R-234 T.12N. R.2W. SEC. 7F

Memorandum

UTAH DEPARTMENT OF TRANSPORTATION

1159

FOUNDATIONS

DATE: May 26, 1983

TO Those Listed Below

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

SUBJECT: BRS-0506(1) - SR-81, Near Fielding
Foundation Report for 2 Structures Over
Corinne Canal at SR-81 Stations 531+16 and
538+73.5 - Drg. Nos. F-509 and F-510

SITE CONDITIONS

Two single span prestressed concrete box beam structures, 69 feet and 51 feet long by 44 feet wide are proposed to carry SR-81 over the Corinne Canal. The crossings will be at angles of approximately 37° and 125° respectively. The SR-81 grade elevation will be approximately 2 feet higher than the existing grade at both the structures.

SUBSURFACE EXPLORATION

One test hole was drilled at each of the structures to a depth of 100 feet. Correlation of subsoils between drill holes is fair. The subsoil profile can be generalized as follows: from the ground surface to 14 feet - layers of soft clayey silt and loose sandy silt; from 14 feet to 50 feet - medium to very stiff silty clay with lenses of sandy silt; from 50 feet to 64 feet in drill hole No. 2 and to 80 feet in drill hole No. 1 - layers of sandy silt, silty clay and clayey silt; from these depths to the maximum depth of exploration - dense to very dense silty sand with lenses of sandy silt, clayey silt and silty clay. For more detailed description of the subsurface materials and test hole locations, refer to Fig. 1, Log of Borings.

A ground water table was observed at 23 to 24 feet below the natural ground surface. Surface drainage in the area is fair.

FOUNDATION RECOMMENDATIONS

One foot diameter steel pipe piles are recommended for support of the abutments on both the structures. The recommended maximum pile load capacities and tip elevations are as follows:

