

FINAL PLAN

VILLAGE OF RIVER HILL

SECTION 4 AREA 4

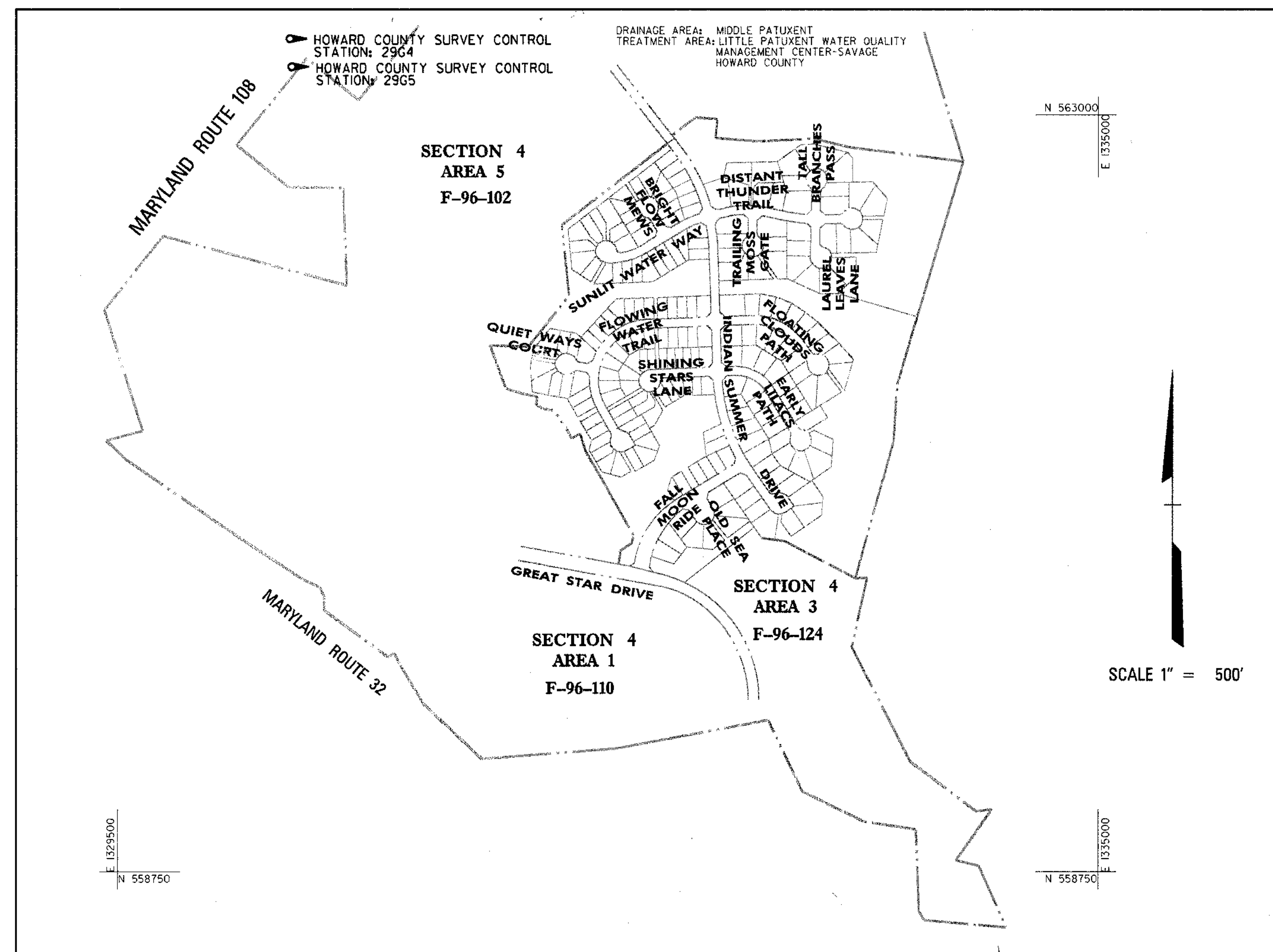
LOTS 1 - 216

5th ELECTION DISTRICT

HOWARD COUNTY, MARYLAND

GENERAL NOTES

- All construction shall be in accordance with the latest standards and specifications of Howard County plus MSHA standards and specifications if applicable.
- The contractor shall notify the Department of Public Works/Bureau of Engineering/Construction Inspection division at 410-313-1880 at least five (5) working days prior to the start of work.
- The contractor shall notify "Miss Utility" at 1-800-257-7777 at least 48 hours prior to any excavation work being done.
- Traffic control devices, markings and signing shall be in accordance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD). All street and regulatory signs be in place prior to the placement of any asphalt.
- Street light placement and the type of fixture and pole shall be in accordance with the Howard County Design Manual, Volume III (1993) and as modified by "Guidelines for Street Lights in Residential Developments (June 1993)." A minimum spacing of 20' shall be maintained between any street light and any tree.
- The existing topography is taken from aerial survey with 2' contour intervals prepared by Mapping Associates Inc. dated 1989.
- The coordinates shown hereon are based upon the Howard County Geodetic Control which is based upon the Maryland State Plane Coordinate System, Howard County Monument Nos. 2964 and 2965 were used for this project.
- Water is Public. Contract No. 34-3420D.
- Sewer is Public. Contract No. 34-3420D.
- Stormwater management quantity and quality for the improvements from Bright Flow Mews, area North of Distant Thunder Trail and DA to M 309 from Section 4 Area 5, F-96-102 will be provided by an excavated pond east of Distant Thunder Trail. Said pond will be jointly maintained. Stormwater management quantity for the improvements west of Indian Summer Drive and south of Sunlit Water Way is provided by Village of River Hill Section 4 Area 1, Phase I, F-96-110. Water quality will be provided by bio-retention or shallow marsh at the storm drain outfalls and will be jointly maintained. Stormwater management quantity for the improvements east of Indian Summer Drive and south of Distant Thunder Trail are provided for in Section 4 Area 1, F-96-110 by proposed features as described in a report prepared by Whitman, Reardon & Assoc. and approved as of 1/20/95. Water quality will be provided by bio-retention or shallow marsh at the storm drain outfalls and will be jointly maintained.
- Existing utilities are based on Existing Construction Plans (contract no. 30-3294-D), field verified manholes and proposed plans provided by MRA Engineers and GLW Engineers.
- The floodplain study for this project was prepared by Whitman Reardon and Associates and was approved on January 20, 1995.
- The wetlands delineation study for this project was prepared by Exploration Research, Inc., and was approved on January 20, 1995.
- The traffic study for this project was prepared by Wells and Associates, and was approved on January 20, 1995.
- Sidewalk ramps shall meet current ADA requirements.
- Project background information:
 Subdivision Name: Village of River Hill
 Tax Map: 34 and 35
 Section/Area: Section 4, Area 4
 Lot./Parcel: 3, 22, 59
 Zoning: NT
 Election District: 5th
 Total Tract Area: 100.6 acres
 Section 4 Area 4
 Number of Proposed Lots: 216
 Preliminary Plan Approval Date: 4 / 19 / 95
 DPZ Reference Number: P-95-11
- All sidewalks at intersections to have handicaps ramps. See detail on sheet 23 of 44.
- Street trees shall be planted at least 5' from any inlet structure.

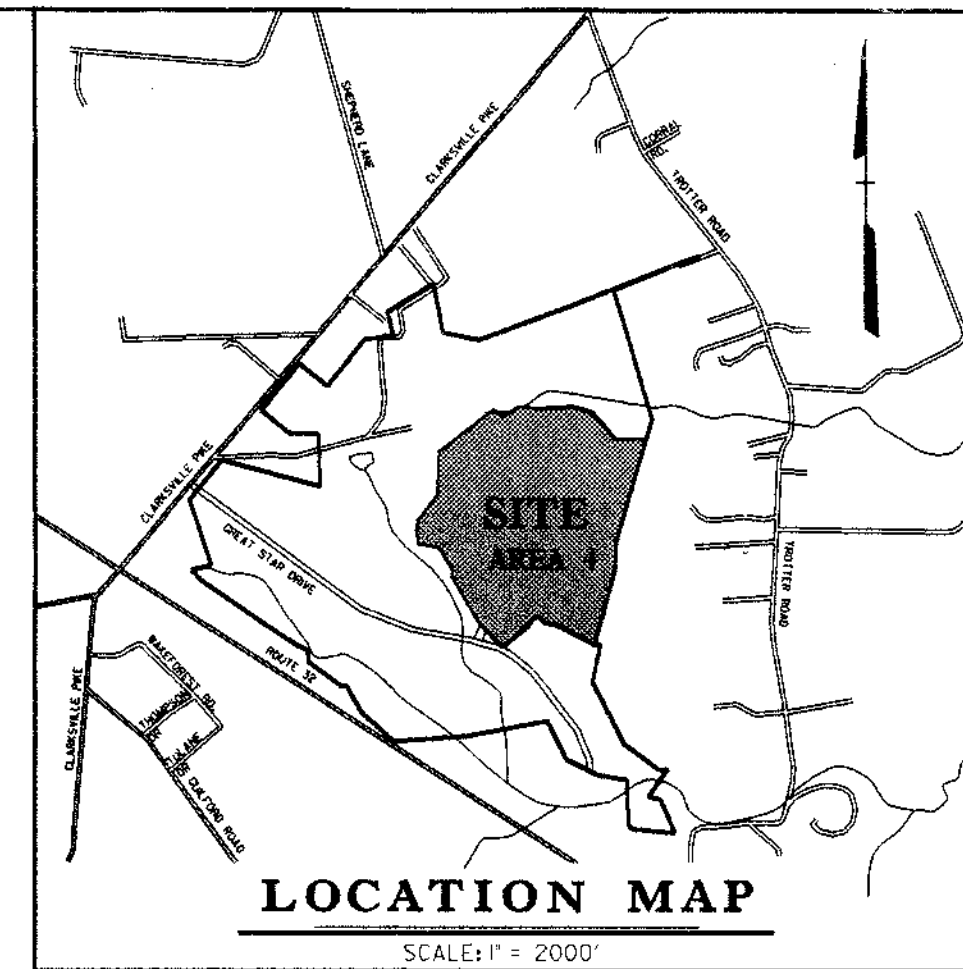


BENCHMARK

DESCRIPTION

HOWARD COUNTY SURVEY CONTROL STATION: 2964
 N 566866.5020 E 1333306.168
 NOTE: HOWARD COUNTY SURVEY CONTROLS ARE STAMPED BRASS OR ALUMINUM DISCS SET ON TOP OF CONCRETE BASE. INTERSECTION OF RT. 108 & MEADOW VISTA WAY.

HOWARD COUNTY SURVEY CONTROL STATION: 2965
 N 568341.18 E 1335392.4
 NOTE: HOWARD COUNTY SURVEY CONTROLS ARE STAMPED BRASS OR ALUMINUM DISCS SET ON TOP OF CONCRETE BASE. 150' NE OF INTERSECTION OF MIDDLE PATUXENT CT & RT. 108



SHEET INDEX	
NO.	DESCRIPTION
1	TITLE SHEET
2	ROAD CONSTRUCTION PLAN FALL MOON RIDE
3	ROAD CONSTRUCTION PLAN OLD SEA PLACE
4	ROAD CONSTRUCTION PLAN SHINING STARS LANE
5	ROAD CONSTRUCTION PLAN EARLY LILACS PATH
6	ROAD CONSTRUCTION PLAN FLOATING CLOUDS PATH
7	ROAD CONSTRUCTION PLAN DISTANT THUNDER TRAIL
8	ROAD CONSTRUCTION PLAN TRAILING MOSS GATE
9	ROAD CONSTRUCTION PLAN LAUREL LEAVES LANE
10	ROAD CONSTRUCTION PLAN TALL BRANCHES PASS
11	ROAD CONSTRUCTION PLAN SUNLIT WATER WAY
12	ROAD CONSTRUCTION PLAN BRIGHT FLOW MEWS
13	ROAD CONSTRUCTION PLAN QUIET WAYS COURT
14	ROAD CONSTRUCTION PLAN FLOWING WATER TRAIL 0+00-7+00
15	ROAD CONSTRUCTION PLAN FLOWING WATER TRAIL 7+00-12+45
16	ROAD CONSTRUCTION PLAN INDIAN SUMMER DRIVE 3+90-18+00
17	ROAD CONSTRUCTION PLAN INDIAN SUMMER DRIVE 18+00-27+00
18	STORM DRAIN PROFILES
19	STORM DRAIN PROFILES
20	STORM DRAIN PROFILES
21	STORM DRAIN PROFILES
22	STORM DRAIN PROFILES
23	STRUCTURE SCHEDULE AND DETAILS
24	DRAINAGE AREA MAP & GRADING PLAN
25	DRAINAGE AREA MAP & GRADING PLAN
26	WATER QUALITY PLANS FACILITIES #1 AND #2
27	WATER QUALITY PLANS FACILITY #3
28	WATER QUALITY PLANS FACILITIES #5 AND #6
29	WATER QUALITY PLANS FACILITIES #7 AND #8
30	WATER QUALITY PROFILES
31	WATER QUALITY PROFILES
32	BIORETENTION PLAN
33	STORMWATER MANAGEMENT PLAN AND DETAILS FACILITY #4
34	STORMWATER MANAGEMENT PROFILE AND DETAILS
35	SWM EROSION AND SEDIMENT CONTROL DETAILS
36	EROSION AND SEDIMENT CONTROL PLAN
37	EROSION AND SEDIMENT CONTROL PLAN
38	EROSION AND SEDIMENT CONTROL PLAN
39	EROSION AND SEDIMENT CONTROL PLAN
40	EROSION AND SEDIMENT CONTROL PLAN
41	EROSION AND SEDIMENT CONTROL DETAILS
42	EROSION AND SEDIMENT CONTROL DETAILS
43	EXISTING STORMWATER MANAGEMENT DRAINAGE AREA MAP
44	PROPOSED STORMWATER MANAGEMENT DRAINAGE AREA MAP

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Andrew M. Daniels 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Colanista 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

William J. ... 5/27/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREAS 4

OWNER /DEVELOPER:
 THE HOWARD RESEARCH AND DEVELOPMENT CORPORATION
 THE ROUSE BUILDING
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

4-2-97
 Date

Professional Engr. No. 10551

DMW
 Duff McCune Walker, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-3333
 Fax 296-4706

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

SUBDIVISION NAME: RIVER HILL SECTION/AREA: 4 - 4 LOT/PARCEL: 3, 27, 59
 PLAT OR L.P. BLOCK: NT TAX/ZONE MAP: 34835 ELECT. DISTRICT: 5th CENSUS TRACT:
 WATER CODE: SEWER CODE:

TITLE SHEET

Date By: RTP Scale: 1" = 500' Proj. No.: 94064
 Dwn By: RTP Date: FEB 1996
 Chk By: JWR Approved: 1 OF 44

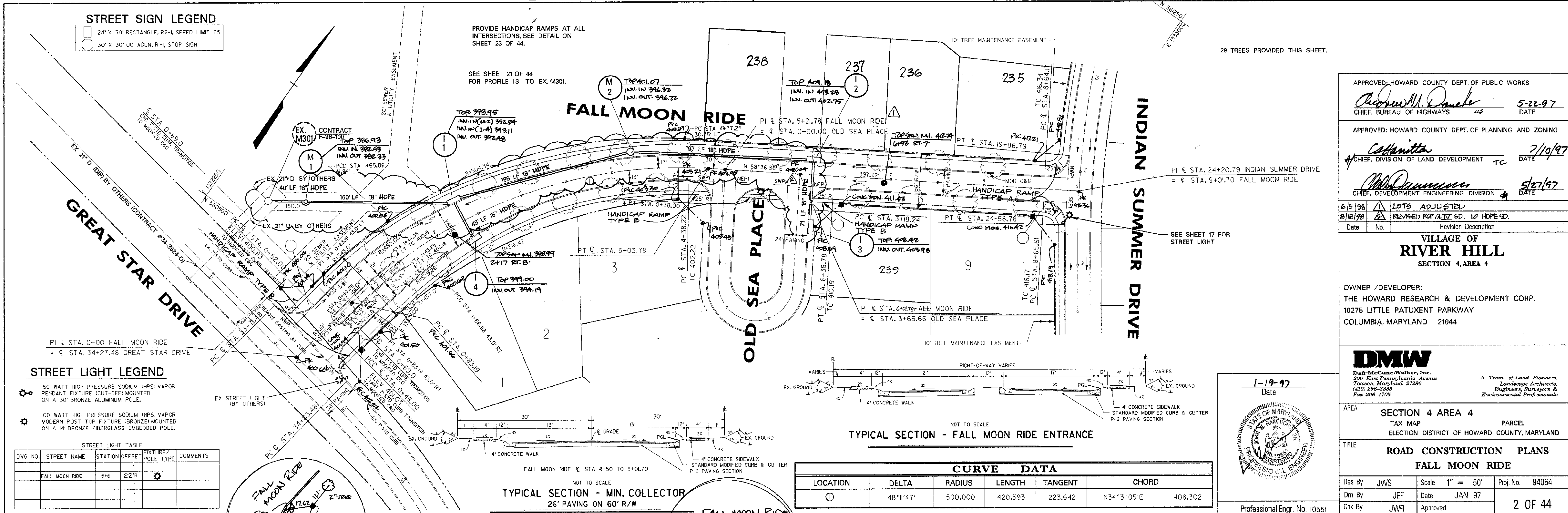
STREET SIGN LEGEND

- 24" X 30" RECTANGLE, R2-L, SPEED LIMIT 25
- 30" X 30" OCTAGON, R-1, STOP SIGN

PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.

SEE SHEET 21 OF 44 FOR PROFILE 13 TO EX. M301.

29 TREES PROVIDED THIS SHEET.



STREET LIGHT LEGEND

- 150 WATT HIGH PRESSURE SODIUM (HPS) VAPOR PENDANT FIXTURE (CUT-OFF) MOUNTED ON A 30' BRONZE ALUMINUM POLE.
- 100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 14' BRONZE FIBERGLASS EMBEDDED POLE.

STREET LIGHT TABLE

DWG NO.	STREET NAME	STATION OFFSET	FIXTURE/POLE TYPE	COMMENTS
	FALL MOON RIDE	5+61	22'R	

TYPICAL SECTION - FALL MOON RIDE ENTRANCE

CURVE DATA

LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	48°11'47"	500.000	420.593	223.642	N34°31'05"E 408.302

TYPICAL SECTION - MIN. COLLECTOR
26' PAVING ON 60' R/W

1-19-97
Date

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Howard M. Daniels 5-22-97
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Colanitta 2/10/97
CHIEF, DIVISION OF LAND DEVELOPMENT TC DATE

APPROVED: *John D. Summers* 5/22/97
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

6/5/98 **LOTS ADJUSTED**
8/18/98 **REVISED RCP ALY 60. TO HDPE 60.**

Revision Description

VILLAGE OF RIVER HILL
SECTION 4, AREA 4

OWNER /DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

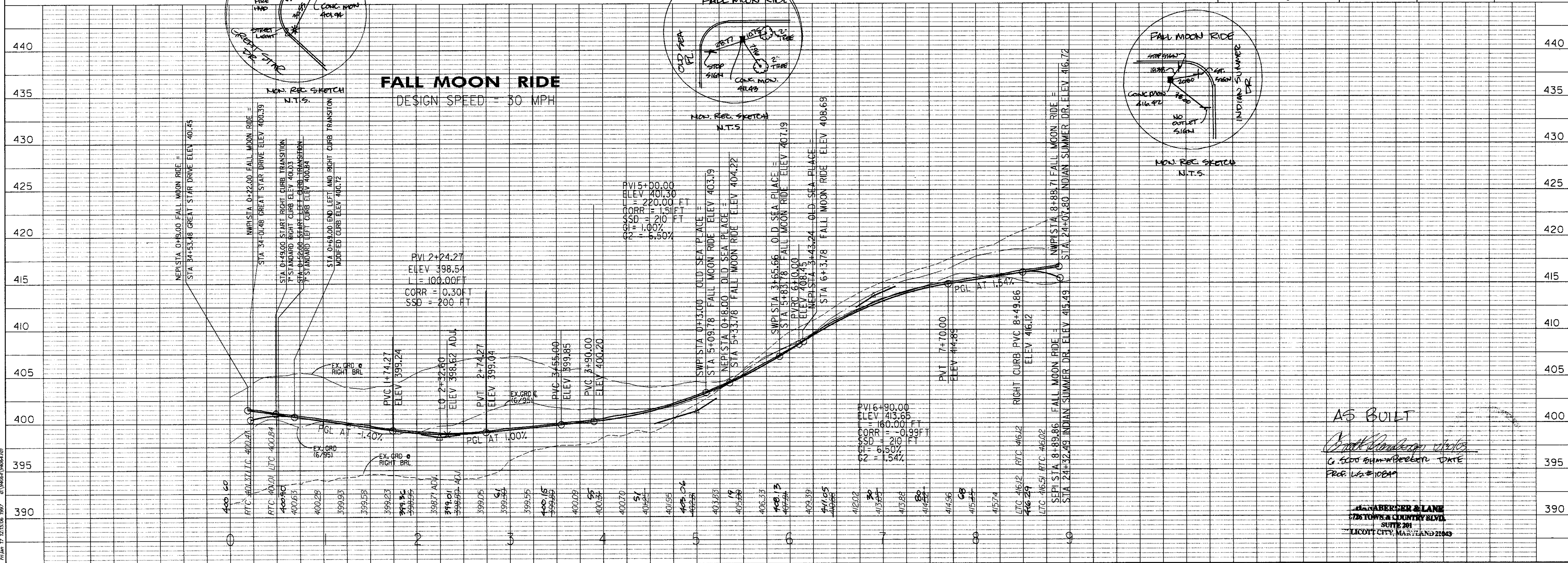
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Towson, Maryland 21286
(410) 296-3333
Fax 296-4706

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

AREA SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE ROAD CONSTRUCTION PLANS
FALL MOON RIDE

Des By JWS Scale 1" = 50' Proj. No. 94064
Dwn By JEF Date JAN 97
Chk By JWR Approved 2 OF 44



AS BUILT

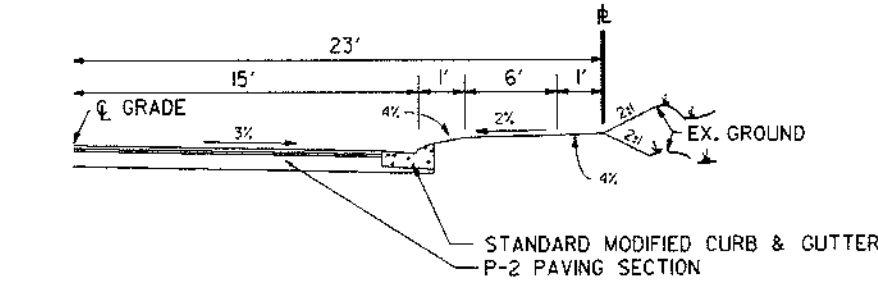
John D. Summers
G. 5000 01M-00000000 DPKTE
Proj. No. 10000

HANABERGER BLANE
776 TOWNS & COUNTRY BLVD.
SUITE 201
LICOTT CITY, MARYLAND 21043

PL Jan 17, 1997 12:52:06 1997 d:\94064\94064.dwg

STREET SIGN LEGEND

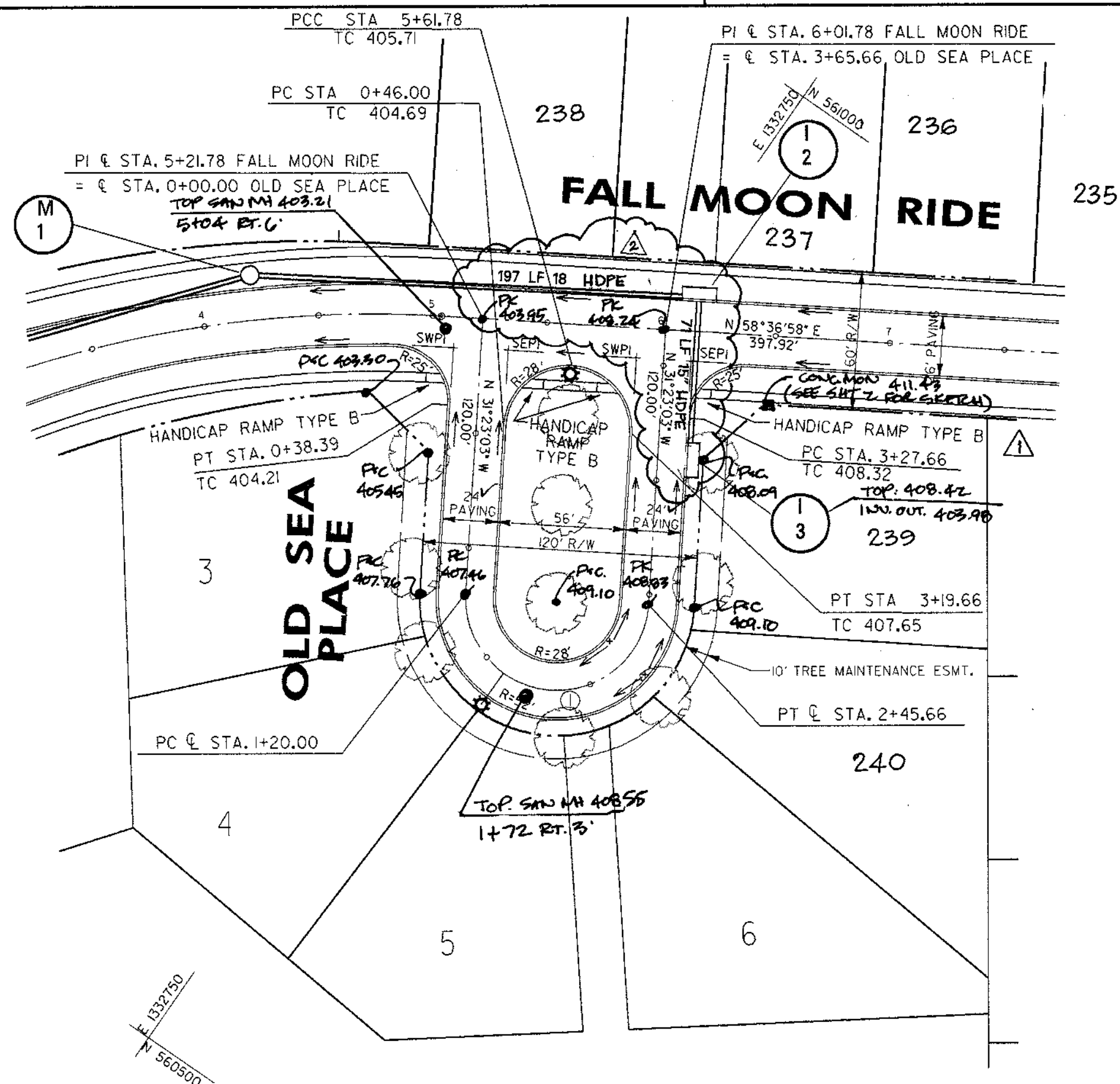
- 24' x 30' RECTANGLE, R2-1, SPEED LIMIT 25
- 30' x 30' OCTAGON, R1-1, STOP SIGN



TYPICAL HALF SECTION
30' PAVING ON 120' R/W
NOT TO SCALE

STREET LIGHT TABLE

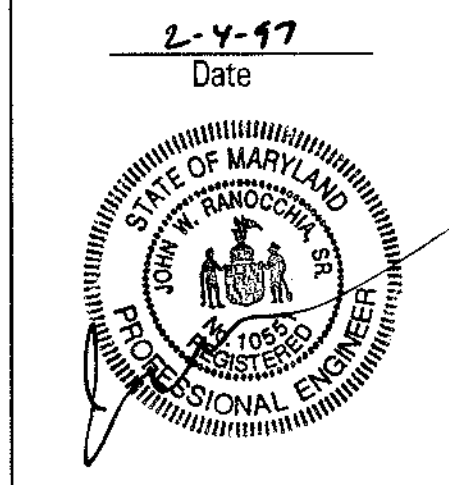
DWG NO.	STREET NAME	STATION OFFSET	FIXTURE/POLE TYPE	COMMENTS
	FALL MOON RIDE	5+61	22'R	SHOWN ON SMT 2 OF 44
	OLD SEA PLACE	1+57	20'R	



10 TREES PROVIDED THIS SHEET.

PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.

CURVE DATA					
LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	180°0'0"	40,000	125.66	0.000	N58°36'58"E 80.000



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Howard M. Daniels 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
John H. Daniels 1/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

APPROVED: *John H. Daniels* 5/22/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Date	No.	Revision Description
6/5/98	1	LOTS ADJUSTED
8/18/98	2	REVISED RECP CL.V. 60. TO HDPE 5D

VILLAGE OF RIVER HILL
SECTION 4, AREA 4
 OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

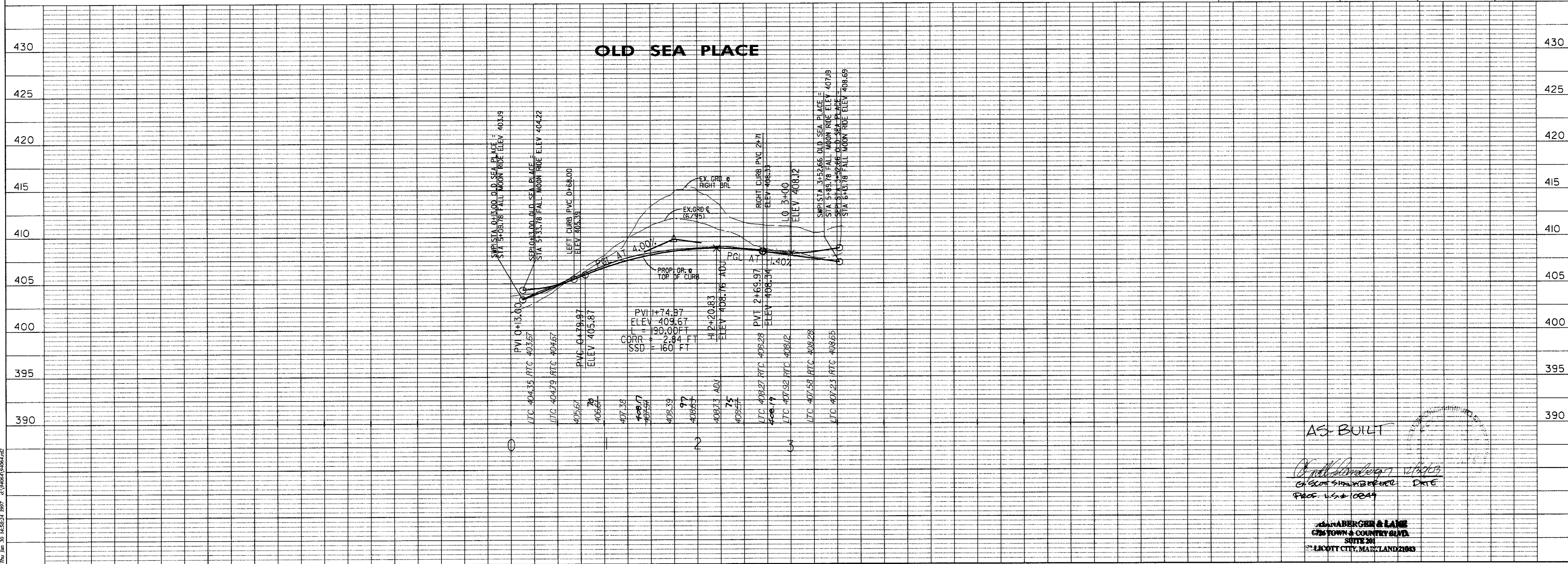
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 (410) 296-3333
 Fax 296-4705
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 4 AREA 4
 TAX MAP PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE ROAD CONSTRUCTION PLANS
 OLD SEA PLACE

Des By	JWS	Scale	1" = 50'	Proj. No.	94064
Dim By	JEF	Date	JAN 97		
Chk By	JWR	Approved			3 OF 44

Professional Engr. No. 10551



AS-BUILT

John H. Daniels
 CHIEF, DEVELOPMENT ENGINEERING DIVISION
 DATE

ALLABERGER & LANE
 CIVIL ENGINEERS & ARCHITECTS
 SUITE 301
 11000 LACOTT CITY, MARYLAND 21083

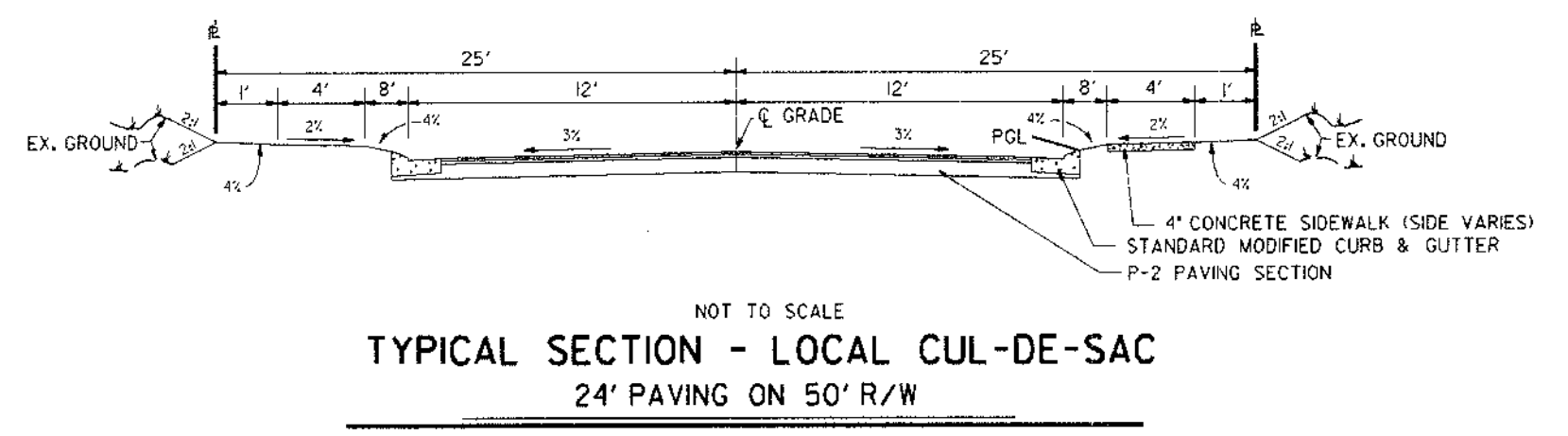
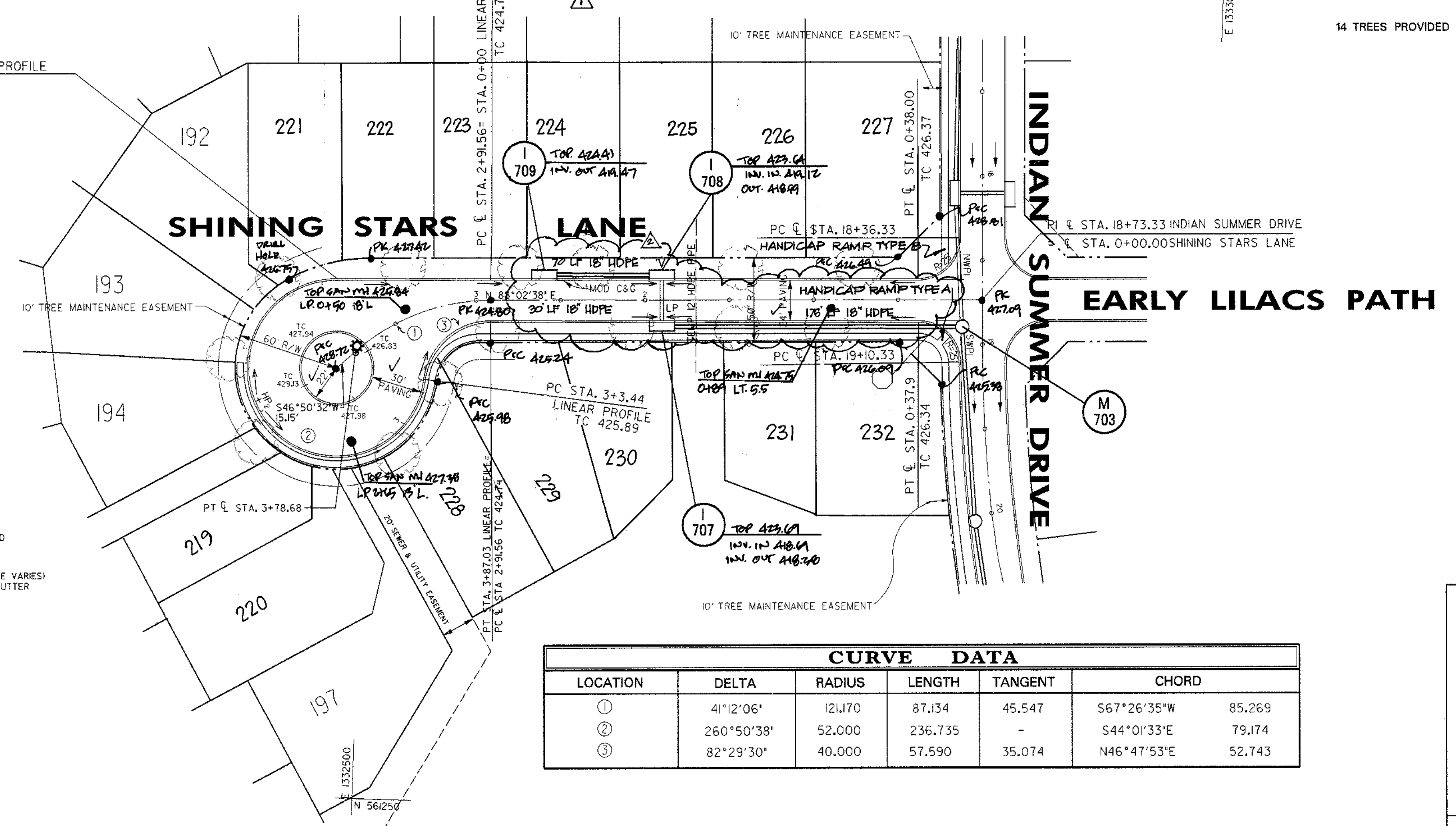
STREET SIGN LEGEND

- 24' X 30" RECTANGLE, R2-1, SPEED LIMIT 25
- 30' X 30" OCTAGON, R1-1, STOP SIGN

PC STA. 0+92.71 LINEAR PROFILE
TC 426.59

PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.

14 TREES PROVIDED THIS SHEET.



NOT TO SCALE
TYPICAL SECTION - LOCAL CUL-DE-SAC
24' PAVING ON 50' R/W

STREET LIGHT LEGEND

100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 4" BRONZE FIBERGLASS EMBEDDED POLE.

DWG NO.	STREET NAME	STATION OFFSET	FIXTURE / POLE TYPE	COMMENTS
SHINING STAR LANE	3+73	25' L	☼	LOCATE 3' BEHIND FACE OF CURB

CURVE DATA					
LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	41°12'06"	121.70	87.134	45.547	S67°26'35"E 85.269
②	260°50'38"	52.000	236.735	-	S44°01'33"E 79.174
③	82°29'30"	40.000	57.590	35.074	N46°47'53"E 52.743

1-12-97
Date

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Andrew M. Daulton 5-22-97
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
John Hammit 7/10/97
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
John D. ... 5/27/97
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

6/5/98
8/18/98
Date No. Revision Description

REVISOR: LOTS ADJUSTED
REVISED RCP CLINSED TO HDPE SD.

VILLAGE OF RIVER HILL
SECTION 4, AREA 4

OWNER / DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

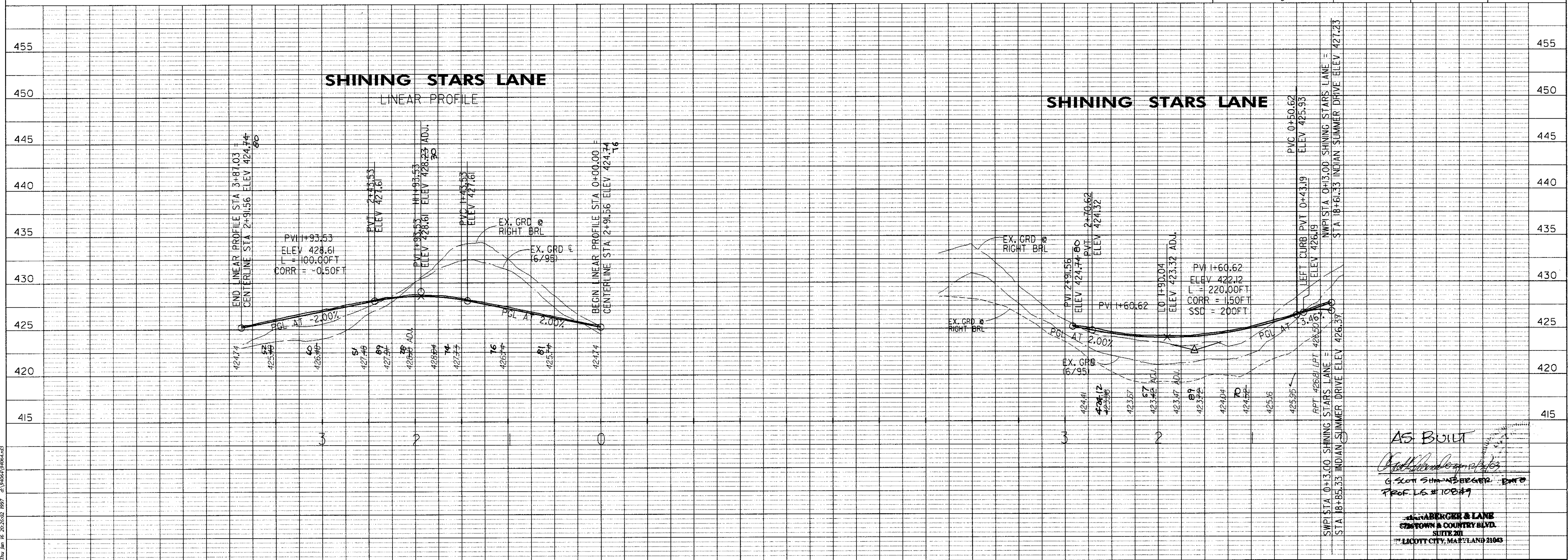
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Poussan, Maryland 21286
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Fax 296-4706

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

AREA: SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE: ROAD CONSTRUCTION PLANS
SHINING STARS LANE

Des By: JWS Scale: 1" = 50' Proj. No.: 940964
Dwn By: JEF Date: JAN 97
Chk By: JWR Approved: 4 OF 44



AS BUILT

John M. Ruppel

JOHN M. RUPPEL
PROF. LG. # 100819

BERGER & LANE
TOWN & COUNTRY BLVD.
SUITE 201
LICOTT CITY, MARYLAND 21043

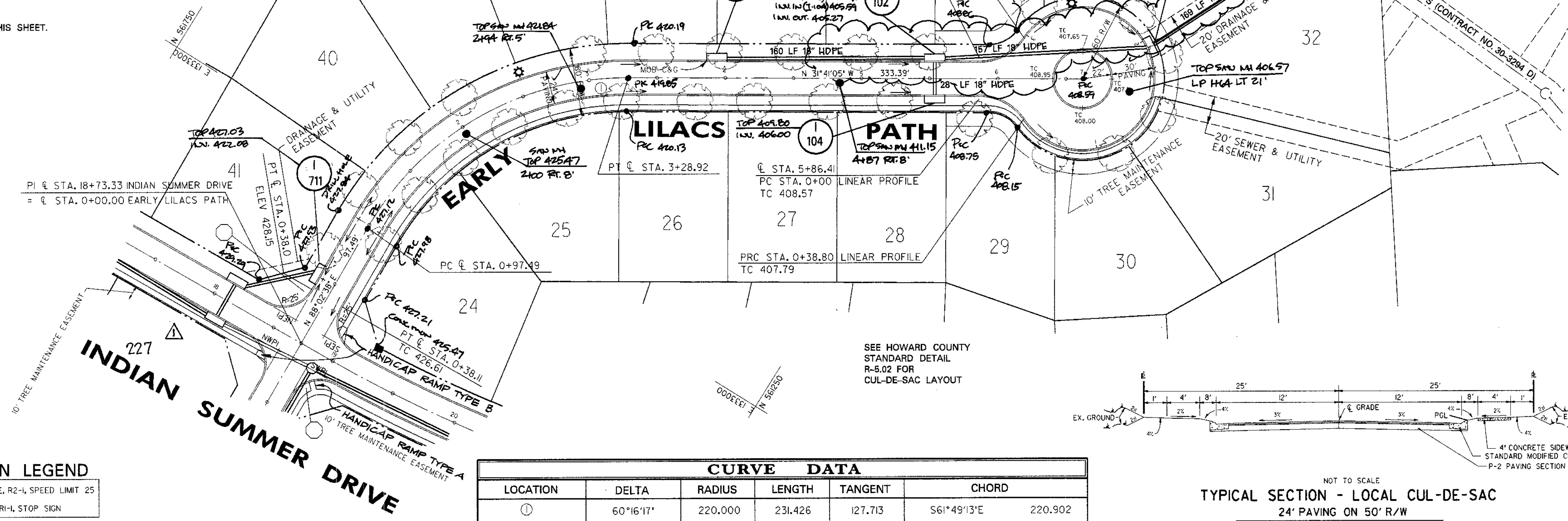
STREET LIGHT LEGEND

100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 1/2" BRONZE FIBERGLASS EMBEDDED POLE.

DWG NO.	STREET NAME	STATION	OFFSET	FIXTURE/POLE TYPE	COMMENTS
EARLY LILACS PATH		2+53	15'		
EARLY LILACS PATH		2+65	3'		LINEAR PROFILE

27 TREES PROVIDED THIS SHEET.

PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.



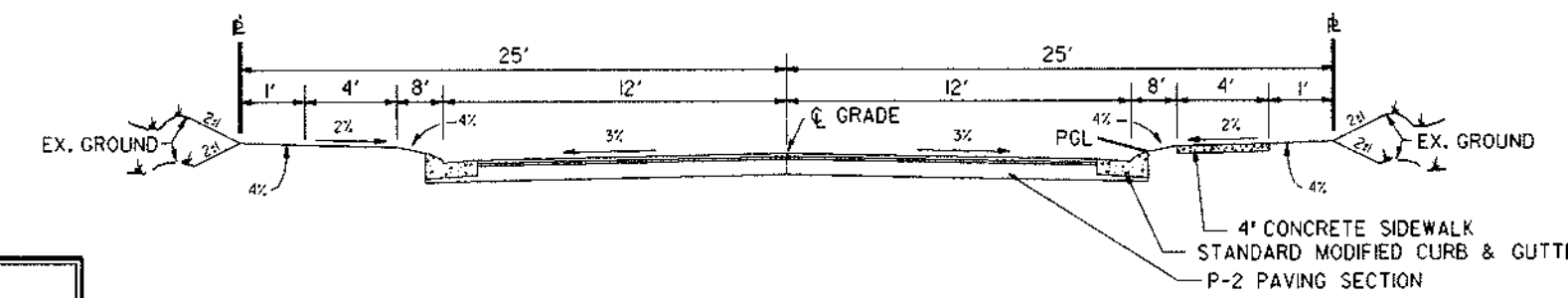
SEE SHEET 21 OF 44 FOR PROFILE 1103 TO ES101.

WQ FACILITY #7

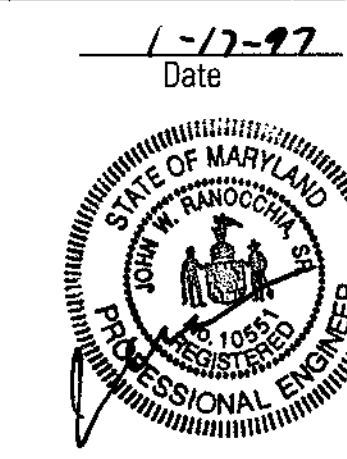
ES 101 INV 392.07

SEE SHEET 28 OF 44 FOR DETAIL OF OUTLET PROTECTION @ STR. ES101.

SEE HOWARD COUNTY STANDARD DETAIL R-5.02 FOR CUL-DE-SAC LAYOUT



NOT TO SCALE
TYPICAL SECTION - LOCAL CUL-DE-SAC
24' PAVING ON 50' R/W



Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Andrew M. Danek
CHIEF, BUREAU OF HIGHWAYS
5-22-97
DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Colleen Miller
CHIEF, DIVISION OF LAND DEVELOPMENT
7/29/97
DATE

APPROVED: *Mark Damm*
CHIEF, DEVELOPMENT ENGINEERING DIVISION
5/27/97
DATE

Date	No.	Revision Description
6/3/98	1	LOT 227 ADJUSTED
8/10/98	2	REVISED RCP CL. TO HDPE 90'

VILLAGE OF RIVER HILL
SECTION 4, AREA 4

OWNER / DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

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Potosi, Maryland 21286
(410) 296-3539
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE ROAD CONSTRUCTION PLANS
EARLY LILACS PATH

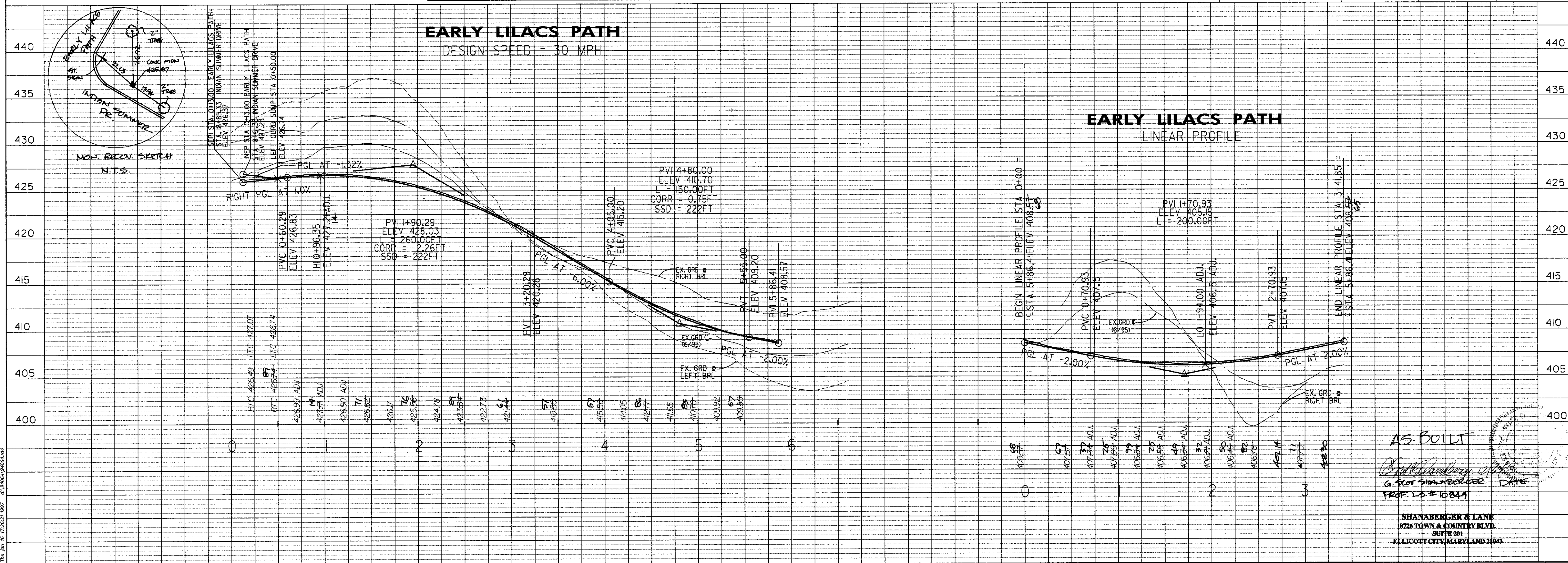
Des By	JWS	Scale	1" = 50'	Proj. No.	94064
Dwn By	JEF	Date	JAN 97		
Chk By	JWR	Approved			5 OF 44

STREET SIGN LEGEND

	24" X 30" RECTANGLE, R2-L, SPEED LIMIT 25
	30" X 30" OCTAGON, R1-L, STOP SIGN

CURVE DATA

LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
1	60°16'17"	220.000	231.426	127.713	561°49'13"E 220.902



AS-BUILT
Shanaberg & Lane
G. Scott Shanaberg
PROF. L.S. # 10849
SHANABERG & LANE
8726 TOWN & COUNTRY BLVD.
SUITE 200
FALLCOTT CITY, MARYLAND 21043

Thu Jun 16 17:26:27 1997 d:\94064\94064.dwg

STREET SIGN LEGEND

- 24" x 30" RECTANGLE, R2-L, SPEED LIMIT 25
- 30" x 30" OCTAGON, R-1, STOP SIGN

STREET LIGHT TABLE

DWG NO.	STREET NAME	STA	OFFSET	FIXTURE / POLE TYPE	COMMENTS
	FLOATING CLOUDS PATH	1+40 LP	2'		OFF CURB
	FLOATING CLOUDS PATH	4+30	5'		

STREET LIGHT LEGEND

- 100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 14" BRONZE FIBERGLASS EMBEDDED POLE.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Richard M. Daniels 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Cottamitta 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

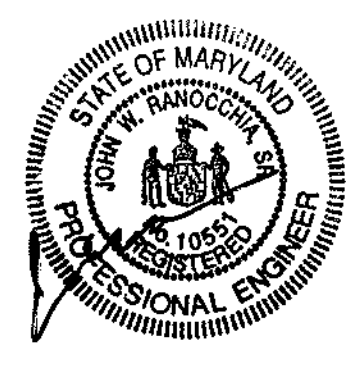
APPROVED: *Bill Dammer* 5/27/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

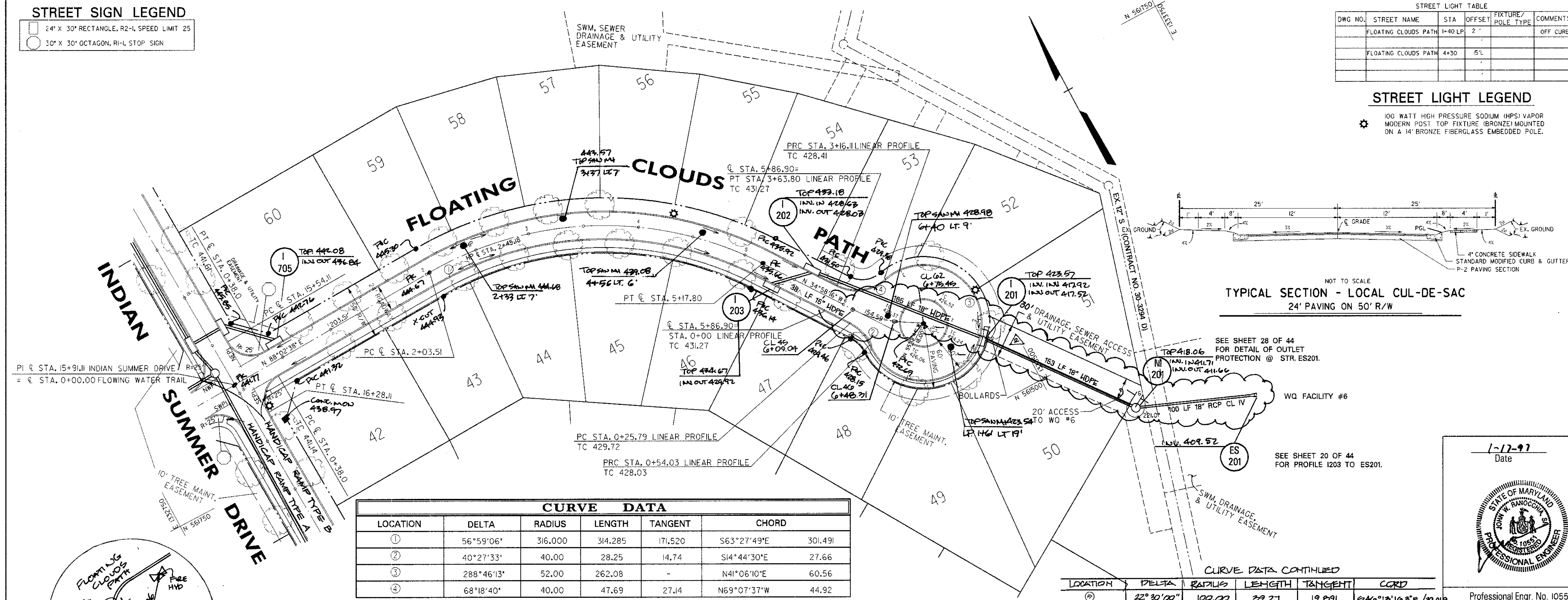
Date	No.	Revision Description
8/10/98	1	REVISED RCP CL IV R2 TO HDPE R2

VILLAGE OF RIVER HILL SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

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 Dan McCune-Walker, Inc.
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 Towson, Maryland 21286
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 Fax 296-4705
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

1-17-97
 Date

 Professional Engr. No. 10551



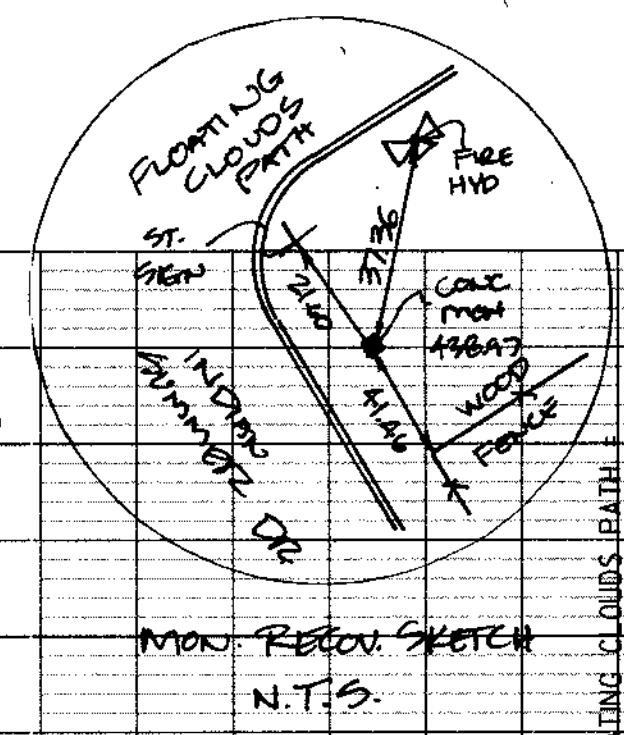
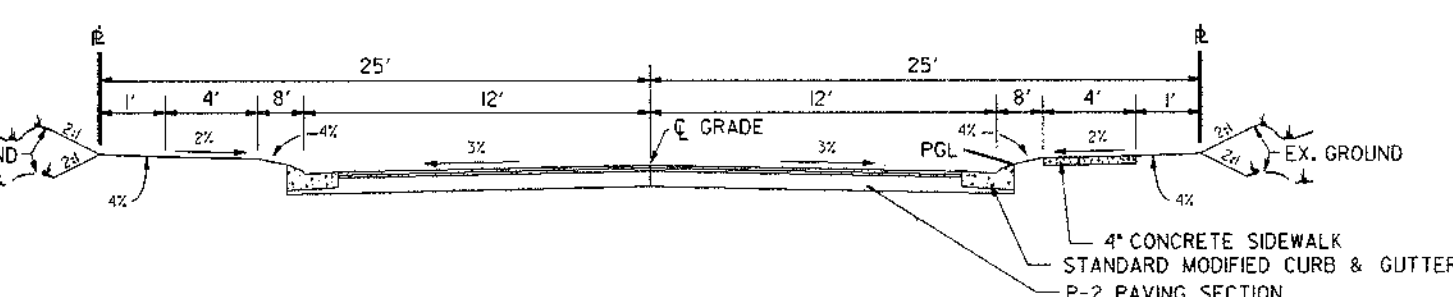
CURVE DATA

LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	56°59'06"	316.000	314.285	171.520	S63°27'49"E 301.491
②	40°27'33"	40.00	28.25	14.74	S14°44'30"E 27.66
③	288°46'13"	52.00	262.08	-	N41°06'10"E 60.56
④	68°18'40"	40.00	47.69	27.14	N69°07'37"W 44.92

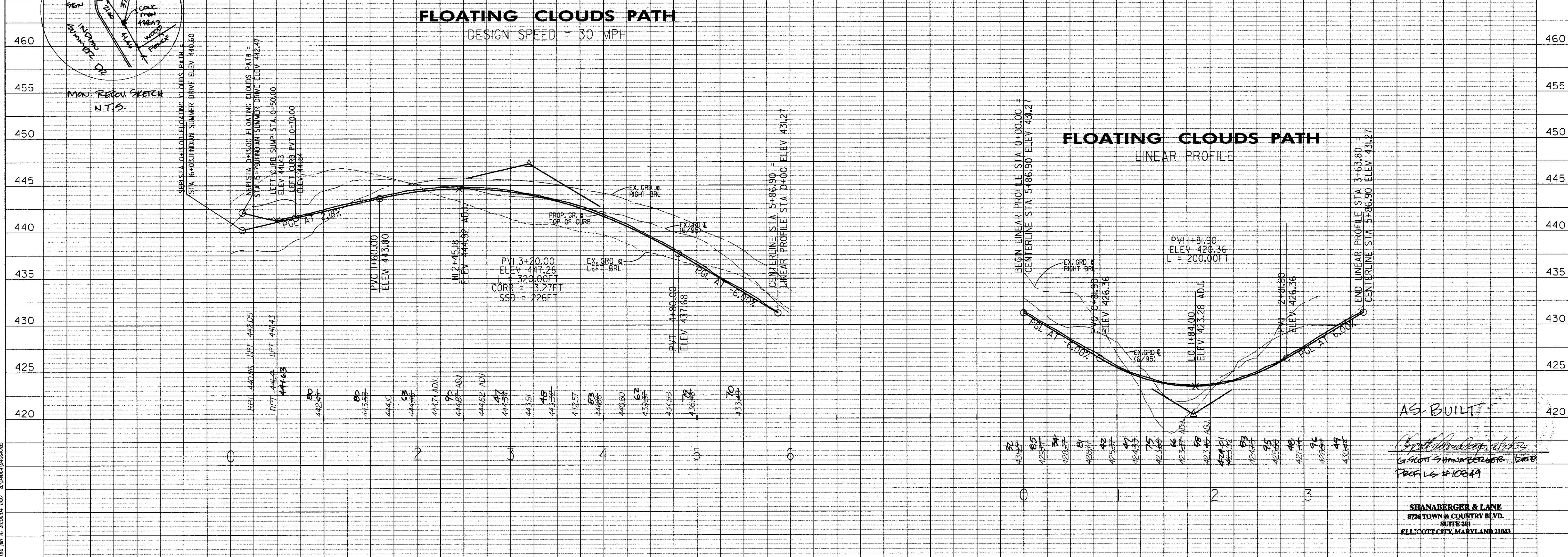
CURVE DATA CONTINUED

LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
⑤	22°30'00"	100.00	39.21	19.091	S46°12'16"E 39.018

TYPICAL SECTION - LOCAL CUL-DE-SAC
 24" PAVING ON 50' R/W



FLOATING CLOUDS PATH
 DESIGN SPEED = 30 MPH



FLOATING CLOUDS PATH LINEAR PROFILE

AS-BUILT
Shanabarger & Lane
 PROJECT #10849

SHANABERGER & LANE
 8721 TOWN & COUNTRY BLVD.
 SUITE 201
 FELLSCOTT CITY, MARYLAND 21043

Thu Jan 16 20:06:04 1997 d:\vmap\lsh\10849.dwg

CURVE DATA					
LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
1	07°47'07"	500.000	67.939	34.022	S82°12'47"E 67.887
2	02°25'08"	1000.00	42.218	21.112	S89°55'32" 42.215

SEE SHEET 33 OF 44 FOR DETAIL OF OUTLET PROTECTION @ STR. ES301.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Richard M. Daneker 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
William M. ... 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

APPROVED: *William M. ...* 5/27/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

6/3/96 LOT 277 ADJUSTED LOT 278 ADDED
 8/15/96 REWAS RECALCULATED TO HOPE RD.
 Date No. Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Daft McCune-Walker, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-3333
 Fax 296-4706

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

AREA SECTION 4 AREA 4
 TAX MAP PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE ROAD CONSTRUCTION PLANS
 DISTANT THUNDER TRAIL

Des By JWS Scale 1" = 50' Proj. No. 94064
 Dwn By JEF Date JAN 97
 Chk By JWR Approved 7 OF 44

STREET LIGHT LEGEND

100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 14' BRONZE FIBERGLASS EMBEDDED POLE.

