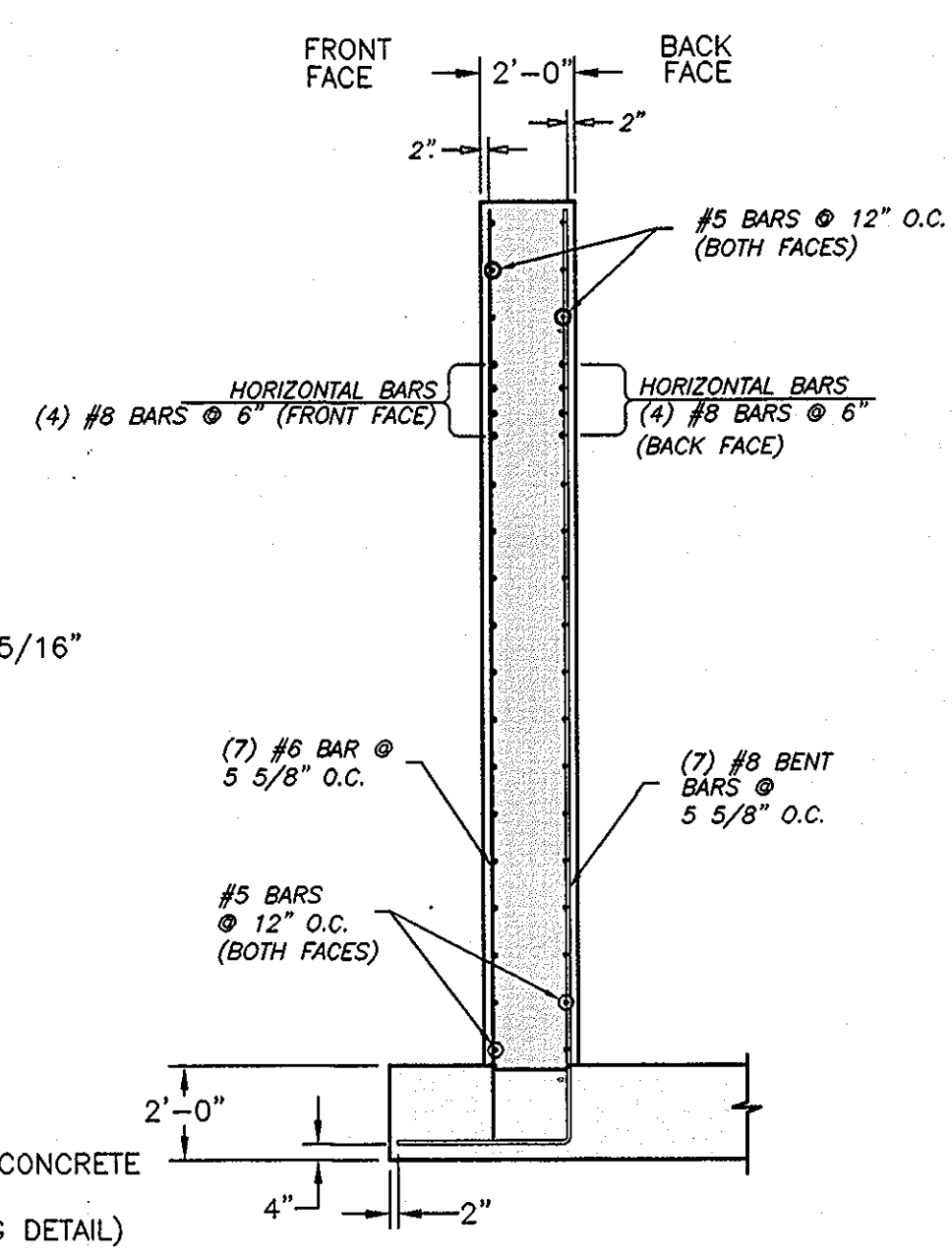
**BASE CHANNEL DETAIL**  
NOT TO SCALE



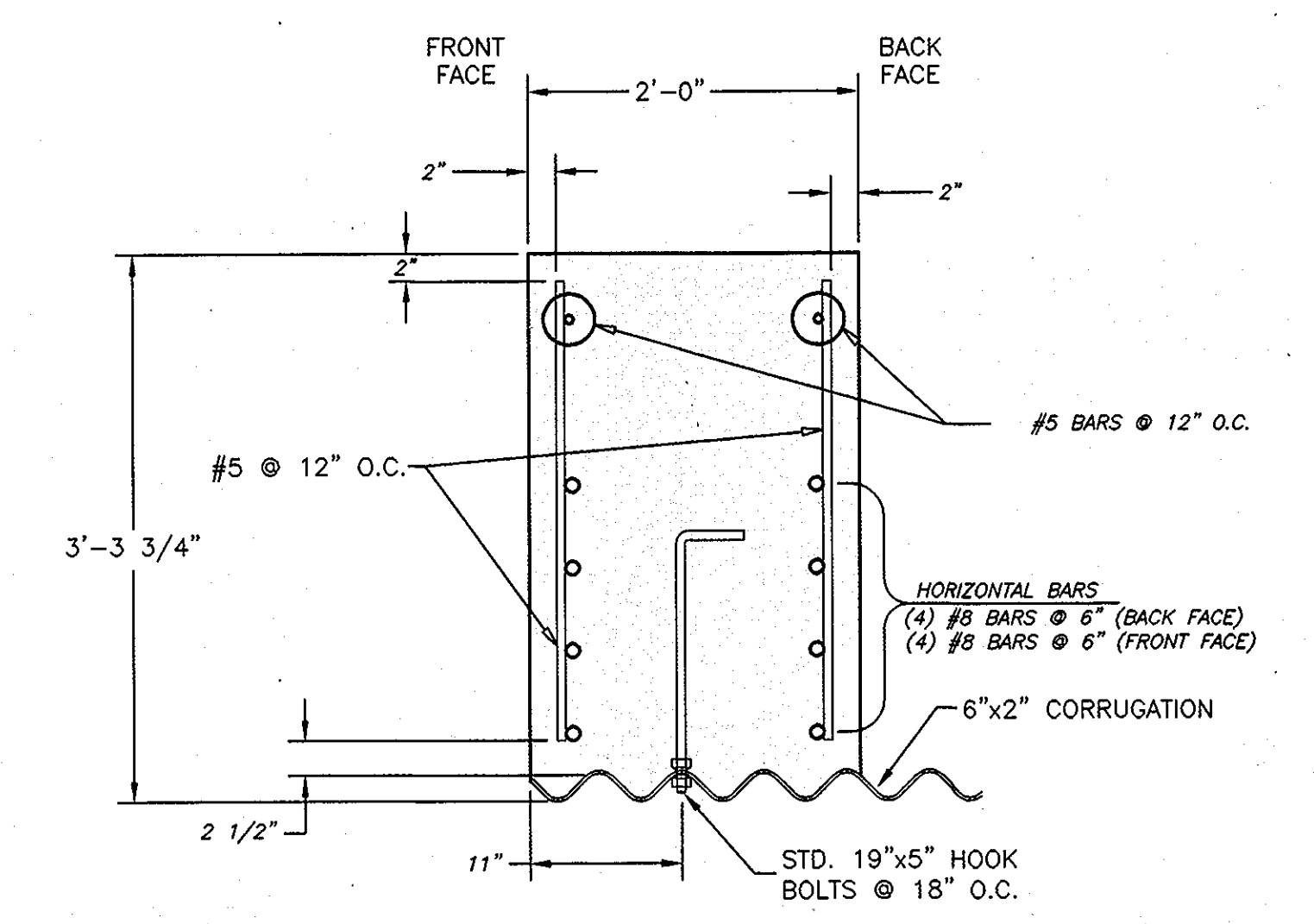
**FOOTING DETAIL**  
GRAPHIC SCALE  
0 0.5 1 2



