R-234

T.7N. R.2W. SEC. 14G

Memorandum

UTAH DEPARTMENT OF TRANSPORTATION

1094

FOUNDATIONS

DATE: March 11, 1980

TO : Those Listed Below

FROM : Edwin E. Lovelace, Engineer of Materials and Research EEL

SUBJECT: RS-BRS-0558(4) - Hot Springs Railroad Separation.
SR-126 Over Union Pacific Railroad and SB US-89

SITE CONDITIONS:

A two span prestressed beam structure is proposed to replace the existing Hot Springs Railroad Separation. The new structure will be 264'-3" long and 46' wide and will span the Union Pacific Railroad tracks and the south bound lane of US-89.

Drainage of the general area varies from good on the east side of south bound US-89 to poor at the west abutment.

SUBSURFACE EXPLORATION:

Two test holes were drilled for this project to depths of 112 feet and 115 feet. A third drill hole was planned for the center bent, but was eliminated due to soft ground conditions.

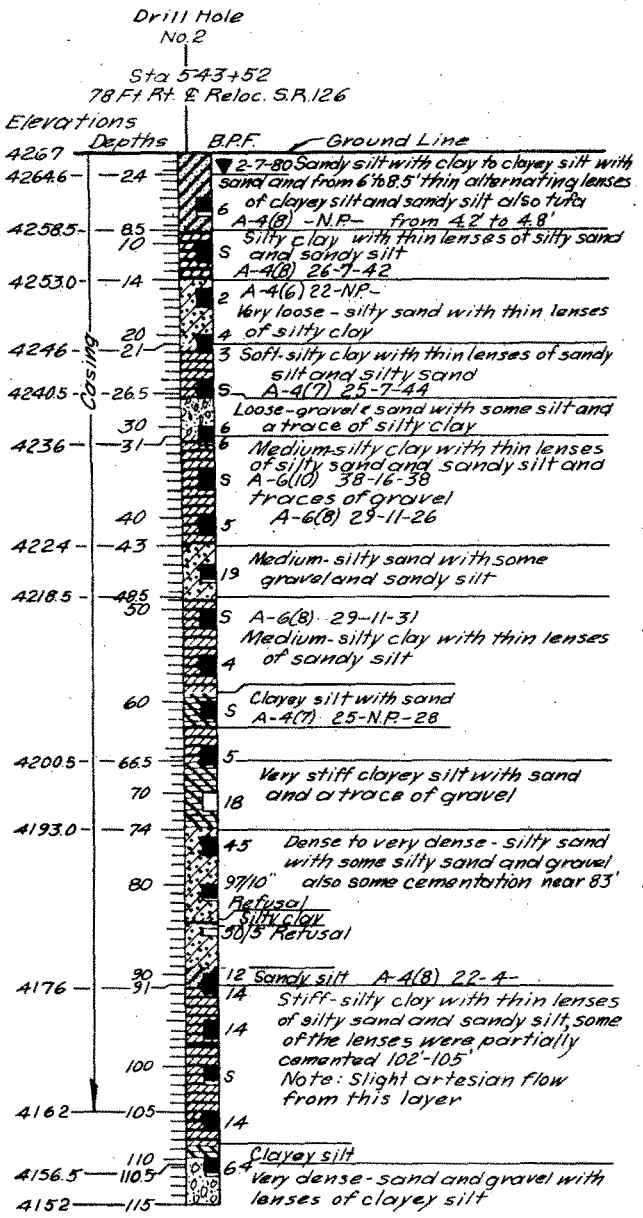
Correlation of soils between the two drill holes is relatively poor with only a few general depositional trends in common. The subsurface soils encountered in these two drill holes were deposited by ancient Lake Bonneville. The soil types vary from a silty sand and gravel to a silty clay. In general, more granular soils were encountered in Drill Hole #1. Refer to the Drilling logs for further subsoils details.

The ground water table varied from 1.8' in Drill Hole #1 to 2.4' in Drill Hole #2.