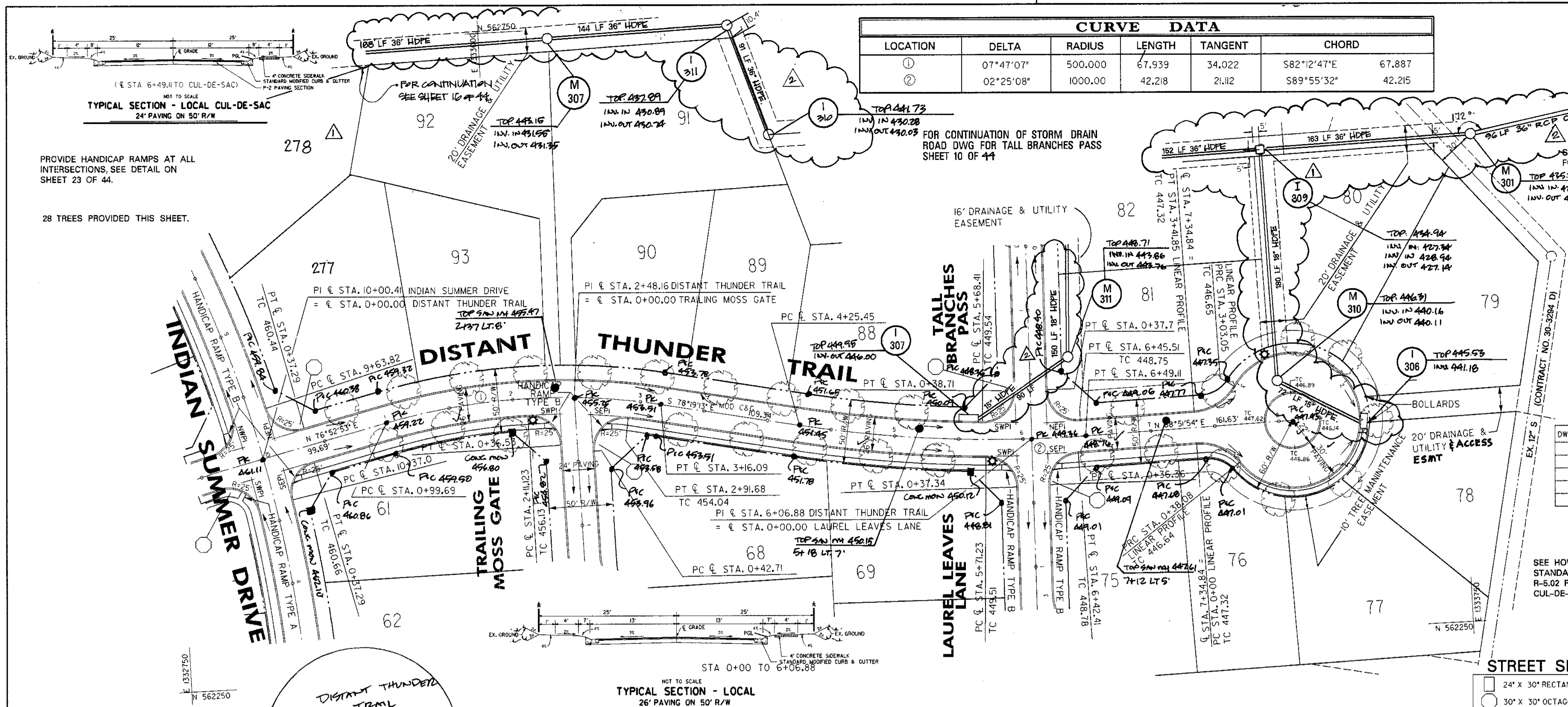
STREET LIGHT TABLE	STATION	OFFSET	FIXTURE / POLE TYPE	COMMENTS
DISTANT THUNDER	2+77	16'R		
DISTANT THUNDER	5+77	16'R		
DISTANT THUNDER	2+70	3'R		LINEAR PROFILE OFF WRB

2-7-97
 Date

 Professional Engr. No. 10551

STREET SIGN LEGEND

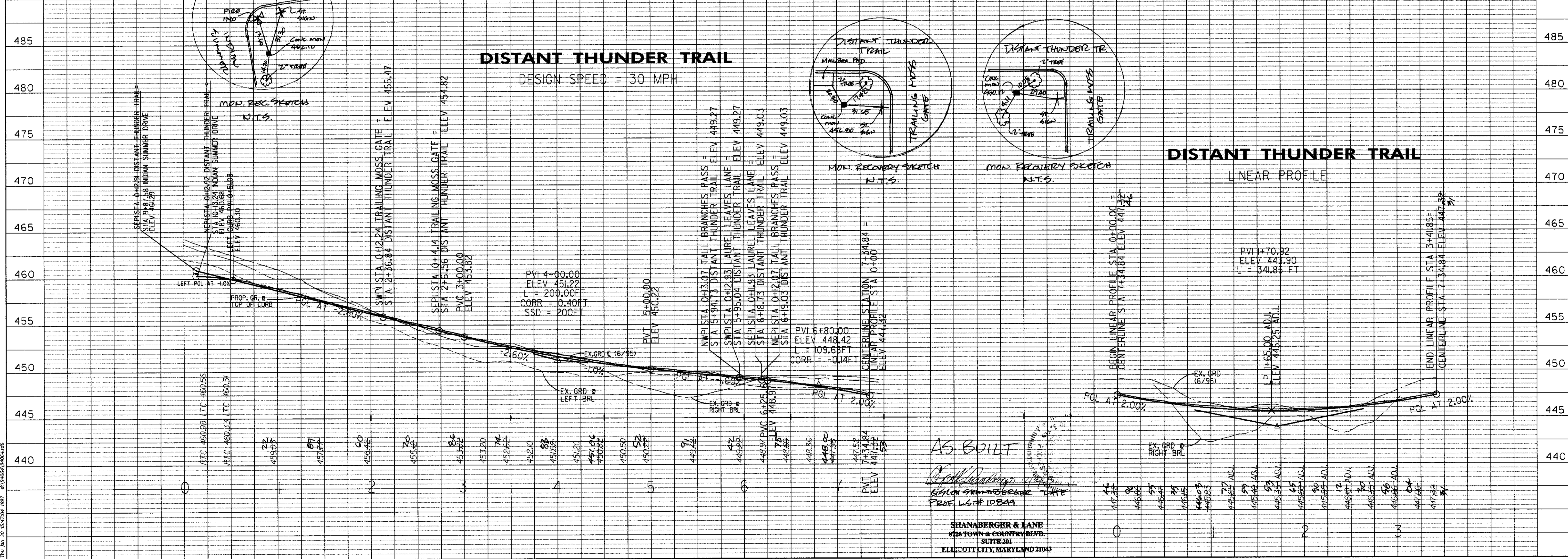
24" x 30" RECTANGLE, R-21, SPEED LIMIT 25
 30" x 30" OCTAGON, R-1, STOP SIGN



TYPICAL SECTION - LOCAL CUL-DE-SAC
 24" PAVING ON 50' R/W

TYPICAL SECTION - LOCAL
 26" PAVING ON 50' R/W

DISTANT THUNDER TRAIL
 DESIGN SPEED = 30 MPH

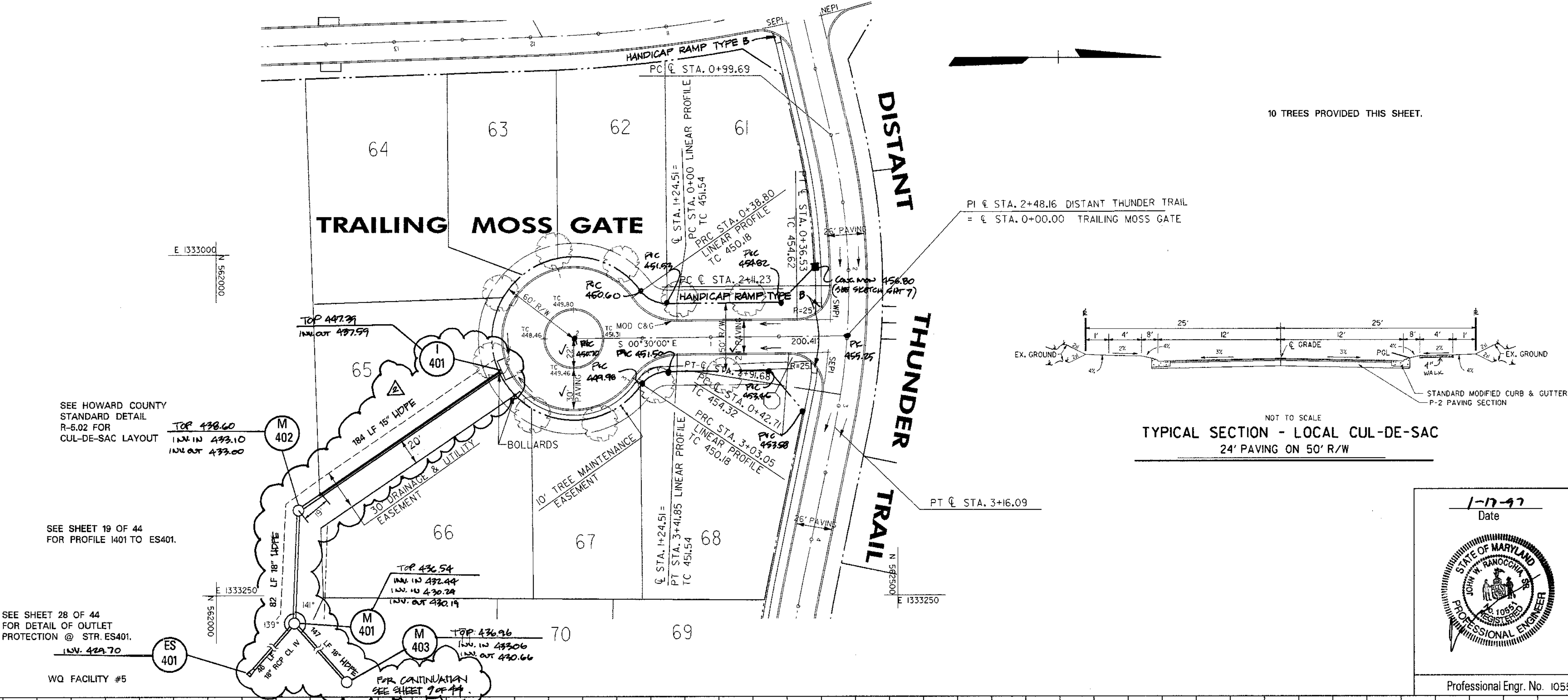


Thu Jan 30 15:47:04 1997 d:\94064\94064.dwg

STREET SIGN LEGEND

- 24" X 30" RECTANGLE, R-1, SPEED LIMIT 25
- 30" X 30" OCTAGON, R-1, STOP SIGN

PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.



SEE HOWARD COUNTY STANDARD DETAIL R-5.02 FOR CUL-DE-SAC LAYOUT

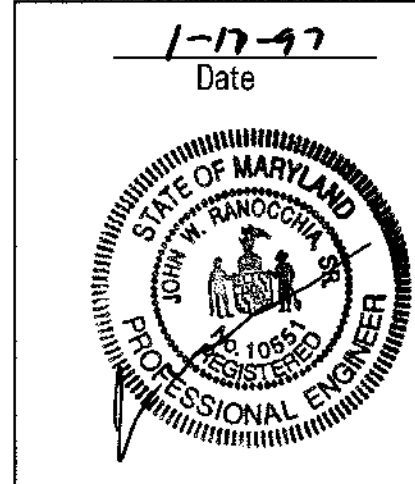
SEE SHEET 19 OF 44 FOR PROFILE I401 TO ES401.

SEE SHEET 28 OF 44 FOR DETAIL OF OUTLET PROTECTION @ STR. ES401.

WQ FACILITY #5

10 TREES PROVIDED THIS SHEET.

TYPICAL SECTION - LOCAL CUL-DE-SAC
24' PAVING ON 50' R/W



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	
<i>Howard M. Dangle</i> CHIEF, BUREAU OF HIGHWAYS	5-22-97 DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING	
<i>Cashmittas</i> CHIEF, DIVISION OF LAND DEVELOPMENT	7/10/97 DATE
<i>John Dammann</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	5/27/97 DATE
08/18/98	REVISED 15' HDPE SID. TO HDPE PAD.
Date	Revision Description

VILLAGE OF RIVER HILL
SECTION 4, AREA 4
OWNER / DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

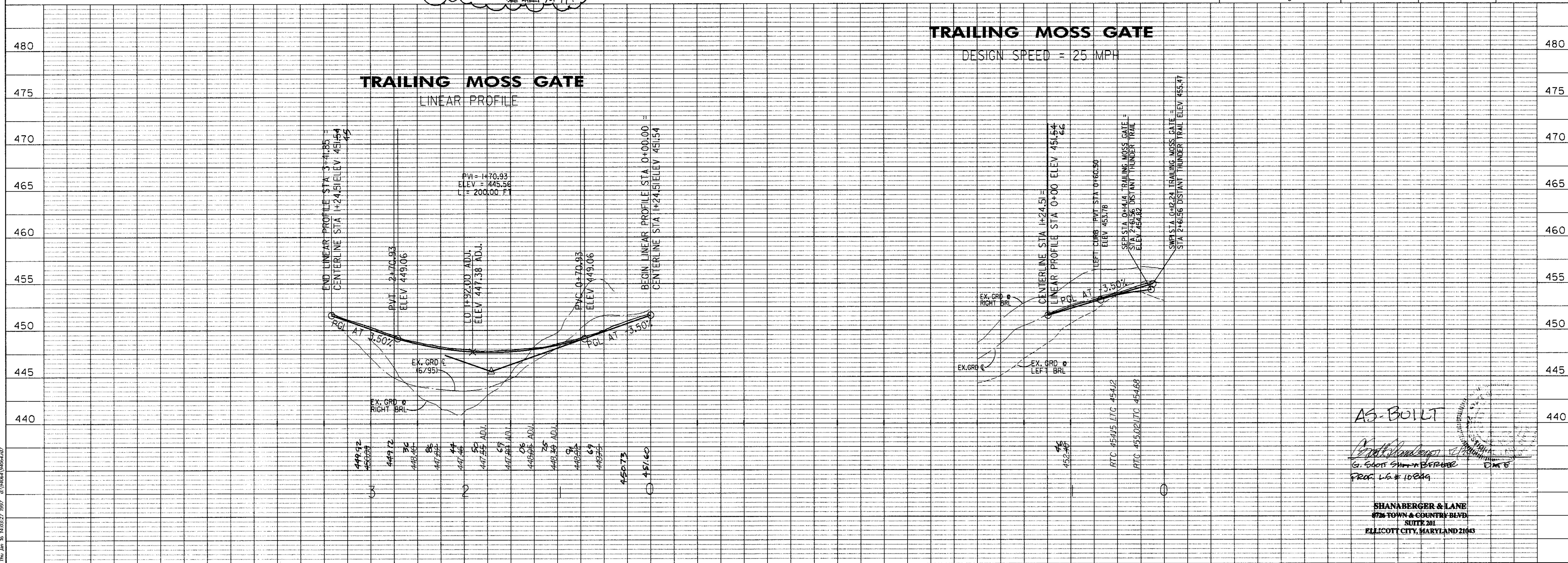
DMW
Dart-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE ROAD CONSTRUCTION PLANS
TRAILING MOSS GATE

Des By	JWS	Scale	1" = 50'	Proj. No.	94064
Drn By	JEF	Date	JAN 97		
Chk By	JWR	Approved			8 OF 44

Professional Engr. No. 10551



TRAILING MOSS GATE
DESIGN SPEED = 25 MPH

AS-BUILT

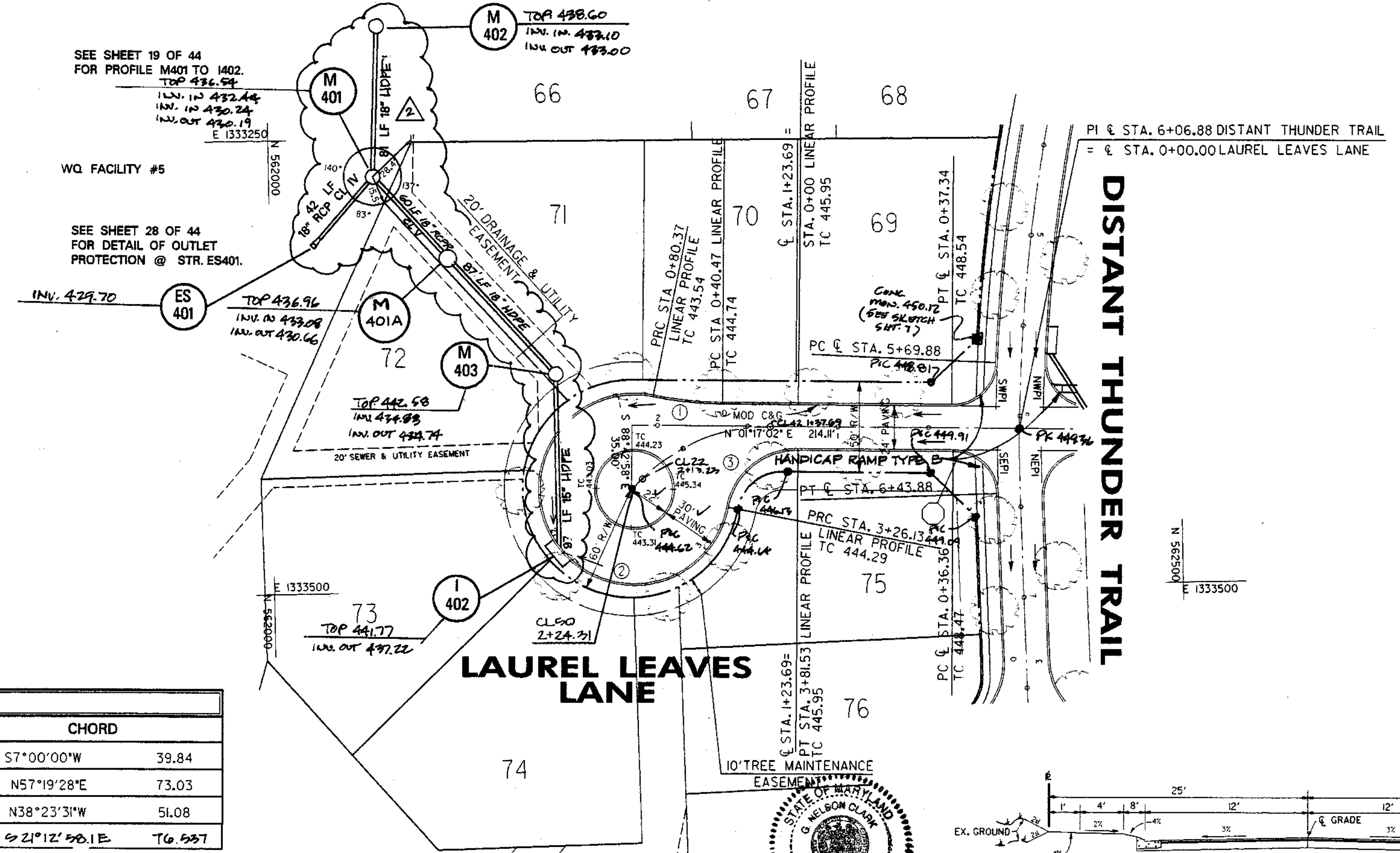
Shanabarger & Lane
G. Scott Shanabarger
PROJ. LG # 16249

SHANABARGER & LANE
4726 TOWN & COUNTRY BLVD
SUITE 201
ELLCOTT CITY, MARYLAND 21043

Thu Jan 16 14:08:27 1997 d:\94064\94064.dwg

STREET SIGN LEGEND

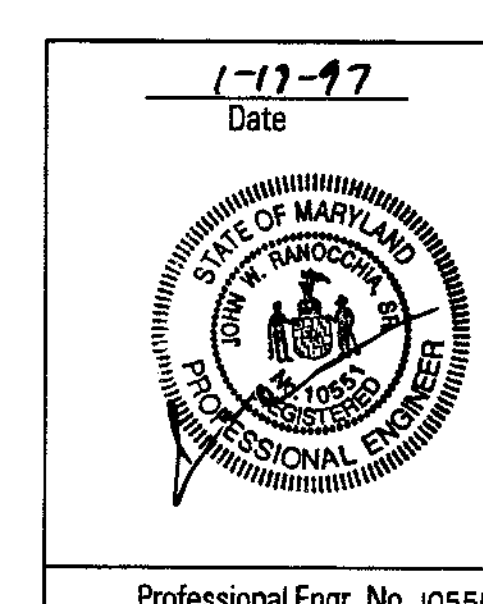
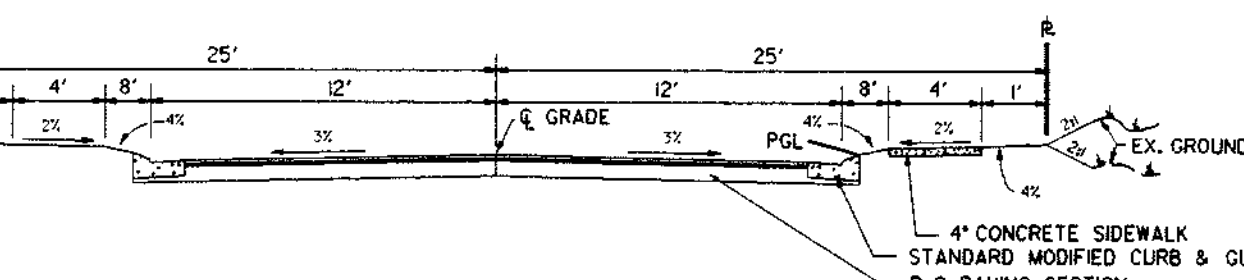
- 24" X 30" RECTANGLE, R2-1, SPEED LIMIT 25
- 30" X 30" OCTAGON, R1-1, STOP SIGN



CURVE DATA					
LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	11°25'57"	200.00	39.91	20.20	S7°00'00"W 39.84
②	27°47'03"	-	245.76	-	N57°19'28"E 73.03
③	79°21'06"	42.00	55.40	33.18	N38°23'31"W 51.08
④	49°00'00"	100.00	78.94	41.421	S21°12'58.1"E 76.937

DISTANT THUNDER TRAIL

LAUREL LEAVES LANE



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Andrew M. Douch 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
John Miller 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

APPROVED: *Mark Dammann* 5/20/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

8/10/95 REVISED RFP CLV TO HDPE SD.

Date	No.	Revision Description
------	-----	----------------------

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Dean McCaskey-Walsh, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 286-3333
 Fax 286-4705
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA: SECTION 4 AREA 4
 TAX MAP: PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

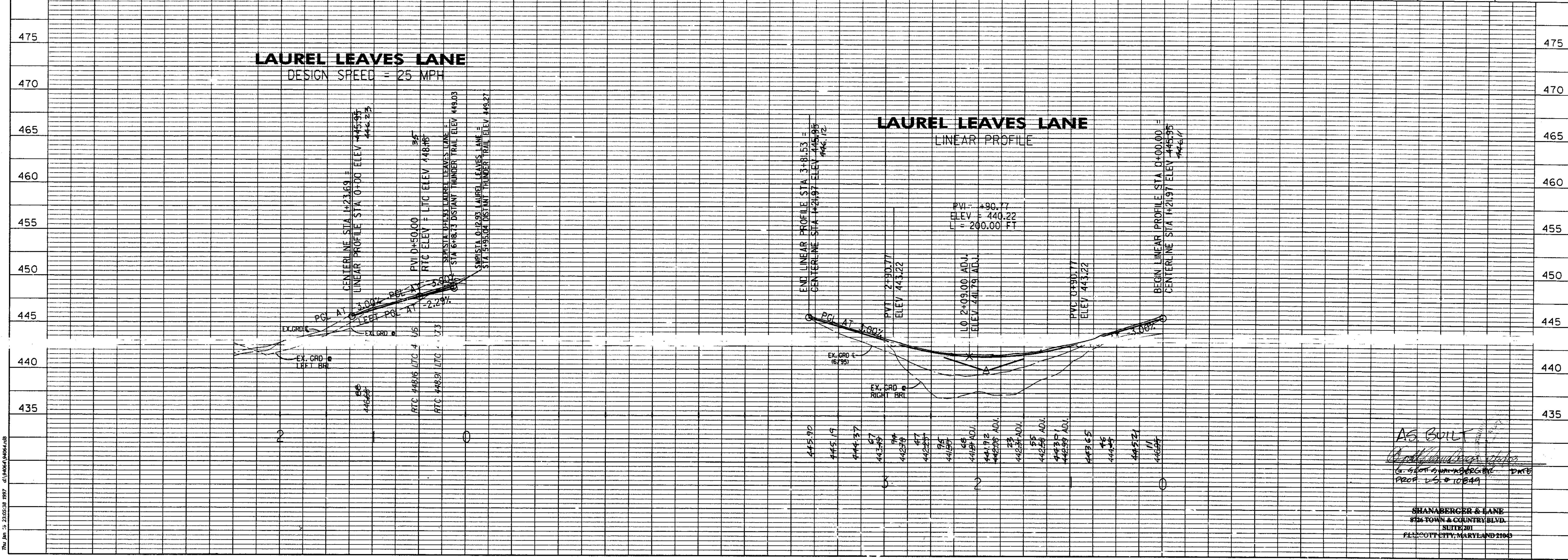
TITLE: ROAD CONSTRUCTION PLANS
 LAUREL LEAVES LANE

Des By	JWS	Scale	1" = 50'	Proj. No.	94064
Drn By	JEF	Date	JAN 97		
Chk By	JWR	Approved			9 OF 44

Professional Engr. No. 10551

FOR CFS REVISION ONLY

NO.	Revisions	Date	By
3	Add Manhole, 401A To Plan View; Revise Pipe Length.	Feb 8, 02	CFS



AS BUILT
John Miller
 G. 4/10/97
 PROF. U.S. 10549

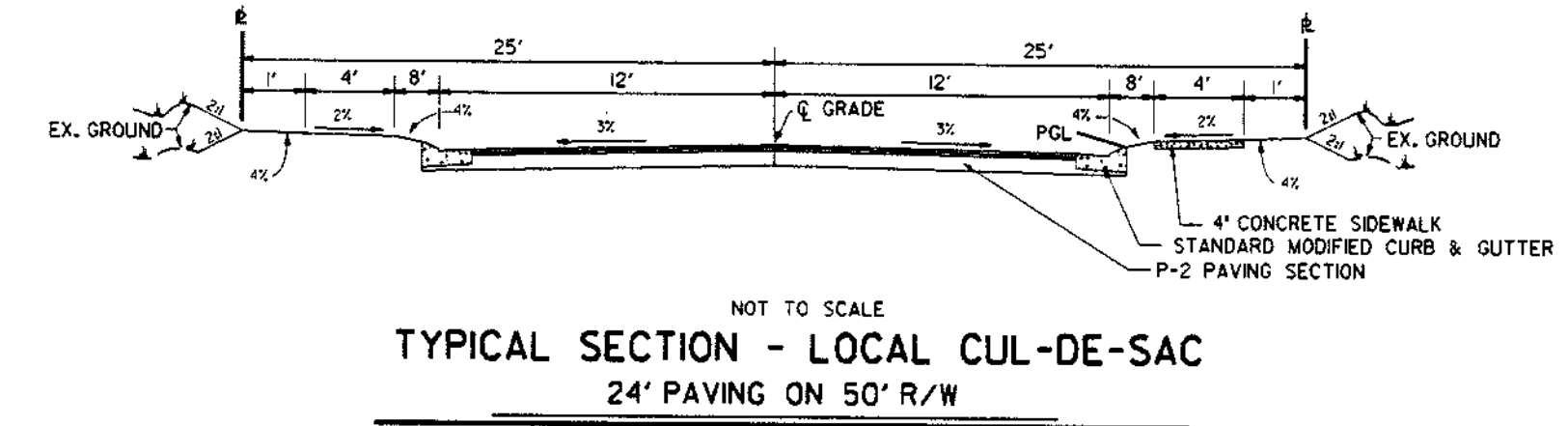
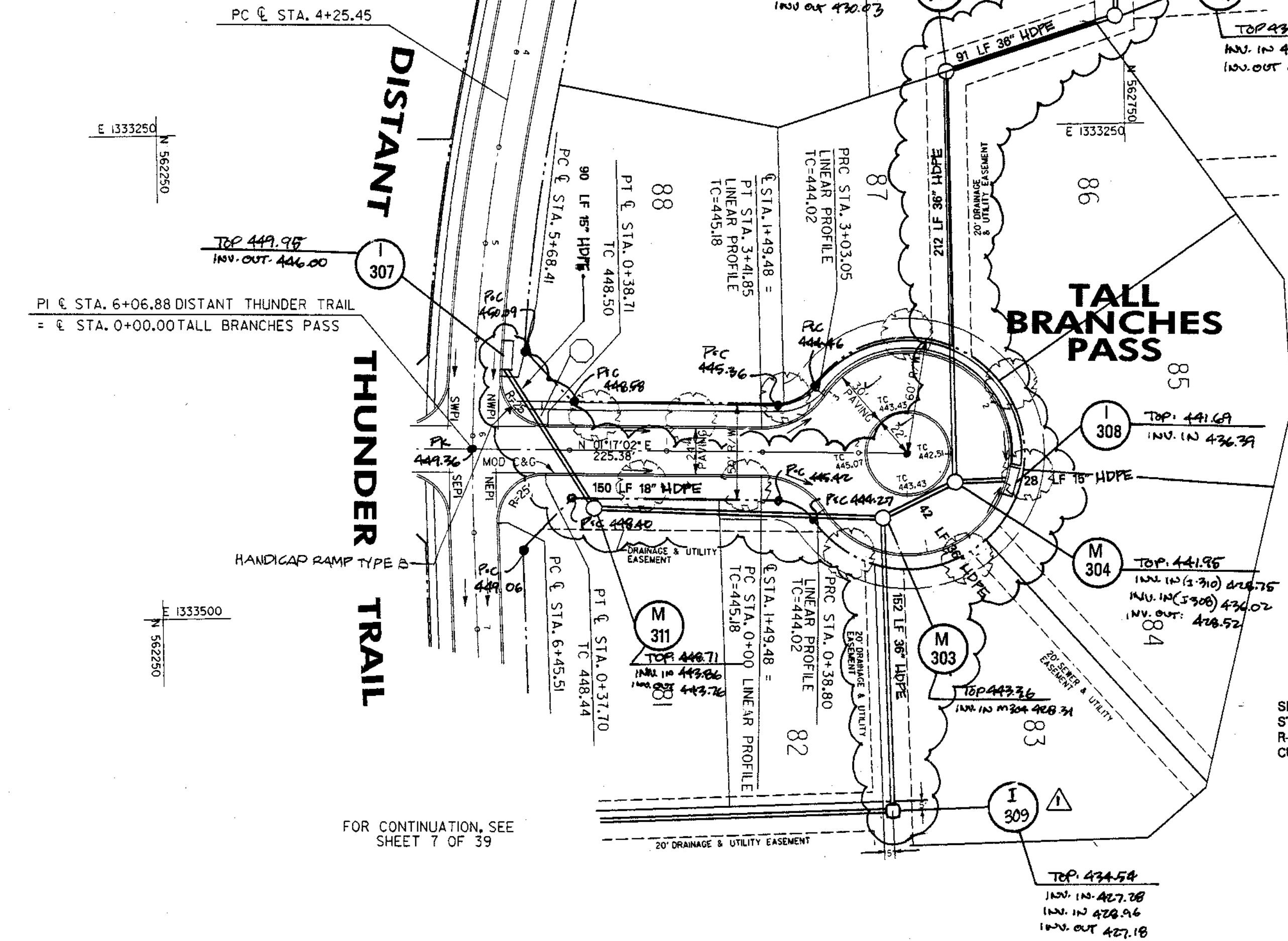
SHANBERGER & LANE
 826 TOWN & COUNTRY BLVD.
 SUITE 201
 FLEETCOTT CITY, MARYLAND 21043

The Date is 2/20/02 8:00 AM

STREET SIGN LEGEND

- 24" X 30" RECTANGLE, R2-L, SPEED LIMIT 25
- 30" X 30" OCTAGON, R1-L, STOP SIGN

PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.



2-4-97
 Date

Professional Engr. No. 10551

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Richard M. Dauter
 CHIEF, BUREAU OF HIGHWAYS 5-22-97
 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
William Hamilton
 CHIEF, DIVISION OF LAND DEVELOPMENT 7/10/97
 DATE

Mark Demmon
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 5/27/97
 DATE

6/5/98	1	M 302 REPLACED BY I 309
8/10/98	2	REVISED PER CIVIL SD TO HDPE SD.
Date	No.	Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

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

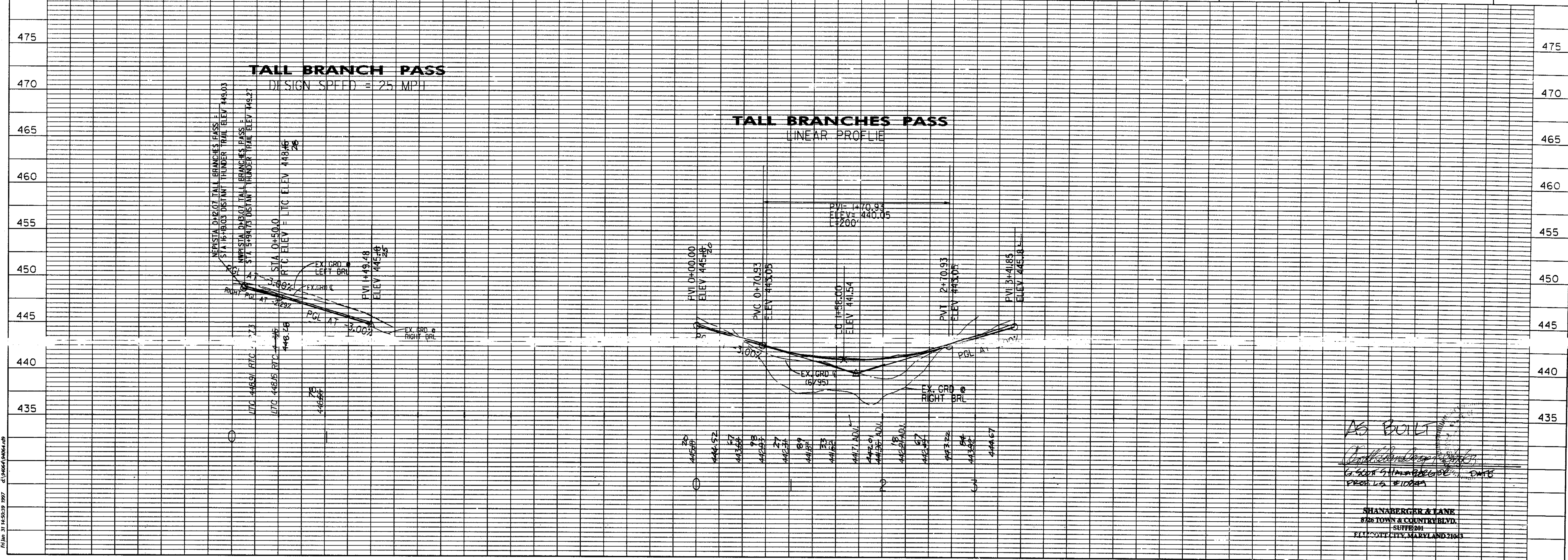
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 4 AREA 4
 TAX MAP PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE ROAD CONSTRUCTION PLANS
 TALL BRANCHES PASS

Des By	JWS	Scale	1" = 50'	Proj. No.	94064
Dwn By	JEF	Date	JAN 97		
Chk By	JWR	Approved			

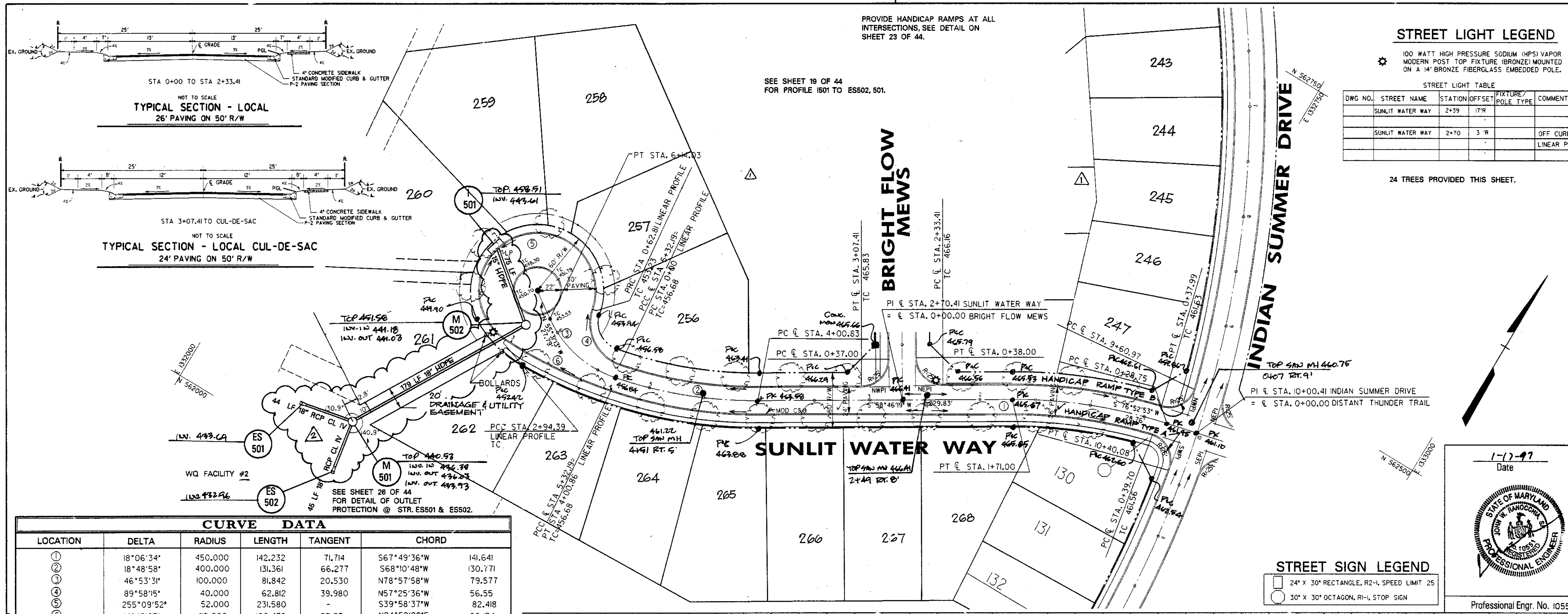
10 OF 44



AS BUILT

Shanaberg & Lane
 G. Scott Shanaberg, P.E. CIVIL
 PE No. 121028

SHANABERG & LANE
 8728 TOWN & COUNTRY BLVD.
 SUITE 201
 ELICOTT CITY, MARYLAND 21043



PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.

SEE SHEET 19 OF 44 FOR PROFILE 1501 TO ESS02, 501.

STREET LIGHT LEGEND

100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 1/2" BRONZE FIBERGLASS EMBEDDED POLE.

DWG NO.	STREET NAME	STATION/OFFSET	FIXTURE/POLE TYPE	COMMENTS
	SUNLIT WATER WAY	2+59	17'R	
	SUNLIT WATER WAY	2+70	3'R	OFF CURB LINEAR PROF.

24 TREES PROVIDED THIS SHEET.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Andrew M. Daniels 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
William Hamilton 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

John Deussen 5/20/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

6/5/98 LOTS ADJUSTED
 8/16/98 REVISED RCP CL V TO HOPE RD
 Date No. Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Dan McCune-Walker, Inc.
 309 East Pennsylvania Avenue
 Towson, Maryland 21286
 410) 286-8383
 Fax 286-4705

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

AREA SECTION 4 AREA 4
 TAX MAP PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

ROAD CONSTRUCTION PLANS
 SUNLIT WATER WAY

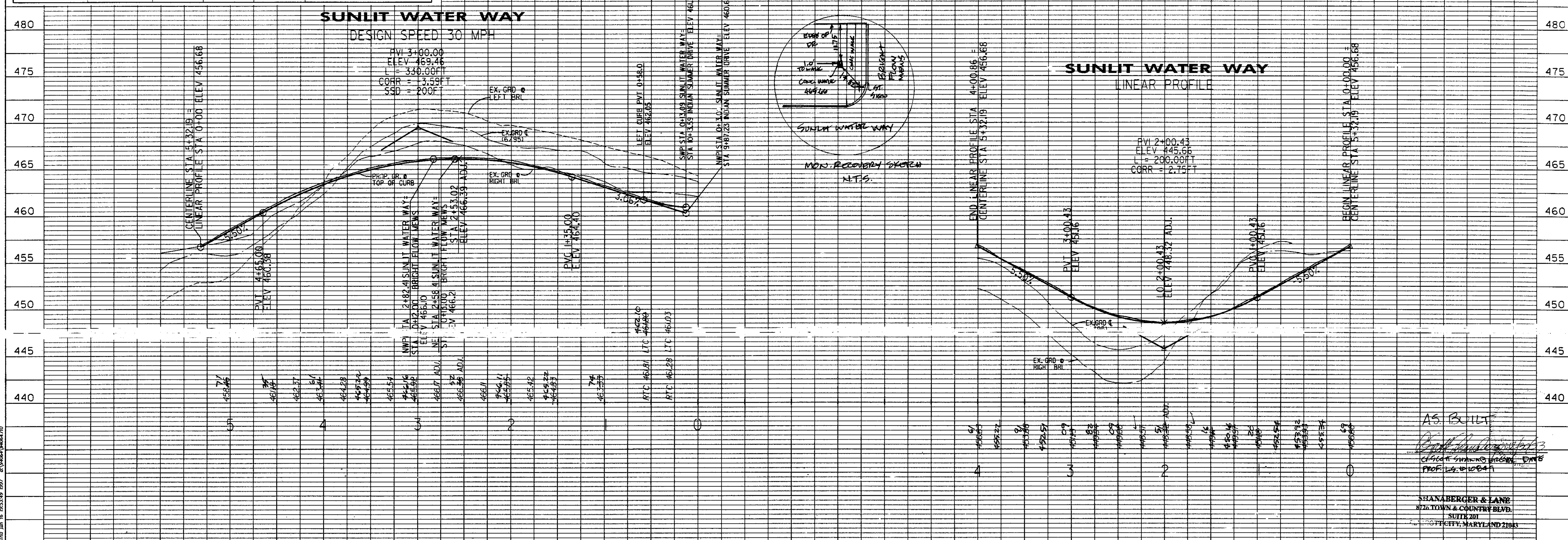
Des By JWS Scale 1" = 50' Proj. No. 94064
 Dm By JEF Date JAN 97
 Chk By JWR Approved 11 OF 44

1-17-97
 Date

Professional Engr. No. 10551

CURVE DATA

LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	18°06'34"	450.000	142.232	71.714	S67°49'36"W 141.641
②	18°48'58"	400.000	131.361	66.277	S68°10'48"W 130.171
③	46°53'31"	100.000	81.842	20.530	N78°57'58"W 79.577
④	89°58'15"	40.000	62.812	39.980	N57°25'36"W 56.555
⑤	255°09'52"	52.000	231.580	-	S39°58'37"W 82.418
⑥	14°48'23"	412.000	106.470	53.553	N84°59'28"E 96.174



A.S. BULLY
Shan Berger & Lane
 Chief Engineer
 8726 TOWN & COUNTRY BLVD.
 SUITE 201
 COLUMBIA, MARYLAND 21046

Thu, Jan 16 19:53:49 1997 d:\saw04\94064.rtd

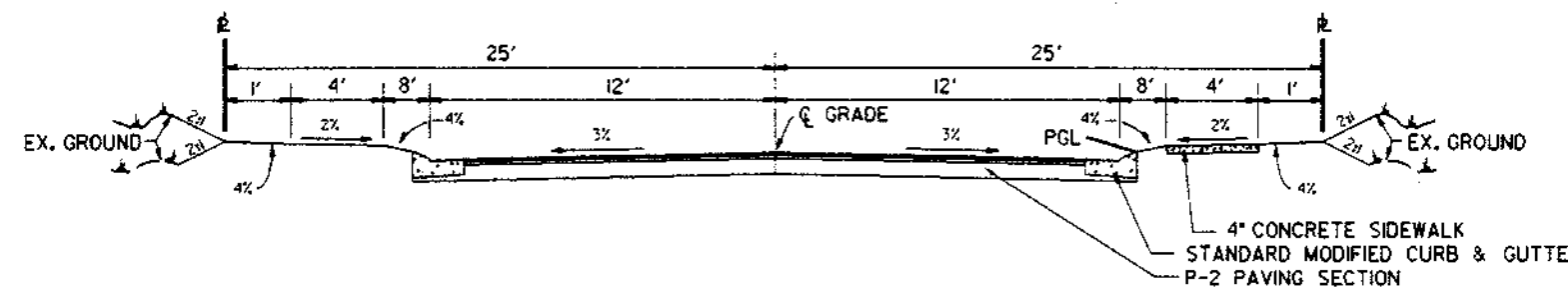
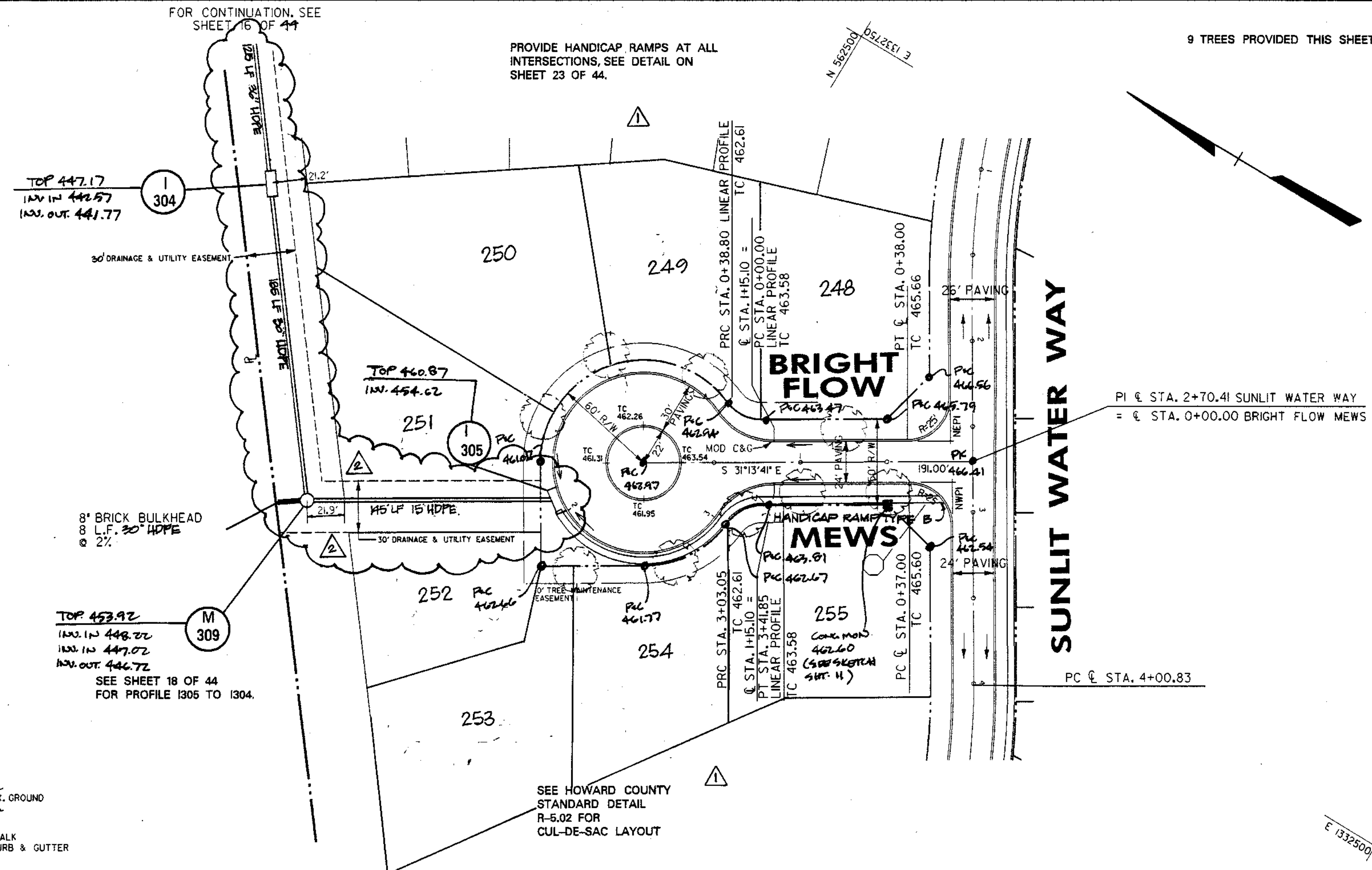
STREET SIGN LEGEND

- 24' x 30' RECTANGLE, R2-1, SPEED LIMIT 25
- 30' x 30' OCTAGON, R1-1, STOP SIGN

FOR CONTINUATION, SEE SHEET 16 OF 44

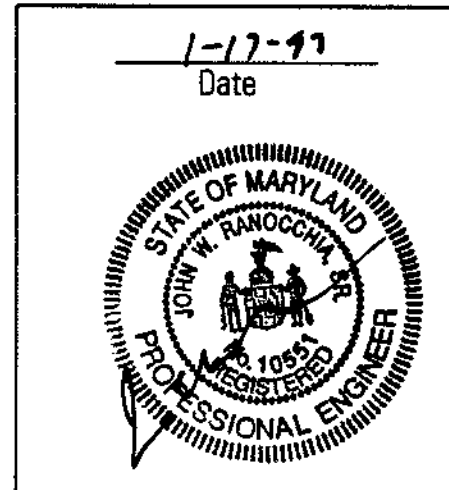
PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.

9 TREES PROVIDED THIS SHEET.



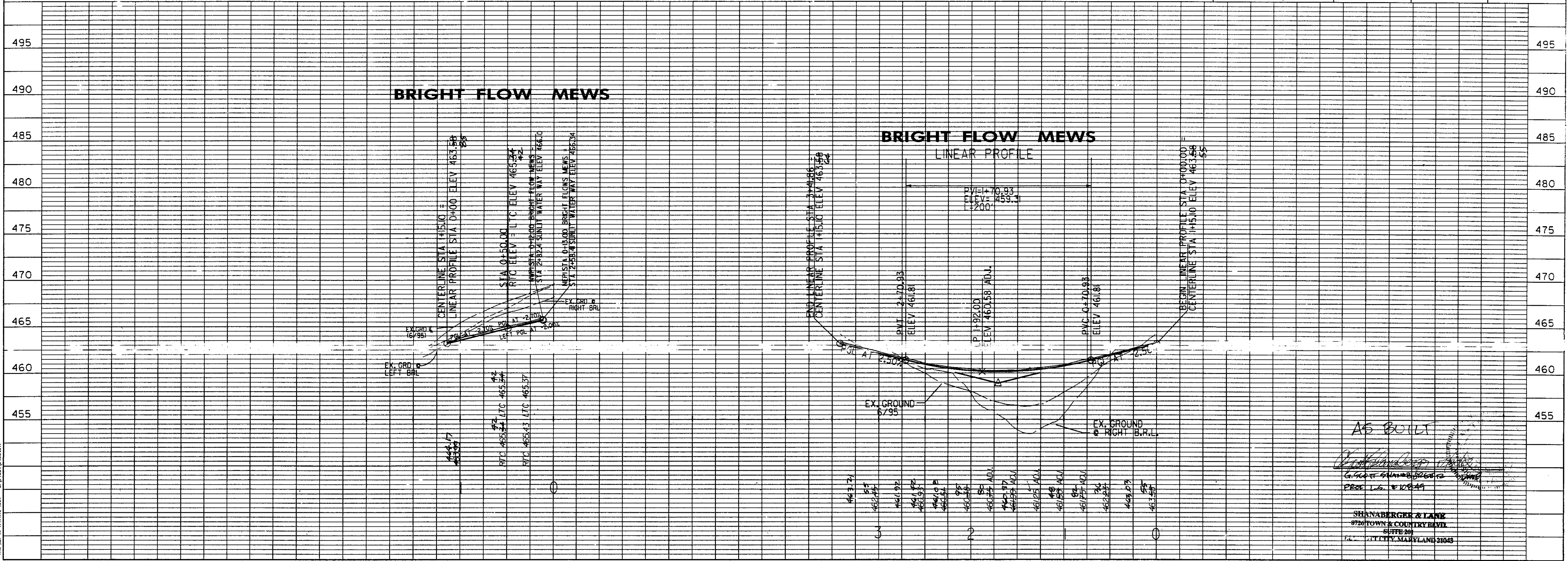
NOT TO SCALE
TYPICAL SECTION - LOCAL CUL-DE-SAC
24' PAVING ON 50' R/W

SEE HOWARD COUNTY STANDARD DETAIL R-5.02 FOR CUL-DE-SAC LAYOUT



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	
<i>Richard M. Danek</i> CHIEF, BUREAU OF HIGHWAYS	5-22-97 DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING	
<i>Catherine</i> CHIEF, DIVISION OF LAND DEVELOPMENT	7/10/97 DATE
APPROVED: DEVELOPMENT ENGINEERING DIVISION	
<i>David</i>	5/2/97 DATE
6/15/98	LOTS ADJUSTED
8/19/98	REVISED R/C LAYOUT TO HDPE 30"
Date	No. Revision Description

VILLAGE OF RIVER HILL SECTION 4, AREA 4	
OWNER / DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORP. 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044	
DMW Darr McCase-Walker, Inc. 200 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-3333 Fax 296-4705	
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals	
AREA	SECTION 4 AREA 4
TAX MAP	PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND	
TITLE	ROAD CONSTRUCTION PLANS BRIGHT FLOW MEWS
Des By	JWS Scale 1" = 50' Proj. No. 94064
Dim By	JEF Date JAN 97
Chk By	JWR Approved
Professional Engr. No. 10551	
12 OF 44	



AS BUILT
David
6/15/98
PROJ. LG. # 10551

SHANBERGER & LANK
8720 TOWN & COUNTRY BLVD.
SUITE 201
COLUMBIA, MARYLAND 21043

Thu, Jan 16, 17:46:08 1997 d:\10003\p0004.rvt

STREET SIGN LEGEND

- 24" x 30" RECTANGLE, R2-1, SPEED LIMIT 25
- 30" x 30" OCTAGON, R1-1, STOP SIGN

STREET LIGHT LEGEND

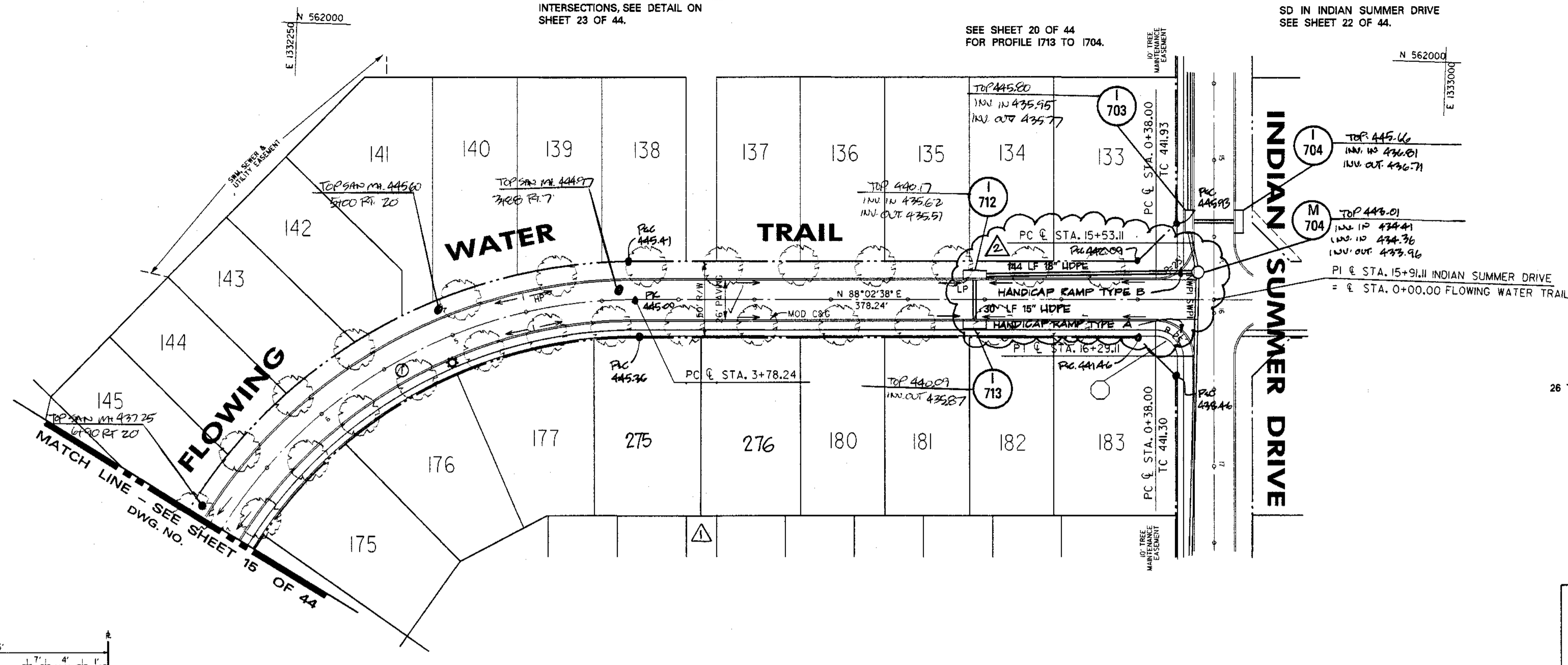
- 100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 1" BRONZE FIBERGLASS EMBEDDED POLE.

DWG NO.	STREET NAME	STATION	OFFSET	FIXTURE / POLE TYPE	COMMENTS
	FLOWING WATER	5+00	16'R		
	TRAIL				
	FLOWING WATER	7+80	19'R		
	TRAIL				

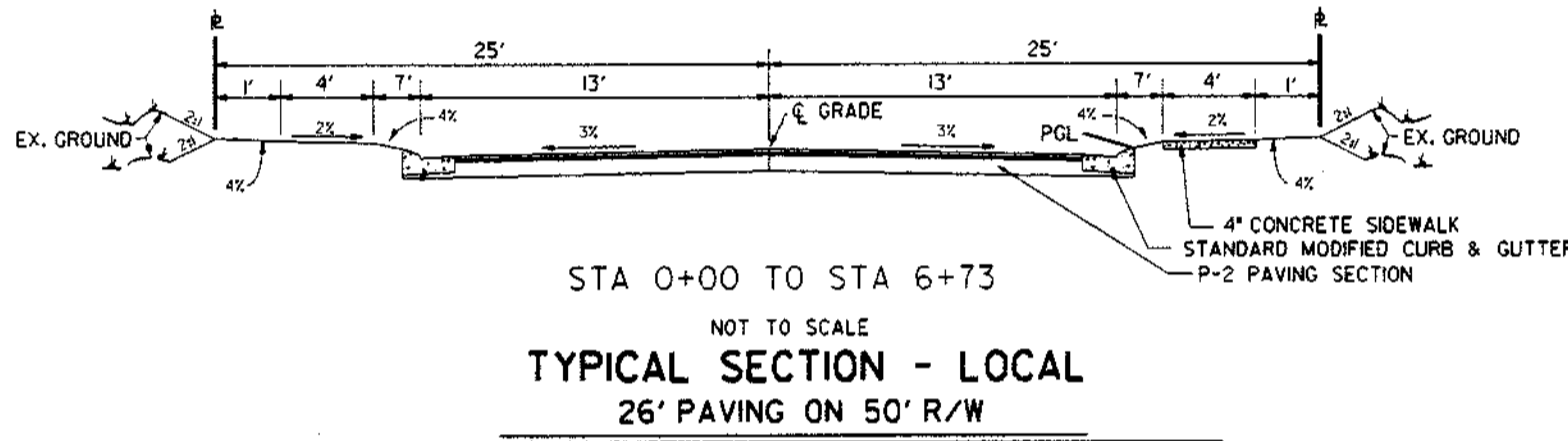
PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS, SEE DETAIL ON SHEET 23 OF 44.

SEE SHEET 20 OF 44 FOR PROFILE 1718 TO 1704.

SD IN INDIAN SUMMER DRIVE SEE SHEET 22 OF 44.



26 TREES PROVIDED THIS SHEET.



STA 0+00 TO STA 6+73
NOT TO SCALE
TYPICAL SECTION - LOCAL
26' PAVING ON 50' R/W

CURVE DATA					
LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	77°25'38"	316.000	427.029	253.286	S49°19'49"W 395.270

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Howard County Seal
 CHIEF, BUREAU OF HIGHWAYS 5-22-97 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Chief of Planning and Zoning
 CHIEF, DIVISION OF LAND DEVELOPMENT TC 7/10/97 DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Chief of Development Engineering
 CHIEF, DEVELOPMENT ENGINEERING DIVISION 8/27/97 DATE

8/18/98 LOTS ADJUSTED
 8/18/98 REVISED RCP CL IN/50 TO HPSV SD.