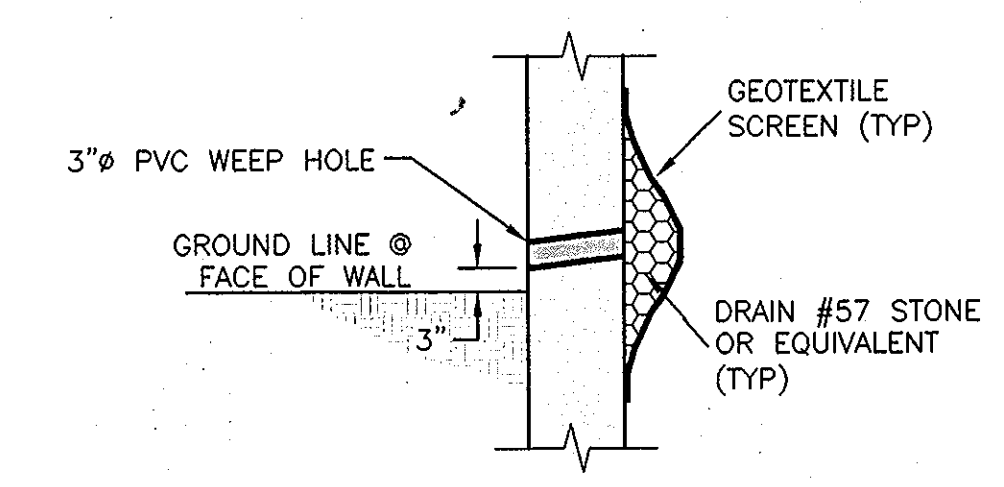
**UPSTREAM ELEVATION VIEW**  
GRAPHIC SCALE  
0 2 4 8



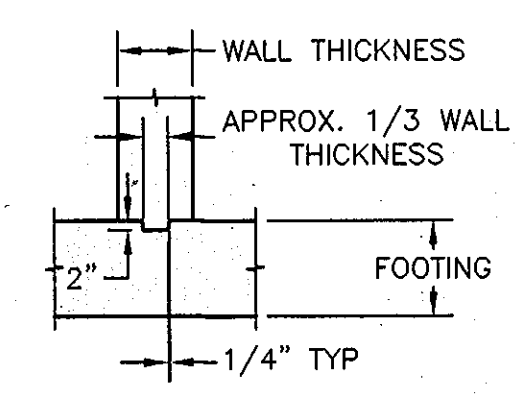
**SECTION 'B-B'**  
GRAPHIC SCALE  
0 2 4 8



**SECTION 'A-A'**  
GRAPHIC SCALE  
0 0.5 1 2



**WEEP HOLE DETAIL**  
NOT TO SCALE



**KEYED CONSTRUCTION JOINT DETAIL**  
NOT TO SCALE

Developer/Owner:  
**Elkridge Town Center, L.L.C.**  
P.O. Box 417  
Ellicott City, Maryland  
Phone: 410-465-6105

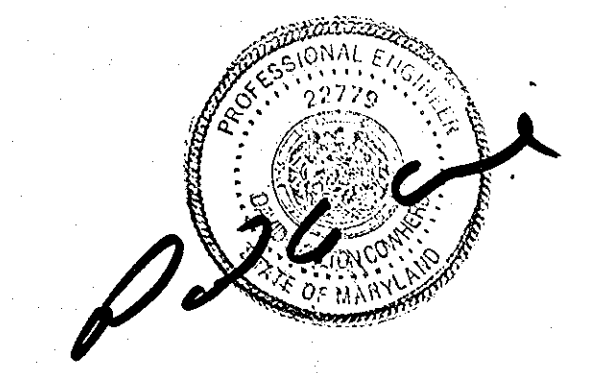
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *[Signature]* DATE 2/16/07

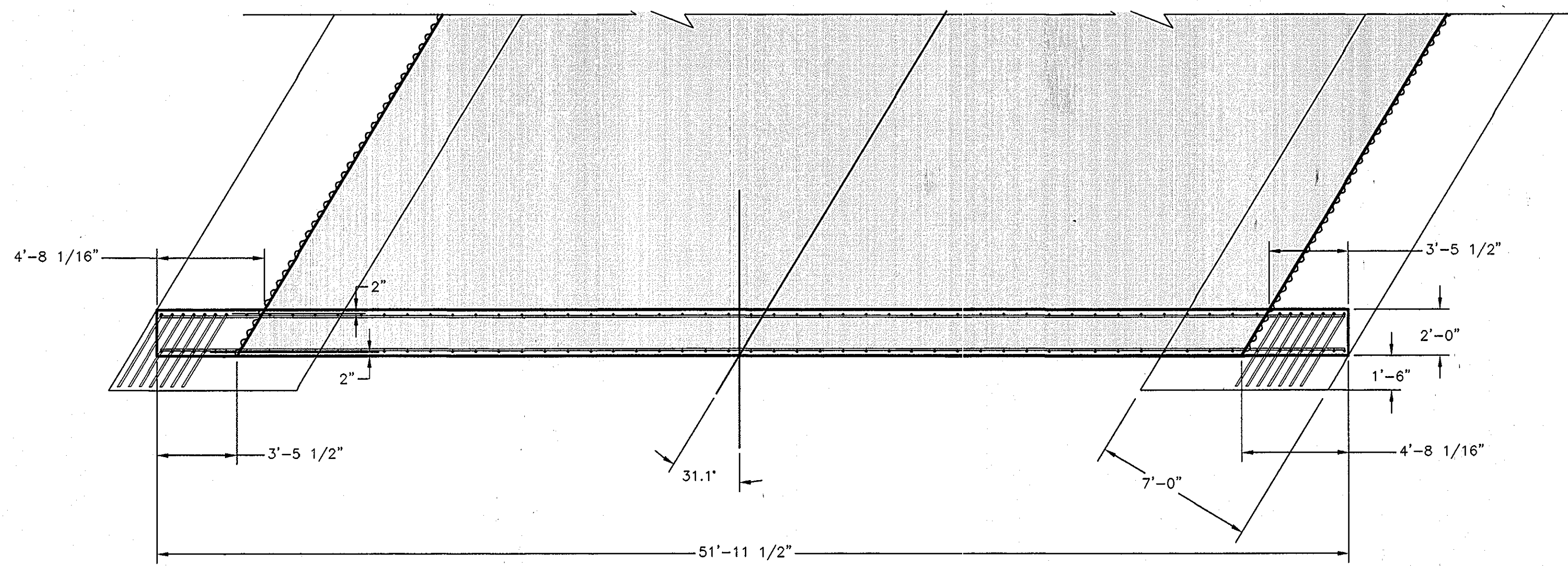
CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* DATE 2/20/07

