

Memorandum

5115
UTAH DEPARTMENT OF TRANSPORTATION

Those Listed Below

T 225 R/LJ
SEC 19M

DATE: July 27, 1984

Heber Vlam, P.E., Engineer of Materials & Research *H.V.*

I-70-1(25)48 - Sigurd to Salina
Foundation Report for I-70 over U.S. 89 and
D & RG.W.R.R. at I-70 EBL Station 2495+98.55 and
WBL Station 2497+12.84 - Drg No. F-490

SITE CONDITIONS

Two prestressed concrete beam structures are proposed to carry I-70 over U.S. 89 and the D. & RG. W.R.R. The structures will consist of three spans each and will be 386 feet long by 44 feet wide. The crossings will be at a skew angle of approximately 52°. The approach embankments will be 34 to 37 feet high.

Drainage of surface water in the area is good.

SUBSURFACE EXPLORATION

Eight test holes were drilled at the site of the proposed structures to depths of 70 to 101 feet. Correlation of subsoils between drill holes is good. The subsoil profile can be generalized as follows: from the ground surface to 5 feet - sandy silt and clayey silt; from 5 feet to 45 feet - medium to very dense silty sand and gravel; from 45 feet to 65 feet - layers of sandy silt, clayey silt and silty clay; from 65 feet to the maximum depth of exploration - very dense silty sand and gravel. For a more detailed description of the subsoils and test hole locations, refer to Figs. 1-a and 1-b, Log of Borings.

A ground water table was observed at approximately 30 feet below the natural ground surface.

FOUNDATION RECOMMENDATIONS

Drilled caissons are recommended to support these structures. Caissons with diameters of 2.5 feet, founded approximately 22 feet below the ground surface in the very dense silty sand and gravel (see Fig. 1-a and 1-b), may be loaded to an allowable bearing capacity of 300 kips per caisson. The recommended caisson tip elevations are as follows:

KEY

RELATIVE DENS.
 VERY LOOSE - 1
 LOOSE - 4
 MEDIUM - 10 TO 15
 DENSE - 30 TO 40
 VERY DENSE - 45

CONSISTENCY
 VERY SOFT - L
 SOFT - 2 TO 4
 MEDIUM - 4 TO 10
 STIFF - 8 TO 15
 VERY STIFF - 15 TO 25
 HARD - MORE

- TOPSOIL OR FILL
- GRAVEL
- SAND
- SILT
- CLAY
- SHALE

DRILL HOLE NO
STATION

ELEVATION
 GROUND ELEVATION

GROUND WATER TABLE
 4552

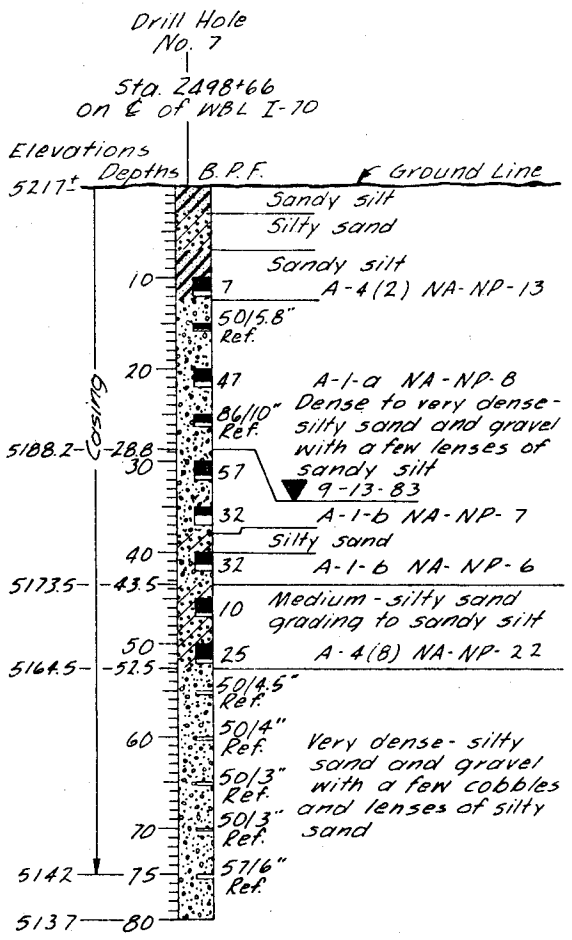
STRATA CHANGE
 4546

LOCATION OF SAMPLE

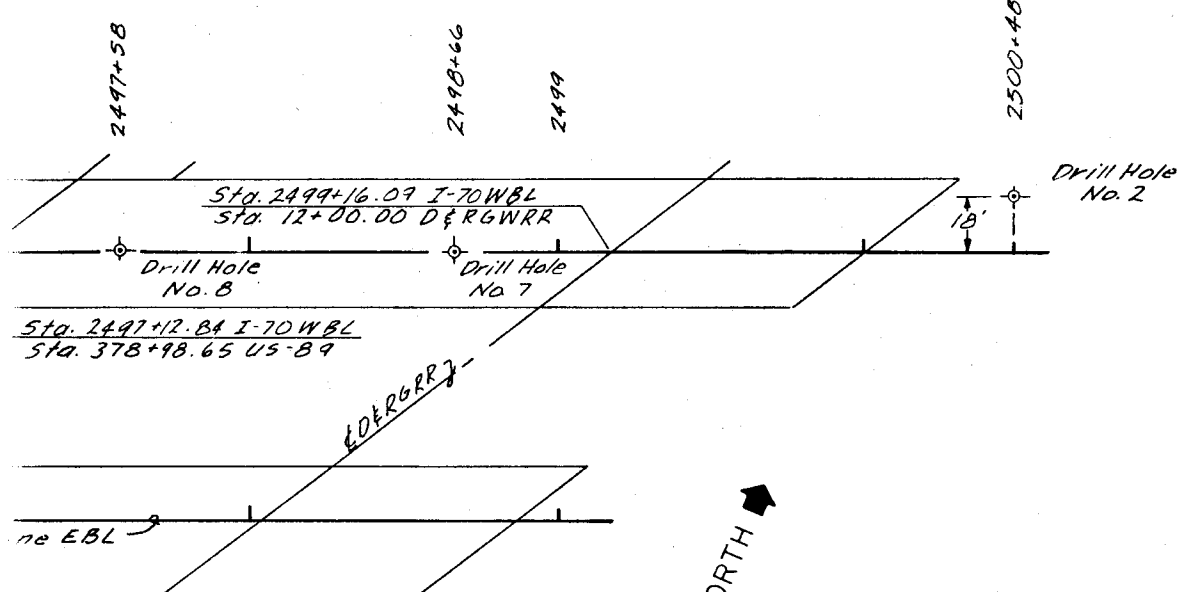
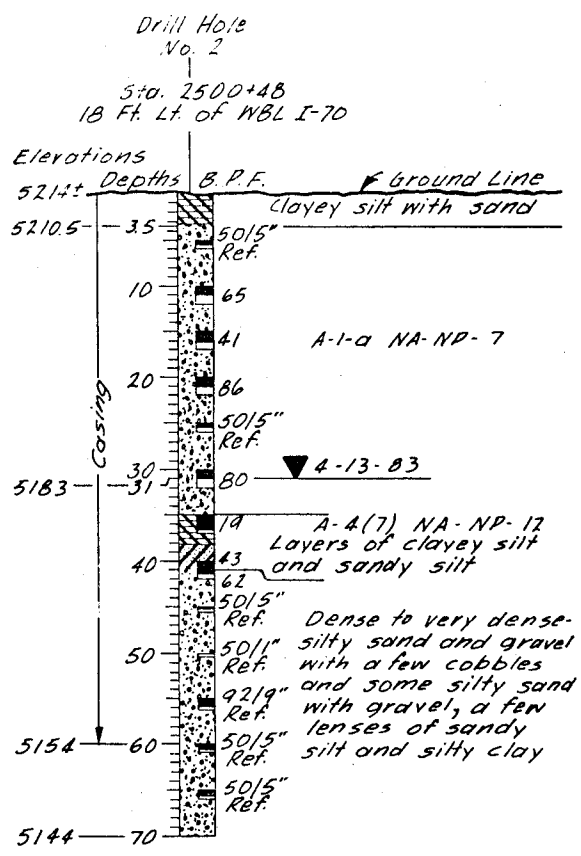
SAMPLE NOT RECOVERED
BOTTOM OF HOLE
 4531

