

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: March 30, 1995

TO: Richard Pauser
Construction and Materials Supervisor
Transportation District 6

FROM: Dennis G. Althaus
Geologist

SUBJECT: Site Investigation Report
Project I.D. 1720-08-01
Structure B-47-140
STH 65 over Goose Creek
Ellsworth to River Falls
Pierce County

Attached is the Site Investigation Report for the above project.

DGA:\

Attachments

cc: District 6 (orig. +3)
C.O. Bridge (2)
C.O. Files
C.O. Design
J.E. Haverberg
Geotechnical File

SITE INVESTIGATION REPORT

Project I.D. 1720-08-01

Structure B-47-140

STH 65 over Goose Creek

Ellsworth to River Falls

Pierce County

1. GENERAL

Two borings were made for a proposed single span structure to replace the present three span steel girder bridge taking STH 65 over Goose Creek at about station 9+995. The new structure will have a 2.4 meter skew and be 5 meters wider than the present structure. The present structure shows some rusting on the girders and is in generally fair condition. The 2.44 meter approach fills look to be in good condition. The creek banks show some signs of erosion. Rolling hills with woods and farm fields make up the surrounding terrain. Goose Creek is 10 to 15 feet wide with a meandering channel that flows north. The creek is dry most of the year. Rock boulders were noted and rock outcrops are visible on the surrounding hillsides. The surface soil is a silty sand.

2. SUBSURFACE CONDITION

Two borings conforming to AASHTO Method T-206, Standard Penetration Test, to estimate relative density, fix presumptive bearing capacity, investigate soil properties to select suitable pile types with their support values, make a cursory review of alternative foundation possibilities, and recover samples for soil textural identification and classification. Soil textures in the borings logs are field identifications made by the drillers and were later verified in the C.O. Geotechnical Lab.

Boring 1 was taken at station 10+006 1.5 meters left of the existing centerline. Boring 1 was logged as the following; elevation 302.889 to 302.65 asphalt, 302.65 to 302.30 base course, 302.30 to 301.40 brown silty sand with some gravel (fill), 301.40 to 299.90 firm brown silty sand with a little gravel, 299.90 to 298.40 loose brown silt with a little sand and a trace of gravel, 298.40 to 296.90 firm brown sand with a trace of silt and a little gravel, 296.90 to 295.40 firm yellow / red sand, 295.40 to 294.00 weathered limestone, 294.00 to 292.5 limestone.

Boring 2 was taken at station 9+9985 1.5 meters right of the existing centerline. Boring 2 was logged as the following; elevation 303.054 to 302.80 asphalt, 302.80 to 298.55 loose to firm brown sand with some silt and a trace of gravel, 298.55 to 297.05 firm brown silt with some sand and gravel, 297.05 to 295.55 firm brown sand with a trace of silt and a little gravel, 295.55 to 293.30 very dense weathered limestone.

The water elevation was 298.914 at the time the borings were taken.

The stream bed elevation was 298.454.

Weathered Rock Elevations

<u>Structure Unit</u>	<u>Station</u>	<u>Rock</u>
West Abutment Boring 1	10+006	295.40
East Abutment Boring 2	9+985	295.55

3. BEARING CAPACITY

The subsurface soils within a practical footing depth have insufficient bearing capacity to support spread footings for this structure.

4. PILES

A cursory review indicates that the soils above rock/weathered rock would not be adequate to support friction/displacement piles at practical load levels.

H-piles or oil field pipe piles however could be driven to 634 kg/square cm load in the steel section if driven into weathered rock at about elevation 294.60.

5. ALTERNATIVE FOUNDATION TYPE

Drilled caissons could be used here but the cost would be more. Dynamic and vibratory methods could not be used effectively here.

6. LATERAL EARTH PRESSURE

Grade 1 granular backfill will exert an equivalent fluid pressure of 30 to 35 psf, silty sands 45 psf, silts 65 psf, silty clays and clays 85 psf or more.

7. CONSTRUCTION PROBLEMS

the 2.5 meter widening on the north and south sides of each of the existing approach fills could cause some differential settlement problems. While the expected differential settlement will be negligible it may be enough to cause cracks where the newly placed fill widening and existing fills meet and any shoulder pavement placed over this area where the fills meet may also crack. Building the new wider approach fills 2 months prior to the construction of the bridge should alleviate the potential differential settlement and shoulder pavement cracking problem. The 2 month time period would be lengthened if any topsoil is not removed from where any fill widening is to be placed or something other than a grade 1 sand is used as fill.

