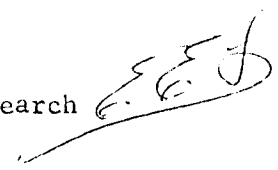


Memorandum

UTAH DEPARTMENT OF TRANSPORTATION

DATE: March 20, 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
Birch Creek Road over I-15 at I-15 \varnothing Station 1175 + 31.66T 125 RIE
Sec. 21 DSITE CONDITIONS

A continuous steel beam structure is proposed to carry Birch Creek Road over I-15 approximately two miles north of Nephi. The two-span structure will be 301 feet long and 34 feet wide with a crossing angle of approximately 64 degrees. The proposed I-15 roadway would be in a cut varying from 10 to 25 feet and the approach embankments for Birch Creek Road vary from 3 to 12 feet high.

Drainage at this site area is good and is westerly into Juab Valley.

SUBSOILS EXPLORATION

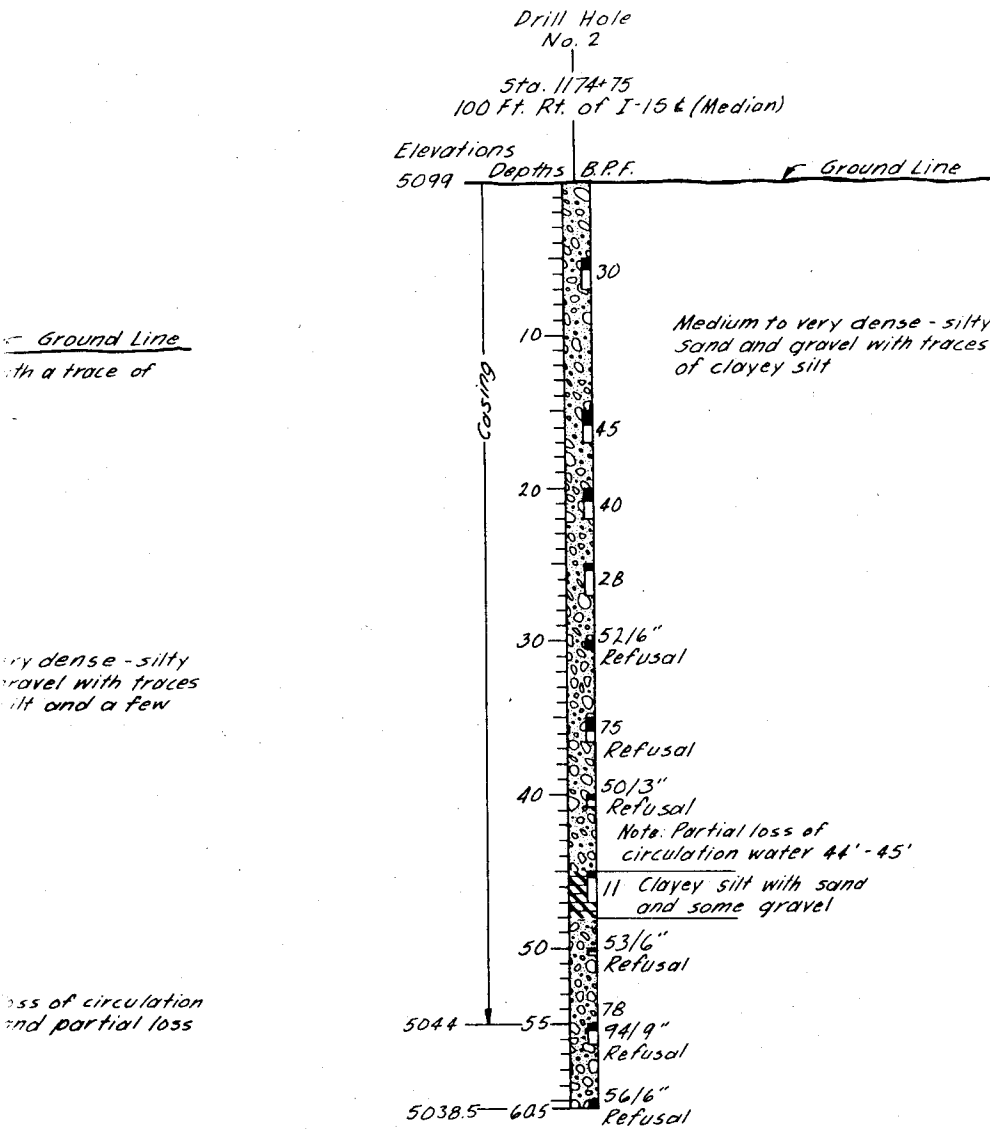
Three test holes were drilled for this project to depths of 50.5, 60.5, and 52 feet. The correlation of subsoils strata between holes is fair and in general medium to very dense silty sand and gravel with traces of clay were found in each hole to the total depth of exploration. Noteable exceptions were a hard cemented gravel layer which was found from 5.5 to 6.5 feet in drill hole No. 1 and a soft clayey silt layer which was found from 45 to 48 feet in drill hole No. 2. The gravels are composed predominately of sandstone and limestone. Refer to the Drilling Logs for further subsoils details.

