

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

*PVL
JET
APT/wes
file*

INTERDEPARTMENT CORRESPONDENCE

FILE IR-285-1(280) COBB-FULTON COUNTIES OFFICE Materials and Research
Forest Park, Georgia
DATE November 3, 1987

FROM *a* David A. Mitchell, Chief, Geotechnical Engineering Bureau

TO Charles Lewis, State Bridge and Structural Design Engineer

SUBJECT Bridge Foundation Investigation
I-285 over S.R. 400 (widening) Bridge #6

As requested, a bridge foundation investigation has been made at the above listed site. The results of this work are attached.

If any additional information is needed, please advise.

Thomas E. Scruggs
Thomas E. Scruggs, P.E.
Engineering Design Unit

TES :cdj

Attachment

copy: Paul Mullins



BRIDGE FOUNDATION INVESTIGATION

PROJECT NO: IR-285-1(280), Cobb - Fulton Counties
 LOCATION: See Map I-285 over S.R. 400 (widening) Bridge #6

GEOLOGIC FORMATION: Biotite Gneiss of Georgia Piedmont Region.
 NOTABLE SUBSURFACE FEATURES: Rock varies from elevation 940 to 950; overlying soils are dense saprolite and sandy silt. Groundwater elevation may be near ground surface at intermediate bents.

MAXIMUM PILE DESIGN LOADS

TIMBER =	12" MS=	12" PSC=	10 BP42 = 55 Tons
END BEARING-(70%)	14" MS=	14" PSC=	12 BP 53= 70 Tons
FRICITION- (30%)	16" MS=	16" PSC=	14 BP 73= 96 Tons
	18" MS=	18" PSC=	

FOUNDATION RECOMMENDATIONS

<u>BENT</u>	<u>SPREAD FTG. (BEARING)</u>	<u>PILE FTG. (PILE TYPE)</u>	<u>PILE BENT (PILE TYPE)</u>
1,3 right, 4	()	(H)	()
2-3 left	(4 ksf) on dense saprolite	()	()
2 right	(3.5 ksf) on dense soil	()	()
	()	()	()

ELEVATIONS

<u>BENT</u>	<u>BOTTOM of FTG.</u>	<u>MINIMUM TIP</u>	<u>ESTIMATED TIP</u>
<u>Left side</u>			
1		970	945 - 950
2	968 or below		
3	966 or below		
4		965	953 - 958
<u>Right side</u>			
1		970	935 - 940
2	959 or below		
3		955	935 - 940
4		965	950 - 955

P.D.O. - Driving resistance after minimum tip elevations have been achieved.

Waiting Period - A 30 day waiting period is recommended before driving piles through new fills at end bents.

Spread Footings - It is anticipated that excavations for spread footings may encounter groundwater above footing elevations. Cofferdams will be required to protect excavations and aid in dewatering. Due to a possible adverse effect of water on the foundation material, we recommend that 12 inches of Type II Foundation Backfill material be set up as required by the Engineer. Footings should be poured as soon as possible after excavations are opened.

Alternate Foundation - Balken piles may be used as an alternate in pile footings with a maximum design load of 55 tons for the 9" size. Recommended tip elevations are:

continued.....

BRIDGE FOUNDATION INVESTIGATION

ADDITIONAL INFORMATION (CONTINUED)

Alternate Foundation (continued)