Date No. Revision Description

VILLAGE OF RIVER HILL
SECTION 4, AREA 4

OWNER / DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

12-3-96 Date

Professional Engr. No. 10551

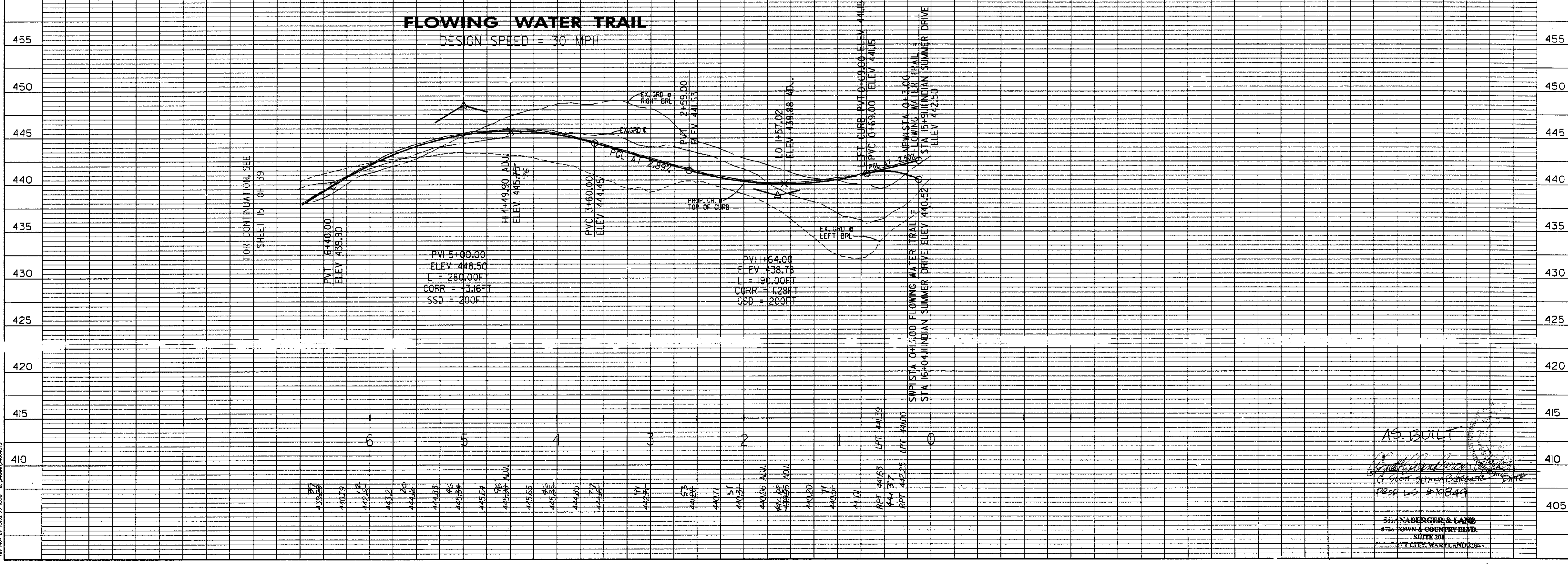
DMW
Dart, McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3353
Fax 296-4705

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

AREA SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE **ROAD CONSTRUCTION PLANS**
FLOWING WATER TRAIL
STA 0+00 TO 7+00

Des By	JWS	Scale	1" = 50'	Proj. No.	94064
Des By	JEF	Date	MAR 96		
Chk By	JVJR	Approved			14 OF 44



AS-BUILT

Signature

PROJ. NO. 94064

SHANBERGER & LANE
8730 FOWN & COUNTRY BLVD.
SUITE 301
FREDERICK, MARYLAND 21704

STREET LIGHT LEGEND

100 WATT HIGH PRESSURE SODIUM (HPS) VAPOR MODERN POST TOP FIXTURE (BRONZE) MOUNTED ON A 14' BRONZE FIBERGLASS EMBEDDED POLE.

DWG NO.	STREET NAME	STATION OFFSET	FIXTURE / POLE TYPE	COMMENTS
	INDIAN SUMMER DR	10+30	17'L	
		16+22	18'L	

43 TREES PROVIDED THIS SHEET.

FUTURE CONSTRUCTION SECTION 4 AREA 5

STREET SIGN LEGEND

- 24" X 30" RECTANGLE, R2-1, SPEED LIMIT 25
- 30" X 30" OCTAGON, R1-1, STOP SIGN

CURVE DATA					
LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	35°50'57"	980.000	613.173	316.996	519°52'51"E 603.219

PROVIDE HANDICAP RAMPS AT ALL INTERSECTIONS. SEE DETAIL ON SHEET 23 OF 44.

FLOATING CLOUDS PATH

SEE SHEET 22 OF 44 FOR PROFILE 1705 TO 1702.

MATCH LINE - SEE SHEET 17 OF 44

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Richard M. Douch 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
John Miller 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Robert Damman 5/27/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

6/5/98 LOTS ADJUSTED
 8/16/98 REVISED R.O.F. CL.V. TO HDPE.G.D.
 Date No. Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

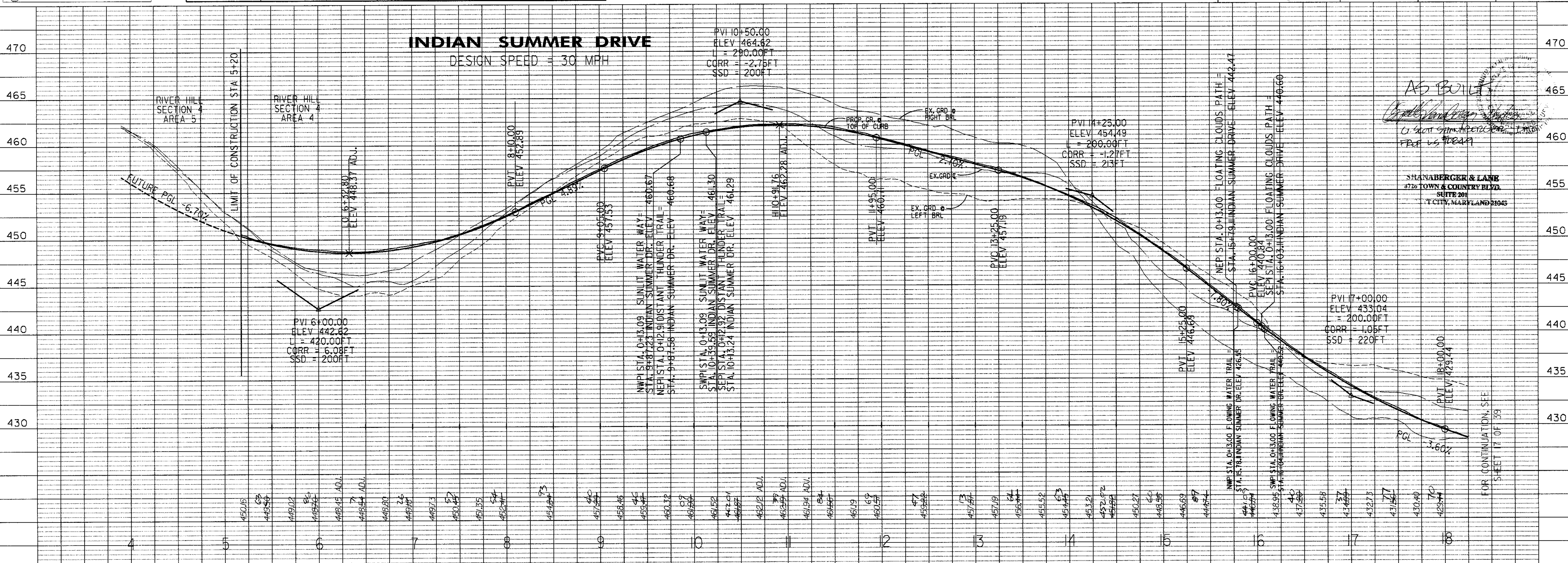
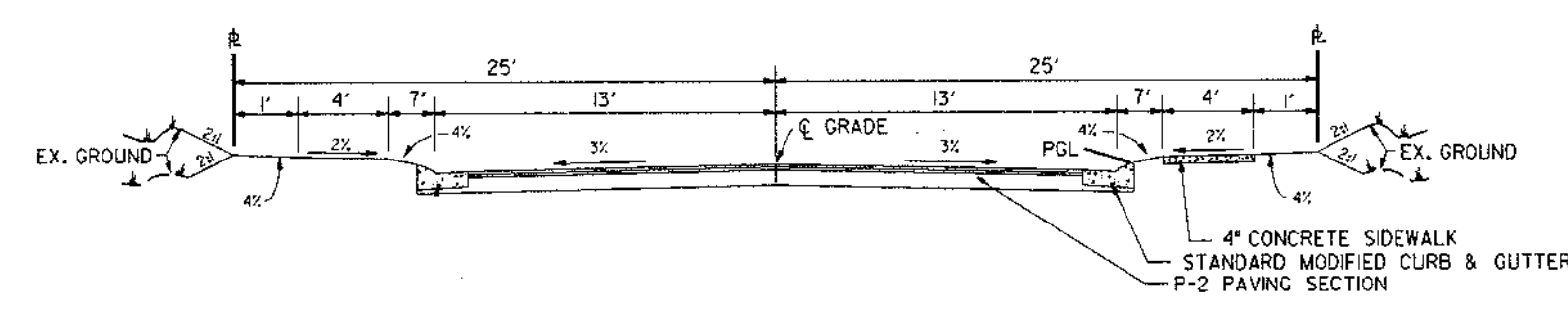
DMW
 Datt-McCune-Walker, Inc.
 200 East Pennsylvania Avenue
 Potosi, Maryland 21788
 (410) 296-3833
 Fax: 296-4706
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 4 AREA 4
 TAX MAP PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

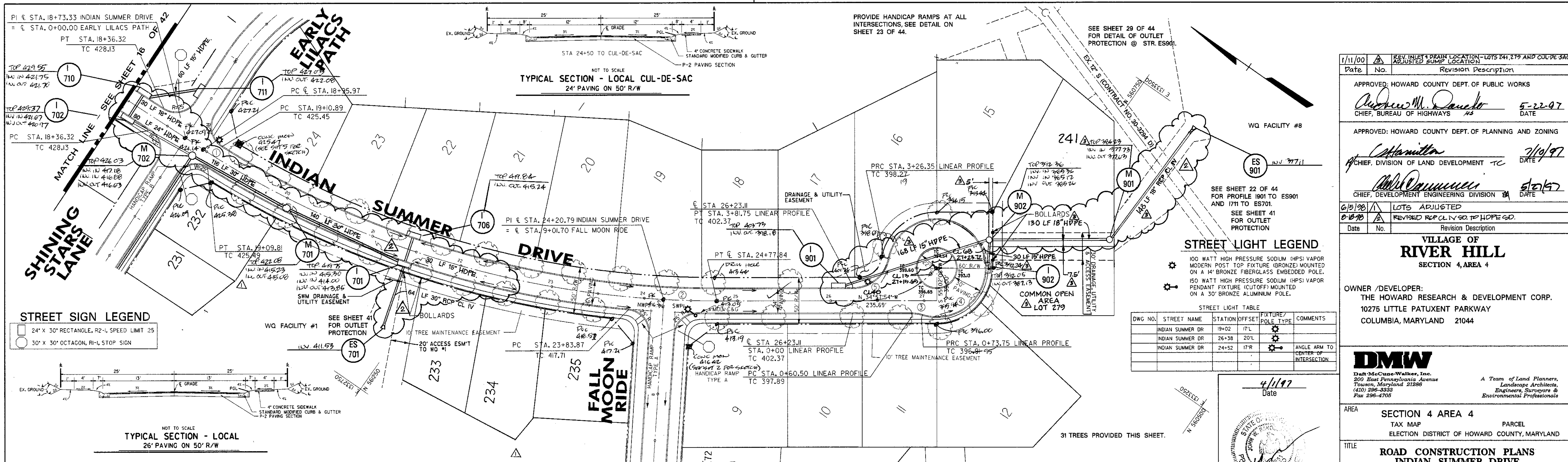
TITLE ROAD CONSTRUCTION PLANS
 INDIAN SUMMER DRIVE
 STA 3+90 - 18+00

Des By JWS Scale 1" = 50' Proj. No. 94064
 Dwn By JEF Date MAR 96
 Chk By JWR Approved 16 OF 44

Professional Engr. No. 10551



FOR CONTINUATION, SEE SHEET 17 OF 39



1/11/00
 Date No. Revision Description
 APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
 APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
 APPROVED: CHIEF, DEVELOPMENT ENGINEERING DIVISION
 G/B/98
 Date No. Revision Description

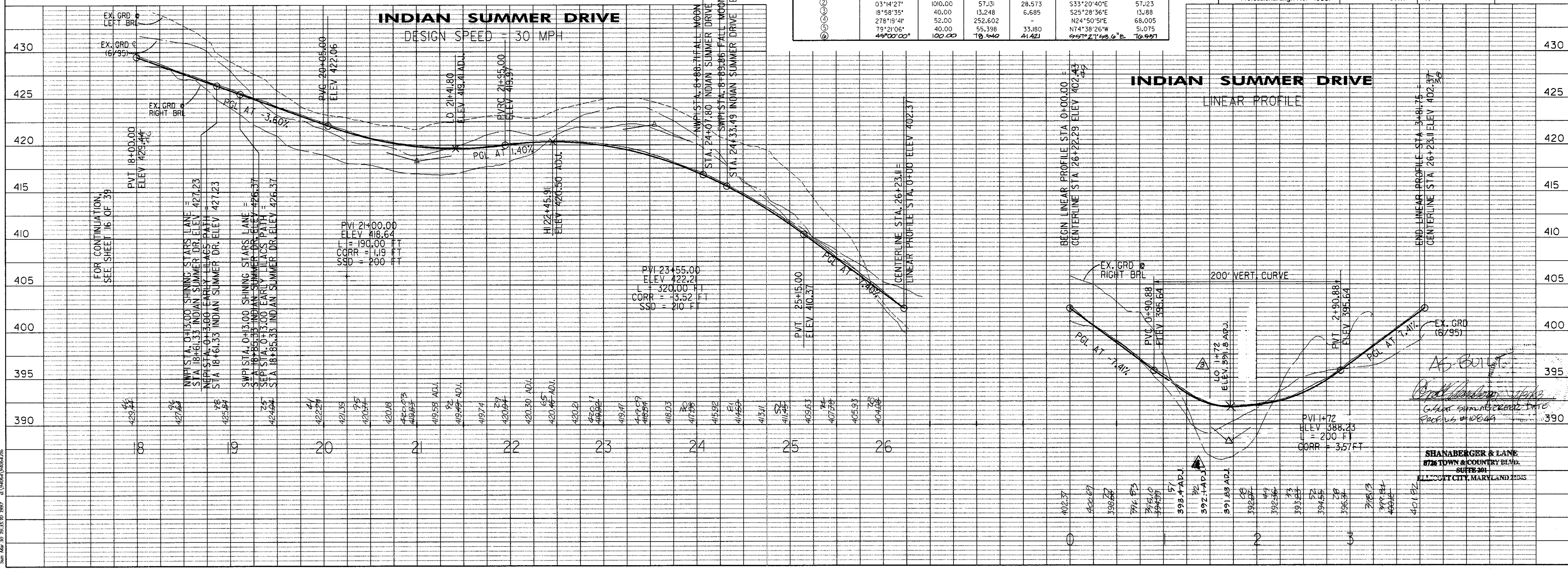
VILLAGE OF RIVER HILL
 SECTION 4, AREA 4
 OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Dan McCune-Walker, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 410-286-4323
 Fax 286-4705
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

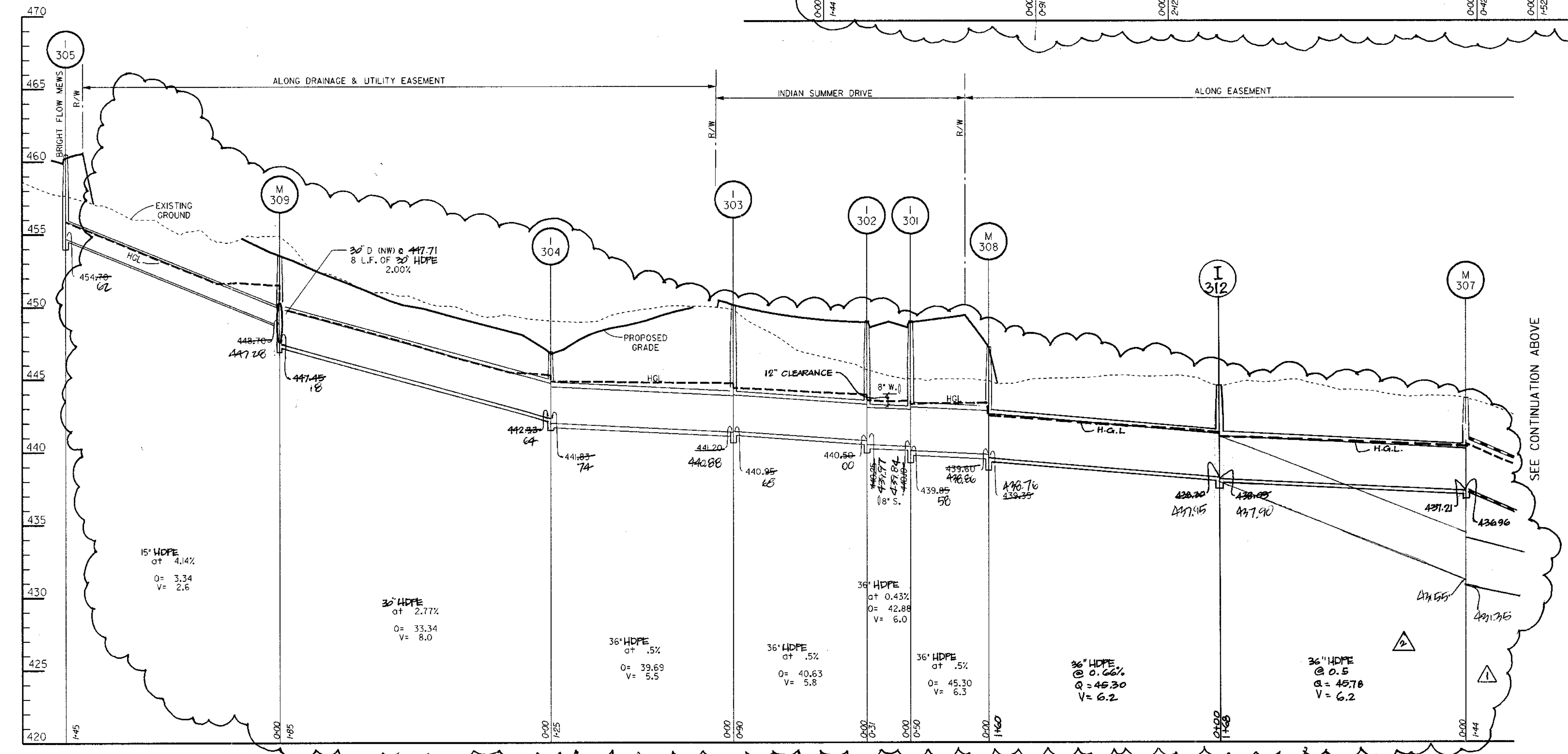
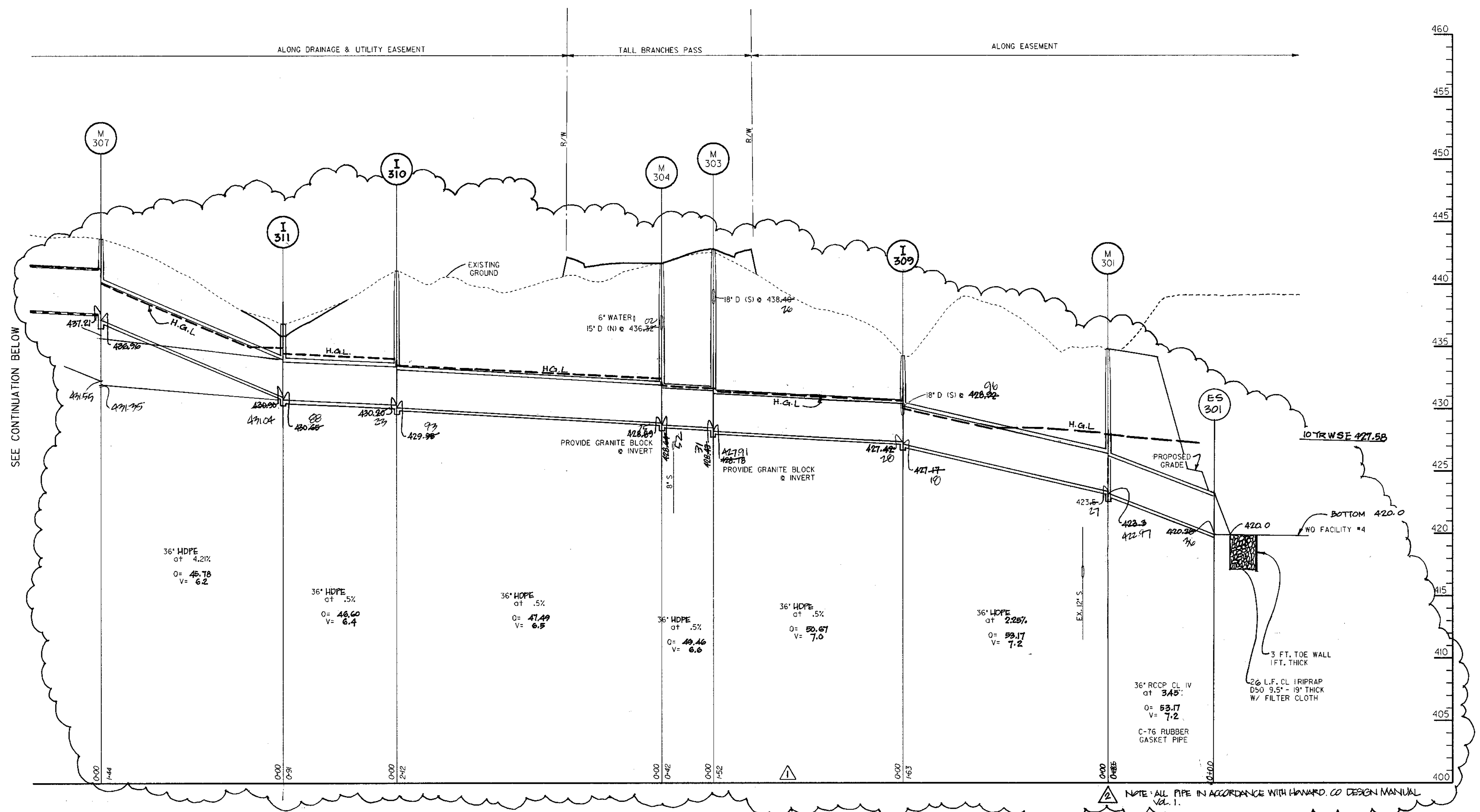
AREA SECTION 4 AREA 4
 TAX MAP PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND
 TITLE ROAD CONSTRUCTION PLANS
 INDIAN SUMMER DRIVE
 STA 18+00 - 27+00
 Des By JWS Scale 1" = 50' Proj. No. 94064
 Dwn By JEF Date JAN 97
 Chk By JWR Approved 17 OF 44

CURVE DATA

LOCATION	DELTA	RADIUS	LENGTH	TANGENT	CHORD
①	29°46'04"	100.00	524.734	268.437	S16°50'24"E 518.816
②	03°14'27"	100.00	57.131	28.573	S33°20'40"E 57.23
③	18°58'35"	40.00	13.248	6.685	S25°28'36"E 13.88
④	27°15'41"	52.00	252.602	124.509	N24°50'51"E 68.005
⑤	73°21'06"	40.00	55.398	33.180	N74°39'26"W 51.075
⑥	68°00'00"	100.00	18.542	4.142	S57°21'59.6"E 18.542



SHANABGERGER & LANE
 8726 TOWN & COUNTRY BLVD.
 SUITE 301
 BELL CO. CITY, MARYLAND 21035



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Richard M. Seneker 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
J. Cottam 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Michael J. ... 5/21/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Date	No.	Revision Description
4/8/96	1	REVISION INVERT FROM 801 TO 780.7, ADDED INLET 301
8/10/96	2	REVISION INVERT FROM 801 TO 780.7, ADDED INLET 301
8/10/96	3	REVISION RCP CL IV TO HDPE

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Daft McCune-Walker, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-3333
 Fax 296-4708

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

AREA: SECTION 4 AREA 4
 TAX MAP: PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE: **STORM DRAIN PROFILES**

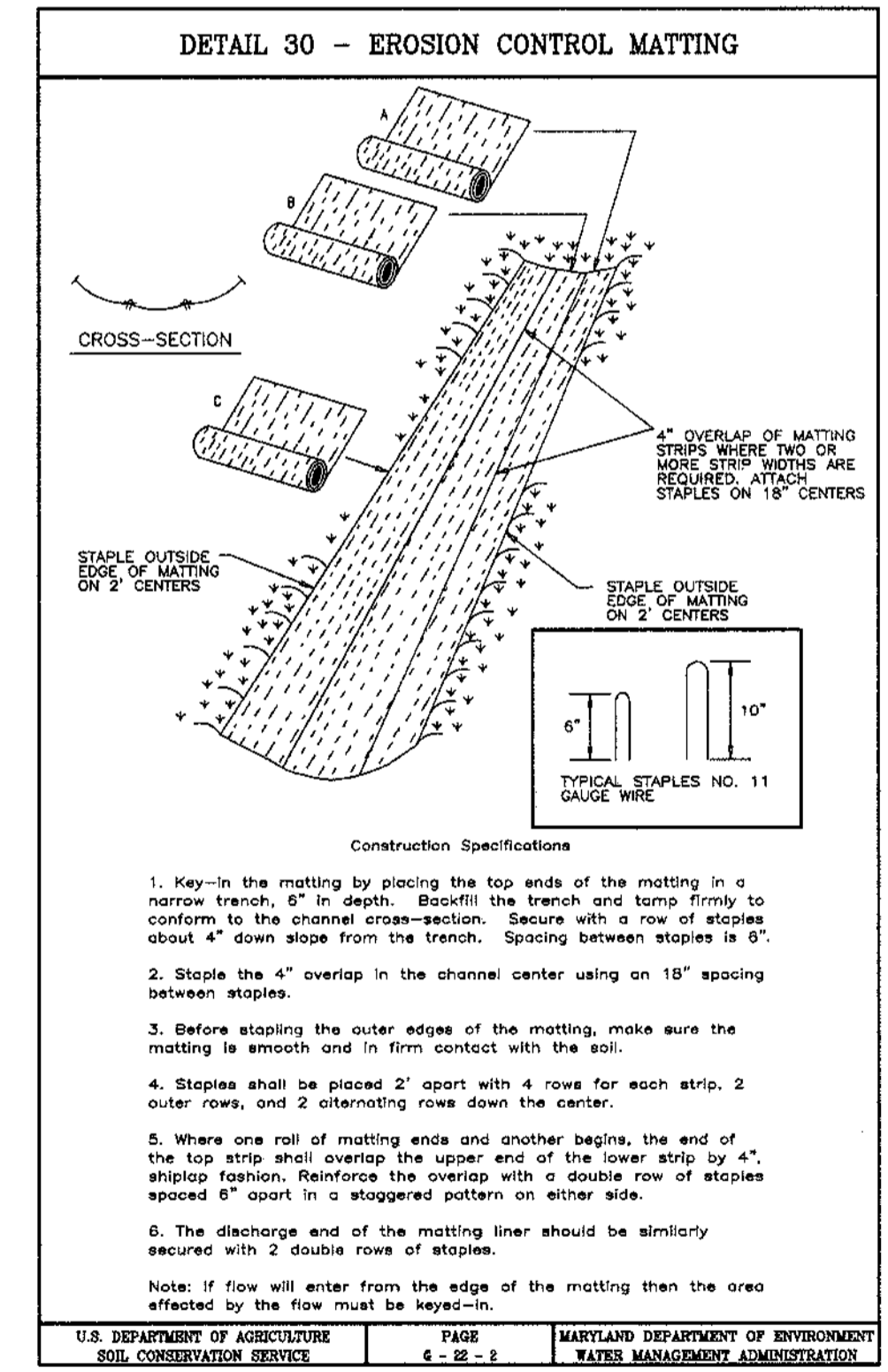
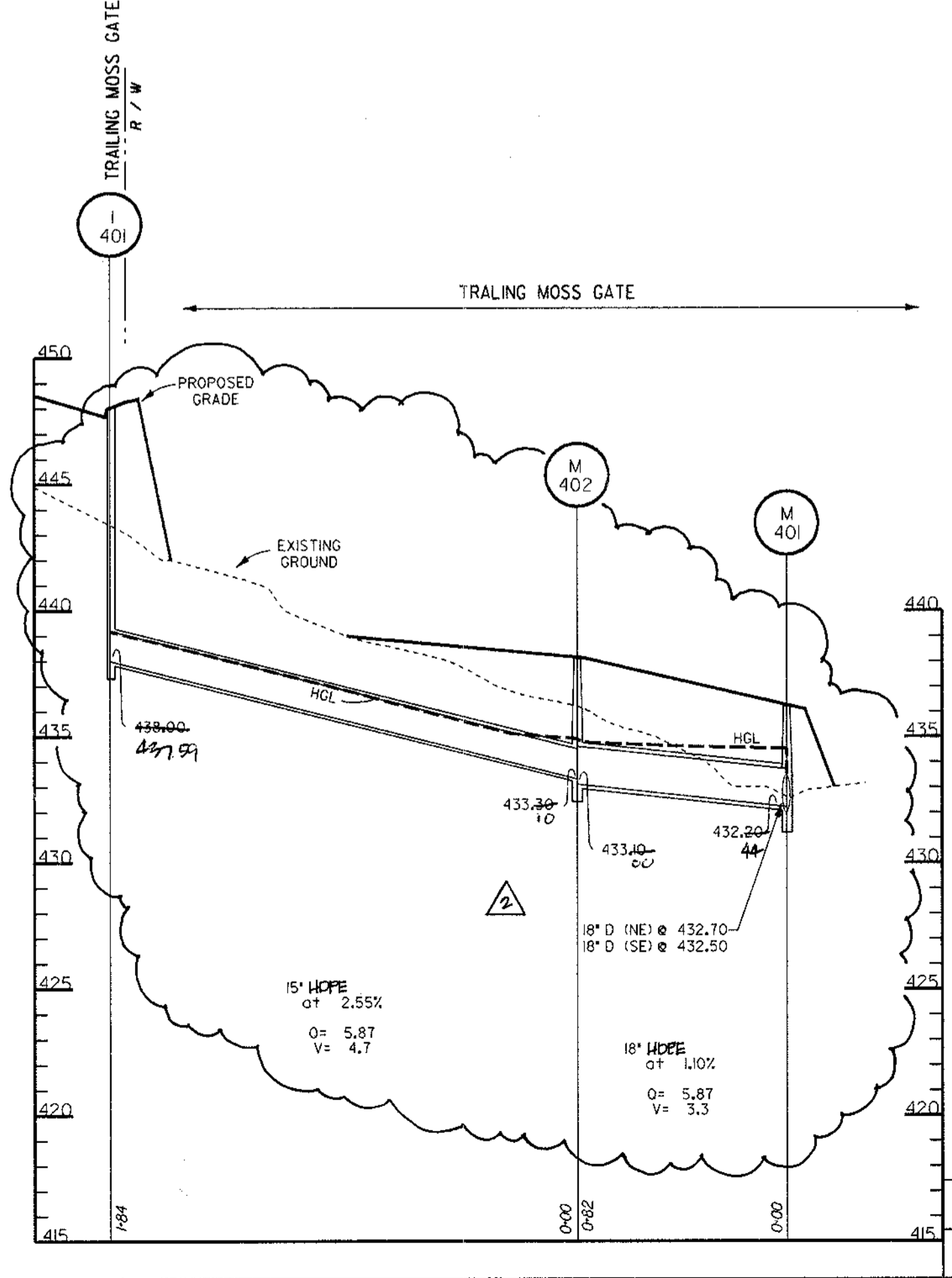
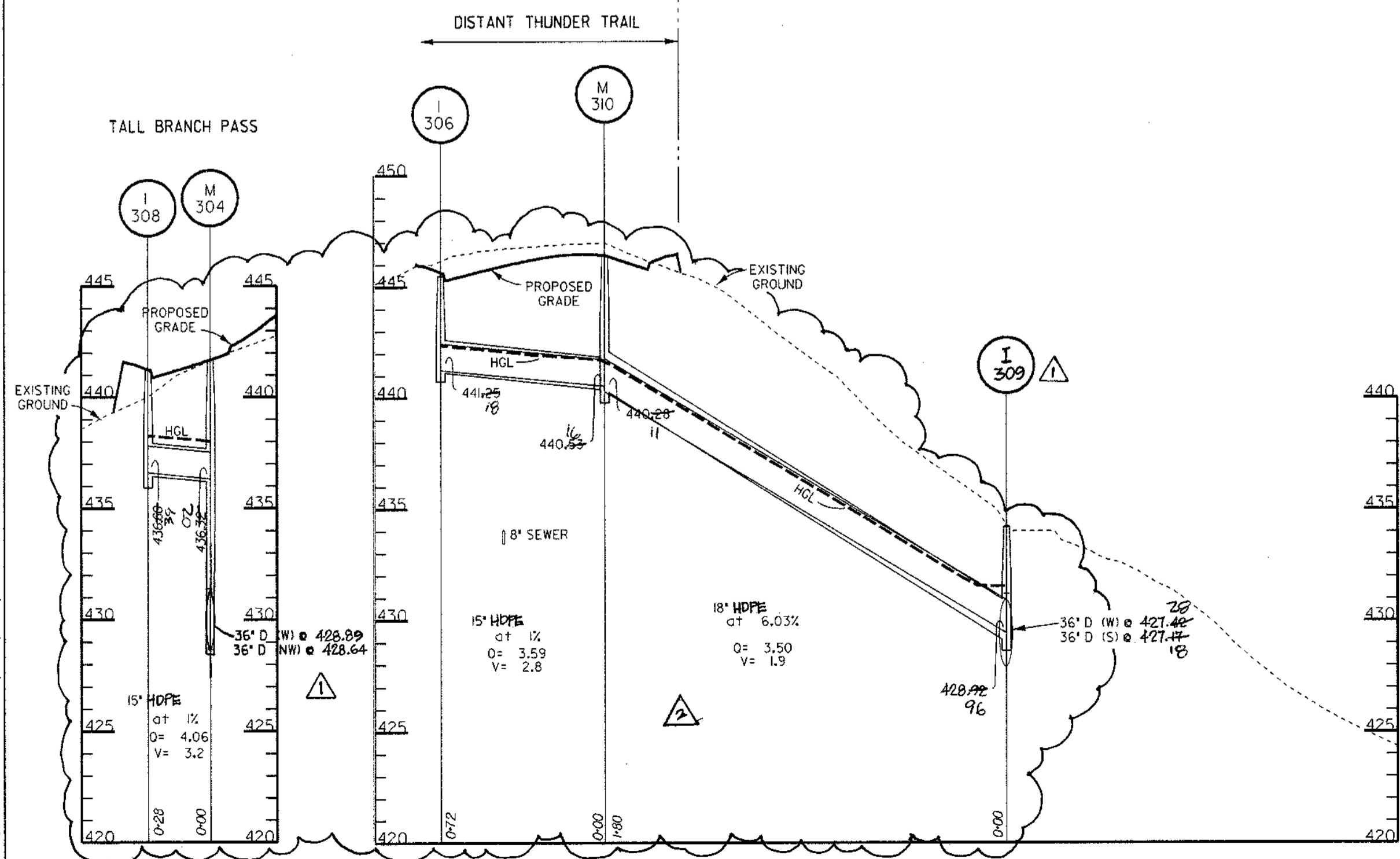
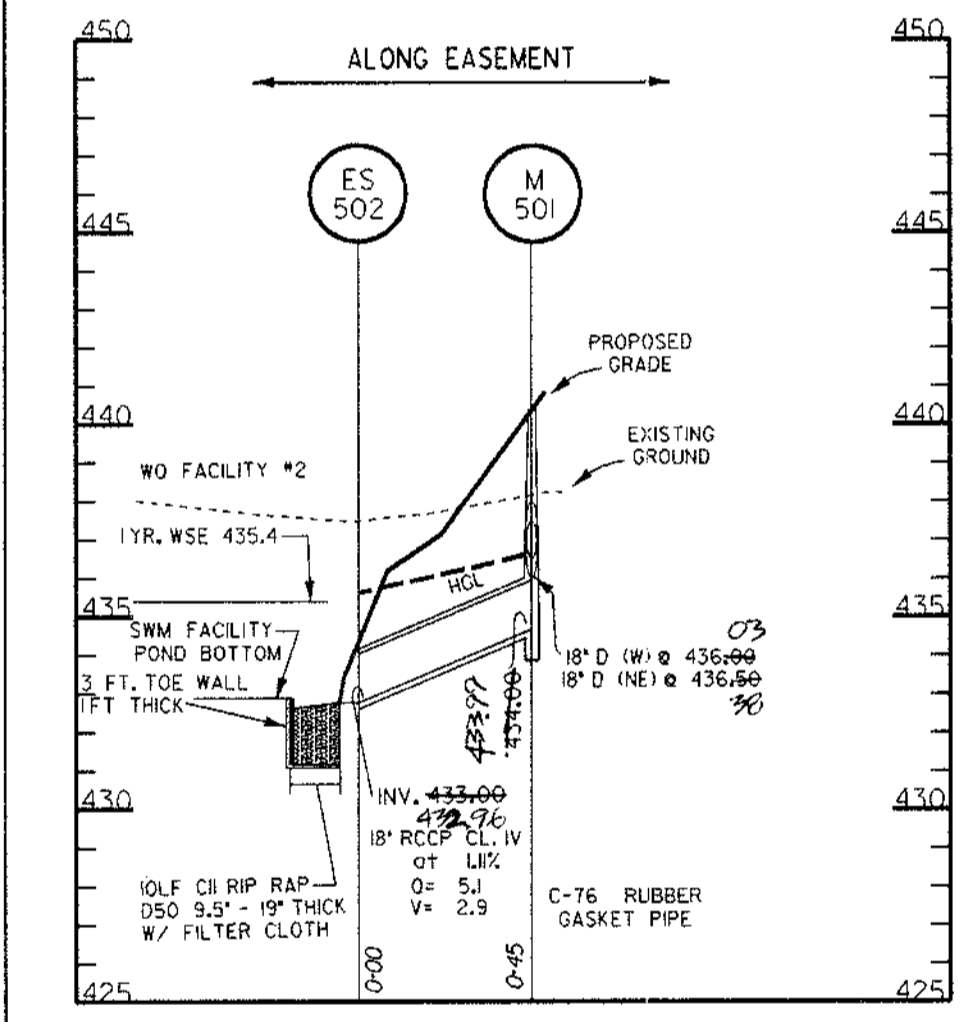
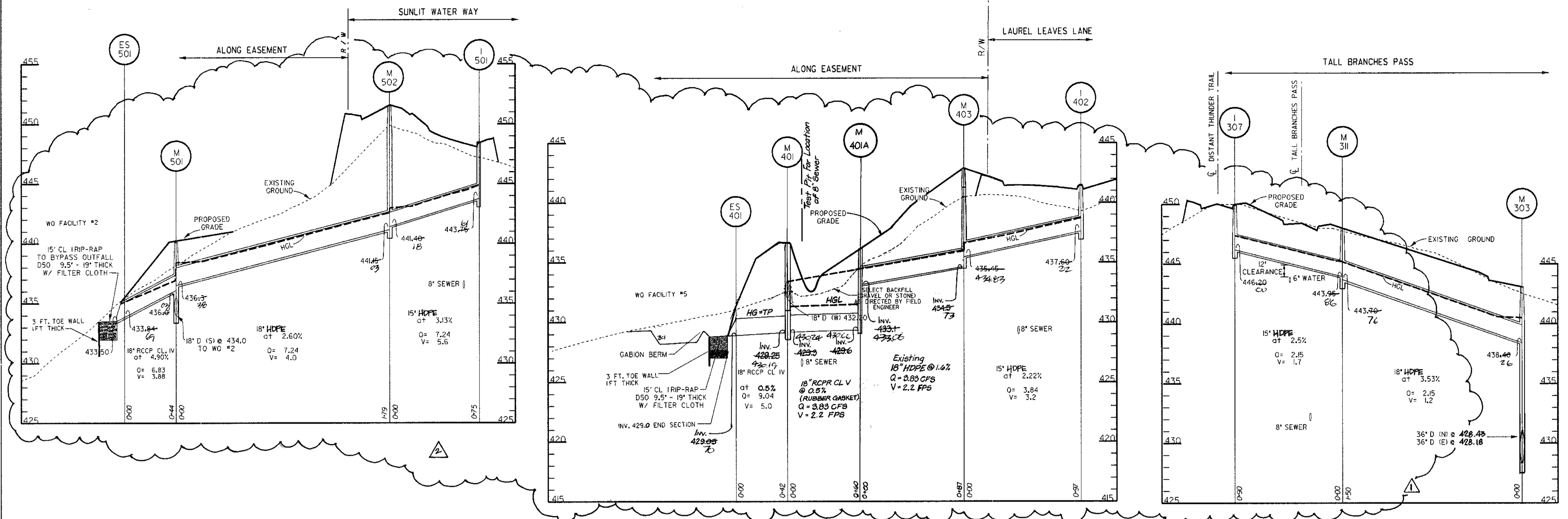
Des By: RS	Scale: 1" = 50'	Proj. No: 94064
Drn By: JEF	Date: MAR 96	
Chk By: JWR	Approved:	18 OF 44

AS-BUILT
Shanabarger & Lane 5/21/97
 G. SLOT SHANABERGER DATE
 PROF. LICENSE 10849

SHANABERGER & LANE
 8726 TOWN & COUNTRY BLVD.
 SUITE 201
 FLEETCOTT CITY, MARYLAND 21035



Wind Nov 27 10:00:27 1996 d:\p04651\0004.p03



AS BUILT

Shanabarger & Lane
 8726 TOWN & COUNTRY BLVD. SUITE 201
 FARMERS CITY, MARYLAND 21043

2-11-2002 CF #S

For CFS Revision Only

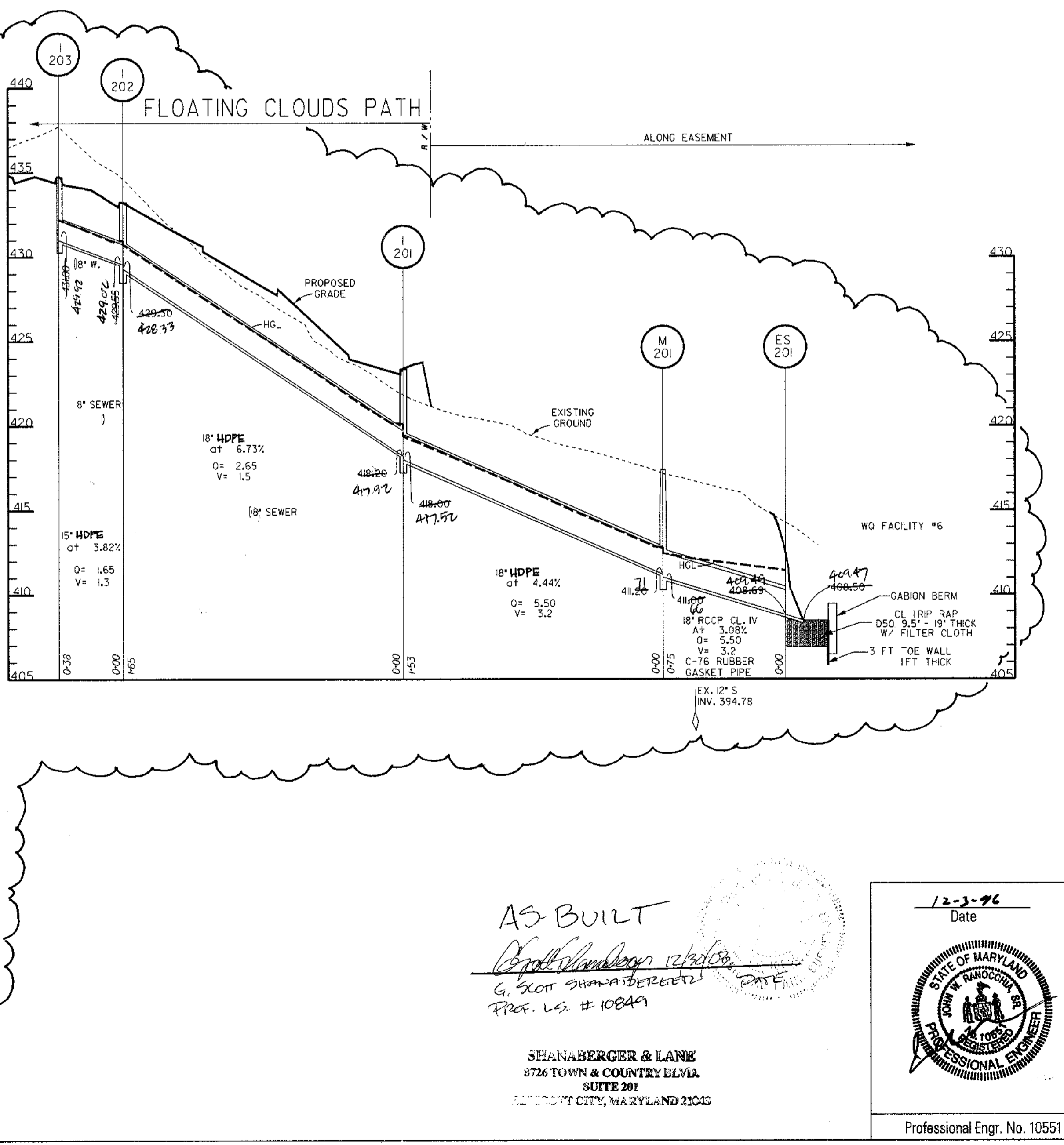
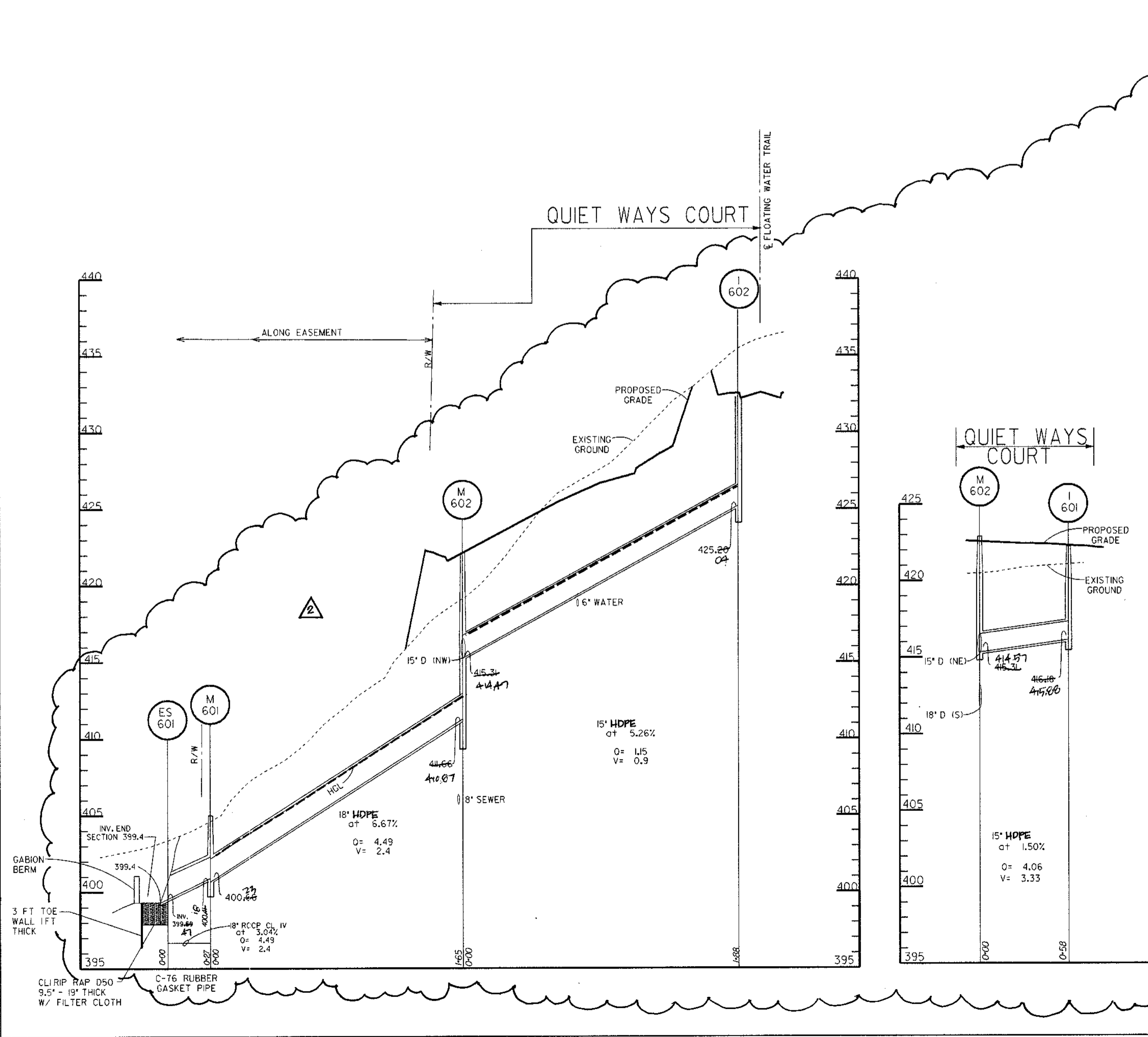
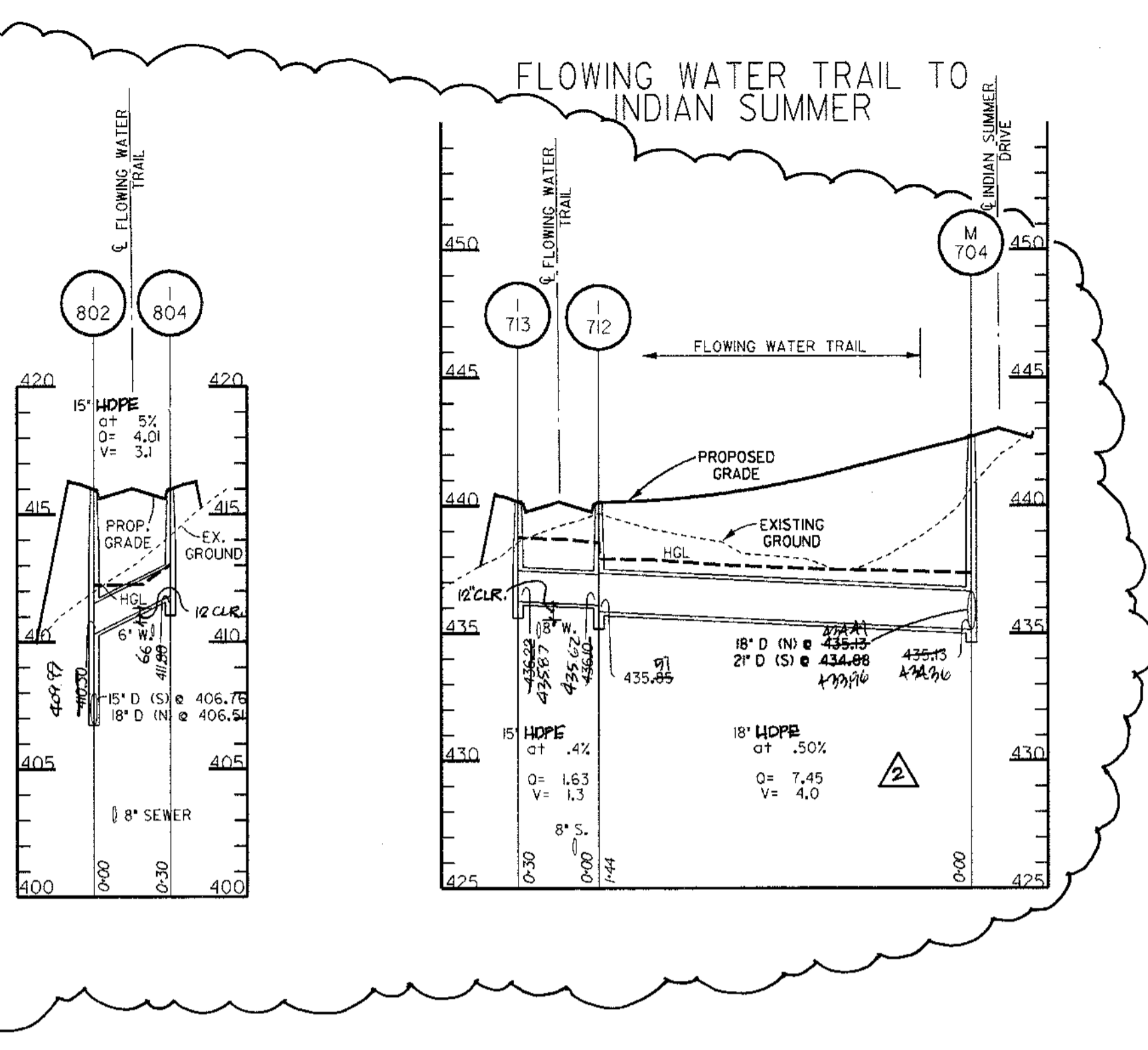
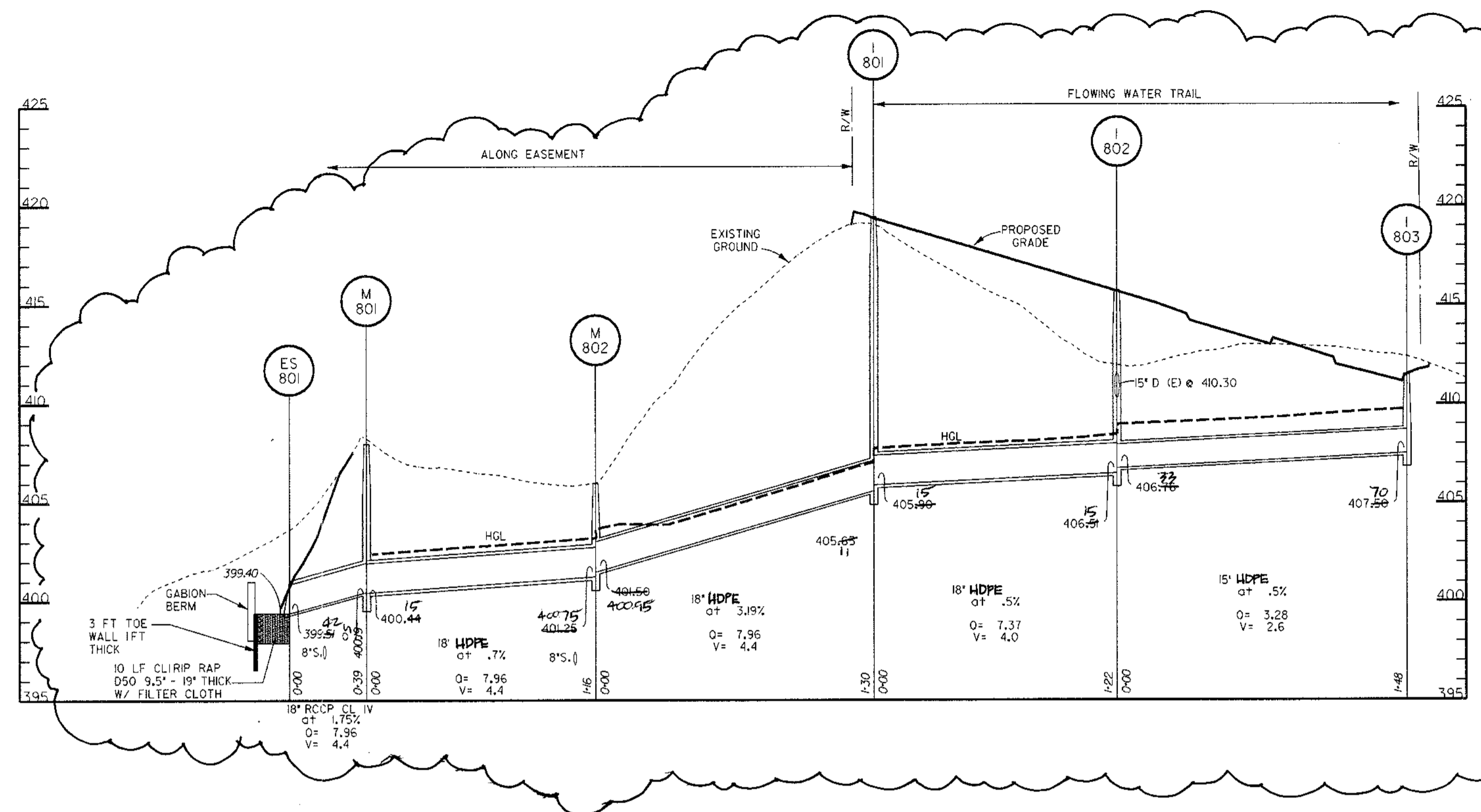
3 REVISIONS Date: By:

2-7-97 Date

STATE OF MARYLAND PROFESSIONAL ENGINEER

STATE OF MARYLAND PROFESSIONAL ENGINEER

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	
<i>Richard M. Deneke</i> CHIEF, BUREAU OF HIGHWAYS	5-22-97 DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING	
<i>Colt Hamilton</i> CHIEF, DIVISION OF LAND DEVELOPMENT	7/10/97 DATE
<i>John R. ...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	5/27/97 DATE
4/28/98	REV. INVERT OF M-302, M-304, REPLACED M302 WITH INLET
6/18/98	REVISED ROR. CL. IN. 90 TO HDPE 50.
Date	No. Revision Description
VILLAGE OF RIVER HILL SECTION 4, AREA 4	
OWNER / DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORP. 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044	
DMW Duff Mc Cune Walker, Inc. 200 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-3333 Fax 296-4705	
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals	
AREA	SECTION 4 AREA 4
TITLE	STORM DRAIN PROFILES
Des By	RS Scale 1" = 50'
Dm By	JEF Date JAN 97
Proj. No.	94064
Chk By	JWR Approved
Professional Engr. No.	10551
19 OF 44	



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Andrew M. Demele 5-22-97
 CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Colleen Miller 7/1/97
 CHIEF, DIVISION OF LAND DEVELOPMENT TC DATE

Michael J. ... 5/21/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

8/18/98 REVISED RCP CL. IV TO 18\"/>
 Date No. Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Dan McCune Walker, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-3333
 Fax 296-4708
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 4 AREA 4 PARCEL
 TAX MAP ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

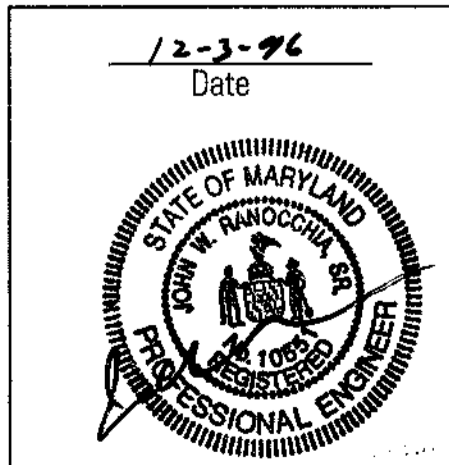
TITLE **STORM DRAIN PROFILES**

Des By RS Scale 1" = 50' Proj. No. 94064
 Dm By JEF Date MAR 96
 Chk By JWR Approved 20 OF 44

