Howard County, Maryland – Department of Public Works

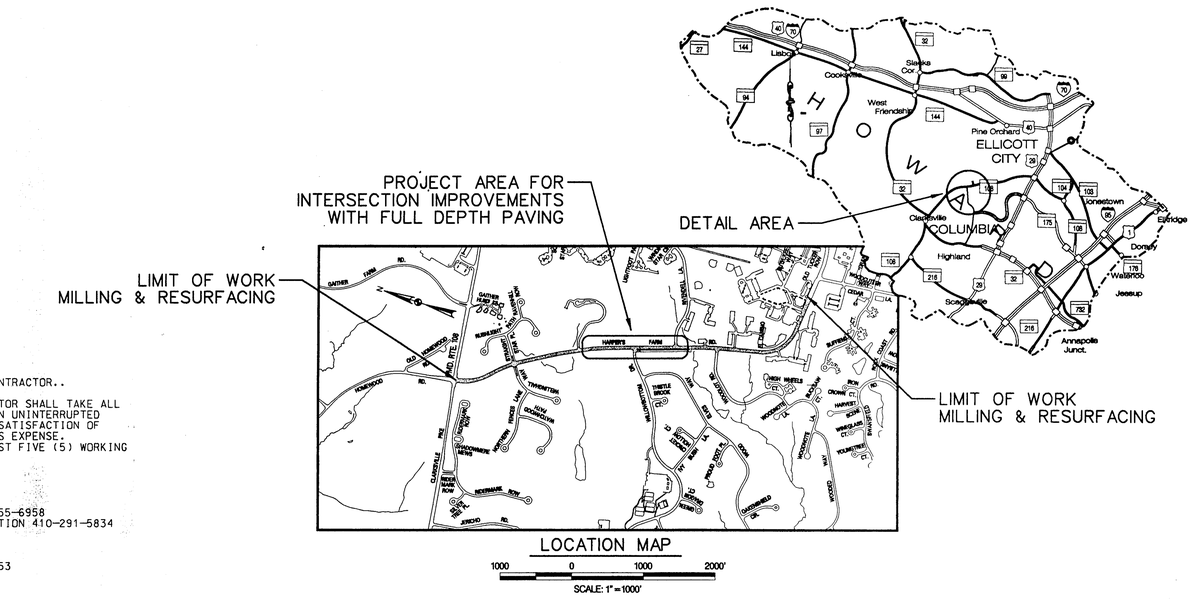
ROADWAY IMPROVEMENTS to HARPERS FARM ROAD and WILLOWBOTTOM DRIVE

CAPITAL PROJECT NO. J-4164

INDEX OF SHEETS

BENCHMARKS

NOTE: SEE SHEET 5 OF 19 FOR CONTROL POINTS, TRAVERSE TIES, COORDINATE DATA AND ROADWAY ALIGNMENT GEOMETRIC DATA.



LOCATION MAP

1000 0 1000 2000'

SCALE: 1" = 1000'

GENERAL NOTES

1. ALL STATIONING AND DIMENSIONING ARE TO BE FIELD VERIFIED BY THE CONTRACTOR..

2. APPROXIMATE LOCATIONS OF EXISTING UTILITIES ARE SHOWN. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES AND TO MAINTAIN UNINTERRUPTED SERVICE. ANY DAMAGE INCURRED SHALL BE REPAIRED IMMEDIATELY TO THE SATISFACTION OF THE HOWARD COUNTY ENGINEER BY THE CONTRACTOR AND AT THE CONTRACTORS EXPENSE. CONTRACTOR SHALL NOTIFY THE FOLLOWING UTILITIES OR AGENCIES AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS:

   MISS UTILITY 1-800-257-7777
   CONSTRUCTION INSPECTION DIVISION, HOWARD COUNTY 410-313-1880
   STATE HIGHWAY ADMINISTRATION DISTRICT 7-0 301-624-8100
   BALTIMORE GAS & ELECTRIC COMPANY – UNDERGROUND ELECTRIC 410-855-6958
   BALTIMORE GAS & ELECTRIC COMPANY – GAS ENGINEERING & CONSTRUCTION 410-291-5834
   DISTRIBUTION CUSTOMER SERVICE 685-0123
   ENGINEERING DAMAGE CONTROL 234-5621
   BELL ATLANTIC TELEPHONE 1-800-870-0000
   AMERICAN TELEPHONE & TELEGRAPH CABLE LOCATION DIVISION 393-3553
   COLONIAL PIPELINE COMPANY 781-4641
   BUREAU OF UTILITIES, HOWARD COUNTY 410-313-4900
   COMCAST CABLE 888-793-1800

   THE CONTRACTOR SHALL *CONTACT* THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION OF ENGINEERING FOR VERIFICATION AND/OR INFORMATION REGARDING:
   A. EXISTING/PROPOSED RIGHT-OF-WAY.
   B. UTILITY RELOCATION.
   C. MAINTENANCE OF TRAFFIC DURING CONSTRUCTION.
   D. EROSION/SEDIMENT CONTROL CERTIFICATION AND PERMIT.
   E. HORIZONTAL/VERTICAL CONTROL.
   F. GRADING PERMIT.

3. PLACE REGULATION "ROAD WORK" AND WARNING SIGNS AS REQUIRED TO COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS AT LIMIT OF WORK ALONG MD. RTE. 108. WHERE LIMIT OF WORK IN ALONG COUNTY ROADWAYS, COMPLY WITH HOWARD COUNTY STANDARD SPECIFICATIONS AND DETAILS.

4. ALL GRADING SHALL BE LIMITED TO EXISTING 80' OR 106' R.O.W. INCLUDING SIDE SLOPES AND STABILIZATION. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED IN ACCORDANCE WITH THE SEDIMENT CONTROL NOTES AND DETAILS ON SHEETS 7 & 8 OF 19.

5. FOR DETAILS NOT SHOWN ON THESE DRAWINGS, AND FOR MATERIALS AND CONSTRUCTION METHODS, THE CONTRACTOR SHALL ABIDE BY THE HOWARD COUNTY STANDARDS AND SPECIFICATIONS. THE PROJECT INVITATION FOR BID BOOKLET, THE SPECIAL PROVISIONS AND THE MARYLAND STATE HIGHWAY ADMINISTRATION'S "BOOK OF STANDARDS FOR HIGHWAY AND INCIDENTAL STRUCTURES" AND "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS." IN THE EVENT OF ANY DISCREPANCY BETWEEN THESE SOURCES, THE SPECIAL PROVISIONS SHALL GOVERN.

6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS OF HOWARD COUNTY PLUS MD SHA STANDARDS AND SPECIFICATIONS.

7. STAGING AND STOCKPILE AREA WILL BE DETERMINED BY CONTRACTOR.

REVIEWED FOR HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

U.S. Natural Resources Conservation Service — Date 4/14/00

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

Howard Soil Conservation District — Date 4/11/00

Approved: For Storm Drainage Systems and Public Roads. Howard County Department of Public Works.

Chief, Division of Transportation Projects and Watershed Management — Date

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DIRECTOR OF PUBLIC WORKS — DATE 4/13/00

CHIEF, BUREAU OF HIGHWAYS — DATE 4-13-00

CHIEF, BUREAU OF ENGINEERING — DATE 4/13/00

CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT — DATE 4/13/00

GPI Greenman-Pedersen, Inc.
ENGINEERS, ARCHITECTS, PLANNERS, CONSTRUCTION ENGINEERS & INSPECTORS
14502 GREENVIEW DRIVE, SUITE 100, LAUREL, MD. 20708
WASH. (301) 470-2772 BALT. (410) 880-3055
FAX: (301) 490-2649 www.gpinet.com

STATE OF MARYLAND — DANIEL JOSEPH MALETIC No. 13759 — REGISTERED PROFESSIONAL ENGINEER

DES: DRN: CHK: DATE:

BY	NO	REVISION	DATE

TITLE SHEET

SCALE MAP NO. _____ BLOCK NO. _____

ROADWAY IMPROVEMENTS TO HARPERS FARM ROAD & WILLOWBOTTOM DRIVE
HOWARD COUNTY, MARYLAND
CAPITAL PROJECT NO. J-4164

SCALE AS SHOWN

SHEET 1 OF 19

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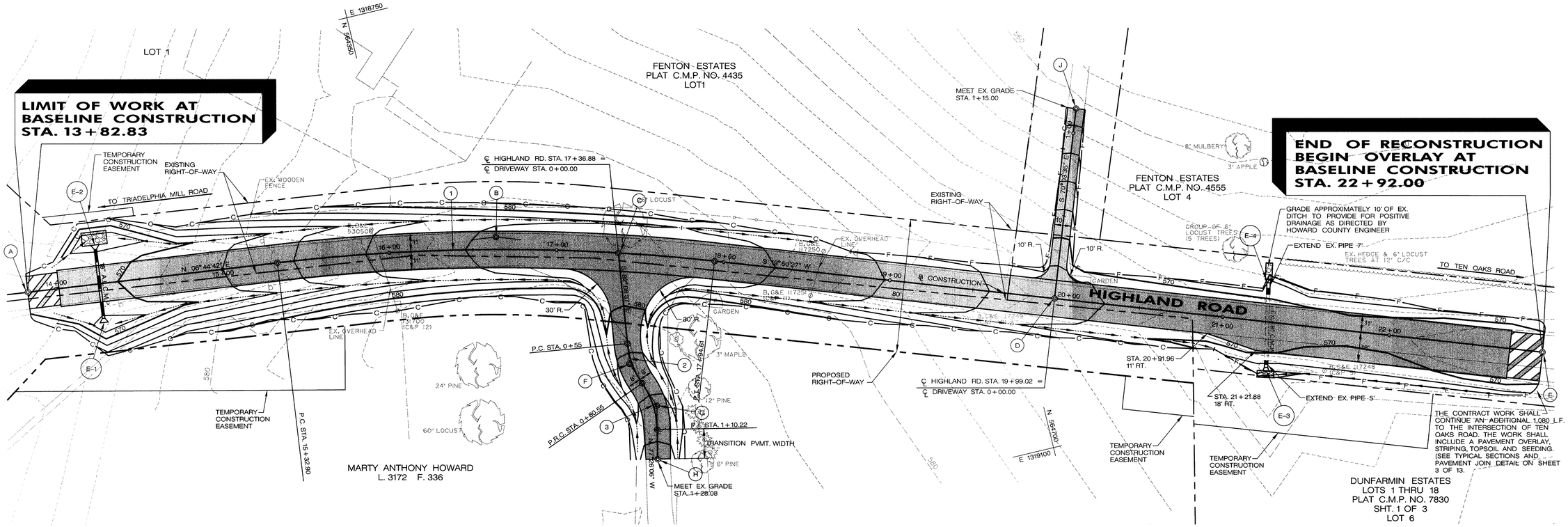

PLAN
SCALE: 1" = 30'

CONSTRUCTION ℄ GEOMETRY

POINT NO.	NORTH	EAST	REMARK
A	564126.117	1318865.895	STA. 13+82.83 LIMIT OF WORK
B	564405.655	1318898.955	STA. 16+64.32 P.I. CURVE NO. 1
C	564474.517	1318925.348	STA. 17+36.88, HIGHLAND ROAD = STA. 0+00.00, DRIVEWAY
D	564721.565	1319012.943	STA. 19+99.02, HIGHLAND ROAD = STA. 0+00.00, DRIVEWAY
E	564997.156	1319112.384	STA. 22+92.00, END OF RECONSTRUCTION BEGIN OVERLAY
F	564465.217	1318992.744	STA. 0+68.03 P.I. CURVE NO. 2
G	564475.573	1319019.133	STA. 0+95.81 P.I. CURVE NO. 3
H	564468.357	1319051.509	STA. 1+28.08 MEET EX. GRADE
J	564760.785	1318904.838	STA. 1+15.00 MEET EX. GRADE

CURVE DATA

CURVE NO.	P.C. COORDINATES		P.T. COORDINATES		Δ	R	T	L
	NORTH	EAST	NORTH	EAST				
1	564275.139	1318883.519	564529.280	1318943.562	13° 05'45"	1145.00'	131.43'	261.71'
2	564467.003	1318979.804	564469.989	1319004.904	29° 16'59"	50.00'	13.06'	25.55'
3	564469.989	1319004.904	564472.248	1319034.050	33° 59'30"	50.00'	15.28'	29.66'

STRUCTURE SCHEDULE

STRUCTURE NO.	TYPE	STANDARD	STATION/OFFSET
E–1	METAL END SECTION, CIRC. PIPE	HO. CO. SD–5.61	14+22 21' RT.
E–2	METAL END SECTION, CIRC. PIPE	HO. CO. SD–5.61 RIP–RAP 15'x8'	14+22 21' LT.
E–3	METAL END SECTION, CIRC. PIPE	HO. CO. SD–5.61 RIP–RAP 10'x4'	21+28 28' RT.
E–4	METAL END SECTION, CIRC. PIPE	HO. CO. SD–5.61 RIP–RAP 4'x10'	21+25 24' LT.

PIPE SCHEDULE

FROM	TO	TYPE	SIZE	LENGTH	SLOPE	INV. FROM	INV. TO	Q (cfs)	V (fps)
E–1	E–2	A.L.C.M.P.	18"	42 LF.	0.83%	566.89	566.54	6.30	3.56
E–3	EX.	A.L.C.M.P.	18"	5 LF.	1.73%	565.80	565.72	N/A	N/A
EX.	E–4	A.L.C.M.P.	18"	7 LF.	1.73%	565.03	564.92	N/A	N/A

DRIVEWAY TABLE

℄ STATION	WIDTH	STD. DETAIL
17+36.88 RT.	16'	* R–6.06
19+99.02 LT.	10'	* R–6.06

* EXTEND P–1 PAVING SECTION FROM THE RIGHT–OF–WAY LINE TO THE LIMIT OF DRIVEWAY RECONSTRUCTION

RELOCATE EXISTING FENCE AS DIRECTED BY THE ENGINEER
STA. 14+00 TO STA. 19+75 LT. ——— 575 LF.
STA. 14+40 TO STA. 16+00 RT. ——— 230 LF.

RELOCATE EXISTING SIGNS AS DIRECTED BY THE ENGINEER
STA. 14+40 RT. ——— 1 EA.
STA. 15+25 LT. ——— 1 EA.
STA. 15+25 RT. ——— 1 EA.
STA. 18+75 LT. ——— 1 EA.

REMOVE EXISTING TREE AS DIRECTED BY THE ENGINEER
STA. 17+38 LT. ——— 1 EA.

RELOCATE EXISTING MAILBOXES AS DIRECTED BY THE ENGINEER
STA. 17+75 LT. ——— 1 EA.
STA. 19+75 LT. ——— 1 EA.
STA. 19+80 LT. ——— 1 EA.