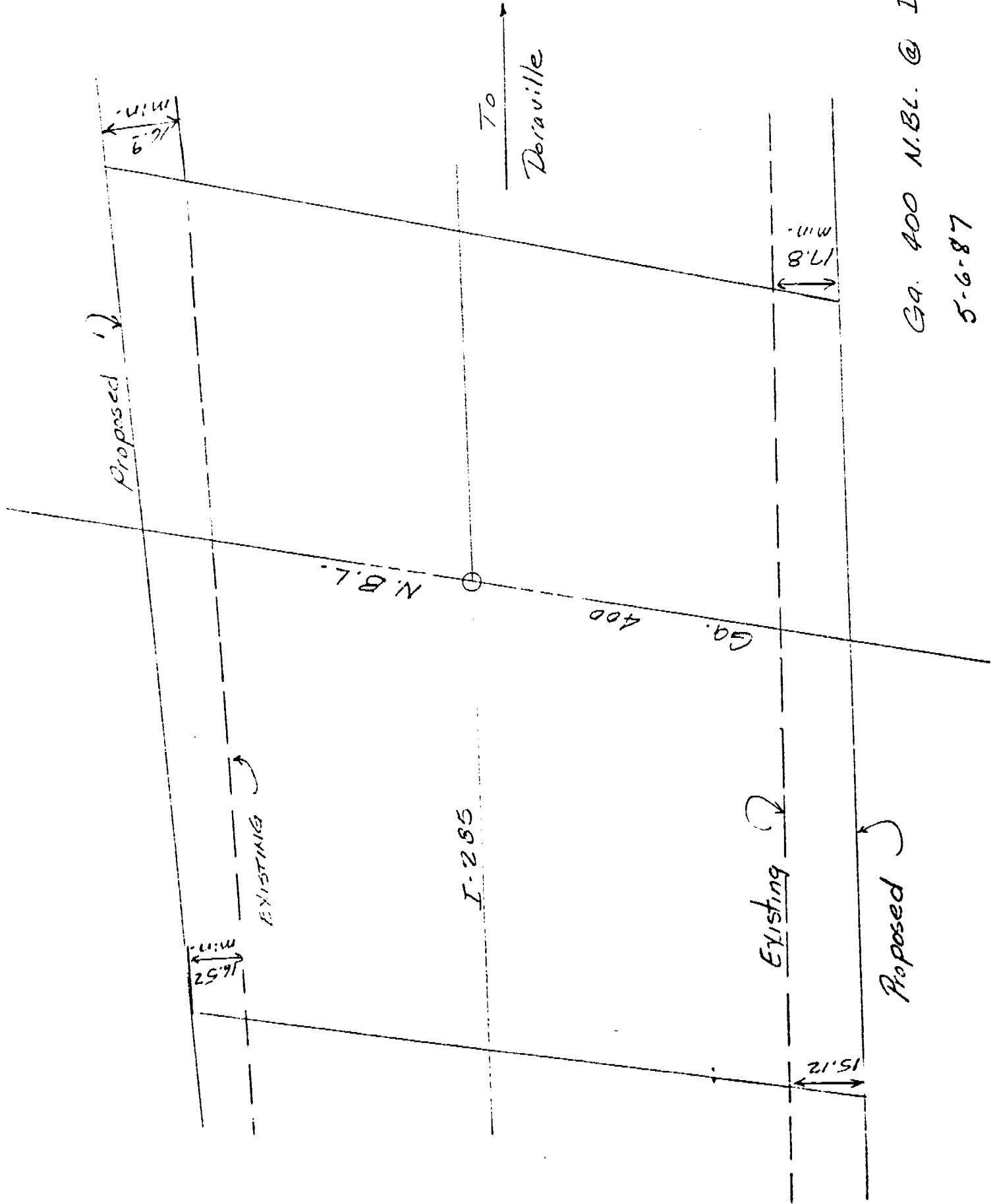
<u>Bent</u>	<u>Minimum Tip</u>	<u>Estimated Tip</u>
<u>Left Side</u>		
1	970	947 - 952
4	965	956 - 961
<u>Right Side</u>		
1	970	940 - 945
3	955	945 - 950
4	965	956 - 961

Test piles should be driven to help determine pile order lengths.

Reviewed by Warrin Bailey, P.E.

Reported By: Thomas E. Scruggs, P.E.

