FINAL ROAD PLANS

ECKERS HOLLOW PHASE I

6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SHEET INDEX

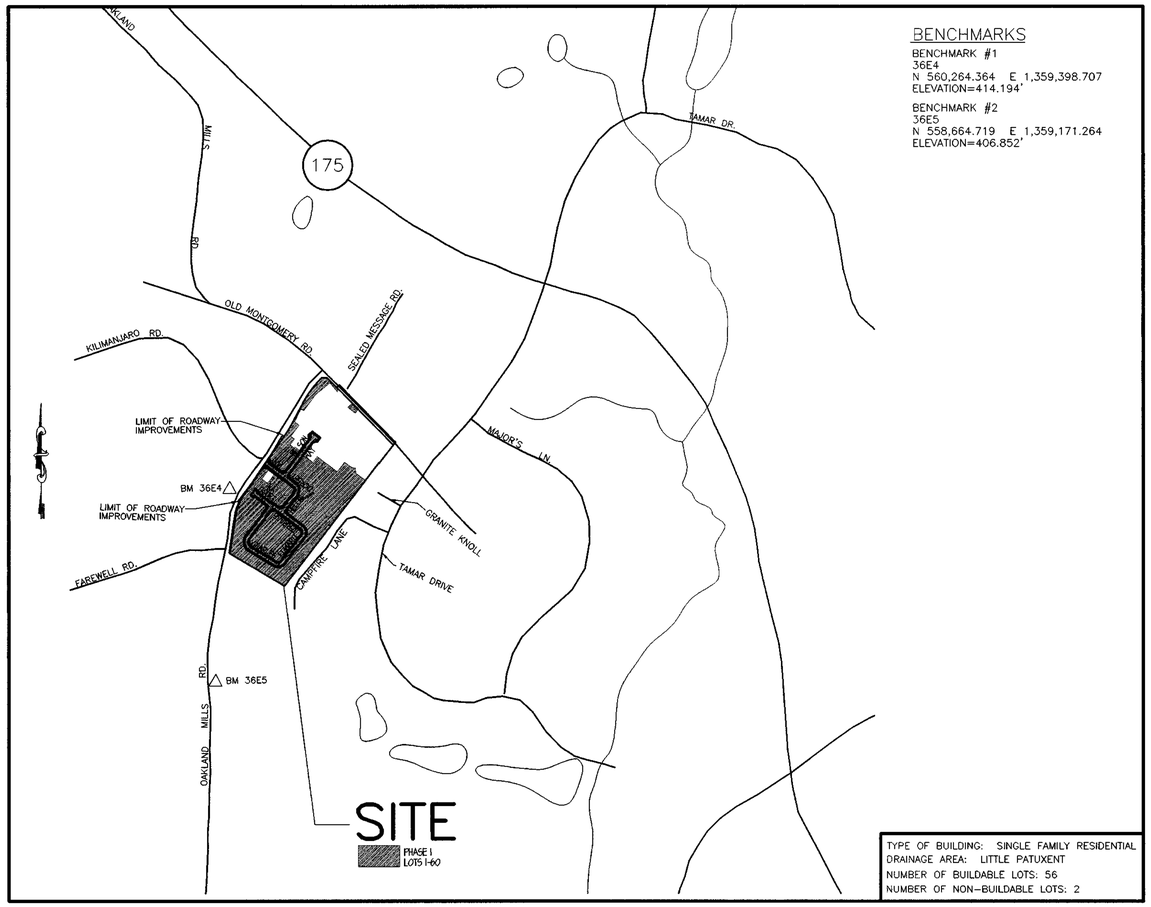
NO.	
1	TITLE SHEET
2	ROAD AND SITE DETAILS
3	ROAD PLAN AND PROFILE – HELEN DORSEY WAY
4	ROAD PLAN AND PROFILE – NELSON WAY & INA COURT
5	ROAD PLAN AND PROFILE – CHARLES EDWARD TERRACE
6	STREET TREE PLAN, PLANTING DETAILS, AND LIGHTING SCHEDULE
7	STORM DRAIN DRAINAGE AREA MAP
8	STORM DRAIN PROFILES & STRUCTURE SCHEDULE
9	SWM POND PLAN, PROFILES, AND DETAILS
10	SWM POND DETAILS, MD-378 NOTES AND SPECIFICATIONS
11	GRADING & SEDIMENT CONTROL PLAN
12	LANDSCAPE PLAN
13	LANDSCAPING & TREE PLANTING DETAILS
14	FOREST CONSERVATION PLAN
15	FOREST CONSERVATION PLAN DETAIL SHEET
16	TRAFFIC CONTROL SIGN PLAN
17	TRAFFIC CONTROL PLAN, OAKLAND MILLS ROAD
18	ROAD IMPROVEMENT PLAN, OAKLAND MILLS ROAD
19	SEDIMENT BASIN, PLAN, PROFILE, AND DETAILS
20	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

ROAD CLASSIFICATION CHART

ROAD	STATION	CLASSIFICATION	R/W WIDTH
CHARLES EDWARD TERRACE	0+00 13+24.35	PUBLIC ACCESS STREET	40'
HELEN DORSEY WAY	0+00 2+07.04	PUBLIC COLLECTOR STREET	50'
HELEN DORSEY WAY	2+07.04 2+67.04	PUBLIC ACCESS STREET	TRANSITION
HELEN DORSEY WAY	2+67.04 6+15.58	PUBLIC ACCESS STREET	40'
INA COURT	0+00 2+69.13	PUBLIC ACCESS STREET	40'
NELSON WAY	0+00 4+22.52	PUBLIC ACCESS STREET	40'
OLD MONTGOMERY ROAD	----	MAJOR COLLECTOR ROAD	60'
OAKLAND MILLS ROAD	----	MAJOR COLLECTOR ROAD	80'

NAD '83 COORDINATE TABLE

POINT	NORTH	EAST
100	559,489.26	1,359,798.63
101	559,761.52	1,359,,345.29
102	560,080.63	1,359,392.62
103	560,225.16	1,359,449.09
104	560,748.80	1,359,805.62
105	560,969.28	1,359,931.83
106	561,223.14	1,360,110.36
107	561,225.08	1,360,157.92
108	560,865.34	1,360,553.06
109	560,689.05	1,360,725.80
110	560,515.10	1,360,586.37
111	560,512.33	1,360,589.10



BENCHMARKS

BENCHMARK #1
36E4
N 560,264.364 E 1,359,398.707
ELEVATION=414.194'

BENCHMARK #2
36E5
N 558,664.719 E 1,359,171.264
ELEVATION=406.852'

TYPE OF BUILDING: SINGLE FAMILY RESIDENTIAL
DRAINAGE AREA: LITTLE PATUXENT
NUMBER OF BUILDABLE LOTS: 56
NUMBER OF NON-BUILDABLE LOTS: 2

VICINITY MAP
SCALE: 1"=600'

GENERAL NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH HOWARD COUNTY DESIGN MANUAL VOLUME IV, DETAILS AND SPECIFICATIONS FOR CONSTRUCTION.
2. ALL HORIZONTAL CONTROLS ARE BASED ON MARYLAND STATE COORDINATES. ALL VERTICAL CONTROLS BASED ON U.S.G.S. DATA.
3. COORDINATES SHOWN HERON ARE BASED ON MARYLAND COORDINATE SYSTEM NAD '83 AS MONUMENTED BY HOWARD COUNTY GEODETIC CONTROL STATION 36E4 AND 36E5.
4. ALL ROAD ELEVATIONS SHOWN ARE CENTERLINE ELEVATIONS UNLESS OTHERWISE NOTED.
5. THE CONTRACTOR SHALL NOTIFY THE HOWARD COUNTY BUREAU OF HIGHWAYS, AT (410)-313-2450 AT LEAST FIVE (5) WORKING DAYS BEFORE ANY OPEN CUT OF ANY COUNTY ROAD OR BORING/JACKING OPERATION IN COUNTY ROADS FOR LAYING WATER/SEWER MAINS. THE APPROVAL OF THESE DRAWINGS WILL CONSTITUTE COMPLIANCE WITH DPW REQUIREMENTS PER SECTION 18.114(a) OF THE HOWARD COUNTY CODE.
6. FOR DETAILS NOT SHOWN ON THE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, USE HOWARD COUNTY DESIGN MANUAL-VOLUME IV-STANDARDS SPECIFICATIONS AND DETAILS FOR CONSTRUCTION (LATEST EDITION). THE CONTRACTOR SHALL HAVE A COPY OF VOLUME IV ON THE JOB.
7. THE CONTRACTOR SHALL TEST PIT EXISTING UTILITIES WHERE SHOWN OR NEEDED AS APPROVED BY THE ENGINEER, A MINIMUM OF TWO WEEKS IN ADVANCE OF CONSTRUCTION.
8. CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITY COMPANIES OR AGENCIES AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

STATE HIGHWAY ADMINISTRATION	410-531-5533
BALTIMORE GAS & ELECTRIC CO. CONTRACTOR SERVICES	410-850-4620
BALTIMORE GAS & ELECTRIC CO. UNDERGROUND DAMAGE CONTROL	410-291-4607
MISS UTILITY	1-800-257-7777
BUREAU OF UTILITIES, HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS	410-313-4900
BELL ATLANTIC / VERIZON	1-800-446-5266

9. APPROXIMATE LOCATION OF EXISTING MAINS ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING MAINS AND SERVICES AND MAINTAIN UNINTERRUPTED SUPPLY. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.
10. THE CONTRACTOR SHALL REMOVE TREES, STUMPS AND ROOTS ALONG THE LINE OF EXCAVATION FOR STORM DRAIN OUTSIDE OF MASS GRADED AREAS. PAYMENT FOR SUCH REMOVAL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONSTRUCTION OF THE STORM DRAIN.
11. CONTRACTOR TO NOTIFY THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION (410-313-1880) AT LEAST 24 HOURS PRIOR TO STARTING WORK SHOWN ON THESE PLANS.
12. ALL STORM DRAIN STRUCTURES SHOWN ARE TO BE HOWARD COUNTY STANDARD UNLESS OTHERWISE NOTED.
13. ALL STORM DRAIN TRENCHES WITHIN RIGHT-OF-WAY ARE TO BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH HOWARD COUNTY STANDARD SPECIFICATIONS.
14. DISTURBED SLOPE AREAS TO BE STABILIZED AS SOON AS GRADING IS COMPLETED. ALL SLOPES AND SWALES SHALL BE PERMANENTLY SEEDED. REFER TO MASS GRADING PLANS FOR SEEDING SPECIFICATIONS. ALL SWALES ARE TO BE STABILIZED WITH EROSION CONTROL MATTING.
15. ALL REINFORCED CONCRETE FOR STORM DRAIN STRUCTURES SHALL HAVE A MINIMUM 28 DAY STRENGTH OF 3500 P.S.I.
16. TRAFFIC CONTROL DEVICES AND THEIR INSTALLATION SHALL BE DONE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION).
17. ALL FILTER FABRIC AT RIP-RAP APRONS SHALL BE MIRAFI 700-X OR EQUIVALENT. STONE FOR RIP-RAP SHALL BE AS SPECIFIED ON THESE PLANS. ALL RIP-RAP SHALL BE NON-GROUTED UNLESS OTHERWISE NOTED.
18. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND SAFETY PRECAUTIONS AND PROGRAMS.
19. ALL MANHOLES SHALL BE 4'-0" INSIDE DIAMETER UNLESS OTHERWISE NOTED.
20. STREET LIGHTS WILL BE INSTALLED BY B.G.&E. AT LOCATIONS SPECIFIED ON THESE PLANS. A MINIMUM SPACING OF 20' SHALL BE MAINTAINED BETWEEN ANY STREET TREE AND ANY LIGHT.
21. ALL SIDEWALKS ARE TO BE CONSTRUCTED ACCORDING TO HOWARD COUNTY STANDARD DETAIL R-3.05. ALL HANDICAP RAMPS MUST MEET ALL A.D.A. REQUIREMENTS. ALL RAMPS ARE TO BE HOWARD COUNTY TYPE A OR B, UNLESS OTHERWISE SPECIFIED ON THESE PLANS.
22. ALL CURB IS TO BE MODIFIED COMBINATION CURB & GUTTER ACCORDING TO HOWARD COUNTY STANDARD DETAIL R-3.01 EXCEPT WHERE TRANSITIONS ARE REQUIRED FOR STORM DRAIN INLETS OR AS INDICATED ON THE PLANS. ALL CURB TRANSITIONS ARE TO BE IN ACCORDANCE WITH THE DETAIL SHOWN ON SHEET 2.
23. PROPOSED STORMWATER MANAGEMENT POND IS PUBLIC AND WILL BE MAINTAINED BY HOWARD COUNTY, DEPARTMENT OF PUBLIC WORKS. THE SWM POND IS AN EXTENDED DETENTION FACILITY.
24. CONTRACTOR TO VERIFY THAT ALL UNDERGROUND UTILITIES UNDERNEATH THE ROAD BED AND WITHIN THE RIGHT-OF-WAY HAVE BEEN CONSTRUCTED PRIOR TO PLACEMENT OF STONE SUB-BASE AND PAVING. REMOVAL OF CURB AND GUTTER AND PAVEMENT TO INSTALL ANY MISSED UTILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
25. LOTS 36,37,44 AND 45 HAVE USE-IN-COMMON DRIVEWAYS AS SHOWN ON THESE PLANS. THESE DRIVEWAYS ARE LOCATED WITHIN A USE-IN-COMMON ACCESS EASEMENT.
26. FILL AREAS WITHIN THE RIGHT-OF-WAY AND UNDERNEATH PROPOSED UTILITIES IS TO BE SELECT BACKFILL, COMPACTED TO 95% COMPACTION IN ACCORDANCE WITH ASSHTO T-180.
27. ALL EXISTING STRUCTURES WILL BE REMOVED UNDER THE MASS GRADING PLANS WITH WAIVER WP-01-09. DEMOLITION PERMITS B00126484 AND B00126485 HAVE BEEN APPROVED BY HOWARD COUNTY TO PERFORM THIS WORK. APPROVAL OF WP-01-09 IS SUBJECT TO THREE CONDITIONS AS STATED IN APPROVAL LETTER FROM DEPARTMENT OF PLANNING & ZONING DATED OCTOBER 25, 2000.
28. A PERMANENT TEE TURN-AROUND IS TO BE CONSTRUCTED AT THE END OF INA COURT IN ACCORDANCE WITH HOWARD COUNTY STD. DETAIL R-5.05.
29. A TEMPORARY TEE TURN-AROUND IS TO BE CONSTRUCTED AT THE END OF NELSON WAY IN ACCORDANCE WITH HOWARD COUNTY STD. DETAIL R-5.05. THIS TEE WILL BE REPLACED BY FUTURE PHILLIP DORSEY WAY.
30. PROPOSED GRADES ARE FINISHED PAVING GRADES.

SURVEY NOTE

TOPOGRAPHIC INFORMATION PROVIDED BY FIELD SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED NOVEMBER 5, 1999.

LOCATION OF EXISTING UTILITIES, STRUCTURES, STREETS, AND ALL SITE SPECIFIC ITEMS PROVIDED BY FIELD RUN SURVEY PERFORMED BY MORRIS & RITCHIE, ASSOCIATES DATED NOVEMBER 5, 1999.

OWNER/DEVELOPER
A. NAME: Doug Eshelman B. DAYTIME TELEPHONE: 410-712-7012 FAX NO.: 410-712-9864
C. COMPANY: Ryland Homes
D. ADDRESS: 7250 Parkway Drive; Suite 520
E. CITY: Hanover STATE: MD ZIP: 21076

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND
P+Z
Cindy Ranatta 3/8/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND PIERO VAN MELLITS No. 21875 REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS 21875

DES:	TCN/CAO
DRN:	TCN/CAO
CHK:	PVM
DATE:	12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD & STORM DRAIN PLANS TITLE SHEET

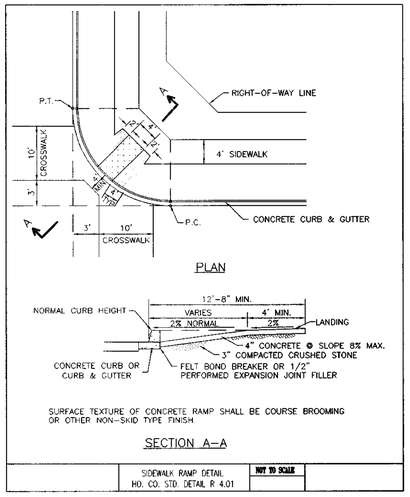
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

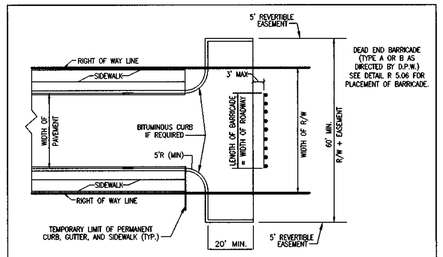
SCALE AS SHOWN

SHEET 1 OF 20

F-01-22



SIDEWALK RAMP DETAIL
HO. CO. STD. DETAIL R 4.01
NOT TO SCALE



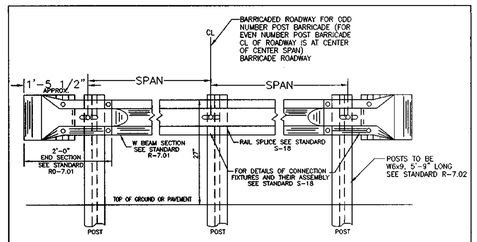
NOTES:

1. A TEE TURNAROUND SHALL BE USED IN LIEU OF A CUL-DE-SAC ONLY IF THE STREET IS TO BE EXTENDED IN THE FUTURE
2. BITUMINOUS CURB SHALL EXTEND AROUND THE TEE TURNAROUND IF AND AS REQUIRED TO CONTROL CURB DRAINAGE FROM THE ROADWAY SECTION.
3. REFER TO STANDARD R-5.06 FOR TYPICAL ROADWAY PROFILE OF TEMPORARY LIMIT OF PAVING.

* PROVIDE REVERTIBLE EASEMENT FOR CONSTRUCTION

4. PROVIDE EASEMENTS AS REQUIRED FOR PLACEMENT OF PAVEMENT BARRICADE AND ANY NECESSARY GRADING (SEE DETAIL R 5.06)

TEE TURN-AROUND
HO. CO. STD. DETAIL R 5.05
NOT TO SCALE

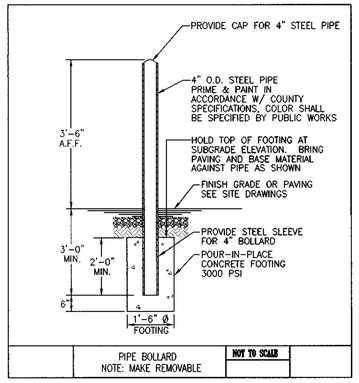


MINIMUM NUMBER OF SPANS - 2
MINIMUM NUMBER OF POSTS - 3
MAXIMUM SPAN: 12'-6"
ALL SPANS TO BE EQUAL LENGTH.
LENGTH OF BARRICADE NOTED ON PLANS REFERS TO DISTANCE FROM CENTER TO CENTER ENDPOSTS.

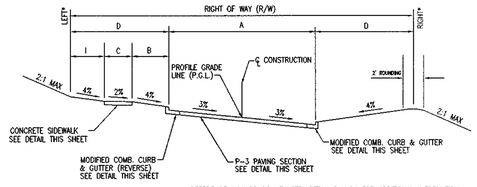
GUARDRAIL W BEAM BARRICADE SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT. THE CONTRACT PRICE BID SHALL INCLUDE THE FURNISHING AND INSTALLATION OF ALL POSTS, W BEAM, POST AND SPLICE BOLTS WITH NUTS, END SECTIONS, GALVANIZING, THE COST OF EXCAVATION, BACKFILLING AND TAMPING INCIDENTAL TO SETTING THE POSTS, OR THE COST OF DRIVING THE POSTS, THE COST OF THE REMOVAL OF EXISTING PAVEMENT WHERE NECESSARY, AS WELL AS THE COST OF LABOR, APPROVED TOOLS AND EQUIPMENT INCIDENTAL TO FURNISHING AND INSTALLING THE BARRICADE AT LOCATIONS NOTED ON THE PLANS OR WHERE DIRECTED BY THE ENGINEER.

PROVIDE REFLECTIVE STRIPPING (RED AND WHITE)

DEAD END BARRICADE
HO. CO. STD. DETAIL R 7.12
NOT TO SCALE



PIPE BOLLARD
NOTE: MAKE REMOVABLE
NOT TO SCALE



REFERENCE HOWARD COUNTY STD. DETAIL R-1.01 FOR ADDITIONAL INFORMATION

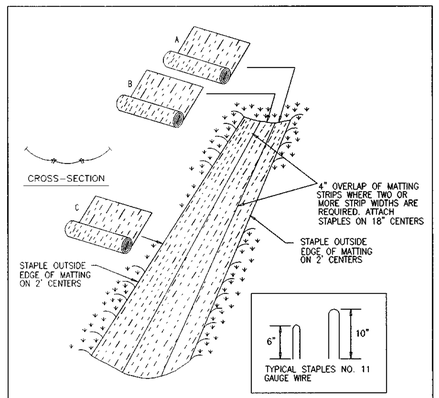
CLASSIFICATION		A	B	C	D	I	R / W
ACCESS STREET	500 ADT	24'	3.5'	4'	8'	0.5'	40'

NOTES

1. STREET TREES MAY BE PLANTED IN SPACE BETWEEN SIDEWALK AND CURB.
2. MAXIMUM SHEET FLOW ACROSS HIGH SIDE OF CURB LIMITED TO 150'.
3. SINGLE CROSS SLOPE ACROSS PAVING SECTION MAY BE USED TO SIMPLIFY DRAINAGE ON TANGENT AND CURVED SECTIONS.

* 4. DIRECTION OF VIEW IS REVERSED (LOOKING DOWN STATION) FOR SECTION 'A' ON HELEN DORSEY WAY AND CHARLES EDWARD TERRACE.

ROAD CROSS SECTION 'A'



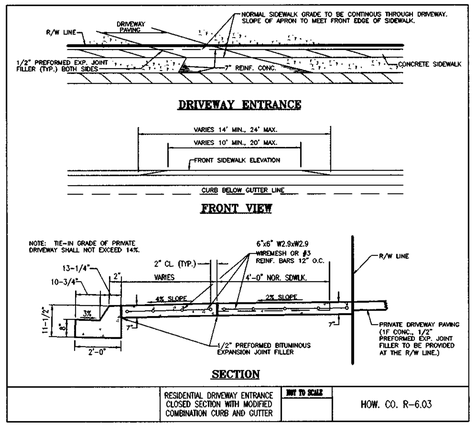
CONSTRUCTION SPECIFICATIONS

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.

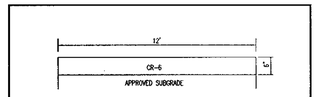
NOTE: IF FLOW WILL ENTER FROM THE EDGE OF THE MATTING THEN THE AREA EFFECTED BY THE FLOW MUST BE KEYED-IN.

NOT TO SCALE

UNITED STATES DEPARTMENT OF AGRICULTURE SOIL CONSERVATION DISTRICT	DETAIL 30 EROSION CONTROL MATTING G-22-2	MARYLAND DEPARTMENT OF THE ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

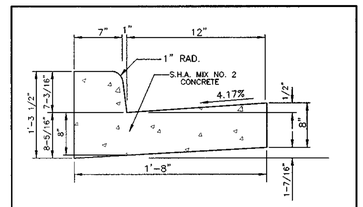


RESIDENTIAL DRIVEWAY ENTRANCE CLOSED SECTION WITH MODIFIED COMBINATION CURB AND GUTTER
NOT TO SCALE
HOW. CO. R-6.03



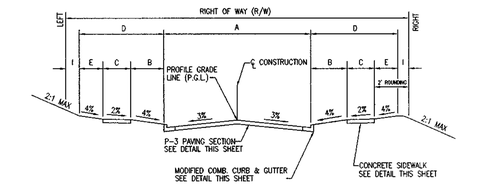
6" LAYER OF GR-6 STONE TO BE PLACED OVER MIRAFI 700-X FILTER CLOTH OR EQUIVALENT.

SWM POND ACCESS DRIVE TYPICAL SECTION
NOT TO SCALE



FOR ADDITIONAL DETAILS SEE HOWARD COUNTY STANDARD DETAIL R-3.01
STANDARD CURB TO BE USED ONLY FOR GUTTER TRANSITION FOR STORM DRAIN INLETS AND FOR OAKLAND MILLS ROAD IMPROVEMENTS.
SEE GUTTER TRANSITION DETAIL THIS SHEET.

STANDARD CURB & GUTTER
NOT TO SCALE
HOW. CO. R-3.01



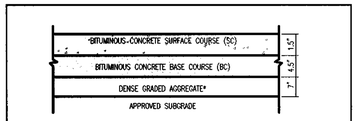
REFERENCE HOWARD COUNTY STD. DETAIL R-1.01 FOR ADDITIONAL INFORMATION

CLASSIFICATION		A	B	C	D	E	I	R / W
ACCESS STREET	500 ADT- 1000 ADT	24'	7'	4'	12'	1'	1'	40'

NOTES

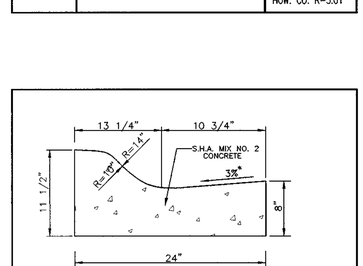
1. STREET TREES MAY BE PLANTED IN SPACE BETWEEN SIDEWALK AND CURB.

ROAD CROSS SECTION 'B'



* DENSE GRADED AGGREGATE TO BE PLACED AND COMPACTED IN 6" MAXIMUM COMPACTED THICKNESS LAYERS.
SEE HOWARD COUNTY STD. DETAIL R-2.01 FOR ADDITIONAL INFORMATION.

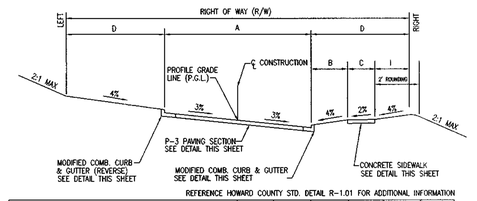
P-3 PAVING SECTION
NOT TO SCALE
HOW. CO. R-2.01



FOR ADDITIONAL DETAILS SEE HOWARD COUNTY STANDARD DETAIL R-3.01

* GUTTER PAN AT HIGH SIDE OF SUPERELEVATED SECTIONS SHALL BE SLOPED AT THE SAME RATE AND IN THE SAME DIRECTION AS PAVEMENT. MATCH PAVEMENT CROSS SLOPE WHEN CURB IS LOCATED ON THE LOW SIDE OF SUPERELEVATED SECTION AND THE RATE OF SUPERELEVATION IS GREATER THAN 3%.

MODIFIED CURB & GUTTER
NOT TO SCALE
HOW. CO. R-3.01



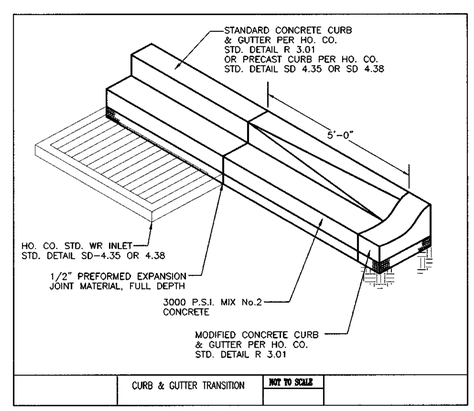
REFERENCE HOWARD COUNTY STD. DETAIL R-1.01 FOR ADDITIONAL INFORMATION

CLASSIFICATION		A	B	C	D	I	R / W
ACCESS STREET	500 ADT	24'	3.5'	4'	8'	0.5'	40'

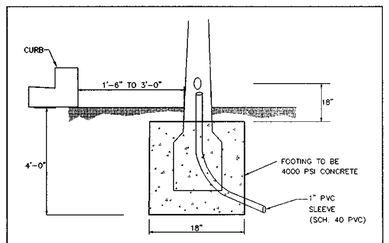
NOTES

1. STREET TREES MAY BE PLANTED IN SPACE BETWEEN SIDEWALK AND CURB.
2. MAXIMUM SHEET FLOW ACROSS HIGH SIDE OF CURB LIMITED TO 150'.
3. SINGLE CROSS SLOPE ACROSS PAVING SECTION MAY BE USED TO SIMPLIFY DRAINAGE ON TANGENT AND CURVED SECTIONS.

ROAD CROSS SECTION 'C'



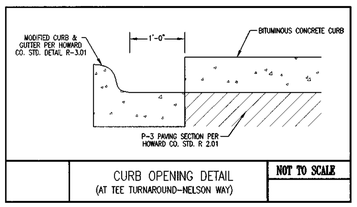
CURB & GUTTER TRANSITION
NOT TO SCALE



TYPICAL LIGHT POLE BASE

NOT TO SCALE

TYPICAL LIGHT POLE BASE
NOT TO SCALE



CURB OPENING DETAIL
(AT TEE TURNAROUND-NELSON WAY)
NOT TO SCALE

CROSS SECTION TABLE

ROAD	STATION	SECTION
HELEN DORSEY WAY	0+34.16 TO 2+07.07	SECTION B
HELEN DORSEY WAY	2+67.04 TO 6+15.58	SECTION A
NELSON WAY	0+00 TO 4+22.52	SECTION A
INA COURT	0+00 TO 2+89.13	SECTION C
CHARLES EDWARD TERRACE	0+00 TO 2+50.00	SECTION A
CHARLES EDWARD TERRACE	3+00.00 TO 13+24.35	SECTION C

TRANSITION TABLE

ROAD	STATION	SECTION CHANGE	R/W WIDTH
HELEN DORSEY WAY	2+07.04 TO 2+67.04	SECTION 'B' TO SECTION 'A'	50' TO 40'
CHARLES EDWARD TERRACE	2+50.00 TO 3+00.00	SECTION 'A' TO SECTION 'C'	NO CHANGE

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

P+2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Andrew M. Doucke 3-8-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND
PIERO VAN MELLITS
No. 21875
REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS No. 21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD AND STORM DRAIN PLANS ROAD & SITE DETAILS

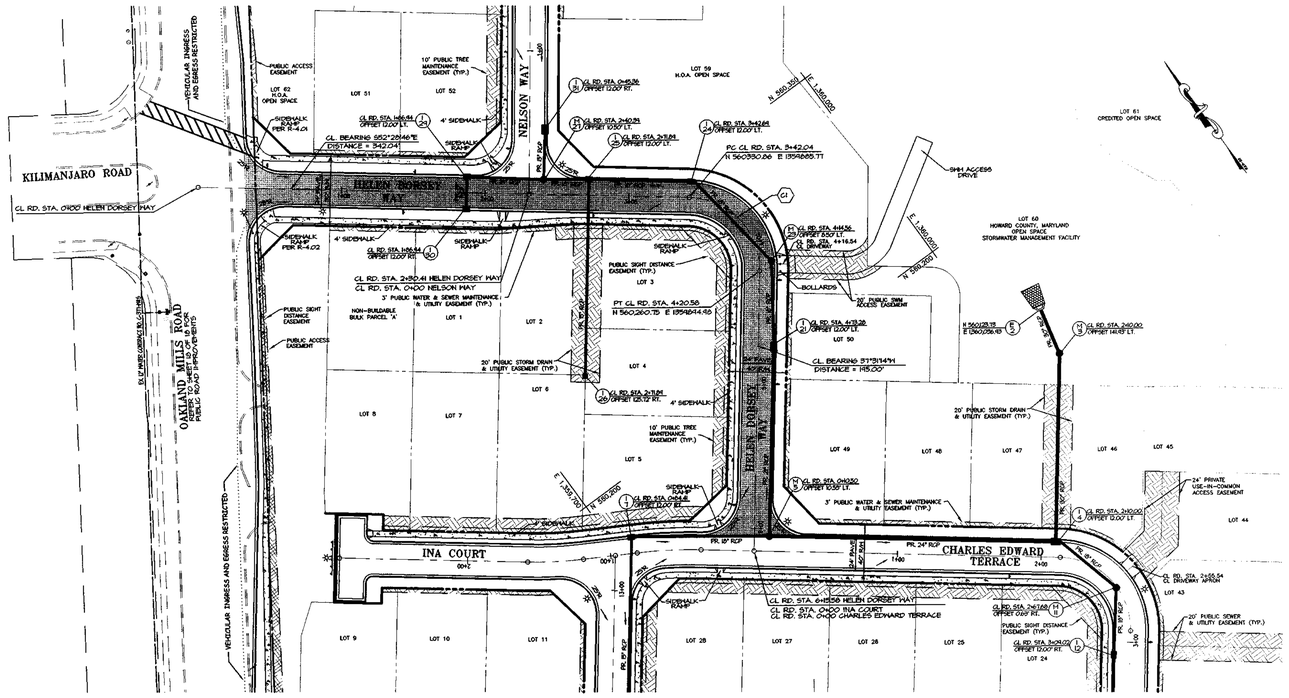
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 2 OF 20

F0122



PLAN VIEW- HELEN DORSEY WAY

SCALE: 1"=50'

CURB TRANSITION TABLE FOR HELEN DORSEY WAY

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
0+51.40 TO 0+56.40	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	N/A	418.84 / 418.49	FROM PT-RETURN
0+57.17 TO 0+62.17	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	N/A	418.73 / 418.37	FROM PT-RETURN
1+79.54 TO 1+84.54	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-30	412.84 / 412.83	TRANSITION TO INLET
1+89.34 TO 1+94.34	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-30	412.59 / 412.09	TRANSITION FROM INLET
1+79.54 TO 1+84.54	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-29	412.84 / 412.83	TRANSITION TO INLET
1+89.34 TO 1+94.34	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-29	412.59 / 412.09	TRANSITION FROM INLET
1+96.76 TO 2+01.76	12.3'/13.6' LT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	411.97 / 411.75	* AT CURB RETURN
2+34.54 TO 2+39.54	12' RIGHT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	410.78 / 410.50	*
2+64.49 TO 2+69.49	12.1'/12.0' LT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-25	409.18 / 409.26	TRANSITION TO INLET
2+74.29 TO 2+79.29	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-25	409.07 / 408.59	TRANSITION FROM INLET
3+35.42 TO 3+40.42	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-24	406.34 / 406.42	TRANSITION TO INLET
3+45.22 TO 3+50.22	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-24	406.23 / 405.75	TRANSITION FROM INLET
4+65.03 TO 4+70.03	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-21	403.16 / 403.41	TRANSITION TO INLET
4+76.53 TO 4+81.53	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-21	403.41 / 403.16	TRANSITION FROM INLET
5+91.26 TO 5+96.26	15.5'/19.3' RT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	406.20 / 406.46	* AT CURB RETURN

NOTES:
1. ALL ELEVATIONS ARE TOP OF CURB AND CORRESPOND TO STATION TRANSITIONS.
2. SEE CROSS SECTION TABLES SHEET 2 OF 18 FOR TYPICAL SECTIONS.

* CURB TRANSITION IS REQUIRED FOR PAVEMENT SECTION TRANSITION.

CROSS SECTION TABLE

ROAD	STATION	SECTION
HELEN DORSEY WAY	0+34.16 TO 2+07.04	SECTION B
HELEN DORSEY WAY	2+67.04 TO 6+15.58	SECTION A

TRANSITION TABLE

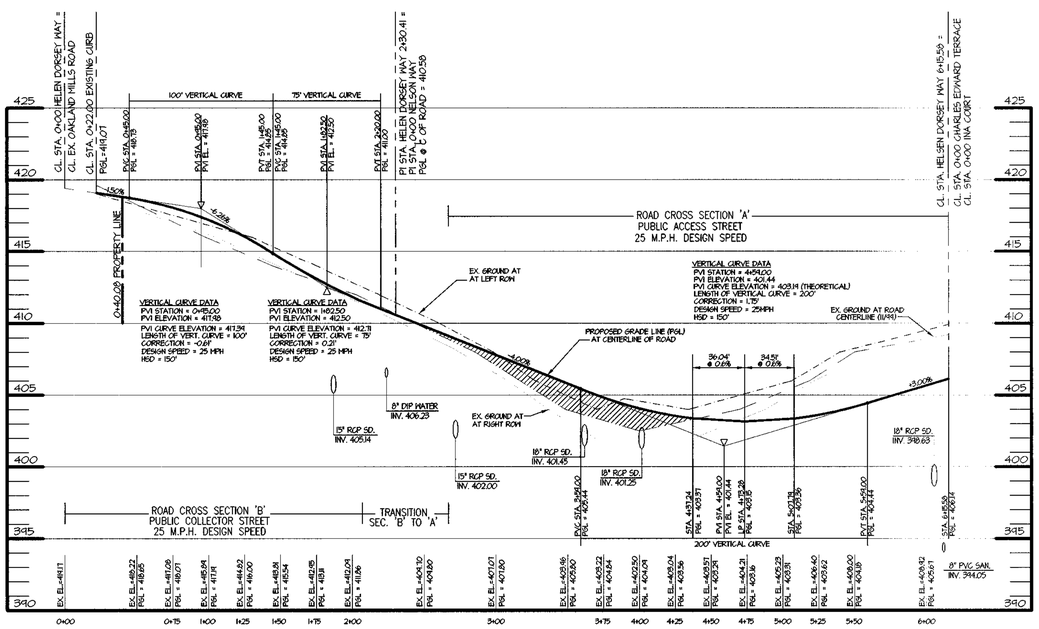
ROAD	STATION	SECTION CHANGE	R/W WIDTH
HELEN DORSEY WAY	2+07.04 TO 2+67.04	SECTION 'B' TO SECTION 'A'	50' TO 40'

CENTERLINE CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	CHORD LENGTH	BEARING	DELTA
C1	50'	78.54'	50'	70.71'	S07°28'46"E	90°00'00" RIGHT

SPEED CONTROL DEVICES

ROAD	LENGTH	# OF DEVICES REQUIRED	# OF DEVICES PROVIDED	TYPE	MIN. DEFLECTION REQUIRED	MIN. DEFLECTION PROVIDED
HELEN DORSEY WAY	615.58'	1	1	AXIAL SHIFT/CRITICAL BEND	60'	90'



PROFILE - HELEN DORSEY WAY

HOR. 1" = 50'
VERT. 1" = 5'

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.

DEPARTMENT OF ~~PUBLIC WORKS~~, HOWARD COUNTY, MARYLAND
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/5/01

DEPARTMENT OF PUBLIC WORKS, HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING, HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

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

STATE OF MARYLAND — PIERO VAN MELLITS — No. 21875 — REGISTERED PROFESSIONAL ENGINEER — 01-01

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD AND STORM DRAIN PLANS HELEN DORSEY WAY

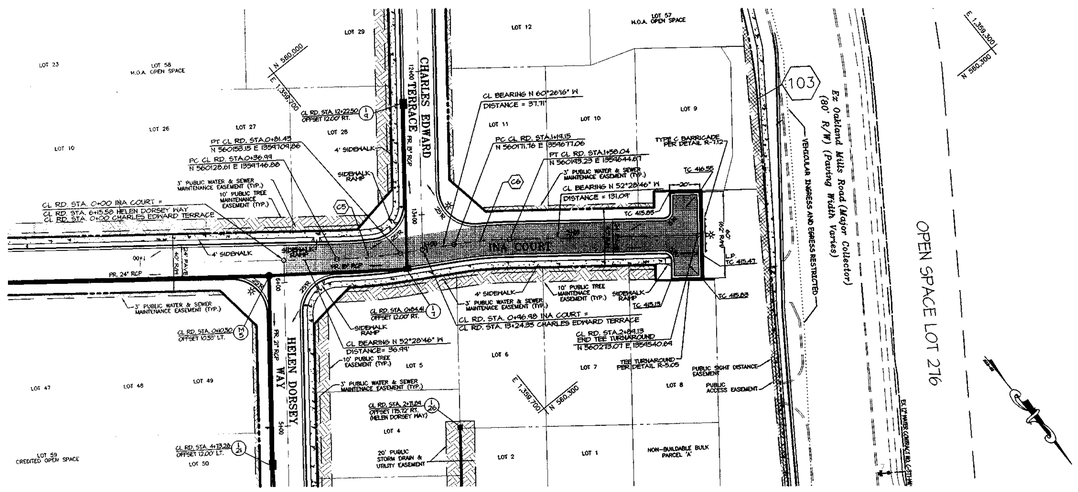
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

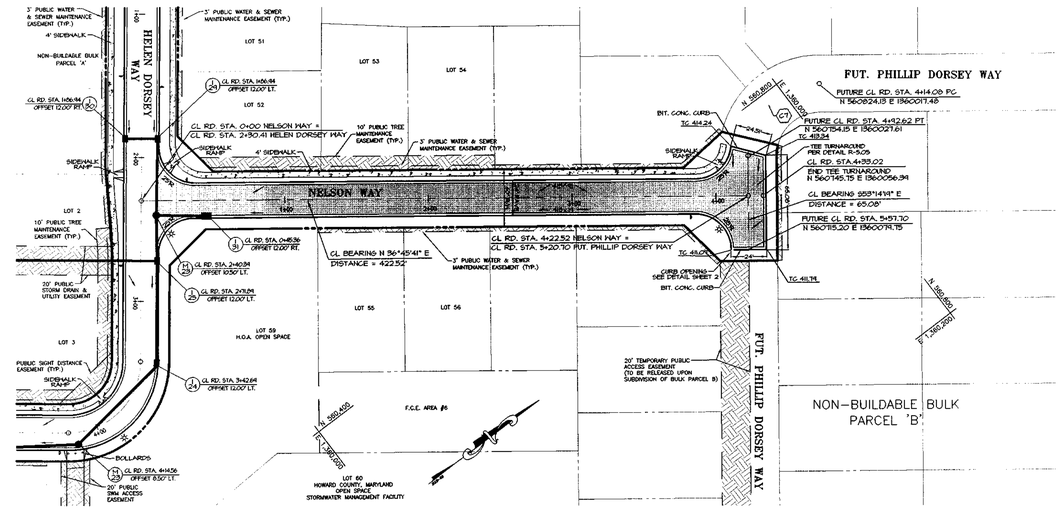
SCALE 1"=50'

SHEET 3 OF 20

F01 22



PLAN VIEW- INA COURT
SCALE: 1"=50'



PLAN VIEW- NELSON WAY
SCALE: 1"=50'

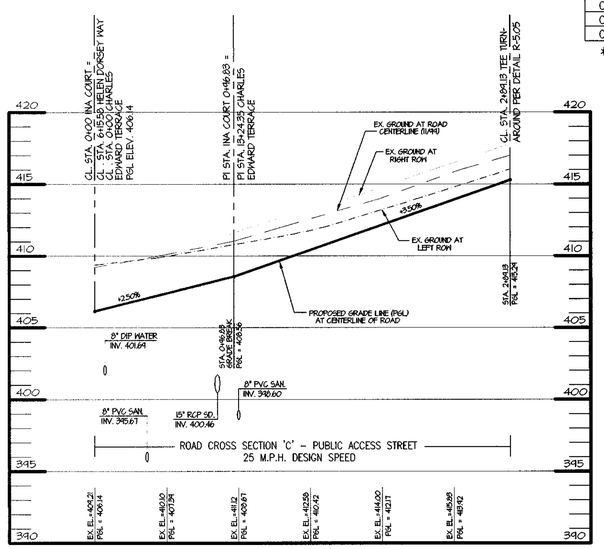
CENTERLINE CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	CHORD LENGTH	BEARING	DELTA	REMARKS
C5	320'	44.45'	22.26'	44.41'	N56°27'31"W	7°57'30" LEFT	
C6	280'	38.89'	19.48'	38.86'	N56°27'31"W	7°57'30" RIGHT	
C7	50'	78.54'	50.00'	70.71'	S08°14'19"E	90°00'00" LEFT	*

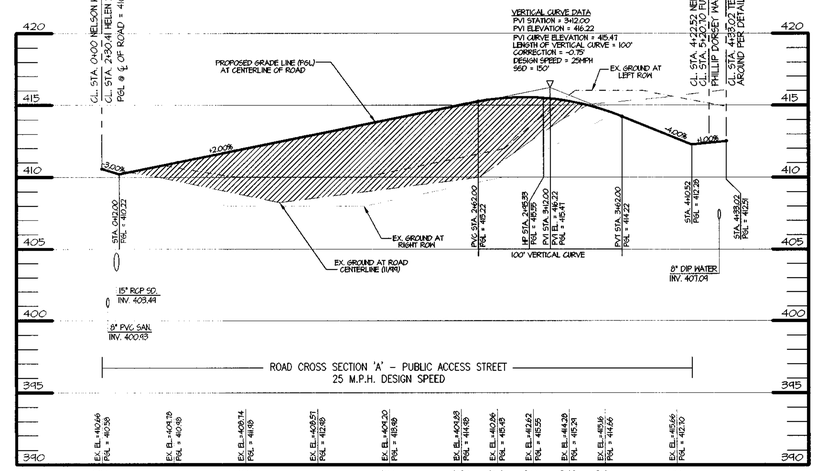
* FUTURE CL CURVE TO BE BUILT UNDER PHASE II ROAD PLANS

SPEED CONTROL DEVICES

ROAD	LENGTH	# OF DEVICES REQUIRED	# OF DEVICES PROVIDED	TYPE	MIN. DEFLECTION REQUIRED	MIN. DEFLECTION PROVIDED
INA COURT	269.13'	–	–	–	–	–
NELSON WAY	422.52'	–	–	INTERSECTIONS W/ STOP SIGNS < 400' APART	–	–



PROFILE - INA COURT
HOR. 1" = 50'
VERT. 1" = 5'



PROFILE - NELSON WAY
HOR. 1" = 50'
VERT. 1" = 5'

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.

CURB TRANSITION TABLE FOR INA COURT

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
0+57.51 TO 0+62.51	12' LEFT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	408.25 / 408.38	*
0+76.85 TO 0+81.85	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-7	408.02 / 408.42	TRANSITION TO INLET
0+86.65 TO 0+91.65	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-7	408.55 / 408.39	TRANSITION FROM INLET
2+71.00 (HAMMERHEAD)	29.5' RIGHT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	415.13	*

NOTES:
1. ALL ELEVATIONS ARE TOP OF CURB AND CORRESPOND TO STATION TRANSITIONS.
2. SEE CROSS SECTION TABLES SHEET 2 OF 18 FOR TYPICAL SECTIONS
* CURB TRANSISTION IS REQUIRED FOR PAVEMENT SECTION TRANSITION.

CROSS SECTION TABLE

ROAD	STATION	SECTION
INA COURT	0+00 TO 2+89.13	SECTION C
NELSON WAY	0+00 TO 4+33.02	SECTION A

CURB TRANSITION TABLE FOR NELSON WAY

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
0+37.11 TO 0+42.11	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-31	410.68 / 411.06	TRANSITION TO INLET
0+48.61 TO 0+53.61	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-31	411.19 / 411.01	TRANSITION FROM INLET
4+34.52 (HAMMERHEAD)	28' LEFT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	413.34	*
4+34.52 (HAMMERHEAD)	5.6' LT/0.6' LT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	412.90 / 412.78	*
4+34.52 (HAMMERHEAD)	37' RIGHT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	411.79	*

NOTES:
1. ALL ELEVATIONS ARE TOP OF CURB AND CORRESPOND TO STATION TRANSITIONS.
2. SEE CROSS SECTION TABLES SHEET 2 OF 18 FOR TYPICAL SECTIONS
* CURB TRANSISTION IS REQUIRED FOR PAVEMENT SECTION TRANSITION.

DEPARTMENT OF ~~PUBLIC WORKS~~ DPZ
HOWARD COUNTY, MARYLAND
Cindy Hamilton 2/8/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
Andrew M. Duble 3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND PIERO VAN HELLITS No. 21875 REGISTERED PROFESSIONAL ENGINEER 12/21/00
PIERO VAN HELLITS No. 21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD AND STORM DRAIN PLANS NELSON WAY & INA COURT

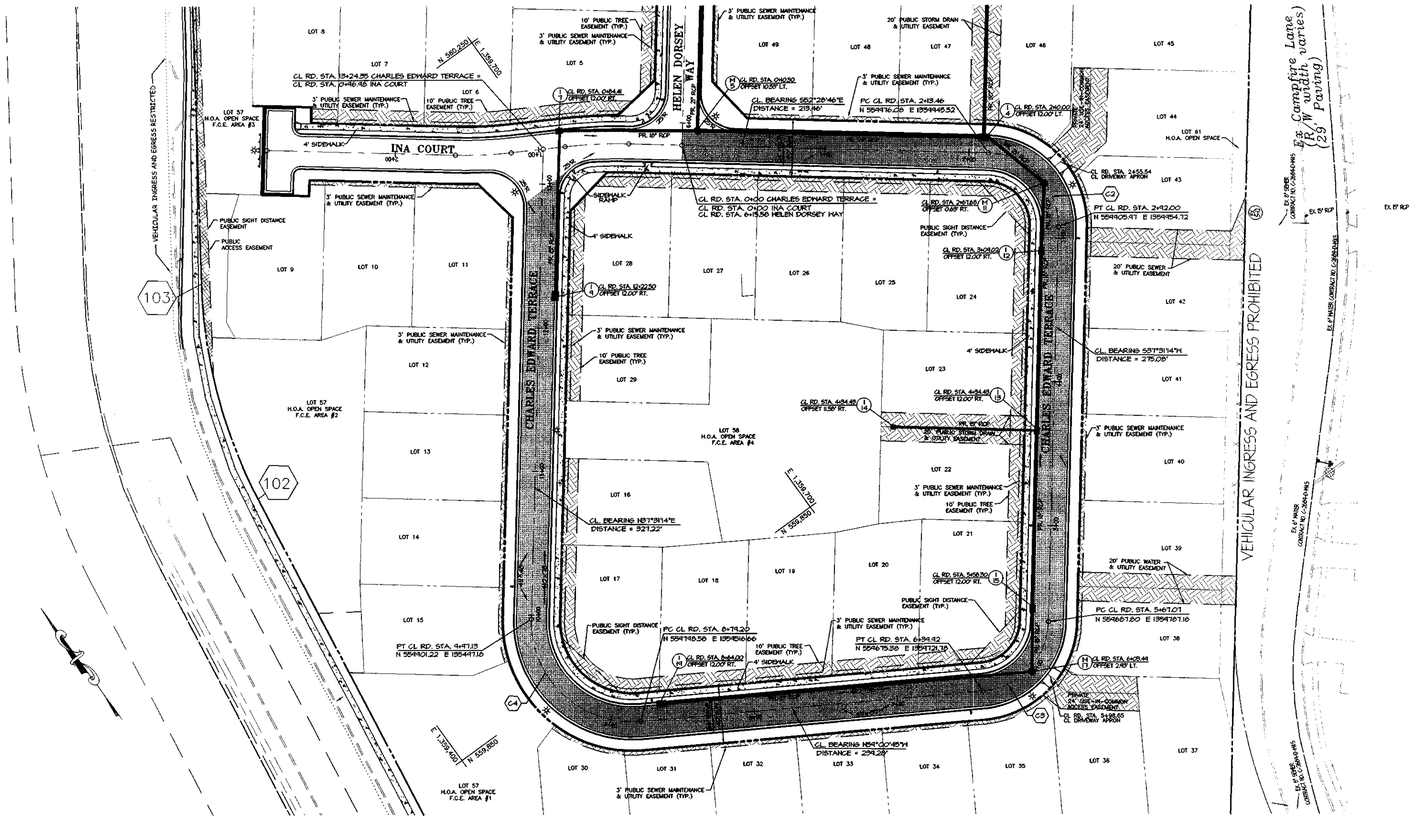
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=50'

SHEET 4 OF 20

F01 22



PLAN VIEW- CHARLES EDWARD TERRACE

SCALE: 1"=50'

CURB TRANSITION TABLE CHARLES EDWARD TERRACE

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
2+01.75 TO 2+06.75	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-3	401.57 / 401.82	TRANSITION TO INLET
2+13.25 TO 2+18.25	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-3	401.82 / 401.57	TRANSITION FROM INLET
2+72.50 TO 2+77.50	12' RIGHT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	--	402.70 / 402.68	*
2+72.50 TO 2+77.50	12' LEFT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	--	402.78 / 402.61	*
3+01.42 TO 3+06.42	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-12	402.83 / 403.20	TRANSITION TO INLET
3+11.22 TO 3+16.22	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-12	403.29 / 403.11	TRANSITION FROM INLET
4+27.03 TO 4+32.03	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-13	405.24 / 405.61	TRANSITION TO INLET
4+36.83 TO 4+41.83	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-13	405.71 / 405.52	TRANSITION FROM INLET
5+50.89 TO 5+55.89	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-15	407.62 / 407.99	TRANSITION TO INLET
5+60.69 TO 5+65.69	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-15	408.09 / 407.90	TRANSITION FROM INLET
8+55.75 TO 8+60.75	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-19	408.92 / 409.14	TRANSITION TO INLET
8+67.25 TO 8+72.25	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-19	409.14 / 408.92	TRANSITION FROM INLET
12+14.25 TO 12+19.25	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-9	407.81 / 408.03	TRANSITION TO INLET
12+25.75 TO 12+30.75	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-9	408.03 / 407.81	TRANSITION FROM INLET

NOTES:
1. ALL ELEVATIONS ARE TOP OF CURB AND CORRESPOND TO STATION TRANSITIONS.
2. SEE CROSS SECTION TABLES SHEET 2 OF 18 FOR TYPICAL SECTIONS

* CURB TRANSISTION IS REQUIRED FOR PAVEMENT SECTION TRANSITION.

