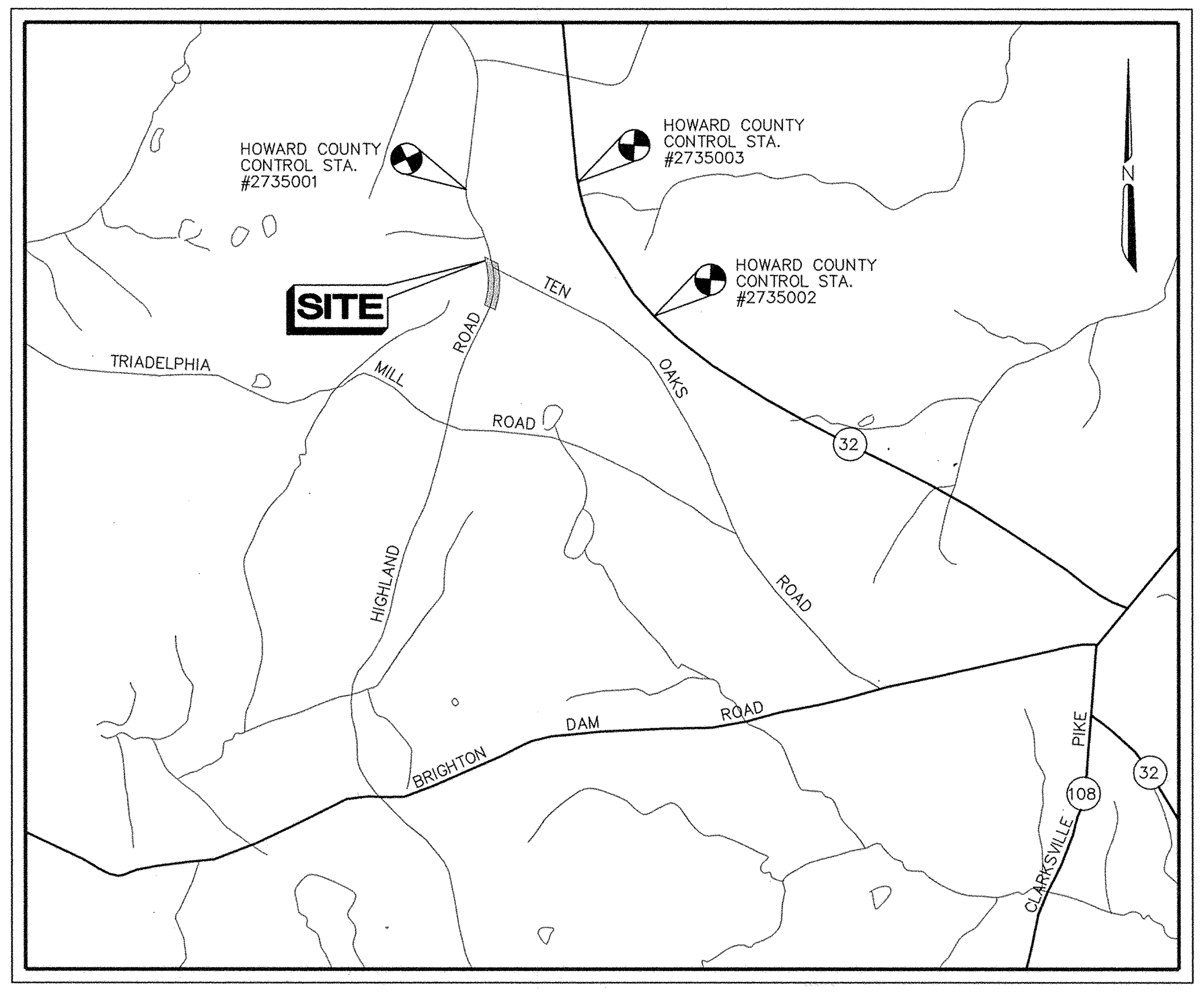
INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	PLAN AND TYPICAL SECTION
3	SEDIMENT AND EROSION CONTROL PLAN
4	SEDIMENT AND EROSION CONTROL DETAILS
5	SEDIMNET AND EROSION CONTROL DETAILS
6	SEDIMENT AND EROSION CONTROL DETAILS
7	SIGNING AND MARKING PLAN
8	TRAFFIC CONTROL PLAN 1
9	TRAFFIC CONTROL PLAN 2
10	PROFILE AND CROSS SECTIONS



LOCATION MAP
SCALE 1" = 2000'

GENERAL NOTES

1. ALL INFORMATION AND DETAILS ON THESE DRAWINGS SHALL BE AS DIRECTED BY THE HOWARD COUNTY ENGINEER.
2. ALL STATIONING AND DIMENSIONING ARE TO BE FIELD VERIFIED BY THE CONTRACTOR.
3. STORM DRAINAGE SLOPES ARE TO BE AS DIRECTED BY HOWARD COUNTY ENGINEER UNLESS OTHERWISE SHOWN ON PLANS.
4. APPROXIMATE LOCATION 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 ENGINEER BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL NOTIFY THE FOLLWING UTILITIES OR AGENCIES AT LEAST FIVE (5) DAYS BEFORE STARTING WORK SHOWN ON THESE PLANS.

   MISS UTILITY 1-800-257-7777
   Baltimore Gas & Electric Company - Electric Distribution Engineering 234-6313
   Transcontinental Gas Pipeline Corp.
   804-973-4384

   THE CONTRACTOR SHALL CONTACT THE HOWARD COUNTY CONSTRUCTION INSPECTION DIVISION OF ENGINEERING FOR VERIFICATION AND/OR INFORMATION REGARDING:
   A. PROPOSED/EXISTING RIGHT-OF-WAY.
   B. UTILITY RELOCATION.
   C. MAINTENANCE OF TRAFFIC DURING CONSTRUCTION.
   D. EROSION/SEDIMENT CONTROL CERTIFICATION AND PERMIT
   E. HORIZONTAL/VERTICAL SURVEY CONTROL.
   F. GRADING PERMIT.
5. SEE HOWARD COUNTY STANDARD DETAILS NO'S G-1.01 & G-1.02 FOR STANDARD SYMBOLS.
6. COORDINATES BASED ON NAD '27, MARYLAND COORDINATE SYSTEM AS PROJECTED BY HOWARD COUNTY GEODETIC CONTROL STATIONS NO. 2735001, NO. 2735002, AND NO. 2735003.

2735001	N. 506548.622 E. 806859.909 ELEV. 591.35
2735002	N. 504719.569 E. 809512.659 ELEV. 560.03
2735003	N. 506705.382 E. 807986.540 ELEV. 565.39

7. MAINTENANCE OF TRAFFIC SHALL BE HANDLED BY STANDARD MD-104.04-01, 104.04-02, 104.33-01 AND 104.33-02 MARYLAND DEPARTMENT OF TRANSPORTATION - WORK ZONE TRAFFIC CONTROL TYPICAL - SHOULDER WORK.
8. MAINTENANCE AND PROTECTION OF TRAFFIC DURING CONSTRUCTION AT TIE IN ALONG HIGHLAND ROAD SHALL BE STANDARD MD-104.31-01 AND 104.32-01 MARYLAND DEPARTMENT OF TRANSPORTATION AND WORK ZONE TRAFFIC CONTROL TYPICAL INTERSECTION FLAGGING OPERATION.
9. A STAGING AND STOCKPILE AREA TO BE DETERMINED BY CONTRACTOR AND APPROVED BY HOWARD COUNTY ENGINEER.
10. TOPOGRAPHIC SURVEY INFORMATION BASED ON FIELD SURVEY PERFORMED BY SPOTTS, STEVENS, AND McCOY, INC. DATED 9/19/91

CAPITAL PROJECT NO. J-4164

Highland Road at Ten Oaks Road

HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS

REVIEWED FOR HOWARD COUNTY SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.
[signature] 3/23/00
U.S. Natural Resources Conservation Service — Date

THIS DEVELOPMENT IS APPROVED FOR EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.
[signature] 3/23/00
Howard Soil Conservation District — Date

APPROVED: FOR STORM DRAINAGE SYSTEMS AND PUBLIC ROADS. HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS.
Elizabeth Anderson Calea 3/20/00
CHIEF, DIVISION OF TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT. — DATE

BENCHMARKS

- BM #2735001 N 506548.622 E 806859.909 ELEV. 591.35
  CONCRETE MONUMENT LOCATED 0.1' BELOW SURFACE ON TEN OAKS ROAD
- BM #2735002 N 504719.569 E 809512.659 ELEV. 560.32
  CONCRETE MONUMENT LOCATED 0.4' BELOW SURFACE ON ROUTE 32
- BM #2735003 N 506705.382 E 807986.540 ELEV. 565.39
  CONCRETE MONUMENT LOCATED 0.1' BELOW SURFACE ON ROUTE 32

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

[signature] 3/21/00 — DEPARTMENT OF PUBLIC WORKS — DATE
Elizabeth Anderson Calea 3/20/00 — CHIEF, BUREAU OF ENGINEERING, acting — DATE
[signature] 3/20/00 — CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE
[signature] 3/21/00 — CHIEF, BUREAU OF HIGHWAYS — DATE

