No GW

2120
2121 ½

Office Memorandum • UTAH STATE DEPARTMENT OF HIGHWAYS

FOUNDATIONS DEPT.

TO Those Listed Below DATE: Nov. 18, 1965

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

2120 T11S R1E Sec 33 N

SUBJECT: Project I-15-5(1)207, North Nephi to South Santaquin
Foundation Report on "B" and "C" Lines over I-15 at I-15 Stations 358+77.32 and 411+70.30 Respectively

2121 T11S R1E Sec 28 P

Enclosed are: Recommendations, Location Plans, Summaries of Test Data, Drilling Logs and Bearing Capacity Curves.

I. SUMMARY OF RECOMMENDATIONS

TABLE I

Structure	Foundations					
	Abutments		Piers			
	Spread Footings	Allowable Bearing Capacity (TSF)	Footing Type	Allowable Capacity (TSF)	Depth Below Ground Surface	Approx. Base Elevation
2120 "B" Line over I-15 station 358+77.32	6 ft. wide	2.1	Spread Footings 6 ft. wide	1.6	8-10 ft.	5206 East Piers 5203 Center Pie 5196 West Piers
2121 "C" Line over I-15 station 411+70.30	6 ft. wide	2.1	Caissons 3 ft. base diameter	5.0 *	20-25 ft.	5067 East Piers 5066 Center Pie 5063 West Piers

General Engineering Recommendations:

Abutments and Piers: Any settlement which will occur should be less than one inch and will take place on load application.

All abutment footings should be placed one footing width back from the edge of the fill and three feet below the fill surface.

Embankments: Stability problems are not anticipated, with 1.5:1 end slopes and 2:1 side slopes. Settlement is expected to be small and will occur during embankment construction.

II. "B" LINE OVER I-15 STATION 358+77.32

Site Conditions:

This simple span structure, which is supported by three interior piers and end abutments, is approximately 231 feet long and 32 feet wide. The approach fills

* See Section III (Piers) of this report

Drill Hole
No. 1
Sta. 11+16
10 Ft. Lt. of "C" Line ℄

Elevations	Depths	B.P.F.		
5092.8				Ground Line
5091.3	1.5	9		Loose - roadbed fill, sand and gravel
		2	A-4(8)	21-1-19
	10	1		Very loose - brown silty fine sand with traces of clay and fine gravel
5079.8	13			
		20		Medium - brown sand to coarse gravel with layers of silty sand
	20	10	A-1-a	-N.P.-
5067.8	25	83/11"		Refusal
	30	42		Medium to very dense - sand to coarse gravel with silt and a trace of clay
		23	A-1-b	-N.P.-
5052.8	40	68/11"		Refusal
				High loss of drill water - hole caving
5042.8	50			

Casing

Ground Line
Roadbed fill - sand and gravel

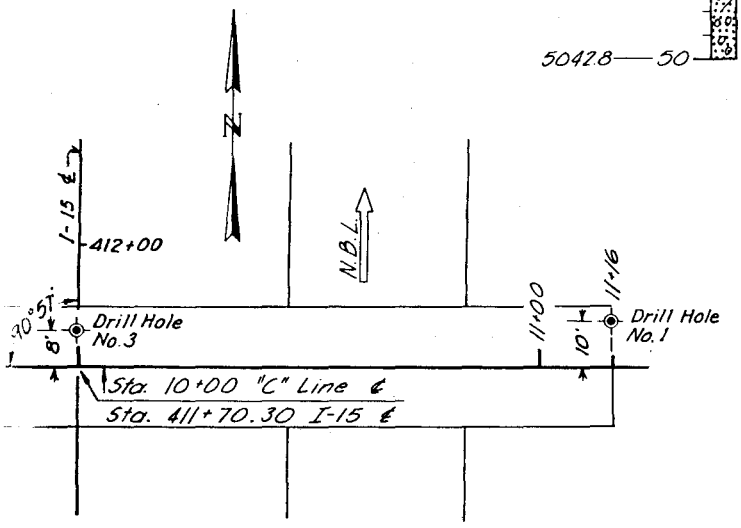
Loose to dense - brown silty sand with occasional thin layers of sand to medium gravel

