

Memorandum · 1173

UTAH DEPARTMENT OF TRANSPORTATION

DATE: April 20, 1978

: Those Listed Below

FROM : Edwin E. Lovelace, Engineer of Materials & Research *EEL*SUBJECT: RS-0531(1) - Cache Junction towards Newton; Foundation Report
SR-23 over Bear River

SITE CONDITIONS:

A three span continuous steel beam structure, 214 feet long and 38 feet wide, is proposed to replace the existing structure at this site. The structure will cross the Bear River at an angle of 90°. The bridge approaches will be constructed on the existing fill.

Drainage of the general area is good, with all apparent drainage toward the Bear River.

SUBSOIL EXPLORATION

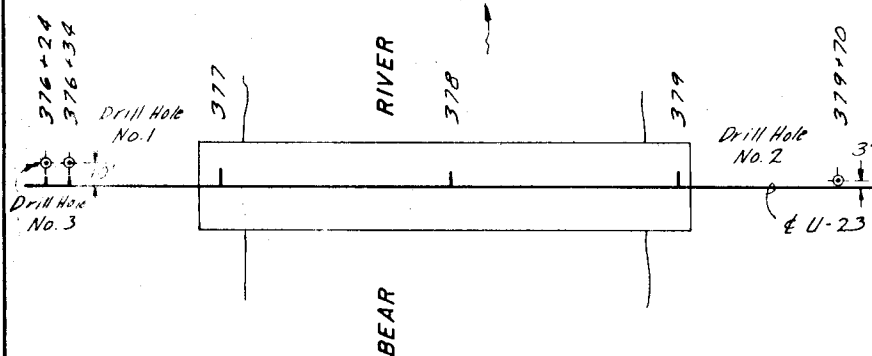
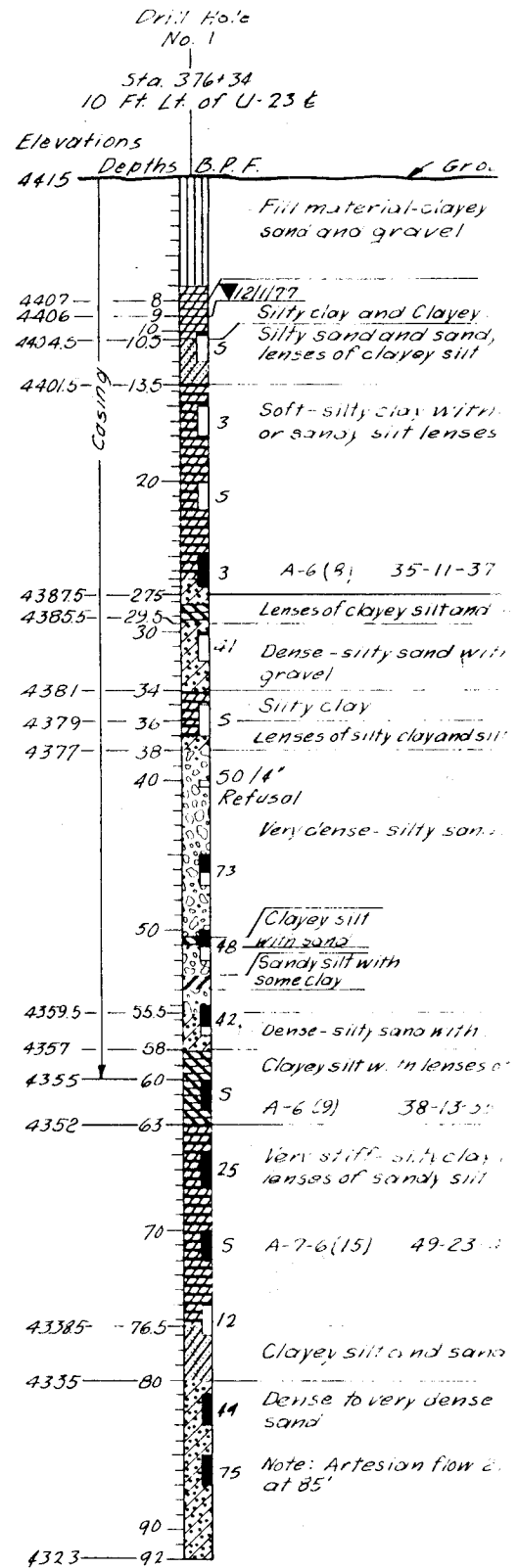
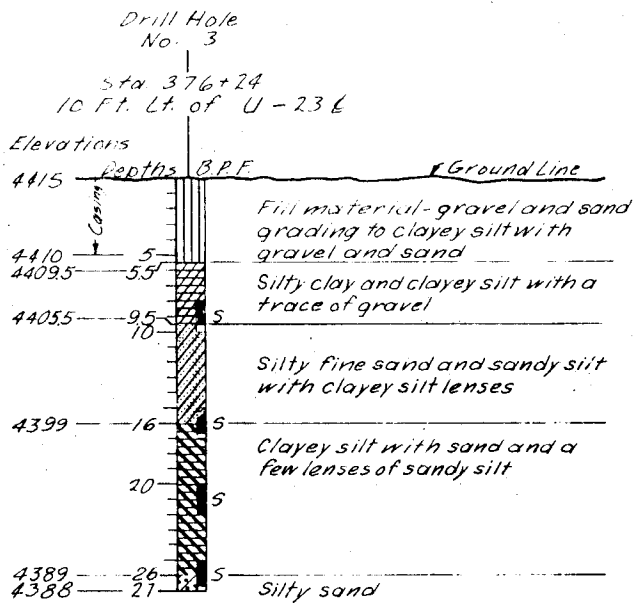
Three test holes were drilled at this site to depths ranging from 27 feet to 100 feet. Correlation between the drill holes is fair.

