SOIL SURVEY SUMMARY

For

EDS-19 (64) Schley County

PI No. 322730

1. **Location / Description** This project is for the widening and relocation of SR3/US 19. The project begins at Station 436+65± and continues north through the city limits of Ellaville in Schley county to Station 591+95±. There is one equality on the project.

2. **Geology** This project will be geologically sited in the Eocene and Oligocene Residuum, Undifferentiated, Providence Sand, and Ripley Formations of the Georgia Coastal Plain Region.

3. **Rock** No rock was encountered.

4. **Removal** The soils near proposed grade in the following area were found to have in-place moisture content far above the optimum moisture content. This condition has the potential to cause severe pumping problems during subgrade and base construction. After excavation in this area is complete, we recommend that 24 inches of subgrade soils directly beneath the pavement and shoulders be removed and either dried out and replaced or replaced with drier soils:

Station to Station	Location
172+00± to 174+00±	Lt., Rt., & CL

This work should be done at the direction of the Engineer, and may be eliminated if the subgrade soils are dry and stable at the time of construction. No other materials requiring removal were encountered.

5. **Waste** None of the soils encountered on this project will require wasting. However, high-volume change Class IIIC materials listed below should not be placed within three (3) feet of the bottom of the subgrade directly beneath the pavement section. These soils may be used in the bottom of high fill sections, in the shoulders, or in side slopes as directed by the Engineer. This work shall be done in accordance with Special Provision 205.

Waste (continued)

Station to Station	Location
136+00± to 138+00±	CL
184+50± to 185+50±	Rt.
224+50± to 225+50±	Rt., CL
230+50± to 234+50±	Rt., CL
361+00± to 367+00±	Lt., Rt., CL
367+00± to 368+00±	Rt., CL
370+50± to 371+50±	Lt.
396+50± to 397+50±	Lt., Rt., CL
399+50± to 400+50±	Lt.
534+50± to 535+50±	Lt., Rt.

6. Subgrade Materials

We recommend that the top 12 inches of subgrade on this entire project, including ramps and crossroads be constructed of Class IIB3 or better material. Refer to the field notes for areas where subgrade soils do not meet this requirement.

This work shall be done in accordance with Special Provision Section 209.

7. Pavement Design Values

We recommend the following values for use in the pavement design calculations for this project:

Soil Support Value = 3.0
Regional Factor = 1.6
Subgrade Reaction, k = 150 pci

Graded aggregate base is the only base material recommended for use on this project.

8. Slopes

Maximum 2:1 slopes will be safe for this project. However, embankment and cut slopes that are greater than 35 feet high will require construction of a berm in accordance with the attached detail.

Station to Station	Location
102+00± to 110+50±	Rt.
112+00± to 115+00±	Rt.
287+00± to 293+50±	Lt.
291+00± to 296+50±	Rt.
323+00± to 324+50±	Rt.
532+00± to 535+50±	Rt.

9. Groundwater

The groundwater elevation was encountered near or above grade at the time of the investigation at the following locations on this project. We recommend that underdrains and drainage stone be set

up on an as-needed basis, as directed by the Engineer, at the following locations:

Groundwater (continued)

Station to Station	Location
214+50± to 215+50±	Lt., Rt., & CL
227+50± to 228+50±	Rt.
364+00± to 368+00±	Lt., Rt., & CL
531+00± to 536+00±	Lt., Rt., & CL

The project crosses low wet areas which may be inundated at the time of construction. Because of the relatively flat terrain on this project, it does not appear that these areas may be drainable. The soils in the low areas listed below consist primarily of loose sands, which will not require removal. However, we do recommend that one layer of low-strength filter fabric be placed on top of the existing ground prior to placing the fills to provide stability over the loose sands. The low wet areas where this fabric will be required are as follows:

