

No 90

Office Memorandum

2118
2119

UTAH STATE DEPARTMENT OF HIGHWAYS

FOUNDATIONS

TO Those Listed Below

DATE: August 20, 1965

FROM W. J. Liddle, Engineer of Materials and Research

2118
T12S R1E
Sec 9M

SUBJECT: Project I-15-5(1)207, North Nephi to South Santaquin, three structures:
I-15 over "A"-line at Sta. 197+54; "D"-line over I-15 at Sta. 517+52;
South Santaquin Interchange at Sta. 49+60.

2119
T11S R1E
Sec 16P

Included are the foundation recommendations, location plans, summaries of test data, bearing capacity curves, and drilling logs for the three structures.

SUMMARY OF FOUNDATION RECOMMENDATIONS

Structure Foundations -

Location	Type	Footing Width and Safe Load Capacity	Depth Below Ground Surface	Approximate Base Elevation
A. I-15 over "A" line Sta. 197+54	Spread Footings Abutments No Piers	6 ft. wide-2.2 TSF	6 ft.	5059 South Abut. 5067 North Abut.
B. "D"-line over I-15 Sta. 517+52	Spread Footings Piers Abutments	6 ft. wide-2.7 TSF 6 ft. wide-2.1 TSF	7 ft.	5116 --
C. South Santaquin Interchange	Spread Footings Abutments No Piers	6 ft. wide-2.1 TSF		-- --

out
at
area

Embankments -

No embankment stability, using 1.5:1 end and side slopes, or time-settlement problems are anticipated at any of the three structure sites. The granular texture of the subgrade soil will prevent embankment failure and cause consolidation upon addition of the embankment material.

A. I-15 over "A" line at I-15 Sta. 197+54

Two simple span structures, each 88 feet long and 40 feet wide are proposed at this site.

Geology -

Surface: The site is on the East side of Juab Valley on the fore-slope of an alluvial fan. The terrain is moderately rolling, with surface boulders to 2.0 ft. in diameter. The ground slopes moderately to the West. Drainage is good and follows the slope of the terrain toward the center of the valley.

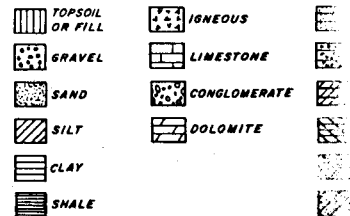
Subsurface: The subsoil investigation consisted of visual examination of cuttings and AASHTO classification of samples taken from the four drill holes shown on Figures 1 and 3. Approximately one foot of silty fine sand topsoil overlays the structure area. Below this topsoil to total depth

KEY TO DRILLING LOGS
RELATIVE DENSITY(SAND & S)

VERY LOOSE - LESS THAN 4 BLOWS PER
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

CONSISTENCY (CLAY)

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



DRILL HOLE NO. _____
STATION 0+00 E OR LT OR RT INF

ELEVATIONS
GROUND ↓ DEPTHS GR. EL. 456.

GROUND ELEVATION			EXAMPLE STIFF MEDIUM BRN. CLAY
	5'	2	AASHO L.L. - P. 17 - 7 -
4555			

GROUND	1550	57	DATE
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WATER TABLE

S ← THIN WALL

15'

TUBE AND SAMPLER

STRATA	4546	10	
CHANGE		11	

20' R ← SPLIT BAR
UNDISTUR

LOCATION OF SAMPLE → 14
18

	25'		
--	-----	--	--

SAMPLE NOT RECOVERED	25 30	REASON RECOVERED
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Diagram of a well casing. The casing is represented by a vertical rectangle. At the top, the word "RECOVERED" is written. Below it, the number "30'" is written. At the bottom, the words "BOTTOM OF HOLE" are written. To the right of the casing, the number "4531" is written. The casing is labeled "RECOVERED" on both the left and right sides.

NO. OF BLOWS OF A 140 LB. HAMMER FALLING	CLASSIFICATION OF EACH
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
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86	86
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88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

AND RESU
CLASSIFIC
TESTS.