UTAH STATE DEPAR. NT OF TRANSPORTATION

MATERIALS AND RESEARCH

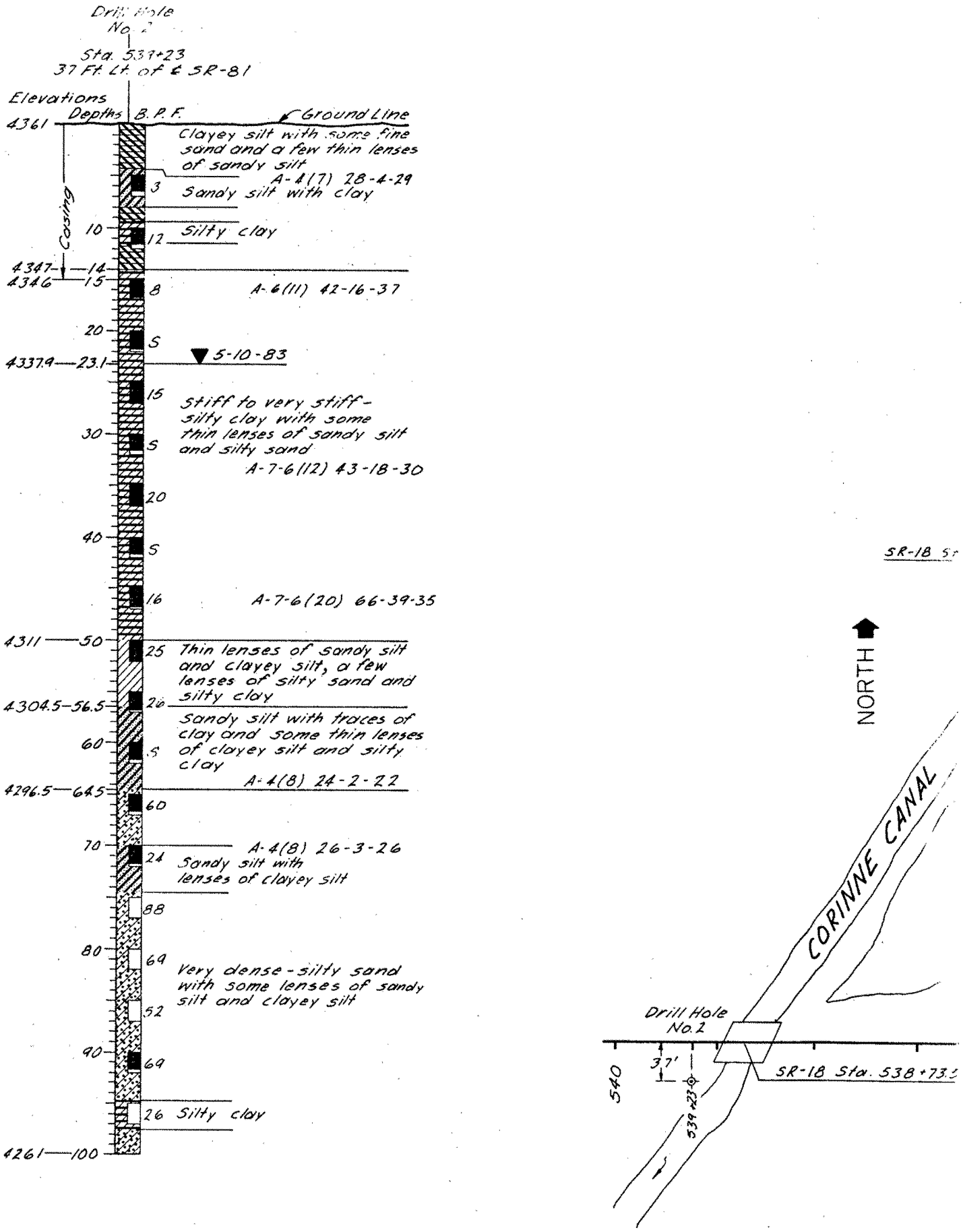
Summary of Test Data

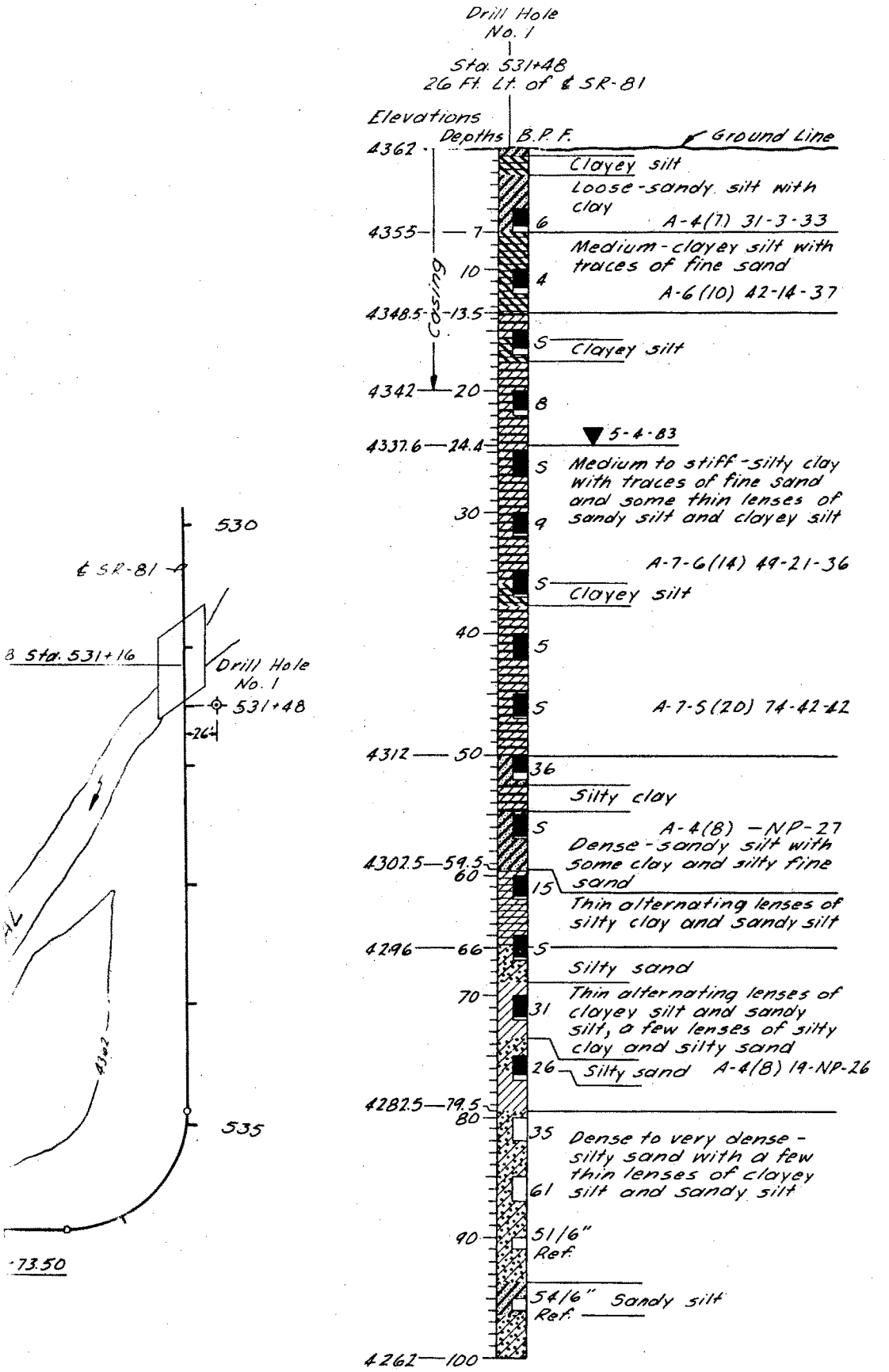
Project Number BRS-0506(1) Sheet 1 Of 1

Project Name Two Structures over Corinne Canal Structure Drg. Nos. F-509 & F-510

Boring No.	Depth	Grading Analysis Percent				Group Classification	Atterberg Limits		Water Cont. ω %	Wet Unit Weight γ P.C.F.	Dry Unit Weight γ_s P.C.F.	Specific Gravity Gs	Permeability k 10^{-4} cm/sec.		Unconfined Strength q_u T.S.F.	Shear Strength				Type Of Test	
																Total Stress		Effective Stress			
		Gravel	Coarse Sand	Fine Sand	Silt and Clay		Liquid Limit L.L.	Plastic Index P.I.					Hor.	Vert.		ø°	C T.S.F.	ø' °	C' T.S.F.		
1	7	1	2	28	69	A-4(7)	31	3	33												
1	12	0	0	2	98	A-6(10)	42	14	37												
1	37	0	0	2	98	A-7-6(14)	49	21	36	118	87				3.75						
1	47	0	1	1	98	A-7-5(20)	72	42	42	119	84				3.55						
1	57	0	0	15	85	A-4(8)	-	NP	27	121	95					15	0.95				
1	72	0	0	25	75	A-4(8)	19	NP	26	111	88				0.58						
2	7	0	1	31	68	A-4(7)	28	4	29												
2	17	0	0	3	97	A-6(11)	42	16	37												
2	32	0	0	2	98	A-7-6(12)	43	18	30	120	93				1.22						
2	47	0	0	1	99	A-7-6(20)	66	39	35												
2	62	0	0	6	94	A-4(8)	24	2	22	122	100					29	0.80				
2	72	0	0	4	96	A-4(8)	26	3	26	117	93				0.31						

S - Shelby Sample P - Penetration Sample T - Triaxial Shear Test C - Consolidation DIR - Direct Shear Test UU - Unconsolidated, Undrained
CU - Consolidated Undrained CD - Consolidated, Drained