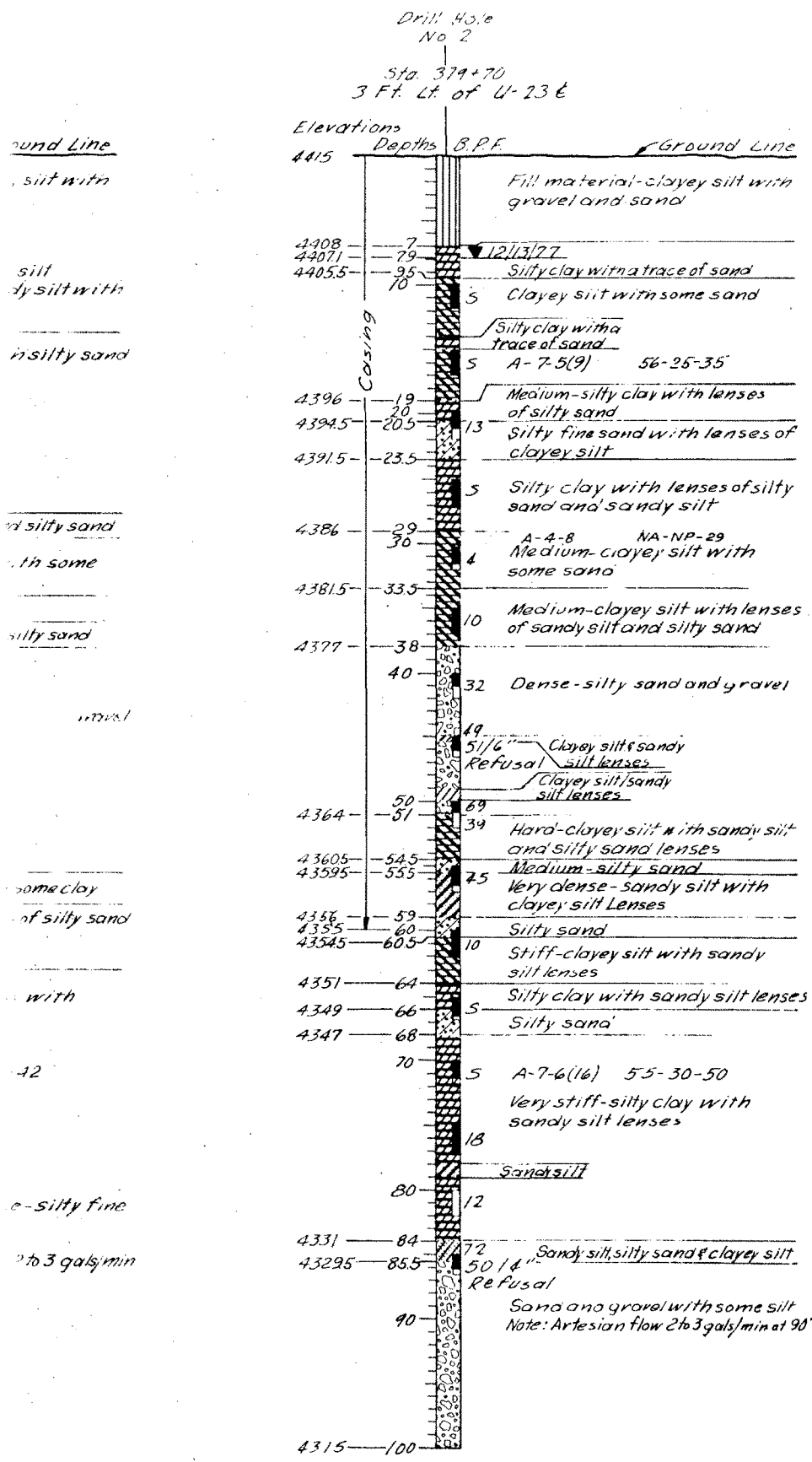
In general, the subsoils profile is as follows: from the ground surface to 8 feet - fill material; from 8 feet to 38 feet - soft to medium silty clay and clayey silt with some lenses of silty sand and sandy silt; from 38 feet to 51 feet - very dense silty sand and gravel with lenses of clayey silt and sandy silt; from 51 feet to 63 feet - alternating layers of clayey silt, silty sand and sandy silt; from 63 feet to depths between 80 feet and 86 feet - very stiff silty clay with a few lenses of sandy silt; from these depths to the maximum depth of exploration - very dense silty sand and gravel.