DIRECTOR

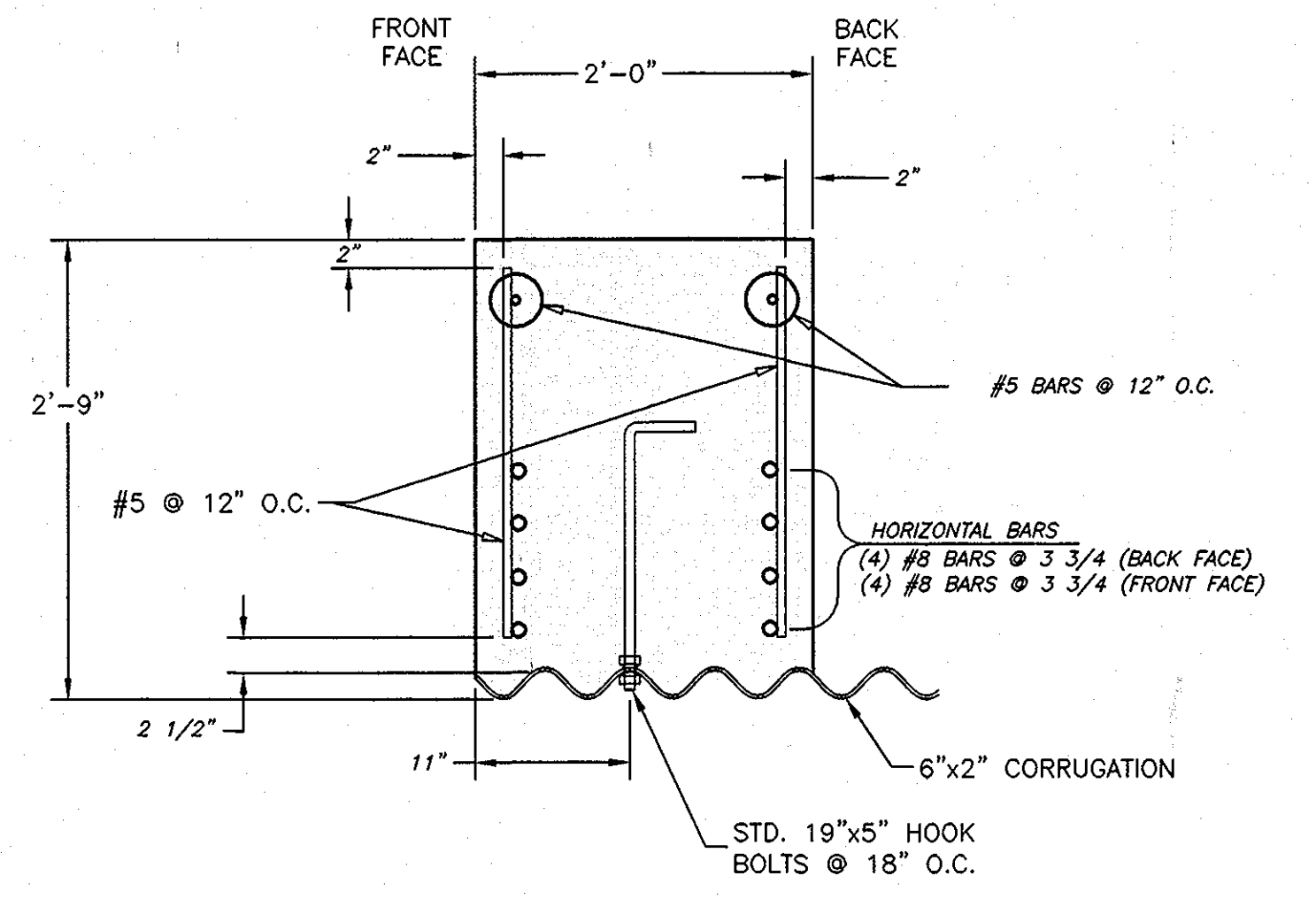
NOTE:  
1.) CONCRETE SHALL BE f'c = 4,000 psi  
2.) ALL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60



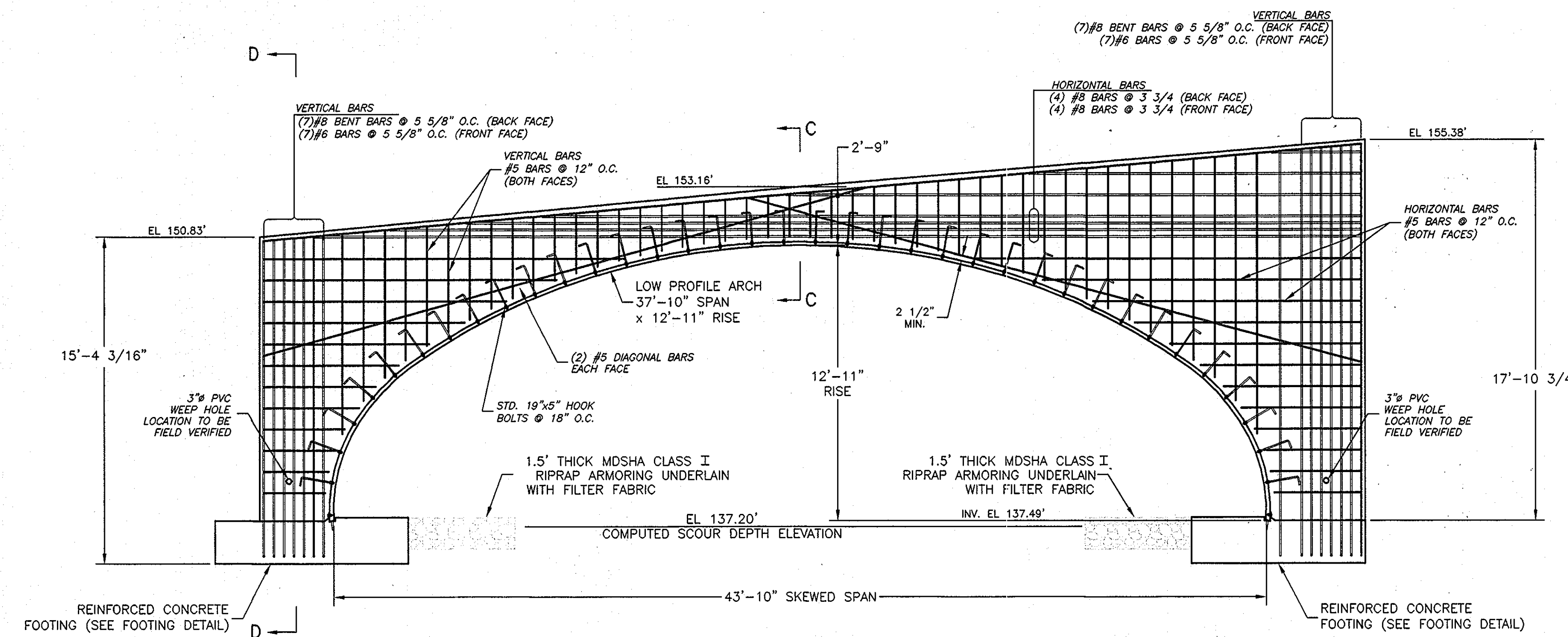
1	12/4/06	DJH	ADDED SCOUR DEPTHS/REV. SIGNATURE BLOCKS
<b>UPSTREAM HEADWALL DESIGN</b>			
Drawn By	Date	CONTECH CONSTRUCTION PRODUCTS, INC. DESIGN OF SUPER-SPAN LOW PROFILE ARCH FOR ELKRIDGE TOWN CENTER HOWARD COUNTY, MD	
JBE	11/11/04		
Approved By	Date		
Scale	Project No.	Rev.	Sheet
GRAPHIC	CBC-6406	1	34 OF 38