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

BOARD OF PROFESSIONAL ENGINEERS — No. 23505 — FREDERICK A. CARIVAN — STATE OF MARYLAND — 3/13/00

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

BY	NO.	REVISION	DATE

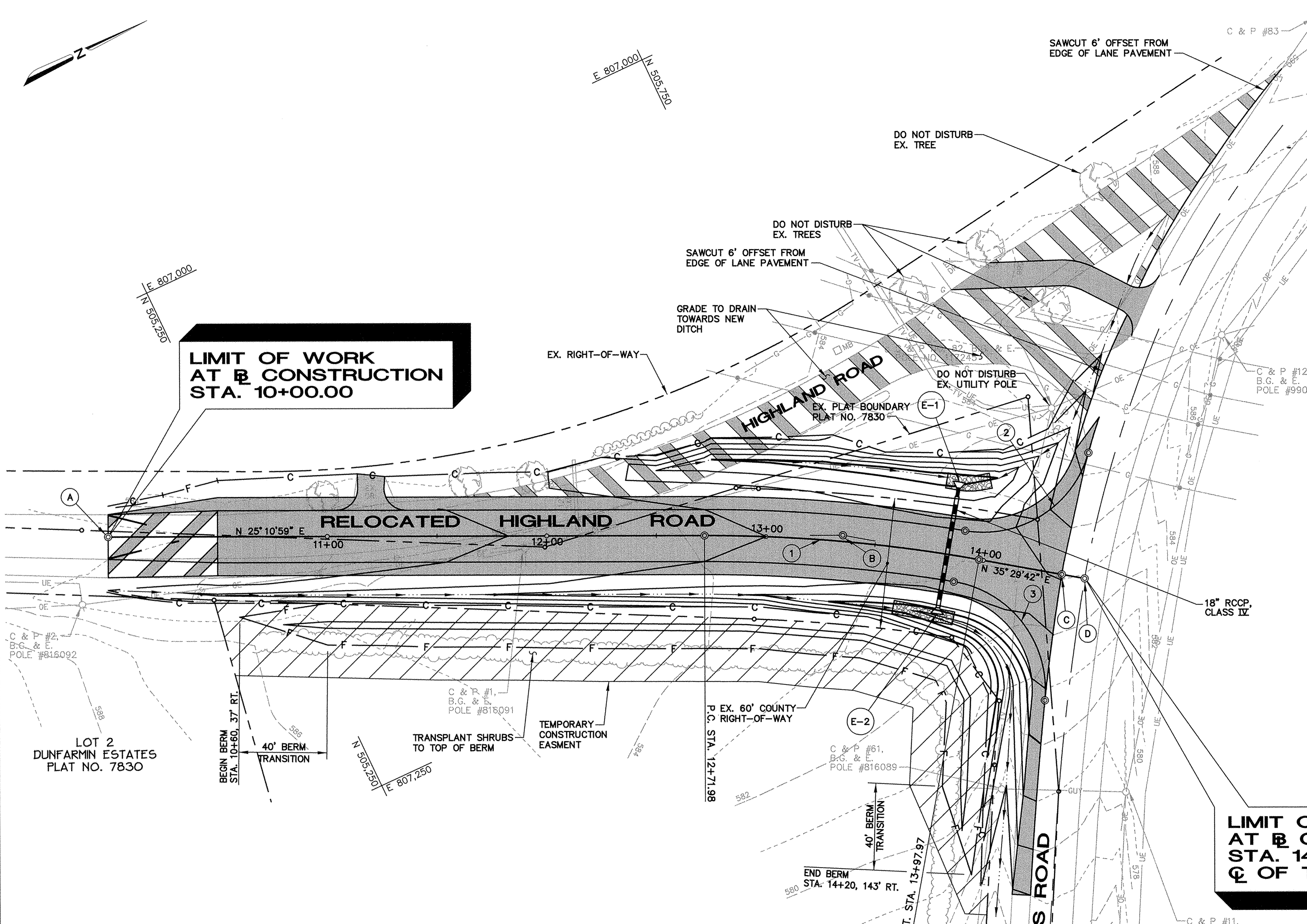
CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. ________ DATE: ________

TITLE SHEET
Highland Road at Ten Oaks Road

SCALE AS SHOWN
SHEET 1 OF 10

FILE: n:\99-393.002\ustation\ps01.dgn
DATE: 09-Mar-00 10:13

EP-99-01



PLAN
SCALE: 1" = 30'

REMOVE AND BACKFILL EXISTING 12" C.M.P.
STA. 12+11 LT. TO STA. 12+14 LT. --- 1 EA.

REMOVE AND SALVAGE EXISTING SIGNS AS DIRECTED BY THE ENGINEER
STA. 11+33 RT. --- 1 EA.
STA. 14+30, 75' LT. --- 1 EA.
STA. 14+38 149' LT. --- 1 EA.
*STA. 14+46 300'± LT. --- 1 EA.
*NOT SHOWN ON PLAN

REMOVE EXISTING TREES AS DIRECTED BY THE ENGINEER
STA. 10+98 LT. --- 1 EA.
STA. 11+60 LT. --- 1 EA.
STA. 11+90 LT. --- 1 EA.

RELOCATE EXISTING SIGNS AS DIRECTED BY THE ENGINEER
STA. 10+30 LT. --- 1 EA.
STA. 14+25 LT. --- 1 EA.

RELOCATE EXISTING UTILITY POLES (BY OTHERS)
STA. 11+90 RT. --- 1 EA.
STA. 14+21 RT. --- 1 EA.

RELOCATE EXISTING MAILBOX AS DIRECTED BY THE ENGINEER
STA. 13+20, 87' LT. --- 1 EA.

RELOCATE UNDERGROUND TV LINE (BY OTHERS)
STA. 14+25 LT. TO RT. --- 1 EA.

INSTALL PROPOSED SIGN AS DIRECTED BY THE ENGINEER
STA. 14+46 350 LT. --- 1 EA.

INSTALL PROPOSED SHRUBS
STA. 10+60 TO STA. 14+20 RT. --- 6 EA.
STA. 14+12 RT. --- 1 EA.
LOCATIONS TO BE DETERMINED BY THE COUNTY WHEN THE EXISTING SHRUBS ARE RELOCATED.

PIPE SCHEDULE

FROM	TO	TYPE	SIZE	LENGTH	SLOPE	INV. FROM	INV. TO	Q (cfs)	V (fps)
E-1	E-2	RCCP, CLASS IV	18"	56 LF.	1.03%	579.32	578.70	1.70	2.73

CONSTRUCTION ℄ GEOMETRY

POINT NO.	NORTH	EAST	REMARK
A	505,186.084	807,093.476	STA. 10+00.00 LIMIT OF WORK (NEW)
B	505,489.375	807,236.085	STA. 13+35.15 P.I., CURVE NO. 1
C	505,572.132	807,295.104	STA. 14+36.45 WEST EDGE OF TEN OAKS ROAD
D	505,580.801	807,301.286	STA. 14+47.10 LIMIT OF WORK, TEN OAKS RD.

STRUCTURE SCHEDULE

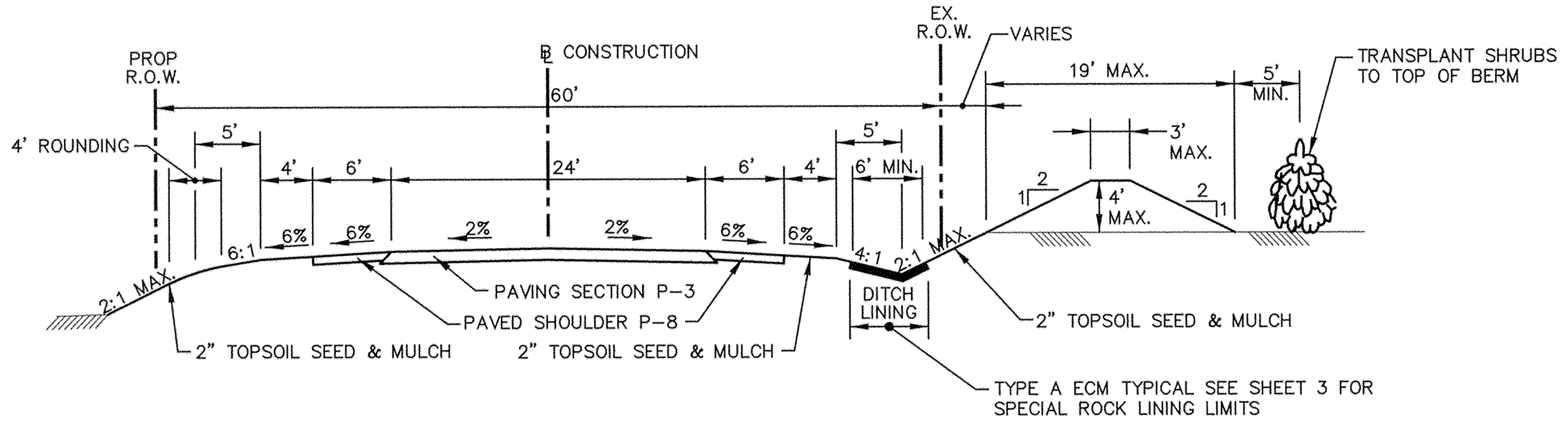
STRUCTURE NO.	TYPE	REMARKS	STATION/OFFSET
E-1	STD. RCCP END SECT.	SD-5.61 RIP RAP 19'x6'	13+81.00 31.0' LT.
E-2	STD. RCCP END SECT.	SD-5.61 RIP RAP 28'x6'	13+81.00 25.0' RT.