TRANSITION TABLE

ROAD	STATION	SECTION CHANGE	R/W WIDTH
CHARLES EDWARD TERRACE	2+50.00 TO 3+00.00	SECTION 'A' TO SECTION 'C'	NO CHANGE

CROSS SECTION TABLE

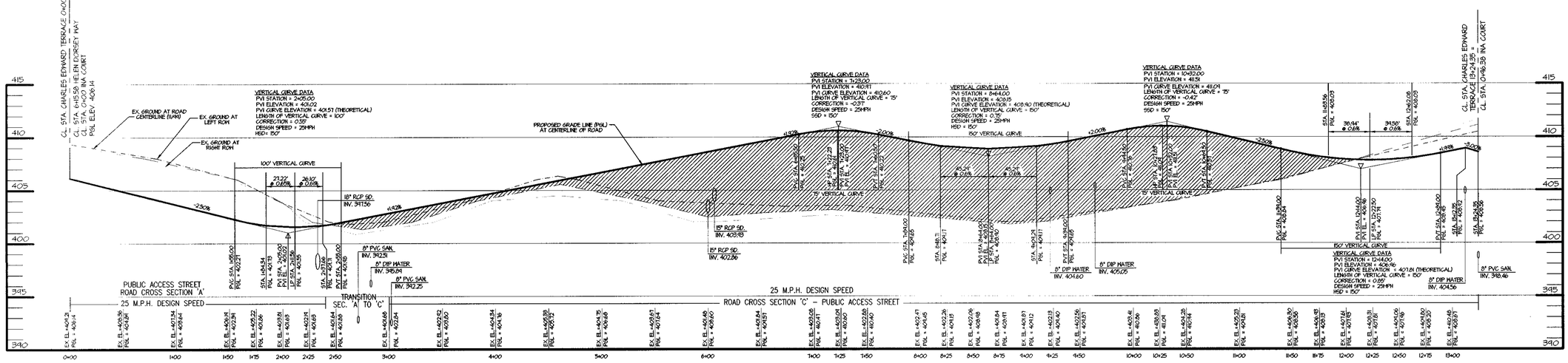
ROAD	STATION	SECTION
CHARLES EDWARD TERRACE	0+00 TO 2+50.00	SECTION A
CHARLES EDWARD TERRACE	3+00.00 TO 13+24.35	SECTION C

CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	CHORD LENGTH	BEARING	DELTA
C2	50'	78.54'	50'	70.71'	S07°28'46"E	90°00'00" RIGHT
C3	50'	72.84'	44.60'	66.57'	S79°15'14"W	83°28'01" RIGHT
C4	70'	117.94'	78.47'	104.47'	N10°44'46"W	96°31'59" RIGHT

SPEED CONTROL DEVICES

ROAD	LENGTH	# OF DEVICES REQUIRED	# OF DEVICES PROVIDED	TYPE	MIN. DEFLECTION REQUIRED	MIN. DEFLECTION PROVIDED
CHARLES EDWARD TERRACE	1,324.35'	3	3	AXIAL SHIFT/CRITICAL BEND	60"	83"



CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.

CHARLES EDWARD TERRACE

HOR. 1" = 50'
VERT. 1" = 5'

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

Cindy Hewitt 3/5/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

P42

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Andrew M. Doucle 3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND — PIERO VAN NELLITS — REGISTERED PROFESSIONAL ENGINEER — No. 21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD AND STORM DRAIN PLANS
CHARLES EDWARD TERRACE

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=50'

SHEET 5 OF 20

F01 22

STREET TREE PLANT LIST

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
CANOPY TREES					
CT-1	5	Acer rubrum 'RED SUNSET'	Red Sunset Red Maple	2½" - 3" cal.	B&B
CT-5	56	Quercus phellos	Willow Oak	2½" - 3" cal.	B&B
CT-7	37	Zelkova serrata 'VILLAGE GREEN'	Village Green Zelkova	2½" - 3" cal.	B&B
FLOWERING TREES					
FT-3	11	Prunus serrulata 'KWANZAN'	Kwanzan Cherry	1½" - 2" cal.	B&B

NOTE: TREE SPACING:

A MINIMUM SPACING OF 20'-0" SHALL BE MAINTAINED BETWEEN ANY STREET LIGHT AND ANY TREE.

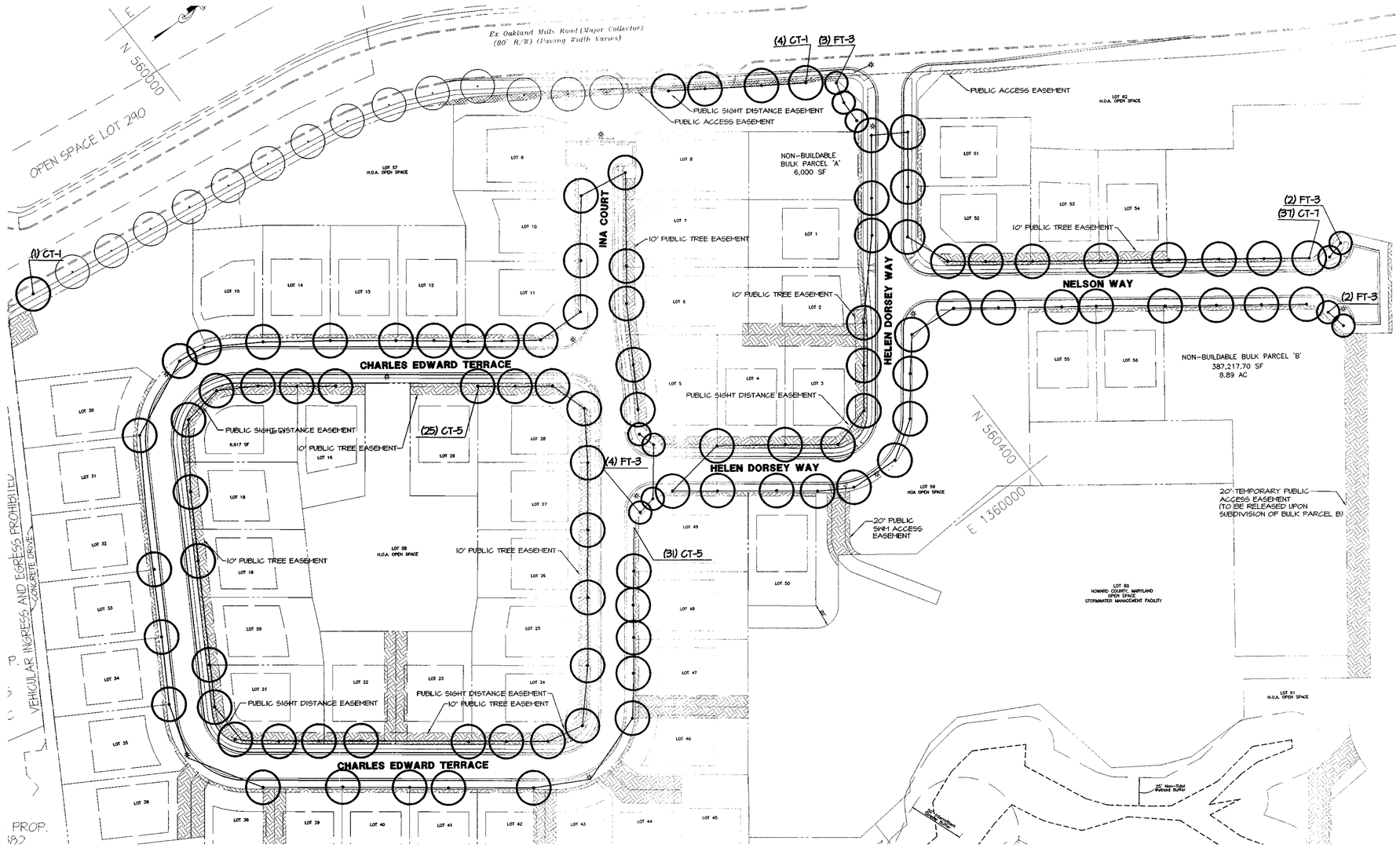
1. ALL PLANT MATERIAL SHALL CONFORM TO HOWARD COUNTY AND "USDA STANDARD FOR NURSERY STOCK", LATEST EDITION.
2. TREES TO BE PLACED A MINIMUM OF 4 FEET BEHIND CURB.
3. SEE GENERAL NOTES ON SHEET 13 FOR ALL LANDSCAPE PLANTING SPECIFICATIONS.

STREET LIGHTING SCHEDULE

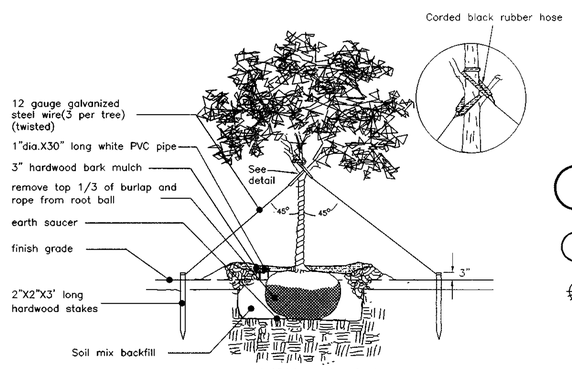
STREET NAME	STATION	OFFSET	DIRECTION
HELEN DORSEY WAY	0+38	31'	RIGHT
HELEN DORSEY WAY	0+87	15'	RIGHT
HELEN DORSEY WAY	3+89	16'	LEFT
HELEN DORSEY WAY	2+53	21'	LEFT
NELSON WAY	4+02	23'	RIGHT
INA COURT	2+98	@ ℄ 9'	STRAIGHT
CHARLES EDWARD TERR.	0+23	21'	LEFT
CHARLES EDWARD TERR.	2+69	16'	LEFT
CHARLES EDWARD TERR.	6+13	16'	LEFT
CHARLES EDWARD TERR.	9+39	16'	LEFT
CHARLES EDWARD TERR.	11+29	15'	RIGHT
CHARLES EDWARD TERR.	12+94	19'	LEFT

NOTES: 1. STREET LIGHTING TO BE INSTALLED BY BGE ACCORDING TO SCHEDULE ABOVE AND STREET LIGHT LOCATIONS AS SHOWN ON THESE PLANS.

2. STREET LIGHT PLACEMENT AND THE TYPE OF FIXTURE AND POLE USED SHALL BE IN ACCORDANCE WITH THE HOWARD COUNTY DESIGN MANUAL, VOLUME III (1993) AND AS MODIFIED BY "GUIDELINES FOR STREET LIGHTS IN RESIDENTIAL DEVELOPMENTS" (JUNE 1993).



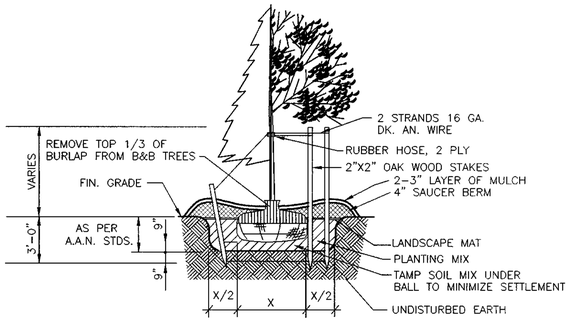
PLAN VIEW
SCALE: 1"=50'



GUYING DETAIL
NOT TO SCALE

LEGEND

- DECIDUOUS TREES
- FLOWERING TREES
- EVERGREEN TREES
- SHRUBS
- STREET LIGHT



SHADE, FLOWERING OR EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND
Cindy Burnham 3/5/01
CHIEF, DIVISION OF LAND DEVELOPMENT DATE

Pg 2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND DEAN WESLEY MEYER No. 20030 REGISTERED LANDSCAPE ARCHITECT
2-22-01
DEAN W. MEYER #200030

DES: TCN/CAO
DRN: TCN/CAO
CHK: DWM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
STREET TREE PLAN, PLANTING DETAILS, & LIGHTING SCHEDULE

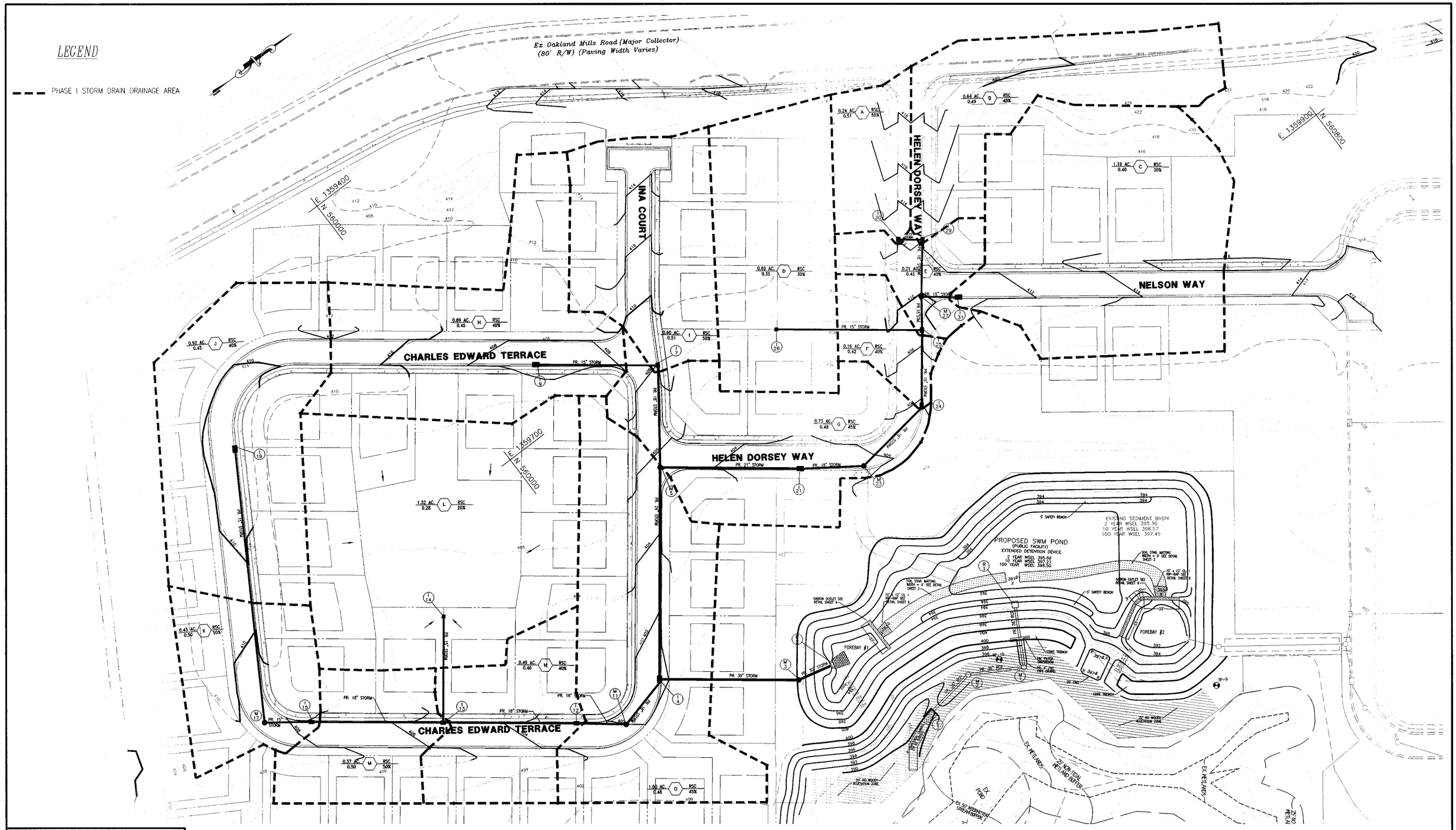
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 6 OF 20

F0122



NOTE: THIS PLAN IS NOT FOR GRADING INFORMATION. REFER TO THE FINAL GRADING & SEDIMENT CONTROL PLAN FOR GRADING INFORMATION.

P+2

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Andrew M. Daniels 3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND
PIERO VAN WELLITS
No. 21675
REGISTERED PROFESSIONAL ENGINEER
PIERO VAN WELLITS REG. NO. 21675

DES:	TCN/CAO
DRN:	TCN/CAO
CHK:	PVM
DATE:	12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
STORM DRAIN
DRAINAGE AREA MAP

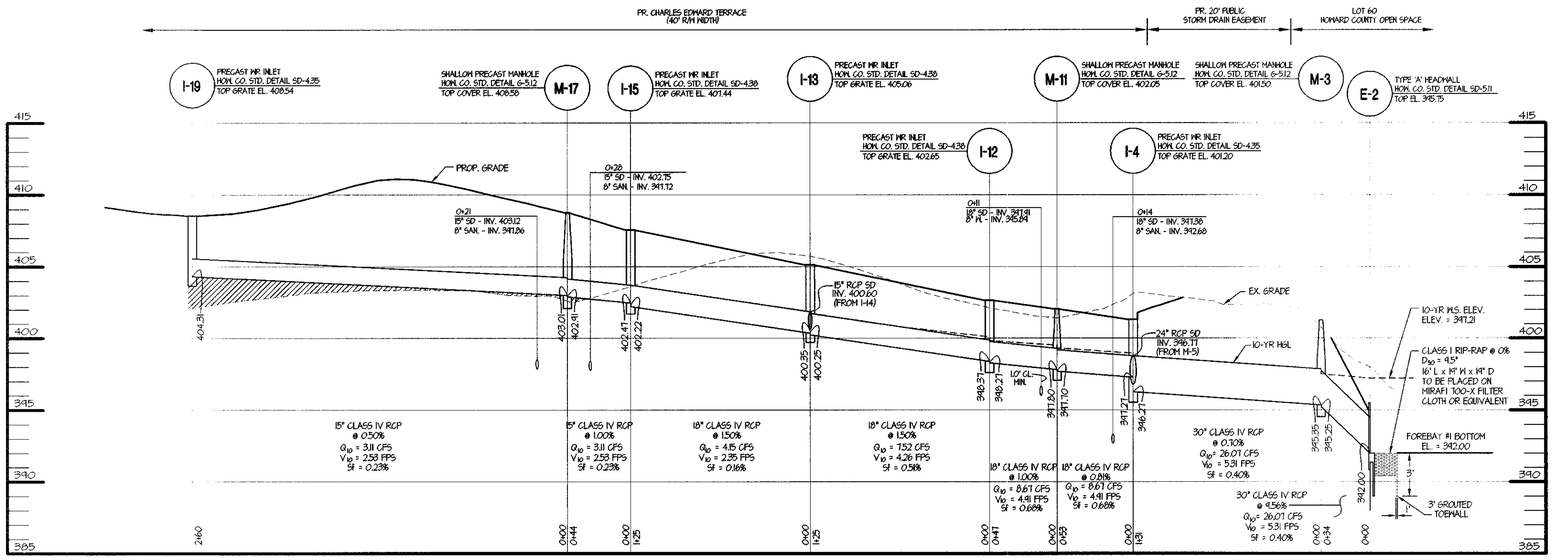
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=40'

SHEET 7 OF 20

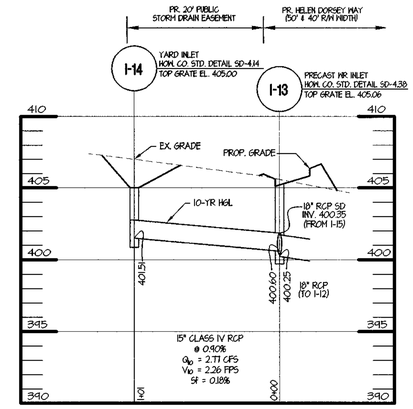
F0122



STORM DRAIN PROFILE

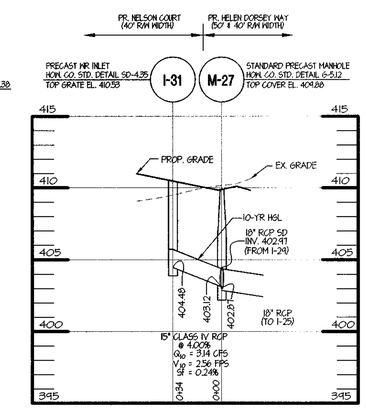
HOR. 1" = 50'
VERT. 1" = 5'

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T-180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.



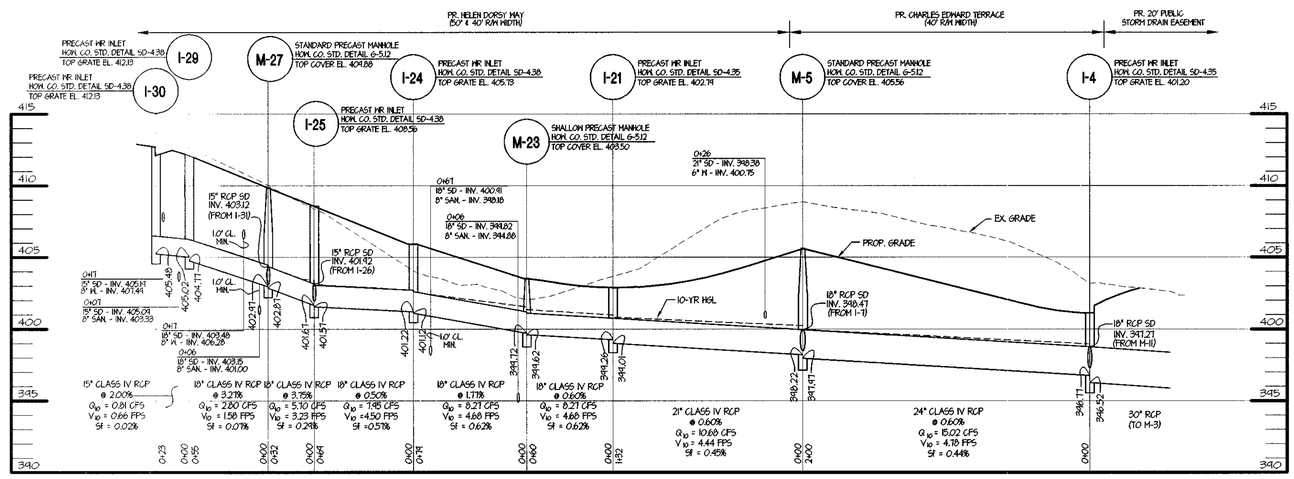
STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



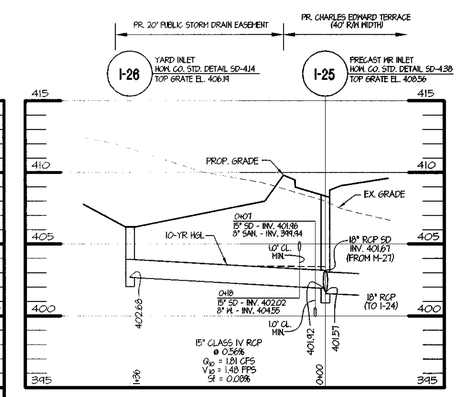
STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



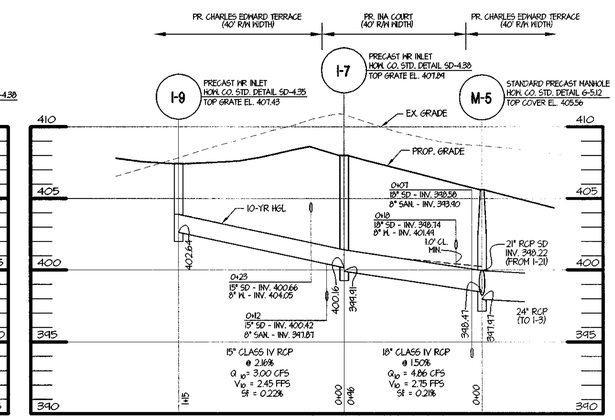
STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

● COORDINATES TO CENTER OF STRUCTURE AT FACE OF CURB FOR INLETS, CENTER OF STRUCTURE FOR MANHOLES AND YARD INLETS

* TOP OF GRATE ELEVATION AT CENTER OF STRUCTURE AT FACE OF CURB. MANHOLE AND YARD INLET ELEVATIONS ARE AT CENTER OF RIM AND GRATE

STORM DRAIN PIPE SCHEDULE

SIZE	TYPE	LENGTH
15"	RCP CL IV	713'
18"	RCP CL IV	741'
21"	RCP CL IV	132'
24"	RCP CL IV	200'
30"	RCP CL IV	162'

STORM DRAIN STRUCTURE SCHEDULE

STR NO.	TOP ELEV	INV IN	INV IN	INV OUT	TYPE	REMARKS	● LOCATION NORTHING	EASTING
E-2	395.75	---	---	392.00	TYPE 'A' HEADWALL HOW. CO. STD. DETAIL SD-5.11		560,123.73	1,360,036.93
M-3	401.50	395.35	---	395.25	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		560,090.76	1,360,029.21
I-4	* 401.20	397.27	396.77	396.27	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		559,987.66	1,359,950.14
M-5	405.56	398.47	398.22	397.97	PRECAST MANHOLE HOW. CO. STD. DETAIL G-5.12		560,108.04	1,359,790.95
I-7	* 407.89	400.16	---	399.91	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,165.02	1,359,713.25
I-9	* 407.43	---	---	402.64	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		560,072.66	1,359,643.95
M-11	402.05	397.80	---	397.70	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		559,936.00	1,359,964.43
I-12	* 402.65	398.37	---	398.27	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		559,899.79	1,359,934.84
I-13	405.06	400.60	400.35	400.25	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		559,800.31	1,359,858.46
I-14	* 405.00	---	---	401.51	YARD INLET HOW. CO. STD. DETAIL SD-4.14		559,860.97	1,359,779.47
I-15	* 407.44	402.47	---	402.22	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		559,702.08	1,359,783.02
M-17	408.58	403.01	---	402.91	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		559,666.24	1,359,757.40
I-19	* 408.54	---	---	404.31	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		559,801.04	1,359,535.86
I-21	* 402.79	399.26	---	399.01	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		560,211.64	1,359,872.39
M-23	403.50	399.72	---	399.62	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		560,261.40	1,359,905.67
I-24	* 405.73	401.22	---	401.12	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,339.85	1,359,893.76
I-25	* 408.56	401.67	401.92	401.57	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,381.11	1,359,837.43
I-26	406.19	---	---	402.68	YARD INLET HOW. CO. STD. DETAIL SD-4.14		560,273.78	1,359,753.68
M-27	409.88	403.12	402.97	402.87	PRECAST MANHOLE HOW. CO. STD. DETAIL G-5.12		560,401.10	1,359,811.54
I-29	* 412.13	405.02	---	404.77	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,434.84	1,359,770.06
I-30	* 412.13	---	---	405.48	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,415.80	1,359,755.45
I-31	* 410.53	---	---	404.48	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		560,428.00	1,359,834.00

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

A42

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
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STATE OF MARYLAND PIERO VAN MELLITS No. 21875 REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS #21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
STORM DRAIN PROFILES
& STRUCTURE SCHEDULE

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

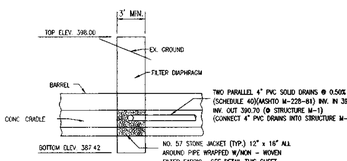
SCALE AS SHOWN

SHEET 8 OF 20

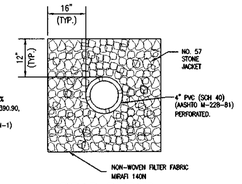
F 01 22

STORMWATER MANAGEMENT STRUCTURE SCHEDULE							● LOCATION	
STR NO.	TOP ELEV	INV IN	INV IN	INV OUT	TYPE	REMARKS	NORTHING	EASTING
R-1	398.70	---	---	390.80	CONCRETE RISER, SEE DETAIL SHEET 10		560,295.84	1,360,095.56
M-1	396.50	390.50	---	390.40	SHALLOW PRECAST MANHOLE, HOW. CO. STD. G-5.13		560,266.67	1,360,147.67
M-2	395.05	390.13	---	390.03	SHALLOW PRECAST MANHOLE, HOW. CO. STD. G-5.13		560,220.73	1,360,121.47
E-1	393.79	---	---	389.79	TYPE 'E' ENDWALL, HOW. CO. STD. DETAIL SD-5.31		560,173.93	1,360,128.75

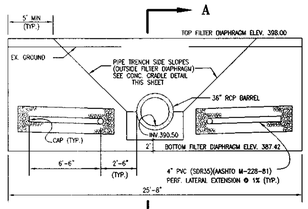
● COORDINATES TO CENTERLINE OF STRUCTURE



SECTION A-A



WRAP DETAIL

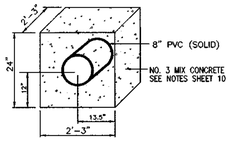


NOTES

1. FILTER MATERIAL SHALL CONFORM TO ASTM C-33 (CONCRETE SAND).
2. FILTER DIAPHRAGM SHALL BE CONSTRUCTED IN HORIZONTAL LAYERS 12 INCHES THICK (BEFORE COMPACTION).
3. EACH LAYER SHALL BE HYDROCOMPACTED USING A SPRINKLER. MATERIAL MUST BE SATURATED.
4. CARE SHALL BE TAKEN SO THAT THE FILTER MATERIAL IS NOT CONTAMINATED.
5. ANY CONTAMINATED SAND SHALL BE REMOVED AND REPLACED WITH APPROVED MATERIAL.
6. PROTECTIVE COVERING OVER THE FILTER SAND MAY BE REQUIRED BETWEEN LIFTS.
7. ELBOWS SHALL BE USED FOR PVC INTERCONNECTIONS.
8. CARE SHOULD BE TAKEN DURING INSTALLATION SO THAT THE FILTER CLOTH IS NOT TORN OR PUNCTURED DURING CONSTRUCTION.
9. PERFORATIONS FOR 4" PVC PIPE SHALL BE 3/8" IN DIAMETER, WITH 12 HOLES DRILLED PER FOOT OF PIPE. (78 TOTAL PER EACH PIPE.)
10. PERFORATIONS ARE TO BE DRILLED THROUGH BOTH SIDES OF PIPE.

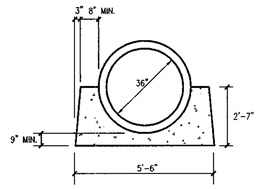
FILTER DIAPHRAGM DETAIL

NOT TO SCALE



DEWATERING DEVICE ANCHOR

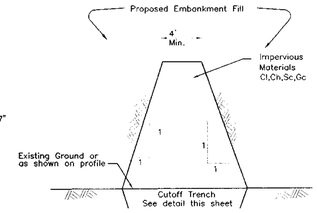
NOT TO SCALE



NOTES:
1. CRADLE TO BE CONTINUOUS ALONG PIPE.
2. CONCRETE FOR CRADLE TO BE MIX No. 3.

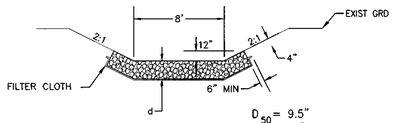
CONCRETE CRADLE DETAIL

NOT TO SCALE



CORE TRENCH

NOT TO SCALE

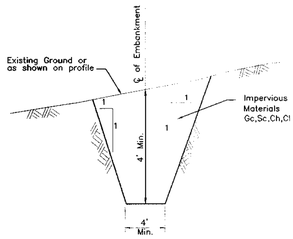


D_{50} = 9.5"
D_{MAX} = 15"
DEPTH (d) = 19"

SECTION 2-2

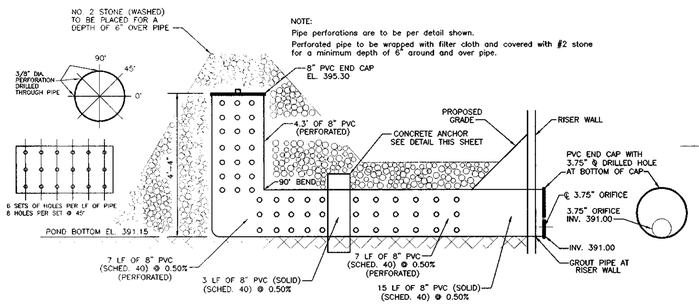
RIP RAP CHANNEL DETAIL

NOT TO SCALE



CUTOFF TRENCH

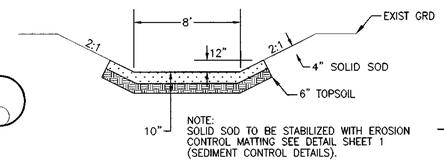
NOT TO SCALE



NOTE:
Pipe perforations are to be per detail shown.
Perforated pipe to be wrapped with filter cloth and covered with #2 stone for a minimum depth of 6" around and over pipe.

DEWATERING DEVICE DETAIL FOR STORMWATER MANAGEMENT

N.T.S.

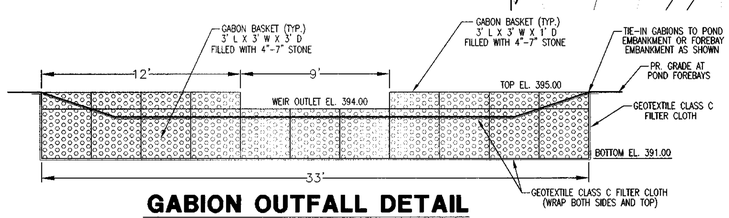


NOTE:
SOLID SOD TO BE STABILIZED WITH EROSION CONTROL MATTING SEE DETAIL SHEET 1 (SEDIMENT CONTROL DETAILS).

SECTION 1-1

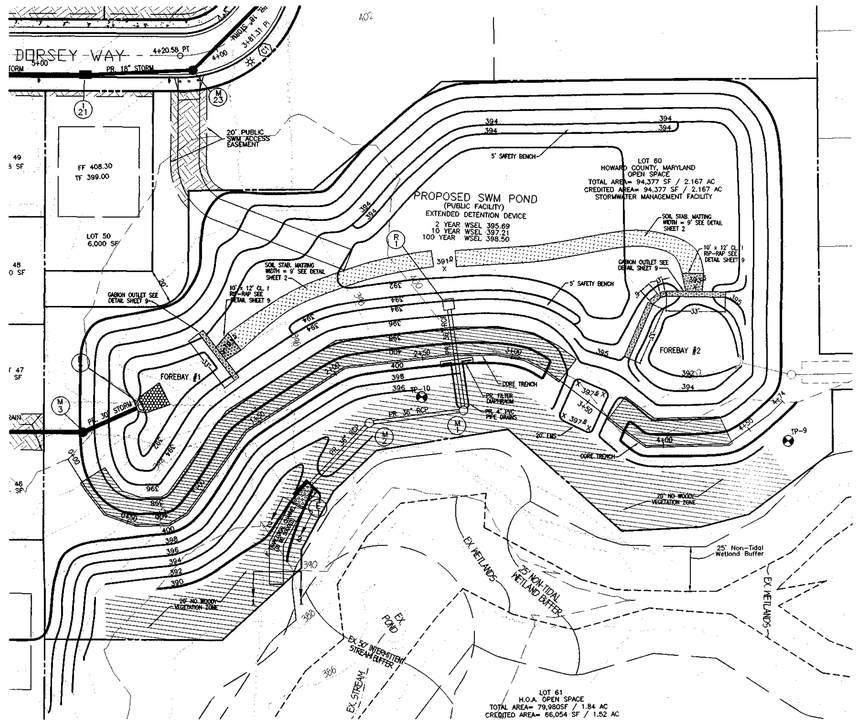
SODDED CHANNEL DETAIL

NOT TO SCALE



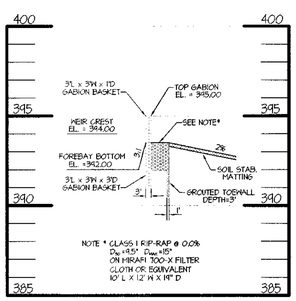
GABION OUTFALL DETAIL

NOT TO SCALE



PLAN VIEW - SWM POND

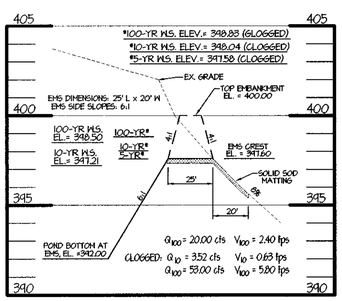
SCALE: 1"=40'



GABION PROFILE

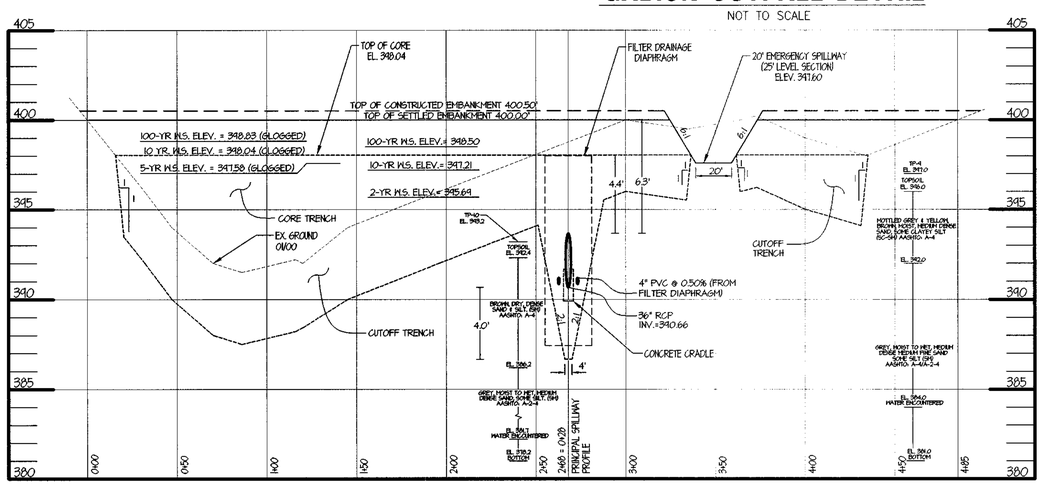
SCALE: HOR. 1" = 40'
VERT. 1" = 4'

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16



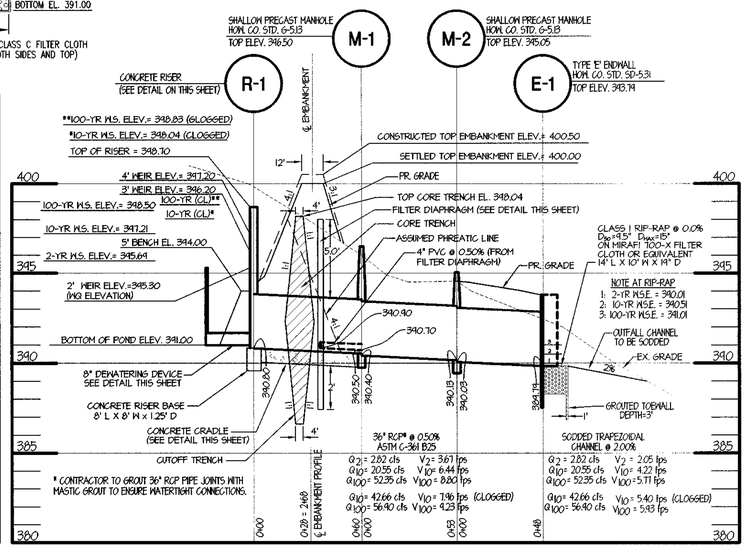
EMS PROFILE

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



POND CENTERLINE OF EMBANKMENT PROFILE

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



PRINCIPAL SPILLWAY PROFILE

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

DEPARTMENT OF ~~PUBLIC WORKS~~ R&P
HOWARD COUNTY, MARYLAND

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

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

3/1/01
HOWARD SOIL CONSERVATION DISTRICT DATE

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

3/1/01
U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND — PIERO VAN MEERTS — No. 21875 — PROFESSIONAL ENGINEER — REGISTERED

DES:	TCN/CAO
DRN:	TCN/CAO
CHK:	MJE
DATE:	12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
SWM POND PLAN, PROFILES AND DETAILS

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 9 OF 20

F0122

MD-378 STORMWATER MANAGEMENT CONSTRUCTION SPECIFICATIONS

I. 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.

II. EARTH FILL

A. 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 MUST 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.

B. 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.

C. 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).

III. 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.

IV. 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 EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

V. 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 OPERATE 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. MATE-RIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7" TO ASSURE FLOWABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING 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 A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURAL BACKFILL (FLOWABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE ?? EMBANKMENT OR OTHER EMBANKMENT MATERIALS.

VI. PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

A. CORRUGATED METAL PIPE

1. MATERIALS - (POLYMER COATED STEEL PIPE) -STEEL PIPES WITH POLYMERIC COATINGS 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 COM-POUND. 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 LEAST 24 MILS IN THICK-NESS.
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 IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR 3/8 INCH CLOSED CELL NEOPRENE GASKET, PRE-PUNCHED TO THE FLANGE BOLT CIRCLE, SANDWICHED BETWEEN ADJACENT FLANGES; A 12-INCH WIDE STANDARD LAP TYPE BAND WITH 12-INCH WIDE BY 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 3/8 INCH 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.

B. RE ENFORCED CONCRETE PIPE

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361.
2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING/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 A 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 AS SHOWN ON THE DRAWINGS.

C. 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.

C. PLASTIC PIPE (CONTINUED)

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.

VII. DRAINAGE DIAPHRAGMS

WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

VIII. CONCRETE STRUCTURES

A. CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

B. REINFORCEMENT

REINFORCEMENT SHALL MEET THE MINIMUM REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 416 (REINFORCEMENT FOR CONCRETE STRUCTURES): SECTION 908 (REINFORCING STEEL - GRADE 60, WIRE ROPE AND WIRE FARIC), AND SECTION 909.02 (STEEL FOR MISCELLANEOUS USE).

IX. ROCK RIPRAP

ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311. GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 921.09, CLASS C.

X. CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE 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 SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

XI. 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 B Y 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.

A. SOD

1. SPECIFICATIONS - SOD SHALL BE "K-31" TALL FESCUE OR KENTUCKY BLUEGRASS/RED FESCUE MIXTURE OR APPROVED EQUAL. CLASS OF TURFGRASS SOD SHALL BE MARYLAND OR VIRGINIA STATE CERTIFIED OR APPROVED SOD.
2. SITE PREPARATION - WHERE SOIL IS ACIDIC OR COMPOSED OF HEAVY DAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 100 LBS./1000 SQ.FT. IN ALL SOILS 5-10-5 FERTILIZER OR APPROVED EQUAL SHALL BE APPLIED AT THE RATE OF 30 LBS/1000 SQ.FT. FERTILIZER SHALL BE UNIFORMLY APPLIED AND MIXED INTO THE TOP 3" OF SOIL WITH THE REQUIRED LIME. SLOW RELEASE NITROGEN, AT THE RATE OF 3.5 LBS/1000 SQ. FT., SHALL BE APPLIED TO THE PREPARED SOIL IMMEDIATELY PRIOR TO SOD INSTALLATION. THIS MATERIAL SHALL BE APPROXIMATELY ONE-THIRD IMMEDIATELY AVAILABLE AND TWO-THIRDS WATER INSOLUBLE NITROGEN. UREA FORMALDEHYDE (UF) AND ISOBUTYLIDENE (IBDU) MEET THESE STANDARDS.
3. SOD INSTALLATION - THE FIRST ROW OF SOD SHALL BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACE PARALLEL TO AND TIGHTLY WEDGED AGAINST EACH OTHER. LATERAL JOINTS SHALL BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. INSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED FIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS. ON SLOPING AREAS WHERE EROSION MAY BE A PROBLEM, SOD SHALL BE LAID WITH LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERED JOINTS. SECURE THE SOD BY TAMPING AND PEGGING OR OTHER APPROVED METHODS. AS SODDING IS COMPLETED IN ANY ONE SECTION, THE ENTIRE AREA SHALL BE ROLLED OR TAMPED TO INSURE SOLID CONTACT OF ROOTS WITH THE SOIL SURFACE. SOD SHALL BE WATERED IMMEDIATELY AFTER ROLLING OR TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOLID SURFACE BELOW THE SOD ARE THOROUGHLY WET. THE OPERATION OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD SHALL BE COMPLETED WITHIN EIGHT HOURS.

B. PERMANENT SEEDING

ALL DISTURBED AREAS SHALL BE STABILIZED AS FOLLOWS:

1. SEEDBED PREPARATION - LOOSEN UPPER 3 INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING.
2. SOIL AMENDMENTS - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS./1000 SQ. FT.), 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS./1000 SQ. FT.) AND 400 LBS. PER ACRE OF 30-0-0 UREAFORM FERTILIZER (9.2 LBS./100 SQ. FT.). HARROW OR DISC LIME AND FERTILIZER INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE (9.2 LBS./1000 SQ. FT.) OF 30-0-0 UREAFORM FERTILIZER AND 500 LBS. PER ACRE (11.5 LBS./1000 SQ.FT.) OF 10-10-10 FERTILIZER.
3. SEEDING - FOR THE PERIOD MARCH 1 THROUGH APRIL 30 SEED WITH 40 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND 15 LBS. PER ACRE INOCULATED CROWNVETCH. FOR THE PERIOD MAY 1 THROUGH JULY 31 SEED WITH 60 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND 2 LBS. PER ACRE INOCULATED WEEPING LOVEGRASS. FOR THE PERIOD OF AUGUST 1 THROUGH OCTOBER 15 SEED WITH 40 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND 20 LBS. PER ACRE INOCULATED INTERSTATE SERICA ESPEDEZA. DURING THE PERIOD OF OCTOBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY: OPTION (1) - 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) - USE SOD.. OPTION (3) - SEED WITH 60 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS PER ACRE WELL ANCHORED STRAW. FOR THE PERIOD OF MAY 1 THROUGH FEBRUARY 28, INOCULATED CROWNVETCH SHALL BE APPLIED DURING THE SUBSEQUENT PERIOD OF MARCH 1 THROUGH APRIL 30 AT THE RATE OF 15 LBS. PER ACRE.
4. MULCHING - APPLY 1.5 TO 2 TONS PER ACRE OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING 218 GALLONS PER ACRE OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPE 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE FOR ANCHORING.
5. MAINTENANCE - INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDING.

C. TEMPORARY SEEDING

1. SEEDBED PREPARATION - . LOOSEN UPPER 3 INCHES OF SOIL BY DISCING, RAKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING.
2. SOIL AMENDMENTS - APPLY 600 LBS. PER ACRE OF 10-10-10 FERTILIZER. WHERE SOIL IS ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE APPLIED AT THE RATE OF 2 TONS PER ACRE (92 LBS./1000 SQ.FT.).
3. SEEDING - FOR PERIODS MARCH 1 THROUGH APRIL 30, AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2.5 BUSHELS PER ACRE ANNUAL RYE. FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS. PER ACRES OF WEEPING LOVEGRASS. FOR THE PERIOD NOVEMBER 16 THROUGH 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.
4. MULCHING - SAME AS PERMANENT SEEDING.

X. 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.

XI. FENCING

FENCING SHALL BE 42" HIGH CHAIN LINK FENCE CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY ADMINISTRATION STANDARD DETAILS 615.02 AND 615.03. THE SPECIFICATIONS FOR A 6'-0" FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6'-8" LINE POSTS. GATE SHALL BE CONSTRUCTED IN ACCORDANCE WITH STATE HIGHWAY ADMINISTRATION STANDARD DETAIL 692.01 WITH 42" FABRIC. FABRIC FOR FENCE AND GATE SHALL CONFORM TO ASSHTO DESIGNATION ML8L.74. DARK VINYL COATING IS REQUIRED FOR THE FENCE POSTS AND WIRE FABRIC IN ACCORDANCE WITH THE LANDSCAPE MANUAL ADOPTED BY RESOLUTION 56-90, OCTOBER 1, 1990.

XI. FILTER CLOTH

1. FILTER CLOTH TO BE MIRAFI 140N OR APPROVED EQUAL.

XII. GABIONS

1. GABIONS TO BE PVC COATED. CLASS IV. ARTICLE 35.06, BALTIMORE COUNTY STANDARD SPECIFICATIONS AND DETAILS.

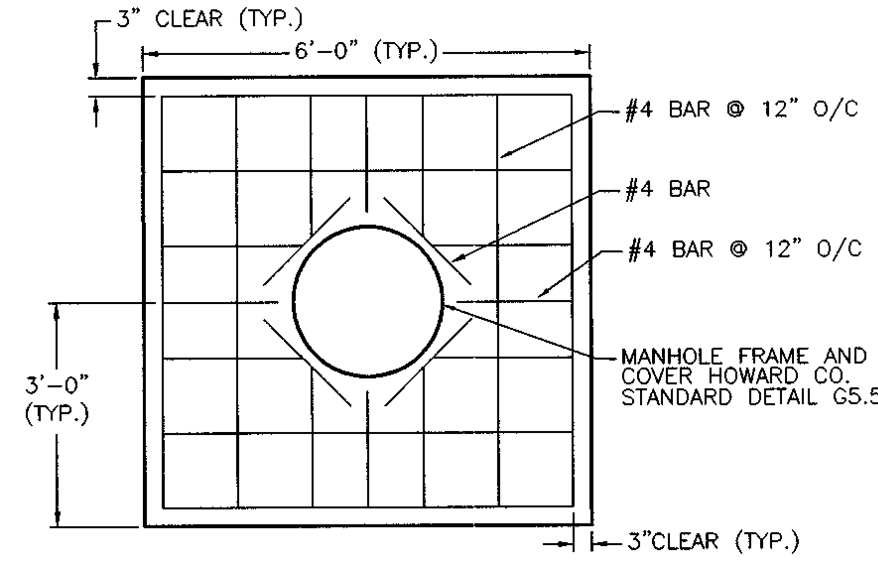
XIII. INSPECTION

THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 5 WORKING DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE PLANS SO THAT STORMWATER MANAGEMENT POND MAY BE INSPECTED DURING CONSTRUCTION.

XIV. REFERENCES

UNLESS OTHERWISE NOTED, ALL MATERIALS AND CONSTRUCTION PRACTICES SHALL CONFORM TO THE FOLLOWING:

1. "STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION" OF THE BALTIMORE COUNTY, MARYLAND, DEPARTMENT OF PUBLIC WORKS, AS AMENDED.
2. "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS", 1993, OF THE MARYLAND STATE HIGHWAY ADMINISTRATION, AS AMENDED.
3. "STANDARD AND SPECIFICATIONS FOR PONDS" OF THE SOIL CONSERVATION SERVICE OF MARYLAND (MD-378), JANUARY 2000 AND AS AMENDED.
4. "REVISED STORMWATER MANAGEMENT POLICY," REVISED SEPTEMBER 11, 1984, BALTIMORE COUNTY MARYLAND.



TOP OF SLAB DETAIL

SCALE: 1"=2'

CONSTRUCTION INSPECTION SCHEDULE

DETENTION AND RETENTION STRUCTURES

I. INSPECTIONS SHALL BECONDUCTED BY THE AS-BUILT CERTIFYING ENGINEER:

1. UPON THE COMPLETION OF EXCAVATION TO SUB-FOUNDATION AND WHEN REQUIRED, AND UPON THE INSTALLATION OF STRUCTURAL SUPPORTS OR REINFORCEMENT FOR STRUCTURES. INCLUDING BUT NOT LIMITED TO:
   - A. CORE TRENCHES FOR STRUCTURAL EMBANKMENT.
   - B. INLET OR OUTLET STRUCTURES AND ANTI-SEEP STRUCTURES.
   - C. WATER-TIGHT CONNECTORS ON PIPES.
   - D. TRENCHES FOR ENCLOSED STORM DRAIN FACILITIES.
   - E. UTILITY CROSSINGS OF EMBANKMENT.
2. DURING THE PLACEMENT OF STRUCTURAL FILL AND CONCRETE, AND INSTALLATION OF PIPING AND CATCH BASINS.
3. DURING BACKFILL OF FOUNDATIONS AND TRENCHES.
4. DURING EMBANKMENT CONSTRUCTION.
5. UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

MAINTENANCE & REPAIR SCHEDULE

MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. IN GENERAL, THE PRACTICES CONTAINED IN THE "MAINTENANCE AND REPAIR" CHAPTER OF THE "MARYLAND DAM SAFETY MANUAL", DNR-WRA 1988, SHOULD BE FOLLOWED AND CONDUCTED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER FAMILIAR WITH DAM CONSTRUCTION, OPERATION, MAINTENANCE, AND REPAIR.

IN ADDITION, THE MD-378 DAM INSPECTION CHECKLIST MAY BE USED AS A GUIDE FOR MAINTENANCE AND INSPECTION.