Station to Station	Location
208+00± to 210+00±	CL
211+50± to 214+50±	Lt., Rt., & CL
275+00± to 276+50±	Lt., Rt., & CL
292+00± to 293+00±	CL
311+00± to 313+00±	CL
312+00± to 315+00±	Lt., Rt., & CL
380+00± to 385+00±	Rt.
411+00± to 418+50±	Lt.
414+00± to 417+50±	Rt.
552+00± to 553+00±	CL
555+50± to 1556+50±	CL
559+00± to 559+75±	CL
577+00± to 580+00±	CL

If it is not feasible to drain these areas during construction, a mat of granular embankment should be placed to a height of 18 inches above the water level prior to placing normal fills. This work shall be done in accordance with Special Provision Section 208. However, if these areas are dry and stable at the time of construction, the fabric may be eliminated, as directed by the Engineer. Placement of the fabric should be in accordance with Special Provision 881.

10. Shrinkage

We recommend an average shrinkage factor of 20% for use in the earthwork calculations for this project.

11. Culverts

We recommend that a 12-inch blanket of Type II Foundation Backfill material be placed under the barrel of all culverts and 48-inch diameter and larger cross-drains on this project with the exception of the culverts at the following locations:

Station	Culvert Size	Type II Foundation Backfill Required
384+00±	DBL 10' X 10'	24"
416+90±	DBL 7' X 9'	24"

12. Corrosion

Reference should be made to the attached "Pipe Culvert Materials Recommendations" for materials allowable by the Laboratory corrosion test.

13. Bench Detail

Where new fills are to be placed on existing slopes steeper than 3:1, the existing slope should be benched in accordance with the attached detail.

14. Pavement Design

We recommend an additional 4 inches of graded aggregate base be set up for use at the direction of the Engineer in the following area:

Station to Station	Location
230+50± to 234+50±	Rt. & CL

15. Special Problems

A. The ponds at the following locations will require siltation control during construction. We also recommend pre- and post-construction cross-sections be prepared at these locations, as per the construction manual to protect the Department against claims.

Station to Station	Location
563+00± to 564+00±	Rt.
575+50± to 576+50±	Rt.

B. Springs may be present at the following locations:

Station	Location
369+00±	Lt. & Rt.

Spring boxes will be required if the presence of these springs is confirmed on construction.

Special Problems (continued)

C. Wells at the following locations will require capping:

Station	Location
98+50±	Rt.
585+50±	Rt.
19+20±, CR 108	Rt.

It should be noted that additional wells may be encountered during construction.

D. Several residences are located very close to the construction limits of this project. Vibrations from construction may cause some concern with property owners. We recommend that the Project Engineer contact the Geotechnical Engineering Bureau prior to construction to evaluate the need for crack surveys and vibration monitoring.

E. We recommend that all bridge approach slabs on this project be constructed in accordance with the notched detail on Georgia Standard 9017-R.

F. Debris in the form of old automobiles and parts, appliances, shingles, and household waste was encountered at the following locations. This debris will require removal prior to construction:

Station to Station	Location
182+00± to 191+00±	CL
285+00± to 285+500±	CL
287+00± to 287+00±	Lt. & CL
298+50± to 289+00±	Rt.
317+00± to 318+00±	Rt. & CL

Reported By William L. DuPree

Reviewed By _____, PE

December 18, 2002

DEPARTMENT OF TRANSPORATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. EDS-19(64) SCHLEY COUNTY
P.I. NO. 322730

SECTION 205 – ROADWAY EXCAVATION

Add the following to Sub-section 205.3.05.E:

The soils that will be excavated from the following cut sections are primarily Class IIIC soils with poor load carrying characteristics. Do not place these soils within 3 feet (915 mm) of the subgrade directly beneath the pavement in fill sections. These soils may be placed in the bottom of high fill sections, in the shoulders or in the median as directed by the Engineer:

Station to Station	Location
136+00± to 138+00±	CL
184+50± to 185+50±	Rt.
224+50± to 225+50±	Rt., CL
230+50± to 234+50±	Rt., CL
361+00± to 367+00±	Lt., Rt., CL
367+00± to 368+00±	Rt., CL
370+50± to 371+50±	Lt.
396+50± to 397+50±	Lt., Rt., CL
399+50± to 400+50±	Lt.
534+50± to 535+50±	Lt., Rt.

