ENGINEERING GEOLOGY & SOILS REPORT
CENTERLINE SOILS

SCOUT LAKE ROAD EXTENSION

Project No. X14615

July 1981

CENTRAL REGION



PREPARED BY

MATERIALS SECTION

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

ENGINEERING GEOLOGY

AND

SOILS REPORT

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July 1981

CENTRAL REGION

W.H. Slater, Chief Geologist

Frank P. Narusch, Central Region
Materials Engineer

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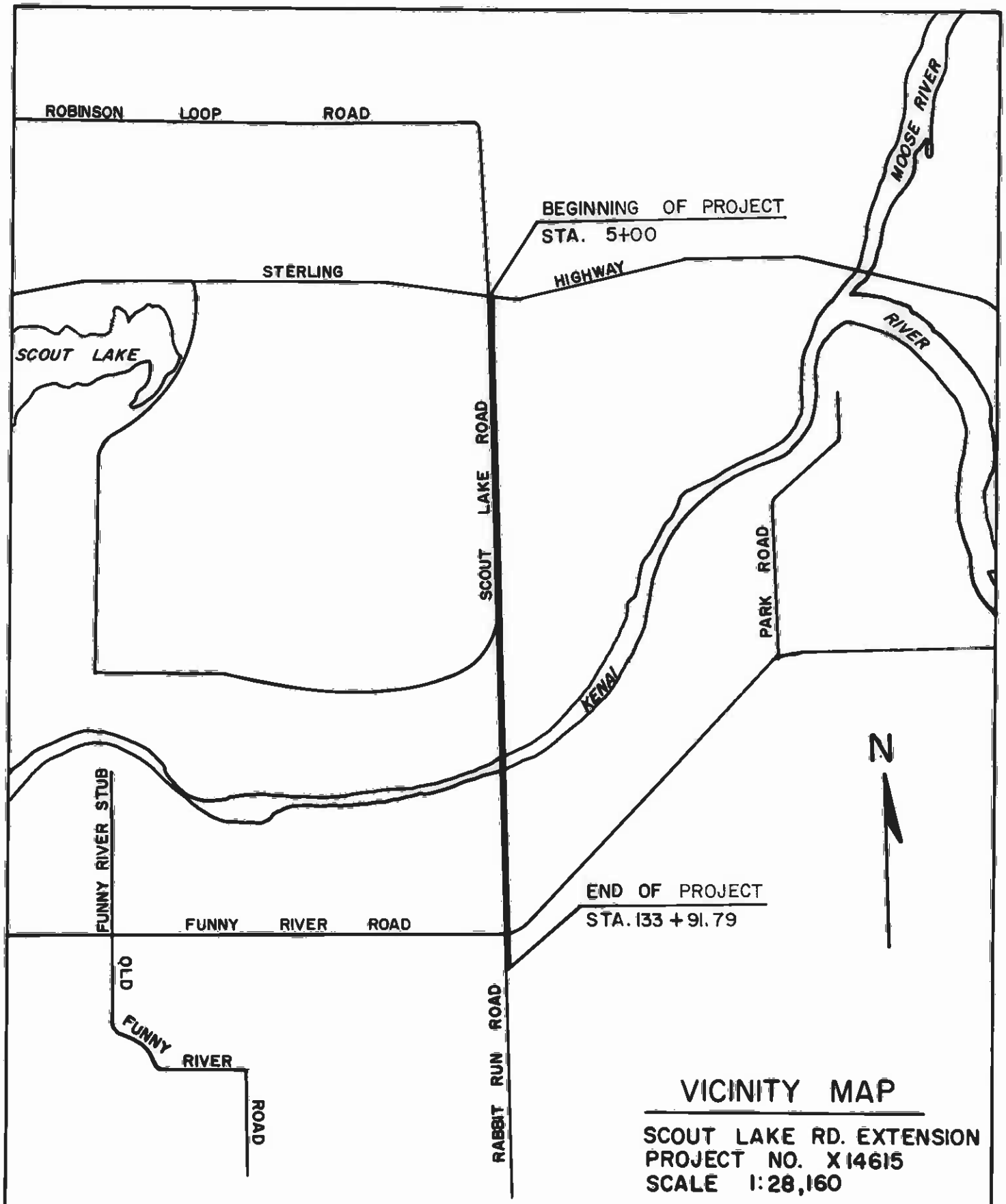
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VICINITY MAP

SCOUT LAKE RD. EXTENSION
PROJECT NO. X14615
SCALE 1:28,160

SCOUT LAKE ROAD EXTENSION X14615

INTRODUCTION

Pursuant to a request from Mr. Frank Narusch, Central Region Materials Engineer, a centerline materials study was performed for the subject project. Field work was undertaken by the Engineering Geology Section of the Central Region Materials Laboratory.

The project consists of the reconstruction, realignment and extension of 2.4 miles of Scout Lake Road, to connect with Funny River Road on the south side of the Kenai River. A bridge is proposed to carry the road across the Kenai River. (Investigation of the soil conditions for the Bridge foundation were conducted by the Foundation Geology Section of Headquarters Materials.)

The boring logs contained in this report are representative only of conditions at the exact location tested, and are an interpretation of drilling data by the geologist who directed the field exploration. Persons utilizing this report for design purposes should satisfy themselves as to the adequacy of coverage, and the applicability and suitability of the borings, soil samples, and laboratory test data.

FIELD INVESTIGATIONS

Initial field work was performed from December 8 through 11, 1980 under the direction of John Fritz, Engineering Geologist. Twenty boreholes were advanced on both sides of the Kenai River, within the "O" line stationing limits of 68+00 to 128+00, using a Nodwell mounted Mobile B-50 drill rig with 6 inch diameter continuous flight auger. Subsequent to this investigation, the project limits were expanded to the north to station 5+00 at the Sterling Highway. Field work was continued under the direction of Don Holland, Senior Field geologist, on January 13 and 14, 1981.

Representative soils samples were taken to the Central Region Materials Laboratory for analysis of soils classification, natural moisture content, organic content, Atterberg Limits, frost susceptibility values, R-value and specific gravity. Results of 66 laboratory analyses are presented at the end of this report. In some cases, the field soils classifications have been modified to reflect the laboratory test results.

In addition, shear strength testing of high organic content soils was done by the vane shear method, principally along the existing alignment at two areas of peat deposits. Data for undisturbed and disturbed samples are presented in the soils profile.

CLIMATE DATA

The following data was obtained from the University of Alaska, Arctic Environmental Information and Data Center, from the Sterling station. (Data was from 10 years prior to 1968):

Mean Temperature & Precipitation Data

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
Temp	(°F)	6.4	13.9	19.0	33.0	43.4	51.3	54.6	53.6	45.2	32.3	20.5	8.8	31.8
Precip	(")	0.97	0.99	0.67	0.84	0.74	1.11	2.45	2.69	2.48	1.42	1.37	1.44	17.17
Snow	(")	8.4	12.3	7.9	3.8	T	0	0	0	T	3.7	8.0	15.7	59.8

GEOLOGY AND TOPOGRAPHY

The project areas lie in the northwestern portion of the Kenai Lowlands, straddling the Kenai River just downstream of its confluence with the Moose River. The Kenai lowlands is a physiographic province of low hills, broad level plains, numerous small lakes, and bog deposits. Thick glacial and alluvial deposits cover the surface, with soil gradations ranging from peat to wind-blown silt (loess) to coarse glacial till. Underlying the glacial deposits are the gently folded silty and sandy sediments of the Kenai formation, with thin lignite beds. These sediments are of Tertiary (Eocene) age.

The area is generally well-forested with small to medium sized spruce, with some larger cottonwood and spruce in the better-drained areas. The project is located along a cleared section line in use as a utility corridor.