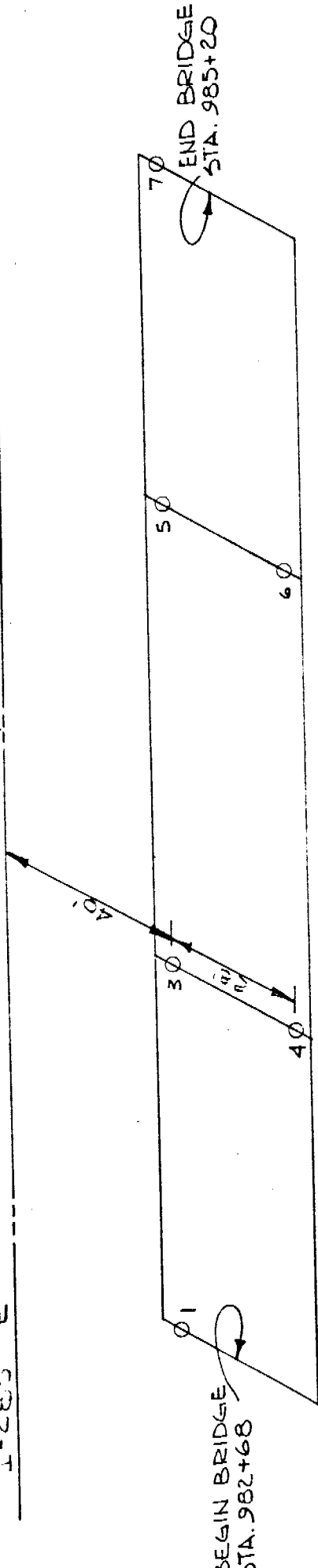
Drafted By: _____



Ga. 400 N.B.L. @ I-285

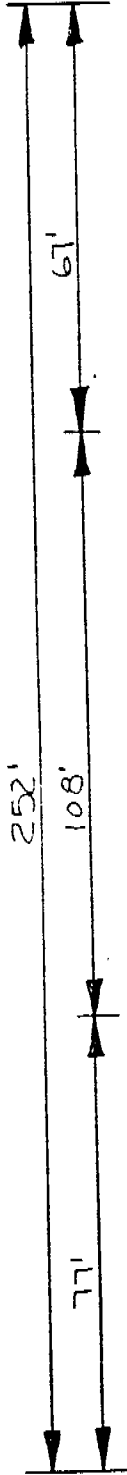
5-6-87

I-285 &



BEGIN BRIDGE
STA. 982+68

END BRIDGE
STA. 985+20



STATE HIGHWAY DEPARTMENT OF GEORGIA
Bridge Foundation Investigation

DRW.
PT
CKD.
LM
APP.

IR-285-1(280) COBB - FULTON-DEKALB
I-285 E.B.L. OVER N.B.L.

BRIDGE # 6
NO SCALE
6-15-66

STATE HIGHWAY DEPARTMENT OF GEORGIA

DIVISION OF MATERIALS AND TEST, ATLANTA, GEORGIA

BRIDGE SUBSURFACE INVESTIGATION

PROJECT APD-F-056-115 COUNTY FULTON DATE 5-19-66
 LOCATION 2222 EBL OVER NBL PD #2 BORING NO. 1
 BENT NO. 1 FOOTING LT. GROUND ELEV. 1007.53
 PROPOSED FOOTING ELEV. 1000.0 PARTY CHIEF S. J. ...

ELEV.	BORING LOG	SAM- PLE	BLOW	REMARKS	W	γ	Gs	C.	ϕ	BC	LL	PI	% 200	% CLAY	e
1000	C-2' BASE														
995	LOOSE - M.C. SILT DENSE MULTICOLORED SANDY CLAYEY SILT	15	18		29.1								21		
990		25	27		30.1								25		
985		35	4		45.6								32		
980		45	9		41.6								23		
975		55	4		40.4								32		
970		65	8		20.8								31		
965		75	11		33.1								26		
960	DENSE MULTICOLORED MICACEOUS SILT	85	37		29.3								37		
955		95	21		30.7								26		
950		105	25		27.4								31		
945		115	43		20.5								11		
940	WEATHERED ROCK														
935	END														