CURVE DATA

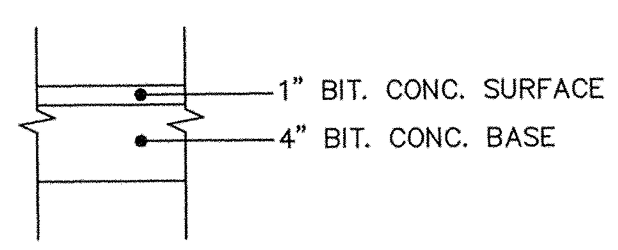
CURVE NO.	P.C. STA./OFFSET	P.T. STA./OFFSET	Δ	R	T	L
1	12+71.98/0.0'	13+97.97/0.0'	10° 18'42"	700.00'	63.16'	125.98'
2	13+89.57/12.0' LT.	14+38.61/57.33' LT.	84° 01'01"	50.00'	45.03'	73.32'
3	13+88.24/12.0' RT.	14+38.94/58.05' RT.	86° 43'25"	50.00'	47.22'	75.68'

DRIVEWAY TABLE
USE P-1 PAVING SECTION BELOW

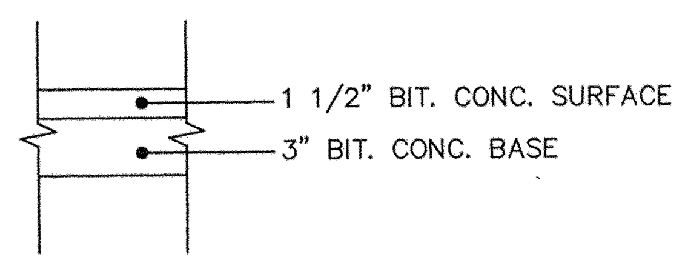
℄ STATION	WIDTH	STD. DETAIL
11+20.00 LT.	12'	R-6.06
13+66.00 LT.	12'	R-6.06



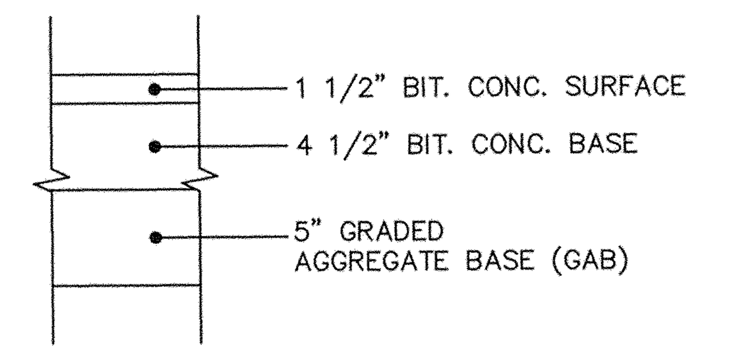
TYPICAL SECTION
NOT TO SCALE



P-1 PAVING SECTION
NOT TO SCALE
(DRIVEWAY PAVING SECTION FOR USE WITH R-6.06)



P-8 PAVING SECTION
NOT TO SCALE
(SHOULDER PAVING SECTION)



P-3 PAVING SECTION
NOT TO SCALE

LEGEND
- FULL DEPTH CONSTRUCTION
- MILL AND RESURFACE
- EXISTING PAVEMENT TO BE REMOVED
- —C— TOP OF CUT
- —F— LIMIT OF FILL

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND
DIRECTOR OF PUBLIC WORKS — DATE 3/21/00
CHIEF, BUREAU OF ENGINEERING, act. — DATE 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE 3/21/00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

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

BY	NO.	REVISION	DATE

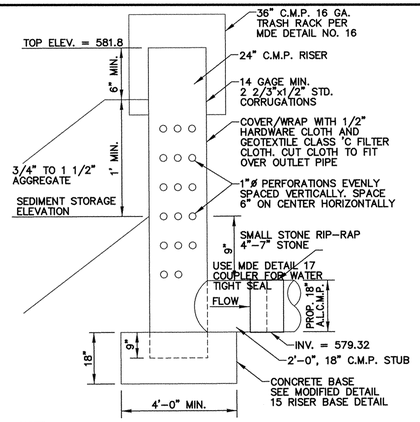
600' SCALE MAP NO. ______ DATE: ______

CAPITAL PROJECT NO.
J-4164

PLAN AND TYPICAL SECTION
Highland Road at Ten Oaks Road

SCALE AS SHOWN

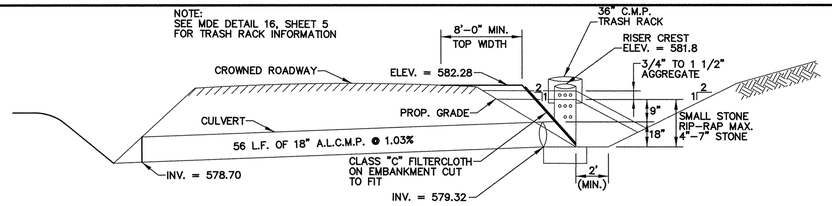
FILE: n:\99-393.002\ustation\ps02.dgn
DATE: 10-Mar-00 11:20



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

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

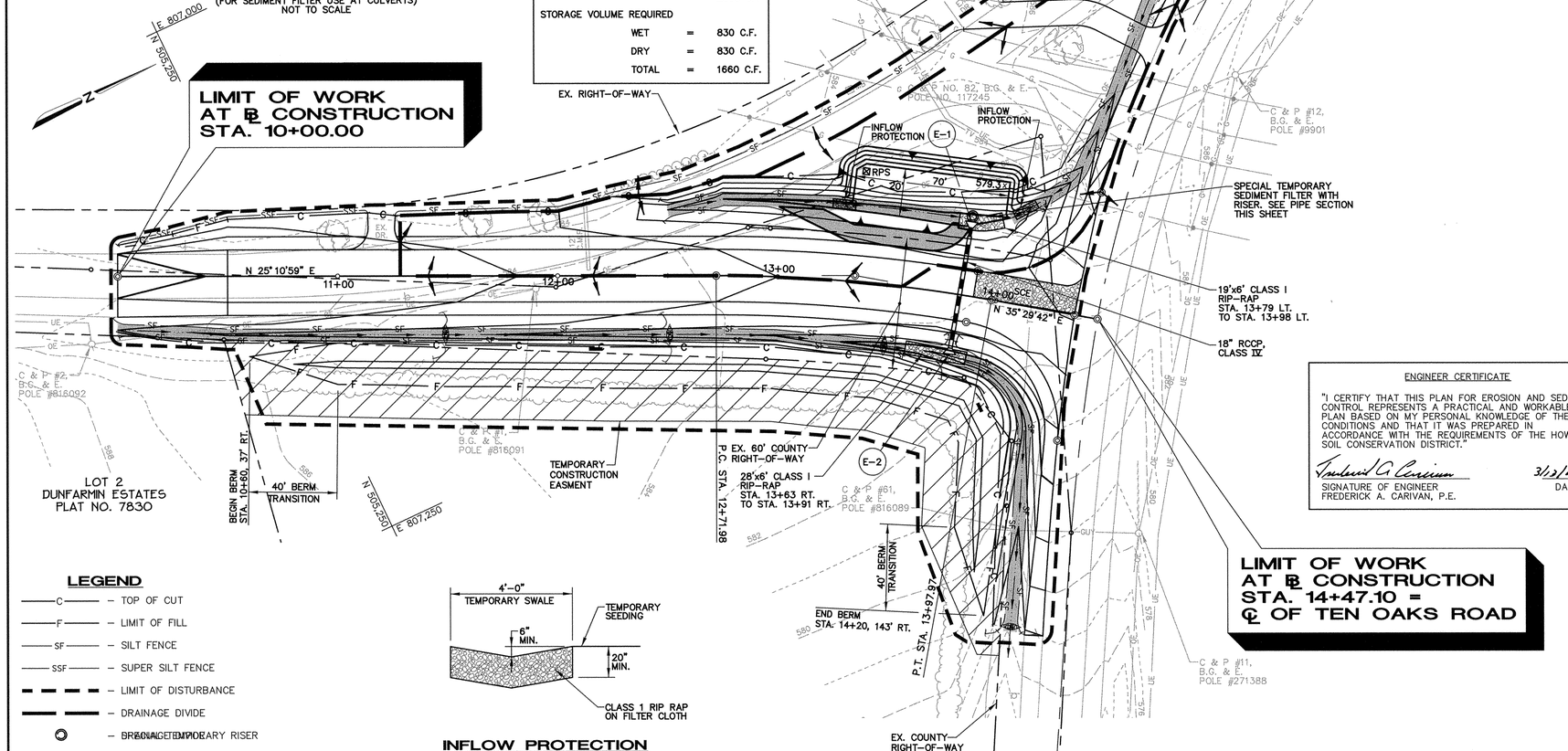
NOTE:
SEE MDE DETAIL 16, SHEET 5
FOR TRASH RACK INFORMATION



TYPICAL SECTION CULVERT WITH SPECIAL TEMPORARY RISER
NOT TO SCALE

SEDIMENT TRAP NO. 1
(MODIFIED ST-1)

WET POOL ELEVATION	=	579.89
DRAINAGE AREA	=	0.46 AC.
ROAD STORAGE VOLUME	=	1,715 CF.
SIDE SLOPES	=	2:1
STORAGE VOLUME PROVIDED	=	70'x20'x2'
	=	2800 CF.
STORAGE VOLUME REQUIRED		
WET	=	830 C.F.
DRY	=	830 C.F.
TOTAL	=	1660 C.F.



LEGEND

C	– TOP OF CUT
F	– LIMIT OF FILL
SF	– SILT FENCE
SSF	– SUPER SILT FENCE
	– LIMIT OF DISTURBANCE
	– DRAINAGE DIVIDE
	– SPECIAL TEMPORARY RISER
RPS	– REMOVABLE PUMPING STATION
	– MODIFIED CHECK DAM
	– DITCH AREAS TO RECIEVE EROSION CONTROL MATTING

INFLOW PROTECTION
NOT TO SCALE

PLAN
SCALE: 1" = 30'

SEDIMENT CONTROL NOTES

1. A MINIMUM OF 24 HOURS NOTICE MUST BE GIVEN TO THE HOWARD COUNTY OFFICE OF INSPECTIONS AND PERMITS PRIOR TO THE START OF ANY CONSTRUCTION (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.
3. FOLLOWING INITIAL SOIL DISTURBANCE OR REDISTURBANCE, PERMANENT OR TEMPORARY STABILIZATION SHALL BE COMPLETED WITHIN: A) 7 CALENDAR DAYS FOR ALL PERIMETER SEDIMENT CONTROL STRUCTURES, DIKES, PERIMETER SLOPES AND ALL SLOPES GREATER THAN 3:1; B) 14 DAYS AS TO ALL OTHER DISTURBED OR GRADED AREAS ON THE PROJECT SITE.
4. ALL SEDIMENT TRAPS/BASINS SHOWN MUST BE FENCED AND WARNING SIGNS POSTED AROUND THEIR PERIMETER IN ACCORDANCE WITH VOL. 1, CHAPTER 12, 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 (SEC. 51), SOD (SEC. 54), TEMPORARY SEEDING (SEC. 50) AND MULCHING (SEC. 52). TEMPORARY STABILIZATION WITH MULCH ALONE CAN 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 THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR.
7) SITE ANALYSIS:

TOTAL AREA OF SITE	N/A
AREA DISTURBED	1.32 ACRES
AREA TO BE ROOFED OR PAVED	0.37 ACRES
AREA TO BE VEGETATIVELY STABILIZED	0.52 ACRES
TOTAL CUT	1443.00 CU. YDS.
TOTAL FILL	34.00 CU. YDS.
OFFSITE WASTE/BORROW AREA LOCATION	TO BE DETERMINED BY CONTRACTOR (SITE WITH A CURRENT ACTIVE GRADNG 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 DPW SEDIMENT CONTROL INSPECTOR.
10. ON ALL SITES WITH DISTURBED AREAS IN EXCESS OF 2 ACRES, APPROVAL OF THE INSPECTION AGENCY SHALL BE REQUESTED UPON COMPLETION OF INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS, BUT BEFORE PROCEEDING WITH ANY OTHER EARTH DISTURBANCE OR GRADING. OTHER BUILDING OR GRADING INSPECTION APPROVALS MAY NOT BE AUTHORIZED UNTIL THIS INITIAL APPROVAL BY THE INSPECTION AGENCY IS MADE.