GENERAL DESIGN CONSIDERATIONS

Design Data

ADT 1981	
ADT 2001	1000
DHV 1997	150
T	5%
V	55 mph
D	40-60%
T.I.	5.6

High concentrations and segregation of ice are found in organic and highly frost-susceptible soils under seasonally frozen conditions. If construction takes place when these soils are frozen, use of heavy equipment can create extremely mucky soil conditions. Excavation and wasting of these soils is normally mandated in these situations.

John Fritz, Engineering Geologist

M.G. Harp, Central Regional Geologist

STATION TO STATION DESCRIPTIONS

The following descriptions are based on the original staked "O" centerline as found in the field during the course of subsurface investigations. The locations have been adjusted on the plan and profile sheets to relate to the subsequent "P" line.

Station 5+00 (B.O.P.) to 14+00

This interval is a fill section of up to 6 feet. The project begins at the Sterling Highway and Scout Lake Road and continues south following the existing road, with the grade dropping slowly across gently rolling terrain vegetated with willow and occasional small spruce. Subsurface drainage is relatively poor, but the existing roadway embankment drains well. The embankment was placed atop organics, after clearing of vegetation. The unpaved roadway enbankment consists of two feet of brown silty sandy gravel(A-1-b, F2) underlain by brown sandy silt (A-4(4), F4) to 7 feet. Organics were found within this sandy silt, and natural moisture was as high as 21.3%. Frost was encountered to 5 feet in depth.

Station 14+00 to 18+00

This interval is a low area, with a small swamp to the right of the roadway. Drainage is poor, vegetation consists of small willow and alder, and grasses. Soils in the roadway consist of brown silty sandy gravel (A-1-b, F2), to 3 feet, beneath which was found brown gravelly silt with wood fragments of 5 feet. The woody fragments are likely the remains of an old corduroy road across the swamp. Below this was found brown organic silt to 10 feet. Borehole 40 was placed in the swamp, 25 feet right of centerline. Brown fibrous organic material was encountered to 6.5 feet. Beneath this is gray silt, to at least 9.5 feet. The fibrous peat contained a natural moisture content of 381.5% to 385.0%. Vane shear testing was performed for both undisturbed (U) and disturbed (D) samples at 2.5 feet and 4.5 feet in the peat. Torque in inch-pounds is shown on the soils profiles. Frost had penetrated to 5 feet deep at the time of investigation.

Station 18+00 to 43+00

This interval consists of cuts and fills over gently rolling terrain. Drainage is poor, and vegetation consists of willow, alder, and some spruce. The existing roadway fill is brown silty gravel. Below this, soils ranged from brown gravelly sand (A-3, F2) to silty sand (A-2-4, F3) to sandy silt (A-4, F4). Natural moisture contents ranged from 5.7% to 32.7% in the upper 5 feet. BH-23 encountered brown sandy gravel with cobbles (A-1-a, NFS) from 3.5 to 8 feet in depth, and it may be present in places in the cut banks on either side of the alignment through this interval. Frost had penetrated from 2.5 to 4 feet deep.

Station 43+00 to 49+00

The proposed alignment dips to cross a low swampy area. Standing water exists on both sides of the road, in ponds occupying the lowest areas. Drainage is poor, with swamp grasses and sedges the predominant vegetation. Along the roadway, beneath a foot of silty gravel fill was encountered brown organic sandy silts (A-4, F4) and silty sands (A-2-4, F3). Natural moisture contents averaged 22%. Test holes off the road on either side revealed up to 8.5 feet of brown fibrous organics. Natural moisture contents ranged from 266.7% to 402.8%. Vane shear data in inch-pounds for undisturbed (U) and disturbed (D) samples are given in the soils profiles. Frost had penetrated to 5 feet in depth.

Station 49+00 to 69+00

The alignment through this interval rises out of the previous swampy area, cuts through a low rise and drops to more wet terrain beyond. Vegetation consists of willow and alder brush, and drainage is good. Soils consist of gray-brown and brown silty sand (A-2-4, F3 and F4) and brown sandy silt (A-4, F4). Frost had penetrated as deep as 5 feet.

Station 69+00 to 94+12

The proposed alignment moves off the existing road and crosses a low swampy area vegetated with grasses and occassional small spruce and willow. Both surface and subsurface drainage is poor. Soils encountered along this realignment were primarily dark brown sand with organic traces, and gray silty sand (A-2-4, F4), and organic silts and sandy silts (A-2-4, F4 and A-4, F4). Natural moisture contents ranged from 11.9% to 19.0% for soils nearest the proposed grade elevation. Organic content in BH-3 was 8.0%. Water was encountered between 1.5 and 2.5 feet below surface, between stations 70 and 76. Borehole 6, less than 300 feet from the Kenai River, encountered gray brown sandy gravel with cobbles (A-1-a, NFS). This was the only such material encountered on the project, and surficially appears to be confined to a narrow band of coarse fluvial sediments along the banks of the Kenai River.

Station 94+12 to 99+00

The proposed bridge will span this interval across the Kenai River. Data from boreholes for the bridge foundations are contained in the report for the subject project, performed by the Foundations Geology Section of Headquarters Materials.

Station 99+00 to 133.79 (E.O.P.)

This interval rises from the Kenai River, cuts through a 75 foot bluff bordering the river valley, and continues across generally level terrain to the end of the project at the intersection of Funny River Road and Rabbit Run Road. Two level, poorly drained areas are crossed from Stations 106 to 108 and 115 to 120. At Station 118+30, a drainage ditch and berm crosses the centerline, flowing left to right. Grasses and swamp vegetation cover these intervals, and small spruce and willow are found in the better drained low slopes along the rest of this interval. Borehole 17 on the south bank of the Kenai River revealed brown silty gravelly sand (A-2-4, F4) over gravelly sandy silt. BH-19 was a 50 foot hole into the high river bluff, which revealed soils grading from sandy silt to silty sand to silty gravelly sand. These soils (A-2-4, F4 and A-4, F4) are typical of glacial till, and exhibited varying moisture contents of 9.7% to 20.9%. The soils on the rest of the alignment were similarly varied, from gravelly silty sand (A-2-3, F4) to sandy silts (A-4, F4) with varying amounts of gravel and organics present. Moisture contents ranged from 7.0% to 70.2%.

Rev.