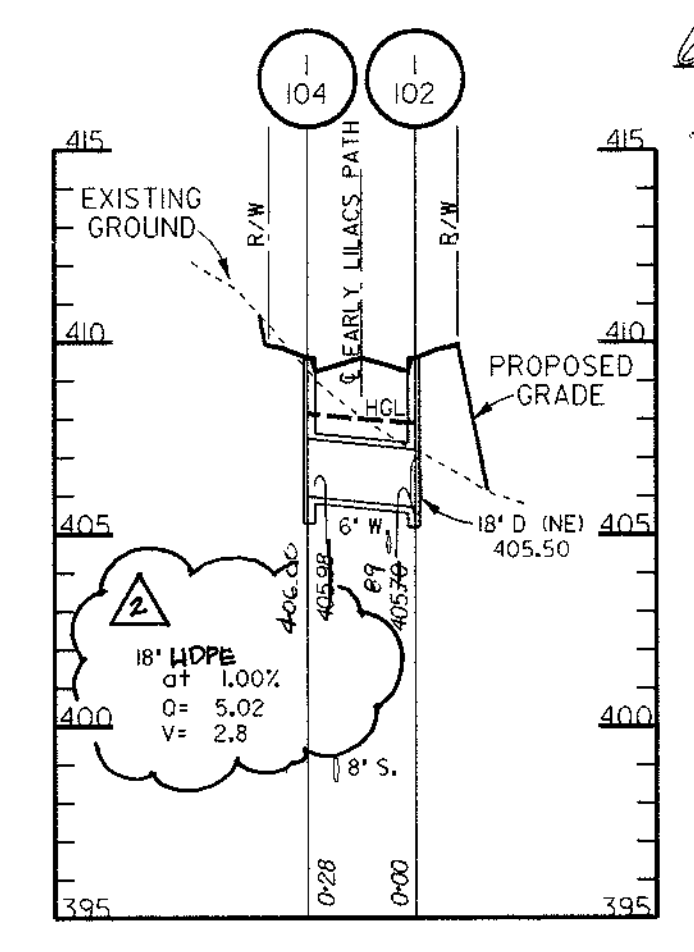
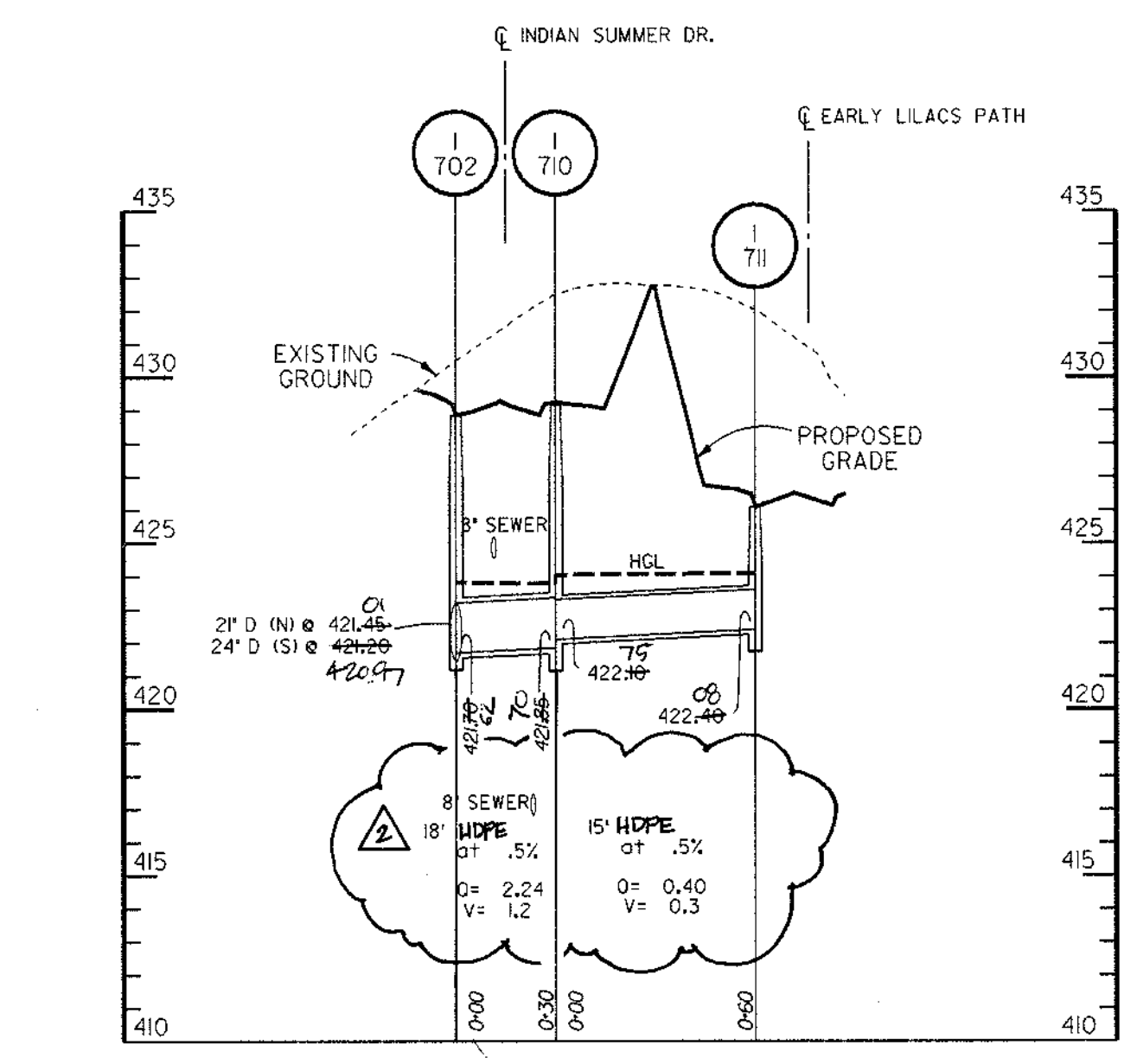
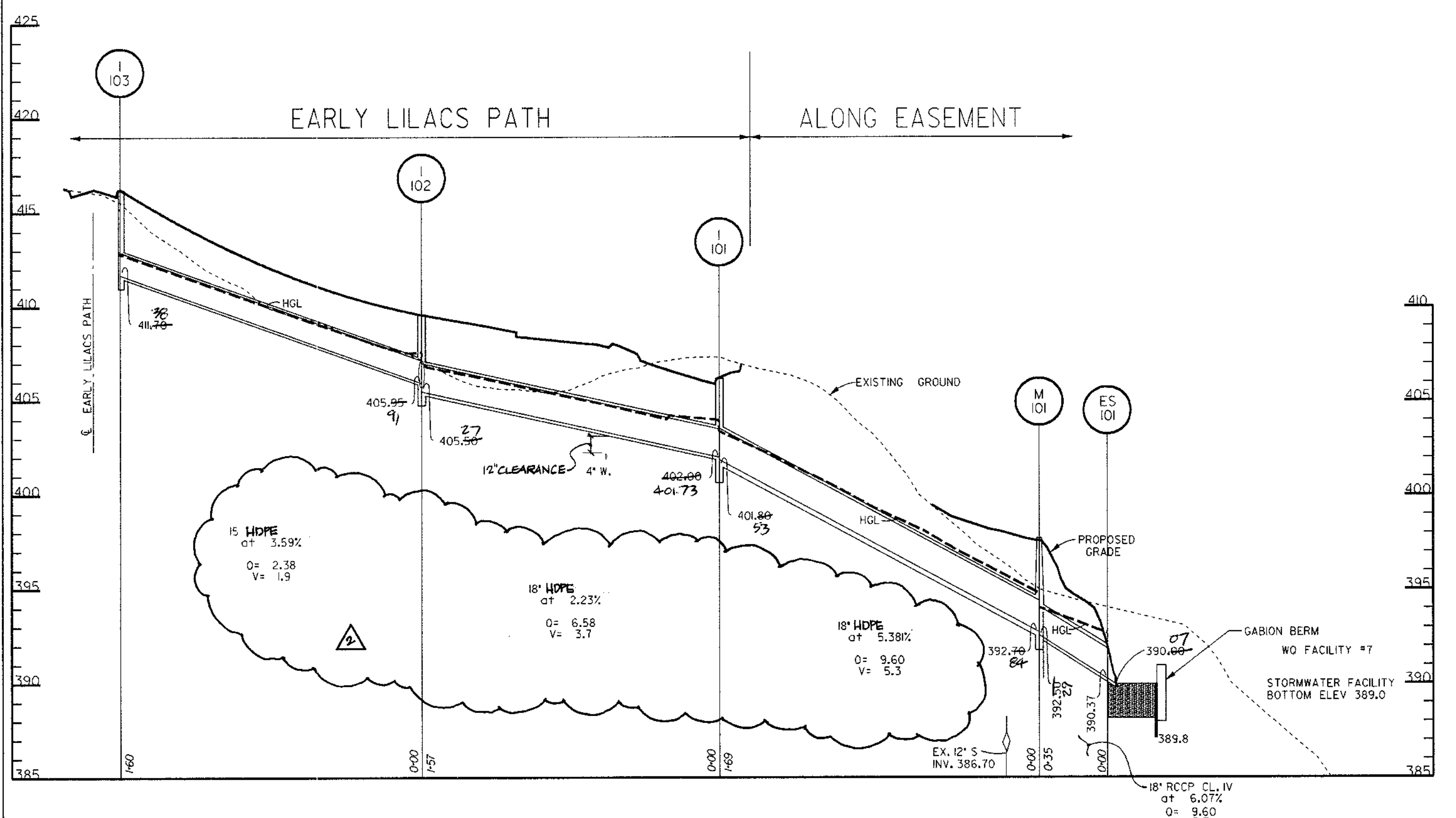
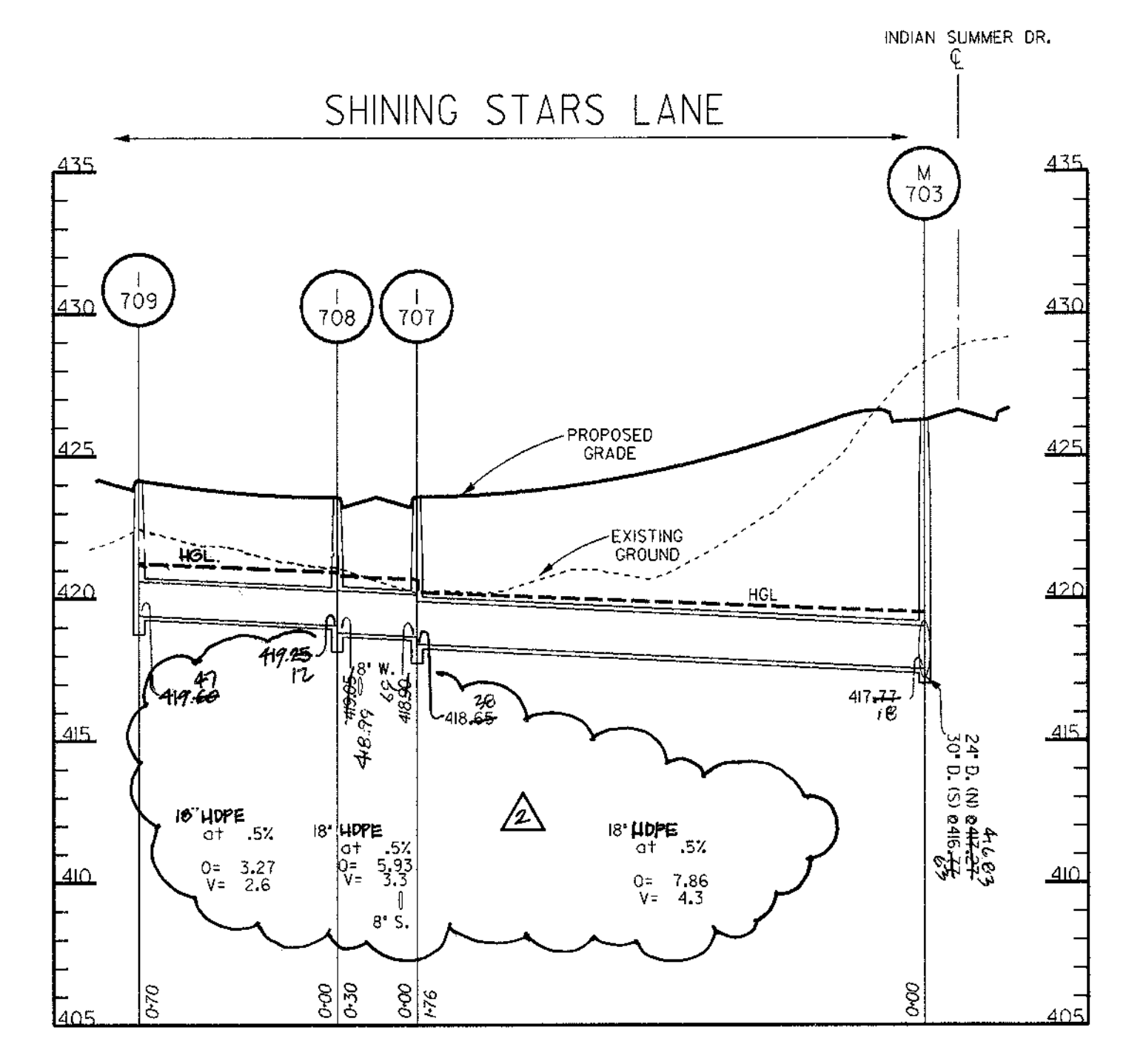
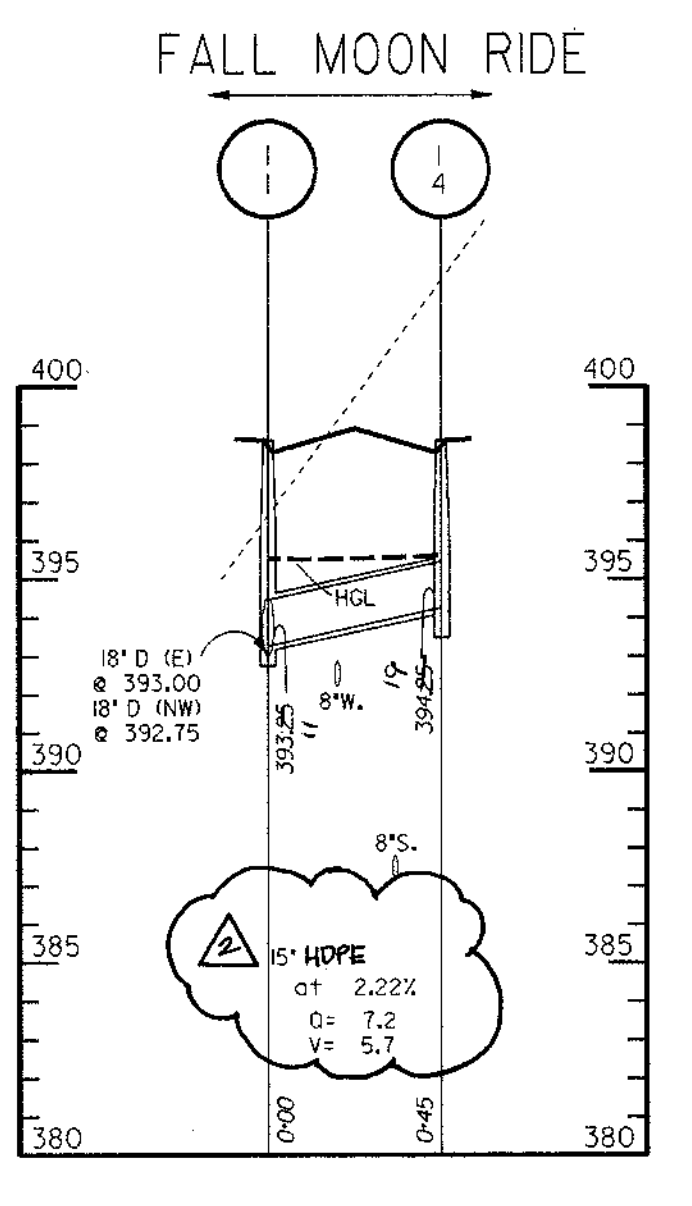
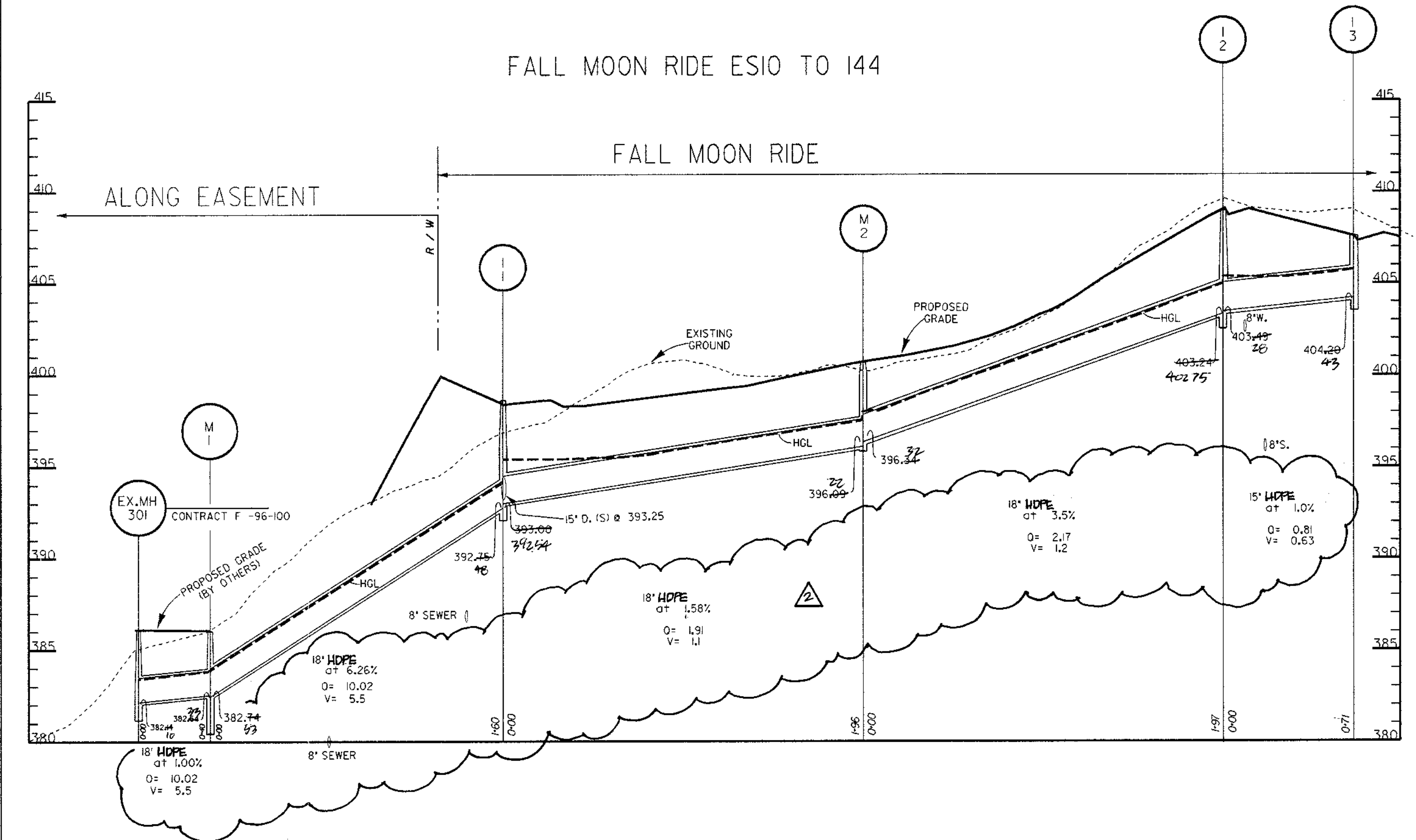
Professional Engr. No. 10551

AS-BUILT
Shanabarger & Lane
 G. Scott Shanabarger
 Prof. Lic. # 10849

SEANABARGER & LANE
 8726 TOWN & COUNTRY BLVD
 SUITE 201
 GREENBELT CITY, MARYLAND 21038



Wof And 27 08/20/06 10:06 a:19:46/13064.dwg



AS-BUILT
[Signature]
 G. COLON SHAW, REGISTERED DATE
 PROF. LS #10049

SEANABERGER & LANE
 8726 TOWN & COUNTRY BLVD.
 SUITE 201
 FALLS CHURCH CITY, MARYLAND 22041

12-3-91
 Date

Professional Engr. No. 10551

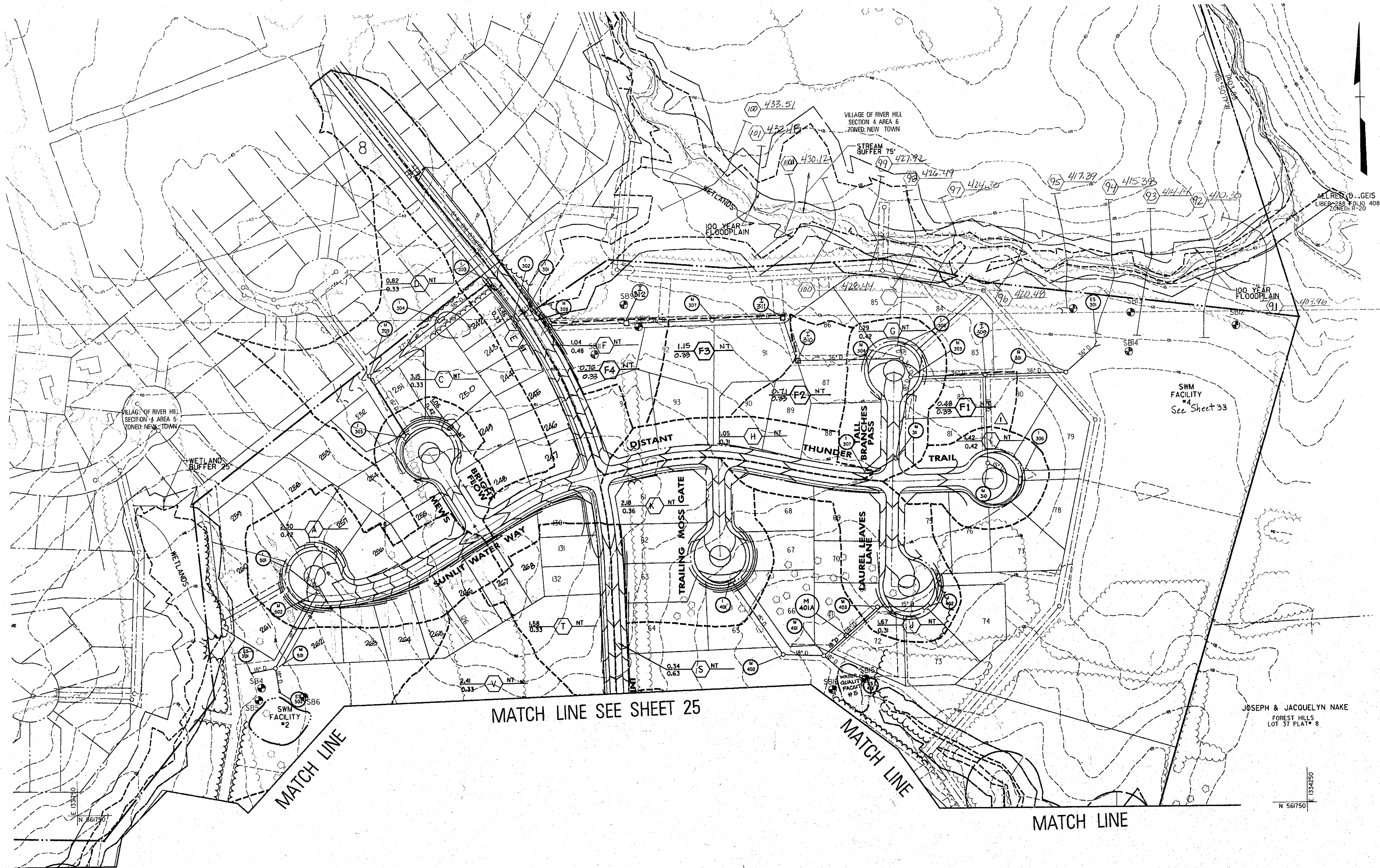
APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS		<i>[Signature]</i> 5-22-97 CHIEF, BUREAU OF HIGHWAYS DATE	
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING		<i>[Signature]</i> 7/10/97 CHIEF, DIVISION OF LAND DEVELOPMENT DATE	
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING		<i>[Signature]</i> 5/22/97 CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE	
8-10-70	Δ	REVISED RCP CL IV GD. TO HOPE GD.	
Date	No.	Revision Description	
VILLAGE OF RIVER HILL SECTION 4, AREA 4			
OWNER / DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORP. 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044			
DMW Daft McCune Walker, Inc. 200 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-3333 Fax 296-4705			
AREA SECTION 4 AREA 4 TAX MAP PARCEL ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND			
TITLE STORM DRAIN PROFILES			
Des By	RS	Scale 1" = 50'	Proj. No. 94064
Drn By	JEF	Date MAR 96	
Chk By	JWR	Approved	21 OF 44

N 563500
E 1334250

- LEGEND**
- ~ PROPOSED TREE LINE
 - EXISTING TREE LINE
 - 25% AND GREATER SLOPE
 - ▨ 15% - 24.99% SLOPE
 - - - LIMIT OF WETLANDS
 - - - 25' WETLANDS BUFFER
 - - - 100 YEAR FLOODPLAIN
 - - - 75' STREAM BUFFER

ACRES S ZONING

Note: Floodplain from Previously Approved Study by Whitney, Regan, and Assoc.



MATCH LINE SEE SHEET 25

MATCH LINE

MATCH LINE

MATCH LINE

MATCH LINE

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	
<i>Andrew M. Donahue</i> CHIEF, BUREAU OF HIGHWAYS	5-22-97 DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING	
<i>Col Hammit</i> CHIEF, DIVISION OF LAND DEVELOPMENT	2/6/97 DATE
<i>John R. ...</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	5/2/97 DATE
4/22/98	REVISION #1: RANDED DA NORTH DISTANT THUNDER TRAIL EAST INDIAN SUMMER DRIVE
Date	No. Revision Description

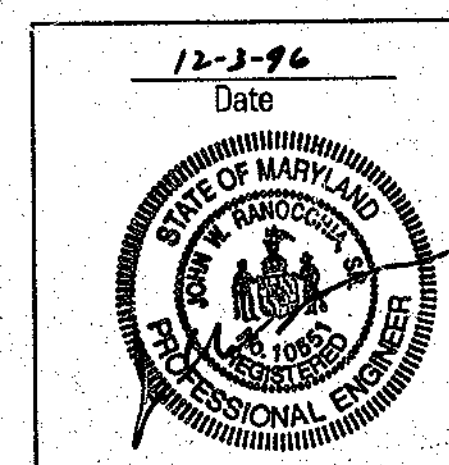
VILLAGE OF RIVER HILL
SECT. 4, AREA 4

OWNER / DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

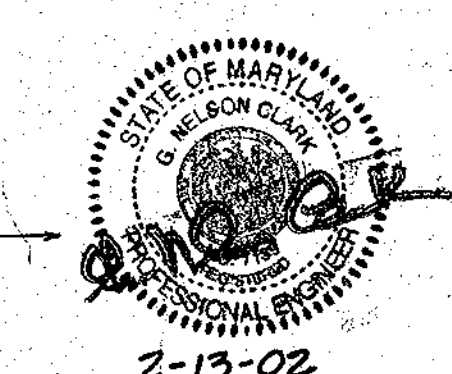
DMW
Daft-MoCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 290-3333
Fax 290-4708

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

AREA	SECTION 4 AREA 4		PARCEL 3,27,59
	TAX MAP 348.35	ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND	
TITLE	DRAINAGE AREA MAP & GRADING PLAN		
Des By	JWS	Scale 1" = 100'	Proj. No. 94064
Dm By	CEV	Date MAR 96	24 OF 44
Chk By	JWR	Approved	



Professional Engr. No. 10551



2-13-02

For CFS Revision Only

2	Add Manhole 401A to Plan View, Correct Location of WQ Facility #5	Feb 11, 2002	CF#5
NR:	Revisions	Date:	By:

FR Nov 22 14:43:38 1996 d:\pwork\1996\06-01

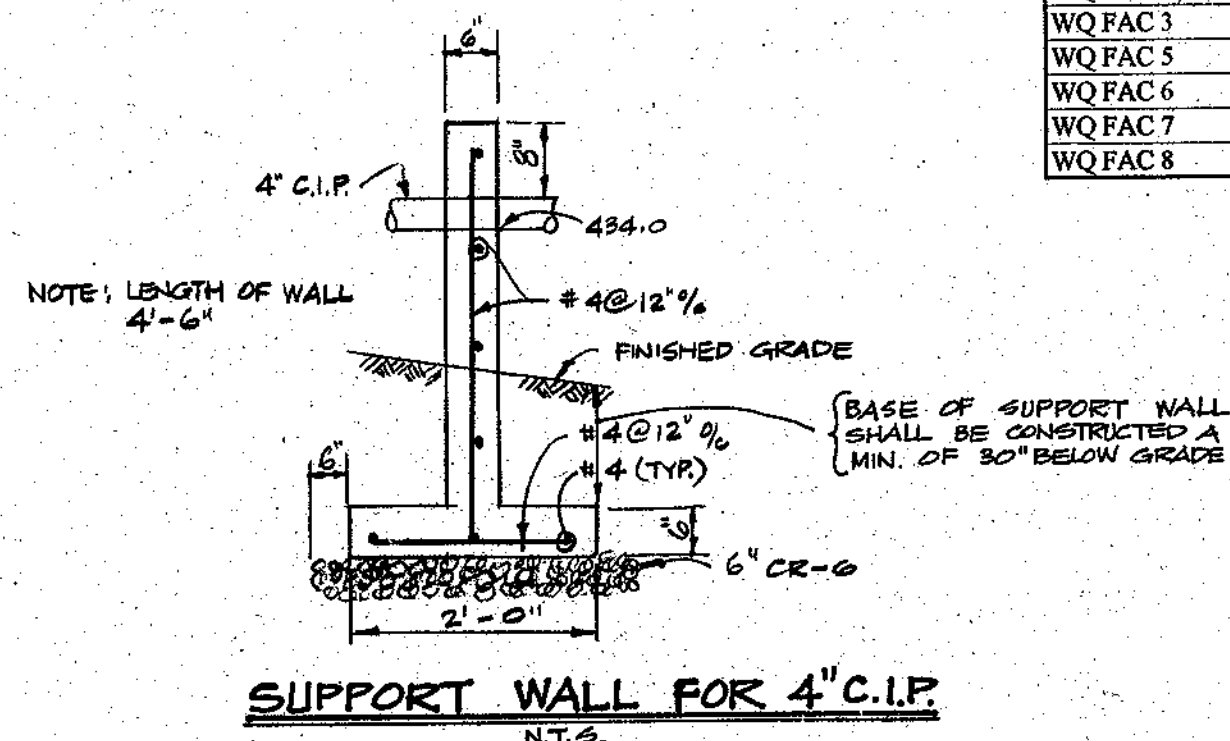
F-96-130

NOTE: FACILITIES 1 AND 2 SHALL BE JOINTLY MAINTAINED BY HOWARD CO. AND COLUMBIA ASSOCIATION

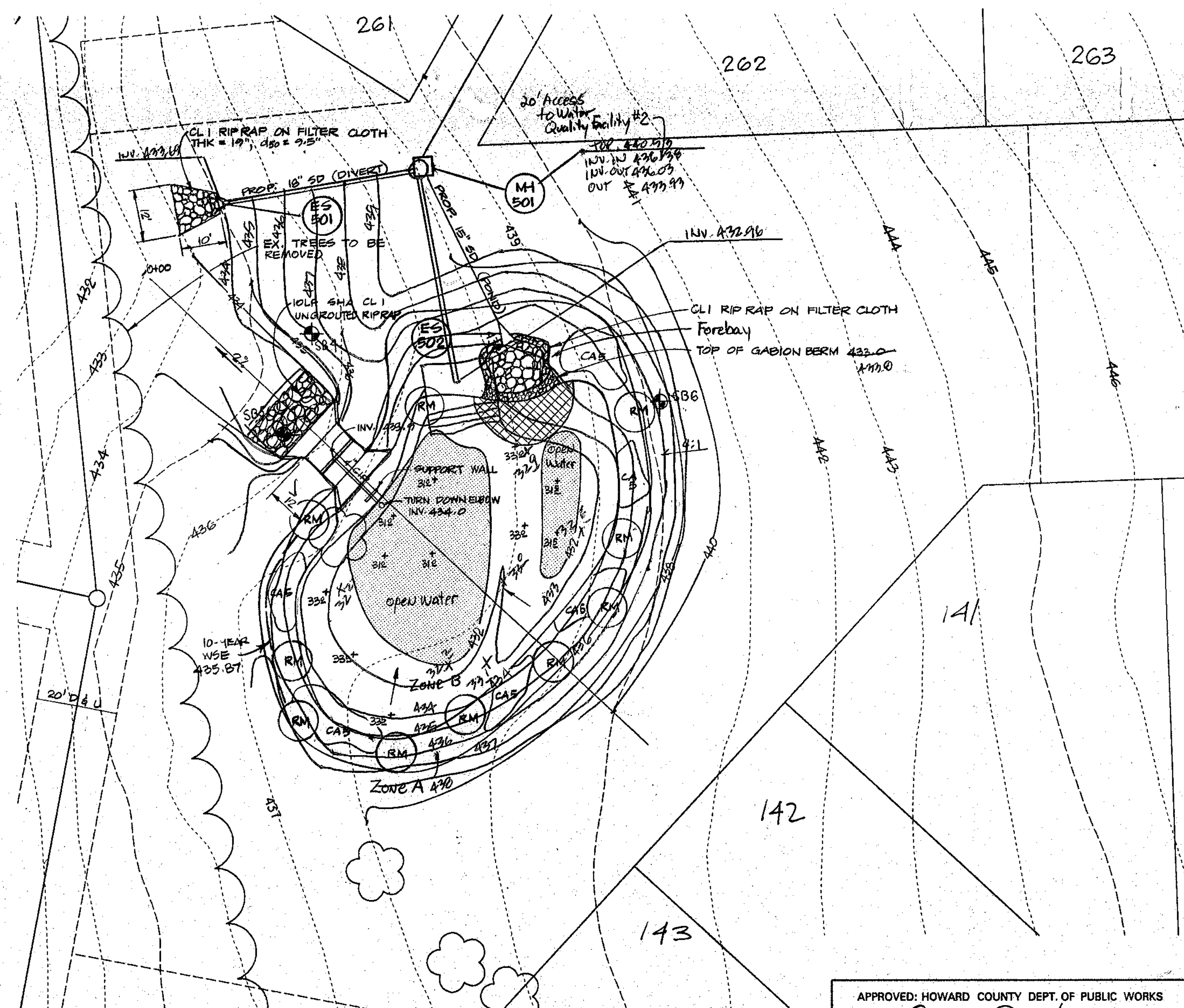


BIO-RETENTION WATER QUALITY FACILITY # 1

SCALE: 1" = 20'
HAZARD CLASS "A"



SUPPORT WALL FOR 4" C.I.P.
N.T.S.



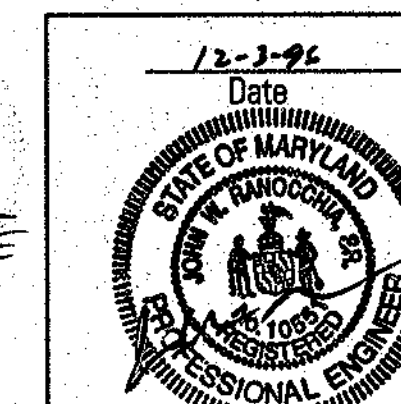
SHALLOW MARSH
WATER QUALITY FACILITY # 2

SCALE: 1" = 20'
HAZARD CLASS "A"

NOTE: FOR BORING LOG INFORMATION SEE SHT. 27 OF 44

	SUMMARY TABLE			
	FOREBAY VOLUME CU FT	WATER QUAL. VOL. CU FT	SA SQ. FT.	WATER QUAL. ELEV. FT
WO FAC 1	630	3462		411.4
WO FAC 2	130	4765	4765	MARSH EL = 434
WO FAC 3	432	1938		399.8
WO FAC 5	220	1166		430
WO FAC 6	270	882		408.9
WO FAC 7	230	1035		389.8
WO FAC 8	270	1005		376

AS-BUILT
SEANBERGER & LANE
876 TOWN & COUNTRY BLVD.
SUITE 201
BELTSVILLE CITY, MARYLAND 21053



APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

Stephen M. Ducker
CHIEF, BUREAU OF HIGHWAYS 412
DATE 5-22-97

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

C. H. ...
CHIEF, DIVISION OF LAND DEVELOPMENT TC
DATE 7/10/97

...
CHIEF, DEVELOPMENT ENGINEERING DIVISION
DATE 5/2/97

6/5/98 LOT'S ADJUSTED

Date	No.	Revision Description

VILLAGE OF
RIVER HILL
SECTION 4, AREA 4

OWNER /DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

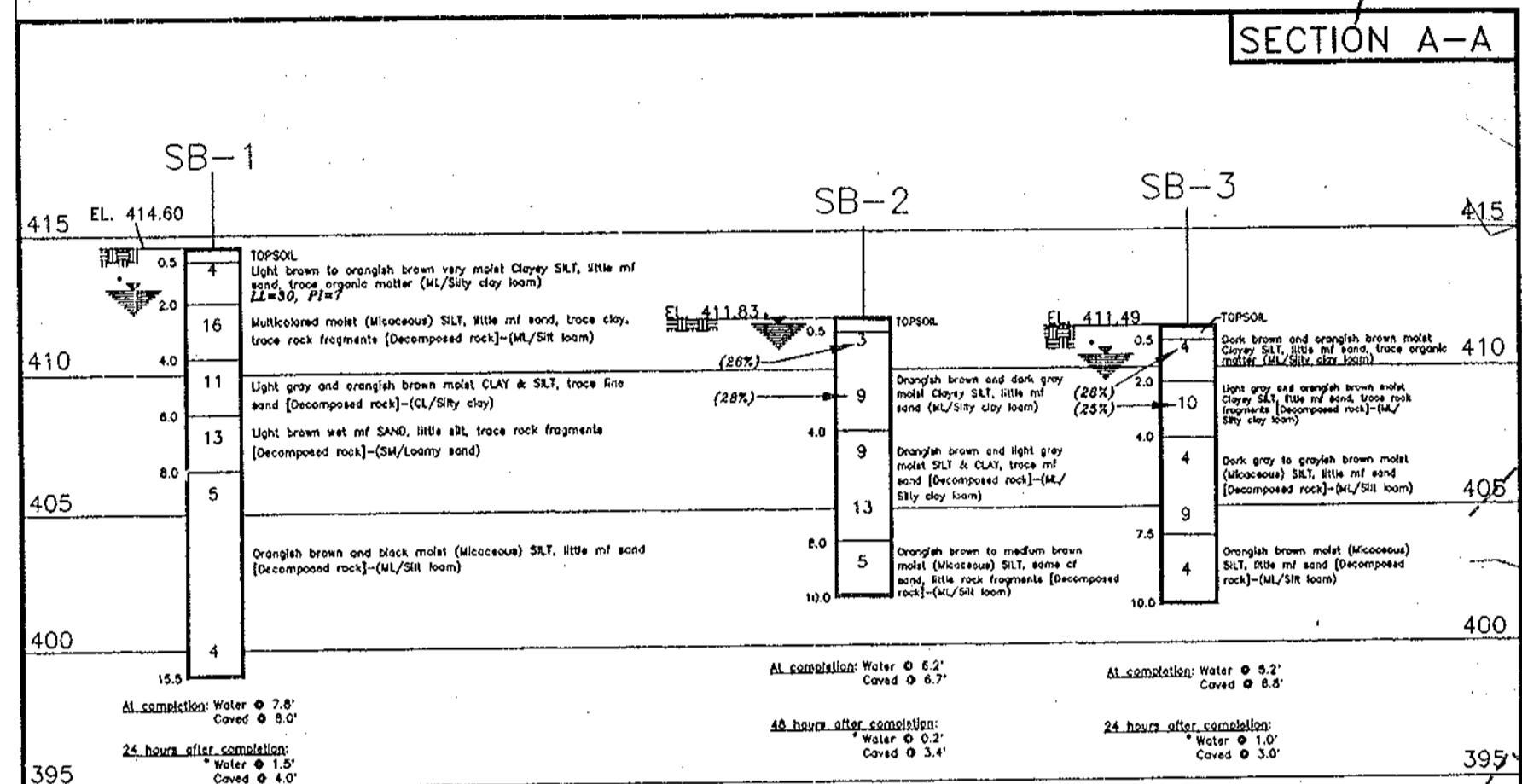
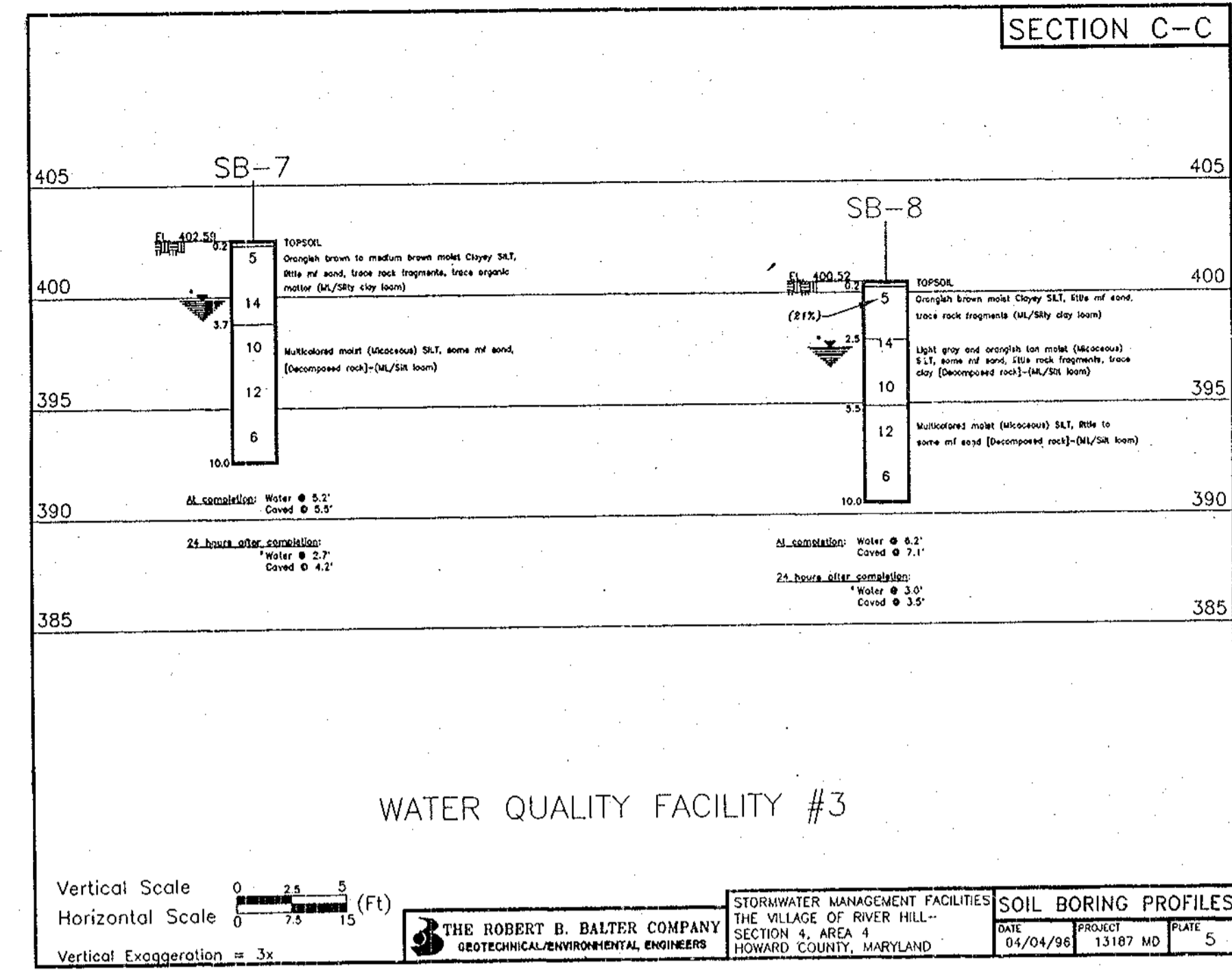
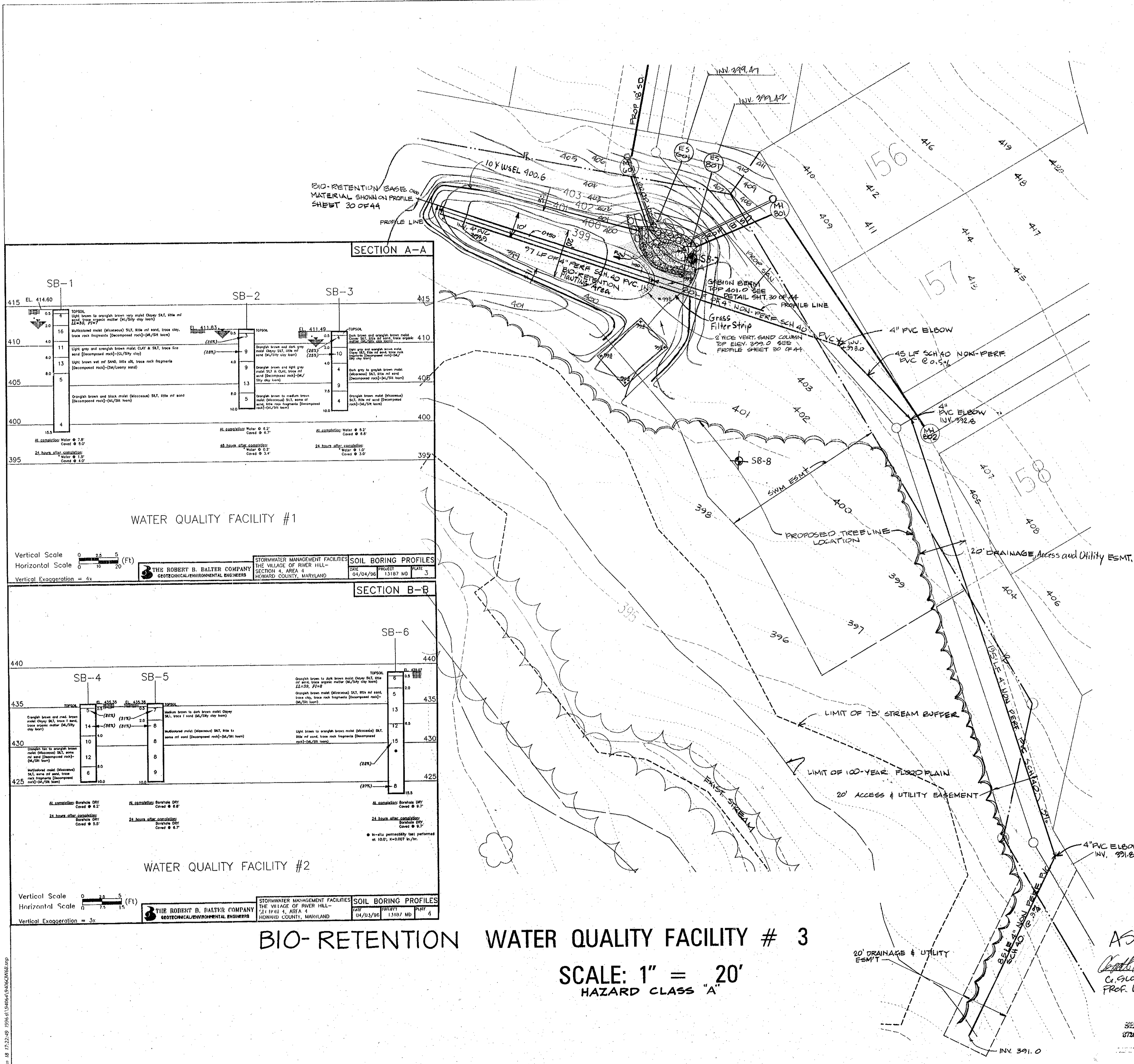
DMW
Date 12-3-96
A Team of Land Planners,
Landscape Architects,
Engineers, Surveyors &
Environmental Professionals

AREA SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE WATER QUALITY FACILITIES #1 & 2

Des By	Scale 1" = 20'	Proj. No. 94064
Dim By	Date NOV 96	
Chk By JWR	Approved	26 OF 44

Professional Engr. No. 10551

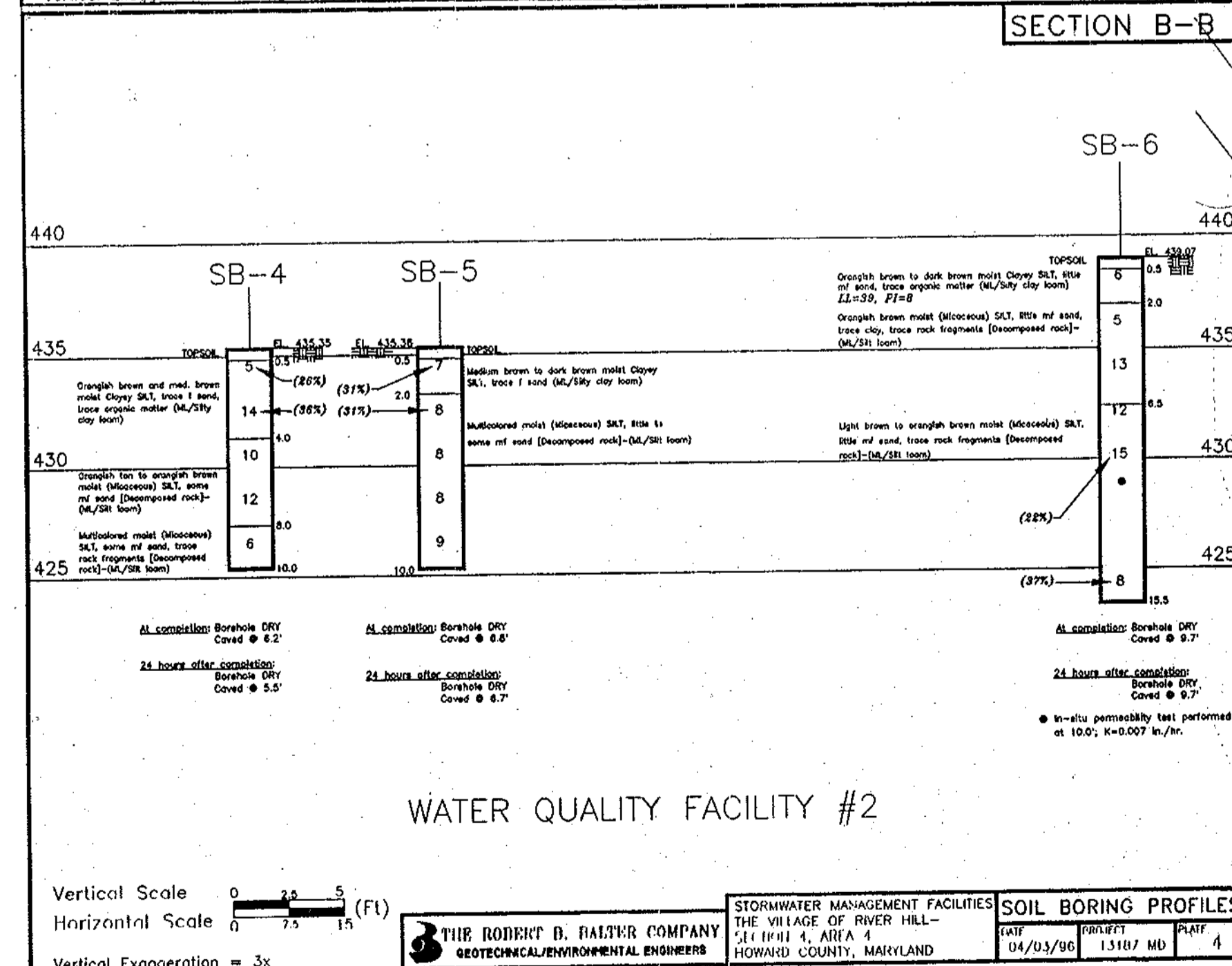


THE ROBERT B. BALTER COMPANY
GEOTECHNICAL/ENVIRONMENTAL ENGINEERS

STORMWATER MANAGEMENT FACILITIES
THE VILLAGE OF RIVER HILL
SECTION 4, AREA 4
HOWARD COUNTY, MARYLAND

SOIL BORING PROFILES

DATE: 04/04/96 PROJECT: 13187 MD PLATE: 3



THE ROBERT B. BALTER COMPANY
GEOTECHNICAL/ENVIRONMENTAL ENGINEERS

STORMWATER MANAGEMENT FACILITIES
THE VILLAGE OF RIVER HILL
SECTION 4, AREA 4
HOWARD COUNTY, MARYLAND

SOIL BORING PROFILES

DATE: 04/03/96 PROJECT: 13187 MD PLATE: 4

BIO-RETENTION WATER QUALITY FACILITY # 3

SCALE: 1" = 20'

HAZARD CLASS "A"

NOTE: FACILITY #3 SHALL BE JOINTLY MAINTAINED BY HOWARD COUNTY AND COLUMBIA ASSOCIATION

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

Andrew M. Deneke 5-22-97
CHIEF, BUREAU OF HIGHWAYS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

C. Hamilton 7/10/97
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

M. D. ... 5/21/97
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

Date No. Revision Description

VILLAGE OF RIVER HILL
SECTION 4, AREA 4

OWNER /DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

IDMW
1340 McCune Walkers, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 286-3332
Fax 296-4705

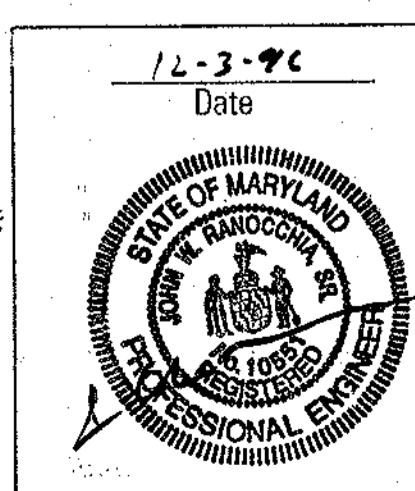
A Team of Land Planners,
Landscape Architects,
Engineers, Surveyors &
Environmental Professionals

AREA SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE

Des By Scale 1" = 20' Proj. No. 94064
Dwn By Date MAR 96
Chk By JWR Approved 27 OF 44

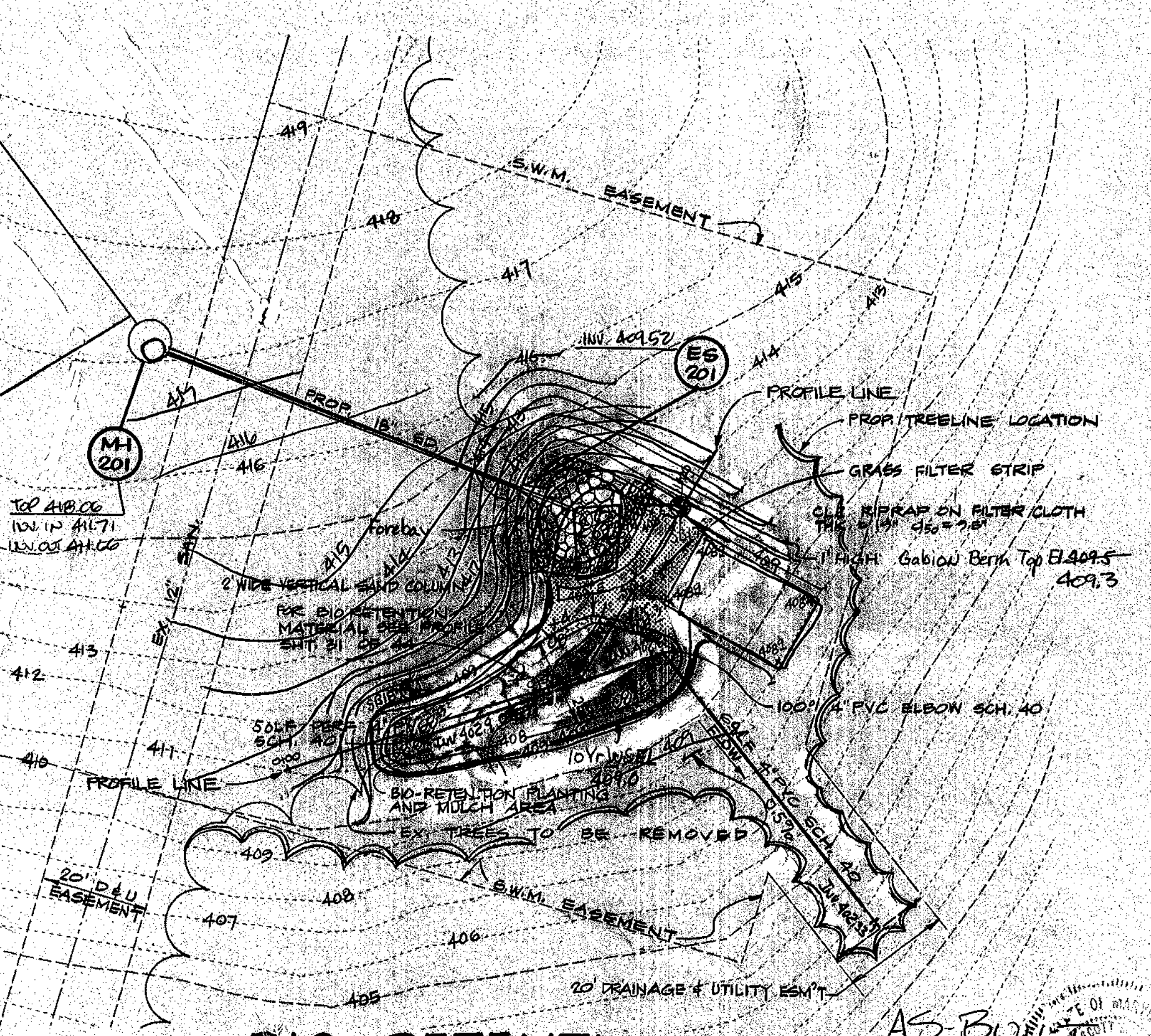
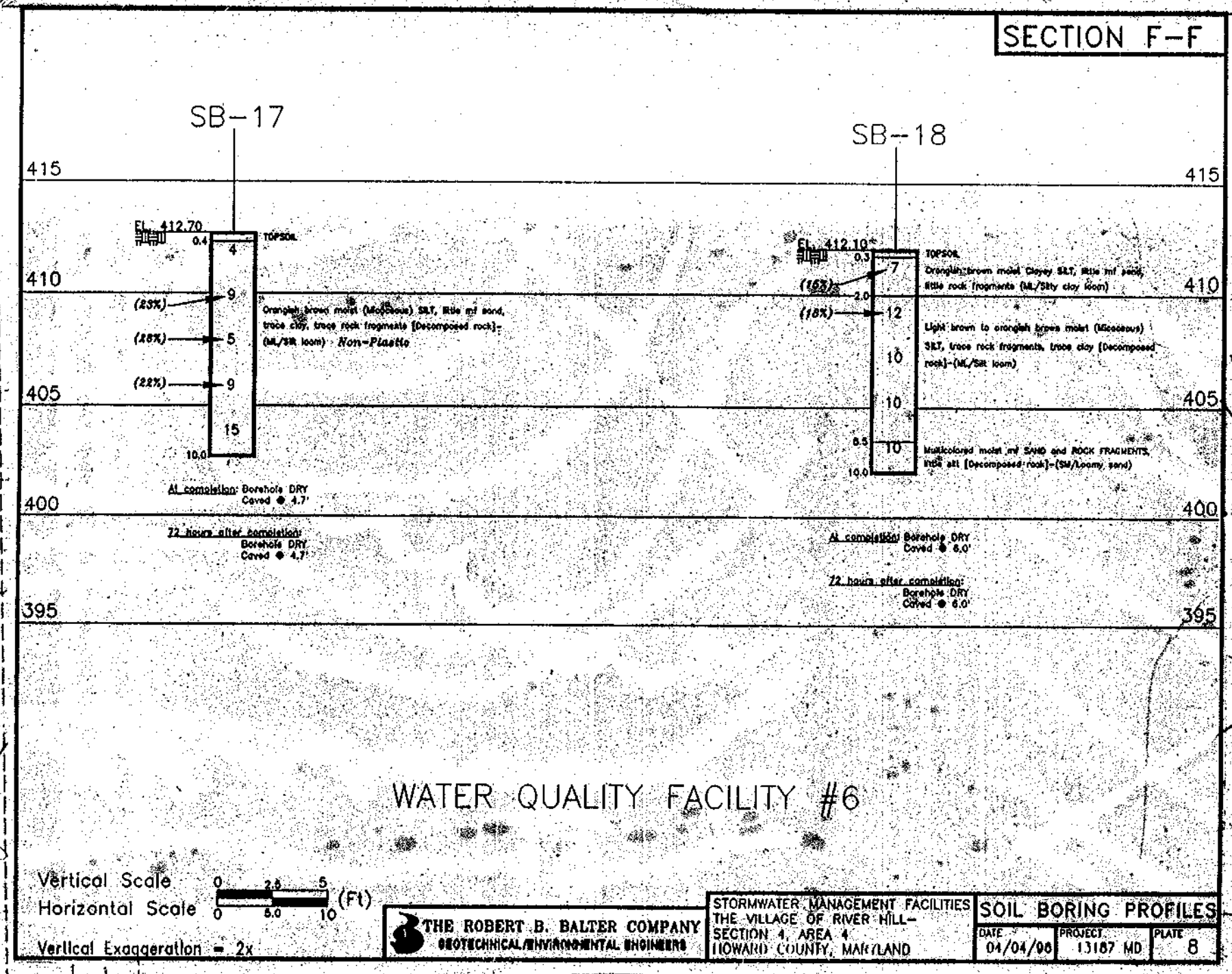
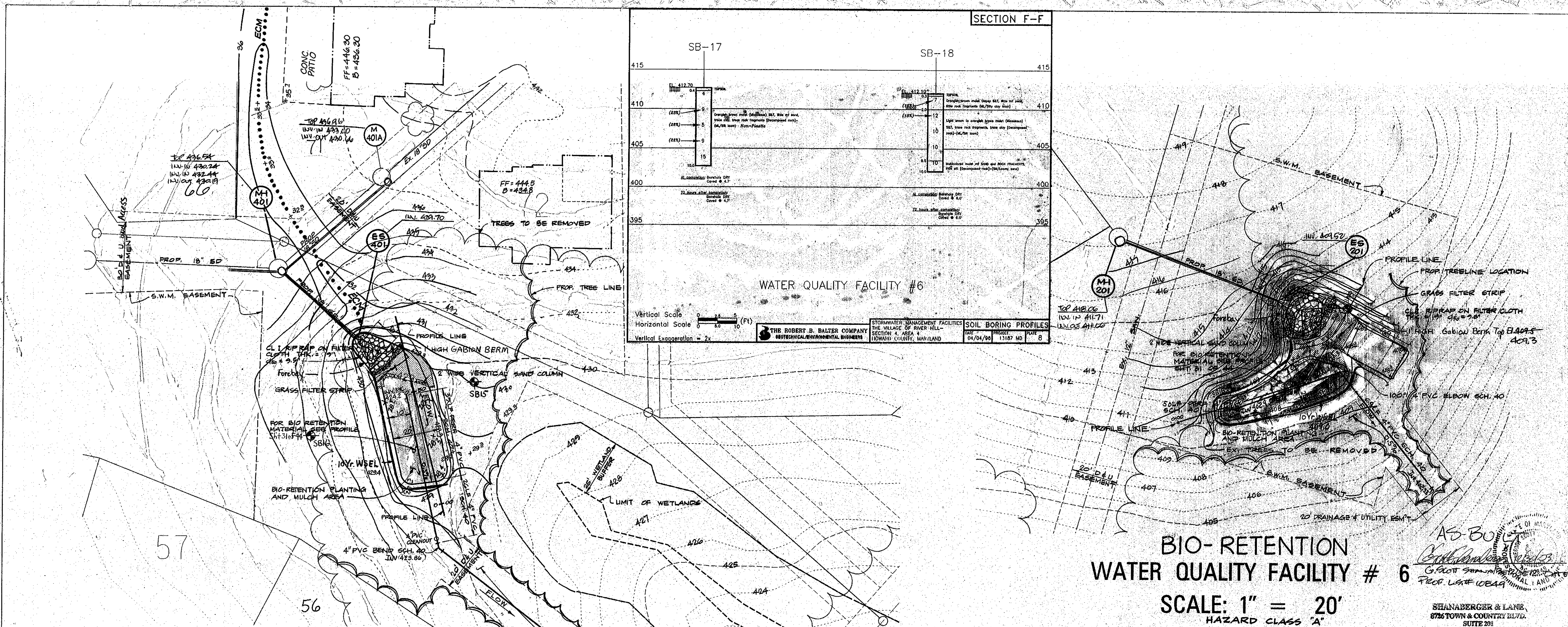
Professional Engr. No. 10551



AS-BUILT

C. G. ...
DATE
PROF. LICENSE NO. 10284

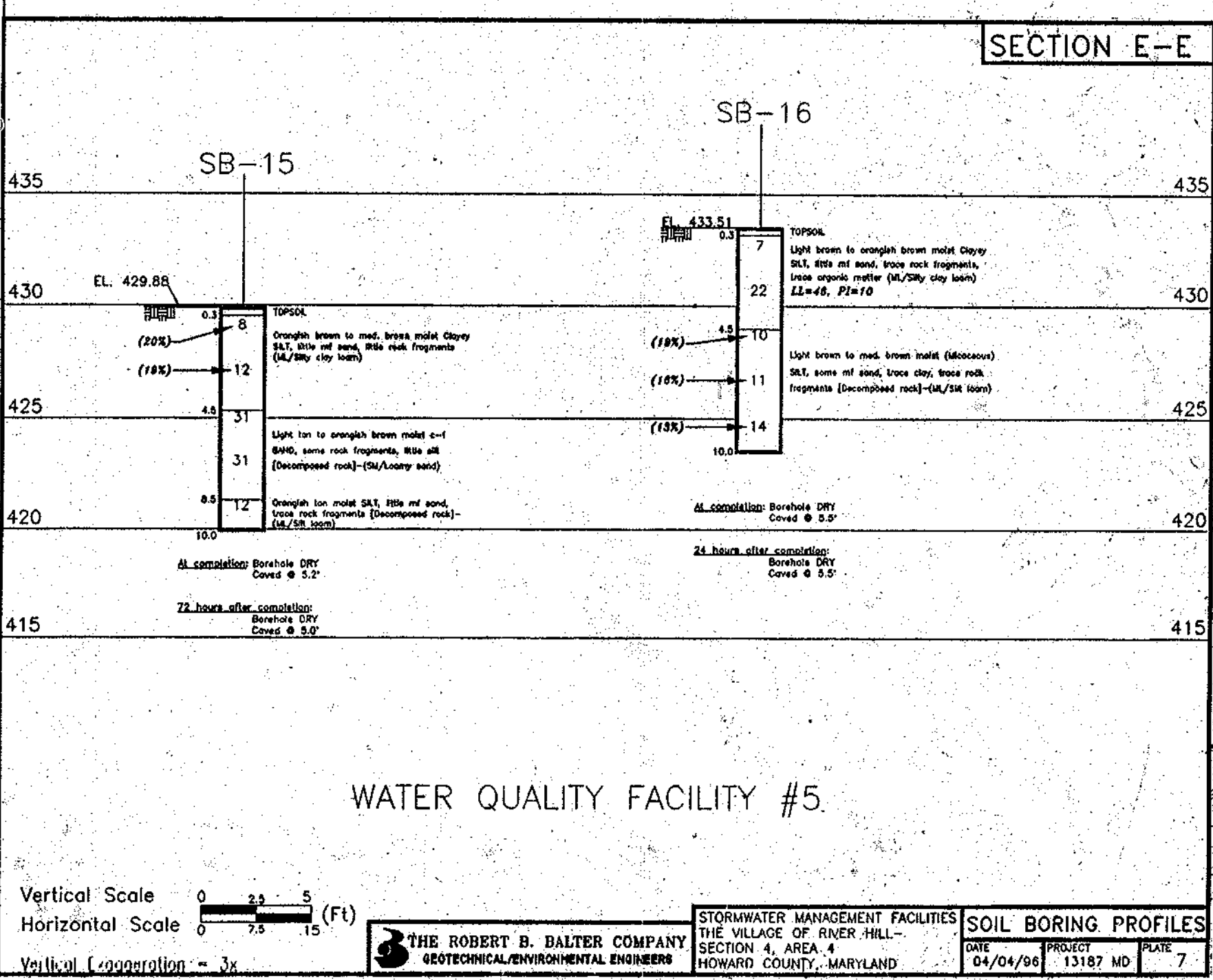
SEANABERGER & LANE
3726 TOWN & COUNTRY BLVD.
SUITE 301
CROFTON, MARYLAND 21114



**BIO-RETENTION
WATER QUALITY FACILITY # 6**

SCALE: 1" = 20'
HAZARD CLASS "A"