2. D.D. SAMPLE TUBE 171.

ABBREVIATIONS

L.L.—LIQUID LIMIT IN %

P.I — PLASTIC INDEX
N. — NATURAL MOISTURE CO

W.G.—WELL GRADED

PEN.—PENETRATION
G.W.T.—GROUND WATER TABLE

B.P.F.—BLOWS PER FOOT.
N. P.—NON-PLASTIC

REF.-REFUSAL

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

NORTH NEPHI TO SOUTH SANTA
SOUTH SANTIAGO INTERCHANG

SOUTH SANTAQUIN INTERCHAN

DRAWN BY <i>Knights</i>	CHECKED BY <i>WJC</i>	1-15
CHECKED BY <i>E.P.</i>	CHECKED BY <i>WJC</i>	

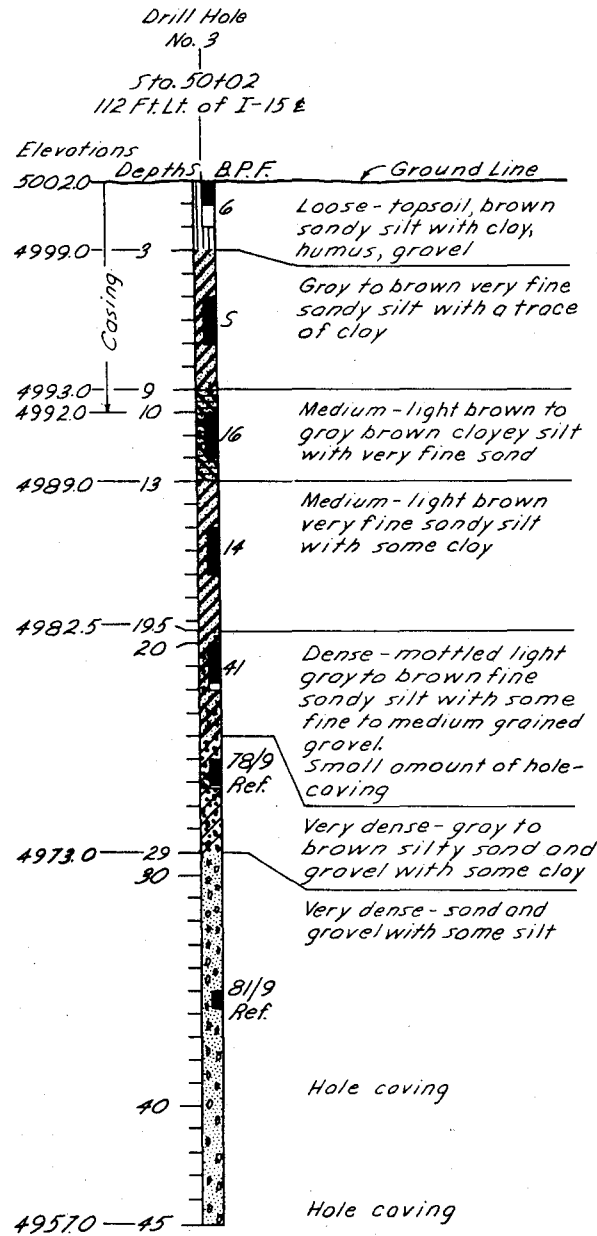
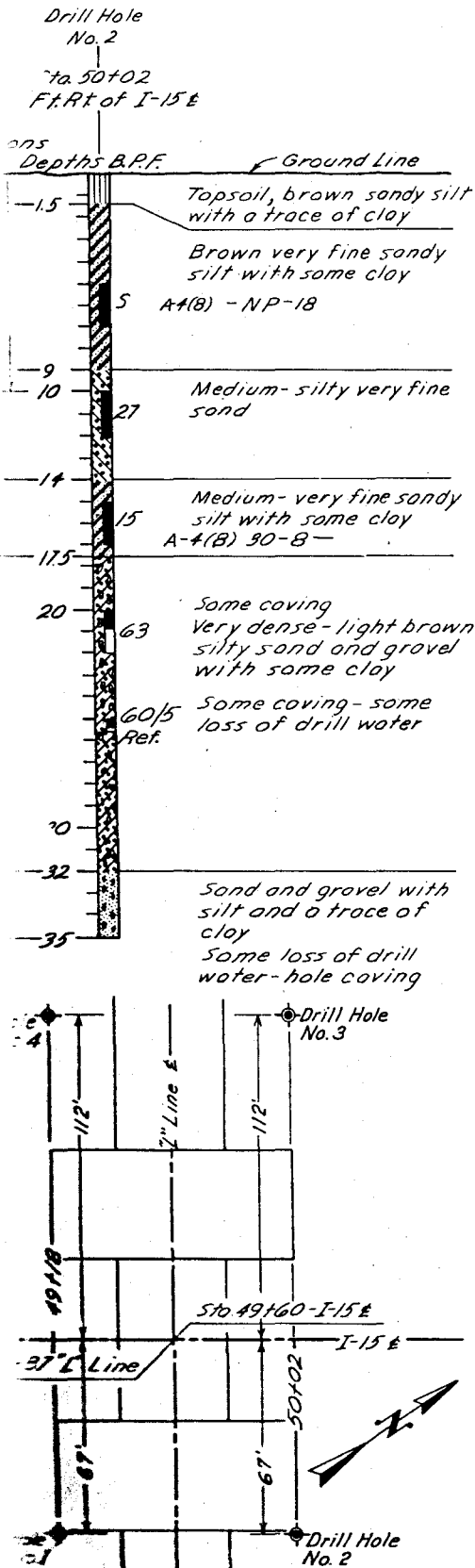
QUANTITIES BY <u>R.H.J.</u>	CHECKED BY <u>D.T.P.</u>	49
APPROVAL		