Jan. 13, 1981

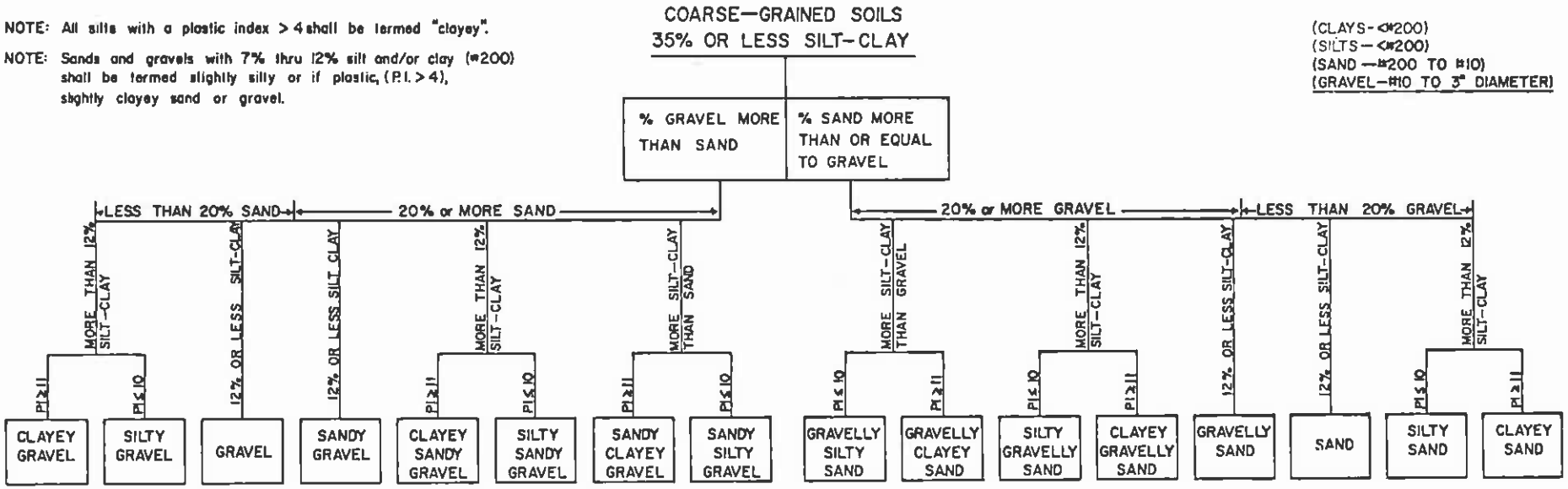
ALASKA DEPARTMENT OF TRANSPORTATION ENGINEERING SOIL CLASSIFICATIONS

NOTE: All silts with a plastic index > 4 shall be termed "clayey".

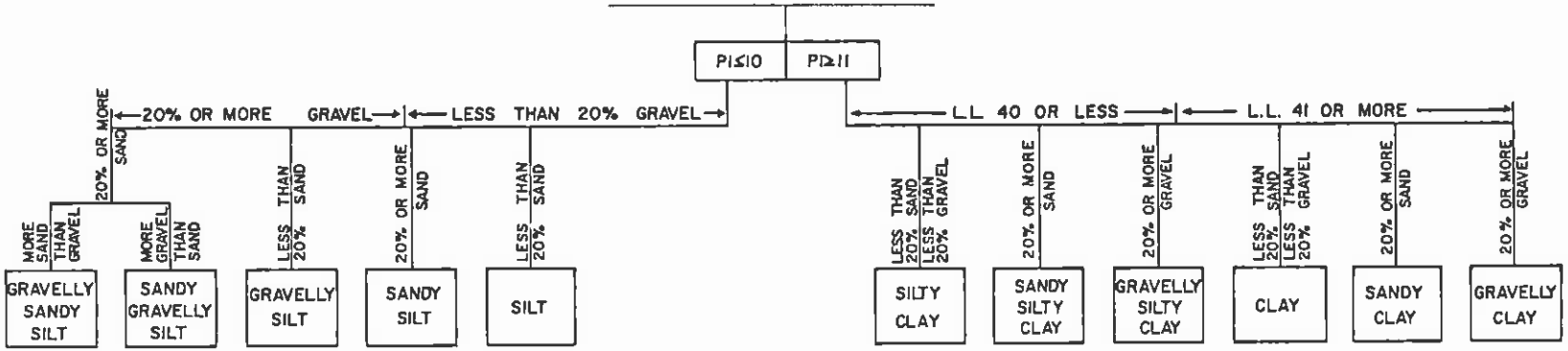
NOTE: Sands and gravels with 7% thru 12% silt and/or clay (#200) shall be termed slightly silty or if plastic, (P.I. > 4), slightly clayey sand or gravel.

(CLAYS - <#200)
(SILTS — <#200)
(SAND — #200 TO #10)
(GRAVEL — #10 TO 3" DIAMETER)

COARSE—GRAINED SOILS
35% OR LESS SILT—CLAY



FINE—GRAINED SOILS
36% OR MORE SILT—CLAY



SOILS TESTING REPORTS

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE Materials MATERIAL SITE SAMPLED BY Don Holland

STATION	7+00	7+00	10+00	10+00	10+00	16+00	16+00	20+00
OFFSET (FEET)	5' Rt.	5' Rt.	7' Rt.	7' Rt.	7' Rt.	25' Rt.	25' Rt.	6' Rt.
DEPTH (FEET)	3'-5'	4'	1'-2'	3'-5'	8'-10'	3'	5'	2'-3'
TEST HOLE NO.	BH-20	BH-20	BH-21	BH-21	BH-21	BH-40	BH-40	BH-23
FIELD NO.	FS-36	FS-37	FS-38	FS-39	FS-40	FS-65	FS-66	FS-41
DATE SAMPLED	01/13/81	01/13/81	01/13/81	01/13/81	01/13/81	01/14/81	01/14/81	01/13/81
LAB NO. 81A-	31	32	33	34	35	60	61	36
ESTIMATED %+10"								
ESTIMATED %+ 3"								
PERCENT PASSING 3"								
2"			100		100			
1"			99	100	98			
3/4"			96	99	94			
1/2"			91	97	88			
3/8"	100		83	96	83			
# 4	98		64	91	73			100
#10	97		49	87	67			100
#40	92		32	80	56			87
#50	88		28	72	47			46
#100	76		22	50	40			18
#200	63		18	38	36			9
.02mm			13	21	26			6
.005mm								
LIQUID LIMIT	26		20	NA	19			NA
PLASTIC INDEX	5		NP	NP	3			NP
NAT. MOISTURE		21.3%				381.5%	385.0%	
ASSHTO CLASS	A-4(4)		A-1-b	A-4(0)	A-4(0)			A-3(0)
F.S.V.	F4		F2	F4	F4			F2
SOILS DESCRIPTION	SaSi		SiSaGrl	SaSi	SaGrlSi			GrlSa
SP. G., FINE			2.70	2.68	2.71			2.70
SP. G., COARSE								
SULFATE SOUNDNESS								
L.A. ABRASION LOSS								

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE X MATERIAL SITE SAMPLED BY Don Holland

STATION		20+00	20+00	25+00	30+00	30+00	30+00	30+00	30+00
OFFSET (FEET)		6' Rt.	6' Rt.	7' Rt.	6' Rt.	6' Rt.	6' Rt.	6' Rt.	6' Rt.
DEPTH (FEET)		3'	6' - 8'	6' - 8'	2' - 3'	3'	4' - 5'	4'	7' - 9'
TEST HOLE NO.		BH-23	BH-23	BH-24	BH-25	BH-25	BH-25	BH-25	BH-25
FIELD NO.		FS-42	FS-43	FS-44	FS-45	FS-46	FS-47	FS-48	FS-49
DATE SAMPLED		01/13/81	01/13/81	01/13/81	01/13/81	01/13/81	01/13/81	01/13/81	01/13/81
LAB NO.	81A-	37	38	39	40	41	42	43	44
ESTIMATED %+10"									
ESTIMATED %+ 3"									
PERCENT PASSING	3"								
	2"		100	100			100		100
	1"		86	99			99		99
	3/4"		77	95			98		98
	1/2"		62	89			96		94
	3/8"		52	86			95		91
	# 4		41	81	100		93		83
	#10		36	78	99		91		77
	#40		26	69	93		74		51
	#50		16	45	88		36		21
	#100		7	19	80		16		9
	#200		5	14	73		14		8
	.02mm			13			10		6
	.005mm								
LIQUID LIMIT			NA	NA	NA		NA		NA
PLASTIC INDEX			NP	NP	NP		NP		NP
NAT. MOISTURE		5.7%				32.7%		8.4%	
ASSHTO CLASS			A-1-a	A-2-4	A-4(0)		A-2-4		A-3(0)
F.S.V.			NFS	F3	F4		F3		F2
SOILS DESCRIPTION			SaGrl	SiGrlSa	SaSi		SiSa		GrlSa
SP. G., FINE				2.70			2.66		2.69
SP. G., COARSE									
SULFATE SOUNDNESS									
L.A. ABRASION LOSS									