SEQUENCE OF CONSTRUCTION

1. OBTAIN PERMISSION FROM HOWARD COUNTY SEDIMENT CONTROL INSPECTOR TO PROCEED. – 1 DAY
2. OBTAIN GRADING PERMIT. – 1 DAY
3. RELOCATE (2) EXISTING UTILITIES AS REQUIRED. – 2 DAYS.
4. INSTALL STABILIZED CONSTRUCTION ENTRANCE, PERIMETER SILT FENCE, AND THE 18" A.L.C.M.P. ROAD CULVERT WITH 24" RISER ATTACHMENT SEDIMENT CONTROL MEASURES AS SHOWN ON PLANS. – 2 DAYS
5. INSTALL ROADSIDE DITCHES AS SHOWN ON THE PLANS. STABILIZE WITH E.C.M., THEN LINE BOTH SIDES OF DITCH WITH SILT FENCE. – 2 DAYS.
6. EXCAVATE FOR THE CONSTRUCTION OF ROADWAY. STABILIZE THE ROADWAY 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. – 5 DAYS
7. PLACE PERMANENT STABILIZATION ON EARTH SLOPES. – 2 DAYS
8. INSTALL BITUMINOUS CONCRETE BASE COURSE ON ROADWAY. – 2 DAYS
9. SWITCH TRAFFIC TO NEW ROADWAY AND REMOVE EXISTING PAVEMENT AS SHOWN ON PLANS – 5 DAYS
10. PLACE BITUMINOUS CONCRETE SURFACE COURSES – 2 DAYS
11. REMOVE SEDIMENT CONTROL DEVICES WITH APPROVAL FROM THE HOWARD COUNTY SEDIMENT CONTROL INSPECTOR. – 1 DAY

NOTES

1. CONTRACTOR TO PROVIDE STONE CONSTRUCTION ENTRANCES IN THE WORK ZONES DURING ALL PHASES OF CONSTRUCTION. SEE DETAIL NO. 24 ON SHEET 4 OF 9.
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.

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 — 3/13/00
SIGNATURE OF ENGINEER FREDERICK A. CARIVAN, P.E. — DATE

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."

Edward Calea — 3/20/00
SIGNATURE OF DEVELOPER, agt — DATE
PRINT NAME BELOW SIGNATURE

FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

James J. Irvin — 3/20/00
DEPARTMENT OF PUBLIC WORKS — DATE

Edward Calea — 3/20/00
CHIEF, BUREAU OF ENGINEERING, acty — DATE

Edward Calea — 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE

Clarence W. Lamielle — 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

BOARD OF PROFESSIONAL ENGINEERS — No. 23808 — FREDERICK A. CARIVAN — STATE OF MARYLAND
3/13/00

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: _____

SEDEMENT AND EROSION CONTROL PLAN
Highland Road at Ten Oaks Road

SCALE AS SHOWN

SHEET 3 OF 10

FILE: n:\99-393.002\ustation\pe03.dgn
DATE: 10-Mar-00 08:48

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 shall 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 e 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 prescribed 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% split plus clay) to provide the capacity to hold a moderate amount of moisture. An exception is if lovegrass or sericia 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 sufficient pore space to permit adequat 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 topsoil 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 or other suitable mans. 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 preceding 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. Inoculant – The inoculant for treating legume seed in the seed mixtures shall be a pure culture of nitrogen–fixing bacteria prepared specifically for the species. Inoculant shall not be used later than the date indicated 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.

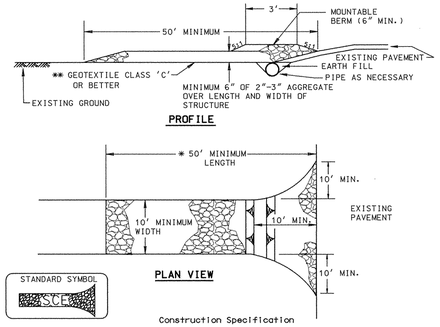
E. Methods of Seeding
   i. Hydroseeding: Apply seed uniformly with hydroseeder (slurry includes seed and fertilizer), broadcast or drop seeder, or a cultipacker seeder.
      a. If fertilizer is being applied at the time of seeding, the application rates amounts will not exceed the following: nitrogen; 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 or 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. Cultipacking seeders are required to bury the seed in such a fashion as to provide at least 1/4 inch of 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 seedings.
      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 loss 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 practice 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 e mixed with water and the mixture shall contain a maximum of 50 pounds of wood cellulose fiber per 100 gallons of water.
   iii. Application 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 e 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 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.

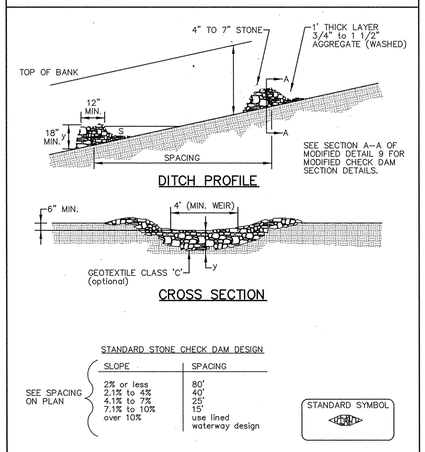
4. Stone – crushed aggregate (2" to 3") or reclaimed or recycled concrete equivalent shall be placed at least 6" deep over the length and width of the entrance.

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.

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

MODIFIED 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

SEE SPACING ON PLAN

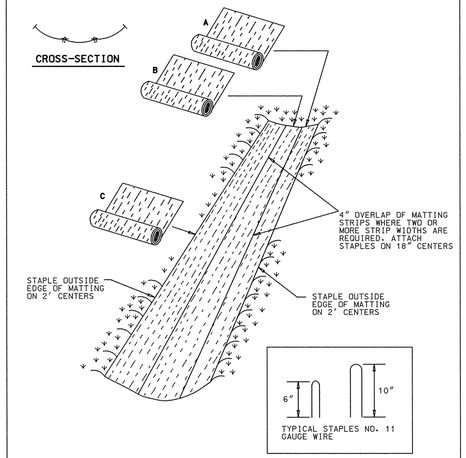
STANDARD SYMBOL

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 IS keyed into the channel banks.
3. The top of the check dam shall be constructed so 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 3/4" to 1 1/2" aggregate.
6. Accumulated sediment shall be removed when it has built up to 1/2 of the original height of the weir crest.

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE B – 8 – 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 30 – EROSION CONTROL MATTING



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

EROSION CONTROL MATTING

Construction Specifications

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

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

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

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

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

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

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

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

FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 3/21/00
CHIEF, BUREAU OF ENGINEERING — DATE 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE 3/21/00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99–393–002

BOARD OF PROFESSIONAL ENGINEERS — No. 23505 — PATRICK A. CROWN — STATE OF MARYLAND — 3/13/00

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 Road at Ten Oaks Road

SCALE AS SHOWN

SHEET 4 OF 10

FILEs:ns\99-393.002\ustation\ps04.dgn
DATE:09-Mar-00 16:25

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.

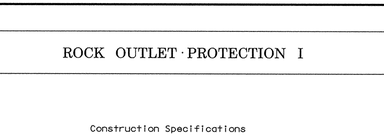
3. Geotextile shall be protected from punching, cutting, or tearing. Any damage other than an occasional small hole shall be repaired by placing another piece of geotextile over the damaged part or by completely replacing the geotextile. All overlaps whether for repairs or for joining two pieces of geotextile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

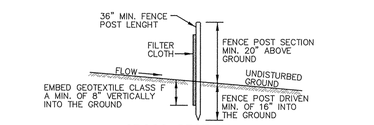
5. The stone shall be placed so that it blends in with the existing ground. If the stone is placed too high then the flow will be forced out of the channel and scour adjacent to the stone will occur.

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

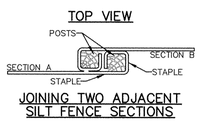
DETAIL 22 – SILT FENCE



PERSPECTIVE VIEW



CROSS SECTION



JOINING TWO ADJACENT SILT FENCE SECTIONS

STANDARD SYMBOL
SF

Construction Specifications

1. Fence posts shall be a minimum of 36" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" X 1 1/2" square (minimum) cut or 1 3/4" diameter (minimum) round and shall bee of sound quality hardwood. Steel posts will be standard T or U section weighting not less than 1.00 pound 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:

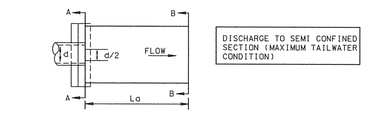
Tensile Strength	50 lbs/in (min.)	Test: MSMT 509
Tensile Modulus	20 lbs/in (min.)	Test: MSMT 509
Flow rate	0.3 gal ft²/minute (max.)	Test: MSMT 322
Filtering Efficiency	75% (min.)	Test: MSMT 322

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.