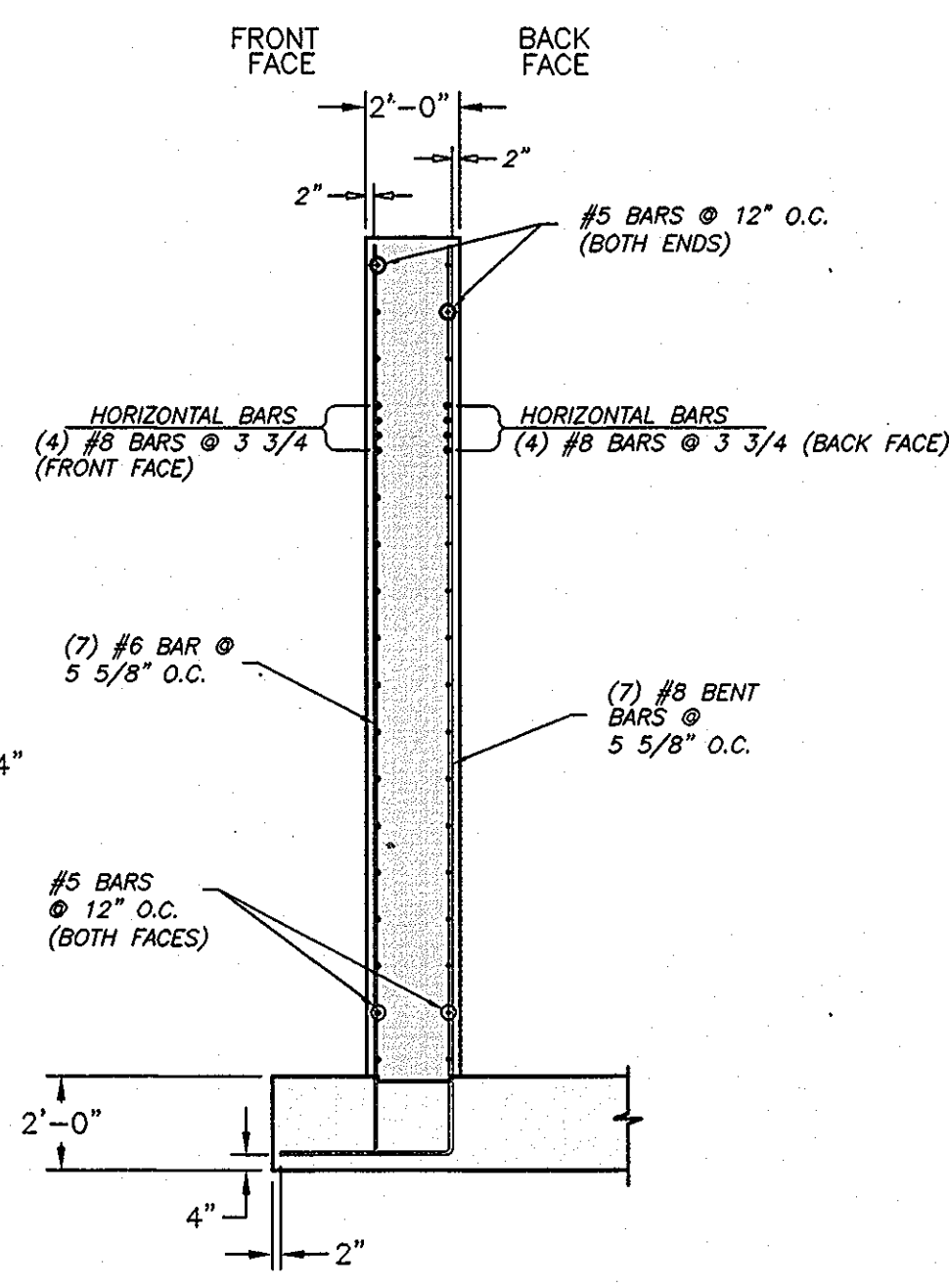
**PLAN VIEW**  
GRAPHIC SCALE



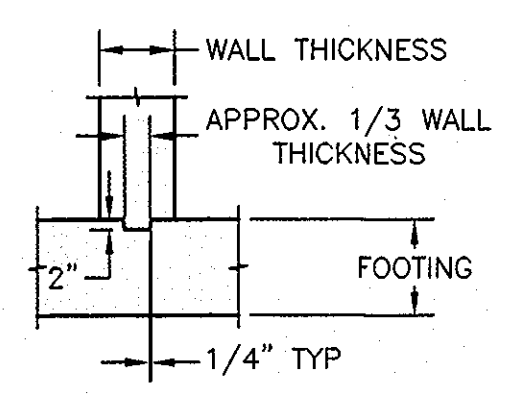
**SECTION 'C-C'**  
GRAPHIC SCALE



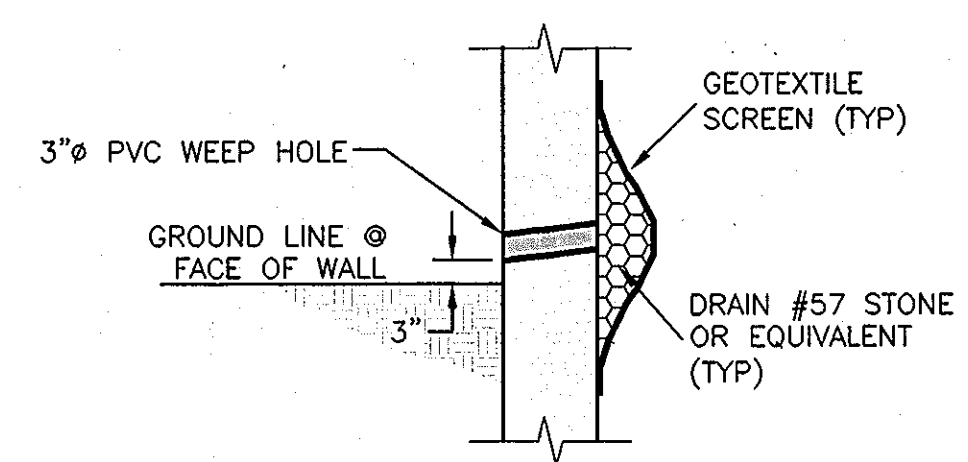
**DOWNSTREAM ELEVATION VIEW**  
GRAPHIC SCALE