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE X MATERIAL SITE SAMPLED BY Don Holland

STATION	45+00	45+00	45+00	45+00	45+00	46+00	46+00	46+50
OFFSET (FEET)	4' Rt.	4' Rt.	4' Rt.	4' Rt.	4' Rt.	50' Lt.	50' Lt.	50' Rt.
DEPTH (FEET)	1' - 3'	2'	6' - 8'	7'	11' - 13'	2.5'	5.0'	2' - 4'
TEST HOLE NO.	BH-28	BH-28	BH-28	BH-28	BH-28	BH-37	BH-37	BH-36
FIELD NO.	FS-50	FS-51	FS-52	FS-53	FS-54	FS-62	FS-63	FS-60
DATE SAMPLED	01/14/81	01/14/81	01/14/81	01/14/81	01/14/81	01/14/81	01/14/81	01/14/81
LAB NO. 81A-	45	46	47	48	49	57	58	55
ESTIMATED %+10"								
ESTIMATED %+ 3"								
3"								
2"								
1"					100			
3/4"	100				99			
1/2"	99		100		97			
3/8"	99		99		95			
# 4	98		99		92			
#10	96		98		89			100
#40	88		89		70			98
#50	79		73		45			
#100	65		56		21			
#200	58		50		15			90
.02mm					10			
.005mm								
LIQUID LIMIT	NA		23		NA			
PLASTIC INDEX	NP		NP		NP			
NAT. MOISTURE		21.0%		24.1%		282%	402.8%	381.5%
ASSHTO CLASS	A-4(0)		A-4(0)		A-2-4			A-8
F.S.V.	F4		F4		F3			
SOILS DESCRIPTION	SaSi		SaSi		SiSa			
SP. G., FINE					2.68			
SP. G., COARSE								
SULFATE SOUNDNESS								
L.A. ABRASION LOSS								
ORGANIC CONTENT								65%

PERCENT PASSING

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE X MATERIAL SITE SAMPLED BY Don Holland

STATION		46+50	47+00	48+00	48+00	50+00	50+00	55+00
OFFSET (FEET)		50' Rt.	50' Lt.	5' Rt.	5' Rt.	6' Rt.	6' Rt.	8' Rt.
DEPTH (FEET)		5'	5'	2' - 4'	3'	2' - 4'	3'	0' - 1'
TEST HOLE NO.		BH-36	BH-38	BH-29	BH-29	BH-30	BH-30	BH-31
FIELD NO.		FS-61	FS-64	FS-55	FS-56	FS-57	FS-58	FS-59
DATE SAMPLED		01/14/81	01/14/81	01/14/81	01/14/81	01/14/81	01/14/81	01/14/81
LAB NO.	81A-	56	59	50	51	52	53	54
ESTIMATED %+10"								
ESTIMATED %+ 3"								
PERCENT PASSING	3"							
	2"							100
	1"					100		99
	3/4"					99		98
	1/2"			100		98		92
	3/8"			99		97		84
	# 4			97		94		67
	#10			94		91		53
	#40			77		74		37
	#50			55		54		26
	#100			34		24		15
	#200			27		15		13
	.02mm			17		8		10
	.005mm							
LIQUID LIMIT				NA		NA		NA
PLASTIC INDEX				NP		NP		NP
NAT. MOISTURE		320.8%	266.7%		22.1%		7.6%	
ASSHTO CLASS				A-2-4		A-2-4		A-1-b
F.S.V.				F4		F3		F2
SOILS DESCRIPTION				SiSa		SiSa		SiSaGrl
SP. G., FINE				2.68		2.70		2.70
SP. G., COARSE								
SULFATE SOUNDNESS								
L.A. ABRASION LOSS								

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE Materials MATERIAL SITE _____ SAMPLED BY John Fritz

STATION		68+00	68+00	71+00	74+79	74+79	78+85	78+85	78+85
OFFSET (FEET)		9' Lt	9' Lt	8' Lt	℄	℄	℄	℄	℄
DEPTH (FEET)			6'-10'	2'-5'	1'-3'	4'-5'	2'-5'	8'-10'	18'-20'
TEST HOLE NO.		BH-8	BH-8	BH-1	BH-2	BH-2	BH-7	BH-7	BH-7
FIELD NO.		FS-17	FS-18	FS-1	FS-2	FS-3	FS-11	FS-12	FS-13
DATE SAMPLED		12/09/80	12/09/80	12/08/80	12/08/80	12/08/80	12/09/80	12/09/80	12/09/80
LAB NO.	80A-	3437	3438	3421	3422	3423	3431	3432	3433
ESTIMATED %+10"									
ESTIMATED %+ 3"									
PERCENT PASSING	3"								100
	2"						100	100	95
	1"			100			98	99	90
	3/4"			99			97	98	82
	1/2"	100		98			96	97	77
	3/8"	98		97		100	93	95	69
	# 4	96	100	95	100	100	90	93	63
	#10	90	92	83	91	94	58	63	50
	#40	80	70	58	80	87	25	28	28
	#50	56	31	18	56	73	7	7	15
	#100	42	19	11	40	61	6	4	13
	#200	24	14	7	27		5		10
	.02mm								
	.005mm								
LIQUID LIMIT		NA	NA	NA	NA	17	NA	NA	NA
PLASTIC INDEX		NP	NP	NP	NP	NP	NP	NP	NP
NAT. MOISTURE			24.1%	24.9%					
ASSHTO CLASS		A-4	A-2-4	A-2-4	A-4	A-4	A-1-b	A-3	A-1-b
F.S.V.		F4	F3	F3	F4	F4	F2	NFS	F3
SOILS DESCRIPTION		SaSi	SaSi	Sa	SaSi	SaSi	Sa	Sa	SiGrlSa
SP. G., FINE		2.66		2.64	2.65		2.70		2.70
SP. G., COARSE									
SULFATE SOUNDNESS									
L.A. ABRASION LOSS									
ORGANIC CONTENT									

SOILS TESTING REPORT

Sheet 6 of 9

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE Materials MATERIAL SITE SAMPLED BY John Fritz

STATION		78+85	78+85	78+85	83+12	83+12	86+10	86+10	87+15
OFFSET (FEET)		℄	℄	℄	30' Lt	30' Lt	29' Rt	29' Rt	10' Lt
DEPTH (FEET)		31'-34'	45' - 50'	53'-57'	1'-3'	7.5'-10'	2'-5'	7'-10'	3'-5'
TEST HOLE NO.		BH-7	BH-7	BH-7	BH-3	BH-3	BH-4	BH-4	BH-5
FIELD NO.		FS-14	FS-15	FS-16	FS-4	FS-5	FS-6	FS-7	FS-8
DATE SAMPLED		12/09/80	12/09/80	12/09/80	12/08/80	12/08/80	12/08/80	12/08/80	12/09/80
LAB NO.	80A-	3434	3435	3436	3424	3425	3426	3427	3428
ESTIMATED %+10"									
ESTIMATED %+ 3"									
PERCENT PASSING	3"								
	2"	100	100	100	100	100		100	
	1"	97	99	94	99	96		98	
	3/4"	92	98	93		93		91	
	1/2"	84	97	91	98	87		76	
	3/8"	77	94	90	98	84		68	
	# 4	62	88	87	95	78		58	
	#10	51	81	83	89	73	100	51	100
	#40	37	69	72	75	66	98	41	85
	#50	30	62	64	68	61	91	35	70
	#100	19	48	48	52	48	55	24	44
	#200	18	38	41	47	37	35	17	30
	.02mm	12	27	30	24	20	20	11	20
	.005mm								
LIQUID LIMIT		NA	16	17	NA	NA	NA	NA	NA
PLASTIC INDEX		NP	NP	NP	NP	NP	NP	NP	NP
NAT. MOISTURE		4.0%	14.5%	11.9%		19.0%	19.4%		16.2%
ASSHTO CLASS		A-1-b	A-4(0)	A-4	A-4	A-4	A-2-4	A-1-b	A-2-4
F.S.V.		F2	F4	F4	F4	F4	F4	F3	F4
SOILS DESCRIPTION		SiSaGrl	SaSi	SaSi	SaSi	GrlSaSi	SiSa	SiSaGrl	SiSa
SP. G., FINE		2.69		2.72	2.55	2.66		2.71	2.70
SP. G., COARSE									
SULFATE SOUNDNESS									
L.A. ABRASION LOSS									
ORGANIC CONTENT					8.0%				
"R" Value			64						

