

SOIL SURVEY SUMMARY

For
**STP-076-1 (29) Lincoln
County
PI No. 231360**

- 1. Location / Description** This project consists of the construction of passing lanes on SR 47, located south of the city of Lincoln in Lincoln County. The project begins at Station 0+00± and continues northwest to Station 137+00±.
- 2. Geology** This project will be geologically sited in the Metadacite and Felsic Metavolcanics Formations of the Georgia Piedmont Region.
- 3. Rock** Rock in the form of boulders and/or weathered rock layers, which may be removed by heavy equipment and/ or light blasting, were encountered on this project. We estimate that this material will be encountered at the following locations:

<u>Station to Station</u>	<u>Location</u>
3+00± to 5+50±	Rt.
29+50± to 33+00±	Lt., & Rt.
52+50± to 56+50±	Lt.
132+50± to 133+50±	Rt.

- 4. Removal** No material requiring removal was encountered.
- 5. Waste** None of the soils encountered on this project will require wasting. However, high-volume change Class IIIC materials excavated from the following areas 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 shoulders or in side slopes as directed by the Engineer. This work shall be done in accordance with Special Provision 205.

<u>Station to Station</u>	<u>Location</u>
15+50± to 29+50±	Lt., Rt.

- 6. Pavement Design Values** We recommend the following values for use in the pavement design calculations for this project:

Soil Support Value = 2.5
Regional Factor = 1.6
Subgrade Reaction, k = 130 pci

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

- 7. Slopes** Maximum 2:1 slopes will be safe for this project.
- 8. Groundwater** Groundwater was not encountered at locations of subsurface borings on the project at the time of the investigation.
- 10. Shrinkage** We recommend an average shrinkage factor of 25% 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 46-inch diameter and larger cross-drains on this project.
- 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 the use of a minimum 10 inches of graded aggregate base in the pavement section for this project. However, this depth of base material may be slightly reduced on side streets with low-volume traffic.

In addition, 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:

<u>Station to Station</u>	<u>Location</u>
15+50± to 29+50±	Lt.

- 15. Special Problems**
 - A.** The pond at the following location will require siltation control during construction. We also recommend pre- and post-construction cross-sections be prepared at this location, as per the construction manual to protect the Department against claims.

<u>Station to Station</u>	<u>Location</u>
24+00± to 26+00±	Lt.

- B.** A pond dam at the following location is within the construction easement. It appears that the dam will not be affected by construction:

Station to Station

38+60± to 41+00±

Location

Lt.

- C.** Several residences and business are located very close to the construction limits. Vibrations from construction may cause some concern with cracking and settlement at the buildings. We recommend that the Project Engineer contact the Geotechnical Engineering Bureau prior to construction to evaluate the need for vibration monitoring during the project