12" CIP
BEARING IN TONS

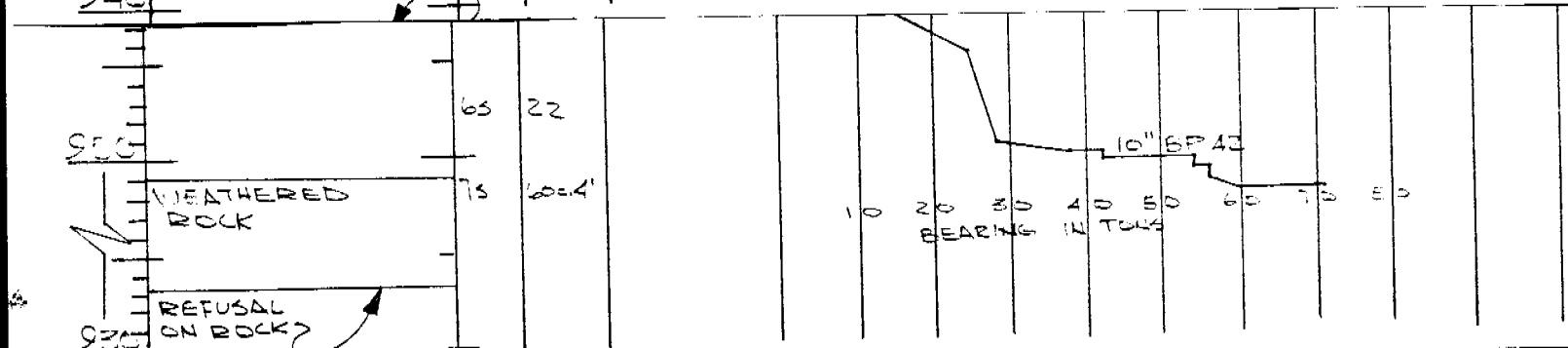
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DIVISION OF MATERIALS AND TEST, ATLANTA, GEORGIA

BRIDGE SUBSURFACE INVESTIGATION

PROJECT APD-E-056-1(5) COUNTY FULTON DATE 6-6-66
 LOCATION I-285 EBL OVER NBL # 4 BORING NO. 4
 BENT NO. 2 FOOTING RT. GROUND ELEV. 100.00
 PROPOSED FOOTING ELEV. 975.0 PARTY CHIEF MANVELL

ELEV.	BORING LOG	SAM- PLE	BLOW	REMARKS	W	γ	Gs	C	φ	BC	LL	PI	% 200	% CLAY	e
	GR. ELEV.			0-2' BLUE											
100.00	2' BLUE FINE SANDY SILT														
99.00	2' BLUE FINE SANDY SILT														
98.00	2' BLUE DENSE - VERY DENSE MULTICOLORED MICACEOUS SILT (MOIST)														
97.50			15	5									27		
97.00			26	12									25		
			36	11									22		
			46	15									27		
			56	14									27		
96.00	DENSE-VERY DENSE MULTICOLORED MICACEOUS SILT		66	30									25		
			76	33									22		
95.00			86	60-8'									26		
	WEATHERED FLK														
94.00															



66 22
 76 60-4'
 WEATHERED
 ROCK
 REFUSAL
 ON ROCK

STATE HIGHWAY DEPARTMENT OF GEORGIA

DIVISION OF MATERIALS AND TEST, ATLANTA, GEORGIA

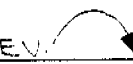
BRIDGE SUBSURFACE INVESTIGATION

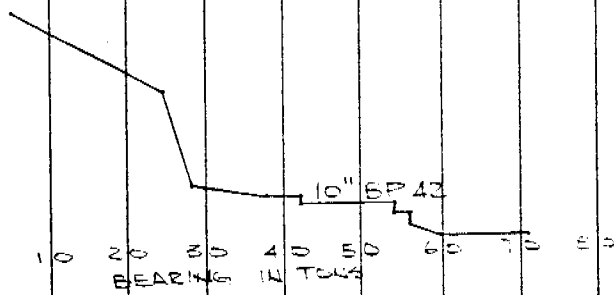
PROJECT APD-F-056-1(5) COUNTY FULTON DATE 5-20-66