2-4 20-2

Very dense - sand to coarse gravel with some clay and silt
1-a -N.P.-

Loss of drill water - hole caving

Note:
Water table was not encountered at this site



KEY TO
RELATIVE D
VERY LOOSE - LES
LOOSE - 4 TO 10
MEDIUM - 10 TO 30
DENSE - 30 TO 50
VERY DENSE - MORE

CONSIST
VERY SOFT - LESS
SOFT - 2 TO 4 BL
MEDIUM - 4 TO 8
STIFF - 8 TO 15 B
VERY STIFF 15 TO
HARD - MORE THA

TOPSOIL OR FILL
GRAVEL
SAND
SILT
CLAY
SHALE

DRILL HOLE NO.
STATION 0+00

ELEVATIONS
GROUND ELEVATION
5'
4555
GROUND WATER TABLE 4552
STRATA CHANGE 15' 4546
LOCATION OF SAMPLE 20'
25'
SAMPLE NOT RECOVERED
BOTTOM OF HOLE 30' 4531

NO. OF BLOWS OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO DRIVE A STD. 1⅜" ID, 2" O.D SAMPLE TUBE 1 FT.

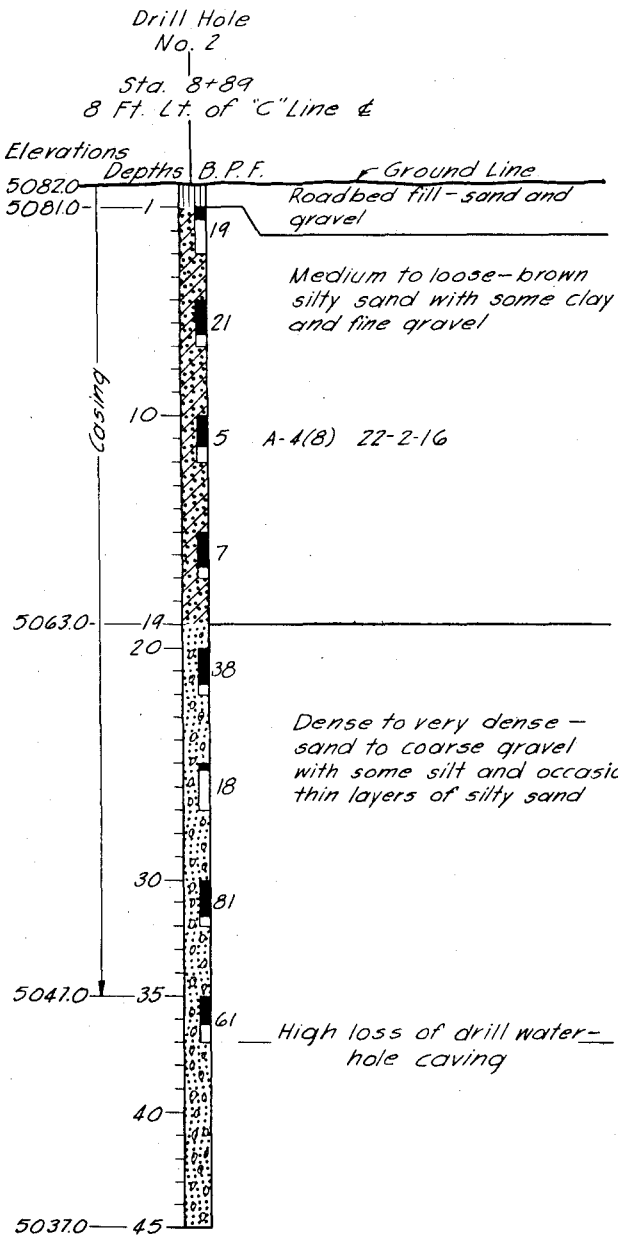
ABBR.
L.L. — LI
P.I — PL
w. — NA
W.G. — M
PEN. — P
G.W.T. — GR
B.P.F. — BL
N.P. — NO