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE Material MATERIAL SITE SAMPLED BY John Fritz

STATION		87+15	91+50	100+24	102+15	102+15	102+15	102+15	102+15
OFFSET (FEET)		10' Lt	6' Rt	2' Rt	20' Rt	20' Rt	20' Rt	20' Rt	20' Rt
DEPTH (FEET)		7'-10'	1'-5'	2'-5'	2' - 5'	8' - 10'	17'-20'	26'-30'	39'-42'
TEST HOLE NO.		BH-5	BH-6	BH-17	BH-19	BH-19	BH-19	BH-19	BH-19
FIELD NO.		FS-9	FS-10	FS-28	FS-31	FS-32	FS-33	FS-34	FS-35
DATE SAMPLED		12/09/80	12/09/80	12/10/80	12/11/80	12/11/80	12/11/90	12/11/80	12/11/80
LAB NO.	80A-	3429	3430	3448	3451	3452	3453	3454	3455
ESTIMATED %+10"									
ESTIMATED %+ 3"									
PERCENT PASSING	3"								
	2"		100	100		100	100	100	
	1"		94	96		99	99	99	100
	3/4"	100	85	92	100	96	98	97	99
	1/2"	98	70	88	99	91	92	93	98
	3/8"	95	62	84	96	86	86	90	97
	# 4	88	45	78	90	79	75	83	95
	#10	82	31	73	83	73	67	77	90
	#40	57	14	65	70	66	60	67	66
	#50	41	10	61	64	60		58	59
	#100	25	7	48	50	45		44	47
	#200	18	5	25	45	36	32	35	39
	.02mm	12		15	32	21		22	29
	.005mm								
LIQUID LIMIT		NA	NA	NA	15	NA	NA	13	16
PLASTIC INDEX		NP	NP	NP	NP	NP	NP	NP	NP
NAT. MOISTURE				15.9%		20.9%		9.7%	15.3%
ASSHTO CLASS		A-1-b	A-1-a	A-2-4	A-4	A-2-4	A-2-4	A-2-4	A-4
F.S.V.		F2	NFS	F4	F4	F4	F4	F4	F4
SOILS DESCRIPTION		SiSa	SaGrl	SiGrlSa	SaSi	GrlSiSa	SiGrlSa	GrlSiSa	SaSi
SP. G., FINE		2.70		2.68	2.65	2.68	2.70	2.71	2.72
SP. G., COARSE									
SULFATE SOUNDNESS									
L.A. ABRASION LOSS									

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE Materials MATERIAL SITE _____ SAMPLED BY John Fritz

STATION		109+63	110+92	112+60	115+10	116+00	116+00	119+15	119+15
OFFSET (FEET)		22' Rt	22' Rt	23' Lt	25' Rt	29' Lt	29' Lt	20' Lt	20' Lt
DEPTH (FEET)		5'-8'	2'-5'	5'-9'	2'-5'	2'-5'	6'-10'	2'-4'	8'
TEST HOLE NO.		BH-15	BH-14	BH-13	BH-12	BH-18	BH-18	BH-11	BH-11
FIELD NO.		FS-27	FS-26	FS-25	FS-24	FS-29	FS-30	FS-22	FS-23
DATE SAMPLED		12/10/80	12/10/80	12/10/80	12/10/80	12/10/80	12/10/80	12/10/80	12/10/80
LAB NO.	80A-	3447	3446	3445	3444	3449	3450	3442	3443
ESTIMATED %+10"									
ESTIMATED %+ 3"									
PERCENT PASSING	3"								
	2"	100	100	100	100	100	100		
	1"	99		99	98	98	99		
	3/4"	96		99	98	96	96	100	
	1/2"	91	98	96	93	88	92	99	
	3/8"	87	98	93	88	84	89		
	# 4	78	98	86	81	77	83	99	
	#10	71	98	81	75	67	76	91	
	#40	62	96	71	66	54	67	70	
	#50	56	94	66	61	51	63	66	
	#100	44	86	53	50		52	58	
	#200	35	74	40	39	49	42	48	
	.02mm	22		25	28	24	30	32	
	.005mm								
LIQUID LIMIT		NA	NA	NA	15	37	14	36	
PLASTIC INDEX		NP	NP	NP	NP	NP	NP	NP	
NAT. MOISTURE					15.6%	35.6%		70.2%	15.3%
ASSHTO CLASS		A-2-4	A-4	A-4	A-4	A-4	A-4	A-4	
F.S.V.		F4	F4	F4	F4	F3	F4	F4	
SOILS DESCRIPTION		GrlSiSa	SaSi	SaSi	SaSi	SaGrlSi	GrlSaSi	SaSi	
SP. G., FINE		2.66		2.69	2.69	2.39	2.56		
SP. G., COARSE									
SULFATE SOUNDNESS									
L.A. ABRASION LOSS									
ORGANIC CONTENT					2.9%	16.8%		5.4%	

SOILS TESTING REPORT

PROJECT NAME Funny River Road Engineering Study PROJECT NO. X14615 CODE NO. X14615

CENTERLINE Materials MATERIAL SITE _____ SAMPLED BY John Fritz

STATION		121+64	128+00	128+00					
OFFSET (FEET)		25' Rt	23' Lt	23' Lt					
DEPTH (FEET)		5'-9'	1.5'-3.5'	8'-11'					
TEST HOLE NO.		BH-10	BH-9	BH-9					
FIELD NO.		FS-21	FS-19	FS-20					
DATE SAMPLED		12/10/80	12/10/80	12/10/80					
LAB NO.	80A-	3441	3439	3440					
ESTIMATED %+10"									
ESTIMATED %+ 3"									
PERCENT PASSING	3"								
	2"			100					
	1"			98					
	3/4"	100		95					
	1/2"	98		88					
	3/8"	96		82					
	# 4	91		74					
	#10	87	100	68					
	#40	77	87	58					
	#50	73	80	54					
	#100	59	71	42					
	#200	46	61	33					
	.02mm	27		24					
	.005mm								
LIQUID LIMIT		NA	30	14					
PLASTIC INDEX		NP	NP	NP					
NAT. MOISTURE		12.1%		7.0%					
ASSHTO CLASS		A-4	A-4	A-2-4					
F.S.V.		F4	F4	F4					
SOILS DESCRIPTION		SaSi	SaSi	SiGrlSa					
SP. G., FINE		2.69		2.67					
SP. G., COARSE									
SULFATE SOUNDNESS									
L.A. ABRASION LOSS									
ORGANIC CONTENT			9.1%						