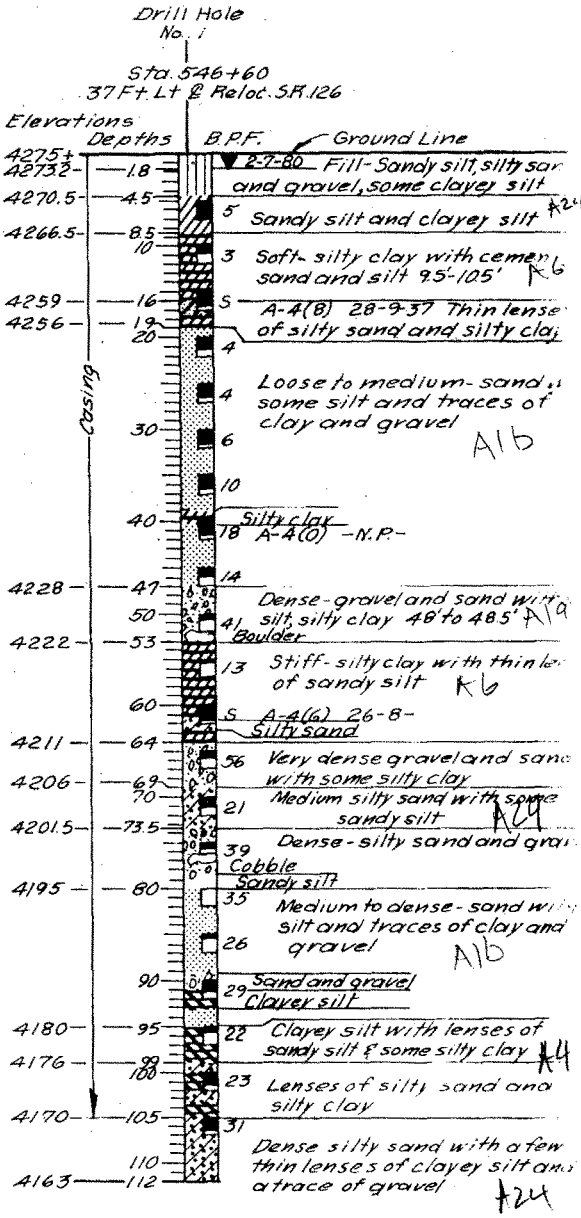
FOUNDATION RECOMMENDATIONS:

Ninety ton capacity steel pipe piles are recommended for support of this structure. The estimated pile tip elevations and corresponding length below natural ground for one foot diameter steel pipe piles are as follows:

Location	Estimated Pile Tip Elevation, Ft.	Depth Below Natural Ground, Ft.	Allowable Pile Load Tons
Abut. #1	4191	76	90
Bent #2	4194	76	90
Abut. #3	4209	66	90



Note: Due to a slight artesian flow an accurate elevation of the water table was not obtained - A 10' deep drill hole adjacent to this hole showed the water table at 2.4' on 2-7-80.



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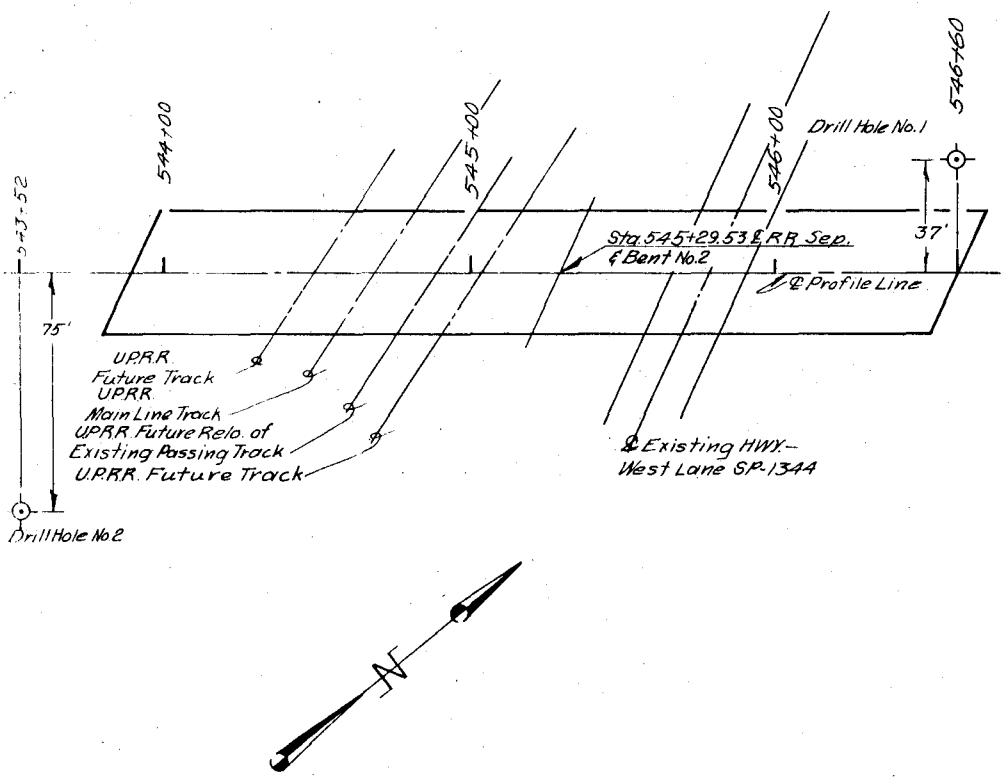

KEY TO DRILLING LOG

RELATIVE DENSITY (NON-PLASTIC SANDS)

VERY LOOSE – LESS THAN 4 BLOWS PER FOOT
LOOSE – 4 TO 10 BLOWS PER FOOT.
MEDIUM – 10 TO 30 BLOWS PER FOOT
DENSE – 30 TO 50 BLOWS PER FOOT.
VERY DENSE – MORE THAN 50 BLOWS PER FOOT

CONSISTENCY (PLASTIC-SILT & CLAY)

VERY SOFT – LESS THAN 2 BLOWS PER FOOT
SOFT – 2 TO 4 BLOWS PER FOOT
MEDIUM – 4 TO 8 BLOWS PER FOOT
STIFF – 8 TO 15 BLOWS PER FOOT.
VERY STIFF 15 TO 30 BLOWS PER FOOT.
HARD – MORE THAN 30 BLOWS PER FOOT.