Drill Hole No. 2
Sta. 539+23
37 Ft. Lt. of ℄ SR-81
Elevations
Depths
B. P. F.
Ground Line
4361
Clayey silt with some fine sand and a few thin lenses of sandy silt
A-4(7) 28-4-29
3
Sandy silt with clay
Casing
10
12
Silty clay
4347
14
4346
15
8
A-6(11) 42-16-37
20
S
4337.9
23.1
5-10-83
15
Stiff to very stiff - silty clay with some thin lenses of sandy silt and silty sand
30
S
A-7-6(12) 43-18-30
20
40
S
16
A-7-6(20) 66-39-35
4311
50
25
Thin lenses of sandy silt and clayey silt, a few lenses of silty sand and silty clay
4304.5
56.5
26
Sandy silt with traces of clay and some thin lenses of clayey silt and silty clay
60
S
A-4(8) 24-2-22
4296.5
64.5
60
70
A-4(8) 26-3-26
24
Sandy silt with lenses of clayey silt
88
80
69
Very dense - silty sand with some lenses of sandy silt and clayey silt
52
90
69
26
Silty clay
4261
100
SR-18 Sta
NORTH
CORINNE CANAL
Drill Hole No. 2
540
37'
539+23
SR-18 Sta. 538+73



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; SANDSTONE; SILTSTONE; SAN CLAY; CLA SA; SILT CLAY; CLA SILT; SILT SAND; SAN SILT

DRILL HOLE NO
STATION 0+00 ℄ OR LT. OR RT. IN FT. OFF

ELEVATIONS | DEPTHS | B.P.F.

GROUND ELEVATION
EXAMPLE: Soft-silty clay, some fine sand
2
5'
AASHTO LL-PI-W
A-6(9) 37-14-30
4555
GROUND WATER TABLE 4552
5 DATE
S ← THIN WALL SHELB TUBE. UNDISTUR SAMPLER USED.
15'
STRATA CHANGE 4546
10
16
20'
R ← SPLIT BARREL UNDISTURBED SAMPLER WITH LI RINGS OR CALIFO TYPE SAMPLER
LOCATION OF SAMPLE
14
25'
SAMPLE NOT RECOVERED
25 REASON NOT RECOVERED
30'
BOTTOM OF HOLE 4531

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

ABBREVIATIONS

- L.L. — LIQUID LIMIT IN %
- P.I — PLASTIC INDEX
- w. — NATURAL MOISTURE CONTENT
- 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 SYS

Date Drilled: May 1983

NO.	BY	DATE	REVISIONS

UTAH STATE DEPARTMENT OF TRANSPORTATI
SALT LAKE CITY, UTAH
MATERIALS and RESEARCH SECTIO

SR-81, NEAR FIELDING
2 STRUCTURES OVER CORINNE CANAL

Drawn By Kistler	Checked By K. Powell	BRS-050
Checked By B. Stevens	Checked By	Project N
Checked By Siddiki	Checked By	531 + 538 + 7
Approval Recommended By Leon H Rawlins		Stru
Received Date	Chief Structural Engr.	BOX ELDE County
Foundations File No. 83-7-FS-17	Org No.	F-509 F-510

FIGURE 1

AREA NUMBER 1159, LOCATION= 4078000N, 4626600E UTM coordinates

BORING NUMBER 1
BORING DEPTH=100.00 ft. GROUND WATER DEPTH= 24.50 ft.

DEPTH (ft.)	CRITICAL ACCELERATION (a/g)	SOIL TYPE	N	N1	SILT CORRECTION
51.00	0.5109	A4	36.0	23.3	7.5
65.75-69.00	A4 SOIL BELOW WATER TABLE NOT TESTED				
75.75	0.3797	A4	26.0	14.2	7.5
81.00	0.4449	A4	35.0	18.5	7.5
86.00	0.8056	A4	61.0	31.4	7.5

MINIMUM CRITICAL ACCELERATION FOR BORING= 0.3797

BORING NUMBER 2
BORING DEPTH=100.25 ft. GROUND WATER DEPTH= 23.00 ft.

DEPTH (ft.)	CRITICAL ACCELERATION (a/g)	SOIL TYPE	N	N1	SILT CORRECTION
66.25	1.1043	A4	60.0	35.1	7.5
71.25	0.3641	A4	24.0	13.6	7.5
76.50	2.5828	A4	88.0	48.3	7.5
81.25	1.2002	A4	69.0	36.8	7.5
86.25	0.6112	A4	52.0	26.9	7.5
91.25	0.8670	A4	69.0	34.8	7.5

MINIMUM CRITICAL ACCELERATION FOR BORING= 0.3641

MINIMUM CRITICAL ACCELERATION FOR AREA= 0.3641