LOCATION I-285 EBL # 4 BORING NO. 5

BENT NO. 3 FOOTING LT GROUND ELEV. 1008.5

PROPOSED FOOTING ELEV. 970.0 PARTY CHIEF MAXWELL

ELEV.	BORING LOG	SAM- PLE	BLOW	REMARKS	W	γ	Gs	C.	ϕ	BC	LL	PI	% 200	% CLAY	e
1000	GR. ELEV.  BROWN MILACEOUS SILT			0-2' BASE											
985	RED SILTY CLAY														
960	LOOSE-MEDIUM DENSE MULTICOLORED MILACEOUS SILT														
970		15	10												
		25	11												
		35	16												
960		45	9												
		55	17												
		65	22												
950	WEATHERED ROCK	75	60-4'												
935	REFUSAL ON ROCK														



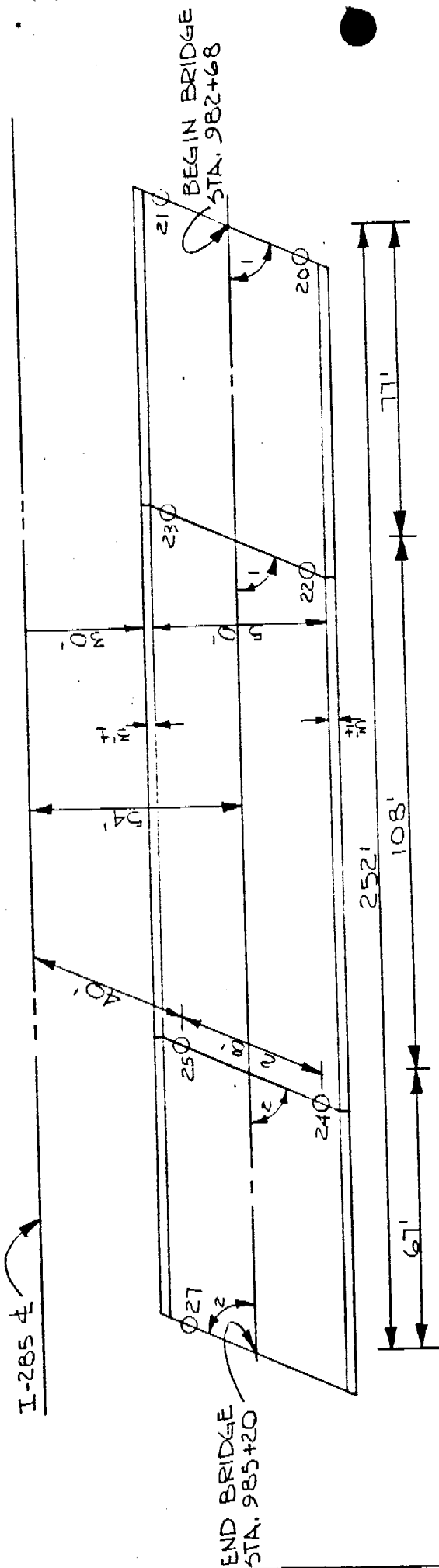
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DIVISION OF MATERIALS AND TEST, ATLANTA, GEORGIA

BRIDGE SUBSURFACE INVESTIGATION

PROJECT APP-D-056-1(5) COUNTY FULTON DATE 5-23-66
 LOCATION I-285 EBL # 4 BORING NO. 7
 BENT NO. 4 FOOTING LT GROUND ELEV. 1001.5
 PROPOSED FOOTING ELEV. 997.0 PARTY CHIEF MANWELL

ELEV.	BORING LOG	SAM- PLE	BLOW	REMARKS	W	γ	Gs	C	ϕ	BC	LL	PI	% 200	% CLAY	e
1002	MEDIUM DENSE BROWN MICACEOUS SILT	16	16	O-21 BASE											
996	STIFF RED MULTICOLORED SILTY CLAY	26	18												
983	LOOSE-MEDIUM DENSE MULTICOLORED MICACEOUS SILT (MUSST)	26	10												
970		56	8												
960	DENSE MULTICOLORED SILTY SAND	86	82												
950	WEATHERED ROCK	98	60-70												
	FRANCH ON ROCK														