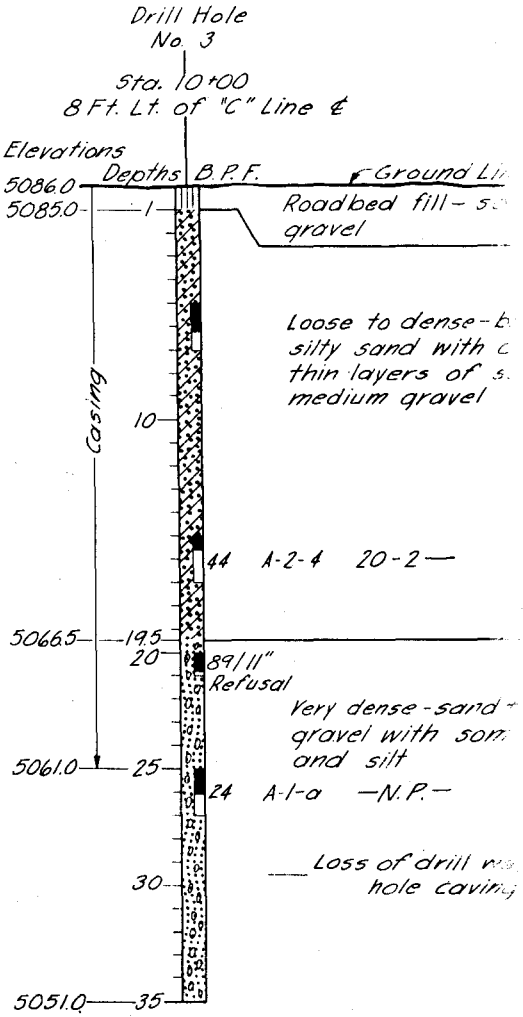
UTAH STATE DEPAR
SALT LAK
MATERIALS AND
NORTH NEPHI TO
"C" LINE

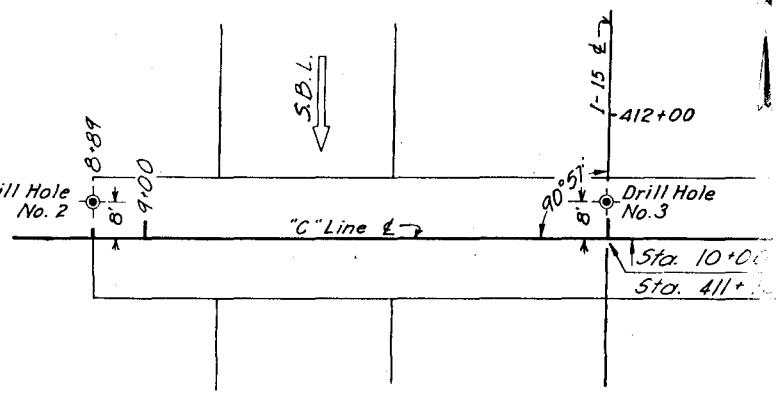
DRAWN BY Kistler | CHECKED
CHECKED BY Horik | CHECKE
CHECKED BY DTP | CHECKE
APPROVAL RECOMMENDED B: William O
RECEIVED BY DATE CHIE
BR. NO.