A ground water table was not found within the depth of exploration.

FOUNDATION RECOMMENDATIONS

Drilled caissons founded in the very dense silty sand and gravel, are recommended for support of this structure. The recommended maximum bearing capacities and tip elevations for 3.5 feet diameter caissons are as follows:

| <u>LOCATION</u> | <u>TIP ELEVATION FT.</u> | <u>APPROXIMATE CAISSON LENGTH FT.</u> | <u>ALLOWABLE CAISSON LOAD TONS</u> |
|-----------------|--------------------------|---|--|
| West Abut. | 5057 | 23 | 115 |
| Bent | 5052 | 11 | 115 |
| East Abut. | 5069 | 27 | 115 |

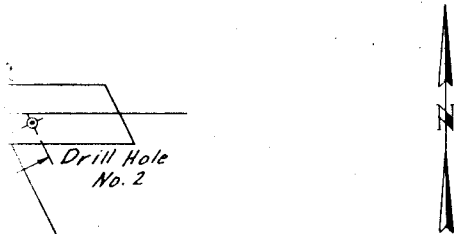


Ground Line
with a trace of

Medium to very dense - silty
sand and gravel with traces
of clayey silt and a few

Loss of circulation
and partial loss

Sta. 1175+31.66 I-15
Sta. 15+00 Birch Creek



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

| DRILL HOLE NO. | STATION | ELEVATIONS | DEPTHS | GROUND LINE | EXAMPLE |
|----------------|----------------------------|--------------------|--------|-------------|--|
| | 0+00 E OR LT OR RT. IN FT. | | | | |
| | | GROUND ELEVATION | | | |
| | | | 2 | | STIFF MEDIUM BROWN CLAY |
| | | | 5 | | AASHTO LL-PI-W 17-7-11 |
| | | 4555 | | | |
| | | GROUND WATER TABLE | 7 | | DATE |
| | | 4552 | | | |
| | | | 10 | | THIN WALL TUBE UNDER SAMPLE |
| | | 4546 | 11 | | |
| | | | 20 | | SPLIT BARRE UNDISTURBED SAMPLER WITH RINGS OR OTHER TYPE SAMPLE |
| | | | 25 | | |
| | | | 29 | | |
| | | | 30 | | REASON FOR RECOVERY |
| | | 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 = 50 or more blows per 6"

UTAH DEPARTMENT OF TRANSPORTATION
 SALT LAKE CITY, UTAH
MATERIALS AND RESEARCH SECTION
 SOUTH NEPHI TO NORTH NEPHI
 BIRCH CREEK OVER I-15

| | | |
|--|---------------------------------|---------------------------|
| DRAWN BY <i>Kistler</i> | CHECKED BY <i>Boyd C. Smith</i> | NO. |
| CHECKED BY <i>Les Lambke</i> | CHECKED BY <i>J. Bytheaway</i> | 1175 |
| CHECKED BY <i>SI SAKHAI</i> | CHECKED BY | 1175 |
| APPROVAL RECOMMENDED BY <i>Loren H. Rauher</i> | | |
| RECEIVED | DATE | CHIEF STRUCTURAL ENGINEER |
| BR. NO. | | DRG. NO. |

NOTE: Ground water table was not encountered in any of the test holes.
 Date Drilled: Jan. & Feb. 1979

| NO. | BY | DATE | REMARKS |
|-----------|----|------|---------|
| REVISIONS | | | |

FIGURE