TOPSOIL OR FILL
GRAVEL
SAND
SILT
CLAY
SHALE
IGNEOUS
LIMESTONE
CONGLOMERATE
DOLOMITE
SAN CLA
CLA SAN
SILTY CLAY
CLAY SILT
SILTY SAN
SAND SILT

DRILL HOLE NO
STATION 0+00 ℄ OR LT OR RT. IN FT. OFF

ELEVATIONS

GROUND ELEVATION
4555
GROUND WATER TABLE 4552
STRATA CHANGE 4546
LOCATION OF SAMPLE
SAMPLE NOT RECOVERED
BOTTOM OF HOLE 4531

DEPTHS: 5', 15', 20', 25', 30'

GROUND LINE

EXAMPLE TYPICA
STIFF MEDIUM PL
BRN. CLAY, SOME S
AASHO LL-PI-W
A-6(4) 17-7-11
DATE
THIN WALL SHELB TUBE. UNDISTURE SAMPLER USED
SPLIT BARREL UNDISTURBED SAMPLER WITH LI RINGS OR CALIFO TYPE SAMPLER
REASON NOT RECOVERED

NO. OF BLOWS OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO DRIVE A STD. 1⅜" ID, 2" O.D SAMPLE TUBE 1 FT.

CLASSIFICATIO OF EACH SAMPLE AND RESULTS OF CLASSIFICATION TESTS.

ABBREVIATIONS

L.L. – LIQUID LIMIT IN %
P.I – PLASTIC INDEX
w. – NATURAL MOISTURE CONTENT
W.G. – WELL GRADED
PEN. – PENETRATION
G.W.T. – GROUND WATER TABLE
B.P.F. – BLOWS PER FOOT.
N.P – NON PLASTIC

Note: Refusal – more than 50 blows per 6"

Drilled: Nov. - Dec. 1979

NO.	BY	DATE	REMARKS

REVISIONS

UTAH STATE DEPARTMENT OF HIGHW
SALT LAKE CITY, UTAH
MATERIALS AND TESTS DIVISION

HOT SPRINGS RAILROAD SEPARATION
Re-align S.R. 126 over S.B. US 89 & UPRR

DRAWN BY Boyd C. Searle	CHECKED BY B. Kistler	RS-BRS-055 PROJECT NO.
CHECKED BY P.J. Sizemore	CHECKED BY Keith Powell	
CHECKED BY S. Sakhai	CHECKED BY	544+93 STATION
APPROVAL RECOMMENDED BY Heber Vlam		BOX ELDE COUNTY
RECEIVED DATE	CHIEF STRUCTURAL ENG.	
BR NO	DRG NO	

[illegible] LOCATION= 4128HON, 457229OE UTM coordinates

BORING NUMBER 1
BORING DEPTH=112.00 ft. GROUND WATER DEPTH= 1.75 ft.

DEPTH (ft.)	CRITICAL ACCELERATION (a/g)	SOIL TYPE	N	N1	SILT CORRECTION
6.00	0.1343	A24	5.0	8.0	5.0
21.00	0.0432	A1a	4.0	4.9	0.0
26.00	0.0394	A1a	4.0	4.5	0.0
31.00	0.0557	A1a	6.0	6.2	0.0
36.00	0.0883	A1a	10.0	9.7	0.0
41.00	0.1537	A1a	18.0	16.3	0.0
46.25	0.1196	A1a	14.0	11.9	0.0
51.00	0.3937	A1a	41.0	33.1	0.0
66.25	0.9047	A24	56.0	39.1	5.0
71.00	0.2496	A24	21.0	14.1	5.0
75.75	0.4247	A24	39.0	25.2	5.0
96.00	0.1077	A4	22.0	12.3	7.5
101.25	0.1567	A4	23.0	12.5	7.5
106.00	0.1386	A24	31.0	16.4	5.0

MINIMUM CRITICAL ACCELERATION FOR BORING= 0.0394

BORING NUMBER 2
BORING DEPTH=115.00 ft. GROUND WATER DEPTH= 2.25 ft.

DEPTH (ft.)	CRITICAL ACCELERATION (a/g)	SOIL TYPE	N	N1	SILT CORRECTION
6.25	0.1062	A4	6.0	9.6	7.5
16.25	0.0942	A4	2.0	2.7	7.5
20.75	0.1140	A4	4.0	4.9	7.5
30.75	0.1014	A24	6.0	6.2	5.0
46.00	0.2297	A4	19.0	16.1	7.5
75.75	0.5968	A4	45.0	28.9	7.5
90.25	0.1624	A4	12.0	7.0	7.5
111.25	0.1890	A1a	64.0	32.7	0.0

MINIMUM CRITICAL ACCELERATION FOR BORING= 0.0942

MINIMUM CRITICAL ACCELERATION FOR AREA= 0.0394