NO.	BY	DATE	REMARKS

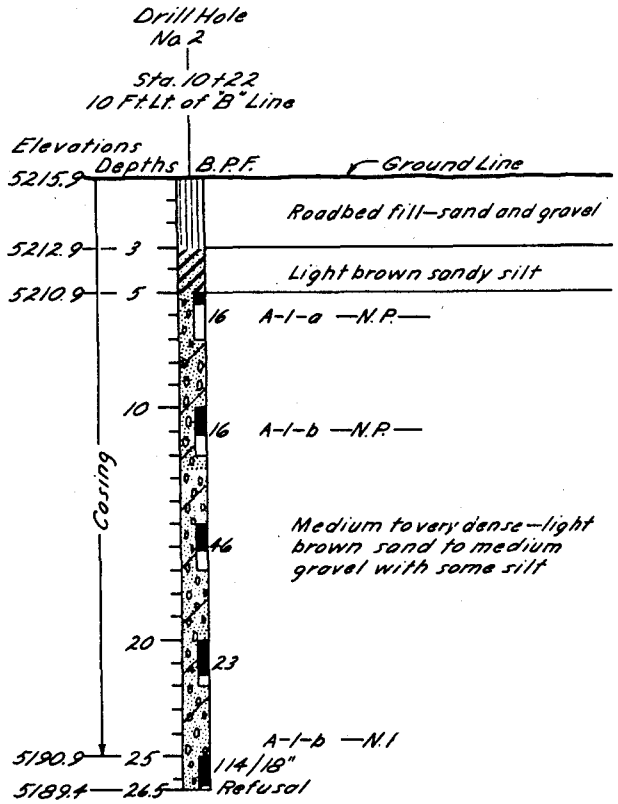
REVISIONS


Drill Hole
No. 2
Sta. 8+89
8 Ft. Lt. of "C" Line ℄
Elevations
Depths
B. P. F.
Ground Line
5082.0
5081.0
1
19
Roadbed fill - sand and gravel
Medium to loose - brown silty sand with some clay and fine gravel
21
10
5
A-4(8) 22-2-16
Casing
7
5063.0
19
20
38
Dense to very dense - sand to coarse gravel with some silt and occasional thin layers of silty sand
18
30
81
5047.0
35
61
High loss of drill water - hole caving
40
5037.0
45


Drill Hole
No. 3
Sta. 10+00
8 Ft. Lt. of "C" Line ℄
Elevations
Depths
B. P. F.
Ground Li
5086.0
5085.0
1
Roadbed fill - s
gravel
Loose to dense - b
silty sand with c
thin layers of s
medium gravel
Casing
10
44
A-2-4 20-2
5066.5
19.5
20
89/11"
Refusal
Very dense - sand
gravel with som
and silt
5061.0
25
24
A-1-a -N.P.-
Loss of drill w
hole caving
30
5051.0
35


S.B.L.
I-15 ℄
412+00
8+89
Drill Hole
No. 2
8'
9.00
90°51'
8'
Drill Hole
No. 3
"C" Line ℄
Sta. 10+0
Sta. 411+

7120



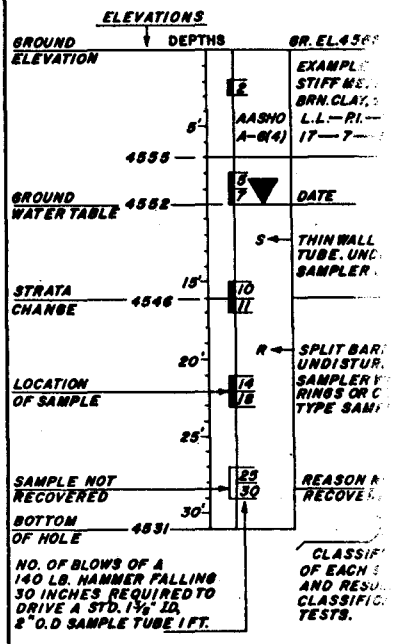
round Line
-sand and gravel
vn sandy silt with
ond fine gravel