**SECTION 'D-D'**  
GRAPHIC SCALE



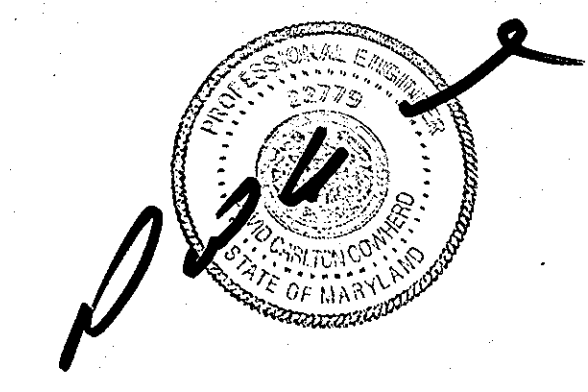
**KEYED CONSTRUCTION JOINT DETAIL**  
NOT TO SCALE



**WEEP HOLE DETAIL**  
NOT TO SCALE

Developer/Owner:  
**Elkridge Town Center, L.L.C.**  
P.O. Box 417  
Ellicott City, Maryland  
Phone: 410-465-6105  
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
CHIEF, DEVELOPMENT ENGINEERING DIVISION  
CHIEF, DIVISION OF LAND DEVELOPMENT  
DIRECTOR

NOTE:  
1.) CONCRETE SHALL BE  $f'_c = 4,000$  psi  
2.) ALL REINFORCEMENT SHALL BE ASTM A-615, GRADE 60



1	12/4/06	DJH	ADDED SCOUR DEPTHS/ REV. SIGNATURE BLOCKS
<b>CBC ENGINEERS</b> DAYTON, OHIO			
<b>DOWNSTREAM HEADWALL DESIGN</b>			
Drawn By	Date	CONTECH CONSTRUCTION PRODUCTS, INC. DESIGN OF SUPER-SPAN LOW PROFILE ARCH FOR ELK RIDGE TOWN CENTER HOWARD COUNTY, MD	
JBE	11/11/04		
Approved By	Date		
Scale	Project No.	Rev.	Sheet
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I - GENERAL

1.0 STANDARDS AND DEFINITIONS

1.1 STANDARDS - All standards refer to latest edition unless otherwise noted.

- 1.1.1 ASTM D-698-70 (Method C) "Standard Test Methods for Moisture, Density Relations of Soils and Soil Aggregate Mixtures Using 5.5-lb (2.5 kg.) Rammer and 12-inch (305-mm) Drop".
- 1.1.2 ASTM D-2922 "Standard Test Method for Density of Soil and Soil Aggregate in Place by Nuclear methods (Shallow Depth)".
- 1.1.3 ASTM D-1556 "Standard Test Method for Density of Soil in place by the Sand-Cone Method".

1.2 DEFINITIONS

- 1.2.1 Owner - In these specifications the word "Owner" shall mean Elkridge Town Center, LLC, in Ellicott City, Maryland.
- 1.2.2 Engineer - In these specifications the word "Engineer" shall mean the Owner designated engineer.
- 1.2.3 Design Engineer - In these specifications the words "Design Engineer" shall mean CBC Engineers and Associates, Ltd.
- 1.2.4 Contractor - In these specifications the word "Contractor" shall mean the firm or corporation undertaking the execution of any work under the terms of these specifications.
- 1.2.5 Approved - In these specifications the word "approved" shall refer to the approval of the Engineer or his designated representative.
- 1.2.6 As Directed - In these specifications the words "as directed" shall refer to the directions to the Contractor from the Owner or his designated representative.

2.0 GENERAL CONDITIONS

- 2.1 The Contractor shall furnish all labor, material and equipment and perform all work and services except those set out and furnished by the Owner, necessary to complete in a satisfactory manner the site preparation, excavation, filling, compaction, grading as shown on the plans and as described therein.

This work shall consist of all mobilization clearing and grading, grubbing, stripping, removal of existing material unless otherwise stated, preparation of the land to be filled, filling of the land, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades, slopes, and specifications.

This work is to be accomplished under the observation of the Owner or his designated representative.

- 2.2 Prior to bidding the work, the Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including, without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site, and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work.

If conditions other than those indicated are discovered by the Contractor, the Owner should be notified immediately. The material which the Contractor believes to be a changed condition should not be disturbed so that the owner can investigate the condition.

- 2.3 The construction shall be performed under the direction of an experienced engineer who is familiar with the design plan.

II - SUPER-SPAN STRUCTURE

1.0 GENERAL

- 1.1 This work shall consist of furnishing, fabricating, and installation of a long-span SUPER-SPAN low profile arch culvert in conformance with these specifications, the manufacturer provisions, and the details shown on the plans.
- 1.2 The contractor shall verify the actual location of all utilities in the field before beginning any work that could be impacted by these utilities.
- 1.3 Contractor must notify/contact all utility companies to determine exact locations of existing utilities prior to commencing any work on this contract.
- 1.4 Contractor shall coordinate construction with work done by others adjacent to or within the contract limits.

2.0 DIMENSIONS

- 2.1 The proposed structure shall be SUPER-SPAN #129A30 low profile arch with the following dimensions:  
Span: 37'-10"  
Rise: 12'-11"  
Contech Structure #129A30  
6" x 2" plate corrugation, Gage 3
- 2.2 All plan dimensions on the contract drawings are measured in a true horizontal plan unless otherwise noted.
- 2.3 All dimensions, locations, and elevations of existing structures shown on the contract drawings shall be verified by the contractor in the field.

3.0 DESIGN CRITERIA

All design, except where noted, conforms to the applicable sections of the 1996 AASHTO standard specifications for highway bridges.

4.0 WORKMANSHIP AND INSPECTIONS

All metal piping materials shall conform to the workmanship and inspection requirements of AASHTO M36 and M167.

5.0 MATERIALS AND DIMENSIONS

- 5.1 Steel structural plate for the pipe shall conform to the requirements of AASHTO M167.
- 5.2 Bolts and nuts shall meet the provisions of ASTM A-449 and ASTM A-563, Grade C, respectively, and shall be galvanized in accordance with the requirements of ASTM A-153, Class C.

6.0 INSTALLATION

ASSEMBLY. The Structure shall be assembled in accordance with the Manufacturer's instructions. All plates shall be unloaded and handled with reasonable care. Plates shall not be rolled or dragged over gravel rock and shall be prevented from striking rock or other hard objects during placement in trench or on bedding.

The Structure shall be placed in the footing starting at the downstream end. Structures with circumferential seams shall be installed with their inside circumferential sheet laps pointing downstream.

III - FOUNDATION REQUIREMENTS

- 1.0 All foundations shall bear on undisturbed soil or engineered fill with a bearing capacity of 4,000 psf.

- 2.0 The area beneath the foundation shall be undercut to suitable original soil with a bearing capacity of 4,000 psf.