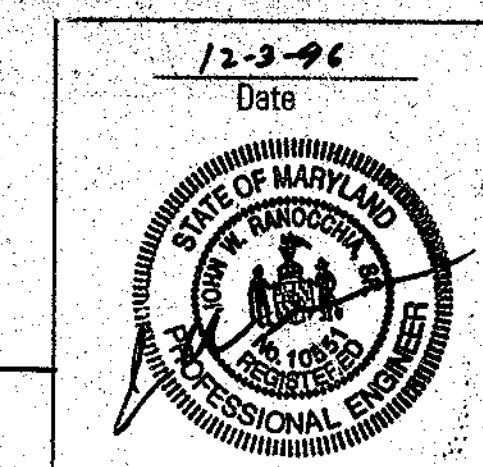
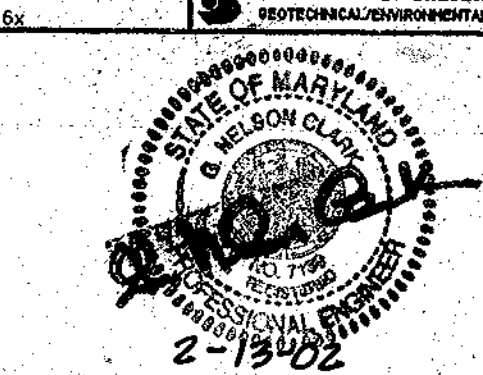
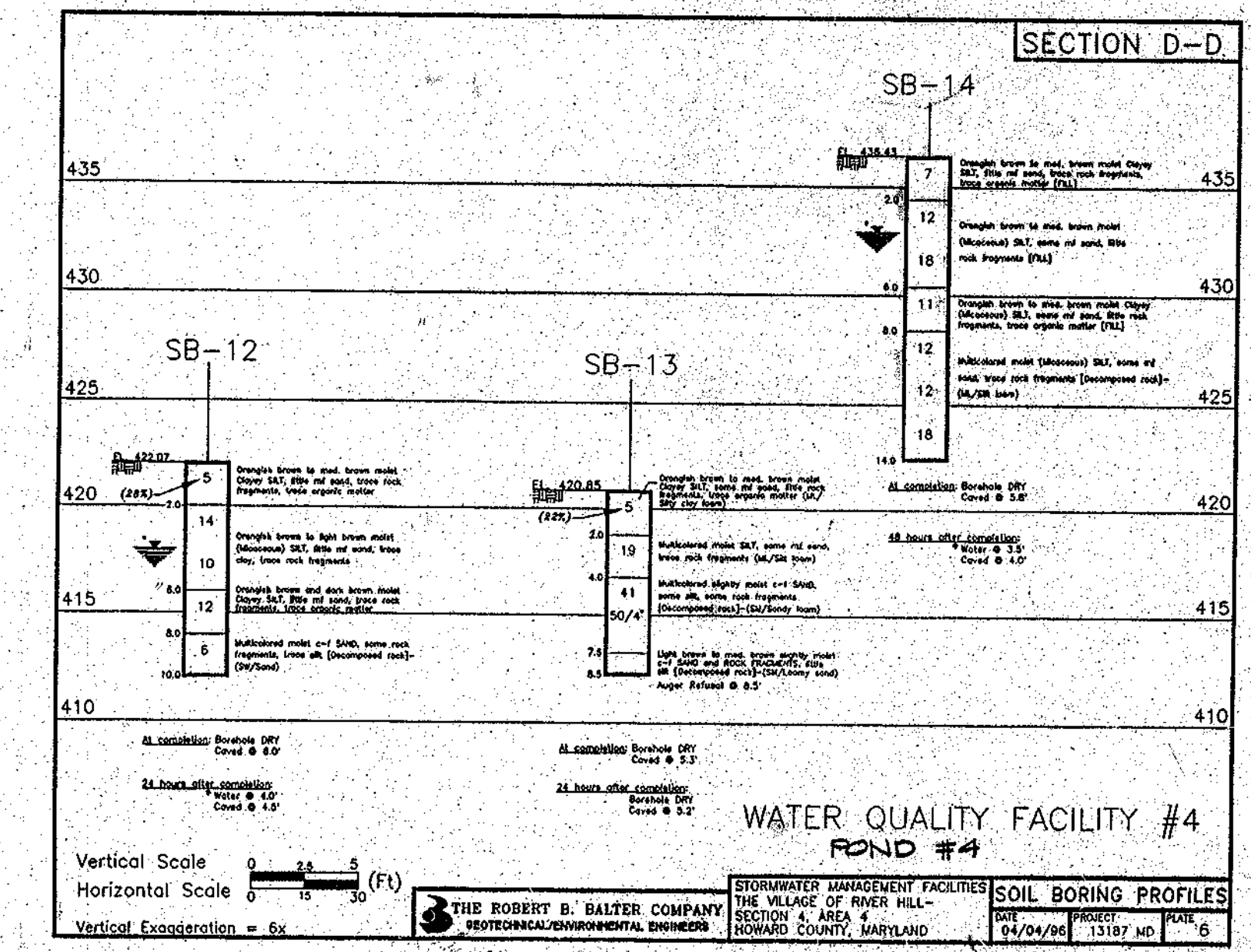
AS-BUILT
SHANBERGER & LANE,
6726 TOWN & COUNTRY BLVD.,
SUITE 201
BELTSVILLE CITY, MARYLAND 21051



BIO-RETENTION WATER QUALITY FACILITY # 5

SCALE: 1" = 20'
HAZARD CLASS "A"

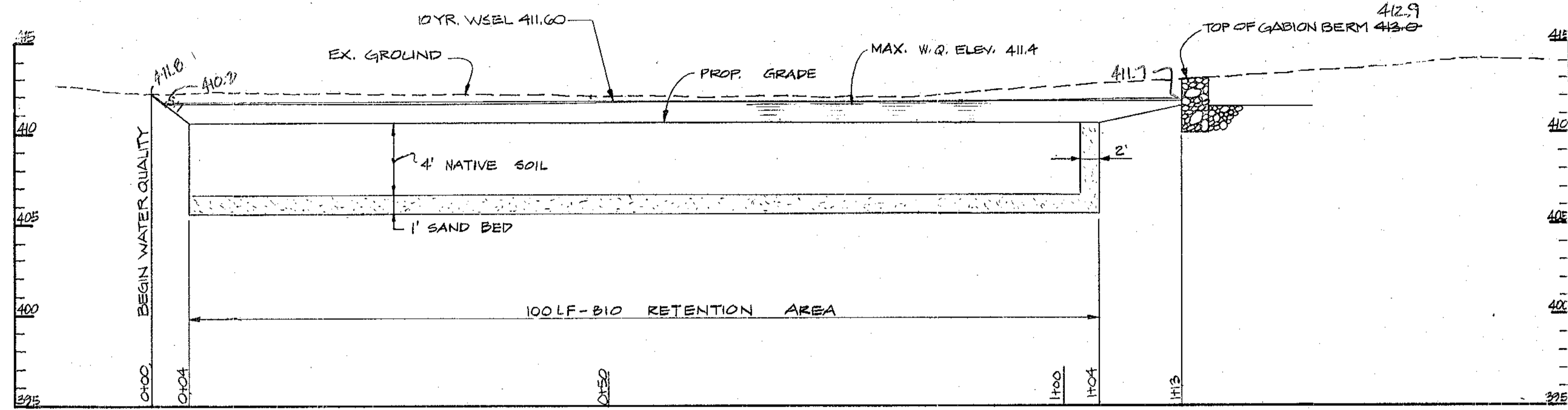
NOTE: FACILITIES #5 AND #6 SHALL BE JOINTLY MAINTAINED BY HOWARD COUNTY AND COLUMBIA ASSOCIATION



No.	Revisions	Date	By
1	Add Existing Home & Grading to Lot 72 Add Existing Home & Proposed Grading to Lot 71 Add Manhole 401 A to Plan View Revise Grad For Water Quality Facility #5	Feb 13, 2002	CF/BS

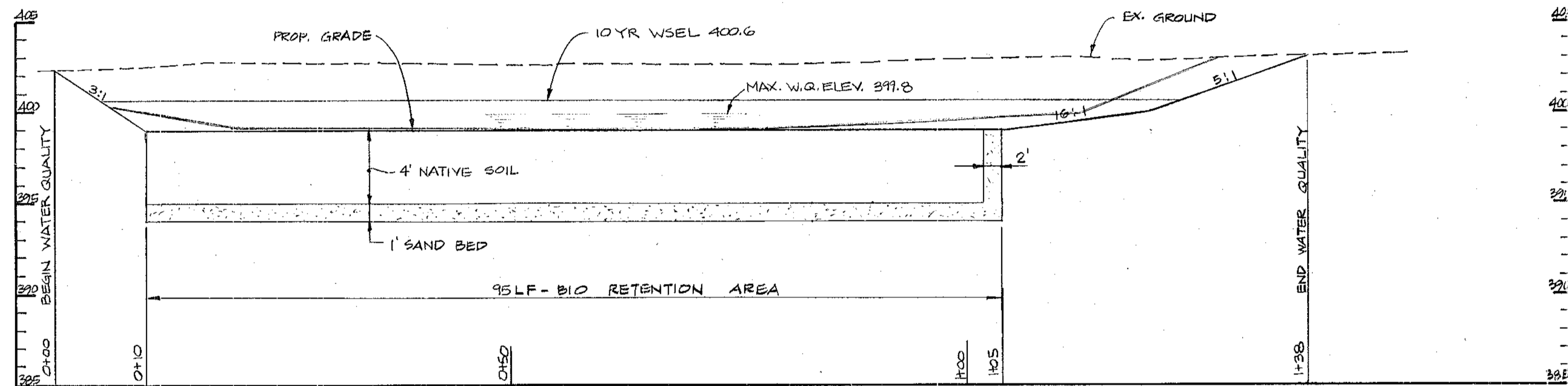
APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS		5-22-97	
Chief, Bureau of Highways		DATE	
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING		7/10/97	
Chief, Division of Land Development		DATE	
APPROVED: CHIEF, DEVELOPMENT ENGINEERING DIVISION		5/27/97	
DATE		DATE	
Date	No.	Revision Description	
VILLAGE OF RIVER HILL SECTION 4, AREA 4			
OWNER / DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORP. 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044			
DMW Dan McCune/Walker, Inc. 300 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-3338 Fax: 296-4706			
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals			
AREA	SECTION 4 AREA 4		
TITLE	TAX MAP ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND		
Des By	Scale	1" = 20'	Proj. No. 94064
Des By	Date	MAR 96	
Chk By	Approved	JWR	28 OF 44

NOTE: P.V.C. PIPES NOT SHOWN FOR CLARITY, SEE PLAN VIEW FOR LOCATIONS.



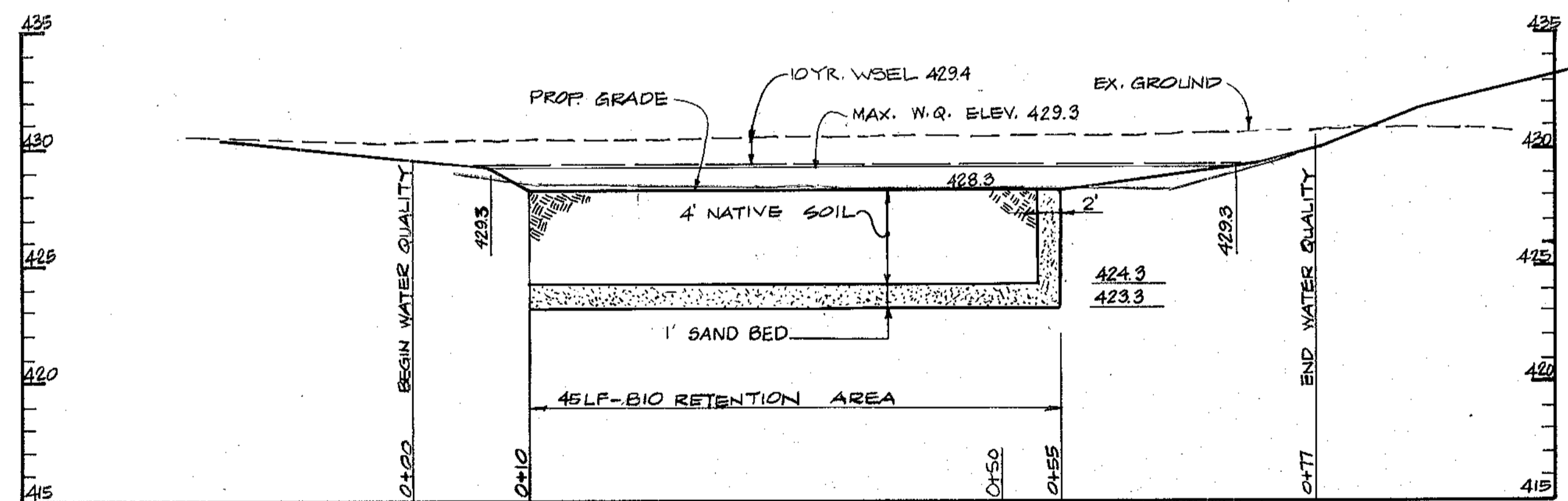
PROFILE WATER QUALITY #1

SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'



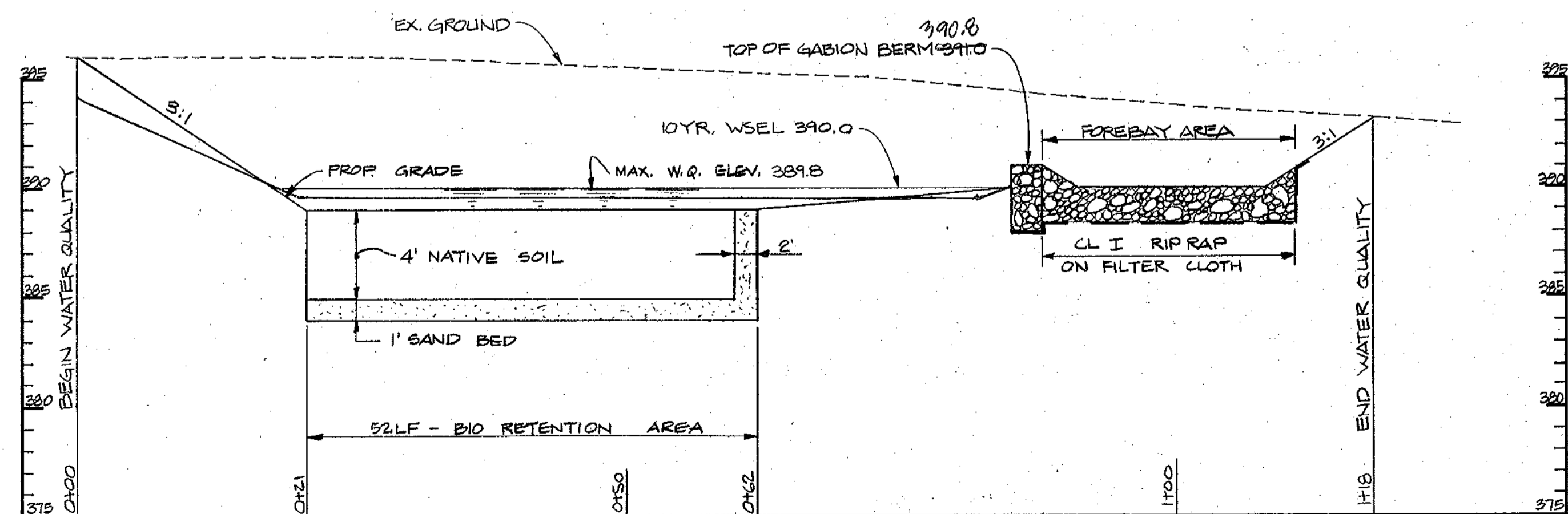
PROFILE WATER QUALITY #3

SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'



PROFILE WATER QUALITY #5

SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'



PROFILE WATER QUALITY #7

SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Richard M. Daniels 5-22-97
CHIEF, BUREAU OF HIGHWAYS NS DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
John Hammit 7/19/97
CHIEF, DIVISION OF LAND DEVELOPMENT TC DATE

William J. ... 8/21/97
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

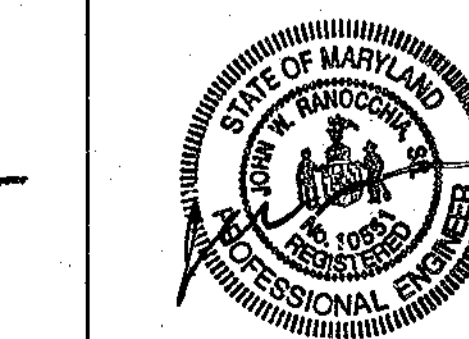
Revision Description
Date No. Revision Description
VILLAGE OF RIVER HILL SECTION 4, AREA 4

OWNER /DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

AS-BUILT
William J. ...
Prof. No. # 10849

SEANBERGER & LANE
3726 TOWN & COUNTRY BLVD.
SUITE 201
LIMSBURY CITY, MARYLAND 21092

12-3-96
Date



DMW
Dan McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 286-3333
Fax 296-4705
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

AREA SECTION 4 AREA 4
TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND
TITLE WATER QUALITY PROFILES

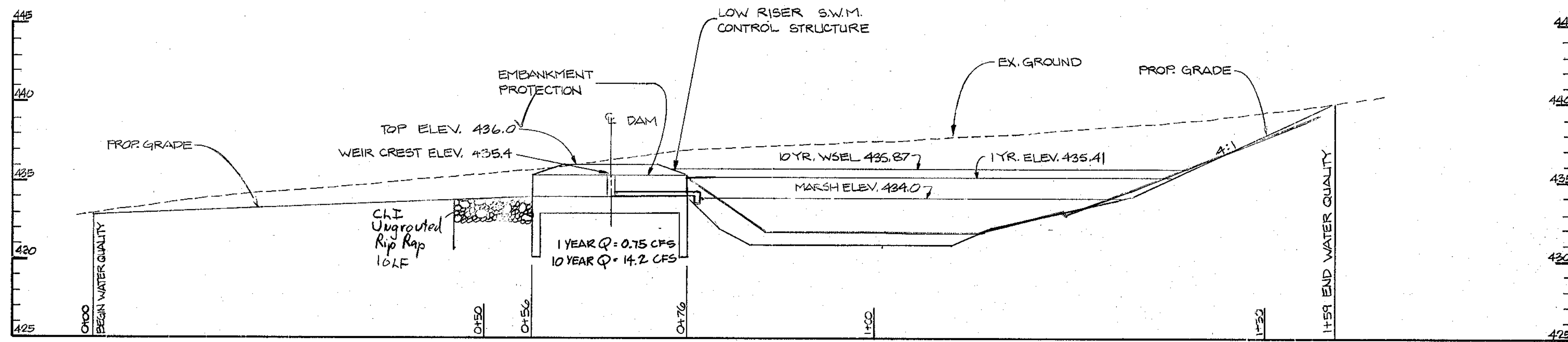
Des By Scale 1" = 10' HORIZ 1" = 5' VERT. Proj. No. 94064
Dm By Date 30 OF 44
Chk By Approved

1	Revise Water Quality Facility #5 Profile	Feb. 11, 2002	CFJS
N2:	Revisions	Date:	By:

For CFS Revision Only

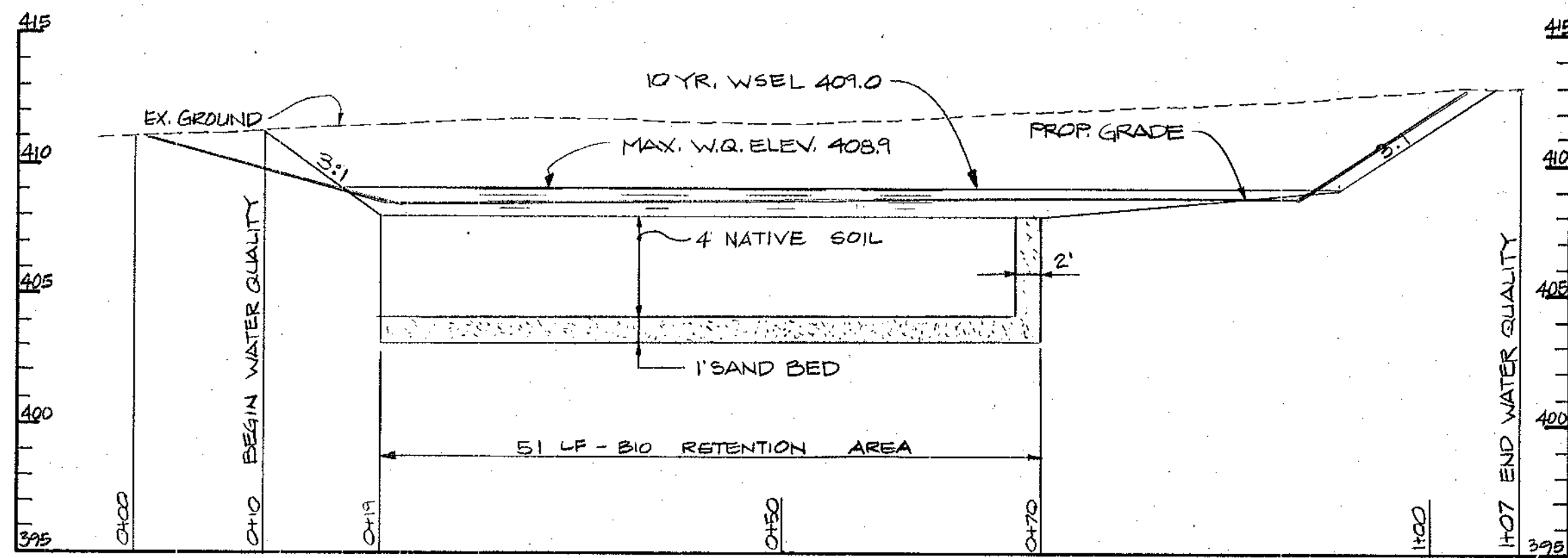
William J. ...
2-13-02

Professional Engr. No. 10551



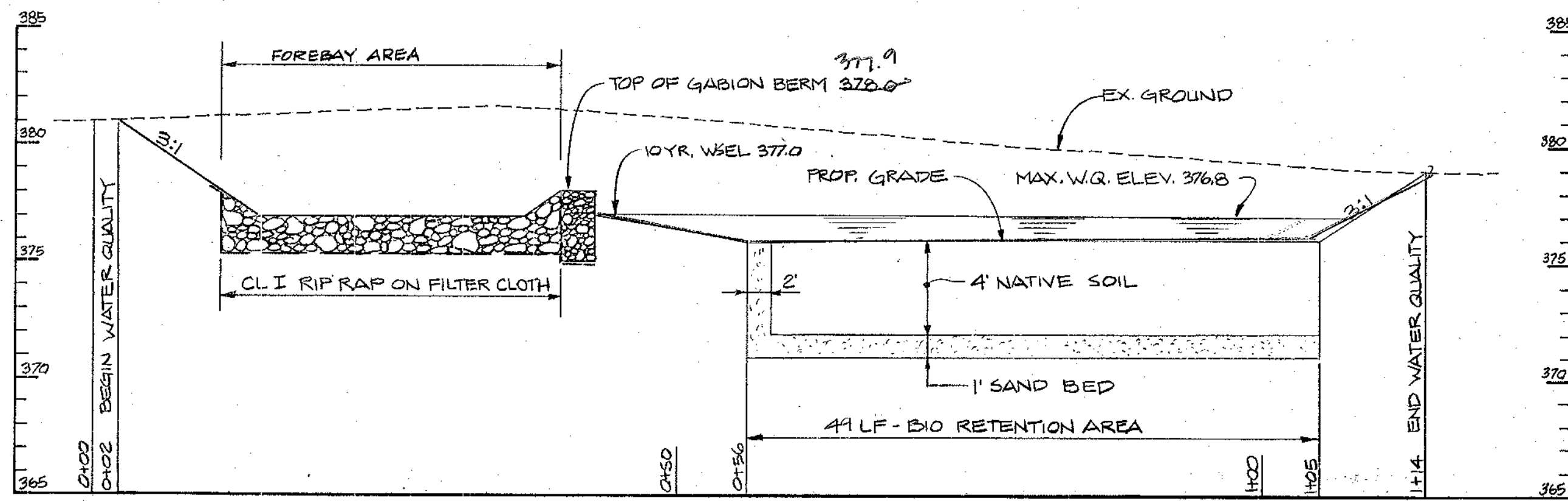
PROFILE STORMWATER MANAGEMENT / WATER QUALITY # 2

SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'



PROFILE WATER QUALITY # 6

SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'



PROFILE WATER QUALITY # 8

SCALE: HORIZ. 1" = 10'
VERT. 1" = 5'

**OPERATION AND MAINTENANCE SCHEDULE
BIO-RETENTION**

ROUTINE MAINTENANCE (PRIVATE)

1. Facility shall be inspected annually and after major storms. Inspections should be performed during wet weather to determine if the pond is functioning properly.
2. The area outside the Bio-Retention area shall be mowed a minimum of two (2) times a year, once in June and once in September. Vegetation shall not exceed 18 inches in height at any time.
3. Debris and litter shall be removed during regular mowing operations and as needed. Silt shall be removed from the forebay and marsh area when accumulation exceeds four (4) inches.
4. Visible signs of erosion, seepage, sliding, or slumping shall be reported to the Howard County Department of Public Works as soon as it is noticed.
5. Rip-Rap to be inspected and repaired as necessary after each storm event.

NON-ROUTINE MAINTENANCE (PUBLIC)

1. Corrective maintenance to the forebay shall be done if standing water remains more than 60 hours after a rainfall event.
2. Corrective maintenance to the facility drains shall be done whenever standing water remains in the bio-retention area for more than 72 hours after a rainfall event.

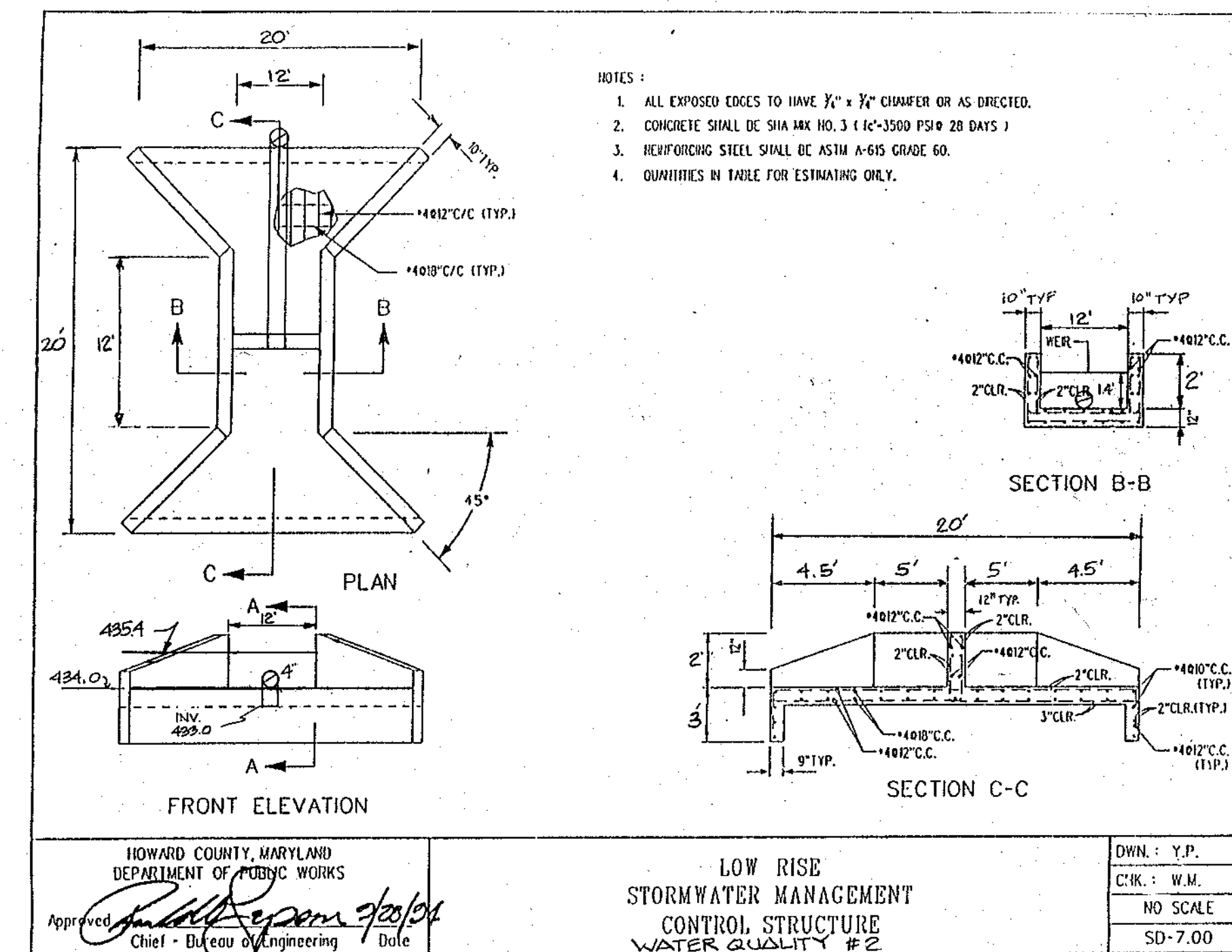
**OPERATION AND MAINTENANCE SCHEDULE
SHALLOW MARSH**

ROUTINE MAINTENANCE (PRIVATE)

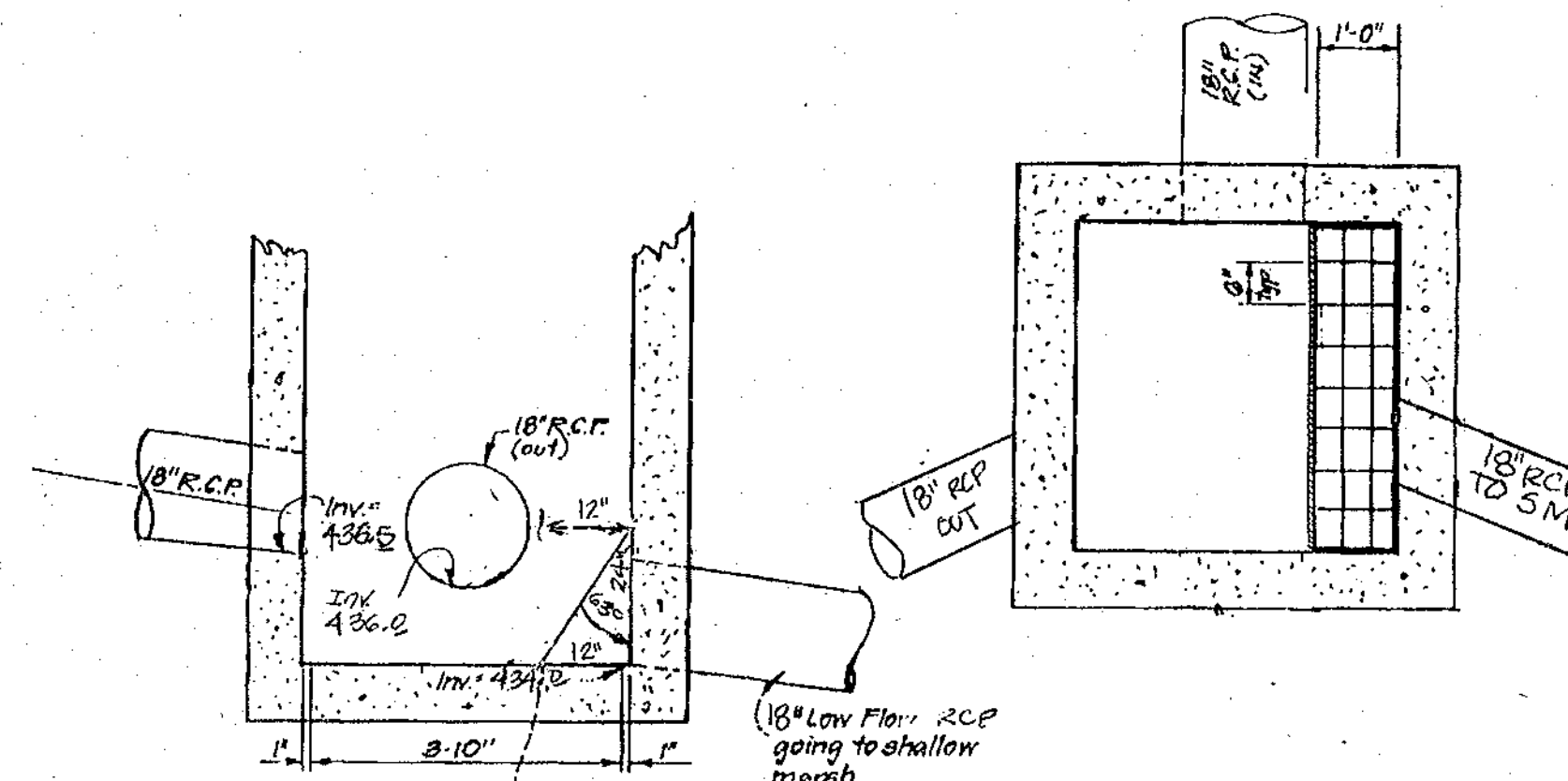
1. Facility shall be inspected annually and after major storms. Inspections should be performed during wet weather to determine if the pond is functioning properly.
2. Top and side slopes of the embankment above the normal pool shall be mowed a minimum of two (2) times a year, once in June and once in September. Other side slopes should be mowed as needed. Vegetation shall not exceed 18 inches in height at any time.
3. Debris and litter shall be removed during regular mowing operations and as needed. Silt shall be removed from the forebay and marsh area when accumulation exceeds four (4) inches.
4. Visible signs of erosion in the pond as well as rip rap outlet area shall be repaired as soon as it is noticed.
5. Rip-Rap to be inspected and repaired as necessary after each storm event.

NON-ROUTINE MAINTENANCE (PUBLIC)

1. Structural components of the pond such as the dam, gabiion structures, and the pipes shall be repaired upon the detection of any damage. The components should be inspected during routine maintenance operations.
2. Sediment should be removed from the pond no later than when the capacity of the pond is half full of sediment, when deemed necessary for aesthetic reasons, or when deemed necessary by the Howard County Department of Public Works.



NOTE: P.V.C. PIPES NOT SHOWN FOR CLARITY, SEE PLAN VIEW FOR LOCATIONS



DETAIL MH 501

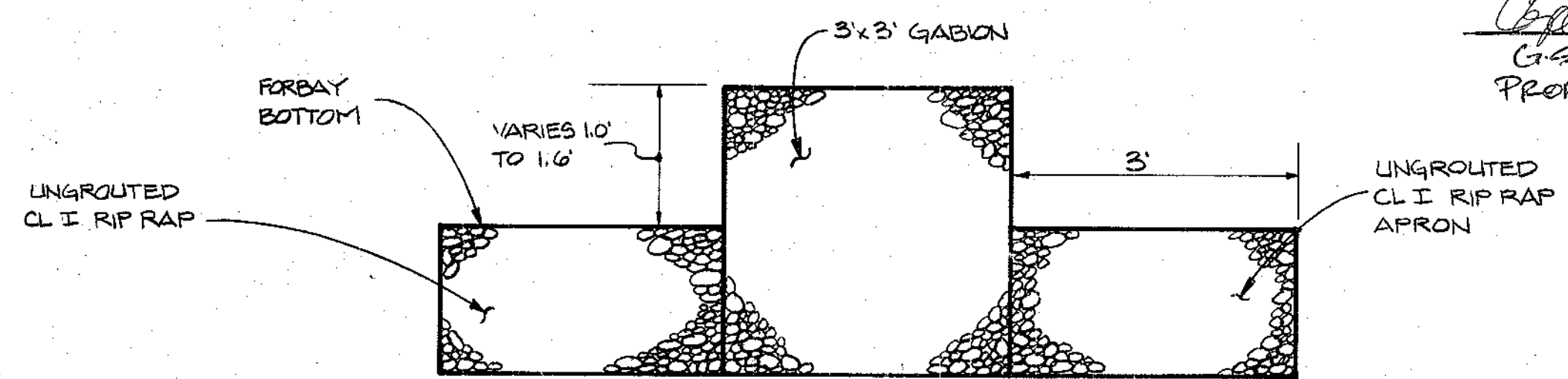
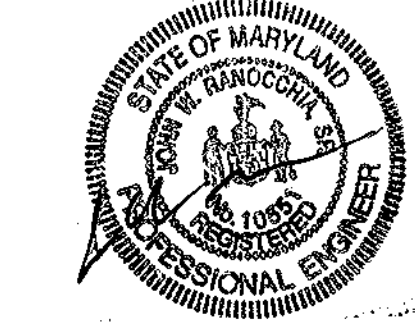
- TRASH RACK NOTES**
- 1) Removable trash rack is to be placed on the bolted angle and is to rest against the side of the structure at a 60° angle as shown. Removal of the trash rack will allow access to the bottom of the structure for maintenance.
 - 2) Trash racks are to lay angled as shown to prevent accumulation of debris in front of the outgoing shallow marsh pipe.
 - 3) 3"x3" L's to be placed 1 ft. back from the structure side wall.
 - 4) All rebar to be #5 at 8" unless otherwise noted.
 - 5) All rebar to be galvanized after fabrication and painted Battleship Gray.

AS-BUILT

[Signature]
C. Goodman
PROF. L.S.# 10849

SEANBERGER & LANE
6126 TOWN & COUNTRY BLVD.
SUITE 201
COLUMBIA, MARYLAND 21044

12-3-96
Date



**WATER QUALITY FACILITIES
GABION BERM**

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS	
<i>[Signature]</i> CHIEF, BUREAU OF HIGHWAYS	5-22-97 DATE
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING	
<i>[Signature]</i> CHIEF, DIVISION OF LAND DEVELOPMENT	7/10/97 DATE
<i>[Signature]</i> CHIEF, DEVELOPMENT ENGINEERING DIVISION	5/21/97 DATE
Date	No.
Revision Description	
VILLAGE OF RIVER HILL SECTION 4, AREA 4	
OWNER / DEVELOPER:	
THE HOWARD RESEARCH & DEVELOPMENT CORP. 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044	
DMW Duff-McCune-Walker, Inc. 200 East Pennsylvania Avenue Towson, Maryland 21286 (410) 296-5535 Fax 296-4705	
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals	
AREA	SECTION 4 AREA 4
TAX MAP	PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND	
TITLE WATER QUALITY PROFILES	
Des By	Scale 1" = 10' HORIZ. 1" = 5' VERT.
Drn By	Date
Chk By	Approved
Professional Engr. No. 10551	Proj. No. 94064 31 OF 44

I. GENERAL

A. Description

Work consists of all labor, materials, equipment and services necessary for and incidental to the execution and completion of TREES, SHRUBS AND GRASSES as indicated on the Drawings and specified herein.

Includes:

1. Furnishing of all plant material.
2. Soil preparation, planting operations, mulching and staking.
3. Maintenance and guarantee.

B. Quality Assurance

1. American Association of Nurserymen (A.A.N.): "American Standard for Nursery Stock", (A.N.S.I. Z60.1) as expanded herein.
2. Nomenclature: In accordance with HORTUS III by L. H. Bailey.
3. United States Department of Agriculture: Textural Classification Diagram for Soils.
4. National Arborist Association "Standard for Pruning of Shade Trees, Guying of Shade Trees, Fertilizing Shade and Ornamental Trees and Pesticides Application Operations."

C. Project Conditions

1. Planting Season: September 15 to May 1; other periods with the written approval of the Landscape Architect. Do not plant when ground is frozen or excessively moist. Do not use frozen or excessively wet planting soil at any time.

D. Definitions

1. Start of Planting: Installation of plant material into excavated pits or beds.
2. Project Acceptance:

a. Upon determination by the Landscape Architect and Owner that the work meets the requirements of Substantial Completion, the Landscape Architect will prepare a Certificate of Substantial Completion, AIA Document G704, for the approval and acceptance of the Owner and the Contractor.

b. The Landscape Architect shall prepare and submit to the Contractor a list of items to be completed or corrected within the time limits established in the Certificate of Substantial Completion.

c. The failure to include any items of such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents.

d. The Landscape Architect and Owner may review and amend the list of items to be completed or corrected and amend the list to the Certificate of Substantial Completion at any time before final Notice of Completion.

e. The continued validity of a "Certificate of Substantial Completion" by the Owner and Landscape Architect shall be contingent upon the satisfactory completion of all punch-list items. Failure to meet this date shall be reason for revocation of this Certificate.

f. All subsequent expenses including reimbursables and fees incurred by the Landscape Architect shall be paid for by the Owner and deducted from the retainage held by the Owner.

g. Warranties required by the Contract Documents shall commence on the Date of Substantial Completion for the work or designated portion thereof unless otherwise provided in the "Certificate of Substantial Completion".

3. Maintenance Period: From start of mobilization and last through 90 days after issuance of "Certificate of Substantial Completion".

4. Guarantee Period: From issuance of AIA "Certificate of Substantial Completion" to expiration of first anniversary (12 months).

Shallow Marsh Planting Plan

Species	Size	Spacing	Quantity	Planting Units	Remarks
Zone "A"					
Acer rubrum	5'-6"/cont	as ind.	10	na	FAC
Cornus amomum	18"-24"/cont	as ind.	25	na	FACW
Agrostis alba	PLS	na	5 lbs/ac	na	FACW
Zone "B"					
Cephalanthus occidentalis	18"-24"/cont	ndm.	40	na	OBL
Alysicarpus occidentalis	18"-24"/cont	ndm.	40	na	OBL
Acorus calamus	cont.	ndm.	250	na	OBL
Carex stricta	cont.	ndm.	250	na	OBL
Open Water					
Sagittaria latifolia	cont.	ndm.	350	na	OBL
Periphery/Upland					
Lolium multiflorum	PLS	na	20 lbs/ac	na	40% mixture
Suaeda frutescens	PLS	na	20 lbs/ac	na	40% mixture
Sorghastrum nutans	PLS	na	4 lbs/ac	na	20% mixture

Note: The precise location of plant massings will be located in the field by landscape architect. Grid patterns will be avoided.

II. BIORETENTION AREA SOIL SPECIFICATIONS

A. Mulch Layer Specifications

A mulch layer shall be provided in the planted filter strip and on top of the planting soil. An acceptable mulch layer shall include shredded hardwood, shredded wood chips, or other similar product approved by the Landscape Architect.

All mulch products must be well aged, uniform in color, and free of foreign material including plant material. Well aged mulch is mulch that has been stockpiled or stored for at least twelve (12) months.

B. Compaction

Soil shall be placed in lifts less than 18 inches and lightly compacted (minimal compactive effort) by tamping with a bucket from a loader, backhoe, or other appropriate equipment.

III. BIORETENTION AREA PLANT SPECIFICATIONS

A. Plants must be:

1. Sound, healthy, vigorous, free from plant diseases, insect pests or their eggs.
2. Nursery stock grown in Maryland, Delaware, New Jersey, Ohio, Pennsylvania, Virginia or West Virginia for at least two (2) years prior to digging.
3. Plants cut back from larger sizes or pruned prior to delivery will not be accepted.
4. Transplanted or root pruned at least once in past three (3) years.
5. Shape and Form: Plant materials shall be symmetrical and typical for the variety and species.

B. Deciduous trees must be:

1. Single leader, well branched, without suckers or evidence of suckering, with straight trunks, and symmetrically balanced according to their normal habit.
 - a. Free of branches for 1.5 feet up the leader from ground level per 1 inch of caliper.
 - b. Measurements: The caliper of all deciduous shade trees shall be measured 6 inches above ground level for trees up to and including 4-inch caliper and 12 inches above ground level for material larger than 4-inch caliper.

C. Shrubs shall have:

1. At least 75 percent of the individual branches or canes of a shrub shall be to the height specified.

D. General:

1. Store balled plants that cannot be planted within 48 hours in a sheltered place, balls covered with soil, straw mulch or similar cover; water and maintain as required until planted.
2. Transport and handle plants so that foliage, roots, or balls are protected from breakage, sun and winds. Tops or roots of plants allowed to dry out or which have been damaged or disturbed root balls will be cause for rejection.
3. B & B (balled and burlapped) plants: Firm, natural balls of soil, with size and depth of ball in accordance with A.A.N. Standards.
4. Walls of planting pit shall be dug so that they are vertical, and scarified to eliminate glazing of the wall.
5. The diameter of the planting pit must be a minimum of six inches (6") larger than the diameter of the ball of the tree.
6. The planting pit shall be deep enough to allow 1/4 inch of the pit shall be above the existing grade. Loose soil at the bottom of the pit shall be tamped by hand.
7. Apply fertilizer in bottom of planting pit as specified below.
8. The plant shall be removed from the container and placed in the planting pit by lifting and carrying the plant by its ball. Do not lift by the branches or trunk.
9. Set the plant vertical in the center of the pit so that the top of the ball is approximately 1/4 inch above the final grade.
10. Backfill planting pit with existing soil.
11. Make sure plant remains vertical during backfilling procedure.
12. Never cover the top of the ball with soil. Mound soil around the exposed ball (1/4").
13. Stake all trees requiring staking within 24 hours after planting.
14. Guying shall be in accordance with planting details.
15. Stakes shall be securely driven in ground and plants guyed to provide and maintain adequate support until removal.

E. Fertilization

1. Tree and Shrub fertilizer shall be a 21 gm. tightly compressed, long lasting, slow release (2-year) fertilizer tablet with a minimum guaranteed analysis of 20-10-5:

Total Nitrogen (N) - 20%
Water Soluble Organic Nitrogen - 7%
Water in Soluble Organic Nitrogen - 13%
Available Phosphoric Acid (P₂O₅) - 10%
Soluble Potash (K₂O) - 5%

2. For containerized trees and shrubs, place the specified fertilizer tablet(s) in the bottom of the planting pit according to the following rates:

- | | |
|-------------------------|----------------------|
| 1 gal. Container | 1 ea. 21 gm. Tablets |
| 3 gal. Container | 2 ea. 21 gm. Tablets |
| 5 gal. Container | 3 ea. 21 gm. Tablets |
| 7 gal. Container or B&B | 5 ea. 21 gm. Tablets |

F. Planting Filter Strip

1. The planting holes shall be dug through the mulch with one of the following: hand trowel, shovel, bulb planter, or hoe.
2. Before planting, biodegradable pots shall be split, and non-biodegradable pots shall be removed. Root systems of all potted plants shall be split or crumbled.
3. The grass shall be planted so that any existing stones/rocks are surrounded by soil below the mulch. Potted plants shall be set so that the top of the pot is even with the existing grade.
4. The entire grass filter strip shall be thoroughly watered.

G. Planting Slopes Adjacent to the Bioretention Area

1. Slopes adjacent to the Bioretention Area shall be seeded per the seeding specification shown in the bioretention system general construction specifications.
2. Seed mix used for this area shall be Loff's Eco-mix or other similar mix as approved by the Landscape Architect.

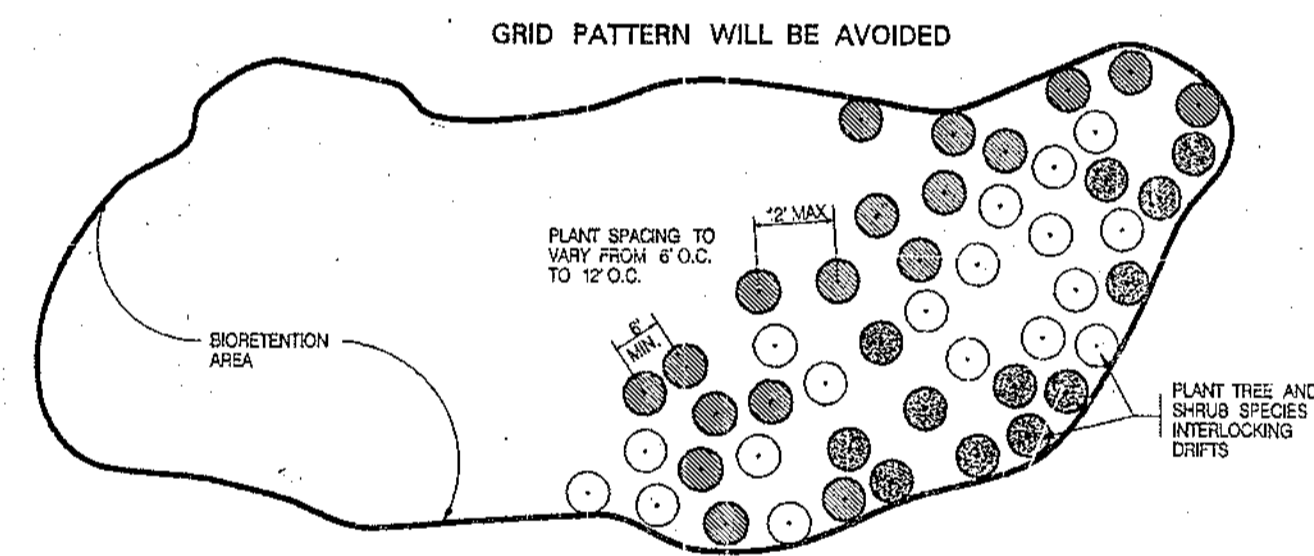
IV. MAINTENANCE

1. The Contractor's Maintenance Period shall begin at mobilization and last through 90 days after the issuance of a Certificate of Substantial Completion.
2. The Contractor's maintenance of new planting shall consist of watering, cultivating, weeding, mulching, re-staking, tightening and repair of guys, resetting plants to proper grades or upright position, and furnishing and applying such pesticide sprays and invigorants as are necessary to keep the plantings free of insects and disease and in thriving condition.
3. Protect planting areas and plants at all times against damage of all kinds for duration of maintenance period. Maintenance includes temporary protection barriers and signs as required for protection. If any plants become damaged or injured, because sufficient protection was not provided, treat or replace as directed by Landscape Architect at no additional cost to Owner.

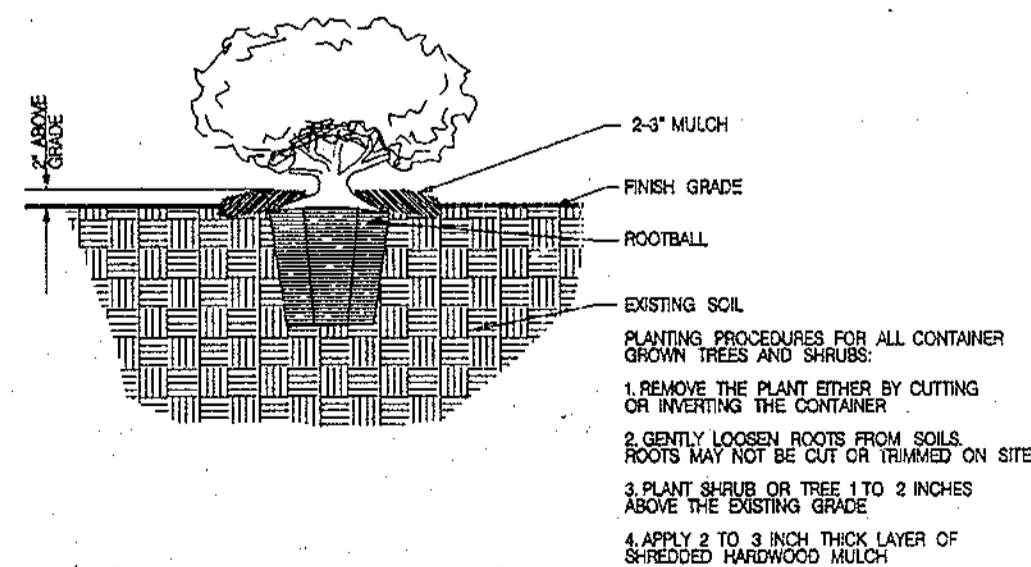
V. WARRANTY

1. Planting shall be warranted by the Contractor to remain alive and healthy for a period of 12 months after the date of Substantial Completion. Plants in an impaired, dead or dying condition after initial acceptance or within 12 months shall be removed and replaced. New planting and method of placing shall comply with the requirements of the specifications. Plants replacing those removed during the guarantee period shall also be guaranteed to remain alive and healthy for an additional 12 months after installation and acceptance.
2. Contractor shall not be held responsible for failure due to neglect by Owner, vandalism, etc., during warranty period. Report such conditions to the Landscape Architect in writing when discovered.
3. Submit a letter of warranty containing the following information:

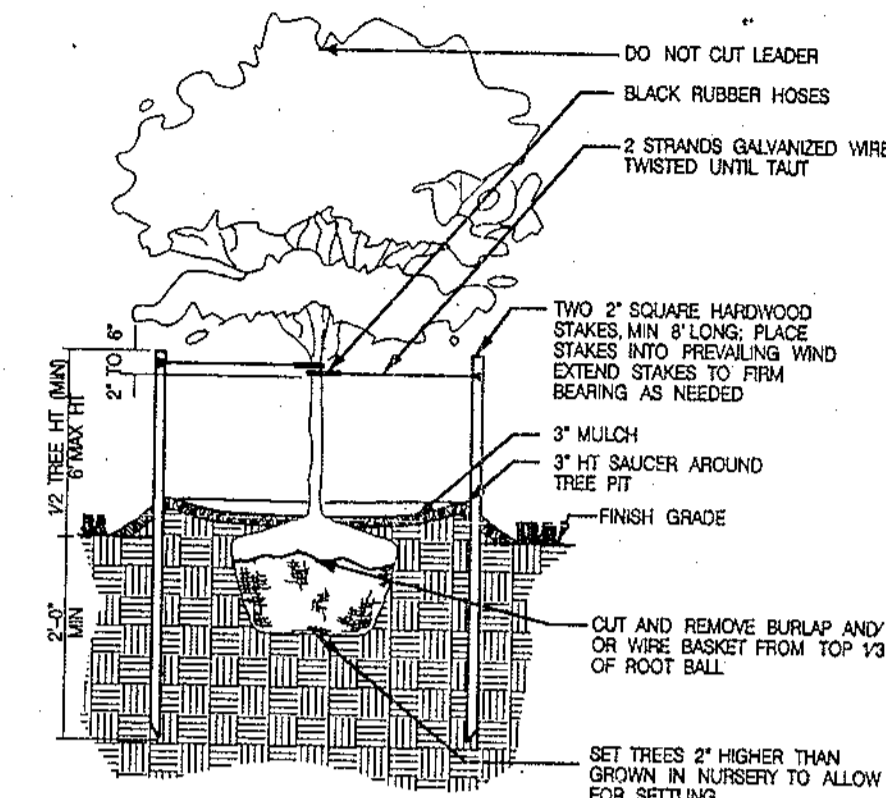
"We hereby guarantee that the landscape planting we have furnished and installed is free from disease and in good condition, and the work has been completed in accordance with the drawings and specifications, ordinary wear and tear and unusual abuse, or neglect excepted. We agree to repair or replace any defects in material or workmanship which may develop during the period of one year from the date of acceptance and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the Owner. We shall make such repairs or replacements within a reasonable time, as determined by the Owner, after receipt of written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of written notice from the Owner by Certified Mail, we authorize the Owner to proceed to have said repairs or replacements made at our expense and we will pay the costs and charges therefore upon demand.



Planting Design Schematic
Not To Scale



Planting of Container Grown Material
Not To Scale



TREE PLANTING - LESS THAN 3" CALIPER
NOT TO SCALE

Bioretention Area Planting List
Water Quality Facility #1

Species	Size	Spacing	Quantity	Planting Units	Stratum	Tolerance
Acer rubrum	2.5' B&B	10'-12' rdm	10	na	Canopy	FAC
Liquidambar styraciflua	2.5' B&B	10'-12' rdm	5	na	Canopy	FAC
Quercus palustris	2.5' B&B	10'-12' rdm	5	na	Canopy	FACW
Hemodella virginiana	3'-4' cont	6'-8' rdm	15	na	Shrub	FACW
Lindera benzoin	3'-4' cont	6'-8' rdm	2	na	Shrub	FAC
Panicum virgatum	1-3/4' P.PIT	18" oc	115 lb/ac	na	Herb	FAC
TOTALS			57			

Water Quality Facility #3

Species	Size	Spacing	Quantity	Planting Units	Stratum	Tolerance
Acer rubrum	2.5' B&B	10'-12' rdm	5	na	Canopy	FAC
Liquidambar styraciflua	2.5' B&B	10'-12' rdm	0	na	Canopy	FAC
Quercus palustris	2.5' B&B	10'-12' rdm	0	na	Canopy	FACW
Hemodella virginiana	3'-4' cont	6'-8' rdm	15	na	Shrub	FAC
Lindera benzoin	3'-4' cont	6'-8' rdm	5	na	Shrub	FACW
Viburnum dentatum	3'-4' cont	6'-8' rdm	0	na	Shrub	FAC
Panicum virgatum	1-3/4' P.PIT	18" oc	150 lb/ac	na	Herb	FAC
TOTALS			35			

Water Quality Facility #5

Species	Size	Spacing	Quantity	Planting Units	Stratum	Tolerance
Acer rubrum	2.5' B&B	10'-12' rdm	5	na	Canopy	FAC
Liquidambar styraciflua	2.5' B&B	10'-12' rdm	0	na	Canopy	FAC
Quercus palustris	2.5' B&B	10'-12' rdm	0	na	Canopy	FACW
Hemodella virginiana	3'-4' cont	6'-8' rdm	15	na	Shrub	FAC
Lindera benzoin	3'-4' cont	6'-8' rdm	2	na	Shrub	FACW
Viburnum dentatum	3'-4' cont	6'-8' rdm	2	na	Shrub	FAC
Panicum virgatum	1-3/4' P.PIT	18" oc	150 lb/ac	na	Herb	FAC
TOTALS			22			

Water Quality Facility #6

Species	Size	Spacing	Quantity	Planting Units	Stratum	Tolerance
Acer rubrum	2.5' B&B	10'-12' rdm	5	na	Canopy	FAC
Liquidambar styraciflua	2.5' B&B	10'-12' rdm	0	na	Canopy	FAC
Quercus palustris	2.5' B&B	10'-12' rdm	0	na	Canopy	FACW
Hemodella virginiana	3'-4' cont	6'-8' rdm	0	na	Shrub	FAC
Lindera benzoin	3'-4' cont	6'-8' rdm	15	na	Shrub	FACW
Viburnum dentatum	3'-4' cont	6'-8' rdm	5	na	Shrub	FAC
Panicum virgatum	1-3/4' P.PIT	18" oc	275 lb/ac	na	Herb	FAC
TOTALS			28			

Water Quality Facility #7

Species	Size	Spacing	Quantity	Planting Units	Stratum	Tolerance
Acer rubrum	2.5' B&B	10'-12' rdm	5	na	Canopy	FAC
Liquidambar styraciflua	2.5' B&B	10'-12' rdm	0	na	Canopy	FAC
Quercus palustris	2.5' B&B	10'-12' rdm	0	na	Canopy	FACW
Hemodella virginiana	3'-4' cont	6'-8' rdm	10	na	Shrub	FAC
Lindera benzoin	3'-4' cont	6'-8' rdm	5	na	Shrub	FACW
Viburnum dentatum	3'-4' cont	6'-8' rdm	0	na	Shrub	FAC
Panicum virgatum	1-3/4' P.PIT	18" oc	150 lb/ac	na	Herb	FAC
TOTALS			20			

Water Quality Facility #8

Species	Size	Spacing	Quantity	Planting Units	Stratum	Tolerance
Acer rubrum	2.5' B&B	10'-12' rdm	5	na	Canopy	FAC
Liquidambar styraciflua	2.5' B&B	10'-12' rdm	0	na	Canopy	FAC
Quercus palustris	2.5' B&B	10'-12' rdm	5	na	Canopy	FACW
Hemodella virginiana	3'-4' cont	6'-8' rdm	5	na	Shrub	FAC
Lindera benzoin	3'-4' cont	6'-8' rdm	5	na	Shrub	FACW
Viburnum dentatum	3'-4' cont	6'-8' rdm	0	na	Shrub	FAC
Panicum virgatum	1-3/4' P.PIT	18" oc	135 lb/ac	na	Herb	FAC
TOTALS			20			

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

Richard M. Daniels
CHIEF, BUREAU OF HIGHWAYS 6-22-97
DATE

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

John A. ...
CHIEF, DIVISION OF LAND DEVELOPMENT TC 7/10/97
DATE

Mark ...
CHIEF, DEVELOPMENT ENGINEERING DIVISION 5/21/97
DATE

Date No. Revision Description

VILLAGE OF RIVER HILL
SECTION 4, AREA 4

OWNER /DEVELOPER:

THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

DMW

Daft-McCune-Walker, Inc.
200 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-3033
Fax 296-4705
A Team of Land Planners,
Landscape Architects,
Engineers, Surveyors &
Environmental Professionals

AREA SECTION 4 AREA 4

TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE WATER QUALITY NOTES, DETAILS & SPECIFICATIONS

Des By	Scale	Proj. No.	94064
Drn By	Date		
Chk By	Approved		32 OF 44

12-3-96
Date

Professional Engr. No. 10551



PLAN
STORMWATER MANAGEMENT FACILITY No.4 & SEDIMENT BASIN
 SCALE: 1" = 50'

GENERAL RECOMMENDATIONS

- The earthwork operations should be completed during the drier seasons, preferably during the summer months, when rainfall is less.
- Construct earth berms or other appropriate features along the top of any newly created or existing slope, where possible, to control surface runoff and minimize the formation of gullies down the face of the slope until slope stabilization is achieved.
- Immediately after final grading, the slopes should be seeded, fertilized and covered with an appropriate mulch and binder.
- Periodic examination of the slope areas during and after construction to locate and regrade any slope areas subjected to scouring from excessive surface run-off.
- The subgrade soils should be profiled with light weight equipment to form a relatively unyielding surface. Any excessively soft or yielding areas should be undercut and replaced with suitable on-site materials, placed in accordance with project specifications.
- Due to the presence of fine-grained or cohesive and weak surficial soils, as indicated by relatively low SPT results at some boring locations, some subgrade yielding under heavy earthwork equipment must be expected. Consideration should be given to the utilization of light-weight, wide-track earthwork equipment and provisions for temporary dewatering during the initial phases of earthwork operations to minimize disturbance to the shallow, weak soils.
- Due to the relatively high moisture contents of the natural soils, manipulation and/or aeration of the soils may be necessary to achieve efficient and satisfactory compaction during placement as controlled fill. The moisture descriptions shown on the SOIL BORING PROFILES were determined during visual classifications of the soil samples, and such descriptions (e.g., moist) are related to dry-wet conditions and do not reflect moisture relative to optimum. Because of the natural variations of the on-site soils, variations in moisture-density relationships must be anticipated during construction. Such changes must be determined in the field by the soils technician during earthwork operations, and be treated appropriately.