RELOCATE EXISTING UTILITY POLES (BY OTHERS)
STA. 15+90 LT. ——— 1 EA.
STA. 16+00 RT. ——— 1 EA.
STA. 18+55 RT. ——— 1 EA.
STA. 18+60 LT. ——— 1 EA.
STA. 19+75 RT. ——— 1 EA.

LEGEND
– PROPOSED CONSTRUCTION
– MILL AND RESURFACE
—— C —— – TOP OF CUT
—— F —— – LIMIT OF FILL

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00
CHIEF, BUREAU OF ENGINEERING — DATE 4/27/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00
CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96–309–047

BOARD OF PROFESSIONAL ENGINEERS No. 23501 PATRICK A. CARNAN STATE OF MARYLAND
3/20/00

DES: F.A.C.
DRN: J.N.W.
CHK: F.A.C.
DATE: 3/00

BY	NO.	REVISION	DATE

CAPITAL PROJECT NO.
J–4164
600' SCALE MAP NO. _____ DATE: _____

PLAN SHEET
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN
SHEET 2 OF 13

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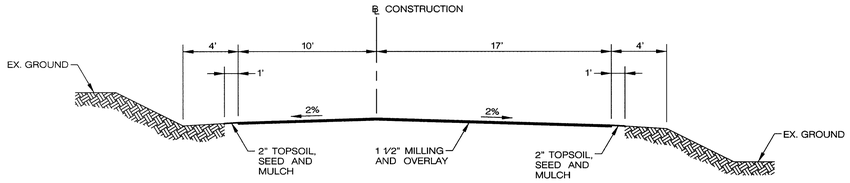
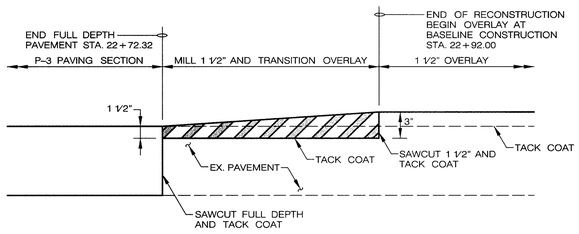
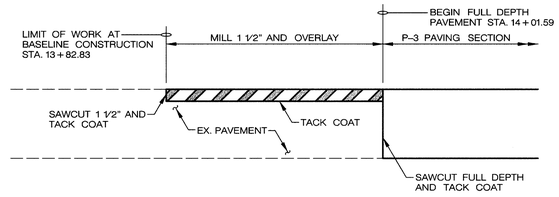
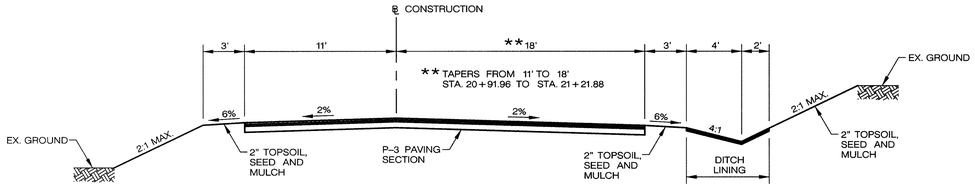


TYPICAL MILLING AND OVERLAY SECTION

STA. 22+72.32 TO STA. 22+92.00
NOT TO SCALE

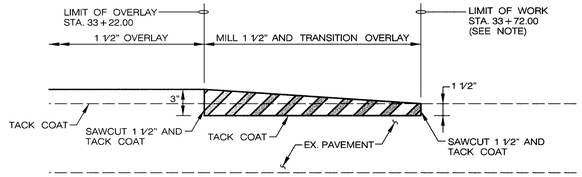






TYPICAL SECTION

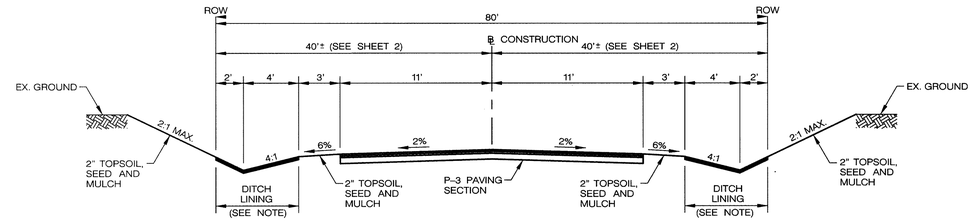
STA. 20+91.96 TO STA. 22+72.32
NOT TO SCALE



NOTE:
THE INTERSECTION OF HIGHLAND ROAD AT TEN OAKS ROAD MAY BE UNDER RECONSTRUCTION AT THE SAME TIME AS THIS PROJECT. THIS LIMIT OF WORK SHALL BE ADJUSTED TO MEET THE WORK LIMIT OF THE OTHER PROJECT. THE CONTACTOR SHALL COOPERATE AND COORDINATE THE WORK INCLUDING TRAFFIC CONTROL BETWEEN THE COUNTY AND THE OTHER CONTRACTOR.

PAVEMENT JOIN DETAILS

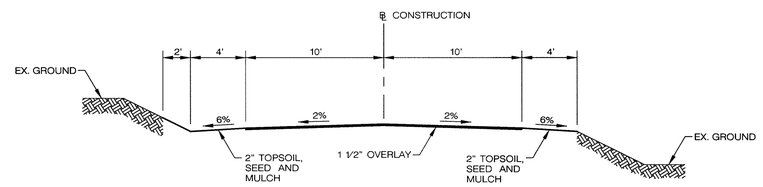
NOT TO SCALE



NOTE:
DITCH LINING SHALL BE EROSION CONTROL MATTING, PERMANENT SEED MIX, SOD OR RIP RAP AS NEEDED.

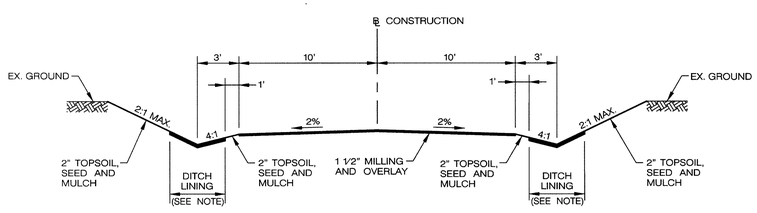
TYPICAL SECTION

STA. 14+01.59 TO STA. 20+91.96
NOT TO SCALE



TYPICAL OVERLAY SECTION

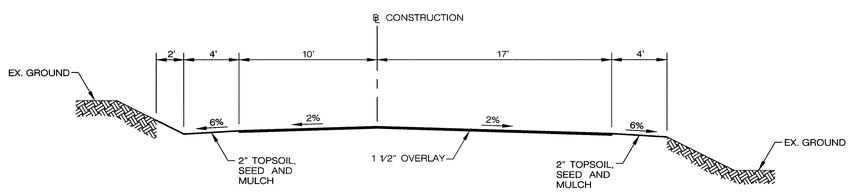
STA. 26+12.00 TO STA. 33+72.00
NOT TO SCALE



NOTE:
DITCH LINING SHALL BE EROSION CONTROL MATTING, PERMANENT SEED MIX, SOD OR RIP RAP AS NEEDED

TYPICAL MILLING AND OVERLAY SECTION

STA. 13+82.83 TO STA. 14+01.59
NOT TO SCALE



TYPICAL OVERLAY SECTION

STA. 22+92.00 TO STA. 26+12.00
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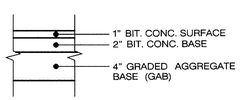

P-1 PAVING SECTION (DRIVEWAY)

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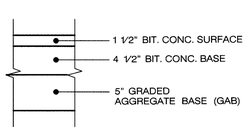

P-3 PAVING SECTION

NOT TO SCALE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00
CHIEF, BUREAU OF ENGINEERING — DATE 4/27/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00
CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-047

BOARD OF PROFESSIONAL ENGINEERS — No. 23508 — FREDERICK A. CANNAN — STATE OF MARYLAND — 3/14/00

DES: F.A.C.					
DRN: J.N.W.					
CHK: F.A.C.					
DATE: 3'00	BY	NO.	REVISION	DATE	600' SCALE MAP NO. _____ DATE: _____

CAPITAL PROJECT NO.
J-4164

TYPICAL SECTIONS AND DETAILS
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN

SHEET 3 OF 13

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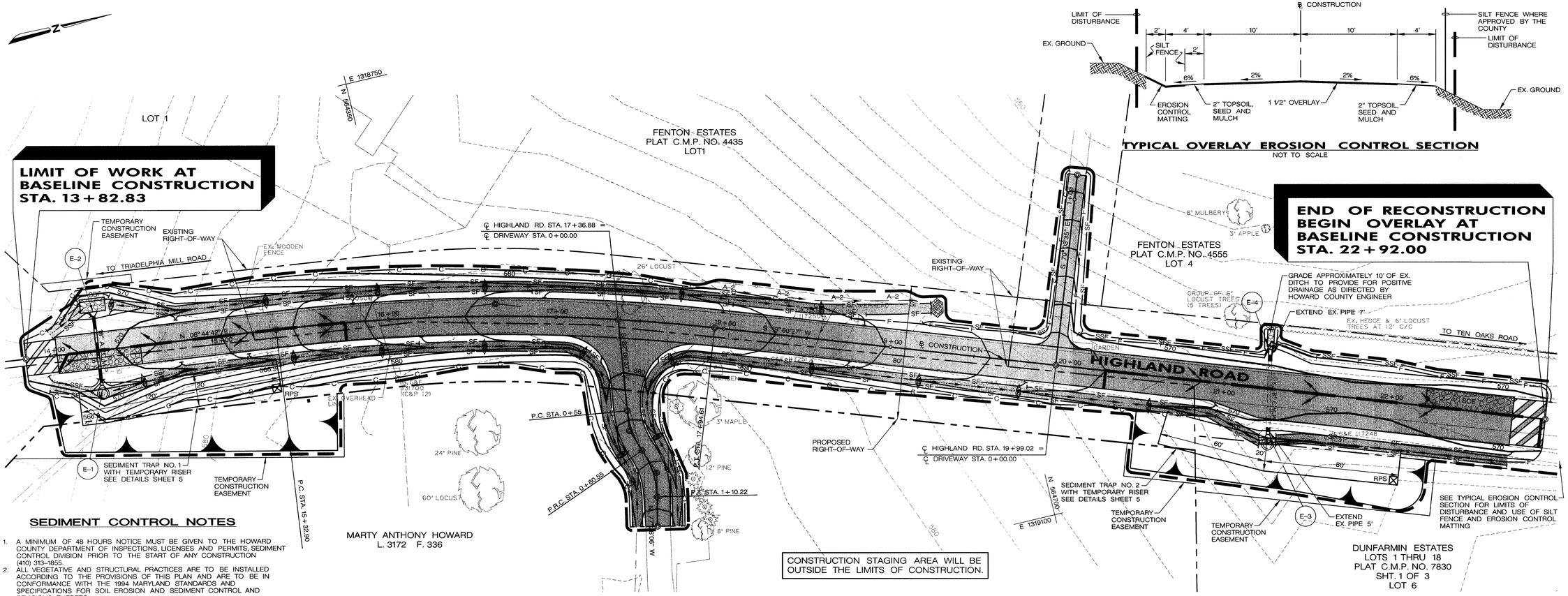

TYPICAL OVERLAY EROSION CONTROL SECTION

NOT TO SCALE

SEDIMENT AND EROSION CONTROL PLAN

SCALE: 1" = 30'

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 48 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY DEPARTMENT OF INSPECTIONS, LICENSES AND PERMITS, SEDIMENT CONTROL DIVISION PRIOR TO THE START OF ANY CONSTRUCTION (410) 313–1855.
2. ALL VEGETATIVE AND STRUCTURAL PRACTICES ARE TO BE INSTALLED ACCORDING TO THE PROVISIONS OF THIS PLAN AND ARE TO BE IN CONFORMANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL AND REVISIONS THERETO.
3. FOLLOWING INITIAL SOIL DISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN:
   A. 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1.
   B. 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 7, OF THE HOWARD COUNTY DESIGN MANUAL, STORM DRAINAGE.
5. ALL DISTURBED AREAS MUST BE STABILIZED WITHIN THE TIME PERIOD SPECIFIED ABOVE IN ACCORDANCE WITH THE 1994 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR PERMANENT SEEDINGS, SOD, TEMPORARY SEEDING, AND MULCHING (SEC. G). TEMPORARY STABILIZATION WITH MULCH ALONE SHALL ONLY BE DONE WHEN RECOMMENDED SEEDING DATES DO NOT ALLOW FOR PROPER GERMINATION AND ESTABLISHMENT OF GRASSES.
6. ALL SEDIMENT CONTROL STRUCTURES ARE TO REMAIN IN PLACE AND ARE TO BE MAINTAINED IN OPERATIVE CONDITION UNTIL PERMISSION FOR THEIR REMOVAL HAS BEEN OBTAINED FROM HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7. SITE ANALYSIS:

TOTAL AREA OF SITE	N/A
AREA DISTURBED	2.35 ACRES
AREA TO BE ROOFED OR PAVED	1.34 ACRES
AREA TO BE VEGETATIVELY STABILIZED	1.01 ACRES
TOTAL CUT	3500 CU. YDS.
TOTAL FILL	453 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION	TO BE DETERMINED BY THE CONTRACTOR (SITE WITH A CURRENT ACTIVE GRADING PERMIT)

8. ANY SEDIMENT CONTROL PRACTICE WHICH IS DISTURBED BY GRADING ACTIVITY FOR PLACEMENT OF UTILITIES MUST BE REPAIRED ON THE SAME DAY OF DISTURBANCE.
9. ADDITIONAL SEDIMENT CONTROLS MUST BE PROVIDED, IF DEEMED NECESSARY BY THE HOWARD COUNTY INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION AGENCY IS MADE.
11. TRENCHES FOR THE CONSTRUCTION OF UTILITIES IS LIMITED TO THREE PIPE LENGTHS OF THAT WHICH SHALL BE BACK-FILLED AND STABILIZED WITHIN ONE WORKING DAY, WHICHEVER IS SHORTER.

NOTES:

1. CONTRACTOR TO PROVIDE STONE CONSTRUCTION ENTRANCES IN THE WORK ZONES DURING ALL PHASES OF CONSTRUCTION. SEE DETAIL NO. 24 ON SHEET 6 OF 11.
2. PROVIDE E.C.M. DITCH LINING FOR ALL SWALES WHERE RIP–RAP LINING IS NOT INDICATED.
3. AS DIRECTED BY THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR ADDITIONAL STONE CHECK DAMS MAY BE REQUIRED.