RECOMMENDED BY <u>William A. Brown</u>		U
RECEIVED BY _____	DATE _____	
CHIEF STRUCTURAL ENGINEER		

BR. NO.	ORG. NO.
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FIGURE 2

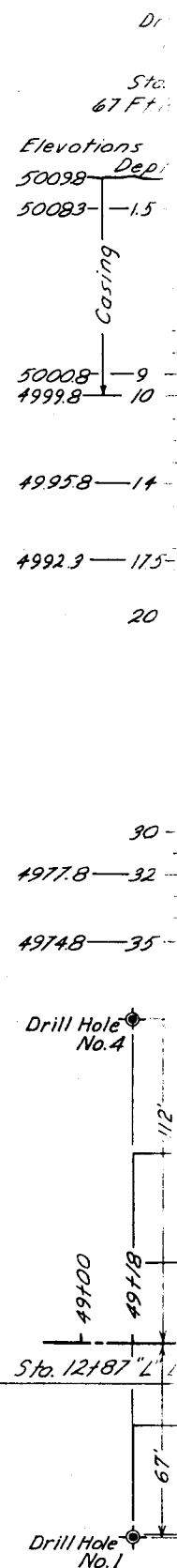
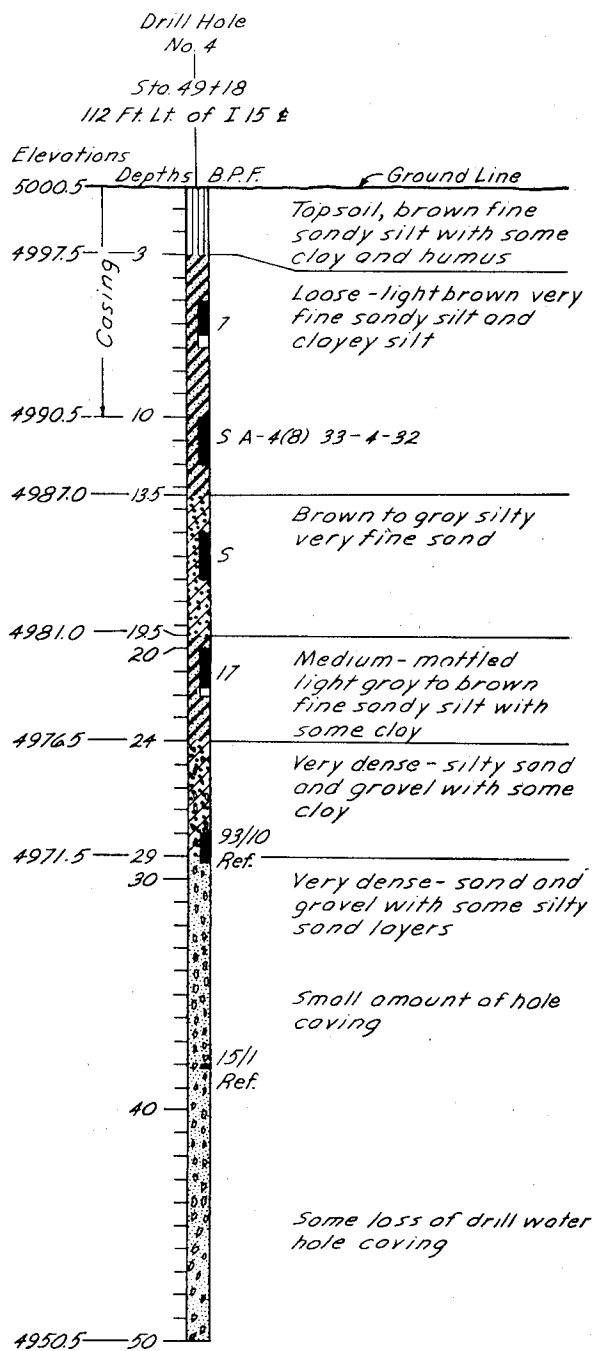
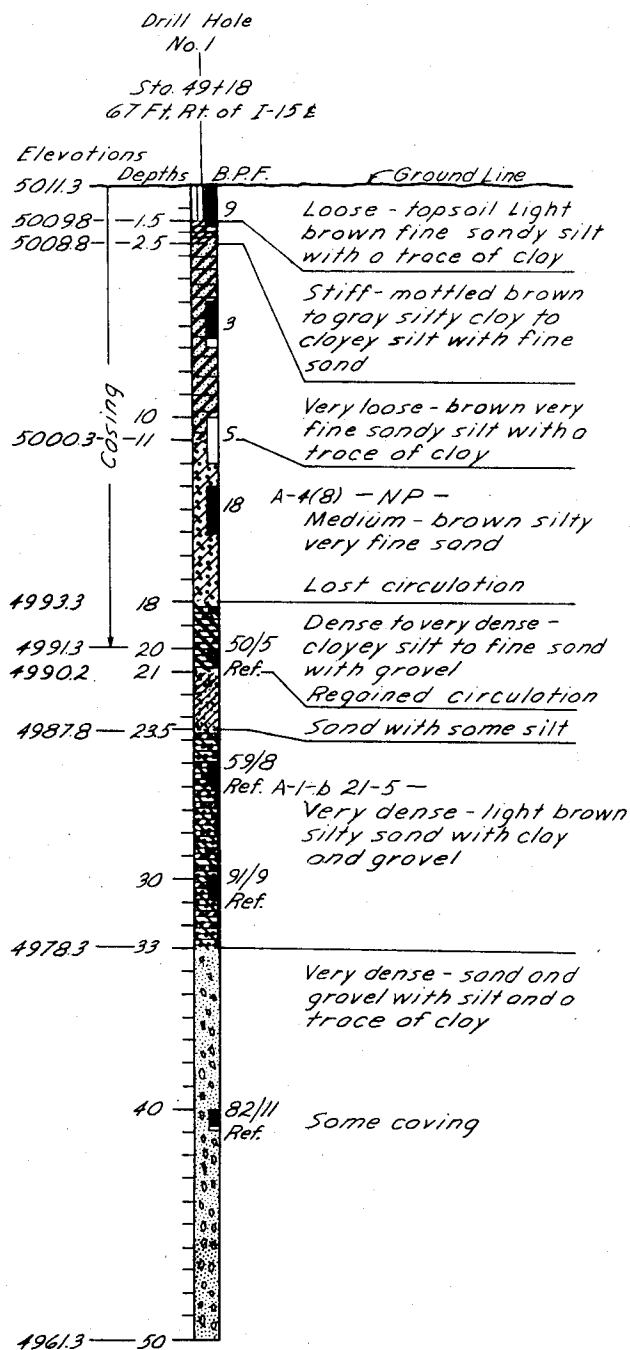
FIGURE 9