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

- AE
- L.L.
- P.I.
- Ref.
- PEN.
- G.W.T.
- B.P.F.
- N.P.
- AASH



NOTE: Heavy to complete loss of circulation water 26' to 30'



Date Drilled: April, May, June, Sept. 1983

NO.	BY	DATE

REVISIONS

UTAH STATE DEPARTMENT OF TRANSPORTATION
MATERIALS
 SIGURDSON
 1-70 OVER

Drawn By KISTLER
 Checked By M. A. ASHBA
 Checked By P. SIZEMORE
 Approval Recommended By [Signature]
 Received _____ Date _____

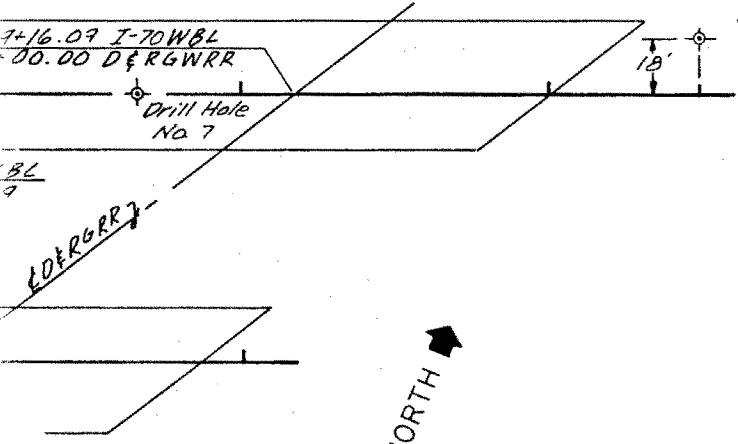
Foundations File No 82-7-FS

8+66
BL I-70

P.F.	Ground Line
	Sandy silt
	Silty sand
7	A-4(2) NA-NP-13
50/5.8"	Ref.
47	A-1-a NA-NP-8
86/10"	Dense to very dense silty sand and gravel with a few lenses of sandy silt
57	9-13-83
32	A-1-b NA-NP-7
32	A-1-b NA-NP-6
10	Medium-silty sand grading to sandy silt
25	A-4(B) NA-NP-22
50/4.5"	Ref.
50/4"	Ref.
50/3"	Very dense silty sand and gravel with a few cobbles
50/3"	Ref.
51/6"	Ref.

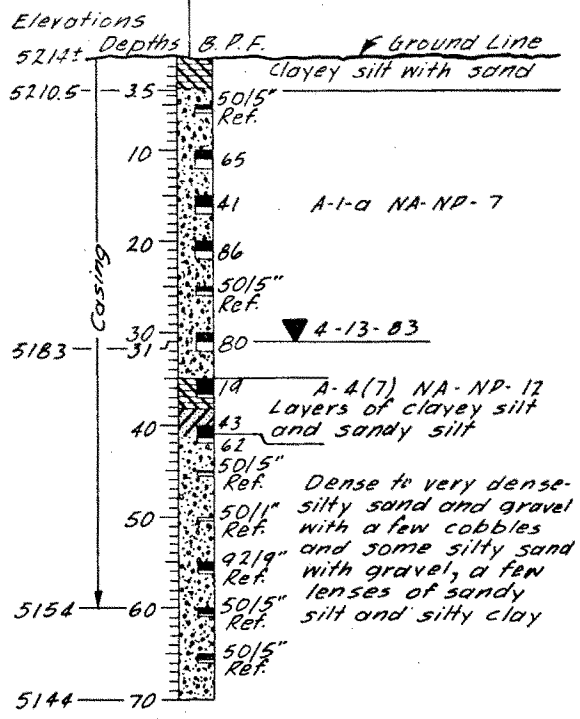
Complete loss of water 26' to 30'