very dense—sand to
ravel with some

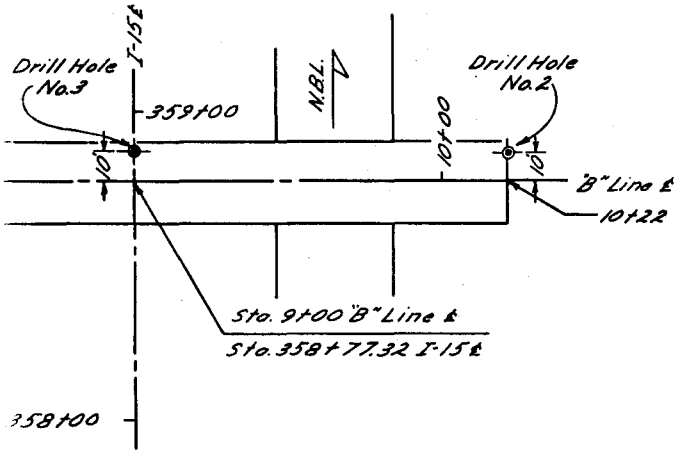
KEY TO DRILLING LOG
RELATIVE DENSITY (SAND & S
VERY LOOSE — LESS THAN 4 BLOWS PE
LOOSE — 4 TO 10 BLOWS PER FOOT.
MEDIUM — 10 TO 30 BLOWS PER FOOT.
DENSE — 30 TO 50 BLOWS PER FOOT.
VERY DENSE — MORE THAN 50 BLOWS PE

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 FOO

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



ABBREVIATIONS
L.L.—LIQUID LIMIT IN %
P.I.—PLASTIC INDEX
w.—NATURAL MOISTURE C
W.G.—WELL GRADED
PEN.—PENETRATION
G.W.T.—GROUND WATER TABLE
B.P.F.—BLOWS PER FOOT.
N.P.—NON PLASTIC