January 15, 2003

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION
PROJECT NO. EDS-19(64) SCHLEY COUNTY
P.I. NO. 322730

SECTION 208 – EMBANKMENTS

Modify Sub-Section 208.2A.1 to read as follows:

INUNDATED EMBANKMENTS: Construct embankments in inundated areas with granular embankment placed to a level of 18 inches (457 mm) above the water surface at the time of construction.

Retain Sub-Section 208.5 - PAYMENT – as written and add the following:

Include costs for granular embankment construction in the pay item provided in the contract for earthwork.

Office of Materials and Research

January 15, 2003

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. EDS-19(64) SCHLEY COUNTY
P.I. NO. 322730

SECTION 209 – SUBGRADE CONSTRUCTION

Delete Sub-Section 209.2.A and substitute the following:

209.2.A SUBGRADE MATERIALS: Construct the top 12 inches (305 mm) of subgrade on this project, including crossroads and ramps, with Class IIB3 or better materials. If the existing soils at grade do not meet this requirement, undercut and replace these soils to provide 12 inches (305 mm) of Class IIB3 or better material at subgrade. Include the costs for this work in the pay item provided in the contract for earthwork.

Office of Materials and Research

Revised October 13, 2004

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. EDS-19(64) SCHLEY COUNTY
P.I. NO. 322730

SECTION 881 – FABRICS

Add the following to Sub-Section 881.2.05A:

Use woven filter fabric for embankment stabilization. Sew fabric with a lock stitch using high strength polypropylene or nylon thread. Obtain approval of the stitch and sewing method from the Engineer prior to use.

Delete Sub-Section 881.2.05.A.4 as written and substitute the following:

Use filter fabric for embankment stabilization with the following minimum tensile strength requirements:

Fabric Type	Tensile Strengths in lb./in. width			
	Warp Direction		Fill Direction	
	5% Strain	Ultimate	5% Strain	Ultimate
Polyester	150 lb./in (26 kN/m)	375 lb./in (66 kN/m)	150 lb./in (26 kN/m)	375 lb./in (66 kN/m)
Polypropylene	150 lb./in (26 kN/m)	600 lb./in (105 kN/m)	150 lb./in (26 kN/m)	600 lb./in (105 kN/m)

Minimum Seam Strength = 150 lb./in. (26 kN/m) width

The ultimate strengths shown are based on reduction factors of 0.4 for polyester and 0.25 for polypropylene from the tensile strengths at 5% strain. The use of reduction

factors other than those shown will be allowed only if verified by laboratory tests acceptable to the Department.

Delete Sub-Section 881.2.05.A.6. in its entirety.

Delete Sub-Section 881.2.05.C as written and substitute the following:

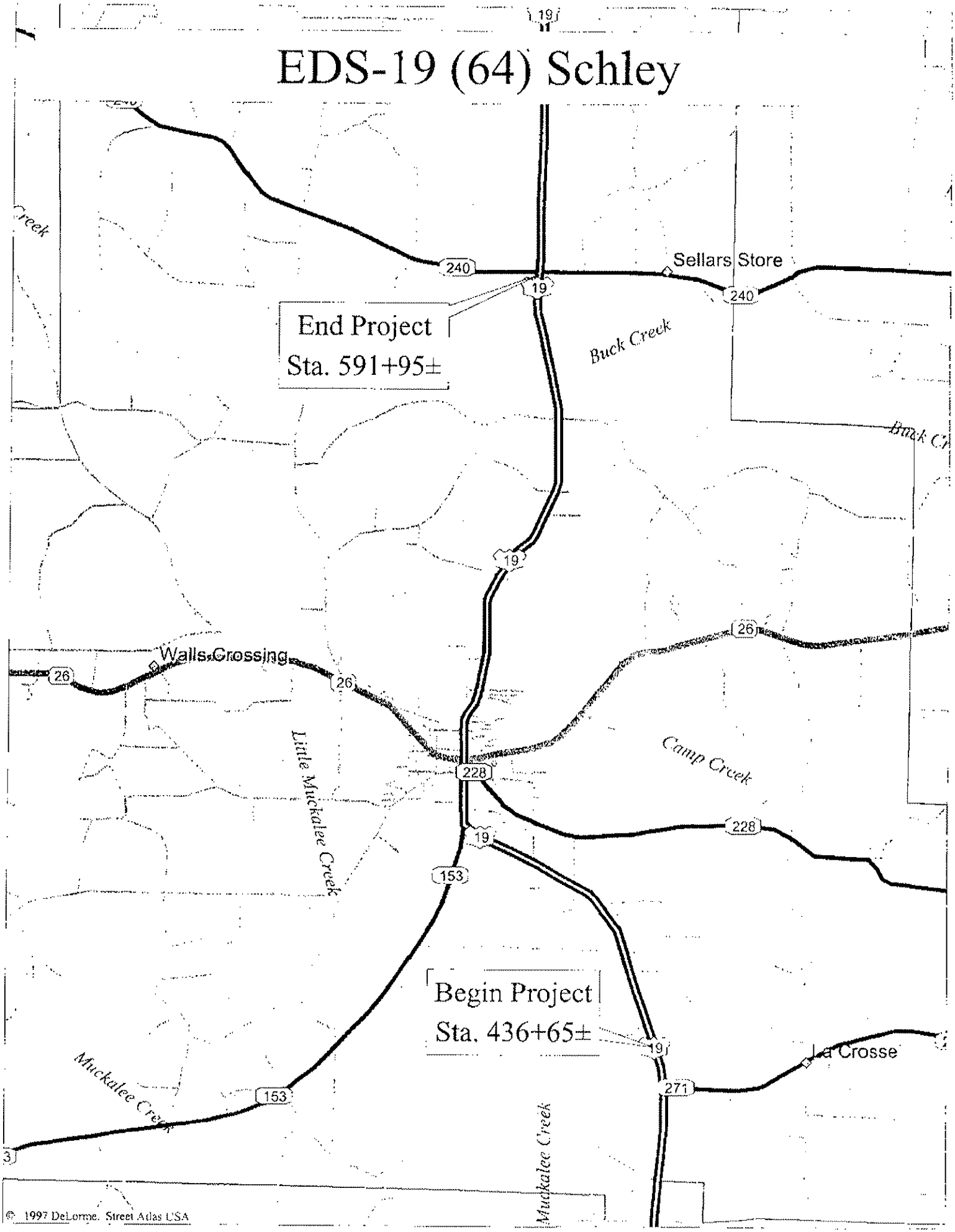
Test the filter fabric using the following methods:

Tensile Strength, Elongation	ASTM D-4594 Wide Strip Test
Seam Strength	ASTM D-4884 Wide Strip Test

Run the tests at a strain rate of 10% per minute. Use a pre-tensioning load of 10 pounds per inch (1.75 kN/m) or 3%, whichever is less.

Supply a certification from the manufacturer showing the physical properties of the fabric used and conformance with the Specification in accordance with Sub-Section 106.05 of the current Specifications.