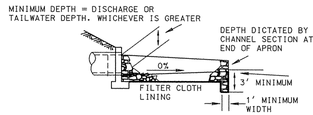
U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE E – 15 – 3	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

DETAIL 25 – ROCK OUTLET PROTECTION I



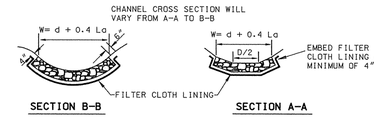
DISCHARGE TO SEMI CONFINED SECTION (MAXIMUM TAILWATER CONDITION)

PLAN VIEW



ELEVATION

NOTE: FILTER CLOTH MUST EXTEND A MINIMUM OF 6" BEYOND APRON AND SIDES

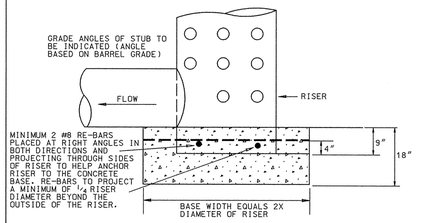


SECTION B-B SECTION A-A

NOTE: FILTER CLOTH SHALL BE GEOTEXTILE CLASS C

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

MODIFIED DETAIL 15 – RISER BASE DETAIL



NOTE: ANCHORING BARS SHOULD PROJECT ¼ DIAMETER BEYOND OUTSIDE OF THE RISER.

Construction Specifications

The riser shall have a base attached with a watertight connection and shall have sufficient weight to prevent flotation of the riser. Two approved bases for risers 10" or less in height are:

1. A concrete base 18" thick with the riser embedded 9" in the base.

2. A ¼" minimum thickness steel plate attached to the riser by a continuous weld around the circumference of the riser to form a watertight connection. The plate shall have 2' of stone, gravel, or compacted earth placed on it to prevent flotation. In either case, each side of the square base shall be twice the riser diameter.

Note: For risers greater than ten feet high computations shall be made to design a base which will prevent floatation. The minimum factor of safety shall be 1.20 (downward forces = 1.20 x upward forces).

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C – 19 – 25	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

STANDARD AND SPECIFICATIONS FOR TOPSOIL

Definition and Purpose

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

To provide a suitable soil medium for vegetative growth. Soils 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 that 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:

   i. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or 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.

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

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

III. For sites having disturbed areas under 5 acres:

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

V. Topsoil Application

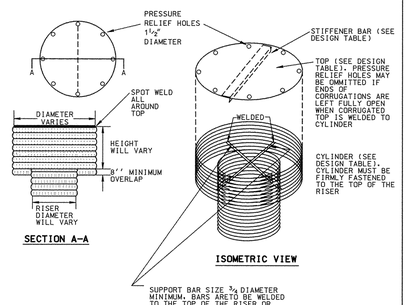
   i. When topsoiling, maintain needed erosion and sediment control practices such as diversions, Grade stabilization Structures, Earth Dikes, Slope Silt Fence and Sediment Traps and Basins.

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

   iii. Topsoil shall be uniformly 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.

   iv. 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.

DETAIL 16 – CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE



SECTION A-A ISOMETRIC VIEW

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE C – 16 – 26	MARYLAND DEPARTMENT OF ENVIRONMENT WATER MANAGEMENT ADMINISTRATION

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

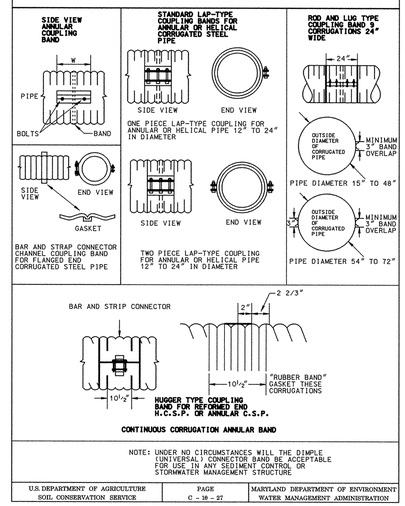
Riser Diam., in.	Trash Rack Cylinder Diam. in.	Thick., gage	H, in.	Minimum Size Support Bar	Minimum Top Thickness	Stiffener
12	18	16	6	#6 Rebar	16 ga.	---
15	21	16	7	"	"	---
18	27	16	8	"	"	---
21	30	16	11	"	"	---
24	36	16	13	"	14 ga.	---
27	42	16	15	"	14 ga.	---
36	54	14	17	#8 Rebar	12 ga.	---
42	60	14	19	"	"	---
48	72	12	21	1-½" pipe or 1-½ x 1-¼ x¼ angle	10 ga.	---
54	78	12	25	"	"	---
60	90	12	29	1-½" pipe or 1-½ x 1-½ x¼ angle	8 ga.	---
66	96	10	33	2" pipe or 2x2x3/16 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 5/16 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 (UNIVERSAL) CONNECTOR BAND BE ACCEPTABLE FOR USE IN ANY SEDIMENT CONTROL OR STORMWATER MANAGEMENT STRUCTURE

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

FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 3/21/00
CHIEF, BUREAU OF ENGINEERING — DATE 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE 3/21/00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99–393–002

BOARD OF PROFESSIONAL ENGINEERS — No. 23586 — PATRICK A. CARVAN — STATE OF MARYLAND — 3/13/00

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 Road at Ten Oaks Road

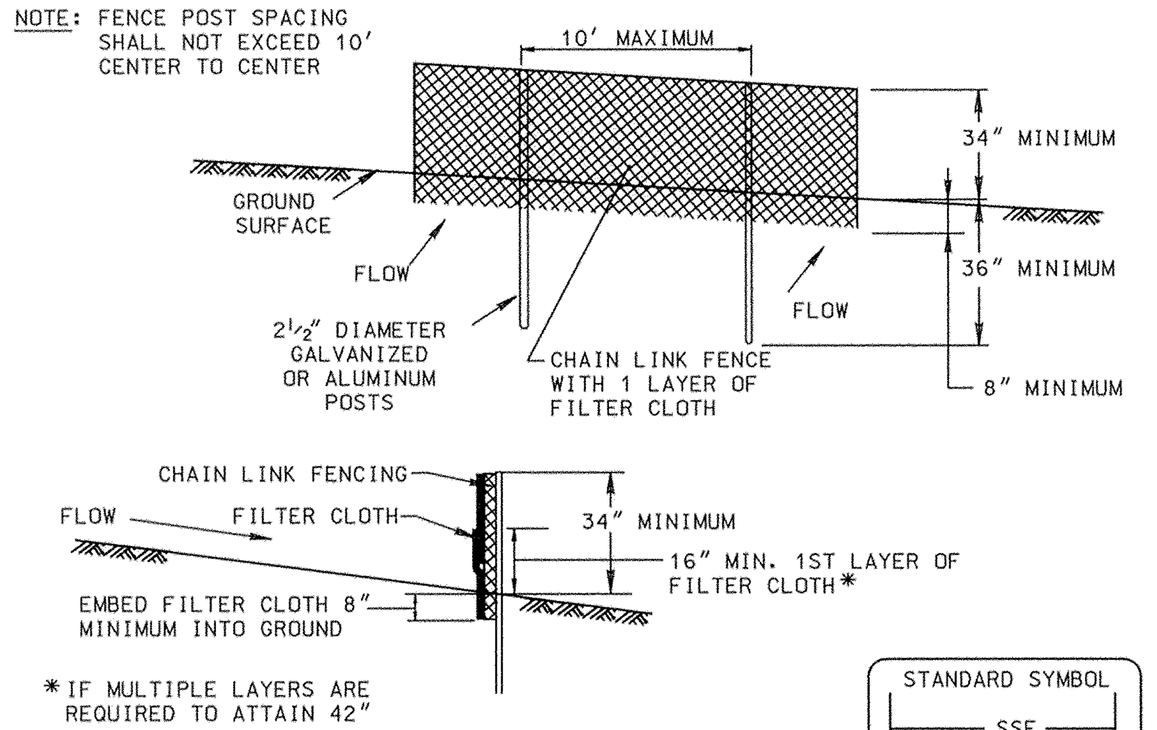
SCALE AS SHOWN

SHEET 5 OF 10

File: n:\99-393_002\ustation\ps05.dgn
DATE: 09-Mar-00 16:26

DETAIL 33 – SUPER SILT FENCE

NOTE: FENCE POST SPACING SHALL NOT EXCEED 10' CENTER TO CENTER



* IF MULTIPLE LAYERS ARE REQUIRED TO ATTAIN 42"