SEQUENCE OF CONSTRUCTION

1. OBTAIN PERMISSION FROM HOWARD COUNTY SEDIMENT CONTROL INSPECTOR TO PROCEED. (1 DAY)
2. OBTAIN GRADING PERMIT. (1 DAY)
3. RELOCATE FIVE (5) EXISTING UTILITY POLES AS REQUIRED BY THEIR OWNERS. (3 DAYS)
4. INSTALL ALL DETOUR SIGNING AND WORK ZONE SIGNING. (2 DAYS)
5. INSTALL SEDIMENT CONTROL MEASURES SHOWN ON PLANS. (2 DAYS)
6. EXCAVATE AND EMBANK FOR THE RECONSTRUCTION OF HIGHLAND ROAD. STABILIZE THE WORKZONE WITH D.G.A.B. MATERIAL. INSTALL TEMPORARY SEED AND MULCH TO ALL SLOPE AREAS THAT ARE DISTURBED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOT EXPOSE EARTH THAT CANNOT BE TEMPORARILY OR PERMANENTLY STABILIZED WITHIN 24 HOURS. (7 DAYS)
7. PLACE PERMANENT STABILIZATION ON EARTH SLOPES. (2 DAYS)
8. INSTALL TWO BITUMINOUS CONCRETE BASE COURSES ON RECONSTRUCTED HIGHLAND ROAD. (3 DAYS)
9. PLACE BITUMINOUS CONCRETE SURFACE COURSE FROM TRIADELPHIA MILL ROAD TO TEN OAKS ROAD. (5 DAYS)
10. PLACE SIGNING, STRIPING AND PAVEMENT MARKINGS. (2 DAYS)
11. REMOVE SEDIMENT CONTROL DEVICES WITH APPROVAL FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR. (1 DAY)
12. REMOVE DETOUR SIGNING WITH APPROVAL OF HOWARD COUNTY. (2 DAYS)

LEGEND

- PROPOSED CONSTRUCTION
- MILL AND RESURFACE
- STABILIZED CONSTRUCTION ENTRANCE
- EROSION CONTROL MATTING
- C — TOP OF CUT
- F — LIMIT OF FILL
- SF — SILT FENCE
- SSF — SUPER SILT FENCE
- DRAINAGE DIVIDE
- TEMPORARY CHECK DAM
- A–2 — EARTH DIKE
- LIMIT OF DISTURBANCE
- TEMPORARY STONE OUTLET SEDIMENT TRAP
- RPS — REMOVABLE PUMPING STATION
- SPECIAL TEMPORARY RISER

ENGINEER CERTIFICATE

"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."

Frederick A. Carivan — 3/29/00

SIGNATURE OF ENGINEER — DATE

FREDERICK A. CARIVAN, P.E.

DEVELOPER'S CERTIFICATE

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

SIGNATURE OF DEVELOPER — DATE

PRINT NAME BELOW SIGNATURE

FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — 4/27/00 DATE
CHIEF, BUREAU OF ENGINEERING — 4/27/00 DATE
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — 4/27/00 DATE
CHIEF, BUREAU OF HIGHWAYS — 4-27-00 DATE

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96–309–047

BOARD OF PROFESSIONAL ENGINEERS — No. 23500 — FREDERICK A. CARIVAN — STATE OF MARYLAND — 3/29/00

DES: F.A.C.	BY	NO.	REVISION	DATE
DRN: J.N.W.				
CHK: F.A.C.				
DATE: 3/00				

CAPITAL PROJECT NO.
J–4164
600' SCALE MAP NO. _____ DATE: _____

SEDIMENT AND EROSION CONTROL PLAN
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN

SHEET 4 OF 13

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DATE: 07–Mar–00 16:00

SECTION I – VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. SITE PREPARATION
   I. INSTALL EROSION AND SEDIMENT CONTROL STRUCTURES (EITHER TEMPORARY OR PERMANENT) SUCH AS DIVERSIONS, GRADE STABILIZATION STRUCTURES, BERMS, WATERWAYS, OR SEDIMENT CONTROL BASINS.
   II. PERFORM ALL GRADING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. FINAL GRADING AND SHAPING IS NOT USUALLY NECESSARY FOR TEMPORARY SEEDING.
   III. SCHEDULE REQUIRED SOIL TESTS TO DETERMINE SOIL AMENDMENT COMPOSITION AND APPLICATION RATES FOR SITE HAVING DISTURBED AREA OVER 5 ACRES.

B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)
   I. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER ON SITES HAVING DISTURBED AREAS OVER 5 ACRES. SOIL ANALYSIS MAY BE PERFORMED BY THE UNIVERSITY OF MARYLAND OR A RECOGNIZED COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSES.
   II. FERTILIZERS SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING AND SUITABLE FOR ACCURATE APPLICATION BY APPROVED EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE APPROPRIATE APPROVAL AUTHORITY. FERTILIZERS SHALL ALL BE DELIVERED TO THE SITE FULLY LABELED ACCORDING TO THE APPLICABLE STATE FERTILIZER LAWS AND SHALL BEAR THE NAME, TRADE NAME OR TRADEMARK AND WARRANTEE OF THE PRODUCER.
   III. LIME MATERIALS SHELL BE GROUND LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED) WHICH CONTAINS AT LEAST 50% TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE SHALL BE GROUND TO SUCH FINENESS THAT AT LEAST 50% WILL PASS THROUGH A #100 MESH SIEVE AND 98–100% WILL PASS THROUGH A #20 MESH SIEVE.
   IV. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3–5" OF SOIL BY DISKING OR OTHER SUITABLE MEANS.

C. SEEDBED PREPARATION
   I. TEMPORARY SEEDING
      A. SEEDBED PREPARATION SHALL CONSIST OF LOOSENING SOIL TO A DEPTH OF 3" TO 5" BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS OR CHISEL PLOWS OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED IT SHOULD NOT BE ROLLED OR DRAGGED SMOOTH BUT LEFT IN THE ROUGHENED CONDITION. SLOPED AREAS (GREATER THAN 3:1) SHOULD BE TRACKED LEAVING THE SURFACE IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
      B. APPLY FERTILIZER AND LIME AS PERSCRIBED ON THE PLANS.
      C. INCORPORATE LIME AND FERTILIZER INTO THE TOP 3 – 5" OF SOIL BY DISKING OR OTHER SUITABLE MEANS.
   II. PERMANENT SEEDING
      A. MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATIVE ESTABLISHMENT:
         1. SOIL PH SHALL BE BETWEEN 6.0 AND 7.0.
         2. SOLUBLE SALTS SHALL BE LESS THAN 500 PARTS PER MILLION (PPM).
         3. THE SOIL SHALL CONTAIN LESS THAN 40% CLAY BUT ENOUGH FINE GRAINED MATERIAL (>30% SILT PLUS CLAY) TO PROVIDE THE CAPACITY TO HOLD A MODERATE AMOUNT OF MOISTURE. AN EXCEPTION IS IF LOVEGRASS OR SERECIA LESPEDEZA IS TO BE PLANTED, THEN A SANDY SOIL (<30% SILT PLUS CLAY) WOULD BE ACCEPTABLE.
         4. SOIL SHALL CONTAIN 1.5% MINIMUM ORGANIC MATTER BY WEIGHT.
         5. SOIL MUST CONTAIN PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
         6. IF THESE CONDITIONS CANNOT BE MET BY SOILS ON SITE, ADDING TOPSOIL IS REQUIRED IN ACCORDANCE WITH SECTION 21 STANDARD AND SPECIFICATION FOR TOPSOIL.
   B. AREAS PREVIOUSLY GRADED IN CONFORMANCE WITH THE DRAWINGS SHALL BE MAINTAINED IN A TRUE AND EVEN GRADE, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 3 – 5" TO PERMIT BONDING OF THE SOPSOIL TO THE SURFACE AREA AND TO CREATE HORIZONTAL EROSION CHECK SLOTS TO PREVENT TOPSOIL FROM SLIDING DOWN A SLOPE.
   C. APPLY SOIL AMENDMENTS AS PER SOIL TEST OR AS INCLUDED ON THE PLANS.
   D. MIX SOIL AMENDMENTS INTO THE TOP 3 – 5" OF TOPSOIL BY DISKING OF OTHER SUITABLE MEANS. LAWN AREAS SHOULD BE RAKED TO SMOOTH THE SURFACE, REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION, LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE.

      STEEP SLOPES (STEEPER THAN 3:1) SHOULD BE TRACKED BY A DOZER LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. THE TOP 1 – 3" OF SOIL SHOULD BE LOOSE AND FRIABLE. SEEDBED LOOSENING MAY NOT BE NECESSARY ON NEWLY DISTURBED AREAS.

D. SEED SPECIFICATIONS
   I. ALL SEED MUST MEET THE REQUIREMENTS OF THE MARYLAND STATE SEED LAW. ALL SEED SHALL BE SUBJECT TO RE–TESTING BY A RECOGNIZED SEED LABORATORY. ALL SEED USED SHALL HAVE BEEN TESTED WITHIN THE 6 MONTHS IMMEDIATELY PRECEEDING THE DATE OF SOWING SUCH MATERIAL ON THIS JOB. NOTE: SEED TAGS SHALL BE MADE AVAILABLE TO THE INSPECTOR TO VERIFY TYPE AND RATE OF SEED USED.
   II. INNOCULANT – THE INOCULANT FOR TREATING LEGUME SEED IN THE SEED MIXTURES SHAL BE A PURE CULTURE OF NITROGEN–FIXING BACTERIA ON THE CONTAINER. ADD FRESH INOCULANT AS DIRECTED ON PACKAGE. USE FOUR TIMES THE RECOMMENDED RATE WHEN HYDROSEEDING.
      NOTE: IT IS VERY IMPORTANT TO KEEP INOCULANT AS COOL AS POSSIBLE UNTIL USED. TEMPERATURES ABOVE 75–80 F. CAN WEAKEN BACTERIA AND MAKE THE INOCULANT LESS EFFECTIVE.

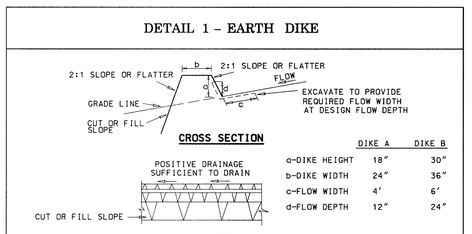
E. METHODS OF SEEDING
   I. HYDROSEEDING: APPLY SEED UNIFORMLY WITH HYDROSEEDER (SLURRY INCLUDES SEED AND FERTILIZER), BROADCAST OR DROP SEEDER, OR A CULTIPACKER SEEDER.
      A. IF FERTILIZER IS BEING APPLIED AT THE TIME OF SEEDING, THE APPLICATION RATES AMOUNTS WILL NOT EXCEED THE FOLLOWING: NITROGEN; MAXIMUM OF 100 LBS. PER ACRE TOTAL OF SOLUBLE NITROGEN; P205 (PHOSPHOROUS): 200 LBS./AC; K20 (POTASSIUM): 200 LBS./AC.
      B. LIME – USE ONLY GROUND AGRICULTURAL LIMESTONE, (UP TO 3 TONS PER ACRE MAY BE APPLIED BY HYDROSEEDING). NORMALLY, NOT MORE THAN 2 TONS ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
      C. SEED AND FERTILIZER SHALL BE MIXED ON SITE AND SEEDING SHALL BE DONE IMMEDIATELY AND WITHOUT INTERRUPTION.
   II. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OF BROADCAST SPREADERS.
      A. SEED SPREAD DRY SHALL BE INCORPORATED INTO THE SUBSOIL AT THE RATES PRESCRIBED ON THE TEMPORARY OR PERMANENT SEEDING SUMMARIES OR TABLES 25 OR 26. THE SEEDED AREA SHALL THEN BE ROLLED WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED TO SOIL CONTACT.
      B. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
   III. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY AND COVER SEED WITH SOIL.
      A. CULTIPACKER SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE AT LEAST 1/4 INCH SOIL COVERING. SEEDBED MUST BE FIRM AFTER PLANTING.
      B. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.

F. MULCH SPECIFICATIONS (IN ORDER OF PREFERENCE)
   I. STRAW SHALL CONSIST OF THOROUGHLY THRESHED WHEAT, RYE OR OAT STRAW, REASONABLY BRIGHT IN COLOR, AND SHALL NOT BE MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY AND SHALL BE FREE OF NOXIOUS WEED SEEDS AS SPECIFIED IN THE MARYLAND SEED LAW.
   II. WOOD CELLULOSE FIBER MULCH (WCFM).
      A. WCFM SHALL CONSIST OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
      B. WCFM SHALL BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
      C. WCFM, INCLUDING DY, SHALL CONTAIN NO GERMINATION OR GROWTH INHIBITING FACTORS.
      D. WCFM MATERIALS SHALL BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZER AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL SHALL FORM A BLOTTER–LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND SHALL COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDLINGS.
      E. WCFM MATERIAL SHALL CONTAIN NO ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO–TOXIC.
      F. WCFM MUST CONFORM TO THE FOLLOWING PHYSICAL REQUIREMENTS: FIBER LENGTH TO APPROXIMATELY 10 MM. DIAMETER APPROXIMATELY 1 MM., PH. RANGE OF 4.0 TO 8.5, ASH CONTENT OF 1.6% MAXIMUM AND WATER HOLDING CAPACITY OF 90% MINIMUM.
      NOTE: ONLY STERILE STRAW MULCH SHOULD BE USED IN AREAS WHERE ONE SPECIES OF GRASS IS DESIRED.

G. MULCHING SEEDED AREAS MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.
   I. IF GRADING IS COMPLETED OUTSIDE OF THE SEEDING SEASON, MULCH ALONE SHALL BE APPLIED AS PRESCRIBED IN THIS SECTION AND MAINTAINED UNTIL THE SEEDING SEASON RETURNS AND SEEDING CAN BE PERFORMED IN ACCORDANCE WITH THESE SPECIFICATIONS.
   II. WHEN STRAW MULCH IS USED, IT SHALL BE SPREAD OVER ALL SEEDED AREAS AT THE RATE OF 2 TONS/ACRE. MULCH SHALL BE APPLIED TO A UNIFORM LOOSE DEPTH OF BETWEEN 1" AND 2". MULCH APPLIED SHALL ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED. IF A MULCH ANCHORING TOOL IS TO BE USED, THE RATE SHOULD BE INCREASED TO 2.5 TONS/ACRE.
   III. WOOD CELLULOSE FIBER USED AS A MULCH SHALL BE APPLIED AT A NET DRY WEIGHT OF 1,500 LBS. PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LBS. OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.