AT A MINIMUM, THE STORMWATER MANAGEMENT FACILITY SHALL BE INSPECTED BI-ANNUALLY FOR THE FOLLOWING ITEMS.

1. CONDITION OF EMBANKMENT
2. CONDITION OF VEGETATIVE COVER
3. CONDITION OF FENCES AND MAINTENANCE ACCESS ROAD.
4. CONDITION OF SPILLWAYS AND PIPE OUTLETS.
5. CONDITION OF POND RESORVOIR STORAGE AREA.
6. CONDITION OF RISER STRUCTURE AND OR PIPE HEADWALLS.
7. SEDIMENT LOAD IN POND RESORVOIR STORAGE AREA OR OUTFALL CHANNEL.
8. SEEPAGE THROUGH EMBANKMENT.
9. ANY OTHER ITEMS WHICH COULD AFFECT THE FUNCTION OF THE SWM FACILITY.
10. EVIDENCE OF CLOGGING OF ALL OPENINGS AND EXTENDED DETENTION DEVICE.
11. EROSION OF EMBANKMENT, POND SIDE SLOPES, OR OUTFALL CHANNEL
12. CRACKING OF CONCRETE RISER AND HEADWALL.
13. EVIDENCE OF ANIMAL TUNNELING THROUGH POND EMBANKMENT.

THE EMBANKMENT AND STORAGE AREA SHALL BE MOWED TWICE A YEAR AND ANY TREES OR BUSHES GROWING ON OR ALONG THE EMBANKMENT SHALL BE REMOVED. ANY NEEDED MAINTENANCE OR REPAIR OF STRUCTURES, SPILLWAYS, CORE TRENCH OR POND EMBANKMENT SHALL BE DONE UNDER THE SUPERVISION OF A QUALIFIED GEOTECHNICAL ENGINEER.

IN ADDITION TO BIANNUAL INSPECTIONS, INSPECTIONS SHALL BE DONE DURING WET SEASON, AND AFTER MAJOR STORMS.

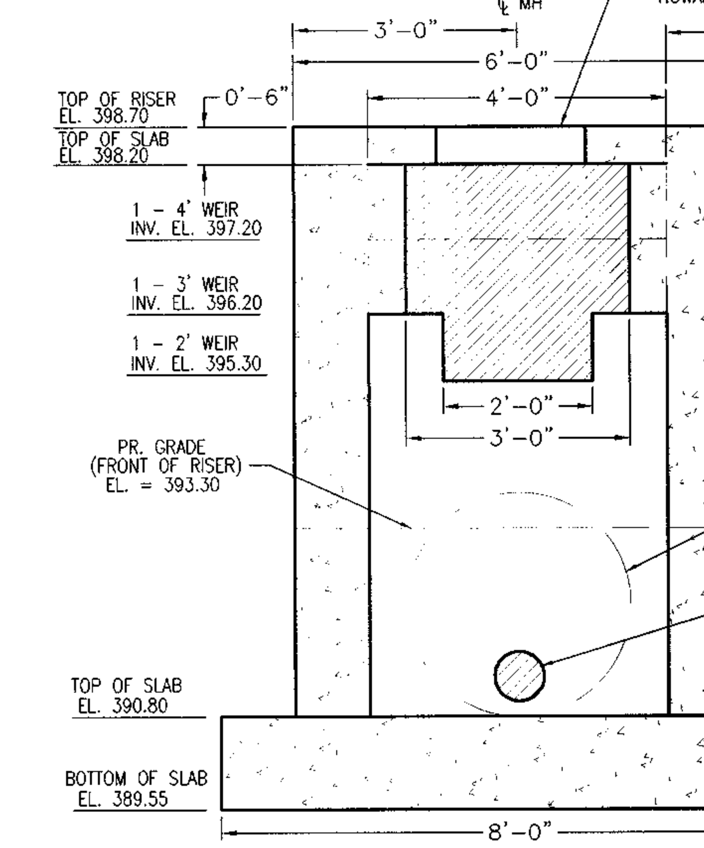
ALL DEBRIS, LITTER, OR SEDIMENT ACCUMULATED IN POND RESORVOIR STORAGE AREA AND OUTFALL CHANNEL SHALL BE REMOVED.

OPERATION AND MAINTENANCE AGREEMENT SCHEDULE FOR EXTENDED DETENTION POND

1. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES PER YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED.
2. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
3. WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, AND UPON APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS, SEDIMENT SHALL BE REMOVED FROM THE POND.

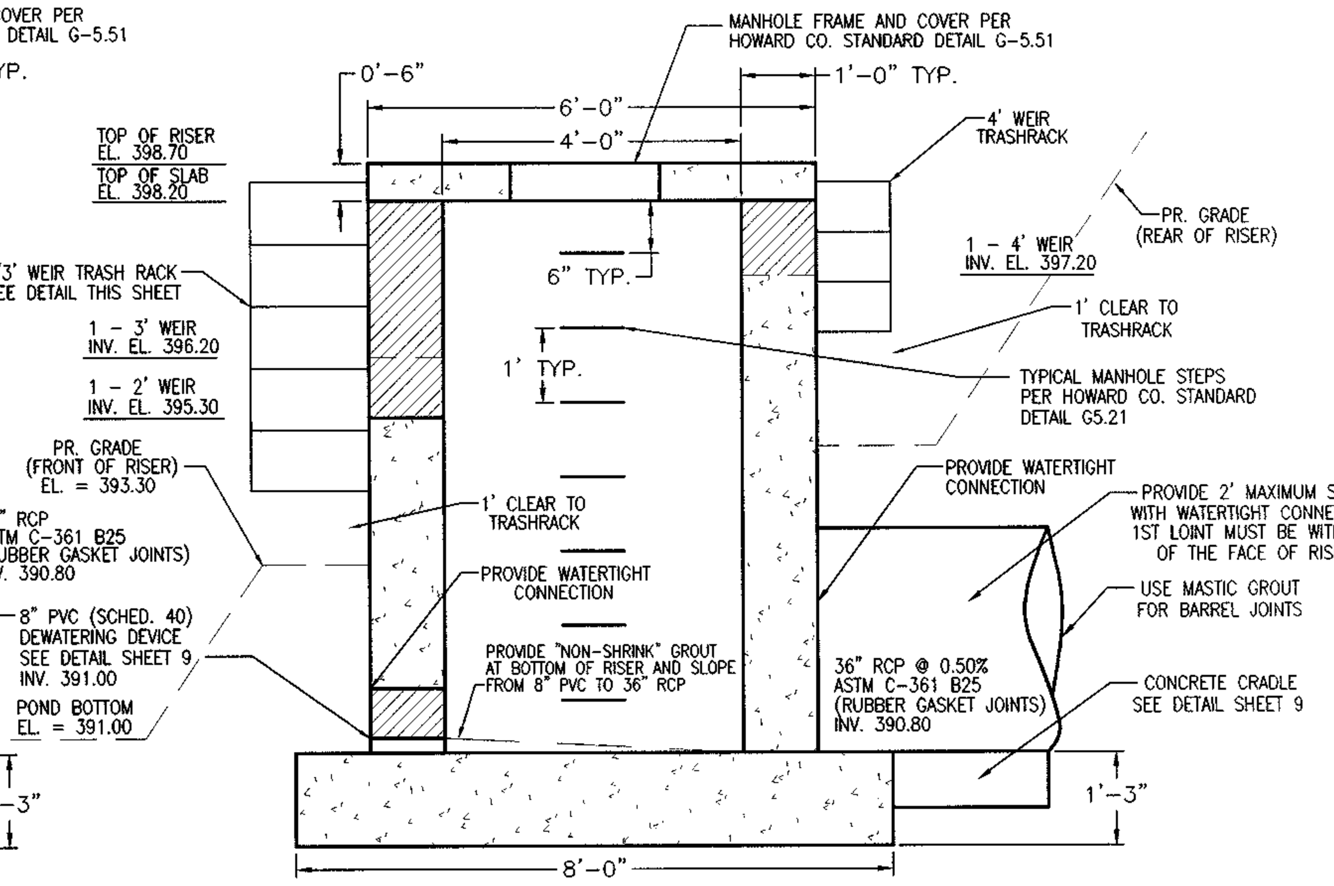
GEOTECHNICAL NOTES & RECOMMENDATIONS

1. PER MD-378 SPECIFICATIONS, SOILS USED FOR CUTOFF TRENCH CONSTRUCTION SHALL MEET USCS CLASSIFICATION CL (LOW PLASTICITY CLAY), CH (HIGH PLASTICITY CLAY), SC (CLAYEY SAND), OR GC (CLAYEY GRAVEL).
2. MATERIALS USED FOR BACKFILL OF PIPE OUTFALL SHOULD BE SIMILAR TO THOSE USED FOR THE CUTOFF TRENCH.
3. ALTHOUGH SUBSURFACE EXPLORATIONS INDICATE THAT NO SUITABLE CUTOFF TRENCH MATERIAL EXISTS ON SITE, TEST PIT EXPLORATION MAY BE PERFORMED IN AN ATTEMPT TO IDENTIFY APPROPRIATE MATERIALS MEETING SCS SPECIFICATIONS FOR CUTOFF CONTRUCTION.
4. IF MATERIALS SUITABLE FOR CUTOFF TRENCH CONSTRUCTION ARE NOT IDENTIFIED ON SITE, OFF-SITE BORROW MAY BE UTILIZED PROVIDED THAT IT MEETS ALL CLASSIFICATIONS REQUIRED BY MD-378, AND BE APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER IN THE FIELD.
5. MD-378 SPECIFIES THAT REFERENCE SOIL CLASSIFICATIONS SUITABLE FOR CUTOFF TRENCH CONSTRUCTION ARE ALSO SUITABLE FOR EMBANKMENT CONSTRUCTION. THE MOST PLASTIC MATERIAL (PI=11 OR MORE) AVAILABLE ON SITE SHALL BE USED FOR EMBANKMENT CONSTRUCTION.
6. FILL FOR CUTOFF TRECH AND EMBANKMENT CONSTRUCTION SHOULD BE PLACED IN 8" LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY IN ACCORDANCE WITH THE STANDARD PROCTOR, ASTM D-698. FILL AROUND THE PIPE OUTFALL SHOULD BE PLACED IN 4" LIFTS AND COMPACTED TO THE SAME STANDARD WITH HAND EQUIPMENT. COMPACTION OF THESE AREAS SHOULD BE MONITORED BY A QUALIFIED GEOTECHNICAL ENGINEER.
7. WHERE INDICATED BY SUBSURFACE CONDITIONS, A 6" GRANULAR BEDDING SHOULD BE PLACED UNDER THE PIPE OUTFALL (BEYOND THE CONCRETE CRADLE) TO PROVIDE UNIFORM PIPE SUPPORT.



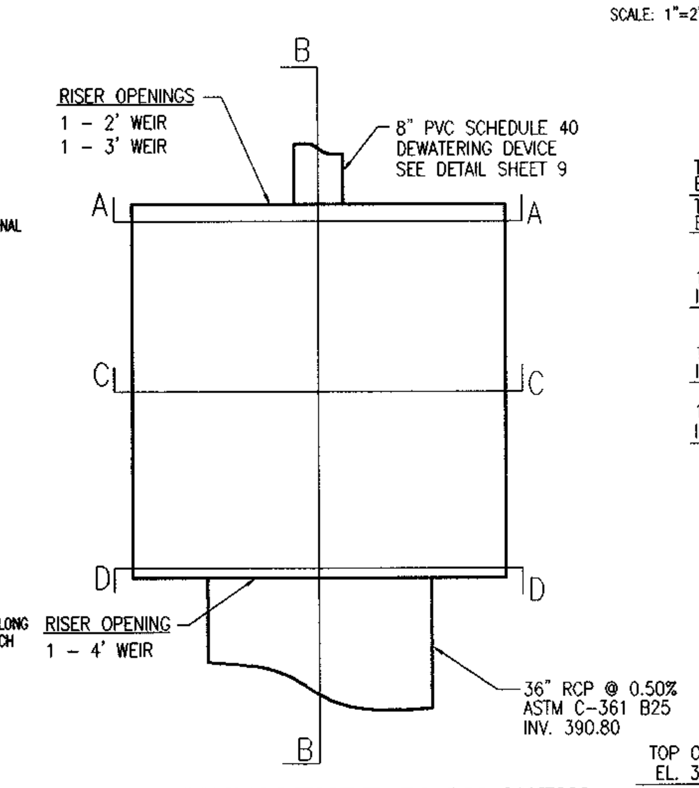
RISER STRUCTURE OPENING DETAIL 'A' SECTION A-A

SCALE: 1"=2'



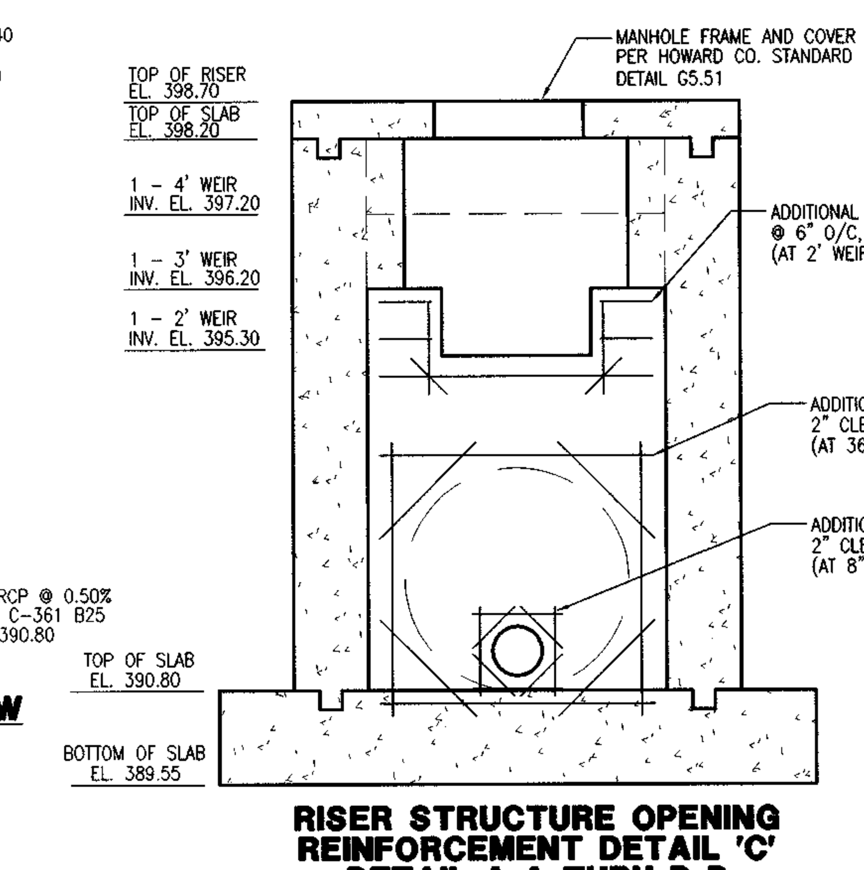
RISER STRUCTURE OPENING DETAIL 'B' SECTION B-B

SCALE: 1"=2'



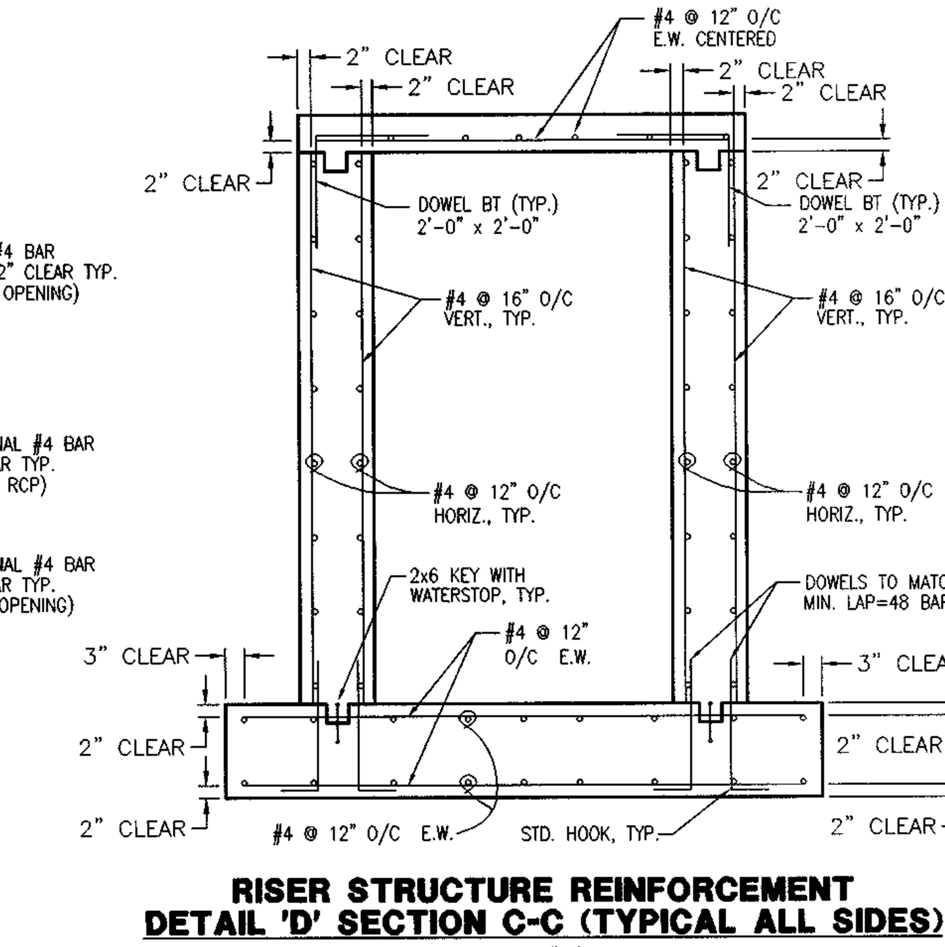
RISER STRUCTURE PLAN VIEW

SCALE: 1"=2'



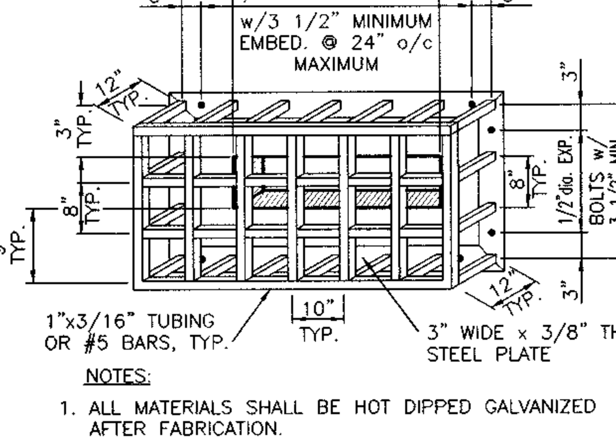
RISER STRUCTURE OPENING REINFORCEMENT DETAIL 'C' DETAIL A-A THRU D-D

SCALE: 1"=2'



RISER STRUCTURE REINFORCEMENT DETAIL 'D' SECTION C-C (TYPICAL ALL SIDES)

SCALE: 1"=2'

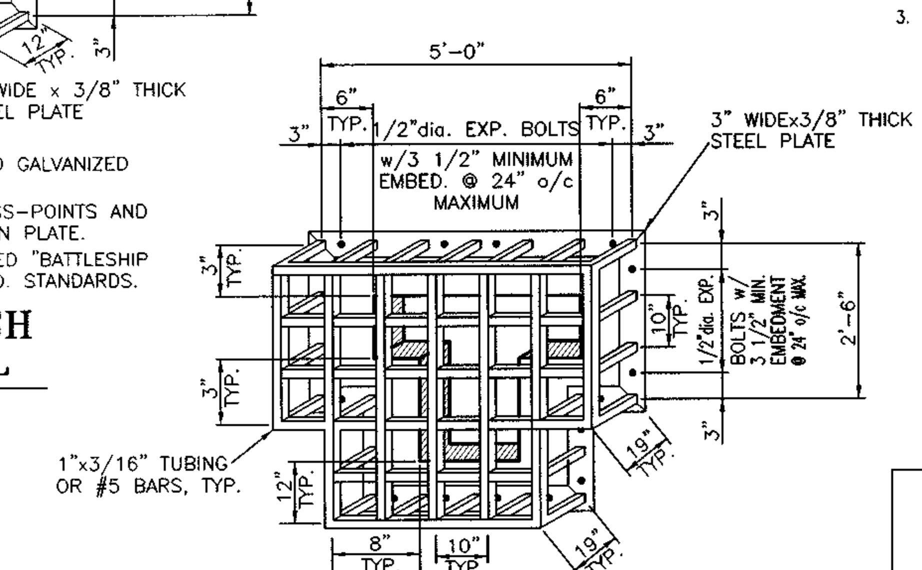


NOTES:

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

4' WEIR TRASH RACK DETAIL

N.T.S.



NOTES:

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

2' WEIR / 3' WEIR TRASH RACK DETAIL

N.T.S.

CONCRETE GENERAL NOTES

1. CODE
   - A. ALL CONSTRUCTION SHALL CONFORM WITH THE PROVISIONS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS AND THE 1992 SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS AND THE 1992 AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, AND ITS SUPPLEMENTS.
2. DESIGN LOADING
   - A. DEAD LOAD - ACTUAL SOIL COVER PLUS 2' SURCHARGE.
3. CAST-IN-PLACE CONCRETE
   - A. ALL CONCRETE WORK SHALL CONFORM TO ALL PROVISIONS OF THE "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301-84), AND TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-83).
   - B. ADDITIONALLY THE CONCRETE SHALL CONFORM TO ALL PROVISIONS OF THE FOLLOWING PUBLICATIONS:
     1. ACI 305R-77 (82) RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING.
     2. ACI 306R-78 RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING.
     3. ACI 347-78 RECOMMENDED PRACTICE FOR CONCRETE FORMWORK.
   - C. ALL CONCRETE SHALL BE MARYLAND DEPARTMENT OF TRANSPORTATION MIX NO. 3 HAVING A MINIMUM COMPRESIVE STRENGTH OF 3,500 PSI AT 28 DAYS.
   - D. ALL REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60. ALL REINFORCING SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI'S MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES (ACI 315).
   - E. PROVIDE MINIMUM 40 BAR DIAMETER LAP SPLICE FOR ALL REINFORCING STEEL, UNLESS OTHERWISE NOTED ON DRAWINGS.
   - F. PROVIDE WATER STOPS IN ALL CONSTRUCTION AND CONTROL JOINTS IN CONCRETE BELOW SUBGRADE.
   - G. LOADS GREATER THAN THE DESIGN LIVE LOADS SHALL NOT BE PLACED ON THE STRUCTURE. A CONCRETE STRUCTURE MAY NOT SUPPORT ITS DESIGN LIVE LOAD AND SUPERIMPOSED DEAD LOADS FOR 28 DAYS.

SUMMARY OF PROP. FACILITY

DESIGN STORM	Proposed Facility Inflow (cfs)	Proposed Facility Discharge (cfs)	Facility Water Surface Elevation (ft)	Facility Storage Volume (acre-ft)
1 year	31.58	0.74	395.25	1.82
2 year	55.96	2.82	395.69	2.18
10 year	107.76	20.55	397.21	3.69
100 year	165.59	72.53	398.50	4.96

Drainage Area 24.35 acres

Impervious Area 8.97 acres

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16

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

HOWARD SOIL CONSERVATION DISTRICT — 3/1/01 — DATE

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

U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE — 3/1/01 — DATE

BY THE DEVELOPER

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

02/23/01

SIGNATURE OF DEVELOPER — DATE
PRINT NAME BELOW SIGNATURE

BY THE ENGINEER

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

PIERO VAN MELLITS, P.E. — 2-22-01

SIGNATURE OF ENGINEER — DATE
PRINT NAME BELOW SIGNATURE

DEPARTMENT OF ~~PUBLIC WORKS~~ P&Z
HOWARD COUNTY, MARYLAND

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF HIGHWAYS — 3-2-01 — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — 3/6/01 — DATE

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

STATE OF MARYLAND — PIERO VAN MELLITS No. 21875 — REGISTERED PROFESSIONAL ENGINEER

DES: TCN/CAO				
DRN: TCN/CAO				
CHK: PVM				
DATE: 12/21/00	BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
SWM POND DETAILS &
MD-378 NOTES & SPECIFICATIONS

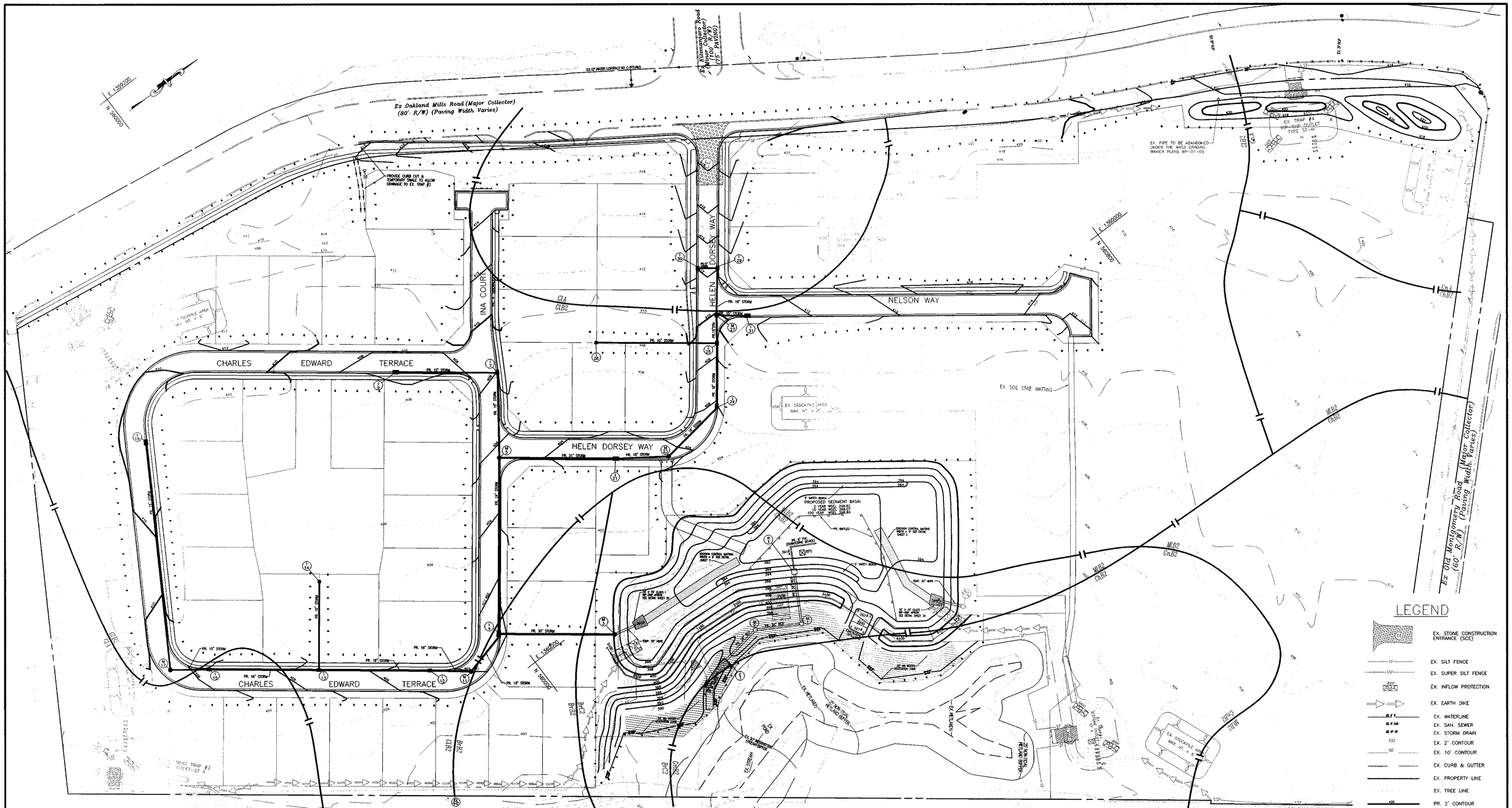
600' SCALE MAP NO. 36 — BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 10 OF 20

F0122



NOTE: THE EXISTING SEDIMENT CONTROLS AS SHOWN ON THESE PLANS IS FOR REFERENCE ONLY. MASS GRADING AND SEDIMENT CONTROL INSTALLATION SHALL BE DONE IN ACCORDANCE WITH MASS GRADING PLANS GP-01-78. SEE SEDIMENT CONTROL DETAILS ON SHEET 19 AND 20 FOR SEDIMENT CONTROL PRACTICES RELAVENT TO THIS PLAN. ALL SWALES AND AREAS OF CONCENTRATED FLOW ARE TO BE STABILIZED WITH SOIL STABILIZATION MATTING PER DETAIL ON SHEET 2.

EX. SEDIMENT TRAP #1 SUMMARY TABLE			
EXISTING DRAINAGE AREA			3.24 ACRES
PROPOSED DRAINAGE AREA			3.88 ACRES
VOLUME REQUIRED	3.88 X 1800	WET	6,984 C.F.
	3.88 X 1800	DRY	6,984 C.F.
TYPE OF TRAP			ST-II
TOTAL VOLUME REQUIRED			13,968 C.F.
TOTAL VOLUME PROVIDED			18,742 C.F.
WEIR LENGTH			16 FT.
WET STORAGE DEPTH			5.0 FT.
LIMIT OF WET STORAGE ELEVATION			398.00
CLEANOUT ELEVATION			396.50
EMBANKMENT HEIGHT			4.0 FT.
EMBANKMENT ELEVATION			402.00
BOTTOM ELEVATION			393.00
WET STORAGE VOLUME			7,667 C.F.
WEIR CREST ELEVATION			400.50
TRAP BOTTOM DIMENSIONS	20 FT. (W) x 40 FT. (L)		

EX. SEDIMENT TRAP #2 SUMMARY TABLE			
EXISTING DRAINAGE AREA			4.46 ACRES
PROPOSED DRAINAGE AREA			1.50 ACRES
VOLUME REQUIRED	4.46 X 1800	WET	8,028 C.F.
	4.46 X 1800	DRY	8,028 C.F.
TYPE OF TRAP			ST-II
TOTAL VOLUME REQUIRED			16,056 C.F.
TOTAL VOLUME PROVIDED			16,811 C.F.
WEIR LENGTH			18 FT.
WET STORAGE DEPTH			6.0 FT.
LIMIT OF WET STORAGE ELEVATION			402.00
CLEANOUT ELEVATION			400.00
EMBANKMENT HEIGHT			3.0 FT.
EMBANKMENT ELEVATION			405.00
BOTTOM ELEVATION			396.00
WET STORAGE VOLUME			10,272 C.F.
WEIR CREST ELEVATION			404.00
TRAP BOTTOM DIMENSIONS	20 FT. (W) x 40 FT. (L)		

EX. SEDIMENT TRAP #3 SUMMARY TABLE			
EXISTING DRAINAGE AREA			1.49 ACRES
PROPOSED DRAINAGE AREA			0.86 ACRES
VOLUME REQUIRED	1.49 X 1800	WET	2,682 C.F.
	1.49 X 1800	DRY	2,682 C.F.
TYPE OF TRAP			ST-II
TOTAL VOLUME REQUIRED			5,364 C.F.
TOTAL VOLUME PROVIDED			5,606 C.F.
WEIR LENGTH			12 FT.
WET STORAGE DEPTH			4.0 FT.
LIMIT OF WET STORAGE ELEVATION			397.00
CLEANOUT ELEVATION			395.50
EMBANKMENT HEIGHT			3.0 FT.
EMBANKMENT ELEVATION			400.00
BOTTOM ELEVATION			393.00
WET STORAGE VOLUME			2,941 C.F.
WEIR CREST ELEVATION			398.50
TRAP BOTTOM DIMENSIONS	13 FT. (W) x 26 FT. (L)		

EX. SEDIMENT TRAP #4 SUMMARY TABLE			
EXISTING DRAINAGE AREA			3.28 ACRES
PROPOSED DRAINAGE AREA			1.43 ACRES
VOLUME REQUIRED	3.28 X 5400	WET	8,028 C.F.
TYPE OF TRAP			ST-III
TOTAL VOLUME REQUIRED			17,712 C.F.
TOTAL VOLUME PROVIDED			25,982 C.F.
WEIR LENGTH			14 FT.
WET STORAGE DEPTH			6.5 FT.
LIMIT OF WET STORAGE ELEVATION			414.50
CLEANOUT ELEVATION			412.00
EMBANKMENT HEIGHT			1.5 FT.
EMBANKMENT ELEVATION			416.00
BOTTOM ELEVATION			408.00
WET STORAGE VOLUME			25,982 C.F.
WEIR CREST ELEVATION			414.50
TRAP BOTTOM DIMENSIONS	30 FT. (W) x 60 FT. (L)		

PR. SEDIMENT BASIN SUMMARY TABLE			
EXISTING DRAINAGE AREA			15.40 ACRES
PROPOSED DRAINAGE AREA			24.35 ACRES
VOLUME REQUIRED	24.35 X 1800	WET	43,830 C.F.
	24.35 X 1800	DRY	43,830 C.F.
TOTAL VOLUME REQUIRED			87,660 C.F.
TOTAL VOLUME PROVIDED			116,551 C.F.
WET STORAGE DEPTH			3.3 FT.
LIMIT OF WET STORAGE ELEVATION			394.30
CLEANOUT ELEVATION			393.30
RISER CREST ELEVATION			396.40
EMBANKMENT ELEVATION			400.00
BOTTOM ELEVATION			391.00
WET STORAGE VOLUME			45,370 C.F.
EMS CREST ELEVATION			397.60
EMS LENGTH			20 FT.
DRAW-DOWN DEVICE			8" PVC
OUTFALL BARREL TYPE			36" RCP

LEGEND

- EX. STONE CONSTRUCTION ENTRANCE (SCE)
- EX. SILT FENCE
- EX. SUPER SILT FENCE
- EX. INFLOW PROTECTION
- EX. EARTH DIKE
- EX. WATERLINE
- EX. SAN. SEWER
- EX. STORM DRAIN
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- EX. CURB & GUTTER
- EX. PROPERTY LINE
- EX. TREE LINE
- PR. 2' CONTOUR
- PR. 10' CONTOUR
- PR. L.O.D.
- PR. SILT FENCE
- SOILS DIVIDE

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND AS SHOWN ON GP-01-78.

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 3/1/01

REVIEW FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REVIEW.

U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE — DATE 3/1/01

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

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

STATE OF MARYLAND — PIERO VAN MELLITS — No. 21875 — REGISTERED PROFESSIONAL ENGINEER — 12-21-00

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS GRADING & SEDIMENT CONTROL PLAN

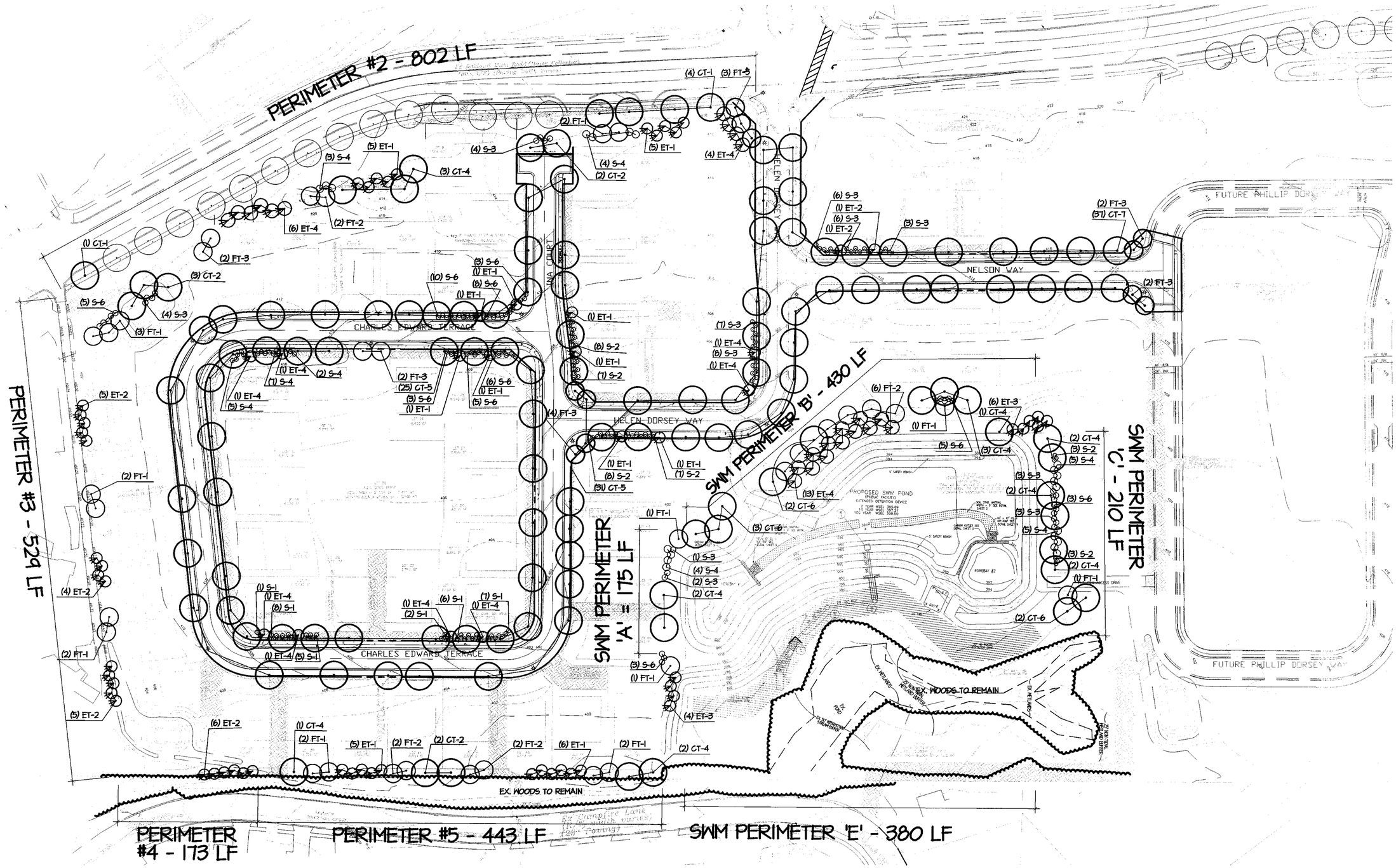
600' SCALE MAP NO. 36 — BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=50'

SHEET 11 OF 20

F0122



DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

Pt 2

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND
DEAN WESLEY MEYER
No. 200030
REGISTERED LANDSCAPE ARCHITECT
2-22-01
DEAN W. MEYER #200030

DES: TCN/CAO
DRN: TCN/CAO
CHK: DWM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
LANDSCAPE PLAN

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=50'

SHEET 12 OF 20

F0122

GENERAL NOTES:

1. ALL PLANT MATERIAL SHALL CONFORM TO THE STANDARDS OF NURSERY STOCK OF THE AMERICAN ASSOCIATION OF NURSERYMEN.

2. TREES AND SHRUBS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, HAVE NORMAL GROWTH HABITS, WELL DEVELOPED, DENSELY FOLIATED BRANCHES, AND VIGOROUS, FIBROUS ROOT SYSTEMS.

3. TREES AND SHRUBS SHALL BE FRESHLY DUG AND NURSERY GROWN. THEY SHALL HAVE BEEN GROWN UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCALITY OF THE PROJECT OR PROPERLY ACCLIMATED TO CONDITIONS OF THE LOCALITY OF THE PROJECT.

4. TREES AND SHRUBS SHALL BE FREE FROM DEFECTS AND INJURIES AND CERTIFIED BY APPROPRIATE FEDERAL AND STATE AUTHORITIES TO BE FREE OF DISEASES AND INSECT INFESTATIONS.

5. THE LANDSCAPE CONTRACTOR SHALL WARRANTY ALL PLANT MATERIAL FOR A PERIOD OF ONE (1) FULL YEAR AFTER THE DATE OF SUBSTANTIAL COMPLETION AGAINST DEFECTS, UNSATISFACTORY GROWTH, DISEASE OR DEATH. UNSATISFACTORY, UNHEALTHY, DYING OR DEAD PLANT MATERIAL (IN THE OPINION OF THE LANDSCAPE ARCHITECT) SHALL BE REPLACED WITH THE SAME SIZE AND SPECIES.

6. IT SHALL BE THE RESPONSIBILITY OF THE LANDSCAPE CONTRACTOR TO ADEQUATELY AND PROPERLY MAINTAIN THE LANDSCAPED AREAS, WHICH SHALL INCLUDE WATERING, CLEANING OF WEEDS AND DEBRIS, PRUNING AND TRIMMING, REPLACEMENT OF DEAD OR DISEASED PLANTINGS, AND FERTILIZING TO MAINTAIN HEALTHY GROWTH.

7. THE LANDSCAPE CONTRACTOR SHALL STAKEOUT PLANT LOCATIONS IN THE FIELD. THE LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE SHALL OBSERVE THESE LOCATIONS PRIOR TO COMMENCING PLANT PIT EXCAVATION. THE LANDSCAPE CONTRACTOR SHALL MAKE ANY ADJUSTMENTS AS REQUESTED BY THE LANDSCAPE ARCHITECT.

8. ALL PLANT SAUCERS AND PLANT BEDS SHALL BE MULCHED WITH DOUBLE SHREDDED HARDWOOD MULCH, A MINIMUM OF 3" IN DEPTH.

9. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE PERMITTED WITHOUT WRITTEN AUTHORIZATION OF THE LANDSCAPE ARCHITECT OR HIS REPRESENTATIVE. THIS SHALL APPLY TO SUBSTITUTIONS OF SPECIES, SIZE AND QUANTITY.

10. THE LANDSCAPE CONTRACTOR SHALL INSTALL SHREDDED HARDWOOD BARK MULCH TO A DEPTH OF 3" UNDER AND SURROUNDING ALL NEW LANDSCAPED MASS PLANTING AREAS TO PROVIDE A UNIFORM AND CONTINUOUS SURFACE AND APPEARANCE BETWEEN AND AROUND ALL PLANT MATERIAL, BUILDING LINES AND PAVED AREAS. IN GENERAL, THIS PERTAINS TO ALL PLANT MATERIAL THAT IS PLANTED CLOSER THAN SIX (6) FEET CENTER TO CENTER. IT IS THE INTENT OF THIS CONTRACT TO INSTALL LANDSCAPE MAT UNDER THE ENTIRE AREA OF SHREDDED BARK MULCH.

11. TREES SHALL BE LOCATED A MINIMUM OF 5' FROM SEWER/WATER CONNECTIONS. CONTRACTOR SHALL BE LIABLE FOR DAMAGE TO ANY AND ALL PUBLIC AND PRIVATE UTILITIES, WATER AND SEWER LINES.

12. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGEROUS, WELL-ROOTED PLANTS AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.

13. CONTRACTOR SHALL SLIGHTLY ADJUST PLANT LOCATIONS IN THE FIELD AS NECESSARY TO BE CLEAR OF DRAINAGE SWALES AND UTILITIES. FINISHED PLANTING BEDS SHALL BE GRADED SO AS NOT TO IMPEDE DRAINAGE AWAY FROM BUILDINGS.

14. TREE STAKING AND GUYING SHALL BE DONE PER DETAILS. CONTRACTOR SHALL ENSURE THAT TREES REMAIN PLUMB AND UPRIGHT FOR THE DURATION OF THE GUARANTEE PERIOD.

15. ALL TREE PITS, SHRUB BEDS, AND PREPARED PLANTING BEDS ARE TO BE COMPLETELY EXCAVATED IN ACCORDANCE WITH THE PLANTING DETAILS.

16. CROWN OF ROOT BALL SHALL BE HIGHER (AFTER SETTING) THAN ADJACENT SOIL.

17. SHADE TREES: HEIGHT SHALL BE MEASURED FROM THE CROWN OF THE ROOT BALL TO THE TOP OF MATURE GROWTH. SPREAD SHALL BE MEASURED TO THE END OF BRANCHING EQUALLY AROUND THE CROWN FROM THE CENTER OF THE TRUNK. MEASUREMENTS ARE NOT TO INCLUDE ANY TERMINAL GROWTH, SINGLE TRUNK TREES SHALL BE FREE OF 'V' CROTCHES THAT COULD BE POINTS OF WEAK LIMB STRUCTURE OR DISEASE INFESTATION.

18. CONTRACTOR MUST CONTACT THE OWNER AT LEAST TEN WORKING DAYS IN ADVANCE TO SCHEDULE ACCEPTANCE INSPECTION(S). CONTRACTOR MUST REPLACE ALL DEAD OR UNACCEPTABLE PLANTS DURING THE FOLLOWING RECOMMENDED PLANTING SEASON.

19. TREES SHALL BE PLANTED DURING ACCEPTABLE PLANTING SEASONS: BETWEEN MARCH 15 AND MAY 15 AND BETWEEN AUGUST 15 AND NOVEMBER 15 OR AS APPROVED BY OWNERS REPRESENTATIVE.

20. ALL TREE STAKING AND GUYING SHALL BE REMOVED BY THE CONTRACTOR AFTER THE TREES ARE ESTABLISHED.

21. SEEDED AREAS THAT WASH OUT MUST BE FILLED AND GRADED AS NECESSARY AND THE RESEEDED. SOME TYPE OF ANCHORING METHOD SHOULD THEN BE USED TO HOLD SEED AND MULCH IN PLACE, THIS IS ESPECIALLY IMPORTANT AROUND WATER COURSED, IN SWALES AND AREAS OF CONCENTRATED FLOWS, AND ON SLOPES.

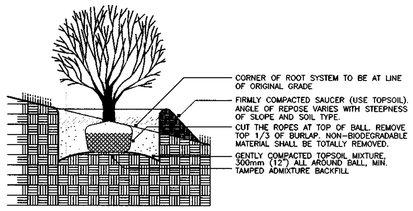
22. THIS PLAN HAS BEEN PREPARED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 16.124 OF THE HOWARD COUNTY CODE AND THE LANDSCAPE MANUAL.

23. FINANCIAL SURETY FOR THE REQUIRED LANDSCAPING MUST BE POSTED AS PART OF THE DPW DEVELOPERS AGREEMENT OR GRADING PERMIT (AS APPLICABLE) IN THE AMOUNT OF $27,600.00 (92 SHADE TREES @ $300.00 ea., 74 EVERGREEN AND 34 FLOWERING TREES @ $150.00 ea.,60 SHRUBS @ $30.00 ea.) THIS AMOUNT REPRESENTS THE REQUIRED LANDSCAPING OBLIGATIONS FOR PHASE ONE, INCLUDING SWM AND PERIMETER PLANTING REQUIREMENTS. THIS AMOUNT DOES NOT INCLUDE STREET TREES, FOREST CONSERVATION PLANTINGS, AND EXCESS VOLUNTARY PLANTINGS.

DEVELOPER'S/BUILDER'S CERTIFICATE

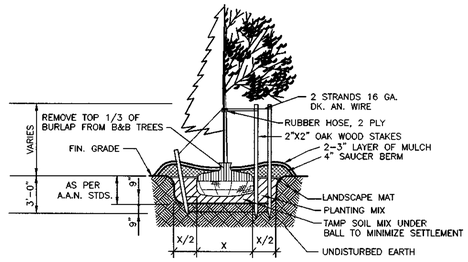
I/WE CERTIFY THAT THE LANDSCAPING SHOWN ON THIS PLAN WILL BE DONE ACCORDING TO THE PLAN, SECTION16.124 OF THE HOWARD COUNTY CODE AND THE HOWARD COUNTY LANDSCAPE MANUAL. I/WE FURTHER CERTIFY THAT UPON COMPLETION A CERTIFICATION OF LANDSCAPE INSTALLATION, ACCOMPANIED BY AN EXECUTED ONE YEAR GUARANTEE OF PLANT MATERIALS, WILL BE SUBMITTED TO THE DEPARTMENT OF PLANNING AND ZONING.

NAME — DATE 02/23/01



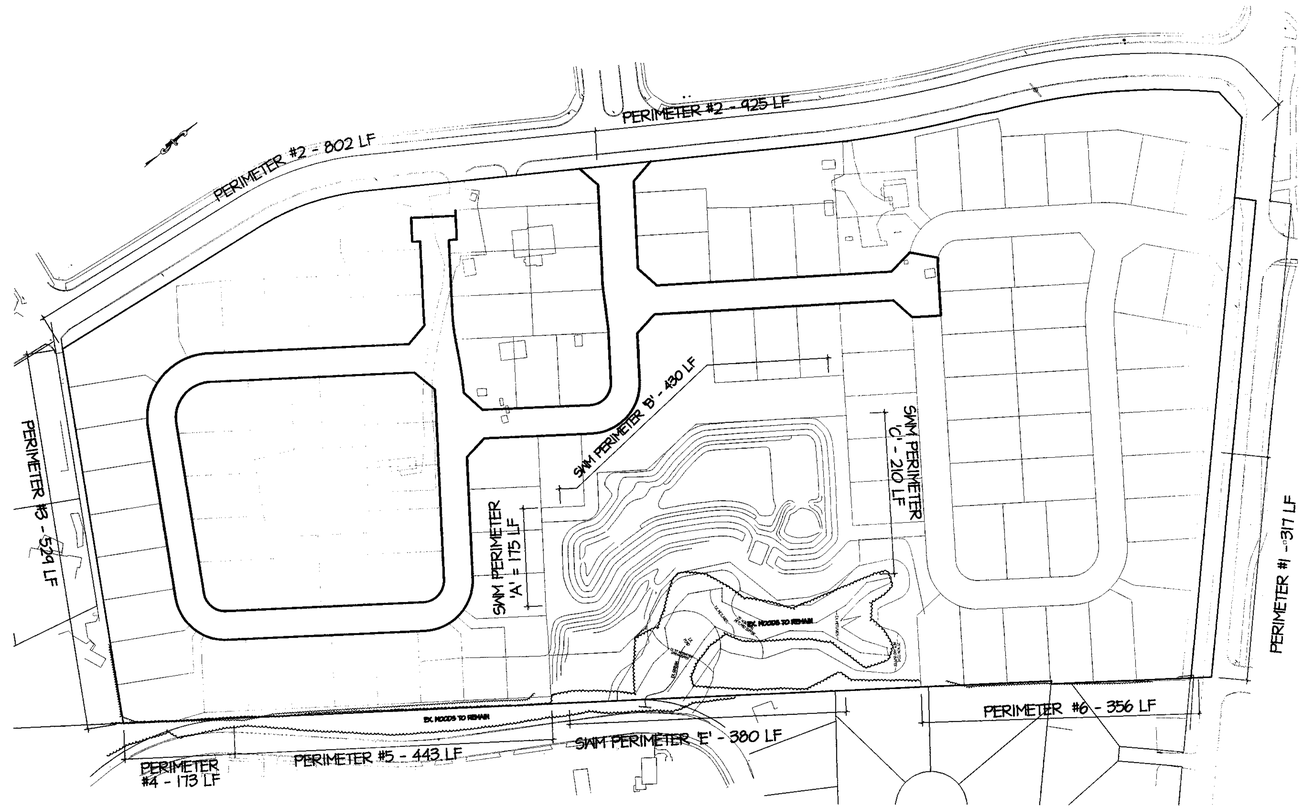
SHRUB PLANTING DETAIL
(BALL & BURLAP OR CONTAINER)

NOT TO SCALE



SHADE, FLOWERING OR
EVERGREEN TREE PLANTING DETAIL

NOT TO SCALE



CALCULATIONS DIAGRAM

SCALE: 1"=100'

SCHEDULE 'A' PERIMETER LANDSCAPE EDGE	① ✳	② ✳	③	④	⑤	⑥ ✳
PERIMETER	① ✳	② ✳	③	④	⑤	⑥ ✳
LANDSCAPE EDGE TYPE	Ⓑ SFD SIDE/REAR TO ROAD	Ⓑ SFD SIDE/REAR TO ROAD	Ⓐ SFD TO SFD	Ⓐ SFD TO SFD	Ⓑ SFD SIDE/REAR TO ROAD	Ⓐ SFD TO SFD
LINEAR FEET OF PERIMETER	779 LF	Phase 1 802 LF/ Phase 2 925 LF	529 LF	173 LF	443 LF	356 LF
NUMBER OF TREES REQUIRED SHADE TREES EVERGREEN TREES	0	1:50 = 16 1:40 = 20 ✳	1:60 = 9 ✳	1:60 = 3 ✳	1:50 = 9 1:40 = 11 ✳	0
CREDIT FOR EXISTING VEGETATION	NO	NO	NO	NO	NO	NO
CREDIT FOR WALL, FENCE OR BERM	NO	NO	NO	NO	NO	NO
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES FLOWERING TREES SHRUBS	 0 0 0 0	 8 20 ✳ 12 20 12 FLOWERING TREES SUBSTITUTED FOR 6 SHADE TREE REQUIREMENTS 20 SHRUBS SUBSTITUTED FOR 2 SHADE TREE REQUIREMENTS	 0 14 ✳ 4 0 14 EVERGREEN TREES SUBSTITUTED FOR 7 SHADE TREE REQUIREMENTS 4 FLOWERING TREES SUBSTITUTED 2 SHADE TREE REQUIREMENTS	 0 6 ✳ 0 0 6 EVERGREEN TREES SUBSTITUTED FOR 3 SHADE TREE REQUIREMENTS	 5 11 ✳ 8 0 8 FLOWERING TREES SUBSTITUTED 4 SHADE TREE REQUIREMENTS	 0 0 0 0

✳ SUBSTITUTIONS WERE MADE FOR SHADE TREE REQUIREMENTS WITH THE FOLLOWING RATES; 2:1 FLOWERING AND EVERGREEN TREES, 10:1 SHRUBS

✳ P1, P6 AND PART OF P2 OBLIGATIONS WILL BE ADDRESSED UNDER FUTURE PHASES 2 & 3.