STATE	PROJECT
ALASKA	X-14615

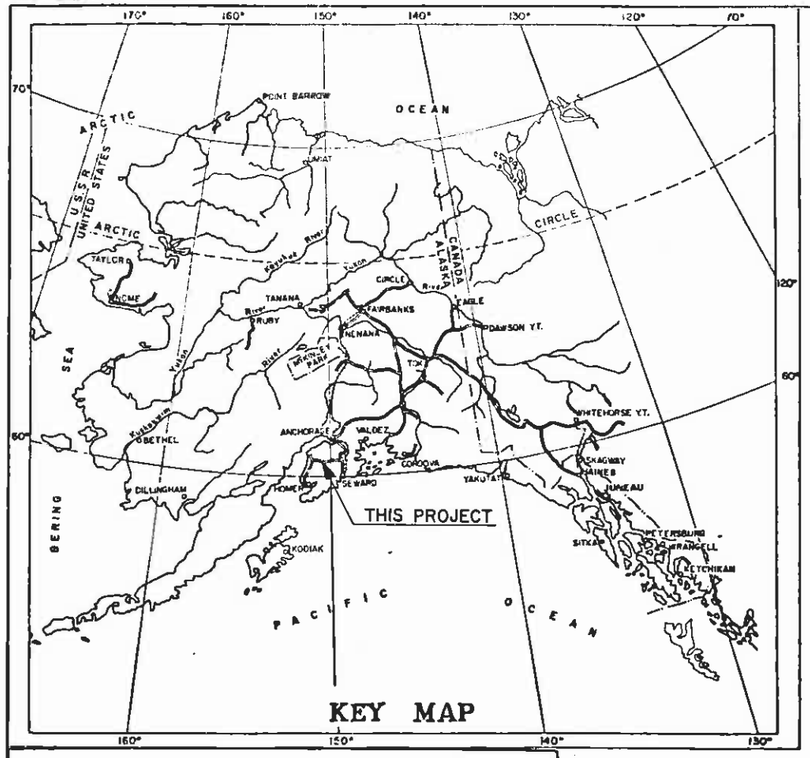
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
&
PUBLIC FACILITIES
SOILS
PLAN AND PROFILE
PROPOSED HIGHWAY PROJECT

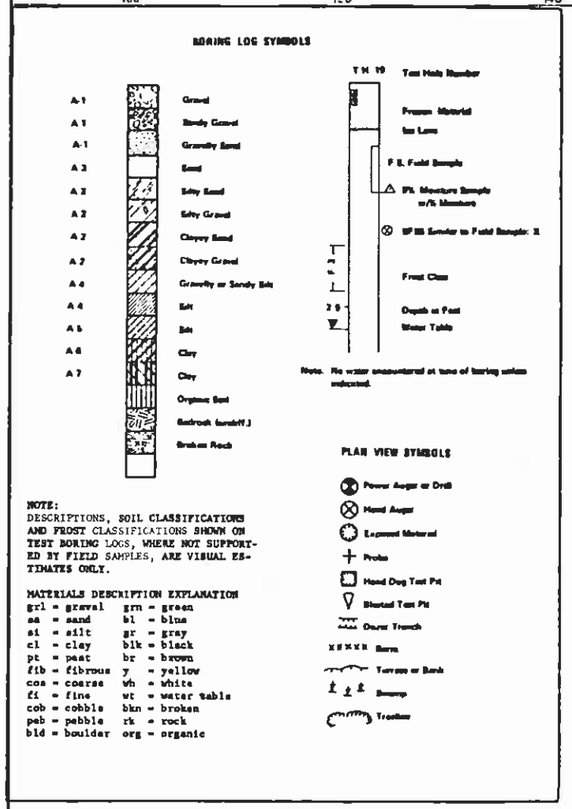
SCOUT LAKE ROAD EXTENSION

X-14615

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2-6	PLAN & PROFILE SHEETS





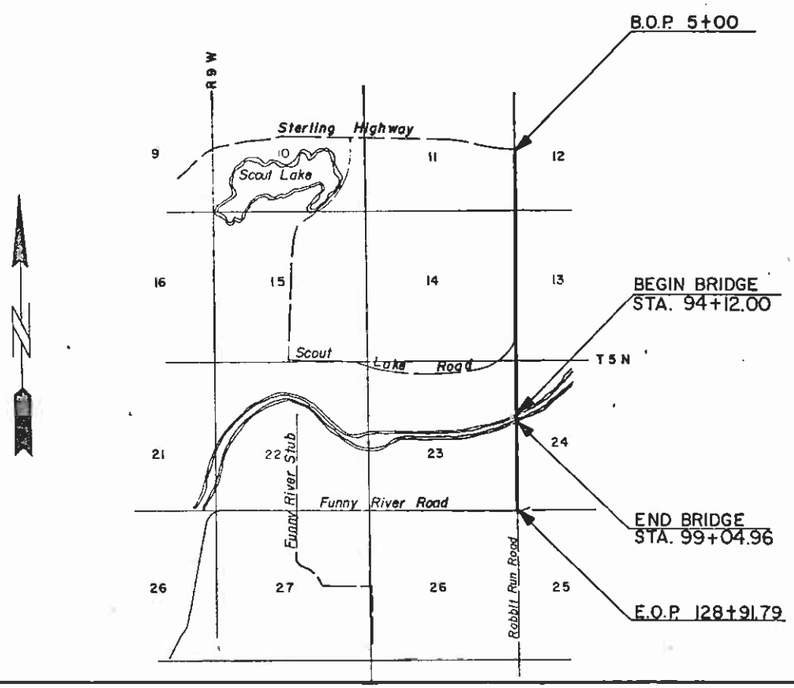
NOTE:
DESCRIPTIONS, SOIL CLASSIFICATIONS AND FROST CLASSIFICATIONS SHOWN ON TEST BORING LOGS, WHERE NOT SUPPORTED BY FIELD SAMPLES, ARE VISUAL ESTIMATES ONLY.

MATERIALS DESCRIPTION EXPLANATION

grl	= gravel	grn	= green
sa	= sand	bl	= blue
si	= silt	gr	= gray
cl	= clay	blk	= black
pt	= peat	br	= brown
fib	= fibrous	y	= yellow
coa	= coarse	wh	= white
fi	= fine	wt	= water table
cob	= cobble	bkn	= broken
peb	= pebble	rk	= rock
bld	= boulder	org	= organic

PROJECT	SUMMARY
WIDTH of SUBBASE	40' ±
LENGTH of GRADING	2.3 Mi
LENGTH of SURFACE	2.3 Mi
LENGTH of BRIDGE	493'
LENGTH of PROJECT	2.4 Mi
WIDTH of SURFACE	36'

DESIGN	DESIGNATION
ADT 1981	
ADT 2001	1000
DHV 1997	150
T	5%
V	55 MPH
D	40-60 %
T1	5.6



RECOMMENDED FOR APPROVAL

_____ DATE _____

CENTRAL REGIONAL ENGINEER

HIGHWAY DESIGN AND CONSTRUCTION

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION
&
PUBLIC FACILITIES

APPROVED

_____ Date _____

REVISIONS			STATE	PROJECT DESIGNATION	YEAR	SHEET NO.
No	Date	Description	ALASKA	X-14615		2

SEC 12

SEC 11

BH 20

BH 21

BH 22

BH 40

BH 23

STERLING HIGHWAY

BEGINNING OF PROJECT
STATION 5+00

STA. 24+00

MATCH LINE

23 + 21.31

10.48 %

Subgrade Profile

Existing Ground

BH 20
STA. 7+00, 5'RT
1/9/81
BROWN SILTY SANDY GRAVEL
F3-37, N.M.=21.3%
A-1-b(0), F2.
GRAY-BROWN SANDY SILT W/ORGANICS,
BROWN SILTY GRAVEL
BROWN SILTY SAND

BH 21
STA. 10+00, 7'RT
1/15/81
BROWN SILTY SANDY GRAVEL
F3-38, A-1-b, F2.
BROWN SANDY SILT
F3-39, A-4(0), F4
BROWN SANDY GRAVELLY SILT
F3-40, A-4(0), F4.

