WORTHINGTON FIELDS
PHASE I LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'
FINAL PLAN
HOWARD COUNTY, MARYLAND

SHEET INDEX	
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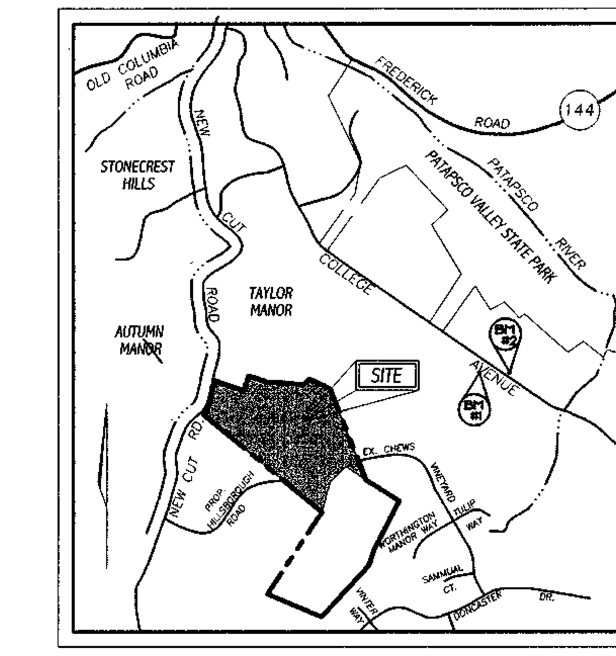
16	LANDSCAPE PLAN
17	FOREST CONSERVATION PLAN
18	FOREST CONSERVATION PLAN
19	RETAINING WALL
20	RETAINING WALL



VICINITY MAP
SCALE:1"=2000'

BENCHMARKS

BENCHMARK NO. 1: COUNTY CONTROL #3044005R
3/4" REBAR 0.8' BELOW SURFACE
N. 578233.92, E. 1373142.33
ELEV. = 374.389

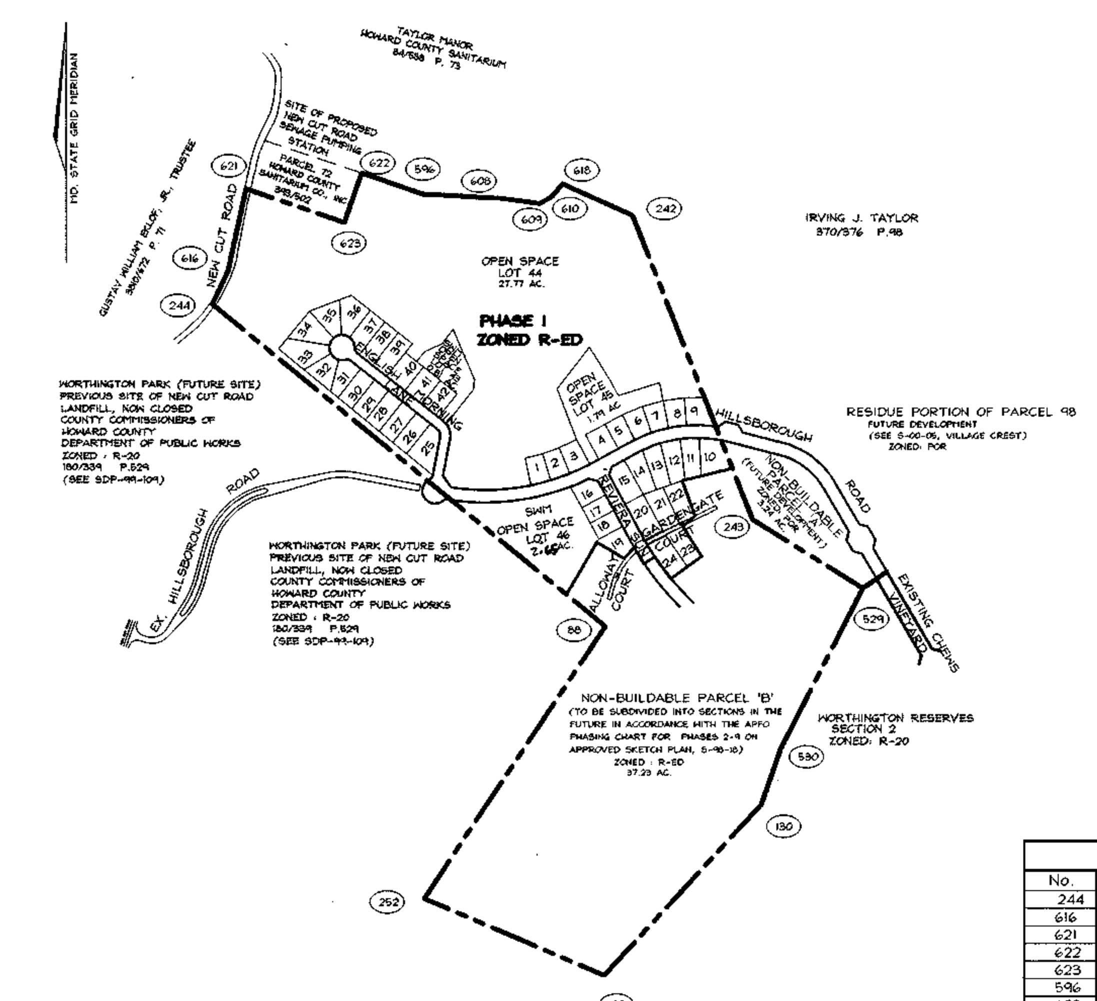
BENCHMARK NO. 2: COUNTY CONTROL #3044004R
3/4" REBAR 0.6' BELOW SURFACE
N. 578128.03, E. 1373460.71
ELEV. =362.575

GENERAL NOTES

1. ALL ASPECTS OF THE PROJECT ARE IN CONFORMANCE WITH THE LATEST HOWARD COUNTY STANDARDS UNLESS WAIVERS HAVE BEEN APPROVED.
2. DEED REFERENCE: L. 370 / F. 376
3. PROJECT BACKGROUND:
   LOCATION: TAX MAP 25, GRID 20 AND TAX MAP 31, GRID 2, P/O PARCEL 98
   2ND ELECTION DISTRICT
   ZONING: R-ED
   POR
   R-20
   NUMBER OF PROPOSED LOTS: 42 BUILDABLE, 4 OPEN SPACE, 2 NON-BUILDABLE PARCELS
   APPLICABLE DPZ FILE NUMBERS: S-98-18, PB-336, P-00-07.
   STREAM CROSSING PERMIT: TRACKING #200061160
4. THE PROJECT BOUNDARY IS BASED ON A BOUNDARY SURVEY PERFORMED BY VOGEL & ASSOCIATES, INC. DATED NOVEMBER, 1998.
5. THE TOPOGRAPHY SHOWN HEREON IS BASED ON AERIAL PHOTOGRAMETRIC BY WINGS AERIAL MAPPING COMPANY, INC. DATED MARCH 1995..
6. COORDINATE DATUM IS BASED ON THE MARYLAND COORDINATE SYSTEM (NAD 83) AS PROJECTED BY THE FOLLOWING HO.CO. GEODETIC CONTROL STATIONS: 22R1 & 23R1
7. WATER AND SEWER FOR THIS PROJECT WILL BE PUBLIC. WATER IS EXTENDED FROM CHEW'S VINEYARD. SEWER IS TO DRAIN TO PLANNED PUMPING STATION. WATER & SEWER CONTRACT #14-3855-D.
   6" FORCE MAIN FROM PUMPING STATION TO CHEWS VINEYARD AND
   4" WATER FROM HILLSBOROUGH TO PUMPING STATION.
   6" FORCE MAIN AND 4" WATER CONTRACT # 10-3853-D.
8. STORMWATER MANAGEMENT (2 YR AND 10 YR) TO BE PROVIDED FOR ULTIMATE DEVELOPED CONDITION. WATER QUALITY TO BE PROVIDED BY WET POND,(POND # 1) AND EXTENDED DETENTION,(POND # 2). THE FACILITIES WILL BE HAZARD CLASS 'A'. ALL STORM WATER MANAGEMENT PONDS WILL BE PRIVATELY OWNED AND MAINTAINED BY THE H.O.A.
9. WETLANDS AND STREAMS SHOWN ONSITE ARE BASED ON A FIELD INVESTIGATION PERFORMED BY EXPLORATION RESEARCH, INC., DATED OCTOBER, 1999.
10. FLOODPLAIN SHOWN ONSITE IS BASED ON FLOODPLAIN STUDY BY VOGEL & ASSOCIATES, INC., DATED OCTOBER, 1999.
11. FOREST CONSERVATION PLAN PREPARED BY EXPLORATION RESEARCH, INC., DATED OCTOBER, 1999. FOREST STAND DELINEATION PLAN PREPARED BY CHESAPEAKE ENVIRONMENTAL, DATED MARCH 1995 AND APPROVED S-98-18.
12. ALL FOREST CONSERVATION EASEMENTS ARE RETENTION AREAS. NO REFORESTATION IS PROPOSED. THE FOREST CONSERVATION OBLIGATION FOR THE LOD FOR HILLSBOROUGH ROAD ON THE POR ZONED RESIDUE PORTION OF PARCEL 98 AND POR ZONED. NON BUILDABLE PARCEL A SHALL BE ADDRESS ON THE FUTURE PLANS FOR THE SUBDIVISION, S-00-05, VILLAGE CREST. NO CLEARING, GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE FOREST CONSERVATION EASEMENT ARE ALLOWED.
13. NO CLEARING GRADING OR CONSTRUCTION IS PERMITTED WITHIN THE WETLANDS, WETLANDS BUFFER, FLOODPLAIN EASEMENT, FOREST CONSERVATION RETENTION EASEMENTS OR STREAM BUFFER AREAS EXCEPT AS SHOWN ON APPROVED PLANS.
14. A TRAFFIC STUDY FOR THIS SITE WAS PREPARED BY THE TRAFFIC GROUP, INC. ,DATED JUNE 8,1998
15. THERE ARE APPROXIMATELY 26.60 AC. OF SLOPES 15-24.99% AND 8.36 AC. OF SLOPES 25% OR GREATER ON SITE.
16. A NOISE STUDY IS NOT REQUIRED FOR THIS SITE.
17. ALL LANDSCAPING REQUIREMENTS AS SET FORTH IN THE LANDSCAPE MANUAL SHALL BE COMPLIED WITH.
18. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE. FOR LOCATION AND TYPES OF LIGHTS SEE 3 OF 18.
19. SEDIMENT AND EROSION CONTROL WILL BE PROVIDED FOR THIS SITE.
20. THIS PROPERTY IS LOCATED IN THE WORTHINGTON SCHOOL DISTRICT.
21. TO THE BEST OF THE OWNERS KNOWLEDGE, THERE ARE NO BURIAL/CEMETARY LOCATIONS ON SITE.
22. OPEN SPACE LOTS 146, 147 & 148 ARE TO BE OWNED AND MAINTAINED BY HOMEOWNERS ASSOCIATION. OPEN SPACE LOT 145 TO BE CONVEYED TO HOWARD COUNTY DEPARTMENT OF RECREATION AND PARKS.
23. STORMWATER MANAGEMENT SOIL BORINGS FOR THIS SITE ARE BASED ON A GEOTECHNICAL ANALYSIS PROVIDED BY HILLIS-CARNES ENGINEERING ASSOCIATES, INC., DATED SEPTEMBER 23, 1999.
24. REFERENCE PLANNING BOARD CASE PB-336 FOR APPROVAL OF THIS DEVELOPMENT WITHIN THE R-ED DISTRICT ON JUNE 16,1999 SUBJECT TO THE FOLLOWING CONDITIONS:
    1. COMPLIANCE WITH TH SUBDIVISION REVIEW COMMITTEE COMMENTS FOR SKETCH PLAN S-98-18.
    2. THE DEVELOPERS SHALL PROVIDE PEDESTRIAN ACCESS FROM THIS SUBDIVISION TO THE ADJACENT WORTHINGTON ELEMENTARY SCHOOL SITE.
25. THE OWNER OF THE ADJACENT PROPERTY WHERE CHEWS VINEYARD CONNECTS TO THE EXISTING ROAD IS ALSO OWNED BY IRVING & EDITH TAYLOR.
26. NON-BUILDABLE PARCELS 'A' AND 'B' ON RESIDUE PARCEL 98 ARE NON-BUILDABLE PENDING FUTURE SUBDIVISION.
27. ALL PROPOSED DWELLINGS SHALL BE REQUIRED TO HAVE A SUB-SURFACE VENTING SYSTEM FOR PROTECTION.

WORTHINGTON FIELDS

TOTAL NUMBER OF LOTS AND PARCELS TO BE RECORDED	48
TOTAL NUMBER OF BUILDABLE LOTS TO BE RECORDED	42
TOTAL NUMBER OF PARCELS TO BE RECORDED	2
TOTAL AREA OF BUILDABLE LOTS TO BE RECORDED	10.23 ACRES
TOTAL AREA OF PARCELS TO BE RECORDED	40.48 ACRES
TOTAL NUMBER OF OPEN SPACE LOTS TO BE RECORDED	4
TOTAL NON-CREDITED OPEN SPACE TO BE RECORDED	0.54 ACRES
TOTAL AREA OF RECREATIONAL OPEN SPACE TO BE RECORDED	1.01 ACRES
TOTAL AREA OF OPEN SPACE LOTS TO BE RECORDED	33.03 ACRES
TOTAL AREA OF BUILDABLE LOTS AND PARCELS TO BE RECORDED	83.74 ACRES
TOTAL AREA OF NON-BUILDABLE PARCEL TO BE RECORDED(ZONED R-ED)	37.23 ACRES
TOTAL AREA OF NON-BUILDABLE PARCEL TO BE RECORDED(ZONED POR)	3.24 ACRES
TOTAL AREA OF ROAD INCLUDING WIDENING STRIPS TO BE RECORDED	3.95 ACRES
TOTAL AREA OF SUBDIVISION TO BE RECORDED	87.69 ACRES
TOTAL AREA OF PHASE I	50.46 ACRES



COORDINATE CHART		
No.	Northing	Easting
244	577,606.1340	1,369,487.53
616	577,736.5191	1,369,549.543
621	578,062.2368	1,369,621.369
622	578,124.7592	1,370.077.658
623	577,927.7562	1,370,009.379
596	578,042.0039	1,370,316.428
608	578,023.6744	1,370,634.400
609	578,002.6822	1,370,830.207
610	578,032.1616	1,370,870.344
618	578,081.1422	1,371,146.920
242	577,955.5100	1,371,620.520
243	576,754.7600	1,372,055.889
529	576,482.7908	1,371,730.762
530	575,844.1251	1,371,730.762
130	575,623.8142	1,371,654.758
125	574,948.0467	1,371,033.450
252	575,251.6521	1,370,324.308
88	576,332.2271	1,371,039.300

LOCATION MAP
SCALE:1"=600'

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hamilton 8/3/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

7/27/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

7-24-01
CHIEF, BUREAU OF HIGHWAYS DATE

FINAL ROAD CONSTRUCTION PLANS & PROFILES
WORTHINGTON FIELDS
PHASE I LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'
COVER SHEET
TAX MAP #25, GRID 20 & # 31 PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND ROBERT HARRIS VOGEL No. 16193 PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: JCO
DRAWN BY: RJ
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

PREV. FILE # S-98-18

1 SHEET OF 20

F-01-60

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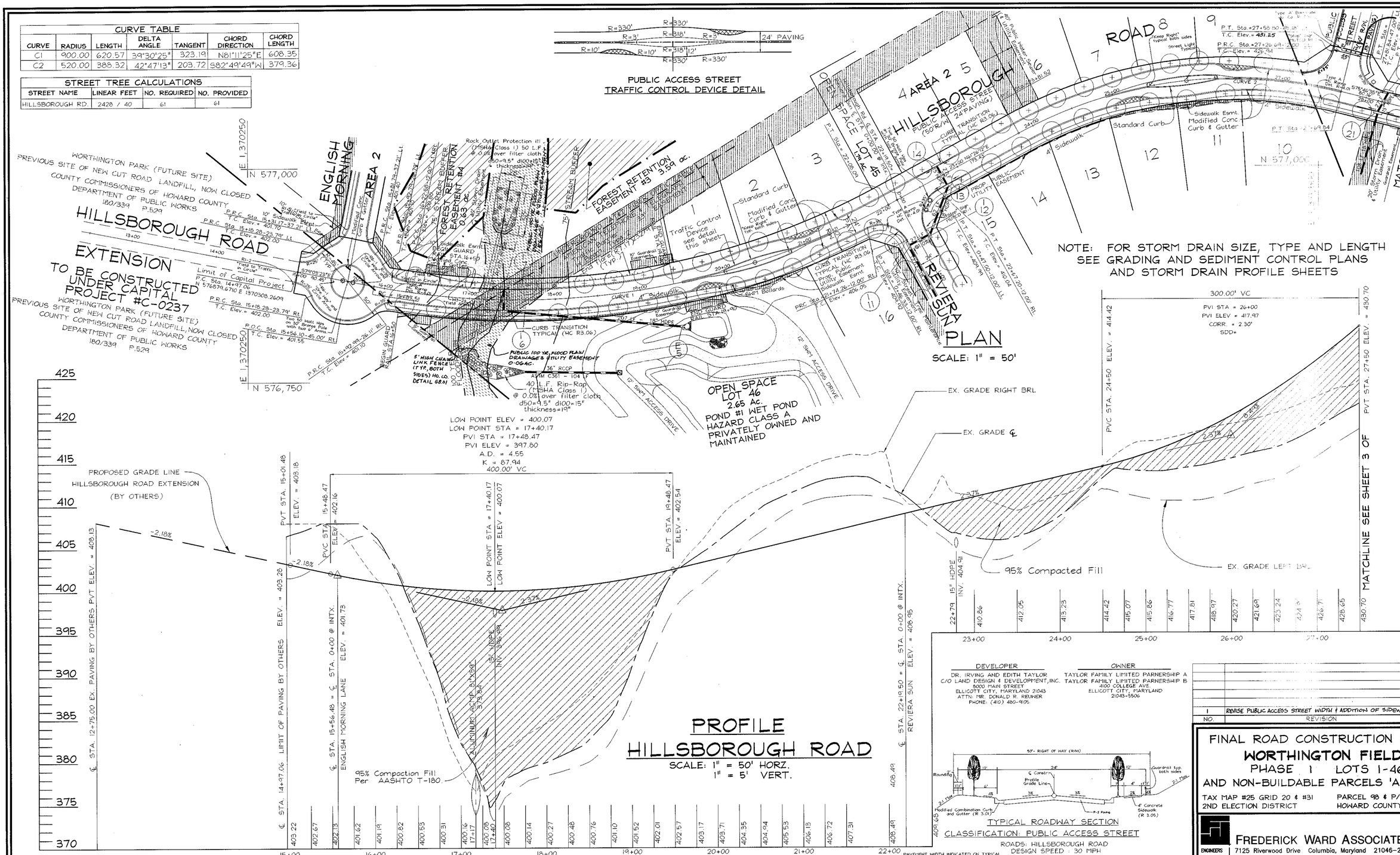
CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA ANGLE	TANGENT	CHORD DIRECTION	CHORD LENGTH
C1	900.00	620.57	39°30'25"	323.19	N81°11'25"E	608.35
C2	520.00	388.32	42°47'13"	203.72	S82°49'49"W	379.36

STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
HILLSBOROUGH RD.	2428 / 40	61	61

PUBLIC ACCESS STREET
TRAFFIC CONTROL DEVICE DETAIL



NOTE: FOR STORM DRAIN SIZE, TYPE AND LENGTH SEE GRADING AND SEDIMENT CONTROL PLANS AND STORM DRAIN PROFILE SHEETS

PLAN
SCALE: 1" = 50'

PROFILE
HILLSBOROUGH ROAD
SCALE: 1" = 50' HORZ.
1" = 5' VERT.

DEVELOPER	OWNER
DR. IRVING AND EDITH TAYLOR C/O LAND DESIGN & DEVELOPMENT, INC. 8000 MAIN STREET ELLICOTT CITY, MARYLAND 21043 ATTN: MR. DONALD R. REUNER PHONE: (410) 480-9105	TAYLOR FAMILY LIMITED PARNERSHIP A TAYLOR FAMILY LIMITED PARNERSHIP B 4100 COLLEGE AVE. ELLICOTT CITY, MARYLAND 21043-5506

NO.	REVISION	DATE
1	REVISE PUBLIC ACCESS STREET WIDTH & ADDITION OF SIDEWALK	12.27.01

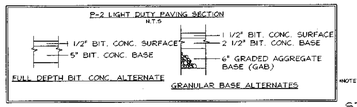
APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

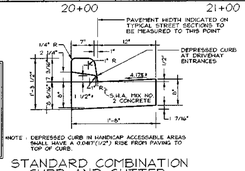
Cindy Hamter 8/3/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION 7/27/01 DATE

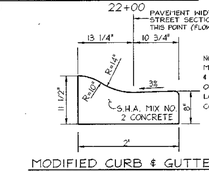
APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

Andrew M. Daniels 7-24-01
CHIEF, BUREAU OF HIGHWAYS DATE

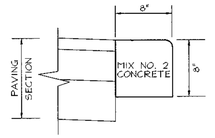




STANDARD COMBINATION CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE



MODIFIED CURB & GUTTER
HOWARD COUNTY STANDARD R3.01
NOT TO SCALE



STANDARD FLUSH CURB
STD DETAIL R.3.01a

TYPICAL ROADWAY SECTION
CLASSIFICATION: PUBLIC ACCESS STREET
ROADS: HILLSBOROUGH ROAD
DESIGN SPEED : 30 MPH
SECTION NOT TO SCALE

FINAL ROAD CONSTRUCTION PLANS
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16198 — PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No. 16198

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 2 OF 20

F-01-60

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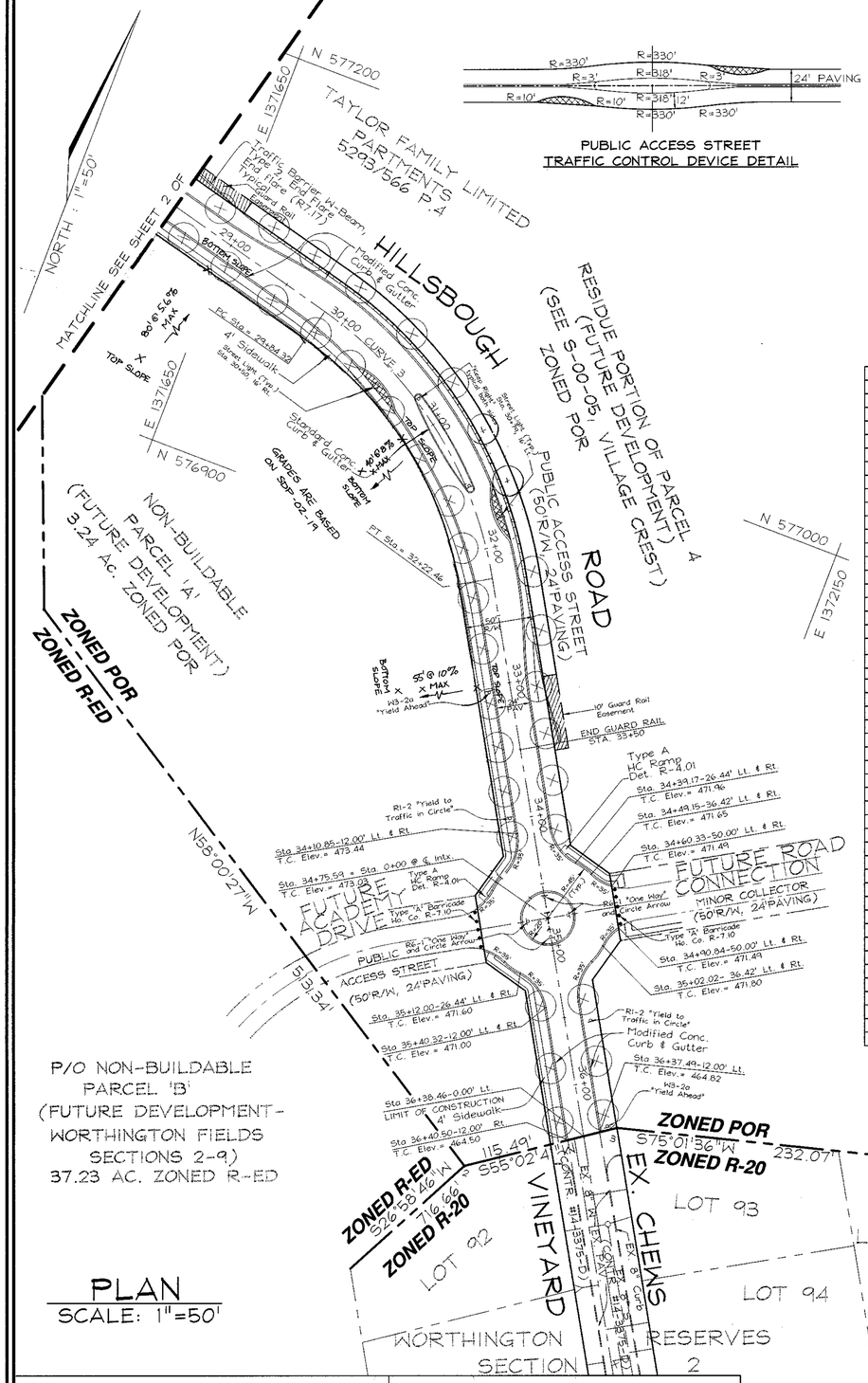


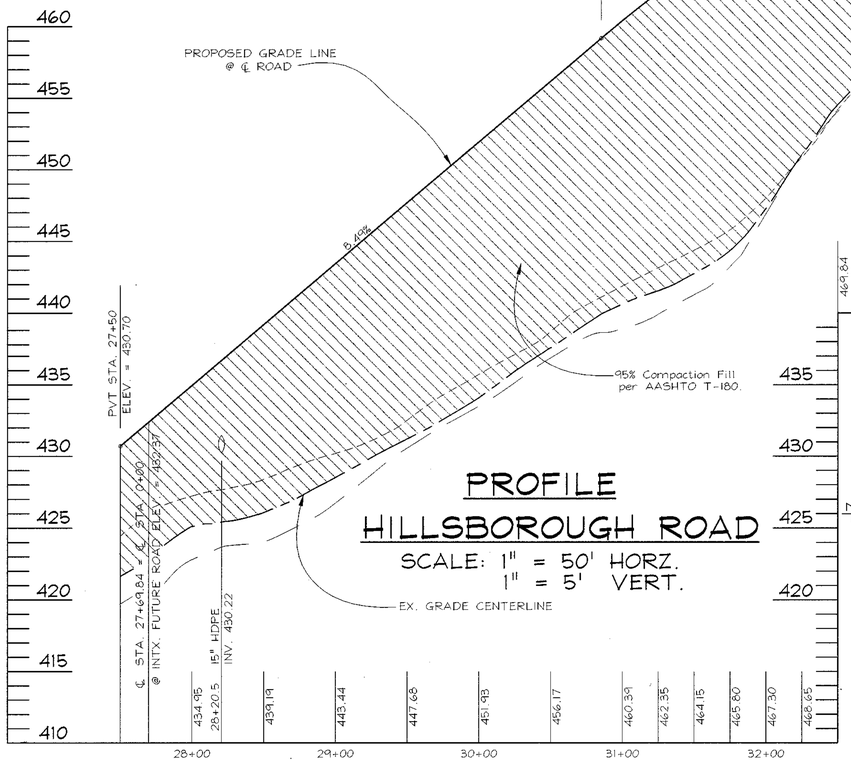
PLAN
SCALE: 1"=50'

PUBLIC ACCESS STREET
TRAFFIC CONTROL DEVICE DETAIL

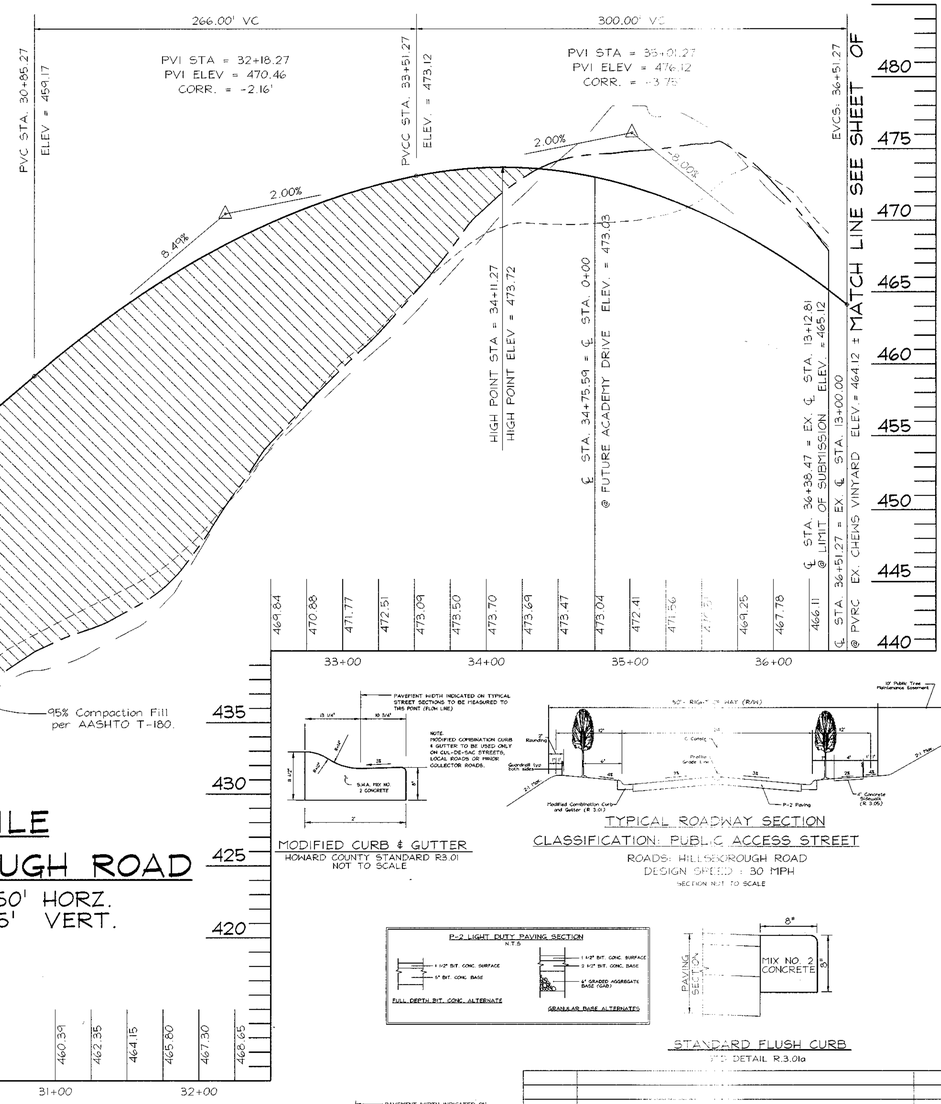
CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA ANGLE	TANGENT	CHORD DIRECTION	CHORD LENGTH
C3	300.00	238.14	45°28'53"	125.74	N53°02'06"W	231.94

STREET LIGHT LOCATION CHART		
STREET NAME	CENTERLINE STATION	CENTERLINE OFFSET
HILLSBOROUGH ROAD	31+13.89	0.00' RT.
HILLSBOROUGH ROAD	34+75.59	0.00' LT.

STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	REQUIRED TREES	PROVIDED TREES
HILLSBOROUGH ROAD	1,390	35	35



PROFILE
HILLSBOROUGH ROAD
SCALE: 1" = 50' HORZ.
1" = 5' VERT.

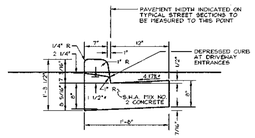


MODIFIED CURB & GUTTER
HOWARD COUNTY STANDARD R3.01
NOT TO SCALE

TYPICAL ROADWAY SECTION
CLASSIFICATION: PUBLIC ACCESS STREET
ROADS: HILLSBOROUGH ROAD
DESIGN SPEED : 30 MPH
SECTION NOT TO SCALE

STANDARD FLUSH CURB
STD. DETAIL R.3.01a

STREET LIGHT LOCATION CHART					
DWG. NO.	STREET NAME	℄ STATION	℄ OFFSET	FIXTURE/POLE TYPE	FIXTURE/POLE TYPE
2 OF 18	HILLSBOROUGH RD.	15+56 22+48	0.00' 23.00' RT	Two(2) - 150 Watt Hps vapor pendant fixture mounted at 30' on bronze fibergalss poles using twin 6' arms on extended as shown on plans (along Hillsborogh Road).	in center of circle
	HILLSBOROUGH RD.	18+00	15.00' L	100 Watt Hps vapor Colonial post-top mounted as a 14' black fibergalss pole.	
	HILLSBOROUGH RD.	20+38	0.00'	- do -	in median island
3 OF 18	-do-	30+50	16.00' R	-do-	
2 OF 18	HILLSBOROUGH RD.	25+88	0.00'	- do -	in median island
2 OF 18	HILLSBOROUGH RD.	28+04	20.00' L	- do -	
3 OF 18	-do-	30+79	16.00 L	-do-	
	HILLSBOROUGH RD.	34+76	0.00'	Two(2) - 150 Watt Hps vapor pendant fixture mounted at 30' on bronze fibergalss poles using twin 6' arms on extended as shown on plans (along Hillsborogh Road/Chews Vineyard)	in center of circle
4 OF 18	ENGLISH MORNING	2+35	14.00' R	100 Watt Hps vapor Colonial post-top mounted as a 14' black fibergalss pole.	
	ENGLISH MORNING	7+50	0.00'	- do -	in col-de-sac island
5 OF 18	REVIERA SUN	1+90	0.00'	- do -	in median island
	REVIERA SUN	3+20	19.00' R	- do -	



STANDARD COMBINATION CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE

NO.	REVISION	DATE
1	REMOVED GUARDRAIL AND GUARDRAIL EASEMENT	12.27.01

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUMER
PHONE: (410) 480-9105

FINAL ROAD CONSTRUCTION PLANS
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31
2ND ELECTION DISTRICT

PARCEL 98 & P/O PARCEL 4
HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS
ARCHITECTS
SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — PROFESSIONAL ENGINEER — 12/27/01

ROBERT H. VOGEL, PE No.16193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 3 OF 20

F-01-60

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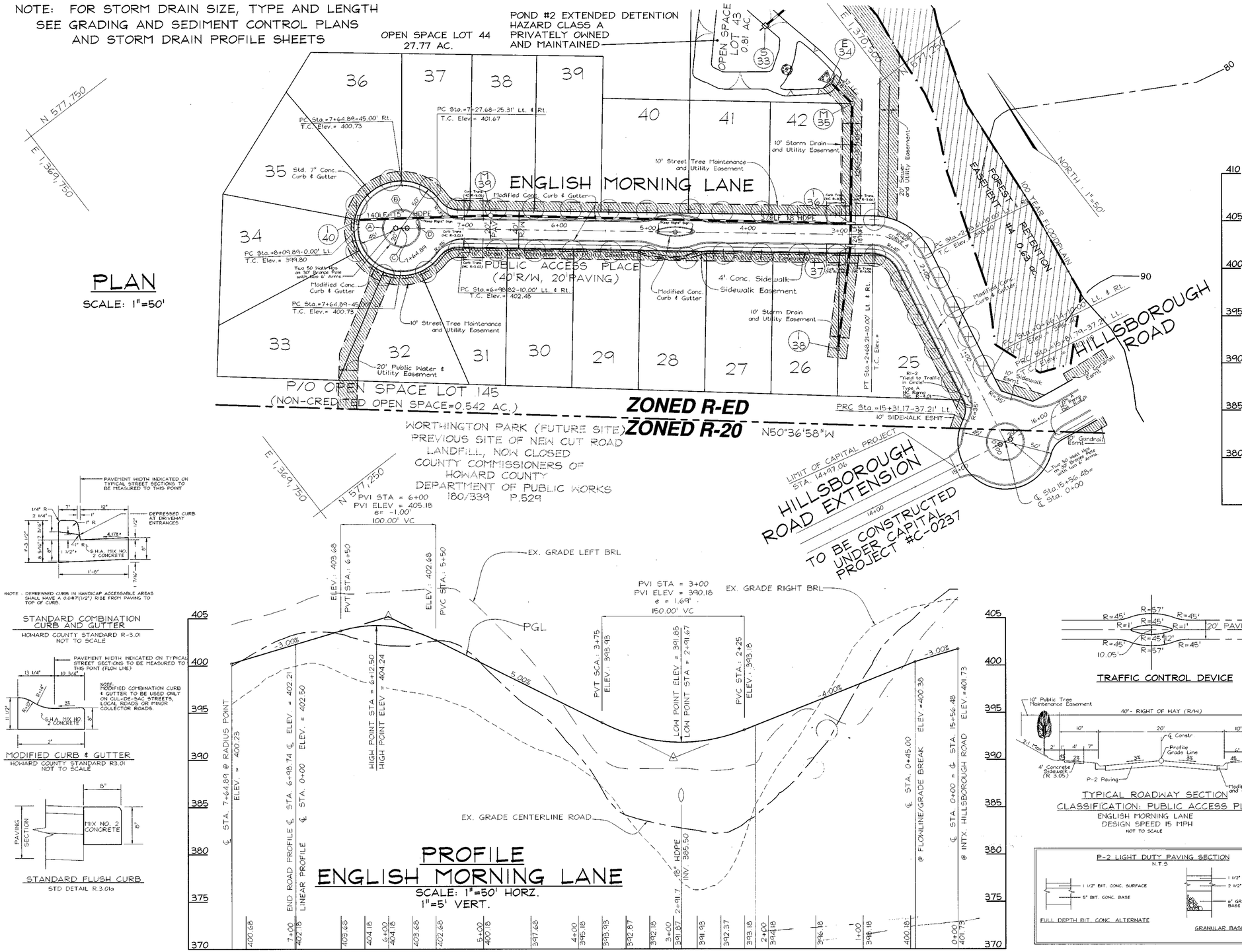
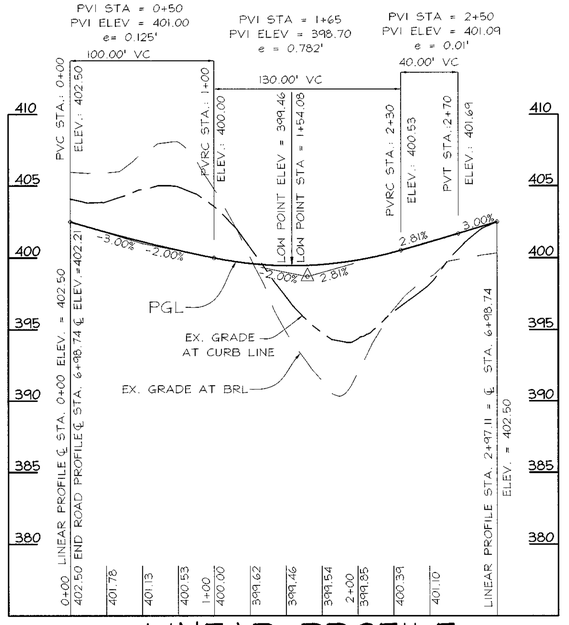
NOTE: FOR STORM DRAIN SIZE, TYPE AND LENGTH SEE GRADING AND SEDIMENT CONTROL PLANS AND STORM DRAIN PROFILE SHEETS



PLAN

SCALE: 1"=50'

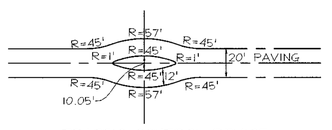
CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA ANGLE	TANGENT	CHORD DIRECTION	CHORD LENGTH
C4	50.00	54.60	62°34'12"	30.38	N20°20'24"W	51.93



LINEAR PROFILE
ENGLISH MORNING LANE

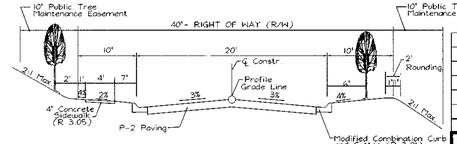
SCALE: 1"=50' HORZ.
1"=5' VERT.

STREET LIGHT LOCATION CHART		
STREET NAME	℄ STATION	℄ OFFSET
ENGLISH MORNING	7+64.89	0.00' RT.
ENGLISH MORNING	4+76.55	0.00' RT.
ENGLISH MORNING	2+51.82	15.59' RT.
ENGLISH MORNING	25+82.42	0.00' RT.
HILLSBOROUGH	15+56.48	0.00' RT.



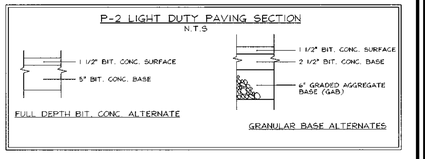
TRAFFIC CONTROL DEVICE

STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
ENGLISH MORNING	1596 / 40	40	40



TYPICAL ROADWAY SECTION
CLASSIFICATION: PUBLIC ACCESS PLACE
ENGLISH MORNING LANE
DESIGN SPEED 15 MPH
NOT TO SCALE

P-2 LIGHT DUTY PAVING SECTION
N.T.S.



NO.	REVISION	DATE

NOTE : DEPRESSED CURB IN HANDICAP ACCESSABLE AREAS SHALL HAVE A 0.04ft"(1/2") RISE FROM PAVING TO TOP OF CURB.

STANDARD COMBINATION CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE

MODIFIED CURB & GUTTER
HOWARD COUNTY STANDARD R3.01
NOT TO SCALE

STANDARD FLUSH CURB
STD DETAIL R.3.01a

PROFILE
ENGLISH MORNING LANE

SCALE: 1"=50' HORZ.
1"=5' VERT.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/23/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

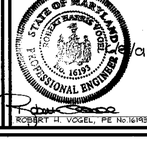
OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

FINAL ROAD CONSTRUCTION PLANS
WORTHINGTON FIELDS
PHASE I LOTS 1-46
AND NON- BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia



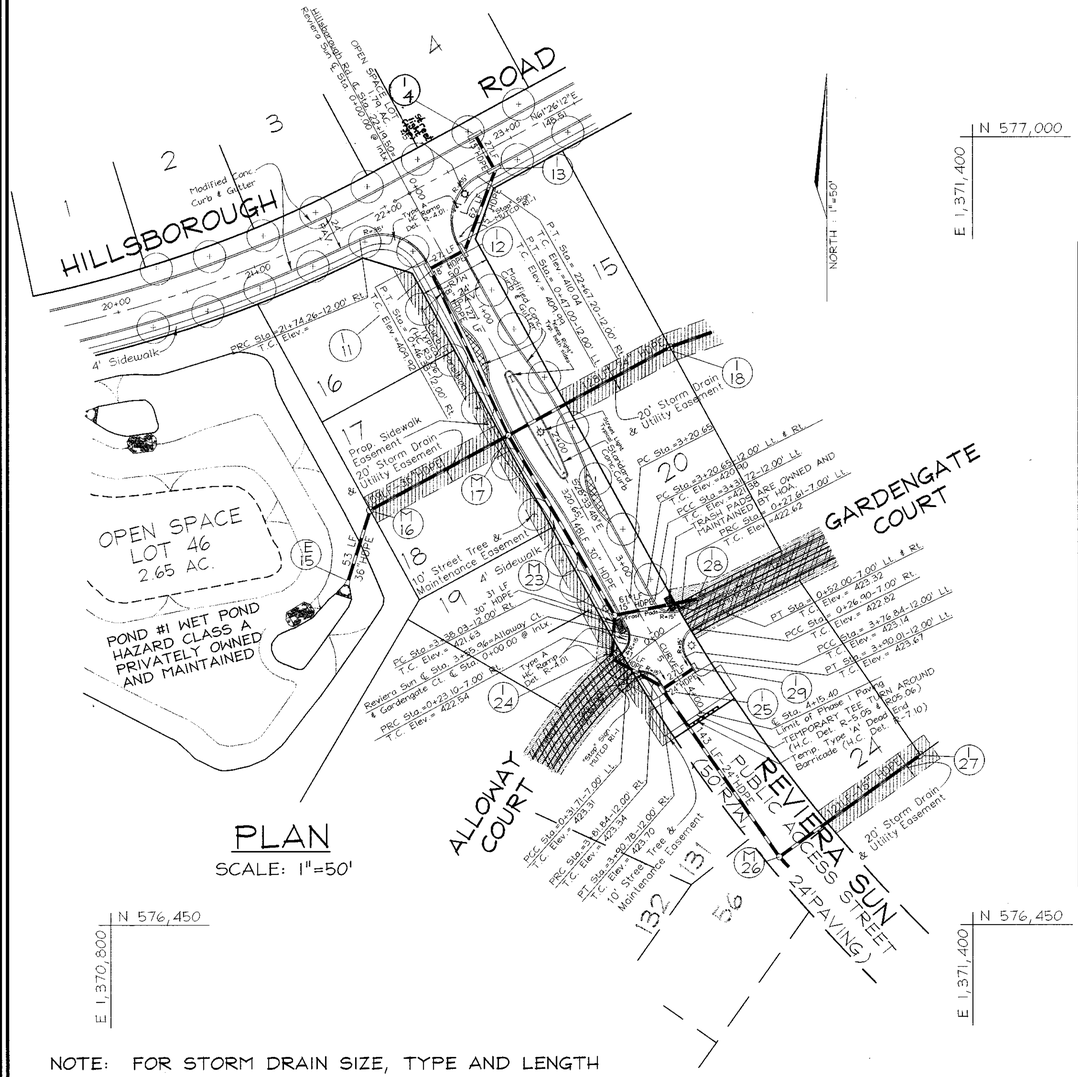
ROBERT H. VOGEL, PE No.16193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

4 SHEET OF 20

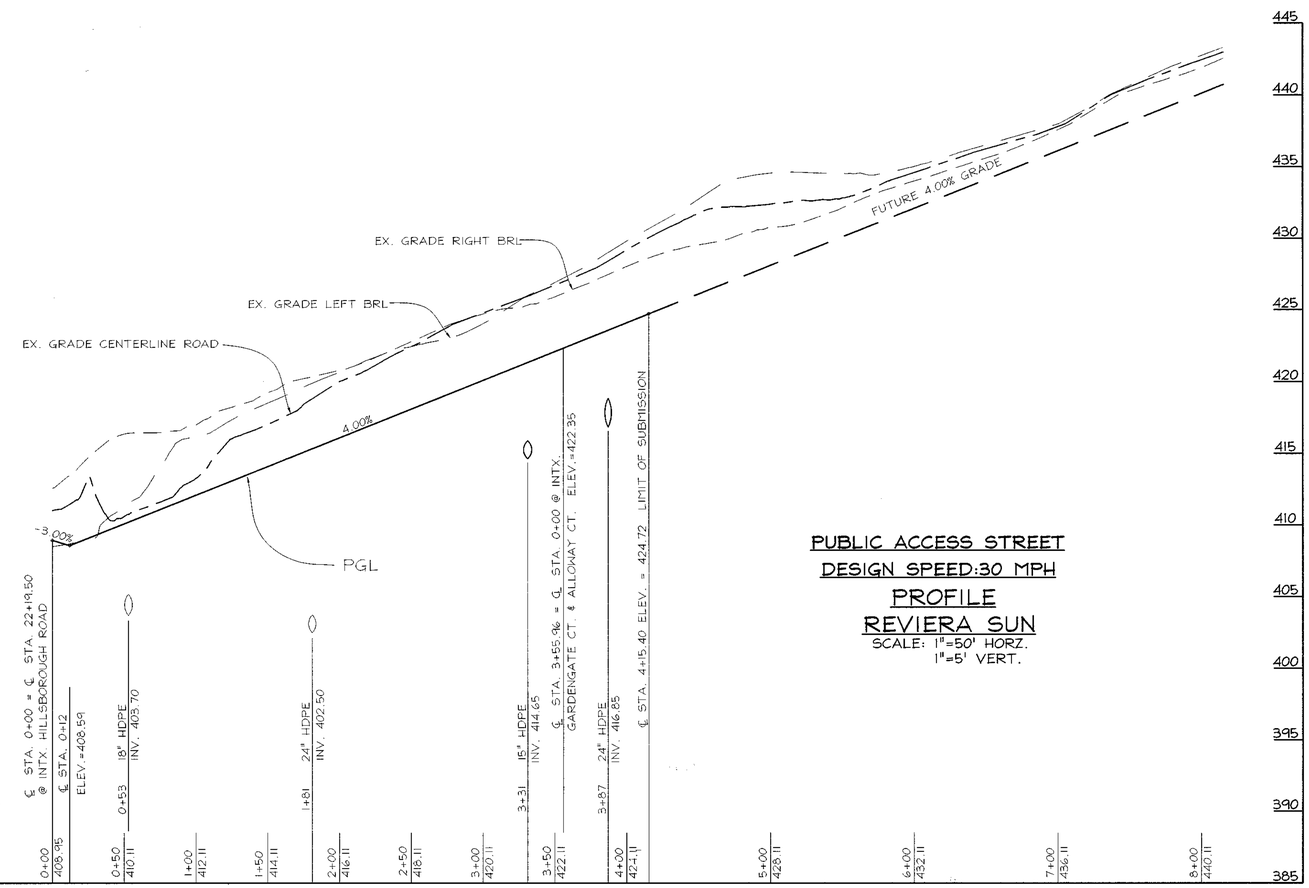
F-01-60

M:\PROJECTS\2015011\ENGR\dwg\final\7018b4.dwg Thu Jun 07 09:56:30 2001 E4



PLAN

SCALE: 1"=50'



PUBLIC ACCESS STREET
DESIGN SPEED:30 MPH
PROFILE
REVIERA SUN

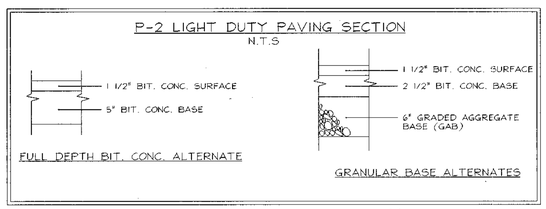
SCALE: 1"=50' HORZ.
1"=5' VERT.

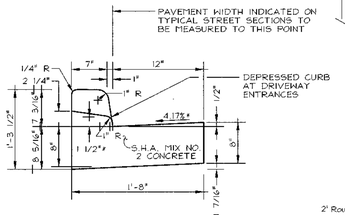
NOTE: FOR STORM DRAIN SIZE, TYPE AND LENGTH SEE GRADING AND SEDIMENT CONTROL PLANS AND STORM DRAIN PROFILE SHEETS

CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA ANGLE	TANGENT	CHORD DIRECTION	CHORD LENGTH
C5	1100.00	94.76	04°56'8"	47.41	S31°01'52"E	94.73

STREET LIGHT LOCATION CHART		
STREET NAME	℄ STATION	℄ OFFSET
HILLSBOROUGH RD.	22+41.61	30.97' RT.
REVIERA SUN	1+85.73	0.00' RT.
REVIERA SUN	3+72.18	19.84' LT.

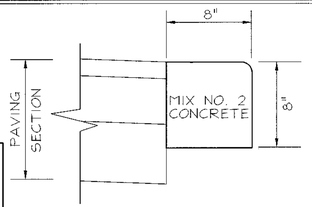
STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
REVIERA SUN	600 / 40	15	16



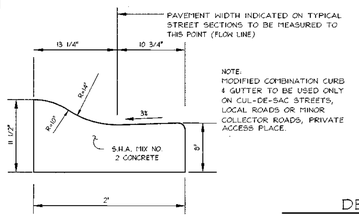


*NOTE : DEPRESSED CURB IN HANDICAP ACCESSABLE AREAS SHALL HAVE A 0.0417'(1/2") RISE FROM PAVING TO TOP OF CURB.

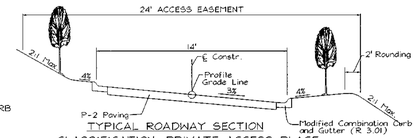
STANDARD COMBINATION CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE



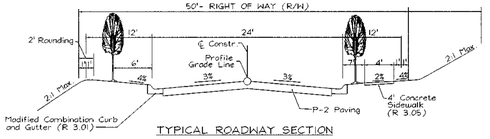
STANDARD FLUSH CURB
STD DETAIL R.3.01a



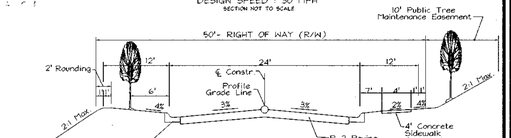
MODIFIED CURB & GUTTER
HOWARD COUNTY STANDARD R3.01
NOT TO SCALE



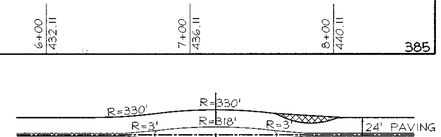
TYPICAL ROADWAY SECTION
CLASSIFICATION: PRIVATE ACCESS PLACE
ALLOWAY COURT
GARDENGATE COURT
DESIGN SPEED 15 MPH
NOT TO SCALE



TYPICAL ROADWAY SECTION
CLASSIFICATION: PUBLIC ACCESS STREET
ROADS: HILLSBOROUGH ROAD
DESIGN SPEED : 30 MPH
SECTION NOT TO SCALE



TYPICAL ROADWAY SECTION
CLASSIFICATION: PUBLIC ACCESS STREET
REVIERA SUN
DESIGN SPEED : 30 MPH
SECTION NOT TO SCALE



PUBLIC ACCESS STREET
TRAFFIC CONTROL DEVICE DETAIL
NOT TO SCALE

NO.	REVISION	DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

FINAL ROAD CONSTRUCTION PLANS
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON- BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31
2ND ELECTION DISTRICT

PARCEL 98 & P/O PARCEL 4
HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS
ARCHITECTS
SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 10193 — PROFESSIONAL ENGINEER

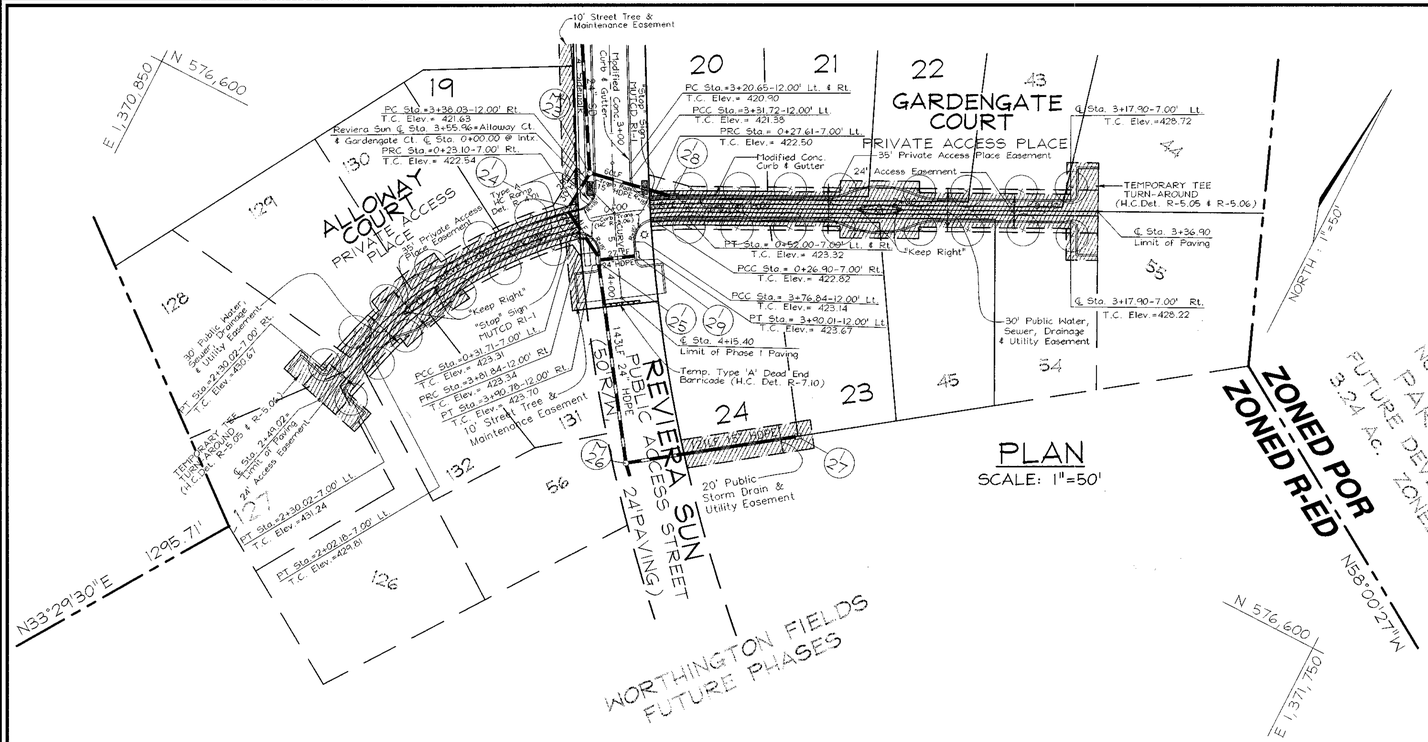
ROBERT H. VOGEL, PE NO 10193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 5 OF 20

F-01-60

W:\PROJECTS\20190111\ENGR\dwg\land\701B5.dwg Thu Jun 07 09:59:32 2001 E4



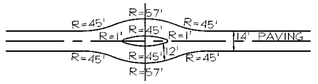
PLAN
SCALE: 1"=50'

NOTE: FOR STORM DRAIN SIZE, TYPE AND LENGTH SEE GRADING AND SEDIMENT CONTROL PLANS AND STORM DRAIN PROFILE SHEETS

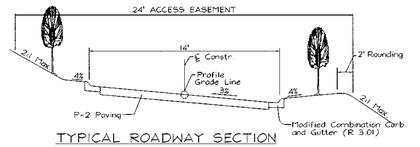
STREET LIGHT LOCATION CHART		
STREET NAME	℄ STATION	℄ OFFSET
REVIERA SUN	3+72.18	19.84' LT.
ALLOWAY CT.	1+50.37	1.73' LT
GARDENGATE CT.	1+84.42	0.00' LT.

STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
ALLOWAY COURT	444 / 40	11	12
GARDENGATE COURT	618 / 40	16	16

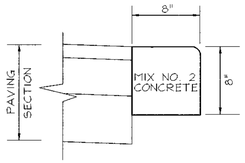
CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA ANGLE	TANGENT	CHORD DIRECTION	CHORD LENGTH
C6	300.00	202.18	38°36'46"	105.10	S34°14'49"W	198.37
C7	300.00	52.00	9°55'54"	26.07	S58°31'09"W	51.94



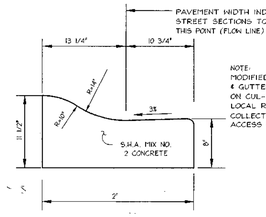
PRIVATE ACCESS PLACE
TRAFFIC CONTROL DEVICE DETAIL



TYPICAL ROADWAY SECTION
CLASSIFICATION: PRIVATE ACCESS PLACE
ALLOWAY COURT
GARDENGATE COURT
DESIGN SPEED 15 MPH
NOT TO SCALE

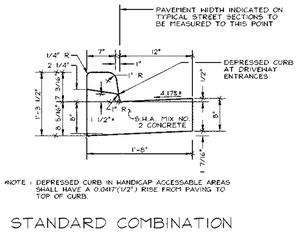


STANDARD FLUSH CURB
STD DETAIL R.3.01a



NOTE:
MODIFIED COMBINATION CURB & GUTTER TO BE USED ONLY ON CUL-DE-SAC STREETS, LOCAL ROADS OR MINOR COLLECTOR ROADS, PRIVATE ACCESS PLACE.

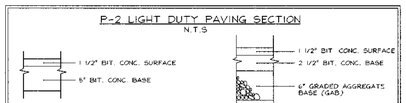
MODIFIED CURB & GUTTER
HOWARD COUNTY STANDARD R3.01
NOT TO SCALE

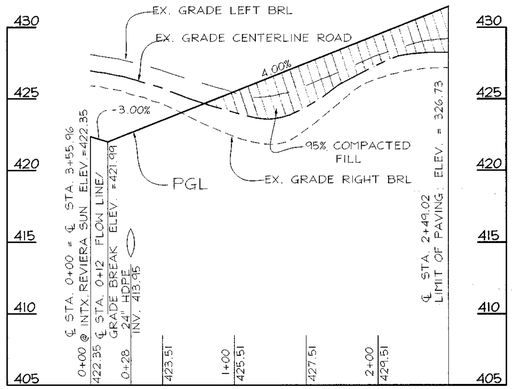


NOTE : DEPRESSED CURB IN HANDICAP ACCESSABLE AREAS SHALL HAVE A 0.0417'(1/2") RISE FROM PAVING TO TOP OF CURB.