SCHEDULE 'D' STORMWATER MANAGEMENT LANDSCAPING	
LINEAR FEET OF PERIMETER	1,195 L.F.
NUMBER OF TREES REQUIRED SHADE TREES EVERGREEN TREES	 1:50 = 24 1:40 = 30
CREDIT FOR EXISTING VEGETATION	280 L.F./23%
CREDIT FOR OTHER LANDSCAPING	NO
NUMBER OF TREES PROVIDED SHADE TREES EVERGREEN TREES FLOWERING TREES SHRUBS	 19 23 10 40

40 SHRUBS WERE SUBSTITUTED FOR 4 SHADE TREES
2 FLOWERING TREES WERE SUBSTITUTED FOR 1 SHADE TREE
8 FLOWERING TREES WERE SUBSTITUTED FOR 7 EVERGREEN TREES

COMPOSITE STREET, PERIMETER & SWM PLANT LIST					
KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
CANOPY TREES					
CT-1	5	Acer rubrum 'RED SUNSET'	Red Sunset Red Maple	2½" - 3" cal.	B&B
CT-2	7	Acer saccharum 'GREEN MOUNTAIN'	Green Mountain Sugar Maple	2½" - 3" cal.	B&B
CT-3	0	Platanus x acerifolia 'Bloodgood'	Bloodgood London Plane	2½" - 3" cal.	B&B
CT-4	18	Quercus coccinea	Scarlet Oak	2½" - 3" cal.	B&B
CT-5	56	Quercus phellos	Willow Oak	2½" - 3" cal.	B&B
CT-6	7	Salix babylonica	Weeping Willow	1½" - 2" cal.	B&B
CT-7	37	Zelkova serrata 'VILLAGE GREEN'	Village Green Japanese Zelkova	2½" - 3" cal.	B&B
FLOWERING TREES					
FT-1	17	Cercis canadensis	Eastern Redbud	6'-8'	B&B
FT-2	12	Magnolia stellata	Star Magnolia	6'-8'	B&B
FT-3	15	Prunus serrulata 'KWANZAN'	Kwanzan Cherry	1½" - 2" cal.	B&B
EVERGREEN TREES					
ET-1	29	Cedrus deodora	Deodar Cedar	6'-8'	B&B
ET-2	36	Cuppressocyparis leylandii	Leyland Cypress	5'-6'	B&B
ET-3	10	Ilex opaca	American Holly	5'-6'	B&B
ET-4	31	Pinus strobus	Eastern White Pine	6'-8'	B&B
SHRUBS					
S-1	29	Cornus stolonifera	Red-Osier Dogwood	2½" - 3'	cont.
S-2	36	Clethra alnifolia	Summersweet Clethra	2½" - 3'	cont.
S-3	47	Ilex glabra	Inkberry	2½" - 3'	cont.
S-4	35	Myrica pensylvanica	Northern Bayberry	2' - 2½"	cont.
S-5	0	Prunus laurocerasus 'SCHIPKAENSIS'	Skip Cherrylaurel	2½" - 3'	cont.
S-6	51	Viburnum carlesii	Korean Spice Viburnum	2½" - 3'	cont.

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

P+Z

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

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

STATE OF MARYLAND — REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT — No. 200030
2-22-01
DEAN W. MEYER #200030

DES: TCN/CAO
DRN: TCN/CAO
CHK: DWM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
LANDSCAPING & TREE PLANTING DETAILS

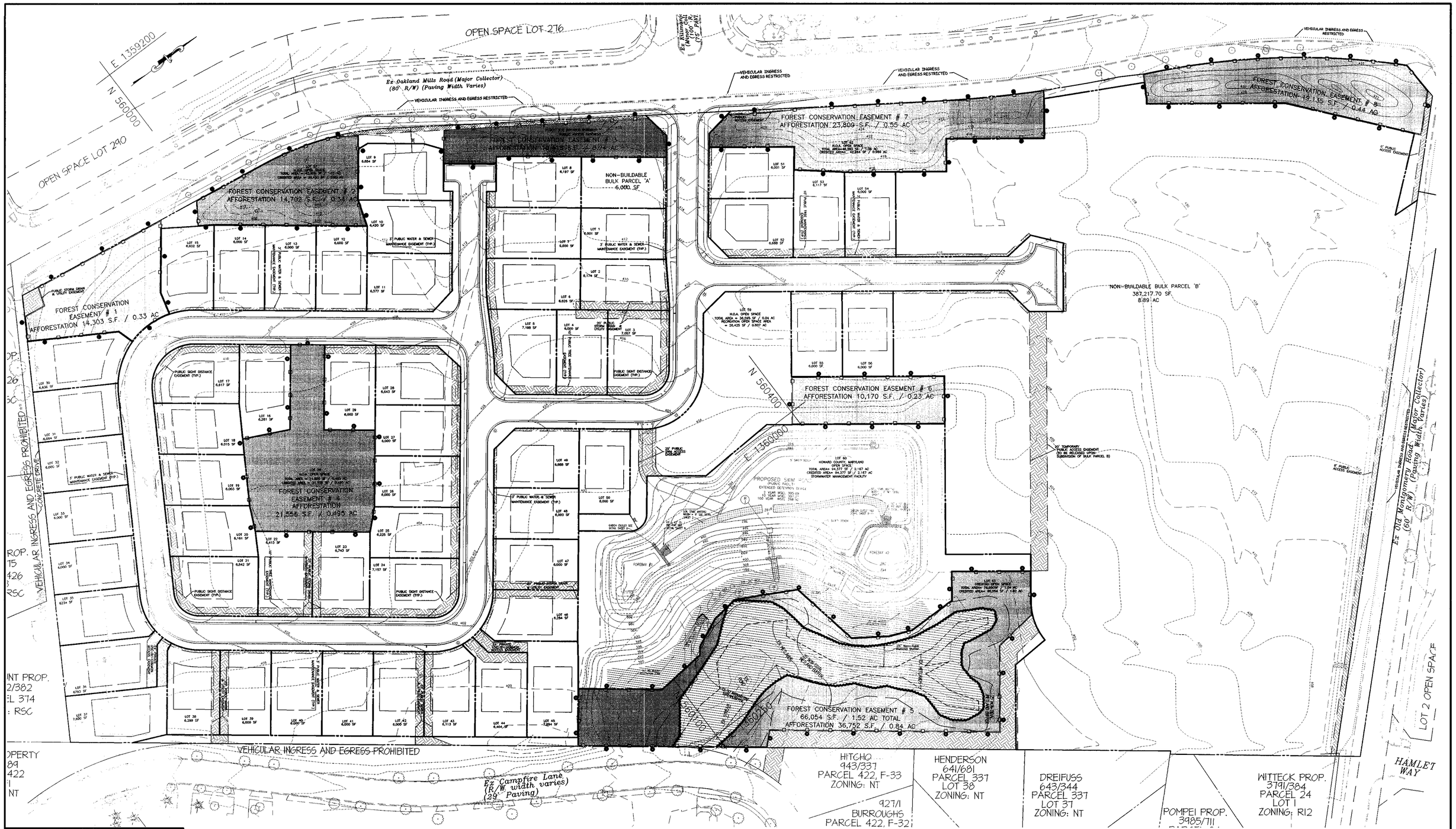
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 13 OF 20

F01 22



LEGEND

- FOREST CONSERVATION EASEMENT
- EXISTING FOREST
- FOREST CONSERVATION SIGN
- SPLIT RAIL FENCE
- AFFORESTATION AREA

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

P+Z

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Andrew M. Daneker 3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

MRA
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STATE OF MARYLAND REGISTERED LANDSCAPE ARCHITECT
2-22-01
DEAN W. MEYER #200030

DES:	TCN/CAO
DRN:	TCN/CAO
CHK:	DWM
DATE:	12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
FOREST CONSERVATION PLAN

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1" = 50'

SHEET 14 OF 20

F0122

Forest Conservation Worksheet 2.1

Note: Use 0 for all negative numbers that result from the calculations.
Net Tract Area
A. Total Tract Area — A= 27.1
B. Deductions (Critical Area, area restricted by local ordinance or program) — B= 0
C. Net Tract Area Net Tract Area = Total Tract (A) − Deductions (B) — C= 27.1
Land Use Category: High Density Residential
D. Afforestation Threshold (Net Tract Area (C) x _15___%) — D=4.1
E. Conservation Threshold (Net Tract Area (C) x __20__%) — E= 5.4
Existing Forest Cover
F. Existing Forest Cover within the Net Tract Area — F= 1.5
G. Area of Forest Above Conservation Threshold
If the Existing Forest Cover (F) is greater than the Conservation Threshold (E), then G = F − E; Otherwise G = 0 — G= 0
Breakeven Point
H. Breakeven Point (Amount of forest that must be retained so that no mitigation is required)
1) If the Area of Forest Above the Conservation Threshold (G) is greater than 0, then H = (0.2 x the Area of Forest Above Conservation Threshold (G) + the Conservation Threshold (E); — H= N/A
2) If the Area of Forest Above the Conservation Threshold (G) is equal to 0, then H = Existing Forest Cover (F),
I. Forest Clearing Permitted Without Mitigation
I = Existing Forest Cover (F) − Breakeven point (H) — I= 0
Proposed Forest Clearing
J. Total Area of Forest to be Cleared — J= 1.0
K. Total Area of Forest to be retained
K = Existing Forest Cover (F)− Forest to be Cleared (J) — K= 0.5

Planting Requirements
If the Total Area of Forest to be Cleared (K) is at or above the Breakeven Point (H), no planting is required and no further calculations are necessary (L=0, M=0, n=0, p=0); Otherwise, calculate the planting requirements(s) as follows:

L. Reforestation for Clearing Above the Conservation Threshold
(1) If the Total Area of Forest to be Retained (K) is greater than the Conservation Threshold (E), then L= the Area of Forest to be Cleared (J) x 0.25;
(2) If the Forest to be Retained (K), is less than or equal to the Conservation Threshold (E), then L=Area of Forest Above Conservation Threshold (G) x 0.25 — L= 0
M. Reforestation for Clearing Below the Conservation Threshold
(1) If Existing Forest Cover (F) is greater than the Conservation Threshold (E) and the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then M=2.0 x (Conservation Threshold (E) − Forest to be retained (K)
(2) If Existing Forest Cover (F) is less than or equal to the Conservation Threshold (E), then M = 2.0 x Forest to be Cleared (J). — M= 2.0
N. Credit for Retention Above the Conservation Threshold
If the area of Forest to be Retained (K) is greater than the Conservation Threshold (E), Then N = K − E — N= 0
P. Total Reforestation Required P = L + M − N — P= 2.0
Q. Total Afforestation Required
If Existing Forest Cover (F) is less than the Afforestation Threshold (D), then Q = Afforestation Threshold (D) − Existing Forest Cover (F) — Q= 2.6
R. Total Planting Requirement R = P + Q — R= 4.6

AN AFFORESTATION REQUIREMENT OF 4.6 ACRES IS GENERATED BY THIS DEVELOPMENT. POTENTIAL ON-SITE AFFORESTATION ACREAGE OF 3.5 ACRES EXISTS WITH A REQUEST TO PAY FEE-IN-LIEU FOR THE BALANCE OF 1.1 ACRES. IF GRANTED, THIS REQUEST WILL BE PAID TO THE FOREST CONSERVATION FUND OF HOWARD COUNTY IN THE SUM OF $14,374.80 (47,916 sf x $0.30 per S.F.) UPON COUNTY APPROVAL.

FOREST CONSERVATION PLANT LIST

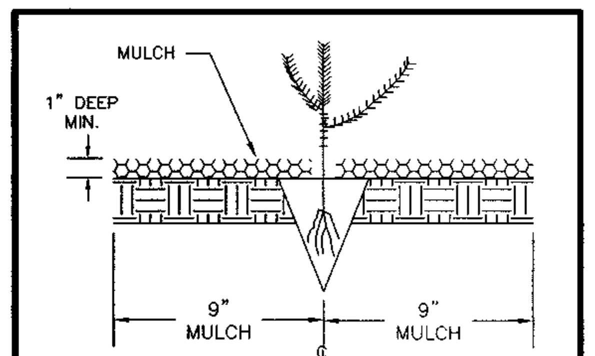
KEY	QTY	BOTANICAL NAME	COMMON NAME	Size and Type of Plant Material							
				AREA #1 (0.33 ac)	AREA #2 (0.34 ac)	AREA #3 (0.24 ac)	AREA #4 (0.50 ac)	AREA #5 (0.84 ac)	AREA #6 (0.23 ac)	AREA #7 (0.55 ac)	AREA #8 (0.44 ac)
T-1	159	Acer rubrum	Red Maple	(15) seedlings/whips	(16) seedlings/whips	(12) seedlings/whips	(23) seedlings/whips	(31) seedlings/whips	(12) seedlings/whips	(24) seedlings/whips	(20) seedlings/whips
T-2	149	Carya tomentosa	Mockernut Hickory	(14) seedlings/whips	(14) seedlings/whips	(10) seedlings/whips	(21) seedlings/whips	(31) seedlings/whips	(10) seedlings/whips	(24) seedlings/whips	(19) seedlings/whips
T-3	149	Cornus florida	Flowering dogwood	(14) seedlings/whips	(14) seedlings/whips	(10) seedlings/whips	(21) seedlings/whips	(31) seedlings/whips	(10) seedlings/whips	(24) seedlings/whips	(19) seedlings/whips
T-4	156	Liriodendron tulipifera	Tulip Poplar	(15) seedlings/whips	(16) seedlings/whips	(12) seedlings/whips	(23) seedlings/whips	(31) seedlings/whips	(10) seedlings/whips	(24) seedlings/whips	(19) seedlings/whips
T-5	149	Nyssa sylvatica	Black Gum	(14) seedlings/whips	(14) seedlings/whips	(10) seedlings/whips	(21) seedlings/whips	(31) seedlings/whips	(10) seedlings/whips	(24) seedlings/whips	(19) seedlings/whips
T-6	149	Prunus serotina	Black Cherry	(14) seedlings/whips	(14) seedlings/whips	(10) seedlings/whips	(21) seedlings/whips	(31) seedlings/whips	(10) seedlings/whips	(24) seedlings/whips	(19) seedlings/whips
T-7	155	Quercus alba	White Oak	(15) seedlings/whips	(16) seedlings/whips	(10) seedlings/whips	(23) seedlings/whips	(31) seedlings/whips	(10) seedlings/whips	(24) seedlings/whips	(20) seedlings/whips
T-8	149	Sassafras albidum	Sassafras	(14) seedlings/whips	(14) seedlings/whips	(10) seedlings/whips	(21) seedlings/whips	(31) seedlings/whips	(10) seedlings/whips	(24) seedlings/whips	(19) seedlings/whips
			Totals trees	(115) seedlings/whips	(118) seedlings/whips	(84) seedlings/whips	(174) seedlings/whips	(296) seedlings/whips	(82) seedlings/whips	(192) seedlings/whips	(154) seedlings/whips

ALL AFFORESTATION / REFORESTATION MEASURES FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS SET FORTH IN THE *HOWARD COUNTY FOREST CONSERVATION MANUAL*, LATEST EDITION. PARTICULAR ATTENTION SHOULD BE DIRECTED TO APPENDIX H FOR PLANTING AND MAINTENANCE GUIDELINES. ANY VARIATIONS OR SUBSTITUTIONS TO THIS PLAN NEED TO BE APPROVED BY THE COUNTY AND ENGINEERING FIRM RESPONSIBLE FOR THIS PLAN.

FOREST CONSERVATION SEQUENCE OF CONSTRUCTION

1. INSPECT EXISTING SEDIMENT CONTROL MEASURES. REPLACE & REPAIR AS NEEDED. — 2 DAYS
2. INSTALL ADDITIONAL SEDIMENT CONTROLS AND TEMPORARY FOREST CONSERVATION MEASURES AS SHOWN ON THESE PLANS. — 2 DAYS
3. INSTALL UTILITIES ACCORDING TO APPROVED PHASE I FINAL WATER & SEWER PLANS. INSTALL STORM DRAIN ACCORDING TO THESE PLANS. — 2 MONTHS
4. FINAL GRADE ROADS. INSTALL CURB & GUTTER AND BASE PAVING. — 1 MONTH
5. FINAL GRADE ROADS. BEGIN HOUSE CONSTRUCTION. INSTALL ADDITIONAL SEDIMENT CONTROLS AS NEEDED. — NO ESTIMATE
6. CONVERT SEDIMENT BASIN TO SWM FACILITY. — 3 WEEKS
7. STABILIZE ALL REMAINING DISTURBED AREAS. WITH SEDIMENT CONTROL INSPECTOR'S PERMISSION, REMOVE ALL REMAINING SEDIMENT CONTROL MEASURES. — 1 WEEK
8. INSTALL FINAL FOREST CONSERVATION MEASURES AND PLANTINGS AS SHOWN ON THESE PLANS. — 2 WEEKS

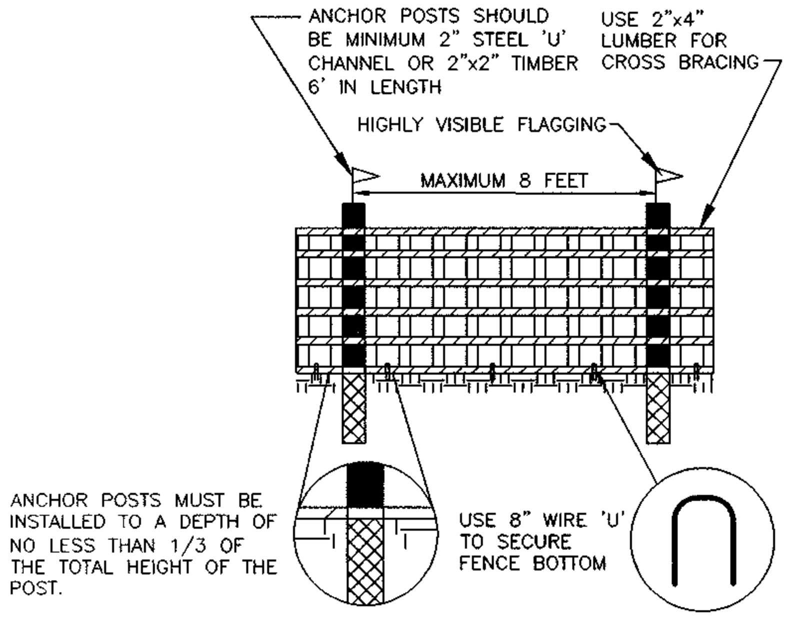
EXHIBIT H-6



MULCHING NEWLY PLANTED SEEDLINGS IS SUGGESTED AS IT HELPS THE SOIL RETAIN MOISTURE AND IT PROTECTS THE SEEDLING FROM COMPACTION AND STEM INJURY.

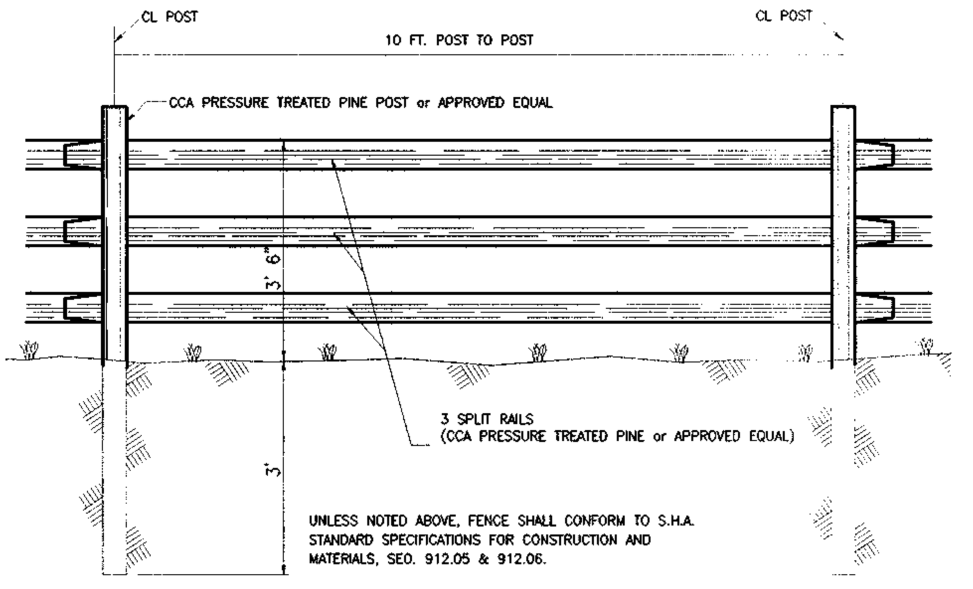
SEEDLING AND WHIP PLANTING DETAIL
NOT TO SCALE

BLAZE ORANGE PLASTIC MESH



NOTES:
1. FOREST RETENTION 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



3 SPLIT RAIL (WOOD) FENCE
NOT TO SCALE

THE ABOVE FENCE DETAIL IS FOR THE FENCE SURROUNDING ALL FOREST CONSERVATION AREAS FOR A MINIMUM TWO YEAR PERIOD. AFTER INSTALLATION OF THE PLANT MATERIAL AND IS TO HELP ENSURE ESTABLISHMENT OF THE PLANT MATERIAL. FOREST CONSERVATION SIGNAGE SHALL BE PLACED DIRECTLY UPON THE NEAREST POST PER THE PLAN LOCATIONS.

EXHIBIT G – 16

Reforestation and Afforestation Area Protection Signage

Min 11"

Forest Conservation Area

REFORESTATION PROJECT

Trees for Your Future

Min 15"

Signs similar to protection signage for Retention Areas can be used on Afforestation and Reforestation Areas. The signs notify construction workers and future residents of the newly planted material, improving the trees survival rates.

Planting Specifications: Container Grown and Balled and Burlapped Stock

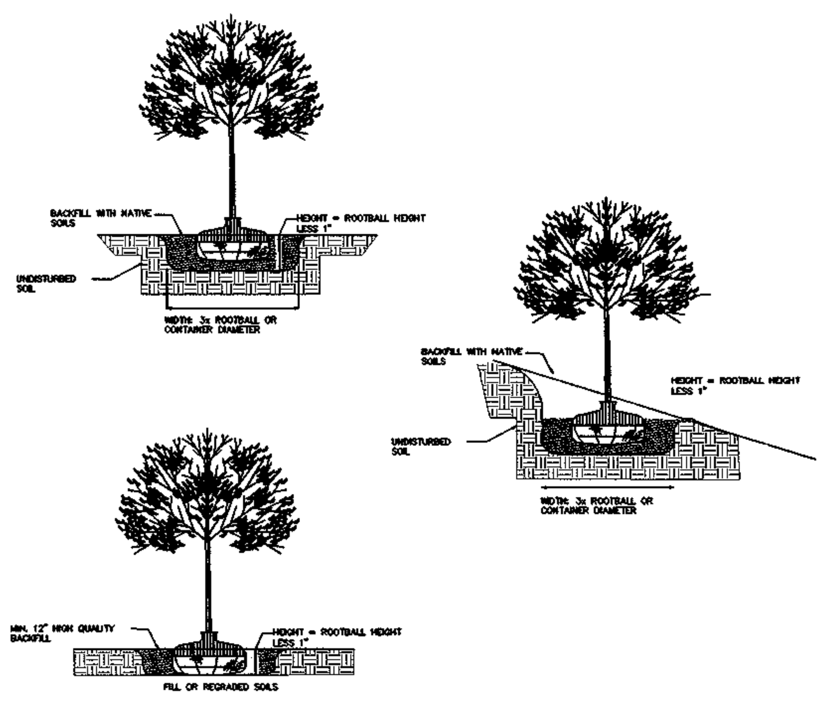


EXHIBIT G – 17

Signage

Min 11"

SPECIMEN TREE

DO NOT REMOVE

MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS

PROHIBITED

VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991

Min 15"

Min 11"

FOREST RETENTION AREA

MACHINERY, DUMPING OR STORAGE OF ANY MATERIALS IS PROHIBITED

VIOLATORS ARE SUBJECT TO FINES AS IMPOSED BY THE MARYLAND FOREST CONSERVATION ACT OF 1991

Min 15"

DEPARTMENT OF ~~PUBLIC WORKS~~ P+Z
HOWARD COUNTY, MARYLAND
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/8/01

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION CE — DATE 3/6/01

MRA
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9090 JUNCTION DRIVE SUITE 9
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FAX (410) 792-7395

STATE OF MARYLAND — DEAN WESLEY MEYER — REGISTERED LANDSCAPE ARCHITECT — No. 200030
2-22-01
DEAN W. MEYER #200030

DES: TCN/CAO
DRN: TCN/CAO
CHK: DWM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
FOREST CONSERVATION PLAN
DETAIL SHEET

600' SCALE MAP NO. 36 — BLOCK NO. 10

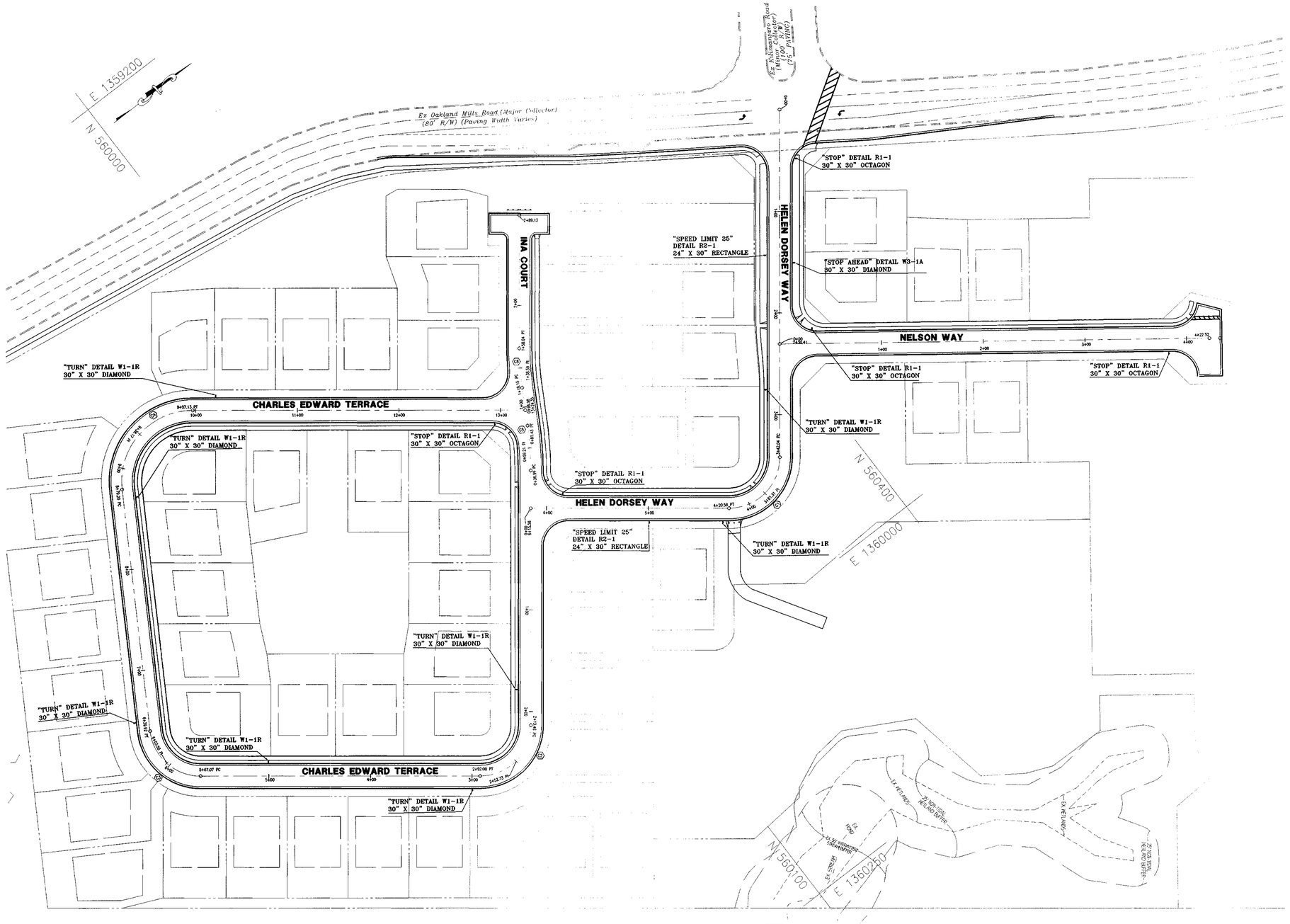
ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

F0122

TRAFFIC CONTROL SIGN TABLE

ROAD	STATION	OFFSET	SIGN	NOTES
HELEN DORSEY WAY	0+47.7	16.0' LEFT	"STOP" HOW. CO. DETAIL R1-1	30" X 30" OCTAGON
HELEN DORSEY WAY	1+42.9	14.5' RIGHT	"SPEED LIMIT 25" DETAIL R2-1	24" X 30" RECTANGLE
HELEN DORSEY WAY	5+00.0	14.0' LEFT	"SPEED LIMIT 25" DETAIL R2-1	24" X 30" RECTANGLE
NELSON WAY	0+31.7	14.8' LEFT	"STOP" HOW. CO. DETAIL R1-1	30" X 30" OCTAGON
HELEN DORSEY WAY	5+83.6	14.5' RIGHT	"STOP" HOW. CO. DETAIL R1-1	30" X 30" OCTAGON
CHARLES EDWARD TERRACE	12+93.8	14.0' RIGHT	"STOP" HOW. CO. DETAIL R1-1	30" X 30" OCTAGON
HELEN DORSEY WAY	2+75.0	14.0' RIGHT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
HELEN DORSEY WAY	4+27.0	14.0' LEFT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
CHARLES EDWARD TERRACE	1+78.0	14.0' RIGHT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
CHARLES EDWARD TERRACE	3+00.0	14.0' LEFT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
CHARLES EDWARD TERRACE	5+00.0	14.0' RIGHT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
CHARLES EDWARD TERRACE	6+50.0	14.0' LEFT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
CHARLES EDWARD TERRACE	8+88.4	14.0' RIGHT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
CHARLES EDWARD TERRACE	10+20.0	14.0' LEFT	"TURN" HOW. CO. DETAIL W1-1R	30" X 30" DIAMOND
NELSON WAY	3+82.1	14.5' RIGHT	"STOP" HOW. CO. DETAIL R1-1	30" X 30" OCTAGON
HELEN DORSEY WAY	1+50	14.5' LEFT	"STOP AHEAD" DETAIL W3-1A	30" X 30" DIAMOND



DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

Pt 2

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND
PIERO VAN MELLITS
No. 21875
REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS No. 21875

DES:	TCN/CAO
DRN:	TCN/CAO
CHK:	PVM
DATE:	12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
TRAFFIC CONTROL SIGN PLAN

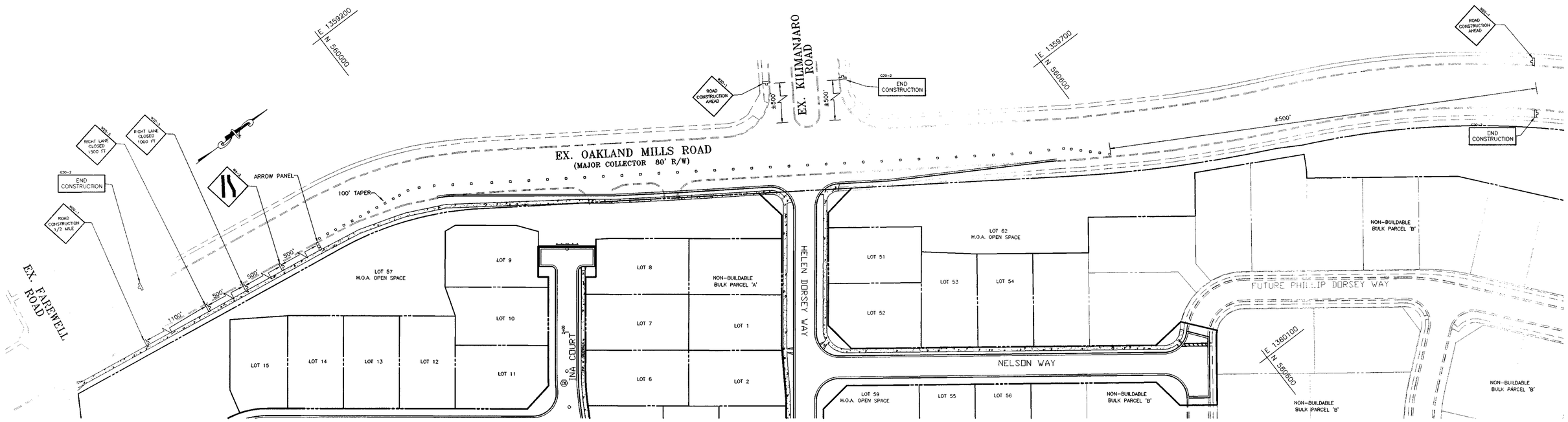
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1" = 50'

SHEET 16 OF 20

F-01-22



SCALE: 1"=50'

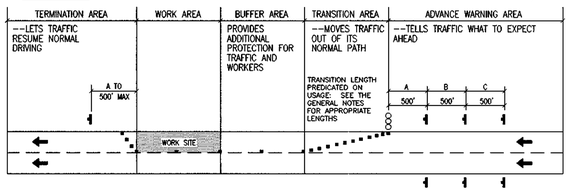
WORK ZONE TRAFFIC CONTROL NOTES

1. SEE HOWARD COUNTY STANDARD DETAILS TE-10, TE-14, AND TE-15 FOR PLACEMENT OF ALL TRAFFIC CONTROL SIGNS AND BARRICADES.
2. AN ARROW PANEL IN THE FLASHING MODE SHALL BE USED ANYTIME THERE IS A LANE CLOSURE ON A MULTILANE HIGHWAY. ARROW PANELS SHALL NOT BE USED ALONG TWO TWO-WAY ROADWAYS UNLESS THEY DISPLAY MSHA'S "FOUR CORNER" LAMP ARRAY.
3. VEHICLES SHOULD NOT OCCUPY OR BE STOPPED IN A LANE BEYOND A HORIZONTAL CURVE OR A VERTICAL CURVE. INSTEAD, VEHICLES STOPPING ARE TO BE PULLED AS FAR OFF THE ROAD AS POSSIBLE OR BE OTHERWISE PARKED IN A MANNER AS TO INHIBIT THE MOVEMENT OF TRAFFIC AS LITTLE AS POSSIBLE.
4. WARNING SIGNS SHALL BE PLACED IN ACCORDANCE WITH THE HOWARD COUNTY DETAILS LISTED IN NOTE #1. THE BOTTOM OF EACH SIGN SHALL NOT BE LESS THAN ONE FOOT ABOVE THE PAVEMENT ELEVATION. ALL SIGNS SHALL BE PLACED IN SUCH A MANNER AS TO PROVIDE ADEQUATE VISIBILITY OF THESE SIGNS AND ALL OTHER EXISTING SIGNS ON THE HIGHWAY TO THE DRIVER.
5. FOR URBAN AREAS WHERE THE PREVAILING SPEED IS 35 MPH OR LESS, THE MINIMUM WARNING SIGN SIZE MAY BE 36" X 36".
6. NO WORK OPERATIONS WHICH INTERFERES WITH THE FLOW OF TRAFFIC MAY TAKE PLACE DURING PEAK HOURS 6 AM-9AM, AND 3PM-7PM MONDAY-FRIDAY UNLESS WRITTEN APPROVAL IS RECEIVED FROM THE HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
7. ALL SIGNS, CHANNELIZING DEVICES, ETC. SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

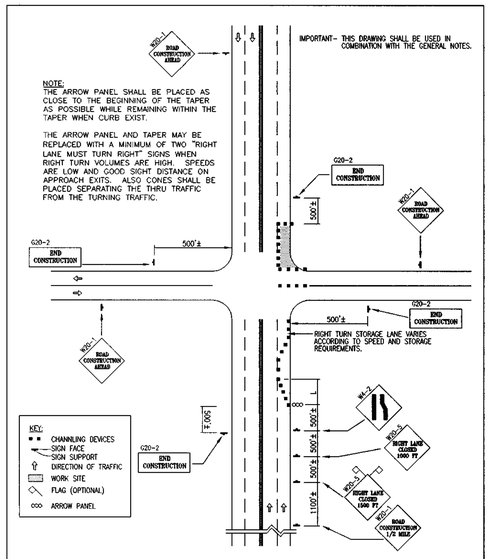
*SPEED M.P.H.	MINIMUM DISTANCE FROM TAPER TO FIRST SIGN	ADDITIONAL SIGNS IN A SERIES TO BE SPACED AT A MINIMUM			MINIMUM COMBINED ADVANCED WARNING
	A	B	C	D	A
0 - 25	200'	200'	200'	–	600'
30 - 35	300'	300'	300'	–	900'
40	500'	500'	500'	–	1500'
41 - 55	800'	700'	1100'	2600' (1/2 MILE)	5200' (1 MILE)

*SPEED LIMIT OR PREVAILING TRAVEL SPEED, WHICH EVER IS HIGHER.

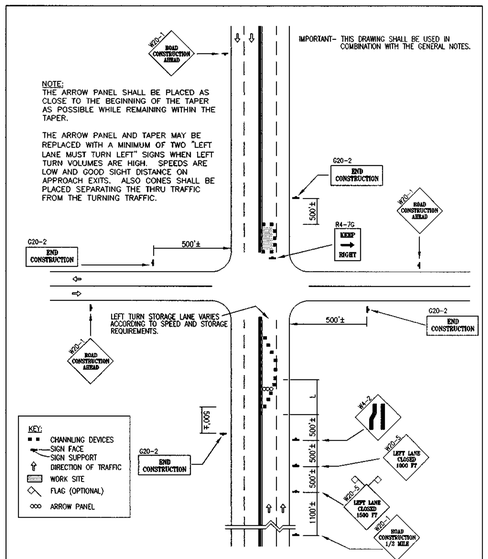
BELOW EXAMPLE: TWO LANES ONE-WAY ROADWAY / SPEED LIMIT IS 35 MPH / PREVAILING SPEED IS 38 MPH (USE 40 MPH)



WORK ZONE TRAFFIC CONTROL PLAN | NOT TO SCALE | HOWARD COUNTY TE-10



WORK ZONE TRAFFIC CONTROL PLAN | NOT TO SCALE | HOWARD COUNTY TE-14



WORK ZONE TRAFFIC CONTROL PLAN | NOT TO SCALE | HOWARD COUNTY TE-15

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

P42

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND PIERO VAN MELLITS No. 21875 REGISTERED PROFESSIONAL ENGINEER
PIERO 21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
TRAFFIC CONTROL PLAN
OAKLAND MILLS ROAD

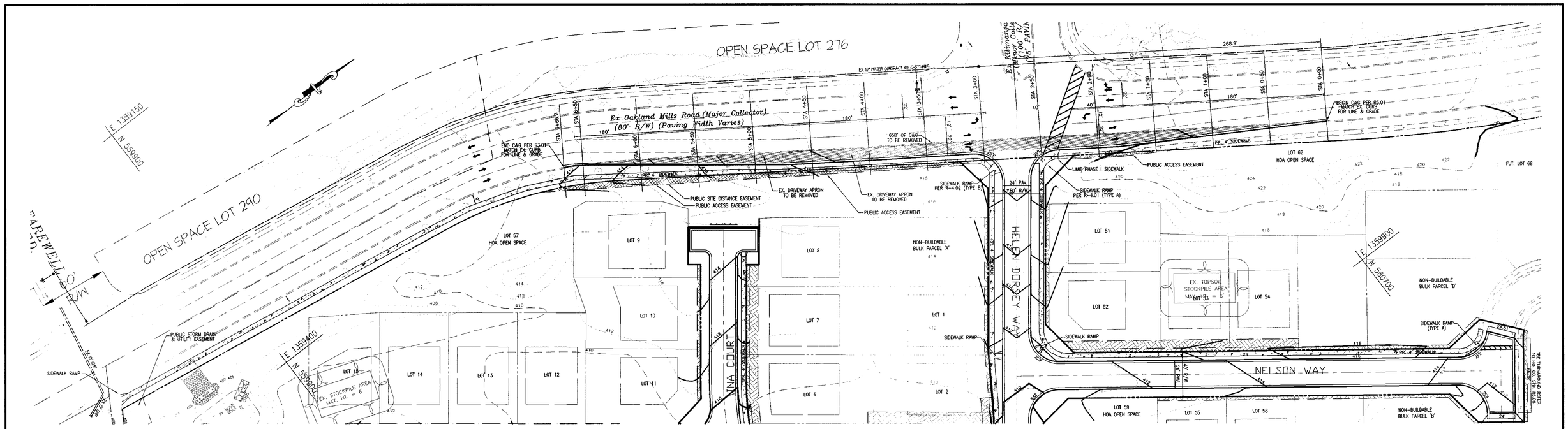
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

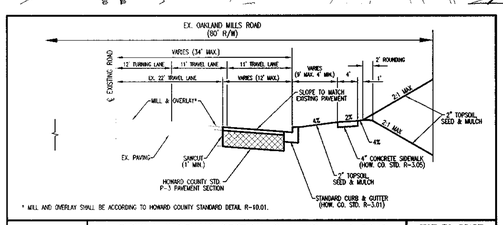
SCALE AS SHOWN

SHEET 17 OF 20

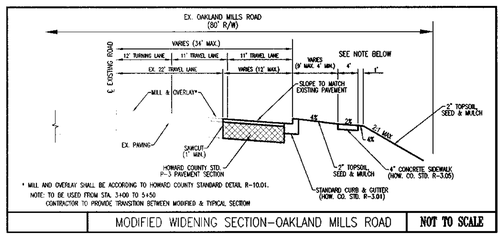
F0122



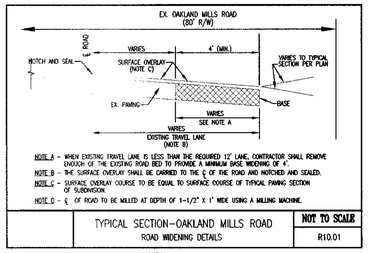
SCALE: 1"=40'



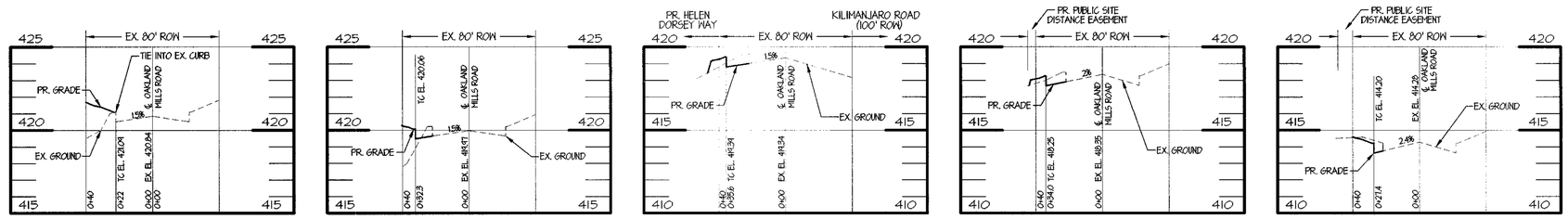
TYPICAL WIDENING SECTION–OAKLAND MILLS ROAD | NOT TO SCALE



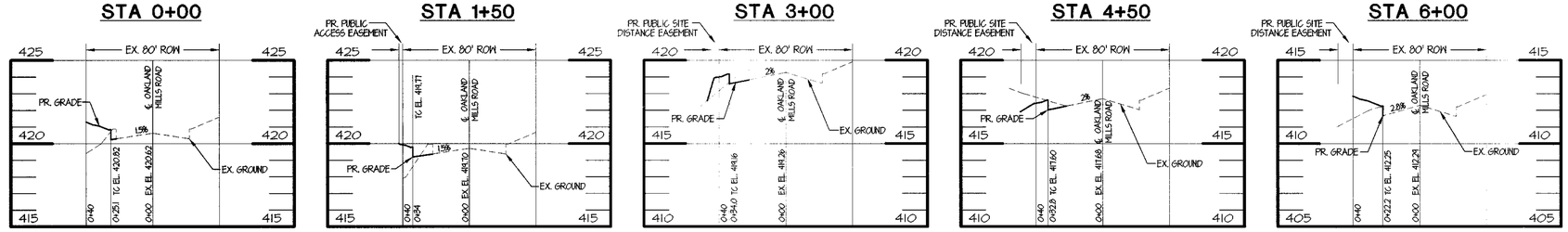
MODIFIED WIDENING SECTION–OAKLAND MILLS ROAD | NOT TO SCALE



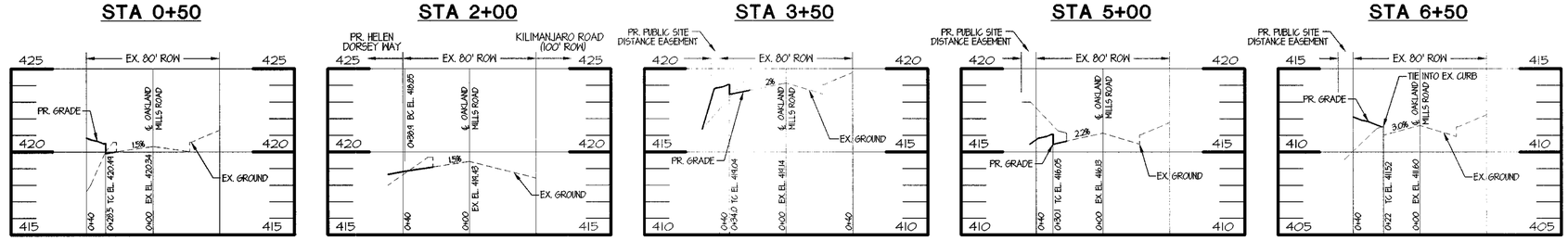
TYPICAL SECTION–OAKLAND MILLS ROAD
ROAD WIDENING DETAILS | NOT TO SCALE | R10.01



STA 0+00 | STA 1+50 | STA 3+00 | STA 4+50 | STA 6+00



STA 0+50 | STA 2+00 | STA 3+50 | STA 5+00 | STA 6+50



STA 1+00 | STA 2+50 | STA 4+00 | STA 5+50 | STA 6+66.7

SCALE: HORIZONTAL: 1"=40' VERTICAL: 1"=4'

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

P+Z

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

MRA
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STATE OF MARYLAND — PIERO VAN MELLITS No. 21875 — REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS REG. NO. 21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
ROAD IMPROVEMENT PLAN
OAKLAND MILLS ROAD

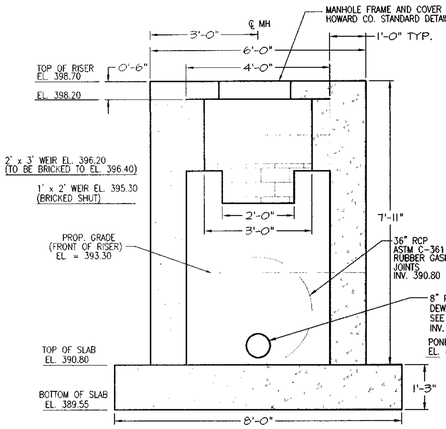
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

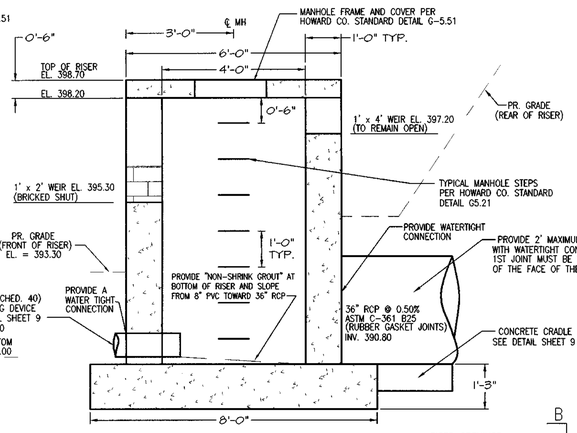
SHEET 18 OF 20

F01 22



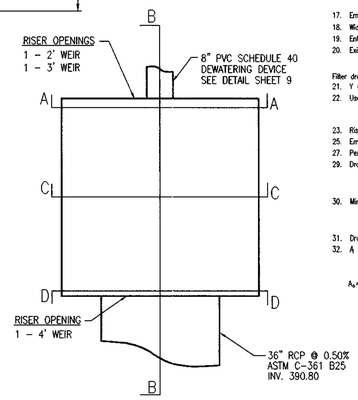
TEMPORARY RISER STRUCTURE OPENING DETAIL 'A' SECTION A-A

SCALE: 1"=2'



TEMPORARY RISER STRUCTURE OPENING DETAIL 'B' SECTION B-B

SCALE: 1"=2'



RISER STRUCTURE PLAN VIEW

SCALE: 1"=2'

Figure 2 Temporary Sediment Basin Design Data Sheet

Competed by: TCN Date: 1/29/01 Checked by: MJE Date: 1/5/01
Project Name: ECKER'S HOLLOW Basin #: 1
Location:

Total area draining to basin: 24.35 acres (ac)

Basin Volume Design

Note: 1. Also see Surface Area Design #30, this form.
2. To convert ft^3 to yd^3 divide ft^3 by 27. To convert ft^2 to yd^2 divide ft^2 by 9.

1. Min. required vol. = 3600 ft^3/ac x 24.35 ac Drainage = 87,660 ft^3
2. Actual Volume of basin = 116,551 ft^3
3. Excavate 80,000 ft^3 2963 yd^3 to obtain required capacity.
4. Vol. at dewatering elev. = 1800 ft^3/ac x 24.35 ac. = 43,830 ft^3
5. Vol. of basin at cleanout = 900 ft^3/ac x 24.35 ac. = 21,915 ft^3
6. Elevation corresponding to min. required volume of basin (riser crest elevation) 396.40 ft
7. Permanent pool elevation 394.30 ft
8. Distance from riser crest elevation to permanent pool elevation 2.1 ft
9. Basin cleanout elevation 393.30 ft
10. Distance from riser crest elevation to cleanout elevation 3.1 ft

Spillway Design

11. Q_{10} = 107.8 cfs (peak discharge from 10-yr, 24-hr storm event, attach computations)

Principal Spillway (Ops)(see Detail 11)

See Stormwater Management Pond Plans and Details
12. Design Principal Spillway (Barrel) discharge, Design Q_{ps} = 10.78 cfs (min. 10% of 10 year peak or 8" Diameter Pipe)
13. H = 6.3 ft; Barrel length = 157 ft
14. Barrel Diameter 36 in. Note: Q_{ps} must equal or exceed Design Q_{ps}
Q_{ps} = Q (from Table 12 or 13) 89.83 x (length correction factor) 0.834 = 79.32 cfs.
15. Riser Diameter N/A in.; Riser Height N/A ft.; Riser Head (h) = N/A ft.
16. Trash Rack Diam. N/A in.; Trash Rack Height = N/A in.

NOTE: A table showing design data shall be included on the plan for each basin.