H. SECURING STRAW MULCH (MULCH ANCHORING): MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE TOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS (LISTED BY PREFERENCE), DEPENDING UPON SIZE OF AREA AND EROSION HAZARD:
   I. A MULCH ANCHORING TOOL IS A TRACTOR DRAWING IMPLEMENT DESIGNED TO PUNCH AND ANCHOR MULCH INTO THE SOIL SURFACE A MINIMUM OF TWO (2) INCHES. THE PRACTICE IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES WHERE EQUIPMENT CAN OPERATE SAFELY. IF USED ON SLOPING LAND, THIS PREACTICE SHOULD BE USED ON THE CONTOUR IF POSSIBLE.
   II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW. THE FIBER BINDER SHALL BE APPLIED AT A NET DRY WEIGHT OF 750 POUNDS/ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 POUNDS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER.
   III. APPLICATIONS OF LIQUID BINDERS SHOULD BE HEAVIER AT THE EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. THE REMAINDER OF AREA SHOULD APPEAR TO BE UNIFORM AFTER BINDER APPLICATION. SYNTHETIC BINDERS – SUCH AS ACRYLIC DLR (AGRO–TACK), DCA–70, PETROSET, TERRA TAX II, TERRA TACK AR OR OTHER APPROVED EQUAL MAY BE USED AT RATES RECOMMENDED BY THE MANUFACTURER TO ANCHOR MULCH.

DETAIL 1 – EARTH DIKE



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

STANDARD SYMBOL A–2 B–3

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 the soil 7" minimum

Construction Specifications

1. All temporary earth dikes shall have uninterrupted positive grade to an outlet. Spot elevations may be necessary for grades less than 1%.

2. Runoff diverted from a disturbed area shall be conveyed to a sediment trapping device.

3. Runoff diverted from an undisturbed area shall outlet directly into an undisturbed, stabilized area at a non–erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectional material shall be removed and disposed of so as not to interfere with the proper functioning of the dike.

5. The dike shall be excavated or shaped to line, grade and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

6. Fill shall be compacted by earth moving equipment.

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

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

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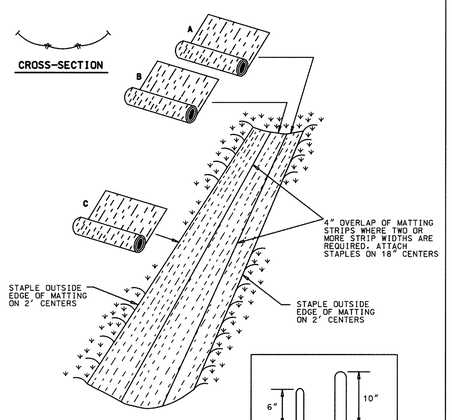
DETAIL 30 – EROSION CONTROL MATTING



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EROSION CONTROL MATTING

Construction Specifications

1. Key–in the matting by placing the top ends of the matting in a narrow trench, 6" in depth. Backfill the trench and tamp firmly to conform to the channel cross–section. Secure with a row of staples about 4" down slope from the trench. Spacing between staples is 6".

2. Staple the 4" overlap in the channel center using an 18" spacing between staples.

3. Before stapling the outer edges of the matting, make sure the matting is smooth and in firm contact with the soil.

4. Staples shall be placed 2' apart with 4 rows for each strip, 2 outer rows, and 2 alternating rows down the center.

5. Where one roll of matting ends and another begins, the end of the top strip shall overlap the upper end of the lower strip by 4", shiplap fashion. Reinforce the overlap with a double row of staples spaced 6" apart in a staggered pattern on either side.

6. The discharge end of the matting liner should be similarly secured with 2 double rows of staples.

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

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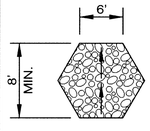
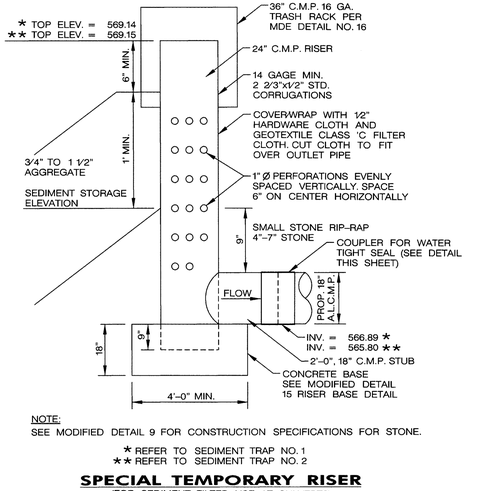


CLASS I RIP RAP ON FILTER CLOTH. MINIMUM DEPTH 19"

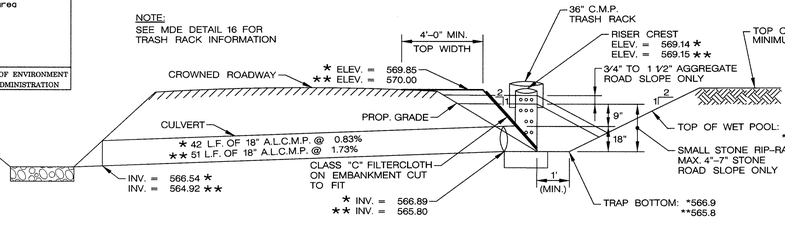
TEMPORARY STONE OUTLET SEDIMENTATION TRAP
STATION 19+25 LT.
NOT TO SCALE



NOTE:
SEE MODIFIED DETAIL 9 FOR CONSTRUCTION SPECIFICATIONS FOR STONE.

★ REFER TO SEDIMENT TRAP NO. 1
★★ REFER TO SEDIMENT TRAP NO. 2

SPECIAL TEMPORARY RISER
(FOR SEDIMENT FILTER USE AT CULVERTS)
NOT TO SCALE



★ REFER TO SEDIMENT TRAP NO. 1
★★ REFER TO SEDIMENT TRAP NO. 2

TYPICAL SECTION CULVERT WITH SPECIAL TEMPORARY RISER
NOT TO SCALE

FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS	4/27/00 DATE	CHIEF, BUREAU OF ENGINEERING	4/27/00 DATE
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION	4/27/00 DATE	CHIEF, BUREAU OF HIGHWAYS	4-27-00 DATE

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96–309–047

BOARD OF PROFESSIONAL ENGINEERS No. 22858 PATRICK A. CARRION STATE OF MARYLAND
3/14/00

DES: F.A.C.					
DRN: J.N.W.					
CHK: F.A.C.					
DATE: 3/00	BY	NO.	REVISION	DATE	600' SCALE MAP NO. _____ DATE: _____

CAPITAL PROJECT NO.
J–4164

SEDIMENT AND EROSION CONTROL DETAILS
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN

SHEET 5 OF 13

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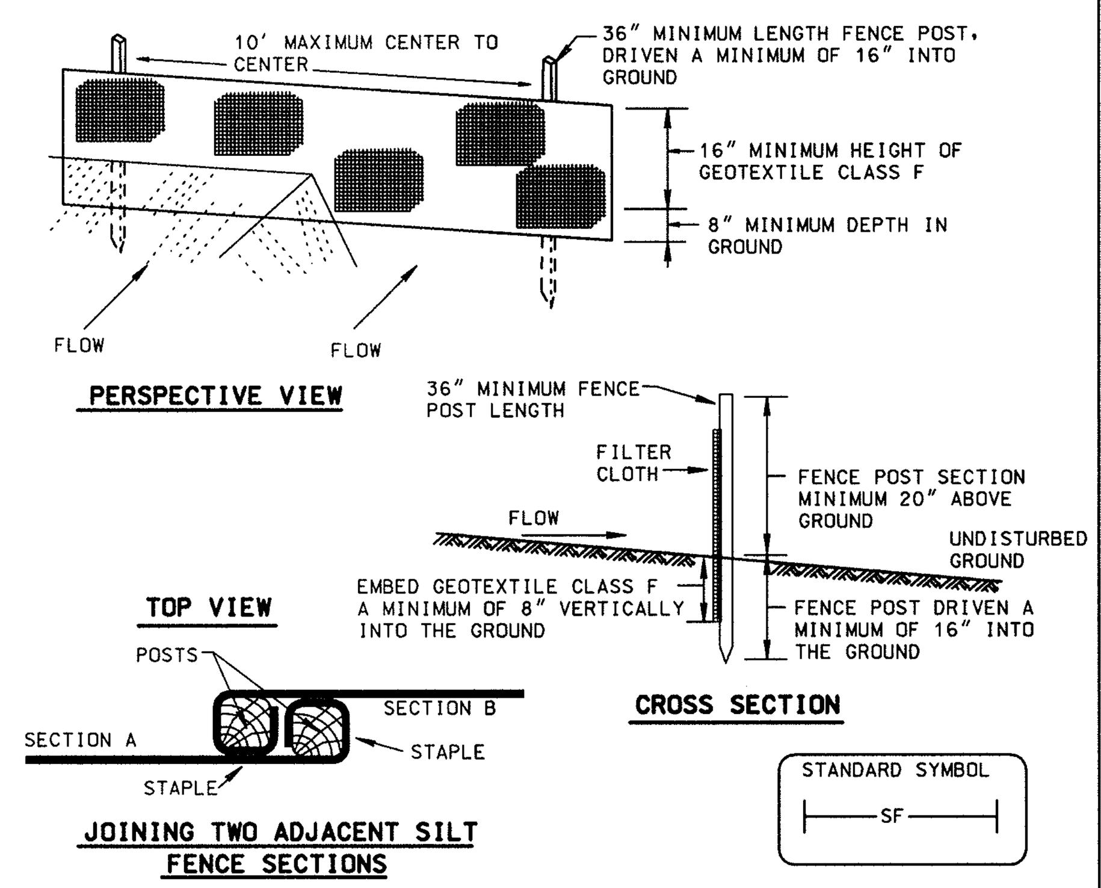
DETAIL 22 - SILT FENCE



Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be $1\frac{1}{2}$" x $1\frac{1}{2}$" square (minimum) cut, or $1\frac{3}{4}$" 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.

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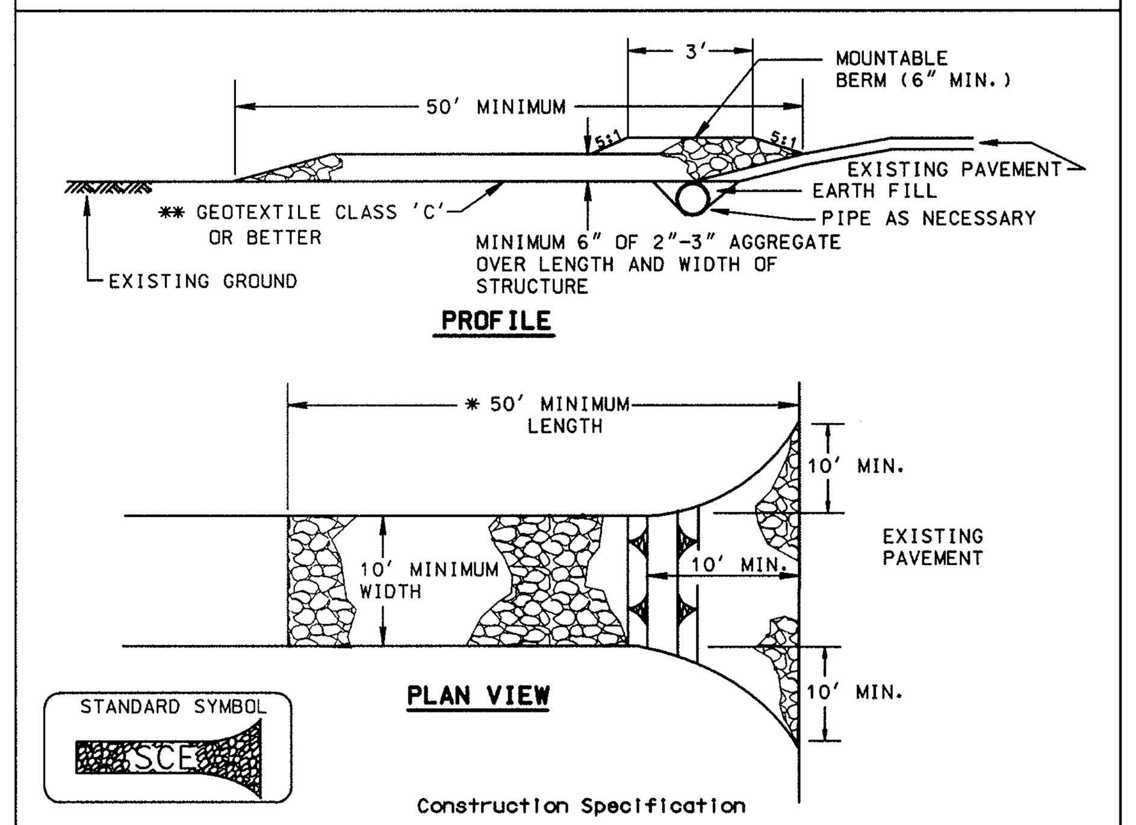
DETAIL 24 - STABILIZED CONSTRUCTION ENTRANCE



Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).

2. Width - 10' minimum, should be flared at the existing road to provide a turning radius.

3. Geotextile fabric (filter cloth) shall be placed over the existing ground prior to placing stone. **The plan approval authority may not require single family residences to use geotextile.

4. Stone - crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

5. Surface Water - all surface water flowing to or diverted toward construction entrances shall be piped through the entrance, maintaining positive drainage. Pipe installed through the stabilized construction entrance shall be protected with a mountable berm with 5:1 slopes and a minimum of 6" of stone over the pipe. Pipe has to be sized according to the drainage. When the SCE is located at a high spot and has no drainage to convey a pipe will not be necessary. Pipe should be sized according to the amount of runoff to be conveyed. A 6" minimum will be required.

6. Location - A stabilized construction entrance shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must travel over the entire length of the stabilized construction entrance.

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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.