Reported By William L. DuPree

Reviewed By _____, PE

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

PROJECT NO. STP-076-1(29) LINCOLN COUNTY
P.I. NO. 231360

SECTION 205 – ROADWAY EXCAVATION

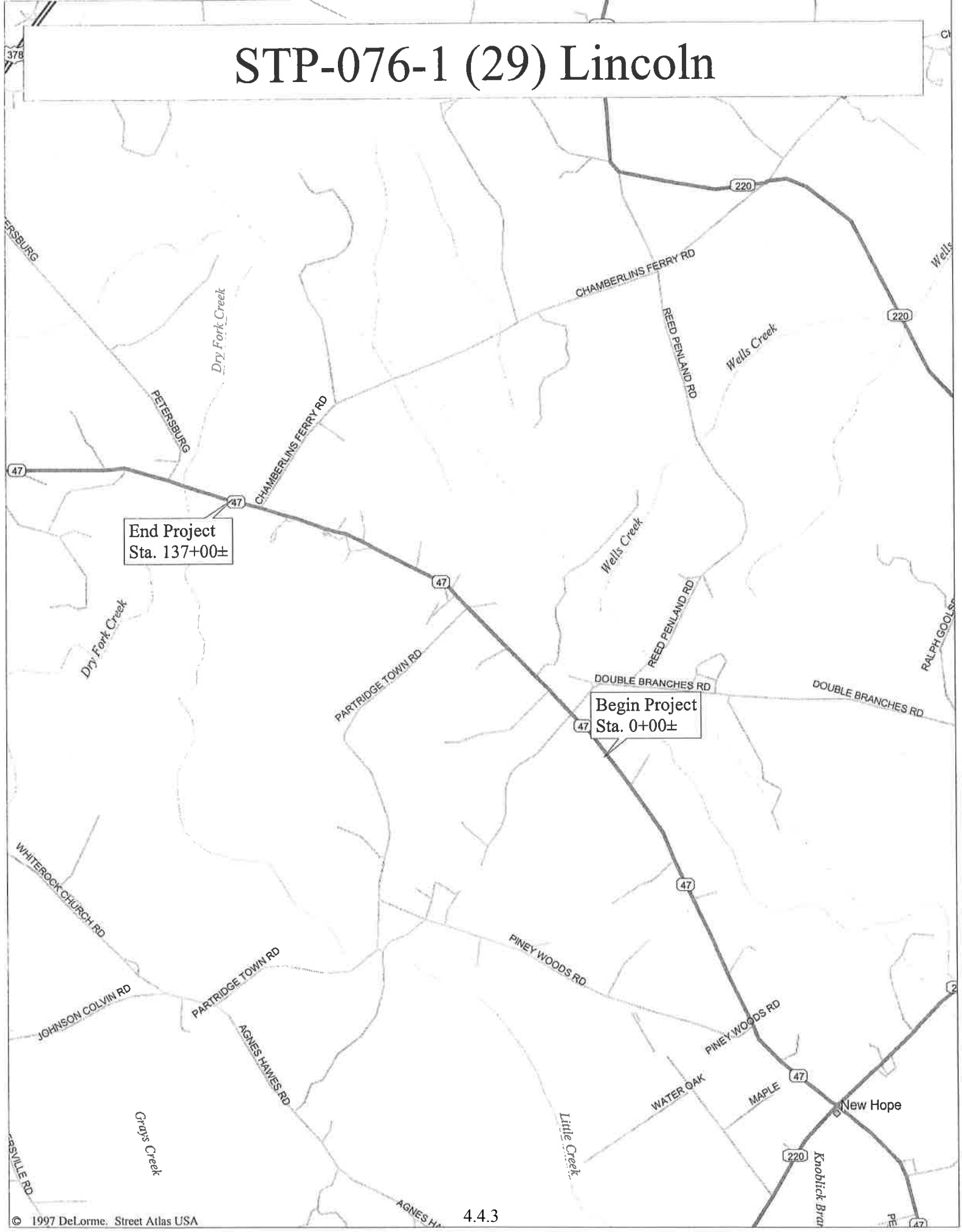
Add the following to Sub-section 205.3.05.E:

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
15+50± to 29+50±

Location
Lt., Rt.