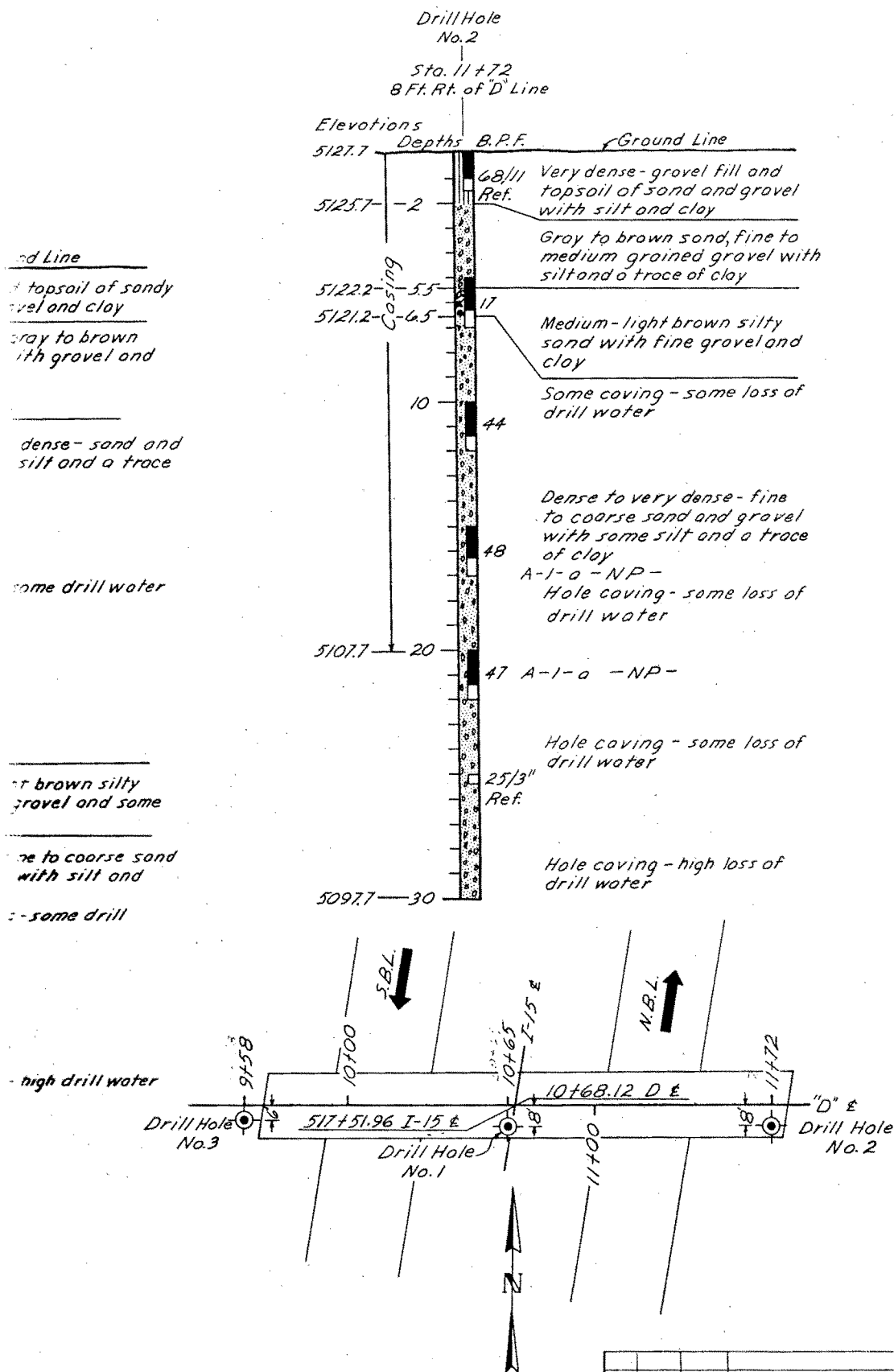


Note: Ground water table not encountered at this site

				APPROVAL RECOMMENDED BY <u>William A. Hardy</u>	
				RECEIVED BY _____ DATE _____ CHIEF STRUCTURAL ENG'G.	
NO.	BY	DATE	REMARKS		
REVISIONS				BR. NO.	DRG. NO.

FIGURE 9





KEY TO DRILLING LOGS RELATIVE DENSITY (SAND & SILT)

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

DRILL HOLE NO. STATION 0+00 E OR LT. OR RT. IN F.