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STABILIZED CONSTRUCTION ENTRANCE

Construction Specification

1. Length - minimum of 50' (*30' for single residence lot).

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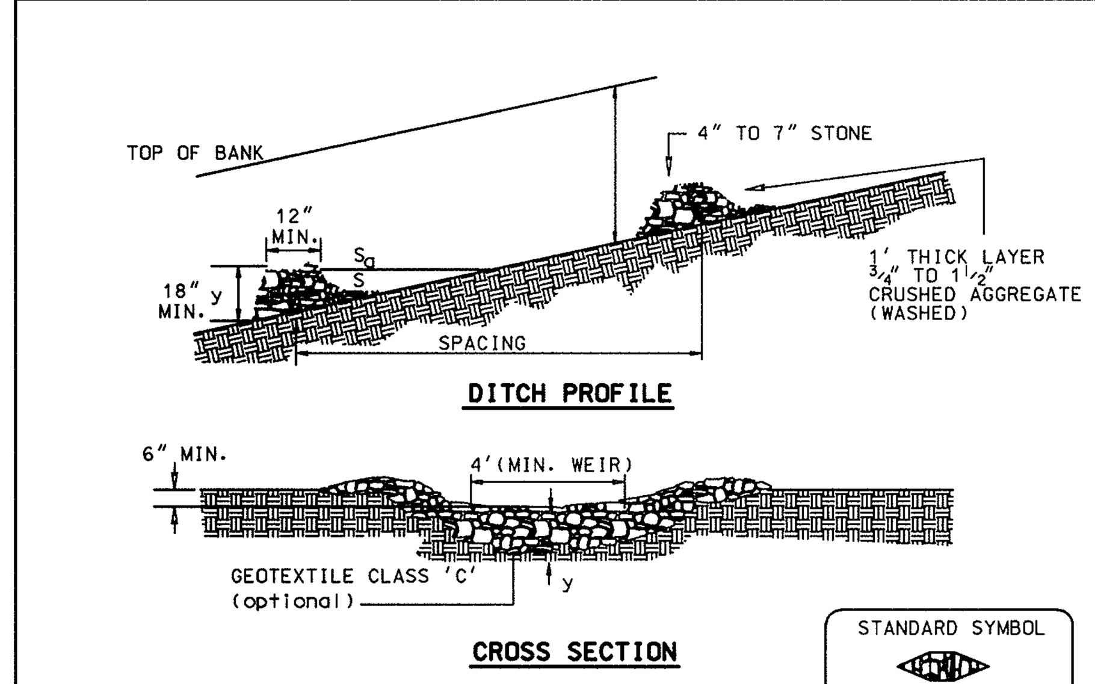
DETAIL 7 - STONE CHECK DAM



STANDARD STONE CHECK DAM DESIGN

SLOPE	SPACING
2% or less	80'
2.1% to 4%	40'
4.1% to 7%	25'
7.1% to 10%	15'
over 10%	use lined waterway design

Construction Specifications

1. Swales and ditches shall be prepared in accordance with the construction specifications described in Section A-2, Standards and Specifications for Temporary Swale.

2. The check dam shall be constructed of 4"-7" stone. The stone shall be placed so that it completely covers the width of the channel and keyed into the channel banks.

3. The top of the check dam shall be constructed so the the center is approximately 6" lower than the outer edges, forming a weir that water can flow across.

4. The maximum height of the check dam at the center shall not exced 2".

5. The upstream sideof the check dam shall be lined with approximately 1" of $\frac{3}{4}$" to $1\frac{1}{2}$" crushed aggregate.

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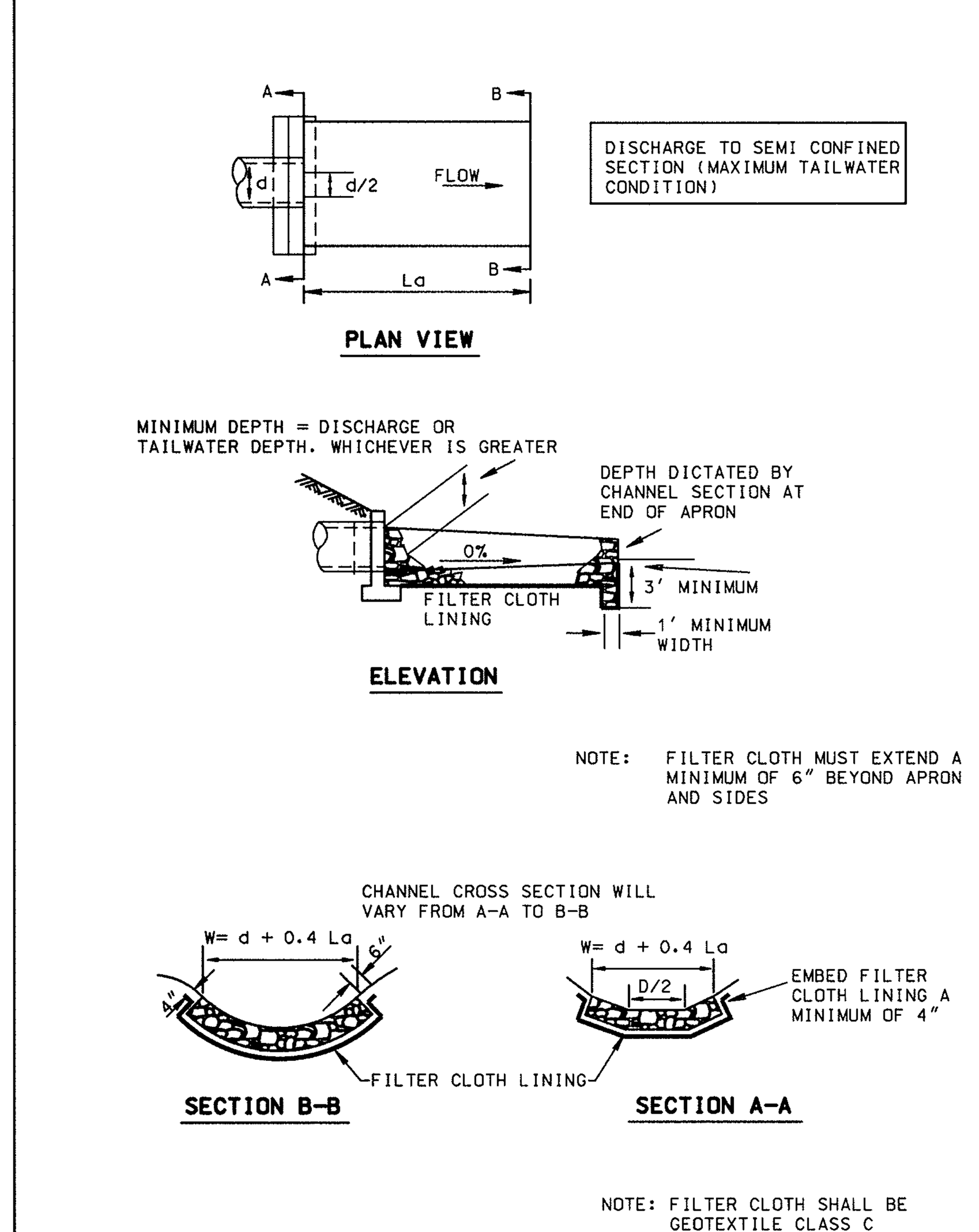
DETAIL 25 - ROCK OUTLET PROTECTION I



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

STANDARDS AND SPECIFICATIONS FOR TOPSOIL

DEFINITION AND PURPOSE

PLACE TOPSOIL OVER A PREPARED SUBSOIL, PRIOR TO ESTABLISHMENT OF PERMANENT VEGETATION, TO PROVIDE A SUITABLE SOIL MEDIUM FOR VEGETATIVE GROWTH. SUBSOILS OF CONCERN HAVE A LOW MOISTURE CONTENT, LOW NUTRIENT LEVELS, LOW PH, MATERIALS TOXIC TO PLANTS, AND/OR UNACCEPTABLE SOIL GRADATION.

CONDITIONS WHERE PRACTICE APPLIES

I. THIS PRACTICE IS LIMITED TO AREAS HAVING 2:1 OR FLATTER SLOPES WHERE:

A. THE TEXTURE OF THE EXPOSED SUBSOIL/PARENT MATERIAL IS NOT ADEQUATE TO PRODUCE VEGETATIVE GROWTH.
B. THE SOIL MATERIAL IS SO SHALLOW THAT THE ROOTING ZONE IS NOT DEEP ENOUGH TO SUPPORT PLANTS OR FURNISH CONTINUING SUPPLIES OF MOISTURE AND PLANT NUTRIENTS.
C. THE ORIGINAL SOIL TO BE VEGETATED CONTAINS MATERIAL TOXIC TO PLANT GROWTH.
D. THE SOIL IS SO ACIDIC THAT TREATMENT WITH LIMESTONE IS NOT FEASIBLE.

II. FOR THE PURPOSE OF THESE STANDARDS AND SPECIFICATIONS, AREAS HAVING SLOPES STEEPER THAN 2:1 REQUIRE SPECIAL CONSIDERATION AND DESIGN FOR ADEQUATE STABILIZATION. AREAS HAVING SLOPES STEEPER THAN 2:1 SHALL HAVE THE APPROPRIATE STABILIZATION SHOWN ON THE PLANS.

CONSTRUCTION AND MATERIAL SPECIFICATIONS

I. TOPSOIL SALVAGED FROM EXISTING SITE MAY BE USED PROVIDED THAT IT MEETS THE STANDARDS AS SET FORTH IN THESE SPECIFICATIONS. TYPICALLY, THE DEPTH OF TOPSOIL TO BE SALVAGED FOR A GIVEN SOIL TYPE CAN BE FOUND IN THE REPRESENTATIVE SOIL PROFILE SECTION IN THE SOIL SURVEY PUBLISHED BY USDA-SCS IN COOPERATION WITH MARYLAND AGRICULTURAL EXPERIMENTAL STATION.

II. TOPSOIL SPECIFICATIONS – SOIL TO BE USED AS TOPSOIL MUST MEET THE FOLLOWING:

A. TOPSOIL SHALL BE A LOAM, SANDY LOAM, CLAY LOAM, SILT LOAM, SANDY CLAY LOAM, LOAMY SAND. OTHER SOILS MAY BE USED IF RECOMMENDED BY AN AGRONOMIST OR SOIL SCIENTIST AND APPROVED BY THE APPROPRIATE APPROVAL AUTHORITY. REGARDLESS, TOPSOIL SHALL NOT BE A MIXTURE OF CONTRASTING TEXTURE SUBSOILS AND SHALL CONTAIN LESS THAN 5% BY VOLUME OF CINDERS, STONE, SLAG, COARSE FRAGMENTS, GRAVEL, STICKS, ROOTS, TRASH, OR OTHER MATERIALS LARGER THAN 1 1/2" IN DIAMETER.
B. TOPSOIL MUST BE FREE OF PLANTS OR PLANT PARTS SUCH AS BERMUDA GRASS, QUACKGRASS, JOHNSONGRASS, NUTSEDGE, POISON IVY, THISTLE, OR OTHERS AS SPECIFIED.
C. WHERE THE SUBSOIL IS EITHER HIGHLY ACIDIC OR COMPOSED OF HEAVY CLAYS, GROUND LIMESTONE SHALL BE SPREAD AT THE RATE OF 4–8 TONS/ACRE (200–400 POUNDS PER 1,000 SQUARE FEET) PRIOR TO THE PLACEMENT OF TOPSOIL. LIME SHALL BE DISTRIBUTED UNIFORMLY OVER DESIGNATED AREAS AND WORKED INTO THE SOIL IN CONJUNCTION WITH TILLAGE OPERATIONS AS DESCRIBED IN THE FOLLOWING PROCEDURES.

III. FOR SITES HAVING DISTURBED AREAS UNDER 5 ACRES:

A. PLACE TOPSOIL (IF REQUIRED) AND APPLY SOIL AMENDMENTS AS SPECIFIED IN 20.0 VEGETATIVE STABILIZATION – SECTION I – VEGETATIVE STABILIZATION METHODS AND MATERIALS.

IV. TOPSOIL APPLICATION

A. 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.
B. GRADES ON THE AREAS TO BE TOPSOILED, WHICH HAVE BEEN PREVIOUSLY ESTABLISHED, SHALL BE MAINTAINED, ALBEIT 4"–8" HIGHER IN ELEVATION.
C. TOPSOIL SHALL BE UNIFORMLY DISTURBED IN A 4" – 8" LAYER AND LIGHTLY COMPACTED TO A MINIMUM THICKNESS OF 4". SPREADING SHALL BE PREFORMED 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.
D. TOPSOIL SHALL NOT BE PLACED WHILE THE TOPSOIL OR SUBSOIL IS IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBSOIL IS EXCESSIVELY WET OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING AND SEEDBED PREPARATION.

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.

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FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS	DATE 4/27/00	CHIEF, BUREAU OF ENGINEERING	DATE 4/27/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION	DATE 4/27/00	CHIEF, BUREAU OF HIGHWAYS	DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-047

BOARD OF PROFESSIONAL ENGINEERS No. 23505 FREDERICK A. CARIVAN STATE OF MARYLAND 3/14/00

DES: F.A.C.			
DRN: J.N.W.			
CHK: F.A.C.			
DATE: 3/00	BY	NO.	REVISION	DATE

CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. ________ DATE: ________

SEDIMENT AND EROSION CONTROL DETAILS
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN

SHEET 6 OF 13

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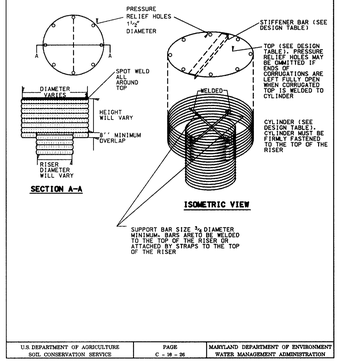
DATE: 13-Mar-00 08:41

DETAIL 16 - CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE



U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 19 - 26	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 16 CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE (continued)

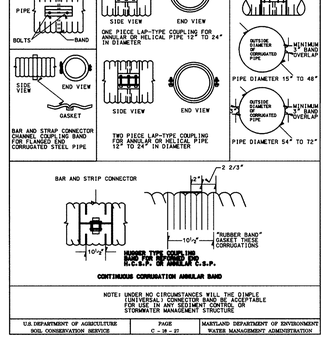
Riser Diam., in.	Trash Rack Cylinder Diam. in.	Trash Rack Cylinder Thick., gage	Ht. in.	Minimum Size Support Bar	Minimum Top Thickness	Stiffener
12	18	16	6	#6 Rebar	16 ga.	—
15	21	16	7	"	"	—
18	27	16	8	"	"	—
21	30	16	11	"	"	—
24	36	16	13	"	14 ga.	—
27	42	16	15	"	14 ga.	—
36	54	14	17	#8 Rebar	12 ga.	—
42	60	14	19	"	"	—
48	72	12	21	1-½" pipe or 1-½ x 1-½ x½ angle	10 ga.	—
54	78	12	25	"	"	—
60	90	12	29	1-½" pipe or 1-½ x 1-½ x½ angle	8 ga.	—
66	96	10	33	2" pipe or 2x2x5/16 angle	8 ga., w/stiffener	2x2x¼ angle
72	102	10	36	"	"	2-1/2x2-1/2x1/4 angle
78	114	10	39	2-½" pipe or 2x2x¼ angle	"	"
84	120	10	42	2-½" pipe or 2-1/2x2-1/2x1/4 angle	"	2-½ x2-1/2x ⅝ angle

Note: The above trash rack and anti-vortex device information is only for corrugated metal pipe. Concrete risers must meet the requirements of MD 378.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 19 - 26A	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 17 - TYPES OF COUPLERS FOR CORRUGATED STEEL PIPE

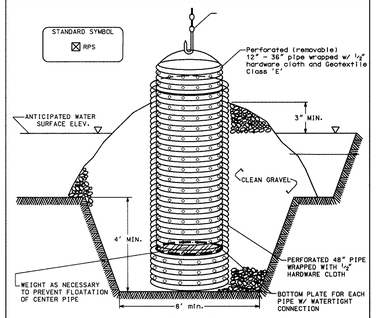
(ALL CONNECTOR BANDS REQUIRE NEOPRENE GASKETS)



NOTE: UNDER NO CIRCUMSTANCES WILL THE DIMPLE COUPLING BAND BE CONSIDERED AN ACCEPTABLE JOINTING MATERIAL FOR USE IN ANY CONCRETE OR STORMWATER MANAGEMENT STRUCTURE

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C - 19 - 27	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 20A - REMOVABLE PUMPING STATION



ELEVATION (CUT AWAY)

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 ½" 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 36 or 72" pipe between 12" and 52" in diameter. The perforations shall consist of ½" diameter holes 6" on center. The center pipe shall be wrapped with ½" 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.