8. RECOMMENDATIONS

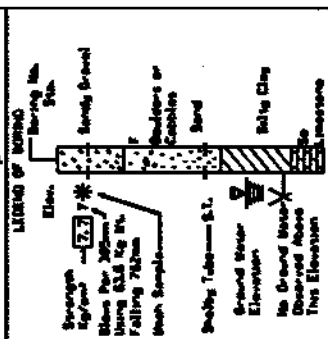
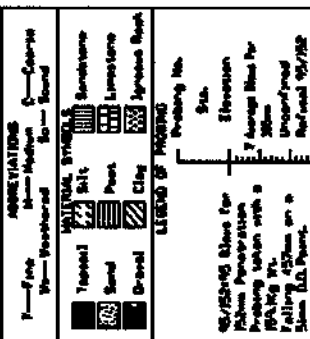
A) Use H-piles or oil field pipe piles driven to 634 kg/square cm load in the steel section driven into weathered rock at about elevation 294.60.

B) Use a grade 1 sand material as fill and backfill. Build the new wider approach fills at least 2 months prior to the construction of the bridge.

C) Remove any topsoil from the areas where a fill widening is to be placed.

D) Since there is signs of erosion on the creek banks, some sort of erosion control measures may be needed to keep the creek from eroding the toe of the fill.

If you have any questions, please contact the Geotechnical Unit.

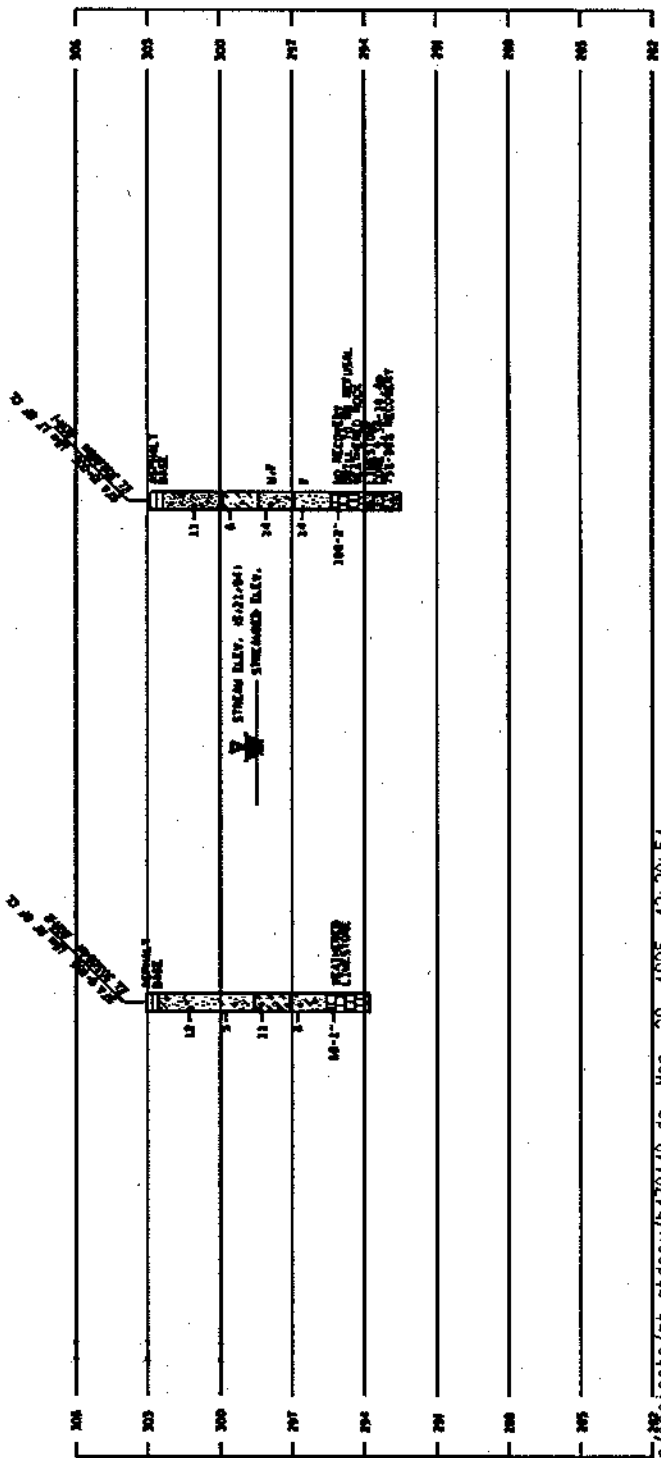


When the car was first put on the market, it was priced at \$1,200. The car was a success, and it was the first car to be sold in the United States.