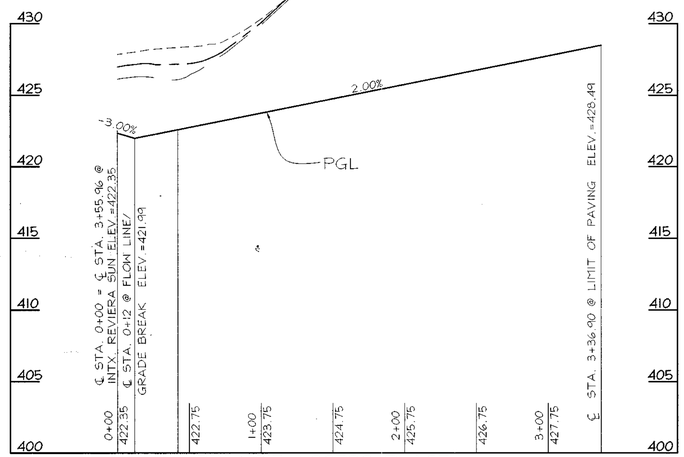
STANDARD COMBINATION CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE

P-2 LIGHT DUTY PAVING SECTION
N.T.S





PRIVATE ACCESS PLACE
DESIGN 15 MPH
PROFILE
ALLOWAY COURT
SCALE: 1"=50' HORZ.



PRIVATE ACCESS PLACE
DESIGN 15 MPH
PROFILE
GARDENGATE COURT
SCALE: 1"=50' HORZ.

NO.	REVISION	DATE

FINAL ROAD CONSTRUCTION PLANS
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON- BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS | ARCHITECTS | SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT H. VOGEL — No. 16193 — PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 6 OF 20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/6/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

F-01-60

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POND NO.2
EXTENDED DETENTION FACILITY
HAZARD CLASS A, PRIVATELY
2 YR WSE = 366.81
10 YR WSE = 367.59
100 YR WSE = 367.99

BASIN NO. 2
TYPE: SWM BASIN

Ex. drainage area:	1.42 Ac.
Proposed drainage area	5.5 Ac.
Total storage required	19800 cf
Total storage provided	19800 Cf
Bottom dimensions:	100 x 50
Bottom elevation:	365.00
Crest elevation:	366.83
Wet storage elevation:	365.00-366.33 (2.33)
Dry storage elevation:	366.33 - 368.00 (2.67)
Total storage depth:	3.83'
Top of embankment:	370.00 372.0
Cleanout Elevation:	364.20
Side slopes:	3:1 to 370.0, 2:1 to 372.0
Q_2(Ex.):	1.78 cfs
Q_2(Prop.):	1.69 cfs
OUTLET ELEV.:	365.3

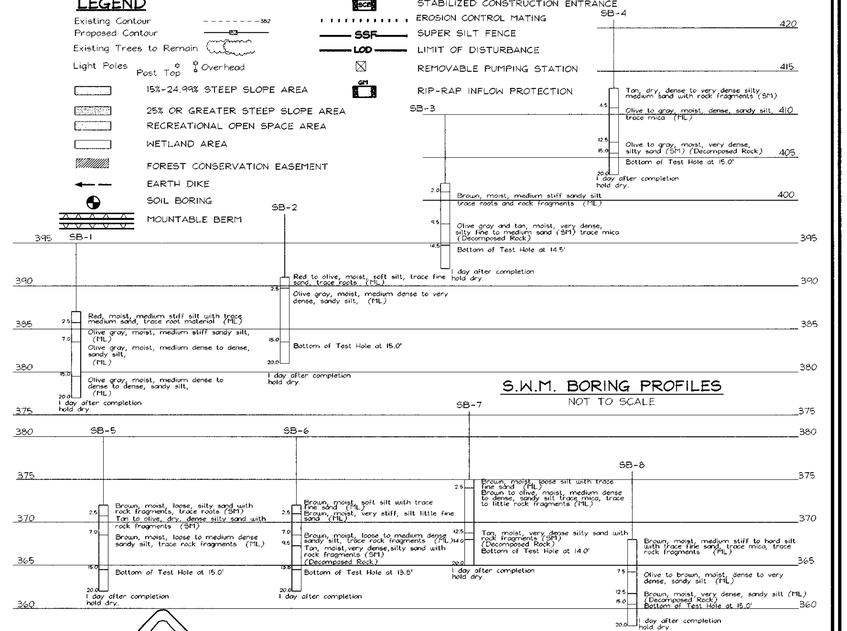
MATCH LINE SEE SHEET 8 OF 18

Maryland State Grid Meridian

LEGEND

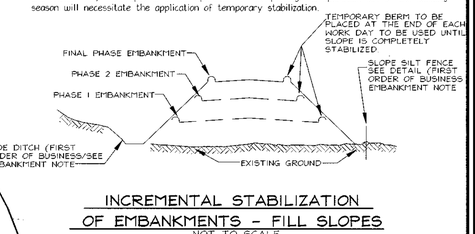
- Existing Contour ---------382
- Proposed Contour
- Existing Trees to Remain
- Light Poles — Post Top / Overhead
- 15%-24.99% STEEP SLOPE AREA
- 25% OR GREATER STEEP SLOPE AREA
- RECREATIONAL OPEN SPACE AREA
- WETLAND AREA
- FOREST CONSERVATION EASEMENT
- EARTH DIKE
- SOIL BORING
- MOUNTABLE BERM
- SCE — STABILIZED CONSTRUCTION ENTRANCE
- EROSION CONTROL MATING
- SSF — SUPER SILT FENCE
- LOD — LIMIT OF DISTURBANCE
- REMOVABLE PUMPING STATION
- RIP-RAP INFLOW PROTECTION

S.W.M. BORING PROFILES
NOT TO SCALE

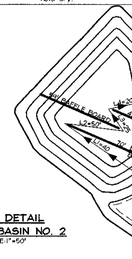


Incremental Stabilization of Embankments - Fill Slopes
i. Embankments shall be constructed in lifts as prescribed on the plans.
ii. Slopes shall be stabilized immediately when the vertical height of the multiple lift reaches 15feet, or when the grading operation ceases as prescribed in the plans.
iii. At the end of each day temporary berm and pipe slopes drains should be constructed along the top edge of the embankment to intercept surface runoff and convey it down the slope in a non-erosive manner to a sediment trapping device.
iv. Construction sequence: Refer to Figure 4 (below).
a. Excavate and stabilize all temporary swales, side ditches, or berms that will be used to divert runoff around the fill. Construct Slope Silt Fence on low side of fill as shown in Figure 5, unless other methods shown on the plans address this area.
b. Place phase 1 embankment, dress and stabilize.
c. Place phase 2 embankment, dress and stabilize.
d. Place final phase embankment, dress and stabilize. Overseed previously seeded area as necessary.

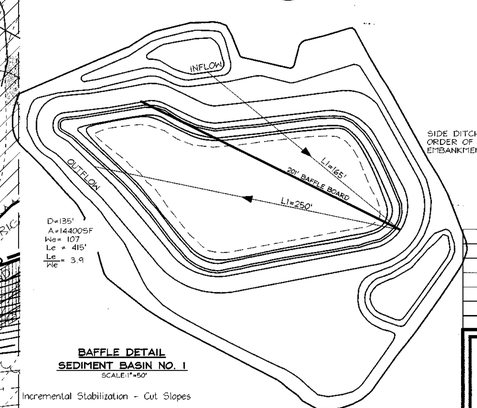
Note: Once the placement of fill has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.



INCREMENTAL STABILIZATION OF EMBANKMENTS - FILL SLOPES
NOT TO SCALE



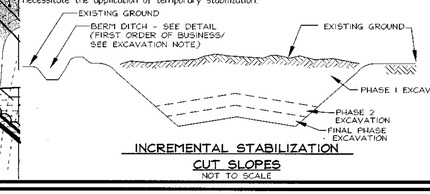
BAFFLE DETAIL
SEDIMENT BASIN NO. 2
SCALE:1"=50'



BAFFLE DETAIL
SEDIMENT BASIN NO. 1
SCALE:1"=50'

Incremental Stabilization - Cut Slopes
i. All cut slopes shall be dressed, prepared and mulched as the work progresses. Slopes shall be excavated and stabilized and equal increments not to exceed 15'.
ii. Construction sequence (Refer to Figure 3 below):
a. Excavate and stabilize all temporary swales, side ditches, or berms that will be used to convey runoff from the excavation.
b. Perform phase 1 excavation, dress, and stabilize.
c. Perform final phase 2 excavation, dress and stabilize. Overseed previously seeded areas as necessary.

Note: Once excavation has begun the operation should be continuous from grubbing through the completion of grading and placement of topsoil (if required) and permanent seed and mulch. Any interruptions in the operation or completing the operation out of the seeding season will necessitate the application of temporary stabilization.



INCREMENTAL STABILIZATION
CUT SLOPES
NOT TO SCALE

NO.	REVISION	DATE

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
5900 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUNER
PHONE: (410) 480-9105

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

DIRECTOR — N/A — DATE

ENGINEERS CERTIFICATE

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

SIGNATURE OF ENGINEER
ROBERT H. VOGEL — DATE 6/20/01

DEVELOPER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE 6/8/01

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

USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE 7/10/01

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 7/10/01

GRADING, SEDIMENT & EROSION CONTROL PLAN
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS / ARCHITECTS / SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT H. VOGEL — No. 16193 — PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: 1"=50'
W.O. NO.: 98-011

PREV. FILE # S-98-18

SHEET 7 OF 20

F-01-60

C:\Land Projects\99-011\dwg\302694.dwg-gh-10.10.2000

W:\PROJECTS\2019\11\ENGR\dwg\final\302657.dwg Tue Jun 19 12:47:13 2001 E4

MATCH LINE SEE SHEET 7 OF 18

N 577250.0000

P/O OPEN SPACE LOT 44 27.77 AC.

FOREST RETENTION EASEMENT #3 8.54 acres

OPEN SPACE LOT 45

HILLSBOROUGH ROAD (MD 99) (VARIABLE WIDTH)

EARTH DIKE A-2

PUBLIC ACCESS STREET (50' R/W) 24' PAVING

FUTURE RD CONNECTION

CLEAN WATER EARTH DIKE A-1

TAYLOR FAMILY LIM 8293/56

RESIDUE PORTION OF PARCEL 4 FUTURE DEVELOPMENT ZONED POR (SEE S-00-05, VILLAGE CREST.)

TEMP. 24" PIPE PROFILE

SCALE: 1"=50' HORZ. 1"=5' VERT.

G. HILLSBOURGH RD STA. 19+15

PROPOSED GRADE

EL. 392.00

EL. 398.00

TEMP. 24" PIPE

EX. GRADE

Q_2 = 23.8 CFS
V = 9.6 FPS
100' @ 1%
EX. GRADE

410 / 405 / 400 / 395 / 390 / 385

SWM OPEN SPACE LOT 46 2.65 AC. H.O.A. WET POND NO.1 BOTTOM ELEV. = 393.00 WET POOL ELEV. = 396.00

RPS

SB#3

GABION RIP-RAP

PHASE ONE

PHASE TWO

GARDENGATE COURT

PRIVATE ACCESS PLACE

ALLOWAY STOCKVILLE AREA

RIVIERA BULEVARD

PUBLIC ACCESS STREET (50' R/W) 24' PAVING

TEMP. STOCKPILE AREA

NON-BUILDABLE PARCEL 'A' (FUTURE DEVELOPMENT) 9.24 Ac. ZONED FOR

N 576750.0000

E 1371650.0000

ZONED POR ZONED R-ED

N58°00'27"W 513.34'

FUTURE ACADEMY DRIVE

PUBLIC ACCESS STREET (50' R/W) 24' PAVING

MINOR COLLECTOR (50' R/W) 24' PAVING

FUTURE ROAD CONNECTION

ZONED POR ZONED R-20

LOT 93

CHE

ZONED R-20

5.9 Ac.

NO WOODY VEGETATION BUFFER

BASIN NO. 1

Trap type: BASIN
Proposed drainage area : 10.3 Ac.
Ex. drainage: 3.2 Ac.

Total storage required : 37080 cf
Total storage provided : 42551 Cf
Bottom dimensions: 140'x75'
Bottom elevation: 393.00
Crest elevation: 396.70
Length: 25'
Wet storage elevation: 393.00-394.40 (1.4)
Dry storage elevation: 394.4-396.7 (2.3)
Total storage depth: 2.7'
Top of embankment: 402.00
Cleanout Elevation: 393.73
Side slopes: 3:1
Outlet elevation: 394.40

POND NO.1

WET POND HAZARD CLASS A
PRIVATELY OWNED & MAINTAINED
2 YR WSE = 397.41
10 YR WSE = 398.51
100 YR WSE = 399.31
WET POOL ELEV. = 396.00

LEGEND

Existing Contour ---382
Proposed Contour 80
Existing Trees to Remain
Light Poles (Post Top/C Overhead)
15%-24.99% STEEP SLOPE AREA
25% OR GREATER STEEP SLOPE AREA
RECREATIONAL OPEN SPACE AREA
WETLAND AREA
FOREST CONSERVATION EASEMENT
EARTH DIKE
SOIL BORING
SCE STABILIZED CONSTRUCTION ENTRANCE
EROSION CONTROL MATING
SSF SUPER SILT FENCE
LOD LIMIT OF DISTURBANCE
REMOVABLE PUMPING STATION
RIP RIP-RAP INFLOW PROTECTION
MOUNTABLE BERM

Q2 (Ex.) = 3.3 CFS
Q2 (Prop.) = 3.8 CFS

NON-BUILDABLE PARCEL 'B' (TO BE SUBDIVIDED INTO SECTIONS IN THE FUTURE IN ACCORDANCE WITH THE APFO PHASING CHART FOR PHASES 2-9 ON THE APPROVED SKETCH PLAN, S-98-18)

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP, A
TAYLOR FAMILY LIMITED PARNERSHIP, B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND, 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

EX. FOREST RETENTION EASEMENT AREA 3

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

ENGINEER'S CERTIFICATE

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

SIGNATURE OF ENGINEER ROBERT H. VOGEL — DATE 6/8/01

DEVELOPER'S CERTIFICATE

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SIGNATURE OF DEVELOPER — DATE 6/8/01

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USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE 7/10/01

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 7/10/01

NO.	REVISION	DATE

GRADING, SEDIMENT & EROSION CONTROL PLAN
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46 AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS, ARCHITECTS, SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 15193 — PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.15193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: 1"=50'
W.O. NO.: 99-011

PREV. FILE # S-98-18

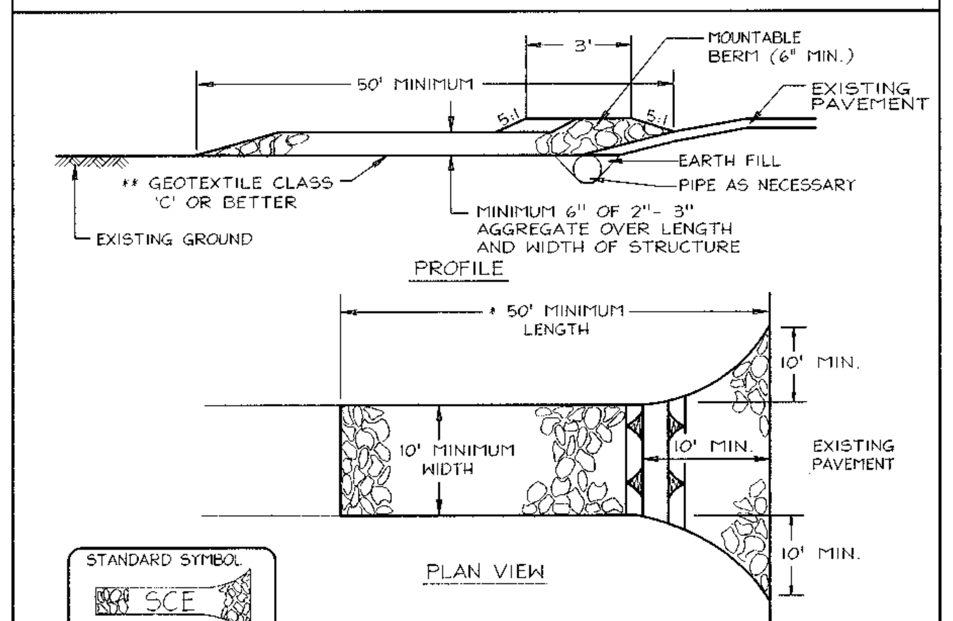
SHEET 8 OF 20

F-01-60

Maryland State Grid Meridian

M:\DRAWINGS\25\201911\ENGR\dwg\final\702688.dwg Thu Jun 07 10:26:09 2001 E4

DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE

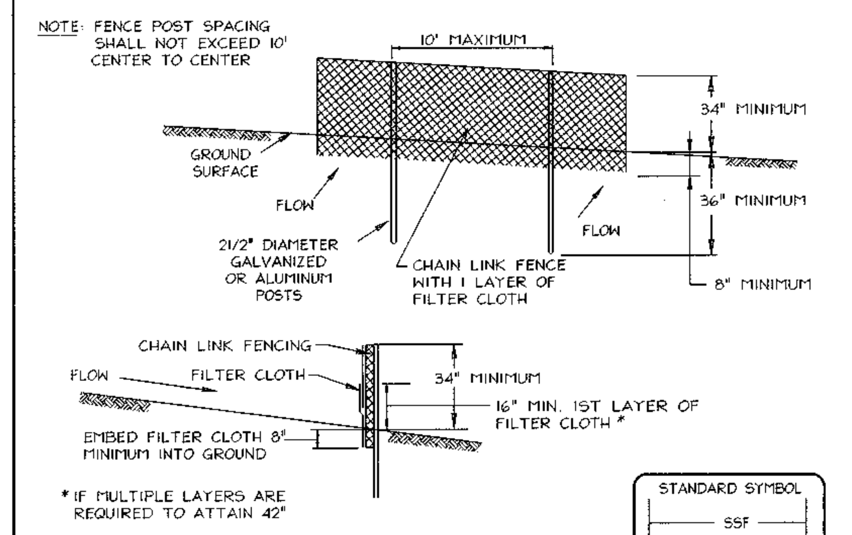


Construction Specification

1. Length - minimum of 50' (* 30' for a single residence lot).
2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.
3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. ** The plan approval authority may not require single family residences to use geotextile.
4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.
5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey, a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.
6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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

DETAIL 33 - SUPER SILT FENCE



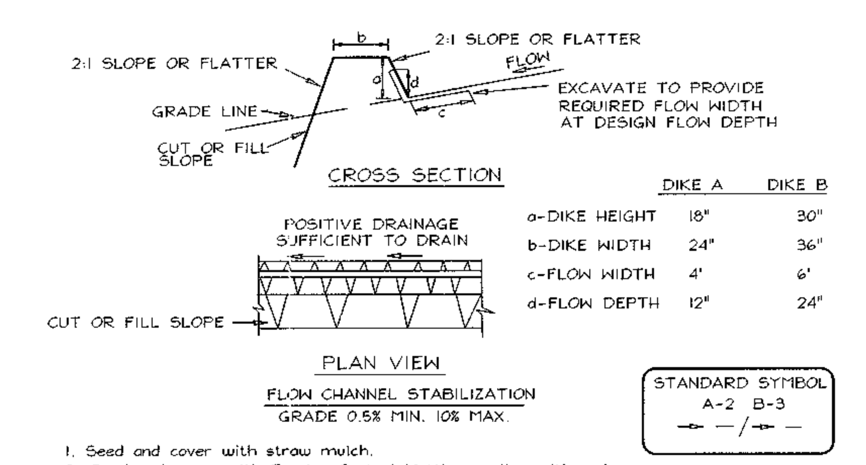
Construction Specifications

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

Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow Rate	0.3 gal/ft ²/minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 26 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 1 - EARTH DIKE



	DIKE A	DIKE B
a-DIKE HEIGHT	18"	30"
b-DIKE WIDTH	24"	36"
c-FLOW WIDTH	4'	6'
d-FLOW DEPTH	12"	24"

FLOW CHANNEL STABILIZATION
GRADE 0.5% MIN. 10% MAX.

STANDARD SYMBOL A-2 B-3

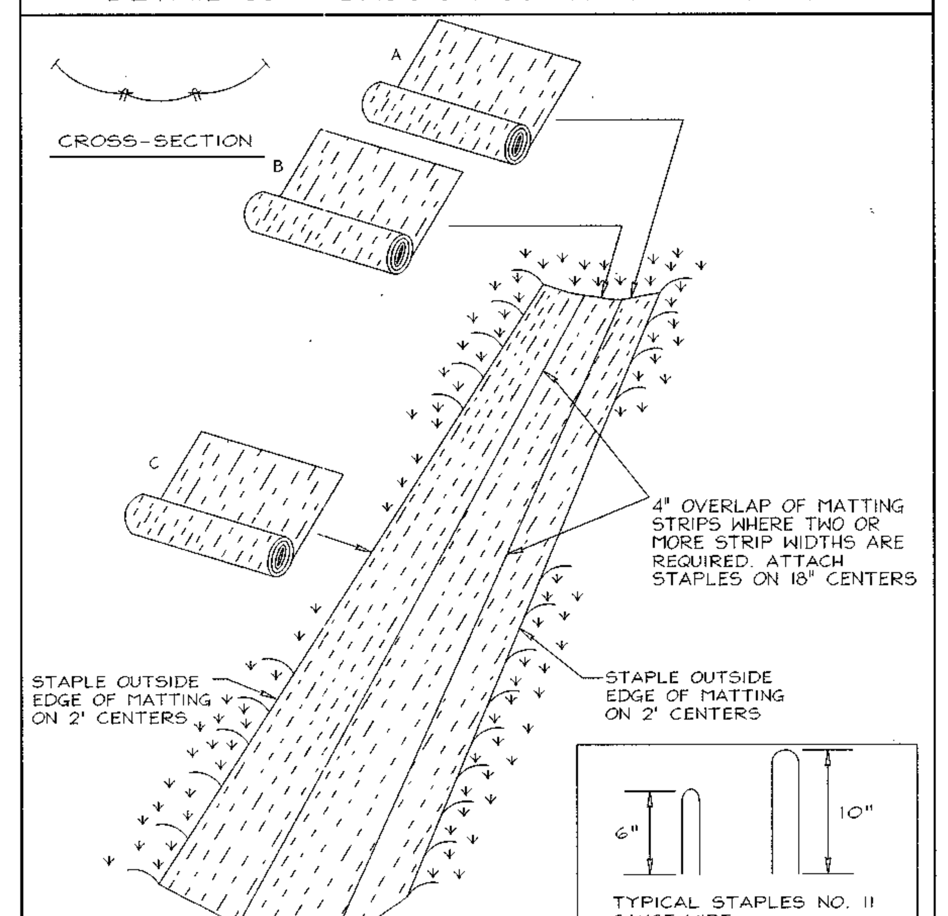
1. Seed and cover with straw mulch.
2. Seed and cover with Erosion Control Matting or line with sod.
3. 4" - 7" stone or recycled concrete equivalent pressed into the soil 7" minimum

Construction Specifications

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

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

DETAIL 30 - EROSION CONTROL MATTING



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

ROCK OUTLET PROTECTION

Construction Specifications

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

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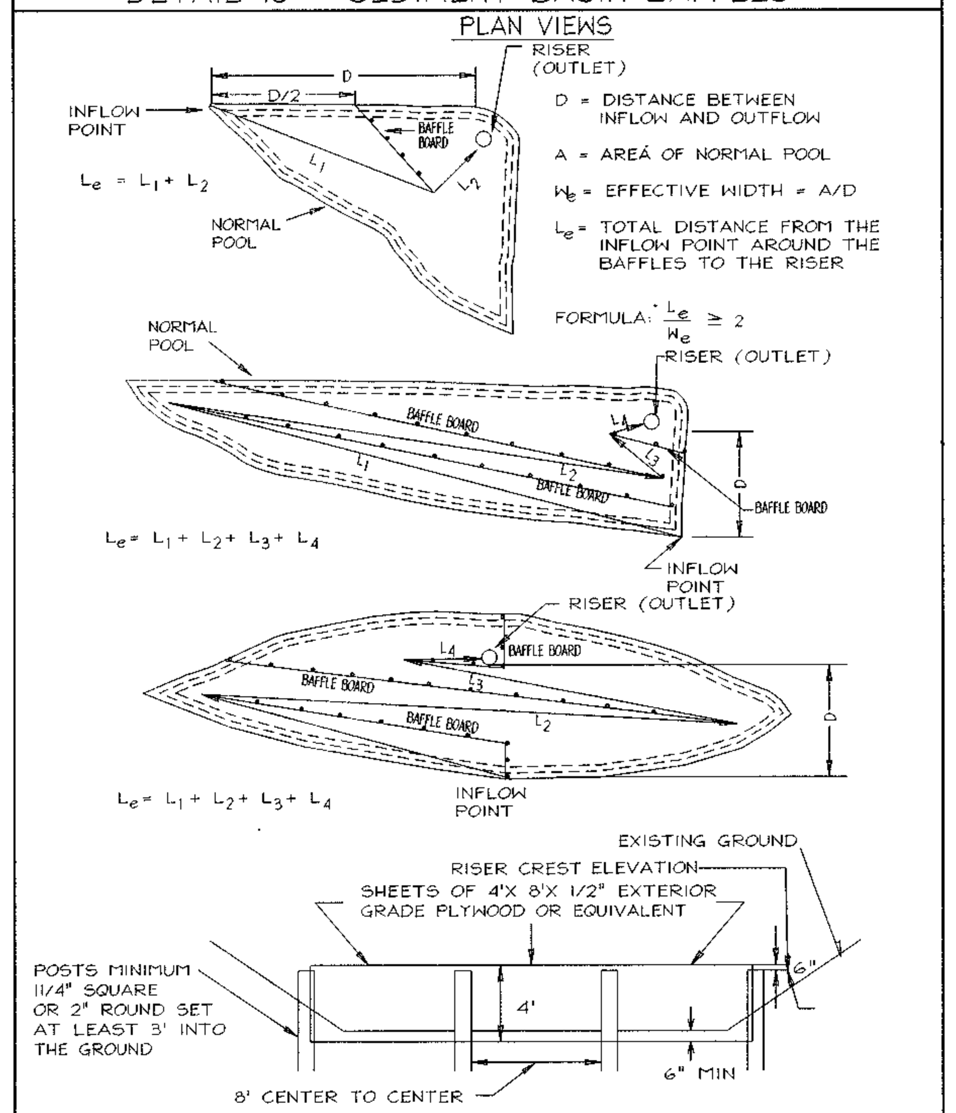
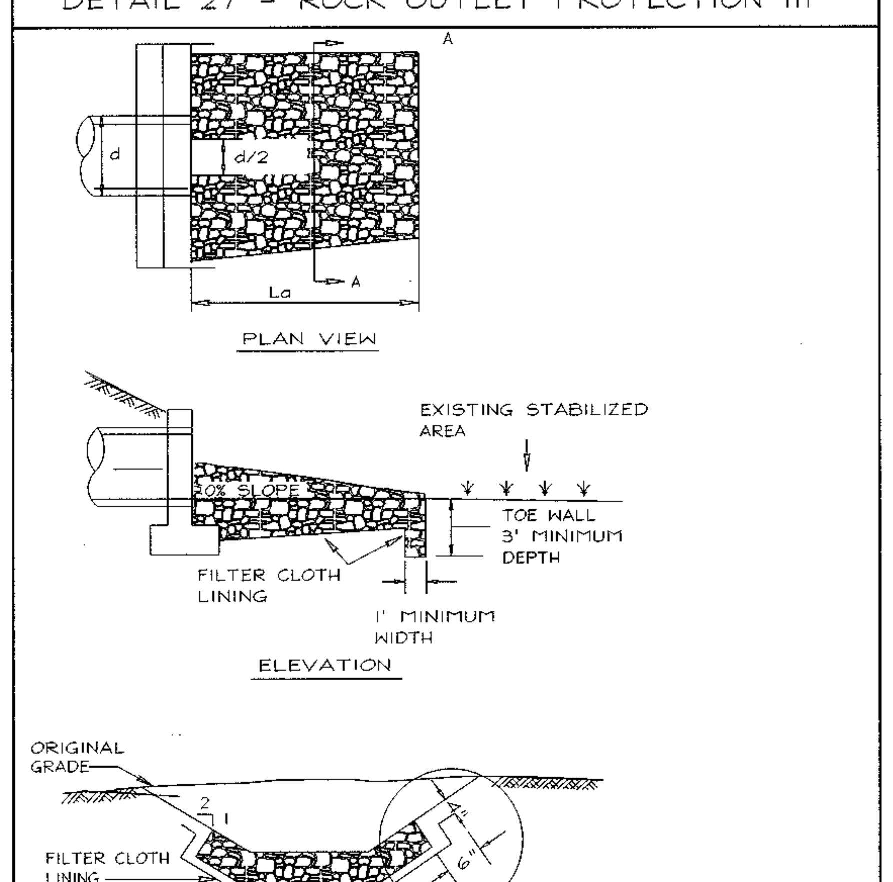
DETAIL 18 - SEDIMENT BASIN BAFFLES



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

DETAIL 27 - ROCK OUTLET PROTECTION III



FILTER FABRIC LINING SHALL BE EMBEDDED A MINIMUM OF 4" AND SHALL EXTEND AT LEAST 6" BEYOND THE EDGE OF THE RIP-RAP

NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 10	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

21.0 STANDARDS AND SPECIFICATIONS FOT TOP SOIL

Definition

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

Purpose

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

Conditions Where Practice Applies

I. This practice is limited to areas having 2:1 or flatter slopes where:

a. The texture of the exposed subsoil/parent material is not adequate to produce vegetative growth.

b. The soil material is so shallow that the rooting zone is not deep enough to support plants or furnish continuing supplies of moisture and plant nutrients.

c. The original soil to be vegetated contains material toxic to plant growth.

d. The soil is so acidic that treatment with limestone is not feasible.