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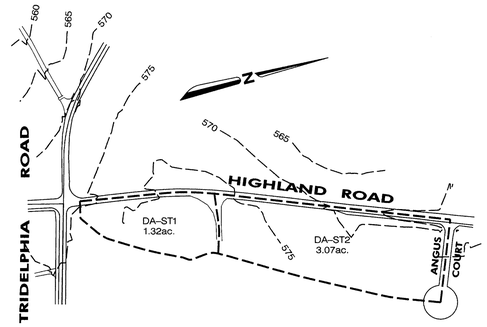
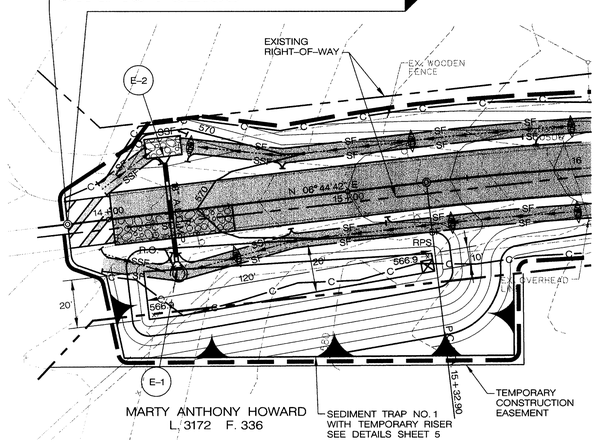


EXISTING DRAINAGE AREA MAP

SCALE: 1" = 200'

LIMIT OF WORK AT BASELINE CONSTRUCTION STA. 13 + 82.83



SEDIMENT TRAP NO. 1 GRADING PLAN

SCALE: 1" = 30'

SEDIMENT TRAP NO. 1

(MODIFIED ST-1)

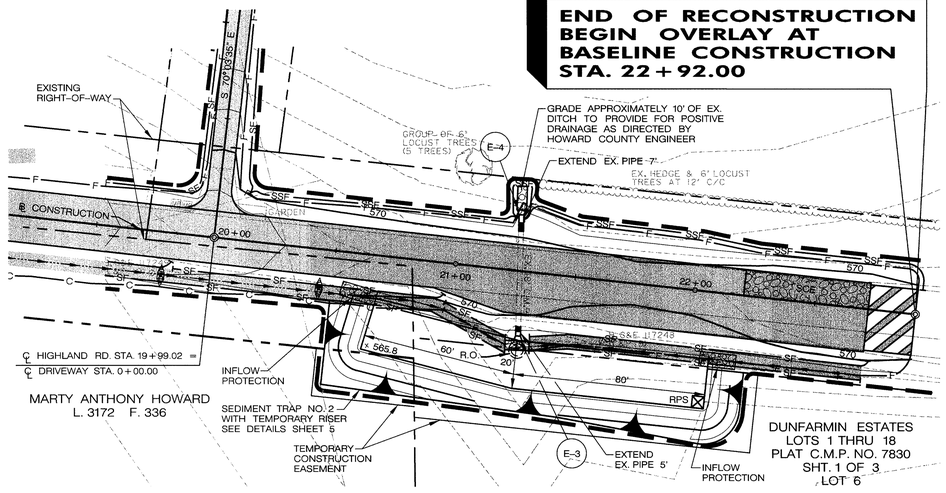
DRAINAGE AREA	=	1.32 AC.
SIDE SLOPES	=	2:1
STORAGE VOLUME PROVIDED	=	120'xAVG. 15'x3'
	=	5,400 CF.
STORAGE REQIURED		
WET	=	2,400 CF.
DRY	=	2,400 CF.
TOTAL	=	4,800 CF.
WET POOL ELEVATION	=	568.23

SEDIMENT TRAP NO. 2

(MODIFIED ST-1)

DRAINAGE AREA	=	3.07 AC.
SIDE SLOPES	=	2:1
STORAGE VOLUME PROVIDED	=	140'x20'x4'
	=	11,200 CF.
STORAGE REQIURED		
WET	=	5,525 CF.
DRY	=	5,525 CF.
TOTAL	=	11,050 CF.
WET POOL ELEVATION	=	567.28

END OF RECONSTRUCTION BEGIN OVERLAY AT BASELINE CONSTRUCTION STA. 22 + 92.00



SEDIMENT TRAP NO. 2 GRADING PLAN

SCALE: 1" = 30'

FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS	4/27/00 DATE	CHIEF, BUREAU OF ENGINEERING	4/27/00 DATE
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION	4/27/00 DATE	CHIEF, BUREAU OF HIGHWAYS	4-27-00 DATE

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-047

BOARD OF PROFESSIONAL ENGINEERS No. 23610 FREDERICK CARLTON STEVENS STATE OF MARYLAND
3/17/00

DES: F.A.C.					
DRN: M.T.					
CHK: F.A.C.					
DATE: 3'00	BY	NO.	REVISION	DATE	

CAPITAL PROJECT NO.
J-4164

600' SCALE MAP NO. _____ DATE: _____

SEDIMENT AND EROSION CONTROL DETAILS
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN

SHEET 7 OF 13

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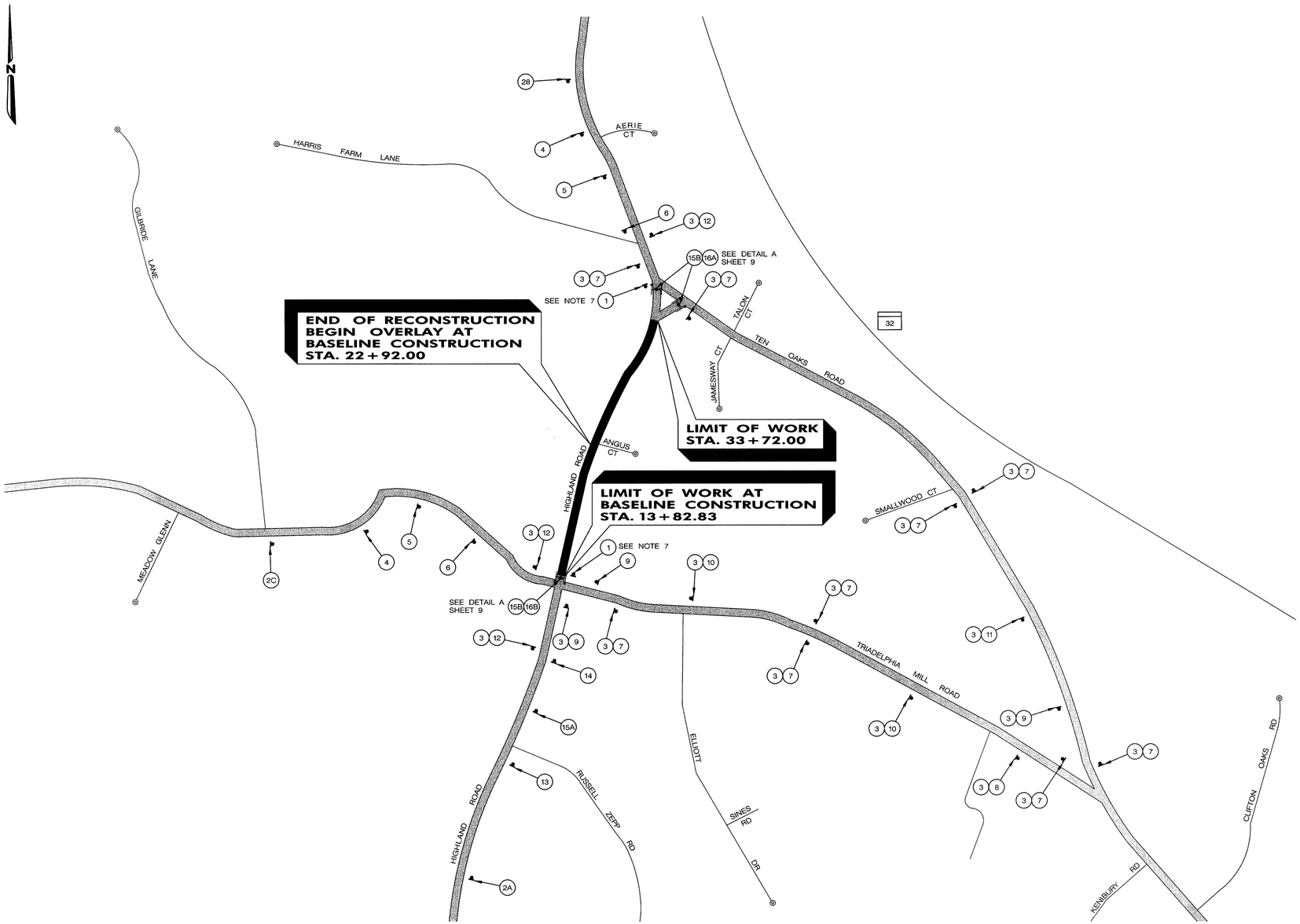


TRAFFIC CONTROL PLAN
NOT TO SCALE

GENERAL NOTES

1. HOWARD COUNTY TRAFFIC ENGINEER SHALL REVIEW PROPOSED SIGN LOCATIONS IN THE FIELD PRIOR TO ANY SIGN INSTALLATION.
2. ALL SIGNS SHALL BE MOUNTED ON AT LEAST ONE 4"x4" WOODEN POST.
3. ALL SIGN DISTANCES MAY BE ADJUSTED TO FIT FIELD CONDITIONS WITH THE ENGINEERS APPROVAL.
4. THE CONTRACTOR SHALL FURNISH, ERECT AND MAINTAIN TRAFFIC CONTROL SIGNS AND DEVICES. MAINTAIN TRAFFIC DURING HOURS OF CONSTRUCTION AND AT ALL OTHER TIMES IN ACCORDANCE WITH METHODS INDICATED ON THESE DRAWINGS, CONTRACT SPECIFICATIONS AND THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL SIGNS SHALL BE PLACED IN ACCORDANCE WITH THE MARYLAND SHA STANDARD SPECIFICATIONS OR AS DIRECTED BY HOWARD COUNTY.
5. SIGNS LARGER THAN 10 SQUARE FEET IN TOTAL AREA SHALL BE INSTALLED ON TWO 4"x4" WOODEN POSTS.
6. ALL SIGNS NOT IN USE SHALL BE EITHER COVERED WITH AN OPAQUE MATERIAL APPROVED BY THE COUNTY OR REMOVED FROM THE SITE IMMEDIATELY UPON COMPLETION OF USE.
7. SIGN NO. 1 SHALL BE PLACED 14 DAYS PRIOR TO ROAD CLOSING AND REMOVED ONCE ROAD IS CLOSED.
8. THE POSSIBILITY EXISTS THAT ONE OR MORE SIGNS MAY HAVE TO BE MOUNTED ON WOODEN STANDS, OR BARRICADES.
9. THE CONTRACTOR SHALL MEET WITH THE ENGINEER, LOCAL POLICE AND RESIDENTS OF HIGHLAND ROAD, WITH IN THE LIMIT OF WORK, ONE WEEK PRIOR TO SETTING UP THE DETOUR AND ROAD CLOSURE TO ADVISE THEM OF HIS WORK SCHEDULE. THE CONTRACTOR SHALL THEN ADVISE THE RESIDENCES BI-WEEKLY ON THE PROGRESS OF CONSTRUCTION.
10. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS ON HIGHLAND ROAD WITHIN THE WORK ZONE.
11. THE CONTRACTOR SHALL SCHEDULE THE WORK SUCH THAT THE DETOUR SYSTEM SHALL BE IN EFFECT FOR THE SHORTEST TIME PRACTICAL. THE CONTRACTOR SHALL PRESENT A SCHEDULE OF WORK TO THE COUNTY PRIOR TO THE START OF THE WORK. THAT SCHEDULE WILL BE REVIEWED TO MINIMIZE THE DETOUR TIME.

PHASE 1

I.1 SET UP SIGNING AND CHANNELIZING DEVICES AS SHOWN ON SHEET 8 AND 9. THE WORK ZONE SHALL BE ENTIRELY CLOSED TO THROUGH TRAFFIC. THE CONTRACTOR MAY USE EITHER HIGHLAND ROAD APPROACH FOR SITE ACCESS.

I.2 THE ENTIRE REPLACEMENT THROUGH FINAL STRIPING, SIGNING, TOPSOIL AND SEEDING SHALL BE FINISHED BEFORE THE ROAD IS OPEN TO TRAVEL.

I.3 ALL DETOUR AND TEMPORARY TRAFFIC CONTROL SIGNS SHALL BE REMOVED IN ONE WORK DAY, BEGINNING WITH THE SIGNS NEAREST THE WORK SITE.