2498+66
2499



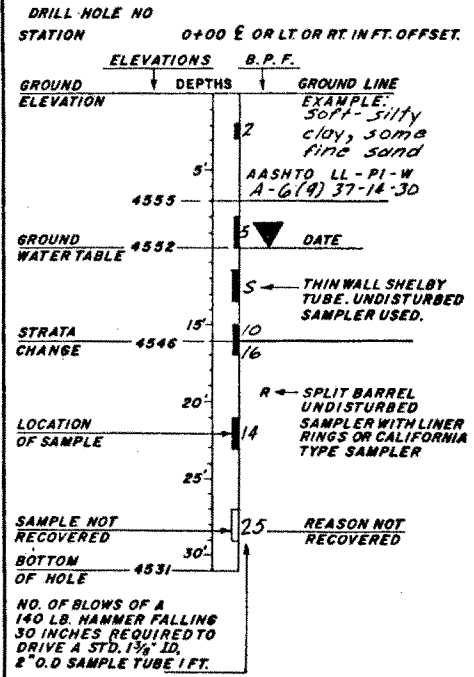
NO.	BY	DATE	REVISIONS

Drill Hole No. 2
S.O. 2500+48
18 Ft. Lt. of WBL I-70



KEY TO DRILLING LOG
RELATIVE DENSITY (NON-PLASTIC SAND & SILT)
 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	IGNEOUS	SANDY CLAY
GRAVEL	LIMESTONE	CLAYEY SAND
SAND	CONGLOMERATE	SILTY CLAY
SILT	DOLOMITE	CLAYEY SILT
CLAY	SANDSTONE	SILTY SAND
SHALE	SILTSTONE	SANDY SILT



ABBREVIATIONS
 L.L. - LIQUID LIMIT IN %
 P.I. - PLASTIC INDEX
 w. - NATURAL MOISTURE CONTENT IN %
 Ref. - REFUSAL ≥ 50 BLOWS PER 6"
 PEN. - PENETRATION
 G.W.T. - GROUND WATER TABLE
 B.P.F. - BLOWS PER FOOT.
 N.P. - NON PLASTIC
 AASHTO - SOIL CLASSIFICATION SYSTEM

UTAH STATE DEPARTMENT OF TRANSPORTATION
 SALT LAKE CITY, UTAH
MATERIALS and RESEARCH SECTION

SIGURD TO SALINA
 1-70 OVER US-89 & D.&R.G.R.R.