II. For the purpose of these Standards and Specifications, areas having slopes steeper than 2:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 2:1 shall have the appropriate stabilization shown on the plans.

Construction and Material Specifications

I. Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the Soil Survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.

II. Topsoil Specifications - Soil to be used as topsoil must meet the following:

i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or a soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textured subsoils and shall contain less than 5% by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger that 1 and 1/2" in diameter.

ii. Topsoil must be free of plants or plant parts such as Bermuda grass, quackgrass, Johnsongrass, nutsedge, poison ivy, thistle, or others as specified.

iii. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.

II. For sites having disturbed areas under 5 acres:

i. Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.

iii. For sites having disturbed areas over 5 acres:
i. On soil meeting topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
a. pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher
b. Organic content of topsoil shall be not less than 1.5 percent by weight.
c. Topsoil having soluble salt content greater than 500 parts per million shall not be used.
d. No sod or seed shall be placed on soil soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min.) to permit dissipation of phyto-toxic materials.

NOTE: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.

ii. Place topsoil (if required) and apply soil ammendments specified in 20.0 Vegetative Stabilization-Section I-Vegetative Stabilization Methods and Materials.

V. Topsoil Application

i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade Stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.

ii. Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4" - 8" higher in elevation.

iii. Topsoil shall be uniformly distributed in a 4" - 8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.

iv. Topsoil shall not be place while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.

TEMPORARY SEEDING NOTES

SEEDBED PREPARATION: Loosen upper three inches of soil by racking, discing or other acceptable means before seeding, if not if not previously loosened.

SOIL AMENDMENTS: Apply 600 lbs. per acre 10-10-10 fertilizer (14 lbs./1000 sq.ft.).

SEEDING: For periods March 1 thru April 30 and from August 15 thru November 15, seed with 2 1/2 bushel per acre of annual rye (3.2 lbs./1000 sq.ft.) For the period May 1 thru August 14, seed with 3 lbs. per acre of weeping lovegrass (.07 lbs./1000 sq.ft.). For the period November 1 thru February 28, protect site by applying 2 tons per acre of well anchored straw mulch and seed as soon as possible in the spring, or use sod.

MULCHING: Apply 1 1/2 to 2 tons per acre (70 to 90 lbs./1000 sq.ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq.ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq.ft.) for anchoring.

REFER TO THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR RATE AND METHODS NOT COVERED.

PERMANENT SEEDING NOTES

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

SEEDBED PREPARATION: Loosen upper three inches of soil by raking, discing or other acceptable means before seeding, if not previously loosened.

SOIL AMENDMENTS: In lieu of soil test recommendations, use one of the following schedules:

1) Preferred-Apply 2 tons per acre dolomitic limestone (92 lbs/100 sq.ft.) and 600 lbs per acre 10-10-10 fertilizer (14 lbs./1000 sq.ft.) before seeding. Harrow or disc into upper three inches of soil. At the time of seeding, apply 400 lbs. per acre 30-0-0 ureaform fertilizer (9 lbs/1000 sq.ft.)

2) Acceptable-Apply 2 tons per acre dolomatic limestone (92 lbs/1000 sq.ft.) and apply 1000 lbs. per acre 10-10-10- fertilizer (23 lbs./1000 sq.ft.) before seeding. Harrow or disc into upper three inches of soil.

SEEDING: For the periods March 1 thru April 30, and August 1 thru October 15, seed with 60 lbs. per acre (1.4 lbs/1000 sq.ft.) of Kentucky 31 Tall Fescue. For the period May 1 thru July 31, seed with 60 lbs. Kentucky 31 Tall Fescue per acre and 2 lbs. per acre (.05 lbs./1000 sq.ft.) of weeping lovegrass. During the period of October 16 thru February 28, protect site by: Option (1) 2 tons per acre well anchored straw mulch and seed as soon as possible in the spring. Option (2) Use sod. Option (3) Seed with 60 lbs/acre Kentucky 31 Tall Fescue and mulch with 2 tons/acre well anchored straw.

MULCHING: Apply 1 1/2 to 2 tons per acre (70 to 90 lbs/1000 sq. ft.) of unrotted small grain straw immediately after seeding. Anchor mulch immediately after application using mulch anchoring tool or 218 gallons per acre (5 gal/1000 sq.ft.) of emulsified asphalt on flat areas. On slopes 8 feet or higher, use 348 gallons per acre (8 gal/1000 sq.ft.) for anchoring.

MAINTENANCE: Inspect all seeded areas and make needed repairs, replacements and reseedings.

30.0 DUST CONTROL

Definition

Controlling dust blowing and movement on construction sites and roads.

Purpose

To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off-site damage health hazards, and improve traffic safety.

Conditions Where Practice Applies

This practice is applicable to areas subject to dust blowing and movement Where on and off-site damage is likely without treatment.

Specifications

Temporary Methods

1. Mulches - See standards for vegetative stabilization with mulches only. Mulch should be crimped or tacked to prevent blowing.
2. Vegetative Cover - See standards for temporary vegetative cover.
3. Tillage - To roughen surface and bring clods to the surface. This is an emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12" apart, spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect.
4. Irrigation - This is generally done as an emergency treatment. Site is sprinkled with water until the surface is moist. Repeat as needed. At no time should the site be irrigated to the point that runoff begins to flow.
5. Barriers - Solid board fences, silt fences, snow fences, burlap fences, straw bales, and similar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 10 times their height are effective in controlling soil blowing.
6. Calcium Chloride - Apply at rates that will keep surface moist. May need retreatment.

Permanent Methods

1. Permanent vegetation - See standards for permanent vegetative cover, and permanent stabilization with sod. Existing trees or large shrubs may afford valuable protection if left in place.
2. Topsoiling - Covering with less erosive soil materials. See standards for Topsoiling.
3. Stone - Cover surface with crushed stone or coarse gravel.

References

1. Agricultural Handbook 346. Wind Erosion Forces in the United States and Their Use in Predicting Soil Loss.
2. Agricultural Information Bulletin 354. How to Control Wind Erosion, USDA-ARS.

EROSION CONTROL MATTING

Construction Specifications

1. Key-in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross-section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".
2. Staple the 4" overlap in the channel center using an 18" spacing between staples.
3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.
4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.
5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.
6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

Note: If flow will enter from the edge of the matting then the area effected by the flow must be keyed-in.

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

SEDIMENT CONTROL NOTES

1. A minimum of 48 hours notice must be given to the Howard County Department of Inspection, License and Permits Sediment Control Division prior to the start of any construction (313-1855).
2. All vegetation and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, and revisions thereto.
3. Following initial soil disturbance or redisturbance, permanent or temporary stabilization shall be completed within: (a) 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes, and all slopes greater than 3:1, (b) 14 days as to all other disturbed or graded areas on the project site.
4. All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol. 1, Chapter 7, HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
5. All disturbed areas must be stabilized within the time period specified above in accordance with the 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL for permanent seeding, sod, temporary seeding, and mulching (Sec. G). Temporary stabilization with mulch alone shall be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
6. All sediment control structures are to remain in place and are to be maintained in operative condition until permission for their removal has been obtained from the Howard County Sediment Control Inspector.
7. Site Analysis :

Total Area	50.46 Acres
Area Disturbed	24.22 Acres
Area to be roofed or paved	5.72 Acres
Area to be vegetatively stabilized	18.50 Acres
Total Cut	120,000 CY
Total Fill	122,000 CY
Offsite waste/borrow area location	*

8. Any sediment control practice which is disturbed by grading activity for placement of utilities must be repaired on the same day of disturbance.
9. Additional sediment controls must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
10. On all sites with disturbed areas in excess of 2 acres, approval of the inspection agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the inspection agency is made.
11. Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized within one working day, whichever is shorter.

* To be determined by contractor, with pre-approval of the Sediment Control Inspector with an approved and active grading permit

SEQUENCE OF CONSTRUCTION	DURATION
1. Obtain grading permit.	
2. Notify Howard County Bureau Of Inspections and Permits (313-1880) at least 24 hours before starting any work.	
3. Construct Stabilized Construction Entrance and install tree protection devices.	
4. Install super silt fence.	
5. Construct stormwater management facilities(sediment basins) and construct sediment control dewatering devices. Install earth dikes.	3 DAYS / 2 WEEK
6. Stabilize all temporary swales, side ditches, or berms. See detail and specifications for incremental stabilization.	
7. With Inspector's approvals Clear and grub site to LOD.	1 DAY
8. Begin construction of water and sewer.	1 WEEK
9. Relocate fiber optic cable prior to mass grading. drain systems as site is graded and outfall into basins.	2 WEEKS
10. Grade road to sub-base and rough grade site. Install storm drain systems as site is graded and outfall into basins.	1 WEEK
11. With inspector's approval remove earth dike along rear of lots 1-9 as road is graded and maintain super silt fence.	2 WEEKS
12. With road graded to sub-base and inlets are in place begin installation of curb and gutter.	2 WEEKS
13. With curb and gutter in place pave road and install sidewalks and street trees.	2 WEEKS
14. As stormwater management pond is stabilized, install pond landscaping as shown in Schedule 'D' and perimeter landscaping as shown in Schedule 'A'. See sheet 15 for Schedule tables.	1 WEEK
15. With inspector's approval with road paving complete and contributing drainage areas stabilized, convert sediment basin to final stormwater management by excavating bottom of basins to pond design bottom. Remove dewatering device from pond 1 and install 6" pond drain. Convert dewatering device in pond 2 to permanent water quality extended detention pipe per detail.	1 WEEK
16. During grading and after each rainfall, the contractor shall inspect and provide the necessary maintenance on the sediment and erosion control measures shown hereon.	
17. Following initial soil disturbance or redisturbance permanent or temporary stabilization shall be complied with: A. 7 calendar days for all perimeter sediment control structures, dikes, swales, ditch perimeter slopes slopes and all slopes greater than 3:1. B. 14 calendar days for all other disturbed areas.	

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

[signature] 7-24-01
CHIEF, BUREAU OF HIGHWAYS — DATE

NO.	REVISION	DATE

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 7/27/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

[signature] 8/3/01
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

N/A
DIRECTOR — DATE

ENGINEERS CERTIFICATE

"I HEREBY CERTIFY THAT THIS PLAN FOR POND CONSTRUCTION, EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT. I HAVE NOTIFIED THE DEVELOPER THAT HE/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] 6/8/01
SIGNATURE OF ENGINEER — DATE
ROBERT H. VOGEL

DEVELOPER'S CERTIFICATE

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

[signature] 6/8/01
SIGNATURE OF DEVELOPER — DATE

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

[signature] 7/10/01
USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE

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

[signature] 7/10/01
HOWARD SOIL CONSERVATION DISTRICT — DATE

SEDIMENT AND EROSION CONTROL DETAILS
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'
COVER SHEET

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland — Columbia, Maryland — Warrenton, Virginia

ROBERT H. VOGEL, PE No.16193

DESIGN BY: RJ
DRAWN BY: RJ
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: As Shown
W.O. NO.: 99-011

F-01-60

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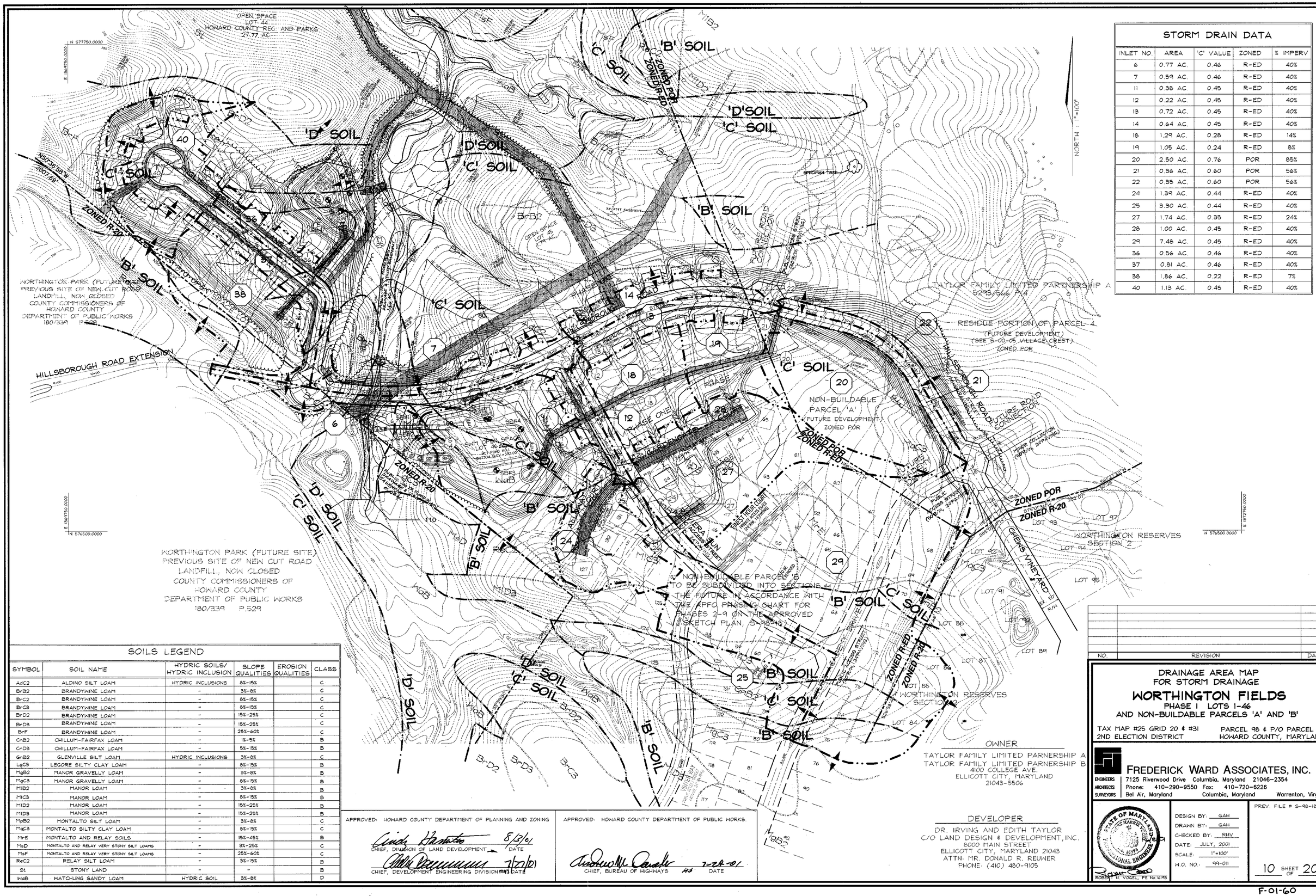

STORM DRAIN DATA

INLET NO.	AREA	'C' VALUE	ZONED	% IMPERV
6	0.77 AC.	0.46	R-ED	40%
7	0.59 AC.	0.46	R-ED	40%
11	0.38 AC.	0.45	R-ED	40%
12	0.22 AC.	0.45	R-ED	40%
13	0.72 AC.	0.45	R-ED	40%
14	0.64 AC.	0.45	R-ED	40%
18	1.29 AC.	0.28	R-ED	14%
19	1.05 AC.	0.24	R-ED	8%
20	2.50 AC.	0.76	POR	85%
21	0.36 AC.	0.60	POR	56%
22	0.35 AC.	0.60	POR	56%
24	1.39 AC.	0.44	R-ED	40%
25	3.30 AC.	0.44	R-ED	40%
27	1.74 AC.	0.35	R-ED	24%
28	1.00 AC.	0.45	R-ED	40%
29	7.48 AC.	0.45	R-ED	40%
36	0.56 AC.	0.46	R-ED	40%
37	0.81 AC.	0.46	R-ED	40%
38	1.86 AC.	0.22	R-ED	7%
40	1.13 AC.	0.45	R-ED	40%

SOILS LEGEND

SYMBOL	SOIL NAME	HYDRIC SOILS/ HYDRIC INCLUSION	SLOPE QUALITIES	EROSION QUALITIES	CLASS
AdC2	ALDINO SILT LOAM	HYDRIC INCLUSIONS	8%-15%		C
BrB2	BRANDYWINE LOAM	-	3%-8%		C
BrC2	BRANDYWINE LOAM	-	8%-15%		C
BrC3	BRANDYWINE LOAM	-	8%-15%		C
BrD2	BRANDYWINE LOAM	-	15%-25%		C
BrD3	BRANDYWINE LOAM	-	15%-25%		C
BrF	BRANDYWINE LOAM	-	25%-60%		C
CnB2	CHILLUM-FAIRFAX LOAM	-	1%-5%		B
CnD3	CHILLUM-FAIRFAX LOAM	-	5%-15%		B
GnB2	GLENVILLE SILT LOAM	HYDRIC INCLUSIONS	3%-8%		C
LgC3	LEGORE SILTY CLAY LOAM	-	8%-15%		B
MgB2	MANOR GRAVELLY LOAM	-	3%-8%		B
MgC3	MANOR GRAVELLY LOAM	-	8%-15%		B
MlB2	MANOR LOAM	-	3%-8%		B
MlC3	MANOR LOAM	-	8%-15%		B
MlD2	MANOR LOAM	-	15%-25%		B
MlD3	MANOR LOAM	-	15%-25%		B
MoB2	MONTALTO SILT LOAM	-	3%-8%		C
MoC3	MONTALTO SILTY CLAY LOAM	-	8%-15%		C
MrE	MONTALTO AND RELAY SOILS	-	15%-45%		B
MsD	MONTALTO AND RELAY VERY STONY SILT LOAMS	-	9%-25%		C
MsF	MONTALTO AND RELAY VERY STONY SILT LOAMS	-	25%-60%		C
ReC2	RELAY SILT LOAM	-	3%-15%		B
St	STONY LAND	-	-		B
WaB	WATCHUNG SANDY LOAM	HYDRIC SOIL	3%-8%		D

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-26-01

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

DEVELOPER

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8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

NO.	REVISION	DATE

DRAINAGE AREA MAP FOR STORM DRAINAGE
WORTHINGTON FIELDS
PHASE I LOTS 1-46 AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
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Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 10193 — PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No. 10193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: 1"=100'
W.O. NO.: 99-011

PREV. FILE # S-98-18

SHEET 10 OF 20

F-01-60

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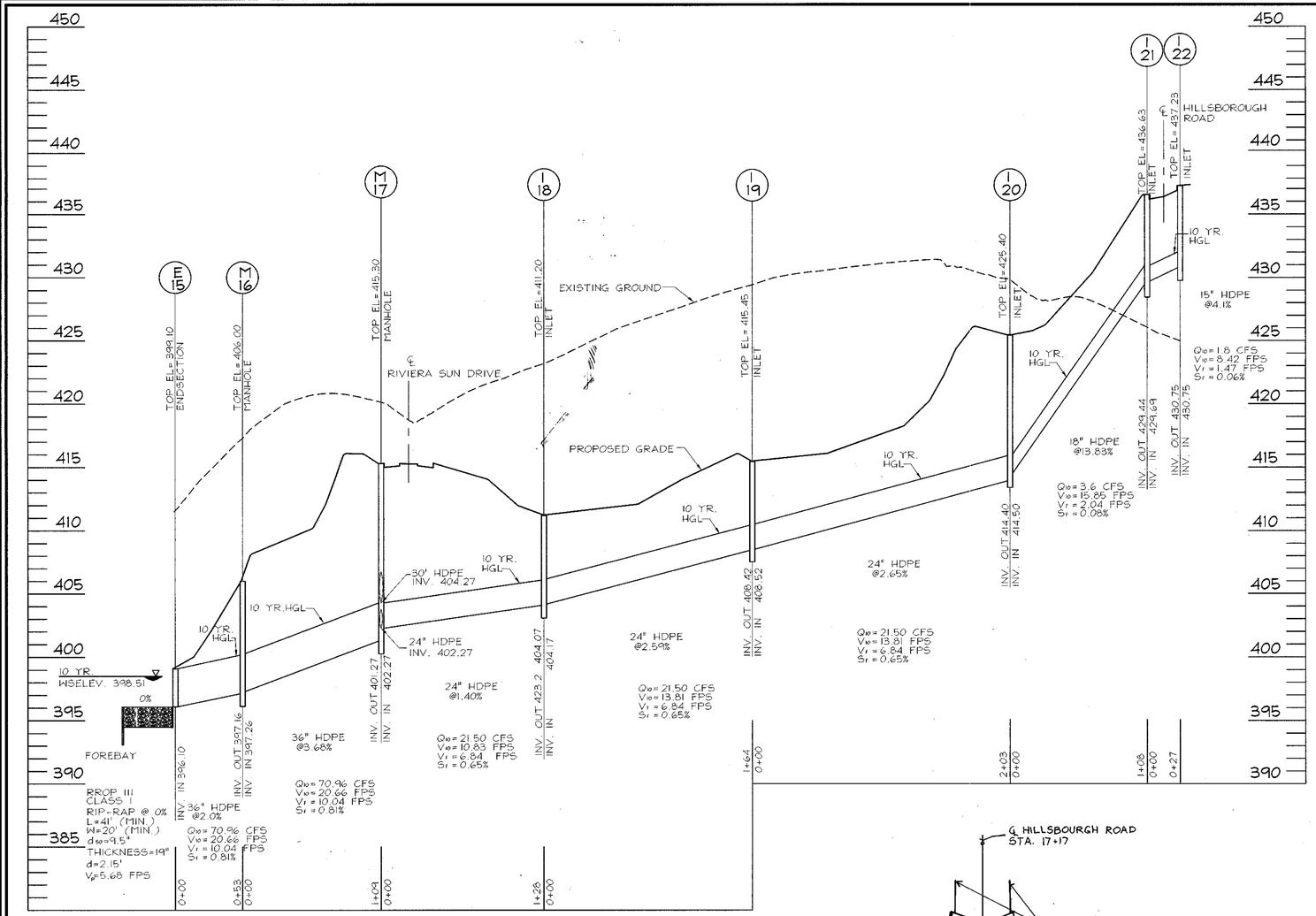
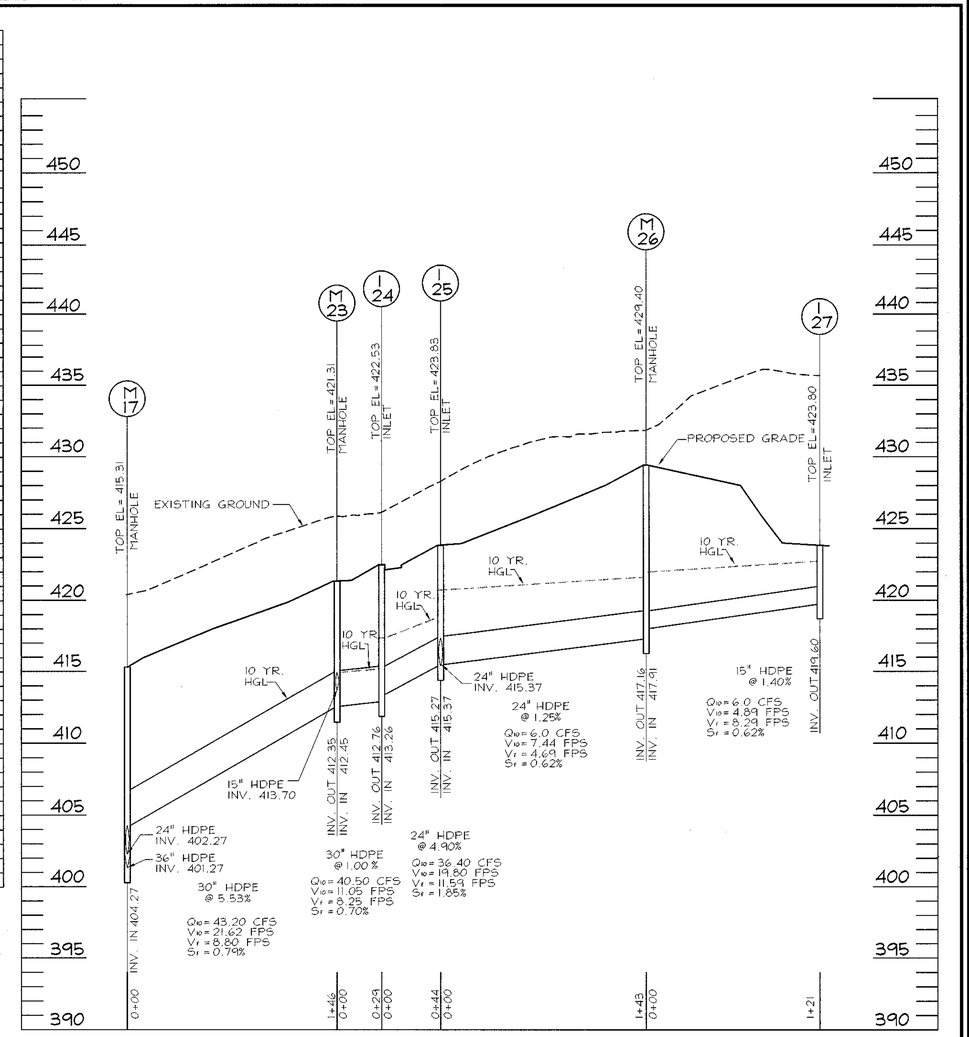


STORM DRAIN PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.



STORM DRAIN PROFILE

SCALE: 1"= 50' HORZ.
1"= 5' VERT.

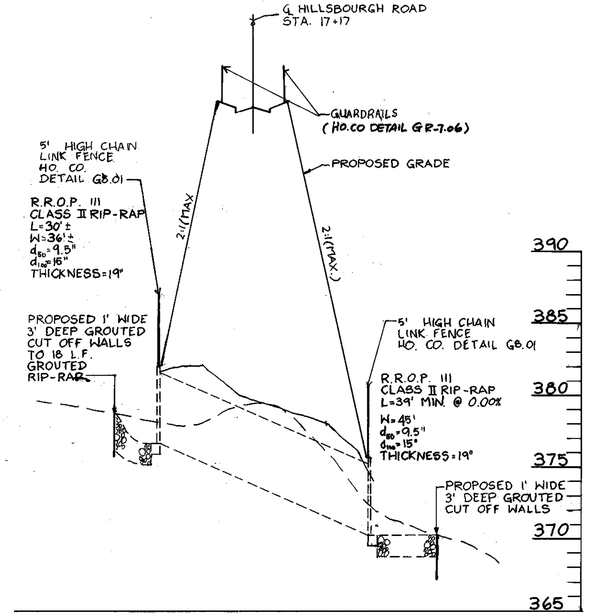
STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	INV IN	INV OUT	REMARKS
E-3	36" CONC. END SECTION	N. 576761.5 E 1370576.80	177.08TS	-	386.00	SD-5.51
S-4	CONTROL STRUCTURE	N. 576759.6 E 1370680.7	400.20	-	- -	SEE DETAIL
E-5	18" HDPE END SECTION	N. 576804?.5 E 1370782.6	397.10TP	-	387?96.60	SEE DETAIL
I-6	A-5 INLET	CL STA. 17+40, 12' RT.	400.31TS	15?396.92	387?96.68	SD-4.40
I-7	A-5 INLET	CL STA. 17+40, 12' LT.	400.31TS	-	387?97.06	SD-4.40
I-11	A-5 INLET	CL STA. 0+53, 12' RT.	410.47TS	18?403.56	387?403.46	SD-4.40
I-12	A-5 INLET	CL STA. 0+53, 12' LT.	410.47TS	18?403.93	387?403.83	SD-4.40
I-13	A-5 INLET	CL STA. 22+79, 12' RT.	410.61TS	15?404.80	387?404.55	SD-4.40
I-14	A-5 INLET	CL STA. 22+79, 12' LT.	410.61TS	-	15?405.07	SD-4.40
E-15	36" HDPE END SECTION	N.576689.3 E.1370964.9	399.10TP	-	36?396.10	SEE DETAIL
M-16	STANDARD 5' MANHOLE	N.576739.9 E.1370980.6	406.0TR	36?397.26	36?397.16	G-5.13
M-17	STANDARD 5' MANHOLE	CL STA. 1+81, 20.6' RT.	415.3TR	(2)24?400.27 30?404.27	36?401.27	G-5.13
I-18	TYPE D INLET	N.576853.5 E.1371169.2	411.20*	24?404.17	24?404.07	SD-4.39
I-19	TYPE D INLET	N.576908.2 E.1371343.9	415.45*	24?408.52	24?408.42	SD-4.39
I-20	TYPE D INLET	N.576956.8 E.1371540.8	425.40*	18?414.50	24?414.40	SD-4.39
I-21	A-5 INLET	CL STA. 28+17, 12' RT.	436.63TS	15?429.69	18?429.44	SD-4.40
I-22	A-5 INLET	CL STA. 28+24, 12' LT.	437.23TS	-	15?430.75	SD-4.40
M-23	STANDARD 4' MANHOLE	CL STA. 3+27, 16' RT.	421.3TR	30?412.45 30?412.35	30?412.35	G-5.12
I-24	TYPE D INLET	CL STA. 0+31, 12' RT.	422.39*	24?413.26	30?412.76	SD-4.39
I-26	A-6 INLET	CL STA. 3+87, 12' RT.	423.83	(2)24?415.37	24?415.27	SD-4.40
M-26	STANDARD 4' MANHOLE	CL STA. 5+28, 16' RT.	429.4TR	15?417.91	24?417.16	G-5.12
I-27	TYPE D INLET	N.576568.4 E.1371363.4	423.80*	-	15?419.60	SD-4.39
I-28	TYPE D INLET	CL STA. 0+42, 12' LT.	422.60*	-	15?417.35	SD-4.39
I-29	A-10 INLET	CL STA. 3+87, 12' LT.	422.83TS	-	24?419.42	SD-4.41
E-32	30" CONC. END SECTION	N 577373.7 E 1370500.6	363.56TP	-	30?361.06	SD-5.51
S-33	CONTROL STRUCTURE	N 577370.6 E 1370483.6	364.00TS	-	30?362.80	SEE DETAIL
E-34	18" HDPE END SECTION	N 577281.2 E1370451.9	363.56TP	-	18?364.64	SEE DETAIL
M-35	STANDARD 4' MANHOLE	N.577249.7 E.1370456.5	380.5TR	18?373.30	18?368.70	G-5.12
I-36	A-5 INLET	CL STA. 2+91.7, 12' RT.	391.24TS	(2)18?386.38	18?385.28	SD-4.40
I-37	A-5 INLET	CL STA. 2+91.7, 12' LT.	391.24TS	15?385.67	18?385.62	SD-4.40
I-38	TYPE D INLET	N.577054.1 E.1370267.0	392.32*	-	15?387.07	SD-4.39
M-39	STANDARD 4' MANHOLE	CL STA. 6+71, 14.6' RT.	403.3TR	15?391.27	18?391.22	G-5.12
I-40	A-5 INLET	LP STA. 1+54	399.46TS	-	15?392.98	SD-4.40