Emergency Spillway (Oes) - "EMS"

17. Emergency spillway cap., Q_{es} = Q_{10} - Q_{ps} = 107.8 - 10.78 = 97.0 cfs
18. Width 20 ft; Hp 1.6 ft (Capacity from Table 14 = 104 cfs)
19. Entrance channel slope 20 %
20. Exit channel slope 8 %

Anti-Seep Collar Design (If Required)

Filler drainage diaphragm used instead of anti-seep collar.
21. Y = N/A ft.; z = N/A :1; pipe slope = N/A %; Ls = N/A ft
22. Use N/A collar(s), N/A ft. - N/A in. square; projection = N/A ft

Design Elevations

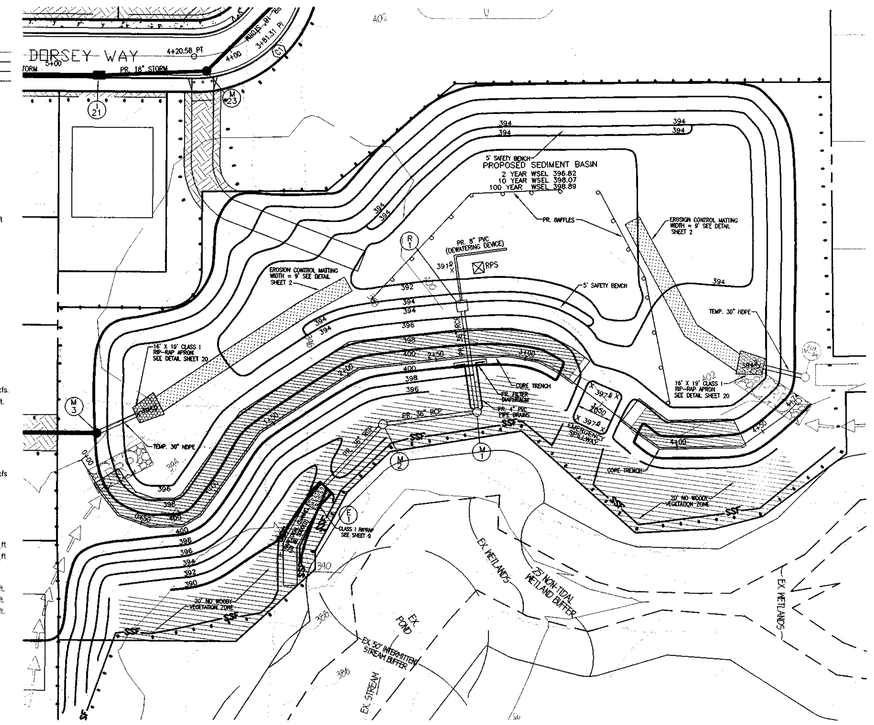
23. Riser Crest	396.40 ft	24. Design High Water	398.89 ft.
25. Emergency Spillway Crest	397.60 ft.	26. Min. settled top of dam	399.89 ft.
27. Permanent pool	394.30 ft.	28. Bottom of Basin	391.00 ft.
29. Draw-down orifice invert	394.30 ft.		

Surface Area Design

30. Min. basin surface area; SA > 0.0035 Q_{10} = 0.0035 x 107.8 cfs < 0.38 ac.

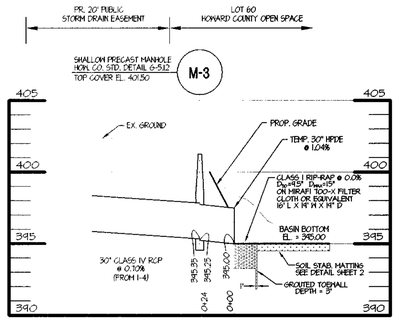
Draw-down Device

31. Draw-down device orifice diameter = 8 in. (From Table 11)
32. A_f = Total area of perforations > $4A_o$
A_f = (# of perforations/foot)(perforation area ft^2)(perforated section length ft.)
A_f = 1.40 ft^2
A_o = Internal orifice area (from Table 11 or computed)
Length = 58.0 ft



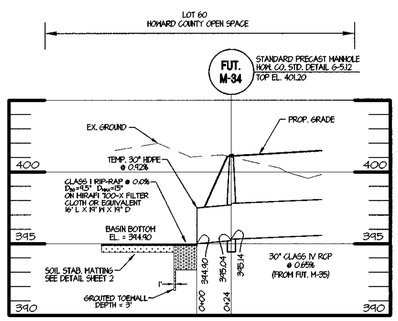
PLAN VIEW - SEDIMENT BASIN

SCALE: 1"=40'



TEMP. SEDIMENT CONTROL STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



TEMP. SEDIMENT CONTROL STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

CONSTRUCTION SEQUENCE FOR SWM POND CONVERSION

1. FLUSH STORM DRAIN SYSTEM OF ALL ACCUMULATED SEDIMENT. 1 DAY
2. DEWATER SEDIMENT BASIN AND REMOVE ALL ACCUMULATED SEDIMENT FROM BASIN BOTTOM. 2 DAYS
3. RE-GRADE POND BOTTOM AS NECESSARY TO MATCH FINAL PROPOSED GRADES. INSTALL SWM POND FOREBAYS. CONVERT POND SIDE SLOPES FROM 3:1 TO 4:1. 3 DAYS
4. REMOVE TEMPORARY HDPE PIPE AND INSTALL 30" RCP FROM M-3 TO E-2. INSTALL STRUCTURE E-2 AND RIP-RAP APRON AT E-2 PER STORM DRAIN PROFILES. 2 DAYS
5. REMOVE TEMPORARY HDPE PIPE AND INSTALL 30" RCP FROM M-34 TO E-3. INSTALL STRUCTURE E-3 AND RIP-RAP APRON AT E-3 PER STORM DRAIN PROFILES. 2 DAYS
6. PROVIDE FINAL STABILIZATION WITHIN SWM POND STORAGE AREA AND EMBANKMENT. 1 DAYS
7. REMOVE SEDIMENT CONTROL DEWATERING DEVICE AND REPLACE WITH SWM POND DEWATERING DEVICE. OPEN ALL BLOCKED OPENINGS AND INSTALL ALL TRASH RACKS AS SHOWN ON SWM DETAIL SHEET. REMOVE RPS (REMOVABLE PUMPING STATION). 2 DAYS
8. WITH GRADING INSPECTOR'S APPROVAL, REMOVE ALL REMAINIAING SEDIMENT CONTROLS AND STABILIZE ANY REMAINING DISTURBED AREAS. 2 DAY

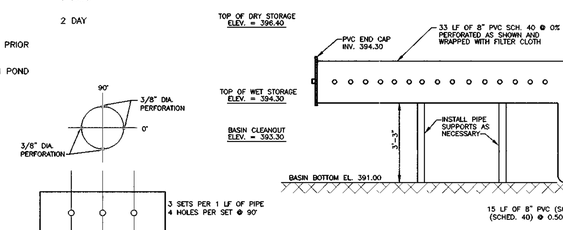
NOTES:
1. CONTRACTOR TO OBTAIN GRADING AND SWM INSPECTOR'S APPROVAL PRIOR BEGINNING SWM POND CONVERSION.
2. CONTRACTOR TO STABILIZE ALL UPSTREAM DRAINAGE AREAS TO SWM POND PRIOR TO BEGINNING SWM POND CONVERSION.
3. ITEMS #3-#6 MAY BE DONE CONCURRENTLY.

CONSTRUCTION SEQUENCE FOR SEDIMENT CONTROL

1. OBTAIN GRADING PERMIT. 1 WEEK
2. INSPECT EXISTING SEDIMENT CONTROL MEASURES. REPLACE & REPAIR, AS NEEDED. 2 DAYS
3. INSTALL ADDITIONAL SEDIMENT CONTROL MEASURES, AS SHOWN ON THESE PLANS. 2 WEEKS
4. INSTALL SEDIMENT BASIN, PER THESE PLANS. THIS INCLUDES CORE TRENCH, BARREL OUTFALL, RIPRAP, FILTER DIAPHRAGM, RISER STRUCTURE, AND EMBANKMENT CONSTRUCTION. REFER TO SHEETS 9 AND 10 FOR ANY OTHER SWM/BASIN DETAILS. BLOCK RISER OPENINGS PER TEMPORARY RISER STRUCTURE OPENING DETAIL. SEE DETAIL THIS SHEET. 4 WEEKS
5. INSTALL UTILITIES ACCORDING TO APPROVED PHASE I FINAL PLANS. INSTALL TEMPORARY STORM DRAIN OUTFALL PIPES, AS SHOWN ON THESE PLANS. 2 MONTHS
6. FINAL GRADE ROADS. INSTALL CURB & GUTTER AND BASE PAVING. 1 MONTH
7. WITH GRADING INSPECTOR'S APPROVAL, CONVERT SEDIMENT BASIN TO SWM FACILITY. SEE CONSTRUCTION SEQUENCE FOR SWM POND CONVERSION. 3 WEEKS
8. ONCE ALL AREAS HAVE BEEN STABILIZED, AND WITH GRADING INSPECTOR'S APPROVAL, REMOVE ALL REMAINING SEDIMENT CONTROL MEASURES AND PROVIDE FINAL STABILIZATION FOR ALL REMAINING DISTURBED AREAS. 1 WEEKS

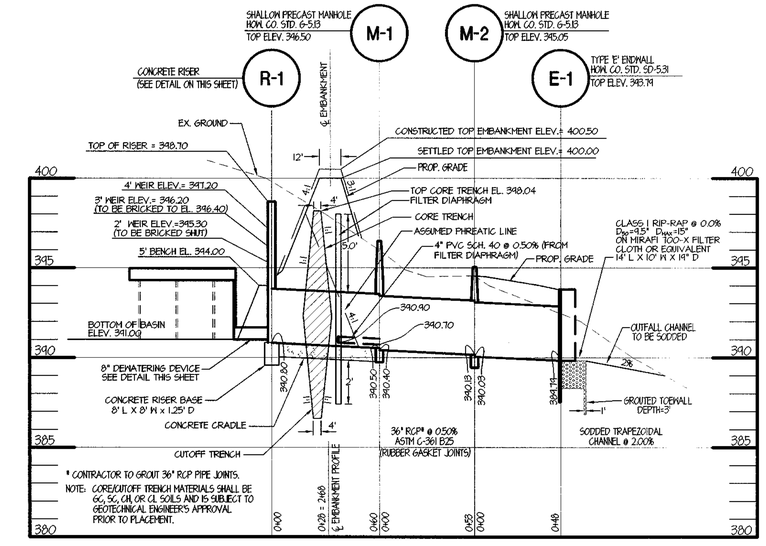
PR. SEDIMENT BASIN SUMMARY TABLE

EXISTING DRAINAGE AREA			15.40 ACRES
PROPOSED DRAINAGE AREA			24.35 ACRES
VOLUME REQUIRED	24.35 x 1800	WET	43,830 C.F.
	24.35 x 1800	DRY	43,830 C.F.
TOTAL VOLUME REQUIRED			87,660 C.F.
TOTAL VOLUME PROVIDED			116,551 C.F.
WET STORAGE DEPTH			3.3 FT.
LIMIT OF WET STORAGE ELEVATION			394.30
CLEANOUT ELEVATION			393.30
RISER CREST ELEVATION			396.40
EMBANKMENT ELEVATION			400.00
BOTTOM ELEVATION			391.00
WET STORAGE VOLUME			45,370 C.F.
EMS CREST ELEVATION			397.60
EMS LENGTH			20 FT.
DRAW-DOWN DEVICE			8" PVC
OUTFALL BARREL TYPE			36" RCP



TEMPORARY DEWATERING DEVICE DETAIL FOR SEDIMENT CONTROL ONLY

N.T.S.



PRINCIPAL SPILLWAY PROFILE

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

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16

REVIEW FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REVIEW.

U.S.D.A. NATURAL RESOURCES CONSERVATION SERVICE — DATE 3/1/01

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND AS SHOWN ON GP-01-78.

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 3/1/01

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

P+2

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
9080 JUNCTION DRIVE SUITE 9
ANNAPOLIS JUNCTION, MARYLAND 20701
(410) 792-9792 or (301) 776-1690
FAX (410) 792-7395

STATE OF MARYLAND — PIERO VAN MELLITS No. 21875 — REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS No. 21875

DES:	TCN/CAO
DRN:	TCN/CAO
CHK:	PVM
DATE:	12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
SEDIMENT BASIN PLAN, PROFILE, AND DETAILS

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 19 OF 20

F0122

VEGETATIVE STABILIZATION

PERMANENT AND TEMPORARY SEEDING, SODDING AND MULCHING

I. SITE PREPARATION

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

II. SEEDED PREPARATION AND SEEDING APPLICATION

LOOSEN THE TOP LAYER OF THE SOIL TO A DEPTH OF 3 TO 5 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT SUCH AS DISC HARROWS, CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. INCORPORATE THE LIME AND FERTILIZER INTO THE TOP 3 TO 5 INCHES OF THE SOIL BY DISCING OR BY OTHER SUITABLE MEANS. ROUGH AREAS SHOULD NOT BE ROLLED OR DRAGGED SMOOTH , BUT LEFT IN A ROUGHENED CONDITION. STEEP SLOPES GREATER THAN 3:1 SHOULD BE TRACKED BY A DOZER, LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL SHOULD BE LOOSE AND FRIABLE. PERMANENT COVER MAY REQUIRE AN APPLICATION OF TOPSOIL. IF SO, IT MUST MEET THE REQUIREMENTS SET FORTH IN SECTION 21.0 STANDARDS AND SPECIFICATIONS FOR TOPSOIL FROM THE 1994 STANDARDS AND SPECIFICATIONS.

III. SOIL AMENDMENTS

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

FERTILIZER NITROGEN 2 LBS/1000 SF (90 LBS/AC)
P205 4 LBS/1000 SF (175 LBS/AC)
K20 4 LBS/1000 SF (174 LBS/AC)

GROUND LIMESTONE 2 TONS/AC

IV. SEDIMENT CONTROL PRACTICE SEEDING

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

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

V. TEMPORARY/PERMANENT SEEDING MIXTURES AND RATES

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

?VI. TURFGRASS ESTABLISHMENT

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

VII. MULCHING

ALL SEEDING REQUIRE MULCHING. ALSO MULCH DURING NON-SEEDING DATES UNTIL SEEDING CAN BE DONE.

MULCH SHALL BE UNROTTED, UNCHOPPED, SMALL GRAIN STRAW APPLIED AT A RATE OF A 2 TONS/ACRE OR 90 LBS/1000 SF (2 BALES). IF A MULCH ANCHORING TOOL IS USED, APPLY 2.5 TONS/ACRE. MULCH MATERIAL SHALL BE RELATIVELY FREE OF ALL KINDS OF WEEDS AND SHALL BE COMPLETELY FREE OF PROHIBITED NOXIOUS WEEDS. SPREAD MULCH UNIFORMLY, MECHANICALLY OR BY HAND, TO A DEPTH OF 1-2 INCHES. MULCH ANCHORING SHALL BE ACCOMPLISHED IMMEDIATELY AFTER MULCH PLACEMENT TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY MULCH NETTINGS, MULCH ANCHORING TOOL, WOOD CELLULOSE FIBER OR LIQUID MULCH BINDERS.

APPLY WOOD CELLULOSE FIBER AT A DRY WEIGHT OF 1,500 LBS/ACRE. IF MIXED WITH WATER, USE 50 LBS. OF WOOD CELLULOSE FIBER PER 1000 GALLONS OF WATER.

LIQUID BINDER SHOULD BE APPLIED HEAVIER AT THE EDGE, WHERE WIND CATCHES MULCH IN VALLEYS, AND ON CREST OF BANKS. THE REMAINDER OF THE AREA SHOULD APPEAR UNIFORM AFTER BINDER APPLICATION. APPLY RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR AND MULCH. STABLE LIGHT WEIGHT, PLASTIC NETTING OVER THE MULCH ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

VIII. SODDING

CLASS OF TURFGRASS SOD SHALL BE MARYLAND OR VIRGINIA STATE CERTIFIED, OR MARYLAND OR VIRGINIA STATE APPROVED SOD. SOD SHALL BE HARVESTED, DELIVERED AND INSTALLED WITHIN A PERIOD OF 36 HOURS. SOD IS TO BE LAID WITH THE LONG EDGES PARALLEL TO THE CONTOUR USING STAGGERED JOINTS WITH ALL ENDS TIGHTLY ABUTTED AND NOT OVER LAPPING. SOD SHALL BE ROLLED AND THOROUGHLY WATERED AFTER INSTALLATION. DAILY WATERING TO MAINTAIN 4 INCH DEPTH OF MOISTURE FOR THE FIRST WEEK IS REQUIRED IN THE ABSENCE OF RAINFALL. SOD IS NOT TO BE APPLIED ON FROZEN GROUND.

IX. MAINTENANCE

A. IRRIGATE-APPLY MINIMUM 1" OF WATER EVERY 3 TO 4 DAYS DEPENDING ON SOIL TEXTURE, WHEN SOIL MOISTURE BECOMES DEFICIENT TO PREVENT LOSS OF STAND OF PROTECTIVE VEGETATION.

B. REPAIRS- IF STAND PROVIDES BETWEEN 40% TO 94% GROUND COVERAGE, OVERSEED AND FERTILIZER USING HALF OF THE RATES ORIGINALLY APPLIED. IF STAND PROVIDES LESS THAN 40% COVERAGE, REESTABLISH AND STAND FOLLOWING ORIGINAL RATES AND PROCEDURES.

NOTE: USE OF THIS INFORMATION DOES NOT PRECLUDE MEETING ALL OF THE REQUIREMENTS OF THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL VEGETATIVE PRACTICES.

STANDARDS AND SPECIFICATION FOR TOPSOIL

DEFINITION

PLACEMENT OF TOPSOIL OVER A PREPARED SUBSOIL PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION.

PURPOSE

TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SOILS OF CONCERN HAVE LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW pH, MATERIAL TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

CONDITIONS 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. AREA 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 STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN REPRESENTATIVES 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 USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURED SUBSOILS AND SHALL CONTAIN LESS THAN 5% BY VOLUME OF CINDERS, STONES, SLAG, COARSE FRAGMENTS, GRAVELS, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2" IN DIAMETER.
- II. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUICKGRASS, 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 SF) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.

II. FOR SITE HAVING DISTURBED AREAS UNDER 5 ACRE
- I. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION-SECTION I-VEGETATIVE STABILIZATION METHODS AND MATERIALS.

III. 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 DISTURBED 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 PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

VI. ALTERNATIVE FOR PERMANENT SEEDING-INSTEAD OF APPLYING THE FULL AMOUNTS OF LIME AND COMMERCIAL FERTILIZER, COMPOSTED SLUDGE AND AMENDMENTS MAY BE APPLIED AS SPECIFIED BELOW:
- I. COMPOSTED SLUDGE MATERIAL FOR USE A SOIL CONDITIONER FOR SITES HAVING DISTURBED AREAS OVER 5 ACRE SHALL BE TESTED TO PRESCRIBE AMENDMENTS AND FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:
  - A. COMPOSTED SLUDGE SHALL BE SUPPLIED BY, OR ORIGINATE FROM, A PERSON OR PERSONS THAT ARE PERMITTED (AT THE TIME OF ACQUISITION OF THE COMPOST) BY THE MARYLAND DEPARTMENT OF THE ENVIRONMENT UNDER COMAR 26.04.06.
  - B. COMPOSTED SLUDGE SHALL CONTAIN AT LEAST 1 PERCENT NITROGEN, 1.5 PERCENT PHOSPHOROUS, AND 0.2 PERCENT POTASSIUM AND HAVE A pH OF 7.0 TO 8.0. IF COMPOST DOES NOT MEET THESE REQUIREMENTS, THE APPROPRIATE CONSTITUENTS MUST BE ADDED TO MEET THE REQUIREMENTS PRIOR TO USE.
  - C. COMPOSTED SLUDGE SHALL BE APPLIED AT A RATE OF 1 TON/1,000 SF.
- II. COMPOSTED SLUDGE SHALL BE AMENDED WITH A POTASSIUM FERTILIZER APPLIED AT THE RATE OF 4LB/1,000 SF, AND 1/3 THE NORMAL LIME APPLICATION RATE.

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

STANDARDS AND SPECIFICATIONS FOR LAND GRADING

DEFINITION

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

PURPOSE

THE PURPOSE OF A LAND GRADING SPECIFICATION IS TO PROVIDE FOR EROSION CONTROL AND VEGETATIVE ESTABLISHMENT ON THOSE AREAS WHERE THE EXISTING LAND SURFACE IS TO BE RESHAPED BY GRADING ACCORDING TO PLAN.

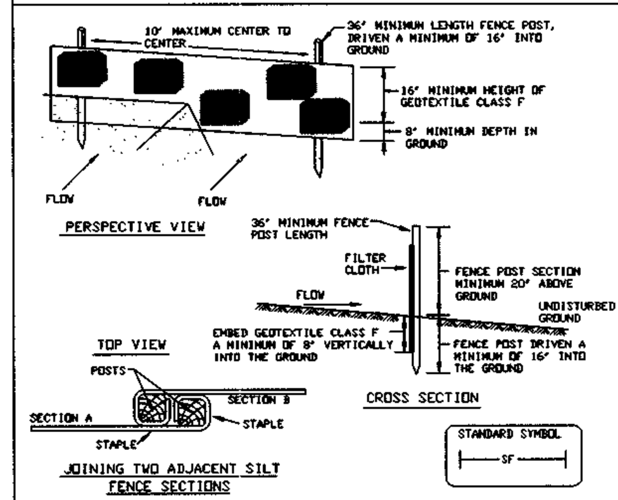
DESIGN CRITERIA

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

MANY COUNTIES HAVE REGULATIONS AND DESIGN PROCEDURES ALREADY ESTABLISHED FOR LAND GRADING AND CUT AND FILL SLOPES. WHERE THESE REQUIREMENTS EXIST, THEY SHALL BE FOLLOWED. THE PLAN MUST SHOW EXISTING AND PROPOSED CONTOURS OF THE AREA(S) TO BE GRADED. THE PLAN SHALL ALSO INCLUDE PRACTICES FOR EROSION CONTROL, SLOPE STABILIZATION, SAFE DISPOSAL OF RUNOFF WATER AND DRAINAGE, SUCH AS WATERWAYS, LINED DITCHES. REVERSE SLOPE BENCHES (INCLUDE GRADE AND CROSS SECTION), GRADE STABILIZATION STRUCTURES, RETAINING WALLS, AND SURFACE AND SUBSURFACE DRAINS. THE PLAN SHALL ALSO INCLUDE PHASING OF THESE PRACTICES. THE FOLLOWING SHALL BE INCORPORATED INTO THE PLAN:

- I. PROVISIONS SHALL BE MADE TO SAFELY CONDUCT SURFACE RUNOFF TO STORM DRAINS, PROTECTED OUTLETS OR TO STABLE WATER COURSES TO INSURE THAT SURFACE RUNOFF WILL NOT DAMAGE SLOPES OR OTHER GRADED AREAS.
- II. CUT AND FILL SLOPES THAT ARE TO BE STABILIZED WITH GRASSES SHALL NOT BE STEEPER THAN 2:1. (WHERE THE SLOPE IS TO BE MOWED THE SLOPE SHOULD BE NO STEEPER THAN 3:1, 4:1 IS PREFERRED BECAUSE OF SAFETY FACTORS RELATED TO MOWING STEEP SLOPES.) SLOPES EXCEEDING 2:1 SHALL REQUIRE SPECIAL DESIGN AND STABILIZATION CONSIDERATIONS THAT SHALL BE ADEQUATELY SHOWN ON THE PLANS.
- III. REVERSE BENCHES SHALL BE PROVIDED WHENEVER THE VERTICAL INTERVAL (HEIGHT) OF ANY 2:1 SLOPE EXCEEDS 20 FEET; FOR 3:1 SLOPE IT SHALL BE INCREASED TO 30 FEET AND FOR 4:1 TO 40 FEET. BENCHES SHALL BE LOCATED TO DIVIDE THE SLOPE FACE AS EQUALLY AS POSSIBLE AND SHALL CONVEY THE WATER TO A STABLE OUTLET. SOILS, SEEPS, ROCK OUTCROPS, ETC., SHALL ALSO BE TAKEN INTO CONSIDERATION WHEN DESIGNING BENCHES.
  - A. BENCHES SHALL BE A MINIMUM OF SIX FEET WIDE TO PROVIDE FOR EASE OF MAINTENANCE.
  - B. BENCHES SHALL BE DESIGNED WITH A REVERSE SLOPE OF 6:1 OR FLATTER TO THE TOE OF THE UPPER SLOPE AND WITH A MINIMUM OF ONE FOOT IN DEPTH. BENCH GRADIENT TO THE OUTLET SHALL BE BETWEEN 2 PERCENT AND 3 PERCENT, UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS.
  - C. THE FLOW LENGTH WITHIN A BENCH SHALL NOT EXCEED 800' UNLESS ACCOMPANIED BY APPROPRIATE DESIGN AND COMPUTATIONS. FOR FLOW CHANNEL STABILIZATION SEE TEMPORARY SWALE.
- IV. SURFACE WATER SHALL BE DIVERTED FROM THE FACE OF ALL CUT AND/OR FILL SLOPES BY THE USE OF EARTH DIKES, DITCHES AND SWALES OR CONVEYED DOWNSLOPE BY THE USE OF A DESIGNED STRUCTURE, EXCEPT WHERE:
  - A. THE FACE OF THE SLOPE IS OR SHALL BE STABILIZED AND THE FACE OF ALL GRADED SLOPES SHALL BE PROTECTED FORM SURFACE RUNOFF UNTIL THEY ARE STABILIZED.
  - B. THE FACE OF SLOPE SHALL NOT BE SUBJECT TO ANY CONCENTRATED FLOWS OF SURFACE WATER SUCH AS FROM NATURAL DRAINAGEWAYS, GRADED SWALES, DOWNSPOUTS, ETC.
  - C. THE FACE OF THE SLOPE WILL BE PROTECTED BY SPECIAL EROSION CONTROL MATERIALS, TO INCLUDE, BUT NOT LIMITED TO: APPROVED VEGETATIVE STABILIZATION PRACTICES (SEE SECTION G), RIP-RAP OR OTHER APPROVED STABILIZATION METHODS.
- V. CUT SLOPES OCCURRING IN RIPABLE ROCK SHALL BE SERRATED AS SHOWN ON THE FOLLOWING DIAGRAM. THESE SERRATIONS SHALL BE MADE WITH CONVENTIONAL EQUIPMENT AS THE EXCAVATION IS MADE. EACH STEP OR SERRATION SHALL BE CONSTRUCTED ON THE CONTOUR AND WILL HAVE STEPS CUT AT NOMINAL TWO-FOOT INTERVALS WITH NOMINAL THREE-FOOT HORIZONTAL SHELVES. THESE STEPS WILL VARY DEPENDING ON THE SLOPE RATIO OR THE CUT SLOPE. THE NOMINAL SLOPE LINE IS 1:1. THESE STEPS WILL WEATHER AND ACT TO HOLD MOISTURE, LIME, FERTILIZER AND SEED THUS PRODUCING A MUCH QUICKER AND LONGER LIVED VEGETATIVE COVER AND BETTER SLOPE STABILIZATION. OVERLAND FLOW SHALL BE DIVERTED FROM THE TOP OF ALL SERRATED CUT SLOPES AND CARRIED TO A SUITABLE OUTLET.
- VI. SUBSURFACE DRAINAGE SHALL BE PROVIDED WHERE NECESSARY TO INTERCEPT SEEPAGE THAT WOULD OTHERWISE ADVERSELY AFFECT SLOPE STABILITY OR CREATE EXCESSIVELY WET SITE CONDITIONS.
- VII. SLOPES SHALL NOT BE CREATED SO CLOSE TO PROPERTY LINES AS TO ENDANGER ADJOINING PROPERTIES WITHOUT ADEQUATELY PROTECTING SUCH PROPERTIES AGAINST SEDIMENTATION, EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED DAMAGES.
- VIII. FILL MATERIAL SHALL BE FREE OF BRUSH, RUBBISH, ROCKS, LOGS, STUMPS, BUILDING DEBRIS, AND OTHER OBJECTIONABLE MATERIAL. IT SHOULD BE FREE OF STONES OVER TWO (2) INCHES IN DIAMETER WHERE COMPACTED BY HAND OR MECHANICAL TAMPERS OR OVER EIGHT (8) INCHES IN DIAMETER WHERE COMPACTED BY ROLLERS OR OTHER EQUIPMENT. FROZEN MATERIAL SHALL NOT BE PLACED IN THE FILL NOR SHALL THE FILL MATERIAL BE PLACED ON A FROZEN FOUNDATION.
- IX. STOCKPILES, BORROW AREAS AND SPOIL SHALL BE SHOWN ON THE PLANS AND SHALL BE SUBJECT TO THE PROVISIONS OF THIS STANDARD AND SPECIFICATIONS.
- X. ALL DISTURBED AREAS SHALL BE STABILIZED STRUCTURALLY OR VEGETATIVELY IN COMPLIANCE WITH 20.0 STANDARDS AND SPECIFICATIONS FOR VEGETATIVE STABILIZATION.

DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 11/2" x 11/2" square (minimum) cut, or 13/4" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pond per linear foot.

2. Geotextile 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 ft²/ minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

3. Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.

4. Silt Fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reached 50% of the fabric height.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

SILT FENCE

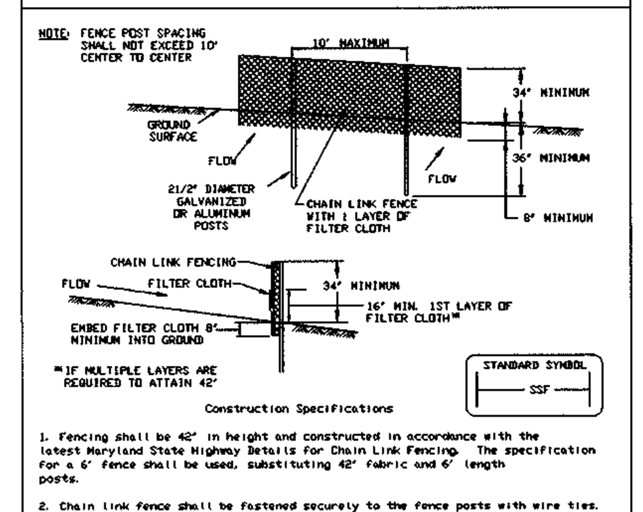
Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

Note: In areas of less than 2% slope and sandy soils (USDA general classification system, soil Class A) maximum slope length and silt fence length will be unlimited. In these areas a silt fence may be the only perimeter control required.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E - 15 - 3A	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.

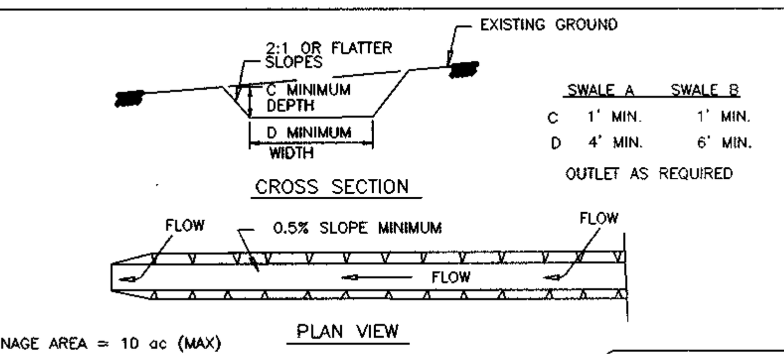
6. Maintenance shall be performed as needed and silt buildups removed when "bulges" develop in the silt fence, or when silt reaches 50% of fence height.

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/ft²/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 2 - TEMPORARY SWALE



DRAINAGE AREA = 10 ac (MAX)
SLOPE = 10% (MAX)

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

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 soil in a minimum 7" layer.

Construction Specifications

1. All temporary swales 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 swale.

5. The swale 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.

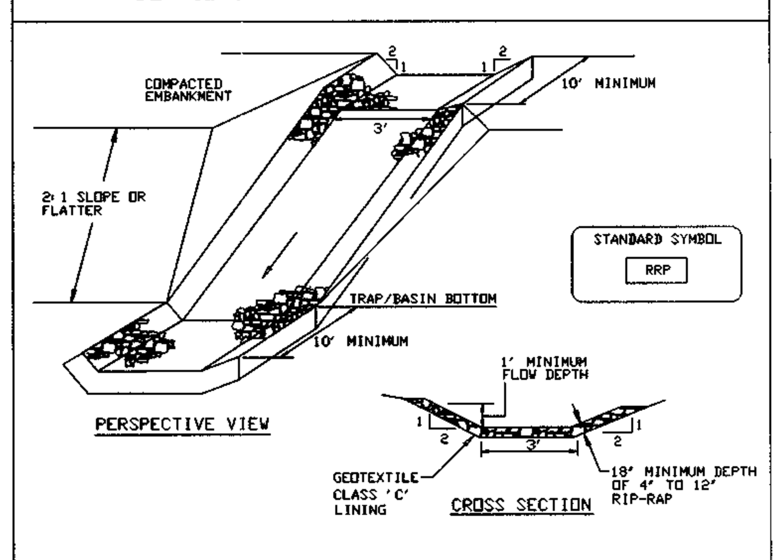
6. Fill, if necessary, shall be compacted by earth moving equipment.

7. All earth removed and not needed for construction shall be placed so that it will not interfere with the functioning of the swale.

8. Inspection and maintenance must be provided periodically and after each rain event.

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

DETAIL 5 - RIP-RAP INFLOW PROTECTION



Construction Specifications

1. Rip-rap lined inflow channels shall be 1' in depth, have a trapezoidal cross section with 2:1 or flatter side slopes and 3' (min.) bottom width. The channel shall be lined with 4" to 12" rip- rap to a depth of 18".

2. Filter cloth shall be installed under all rip-rap. Filter cloth shall be Geotextile Class C.

3. Entrance and exit sections shall be installed as shown on the detail section.

4. Rip-rap used for the lining may be recycled for permanent outlet protection if the basin is to be converted to a stormwater management facility.

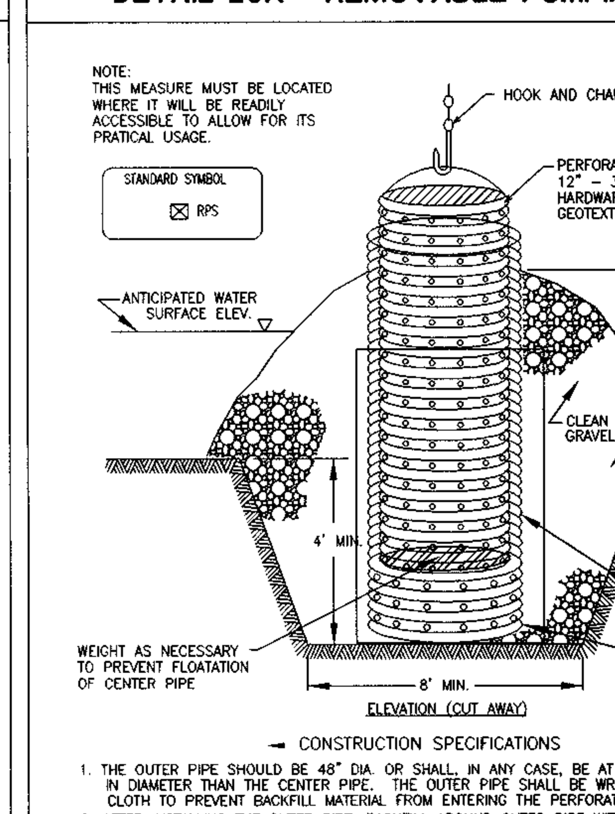
5. Gabion Inflow Protection may be used in lieu of Rip-rap Inflow Protection.

6. Rip-rap should blend into existing ground.

7. Rip-rap Inflow Protection shall be used where the slope is between 4:1 and 10:1, for slopes flatter than 10:1 use Earth Dike or Temporary Swale lining criteria.

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

DETAIL 20A - REMOVABLE PUMPING STATION



CONSTRUCTION SPECIFICATIONS

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

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

ROCK OUTLET PROTECTION I

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.

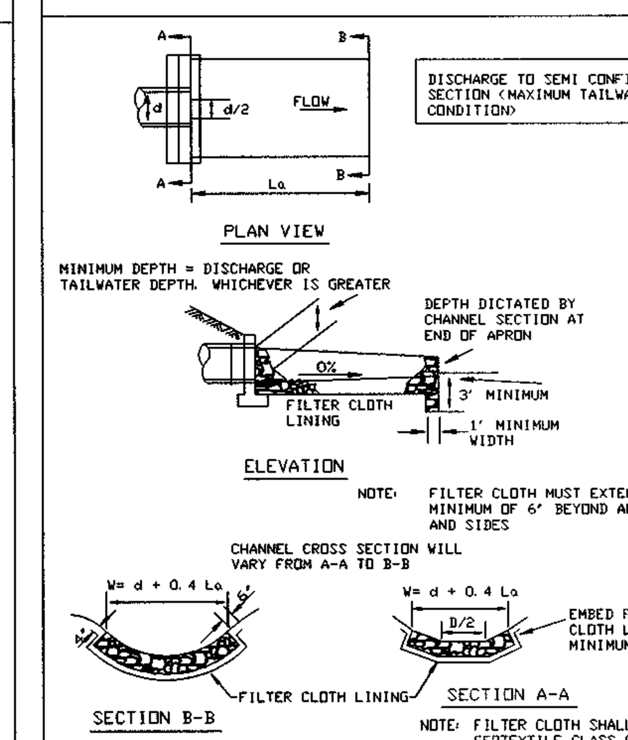
3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile 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.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 8A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 25 - ROCK OUTLET PROTECTION I



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 8	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

TEMPORARY SEEDING SUMMARY

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATE	SEEDING DEPTH	FERTILIZER RATE (10-10-10)	LIME RATE
SEED MIXTURE(HARDINESS ZONE 7a) FROM TABLE 26						
1	BARLEY OR RYE PLUS FOXTAIL MILLET	8/15-11/30	8/15-11/30	1/4"-1/2"	600 LB/AC (15 LB/1000 SF)	2 TONS/AC (100 LB/1000 SF)

PERMANENET SEEDING SUMMARY

NO.	SPECIES	APPLICATION RATE (LB/AC)	SEEDING DATE	SEEDING DEPTH	N	P_2O_5	K_2O	LIME RATE
SEED MIXTURE(HARDINESS ZONE 7a) FROM TABLE 25					FERTILIZER RATE (10-20-20)			
3	TOLL FESCUE (85%)	8/15-11/30	8/15-11/30	1/4"-1/2"	2 LB/ 1000 SF	4 LB/ 1000 SF	4 LB/ 1000 SF	2 TONS/AC (100 LB/ 1000 SF)
	CHEWINGS FESCUE (10%)	8/15-11/30	8/15-11/30	1/4"-1/2"				
	KENTUCKY BLUE GRASS (5%)	8/15-11/30	8/15-11/30	1/4"-1/2"	=900 LBS/AC OF 10-20-20			

BY THE ENGINEER

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

PIERO VAN MELLITS, P.E. 2-22-01

SIGNATURE OF ENGINEER DATE
PRINT NAME BELOW SIGNATURE

BY THE DEVELOPER

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

02/23/01

SIGNATURE OF DEVELOPER DATE
PRINT NAME BELOW SIGNATURE

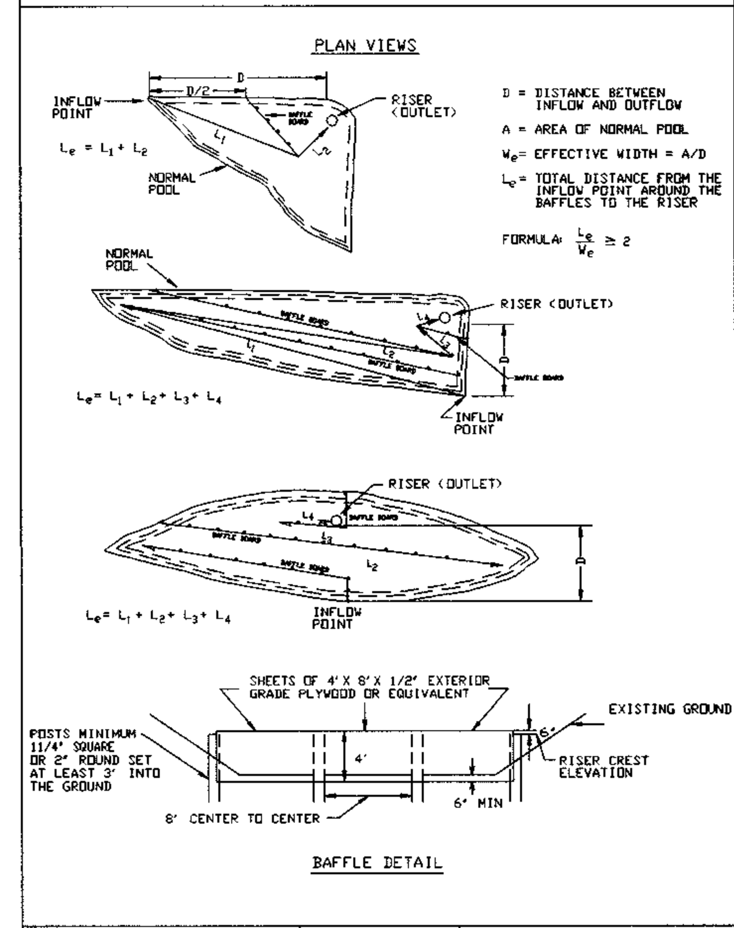
SITE ANALYSIS

TOTAL SITE AREA (PHASE I)	= 18.53 AC.
AREA TO BE DISTRUBED	= 9.51 AC.
AREA TO BE PAVED	= 4.59 AC.
AREA TO BE VEGETATIVELY STABILIZED	= 4.92 AC.
AREA TO BE CLEARED	= 0.00 AC.
TOTAL CUT	= 20,000 CU. YDS.
TOTAL FILL	= 20,000 CU. YDS.
TOTAL TOPSOIL	= 5,000 CU. YDS.

OFFSITE WASTE/BORROW AREA LOCATION:

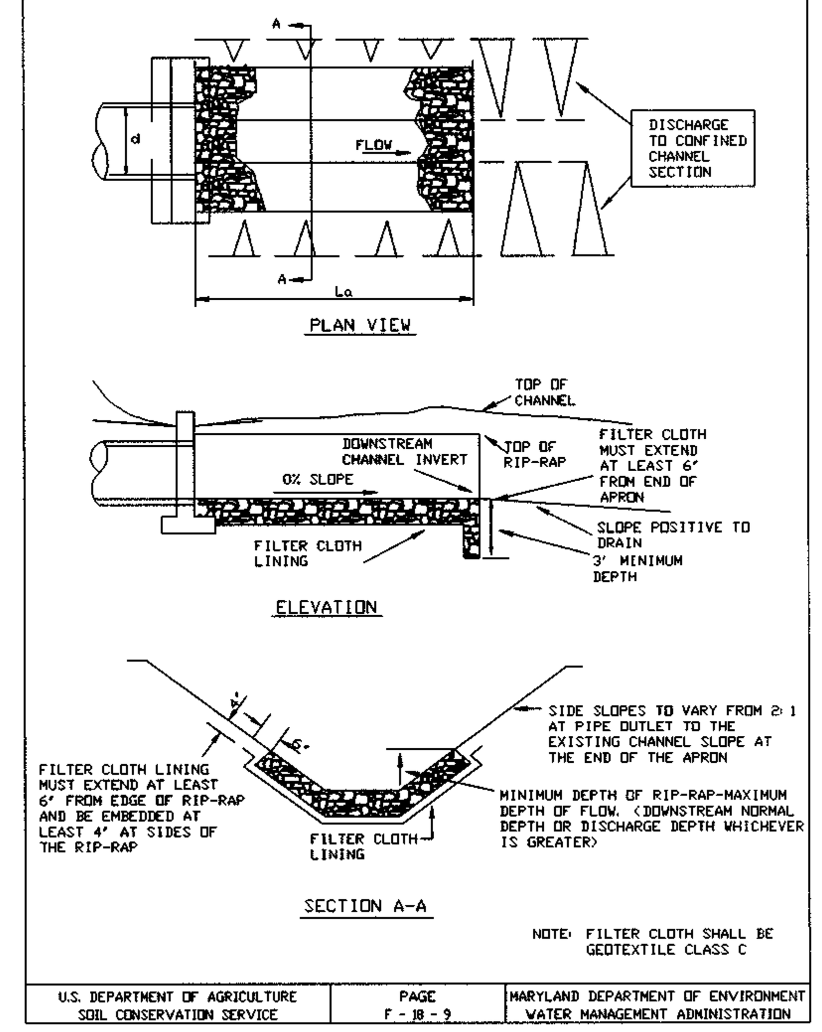
"THE EARTHWORK QUANTITIES SHOWN HERON ARE FOR INFORMATION PURPOSES ONLY. MRA MAKES NO GUARANTEE OF ACCURACY OF QUANTITIES OR BALANCE OF SITE. THE DEVELOPER AND CONTRACTOR SHALL TAKE FULL RESPONSIBILITY OF ACTUAL EARTHWORK QUANTITIES ENCOUNTERED DURING CONSTRUCTION."

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 26 - ROCK OUTLET PROTECTION II



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 9	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

ROCK OUTLET PROTECTION II

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.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE F - 18 - 8A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DEPARTMENT OF ~~PUBLIC WORKS~~ P&Z
HOWARD COUNTY, MARYLAND

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

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND AS SHOWN ON GP-01-78.

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

3/1/01
HOWARD SOIL CONSERVATION DISTRICT DATE

REVIEW FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REVIEW.

3/1/01
U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE DATE

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16

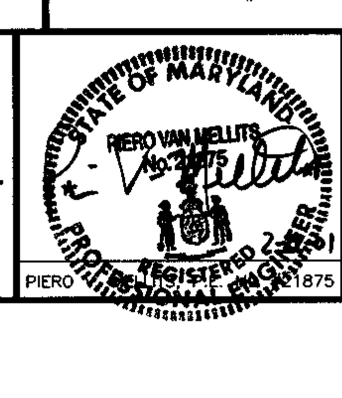
DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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



DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

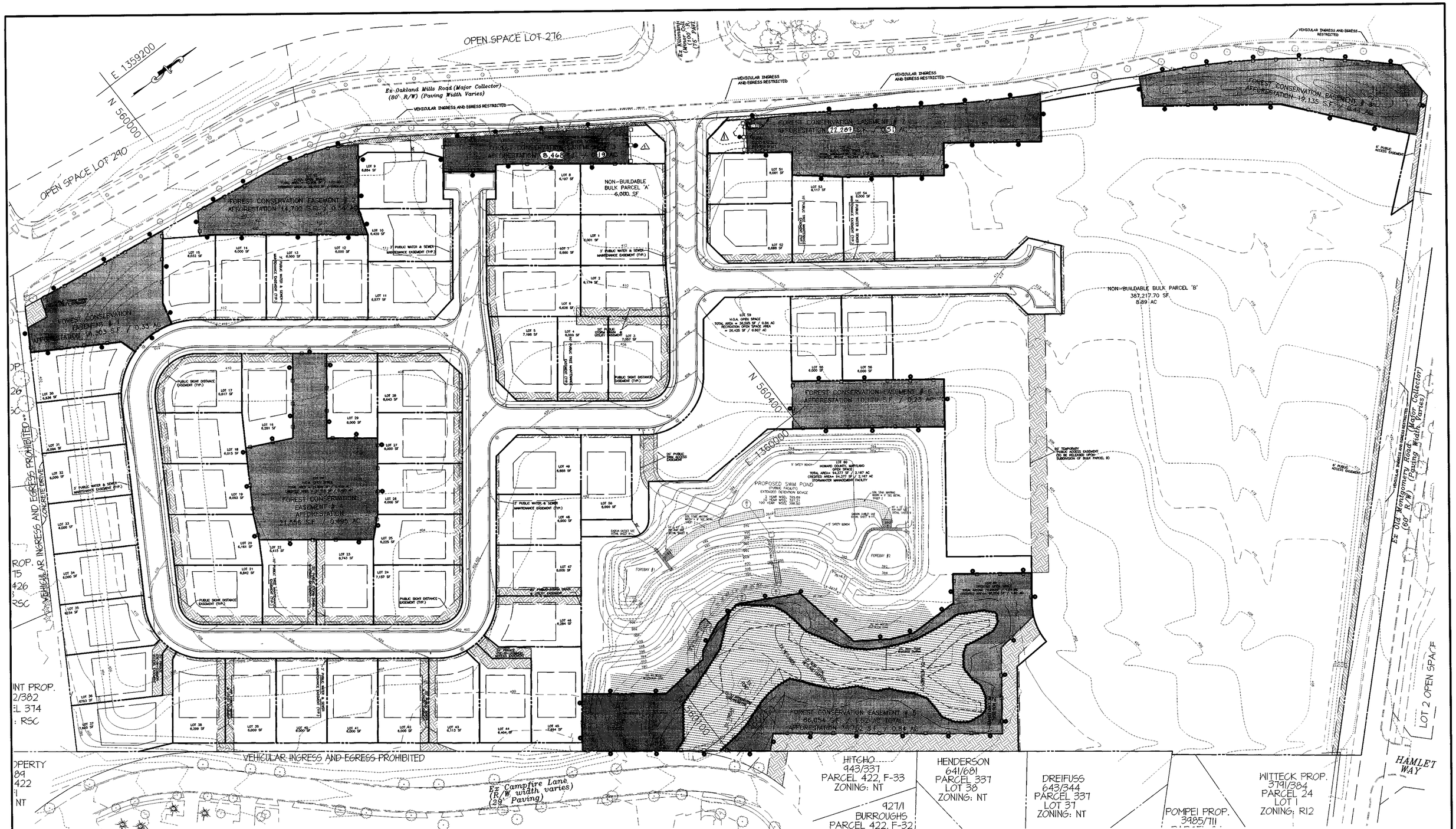
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 20 OF 20

F0122



LEGEND

- FOREST CONSERVATION EASEMENT
- SPLIT RAIL FENCE
- EXISTING FOREST
- AFFORESTATION AREA
- FOREST CONSERVATION SIGN

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION DATE

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

STATE OF MARYLAND REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT DEAN W. MEYER #200030
2-22-01
DEAN W. MEYER #200030

DES: TCN/CAO	DWM	1	REV. FOREST CONSERVATION AREAS #3 AND 7	12/12/01
DRN: TCN/CAO				
CHK: DWM				
DATE: 12/21/00	BY	NO.	REVISIONS	DATE

FINAL ROAD PLANS
FOREST CONSERVATION PLAN

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1" = 50'

SHEET 14 OF 20

F01 22

Forest Conservation Worksheet 2.1

Note: Use 0 for all negative numbers that result from the calculations.

Net Tract Area
A. Total Tract Area — A= 27.1
B. Deductions (Critical Area, area restricted by local ordinance or program) — B= 0
C. Net Tract Area Net Tract Area = Total Tract (A) – Deductions (B) — C= 27.1

Land Use Category: High Density Residential
D. Afforestation Threshold (Net Tract Area (C) x _15___%) — D=4.1
E. Conservation Threshold (Net Tract Area (C) x __20___%) — E= 5.4

Existing Forest Cover
F. Existing Forest Cover within the Net Tract Area — F= 1.5
G. Area of Forest Above Conservation Threshold
If the Existing Forest Cover (F) is greater than the Conservation Threshold (E), then G = F – E: Otherwise G = 0 — G= 0

Breakeven Point
H. Breakeven Point (Amount of forest that must be retained so that no mitigation is required)
1) If the Area of Forest Above the Conservation Threshold (G) is greater than 0, then H = (0.2 x the Area of Forest Above Conservation Threshold (G) + the Conservation Threshold (E); — H= N/A
2) If the Area of Forest Above the Conservation Threshold (G) is equal to 0, then H = Existing Forest Cover (F).

I. Forest Clearing Permitted Without Mitigation
I = Existing Forest Cover (F) – Breakeven point (H) — I= 0

Proposed Forest Clearing
J. Total Area of Forest to be Cleared — J= 1.0
K. Total Area of Forest to be retained
K = Existing Forest Cover (F)– Forest to be Cleared (J) — K= 0.5

Planting Requirements
If the Total Area of Forest to be Cleared (K) is at or above the Breakeven Point (H), no planting is required and no further calculations are necessary (L=0, M=0, n=0, p=0); Otherwise, calculate the planting requirements(s) as follows:

L. Reforestation for Clearing Above the Conservation Threshold
(1) If the Total Area of Forest to be Retained (K) is greater than the Conservation Threshold (E), then L= the Area of Forest to be Cleared (J) x 0.25;
(2) If the Forest to be Retained (K), is less than or equal to the Conservation Threshold (E), then L=Area of Forest Above Conservation Threshold (G) x 0.25 — L= 0

M. Reforestation for Clearing Below the Conservation Threshold
(1) If Existing Forest Cover (F) is greater than the Conservation Threshold (E) and the Forest to be Retained (K) is less than or equal to the Conservation Threshold (E), then M=2.0 x (Conservation Threshold (E) – Forest to be retained (K)
(2) If Existing Forest Cover (F) is less than or equal to the Conservation Threshold (E), then M = 2.0 x Forest to be Cleared (J). — M= 2.0

N. Credit for Retention Above the Conservation Threshold
If the area of Forest to be Retained (K) is greater than the Conservation Threshold (E), Then N = K – E — N= 0

P. Total Reforestation Required P = L + M – N — P= 2.0

Q. Total Afforestation Required
If Existing Forest Cover (F) is less than the Afforestation Threshold (D), then Q = Afforestation Threshold (D) – Existing Forest Cover (F) — Q= 2.6

R. Total Planting Requirement R = P + Q — R= 4.6

AN AFFORESTATION REQUIREMENT OF 4.6 ACRES IS GENERATED BY THIS DEVELOPMENT. POTENTIAL ON-SITE AFFORESTATION ACREAGE OF 3.5 ACRES EXISTS WITH A REQUEST TO PAY FEE-IN-LIEU FOR THE BALANCE OF 1.1 ACRES. IF GRANTED, THIS REQUEST WILL BE PAID TO THE FOREST CONSERVATION FUND OF HOWARD COUNTY IN THE SUM OF $14,374.80 (47,916 sf x $0.30 per S.F.) UPON COUNTY APPROVAL.