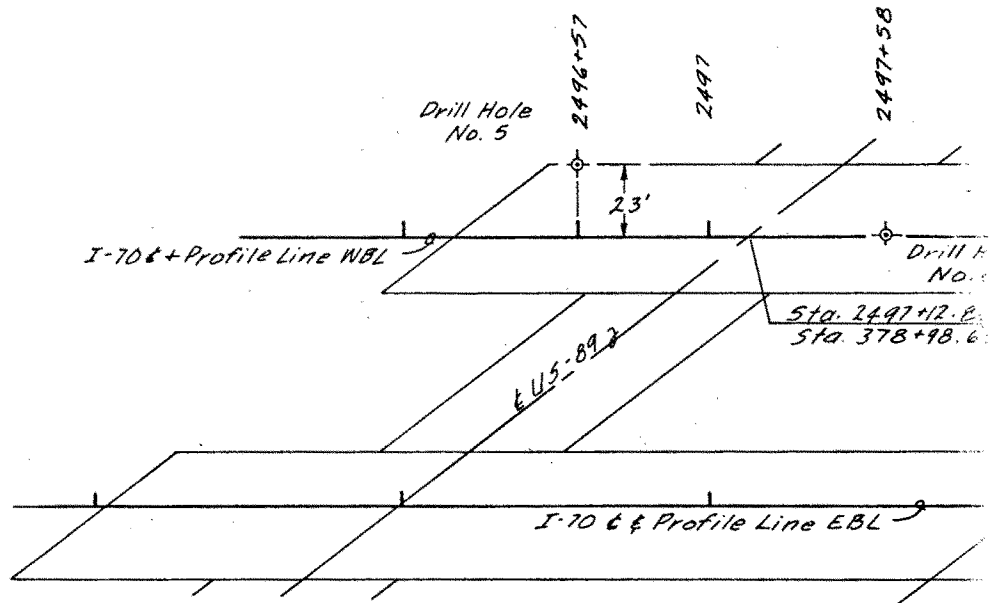
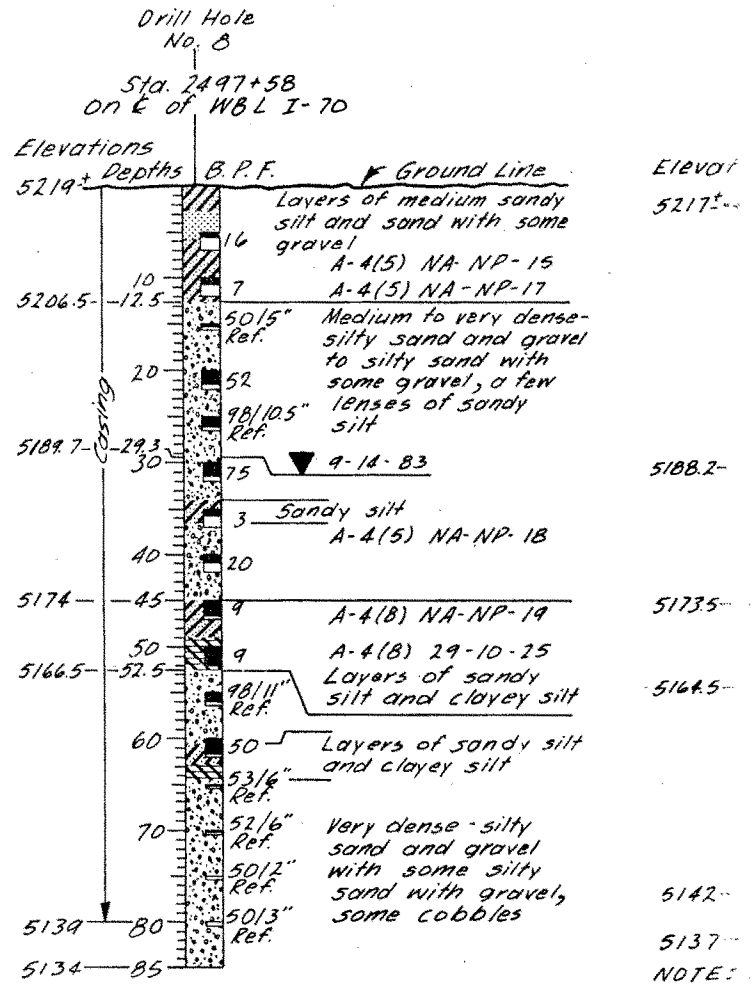
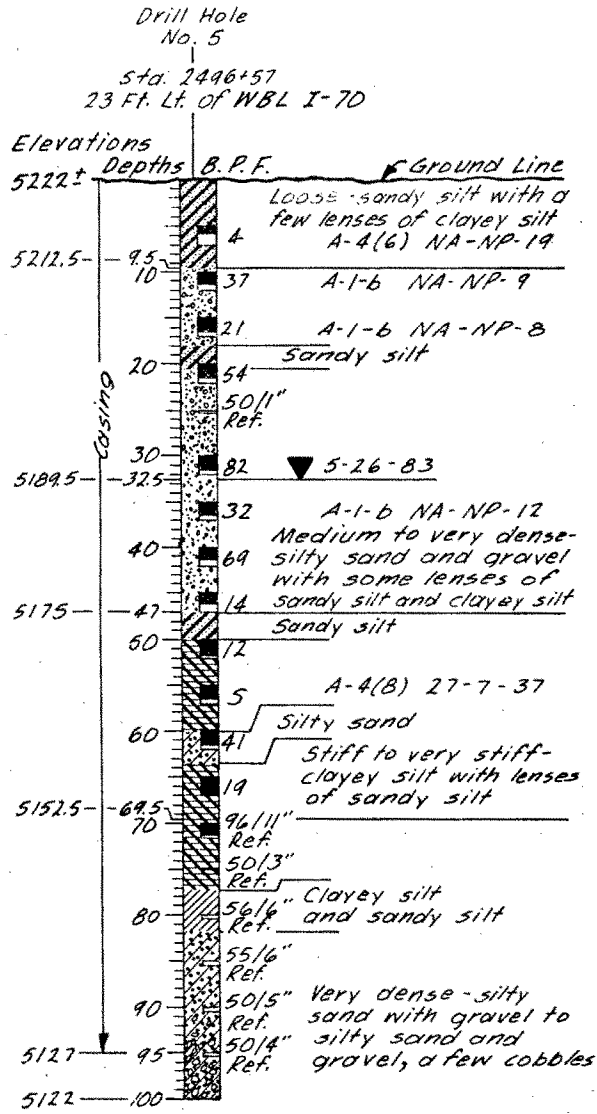
Drawn By: *KISTLER* Checked By: *De Balleu* 1-70-11(25)48
 Checked By: *M. A. BAHA* Checked By: Project Number
 Checked By: *P. SIZEMORE* Checked By: 2498+18.09 WBL
 Approved Recommended By: *Tom H. Raucher* 2498+40.25 EBL
 Station