BH 22
STA. 15+00, 5'RT.
1/13/81
BROWN SILTY SANDY GRAVEL
F3-41, A-1-b(0), F2, N.M.=5.3%
BROWN GRAVELLY SILT W/ WOOD FRAGMENTS
BROWN ORGANIC SILT

BH 40
STA. 16+00, 25'RT.
1/14/81
ELEV. 21'
BROWN FIBROUS ORGANIC
F3-85, N.M.=361.5%.
F3-86, N.M.=383.0%.
GRAY SILT

BH 23
STA. 20+00, 6'RT
1/15/81
BROWN SILTY GRAVEL
BROWN-GRAVELLY SAND
F3-42, A-3(0), F2, N.M.=5.7%.
BROWN SANDY GRAVEL W/COBBLES 5-15 %
F3-43, A-1-a, NFS.
BROWN GRAVELLY SAND

260
250
240
230
220
210
200

0
5
10
15
20

Protect Benchmark
USCGS Q-79, Elevation 246.55

TBM #1
in Southeast Quadrant of Sterling Highway
and Scout Lake Road. 60d Spike in
G.P. # 155/1 Elevation 236.76

TBM # 2
Spike in 5". Aspen, Rt of
Sta. 24+00, Elevation 227.98

1 in. = 100ft.
HORIZONTAL AND VERTICAL SCALES

K&E PLATE 1, PLAN-PROFILE
KEUFFEL & ESSER CO.

REVISIONS			STATE	PROJECT DESIGNATION	YEAR
No.	Date	Description	ALASKA	X-14615	

PLAN — SURVEYED, PLOTTED, NOTE BOOK, No., ALIGNMENT CHECKED, BY, DATE

PROFILE — SURVEYED, PLOTTED, NOTE BOOK, No., VERTICAL EXAGGERATION 5 TIMES HORIZONTAL, BY, DATE

STA. 24+00 — MATCH LINE — SEC. 13 — SEC. 14 — 49+61.44 — STA. 54+00 — MATCH LINE

BH 24 · BH 25 · BH 26 · BH 27 · BH 28 · BH 29 · BH 30 · BH 34 · BH 35 · BH 36 · BH 37 · BH 38 · BH 39 · POND · POND

BH 24 STA. 24+00, 7'RT 1/15/81
BROWN SILTY GRAVEL
BROWN SANDY SILT
BROWN GRAVELLY SANDY SILT
BROWN SANDY SILT
BROWN SILTY GRAVELLY SAND
FS-44, A-2-4, F3.

BH 25 STA. 30+00, 6'RT 1/19/81
BROWN SILTY GRAVEL
BROWN SANDY SILT
FS-47, A-2-4, F3, N.M.=32.7%
BROWN SILTY SAND
BROWN GRAVELLY SAND
FS-49, A-3(0), F2.

BH 26 STA. 35+00, 7'RT 1/13/81
BROWN SILTY GRAVEL
BROWN SANDY SILT
@ SFS-45
BROWN SILTY SAND
@ SFS-46
BROWN GRAVELLY SAND

BH 27 STA. 40+00, 7'RT. 1/13/81
BROWN SILTY GRAVEL
BROWN SANDY SILT
@ SFS-47
BROWN SILTY SAND
@ SFS-48
BROWN GRAVELLY SAND

BH 28 STA. 45+00, 4'RT 1/18/81
ELEV. 200
ORGANIC MAT.
BROWN FIBROUS ORGANICS
FS-64, N.M.=286.7%
GRAY SILTY SAND
@ SFS-36
BROWN SILTY GRAVEL
FS-50, A-1(0)
BROWN SANDY SILT
BRN. ORG SANDY SILT
FS-53, N.M.=24.7%
BROWN SILTY SAND
FS-54, A-2-4, F3

BH 29 STA. 48+00, 5'RT 1/18/81
BROWN SILTY GRAVEL
FS-58, N.M.=22.1%
BROWN SILTY SAND
BROWN ORGANIC SANDY SILT
@ SFS-52
GRAY SILTY SAND
@ SFS-34

BH 30 STA. 50+00, 8'RT 1/19/81
ELEV. 205
BROWN SILTY GRAVEL
GRAY-BROWN SILTY SAND
FS-57, A-1-b, F2.
GRAY SILTY SAND
FS-59, A-2-4, F3.

BH 34 STA. 48+50, 50'RT 1/14/81
ELEV. 202
BROWN FINE FIBROUS ORGANIC SILT
GRAY SAND

BH 35 STA. 47+50, 50'RT 1/14/81
ELEV.=195
BROWN FINE FIBROUS ORGANICS
GRAY SILTY SAND
@ SFS-54

BH 36 STA. 48+50, 50'RT 1/18/81
ELEV. 201
VEGETATION (MOSS COVER)
BROWN FIBROUS ORGANICS
FS-60, N.M.=387.5%, DRY=69%
FS-61, N.M.=320.6%
GRAY SILTY SAND
@ SFS-54

BH 37 STA. 48+00, 50'RT 1/14/81
ELEV.=201
ORGANIC MAT.
BROWN FIBROUS ORG.
FS-62, N.M.=282.0%
FS-63, N.M.=402.6%
GRAY GRAVELLY SAND

BH 38 STA. 47+00, 50'LT 1/14/81
ELEV.=198.5
BROWN FIBROUS ORGANICS
GRAY GRAVELLY SAND

BH 39 STA. 47+00, 50'LT 1/14/81
ELEV. 205
BROWN SILTY GRAVEL
GRAY-BROWN SILTY SAND
FS-37, A-1-b, F2.

Existing Ground

TBM = 2
Spike in 5" Aspen, Rt
of Station 24+00
Elevation 227.98

240 230 220 210 200 190

25 30 35 40 45 50 54

K·E PLATE 1, PLAN-PROFILE
Keuffel & Esser Co.

REVISIONS			STATE	PROJECT DESIGNATION	YEAR	SHEET NO.
No.	Date	Description	ALASKA	X-14615		4

CURVE DATA
PI = 67 + 00 "P" Line
Δ = 5° 12' 50"
D = 1°
R = 5729.58'
L = 521.39'
T = 260.87'
S = 0.0250

STA. 54 + 00

64 + 39.13 P.C.

69 + 60.52 P.T.

STA. 84 + 00

MATCH LINE

"P" Line

"O" Line

BH 31 · BH 32 · BH 33 · BH 6 · BH 1 · BH 2 · BH 7 · BH 3

73 + 64.98 P.T.

81 + 42.24 P.T.

