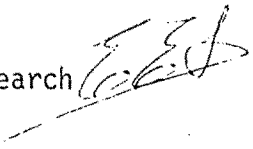


Memorandum

UTAH DEPARTMENT OF TRANSPORTATION

DATE: April 4, 1980

TO : Those Listed Below

FROM : Edwin E. Lovelace, Engineer of Materials and Research SUBJECT: I-15-5(6)220 - South Nephi to North Nephi; North Nephi Interchange,
US-91 over I-15 at I-15 ℓ Station 1122+00T 125 R 1 E
Sec 21 N

SITE CONDITIONS

A two-span steel beam structure 385 feet long by 46 feet wide is proposed to carry US-91 over I-15. The crossing will be at an angle of approximately 46°. The I-15 roadway will require a cut of 18 to 24 feet at this site, while US-91 will have approach embankments about 4 to 7 feet high.

Surface drainage in the area is good.

SUBSURFACE EXPLORATION

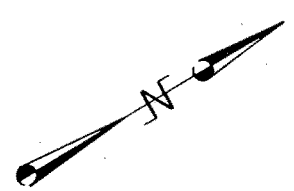
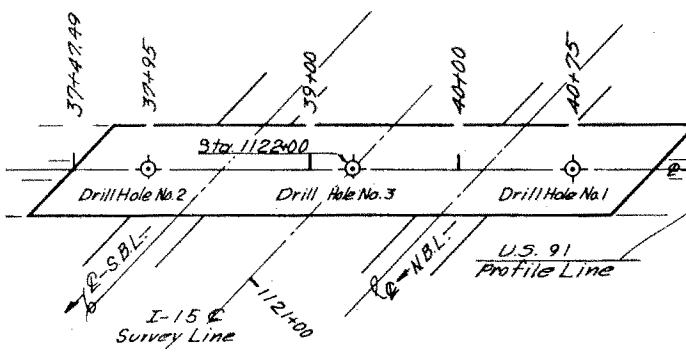
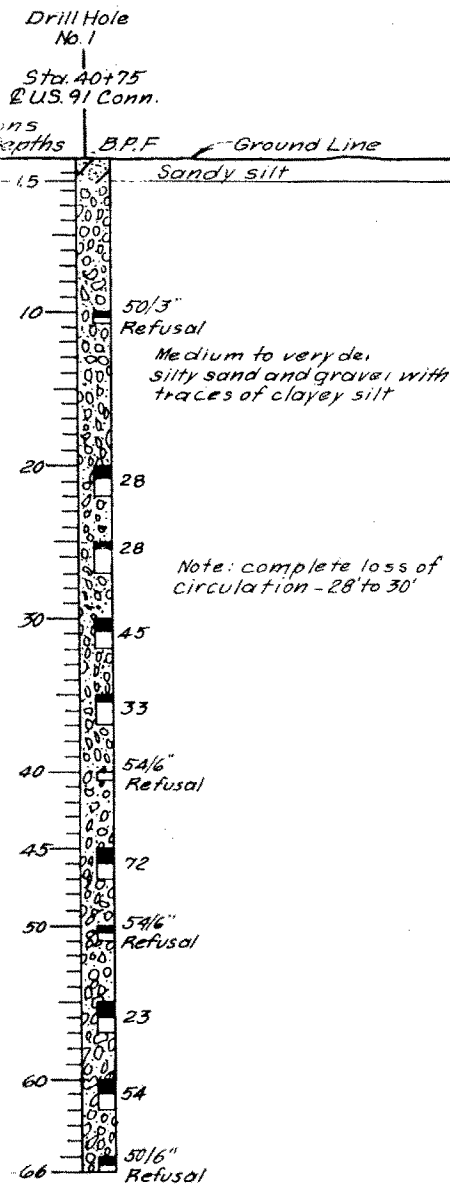
Three test holes were drilled at this site to depths of 66, 51 and 62 feet. With the exception of a 2 foot thick surface layer of clayey silt and sandy silt, all test holes encountered the following type of materials - medium to very dense silty sand and gravel with traces of clayey silt. For a more detailed description of the subsurface materials and test hole locations, refer to Fig. 1, Log of Borings.

A ground water table was not found in any of the test holes.

FOUNDATION RECOMMENDATIONS

Spread footings are recommended to support both abutments. Five foot wide continuous footings at the abutments may be loaded to an allowable soil bearing pressure of 4.5 t.s.f. See Figure 2 for the bearing capacity of continuous spread footing with other widths. The footings should be founded in the medium to very dense silty sand and gravel (see Fig. 1). The recommended footing base elevations are 5176 feet for the south abutment and 5179 for the north abutment. The maximum expected footing settlement is one inch.

Spread footings are also recommended for support of the bent. A 10 foot wide rectangular footing at the bent may be loaded to an allowable soil bearing pressure of 4.7 t.s.f. See Figure 3 for the bearing capacity of footings with other widths. The footing should be founded in the medium to very dense silty sand and gravel. The recommended footing base elevation is 5150 feet. The maximum expected footing settlement is one inch.



KEY TO DRILLING LOG

RELATIVE DENSITY (NON-PLASTIC SAND)
 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

DRILL HOLE NO. 1		STATION 0+00 E OR LT OR RT IN FT. OF	
ELEVATIONS			
GROUND ELEVATION	↓ DEPTHS	GROUND LINE	EXAMPLE TYPE
4555	2'	STIFF MEDIUM BRN. CLAY, SOFT	LL-PI-W
4552	5'	AASMO A-64	IT-7-11
4546	15'	DATE	
	20'	THIN WALL SHEET PILE SAMPLER USED	
	25'	SPLIT POINT SAMPLER WITH RINGS OR CALIBER TYPE SAMPLES	
	30'	REASON NOT RECOVERED	
	4531	CLASSIFICATION 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"

Note: A ground water table was not encountered in any of the drill holes

Drilled: Jan, Feb, and March, 1979

NO.	BY	DATE	REMARKS
REVISIONS			

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

NORTH NEPHI TO SOUTH NEPHI
 U.S. 91 CONNECTION (NO NEPHI INTERCHANGE)

DRAWN BY Boyd C. Searle CHECKED BY B. Kistler I-15-5(6)

CHECKED BY R. D. Sizemore CHECKED BY K. F. Powell 1

CHECKED BY S. Sakhal CHECKED BY _____ 1

APPROVAL _____ 30

RECOMMENDED BY L. H. Rauhaen U.S. STAT. JUA

RECEIVED _____ DATE _____ CHIEF STRUCTURAL ENG. R. COUNTY

BR. NO. _____ DRG. NO. _____

Fig. 1