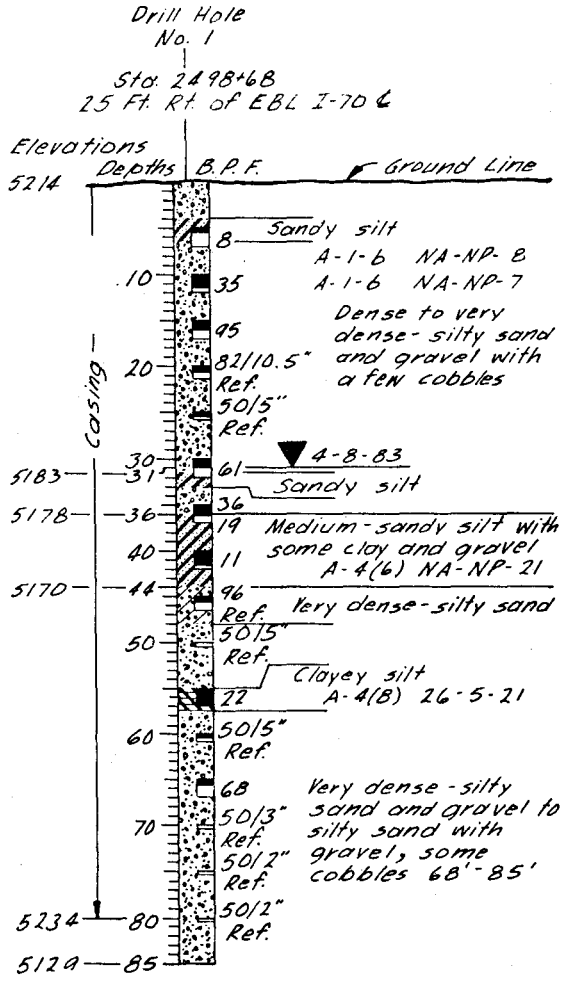
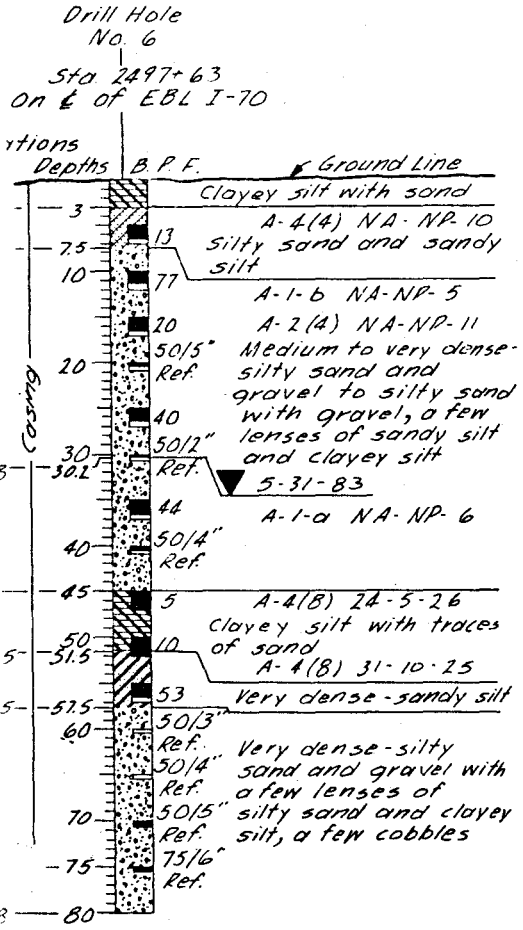
Received: _____ Date: _____ Chief Structural Engr.
 SEVIER
 County