MATCH LINE

76 + 91.70 "O" Line

CURVE DATA
PI = 78 + 54.45 "P" Line
Δ = 11° 33' 19"
D = 2°
R = 2864.79'
L = 577.76'
T = 289.97'
S = .0450

VPI 59 + 00
Elev. 220.00
1000' VC

VPI 70 + 00
Elev. 180.70
400' VC

VPI 78 + 00
Elev. 170.00
400' VC

-3.57 %

Subgrade Profile

1.33 %

2.46 %

TBM # 3
Nail in Power Pole
65 + 05 41' Rt
Elevation 187.56

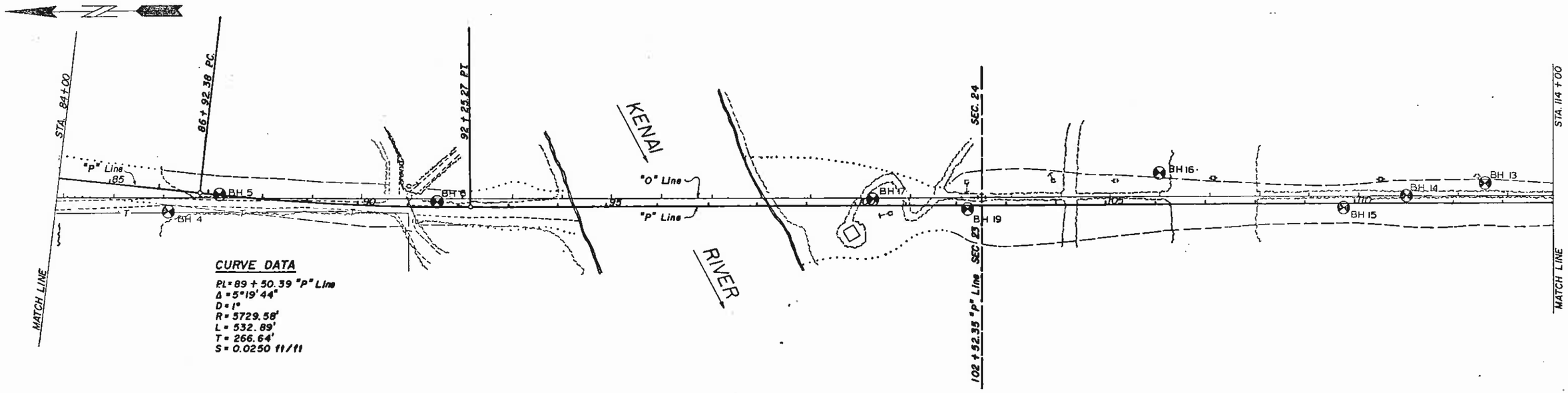
220 · 210 · 200 · 190 · 180 · 170 · 160 · 150 · 140

55 · 60 · 65 · 70 · 75 · 80 · 84

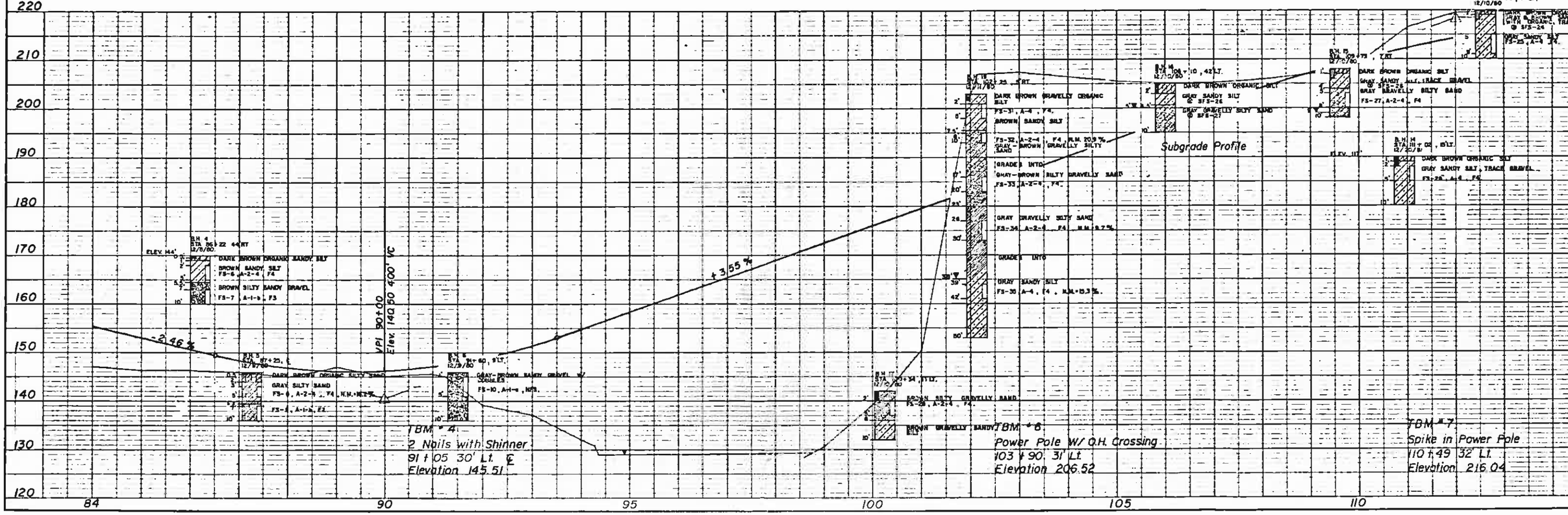
PLATE 1, PLAN-PROFILE

REVISIONS			STATE	PROJECT DESIGNATION	YEAR	SHEET NO.
No	Date	Description	ALASKA	X-14615		5

PLAN — SURVEYED, PLOTTED, NOTE BOOK, No., DRAWN, ALIGNMENT CHECKED, R.O.W. MONUMENTS LOCATED, DATE, BY



PROFILE — SURVEYED, PLOTTED, NOTE BOOK, No., DRAWN, GRADES CHECKED, R.O.W. MONUMENTS LOCATED, DATE, BY



REVISIONS			STATE	PROJECT DESIGNATION	YEAR	SHEET NO.
No.	Date	Description	ALASKA	X-14615		6

PLAN — NOTED — PLOTTED — NOTE BOOK — No. — ALIGNMENT CHECKED — GRADE CHECKED — BY — DATE — STRUCTURE DESIGNATION CHECKED — BY OF WAY CHECKED

STA. 114+00

MATCH LINE

BH 18

BH 11

BH 12

120

BH 10

"P" Line

"O" Line

125

BH 9

24

26

26

130

T

T

B5

RABBIT RUN ROAD

FUNNY RIVER ROAD
128+91.79 "P" Line

END OF PROJECT
STATION 133+91.79

PROFILE — NOTED — PLOTTED — NOTE BOOK — No. — GRADE CHECKED — BY — DATE — STRUCTURE DESIGNATION CHECKED

240
230
220
210
200
190
180
170

Subgrade Profile

BH 12
STA. 115+20.10' RT
12/10/80
DARK BROWN ORGANIC SILT
GRAY & BROWN ORGANIC SANDY SILT
FS-24, A-4, F4, N.M.=15.8%

BH 11
STA. 118+25.55 LT
12/10/80
DARK BROWN SANDY SILT
FS-22, A-4, F4
N.M.=70.2%, ORG 8.4%
@ MS-25 N.M.=15.3%
GRAY SANDY SILT
TRACE GRAVEL

BH 10
STA. 121+07.74 15' RT
12/10/80
DARK BROWN ORGANIC SANDY SILT
@ SFS-19
GREY SANDY SILT
FS-21, A-4, F4
N.M.=12.1%

BH 9
STA. 128+00.38 LT
12/10/80
DARK BROWN SANDY SILT
FS-18, A-4, F4, ORG= 8.1%.
GRAY SILTY GRAVELLY SAND
FS-20, A-2-4, F4, N.M.=7.0%.

BH 18
STA. 116+10.44 LT.
10/20/80
ELEV. 218'
DARK BROWN SANDY GRAVELLY SILT
FS-29, A-4, F3,
N.M.=33.6%, ORG=16.8%*
GRAY GRAVELLY SANDY SILT
FS-30, A-4, F4.

*NOTE: AASHTO CLASSIFICATION MAY BE INAPPROPRIATE DUE TO THE HIGH ORGANIC CONTENT.

TBM
Spike in Power Pole
128 + 38 33' Lt OH
Line Running West
Elevation 223.17

115 120 125 130 135 140

K·E PLATE 1, PLAN PROFILE
KEUFFEL & ESSER CO.