STP-076-1 (29) Lincoln



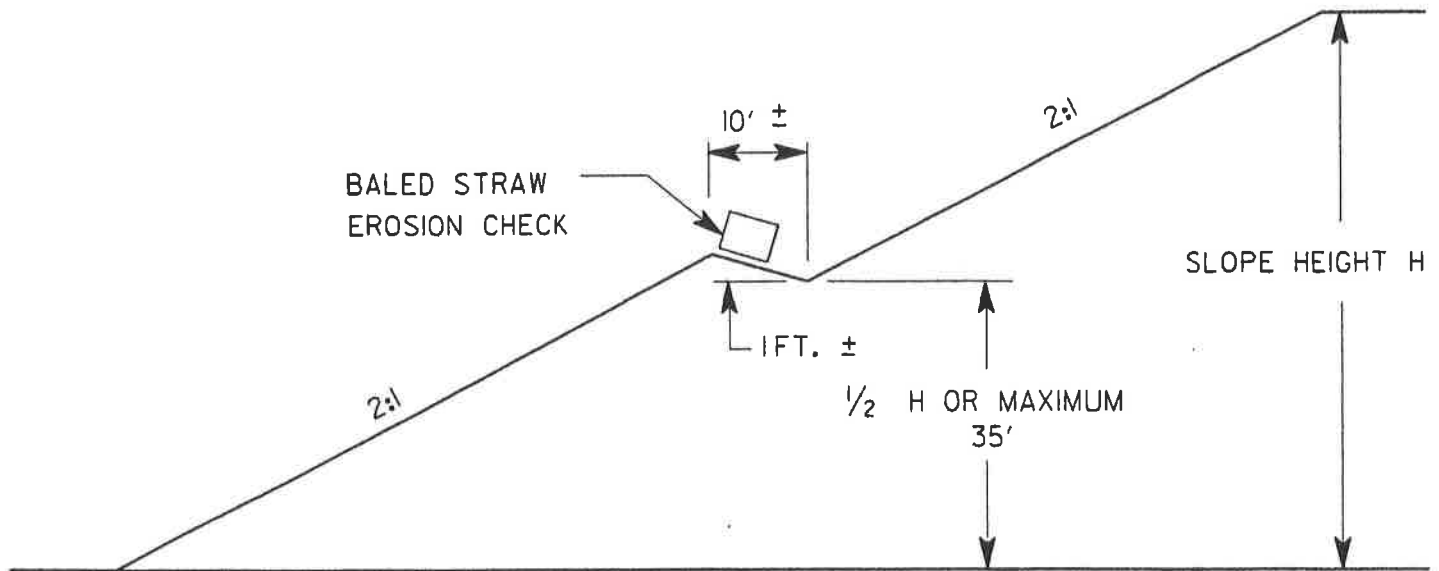
Soil Report

Soil Sample Number	Soil County	Contract Number	Material Code	Soil Station	Soil Location	Exam. For	Depth	Moisture	Shrinkage	Swelling	Plasticity	Flow	Compaction	Moisture	Flow	Compaction	Moisture	Flow	Compaction					
No.	Accepted No.			Sample No.			1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2					
Project Number: STP-076-1(29)																								
1	KILG0001-04-006243	102303 Lincoln	EMBSOIL	102303	3+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	86.0	79.0	49.0	44.0	20.2	13.4	6.8	112.0	18.6	41.0	5.0	4.10	IB4	A-5
2	KILG0001-04-006244	102303 Lincoln	EMBSOIL	102303	8+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	93.0	82.0	58.0	53.0	15.7	11.8	3.9	101.7	18.7	42.0	5.0	3.00	IB4	A-5
3	KILG0001-04-006245	102303 Lincoln	EMBSOIL	102303	18+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	93.0	85.0	47.0	39.0	25.4	18.1	7.3	106.0	16.6	47.0	9.0	4.35	IB4	A-5
4	KILG0001-04-006246	102303 Lincoln	EMBSOIL	102303	31+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	89.0	76.0	44.0	41.0	15.5	7.6	7.9	103.4	17.7	35.0	8.0	4.72	IB4	A-4
5	KILG0001-04-006247	102303 Lincoln	EMBSOIL	102303	39+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	91.0	85.0	43.0	35.0	7.8	5.6	2.2	101.2	18.9	33.0	5.0	4.84	IB4	A-4
6	KILG0001-04-006248	102303 Lincoln	EMBSOIL	102303	42+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	94.0	84.0	61.0	58.0	15.2	8.4	6.8	94.7	22.9	52.0	7.0	2.63	IB4	A-5
7	KILG0001-04-006249	102303 Lincoln	EMBSOIL	102303	42+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	88.0	70.0	48.0	46.0	22.7	18.8	3.9	100.2	19.7	50.0	8.0	4.23	IB4	A-5
8	KILG0001-04-006250	102303 Lincoln	EMBSOIL	102303	50+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	76.0	53.0	19.0	16.0	23.5	16.7	6.8	117.6	10.9	0.0	0.0	7.79	IB4	A-2-4
9	KILG0001-04-006251	102303 Lincoln	EMBSOIL	102303	55+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	97.0	92.0	71.0	68.0	19.1	13.7	5.4	93.6	23.0	57.0	8.0	1.40	IB4	A-5
10	KILG0001-04-006252	102303 Lincoln	EMBSOIL	102303	58+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	89.0	74.0	43.0	39.0	22.6	10.4	12.2	97.0	25.8	38.0	4.0	4.84	IB4	A-4
11	KILG0001-04-006253	102303 Lincoln	EMBSOIL	102303	73+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	91.0	86.0	59.0	48.0	21.2	15.0	6.2	94.0	27.4	39.0	6.0	2.87	IB4	A-4
12	KILG0001-04-006254	102303 Lincoln	EMBSOIL	102303	83+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	94.0	90.0	54.0	43.0	15.2	5.0	10.2	98.0	23.8	38.0	7.0	3.49	IB4	A-4
13	KILG0001-04-006255	102303 Lincoln	EMBSOIL	102303	93+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	90.0	77.0	26.0	18.0	1.5	0.0	1.5	94.7	22.9	0.0	0.0	6.93	IB4	A-2-4
14	KILG0001-04-006256	102303 Lincoln	EMBSOIL	102303	97+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	95.0	90.0	56.0	49.0	7.2	2.3	4.9	98.0	23.5	33.0	5.0	3.74	IB4	A-4
15	KILG0001-04-006257	102303 Lincoln	EMBSOIL	102303	97+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	95.0	80.0	46.0	42.0	14.4	9.5	4.9	93.0	26.3	46.0	8.0	4.47	IB4	A-5
16	KILG0001-04-006258	102303 Lincoln	EMBSOIL	102303	102+00 35' LTCL	810.01	0121/04	100.0	100.0	100.0	92.0	83.0	53.0	48.0	21.9	14.5	7.4	93.5	28.5	39.0	4.0	3.61	IB4	A-4
17	KILG0001-04-006259	102303 Lincoln	EMBSOIL	102303	107+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	96.0	92.0	62.0	54.0	6.4	1.6	4.8	97.0	25.3	41.0	5.0	2.50	IB4	A-5
18	KILG0001-04-006260	102303 Lincoln	EMBSOIL	102303	126+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	96.0	93.0	64.0	57.0	16.3	5.7	10.6	96.0	25.9	44.0	7.0	2.26	IB4	A-5
19	KILG0001-04-006261	102303 Lincoln	EMBSOIL	102303	131+00 35' RTCL	810.01	0121/04	100.0	100.0	100.0	78.0	65.0	27.0	20.0	13.8	3.6	10.2	106.5	22.1	0.0	0.0	6.81	IB3	A-2-4