STANDARD SYMBOL

—— SSF ——

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

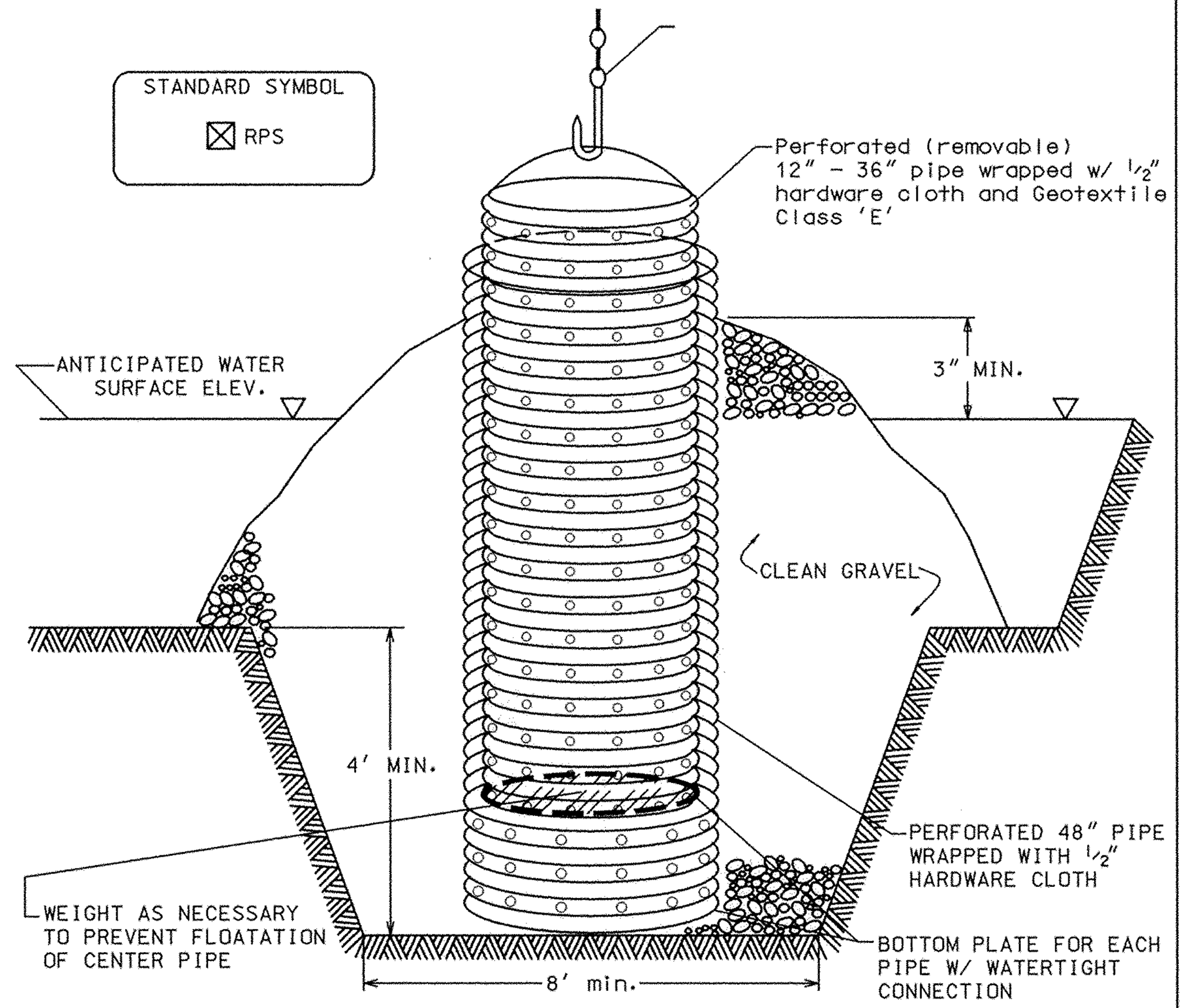
SUPER SILT FENCE

Design Criteria

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

U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	PAGE H - 26 - 3A	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 or PVC pipe between 12" and 36" in diameter. The perforations shall be ½" X 6" slits or 1" 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.

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

FOR SEDIMENT & EROSION CONTROL ONLY

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — 3/21/00 DATE
CHIEF, BUREAU OF ENGINEERING — 3/20/00 DATE
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — 3/20/00 DATE
CHIEF, BUREAU OF HIGHWAYS — 3/21/00 DATE

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

BOARD OF PROFESSIONAL ENGINEERS No. 23595 FREDERICK A. CARIVAN STATE OF MARYLAND 3/13/00

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: ________

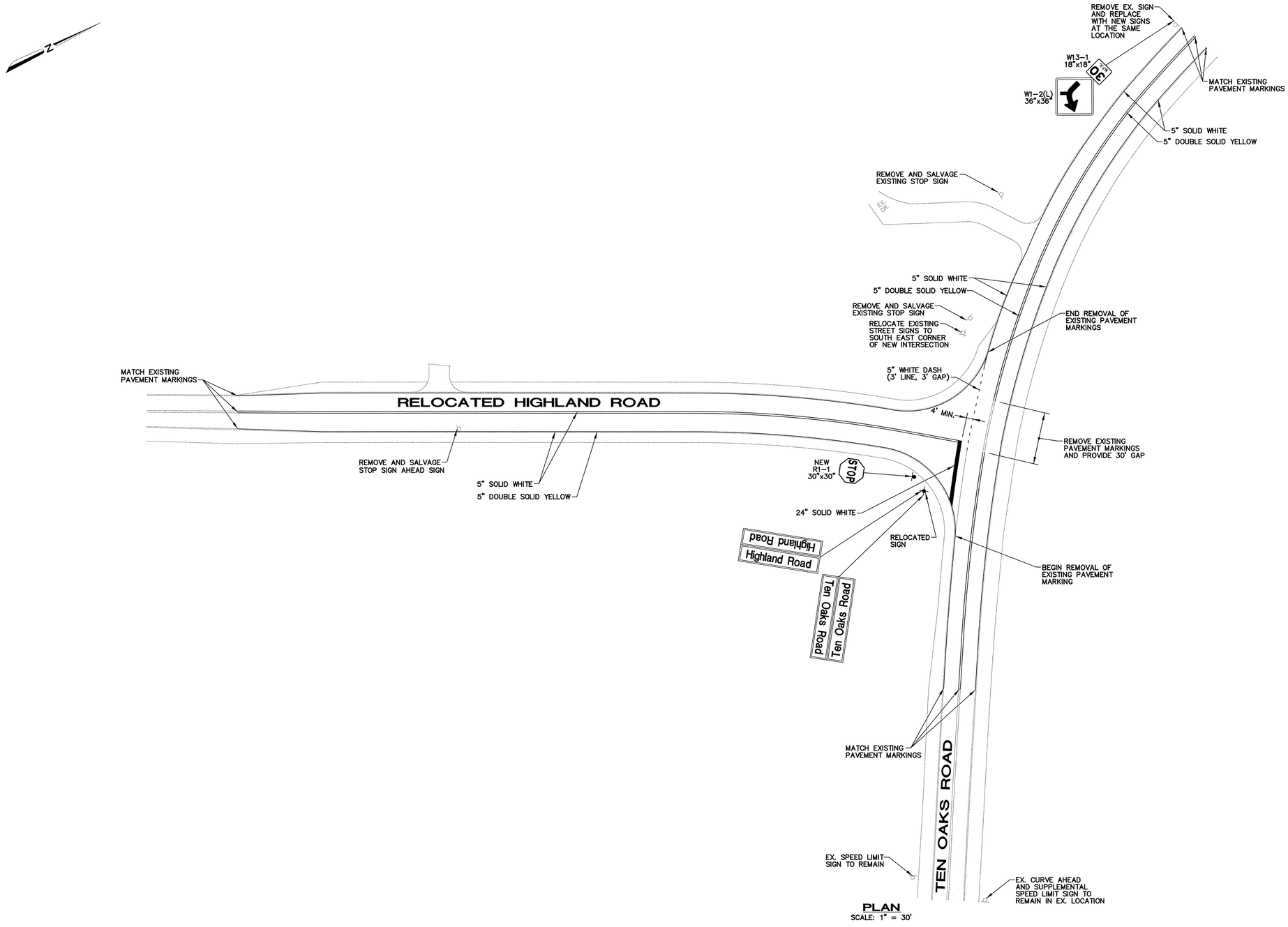
SEDIMENT AND EROSION CONTROL DETAILS

Highland Road at Ten Oaks Road

SCALE AS SHOWN

SHEET 6 OF 10

FILE: n:\99-393.002\ustation\ps06.dgn
DATE: 09-Mar-00 16:27



PLAN
SCALE: 1" = 30'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 3/21/00
CHIEF, BUREAU OF ENGINEERING — DATE 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE 3/21/00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

BOARD OF PROFESSIONAL ENGINEERS — No. 23501 — PATRICK A. CARVIN — STATE OF MARYLAND — 3/13/00

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

BY	NO.	REVISION	DATE

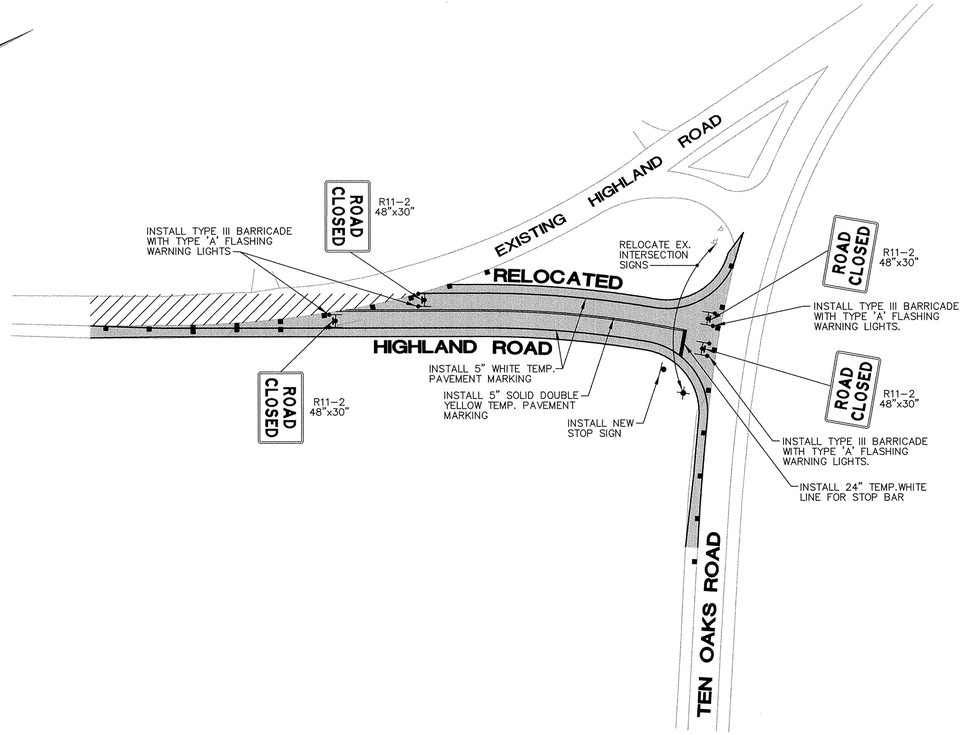
CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. _____ DATE: _____

SIGNING AND PAVEMENT MARKING
Highland Road at Ten Oaks Road

SCALE AS SHOWN

SHEET 7 OF 10

FILE: n:\99-393,002\ustation\ps07.dgn
DATE: 09-Mar-00 16:27



PHASE I
SCALE 1" = 50'

GENERAL NOTES

1. THE MAINTENANCE OF TRAFFIC PLAN AS SHOWN HEREON SHALL BE USED BY CONTRACTOR UNLESS AN ALTERNATE PLAN IS SUBMTTED, REVIEWED AND APPROVED BY THE HOWARD COUNTY ENGINEER.
2. SIGNING AND CHANNELIZATION ALONG TEN OAKS ROAD SHALL FOLLOW MD SHA STANDARD MD 104.04-01, 104.31-01 AND 104.33-01. SIGNING AND CHANNELIZATION ALONG HIGHLAND ROAD SHALL FOLLOW MD SHA STANDARD 104.04-02, AND 104.33-02. SIGNING AND CHANNELIZATION AT THE INTERSECTION SHALL FOLLOW MD SHA STANDARD MD 104.32.01. SEE CONSTRUCTION PHASING NOTES FOR APPLICATION CONDITIONS.