NOTICE: THE FOLLOWING INFORMATION IS FOR INFORMATIONAL PURPOSES ONLY AND DOES NOT CONSTITUTE A RECOMMENDATION OR AN OFFER OF ANY FINANCIAL PRODUCT.

the fact that the Government has been unable to obtain the necessary information to enable it to make a proper assessment of the situation in the country. The Government has been unable to obtain the necessary information to enable it to make a proper assessment of the situation in the country. The Government has been unable to obtain the necessary information to enable it to make a proper assessment of the situation in the country.

NO.	DATE	REVISION	BY
STATE OF MISSISSIPPI DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS			
STRUCTURE B-47-140			
SHEET NO.		OF TOTAL SHEETS	
SUBSURFACE		EXPLORATION	
EXPLORATION		X	



FIELD BORING LOG
6 Meter Log

Boring No. 1 Structure B-47-140 County PIERCE Sheet 1 of 2
Project 1720-08-01 Road STH "65" Goose Creek
Station 10+00.6 Offset 1.5m LT of R Surface Elevation 302.889

GROUND WATER OBSERVATIONS

Streambed Elev. 298.454 Time After Drilling _____
Water Elev. 298.914
Top of Well Elev. _____ Depth to Water _____

MOISTURE

D = Damp
M = Moist
W = Wet

A = Auger
C = Coring
CA = Casing Advancer
WA = Wash Ahead
HS = Hollowstem

DRILLING METHOD

DM = Drilling Mud NW = Casing, 76.2mm I.D. (3")
RB = Rockbit HW = Casing, 101.6mm I.D. (4")
SS = Splitspoon BV = Corebarrel, 36.5mm Core Dia. (1 7/16")
ST = Shelby Tube NV = Corebarrel, 47.6mm Core Dia. (1 7/8")
E = Easy M = Medium H = Hard

Start 02-24-95 Unit 4Finish 02-24-95 Chief ANDERSON

Sample No.	Moisture	Blows on Sampler	Sample and Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unclassified Status	Boulders	Drilling Method	Probe Blows
					ASPHALT			RB	
					30 cm			SS	
					BASE COURSE				
					60 cm				
					SILTY SAND (Fill)				
					90 cm				
					120 cm				
					1.5 m				
1	D	7 7			FIRM				
		4 4			BROWN SILTY SAND				
					LITTLE GRAVEL				
					210 cm				
					240 cm				
					270 cm				
					3 m				
2	M	7 3			LOOSE BRN SILT - LITTLE SAND				
		3 4			TR GRAVEL				
					330 cm				
					360 cm				
					390 cm				
					420 cm				
					4.5 m				
3	W	2 5			FIRM MED-FINE BRN SAND				
		9 14			TR. SILT - LITTLE GRAVEL				
					480 cm				
					510 cm				
					540 cm				
					570 cm				
					6 m				
4	M	10 6			FIRM FINE Yellow/REDDISH SAND				
		8 7							

Checked by

METRIC CONVERSION FACTORS

1 cm = 0.3937 inches
1 m = 3.281 feet

1 inch = 2.54 cm
1 foot = 30.48 cm, 0.3048 m

Boring No.

1

FIELD BORING LOG
6 Meter Log

Boring No. 1 Structure B-47-140 County PIERCE Sheet 2 of 2
Project 1720-08-01 Road STH "65" Goose Creek
Station 10+00.6 Offset 1.5 M LT of C Surface Elevation 302.889

GROUND WATER OBSERVATIONS

Streambed Elev. 298.454 Time After Drilling _____
Water Elev. 298.914 _____
Top of Well Elev. _____ Depth to Water _____

MOISTURE

D = Damp
M = Moist
W = Wet

A = Auger
C = Coring
CA = Casing Advancer
WA = Wash Ahead
HS = Hollowstem

DRILLING METHOD

DM = Drilling Mud NW = Casing, 76.2mm I.D. (3")
RB = Rockbit HW = Casing, 101.6mm I.D. (4")
SS = Spitspoon BV = Corebarrel, 36.5mm Core Dia. (1 7/16")
ST = Shelby Tube NV = Corebarrel, 47.6mm Core Dia. (1 7/8")
E = Easy M = Medium H = Hard

Start 02-24-95 Unit 4Finish 02-24-95 Chief ANDERSON

Sample No.	Moisture	Blows on Sampler	Sample and Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unconfined Strength	Boulders	Drilling Method	Probe Blows
4	M	10 8	6 7		030 cm FIRM FINE YELLOW/REDDISH SAND 060 cm 090 cm 120 cm 150 cm 180 cm 210 cm 240 cm 270 cm 300 cm 330 cm 360 cm 390 cm 420 cm 450 cm 480 cm 510 cm 540 cm 570 cm 600 cm 630 cm 660 cm 690 cm 720 cm 750 cm 780 cm 810 cm 840 cm 870 cm 900 cm 930 cm 960 cm 990 cm 1020 cm 1050 cm 1080 cm 1110 cm 1140 cm 1170 cm 1200 cm			RB	
5	100% 12H				FIRM No RECOVERY DRILL DOWN TO RB - REFUSAL WEATHERED ROCK CORE 75% - 80% RECOVERY LIMESTONE & SAND E.O.B.			C	

Checked by

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1 foot = 30.48 cm, 0.3048 m

Boring No.