LEGEND

- ROAD CLOSED
- RURAL AREA ROADS
- POST MOUNTED SIGN
- SIGN MOUNTED ON TYPE III LIGHTED BARRICADE
- TYPE III LIGHTED BARRICADE

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00
CHIEF, BUREAU OF ENGINEERING — DATE 4/27/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00
CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-047

BOARD OF PROFESSIONAL ENGINEERS — No. 23505 — FREDERICK A. CARVIN, JR. — STATE OF MARYLAND — 3/14/00

DES: F.A.C.					
DRN: J.N.W.					
CHK: F.A.C.					
DATE: 3/00	BY	NO.	REVISION	DATE	

CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. _____ DATE: _____

TRAFFIC CONTROL PLAN
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN

SHEET 8 OF 13

FILE: k:\96-309.047\ustation\newdesign\ps08high.dgn
DATE: 13-Mar-00 08:49

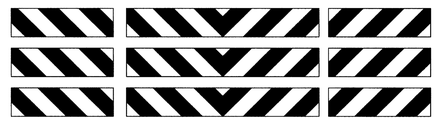
SIGN NO.	SIGN	SIZE	TEXT/BACKGROUND
1	NOTICE ROAD TO BE CLOSED ON OR ABOUT / / INFO CALL 313-2214	72"x84"	6" LETTERS BLACK/YELLOW 4" LETTERS 4" LETTERS 6" LETTERS BLACK/WHITE 4" LETTERS 4" LETTERS 4" LETTERS WHITE/BLUE
2A	NOTICE HIGHLAND ROAD CLOSED TO TRIADELPHIA MILL ROAD 1 MILE NORTH DETOUR AHEAD TO TEN OAKS ROAD	84"x96"	6" LETTERS BLACK/YELLOW BLACK/WHITE 4" LETTERS 6" LETTERS BLACK/ORANGE 4" LETTERS 4" LETTERS 4" LETTERS BLACK/YELLOW 4" LETTERS
2B	NOTICE HIGHLAND ROAD CLOSED AT TEN OAKS ROAD 1 MILE SOUTH DETOUR AHEAD TO TRIADELPHIA MILL ROAD	84"x96"	6" LETTERS BLACK/WHITE 4" LETTERS 6" LETTERS BLACK/ORANGE 4" LETTERS 4" LETTERS 4" LETTERS BLACK/YELLOW 4" LETTERS
2C	NOTICE HIGHLAND ROAD CLOSED 1 MILE EAST DETOUR AHEAD	48"x72"	6" LETTERS BLACK/YELLOW 4" LETTERS 6" LETTERS BLACK/WHITE 4" LETTERS 4" LETTERS BLACK/ORANGE
3	Highland Rd	D3-2 30"x8"	BLACK/WHITE

NOTE:
WHEN USING "ROAD NAME" SIGN WITH A DETOUR SIGN, ALWAYS PLACE ROAD NAME PANEL ON TOP.

SIGN NO.	SIGN	SIZE	TEXT/BACKGROUND
4	DETOUR 1/2 MILE	W20-2 36"x36"	BLACK/ORANGE
5	DETOUR 1500 FT	W20-2 36"x36"	BLACK/ORANGE
6	DETOUR 800 FT	W20-2 36"x36"	BLACK/ORANGE
7	DETOUR ↑	M4-9 30"x24"	BLACK/ORANGE
8	DETOUR ←	M4-9L 30"x24"	BLACK/ORANGE
9	DETOUR →	M4-9R 30"x24"	BLACK/ORANGE
10	DETOUR ↰	M4-9 30"x24"	BLACK/ORANGE
11	DETOUR ↱	M4-9 30"x24"	BLACK/ORANGE
12	END DETOUR	M4-8A 24"x18"	BLACK/ORANGE

SIGN NO.	SIGN	SIZE	TEXT/BACKGROUND
13	ROAD CLOSED 1/2 MILE	W20-3 36"x36"	BLACK/ORANGE
14	ROAD CLOSED 800 FT	W20-3 36"x36"	BLACK/ORANGE
15A	ROAD CLOSED 1/4 MILE AHEAD LOCAL TRAFFIC ONLY	R11-3A 60"x30"	BLACK/WHITE PLACED ON TYPE III BARRICADE W/2 HIGH INTENSITY FLASHERS PER BARRICADE
15B	ROAD CLOSED TO THRU TRAFFIC	R11-4 60"x30"	BLACK/WHITE PLACED ON TYPE III BARRICADE W/2 HIGH INTENSITY FLASHERS PER BARRICADE
16A	← DETOUR	M4-10L 18"x48"	BLACK/ORANGE
16B	DETOUR →	M4-10R 18"x48"	BLACK/ORANGE

BARRICADE PANEL DETAIL 'A'



RED/WHITE

NOTE:
PLACE ON 3-TYPE III BARRICADES.

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00
CHIEF, BUREAU OF ENGINEERING — DATE 4/27/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00
CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-047

BOARD OF PROFESSIONAL ENGINEERS — No. 23538 — PATRICK A. CARVAN — STATE OF MARYLAND
3/14/00

DES: F.A.C.						
DRN: J.N.W.						
CHK: F.A.C.						
DATE: 3/00	BY	NO.	REVISION	DATE	600' SCALE MAP NO. _____ DATE: _____	

CAPITAL PROJECT NO.
J-4164

TRAFFIC CONTROL SIGNS
Highland Rd. Improvements
Triadelphia Mill Road to
Ten Oaks Road

SCALE AS SHOWN

SHEET 9 OF 13

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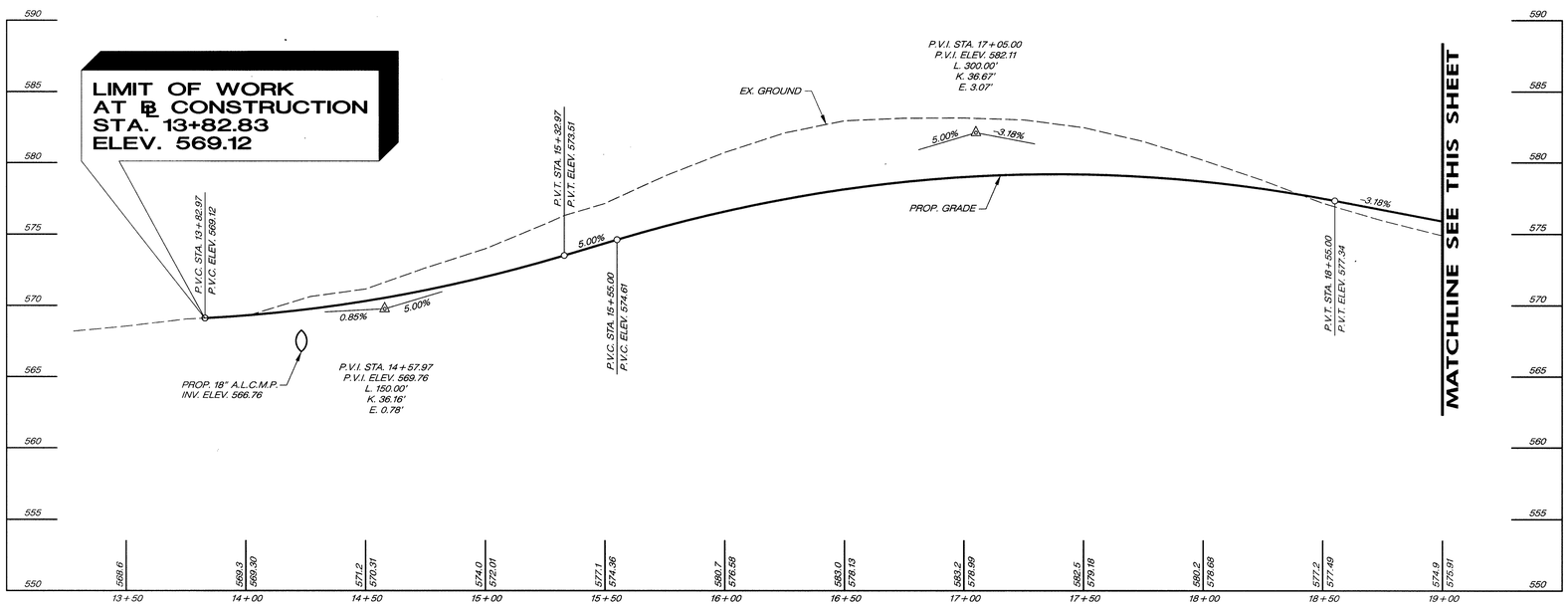
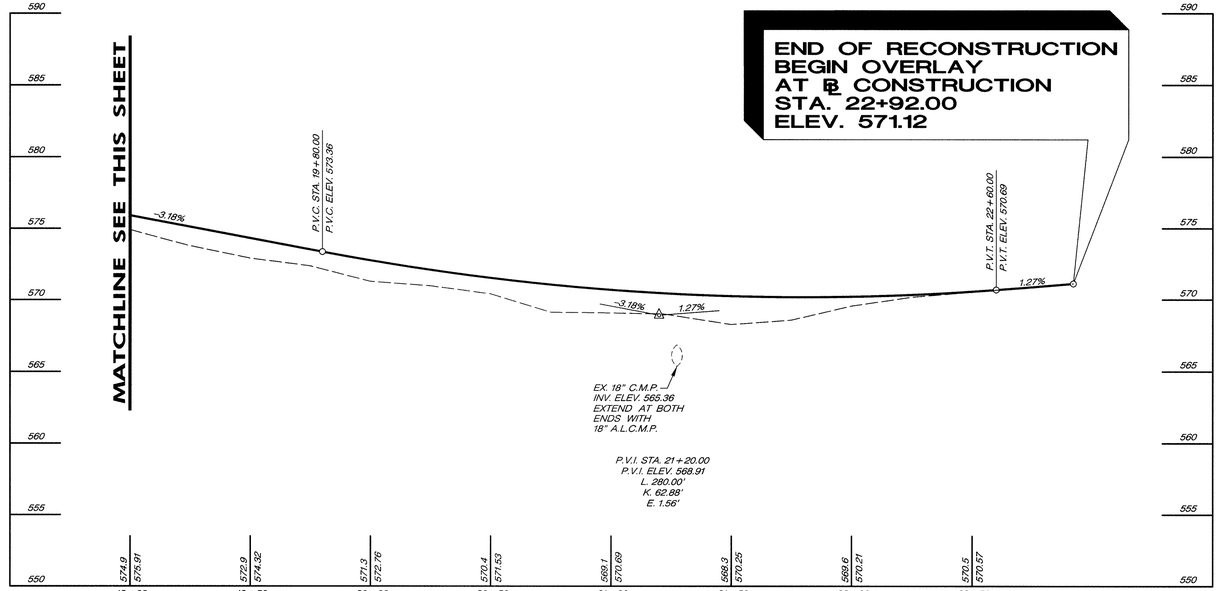


PROFILE
SCALE: HORZ. 1" = 30'
VERT. 1" = 5'



PROFILE
SCALE: HORZ. 1" = 30'
VERT. 1" = 5'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00
CHIEF, BUREAU OF ENGINEERING — DATE 4-27-00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00
CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-07

BOARD OF PROFESSIONAL ENGINEERS — No. 23824 — PATRICK A. CARTAN — STATE OF MARYLAND — 3/14/00

DES: F.A.C.	BY	NO.	REVISION	DATE
DRN: J.N.W.				
CHK: F.A.C.				
DATE: 3/00				

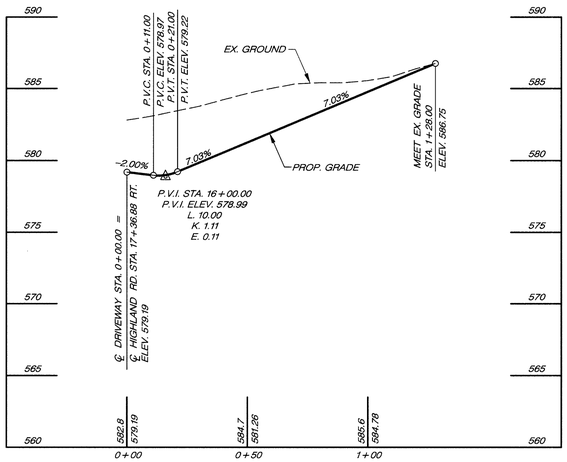
CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. _____ DATE: _____

HIGHLAND ROAD PROFILE
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

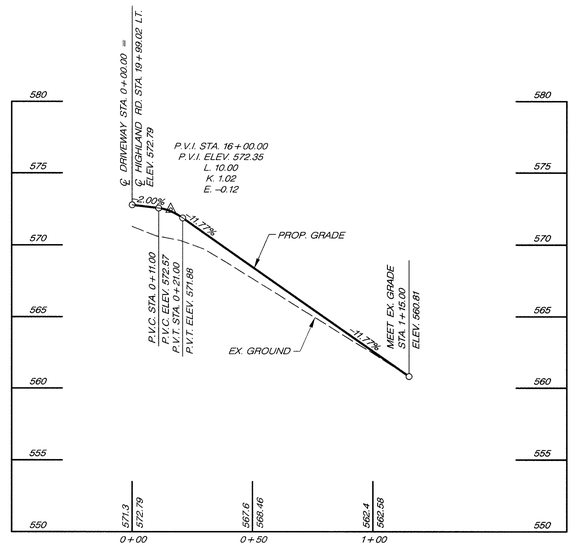
SCALE AS SHOWN

SHEET 10 OF 13

FILE: k:\96-309.047\station\reviewdesign\ps10high.dgn
DATE: 13-Mar-00 08:51



DRIVEWAY PROFILE
SCALE: HORZ. 1" = 30'
VERT. 1" = 5'



DRIVEWAY PROFILE
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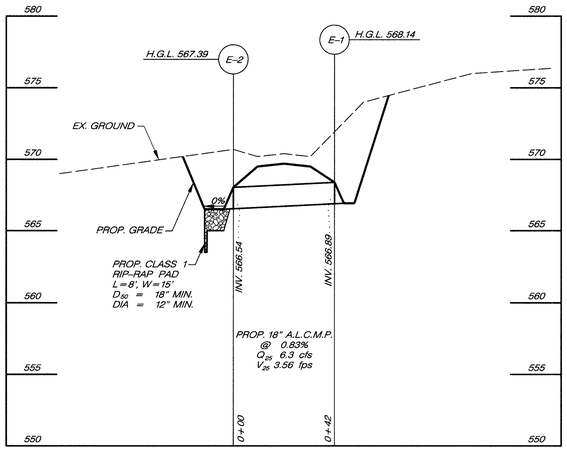
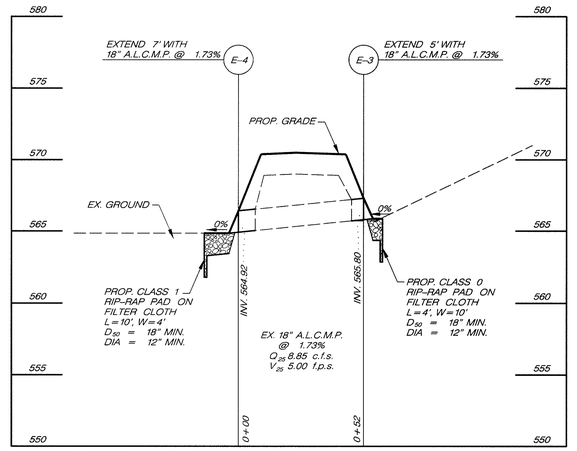
VERT. 1" = 5'



STORM DRAIN PROFILE
SCALE: HORZ. 1" = 30'
VERT. 1" = 5'



STORM DRAIN EXTENSION PROFILE
SCALE: HORZ. 1" = 30'
VERT. 1" = 5'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00
CHIEF, BUREAU OF ENGINEERING — DATE 4/27/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00
CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-047