ELEVATIONS	DEPTHS	GR. EL. 4
GROUND ELEVATION		EXAMPLE
	2	STIFF M.E.
	5	BRN CL.
	5	AASHO A-6(4)
	4555	L.L. - R. 17 - 7
GROUND WATER TABLE	5	DATE
	5	THIN WALL TUBE UN. SAMPLER
STRATA CHANGE	15	10
	4546	11
LOCATION OF SAMPLE	20	R
	20	SPLIT BAR UNDISTURBED SAMPLER RINGS TYPE SAM
	25	25
SAMPLE NOT RECOVERED	30	30
BOTTOM OF HOLE	4551	REASON RECOVER
NO. OF BLOWS OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO DRIVE A STD. 1 1/4" ID, 2" O.D. SAMPLE TUBE 1 FT.		
CLASS. OF EACH AND RES. CLASSIFI. TESTS		

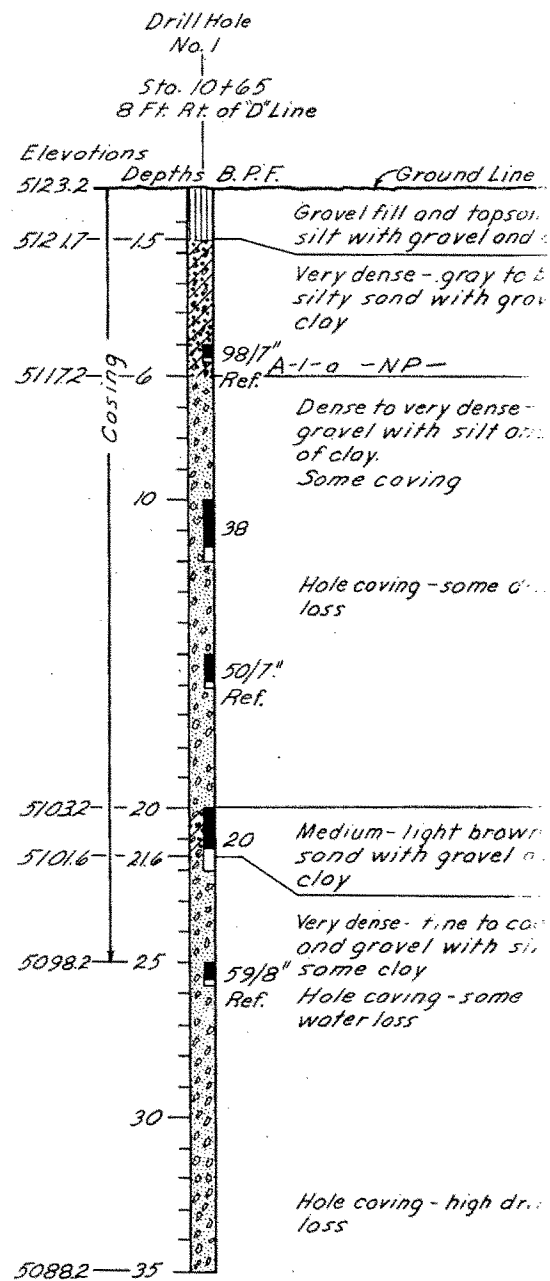
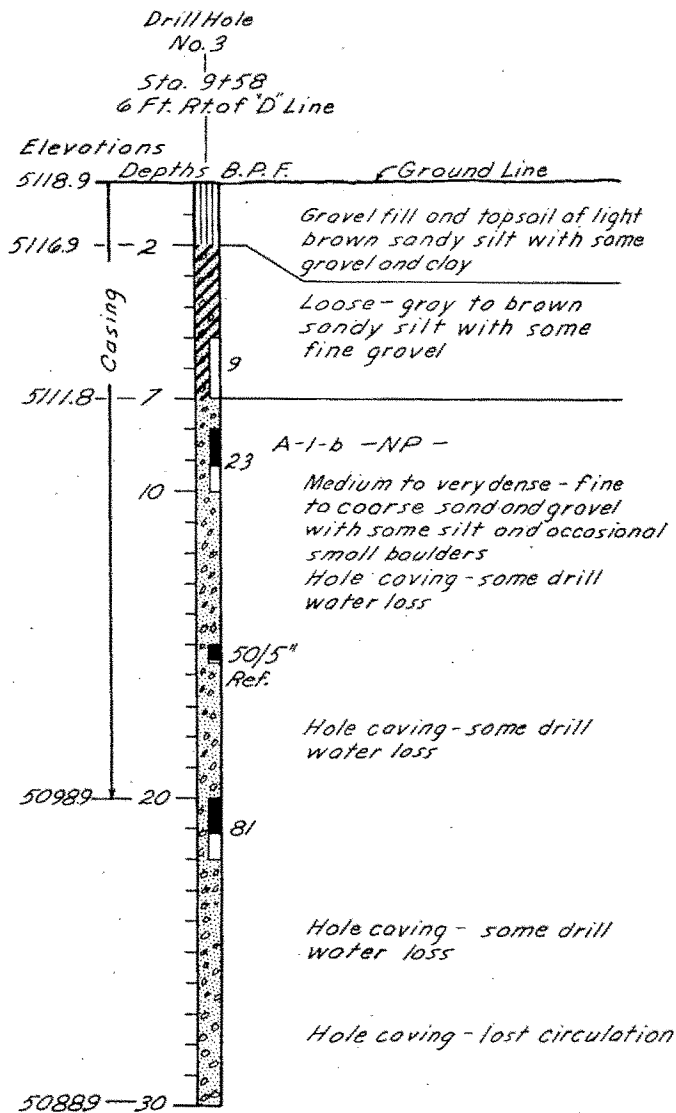
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UTAH STATE DEPARTMENT OF HIGHWAYS
SALT LAKE CITY, UTAH
MATERIALS AND RESEARCH DIVISION
NORTH NEPHI TO SOUTH SALT LAKE
D LINE OVER I-15