1.5KEW ANGLE 65° 50' 50"
 2.5KEW ANGLE 65° 05' 46"

STATE HIGHWAY DEPARTMENT OF GEORGIA
 Bridge Foundation Investigation

DRW.	IR-285-1(280)	COBB - FULTON-DEKALB
PT	I-285 N.B.	OVER N.B.L.
CKD.		
APP.	BRIDGE #6	NO SCALE
		6-9-66

STATE HIGHWAY DEPARTMENT OF GEORGIA

DIVISION OF MATERIALS AND TEST, ATLANTA, GEORGIA

BRIDGE SUBSURFACE INVESTIGATION

PROJECT APD-F-056-1(5) COUNTY FULTON DATE 5-31-66

LOCATION I-285 U.B.L. OVER N.E.L. BRIDGE # 5 BORING NO. 20

BENT NO. 1 FOOTING LT. GROUND ELEV. 1005.60

PROPOSED FOOTING ELEV. 995.0+ PARTY CHIEF MANWELL

ELEV.	BORING LOG	SAM- PLE	BLOW	REMARKS	W	γ	Gs	C.	ϕ	BC	LL	PI	% 200	% CLAY	e
	GR. ELEV.														
	BASE			0-1.6' PAVEMENT											
1000	LOOSE-MEDIUM DENSE MULTICOLORED MILACEOUS SILT														
		10			22.8	113.1	2.67				—	—	48.7	7.5	
		25	17								—	—	50.7	7.5	
		30			27.9	114.9	2.63				—	—	50.7	7.5	
995		45	9								—	—	50.7	7.2	
		50			25.4	112.6	2.67				—	—	50.7	7.2	
		65	13								—	—	54.7	6.6	
985		70			21.2	112.8	2.62				—	—	54.7	6.6	
		85	8								—	—	57.7	5.0	
		90			22.6	112.9	2.67				—	—	57.7	5.0	
		105	17												
		115	7												
970		125	16												
		135	17												
965		145	22												
	DENSE-VERY DENSE MULTICOLORED SILTY SAND	155	26												
950		165	60.5!												
	REFUSAL ON ROCKS														
940															

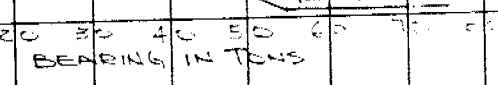
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DIVISION OF MATERIALS AND TEST, ATLANTA, GEORGIA

BRIDGE SUBSURFACE INVESTIGATION

PROJECT APD-E-056-1(5) COUNTY FULTON DATE 5-17-66
 LOCATION I-285 WBL # 5 BORING NO. 21
 BENT NO. 1 FOOTING RT. GROUND ELEV. 1025.57
 PROPOSED FOOTING ELEV. 999.0± PARTY CHIEF MAYNELL

ELEV.	BORING LOG	SAM- PLE	BLOW	REMARKS	W	γ	Gs	C.	ϕ	BC	LL	PI	% 200	% CLAY	e	
	GR. ELEV.															
	BASE			20' 6" DISTANCE												
	CLAYEY SILT															
1025	LOOSE - REDDISH	13	13		26.3								40			
	DENSE															
	MULTICOLORED															
	SILTY SAND	23	9		50.6								39			
995		25	10		52.0								34			
		23	7		45.0								30			
980		53	8		44.2								30			
		63	8		42.1								30			
970		73	9		35.9								50			
		83	11		35.1								50			
960	WEATHERED ROCK	93	60=7'		18.6								33			
		103	60=11'		23.3								26			
950																
	REFUSAL ON ROCK?															