Foundation File No. 82-7-FS-19
 Dra. No. F-490
 01

Date Drilled: April, May, June, Sept. 1983

FIGURE 1-b



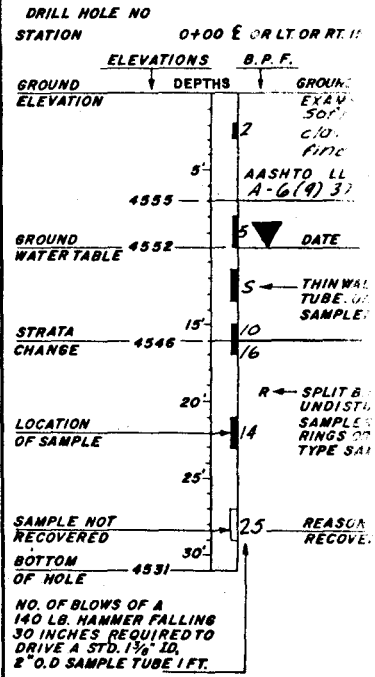


KEY TO DRILLING LOG

RELATIVE DENSITY (NON-PLASTIC)
 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

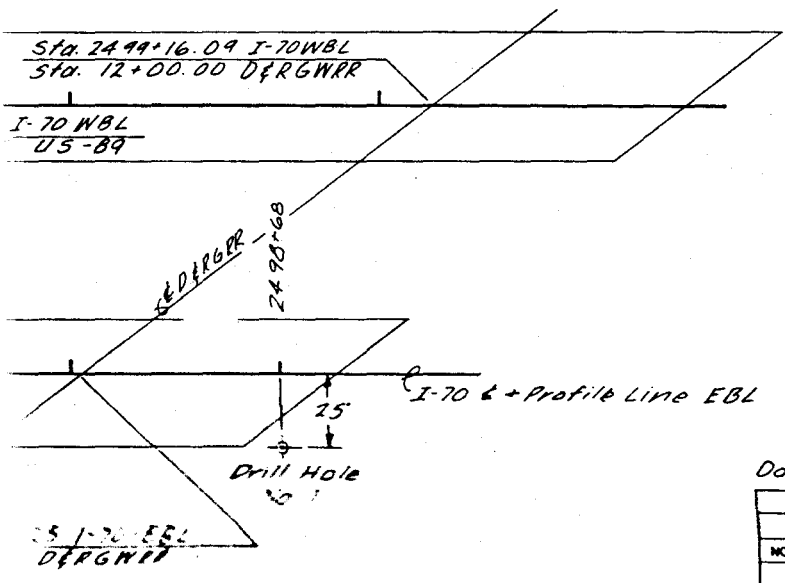
CONSISTENCY (PLASTIC SILT & CLAY)
 VERY SOFT - LESS THAN 2 BLOWS PER FOOT
 SOFT - 2 TO 4 BLOWS PER FOOT
 MEDIUM - 4 TO 8 BLOWS PER FOOT
 STIFF - 8 TO 15 BLOWS PER FOOT
 VERY STIFF - 15 TO 30 BLOWS PER FOOT
 HARD - MORE THAN 30 BLOWS PER FOOT

- | | |
|-----------------|--------------|
| TOPSOIL OR FILL | IGNEOUS |
| GRAVEL | LIMESTONE |
| SAND | CONGLOMERATE |
| SILT | DOLOMITE |
| CLAY | SANDSTONE |
| SHALE | SILTSTONE |



ABBREVIATIONS

L.L. - LIQUID LIMIT IN %
 P.I. - PLASTIC INDEX
 W. - NATURAL MOISTURE CONTENT
 Ref. - REFUSAL ≥ 50 BLOWS
 PEN. - PENETRATION
 G.W.T. - GROUND WATER TABLE
 B.P.F. - BLOWS PER FOOT
 N.P. - NON PLASTIC
 ASHTO - SOIL CLASSIFICATION



Date Drilled: April, May & June 1983

NO	BY	DATE

REVISIONS

UTAH STATE DEPARTMENT OF TRANSPORTATION
 SALT LAKE CITY, UTAH

MATERIALS and RESEARCH SECTION

SIGURD TO SALINA
 I-70 OVER US-89 & D.B.R.G.R.

Drawn By <i>Kistler</i>	Checked By <i>P. Sizemore</i>
Checked By <i>Mohammadi</i>	Checked By <i>R.K. Powell</i>
Checked By <i>R. Sullivan</i>	Checked By

Approved Recommended By *John A. Rauscher*

Received _____ Date _____ Chief Structural Eng.

Foundations File No. 82-7-FS-19 Drg No. **F-490**

FIGURE 1-0