STA	DEPTH	DES	CLASS	SAMPLE
		35' RT		
73100	0'-5'	BRNCHSHP 11	II	BT 11
78100	0'-5'	BRNCHSHP 11	II	BT 11
83100	0'-5'	BRNCHSHP 11	II	BT 12
88100	0'-5'	BRNCHSHP 11	II	BT 12
93100	0'-5'	BRNCHSHP 11	II	BT 13
97100	0'-5'	BRNCHSHP 11	II	BT 14
	5'-12'	BRNCHSHP 11	II	BT 15
102100	0'-9'	MITSHP 11	II	BT 16
107100	0'-5'	BRNCHSHP 11	II	BT 17

Notes

79x50-24" CMCID - in poor cond.
 - soil core samp 2-c to ker here



NOTES:

1. FOR SLOPE HEIGHTS LESS THAN 70 FT. BUT GREATER THAN 35 FT., A BERM SHOULD BE CONSTRUCTED AT APPROX. $\frac{1}{2}$ THE SLOPE HEIGHT. FOR SLOPE HEIGHTS GREATER THAN 70 FT., CONSTRUCT A BERM EVERY 35 FT.
2. THE BERM SHOULD BE SLOPED TO DRAIN AND SHOULD BE CONNECTED TO CONCRETE FLUMES TO REMOVE WATER FROM SLOPE.
3. A DRAINAGE DITCH SHOULD BE CONSTRUCTED AT THE TOP OF CUT SLOPES WHERE WATER DRAINS TOWARDS SLOPE.

BERM DETAIL FOR CUTS OR FILLS OVER 35 FEET

NO SCALE

Pipe Culvert Material Alternates For Piedmont/Blue Ridge Region

TYPE OF PIPE INSTALLATION		CONCRETE	CORRUGATED STEEL AASHTO M-36		CORRU- GATED 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	POLY VINYL CHLORIDE (PVC) CORRUGATED SMOOTH INTERIOR ASTM F-949	
STORM DRAIN	LONGITUDINAL INTERSTATE AND TRAVEL BEARING	X								
	LONGITUDINAL NON- INTERSTATE AND NON- TRAVEL BEARING	X	X		X		X	X	X	
	CROSS DRAIN	ADT < 250	X	X	X	X		X	X	X
		GRADE ≤ 10% 250 < ADT < 1500	X	X*		X				X
		ADT > 1500	X							
	GRADE > 10%	ADT < 250		X	X	X		X	X	X
		ADT > 250				X				X
	SIDE DRAIN		X	X	X	X		X	X	X
PERMANENT SLOPE DRAIN			X	X	X		X	X	X	
PERFORATED UNDERDRAIN			X	X	X	X	X		X	

* This type pipe can be used if the addition of Type "B" Coating (AASHTO M-190, Half Bituminous Coated with Paved Invert) is utilized.