EDS-19 (64) Schley



Department of Transportation
Off ° Materials and Research
Forest Park, Ga

Soil R ort

Seq No.	Sample Number	Date Received	County	Contract Number	Material Code	Date Sampled	No.	Station	Loc	Location	Exam. For	Date Complete	2 1/2	1 1/2	#10	#40	#60	#200	% Clay	% Vol Chang	% Swell	% Shrink	%Max Dry Den	%Opt. Moist.	% Liq. Limit	Plast. Index	Exam. Index	Resist.	CBR	SSV	PH	% Ga Soil Orga.	AASHTO Class	AASHTO Class
Project Number:	**EDS-19(64)**																																	
1	PAYN0001-03-016719	06/11/03	Schley		EMBSOIL	06/10/03		39+00	CL		810.01	08/06/03	100.0	100.0	100.0	85.0	67.0	48.0	42.0	9.9	4.3	5.6	101.3	18.9	38.0	10.0	4.23						IIB4	A-4
2	PAYN0001-03-016720	06/11/03	Schley		EMBSOIL	06/10/03					810.01	08/06/03	100.0	100.0	100.0	82.0	64.0	50.0	47.0	7.2	2.1	5.1	99.2	20.2	37.0	5.0	3.98						IIB4	A-4
3	PAYN0001-03-016721	06/11/03	Schley		EMBSOIL	06/10/03		54+00	CL		810.01	08/06/03	100.0	100.0	100.0	82.0	66.0	46.0	39.0	7.3	2.1	5.2	101.6	18.7	32.0	5.0	4.47						IIB4	A-4
4	PAYN0001-03-016722	06/11/03	Schley		EMBSOIL	06/10/03		59+00	CL		810.01	08/06/03	100.0	100.0	100.0	88.0	70.0	47.0	42.0	8.4	1.2	7.2	102.0	18.6	31.0	5.0	4.35						IIB4	A-4
5	PAYN0001-03-016723	06/11/03	Schley		EMBSOIL	06/10/03		69+00	CL		810.01	08/06/03	100.0	100.0	100.0	84.0	63.0	38.0	32.0	2.5	0.1	2.5	109.8	14.9	26.0	4.0	5.46						IIB3	A-4
6	PAYN0001-03-016724	06/11/03	Schley		EMBSOIL	06/10/03		94+00	130' RTCL		810.01	08/06/03	100.0	100.0	100.0	83.0	63.0	32.0	27.0	6.8	2.8	4.0	108.5	14.1	26.0	6.0	6.19						IIB3	A-2-4
7	PAYN0001-03-016725	06/11/03	Schley		EMBSOIL	06/10/03		121+00	75' LTCL		810.01	08/06/03	100.0	100.0	100.0	90.0	81.0	58.0	56.0	5.3	0.1	5.3	110.8	14.4	42.0	9.0	3.00						IIB4	A-5
8	PAYN0001-03-016726	06/11/03	Schley		EMBSOIL	06/10/03		210+00	CL		810.01	08/06/03	100.0	100.0	100.0	60.0	59.0	25.0	16.0	3.5	1.0	2.5	111.2	12.6	0.1	0.1	7.06						IA2	A-2-4
9	PAYN0001-03-016727	06/11/03	Schley		EMBSOIL	06/10/03		215+00	CL		810.01	08/06/03	100.0	100.0	100.0	79.0	49.0	16.0	11.0	5.7	2.5	3.2	111.2	12.6	0.1	0.1	8.16						IA2	A-2-4
10	PAYN0001-03-016728	06/11/03	Schley		EMBSOIL	06/10/03		205+00	CL		810.01	08/06/03	100.0	100.0	100.0	93.0	79.0	50.0	45.0	10.4	3.1	7.3	119.4	11.0	41.0	8.0	3.98						IIB3	A-5