EXTENDED DETENTION POND #4 MAINTENANCE SCHEDULE

Routine Maintenance (Private)

- The facilities shall be inspected annually and after major storms. Inspections should be performed during wet weather to determine if the ponds are functioning properly. The facilities shall be inspected in accordance with the checklist and requirements contained within USDA, NRCS "Standards and Specifications for Ponds" (MD-378). The pond owner(s) and any heirs, successors, or assigns shall be responsible for the safety of the ponds and the continued operation, surveillance, inspection and maintenance thereof. The pond owner(s) shall promptly notify the Soil Conservation District of any unusual observations that may be indications of distress such as excessive seepage, turbid seepage, sliding or slumping.
- The top and side slopes of the embankments shall be mowed a minimum of two (2) times a year, once in June and once in September. Other side slopes, the bottom of the pond, and maintenance access should be mowed as needed or when the height of vegetation exceeds 18" on the embankment top, or faces.
- Debris and litter near the outlet structure shall be removed during regular mowing operations and as needed.
- Visible signs of erosion in the pond as well as rip rap outlet areas shall be repaired as soon as it is noticed.

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

APPROVED: *[Signature]* DATE: 7/16/98

U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

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

APPROVED: *[Signature]* DATE: 7/16/98

HOWARD SOIL CONSERVATION DISTRICT

DEVELOPERS CERTIFICATE:

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

APPROVED: *[Signature]* DATE: 7-14-98

DEVELOPER SIGNATURE: Gregory R. Khar

ENGINEERS CERTIFICATE:

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

APPROVED: *[Signature]* DATE: 7/16/98

ENGINEER SIGNATURE: John W. Ramonch, Jr.

STORMWATER MANAGEMENT POND

GENERAL CONSTRUCTION SPECIFICATIONS

All stormwater management facilities shall be constructed in accordance with Howard County's "Design Manual Vol. 1 - Storm Drainage (1990)" and the NRCS Maryland Standards and Specifications for Ponds" (MD-378, 1992).

These specifications are appropriate to all ponds within the scope of the Standard Practice MD-378. All reference to ASTM and AASHTO specifications apply to the most recent version.

1. SITE PREPARATION

Areas designated for borrow areas, embankment, and structural works shall be cleared, grubbed and stripped of topsoil. All trees, vegetation, roots and other objectionable material shall be removed. Channel banks and entry berms shall be sloped to no steeper than 1:1.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fence rubbish and other objectionable material unless otherwise directed on the plans. Trees, brush and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 50 foot radius around the inlet structure shall be cleared.

All cleared and grubbed material shall be disposed of outside and below the limits of the dam and reservoir as directed by the owner or his representative. When specified, a sufficient quantity of topsoil will be stockpiled in a suitable location for use on the embankment and other designated areas.

2. EARTH FILL

MATERIAL: The fill material shall be taken from approved designated borrow area. It shall be free of roots, stumps, rocks, rubble, stones greater than 6" from or other objectionable material. Fill material from the center of the embankment and cut trench shall conform to Unified Soil Classification GC, GC, CH or CL. Consideration may be given to the use of other materials in the embankment design and construction as supervised by a geotechnical engineer.

PLACEMENT: Areas on which fill to be placed shall be scarified prior to placement of fill. Fill material shall be placed in maximum 6" thick (before compaction) layers which are to be continuous over the entire length of the fill. The most permeable borrow material shall be placed in the downstream portions of the embankment. The principal seepage must be installed concurrently with fill placement and not excavated into the embankment.

COMPACTION: The movement of the heating and extruding equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one track of the equipment or compaction shall be achieved by a minimum of four complete passes of a sheepsfoot, rubber tired or vibratory roller. Fill material shall contain sufficient moisture such that the required degree of compaction will be obtained with the equipment used. The fill material shall contain sufficient moisture so that if formed into a ball it will crumble yet not be so wet that water can be squeezed out.

All compaction is to be not less than 98% percent of the maximum dry density as determined by AASHTO Specification T-99 (Standard Proctor) with a moisture content within 2 percent of optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction.

CUTOFF TRENCH AND IMPERVIOUS CORE: The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least 4 feet below existing grade or as shown on the plans. The side slope of the trench shall be 1 to 1 for better. The top width of the impervious core shall be 4 feet minimum. The height of the core shall be as shown on the plans. The side slope of the core shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, roller, or hand tampers to assure maximum density and minimum permeability.

3. STRUCTURAL BACKFILL

Backfill adjacent to pipe or structure shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed 4 inches in thickness and compacted by hand tamper, or other manually directed compaction equipment. The

material needs to fill completely all space under and adjacent to the pipe. At no time during the backfilling operation shall vibration equipment be allowed to operate closer than 4 feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24 inches or greater over the structure or pipe.

4. REMOVAL AND REPLACEMENT OF DEFECTIVE FILL

Fill placed as denser than that specified minimum density or as moisture content outside the specified acceptable range of moisture content or otherwise not conforming to the requirements of the specifications shall be removed to meet the requirements or removed and replaced by acceptable fill. The bottom of such excavations shall be finished flat or gently curving and at the side of such excavations the adjacent sound fill shall be trimmed to an slope not steeper than 3 feet horizontally to 1 foot vertically extending from the bottom of the excavation to the fill surface.

5. PIPE CONCRETE

Altogether shall be greater in cross section. All perforated pipe shall have a minimum of 325 square inches of opening per square foot of pipe surface (i.e., 30 3/8 inch holes per square foot). Perforations are to be uniformly spaced around the full periphery of the pipe. Any hole blocked or partially blocked by limestone coating shall be opened prior to installation.

REINFORCED CONCRETE PIPE: All of the following criteria shall apply for reinforced concrete pipe:

- Materials - Reinforced concrete pipe shall have belted spiral joints with rubber gaskets and shall equal or exceed ASTM designation C-301.
- Grade - All reinforced concrete pipe conduits shall be laid in a concrete cradle for their entire length. This cradle shall consist of high strength concrete placed under the pipe and up the side of the pipe at least 90 percent of the outside diameter with a minimum thickness of 6 inches, or as shown on the drawings.
- Laying Pipe - Belled spiral pipe shall be placed with the belted upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the cradle shall be placed so that all space under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The free pipes must be located within 2 feet from the wall.
- Backfilling shall conform to "Structural Backfill".
- Connections - All connections (to anti-seep collars, etc.) shall be watertight.
- Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

6. POLYVINYL CHLORIDE (PVC) PIPE

All of the following criteria shall apply for PVC pipe:

- Materials - Non-perforated Outfall Pipe PVC pipe shall be PVC-1220 or PVC-1220 conforming to ASTM D-1725 or ASTM D-2241. Joints and connections shall be completely watertight.
- Materials - Perforated Pipe in-line Filter Drainage Diaphragm PVC pipe and fittings for facility drawdown shall be VC conforming to the requirements of ASTM D-2728.
- Joints and connections to anti-seep collars shall be completely watertight.
- Backfilling shall be firmly and uniformly backed throughout the entire length. Where rock or soft, springy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.
- Backfilling shall conform to "Structural Backfill".
- Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

7. CAST-IN-PLACE CONCRETE STRUCTURES

1. Specifications: Maryland Department of Transportation, State Highway Administration (SHA) "Standard Specifications for Construction and Materials", October, 1990 edition, for materials and construction, including all items specifications.

2. AASHTO "Standard Specifications for Highway Bridges", dated 1990, for design, including all item specifications.

Concrete design by the "Service Load Design Method".

2. Concrete shall meet the requirements of SHA Methods 454 and 902, Mix No. 3.

Contractor shall supply mix design for approval prior to application. Load and mix ratios shall be supplied for each truck delivery. No partial field mixes shall be allowed.

All concrete shall attain a minimum compressive strength of 3500 PSI at 28 days. Design $f_c = 12000$ PSI.

All exposed edges shall be chamfered 3/4" x 3/4". All construction keys are shown normal to the face.

2. Reinforcing Steel: Reinforcing steel shall conform to ASTM A-615, Grade 60. Where not indicated, bar lap splices shall be in accordance with AASHTO specifications. The minimum concrete cover shall be 2 inches unless otherwise noted. Design $f_c = 24000$ PSI.

4. Foundation: Permitted soil bearing capacity = 2500 PSF. The engineer must approve all foundations prior to concrete placement. If unstable material is encountered, the material shall be undercut and backfilled with structural backfill.

Supply mixture for approval prior to application. Contractor shall supply load and mix ratios for each truckload. No partial field mixes shall be allowed.

DESIGN FLOW SUMMARY

ITEM	2 YEAR	10 YEAR	100 YEAR
PROPOSED INFLOW (CFS)	36.61	91.48	152.19
ALLOWABLE RELEASE (CFS)	0.30	2.87	94.45
WATER SURFACE ELEV. (FT.)	422.24	427.53	429.25
STORAGE PROVIDED (AC. - FT.)	5.17	4.36	6.19
STRUCTURE TYPE	DRY, EXTENDED DETENTION, EMBANKMENT		
STRUCTURE CLASS	URBAN		
STRUCTURE LOCATION	WATERSHED AREA TO FACILITY (AC)		
MAX. HEIGHT OF FILL (FT.)	7.0	40.50	
STORAGE HEIGHT PRODUCT (AC. - FT.)	12	2.05	
MIN. TOP OF DAM WIDTH (FT.)	28.37	190.10	
EXISTING PEAK (CFS)	27.40	155.95	
PROP. PEAK (CFS)			

"AS-BUILT" CERTIFICATION

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

SIGNED: _____ P.E. _____ DATE: _____

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

ROCK RIP-RAP

All rock shall be dense sound, free from cracks, seams and other defects conducive to accelerated weathering. The rock fragments shall be angular to subangular in shape. The least dimension of an individual rock fragment shall not be less than one-third the greatest dimension of the fragment.

The rock shall have the following properties:

- Dust specific gravity (saturated surface-dry basis) not less than 2.5.
- Absorption not more than 5 percent.
- Soundness weight loss in five cycles not more than 20 % when sodium sulfate is used.

Dust specific gravity and absorption shall be determined according to ASTM C-927. The test for soundness shall be performed according to ASTM C-666.

Rip-rap shall be placed to a uniform thickness in one operation. The rock shall be delivered and placed in a manner that will insure the rip-rap in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with smaller rocks filling the voids between the larger rocks. Filter cloth shall be placed under rip-rap and shall meet the requirements of Maryland Dept. of Transportation, State Highway Administration Standard Specifications for Construction and Mat. Ints, Section 919.12.

CARE OF WATER DURING CONSTRUCTION

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream obstructions necessary to protect the areas to be occupied by the permanent work. The Contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from the various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work. After having served their purpose, all temporary protective works shall be removed or leveled and graded to the extent required to prevent obstruction in any degree whatsoever of the flow of water to the up-ey or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the full flow can be passed through the permanent works. The removal of water from the required excavation and the foundation shall be accomplished in a manner and to the extent that will maintain stability of the excavated slope and bottom of required excavations and will allow satisfactory performance of all construction operations. During the placing and compacting of material in required excavations, the water level at the location being filled shall be maintained below the bottom of the excavation at each location which may require draining the water to pumps from which the water shall be pumped. Water encountered during core trench construction shall be pumped.

11. EROSION AND SEDIMENT CONTROL

Construction operations will be carried out in such a manner that erosion will be controlled and water and air pollution minimized. State and local laws concerning pollution abatement will be followed. Construction plans shall detail erosion and sediment control measures to be employed during the construction process.

12. SEEDING

Seeding, fertilizing and mulching shall be as follows:

- Seed Mix: 90% Fescue Tall Fescue
- 10% Kentucky Bluegrass Applied at a rate of 100 lbs. per acre.
- Line: 2 tons/acre Dolomitic Limestone.
- Fertilizer: 600 lbs./acre 10-10-10 fertilizer before seeding.
- 400 lbs./acre 50-0-0 urea-form fertilizer at time of seeding.
- Accounting: Mulching tool or mulched straw binder at a rate of 0.5 gal. per 1000 sq. ft.

13. FILTER CLOTH

All filter cloth shall conform to MWH 140N, Dupont Tygar 3241 or 3401, Dupon EP or approved equal.

14. GASKETS

All gaskets shall be PVC coated wire baskets. Stone size shall be 4 inches to 7 inches.

15. CONSTRUCTION INSPECTION BY DESIGNATED ENGINEERS

The construction of the pond and embankment, and certification that the pond and embankment have been built in accordance with the plans shall be under the supervision of a Registered Professional Engineer. The Engineer shall be notified sufficiently in advance of construction in order that arrangements can be made for (1) inspection of pipe trench and bedding, (2) inspection of riser and anti-seep collars and (3) supervision of embankment construction and completion thereof. The Engineer shall direct the handling of water during construction, minor changes not affecting the integrity of the dam in order to compensate for unusual conditions, and the removal and replacement of defective fill.

AS-BUILT

[Signature]
 G. SCOTT GARDNER, REGISTERED PROFESSIONAL ENGINEER
 P.E. No. 102491

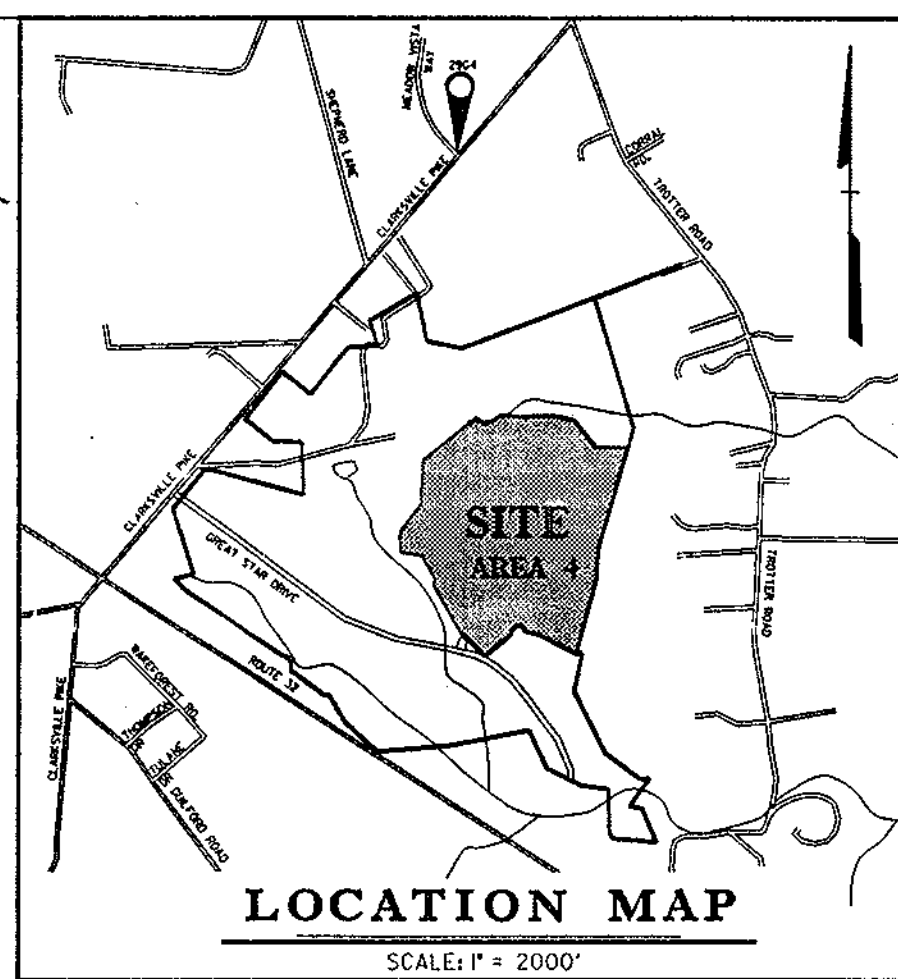
PLANT LIST

SYMBOL	QUANTITY	NAME	REMARKS
LS	4	LIQUID AMBAR STYRACIFLUA Sweet Gum	13'-15" HT. 2-1/2" TO 3" CAL. B&B
PS	6	PINUS STROBUS Eastern White Pine	6'-8" HT. UNSHEARED

THE PURPOSE OF THIS PLAN REVISION IS TO ADJUST THE POND DEPTH AND ELEVATIONS TO REDUCE THE AMOUNT OF EXCAVATION.

NOTE: TREES, SHRUBS AND OTHER WOODY VEGETATION NOT ALLOWED WITHIN FIFTY (50) FEET OF INLET STRUCTURE AND NOT ALLOWED WITHIN CITY COEFFICIENT OF ANY PORTION OF EMBANKMENT.

Professional Engr. No. 10551



LOCATION MAP
 SCALE: 1" = 2000'

BENCHMARK DESCRIPTION

HOWARD COUNTY SURVEY CONTROL STATION: 2964
 N 566866.5020 E 133506.166
 NOTE: HOWARD COUNTY SURVEY CONTROLS ARE STAMPED BRASS OR ALUMINUM DISCS SET ON TOP OF CONCRETE BASE AT INTERSECTION OF RT. 108 & MEADOW VISTA WAT.

GENERAL NOTES:

- THESE FACILITIES ARE PUBLICLY OWNED.
- THESE FACILITIES LIE WITHIN THE MIDDLE PATUXENT RIVER WATERSHED.
- THESE FACILITIES ARE HAZARD CLASS A.

SEDIMENT TRAP DATA

Basin Number	Existing Drainage Area Ac.	Interim Drainage Area Ac.	Proposed Drainage Area Ac.	Storage Required C.F.	Storage Provided C.F.
	3	4.32	4.32	1776	1552
		Wet	1776		
		Dry	1776		
		Total	3552		
		Wet	324		
		Dry	1620.06		
		Total	1944.06		
		Wet	0		
		Dry	0		
		Total	0		
		Wet	2		
		Dry	7.2		
		Total	9.2		
		Design Highwater	422.9		
		Freeboard Provided	8.2		
		Riser Diameter / Interior	4.5/4		
		Emergency Spillway Width	20'		
		Interim SWM Required	0.19		
		Interim SWM Provided	0.22		
		Wet Storage Zone Elev.	423.00		
		Dry Storage Zone Elev.	427.2-420		

APPROVED: HOWARD COUNTY DEPT. OF PUBL. WORKS
[Signature] 8-17-98
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
[Signature] 8/19/98
 CHIEF, DIVISION OF LAND DEVELOPMENT

APPROVED: *[Signature]* 8/17/98
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

Date	No.	Revision Description
5-1-98	1	REVISED POND #4 NEW MYLAERS

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 DeWitt McCune Walker, Inc.
 233 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-3833
 Fax: 296-4706

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

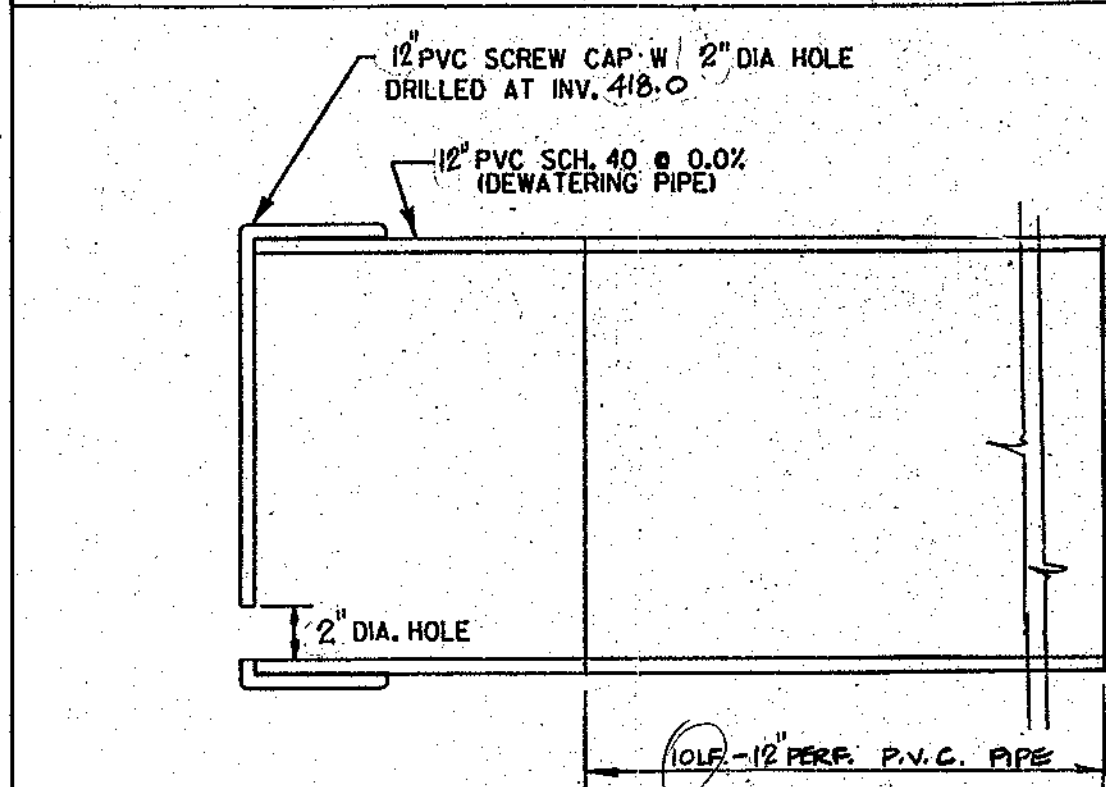
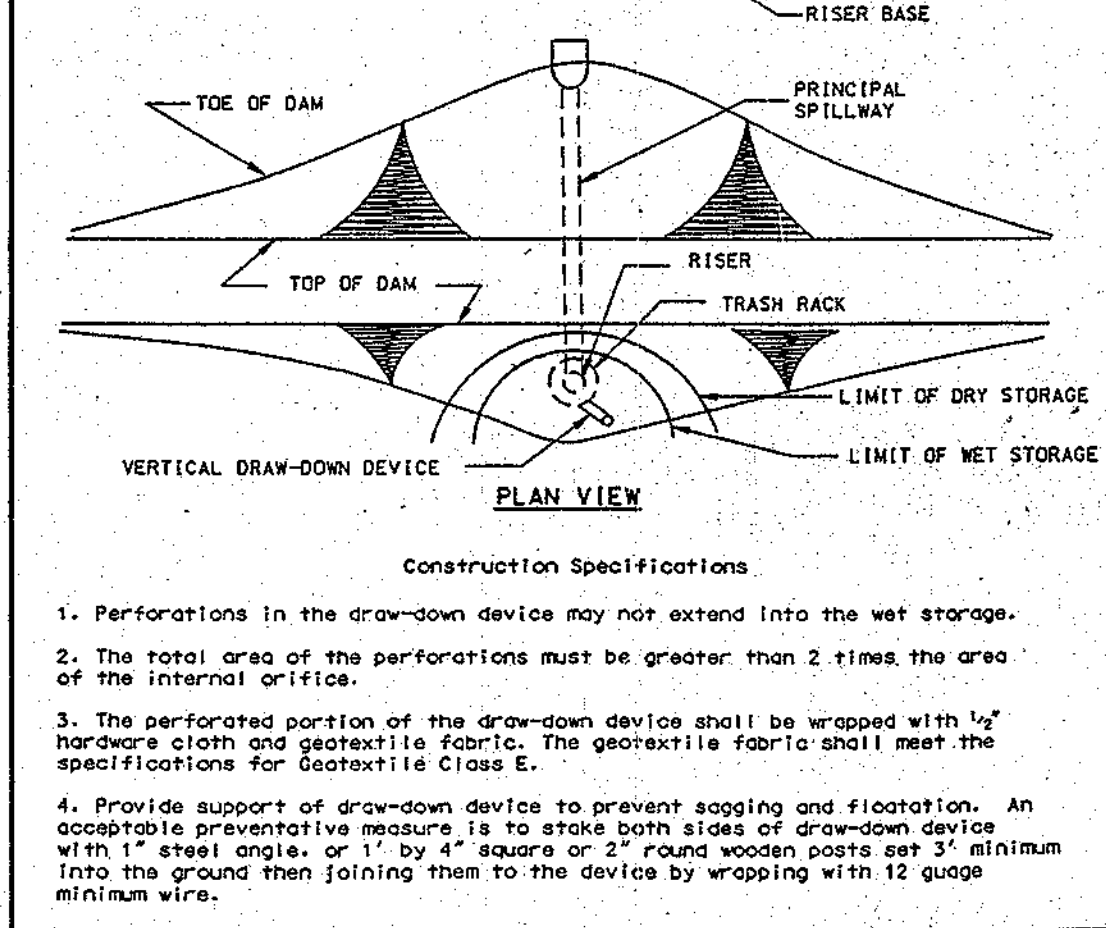
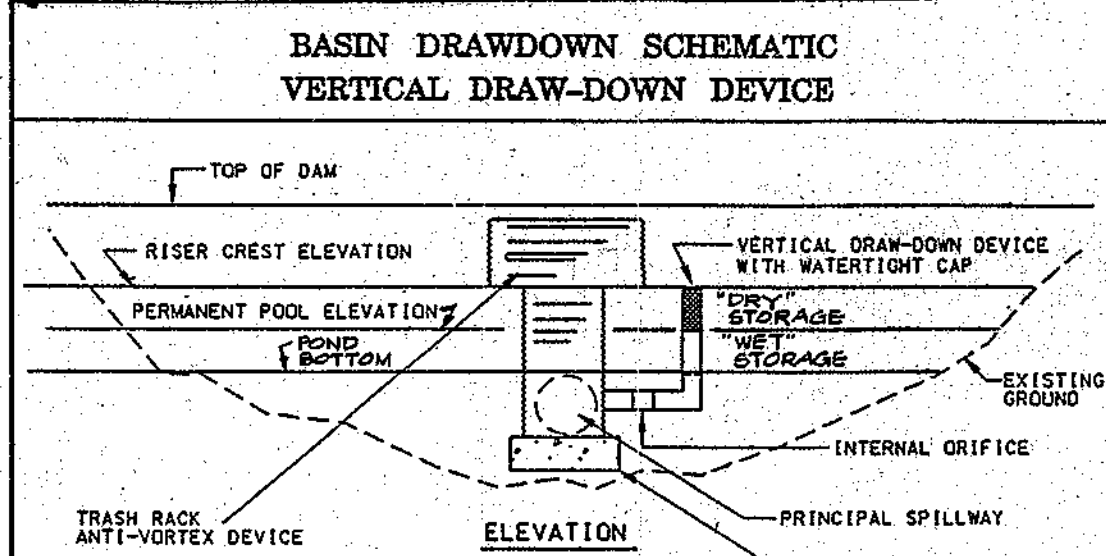
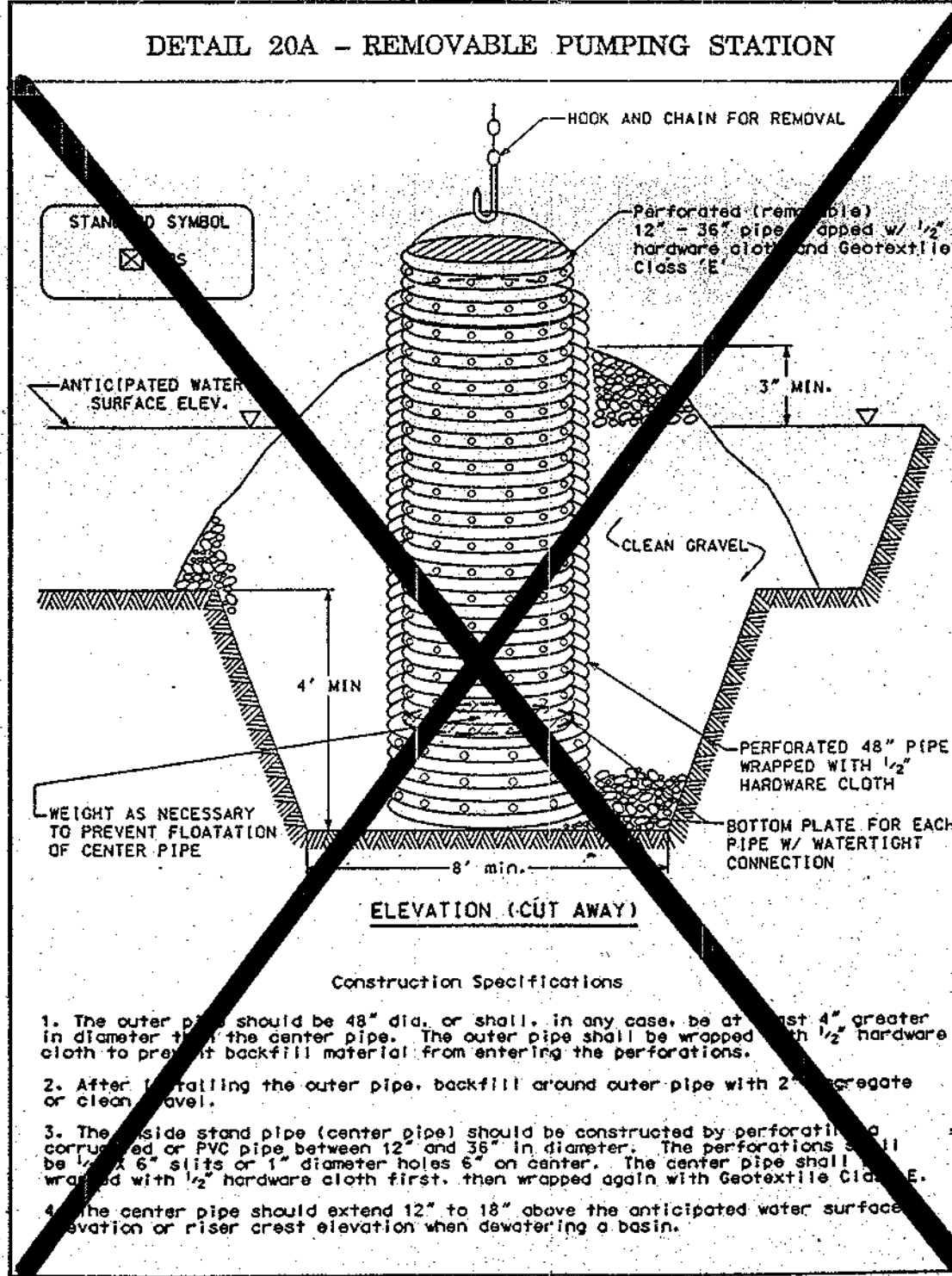
TITLE: REVISED ROAD CONSTRUCTION DRAWINGS STORMWATER MANAGEMENT

PLAN AND DETAILS

Des By: JWH Scale: 1" = 50'
 Dwn By: KUE Lts: MAR 98
 Chk By: JWR Appr: JWH

Professional Engr. No. 10551

F-96-130



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

APPROVED: *[Signature]* DATE: 04-24-97

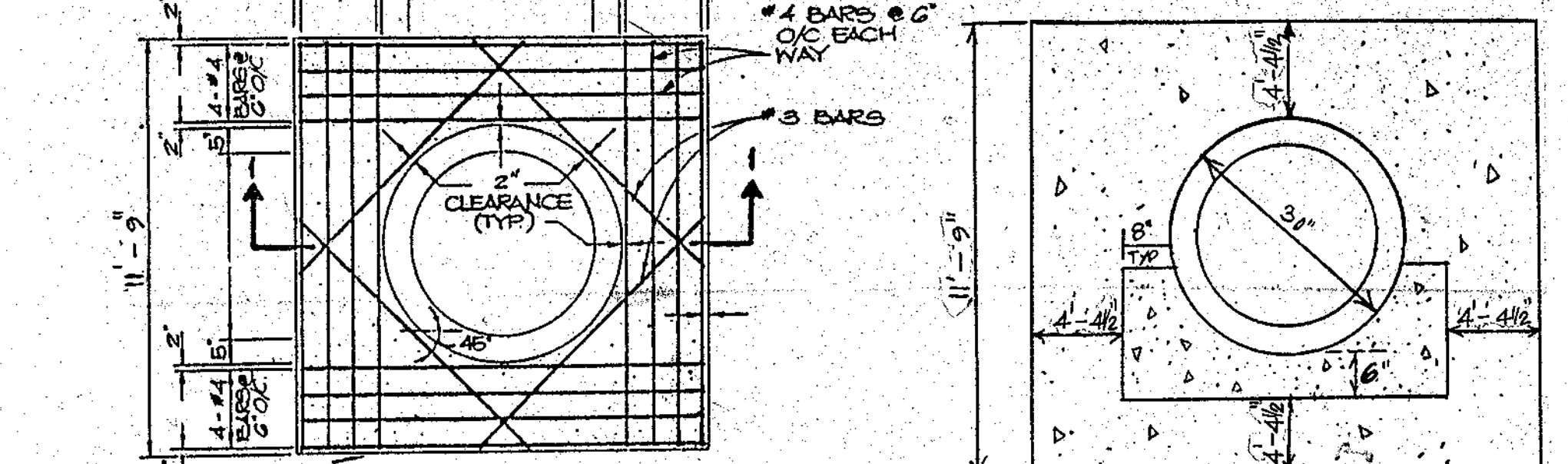
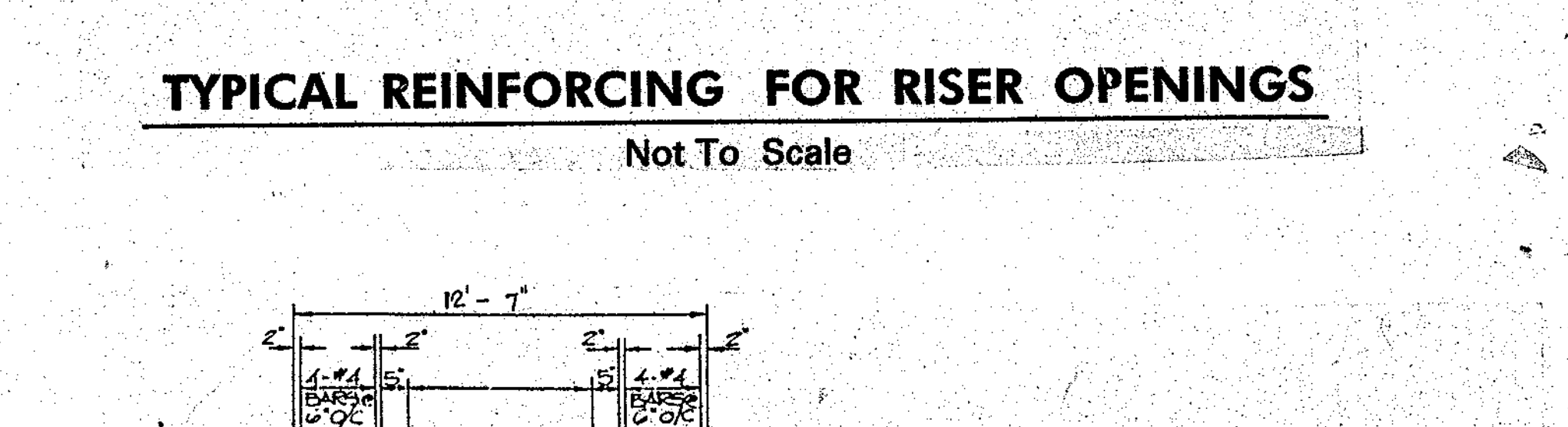
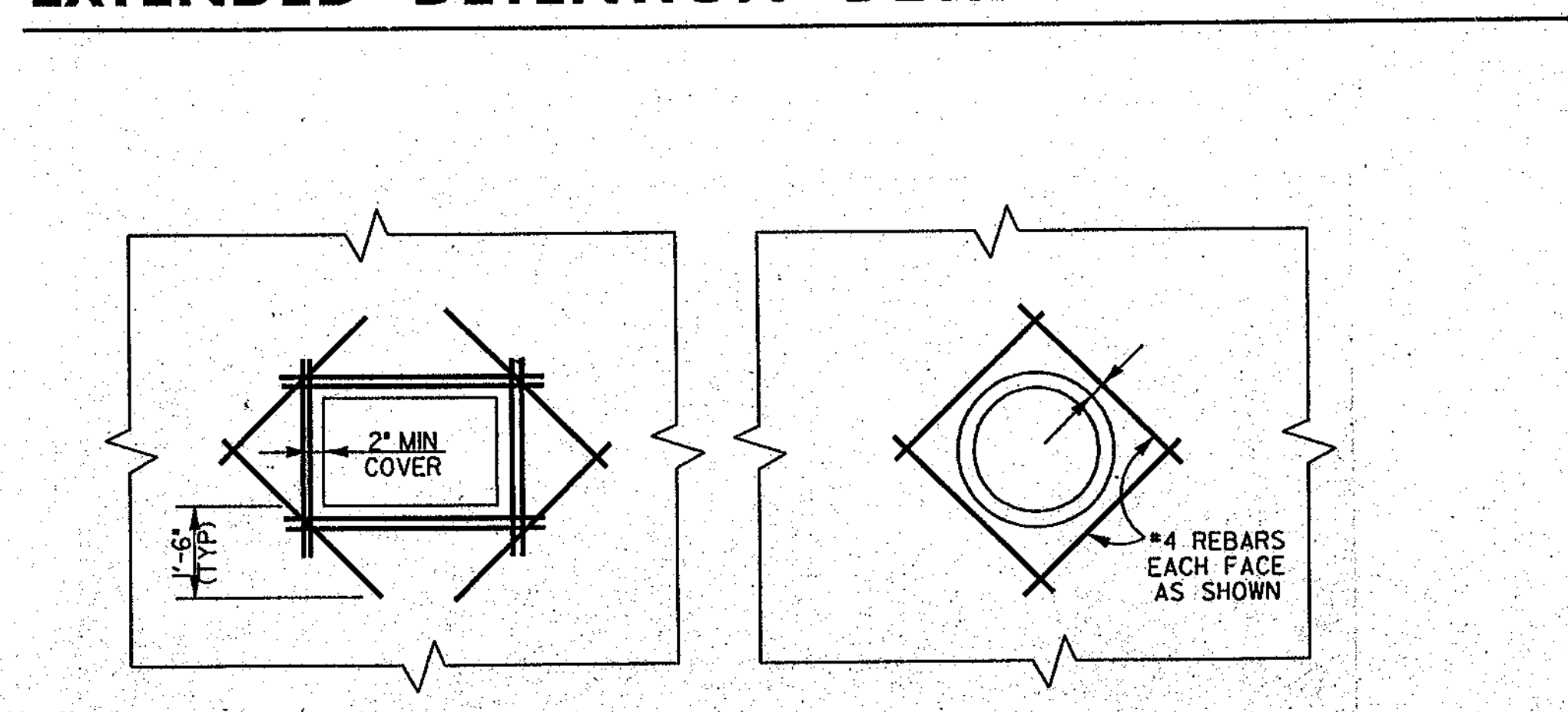
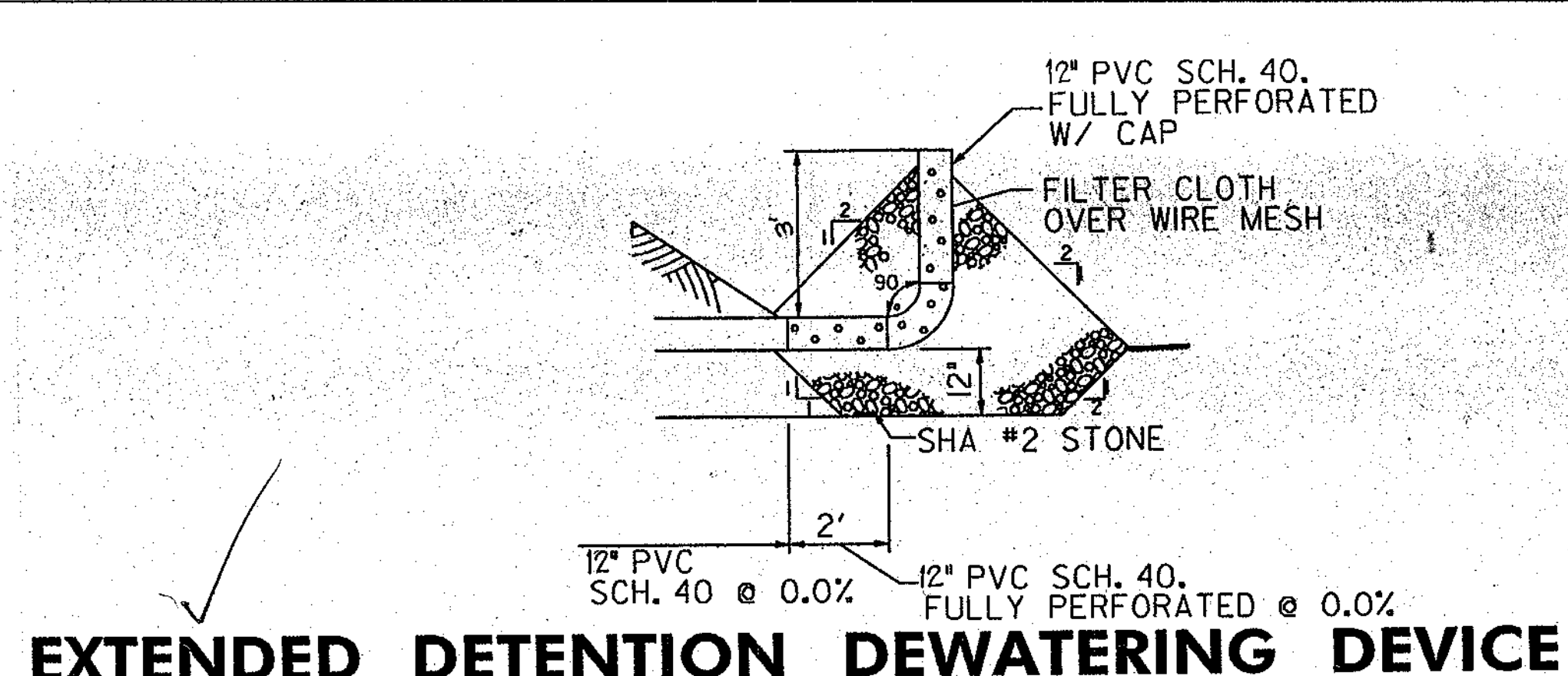
U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

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

APPROVED: *[Signature]* DATE: 4-26-97

HOWARD SOIL CONSERVATION DISTRICT

PLAN NUMBER



CONSTRUCTION SPECIFICATIONS:

- The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
- The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.
- Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.
- Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
- 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.

DEVELOPERS CERTIFICATE:

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

APPROVED: *[Signature]* DATE: 1/21/97

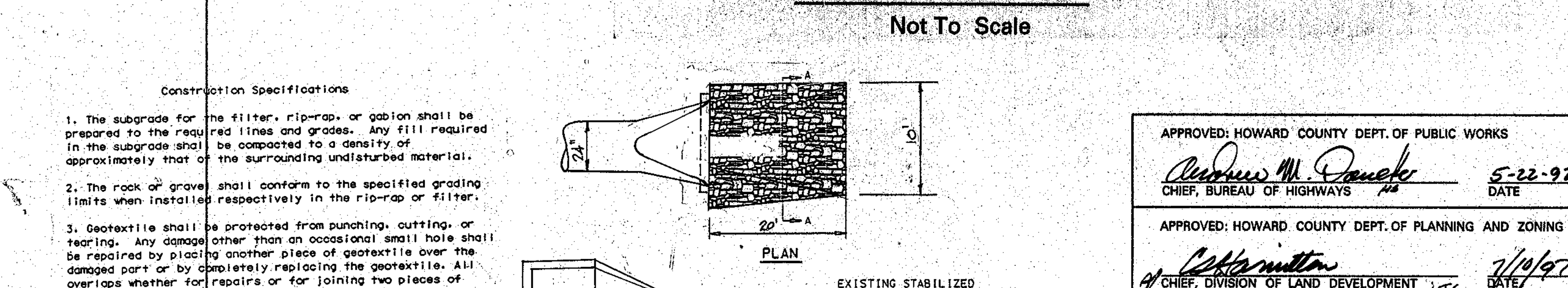
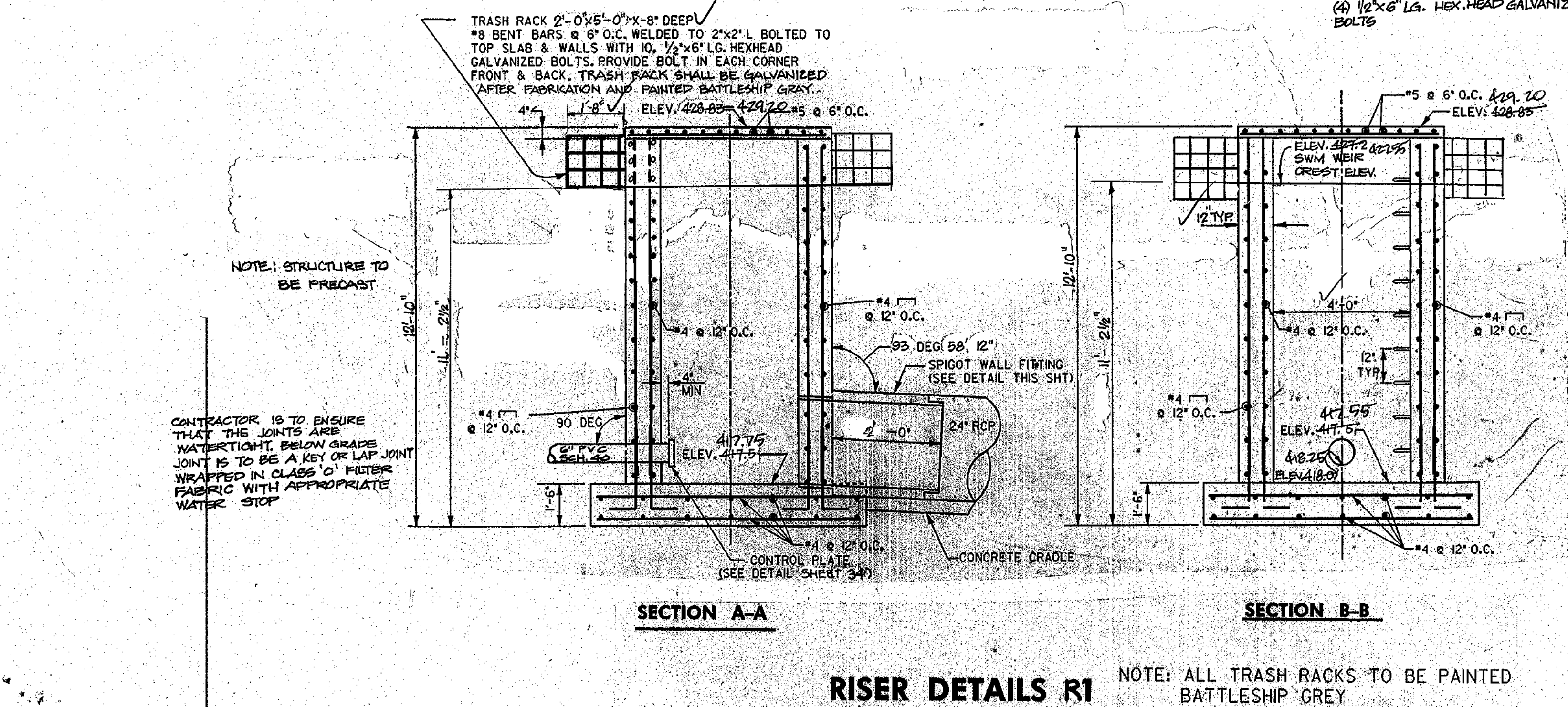
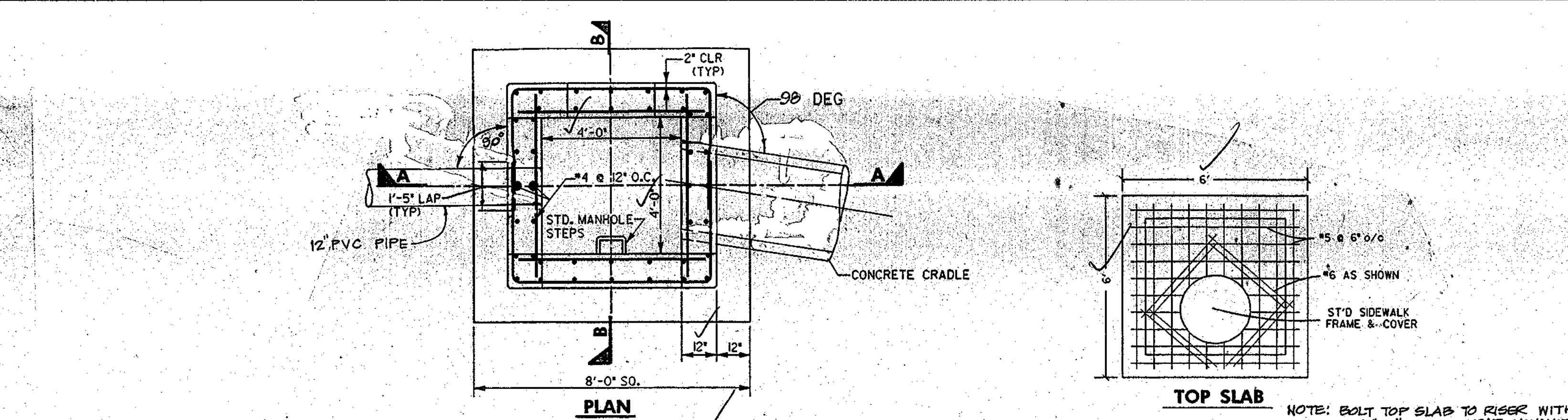
SIGNATURE OF DEVELOPER

ENGINEERS CERTIFICATE:

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

APPROVED: *[Signature]* DATE: 12-3-96

SIGNATURE OF ENGINEER



CONSTRUCTION SPECIFICATIONS:

- The subgrade for the filter, rip-rap, or gabion shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density of approximately that of the surrounding undisturbed material.
- The rock or gravel shall conform to the specified grading limits when installed respectively in the rip-rap or filter.
- Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile shall be a minimum of one foot.
- Stone for the rip-rap or gabion outlets may be placed by equipment. They shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of underlying materials. The stone for rip-rap or gabion outlets shall be delivered and placed in a manner that will ensure that it is reasonably homogeneous with the smaller stones and spalls filling the voids between the larger stones. Rip-rap shall be placed in a manner to prevent damage to the filter blanket or geotextile. Hand placement will be required to the extent necessary to prevent damage to the permanent works.
- 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.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS

[Signature] DATE: 5-22-97

CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING

[Signature] DATE: 7/10/97

CHIEF, DIVISION OF LAND DEVELOPMENT

[Signature] DATE: 5/21/97

CHIEF, DEVELOPMENT ENGINEERING DIVISION

REVISIONS:

Date	No.	Revision Description
05/11/96	1	REVISED DETAILS

VILLAGE OF RIVER HILL SECTION 4, AREA 4

OWNER / DEVELOPER: THE HOWARD RESEARCH & DEVELOPMENT CORP. 10275 LITTLE PATUXENT PARKWAY COLUMBIA, MARYLAND 21044

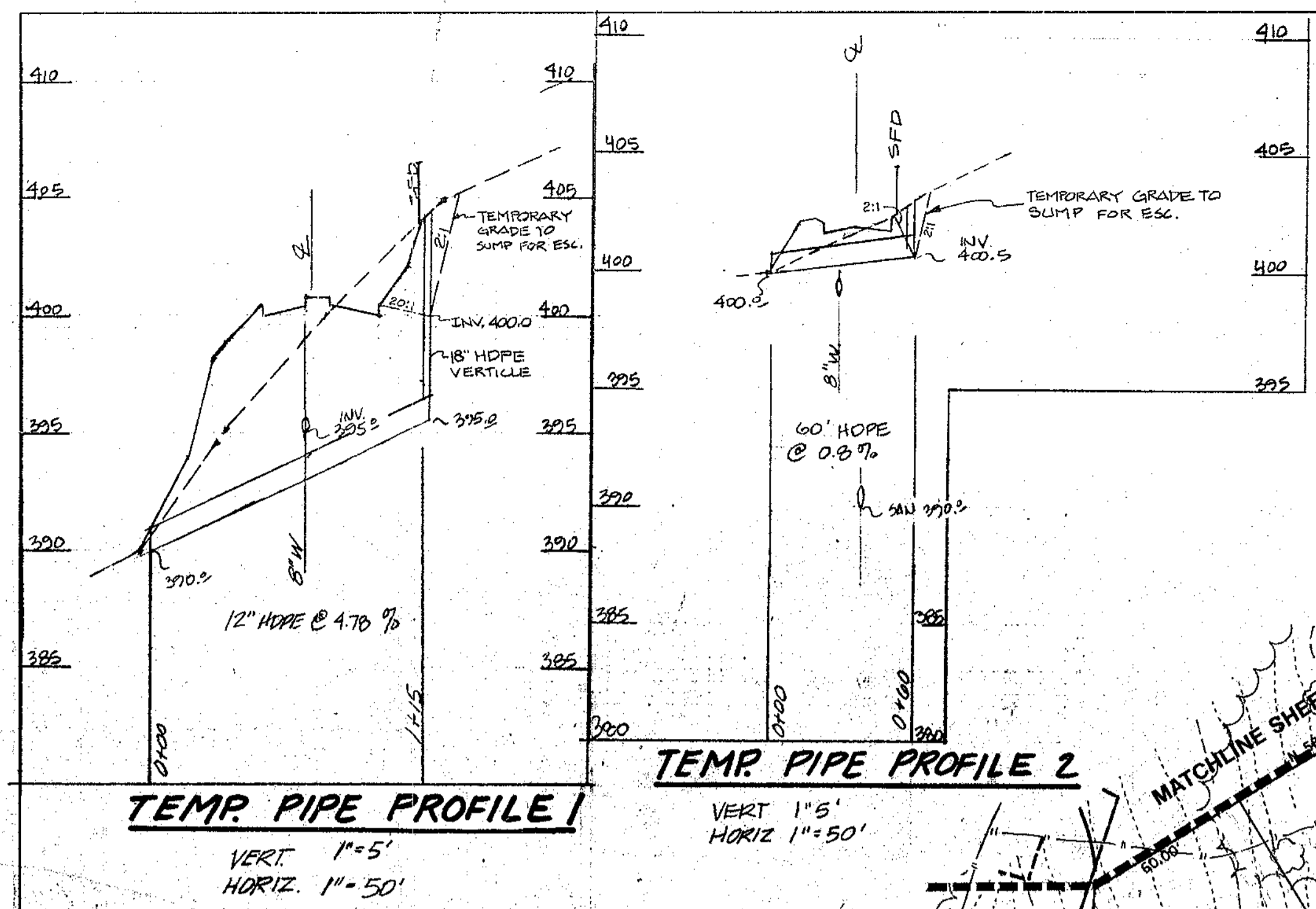
DMW

DATE: 12-3-96

AS-BUILT

APPROVED: *[Signature]* DATE: 12-3-96

SIGNATURE OF ENGINEER

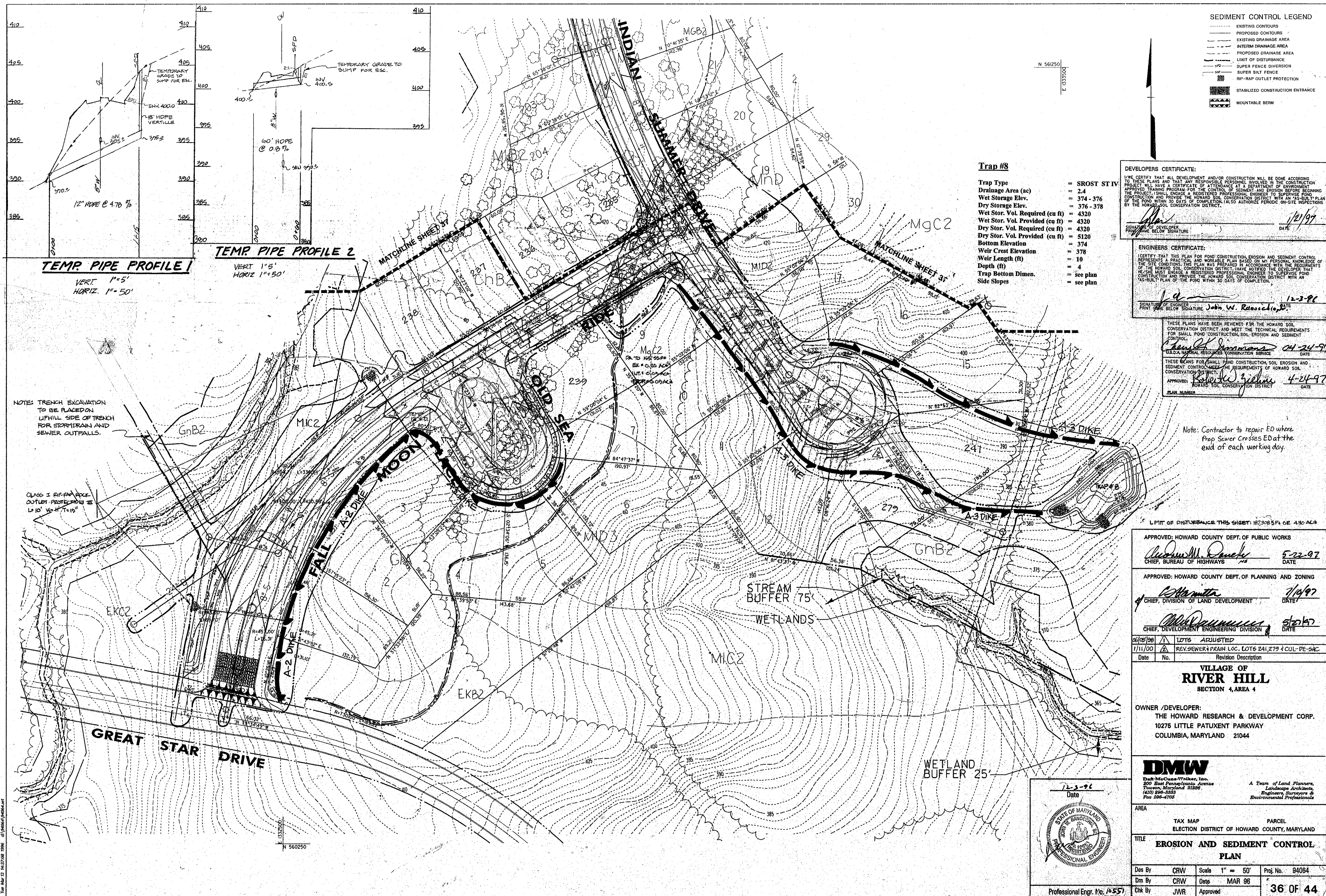


TEMP PIPE PROFILE 1
VERT 1"=5'
HORIZ 1"=50'

TEMP PIPE PROFILE 2
VERT 1"=5'
HORIZ 1"=50'

NOTES: TRENCH EXCAVATION TO BE PLACED ON UPHILL SIDE OF TRENCH FOR STORMDRAIN AND SEWER OUTFALLS.

CLASS I RIP-RAP ROCK OUTFLET PROTECTION III L=10' W=14" T=10"



Trap #8

Trap Type	=	SROST ST IV
Drainage Area (ac)	=	2.4
Wet Storage Elev.	=	374 - 376
Dry Storage Elev.	=	376 - 378
Wet Stor. Vol. Required (cu ft)	=	4320
Wet Stor. Vol. Provided (cu ft)	=	4320
Dry Stor. Vol. Required (cu ft)	=	5120
Bottom Elevation	=	374
Weir Crest Elevation	=	378
Weir Length (ft)	=	10
Depth (ft)	=	4
Trap Bottom Dimen.	=	see plan
Side Slopes	=	see plan

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

Signature: *[Signature]* DATE: 12/1/97

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

Signature: *[Signature]* DATE: 12-3-96
PRINT NAME BELOW SIGNATURE: John W. Ranocchio, P.E.

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

Signature: *[Signature]* DATE: 04-24-97
U.S.D.A. NATIONAL RESOURCES CONSERVATION SERVICE

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

Signature: *[Signature]* DATE: 4-24-97
APPROVED: HOWARD SOIL CONSERVATION DISTRICT

Note: Contractor to repair ED where Prop Sewer Crosses ED at the end of each working day.