2.1 The fill to bring the footing excavations back to grade shall be a suitable granular material compacted to a dry unit weight equal to at least 95% of the maximum dry unit weight as achieved by the modified Proctor test or 1000 psi flowable fill.

2.2 The excavations shall extend laterally beyond the footings 1 foot for each foot depth of excavations.

- 3.0 The excavations for all foundations shall be inspected by a Geotechnical Engineer or his representative to insure all foundations are bearing on undisturbed soil or suitably compacted fill with a bearing capacity of at least 4,000 psf, and that all soft material and any sloughed material has been removed before footings are poured.

- 4.0 Foundation excavations shall be kept free of groundwater.

- 5.0 The footing dimensions and reinforcement shall be according to the construction drawings.

IV - SELECT BACKFILL SPECIFICATIONS

1.0 GENERAL CONDITIONS

- 1.1 The contractor shall furnish all labor, materials, and equipment, and perform all work and services necessary to complete in a satisfactory manner the site preparation, excavation, filling, compaction and grading as shown on the plans and as described therein.
- 1.2 This work shall consist of all clearing and grading, removal of existing structures unless otherwise stated, preparation of the land to be filled, spreading and compaction of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades, slopes, and specifications.
- 1.3 This work is to be accomplished under the constant and continuous supervision of the Owner or his designated representative.

2.0 SUBSURFACE CONDITIONS

- 2.1 The Contractor shall examine, investigate and inspect the construction site as to the nature and location of the work, and the general and local conditions at the construction site, including, without limitation, the character of surface or subsurface conditions and obstacles to be encountered on and around the construction site; and shall make such additional investigation as he may deem necessary for the planning and proper execution of the work.
- 2.2 If conditions other than those indicated are discovered by the Contractor, the Owner should be notified immediately. The material which the Contractor believes to be a changed condition should not be disturbed so that the Owner can investigate the condition.

3.0 SITE PREPARATION

- 3.1 Within the specified areas, all debris, existing stockpile material, and structures scheduled for demolition shall be removed and disposed of.
- 3.2 Any rubbish, organic and other objectionable soils, and other deleterious material, shall be disposed of off the site, or as directed by the Owner or his designated representative if on site disposal is provided. In no case shall such objectionable material be allowed in, or under the fill.
- 3.3 Prior to the addition of fill, the undercuts specified in Section II shall be made and the original ground shall be compacted to the project specifications as outlined below. Special attention shall be given to the proposed fill area at this time. If wet spots, spongy conditions, or ground water seepage is found, corrective measures must be taken before the placement of fill.

4.0 FORMATION OF FILL AREAS

4.1 SELECT BACKFILL

4.1.1 Select backfill shall be placed to a minimum distance of 6 feet horizontally, as measured from the springline of the structure, and to a distance of 4 feet above the crown of the structure as shown on the construction drawings.

5.0 MINIMUM BACKFILL REQUIREMENTS FOR SUPER-SPAN AND LONG SPAN STRUCTURES

5.1 MATERIAL

A granular type of material shall be used around and over the structure. This select structural backfill material shall conform to AASHTO Specification M-145: A-1-a meeting the following criteria:

AASHTO M-145 - TABLE 2 (MODIFIED)*	
GROUP CLASSIFICATION	A-1
	A-1-a
Sieve Analysis, Percent Passing	
No. 10 (2.00 mm)	50 max.
No. 40 (0.425 mm)	30 max.
No. 100 (.150 mm)	--
No. 200 (0.075 mm)	15 max.
CHARACTERISTICS OF FRACTION PASSING NO. 40 (0.425 mm)	
Liquid Limit	--
Plasticity Index	6 max.
USUAL TYPES OF SIGNIFICANT CONSTITUENT MATERIALS	Stone Fragments, Gravel and Sand

\*Modified to be more select than M-145.

Additional Backfill Material Requirements:

- 1. Backfill must be dense-graded material. Open-graded or gap-graded materials are not allowed.
  - 2. Fine beach sands, windblown sands, stream deposited sands exhibiting fine, rounded particles and typically classified by AASHTO M-145 as A-3 materials are not allowed.
  - 3. On-site mixing or blending to achieve specified gradation is not allowed.
  - 4. Maximum particle size shall not exceed 3 inches.
  - 5. The stone particles shall be angular and not rounded.
- Other backfill materials which provide equivalent long term structural properties 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 SUPER-SPAN and long span structures and approval by the Chief Engineer, Contech.

5.2 BACKFILL LIMITS

The required width of the structural backfill shall be 6 feet minimum outside the springline and to 4 feet over the top of the structure.

5.3 BACKFILL PLACEMENT

Before backfilling, the erected structure shall meet the tolerance and symmetry requirements of AASHTO and Contech.

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 95% modified Proctor per AASHTO Test Method No. T-180. Field density tests of compacted backfill shall be made at regular intervals during backfill.

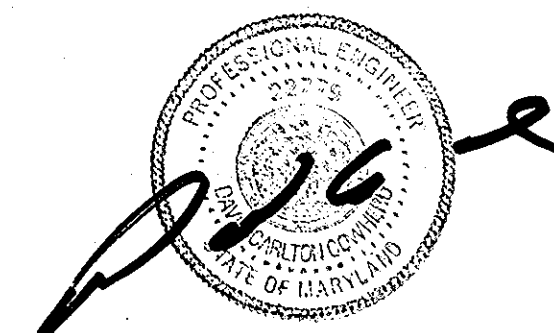
Developer/Owner:  
Elkridge Town Center, L.L.C.  
P.O. Box 417  
Ellicott City, Maryland  
Phone: 410-465-6105

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION *[Signature]* 12/10/07 DATE

CHIEF, DIVISION OF LAND DEVELOPMENT *[Signature]* 2/16/08 DATE

DIRECTOR *[Signature]* 2/20/08 DATE



1	12/4/06	DJH	ADDED SCOUR DEPTHS/ REV. SIGNATURE BLOCKS
<b>SPECIFICATIONS</b>			
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SUPER-SPAN and 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 these 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 are prohibited inside the select fill envelope zone until appropriate minimum cover height has been obtained.

**5.4 CONSTRUCTION OBSERVATION**

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 structural backfill to the minimum cover height over the structure. The Shape Control Technician shall take initial measurements of the erected structure before backfilling, monitor all backfill materials, their placement and their compaction. 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 95% per AASHTO T-180. **No structural backfill shall be placed without the Contech Shape Control Technician on site.**

The Contech Shape Control Technician shall:

- monitor the structure's shape throughout the backfilling operation and report shape change rates to the contractor.
- contact the Contech Regional Engineer immediately if there are problems in meeting the established tolerances.
- have full authority to stop backfill work if necessary.

It is the Project Engineer's responsibility to insure that the requirements of AASHTO and Contech have been met relative to the installation and backfilling of the structure. The Project Engineer shall also provide field density tests of the compacted backfill as directed by the Contech Shape Control Technician.