11	PAYN0001-03-016729	06/11/03	Schley		EMBSOIL	06/10/03		205+00	CL		810.01	08/06/03	100.0	100.0	100.0	95.0	91.0	68.0	64.0	6.9	3.6	3.3	119.4	11.0	61.0	11.0	1.77						IIB4	A-7-5
12	PAYN0001-03-016730	06/11/03	Schley		EMBSOIL	06/10/03		14+00	40' RTCL		810.01	08/06/03	100.0	100.0	100.0	86.0	64.0	35.0	29.0	4.4	0.9	3.5	99.4	20.6	28.0	7.0	5.71						IIB4	A-4
13	PAYN0001-03-016731	06/11/03	Schley		EMBSOIL	06/10/03		13+00	60' RTCL		810.01	08/06/03	100.0	100.0	100.0	93.0	83.0	59.0	55.0	13.5	5.3	8.2	92.8	24.3	46.0	7.0	2.87						IIB4	A-5
14	PAYN0001-03-016732	06/11/03	Schley		EMBSOIL	06/10/03		218+00	CL		810.01	08/06/03	100.0	100.0	100.0	81.0	56.0	32.0	27.0	8.9	5.7	3.2	113.3	13.5	27.0	5.0	6.19						IIB2	A-2-4
15	PAYN0001-03-016733	06/11/03	Schley		EMBSOIL	06/10/03		218+00	CL		810.01	08/06/03	100.0	100.0	100.0	73.0	50.0	29.0	24.0	11.5	5.0	6.5	109.7	15.0	34.0	8.0	6.57						IIB3	A-2-4
16	PAYN0001-03-016734	06/11/03	Schley		EMBSOIL	06/10/03		234+00	85' LTCL		810.01	08/06/03	100.0	100.0	100.0	84.0	65.0	42.0	38.0	27.7	24.2	3.5	104.8	17.1	36.0	9.0	4.96						IIIC1	A-4
17	PAYN0001-03-016735	06/11/03	Schley		EMBSOIL	06/10/03		239+00	CL		810.01	08/06/03	100.0	100.0	100.0	83.0	58.0	35.0	30.0	9.8	3.6	6.2	111.0	14.2	28.0	6.0	5.83						IIB2	A-2-4
18	PAYN0001-03-016736	06/11/03	Schley		EMBSOIL	06/10/03		249+00	CL		810.01	08/06/03	100.0	100.0	100.0	80.0	56.0	35.0	30.0	8.1	4.3	3.8	110.0	14.2	26.0	5.0	5.83						IIB2	A-2-4
19	PAYN0001-03-016737	06/11/03	Schley		EMBSOIL	06/10/03		259+00	CL		810.01	08/06/03	100.0	100.0	100.0	87.0	63.0	38.0	33.0	6.4	4.8	1.6	114.4	13.1	26.0	5.0	5.46						IIB3	A-4
20	PAYN0001-03-016738	06/11/03	Schley		EMBSOIL	06/10/03		269+00	CL		810.01	08/06/03	100.0	100.0	100.0	82.0	60.0	39.0	33.0	9.5	4.1	5.4	114.0	13.2	27.0	5.0	5.33						IIB3	A-4
21	PAYN0001-03-016739	06/11/03	Schley		EMBSOIL	06/10/03		272+00	CL		810.01	08/06/03	100.0	100.0	100.0	76.0	47.0	23.0	19.0	2.4	0.7	1.7	119.1	11.2	0.1	0.1	7.30						IIB2	A-2-4
22	PAYN0001-03-016740	06/11/03	Schley		EMBSOIL	06/10/03		282+00	CL		810.01	08/06/03	100.0	100.0	100.0	89.0	71.0	47.0	42.0	10.0	4.5	5.5	107.0	16.0	35.0	8.0	4.35						IIB3	A-4
23	PAYN0001-03-016741	06/11/03	Schley		EMBSOIL	06/10/03		285+00	75' RTCL		810.01	08/06/03	100.0	100.0	100.0	88.0	69.0	49.0	47.0	8.0	4.7	3.3	99.6	20.0	35.0	5.0	4.10						IIB4	A-4