⚠ FEE-IN-LIEU FOR 1.1 AC WAS PAID TO THE FOREST CONSERVATION FUND, SECT 16.1211 ACCOUNT # 810-005-4206 ON MARCH 28, 2001 IN THE AMOUNT OF $14,374.80. AN ADDITIONAL REQUEST OF 3,469 S.F.

FOREST CONSERVATION PLANT LIST

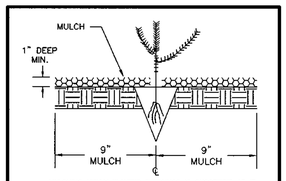
KEY	QTY	BOTANICAL NAME	COMMON NAME	Size and Type of Plant Material							
				AREA #1 (0.33 ac)	AREA #2 (0.34 ac)	⚠ AREA #3 (0.19 ac)	AREA #4 (0.50 ac)	AREA #5 (0.84 ac)	AREA #6 (0.23 ac)	⚠ AREA #7 (0.51 ac)	AREA #8 (0.44 ac)
T-1	159	Acer rubrum	Red Maple	(15) seedlings/whips	(16) seedlings/whips	(10) seedlings/whips	(23) seedlings/whips	(37) seedlings/whips	(12) seedlings/whips	(22) seedlings/whips	(20) seedlings/whips
T-2	149	Carya tomentosa	Mockernut Hickory	(14) seedlings/whips	(14) seedlings/whips	(8) seedlings/whips	(21) seedlings/whips	(37) seedlings/whips	(10) seedlings/whips	(22) seedlings/whips	(19) seedlings/whips
T-3	149	Cornus florida	Flowering dogwood	(14) seedlings/whips	(14) seedlings/whips	(8) seedlings/whips	(21) seedlings/whips	(37) seedlings/whips	(10) seedlings/whips	(22) seedlings/whips	(19) seedlings/whips
T-4	156	Liriodendron tulipifera	Tulip Poplar	(15) seedlings/whips	(16) seedlings/whips	(10) seedlings/whips	(23) seedlings/whips	(37) seedlings/whips	(10) seedlings/whips	(22) seedlings/whips	(19) seedlings/whips
T-5	149	Nyssa sylvatica	Black Gum	(14) seedlings/whips	(14) seedlings/whips	(8) seedlings/whips	(21) seedlings/whips	(37) seedlings/whips	(10) seedlings/whips	(22) seedlings/whips	(19) seedlings/whips
T-6	149	Prunus serotina	Black Cherry	(14) seedlings/whips	(14) seedlings/whips	(8) seedlings/whips	(21) seedlings/whips	(37) seedlings/whips	(10) seedlings/whips	(22) seedlings/whips	(19) seedlings/whips
T-7	155	Quercus alba	White Oak	(15) seedlings/whips	(16) seedlings/whips	(8) seedlings/whips	(23) seedlings/whips	(37) seedlings/whips	(10) seedlings/whips	(22) seedlings/whips	(20) seedlings/whips
T-8	149	Sassafras albidum	Sassafras	(14) seedlings/whips	(14) seedlings/whips	(8) seedlings/whips	(21) seedlings/whips	(37) seedlings/whips	(10) seedlings/whips	(22) seedlings/whips	(19) seedlings/whips
			Totals trees	(115) seedlings/whips	(118) seedlings/whips	(61) seedlings/whips	(174) seedlings/whips	(246) seedlings/whips	(82) seedlings/whips	(179) seedlings/whips	(154) seedlings/whips

ALL AFFORESTATION / REFORESTATION MEASURES FOR THIS PROJECT SHALL CONFORM TO THE STANDARDS SET FORTH IN THE ***HOWARD COUNTY FOREST CONSERVATION MANUAL*, LATEST EDITION**. PARTICULAR ATTENTION SHOULD BE DIRECTED TO **APPENDIX H** FOR PLANTING AND MAINTENANCE GUIDELINES. ANY VARIATIONS OR SUBSTITUTIONS TO THIS PLAN NEED TO BE APPROVED BY THE COUNTY AND ENGINEERING FIRM RESPONSIBLE FOR THIS PLAN.

FOREST CONSERVATION SEQUENCE OF CONSTRUCTION

1. INSPECT EXISTING SEDIMENT CONTROL MEASURES. REPLACE & REPAIR AS NEEDED. — 2 DAYS
2. INSTALL ADDITIONAL SEDIMENT CONTROLS AND TEMPORARY FOREST CONSERVATION MEASURES AS SHOWN ON THESE PLANS. — 2 DAYS
3. INSTALL UTILITIES ACCORDING TO APPROVED PHASE I FINAL WATER & SEWER PLANS. INSTALL STORM DRAIN ACCORDING TO THESE PLANS. — 2 MONTHS
4. FINAL GRADE ROADS. INSTALL CURB & GUTTER AND BASE PAVING. — 1 MONTH
5. FINAL GRADE ROADS. BEGIN HOUSE CONSTRUCTION. INSTALL ADDITIONAL SEDIMENT CONTROLS AS NEEDED. — NO ESTIMATE
6. CONVERT SEDIMENT BASIN TO SWM FACILITY. — 3 WEEKS
7. STABILIZE ALL REMAINING DISTURBED AREAS. WITH SEDIMENT CONTROL INSPECTOR'S PERMISSION, REMOVE ALL REMAINING SEDIMENT CONTROL MEASURES. — 1 WEEK
8. INSTALL FINAL FOREST CONSERVATION MEASURES AND PLANTINGS AS SHOWN ON THESE PLANS. — 2 WEEKS

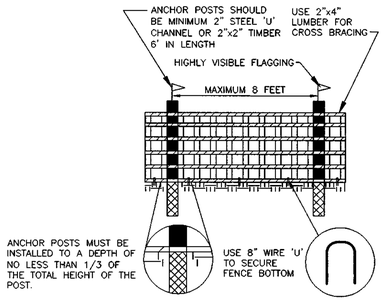
EXHIBIT H-6



MULCHING NEWLY PLANTED SEEDLINGS IS SUGGESTED AS IT HELPS THE SOIL RETAIN MOISTURE AND IT PROTECTS THE SEEDLING FROM COMPACTION AND STEM INJURY.

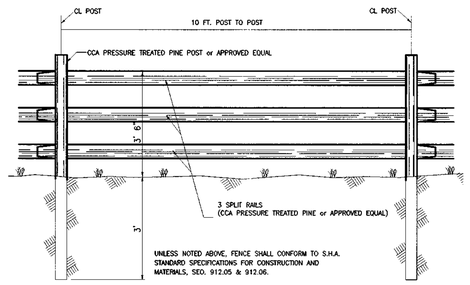
SEEDLING AND WHIP PLANTING DETAIL
NOT TO SCALE

BLAZE ORANGE PLASTIC MESH



NOTES:
1. FOREST RETENTION 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

SOURCE: PRINCE GEORGE'S COUNTY, MARYLAND; CONSTRUCTION. WOODLAND CONSERVATION MANUAL

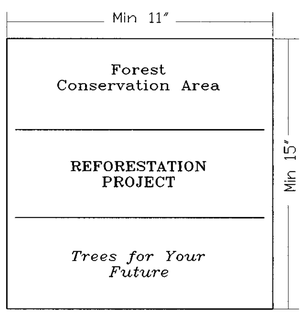


3 SPLIT RAIL (WOOD) FENCE
NOT TO SCALE

THE ABOVE FENCE DETAIL IS FOR THE FENCE SURROUNDING ALL FOREST CONSERVATION AREAS FOR A MINIMUM TWO YEAR PERIOD. AFTER INSTALLATION OF THE PLANT MATERIAL AND IS TO HELP ENSURE ESTABLISHMENT OF THE PLANT MATERIAL. FOREST CONSERVATION SIGNAGE SHALL BE PLACED DIRECTLY UPON THE NEAREST POST PER THE PLAN LOCATIONS.

EXHIBIT G – 16

Reforestation and Afforestation Area Protection Signage



Signs similar to protection signage for Retention Areas can be used on Afforestation and Reforestation Areas. The signs notify construction workers and future residents of the newly planted material, improving the trees survival rates.

Planting Specifications:
Container Grown and Balled and Burlapped Stock

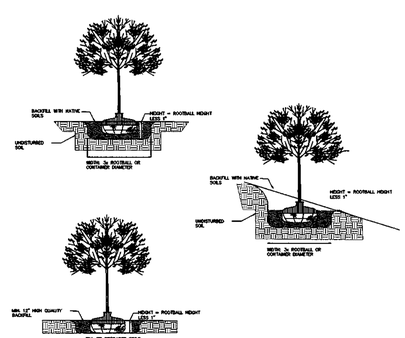
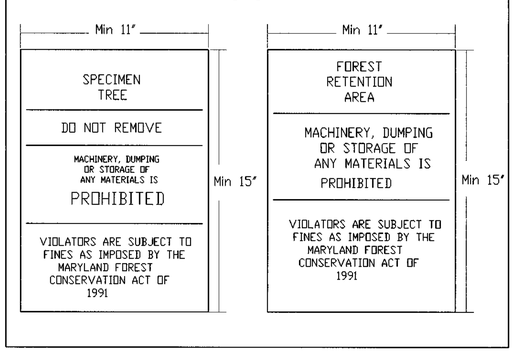


EXHIBIT G - 17

Signage



DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND
Pt 2
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/8/01

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

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

STATE OF MARYLAND — DEAN WESLEY MEYER — No. 20003 — PROFESSIONAL LANDSCAPE ARCHITECT
2-22-01
DEAN W. MEYER #200030

DES: TCN/CAO
DRN: TCN/CAO
CHK: DWM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
DWM	⚠	ADDITIONAL FEE-IN-LIEU NOTE AND CALCULATIONS	12/12/01

FINAL ROAD PLANS
FOREST CONSERVATION PLAN
DETAIL SHEET

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 15 OF 20

F0122

Pt2

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

NOTE: THIS PLAN IS NOT FOR GRADING INFORMATION. REFER TO THE FINAL GRADING & SEDIMENT CONTROL PLAN FOR GRADING INFORMATION.

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND 3-2-01 CHIEF, BUREAU OF HIGHWAYS — DATE	**DEPARTMENT OF PLANNING & ZONING** HOWARD COUNTY, MARYLAND 3/6/01 CHIEF, DEVELOPMENT ENGINEERING DIVISION ce — DATE	MRA MORRIS & RITCHIE ASSOCIATES, INC. ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS 9090 JUNCTION DRIVE SUITE 9 ANNAPOLIS JUNCTION, MARYLAND 20701 (410) 792-9792 or (301) 776-1690 FAX (410) 792-7395	STATE OF MARYLAND PIERO VAN MELLITS No. 21875 REGISTERED PROFESSIONAL ENGINEER	DES: TCN/CAO DRN: TCN/CAO CHK: PVM DATE: 12/21/00	**FINAL ROAD PLANS STORM DRAIN DRAINAGE AREA MAP**

BY	NO.	REVISIONS	DATE
MRA	1	ADD STORM DRAIN SYSTEM I-33 TO M-34	5-01

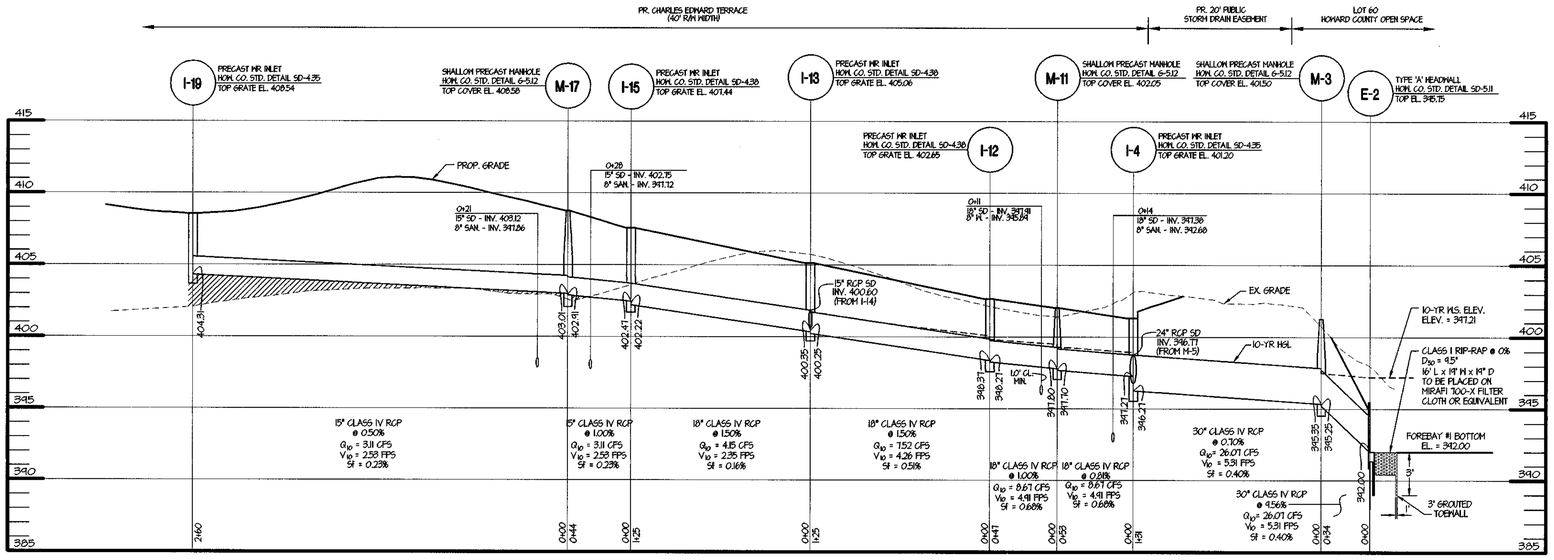
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=40'

SHEET 7 OF 20

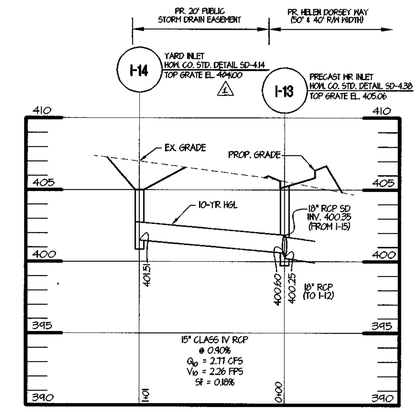
F0122



STORM DRAIN PROFILE

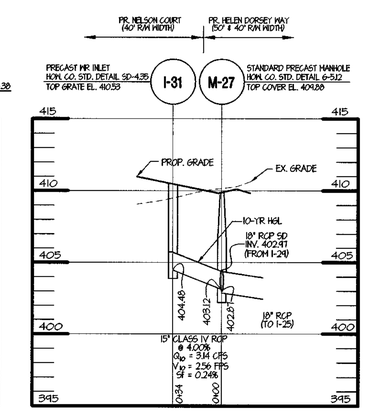
HOR. 1" = 50'
VERT. 1" = 5'

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T-180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.



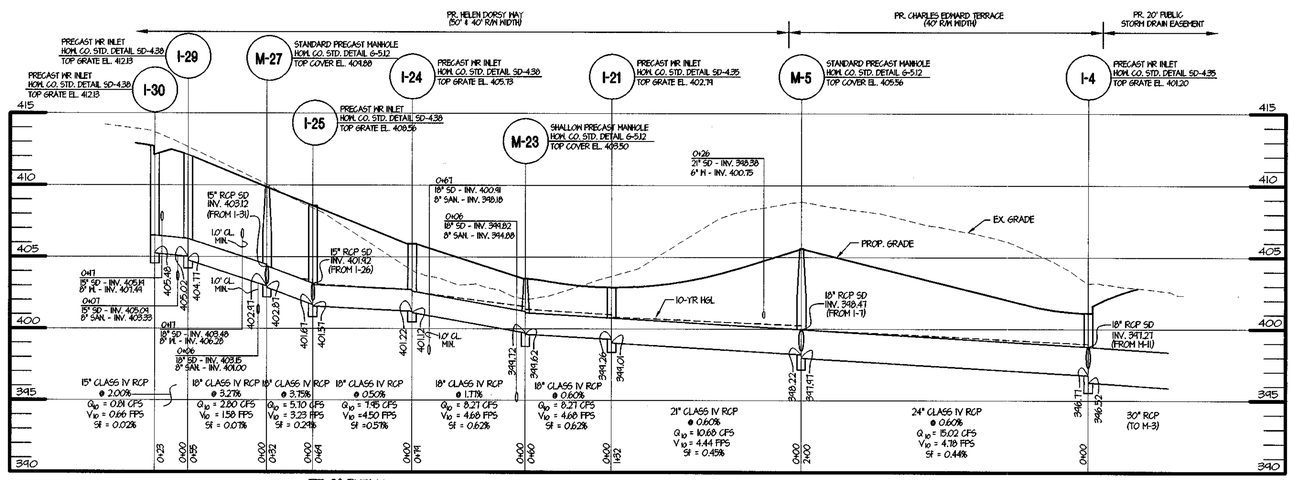
STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



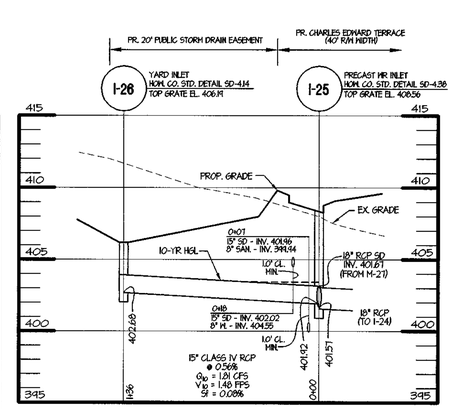
STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



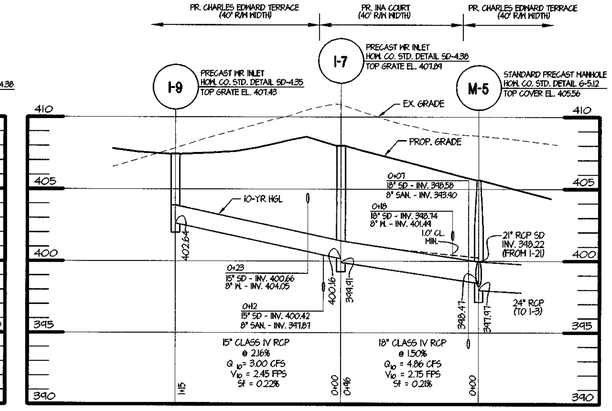
STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE

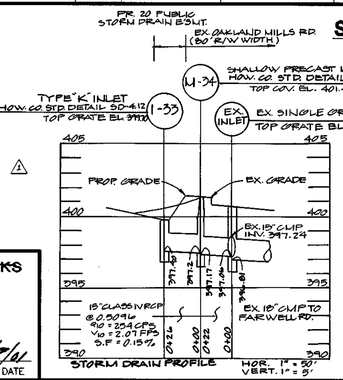
HOR. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

● COORDINATES TO CENTER OF STRUCTURE AT FACE OF CURB FOR INLETS, CENTER OF STRUCTURE FOR MANHOLES AND YARD INLETS
* TOP OF GRATE ELEVATION AT CENTER OF STRUCTURE AT FACE OF CURB. MANHOLE AND YARD INLET ELEVATIONS ARE AT CENTER OF RIM AND GRATE



STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

STORM DRAIN PIPE SCHEDULE		
SIZE	TYPE	LENGTH
15"	RCP CL IV	713'
18"	RCP CL IV	741'
21"	RCP CL IV	132'
24"	RCP CL IV	200'
30"	RCP CL IV	162'

STATE OF MARYLAND — PIERO VAN MELLITS No. 21675 — REGISTERED PROFESSIONAL ENGINEER — 5-01

REVISION #1 ONLY
PIERO VAN MELLITS, P.E. # 21675

STR. NO	TOP EL	INV. IN	INV. OUT	TYPE	NORTHING	EASTING
I-33	399.70	---	397.40	TYPE 'K' INLET HOW. CO. STD. SD-4.12	559,767.01	1,359,361.10
M-34	401.40	397.27	397.17	SHALLOW MH. HOW. CO. STD. G-5.12	559,778.00	1,359,356.62

STORM DRAIN STRUCTURE SCHEDULE								● LOCATION	
STR. NO.	TOP ELEV	INV IN	INV IN	INV OUT	TYPE		REMARKS	NORTHING	EASTING
E-2	395.75	---	---	392.00	TYPE 'A' HEADWALL	HOW. CO. STD. DETAIL SD-5.11		560,123.73	1,360,036.93
M-3	401.50	395.35	---	395.25	SHALLOW MANHOLE	HOW. CO. STD. DETAIL G-5.12		560,090.76	1,360,029.21
I-4	* 401.20	397.27	396.77	396.27	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.35		559,987.66	1,359,950.14
M-5	405.56	398.47	398.22	397.97	PRECAST MANHOLE	HOW. CO. STD. DETAIL G-5.12		560,108.04	1,359,790.95
I-7	* 407.89	400.16	---	399.91	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		560,165.02	1,359,713.25
I-9	* 407.43	---	---	402.64	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.35		560,072.66	1,359,643.95
M-11	402.05	397.80	---	397.70	SHALLOW MANHOLE	HOW. CO. STD. DETAIL G-5.12		559,936.00	1,359,964.43
I-12	* 402.65	398.37	---	398.27	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		559,899.79	1,359,934.84
I-13	405.06	400.60	400.35	400.25	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		559,800.31	1,359,858.46
I-14	* 404.00 △1	---	---	401.51	YARD INLET	HOW. CO. STD. DETAIL SD-4.14		559,860.97	1,359,779.47
I-15	* 407.44	402.47	---	402.22	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		559,702.08	1,359,783.02
M-17	408.58	403.01	---	402.91	SHALLOW MANHOLE	HOW. CO. STD. DETAIL G-5.12		559,666.24	1,359,757.40
I-19	* 408.54	---	---	404.31	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.35		559,801.04	1,359,535.86
I-21	* 402.79	399.26	---	399.01	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.35		560,211.64	1,359,872.39
M-23	403.50	399.72	---	399.62	SHALLOW MANHOLE	HOW. CO. STD. DETAIL G-5.12		560,261.40	1,359,905.67
I-24	* 405.73	401.22	---	401.12	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		560,339.85	1,359,893.76
I-25	* 408.56	401.67	401.92	401.57	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		560,381.11	1,359,837.43
I-26	406.19	---	---	402.68	YARD INLET	HOW. CO. STD. DETAIL SD-4.14		560,273.78	1,359,753.68
M-27	409.88	403.12	402.97	402.87	PRECAST MANHOLE	HOW. CO. STD. DETAIL G-5.12		560,401.10	1,359,811.54
I-29	* 412.13	405.02	---	404.77	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		560,434.84	1,359,770.06
I-30	* 412.13	---	---	405.48	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.38		560,415.80	1,359,755.45
I-31	* 410.53	---	---	404.48	PRECAST WR INLET	HOW. CO. STD. DETAIL SD-4.35		560,428.00	1,359,834.00

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

Andrew M. Daniele 3-2-01
CHIEF, BUREAU OF HIGHWAYS — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

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

STATE OF MARYLAND — PIERO VAN MELLITS No. 21675 — REGISTERED PROFESSIONAL ENGINEER — 5-01
PIERO VAN MELLITS #21675

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
LRA	1	ADD STORM DRAIN SYSTEM I-33 TO M-34	5-01

FINAL ROAD PLANS
STORM DRAIN PROFILES
& STRUCTURE SCHEDULE

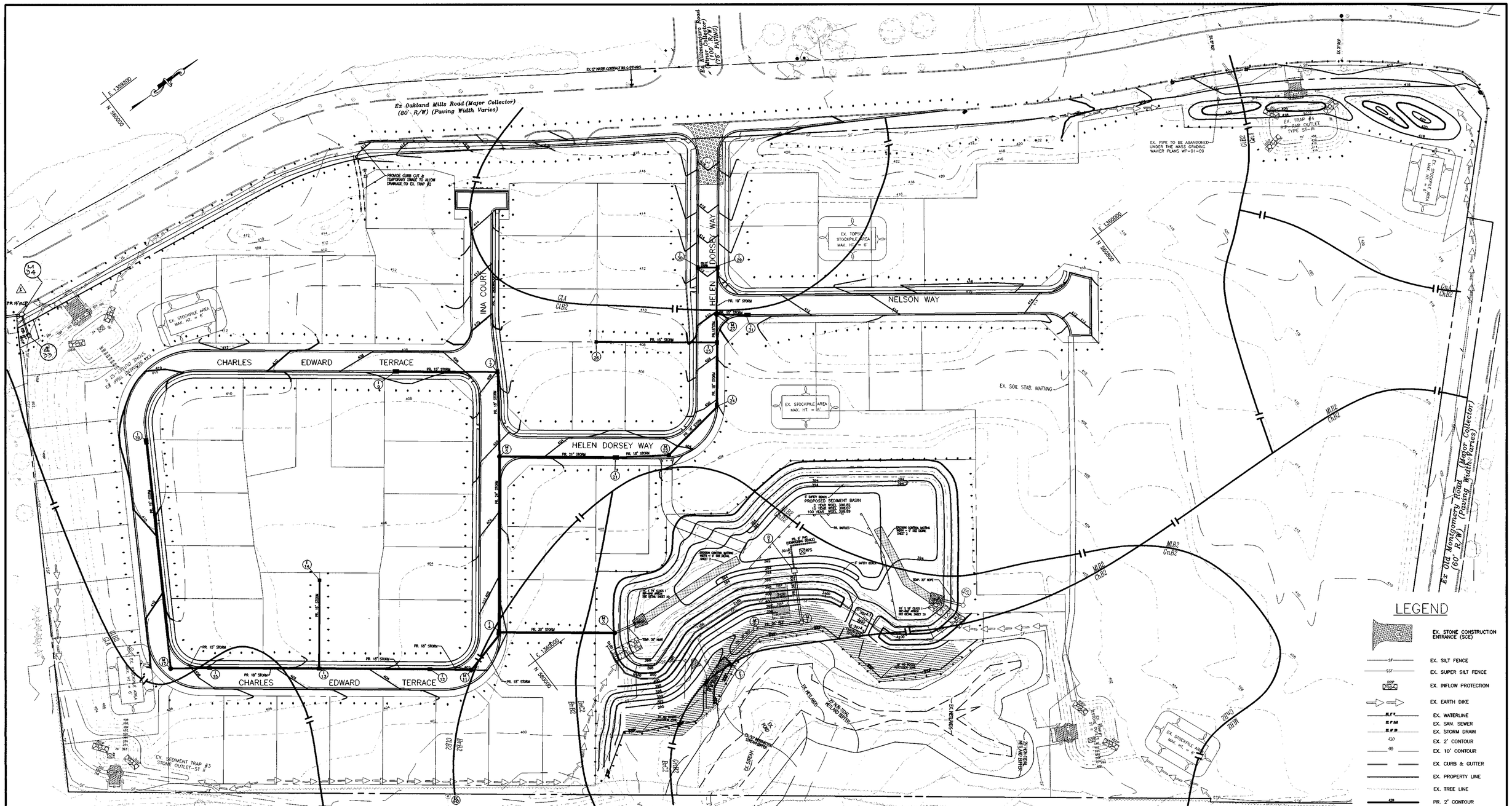
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 8 OF 20

F 01 22



NOTE: THE EXISTING SEDIMENT CONTROLS AS SHOWN ON THESE PLANS IS FOR REFERENCE ONLY. MASS GRADING AND SEDIMENT CONTROL INSTALLATION SHALL BE DONE IN ACCORDANCE WITH MASS GRADING PLANS GP-01-78. SEE SEDIMENT CONTROL DETAILS ON SHEET 19 AND 20 FOR SEDIMENT CONTROL PRACTICES RELAVENT TO THIS PLAN. ALL SWALES AND AREAS OF CONCENTRATED FLOW ARE TO BE STABILIZED WITH SOIL STABILIZATION MATTING. SEE DETAIL ON SHEET 2.

EX. SEDIMENT TRAP #1 SUMMARY TABLE		
EXISTING DRAINAGE AREA		3.24 ACRES
PROPOSED DRAINAGE AREA		3.88 ACRES
VOLUME REQUIRED	3.88 X 1800 WET	6,984 C.F.
	3.88 X 1800 DRY	6,984 C.F.
TYPE OF TRAP		ST-II
TOTAL VOLUME REQUIRED		13,968 C.F.
TOTAL VOLUME PROVIDED		18,742 C.F.
WEIR LENGTH		16 FT.
WET STORAGE DEPTH		5.0 FT.
LIMIT OF WET STORAGE ELEVATION		398.00
CLEANOUT ELEVATION		396.50
EMBANKMENT HEIGHT		4.0 FT.
EMBANKMENT ELEVATION		402.00
BOTTOM ELEVATION		393.00
WET STORAGE VOLUME		7,667 C.F.
WEIR CREST ELEVATION		400.50
TRAP BOTTOM DIMENSIONS		20 FT. (W) x 40 FT. (L)

EX. SEDIMENT TRAP #2 SUMMARY TABLE		
EXISTING DRAINAGE AREA		4.46 ACRES
PROPOSED DRAINAGE AREA		1.50 ACRES
VOLUME REQUIRED	4.46 X 1800 WET	8,028 C.F.
	4.46 X 1800 DRY	8,028 C.F.
TYPE OF TRAP		ST-II
TOTAL VOLUME REQUIRED		16,056 C.F.
TOTAL VOLUME PROVIDED		16,811 C.F.
WEIR LENGTH		18 FT.
WET STORAGE DEPTH		6.0 FT.
LIMIT OF WET STORAGE ELEVATION		402.00
CLEANOUT ELEVATION		400.00
EMBANKMENT HEIGHT		3.0 FT.
EMBANKMENT ELEVATION		405.00
BOTTOM ELEVATION		396.00
WET STORAGE VOLUME		10,272 C.F.
WEIR CREST ELEVATION		404.00
TRAP BOTTOM DIMENSIONS		20 FT. (W) x 40 FT. (L)

EX. SEDIMENT TRAP #3 SUMMARY TABLE		
EXISTING DRAINAGE AREA		1.49 ACRES
PROPOSED DRAINAGE AREA		0.88 ACRES
VOLUME REQUIRED	1.49 X 1800 WET	2,682 C.F.
	1.49 X 1800 DRY	2,682 C.F.
TYPE OF TRAP		ST-II
TOTAL VOLUME REQUIRED		5,364 C.F.
TOTAL VOLUME PROVIDED		5,606 C.F.
WEIR LENGTH		12 FT.
WET STORAGE DEPTH		4.0 FT.
LIMIT OF WET STORAGE ELEVATION		397.00
CLEANOUT ELEVATION		395.50
EMBANKMENT HEIGHT		3.0 FT.
EMBANKMENT ELEVATION		400.00
BOTTOM ELEVATION		393.00
WET STORAGE VOLUME		2,941 C.F.
WEIR CREST ELEVATION		398.50
TRAP BOTTOM DIMENSIONS		13 FT. (W) x 26 FT. (L)

EX. SEDIMENT TRAP #4 SUMMARY TABLE		
EXISTING DRAINAGE AREA		3.28 ACRES
PROPOSED DRAINAGE AREA		1.43 ACRES
VOLUME REQUIRED	3.28 X 5400 WET	8,028 C.F.
TYPE OF TRAP		ST-III
TOTAL VOLUME REQUIRED		17,712 C.F.
TOTAL VOLUME PROVIDED		25,982 C.F.
WEIR LENGTH		14 FT.
WET STORAGE DEPTH		6.5 FT.
LIMIT OF WET STORAGE ELEVATION		414.50
CLEANOUT ELEVATION		412.00
EMBANKMENT HEIGHT		1.5 FT.
EMBANKMENT ELEVATION		416.00
BOTTOM ELEVATION		408.00
WET STORAGE VOLUME		25,982 C.F.
WEIR CREST ELEVATION		414.50
TRAP BOTTOM DIMENSIONS		30 FT. (W) x 60 FT. (L)

PR. SEDIMENT BASIN SUMMARY TABLE		
EXISTING DRAINAGE AREA		15.40 ACRES
PROPOSED DRAINAGE AREA		24.35 ACRES
VOLUME REQUIRED	24.35 X 1800 WET	43,830 C.F.
	24.35 X 1800 DRY	43,830 C.F.
TOTAL VOLUME REQUIRED		87,660 C.F.
TOTAL VOLUME PROVIDED		116,551 C.F.
WET STORAGE DEPTH		3.3 FT.
LIMIT OF WET STORAGE ELEVATION		394.30
CLEANOUT ELEVATION		393.30
RISER CREST ELEVATION		396.40
EMBANKMENT ELEVATION		400.00
BOTTOM ELEVATION		391.00
WET STORAGE VOLUME		45,370 C.F.
EMS CREST ELEVATION		397.60
EMS LENGTH		20 FT.
DRAW-DOWN DEVICE		6" PVC
OUTFALL BARREL TYPE		36" RCP

LEGEND

- EX. STONE CONSTRUCTION ENTRANCE (SCE)
- EX. SILT FENCE
- EX. SUPER SILT FENCE
- EX. INFLOW PROTECTION
- EX. EARTH DIKE
- EX. WATERLINE
- EX. SAN. SEWER
- EX. STORM DRAIN
- EX. 2' CONTOUR
- EX. 10' CONTOUR
- EX. CURB & GUTTER
- EX. PROPERTY LINE
- EX. TREE LINE
- PR. 2' CONTOUR
- PR. 10' CONTOUR
- PR. L.O.D.
- PR. SILT FENCE
- SOILS DIVIDE

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16

SEDIMENT CONTROL MEASURES FOR THIS CONTRACT WILL BE IMPLEMENTED IN ACCORDANCE WITH SECTION 219 OF THE SPECIFICATIONS AND AS SHOWN ON GP-01-78.

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

HOWARD SOIL CONSERVATION DISTRICT — DATE 3/1/01

REVIEW FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REVIEW.

U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE — DATE 3/1/01

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

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

PR2

STATE OF MARYLAND — PIERO VAN MELLITS No. 21875 — REGISTERED PROFESSIONAL ENGINEER
REVISION # 1 JULY 5-01
PIERO VAN MELLITS P.E. # 21875

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
9090 JUNCTION DRIVE SUITE 9
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STATE OF MARYLAND — PIERO VAN MELLITS No. 21875 — REGISTERED PROFESSIONAL ENGINEER
REVISION # 1 JULY 5-01
PIERO VAN MELLITS P.E. # 21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
LRA	1	ADD STORM DRAIN SYSTEM 1-23 TO M-34	5-01

FINAL ROAD PLANS
GRADING & SEDIMENT
CONTROL PLAN

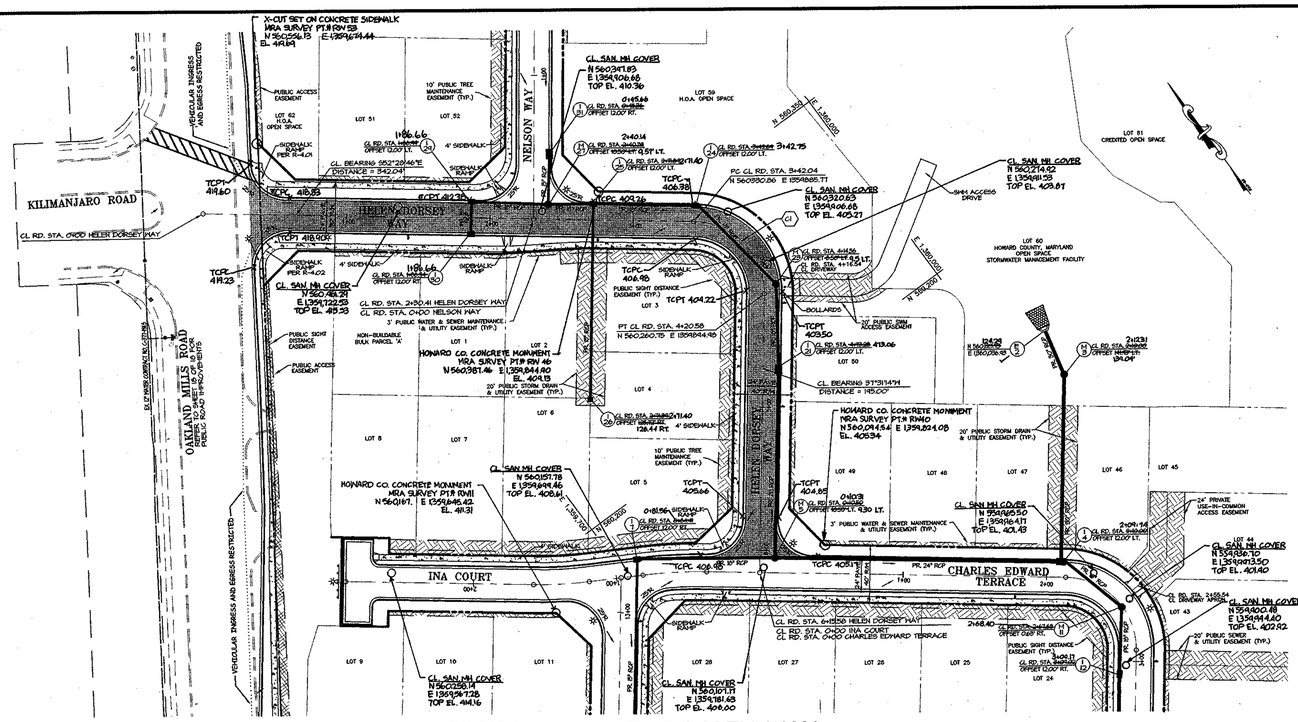
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=50'

SHEET 11 OF 20

F01/22



PLAN VIEW- HELEN DORSEY WAY

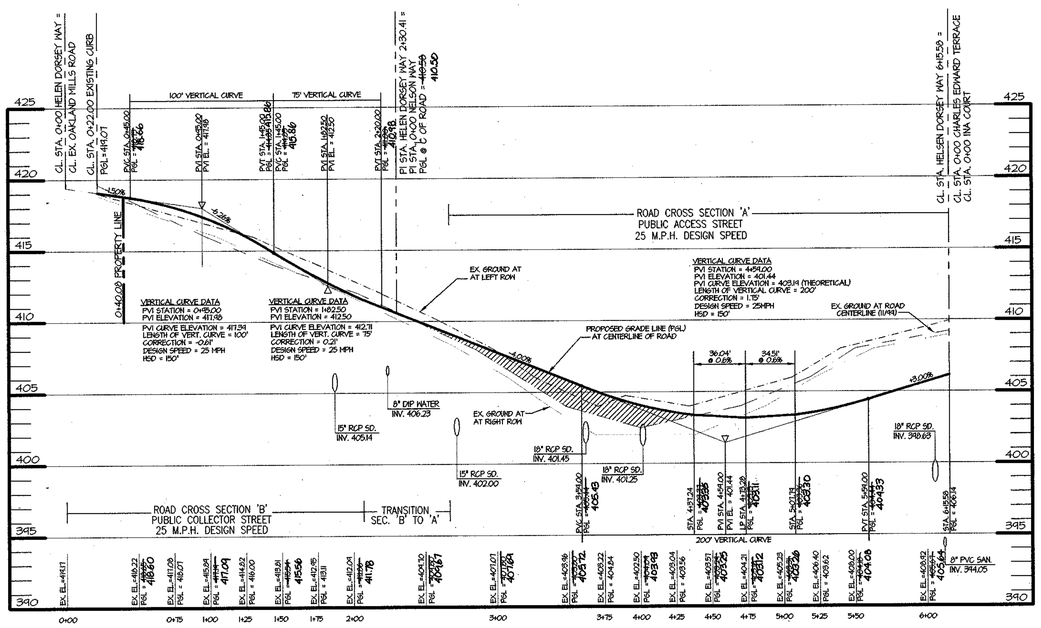
SCALE: 1"=50'

CURB TRANSITION TABLE FOR HELEN DORSEY WAY

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
0+51.40 TO 0+56.40	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	N/A	418.84 / 418.49	FROM PT-RETURN
0+57.17 TO 0+62.17	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	N/A	418.73 / 418.37	FROM PT-RETURN
1+79.54 TO 1+84.54	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-30	412.84 / 412.83	TRANSITION TO INLET
1+89.34 TO 1+94.34	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-30	412.59 / 412.09	TRANSITION FROM INLET
1+79.54 TO 1+84.54	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-29	412.84 / 412.83	TRANSITION TO INLET
1+89.34 TO 1+94.34	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-29	412.59 / 412.09	TRANSITION FROM INLET
1+96.76 TO 2+01.76	12.3'/13.6' LT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	411.97 / 411.75	* AT CURB RETURN
2+34.54 TO 2+39.54	12' RIGHT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	410.78 / 410.50	*
2+64.49 TO 2+69.49	12.1'/12.0' LT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-25	409.18 / 409.26	TRANSITION TO INLET
2+74.29 TO 2+79.29	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-25	409.07 / 408.59	TRANSITION FROM INLET
3+35.42 TO 3+40.42	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-24	406.34 / 406.42	TRANSITION TO INLET
3+45.22 TO 3+50.22	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-24	406.23 / 405.75	TRANSITION FROM INLET
4+65.03 TO 4+70.03	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-21	403.16 / 403.41	TRANSITION TO INLET
4+76.53 TO 4+81.53	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-21	403.41 / 403.16	TRANSITION FROM INLET
5+91.26 TO 5+96.26	15.5'/19.3' RT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	406.20 / 406.46	* AT CURB RETURN

NOTES:
1. ALL ELEVATIONS ARE TOP OF CURB AND CORRESPOND TO STATION TRANSITIONS.
2. SEE CROSS SECTION TABLES SHEET 2 OF 18 FOR TYPICAL SECTIONS.

* CURB TRANSITION IS REQUIRED FOR PAVEMENT SECTION TRANSITION.



PROFILE - HELEN DORSEY WAY

HOR. 1" = 50'
VERT. 1" = 5'

THIS ASBUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED 2/02/04.

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.

STATE OF MARYLAND
THOMAS C. NEUGEBAUER
No. 29203
REGISTERED
PROFESSIONAL ENGINEER

7-1-04
FOR AS-BUILT ITEM ONLY
THOMAS C. NEUGEBAUER, P.E. # 29203

CROSS SECTION TABLE

ROAD	STATION	SECTION
HELEN DORSEY WAY	0+34.16 TO 2+07.04	SECTION B
HELEN DORSEY WAY	2+67.04 TO 6+15.58	SECTION A

TRANSITION TABLE

ROAD	STATION	SECTION CHANGE	R/W WIDTH
HELEN DORSEY WAY	2+07.04 TO 2+67.04	SECTION 'B' TO SECTION 'A'	50' TO 40'

CENTERLINE CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	CHORD LENGTH	BEARING	DELTA
C1	50'	78.54'	50'	70.71'	S07°28'46"E	90°00'00" RIGHT

SPEED CONTROL DEVICES

ROAD	LENGTH	# OF DEVICES REQUIRED	# OF DEVICES PROVIDED	TYPE	MIN. DEFLECTION REQUIRED	MIN. DEFLECTION PROVIDED
HELEN DORSEY WAY	615.58'	1	1	AXIAL SHIFT/CRITICAL BEND	60'	90'

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND
3/5/01
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
3-2-01
CHIEF, BUREAU OF HIGHWAYS — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

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

STATE OF MARYLAND
PIERO VAN MELLITS
No. 21875
REGISTERED
PROFESSIONAL ENGINEER
PIERO VAN MELLITS #21875 — 12-01

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	07/04

FINAL ROAD AND STORM DRAIN PLANS HELEN DORSEY WAY

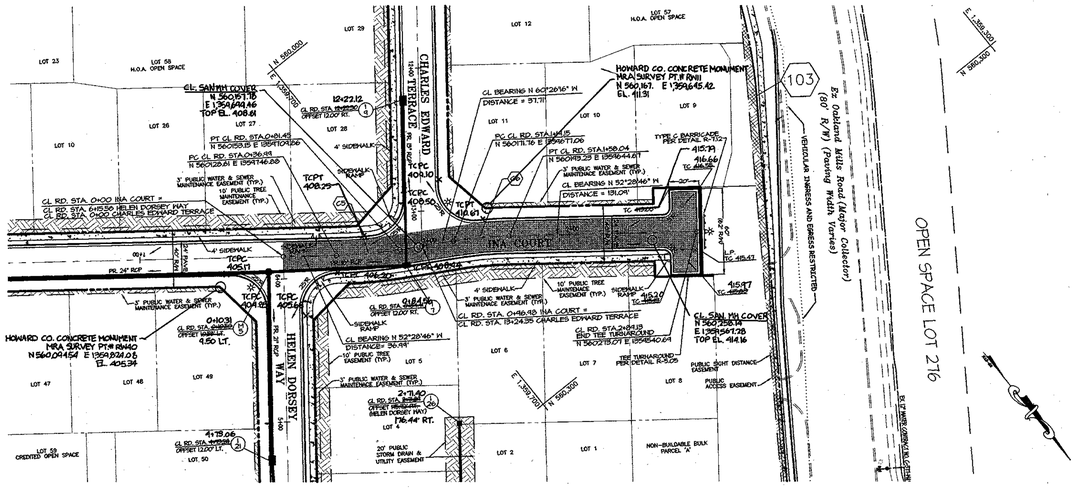
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

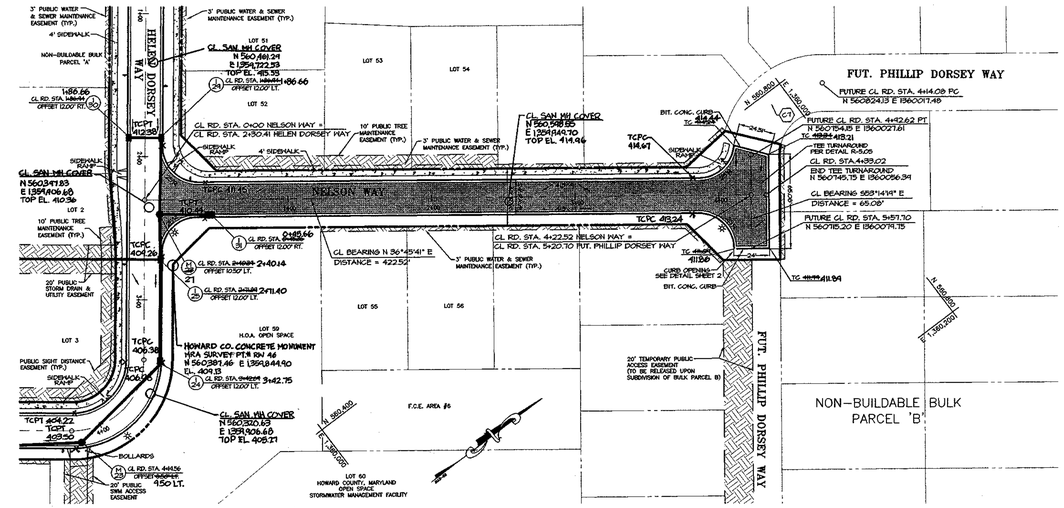
SCALE 1"=50'

SHEET 3 OF 20

F01 22



PLAN VIEW- INA COURT
SCALE: 1"=50'

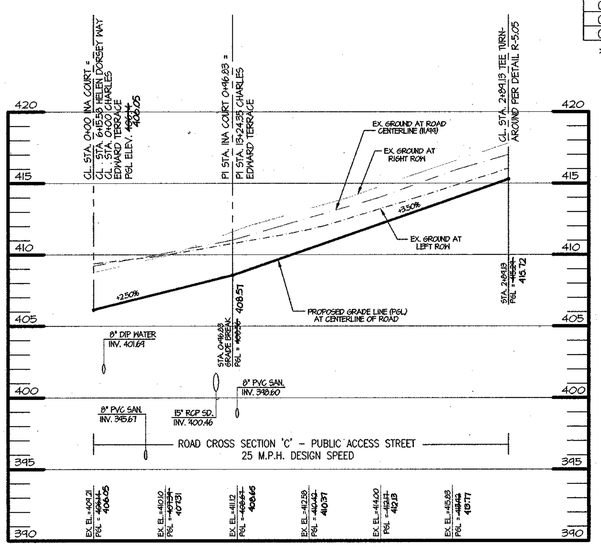


PLAN VIEW- NELSON WAY
SCALE: 1"=50'

CENTERLINE CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	CHORD LENGTH	BEARING	DELTA	REMARKS
C5	320'	44.45'	22.26'	44.41'	N56°27'31"W	7°57'30" LEFT	
C6	280'	38.89'	19.48'	38.86'	N56°27'31"W	7°57'30" RIGHT	
C7	50'	78.54'	50.00'	70.71'	S08°14'19"E	90°00'00" LEFT	*

* FUTURE CL CURVE TO BE BUILT UNDER PHASE II ROAD PLANS

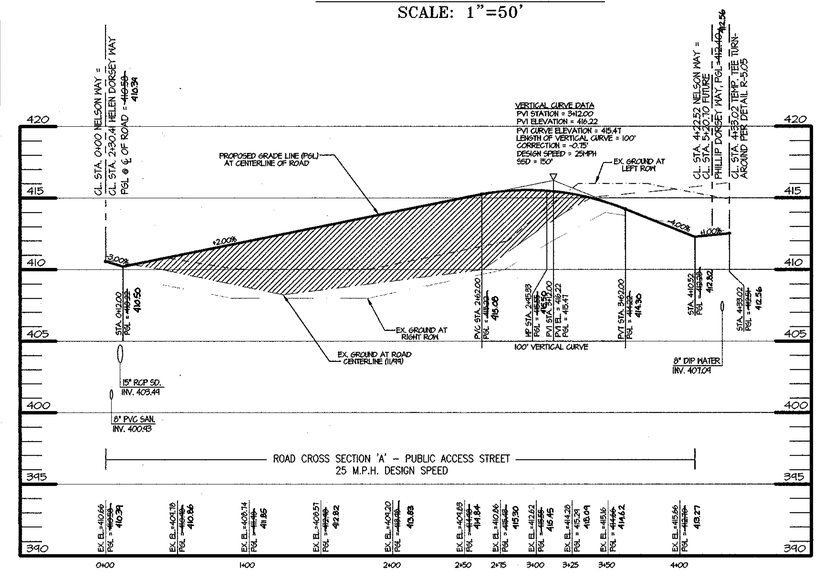


PROFILE - INA COURT
HOR. 1" = 50'
VERT. 1" = 5'

SPEED CONTROL DEVICES

ROAD	LENGTH	# OF DEVICES REQUIRED	# OF DEVICES PROVIDED	TYPE	MIN. DEFLECTION REQUIRED	MIN. DEFLECTION PROVIDED
INA COURT	269.13'	-	-	-	-	-
NELSON WAY	422.52'	-	-	INTERSECTIONS W/ STOP SIGNS < 400' APART	-	-

THIS AS-BUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED 2/02/04



PROFILE - NELSON WAY
HOR. 1" = 50'
VERT. 1" = 5'

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.

CURB TRANSITION TABLE FOR INA COURT

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
0+57.51 TO 0+62.51	12' LEFT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	408.25 / 408.38	*
0+76.85 TO 0+81.85	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-7	408.02 / 408.42	TRANSITION TO INLET
0+86.65 TO 0+91.65	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-7	408.55 / 408.39	TRANSITION FROM INLET
2+71.00 (HAMMERHEAD)	29.5' RIGHT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	415.13	*

NOTES:
1. ALL ELEVATIONS ARE TOP OF CURB AND CORRESPOND TO STATION TRANSITIONS.
2. SEE CROSS SECTION TABLES SHEET 2 OF 18 FOR TYPICAL SECTIONS

* CURB TRANSISTION IS REQUIRED FOR PAVEMENT SECTION TRANSITION.

CROSS SECTION TABLE

ROAD	STATION	SECTION
INA COURT	0+00 TO 2+89.13	SECTION C
NELSON WAY	0+00 TO 4+33.02	SECTION A

CURB TRANSITION TABLE FOR NELSON WAY

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
0+37.11 TO 0+42.11	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-31	410.68 / 411.06	TRANSITION TO INLET
0+48.61 TO 0+53.61	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-31	411.19 / 411.01	TRANSITION FROM INLET
4+34.52 (HAMMERHEAD)	28' LEFT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	413.34	*
4+34.52 (HAMMERHEAD)	5.6' LT/0.6' LT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	N/A	412.90 / 412.78	*
4+34.52 (HAMMERHEAD)	37' RIGHT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	N/A	411.79	*

NOTES:
1. ALL ELEVATIONS ARE TOP OF CURB AND CORRESPOND TO STATION TRANSITIONS.
2. SEE CROSS SECTION TABLES SHEET 2 OF 18 FOR TYPICAL SECTIONS

* CURB TRANSISTION IS REQUIRED FOR PAVEMENT SECTION TRANSITION.