NOTE: ALL STORM DRAIN PIPE TO BE HDPE UNLESS OTHERWISE NOTED.
TS = TOP OF SLAB, FACE OF STRUCTURE
TP = TOP OF PIPE
TR = TOP CENTER OF RIM
* ELEV. AT THROAT OPENING

PIPE SCHEDULE

PIPE SIZE	TYPE	TOTAL LENGTH
15"	HDPE	511 LF
18"	HDPE	965 LF
24"	HDPE	809 LF
30"	HDPE	175 LF
36"	HDPE	162 LF
30"	ASTM C-361	67 LF
36"	ASTM C-361	104 LF



CULVERT PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
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DEVELOPER

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NO.	REVISION	DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

STORM DRAIN PROFILES

WORTHINGTON FIELDS

PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
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Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT H. VOGEL, PE No. 16185

DESIGN BY: GAH
DRAWN BY: R.J.
CHECKED BY: R.H.V.
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 11 OF 20

F-01-60

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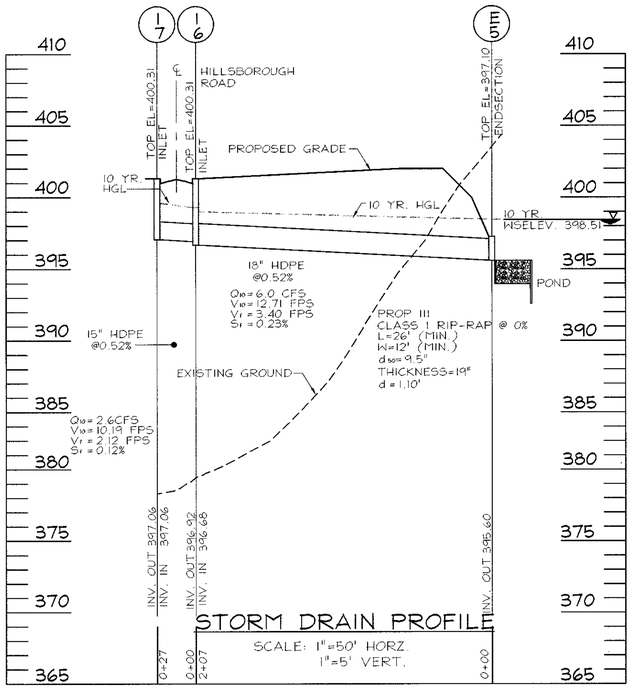
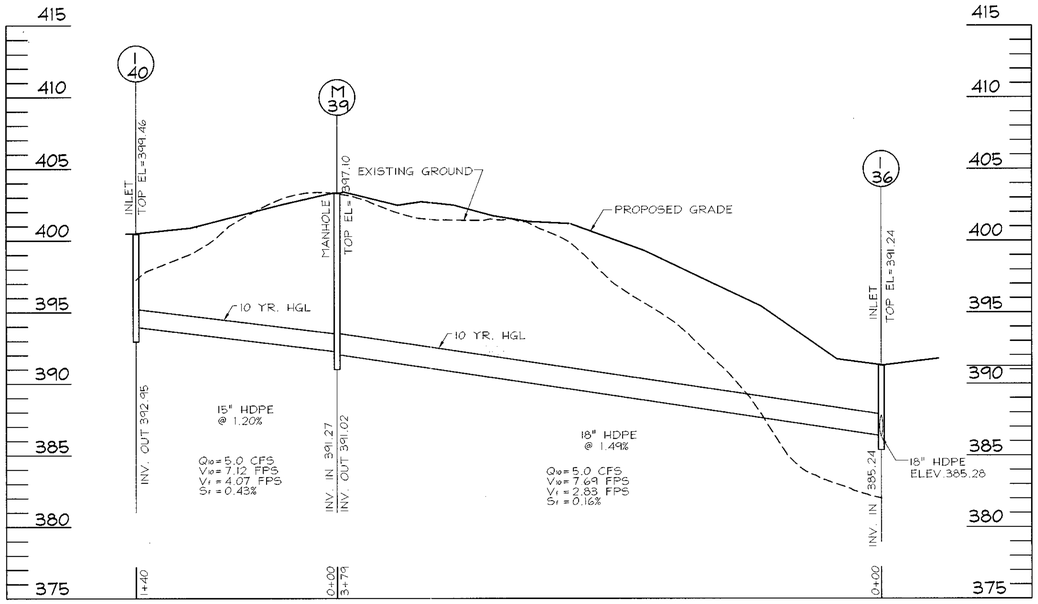


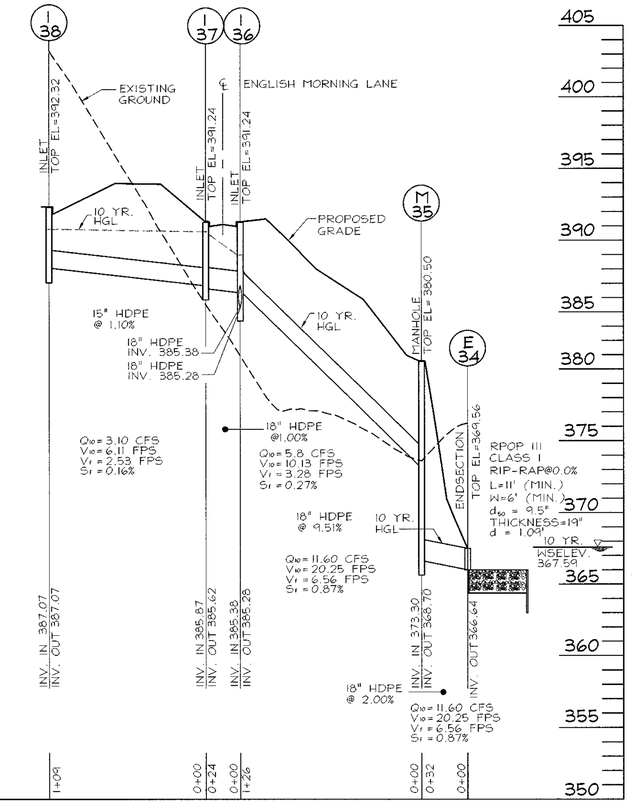
STORM DRAIN PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.



STORM DRAIN PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.

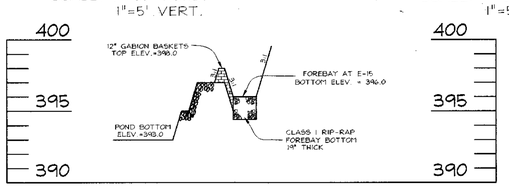


STORM DRAIN PROFILE

SCALE: 1"= 50' HORZ.
1"= 5' VERT.

STORM DRAIN PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.

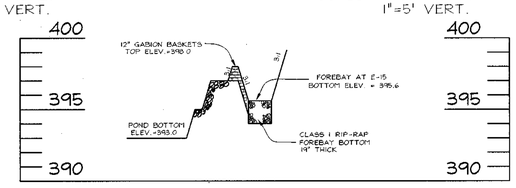


FOREBAY PROFILE AT E-15

SCALE: 1"=50' HORZ.
1"=5' VERT.

STORM DRAIN PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.

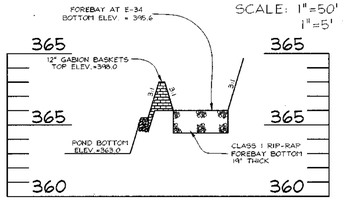


FOREBAY PROFILE AT E-5

SCALE: 1"=50' HORZ.
1"=5' VERT.

STORM DRAIN PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.



FOREBAY PROFILE AT E-34

SCALE: 1"=50' HORZ.
1"=5' VERT.

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

NO.	REVISION	DATE

STORM DRAIN PROFILES
WORTHINGTON FIELDS

PHASE I LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS | 7125 Riverwood Drive Columbia, Maryland 21046-2354
ARCHITECTS | Phone: 410-290-9550 Fax: 410-720-6226
SURVEYORS | Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-29-01

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16193 — PROFESSIONAL ENGINEER

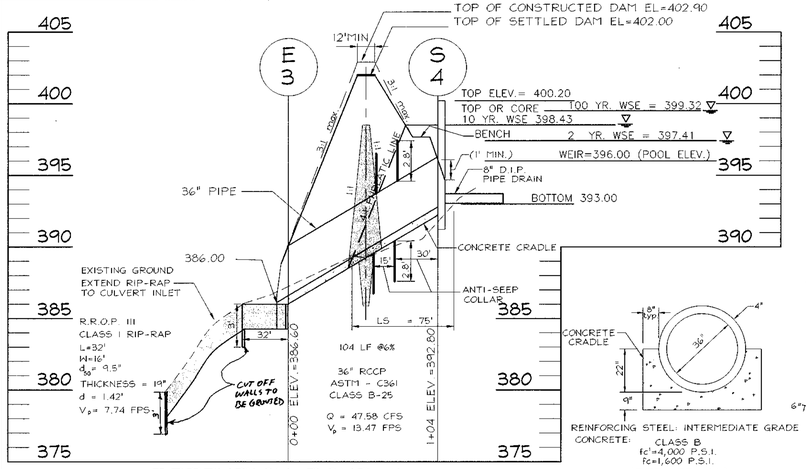
ROBERT H. VOGEL, PE No.16193

DESIGN BY: G.A.H.
DRAWN BY: R.J.
CHECKED BY: R.H.V.
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 12 OF 20

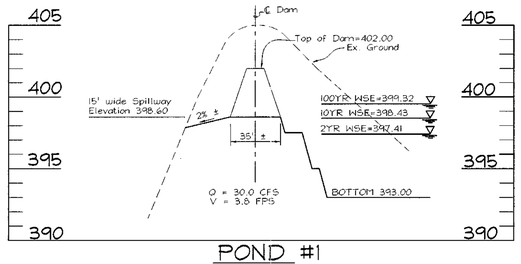
F-01-60

M:\PROJECTS\2019011\ENGR\dwg\final\7024511.dwg Thu Jun 07 10:56:18 2001 E4



RETENTION POND # 1
PRINCIPLE SPILLWAY PROFILE

SCALE: 1"= 50' HORZ.
1"= 5' VERT.

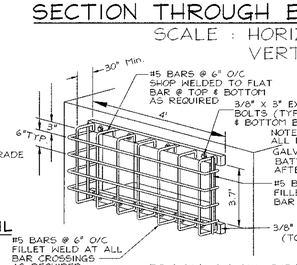


POND #1
SECTION THROUGH EMERGENCY SPILLWAY

SCALE : HORIZONTAL - 1"=50'
VERTICAL - 1"=5'

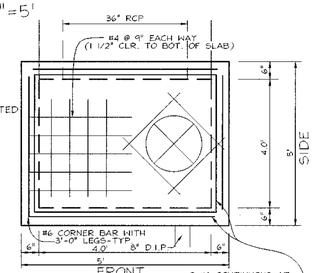
REINFORCING STEEL: INTERMEDIATE GRADE
CONCRETE: CLASS B
f'c=4,000 P.S.I.
fc=1,600 P.S.I.
(REF. TR-46)

PIPE CRADLE DETAIL
NOT TO SCALE



#5 BARS @ 6" O/C FILLET WELD AT ALL BAR CROSSINGS AS REQUIRED

TRASH RACK DETAIL
NOT TO SCALE



6" TOP SLAB
NOT TO SCALE

OPERATION AND MAINTENANCE SCHEDULE FOR STORMWATER MANAGEMENT RETENTION FACILITY

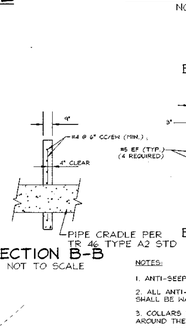
STORMWATER MANAGEMENT FACILITY

ROUTINE MAINTENANCE

1. FACILITY WILL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
3. DEBRIS AND LITTER NEXT TO THE OUTLET STRUCTURE SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON-ROUTINE MAINTENANCE

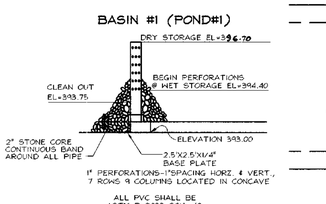
1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, INTERFERE WITH THE FUNCTION OF THE RISER, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.



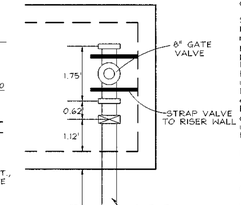
SECTION B-B
NOT TO SCALE

SECTION A-A
NOT TO SCALE

ASPHALT JOINT FILLER MATERIAL SHALL BE PROVIDED BETWEEN ALL CONCRETE SURFACES EXCEPT BETWEEN CRADLE AND PIPE.



SEDIMENT BASIN DEWATERING DEVICE I WITH 6" PERFORATED RISER
NOT TO SCALE

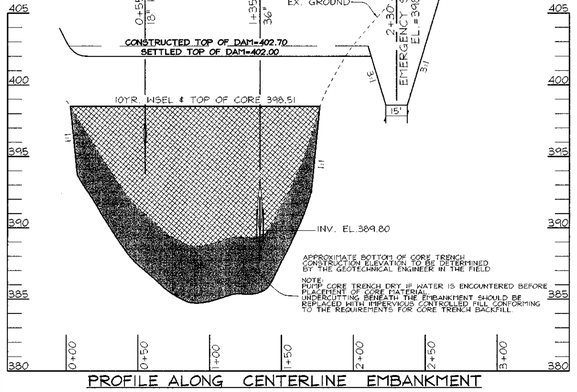


NOTE:
VALVE TO BE PLACED UNDER COVER OPENING.

POND DRAIN DETAIL
NOT TO SCALE

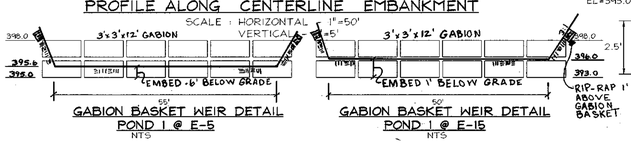
NOTES:
1. ANTI-SEEP COLLARS SHOULD BE PLACED WITHIN THE SATURATION ZONE.
2. ALL ANTI-SEEP COLLARS AND THEIR CONNECTIONS TO THE CONDUIT SHALL BE WATERTIGHT AND MADE OF COMPATIBLE WITH THE CONDUIT.
3. COLLARS DIMENSIONS SHALL EXTEND A MIN. OF 2' IN ALL DIRECTIONS AROUND THE PIPE.
4. ANTI-SEEP COLLARD SHALL BE PLACED A MIN. OF 2' FROM PIPE JOINTS EXCEPT WHERE FLANGED JOINTS ARE USED.

(2 COLLARS)



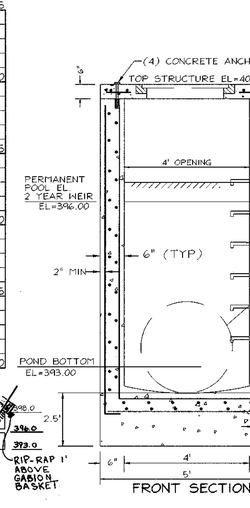
CONCRETE ANTI-SEEP COLLAR DETAIL
NOT TO SCALE

PROFILE ALONG CENTERLINE EMBANKMENT
SCALE : HORIZONTAL 1"=50'
VERTICAL 1"=5'



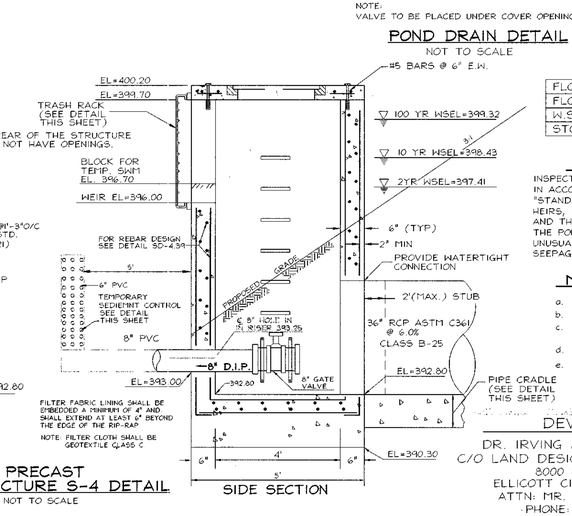
GABION BASKET WEIR DETAIL POND 1 @ E-5
NTS

GABION BASKET WEIR DETAIL POND 1 @ E-15
NTS



FRONT SECTION

PRECAST STRUCTURE S-4 DETAIL
NOT TO SCALE



SIDE SECTION

FILTER FABRIC LINING SHALL BE EMBEDDED A MINIMUM OF 4" AND SHALL EXTEND AT LEAST 6" BEYOND THE EDGE OF THE RIP-RAP

NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

MARYLAND 378
STORMWATER MANAGEMENT POND CONSTRUCTION SPECIFICATIONS

CONSTRUCTION SPECIFICATIONS

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

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 sharp breaks shall be sloped to no steeper than 1:1. All trees shall be cleared and grubbed within 15 feet of the toe of the embankment.

Areas to be covered by the reservoir will be cleared of all trees, brush, logs, fences, rubbish and other objectionable material unless otherwise designated on the plans. Trees, brush, and stumps shall be cut approximately level with the ground surface. For dry stormwater management ponds, a minimum of a 25-foot radius around the inlet structure shall be cleared.

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

Earth Fill

Material - The fill material shall be taken from approved designated borrow areas. It shall be free of roots, stumps, wood, rubbish, stones greater than 6", frozen or other objectionable materials. Fill material for the center of the embankment, and cut off trench shall conform to Unified Soil Classification GC, SC, CH, or CL and meet have at least 30% passing the #200 sieve. Consideration may be given to the use of other materials in the embankment if designed by a geotechnical engineer. Such special designs must have construction supervised by a geotechnical engineer. Materials used in the outer shell of the embankment must have the capability to support vegetation of the quality required to prevent erosion of the embankment.

Placement - Areas on which fill is to be placed shall be scarified prior to placement of fill. Fill materials shall be placed in maximum 8 inch 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 spillway must be installed concurrently with fill placement and not excavated into the embankment.

Compaction - The movement of the hauling and spreading equipment over the fill shall be controlled so that the entire surface of each lift shall be traversed by not less than one tread track of heavy 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 not crumble, yet not be so wet that water can be squeezed out.

When required by the reviewing agency the minimum required density shall not be less than 95% of maximum dry density with a moisture content within +\-2% of the optimum. Each layer of fill shall be compacted as necessary to obtain that density, and is to be certified by the Engineer at the time of construction. All compaction is to be determined by AASHTO Method T-99 (Standard Proctor).

Cut Off Trench - The cutoff trench shall be excavated into impervious material along or parallel to the centerline of the embankment as shown on the plans. The bottom width of the trench shall be governed by the equipment used for excavation, with the minimum width being four feet. The depth shall be at least four feet below existing grade or as shown on the plans. The side slopes of the trench shall be 1 to 1 or flatter. The backfill shall be compacted with construction equipment, rollers, or hand tampers to assure maximum density and minimum permeability.

Embankment Core - The core shall be parallel to the centerline of the embankment as shown on the plans. The top width of the core shall be a minimum of four feet. The height shall extend up to at least the 10 year water elevation or as shown on the plans. The side slopes shall be 1 to 1 or flatter. The core shall be compacted with construction

Structure Backfill

Backfill adjacent to pipes or structures shall be of the type and quality conforming to that specified for the adjoining fill material. The fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material needs to fill completely all spaces under and adjacent to the pipe. At no time during the backfilling operation shall driven equipment be allowed to operated closer than four feet, measured horizontally, to any part of a structure. Under no circumstances shall equipment be driven over any part of a concrete structure or pipe, unless there is a compacted fill of 24" or greater over the structure or pipe.

Structure backfill may be flowable fill meeting the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 313 as modified. The mixture shall have a 100-200 psi, 28 day unconfined compressive strength. The flowable fill shall have a minimum pH of 4.0 and a minimum resistivity of 2,000 ohm-cm. Material shall be placed such that minimum of 6" (measured perpendicular to the outside of the pipe) of flowable fill shall be under (bedding), over and on the sides of the pipe. It only needs to extend up to the spring line for rigid conduits. Average slump of the fill shall be 7" to assure flowability of the material. Adequate measures shall be taken (sand bags, etc.) to prevent floating the pipe. When using flowable fill, all metal pipe shall be bituminous coated. Any adjoining soil fill shall be placed in horizontal layers not to exceed four inches in thickness and compacted by hand tampers or other manually directed compaction equipment. The material shall completely fill all voids adjacent to the flowable fill zone. At no time during the backfilling operation shall driven equipment be allowed to operate closer than four feet, measured horizontally, to any part of the structure. Under no circumstances shall equipment be driven over any part of a structure or pipe unless there is a compacted fill of 24" or greater over the structure or pipe. Backfill (flowable fill)zone shall be of the type and quality conforming to that specified for the care of the embankment or other embankment materials.

Pipe Conduits

All pipes shall be circular in cross section.

Corrugated Metal Pipe - All of the following criteria shall apply for corrugated metal pipe:

1. Materials - (Polymer Coated steel pipe)- Steel pipes with polymeric coating shall have a minimum coating thickness of 0.01 inch (10 mil) on both sides of the pipe. This pipe and its appurtenances shall conform to the requirements of AASHTO Specifications M-245 & M-246 with watertight coupling bands or flanges.

Materials - (Aluminum Coated Steel Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-274 with watertight coupling bands or flanges. Aluminum Coated Steel Pipe, when used with flowable fill or when soil and/or water conditions warrant the need for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Any aluminum coating damaged or otherwise removed shall be replaced with cold applied bituminous coating compound. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt.

Materials - (Aluminum Pipe) - This pipe and its appurtenances shall conform to the requirements of AASHTO Specification M-196 or M-211 with watertight coupling bands or flanges. Aluminum Pipe, when used with flowable fill or when soil and/or water conditions warrant for increased durability, shall be fully bituminous coated per requirements of AASHTO Specification M-190 Type A. Aluminum surfaces that are to be in contact with concrete shall be painted with one coat of zinc chromate primer or two coats of asphalt. Hot dip galvanized bolts may be used for connections. The pH of the surrounding soils shall be between 4 and 9.

2. Coupling, bands, anti-seep collars, end sections, etc., must be composed of the same material and coatings as the pipe. Metals must be insulated from dissimilar materials with use of rubber or plastic insulating materials at lease 24 mils in thickness.

3. Connections - All connections with pipes must be completely watertight. The drain pipe or barrel connection to the riser shall be welded all around when the pipe and riser are metal. Anti-seep collars shall be connected to the pipe in such a manner as to be completely watertight. Dimple bands are not considered to be watertight.

All connections shall use a rubber or neoprene gasket when joining pipe sections. The end of each pipe shall be re-rolled an adequate number of corrugations to accommodate the bandwidth. The following type connections are acceptable for pipes less than 24 inches diameter: flanges on both ends of the pipe with a circular 3/8 inch thick closed cell circular neoprene gasket, and a 12-inch wide hugger type band with o-ring gaskets having a minimum diameter of 1/2 inch greater than the corrugation depth. Pipes 24 inches in diameter and larger shall be connected by a 24 inch long annular corrugated band using a minimum of 4(four) rods and lugs, 2 on each connecting pipe end. A 24-inch wide by 3/8-inch thick closed cell circular neoprene gasket will be installed with 12 inches on the end of each pipe. Flanged joints with 3/8inch closed cell gaskets the full width of the flange is also acceptable.

Helically corrugated pipe shall have either continuously welded seams or have lock seams with internal caulking or a neoprene bead.

4. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

5. Backfilling shall conform to Structure Backfill.
6. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Reinforced Concrete Pipe- All of the following criteria shall apply for reinforced concrete pipe:

1. Materials - Reinforced concrete pipe shall have bell and spigot joints with rubber gaskets and shall equal or exceed ASTM C-361.

2. Bedding - Reinforced concrete pipe conduits shall be laid on a concrete bedding/cradle for their entire length. This bedding/cradle shall consist of high slump concrete placed under the pipe and up the sides of the pipe at least 50% of its outside diameter with a minimum thickness of 6 inches. Where concrete cradle is not needed for structural reasons, flowable fill may be used as described in the "Structure Backfill" section of this standard. Gravel bedding is not permitted.

3. Laying pipe - Bell and spigot pipe shall be placed with the bell end upstream. Joints shall be made in accordance with recommendations of the manufacturer of the material. After the joints are sealed for the entire line, the bedding shall be placed so that all spaces under the pipe are filled. Care shall be exercised to prevent any deviation from the original line and grade of the pipe. The first joint must be located within 4 feet from the riser.

4. Backfilling shall conform to Structure Backfill.

5. Other details (anti-seep collars, valves, etc.) shall be shown on the drawings.

Plastic Pipe- The following criteria shall apply for plastic pipe:

1. Materials - PVC pipe shall be PVC-1120 or PVC-1220 conforming to ASTM D-1785 or ASTM D-2241. Corrugated High Density Polyethylene (HDPE) pipe, couplings and fittings shall conform to the following: 4" -10" inch pipe shall meet the requirements of AASHTO M252 Type S, and 12" through 24" inch shall meet the requirements of AASHTO M294 Type S.

2. Joints and connections to anti-seep collars shall be completely watertight.

3. Bedding - The pipe shall be firmly and uniformly bedded throughout its entire length. Where rock or soft, spongy or other unstable soil is encountered, all such material shall be removed and replaced with suitable earth compacted to provide adequate support.

4. Backfilling shall conform to Structure Backfill.

5. Other details (anti-seep collars, valves, etc.) shall be as shown on the drawings.

Drainage Diaphragms - When a drainage diaphragm is used, a registered professional engineer will supervise the design and construction inspection.

Concrete

Concrete shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 414, Mix No. 3.

Rock Riprap

Rock riprap shall meet the requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction Materials, Section 311.

Geotextile shall be placed under all riprap and shall meet requirements of Maryland Department of Transportation, State Highway Administration Standard Specifications for Construction and Materials, Section 921.09, Class C.

Care of Water during Construction

All work on permanent structures shall be carried out in areas free from water. The Contractor shall construct and maintain all temporary dikes, levees, cofferdams, drainage channels, and stream diversions necessary to protect to be occupied by the permanent works. The contractor shall also furnish, install, operate, and maintain all necessary pumping and other equipment required for removal of water from various parts of the work and for maintaining the excavations, foundation, and other parts of the work free from water as required or directed by the engineer for constructing each part of the work 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 spillway or outlet works and so as not to interfere in any way with the operation or maintenance of the structure. Stream diversions shall be maintained until the 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 slopes and bottom 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 locations being refilled shall be maintained below the bottom of the excavation at such locations which may require draining the water semps from which the water shall be pumped.

Stabilization

All borrow areas shall be graded to provide proper drainage and left in a sightly condition. All exposed surfaces of the embankment, spillway, spoil and borrow areas, and berms shall be stabilized by seeding, liming, fertilizing and mulching in accordance with the Natural Resources Conservation Service Standards and Specifications for Critical Area Planting (MD-342) or as shown on the accompanying drawings.

Erosion and Sediment Control

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

POND #1 SUMMARY

	2 YEAR	10 YEAR	100 YEAR
FLOW INTO POND	47.80 c.f.s.	97.67 c.f.s.	154.58 c.f.s.
FLOW OUT OF POND	20.85 c.f.s.	40.73 c.f.s.	80.73 c.f.s.
W.S. ELEVATION	397.41	398.43	399.32
STORAGE VOLUME	1.03 AC FT	2.06 AC FT	3.17 AC FT

OPERATION, MAINTENANCE AND INSPECTION

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

MAINTENANCE REQUIREMENTS FOR WET POND

a. Removal of silt when accumulation exceeds six (6) inches in forebay.
b. Removal of accumulated paper, trash and debris as necessary.
c. Vegetation growing on the embankment top and faces of the forebay or basin is not allowed to exceed 18 inches in height at any time.
d. Annual inspection and repair of the structure.
e. Corrective maintenance's required any time a forebay does not drain within 60 hours (i.e., no standing water is allowed unless designed for).

POND BOTTOM SOIL CONDITIONS

If broken rock fragments are encountered at finished pond bottom, under cut a minimum of 12" below basin grade and to a horizontal distance of at least 18" beyond each edge of the . broken rock and backfill with fine-grained ML or CL soils compacted to a firm condition. This procedure should be performed under the supervision of the project Geotechnicaly Engineer.