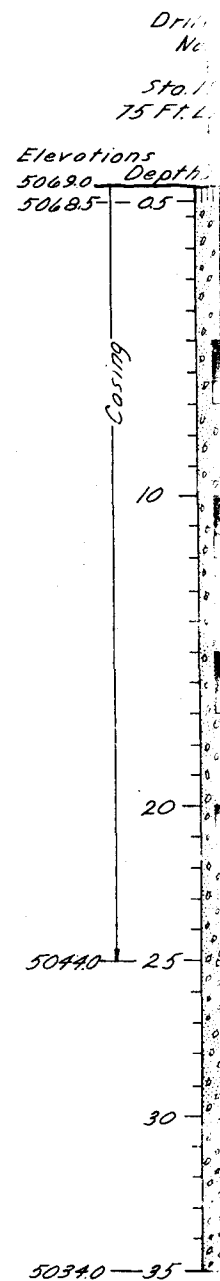
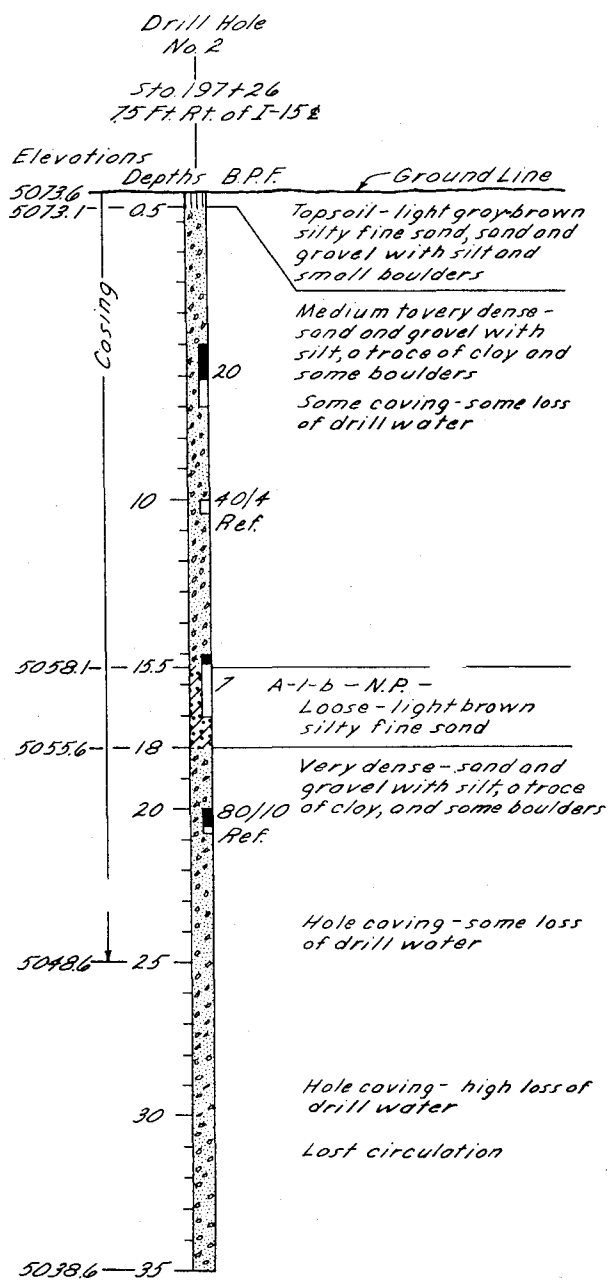
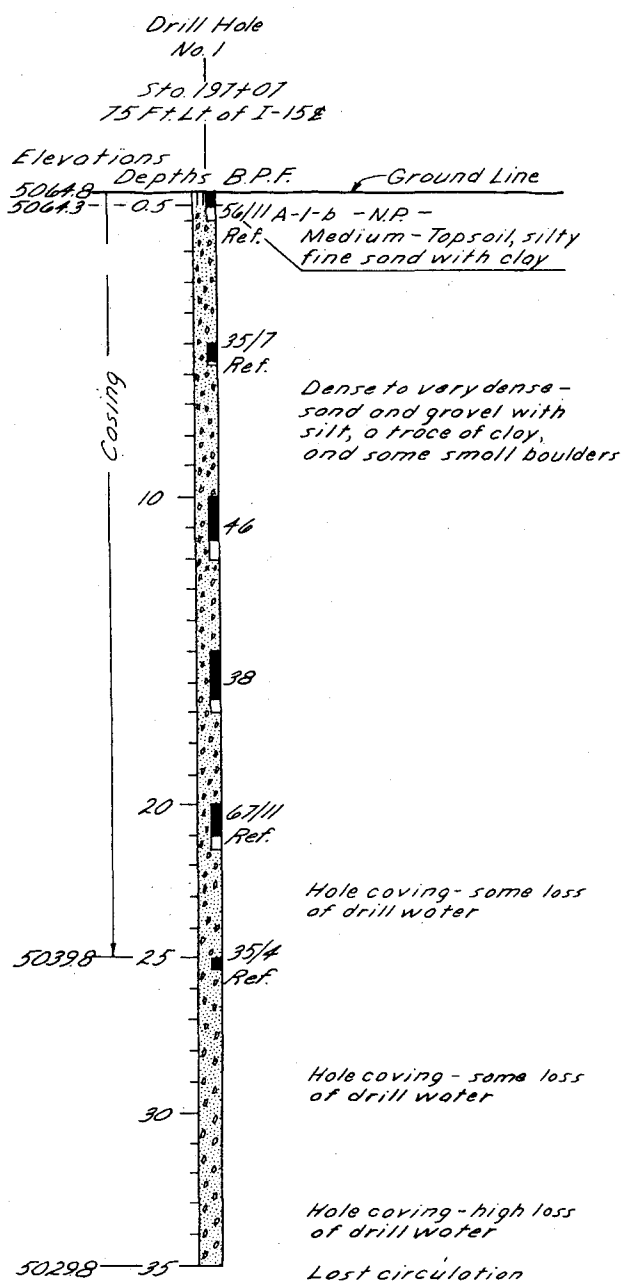
DRAWN BY: D.B.R.	CHECKED BY: W.L.C.
CHECKED BY: E.P.	CHECKED BY: B.H.
QUANTITIES BY: R.H.V.	CHECKED BY: D.T.P.
APPROVAL	RECOMMENDED BY: William D. Hensley
RECEIVED BY:	DATE: _____
NO.	BY
DATE	REMARKS
REVISIONS	
DR. NO.	DRG. NO.

FIGURE 7



Note: Ground water was not encountered

FIGURE 3



Note: Groundwater not encountered
of this site