FIELD BORING LOG
6 Meter Log

Boring No. 2 Structure B-47-140 County PIERCE Sheet 1 of 2
Project 1720-08-01 Road STH "65" GOOSE CREEK
Station 91985 Offset 1.5 m RT of Q Surface Elevation 303.054

GROUND WATER OBSERVATIONS

Streambed Elev. 298.454 Time After Drilling _____
Water Elev. 298.914 _____
Top of Well Elev. _____ Depth to Water _____

MOISTURE

D = Damp
M = Moist
W = Wet

DRILLING METHOD

A = Auger DM = Drilling Mud NW = Casing, 76.2mm I.D. (3")
C = Coring RB = Rockbit HW = Casing, 101.6mm I.D. (4")
CA = Casing Advancer SS = Splitspoon BV = Corebarrel, 36.5mm Core Dia. (1 7/16")
WA = Wash Ahead ST = Shelby Tube NV = Corebarrel, 47.6mm Core Dia. (1 7/8")
HS = Hollowstem E = Easy M = Medium H = Hard

Start 03-21-91 Unit 4

Finish 03-21-91 Chief K. WALSH

Sample No.	Moisture	Blows on Sampler	Sample and Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unconfined Strength	Boulders	Drilling Method	Probe Blows
					Asphalt			A	
					Base			SS	
					30 cm				
					60 cm				
					90 cm				
					120 cm				
					1.5 m	1.5 m			
1	D	10	8		180 cm FIRM - BRN SAND some SILT				
		4	4		TR GRAVEL				
					210 cm				
					240 cm				
					270 cm				
					3 m	3 m			
2		5	3		330 cm LOOSE				
	W	2	2		360 cm				
					390 cm				
					420 cm				
					4.5 m	4.5 m			
3	W	3	4		480 cm FIRM BRN SILT some SAND				
		7	9		510 cm some GRAVEL				
					540 cm				
					570 cm				
					6 m	6 m			
4	W	4	7		FIRM BRN SAND LITTLE GRAVEL				
		1	4		TR SILT				

Checked by _____

METRIC CONVERSION FACTORS

1 cm = 0.3937 inches 1 inch = 2.54 cm
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Boring No.

2

FIELD BORING LOG
6 Meter Log

Boring No. 2 Structure B-47-140 County PIERCE Sheet 2 of 2
Project 1720-08-01 Road STH "65" GORSE Creek
Station 9+985 Offset 1.5m E of C Surface Elevation 303.057

GROUND WATER OBSERVATIONS

Streambed Elev. 298.454 Time After Drilling _____
Water Elev. 298.914 _____
Top of Well Elev. _____ Depth to Water _____

MOISTURE

D = Damp
M = Moist
W = Wet

DRILLING METHOD

A = Auger DM = Drilling Mud NW = Casing, 76.2mm I.D. (3")
C = Coring RB = Rockbit HW = Casing, 101.6mm I.D. (4")
CA = Casing Advancer SS = Spitspoon BV = Corebarrel, 36.5mm Core Dia. (1 7/16")
WA = Wash Ahead ST = Shelby Tube NV = Corebarrel, 47.6mm Core Dia. (1 7/8")
HS = Hollowstem E = Easy M = Medium H = Hard

Start 03-21-95 Unit 4Finish 03-21-95 Chief KOWALD

Sample No.	Moisture	Blows on Sampler	Sample and Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS	Unconfined Strength	Boulders	Drilling Method	Probe Blows
4	W	4 7			30 cm Auger FIRM SAND, SILT LITTLE GRAVEL			A	
		7 4			60 cm			SS	
					90 cm				
					120 cm				
					1.5 m				
5	W	32 66			180 cm V. DENSE WEATHERED Limestone			V	
		41"			210 cm			Auger	
					240 cm				
					270 cm				
					3 m				
					330 cm				
					360 cm E.O.S.				
					390 cm				
					420 cm				
					4.5 m				
					480 cm				
					510 cm				
					540 cm				
					570 cm				
					6 m				

Checked by _____

METRIC CONVERSION FACTORS

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1 m = 3.281 feet 1 foot = 30.48 cm, 0.3048 m

Boring No.

2