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

NO.	REVISION	DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/3/01

DIRECTOR — DATE N/A

ENGINEERS CERTIFICATE

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

SIGNATURE OF ENGINEER — DATE 6/8/01
ROBERT H. VOGEL

DEVELOPER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE 6/8/01

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

USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE 7/10/01

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 7/10/01

PROFILES AND DETAILS
SWM POND #1
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'
TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

DEVELOPER	OWNER
DR. IRVING AND EDITH TAYLOR C/O LAND DESIGN & DEVELOPMENT, INC. 8000 MAIN STREET ELLICOTT CITY, MARYLAND 21043 ATTN: MR. DONALD R. REUWER PHONE: (410) 480-9105	TAYLOR FAMILY LIMITED PARNERSHIP A TAYLOR FAMILY LIMITED PARNERSHIP B 4100 COLLEGE AVE. ELLICOTT CITY, MARYLAND 21043-5506

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS | 7125 Riverwood Drive Columbia, Maryland 21046-2354
ARCHITECTS | Phone: 410-290-9550 Fax: 410-720-6226
SURVEYORS | Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 15765 — PROFESSIONAL ENGINEER — 6/8/01
ROBERT H. VOGEL, P.E. No. 15765

DESIGN BY: G.A.H.
DRAWN BY: G.A.H.
CHECKED BY: R.H.V.
DATE: JULY 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

13 SHEET OF 20

F-01-60

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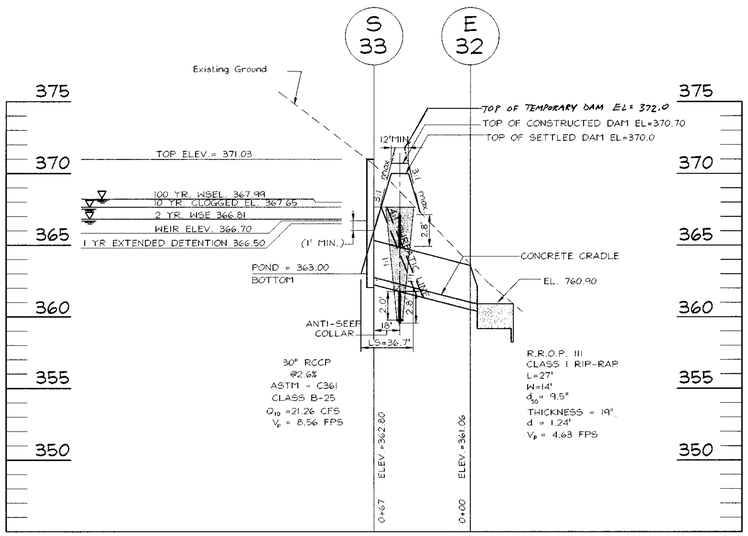
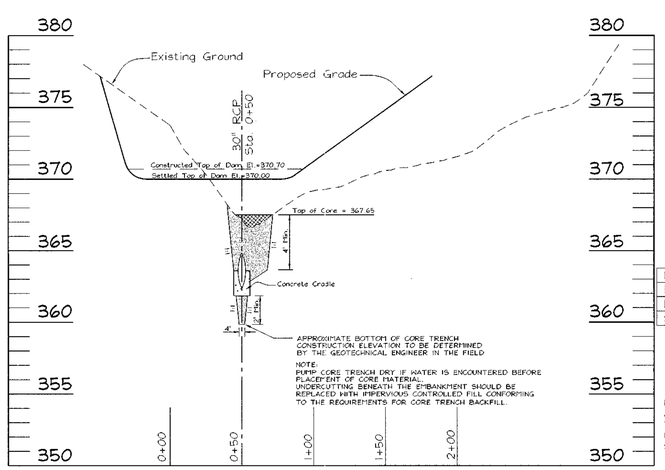




OPERATION AND MAINTENANCE SCHEDULE FOR STORMWATER MANAGEMENT DETENTION FACILITY

STORMWATER MANAGEMENT FACILITY

ROUTINE MAINTENANCE

1. FACILITY WILL BE INSPECTED ANNUALLY AND AFTER MAJOR STORMS. INSPECTIONS SHOULD BE PERFORMED DURING WET WEATHER TO DETERMINE IS FUNCTIONING PROPERLY.
2. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES A YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHOULD BE MOWED AS NEEDED.
3. DEBRIS AND LITTER NEXT TO THE OUTLET STRUCTURE SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
4. VISIBLE SIGNS OF EROSION IN THE POND AS WELL AS RIPRAP OUTLET AREAS SHALL BE REPAIRED AS SOON AS IT IS NOTICED.

NON-ROUTINE MAINTENANCE

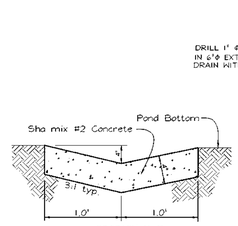
1. STRUCTURAL COMPONENTS OF THE POND SUCH AS THE DAM, THE RISER, AND THE PIPES SHALL BE REPAIRED UPON DETECTION OF ANY DAMAGE. THE COMPONENTS SHOULD BE INSPECTED DURING ROUTINE MAINTENANCE OPERATIONS.
2. SEDIMENT SHOULD BE REMOVED WHEN ITS ACCUMULATION SIGNIFICANTLY REDUCES THE DESIGN STORAGE, INTERFERE WITH THE FUNCTION OF THE RISER, WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, OR WHEN DEEMED NECESSARY BY THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

POND #2 SUMMARY

	2 YEAR	10 YEAR	100 YEAR
FLOW INTO POND	12.45 c.f.s.	25.45 c.f.s.	40.28 c.f.s.
FLOW OUT OF POND	1.71 c.f.s.	21.26 c.f.s.	36.73 c.f.s.
W.S. ELEVATION	366.81	367.59	367.99
STORAGE VOLUME	0.44 AC FT	0.59 AC FT	0.67 AC FT

OPERATION, MAINTENANCE AND INSPECTION

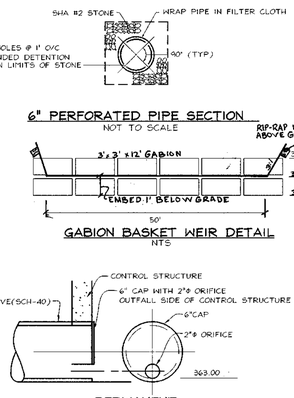
INSPECTION OF THE POND(S) SHOWN HEREON SHALL BE PERFORMED AT LEAST ANNUALLY, IN ACCORDANCE WITH THE CHECKLIST AND REQUIREMENTS CONTAINED WITHIN USDA, SCS "STANDARDS AND SPECIFICATIONS FOR PONDS" (MD-378). THE POND OWNER(S) AND ANY HEIRS, SUCCESSORS, OR ASSIGNS SHALL BE RESPONSIBLE FOR THE SAFETY OF THE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



SECTION B-B

CONCRETE PILOT CHANNEL

NOT TO SCALE



6" PERFORATED PIPE SECTION

NOT TO SCALE

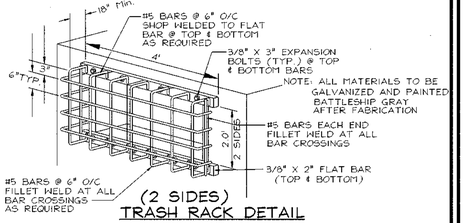
GABION BASKET WEIR DETAIL

NTS

PERMANENT

ORIFICE DETAIL IN CONTROL STRUCTURE

NOT TO SCALE

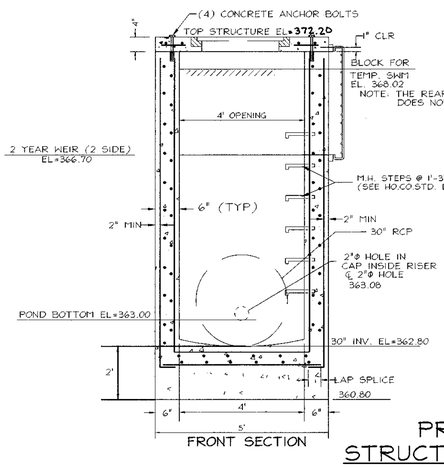


TRASH RACK DETAIL

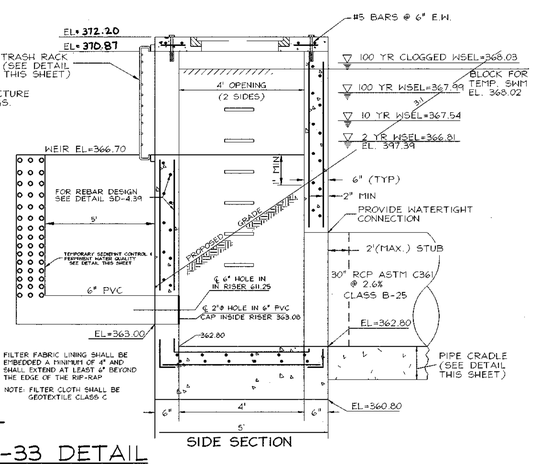
NOT TO SCALE

POND # 2
PRINCIPLE SPILLWAY PROFILE

SCALE: 1"= 50' HORZ.
1"= 5' VERT.



FRONT SECTION



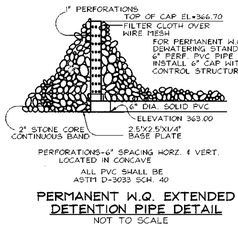
SIDE SECTION

PRECAST
STRUCTURE S-33 DETAIL

NOT TO SCALE

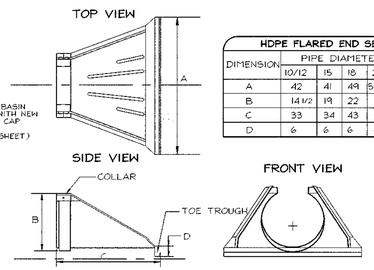
PROFILE ALONG ℄ EMBANKMENT

SCALE: 1"= 50' HORZ.
1"= 5' VERT.



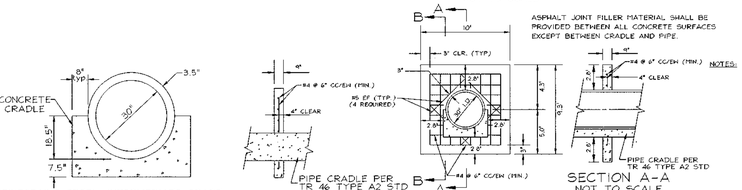
PERMANENT W.Q. EXTENDED
DETENTION PIPE DETAIL

NOT TO SCALE



HDPE END SECTION DETAIL

HDPE FLARED END SECTION						
DIMENSION	PIPE DIAMETER(INCHES)					
	10/12	15	18	24	30	36
A	42	41	49	59 1/2	88	88
B	14 1/2	19	22	28	36	43
C	33	34	43	48	63 1/2	66 1/2
D	6	6	6	6	6	6



PIPE CRADLE DETAIL

NOT TO SCALE

SECTION B-B

NOT TO SCALE

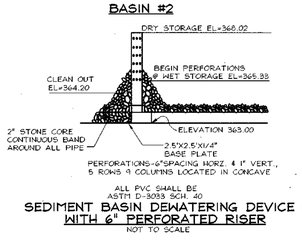
SECTION A-A

NOT TO SCALE

1. ANTI-SEEP COLLARS SHOULD BE PLACED WITHIN THE SATURATION ZONE.
2. ALL ANTI-SEEP COLLARS AND THEIR CONNECTIONS TO THE CONDUIT SHALL BE WATERTIGHT AND MADE OF COMPATIBLE WITH THE CONDUIT.
3. COLLARS DIMENSIONS SHALL EXTEND A MIN. OF 2' IN ALL DIRECTIONS AROUND THE PIPE.
4. ANTI-SEEP COLLARD SHALL BE PLACED A MIN. OF 2' FROM PIPE JOINTS EXCEPT WHERE FLANGED JOINTS ARE USED.

CONCRETE ANTI-SEEP COLLAR DETAIL

NOT TO SCALE



SEDIMENT BASIN DEWATERING DEVICE I
WITH 6" PERFORATED RISER

NOT TO SCALE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

NO.	REVISION	DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/2/01

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/3/01

DIRECTOR — N/A — DATE

ENGINEERS CERTIFICATE

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

SIGNATURE OF ENGINEER — DATE 6/8/01
ROBERT H. VOGEL

DEVELOPER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE 6/8/01

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

USDA-NATURAL RESOURCES CONSERVATION SERVICE — DATE 7/10/01

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 7/10/01

PROFILES AND DETAILS
SWM POND #2
WORTHINGTON FIELDS

PHASE I LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS
ARCHITECTS
SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT HARRIS VOGEL — No. 16785 — REGISTERED PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No.16785

DESIGN BY: G.A.H.
DRAWN BY: G.A.H.
CHECKED BY: R.H.V.
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 14 OF 20

F-01-60

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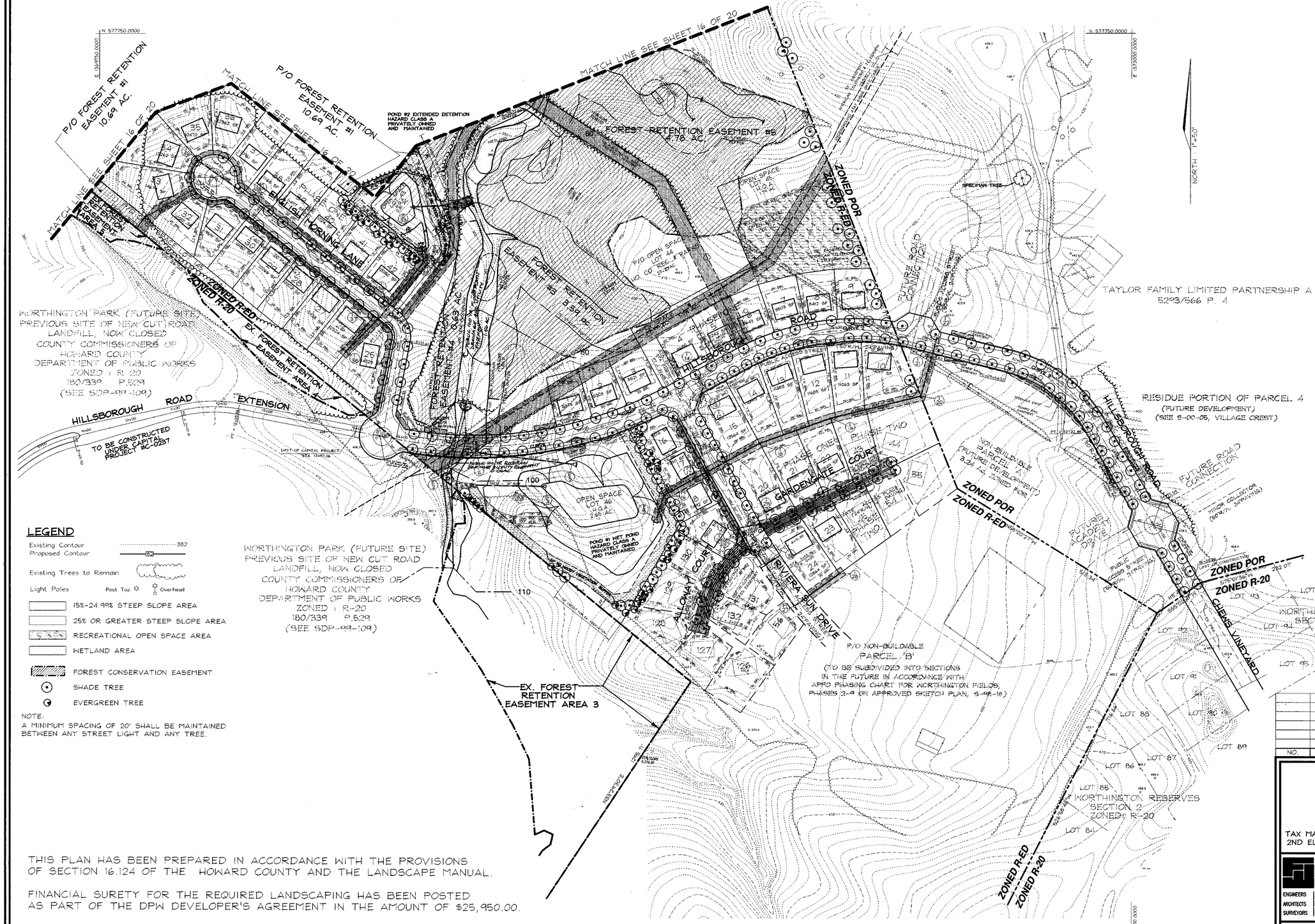

LEGEND

- Existing Contour 382
- Proposed Contour ——— 382
- Existing Trees to Remain
- Light Poles — Post Top ☼ — Overhead
- 15%-24.99% STEEP SLOPE AREA
- 25% OR GREATER STEEP SLOPE AREA
- RECREATIONAL OPEN SPACE AREA
- WETLAND AREA
- FOREST CONSERVATION EASEMENT
- SHADE TREE
- EVERGREEN TREE

NOTE:
A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY AND THE LANDSCAPE MANUAL.

FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF $25,950.00.

SCHEDULE D
STORMWATER MANAGEMENT AREA LANDSCAPING

POND NUMBER	1	2
PERIMETER DESIGNATION	G	H
LANDSCAPE TYPE	B	B
TOTAL LINEAR FEET OF PERIMETER	1240	720
CREDIT FOR EXISTING VEGETATION LINEAR FEET	150	150
CREDIT FOR OTHER LANDSCAPING	NO	NO
NUMBER OF TREES REQUIRED SHADE TREES(1:50) EVERGREEN TREES(1:40)	22 29	12 14
NUMBER OF PLANTS PROVIDED		
SHADE TREES(1:50) EVERGREEN TREES(1:40) SHRUBS(10:1 TREE SUBSTITUTION)	22 27 -	12 14 -

SCHEDULE A
PERIMETER LANDSCAPE EDGE

LANDSCAPE EDGE	(A)	(B)	(C)	(D)	(E)	(F)	(J)
LANDSCAPE TYPE	A	A	A	A	NONE	A	A
LINEAR FEET OF ROADWAY FRONTAGE/PERIMETER	1298	504	784	620	478	1070	120
CREDIT FOR EXISTING VEGETATION (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	YES 90	YES 784	YES 620	NO	YES 790	NO
CREDIT FOR WALL, FENCE OR BERM (YES, NO, LINEAR FEET) (DESCRIBE BELOW IF NEEDED)	NO	NO	NO	NO	NO	NO	NO
NUMBER OF PLANTS REQUIRED	TYPE A	TYPE B			NONE		
SHADE TREES (1:40) (1:50)	22	3	0	0		5	2
EVERGREEN TREES 0 (1:40)	0	0	0	0		0	0
SHRUBS	0	0	0	0		0	0
NUMBER OF PLANTS TO BE PROVIDED	TYPE A	TYPE B			NONE		
SHADE TREES (1:40) (1:50)	22	3	0	0		5	2
EVERGREEN TREES 0 (1:40)	0	0	0	0		0	0
OTHER TREES (2:1 SUBSTITUTION)	0	0	0	0		0	0
SHRUBS (10:1 SUBSTITUTION)							

NOTE: THE REQUIRED TYPE B PLANTINGS WHERE THE SIDE OR REAR OF A DWELLING UNIT IS ORIENTED TOWARD A PUBLIC ROAD WILL BE ADDRESSED ON THE FUTURE SITE DEVELOPMENT PLAN(S) FOR THE RESIDENTIAL LOTS.

NO.	REVISION	DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hanta 6/3/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS DATE 7-24-01

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

LANDSCAPE PLAN
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS | ARCHITECTS | SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT H. VOGEL — No. 15193 — PROFESSIONAL ENGINEER
ROBERT H. VOGEL, PE No. 15193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: 1"=100'
W.O. NO.: 99-011

PREV. FILE # S-98-18

15 SHEET OF 20

F-01-60

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LEGEND

Existing Contour 382
Proposed Contour ——— 82

Existing Trees to Remain

Light Poles Post Top ☆ Overhead

15%-24.99% STEEP SLOPE AREA

25% OR GREATER STEEP SLOPE AREA

WETLAND AREA

FOREST CONSERVATION EASEMENT

NOTE:
A MINIMUM SPACING OF 20' SHALL BE MAINAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

NO.	REVISION	DATE

THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY AND THE LANDSCAPE MANUAL.

FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING HAS BEEN POSTED AS PART OF THE DPW DEVELOPER'S AGREEMENT IN THE AMOUNT OF $25,950.00.

LANDSCAPE PLAN
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

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OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 6/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

STATE OF MARYLAND — ROBERT H. VOGEL — No. 10198 — REGISTERED LANDSCAPE ARCHITECT

DESIGN BY:	GAH
DRAWN BY:	GAH
CHECKED BY:	RHV
DATE:	JULY, 2001
SCALE:	1"=100'
W.O. NO.:	98-011

PREV. FILE # S-98-18

SHEET 16 OF 20

F-01-60

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NOTES:

1. ALL FOREST CONSERVATION EASEMENTS ARE RETENTION AREAS. NO REFORESTATION IS PROPOSED.
2. THE FOREST CONSERVATION OBLIGATION FOR THE LOD FOR HILLSBOROUGH ROAD ON THE POR ZONED RESIDUE PORTION OF PARCEL 98 AND POR ZONED NON-BUILDABLE PARCEL A SHALL BE ADDRESSED ON THE FUTURE PLANS FOR THE SUBDIVISION, S-00-05, VILLAGE CREST.

Surety in the amount of $88,513.92 for the 20.32 acres of forest conservation retention easements on this plan will be posted as a part of the developers agreement.

SPECIMEN TREE LIST

Tree#	DBH	Botanical Name	Common Name	Condition	Remarks
1	30	Liriodendton tulipifera	Tulip Poplar	Excellent	Retain
2	30	Liriodendton tulipifera	Tulip Poplar	Excellent	Retain
3	31	Liriodendton tulipifera	Tulip Poplar	Good	Retain
4	36	Quercus prinus	Chestnut Oak	Excellent	Retain
5	32	Liriodendton tulipifera	Tulip Poplar	Good	Retain
6	45	Fraxinus americana	White Ash	Good	Remove
7	36	Quercus alba	White Oak	Fair	Retain
8	34	Liriodendton tulipifera	Tulip Poplar	Good	Retain
9	38	Quercus alba	White Oak	Good	Remove
10	43	Liriodendton tulipifera	Tulip Poplar	Excellent	Retain
11	31	Quercus alba	White Oak	Excellent	Remove
12	30	Fagus grandifolia	American Beech	Good	Retain
13	34	Quercus alba	White Oak	Excellent	Retain
14	36	Liriodendton tulipifera	Tulip Poplar	Excellent	Remove
15	30	Fagus grandifolia	American Beech	Good	Retain
16	31	Liriodendton tulipifera	Tulip Poplar	Good	Retain
17	31	Fraxinus americana	White Ash	Excellent	Retain
18	50	Fraxinus americana	White Ash	Fair	Retain
19	35	Quercus alba	White Oak	Fair	Retain
20	44	Fraxinus americana	White Ash	Good	Retain
21	32	Fraxinus americana	White Ash	Good	Retain
22	50	Fraxinus americana	White Ash	Good	Retain
23	31	Fraxinus americana	White Ash	Good	Retain

LEGEND

- Limit of Study Area
- Forest Conservation Easement Area
- Existing Treeline
- Proposed Treeline
- Specimen Tree T18
- Forest Conservation Easement Area Sign
- Tree Protection Fence

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

8/3/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

7/27/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

7-29-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
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OWNER

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TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
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NO.	REVISION	DATE

FOREST CONSERVATION PLAN
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

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Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND STEPHEN L. HUBER No. 383 REGISTERED PROFESSIONAL FORESTER 6/7/01

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JANUARY, 2001
SCALE: 1"=100'
W.O. NO.: 99-011

PREV. FILE # S-98-18

17 SHEET OF 20

F-01-60

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NARRATIVE

This Forest Conservation Plan has been developed in accordance with the Howard County Forest Conservation Manual and the 1991 Forest Conservation Act.

The existing site consists of 47.22 acres. Floodplain areas consisting of 1.62 acres are excluded from net tract area. The site has 31.37 acres of existing forest within the net tract area. Retention areas have been prioritized to provide protection to steep slopes and highly erodible soils. 20.32 acres of woodland will be retained under easement in these areas. 8.43 acres of this easement area is in excess of the amount of forest that must be retained so that no reforestation is required.

Forest Conservation/Retention Easement Areas platted with Phase 1 which are in excess of the minimum required for Phase 1 will be credited to future phases of Worthington Fields.

FOREST CONSERVATION WORKSHEET

	Acres (1/100 ac.)
Net Tract Area	
A. Total Tract Area	47.22
B. Area Within 100 Year Floodplain	1.62
C. Other deductions	0
D. Net Tract Area	45.60
Zoning Use Category: High Density Residential	
Land Use Category	
E. Afforestation Threshold (15% x D)	6.84
F. Conservation Threshold (20% x D)	9.12
Existing Forest Cover	
G. Existing Forest on Net Tract Area	31.37
H. Forest Area Above Conservation Threshold	22.25
Breakeven Point	
I. Forest Retention Above Threshold with no Mitigation	13.57
J. Clearing Permitted without Mitigation	17.80
Proposed Forest Clearing	
K. Forest Areas to be Cleared	11.05
L. Forest Areas to be Retained	20.32
Planting Requirements	
M. Reforestation for Clearing Above Threshold	2.76
N. Reforestation for Clearing Below the Threshold	0
P. Credit for Retention Above Conservation Threshold	11.20
Q. Total Reforestation Required	0
R. Total Afforestation Required	0
S. Total Reforestation and Afforestation Requirement	0

FOREST CONSERVATION EASEMENT SUMMARY

Conservation Easement #1	10.69 Ac.
Conservation Easement #2	0.63 Ac.
Conservation Easement #3	3.59 Ac.
Conservation Easement #4	0.63 Ac.
Conservation Easement #5	4.78 Ac.
Total Conservation Easement	20.32 Ac.

MANAGEMENT NOTES FOR FOREST RETENTION AREAS

1. All proposed activities shall adhere to the conditions, schedules and terms of an approved sediment control and erosion plan.

2. After the boundaries of the retention area have been staked and flagged and before any disturbance has taken place on-site, a preconstruction meeting at the construction site shall take place. The developer, contractor or project manager, and appropriate County inspectors shall attend.

3. Tree protection for all retained areas:

a. All retention areas within 50 feet of proposed construction activities shall be protected by highly visible, well anchored temporary protection devices (super silt fence or blaze orange plastic mesh).

b. All protection devices shall be in place prior to any grading or land clearing.

c. All protection devices shall be properly maintained and shall remain in place until construction has ceased.

d. Attachment of signs, fencing or other objects to trees is prohibited.

e. No equipment, machinery, vehicles, materials or excessive pedestrian traffic shall be allowed within protected areas.

4. If the critical root zone (see detail) is affected by construction activities such as grade change, digging for foundations and roads or utility installation:

a. Prune roots with a clean cut using proper pruning equipment (see root pruning detail)

b. Water and fertilize as needed.

5. During construction phase, monitor and correct condition of retained trees for: soil compaction, root injury, flood conditions, drought conditions and other stress signs.

6. Post-Construction Phase

a. Inspect existing trees around the perimeter of disturbed limits for evidence of soil compaction, root injury, limb injury, or other stress signs and correct with proper management techniques such as root or limb pruning, soil aeration, fertilization, crown reduction or watering. Inspection and evaluation shall be performed by a licensed arborist.

b. Inspect for dead or dying trees or limbs which may pose safety hazard and remove.

c. No burial of discarded materials will occur onsite within the conservation areas.

d. No burning within 100 feet of wooded area.

e. All temporary forest protection structures will be removed after construction.

f. Following completion of construction, prior to use, the County inspector shall inspect the entire area.

Critical Root Zone

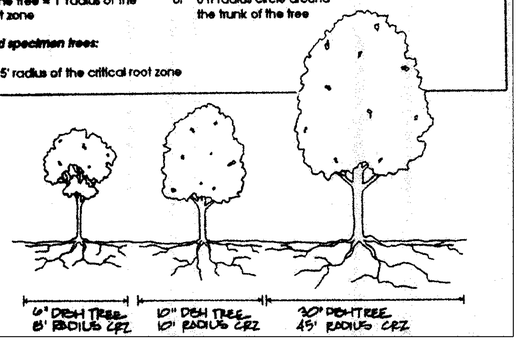
For the edges of large areas, use the greater of the two choices below:

1" DBH of the tree = 1' radius of the critical root zone

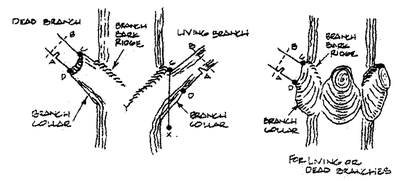
or 8 ft radius circle around the trunk of the tree

For isolated specimen trees:

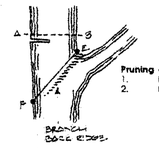
1" DBH = 1.5' radius of the critical root zone



Crown Reduction



Pruning a Branch
1. Remove branch weight by undercutting at A and remove limb by cutting through at B.
2. Remove stub at CD (line between branch bark ridge and outer edge of branch collar).
3. If D is difficult to find on hardwoods, drop vertical from C (line CX). Angle XCY=XCD.

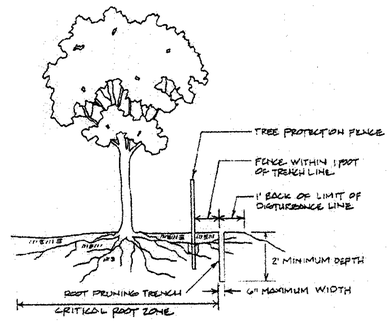


Pruning a Leader or To Reduce Size
1. Remove top weight by cutting at A&E.
2. Remove stub at EF parallel to the Branch Bark Ridge.

Source: Fairfax County, Virginia Vegetation Preservation & Planting

Notes:
1. Only prune at specified times
2. No more than 30% of crown to be removed at one time.

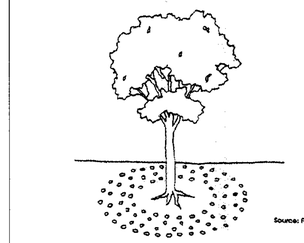
Root Pruning



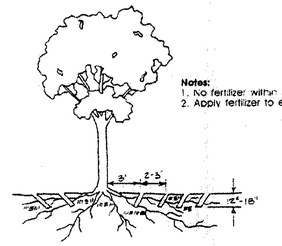
Notes:
1. Retention Areas will be set as part of the review process
2. Boundaries of Retention Areas should be staked flagged prior to trenching
3. Exact location of trench should be identified
4. Trench should be immediately backfilled with soil removed or other high organic soil
5. Roots should be cleanly cut using vioratory knife or other acceptable equipment

Source: City of Gaithersburg, Maryland: City Tree Manual

Application of Fertilizers by Injection

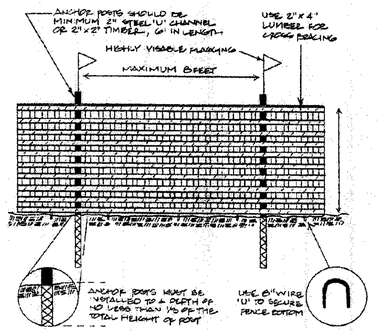


Source: Pirone, 1978



Notes:
1. No fertilizer within 3 feet of trunk
2. Apply fertilizer to entire critical root zone

Blaze Orange Plastic Mesh



Notes
1. Forest protection device only.
2. Retention Area will be set as part of the review process.
3. Boundaries of Retention Area should be staked and flagged prior to installing device.
4. Root damage should be avoided.
5. Protective signage may also be used.
6. Device should be maintained throughout construction.