LIMIT OF DISTURBANCE THIS SHEET: 187,308.5 F.S. OR 4.30 AC±

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
Signature: *[Signature]* DATE: 5-22-97
CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
Signature: *[Signature]* DATE: 7/19/97
CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *[Signature]* DATE: 5/21/97
CHIEF, DEVELOPMENT ENGINEERING DIVISION

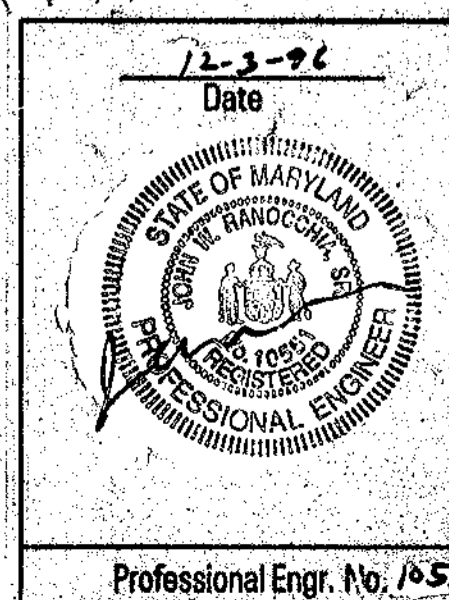
06/02/98 LOTS ADJUSTED
1/11/00 REV. SEWER DRAIN LOC. LOTS 2A1, 279 & COL-DE-SAC
Date No. Revision Description

VILLAGE OF RIVER HILL
SECTION 4, AREA 4

OWNER / DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10276 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

DMW
Duff McCune Walker, Inc.
300 East Pennsylvania Avenue
Towson, Maryland 21286
(410) 296-8333
Fax 296-4705

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

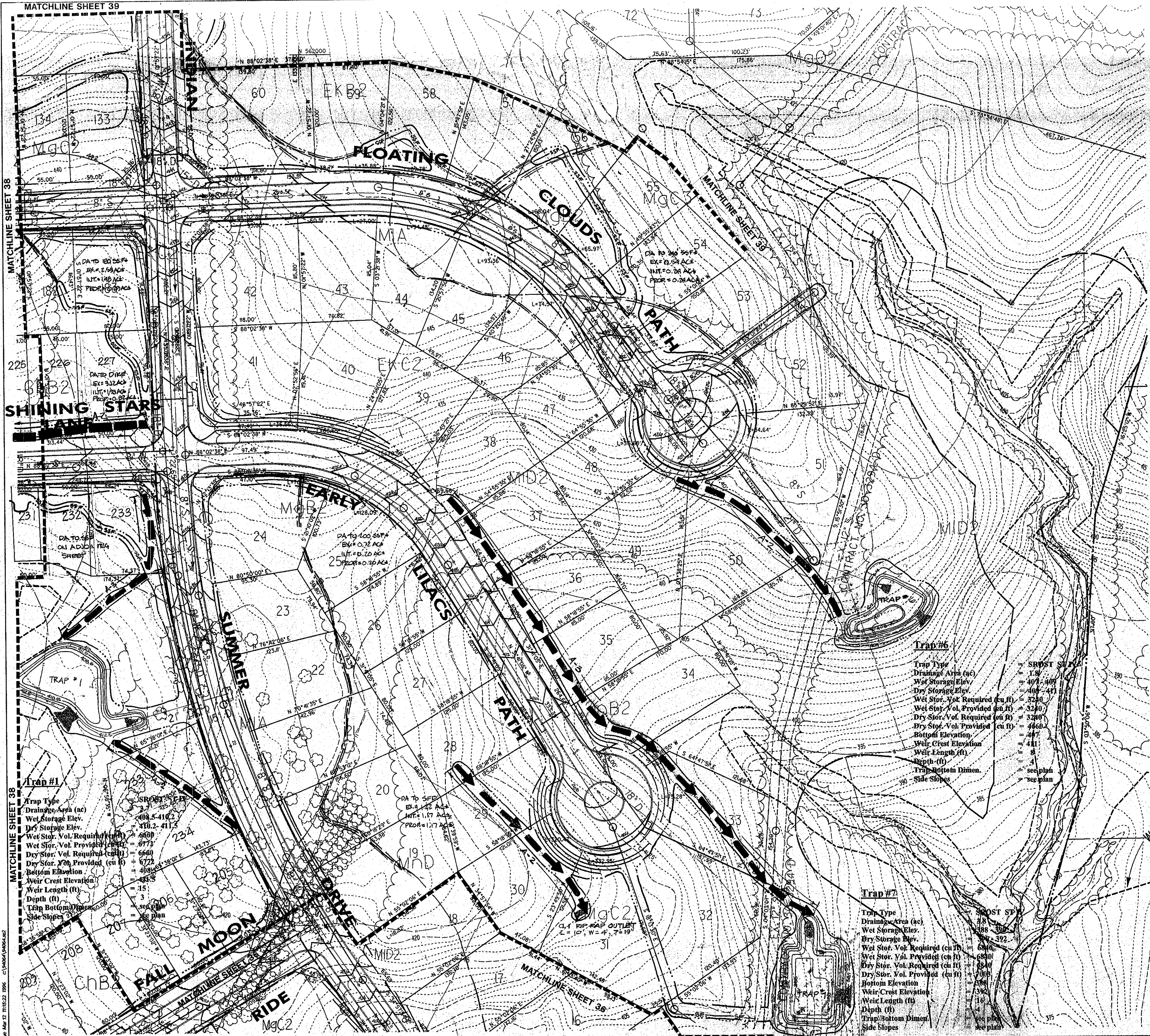


AREA: TAX MAP PARCEL
ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE: **EROSION AND SEDIMENT CONTROL PLAN**

Des By	CRW	Scale	1" = 50'	Proj. No.	94064
Drn By	CRW	Date	MAR 96		
Chk By	JWR	Approved			

Professional Engr. No. 16557



SEDIMENT CONTROL LEGEND

- EXISTING CONTOURS
- - - - PROPOSED CONTOURS
- EXISTING DRAINAGE AREA
- - - - INTERIM DRAINAGE AREA
- - - - PROPOSED DRAINAGE AREA
- LIMIT OF DISTURBANCE
- SUPERFENCE DIVERTER
- SUPER SILT FENCE
- SILT FENCE
- EARTH DIKE
- RUP-RAP OUTLET PROTECTION

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

Signature: *[Signature]* DATE: 1/21/97
 PRINT NAME: DEVELOPER

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

Signature: *[Signature]* DATE: 12-3-96
 PRINT NAME: BELOW SIGNATURE: John W. Ramoche, Inc.

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEET THE TECHNICAL REQUIREMENTS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL.
 Signature: *[Signature]* DATE: 04-24-97
 U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

THESE PLANS FOR SMALL POND CONSTRUCTION, SOIL EROSION AND SEDIMENT CONTROL MEET THE REQUIREMENTS OF HOWARD SOIL CONSERVATION DISTRICT.
 Signature: *[Signature]* DATE: 4-24-97
 APPROVED: HOWARD SOIL CONSERVATION DISTRICT

LIMIT OF DISTURBANCE THIS SHEET = 281,637 SF ± OR 6.4 AC ±

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
 Signature: *[Signature]* DATE: 5-22-97
 CHIEF, BUREAU OF HIGHWAYS

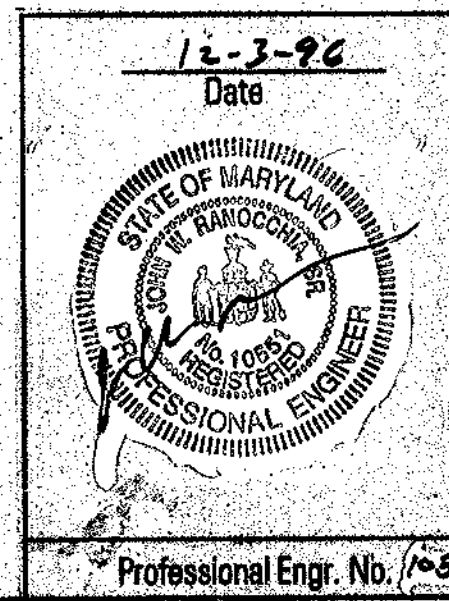
APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
 Signature: *[Signature]* DATE: 7/9/97
 CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *[Signature]* DATE: 5/2/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

06/08/98	1	LOTS ADJUSTED
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VILLAGE OF RIVER HILL
 SECTION 4, AREA 4
 OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Dan McCune-Walkers, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 286-3838
 Fax: 286-4706
 A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals



AREA	TAX MAP	PARCEL	
	ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND		
TITLE			
EROSION AND SEDIMENT CONTROL PLAN			
Des By	CRW	Scale 1" = 50'	Proj. No. 94064
Drn By	CRW	Date MAR 96	
Chk By	JWR	Approved	37 OF 44

MATCHLINE SHEET 38

- SEDIMENT CONTROL LEGEND**
- EXISTING CONTOURS
 - PROPOSED CONTOURS
 - EXISTING DRAINAGE AREA
 - INTERIM DRAINAGE AREA
 - PROPOSED DRAINAGE AREA
 - LIMIT OF DISTURBANCE
 - SUPER FENCE DIVERSION
 - SUPER SILT FENCE
 - SILT FENCE
 - EARTH DIKE
 - HP-RAP OUTLET PROTECTION

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

Signature: *[Signature]* Date: 12/1/97
 PRINT NAME BELOW SIGNATURE

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

Signature: *[Signature]* Date: 12-3-97
 PRINT NAME BELOW SIGNATURE: John W. Ranocchio, Jr.

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

Signature: *[Signature]* Date: 04-21-97
 U.S. A. NATIONAL REGISTERED PROFESSIONAL ENGINEER

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

Signature: *[Signature]* Date: 4-24-97
 APPROVED: HOWARD SOIL CONSERVATION DISTRICT
 PLAN NUMBER

LIMIT OF DISTURBANCE THIS SHEET 283,501 SQ. FT. OR 6.51 AC.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
 Signature: *[Signature]* Date: 5-22-97
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
 Signature: *[Signature]* Date: 7/18/97
 CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *[Signature]* Date: 6-27-97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

12/05/98 1/1 LOTS ADJUSTED

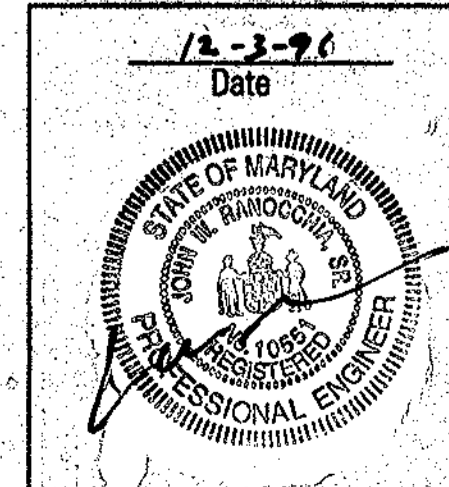
Date	No.	Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

DMW
 Dept. 255-Crosswalk, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 286-8333
 Fax 286-4705

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

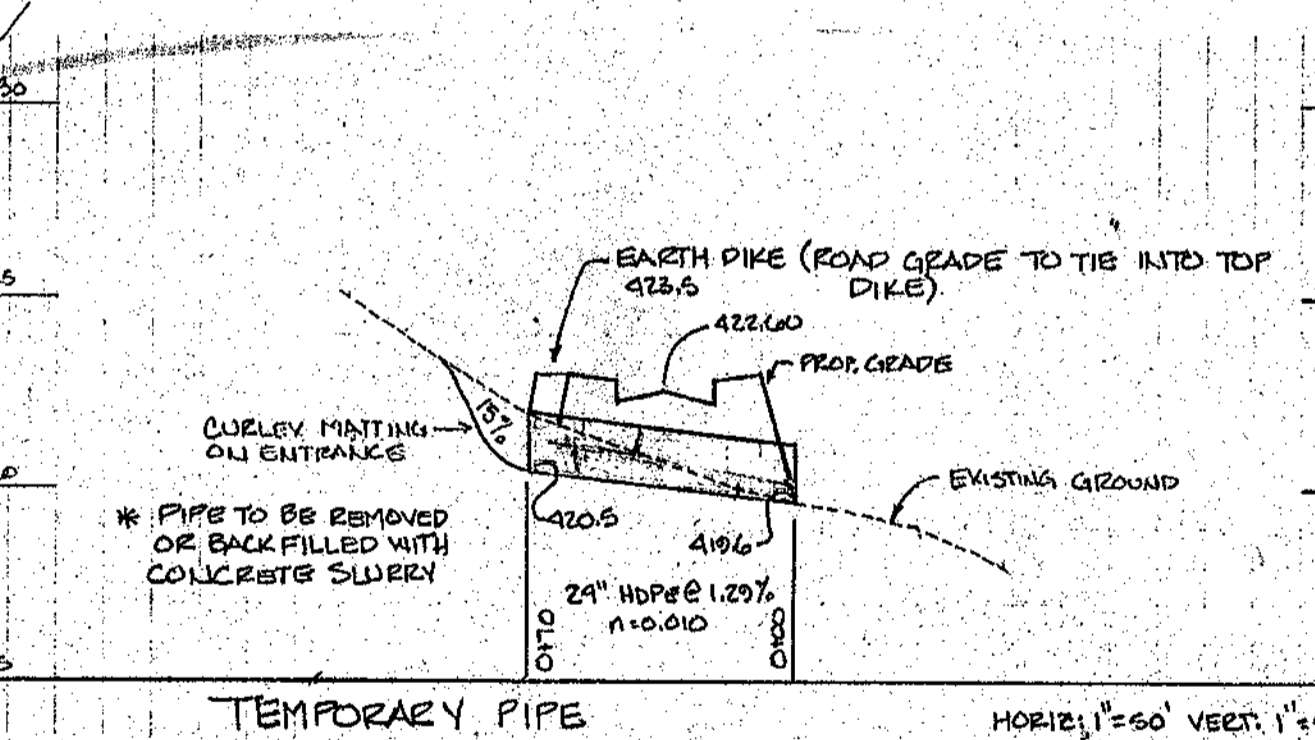


AREA	TAX MAP	PARCEL	ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND
TITLE	EROSION AND SEDIMENT CONTROL PLAN		
Des By	CRW	Scale	1" = 50'
Drn By	CRW	Date	MAR 96
Chk By	JWR	Approved	
Proj. No.	94084		38 OF 44

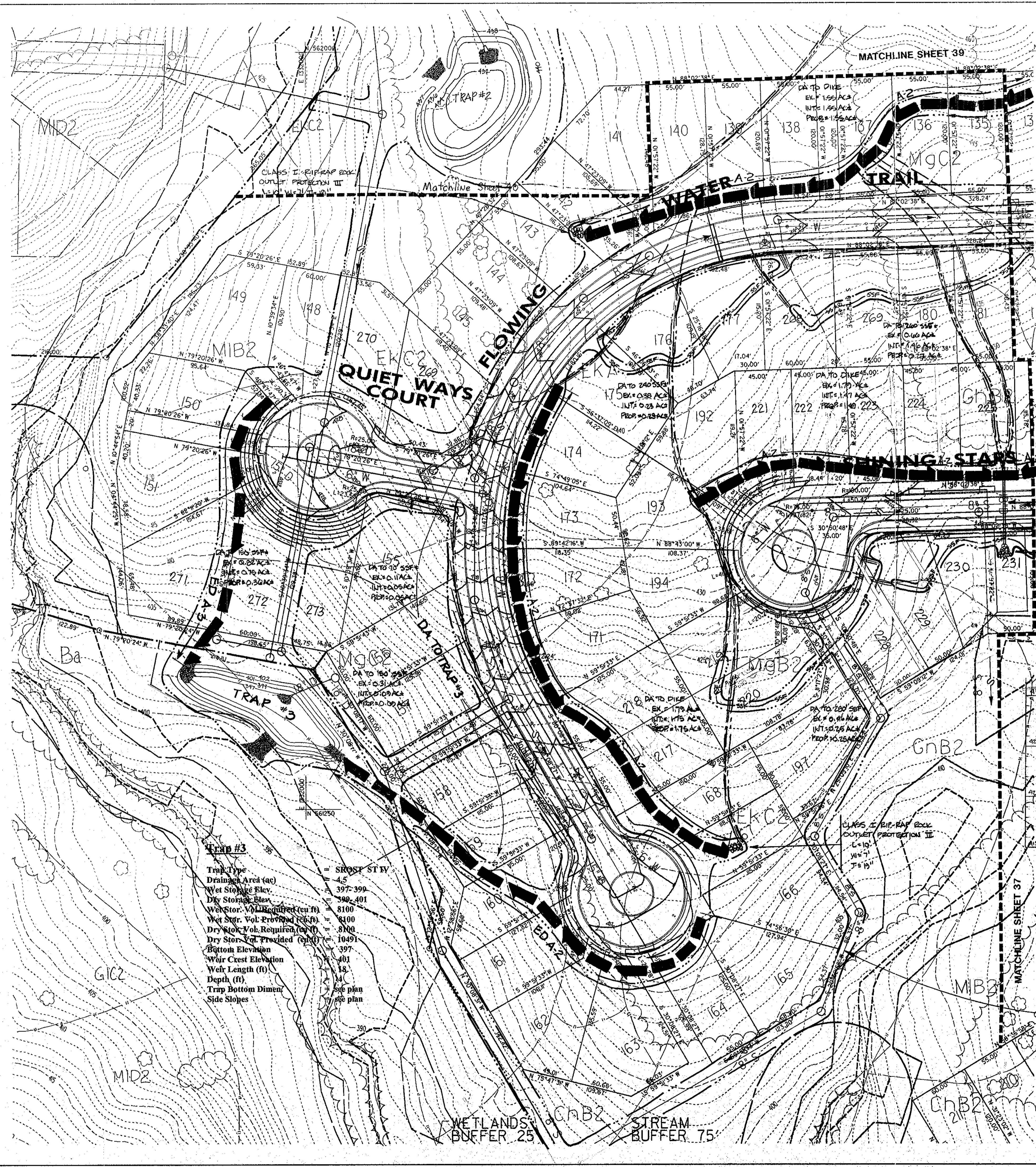
DA TO TEMP 24" HDPE PIPE
 EX. = 9.07 AC
 INT. = 3.51 AC
 PROP. = 2.40 AC

CLASS I RIPRAP ROCK
 OUTLET PROTECTION III
 L=12'
 W=14'
 T=19"

DA TO 310' 55" (PORTION ON ADJOINING SHEET)
 EX. = 1.18 AC
 INT. = 1.07 AC
 PROP. = 0.27 AC

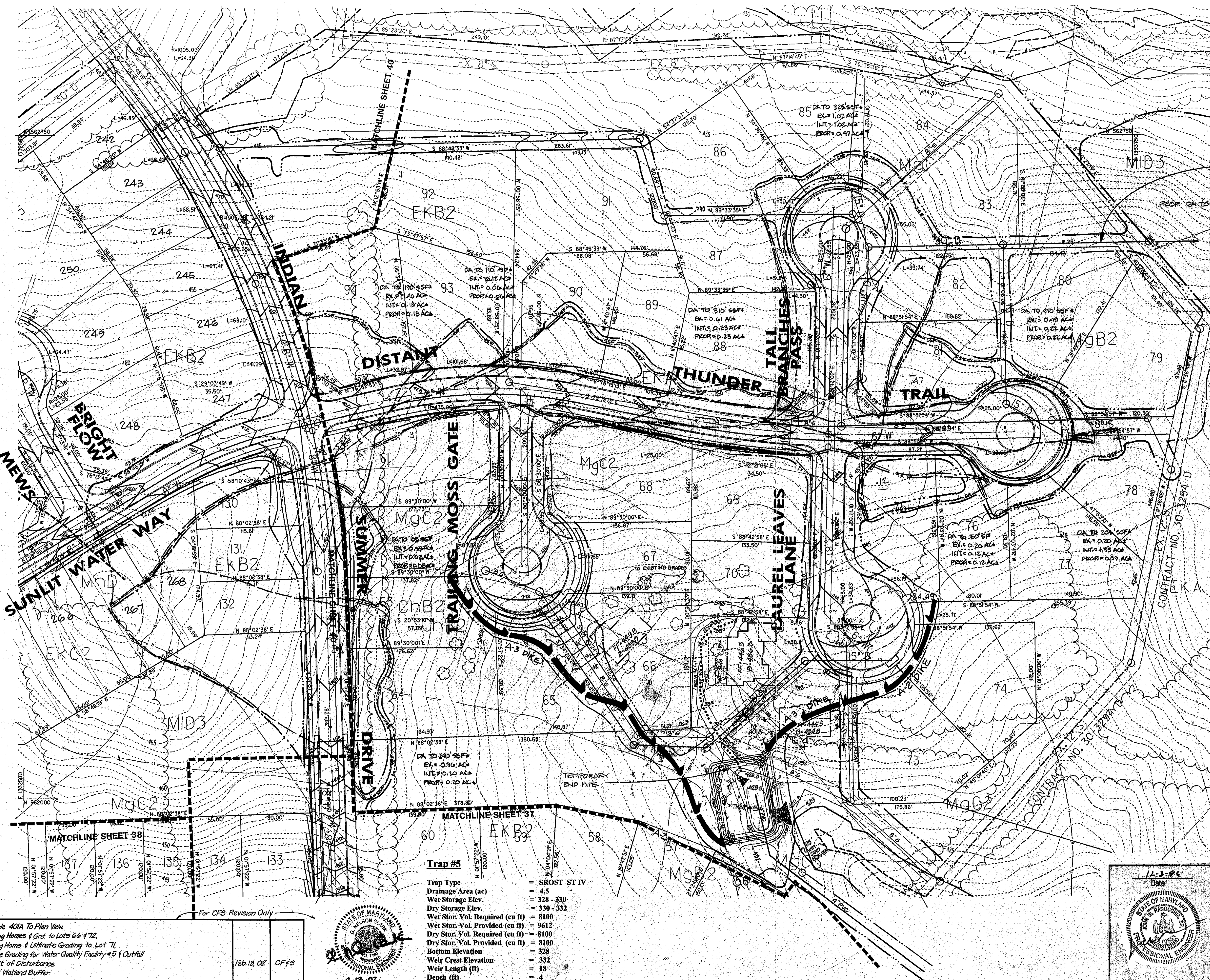


NOTE: TRENCH EXCAVATION TO BE PLACED ON UPHILL SIDE OF TRENCH FOR STORMDRAIN AND SEWER OUTFALLS.



Trap #3

- Trap Type = SROSS STY
- Drainage Area (ac) = 4.5
- Wet Storage Elev. = 397.399
- Dry Storage Elev. = 399.401
- Wet Stor. Vol. Required (cu ft) = 8100
- Wet Stor. Vol. Provided (cu ft) = 8100
- Dry Stor. Vol. Required (cu ft) = 8100
- Dry Stor. Vol. Provided (cu ft) = 10491
- Bottom Elevation = 397
- Weir Crest Elevation = 401
- Weir Length (ft) = 18
- Depth (ft) = 14
- Trap Bottom Dimen. = See plan
- Side Slopes = 1:1.5 plan



- SEDIMENT CONTROL LEGEND**
- EXISTING CONTOURS
 - PROPOSED CONTOURS
 - EXISTING DRAINAGE AREA
 - INTERIM DRAINAGE AREA
 - PROPOSED DRAINAGE AREA
 - LIMIT OF DISTURBANCE
 - SUPER SILT FENCE
 - SILT FENCE
 - EARTH DIKE
 - RIP-RAP OUTLET PROTECTION
 - EROSION CONTROL MATTING (Refer to Sheet 19 of 44 For Detail)
- NOTE:** TRENCH EXCAVATION TO BE PLACED ON UPHILL SIDE OF TRENCH FOR STORMDRAIN AND SEWER OUTFALLS.

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

Signature: *[Signature]* Date: 12/1/97

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

Signature: *[Signature]* Date: 12-3-96

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

Signature: *[Signature]* Date: 04-21-97

U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

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

Signature: *[Signature]* Date: 4-24-97

APPROVED: HOWARD SOIL CONSERVATION DISTRICT

LIMIT OF DISTURBANCE THIS SHEET = 265,710 SQ. FT. OR 6.10 AC.

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
 Signature: *[Signature]* Date: 5-22-97
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
 Signature: *[Signature]* Date: 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *[Signature]* Date: 5/27/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

06/08/98 GRADED SWALE

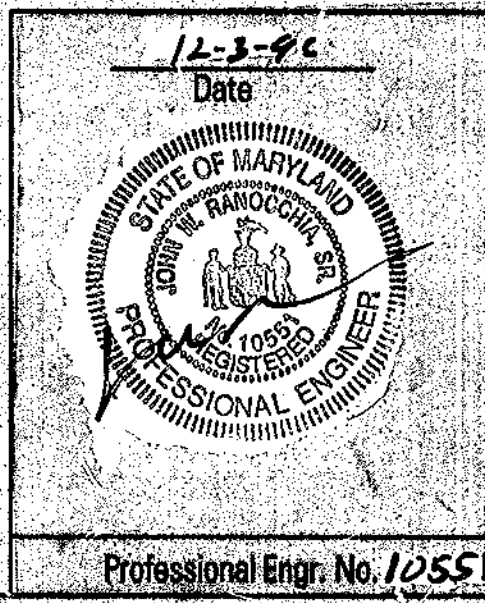
Date: _____ No. _____ Revision Description: _____

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10276 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

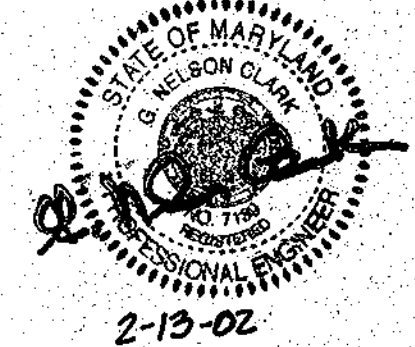
DMW
 Dan H. Williams, Inc.
 800 East Pennsylvania Avenue
 Towson, Maryland 21286
 410-286-8888
 Fax: 410-286-4705

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



Trap #5

Trap Type	= SROST ST IV
Drainage Area (ac)	= 4.5
Wet Storage Elev.	= 328 - 330
Dry Storage Elev.	= 330 - 332
Wet Stor. Vol. Required (cu ft)	= 8100
Wet Stor. Vol. Provided (cu ft)	= 9612
Dry Stor. Vol. Required (cu ft)	= 8100
Dry Stor. Vol. Provided (cu ft)	= 8100
Bottom Elevation	= 328
Weir Crest Elevation	= 332
Weir Length (ft)	= 18
Depth (ft)	= 4
Trap Bottom Dimen.	= 74 x 46
Side Slopes	= 2:1



For CFS Revision Only

No.	Revisions	Date	By
2	Add Manhole 401A To Plan View, Add Existing Homes & Grd. to Lots 66 & 72, Add Existing Homes & Ultimate Grading to Lot 71, Add Ultimate Grading for Water Quality Facility #5 & Outfall Correct Limit of Disturbance Correct 25' Wetland Buffer	Feb. 13, 02	CFJ

THE MAY 17, 1996 15:57:00 1996 410664.DWG

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

Signature: *[Signature]* DATE: 12/97
 SIGNATURE OF DEVELOPER
 PRINT NAME BELOW SIGNATURE

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

Signature: *[Signature]* DATE: 12-3-96
 SIGNATURE OF ENGINEER
 PRINT NAME BELOW SIGNATURE: John W. Ranocchia, P.E.

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

Signature: *[Signature]* DATE: 04-24-97
 U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

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

Signature: *[Signature]* DATE: 4/24/97
 APPROVED: HOWARD SOIL CONSERVATION DISTRICT

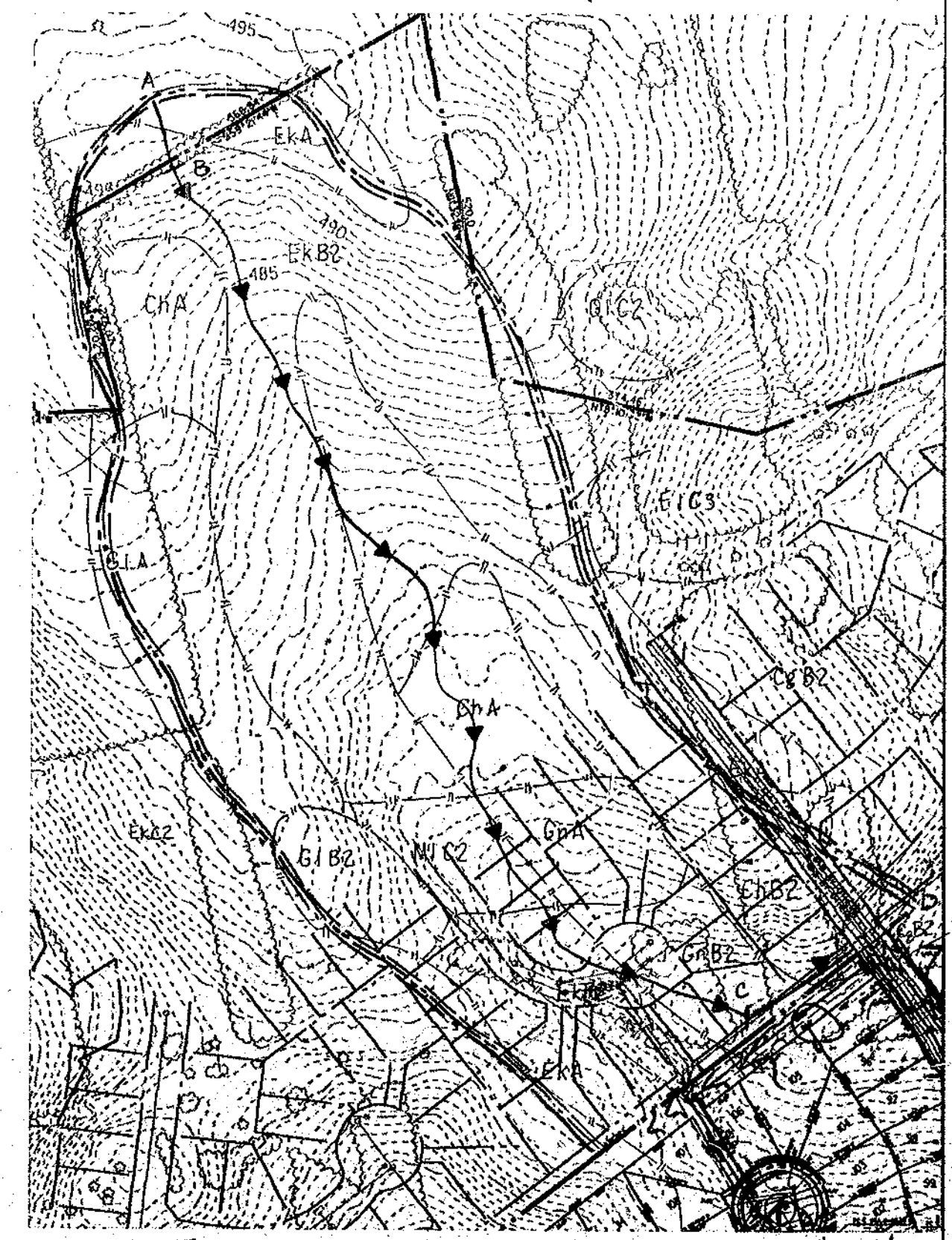
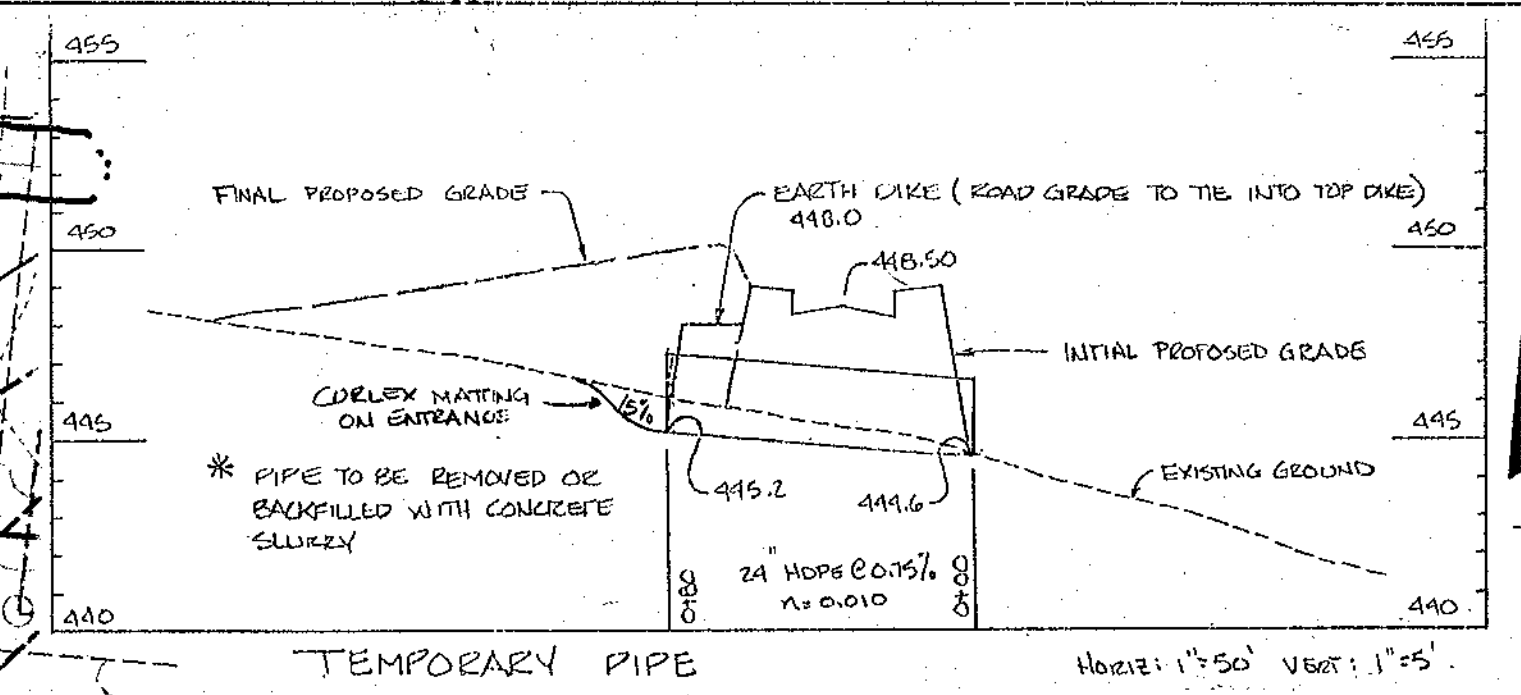
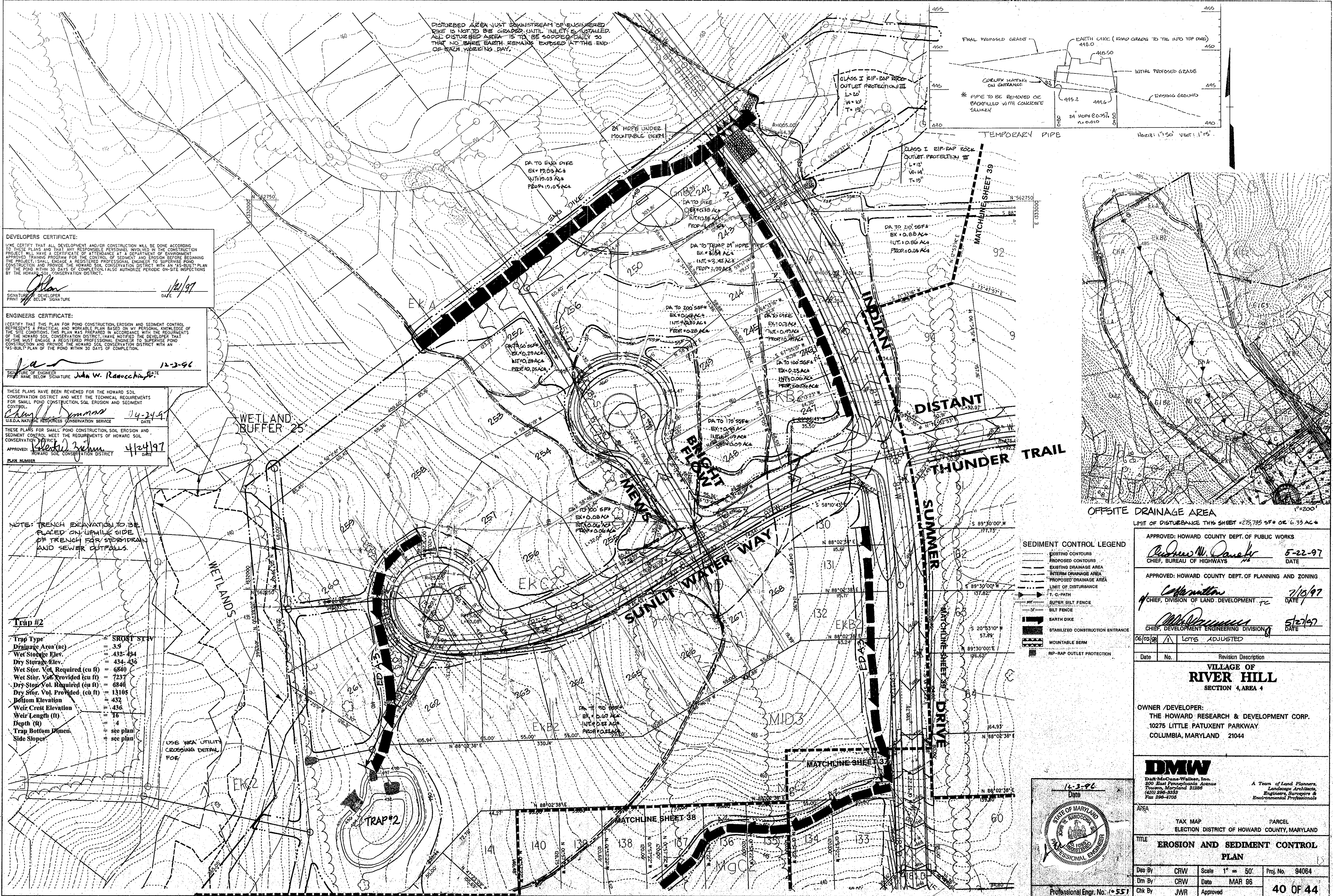
PLAN NUMBER

NOTE: TRENCH EXCAVATION TO BE PLACED ON UPHILL SIDE OF TRENCH FOR STORMWATER AND SEWER OUTFALLS.

Trap #2

Type	SR02T SL4V
Drainage Area (ac)	= 3.5
Wet Storage Elev.	= 432'-434
Dry Storage Elev.	= 434'-436
Wet Stor. Vol. Required (cu ft)	= 6840
Wet Stor. Vol. Provided (cu ft)	= 7237
Dry Stor. Vol. Required (cu ft)	= 6840
Dry Stor. Vol. Provided (cu ft)	= 13105
Bottom Elevation	= 432
Weir Crest Elevation	= 436
Weir Length (ft)	= 76
Depth (ft)	= 4
Trap Bottom Dimen.	see plan
Side Slopes	see plan

USE WEA UTILITY CROSSING DETAIL FOR



- SEDIMENT CONTROL LEGEND**
- - - - - EXISTING CONTOURS
 - - - - - PROPOSED CONTOURS
 - - - - - EXISTING DRAINAGE AREA
 - - - - - INTERIM DRAINAGE AREA
 - - - - - PROPOSED DRAINAGE AREA
 - - - - - LIMIT OF DISTURBANCE
 - - - - - T. C. PATH
 - - - - - SUPER SILT FENCE
 - - - - - SILT FENCE
 - - - - - EARTH DIKE
 - - - - - STABILIZED CONSTRUCTION ENTRANCE
 - - - - - MOUNTABLE BERM
 - - - - - RIP-RAP OUTLET PROTECTION

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
 Signature: *[Signature]* DATE: 5-22-97
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
 Signature: *[Signature]* DATE: 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *[Signature]* DATE: 5/21/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

06/05/98 / A / LOTS ADJUSTED

Date No. Revision Description

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044



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

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

TAX MAP PARCEL
 ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE: **EROSION AND SEDIMENT CONTROL PLAN**

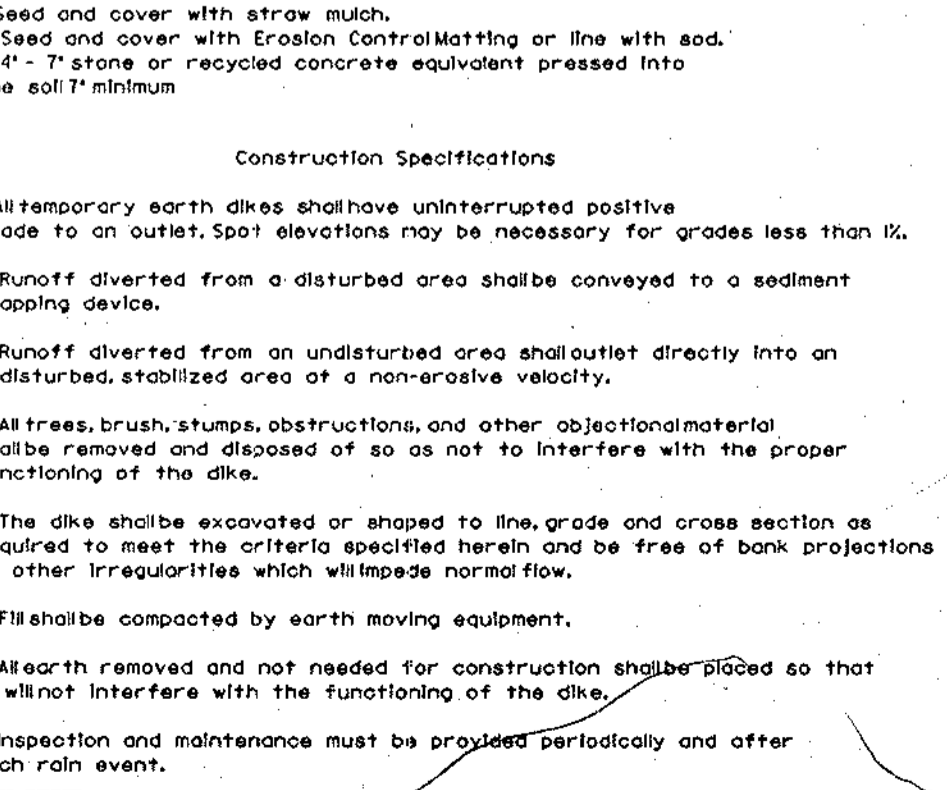
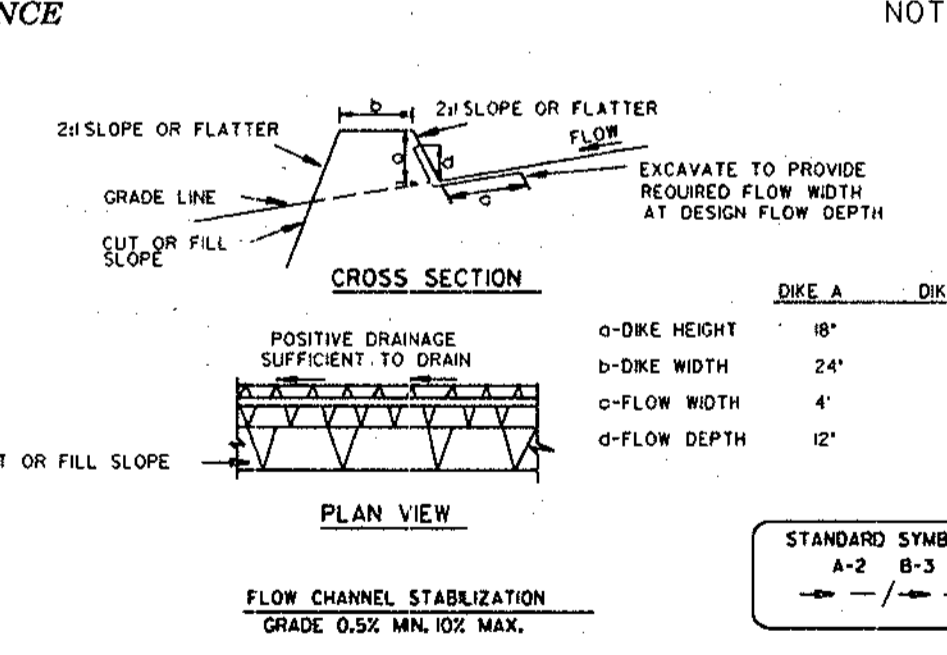
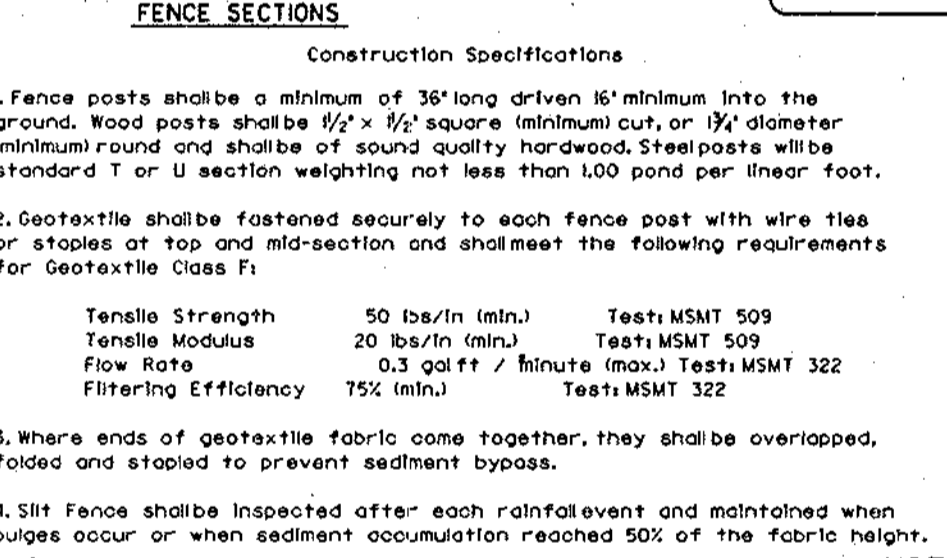
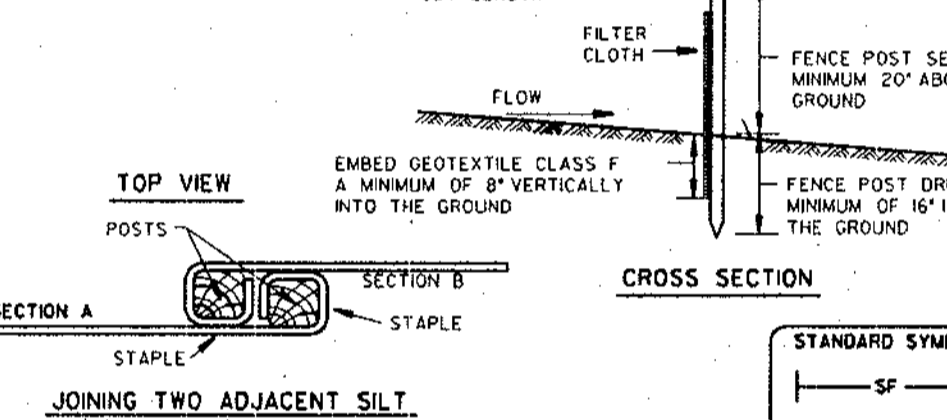
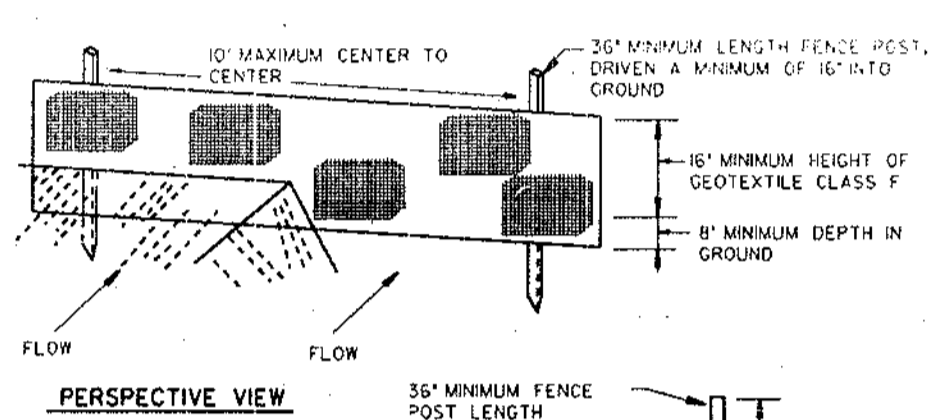
Des. By	CRW	Scale	1" = 50'	Proj. No.	94064
Dim. By	CRW	Date	MAR 96		
Chk. By	JWR	Approved			40 OF 44

Professional Engr. No. 10551

- A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPT. OF INSPECTIONS AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION.
- ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1985 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL.
- FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN THE FOLLOWING TIME PERIODS:
 - SEVEN CALENDAR DAYS FOR ALL PERMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1.
 - FOURTEEN DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
- ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THESE PERIMETERS IN ACCORDANCE WITH VOL. 1, CHAPTER 20 OF THE "HOWARD COUNTY DESIGN MANUAL," STORM DRAINAGE.
- ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1985 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL. FOR PERMANENT SEEDING, SEE SECTION 50, 500 SECTION 50.1 TEMPORARY SEEDING, SECTION 50.1 AND MULCHING, SECTION 50.2. TEMPORARY STABILIZATION WITH MULCH ALONE CAN ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
- ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMITS FOR THEIR REMOVAL HAS BEEN OBTAINED FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE	99.05 ACRES ±
AREA TO BE GRADED OR PAVED	29.51 ACRES ±
AREA TO BE VEGETATIVELY STABILIZED	196 ACRES ±
TOTAL CUT	2116 CUBIC YARDS ±
TOTAL FILL	339 CUBIC YARDS ±
OFF-SITE WASTE/BORROW AREA LOCATION	WASTE: N/A
BORROW: N/A	
8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY DPM SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING, OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

HOWARD COUNTY SEDIMENT CONTROL GENERAL NOTES



Permanent Seeding Notes
Apply to graded or cleared areas not subject to immediate further disturbance where a permanent long-lived vegetative cover is needed.

Seeded Preparation - Loosen upper 3 inches of soil by raking, disking, or other acceptable means before seeding, if not previously loosened.

Soil Amendments - In lieu of soil test recommendations, use one of the following schedules:
1. **Erastar** - Apply 2 tons per acre diammonia phosphate (42 lbs./1000 sq. ft.) and 1000 lbs. per acre 10-10-10 fertilizer (40 lbs./1000 sq. ft.) before seeding. Harrow or disk into upper 3 inches of soil. At time of seeding, apply 400 lbs. per acre 30-0-0 urea-form fertilizer (19 lbs./1000 sq. ft.).
2. **Accotote** - Apply 2 tons per acre diammonia phosphate (42 lbs./1000 sq. ft.) and 1000 lbs. per acre 10-10-10 fertilizer (40 lbs./1000 sq. ft.) before seeding. Harrow or disk into upper 3 inches of soil.

Seeding - For the periods March through April 30, and August through October 15, seed with 60 lbs. per acre (4 lbs./1000 sq. ft.) of Rebel Tall Fescue. For the period May through July 31, seed with 60 lbs. Rebel Tall Fescue per acre and 2 lbs. per acre 100 lbs./1000 sq. ft. of wetting agent. During the period of October 15 through February 28, protect site by 100 lbs. of 2-ton per acre of wetland straw mulch and seed as soon as possible in the spring. Option (2) - Use seed Option (1) - seed with 60 lbs. per acre Rebel Tall Fescue and much with 2 tons/acre wetland straw.

Mulching - Apply 1/2 to 2 tons per acre (10 to 90 lbs./1000 sq. ft.) of unrotted mulch straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool. 20 gallons per acre (5 gal./1000 sq. ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (18 gal./100 sq. ft.) for anchoring.

Maintenance - Inspect overseeding area and make needed repairs, replacements and reseed.

Temporary Seeding Notes
Apply to graded or cleared areas likely to be redistributed where a short-term vegetative cover is needed.

Seeded Preparation - Loosen upper 3 inches of soil by raking, disking, or other acceptable means before seeding, if not previously loosened.

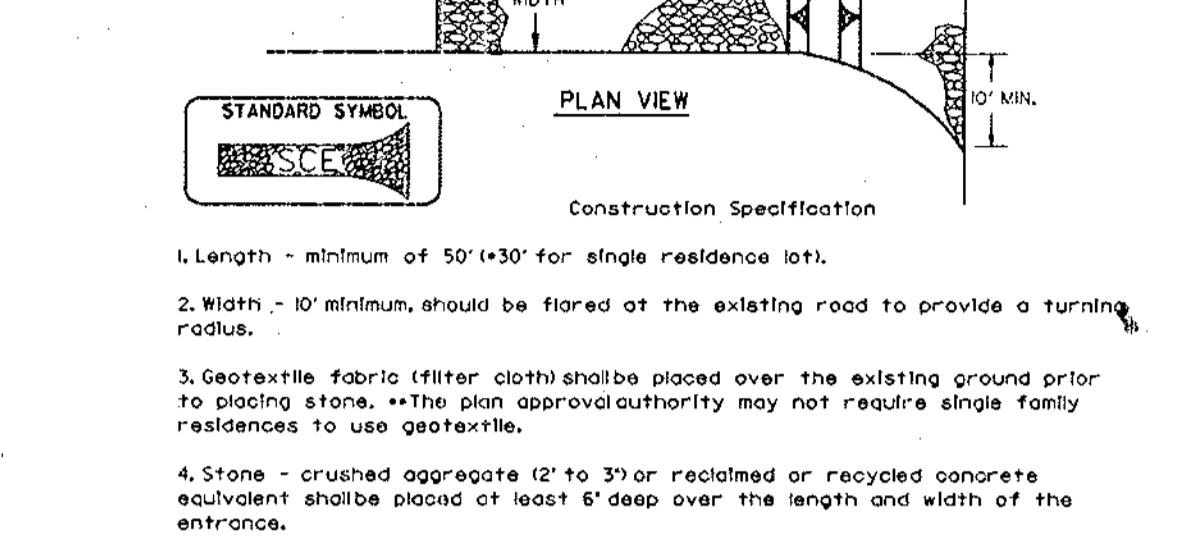
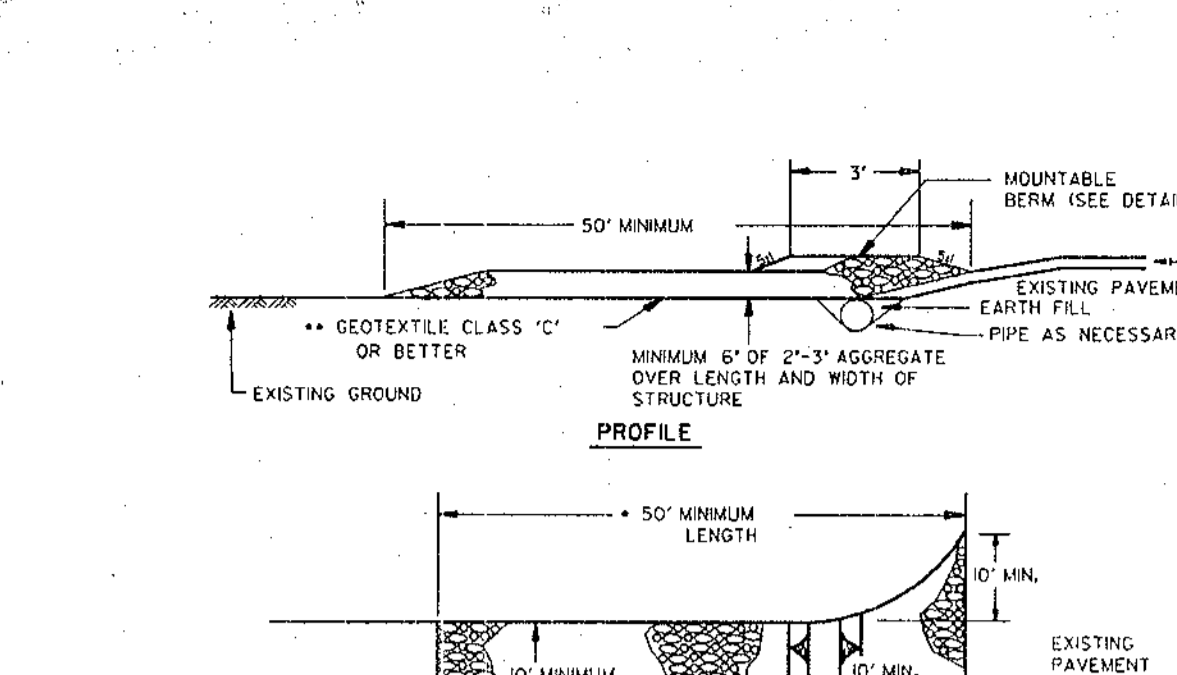
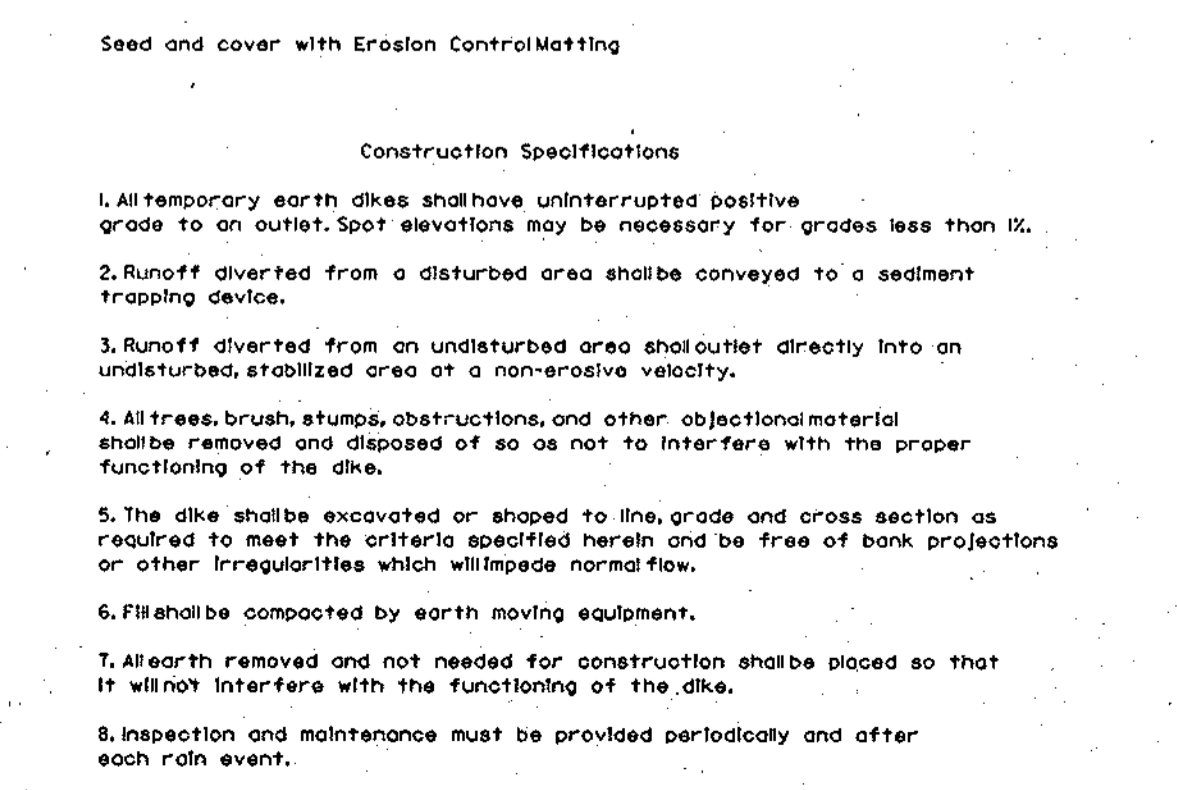
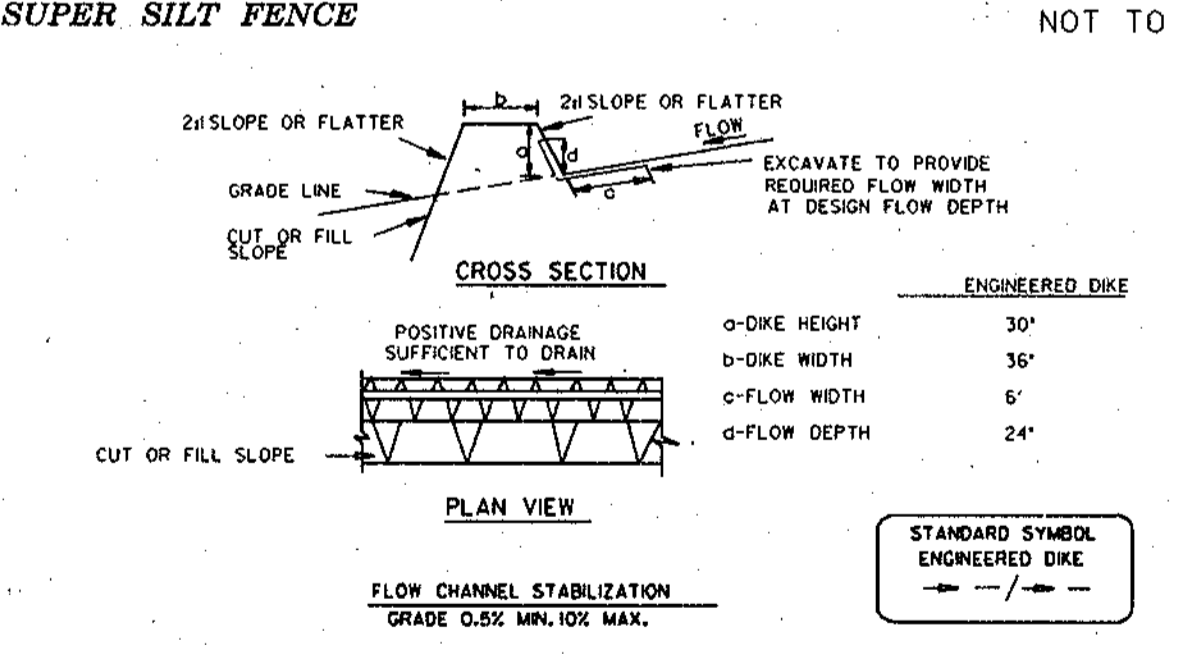
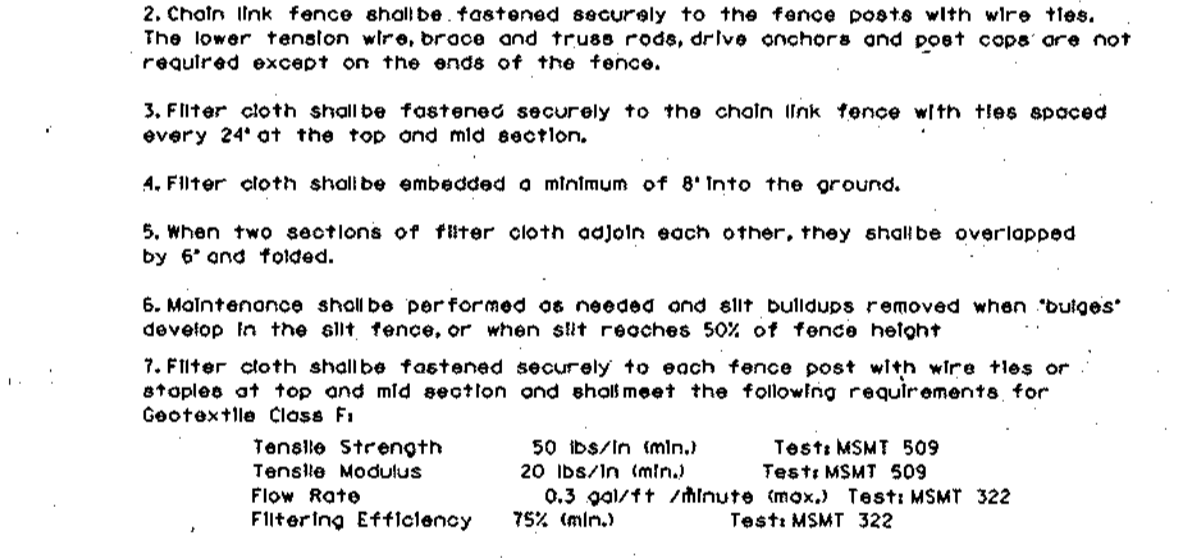
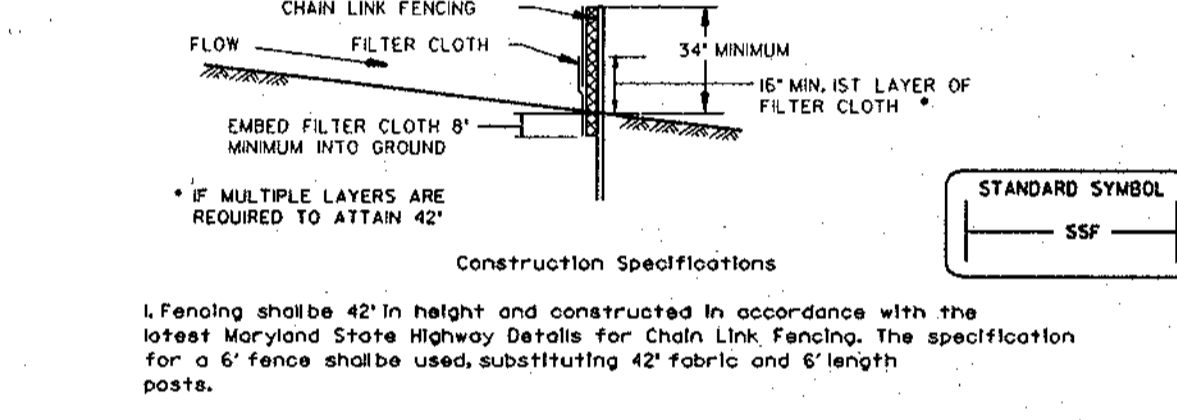
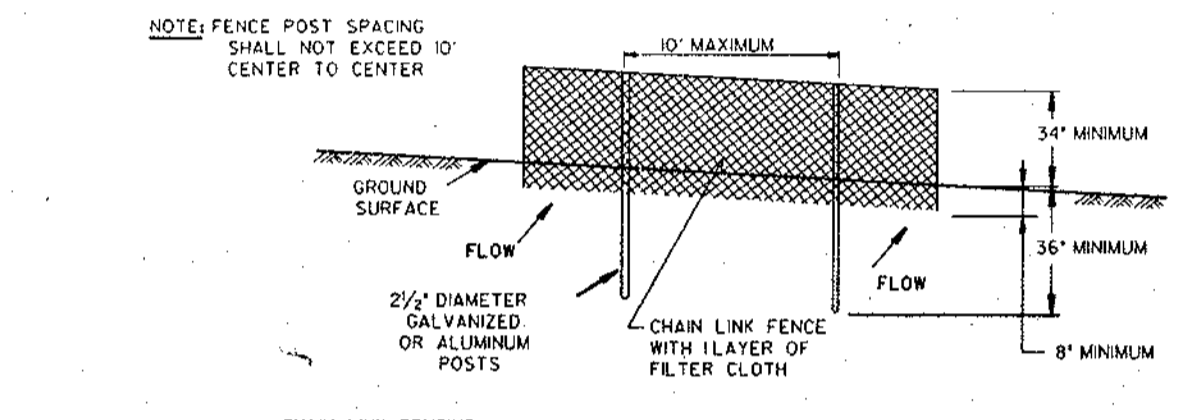
Soil Amendments - Apply 600 lbs. per acre 10-0-10 fertilizer (4 lbs./1000 sq. ft.).