const 8

STA	DEPTH	DESC	CLASS	SAMP
39+00	0-5'	Rd sndy cly	II-B4	1
44+00	0-5'	Rd & Brn sndy cly	II-B4	2
49+00	0-2.5'	Rd & Brn sndy cly	II-B4	2
54+00	0-1.5'	Brn & cly so		no samp
	1.5-5'	Brn sndy cly	II-B4	3
59+00	0-10'	Rd & Brn sndy cly	II-B4	4
64+00	0-5'	Rd & Brn sndy cly	II-B4	4

notes

Sta 436+65.34 Begin PROJ.

Sta 437+40 BK = Sta 37+41.43 AH. Equality

Sta 37+00 → Sta 41+50 OSE woods on Req R/W.

Sta 41+50 → Sta 54+00 cultivated field on Req R/W w/ irrigation – worked w/ hand tools

Sta 37+00 → Sta 126+00 worked without stakes – worked by landmarks – relocation

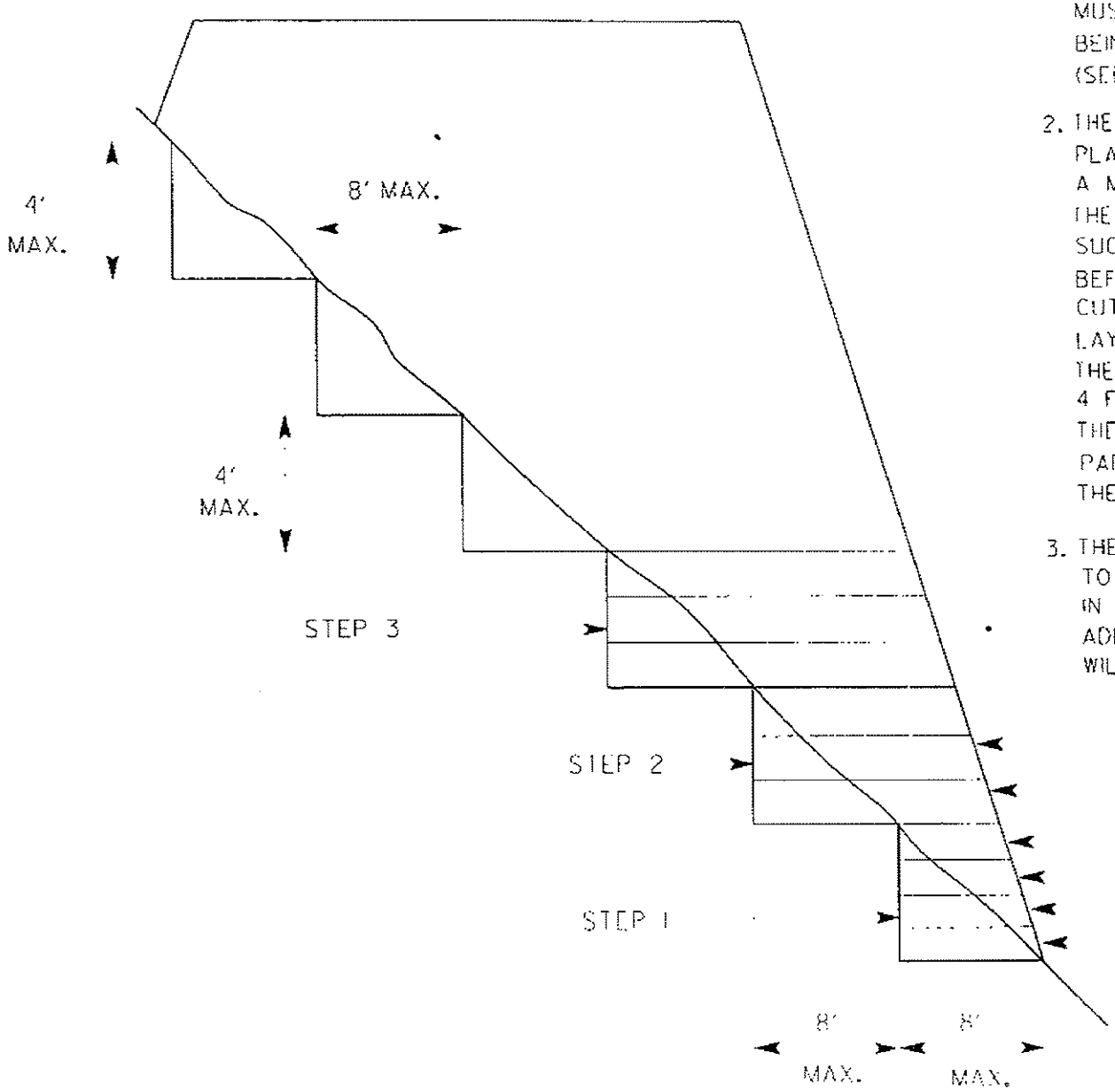
Sta 57+00 X-S.S. taken here

Pipe Culvert Material Alternates
For Coastal Plain Region

TYPE OF PIPE INSTALLATION				CONCRETE	CORRUGATED STEEL AASHTO M-36		CORRUGATED ALUMINUM AASHTO M-196	PLASTIC		
					ALUMINUM COATED (TYPE 2) CORR. STEEL	PLAIN ZINC COATED	PLAIN UNCOATED ALUMINUM	CORR. POLY-ETHYLENE AASHTO M-252	CORR. POLY-ETHYLENE SMOOTHED LINED AASHTO M-294 TYPE "S"	POLY VINYL CHLORIDE (PVC) PROFILE WALL AASHTO M-304
STORM DRAIN	LONGITUDINAL INTERSTATE AND TRAVEL BEARING			X						
	LONGITUDINAL NON-INTERSTATE AND NON-TRAVEL BEARING			X	X		X		X	X
	CROSS DRAIN	GRADE ≤ 10%	ADT < 250	X	X	X	X		X	X
			250 < ADT < 1500	X			X			
			ADT > 1500	X						
		GRADE > 10%	ADT < 250		X	X	X		X	X
			ADT > 250				X			