Source: Prince George's County, Maryland: Woodland Conservation Manual

Surety in the amount of $88,513.92 for the 20.32 acres of forest conservation retention easements on this plan will be posted as a part of the developers agreement.

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

Cindy Hansen 07/2/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

Andrew M. Daniels 7-24-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUNER
PHONE: (410) 480-9105

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

EXPLORATION RESEARCH, INC.
ENVIRONMENTAL CONSULTANTS
8318 FORREST STREET
HISTORIC ELLICOTT CITY, MARYLAND 21043
PHONE: (410) 750-1150 FAX: (410) 750-7350

NO.	REVISION	DATE

FOREST CONSERVATION PLAN
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS, ARCHITECTS, SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — STEPHEN L. HIGER — No. 389 — REGISTERED PROFESSIONAL FORESTER — 6/7/01

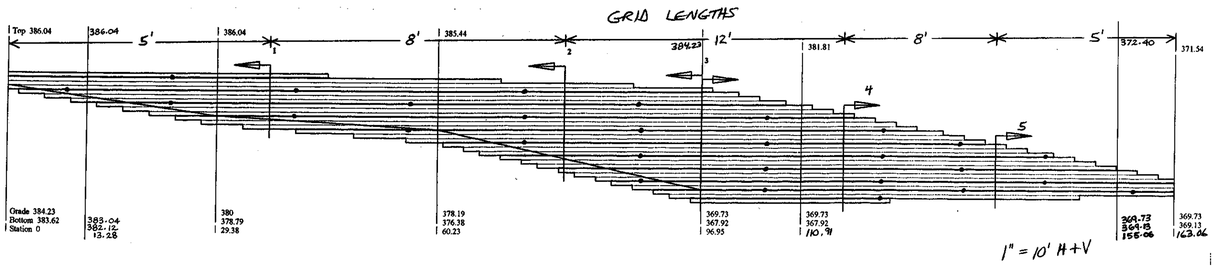
DESIGN BY: CPB
DRAWN BY: AB
CHECKED BY: SH
DATE: JANUARY, 2001
SCALE: 1"=100'
W.O. NO.: 99055

SHEET 18 OF 20

F-01-60

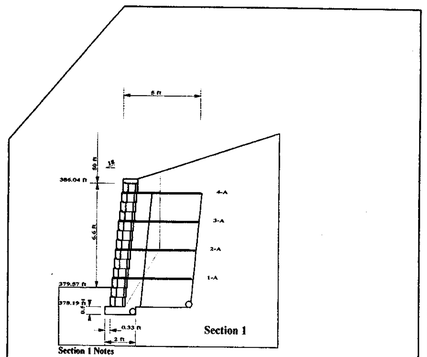
Project Information

Project Name:	**WORTHINGTON FIELDS- Phase I**
Location:	**Howard County, MD**
Project Number:	**DS211065**
Wall Number:	**Detention Pond- Lots 1- 46**
Designer:	**DKS**
Date:	**02-23-01**



Section	1	2	3
Top	386.04	384.83	384.23
Grade	379.37	374.13	369.73
Bottom	378.19	372.13	367.92
Station	56.72	77.66	96.95

Allan Block Retaining Wall Elevation - Detention Pond- Lots 1- 46
Horizontal Scale: 1" = 10'-0" Vertical Scale: 1" = 10'-0"



Section 1 Notes

Allan Block Corp.
7400 Metro Blvd.
Suite 185
Edina, MN 55439
Phone 612/835-5309
Fax 612/835-0013
http://www.allanblock.com

Nitterhouse Masonry Prod.
859 Cleveland Ave. PO Box 692
Chambersburg, PA 17201
717-267-4500
717-264-7535 - fax

AB Classic
Total Wall Height = 7.85 Feet
Block Height = 0.604 Feet
Angle of Setback = 6 Deg.
Depth of Block = 0.97 Feet
Length of Block = 1.469 Feet

Infill Soil	Retained Soil
Friction Angle = 28 Deg.	Friction Angle = 28 Deg.
Unit Weight = 120 PCF	Unit Weight = 120 PCF

Foundation Soil
Friction Angle = 28 Deg. Cohesion = 0 PSF
Unit Weight = 120 PCF

Bearing Capacity
Factor of Safety = 3.14

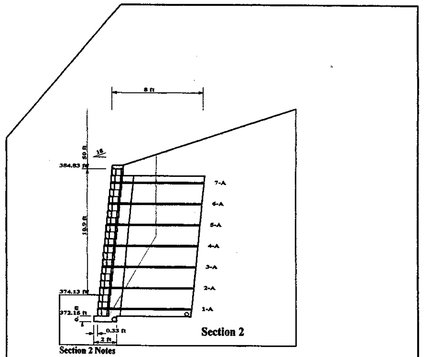
Safety Factors Static
Actual Sliding = 1.724
Actual Overturning = 3.518

Safety Factors Seismic
Actual Sliding = N.A.
Actual Overturning = N.A.

Geogrid Legend
A-Miragrid 5XT
B-Miragrid 7XT
C-Miragrid 8XT
s-Grouted Con.
Min. Length of Geogrid = 5 Feet

1 of 5

Project Name:	WORTHINGTON FIELDS- Phase I
Location:	Howard County, MD
Project Number:	DS211065
Wall Number:	Detention Pond- Lots 1- 46
Designer:	DKS
Date:	02-23-01



Section 2 Notes

Allan Block Corp.
7400 Metro Blvd.
Suite 185
Edina, MN 55439
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717-264-7535 - fax

AB Classic
Total Wall Height = 12.68 Feet
Block Height = 0.604 Feet
Angle of Setback = 6 Deg.
Depth of Block = 0.97 Feet
Length of Block = 1.469 Feet

Infill Soil	Retained Soil
Friction Angle = 28 Deg.	Friction Angle = 28 Deg.
Unit Weight = 120 PCF	Unit Weight = 120 PCF

Foundation Soil
Friction Angle = 28 Deg. Cohesion = 0 PSF
Unit Weight = 120 PCF

Bearing Capacity
Factor of Safety = 2.32

Safety Factors Static
Actual Sliding = 1.672
Actual Overturning = 3.337

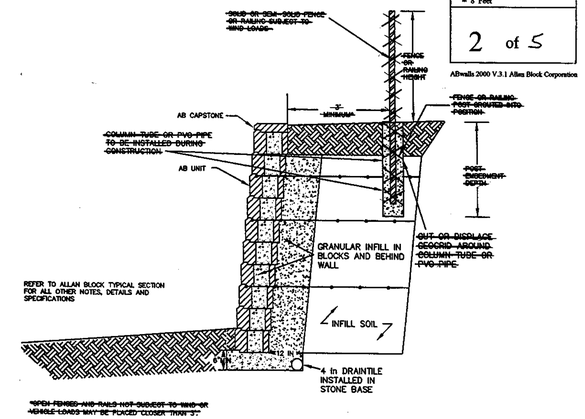
Safety Factors Seismic
Actual Sliding = N.A.
Actual Overturning = N.A.

Geogrid Legend
A-Miragrid 5XT
B-Miragrid 7XT
C-Miragrid 8XT
s-Grouted Con.
Min. Length of Geogrid = 8 Feet

2 of 5

ABwalls 2000 V.3.1 Allan Block Corporation

ALLAN BLOCK FENCE OR RAILING DETAIL



Project Name:	WORTHINGTON FIELDS- Phase I
Location:	Howard County, MD
Project Number:	DS211065
Wall Number:	Detention Pond- Lots 1- 46
Designer:	DKS
Date:	02-23-01

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859 Cleveland Ave. PO Box 692
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717-264-7535 - fax

AB Classic
Total Wall Height = 7.85 Feet
Block Height = 0.604 Feet
Angle of Setback = 6 Deg.
Depth of Block = 0.97 Feet
Length of Block = 1.469 Feet

Infill Soil	Retained Soil
Friction Angle = 28 Deg.	Friction Angle = 28 Deg.
Unit Weight = 120 PCF	Unit Weight = 120 PCF

Foundation Soil
Friction Angle = 28 Deg. Cohesion = 0 PSF
Unit Weight = 120 PCF

Bearing Capacity
Factor of Safety = 3.14

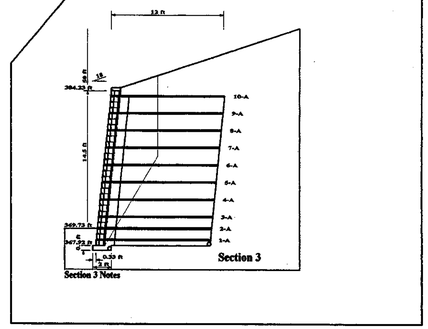
Safety Factors Static
Actual Sliding = 1.724
Actual Overturning = 3.518

Safety Factors Seismic
Actual Sliding = N.A.
Actual Overturning = N.A.

Geogrid Legend
A-Miragrid 5XT
B-Miragrid 7XT
C-Miragrid 8XT
s-Grouted Con.
Min. Length of Geogrid = 5 Feet

5 of 5

ABwalls 2000 V.3.1 Allan Block Corporation



Section 3 Notes

Allan Block Corp.
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Suite 185
Edina, MN 55439
Phone 612/835-5309
Fax 612/835-0013
http://www.allanblock.com

Nitterhouse Masonry Prod.
859 Cleveland Ave. PO Box 692
Chambersburg, PA 17201
717-267-4500
717-264-7535 - fax

AB Classic
Total Wall Height = 16.31 Feet
Block Height = 0.604 Feet
Angle of Setback = 6 Deg.
Depth of Block = 0.97 Feet
Length of Block = 1.469 Feet

Infill Soil	Retained Soil
Friction Angle = 28 Deg.	Friction Angle = 28 Deg.
Unit Weight = 120 PCF	Unit Weight = 120 PCF

Foundation Soil
Friction Angle = 28 Deg. Cohesion = 0 PSF
Unit Weight = 120 PCF

Bearing Capacity
Factor of Safety = 2.02

Safety Factors Static
Actual Sliding = 1.829
Actual Overturning = 4.023

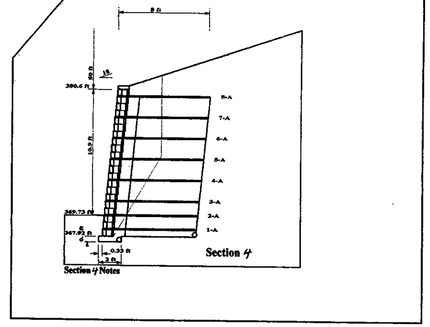
Safety Factors Seismic
Actual Sliding = N.A.
Actual Overturning = N.A.

Geogrid Legend
A-Miragrid 5XT
B-Miragrid 7XT
C-Miragrid 8XT
s-Grouted Con.
Min. Length of Geogrid = 12 Feet

3 of 5

ABwalls 2000 V.3.1 Allan Block Corporation

Project Name:	WORTHINGTON FIELDS- Phase I
Location:	Howard County, MD
Project Number:	DS211065
Wall Number:	Detention Pond- Lots 1- 46
Designer:	DKS
Date:	02-23-01



Section 4 Notes

Allan Block Corp.
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Chambersburg, PA 17201
717-267-4500
717-264-7535 - fax

AB Classic
Total Wall Height = 12.68 Feet
Block Height = 0.604 Feet
Angle of Setback = 6 Deg.
Depth of Block = 0.97 Feet
Length of Block = 1.469 Feet

Infill Soil	Retained Soil
Friction Angle = 28 Deg.	Friction Angle = 28 Deg.
Unit Weight = 120 PCF	Unit Weight = 120 PCF

Foundation Soil
Friction Angle = 28 Deg. Cohesion = 0 PSF
Unit Weight = 120 PCF

Bearing Capacity
Factor of Safety = 2.32

Safety Factors Static
Actual Sliding = 1.672
Actual Overturning = 3.337

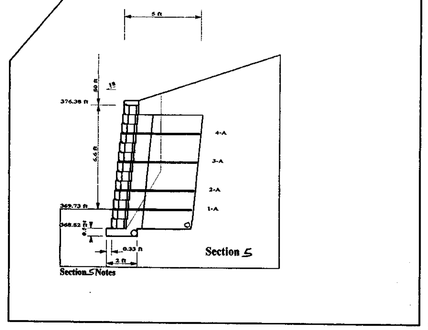
Safety Factors Seismic
Actual Sliding = N.A.
Actual Overturning = N.A.

Geogrid Legend
A-Miragrid 5XT
B-Miragrid 7XT
C-Miragrid 8XT
s-Grouted Con.
Min. Length of Geogrid = 8 Feet

4 of 5

ABwalls 2000 V.3.1 Allan Block Corporation

Project Name:	WORTHINGTON FIELDS- Phase I
Location:	Howard County, MD
Project Number:	DS211065
Wall Number:	Detention Pond- Lots 1- 46
Designer:	DKS
Date:	02-23-01



Section 5 Notes

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717-264-7535 - fax

AB Classic
Total Wall Height = 12.68 Feet
Block Height = 0.604 Feet
Angle of Setback = 6 Deg.
Depth of Block = 0.97 Feet
Length of Block = 1.469 Feet

Infill Soil	Retained Soil
Friction Angle = 28 Deg.	Friction Angle = 28 Deg.
Unit Weight = 120 PCF	Unit Weight = 120 PCF

Foundation Soil
Friction Angle = 28 Deg. Cohesion = 0 PSF
Unit Weight = 120 PCF

Bearing Capacity
Factor of Safety = 3.14

Safety Factors Static
Actual Sliding = 1.724
Actual Overturning = 3.518

Safety Factors Seismic
Actual Sliding = N.A.
Actual Overturning = N.A.

Geogrid Legend
A-Miragrid 5XT
B-Miragrid 7XT
C-Miragrid 8XT
s-Grouted Con.
Min. Length of Geogrid = 5 Feet

5 of 5

ABwalls 2000 V.3.1 Allan Block Corporation

NO.	REVISION	DATE

RETAINING WALL
WORTHINGTON FIELDS
PHASE 1 LOTS 1–46
AND NON–BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS
ARCHITECTS
SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046–2354
Phone: 410–290–9550 Fax: 410–720–6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 5/3/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT,INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480–9105

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043–5506

RYAN & ASSOCIATES, INC.
RETAINING WALL DIVISION
717–709–1153 fax 717–709–1154
6242 MollyPitcher Hwy
Shippensburg, PA 17257

STATE OF MARYLAND — WILLIAM R. RYAN — No. 21586 — 7/26/01

DESIGN BY:	
DRAWN BY:	
CHECKED BY:	
DATE:	
SCALE:	
W.O. NO.:	99–011

PREV. FILE # S–98–18

SHEET 19 OF 20

F-01-60

C:\Land Projects\99–011\dwg\7022S15.dwg–RJ–10–10–2000

RYAN & ASSOCIATES

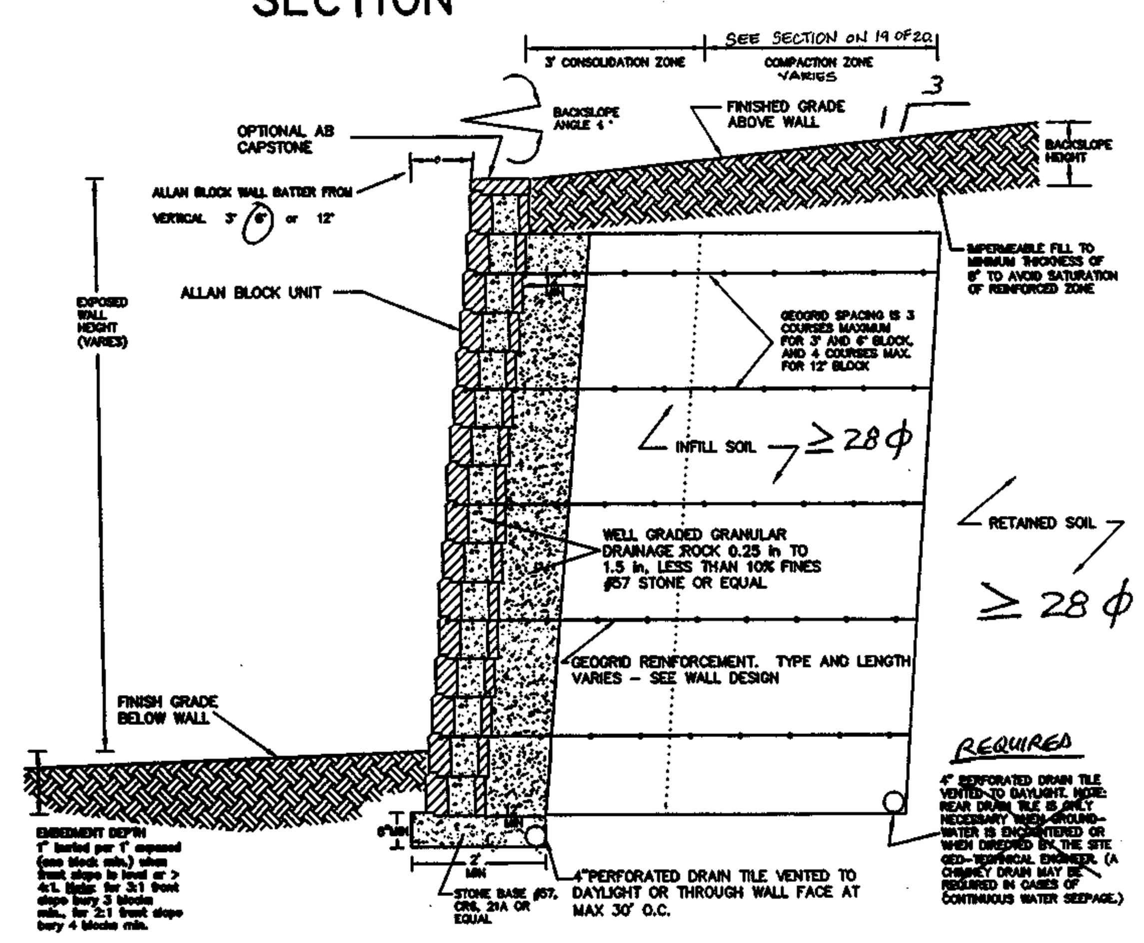
****

PROJECT NAME:	Worthington Fields- Phase I	PROJECT#:	DS211065
LOCATION:	Howard County, MD	BLOCK TYPE:	Allan Block

GENERAL NOTES:

- **SOILS:** An internal angle of friction of 28 degrees was used for the site soil in this design based on review of the geo-technical report done by Hillis- Carnes. This is for the native ML and SM soil types. CH (fat clay), MH (fat silt) and OH (organic) soils are not acceptable for wall construction. If these unsuitable soils are encountered they shall be removed and replaced with soils meeting or exceeding the design friction angle of 28 degrees. The on site geo-technical engineer shall monitor this during the construction process.
- **BEARING CAPACITY:** The footing sub-grade must be tested and have an allowable bearing capacity of 3,000 PSF prior to the installation of the stone base. The actual highest bearing pressure exerted by the wall on this project (including any slopes and surcharges above) is 2680 PSF. If this is not met, an enlarged, grid-reinforced stone footer will be required.
- **SLOPES & SURCHARGES:** The wall design accounts for the load of a 3:1 infinite slope above the wall.
- **WALL PROFILE:** The elevation drawing was done to represent the grade changes necessary on the civil drawings. Since the design was done in even block course increments the elevations may not exactly match those on the civil plans. Minor field changes may be necessary if the actual grades differ from the site plan. NOTE: the cap height of .333' is not shown on the profile drawings. This height may have been used in some cases to achieve the desired TW elevation.
- **GEO-GRIDS:** The geo-grid used in this design is Mirafi 5XT which has a LTDS of 1702. No substitutions are acceptable without prior approval of Ryan & Associates.
- **SPECIFICATIONS:** Construction and materials must conform to the attached Ryan & Associates' "Specifications for Segmental Retaining Wall Systems" and the Allan Block "Installation Guide for Geo-grid Reinforced Retaining Walls".
- **WALL BATTER:** A 6° batter was used for the Allan block set back in this design.
- **EMBEDMENT:** 1 block minimum. 2 blocks and 3 blocks where indicated on the elevation and cross sections. Note that 3 blocks must be buried from station 60 to 1+11 where the wall is above the pond slope.
- **REAR DRAIN TILE:** A rear drain pipe is required on this project since it is a "cut" situation and since Howard County dictates a rear drain on walls taller than 12'. This pipe shall be vented to daylight.
- **FLOOD ELEVATION:** The 100 year flood elevation is lower than the BW so there is not a water impact on this wall.
- **CONSTRUCTION MONITORING:** This wall shall be built under supervision of a qualified geo-technical engineer. The footing sub-grade must be tested. Compaction tests must be done on the reinforced geo-grid zone at 25%, 50%, 75% and 100% of wall height (or as directed by the owner's geo-technical engineer).

ALLAN BLOCK TYPICAL WALL SECTION



APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

[signature] 8/2/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

[signature] 7/27/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION MAJ DATE

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

[signature] 7-24-01
CHIEF, BUREAU OF HIGHWAYS HS DATE

SPECIFICATIONS FOR SEGMENTAL RETAINING WALL SYSTEMS

PART 1: GENERAL

1.01 Description

A. Work includes furnishing and installing segmental retaining wall (SRW) units to the lines and grades designated on the construction drawings. Also included is furnishing and installing appurtenant materials required for construction of the retaining wall as shown on the construction drawings.

1.02 Reference Standards

A. **ASTM C 140-** Sampling and Testing Concrete Masonry Units
B. **ASTM D 4595-** Tensile Properties of Geotextiles by the Wide-Width Strip Method.
C. **ASTM D 5262-** Test Method for Evaluating the Unconfined Creep Behavior of Geo- Grids
D. **GRI:GG1-** Single Rib Geogrid Tensile Strength
E. **GRI:GG5-** Geogrid Pullout
F. **ASTM D 698-** Moisture Density Relationship for Soils, Standard Method
G. **ASTM D 422-** Gradation of Soils
H. **ASTM 4318-** Atterberg Limits of Soil
I. **ASTM 3034-** Specification for Polyvinyl Chloride (PVC) Plastic Pipe
J. **ASTM D1248-** Specification for Corrugated Plastic Pipe

PART 2: MATERIALS

2.01 Segmental Retaining Wall Units

A. SRW units shall be machine formed, Portland Cement concrete blocks specifically designed for retaining wall applications. SRW unit currently approved for this project is:

Allan Block as manufactured by Nitterhouse Masonry Products

NOTE: Where Allan Block specifications and reference documents conflict with these specifications, these specifications hold precedence.

B. SRW units shall be capable of being erected with the horizontal gap between adjacent units not exceeding 1/8". The units shall be uniformly square and not trapezoidal in shape.

C. SRW units shall have a minimum 4" overlap of units on each successive course so that walls are interlocked and continuous.

D. SRW units shall be sound and free of cracks or other defects that would interfere with the proper placing of the unit or significantly impair the strength or permanence of the structure. Cracking or excessive chipping may be grounds for rejection. Units showing cracks longer than 1/2" shall not be used within the wall. Units showing chips visible at a distance of 30 feet from the wall shall not be used within the wall.

E. Concrete used to manufacture SRW units shall have a minimum 28 days compressive strength of 3,000 psi and a maximum moisture absorption rate, by weight, of 8% as determined in accordance with ASTM C 140. Compressive strength test specimens shall conform to the saw-cut coupon provisions of Section 5.2.4 of ASTM C140 with the following exception: Coupon shall be taken from the least dimension of the unit of a size and shape representing the geometry of the unit as a whole.

F. SRW units' molded dimensions shall not differ more than ± 1/8 inch from that specified, except height which shall be ± 1/16 inch as measured in accordance with ASTM C140.

2.02 Geosynthetic Reinforcement

A. Geosynthetic reinforcement shall consist of geogrids or geotextiles as indicated on the design plans. No grid substitutions shall be permitted without the approval of Ryan & Associates.

2.03 Leveling Pad

A. Unless otherwise noted on the cross sections, the leveling pad shall be 6" deep X 24" wide. Material for leveling pad shall consist of compacted sand, gravel, or a combination thereof. (Typical stone used for this pad is #57, CR6, 21A, etc.) The leveling pad should extend laterally at least a distance of 6 inches from the toe and heel of the lowermost SRW unit. In cases of poor bearing capacity or fill soils an enlarged, grid reinforced footer may be required. This typically consists of 1' deep X 4' wide with geo-grid under and within the stone. Lean, un-reinforced concrete with strength of 1500 PSI and 6" deep may also be used as for the leveling pad.

2.04 Drainage Aggregate

A. Drainage aggregate shall be angular, clean stone or granular fill consisting of #57 or approved equal (i.e.- median stone size ½" to 1 ½"). Rounded, pea gravel is not permissible.

2.05 Drainage Pipe

A. The drainage collection pipe shall be a 4" perforated or slotted PVC, or corrugated HDPE pipe.

B. Drain pipes are mandatory and shall be vented to daylight at the end(s) of the wall or at a central low point of the wall. If this is not possible, vent through the wall above finished grade at maximum intervals of 30' O.C. In no case shall a continuous pipe be run for more than 300' without an outlet to daylight.

2.06 Reinforced (Infill) Soil: the reinforced geo-grid zone

A. The soil used must meet or exceed the design friction angle noted on the design cross sections. The reinforced material shall be free of debris and organic material (i.e.- no trash, plants or root matter, top soil, etc.). Unless otherwise noted on the plans, the reinforced zone material shall **not** consist of CH (fat clay), MH (fat silt), or OH (organic) soils.

B. Rocks may be used as infill material as long as their diameter is 6" or less. NOTE: when all gravel is used as infill the LTDS of the geo-grid must be reduced to account for additional installation damage from the large particles. Recycled concrete is permissible for infill.

2.07 Retained Soil: the area beyond the infill soil and extending to a distance of twice the exposed wall height

A. The soil used must meet or exceed the design friction angle noted on the design cross sections. Unless otherwise noted on the plans, the retained material shall **not** consist of CH (fat clay), MH (fat silt), or OH (organic) soils.

PART 3: CONSTRUCTION

3.01 Inspection

A. The Owner or Owner's Representative is responsible for verifying that the contractor meets all the requirements of the specification. This includes all submittals for materials and design, qualifications, and proper installation of wall system.

B. Contractor's field construction supervisor shall have demonstrated experience and be qualified to direct all work at the site.

3.02 Excavation

A. Contractor shall excavate to the lines and grades shown on the project plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material or as directed by the Geotechnical Engineer.

B. Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of wall excavation. Excavation support (shoring), if required, is the responsibility of the Contractor

3.03 Foundation Preparation

A. Following excavation, the foundation soil shall be examined by the Owner's Geotechnical Engineer to assure that the actual foundation soil strength meets or exceeds the allowable design bearing strength (this parameter can be found in the design's General Notes). Soils not meeting the required strength shall be removed and replaced with select structural fill compacted to 95% of a standard proctor for the full depth.

B. If large deposits of fill are encountered an enlarged, grid reinforced footer may be required.

4.04 Leveling Pad Construction

A. Leveling pad shall be placed as shown on the construction drawings with a minimum thickness of 6" and a minimum width of 24". The leveling pad should at a minimum extend laterally at least a distance of 6 inches from the toe and heel of the lower most SRW Unit.

B. Soil leveling pad material shall be compacted with a vibratory plate compactor to provide a firm, level-bearing surface on which to place the first course of units. Compaction will be with mechanical plate compactors to achieve 95% of maximum standard proctor density (ASTM D 698). A thin layer (not to exceed ½") of well-graded sand or stone dust can be used to smooth the top of the leveling pad.

4.05 SRW Unit Installation

A. All SRW units shall be installed at the proper elevation and orientation as shown on the wall profiles and details on the construction plans. The SRW units shall be installed in general accordance with the manufacturer's recommendations. The design engineer of record (Ryan & Associates) specifications and drawings shall govern in any conflict between the two requirements.

B. First course of SRW units shall be placed on the leveling pad. The units shall be leveled side-to-side, front-to-rear and with adjacent units, and aligned to ensure intimate contact with the leveling pad. The first course is the most important to ensure accurate and acceptable results. No gaps shall be left between the front of adjacent units. Alignment may be done by means of a string line or offset from base line to the back of the units.

C. Clean all excess debris from top of units and install next course.

D. Lay out of curves and corners shall be installed in accordance with the plan details or in general accordance with SRW manufacturer's installation guidelines. Walls shall be interlocked by overlapping successive courses. Continuous vertical joints are not permitted unless glued. In general, all tangent angles shown on the civil drawings should be changed into curves to enhance the wall's strength and appearance. Inside and outside corners may be constructed without compromising the wall's integrity.

E. Repeat procedures to extent of wall height.

F. The wall face cant shall not differ more than ± 2 degrees from that specified.

G. Embedment shall follow the general rule of 1" buried for every 1' of wall exposed when the front slope is 4:1 or greater. For 3:1 front slopes a minimum of 21" shall be buried, and for 2:1 front slopes a minimum of 29" shall be buried.

4.06 Geosynthetic Reinforcement Placement

A. All geosynthetic reinforcement shall be installed at the proper elevation and orientation as shown on the wall profiles and details on the final construction plans. Partial grid coverage is not acceptable- no gaps shall be present between grid sections.

B. At the elevations shown on the plans, the geosynthetic reinforcement shall be laid horizontally on compacted infill and on top of the concrete SRW units. Embedment of the geosynthetic in the SRW units shall be consistent with SRW manufacturer's recommendations. Correct orientation of the geosynthetic reinforcement shall be verified by the Contractor to be in accordance with the geosynthetic manufacturer's recommendations. The highest strength direction of the geosynthetic must be perpendicular to the wall face.

C. Geosynthetic reinforcement layers shall be one continuous piece for their entire embedment length. Overlap of the geosynthetic in the design strength direction (perpendicular to the wall face) is not permitted.

D. Tracked construction equipment shall not be operated directly on the geosynthetic reinforcement. A minimum of 6 inches of backfill is required prior to operation of tracked vehicles over the geosynthetic. Turning should be kept to a minimum. Rubber-tired equipment may pass over the geosynthetic reinforcement at slow speeds (less than 5 mph).

E. The geosynthetic reinforcement shall be in tension and free of wrinkles prior to placement of soil fill. The nominal tension shall be applied to the reinforcement and secured in place with staples, stakes or by hand tensioning until reinforcement is covered by six inches of fill.