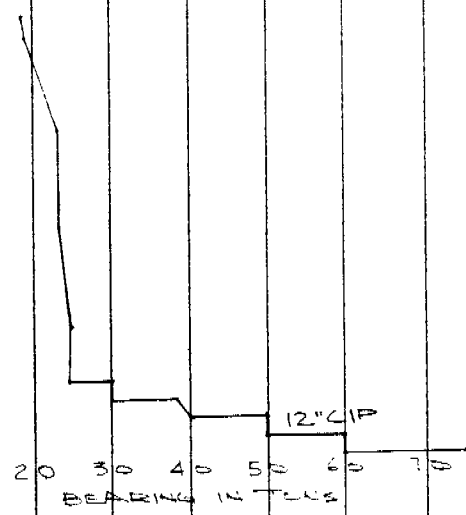
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DIVISION OF MATERIALS AND TEST, ATLANTA, GEORGIA

BRIDGE SUBSURFACE INVESTIGATION

PROJECT APD-FC56-115 COUNTY FULTON DATE 5-19-66
 LOCATION I-285 W E L # 5 BORING NO. 57
 BENT NO. 4 FOOTING RT GROUND ELEV. 104.15
 PROPOSED FOOTING ELEV. 99.40 PARTY CHIEF MAYNELL

ELEV.	BORING LOG	SAM- PLE	BLOW	REMARKS	W	γ	G _s	C.	ϕ	BC	LL	PI	% 200	% CLAY	e
104.15	GR. ELEV. BASE			10'-6" PAVEMENT											
	SOFT RED SILTY CLAY														
	MEDIUM DENSE MULTICOLORED MICACEOUS SILT (MOIST)	15	13												
		25	11												
		35	11												
		45	13												
		55	13												
		65	12												
	DENSE (SAME)	75	26												
	WEATHERED ROCK	85	60-4												
	REFUSAL OF ROCK														



LEGEND OF SYMBOLS

Sample	u (undisturbed) s (split spoon)
Blows.	number of blows with a 140 pound hammer dropping 30 in. required to drive split spoon 1 ft.
W	Water content (%)
γ	Unit weight of undisturbed sample (pcf)
G_s	Specific gravity of soils solids
e	Void ratio
S	Degree of saturation (%)
LL	Liquid limit (%)
PI	Plasticity Index (%)
C	Cohesion - apparent or real (ksf)
ϕ	Angle of internal friction (degrees)
q	Indicated ultimate strength (ksf)
B.C.	Estimated safe bearing capacity based on assumptions noted on report sheet (ksf)
<u>wl</u>	Water level at time boring was made
NP	Non-plastic
NR	No results or no recovery

JPT/WEI
MEE
lets talk
CHECK W/PIRD
ON WHAT WAS
CONSTRUCTED
WBT
1-18-94

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

INTERDEPARTMENT CORRESPONDENCE

FILE IR-285-1(298) OFFICE Materials and Research
Fulton/DeKalb Forest Park, Georgia
P. I. No. 712272 DATE January 10, 1994
FROM Ronald Collins, State Materials and Research Engineer
TO Charles Law, District Engineer, Cartersville
SUBJECT I-285 WESTBOUND BRIDGE OVER SR 400 (BRIDGE #4) LT & RT

As requested, we have investigated the soils adjacent to the subject bridge at bents 2 Left and 3 Left. The purpose of which was to determine if H-piles could be used instead of spread footings at these two locations. The attached boring logs document the soils encountered at these locations.

Based on our study, we have determined H-piles are an acceptable option. The pile design loads to be used are as follows:

- 10BP42 55 Tons
- 12BP53 70 Tons
- 14BP73 96 Tons

Also, the following tip elevations should be used:

Bent	Minimum Tip	Estimated Tip
2 Lt.	955	955
3 Lt.	956	956

If you have any questions, you may contact Steve Valdez of the Geotechnical Engineering Bureau at 363-7546.

RC:SFV:gt

Attachment

copy: Paul Liles, State Bridge and Structural Design Engineer
Attn: Marion Clements
Randall Hart, District Construction Engineer
Attn: Jackie Puckett



P.L.B FOOTINGS WERE
USED AT BT 2 LT & RT
AND BT 3 LT & RT

FOOTING DESIGN AT BT 3 RT WAS USED.
WBT