SIDE DRAIN				X	X	X	X		X	X
PERMANENT SLOPE DRAIN					X	X	X		X	X
PERFORATED UNDERDRAIN					X	X	X	X	X	

NOTE:

1. Allowable materials are indicated by an "X".
2. Structural requirements of storm drain pipe will be in accordance with Georgia Standard 1030-D or 1030-P, whichever is applicable, and the Standard Specifications.



1. WHERE THE EMBANKMENT IS TO BE PLACED ON A HILLSIDE OR ANOTHER EXISTING EMBANKMENT HAVING A SLOPE OF 3 TO 1 OR STEEPER, THE FOUNDATION MUST BE BENCHED WHILE THE EMBANKMENT IS BEING MADE. (SEE DIAGRAM AT LEFT.)

2. THE DIAGRAM SHOWS THAT BEFORE LAYER "A" IS PLACED THE FIRST STEP (1) IS CUT INTO THE SLOPE A MAXIMUM DISTANCE OF ABOUT 8 FEET (ABOUT ¾ THE WIDTH OF THE TYPICAL D-8 BULLDOZER BLADE). SUCCESSIVE LAYERS B, C, AND D ARE THEN PLACED BEFORE LAYER "E" IS PLACED, THE SECOND STEP IS CUT 8 FEET INTO THE SLOPE AND SUCCESSIVE LAYERS ARE AGAIN PLACED. IF IT IS ANTICIPATED THAT THE VERTICAL PART OF THE STEP WILL EXCEED 4 FEET IF A 8 FEET HORIZONTAL CUT IS MADE, THEN THE ACTUAL CUT STOPS WHEN THE VERTICAL PART REACHES A MAXIMUM OF 4 FEET ALLOWING THE HORIZONTAL DISTANCE TO VARY.

3. THE PROCESS OF BENCHING IS CONSIDERED INCIDENTAL TO THE ITEM OF UNCLASSIFIED EXCAVATION AND BORROW IN CONSTRUCTION OF THE EMBANKMENT AND NO ADDITIONAL MEASUREMENT OF QUANTITY OR PAYMENT WILL BE MADE FOR BENCHING.

BENCHING DETAIL