4.07 Drainage Materials

A. Drainage aggregate shall be installed to the line, grades, and sections shown on the final plans. Drainage fill shall be placed to the minimum thickness of 12" as shown on the construction plans behind units. Drainage fill shall also fill all voids between and within (if hollow) the units.

B. Drainage collection pipes shall be installed to maintain gravity flow of water outside the reinforced soil zone. The drainage collection pipe shall daylight into a storm sewer manhole or along a slope at an elevation lower than the lowest point of the pipe within the aggregate drain (see section 2.05).

C. All drainage zone aggregate, including the stone placed within the block cells shall be compacted with a vibratory plate compactor with a minimum of two passes.

4.08 Backfill Placement

A. The reinforced backfill shall be placed as shown in the construction plans in the maximum compacted lift thickness of 10 inches and shall be compacted to a minimum of 95% of standard proctor density (ASTM D 698) at a moisture content within 2% of optimum. The backfill shall be placed and spread in such a manner as to eliminate wrinkles or movement of the geosynthetic reinforcement and the SRW units. Compaction testing shall be done at 25%, 50%, 75%, and 100% of the wall height or as specified by the site geo-technical engineer.

B. Only a vibratory plate or small-scale vibratory smooth drum compactor equipment shall be allowed within 3 feet of the front of the wall face. Compaction within the 3 feet behind the wall face shall be achieved by at least three (3) passes of the lightweight mechanical plate compactor or roller. Heavy equipment (such as track hoes, ride on rollers, pans, etc.) must be kept back a minimum of 3' from the rear of the wall.

C. At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct water runoff away from the wall face.

C. At completion of wall construction if final grading, paving, landscaping, and/or storm drainage installation adjacent to the wall is not placed immediately after wall completion, temporary grading shall be provided to ensure water runoff is not allowed to *collect or pond* behind the wall until final construction adjacent to the wall is completed.

D. Filter fabric is neither required nor recommended behind the drainage layer. Installation of filter fabric has proven to result in poor wall construction and its benefit has not been proven when used with clays, silts, and mixed soils. The exception is when all sand is used for infill material since it is non-cohesive and could potentially slough, clogging the drainage layer.

4.09 SRW Caps

A. SRW caps shall be properly aligned and glued to underlying units with a flexible, high-strength concrete adhesive (adhesive should be designed for "concrete to concrete" applications). Rigid adhesive or mortar is not acceptable.

4.10 Water Applications

A. When walls are installed in water applications (such as storm water ponds, streams, bulkheads, areas adjacent to flood plains, etc.) all granular material must be used as infill up to 1' above the 100 year flood elevation or the high water level. This material must be free draining and have less than 10% fines. The leveling pad and the reinforced zone (up to the extent of the stone infill) must be wrapped in filter fabric to prevent migration of fines. Rip rap stone is required in front of the bottom three course on walls installed in tidal waters. Rip rap may also be required to prevent scouring and erosion in front of walls installed in water sources prone to fluctuating water levels, and where pipes that frequently carry water exit through walls.

4.11 Rails, Fences, & Other Structures

A. Open rails and fences not subject to wind loads may be placed directly behind the wall as long as they are not subject to vehicular impact. Solid or semi-solid fences that are subject to wind loads must be kept back a minimum of 3' from the rear of the wall to prevent loading of the wall.

B. Guardrails subject to vehicular impact must be kept back a minimum of 3' to prevent loading of the wall. Guardrails may be placed closer than this 3' minimum only if a barrier (such as wheel stops, curbing, etc.) prevents impact.

C. Light posts and similar structures subject to wind loads must be kept back a minimum of 3' to prevent loading of the wall.

D. In cases where this 3' minimum cannot be met due to restraints on the site, additional analyses will need to be done to determine a method of stabilization. Ryan & Associates can be contracted to provide this design for an additional cost.

4.13 Construction Adjacent to Completed Wall

A. The Owner or Owner's Representative is responsible for ensuring that construction adjacent to the wall by others does not disturb the wall or place temporary construction loads on the wall that exceed design loads, including loads such as water pressure, temporary grades, or equipment loading. Heavy paving or grading equipment shall be kept a minimum of three feet behind the back of the wall face. Equipment with wheel loads in excess of 150 psf live load shall not be operated with 10 feet of the face of the retaining wall during construction adjacent to the wall. Care should be taken by the General Contractor to ensure water runoff is directed away from the wall structure until final grading and surface drainage collection systems are completed.

B. Care must be taken when installing appurtenances (such as transformers, generators, etc.) within the reinforced zone of the wall. The compaction integrity of the reinforced zone must be maintained, both below and beside (around) the appurtenance. Neglecting to do so may cause hydrostatic pressure and wall failure.

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

RYAN & ASSOCIATES, INC.
RETAINING WALL DIVISION
717-709-1153 fax 717-709-1154
6242 MollyPitcher Hwy
Shippensburg, PA 17257

NO.	REVISION	DATE

RETAINING WALL
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31
2ND ELECTION DISTRICT

PARCEL 98 & P/O PARCEL 4
HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS ARCHITECTS SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — WILLIAM K. RYAN — 7/26/01
WILLIAM K. RYAN, PE No.21586

DESIGN BY:
DRAWN BY:
CHECKED BY:
DATE:
SCALE:
W.O. NO.: 99-011

PREV. FILE # S-98-18

20 SHEET OF 20

F-01-60

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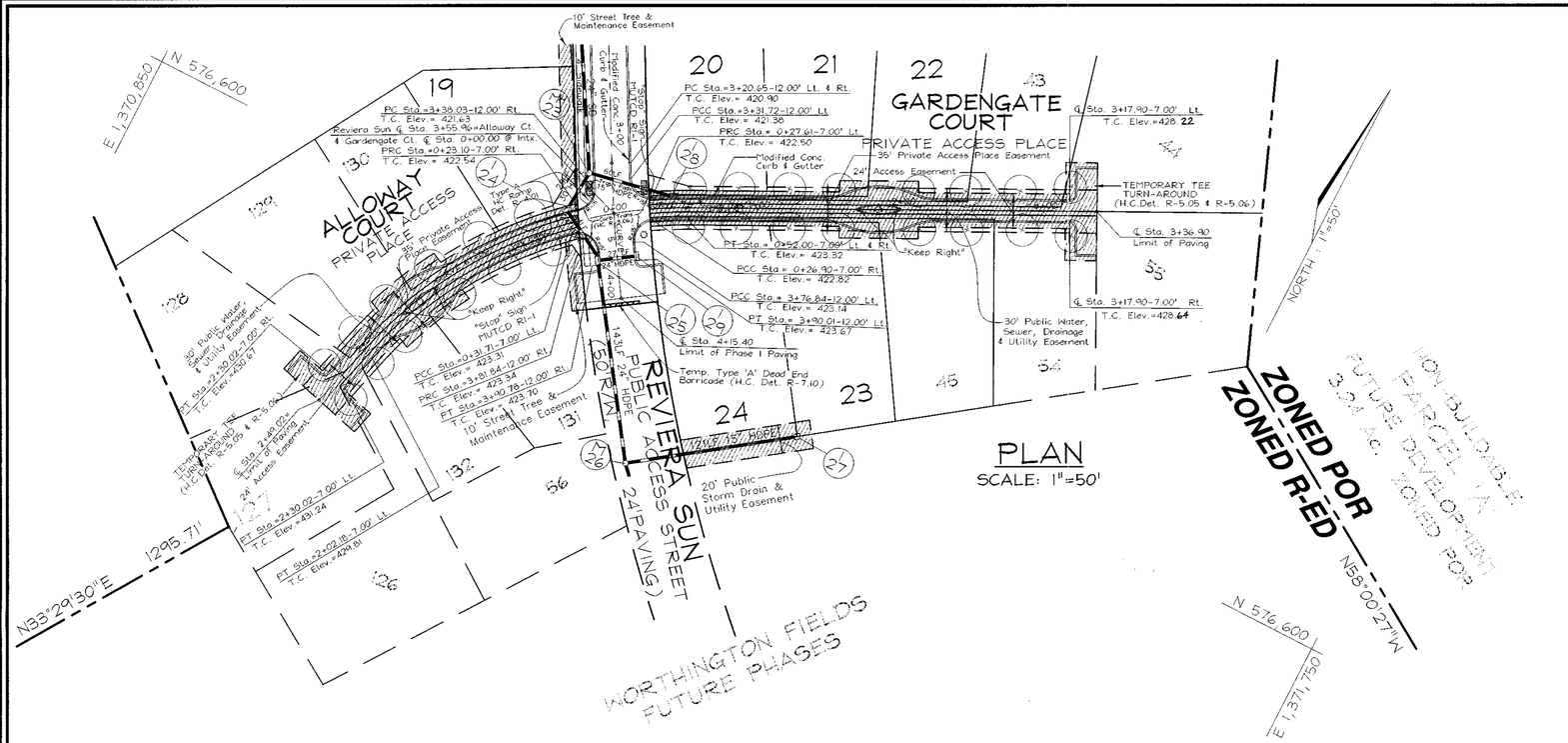
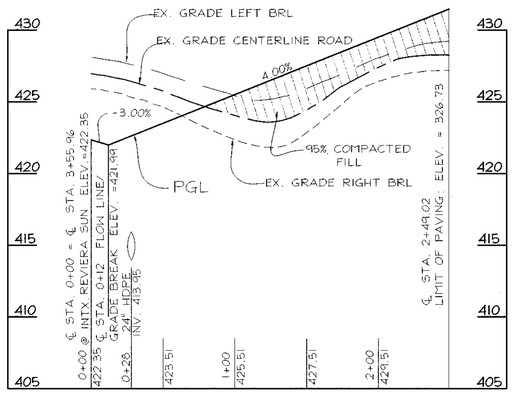
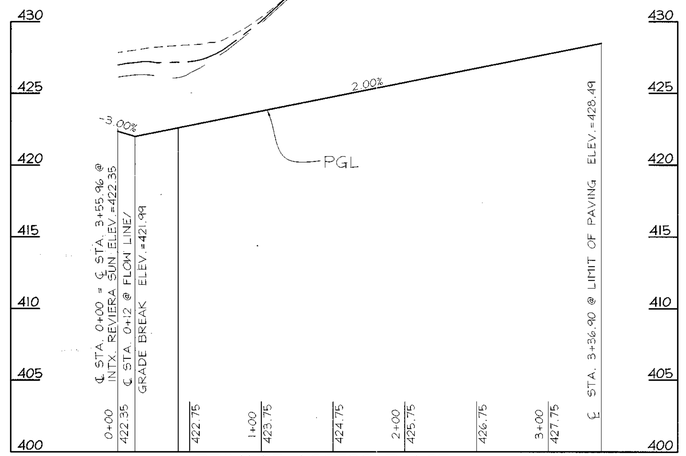


PLAN
SCALE: 1"=50'

NOTE: FOR STORM DRAIN SIZE, TYPE AND LENGTH SEE GRADING AND SEDIMENT CONTROL PLANS AND STORM DRAIN PROFILE SHEETS



PRIVATE ACCESS PLACE
DESIGN 15 MPH
PROFILE
ALLOWAY COURT
SCALE: 1"=50' HORZ.

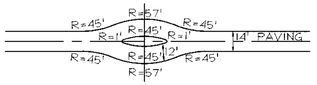


PRIVATE ACCESS PLACE
DESIGN 15 MPH
PROFILE
GARDENGATE COURT
SCALE: 1"=50' HORZ.

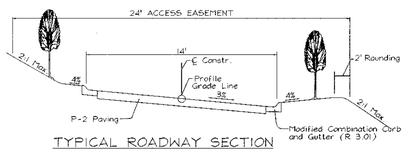
STREET LIGHT LOCATION CHART		
STREET NAME	℄ STATION	℄ OFFSET
REVIERA SUN	3+72.18	19.84' LT.
ALLOWAY CT.	1+50.37	1.73' LT.
GARDENGATE CT.	1+84.42	0.00' LT.

STREET TREE CALCULATIONS			
STREET NAME	LINEAR FEET	NO. REQUIRED	NO. PROVIDED
ALLOWAY COURT	444 / 40	11	12
GARDENGATE COURT	618 / 40	16	16

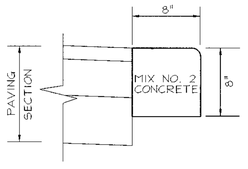
CURVE TABLE						
CURVE	RADIUS	LENGTH	DELTA ANGLE	TANGENT	CHORD DIRECTION	CHORD LENGTH
C6	300.00	202.18	38°36'46"	105.10	S34°14'49"W	198.37
C7	300.00	52.00	9°55'54"	26.07	S58°31'09"W	51.94



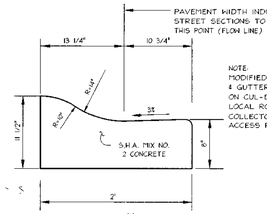
PRIVATE ACCESS PLACE
TRAFFIC CONTROL DEVICE DETAIL



TYPICAL ROADWAY SECTION
CLASSIFICATION: PRIVATE ACCESS PLACE
ALLOWAY COURT
GARDENGATE COURT
DESIGN SPEED 15 MPH
NOT TO SCALE

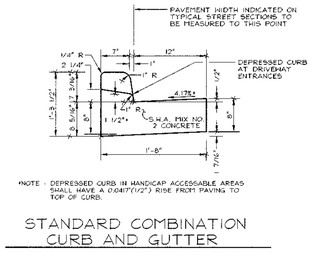


STANDARD FLUSH CURB
STD DETAIL R.3.01a



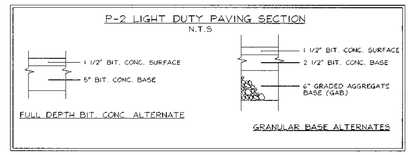
NOTE:
MODIFIED COMBINATION CURB & GUTTER TO BE USED ONLY ON CUL-DE-SAC STREETS, LOCAL ROADS OR MINOR COLLECTOR ROADS, PRIVATE ACCESS PLACE.

MODIFIED CURB & GUTTER
HOWARD COUNTY STANDARD R3.01
NOT TO SCALE



NOTE : DEPRESSED CURB IN HANDICAP ACCESSABLE AREAS SHALL HAVE A 0.04IT(1/2") RISE FROM PAVING TO TOP OF CURB.

STANDARD COMBINATION CURB AND GUTTER
HOWARD COUNTY STANDARD R-3.01
NOT TO SCALE



NO.	REVISION	DATE
1	REVISED T.C. ELEVATION	9/27/01

FINAL ROAD CONSTRUCTION PLANS
WORTHINGTON FIELDS
PHASE 1 LOTS 1-46
AND NON- BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25, GRID 20 & # 31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS | ARCHITECTS | SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT H. VOGEL — No. 11193 — REGISTERED PROFESSIONAL ENGINEER — 10-9-01
ROBERT H. VOGEL, PE NO.11193

DESIGN BY: GAH
DRAWN BY: GAH
CHECKED BY: RHV
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 6 OF 20

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/8/01

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 7/20/01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-24-01

DEVELOPER
DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

OWNER
TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

F-01-60

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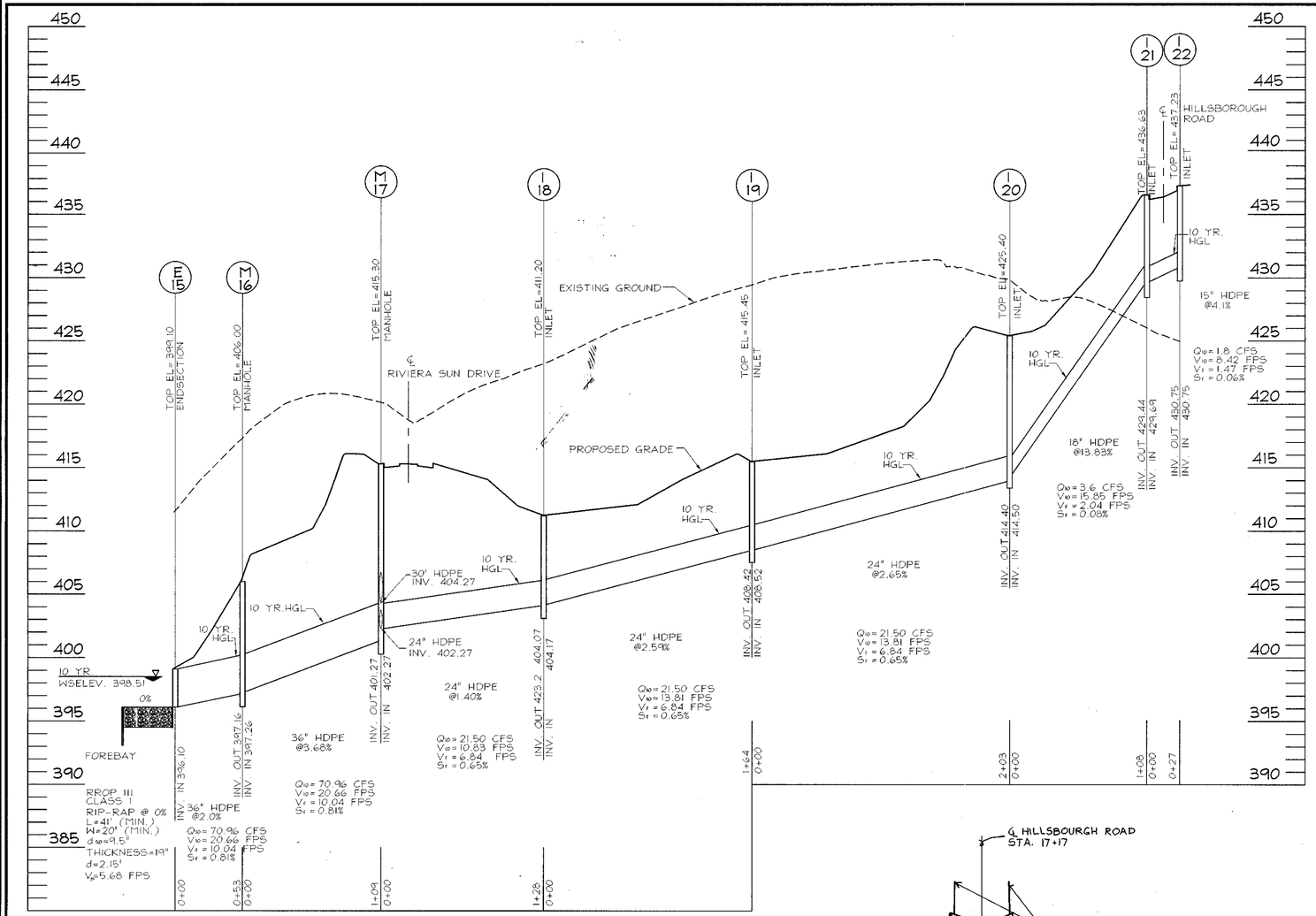
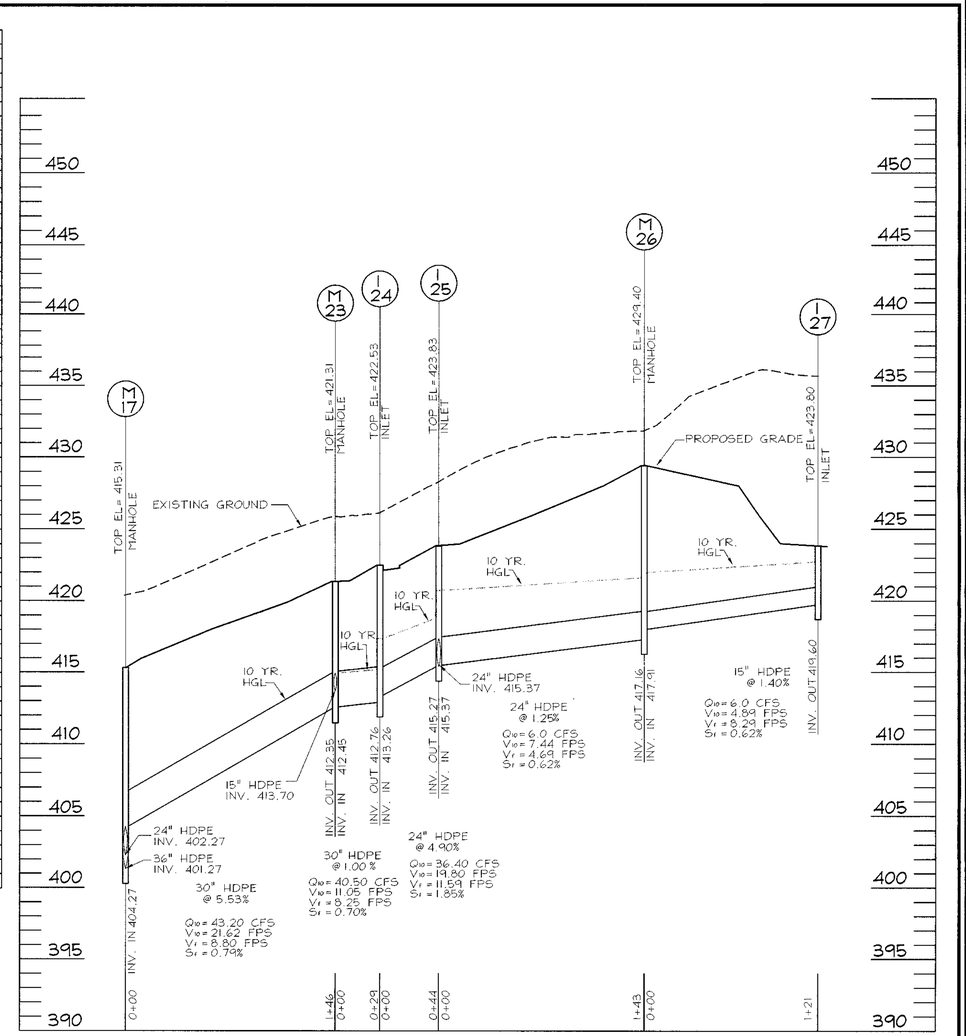


STORM DRAIN PROFILE

SCALE: 1"=50' HORZ.
1"=5' VERT.



STORM DRAIN PROFILE

SCALE: 1"= 50' HORZ.
1"= 5' VERT.

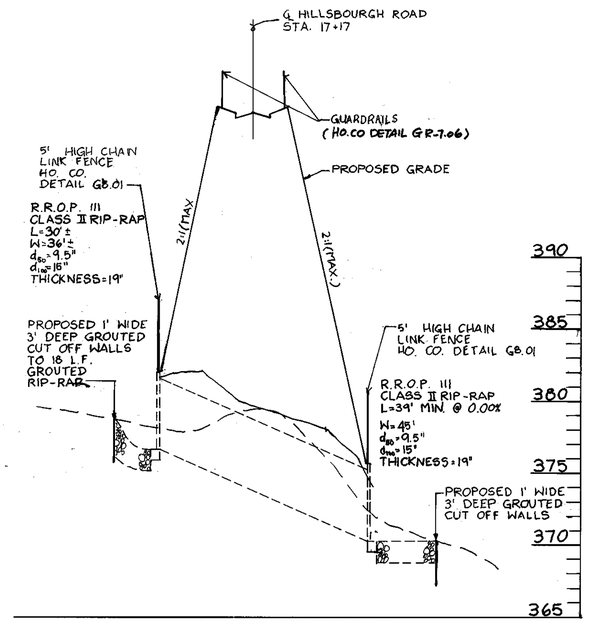
STRUCTURE SCHEDULE

NO.	TYPE	LOCATION	TOP ELEV.	INV IN	INV OUT	REMARKS
E-3	36" CONC. END SECTION	N.576761.5 E.1370576.80	177.08TS	-	386.00	SD-5.51
S-4	CONTROL STRUCTURE	N.576759.6 E.1370680.7	400.20	-	- -	SEE DETAIL
E-5	18" HDPE END SECTION	N.576804?.5 E.1370782.6	397.10TP	-	16?396.60	SEE DETAIL
I-6	A-5 INLET	CL STA. 17+40, 12' RT.	400.31TS	16?396.92	16?396.66	SD-4.40
I-7	A-5 INLET	CL STA. 17+40, 12' LT.	400.31TS	-	16?397.06	SD-4.40
I-11	A-5 INLET	CL STA. 0+53, 12' RT.	410.47TS	16?403.56	16?403.46	SD-4.40
I-12	A-5 INLET	CL STA. 0+53, 12' LT.	410.47TS	16?403.93	16?403.83	SD-4.40
I-13	A-5 INLET	CL STA. 22+79, 12' RT.	410.61TS	16?404.50	16?404.55	SD-4.40
I-14	A-5 INLET	CL STA. 22+79, 12' LT.	410.61TS	-	16?405.07	SD-4.40
E-15	36" HDPE END SECTION	N.576688.3 E.1370944.9	399.10TP	-	36?396.10	SEE DETAIL
M-16	STANDARD 5' MANHOLE	N.576739.9 E.1370980.6	406.0TR	36"397.26	36"397.16	G-5.13
M-17	STANDARD 5' MANHOLE	CL. STA. 1+81, 20.6' RT.	415.3TR	12"390.40?? 30"402.27	36"401.27	G-5.13
I-18	TYPE D INLET	N.576863.5 E.1371189.2	411.20*	24"404.17	24"404.07	SD-4.39
I-19	TYPE D INLET	N.576906.2 E.1371343.9	415.45*	24"408.52	24"408.42	SD-4.39
I-20	TYPE D INLET	N.576966.8 E.1371540.8	425.40*	18"414.50	24"414.40	SD-4.39
I-21	A-5 INLET	CL STA. 28+17, 12' RT.	436.63TS	16"429.69	16"429.44	SD-4.40
I-22	A-5 INLET	CL STA. 28+24, 12' LT.	437.23TS	-	16"430.75	SD-4.40
M-23	STANDARD 4' MANHOLE	CL. STA. 3+27, 16' RT.	421.31TR	12"412.345 30"412.45	30"412.35	G-5.12
I-24	A-5 INLET	CL. STA. 0+31, 7' RT.	422.53TS	24"413.26	30"412.76	SD-4.40
I-25	A-5 INLET	CL. STA. 3+87, 12' RT.	423.83	21?412.37	24"415.27	SD-4.40
M-26	STANDARD 4' MANHOLE	CL STA. 5+28, 16' RT.	429.41TR	15"417.91	24"417.16	G-5.12
I-27	TYPE D INLET	N.576968.4 E.1371363.4	423.80*	-	15"419.60	SD-4.39
I-28	A-5 INLET	CL. STA. 0+42, 7' LT.	422.98TS	-	15"417.36	SD-4.40
I-29	A-10 INLET	CL. STA. 3+87, 12' LT.	422.83TS	-	24"419.42	SD-4.41
E-32	30" CONC. END SECTION	N 577373.7 E 1370500.6	363.56TP	-	30"361.06	SD-5.51
S-33	CONTROL STRUCTURE	N 577370.6 E 1370433.6	369.00TS	-	30"362.62	SEE DETAIL
E-34	18" HDPE END SECTION	N 577281.2 E1370451.9	369.56TP	-	18"366.64	SEE DETAIL
M-35	STANDARD 4' MANHOLE	N.577249.7 E.1370456.5	380.5TR	18"373.30	18"368.70	G-5.12
I-36	A-5 INLET	CL. STA. 2+91.7, 12' RT.	391.24TS	12.98"386.38	18"386.28	SD-4.40
I-37	A-5 INLET	CL. STA. 2+91.7, 12' LT.	391.24TS	16"385.67	16"385.62	SD-4.40
I-38	TYPE D INLET	N.577054.1 E.1370287.0	392.32*	-	15"387.07	SD-4.39
M-39	STANDARD 4' MANHOLE	CL. STA. 6+71, 14.6' RT.	403.3TR	15"398.27	18"398.02	G-5.12
I-40	A-5 INLET	LP STA. 1+54	399.46TS	-	15"392.96	SD-4.40

NOTE: ALL STORM DRAIN PIPE TO BE HDPE UNLESS OTHERWISE NOTED.
TS = TOP OF SLAB, FACE OF STRUCTURE
TP = TOP OF PIPE
TR = TOP CENTER OF RIM
* ELEV. AT THROAT OPENING

PIPE SCHEDULE

PIPE SIZE	TYPE	TOTAL LENGTH
15"	HDPE	511 LF
18"	HDPE	965 LF
24"	HDPE	809 LF
30"	HDPE	175 LF
36"	HDPE	162 LF
30"	ASTM C-361	67 LF
36"	ASTM C-361	104 LF



CULVERT PROFILE

SCALE: 1"= 50' HORZ.
1"= 5' VERT.

OWNER

TAYLOR FAMILY LIMITED PARNERSHIP A
TAYLOR FAMILY LIMITED PARNERSHIP B
4100 COLLEGE AVE.
ELLICOTT CITY, MARYLAND
21043-5506

DEVELOPER

DR. IRVING AND EDITH TAYLOR
C/O LAND DESIGN & DEVELOPMENT, INC.
8000 MAIN STREET
ELLICOTT CITY, MARYLAND 21043
ATTN: MR. DONALD R. REUWER
PHONE: (410) 480-9105

NO.	REVISION	DATE
1	REVISED STRUCTURE SCHEDULE	9-27-01

APPROVED: HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.

CHIEF, BUREAU OF HIGHWAYS — DATE 7-28-01

APPROVED: HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 8/1/01

DEVELOPMENT ENGINEERING DIVISION — DATE 7/27/01

STORM DRAIN PROFILES

WORTHINGTON FIELDS

PHASE 1 LOTS 1-46
AND NON-BUILDABLE PARCELS 'A' AND 'B'

TAX MAP #25 GRID 20 & #31 — PARCEL 98 & P/O PARCEL 4
2ND ELECTION DISTRICT — HOWARD COUNTY, MARYLAND

FREDERICK WARD ASSOCIATES, INC.
ENGINEERS, ARCHITECTS, SURVEYORS
7125 Riverwood Drive Columbia, Maryland 21046-2354
Phone: 410-290-9550 Fax: 410-720-6226
Bel Air, Maryland Columbia, Maryland Warrenton, Virginia

STATE OF MARYLAND — ROBERT H. VOGEL — No. 15195 — REGISTERED PROFESSIONAL ENGINEER

ROBERT H. VOGEL, PE No.15195

DESIGN BY: GAH
DRAWN BY: R.J.
CHECKED BY: R.H.V.
DATE: JULY, 2001
SCALE: AS SHOWN
W.O. NO.: 99-011

SHEET 11 OF 20

F-01-60

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