DETOUR NOTES

1. HOWARD COUNTY TRAFFIC ENGINEERING SHALL REVIEW PROPOSED SIGN LOCATIONS IN THE FIELD PRIOR TO ANY SIGN INSTALLATIONS.
2. ALL SIGNS SHALL BE MOUNTED ON 4'x4' WOODEN POSTS.
3. ALL SIGN DISTANCES MAY BE ADJUSTED TO FIT FIELD CONDITIONS WITH 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 THE METHODS INDICATED ON THESE DRAWINGS, CONTRACT SPECIFICATIONS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION). ALL SIGNS SHALL BE PLACED IN ACCORDANCE WITH THE MARYLAND SHA SPECIFICATIONS AND STANDARD NO. MD-107.002, THE MUTCD AND/OR AS DIRECTED.
5. SIGNS LARGER THAN 10 SQUARE FEET IN TOTAL AREA SHALL BE INSTALLED ON TWO 4'x4' 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.
7. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS ON HIGHLAND ROAD WITHIN THE WORK ZONE.
8. THE CONTRACTOR SHALL SCHEDULE THE WORK SUCH THAT THE DETOUR SYSTEM SHALL BE IN EFFECT FOR THE SHORTEST TIME PRACTICAL. THE CONSTRACTOR SHALL PRESENT A SCHEDULE OF WORK TO THE COUNTY PRIOR TO THE START OF WORK. THAT SCHEDULE WILL BE REVIEWED TO MINIMIZE THE DETOUR TIME.

CONSTRUCTION PHASING

Phase I

I-1 Set up signing and channelizing devices as shown on Phase I. Relocate tree row along south side of new road alignment. Construct the new portion of Highland Road from station 11+50 to station 14+36. All signing and channelization devices as shown on MD SHA Standard MD 104.04-01 shall be used along Ten Oaks Road and MD SHA Standard MD 104.04-02 shall be used along Highland Road during construction of Phase I as directed by the Howard County engineer.

I-2 Mill and resurface the existing portion of Highland Road from station 10+00 to station 11+50. Reconstruct the right shoulder of Highland Road. All signing and channelization devices as shown on MD SHA Standard MD 104.31-01 shall be used during construction of the milling and shoulder work as directed by the Howard County Engineer.

I-3 Place temporary pavement markings on the new pavement surface and switch to the Phase II traffic control plan.

As directed by the Howard County Engineer use MD SHA Standard MD 104.31-01 along Ten Oaks Road and MD SHA Standard MD 104.31-02 along Highland Road for any operation during Phase I or Phase II when travel conditions and contractors work warrants.

LEGEND

- WORK ZONE
- PROP. TEMPORARY PAVEMENT
- CHANNELIZATION DEVICE
- SIGN WITH SUPPORT
- TYPE III BARRICADE WITH FLASHING LIGHTS AND SIGN

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 3/21/00
CHIEF, BUREAU OF ENGINEERING — DATE 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE 3/21/00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

BOARD OF PROFESSIONAL ENGINEERS No. 23506 PATRICK A. CONNAN STATE OF MARYLAND 3/13/00

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

BY	NO.	REVISION	DATE

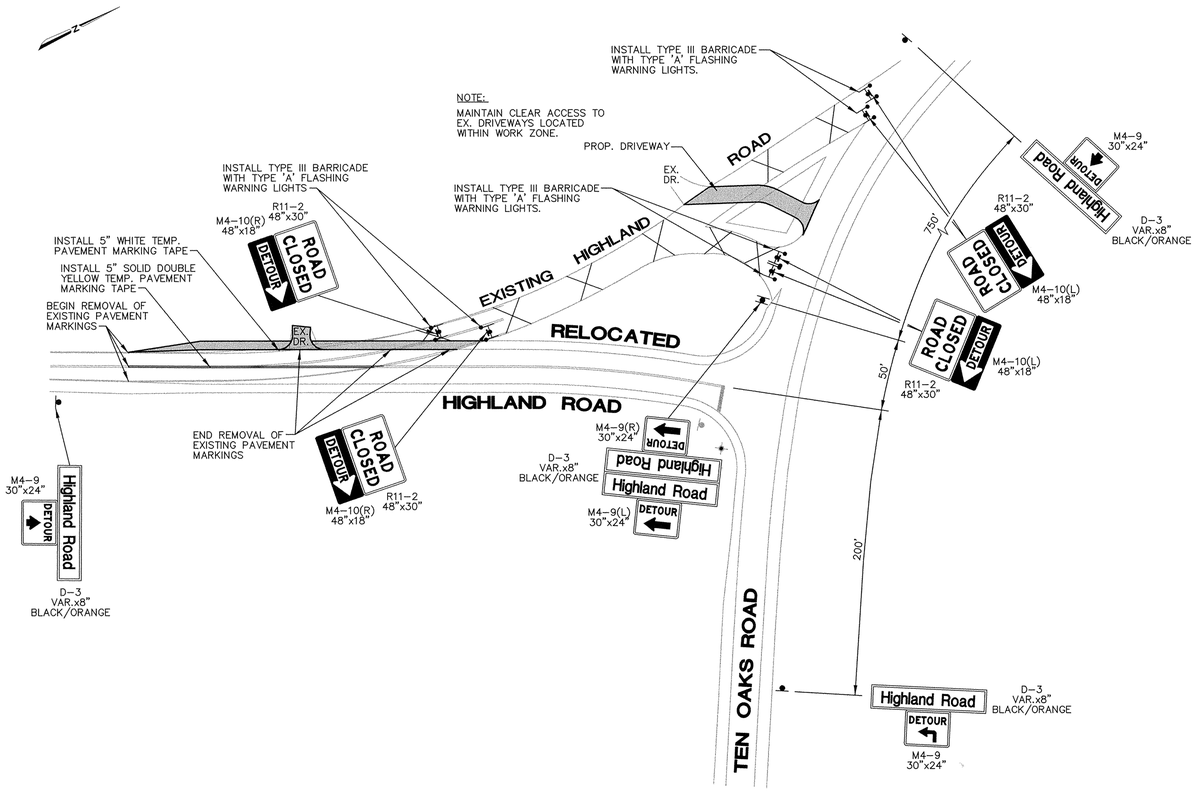
CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. _____ DATE: _____

TRAFFIC CONTROL PLAN 1
Highland Road at Ten Oaks Road

SCALE AS SHOWN

SHEET 8 OF 10

FILE: n:\99-393.002\ustation\pa08.dgn
DATE: 09-Mar-00 16:28



PHASE II
SCALE 1" = 50'

GENERAL NOTES

1. THE MAINTENANCE OF TRAFFIC PLAN AS SHOWN HEREON SHALL BE USED BY CONTRACTOR UNLESS AN ALTERNATE PLAN IS SUBMITTED, REVIEWED AND APPROVED BY THE HOWARD COUNTY ENGINEER.
2. SIGNING AND CHANNELIZATION ALONG TEN OAKS ROAD SHALL FOLLOW MD SHA STANDARD MD 104.04-01, 104.31-01 AND 104.33-01. SIGNING AND CHANNELIZATION ALONG HIGHLAND ROAD SHALL FOLLOW MD SHA STANDARD 104.04-02, AND 104.33-02. SIGNING AND CHANNELIZATION AT THE INTERSECTION SHALL FOLLOW MD SHA STANDARD MD 104.32.01. SEE CONSTRUCTION PHASING NOTES FOR APPLICATION CONDITIONS.

DETOUR NOTES

1. HOWARD COUNTY TRAFFIC ENGINEERING SHALL REVIEW PROPOSED SIGN LOCATIONS IN THE FIELD PRIOR TO ANY SIGN INSTALLATIONS.
2. ALL SIGNS SHALL BE MOUNTED ON 4'x4' WOODEN POSTS.
3. ALL SIGN DISTANCES MAY BE ADJUSTED TO FIT FIELD CONDITIONS WITH 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 THE METHODS INDICATED ON THESE DRAWINGS, CONTRACT SPECIFICATIONS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (LATEST EDITION). ALL SIGNS SHALL BE PLACED IN ACCORDANCE WITH THE MARYLAND SHA SPECIFICATIONS AND STANDARD NO. MD-107.002, THE MUTCD AND/OR AS DIRECTED.
5. SIGNS LARGER THAN 10 SQUARE FEET IN TOTAL AREA SHALL BE INSTALLED ON TWO 4'x4' 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.
7. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS ON HIGHLAND ROAD WITHIN THE WORK ZONE.
8. THE CONTRACTOR SHALL SCHEDULE THE WORK SUCH THAT THE DETOUR SYSTEM SHALL BE IN EFFECT FOR THE SHORTEST TIME PRACTICAL. THE CONSTRACTOR SHALL PRESENT A SCHEDULE OF WORK TO THE COUNTY PRIOR TO THE START OF WORK. THAT SCHEDULE WILL BE REVIEWED TO MINIMIZE THE DETOUR TIME.

CONSTRUCTION PHASING

Phase II

II-1 Set up signing and channelizing device as shown on Phase II. Remove the existing pavement and shoulder material on existing Highland Road. Retain signing on Ten Oaks Road according to MD SHA Standard number 104.04.01.