The Contech Shape Control Technician is not directly responsible for additional project control matters. However, the Shape Control inspector is expected to make observations and notify the Engineer of Record, Contractor, Project Engineer and Contech Region Engineer of any apparent problems or site condition charges which, in his judgment, may affect the quality or performance of the finished installation. Such conditions may include, but are not limited to:

- Observed soft or weak spots in the foundation, trench wall, embankment, or area within the controlled backfill zone.
- Apparent improper or changing backfill material quality. Specific details of the backfill material approved for the job will be provided by the Contech Region Engineer. Any changes in the backfill requirements must be approved in writing by the Contech Region Engineer.
- Use of improper compaction methods and/or lift thicknesses.
- Structural backfill limits that are less than those required by the plans and specifications.
- Adverse reaction of the SUPER-SPAN or long span to backfill placement or compaction methods.
- All items discussed and outlined in the Installation and Inspection Practices included in the Inspection Plan.

**6.0 SLOPE RATIO AND STORM WATER RUN-OFF**

Protected slopes shall not be greater than 2.0 (horizontal) to one (1) (vertical) in both cut and fill, and storm water shall not be drained over the slopes.

**7.0 GRADING**

The Contractor shall furnish, operate, and maintain such equipment as is necessary to construct uniform layers, and control smoothness of grade for maximum compaction and drainage.

**8.0 COMPACTING**

8.1 The compaction equipment shall be approved equipment of such design, weight, and quantity to obtain the required density in accordance with these specifications, without distorting the structure.

8.2 During backfill, only small tracked vehicles (D-4 or smaller) shall be near the structure as fill progresses above the crown and to finished grade. The contractor is cautioned that the minimum cover may need to be increased to handle temporary construction vehicle loads (larger than a D-4).

**9.0 TOP LOADING**

9.1 If the structure rises, and chord dimensions have become distorted by more than ±2% of plan, top loading or bracing may be necessary.

9.2 The structure can carry legal highway loads once the backfill is placed and compacted to a minimum cover of 4 feet. For heavier construction loads in the unpaved conditions the Contractor shall consult the Engineer.

**10.0 TESTING AND INSPECTION SERVICES**

10.1 Testing and inspection services will be provided by the Owner. No structural backfill shall be placed without the Contech Shape Control Technician on site.

10.2 Regular inspection during erection and backfilling is required to achieve a structure with proper shape and backfill compacted to the specified density. The structure's shape shall be monitored at all times during installation, and soil materials and compaction methods must be verified by testing.

**11.0 SPECIFICS OF SHAPE MONITORING**

11.1 The shape of the structure shall be monitored during construction.

11.2 Monitoring points other than the shape control hooks shall be identified with permanent paint. These points shall be monitored periodically throughout the placement of the backfill to determine if the shape of the structure has changed and to determine the rate of change. Typically the rise and chord dimensions should be maintained to less than ±2% of design values.

11.3 A set of measurements shall be made for each 12 to 16 inches of fill placed or one time each day, whichever is greater. The structure measurements should continue throughout the backfilling operation until all of the select material has been placed and compacted. After placement of soil over the select fill and completion of the final grade and roadway surfacing, the structure's shape should be documented by preparing an as-built shape of the structure.

11.4 Additional measurements shall be made to provide a record of the shape of the structure for comparison during future inspections. Corrugated metal structures can deflect and distort during erection and backfilling and also under subsequent loading. Although these distortions are not generally serious, the initial shape of the structure shall be documented for comparison with future inspections.

**V - HEADWALLS**

1.0 The headwalls shall consist of reinforced concrete conforming to Chapter VII of these specifications and to Division II, Section 8, of the AASHTO Standard Specifications for highway bridges having a minimum compression strength of 4,000 psi.

2.0 Reinforcing steel shall conform to ASTM A-615, Grade 60, having a minimum yield strength of 60,000 psi.

3.0 The headwalls shall be anchored to the arch in the manner shown on the plans and shall be formed and poured in accordance with the plan dimensions.

4.0 Round weep holes shall be placed in the walls as shown on the construction drawings. A granular envelope, consisting of #57 stone or equivalent, shall be placed behind each weep hole for a distance of approximately 1 foot from all edges of the weep hole. A free-draining geotextile screen shall be placed between the weep hole and the stone to prevent erosion of the stone.

**VI - SCOUR PROTECTION**

1.0 All riprap placed in conjunction with this project shall be MDSHA Class I armor and shall possess the following minimum gradation:

TABLE VI-1  
RIP-RAP GRADATION

ROCK SIZE		% SMALLER BY SIZE
DIAMETER, (in.)	WEIGHT, (lbs)	
16	200	100
12	75	50
5	25	10

1.1 Riprap shall be placed in the locations shown on the construction drawings.

1.2 The total thickness of riprap shall be not less than 1.5 feet.

1.3 All riprap shall be underlain by a layer of Mirafix 140N or equivalent filter fabric as shown on the construction drawings.

**VII - CONCRETE**

**1.0 CODES AND STANDARDS**

1.1 Reinforced concrete shall conform to the requirements of AASHTO Standard Specifications for Highway Bridges, Division II - Construction, Section 8, "Concrete Structures", for Class A concrete, having a minimum compressive strength of 4,000 psi.

**2.0 STANDARDS FOR MATERIALS**

2.1 Portland Cement - Conforming to ASTM Specification C-150, Type I or II.

2.2 Water - The water shall be drinkable, clean free from injurious amounts of oils, acids, alkalis, organic materials, or deleterious substances.

2.3 Aggregates - Fine and coarse aggregates shall conform to current ASTM Specification C-33 "Specification for Concrete Aggregates" except that local aggregates which have been shown by tests and by actual service to produce satisfactory qualities may be used when approved by the Engineer.

2.4 Submittals - Test data and/or certifications to the Owner shall be furnished upon request.

**3.0 PROPORTIONING OF CONCRETE**

**3.1 COMPOSITION**

3.1.1 The concrete shall be composed of cement, fine aggregate, coarse aggregate and water.

3.1.2 The concrete shall be homogeneous, readily placeable and uniformly workable and shall be proportioned in accordance with ACI-211.1.

3.1.3 Proportions shall be established on the basis of field experience with the materials to be employed. The amount of water used shall not exceed the maximum 0.49 water/cement ratio, and shall be reduced as necessary to produce concrete of the specified consistency at the time of placement.

3.1.4 An air-entraining admixture, conforming to the requirements of ASTM C260, shall be used in all concrete furnished under this contract. The quantity of admixture shall be such as to produce an air content in the freshly mixed concrete of 6 percent plus or minus 1 percent as determined in accordance with ASTM C231 or C173.

**3.2 Qualities Required - As indicated in the table below:**

TABLE VII-1  
QUALITIES REQUIRED

ITEM	QUALITY REQUIRED
Class	A
Type of Cement	I or II
Compressive Strength $f_c$ @ 28 days	4,000 psi
Slump, inches	2 - 4 in.

3.3 Maximum Size of Coarse Aggregates - Maximum size of coarse aggregates shall not be larger than 38 mm (1 1/2 inches).

3.4 Rate of Hardening of Concrete - Concrete mix shall be adjusted to produce the required rate of hardening for varied climatic conditions:

Under 40°F Ambient Temperature - Accelerate calcium chloride at 2% is acceptable when used within the recommendations of ACI-306R "Cold Weather Concreting." Admixtures containing chloride ion in excess of 1% by weight of admixture shall not be used in reinforced concrete.