BOARD OF PROFESSIONAL ENGINEERS — No. 23808 — PATRICK A. CAVANAUGH — STATE OF MARYLAND — 3/14/00

DES: F.A.C.
DRN: J.N.W.
CHK: F.A.C.
DATE: 3/00

BY	NO.	REVISION	DATE

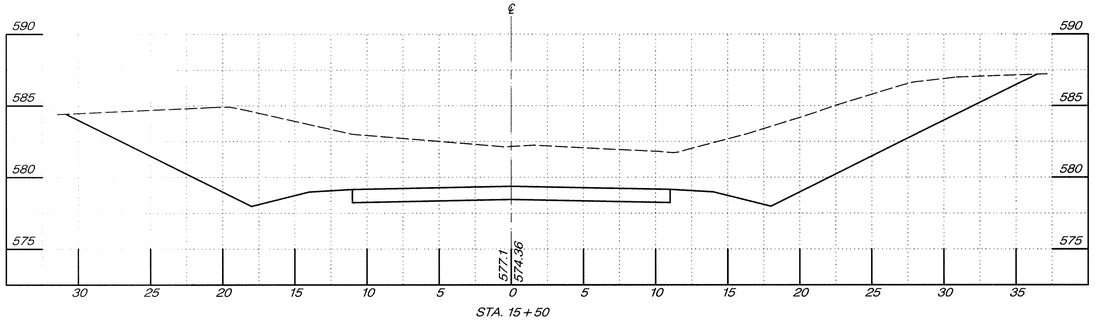
CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. _____ DATE: _____

DRIVEWAY AND DRAINAGE PROFILES
Highland Rd. Improvements Triadelphia Mill Road to Ten Oaks Road

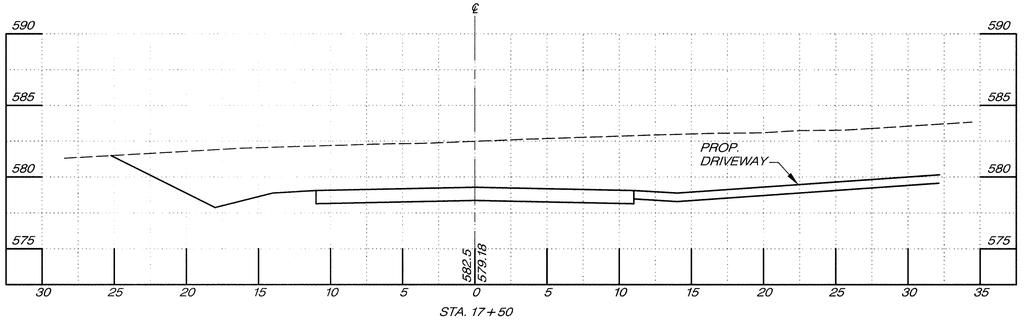
SCALE AS SHOWN

SHEET 11 OF 13

FILE: k:\96-309.047\ustation\newdesign\ps11high.dgn
DATE: 13-Mar-00 09:11



STA. 15+50



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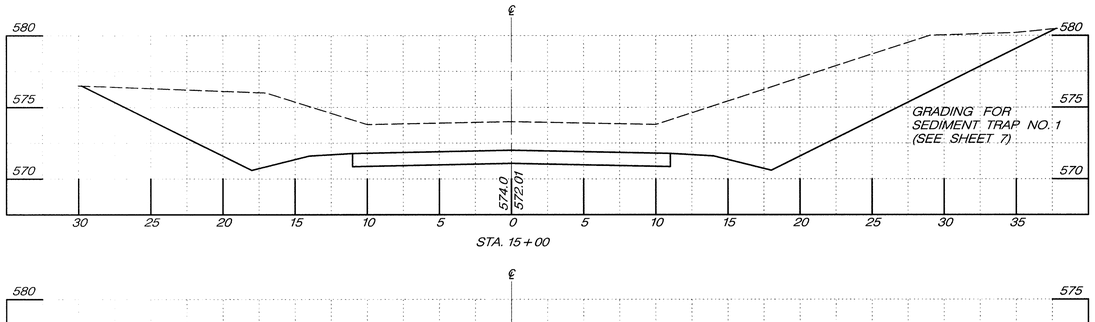

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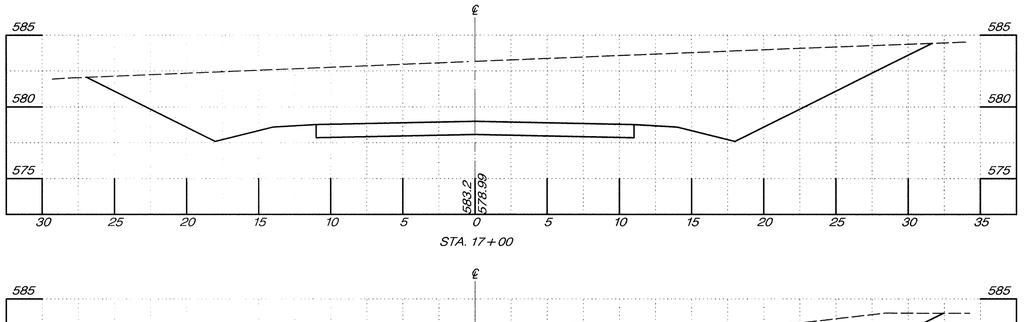

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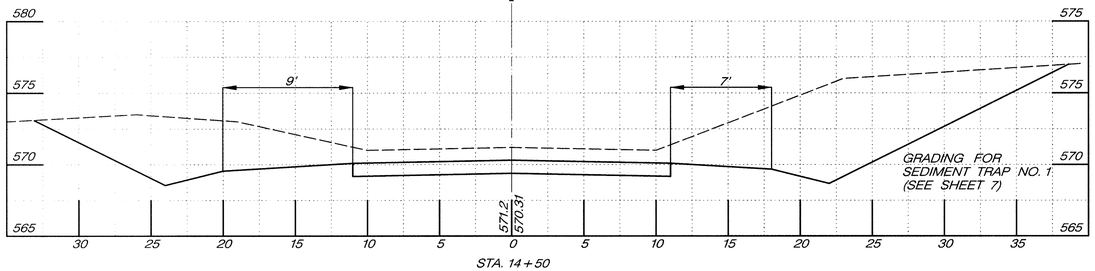
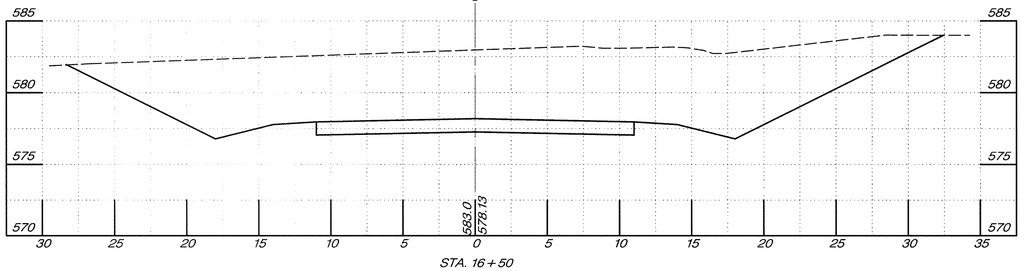


STA. 14+50



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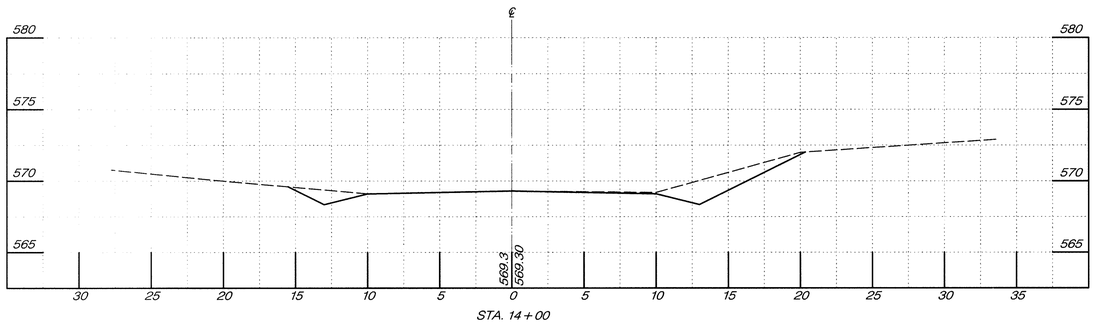

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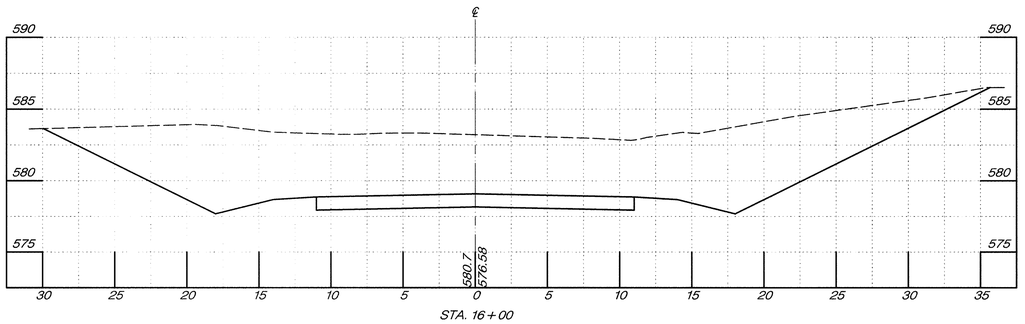


STA. 16+00

CROSS SECTIONS

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

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00
CHIEF, BUREAU OF ENGINEERING — DATE 4/27/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00
CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 96-309-047

BOARD OF PROFESSIONAL ENGINEERS No. 23601 FREDERICK A. CARLSON STATE OF MARYLAND 3/14/00

DES: F.A.C.						
DRN: A.M.T.						
CHK: F.A.C.						
DATE: 300	BY	NO.	REVISION	DATE	600' SCALE MAP NO. _____ DATE: _____	

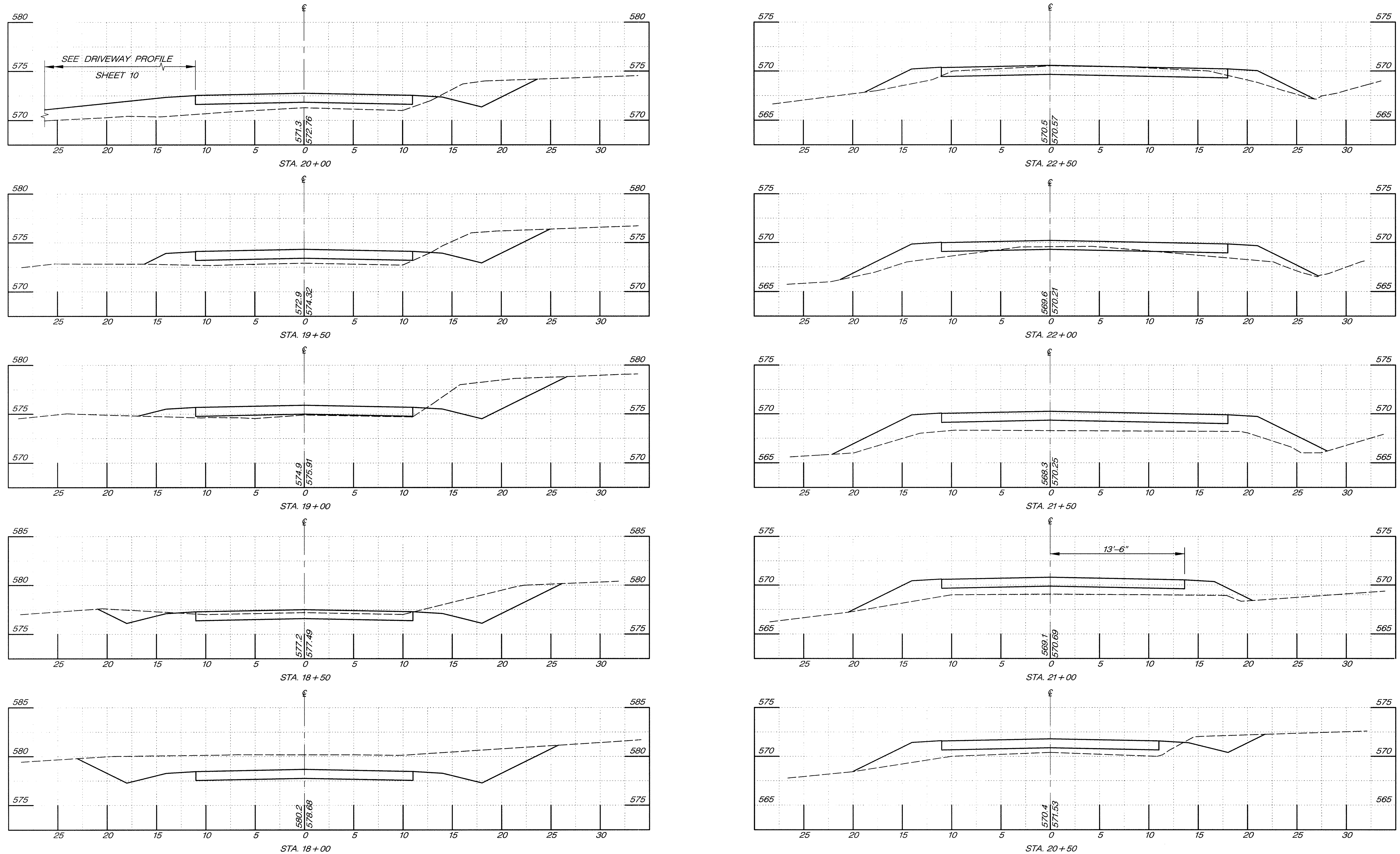
CAPITAL PROJECT NO.
J-4164

CROSS SECTIONS
Highland Rd. Improvements
Triadelphia Mill Road to Ten Oaks Road

SCALE AS SHOWN

SHEET 12 OF 13

FILE: k:\96-309.047\ustation\newdesign\cs12highdgn
DATE: 10-Mar-00 12:33



CROSS SECTIONS
SCALE: HORIZ. 1" = 5'
VERT. 1" = 5'

DEPARTMENT OF PUBLIC WORKS HOWARD COUNTY, MARYLAND DEPARTMENT OF PUBLIC WORKS — DATE 4/27/00 CHIEF, BUREAU OF ENGINEERING — DATE 4/27/00 CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 4/27/00 CHIEF, BUREAU OF HIGHWAYS — DATE 4-27-00	A/E GROUP, INC. ENGINEERS • PLANNERS 181 E. Main Street Westminster, Maryland 21158 A/E Job No. 96-309-047	DES: F.A.C. DRN: A.M.T. CHK: F.A.C. DATE: 300	BY / NO. / REVISION / DATE	CAPITAL PROJECT NO. J-4164 600' SCALE MAP NO. ______ DATE: ______

CROSS SECTIONS
Highland Rd. Improvements
Triadelphia Mill Road to
Ten Oaks Road

SCALE AS SHOWN

SHEET 13 OF 13

FILE: k:\96-309.047\ustation\newdesign\cs12high.dgn
DATE: 10-Mar-00 12:33