Seeding - For the periods March through April 30, and August through October 15, seed with 1/2 bushel per acre of annual ryegrass (3.2 lbs./1000 sq. ft.). For the period May through August 14, seed with 3 lbs. per acre of wetting agent (107 lbs./1000 sq. ft.). For the period November 15 through February 28, protect site by applying 2 tons per acre of wetland straw mulch and seed as soon as possible in the spring or use seed.

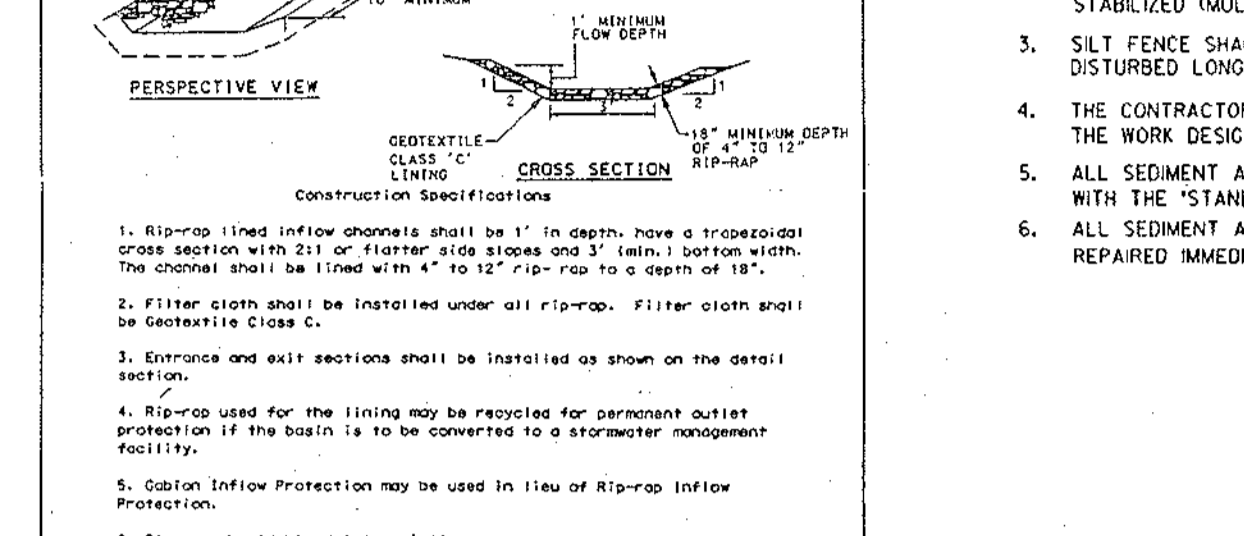
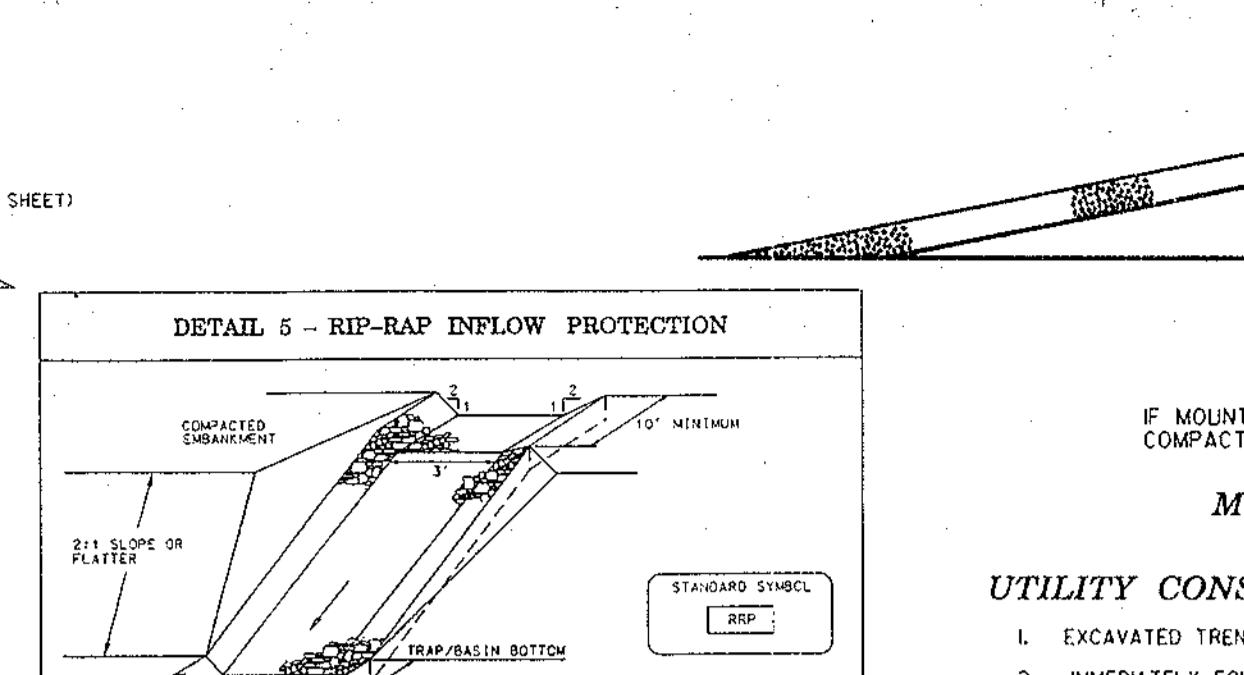
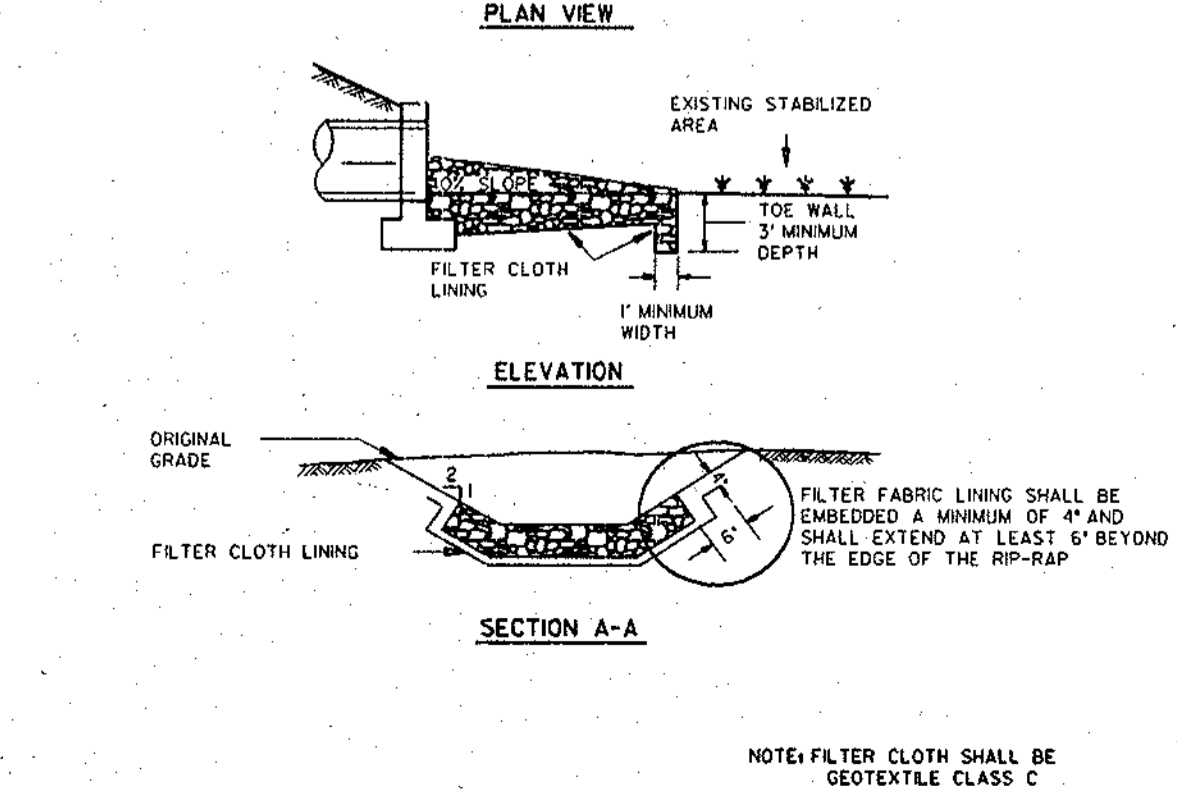
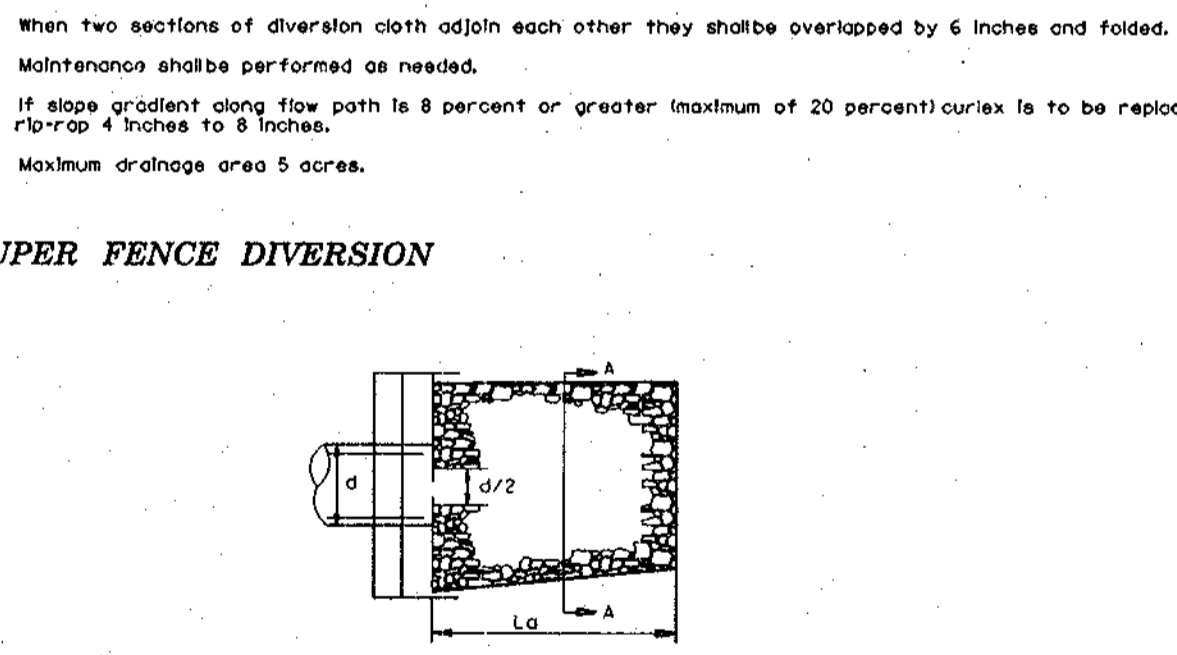
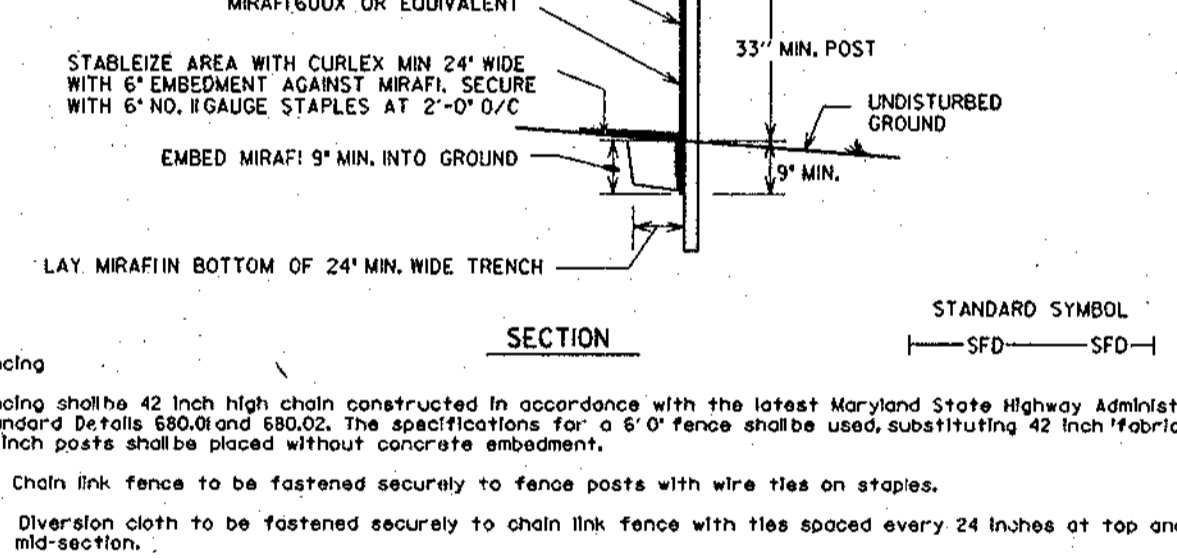
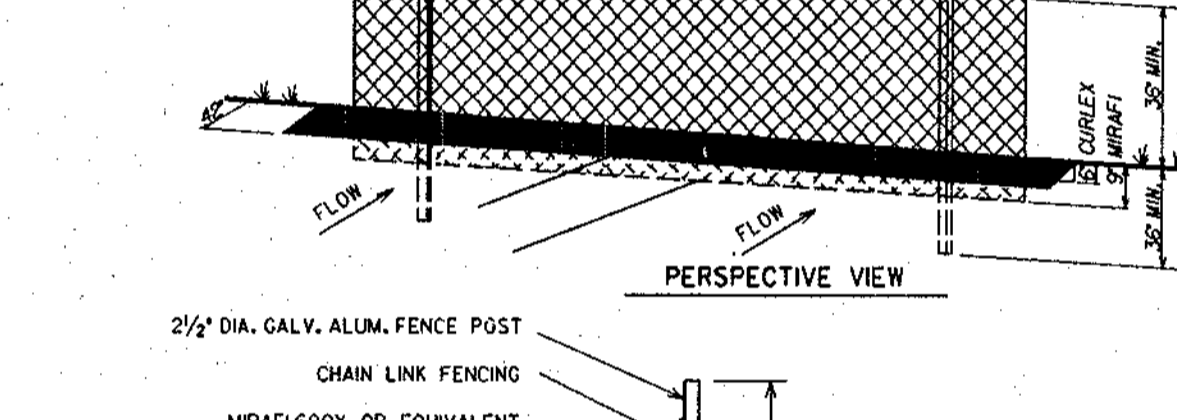
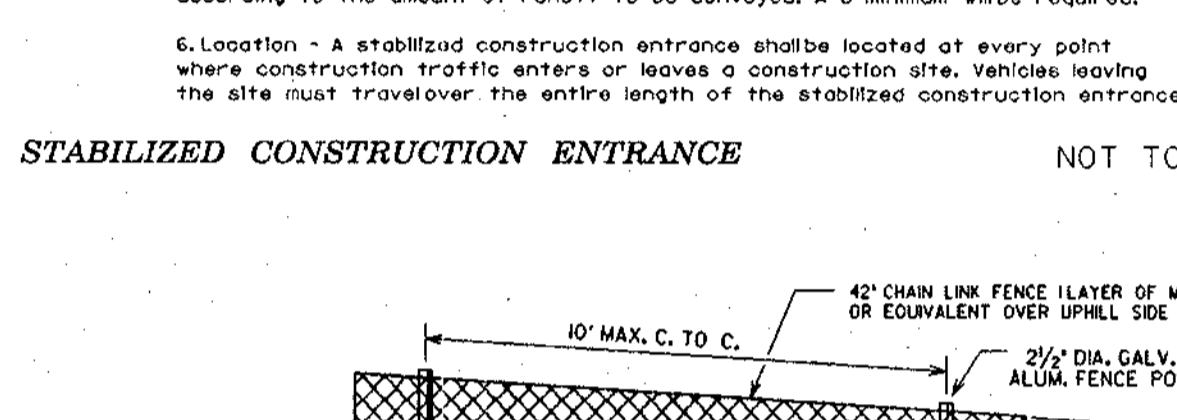
Mulching - Apply 1/2 to 2 tons per acre (10 to 90 lbs./1000 sq. ft.) of unrotted mulch straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool. 20 gallons per acre (5 gal./1000 sq. ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (18 gal./100 sq. ft.) for anchoring.

Refer to the 1985 Maryland Standards and Specifications for Soil Erosion and Sediment Control for additional notes and methods not covered.

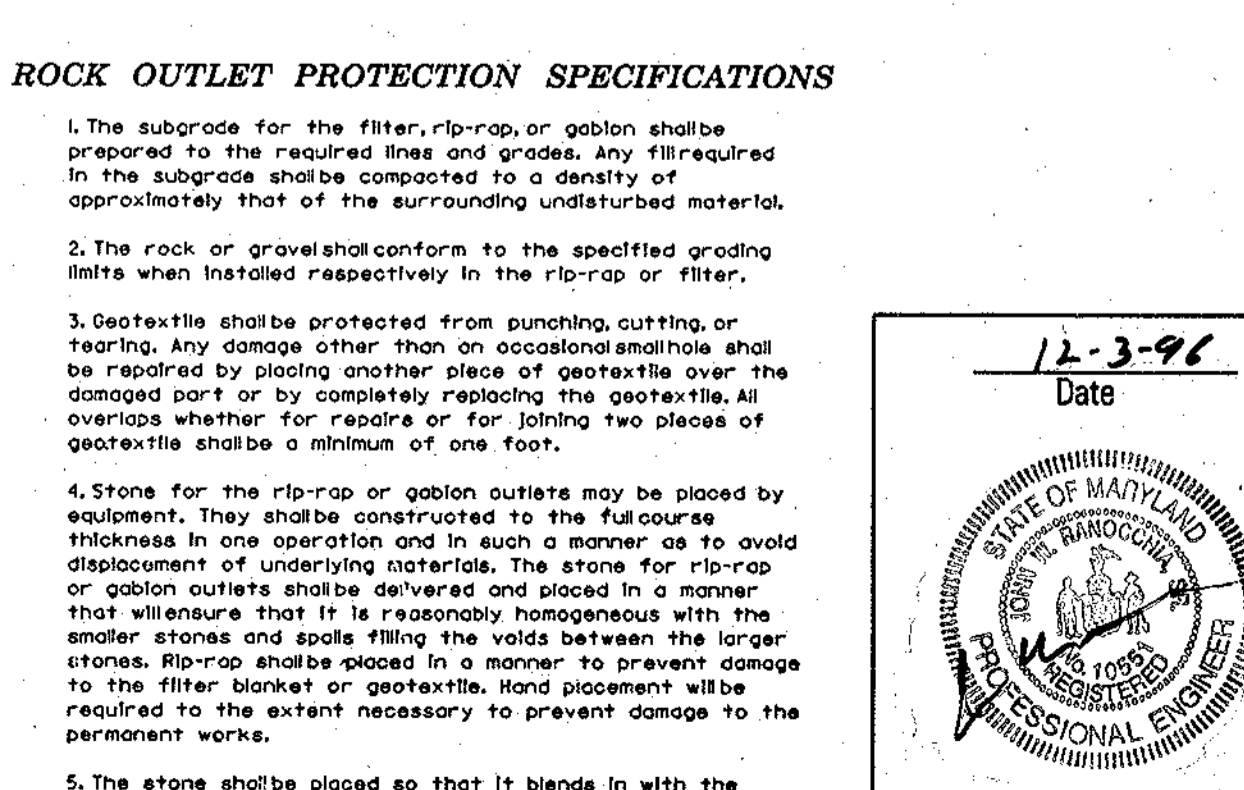
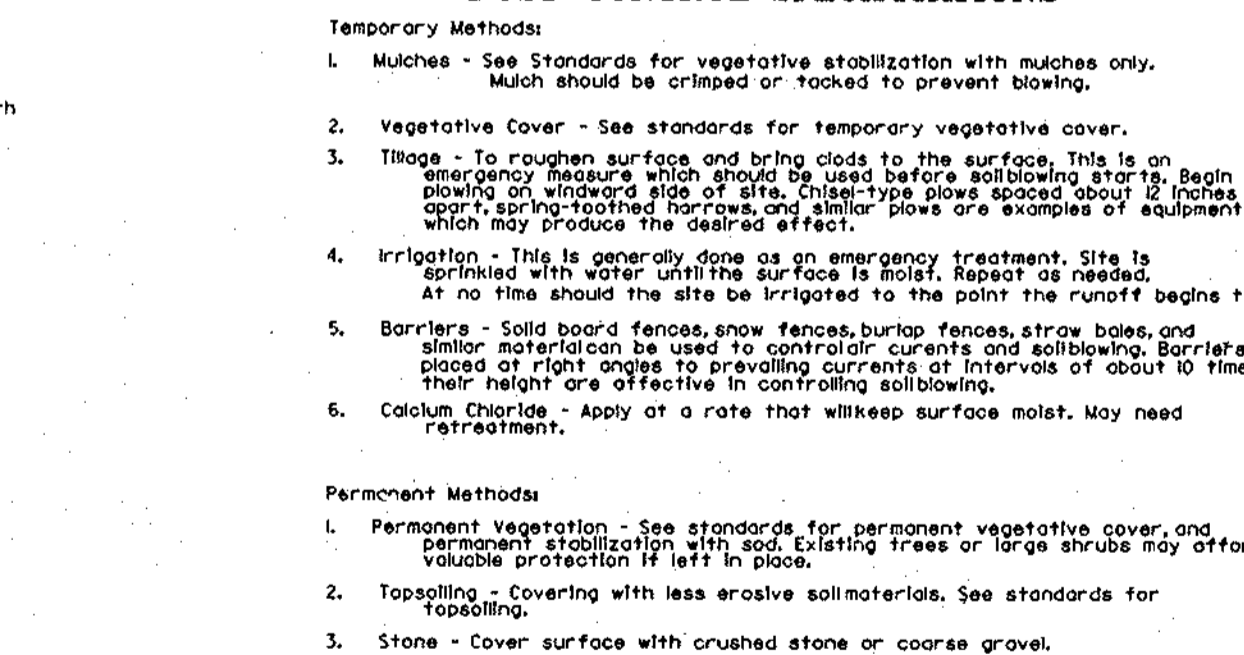
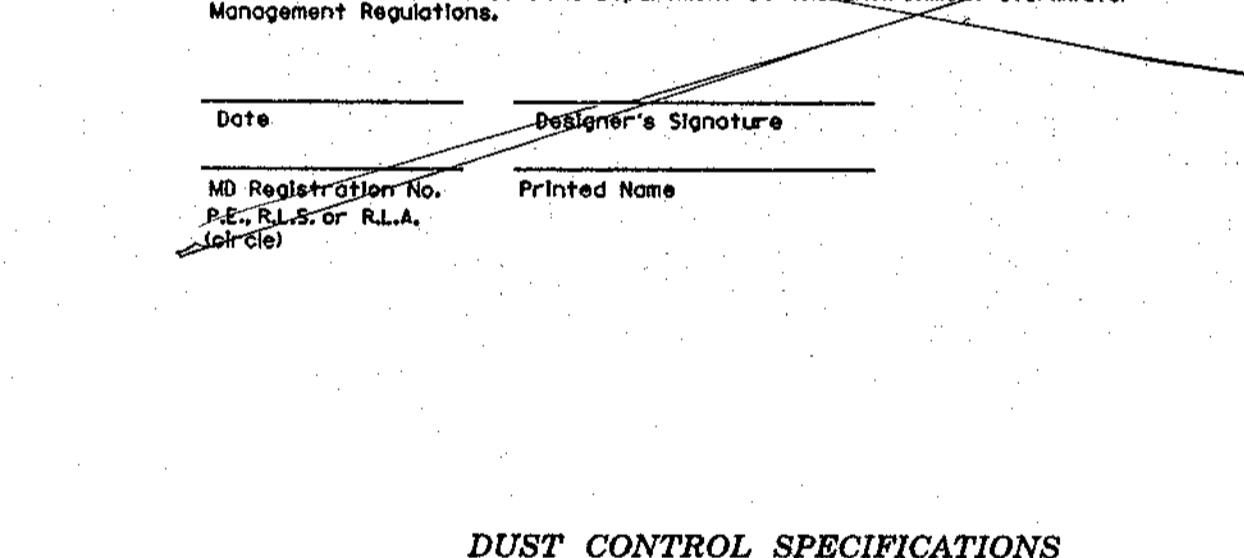
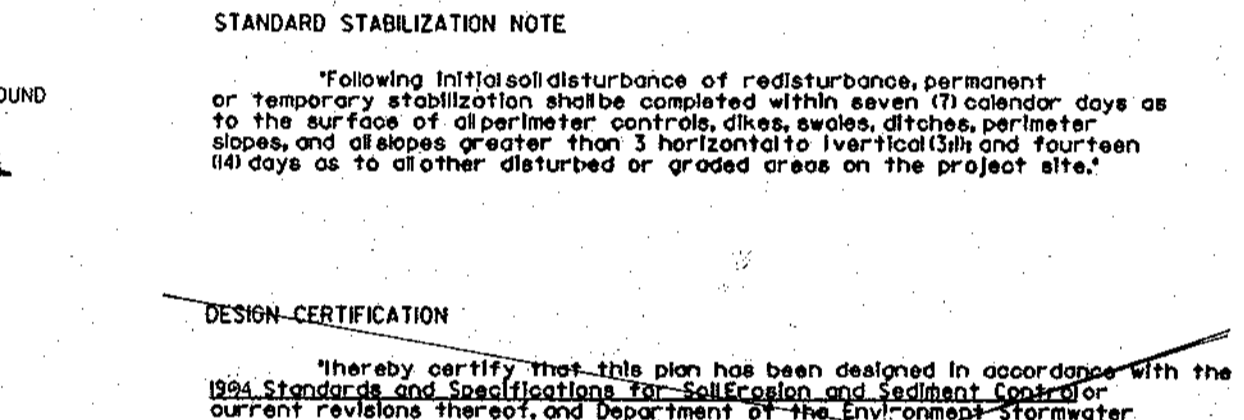
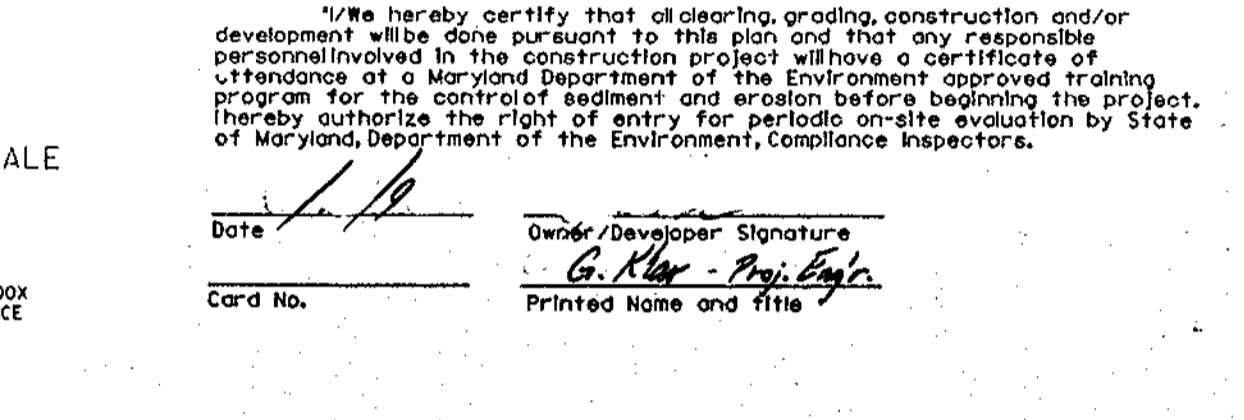
SEEDING NOTES



STABILIZED CONSTRUCTION ENTRANCE NOT TO SCALE



UTILITY CONSTRUCTION OUTSIDE SEDIMENT CONTROL PRACTICES



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

DATE: 12/97

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

DATE: 12-3-96

DESIGN CERTIFICATION
I hereby certify that this plan has been designed in accordance with the 1985 Standards and Specifications for Soil Erosion and Sediment Control or other applicable standards of the Environmental Protection Management Regulations.

DATE: 04-24-97

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
5-22-97

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
7/10/97

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
5/24/97

VILLAGE OF RIVER HILL SECTION 4, AREA 4

OWNER/DEVELOPER:
THE HOWARD RESEARCH & DEVELOPMENT CORP.
10275 LITTLE PATUXENT PARKWAY
COLUMBIA, MARYLAND 21044

DMW
Dan McCune-Walker, Inc.
200 East Pennsylvania Avenue
Ft. Detrick, Maryland 21740
(410) 996-8830
Fax 296-4708

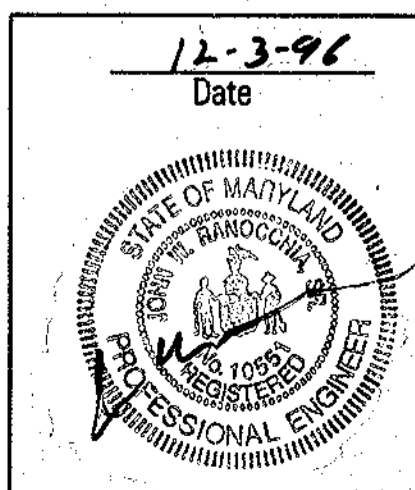
A Team of Land Planners, Landscape Architects, Engineers, Surveyors & Environmental Professionals

TITLE
EROSION AND SEDIMENT CONTROL DETAILS

DATE
MAR 96

PROJ. NO.
94064

41 OF 44



- Obtain all necessary permits for construction.
 - Notify Howard County Office of Inspections and Permits (410)313-1855 a minimum of 48 hours prior to the start of any construction (2 days).
 - Notify the engineer in charge of the As-built inspection at (410)296-3333 (1 day).
 - Clear and grub for and install erosion and sediment control measures (4 weeks), including traps 1 - 3 and 5 - 8.
 - Clear, grub and construct sediment basin in the following order.
 - Clear and grub pond areas (1 week).
 - Excavate and construct cutoff trench. Concurrently grade sediment basin, principal spillway, and low flow dewatering pipe (5 weeks).
 - Install the ESC dewatering pipe (1 day).
 - Conduct a partial as-built of the sediment basin/SWM pond structures. Stabilize as instructed by the ESC Inspector (1 week).
 - With the approval of ESC Inspector, clear, grub the remainder of the site (2 weeks).
 - Mass grade site and provide dust control as needed (5 weeks).
 - Install all utilities. Stabilize all non-active graded surfaces with temporary seeding. Provide inlets with protection as directed by the sediment control inspector (8 weeks).
 - Final grade all paved surfaces. Install curb and gutter. Apply road subbase (3 weeks).
 - Final grade all lawn area and stabilize with permanent seeding (2 weeks).
 - Pave roadways (1 week).
 - With the prior permission of the Sediment Control Inspector and the Howard County Sediment Control Division, remove sediment controls. Final grade and stabilize these areas (3 weeks).
 - Convert sediment basin to stormwater management pond per approved plans (4 weeks) and convert traps to water quality facilities.
 - Install landscaping (1 week).
- # Temp. end pipes at TRAP #5. See plans.

MATERIALS SPECIFICATIONS

Table 27 Geotextile Fabrics

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

US Std Sieve CW-02215

The properties shall be determined in accordance with the following procedures:

- Apparent opening size MSMT 323
- Grab tensile strength ASTM D 1682: 4x8" specimen, 1x2" clamps, 12"/min. strain rate in both principal directions of geotextile fabric.
- Burst strength ASTM D 3786

Table 28 Stone Size

NUMBER	SIZE RANGE	D ₅₀	D ₁₀₀	AASHTO	WEIGHT
NUMBER 57*	3/8" - 1 1/2"	1/2"	1 1/2"	M-43	N/A
NUMBER 1	2" - 3"	2 1/2"	3"	M-43	N/A
RIP-RAP**	4" - 7"	5 1/2"	7"	N/A	N/A
CLASS I	N/A	9.5"	15"	N/A	150lb max
CLASS II	N/A	16"	24"	N/A	700lb max
CLASS III	N/A	23"	34"	N/A	2000lb max

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

Stone For Gabion Baskets

INCHES	BASKET THICKNESS		SIZE OF INDIVIDUAL STONES	
	MM	INCHES	MM	INCHES
6	150	3 - 5	75 - 125	
9	225	4 - 7	100 - 175	
12	300	4 - 7	100 - 175	
18	460	4 - 7	100 - 175	
36	910	4 - 12	100 - 300	

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

DEVELOPERS CERTIFICATE:

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

Signature of Developer: *[Signature]* Date: 12/1/97

ENGINEERS CERTIFICATE:

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

Signature of Engineer: *[Signature]* Date: 12-3-96

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

Signature: *[Signature]* Date: 04-24-97
 U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE

Signature: *[Signature]* Date: 4-24-97
 APPROVED: HOWARD SOIL CONSERVATION DISTRICT

APPROVED: HOWARD COUNTY DEPT. OF PUBLIC WORKS
 Signature: *[Signature]* Date: 5-22-97
 CHIEF, BUREAU OF HIGHWAYS

APPROVED: HOWARD COUNTY DEPT. OF PLANNING AND ZONING
 Signature: *[Signature]* Date: 7/10/97
 CHIEF, DIVISION OF LAND DEVELOPMENT

Signature: *[Signature]* Date: 5/27/97
 CHIEF, DEVELOPMENT ENGINEERING DIVISION

VILLAGE OF RIVER HILL
 SECTION 4, AREA 4

OWNER / DEVELOPER:
 THE HOWARD RESEARCH & DEVELOPMENT CORP.
 10275 LITTLE PATUXENT PARKWAY
 COLUMBIA, MARYLAND 21044

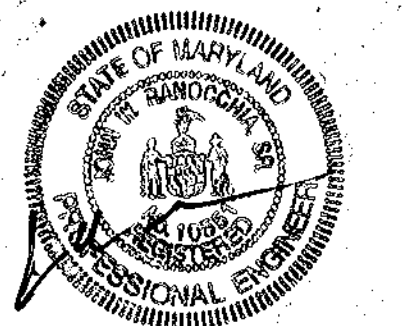
DMW
 Dan McQuinn-Walkley, Inc.
 200 East Pennsylvania Avenue
 Towson, Maryland 21286
 (410) 296-4058
 Fax: 296-4705

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

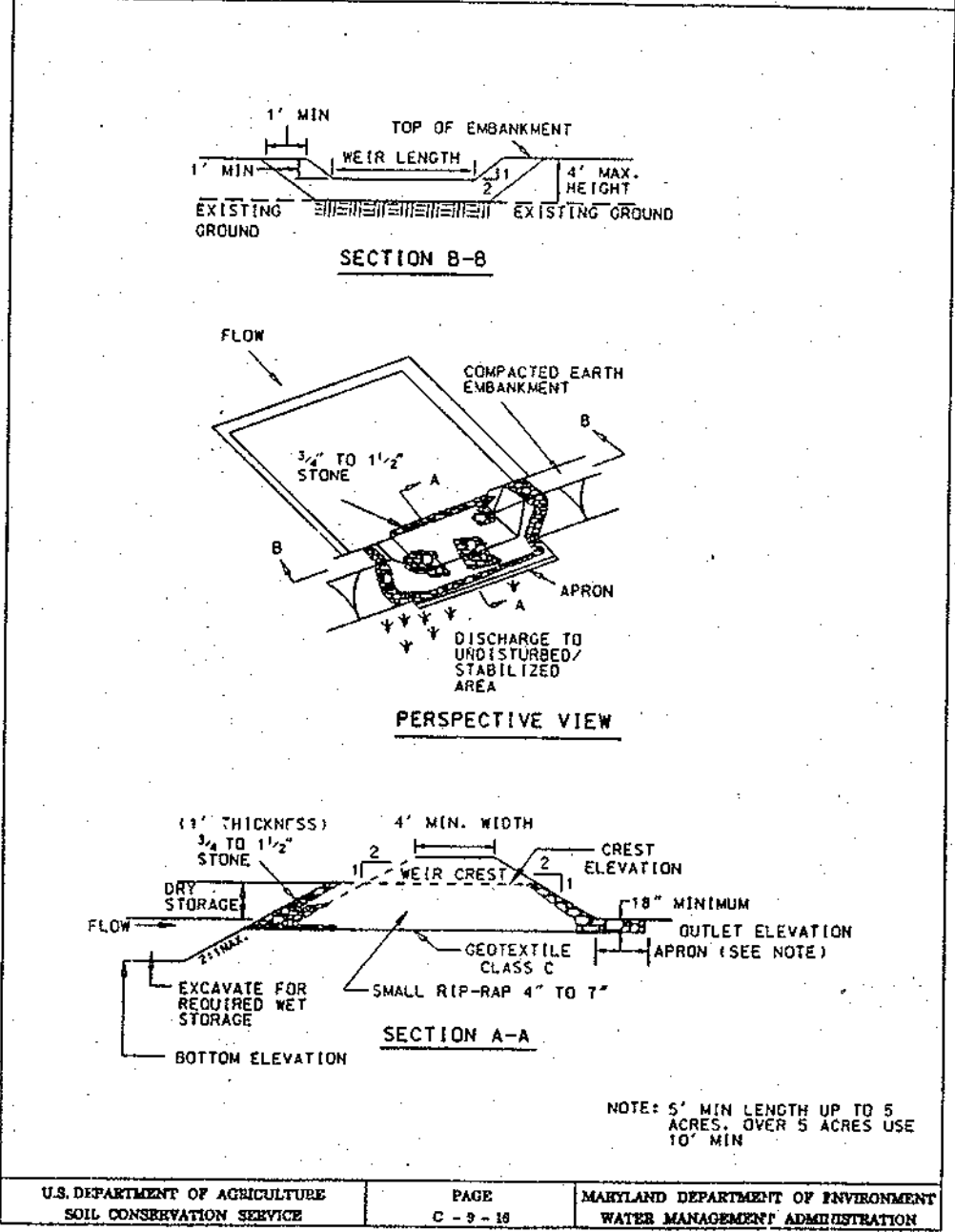
AREA TAX MAP PARCEL ELECTION DISTRICT OF HOWARD COUNTY, MARYLAND

TITLE EROSION AND SEDIMENT CONTROL DETAILS

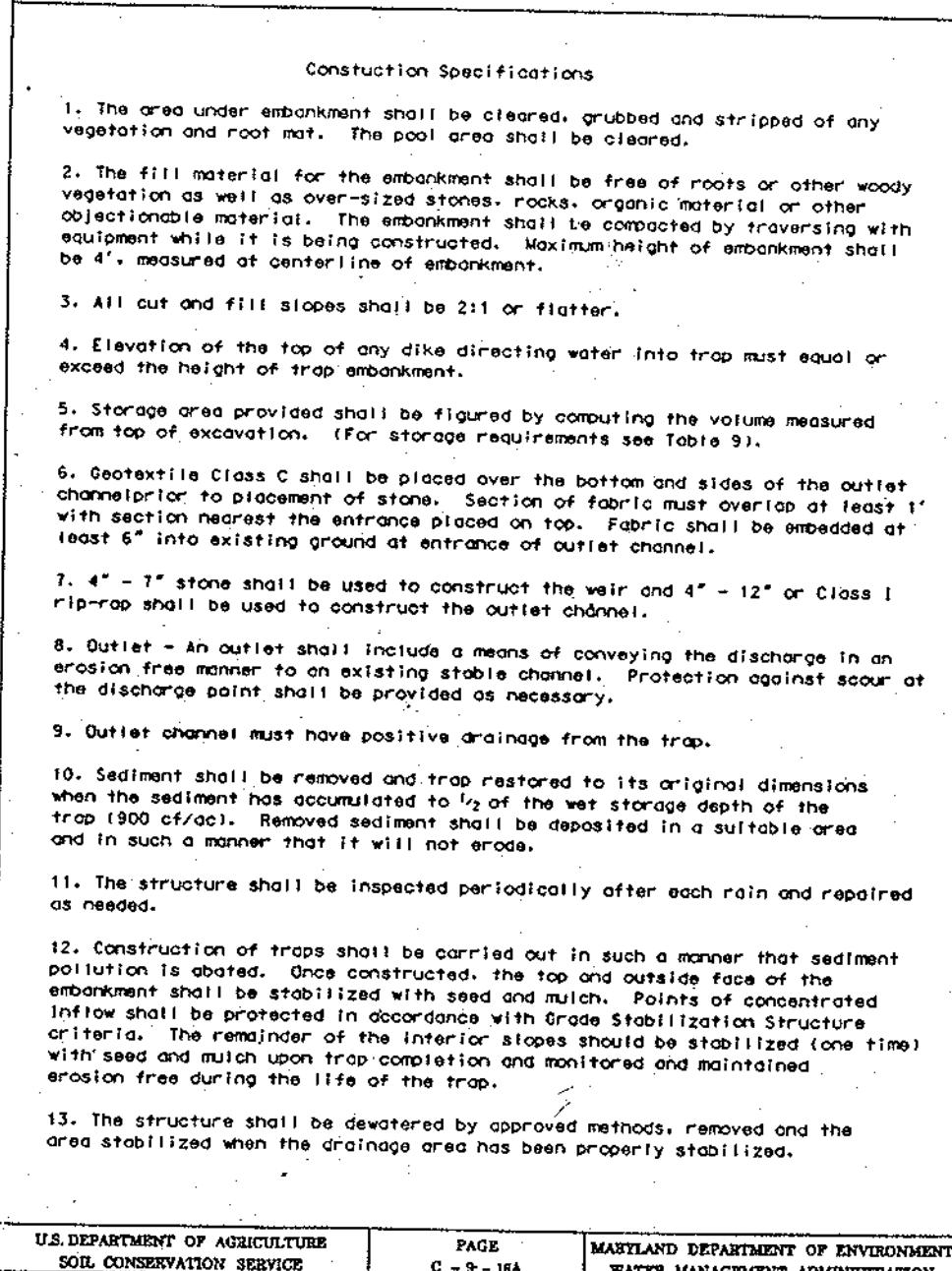
Des By: CRW Scale: Proj. No. 94064
 Dwn By: CRW Date: MAR 96
 Chk By: JVR Approved: 42 OF 44



DETAIL 10A - STONE / RIP-RAP OUTLET SEDIMENT TRAP - ST IV



STONE / RIP-RAP OUTLET SEDIMENT TRAP - ST IV



Inlet Protection

The contractor is required to install inlet protection on all storm drain inlets with the exception of the following:

- Any inlet outfalling directly into a sediment trapping device.
- Inlets on private or public paved roadways open to the public.

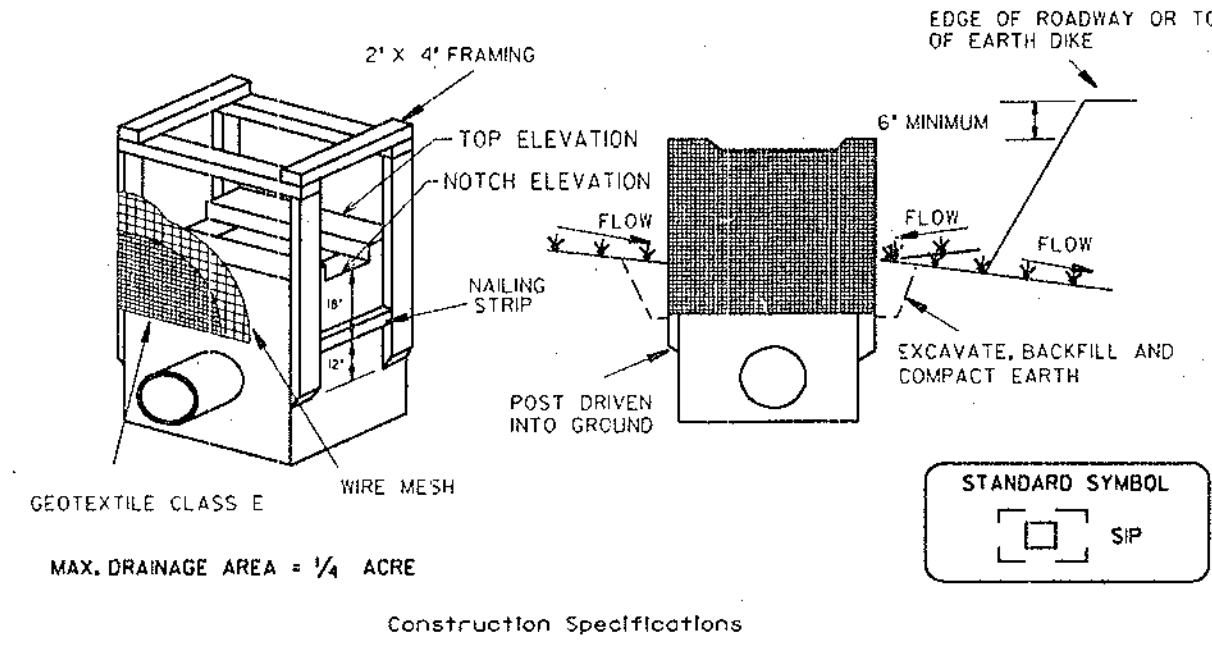
All inlet protection shall be installed as directed by the Inspector in accordance with the 1994 Maryland Standards and Specifications for Soil Erosion and Sediment Control, Page E-16-16 or as may be amended.

The removal of any inlet protection devices will require approval from the Inspector.

- Storm drains are to be flushed prior to removal of trapping device.

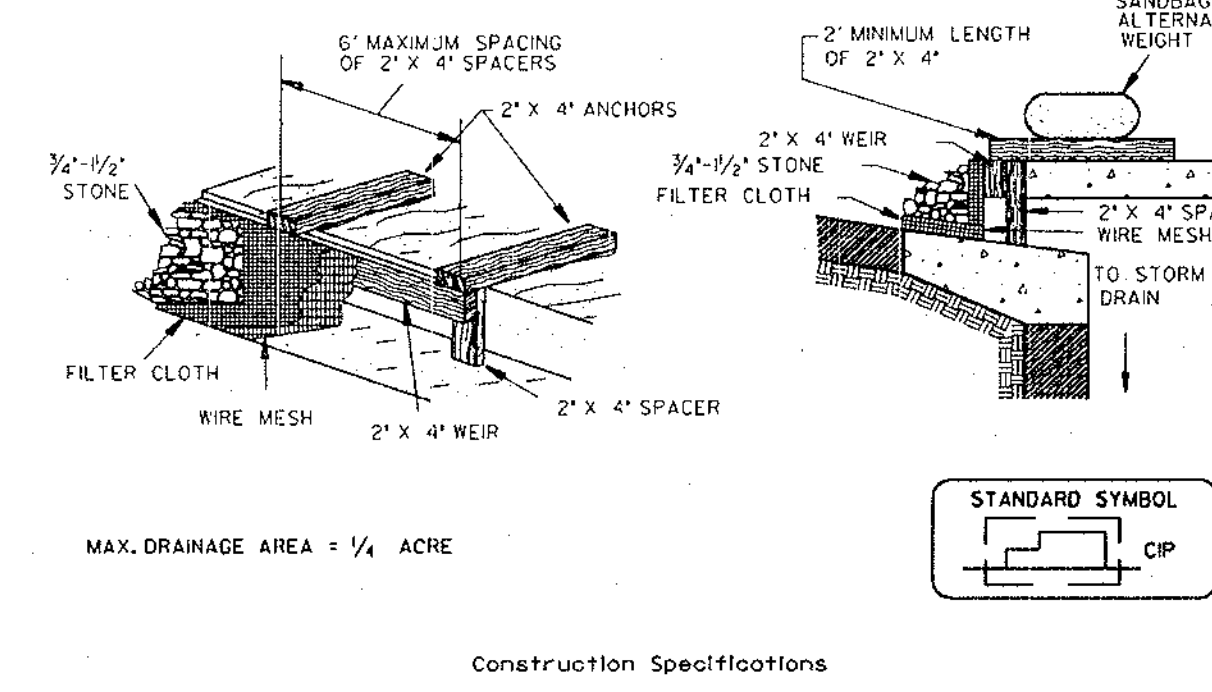
Stream closure dates for fish spawning or migration within waterways are as follows:

Use I and IP	March 1 - June 15
Use II	June 1 - September 30 and December 16 - March 14
Use III and IIIP	October 1 - April 30
Use IV	March 1 - May 31
SAV (All flowing streams)	April 15 - October 15



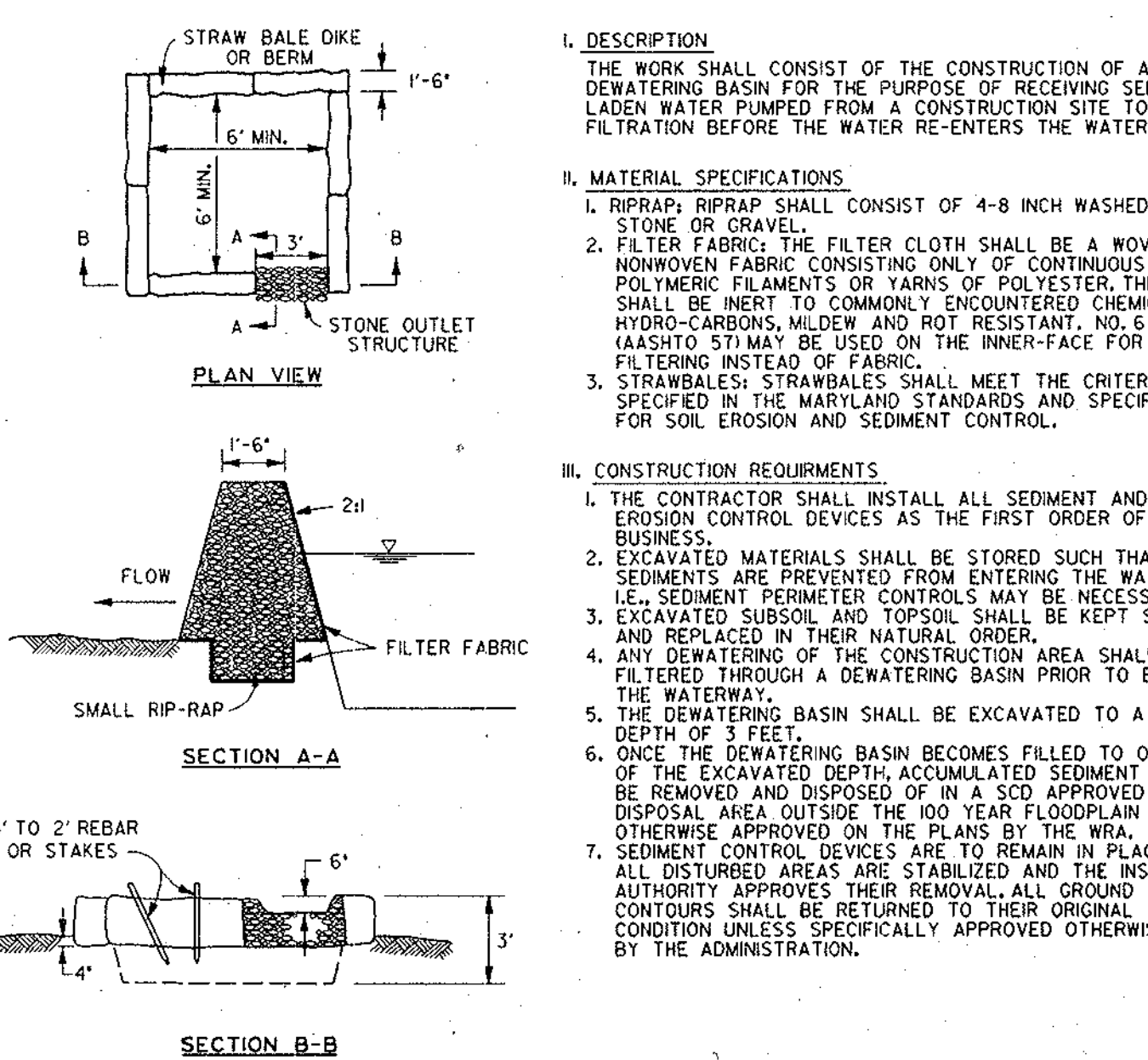
- Excavate completely around the inlet to a depth of 18" below the notch elevation.
- Drive the 2" x 4" construction grade lumber posts 1" into the ground at each corner of the inlet. Place nailstrips between the posts on the ends of the inlet. Assemble the top portion of the 2" x 4" frame using the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

STANDARD INLET PROTECTION NOT TO SCALE



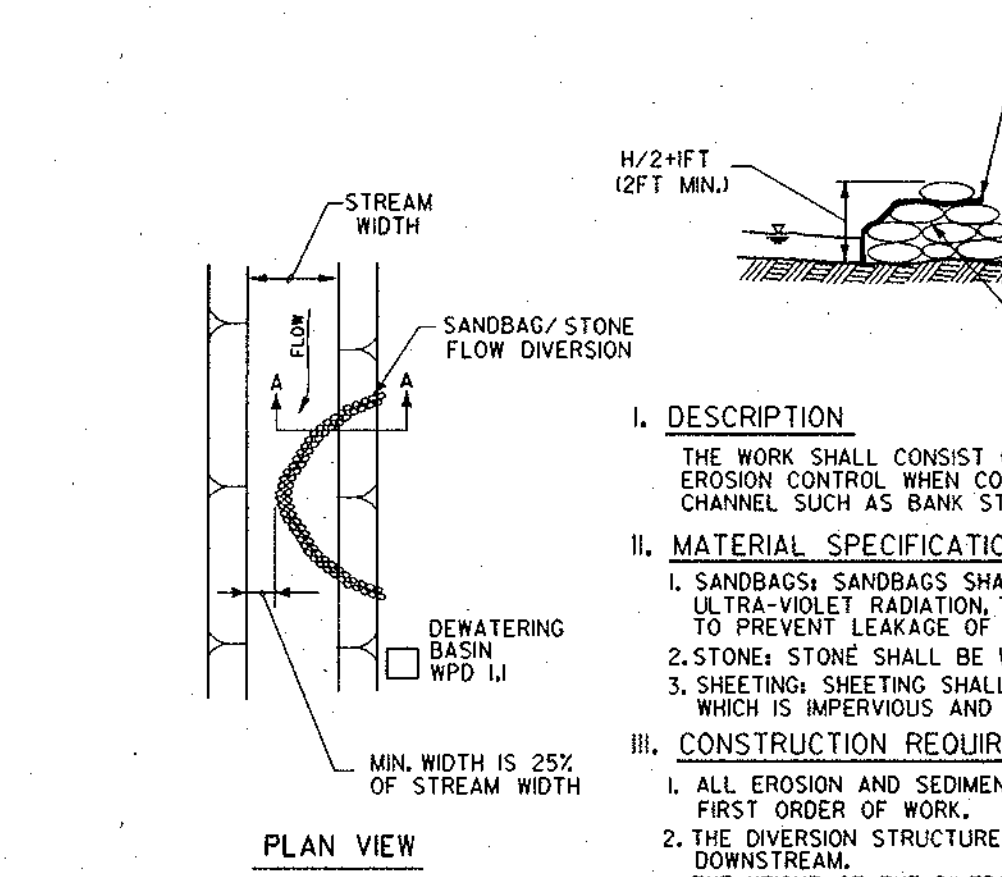
- Attach a continuous piece of wire mesh (30" minimum width by throat length plus 4") to the 2" x 4" weir (measuring throat length plus 2") as shown on the standard drawing.
- Place a continuous piece of Geotextile Class E the same dimensions as the wire mesh over the wire mesh and securely attach it to the 2" x 4" weir.
- Securely nail the 2" x 4" weir to a 5" long vertical spacer to be located between the weir and the inlet face (max. 4" apart).
- Place the assembly against the inlet throat and nail (minimum 2" lengths of 2" x 4" to the top of the weir at spacer locations). These 2" x 4" anchors shall extend across the inlet top and be held in place by sandbags or alternate weight.
- The assembly shall be placed so that the end spacers are a minimum 1' beyond both ends of the throat opening.
- Form the 1/2" x 1/2" wire mesh and the geotextile fabric to the concrete gutter and against the face of the curb on both sides of the inlet. Place clean 3/4" x 1/2" stone over the wire mesh and geotextile in such a manner to prevent water from entering the inlet under or around the geotextile.
- This type of protection must be inspected frequently and the filter cloth and stone replaced when clogged with sediment.
- Assure that storm flow does not bypass the inlet by installing a temporary earth or asphalt dike to direct the flow to the inlet.

CURB INLET PROTECTION (COG OR COS INLETS) NOT TO SCALE



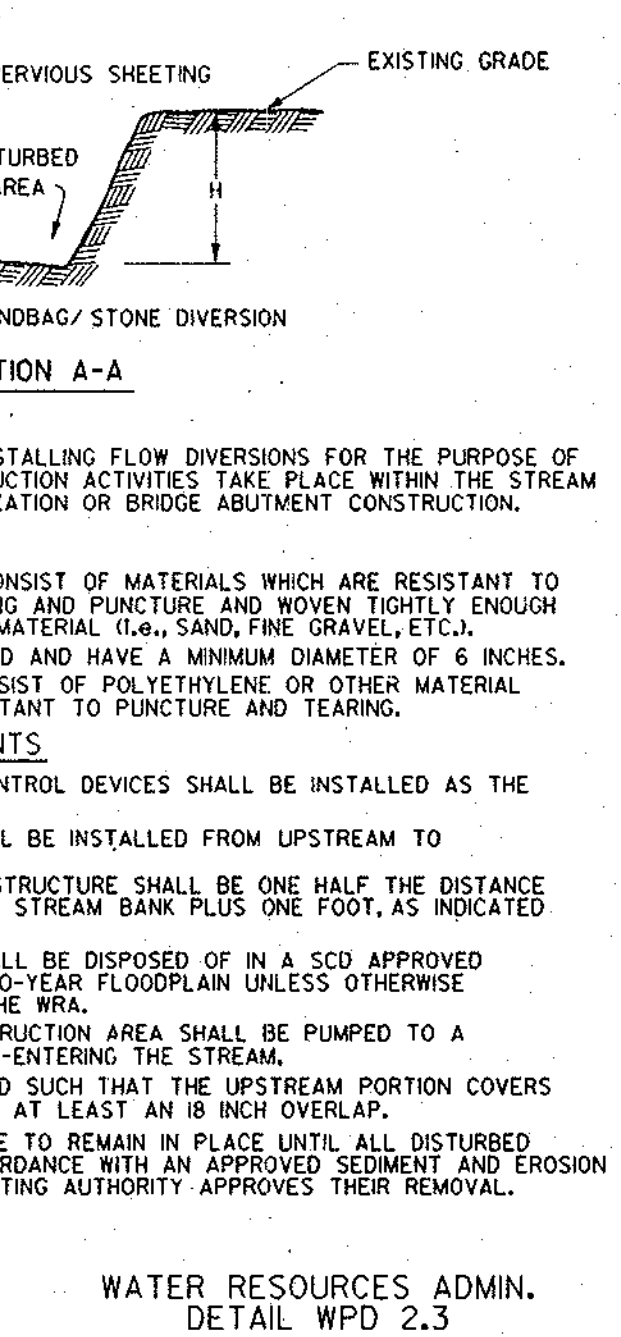
DEWATERING BASINS WATER RESOURCES ADMINISTRATION DETAIL WPD 11

UTILITY CROSSING

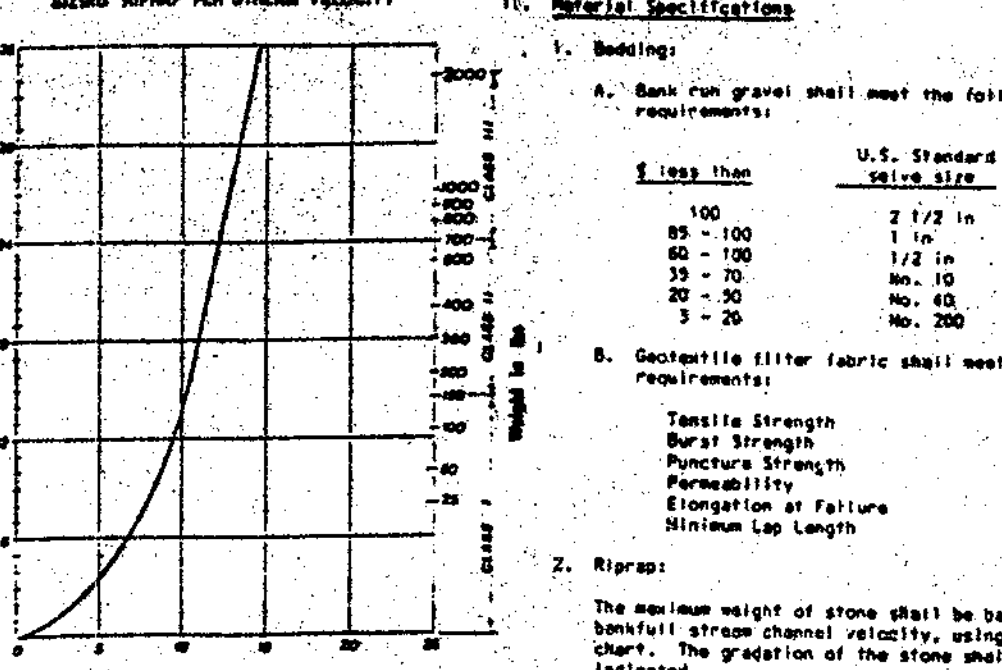


SANDBAG / STONE DIVERSION WATER RESOURCES ADMIN. DETAIL WPD 2.3

WATER RESOURCES ADMINISTRATION DETAIL WPD 5.J



SIZING RIPRAP PER STREAM VELOCITY



RIPRAP GRADATION

Class	Weight per Cubic Foot	Weight per Square Foot
Class 1	200 - 300	100 - 150
Class 2	100 - 200	50 - 100
Class 3	50 - 100	25 - 50