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — No. 29203 — PROFESSIONAL ENGINEER

7-1-04
FOR AS-BUILT ITEM ONLY
THOMAS C. NEUGEBAUER, P.E. #29203

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

2/8/01
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
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9090 JUNCTION DRIVE SUITE 9
ANNAPOLIS JUNCTION, MARYLAND 20701
(410) 792-9792 or (301) 776-1690
FAX (410) 792-7395

STATE OF MARYLAND — PIERO VAN MELLITS — No. 21875 — REGISTERED PROFESSIONAL ENGINEER — 2/21/01

DES:	TCN/CAO
DRN:	TCN/CAO
CHK:	PVM
DATE:	12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	7-04

FINAL ROAD AND STORM DRAIN PLANS
NELSON WAY & INA COURT

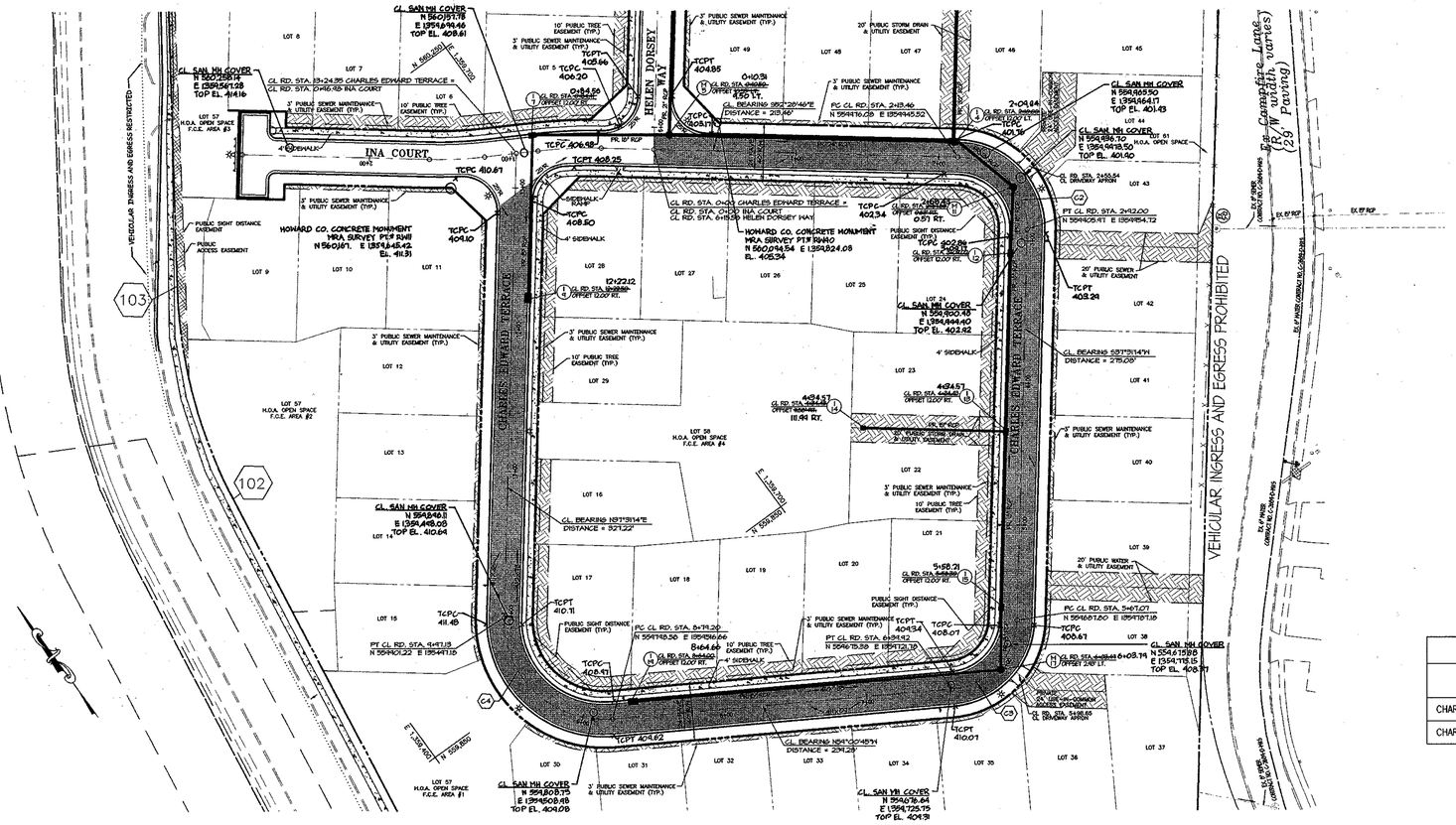
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=50'

SHEET 4 OF 20

F01 22



PLAN VIEW- CHARLES EDWARD TERRACE

SCALE: 1"=50'

CURB TRANSITION TABLE CHARLES EDWARD TERRACE

STATION	OFFSET	CURB TRANSITION	STRUC.	ELEVATION	REMARKS
2+01.75 TO 2+06.75	12' LEFT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-3	401.57 / 401.82	TRANSITION TO INLET
2+13.25 TO 2+18.25	12' LEFT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-3	401.82 / 401.57	TRANSITION FROM INLET
2+72.50 TO 2+77.50	12' RIGHT	REVERSE MODIFIED (ROLLED) TO MODIFIED (ROLLED)	--	402.70 / 402.68	*
2+72.50 TO 2+77.50	12' LEFT	MODIFIED (ROLLED) TO REVERSE MODIFIED (ROLLED)	--	402.78 / 402.61	*
3+01.42 TO 3+06.42	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-12	402.83 / 403.20	TRANSITION TO INLET
3+11.22 TO 3+16.22	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-12	403.29 / 403.11	TRANSITION FROM INLET
4+27.03 TO 4+32.03	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-13	405.24 / 405.61	TRANSITION TO INLET
4+36.83 TO 4+41.83	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-13	405.71 / 405.52	TRANSITION FROM INLET
5+50.89 TO 5+55.89	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-15	407.62 / 407.99	TRANSITION TO INLET
5+60.69 TO 5+65.69	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-15	408.09 / 407.90	TRANSITION FROM INLET
8+55.75 TO 8+60.75	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-19	408.92 / 409.14	TRANSITION TO INLET
8+67.25 TO 8+72.25	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-19	409.14 / 408.92	TRANSITION FROM INLET
12+14.25 TO 12+19.25	12' RIGHT	MODIFIED (ROLLED) TO STANDARD 7" COMB.	I-9	407.81 / 408.03	TRANSITION TO INLET
12+25.75 TO 12+30.75	12' RIGHT	STANDARD 7" COMB. TO MODIFIED (ROLLED)	I-9	408.03 / 407.81	TRANSITION FROM INLET

NOTES:
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TRANSITION TABLE

ROAD	STATION	SECTION CHANGE	R/W WIDTH
CHARLES EDWARD TERRACE	2+50.00 TO 3+00.00	SECTION 'A' TO SECTION 'C'	NO CHANGE

CROSS SECTION TABLE

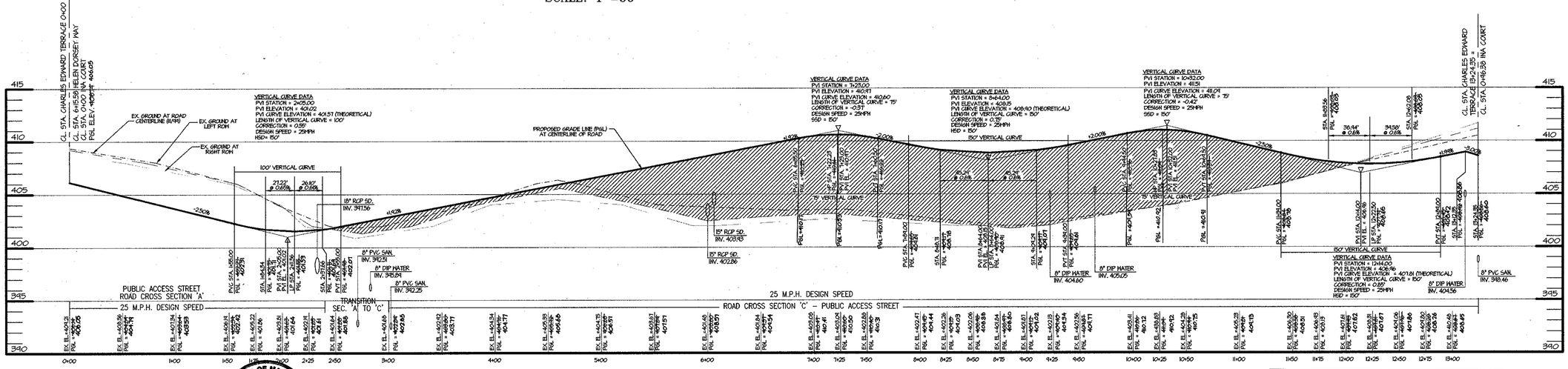
ROAD	STATION	SECTION
CHARLES EDWARD TERRACE	0+00 TO 2+50.00	SECTION A
CHARLES EDWARD TERRACE	3+00.00 TO 13+24.35	SECTION C

CURVE TABLE

CURVE	RADIUS	LENGTH	TANGENT	CHORD LENGTH	BEARING	DELTA
C2	50'	78.54'	50'	70.71'	S07°28'46"E	90°00'00" RIGHT
C3	50'	72.84'	44.60'	66.57'	S79°15'14"W	83°28'01" RIGHT
C4	70'	117.94'	78.47'	104.47'	N10°44'46"W	96°31'59" RIGHT

SPEED CONTROL DEVICES

ROAD	LENGTH	# OF DEVICES REQUIRED	# OF DEVICES PROVIDED	TYPE	MIN. DEFLECTION REQUIRED	MIN. DEFLECTION PROVIDED
CHARLES EDWARD TERRACE	1,324.35'	3	3	AXIAL SHIFT/CRITICAL BEND	60'	83'



CHARLES EDWARD TERRACE

HOR. 1" = 50'
VERT. 1" = 5'

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER ASHTO T180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.

THIS AS-BUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED 2/02/04

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/5/01

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — No. 29203 — PROFESSIONAL ENGINEER
7-1-04
FOR AS-BUILT ITEM ONLY
THOMAS C. NEUGEBAUER, P.E. #29203

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

MRA
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ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
9090 JUNCTION DRIVE SUITE 9
ANNAPOLIS JUNCTION, MARYLAND 20701
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FAX (410) 792-7395

STATE OF MARYLAND — PIERO VAN MELLITS — No. 21875 — REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS — No. 21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	7-04

FINAL ROAD AND STORM DRAIN PLANS
CHARLES EDWARD TERRACE

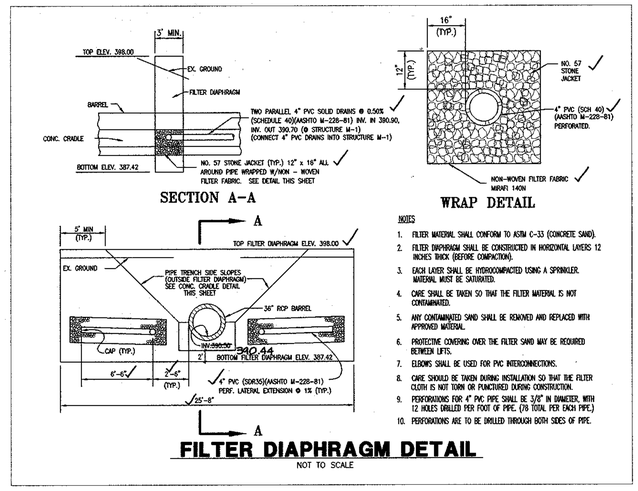
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=50'

SHEET 5 OF 20

F01 22



NOTES

1. FILTER MATERIAL SHALL CONFORM TO ASTM C-33 (CONCRETE SAND).
2. FILTER DIAPHRAGM SHALL BE CONSTRUCTED IN HORIZONTAL LAYERS 12 INCHES THICK (BEFORE COMPACTION).
3. EACH LAYER SHALL BE HYDROCOMPACTED USING A SPRINKLER. MATERIAL MUST BE SATURATED.
4. CARE SHALL BE TAKEN SO THAT THE FILTER MATERIAL IS NOT CONTAMINATED.
5. ANY CONTAMINATED SAND SHALL BE REMOVED AND REPLACED WITH APPROVED MATERIAL.
6. PROTECTIVE COVERING OVER THE FILTER SAND MAY BE REQUIRED BETWEEN LIFTS.
7. ELBOWS SHALL BE USED FOR PVC INTERCONNECTIONS.
8. CARE SHOULD BE TAKEN DURING INSTALLATION SO THAT THE FILTER CLOTH IS NOT TORN OR PUNCTURED DURING CONSTRUCTION.
9. PERFORATIONS FOR 4" PVC PIPE SHALL BE 3/8" IN DIAMETER, WITH 12 HOLES DRILLED PER FOOT OF PIPE. (78 TOTAL PER EACH PIPE.)
10. PERFORATIONS ARE TO BE DRILLED THROUGH BOTH SIDES OF PIPE.

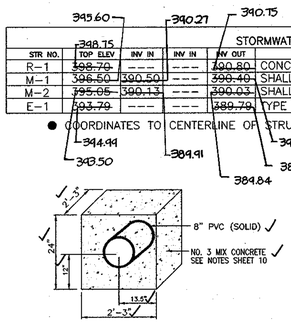
FILTER DIAPHRAGM DETAIL

NOT TO SCALE

STORMWATER MANAGEMENT STRUCTURE SCHEDULE

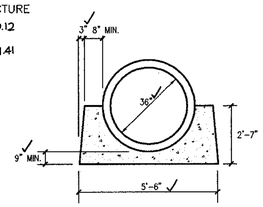
STR NO.	TOP ELEV	INV IN	INV IN	INV OUT	TYPE	REMARKS	● LOCATION NORTHING	EASTING
R-1	~~398.70~~ 398.75	---	---	~~390.80~~ 390.90	CONCRETE RISER, SEE DETAIL SHEET 10		560,~~295.94~~ 245.45	1,360,095.~~56~~ 37
M-1	~~396.50~~ 396.50	390.50	---	~~390.40~~ 390.40	SHALLOW PRECAST MANHOLE, HOW. CO. STD. G-5.13 ✓		560,~~266.67~~ 264.00	1,360,~~147.67~~ 149.76
M-2	~~395.05~~ 395.05	390.13	---	~~390.03~~ 390.03	SHALLOW PRECAST MANHOLE, HOW. CO. STD. G-5.13 ✓		560,~~220.75~~ 218.61	1,360,~~121.47~~ 119.23
E-1	~~393.79~~ 393.79	---	---	~~389.79~~ 389.79	TYPE 'E' ENDWALL, HOW. CO. STD. DETAIL SD-5.31 ✓		560,~~173.95~~ 170.50	1,360,~~128.75~~ 129.34

● COORDINATES TO CENTERLINE OF STRUCTURE



DEWATERING DEVICE ANCHOR

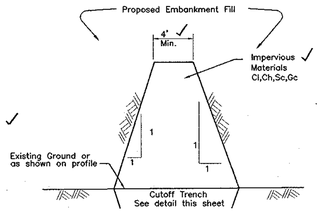
NOT TO SCALE



NOTES:
1. CRADLE TO BE CONTINUOUS ALONG PIPE.
2. CONCRETE FOR CRADLE TO BE MIX No. 3.

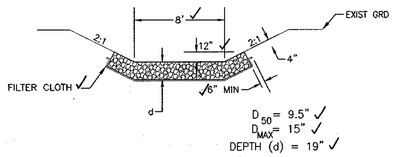
CONCRETE CRADLE DETAIL

NOT TO SCALE



CORE TRENCH

NOT TO SCALE

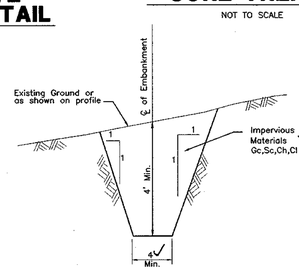


D_{50} = 9.5" ✓
D_{MAX} = 15" ✓
DEPTH (d) = 19" ✓

SECTION 2-2

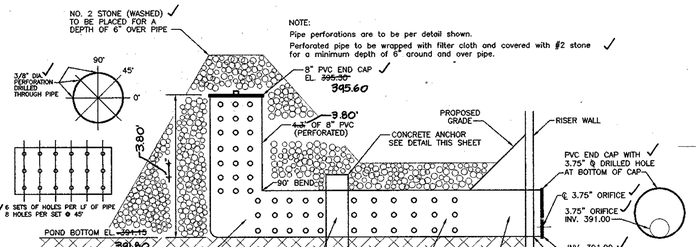
RIP RAP CHANNEL DETAIL

NOT TO SCALE



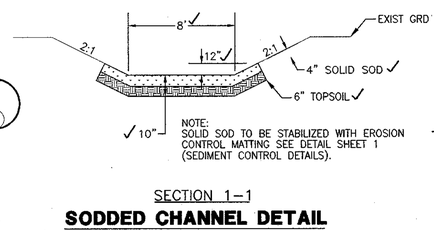
CUTOFF TRENCH

NOT TO SCALE



DEWATERING DEVICE DETAIL FOR STORMWATER MANAGEMENT

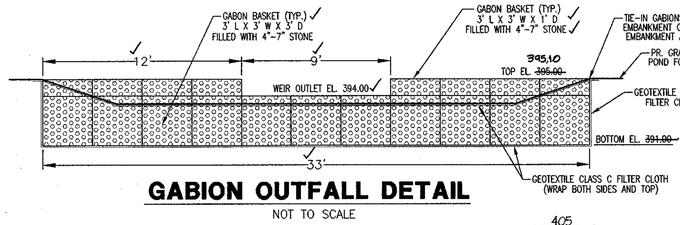
N.T.S.



SECTION 1-1

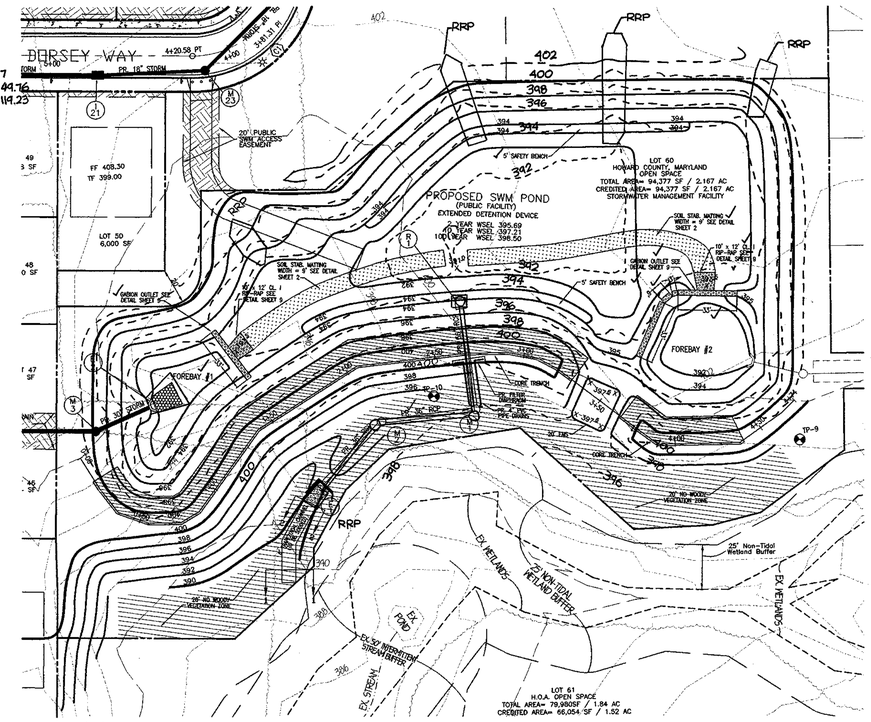
SODDED CHANNEL DETAIL

NOT TO SCALE



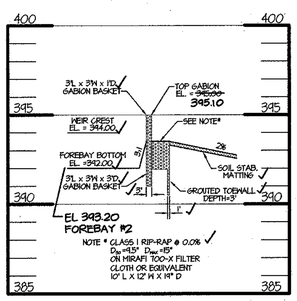
GABION OUTFALL DETAIL

NOT TO SCALE



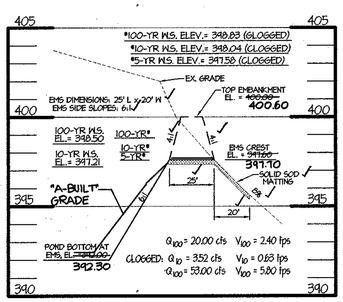
PLAN VIEW - SWM POND

SCALE: 1"=40'



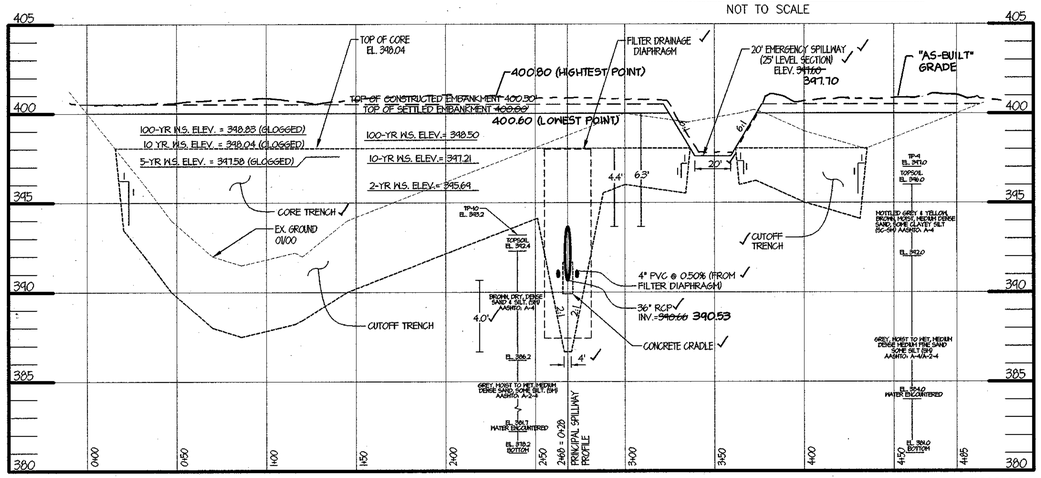
GABION PROFILE

SCALE: NONE



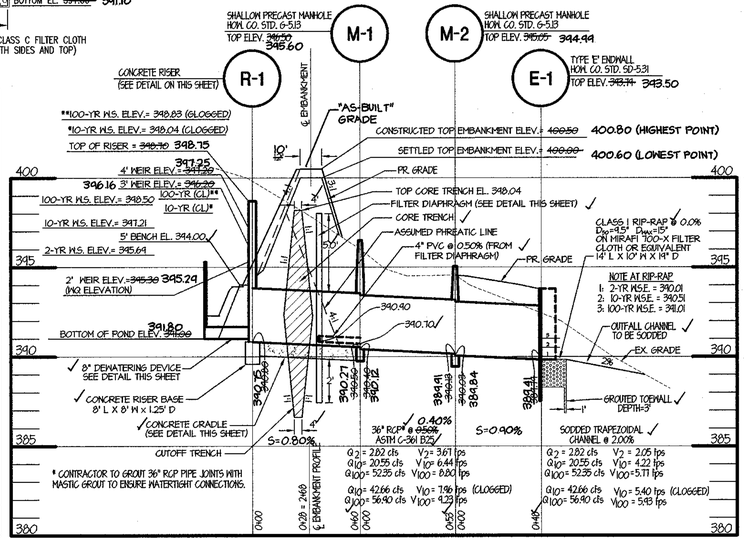
EMS PROFILE

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



POND CENTERLINE OF EMBANKMENT PROFILE

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



PRINCIPAL SPILLWAY PROFILE

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

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — No. 29203 — PROFESSIONAL ENGINEER

7-1-04
FOR AS-BUILT ITEM ONLY
THOMAS C. NEUGEBAUER, P.E. 29203

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 3/1/01

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

U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE — DATE 3/1/01

THIS AS-BUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATE, INC. DATED 11/17/03.

SWM "AS-BUILT" CERTIFICATION

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

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

CHIEF, DIVISION OF LAND DEVELOPMENT — DATE 3/15/01

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

CHIEF, BUREAU OF HIGHWAYS — DATE 3-2-01

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE 3/6/01

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

STATE OF MARYLAND — PIERO VAN METER LITTS — No. 21875 — REGISTERED PROFESSIONAL ENGINEER

DES: TCN/CAO
DRN: TCN/CAO
CHK: MJE
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	7-04

FINAL ROAD PLANS
SWM POND PLAN, PROFILES AND DETAILS

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 9 OF 20

F01/22

MD-378 STORMWATER MANAGEMENT CONSTRUCTION SPECIFICATIONS

I. 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.

II. EARTH FILL

A. 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 MUST 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.

B. 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.

C. 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).

III. 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

IV. 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 EQUIPMENT, ROLLERS, OR HAND TAMPERS TO ASSURE MAXIMUM DENSITY AND MINIMUM PERMEABILITY. IN ADDITION, THE CORE SHALL BE PLACED CONCURRENTLY WITH THE OUTER SHELL OF THE EMBANKMENT.

V. 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 OPERATE 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. MATE-RIAL SHALL BE PLACED SUCH THAT A MINIMUM OF 6" (MEASURED PERPENDICULAR TO THE OUTSIDE OF THE PIPE) OF FLOWABLE FILL SHALL BE UNDER (BEDDING), OVER AND, ON THE SIDES OF THE PIPE. IT ONLY NEEDS TO EXTEND UP TO THE SPRING LINE FOR RIGID CONDUITS. AVERAGE SLUMP OF THE FILL SHALL BE 7" TO ASSURE FLOWABILITY OF THE MATERIAL. ADEQUATE MEASURES SHALL BE TAKEN (SAND BAGS, ETC.) TO PREVENT FLOATING 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 A STRUCTURE. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE DRIVEN OVER ANY PART OF A STRUCTURE OR PIPE UNLESS THERE IS A COMPACTED FILL OF 24" OR GREATER OVER THE STRUCTURE OR PIPE. BACKFILL MATERIAL OUTSIDE THE STRUCTURAL BACKFILL (FLOWABLE FILL) ZONE SHALL BE OF THE TYPE AND QUALITY CONFORMING TO THAT SPECIFIED FOR THE CORE OF THE ?? EMBANKMENT OR OTHER EMBANKMENT MATERIALS.

VI. PIPE CONDUITS

ALL PIPES SHALL BE CIRCULAR IN CROSS SECTION.

A. CORRUGATED METAL PIPE

1. MATERIALS - (POLYMER COATED STEEL PIPE) -STEEL PIPES WITH POLYMERIC COATINGS 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 COM-POUND. 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 LEAST 24 MILS IN THICK-NESS.
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 IN DIAMETER: FLANGES ON BOTH ENDS OF THE PIPE WITH A CIRCULAR 3/8 INCH CLOSED CELL NEOPRENE GASKET, PRE-PUNCHED TO THE FLANGE BOLT CIRCLE, SANDWICHED BETWEEN ADJACENT FLANGES; A 12-INCH WIDE STANDARD LAP TYPE BAND WITH 12-INCH WIDE BY 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 3/8 INCH 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.

B. RE ENFORCED CONCRETE PIPE

1. MATERIALS - REINFORCED CONCRETE PIPE SHALL HAVE BELL AND SPIGOT JOINTS WITH RUBBER GASKETS AND SHALL EQUAL OR EXCEED ASTM C-361.
2. BEDDING - REINFORCED CONCRETE PIPE CONDUITS SHALL BE LAID IN A CONCRETE BEDDING/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 A 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 AS SHOWN ON THE DRAWINGS.

C. 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.

C. PLASTIC PIPE (CONTINUED)

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.

VII. DRAINAGE DIAPHRAGMS

WHEN A DRAINAGE DIAPHRAGM IS USED, A REGISTERED PROFESSIONAL ENGINEER WILL SUPERVISE THE DESIGN AND CONSTRUCTION INSPECTION.

VIII. CONCRETE STRUCTURES

A. CONCRETE SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 414, MIX NO. 3.

B. REINFORCEMENT
REINFORCEMENT SHALL MEET THE MINIMUM REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 416 (REINFORCEMENT FOR CONCRETE STRUCTURES): SECTION 908 (REINFORCING STEEL - GRADE 60, WIRE ROPE AND WIRE FARIC), AND SECTION 909.02 (STEEL FOR MISCELLANEOUS USE).

IX. ROCK RIPRAP
ROCK RIPRAP SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 311. GEOTEXTILE SHALL BE PLACED UNDER ALL RIPRAP AND SHALL MEET THE REQUIREMENTS OF MARYLAND DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY ADMINISTRATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS, SECTION 921.09, CLASS C.

X. CARE OF WATER DURING CONSTRUCTION

ALL WORK ON PERMANENT STRUCTURES SHALL BE CARRIED OUT IN AREAS FREE FROM WATER. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN ALL TEMPORARY DIKES, LEVEES, COFFERDAMS, DRAINAGE CHANNELS, AND STREAM DIVERSIONS NECESSARY TO PROTECT THE AREAS TO BE OCCUPIED BY THE PERMANENT WORKS. THE CONTRACTOR SHALL ALSO FURNISH, INSTALL, OPERATE, AND MAINTAIN ALL NECESSARY PUMPING AND OTHER EQUIPMENT REQUIRED FOR REMOVAL OF WATER FROM VARIOUS PARTS OF THE WORK AND FOR MAINTAINING THE EXCAVATIONS, FOUNDATION, AND OTHER PARTS OF THE WORK FREE FROM WATER AS REQUIRED OR DIRECTED BY THE ENGINEER FOR CONSTRUCTING EACH PART OF THE WORK. AFTER HAVING SERVED THEIR PURPOSE, ALL TEMPORARY PROTECTIVE WORKS SHALL BE REMOVED OR LEVELED AND GRADED TO THE EXTENT REQUIRED TO PREVENT OBSTRUCTION IN ANY DEGREE WHATSOEVER OF THE FLOW OF WATER TO THE 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 SUMPS FROM WHICH THE WATER SHALL BE PUMPED.

XI. 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 B Y 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.

A. SOD

1. SPECIFICATIONS - SOD SHALL BE "K-31" TALL FESCUE OR KENTUCKY BLUEGRASS/RED FESCUE MIXTURE OR APPROVED EQUAL. CLASS OF TURFGRASS SOD SHALL BE MARYLAND OR VIRGINIA STATE CERTIFIED OR APPROVED SOD.
2. SITE PREPARATION - WHERE SOIL IS ACIDIC OR COMPOSED OF HEAVY DAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 100 LBS./1000 SQ.FT. IN ALL SOILS 5-10-5 FERTILIZER OR APPROVED EQUAL SHALL BE APPLIED AT THE RATE OF 30 LBS/1000 SQ.FT. FERTILIZER SHALL BE UNIFORMLY APPLIED AND MIXED INTO THE TOP 3" OF SOIL WITH THE REQUIRED LIME. SLOW RELEASE NITROGEN, AT THE RATE OF 3.5 LBS/1000 SQ. FT., SHALL BE APPLIED TO THE PREPARED SOIL IMMEDIATELY PRIOR TO SOD INSTALLATION. THIS MATERIAL SHALL BE APPROXIMATELY ONE-THIRD IMMEDIATELY AVAILABLE AND TWO-THIRDS WATER INSOLUBLE NITROGEN. UREA FORMALDEHYDE (UF) AND ISOBUTYLIDENE (IBDU) MEET THESE STANDARDS.
3. SOD INSTALLATION - THE FIRST ROW OF SOD SHALL BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACE PARALLEL TO AND TIGHTLY WEDGED AGAINST EACH OTHER. LATERAL JOINTS SHALL BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. INSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED FIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE AIR DRYING OF THE ROOTS. ON SLOPING AREAS WHERE EROSION MAY BE A PROBLEM, SOD SHALL BE LAID WITH LONG EDGES PARALLEL TO THE CONTOUR AND WITH STAGGERED JOINTS. SECURE THE SOD BY TAMPING AND PEGGING OR OTHER APPROVED METHODS. AS SODDING IS COMPLETED IN ANY ONE SECTION, THE ENTIRE AREA SHALL BE ROLLED OR TAMPED TO INSURE SOLID CONTACT OF ROOTS WITH THE SOIL SURFACE. SOD SHALL BE WATERED IMMEDIATELY AFTER ROLLING OR TAMPING UNTIL THE UNDERSIDE OF THE NEW SOD PAD AND SOLID SURFACE BELOW THE SOD ARE THOROUGHLY WET. THE OPERATION OF LAYING, TAMPING AND IRRIGATING FOR ANY PIECE OF SOD SHALL BE COMPLETED WITHIN EIGHT HOURS.

B. PERMANENT SEEDING

ALL DISTURBED AREAS SHALL BE STABILIZED AS FOLLOWS:

1. SEEDBED PREPARATION - LOOSEN UPPER 3 INCHES OF SOIL BY RAKING, DISCING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING.
2. SOIL AMENDMENTS - APPLY 2 TONS PER ACRE DOLOMITIC LIMESTONE (92 LBS./1000 SQ. FT.), 600 LBS. PER ACRE 10-10-10 FERTILIZER (14 LBS./1000 SQ. FT.) AND 400 LBS. PER ACRE OF 30-0-0 UREAFORM FERTILIZER (9.2 LBS./100 SQ. FT.). HARROW OR DISC LIME AND FERTILIZER INTO UPPER THREE INCHES OF SOIL. AT TIME OF SEEDING, APPLY 400 LBS PER ACRE (9.2 LBS./1000 SQ. FT.) OF 30-0-0 UREAFORM FERTILIZER AND 500 LBS. PER ACRE (11.5 LBS./1000 SQ.FT.) OF 10-10-10 FERTILIZER.
3. SEEDING - FOR THE PERIOD MARCH 1 THROUGH APRIL 30 SEED WITH 40 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND 15 LBS. PER ACRE INOCULATED CROWNVETCH. FOR THE PERIOD MAY 1 THROUGH JULY 31 SEED WITH 60 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND 2 LBS. PER ACRE INOCULATED WEEPING LOVEGRASS. FOR THE PERIOD OF AUGUST 1 THROUGH OCTOBER 15 SEED WITH 40 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND 20 LBS. PER ACRE INOCULATED INTERSTATE SERICA ESPEDEZA. DURING THE PERIOD OF OCTOBER 16 THROUGH FEBRUARY 28, PROTECT SITE BY: OPTION (1) - 2 TONS PER ACRE OF WELL ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) - USE SOD.. OPTION (3) - SEED WITH 60 LBS. PER ACRE KENTUCKY 31 TALL FESCUE AND MULCH WITH 2 TONS PER ACRE WELL ANCHORED STRAW. FOR THE PERIOD OF MAY 1 THROUGH FEBRUARY 28, INOCULATED CROWNVETCH SHALL BE APPLIED DURING THE SUBSEQUENT PERIOD OF MARCH 1 THROUGH APRIL 30 AT THE RATE OF 15 LBS. PER ACRE.
4. MULCHING - APPLY 1.5 TO 2 TONS PER ACRE OF UNROTTED SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING 218 GALLONS PER ACRE OF EMULSIFIED ASPHALT ON FLAT AREAS. ON SLOPE 8 FEET OR HIGHER, USE 348 GALLONS PER ACRE FOR ANCHORING.
5. MAINTENANCE - INSPECT ALL SEEDED AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDING.

C. TEMPORARY SEEDING

1. SEEDBED PREPARATION - . LOOSEN UPPER 3 INCHES OF SOIL BY DISCING, RAKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING.
2. SOIL AMENDMENTS - APPLY 600 LBS. PER ACRE OF 10-10-10 FERTILIZER. WHERE SOIL IS ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE APPLIED AT THE RATE OF 2 TONS PER ACRE (92 LBS./1000 SQ.FT.).
3. SEEDING - FOR PERIODS MARCH 1 THROUGH APRIL 30, AND FROM AUGUST 15 THROUGH NOVEMBER 15, SEED WITH 2.5 BUSHELS PER ACRE ANNUAL RYE. FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 LBS. PER ACRES OF WEEPING LOVEGRASS. FOR THE PERIOD NOVEMBER 16 THROUGH 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.
4. MULCHING - SAME AS PERMANENT SEEDING.

X. 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.

XI. FENCING
FENCING SHALL BE 42" HIGH CHAIN LINK FENCE CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY ADMINISTRATION STANDARD DETAILS 615.02 AND 615.03. THE SPECIFICATIONS FOR A 6'-0" FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6'-8" LINE POSTS. GATE SHALL BE CONSTRUCTED IN ACCORDANCE WITH STATE HIGHWAY ADMINISTRATION STANDARD DETAIL 692.01 WITH 42" FABRIC. FABRIC FOR FENCE AND GATE SHALL CONFORM TO ASSHTO DESIGNATION ML8L74. DARK VINYL COATING IS REQUIRED FOR THE FENCE POSTS AND WIRE FABRIC IN ACCORDANCE WITH THE LANDSCAPE MANUAL ADOPTED BY RESOLUTION 56-90, OCTOBER 1, 1990.

XI. FILTER CLOTH
1. FILTER CLOTH TO BE MIRAFI 140N OR APPROVED EQUAL.

XII. GABIONS
1. GABIONS TO BE PVC COATED. CLASS IV. ARTICLE 35.06, BALTIMORE COUNTY STANDARD SPECIFICATIONS AND DETAILS.

XIII. INSPECTION
THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 5 WORKING DAYS PRIOR TO STARTING ANY WORK SHOWN ON THESE PLANS SO THAT STORMWATER MANAGEMENT POND MAY BE INSPECTED DURING CONSTRUCTION.

XIV. REFERENCES

UNLESS OTHERWISE NOTED, ALL MATERIALS AND CONSTRUCTION PRACTICES SHALL CONFORM TO THE FOLLOWING:

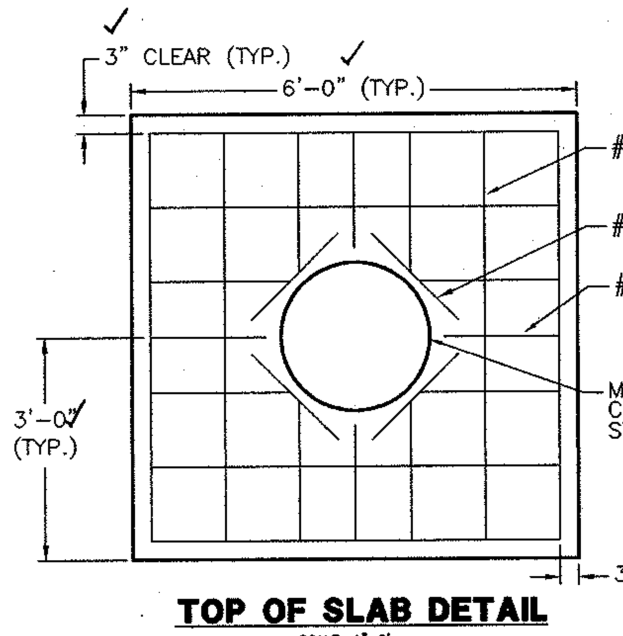
1. "STANDARD SPECIFICATIONS AND DETAILS FOR CONSTRUCTION" OF THE BALTIMORE COUNTY, MARYLAND, DEPARTMENT OF PUBLIC WORKS, AS AMENDED.
2. "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS", 1993, OF THE MARYLAND STATE HIGHWAY ADMINISTRATION, AS AMENDED.
3. "STANDARD AND SPECIFICATIONS FOR PONDS" OF THE SOIL CONSERVATION SERVICE OF MARYLAND (MD-378), JANUARY 2000 AND AS AMENDED.
4. "REVISED STORMWATER MANAGEMENT POLICY," REVISED SEPTEMBER 11, 1984, BALTIMORE COUNTY MARYLAND.

SWM "AS-BUILT" CERTIFICATION

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

THIS AS-BUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED 11/17/03.

7-1-04
FOR AS-BUILT ITEM ONLY
THOMAS C. NEUGEBAUER, P.E. #29203



TOP OF SLAB DETAIL

SCALE: 1"=2'

CONSTRUCTION INSPECTION SCHEDULE

DETENTION AND RETENTION STRUCTURES

I. INSPECTIONS SHALL BECONDUCTED BY THE AS-BUILT CERTIFYING ENGINEER:

1. UPON THE COMPLETION OF EXCAVATION TO SUB-FOUNDATION AND WHEN REQUIRED, AND UPON THE INSTALLATION OF STRUCTURAL SUPPORTS OR REINFORCEMENT FOR STRUCTURES. INCLUDING BUT NOT LIMITED TO:
   A. CORE TRENCHES FOR STRUCTURAL EMBANKMENT.
   B. INLET OR OUTLET STRUCTURES AND ANTI-SEEP STRUCTURES.
   C. WATER-TIGHT CONNECTORS ON PIPES.
   D. TRENCHES FOR ENCLOSED STORM DRAIN FACILITIES.
   E. UTILITY CROSSINGS OF EMBANKMENT.
2. DURING THE PLACEMENT OF STRUCTURAL FILL AND CONCRETE, AND INSTALLATION OF PIPING AND CATCH BASINS.
3. DURING BACKFILL OF FOUNDATIONS AND TRENCHES.
4. DURING EMBANKMENT CONSTRUCTION.
5. UPON COMPLETION OF FINAL GRADING AND ESTABLISHMENT OF PERMANENT STABILIZATION.

MAINTENANCE & REPAIR SCHEDULE

MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. IN GENERAL, THE PRACTICES CONTAINED IN THE "MAINTENANCE AND REPAIR" CHAPTER OF THE "MARYLAND DAM SAFETY MANUAL", DNR-WRA 1988, SHOULD BE FOLLOWED AND CONDUCTED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER FAMILIAR WITH DAM CONSTRUCTION, OPERATION, MAINTENANCE, AND REPAIR.

IN ADDITION, THE MD-378 DAM INSPECTION CHECKLIST MAY BE USED AS A GUIDE FOR MAINTENANCE AND INSPECTION.

AT A MINIMUM, THE STORMWATER MANAGEMENT FACILITY SHALL BE INSPECTED BI-ANNUALLY FOR THE FOLLOWING ITEMS.

1. CONDITION OF EMBANKMENT
2. CONDITION OF VEGETATIVE COVER
3. CONDITION OF FENCES AND MAINTENANCE ACCESS ROAD.
4. CONDITION OF SPILLWAYS AND PIPE OUTLETS.
5. CONDITION OF POND RESORVOIR STORAGE AREA.
6. CONDITION OF RISER STRUCTURE AND OR PIPE HEADWALLS.
7. SEDIMENT LOAD IN POND RESORVOIR STORAGE AREA OR OUTFALL CHANNEL.
8. SEEPAGE THROUGH EMBANKMENT.
9. ANY OTHER ITEMS WHICH COULD AFFECT THE FUNCTION OF THE SWM FACILITY.
10. EVIDENCE OF CLOGGING OF ALL OPENINGS AND EXTENDED DETENTION DEVICE.
11. EROSION OF EMBANKMENT, POND SIDE SLOPES, OR OUTFALL CHANNEL
12. CRACKING OF CONCRETE RISER AND HEADWALL.
13. EVIDENCE OF ANIMAL TUNNELING THROUGH POND EMBANKMENT.

THE EMBANKMENT AND STORAGE AREA SHALL BE MOWED TWICE A YEAR AND ANY TREES OR BUSHES GROWING ON OR ALONG THE EMBANKMENT SHALL BE REMOVED. ANY NEEDED MAINTENANCE OR REPAIR OF STRUCTURES, SPILLWAYS, CORE TRENCH OR POND EMBANKMENT SHALL BE DONE UNDER THE SUPERVISION OF A QUALIFIED GEOTECHNICAL ENGINEER.

IN ADDITION TO BIANNUAL INSPECTIONS, INSPECTIONS SHALL BE DONE DURING WET SEASON, AND AFTER MAJOR STORMS.

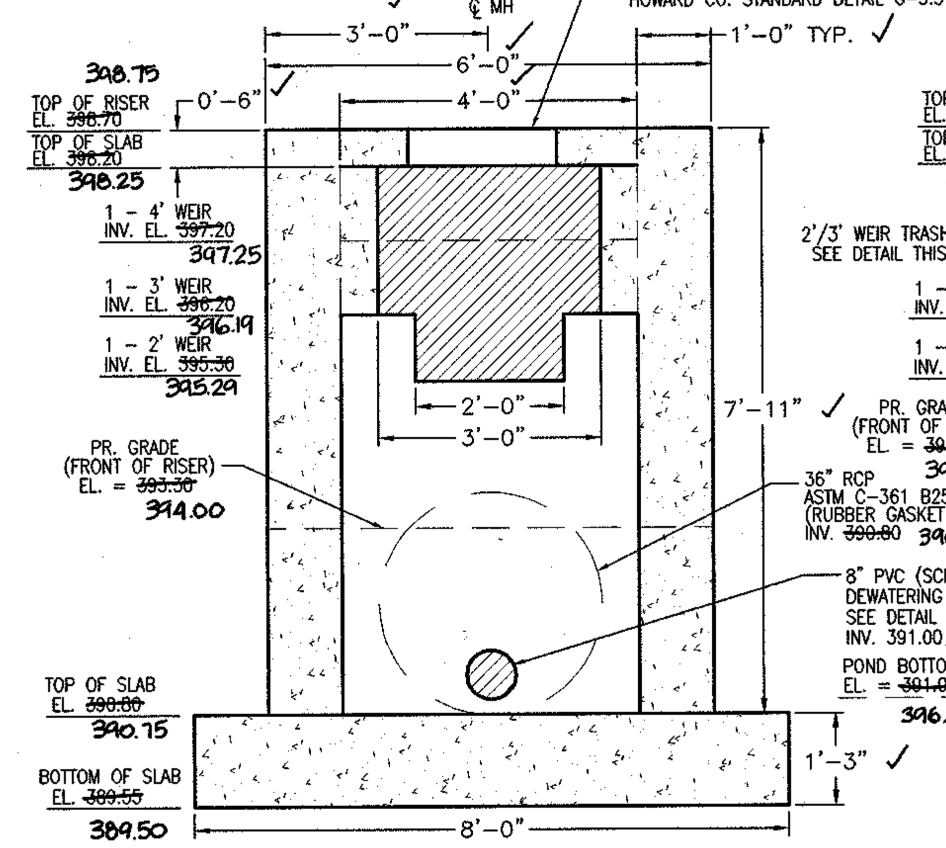
ALL DEBRIS, LITTER, OR SEDIMENT ACCUMULATED IN POND RESERVOIR STORAGE AREA AND OUTFALL CHANNEL SHALL BE REMOVED.

OPERATION AND MAINTENANCE AGREEMENT SCHEDULE FOR EXTENDED DETENTION POND

1. TOP AND SIDE SLOPES OF THE EMBANKMENT SHALL BE MOWED A MINIMUM OF TWO (2) TIMES PER YEAR, ONCE IN JUNE AND ONCE IN SEPTEMBER. OTHER SIDE SLOPES AND MAINTENANCE ACCESS SHALL BE MOWED AS NEEDED.
2. DEBRIS AND LITTER SHALL BE REMOVED DURING REGULAR MOWING OPERATIONS AND AS NEEDED.
3. WHEN DEEMED NECESSARY FOR AESTHETIC REASONS, AND UPON APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS, SEDIMENT SHALL BE REMOVED FROM THE POND.

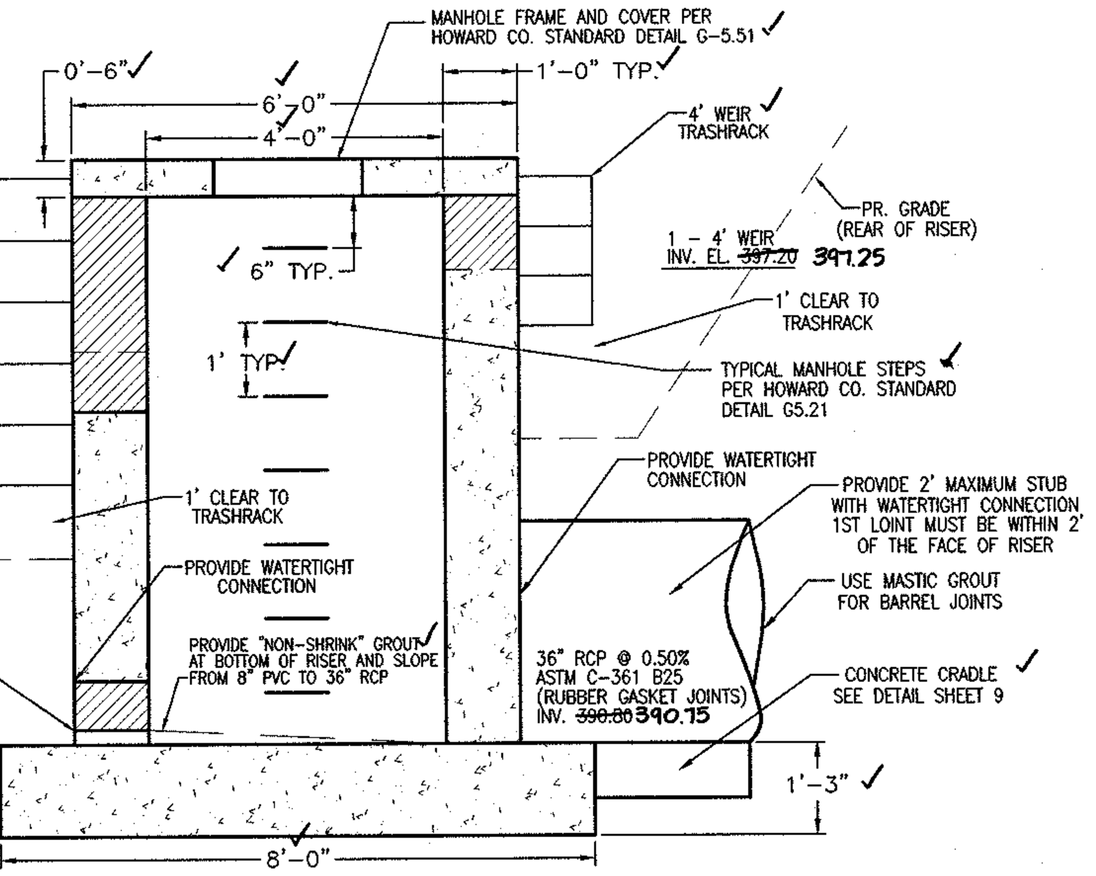
GEOTECHNICAL NOTES & RECOMMENDATIONS

1. PER MD-378 SPECIFICATIONS, SOILS USED FOR CUTOFF TRENCH CONSTRUCTION SHALL MEET USCS CLASSIFICATION CL (LOW PLASTICITY CLAY), CH (HIGH PLASTICITY CLAY), SC (CLAYEY SAND), OR GC (CLAYEY GRAVEL).
2. MATERIALS USED FOR BACKFILL OF PIPE OUTFALL SHOULD BE SIMILAR TO THOSE USED FOR THE CUTOFF TRENCH.
3. ALTHOUGH SUBSURFACE EXPLORATIONS INDICATE THAT NO SUITABLE CUTOFF TRENCH MATERIAL EXISTS ON SITE, TEST PIT EXPLORATION MAY BE PERFORMED IN AN ATTEMPT TO IDENTIFY APPROPRIATE MATERIALS MEETING SCS SPECIFICATIONS FOR CUTOFF CONTRUCTION.
4. IF MATERIALS SUITABLE FOR CUTOFF TRENCH CONSTRUCTION ARE NOT IDENTIFIED ON SITE, OFF-SITE BORROW MAY BE UTILIZED PROVIDED THAT IT MEETS ALL CLASSIFICATIONS REQUIRED BY MD-378, AND BE APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER IN THE FIELD.
5. MD-378 SPECIFIES THAT REFERENCE SOIL CLASSIFICATIONS SUITABLE FOR CUTOFF TRENCH CONSTRUCTION ARE ALSO SUITABLE FOR EMBANKMENT CONSTRUCTION. THE MOST PLASTIC MATERIAL (PI=11 OR MORE) AVAILABLE ON SITE SHALL BE USED FOR EMBANKMENT CONSTRUCTION.
6. FILL FOR CUTOFF TRECH AND EMBANKMENT CONSTRUCTION SHOULD BE PLACED IN 8" LOOSE LIFTS, COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY IN ACCORDANCE WITH THE STANDARD PROCTOR, ASTM D-698. FILL AROUND THE PIPE OUTFALL SHOULD BE PLACED IN 4" LIFTS AND COMPACTED TO THE SAME STANDARD WITH HAND EQUIPMENT. COMPACTION OF THESE AREAS SHOULD BE MONITORED BY A QUALIFIED GEOTECHNICAL ENGINEER.
7. WHERE INDICATED BY SUBSURFACE CONDITIONS, A 6" GRANULAR BEDDING SHOULD BE PLACED UNDER THE PIPE OUTFALL (BEYOND THE CONCRETE CRADLE) TO PROVIDE UNIFORM PIPE SUPPORT.