**4.0 MIXING AND PLACING**

4.1 Equipment - Ready Mix Concrete shall be used and shall conform to the "Specifications for Ready-Mix Concrete," ASTM C-94. Approval is required prior to using job mixed concrete.

4.2 Preparation - All work shall be in accordance with ACI-304, "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete." All construction debris and extraneous matter shall be removed from within the forms. Concrete shall be placed on clean surfaces, free from water. Concrete that has to be dropped four (4) feet or more shall be placed through a tremie.

4.3 All concrete shall be consolidated by internal mechanical vibration immediately after placement. Vibrators shall be of a size appropriate for the work, capable of transmitting vibration to concrete at frequencies of not less than 4,500 impulses per minute.

**5.0 FORMWORK**

5.1 Forms shall be of wood, steel or other approved material and shall be set and held true to the dimensions, lines and grades of the structure (footings) prior to and during the placement of concrete.

5.2 Forms shall not be removed until the concrete has sufficient strength to prevent concrete drainage.

**6.0 CURING**

6.1 Fresh concrete shall be protected from rains, flowing water and mechanical injury for a period of four (4) days.

Developer/Owner:

**Elkridge Town Center, L.L.C.**  
P.O. Box 417  
Ellicott City, Maryland

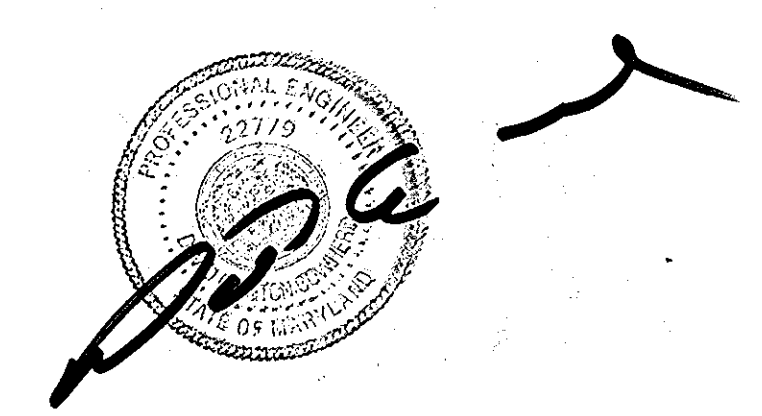
Phone: 410-465-6105

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 1/31/07  
CHIEF, DEVELOPMENT ENGINEERING DIVISION

*[Signature]* 2/14/07  
CHIEF, DIVISION OF LAND DEVELOPMENT

*[Signature]* 2/12/07  
DIRECTOR



1	12/4/06	DJH	ADDED SCOUR DEPTHS/ REV. SIGNATURE BLOCKS
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**CBC ENGINEERS**  
DAYTON, OHIO

**SPECIFICATIONS - CONT'D**

Drawn By	Date	CONTECH CONSTRUCTION PRODUCTS, INC. DESIGN OF SUPER-SPAN LOW PROFILE ARCH FOR ELKRIDGE TOWN CENTER HOWARD COUNTY, MD	
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7.0 REINFORCING STEEL

7.1 MATERIAL

7.1.1 All reinforcing bars shall be deformed bars (ASTM-A615) Grade 60.

7.2 BENDING AND SPLICING

7.2.1 Bar reinforcement shall be cut and bent to the shapes shown on the plans. Fabrication tolerances shall be in accordance with ACI 315. All bars shall be bent cold, unless otherwise permitted.

7.2.2 All reinforcement shall be furnished in the full lengths indicated on the plans unless otherwise permitted. Except for splices shown on the plans and splices for No. 5 or smaller bars, splicing of bars will not be permitted without written approval. Splices shall be staggered as far as possible.

7.2.3 In lapped splices, the bars shall be placed and wired in such a manner as to maintain the minimum distance to the surface of the concrete shown on the plans.

7.2.4 Substitution of different size bars will be permitted only when authorized by the engineer. The substituted bars shall have an area equivalent to the design area, or larger.

7.3 PLACING AND FASTENING

7.3.1 Steel reinforcement shall be accurately placed as shown on the plans and firmly held in position during the placing and setting of concrete. Bars shall be tied at all intersections around the perimeter of each mat and at not less than 2 foot centers or at every intersection, whichever is greater, elsewhere. Welding of cross bars (tack welding) will not be permitted for assembly of reinforcement.

7.3.2 Reinforcing steel shall be supported in its proper position by use of mortar blocks, wire bar supports, supplementary bars or other approved devices. Such devices shall be of such height and placed at sufficiently frequent intervals so as to maintain the distance between the reinforcing and the formed surface or the top surface within 1/4 inch of that indicated on the plans.

VIII - FILTER FABRIC (GEOTEXTILE SCREEN)

1.1 A minimum 18 inches of geotextile (filter fabric) shall be placed over all weepholes from all edges of the weepholes. The filter fabric shall be placed between weepholes and the granular material. Filter fabric shall be placed at all locations shown on the construction drawings.

1.2 Filter fabric cloth shall conform to Contech specification for C60-NW or equivalent and shall meet the following ASTM tests:

1.2.1 ASTM D4751 - Apparent opening size equal to #70 U.S. Standard Sieve Size.

1.2.2 ASTM D4632 (Grab Tensile Test) - Minimum Strength = 160 pounds.

1.2.3 ASTM D4632 (Grab Elongation) - 30-70%.

1.2.4 ASTM D4533 (Trapezoidal Tear) - Minimum Strength = 60 pounds.

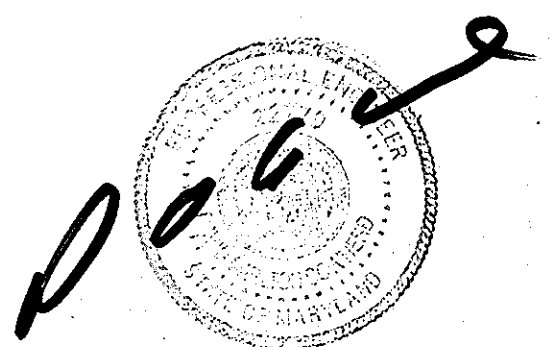
1.2.5 ASTM D4355 (Stabilized for Heat and Ultra-Violet Degradation) - 70% strength retained.

1.3 The minimum fabric coefficient of permeability (ASTM D4491) shall be 0.24 cm/sec.

1.4 The fabric shall be non-woven with a minimum thickness (ASTM D5199) of 60 mils.

1.5 Fabric shall not be placed over sharp or angular rocks that could tear or puncture it.

1.6 Care should be exercised to prevent any puncturing or rupture of the filter fabric. Should such rupture occur the damaged area should be covered with a patch of filter fabric using an overlap minimum of one (1) foot.



Developer/Owner:

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Phone: 410-465-6105

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

*[Signature]* 1/16/07  
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

*[Signature]* 2/16/07  
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

*[Signature]* 2/20/07  
DIRECTOR DATE

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