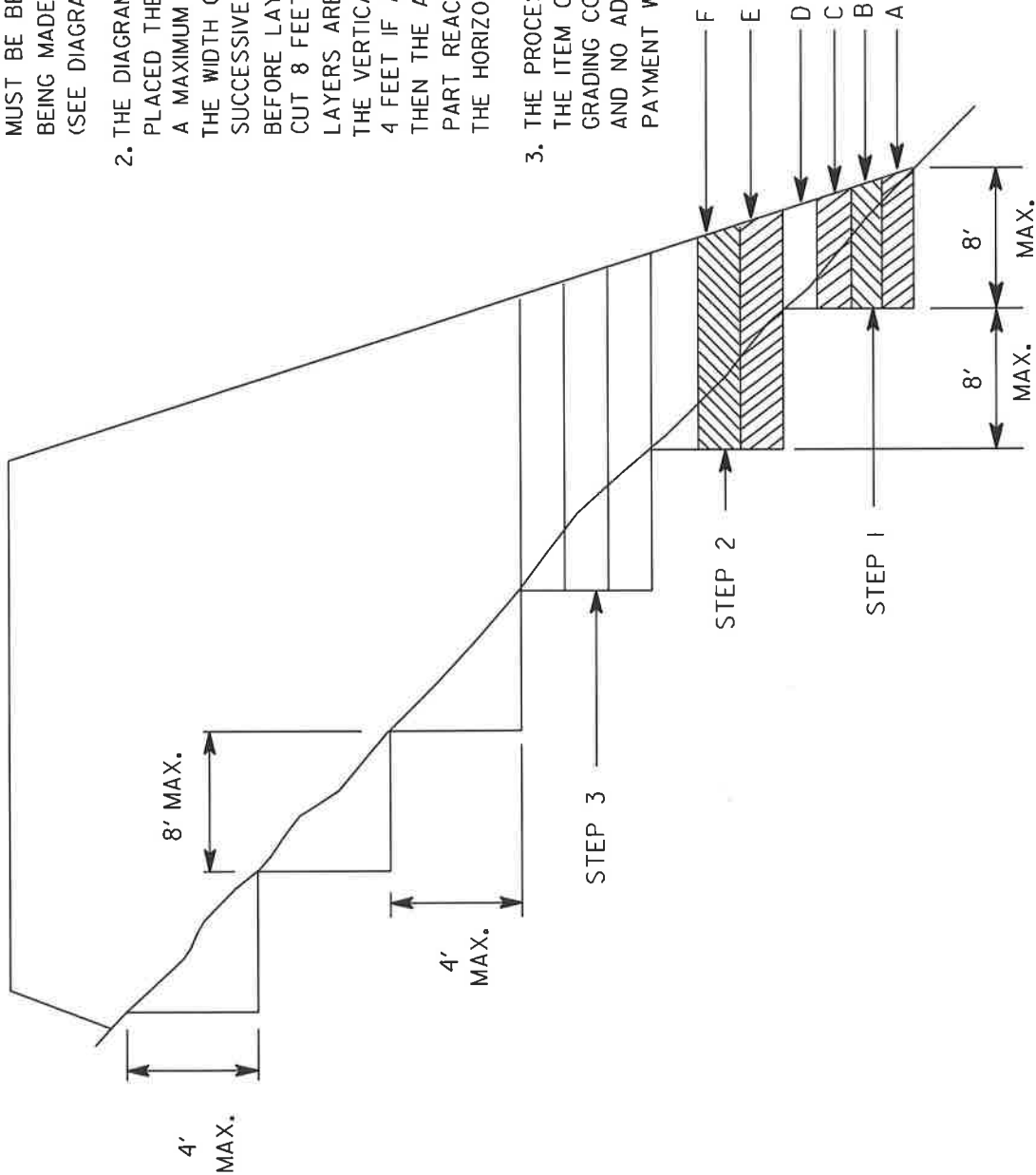
NOTES:

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.
 3. Graded aggregate backfill shall be used in cross drain applications for all plastic pipes (AASHTO M-294, HDPE pipe; AASHTO M-304, PVC pipe; ASTM F-949, PVC pipe).
- Rev. 10-04-05

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 BENCHING 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 3/4 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 OR GRADING COMPLETE IN CONSTRUCTION OF THE EMBANKMENT AND NO ADDITIONAL MEASUREMENT OF QUANTITY OR PAYMENT WILL BE MADE FOR BENCHING.



BENCHING DETAIL

NO SCALE