The ground water table was observed at depths of 7.9 feet and 9 feet below the existing fill surface. Refer to the Drilling Log, Figure 1 for further details and location of the drill holes.

FOUNDATION RECOMMENDATIONS

Forty ton capacity steel pipe piles driven into the dense silty sand and gravel layer approximately 46 feet below the existing fill surface, are recommended for support of this structure. The estimated pile tip elevation for both abutments is 4369 feet. Piles should not be driven below 4369 feet.





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.

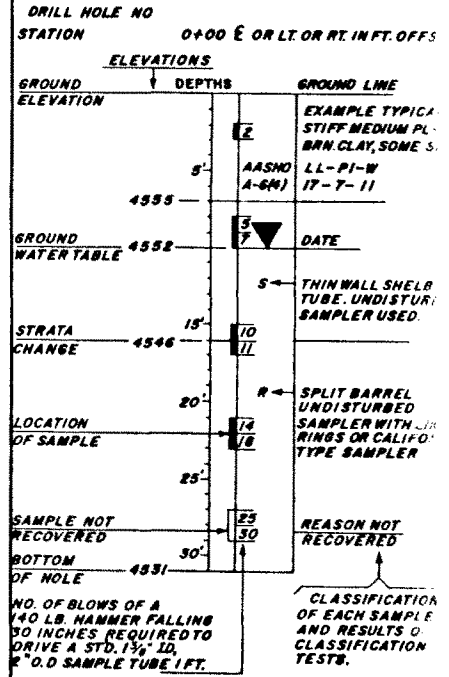
MEDIUM - 4 TO 8 BLOWS PER FOOT.

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	IRREGULAR	SAND
GRAVEL	LIMESTONE	CLAY
SAND	CONGLOMERATE	SILT
SILT	DOLOMITE	CLAY
CLAY		SILT
SHALE		SAND



ABBREVIATIONS

L.L. - LIQUID LIMIT IN %

P.I. - PLASTIC INDEX

N. - 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

UTAH STATE DEPARTMENT OF HIGHWAYS

SALT LAKE CITY, UTAH

MATERIALS AND TESTS DIVISION

CACHE JUNCTION TOWARDS NEWTON

U-23 OVER BEAR RIVER

DRAWN BY B. K. H. CHECKED BY B. C. S. PROJECT NO. RS-053

CHECKED BY G. C. P. CHECKED BY D. K. P. STATION 377 + 70

CHECKED BY E. K. CHECKED BY L. H. P. COUNTY CACHE

RECEIVED DATE

NO. BY DATE REMARKS

REVISIONS

AREA NUMBER 1173, LOCATION= 416800N, 4632700E UTM coordinates

BORING NUMBER 1

BORING DEPTH= 92.00 ft. GROUND WATER DEPTH= 9.00 ft.

DEPTH (ft.)	CRITICAL ACCELERATION (a/g)	SOIL TYPE	N	N1	SILT CORRECTION
31.25	3.7608	A4	41.0	38.0	7.5
46.00	15.8702	GP	73.0	57.3	0.0
51.00	1.1579	GP	48.0	35.8	0.0
56.25	1.4842	A4	42.0	29.9	7.5
82.25	1.3723	A4	49.0	28.5	7.5
86.25	7.9537	A4	75.0	42.6	7.5

MINIMUM CRITICAL ACCELERATION FOR BORING= 1.1579

BORING NUMBER 2

BORING DEPTH=100.25 ft. GROUND WATER DEPTH= 8.00 ft.

DEPTH (ft.)	CRITICAL ACCELERATION (a/g)	SOIL TYPE	N	N1	SILT CORRECTION
21.00	0.3315	A4	13.0	14.1	7.5
41.25	0.4255	GP	32.0	26.7	0.0
44.75	1.6961	GP	49.0	39.4	0.0
56.00	2.0289	A4	45.0	32.4	7.5

MINIMUM CRITICAL ACCELERATION FOR BORING= 0.3315

MINIMUM CRITICAL ACCELERATION FOR AREA= 0.3315