II-2 Grade work zone to drain.

II-3 Relocate two existing driveways and remove one tree.

II-4 Place final pavement course and permanent striping utilizing channelization and signing as shown on MD SHA Standard MD 104.33-01 along Ten Oaks Road and MD SHA Standard MD 104.33-02 shall be used along Highland Road as directed by Howard County Engineer.

As directed by the Howard County Engineer use MD SHA Standard MD 104.31-01 along Ten Oaks Road and MD SHA Standard MD 104.31-02 along Highland Road for any operation during Phase I or Phase II when travel conditions and contractors work warrants.

LEGEND

- WORK ZONE
- EX. PAVEMENT TO BE REMOVED
- CHANNELIZATION DEVICE
- SIGN WITH SUPPORT
- TYPE III BARRICADE WITH FLASHING LIGHTS AND SIGN

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 3/21/00
CHIEF, BUREAU OF ENGINEERING — DATE 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE 3/21/00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

BOARD OF PROFESSIONAL ENGINEERS No. 23501 PATRICK A. CROWN STATE OF MARYLAND 3/13/00

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

BY	NO.	REVISION	DATE

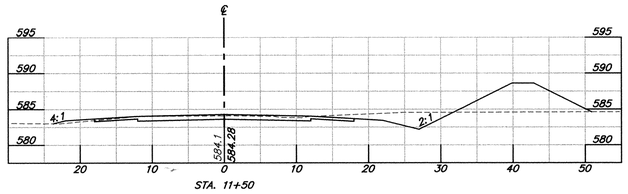
CAPITAL PROJECT NO.
J-4164
600' SCALE MAP NO. _____ DATE: _____

TRAFFIC CONTROL PLAN 2
Highland Road at Ten Oaks Road

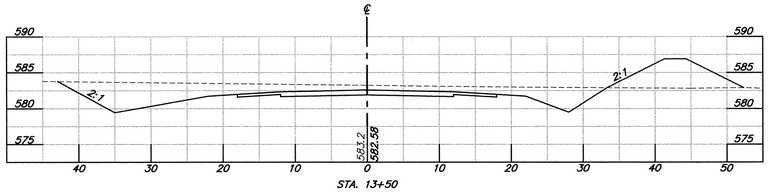
SCALE AS SHOWN

SHEET 9 OF 10

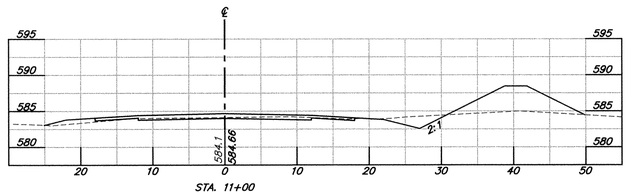
FILE: K:\99-393.002\publish\ps09.dgn
DATE: 03-Mar-00 16:29



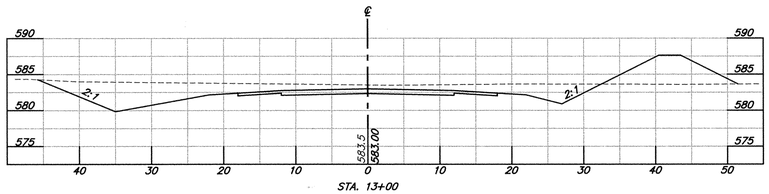
STA. 11+50



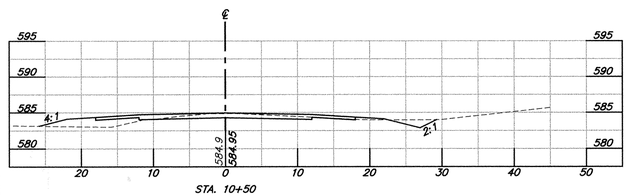
STA. 13+50



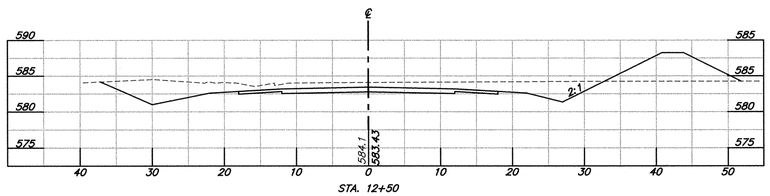
STA. 11+00



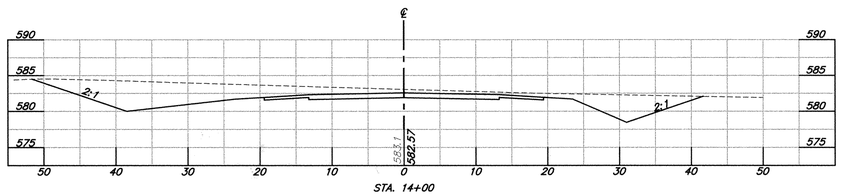
STA. 13+00



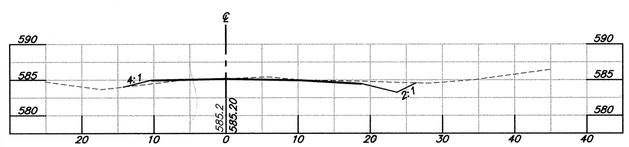
STA. 10+50



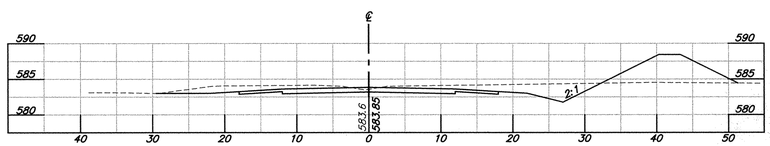
STA. 12+50



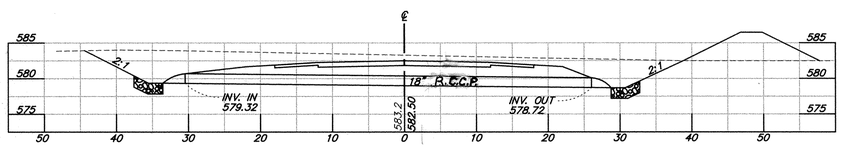
STA. 14+00



STA. 10+00



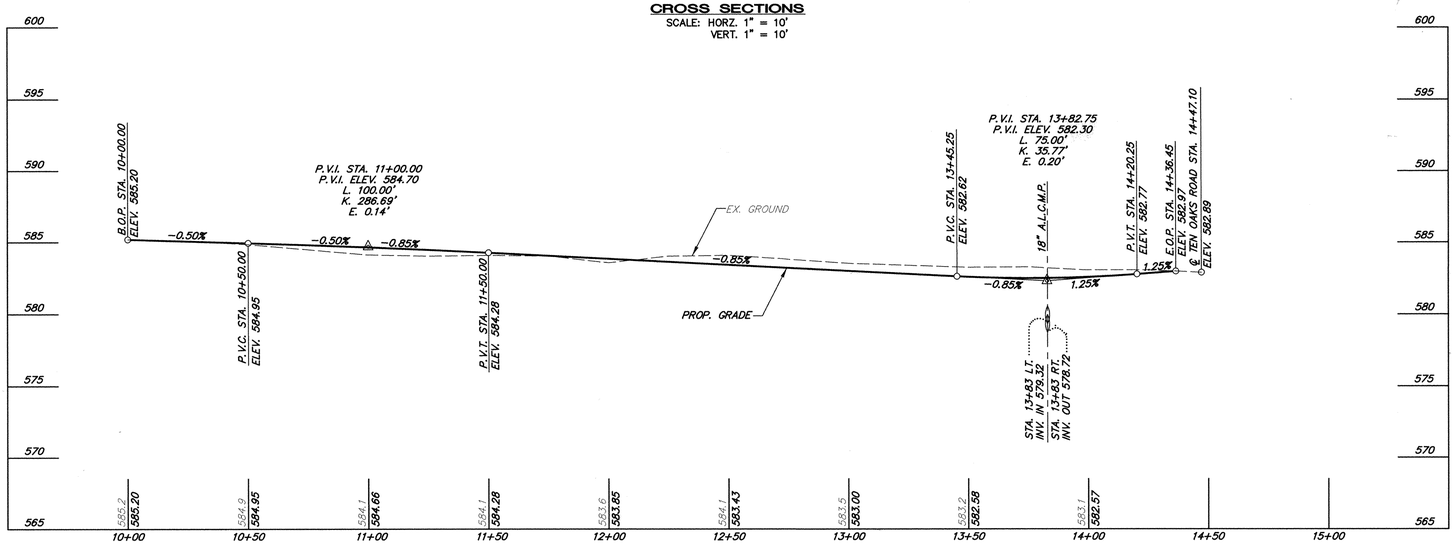
STA. 12+00



STA. 13+83

CROSS SECTIONS

SCALE: HORZ. 1" = 10'
VERT. 1" = 10'



PROFILE

SCALE: 1" = 30'
1" = 5'

DEPARTMENT OF PUBLIC WORKS
HOWARD COUNTY, MARYLAND

DEPARTMENT OF PUBLIC WORKS — DATE 3/21/00
CHIEF, BUREAU OF ENGINEERING — DATE 3/20/00
CHIEF, TRANSPORTATION PROJECTS AND WATERSHED MANAGEMENT DIVISION — DATE 3/20/00
CHIEF, BUREAU OF HIGHWAYS — DATE 3/21/00

A/E GROUP, INC.
ENGINEERS • PLANNERS
181 E. Main Street
Westminster, Maryland 21158
A/E Job No. 99-393-002

BOARD OF PROFESSIONAL ENGINEERS — No. 23580 — FREDERICK A. CARLSON — STATE OF MARYLAND — 3/13/00

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: _____

CROSS SECTIONS AND PROFILE
Highland Road at Ten Oaks Road

SCALE AS SHOWN

SHEET 10 OF 10

FILE: n:\99-393.002\ustation\cs01.dgn
DATE: 10-Mar-00 14:57