Note: No water table encountered at this site

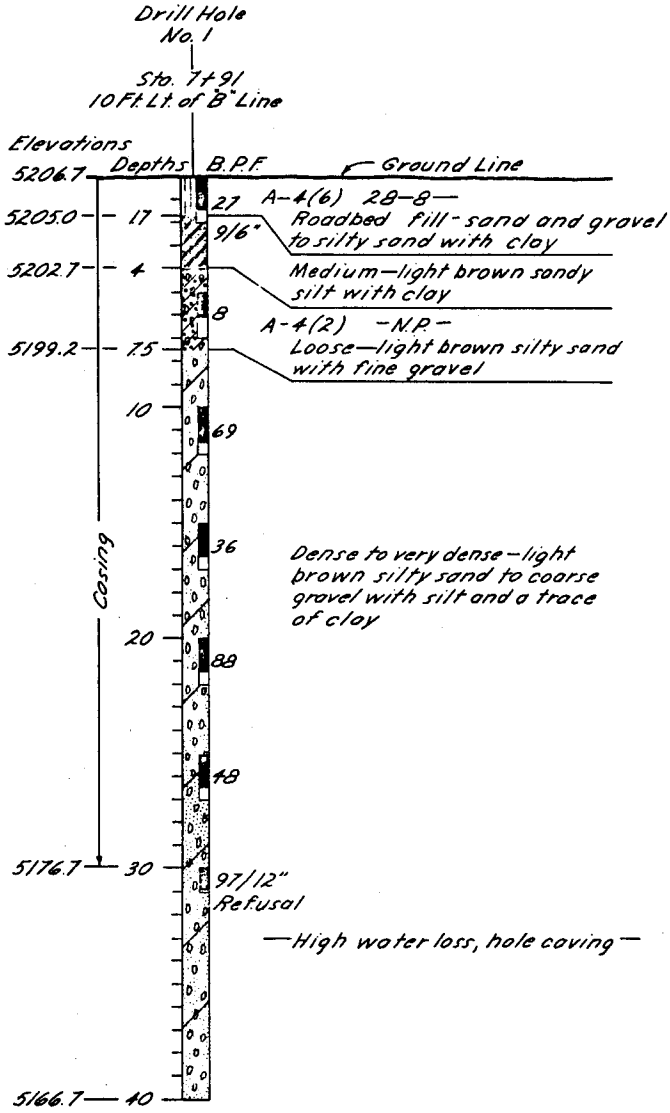
NO.	BY	DATE	REMARKS

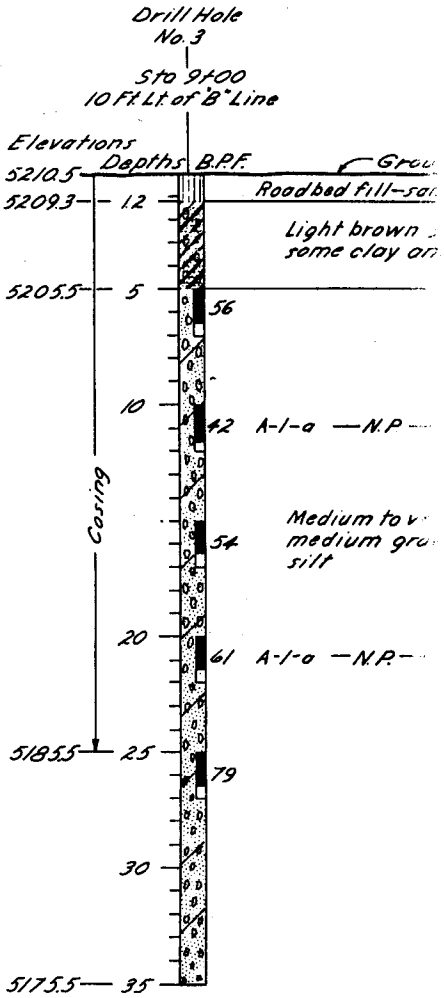
REVISIONS

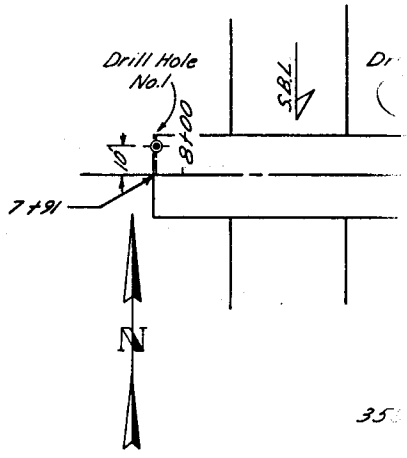
UTAH STATE DEPARTMENT OF HI
SALT LAKE CITY, UTAH
MATERIALS AND RESEARCH DIVISION
NORTH NEPHI TO SOUTH SANTAQ
'B' LINE OVER I-15

DRAWN BY R.Knight	CHECKED BY E.P.	I-15-
CHECKED BY DIP	CHECKED BY W.J.C.	PROJ.
CHECKED BY Hawk	CHECKED BY [illegible]	358
APPROVAL RECOMMENDED BY [signature]		
RECEIVED BY ____ DATE	CHIEF STRUCTURAL ENG'R.	J

BR. NO. ____ DRG. NO. ____


Drill Hole
No. 1
Sta. 7+91
10 Ft. Lt. of "B" Line
Elevations
Depths
B.P.F.
Ground Line
5206.7
5205.0
17
27
A-4(6) 28-8
Roadbed fill - sand and gravel to silty sand with clay
9/6"
5202.7
4
Medium—light brown sandy silt with clay
8
5199.2
7.5
A-4(2) -N.P.-
Loose—light brown silty sand with fine gravel
10
69
36
Dense to very dense—light brown silty sand to coarse gravel with silt and a trace of clay
Casing
20
88
48
5176.7
30
97/12"
Refusal
—High water loss, hole caving—
5166.7
40


Drill Hole
No. 3
Sta 9+00
10 Ft. Lt. of "B" Line
Elevations
Depths
B.P.F.
5210.5
5209.3
1.2
Roadbed fill—sa
Light brown
some clay or
5205.5
5
56
10
42
A-1-a —N.P.
Casing
Medium to v
medium gra
silt
54
20
61
A-1-a —N.P.—
5185.5
25
79
30
5175.5
35


Drill Hole
No. 1
9+00
10'
7+91
N