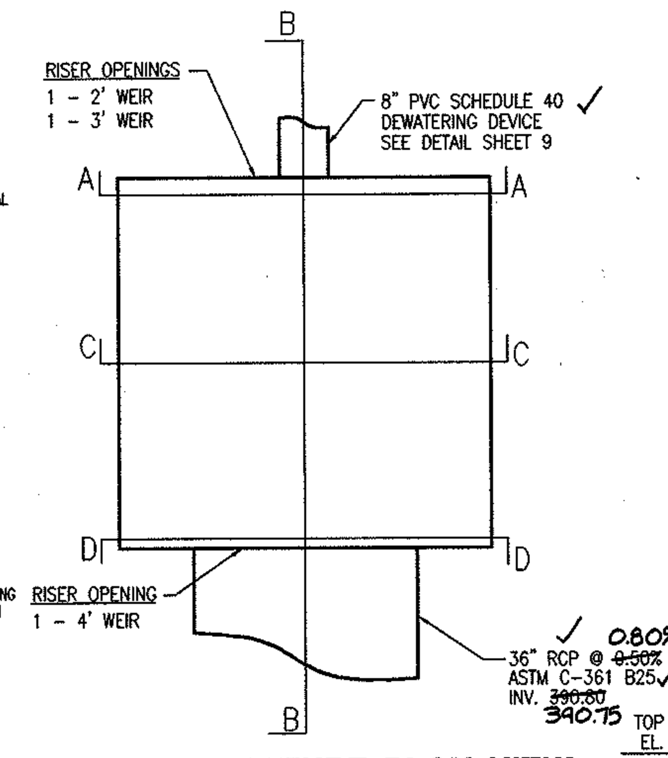
RISER STRUCTURE OPENING DETAIL 'A' SECTION A-A

SCALE: 1"=2'



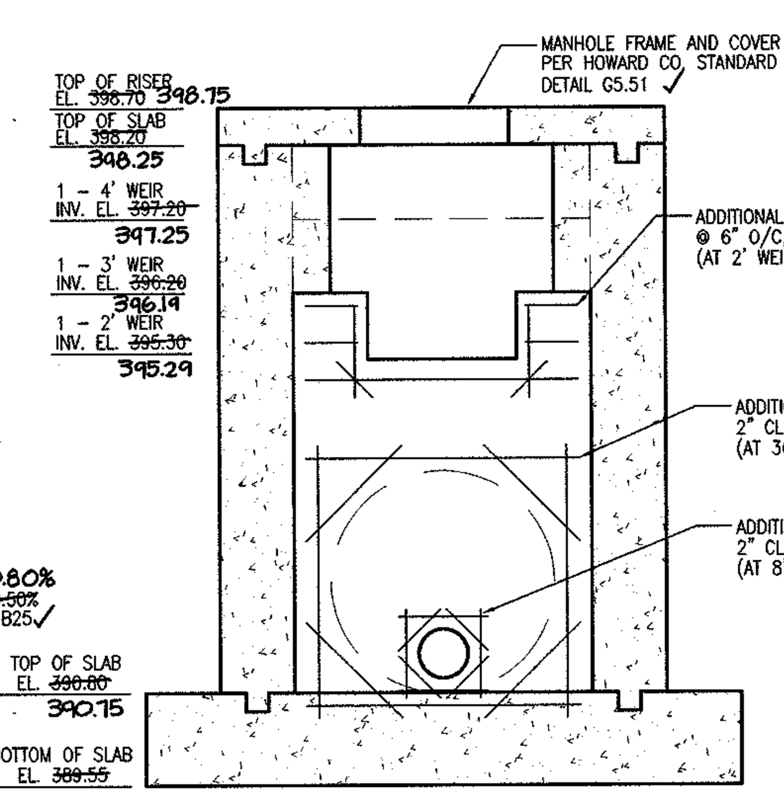
RISER STRUCTURE OPENING DETAIL 'B' SECTION B-B

SCALE: 1"=2'



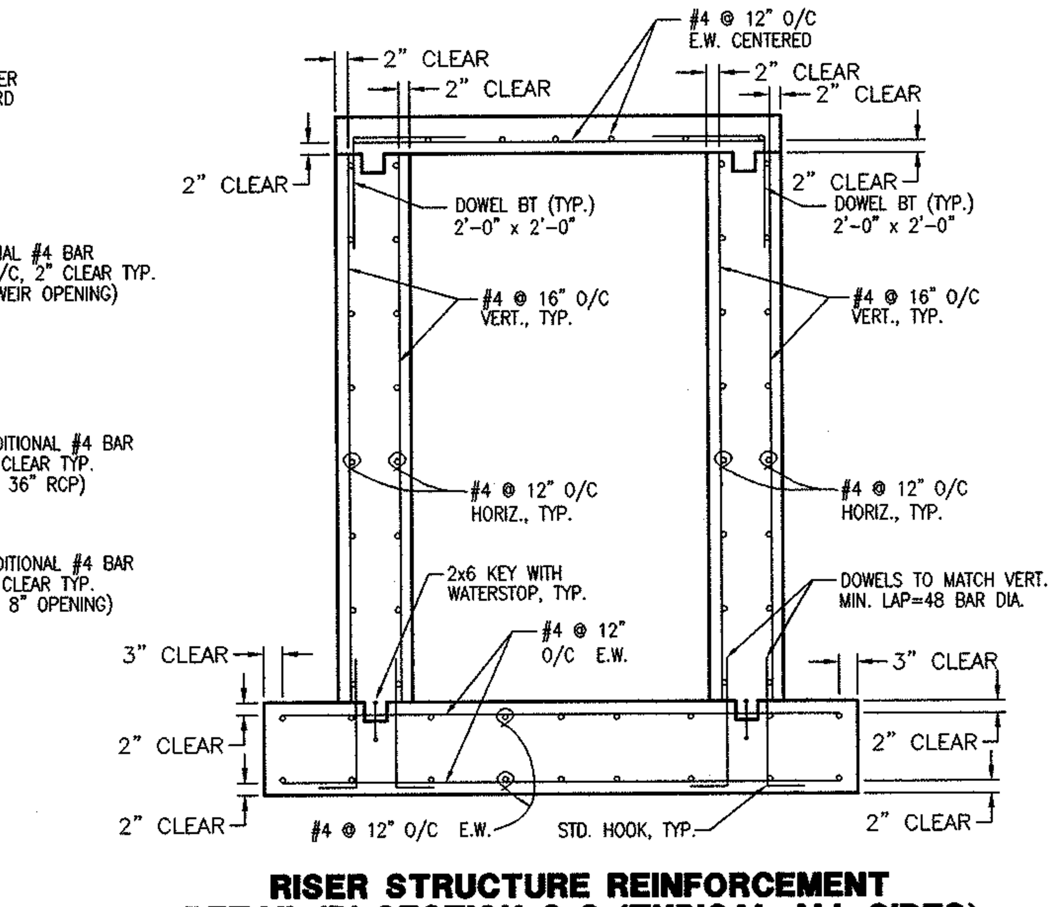
RISER STRUCTURE PLAN VIEW

SCALE: 1"=2'



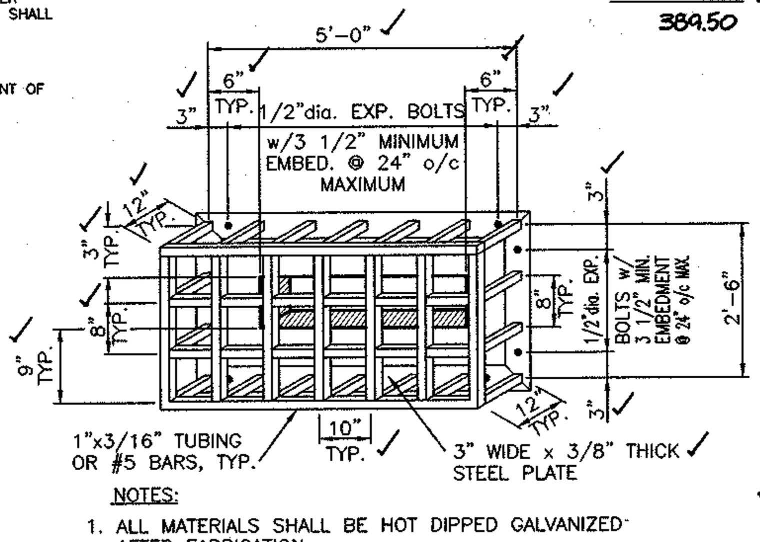
RISER STRUCTURE OPENING REINFORCEMENT DETAIL 'C' DETAIL A-A THRU D-D

SCALE: 1"=2'



RISER STRUCTURE REINFORCEMENT DETAIL 'D' SECTION C-C (TYPICAL ALL SIDES)

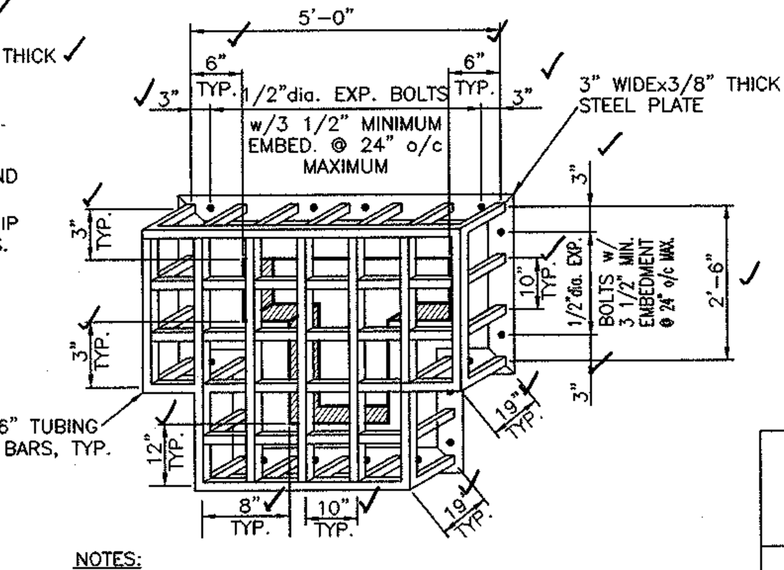
SCALE: 1"=2'



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

4' WEIR TRASH RACK DETAIL

N.T.S.



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

2' WEIR / 3' WEIR TRASH RACK DETAIL

N.T.S.

CONCRETE GENERAL NOTES

1. CODE
   A. ALL CONSTRUCTION SHALL CONFORM WITH THE PROVISIONS OF THE MARYLAND DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS AND THE 1992 SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS AND THE 1992 AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, AND ITS SUPPLEMENTS.
2. DESIGN LOADING
   A. DEAD LOAD - ACTUAL SOIL COVER PLUS 2' SURCHARGE.
3. CAST-IN-PLACE CONCRETE
   A. ALL CONCRETE WORK SHALL CONFORM TO ALL PROVISIONS OF THE "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301-84), AND TO THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-83).
   B. ADDITIONALLY THE CONCRETE SHALL CONFORM TO ALL PROVISIONS OF THE FOLLOWING PUBLICATIONS:
      1. ACI 305R-77 (82) RECOMMENDED PRACTICE FOR HOT WEATHER CONCRETING.
      2. ACI 306R-78 RECOMMENDED PRACTICE FOR COLD WEATHER CONCRETING.
      3. ACI 347-78 RECOMMENDED PRACTICE FOR CONCRETE FORMWORK.
   C. ALL CONCRETE SHALL BE MARYLAND DEPARTMENT OF TRANSPORTATION MIX NO. 3 HAVING A MINIMUM COMPRESIVE STRENGTH OF 3,500 PSI AT 28 DAYS.
   D. ALL REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60. ALL REINFORCING SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH ACI'S MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES (ACI 315).
   E. PROVIDE MINIMUM 40 BAR DIAMETER LAP SPLICE FOR ALL REINFORCING STEEL, UNLESS OTHERWISE NOTED ON DRAWINGS.
   F. PROVIDE WATER STOPS IN ALL CONSTRUCTION AND CONTROL JOINTS IN CONCRETE BELOW SUBGRADE.
   G. LOADS GREATER THAN THE DESIGN LIVE LOADS SHALL NOT BE PLACED ON THE STRUCTURE. A CONCRETE STRUCTURE MAY NOT SUPPORT ITS DESIGN LIVE LOAD AND SUPERIMPOSED DEAD LOADS FOR 28 DAYS.

SUMMARY OF PROP. FACILITY

DESIGN STORM	Proposed Facility Inflow (cfs)	Proposed Facility Discharge (cfs)	Facility Water Surface Elevation (ft)	Facility Storage Volume (acre-ft)
1 year	31.58	0.74	395.25	1.82
2 year	55.96	2.82	395.69	2.18
10 year	107.76	20.55	397.21	3.69
100 year	165.59	72.53	398.50	4.96

Drainage Area 24.35 acres
Impervious Area 8.97 acres

FINAL PLAN REFERENCE # F-01-22
SDP REFERENCE # SDP-01-16

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

HOWARD SOIL CONSERVATION DISTRICT — 3/1/01 — DATE

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

U.S.D.A.-NATURAL RESOURCES CONSERVATION SERVICE — 3/1/01 — DATE

BY THE DEVELOPER

"I/WE CERTIFY THAT ALL DEVELOPMENT AND/OR CONSTRUCTION WILL BE DONE ACCORDING TO THESE PLANS, AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF 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. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HOWARD SOIL CONSERVATION DISTRICT."

SIGNATURE OF DEVELOPER — 02/23/01 — DATE
PRINT NAME BELOW SIGNATURE

BY THE ENGINEER

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

PIERO VAN MELLITS, P.E. — 2-22-01
SIGNATURE OF ENGINEER — DATE
PRINT NAME BELOW SIGNATURE

DEPARTMENT OF ~~PUBLIC WORKS~~ P&Z
HOWARD COUNTY, MARYLAND
3/8/01
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
3-2-01
CHIEF, BUREAU OF HIGHWAYS — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

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

PIERO VAN MELLITS — REGISTERED PROFESSIONAL ENGINEER #21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	7-04

FINAL ROAD PLANS
SWM POND DETAILS &
MD-378 NOTES & SPECIFICATIONS

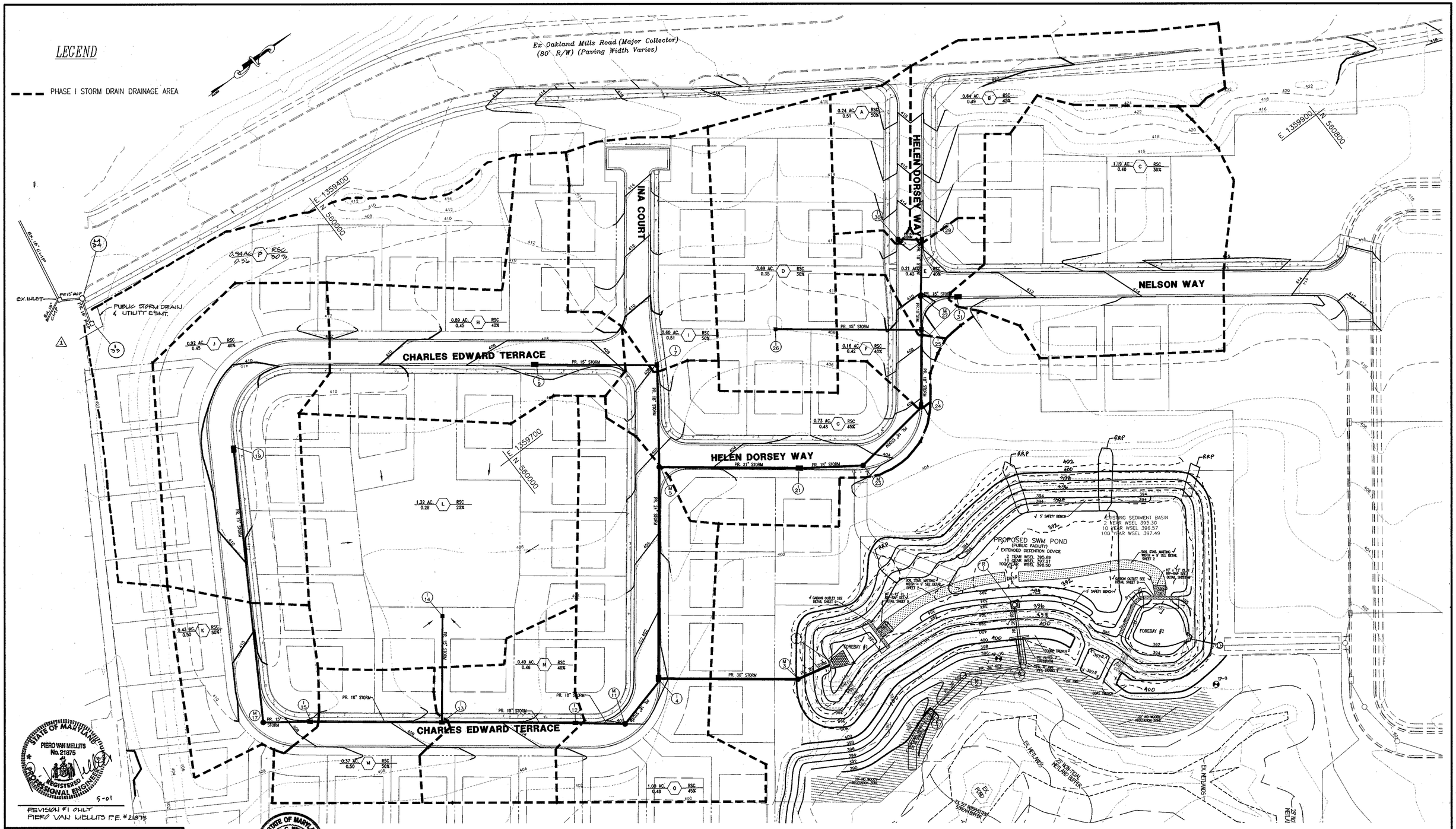
600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 10 OF 20

F0122



REVISION #1 ONLY
PIERO VAN WELLITS P.E. #21875

STATE OF MARYLAND
PIERO VAN WELLITS
No. 21875
REGISTERED PROFESSIONAL ENGINEER
5-01

DEPARTMENT OF ~~PUBLIC WORKS~~ HOWARD COUNTY, MARYLAND CHIEF, DIVISION OF LAND DEVELOPMENT	DATE 3/8/01
DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND CHIEF, BUREAU OF HIGHWAYS	DATE 3-2-01
DEPARTMENT OF PLANNING & ZONING HOWARD COUNTY, MARYLAND CHIEF, DEVELOPMENT ENGINEERING DIVISION	DATE 3/6/01

Pt 2

STATE OF MARYLAND
THOMAS C. NEUGEBAUER
No. 29203
PROFESSIONAL ENGINEER
7-1-04
FOR AS-BUILT ITEM ONLY
THOMAS C. NEUGEBAUER, P.E. #29203

THIS AS-BUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED 11/17/03.

NOTE: THIS PLAN IS NOT FOR GRADING INFORMATION. REFER TO THE FINAL GRADING & SEDIMENT CONTROL PLAN FOR GRADING INFORMATION.

SWM "AS-BUILT" CERTIFICATION

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

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
ENGINEERS, PLANNERS, SURVEYORS AND LANDSCAPE ARCHITECTS
9090 JUNCTION DRIVE SUITE 9
ANNAPOLIS JUNCTION, MARYLAND 20701
(410) 792-9792 or (301) 776-1690
FAX (410) 792-7595

STATE OF MARYLAND
PIERO VAN WELLITS
No. 21875
REGISTERED PROFESSIONAL ENGINEER
PIERO VAN WELLITS P.E. #21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM.
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	07/04
MRA	1	ADD STORM DRAIN SYSTEM I-33 TO I-34	5-01

FINAL ROAD PLANS
STORM DRAIN
DRAINAGE AREA MAP

600' SCALE MAP NO. 36 BLOCK NO. 10

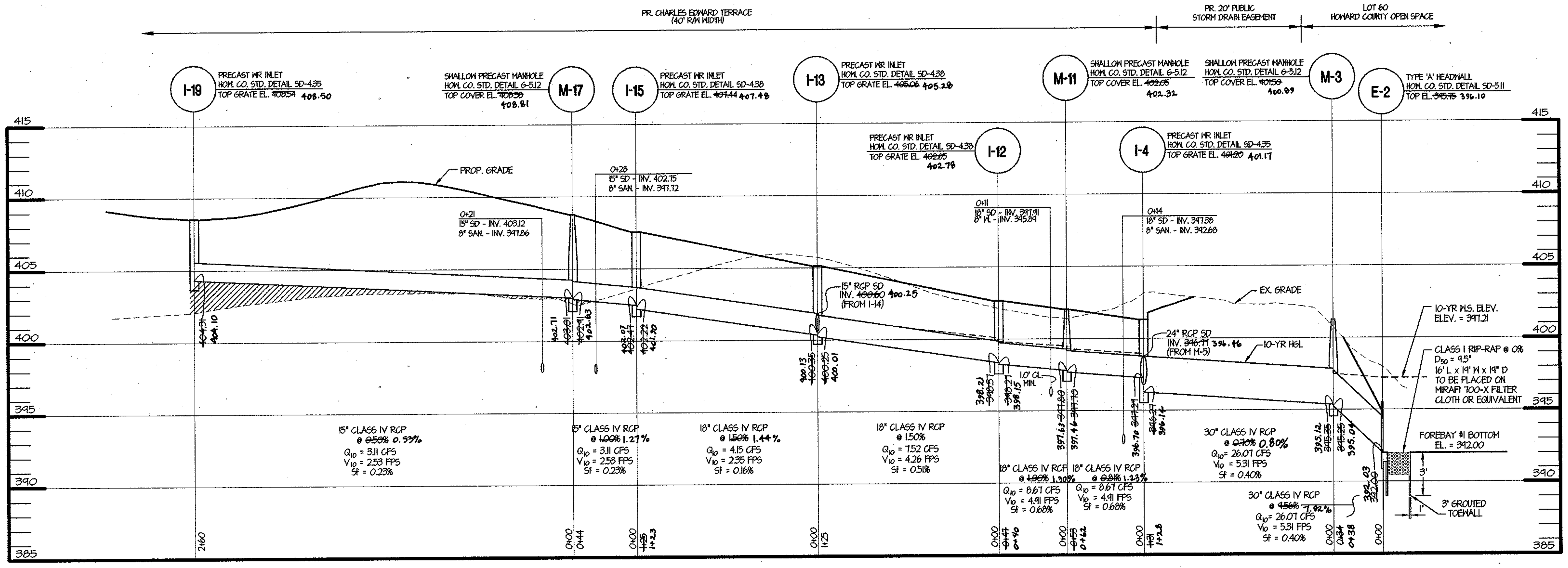
ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE 1"=40'

SHEET 7 OF 20

F0122

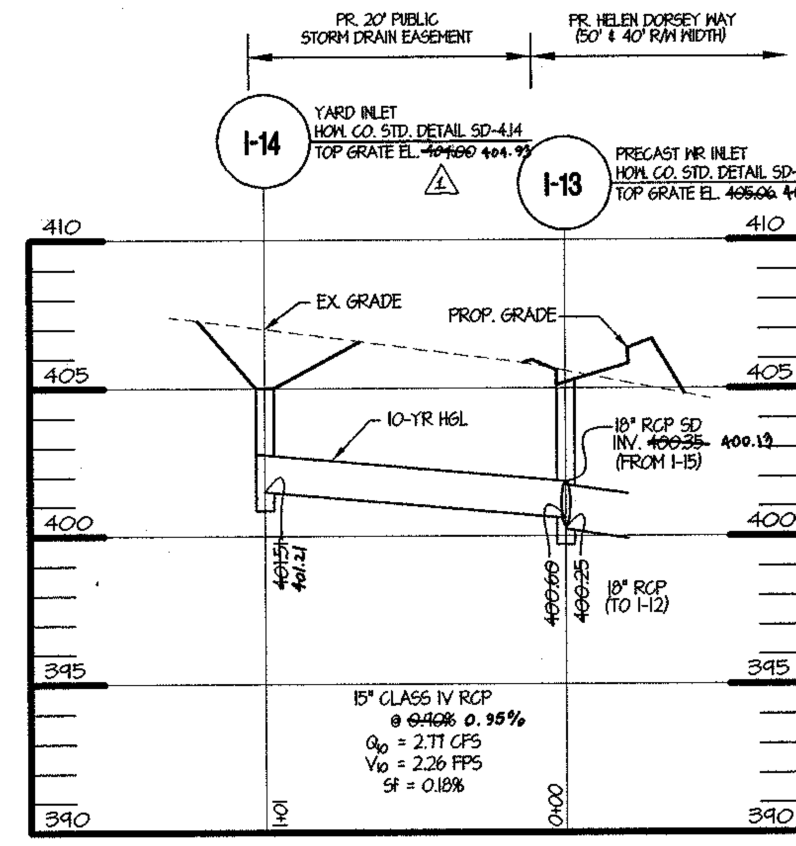
THIS AS-BUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED 2/02/04.



STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

CONTROLLED AND COMPACTED FILL TO 95% COMPACTION PER AASHTO T-180 AND AS DIRECTED BY AN APPROVED SOILS ENGINEER.



STORM DRAIN PROFILE

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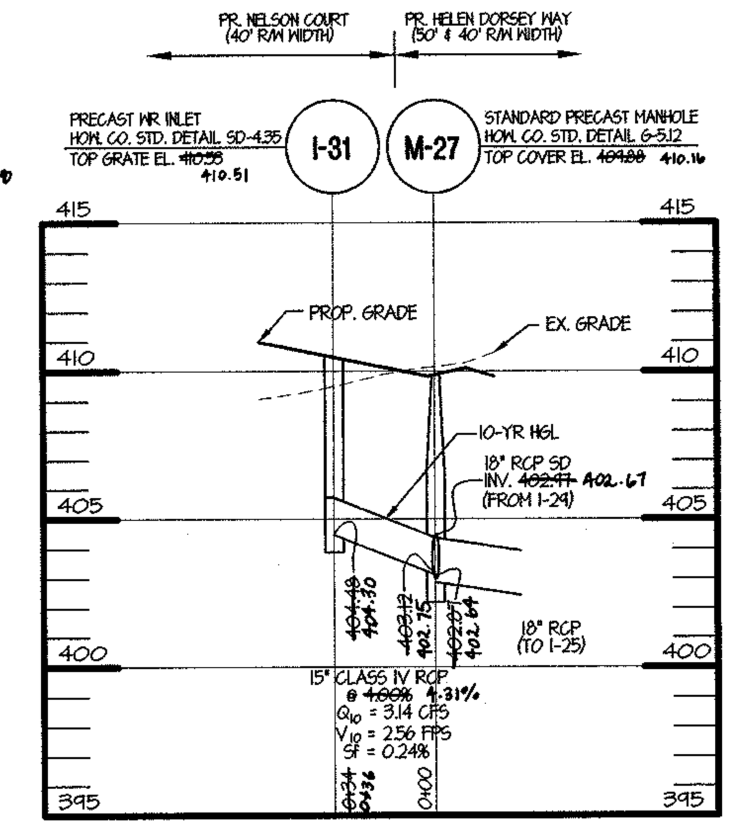

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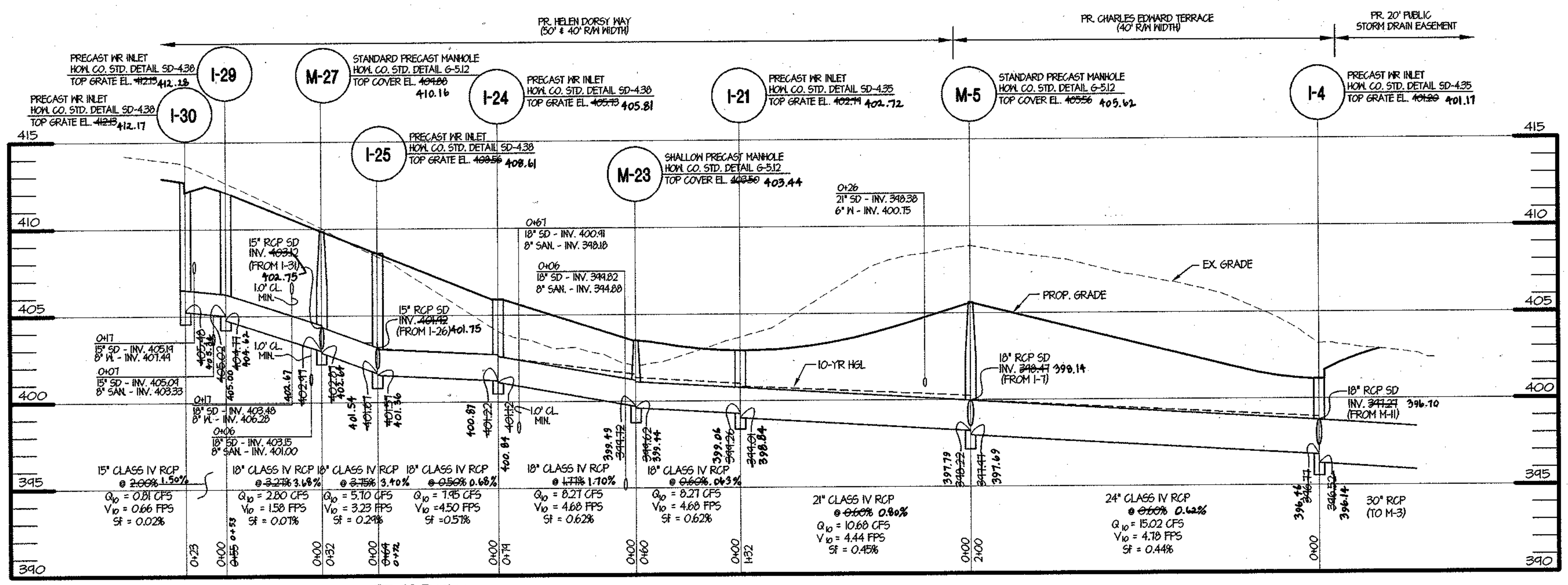
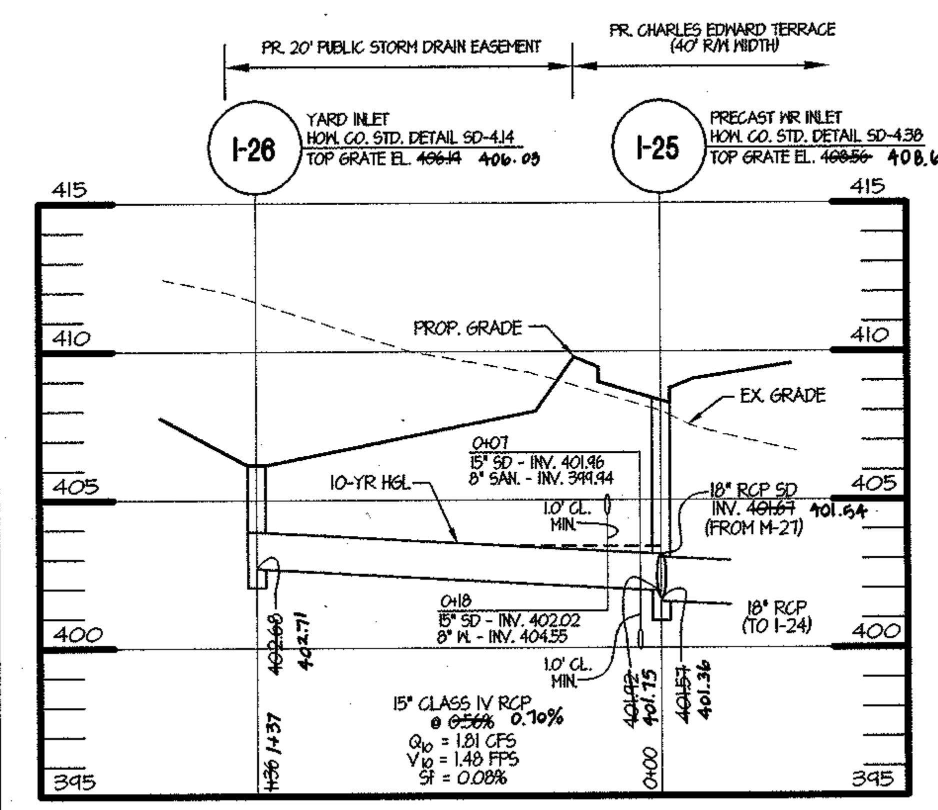


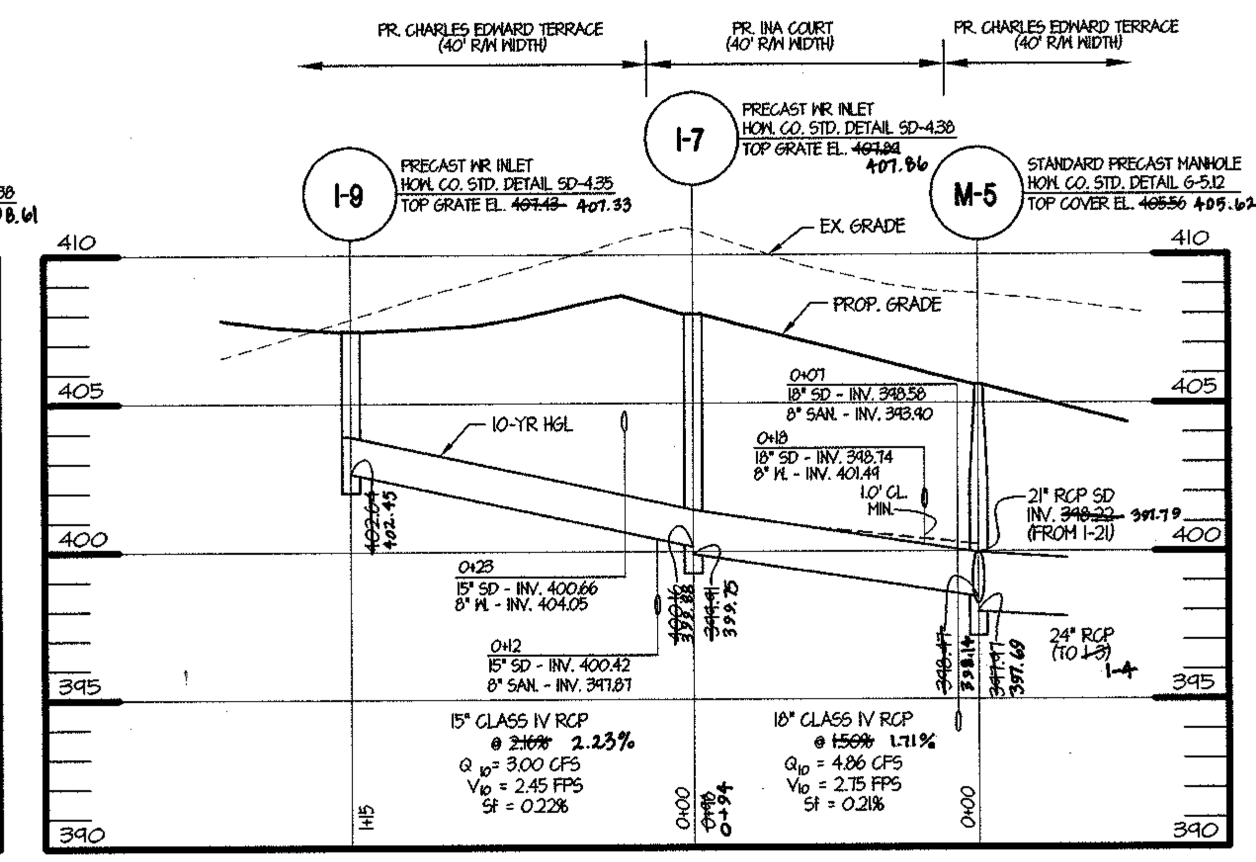
STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE

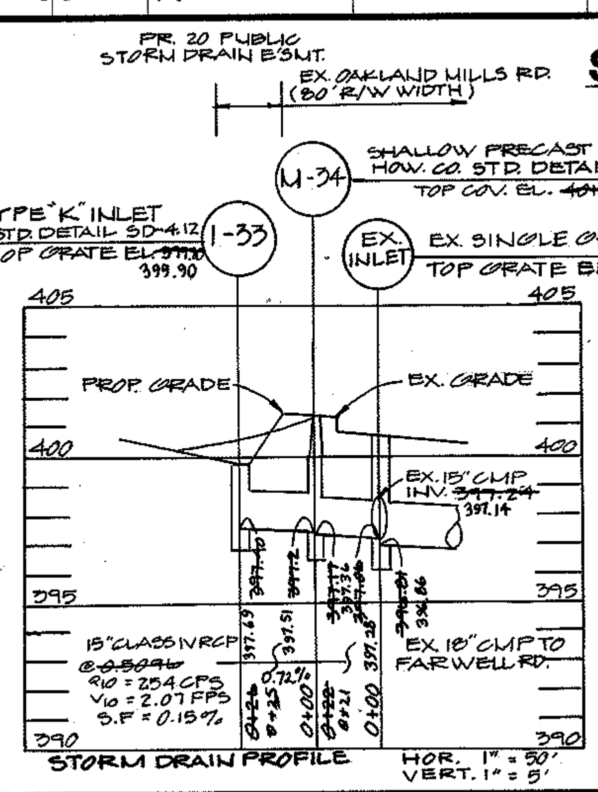
HOR. 1" = 50'
VERT. 1" = 5'



STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

● COORDINATES TO CENTER OF STRUCTURE AT FACE OF CURB FOR INLETS, CENTER OF STRUCTURE FOR MANHOLES AND YARD INLETS
* TOP OF GRATE ELEVATION AT CENTER OF STRUCTURE AT FACE OF CURB. MANHOLE AND YARD INLET ELEVATIONS ARE AT CENTER OF RIM AND GRATE



STORM DRAIN PROFILE HOR. 1" = 50' VERT. 1" = 5'

STORM DRAIN PROFILE

HOR. 1" = 50'
VERT. 1" = 5'

STORM DRAIN PIPE SCHEDULE		
SIZE	TYPE	LENGTH
15"	RCP CL IV	713'
18"	RCP CL IV	741'
21"	RCP CL IV	132'
24"	RCP CL IV	200'
30"	RCP CL IV	162'

STR. NO.	TOP EL	INV. IN	INV. OUT	TYPE	NORTHING	EASTING
I-33	~~399.10~~ 399.90		~~397.49~~ 397.69	TYPE 'K' INLET HOW.CO.STD. SD-4.12	559,767,~~846.95~~ 0.94	1,359,361.~~10~~
M-34	~~401.40~~ 401.27	~~397.29~~ 397.51	~~397.19~~ 397.36	SHALLOW MH, HOW.CO.STD. G-5.12	559,77~~5.00~~ 4.76	1,359,3~~36.62~~ 1.29

STORM DRAIN STRUCTURE SCHEDULE

STR NO.	TOP ELEV	INV IN	INV IN	INV OUT	TYPE	REMARKS	● LOCATION NORTHING	EASTING	TOP ELEV.	INV. IN	INV. IN	INV. OUT
E-2	~~395.75~~	---	---	~~392.00~~	TYPE 'A' HEADWALL HOW. CO. STD. DETAIL SD-5.11		560,123.73	1,360,036.93	396.10	-	-	392.03
M-3	~~401.50~~	~~395.35~~	---	~~395.25~~	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		560,090.76	1,360,029.21	400.89	395.12	-	395.04
I-4	* ~~401.20~~	~~397.27~~	~~396.77~~	~~396.27~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		559,987.66	1,359,950.14	401.17	396.70	396.46	396.14
M-5	~~405.56~~	~~398.47~~	~~398.22~~	~~397.97~~	PRECAST MANHOLE HOW. CO. STD. DETAIL G-5.12		560,108.04	1,359,790.95	405.62	398.14	397.79	397.69
I-7	* ~~407.89~~	~~400.16~~	---	~~399.91~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,165.02	1,359,713.25	407.86	399.88	-	399.75
I-9	* ~~407.43~~	---	---	~~402.64~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		560,072.66	1,359,643.95	407.33	-	-	402.45
M-11	~~402.05~~	~~397.80~~	---	~~397.70~~	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		559,936.00	1,359,964.43	402.32	397.63	-	397.46
I-12	* ~~402.65~~	~~398.37~~	---	~~398.27~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		559,899.79	1,359,934.84	402.78	398.21	-	398.15
I-13	~~405.06~~	~~400.60~~	~~400.35~~	~~400.25~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		559,800.31	1,359,858.46	405.28	400.25	400.13	400.01
I-14	* ~~404.00~~	---	---	~~401.51~~	YARD INLET HOW. CO. STD. DETAIL SD-4.14		559,860.97	1,359,779.47	404.93	-	-	401.21
I-15	* ~~407.44~~	~~402.47~~	---	~~402.22~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		559,702.08	1,359,783.02	407.48	402.07	-	401.90
M-17	~~408.58~~	~~403.01~~	---	~~402.91~~	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		559,666.24	1,359,757.40	408.81	402.71	-	402.63
I-19	* ~~408.54~~	---	---	~~404.31~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		559,801.04	1,359,535.86	408.50	-	-	404.10
I-21	* ~~402.79~~	~~399.26~~	---	~~399.01~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		560,211.64	1,359,872.39	402.72	399.06	-	398.84
M-23	~~403.50~~	~~399.72~~	---	~~399.62~~	SHALLOW MANHOLE HOW. CO. STD. DETAIL G-5.12		560,261.40	1,359,905.67	403.44	399.49	-	399.44
I-24	* ~~405.73~~	~~401.22~~	---	~~401.12~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,339.85	1,359,893.76	405.81	400.87	-	400.84
I-25	* ~~408.56~~	~~401.67~~	~~401.92~~	~~401.57~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,381.11	1,359,837.43	408.61	401.54	401.75	401.36
I-26	~~406.19~~	---	---	~~402.68~~	YARD INLET HOW. CO. STD. DETAIL SD-4.14		560,273.78	1,359,753.68	406.03	-	-	402.71
M-27	~~409.88~~	~~403.12~~	~~402.97~~	~~402.87~~	PRECAST MANHOLE HOW. CO. STD. DETAIL G-5.12		560,401.10	1,359,811.54	410.16	402.75	402.67	402.64
I-29	* ~~412.13~~	~~405.02~~	---	~~404.77~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,434.84	1,359,770.06	* 412.28	405.00	-	404.62
I-30	* ~~412.13~~	---	---	~~405.48~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.38		560,415.80	1,359,755.45	* 412.17	-	-	405.34
I-31	* ~~410.53~~	---	---	~~404.48~~	PRECAST WR INLET HOW. CO. STD. DETAIL SD-4.35		560,428.00	1,359,834.00	* 410.51	-	-	404.30

STATE OF MARYLAND THOMAS C. NEUGEBAUER NO. 29203 REGISTERED PROFESSIONAL ENGINEER

7-1-04
FOR AS-BUILT ITEM ONLY
THOMAS C. NEUGEBAUER, P.E. #29203

STATE OF MARYLAND PIERO VAN MELLITS No. 21875 REGISTERED PROFESSIONAL ENGINEER
5-01
REVISION #1 ONLY
PIERO VAN MELLITS, P.E. #21875

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND
3/8/01
CHIEF, DIVISION OF LAND DEVELOPMENT — DATE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
3-2-01
CHIEF, BUREAU OF HIGHWAYS — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND
3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION CE — DATE

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

STATE OF MARYLAND PIERO VAN MELLITS No. 21875 REGISTERED PROFESSIONAL ENGINEER #21875

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	7-04
MRA	1	ADD STORM DRAIN SYSTEM I-33 TO M-34	5-01

FINAL ROAD PLANS
STORM DRAIN PROFILES
& STRUCTURE SCHEDULE

600' SCALE MAP NO. 36 — BLOCK NO. 10

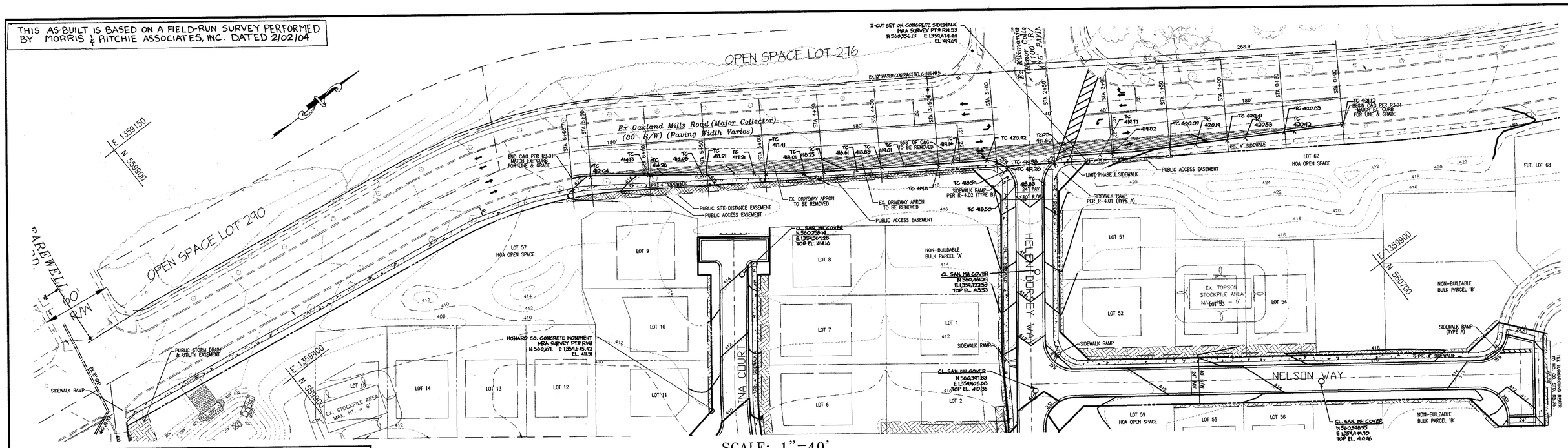
ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

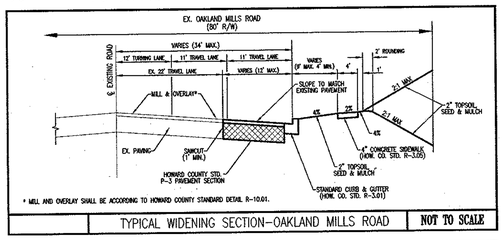
SHEET 8 OF 20

F01 22

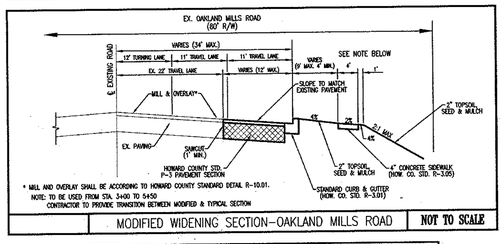
THIS AS-BUILT IS BASED ON A FIELD-RUN SURVEY PERFORMED BY MORRIS & RITCHIE ASSOCIATES, INC. DATED 2/02/04.



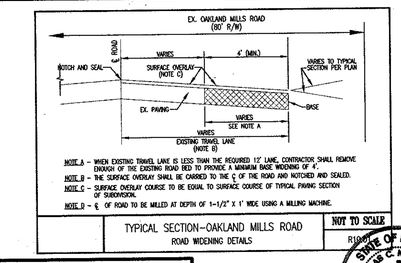
SCALE: 1"=40'



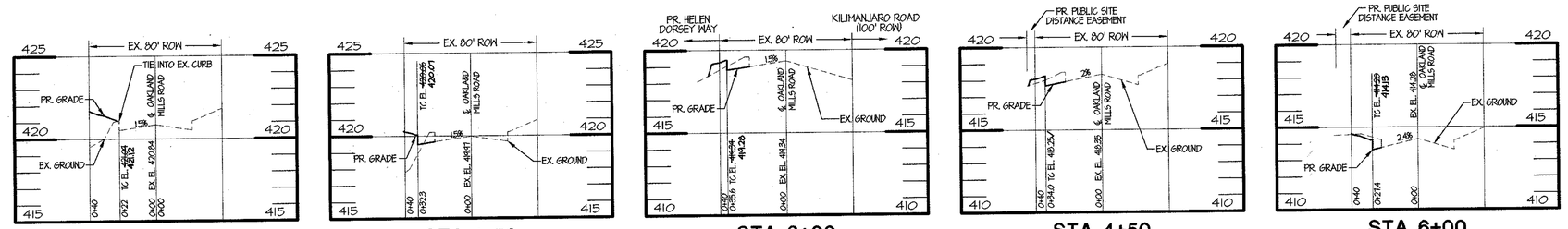
TYPICAL WIDENING SECTION–OAKLAND MILLS ROAD — NOT TO SCALE

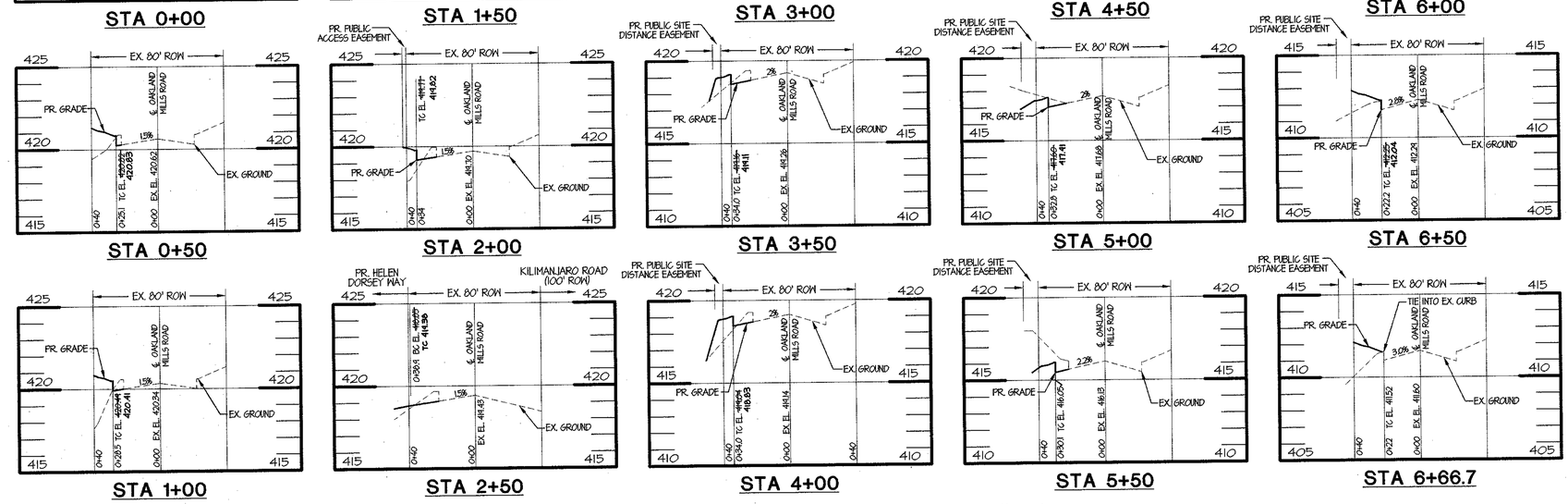


MODIFIED WIDENING SECTION–OAKLAND MILLS ROAD — NOT TO SCALE



TYPICAL SECTION–OAKLAND MILLS ROAD ROAD WIDENING DETAILS — NOT TO SCALE





SCALE: HORIZONTAL: 1"=40' VERTICAL: 1"=4'

DEPARTMENT OF ~~PUBLIC WORKS~~
HOWARD COUNTY, MARYLAND

Pt 2

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

STATE OF MARYLAND — THOMAS C. NEUGEBAUER — No. 29203 — PROFESSIONAL ENGINEER
7-12-04
FOR AS-BUILT REVIEW ONLY
THOMAS C. NEUGEBAUER, P.E. #29203

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

3-2-01
CHIEF, BUREAU OF HIGHWAYS — DATE

DEPARTMENT OF PLANNING & ZONING
HOWARD COUNTY, MARYLAND

3/6/01
CHIEF, DEVELOPMENT ENGINEERING DIVISION — DATE

MRA
MORRIS & RITCHIE ASSOCIATES, INC.
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9090 JUNCTION DRIVE SUITE 9
ANNAPOLIS JUNCTION, MARYLAND 20701
(410) 792-9792 or (301) 776-1690
FAX (410) 792-7395

STATE OF MARYLAND — PIERO VAN MELLITS — No. 21875 — REGISTERED PROFESSIONAL ENGINEER
PIERO VAN MELLITS #21875 — 7-12-01

DES: TCN/CAO
DRN: TCN/CAO
CHK: PVM
DATE: 12/21/00

BY	NO.	REVISIONS	DATE
MRA	2	ADDED AS-BUILT INFORMATION TO PLAN	7-04

FINAL ROAD PLANS
ROAD IMPROVEMENT PLAN
OAKLAND MILLS ROAD

600' SCALE MAP NO. 36 BLOCK NO. 10

ECKERS HOLLOW
PHASE I - OAKLAND MILLS ROAD
6th ELECTION DISTRICT
HOWARD COUNTY, MARYLAND

SCALE AS SHOWN

SHEET 18 OF 20

F-01 22